

Reliability Report

Report Title:	SOIC-W Assembly Transfer to CP1 Qualification
Report Number:	19988
Revision:	A
Date:	9 August 2022

Summary

This report summarizes the reliability qualification data for the Wide variant of the Small Outline IC package (SOIC-W) assembly transfer at Cirtek Philippines (CP1).

The DS3234 and MAX3535ECWI+ are used as device vehicles for this qualification.

- The DS3234 is a low-cost, extremely accurate SPI bus real-time clock (RTC) with an integrated temperature-compensated crystal oscillator (TCXO) and crystal. Table 1 describes the DS3234 product characteristics. Reference Legacy Maxim Reliability data is documented in Appendix A.
- The MAX3535ECWI+ is an isolated RS-485/RS-422 full duplex transceiver providing 2500VRMS of galvanic isolation between the RS-485/RS-422 side and the processor or control logic side. Table 2 describes the MAX3535ECWI+ product characteristics. Reference Legacy Maxim Reliability data is documented in Appendix B.

This qualification is also supported by historical data from Legacy Maxim as documented in Appendix C.

Table 1: DS3234 Product Characteristics**Die/Fab**

Die Id	8YB73 A
Die Size (mm)	102 x 141
Wafer Fabrication Process	E6E-2P2M, HPVt, EPROM, LV-NRDSD, PF ALOCOS:GOI
Passivation	Passivation w/ Nov TEOS Oxide-OxyNitride
Interconnect	Aluminum / 1% Silicon / 0.5% Copper

Package/Assembly

Package	20 SOIC
Body Size (mm)	300 x 2.3
Assembly Location	Cirtek (CP1)
Molding Compound	Sumitomo G600
Wire Type	Au Wire
Wire Diameter (mils)	1.0
Die Attach	Ablestik 84-1LMIS R4
Lead Frame Material	Copper
Lead Finish	100% Sn, Matte
Moisture Sensitivity Level	MSL 1
Maximum Peak Reflow Temperature (°C)	260 °C

Table 2: MAX3535ECWI+ Product Characteristics**Die/Fab**

Die Id	RT47W
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Package/Assembly

Package	28 SOIC-W
Assembly Location	Cirtek (CP1)
Molding Compound	Sumitomo G600
Wire Type	Au Wire
Wire Diameter (mils)	1.0
Die Attach	Ablestik 84-1LMIS R4
Lead Frame Material	Copper
Lead Finish	100% Matte Sn
Moisture Sensitivity Level	MSL 1
Maximum Peak Reflow Temperature (°C)	260 °C

Description / Results of Tests Performed

Table 3 provides a description of the qualification tests conducted and the associated test results for products manufactured on the same technologies as described in Tables 1 and 2. All devices were electrically tested before and after each stress. Any device that did not meet all electrical data sheet limits following stressing would be considered a valid (stress-attributable) failure unless there was conclusive evidence to indicate otherwise.

Table 3: SOIC-W Assembly Transfer to CP1 Qualification Test Results

Test Name	Specification	Conditions	Device	Lot #	Sample Size	Qty. Failures
High Temperature Storage Life (HTSL)	JESD22-A103	125°C, 1,000 Hours	DS3234	0601	77	0
		150°C, 1,000 Hours	MAX3535ECWI+	R090132A	77	0
				R090132B	77	0
				R090132C	77	0
Solder Heat Resistance (SHR) ¹	J-STD-020	MSL-1	DS3234	0601	22	0
Temperature Cycling (TC) ¹	JESD22-A104	-40°C/+85°C, 1000 Cycles	DS3234	0601	77	0
		- 65°C/+150°C, 1000 Cycles	MAX3535ECWI+	R090132A	77	0
				R090132B	77	0
				R090132C	77	0
Autoclave (AC) ¹	JESD22-A102	121°C 100%RH 2ATM, 168 Hours	DS3234	0601	77	0
Temperature, Humidity Bias (THB) ¹	JESD22-A108F	85°C 85%RH, 1000Hrs	DS3234	0601	45	0
Highly Accelerated Stress Test (HAST) ¹	JESD22-A110	130°C 85%RH, 100 Hours	MAX3535ECWI+	R090132A	45	0
				R090132B	45	0
				R090132C	45	0

¹ These samples were subjected to preconditioning (per J-STD-020 Level 1) prior to the start of the stress test. Level 1 preconditioning consists of the following: Bake: 24 hrs @ 125°C, Unbiased Soak: 168 hrs @ 85°C, 85%RH, Reflow: 3 passes through an oven with a peak temperature of 260°C.

Samples of the many devices manufactured with these package and process technologies are continuously undergoing reliability evaluation as part of the ADI Reliability Monitor Program. Additional qualification data is available on [Analog Devices' web site](#).

Approvals

Reliability Engineer: Pernell Marc Mosuela

Additional Information

Data sheets and other additional information are available on [Analog Devices' web site](#)

Appendix

Appendix A: Reliability Report for DS3234, Rev A1.



1/31/2007

RELIABILITY REPORT
FOR

DS3234, Rev A1

Dallas Semiconductor

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Conclusion:

The following qualification successfully meets the quality and reliability standards required of all Dallas

DS3234, Rev A1

Device Description:

A description of the device used in this qualification can be found in the product data sheet. You can find the product data sheet at http://dbserv.maxim-ic.com/l_datasheet3.cfm.

Reliability Derating:

The Arrhenius model will be used to determine the acceleration factor for failure mechanisms that are temperature accelerated.

$AfT = \exp((Ea/k) * (1/Tu - 1/Ts)) = tu/ts$
AfT = Acceleration factor due to Temperature
tu = Time at use temperature (e.g. 55°C)
ts = Time at stress temperature (e.g. 125°C)
k = Boltzmann's Constant (8.617×10^{-5} eV/°K)
Tu = Temperature at Use (°K)
Ts = Temperature at Stress (°K)
Ea = Activation Energy (e.g. 0.7 eV)

The activation energy of the failure mechanism is derived from either internal studies or industry accepted standards, or activation energy of 0.7eV will be used whenever actual failure mechanisms or their activation energies are unknown. All deratings will be done from the stress ambient temperature to the use ambient temperature.

An exponential model will be used to determine the acceleration factor for failure mechanisms, which are voltage accelerated.

$AfV = \exp(B * (Vs - Vu))$
AfV = Acceleration factor due to Voltage
Vs = Stress Voltage (e.g. 7.0 volts)
Vu = Maximum Operating Voltage (e.g. 5.5 volts)
B = Constant related to failure mechanism type (e.g. 1.0, 2.4, 2.7, etc.)

The Constant, B, related to the failure mechanism is derived from either internal studies or industry accepted standards, or a B of 1.0 will be used whenever actual failure mechanisms or their B are unknown. All deratings will be done from the stress voltage to the maximum operating voltage. Failure rate data from the operating life test is reported using a Chi-Squared statistical model at the 60% or 90% confidence level (Cf).

The failure rate, Fr, is related to the acceleration during life test by:

$Fr = X / (ts * AfV * AfT * N * 2)$
X = Chi-Sq statistical upper limit
N = Life test sample size

Failure Rates are reported in FITs (Failures in Time) or MTTF (Mean Time To Failure). The FIT rate is related to MTTF by:

$$MTTF = 1/Fr$$

NOTE: MTTF is frequently used interchangeably with MTBF.

The calculated failure rate for this device/process/assembly is

FAILURE RATE:	MTTF (YRS):	5288	FITS:	21.6
	DEVICE HOURS:	45000	FAILS:	0

Only data from Operating Life or similar stresses are used for this calculation.

The parameters used to calculate this failure rate are as follows:

Cf: 60% Ea: 0.7 B: 0 Tu: 25 °C Vu: 5.5 Volts

The reliability data follows. At the start of this data is the device information. This is a description of the device for this report. Following this is the assembly information. This section includes a description of the assembly vehicle used to generate this reliability data for both qualifications and monitors. The next section is the detailed reliability data for each stress found in the qualification / monitor. If there are additional assemblies used as part of this report, a description of each will follow which includes the respective reliability data for that assembly. The reliability data section includes the latest data available.

Device Information:

Device: DS3234
Process: E6E-2P2M,HPVt,EPROM,LV-NRDSD,PF ALOCOS:GOI
Passivation: Passivation w/Nov TEOS Oxide-OxyNitride
Die Size: 102 x 141
Number of Transistors: 0
Interconnect: Aluminum / 1% Silicon / 0.5% Copper
Gate Oxide Thickness: 150 Å

Assembly Information:

Qualification Vehicle: DS3234
Assembly Site: CIRTEK
Pin Count: 20
Package Type: SOIC Welded Crystal (RoHS)
Body Size: 300x2.3
Mold Compound: Sumitomo G600
Lead Frame: Etched Copper CDA194 & welded With Oscilent crystal onl
Lead Finish: Sn Plate 100% Matte (With Anneal Bake)
Die Attach: 84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size: Au / 1.0 mil
Theta JA:
Theta JC:
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A): Level 1
Date Code Range: 0601 to 0601

ELECTRICAL CHARACTERIZATION

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
ESD SENSITIVITY	0601	EOS/ESD S5.1 HBM 500 VOLTS	1 PUL'S	3	0	

ESD SENSITIVITY	0601	EOS/ESD S5.1 HBM 1000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0601	EOS/ESD S5.1 HBM 2000 VOLTS	1	PUL'S	3	0	
ESD SENSITIVITY	0601	EOS/ESD S5.1 HBM 3000 VOLTS	1	PUL'S	3	2	No FA
ESD SENSITIVITY	0601	EOS/ESD S5.1 HBM 4000 VOLTS	1	PUL'S	3	3	No FA
LATCH-UP	0601	JESD78, I-TEST 125C			6	0	
LATCH-UP	0601	JESD78, V-SUPPLY TEST 125C			6	0	
Total:					5		

MOISTURE SENSITIVITY LEVEL 1

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
ULTRASOUND	0601	J-STD-020		22	0	
STORAGE LIFE		125C	24 HRS	22		
MOISTURE SOAK		85 C/85% R.H.	168 HRS	22		
CONVECTION REFLOW		260C +/-5C	2 PASS	22	0	
X-RAY		MIL-STD-883-2012 : TOP & SIDE VIEW		22	0	
EXTERNAL VISUAL		J-STD-020, 6.1a		22	0	
PRECONDITION U/S		J-STD-020		22	0	
Total:					0	

OPERATING LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
HIGH TEMP OP LIFE	0601	125C, 5.5 VOLTS	1000 HRS	45	0	
Total:					0	

PACKAGE TESTS

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
SOLDERABILITY (Pb-Free)	0601	JESD22-B102, COND C		6	0	
SOLDERABILITY (Sn/Pb)		JESD22-B102, COND C		6	0	
X-RAY	0601	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS		JESD22-B100		6	0	
MARK PERMANENCY		JESD22-B107		6	0	
LEAD INTEGRITY		JESD22-B105, COND B		6	0	
Total:					0	

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0601	125C	24 HRS	353		
MOISTURE SOAK		85 C/85% R.H.	168 HRS	353		
CONVECTION REFLOW		260C +/-5C	2 PASS	353	0	
Total:					0	

STORAGE LIFE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0601	125C	1000 HRS	77	0	
Total:					0	

TEMPERATURE CYCLE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
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TEMP CYCLE	0601	-40 TO 85C	1000 CYS	77	0
			Total:		0

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
BIASED MOISTURE	0601	85/85, 5.5 VOLTS	1000 HRS	45	0	
			Total:		0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE CODE	CONDITION	READPOINT	QTY	FAILS	FA#
AUTOCLAVE	0601	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
			Total:		0	

FAILURE RATE:	MTTF (YRS):	5288	FITS:	21.6
	DEVICE HOURS:	45000	FAILS:	0

Appendix B: Cirtek (Philippines) 28L WSOIC (300-mil) Hybrid Lead-Free Package Qualification

☒ Qualification
☐ Evaluation

Report#: R090132FQ
Date: 3/20/09

MAXIM RELIABILITY QUALIFICATION REPORT

SUBJECT

Cirtek (Philippines) 28L WSOIC (300-mil) Hybrid Lead-Free Package Qualification.

PURPOSE

Qualify assembler Cirtek to build 28L WSOIC (300-mil) hybrid package with lead-free plating process. This package is made with 100% Matte Tin plating, copper alloy leadframe, Sumitomo G600 molding compound, silver-filled epoxy die attach from vendor Ablestik (84-1LMISR4), and 1.0 mil diameter gold bond wire. MAX3535ECWI+ in 28L WSOIC lead-free package was used as a test vehicle.

CONCLUSION

All qualification lots assembled at Cirtek have passed Maxim reliability requirements. In addition, the package has completed moisture level 1 testing per JEDEC J-STD-020D and solder reflow at 260°C peak temperature. Therefore, assembler Cirtek is qualified to build 28L WSOIC hybrid lead-free package.



SAMPLE DESCRIPTIONS

Table 1.

REL#:	R090132A	PROCESS:	B8EIFW
DEVICE:	MAX3535ECWI+	LOT#:	8QL0ADKQ1
DIE TYPE:	RT47W=RT45Z+RT46Z	TOP MARK:	Q1
PACKAGE:	28L WSOIC	DATE CODE:	0828
REL#:	R090132B	PROCESS:	B8EIFW
DEVICE:	MAX3535ECWI+	LOT#:	8QL0ADKQ2
DIE TYPE:	RT47W=RT45Z+RT46Z	TOP MARK:	Q2
PACKAGE:	28L WSOIC	DATE CODE:	0828
REL#:	R090132C	PROCESS:	B8EIFW
DEVICE:	MAX3535ECWI+	LOT#:	8QL0ADKQ3
DIE TYPE:	RT47W=RT45Z+RT46Z	TOP MARK:	Q3
PACKAGE:	28L WSOIC	DATE CODE:	0828

TEST RESULT

See Table 3 for details.

 Alex Arreola SMTS, Reliability Engineer	 Ping Lin Director, Reliability
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DISCUSSION

I. Failure Rate Calculation

Based on the 1000 hours 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. This is an acceptable failure rate.

II. Qualification Requirements/Acceptance Criteria

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

Table 2.

Stress Test	Test Condition	Sampling Plan
Life Test	135°C, 1000 hours	0/45
Convection Solder Reflow *1	260°C, 3X	0/250
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
Wire Bond Pull	5 grams minimum	0/200 wires
Solder Shock	260°C, 10 seconds	0/15
Resistance to Soldering Heat	300°C, 10 seconds	0/15
Physical Dimensions	Per specification	0/15
Solderability	245°C, 8 hours steam aging	0/15
Solderability (Backward Compatibility)	215°C, 8 hours steam aging	0/15
Plating Thickness	400 u-inch minimum	0/10

Note: *1. Level 1 soak (168hrs of 85°C/85% R.H.) 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 assembled at Cirtek. All lots in 28L WSOIC package with lead-free plating process have passed Maxim reliability requirements as well as JEDEC J-STD-020D moisture sensitivity level 1 requirements with zero failures. This package is considered non-moisture sensitive and does not require dry-pack.

SUMMARY

All qualification lots have shown good reliability performance. Therefore, assembler Cirtek (Philippines) is qualified to build 28L WSOIC (300-mil) hybrid lead-free package.

TEST RESULTS/ LOT INFORMATION:
Table 3.

TEST	REL#: R090132A	REL#: R090132B	REL#: R090132C
	DEVICE: MAX3535ECWI+	DEVICE: MAX3535ECWI+	DEVICE: MAX3535ECWI+
	DIE: RT47W	DIE: RT47W	DIE: RT47W
	LOT# 8QL0ADKQ1	LOT# 8QL0ADKQ2	LOT# 8QL0ADKQ3
	D/C: 0828	D/C: 0828	D/C: 0828
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
WIRE BOND PULL	0/200 wires	0/200 wires	0/200 wires
SOLDER SHOCK	0/15	0/15	0/15
RESIST SOLDER HEAT	0/15	0/15	0/15
PHYSICAL DIMENSIONS	0/15	0/15	0/15
SOLDERABILITY (245°C)	0/15	0/15	0/15
SOLDERABILITY (215°C)	0/15	0/15	0/15
PLATING THICKNESS	0/10	0/10	0/10

Note: *1 – MSL 1 (168hrs of 85°C/85% R.H.) is used as preconditioning.
*2 – Convection Reflow at 260°C peak temperature is used as preconditioning.

Appendix C: Package Reliability Report for Cirtek, 16L SOIC w/ Crystal, 300 Mil, RoHS



9/12/2005

PACKAGE RELIABILITY REPORT
FOR

Cirtek, 16L SOIC w/Crystal, 300 Mil, RoHS

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Conclusion

The following qualification successfully meets the quality and reliability standards required of all Dallas Semiconductor packages:

Cirtek, 16L SOIC w/Crystal, 300 Mil, RoHS

In addition, Dallas Semiconductor's continuous reliability monitor program ensures that all outgoing assemblies will continue to meet Maxim's quality and reliability standards. The current status of the reliability monitor program can be viewed at <http://www.maxim-ic.com/TechSupport/dsreliability.html>.

Package Description:

A description of this assembly can be found in the product data sheet. You can find the product data sheet at http://dbserv.maxim-ic.com/l_datasheet3.cfm.

Reliability Derating:

The Arrhenius model will be used to determine the acceleration factor for failure mechanisms that are temperature accelerated.

$AfT = \exp((Ea/k) * (1/Tu - 1/Ts)) = tu/ts$
AfT = Acceleration factor due to Temperature
tu = Time at use temperature (e.g. 55°C)
ts = Time at stress temperature (e.g. 125°C)
k = Boltzmann's Constant (8.617×10^{-5} eV/°K)
Tu = Temperature at Use (°K)
Ts = Temperature at Stress (°K)
Ea = Activation Energy (e.g. 0.7 eV)

The activation energy of the failure mechanism is derived from either internal studies or industry accepted standards, or activation energy of 0.7eV will be used whenever actual failure mechanisms or their activation energies are unknown. All deratings will be done from the stress ambient temperature to the use ambient temperature.

An exponential model will be used to determine the acceleration factor for failure mechanisms, which are voltage accelerated.

$AfV = \exp(B * (Vs - Vu))$
AfV = Acceleration factor due to Voltage
Vs = Stress Voltage (e.g. 7.0 volts)
Vu = Maximum Operating Voltage (e.g. 5.5 volts)
B = Constant related to failure mechanism type (e.g. 1.0, 2.4, 2.7, etc.)

The Constant, B, related to the failure mechanism is derived from either internal studies or industry accepted standards, or a B of 1.0 will be used whenever actual failure mechanisms or their B are unknown. All deratings will be done from the stress voltage to the maximum operating voltage. Failure rate data from the operating life test is reported using a Chi-Squared statistical model at the 60% or 90% confidence level (Cf).

The failure rate, Fr, is related to the acceleration during life test by:

$Fr = X / (ts * AfV * AfT * N * 2)$
X = Chi-Sq statistical upper limit
N = Life test sample size

Failure Rates are reported in FITs (Failures in Time) or MTTF (Mean Time To Failure). The FIT rate is related to MTTF by:

$$MTTF = 1/Fr$$

NOTE: MTTF is frequently used interchangeably with MTBF.

The calculated failure rate for this device/process is:

FAILURE RATE: MTTF (YRS): 15863 FITS: 7.2

The parameters used to calculate this failure rate are as follows:

Cf: 60% Ea: 0.7 B: 0 Tu: 25 °C Vu: 5.5 Volt

The reliability data follows. Some of the data in this report may be generic. At the start of this data is a description of the assembly vehicle used to generate this reliability data. The next section is the detailed reliability data for each stress. If there are additional assemblies used as part of this report, a description of each will follow which includes the respective reliability data for that assembly. Where appropriate, preconditioning is performed before all stresses and the bond crater test unless otherwise noted. The reliability data section includes the latest data available.

Assembly Information:

Assembly Site: CIRTEK
Pin Count: 16
Package Type: SOIC w/Welded Crystal (RoHS)
Body Size: 300x2.3
Mold Compound: Sumitomo G600
Lead Frame: Etched Copper CDA194
Lead Finish: Sn Plate 100% Matte (With Anneal Bake)
Die Attach: 84-1 LMISR4 Epoxy Silverfilled Ablebond
Bond Wire / Size: Au / 1.0 mil
Flammability: UL 94-V0
Theta JA:
Theta JC:
Moisture Sensitivity (JEDEC J-STD20A) Level 1
Date Code Range: 0520 to 0520

CONSTRUCTION ANALYSIS

DESCRIPTION	DATE COD	CONDITION	READPOINT	QTY	FAILS	FA#
PACKAGE, ASSEMBLY PROCESS	0520	PERFORMED BY ASSEMBLY SITE		5	0	
Total:					0	

MOISTURE SENSITIVITY LEVEL 1

DESCRIPTION	DATE COD	CONDITION	READPOINT	QTY	FAILS	FA#
ULTRASOUND	0520	J-STD-020		44	0	
STORAGE LIFE		125C	24 HRS	44		
MOISTURE SOAK		85 C/85% R.H.	168 HRS	44		
CONVECTION REFLOW		280C +/-5C	2 PASS	44	0	
X-RAY		MIL-STD-883-2012 : TOP & SIDE VIEW		44	0	
EXTERNAL VISUAL		J-STD-020, 6.1a		44	0	
PRECONDITION U/S		J-STD-020		44	0	
ULTRASOUND	0520	J-STD-020		44	0	
STORAGE LIFE		125C	24 HRS	44		

MOISTURE SOAK	0520	85 C/85% R.H.	168	HRS	44	
CONVECTION REFLOW		260C +/-5C	2	PASS	44	0
X-RAY		MIL-STD-883-2012 : TOP & SIDE VIEW			44	0
EXTERNAL VISUAL		J-STD-020, 6.1a			44	0
PRECONDITION U/S		J-STD-020			44	0
ULTRASOUND	0520	J-STD-020			44	0
STORAGE LIFE		125C	24	HRS	44	
MOISTURE SOAK		85 C/85% R.H.	168	HRS	44	
CONVECTION REFLOW		260C +/-5C	2	PASS	44	0
X-RAY		MIL-STD-883-2012 : TOP & SIDE VIEW			44	0
EXTERNAL VISUAL		J-STD-020, 6.1a			44	0
PRECONDITION U/S		J-STD-020			44	0
Total:					0	

OPERATING LIFE

DESCRIPTION	DATE COD	CONDITION	READPOINT	QTY	FAILS	FA#
HIGH TEMP OP LIFE	0520	125C, 5.5 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0520	125C, 5.5 VOLTS	1000 HRS	45	0	
HIGH TEMP OP LIFE	0520	125C, 5.5 VOLTS	1000 HRS	45	0	
Total:					0	

PACKAGE TESTS

DESCRIPTION	DATE COD	CONDITION	READPOINT	QTY	FAILS	FA#
SOLDERABILITY (Pb-Free)	0520	JESD22-B102, COND C		3	0	
X-RAY	0520	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS		JESD22-B100		6	0	
MARK PERMANENCY		JESD22-B107		6	0	
LEAD INTEGRITY		JESD22-B105, COND B		6	0	
X-RAY	0520	MIL-STD-883-2012 : TOP & SIDE VIEW		397	0	
SOLDERABILITY (Pb-Free)	0520	JESD22-B102, COND C		3	0	
X-RAY	0520	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS		JESD22-B100		6	0	
MARK PERMANENCY		JESD22-B107		6	0	
LEAD INTEGRITY		JESD22-B105, COND B		6	0	
X-RAY	0520	MIL-STD-883-2012 : TOP & SIDE VIEW		397	0	
SOLDERABILITY (Pb-Free)	0520	JESD22-B102, COND C		3	0	
X-RAY	0520	MIL-STD-883-2012 : TOP & SIDE VIEW		6	0	
PHYSICAL DIMENSIONS		JESD22-B100		6	0	
MARK PERMANENCY		JESD22-B107		6	0	
LEAD INTEGRITY		JESD22-B105, COND B		6	0	
X-RAY	0520	MIL-STD-883-2012 : TOP & SIDE VIEW		397	0	
Total:					0	

PRECONDITIONING LEVEL 1

DESCRIPTION	DATE COD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0520	125C	24 HRS	353		

MOISTURE SOAK	0520	85 C/85% R.H.	168	HRS	353		
CONVECTION REFLOW		260C +/-5C	2	PASS	353	0	
X-RAY		MIL-STD-883-2012 : TOP & SIDE VIEW			353	0	
STORAGE LIFE	0520	125C	24	HRS	353		
MOISTURE SOAK		85 C/85% R.H.	168	HRS	353		
CONVECTION REFLOW		260C +/-5C	2	PASS	353	0	
X-RAY		MIL-STD-883-2012 : TOP & SIDE VIEW			353	0	
STORAGE LIFE	0520	125C	24	HRS	353		
MOISTURE SOAK		85 C/85% R.H.	168	HRS	353		
CONVECTION REFLOW		260C +/-5C	2	PASS	353	0	
X-RAY		MIL-STD-883-2012 : TOP & SIDE VIEW			353	0	
Total:						0	

STORAGE LIFE

DESCRIPTION	DATE COD	CONDITION	READPOINT	QTY	FAILS	FA#
STORAGE LIFE	0520	125C	1000 HRS	77	0	
STORAGE LIFE	0520	125C	1000 HRS	77	0	
STORAGE LIFE	0520	125C	1000 HRS	77	0	
Total:					0	

TEMPERATURE CYCLE

DESCRIPTION	DATE COD	CONDITION	READPOINT	QTY	FAILS	FA#
TEMP CYCLE	0520	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0520	-40 TO 85C	1000 CYS	77	0	
TEMP CYCLE	0520	-40 TO 85C	1000 CYS	77	0	
Total:					0	

TEMPERATURE HUMIDITY BIAS

DESCRIPTION	DATE COD	CONDITION	READPOINT	QTY	FAILS	FA#
BIASED MOISTURE	0520	85/85, 5.5 VOLTS	1000 HRS	77	0	
BIASED MOISTURE	0520	85/85, 5.5 VOLTS	1000 HRS	77	0	
BIASED MOISTURE	0520	85/85, 5.5 VOLTS	1000 HRS	77	0	
Total:					0	

UNBIASED MOISTURE RESISTANCE

DESCRIPTION	DATE COD	CONDITION	READPOINT	QTY	FAILS	FA#
AUTOCLAVE	0520	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0520	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
AUTOCLAVE	0520	121C, 2 ATM STEAM, UNBIASED	168 HRS	77	0	
Total:					0	

FAILURE RATE: MTF (YRS): 15863 FITS: 7.2

Material Set Change:

Assembly Site	Amkor Philippines	Cirtek
Wire	1.2 Au	1.2 Au
Die Attach	Ablestik 84-1LMISR4	Ablestik 84-1LMISR4
Mold Compound	Sumitomo G600	Sumitomo G600
Plating	100% Matte Sn	100% Matte Sn