

		<b>APPLICATION FOR EXTENSION OF ESCC TECHNOLOGY FLOW APPROVAL</b>				Page 1																																				
		Component Title: <b>Thin Film Technology for Chip, Wraparound, Single and Network Resistors, Fixed</b>	Executive Member: <b>CNES</b>		Date: <b>23/01/2015</b>	Appl. No. <b>287D</b>																																				
Technology Flow submitted for Extension of Qualification Approval:						1																																				
<b>SUMMARY DESCRIPTION</b> P : Single resistor 0402, 0603, 0805, 1206, 2010 chip PRA : 2 to 8 resistors of similar value, based on 0603 (PRA 100), 0805 (PRA135) or 1206 (PRA182) units CNW : 2 to 8 resistors with at least two different values with the same form factor as PRA Substrate : Alumina Resistive layer : Nickel Chromium Protection : Silicium nitride Termination : Nickel Barrier Processes : Thin Film deposition Finish : SnPbAg or Au		<b>TEST STRUCTURES</b> P0402, P0603, P0805, P1206 and P2010 with min., critical resistance and max. values, PRA100, PRA135, PRA182 with min., critical resistance and max. values.		<b>COMPONENTS PROPOSED FOR QUALIFICATION</b> By form factor : ESCC4001023 var. 15 and 13, 14(*) ESCC4001023 var. 01, 05 (*) and 09 ESCC4001023 var. 02, 06 (*) and 10 ESCC4001023 var. 03, 07 (*) and 11 ESCC4001023 var. 04, 08 (*) and 12 ESCC4001025 var. 01 to 07, 22 to 28 ESCC4001025 var. 08 to 14, 29 to 35 ESCC4001025 var. 15 to 21, 36 to 42 (*) Note that gold finish variants are not intended for de-golding and tinning																																						
Component Manufacturer <b>2</b> <b>VISHAY SA</b> <b>Division Résistances de Très Haute Précision</b>	Location of Manufacturing Plant(s) <b>3</b> <b>Nice (France)</b>		Date of original qualification approval: <b>4</b> Date: <b>15/02/2009</b> Certificate Ref No. <b>287</b>																																							
ESCC Specifications used for Maintenance testing: <b>5</b> Generic: 4001 Issue: 4 Detail(s): 4001/023 Issue: 11 4001/025 Issue: 7	Deviations to LVT testing and Detail Specification used: <b>6</b> No <input type="checkbox"/> Yes <input checked="" type="checkbox"/> (supply details in Box 15) Deviation from current Specifications: No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (Supply details)		Qualification Extension Report reference and date: <b>7</b> <b>QML Quality Synthesis reports :</b> <b>QML 2013 Synthesis, including PHR0402 Qualification report,</b> <b>QML 2014 Synthesis, 20/12/2014</b>																																							
Summary of procurement or equivalent test results during current validity period in support of this application (those to ESCC listed first) <b>Note that 2013 data are available from the 2013 QML Synthesis Report, 2014 summary is available in Annex 2 box 22.</b>						8																																				
<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>																																										9
PID changes since start of qualification <b>9</b> None <input type="checkbox"/> Minor* <input checked="" type="checkbox"/> Major* <input type="checkbox"/> *Provide details in box: <b>19</b>		Current PID Verified by: <b>CNES</b> <b>10</b> Name of Executive Representative Ref No: <b>PID-TFD P PRA CNW</b> Issue: <b>7</b> Date: <b>02/02/2015</b> Rev. <b>0</b> Date: <b>22/01/2015</b>																																								
Current Manufacturing facilities surveyed by: <b>ESA and CNES</b> on <b>22/01/2015</b> <b>11</b> (Name of Executive Representative) (Date) Satisfactory: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Explain Report Reference: <b>CNES – DCT/AQ/CQ/2015-01664</b>																																										



## APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

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Failure Analysis, DPA, NCCS available: Yes ☒ No ☐ (Supply data) 8D reports 114006, 114012, 114018, 114020, 114032, 114037

Ref. No's and purposes: Post or pre-assembly peeling of top metallization: 114006 (PRAHR dc1246), 114018 (P1206 dc 1234), 114032 (PFRR1206 dc 1421), 114037 (PFRR0603 dc 1304)

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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 CNES as the responsible Executive Member for ESCC qualification status to be extended to the component(s) listed herein.

Date: 03/02/2015

JP. BUSSENOT

(Signature of the Executive Coordinator)

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Continuation of Boxes above:

**Box 6: Periodic Testing is defined in paragraph 6 of the Technology Flow PID (See page 3)**

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Non compliance to ESCC requirements:

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No.:	Specification	Paragraph	Non compliance
1	4001	Chart F4	Chart F4 testing replaced with the implementation of periodic testing as described in box 16

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

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None

PRELEVEMENT PHR	PRA/CNW HR (I4 mini)	ESSAIS	SPECIFICATION
3 mois / 10p		Pilage	ESCC 4001 Para 8.11.2.2
3 mois / 10p	6 mois / 5p	VRT (pièces montées pour CMS)	ESCC 4001 Para 8.8
3 mois / 20p		Séquence Climatique	ESCC 4001 Para 8.10
Note 1	12 mois / 10p	Endurance 2000h	ESCC 4001 Para 8.13
3 mois / 10p	6 mois / 5p	Soudure : 1) Soudabilité 2) Résistance chaleur de soudage	ESCC 4001 Para 8.14 & 8.12
3 mois / 10p	6 mois / 10p	CT (+ Tracking sur PRA/CNW)	ESCC 4001 Para 8.3.3

Note 1 : See PID, includes PFRR ESCC 26000 testing for Ohmic value > 99.9 ohm and yearly 2 000 hours for values < 100 ohms

Executive Manager Disposition

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Application Approval: Yes ☐ No ☐

Action / Remarks:

Date:



Signature, ESA Representative





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

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Tests conducted in compliance with:

- ESCC 4001 generic specification; Chart F4 (for ESCC/QPL parts);
- or PID-TFD P PRA CNW Issue 7 (for ESCC/QML parts)

Tests vehicle identification/description:

PHR0402 (x3) dc 1338 (Chart F4), 1438 PHR0603 dc 1302, 1308, 1347, (x2) 1413 (LVT3) 1438	PHR2010 dc 1319, 1343, 1416, 1439
PHR0805 dc 1344, 1350, 1406 PHR1206 dc 1308, 1331, 1345, 1414 (LVT1)	PRAHR dc 1321, 1342, 1347, 1413 CNWHR dc 1312, 1320, 1337, 1410

Detail Specification reference: **4001/023 & /025**

Chart F4	Test	Tick when done	Conditions	Date Code	Tested Qty	N° of Rejects	Comments if not performed. Comments on Rejection
Environmental / Mechanical Subgroup	Mounting	<input checked="" type="checkbox"/>	IEC 60115-1 clause 4.31	1344 1345 1342 1347 1337 1406 1350 1343 1319 1413 1410	5 5 5 5 5 5 5 5 5 5 5	0	
	Rapid Change Of Temperature	<input checked="" type="checkbox"/>	IEC 60068-2-14	1344 1345 1342 1347 1337 1406 1350 1343 1319 1413 1410	5 5 5 5 5 5 5 5 5 5 5	0	
	Vibration	<input type="checkbox"/>	IEC 60068-2-6				NA
	Climatic test Sequence	<input checked="" type="checkbox"/>	ESCC 4001, Para 8.10	1344 1345 1406 1350 1343 1319	10 10 10 10 10 10	0	
	Seal Test	<input type="checkbox"/>	IEC 60068-2-17				NA
	Mounting	<input checked="" type="checkbox"/>	IEC 60115-1 clause 4.31	1347 1344 1345 1406 1350 1343 1319 1416	5 5 5 5 5 5 5 5	0	
	Robustness of Terminations	<input checked="" type="checkbox"/>	IEC 60068-2-21	1347 1344 1345 1406 1350 1343 1319 1416	5 5 5 5 5 5 5 5	0	
	Climatic test Sequence	<input type="checkbox"/>	ESCC 4001, Para 8.10				NA vs PID
	Seal Test	<input type="checkbox"/>	IEC 60068-2-17				NA
	Resistance to Soldering Heat	<input checked="" type="checkbox"/>	IEC 60068-2-20	1347 1344 1342 1347 1337 1406 1350 1319 1416 1413 1410	5 5 3 3 3 5 5 5 5 5 5	0	
	Mounting	<input type="checkbox"/>	IEC 60115-1 clause 4.31				
	Climatic test Sequence	<input type="checkbox"/>	ESCC 4001, Para 8.10				NA vs PID
	Seal Test	<input type="checkbox"/>	IEC 60068-2-17				NA
	Mounting	<input type="checkbox"/>	IEC 60115-1 clause 4.31				

	Insulation Resistance	<input type="checkbox"/>	ESCC 4001, Para 8.3.1.2				NA vs PID
	Voltage Proof	<input type="checkbox"/>	ESCC 4001, Para 8.3.1.3				NA vs PID
Endurance Subgroup	Mounting	<input checked="" type="checkbox"/>	IEC 60115-1 clause 4.31	1342 1347 1337	5 5 5	0	PRA / CNW
	Operating Life	<input checked="" type="checkbox"/>	ESCC 4001, Para 8.13	1342 1347 1337 1413 1410	5 5 5 5 5	0	PRA / CNW
	Seal Test	<input type="checkbox"/>	IEC 60068-2-17				NA
Assembly Capability Subgroup	Solderability	<input checked="" type="checkbox"/>	IEC 60068-2-20	1347 1344 1342 1347 1337 1406 1350 1343 1319 1413 1410	5 5 5 5 5 5 5 5 5 5 5	0	
	Permanence of marking	<input checked="" type="checkbox"/>	ESCC 24800	1342 1347 1337 1413 1410	2 2 2 2 2	0	PRA / CNW
Failure Rate Endurance Subgroup	Operating Life	<input checked="" type="checkbox"/>	ESCC 4001, Para 8.13	Various	120 400 400	0	2 000H 4 000H 8 000H
	Seal Test	<input type="checkbox"/>	IEC 60068-2-17				NA
Additional Tests	High & Low Temp (Temperature Coefficient)	<input checked="" type="checkbox"/>	ESCC 4001	1347 1344 1345 1342 1347 1337 1406 1350 1343 1319 1416 1413 1410	5 4 8 5 5 5 5 5 4 3 3 5 5	0	
		<input type="checkbox"/>					
		<input type="checkbox"/>					



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

## ENTRIES

## 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 1

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.

## Box 2; 3 and 4

As per QPL entry; otherwise, an explanation of the changes must be supplied.

## 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.

## 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 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.

## 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 18

Fill in Table as requested.

## Box 19

Confidential Details of PID changes including those of a confidential nature, shall be provided.

## Box 20

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'.

## Box 21

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 22

Additional Comments.