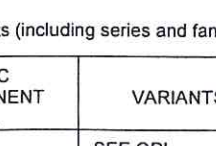


|                                                                  |                                         | <b>APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL</b><br>Component Title: MICROWAVE, SILICON, PIN AND VARACTORS<br>Executive Member: ESA                      Date: 07/06/2019                                                                                                                         |                |                                                                                             | Page 1<br><br>Appl. No.<br><br>200J |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------|-------------------------------------|----|
| Components (including series and families) submitted for Extension of Qualification Approval:                                                     |                                         |                                                                                                                                                                                                                                                                                                                  |                |                                                                                             |                                     | 1  |
| ESCC COMPONENT NO.                                                                                                                                | VARIANTS                                | RANGE OF COMPONENTS                                                                                                                                                                                                                                                                                              | BASED ON       | TEST VEHICLE / S                                                                            | COMPONENT SIMILAR                   |    |
| 5513/007                                                                                                                                          | SEE QPL                                 | SEE QPL                                                                                                                                                                                                                                                                                                          | ML4207 TO 4209 |                                                                                             |                                     |    |
| 5513/009/010/014/015                                                                                                                              | SEE QPL                                 | SEE QPL                                                                                                                                                                                                                                                                                                          | ML46XX         | 1000046436                                                                                  | ML4617-30 (5513/009)                |    |
| 5512/001/003/004/005/006/007                                                                                                                      | SEE QPL                                 | SEE QPL                                                                                                                                                                                                                                                                                                          | ML43XX         |                                                                                             |                                     |    |
| Component Manufacturer<br>API Microwave Limited                                                                                                   |                                         | Location of Manufacturing Plant(s)<br>Featherstone Road, Wolverton Mill<br>Milton Keynes, Buckinghamshire<br>MK12 5EW, United Kingdom                                                                                                                                                                            |                | Date of original qualification approval:<br>Date: 15/12/1993<br><br>Certificate Ref No. 200 |                                     | 4  |
|                                                                                                                                                   |                                         |                                                                                                                                                                                                                                                                                                                  |                |                                                                                             |                                     | 5  |
| ESCC Specifications used for Maintenance of qualification testing:<br>Generic: 5010          Issue: 1<br><br>Detail(s): 5513/009    Issue: 3<br>+ |                                         | Deviations to LVT testing and Detail Specification used:<br>No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> (supply details in Box 15)<br><br>Deviation from current Specifications:<br><input type="checkbox"/> Yes <input checked="" type="checkbox"/> (Supply details)<br>SCD MD1/0314/03 |                | Qualification Extension Report reference and date:<br>MOQ report MK1502 of 29/05/2019       |                                     | 7  |
| Summary of procurement or equivalent test results during current validity period in support of this application (those to ESCC listed first)      |                                         |                                                                                                                                                                                                                                                                                                                  |                |                                                                                             |                                     | 8  |
| Project Name                                                                                                                                      | Testing Level                           | LAT                                                                                                                                                                                                                                                                                                              | Date code      | Quantity Delivered                                                                          |                                     |    |
|                                                                                                                                                   |                                         |                                                                                                                                                                                                                                                                                                                  |                |                                                                                             |                                     |    |
| PID changes since start of qualification                                                                                                          |                                         | Current PID Verified by: ESA, F. Martínez                                                                                                                                                                                                                                                                        |                |                                                                                             |                                     | 9  |
| None <input type="checkbox"/>                                                                                                                     |                                         | Name of Excutive Representative                                                                                                                                                                                                                                                                                  |                |                                                                                             |                                     | 10 |
| Minor* <input checked="" type="checkbox"/>                                                                                                        |                                         | Ref No: ESA-PFC3-PID [N-EPI] + ESA-PKG-PID [PACKG]                                                                                                                                                                                                                                                               |                |                                                                                             |                                     |    |
| Major* <input type="checkbox"/> *Provide details in box:                                                                                          |                                         | Issue: 12 AND 12                                                                                                                                                                                                                                                                                                 |                | Date: 15/01/2015                                                                            |                                     |    |
|                                                                                                                                                   |                                         | Rev Date: 12/05/2017                                                                                                                                                                                                                                                                                             |                |                                                                                             |                                     |    |
| Current Manufacturing facilities surveyed by: ESA, F. Martínez and MG Perichaud on 16/06/2015                                                     |                                         |                                                                                                                                                                                                                                                                                                                  |                |                                                                                             |                                     | 11 |
| (Name of Executive Representative) (Date)                                                                                                         |                                         |                                                                                                                                                                                                                                                                                                                  |                |                                                                                             |                                     |    |
| Satisfactory:                                                                                                                                     | Yes <input checked="" type="checkbox"/> | No <input type="checkbox"/>                                                                                                                                                                                                                                                                                      | Explain        |                                                                                             |                                     |    |
| Report Reference: ESA-TECQUES-MIN-1159                                                                                                            |                                         |                                                                                                                                                                                                                                                                                                                  |                |                                                                                             |                                     |    |



## APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

Component title: MICROWAVE, SILICON, PIN AND VARACTORS

Executive Member: ESA

Date: 07/06/2019

Page 2

Appl. No.

200J

Failure Analysis, DPA, NCCS available: Yes ☐ No ☒ (Supply data)

12

Ref. No's and purposes:

The undersigned hereby certifies on behalf of the ESCC Executive - that the above information is correct; - that the appropriate documentation has been evaluated; - that full compliance to all ESCC requirements is evidence (except as stated in box 15;) - that the reports and data are available at the ESCC Executive and therefore applies on behalf of ESA as the responsible Executive Member for ESCC qualification status to be extended to the component(s) listed herein.

13

Date: 11/06/2019

  
A. Pesce, ESCC Executive Coordinator

Continuation of Boxes above:

14

|                                                                                   |                                                                 |                          |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------|
|  | <b>APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL</b> | Page 3                   |
|                                                                                   | Component title: MICROWAVE, SILICON, PIN AND VARACTORS          | Appl. No.                |
|                                                                                   | Executive Member: ESA                                           | Date: 07/06/2019<br>200J |

Non compliance to ESCC requirements: 15

| No.: | Specification  | Paragraph | Non compliance                                |
|------|----------------|-----------|-----------------------------------------------|
| 1    | ESCC 5010 ISS2 | all       | Adoption of ESCC 5010 issue 2 is not achieved |

Additional tasks required to achieve full compliance for ESCC qualification or rationale for acceptability of noncompliance: 16

The qualification is to be stopped and no effort has been made in the adoption of the latest version of the Generic specification and the amendment of all related Detail specifications (11 specs). There have been no technical changes to the approved PID baseline since several years ago. The confidence on this established baseline is regularly verified by customers with LAT testing

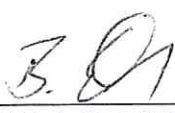
Executive Manager Disposition 17

Application Approval:    Yes    ☒    No    ☐

Action / Remarks:

Qualification validity will not be extended beyond this last extension, granted up to March 2020

Date:

  
 B. Schade, Head of ESA Product Assurance and Safety Department



## APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

Component Title: MICROWAVE, SILICON, PIN AND VARACTORS

Executive Member: ESA

Date: 07/06/2019

Page 4

Appl. No.

200J

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

18

Tests conducted in compliance with:

- ESCC 5000 generic specification; Chart F4 (for ESCC/QPL parts);
- or PID-TFD (for ESCC/QML parts)

Tests vehicle identification/description:

|                                               |  |
|-----------------------------------------------|--|
| ML4617-30, Production Lot code 8474A, dc 1822 |  |
|                                               |  |

Detail Specification reference: MD1/0314/03

| Chart F4                          | Test                            | Tick when done                      | Conditions                                         | Date Code Diffusion Lot | Tested Qty | N° of Rejects | Comments if not performed. Comments on Rejection                |
|-----------------------------------|---------------------------------|-------------------------------------|----------------------------------------------------|-------------------------|------------|---------------|-----------------------------------------------------------------|
| Environmental/Mechanical Subgroup | Mechanical shock                | <input checked="" type="checkbox"/> | MIL-STD-750 TM2016                                 | 1822                    | 6          | 0             |                                                                 |
|                                   | Vibration                       | <input checked="" type="checkbox"/> | MIL-STD-750 TM2056                                 | 1822                    | 6          | 0             |                                                                 |
|                                   | Constant acceleration           | <input checked="" type="checkbox"/> | MIL-STD-750 TM2006                                 | 1822                    | 6          | 0             |                                                                 |
|                                   | Seal<br>Fine leak<br>Gross leak | <input checked="" type="checkbox"/> | MIL-STD-750 TM1071                                 | 1822                    | 6          | 0             |                                                                 |
|                                   | Electrical Measurement          | <input checked="" type="checkbox"/> | Intermediate and End-Point Electrical Measurements | 1822                    | 6          | 0             |                                                                 |
|                                   | External Visual                 | <input checked="" type="checkbox"/> | ESCC Basic Spec 20500                              | 1822                    | 6          | 0             |                                                                 |
|                                   | Thermal shock                   | <input checked="" type="checkbox"/> | MIL-STD-750 TM1056                                 | 1822                    | 6          | 0             |                                                                 |
|                                   | Temperature Cycling             | <input type="checkbox"/>            | MIL-STD-750 TM1051                                 |                         |            |               | ESCC 5010 issue 1 required thermal shock and no thermal cycling |
|                                   | Moisture Resistance             | <input checked="" type="checkbox"/> | MIL-STD-750 TM1021                                 | 1822                    | 6          | 0             |                                                                 |
|                                   | Seal<br>Fine leak<br>Gross leak | <input checked="" type="checkbox"/> | MIL-STD-750 TM1071                                 | 1822                    | 6          | 0             |                                                                 |
|                                   | Electrical Measurement          | <input checked="" type="checkbox"/> | Intermediate and End-Point Electrical Measurements | 1822                    | 6          | 0             |                                                                 |
|                                   | External Visual                 | <input checked="" type="checkbox"/> | ESCC Basic Spec 20500                              | 1822                    | 6          | 0             |                                                                 |
| Endurance Subgroup                | Operating Life                  | <input checked="" type="checkbox"/> | MIL-STD-750/1026, 1000h                            | 1822                    | 8          | 0             |                                                                 |
|                                   | Electrical Measurement          | <input checked="" type="checkbox"/> | Intermediate and End-Point Electrical Measurements | 1822                    | 8          | 0             |                                                                 |
|                                   | Seal<br>Fine leak<br>Gross leak | <input type="checkbox"/>            | MIL-STD-750 TM1071                                 |                         |            |               |                                                                 |
|                                   | External Visual Inspection      | <input checked="" type="checkbox"/> | ESCC Basic Spec 20500                              | 1822                    | 8          | 0             |                                                                 |
| Assembly Capability Subgroup      | Permanence of Marking           | <input checked="" type="checkbox"/> | ESCC Basic Spec 24800                              | 1822                    | 2          | 0             |                                                                 |
|                                   | Terminal Strength               | <input checked="" type="checkbox"/> | ESCC 5000 Para. 8.18                               | 1822                    | 2          | 0             |                                                                 |
|                                   | Internal Visual                 | <input type="checkbox"/>            | ESCC Basic Spec 20400                              |                         |            | 0             | Not repeated after PRECAP                                       |
|                                   | Bond Strength                   | <input type="checkbox"/>            | MIL-STD-750 TM 2037                                |                         |            | 0             | Not repeated after PRECAP                                       |
|                                   | Die Shear                       | <input type="checkbox"/>            | MIL-STD-750 TM 2017                                |                         |            | 0             | Performed on sample as production control                       |



## APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

Component title: MICROWAVE, SILICON, PIN AND VARACTORS

Executive Member: ESA

Date: 07/06/2019

Page 5

Appl. No.

200J

| Chart<br>F4         | Test                         | Tick<br>when<br>done                | Conditions         | Date<br>Code<br>Diffusion<br>Lot | Tested<br>Qty | N° of<br>Rejects | Comments if not<br>performed.<br>Comments on Rejection |
|---------------------|------------------------------|-------------------------------------|--------------------|----------------------------------|---------------|------------------|--------------------------------------------------------|
| Additional<br>Tests | Seal test after<br>endurance | <input type="checkbox"/>            | 750/1071, H1 and C |                                  |               |                  |                                                        |
|                     | Solderability                | <input checked="" type="checkbox"/> | 750/2026           | 1822                             | 2             | 0                |                                                        |
|                     |                              | <input type="checkbox"/>            |                    |                                  |               |                  |                                                        |



|                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
|                                       | <p align="center"><b>APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL</b></p> <p>Component title:      MICROWAVE, SILICON, PIN AND VARACTORS</p> <p>Executive Member:      ESA      Date:      07/06/2019</p>                                                                                                                                                                                                                                                                                                                            | <p align="center">Page 7</p> <p align="center">Appl. No.</p> <p align="center">200J</p> |
| <p align="center"><b>NOTES ON THE COMPLETION OF THE APPLICATION FORM FOR ESCC QUALIFICATION EXTENSION APPROVAL</b></p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                         |
| <p><b>ENTRIES</b></p>                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                         |
| Form heading                                                                                                           | <p>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.</p>                                                                                                                                                                                                                                                                                                                     |                                                                                         |
| Box 1                                                                                                                  | <p>shall provide details given in the table; in particular there shall be listed: - the variants or range of variants; - the range of 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 if relevant.</p> |                                                                                         |
| Box 2; 3 and 4                                                                                                         | <p>As per QPL entry; otherwise, an explanation of the changes must be supplied.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                         |
| Box 5                                                                                                                  | <p>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.</p>                                                                                                                                                                                                                                                                                |                                                                                         |
| Box 6                                                                                                                  | <p>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.</p>                                                                                                                                                                          |                                                                                         |
| Box 7                                                                                                                  | <p>Must reference the report(s) supplied in support of the application.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                         |
| Box 8                                                                                                                  | <p>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.</p>                                                                                                                                                                                                                                                                         |                                                                                         |
| Box 9                                                                                                                  | <p>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.</p>                                                                                                                                                                                                                                                                                                  |                                                                                         |
| Box 10                                                                                                                 | <p>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.</p>                                                                                                                                                                                                                                                                                                                                       |                                                                                         |
| Box 11                                                                                                                 | <p>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.</p>                                                                                                                                                    |                                                                                         |
| Box 12                                                                                                                 | <p>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.</p>                                                                                                                                                                                                                                                         |                                                                                         |
| Box 13                                                                                                                 | <p>Enter only the name of the Executive Member (i.e., CNES, DLR, ESTEC, etc.) and the signature of the responsible Executive Coordinator.</p>                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                         |
| Box 14                                                                                                                 | <p>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.</p>                                                                                                                                                                                                                                                                                                          |                                                                                         |
| Box 15                                                                                                                 | <p>Fill in Table as requested.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                         |
| Box 16                                                                                                                 | <p>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.</p>                                                                                                                                                                                                                                                                                                                |                                                                                         |
| Box 17                                                                                                                 | <p>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.</p>                                                                                                                                                                                                                                                                        |                                                                                         |
| Box 18                                                                                                                 | <p>Fill in Table as requested.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                         |
| Box 19                                                                                                                 | <p>Confidential Details of PID changes including those of a confidential nature, shall be provided.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                         |
| Box 20                                                                                                                 | <p>State noncompliance with reference to specification(s) and paragraph(s). To simplify reference in Box 16 each nonconformance shall be sequentially numbered. If relevant state 'None'.</p>                                                                                                                                                                                                                                                                                                                                                    |                                                                                         |
| Box 21                                                                                                                 | <p>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.</p>                                                                                                                                                                                                                                                                                                                |                                                                                         |
| Box 22                                                                                                                 | <p>Additional Comments.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                         |