

Component Title: Capacitors, Leadless Surface Mounted, Tantalum, Solid electrolyte, Low equivalent series resistance based on type TES.

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|  |                           | xecutive interriber.  | -57                |  | Date. 221   | 09/2017                         | 327B                 |     |
|--|---------------------------|---|--------------------|--|---|---------------------------------|----------------------|-----|
| Components (includi                        | ng series and families) s | ubmitted for Extension  | of Qualification   | Approval:                              |   |                                 |                      | 1   |
| ESCC<br>COMPONENT<br>NO.                   | VARIANTS                  | RANGE OF COM  | IPONENTS           | BASED<br>ON                            |   | TEST<br>VEHICLE / S             |                      | Т   |
| 3012/004                                   | 01 A-G16                  | ESCC 3012/004 Tabl  | le 1(a)            | TES                                    | See box   |                                 | all other variants a | ind |
|  | 02 B-G16                  | 1uF-470uF, 6V-50V   |                    |  |   |                                 | alues.               |     |
|  | 03 C - P17                |   |                    |  |   |                                 |                      |     |
|  | 04 D-P17 05E-P17          |   |                    |  |   | İ                               |                      |     |
| Component M                                | anufacturer 2             | Location of Mar   | nufacturing Plant  | i(s) 3                                 |   |                                 |                      | 4   |
| AVX Czech Republic                         |                           | Dvorakova 328<br>Lanskroun<br>Czech Republic                        | idiaciding Fiam    | (10)                                   | Date of original qualification approval: Date: 10/12/2013  Certificate Ref No. 327  |                                 |                      | 7   |
|  | 5                         |   |                    | 6                                      |   |                                 |                      | 7   |
| ESCC Specifications<br>Maintenance of qual | used for                  | Deviations to LVT tes<br>used:                                      | sting and Detail   | 1                                      | Qualification Extension Report reference and date:                                  |                                 |                      |     |
| Generic: 3012                              | Issue: 3                  | No ⊠ Yes  | (supply of         | details in Box                         | Extension of Valid Qualification, Customer Information Package, 22th September 2017 |                                 |                      | ion |
| Detail(s): 3012/00                         | 4 Issue: 4                | Deviation from currer   |                    | •0                                     | Package, 22th   | September 2017                  |                      |     |
| Detail(s). 3012/00                         | 4 issue. 4                | Deviation from current Specifications:  No ⊠ Yes □ (Supply details) |                    |  |   |                                 |                      |     |
|  |                           | (Cuppi, details)  |                    |  |   |                                 |                      |     |
|  |                           |   |                    |  |   |                                 |                      | 8   |
| Summary of procure                         | ment or equivalent test r | esults during current va  | lidity period in s | upport of this ar                      | plication (those to   | ESCC listed first)              | r                    |     |
| Project Name                               | Testing Level             | LAT   |                    | Date code                              |   | Quantity De                     |                      |     |
| See box 22                                 |                           |   |                    |  |   |                                 |                      |     |
|  |                           |   |                    |  |   |                                 |                      |     |
|  |                           |   |                    |  |   |                                 |                      |     |
|  |                           |   |                    |  |   |                                 |                      |     |
|  |                           |   |                    |  |   |                                 |                      |     |
|  |                           |   |                    |  | - 1   |                                 |                      |     |
| PID changes since s                        | tart of qualification     | 9   | Current PID        | Verified by:                           |   | ESA                             |                      | 10  |
| None 🗵                                     |                           |   | 0.2000-0.200       | ************************************** | Name of Excutive Representative   |                                 |                      |     |
| Minor* □                                   |                           |   | Ref No:            | PID100 issue 3                         | , PID 100/004 issi  | ue 5                            |                      |     |
| Major* □                                   | *Provide details in box:  |   | Issue:             |  |   | Date:                           | 07/09/2017           |     |
| 3  |                           |   | Rev Date:          | 22/09/2017                             |   |                                 |                      |     |
|  |                           |   |                    |  |   |                                 |                      | 11  |
| Current Manufacturii                       |                           | ESA   |                    | on                                     | 23/06   | /2015                           |                      |     |
|  |                           | (Name   | of Executive R     | epresentative)                         |   | (Da                             | ate)                 |     |
| Satisfactory:                              | Yes ⊠                     | No □ Exp  |                    |  | from the audit hav<br>took place on the   | e been closed out<br>16/09/2015 | during a             |     |
| Report Reference:                          | AVXLAN-AUD-20             | 015-1   | ~                  |  |   |                                 |                      |     |

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| Failure Analysis, DPA         | , NCCS available:   | Yes                        | ×                    | No                    |        | (Supply data)   | 12 |
|-------------------------------|---|----------------------------|----------------------|-----------------------|--------|---|----|
| Ref. No's and purposes:       | The NCCS 2EAVX601   | has been                   | closed               | l out.                |        |   |    |
| (except as stated in box 15;) | ntation has been evaluated<br>- that the reports and data | d; - that fu<br>a are avai | ıll comp<br>lable at | oliance to<br>the ESC | all ES | ormation is correct, - CC requirements is evidence cutive and therefore applies on behalf of d to the component(s) listed herein. | 13 |
|                               |   |                            |                      |                       |        | (Signature of the Executive Coordinator)  |    |
| Continuation of Boxes above   | 3   |                            |                      |                       |        |   | 14 |

Selection of codes was besed on:

o Coverage of different case sizes
Coverage wide range of voltage
Coverage different capacitances and used powders

Selected codes:

A1/25 - 301200401B105KE3000 B47/6,3 - 301200402B476KJ0500 C3,3/50 - 301200403B335KT1000 D220/10 - 301200404B227KA0035 E150/16 - 301200405B157KC0040

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| Non compliance to ESCC requirements: |   |   |                               |    |  |  |
|--------------------------------------|---|---|-------------------------------|----|--|--|
| No.:                                 | Specification                                   | Paragraph   | Non compliance                |    |  |  |
|                                      |   |   |                               |    |  |  |
| Additiona                            | I tasks required to achieve full compliance for | ESCC qualification or rationale for acceptability | of                            | 30 |  |  |
| noncomp                              | liance:   | 2000 qualification of rationale for asseptability |                               | 16 |  |  |
|                                      |   |   |                               |    |  |  |
| Executive                            | Manager Disposition                             |   |                               | 17 |  |  |
| Application / F                      | on Approval: Yes                                |   |                               |    |  |  |
| Detro                                |   | . *   | 6-4 Dr                        |    |  |  |
| Date:                                |   |   | Signature, ESA Representative |    |  |  |

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# ANNEX 1: LIST OF TESTS DONE TO SUPPORT EXTENSION OF QUALIFICATION

Tests conducted in compliance with:

ESCC 3012 generic specification; Chart V (for ESCC/QPL parts);
Or PID-TFD (for ESCC/QML parts)

Tests vehicle identification/description:

Detail Specification reference:

3012/004

| Chart IV  | Test                              | Tick<br>when<br>done | Conditions            | Date Code  | Tested<br>Qty | No. of<br>Rejects | Comments if not performed.<br>Comments on Rejection |
|---|-----------------------------------|----------------------|-----------------------|--|---------------|-------------------|---|
| Environmental / Mechanical Subgroup (Column 1)    | Mounting                          | ×                    | IEC 384-1             | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
|   | Adhesion                          | ×                    | ESCC 3012, Para. 9.10 | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
|   | External<br>Visual<br>Inspection  | ⊠                    | ESCC 20500            | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
|   | Permanence<br>of Marking          | ×                    | ESCC 24800            | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
|   | Climatic<br>Sequence              | ×                    | ESCC 3012, Para. 9.13 | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
| hanical<br>n 2)                                   | Mounting                          | ×                    | IEC 384-1             | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
| Environmental / Mechanical<br>Subgroup (Column 2) | Rapid<br>Change of<br>Temperature | ×                    | IEC 68-2-14           | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
|   | Vibration                         | ×                    | IEC 68-2-6            | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |

|                    | STREET, CONTRACTOR  | 11 |                               | A 464E   |      |   |  |
|--------------------|---|----|-------------------------------|--|------|---|--|
|                    | Shock or Bump   | ⊠  | IEC 68-2-27 or<br>IEC 68-2-29 | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5 | 0 |  |
|                    | External<br>Visual<br>Inspection                          | ×  | ESCC 20500                    | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5 | 0 |  |
|                    | Permanence<br>of Marking                                  | ×  | ESCC 24800                    | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5 | 0 |  |
|                    | Climatic<br>Sequence                                      | ×  | ESCC 3012, Para. 9.13         | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5 | 0 |  |
| dno                | Mounting  | ×  | IEC 384-1                     | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 36x5 | 0 |  |
| Endurance Subgroup | Operating<br>Life at<br>85 °C                             | ⊠  | ESCC 3012, Para.<br>9.17.2    | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 36x5 | 0 |  |
| End                | Electrical<br>Measurements<br>during Endurance<br>Testing | ⊠  | ESCC 3012, Para. 9.4.5        | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 36x5 | 0 |  |



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| Chart IV   | Test  | Tick<br>when<br>done | Conditions                | Date Code<br>(YearWeek)                            | Tested<br>Qty | No. of<br>Rejects | Comments if not performed.<br>Comments on Rejection |
|--|---|----------------------|---------------------------|--|---------------|-------------------|---|
| Electrical Subgroup (Electrical<br>Measurements) | High and Low<br>Temperature<br>Stability          | ⊠                    | ESCC 3012, Para. 9.14     | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
|  | Electrical<br>Measurements<br>at Room Temperature | ×                    | ESCC 3012, Para. 9.4.4    | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
|  | External<br>Visual<br>Inspection                  | ×                    | ESCC 20500                | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
| ubgroup<br>ab. Tests)                            | Surge<br>Voltage                                  | ×                    | ESCC 3012, Para. 9.15     | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
| Electrical Subgroup<br>(Ass. / Capab. Tests)     | Solderability                                     | ⊠                    | IEC 68-2-20               | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 |   |
| Tests  | Operating Life at 125°C                           | ⊠                    | ESCC 3012, Para<br>9.17.2 | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 24x5          | 0                 | Performed as part of chart IV.                      |
| Additional Tests                                 | Damp Heat Steady<br>State                         | ×                    | ESCC 3012, Para 9.16      | A 1645,<br>B 1644,<br>C 1648,<br>D 1710,<br>E 1644 | 12x5          | 0                 | Performed as part of chart IV.                      |
|  |   |                      |                           |  |               |                   |   |



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# NOTES ON THE COMPLETION OF THE APPLICATION FORM FOR ESCC QUALIFICATION EXTENSION APPROVAL

| components (the ESCC code is recommended to indicate the values or values range, the lociance, the voltage, etc); the designation given in the detail specification as "base on"; under Test Vehicle enter either an ESCC code or the specific characteristic capable of identifying the component tested (e.g., voltage of coil for a relay); under component similar enter a cross if relevant.  Box 2; 3 and 4  As per QPL entry; otherwise, an explanation of the changes must be supplied.  Will show the ESCC Generic and Detail specifications, including issue number and revision letter, current at the time the tests reported were performed. If the specifications are different from those current on the date of the application, see Box 6.  Will show the deviations from the Generic and Detail Specifications listed in Box 5, in particular deviations from testing, in case of deviations this must be listed in Box 15. In case the referenced specification in Box 5 have currently a different issue and/or revision indicate also whether the test data deviates or not from such current documents.  Box 7  Must reference the report(s) supplied in support of the application.  Box 8  Should provide the details of procurrement to the full ESCC System, documentation of all of which should already have been delivered to the ESCC Executive under the terms of the relevant Generic Specification. An appropriate table has been drawn in this box.  Box 9  If the PID evolved after the Original Qualification or after the last Extension of Qualification, adequate details of such evolution shall be provided together with the reasons for the changes. Major changes shall be clearly marked.  Box 10  Identify the current PID issue status, date and actual date of verification. The date of verification of the current PID should be arranged as close as possible to the required date of extension.  Box 11  This box can be completed only after a physical visit to the plant to confirm that no unexplained changes occurred and that the practices, procedures, marked all | ENTRIES<br>Form heading | shall indicate: - the title of the component as given in its detail specification or the name of the series, family; - the Executive Member; - the entering date; - the certificate number and its sequential suffix.   |
|--|-------------------------|---|
| Box 5  Will show the ESCC Generic and Detail specifications, including issue number and revision letter, current at the time the tests reported were performed. If the specifications are different from those current on the date of the application, see Box 6.  Will show the deviations from the Generic and Detail Specifications listed in Box 5, in particular deviations from testing, in case of deviations this must be listed in Box 15, in case the referenced specification in Box 5 have currently a different issue and/or revision indicate also whether the Box 15 in case the referenced specification in Box 5 have currently a different issue and/or revision indicate also whether the statiate deviates or not from such current documents.  Box 7  Must reference the report(s) supplied in support of the application.  Should provide the details of procurement to the full ESCC System, documentation of all of which should already have been delivered to the ESCC Executive under the terms of the relevant Generic Specification, An appropriate table has been drawn in this box.  If the PID evolved after the Original Qualification or after the last Extension of Qualification, adequate details of such evolution shall be provided together with the reasons for the changes. Major changes shall be clearly marked.  Box 10  Identify the current PID issue status, date and actual date of verification. The date of verification of the current PID should be arranged as dose as possible to the required date of extension.  Box 11  This box can be completed only after a physical vist to the plant to confirm that no unexplained changes occurred and that the practices, procedures, mainteil, etc. used in manufacturing the components are as described in the PID. This survey shall be carried out in accordance with the requirements of ESCC Basic Specification No. 20200 and its findings shall be recorded.  Box 12  Provide details of, or reference to, any Destructive Physical Analysis (DPA) and Failure Analysis reports as well as any Nonconformance(s) (N | Box 1                   | components (the ESCC code is recommended to indicate the values or values range, the tolerance, the voltage, etc); the designation given in the detail specification as 'base on'; - under Test Vehicle enter either an ESCC code or the specific characteristic capable of identifying the component tested (e.g., voltage of coil for a relay); - under component similar enter a cross |
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| deviations this must be listed in Box 15. In case the referenced specification in Box 5 have currently a different issue and/or revision indicate also whether the test data deviates or not from such current documents.  Must reference the report(s) supplied in support of the application.  Should provide the details of procurrement to the full ESCC System, documentation of all of which should already have been delivered to the ESCC Executive under the terms of the relevant Generic Specification. An appropriate table has been drawn in this box.  Box 9 If the PID evolved after the Original Qualification or after the last Extension of Qualification, adequate details of such evolution shall be provided together with the reasons for the changes. Major changes shall be clearly marked.  Box 10 Identify the current PID issue status, date and actual date of verification. The date of verification of the current PID should be arranged as close as possible to the required date of extension.  Box 11 This box can be completed only after a physical visit to the plant to confirm that no unexplained changes occurred and that the practices, procedures, material, etc. used in manufacturing the components are as described in the PID. This survey shall be carried out in accordance with the requirements of ESCC Basic Specification No. 20200 and its findings shall be recorded.  Box 12 Provide details of, or reference to, any Destructive Physical Analysis (DPA) and Failure Analysis reports as well as any Nonconformance(s) (NCCS) occurred during the qualification validity period, stating if established corrective action have produced satisfactory results.  Box 13 Enter only the name of the Executive Member (i.e., CNES, DLR, ESTEC, etc.) and the signature of the responsible Executive Coordinator.  Box 14 To be used when there is a need to expand any of the boxes from 1 through 12. Identify box affected and reference the Box 14 in the relevant Box. Box 14 can be broken into 14a, 14b, etc. if several boxes have to be expanded.  Box 16 Any a | Box 5                   |   |
| Should provide the details of procurement to the full ESCC System, documentation of all of which should already have been delivered to the ESCC Executive under the terms of the relevant Generic Specification. An appropriate table has been drawn in this box.  Box 9 If the PID evolved after the Original Qualification or after the last Extension of Qualification, adequate details of such evolution shall be provided together with the reasons for the changes. Major changes shall be clearly marked.  Box 10 Identify the current PID issue status, date and actual date of verification. The date of verification of the current PID should be arranged as close as possible to the required date of extension.  This box can be completed only after a physical visit to the plant to confirm that no unexplained changes occurred and that the practices, procedures, material, etc. used in manufacturing the components are as described in the PID. This survey shall be carried out in accordance with the requirements of ESCC Basic Specification No. 20200 and its findings shall be recorded.  Box 12 Provide details of, or reference to, any Destructive Physical Analysis (DPA) and Failure Analysis reports as well as any Nonconformance(s) (NCCS) occurred during the qualification validity period, stating if established corrective action have produced satisfactory results.  Box 13 Enter only the name of the Executive Member (i.e., CNES, DLR, ESTEC, etc.) and the signature of the responsible Executive Coordinator.  Box 14 To be used when there is a need to expand any of the boxes from 1 through 12. Identify box affected and reference the Box 14 in the relevant Box, Box 14 can be broken into 14a, 14b, etc. if several boxes have to be expanded.  Box 15 Fill in Table as requested.  Box 16 Any additional action deemed necessary by the Executive Member to bring the submitted data to a standard likely to be accepted by the ESCC Executive Manager recommendations on the application itself, special conditions or restrictions, modifications of the QPL or QM | Box 6                   | deviations this must be listed in Box 15. In case the referenced specification in Box 5 have currently a different issue and/or   |
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| Identify the current PID issue status, date and actual date of verification. The date of verification of the current PID should be arranged as close as possible to the required date of extension.  Box 11 This box can be completed only after a physical visit to the plant to confirm that no unexplained changes occurred and that the practices, procedures, material, etc. used in manufacturing the components are as described in the PID. This survey shall be carried out in accordance with the requirements of ESCC Basic Specification No. 20200 and its findings shall be recorded.  Box 12 Provide details of, or reference to, any Destructive Physical Analysis (DPA) and Failure Analysis reports as well as any Nonconformance(s) (NCCS) occurred during the qualification validity period, stating if established corrective action have produced satisfactory results.  Box 13 Enter only the name of the Executive Member (i.e., CNES, DLR, ESTEC, etc.) and the signature of the responsible Executive Coordinator.  Box 14 To be used when there is a need to expand any of the boxes from 1 through 12. Identify box affected and reference the Box 14 in the relevant Box. Box 14 can be broken into 14a, 14b, etc. if several boxes have to be expanded.  Box 15 Fill in Table as requested.  Box 16 Any additional action deemed necessary by the Executive Member to bring the submitted data to a standard likely to be accepted by the ESCC Executive Should be listed herein or the reason(s) to accept the noncompliance.  Box 17 All Executive Manager recommendations on the application itself, special conditions or restrictions, modifications of the QPL or QML entry, letters to the manufacturer, etc. shall be entered clearly in Box 19, signed by the representative for ESA, and dated.  Box 19 Confidential Details of PID changes including those of a confidential nature, shall be provided.  State noncompliance with reference to specification(s) and paragraph(s). To simplify reference in Box 16 each nonconformance shall be sequentially numbered. If relevant stat | Box 8                   | delivered to the ESCC Executive under the terms of the relevant Generic Specification. An appropriate table has been drawn in   |
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| Box 22 Additional Comments.  | Box 21                  |   |
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