




ESCC QUALIFIED PARTS LIST (QPL)

ESCC/RP/QPL005-171


Updated April 2017



Document Custodian: European Space Agency - see <https://spacecomponents.org>



| | General Information | |
|--|--|---|
| As affected | | |
| Section/Page No. | Description | |
| Section 01 01-02-001-1 01-02-001-2 01-02-002-1A-C 01-02-002-2 01-11-001 | Index of Capacitors Type 1 from AVX/TPC Type 1, Types CEC2S to CEC14S from Exxelia Technologies Type II from AVX/TPC Type II, Types CNC2S and CNC14S from Exxelia Technologies Type 101M, 201M, 400M and 401M from Cobham Microwave | Amended Extended Extended Extended Extended Extended |
| Section 03 03-01-001-3 03-01-002-3 | Index of Crystals TO-5 Can from KVG TO-8 Can from KVG | Amended Deleted Deleted |
| Section 08 08-80-001-2 | Index of Microcircuits 4000B Series from ST Microelectronics | Amended |
| Section 13 13-01-004-1 | Index of Wires and Cables Polyimide, Type SPC from WL Gore | Amended Extended |
| Section 14 14-30-10-006 | Index of Miscellaneous Isolators, Type BE1xE2-105, BG1xE2-206 from Cobham | Amended Added |
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| Change Date: April 2017 | | |






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| Section/Page No. | Description | |
| Section 08 08-08-003 | Index of Microcircuits MH1RT from Microchip Atmel | Amended Revised |
| Section 09 09-01-002 | Index of Relays Type GP5 from Leach Niort | Amended Deleted |
| 09-02-002 | Type GP2 from Leach Niort | Deleted |
| 09-02-006 | Type D from Leach Niort | Deleted |
| 09-02-001 | Type GP250 from Leach Niort | Deleted |
| Section 10 10-11-002 | Index of Resistors Single & Double Layer from Minco | Amended Extended |
| Section 12 12-06-003-1 | Index of Transistors Type STRH40P10 from ST Microelectronics | Amended Extended |
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| Section/Page No. | Description | |
| Section 10 10-09-002A-D | Index of Resistors Type PUR, PFRR; PRAHR/CNWHR from Vishay SA Sfernice | Amended Extended |
| Section 08 08-80-003 | Index of Microcircuits Type MH1RT from Microchip-Atmel | Amended Revised |
| 08-80-004 | Types ATC18RHA, ATF280F and ATF280F from Microchip-Atmel | Revised |
| 08-80-005 | Type ATMX150RHA from Microchip-Atmel | Revised |
| Section 13 13-01-011-1 | Index of Wires and Cables Crosslinked, Modified ETFE, Type Silver-Plated Copper, Lightweight from Tyco Electronics | Amended Extended |
|   | Qualified Parts List | |
| | DOCUMENT CHANGES | |
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| | General Information | |
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| As affected | | |
| Section/Page No. | Description | |
| Section 01 01-01-005 01-01-006 01-02-004-1 | Index of Capacitors Type II, High Capacitance from AVX (N.I.) Type II, Types CNC 31 to CNC 34 from AVX (N.I.) Type II, High Voltage from AVX (N.I.) | Amended Extended Extended Extended |
| Section 08 08-80-001-2 A-E | Index of Microcircuits Digital CMOS 4000B Series from ST Microelectronics | Amended |
| Section 10 10-11-003 | Index of Resistors Single & Double Layer from IRCA | Amended Extended |
|   | Qualified Parts List | |
| | DOCUMENT CHANGES | |
| | | Change Date: January 2017 |


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| Section/Page No. | Description | |
| Section 04 04-02-002-1 04-02-003-1 | Index of Diodes Type STPS20100 from ST Microelectronics Types BYW81, BYV54 from ST Microelectronics | Amended Extended Extended |
| Section 05 05-02-001 | Index of Filters SAW Filters (transversal band pass/resonator/notch/low loss impedance element) from Kongsberg Norspace | Amended Added (QML) |
| Section 08 08-80-003 08-80-004 08-80-005 | Index of Microcircuits Type MH1RT from Atmel Types ATC18RHA, ATF280F and ATF280F from Atmel Type ATMX150RHA from Atmel | Amended Added (QML) Added (QML) Added (QML) |
|  | | <p align="center">Qualified Parts List</p> <p align="center">DOCUMENT CHANGES</p> <hr/> <p align="center">Change Date: December 2016</p> |


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| Section/Page No. | Description | | |
| Section 08 08-90-001 | Index of Microcircuits PWM, based on types ST1843 and ST1845 from STMicroelectronics | Amended Added | |
| Section 09 09-02-004 | Index of Relays Type EL215 from REL STPI | Amended Extended | |
| Section 13 13-01-012-2 13-02-003-2 | Index of Wire and Cables Fluoropolymer, Lightweight based on Type CSWL from WL Gore Symmetric, Quad, Spacewire from WL Gore | Amended Extended Extended | |
|  | | Qualified Parts List | |
| | | DOCUMENT CHANGES | |
| | | Change Date: November 2016 | |

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| As affected | | | |
| Section/Page No. | Description | | |
| Section 09 09-02-001 | Index of Relays Type TL from REL STPI | Amended | Extended |
| Section 12 12-05-003-1 | Index of Transistors Types STRH100N10, STRH40N6, STRH100N6 and STRH8N10 from ST Microelectronics | Amended | Extended |
|   | | Qualified Parts List DOCUMENT CHANGES | |
| | | Change Date: October 2016 | |

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| As affected | | |
| Section/Page No. | Description | |
| Section 01 01-02-002-1 | Index of Capacitors Type II from AVX/TPC | Amended Revised |
| Section 04 04-02-001-4 04-05-001-3 | Index of Diodes Types 1N5819U and 1N5822U from STMicroelectronics Schottky, BAS40, BAS70, BXY42-44 from Infineon | Amended Extended Amended |
| Section 06 06-01-002 | Index of Fuses Type HCSF from Schurter | Amended Extended |
| Section 07 07-01-003 07-02-002 | Index of Inductors Types MSC1 10K 12K, 20K and H01 from Exxelia Magnetics Types SES1 and CMC from Exxelia Magnetics | Amended Amended Amended |
| Section 10 10-07-001 | Index of Resistors Types SMV-PW and SM*-PT from Isabellenhütte | Amended Extended |
| Section 12 12-01-002-3A-B 12-02-002-3A-B | Index of Transistors Types NPN from STMicroelectronics Types PNP from STMicroelectronics | Amended Extended Extended |
| Section 13 13-01-004-2 | Index of Wires and Cables Polyimide, Types SPL from WL Gore | Amended Extended |
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| | | Qualified Parts List |
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| Section/Page No. | Description | |
| Section 02 02-01-001-1 02-05-003-1 02-05-004-1 | Index of Connectors D*M Series, Rectangular from C&K Components MDMA, Rectangular from C&K Components 8MCG, Rectangular from Souriau | Amended Revised Revised Extended |
| Section 05 05-01-001-A-B | Index of Filters Types SFC, SFL, SFP from Exxelia Technologies | Amended Extended |
| Section 06 06-01-002 | Index of Fuses Type MGA-s from Schurter | Amended Extended |
| Section 07 07-01-001 | Index of Inductors Types MSC1 10K, 12K, 20K and H01 from Microspire | Amended Extended |
| Section 12 12-05-003-2 12-06-003-1 | Index of Transistors Type BUY**CS** from Infineon Types STRH40P10 from STMicroelectronics | Amended Amended |
| Section 14 14-16-99 | Index of Miscellaneous Thermostatic, Biometallic from Comepa | Amended Extended |
|  | Qualified Parts List DOCUMENT CHANGES | |
| | Change Date: August 2016 | |

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| Section/Page No. | Description |
| Section 13 13-01-008 | Index of Wires and Cables PTFE, Polyimide/PFA insulated based on Type SPP from WL Gore Amended Extended |
| <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">  <p>ESCC European Space Components Coordination</p> <p>QPL</p> </div> <div style="text-align: center;"> <p>Qualified Parts List</p> <p>DOCUMENT CHANGES</p> <hr/> <p>Change Date: July 2016</p> </div> </div> | |

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| Section/Page No. | Description | |
| Section 04 04-05-001-3 04-16-002-2 04-16-003 | Index of Diodes Schottky, BAS40, BAS70, BXY42 - 44 from Infineon PIN, BXY 42 from Infineon PIN, BXY 43 and 44 from Infineon | Amended Extended Deleted Deleted |
| Section 09 09-01-002 09-01-004-3 09-02-002 09-02-003-3 09-02-006 09-03-001 | Index of Relays Type GP5 from Leach Niort Type M300 from Leach Sarralbe Type GP2 from Leach Niort Type M402 from Leach Sarralbe Type D from Leach Niort Type GP250 from Leach Niort | Amended Amended Extended Amended Extended Amended Amended |
| Section 12 12-16-001 | Index of Transistors Type CFY67, High Electron Mobility from Infineon | Amended Extended |
| Section 13 13-01-003 13-02-001 | Index of Wires and Cables PTFE, Types MTV-BTV From Nexans PTFE/Polyimide, Type 50 CIS from Nexans | Amended Extended Extended |
| Section 14 14-30-10-005 | Index of Miscellaneous Isolators and circulators, Type BK1XXX and BK3XXX from Cobham | Amended Added |
|  | | Qualified Parts List |
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| | General Information | |
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| Section/Page No. | Description | |
| Section 02 02-01-001-2 02-02-001-1 | Index of Connectors D*M Series, Rectangular from Souriau D*MA Series Rectangular from Souriau | Amended Extended Extended |
| Section 04 04-01-003-3 | Index of Diodes Types BAY6642 from Infineon | Amended Deleted |
| Section 12 12-02-002-3A-B 12-05-003-3 12-10-001 12-10-002 12-10-003 12-10-004 12-10-005 | Index of Transistors Types PNP from ST Microelectronics Type BUY15CS from Infineon Type BFY 193 from Infineon Types BFY405,-420 and -450 from Infineon Types BFY640 from Infineon Types BFY640B and BFY650B from Infineon Types BFY640, 640B,650B and 740B from Infineon | Amended Revised Added Extended Extended Deleted Deleted Extended |
| Section 13 13-01-013-1 | Index of Wires and Cables Extra thin, fluoropolymer, Lightweight, based on type CSC from WL Gore | Amended Extended |
|  | Qualified Parts List | |
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| 'A' Qualified Components List | 4 |

1. FOREWORD

This document contains a list of components that have been qualified to the rules of the ESCC System and are intended for use in ESA and other spacecraft and associated equipment in accordance with the requirements of the ECSS Standard ESCC-Q-ST-60.

It is permitted to advertise the ESCC qualification status of a product provided such publicity or advertisement does not state or imply that the product is the only qualified or capability approved one of that particular type, range or family.

2. PROCURORS' RESPONSIBILITY

When procuring ESCC qualified or capability approved components, the procurer is responsible for ensuring that the qualification or capability approval status is valid and that delivered components fulfill the specified requirements of the applicable ESCC specifications. The procurer is advised to utilise the ESCC non-conformance system in the event that a qualified or capability approved manufacturer delivers non-conforming components.

3. USE OF TABLES

3.1 Publication

The individual entries are published in sections within this document and are presented by manufacturer on the web. Please refer to our escies.org website.

3.2 Type Designation

The referenced type (style) designations are derived from industrial standards (i.e., JEDEC PRO-ELECTRON, MIL, IEC and CECC). The purpose is to identify the similarity of a listed qualified component to a standard type designation.

3.3 Components Characteristics

The electrical characteristics are listed for guidance only and, unless otherwise stated, are specified at +25°C. The precise characteristics of the qualified component are defined in the referenced ESCC specification.

3.4 Manufacturer

Plant locations are indicated in the individual listing; contact information is given in full on the appropriate web pages. Please refer to our escies.org website.

4. REVISION PROCEDURE

Amendments to earlier issues of the QPL implemented herein are indicated by the date on the front page and by the content of the "Document Changes" pages. The latter provides the changes over a one year period. The same issue date appears on the table at the start of each Section on the Appendix irrespective of whether changes have been made in a particular section. This indicates the information has been reviewed and is current. Finally, it should be noted that the ESA/SCC System is superseded by the ESCC (European Space Components Coordination) System.



5. TABLE OF QUALIFIED COMPONENTS

Components qualified to the ESCC System are grouped by component type designations. Individual components are listed within the relevant sections as indicated in Table 5.1

TABLE 5.1


| Section | Component Types |
|---------|------------------|
| 01 | Capacitors |
| 02 | Connectors |
| 03 | Crystals |
| 04 | Diodes |
| 05 | Filters |
| 06 | Fuses |
| 07 | Inductors |
| 08 | Microcircuits |
| 09 | Relays |
| 10 | Resistors |
| 11 | Thermistors |
| 12 | Transistors |
| 13 | Wires and Cables |
| 14 | Miscellaneous |
| 18 | Optoelectronics |


APPENDIX A


Qualified Components List


Section 01**Component Type: Capacitors**


| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|--------------|----------------|-------|---|----------------------|
| 01-01 | | | Ceramic, Fixed | |
| | 01-01-005 | 231 K | Type II, High Capacitance | AVX (N.I.) |
| | 01-01-005-1 | 315 B | Type II, Types CNC 31 to CNC 34 | Exxelia Technologies |
| | 01-01-006 | 262 G | Type II, High Voltage | AVX (N.I.) |
| | 01-01-007 | 306 B | Type II, Types CNC 53 to CNC 56 | Exxelia Technologies |
| 01-02 | | | Ceramic, Fixed, Chip | |
| | 01-02-001-1 | 109 N | Type I | AVX/TPC |
| | 01-02-001-2 | 323 B | Type I, Types CEC2S to CEC14S | Exxelia Technologies |
| | 01-02-002-1A-C | 110 N | Type II | AVX/TPC |
| | 01-02-002-2 | 324 B | Type II, Types CNC2S to CNC14S | Exxelia Technologies |
| | 01-02-004-1 | 264 G | Type II, High Voltage | AVX (N.I.) |
| | 01-02-004-3 | 331 | Type II, Types TTP 0603, 0805, 1206, 1210, 1812 | AVX (N.I.) |
| 01-03 | | | Tantalum, (Solid), Fixed, Electrolytic | |
| | 01-03-004 | 196 G | Type TAJ | AVX (CZ) |
| | 01-03-005 | 327 A | Low ESR, Type TES | AVX (CZ) |
| 01-05 | | | Fixed, Film | |
| | 01-05-001-1 | 251 H | Type HT86PS, High Voltage | Exxelia Technologies |
| | 01-05-003-1 | 270 F | Type PM94S | Exxelia Technologies |
| | 01-05-004-1 | 338 | Type PM907S and PM948S | Exxelia Technologies |
| 01-11 | | | Semiconductor | |
| | 01-11-001 | 286 D | Type 101M, 201M, 400M and 401M | Cobham Microwave |


| | | | | |
|---|--|---|-----------------------------------|------------------------------------|
| Types covered by similarity: ±20% tolerance | | Remarks: Capacitors no longer use a varnish finish. | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3001 Detail ESCC 3001/030 | AVX Limited Coleraine Northern Ireland | Qualification | UK Space Agency | Jul 1996 |
| <p>Characteristics: E12 series</p> <p>Qualified Range:</p> <p>Variants 01 to 74 capacitance range for 50V, 100V and 200V, as per Detail Specification Variants 01 to 52, and 59 to 60, for 500V are qualified ±10% tolerance</p> <p>Operating Temperature Range (°C): -55 to +125</p> | | | | |
|  | <p>CAPACITORS, CERAMIC, TYPE II, HIGH CAPACITANCE, BASED ON CASE STYLES BR, CV, AND CH</p> | | <p>Certificate 231 K</p> | <p>Page 01-01 005</p> |

| | | | | |
|---|--|--------------------|--------------------------|----------------------------|
| Types covered by similarity: E6 ±20% tolerance | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3001 Detail ESCC 3001/037 | Exxelia Technologies Chanteloup en Brie France | Qualification | CNES | Nov 2011 |
| Characteristics: E12 ±10% tolerance Qualified Range: Variants 01 to 16. 16V : 2.2 to 68 µF 25V: 1.2 to 39 µF DIL format with equal number of leads per side Lead material : type A with type 10 finish (electro-deposited 98% Ag min.) Operating Temperature Range (°C): -55 to +125 | | | | |
|  | CAPACITORS, CERAMIC, TYPE II, MULTIPLE LAYERS, BASED ON TYPES CNC 31 to 34, NE, PE AND PLE | | Certificate 315 B | Page 01-01 005-1 |

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|---|---|--------------------|-----------------------------------|------------------------------------|
| Types covered by similarity: ±20% tolerance | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3001 Detail ESCC 3001/034 | AVX Limited Coleraine Northern Ireland | Qualification | UK Space Agency | Sep 2000 |
| <p>Characteristics: E12 series</p> <p>Qualified Range:</p> <p>Variants 01 to 22 are qualified ±10% tolerance</p> <p>Operating Temperature Range (°C): -55 to +125</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>CAPACITORS, CERAMIC, TYPE II, HIGH VOLTAGE, 1.0 TO 5.0 KV, BASED ON CASE STYLES VR, CV, AND CH</p> | | <p>Certificate 262 G</p> | <p>Page 01-01 006</p> |

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|--|--|--------------------|--------------------------|----------------------------|
| Types covered by similarity: E6: ±20% tolerance | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3001 Detail ESCC 3001/038 | Exxelia Technologies Chanteloup en Brie France | Qualification | CNES | Mar 2011 |
| Characteristics: Qualified Range: Variants 01 to 04, 08 to 11, 15 to 18 and 22 to 25 are qualified All values 50V to 500V E12: ±10% tolerance Operating Temperature Range (°C): -55 to +125 | | | | |
|  | CAPACITORS, CERAMIC, TYPE II, 50V TO 500V, BASED ON TYPES CNC53 TO CNC56 | | Certificate 306 B | Page 01-01 007 |

| Types covered by similarity: Tolerance (\pm): 0.5pF; 2, 5, 20% | | | | | Remarks: Variant 01 removed | | | |
|---|-------|--------------|--|-------------------------------------|-----------------------------|--------------------------|------------------------|----------------------------|
| Procurement Specifications | | | | Manufacturer | | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3009 Detail ESCC 3009/003 3009/004 3009/005 3009/006 3009/022 | | | | AVX/TPC St Apollinaire France | | Qualification | CNES | Feb 1983 |
| Characteristics: Operating Temp. Range ($^{\circ}$ C), -55 to +125 Variants 03 and 06 are qualified Values covered by ESCC Specifications defined below. | | | | | | | | |
| Style | Model | Detail Spec. | Variants | Capacitance Range (pF) | Rated Volt. (V) | Tolerance (\pm %) | TC (ppm/ $^{\circ}$ C) | |
| 0805 | A_12C | 3009/003 | 03, 06 | 4.7 to 9.1 10 to 1 500 | 50, 100 50, 100 | 0.5pF 1, 2, 5, 10 | \pm 30 | |
| 1206 | A_20C | 3009/022 | 03, 06 | 10 to 3 900 | 50, 100 | 1, 2, 5, 10 | \pm 30 | |
| 1210 | A_13C | 3009/004 | 03, 06 | 22 to 6 800 8 200 to 10 000 | 50, 100 50 | 1, 2, 5, 10 | \pm 30 | |
| 1812 | A_14C | 3009/005 | 03, 06 | 100 to 15 000 | 50, 100 | 1, 2, 5, 10 | \pm 30 | |
| 2220 | A_15C | 3009/006 | 03, 06 | 470 to 33 000 | 50, 100 | 1, 2, 5, 10 | \pm 30 | |
|  | | | CAPACITORS, CERAMIC, FIXED, CHIP, TYPE I | | | Certificate 109 N | | Page 01-02 001-1 |

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|--|--|--------------------|--------------------------|-----------------------------|
| Types covered by similarity: Tolerance (\pm): <10pF; 0.25– 0.5-1pF; \geq 10pF; 1, 2, 5, 10% | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3009 Detail ESCC 3009/003 3009/004 3009/005 3009/006 3009/022 3009/037 | Exxelia Technologies Chanteloup en Brie France | Qualification | CNES | Oct 2012 |
| Characteristics: Variant 06 is qualified See Table on next page Operating Temp. Range ($^{\circ}$ C), -55 to +125 | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | CAPACITORS, CERAMIC, FIXED, CHIP, TYPE I | | Certificate 323 B | Page 01-02 001-2A |

Characteristics:


| Style | Model | Detail Spec. | Variants | Capacitance Range (pF) | Rated Volt. (V) | Tol. (±%) | | |
|-------|--------|--------------|----------|------------------------|-----------------|---------------------------|----------------------|--|
| 0805 | CEC2S | 3009/003 | 06 | 10 to 2 700 | 16 | <10pF 0.25—0.5 -1 (pF) | | |
| | | | | 10 to 2 200 | 25 | | | |
| | | | | 1 to 1 800 | 50 | | | |
| | | | | 1 to 1 200 | 100 | | | |
| 1210 | CEC4S | 3009/004 | 06 | 10 to 15 000 | 16 | | ≥10pF 1, 2, 5, 10 | |
| | | | | 10 to 13 000 | 25 | | | |
| | | | | 10 to 12 000 | 50 | | | |
| | | | | 10 To 6 800 | 100 | | | |
| 1812 | CEC6S | 3009/005 | 06 | 100 to 33 000 | 16 | | | |
| | | | | 100 to 30 000 | 25 | | | |
| | | | | 100 to 22 000 | 50 | | | |
| | | | | 100 to 12 000 | 100 | | | |
| 2220 | CEC7S | 3009/006 | 06 | 470 to 68 000 | 16 | | | |
| | | | | 470 to 56 000 | 25 | | | |
| | | | | 470 to 47 000 | 50 | | | |
| | | | | 470 to 27 000 | 100 | | | |
| 1206 | CEC12S | 3009/022 | 06 | 10 to 6 800 | 16 | | | |
| | | | | 10 to 6 200 | 25 | | | |
| | | | | 1 to 5 600 | 50 | | | |
| | | | | 1 to 3 900 | 100 | | | |
| 0603 | CEC14S | 3009/037 | 06 | 10 to 1 000 | 16 | | | |
| | | | | 10 to 680 | 25 | | | |
| | | | | 1 to 560 | 50 | | | |
| | | | | 1 to 330 | 100 | | | |



CAPACITORS,
CERAMIC, FIXED,
CHIP, TYPE I

Certificate
323 B

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01-02
001-2B

| | | | | |
|--|---|-----------------------------|--------------------------|-----------------------------|
| Types covered by similarity: Tolerance ($\pm\%$): 10, 20% | | Remarks: Variant 01 deleted | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3009 Detail ESCC 3009/008 3009/009 3009/010 3009/011 3009/023 | AVX/TPC St Apollinaire France | Qualification | CNES | Feb 1983 |
| Characteristics: See Table on next page Operating Temperature Range ($^{\circ}\text{C}$), -55 to +125 | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | CAPACITORS, CERAMIC, FIXED, CHIP, TYPE II | | Certificate 110 N | Page 01-02 002-1A |

| Characteristics: | Style | Model | Detail Spec. | Variants | Capacitance Range (pF) | | | Rated Volt. (V) | Tol. (±%) |
|------------------|-------|----------|--------------|----------|------------------------|-----------|---------|-----------------|-----------|
| | 0805 | A_12G | 3009/008 | 03, 06 | 820 | to | 47 000 | 25 | 5, 10, 20 |
| | | | | | 820 | to | 27 000 | 50 | 5, 10, 20 |
| | | | | | 820 | to | 10 000 | 100 | 5, 10, 20 |
| | 0805 | A612Z | 3009/008 | 07 | 2 700 | to | 100 000 | 25 | 5, 10, 20 |
| | | | | | 2 700 | to | 100 000 | 50 | |
| | | | | | 2 700 | To | 47 000 | 100 | |
| | | | | | 330 | to | 15 000 | 200 | |
| | 1210 | A_13G | 3009/009 | 03, 06 | 3 900 | to | 220 000 | 25 | 5, 10, 20 |
| | | | | | 3 900 | to | 150 000 | 50 | 5, 10, 20 |
| 3 900 | | | | | to | 47 000 | 100 | 5, 10, 20 | |
| 1210 | A613Z | 3009/009 | 07 | 3 900 | to | 470 000 | 25 | 5, 10, 20 | |
| | | | | 3 900 | to | 330 000 | 50 | | |
| | | | | 3 900 | to | 220 000 | 100 | | |
| | | | | 680 | to | 68 000 | 200 | | |
| 1812 | A_14G | 3009/010 | 03, 06 | 6 800 | to | 470 000 | 25 | 5, 10, 20 | |
| | | | | 6 800 | to | 270 000 | 50 | 5, 10, 20 | |
| | | | | 6 800 | to | 82 000 | 100 | 5, 10, 20 | |
| 1812 | A614Z | 3009/010 | 07 | 22 000 | to | 1 000 000 | 25 | 5, 10, 20 | |
| | | | | 22 000 | to | 680 000 | 50 | | |
| | | | | 22 000 | to | 470 000 | 100 | | |
| | | | | 3 300 | to | 150 000 | 200 | | |
| 2220 | A_15G | 3009/011 | 03, 06 | 18 000 | to | 1 000 000 | 25 | 5, 10, 20 | |
| | | | | 18 000 | to | 680 000 | 50 | 5, 10, 20 | |
| | | | | 18 000 | to | 180 000 | 100 | 5, 10, 20 | |
| 2220 | A615Z | 3009/011 | 07 | 100 000 | to | 2 200 000 | 25 | 5, 10, 20 | |
| | | | | 100 000 | To | 1 500 000 | 50 | | |
| | | | | 100 000 | To | 1 000 000 | 100 | | |
| | | | | 6 800 | to | 330 000 | 200 | | |



CAPACITORS,
CERAMIC, FIXED,
CHIP, TYPE II

Certificate

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Characteristics:

| Style | Model | Detail Spec. | Variants | Capacitance Range (pF) | | | Rated Volt. (V) | Tol. (±%) |
|-------|-------|--------------|----------|------------------------|----|---------|-----------------|-----------|
| 1206 | A_20G | 3009/023 | 03, 06 | 2 200 | to | 100 000 | 25 | 5, 10, 20 |
| | | | | 2 200 | to | 68 000 | 50 | 5, 10, 20 |
| | | | | 2 200 | to | 22 000 | 100 | 5, 10, 20 |
| 1206 | A620Z | 3009/023 | 07 | 3 300 | to | 220 000 | 25 | 5, 10, 20 |
| | | | | 3 300 | to | 150 000 | 50 | |
| | | | | 3 300 | To | 100 000 | 100 | |
| | | | | 470 | to | 47 000 | 200 | |




CAPACITORS,
 CERAMIC, FIXED,
 CHIP, TYPE II

Certificate

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| Types covered by similarity: Tolerance ($\pm\%$): 10, 20% | | | | | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------|-------|---|--|------------------------|--------------------|--------------------------|-----------------------|-----------------------------|--|-------|-------|--------------|----------|------------------------|--|-----------------|------------------|--|------|-------|----------|----|-------|------------|----|-----------|--|--|--|--|--|-------|------------|----|--|--|--|--|--|-----|-----------|----|--|--|--|--|--|----|-----------|-----|------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|----|-------|------------|----|-----------|--|--|--|--|--|-------|------------|----|--|--|--|--|--|-----|------------|----|--|--|--|--|--|----|-----------|-----|
| Procurement Specifications | | | | Manufacturer | | Nature of Approval | | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 3009 Detail ESCC 3009/008 3009/009 3009/010 3009/011 3009/023 3009/038 3009/039 | | | | Exxelia Technologies Chanteloup en Brie France | | Qualification | | CNES | Oct 2012 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Characteristics: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2"></th> <th>Style</th> <th>Model</th> <th>Detail Spec.</th> <th>Variants</th> <th colspan="2">Capacitance Range (pF)</th> <th>Rated Volt. (V)</th> <th>Tol. ($\pm\%$)</th> </tr> </thead> <tbody> <tr> <td></td> <td>0805</td> <td>CNC2S</td> <td>3009/008</td> <td>06</td> <td>6 800</td> <td>to 150 000</td> <td>16</td> <td rowspan="4">5, 10, 20</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>6 800</td> <td>to 100 000</td> <td>25</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>100</td> <td>to 47 000</td> <td>50</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>68</td> <td>to 10 000</td> <td>100</td> </tr> <tr> <td colspan="10">Table continues on next page</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>07</td> <td>6 800</td> <td>to 220 000</td> <td>16</td> <td rowspan="4">5, 10, 20</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>6 800</td> <td>to 150 000</td> <td>25</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>100</td> <td>to 100 000</td> <td>50</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>68</td> <td>to 47 000</td> <td>100</td> </tr> </tbody> </table> | | | | | | | | | | | Style | Model | Detail Spec. | Variants | Capacitance Range (pF) | | Rated Volt. (V) | Tol. ($\pm\%$) | | 0805 | CNC2S | 3009/008 | 06 | 6 800 | to 150 000 | 16 | 5, 10, 20 | | | | | | 6 800 | to 100 000 | 25 | | | | | | 100 | to 47 000 | 50 | | | | | | 68 | to 10 000 | 100 | Table continues on next page | | | | | | | | | | | | | | 07 | 6 800 | to 220 000 | 16 | 5, 10, 20 | | | | | | 6 800 | to 150 000 | 25 | | | | | | 100 | to 100 000 | 50 | | | | | | 68 | to 47 000 | 100 |
| | Style | Model | Detail Spec. | Variants | Capacitance Range (pF) | | Rated Volt. (V) | Tol. ($\pm\%$) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 0805 | CNC2S | 3009/008 | 06 | 6 800 | to 150 000 | 16 | 5, 10, 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 6 800 | to 100 000 | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 100 | to 47 000 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 68 | to 10 000 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Table continues on next page | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 07 | 6 800 | to 220 000 | 16 | 5, 10, 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 6 800 | to 150 000 | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 100 | to 100 000 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 68 | to 47 000 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating Temperature Range ($^{\circ}\text{C}$), -55 to +125 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | CAPACITORS, CERAMIC, FIXED, CHIP, TYPE II | | | | Certificate 324 B | | Page 01-02 002-2A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Characteristics: | Style | Model | Detail Spec. | Variants | Capacitance Range (pF) | | | Rated Volt. (V) | Tol. (±%) |
|------------------|----------|----------|--------------|--|---|-----------------------|-----------|-----------------|-----------|
| | 0805 | CNC2 04S | 3009/039 | 02 | 6 800 to 150 000 6 800 to 100 000 100 to 47 000 68 to 10 000 | 16 25 50 100 | 5, 10, 20 | | |
| | | | 14 | 6 800 to 390 000 6 800 to 150 000 100 to 100 000 68 to 47 000 | 16 25 50 100 | 5, 10, 20 | | | |
| 1210 | CNC4S | 3009/009 | 06 | 33 000 to 560 000 33 000 to 330 000 | 16 25 | 5, 10, 20 | | | |
| | CNC4 04S | 3009/039 | 04 | 2 200 to 220 000 2 200 to 56 000 | 50 100 | | | | |
| | CNC4S | 3009/009 | 07 | 33 000 to 820 000 33 000 to 560 000 | 16 25 | 5, 10, 20 | | | |
| | CNC4 04S | 3009/039 | 16 | 2 200 to 390 000 2 200 to 220 000 | 50 100 | | | | |
| 1812 | CNC6S | 3009/010 | 06 | 100 000 to 1 200 000 100 000 to 680 000 | 16 25 | 5, 10, 20 | | | |
| | CNC6 04S | 3009/039 | 05 | 3 900 to 470 000 3 900 to 120 000 | 50 100 | | | | |
| | CNC6S | 3009/010 | 07 | 100 000 to 1 800 000 100 000 to 1 200 000 | 16 25 | 5, 10, 20 | | | |
| | CNC6 04S | 3009/039 | 17 | 3 900 to 820 000 3 900 to 470 000 | 50 100 | | | | |
| 2220 | CNC7S | 3009/011 | 06 | 150 000 to 2 700 000 150 to 1 500 000 | 16 25 | 5, 10, 20 | | | |
| | CNC7 04S | 3009/039 | 06 | 22 000 to 1 000 000 22 000 to 270 000 | 50 100 | | | | |
| | CNC7S | 3009/011 | 07 | 150 000 to 3 900 000 150 000 to 2 200 000 | 16 25 | 5, 10, 20 | | | |
| | CNC7 04S | 3009/039 | 18 | 22 000 to 1 800 000 22 000 to 1 000 000 | 50 100 | | | | |
| 1206 | CNC12S | 3009/023 | 06 | 10 000 to 270 000 10 000 to 180 000 470 to 82 000 470 to 27 000 | 16 25 50 100 | 5, 10, 20 | | | |
| | | | 07 | 10 000 to 390 000 10 000 to 270 000 470 to 180 000 470 to 120 000 | 16 25 50 100 | | | | |



CAPACITORS,
CERAMIC, FIXED,
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Characteristics:


| Style | Model | Detail Spec. | Variants | Capacitance Range (pF) | | | Rated Volt. (V) | Tol. (±%) |
|-------|-----------|--------------|----------|------------------------|----|-----------|-----------------|-----------|
| 1206 | CNC12 04S | 3009/039 | 03 | 10 000 | to | 270 000 | 16 | 5, 10, 20 |
| | | | | 10 000 | to | 180 000 | 25 | |
| | | | | 470 | to | 82 000 | 50 | |
| | | | | 470 | to | 27 000 | 100 | |
| | | | 15 | 10 000 | to | 1 000 000 | 16 | 5, 10, 20 |
| | | | | 10 000 | to | 270 000 | 25 | |
| | | | | 470 | to | 180 000 | 50 | |
| | | | | 470 | to | 120 000 | 100 | |
| 0603 | CNC14S | 3009/038 | 06 | 390 | to | 33 000 | 16 | 5, 10, 20 |
| | | | | 390 | to | 22 000 | 25 | |
| | | | | 10 | to | 10 000 | 50 | |
| | | | | 10 | to | 2 700 | 100 | |
| | | | 07 | 390 | to | 39 000 | 16 | 5, 10, 20 |
| | | | | 390 | to | 33 000 | 25 | |
| | | | | 10 | to | 22 000 | 50 | |
| | | | | 10 | to | 12 000 | 100 | |
| 0603 | CNC14 04S | 3009/039 | 01 | 390 | to | 33 000 | 16 | 5, 10, 20 |
| | | | | 390 | to | 22 000 | 25 | |
| | | | | 10 | to | 10 000 | 50 | |
| | | | | 10 | to | 2 700 | 100 | |
| | | | 13 | 390 | to | 100 000 | 16 | 5, 10, 20 |
| | | | | 390 | to | 33 000 | 25 | |
| | | | | 10 | to | 22 000 | 50 | |
| | | | | 10 | to | 12 000 | 100 | |





CAPACITORS,
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| Types covered by similarity: ±20% tolerance | | | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--------------------|--|-----------|---|-----------------------|--------------------------------------|-------|--------------------|------------------------|-----------|------|-----|-----------------|----|-----|----------------|----|-----|--------------|----|------|-----|------------------|----|-----|----------------|----|-----|--------------|----|
| Procurement Specifications | | Manufacturer | | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 3009 Detail ESCC 3009/034 | | AVX Limited Coleraine Northern Ireland | | Qualification | UK Space Agency | Feb 2001 | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Characteristics: E12 series</p> <p>Qualified Range: Variants 01 to 12 are qualified</p> <p>Terminations: Variants 01 to 12: metallised pads</p> <p>Operating Temperature Range (°C):-55 to +125</p> | | | | <table border="1"> <thead> <tr> <th>Style</th> <th>Rated Voltage (kV)</th> <th>Capacitance Range (pF)</th> <th>Tol. (±%)</th> </tr> </thead> <tbody> <tr> <td rowspan="3">1812</td> <td>1.0</td> <td>3 900 to 22 000</td> <td>10</td> </tr> <tr> <td>2.0</td> <td>1 500 to 1 800</td> <td>10</td> </tr> <tr> <td>3.0</td> <td>820 to 1 000</td> <td>10</td> </tr> <tr> <td rowspan="3">1825</td> <td>1.0</td> <td>27 000 to 56 000</td> <td>10</td> </tr> <tr> <td>2.0</td> <td>2 200 to 6 800</td> <td>10</td> </tr> <tr> <td>3.0</td> <td>820 to 2 700</td> <td>10</td> </tr> </tbody> </table> | | | Style | Rated Voltage (kV) | Capacitance Range (pF) | Tol. (±%) | 1812 | 1.0 | 3 900 to 22 000 | 10 | 2.0 | 1 500 to 1 800 | 10 | 3.0 | 820 to 1 000 | 10 | 1825 | 1.0 | 27 000 to 56 000 | 10 | 2.0 | 2 200 to 6 800 | 10 | 3.0 | 820 to 2 700 | 10 |
| Style | Rated Voltage (kV) | Capacitance Range (pF) | Tol. (±%) | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1812 | 1.0 | 3 900 to 22 000 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2.0 | 1 500 to 1 800 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3.0 | 820 to 1 000 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1825 | 1.0 | 27 000 to 56 000 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2.0 | 2 200 to 6 800 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3.0 | 820 to 2 700 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | <p>CAPACITORS, FIXED, CHIP, CERAMIC, TYPE II, HIGH VOLTAGE, BASED ON 1812 and 1825</p> | | <p>Certificate 264 G</p> | | <p>Page 01-02 004-1</p> | | | | | | | | | | | | | | | | | | | | | | | | |


| | | | | |
|--|---|--------------------|---------------------------------|--------------------------------------|
| Types covered by similarity: Capacitance tolerances 5%, 10%, 20% | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3009 Detail ESCC 3009/041 | AVX Limited Coleraine Northern Ireland | Qualification | ESA | April 2015 |
| <p>Characteristics: E12 value series</p> <p>Qualified Range: Variant 02 0603, Cn as in Detail specification, 5%, 10%, 20% tolerances, 16V, 25V, 50V, 100V rated Variant 03 0805, Cn as in Detail specification, 5%, 10%, 20% tolerances, 16V, 25V, 50V, 100V rated Variant 04 1206, Cn as in Detail specification, 5%, 10%, 20% tolerances, 16V, 25V, 50V, 100V rated Variant 05 1210, Cn as in Detail specification, 5%, 10%, 20% tolerances, 16V, 25V, 50V, 100V rated Variant 06 1812, Cn as in Detail specification, 5%, 10%, 20% tolerances, 16V, 25V, 50V, 100V rated</p> <p>Terminations: Cu and Ag-loaded epoxy + Ni barrier+ Sn/Pb plating finish (10% Pb minimum) Operating Temperature Range (°C):-55 to +125</p> | | | | |
|  | <p>CAPACITORS, FIXED, CHIP, BASE METAL ELECTRODE, CERAMIC DIELECTRIC TYPE II, BASED ON TYPE TTP, 0603, 0805, 1206, 1210, 1812</p> | | <p>Certificate 331</p> | <p>Page 01-02 004-2</p> |


| | | | | |
|--|--|--------------------|-----------------------------------|------------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3012 Detail ESCC 3012/001 | AVX Czech Republic sro Tantalum Division Lanskroun Czech Republic | Qualification | ESA | Jun 1993 |
| <p>Characteristics:</p> <p>Variants 01 to 07 and 11 to 17 are qualified</p> <p>Termination finish:</p> <ul style="list-style-type: none"> A and B case sizes are available in NILO only, e.g., <ul style="list-style-type: none"> Variant 01 (A case), Variant 02 (B case) C, D, E case sizes are available as Copper only, e.g., <ul style="list-style-type: none"> Variant 13 (C case), Variant 14 (D case), Variant 17 (E case) | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>CAPACITORS, LEADLESS SURFACE MOUNTED, TANTALUM, SOLID ELECTROLYTE, TYPE TAJ</p> | | <p>Certificate 196 G</p> | <p>Page 01-03 004</p> |

| Types covered by similarity: All CV product combinations allowed in 3012/004 are qualified | | | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------------|--|------|--------------------|--------------------------|----------------------------|------------------------------------|---------------------|--|--|--|--|--|--|--|------|-----|-----|-----|-----|-----|-----|-----|---|--|--|--|--|--|--------|--|--------|-----|--|--|--|--|--------|--|--------|--------|-----|--|--|--|--------|--|--------|-------|-------|----|--|--------|--|--|--------|-------|-------|--|----|-------|--|--|-------|-------|--|-------|--|----|--|-------|--|--|-------|------|------|--|----|-------|--|--|-------|------|------|--|--|-----|--|-------|--|------|------|--|--|--|-----|-------|------|--|------|--|--|--|--|-----|--|------|------|--|--|--|--|--|-----|------|------|--|--|--|--|--|--|-----|------|--|--|--|--|--|--|--|
| Procurement Specifications | | Manufacturer | | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 3012 Detail ESCC 3012/004 | | AVX Czech Republic sro Tantalum Division Lanskrout Czech Republic | | Qualification | ESA | Oct 2013 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Variants 01 to 05. Case styles A (1206), B (1210), C (2312), D (2917), E (2917) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th rowspan="2">Capacitance C_n (μF)</th> <th colspan="8">Rated Voltage U_R</th> </tr> <tr> <th>6.3V</th> <th>10V</th> <th>12V</th> <th>16V</th> <th>20V</th> <th>25V</th> <th>35V</th> <th>50V</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>A 3000</td> <td></td> <td>B 2000</td> </tr> <tr> <td>3.3</td> <td></td> <td></td> <td></td> <td></td> <td>A 2500</td> <td></td> <td>B 1000</td> <td>C 1000</td> </tr> <tr> <td>4.7</td> <td></td> <td></td> <td></td> <td>A 2000</td> <td></td> <td>B 1000</td> <td>C 600</td> <td>D 200</td> </tr> <tr> <td>10</td> <td></td> <td>A 1800</td> <td></td> <td></td> <td>B 1000</td> <td>C 600</td> <td>D 120</td> <td></td> </tr> <tr> <td>22</td> <td>A 900</td> <td></td> <td></td> <td>B 600</td> <td>C 400</td> <td></td> <td>D 100</td> <td></td> </tr> <tr> <td>33</td> <td></td> <td>B 650</td> <td></td> <td></td> <td>C 300</td> <td>D 65</td> <td>E 65</td> <td></td> </tr> <tr> <td>47</td> <td>B 500</td> <td></td> <td></td> <td>C 350</td> <td>D 55</td> <td>E 65</td> <td></td> <td></td> </tr> <tr> <td>100</td> <td></td> <td>C 200</td> <td></td> <td>D 55</td> <td>E 45</td> <td></td> <td></td> <td></td> </tr> <tr> <td>150</td> <td>C 300</td> <td>D 45</td> <td></td> <td>E 40</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>220</td> <td></td> <td>D 35</td> <td>E 35</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>330</td> <td>D 35</td> <td>E 35</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>470</td> <td>E 30</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | | | | | | | Capacitance C_n (μ F) | Rated Voltage U_R | | | | | | | | 6.3V | 10V | 12V | 16V | 20V | 25V | 35V | 50V | 1 | | | | | | A 3000 | | B 2000 | 3.3 | | | | | A 2500 | | B 1000 | C 1000 | 4.7 | | | | A 2000 | | B 1000 | C 600 | D 200 | 10 | | A 1800 | | | B 1000 | C 600 | D 120 | | 22 | A 900 | | | B 600 | C 400 | | D 100 | | 33 | | B 650 | | | C 300 | D 65 | E 65 | | 47 | B 500 | | | C 350 | D 55 | E 65 | | | 100 | | C 200 | | D 55 | E 45 | | | | 150 | C 300 | D 45 | | E 40 | | | | | 220 | | D 35 | E 35 | | | | | | 330 | D 35 | E 35 | | | | | | | 470 | E 30 | | | | | | | |
| Capacitance C_n (μ F) | Rated Voltage U_R | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 6.3V | 10V | 12V | 16V | 20V | 25V | 35V | 50V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | | | | | | A 3000 | | B 2000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.3 | | | | | A 2500 | | B 1000 | C 1000 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4.7 | | | | A 2000 | | B 1000 | C 600 | D 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | A 1800 | | | B 1000 | C 600 | D 120 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | A 900 | | | B 600 | C 400 | | D 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | | B 650 | | | C 300 | D 65 | E 65 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 47 | B 500 | | | C 350 | D 55 | E 65 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 100 | | C 200 | | D 55 | E 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 150 | C 300 | D 45 | | E 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 220 | | D 35 | E 35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 330 | D 35 | E 35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 470 | E 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | CAPACITORS, LEADLESS SURFACE MOUNTED, TANTALUM, SOLID ELECTROLYTE, LOW ESR, TYPE TES | | | Certificate 327 A | | Page 01-03 005 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Types covered by similarity: | | | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----|---|--|---------------------|----------------------------|-----------|---------------------|----|----|-------|----|-----|----|----|-------|----|-----|----|----|-------|----|-----|-----|----|-----|----|-----|-----|----|-----|----|-----|-----|----|-----|----|------|-----|----|----|----|------|-----|----|----|----|------|------|----|----|----|------|------|--|
| Procurement Specifications | | | Manufacturer | | Nature of Approval | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 3006 | | | Exxelia Technologies Chanteloup en Brie France | | Supervising Authority | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Detail ESCC 3006/022 | | | | | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Characteristics: Operating Temperature Range, (°C): -55 to +125 All values defined by the ESCC Detail Specification | | | Qualification | | Aug 1998 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th colspan="3">Capacitance Range (nF)</th> <th>Tol. (±%)</th> <th>U_R(kV)</th> </tr> </thead> <tbody> <tr> <td>33</td> <td>to</td> <td>2 200</td> <td>10</td> <td>1.5</td> </tr> <tr> <td>15</td> <td>to</td> <td>1 500</td> <td>10</td> <td>2.5</td> </tr> <tr> <td>15</td> <td>to</td> <td>1 000</td> <td>10</td> <td>3.5</td> </tr> <tr> <td>6.8</td> <td>to</td> <td>470</td> <td>10</td> <td>5.0</td> </tr> <tr> <td>2.2</td> <td>to</td> <td>220</td> <td>10</td> <td>7.5</td> </tr> <tr> <td>1.0</td> <td>to</td> <td>100</td> <td>10</td> <td>10.0</td> </tr> <tr> <td>3.3</td> <td>to</td> <td>68</td> <td>10</td> <td>12.5</td> </tr> <tr> <td>1.5</td> <td>to</td> <td>33</td> <td>10</td> <td>15.0</td> </tr> <tr> <td>0.68</td> <td>to</td> <td>15</td> <td>10</td> <td>20.0</td> </tr> </tbody> </table> | | | Capacitance Range (nF) | | | Tol. (±%) | U _R (kV) | 33 | to | 2 200 | 10 | 1.5 | 15 | to | 1 500 | 10 | 2.5 | 15 | to | 1 000 | 10 | 3.5 | 6.8 | to | 470 | 10 | 5.0 | 2.2 | to | 220 | 10 | 7.5 | 1.0 | to | 100 | 10 | 10.0 | 3.3 | to | 68 | 10 | 12.5 | 1.5 | to | 33 | 10 | 15.0 | 0.68 | to | 15 | 10 | 20.0 | CNES | |
| Capacitance Range (nF) | | | Tol. (±%) | U _R (kV) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 33 | to | 2 200 | 10 | 1.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | to | 1 500 | 10 | 2.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | to | 1 000 | 10 | 3.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6.8 | to | 470 | 10 | 5.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.2 | to | 220 | 10 | 7.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.0 | to | 100 | 10 | 10.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.3 | to | 68 | 10 | 12.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.5 | to | 33 | 10 | 15.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.68 | to | 15 | 10 | 20.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | CAPACITORS, FIXED, RECONSTITUTED MICA, HIGH VOLTAGE, BASED ON TYPE HT86PS | | | Certificate | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 251 H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Page | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | 01-05 001-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Types covered by similarity: All values defined by the ESCC Detail Specification ±20% (E6 Series) tolerance by variant where applicable | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--------------------------|----------------------------|------------------------|--|-----------|--------------------|-----|-------|----|----|-----|-------|----|----|------|-------|----|-----|------|--------|----|-----|------|--------|----|-----|------|--------|----|-----|
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 3006 Detail ESCC 3006/024 | Exxelia Technologies Marmoutier France | Qualification | CNES | Aug 2002 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Characteristics: E12 Series Sizes Available 01, 02, 03, 04 Maximum dimensions (mm): 01: 10.7 x 10.7 x B 02: 15.5 x 15.5 x B 03: 16.5 x 15.5 x B 04: 18.5 x 17.0 x B Where B= 6, 8, 10, 12, 14, 15 depending on capacitance value Operating Temperature Range, (°C): -55 to +125 | | <table border="1"> <thead> <tr> <th colspan="2">Capacitance Range (µF)</th> <th>Tol. (±%)</th> <th>U_R(V)</th> </tr> </thead> <tbody> <tr> <td>2.2</td> <td>to 47</td> <td>10</td> <td>50</td> </tr> <tr> <td>1.5</td> <td>to 22</td> <td>10</td> <td>63</td> </tr> <tr> <td>0.56</td> <td>to 12</td> <td>10</td> <td>100</td> </tr> <tr> <td>0.33</td> <td>to 5.6</td> <td>10</td> <td>200</td> </tr> <tr> <td>0.22</td> <td>to 4.7</td> <td>10</td> <td>250</td> </tr> <tr> <td>0.10</td> <td>to 1.8</td> <td>10</td> <td>400</td> </tr> </tbody> </table> | | | Capacitance Range (µF) | | Tol. (±%) | U _R (V) | 2.2 | to 47 | 10 | 50 | 1.5 | to 22 | 10 | 63 | 0.56 | to 12 | 10 | 100 | 0.33 | to 5.6 | 10 | 200 | 0.22 | to 4.7 | 10 | 250 | 0.10 | to 1.8 | 10 | 400 |
| Capacitance Range (µF) | | Tol. (±%) | U _R (V) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.2 | to 47 | 10 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.5 | to 22 | 10 | 63 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.56 | to 12 | 10 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.33 | to 5.6 | 10 | 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.22 | to 4.7 | 10 | 250 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.10 | to 1.8 | 10 | 400 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | CAPACITORS, FIXED, SURFACE MOUNT, D.C. SELF-HEALING, NON-INDUCTIVE, POLYTEREPH- THALATE DIELECTRIC, BASED ON TYPE PM94S | | Certificate 270 F | Page 01-05 003-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |


| | | | | |
|---|---|----------------------------|---------------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3006 Detail ESCC 3006/025 ESCC 3006/026 | Exxelia Technologies Marmoutier France | Qualification | CNES | Mar 2016 |
| <p>Characteristics: Operating Temperature Range, (°C): -55 to +125</p> <p>All variants in the ESCC Detail specifications 3006/025 and 3006/026 are qualified.</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>CAPACITORS, FIXED, SELF-HEALING, NON-INDUCTIVE, PET DIELECTRIC, BASED ON TYPES PM907S AND PM948S</p> | <p>Certificate 338</p> | <p>Page 01-05 004-1</p> | |


| Types covered by similarity: Unless otherwise stated in Table 1(a) of the Detail Specification, 10% and 20% tolerance are available. | | Remarks: | | | | | | | | | | | | | | | | | | |
|--|--|---|--------------------|-----------------------------------|------------------------------------|------|------------------------|--------------------|--|--|----|---|--|-----|--|--|-----|----------------------|--------------|-----|
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | |
| Generic ESCC 5010 Detail ESCC 5711/002 | | COBHAM MICROWAVE Les Ulis France | Qualification | CNES | Dec 2008 | | | | | | | | | | | | | | | |
| <p>Characteristics: Operating Temperature Range, (°C): -55 to +150 All variants defined by the ESCC Detail Specification.</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Capacitance Range (pF)</th> <th>U_R(V)</th> </tr> </thead> <tbody> <tr> <td>400M106A & C 400M10xA & 107C 400M108A & C 400M110A & C 400M113J & 114J</td> <td>8.2, 10, 12, 15 18, 22, 27, 33, 39 47, 56, 68 81, 100 10</td> <td>40</td> </tr> <tr> <td>101M106A & C 101M10xA & 107C 101M108A & C</td> <td>3.9, 4.7, 5.6, 6.8 10, 12, 15 22, 27, 33, 39</td> <td>100</td> </tr> <tr> <td>201M106C 201M106A 201M10xA & 107C 201M108A & C 201M111J & 112J</td> <td>2.2, 2.7, 3.3 0.1X (201M106C, -107C, -108C) + 210M106C 3.9, 4.7, 5.6, 6.8, 8.2 10, 12, 15, 18 0.25 & 0.4</td> <td>200</td> </tr> <tr> <td>401M111J 401M112J</td> <td>0.125 0.2</td> <td>400</td> </tr> </tbody> </table> | | | | | | Type | Capacitance Range (pF) | U _R (V) | 400M106A & C 400M10xA & 107C 400M108A & C 400M110A & C 400M113J & 114J | 8.2, 10, 12, 15 18, 22, 27, 33, 39 47, 56, 68 81, 100 10 | 40 | 101M106A & C 101M10xA & 107C 101M108A & C | 3.9, 4.7, 5.6, 6.8 10, 12, 15 22, 27, 33, 39 | 100 | 201M106C 201M106A 201M10xA & 107C 201M108A & C 201M111J & 112J | 2.2, 2.7, 3.3 0.1X (201M106C, -107C, -108C) + 210M106C 3.9, 4.7, 5.6, 6.8, 8.2 10, 12, 15, 18 0.25 & 0.4 | 200 | 401M111J 401M112J | 0.125 0.2 | 400 |
| Type | Capacitance Range (pF) | U _R (V) | | | | | | | | | | | | | | | | | | |
| 400M106A & C 400M10xA & 107C 400M108A & C 400M110A & C 400M113J & 114J | 8.2, 10, 12, 15 18, 22, 27, 33, 39 47, 56, 68 81, 100 10 | 40 | | | | | | | | | | | | | | | | | | |
| 101M106A & C 101M10xA & 107C 101M108A & C | 3.9, 4.7, 5.6, 6.8 10, 12, 15 22, 27, 33, 39 | 100 | | | | | | | | | | | | | | | | | | |
| 201M106C 201M106A 201M10xA & 107C 201M108A & C 201M111J & 112J | 2.2, 2.7, 3.3 0.1X (201M106C, -107C, -108C) + 210M106C 3.9, 4.7, 5.6, 6.8, 8.2 10, 12, 15, 18 0.25 & 0.4 | 200 | | | | | | | | | | | | | | | | | | |
| 401M111J 401M112J | 0.125 0.2 | 400 | | | | | | | | | | | | | | | | | | |
|  | | <p>CAPACITORS, MICROWAVE, SILICON, NAKED DIE, MOS, BASED ON TYPES 101M, 201M, 400M AND 401M</p> | | <p>Certificate 286 D</p> | <p>Page 01-11 001</p> | | | | | | | | | | | | | | | |


Section 02


Component Type: Connectors


| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|-------------|----------------|------------------------------------|-------------------------------|
| 02-01 | | | Multipin, Solder Contacts | |
| | 02-01-001-1 | 71 Q Rev 1 | D*M Series, Rectangular | C&K COMPONENTS |
| | 02-01-001-2 | 155 M | D*M Series, Rectangular | SOURIAU |
| 02-02 | | | Multipin, Crimp Contacts | |
| | 02-02-001-1 | 72 Q | D*MA Series, Rectangular | C&K COMPONENTS |
| | 02-02-001-2 | 156 L | D*MA Series, Rectangular | SOURIAU |
| | 02-02-003 | 25 P | DBAS Series, Circular | Deutsch |
| | 02-02-005 | 220 H | Series I, Circular, Crimp | SOURIAU |
| | 02-02-006 | 221 H | Series II, Circular, Crimp | SOURIAU |
| | 02-02-007-1 | 222 H | Series III, Circular, Miniature | SOURIAU |
| | 02-02-008 | 223 G | Series III, Hermetic | SOURIAU |
| | 02-02-009 | 288 C | ACB1 Series | Axon' Cables |
| | 02-02-010 | 337 | Fast-locking Screw Lock Assemblies | C&K COMPONENTS |
| 02-03 | | | Printed Circuit Board | |
| | 02-03-001-1 | 99 N | HE 801 Series | Smiths Connectors Hypertac |
| | 02-03-002-1 | 149 L | KMC Series | Smiths Connectors Hypertac |
| | 02-03-003-1 | 250 G | MHD Series | Smiths Connectors Hypertac |
| | 02-03-004-1 | 281 D | IHD INTERPOSER | Smiths Connectors Hypertac |
| 02-04 | | | R.F. Coaxial | |
| | 02-04-001 | 68 N | SMA Series | Radiall |
| | 02-04-002 | 283 D | SMA 2.9 | Radiall |
| | 02-04-003 | 329 A | SMA, SMA 2.92, TNC and SMP | Rosenberger |
| 02-05 | | | Micro-miniature, Crimp Contacts | |
| | 02-05-001-1 | 140 N Rev 1 | MDM Series, Rectangular | C&K COMPONENTS |
| | 02-05-002-1 | 141 N | MTB Series, Rectangular | C&K COMPONENTS |
| | 02-05-003-1 | 290 C Rev 1 | MDMA, Rectangular | C&K COMPONENTS |
| | 02-05-004-1 | 301 C | 8MCG, Rectangular | SOURIAU |


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|---|--|--|--------------------|-----------------------------------|---------------------------------|
| Types covered by similarity: | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3401</p> <p>Detail ESCC 3401/001 3401/004 3401/022 3401/040 3401/072 3401/080</p> | | C&K COMPONENTS Dole France | Qualification | CNES | Feb 1981 |
| <p>Characteristics: Shell Size: E, A, B, C, D, F</p> <p>Range of Contacts: 9, 15, 25, 37 and 50 size 20 contacts for standard density layout 3W3 to 8W8, 5W1 to 47W1 combined contact arrangements 15, 26, 44, 62, 78 and 104 size 22 contacts for high density layout</p> <p>Mounting Type: Blank: standard mounting holes; Y: floating mount; E: captive nuts</p> <p>Range of Connectors: 3401/001: Variants 01 & 02</p> <p>Range of Contacts: 3401/004: Variants 01 to 25; 3401/022: 01 to 97; 3401/040: 01 to 17; 3401/080: 01 3401/072: Variants 05 to 19, 25 to 39, 46 to 55, 61 to 65, 72, 73, 76 to 80</p> <p>Termination contacts: solder bucket, straight PCB, 90° PCB</p> <p>Gold-plated non-magnetic coating</p> <p>Coaxial contact arrangements: 3401/004 variants 01 to 25: Power contact arrangements: 3401/040 variants 01 to 17</p> <p>Operating Temperature Range (°C): -55 to +125</p> | | | | | |
|  | | <p>CONNECTORS, ELECTRICAL, SOLDER AND WIRE WRAP CONTACTS, RECTANGULAR RECEPTACLE AND PLUG, BASED ON TYPE D*M</p> | | <p>Certificate 71 Q Rev 1</p> | <p>Page 02-01 001-1</p> |


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|---|--|---|--------------------|------------------------------|---------------------------------|
| Types covered by similarity: | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3401</p> <p>Detail ESCC 3401/001 3401/022 3401/072</p> | | <p>SOURIAU Connection Technology Marolles en Brie France</p> | Qualification | CNES | Sep 1988 |
| <p>Characteristics: Complete range as defined in the Detail Specifications are qualified <u>except</u> for</p> <ul style="list-style-type: none"> • high density 104 contacts arrangement • coaxial and power contacts and arrangement <p>Range of Connectors: 3401/001: variants 01 to 02</p> <p>Range of Contacts: Size 20 : 9, 15, 25, 37 and 50 contacts, Size 22: 15, 26, 44, 62, 78 contacts</p> <p>3401/022: variants 01 to 16 & 44 to 57 & 65 to 80 3401/072: variants 01 to 65</p> <p>Mounting Type= blank: standard mounting holes; Y: floating mount; E: captive nuts</p> <p>Gold-plated non-magnetic coating</p> <p>Operating Temperature Range (°C): -55 to +125</p> | | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | | <p>CONNECTORS, ELECTRICAL, SOLDER AND WIRE WRAP CONTACTS, NON-REMOVABLE, RECTANGULAR RECEPTACLE AND PLUG, BASED ON TYPE D*M</p> | | <p>Certificate 155 M</p> | <p>Page 02-01 001-2</p> |


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|--|--|---|--------------------|----------------------------------|--------------------------------------|
| Types covered by similarity: | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3401</p> <p>Detail ESCC 3401/002 3401/005 3401/020 3401/021</p> | | C&K COMPONENTS Dole France | Qualification | CNES | Feb 1981 |
| <p>Characteristics: Complete range defined in the corresponding Detail Specifications are qualified Shell Size: E, A, B, C, D, F</p> <p>Range of Connectors: 3401/002: variants 01 and 02 9, 15, 25, 37 and 50 size 20* contacts for standard density layout</p> <p>Range of Contacts: *Accepts wire sizes : AWG # 20 to 24 (standard bucket: variants 01 and 02) per 3401/005 3401/005: variants 01 to 08 : AWG # 26 and 28 (reduced bucket: variants 03 and 04) per 3401/005 3401/020 variants 01 & 02 :AWG # 18 and 20 (large bucket: variants 05 to 06) per 3401/005 3401/021: variants 01 & 02 15, 26, 44, 62, 78 and 104 size 22** contacts for high density layout ** Accepts wire sizes AWG # 22 to 26 (standard bucket: variants 07 to 08) per 3401/005</p> <p>Mounting Type: Blank: standard mounting holes; Y: floating mount; E: captive nuts Gold-plated non-magnetic coating Connector Savers: For usage with above connector range</p> <p>Operating Temperature Range (°C): -55 to +125</p> | | | | | |
|  | | <p>CONNECTORS ELECTRICAL, CRIMP CONTACTS, RECTANGULAR RECEPTACLE AND PLUG, BASED ON TYPE D*MA</p> | | <p>Certificate 72 Q</p> | <p>Page 02-02 001-1</p> |


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|--|--|--|--------------------|-----------------------------------|----------------------------|--------------------------------------|
| Types covered by similarity: | | Remarks: | | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | |
| <p>Generic ESCC 3401</p> <p>Detail ESCC 3401/002 3401/005 3401/020 3401/021 3401/022 3401/072</p> | | SOURIAU Connection Technology Marolles en Brie France | Qualification | CNES | Sep 1988 | |
| <p>Characteristics: Complete range as defined in the Detail Specifications <u>except</u> high density 104 contacts arrangement are qualified Accessories variants qualified: 3401/022: variants 01 to 16, 44 to 57, 65 to 80 3401/072: variants 01 to 65</p> <p>Range of Connectors:- 3401/002: variants 1 & 2 *Accepts wire sizes AWG # 20 to 24 (standard bucket: variants 01 and 02) 3401/005: variants 1 to 8 *Accepts wire sizes AWG # 26 and 28 (reduced bucket: variants 03 and 04) 3401/021 & 22: variants 1 & 2 *Accepts wire size AWG# 18 and 20 (large bucket: variants 05 and 06) *Accepts wire size AWG # 22, 24 and 26 (contact AWG # 22 for high density, contact arrangements, variants 07 and 08)</p> <p>Range of Contacts: 9, 15, 25, 37 and 50 contacts size 20 for standard contact arrangements 15, 26, 44, 62, 78 contacts size 22 for high density contact arrangements</p> <p>Gold-plated non-magnetic coating Connector Savers- For usage with connector range defined above</p> <p>Operating Temperature Range (°C): -55 to +125</p> | | | | | | |
|  | | <p>CONNECTORS AND CONNECTOR SAVER, ELECTRICAL, CRIMP CONTACTS, REMOVABLE RECTANGULAR RECEPTACLE AND PLUG, BASED ON TYPE D*MA</p> | | <p>Certificate 156 L</p> | | <p>Page 02-02 001-2</p> |


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|---|--|--|--------------------|-----------------------------|-------------------------------|
| Types covered by similarity: | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3401</p> <p>Detail ESCC 3401/008 3401/009 3401/012 3401/064</p> | | Cie DEUTSCH Evreux France | Qualification | CNES | Jul 1979 |
| <p>Characteristics: 3401/008: Variant 01 3401/009: Variants 01 to 20; 3401/012: Variants 01 to 04; 3401/064: Variants 01 to 41</p> <p>Circular Multicontact connectors Standard contact arrangements with 3, 7, 12, 19, 27, 37 or 61 contacts in wire size AWG # 20 Special contact arrangements with contacts size AWG 22, 20, 16, 12 and 8</p> <p>Operating Temperature Range (°C): -65 to +200</p> | | | | | |
|  | | <p>CONNECTORS, MINIATURE, ELECTRICAL, CIRCULAR, PUSH-PULL COUPLING, REMOVABLE CRIMP CONTACTS, BASED ON TYPE DBAS</p> | | <p>Certificate 25 P</p> | <p>Page 02-02 003</p> |


| Types covered by similarity: | | Remarks: | | | | | | | | | | | | | | | | | |
|--|-------------|---|--------------------|------------------------------|-------------------------------|---|----|---|------|----|------|----|------|----|-----|----|-----|--|--|
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | |
| <p>Generic ESCC 3401</p> <p>Detail ESCC 3401/052 3401/058 3401/062</p> | | <p>SOURIAU Connection Technology Marolles en Brie France</p> | Qualification | CNES | May 1995 | | | | | | | | | | | | | | |
| <p>Characteristics: All connector variants are qualified For 3401/058, variants 01 to 14 are qualified For 3401/062, variants 01 to 27 are qualified</p> | | <table border="1"> <thead> <tr> <th>Contact Size</th> <th>Ratings (A)</th> </tr> </thead> <tbody> <tr><td>4</td><td>80</td></tr> <tr><td>8</td><td>46.0</td></tr> <tr><td>12</td><td>23.0</td></tr> <tr><td>16</td><td>13.0</td></tr> <tr><td>20</td><td>7.5</td></tr> <tr><td>22</td><td>5.0</td></tr> </tbody> </table> | | Contact Size | Ratings (A) | 4 | 80 | 8 | 46.0 | 12 | 23.0 | 16 | 13.0 | 20 | 7.5 | 22 | 5.0 | | |
| Contact Size | Ratings (A) | | | | | | | | | | | | | | | | | | |
| 4 | 80 | | | | | | | | | | | | | | | | | | |
| 8 | 46.0 | | | | | | | | | | | | | | | | | | |
| 12 | 23.0 | | | | | | | | | | | | | | | | | | |
| 16 | 13.0 | | | | | | | | | | | | | | | | | | |
| 20 | 7.5 | | | | | | | | | | | | | | | | | | |
| 22 | 5.0 | | | | | | | | | | | | | | | | | | |
| <p>Range: # 20 with standard contact arrangements 3, 6, 10, 19, 26, 32, 41, 53, 61 # 22 with high density arrangements 6, 13, 22, 37, 55, 66, 79, 100, 128</p> <p>Other arrangements with contact sizes: 20, 16, 12, 8 Receptacle and Plug Shell Sizes: 09, 11, 13, 15, 17, 19, 21, 23, 25 Operating Temperature Range (°C): -65 to +200</p> | | | | | | | | | | | | | | | | | | | |
|  | | <p>CONNECTORS, ELECTRICAL, CIRCULAR, BAYONET COUPLING, SCOOP-PROOF, REMOVABLE CRIMP CONTACTS, BASED ON TYPE MIL-C-38999, SERIES</p> | | <p>Certificate 220 H</p> | <p>Page 02-02 005</p> | | | | | | | | | | | | | | |


| Types covered by similarity: | | Remarks: | | | | | | | | | | | | | |
|--|-------------|---|--------------------|------------------------------|-------------------------------|----|------|----|------|----|-----|----|-----|--|--|
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | |
| <p>Generic ESCC 3401</p> <p>Detail ESCC 3401/044 3401/045 3401/062</p> | | <p>SOURIAU Connection Technology Marolles en Brie France</p> | Qualification | CNES | May 1995 | | | | | | | | | | |
| <p>Characteristics: For 3401/044, all variants are qualified For 3401/045, variants 01 to 08 are qualified For 3401/062, variants 01 to 27 are qualified</p> <p>Range: # 20 with standard contact arrangements 3, 6, 10, 18, 26, 32, 41, 55, 61 # 22 with high density arrangements 6, 13, 22, 37, 55, 66, 79, 100, 128</p> <p>Other arrangements with contact sizes: 20, 16, 12 Receptacle and Plug Shell Sizes: 08, 10, 12, 14, 16, 18, 20, 22, 24 Operating Temperature Range (°C): -65 to +200</p> | | <table border="1"> <thead> <tr> <th>Contact Size</th> <th>Ratings (A)</th> </tr> </thead> <tbody> <tr> <td>12</td> <td>23.0</td> </tr> <tr> <td>16</td> <td>13.0</td> </tr> <tr> <td>20</td> <td>7.5</td> </tr> <tr> <td>22</td> <td>5.0</td> </tr> </tbody> </table> | | Contact Size | Ratings (A) | 12 | 23.0 | 16 | 13.0 | 20 | 7.5 | 22 | 5.0 | | |
| Contact Size | Ratings (A) | | | | | | | | | | | | | | |
| 12 | 23.0 | | | | | | | | | | | | | | |
| 16 | 13.0 | | | | | | | | | | | | | | |
| 20 | 7.5 | | | | | | | | | | | | | | |
| 22 | 5.0 | | | | | | | | | | | | | | |
|  | | <p>CONNECTORS, ELECTRICAL, CIRCULAR, BAYONET COUPLING, REMOVABLE CRIMP CONTACTS, BASED ON TYPE MIL-C-38999, SERIES II</p> | | <p>Certificate 221 H</p> | <p>Page 02-02 006</p> | | | | | | | | | | |


| Types covered by similarity: | | | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------|------------------|--|----------|--------------------------|-----------------------|----------------------------|-------------|---|------|----|------|---|------|----|-----|----|------|----|-----|----|------|--|--|----|-----|--|--|----|-----|--|--|--|--|--|
| Procurement Specifications | | | Manufacturer | | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 3401 Detail ESCC 3401/056 3401/058 3401/062 3401/066 3401/070 | | | SOURIAU Connection Technology Marolles en Brie France | | Qualification | CNES | May 1995 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Charac- teristics: 3401/056 all variants are qualified 3401/058 variants 01 to 14 are qualified 3401/062 variants 28 to 54 are qualified 3401/066 variants 01 and 02 are qualified 3401/058 crimp contacts and 3401/066 triax contacts to be mounted on 3401/056 connectors 3401/070 connector receptacles with PCB contacts | | | <table border="1"> <thead> <tr> <th>Crimp Contact Size</th> <th>Ratings (A)</th> <th>PCB Contact Size</th> <th>Ratings (A)</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>80.0</td> <td>16</td> <td>10.0</td> </tr> <tr> <td>8</td> <td>46.0</td> <td>20</td> <td>5.0</td> </tr> <tr> <td>12</td> <td>23.0</td> <td>22</td> <td>3.0</td> </tr> <tr> <td>16</td> <td>13.0</td> <td></td> <td></td> </tr> <tr> <td>20</td> <td>7.5</td> <td></td> <td></td> </tr> <tr> <td>22</td> <td>5.0</td> <td></td> <td></td> </tr> </tbody> </table> | | Crimp Contact Size | Ratings (A) | PCB Contact Size | Ratings (A) | 4 | 80.0 | 16 | 10.0 | 8 | 46.0 | 20 | 5.0 | 12 | 23.0 | 22 | 3.0 | 16 | 13.0 | | | 20 | 7.5 | | | 22 | 5.0 | | | | | |
| Crimp Contact Size | Ratings (A) | PCB Contact Size | Ratings (A) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 80.0 | 16 | 10.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 46.0 | 20 | 5.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | 23.0 | 22 | 3.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16 | 13.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 7.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22 | 5.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Range: # 20 with standard contact arrangements (3, 4, 5, 6, 7, 8, 10, 18, 19, 26, 32, 41, 53, 55, 61 contacts) # 22 with high density arrangements (6, 13, 22, 37, 55, 66, 79, 100, 128 contacts) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Other arrangements with contact sizes:# 20, 16, 12, 8, 4 Receptacle and Plug Shell Sizes: 09, 11, 13, 15, 17, 19, 21, 23, 25. Triax contacts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating Temperature Range (°C): -65 to +200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | CONNECTORS, MINIATURE, ELECTRICAL, CIRCULAR, TRIPLE-START SELF- LOCKING COUPLING, SCOOP-PROOF, REMOVABLE AND NON-REMOVABLE CRIMP CONTACTS BASED ON TYPE MIL-C-38999, SERIES III | | Certificate 222 H | | Page 02-02 007-1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |


| Types covered by similarity: | | Remarks: | | | | | | | |
|---|------------------------|--|--------------------|--------------------------|----------------------------|--|--|--|--|
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | |
| Generic ESCC 3401 Detail ESCC 3401/057 | | SOURIAU Connection Technology Marolles en Brie France | Qualification | CNES | May 1995 | | | | |
| Characteristics: All variants are qualified <table border="1" data-bbox="98 834 595 978"> <thead> <tr> <th>Contact Size</th> <th>Ratings (A)</th> </tr> </thead> <tbody> <tr> <td>8, 12, 16 20, 22D</td> <td>33, 17, 10 5.0, 3.0</td> </tr> </tbody> </table> <p>Range: # 20 with standard contact arrangements (3, 6, 10, 19, 26, 32, 41, 53, 61 contacts) # 22 with high density arrangements (6, 13, 22, 37, 55, 66, 79, 100, 128 contacts)</p> <p>Receptacle Shell Sizes: 09, 11, 13, 15, 17, 19, 21, 23, 25</p> <p>Receptacle (contacts # 8, 12, 16, 20, 22D) and Feedthrough (contacts # 8, 12, 16, 20, 22D)</p> <p>Operating Temperature Range (°C): -65 to +200</p> | | Contact Size | Ratings (A) | 8, 12, 16 20, 22D | 33, 17, 10 5.0, 3.0 | | | | |
| Contact Size | Ratings (A) | | | | | | | | |
| 8, 12, 16 20, 22D | 33, 17, 10 5.0, 3.0 | | | | | | | | |
|  | | CONNECTORS, MINIATURE, ELECTRICAL, CIRCULAR, TRIPLE-START SELF- LOCKING COUPLING, SCOOP-PROOF, HERMETIC RECEPTABLE AND FEEDTHROUGH, BASED ON TYPE MIL-C-38999, SERIES III | | Certificate 223 G | Page 02-02 008 | | | | |


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|--|---|--------------------|------------------------------|-------------------------------|
| Types covered by similarity: Variants 01, 03 to 05, 07 to 09, 11 to 13, 15 to 18 | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3401 Detail ESCC 3401/079 | AXON' CABLE S.A. Montmirail France | Qualification | CNES | May 2009 |
| <p>Characteristics:</p> <p>Variants 01 to 18 are qualified</p> <p>Variants 01 to 08: Plug 3 and 4 Lugs, Straight and Right Angle with pin contact Variants 09 to 18: Bulkhead Jacks, 3 and 4 Lugs, Straight and Right Angle with solder contact</p> <p>All cables are 77Ω MIL-STD-1553B Data Bus twisted shielded pairs</p> <p>Working Voltage: 200 Vrms Rated Current (contact): 1A Operating Temperature Range (°C): -55 to +150</p> | | | | |
|  | <p>CONNECTORS, ELECTRICAL, TRIAXIAL, BAYONET COUPLING, NON-REMOVABLE CRIMP CONTACTS, MIL-STD-1553B DATABUS, BASED ON TYPE ACB1 SERIES</p> | | <p>Certificate 288 C</p> | <p>Page 02-02 009</p> |


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|--|---|------------------------|--------------------------|----------------------------|
| Types covered by similarity: Variants 01 TO 06. Variant 06 is mandatory where applicable | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3401 Detail ESCC 3401/085 | C&K Components Dole France | Qualification | CNES | Jan 2016 |
| Characteristics: Variants All Variants are qualified. Variant 06 is mandatory where applicable Operating Temperature Range (°C): -55 to +125 | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | FAST LOCKING SCREW LOCK ASSEMBLIES FOR RECTANGULAR CONNECTORS 3401/001, 3401/002 AND CONNECTOR SAVERS 3401/020, 3401/080 | Certificate 337 | Page 02-02 010 | |


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|---|--|--------------------|-----------------------------|---------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3401</p> <p>Detail ESCC 3401/016 3401/017</p> | <p>Smiths Connectors - Hypertac Saint-Aubin-Lès-Elbeuf France</p> | Qualification | CNES | Nov 1982 |
| <p>Characteristics: All variants are qualified</p> <p>Shell specifications and sizes: 3401/016</p> <p>Contact: 3401/017 Crimp wire-wrap solder and savers, 1 to 22 and 64 to 70</p> <p>2 rows: 17, 29, 41, 53, 65, 72, 84, 96, 120 contacts</p> <p>3 rows: 62, 80, 98, 160 contacts</p> <p>Contact Ratings: 5 A (1 contact AWG 22) 1.5 A (>31 contacts, AWG 22)</p> <p>Operating Temperature Range (°C): -55 to +125</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>CONNECTORS, ELECTRICAL, REMOVABLE CONTACTS, CRIMP WIRE-WRAP SOLDER AND SAVER, PRINTED CIRCUIT BOARD, BASED ON TYPE HE 801</p> | | <p>Certificate 99 N</p> | <p>Page 02-03 001-1</p> |


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|--|---|--------------------------|-----------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3401 Detail ESCC 3401/039 | Smiths Connectors - Hypertac Saint-Aubin-Lès-Elbeuf France | Qualification | CNES | Mar 1987 |
| Characteristics: 3 rows contacts: 26, 44, 62, 80, 98, 144 Contact codes: 10, 30, 31, 40, 50, 51 and 91 Guiding and locking devices codes: 110, 121, 143, 201, 202, 204, 206, 703 Contact Ratings: 2 A (1 contact) Operating Temperature Range (°C): -55 to +125 | | | | |
|  | CONNECTORS, ELECTRICAL, NON-REMOVABLE SOLDER AND WIRE-WRAP CONTACTS AND SAVERS, PRINTED CIRCUIT BOARD, BASED ON TYPE KMC | Certificate 149 L | | Page 02-03 002-1 |


| | | | | |
|--|--|--------------------------|-----------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3401 Detail ESCC 3401/065 | Smiths Connectors - Hypertac Saint-Aubin-Les-Elbeuf France | Qualification | CNES | Aug 1998 |
| Characteristics: Contact: 52, 100, 152, 200, 252, 300, 352 and 400 Contact Codes: 10, 11, 12, 30, 31, 43, 45, 47 and 91 Guiding and Locking Devices Codes: 110, 111, 121, 124, 134 and 201 Operating Temperature Range (°C): -55 to +125 | | | | |
|  | CONNECTORS AND SAVERS, ELECTRICAL, RECTANGULAR, NON-REMOVABLE, PRINTED CIRCUIT BOARD, BASED ON TYPE MHD | Certificate 250 G | | Page 02-03 003-1 |


| | | | | |
|---|---|-----------------------------------|--------------------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3401</p> <p>Detail ESCC 3401/076</p> | <p>Smiths Connectors - Hypertac Saint-Aubin-Les-Elbeuf France</p> | Qualification | CNES | Aug 2007 |
| <p>Characteristics:</p> <p>Max. number of rows 11 Max. number of contacts: 660</p> <p>Locking and Guiding Devices:</p> <p>Rated current: 1A each contact Total contact compression range: 0.1 to 0.65 mm per contact Compression force: 1.6N per contact Torque for locking devices: 10 N-cm</p> <p>Operating Temperature Range (°C): -55 to +125</p> | <p>All design envelops specified in Table 1(a) of ESCC Detail Specification are qualified</p> <p>-Through holes only -M2 studs with locking nuts and washers -Locating pins not available</p> | | | |
|  | <p>CONNECTORS, ELECTRICAL, CRIMP CONTACTS, Z-AXIS INTERPOSER, PRINTED CIRCUIT BOARD, BASED ON TYPE RX</p> | <p>Certificate 281 D</p> | <p>Page 02-03 004-1</p> | |


| | | | | |
|--|---|--------------------|----------------------------------|------------------------------------|
| Types covered by similarity: - Hermetically sealed receptacle | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3402</p> <p>Detail ESCC 3402/001 3402/002 3402/003</p> | RADIALL Saint-Quentin-Fallavier France | Qualification | CNES | Feb 1981 |
| <p>Characteristics:</p> <p>Frequency Range 0-18 GHz</p> <p>3402/001 Pin contact (Plug). Variants 01 to 47 (except 11, 19, 31 –not in use)</p> <p>3402/002 socket contact (Receptacle). Variants 01 to 85 (except 33, 35, 52 –not in use)</p> <p>3402/003 Adapters. Variants 01 to 14</p> <p>Crimp– or solder-type contact for flexible and semi-rigid cables, contacts for micro strip</p> <p>Shell material and finish: Beryllium copper gold plated, copper or nickel underplate; stainless steel, electro-passivated or gold plated.</p> <p>Operating Temperature Range (°C): See Detail Specifications</p> | | | | |
|  | <p>CONNECTORS, RF, COAXIAL, SOLDER AND CRIMP CONTACTS, MALE, FEMALE ADAPTORS AND CONNECTING PIECES, BASED ON TYPE SMA</p> | | <p>Certificate 68 N</p> | <p>Page 02-04 001</p> |


| | | | | | |
|---|--|---|--------------------|------------------------------|-------------------------------|
| Types covered by similarity: | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3402</p> <p>Detail ESCC 3402/021 3402/022 3402/023</p> | | RADIALL Saint-Quentin-Fallavier France | Qualification | CNES | Dec 2007 |
| <p>Characteristics:</p> <p>Frequency Range 0-40 GHz 50 Ohms</p> <p>3402/021 Pin contact (Plug). Variants 01 to 05 and 07 3402/022 Socket contact (Receptacle). Variants 01 to 05 3402/023 Adapters. Variants 01 to 06 Crimp- or solder-type contact for flexible and semi-rigid cables, contacts for micro strip Shell material and finish: passivated amagnetic stainless steel. Operating Temperature Range (°C): -65 to +165</p> | | | | | |
|  | | <p>CONNECTORS, RF, COAXIAL, SOLDER AND CRIMP CONTACTS, MALE, FEMALE ADAPTORS AND CONNECTING PIECES, BASED ON TYPE SMA 2.9</p> | | <p>Certificate 283 D</p> | <p>Page 02-04 002</p> |

| Types covered by similarity: See below the range of qualified variants for each specification | | Remarks: | | |
|--|--|--------------------|------------------------------|-------------------------------|
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3402</p> <p>Detail ESCC 3402/001, 3402/002, 3402/003 (SMA range) 3402/008, 3402/009, 3402/010 (TNC range) 3402/021, 3402/022, 3402/023 (SMA 2.9 range) 3402/024, 3402/025, 3402/026 (SMP range)</p> | Rosenberger Fridolfing Germany | Qualification | DLR | Dec 2013 |
| <p>Qualified variants:</p> <p>3402/001: 1 to 10, 12 to 18, 20 to 30, 32 to 35, 37 to 47 3402/002: 1 to 24, 27 to 32, 34, 36 to 51, 53 to 61, 65 to 71 3402/003: 1 to 6, 8 to 14 3402/008: 1 to 7; 3402/009: 1 to 5; 3402/010: 1 to 5 3402/021: 1 to 5, 7; 3402/022: 1 to 5; 3402/023: 1 to 6 3402/024: 1 to 26, 28 to 35; 3402/025: 1 to 14; 3402/026: 1 to 13</p> | | | | |
|  | <p>CONNECTORS, RF, COAXIAL, SOLDER AND CRIMP CONTACTS, MALE, FEMALE ADAPTORS AND CONNECTING PIECES, BASED ON TYPES SMA, SMA 2.92 TNC and SMP</p> | | <p>Certificate 329 A</p> | <p>Page 02-04 003</p> |

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|--|--|--|--------------------|-----------------------------------|---------------------------------|
| Types covered by similarity: | | Remarks: 3401/029 termination types GMR7580 and GMR7590 are NOT qualified. | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3401</p> <p>Detail ESCC 3401/029 3401/041 3401/032 3401/087</p> | | C&K COMPONENTS Dole France | Qualification | CNES | Oct 1986 |
| <p>Characteristics:</p> <p>Layout: 9 - 15 - 21- 25 - 31 - 37 - 51 Contacts, Non removable crimp contacts</p> <p>Variants: 3401/029: 01 and 02 3401/041: 01 to 07 3401/032: 03, 04, 07 to 17 3401/087: 01 to 56</p> <p>Termination types: AWG 25: Uninsulated rigid wire. Bent and straight PCB - Max rated: 2.5 A AWG 26: ESCC 390101302, ESCC 390100256 - Max rated: 2.5 A AWG 28: ESCC 390101301, ESCC 390100261 - Max rated: 1.5 A</p> <p>Nickel or Gold Plated Shells, Operating Temperature Range (°C): -55 to +125</p> | | | | | |
|  | | <p>CONNECTORS, ELECTRICAL, RECTANGULAR, MICROMINIATURE, CRIMP CONTACT, BASED ON TYPE MDM</p> | | <p>Certificate 140 N rev1</p> | <p>Page 02-05 001-1</p> |

| | | | | |
|---|---|--------------------|--------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3401 Detail ESCC 3401/031 | C&K COMPONENTS Dole France | Qualification | CNES | Oct 1986 |
| Characteristics: Shell sizes: 5 through 81 contacts, Non removable crimp contacts Variants: 3401/031: 01&02 Termination Types: AWG 25: Uninsulated rigid wire. Bent PCB - Max rated: 2.5 A AWG 26: ESCC 390101302 - Max rated: 2.5 A AWG 28: ESCC 390101301 - Max rated: 1.5 A Operating Temperature Range (°C): -55 to +125 | | | | |
|  | CONNECTORS, ELECTRICAL, MICROMINIATURE, CRIMP CONTACT, SINGLE-IN-LINE, BASED ON TYPE MTB | | Certificate 141 N | Page 02-05 002-1 |


| | | | | |
|---|---|--------------------|--------------------------------|----------------------------|
| Types covered by similarity: Contact sizes 21, 31 | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3401 Detail ESCC 3401/077 3401/078 | C&K COMPONENTS Dole France | Qualification | CNES | Jun 2009 |
| Characteristics: All variants are qualified Range of contacts: 9 - 15 - 21- 25 - 31 - 37—51 Accepts wires AWG 24 or 2x28 in crimping barrel AWG 24 Accepts wires AWG 26 and 28 in crimping barrel AWG 26 Max. rating for 1 isolated contact:- AWG 24 wire: 3.5 A AWG 26 wire and uninsulated AWG 25 solid wire: 2.5 A AWG 28 wire: 1.5 A Nickel or Gold Plated Shells Working Voltage (Max.) 150Vrms Operating Temperature Range (°C): -55 to +125 | | | | |
|  | CONNECTORS, ELECTRICAL, RECTANGULAR, MICROMINIATURE, REMOVABLE CRIMP CONTACT, BASED ON TYPE MDMA | | Certificate 290 C Rev 1 | Page 02-05 003-1 |


| | | | | |
|--|---|--------------------|------------------------------|---------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3401</p> <p>Detail ESCC 3401/081 3401/082 3401/083 3401/084</p> | <p>SOURIAU Connection Technology Marolles en Brie France</p> | Qualification | CNES | Jun 2010 |
| <p>Characteristics:</p> <p>3401/081: Shell variant 01 (glass-fibre reinforced thermoplastic), variant 02 (aluminium alloy). Contacts arrangements 7, 13, 25, 51, 104 contacts. Contacts termination OL3 (straight PCB), 1A7N (90° PCB 2.54mm spacing), 1B7N (90° PCB 2.54mm spacing). Gold-plated shells.</p> <p>3401/082: Shell variant 01 (glass-fibre reinforced thermoplastic), variant 02 (aluminium alloy). Contacts arrangements 7, 13, 25, 51, 104 contacts.</p> <p>3401/083: Contacts variant 01 (male crimp barrel 26), 02 (female crimp barrel 26), 03 (male crimp barrel 24), 04 (female crimp barrel 24). Accepts wires AWG 24, 26, 28</p> <p>3401/084: Accessories variants 01 to 62.</p> <p>Operating Temperature Range (°C): -55 to +125</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>CONNECTORS, ELECTRICAL, RECTANGULAR, MICROMINIATURE, REMOVABLE AND NON- REMOVABLE, GAUGE 26, PCB PIN CONTACT, BASED ON TYPE 8MCG</p> | | <p>Certificate 301 C</p> | <p>Page 02-05 004-1</p> |

Section 03**Component Type: Crystals**

| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|-------------|-------|------------------|--------------|
| 03-01 | | | Crystals | |
| | 03-01-001-2 | 333 | TO-5 Can | RAKON (F) |
| | 03-01-002-2 | 334 | TO-8 Can | RAKON (F) |

**SECTION 03-**: INDEX OF CRYSTALS****REP005 Updated Apr 2017**


| Types covered by similarity: All variants previously specified in (retired) specifications: 3501/001, 3501/008, 3501/011, 3501/012 | | | Remarks: Upon receipt of a request for any retired Variant, the Manufacturer will allocate a new Specific Crystal Identification Number in accordance with 3501/018. It will have identical crystal characteristics to those of the retired variant. | | | | | | | | | | | | | | |
|---|-----------|---|--|-----------------------|-----------------------------|----|----------|----------|----|-----------|-----------|----|-----------|-----------|--|--|--|
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | |
| Generic ESCC 3501 Detail ESCC 3501/018 | | RAKON France Pont Sainte Marie France | Qualification (Previously qualified in Argenteuil site) | CNES | Sept 2015 (Oct 1979) | | | | | | | | | | | | |
| Characteristics: TO-5 Can (T 807) All variants are qualified. Frequency Ranges: <table border="1" data-bbox="405 997 898 1182"> <thead> <tr> <th></th> <th>AT (MHz)</th> <th>SC (MHz)</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>14 to 35</td> <td>15 to 38</td> </tr> <tr> <td>P3</td> <td>20 to 100</td> <td>22 to 110</td> </tr> <tr> <td>P5</td> <td>45 to 140</td> <td>55 to 140</td> </tr> </tbody> </table> | | | | AT (MHz) | SC (MHz) | P1 | 14 to 35 | 15 to 38 | P3 | 20 to 100 | 22 to 110 | P5 | 45 to 140 | 55 to 140 | | | |
| | AT (MHz) | SC (MHz) | | | | | | | | | | | | | | | |
| P1 | 14 to 35 | 15 to 38 | | | | | | | | | | | | | | | |
| P3 | 20 to 100 | 22 to 110 | | | | | | | | | | | | | | | |
| P5 | 45 to 140 | 55 to 140 | | | | | | | | | | | | | | | |
|  | | CRYSTALS, TO-5 CAN | Certificate 333 | | Page 03-01 001-2 | | | | | | | | | | | | |


| | | | | | |
|--|--|--|---|------------------------|----------------------------|
| Types covered by similarity: All variants previously specified in (retired) specifications: 3501/002 and 3501/009 | | Remarks: Upon receipt of a request for any retired Variant, the Manufacturer will allocate a new Specific Crystal Identification Number in accordance with 3501/019. It will have identical crystal characteristics to those of the retired variant. | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3501 Detail ESCC 3501/019 | | RAKON France Pont Sainte Marie France | Qualification (Previously qualified in Argenteuil site) | CNES | Sept 2015 Oct 1979 |
| Characteristics: All variants are qualified. | | | | | |
| TO-8 Can (T 1507) | | | | | |
| Frequency Ranges: | | | | | |
| | | AT (MHz) | SC (MHz) | | |
| P1 | | 3 to 20 | 3 to 22 | | |
| P3 | | 10 to 30 | 10 to 33 | | |
| P5 | | 15 to 65 | 16 to 71 | | |
|  | | CRYSTALS, TO-8 CAN | | Certificate 334 | Page 03-01 002-2 |


Section 04


Component Type: Diodes

| | | | | |
|-------|----------------|-------|--|-------------------------------------|
| 04-01 | | | Switching | |
| | 04-01-003-2 | 311 B | Types 1N6640U and 1N6642U | STMicroelectronics |
| 04-02 | | | Power Rectifier | |
| | 04-02-001-3 | 297 C | Types 1N5806U and 1N5811U | STMicroelectronics |
| | 04-02-001-4 | 302 C | Types 1N5819U and 1N5822U | STMicroelectronics |
| | 04-02-002-1 | 272 G | Type STPS20100 | STMicroelectronics |
| | 04-02-003-1 | 274 F | Types BYW-81 and BYV54 | STMicroelectronics |
| 04-05 | | | RF/Microwave, Silicon Schottky | |
| | 04-05-001-3 | 227 F | Schottky, BAS40, BAS70, BXY42-44 | Infineon |
| 04-13 | | | RF/Microwave, Varactors | |
| | 04-13-003 1A-B | 200 G | PIN and Varactors | API Technologies - RF2M Division |
| | 04-13-003-2A-B | 225 F | Multiplier and PIN, DH 2xx and DH 50xxx | Cobham Microwave |
| | 04-13-003-3 | 273 E | Varactor, Tuning, DH 76xxx | Cobham Microwave |

| Types covered by similarity: | | | | Remarks: | | | | | | | | | | | | | | | | | | | | |
|---|----------|---|----------------------|----------------------|--------------------------|----------------------------|----------------------------|----------|---------------------|----------------------|----------------------|------|---------|--------|----|----|---|--------|---------|--------|-----|-----|---|--------|
| Procurement Specifications | | Manufacturer | | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | |
| Generic ESCC 5000 Detail ESCC 5101/026 5101/027 | | ST Microelectronics Rennes France | | Qualification | CNES | May 2011 | | | | | | | | | | | | | | | | | | |
| Characteristics: <table border="1" data-bbox="91 903 1341 1070"> <thead> <tr> <th>Type</th> <th>Variants</th> <th>V_{BR} (V)</th> <th>V_{RWM} (V)</th> <th>I_{FSM} (A)</th> <th>Case</th> </tr> </thead> <tbody> <tr> <td>1N6640U</td> <td>07, 08</td> <td>75</td> <td>75</td> <td>2</td> <td>LCC2-D</td> </tr> <tr> <td>1N6642U</td> <td>07, 08</td> <td>100</td> <td>100</td> <td>2</td> <td>LCC2-D</td> </tr> </tbody> </table> <p>Operating Temperature Range (°C): -65 to +175</p> | | | | | | | Type | Variants | V _{BR} (V) | V _{RWM} (V) | I _{FSM} (A) | Case | 1N6640U | 07, 08 | 75 | 75 | 2 | LCC2-D | 1N6642U | 07, 08 | 100 | 100 | 2 | LCC2-D |
| Type | Variants | V _{BR} (V) | V _{RWM} (V) | I _{FSM} (A) | Case | | | | | | | | | | | | | | | | | | | |
| 1N6640U | 07, 08 | 75 | 75 | 2 | LCC2-D | | | | | | | | | | | | | | | | | | | |
| 1N6642U | 07, 08 | 100 | 100 | 2 | LCC2-D | | | | | | | | | | | | | | | | | | | |
|  | | DIODES, SWITCHING, BASED ON TYPES 1N6640U AND 1N6642U | | | Certificate 311 B | | Page 04-01 003-2 | | | | | | | | | | | | | | | | | |

| Types covered by similarity: | | | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------|---|--------------|--------------------|-----------------------|----------------------------|------------------------|------|----------|--------------|---------------|---------------|------|----------|---------|--------|-----|-----|----|--------|----------|---------|--------|-----|-----|-----|--------|
| Procurement Specifications | | Manufacturer | | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 5000 Detail ESCC 5101/013 5101/014 | | ST Microelectronics Rennes France | | Qualification | CNES | Nov 2009 | | | | | | | | | | | | | | | | | | | | | |
| Characteristics: <table border="1" data-bbox="107 885 1386 1050"> <thead> <tr> <th>ESCC</th> <th>Type</th> <th>Variants</th> <th>V_{BR} (V)</th> <th>V_{RWM} (V)</th> <th>I_{FSM} (A)</th> <th>Case</th> </tr> </thead> <tbody> <tr> <td>5101/014</td> <td>1N5806U</td> <td>13, 14</td> <td>160</td> <td>150</td> <td>33</td> <td>LCC2-A</td> </tr> <tr> <td>5101/013</td> <td>1N5811U</td> <td>11, 12</td> <td>160</td> <td>150</td> <td>100</td> <td>LCC2-B</td> </tr> </tbody> </table> <p>Operating Temperature Range (°C): -65 to +175</p> | | | | | | | ESCC | Type | Variants | V_{BR} (V) | V_{RWM} (V) | I_{FSM} (A) | Case | 5101/014 | 1N5806U | 13, 14 | 160 | 150 | 33 | LCC2-A | 5101/013 | 1N5811U | 11, 12 | 160 | 150 | 100 | LCC2-B |
| ESCC | Type | Variants | V_{BR} (V) | V_{RWM} (V) | I_{FSM} (A) | Case | | | | | | | | | | | | | | | | | | | | | |
| 5101/014 | 1N5806U | 13, 14 | 160 | 150 | 33 | LCC2-A | | | | | | | | | | | | | | | | | | | | | |
| 5101/013 | 1N5811U | 11, 12 | 160 | 150 | 100 | LCC2-B | | | | | | | | | | | | | | | | | | | | | |
|  | | DIODES, POWER RECTIFIER, BASED ON TYPES 1N5806U AND 1N5811U | | | Certificate 297 C | | Page 04-02 001-3 | | | | | | | | | | | | | | | | | | | | |

| Types covered by similarity: | | Remarks: | | | | | | | | | | | | | | | | | | | | | |
|--|---------------|---|-------------------------------|--------------------------|----------------------------|----------------------------|---------------|----------------------|-------------------------------|---------------|-----------------------|---------|----|--------|---------|----|---|---------|----|--------|------------|----|---|
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | |
| Generic ESCC 5000 Detail ESCC 5106/020 5106/021 | | ST Microelectronics Rennes France | Qualification | CNES | Sep 2010 | | | | | | | | | | | | | | | | | | |
| Characteristics: Variants 01 and 02 of 5106/020 and Variants 02 and 03 of 5106/021 are qualified | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Type</th> <th>V_{RWM} (V)</th> <th>dV/dt (V/μs)</th> <th>I_R (μA) @ $V_R = 40$</th> <th>I_{FSM} (A)</th> <th>I_O (A) @ T_{amb}</th> </tr> </thead> <tbody> <tr> <td>1N5819U</td> <td>40</td> <td>10 000</td> <td>15 (DC)</td> <td>25</td> <td>1</td> </tr> <tr> <td>1N5822U</td> <td>40</td> <td>10 000</td> <td>80 (pulse)</td> <td>80</td> <td>3</td> </tr> </tbody> </table> | | | | | | Type | V_{RWM} (V) | dV/dt (V/ μ s) | I_R (μ A) @ $V_R = 40$ | I_{FSM} (A) | I_O (A) @ T_{amb} | 1N5819U | 40 | 10 000 | 15 (DC) | 25 | 1 | 1N5822U | 40 | 10 000 | 80 (pulse) | 80 | 3 |
| Type | V_{RWM} (V) | dV/dt (V/ μ s) | I_R (μ A) @ $V_R = 40$ | I_{FSM} (A) | I_O (A) @ T_{amb} | | | | | | | | | | | | | | | | | | |
| 1N5819U | 40 | 10 000 | 15 (DC) | 25 | 1 | | | | | | | | | | | | | | | | | | |
| 1N5822U | 40 | 10 000 | 80 (pulse) | 80 | 3 | | | | | | | | | | | | | | | | | | |
| Operating Temperature Range (°C): -65 to +150 Package Type: LCC2-B | | | | | | | | | | | | | | | | | | | | | | | |
|  | | DIODES, POWER SCHOTTKY, BASED ON TYPES 1N5819U AND 1N5822U | | Certificate 302 C | | Page 04-02 001-4 | | | | | | | | | | | | | | | | | |

| | | | | |
|--|---|----------------------|-----------------------|----------------------------|
| Types covered by similarity: see next page | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 5000 Detail ESCC 5106/016 5106/017 5106/018 5106/019 | ST Microelectronics Rennes France | Qualification | CNES | Nov 2002 |
| Characteristics: Maximum Ratings for 5106/016: V_{RRM} : 100 V I_o : 2 x 20 A dV/dt : 10 000 V/ μ s T_j : + 175°C Package Types TO254, SMD.5 and SMD1 Operating Temperature Range (°C): -65 to +175 | | | | |
|  | DIODES, POWER, SCHOTTKY BARRIER, BASED ON TYPE STPS20100 | Certificate 272 G | | Page 04-02 002-1A |

Types covered by similarity:

| ESCC COMP. NO. | VARANTS | RANGE OF COMPONENTS | BASED ON | Test Vehicle/s |
|-------------------|-------------|-------------------------|-------------|-------------------|
| 5106/016 | 05,06,07,11 | TO-254, SMD0.5, SMD1 | STPS20100 | 33125118ZR |
| 5106/017 | 01, 02 | SMD0.5 | STPS1045S | 33125209ZN |
| 5106/018 | 02 | SMD1 | STPS6045 | |
| 5106/019 | 03, 05 | TO254, SMD1 | STPS40100 | |




DIODES, POWER, SCHOTTKY BARRIER,
BASED ON TYPE STPS20H100


Certificate


272 G

Page

04-02
002-1B

| | | | | |
|--|---|------------------------------|-----------------------|---------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 5000</p> <p>Detail ESCC 5103/029 5103/031</p> | <p>ST Microelectronics Rennes France</p> | Qualification | CNES | Aug 2003 |
| <p>Characteristics:</p> <p>5103/029 variants 05 07 and 08 are qualified (types BYW81-200) 5103/031 variant 02 to 05 are qualified (types BYV54-200) Maximum Ratings:</p> <p>V_{RRM}: 200 V I_O: 40 A for BYV 54-200, 15 and 30 A for BYW-81-200 T_j: +150°C Package Types TO254, TO254AA and SMD0.5 Operating Temperature Range (°C): -55 to +150</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>DIODES, SILICON, POWER RECTIFIER, HIGH EFFICIENCY, FAST RECOVERY, BASED ON TYPES BYW81 AND BYV54</p> | <p>Certificate 274 F</p> | | <p>Page 04-02 003-1</p> |

| | | | | | |
|--|--|---|--------------------|--------------------------|----------------------------|
| Types covered by similarity: | | Remarks: Revision F includes devices previously qualified under Certificates 224 and 236. | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 5010 Detail ESCC 5512/020 ESCC 5513/017 ESCC 5513/030 | | INFINEON Technologies AG Neubiberg Germany | Qualification | DLR | Sep 1995 |
| Characteristics: Variants 01 and 03 are qualified 5512/020 Variants 01 and 02 are qualified 5513/017 Variants 01, 02, 05, and 06 are qualified 5513/030 | | | | | |
|  | | DIODES, MICROWAVE, SILICON, SCHOTTKY, GENERAL PURPOSE, BASED ON TYPES BAS 40, BAS 70, AND MICROWAVE, SILICON, PIN, BASED ON TYPES BXY42, BXY43 AND BXY44 | | Certificate 227 F | Page 04-05 001-3 |

| | | | | |
|--|--|--------------------------|-----------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 5010 Detail ESCC See types covered by similarity | API Technologies - RF2M Milton Keynes England | Qualification | UK Space Agency | Dec 1993 |
| Characteristics: Operating Temperature Range (°C): -65 to +125 and 150 | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | DIODES, MICROWAVE, SILICON, PIN AND VARACTORS | Certificate 200 G | Page 04-13 003-1A | |

Types covered by similarity:


| ESCC Spec. No. | Component Type |
|----------------|---|
| 5513/007 | ML4207 to ML 4209, variants 01-03, 06, 08-13, 17, 19, 21-27, 30, 32-37, 41, 43, 45-51, 54, 56-61, 65, 67, 69-72 |
| 5513/009 | ML4610, ML4617 to ML4619, variants 01-03, 06, 08-13, 17, 19, 21-23, 25-28, 31, 33-38, 42, 44, 46-48, 50-53, 56, 58-63, 67, 69, 71-73, 75-78, 81, 83-88, 92, 94, 96-99 |
| 5513/010 | ML4611, ML4612, ML4614, ML4615, variants 01-03, 06, 08-13, 17, 19, 21-23, 25-28, 31, 33-38, 42, 44, 46-48, 50-53, 56, 58-63, 67, 69, 71-73, 75-78, 81, 83-88, 92, 94, 96-99 |
| 5513/014 | ML4622 to ML4624, variants 01-03, 06, 08-13, 17, 19, 21-23, 25-28, 31, 33-38, 42, 45-47, 49-52, 55, 57-58, 61, 63 |
| 5513/015 | ML4627 to ML4629, variants 01-03, 06, 08-13, 17, 19, 21-23, 25-28, 31, 33-38, 42, 45-47, 49-52, 55, 57-58, 61, 63 |
| 5512/001 | ML4402, ML4404 to ML4409 and ML40721, variants 01-03,05, 07-12, 14-18, 20, 22-27, 29-33, 35, 37-42, 44-48, 50, 52-57, 59-63, 65, 67-72, 74-78, 80, 82-84, 86, 88, 90-92 |
| 5512/003 | ML4310 to ML4319, variants 01-02, 05-06, 09-13, 16-17, 20-24, 27-28, 31-35, 38-39, 42-46, 49-50, 53-57, 60-61, 64-68, 71-72, 75-79, 83-85, 89-91, 95 |
| 5512/004 | ML4331 to ML4335, variants 01-02, 05-06, 09-13, 16-17, 20-24, 27-28, 31-35, 38-39, 42-46, 49-50, 53-55 |
| 5512/005 | ML4336 to ML4343, variants 01-02, 06-08, 12-14, 18-20, 24-26, 30-32, 36-38, 42-44, 48 |
| 5512/006 | ML4351 to ML4354, variants 01-02, 05-06, 09-13, 16-17, 20-24, 27-28, 31-35, 38-39, 42-44 |
| 5512/007 | ML4355 to ML4365, variants 01-02, 06-08, 12-14, 18-20, 24-26, 30-32, 36-38, 42-44, 47-48, 51-52, 55-56 |



DIODES,
MICROWAVE, SILICON, PIN AND VARACTORS

Certificate
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| | | | | |
|--|---|---|--|----------------------------|
| Types covered by similarity: | | Remarks: Certificate 259C has been merged with this certificate beginning February 2012. | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 5010 Detail ESCC Please refer to the next page | COBHAM MICROWAVE Villebon Sur Yvette France | Qualification | CNES | Jun 1995 |
| Characteristics: Refer to the Detail Specifications Operating Temperature Range (°C): -55 to +125 | | | | |
|  | <p style="text-align: center;">DIODES, MICROWAVE, SILICON, MULTIPLIER AND PIN, BASED ON TYPES DH 2XX AND DH 50XXX</p> | <p style="text-align: center;">Certificate 225 F</p> | <p style="text-align: center;">Page 04-13 003-2A</p> | |

Types covered by similarity:


| ESCC Spec. No. | Component Type |
|----------------|---|
| 5513/031 | DH 50151 to DH 50157, Variants 01 to 56 |
| 5513/032 | DH 50033 to DH 50037, Variants 01 to 40 |
| 5513/033 | DH 50201 to DH 50209, Variants 01 to 70 |
| 5513/034 | DH 50251 to DH 50256, Variants 01 to 41 |
| 5513/036 | DH 50052 to DH 50057, Variants 01 to 48 |
| 5513/037 | DH 50071 to DH 50077, Variants 01 to 56 |
| 5513/038 | DH 50101 to DH 50107, Variants 01 to 56 |
| 5512/016 | DH 267, Variants 10 to 15 and 16 |
| 5512/016 | DH 292, Variants 20 to 25 and 26 |
| 5512/016 | DH 256, Variants 30 to 35 and 36 |
| 5512/016 | DH 252, Variants 40 to 45 and 46 |
| 5512/016 | DH 294, Variants 50 to 55 and 56 |



DIODES,
MICROWAVE, SILICON, MULTIPLIER AND PIN,
BASED ON TYPES DH 2XX AND DH 50XXX


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| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|--------------------|---|---|----------------------------|----------|---------|----------|----------|---------|----------|----------|---------|----------|----------|---------|----------|----------|---------|----------|----------|----------|----------|----------|----------|----------|--|--|--|--|--|
| Types covered by similarity: | | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 5010 Detail ESCC 5512/023 | | COBHAM MICROWAVE Villebon Sur Yvette France | Qualification | CNES | Jun 2003 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Characteristics: All variants are qualified. <table border="0"> <tr> <td>Maximum Ratings:</td> <td>$V_R = 20$ at $I_R = 10 \mu A$ and $T_{amb} = +25 \text{ }^\circ C$</td> </tr> <tr> <td>Operating Temperature Range ($^\circ C$):</td> <td>-55 to +155</td> </tr> </table> | | | Maximum Ratings: | $V_R = 20$ at $I_R = 10 \mu A$ and $T_{amb} = +25 \text{ }^\circ C$ | Operating Temperature Range ($^\circ C$): | -55 to +155 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Maximum Ratings: | $V_R = 20$ at $I_R = 10 \mu A$ and $T_{amb} = +25 \text{ }^\circ C$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating Temperature Range ($^\circ C$): | -55 to +155 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="0"> <tr> <td>Variants</td> <td>C_j(typ.) (-4 V)</td> <td>Based on Type</td> </tr> <tr> <td>01 to 09</td> <td>1.0 pF</td> <td>DH 76010</td> </tr> <tr> <td>10 to 18</td> <td>1.50 pF</td> <td>DH 76015</td> </tr> <tr> <td>19 to 27</td> <td>2.20 pF</td> <td>DH 76022</td> </tr> <tr> <td>28 to 36</td> <td>2.30 pF</td> <td>DH 76033</td> </tr> <tr> <td>37 to 45</td> <td>4.70 pF</td> <td>DH 76047</td> </tr> <tr> <td>46 to 54</td> <td>6.80 pF</td> <td>DH 76068</td> </tr> <tr> <td>55 to 63</td> <td>10.00 pF</td> <td>DH 76100</td> </tr> <tr> <td>64 to 72</td> <td>15.00 pF</td> <td>DH 76150</td> </tr> </table> | Variants | C_j (typ.) (-4 V) | Based on Type | 01 to 09 | 1.0 pF | DH 76010 | 10 to 18 | 1.50 pF | DH 76015 | 19 to 27 | 2.20 pF | DH 76022 | 28 to 36 | 2.30 pF | DH 76033 | 37 to 45 | 4.70 pF | DH 76047 | 46 to 54 | 6.80 pF | DH 76068 | 55 to 63 | 10.00 pF | DH 76100 | 64 to 72 | 15.00 pF | DH 76150 | | | | | |
| Variants | C_j (typ.) (-4 V) | Based on Type | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01 to 09 | 1.0 pF | DH 76010 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 to 18 | 1.50 pF | DH 76015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 19 to 27 | 2.20 pF | DH 76022 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 to 36 | 2.30 pF | DH 76033 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 to 45 | 4.70 pF | DH 76047 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 to 54 | 6.80 pF | DH 76068 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 55 to 63 | 10.00 pF | DH 76100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 64 to 72 | 15.00 pF | DH 76150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | DIODES, MICROWAVE, SILICON, HYPER-ABRUPT JUNCTION TUNING VARACTOR BASED ON TYPES DH 76xxx | | Certificate 273 E | | Page 04-13 003-3 | | | | | | | | | | | | | | | | | | | | | | | | | | |

Section 05**Component Type: Filters**

| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|---------------|-------|---|----------------------|
| 05-01 | | | Feedthrough | |
| | 05-01-001-A-B | 252 H | Types SFC, SFL, SFP | Exxelia Technologies |
| 05-02 | | | SAW | |
| | 05-02-001 | 313 B | SAW Filters (transversal band pass/ resonator/notch/low loss impedance element) | Kongsberg Norspace |

| | | | | |
|--|---|--------------------|---------------------------------|-------------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3008</p> <p>Detail ESCC Please refer to the next page</p> | <p>Exxelia Technologies Chanteloup en Brie France</p> | Qualification | CNES | Aug 1998 |
| <p>Characteristics:</p> <p>All variants specified in the Detail Specifications are qualified.</p> <p>Operating Temperature Range (°C): -55 to +125</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>FILTERS, PI-, C-, AND L- TYPES, FEEDTHROUGH, ELECTROMAGNETIC INTERFERENCE SUPPRESSION, HERMETICALLY AND NON-HERMETICALLY SEALED, BASED ON TYPES SFC, SFL AND SFP</p> | | <p>Certificate</p> <p>252 H</p> | <p>Page</p> <p>05-01 001-1A</p> |

Types covered by certificate:


| Domain | Style | Detail Specification | Variants | Capacitance Range (nF) | Rated Current (A) | Rated Voltage (V) |
|--------------------------------|----------|----------------------|----------|------------------------|-------------------|-------------------|
| SFC, Hermetic, Glass Fill | SFC 060 | 3008/026 | 01 to 06 | 0.68 to 220 | 10 | 25 to 200 |
| | SFC 100 | 3008/027 | 01 to 06 | 1.0 to 1000 | 10 | 25 to 200 |
| SFP, Hermetic, Glass Fill | SFP 060 | 3008/021 | 01 to 14 | 2.4 to 89.6 | 10 | 35 to 500 |
| | SFP 100 | 3008/028 | 01 to 06 | 0.16 to 1 312.0 | 10 | 50 to 300 |
| SFL, Hermetic, Glass Fill | SFL 100 | 3008/029 | 01 to 48 | 17.6 to 1 600 | 5, 10, 15 | 40 to 300 |
| Capacitance Range (pF) | | | | | | |
| SFC, Non-Hermetic, Resin Fill | SFC 035 | 3008/031 | 01 to 06 | 470 to 22 000 | 10 | 25 to 200 |
| | SFC 040 | 3008/032 | 01 to 12 | 470 to 22 000 | 10 | 25 to 200 |
| | SFC 060 | 3008/033 | 01 to 12 | 680 to 220 000 | 10 | 25 to 200 |
| SFP, Non-Hermetic, Resin Fill | SFP 035 | 3008/025 | 01 to 20 | 2 400 to 35 200 | 10 | 35 to 200 |
| | SFP 040 | 3008/014 | 01 to 40 | 750 to 4 800 | 10 (DC 7 LF) | 70 to 250 |
| | SFP 060 | 3008/030 | 01 to 28 | 2 400 to 89 600 | 10 | 35 to 500 |
| Capacitance Range (pF) | | | | | | |
| SFC, Mixed fill, for soldering | SFC 030V | 3008/020 | 01 to 12 | 470 to 22 000 | 1.0 to 5.0 | 25 to 200 |



CAPACITOR FILTERS, PI-, C-, AND L- TYPES, FEEDTHROUGH,
 ELECTROMAGNETIC INTERFERENCE SUPPRESSION,
 HERMETICALLY AND NON-HERMETICALLY SEALED,
 BASED ON TYPES SFC, SFL AND SFP

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| | | | | |
|--|---|--------------------------|-----------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3502 Detail ESCC 3502/002 | Kongsberg Norspace Norway | Qualification | ESA/ESTEC | Aug 2011 |
| Characteristics: | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | SAW FILTERS (TRANSVERSAL BAND PASS/RESONATOR/NOTCH/ LOW LOSS IMPEDANCE ELEMENT) | Certificate 313 B | | Page 05-01 002 |

Section 06**Component Type: Fuses**

| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|-----------|-------|------------------|--------------|
| 06-01 | | | Thin film | |
| | 06-01-001 | 284 D | Type MGA-S | Schurter |
| | 06-01-002 | 336 A | Type HCSF | Schurter |

**SECTION 06-**: INDEX OF FUSES****REP005 Updated Apr 2017**


| | | | | |
|---|---|--------------------|-----------------------------------|------------------------------------|
| Types covered by similarity: Variants 02 to 07, 09, 10, 11 | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 4008 Detail ESCC 4008/001 | Schurter Lucerne Switzerland | Qualification | ESA | Jun 2008 |
| <p>Characteristics: Variants 01 to 12 are qualified.</p> <p>Rated Voltage (VAC or VDC): 125/125, 63/125 and 32/125 by variant</p> <p>Rated Current (VAC and VDC): 0.14 to 3.5 A by variant</p> <p>AC Interrupt Current (A): 50 at maximum rated voltage, power factor > 0.95</p> <p>DC Interrupt Current (A): at maximum rated voltage, time constant ≤ 1 ms</p> <p>Variants 01 to 10: 300, Variants 11 and 12: 50</p> <p>Operating Temperature Range, (°C): -50 to +125 (90% I_R to 107% I_R)</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>FUSES, SURFACE MOUNT, THIN FILM, 0.14 TO 3.5 AMPS, BASED ON TYPE MGA-S</p> | | <p>Certificate 284 D</p> | <p>Page 06-01 001</p> |


| | | | | |
|--|--|--------------------------|--------------------------|----------------------------|
| Types covered by similarity: Variants 24, 26, 28 , 32 are qualified (5A, 7.5A, 10A, 15A) | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 4008 Detail ESCC 4008/002 | Schurter Lucerne Switzerland | Qualification | ESA | Jan 2016 |
| Characteristics: Variants 24, 26, 28 , 32 are qualified. | | | | |
| Operating Temperature Range, (°C): -50 to +125 (T _{amb} 106% I _R to 80% I _R) | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | FUSES, SOLID STATE, THIN FILM, BASED ON TYPE HCSF | Certificate 336 A | Page 06-01 002 | |

Section 07**Component Type: Inductors**

| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|-----------|-------|----------------------------------|-------------------|
| 07-01 | | | Fixed, RF | |
| | 07-01-001 | 241 H | Types MSC1 10K, 12K, 20K and H01 | Exxelia Magnetics |
| 07-02 | | | Power | |
| | 07-02-002 | 276 E | Types SESI and CMC | Exxelia Magnetics |

**SECTION 07-**: INDEX OF INDUCTORS****REP005 Updated Apr 2017**

| | | | | | | | | | |
|--|--------------|----------------|---------|---|-------------------------------|---------------------------------------|--------------------------|-----------------------|----------------------------|
| Types covered by similarity: | | | | | | | Remarks: | | |
| Procurement Specifications | | | | Manufacturer | | | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3201 Detail ESCC 3201/008 | | | | Exxelia Magnetics (Microspire) Illange France | | | Qualification | CNES | Apr 1997 |
| Characteristics: Variants 01 to 05 are qualified | | | | | | | | | |
| Series No. | Range (μH) | Tolerance (±%) | Q min. | Min. SRF f _r (MHz) | Max. DCR, R _{dc} (Ω) | Rated DC Current, I _R (mA) | | | |
| 10k | 0.010- 10 | 2.0, 5.0, 10 | 60 - 42 | 1000 - 33 | 0.025 - 3.3 | 750 - 87 | | | |
| 12k | 12 - 1000 | 2.0, 5.0, 10 | 56 - 12 | 26 - 1.5 | 2.0 - 120 | 110 - 15 | | | |
| 20k | 0.010 - 1000 | 10 | 75 - 30 | 1000 - 1.7 | 0.04 - 80 | 1000 - 25 | | | |
| H01 | 0.380 - 100 | 15 | 30 | 8 | 0.029 - 3.8 | 1500 - 100 | | | |
| Dielectric Withstanding Voltage (DWV): 200 Vrms Operating Temperature Range (°C): -55 to +125 | | | | | | | | | |
|  | | | | INDUCTORS, FIXED, RF, MINIATURE, MOULDED, SURFACE MOUNT, BASED ON SERIES MSC1 10k, 12k, 20k and H01 | | | Certificate 241 H | | Page 07-01 001 |

| | | | | | |
|--|--|--|--------------------|--------------------------|----------------------------|
| Types covered by similarity: | | Remarks: Termination finish shall be Sn90Pb10 | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3201 Detail ESCC 3201/009 3201/010 | | Exxelia Magnetics (Microspire) Illange France | Qualification | CNES | Apr 2004 |
| Characteristics: 3201/009 Variants 01 to 08 are qualified 3201/010 Variants 01, 03 and 05 are qualified 3201/009 SESI 14 15 15W 18 9.1 22 32WR 32PR Variant 01 02 03 04 05 06 07 08 3201/010 CMC 15 18 22 Variant 01 02 03 Operating Temperature Range (°C): -55 to +125 | | | | | |
|  | | INDUCTORS, POWER, MOULDED, SURFACE MOUNT, BASED ON SERIES SESI AND CMC | | Certificate 276 E | Page 07-02 002 |

Section 08


Component Type: Microcircuits

| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|-----------------------|---------------|--|---------------------|
| 08-80 | | | Digital C-MOS | |
| | 08-80-001-2 A to E | 73 Q | 4000 B Series | ST Microelectronics |
| | 08-80-002-2 A to F | 190 L | 54HCMOS Series | ST Microelectronics |
| | 08-80-003 | 278 E rev2 | MH1RT | Microchip Atmel |
| | 08-80-004 | 312 B rev1 | Types ATC18RHA, ATF280F and ATF280F | Microchip Atmel |
| | 08-80-005 | 342 rev1 | ATMX150RHA | Microchip Atmel |
| 08-90 | | | Linear Switching Regulator | |
| | 08-90-001 | 344 | Pulse Width Modulator, based on types ST1843 and ST1845 | ST Microelectronics |



SECTION 08-**: INDEX OF MICROCIRCUITS

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| | | | | | |
|--|--|---|-------------------------|-----------------------------|----------------------------|
| Types covered by similarity: See next pages | | Remarks: The following (qualified) product types are affected by a Last Time Buy announced by ST Microelectronics in their PCN No. PCN/RNS/HR/17001 of January 2017: HCC4012B, HCC4023B, HCC4025B, HCC4034B, HCC4032B, HCC4078B, HCC4082B | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 9000 Detail ESCC See types covered by similarity | | ST Microelectronics Rennes France | Qualification | CNES | Apr 1981 |
| Characteristics: Package Types: Ceramic Dual-in-Line Ceramic Flat Pack | | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | MICROCIRCUITS, DIGITAL, C-MOS-B, 4000B SERIES | | Certificate 73 Q | Page 08-80 001-2A | |

Types covered by similarity:

| ESCC Spec. No. | Component Type | Component Type |
|----------------|---|--|
| 9201/041 | Quad 2-input NOR gate | 4001B |
| 9201/042 | Dual 4-input NOR gate | 4002B |
| 9202/039 | 4-bit full adder | 4008B |
| 9201/043 | Quad 2-input NAND gate | 4011B |
| 9201/044 | Dual 4-input NAND gate | 4012B <i>Product Terminated -Last time buy 30-Jun-17</i> |
| 9203/023 | Dual D-type flip-flop | 4013B |
| 9306/014 | 8-stage synchronous static shift register | 4014B |
| 9306/015 | Dual 4-stage static shift register with serial input/parallel input | 4015B |
| 9204/020 | Decade counter/divider | 4017B |
| 9204/021 | Presetable divide-by-N counter | 4018B |
| 9202/051 | Quad AND/OR select gate | 4019B |
| 9204/022 | 14-stage ripple carry binary counter/divider | 4020B |
| 9306/016 | 8-stage static shift register | 4021B |
| 9204/023 | Octal counter/divider | 4022B |
| 9201/045 | Triple 3-input NAND gates | 4023B |
| 9204/024 | 7-stage ripple carry binary counter/divider | 4024B <i>Product Terminated -Last time buy 30-Jun-17</i> |
| 9201/046 | Triple 3-input NOR gate | 4025B <i>Product Terminated -Last time buy 30-Jun-17</i> |
| 9203/022 | Dual J-K master slave flip-flop | 4027B |



MICROCIRCUITS, DIGITAL,
C-MOS-B, 4000B SERIES

Certificate

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Types covered by similarity:

| ESCC Spec. No. | Component Type | Component Type |
|----------------|--|---|
| 9205/010 | BCD-to-decimal or binary-to-octal decoder | 4028B |
| 9204/025 | Presetable up/down counter binary or BCD decade | 4029B |
| 9201/047 | Quad 2-input exclusive OR gates | 4030B |
| | | |
| 9306/025 | 8-stage static bidirectional parallel/serial input/output bus register with 3 state output | 4034B <i>Product Terminated - Last time buy 30-Jun-17</i> |
| | | |
| 9204/026 | 12-stage ripple carry binary counter/divider | 4040B |
| 9202/040 | Quad true/complement buffer with unbuffered outputs | 4041UB |
| 9202/041 | Quad clocked D latch | 4042B <i>Product Terminated -Last time buy 30-Jun-17</i> |
| 9202/042 | Quad NOR 3-state R/S latches | 4043B |
| 9202/043 | Quad NAND 3-state R/S latch | 4044B |
| 9202/044 | Micropower phase-locked loop | 4046B |
| 9207/003 | Low power monostable/astable multivibrator | 4047B |
| 9202/045 | Hex buffer/converter (inverting type) | 4049UB |
| 9202/046 | Hex buffer/converter (non-inverting type) | 4050B |
| 9202/047 | Analogue multiplexer/demultiplexer | 4051B |
| 9202/048 | Analogue multiplexer/demultiplexer | 4052B |
| 9202/049 | Triple 2-channel analogue multiplexer/demultiplexer | 4053B |
| 9209/001 | 4-bit magnitude comparator | 4063B |
| 9204/052 | 14-stage ripple-carry binary counter/divider and oscillator | 4060B |



MICROCIRCUITS, DIGITAL,
C-MOS-B, 4000B SERIES

Certificate

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Page

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001-2C

Types covered by similarity:

| ESCC Spec. No. | Component Type | Component Type |
|----------------|--|--|
| 9408/005 | Quad bilateral switch | 4066B |
| 9408/009 | Analogue multiplexer/demultiplexer | 4067B |
| 9201/061 | 8-input NAND gate | 4068B |
| 9401/010 | Hex inverter | 4069UB |
| 9201/048 | Quad exclusive OR gate | 4070B |
| 9201/063 | Quad 2-input OR gate | 4071B |
| 9201/082 | Dual 4-input OR gate | 4072B |
| 9201/064 | Triple 3-input AND gate | 4073B |
| 9201/065 | Triple 3-input OR gate | 4075B |
| 9306/022 | 4-bit D-type register with 3-state output | 4076B |
| 9201/055 | Quad exclusive NOR gate | 4077B |
| 9201/062 | 8-input OR/NOR gate | 4078B <i>Product Terminated -Last time buy 30-Jun-17</i> |
| 9201/052 | Quad 2-input AND gate | 4081B |
| 9201/066 | Dual 4-input AND gate | 4082B |
| 9409/002 | Quad 2-input NAND gate with Schmitt trigger input | 4093B |
| 9306/026 | 8-stage shift and store bus register with synchronous serial outputs and 3-state parallel output | 4094B |
| 9206/003 | Dual monostable multivibrator | 4098B |
| | | |



MICROCIRCUITS, DIGITAL,
C-MOS-B, 4000B SERIES

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001-2D

Types covered by similarity:

| ESCC Spec. No. | Component Type | Component Type |
|----------------|--|----------------|
| | Hex non-inverting buffers with 3-state output | 4503B |
| | | |
| | 8-channel multiplexer with 3-state output | 4512B |
| 9408/012 | 4-bit latch/4-to-16 decoder | 4514B |
| 9205/011 | 4-bit latch/4-to-16 line decoder | 4515B |
| 9204/045 | Synchronous quad presettable up/down binary counter | 4516B |
| 9204/028 | Dual binary up counter | 4520B |
| 9202/065 | 8-bit priority encoder | 4532B |
| 9207/007 | Dual monostable multivibrator with reset | 4538B |
| 9408/011 | Dual 1-of-4 decoder/demultiplexer | 4555B |
| 9408/025 | Dual 1-of-4 decoder/demultiplexer (output low on select) | 4556B |
| 9204/036 | Presettable 8-bit synchronous down-counter | 40103B |
| 9409/005 | Hex Schmitt-trigger | 40106B |
| 9401/013 | Dual 2-input NAND buffer/driver | 40107B |
| 9407/003 | Quad low-to-high 3-state voltage level shifter | 40109B |
| 9204/054 | Programmable 4-bit binary counter with asynchronous clear | 40161B |
| 9203/038 | Hex D-type flip-flop | 40174B |
| 9204/041 | Presettable binary up/down counter (dual clock with reset) | 40193B |
| | | |




MICROCIRCUITS, DIGITAL,
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001-2E

| | | | | |
|---|---|--------------------------|-----------------------------|----------------------------|
| Types covered by similarity: See next pages | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 9000 | ST Microelectronics Rennes France | Qualification | CNES | Nov 1992 |
| Detail ESCC See types covered by similarity | | | | |
| Characteristics: Qualified Packages: <ul style="list-style-type: none"> • Ceramic Dual-in-Line • Ceramic Flat Pack | | | | |
| NOTES 1. These parts have successfully passed radiation testing to 50 kRads. | | | | |
|  | MICROCIRCUITS, DIGITAL, MONOLITHIC, HIGH SPEED CMOS, 54HC AND 54HCT SERIES | Certificate 190 L | Page 08-80 002-2A | |

Types covered by similarity:

| ESCC Spec. No. | Component Type | Component Type | Note |
|----------------|---|----------------|------|
| 9201/105 | Quad 2-input NAND gate | 54HC 00 | 1 |
| 9201/113 | Quad 2-input NOR gate | 02 | 1 |
| 9201/114 | Quad 2-input NAND gate with open drain output | 03 | 1 |
| 9401/033 | Hex inverter | 04 | 1 |
| 9201/106 | Quad 2-input positive AND gate | 08 | 1 |
| 9201/107 | Triple 3-input NAND gate | 10 | 1 |
| 9201/117 | Triple 3-input AND gate | 11 | 1 |
| 9409/007 | Hex Schmitt trigger inverter | 14 | 1 |
| 9201/118 | Dual 4-input NAND gate | 20 | 1 |
| 9201/108 | Dual 4-input AND gate | 21 | 1 |
| 9201/109 | Triple 3-input NOR gate | 27 | 1 |
| 9201/110 | 8-input NAND gate | 30 | 1 |
| 9201/111 | Quad 2-input OR gate | 32 | 1 |
| 9203/050 | Dual D-type flip-flop with preset and clear | 74 | 1 |
| 9209/004 | 4-bit magnitude comparator | 85 | 1 |
| 9201/119 | Quad 2-input exclusive OR gate | 86 | 1 |
| | | | |



MICROCIRCUITS, DIGITAL, MONOLITHIC,
HIGH SPEED CMOS, 54HC AND 54HCT SERIES

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Types covered by similarity:

| ESCC Spec. No. | Component Type | Component Type | Note |
|----------------|--|----------------|------|
| 9306/048 | Dual J-K positive edge triggered flip-flop with preset and clear | 54HC 109 | 1 |
| 9207/006 | Dual positive or negative edge Schmitt-retriggerable monostable multivibrator with clear | 123 | 1 |
| 9401/039 | Quad bus buffer with 3 state output | 125 | 1 |
| 9201/120 | Quad 2-input NAND gate with Schmitt-trigger input | 132 | 1 |
| 9205/013 | 3-to-8 line decoder/demultiplexer with address latch and inverted output | 137 | 1 |
| 9408/046 | 3-to-8 line decoder/demultiplexer with inverted output | 138 | 1 |
| 9205/017 | Dual 2-to-4 line decoder/demultiplexer with inverted output | 139 | 1 |
| 9410/017 | 8-line to 3-line priority encoder | 148 | 1 |
| 9408/054 | 8-line to 1-line data selector/multiplexer | 151 | 1 |
| 9408/038 | Dual 4-line to 1-line data selectors/multiplexer | 153 | 1 |
| 9205/023 | 4-to-16 line decoder/demultiplexer with inverted output | 154 | 1 |
| 9408/057 | Quad 2-line to 1-line data selector/multiplexer | 157 | 1 |
| 9408/059 | Quad 2-line to 1-line data selector/multiplexer with inverted output | 158 | 1 |
| 9204/062 | Synchronous presettable 4-bit decade counter with direct clear | 160 | 1 |
| 9204/059 | Asynchronous 4-bit binary counter | 161 | 1 |
| 9306/041 | 8-bit SIPO shift register | 164 | 1 |
| 9306/042 | 8-bit PISO shift register | 165 | 1 |



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HIGH SPEED CMOS, 54HC AND 54HCT SERIES

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002-2C

Types covered by similarity:

| ESCC Spec. No. | Component Type | Component Type | Note |
|----------------|---|----------------|------|
| 9306/043 | 8-bit PISO shift register | 54HC 166 | 1 |
| 9306/052 | Hex D-type edge-triggered flip-flop with clear | 174 | 1 |
| 9203/052 | Quad D-type edge-triggered flip-flop with clear | 175 | 1 |
| 9204/066 | Synchronous 4-bit up/down binary counter | 191 | 1 |
| 9204/065 | Synchronous 4-bit up/down binary counter (dual clock with clear) | 193 | 1 |
| 9306/047 | 4-bit PIPO shift register | 194 | 1 |
| 9205/021 | 3-line to 8-line decoder/demultiplexer with address latch | 237 | 1 |
| 9401/034 | Octal bus buffer with inverted 3-state output | 240 | 1 |
| 9401/048 | Octal bus buffer with 3-state output | 244 | 1 |
| 9405/013 | Octal bus transceiver with 3-state output | 245 | 1 |
| 9408/048 | 1-to-8 data selector/multiplexer with 3-state output | 251 | 1 |
| 9408/047 | Quad 2-line to 1-line data selector/multiplexer with 3-state output | 257 | 1 |
| 9203/073 | 8-bit addressable latch | 259 | 1 |
| 9203/053 | Octal D-type edge-triggered flip-flop with clear | 273 | 1 |
| 9208/003 | 9-bit odd/even parity generator/checker | 280 | 1 |



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002-2D

Types covered by similarity:

| ESCC Spec. No. | Component Type | Component Type | Note |
|----------------|--|----------------|------|
| 9202/075 | 4-bit binary full adder with fast carry | 54HC 283 | 1 |
| 9401/044 | Hex bus buffer with 3-state output | 367 | 1 |
| 9203/059 | Octal D-type transparent latch with 3-state output | 373 | 1 |
| 9203/060 | Octal D-type edge-triggered flip-flop with 3-state output | 374 | 1 |
| 9204/074 | Dual 4-bit negative edge-triggered binary counter | 393 | 1 |
| 9401/049 | Octal bus buffer with inverted 3-state output | 540 | 1 |
| 9401/047 | Octal bus buffer with 3-state output | 541 | 1 |
| 9202/072 | Octal D-type transparent latch with 3-state output | 573 | 1 |
| 9203/054 | Octal D-type edge-triggered flip-flop with 3-state output | 574 | 1 |
| 9204/071 | 8-bit binary counter with 3-state output register | 590 | 1 |
| 9306/051 | 8-bit shift register with 3-state output register | 595 | 1 |
| 9306/054 | 8-bit PISO shift register | 597 | 1 |
| 9209/005 | 8-bit identify comparator | 688 | 1 |
| 9204/070 | Asynchronous negative-edge-triggered 14-bit binary counter | 4020 | 1 |
| 9204/069 | Asynchronous negative edge-triggered 12-bit binary counter | 4040 | 1 |
| 9401/037 | Hex buffer/converter with inverted output | 4049 | 1 |
| 9401/038 | Hex buffer/converter | 4050 | 1 |



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Types covered by similarity:

| ESCC Spec. No. | Component Type | Component Type | Note |
|----------------|---|----------------|------|
| 9408/064 | Analogue multiplexer/demultiplexer | 54HC 4051 | 1 |
| 9408/065 | Analogue multiplexer/demultiplexer (triple 2-channel) | 4053 | 1 |
| 9204/076 | Asynchronous negative-edge-triggered 14-bit binary counter and oscillator | 4060 | 1 |
| 9408/052 | Quad bilateral switch | 4066 | 1 |
| 9201/123 | 8-input OR/NOR gate | 4078 | 1 |
| 9306/050 | 8-bit SIPO shift latch register with 3-state output | 4094 | 1 |
| 9205/019 | 4-to-16 line decoder/latch | 4514 | 1 |
| 9203/070 | Dual D-type flip-flop with preset and clear | 54HCT 74 | 1 |
| 9402/009 | Octal bus buffer with 3-state output | 244 | 1 |
| 9405/014 | Octal bus transceiver with 3-state output | 245 | 1 |
| 9203/064 | Octal D-type transparent latch with 3-state output | 373 | 1 |




MICROCIRCUITS, DIGITAL, MONOLITHIC,
HIGH SPEED CMOS, 54HC AND 54HCT SERIES


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| | | | | | |
|---|--|--|--------------------|-------------------------------|----------------------------|
| Types covered by similarity: . | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 9000 Detail ESCC 9202/076 | | Microchip-Atmel Nantes France | Qualification | CNES | Dec 2006 |
| Characteristics: | | | | | |
|  | | INTEGRATEC CIRCUITS, SILICON MONOLITHIC, CMOS GATE/EMBEDDED ARRAY BASED ON TYPE MH1RT | | Certificate 278 E rev2 | Page 08-80 003 |

| | | | | | | |
|---|--|--|--|-------------------------------|-----------------------|----------------------------|
| Types covered by similarity: . | | Remarks: | | | | |
| Procurement Specifications | | Manufacturer | | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 9000 Detail ESCC 9202/080 9512/004 9304/165 | | Microchip-Atmel Nantes France | | Qualification | CNES | Aug 2012 |
| Characteristics: 9202/080: INTEGRATEC CIRCUITS, SILICON MONOLITHIC, CMOS CELL-BASED ARRAY BASED ON TYPE ATC18RHA 9512/004: INTEGRATEC CIRCUITS, SILICON, 32-BIT SPARC PROCESSOR, BASED ON TYPE AT697F 9304/165: INTEGRATEC CIRCUITS, SILICON MONOLITHIC, CMOS DIGITAL, FIELD PRO GRAMMABLE GATE ARRAY, 280000 GATES, BASED ON TYPE ATF280F | | | | | | |
|  | | INTEGRATEC CIRCUITS, SILICON MONOLITHIC, CMOS CELL-BASED ARRAY BASED ON TYPE ATC18RHA | | Certificate 312 B rev1 | | Page 08-80 004 |

| | | | | | |
|---|--|-------------------------------------|-----------------------------|--------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 9000 Detail ESCC 9202/083 | | Microchip-Atmel Nantes France | Qualification | CNES | Aug 2016 |
| Characteristics: | | | | | |
|  | INTEGRATEC CIRCUITS, SILICON MONOLITHIC, CMOS CELL-BASED ARRAY BASED ON TYPE ATMX150RHA—Ph1 DIGITAL ONLY 7MGATES 5ML | | Certificate 342 rev1 | Page 08-80 005 | |

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|--|--|---|--------------------|------------------------|----------------------------|
| Types covered by similarity: . | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 9000 Detail ESCC 9108/020 9108/021 | | ST Microelectronics Rennes France | Qualification | CNES | Nov 2016 |
| Characteristics: Variants 01, 02 | | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | | INTEGRATEC CIRCUITS, PULSE WIDTH MODULATOR, BASED ON TYPES ST1843 AND ST1845 | | Certificate 344 | Page 08-90 001 |

Section 09


Component Type: Relays


| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|-------------|-------|------------------------------------|----------------|
| 09-01 | | | Non-Latching, 28Vdc Contact Rating | |
| | 09-01-001 | 102 H | Type T** | REL STPI |
| | 09-01-004 | 205 E | Type E 215 | REL STPI |
| | 09-01-004-3 | 318 B | Type M300 | LEACH Sarralbe |
| 09-02 | | | Latching, 28Vdc Contact Rating | |
| | 09-02-001 | 88 J | Type TL | REL STPI |
| | 09-02-003 | 98 G | Type EL415 | REL STPI |
| | 09-02-003-3 | 317 B | Type M402 | LEACH Sarralbe |
| | 09-02-004 | 167 G | Type EL215 | REL STPI |
| | 09-02-004-3 | 310 B | Type M302 | LEACH Sarralbe |
| 09-03 | | | Latching, 50Vdc Contact Rating | |





SECTION 09-**: INDEX OF RELAYS


REP005 Updated Apr 2017


| | | | | | |
|--|--|---|--------------------|--------------------------|----------------------------|
| Types covered by similarity: Rated Coil Voltages 5, 6, 9, 12 and 18 Vdc | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3601 Detail ESCC 3601/002 | | REL-STPI St Jean de la Ruelle France | Qualification | CNES | Feb 1983 |
| Characteristics: Variants 01 to 06 are qualified Contact Rating 1A at 28Vdc Contact Configuration 2PDT Package Type TO-5 Can Coil Voltage 5 - 26.5 Vdc Operating Temperature Range (°C): -65 to +125 | | | | | |
|  | | RELAY, NON-LATCHING, ELECTROMAGNETIC, TYPE T ** | | Certificate 102 H | Page 09-01 001 |


| | | | | | |
|---|--|--|--------------------|--------------------------|----------------------------|
| Types covered by similarity: Coil Voltage 12 Vdc | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3601 Detail ESCC 3601/007 | | REL STPI St Jean de la Ruelle France | Qualification | CNES | Jan 1994 |
| Characteristics: Variants 03, 04 and 06 are qualified Contact Rating 15 A at 28 Vdc Contact Configuration 2 PDT Package Type Half cubic inch can Coil Voltage 12 and 28 Vdc Operating Temperature Range (°C): -65 to +125 | | | | | |
|  | | RELAY, NON-LATCHING, ELECTROMAGNETIC, TYPE E 215 | | Certificate 205 E | Page 09-01 004 |


| | | | | | |
|---|--|---|--------------------|--------------------------|----------------------------|
| Types covered by similarity: Coil Voltage 12 Vdc | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3601 Detail ESCC 3601/007 | | LEACH Sarralbe France | Qualification | CNES | Feb 2012 |
| Characteristics: Variants 03, 04 and 06 are qualified Contact Rating 15 A at 28 Vdc Contact Configuration 2 PDT Package Type Half cubic inch can Coil Voltage 12 and 28 Vdc Operating Temperature Range (°C): -65 to +125 | | | | | |
|  | | RELAY, NON-LATCHING, ELECTROMAGNETIC, TYPE M300 | | Certificate 318 B | Page 09-01 004-3 |

| | | | | | | |
|---|--|---|--------------------|-------------------------|----------------------------|--------------------------|
| Types covered by similarity: Rated Coil Voltages 5, 6, 9, 12 and 18 Vdc | | Remarks: As from September 2015, in relation to NCCS 2STPI501 , each delivery of TL26 parts shall be subject to an official prior agreement by the ESCC Executive during a MRB. | | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | |
| Generic ESCC 3602 Detail ESCC 3602/002 | | REL-STPI Saint Jean de la Ruelle France | Qualification | CNES | Jan 1982 | |
| Characteristics: Variants 01 to 06 are qualified Contact Rating 1 A at 28 Vdc Contact Configuration 2 PDT Package Type TO-5 Can Coil Voltage 26.5 Vdc Operating Temperature Range (°C): -65 to +125 | | | | | | |
|  | | RELAY, LATCHING, ELECTROMAGNETIC, TYPE TL | | Certificate 88 J | | Page 09-02 001 |

| | | | | | |
|---|--|---|--------------------|-------------------------|----------------------------|
| Types covered by similarity: Coil voltage : 12 Vdc | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3602 | | REL STPI St Jean de la Ruelle France | Qualification | CNES | Nov 1982 |
| Detail ESCC 3602/004 | | | | | |
| Characteristics: Variants 04, 06 and 09 and 14, 16 and 19 are qualified Contact Rating 15 A at 28 Vdc Contact Configuration 4PDT Package Type Cubic inch can Coil Voltage 28 Vdc Operating Temperature Range (°C): -65 to +125 | | | | | |
|  | | RELAY, LATCHING, ELECTROMAGNETIC, TYPE EL 415 | | Certificate 98 G | Page 09-02 003 |

| | | | | | |
|--|--|---|--------------------|--------------------------|----------------------------|
| Types covered by similarity: Coil voltage : 12 Vdc | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3602 | | LEACH Sarralbe France | Qualification | CNES | Feb 2012 |
| Detail ESCC 3602/004 | | | | | |
| Characteristics: Variants 04, 06 and 09 and 14, 16 and 19 are qualified Contact Rating 15 A at 28 Vdc Contact Configuration 4PDT Package Type Cubic inch can Coil Voltage 28 Vdc Operating Temperature Range (°C): -65 to +125 | | | | | |
|  | | RELAY, LATCHING, ELECTROMAGNETIC, TYPE M402 | | Certificate 317 B | Page 09-02 003-3 |


| | | | | | |
|---|--|---|--------------------|--------------------------|----------------------------|
| Types covered by similarity: Coil voltage : 12 Vdc | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3602 | | REL STPI St Jean de la Ruelle France | Qualification | CNES | Feb 1990 |
| Detail ESCC 3602/009 | | | | | |
| Characteristics: Variants 03, 04 and 06 and 13, 14 and 16 are qualified Contact Rating 15 A at 28 Vdc Contact Configuration 2PDT Package Type Half-cubic inch can Coil Voltage 28 Vdc Operating Temperature Range (°C): -65 to +125 | | | | | |
|  | | RELAY, LATCHING, ELECTROMAGNETIC, TYPE EL 215 | | Certificate 167 G | Page 09-02 004 |

| | | | | | |
|--|--|--|--------------------|--------------------------|----------------------------|
| Types covered by similarity: Coil voltage : 12 Vdc | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3602 | | LEACH Sarralbe France | Qualification | CNES | Apr 2011 |
| Detail ESCC 3602/009 | | | | | |
| Characteristics: Variants 03, 04 and 06 and 13, 14 and 16 are qualified Contact Rating 15 A at 28 Vdc Contact Configuration 2PDT Package Type Half-cubic inch can Coil Voltage 28 Vdc Operating Temperature Range (°C): -65 to +125 | | | | | |
|  | | RELAY, LATCHING, ELECTROMAGNETIC, BASED ON TYPE M302 | | Certificate 310 B | Page 09-02 004-3 |

Section 10

Component Type: Resistors

| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|---------------------|-------|-----------------------------|------------------------|
| 10-07 | | | Shunts | |
| | 10-07-001 | 285 D | Types SMV-PW and SM*-PT | Isabellenhütte |
| 10-08 | | | Fixed, Film | |
| | 10-08-006 | 256 H | Surface Mount, Type MS1 | Vishay Electronic GmbH |
| | 10-08-007 | 289 C | Surface Mount, Type TNPS | Vishay Electronic GmbH |
| 10-09 | | | Chip | |
| | 10-09-002 A to D | 287 È | Type PHR; PFRR; PRAHR/CNWHR | Vishay S.A., Sfernice |
| | 10-09-003 | 314 B | Type CHP | Vishay S.A., Sfernice |
| 10-11 | | | Flexible, Foil, Heaters | |
| | 10-11-001-1 | 184 L | Single & Double Layer | IRCA |
| | 10-11-002 | 325 B | Single & Double Layer | Minco |
| | 10-11-003 | 330 A | Single & Double Layer | IRCA |

| Types covered by similarity: Tolerance (%) = ± 1 | | Remarks: the extension of qualification in 2014 did not maintain in the qualified scope the SMR type due to low sales. | | | | |
|--|--|--|--|--------------------------|-----------------------|----------------------------|
| Procurement Specifications | | Manufacturer | | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 4001 Detail ESCC 4001/027 4001/028 | | ISABELLENHÜTTE HEUSLER GmbH & Co. KG Dillenburg Germany | | Qualification | DLR | Nov 2008 |
| Characteristics: ESCC 4001/027 variants 01, 02 and 03 are qualified (SMP-PW, SMS-PW, SMT-PW) ESCC 4001028 variant 02 is qualified (SMV-PW) | | | | | | |
| Operating Temperature Range, (°C): -55 to 170C | | | | | | |
|  | | RESISTORS, FIXED, CHIP, METAL FOIL, BASED ON TYPES SMV-PW AND SM*-PT | | Certificate 285 D | | Page 10-07 001 |

Types covered by similarity:
Tolerance ($\pm\%$) = 0.1, 0.5, 1.0

Remarks:


| | | | | |
|----------------------------|--------------|--------------------|-----------------------|----------------------------|
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
|----------------------------|--------------|--------------------|-----------------------|----------------------------|


| | | | | |
|---|--|---------------|-----|----------|
| Generic ESCC 4001 Detail ESCC 4001/022 | VISHAY Electronic GmbH Division Draloric Selb Germany | Qualification | DLR | Oct 1999 |
|---|--|---------------|-----|----------|


Characteristics: Critical R = 160 k Ω

| Range (Ω) | Tol. ($\pm\%$) | TC (\pm ppm/ $^{\circ}$ C) | Value Series |
|--------------------|------------------|-------------------------------|--------------|
| 43.2 - 1.004 M | 0.1 | 50 | E96 |
| 10.0 - 1.004 M | 0.5 | | |
| 2.20 - 5.114 M | 1.0 | | |
| 43.2 - 1.004 M | 0.1 | 25 | E96 |
| 10.0 - 1.004 M | 0.5 | | |
| 10.0 - 1.004 M | 1.0 | | |
| 43.2 - 0.2213 M | 0.1 | 15 | E96 |
| 10.0 - 0.5113 M | 0.5 | | |

Operating Temperature Range, ($^{\circ}$ C): -55 to +125

| | | | |
|---|---|----------------------|----------------------|
|  | RESISTORS, FILM, FIXED, SURFACE MOUNT, NON-HERMETICALLY SEALED, BASED ON TYPE MS1 | Certificate 256 H | Page 10-08 006 |
|---|---|----------------------|----------------------|

| Types covered by similarity: Temperature Coefficient (\pm ppm/ $^{\circ}$ C): 25, 50 Tolerance (\pm %) = 0.5, 1.0 | | | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----------------|------------------------|--|----------------------|--------------------|--|-----------------------------------|--------------------------|----------------|------------------------|--|----------------------|--------------|--|-----------------------------------|----------------|------------------|-------------------|----|------|----|-------|-------------|-----|------------|-------|-------|----|------|----|-------|-------------|-----|------------|-----|-------|----|------|----|---|-------------|-----|------------|-----|-------|
| Procurement Specifications | | | Manufacturer | | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 4001 Detail ESCC 4001/029 | | | VISHAY Electronic Division Draloric Selb Germany | | Qualification | DLR | May 2009 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Characteristics: Variants 01 to 03 inclusive are qualified E96 Series</p> <table border="1"> <thead> <tr> <th rowspan="2">Variant Number</th> <th rowspan="2">Style (Note 1)</th> <th colspan="2">Resistance Range R_n</th> <th rowspan="2">Tolerance (\pm %)</th> <th rowspan="2">Value Series</th> <th rowspan="2">Temperature Coefficient TC ($\pm 10^{-6}/^{\circ}$C)</th> <th rowspan="2">Critical Resistance (kΩ)</th> <th rowspan="2">Weight max (g)</th> </tr> <tr> <th>Min (Ω)</th> <th>Max (MΩ)</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>0603</td> <td>10</td> <td>0.221</td> <td>0.1, 0.5, 1</td> <td>E96</td> <td>15, 25, 50</td> <td>56.25</td> <td>0.002</td> </tr> <tr> <td>02</td> <td>0805</td> <td>10</td> <td>0.422</td> <td>0.1, 0.5, 1</td> <td>E96</td> <td>15, 25, 50</td> <td>180</td> <td>0.006</td> </tr> <tr> <td>03</td> <td>1206</td> <td>10</td> <td>1</td> <td>0.1, 0.5, 1</td> <td>E96</td> <td>15, 25, 50</td> <td>160</td> <td>0.008</td> </tr> </tbody> </table> <p>Operating Temperature Range, ($^{\circ}$C): -55 to +125</p> | | | | | | | | Variant Number | Style (Note 1) | Resistance Range R_n | | Tolerance (\pm %) | Value Series | Temperature Coefficient TC ($\pm 10^{-6}/^{\circ}$ C) | Critical Resistance (k Ω) | Weight max (g) | Min (Ω) | Max (M Ω) | 01 | 0603 | 10 | 0.221 | 0.1, 0.5, 1 | E96 | 15, 25, 50 | 56.25 | 0.002 | 02 | 0805 | 10 | 0.422 | 0.1, 0.5, 1 | E96 | 15, 25, 50 | 180 | 0.006 | 03 | 1206 | 10 | 1 | 0.1, 0.5, 1 | E96 | 15, 25, 50 | 160 | 0.008 |
| Variant Number | Style (Note 1) | Resistance Range R_n | | Tolerance (\pm %) | Value Series | Temperature Coefficient TC ($\pm 10^{-6}/^{\circ}$ C) | Critical Resistance (k Ω) | | | Weight max (g) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Min (Ω) | Max (M Ω) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 01 | 0603 | 10 | 0.221 | 0.1, 0.5, 1 | E96 | 15, 25, 50 | 56.25 | 0.002 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 02 | 0805 | 10 | 0.422 | 0.1, 0.5, 1 | E96 | 15, 25, 50 | 180 | 0.006 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 03 | 1206 | 10 | 1 | 0.1, 0.5, 1 | E96 | 15, 25, 50 | 160 | 0.008 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | RESISTORS, FILM, FIXED, SURFACE MOUNT, NON-HERMETICALLY SEALED, BASED ON TYPE TNPS | | | Certificate 289 C | | Page 10-08 007 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | |
|---|---|--|-------------------------------------|----------------------------|
| Types covered by similarity: | | Remarks: Components under ESCC QML qualification. Refer to Technology Flow description in REP006. | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 4001 Detail ESCC 4001/023 ESCC 4001/025 | VISHAY S.A. Division Sfernice Nice France | Qualification | CNES | Feb 2009 |
| <p>Characteristics and qualified variants: Refer to tables on the next page.</p> <p>4001/023 PHR High Stability and Precision Chip</p> <p>4001/023 PFRR High Stability and Precision Chip with Established Reliability Level R</p> <p>4001/025 PRA/CNWHR High Stability and Precision Surface Mount Array</p> <p>Operating Temperature Range, (°C): -55 to +155 Lead material is E with either Type 2 or Type 4 finish. The terminal material and finish of some of these variants makes them unsuitable for solder assembly methods . They shall be assembled using glue or wire bond techniques. See Detail specifications.</p> | | | | |
|  | <p>RESISTORS, FILM, FIXED, CHIP AND ARRAY, THIN FILM, BASED ON TYPES PHR; PFRR; PRAHR/CNWHR</p> | <p>Certificate 287 E</p> | <p>Page 10-09 002A</p> | |

Characteristics: Type PHR, Variants 01 to 08, 13 and 14 are qualified:

| Detail Specification | Style | Critical R (kΩ) | Rated Dissipation (W) | Limiting Element Voltage (V) | Type Variant |
|----------------------|-------|-----------------|-----------------------|------------------------------|--------------|
| 4001/023 | 0402 | 18 | 0.050 | 30 | 13; 14 |
| | 0603 | 12.25 | 0.100 | 35 | 01; 05 |
| | 0805 | 45 | 0.125 | 75 | 02; 06 |
| | 1206 | 40 | 0.250 | 100 | 03; 07 |
| | 2010 | 45 | 0.500 | 150 | 04; 08 |

| Variant | Style | Resistance Range (Note 1) | | Tolerance (±%) (Note 2) | Temperature Coefficient (10 ⁻⁶ /°C) (Note 2) | Weight (g) |
|---------|-------|---------------------------|-------------------------------|-------------------------|---|------------|
| | | Min (Ω) | Max (MΩ) | | | |
| 01, 05 | 0603 | 10 | 0.200 (0.160 for TC « C ») | 0.01; 0.02; 0.05; 0.1 | ±5; ±10; ±25 | 0.003 |
| 02, 06 | 0805 | 10 | 0.250 | 0.01; 0.02; 0.05; 0.1 | ±5; ±10; ±25 | 0.004 |
| 03, 07 | 1206 | 10 | 1.000 | 0.01; 0.02; 0.05; 0.1 | ±5; ±10; ±25 | 0.01 |
| 04, 08 | 2010 | 10 | 3.000 | 0.01; 0.02; 0.05; 0.1 | ±5; ±10; ±25 | 0.03 |
| 13, 14 | 0402 | 10 | 0.100 (0.067 for TC « C ») | 0.01; 0.02; 0.05; 0.1 | ±5; ±10; ±25 | 0.002 |

NOTES

1.

| Variant | Style | Critical Resistance (KΩ) |
|---------|-------|--------------------------|
| 01 – 05 | 0603 | 12.25 |
| 02 – 06 | 0805 | 45 |
| 03 – 07 | 1206 | 40 |
| 04 – 08 | 2010 | 45 |
| 13 - 14 | 0402 | 18 |

2.

| Resistance (Ω) | Available Tolerances (±%) | Series |
|----------------|---------------------------|-----------------------------------|
| 10 ≤ R < 50 | 0,1 | Any value in the resistance range |
| 50 ≤ R < 100 | 0,05 and 0,1 | |
| 100 ≤ R < 250 | 0,02; 0,05 and 0,1 | |
| R ≥ 250 | 0,01; 0,02; 0,05 and 0,1 | |

| Resistance (Ω) | Temperature Coefficient (ppm/°C) | Series |
|----------------|----------------------------------|-----------------------------------|
| 10 ≤ R < 20 | E: 25 (-55 °C; +155 °C) | Any value in the resistance range |
| 20 ≤ R < 50 | Y: 10 (-55 °C; +155 °C) | |
| 20 ≤ R < 50 | Z: 5 (+22 °C; +70 °C) | |
| R ≥ 50 | C: 5 (-55 °C; +155 °C) | |



RESISTORS,
FILM, FIXED, CHIP AND ARRAY, THIN FILM,
BASED ON TYPES PHR; PFRR; PRAHR/CNWHR

Certificate

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002B

Characteristics: Type PFRR, Variants 09 to 12 and 15 are qualified

| Detail Specification | Style | Critical R (kΩ) | Rated Dissipation (W) | Limiting Element Voltage (V) | Type Variant |
|----------------------|-------|-----------------|-----------------------|------------------------------|--------------|
| 4001/023 | 0402 | 32 | 0.050 | 40 | 15 |
| | 0603 | 25 | 0.100 | 50 | 09 |
| | 0805 | 80 | 0.125 | 100 | 10 |
| | 1206 | 90 | 0.250 | 150 | 11 |
| | 2010 | 80 | 0.500 | 200 | 12 |

| Style | Resistance Range (Ω) | Tolerance (±%) | Temperature Coefficient TC(±10 ⁻⁶ /°C) |
|------------------------------|----------------------|----------------|---|
| 0402; 0603; 0805; 1206; 2010 | From 100 to ≤ 100K | 0.05; 0.1 | 10; 25 |
| 0603; 0805; 1206; 2010 | From 100 to ≤ 261K | 0.05; 0.1 | 10; 25 |
| 0805; 1206; 2010 | From 261K to ≤ 301K | 0.05; 0.1 | 10; 25 |
| 1206; 2010 | From 301K to ≤ 1M | 0.05; 0.1 | 10; 25 |
| 2010 | From 1M to 3M01 | 0.05; 0.1 | 10; 25 |

The Established Reliability Level R is evaluated according to the ESCC Basic Specification 26000.



RESISTORS,
FILM, FIXED, CHIP AND ARRAY, THIN FILM,
BASED ON TYPES PHR; PFRR; PRAHR/CNWHR

Certificate
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002C

Characteristics: Type PRAHR/CNWHR,, Variants 01 to 42 are qualified

| Detail Specification | Style | Critical R (KΩ) | Rated Dissipation (W/resistor) | Limiting Element Voltage (V/resistor) | Type Variant | |
|----------------------|--------|-----------------|--------------------------------|---------------------------------------|-------------------|------------------------|
| | | | | | Same Ohmic Values | Different Ohmic Values |
| 4001/025 | PRA100 | 12.25 | 0.100 | 35 | 01 to 07 | 22 to 28 |
| | PRA135 | 56.25 | 0.100 | 75 | 08 to 14 | 29 to 35 |
| | PRA182 | 100 | 0.100 | 100 | 15 to 21 | 36 to 42 |

| Style | Resistance Range (Ω) | Tolerance (±%) | | Temperature Coefficient TC(±10 ⁻⁶ /°C) | |
|------------------------|----------------------|----------------|-----------|---|----------|
| | | Absolute | Relative | Absolute | Relative |
| PRA100; PRA135; PRA182 | From 100 to 200K | 0.1; 0.5; 1 | 0.05; 0.1 | 10 | 3; 5 |
| PRA135; PRA182 | From 200K to 250K | 0.1; 0.5; 1 | 0.05; 0.1 | 10 | 3; 5 |
| PRA182 | From 250K to 1M | 0.1; 0.5; 1 | 0.05; 0.1 | 10 | 3; 5 |


Number of Resistors per Array: 2 to 8





RESISTORS,
FILM, FIXED, CHIP AND ARRAY, THIN FILM,
BASED ON TYPES PHR; PFRR; PRAHR/CNWHR


Certificate
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Page
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002D

| Types covered by similarity: | | | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------------------|--|------------------------------|--------------------|--------------------------|----------------------------|-------|-------------------------|-------------------|------------------------------|--------------------------|----------------|------|-------|--------------------------|-----------------|---------|----------|--------------------------|-----------------------|---------------|------|-----|-------|-----|---------------|------|-----|-------|-----|---------------|------|-------|-------|-----|---------------|
| Procurement Specifications | | Manufacturer | | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 4001 Detail ESCC 4001/026 | | VISHAY S.A. Division Sfernice Nice France | | Qualification | CNES | Oct 2011 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Characteristics: Type CHPHR, Variants 01 to 10 are qualified. Type CHPFR, variants 11 to 20 are qualified. The qualified is range restricted as below: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Style</th> <th>Critica R (KΩ)</th> <th>Rated Dissipation</th> <th>Limited Element Voltage (V)</th> <th>Type Variant</th> </tr> </thead> <tbody> <tr> <td>0603</td> <td>25</td> <td>0.100</td> <td>50</td> <td>01;06; 11, 16</td> </tr> <tr> <td>0805</td> <td>50</td> <td>0.200</td> <td>100</td> <td>02;07; 12, 17</td> </tr> <tr> <td>1206</td> <td>160</td> <td>0.250</td> <td>200</td> <td>03;08; 13, 18</td> </tr> <tr> <td>2010</td> <td>180</td> <td>0.500</td> <td>300</td> <td>04;09; 14, 19</td> </tr> <tr> <td>2512</td> <td>112.5</td> <td>0.800</td> <td>300</td> <td>05;10; 15, 20</td> </tr> </tbody> </table> | | | | | | | Style | Critica R (K Ω) | Rated Dissipation | Limited Element Voltage (V) | Type Variant | 0603 | 25 | 0.100 | 50 | 01;06; 11, 16 | 0805 | 50 | 0.200 | 100 | 02;07; 12, 17 | 1206 | 160 | 0.250 | 200 | 03;08; 13, 18 | 2010 | 180 | 0.500 | 300 | 04;09; 14, 19 | 2512 | 112.5 | 0.800 | 300 | 05;10; 15, 20 |
| Style | Critica R (K Ω) | Rated Dissipation | Limited Element Voltage (V) | Type Variant | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0603 | 25 | 0.100 | 50 | 01;06; 11, 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0805 | 50 | 0.200 | 100 | 02;07; 12, 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1206 | 160 | 0.250 | 200 | 03;08; 13, 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2010 | 180 | 0.500 | 300 | 04;09; 14, 19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2512 | 112.5 | 0.800 | 300 | 05;10; 15, 20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Style</th> <th>Range(Ω)</th> <th>Tol. (\pm%)</th> <th>TC(\pmppm/$^{\circ}$C)</th> </tr> </thead> <tbody> <tr> <td>0603;0805;1206;2010;2512</td> <td>From 1 to < 10</td> <td>2; 5</td> <td>200</td> </tr> <tr> <td>0603;0805;1206;2010;2512</td> <td>From 10 to < 1M</td> <td>1; 2; 5</td> <td>100; 200</td> </tr> <tr> <td>0603;0805;1206;2010;2512</td> <td>From 1M to \leq 10M</td> <td>2; 5</td> <td>200</td> </tr> </tbody> </table> | | | | | | | Style | Range(Ω) | Tol. (\pm %) | TC(\pm ppm/ $^{\circ}$ C) | 0603;0805;1206;2010;2512 | From 1 to < 10 | 2; 5 | 200 | 0603;0805;1206;2010;2512 | From 10 to < 1M | 1; 2; 5 | 100; 200 | 0603;0805;1206;2010;2512 | From 1M to \leq 10M | 2; 5 | 200 | | | | | | | | | | | | | | |
| Style | Range(Ω) | Tol. (\pm %) | TC(\pm ppm/ $^{\circ}$ C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0603;0805;1206;2010;2512 | From 1 to < 10 | 2; 5 | 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0603;0805;1206;2010;2512 | From 10 to < 1M | 1; 2; 5 | 100; 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0603;0805;1206;2010;2512 | From 1M to \leq 10M | 2; 5 | 200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating Temperature Range, ($^{\circ}$ C): -55 to +155. Lead material is E with either Type 2 or Type 4 finish | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | RESISTORS, FIXED, CHIP, THICK FILM, BASED ON TYPE CHP | | | Certificate 314 B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | Page 10-09 003 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | |
|---|--|--------------------------|----------------------------|----------------------------|
| Types covered by similarity: Variants 01 through 48 are qualified | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 4009 Detail ESCC 4009/002 | IRCA RICA Division Vitorio Veneto Italy | Qualification | ESA | Apr 1992 |
| <p>Characteristics:</p> <p>Single, double layer and magnetically compensated heaters</p> <p>Maximum Ohmic density 200 Ω/cm²</p> <p>Tolerances ±2, 3, 5, 10 %</p> <p>Resistance 1 to 5000 Ω</p> <p>Heating Area 1.6 to 1300 cm²</p> <p>Terminal Lead 20, 22, 24, 26, 28, 30 AWG</p> <p>Temperature coefficient (10⁻⁶/°C): 175</p> <p>Operating Temperature Range, (°C): -65 to +200</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | RESISTORS, HEATERS, FLEXIBLE SINGLE AND DOUBLE LAYER | Certificate 184 L | Page 10-11 001-1 | |


| | | | | |
|--|---|--------------------|-----------------------------------|------------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 4009 Detail ESCC 4009/003 | Minco SAS Aston France | Qualification | CNES | Mar 2013 |
| <p>Characteristics: Variants 01, 02 and 03 are qualified</p> <p>Single, double layer heaters</p> <p>Maximum Ohmic density $70 \Omega/\text{cm}^2$</p> <p>Rated power density 0.38 (variants 01, 03), 0.54 (variant 02) W/cm^2</p> <p>Resistance 1 to 5000Ω</p> <p>Heating Area 0.26 to 1000 cm^2</p> <p>Terminal Lead 20 to 30 AWG</p> <p>Resistance Tolerance (%): ± 1 to ± 10</p> <p>Operating Temperature Range, ($^{\circ}\text{C}$): -65 to $+150$ for variants 01 and 03; 65 to $+200$ for variant 02</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>RESISTORS, HEATERS, FLEXIBLE SINGLE AND DOUBLE LAYER</p> | | <p>Certificate 325 B</p> | <p>Page 10-11 002</p> |

| | | | | |
|---|---|-----------------------------------|-----------------------|------------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 4009 Detail ESCC 4009/004 | IRCA RICA Division Vitorio Veneto Italy | Qualification | ESA | Jan 2015 |
| <p>Characteristics: All variants are qualified</p> <p>Single, double layer heaters</p> <p>Maximum Ohmic density 330 Ω/cm^2</p> <p>Rated power density 0.38</p> <p>Resistance 1 to 10000 Ω</p> <p>Heating Area 1.66 to 1300 cm^2</p> <p>Terminal Lead 20 to 30 AWG</p> <p>Resistance Tolerance (%): ± 2 to ± 10</p> <p>Operating Temperature Range, ($^{\circ}\text{C}$): $^{-}65$ to $^{+}150$</p> | | | | |
|  | <p>RESISTORS, HEATERS, FLEXIBLE SINGLE AND DOUBLE LAYER</p> | <p>Certificate 330 A</p> | | <p>Page 10-11 003</p> |

Section 11**Component Type: Thermistors**

| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|-----------|-------|-----------------------------|---|
| 11-01 | | | NTC | |
| | 11-01-001 | 266 H | Types G15K4D489 and *K3A35* | TE Connectivity MEAS -(Betatherm) Ltd. |


**SECTION 11-**: INDEX OF THERMISTORS****REP005 Updated Apr 2017**

| | | | | | |
|--|--|---|--------------------|--------------------------|----------------------------|
| Types covered by similarity: | | Remarks: Refer to variants table 1(a) in the Detail Specifications for resistance to temperature characteristics. | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 4006 Detail ESCC 4006/013 4006/014 | | TE Connectivity MEAS (Betatherm) Galway Ireland | Qualification | ESA | Jul 2001 |
| Characteristics: 4006/013: Variants 01 to 05 and 06 to 07 are qualified. 4006/014: Variants 08, 09 and 13 are qualified. Operating Temperature Range, (°C): 4006/013 : -55 to +115 4006/014 : -60 to +160 Please refer to the relevant Detail Specification for complete information on the qualified variants. | | | | | |
|  | | THERMISTORS, (THERMALLY SENSITIVE RESISTORS), NTC, BASED ON TYPES G15K4D489 AND *K3A35* | | Certificate 266 H | Page 11-01 001 |

Section 12

Component Type: Transistors

| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|----------------|-------|---|--------------------|
| 12-01 | | | Low Power, NPN | |
| | 12-01-002-3A-B | 233 L | Types NPN | STMicroelectronics |
| 12-02 | | | Low Power, PNP | |
| | 12-02-002-3A-B | 234 L | Types PNP | STMicroelectronics |
| 12-05 | | | MOSFET, Power, N-Channel | |
| | 12-05-003-1 | 303 C | Types STRH100N10, STRH40N6, SRH100N6 and STRH8N10 | STMicroelectronics |
| | 12-05-003-2 | 319 B | Type BUY**CS*** | Infineon |
| | 12-05-003-3 | 339 | Type BUY15CS | Infineon |
| 12-06 | | | MOSFET, Power, P-Channel | |
| | 12-06-003-1 | 326 B | Type STRH40P10 and STRH12P10 | STMicroelectronics |
| 12-10 | | | RF/Microwave, NPN, Low Power, Low Noise | |
| | 12-10-001 | 230 G | Types BFY193 | Infineon |
| | 12-10-002 | 245 G | Types BFY405, -420 and -450 | Infineon |
| | 12-10-005 | 322 A | Types BFY 640, 640B, 650B, 740B | Infineon |
| 12-16 | | | Microwave, Gallium Arsenide | |
| | 12-16-001 | 213 G | Types CFY67, High Electron Mobility, Low Noise | Infineon |

| | | | | | | | | | | | | | | | | | |
|---|-------------------------------|---------|--------|--------|-----------------------|---|--|--|--|--|---------------------------------|--|--------|--------|--------|--------|---------|
| Types covered by similarity: | | | | | | Remarks: | | | | | | | | | | | |
| Procurement Specifications | | | | | | Manufacturer | | | | | | | | | | | |
| Generic ESCC 5000 | | | | | | ST Microelectronics | | | | | | | | | | | |
| Detail ESCC Please refer to the next page | | | | | | Rennes France | | | | | | | | | | | |
| Characteristics: | | | | | | Qualification | | | | | CNES | Initial Qualification Date Sep 1996 | | | | | |
| Maximum Rating: | | | | | | | | | | | | | | | | | |
| | 2N 2219 | 2N2222A | 2N2484 | 2N3019 | | | | | | | | | 2N5551 | 2N3700 | 2N5154 | BUX 77 | 2N2920A |
| V _{CB0} (V): | 75 | 75 | 60 | 140 | BV _{CB0} (V) | | | | | | | | 180 | 140 | 100 | 100 | 60 |
| V _{CE0} (V): | 40 | 50 | 60 | 80 | BV _{CE0} (V) | | | | | | | | 160 | 80 | 80 | 80 | 60 |
| Packages: | See next page | | | | | | | | | | | | | | | | |
| Operating Temperature Range (°C), -65 to +200 | | | | | | | | | | | | | | | | | |
|  | | | | | | <p>TRANSISTORS, LOW AND HIGH POWER, NPN</p> | | | | | <p>Certificate</p> <p>233 L</p> | <p>Page</p> <p>12-01 002-3A</p> | | | | | |

| ESCC Specification No. | Component Type | Package | Qualified Variants |
|------------------------|----------------|------------------------|------------------------|
| 5201/001 | 2N 2484 | TO-18, LCCC3, LCCC3 +1 | 01, 02, 04, 05, 06, 07 |
| 5201/002 | 2N 2222A | TO-18, LCCC3, LCCC3 +1 | 01, 02, 04, 05, 11, 12 |
| 5201/019 | 2N 5551 | TO-18, LCCC3, LCCC3 +1 | 01, 02, 04, 05, 08, 09 |
| | | | |
| 5201/004 | 2N 3700 | TO-18, LCCC3, LCCC3 +1 | 01, 02, 04, 05, 06, 07 |
| 5203/010 | 2N 5154 | TO-257, SMD.5, TO-39 | 01, 02, 04, 05, 06, 07 |
| 5203/016 | BUX 77ESY | TO-257 | 06, 07 |
| 5207/002 | 2N 2920A | TO-77, LCCC6, FP-8 | 03, 06, 12, 15, 16, 17 |
| 5201/003 | 2N 2219 | TO-39 | 01, 02 |
| 5201/011 | 2N 3019 | TO-39 | 03, 04 |




TRANSISTORS,
LOW AND HIGH POWER,
NPN

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12-01
002-3B

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|---|-------------------------------|---------|--------|--|--------|--------|----------------------|----------|-------------------------|----------------------------|--------|--------|--------|---------------|----|----|----|-----|-----|-----|---------------|----|----|----|----|----|-----|-----------|-------------------------------|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|
| Types covered by similarity: | | | | | | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Procurement Specifications | | | | Manufacturer | | | Nature of Approval | | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 5000 Detail ESCC Please refer to the next page | | | | ST Microelectronics Rennes France | | | Qualification | | CNES | Sep 1996 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Characteristics: <table border="1" data-bbox="78 901 900 1181"> <tr> <td></td> <td>2N 2905A</td> <td>2N2907A</td> <td>2N3810</td> <td>2N5153</td> <td>BUX 78</td> <td>2N5401</td> </tr> <tr> <td>$BV_{CBO}(V)$</td> <td>60</td> <td>60</td> <td>60</td> <td>100</td> <td>100</td> <td>160</td> </tr> <tr> <td>$BV_{CEO}(V)$</td> <td>60</td> <td>60</td> <td>60</td> <td>80</td> <td>80</td> <td>150</td> </tr> <tr> <td>Packages:</td> <td colspan="6">See next page</td> </tr> <tr> <td colspan="7">Operating Temperature Range (°C), -65 to +200</td> </tr> </table> | | | | | | | | 2N 2905A | 2N2907A | 2N3810 | 2N5153 | BUX 78 | 2N5401 | $BV_{CBO}(V)$ | 60 | 60 | 60 | 100 | 100 | 160 | $BV_{CEO}(V)$ | 60 | 60 | 60 | 80 | 80 | 150 | Packages: | See next page | | | | | | Operating Temperature Range (°C), -65 to +200 | | | | | | | | | | |
| | 2N 2905A | 2N2907A | 2N3810 | 2N5153 | BUX 78 | 2N5401 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $BV_{CBO}(V)$ | 60 | 60 | 60 | 100 | 100 | 160 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $BV_{CEO}(V)$ | 60 | 60 | 60 | 80 | 80 | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Packages: | See next page | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Operating Temperature Range (°C), -65 to +200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | | | TRANSISTORS, LOW AND HIGH POWER, PNP | | | Certificate 234 L | | Page 12-02 002-3A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| ESCC Specification No. | Component Type | Package | Qualified Variants |
|---------------------------|----------------|------------------------|------------------------|
| 5202/002 | 2N 2905A | TO-39 | 01, 02 |
| 5202/001 | 2N 2907A | TO-18, LCCC3, LCCC3 +1 | 01, 02, 04, 05,06, 07 |
| 5202/014 | 2N 5401 | TO-18, LCCC3, LCCC3 +1 | 01, 02, 04, 05, 06, 07 |
| 5204/002 | 2N 5153 | TO-39, TO-257, SMD.5 | 01, 02, 04, 05, 06, 07 |
| 5204/006 | BUX 78ESY | TO-257 | 06, 07 |
| 5207/005 | 2N 3810 | TO-78, LCCC6, FP | 01, 02, 07, 09, 10, 11 |
| | | | |




TRANSISTORS,
LOW AND HIGH POWER,
PNP


Certificate


234 L


Page


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002-3B


| | | | | | |
|--|--|---|--------------------|--------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 5000 Detail ESCC 5205/021, ESCC 5205/022 ESCC 5205/023, ESCC 5205/024 | | STMicroelectronics Rennes France | Qualification | CNES | Oct 2010 |
| Characteristics: 5205/021 & 5205/022 5205/023 & 5205/024 Maximum Ratings for: 5205/021 V _{GS(th)} : r _{DS(on)} (m Ω): I _{DS} (A) V _{DS} (V _{dc}): V _{GS} (V _{dc}): P _{TOT} : Package Types: TO-254AA, SMD.5 for STRH40N6 and STRH8N10 Operating Temperature Range (°C): -55 to +150 | | Variants 01 and 02 are qualified Variant 01 is qualified 2 –4.5 min/max, I _D =1 mA 35, V _{GS} =12V, I _D =24A 48, T _{case} (°C)= +25 100 over T _{op} , V _{GS} = 0 V ± 20 170 W at T _{case} ≤ +25 C | | | |
|  | | TRANSISTORS, MOSFET, N-CHANNEL, POWER, BASED ON TYPES STRH100N10, STRH40N6, STRH100N6 AND STRH8N10 | | Certificate 303 C | Page 12-05 003-1 |


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|--|---|--|--------------------------------------|----------------------------|
| Types covered by similarity: | | Remarks: These devices have a TID tested capability of 100 kRad (Si) SEE tested : LET (MeV-cm ² /mg) 56 @ V _{GS} = -10V, V _{DS} = 250V SOA and SE SOA derating graphs are incorporated in the Detail Specifications. | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 5000 Detail ESCC 5205/026 5205/027 5205/028 5205/030 | Infineon Technologies AG Neubiberg Germany | Qualification | DLR | Aug 2012 |
| <p>Qualified variants:</p> <p>5205/026— variant 01R</p> <p>5205/027— variant 01R</p> <p>5205/028 —variant 01R</p> <p>5205/030 — variants 01R, 02R, 03R</p> | | | | |
|  | <p>TRANSISTORS, POWER, MOSFET, N-CHANNEL, BASED ON TYPE BUY **CS***</p> | <p>Certificate 319 B</p> | <p>Page 12-05 003-2</p> | |


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|---|--|--|--------------------|---------------------------------|--------------------------------------|
| Types covered by similarity: All Variants are qualified | | Remarks: These devices have a TID tested capability of 100 kRad (Si) SEE tested : LET (MeV-cm ² /mg) 56 @ V _{GS} = -10V, V _{DS} = 250V SOA and SE SOA derating graphs are incorporated in the Detail Specifications. | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 5000 Detail ESCC 5205/031 | | Infineon Technologies AG Neubiberg Germany | Qualification | DLR | May 2016 |
| <p>Characteristics: ESCC No. 5205/031</p> <p>r_{DS(ON)} (mΩ) @ 25 °C 150</p> <p>Maximum Ratings:</p> <p>I_{DS} (A) 23</p> <p>V_{DS} (V) max. 150</p> <p>V_{GS} (V) max. ± 20</p> <p>P_{tot} (W) 75</p> <p>R_{th(j-c)} (°C/W) 1.66</p> <p>Package: SMD0.5, SMD2, TO-254AA, TO-257AA</p> <p>Operating Temperature Range (°C): T_{op} = - 55 to +150</p> | | | | | |
|  | | <p>TRANSISTORS, POWER, MOSFET, N-CHANNEL, RADHARD BASED ON TYPE BUY 15CS</p> | | <p>Certificate 339</p> | <p>Page 12-05 003-3</p> |

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|---|---|--|----------------------------|----------------------------|
| Types covered by similarity: | | Remarks: These devices have a TID tested capability of 100kRAD(Si). | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 5000 Detail ESCC 5205/025 and 5205/029 | ST Microelectronics Rennes France | Qualification | CNES | Mar 2013 |
| Characteristics: Variants 01 and 02 in each specification are qualified | | | | |
|  | TRANSISTORS, MOSFET, P-CHANNEL, POWER, TYPE STRH40P10 and STRH12P10 | Certificate 326 B | Page 12-06 003-1 | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-----------|---|-----------------------------------|------------------------------------|----------------------------|--------------------|--|----|--|-------------------|--|--------|-----------------------------------|--------------|---------|-----|-----------------------------------|-------------------|---------|------|-----------------------------------|------------------|-----------|-----|-----------------------------------|--|--|--|
| Types covered by similarity: Variants 01 to 08. | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 5010 Detail ESCC 5611/006 | | Infineon Technologies AG Neubiberg Germany | Qualification | DLR | Jun 1996 | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Characteristics for BFY 193</p> <table border="0"> <tr> <td>V_{CE0} (V) max.</td> <td></td> <td>12</td> <td></td> </tr> <tr> <td>V_{CBO} (V) max.</td> <td></td> <td>20</td> <td></td> </tr> <tr> <td>h_{FE} min/max.</td> <td></td> <td>50/175</td> <td>@ $V_{CE} = 8.0$ V, $I_C = 30$ mA</td> </tr> <tr> <td>NF (dB) max.</td> <td>@ 2 GHz</td> <td>2.9</td> <td>@ $V_{CE} = 5.0$ V, $I_C = 15$ mA</td> </tr> <tr> <td>MAG/MSG (dB) min.</td> <td>@ 2 GHz</td> <td>12.5</td> <td>@ $V_{CE} = 5.0$ V, $I_C = 40$ mA</td> </tr> <tr> <td>f_T (GHz) min.</td> <td>@ 500 MHz</td> <td>6.5</td> <td>@ $V_{CE} = 5.0$ V, $I_C = 40$ mA</td> </tr> </table> <p>Package: " Micro-X1"</p> <p>Total Power Dissipation (P_{tot}) = 580 mW</p> <p>Operating Temperature Range (°C): $T_{op} = - 65$ to +200</p> | | V_{CE0} (V) max. | | 12 | | V_{CBO} (V) max. | | 20 | | h_{FE} min/max. | | 50/175 | @ $V_{CE} = 8.0$ V, $I_C = 30$ mA | NF (dB) max. | @ 2 GHz | 2.9 | @ $V_{CE} = 5.0$ V, $I_C = 15$ mA | MAG/MSG (dB) min. | @ 2 GHz | 12.5 | @ $V_{CE} = 5.0$ V, $I_C = 40$ mA | f_T (GHz) min. | @ 500 MHz | 6.5 | @ $V_{CE} = 5.0$ V, $I_C = 40$ mA | | | |
| V_{CE0} (V) max. | | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| V_{CBO} (V) max. | | 20 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| h_{FE} min/max. | | 50/175 | @ $V_{CE} = 8.0$ V, $I_C = 30$ mA | | | | | | | | | | | | | | | | | | | | | | | | | |
| NF (dB) max. | @ 2 GHz | 2.9 | @ $V_{CE} = 5.0$ V, $I_C = 15$ mA | | | | | | | | | | | | | | | | | | | | | | | | | |
| MAG/MSG (dB) min. | @ 2 GHz | 12.5 | @ $V_{CE} = 5.0$ V, $I_C = 40$ mA | | | | | | | | | | | | | | | | | | | | | | | | | |
| f_T (GHz) min. | @ 500 MHz | 6.5 | @ $V_{CE} = 5.0$ V, $I_C = 40$ mA | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | <p>TRANSISTORS, MICROWAVE, SMALL SIGNAL, BIPOLAR, BASED ON TYPE BFY 193</p> | <p>Certificate 230 G</p> | <p>Page 12-10 001</p> | | | | | | | | | | | | | | | | | | | | | | | | |

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|--|-----------|---|--|------------------------------------|----------------------------|---------------------------|--|-----|--|--|--|---------------------------|--|----|--|--|--|--------------------------|--|-----|--|--|--|--------------------------|--|----|--|--|--|--------------------------|--|--------|--|--|--|--------------|-----------|-----|--|--|--|---------------------------|-----------|----|--|--|--|
| Types covered by similarity: Variants 01, 02 and 03 are qualified. | | Remarks: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Generic ESCC 5010 Detail ESCC 5611/008 | | Infineon Technologies AG Neubiberg Germany | Qualification | DLR | Jun 1997 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Characteristics for BFY 450</p> <table border="0"> <tr> <td>V_{CEO} (V) max.</td> <td></td> <td>4.5</td> <td></td> <td></td> <td></td> </tr> <tr> <td>V_{CBO} (V) max.</td> <td></td> <td>15</td> <td></td> <td></td> <td></td> </tr> <tr> <td>I_C (mA) max.</td> <td></td> <td>100</td> <td></td> <td></td> <td></td> </tr> <tr> <td>I_B (mA) max.</td> <td></td> <td>10</td> <td></td> <td></td> <td></td> </tr> <tr> <td>h_{FE} min/max.</td> <td></td> <td>50/150</td> <td>@ V_{CE} = 1.0 V, I_C = 20mA</td> <td></td> <td></td> </tr> <tr> <td>NF (dB) max.</td> <td>@ 1.8 GHz</td> <td>2.0</td> <td>@ V_{CE} = 2.0 V, I_C = 10mA</td> <td></td> <td></td> </tr> <tr> <td>f_T (GHz) min.</td> <td>@ 1.0 GHz</td> <td>18</td> <td>@ V_{CE} = 3.0 V, I_C = 90mA</td> <td></td> <td></td> </tr> </table> <p>Package: "Micro-X"</p> <p>Total Power Dissipation (P_{tot}) = 450 mW</p> <p>Operating Temperature Range (°C): T_{op} = - 65 to +175</p> | | | | | | V _{CEO} (V) max. | | 4.5 | | | | V _{CBO} (V) max. | | 15 | | | | I _C (mA) max. | | 100 | | | | I _B (mA) max. | | 10 | | | | h _{FE} min/max. | | 50/150 | @ V _{CE} = 1.0 V, I _C = 20mA | | | NF (dB) max. | @ 1.8 GHz | 2.0 | @ V _{CE} = 2.0 V, I _C = 10mA | | | f _T (GHz) min. | @ 1.0 GHz | 18 | @ V _{CE} = 3.0 V, I _C = 90mA | | |
| V _{CEO} (V) max. | | 4.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| V _{CBO} (V) max. | | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I _C (mA) max. | | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I _B (mA) max. | | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| h _{FE} min/max. | | 50/150 | @ V _{CE} = 1.0 V, I _C = 20mA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| NF (dB) max. | @ 1.8 GHz | 2.0 | @ V _{CE} = 2.0 V, I _C = 10mA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| f _T (GHz) min. | @ 1.0 GHz | 18 | @ V _{CE} = 3.0 V, I _C = 90mA | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  | | <p>TRANSISTORS, MICROWAVE, SMALL SIGNAL, BIPOLAR, BASED ON TYPE BFY 450</p> | | <p>Certificate 245 G</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | <p>Page 12-10 002</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|---|--|--|--------------------|---------------------------------|----------------------------|
| Types covered by similarity: | | Remarks: This certificate, from its issue B, release in May 2016, includes in its scope of qualification some devices previously listed in the QPL under certificates No. 320 and 321, which are no longer maintained. | | | |
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 5010 Detail ESCC 5611/009 5611/010 5611/011 | | Infineon Technologies AG Neubiberg Germany | Qualification | DLR | Sep 2012 |
| Qualified variants: 5611/009: variants 01, 02, 03 5611/010: variants 01, 02, 03, 04 5611/011: variant 01 | | | | | |
|  | | TRANSISTORS, MICROWAVE, SMALL SIGNAL, BIPOLAR, BASED ON TYPES BFY 640, 640B, 650B and 740B | | Certificate 322 B | Page 12-10 005 |

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|---|----------------|--|---------|--------------------|--------------------------|----------------------------|
| Types covered by similarity: | | | | Remarks: | | |
| Procurement Specifications | | Manufacturer | | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 5010 Detail ESCC 5613/004 | | Infineon Technologies AG Neubiberg Germany | | Qualification | DLR | Apr 1994 |
| Characteristics (@ 12 GHz): All variants are qualified | | | | | | |
| | | NFmin. (dB) | Ga (dB) | | | |
| 5613/004 | variants 1 & 3 | 0.8 | 11 | | | |
| pseudo-morphic | Variants 2 & 4 | 1.0 | 10.5 | | | |
| Package: Micro-X Total Power Dissipation (P_{tot}) = 200 mW derated from $+31\text{ }^{\circ}\text{C } T_{amb}$ Operating Temperature Range ($^{\circ}\text{C}$): $T_{stg} = -65$ to $+150$ | | | | | | |
|  | | TRANSISTORS, HIGH ELECTRON MOBILITY, GALLIUM ARSENIDE, MICROWAVE, LOW NOISE, SMALL SIGNAL, BASED ON TYPE CFY 67 | | | Certificate 213 G | |
| | | | | | Page 12-16 001 | |

Section 13

Component Type: Wires and Cables

INDEX PAGE 1 of 2

| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|-------------|-------|--|------------------|
| 13-01 | | | Low Frequency | |
| | 13-01-001-1 | 07 R | Polyimide, Types FA-3901-1, FA 3901-2 | Draka Fileca |
| | 13-01-001-2 | 09 Q | Polyimide, Types 1871-1872 | Nexans |
| | 13-01-001-3 | 132 N | Polyimide, Types 3901002**B | Axon' Cable |
| | 13-01-003 | 08 R | PTFE, Types MTV-BTV | Nexans |
| | 13-01-003-2 | 292 C | PTFE/Polyimide, Types 3901013**B | Axon' Cable |
| | 13-01-004-1 | 138 M | Polyimide, Type SPC | Gore |
| | 13-01-004-2 | 219 L | Polyimide, Types SPL | Gore |
| | 13-01-004-3 | 268 F | Polyimide, Types 3901019**B | Axon' Cable |
| | 13-01-004-4 | 295 C | Polyimide, Types 3901019 | Leoni |
| | 13-01-005-1 | 159 M | Crosslinked PTFE, Type Silver-Plated Copper | Tyco Electronics |
| | 13-01-005-2 | 267 G | Crosslinked PTFE, Type Silver-Plated Copper | Axon' Cable |
| | 13-01-008 | 215 L | PTFE, Polyimide / PFA Insulated, Type SPP | Gore |
| | 13-01-009 | 216 K | PTFE, Polyimide / PFA Insulated, Shielded, Type SPM | Gore |
| | 13-01-009-2 | 294 C | PTFE, Polyimide/PFA Insulated, Shielded, Type 3901018 | Leoni |
| | 13-01-009-3 | 300 C | PTFE, Polyimide / PFA Insulated, Shielded, Type SPM | Axon' Cable |
| | 13-01-010-1 | 229 K | Polyimide, Insulated, Shielded, Type SPLD, Drain Wire | Gore |
| | 13-01-010-2 | 293 C | Polyimide, Insulated, Shielded, Drain Wire, Types 3901021**B | Axon' Cable |
| | 13-01-010-3 | 296 C | Polyimide, Insulated, Shielded, Drain Wire, Type 3901021 | Leoni |
| | 13-01-011-1 | 257 H | Crosslinked, Modified ETFE, Type Silver-Plated Copper, Lightweight | Tyco Electronics |
| | 13-01-012-1 | 299 C | Fluoropolymer, Lightweight, Based on Type CSWL | Axon' Cable |
| | 13-01-012-2 | 305 C | Fluoropolymer, Lightweight, Based on Type CSWL | Gore |
| | 13-01-013-1 | 328 A | Extra thin, fluorothermoplastic / polyimide, Based on Type CSC | Gore |




SECTION 13-**: INDEX OF WIRES AND CABLES


REP005 Updated Apr 2017


Section 13**Component Type: Wires and Cables****INDEX PAGE 2 of 2**


| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|-------------|-------|---|--------------|
| 13-02 | | | Coaxial, RF, Flexible | |
| | 13-02-001 | 24 S | PTFE/Polyimide, Type 50 CIS | Nexans |
| | 13-02-002-1 | 255 J | Coaxial, Triaxial, Balanced Shielded Line | Gore |
| | 13-02-002-2 | 298 C | Coaxial, Triaxial, Balanced Shielded Line | Axon' Cable |
| | 13-02-003-1 | 291 C | Symmetric, Quad, Spacewire | Axon' Cable |
| | 13-02-003-2 | 304 C | Symmetric, Quad, Spacewire | Gore |
| | 13-02-003-3 | 335 | Symmetric, Quad, Spacewire | Axon' Cable |


**SECTION 13-**: INDEX OF WIRES AND CABLES****REP005 Updated Apr 2017**


| | | | | |
|---|---|--------------------|-------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/001 3901/002 | Draka Fileca Ste-Genevieve France | Qualification | CNES | Jan 1979 |
| Characteristics: FA 3901-1 All Variants defined in the Detail Specification 3901/001 are qualified except those based on AWG 12-14 FA 3901-2 Variants 31 to 73 and 74 to 91 as defined in the Detail Specification 3901/002 are qualified Voltage Rating, maximum (Vrms):600 Temperature Range (°C): -100 to +200 | | | | |
|  | WIRES AND CABLES, LOW FREQUENCY, POLYIMIDE INSULATION BASED ON TYPES FA 3901-1, FA 3901-2 | | Certificate 07 R | Page 13-01 001-1 |


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|--|---|--------------------|----------------------------------|--------------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3901</p> <p>Detail ESCC 3901/001 3901/002</p> | Nexans Draveil France | Qualification | CNES | Jan 1979 |
| <p>Characteristics:</p> <p>Medium weight 1871 - n/1871 - 871 (3901/001) Variants 24 to 47 are qualified Light weight 1872 - n/1872 - 872 (3901/002) Variants 31 to 73 are qualified</p> <p>Voltage Rating, maximum (Vrms):600 Temperature Range (°C): -100 to +200</p> | | | | |
|  | <p>WIRES AND CABLES, LOW FREQUENCY, POLYIMIDE INSULATION BASED ON TYPES 1871 - 1872</p> | | <p>Certificate 09 Q</p> | <p>Page 13-01 001-2</p> |


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|---|--|--------------------|-----------------------------------|--------------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3901</p> <p>Detail ESCC 3901/001 3901/002</p> | <p>AXON' CABLE Montmirail France</p> | Qualification | CNES | Dec 1985 |
| <p>Characteristics:</p> <p>The following variants are qualified: 3901/001: variants 24 to 47 3901/002: variants 31 to 73</p> <p>Voltage Rating, maximum (Vrms):600 Temperature Range (°C): -100 to +200</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>WIRES AND CABLES, LOW FREQUENCY, POLYIMIDE INSULATION, BASED ON TYPES 3901001**B and 3901002**B</p> | | <p>Certificate 132 N</p> | <p>Page 13-01 001-3</p> |


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|---|--|--------------------|-------------------------|----------------------------|
| Types covered by similarity: -MTV - BTV -MTV/G - BTV/G -MTV/BF/G - BTV/BF/G | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/013 | Nexans Draveil France | Qualification | CNES | Jan 1979 |
| Characteristics: Variants 01 to 77 are qualified Voltage Rating, maximum (Vrms):600 Temperature Range (°C): -100 to +200 | | | | |
|  | WIRES AND CABLES, LOW FREQUENCY, PTFE/POLYIMIDE INSULATION, BASED ON TYPES MTV-BTV | | Certificate 08 R | Page 13-01 003 |


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|--|---|--------------------------|----------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/013 | AXON' CABLE Montmirail France | Qualification | CNES | Jun 2009 |
| Characteristics: All variants are qualified Voltage Rating, maximum (Vrms):600 Temperature Range (°C): -100 to +200 | | | | |
|  | WIRES AND CABLES, LOW FREQUENCY, PTFE/POLYIMIDE INSULATION, BASED ON TYPES 3901013**B | Certificate 292 C | Page 13-01 003-2 | |


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|--|--|--------------------|--------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/009 | W.L. Gore & Co Pleinfeld Germany | Qualification | DLR | Aug 1986 |
| Characteristics: Variants 01-66 are qualified Voltage Rating, maximum (Vrms):600 Temperature Range (°C): -200 to +200 | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | WIRES AND CABLES, LOW FREQUENCY, POLYIMIDE INSULATION, BASED ON TYPES SPC 2110 | | Certificate 138 M | Page 13-01 004-1 |


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|---|--|--------------------|-----------------------------------|--------------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/019 | W.L. Gore & Co Pleinfeld Germany | Qualification | DLR | Nov 1994 |
| <p>Characteristics:</p> <p>Variants 01-94 are qualified</p> <p>Voltage Rating, maximum (Vrms):600</p> <p>Temperature Range (°C): -200 to +200</p> | | | | |
|  | <p>WIRES AND CABLES, LOW FREQUENCY, POLYIMIDE INSULATION, BASED ON TYPES SPL</p> | | <p>Certificate 219 L</p> | <p>Page 13-01 004-2</p> |


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|--|--|--------------------------|----------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/019 | AXON' CABLE Montmirail France | Qualification | CNES | Jun 2002 |
| Characteristics: All variants are qualified Voltage Rating, maximum (Vrms):600 Temperature Range (°C): -200 to +200 | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | WIRES AND CABLES, LOW FREQUENCY, POLYIMIDE INSULATION, BASED ON TYPES 3901019**B | Certificate 268 F | Page 13-01 004-3 | |


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|---|---|--------------------|------------------------------|---------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3901</p> <p>Detail ESCC 3901/019</p> | <p>LEONI Special Cables GmbH Friesoythe Germany</p> | Qualification | DLR | Oct 2009 |
| <p>Characteristics:</p> <p>All variants are qualified with the exception of variants 01, 09, 17, 24, 25, 32, 48, 56, 64, 72, and 79</p> <p>Conductor according to ISO 2635 (except AWG 28) AWG 12 to 28 inclusive are qualified For silver coated strands the silver thickness shall be 2.0µm minimum</p> <p>Voltage Rating, maximum (V_{rms}):600</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>WIRES AND CABLES, LOW FREQUENCY, POLYIMIDE INSULATION, BASED ON TYPE 3901019</p> | | <p>Certificate 295 C</p> | <p>Page 13-01 004-4</p> |


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|--|--|---|--------------------------|----------------------------|
| Types covered by similarity: | | Remarks: This product is not intended for human space flight applications. | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/012 | Tyco Electronics Dorcan, Swindon England | Qualification | UK Space Agency | Feb 1989 |
| Characteristics: Variants 01 to 80 are qualified Maximum voltage: 600 Vrms Operating temperature range (°C): -100 to +200 | | | | |
|  | WIRES AND CABLES, LOW FREQUENCY, 600V, SILVER-PLATED COPPER, EXTRUDED CROSSLINKED FLUOROPOLYMER INSULATION, BASED ON TYPE 55/995X | | Certificate 159 M | Page 13-01 005-1 |


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|--|---|---|--------------------------|----------------------------|
| Types covered by similarity: | | Remarks: This product is not intended for human space flight applications. | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/012 | AXON' CABLE Montmirail France | Qualification | CNES | Mar 2002 |
| Characteristics: All variants are qualified Wire code ISO 2635 Voltage Rating, maximum (Vrms) : 600 Temperature Range (°C): -100 to +200 | | | | |
|  | WIRES AND CABLES, LOW FREQUENCY, 600V, SILVER-PLATED COPPER, EXTRUDED CROSSLINKED FLUOROPOLYMER INSULATION, BASED ON TYPE 3901012**B | | Certificate 267 G | Page 13-01 005-2 |


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|---|---|--------------------|--------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/017 | W.L. Gore & Co. Pleinfeld Germany | Qualification | DLR | Jul 1994 |
| Characteristics: All variants are qualified Voltage Rating, maximum (Vrms) : 600 Temperature Range (°C): -200 to +200 I_{max} (A): 45, 81 and 133 for AWG: 0, 4 and 8, respectively | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | POWER WIRES FOR CRIMPING, LOW FREQUENCY, BASED ON TYPE SPP | | Certificate 215 L | Page 13-01 008 |


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|---|---|--------------------|---------------------------------|----------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3901</p> <p>Detail ESCC 3901/018</p> | <p>W.L. Gore & Co. Pleinfeld Germany</p> | Qualification | DLR | Jul 1994 |
| <p>Characteristics:</p> <p>Variants 01 to 88 are qualified.</p> <p>Voltage Rating, maximum (V^{rms}) : 600 Temperature Range ($^{\circ}C$): -200 to $+200$</p> <p>Expanded PTFE, extruded polyimide/ FEP, sintered PTFE insulated wires. Expanded PTFE, extruded polyimide/fluorothermoplast insulated cables, shielded and jacketed.</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>WIRES AND CABLES, LOW FREQUENCY, INSULATED, POLYIMIDE/FLUOROTHERMOPLAST, BASED ON TYPE SPM</p> | | <p>Certificate</p> <p>216 K</p> | <p>Page</p> <p>13-01 009</p> |


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|--|---|--------------------|---------------------------------|------------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3901</p> <p>Detail ESCC 3901/018</p> | <p>LEONI Special Cables GmbH Friesoythe Germany</p> | Qualification | DLR | Oct 2009 |
| <p>Characteristics:</p> <p>Variants 01 to 88 are qualified.</p> <p>Voltage Rating, maximum (V_{rms}) : 600 Temperature Range (°C): -200 to +200</p> <p>Expanded PTFE, extruded polyimide/ FEP, sintered PTFE insulated wires. Expanded PTFE, extruded polyimide/fluorothermoplast insulated cables, shielded and jacketed.</p> <p>Conductor silver thickness shall be 2.0µm minimum</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>WIRES AND CABLES, LOW FREQUENCY, INSULATED, POLYIMIDE/FLUOROTHERMOPLAST, BASED ON TYPE 3901018</p> | | <p>Certificate</p> <p>294 C</p> | <p>Page</p> <p>13-01 009-2</p> |


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|---|---|--------------------------|-----------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/018 | AXON' CABLE Montmirail France | Qualification | CNES | Dec 2009 |
| Characteristics: Variants 01 to 88 are qualified AWG 30 and 32 variants are qualified. Voltage Rating, maximum (V_{rms}) : 600 Temperature Range (°C): -200 to +200 Expanded PTFE, extruded polyimide/ FEP, sintered PTFE insulated wires. | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | WIRES AND CABLES, LOW FREQUENCY, INSULATED, POLYIMIDE/FLUOROTHERMOPLAST, BASED ON TYPE SPM | Certificate 300 C | | Page 13-01 009-3 |


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|--|---|--------------------------|----------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/021 | W.L. Gore & Co. Pleinfeld Germany | Qualification | DLR | Feb 1996 |
| Characteristics: All variants (01 to 41) are qualified Voltage Rating, maximum (Vrms) : 600 Temperature Range (°C): -200 to +200 . | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | POLYIMIDE INSULATED SHIELDED CABLES WITH DRAIN WIRE, LOW FREQUENCY, BASED ON TYPE SPLD | Certificate 229 K | Page 13-01 010-1 | |


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|---|--|--------------------------|----------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/021 | AXON' CABLE Montmirail France | Qualification | CNES | Jun 2009 |
| Characteristics: All variants are qualified Voltage Rating, maximum (Vrms) : 600 Temperature Range (°C): -200 to +200 . | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | POLYIMIDE INSULATED SHIELDED CABLES WITH DRAIN WIRE, LOW FREQUENCY, BASED ON TYPES 3901021**B | Certificate 293 C | Page 13-01 010-2 | |


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|--|--|------------------------------|---------------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3901</p> <p>Detail ESCC 3901/021</p> | <p>LEONI Special Cables GmbH Friesoythe Germany</p> | Qualification | DLR | Oct 2009 |
| <p>Characteristics:</p> <p>All variants 01 to 41 are qualified</p> <p>Voltage Rating, maximum (Vrms) : 600 Temperature Range (°C): -200 to +200</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>POLYIMIDE INSULATED SHIELDED CABLES WITH DRAIN WIRE, LOW FREQUENCY, BASED ON TYPE 3901021</p> | <p>Certificate 296 C</p> | <p>Page 13-01 010-3</p> | |


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|--|---|--------------------|---------------------------------|------------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3901</p> <p>Detail ESCC 3901/020 ESCC 3901/022</p> | <p>Tyco Electronics Dorcan, Swindon England</p> | Qualification | UK Space Agency | Oct 1999 |
| <p>Characteristics: 3901/020: All variants (01 - 80) are qualified 3901/022: All variants (01 - 72) are qualified.</p> <p>Wires and Cables variants consist of 1, 2, 3 and 4 cores with and without jackets and shields</p> <p>ESCC Detail Specification No. 3901/020 cables are silver-plated copper braided, and ESCC Detail Specification No. 3901/022 cables are silver-plated copper spiral shielded, Wire sizes are in accordance with ISO 2635.</p> <p>Maximum voltage: 600 Vrms Operating temperature range (°C): -100 to +200</p> | | | | |
|  | <p>WIRES AND CABLES, LOW FREQUENCY, 600V, SILVER-PLATED COPPER, EXTRUDED CROSSLINKED MODIFIED ETFE, LIGHTWEIGHT</p> | | <p>Certificate</p> <p>257 H</p> | <p>Page</p> <p>13-01 011-1</p> |


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|---|---|--------------------|------------------------------|---------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3901</p> <p>Detail ESCC 3901/024</p> | <p>AXON' CABLE Montmirail France</p> | Qualification | CNES | Dec 2009 |
| <p>Characteristics: Variants 01 to 64 are qualified (AWG 30 variants are qualified)</p> <p>Wires and Cables variants consist of 1, 2, 3 and 4 cores with and without jackets and shields NOTE: The high strength toughened fluoropolymer PTFE tape (HST-F) use for the manufacturing of the primary insulation of the wire is named "ART tape".</p> <p>Maximum voltage: 600 Vrms Operating temperature range (°C): -200 to +200</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>WIRES AND CABLES, LOW FREQUENCY, FLUROPOLYMER INSULATION, 600V, BASED ON TYPE CSWL</p> | | <p>Certificate 299 C</p> | <p>Page 13-01 012-1</p> |


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|--|---|--------------------|------------------------------|---------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| <p>Generic ESCC 3901</p> <p>Detail ESCC 3901/024</p> | <p>W.L. Gore Pleinfeld Germany</p> | Qualification | DLR | Jan 2011 |
| <p>Characteristics:</p> <p>Variants 01 to 64 inclusive are qualified The specification contains 64 variants with several wire sizes, single wires and cables with several cores, either shielded or unshielded.</p> <p>Cable construction: 1, 2, 3 and 4 twisted wires are in one core with or without shield</p> <p>Maximum voltage: 600 Vrms</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>WIRES AND CABLES, LOW FREQUENCY, FLUROPOLYMER INSULATION, 600V, BASED ON TYPE CSWL</p> | | <p>Certificate 305 C</p> | <p>Page 13-01 012-2</p> |


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|---|--|--------------------|-----------------------------------|--------------------------------------|
| Types covered by similarity: All variants 01 to 21 are qualified | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3901 Detail ESCC 3901/025 | W.L. Gore Pleinfeld Germany | Qualification | DLR | June 2014 |
| <p>Characteristics:</p> <p>The specification contains 21 variants with several wire sizes, single wires and cables with several cores, either shielded or unshielded.</p> <p>Cable construction: 1, 2, 3 and 4 twisted wires are in one core with or without shield</p> <p>Maximum voltage: 600 Vrms Operating temperature range (°C): -200 to +200</p> | | | | |
|  | <p>WIRES AND CABLES, LIGHTWEIGHT, EXTRA THIN, FLUORTHHERMOPLASTIC / POLYIMIDE INSULATED WIRES AND CABLES BASED ON TYPE CSC</p> | | <p>Certificate 328 A</p> | <p>Page 13-01 013-1</p> |


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|--|---|-------------------------|-----------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3902 Detail ESCC 3902/001 | Nexans Draveil France | Qualification | CNES | July 1979 |
| Characteristics: Variants 01, 02, and 03 are qualified Miniature flexible 50 ohm coaxial cable PTFE Dielectric Polyimide Jacketed, Double Shield and Shielded / Jacketed Maximum voltage: 900 Vrms Operating temperature range (°C): -80 to +200 (-100 for variant 01) | | | | |
|  | WIRES AND CABLES, RF COAXIAL, PTFE/POLYIMIDE INSULATION, BASED ON TYPE 50 CIS | Certificate 24 S | | Page 13-02 001 |

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|--|---|--------------------|---------------------------------|------------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3902 Detail ESCC 3902/002 | W.L. Gore Pleinfeld Germany | Qualification | DLR | Jan 1999 |
| <p>Characteristics:</p> <p>Variants 03 to 06, 10 to 13 and 20 to 30 are qualified</p> <p>Variants encompass coaxial, triaxial, and balanced shielded line</p> <p>Operating Voltage (Continuous), maximum ratings, (Vrms):</p> <p>Variants 03 180</p> <p>Variants 04, 10, 21, 22, 23, 24 200</p> <p>Variants 06, 25 250</p> <p>All Other Variants 300</p> <p>AWG Range: 20, 22, 24, 26, 28, 30 dependent on variant</p> | | | | |
|  | <p>WIRES AND CABLES, RADIO FREQUENCY, FLEXIBLE, COAXIAL, TRIAxIAL AND SYMMETRIC, BASED ON TYPES GCX, GTX, GSC AND GBL</p> | | <p>Certificate</p> <p>255 J</p> | <p>Page</p> <p>13-02 002-1</p> |

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|--|---|--------------------------|-----------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3902 Detail ESCC 3902/002 | AXON' CABLE Montmirail France | Qualification | CNES | Dec 2009 |
| Characteristics: Variants encompass coaxial, triaxial, and balanced shielded line Variants 03 to 06, 10 to 13 and 20 to 30 are qualified Temperature range (°C): -200 to +180 | | | | |
|  | WIRES AND CABLES, RADIO FREQUENCY, FLEXIBLE, COAXIAL, TRIAXIAL AND SYMMETRIC, BASED ON TYPE 3902/002 | Certificate 298 C | | Page 13-02 002-2 |

| Types covered by similarity: | | Remarks: | | | | | | | | | | | | | | | |
|--|----------------|---|--------------------|--------------------------|----------------------------|----------------------------|-----------|--|-------------|----|----------------|-----|-----|----|----------------|-----|-----|
| Procurement Specifications | | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date | | | | | | | | | | | | |
| Generic ESCC 3902 Detail ESCC 3902/003 | | AXON' CABLE Montmirail France | Qualification | CNES | Jun 2009 | | | | | | | | | | | | |
| Characteristics: Variant 01 AWG 28/07 (white) and variant 02 AWG 26/07 (blue) are qualified | | | | | | | | | | | | | | | | | |
| Temperature range (°C): -200 to $+180$ | | <table border="1"> <thead> <tr> <th>Variant</th> <th>Data Rate</th> <th>Operating Voltage (Continuous), (Vrms)</th> <th>Current (A)</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>100Mb/s—400MHz</td> <td>200</td> <td>1.5</td> </tr> <tr> <td>02</td> <td>200Mb/s—400MHz</td> <td>200</td> <td>2.5</td> </tr> </tbody> </table> | | | | Variant | Data Rate | Operating Voltage (Continuous), (Vrms) | Current (A) | 01 | 100Mb/s—400MHz | 200 | 1.5 | 02 | 200Mb/s—400MHz | 200 | 2.5 |
| Variant | Data Rate | Operating Voltage (Continuous), (Vrms) | Current (A) | | | | | | | | | | | | | | |
| 01 | 100Mb/s—400MHz | 200 | 1.5 | | | | | | | | | | | | | | |
| 02 | 200Mb/s—400MHz | 200 | 2.5 | | | | | | | | | | | | | | |
|  | | WIRES AND CABLES, SPACEWIRE, ROUND, QUAD SYMMETRIC, FLEXIBLE, BASED ON TYPE SPACEWIRE | | Certificate 291 C | | Page 13-02 003-1 | | | | | | | | | | | |

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|--|---|--------------------|--------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3902 Detail ESCC 3902/003 | W.L. Gore Pleinfeld Germany | Qualification | DLR | Jan 2011 |
| Characteristics: Variant 01 AWG 28/07 (white) and Variant 02 AWG 26/07 (blue) are qualified, 100 Ω Data Rate, Operating Voltage (Continuous), Current Variant 01 100Mb/s—400 MHz 200V—1.5A Variant 02 200Mb/s—400 MHz 200V— 2.5A Temperature range (°C): -200 to +180 | | | | |
|  | WIRES AND CABLES, SPACEWIRE, ROUND, QUAD SYMMETRIC, FLEXIBLE, BASED ON TYPE SPACEWIRE | | Certificate 304 C | Page 13-02 003-2 |


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|---|---|------------------------|----------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3902 Detail ESCC 3902/004 | AXON' CABLE Montmirail France | Qualification | CNES | October 2015 |
| Characteristics: Temperature range (°C): -100 to +150 | | | | |
|  | WIRES AND CABLES, SPACEWIRE, ROUND, QUAD SYMMETRIC, FLEXIBLE, BASED ON TYPE SPACEWIRE | Certificate 335 | Page 13-02 003-3 | |


Section 14**Component Type: Miscellaneous**


| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|----------------|-------|--|--------------|
| 14-16-99 | | | Switches | |
| | 14-16-99-003 | 275 F | Thermostatic, Bimetallic | COMEPA |
| 14-30-10 | | | Passive Devices, RF | |
| | 14-30-10-002-2 | 185 H | Coaxial Loads, 0 to 22 GHz | Radiall |
| | 14-30-10-004 | 178 J | Attenuators, Type R413 | Radiall |
| | 14-30-10-005 | 340 | Isolators and Circulators, Type BK1XXX and BK3XXX | Cobham |
| | 14-30-10-006 | 347 | Isolators, High Power, Coaxial S and C band, Type BE1xE2-105, BG1xE2-206 | Cobham |





SECTION 14-: INDEX OF MISCELLANEOUS
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|--|---|--------------------|-----------------------------------|---------------------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3702 Detail 3702/001 | COMEPA BAGNOLET France | Qualification | CNES | Mar 2004 |
| <p>Characteristics:</p> <p>Variants 01 to 03 are qualified</p> <p>Range of Components: Grade 1 and Grade Y</p> <p>Maximum Ratings:</p> <p>Rated Current (I_R): 4 A (30 Vdc resistive)</p> <p>Operating Temperature Range ($^{\circ}\text{C}$), -50 to $+150$</p> | | | | |
|  <p>ESCC European Space Components Coordination QPL</p> | <p>SWITCHES, THERMOSTATIC, BIMETALLIC, SPST, OPENING CONTACT, BASED ON TYPE TH 47</p> | | <p>Certificate 275 F</p> | <p>Page 14-16 99-003</p> |

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|---|-------------------|-----------------------|--|--|----------|--------------------|--------------------------|-----------------------|-------------------------------|
| Types covered by similarity: | | | | | Remarks: | | | | |
| Procurement Specifications | | | | Manufacturer | | Nature of Approval | | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3403 Detail 3403/006 | | | | RADIALL Saint-Quentin-Fallavier France | | Qualification | | CNES | Jul 1992 |
| Characteristics: All variants are qualified. 50 ohms DC to 22 GHz | | | | | | | | | |
| Type | Detail Spec. | Frequency Range (GHz) | Rated Pin (W) | Impedance (Ω) | | | | | |
| 3403/006 | 3403/006 | 0-22 | 1 | 50 | | | | | |
| Type | VSWR max | | | | | | | | |
| | 0<f(GHz) \leq 4 | 4<f(GHz) \leq 12.4 | 12.4<f(GHz) \leq 18 | 18<f(GHz) \leq 22 | | | | | |
| 1 | 1.05 | 1.15 | 1.20 | 1.30 | | | | | |
| 2 | 1.05 | 1.15 | 1.20 | 1.25 | | | | | |
| Operating Temperature Range ($^{\circ}$ C), -55 to +125 | | | | | | | | | |
|  | | | PASSIVE DEVICES, R.F. COAXIAL LOADS, 0-22 GHz BASED ON TYPE R404 | | | | Certificate 185 H | | Page 14-30 10-002-2 |

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|---|--|--------------------------|-----------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3403 Detail 3403/005 | RADIALL Saint-Quentin-Fallavier France | Qualification | CNES | Jan 1991 |
| Characteristics: Variants 01 to 31 Frequency range (GHz): 0 - 22 Attenuation (dB): 0 - 20 Operating Temperature Range (°C), -55 to +125 | | | | |
|  | R.F. ATTENUATORS FIXED, COAXIAL BASED ON TYPE R413 | Certificate 178 J | Page 14-30 10-004 | |

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|---|--|------------------------|-----------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3202 Detail 3202/026 | Cobham Microwave Villebon-sur Yvette France | Qualification | CNES | Jun 2016 |
| Characteristics: Variants 01 and 02 are qualified | | | | |
|  | ISOLATORS AND CIRCULATORS, LOW POWER, KA-BAND (22GHz—32 GHz), WITH NON-INTEGRAL SMA 2.9 COAXIAL CONNECTORS, BASED ON TYPES BK1XXX and BK3XXX | Certificate 340 | Page 14-30 10-005 | |

| | | | | |
|---|---|------------------------|-----------------------------|----------------------------|
| Types covered by similarity: | | Remarks: | | |
| Procurement Specifications | Manufacturer | Nature of Approval | Supervising Authority | Initial Qualification Date |
| Generic ESCC 3202 Detail 3202/022 3202/023 | Cobham Microwave Villebon-sur Yvette France | Qualification | CNES | April 2017 |
| Characteristics: | | | | |
|  | ISOLATORS, HIGH POWER, COAXIAL, S AND C BAND, BASED ON TYPES BE1xE2-105 and BG1xE2-206 | Certificate 347 | Page 14-30 10-006 | |

Section 18

Component Type: Optoelectronics

| Sub-Section | Page No. | Cert. | Type Designation | Manufacturer |
|-------------|----------|-------|---|--------------|
| | | | Currently there are no qualified sources of Optoelectronics | |



SECTION 18-: INDEX OF OPTOELECTRONICS**

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