

		APPLICATION FOR ESCC QUALIFICATION APPROVAL				Page 1 Appl. No.	
		Component Title: ATC18RHA ASIC family		Executive Member: CNES		Date: 28/03/2019 357	
Components (including series and families) submitted for Qualification Approval							1
ESCC COMPONENT. NO.	VARIANTS	RANGE OF COMPONENTS	BASED ON	TEST VEHICLE / S	COMPONENT SIMILAR		
9202080	All	ASICs	ATC18RHA technology	V40 & V52	AT697F		
Component Manufacturer 2 MICROCHIP TECHNOLOGY NANTES (ex-ATMEL NANTES)		Location of Manufacturing Plant 3 MCHP Nantes (design & test) UMC Taiwan (wafer fab) MMT Thailand (assembly) HCM La Rochelle (column mounting)		ESCC Specification used for Qualification 4 Generic: ESCC 9000 Issue Detail/s: ESCC 9202/080 Issue			
Qualification Report Reference and date: 5 ATC18RHA Qualification Maintenance Request 2018-09-20 rev2 Date: 20/09/2018			PID used for manufacturing Qualification Lot 6 Ref No: ATC18RHA PID 0032 Issue: Rev D Date: 15/03/2018				
PID changes since start of qualification 7 None <input type="checkbox"/> Minor* <input checked="" type="checkbox"/> (* Details not published, provided in confidential annex 2.) Major* <input type="checkbox"/>			Current PID Verified by CNES (F. Malou) 8 Name of Executive Representative ATC18RHA PID 0032 – Rev D – 15/03/2019 MMT PID FOR MCHP NANTES – 1G-QM-0105 – 04/02/2019 HCM Columns manufacturing & Assembly on CLGA PID 11 issue E – 09/01/2019				
Current Manufacturing facilities surveyed by: CNES (F. Malou) & ESA (F. Martinez)							9
(Name of Executive Responsible) _____ (Date) 15/10/2018							
Report Reference - ESCC validation audit of MMT assembly for ATC18RHA and ATMX150RHA ASICs ESCC QML - DSO/AQ/EC-2018.19112, 29/10/2018							
Satisfactory: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Explain							
Quality and Reliability Data Evaluation testing performed Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Report Ref. No.: MMT assembly line - Qualification Tests Report 2017-EC-212 rev2 Date: 16/08/2018 Equivalent Data: Certification:				Failure analysis, DPA, NCCS available Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (supply data) Ref Nos. and purpose: Construction analysis report done by MCHP (see Appendix 1) Construction analysis reports done by CNES : DSO/AQ/LE-2018.0010689 on multi-decks & DSO/AQ/LE-2019.0003248 on flat-substrates			
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	<p align="center">APPLICATION FOR ESCC QUALIFICATION APPROVAL</p> <p>Component Title: ATC18RHA ASIC family</p> <p>Executive Member: CNES</p> <p align="right">Date: 28/03/2019</p>	<p align="center">Page 2</p> <p align="center">Appl. No.</p> <p align="center">357</p>
<p>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.</p> <p>Date: 28/03/2019</p> <p align="right">  <u>JP. BUSSENOT</u> (Signature of the Executive Coordinator) </p>		
<p>Continuation of Boxes above: (Only non-confidential comments)</p> <p>[1] ESCC Qualified device within the domain = AT697F, all variants listed in ESCC 9512/004</p> <p>[5] ESCC QML qualification of ATC18RHA technology with MMT assembly : ATC18RHA Qualification Maintenance Request 2018-09-20 rev2 and associated reports:</p> <ul style="list-style-type: none"> - MMT assembly line - Qualification Tests Report 2017-EC-212 rev2 - QTR_2018-IC-355_rev1 : MMT domain extension Wafer back-grinding – wafer sawing – Die inspection Qualification Test Report - QTR3240 Markem4489 2017-IC-294 rev1 : CRS 17-0771 MMT assembly line – extension of Assembly qualified domain with INK marking Markem4489 Qualification Test Report - QTR lid finish 2018-IC-366 rev1.0 : CRS 17-0824 Lid finish – process change Qualification Test Report <p>[7] PID changes:</p> <p>ATC18RHA PID 0032 rev D</p> <ul style="list-style-type: none"> - Move from ATMEL to Microchip - Remove San José design center - Switching to MMT for wafer grinding and sawing and assembly <p>[8] MMT PID exclusions :</p> <ul style="list-style-type: none"> - The use of 18µm wire is not authorized for ESCC product - Multi-dice devices in flat substrate packages are not authorized for ESCC product <p>[9] AUDITS AND JOURNALS</p> <p>LAST ESCC QML ANNUAL QUALITY MEETING HELD IN JUNE'18,</p> <p>REF. CNES/DSO/AD/EC-2018.0010779</p>		

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Non compliance to ESCC requirements:

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No.:	Specification	Paragraph	Non compliance

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

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Executive Manager Disposition

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Application Approval: Yes ☒ No ☐

Action / Remarks:

Date:

B. Schade, Head of ESA Product Assurance
and Safet Department



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ANNEX 1: LIST OF TESTS DONE TO SUPPORT QUALIFICATION

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Tests conducted in compliance with: **ESCC 9000**

- ESCC 9000 generic specification; Chart F4 (for ESCC/QPL parts);
- Or PID-TFD (for ESCC/QML parts)

Tests vehicle identification/description:

Multi-decks package Test vehicles description

CQFP/CLGA family	2R6674A (Lot 3 from QTR)	DC1642	CQFP352 AI Ø32µm
	Z5801A22BX	DC1711	CQFP132
	DAANTA23KU	DC1730	CQFP132
	PLL97.7B	DC1752	CQFP256
CCGA family	2R6674A225N (Lot 2 from QTR)	DC1641	CCGA472 AI Ø25µm
	DC6H8A22KK	DC1752	CCGA625 AI Ø32µm

Flat-substrate package Test vehicles description

CQFP/CLGA family	DAANTA22PC (Lot 6 from QTR)	DC1813	CQFP352 AI Ø25µm
CCGA family	3R8126 (Lot 5 from QTR)	DC1745	CCGA472 AI Ø25µm

Tests vehicle identification:

V40	ATC18RHA standard evaluation circuit (5 metal layers) DC1720
V52	ATC18RHA standard evaluation circuit (6 metal layers) DC1811

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	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2002	DC1642 2R6674A DC1711 Z5801A22BX DC1730 DAANTA23KU DC1752 PLL97.7B	15	0	
	Vibration	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2007		15	0	
	Constant Acceleration	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2001		15	0	
	Seal (Fine and Gross Leak)	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1014		15	0	
	Intermediate and End-Point Electrical Measurements	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements in the Detail Specification		15	0	
	External Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20500		15	0	
	Thermal Shock	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1011		15	0	
	Temperature Cycling	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1010		15	0	
	Moisture Resistance	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1004		15	0	
	Seal (Fine and Gross Leak)	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1014		15	0	
	Intermediate and End-Point Electrical Measurements	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements in the Detail Specification		15	0	
	External Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20500		15	0	
Assembly Capability Subgroup	Internal Gas Analysis	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1018	DC1642 2R6674A DC1711 Z5801A22BX DC1730 DAANTA23KU DC1752 PLL97.7B	3	0	
	Permanence of Marking	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 24800		3	0	
	Terminal Strength	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2004		3	0	
	Internal Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20400		2	0	
	Bond Strength	<input checked="" type="checkbox"/>	MIL-STD-883 Test Method 2011		4	0	
	Die Shear or Substrate Attach Strength	<input checked="" type="checkbox"/>	MIL-STD-883 Test Method 2027		4	0	
	Solderability	<input checked="" type="checkbox"/>	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	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2002	DC1641 2R6674A225N DC1752 DC6H8A22KK	15	0	
	Vibration	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2007		15	0	
	Constant Acceleration	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2001		15	0	
	Seal (Fine and Gross Leak)	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1014		15	0	
	Intermediate and End-Point Electrical Measurements	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements in the Detail Specification		15	0	
	External Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20500		15	0	
	Thermal Shock	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1011		15	0	
	Temperature Cycling	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1010		15	0	
	Moisture Resistance	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1004		15	0	
	Seal (Fine and Gross Leak)	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1014		15	0	
	Intermediate and End-Point Electrical Measurements	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements in the Detail Specification		15	0	
	External Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20500		15	0	

Assembly Capability Subgroup	Internal Gas Analysis	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1018	DC1641 2R6674A225N DC1752 DC6H8A22KK	3	0	
	Permanence of Marking	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 24800		3	0	
	Terminal Strength	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2004		3	0	
	Internal Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20400		2	0	
	Bond Strength	<input checked="" type="checkbox"/>	MIL-STD-883 Test Method 2011		4	0	
	Die Shear or Substrate Attach Strength	<input checked="" type="checkbox"/>	MIL-STD-883 Test Method 2027		4	0	
	Solderability	<input checked="" type="checkbox"/>	MIL-STD-883 Test Method 2003		3	0	

CLGA & CQFP flat-substrate 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	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2002	DC1813 DAANTA22PC	15	0	+ 45 shocks for evaluation
	Vibration	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2007		15	0	+108 sweeps for evaluation
	Constant Acceleration	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2001		15	0	
	Seal (Fine and Gross Leak)	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1014		15	0	
	Intermediate and End-Point Electrical Measurements	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements in the Detail Specification		15	0	
	External Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20500		15	0	
	Thermal Shock	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1011		15	0	+ 85 cycles for evaluation
	Temperature Cycling	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1011		15	0	
	Moisture Resistance	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1004		15	0	
	Seal (Fine and Gross Leak)	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1014		15	0	
	Intermediate and End-Point Electrical Measurements	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements in the Detail Specification		15	0	
	External Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20500		15	0	

Assembly Capability Subgroup	Internal Gas Analysis	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1018	DC1813 DAANTA22PC	3	0	
	Permanence of Marking	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 24800		3	0	
	Terminal Strength	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2004		3	0	
	Internal Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20400		2	0	
	Bond Strength	<input checked="" type="checkbox"/>	MIL-STD-883 Test Method 2011		4	0	
	Die Shear or Substrate Attach Strength	<input checked="" type="checkbox"/>	MIL-STD-883 Test Method 2027		4	0	
	Solderability	<input checked="" type="checkbox"/>	MIL-STD-883 Test Method 2003		3	0	

CCGA flat-substrate 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	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2002	DC1745 3R8126	15	0	+ 45 shocks for evaluation
	Vibration	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2007		15	0	+108 sweeps for evaluation
	Constant Acceleration	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2001		15	0	
	Seal (Fine and Gross Leak)	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1014		15	0	
	Intermediate and End-Point Electrical Measurements	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements in the Detail Specification		15	0	
	External Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20500		15	0	
	Thermal Shock	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1011		15	0	+ 85 cycles for evaluation
	Temperature cycling	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1011		15	0	
	Moisture Resistance	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1004		15	0	
	Seal (Fine and Gross Leak)	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1014		15	0	
	Intermediate and End-Point Electrical Measurements	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements in the Detail Specification		15	0	
	External Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20500		15	0	

Assembly Capability Subgroup	Internal Gas Analysis	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1018	DC1745 3R8126	3	0	
	Permanence of Marking	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 24800		3	0	
	Terminal Strength	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 2004		3	0	
	Internal Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20400		2	0	
	Bond Strength	<input checked="" type="checkbox"/>	MIL-STD-883 Test Method 2011		4	0	
	Die Shear or Substrate Attach Strength	<input checked="" type="checkbox"/>	MIL-STD-883 Test Method 2027		4	0	
	Solderability	<input checked="" type="checkbox"/>	MIL-STD-883 Test Method 2003		3	0	



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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	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1005	V40 PMF30.1A Diffusion 17Q1 DC1720 V52 PP4F0.1 Diffusion 17Q4 DC1811	15 45 (*)	0	(*) +150°C / 500H
	Intermediate and End-Point Electrical Measurements	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements in the Detail Specification				
	Seal (Fine and Gross Leak)	<input checked="" type="checkbox"/>	MIL-STD-883, Test Method 1014		15 45	0	
	External Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Specification No. 20500		15 45	0	
Additional Tests	Construction analysis	<input checked="" type="checkbox"/>		DC1642- CQFP352-AI Ø32µm- 2R6674A DC1641- 2R6674A225N- CCGA472-AI Ø25µm DC1813- DAANTA22PC- CQFP352-AI Ø25µm DC1745- 3R8126- CCGA472-AI Ø25µm	3 to 5	0	

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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