APPLICATION FOR EXTENSION OF ESCC TECHNOLOGY FLOW APPROVAL

Component Title:

Thin Film Technology for Chip, Wraparound, Single and Network Resistors, Fixed

Executive Member:

CNES

Date: 14/02/2019

Appl. No.

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Technology Flow submitted	d for Extension of	of Qualification Appro	oval:			L	-	
SUMMARY DESCRIPTION	N I	TEST	STRU	CTURES		COMPONENTS PROPOSED FOR QUALIFICAT	ION	
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				P1206 and P2010 ance and max. .182 with min.,	0	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 Manufacti	urer 2	Location of Ma	anufactu	ring Plant(s)	3	Date of original qualification approval:	4	
VISHAY SA		hii 20				Date: 15/02/2009		
Division Résistances	de Très	Nice (France)				Certificate Ref No. 287		
Haute Précision						Gertificate Net No. 231		
ESCC Specifications used Maintenance testing:	ESCC Specifications used for Maintenance testing: Deviations to LVT t Specification used:			and Detail	6	Qualification Extension Report reference and date:		
Generic: 4001 I	ssue: 4	No □ Yes	\boxtimes	(supply details in		QML Quality Synthesis reports :		
		20- 9-90- 99		Box 15)		QML 2017 Synthesis, 03/01/2018		
### CHEST CAN CONTROL OF THE CONTRO	ssue: 11	Deviation from curr	nemet			QML 2018 Synthesis, 25/01/2019		
4001/025 Is	ssue: 7	No ⊠ Yes		(Supply details)				
Summary of procurement of	or equivalent tes	t results during curre	ent validi	ity period in support	t of th	is application (those to ESCC listed first)	8	
Customer	Component	LVT		Date code	())	Quantity Delivered		
TTI, Airbus DS,	PHR1206 PHR0805 PHR0603	LVT1		1836		2017: 177 046 2018: 144 230		
TTI, TAS Italy, F	PRA / CNW					2017: 2 084 2018: 2 264		
ALTER, Charcroft, ECOMAL	PFRR	•				2017: 4 760 2018: 30 486		
PID changes since start of	qualification	9	Curre	nt PID Verified by:		CNES	10	
None						Name of Excutive Representative		
Minor* ⊠			Ref N	lo: PID-TFD	P PR	RA CNW		
Major* ☐ *Provide details in box:				: 10		Date: 14/02/2019		
19			Rev. Date:	0 04/01/20	19			
Current Manufacturing facil	lities surveyed b	y: J.P Bussen		ES) and S. Hernand	dez (E	ESAP ⁿ 07/02/2019	11	
,	(5).	20 PR	e Representative)	-	(Date)			
Satisfactory: Y	es 🗵	No 🗆	Expla	in				
•	(73)	, ,,	7.0					
Report Reference: CN	NES DCT/AQ/C	Q/022019-VIS						

APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL Page 2 Component title: Thin Film Technology for Chip, Wraparound, Single and Network Appl. No. Resistors, Fixed Executive Member: **CNES** 14/02/2019 Date: 287F 12 Failure Analysis, DPA, NCCS available: Yes \boxtimes 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. 13 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. 15/02/2019 JP. BUSSENOT Date: (Signature of the Executive Coordinator) Continuation of Boxes above: 14 Box 6: Periodic Testing is defined in paragraph 6 of the Technology Flow PID (See page 3)

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Executive Member:

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Non com	pliance to ESCC requirements:			15
No.:	Specification	Paragraph	Non compliance	
1	4001	Chart F4	Chart F4 testing replaced with the implementation of periodic testing as descr in PID paragraph 6.3	ibed
Additiona	Il tasks required to achieve full compliance f	or ESCC qualification or rationale for acceptabili	ty of	16
noncomp None	marice:			L
Executiv	e Manager Disposition			17
Applicati	on Approval: Yes 🗹 No 🛭 Remarks:		7 D1	
Date:			B. Schade. Head of ESA Product Assurance and Safety Department	:e



APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

Component Title:

Executive Member:

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Resistors, Fixed

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

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) PHR0603 dc 1743 (10R), 1812 (12K7), 1829 (200K) PHR1206 dc 1709 (470K), 1719 (19K1), 1736 (68R1), 1814 (40K) PHR2010 dc 1635 (100K, 1M18), 1709 (2M2)

PRAHR dc 1721, 1711, 1802, 1803 CNWHR dc 1717, 1811

PHR0805 dc 1708 (138K), 1718 (12K1), 1728

In progress, will be included in 2019 QML Synthesis

Detail Specification reference:

4001/023 & /025

Extracted fro	m 2017 &	2018 QML 5	Synthesis
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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	×	IEC 60115-1 clause 4.31	1708 1709 1718 1719 1721 1711 1717 1730 1728 1736 1743 1804 1804 1812 1814 1802	5 x 5 9 9 5 5 5 5 5 5 10 10 5 5 5 5 5 5 5 5 5 5 5	0	
	Rapid Change Of Temperature	Ø	IEC 60068-2-14	1708 1709 1718 1719 1721 1711 1717 1730 1728 1736 1743 1804 1804 1812 1814 1802 1803	5 x 5 9 9 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0	
ronm	Vibration		IEC 60068-2-6				NA
Envir	Climatic test Sequence	⊠	ESCC 4001, Para 8.10	1708 1709 1718 1719 1730 1728 1736 1743 1804 1804 1812	9 2 x 9 18 18 9 9 13 13 7 7	o	
	Seal Test		IEC 60068-2-17				NA
	Mounting	Ø	IEC 60115-1 clause 4.31	1708 1709 1718 1719 1730 1728 1736 1743 1804 1804 1812	4 2 x 4 9 9 4 4 4 3 3 2 2	0	

	Robustness of Terminations	Ø	IEC 60068-2-21	1708 1709 1718 1719 1730 1728 1736 1743 1804 1804 1812	4 2 x 4 9 9 4 4 4 3 3 2 2	0	Adhesion + Substrate bending
	Climatic test Sequence		ESCC 4001, Para 8.10	1			NA vs PID
	Seal Test		IEC 60068-2-17				NA
	Resistance to Soldering Heat	⊠	IEC 60068-2-20	1708 1709 1718 1719 1721 1711 1717 1730 1728 1736 1743 1804 1804 1812 1814 1802 1803	5 2 x 5 10 10 5 5 5 5 5 5 5 3 3 2 2 2 2 2 2 2 2 2	0	
	Mounting		IEC 60115-1 clause 4.31				
	Climatic test Sequence		ESCC 4001, Para 8.10				NA vs PID
4.01.70	Seal Test		IEC 60068-2-17				NA
	Mounting		IEC 60115-1 clause 4.31				
	Insulation Resistance		ESCC 4001, Para 8.3.1.2				NA vs PID
	Voltage Proof		ESCC 4001, Para 8.3.1.3				NA vs PID
dpgroup	Mounting	×	IEC 60115-1 clause 4.31	1721 1711 1717 1730 1728 1736 1743 1804 1802 1803	10 10 10 5 5 5 10 10 10	0	
Endurance Subgroup	Operating Life	×	ESCC 4001, Para 8.13	1721 1711 1717 1730 1728 1736 1743 1804 1802 1803 1811	10 10 5 5 5 10 10 10	0	PRAHR 100I4B PRAHR 135I4B CNWHR 1668 PHR Low Ohmic value PRAHR 100IBB PRAHR 135I4B CNWHR 1689
	Seal Test		IEC 60068-2-17				NA
Assembly Capability Subgroup	Solderability	⊠	IEC 60068-2-20	1708 1709 1718 1719 1721 1711 1717 1730 1728 1736 1743 1804 1812 1814 1802 1812	2 2 3 3 5 5 5 5 2 2 2 3 3 2 2 2 5 5 5 5	0	
	Permanence of marking	⊠	ESCC 24800	1721 1711 1717 1802 1803 1811	5 5 5 5 5 5	0	PRA/CNW
Failure Rate Endurance Subgroup	Operating Life	×	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

	Seal Test		IEC 60068-2-17				NA
Additional Tests	High & Low Temp (Temperature Coefficient)	×	ESCC 4001	1708 1709 1718 1719 1721 1711 1717 1730 1728 1736 1743 1804 1804 1804 1812 1814 1802	5 2 x 5 10 10 5 5 5 5 5 5 10 10 10 10 5 5 5 5	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	



APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

Thin Film Technology for Chip, Wraparound, Single and Network Resistors, Fixed Component title:

Executive Member: CNES 14/02/2019 Date:

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

l NC	TIES 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.