

RELIABILITY MONITOR REPORT
FOR

SOIC Package

Dallas Semiconductor

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This Report was prepared by
Dallas Semiconductor Reliability Engineering

Summary:

The data in the tables that follow was generated as the result of an on-going Package Reliability Monitor. The assemblies covered by this package monitor are:

| ASSY SITE | PINS | PACKAGE | | |
|----------------------|------|---------------------------------|----------------------|------------------------------------|
| ATK (Amkor, K) | 14 | SOIC | ATK (Amkor, K) | 16 SOIC |
| ATK (Amkor, K) | 20 | SOIC | ATK (Amkor, K) | 24 SOIC |
| ATK (Amkor, K) | 28 | SOIC | ATK (Amkor, K) | 8 SOIC |
| ATP (Amkor, PI) | 14 | SOIC | ATP (Amkor, PI) | 16 SOIC |
| ATP (Amkor, PI) | 20 | SOIC | ATP (Amkor, PI) | 24 SOIC |
| ATP (Amkor, PI) | 28 | SOIC | ATP (Amkor, PI) | 8 SOIC |
| ATP (Amkor, PI) | 14 | SOIC (Pb-Free) | ATP (Amkor, PI) | 16 SOIC (Pb-Free) |
| ATP (Amkor, PI) | 20 | SOIC (Pb-Free) | ATP (Amkor, PI) | 24 SOIC (Pb-Free) |
| ATP (Amkor, PI) | 28 | SOIC (Pb-Free) | ATP (Amkor, PI) | 8 SOIC (Pb-Free) |
| ATP (Amkor, PI) | 16 | SOIC w/CRYSTAL | Brilliance Semicondu | 28 SOIC |
| Brilliance Semicondu | 32 | SOIC | Brilliance Semicondu | 32 SOIC (Pb-Free) |
| Carsem | 14 | SOIC | Carsem | 16 SOIC |
| Carsem | 20 | SOIC | Carsem | 24 SOIC |
| Carsem | 28 | SOIC | Carsem | 8 SOIC |
| Carsem | 14 | SOIC (Pb-Free) | Carsem | 16 SOIC (Pb-Free) |
| Carsem | 20 | SOIC (Pb-Free) | Carsem | 24 SOIC (Pb-Free) |
| Carsem | 28 | SOIC (Pb-Free) | Carsem | 8 SOIC (Pb-Free) |
| CIRTEK | 16 | SOIC | CIRTEK | 16 SOIC (Pb-Free) |
| CIRTEK | 16 | SOIC w/Welded Crystal (Pb-Free) | CIRTEK | 20 SOIC w/Welded Crystal (Pb-Free) |
| CSPI (Cypress) | 28 | SOIC | Cypress | 28 SOIC |
| Cypress | 32 | SOIC | Hana | 8 SOIC |
| Hana | 8 | SOIC (Pb-Free) | Hana | 16 SOIC w/Welded Crystal (Pb-Free) |
| Hitachi | 28 | SOIC | Hyundai | 32 SOIC |
| Mitsubishi | 28 | SOIC | Mitsubishi | 32 SOIC |
| OSEP | 14 | SOIC | OSEP | 16 SOIC |
| OSEP | 20 | SOIC | OSEP | 24 SOIC |
| OSEP | 28 | SOIC | OSEP | 8 SOIC |
| OSEP | 14 | SOIC (Pb-Free) | OSEP | 16 SOIC (Pb-Free) |
| OSEP | 20 | SOIC (Pb-Free) | OSEP | 24 SOIC (Pb-Free) |
| OSEP | 28 | SOIC (Pb-Free) | OSEP | 8 SOIC (Pb-Free) |
| Samsung | 32 | SOIC | Sharp | 28 SOIC |
| Taiwan | 32 | SOIC | Unisem | 8 SOIC |
| Unisem | 8 | SOIC (Pb-Free) | UTL (NSEB) UTAC | 14 SOIC |
| UTL (NSEB) UTAC | 16 | SOIC | UTL (NSEB) UTAC | 8 SOIC |
| UTL (NSEB) UTAC | 14 | SOIC (Pb-Free) | UTL (NSEB) UTAC | 16 SOIC (Pb-Free) |
| UTL (NSEB) UTAC | 8 | SOIC (Pb-Free) | ZMD | 28 SOIC |

The calculated failure rate for this assembly is:

FAILURE RATE: MTTF (YRS): 213479 FITS: 0.5

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. A 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. The reliability data section includes the latest data available. This report covers data between 10/1/2005 and 9/30/2006

Assembly Information:

Package Type: SOIC 150x1.4
 Flammability: UL 94-V0

Moisture Sensitivity
(JEDEC J-STD20A)

Level 1

Date Code Range: 0536 to 0632

OPERATING LIFE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------|-----------|--------------|------------------|-----------|----------|----------|-------|
| HIGH TEMP OP LIFE | 0536 | DS1232 | 125C, 5.5 VOLTS | 1000 HRS | 80 | 0 | |
| HIGH TEMP OP LIFE | 0541 | DS1388 | 125C, 5.5 VOLTS | 1000 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0545 | DS1672 | 125C, 3.6 VOLTS | 1000 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0547 | DS2431 | 125C, 5.25 VOLTS | 1000 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0550 | DS1803 | 125C, 5.25 VOLTS | 1000 HRS | 80 | 0 | |
| HIGH TEMP OP LIFE | 0627 | DS2431 | 125C, 5.25 VOLTS | 1000 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0629 | DS620 | 125C, 3.5 VOLTS | 1000 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0629 | DS2431 | 125C, 5.25 VOLTS | 1000 HRS | 76 | 0 | |
| HIGH TEMP OP LIFE | 0632 | DS2431 | 125C, 5.25 VOLTS | 1000 HRS | 77 | 0 | |
| Total: | | | | | | 0 | |

PRECONDITIONING LEVEL 1

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------|-----------|--------------|---------------|-----------|----------|----------|-------|
| ULTRASOUND | 0536 | DS1232 | J-STD-020 | | 4 | 0 | |
| STORAGE LIFE | 0536 | DS1232 | 125C | 24 HRS | 241 | | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 HRS | 241 | | |
| CONVECTION REFLOW | | | 235C +5/-0C | 3 PASS | 241 | 0 | |
| PRECONDITION U/S | 0536 | DS1232 | J-STD-020 | | 4 | 0 | |
| ULTRASOUND | 0550 | DS1803 | J-STD-020 | | 4 | 0 | |
| STORAGE LIFE | 0550 | DS1803 | 125C | 24 HRS | 241 | | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 HRS | 241 | | |
| CONVECTION REFLOW | | | 235C +5/-0C | 3 PASS | 241 | 0 | |
| PRECONDITION U/S | 0550 | DS1803 | J-STD-020 | | 4 | 0 | |
| Total: | | | | | | 0 | |

TEMPERATURE CYCLE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|-----------|--------------|--------------|-----------|----------|----------|-------|
| TEMP CYCLE | 0536 | DS1232 | -55C TO 125C | 1000 CYS | 40 | 0 | |
| TEMP CYCLE | 0547 | DS2431 | -55C TO 125C | 1000 CYS | 77 | 0 | |
| TEMP CYCLE | 0550 | DS1803 | -55C TO 125C | 1000 CYS | 40 | 0 | |
| TEMP CYCLE | 0627 | DS2431 | -55C TO 125C | 1000 CYS | 77 | 0 | |
| TEMP CYCLE | 0629 | DS2431 | -55C TO 125C | 1000 CYS | 76 | 0 | |
| TEMP CYCLE | 0632 | DS2431 | -55C TO 125C | 1000 CYS | 77 | 0 | |
| Total: | | | | | | 0 | |

TEMPERATURE HUMIDITY BIAS

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------|-----------|--------------|-----------|-----------|----------|-------|-------|
|-------------|-----------|--------------|-----------|-----------|----------|-------|-------|

| | | | | | | | | |
|-----------------|------|--------|--------------------|------|-----|----|----------|--|
| HAST | 0536 | DS1232 | 130C, 85%R.H.,5.5V | 96 | HRS | 77 | 0 | |
| HAST | 0547 | DS2431 | 130C, 85%R.H.,5.5V | 96 | HRS | 72 | 0 | |
| BIASED MOISTURE | 0550 | DS1803 | 85/85, 5.5 VOLTS | 1000 | HRS | 77 | 0 | |
| HAST | 0627 | DS2431 | 130C, 85%R.H.,5.5V | 96 | HRS | 77 | 0 | |
| HAST | 0629 | DS2431 | 130C, 85%R.H.,5.5V | 96 | HRS | 76 | 0 | |
| HAST | 0632 | DS2431 | 130C, 85%R.H.,5.5V | 96 | HRS | 77 | 0 | |
| Total: | | | | | | | 0 | |

UNBIASED MOISTURE RESISTANCE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO | |
|---------------|-----------|--------------|-----------------------------|-----------|----------|-------|----------|--|
| AUTOCLAVE | 0536 | DS1232 | 121C, 2 ATM STEAM, UNBIASED | 96 | HRS | 40 | 0 | |
| AUTOCLAVE | 0547 | DS2431 | 121C, 2 ATM STEAM, UNBIASED | 168 | HRS | 77 | 0 | |
| AUTOCLAVE | 0550 | DS1803 | 121C, 2 ATM STEAM, UNBIASED | 168 | HRS | 40 | 0 | |
| AUTOCLAVE | 0627 | DS2431 | 121C, 2 ATM STEAM, UNBIASED | 168 | HRS | 77 | 0 | |
| AUTOCLAVE | 0629 | DS2431 | 121C, 2 ATM STEAM, UNBIASED | 168 | HRS | 76 | 0 | |
| AUTOCLAVE | 0632 | DS2431 | 121C, 2 ATM STEAM, UNBIASED | 168 | HRS | 77 | 0 | |
| Total: | | | | | | | 0 | |

Assembly Information:

Package Type: SOIC 208x1.9
 Flammability: UL 94-V0
 Moisture Sensitivity (JEDEC J-STD20A) Level 1
 Date Code Range: 0606 to 0606

OPERATING LIFE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------|-----------|--------------|-----------------|-----------|----------|-------|----------|
| HIGH TEMP OP LIFE | 0606 | DS1821 | 125C, 5.5 VOLTS | 1000 | HRS | 77 | 0 |
| Total: | | | | | | | 0 |

TEMPERATURE CYCLE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|-----------|--------------|--------------|-----------|----------|-------|----------|
| TEMP CYCLE | 0606 | DS1821 | -55C TO 125C | 1000 | CYS | 77 | 0 |
| Total: | | | | | | | 0 |

TEMPERATURE HUMIDITY BIAS

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-----------------|-----------|--------------|------------------|-----------|----------|-------|----------|
| BIASED MOISTURE | 0606 | DS1821 | 85/85, 5.5 VOLTS | 1000 | HRS | 77 | 0 |
| Total: | | | | | | | 0 |

UNBIASED MOISTURE RESISTANCE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|-----------|--------------|-----------------------------|-----------|----------|-------|----------|
| AUTOCLAVE | 0606 | DS1821 | 121C, 2 ATM STEAM, UNBIASED | 168 | HRS | 77 | 0 |
| Total: | | | | | | | 0 |

Assembly Information:

Package Type: SOIC 300x2.3
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 1
Date Code Range: 0549 to 0614

OPERATING LIFE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------|-----------|--------------|-------------------------------|-----------|----------|----------|-------|
| HIGH TEMP OP LIFE | 0549 | DS2422 | 125C, 5.5V (PSA) & 3.0V (PSB) | 1000 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0614 | DS1205 | 125C, 5.5 VOLTS | 1000 HRS | 77 | 0 | |
| Total: | | | | | | 0 | |

TEMPERATURE CYCLE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|-----------|--------------|--------------|-----------|----------|----------|-------|
| TEMP CYCLE | 0614 | DS1205 | -55C TO 125C | 1000 CYS | 77 | 0 | |
| Total: | | | | | | 0 | |

TEMPERATURE HUMIDITY BIAS

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-----------------|-----------|--------------|------------------|-----------|----------|----------|-------|
| BIASED MOISTURE | 0614 | DS1205 | 85/85, 5.5 VOLTS | 1000 HRS | 77 | 0 | |
| Total: | | | | | | 0 | |

UNBIASED MOISTURE RESISTANCE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|-----------|--------------|-----------------------------|-----------|----------|----------|-------|
| AUTOCLAVE | 0614 | DS1205 | 121C, 2 ATM STEAM, UNBIASED | 168 HRS | 77 | 0 | |
| Total: | | | | | | 0 | |

Assembly Information:

Package Type: SOIC (Pb-Free) 150x1.4
Flammability: UL 94-V0
Moisture Sensitivity (JEDEC J-STD20A) Level 1
Date Code Range: 0536 to 0633

OPERATING LIFE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------|-----------|--------------|---|-----------|----------|-------|-------|
| HIGH TEMP OP LIFE | 0536 | DS1077L | 125C, 3.6 VOLTS | 1000 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0550 | DS1337 | 125C, 5.5 VOLTS | 1000 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0552 | DS1881 | 125C, +5.5V (PSA), +5.5V (PSD) | 192 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0606 | DS25LV02 | 125C, 5.5 VOLTS | 1000 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0606 | DS75LV | 125C, 3.7 VOLTS | 1000 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0623 | DS1882 | 125C, 5.5V (PSA), -7.0V (PSC) & +7.0V (PSD) | 1000 HRS | 77 | 0 | |
| HIGH TEMP OP LIFE | 0624 | DS28CM00 | 125C, 5.25 VOLTS | 1000 HRS | 45 | 0 | |

| | | | | | | |
|-------------------|------|--------|-----------------|----------|----|----------|
| HIGH TEMP OP LIFE | 0625 | DS1805 | 125C, 5.5 VOLTS | 1000 HRS | 45 | 0 |
| HIGH TEMP OP LIFE | 0628 | DS1232 | 125C, 5.5 VOLTS | 1000 HRS | 77 | 0 |
| HIGH TEMP OP LIFE | 0630 | DS1805 | 125C, 5.5 VOLTS | 1000 HRS | 77 | 0 |
| HIGH TEMP OP LIFE | 0633 | DS1804 | 125C, 5.5 VOLTS | 1000 HRS | 77 | 0 |
| Total: | | | | | | 0 |

PACKAGE TESTS

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------------|-----------|--------------|------------------------------------|-----------|----------|----------|-------|
| SOLDERABILITY (Sn/Pb) | 0625 | DS1805 | JESD22-B102, COND C | | 3 | 0 | |
| SOLDERABILITY (Pb-Free) | | | JESD22-B102, COND C | | 3 | 0 | |
| X-RAY | 0625 | DS1805 | 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 | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------|-----------|--------------|---------------|-----------|----------|----------|-------|
| STORAGE LIFE | 0536 | DS1077L | 125C | 24 HRS | 385 | | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 HRS | 385 | | |
| CONVECTION REFLOW | | | 260C +/-5C | 3 PASS | 385 | 0 | |
| STORAGE LIFE | 0625 | DS1805 | 125C | 24 HRS | 321 | | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 HRS | 321 | | |
| CONVECTION REFLOW | | | 260C +/-5C | 3 PASS | 321 | 0 | |
| STORAGE LIFE | 0628 | DS1232 | 125C | 48 HRS | 231 | | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 HRS | 231 | | |
| CONVECTION REFLOW | | | 260C +/-5C | 3 PASS | 231 | 0 | |
| Total: | | | | | | 0 | |

STORAGE LIFE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|-----------|--------------|-----------|-----------|----------|----------|-------|
| STORAGE LIFE | 0536 | DS1077L | 150C | 1000 HRS | 77 | 0 | |
| STORAGE LIFE | 0606 | DS25LV02 | 150C | 1000 HRS | 77 | 0 | |
| STORAGE LIFE | 0625 | DS1805 | 150C | 1000 HRS | 77 | 0 | |
| Total: | | | | | | 0 | |

TEMPERATURE CYCLE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|-----------|--------------|--------------|-----------|----------|----------|-------|
| TEMP CYCLE | 0536 | DS1077L | -55C TO 125C | 1000 CYS | 77 | 0 | |
| TEMP CYCLE | 0625 | DS1805 | -55C TO 125C | 1000 CYS | 77 | 0 | |
| TEMP CYCLE | 0628 | DS1232 | -55C TO 125C | 1000 CYS | 77 | 0 | |
| Total: | | | | | | 0 | |

TEMPERATURE HUMIDITY BIAS

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------|-----------|--------------|--------------------|-----------|----------|-------|-------|
| HAST | 0536 | DS1077L | 130C, 85%R.H.,3.5V | 96 HRS | 77 | 0 | |

| | | | | | | | |
|-----------------|------|--------|--------------------|------|-----|----|----------|
| BIASED MOISTURE | 0625 | DS1805 | 85/85, 5.5 VOLTS | 1000 | HRS | 45 | 0 |
| HAST | 0628 | DS1232 | 130C, 85%R.H.,5.5V | 96 | HRS | 77 | 0 |
| Total: | | | | | | | 0 |

UNBIASED MOISTURE RESISTANCE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|-----------|--------------|-----------------------------|-----------|----------|-------|----------|
| AUTOCLAVE | 0536 | DS1077L | 121C, 2 ATM STEAM, UNBIASED | 168 | HRS | 77 | 0 |
| AUTOCLAVE | 0625 | DS1805 | 121C, 2 ATM STEAM, UNBIASED | 168 | HRS | 77 | 0 |
| AUTOCLAVE | 0628 | DS1232 | 121C, 2 ATM STEAM, UNBIASED | 168 | HRS | 75 | 0 |
| Total: | | | | | | | 0 |

Assembly Information:

Package Type: SOIC (Pb-Free) 300x2.3
 Flammability: UL 94-V0
 Moisture Sensitivity (JEDEC J-STD20A) Level 1
 Date Code Range: 0604 to 0619

PACKAGE TESTS

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------------|-----------|--------------|----------------------------|-----------|----------|-------|----------|
| SOLDERABILITY (Pb-Free) | 0604 | DS1021 | EIAJ ED-4701, METHOD 303 | | 15 | 0 | |
| SOLDERABILITY (Pb-Free) | 0604 | DS1021 | J-STD-002, WETTING BALANCE | | 20 | | |
| SOLDERABILITY (Pb-Free) | 0619 | DS1021 | EIAJ ED-4701, METHOD 303 | | 15 | 0 | |
| SOLDERABILITY (Pb-Free) | 0619 | DS1021 | J-STD-002, WETTING BALANCE | | 20 | | |
| Total: | | | | | | | 0 |

SOLDER HEAT

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|------------------------------|-----------|--------------|-------------------|-----------|----------|-------|-------|
| ULTRASOUND | 0619 | DS1021 | J-STD-020 | | 22 | 0 | |
| STORAGE LIFE | | | 125C | 24 | HRS | 22 | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 | HRS | 22 | |
| WAVE SOLDERING | | | 260C +/-3C, 3 SEC | 2 | PASS | 22 | 0 |
| EXTERNAL VISUAL | | | J-STD-020, 6.1a | | 22 | 0 | |
| PRECONDITION U/S | | | J-STD-020 | | 22 | 0 | |
| ULTRASOUND | 0619 | DS1021 | J-STD-020 | | 10 | 0 | |
| STORAGE LIFE | | | 125C | 24 | HRS | 10 | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 | HRS | 10 | |
| SOLDER DIP (HEAT RESISTANCE) | | | 380C +/-10C, 3SEC | 2 | PASS | 10 | 0 |
| EXTERNAL VISUAL | | | J-STD-020, 6.1a | | 10 | 0 | |
| PRECONDITION U/S | | | J-STD-020 | | 10 | 0 | |
| ULTRASOUND | 0619 | DS1021 | J-STD-020 | | 22 | 0 | |
| STORAGE LIFE | | | 125C | 24 | HRS | 22 | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 | HRS | 22 | |
| WAVE SOLDERING | | | 260C +/-3C, 3 SEC | 2 | PASS | 22 | 0 |
| EXTERNAL VISUAL | | | J-STD-020, 6.1a | | 22 | 0 | |

| | | | | | | | |
|------------------------------|------|--------|-------------------|-----|------|----------|----------|
| PRECONDITION U/S | 0619 | DS1021 | J-STD-020 | | | 22 | 0 |
| ULTRASOUND | 0619 | DS1021 | J-STD-020 | | | 10 | 0 |
| STORAGE LIFE | | | 125C | 24 | HRS | 10 | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 | HRS | 10 | |
| SOLDER DIP (HEAT RESISTANCE) | | | 380C +/-10C, 3SEC | 2 | PASS | 10 | 0 |
| EXTERNAL VISUAL | | | J-STD-020, 6.1a | | | 10 | 0 |
| PRECONDITION U/S | | | J-STD-020 | | | 10 | 0 |
| Total: | | | | | | 0 | 0 |

Assembly Information:

Package Type: SOIC w/Crystal 300x2.3
 Flammability: UL 94-V0
 Moisture Sensitivity (JEDEC J-STD20A) Level 1
 Date Code Range: 0529 to 0633

MOISTURE SENSITIVITY LEVEL 1

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------|-----------|--------------|------------------------------------|-----------|----------|----------|----------|
| ULTRASOUND | 0529 | DS3232 | 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 |
| ULTRASOUND | 0601 | DS3234 | 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 | 0 |

OPERATING LIFE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------|-----------|--------------|-----------------|-----------|----------|----------|----------|
| HIGH TEMP OP LIFE | 0529 | DS3232 | 125C, 5.5 VOLTS | 1000 | HRS | 45 | 0 |
| HIGH TEMP OP LIFE | 0601 | DS3234 | 125C, 5.5 VOLTS | 1000 | HRS | 45 | 0 |
| HIGH TEMP OP LIFE | 0633 | DS32KHZS | 125C, 5.5 VOLTS | 1000 | HRS | 77 | 0 |
| Total: | | | | | | 0 | 0 |

PACKAGE TESTS

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------------|-----------|--------------|------------------------------------|-----------|----------|-------|-------|
| SOLDERABILITY (Pb-Free) | 0529 | DS3232 | JESD22-B102, COND C | | | 6 | 0 |
| SOLDERABILITY (Sn/Pb) | | | JESD22-B102, COND C | | | 6 | 0 |
| X-RAY | 0529 | DS3232 | 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 |

| | | | | | |
|-------------------------|------|--------|------------------------------------|----------|----------|
| SOLDERABILITY (Pb-Free) | 0601 | DS3234 | JESD22-B102, COND C | 6 | 0 |
| SOLDERABILITY (Sn/Pb) | | | JESD22-B102, COND C | 6 | 0 |
| X-RAY | 0601 | DS3234 | 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 | 0 |

PRECONDITIONING LEVEL 1

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------------|-----------|--------------|---------------|-----------|----------|----------|----------|
| STORAGE LIFE | 0529 | DS3232 | 125C | 24 HRS | 353 | | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 HRS | 353 | | |
| CONVECTION REFLOW | | | 260C +0/-5C | 2 PASS | 353 | 0 | |
| STORAGE LIFE | 0601 | DS3234 | 125C | 24 HRS | 353 | | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 HRS | 353 | | |
| CONVECTION REFLOW | | | 260C +0/-5C | 2 PASS | 353 | 0 | |
| STORAGE LIFE | 0633 | DS32KHZS | 125C | 24 HRS | 231 | | |
| MOISTURE SOAK | | | 85 C/85% R.H. | 168 HRS | 231 | | |
| CONVECTION REFLOW | | | 260C +0/-5C | 2 PASS | 231 | 0 | |
| Total: | | | | | | 0 | 0 |

STORAGE LIFE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|-----------|--------------|-----------|-----------|----------|----------|----------|
| STORAGE LIFE | 0529 | DS3232 | 125C | 1000 HRS | 77 | 0 | |
| STORAGE LIFE | 0601 | DS3234 | 125C | 1000 HRS | 77 | 0 | |
| STORAGE LIFE | 0633 | DS32KHZS | 125C | 1000 HRS | 77 | 0 | |
| Total: | | | | | | 0 | 0 |

TEMPERATURE CYCLE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|---------------|-----------|--------------|------------|-----------|----------|----------|----------|
| TEMP CYCLE | 0529 | DS3232 | -40 TO 85C | 1000 CYS | 77 | 0 | |
| TEMP CYCLE | 0601 | DS3234 | -40 TO 85C | 1000 CYS | 77 | 0 | |
| TEMP CYCLE | 0633 | DS32KHZS | -40 TO 85C | 1000 CYS | 77 | 0 | |
| Total: | | | | | | 0 | 0 |

TEMPERATURE HUMIDITY BIAS

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-----------------|-----------|--------------|------------------|-----------|----------|----------|----------|
| BIASED MOISTURE | 0529 | DS3232 | 85/85, 5.5 VOLTS | 1000 HRS | 77 | 0 | |
| BIASED MOISTURE | 0601 | DS3234 | 85/85, 5.5 VOLTS | 1000 HRS | 45 | 0 | |
| BIASED MOISTURE | 0633 | DS32KHZS | 85/85, 5.5 VOLTS | 1000 HRS | 77 | 0 | |
| Total: | | | | | | 0 | 0 |

UNBIASED MOISTURE RESISTANCE

| DESCRIPTION | DATE CODE | TEST VEHICLE | CONDITION | READPOINT | QUANTITY | FAILS | FA NO |
|-------------|-----------|--------------|-----------------------------|-----------|----------|-------|-------|
| AUTOCLAVE | 0529 | DS3232 | 121C, 2 ATM STEAM, UNBIASED | 168 HRS | 72 | 0 | |

| | | | | | | | |
|-----------|------|----------|-----------------------------|-----|---------------|----|----------|
| AUTOCLAVE | 0601 | DS3234 | 121C, 2 ATM STEAM, UNBIASED | 168 | HRS | 77 | 0 |
| AUTOCLAVE | 0633 | DS32KHZS | 121C, 2 ATM STEAM, UNBIASED | 168 | HRS | 77 | 0 |
| | | | | | Total: | | 0 |

FAILURE RATE: **MTTF (YRS): 213479** **FITS: 0.5**