Product Change Notification / NTDO-17SDDT634

Date:

07-Dec-2021

Product Category:

32-bit Microcontrollers, Smart Energy Wireless Communications, Wireless Modules

PCN Type:

Manufacturing Change

Notification Subject:

CCB 4529 Final Notice: Qualification of MTAI as an additional assembly site for selected AT86RF215, ATmega644/1284/2564RFR2 and ATSAM4Lx8xx device families available in 48L VQFN (7x7x0.9mm) package.

Affected CPNs:

NTDO-17SDDT634_Affected_CPN_12072021.pdf
NTDO-17SDDT634_Affected_CPN_12072021.csv

Notification Text:

PCN Status: Final Notification

PCN Type: Manufacturing Change

Microchip Parts Affected: Please open one of the files found in the Affected CPNs section.
Note: For your convenience Microchip includes identical files in two formats (.pdf and .xls)

Description of Change: Qualification of MTAI as an additional assembly site for selected AT86RF215, ATmega644/1284/2564RFR2 and ATSAM4Lx8xx device families available in 48L VQFN (7x7x0.9mm) package.

Pre and Post Change Summary:

For AT86RF215 device family currently assembled in ASE:

	Pre Change	Post Change
Assembly Site	ASE Inc. (ASE)	Microchip Technology Thailand (HQ) (MTAI)
Wire material	PdCu	Au
Die attach material	EN-4900F	3280
Molding compound material	G631H	G700LTD
MSL information	MSL 3	MSL 1
Lead frame material	C194	C194
DAP Surface Prep	Ag Ring plating	Bare Cu
Lead frame plating finish	Matte tin	Matte tin
Lead frame lead-lock	No	Yes
	See Pre and Post Change attachment for lead frame comparison	

For AT86RF215, ATmega644/1284/2564RFR and ATSAM4Lx8xx device families currently assembled in ASE and MMT:

	Pre Change		Post Change		
Assembly Site	ASE Inc. (ASE)	Microchip Technology Thailand (Branch) (MMT)	ASE Inc. (ASE)	Microchip Technology Thailand (Branch) (MMT)	Microchip Technology Thailand (HQ) (MTAI)
Wire material	PdCu	Au	PdCu	Au	Au
Die attach material	EN-4900F	3280	EN-4900F	3280	3280
Molding compound material	G631H	G700LTD	G631H	G700LTD	G700LTD
MSL information	MSL 3	MSL 1	MSL 3	MSL 1	MSL 1

Lead frame material	C194	C194	C194	C194	C194
DAP Surface Prep	Ag Ring plating	Bare Cu	Ag Ring plating	Bare Cu	Bare Cu
Lead frame plating finish	Matte tin	Matte tin	Matte tin	Matte tin	Matte tin
Lead frame lead-lock	No	Yes	No	Yes	Yes
	See Pre and Post Change attachment for lead frame comparison				

For ATmega2564RFR device families currently assembled in ATP7 and MMT:

	Pre Change		**Post Change**		
Assembly Site	Amkor Technology Philippines (P3/P4), INC. (ATP7)	Microchip Technology Thailand (Branch) (MMT)	Amkor Technology Philippines (P3/P4), INC. (ATP7)	Microchip Technology Thailand (Branch) (MMT)	Microchip Technology Thailand (HQ) (MTAI)
Wire material	AuPd	Au	AuPd	Au	Au
Die attach material	AMK-06	3280	AMK-06	3280	3280
Molding compound material	G700Y	G700LTD	G700Y	G700LTD	G700LTD
MSL information	MSL 3	MSL 1	MSL 3	MSL 1	MSL 1
Lead frame material	C194	C194	C194	C194	C194
DAP Surface Prep	Bare Cu	Bare Cu	Bare Cu	Bare Cu	Bare Cu
Lead frame plating finish	Matte tin	Matte tin	Matte tin	Matte tin	Matte tin
Lead frame lead-lock	No	Yes	No	Yes	Yes

	See Pre and Post Change attachment for lead frame comparison

Impacts to Data Sheet: None

Change Impact None

Reason for Change: To improve on-time delivery performance by qualifying MTAI as an additional assembly site.

Change Implementation Status: In Progress

Estimated First Ship Date: December 29, 2021 (date code: 2153)

Note: Please be advised that after the estimated first ship date customers may receive pre and post change parts.

Time Table Summary:

	July 2021					**>**	**December 2021**				
Workweek	27	28	29	30	31		49	50	51	52	53
Initial PCN Issue Date				x							
Qual Report Availability								x			
Final PCN Issue Date								x			
Estimated Implementation Date											x

Method to Identify Change: Traceability code

Qualification Report: Please open the attachments included with this PCN labeled as PCN_#_Qual_Report.

Revision History: July 2, 2021: Issued initial notification.
December 7, 2021: Issued final notification. Attached the Qualification Report. Provided estimated first ship date to be on December 29, 2021.

The change described in this PCN does not alter Microchip's current regulatory compliance regarding the

material content of the applicable products.

Attachments:

PCN_NTDO-17SDDT634 Qual Report.pdf
PCN_NTDO-17SDDT634_Pre and Post Change Summary.pdf

Please contact your local Microchip sales office with questions or concerns regarding this notification.

Terms and Conditions:

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If you wish to change your PCN profile, including opt out, please go to the PCN home page select login and sign into your myMicrochip account. Select a profile option from the left navigation bar and make the applicable selections.

Affected Catalog Part Numbers (CPN)

AT86RF215-ZU
AT86RF215IQ-ZU
AT86RF215-ZU-004
AT86RF215M-ZU
AT86RF215-ZUR
AT86RF215-ZUR004
AT86RF215M-ZUR
ATMEGA2564RFR2-ZF
ATMEGA2564RFR2-ZFR
ATSAM4LS8AA-MU
ATSAM4LC8AA-MU
ATSAM4LS8AA-MUR
ATSAM4LC8AA-MUR
ATMEGA1284RFR2-ZF
ATMEGA644RFR2-ZF
ATMEGA2564RFR2-ZU
ATMEGA1284RFR2-ZU
ATMEGA644RFR2-ZU
ATMEGA644RFR2-ZUR
ATMEGA2564RFR2-ZUR
ATMEGA1284RFR2-ZUR
ATMEGA1284RFR2-ZFR
ATMEGA644RFR2-ZFR
ATMEGA2564RFR2-ZFRP01

QUALIFICATION REPORT SUMMARY
RELIABILITY LABORATORY

PCN #: NTDO-17SDDT634

Date:
October 28, 2021

Qualification of MTAI as an additional assembly site for selected AT86RF215, ATmega644/1284/2564RFR2 and ATSAM4Lx8xx device families available in 48L VQFN (7x7x0.9mm) package.

Purpose: Qualification of MTAI as an additional assembly site for selected AT86RF215, ATmega644/1284/2564RFR2 and ATSAM4Lx8xx device families available in 48L VQFN (7x7x0.9mm) package.

CCB: 4529

Misc.	Qual ID	QTP4498 Rev. A
	Assembly site	MTAI
	BD Number	BDM-002796 rev.A
	MP Code (MPC)	58Z547SMBC01
	Part Number (CPN)	ATSAM4LS8AA-MU
	MSL information	MSL1/260
	Assembly Shipping Media (T/R, Tube/Tray)	Tray
	Base Quantity Multiple (BQM)	416
	Reliability Site	MPHIL
Lead-Frame	Paddle size	228x228 mils
	Material	C194
	DAP Surface Prep	Bare Cu
	Treatment	Roughened Cu
	Process	Etched
	Lead-lock	Yes
	Part Number	10104801
	Lead Plating	Matte Tin
	Strip Size	70 x 250 mm
	Strip Density	240 units/strip
Bond Wire	Material	Au
Die Attach	Part Number	3280
	Conductive	Yes
MC	Part Number	G700LTD
PKG	PKG Type	VQFN
	Pin/Ball Count	48
	PKG width/size	7x7 mm

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Package Qualification Report

Assembly Yield

Wafer Lot ID	Assembly Lot ID
U08C921298707.500	MTAI220902075.000
U08C921298707.520	MTAI220902076.000
U08C921298707.510	MTAI220902074.000

Result ☑ Pass ☐ Fail ☐ _____

58Z54 in 48L VQFN 7x7 SMB package from MTAI assembly pass reliability test per QCI-39000 which was conducted at MPHL rel lab. This package is qualified Moisture/Reflow Sensitivity Classification Level 1 at 260°C reflow temperature per IPC/JEDEC J-STD-020E standard.

PACKAGE QUALIFICATION REPORT

Test Number (Reference)	Test Condition	Standard/ Method	Qty. (Acc.)	Def/SS	Result	Remarks
Precondition Prior Perform Reliability Tests (At MSL Level 1)	**Electrical Test :85°C** Magnum	JESD22-A113, JIP/ IPC/JEDEC J-STD-020E	231 per lot	Lot 1 0/231 Lot 2 0/231 Lot 3 0/231	Pass Pass Pass	Good Devices
	0hr C-SAM Inspection		45 per lot	Lot 1 0/45 Lot 2 0/45 Lot 3 0/45	Pass Pass Pass	
	Bake 150°C, 24 hrs System: HERAEUS		231 per lot			
	Moisture Soak 168h(85°C/85%RH) System: Climats Excal 5423-HE		231 per lot			
	Reflow 3x Convection-Reflow 265°C max System: Mancorp CR.5000F		231 per lot	Lot 1 0/231 Lot 2 0/231 Lot 3 0/231	Pass Pass Pass	
	Post C-SAM Inspection		45 per lot	Lot 1 0/45 Lot 2 0/45 Lot 3 0/45	Pass Pass Pass	
	Electrical Test :85°C Magnum SV 1024		231 per lot	Lot 1 0/231 Lot 2 0/231 Lot 3 0/231	Pass Pass Pass	

PACKAGE QUALIFICATION REPORT

Test Number (Reference)	Test Condition	Standard/ Method	Qty. (Acc.)	Def/SS.	Result	Remarks
UNBIASED HAST	**Stress Condition:** (Standard) + 130°C, 85%RH, 96 hrs. System: HIRAYAMA HASTEST PC-422R8 **Electrical Test:** 85°C System: Magnum	JESD22-A118	77 units per lot	Lot 1 0/77 Lot 2 0/77 Lot 3 0/77	Pass Pass Pass	Parts had been pre-conditioned at 260°C
	Internal Package Analysis		5 units per lot	Lot 1, 0/5 Lot 2, 0/5 Lot 3, 0/5	Pass Pass Pass	
HAST	**Stress Condition:** (Standard) 130°C, 85%RH, 96 hrs. VOLTS=5.5V System: HIRAYAMA HASTEST PC-422R8 **Electrical Test:** 85°C System: Magnum	JESD22-A110	77 units per lot	Lot 1 0/77 Lot 2 0/77 Lot 3 0/77	Pass Pass Pass	
	Internal Package Analysis		5 units per lot	Lot 1, 0/5 Lot 2, 0/5 Lot 3, 0/5	Pass Pass Pass	

PACKAGE QUALIFICATION REPORT

Test Number (Reference)	Test Condition	Standard/ Method	Qty. (Acc.)	Def/SS	Result	Remarks
Temp Cycle	**Stress Condition:** (Standard) -65°C to +150°C, 500 Cycles System : Votsch VTS^{2}7012 **Electrical Test:** 85°C System: Magnum	JESD22-A104	77 units per lot	Lot 1 0/77 Lot 2 0/77 Lot 3 0/77	Pass Pass Pass	Parts had been pre-conditioned at 260°C
	Internal Package Analysis		5 units per lot	Lot 1, 0/5 Lot 2, 0/5 Lot 3, 0/5	Pass Pass Pass	
	Bond Strength: Wire Pull (> 1.75 grams) Bond *Shear (>12.6 grams)* System: Dage		5 units, 30 bonds per lot	Lot 1 0/30 Lot 2 0/30 Lot 3 0/30	Pass Pass Pass	
High Temperature Storage Life	**Stress Condition:** Bake 175°C, 500 hrs System: HERAEUS **Electrical Test:** 85°C System: Magnum	JESD22-A103	45 units per lot	Lot 1 0/45	Pass	

PACKAGE QUALIFICATION REPORT

Test Number (Reference)	Test Condition	Standard/ Method	Qty. (Acc.)	Def/SS.	Result	Remarks
Bond Strength, 0 Hour	**System:** Dage Wire Pull (> 1.75 grams) Bond *Shear (>12.6 grams)*		5 units, 30 bonds per lot	Lot 1 0/30 Lot 2 0/30 Lot 3 0/30	Pass Pass Pass	

CCB 4529
Pre and Post Change Summary
PCN#: NTDO-17SDDT634

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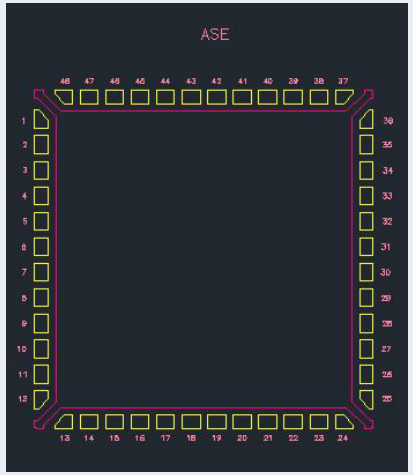
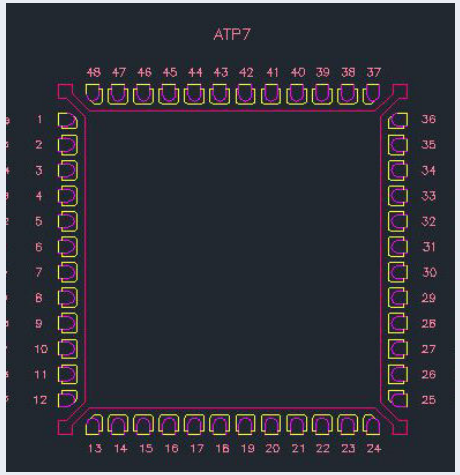
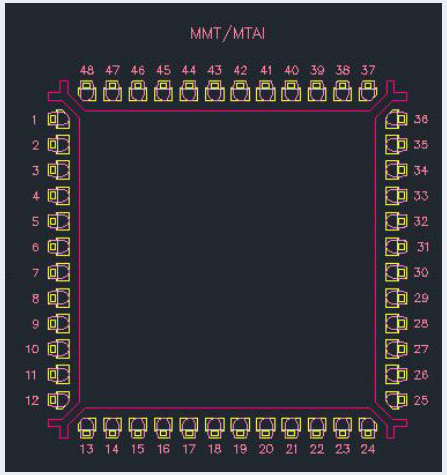
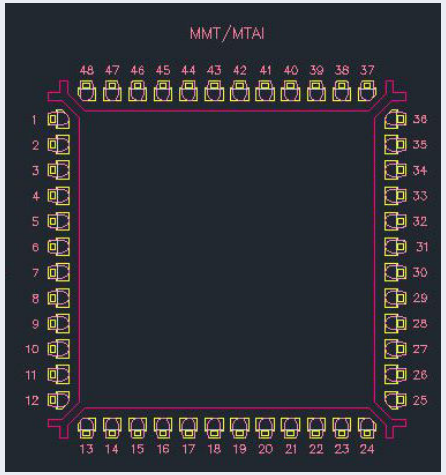
Lead frame Comparison

Pre Change			Post Change
ASE	**ATP7**	**MMT**	**MTAI**
			
Lead frame material C194 **Lead frame DAP surface prep** Ag Ring plating **Lead frame lead-lock** No	**Lead frame material** C194 **Lead frame DAP surface prep** Bare Cu **Lead frame lead-lock** No	**Lead frame material** C194 **Lead frame DAP surface prep** Bare Cu **Lead frame lead-lock** Yes	**Lead frame material** C194 **Lead frame DAP surface prep** Bare Cu **Lead frame lead-lock** Yes

Note: The lead lock hole fills with mold compound during the assembly process and provides improved protection against moisture penetration around the interface edges between pins and mold compound.