APPLICATION FOR ESCC QUALIFICATION APPROVAL

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Component Title: CRYSTAL OSCILLATOR RK135, CLASS 2, 4MHz to 100MHz, AHCMOS compatible output, RAD-HARD

Appl. No. 371

Executive Member: CNES Date: 15/02/2021

1 Components (including series and families) submitted for Qualification Approval

ESCC COMPONENT. NO.	VARIANTS	RANGE OF COMPONENTS	BASED ON	TEST VEHICLE / S	COMPONENT SIMILAR
3503001	05 and 11	DIL package	RK135 type	RK115 DIL1 B2 EQM 13M50000 CONFIG1	
	01 to 04 and 06 to 10	FP1, FP2, FP3 and FP4 packages		RK 115 AC FP4 B2 EM 100M000000 CONFIG2	
				RK135 FP4 B1 EM 13.500000MHz Config 3-2	
				RK 115 FP4 C1 EQM 100M000000	
				RK 115 FP4 C1 100M00000	

2 Component Manufacturer

RAKON France

3 Location of Manufacturing Plant

2 Rue Robert Keller
10150 Pont-Sainte-Marie

4 ESCC Specification used for Qualification

Generic: ESCC 3503
Issue 03
Detail/s: 3503/001
Issue 03

5 Qualification Report Reference and date:

51001617.520.01-A0, 20/10/2016
51001617.520.02-A0, 20/10/2016
51001617.520.03-A0, 15/01/2019
51001232.570.00-A1, 18/01/2021
TRAD_TE_RK135FP4B1EM_1528_TEM_JPA_1510 Rev 0, 16/12/2015
TRAD_TN_RK135FP4B1EM_1528_TEM_JPA_1510 Rev 3, 04/01/2016
Date: (see above)

6 **PID** used for manufacturing Qualification Lot

Ref No: 51001742

Issue : B0

Date: 29/05/2015

7 **PID** changes since start of qualification

None ☐
Minor* ☒
Major* ☐

(* Details not published, provided in confidential annex 2.)

8 Current **PID** Verified by C. Doucet, CNES
Name of Executive Representative

Ref No: 51001742
Issue D0
Date 30/11/2019

9 Current Manufacturing facilities surveyed by:

C. Doucet, CNES and D. Lacombe, ESA — 20/11/2019
(Name of Executive Responsible) (Date)

Rakon-AUD-2019
Report Reference

Satisfactory: Yes ☒ No ☐ Explain Corrective actions implemented in PID issue D0

10 Quality and Reliability Data

Evaluation testing performed Yes ☒ No ☐

Report Ref. No.: 51001742.520 Issue A0 Date: 29/03/2016

Equivalent Data:

Certification:

Failure analysis, DPA, NCCS available Yes ☒ No ☐

(supply data)

DPA report : 20-4120-100_DPA RK115 FP4 100MHz DC 1949

Ref Nos. and purpose: NC2RAKC2002 – Constant acceleration test removal from Qualification tests (already performed during screening)

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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 13; that the reports and data are available at the ESCC Executive and therefore applies for ESCC qualification status to be given to the component(s) listed herein.

Date: 15/02/2021

JP. BUSSENOT

(Signature of the Executive Coordinator)

Continuation of Boxes above: (Only non-confidential comments)

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13

Non compliance to ESCC requirements:

No.:	Specification	Paragraph	Non compliance

14

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

15

Executive Manager Disposition

Application Approval: Yes ☒ No ☐

Action / Remarks:

Date:

Digitally signed by Britta Schade
Date: 2021.02.23 19:00:21 +01'00'

B. Schade: Head of the Product Assurance and Safety Department

ANNEX 1: LIST OF TESTS DONE TO SUPPORT QUALIFICATION

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Tests conducted in compliance with:

- ESCC 3503 generic specification; Chart F4 (for ESCC/QPL parts);
- Or PID-TFD [redacted] (for ESCC/QML parts)

Tests vehicle identification/description:

RK115 DIL1 B2 EQM 13M50000 CONFIG1 / DC 1524	RK115 AC FP4 B2 EM 100M000000 CONFIG2 / DC 1524	RK135 FP4 B1 EM 13M500000 CONFIG 3-2 / DC 1528
RK 115 FP4 C1 EQM 100M000000 / DC 1728	RK115 FP4 C1 100M000000 / DC 1949	

Detail Specification reference: 3503/001 Issue 03

Chart F4	Test	Tick when done	Conditions	Date Code	Tested Qty	No. of Rejects	Comments if not performed. Comments on Rejection
Environmental/Mechanical Subgroup (Mechanical)	Mechanical Shock	☒	MIL-STD-202, Test Method 213	1524 / 1728 / 1949	41	4	Delta qualification has been run and successfully passed after improvement of the test set-up
	Random Vibration	☒	MIL-STD-202, Test Method 214	1524 / 1728 / 1949	37	0	
	Constant Acceleration	☐	MIL-STD-883, Test Method 2001		NA		Constant acceleration was removed after issuing a DCR (NC2RAKC2002)
	Temperature Cycling	☒	MIL-STD-883, Test Method 1010	1524 / 1949	23	0	6 parts submitted only to 200 cycles 12 parts submitted to 500 cycles but not to previous mechanical tests
	Seal (Fine and Gross Leak)	☒	MIL-STD-883, Test Method 1014	1524 / 1949	11	0	
	Intermediate and End-Point Electrical Measurements	☒	Intermediate and End-Point Electrical Measurements in the Detail Specification	1524 / 1949	12	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	1524 / 1949	12	0	
	DPA	☒	MIL-STD-1580	1524 / 1728 / 1949	10	0	
Environmental/Mechanical Subgroup (Environmental)	Thermal Shock	☐	MIL-STD-883, Test Method 1011				
	Moisture Resistance	☐	MIL-STD-883, Test Method 1004				
	Seal (Fine and Gross Leak)	☐	MIL-STD-883, Test Method 1014				
	Intermediate and End-Point Electrical Measurements	☐	Intermediate and End-Point Electrical Measurements in the Detail Specification				
	External Visual Inspection	☐	ESCC Basic Specification No. 20500				
Endurance Subgroup	Operating Life	☒	MIL-STD-883, Test Method 1005	1524 / 1728	11	0	
	Intermediate and End-Point Electrical Measurements	☒	Intermediate and End-Point Electrical Measurements in the Detail Specification	1524 / 1728	11	0	
	Seal (Fine and Gross Leak)	☒	MIL-STD-883, Test Method 1014	1524	4	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	1524	11	0	

Chart F4	Test	Tick when done	Conditions	Date Code	Tested Qty	No. of Rejects	Comments if not performed. Comments on Rejection
Radiation Subgroup	Radiation	☒	ESCC Basic Specification No. 22900	1528	15	0	
Assembly Capability Subgroup	Lead Integrity	☐	MIL-STD-883, Test Method 2004		NA		Performed at package procurement level
	External Visual Inspection	☐	ESCC Basic Specification No. 20500		NA		Already performed during screening
	Permanence of Marking	☐	ESCC Basic Specification No. 24800		NA		Marking done by engraving
	Solderability	☒	MIL-STD-883 Test Method 2003 ESCC-Q-ST-70-08	1524	6	0	Solderability test is done at procurement level. A resistance to solder heat test is performed instead.
	Seal (Fine and Gross Leak)	☒	MIL-STD-883 Test Method 1014	1524	6	0	
	Internal Water Vapour	☒	MIL-STD-883 Test Method 1018	1524	2		
Additional Tests	Storage	☒	2000h @125°C (non-operating)	1524	18	0	3 parts submitted to only 1000h and then to an intermediate DPA
		☐					
		☐					

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

ENTRIES

Form Heading	shall indicate:— the title of the component as given in its detail specification or the name of the series or family; — the entering date; — the serial number and the suffix of the form.
Box 1	shall provide details given in table; in particular there shall be listed - the variants or range of variants; the range of components by using the ESCC code for values tolerances, etc.; the designation given in detail specification as 'based on'; ---under Test Vehicle enter either a cross or the specific characteristic capable to identify the component tested; — under component similar enter a cross.
Box 2 and 3	Manufacturer's name and location of plant where the components were manufactured and tested.
Box 4	Generic and detail specifications used during qualification program.
Box 5	Reference to test report(s) submitted in support of application.
Box 6	Enter details to identify the PID that was applicable at the time the qualification lot was manufactured.
Box 7	If the PID was evolved after qualification lot manufacture, adequate details of such evolution shall be provided together with reasons for changes. Major changes shall be clearly marked.
Box 8	The box serves to identify the current PID and the Executive Representative that has verified it together with the date of this occurrence.
Box 9	This box can be completed only after a physical visit to the plant to confirm that the practices, procedures, materials, 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 10	Details entered shall be sufficient to evidence that an evaluation program according to ESCC Basic Specification No. 22600 has been performed and that the results thereof are summarized in the survey and test reports. If the evaluation program has not been carried out according to established ESCC documents, the applicant Executive Representative shall provide alternative data and declare its assessed degree of satisfactory compliance with the ESCC basic requirements. Reference shall be made to the reports on Destructive Physical Analysis (DPA), Failure Analysis and Non conformance (NCCS) issued during the Evaluation and/or Qualification Phase.
Box 11	Enter the name of the Executive Coordinator and the signature.
Box 12	To be used when there is a need to expand any of the boxes from 1 through 10. Identify box affected and reference the Box 12 in the relevant Box. Box 12 can be broken into 12a, 12b, etc. if several Boxes have to be expanded.
Box 13	Fill table as requested.
Box 14	Fill in any additional tasks required to achieve full compliance.
Box 15	All Executive recommendations on the application itself, special conditions or restrictions, modifications of the QPL or ESCC QML entry, letters to the manufacturer, etc. shall be entered clearly in Box 15, signed by the ESA Representative.
Box 16	Fill in Table as requested.
Box 17	Confidential details of PID changes shall be provided.
Box 18	State noncompliance with reference to specification(s) and paragraph(s). To simplify reference in Box 18 each nonconformance shall be sequentially numbered. If relevant state 'None'
Box 19	Any additional action deemed necessary by the Executive Representative 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 nonconformance.
Box 20	Additional Comments