QUALIFICATION REPORT SUMMARY

PCN#: MAAN-04KQZT866

Date:
July 30, 2025

Qualification of Microchip Technology Colorado – Fab 5 (MCSO) as a new fabrication location for selected MIC18xx, MIC20xx, MIC23xx, MIC27xx, MIC28xx, MIC33xx, MIC47xx, MIC51xx, MIC53xx, MIC63xx, MIC80xx, MIC81xx, MIC82xx and MIC94xx device families available in various packages. The selected MIC2005, MIC22400, MIC22600, MIC2315x, MIC2800, MIC2810, MIC4722, MIC530x, MIC5310, MIC533x, MIC535x, MIC536x, MIC537x, MIC538x, MIC94052, MIC94053, MIC94060 and MIC9409x device families of 22K technology available in various packages will qualify by similarity (QBS).

Purpose: Qualification of Microchip Technology Colorado – Fab 5 (MCSO) as a new fabrication location for selected MIC18xx, MIC20xx, MIC23xx, MIC27xx, MIC28xx, MIC33xx, MIC47xx, MIC51xx, MIC53xx, MIC63xx, MIC80xx, MIC81xx, MIC82xx and MIC94xx device families available in various packages. The selected MIC2005, MIC22400, MIC22600, MIC2315x, MIC2800, MIC2810, MIC4722, MIC530x, MIC5310, MIC533x, MIC535x, MIC536x, MIC537x, MIC538x, MIC94052, MIC94053, MIC94060 and MIC9409x device families of 22K technology available in various packages will qualify by similarity (QBS).

I. Summary:

The purpose of this qualification is to release the CSI05 process fabricated at Fab 5 (Colorado Spring) per **Die Qual CCB 7364.003, 7364.057** and **Package Qual CCB 7428.004**, following guidelines established in Microchip specification QCI-39000, "Worldwide Quality Conformance Requirements". Device MIC23250-S4YMT in in 10L UDFN COL assembled at UNIS with 1.3 mil Au wire is selected as the qualification vehicle. CSI05 process is currently fabricated at Fab 2 (Tempe).

II. Conclusion:

Based on successful Reliability stress results on test device MIC23250-S4YMT and the fact that ESD HBM, CDM and LU levels of Fab 5 material are comparable to those fabricated in Fab 2, CSI05 process at Fab 5 (Colorado Spring) is released to production.

III. Device Description:

Device	MIC23250-S4YMT
Document Control Number	ML0720258469
Document Revision	B
CCB No.	7428.004, 7364.003 and 7364.057

IV. Qualification Material:

Die Qual Material (CCB# 7364.003 and 7364.057)

Test Lot	Lot 1	Lot 2	Lot 3
WAFER LOT	MCSO525376352.210/B4D1521	MCSO525447112.222/D5A0438	MCSO525396512.112/B4D1602
ASSEMBLY LOT	UNIS254400021.000	UNIS260500035.000	UNIS260500036.000
PACKAGE	10-lead UDFN2mmx2mm	10-lead UDFN2mmx2mm	10-lead UDFN2mmx2mm
QUAL TESTS	HTOL, ESD-CDM, ESD HBM, LU	HTOL, ESD-CDM, ESD HBM, LU	HTOL, ESD-CDM, ESD HBM

Package Qual Material (CCB# 7428.004 and 7364.057)

Test Lot	Lot 4	Lot 5	Lot 6
WAFER LOT	MCSO525376352.220/B4D1521	MCSO525447112.220/D5A0438	MCSO525396512.113/B4D1602
ASSEMBLY LOT	UNIS254900019.000	UNIS260600001.000	UNIS260600002.000
PACKAGE	10-lead UDFN2mmx2mm	10-lead UDFN2mmx2mm	10-lead UDFN2mmx2mm
QUAL TESTS	HTSL, HAST, UHAST, TC, WBP, WBS	HTSL, HAST, UHAST, TC, WBP, WBS	HAST, UHAST, TC, WBP, WBS

V. BOM:

Misc.	Assembly site	**UNIS**
	BD Number	D-003999
	MP Code (MPC)	22601YJ4AA07
	Part Number (CPN)	MIC23250-S4YMT
	MSL information	MSL-1
	Assembly Shipping Media (T/R, Tube/Tray)	T/R
	Base Quantity Multiple (BQM)	5000
Lead-Frame	Material	A194
	DAP Surface Prep	NiPdAu
	Process	Etched
	Lead-lock	Yes
	Part Number	40100097
	Lead Plating	NiPdAu
Bond Wire	Material	Au
Die Attach	Part Number	8006NS
	Conductive	Yes
MC	Part Number	G770HCD
PKG	Package Type	UDFN
	Pin/Ball Count	10L
	PKG width/size	2x2x0.6 mm

I. Die Qualification Data:

a. High Temperature Operating Life (HTOL)

Test Method/Condition	Ta = 125C, 1000 hrs, VIN = 5.5V			
Sample Requirement	3 lots, minimum sample size = 77 units/lot.			
Test Material	Lot 1	Lot 2	Lot 3	Result
ATE Result (fail/sample size)	0/81	0/82	0/82	Pass

Pre and Post testing conducted at +25◦C.

b. ESD-HBM

Test Method/Condition	JS-001-2012				
Test Material	Lot 1	Lot 2	Lot 3	Fab 2 Control	Result
Highest Passing Level	+/-0.5kV	+/-0.5kV	+/-0.5kV	+/- 0.5kV	Pass

Pre and Post testing conducted at +25◦C.

Note on ESD-HBM: ESD level of this product in Fab 5 is identical to Fab 2. Both pass up to 0.5kV. For the ESD HBM performance of Fab 2 material, please refer to ML0720251148.

c. ESD-CDM

Test Method/Condition	JS-002-2014			
Test Material	Lot 1	Lot 2	Lot 3	Result
Highest Passing Level	+/- 2kV	+/- 2kV	+/- 2kV	Pass

Pre and Post testing conducted at +25◦C

d. Latch Up (LU)

Test Method	JESD78C1	
Test Material	Lot 1	Lot 2
Sample Size	12	12
Latch Up Result	Pass	Pass
Post LU ATE (fail/ss)	0/12	0/12

Pre and Post testing conducted at +25◦C

II. Package Qualification Data:

a. Package Preconditioning:

Test Method/Condition	JEDEC J-STD-020 and JESD22-A113, MSL Level 1 soak at +85°C/85%RH/168hrs, 3x at 260°C peak Reflow Temperature			
Sample Requirement	3 lots, minimum sample size = 231 units/lot.			
Test Material	Lot 4	Lot 5	Lot 6	Result
ATE Result (fail/sample size)	0/251	0/255	0/255	Pass

Pre and Post testing was conducted at +25°C

b. HAST Post MSL1 Preconditioning.

Test Method/Condition	JESD22-A110, VIn = +5.5V, Ta = +130°C/85%RH, 96 hrs			
Sample Requirement	3 lots, minimum sample size = 77 units/lot.			
Test Material	Lot 4	Lot 5	Lot 6	Result
ATE Result (fail/sample size)	0/82	0/82	0/80	Pass

Pre and Post testing was conducted at +25°C

c. Unbiased HAST post MSL1 Preconditioning.

Test Method/Condition	JESD22-A118, Ta = +130°C/85%RH, 96hrs.			
Sample Requirement	3 lots, minimum sample size = 77 units/lot.			
Test Material	Lot 4	Lot 5	Lot 6	Result
ATE Result (fail/sample size)	0/82	0/82	0/82	Pass

Pre and Post testing was conducted at +25°C

d. Temperature Cycling post MSL1 Preconditioning

Test Method/Condition	JESD22-A104, Ta = -65°C/+150 °C, 500 cycles.			
Sample Requirement	3 lots, minimum sample size = 77 units/lot.			
Test Material	Lot 1	Lot 2	Lot 3	Result
ATE Result (fail/sample size)	0/82	0/82	0/82	Pass

Pre and Post testing was conducted at +25°C

e. High Temperature Storage Life

Test Method/Condition	JESD22-A103, Ta = +175 ºC, 500 hrs		
Sample Requirement	1 lot, minimum sample size = 45 units/lot.		
Test Material	Lot 4	Lot 5	Result
ATE Result (fail/sample size)	0/50	0/50	Pass

Pre and Post testing was conducted at +25◦C