November 1999

RR-2C

# Surface-Mount Devices Reliability Report

*This report presents reliability data for Maxim's surface-mount devices, including the results of extensive reliability stress tests performed solely on epoxy surface-mount packages since 1995.*



*Maxim's surface-mount packages are subjected to standard reliability tests typically applied to epoxy DIP packages, as well as to a series of stringent solder reflow tests that simulate the worst-case PC board assembly. These reliability tests conform to the JEDEC Standard No. 22 Test Method and Procedures for Solid-State Devices.*

*For surface-mount packages, Maxim uses state-of-the-art packaging materials and processing methods that substantially reduce die surface stress and provide superior moisture resistance. Maxim's surface-mount packages exhibit no degradation after moisture resistance tests or solder reflow simulation, nor do they show any compromise in other reliability performance.*

# Surface-Mount Devices Reliability Report



## Table of Contents

## Introduction

Maxim Integrated Products designs, develops, manufactures, and markets linear and mixed-signal integrated circuits. Products include data converters, interface circuits, microprocessor supervisors, operational amplifiers, power supplies, multiplexers, switches, battery chargers, battery management circuits, RF circuits, fiber optic transceivers, sensors, and voltage references. Maxim Integrated Products is a global company with manufacturing facilities in the United States, testing facilities in the Philippines, and sales offices throughout the world. The company's products are sold to customers in numerous markets, including data processing, telecommunications, networking, industrial control, instrumentation, and military markets.

Maxim offers each product in various package types, including plastic surface-mount packages. These surface-mount packages are processed through the same manufacturing flow as our plastic dual-in-line (DIP) devices, and are tested to the same stringent electrical standard of 100% datasheet parameters and visual AQL (acceptable quality limit) levels.

Maxim has taken a leading-edge position by developing a unique surface-mount packaging system unequaled in product performance and reliability, despite the stresses that occur in typical surface-mount assembly operations.

This report summarizes the reliability data used to substantiate our surface-mount package assembly quality and reliability.

## Quality Assurance Control Policy

### Quality Assurance of Outgoing Product

Every lot shipped, including commercial product, must conform to exceptionally high standards for outgoing product quality. This is accomplished with inspections, as well as with Quality Assurance electrical and visual lot sampling. Our Quality Assurance testing guarantees an AQL of:

0.1% for electrical conformance to data sheet specifications.

0.1% for visually observable packaging defects.

### Quality Control of Measurement and Test Equipment

The accuracy and reliability of our production test equipment directly affects product quality. Maxim's standard procedure for ensuring correct operation and calibration of this equipment includes the following:

1) Daily computer-controlled calibration of production testers using standards traceable to the National Institute of Standards and Technology (NIST)
2) The establishment of KGUs (known good units), and their daily use for verifying production setup

Maxim is compliant to ANSI/NCSL Z540-1 and all ISO 9000 requirements for calibration control.

**TABLE 1. MAXIM SURFACE-MOUNT PACKAGE TYPES**

| PKG. TYPE | DESCRIPTION | LEAD COUNT | MAX WIDTH | MAX LENGTH | THICKNESS | PITCH |
|---|---|---|---|---|---|---|
| NSO | Narrow Small Outline | 8 | 4.0 | 5.0 | 1.50 | 1.27 |
| | | 14 | 4.0 | 8.75 | 1.50 | 1.27 |
| | | 16 | 4.0 | 10.0 | 1.50 | 1.27 |
| | | 28 | 7.6 | 18.1 | 2.35 | 1.27 |
| WSO | Wide Small Outline | 16 | 7.6 | 10.50 | 2.35 | 1.27 |
| | | 18 | 7.6 | 11.75 | 2.35 | 1.27 |
| | | 20 | 7.6 | 13.00 | 2.35 | 1.27 |
| | | 24 | 7.6 | 15.6 | 2.35 | 1.27 |
| | | 28 | 7.6 | 18.1 | 2.35 | 1.27 |
| SSOP | Shrink Small Outline | 14 | 5.38 | 6.33 | 1.78 | 0.65 |
| | | 16 | 5.38 | 6.33 | 1.78 | 0.65 |
| | | 20 | 5.38 | 7.33 | 1.78 | 0.65 |
| | | 24 | 5.38 | 8.33 | 1.78 | 0.65 |
| | | 28 | 5.38 | 10.33 | 1.78 | 0.65 |
| | | 36 | 7.57 | 15.49 | 2.37 | 0.80 |
| | | 44 | 7.57 | 17.98 | 2.37 | 0.80 |
| TSSOP | Thin Shrink Small Outline | 16 | 4.50 | 5.1 | 0.95 | 0.65 |
| | | 20 | 4.50 | 6.6 | 0.95 | 0.65 |
| | | 24 | 4.50 | 7.9 | 0.95 | 0.65 |
| | | 28 | 4.50 | 9.8 | 0.95 | 0.65 |
| QSOP | Quarter Small Outline | 16 | 3.99 | 4.98 | 1.55 | 0.635 |
| | | 20 | 3.99 | 8.74 | 1.55 | 0.635 |
| | | 24 | 3.99 | 8.74 | 1.55 | 0.635 |
| | | 28 | 3.99 | 9.98 | 1.55 | 0.635 |
| PQFP | Quad Flat Pack | 44 | 10.109 | 10.109 | 2.134 | 0.80 |
| µMAX | Maxim µMAX | 8 | 3.05 | 3.05 | 0.91 | 0.635 |
| | | 10 | 3.15 | 3.099 | 0.94 | 0.5 |
| SOT | Small | 3 | 1.397 | 3.048 | 1.067 | 2.032 |
| | | 4 | 1.397 | 3.048 | 1.067 | 2.007 |
| | | 5 | 1.75 | 3.0 | 1.30 | 0.95 |
| | | 6 | 1.75 | 3.0 | 1.30 | 0.95 |
| SC70 | SC70 | 5 | 1.35 | 2.20 | 1.00 | 0.65 |
| TQFP | Thin Quad Flat Pack | 32 | 7.0 | 7.0 | 1.45 | 0.8 |
| | | 48 | 7.0 | 7.0 | 1.45 | 0.5 |
| | | 64 | 10.0 | 10.0 | 1.45 | 0.5 |
| MQFP | Metric Quad Flat Pack | 44 | 10.109 | 10.109 | 2.134 | 0.80 |
| | | 100 | 14.10 | 20.10 | 3.05 | 0.65 |
| PLCC | Plastic Leaded Chip Carrier | 20 | 9.04 | 9.04 | 3.96 | 1.27 |
| | | 28 | 12.57 | 12.57 | 3.96 | 1.27 |
| | | 44 | 17.65 | 17.65 | 3.96 | 1.27 |
| | | 68 | 25.27 | 25.27 | 3.96 | 1.27 |

*Note: All dimensions are in millimeters*

## Maxim Plastic Surface-Mount Package Types

Maxim offers a wide range of plastic surface-mount packages, from the miniature SC70, SOT, µMAX, NSO, and WSO, to the medium to high pin-count SSOP, TSSOP, QSOP, QFP, TQFP, PLCC, BGA, etc. All these surface-mount packages conform to the JEDEC outline (except the µMAX, which is a Maxim proprietary package). Please refer to **Table 1** for available Maxim surface-mount packages.

Customers can select a preferred package type from Table 1. Maxim's surface-mount packages can be shipped in antistatic plastic rails. They are also available in tape-and-reel format for customers using automatic placement systems. The tape is wound and shipped on reels. The tape-and-reel specifications can be found in the EIA (Electronic Industries Association) specification 481-A. Due to the IC device application in the intended end market, not all package types are available for each device. Consult your nearest Maxim representative or factory for your package selection and availability.

## Surface-Mount Package Reliability

Surface-mount packages offer significant advantages over the standard epoxy plastic DIPs: a smaller footprint and lower profile. However, these physical advantages can cause reliability problems, particularly in high-humidity environments. Achieving surface-mount reliability rivaling that of plastic DIPs (especially in harsh, humid environments) requires a unique combination of molding compound formulation and cure time, material expansion coefficients, leadframe composition and processing, and lead finish.

### Effects of Thermal Stress on Surface-Mount Packages

The surface-mounting of SOIC packages subjects them to more stress than does the soldering of through-hole devices. This exposure to high temperature can degrade the package's moisture resistance, due to microcracks created on the molding compound and leadframe interface. In some cases, it can also cause the plastic package to crack (usually at the edge of the die attach pad) from the high-stress-concentration area, and this crack can propagate to the outside of the plastic package. Once a crack is created, corrosive contaminants from flux and solder paste can enter the package.

Subsequent exposure of the device to a humid environment can cause the contaminants to dissolve and flow along the microcracks to the die. The resulting aluminum corrosion can cause premature device failure.

Another reliability concern for surface-mount packages is stress-induced cracking on the die surface when the package is subjected to thermal cycling stress. This includes passivation cracking, dielectric cracking or, in the worst case, die cracking. All these defects can cause a malfunction of the integrated circuit inside the surface-mount package.

Using state-of-the-art materials and processing, Maxim has developed a packaging system that reduces stress to the die surface. This system reduces or eliminates the occurrence of microcracks, package cracks, and stress-induced die cracks, while providing superior moisture resistance. Maxim is constantly looking for improvements in molding compounds, die attach material, and assembly processing, to achieve even better package reliability performance.

## Reliability Methodology

Maxim's surface-mount packages are subjected to the same stringent reliability qualification as DIP products, plus a sequence of stringent solder reflow tests simulating worst-case surface-mount package PC board assembly. **Table 2** lists Maxim's standard reliability tests for our surface-mount packages.

**TABLE 2. SURFACE-MOUNT PACKAGE RELIABILITY TESTS**

| RELIABILITY STRESS TEST | TEST CONDITIONS | SAMPLING PLAN |
|---|---|---|
| High-Temperature Operating Life Test (HTOL) | 135°C, biased, 1000 hrs | 1/77 |
| Biased Temperature and Humidity Test (85/85) | 85°C/85% R.H., biased, 1000 hrs | 1/77 |
| Pressure Pot Test (PP) | 121°C/100% R.H., 15 psig, 168 hrs | 0/77 |
| Highly Accelerated Stress Test (HAST) | 130°C/85% R.H., biased, 100 hrs | 0/45 |
| Temperature Cycling Test (T/C) | -65°C to +150°C, air-to-air, 1000 cycles, 2 cycles/hr | 1/77 |
| High-Temperature Storage Life Test (HTSL) | 150°C ambient, no bias, 1000 hrs | 1/77 |
| Infrared Solder Reflow Test | 235 ±5°C peak 10s, 120s to 180s above 183°C, 3 cycles | 0/150 |
| Solder Shock Test | 260°C/10s | 0/15 |
| Resistance to Soldering Heat Test | 300°C/10s | 0/15 |

### *Reliability Data*

**Table 3** summarizes the reliability results of the following tests: 85/85, Pressure Pot, HAST, Temperature Cycling, and HTSL. It also shows the total number of samples tested, total device hours (or total device cycles), and number of rejects detected during reliability testing.

**TABLE 3. RELIABILITY TEST SUMMARY**

| STRESS TEST | TOTAL UNITS TESTED | TOTAL DEVICE HRS (OR CYCLES) | NUMBER OF REJECTS |
|---|---|---|---|
| 85/85 | 1574 | 1,574,000 | 0 |
| Pressure Pot | 5432 | 912,576 | 0 |
| HAST | 1387 | 138,700 | 1 |
| Temperature Cycling | 4809 | 4,809,000 | 0 |
| High Temperature Storage Life | 3501 | 3,501,000 | 0 |
| Infrared Solder Reflow | 18,442 | — | 0 |

### *Surface Mount Packages Reeled in Tape*

Maxim surface-mount packages are shipped in antistatic plastic rails. For customers using automatic placement systems, parts also come mounted in pockets on embossed tape. The tape is wound and shipped on reels.

The **Table 4** and Figures 1-4 indicate the tape sizes used for various package types and the basic orientation convention used. Further tape-and-reel specifications can be found in the Electronic Industries Association (EIA) standard 481.

**TABLE 4. Tape-and-Reel Size/Pitch**

| DEVICE TYPE | BODY SIZE | PIN COUNT | TAPE WIDTH (mm) | TAPE PITCH (mm) | REEL SIZE (inch) | QUANTITY PER REEL | ORIENTATION IN TAPE |
|---|---|---|---|---|---|---|---|
| SOIC | .150 | 8 | 12 | 8 | 13 | 2500 | Figure 2 |
| | | 14 | 16 | 8 | 13 | | |
| | | 16 | 16 | 8 | 13 | | |
| | .300 | 16 | 16 | 12 | 13 | 1000 | Figure 2 |
| | | 18 | 24 | 16 | 13 | | |
| | | 20 | 24 | 12 | 13 | | |
| | | 24 | 24 | 12 | 13 | | |
| | | 28 | 24 | 12 | 13 | | |
| QSOP | .150 | 16 | 12 | 8 | 13 | 2500 | Figure 2 |
| | | 20 | 16 | 8 | 13 | | |
| | | 24 | 16 | 8 | 13 | | |
| | | 28 | 16 | 8 | 13 | | |
| SSOP | .209 | 14 | 16 | 12 | 13 | 2000 | Figure 2 |
| | | 16 | 16 | 12 | 13 | | |
| | | 20 | 16 | 12 | 13 | | |
| | | 24 | 16 | 12 | 13 | | |
| | | 28 | 16 | 12 | 13 | | |
| | .300 | 36 | 24 | 12 | 13 | 1000 | |
| | | 44 | 24 | 12 | 13 | | |
| TSSOP | .173 | 16 | 16 | 8 | 13 | 2500 | Figure 2 |
| | | 20 | 16 | 8 | 13 | | |
| | | 24 | 16 | 8 | 13 | | |
| | | 28 | 16 | 8 | 13 | | |
| PLCC | | 20 | 16 | 12 | 13 | 1000 | Figure 4 |
| | | 28 | 24 | 16 | 13 | 500 | |
| | | 44 | 32 | 24 | 13 | | |
| | | 68 | 44 | 32 | 13 | 250 | |
| MSOP | .118 | 8 | 12 | 8 | 13 | 2500 | Figure 2 |
| | | 10 | 12 | 8 | 13 | | |
| SOT23-3 | | 3 | 8 | 4 | 7* | 2500* | Figure 3 |
| SOT143 | | 4 | 8 | 4 | 7* | | |
| SOT23-5 | | 5 | 8 | 4 | 7* | | |
| SOT23-6 | | 6 | 8 | 4 | 7* | | |
| SOT23-8 | | 8 | 8 | 4 | 7* | | |
| TQFP | 7x7 | 32 | 16 | 12 | 13 | 1000 | Figure 4 |
| | 7x7 | 48 | 16 | 12 | 13 | 750 | |
| | 10x10 | 64 | 24 | 16 | 13 | | |
| | 12x12 | 80 | 24 | 24 | 13 | | |
| MQFP | 10x10 | 44 | 24 | 24 | 13 | 750 | Figure 4 |
| | 14x20 | 100 | 44 | 32 | 13 | 400 | |

**OPTION = 13 at 10,000 parts per reel.*

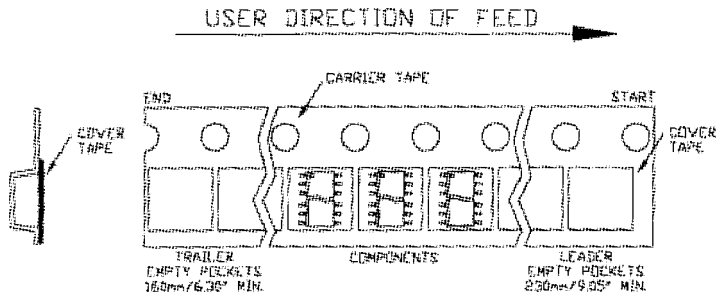


FIGURE 1

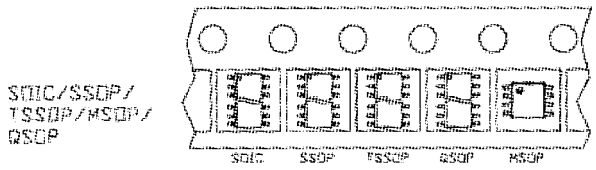


FIGURE 2

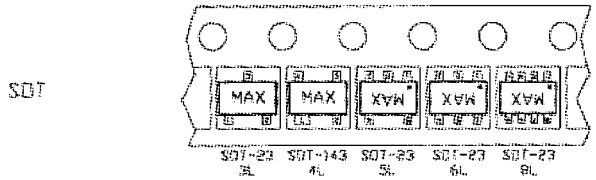


FIGURE 3

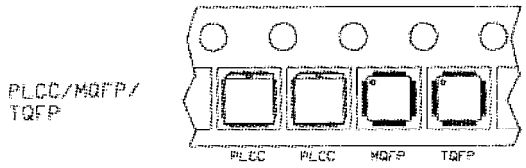


FIGURE 4

*Figures 1-4. Basic Tape and Reel Orientation*

Tables 5–10 list the results of reliability tests Maxim has performed for various surface-mount packages.

**TABLE 5. TEMPERATURE AND HUMIDITY TEST RESULTS (85/85)**

| DEVICE TYPE | DATE CODE | PACKAGE TYPE | SAMPLE SIZE | FAILURES (HRS) | |
|---|---|---|---|---|---|
| | | | | 500 | 1000 |
| | | SO | | | |
| MAX662 | 9523 | 8 SO | 44 | 0 | 0 |
| MAX706 | 9532 | 8 SO | 76 | 0 | 0 |
| MAX8211 | 9538 | 8 SO | 44 | 0 | 0 |
| MAX921 | 9547 | 8 SO | 39 | 0 | 0 |
| MAX478 | 9548 | 8 SO | 42 | 0 | 0 |
| REF01 | 9550 | 8 SO | 77 | 0 | 0 |
| MAX471 | 9607 | 8 SO | 45 | 0 | 0 |
| MAX8211 | 9612 | 8 SO | 77 | 0 | 0 |
| MAX8211 | 9624 | 8 SO | 76 | 0 | 0 |
| MAX8211 | 9633 | 8 SO | 77 | 0 | 0 |
| MAX8211 | 9636 | 8 SO | 38 | 0 | 0 |
| MAX692 | 9637 | 8 SO | 45 | 0 | 0 |
| MAX8211 | 9650 | 8 SO | 75 | 0 | 0 |
| MAX8211 | 9712 | 8 SO | 77 | 0 | 0 |
| MAX8211 | 9724 | 8 SO | 76 | 0 | 0 |
| MAX8211 | 9735 | 8 SO | 45 | 0 | 0 |
| MAX890 | 9811 | 8 SO | 45 | 0 | 0 |
| MAX8211 | 9815 | 8 SO | 45 | 0 | 0 |
| MAX887 | 9827 | 8 SO | 77 | 0 | 0 |
| MAX850 | 9827 | 8 SO | 77 | 0 | 0 |
| MAX8211 | 9841 | 8 SO | 45 | 0 | 0 |
| MAX798 | 9737 | 16 NSO | 77 | 0 | 0 |
| MAX202 | 9538 | 16 WSO | 26 | 0 | 0 |
| MAX202E | 9604 | 16 WSO | 26 | 0 | 0 |
| MAX213 | 9530 | 28 WSO | 43 | 0 | 0 |
| MAX211 | 9537 | 28 WSO | 45 | 0 | 0 |
| Subtotals | | | 1459 | 0 | 0 |
| | | SSOP | | | |
| MAX211E | 9542 | 28 SSOP | 45 | 0 | 0 |
| MAX211E | 9545 | 28 SSOP | 45 | 0 | 0 |
| Subtotals | | | 90 | 0 | 0 |
| | | PLCC | | | |
| MAX547 | 9749 | 44 PLCC | 25 | 0 | 0 |
| Subtotals | | | 25 | 0 | 0 |
| | | | | | |
| Combined Totals | | | 1574 | 0 | 0 |

**TABLE 6. PRESSURE POT TEST RESULTS**
**121°C/100% RH/15 PSIG/168 HRS.**

| DEVICE TYPE | DATE CODE | PACKAGE TYPE | SAMPLE SIZE | FAILURES (HRS.) | NOTES |
|---|---|---|---|---|---|
| | | | | 168 | |
| | | SOT | | | |
| MAX809 | 9611 | 3SOT | 43 | 0 | |
| MAX809 | 9613 | 3SOT | 45 | 0 | |
| MAX809 | 9614 | 3SOT | 44 | 0 | |
| MAX6809 | 9727 | 3SOT | 40 | 0 | |
| MAX811 | 9701 | 4SOT | 61 | 0 | |
| MAX8863 | 9602 | 5SOT | 60 | 0 | |
| MAX8864 | 9602 | 5SOT | 53 | 0 | |
| MAX8864 | 9612 | 5SOT | 59 | 0 | |
| MAX8863 | 9647 | 5SOT | 77 | 0 | |
| MAX8863 | 9724 | 5SOT | 40 | 0 | |
| MAX4180 | 9741 | 6SOT | 74 | 0 | |
| Subtotals | | | 596 | 0 | |
| | | SO | | | |
| MAX660 | 9528 | 8SO | 45 | 0 | |
| MAX706 | 9532 | 8SO | 45 | 0 | |
| MAX680 | 9538 | 8SO | 77 | 0 | |
| MAX8211 | 9538 | 8SO | 44 | 0 | |
| MAX619 | 9546 | 8SO | 45 | 0 | |
| MAX619 | 9548 | 8SO | 45 | 0 | |
| MAX478 | 9548 | 8SO | 43 | 0 | |
| REF01 | 9550 | 8SO | 36 | 0 | |
| MAX471 | 9604 | 8SO | 77 | 0 | |
| MAX850 | 9607 | 8SO | 77 | 0 | |
| MAX850 | 9611 | 8SO | 77 | 0 | |
| MAX8211 | 9611 | 8SO | 42 | 0 | |
| MAX8211 | 9650 | 8SO | 44 | 0 | |
| MAX8211 | 9712 | 8SO | 45 | 0 | |
| MAX4112 | 9716 | 8SO | 77 | 0 | |
| MAX4503 | 9716 | 8SO | 45 | 0 | |
| MAX619 | 9717 | 8SO | 45 | 0 | |
| MAX8211 | 9724 | 8SO | 45 | 0 | |
| MAX667 | 9725 | 8SO | 45 | 0 | |
| MAX667 | 9726 | 8SO | 45 | 0 | |
| MAX8211 | 9735 | 8SO | 45 | 0 | |
| MAX8211 | 9735 | 8SO | 45 | 0 | |
| MAX667 | 9736 | 8SO | 45 | 0 | |
| MAX890 | 9736 | 8SO | 45 | 0 | |
| MAX850 | 9737 | 8SO | 41 | 0 | |
| MAX707 | 9747 | 8SO | 42 | 0 | |
| MAX619 | 9748 | 8SO | 45 | 0 | |
| MAX8211 | 9749 | 8SO | 45 | 0 | |
| MAX619 | 9801 | 8SO | 45 | 0 | |
| MAX843 | 9806 | 8SO | 45 | 0 | |
| MAX890 | 9811 | 8SO | 45 | 0 | |
| MAX887 | 9813 | 8SO | 45 | 0 | |
| MAX6160 | 9815 | 8SO | 45 | 0 | |
| MAX8211 | 9815 | 8SO | 45 | 0 | |
| MAX887 | 9826 | 8SO | 45 | 0 | |
| MAX850 | 9827 | 8SO | 45 | 0 | |
| MAX8211 | 9841 | 8SO | 45 | 0 | |
| MAX545 | 9703 | 14SO | 45 | 0 | |
| MAX243 | 9615 | 16SO | 45 | 0 | |
| MAX243 | 9621 | 16SO | 44 | 0 | |
| MAX797 | 9648 | 16SO | 80 | 0 | |
| MAX8213 | 9721 | 16SO | 45 | 0 | |
| MAX797 | 9723 | 16SO | 45 | 0 | |
| DG445 | 9730 | 16SO | 45 | 0 | |
| MAX798 | 9737 | 16SO | 45 | 0 | |
| MAX849 | 9745 | 16SO | 77 | 0 | |
| MAX797 | 9807 | 16SO | 45 | 0 | |
| MAX232A | 9814 | 16SO | 45 | 0 | |
| MAX202 | 9538 | 16WSO | 45 | 0 | |
| DG303 | 9601 | 16WSO | 45 | 0 | |
| MAX232 | 9602 | 16WSO | 76 | 0 | |
| MAX232 | 9729 | 16WSO | 45 | 0 | |
| MAX232 | 9730 | 16WSO | 45 | 0 | |
| MAX232 | 9746 | 16WSO | 45 | 0 | |
| MAX232 | 9748 | 16WSO | 45 | 0 | |
| MAX384 | 9724 | 18SO | 41 | 0 | |
| MAX233A | 9718 | 20WSO | 45 | 0 | |

**TABLE 6. PRESSURE POT TEST RESULTS**
**121°C/100% RH/15 PSIG/168 HRS. (*continued*)**

| | | | | | |
|---|---|---|---|---|---|
| MAX233A | 9719 | 20WSO | 45 | 0 | |
| MAX233A | 9722 | 20WSO | 45 | 0 | |
| MAX233A | 9723 | 20WSO | 45 | 0 | |
| MAX203 | 9725 | 20WSO | 45 | 0 | |
| MAX527 | 9729 | 24WSO | 35 | 0 | |
| MAX502 | 9730 | 24WSO | 45 | 0 | |
| MAX213 | 9530 | 28WSO | 44 | 0 | |
| MAX211 | 9537 | 28WSO | 43 | 0 | |
| Subtotals | | | 3142 | 0 | |
| | | µMAX | | | |
| MAX708 | 9538 | 8uMAX | 45 | 0 | |
| MAX857 | 9649 | 8uMAX | 80 | 0 | |
| MAX552 | 9719 | 10uMAX | 41 | 0 | |
| MAX551 | 9720 | 10uMAX | 42 | 0 | |
| MAX4333 | 9729 | 10uMAX | 45 | 0 | |
| Subtotals | | | 253 | 0 | |
| | | QSOP | | | |
| MAX1620 | 9726 | 16QSOP | 45 | 0 | |
| MAX1617 | 9731 | 16QSOP | 39 | 0 | |
| MAX1617 | 9736 | 16QSOP | 44 | 0 | |
| MAX1617 | 9742 | 16QSOP | 45 | 0 | |
| MAX1617 | 9743 | 16QSOP | 50 | 0 | |
| MAX1617 | 9744 | 16QSOP | 50 | 0 | |
| MAX1617 | 9751 | 16QSOP | 50 | 0 | |
| MAX1617 | 9752 | 16QSOP | 50 | 0 | |
| MAX1617 | 9802 | 16QSOP | 50 | 0 | |
| Subtotals | | | 423 | 0 | |
| | | SSOP | | | |
| MAX767 | 9527 | 20SSOP | 77 | 0 | |
| MAX1647 | 9721 | 20SSOP | 45 | 0 | |
| MAX211E | 9546 | 24SSOP | 45 | 0 | |
| MAX211 | 9530 | 28SSOP | 45 | 0 | |
| MAX211E | 9542 | 28SSOP | 45 | 0 | |
| MAX241E | 9544 | 28SSOP | 45 | 0 | |
| MAX1600 | 9601 | 28SSOP | 45 | 0 | |
| MAX786 | 9612 | 28SSOP | 45 | 0 | |
| MAX1635 | 9652 | 28SSOP | 77 | 0 | |
| MAX211E | 9725 | 28SSOP | 50 | 0 | |
| MAX1603 | 9727 | 28SSOP | 76 | 0 | |
| Subtotals | | | 595 | 0 | |
| | | TSSOP | | | |
| MAX1664 | 9821 | 20TSSOP | 45 | 0 | |
| MAX1664 | 9824 | 20TSSOP | 45 | 0 | |
| Subtotals | | | 90 | 0 | |
| | | PLCC | | | |
| MAX547 | 9736 | 44PLCC | 45 | 0 | |
| MAX547 | 9737 | 44PLCC | 45 | 0 | |
| MAX547 | 9739 | 44PLCC | 45 | 0 | |
| MAX547 | 9742 | 44PLCC | 44 | 0 | |
| Subtotals | | | 179 | 0 | |
| | | PQFP | | | |
| MAX134 | 9537 | 44PQFP | 77 | 0 | |
| MAX134 | 9538 | 44PQFP | 77 | 0 | |
| Subtotals | | | 154 | 0 | |
| | | | | | |
| Combined Totals | | | 5432 | 0 | |

**TABLE 7. HAST TEST RESULTS**
**130°C/85% RH/BIASED/100 HRS.**

| DEVICE TYPE | DATE CODE | PACKAGE TYPE | SAMPLE SIZE | FAILURES (HRS) 100 | NOTES |
|---|---|---|---|---|---|
| | | SOT | | | |
| MAX809 | 9512 | 3SOT | 25 | 0 | |
| MAX809 | 9514 | 3SOT | 24 | 0 | |
| MAX8864 | 9601 | 5SOT | 24 | 0 | |
| MAX8864 | 9602 | 5SOT | 25 | 0 | |
| MAX8863 | 9602 | 5SOT | 25 | 0 | |
| MAX8864 | 9621 | 5SOT | 25 | 0 | |
| MAX8863 | 9622 | 5SOT | 25 | 0 | |
| MAX4501 | 9622 | 5SOT | 25 | 0 | |
| MAX8863 | 9724 | 5SOT | 25 | 0 | |
| Subtotals | | | 223 | 0 | |
| | | µMAX | | | |
| MAX552 | 9719 | 10µMAX | 25 | 0 | |
| MAX551 | 9720 | 10µMAX | 25 | 0 | |
| MAX4333 | 9729 | 10µMAX | 24 | 0 | |
| Subtotals | | | 74 | 0 | |
| | | SO | | | |
| MAX8211 | 9538 | 8SO | 25 | 0 | |
| MAX4123 | 9618 | 8SO | 25 | 0 | |
| MAX4125 | 9620 | 8SO | 25 | 0 | |
| MAX488 | 9636 | 8SO | 25 | 0 | |
| MAX8211 | 9735 | 8SO | 24 | 0 | |
| MAX850 | 9737 | 8SO | 25 | 0 | |
| MAX8211 | 9749 | 8SO | 25 | 0 | |
| MAX843 | 9806 | 8SO | 25 | 0 | |
| MAX887 | 9811 | 8SO | 25 | 0 | |
| MAX6160 | 9815 | 8SO | 25 | 0 | |
| MAX719 | 9723 | 16NSO | 25 | 0 | |
| MAX798 | 9737 | 16NSO | 25 | 0 | |
| MAX849 | 9745 | 16NSO | 25 | 0 | |
| MAX232 | 9602 | 16WSO | 25 | 0 | |
| MAX636 | 9607 | 16WSO | 25 | 0 | |
| MAX202 | 9620 | 16WSO | 25 | 0 | |
| MAX203 | 9635 | 20WSO | 25 | 0 | |
| MAX203 | 9637 | 20WSO | 25 | 1 | Cap Open |
| MAX203 | 9640 | 20WSO | 25 | 0 | |
| MAX233A | 9651 | 20WSO | 25 | 0 | |
| MAX233A | 9718 | 20WSO | 25 | 0 | |
| MAX233A | 9719 | 20WSO | 25 | 0 | |
| MAX203 | 9725 | 20WSO | 25 | 0 | |
| Subtotals | | | 574 | 0 | |
| | | QSOP | | | |
| MAX1617 | 9736 | 16QSOP | 47 | 0 | |
| MAX768 | 9741 | 16QSOP | 25 | 0 | |
| MAX1617 | 9742 | 16QSOP | 52 | 0 | |
| MAX768 | 9743 | 16QSOP | 25 | 0 | |
| MAX1617 | 9743 | 16QSOP | 25 | 0 | |
| Subtotals | | | 174 | 0 | |
| | | SSOP | | | |
| MAX786 | 9617 | 28SSOP | 25 | 0 | |
| MAX211E | 9627 | 28SSOP | 25 | 0 | |
| MAX211 | 9635 | 28SSOP | 25 | 0 | |
| MAX1603 | 9717 | 28SSOP | 25 | 0 | |
| MAX1630 | 9717 | 28SSOP | 25 | 0 | |
| MAX1603 | 9727 | 28SSOP | 25 | 0 | |
| Subtotals | | | 150 | 0 | |
| | | TSSOP | | | |
| MAX1664 | 9821 | 20TSSOP | 23 | 0 | |
| MAX1664 | 9824 | 20TSSOP | 25 | 0 | |
| Subtotals | | | 48 | 0 | |
| | | PLCC | | | |
| MAX547 | 9736 | 44PLCC | 25 | 0 | |
| MAX547 | 9737 | 44PLCC | 25 | 0 | |
| MAX547 | 9739 | 44PLCC | 25 | 0 | |
| MAX547 | 9742 | 44PLCC | 25 | 0 | |
| Subtotals | | | 100 | 0 | |
| | | PQFP | | | |
| MAX134 | 9537 | 44PQFP | 22 | 0 | |
| MAX134 | 9538 | 44PQFP | 22 | 0 | |
| Subtotals | | | 44 | 0 | |
| Combined Totals | | | 1387 | 1 | |

**TABLE 8. TEMPERATURE CYCLING TEST RESULTS**
**-65°C TO +150°C/1000 CYCLES**

| DEVICE TYPE | DATE CODE | PKG. TYPE | SAMPLE SIZE | FAILURES (CYLES) | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | | 200 | 500 | 1000 | |
| SOT | | | | | | | |
| MAX809 | 9611 | 3SOT | 44 | 0 | 0 | 0 | |
| MAX809 | 9614 | 3SOT | 44 | 0 | 0 | 0 | |
| MAX811 | 9701 | 4SOT | 75 | 0 | 0 | 0 | |
| MAX8864 | 9601 | 5SOT | 47 | 0 | 0 | 0 | |
| MAX8864 | 9602 | 5SOT | 44 | 0 | 0 | 0 | |
| MAX8863 | 9602 | 5SOT | 60 | 0 | 0 | 0 | |
| MAX8864 | 9621 | 5SOT | 72 | 0 | 0 | 0 | |
| MAX8863 | 9622 | 5SOT | 77 | 0 | 0 | 0 | |
| MAX4501 | 9622 | 5SOT | 67 | 0 | 0 | 0 | |
| MAX8863 | 9725 | 5SOT | 45 | 0 | 0 | 0 | |
| Subtotals | | | 575 | 0 | 0 | 0 | |
| µMAX | | | | | | | |
| MAX552 | 9719 | 10µMAX | 77 | 0 | 0 | 0 | |
| MAX551 | 9720 | 10µMAX | 77 | 0 | 0 | 0 | |
| MAX4333 | 9729 | 10µMAX | 77 | 0 | 0 | 0 | |
| Subtotals | | | 231 | 0 | 0 | 0 | |
| SO | | | | | | | |
| MAX662 | 9523 | 8SO | 33 | 0 | 0 | 0 | |
| MAX660 | 9528 | 8SO | 45 | 0 | 0 | 0 | |
| MAX706 | 9532 | 8SO | 77 | 0 | 0 | 0 | |
| MAX680 | 9538 | 8SO | 44 | 0 | 0 | 0 | |
| MAX8211 | 9538 | 8SO | 44 | 0 | 0 | 0 | |
| MAX619 | 9546 | 8SO | 74 | 0 | 0 | 0 | |
| MAX619 | 9548 | 8SO | 75 | 0 | 0 | 0 | |
| MAX478 | 9548 | 8SO | 45 | 0 | 0 | 0 | |
| REF01 | 9550 | 8SO | 77 | 0 | 0 | 0 | |
| MAX471 | 9607 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9624 | 8SO | 77 | 0 | 0 | 0 | |
| MAX8212 | 9633 | 8SO | 77 | 0 | 0 | 0 | |
| MAX488 | 9636 | 8SO | 45 | 0 | 0 | 0 | |
| MAX692A | 9637 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9650 | 8SO | 77 | 0 | 0 | 0 | |
| MAX8211 | 9712 | 8SO | 77 | 0 | 0 | 0 | |
| MAX4112 | 9716 | 8SO | 77 | 0 | 0 | 0 | |
| MAX8211 | 9724 | 8SO | 77 | 0 | 0 | 0 | |
| MAX667 | 9725 | 8SO | 71 | 0 | 0 | 0 | |
| MAX667 | 9726 | 8SO | 77 | 0 | 0 | 0 | |
| MAX8211 | 9735 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9735 | 8SO | 77 | 0 | 0 | 0 | |
| MAX667 | 9736 | 8SO | 45 | 0 | 0 | 0 | |
| MAX890 | 9736 | 8SO | 45 | 0 | 0 | 0 | |
| MAX850 | 9737 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9749 | 8SO | 77 | 0 | 0 | 0 | |
| MAX843 | 9806 | 8SO | 45 | 0 | 0 | 0 | |
| MAX890 | 9811 | 8SO | 45 | 0 | 0 | 0 | |
| MAX887 | 9813 | 8SO | 77 | 0 | 0 | 0 | |
| MAX8211 | 9815 | 8SO | 77 | 0 | 0 | 0 | |

| DEVICE TYPE | DATE CODE | PKG. TYPE | SAMPLE SIZE | FAILURES (CYLES) | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | | 200 | 500 | 1000 | |
| MAX887 | 9827 | 8SO | 77 | 0 | 0 | 0 | |
| MAX850 | 9827 | 8SO | 77 | 0 | 0 | 0 | |
| MAX8211 | 9841 | 8SO | 77 | 0 | 0 | 0 | |
| MAX545 | 9703 | 14NSO | 77 | 0 | 0 | 0 | |
| MAX719 | 9724 | 16NSO | 45 | 0 | 0 | 0 | |
| MX7533 | 9726 | 16NSO | 45 | 0 | 0 | 0 | |
| MAX798 | 9737 | 16NSO | 45 | 0 | 0 | 0 | |
| MAX798 | 9737 | 16NSO | 77 | 0 | 0 | 0 | |
| MAX849 | 9745 | 16NSO | 77 | 0 | 0 | 0 | |
| MAX797 | 9807 | 16NSO | 77 | 0 | 0 | 0 | |
| MXA691A | 9836 | 16NSO | 77 | 0 | 0 | 0 | |
| MAX202E | 9604 | 16WSO | 44 | 0 | 0 | 0 | |
| MAX202 | 9538 | 16WSO | 45 | 0 | 0 | 0 | |
| DG303 | 9601 | 16WSO | 77 | 0 | 0 | 0 | |
| MAX232 | 9602 | 16WSO | 77 | 0 | 0 | 0 | |
| MAX676 | 9533 | 20WSO | 53 | 0 | 0 | 0 | |
| MAX213 | 9530 | 28WSO | 45 | 0 | 0 | 0 | |
| MAX211 | 9537 | 28WSO | 45 | 0 | 0 | 0 | |
| Subtotals | | | 2974 | 0 | 0 | 0 | |
| QSOP | | | | | | | |
| MAX846 | 9640 | 16QSOP | 77 | 0 | 0 | 0 | |
| MAX768 | 9734 | 16QSOP | 45 | 0 | 0 | 0 | |
| MAX768 | 9746 | 16QSOP | 45 | 0 | 0 | 0 | |
| Subtotals | | | 167 | 0 | 0 | 0 | |
| SSOP | | | | | | | |
| MAX767 | 9527 | 20SSOP | 44 | 0 | 0 | 0 | |
| MAX211 | 9530 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX211E | 9542 | 28SSOP | 44 | 0 | 0 | 0 | |
| MAX241E | 9544 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX211E | 9545 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX211E | 9546 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX1630 | 9627 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX211 | 9635 | 28SSOP | 76 | 0 | 0 | 0 | |
| MAX1603 | 9727 | 28SSOP | 45 | 0 | 0 | 0 | |
| Subtotals | | | 478 | 0 | 0 | 0 | |
| TSSOP | | | | | | | |
| MAX1664 | 9821 | 20TSSOP | 77 | 0 | 0 | 0 | |
| MAX1614 | 9824 | 20TSSOP | 77 | 0 | 0 | 0 | |
| Subtotals | | | 154 | 0 | 0 | 0 | |
| PLCC | | | | | | | |
| MAX547 | 8737 | 44PLCC | 45 | 0 | 0 | 0 | |
| MAX547 | 9736 | 44PLCC | 45 | 0 | 0 | 0 | |
| MAX547 | 9739 | 44PLCC | 45 | 0 | 0 | 0 | |
| MAX547 | 9742 | 44PLCC | 45 | 0 | 0 | 0 | |
| MAX547 | 9746 | 44PLCC | 25 | 0 | 0 | 0 | |
| MAX547 | 9749 | 44PLCC | 25 | 0 | 0 | 0 | |
| Subtotals | | | 230 | 0 | 0 | 0 | |
| Combined Totals | | | 4809 | 0 | 0 | 0 | |

**TABLE 9. HIGH TEMPERATURE STORAGE TEST RESULTS**
**150°C/1000 HRS.**

| DEVICE TYPE | DATE CODE | PACKAGE TYPE | SAMPLE SIZE | FAILURES (HRS) 168 | 500 | 1000 | NOTES |
|---|---|---|---|---|---|---|---|
| | | | SO | | | | |
| MAX8864 | 9601 | 5SOT | 45 | 0 | 0 | 0 | |
| MAX8864 | 9602 | 5SOT | 44 | 0 | 0 | 0 | |
| MAX8863 | 9602 | 5SOT | 42 | 0 | 0 | 0 | |
| MAX8864 | 9621 | 5SOT | 73 | 0 | 0 | 0 | |
| MAX8863 | 9622 | 5SOT | 42 | 0 | 0 | 0 | |
| MAX8863 | 9724 | 5SOT | 40 | 0 | 0 | 0 | |
| Subtotals | | | 286 | 0 | 0 | 0 | |
| | | | µMAX | | | | |
| MAX552 | 9719 | 10µMAX | 45 | 0 | 0 | 0 | |
| MAX551 | 9720 | 10µMAX | 44 | 0 | 0 | 0 | |
| MAX4333 | 9729 | 10µMAX | 45 | 0 | 0 | 0 | |
| Subtotals | | | 134 | 0 | 0 | 0 | |
| | | | SO | | | | |
| MAX660 | 9528 | 8SO | 45 | 0 | 0 | 0 | |
| MAX706 | 9532 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9538 | 8SO | 44 | 0 | 0 | 0 | |
| MAX680 | 9538 | 8SO | 45 | 0 | 0 | 0 | |
| MAX619 | 9548 | 8SO | 77 | 0 | 0 | 0 | |
| MAX478 | 9548 | 8SO | 43 | 0 | 0 | 0 | |
| REF01 | 9550 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9612 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9624 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8212 | 9633 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9650 | 8SO | 45 | 0 | 0 | 0 | |
| MAX471 | 9707 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9712 | 8SO | 45 | 0 | 0 | 0 | |
| MAX4112 | 9716 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9724 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9735 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9735 | 8SO | 45 | 0 | 0 | 0 | |
| MAX667 | 9736 | 8SO | 45 | 0 | 0 | 0 | |
| MAX850 | 9737 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9749 | 8SO | 77 | 0 | 0 | 0 | |
| MAX843 | 9806 | 8SO | 45 | 0 | 0 | 0 | |
| MAX890 | 9811 | 8SO | 45 | 0 | 0 | 0 | |
| MAX887 | 9813 | 8SO | 45 | 0 | 0 | 0 | |
| MAX6160 | 9815 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9815 | 8SO | 45 | 0 | 0 | 0 | |
| MAX887 | 9827 | 8SO | 45 | 0 | 0 | 0 | |
| MAX850 | 9827 | 8SO | 45 | 0 | 0 | 0 | |
| MAX8211 | 9841 | 8SO | 77 | 0 | 0 | 0 | |
| MAX798 | 9737 | 16NSO | 44 | 0 | 0 | 0 | |
| MAX798 | 9737 | 16NSO | 45 | 0 | 0 | 0 | |
| MAX849 | 9745 | 16NSO | 45 | 0 | 0 | 0 | |
| MAX202 | 9538 | 16WSO | 45 | 0 | 0 | 0 | |
| DG303 | 9601 | 16WSO | 45 | 0 | 0 | 0 | |

| DEVICE TYPE | DATE CODE | PACKAGE TYPE | SAMPLE SIZE | FAILURES (HRS) 168 | 500 | 1000 | NOTES |
|---|---|---|---|---|---|---|---|
| | | | QSOP | | | | |
| MAX202E | 9604 | 16WSO | 45 | 0 | 0 | 0 | |
| MAX233A | 9617 | 20WSO | 14 | 0 | 0 | 0 | |
| MAX233A | 9618 | 20WSO | 14 | 0 | 0 | 0 | |
| MAX203 | 9635 | 20WSO | 45 | 0 | 0 | 0 | |
| MAX203 | 9637 | 20WSO | 45 | 0 | 0 | 0 | |
| MAX203 | 9640 | 20WSO | 45 | 0 | 0 | 0 | |
| MAX203 | 9725 | 20WSO | 45 | 0 | 0 | 0 | |
| MAX213 | 9530 | 28WSO | 45 | 0 | 0 | 0 | |
| MAX211 | 9537 | 28WSO | 44 | 0 | 0 | 0 | |
| Subtotals | | | 1919 | 0 | 0 | 0 | |
| | | | | | | | |
| MAX768 | 9734 | 16QSOP | 43 | 0 | 0 | 0 | |
| MAX768 | 9741 | 16QSOP | 45 | 0 | 0 | 0 | |
| MAX1617 | 9742 | 16QSOP | 100 | 0 | 0 | 0 | |
| MAX768 | 9743 | 16QSOP | 45 | 0 | 0 | 0 | |
| MAX1617 | 9743 | 16QSOP | 100 | 0 | 0 | 0 | |
| MAX1617 | 9744 | 16QSOP | 100 | 0 | 0 | 0 | |
| MAX768 | 9750 | 16QSOP | 45 | 0 | 0 | 0 | |
| Subtotals | | | 478 | 0 | 0 | 0 | |
| | | | SSOP | | | | |
| MAX211 | 9530 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX211E | 9542 | 28SSOP | 44 | 0 | 0 | 0 | |
| MAX241E | 9544 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX211E | 9545 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX211E | 9546 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX211 | 9635 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX211 | 9644 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX1603 | 9717 | 28SSOP | 45 | 0 | 0 | 0 | |
| MA1603 | 9727 | 28SSOP | 45 | 0 | 0 | 0 | |
| MAX1632 | 9744 | 28SSOP | 45 | 0 | 0 | 0 | |
| Subtotals | | | 449 | 0 | 0 | 0 | |
| | | | TSSOP | | | | |
| MAX1664 | 9821 | 20TSSOP | 45 | 0 | 0 | 0 | |
| MAX1664 | 9824 | 20TSSOP | 45 | 0 | 0 | 0 | |
| Subtotals | | | 90 | 0 | 0 | 0 | |
| | | | PLCC | | | | |
| MAX547 | 9736 | 44PLCC | 45 | 0 | 0 | 0 | |
| MAX547 | 9737 | 44PLCC | 10 | 0 | 0 | 0 | |
| MAX547 | 9739 | 44PLCC | 45 | 0 | 0 | 0 | |
| MAX547 | 9742 | 44PLCC | 45 | 0 | 0 | 0 | |
| Subtotals | | | 145 | 0 | 0 | 0 | |
| Combined Totals | | | 3501 | 0 | 0 | 0 | |

**TABLE 10. INFRARED SOLDER REFLOW TEST**

| DEVICE TYPE | DATE CODE | PACKAGE TYPE | SAMPLE SIZE | FAILURES |
|---|---|---|---|---|
| | | SOT | | |
| MAX809LEUR | 9626 | 3 SOT23 | 147 | 0 |
| MAX809LEUR | 9628 | 3 SOT23 | 154 | 0 |
| MAX811MEUS | 9701 | 4 SOT23 | 200 | 0 |
| MAX4501CUK | 9846A | 5 SC70 | 150 | 0 |
| MAX4501CUK | 9846B | 5 SC70 | 150 | 0 |
| MAX4501CUK | 9846C | 5 SC70 | 150 | 0 |
| MAX8864SEUK | 9601 | 5 SOT23 | 143 | 0 |
| MAX8863TEUK | 9602 | 5 SOT23 | 158 | 0 |
| MAX8864TEUK | 9602 | 5 SOT23 | 149 | 0 |
| MAX8864SEUK | 9621 | 5 SOT23 | 200 | 0 |
| MAX8863TEUK | 9622 | 5 SOT23 | 200 | 0 |
| MAX4501CUK | 9622 | 5 SOT23 | 200 | 0 |
| MAX828EUK | 9750 | 5 SOT23 | 147 | 0 |
| MAX828EUK | 9802 | 5 SOT23 | 150 | 0 |
| MAX828EUK | 9803 | 5 SOT23 | 150 | 0 |
| MAX4501CUK | 9803 | 5 SOT23 | 150 | 0 |
| MAX4501CUK | 9807 | 5 SOT23 | 150 | 0 |
| MAX4501CUK | 9808 | 5 SOT23 | 150 | 0 |
| MAX4501CUK | 9808 | 5 SOT23 | 150 | 0 |
| MAX4180EUT | 9741 | 6 SOT23 | 150 | 0 |
| MAX4180EUT | 9742 | 6 SOT23 | 150 | 0 |
| MAX4529EUK | 9802 | 6 SOT23 | 150 | 0 |
| MAX4330EUK | 9844A | 6 SOT23 | 150 | 0 |
| MAX4330EUK | 9844B | 6 SOT23 | 150 | 0 |
| MAX4501CUK | 9847A | 8 SOT23 | 150 | 0 |
| MAX4501CUK | 9847B | 8 SOT23 | 150 | 0 |
| MAX4501CUK | 9847C | 8 SOT23 | 150 | 0 |
| Subtotals | | | 4248 | 0 |
| | | µMAX | | |
| MAX708CUA | 9750 | 8 µMAX | 150 | 0 |
| MAX708CUA | 9751 | 8 µMAX | 150 | 0 |
| MAX708CUA | 9801 | 8 µMAX | 150 | 0 |
| MAX708CUA | 9801 | 8 µMAX | 150 | 0 |
| MAX860IUA | 9820 | 8 µMAX | 150 | 0 |
| MAX708CUA | 9841A | 8 µMAX | 150 | 0 |
| MAX708CUA | 9841B | 8 µMAX | 150 | 0 |
| MAX708CUA | 9841C | 8 µMAX | 150 | 0 |
| MAX662BCUB | 9719 | 10 µMAX | 177 | 0 |
| MAX551BCUB | 9720 | 10 µMAX | 180 | 0 |
| MAX4333EUB | 9729 | 10 µMAX | 180 | 0 |
| Subtotals | | | 1737 | 0 |
| | | SO | | |
| MAX667CSA | 9725 | 8 SO | 179 | 0 |
| MAX667CSA | 9726 | 8 SO | 180 | 0 |
| MAX667CSA | 9734 | 8 SO | 180 | 0 |
| MAX8211CSA | 9735 | 8 SO | 180 | 0 |
| MAX667CSA | 9736 | 8 SO | 180 | 0 |
| MAX707CSA | 9747 | 8 SO | 150 | 0 |
| MAX707CSA | 9747 | 8 SO | 42 | 0 |
| MAX707CSA | 9748 | 8 SO | 43 | 0 |
| MAX619ESA | 9748 | 8 SO | 45 | 0 |
| MAX619ESA | 9749 | 8 SO | 45 | 0 |
| MAX663ESA | 9809 | 8 SO | 150 | 0 |
| MAX843ISA | 9810 | 8 SO | 150 | 0 |
| MAX485CSA | 9810 | 8 SO | 150 | 0 |
| MAX485CSA | 9810 | 8 SO | 150 | 0 |
| MAX843ISA | 9811 | 8 SO | 150 | 0 |
| MAX843ISA | 9812 | 8 SO | 150 | 0 |
| MAX663ESA | 9820 | 8 SO | 150 | 0 |
| MAX663ESA | 9820 | 8 SO | 150 | 0 |
| MAX485CSA | 9821 | 8 SO | 150 | 0 |
| MAX663ESA | 9836 | 8 SO | 150 | 0 |
| MAX485CSA | 9837 | 8 SO | 150 | 0 |
| MAX4331ESA | 9844A | 8 SO | 150 | 0 |
| MAX4331ESA | 9844B | 8 SO | 150 | 0 |
| MAX418ESD | 9732 | 14 NSO | 150 | 0 |
| MAX479CSD | 9740 | 14 NSO | 150 | 0 |
| MAX414CSD | 9746 | 14 NSO | 150 | 0 |
| MAX475CSD | 9810 | 14 NSO | 150 | 0 |
| MAX719CSE | 9723 | 16 NSO | 180 | 0 |
| MAX719CSE | 9724 | 16 NSO | 140 | 0 |
| MAX691ACSE | 9810 | 16 NSO | 150 | 0 |
| MAX691ACSE | 9828 | 16 NSO | 150 | 0 |
| MAX691ACSE | 9836 | 16 NSO | 150 | 0 |
| MAX232CWE | 9746 | 16 WSO | 45 | 0 |
| MAX232CWE | 9748 | 16 WSO | 45 | 0 |
| MAX203EWP | 9635 | 20 WSO | 140 | 0 |
| MAX203CWP | 9637 | 20 WSO | 140 | 0 |
| MAX203CWP | 9640 | 20 WSO | 140 | 0 |
| MAX233ACWP | 9649 | 20 WSO | 105 | 0 |
| MAX233ACWP | 9650 | 20 WSO | 105 | 0 |
| MAX233ACWP | 9651 | 20 WSO | 105 | 0 |
| MAX233ACWP | 9718 | 20 WSO | 150 | 0 |
| MAX233ACWP | 9719 | 20 WSO | 150 | 0 |
| MAX203CWP | 9725 | 20 WSO | 160 | 0 |
| MAX233ACWP | 9804 | 20 WSO | 50 | 0 |
| MAX233ACWP | 9806 | 20 WSO | 50 | 0 |
| Subtotals | | | 5929 | 0 |
| | | QSOP | | |
| MAX869LEEE | 9730 | 16 QSOP | 149 | 0 |
| MAX768EEE | 9734 | 16 QSOP | 150 | 0 |
| MAX768EEE | 9734 | 16 QSOP | 180 | 0 |
| MAX768EEE | 9746 | 16 QSOP | 180 | 0 |
| MAX869LEEE | 9747 | 16 QSOP | 150 | 0 |
| MAX1617MEE | 9803 | 16 QSOP | 230 | 0 |
| MAX1617MEE | 9816 | 16 QSOP | 150 | 0 |
| MAX1617MEE | 9819 | 16 QSOP | 150 | 0 |
| MAX1617MEE | 9820 | 16 QSOP | 150 | 0 |
| MAX1617MEE | 9821 | 16 QSOP | 150 | 0 |
| MAX1617MEE | 9834 | 16 QSOP | 100 | 0 |
| MAX1617MEE | 9837 | 16 QSOP | 100 | 0 |
| MAX1617MEE | 9838 | 16 QSOP | 100 | 0 |
| MAX1617MEE | 9839 | 16 QSOP | 100 | 0 |
| MAX1617MEE | 9840 | 16 QSOP | 100 | 0 |
| MAX1617MEE | 9841 | 16 QSOP | 100 | 0 |
| Subtotals | | | 2239 | 0 |
| | | SSOP | | |
| MAX211CAI | 9635 | 28 SSOP | 200 | 0 |
| MAX211CAI | 9644 | 28 SSOP | 190 | 0 |
| MAX213CAI | 9709 | 28 SSOP | 99 | 0 |
| MAX211ECAI | 9725 | 28 SSOP | 500 | 0 |
| MAX211CAI | 9733 | 28 SSOP | 500 | 0 |
| MAX241CAI | 9849A | 28 SSOP | 150 | 0 |
| MAX241CAI | 9849B | 28 SSOP | 150 | 0 |
| MAX241CAI | 9849C | 28 SSOP | 150 | 0 |
| Subtotals | | | 1939 | 0 |
| | | TSSOP | | |
| MAX1664CUP | 9810 | 20 TSSOP | 150 | 0 |
| MAX1664CUP | 9813 | 20 TSSOP | 100 | 0 |
| MAX1664CUP | 9821 | 20 TSSOP | 150 | 0 |
| MAX1664CUP | 9824 | 20 TSSOP | 150 | 0 |
| MAX3243EUT | 9841A | 28 TSSOP | 100 | 0 |
| MAX3243EUT | 9841B | 28 TSSOP | 100 | 0 |
| MAX3243EUT | 9841C | 28 TSSOP | 100 | 0 |
| MAX3243EUI | 9851A | 28 TSSOP | 150 | 0 |
| MAX3243EUI | 9851B | 28 TSSOP | 150 | 0 |
| MAX3243EUI | 9851C | 28 TSSOP | 150 | 0 |
| MAX3243EUI | 9851A | 28 TSSOP-EP | 150 | 0 |
| MAX3243EUI | 9851B | 28 TSSOP-EP | 150 | 0 |
| MAX3243EUI | 9851C | 28 TSSOP-EP | 150 | 0 |
| Subtotals | | | 1750 | 0 |
| | | PLCC | | |
| MAX547ACQH | 9737 | 44 PLCC | 150 | 0 |
| MAX547ACQH | 9742 | 44 PLCC | 150 | 0 |
| Subtotals | | | 300 | 0 |
| | | PQFP | | |
| MAX136CMH | 9817 | 44 PQFP | 150 | 0 |
| MAX136CMH | 9820 | 44 PQFP | 150 | 0 |
| Subtotals | | | 300 | 0 |
| Combined Totals | | | 18842 | 0 |

# Surface-Mount Devices Product Reliability Report



## Maxim U.S. Sales Offices

***Alabama***
1-800-570-9738
*Arizona*
1-800-570-9732
***California***
(Northern California)
(408) 737-0214
(Southern California)
1-800-570-9732
***Colorado***
1-800-570-9731
***Connecticut***
1-800-416-7237
***Delaware***
1-800-570-9737
***Florida***
1-800-570-9738
***Georgia***
1-800-570-9738
***Idaho***
1-800-570-9731
***Illinois***
1-800-570-9735
***Indiana***
1-800-570-9735
***Iowa***
1-800-570-9735
***Kansas***
1-800-631-1070
***Kentucky***
1-800-570-9735
***Louisiana***
1-800-631-1070
***Maine***
1-800-416-7237
***Maryland***
1-800-570-9737
***Massachusetts***
1-800-416-7237
***Michigan***
1-800-570-9735
***Minnesota***
1-800-570-9735
***Missouri***
1-800-631-1070
***Montana***
1-800-570-9731
***Nebraska***
1-800-631-1070
***New Hampshire***
1-800-416-7237
***New Jersey***
1-800-570-9737
***New Mexico***
1-800-570-9732
***New York***
(Upstate)
1-800-416-7237
(Metro)
1-800-570-9737
***North Carolina***
1-800-570-9738
***Ohio***
1-800-570-9735
***Oklahoma***
1-800-631-1070
***Oregon***
1-800-570-9731
***Pennsylvania***
(Pittsburgh area)
1-800-570-9735
(Philadelphia/Other)
1-800-570-9737
***South Carolina***
1-800-570-9738
***Texas***
1-800-631-1070
***Utah***
1-800-570-9731
***Vermont***
1-800-416-7237
***Virginia***
1-800-570-9737
***Washington***
1-800-570-9731
***Wisconsin***
1-800-570-9735

## Maxim U.S. Franchised Distributors

Maxim Distribution
1-888-MAXIM-IC

Arrow Electronics
1-800-777-2776

Avnet Electronics Marketing
1-800-332-8638

CAM RPC
(412) 963-6202

Digi-Key Corp.
1-800-344-4539

Elmo Semiconductor
(818) 768-7400

Nu Horizons
(631) 396-5000

Zeus Electronics
(914) 937-7400

## Maxim Corporate Headquarters

Maxim Integrated Products, Inc.
120 San Gabriel Drive
Sunnyvale, CA 94086
(408) 737-7600

## Maxim International Sales Representatives and Distributors

***Argentina***
YEL SRL
(1) 372 7163
***Australia***
Arrow Electronics Australia
Pty.Ltd.
(Victoria)
(03) 9574 9300
(Western Australia)
(08) 9472 3855
(New South Wales)
(02) 9745 1400
(Queensland)
(07) 3216 0770
(South Australia)
(08) 8271 0355
***Austria***
Maxim GmbH
(Germany)
0800-29-5954 (Toll Free)
***Belgium***
Master Chips
(02) 465 0986
***Brazil***
Intectra (U.S.A.)
(650) 967-8818
***Canada***
Maxim Integrated Products
(Western)
1-800-241-4813
(Central)
1-800-416-7237
(Eastern)
1-800-416-7237
***Canada Distributors***
Arrow
(514) 421-7411
(613) 226-6903
(418) 871-7500
(416) 670-7769
(604) 421-2333
Avnet Electronics Marketing
1-800-332-8638
***China***
Maxim China
(010) 620 10598
(800) 810 0310 (Toll Free)
***China Distributors***
Ingram Micro Hong Kong
(China) Ltd.
(021) 64678010
(Shanghai)
(010) 64441966
(Beijing)
QCE
(010) 68408121
(Beijing)
(0755) 2285151
(Shenzhen)
***Czech Republic***
Spezial-Electronic KG
42 2 24342200
***Denmark***
Arrow Denmark A/S
4450 8200
***Finland***
ACTE NC Finland Oy
(0) 9 752 761
***France***
Maxim France
01 39 30 19 00
***France Distributors***
Maxim Distribution
0800 05 04 27
Dimacel Composants
01 34 23 70 00
***Germany***
Maxim GmbH
0800-8279250-000 (Toll Free)
49 (089) 857 99-0
***Germany Distributors***
Maxim Distribution
(0130) 827925 (Toll Free)
49 (089) 857 99-0
SE Spezial-Electronic GmbH
0800-0007367 (Toll Free)
***Hong Kong***
Maxim Integrated
Products, Inc.
2376 3000
***India***
Unique Maxvale India
22-7668360
***Ireland***
FMG Electronics
056-64002
***Israel***
Tritech, Ltd.
(09) 741 7277
***Italy***
Maxim Italy
(039) 6058555
***Italy Distributor***
Esco Italiana Electronics Supply
(039) 20481
***Japan***
Maxim Japan Co., Ltd.
(03) 3232-6141
***Japan/Distributors***
Easton Co., Ltd.
(03) 3279-1922
Internix, Inc.
(03) 3369-1101
Maruban Corp.
(03) 3639-0677
***Korea***
Maxim Korea
(02) 508 1170
***Mexico***
Arrow (USA)
(516) 231-1000
***Netherlands***
Getronics Telecom Solutions B.V.
(015) 2609906
***New Zealand***
Power Technology
Components Ltd.
00649 8366-744
***Norway***
ACTE Norway AS
63 89 89 00
***Philippines***
Marubun Electronics (s) Pte
Ltd.
(2) 7593051
***Poland***
SE Spezial Electronic Spolka
Z.O.O.
095/758-05-72
***Portugal***
Avnet-ADM Electronics, S.A.
(2) 25898070
***Russia***
SE Spezial-Electronic ZAO
(Moscow)
007/095-433-2582/83
007/095-438-7343/59
(St. Petersburg)
007/812-275-3860
***Singapore/Malaysia***
***Thailand***
Maxim Integrated Products, Inc.
(Singapore)
841-7117
Ingram Micro Asia Ltd.
(Singapore)
(65) 298 0888/488 5111
Ingram Micro
(Thailand) Ltd.
(Bangkok)
662 641 1881
Electronic Resources (Malaysia)
Sdn. Bhd.
(Petaling Jaya)
(60) 03 757 5778
Electronic Resources (Malaysia)
Sdn. Bhd.
(Penang)
(60) 04 646 8888
***South Africa***
Arrow Altech Distribution
(Pty), Ltd.
(011) 923 9600
***Spain***
Maxim Distribution
900 99 44 44 (Tel. gratuito)
Avnet-ADM Electronics, S.A.
91-3727100
***Sweden***
Maxim Sweden
(08) 444 5430
***Sweden Distributor***
Egevo Elektronik AB
(08) 5870 6700
***Switzerland***
Maxim Integrated Projects
Switzerland AG
0800-862946
***Switzerland Distributor***
Maxim Distribution
0800-862946
***Taiwan***
Maxim Taiwan
(02) 2547-3888
***U.K.***
Maxim Integrated Products
(U.K.), Ltd.
0800 585 048 (Toll Free)
(0118) 9303388
***U.K. Distributors***
Maxim Distribution
(0118) 9303388
2001 Electronic Components
(01438) 742001
Eurodis HB Electronics
(01204) 555100
***Ukraine***
Spezial-Electronic GmbH
044-532-40-31