	APPLICATION FOR EXTENSION OF ESCC TECHNOLOGY FLOW APPROVAL	Page 1
ESCC	Component Title: **Integrated Circuits, Silicon, Monolithic, CMOS, Cell-Based Array,based on Type ATC18RHA**	Appl. No.
	Executive Member: **CNES** Date: **27/05/2021**	**357A**

1 Technology Flow submitted for Extension of Qualification Approval:

SUMMARY DESCRIPTION	TEST STRUCTURES	COMPONENTS PROPOSED FOR QUALIFICATION
ATC18RHA ASICs **see REP 006 (see box 14 and TF summary update in appendix)**	**V40 & V52** **See REP 006 (see TF summary update in appendix)**	**ATC18RHA ASICs** **AT697F** **AT7991 (See box 14 and TF summary update in appendix)**

2 Component Manufacturer	**3** Location of Manufacturing Plant(s)	**4** Date of original qualification approval:
MICROCHIP TECHNOLOGY NANTES (ex-ATMEL NANTES)	**MCHP Nantes (design & test)** **UMC Taïwan (wafer fab)** **MMT Thailand (assembly)** **HCM La Rochelle (column mounting)**	Date: **22/04/2019** Certificate Ref No. **357**

| **5** ESCC Specifications used for Maintenance testing:

 Generic: 9000   Issue: 10

 Detail(s): 9202/080 Issue: 5
 9512/005 Issue: 1 | **6** Deviations to LVT testing and Detail Specification used:

 No ☒ Yes ☐ (supply details in Box 15)

 Deviation from current Specifications:
 No ☒ Yes ☐ (Supply details) | **7** Qualification Extension Report reference and date:

 Qualification Extension report ATC18RHA 2021-04 rev1, 15/03/2021

 Qualification Package AT7991, February 2019

 AT7991 – AGGA4b Radiation Test Report – Rev 1.1 – Nov 2020 |

8 Summary of procurement or equivalent test results during current validity period in support of this application (those to ESCC listed first)

Customer	Component	LVT	Date code	Quantity Delivered
See Qualification Extension report				
		-		

9 PID changes since last maintenance of qualification	**10** Current PID Verified by: **F.Malou, CNES,**
None ☐ Minor* ☒ Major* ☐ *Provide details in box: **19**	Name of Excutive Representative Agency Ref No: **ATC18RHA PID 0032 – Rev E – 03/05/2021** Ref No: **MMT PID FOR MCHP NANTES – 1G-QM-0105 – 04/02/2019** Ref No: **HCM Colums manaufacturing & Assembly on CLGA PID 11 issue F – 12/09/2019**

11 Current Manufacturing facilities surveyed by: **F. Martinez, ESA and F. Malou, CNES** on **07/02/2019**

(Name of Executive Representative Agencies)   (Date)

Satisfactory: Yes ☒ No ☐ Explain

Report Reference: **MoM ESCC audit of MMT assembly for ATC18RHA and ATMX150RHA ASICs - CNES/ DSO/AQ/EC-2019.0013984**

12

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

Ref. No's and purposes:

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.

Date: **28/05/2021**   **JP. BUSSENOT**

(Signature of the Executive Coordinator)

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Continuation of Boxes above:

Box 1:

An End-Of-Life of the ATC18RHA ASIC offer for new design has been announced by Microchip ADG in January 2021, see CRS20-0158 notification
• ADG Microchip wants to stop wafer manufacturing launch by December 2021.
• ADG Microchip commits to maintain the wafer/die stock, based on customer needs, for an undetermined duration
• ADG Microchip will continue Flight Models manufacturing from this wafer/die stock for an undetermined duration and needs the ESCC QML to be maintained.

Introduction of AT7991 :
AT7991 is a radiation tolerant GNSS baseband SoC capable of processing the modernized GPS, Galileo and other signals such as Glonass. In addition to its GNSS core, the AT7991 embarks a LEON2FT processor, multiple interfaces like SPI, UART, Spacewire and 1553. The AT7991 has been designed by Airbus GmBH, using the ATC18RHA ASIC Design flow, it is packaged in a hermetic CQFP352, and tested in the extended temperature range -55°C/125°C.
- Microchip - QP-7991 Qualification Package AT7991
- Microchip - AT7991 – AGGA4b Radiation Test Report – Rev 2 – May 2021
- ESCC Detail Specification No. 9512/005

Non compliance to ESCC requirements:

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No.:	Specification	Paragraph	Non compliance
1	**9000**	**Chart F4**	**Chart F4 testing replaced with the implementation of periodic testing as described in PID**

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

16

None

Executive Manager Disposition

17

Application Approval: Yes ☒ No ☐

Action / Remarks:

Britta Schade

Digitally signed by Britta Schade
Date: 2021.08.31
11:29:45 +02'00'

Date:

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

ANNEX 1: LIST OF TESTS DONE TO SUPPORT EXTENSION OF QUALIFICATION | 18

Tests conducted in compliance with:
– ESCC 9000 generic specification; Chart F4 (for ESCC/QPL parts);
– or PID-TFD **ATC18RHA PID 0032 – Rev E** (for ESCC/QML parts)

Tests vehicle identification/description:

Multi-decks package

CQFP/CLGA family	**A8S52A22T9**	**DC1824**	**CQFP256 (Al Ø32µm)**
	Z5801A25SY	**DC1948**	**CQFP132 (Al Ø32µm)**
	A96X6A22S3	**DC2035**	**CQFP032 (Al Ø25µm)**
CCGA family	**C1S66A225P**	**DC1904**	**CCGA472 (Al Ø32µm)**

SEC

V52/02DB – PRR24A25SC – DC1933 **V52/02DB – PW007A2AC2 – DC2047**	**ATC18RHA standard evaluation circuit 6LM**

Detail Specification reference: **9202/080**

CLGA & CQFP multi-decks packages family

Chart F4		Test	Tick when done	Conditions	Date Code Diffusion Lot	Tested Qty	No. of Rejects	Comments if not performed. Comments on Rejection
Environmental/Mechanical Subgroup		Mechanical Shock	☒	MIL-STD-883, Test Method 2002		15	0	
		Vibration	☒	MIL-STD-883, Test Method 2007		15	0	
		Constant Acceleration	☒	MIL-STD-883, Test Method 2001		15	0	
		Seal (Fine and Gross Leak)	☒	MIL-STD-883, Test Method 1014	A8S52A22T9 DC1824	15	0	
		Intermediate and End-Point Electrical Measurements	☒	Intermediate and End-Point Electrical Measurements in the Detail Specification	Z5801A25SY	15	0	
		External Visual Inspection	☒	ESCC Basic Specification No. 20500	DC1948	15	0	
		Thermal Shock	☒	MIL-STD-883. Test Method 1011		15	0	
		Temperature Cycling	☒	MIL-STD-883. Test Method 1010	A96X6A22S3 DC2035	15	0	
		Moisture Resistance	☒	MIL-STD-883, Test Method 1004		15	0	
		Seal (Fine and Gross Leak)	☒	MIL-STD-883, Test Method 1014		15	0	
		Intermediate and End-Point Electrical Measurements	☒	Intermediate and End-Point Electrical Measurements in the Detail Specification		15	0	
		External Visual Inspection	☒	ESCC Basic Specification No. 20500		15	0	
Assembly Capability Subgroup		Internal Gas Analysis	☒	MIL-STD-883, Test Method 1018	A8S52A22T9 DC1824	3	0	
		Permanence of Marking	☒	ESCC Basic Specification No. 24800		3	0	
		Terminal Strength	☒	MIL-STD-883, Test Method 2004	Z5801A25SY	3	0	
		Internal Visual Inspection	☒	ESCC Basic Specification No. 20400	DC1948	2	0	
		Bond Strength	☒	MIL-STD-883 Test Method 2011		4	0	
		Die Shear or Substrate Attach Strength	☒	MIL-STD-883 Test Method 2027	A96X6A22S3 DC2035	4	0	
		Solderability	☒	MIL-STD-883 Test Method 2003		3	0	

CCGA multi-decks packages family

Chart F4	Test	Tick when done	Conditions	Date Code Diffusion Lot	Tested Qty	No. of Rejects	Comments if not performed. Comments on Rejection
Environmental/Mechanical Subgroup	Mechanical Shock	☒	MIL-STD-883, Test Method 2002	C1S66A225P DC1904	15	0	
	Vibration	☒	MIL-STD-883, Test Method 2007		15	0	
	Constant Acceleration	☒	MIL-STD-883, Test Method 2001		15	0	
	Seal (Fine and Gross Leak)	☒	MIL-STD-883, Test Method 1014		15	0	
	Intermediate and End-Point Electrical Measurements	☒	Intermediate and End-Point Electrical Measurements in the Detail Specification		15	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500		15	0	
	Thermal Shock	☒	MIL-STD-883. Test Method 1011		15	0	
	Temperature Cycling	☒	MIL-STD-883. Test Method 1010		15	0	
	Moisture Resistance	☒	MIL-STD-883, Test Method 1004		15	0	
	Seal (Fine and Gross Leak)	☒	MIL-STD-883, Test Method 1014		15	0	
	Intermediate and End-Point Electrical Measurements	☒	Intermediate and End-Point Electrical Measurements in the Detail Specification		15	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500		15	0	

Chart F4	Test	Tick when done	Conditions	Date Code Diffusion Lot	Tested Qty	No. of Rejects	Comments if not performed. Comments on Rejection
Assembly Capability Subgroup	Internal Gas Analysis	☒	MIL-STD-883, Test Method 1018	C1S66A225P DC1904	3	0	
	Permanence of Marking	☒	ESCC Basic Specification No. 24800		3	0	
	Column pull test	☒	MIL-STD-883, Test Method 2038		3	0	
	Internal Visual Inspection	☒	ESCC Basic Specification No. 20400		2	0	
	Bond Strength	☒	MIL-STD-883 Test Method 2011		4	0	
	Substrate Attach Strength	☒	MIL-STD-883 Test Method 2027		4	0	
	Solderability	☒	MIL-STD-883 Test Method 2003		3	0	

SEC

Chart F4	Test	Tick when done	Conditions	Date Code Diffusion Lot	Tested Qty	No. of Rejects	Comments if not performed. Comments on Rejection
Endurance Subgroup	Operating Life	☒	MIL-STD-883, Test Method 1005	V52/02DB – PRR24A25SC – DC1933 V52/02DB – PW007A2AC2 – DC2047	15	0	
	Intermediate and End-Point Electrical Measurements	☒	Intermediate and End-Point Electrical Measurements in the Detail Specification				
	Seal (Fine and Gross Leak)	☒	MIL-STD-883, Test Method 1014		15	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500		15	0	

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.