Product Change Notification / KSRA-20BGKY389

Date:

11-Apr-2023

Product Category:

8-bit Microcontrollers

PCN Type:

Manufacturing Change

Notification Subject:

CCB 4023.001 and 4023.002 Final Notice: Qualification of MTAI as a new assembly site for selected Atmel products available in 32L (7x7x1.0mm) and 48L TQFP (7x7x1.0mm) package using gold (Au) wire.

Affected CPNs:

KSRA-20BGKY389_Affected_CPN_04112023.pdf
KSRA-20BGKY389_Affected_CPN_04112023.csv

Notification Text:

PCN Status:
Final notification

PCN Type: Manufacturing Change

Microchip Parts Affected: Please open one of the icons found in the Affected CPNs section above.

NOTE: For your convenience Microchip includes identical files in two formats (.pdf and .xls).

Description of Change: Qualification of MTAI as a new assembly site for selected Atmel products available in 32L (7x7x1.0mm) and 48L TQFP (7x7x1.0mm) package using gold (Au) wire.

Pre Change:
Assembled at ASCL assembly site using palladium coated copper with gold flash (CuPdAu) bond wire, G700 and CEL-9240 molding compound, EN4900G die attach, and C194-ESH lead frame material with MSL Level 3 classification

Post Change:

Assembled at MTAI assembly site using gold (Au) bond wire, G700 molding compound, 3280 die attach, and C7025 lead frame material with MSL Level 1 classification

Pre and Post Change Summary:

	Pre Change		Post Change
Assembly Site	ASE Group Chung-Li / ASCL		Microchip Technology Thailand (HQ) / MTAI
Wire material	CuPdAu		Au
Die attach material	EN4900G		3280
Molding compound material	G700	CEL-9240	G700
Lead frame material	C194-ESH		C7025
MSL	MSL 3		MSL 1

Impacts to Data Sheet:

None

Change Impact: None

Reason for Change: To improve productivity by qualifying MTAI as a new assembly site

Change Implementation Status: In Progress

Estimated First Ship Date: March 14, 2020(date code: 2011)

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

Time Table Summary:

	December 2019				→	February 2020					March 2020				
Workweek	49	50	51	52		05	06	07	08	09	10	11	12	13	14
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:December 23, 2019: Issued initial notification.
February 14, 2020: Issued final notification. Attached the Qualification Report. Updated the pre and post change to add

CEL-9240 molding compound material. Provided estimated first ship date to be on March 14, 2020**April 11, 2023:** Re-issued final notification. Updated affected parts list to includeATMEGA328PB-ABTVAO catalog part number (CPN).

The change described in this PCN does not alter Microchip's current regulatory compliance regarding the material content of the applicable products.

Attachments:

PCN_KSRA-20BGKY389_Qual_Report.pdf

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

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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.

QUALIFICATION REPORT SUMMARY
RELIABILITY LABORATORY

PCN#: KSRA-20BGKY389

Date
January 14, 2020

Qualification of MTAI as a new assembly site for selected Atmel products available in 48L TQFP (7x7x1.0mm) package using gold (Au) wire. The selected products available in 32L (7x7x1.0mm) TQFP package will qualify by similarity (QBS). This is a Q100 Grade 1 & 3 qualification.

PACKAGE QUALIFICATION REPORT

Purpose: Qualification of MTAI as a new assembly site for selected Atmel products available in 48L TQFP (7x7x1.0mm) package using gold (Au) wire. The selected products available in 32L (7x7x1.0mm) TQFP package will qualify by similarity (QBS). This is a Q100 Grade 1 & 3 qualification.

Misc.	Assembly site	MTAI
	BD Number	BDE-005935-01
	MP Code (MPC)	59B20YY8XVA1
	Part Number (CPN)	ATMEGA4809-AFR-VAO
	MSL information	1
	Assembly Shipping Media (T/R, Tube/Tray)	T/R
	Base Quantity Multiple (BQM)	2500
	Qual ID	QTP3956 Rev. A
	CCB No.	4023, 4023.001, 4023.002
Lead-Frame	Paddle size	200 x 200
	Material	C7025
	DAP Surface Prep	Cu
	Treatment	BOT with Bare Cu on Paddle
	Process	Stamping
	Lead-lock	No
	Part Number	10104805
	Lead Plating	Matte Tin
	Strip Size	70x x250
	Strip Density	440
Bond Wire	Material	Au
	Wire Diameter	0.8
Die Attach	Part Number	3280
	Conductive	Yes
MC	Part Number	G700HA
PKG	PKG Type	TQFP
	Pin/Ball Count	48
	PKG width/size	7 x 7 mm
Die	Die Thickness	11 mils
	Die Size	2.614x2.794 mm
	Fab Process (site)	59.91K / UMC 8D

PACKAGE QUALIFICATION REPORT

Manufacturing Information

Assembly Lot No.	QTY In	QTY Out	Assembly Yield
MTAI203002582.000	979	979	100.00%
MTAI203002653.000	980	980	100.00%
MTAI203002654.000	976	975	99.89%
Average Yield			99.96%

Result ■ Pass ☐ Fail ☐ _____

59B20 ATMEGA4809 Family UMC using Au wire assembled in **MTAI** is qualified the Moisture/ Reflow Sensitivity Classification Level 1 at 260°C reflow temperature per IPC/JEDEC J-STD-020D standard. No delamination were observed on all the units.

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 :**+25°C System:	JESD22-A113 231 units of 3 Lots	693(0)	0/693	Pass	
	0hr CSAM	45 units of 3 Lots	135(0)	0/135	Pass	
	Bake 150°C, 24 hrs System:		693(0			
	85°C/85%RH Moisture Soak 168 hrs. System: Climats Excal 5423-HE	IPC/JEDEC J-STD-020E	693(0)			
	3x Convection-Reflow 265°C max System: Mancorp CR.5000F		693(0)	0/693	Pass	
	Post CSAM	45 units of 3 Lots	135(0)	0/135	Pass	
	Electrical Test :+25°C System: Magnum PV		693(0)	0/693	Pass	

High Temperature Storage Life	**Stress Condition: (Standard)** Bake 175°C, 500 hrs System : VOTSCH VT 7012 S2	JESD22-A104 45 units of 3 Lots	135(0)			
	Electrical Test : +25°C , +85°C, +125°C System: Magnum PV		135(0)	0/135	Pass	

PACKAGE QUALIFICATION REPORT

Test Number (Reference)	Test Condition	Standard / Method	Qty. (Acc.)	Def/SS	Result	Remarks
Temp Cycle Parts had been pre-conditioned at 260°C	Stress Condition: (Standard) -65°C to +150°C, 500 Cycles System : **Electrical Test :+85°C, +125°C** System: Magnum PV **Bond Strength:** Wire /Stitch Pull (Cpk ≥ 1.67) Bond Shear (Cpk≥1.67)	JESD22-A104 77 units of 3 Lots	231(0) 231(0) 15(0)	0/231 0/15	Pass Pass	Attachment 2
Biased HAST Parts had been pre-conditioned at 260°C	**Stress Condition: (Standard)** +130°C/85%RH, 96hrs. Bias Volt: 5.5 Volts System : **Electrical Test : +25°C , +85°C, +125°C** System: Magnum PV	JESD22-A104 77 units of 3 Lots	231(0) 231(0)	0/231	Pass	
UnBiased HAST Parts had been pre-conditioned at 260°C	**Stress Condition: (Standard)** +130°C/85%RH, 96hrs System : **Electrical Test :+25°C** System: Magnum PV	JESD22-A104 77 units of 3 Lots	231(0) 231(0)	0/213	Pass	
Bond Strength Data Assembly	Wire /Stitch Pull (Cpk ≥1.67) : Bond Shear (Cpk ≥1.67) :	M2011.8 MIL-STD-883 30 bonds from 5 units min	30(0) 30(0)	0/30 0/30	Pass Pass	Attachment 1 Attachment 1

Attachment 1: *Bond Strength WBP/WSP/WBS (Assembly Data)*

Lot No: MTAI203002582.000
Wire Size/Type: 0.8 mil/Au

Samples	Bond ability test			Ball size	BTK	BAR
	BST	WPT	SPT			
1	30.65	10.45	4.85	2.30	0.53	4.36
2	33.25	10.85	5.15	2.21	0.56	3.95
3	31.45	10.85	4.95	2.26	0.55	4.15
4	31.75	11.15	4.85	2.23	0.56	3.97
5	31.45	10.45	4.85	2.32	0.51	4.56
6	31.15	10.55	5.15	2.26	0.51	4.44
7	27.65	10.25	5.05	2.31	0.53	4.37
8	29.15	10.15	5.05	2.32	0.54	4.28
9	28.35	10.15	5.05	2.22	0.51	4.36
10	28.95	10.75	5.15	2.29	0.53	4.32
11	27.45	11.05	5.25	2.41	0.52	4.59
12	29.75	10.75	5.45	2.27	0.51	4.41
13	27.75	10.65	4.75	2.30	0.55	4.17
14	30.05	10.05	4.55	2.40	0.56	4.30
15	26.55	10.55	4.55	2.35	0.53	4.43
16	29.35	10.35	4.65	2.21	0.53	4.15
17	28.95	10.55	5.35	2.26	0.55	4.10
18	27.95	10.85	4.35	2.23	0.53	4.24
19	27.05	10.35	4.55	2.32	0.52	4.44
20	28.05	10.45	4.75	2.26	0.55	4.10
21	28.85	11.15	4.75	2.31	0.55	4.21
22	28.85	11.15	4.75	2.32	0.53	4.40
23	27.45	11.15	5.15	2.22	0.52	4.29
24	28.75	10.85	4.65	2.29	0.51	4.47
25	27.65	9.95	5.15	2.41	0.53	4.55
26	30.05	10.75	5.35	2.23	0.52	4.28
27	32.15	10.65	5.35	2.34	0.56	4.19
28	28.85	10.75	4.75	2.41	0.52	4.59
29	30.85	10.75	4.35	2.27	0.51	4.42
30	31.35	10.55	5.15	2.29	0.51	4.50
min	**26.55**	**9.95**	**4.35**	**2.21**	**0.51**	**3.95**
max	**33.25**	**11.15**	**5.45**	**2.41**	**0.56**	**4.59**
stdev	**1.71**	**0.33**	**0.30**	**0.06**	**0.02**	**0.17**
ave	**29.38**	**10.63**	**4.92**	**2.29**	**0.53**	**4.32**
Ppk	**2.22**	**5.14**	**2.66**	**-**	**-**	**-**

Lot No: MTAI203002653.000
Wire Size/Type: 0.8 mil/Au

Samples	Bond ability test			Ball size	BTK	BAR
	BST	WPT	SPT			
1	28.85	13.05	4.95	2.13	0.54	3.95
2	28.85	11.45	4.95	2.04	0.54	3.74
3	27.35	12.25	4.95	2.07	0.55	3.78
4	31.35	11.65	4.15	2.10	0.54	3.86
5	28.65	11.35	4.65	2.13	0.55	3.87
6	25.15	11.25	4.35	2.13	0.52	4.08
7	25.75	10.85	4.35	2.16	0.53	4.10
8	29.15	11.65	4.65	2.06	0.55	3.78
9	30.95	11.75	4.65	2.08	0.52	4.00
10	27.35	10.45	4.85	2.10	0.52	4.06
11	27.35	11.05	4.75	2.07	0.54	3.80
12	29.85	11.25	4.75	2.14	0.54	3.96
13	27.35	11.25	4.85	2.21	0.52	4.24
14	28.85	10.95	5.15	2.05	0.51	4.01
15	31.25	11.45	4.95	2.13	0.54	3.97
16	29.75	10.65	5.05	2.04	0.53	3.85
17	29.75	11.95	4.75	2.07	0.54	3.83
18	28.55	11.45	4.75	2.10	0.55	3.85
19	30.25	11.45	4.95	2.13	0.53	4.05
20	30.55	10.75	4.35	2.13	0.56	3.82
21	29.45	10.85	4.25	2.16	0.55	3.94
22	29.25	12.45	4.25	2.06	0.53	3.91
23	29.05	11.55	4.95	2.08	0.52	4.01
24	28.75	9.85	4.55	2.10	0.54	3.86
25	28.05	11.55	4.65	2.07	0.52	3.96
26	27.35	9.55	4.95	2.18	0.52	4.23
27	28.75	10.95	4.15	2.14	0.53	4.04
28	30.95	10.95	4.75	2.24	0.54	4.15
29	29.05	11.45	5.05	2.04	0.51	4.00
30	27.35	11.35	4.95	2.14	0.55	3.89
min	**25.15**	**9.55**	**4.15**	**2.04**	**0.51**	**3.74**
max	**31.35**	**13.05**	**5.15**	**2.24**	**0.56**	**4.24**
stdev	**1.52**	**0.69**	**0.29**	**0.05**	**0.01**	**0.13**
ave	**28.83**	**11.28**	**4.71**	**2.11**	**0.53**	**3.95**
Ppk	**2.38**	**2.79**	**2.55**	**-**	**-**	**-**

Lot No: MTAI203002654.000
Wire Size/Type: 0.8 mil/Au

Samples	Bond ability test			Ball size	BTK	BAR
	BST	WPT	SPT			
1	27.75	10.35	5.80	2.39	0.62	3.84
2	33.75	10.15	5.45	2.48	0.64	3.88
3	26.95	10.55	5.25	2.55	0.63	4.08
4	29.35	9.95	4.75	2.49	0.60	4.16
5	29.35	10.25	5.25	2.51	0.64	3.94
6	29.15	9.25	5.30	2.56	0.64	4.01
7	29.75	9.55	5.70	2.37	0.64	3.68
8	31.75	10.15	5.05	2.48	0.64	3.88
9	33.75	9.45	5.15	2.55	0.65	3.95
10	30.55	9.95	5.30	2.39	0.61	3.90
11	28.95	10.65	5.80	2.48	0.62	4.01
12	28.55	10.65	5.35	2.55	0.64	3.99
13	28.35	10.35	4.35	2.37	0.64	3.71
14	26.95	10.25	4.65	2.47	0.63	3.94
15	29.15	9.45	4.70	2.36	0.60	3.93
16	30.95	10.05	5.65	2.40	0.64	3.76
17	30.35	9.75	5.45	2.43	0.64	3.81
18	29.35	10.25	5.50	2.46	0.64	3.83
19	29.75	10.95	5.00	2.46	0.64	3.85
20	28.15	9.85	5.50	2.49	0.65	3.86
21	28.15	10.55	5.40	2.49	0.61	4.07
22	29.55	10.35	5.60	2.51	0.62	4.07
23	30.15	10.55	5.95	2.56	0.64	4.00
24	32.55	10.35	5.85	2.37	0.61	3.88
25	31.95	9.75	5.00	2.48	0.61	4.09
26	29.95	9.45	4.95	2.55	0.64	3.99
27	28.95	9.85	5.00	2.54	0.63	4.00
28	28.75	10.45	5.40	2.45	0.63	3.86
29	29.25	10.25	5.35	2.37	0.60	3.95
30	29.95	10.35	5.75	2.49	0.65	3.86
min	**26.95**	**9.25**	**4.35**	**2.36**	**0.60**	**3.68**
max	**33.75**	**10.95**	**5.95**	**2.56**	**0.65**	**4.16**
stdev	**1.69**	**0.42**	**0.39**	**0.07**	**0.02**	**0.11**
ave	**29.73**	**10.12**	**5.31**	**2.47**	**0.63**	**3.93**
Ppk	**2.31**	**3.65**	**2.40**	**-**	**-**	**-**

Attachment 2: *Post TC 500cycles WBS and WBP*

MTAI203002582.000

Reading Comment:		WBP Wire Bond Pull break force post TC_-65C-150C_500x			
Min	4.70	Break Code Summary			
Max	7.00	# of Break Code 1	29	# of Break Code 4	0
Average	5.60	# of Break Code 2	1	# of Break Code 5	0
Stdev	0.580	# of Break Code 3	0	# of Break Code 6	0
cpk_{L_Side}	2.21	Min > μ-3σ	YES	# outliers	0

Reading Comment:		WBS Wire Ball Shear break force post TC_-65C-150C_500x			
Min	28.1	Break Code Summary			
Max	38.0	# of Break Code 1	0	# of Break Code 4	0
Average	34.1	# of Break Code 2	30	# of Break Code 5	0
Stdev	2.180	# of Break Code 3	0	# of Break Code 6	0
cpk_{L_Side}	3.29	Min > μ-3σ	YES	# outliers	0

MTAI203002654.000

Reading Comment:		WBP Wire Bond Pull break force post TC_-65C-150C_500x			
Min	4.30	Break Code Summary			
Max	7.50	# of Break Code 1	28	# of Break Code 4	0
Average	5.50	# of Break Code 2	2	# of Break Code 5	0
Stdev	0.680	# of Break Code 3	0	# of Break Code 6	0
cpk_{L_Side}	1.84	Min > μ-3σ	YES	# outliers	0

Reading Comment:		WBS Wire Ball Shear break force post TC_-65C-150C_500x			
Min	30.9	Break Code Summary			
Max	41.0	# of Break Code 1	0	# of Break Code 4	0
Average	35.2	# of Break Code 2	30	# of Break Code 5	0
Stdev	2.180	# of Break Code 3	0	# of Break Code 6	0
cpk_{L_Side}	3.45	Min > μ-3σ	YES	# outliers	0

MTAI203002653.000

Reading Comment:		WBP Wire Bond Pull break force post TC_-65C-150C_500x			
Min	4.10	Break Code Summary			
Max	6.50	# of Break Code 1	29	# of Break Code 4	0
Average	5.50	# of Break Code 2	1	# of Break Code 5	0
Stdev	0.540	# of Break Code 3	0	# of Break Code 6	0
cpk_{L_Side}	2.31	Min > μ-3σ	YES	# outliers	0

Reading Comment:		WBS Wire Ball Shear break force post TC_-65C-150C_500x			
Min	26.1	Break Code Summary			
Max	36.3	# of Break Code 1	0	# of Break Code 4	0
Average	32.5	# of Break Code 2	30	# of Break Code 5	0
Stdev	2.170	# of Break Code 3	0	# of Break Code 6	0
cpk_{L_Side}	3.05	Min > μ-3σ	YES	# outliers	0

KSRA-20BGKY389 - CCB 4023.001 and 4023.002 Final Notice: Qualification of MTAI as a new assembly

Affected Catalog Part Numbers(CPN)

ATMEGA168PB-AU
ATMEGA168PB-AN
ATMEGA168PB-ANR
ATMEGA168PB-AUR
ATMEGA88PB-AU
ATMEGA48PB-AU
ATMEGA88PB-AN
ATMEGA48PB-AN
ATMEGA88PB-ANR
ATMEGA48PB-ANR
ATMEGA88PB-AUR
ATMEGA48PB-AUR
ATMEGA808-AF
ATMEGA1608-AF
ATMEGA1608-AU
ATMEGA808-AU
ATMEGA1608-AUR
ATMEGA808-AUR
ATMEGA1608-AFR
ATMEGA808-AFR
ATMEGA328PB-AU
ATMEGA328PB-AN
ATMEGA328PB-ANR
ATMEGA328PB-AUR
ATMEGA4808-AF
ATMEGA3208-AF
ATMEGA4808-AU
ATMEGA3208-AU
ATMEGA4808-AUR
ATMEGA3208-AUR
ATMEGA4808-AFR
ATMEGA3208-AFR
ATMEGA809-AF
ATMEGA1609-AF
ATMEGA1609-AU
ATMEGA809-AU
ATMEGA1609-AUR
ATMEGA809-AUR
ATMEGA1609-AFR
ATMEGA809-AFR
ATMEGA4809-AF
ATMEGA3209-AF

ATMEGA4809-AU
ATMEGA3209-AU
ATMEGA4809-AUR
ATMEGA3209-AUR
ATMEGA4809-AFR
ATMEGA3209-AFR
ATMEGA328PB-ABTVAO