Product Change Notification / GBNG-28BFRL552

Date:

02-Aug-2022

Product Category:

Memory

PCN Type:

Manufacturing Change

Notification Subject:

eSign # E000123575 Final Notice: Qualification of UMC Fab 8D as an additional fabrication site for selected 24FC256, 24AA256 and 24LC256 device families available in 8L DFN-S (6x5x0.9mm), MSOP (3x3mm), PDIP (.300in), SOIC (3.90mm), SOIJ (.208in), TDFN (2x3x0.8mm), TSSOP (4.4mm) packages.

Affected CPNs:

GBNG-28BFRL552_Affected_CPN_08022022.pdf
GBNG-28BFRL552_Affected_CPN_08022022.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 UMC Fab 8D as an additional fabrication site for selected 24FC256, 24AA256 and 24LC256 device families available in 8L DFN-S (6x5x0.9mm), MSOP (3x3mm), PDIP (.300in), SOIC (3.90mm), SOIJ (.208in), TDFN (2x3x0.8mm), TSSOP (4.4mm) packages.

Pre and Post Change Summary:

	Pre Change		Post Change		
Fabrication Site	Microchip Technology Tempe – Fab 2 (TMGR) and Microchip Technology Gresham – Fab 4 (GRTM)	Key Foundry Co., Ltd (MC04)	Microchip Technology Tempe – Fab 2 (TMGR) and Microchip Technology Gresham – Fab 4 (GRTM)	Key Foundry Co., Ltd (MC04)	United Microelectronics Corporation (Fab 8D) (U08D)
Wafer Diameter	8 inches (200 mm)	8 inches (200 mm)	8 inches (200 mm)	8 inches (200 mm)	8 inches (200 mm)
Certifications	ISO/TS16949	ISO/TS16949	ISO/TS16949	ISO/TS16949	ISO/TS16949

Impacts to Data Sheet: None

Change Impact None

Reason for Change: To improve manufacturability by qualifying UMC Fab 8D as an additional fabrication site.

Change Implementation Status: In Progress

Estimated First Ship Date: September 19, 2022 (date code: 2239)

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

Time Table Summary:

	August 2022					September 2022			
Workweek	32	33	34	35	36	37	38	39	40
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: August 02, 2022: Issued final notification.

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

Attachments:

PCN_GBNG-28BFRL552_Qual_Report.pdf

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

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QUALIFICATION REPORT SUMMARY

PCN #: GBNG-28BFRL552

Date:
July 20, 2022

Qualification of UMC Fab 8D as an additional fabrication site for selected 24FC256, 24AA256 and 24LC256 device families available in 8L DFN-S (6x5x0.9mm), MSOP (3x3mm), PDIP (.300in), SOIC (3.90mm), SOIJ (.208in), TDFN (2x3x0.8mm), TSSOP (4.4mm) packages.

Purpose: Qualification of UMC Fab 8D as an additional fabrication site for selected 24FC256, 24AA256 and 24LC256 device families available in 8L DFN-S (6x5x0.9mm), MSOP (3x3mm), PDIP (.300in), SOIC (3.90mm), SOIJ (.208in), TDFN (2x3x0.8mm), TSSOP (4.4mm) packages.

eSign #: E000123575
Qual ID: ML0720220038 Rev A

I. Summary

This report summarizes the passing results of stresses performed on Foundry UMC 8D in an 8L-SOIC package assembled and tested at MTAI (unless specified). The assembly lots were processed through the entire production package assembly flow and the sampled units were qualified to the device qualification guidelines established in Microchip specification QCI-39000.

Conclusion

This report presents data that qualifies the following products (24xx256-E/x / 24xx256- I/x) for Grade 1 Automotive per AEC Q100 (Rev G).

II. Description of Device Utilized for Qualification

CPN	24LC256-E/P; 24AA256-E/P	24FC256-I/SN; 24AA256-I/SN; 24AA256-E/SN
MPC	668284C4XA00; 668284C4XB00	668287C2XC00; 668287C2XB00; 668284C2XB00
MSL	5366	5366
Wafer Fab	UMC8D	UMC8D
Wafer Probe	MPHIL	MPHIL
Package & Pin Count	8L-DIP; 8L-CERDIP	8-SOIC
Stress Site	MTAI	SJO
Lots	1, 2, 3, 4, 5	6

III. Lot Information

Lot #	Lot Number	Lot / Wafer (Wafer)	Trace Code	Stress
Lot 1	MMT-224200244.000	U08D22323458.100	2202QPH	ELFR, DLT, Endurance, Data Retention
Lot 2	MMT-224400295.000	U08D922250195.300	2204AMW	ELFR, DLT, Endurance, Data Retention
Lot 3	MMT-225101748.000	U08D922470382.100	2211JC2	ELFR, DLT, Endurance, Data Retention
Lot 4	MTAI224602138.100	QSJ1HA (12)	220637A	CDM (& SJO DLT)
Lot 5	MTAI224602138.000	QSH5N (3)	n/a	Latch Up, HBM
Lot 6	MTAI224601959.100 MTAI224602137.100 MTAI224602138.100	QSJ1HA (12) QSJ1HA (12) QSJ1HA (12)	22062MD 2206372 220637A	Engineering Review Repeat of DLT at Microchip SJO site.

IV. Stress Results

Early Life Failure (ELFR)

Test Method	MIL-STD 883 M1005
Test Condition	150ºC / 24 hours / Max Vcc
Minimum Sample Size / # of Lots	800 each lot / 3 lots
Electrical Test Results (Fail / Pass)	0 / 815; 0 / 814; 0 / 815

- Pre / Post testing at -40°C, +25°C, +85°C and +125°C.

High Temperature Operating Life (HTOL) w/ Units from ELFR

Test Method	MIL-STD 883 M1005
Test Condition	150°C / 408 hours / Max Vcc
Minimum Sample Size / # of Lots	600 each lot / 3 lots
Electrical Test Results (Fail / Pass)	0 / 609*; 0 / 600*; 0 / 613*

- Pre / Post testing at -40°C, +25°C, +85°C and +125°C.
- *Note: Stress input signal voltage overshoot caused VT shift. This resulted in marginal Vih performance at the endpoint test on a small number of units. Product engineering simulation and design studies conducted indicate this phenomenon is not related to die defects or design weakness. The reported passing quantity omits these units. Repeat stress of 1 lot at the Microchip SJO lab found no failures through ELFR and HTOL, which substates the conclusion (see below table).

At SJO: High Temperature Operating Life (HTOL) w/ ELFR

Test Method	MIL-STD 883 M1005
Test Condition	150°C / 24 hours / Max Vcc
Minimum Sample Size / # of Lots	800 / 1 lot
Electrical Test Results (Fail / Pass)	0 / 810
Test Condition	150°C / 408 hours / Max Vcc
Minimum Sample Size / # Lots	600 / 1 lot
Electrical Test Results (Fail / Pass)	0 / 610

- Pre / Post testing at -40°C, +25°C, +85°C and +125°C.

Endurance / Device Life Test (DLT)

Test Method	MIL-STD 883 M1033 & M1005, AEC-Q100-008
Endurance Precondition Test Condition	85°C / 100,000 cycles
LifeTest Condition	150°C / 504 hours
Minimum Sample Size / # of lots	77 each lot / 3 lots
Electrical Test Results (Fail / Pass)	0 / 82; 0 / 102; 0 / 92

- Pre / Post testing at -40°C, +25°C, +85°C and +125°C.

Endurance / Data Retention

Test Method	MIL-STD 883 M1033, AEC-Q100-008
Endurance Precondition Test Condition	85°C / 100,000 cycles
LifeTest Condition	175°C / 504 hours
Minimum Sample Size / # of Lots	231 each lot / 3 lots
Electrical Test Results (Fail / Pass)	0 / 246; 0 / 245; 0 / 246

- Pre / Post testing at -40°C, +25°C, +85°C and +125°C.

Latch Up

Test Method	QCI-39000/ QCI-30521; AEC Q100-004
Test Condition	25°C, Itrig = 105mA, +1.5x Vmax / - 0.5x Vmax 125°C, Itrig = 105mA, +1.5x Vmax / - 0.5x Vmax
Sample Size / # of Lots	6 units per temperature / 1 lot
Test Results (Fail / Pass)	0 / 12

- In an 8L-Side Brazed DIP package. Pre / Post testing at 25°C, +85°C and +125°C.

ESD – Human Body Model (HBM)

Test Method	AEC Q100-002 / JS-001-2017
Test Condition	25°C; 500V, 1000V, 2000V, 3000V, 4000V
Sample Size / # of Lots	3 devices per voltage step / 1 lot
Maximum Voltage Level Passed	4000V

- In an 8L-Side Brazed DIP package. Pre / Post testing at 25°C, +85°C and +125°C.

ESD – Charge Device Model (CDM)

Test Method	AEC Q100-011 (JS002)
Test Condition	25°C; 750V on corner pins 250V, 500V, 750V, 1kV, 1.5kV, 2kV on other pins
Sample Size / # of Lots	3 devices per voltage step / 1 lot
Maximum Voltage Level Passed	2000V (both corner and other pins)

- In an 8L-SOIC package. Pre / Post testing at 25°C, +85°C and +125°C.

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Affected Catalog Part Numbers (CPN)

24LC256-E/MS
24AA256-E/MS
24LC256-E/MF
24AA256-E/MF
24LC256-E/SN
24AA256-E/SN
24FC256-E/SN
24LC256-E/SM
24AA256-E/SM
24LC256-E/P
24AA256-E/P
24LC256-E/ST
24AA256-E/ST
24FC256-E/ST
24LC256-I/MS
24AA256-I/MS
24FC256-I/MS
24LC256-I/MF
24AA256-I/MF
24FC256-I/MF
24LC256-I/SN
24AA256-I/SN
24FC256-I/SN
24LC256-I/SM
24AA256-I/SM
24FC256-I/SM
24LC256-I/P
24AA256-I/P
24FC256-I/P
24LC256-I/ST
24AA256-I/ST
24FC256-I/ST
24LC256T-I/MS
24AA256T-I/MS
24FC256T-I/MS
24LC256T-I/MF
24AA256T-I/MF
24FC256T-I/MF
24LC256T-I/SN
24AA256T-I/SN
24FC256T-I/SN
24LC256T-I/SM
24AA256T-I/SM
24FC256T-I/SM
24LC256T-I/ST
24AA256T-I/ST

24FC256T-I/ST

24LC256T-E/MS

24AA256T-E/MS

24LC256T-E/MF

24AA256T-E/MF

24LC256T-E/SN

24AA256T-E/SN

24FC256T-E/SN

24LC256T-E/SM

24AA256T-E/SM

24LC256T-E/ST

24AA256T-E/ST

24FC256T-E/ST

24LC256T-I/MNY

24AA256T-I/MNY

24FC256T-I/MNY

24LC256T-E/MNY

24AA256T-E/MNY