



Product Change Notification / LIAL-23CCBP390

Date:

10-Feb-2022

Product Category:

AntiFuse FPGAs, General Purpose FPGAs, System On Chip FPGAs

PCN Type:

Manufacturing Change

Notification Subject:

eSign # E000089324 Final Notice: Qualification of ASEM as a new assembly site for selected Microsemi products available in 144L, 256L, and 324L LFBGA, 281L and 288L TFBGA packages.

Affected CPNs:

[LIAL-23CCBP390_Affected_CPN_02102022.pdf](#)
[LIAL-23CCBP390_Affected_CPN_02102022.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 ASEM as a new assembly site for selected Microsemi products available in 144L, 256L, and 324L LFBGA, 281L and 288L TFBGA packages.

Pre and Post Change Summary:

	Pre-Change	Post Change
Assembly Site	UTAC Dongguan Limited	ASE Group -Malaysia

	(UDG)		(ASEM)	
	Au	CuPd	Au	CuPdAu
Wire material	Refer to attached excel file for details of material change by device.			
Die attach material	CRM-1076WB	CRM1525D	2100A	
	Refer to attached excel file for details of material change by device.			
Molding compound material	KE-G1250LKDS-30		G750E	
	Refer to attached excel file for details of material change by device.			
Solder Ball	SAC305	SnPb	SAC305	SnPb
	Refer to attached excel file for details of material change by device.			

Impacts to Data Sheet:None

Change Impact:None

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

Note: Because of capacity constraints that have been observed throughout the industry there may be limited or no inventory available as identified in the pre-change.

Change Implementation Status:In Progress

Estimated First Ship Date:February 28, 2022 (date code: 2210)

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

Time Table Summary:

	June 2021					>	February 2022				
Workweek	2	2	2	2	2		0	0	0	0	1
	3	4	5	6	7		6	7	8	9	0
Initial PCN Issue Date				X							

Qual Report Availability									X			
Final PCN Issue Date									X			
Estimated Implementation Date												X

Method to Identify Change:1. Traceability code
2. Parts can be identified by Country of Origin marked on the unit. CHN (China) for devices built at UDG. MYS (Malaysia) for devices built at ASEM.

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

Revision History:

June 25, 2021: Issued initial notification.

February 10, 2022: Issued final Notification under eSign# E000089324. Initial PCN was issued with reference Memo # ML062021004D & TRB# WW22. Attached the qualification report. Provided estimated first ship date to be on February 28, 2022.

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

Attachments:

- [PCN_LIAL-23CCBP390_Qual Report_PA-237_Au wire.pdf](#)
- [PCN_LIAL-23CCBP390_Qual Report_PA-233_CuPdAu wire.pdf](#)
- [PCN_LIAL-23CCBP390_Affected CPN_Cisco_with materials.pdf](#)
- [PCN_LIAL-23CCBP390_Affected CPN_Cisco_with materials.xlsx](#)

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.

Affected Catalog Part Numbers (CPN)

A3P1000-1FGG256
A3P1000-1FGG256I
A3P1000-1FGG256M
A3P1000-1FGG256T
A3P1000-2FG256
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A3PE3000L-FGG324I
A3PE3000L-FGG324IX6
M1A3PE3000-1FG324
M1A3PE3000-1FG324I
M1A3PE3000-1FGG324
M1A3PE3000-1FGG324I
M1A3PE3000-2FG324
M1A3PE3000-2FG324I
M1A3PE3000-2FGG324
M1A3PE3000-2FGG324I
M1A3PE3000-FG324
M1A3PE3000-FG324I
M1A3PE3000-FGG324
M1A3PE3000-FGG324I
A3PE600-1FG256
A3PE600-1FG256I
A3PE600-1FGG256
A3PE600-1FGG256I
A3PE600-2FG256
A3PE600-2FG256I
A3PE600-2FG256IX7
A3PE600-2FGG256
A3PE600-2FGG256I
A3PE600-FG256
A3PE600-FG256I
A3PE600-FG256IX6

A3PE600-FGG256
A3PE600-FGG256I
AFS1500-1FG256
AFS1500-1FG256I
AFS1500-1FG256K
AFS1500-1FGG256
AFS1500-1FGG256I
AFS1500-1FGG256K
AFS1500-2FG256
AFS1500-2FG256I
AFS1500-2FG256IX94
AFS1500-2FGG256
AFS1500-2FGG256I
AFS1500-FG256
AFS1500-FG256I
AFS1500-FG256K
AFS1500-FGG256
AFS1500-FGG256I
AFS1500-FGG256IW
AFS1500-FGG256K
M1AFS1500-1FG256
M1AFS1500-1FG256I
M1AFS1500-1FG256K
M1AFS1500-1FGG256
M1AFS1500-1FGG256I
M1AFS1500-1FGG256K
M1AFS1500-2FG256
M1AFS1500-2FG256I
M1AFS1500-2FGG256
M1AFS1500-2FGG256I
M1AFS1500-FG256
M1AFS1500-FG256I
M1AFS1500-FG256K
M1AFS1500-FGG256
M1AFS1500-FGG256I
M1AFS1500-FGG256K
P1AFS1500-2FG256
P1AFS1500-2FG256I
P1AFS1500-2FGG256
P1AFS1500-2FGG256I
U1AFS1500-FG256
U1AFS1500-FG256I
U1AFS1500-FGG256
U1AFS1500-FGG256I
AFS600-1FG256
AFS600-1FG256I
AFS600-1FG256K
AFS600-1FGG256
AFS600-1FGG256I

AFS600-1FGG256K
AFS600-2FG256
AFS600-2FG256I
AFS600-2FGG256
AFS600-2FGG256I
AFS600-FG256
AFS600-FG256I
AFS600-FG256IX3
AFS600-FG256IX94
AFS600-FG256K
AFS600-FGG256
AFS600-FGG256I
AFS600-FGG256IX94
AFS600-FGG256K
AFS600-FGG256X297
M1AFS600-1FG256
M1AFS600-1FG256I
M1AFS600-1FG256K
M1AFS600-1FGG256
M1AFS600-1FGG256I
M1AFS600-1FGG256K
M1AFS600-2FG256
M1AFS600-2FG256I
M1AFS600-2FGG256
M1AFS600-2FGG256I
M1AFS600-FG256
M1AFS600-FG256I
M1AFS600-FG256K
M1AFS600-FGG256
M1AFS600-FGG256I
M1AFS600-FGG256K
M7AFS600-1FG256
M7AFS600-1FG256I
M7AFS600-1FGG256
M7AFS600-1FGG256I
M7AFS600-2FG256
M7AFS600-2FG256I
M7AFS600-2FGG256
M7AFS600-2FGG256I
M7AFS600-FG256
M7AFS600-FG256I
M7AFS600-FGG256
M7AFS600-FGG256I
P1AFS600-2FG256
P1AFS600-2FG256I
P1AFS600-2FG256IX297
P1AFS600-2FGG256
P1AFS600-2FGG256I
P1AFS600-FG256I

P1AFS600-FGG256
U1AFS600-FG256
U1AFS600-FG256I
U1AFS600-FGG256
U1AFS600-FGG256I
AGL1000V2-CS281
AGL1000V2-CS281I
AGL1000V2-CSG281
AGL1000V2-CSG281I
AGL1000V5-CS281
AGL1000V5-CS281I
AGL1000V5-CSG281
AGL1000V5-CSG281I
AGL1000V5-CSG281ID
M1AGL1000V2-CS281
M1AGL1000V2-CS281I
M1AGL1000V2-CSG281
M1AGL1000V2-CSG281I
M1AGL1000V5-CS281
M1AGL1000V5-CS281I
M1AGL1000V5-CSG281
M1AGL1000V5-CSG281I
AGL1000V2-FG144
AGL1000V2-FG144I
AGL1000V2-FGG144
AGL1000V2-FGG144I
AGL1000V5-FG144
AGL1000V5-FG144I
AGL1000V5-FGG144
AGL1000V5-FGG144I
M1AGL1000V2-FG144
M1AGL1000V2-FG144I
M1AGL1000V2-FGG144
M1AGL1000V2-FGG144I
M1AGL1000V5-FG144
M1AGL1000V5-FG144I
M1AGL1000V5-FGG144
M1AGL1000V5-FGG144I
AGL1000V2-FG256
AGL1000V2-FG256I
AGL1000V2-FGG256
AGL1000V2-FGG256I
AGL1000V5-FG256
AGL1000V5-FG256I
AGL1000V5-FGG256
AGL1000V5-FGG256I
M1AGL1000V2-FG256
M1AGL1000V2-FG256I
M1AGL1000V2-FGG256

M1AGL1000V2-FGG256I
M1AGL1000V5-FG256
M1AGL1000V5-FG256I
M1AGL1000V5-FGG256
M1AGL1000V5-FGG256I
AGL125V2-FG144
AGL125V2-FG144I
AGL125V2-FGG144
AGL125V2-FGG144I
AGL125V5-FG144
AGL125V5-FG144I
AGL125V5-FGG144
AGL125V5-FGG144I
AGL250V2-FG144
AGL250V2-FG144I
AGL250V2-FGG144
AGL250V2-FGG144I
AGL250V5-FG144
AGL250V5-FG144I
AGL250V5-FGG144
AGL250V5-FGG144I
AGL250V5-FGG144IX130
AGL250V5-FGG144IX94
M1AGL250V2-FG144
M1AGL250V2-FG144I
M1AGL250V2-FGG144
M1AGL250V2-FGG144I
M1AGL250V5-FG144

Affected Part Numbers - (Cisco)	Wire type		Epoxy		Mold Compound		Solder Ball	
	<u>Pre change</u>	<u>Post Change</u>	<u>Pre change</u>	<u>Post Change</u>	<u>Pre change</u>	<u>Post Change</u>	<u>Pre change</u>	<u>Post Change</u>
A2F200M3F-FGG256IQ116	Au	CuPdAu	CRM-1076WB	2100A	KE-G1250LKDS-30	G750E	SAC305	SAC305
A2F200M3F-FGG256IQ123	Au	CuPdAu	CRM-1076WB	2100A	KE-G1250LKDS-30	G750E	SAC305	SAC305
A2F200M3F-FGG256IQ124	Au	CuPdAu	CRM-1076WB	2100A	KE-G1250LKDS-30	G750E	SAC305	SAC305
A2F200M3F-FGG256IQ139	Au	CuPdAu	CRM-1076WB	2100A	KE-G1250LKDS-30	G750E	SAC305	SAC305
A2F200M3F-FGG256IQ141	Au	CuPdAu	CRM-1076WB	2100A	KE-G1250LKDS-30	G750E	SAC305	SAC305
A2F200M3F-FGG256IQ147	Au	CuPdAu	CRM-1076WB	2100A	KE-G1250LKDS-30	G750E	SAC305	SAC305
A2F200M3F-FGG256IQ150	Au	CuPdAu	CRM-1076WB	2100A	KE-G1250LKDS-30	G750E	SAC305	SAC305
A2F200M3F-FGG256IQ169	Au	CuPdAu	CRM-1076WB	2100A	KE-G1250LKDS-30	G750E	SAC305	SAC305



MICROCHIP

QUALIFICATION REPORT SUMMARY

PCN #: LIAL-23CCBP390

**Date:
January 5, 2022**

**Qualification of ASEM as a new assembly site for selected
Microsemi products available in 144L, 256L, and 324L
LFBGA, 281L and 288L TFBGA packages using CuPdAu wire.**

Purpose: Qualification of ASEM as a new assembly site for selected Microsemi products available in 144L, 256L, and 324L LFBGA, 281L and 288L TFBGA packages using CuPdAu wire.

Qualification No: PA-233

Criteria used for qualification: JESD47K.

SN	Qualification Vehicle
1	A3PE3000-FG324
2	APA600-FGG256
3	AFS1500-FGG256
4	A2F500M3G-CSG288
5	AGL1000V5-CSG281

Additional products qualified: Refer to table A for list of devices that will be qualified by extension/similarity

Qualification vehicles:

1) A3PE3000-FG324

Lot Info	Wafer Lot #	Mesa Lot #	Date Code
Lot 1	QRTWG	111125008	2125
Lot 2	QRTWG	111125010	2125
Lot 3	QRTWG	111125009	2126

Note: Non-consecutive lots at assembly processing.

2) APA600-FGG256

Lot Info	Wafer Lot #	Mesa Lot #	Date Code
Lot 1	RKQT9	109692001	2131

3) AFS1500-FGG256

Lot Info	Wafer Lot #	Mesa Lot #	Date Code
Lot 1	ZA045099	109789005	2136

4) A2F500M3G-CSG288

Lot Info	Wafer Lot #	Mesa Lot #	Date code
Lot 1	ZA110420	111586008	2141

5) AGL1000V5-CSG281

Lot Info	Wafer Lot #	Mesa Lot #	Date code
Lot 1	QRMLQ	109815009	2142

		Package Information			Package Test Information
SN	Product	Name & location	Package name	Bonding diagram and Rev.	Name & Location
1	A3PE3000-FG324	ASE Malaysia	FG324	1-8A-111027 Rev. 1	San JoseCA
2.	APA600-FGG256	ASE Malaysia	FGG256	1-8A-11914u Rev. 1	San JoseCA
3.	AFS1500-FGG256	ASE Malaysia	FGG256	1-8A-11985n Rev. 0	San JoseCA
4.	A2F500M3G-CSG288	ASE Malaysia	CSG288	1-8A-11971n Rev. 1	San JoseCA
5.	AGL1000V5-CSG281	ASE Malaysia	CSG281	1-8A-11983u Rev. 0	San JoseCA

Additional Information:

- **Bill of Materials**

- Die Attach: Ablebond 2100A
- Bond wire : AuPdCu: 0.8 mil
- Mold compound: Sumitomo G750E
- Substrates
 - Core material: GHPL-830NXA, CCL-HL832NXA
 - Solder mask: AUS308
- Solder ball materials for each device qualification vehicle
 - A3PE3000-FG324: Sn63/Pb37, 0.5mm diameter
 - APA600-FGG256: SAC305, 0.5mm diameter
 - AFS1500-FGG256: SAC305, 0.5mm diameter
 - A2F500M3G-CSG288: SAC305, 0.3 mm diameter
 - AGL1000V5-CSG281: SAC305, 0.3 mm diameter

- Reflow temperature used at MSL-3 is 260°C for all devices above.
- Since lead-free solder ball has higher reflow temperature than Sn63/Pb37 eutectic solder ball, this qualification runeffectively covers the qualification of packages with eutectic solder balls.
- Biased HAST was not done in this qualification run. However, BHAST was performed on a separate qualification activity with device A2F500M3G-FGG256 as qualification vehicle and with CuPdAu wire and mold compound G750E. Refer to document PA-232 for details.

Qualification Test Summary

1. A3PE3000-FG324

Test Name	Test Criteria	Test Condition	# of Lots	Sample Size per lot	Test Duration Pull Point	Acceptance Criteria	Results
Preconditioning (MSL-3)	JESD22-A113	30°C, 60%RH, 192 hrs.: 260°C reflow Temp	3	110 units/lot	192 hours	Pass Electric al test	Passed
Temperature Cycle (TC)	JESD22-A104	-55°C to 125°C, condition B, 700 cycles	3	30 units/lot (90 units total)	701 cycles 1035 cycles	Pass Electric al test	Passed
HAST (Unbiased HAST)	JESD22-A118	110°C, 85%RH, 264 hours	3	30 units/lot (90 units total)	264 hours	Pass Electric al test	Passed
High Temp Storage (HTS ¹)	JESD22-A103	150°C, 1000 hours	3	30 units/lot (90 units total)	1008 hours	Pass Electric al test	Passed

2. APA600-FGG256

Test Name	Test Criteria	Test Condition	# of Lots	Sample Size per lot	Test Duration Pull Point	Acceptance Criteria	Results
Preconditioning (MSL-3)	JESD22-A113	30°C, 60%RH, 192 hrs.: 260°C reflow Temp	1	145 units	192 hours	Pass Electric al test	Passed
Temperature Cycle (TC) ^{1/}	JESD22-A104	-55 °C to 125 °C, condition B, 700 cycles	1	48 units	710 cycles	Pass Electric al test	Passed
UHAST (Unbiased HAST)	JESD22-A118	110°C, 85%RH, 264 hours	1	48 units	264 hours	Pass Electric al test	Passed
High Temp Storage (HTS ¹)	JESD22-A103	150°C, 1000 hours	1	48 units	1008 hours	Pass Electric al test	Passed

3. AFS1500-FGG256

Test Name	Test Criteria	Test Condition	# of Lots	Sample Size per lot	Test Duration Pull Point	Acceptance Criteria	Results
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Preconditioning(MSL-3)	JESD22-A113	30°C, 60%RH, 192 hrs.: 260°C reflow Temp	1	122 units	192 hours	Pass Electric altest	Passed
Temperature Cycle (TC)	JESD22-A104	-55 °C to 125 °C, condition B, 700 cycles	1	50 units	712 cycles	Pass Electric altest	Passed
UHAST (Unbiased HAST)	JESD22-A118	110°C, 85%RH, 264 hours	1	50 units	264 hours	Pass Electric altest	Passed

4. A2F500M3G-CSG288

Test Name	Test Criteria	Test Condition	# of Lots	Sample Size per lot	Test Duration Pull Point	Acceptance Criteria	Results
Preconditioning (MSL-3)	JESD22-A113	30°C, 60%RH, 192 hrs.: 260°C reflow Temp	1	122 units	192 hours	Pass Electric altest	Passed
Temperature Cycle (TC)	JESD22-A104	-55 °C to 125 °C, condition B, 700 cycles	1	50 units	712 cycles	Pass Electric altest	Passed
UHAST (Unbiased HAST)	JESD22-A118	110°C, 85%RH, 264 hours	1	50 units	264 hours	Pass Electric altest	Passed

5. AGL1000V5-CSG281

Test Name	Test Criteria	Test Condition	# of Lots	Sample Size per lot	Test Duration Pull Point	Acceptance Criteria	Results
Preconditioning (MSL-3)	JESD22-A113	30°C, 60%RH, 192 hrs.: 260°C reflow Temp	1	122 units	192 hours	Pass Electric altest	Passed
Temperature Cycle (TC)	JESD22-A104	-55 °C to 125 °C, condition B, 700 cycles	1	50 units	712 cycles	Pass Electric altest	Passed
UHAST (Unbiased HAST)	JESD22-A118	110°C, 85%RH, 264 hours	1	50 units	264 hours	Pass Electric altest	Passed

In-process Assembly Data

1.1 Device A3PE3000-FG324, Mesa lot# 111125008, ASEM Assembly Lot# 125UC01

Assembly process/TestName	Test method	Criteria	Sample size	Comments
Die shear	MIL-STD-883 TM2019	≥5Kg-f	10 dice	Passed
Stitch Pull	Internal control	≥3 g-f	30 wires from 3 units	Passed
Wire Pull	TM2011	≥3 g-f	30 wires from 3 units	Passed
Bond Shear	JESD22-B116	≥8 g-f	30 bonds from 3 units	Passed
Crater test	Internal control	No cratering	2 dice	Passed
Wire sweep	X-Ray	<15% deflection	1 mold shot	Passed
Solder ball shear	JESD22-B117	≥ 500 g-f	25 balls from 3 units	Passed
Package dimension	JESD22-B100	Per Package Drawing	25 units	Passed

1.2 Device A3PE3000-FG324, Mesa lot# 111125010, ASEM Assembly Lot# 125UC02

Assembly process/TestName	Test method	Criteria	Sample size	Comments
Die shear	MIL-STD-883 TM2019	≥5Kg-f	10 dice	Passed
Stitch Pull	Internal control	≥3 g-f	30 wires from 3 units	Passed
Wire Pull	TM2011	≥3 g-f	30 wires from 3 units	Passed
Bond Shear	JESD22-B116	≥8 g-f	30 bonds from 3 units	Passed
Wire sweep	X-Ray	<15% deflection	1 mold shot	Passed
Solder ball shear	JESD22-B117	≥ 500 g-f	24 balls from 3 units	Passed
Package dimension	JESD22-B100	Per Package Drawing	25 units	Passed

1.3 Device A3PE3000-FG324, Mesa lot# 111125009, ASEM Assembly Lot# 126UC01

Assembly process/TestName	Test method	Criteria	Sample size	Comments
Die shear	MIL-STD-883 TM2019	≥5Kg-f	10 dice	Passed
Stitch Pull	Internal control	≥3 g-f	30 wires from 3 units	Passed
Wire Pull	TM2011	≥3 g-f	30 wires from 3 units	Passed
Bond Shear	JESD22-B116	≥8 g-f	30 bonds from 3 units	Passed
Wire sweep	X-Ray	<15% deflection	1 mold shot	Passed
Solder ball shear	JESD22-B117	≥ 500 g-f	25 balls from 3 units	Passed
Package dimension	JESD22-B100	Per Package Drawing	25 units	Passed

2. Device APA600-FGG256, Mesa lot# 109692001, ASEM Assembly Lot# 131UC02

Assembly process/TestName	Test method	Criteria	Sample size	Comments
Die shear	MIL-STD-883 TM2019	≥5Kg-f	10 dice	Passed
Stitch Pull	Internal control	≥3 g-f	30 wires from 3 units	Passed
Wire Pull	TM2011	≥3 g-f	30 wires from 3 units	Passed
Bond Shear	JESD22-B116	≥8 g-f	30 bonds from 3 units	Passed
Crater test	Internal control	No cratering	2 dice	Passed
Wire sweep	X-Ray	<15% deflection	1 mold shot	Passed
Solder ball shear	JESD22-B117	≥ 500 g-f	25 balls from 3 units	Passed
Package dimension	JESD22-B100	Per Package Drawing	25 units	Passed

3. Device AFS1500-FGG256, Mesa lot# 109789005, ASEM Assembly Lot# 136UC04

Assembly process/TestName	Test method	Criteria	Sample size	Comments
Die shear	MIL-STD-883 TM2019	≥5Kg-f	10 dice	Passed
Stitch Pull	Internal control	≥3 g-f	30 wires from 3 units	Passed
Wire Pull	TM2011	≥3 g-f	30 wires	Passed

			from 3 units	
Bond Shear	JESD22-B116	≥8 g-f	30 bonds from 3 units	Passed
Crater test	Internal control	No cratering	2 dice	Passed
Wire sweep	X-Ray	<15% deflection	1 mold shot	Passed
Solder ball shear	JESD22-B117	≥ 500 g-f	25 balls from 3 units	Passed
Package dimension	JESD22-B100	Per Package Drawing	25 units	Passed

4. Device A2F500M3G-CSG288, Mesa lot# 111586008, ASEM Assembly Lot# 141UC02

Assembly process/TestName	Test method	Criteria	Sample size	Comments
Die shear	MIL-STD-883 TM2019	≥5Kg-f	10 dice	Passed
Stitch Pull	Internal control	≥3 g-f	30 wires from 3 units	Passed
Wire Pull	TM2011	≥3 g-f	30 wires from 3 units	Passed
Bond Shear	JESD22-B116	≥8 g-f	30 bonds from 3 units	Passed
Crater test	Internal control	No cratering	2 dice	Passed
Wire sweep	X-Ray	<15% deflection	1 mold shot	Passed
Solder ball shear	JESD22-B117	≥ 200 g-f	24 balls from 3 units	Passed
Package dimension	JESD22-B100	Per Package Drawing	25 units	Passed

5. AGL1000V5-CSG281 , Mesa lot# 109815009, ASEM Assembly Lot# 142UC01

Assembly process/TestName	Test method	Criteria	Sample size	Comments
Die shear	MIL-STD-883 TM2019	≥5Kg-f	10 dice	Passed
Stitch Pull	Internal control	≥3 g-f	30 wires from 3 units	Passed
Wire Pull	TM2011	≥3 g-f	30 wires from 3 units	Passed
Bond Shear	JESD22-B116	≥8 g-f	0 bonds from 3 units	Passed
Crater test	Internal control	No cratering	2 dice	Passed
Wire sweep	X-Ray	<15% deflection	1 mold shot	Passed
Solder ball shear	JESD22-B117	≥ 200 g-f	25 balls from 3 units	Passed
Package dimension	JESD22-B100	Per Package Drawing	25 units	Passed

Table A: List of Devices covered by this qualification run

1. A3PE3000-FG324

Device	Pb-Free Package	With SnPb Solder ball
A3PE3000 – Qual vehicle*	FGG324	FG324
A3P1000	FGG256	FG256
A3P250	FGG256	FG256
A3P1000	FGG144	FG144
A3P600	FGG144	FG144
A3P400	FGG144	FG144
A3P250	FGG144	FG144
A3P125	FGG144	FG144
A3P060	FGG144	FG144
AGL1000	FGG256	FG256
AGL600	FGG256	FG256
AGL400	FGG256	FG256
A3P600	FGG256	FG256
A3P400	FGG256	FG256
A3PE600	FGG256	FG256
AGLE600	FGG256	FG256
AGL1000	FGG144	FG144
AGL600	FGG144	FG144
AGL400	FGG144	FG144
AGL250	FGG144	FG144
AGL125	FGG144	FG144

Note 1: * Qual vehicle. The other devices are qualified by extension

2. APA600-FGG256

Device	Pb-Free Package	With SnPb Solder ball
APA600 – Qual vehicle*	FGG256	FG256
APA450	FGG256	FG256
APA300	FGG256	FG256
APA150	FGG256	FG256
APA450	FGG144	FG144
APA300	FGG144	FG144
APA150	FGG144	FG144
APA075	FGG144	FG144

3. AFS1500-FGG256

Device	Pb-Free Package	With SnPb Solder ball
AFS1500 – Qual vehicle*	FGG256	FG256
AFS600	FGG256	FG256

AFS250	FGG256	FG256
A3P1000	FGG256	FG256
A3P250	FGG256	FG256
A3P250	FGG144	FG144
A3P125	FGG144	FG144
A3P060	FGG144	FG144

4. AGL1000-CSG281

Device	Pb-Free Package	With SnPb Solder balls
AGL1000 – Qual vehicle*	CSG281	CS281
AGL600	CSG281	CS281
AGLP125	CSG281	CS281

Note 1: * Qual vehicle. The other devices are qualified by extension.

5. A2F500M3G-CSG288

Device	Pb-Free Package	With SnPb Solder balls
A2F500M3G – Qual vehicle*	CSG288	CS288
A2F200M3F	CSG288	CS288

Note: * Qual vehicle. The other devices are qualified by extension



MICROCHIP

QUALIFICATION REPORT SUMMARY

PCN #: LIAL-23CCBP390

**Date:
January 5, 2022**

**Qualification of ASEM as a new assembly site for selected
Microsemi products available in 144L, 256L, and 324L
LFBGA, 281L and 288L TFBGA packages using Au wire.**

Purpose: Qualification of ASEM as a new assembly site for selected Microsemi products available in 144L, 256L, and 324L LFBGA, 281L and 288L TFBGA packages using Au wire

Qualification No: PA-237

Criteria used for qualification: JESD47K.

Devices to qualify by extension:

- Device with "X part#" in FG(G)256 and FG(G)144 requiring use of Au wire such as:
 - o A3P1000-FG144MX399
 - o A3P250-FGG256X399
 - o A3P250-FGG256GW
 - o A3P125-FGG144GW
 - o AFS1500-FG256IDX402
 - o AFS1500-FG256IX456
- AX250-FG(G)256

Qualification vehicles:

Lot Info	Wafer Lot #	Mesa Lot #	D/C
Lot 1	ZA045020	109793011	2128
Lot 2	ZA045020	109793013	2128
Lot 3	ZA045020	109793012	2128

Note: Assembly lots were processed one day apart at each process steps.

Package Information			Package Test Information	
Name & location	Package name	Bonding diagram and Rev	Name & Location	Test program name and Rev
ASE Malaysia	FGG256	1-8a-11963n R1	MSCC, SJ	AUTOA3P1000, REV: B3

Additional Information:

Bill of Material

- Mold compound: Sumitomo G750E
- Die attach epoxy: Ablebond 2100A
- Bond wire: Au, 0.8 mil diameter
- Solder ball: 96.5%Sn/3%Ag/0.5%Cu (SAC305)
- Substrates:
 - o Core material: GHPL-830NXA, CCL-HL832NXA
 - o solder mask: AUS308
- Reflow temperature used at MSL-3 is 260C for all devices above.

Since lead-free solder ball has higher reflow temperature than Sn63/Pb37 eutectic solder ball, this qualification run effectively covers the qualification of device with eutectic solder balls.

Accelerated Environment Stress Tests Summary

Test Name Group	Test Criteria	Test Condition	# of Lots	Sample Size perlot	Test Duration Pull Point	Acceptance Criteria	Results	Comments
Preconditioning (MSL -3)	JESD22-A113	30°C, 60%RH, 192 hrs. 260°C reflow Temp	3	314 units/lot	192 hrs.	0 Failure	Passed	Test at room temperatureand 125°C
Biased HAST (B-HAST)	JESD22-A110	110°C, 85%RH, 264 hrs.	3	82 units/lot (246 units total)	264 hrs.	0 Failure	Passed	Test at room temperatureand 125°C
Unbiased HAST (U-HAST)	JESD22-A118	110°C, 85%RH, 264 hrs.	3	82 units/lot (246 units total)	264 hrs.	0 Failure	Passed	Test at room temperature
Temperature Cycle (TC)	JESD22-A104	-65 °C to 150 °C, 500 cycles	3	82/lot (246 units total)	500 cycles	0 Failure	Passed	Test at room temperatureand 125°C
				Lot 1: 77 units Lot 2: 82 units Lot 3: 82 units (241 units total)	1000 cycles	0 failure	Passed	Test at room temperatureand 125°C
High Temp Storage(HTS)	JESD22-A103	150°C, 1000 hrs.	3	48 units/lot (144 total)	1000 hrs.	0 Failure	Passed	Test at room temperatureand 125°C

Package Assembly Integrity Tests

Mesa lot# 109793011, ASEM Assembly Lot# 128UC01

Assembly process/TestName	Test method	Criteria	Sample size	Comments
Die shear	MIL-STD-883TM2019	≥5Kg-f	10 dice	Passed
Stitch Pull	Internal control	≥3 g-f	30 wires from 3 units	Passed
Wire Pull	TM2011	≥3 g-f	30 wires from 3 units	Passed
Bond Shear	JESD22-B116	≥8 g-f	30 bonds from 3 units	Passed
Crater test	Internal control	No cratering	2 dice	Passed
Wire sweep	X-Ray	<15% deflection	1 mold shot	Passed
Solder ball shear	JESD22-B117	≥ 500 g-f	25 balls from 3 units	Passed
Package dimension	JESD22-B100	Per Package Drawing	25 units	Passed

Mesa lot# 109793013, ASEM Assembly Lot# 128UC02

Assembly process/TestName	Test method	Criteria	Sample size	Comments
Die shear	MIL-STD-883TM2019	≥5Kg-f	10 dice	Passed
Stitch Pull	Internal control	≥3 g-f	30 wires from 3 units	Passed
Wire Pull	TM2011	≥3 g-f	30 wires from 3 units	Passed
Bond Shear	JESD22-B116	≥8 g-f	30 bonds from 3 units	Passed
Wire sweep	X-Ray	<15% deflection	1 mold shot	Passed
Solder ball shear	JESD22-B117	≥ 500 g-f	25 balls from 3 units	Passed
Package dimension	JESD22-B100	Per Package Drawing	25 units	Passed

Mesa lot# 109793012, ASEM Assembly Lot# 128UC03

Assembly process/TestName	Test method	Criteria	Sample size	Comments
Die shear	MIL-STD-883TM2019	≥5Kg-f	10 dice	Passed
Stitch Pull	Internal control	≥3 g-f	30 wires from 3 units	Passed
Wire Pull	TM2011	≥3 g-f	30 wires from 3 units	Passed
Bond Shear	JESD22-B116	≥8 g-f	30 bonds from 3 units	Passed
Wire sweep	X-Ray	<15% deflection	1 mold shot	Passed
Solder ball shear	JESD22-B117	≥ 500 g-f	25 balls from 3 units	Passed
Package dimension	JESD22-B100	Per Package Drawing	25 units	Passed