PCN # 1356
DATE: October 30, 2013

Quality Assurance
160 Rio Robles
San Jose, CA 95134

☐ **PROCESS CHANGE NOTICE**
☒ **PRODUCT CHANGE NOTICE**

MAXIM 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: Currently single source assembly at UTAC Thai Limited (UTL)	CHANGE TO: Add ASE-CL as an additional assembly vendor.
JUSTIFICATION: Adding ASE-CL as an additional qualified assembly site to ensure supply continuity. Other Maxim parts are already in production at ASE-CL. Please see the attached Rel Reports that qualify these devices/package by extension R25454 & R26194.	

TRACEABILITY: MAXIM maintains traceable by markings as branded on packaged units.

Maxim's Change Notification System is designed to keep our customer base appraised 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 Company Representative or Deborah Meeker, PCN Coordinator
408-601-5618 / pcn.coordinator@maxim-ic.com

Document Title: Product Change Notice - Notification Only	Document ID: 18-0582/J

☒ Qualification
☐ Evaluation

Report#: R25454FQ
Date: 2/25/2012

MAXIM RELIABILITY QUALIFICATION REPORT

SUBJECT

ASE Chung-Li Taiwan 8L (2x2x0.8 mm) TDFN-EP Lead-Free Package Qualification.

PURPOSE

Qualify assembler ASE Chung-Li Taiwan to build 8L (2x2x0.8 mm) TDFN-EP lead-free package with Sumitomo G770HJ molding compound, 100% matte tin plate finish, copper alloy leadframe, non-conductive die attach from vendor Henkel (ATB-125) and 1.3 mil diameter gold bond wire. MAX8901BETA+T and MAX1976AETA120+T in 8L (2x2x0.8 mm) TDFN-EP package were used as test vehicles.

CONCLUSION

All qualification lots have passed Maxim reliability qualification requirements. In addition, the package has completed moisture soak level 1 testing per JEDEC J-STD-020D, and solder reflow test at 260°C peak temperature (Tp). Therefore, assembler ASE Chung-Li Taiwan is qualified to build 8L (2x2x0.8 mm) TDFN-EP lead-free package.

SAMPLE DESCRIPTIONS

REL#	DEVICE	DIE TYPE	PACKAGE	PROCESS	LOT#	TOP MARK	DATE CODE
R25454A	MAX8901BETA+T	PQ04Y	8L TDFN-EP (2x2x0.8mm)	S45UT	SFBZEA035Q1	Q1	1107
R25454B	MAX8901BETA+T	PQ04Y	8L TDFN-EP (2x2x0.8mm)	S45UT	SFBZEA035Q2	Q2	1107
R25454C	MAX8901BETA+T	PQ04Y	8L TDFN-EP (2x2x0.8mm)	S45UT	SFBZEA035Q3	Q3	1107
R25454D	MAX1976AETA120+T	PM35Y	8L TDFN-EP (2x2x0.8mm)	S4LDS	TM20GA179Q1	Q1	1148
R25454E	MAX1976AETA120+T	PM35Y	8L TDFN-EP (2x2x0.8mm)	S4LDS	TM20GA179Q2	Q2	1148
R25454F	MAX1976AETA120+T	PM35Y	8L TDFN-EP (2x2x0.8mm)	S4LDS	TM20GA179Q3	Q3	1148

TEST RESULT

See attached spreadsheet for details.

Faisal Amin AMTS, Reliability Engineer	Alex Arreola SMTS, Reliability Engineer	P. Lin Ping Lin Director, Reliability

DISCUSSION

I. Failure Rate Calculation

Based on the 1000 hours at 135°C life test results from the qualification lots, the calculated failure in time rate is 1.54 (FIT) at 60% confidence level and 0.8eV activation energy when derated to 25°C.

II. Qualification Requirements/Acceptance Criteria

The reliability test requirements and acceptance criteria are defined as follow:

Stress Test	Test Condition	Sampling Plan
Life Test	135°C junction, 1000 hours	0/45
Convection Solder Reflow *1	260°(+0/-5)C, 3X	0/300
Temperature Cycle *2	-65°C to +150°C, 1000 cycles	0/77
High Temperature Storage *2	150°C, 1000 hours	0/77
HAST *2	130°C/85% R.H., 100 hours	0/45
Bond Crater *2	Per specification	0/20
Physical Dimensions	Per specification	0/15
Solderability	245°C, 8 hrs steamaging	0/15
Solderability Backward Compatibility	215°C, 8 hrs steamaging	0/15
Plating Thickness	400 u-inch minimum	0/10

Note: *1. Level 1 soak (85°C/85%R.H. for 168hrs) is used as preconditioning.
*2. Convection solder reflow at 260°C Tp. is used as preconditioning.

III. Qualification Test Results

The tests in item II (Qualification Requirements/Acceptance Criteria) were implemented on all qualification lots. All lots in 8L (2x2x0.8 mm) TDFN-EP package have passed Maxim reliability requirements as well as JEDEC J-STD-020D moisture sensitivity level 1 requirements with zero failures.

SUMMARY

All qualification lots assembled at ASE Chung-Li Taiwan have shown good reliability performance. Therefore, assembler ASE Chung-Li Taiwan is qualified to build 8L (2x2x0.8 mm) TDFN-EP lead-free package.

TEST RESULTS/ LOT INFORMATION:

TEST	REL#: R25454A DEVICE: MAX8901BETA+T DIE: PQ04Y LOT#: SFBZEA035Q1 D/C: 1107	REL#: R25454B DEVICE: MAX8901BETA+T DIE: PQ04Y LOT#: SFBZEA035Q2 D/C: 1107	REL#: R25454C DEVICE: MAX8901BETA+T DIE: PQ04Y LOT#: SFBZEA035Q3 D/C: 1107
LIFE TEST	1000 HRS – 0/45	1000 HRS – 0/45	1000 HRS – 0/45
CONVECTION REFLOW *1	0/300	0/300	0/300
TEMP CYCLE *2	1000X - 0/77	1000X - 0/77	1000X - 0/77
HIGH TEMP STORAGE *2	1000 HRS – 0/77	1000 HRS – 0/77	1000 HRS – 0/77
HAST *2	100 HRS - 0/45	100 HRS - 0/45	100 HRS - 0/45
PHYSICAL DIMENSIONS	0/15	0/15	0/15
SOLDERABILITY (245°C)	0/15	0/15	0/15
SOLDERABILITY BACKWARD COMPATIBILITY (215°C)	0/15	0/15	0/15
PLATING THICKNESS	0/10	0/10	0/10

Note: *1 – Level 1 soak (85°C/85%R.H. for 168hrs) is used as preconditioning.
*2 – Convection solder reflow at 260°C Tp. is used as preconditioning.

TEST	REL#: R25454D DEVICE: MAX1976AETA120+T DIE: PM35Y LOT#: TM20GA179Q1 D/C: 1148	REL#: R25454E DEVICE: MAX1976AETA120+T DIE: PM35Y LOT#: TM20GA179Q2 D/C: 1148	REL#: R25454F DEVICE: MAX1976AETA120+T DIE: PM35Y LOT#: TM20GA179Q3 D/C: 1148
BOND CRATER *2	0/20	0/20	0/20

Note: *1 – Level 1 soak (85°C/85%R.H. for 168hrs) is used as preconditioning.
*2 – Convection solder reflow at 260°C Tp. is used as preconditioning.

☒ Qualification
☐ Evaluation

Report#: R26194FQ
Date: 2/20/13

MAXIM RELIABILITY QUALIFICATION REPORT

SUBJECT

ASE Chung-Li (Taiwan) 48L (6X6X0.8 mm) TQFN-EP, 0.4 mm-Pitch NiPdAu Non-conductive Die Attach (ATB125 film) Package Qualification.

PURPOSE

Qualify assembler ASE Chung-Li Taiwan to build 48L (6X6X0.8 mm) TQFN exposed pad lead-free package with Sumitomo G700LA molding compound, NiPdAu pre-plated frame, core copper alloy leadframe, non-conductive die attach from vendor Henkel (ATB125), and 1.3 mil diameter gold bond wire. MAX17094ETM+ in 48L (6X6X0.8mm) TQFN-EP package was used as a test vehicle.

CONCLUSION

All qualification lots have passed Maxim reliability qualification requirements. In addition, the package has completed moisture soak level 1 testing per JEDEC J-STD-020D, and solder reflow test at 260°C peak temperature (Tp). Therefore, assembler ASE Chung-Li Taiwan is qualified to build 48L (6X6X0.8 mm) TQFN-EP lead-free package.

SAMPLE DESCRIPTIONS

REL#	DEVICE	DIE TYPE	PACKAGE	PROCESS	LOT#	TOP MARK	DATE CODE
R26194A	MAX17094ETM+	PF37Z	48L (6X6X0.8mm) TQFN T4866N+1	S45URS	TQGZD3085Q1	Q1	1227
R26194B	MAX17094ETM+	PF37Z	48L (6X6X0.8mm) TQFN T4866N+1	S45URS	TQGZD3085Q2	Q2	1227
R26194C	MAX17094ETM+	PF37Z	48L (6X6X0.8mm) TQFN T4866N+1	S45URS	TQGZD3085Q3	Q3	1227

TEST RESULT

See attached spreadsheet for details.

		P. Lin
Faisal Amin AMTS, Reliability Engineer	Alex Arreola PMTS, Reliability Engineer	Ping Lin Director, Reliability

DISCUSSION

I. Failure Rate Calculation

Based on the 1000 hours at 135°C junction temperature life test results from the qualification lots, the calculated failure in time rate is 1.54 (FIT) at 60% confidence level and 0.8eV activation energy when derated to 25°C. This is an acceptable failure rate.

II. Qualification Requirements/Acceptance Criteria

The reliability test requirements and acceptance criteria are defined as follow:

Stress Test	**Test Condition**	**Sampling Plan**
Life Test	135°C junction, 1000 hours	0/45
Convection Solder Reflow *1	260°(+0/-5)C, 3X	0/250
Temperature Cycle *2	-65°C to +150°C, 500 cycles	0/77
High Temperature Storage *2	150°C, 1000 hours	0/77
Temperature Humidity Biased (THB *2)	85°C/85% R.H., 1000 hours, with bias	0/45
Wire Bond Pull	5 grams minimum	0/200 wires
Bond Crater *2	Per specification	0/20
Physical Dimensions	Per specification	0/15
Solderability	8 hrs steam aging, 245 C	0/15
Plating Thickness	400 u-inch minimum	0/10

Note: *1. Level 1 soak (85°C/85%R.H. for 168hrs) is used as preconditioning.
*2. Convection solder reflow at 260°C Tp. is used as preconditioning.

III. Qualification Test Results

The tests in item II (Qualification Requirements/Acceptance Criteria) were implemented on all qualification lots. All lots in 48L (6X6X0.8mm) TQFN-EP package have passed Maxim reliability requirements as well as JEDEC J-STD-020D moisture sensitivity level 1 requirements with zero failures.

SUMMARY

All qualification lots assembled at ASE (Chung-Li) have shown good reliability performance. Therefore, assembler ASE Chung-Li Taiwan is qualified to build 48L (6X6X0.8 mm) TQFN-EP lead-free package.

TEST RESULTS/ LOT INFORMATION:

TEST	REL#: R26194A DEVICE: MAX17094ETM+ DIE: PF37Z LOT#: TQGZD3085Q1 D/C: 1227	REL#: R26194B DEVICE: MAX17094ETM+ DIE: PF37Z LOT#: TQGZD3085Q2 D/C: 1227	REL#: R26194C DEVICE: MAX17094ETM+ DIE: PF37Z LOT#: TQGZD3085Q3 D/C: 1227
LIFE TEST	1000 HRS – 0/47	1000 HRS – 0/47	1000 HRS – 0/47
CONVECTION REFLOW *1	0/400	0/400	0/400
TEMP CYCLE *2	500X- 0/80 1000X - 0/80	500X- 0/77 1000X - 0/77	500X- 0/77 1000X - 0/77
HIGH TEMP STORAGE *2	1000 HRS – 0/80	1000 HRS – 0/77	1000 HRS – 0/77
THB (85°C /85R.H.) *2	1000 HRS - 0/43	1000 HRS - 0/43	1000 HRS - 0/43
WIRE BOND PULL	0/200 wires	0/200 wires	0/200 wires
BOND CRATER *2	0/20	0/20	0/20
PHYSICAL DIMENSIONS	0/15	0/15	0/15
SOLDERABILITY	0/15	0/15	0/15
PLATING THICKNESS	0/10	0/10	0/10

Note: *1 – Level 1 soak (85°C/85%R.H. for 168hrs) is used as preconditioning.
*2 – Convection solder reflow at 260°C Tp. is used as preconditioning.