

		APPLICATION FOR EXTENSION OF ESCC TECHNOLOGY FLOW APPROVAL		Page 1 Appl. No. 287F	
Component Title: Thin Film Technology for Chip, Wraparound, Single and Network Resistors, Fixed		Executive Member: CNES		Date: 14/02/2019	
Technology Flow submitted for Extension of Qualification Approval: 1					
SUMMARY DESCRIPTION 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		TEST STRUCTURES P0402, P0603, P0805, P1206 and P2010 with min., critical resistance and max. values, PRA100, PRA135, PRA182 with min., critical resistance and max. values.		COMPONENTS PROPOSED FOR QUALIFICATION 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 2 VISHAY SA Division Résistances de Très Haute Précision		Location of Manufacturing Plant(s) 3 Nice (France)		Date of original qualification approval: 4 Date: 15/02/2009 Certificate Ref No. 287	
ESCC Specifications used for Maintenance testing: 5 Generic: 4001 Issue: 4 Detail(s): 4001/023 Issue: 11 4001/025 Issue: 7		Deviations to LVT testing and Detail Specification used: 6 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: 7 QML Quality Synthesis reports : QML 2017 Synthesis, 03/01/2018 QML 2018 Synthesis, 25/01/2019	
Summary of procurement or equivalent test results during current validity period in support of this application (those to ESCC listed first) 8					
Customer	Component	LVT	Date code	Quantity Delivered	
TAS Belgium, RUAG, TTI, Airbus DS, ALTER, Sodern, ECOMAL ...	PHR1206 PHR0805 PHR0603	LVT1	1836	2017: 177 046 2018: 144 230	
TTI, TAS Italy, Chardcroft ...	PRA / CNW			2017: 2 084 2018: 2 264	
ALTER, Chardcroft, ECOMAL ...	PFRR	-		2017: 4 760 2018: 30 486	
PID changes since start of qualification 9 None <input type="checkbox"/> Minor* <input checked="" type="checkbox"/> Major* <input type="checkbox"/> *Provide details in box: <div style="border: 1px solid black; padding: 2px; width: 100px;">19</div>		Current PID Verified by: CNES 10 Name of Executive Representative Ref No: PID-TFD P PRA CNW Issue: 10 Date: 14/02/2019 Rev. 0 Date: 04/01/2019			
Current Manufacturing facilities surveyed by: J.P Bussenot (CNES) and S. Hernandez (ESA)^{pn} 11 <div style="display: flex; justify-content: space-between;"> (Name of Executive Representative) (Date) </div> Satisfactory: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Explain Report Reference: <u>CNES DCT/AQ/CQ/022019-VIS</u>					



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Failure Analysis, DPA, NCCS available: Yes ☒ No ☐ (Supply data) NCCS 1CSFE801 (Closed)

Ref. No's and purposes: 1CSF801: Marginal burn-in duration (232H instead of 192H max.) on 6 lots – See closed NCCS in appendix.

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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: 15/02/2019

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 PID paragraph 6.3

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

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None

Executive Manager Disposition

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Application Approval: Yes ☒ No ☐

Action / Remarks:

Date:

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



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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 9 (for ESCC/QML parts)

Tests vehicle identification/description:

PHR0402 dc 1601 (10R, 100R), 1730 (24R9), 1804 (68R1, PFRR 4K7), 1822 (19K6)	PHR1206 dc 1709 (470K), 1719 (19K1), 1736 (68R1), 1814 (40K)
PHR0603 dc 1743 (10R), 1812 (12K7), 1829 (200K)	PHR2010 dc 1635 (100K, 1M18), 1709 (2M2)
PHR0805 dc 1708 (138K), 1718 (12K1), 1728 (51R1)	PRAHR dc 1721, 1711, 1802, 1803 CNWHR dc 1717, 1811

In progress, will be included in 2019 QML Synthesis

Detail Specification reference: 4001/023 & /025

Extracted from 2017 & 2018 QML Synthesis

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	1708 1709 1718 1719 1721 1711 1717 1730 1728 1736 1743 1804 1804 1812 1814 1802 1803 1811	5 2 x 5 9 9 5 5 5 5 5 5 10 10 5 5 5 5 5 5	0	
	Rapid Change Of Temperature	<input checked="" type="checkbox"/>	IEC 60068-2-14	1708 1709 1718 1719 1721 1711 1717 1730 1728 1736 1743 1804 1804 1812 1814 1802 1803 1811	5 2 x 5 9 9 5 5 5 5 5 5 10 10 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	1708 1709 1718 1719 1730 1728 1736 1743 1804 1804 1812 1814	9 2 x 9 18 18 9 9 9 13 13 7 7 7	0	
	Seal Test	<input type="checkbox"/>	IEC 60068-2-17				NA
	Mounting	<input checked="" type="checkbox"/>	IEC 60115-1 clause 4.31	1708 1709 1718 1719 1730 1728 1736 1743 1804 1804 1812 1814	4 2 x 4 9 9 4 4 4 3 3 2 2 2	0	

		Robustness of Terminations	<input checked="" type="checkbox"/>	IEC 60068-2-21	1708 1709 1718 1719 1730 1728 1736 1743 1804 1804 1812 1814	4 2 x 4 9 9 4 4 4 3 3 2 2 2	0	Adhesion + Substrate bending
		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	1708 1709 1718 1719 1721 1711 1717 1730 1728 1736 1743 1804 1804 1812 1814 1802 1803 1811	5 2 x 5 10 10 5 5 5 5 5 5 3 3 2 2 2 2 2 2	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	1721 1711 1717 1730 1728 1736 1743 1804 1802 1803 1811	10 10 10 5 5 5 10 10 10 10 10	0	
		Operating Life	<input checked="" type="checkbox"/>	ESCC 4001, Para 8.13	1721 1711 1717 1730 1728 1736 1743 1804 1802 1803 1811	10 10 10 5 5 5 10 10 10 10 10	0	PRAHR 100I4B PRAHR 135I4B CNWHR 1668 PHR Low Ohmic value PHR Low Ohmic value PHR Low Ohmic value PHR Low Ohmic value PHR Low Ohmic value PRAHR 100I8B PRAHR 135I4B CNWHR 1689
		Seal Test	<input type="checkbox"/>	IEC 60068-2-17				NA
	Assembly Capability Subgroup	Solderability	<input checked="" type="checkbox"/>	IEC 60068-2-20	1708 1709 1718 1719 1721 1711 1717 1730 1728 1736 1743 1804 1804 1812 1814 1802 1803 1811	2 2 x 2 3 3 5 5 5 2 2 2 3 3 2 2 5 5 5	0	
		Permanence of marking	<input checked="" type="checkbox"/>	ESCC 24800	1721 1711 1717 1802 1803 1811	5 5 5 5 5 5	0	PRA / CNW
	Failure Rate Endurance Subgroup	Operating Life	<input checked="" type="checkbox"/>	ESCC 4001, Para 8.13	July '16 to October '17 - Nov '17 to January '19	120 140 120 480 - 600 420 120 200	0 - 0	2 000H 4 000H 6 000H 8 000H - 2000H 4000H 6000H 8000H

	Seal Test	<input type="checkbox"/>	IEC 60068-2-17				NA
Additional Tests	High & Low Temp (Temperature Coefficient)	<input checked="" type="checkbox"/>	ESCC 4001	1708	5	0	
				1709	2 x 5	0	
				1718	10	0	
				1719	10	0	
				1721	5	0	
				1711	5	0	
				1717	5	0	
				1730	5	0	
				1728	5	0	
				1736	5	0	
				1743	10	0	
				1804	10	0	
				1804	10	0	
				1812	10	0	
				1814	10	0	
				1802	5	0	
				1803	5	0	
				1811	5	0	
		<input type="checkbox"/>					
		<input type="checkbox"/>					

