DALLAS SEMICONDUCTOR MAXIM

**Automotive Qualification Report**

**MAX9234EUM**

***Hot-Swappable 21-Bit DC-Balanced LVDS Deserializers***

***Grade 3***

***48-Lead TSSOP***

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ✓ | | | ✓ | | | ✓ | | | ✓ | | | ✓ | | | ✓ | | | ✓ | | |
| | | | | Lot # 1 (QWB2AQ001A) | | | Lot # 2 (QFE0AQ003C) | | | Lot # 3 (QFB4BQ001AA) | | | Lot # 4 (QFE2AQ001Q) | | | Lot # 5 (QIO0BQ002E) | | | Lot # 6 (Q43ACQ001B) | | | | |
| | | Maxim Part Number | | **MAX9234EUM** | | | MAX9209EUM | | | MAX9222EUM | | | MAX9213EUM+ (Note 2) | | | MAX1471ATJ | | | MAX1499EHJ | | | | |
| | | Description (Note 1) | | **AEC-Q100** | | | AEC-Q100 | | | AEC-Q100 | | | Maxim | | | AEC-Q100 | | | Maxim | | | | |
| | | Operating Temperature | | **-40C to +85C** | | | -40C to +85C | | | -40C to +85C | | | -40C to +85C | | | -40 to +125C | | | -40C to +85C | | | | |
| | | Temperature Grade | | **3** | | | 3 | | | 3 | | | 3 | | | 1 | | | 3 | | | | |
| | | Fab Location | | **TSMC Fab 9** | | | TSMC Fab 9 | | | TSMC Fab 9 | | | TSMC Fab 9 | | | TSMC Fab 9 | | | TSMC Fab 9 | | | | |
| | | Fab Process | | **.35um 1P4M** | | | .35um 2P4M | | | .35um 1P4M | | | .35um 2P4M | | | .35um 2P3M | | | .35um 2P4M | | | | |
| | | Die | | **HS37Z-2Z** | | | HS30Z | | | HS31Z-6Z | | | HS30Z-2Z | | | SC71Z | | | AC12Y | | | | |
| | | Assembly Location | | **Anam/Amkor Philippines** | | | Anam/Amkor Philippines | | | Anam/Amkor Philippines | | | Anam/Amkor Philippines | | | NSEB Thailand | | | Carsem-S Malaysia | | | | |
| | | Die Size (mils) | | **97 x 139** | | | 88 x 117 | | | 92 x 108 | | | 88 x 117 | | | 90 x 78 | | | 85 x 87 | | | | |
| | | Package | | **48-Lead TSSOP** | | | 48-Lead TSSOP | | | 48-Lead TSSOP | | | 48-Lead TSSOP | | | 32-Lead TQFN | | | 32-Lead TQFP | | | | |
| | | Wire Bond Material | | **Au .001"** | | | Au .001" | | | Au .001" | | | Au .001" | | | Au .001" | | | Au .001" | | | | |
| | | Mold Compound | | **G700K** | | | G700K | | | G700K | | | G700K | | | G770HC | | | EME7320CR | | | | |
| | | Die Attach | | **8290** | | | 8290 | | | 8290 | | | 8290 | | | AB8200T | | | 84-1LMISR4 | | | | |
| | | Lead Frame | | **Copper** | | | Copper | | | Copper | | | Copper | | | Copper | | | Copper | | | | |
| | | Lead Finish | | **85/15 Sn/Pb** | | | 85/15 Sn/Pb | | | 85/15 Sn/Pb | | | 100% Matte Sn | | | 85/15 Sn/Pb | | | 85/15 Sn/Pb | | | | |
| | | Reliability Lot Number | | A050012, DC 0534 | | | A050002, DC 0451 | | | A050010, DC 0453 | | | R040020, DC 0404 | | | A050005, DC 0517 | | | R020068B, DC 0309 | | | | |
| | | | | **Failures/Sample Size** | | | **Failures/Sample Size** | | | **Failures/Sample Size** | | | **Failures/Sample Size** | | | **Failures/Sample Size** | | | **Failures/Sample Size** | | | | |
| **AEC-Q100 Rev. F Tests** | **#** | **Conditions** | **+25C** | **+85C** | **-40C** | **+25C** | **+125C** | **-40C** | **+25C** | **+85C** | **-40C** | **+25C** | **+85C** | **-40C** | **+25C** | **+125C** | **-40C** | **+25C** | **+85C** | **-40C** |
| MSL 3 - Preconditioning (PC) | A1 | 240C (Sn/Pb) | 0/215 | | | 0/215 | | | 0/22 | | | | | | | | | 0/150 | | |
| | | 260C (100% Sn) | | | | | | | | | | 0/449 | | | | | | | | |
| =>CSAM | | J-STD-020C (1 lot) | 0/22 | | | 0/22 | | | 0/22 | | | | | | | | | | | |
| Temperature Humidity-Bias (THB) | A2 | 85C/85%RH 1000 Hours | | | | | | | | | | | | | | | | 0/44 | | |
| Biased HAST (HAST) | A2 | 130C/85%RH 96 Hours | 0/48 | 0/48 | | 0/45 | 0/45 | | | | | 0/135 | | | | | | | | |
| Autoclave (AC) | A3 | 121C/85%RH 168 Hours | | | | | | | | | | 0/231 | | | | | | 0/77 | | |
| Unbiased HAST (UHAST) | A3 | 130C/85%RH 96 Hours | 0/50 | 0/50 | | 0/45 | | | | | | | | | | | | | | |
| Temperature Cycle (TC) | A4 | -65 to +150C 1000 Cycles | 0/80 | 0/80 | | 0/77 | 0/77 | | | | | 0/231 | | | | | | | | |
| =>Wirebond Pull (WBP) | | >3 grams | 0/200 | | | 0/240 | | | | | | | | | | | | | | |
| High Temperature Storage (HTSL) | A6 | +150C 1000 Hours | 0/79 | 0/79 | | 0/77 | 0/77 | | | | | 0/231 | | | | | | 0/71 | | |
| High Temperature Op Life (HTOL) | B1 | +135C 1000 Hours | +115C 0/47 | +115C 0/47 | +115C 0/47 | +115C 0/45 | +115C 0/45 | +115C 0/45 | +115C 0/47 | +115C 0/47 | +115C 0/47 | +115C 0/134 | | | 0/48 | 0/48 | 0/48 | 0/78 | | |
| Early Life Failure Rate (ELFR) | B2 | +135C 48 Hours | | | | | | | | | | | | | | | | (Note 4) 0/845 | (Note 4) 0/845 | |
| Maxim Infant Mortality Evaluation | | +135C 12 Hours | | | | | | | | | | | | | | | | 0/2637 | | |
| Wire Bond Shear (WBS) | C1 | | (Note 3) | | | (Note 3) | | | | | | | | | | | | | | |
| Wire Bond Pull (WBP) | C2 | | (Note 3) | | | (Note 3) | | | | | | 0/678 | | | | | | | | |
| Solderability (SD) | C3 | | 0/15 | | | 0/15 | | | | | | 0/45 | | | | | | | | |
| Physical Dimensions (PD) | C4 | | 0/15 | | | 0/15 | | | | | | 0/45 | | | | | | | | |
| Lead Integrity (LI) | C6 | | 0/10 | | | 0/15 | | | | | | 0/15 | | | | | | | | |
| (EM, TDDB, HCI) | D1-3 | | TSMC | | | TSMC | | | TSMC | | | TSMC | | | TSMC | | | TSMC | | |
| Pre- and Post-Stress Electrical (TEST) | E1 | | All | All | All | All | All | All | All | All | All | All | | | All | All | All | All | All | |
| Human Body Model ESD (HBM) | E2 | JESD22/A114 | 2500V | 2500V | | | | | | | | | | | | | | | | |
| Machine Model ESD (MM) | E2 | JESD22/A115 | | | | | | | | | | | | | | | | | | |
| Charged Device Model ESD (CDM) | E3 | AEC-Q100-011 | 750V | 750V | | | | | | | | | | | | | | | | |
| Latch-Up (LU) | E4 | JESD78, Class I | 0/6 | 0/6 | | | | | | | | | | | | | | | | |

**(Note 1)** AEC-Q100 test performed per Rev. F guidelines. Maxim tests performed to internal specification 10-3006.

**(Note 2)** Tests performed on three assembly lots.

**(Note 3)** Monitor data from assembly subcontractor.

**(Note 4)** Data from Lot Q43ACQ002B, per AEC-Q100 ELFR requirements.

✓ = Complete

□ = Open