PCN # 1523

DATE: April 3, 2015

Quality Assurance
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San Jose, CA 95134

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☒ PROCESS CHANGE NOTICE
☐ PRODUCT CHANGE NOTICE

MAXIM INTEGRATED HEREBY ISSUES NOTIFICATION OF CHANGE THAT MAY AFFECT THE FOLLOWING CATEGORIES:

☐ DESIGN	☒ WAFER FAB	☐ ASSEMBLY	☐ TEST	☐ ELEC/MECH SPECS

AFFECTED PRODUCT:

Ordering P/N: (See PN listing XLS in PCN ZIP file)

CHANGE FROM: MAX14689 devices fabricated only at Maxim's fabrication partner Epson in Japan in the S18U process.	CHANGE TO: MAX14689 devices to also be fabricated at Maxim's San Antonio, TX facility.

JUSTIFICATION: The addition of the San Antonio fabrication facility will provide supply chain flexibility.

The S18U fabrication process was fully qualified and released to production at Maxim’s San Antonio fabrication facility in July, 2011.

There will be no change to the form, fit, function, die geometry or guaranteed electrical datasheet EC table performance of these devices.

Attached is the Reliability qualification report for the transfer to the San Antonio fabrication facility.

TRACEABILITY: Maxim Integrated maintains full traceability by device marking, packaging labels and shipment documents.

Maxim Integrated's Change Notification System is designed to keep our customer base apprised of major product, manufacturing, or facility improvements.

Deborah Meeker

Deborah Meeker / PCN Coordinator

For further information, please contact either of the people listed below.

Contact your local Maxim Integrated Company Representative or Deborah Meeker, PCN Coordinator
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1) QUALIFICATION TEST RESULTS

All samples from the qualification lots were stressed according to Table 1 to Table 3. All samples have passed full qualification requirements.

Table 1: SA S18UM3S, S18UM4S & S18UM4TF Phase I (up to 48V devices) Qualification data

Rel. #:		R26410A	R26410B	R26410C	R26410A
Lot #:		TAMC4U004H	TALN4Z003A	TALM4Z001C	TAMC4U005P
Device:		MAX16840ATB+	MAX14562ETA+	MAX17491GTA+	MAX16840ATB+
Die Type:		SP26A-0A	AL02Y	PE53Y	SP26A-0A
Die Size (mils):		46.85x61.42	31.89x30.71	24.02x46.85	46.85x61.42
Package Type/ Package Code):		10L TDFN 3x3/ T1033+1	8L TDFN 2x2/ T822+1	8L TQFN 3x3/ TQ833+1	10L TDFN 3x3/ T1033+1
Date Code:		1330	1331	1327	1337
Back Mark:		AA	AF	BI	AC
Process/ Rev:		S18UM3S	S18UM4S	S18UM3S	S18UM3S
Test	Test Duration, Condition	Result	Result	Result	Result
Infant Mortality Evaluation	12 hrs, 135°C	0/7274	0/3463	0/8340	**2/7315 *1,2**
Early Life Failure Rate	48 hrs, 135°C			0/1628	
High Temp Op Life	1000 hrs, 135°C	0/77	0/77	0/77	0/77
Convection Reflow	260°C Peak, 3x Reflow	0/320	0/320	0/320	0/320
Temperature Cycling	500X, -65°C to +150°C	0/77	0/77	0/77	0/77
High Temp Storage	1000 hrs, 150°C	0/77	0/77	0/77	0/77
HAST	96 hrs, 130°C/85% R.H.	0/77	0/77	0/77	
Unbiased HAST	96 hrs, 130°C/85% R.H., unbiased		0/77	0/77	
ESD (HBM)	2000V or actual rating	Pass 2500V	Pass 1000V	Pass 2500V	Pass 2500V
Latch-up	±200mA or actual rating	Pass -30mA/+100mA (Drain pin) Pass -85mA/+100mA (EXT pin) Pass ±100mA (all other pins)	Pass ±100mA	Pass ±250mA	Pass -30mA/+100mA (Drain pin) Pass -85mA/+100mA (EXT pin) Pass ±100mA (all other pins)

Note *1: IFAR# 40052522 – unit damaged during analysis, root cause unknown.
Note *2: IFAR# 40055288 – Valid failure. Fab defect (silicon cone) was observed.

Table 2: SA S18UM3S, S18UM4S & S18UM4TF Phase I (up to 48V devices) Qualification data

Rel. #:		R26410E	R26410F	R26410G *3
Lot #:		TAMB0Z001BC	TALM4U003A	TAQT1Q001A
Device:		MAX5704AUB+	MAX17491GTA+	MAX16936RATEA/V+CA
Die Type:		DB50A-0C	PE53Y	AP33A-0E
Die Size (mils):		31.89x62.6	24.02x46.85	64.17x66.14
Package Type/ Package Code):		10L uMax/ U10+2	8L TQFN 3x3/ TQ833+1	16L TQFN 5x5/ T1655+4
Date Code:		1334	1346	1415
Back Mark:		AA	BK	AA
Process/ Rev:		S18UM4TFS	S18UM3S	S18UM4S
Test	Test Duration, Condition	Result	Result	Result
Infant Mortality Evaluation	12 hrs, 135°C		0/8763	0/2212
Early Life Failure Rate	48 hrs, 135°C		0/1316	0/954
High Temp Op Life	1000 hrs, 135°C	0/77	0/77	0/77
Convection Reflow	260°C Peak, 3x Reflow	0/320	0/320	0/320
Temperature Cycling	500X, -65°C to +150°C	0/77	0/77	0/77
High Temp Storage	1000 hrs, 150°C	0/77	0/77	0/74 *4
HAST	96 hrs, 130°C/85% R.H.	0/77	0/77	0/77
Unbiased HAST	96 hrs, 130°C/85% R.H., unbiased			0/77
ESD (HBM)	2000V or actual rating	Pass 2500V	Pass 2500V	Pass 2000V
Latch-up	±200mA or actual rating	Pass ±250mA	Pass ±250mA	Pass ±100mA

Note *3: All electrical tests pre- and post-stress were performed at +25°C & +125°C. Electrical test pre- and post-HTOL stress was also performed at -40°C.

Note *4: 3 units were missing at hot temperature testing.

Table 3: SA S18UM4S Additional AEC-Q100 Qualification data

Rel. #:		R27254A *5	R27254B *5	R27202A *5
Lot #:		TAQT1Q002BA	TAQT1Q003BA	TAQJ4Q001F
Device:		MAX16936RATEA/V+	MAX16936RATEA/V+	MAX16990ATCD/V+
Die Type:		AP33A-0E	AP33A-0E	AP37A-0C
Die Size (mils):		64.17 x 66.14	64.17 x 66.14	50 x 50
Package Type/ Package Code):		16L TQFN 5x5	16L TQFN 5x5	12L TQFN 3x3
Date Code:		1426	1425	1424
Back Mark:		AB	AC	AA
Process/ Rev:		S18UM4S	S18UM4S	S18UM4S
Test	Test Duration, Condition	Result	Result	Result
Infant Mortality Evaluation	12 hrs, 135°C			
Early Life Failure Rate	48 hrs, 135°C	0/800	0/800	0/800
High Temp Op Life	1000 hrs, 135°C	0/77		0/77
Convection Reflow	260°C Peak, 3x Reflow	0/231	0/231	0/231
Temperature Cycling	500X, -65°C to +150°C	0/77	0/77	0/77
High Temp Storage	1000 hrs, 150°C			0/45
HAST	96 hrs, 130°C/85% R.H.	0/77	0/77	
Unbiased HAST	96 hrs, 130°C/85% R.H., unbiased	0/77	0/77	0/77
ESD (HBM)	2000V or actual rating			
Latch-up	±200mA or actual rating			

Note *5: All electrical tests pre- and post-stress were performed at +25°C & +125°C; except Convection Reflow and Unbiased HAST. Electrical test pre- and post-HTOL stress was also performed at -40°C.

2) <u>CONCLUSION</u>

All qualification lots have demonstrated reliable operation by passing all the qualification stress tests. Therefore, SA S18U (up to & including 48V devices) process meets all the reliability qualification requirements.

All pre and post stress electrical testing is in compliance with AEC-Q100 guidelines. Since this qualification complies with the sample size, acceptance criteria and pre and post stress temperature testing guidelines of AEC-Q100, this newly qualified process is suitable for automotive product applications.