



Date: April 24, 2009

CN Number: 0901

Subject: ESD Sensitivity for SX-A and eX Family Devices

Dear Valued Customer,

This Customer Notification (CN) is to inform users about the SX-A (A54SX08A, A54SX16A, A54SX32A, and A54SX72A devices) and eX (eX64, eX128, and eX256 devices) families in regard to the Electrostatic Discharge (ESD) Voltage Sensitivity Level. Appendix A contains a full list of devices affected by this CN. ESD tests conducted on these devices per MIL-STD-883, TM3015.7 showed that four pins on these devices passed 75 V Human Body Model (HBM) ESD only. The remaining pins pass HBM ESD testing at 1,000 V or higher. The ESD voltage sensitivity shall be rated at 75 V for all devices that are listed above. The ESD classifications for these devices shall be classified as Class 0 per revision G of MIL-STD-883, TM3015.7. Users following ESD handling requirements for Class 0 devices should not be affected. This CN is intended to remind users of the importance of enforcing appropriate ESD handling requirements for Class 0 devices. Class 0 devices must be treated assuming they could have 0 volt ESD sensitivity. There are four Ground Q (GNDQ) pins per device, which are all shown as Ground pins in the datasheets. In ESD testing, all pins passed 1,000 V ESD except for the four GNDQ pins, which passed 75 V. By removing the Ground pin group from the test population, the ESD sensitivity improves to >1,000 V.

Test results show ESD failures at 150 V for the GNDQ pins; however, all pins passed at 75 V. Failure analysis determined that the same input cell transistor failed in each case. This failure occurs only when the positive tester terminal is connected to a GNDQ pin and the negative tester terminal is connected to a V_{CCI} pin. Damage to the identified transistor results in a stuck-at-1 failure, which can be detected by JTAG (IEEE 1149.1) boundary-scan testing. For users who are concerned with parts already integrated on boards that may have been subjected to handling procedures inconsistent with the Class 0, 0 V, ESD handling requirement, boundary-scan testing can be used to verify correct operation of each input cell.

For customers who subscribe to the GIDEP system, this notification has been previously published in GIDEP SC7-P-05-01A. For further detailed information on the failure symptom and general ESD handling, please consult Actel application note, *Electro-Static Discharge*, which is located on Actel's website at http://www.actel.com/documents/ESD_AN.pdf.

If you have additional questions, please contact the Actel hotline (1-800-262-1060) or your regional FAE for assistance.

Regards,
Actel



Table 1. Class 0 ESD SX-A Device Family Part Numbers

SX-A Device Part Numbers			
A54SX08A-FG144	A54SX08A-TQ100A	A54SX16A-FG256I	A54SX16A-TQ100A
A54SX08A-FGG144	A54SX08A-TQG100A	A54SX16A-FGG256I	A54SX16A-TQG100A
A54SX08A-FFG144	A54SX08A-TQ144	A54SX16A-1FG256I	A54SX16A-TQ100M
A54SX08A-FFGG144	A54SX08A-TQG144	A54SX16A-1FGG256I	A54SX16A-TQG100M
A54SX08A-1FG144	A54SX08A-FTQ144	A54SX16A-2FG256I	A54SX16A-ITQ100M
A54SX08A-1FGG144	A54SX08A-FTQG144	A54SX16A-2FGG256I	A54SX16A-ITQG100M
A54SX08A-2FG144	A54SX08A-ITQ144	A54SX16A-FG256A	A54SX16A-TQ144
A54SX08A-2FGG144	A54SX08A-ITQG144	A54SX16A-FGG256A	A54SX16A-TQG144
A54SX08A-FG144I	A54SX08A-2TQ144	A54SX16A-FG256M	A54SX16A-FTQ144
A54SX08A-FGG144I	A54SX08A-2TQG144	A54SX16A-FGG256M	A54SX16A-FTQG144
A54SX08A-1FG144I	A54SX08A-TQ144I	A54SX16A-1FG256M	A54SX16A-ITQ144
A54SX08A-1FGG144I	A54SX08A-TQG144I	A54SX16A-1FGG256M	A54SX16A-ITQG144
A54SX08A-2FG144I	A54SX08A-ITQ144I	A54SX16A-PQ208	A54SX16A-2TQ144
A54SX08A-2FGG144I	A54SX08A-ITQG144I	A54SX16A-PQG208	A54SX16A-2TQG144
A54SX08A-FG144A	A54SX08A-2TQ144I	A54SX16A-FPQ208	A54SX16A-TQ144I
A54SX08A-FGG144A	A54SX08A-2TQG144I	A54SX16A-FPQG208	A54SX16A-TQG144I
A54SX08A-PQ208	A54SX08A-TQ144A	A54SX16A-1PQ208	A54SX16A-ITQ144I
A54SX08A-PQG208	A54SX08A-TQG144A	A54SX16A-1PQG208	A54SX16A-ITQG144I
A54SX08A-FPQ208	A54SX16A-FG144	A54SX16A-2PQ208	A54SX16A-2TQ144I
A54SX08A-FPQG208	A54SX16A-FGG144	A54SX16A-2PQG208	A54SX16A-2TQG144I
A54SX08A-1PQ208	A54SX16A-FFG144	A54SX16A-PQ208I	A54SX16A-TQ144A
A54SX08A-1PQG208	A54SX16A-FFGG144	A54SX16A-PQG208I	A54SX16A-TQG144A
A54SX08A-2PQ208	A54SX16A-1FG144	A54SX16A-1PQ208I	A54SX16A-TQ144M
A54SX08A-2PQG208	A54SX16A-1FGG144	A54SX16A-1PQG208I	A54SX16A-TQG144M
A54SX08A-PQ208I	A54SX16A-2FG144	A54SX16A-2PQ208I	A54SX16A-ITQ144M
A54SX08A-PQG208I	A54SX16A-2FGG144	A54SX16A-2PQG208I	A54SX16A-ITQG144M
A54SX08A-1PQ208I	A54SX16A-FG144I	A54SX16A-PQ208A	A54SX32A-BG329



Table 1. Class 0 ESD SX-A Device Family Part Numbers (Continued)

SX-A Device Part Numbers			
A54SX08A-1PQG208I	A54SX16A-FGG144I	A54SX16A-PQG208A	A54SX32A-BGG329
A54SX08A-2PQ208I	A54SX16A-1FG144I	A54SX16A-PQ208M	A54SX32A-FBG329
A54SX08A-2PQG208I	A54SX16A-1FGG144I	A54SX16A-PQG208M	A54SX32A-FBGG329
A54SX08A-PQ208A	A54SX16A-2FG144I	A54SX16A-1PQ208M	A54SX32A-1BG329
A54SX08A-PQG208A	A54SX16A-2FGG144I	A54SX16A-1PQG208M	A54SX32A-1BGG329
A54SX08A-TQ100	A54SX16A-FG144A	A54SX16A-TQ100	A54SX32A-2BG329
A54SX08A-TQG100	A54SX16A-FGG144A	A54SX16A-TQG100	A54SX32A-2BGG329
A54SX08A-FTQ100	A54SX16A-FG144M	A54SX16A-FTQ100	A54SX32A-BG329I
A54SX08A-FTQG100	A54SX16A-FGG144M	A54SX16A-FTQG100	A54SX32A-BGG329I
A54SX08A-ITQ100	A54SX16A-1FG144M	A54SX16A-ITQ100	A54SX32A-1BG329I
A54SX08A-ITQG100	A54SX16A-1FGG144M	A54SX16A-ITQG100	A54SX32A-1BGG329I
A54SX08A-2TQ100	A54SX16A-FG256	A54SX16A-2TQ100	A54SX32A-2BG329I
A54SX08A-2TQG100	A54SX16A-FGG256	A54SX16A-2TQG100	A54SX32A-2BGG329I
A54SX08A-TQ100I	A54SX16A-FFG256	A54SX16A-TQ100I	A54SX32A-BG329M
A54SX08A-TQG100I	A54SX16A-FFGG256	A54SX16A-TQG100I	A54SX32A-BGG329M
A54SX08A-ITQ100I	A54SX16A-1FG256	A54SX16A-ITQ100I	A54SX32A-1BG329M
A54SX08A-ITQG100I	A54SX16A-1FGG256	A54SX16A-ITQG100I	A54SX32A-1BGG329M
A54SX08A-2TQ100I	A54SX16A-2FG256	A54SX16A-2TQ100I	A54SX32A-FG144
A54SX08A-2TQG100I	A54SX16A-2FGG256	A54SX16A-2TQG100I	A54SX32A-FGG144
A54SX32A-FFG144	A54SX32A-FG484I	A54SX32A-TQ100M	A54SX32A-CQ84B
A54SX32A-FFGG144	A54SX32A-FGG484I	A54SX32A-TQG100M	A54SX32A-1CQ84B
A54SX32A-1FG144	A54SX32A-1FG484I	A54SX32A-ITQ100M	A54SX32A-CQ208
A54SX32A-1FGG144	A54SX32A-1FGG484I	A54SX32A-ITQG100M	A54SX32A-1CQ208
A54SX32A-2FG144	A54SX32A-2FG484I	A54SX32A-TQ144	A54SX32A-CQ208M
A54SX32A-2FGG144	A54SX32A-2FGG484I	A54SX32A-TQG144	A54SX32A-1CQ208M
A54SX32A-FG144I	A54SX32A-FG484M	A54SX32A-FTQ144	A54SX32A-CQ256



Table 1. Class 0 ESD SX-A Device Family Part Numbers (Continued)

SX-A Device Part Numbers			
A54SX32A-FGG144I	A54SX32A-FGG484M	A54SX32A-FTQG144	A54SX32A-1CQ256
A54SX32A-1FG144I	A54SX32A-1FG484M	A54SX32A-ITQ144	A54SX32A-CQ256M
A54SX32A-1FGG144I	A54SX32A-1FGG484M	A54SX32A-ITQG144	A54SX32A-1CQ256M
A54SX32A-2FG144I	A54SX32A-PQ208	A54SX32A-2TQ144	A54SX72A-FG256
A54SX32A-2FGG144I	A54SX32A-PQG208	A54SX32A-2TQG144	A54SX72A-FGG256
A54SX32A-FG144A	A54SX32A-FPQ208	A54SX32A-TQ144I	A54SX72A-FFG256
A54SX32A-FGG144A	A54SX32A-FPQG208	A54SX32A-TQG144I	A54SX72A-FFGG256
A54SX32A-FG144M	A54SX32A-1PQ208	A54SX32A-ITQ144I	A54SX72A-1FG256
A54SX32A-FGG144M	A54SX32A-1PQG208	A54SX32A-ITQG144I	A54SX72A-1FGG256
A54SX32A-1FG144M	A54SX32A-2PQ208	A54SX32A-2TQ144I	A54SX72A-2FG256
A54SX32A-1FGG144M	A54SX32A-2PQG208	A54SX32A-2TQG144I	A54SX72A-2FGG256
A54SX32A-FG256	A54SX32A-PQ208I	A54SX32A-TQ144A	A54SX72A-FG256I
A54SX32A-FGG256	A54SX32A-PQG208I	A54SX32A-TQG144A	A54SX72A-FGG256I
A54SX32A-FFG256	A54SX32A-1PQ208I	A54SX32A-TQ144M	A54SX72A-1FG256I
A54SX32A-FFGG256	A54SX32A-1PQG208I	A54SX32A-TQG144M	A54SX72A-1FGG256I
A54SX32A-1FG256	A54SX32A-2PQ208I	A54SX32A-ITQ144M	A54SX72A-2FG256I
A54SX32A-1FGG256	A54SX32A-2PQG208I	A54SX32A-ITQG144M	A54SX72A-2FGG256I
A54SX32A-2FG256	A54SX32A-PQ208A	A54SX32A-TQ176	A54SX72A-FG256A
A54SX32A-2FGG256	A54SX32A-PQG208A	A54SX32A-TQG176	A54SX72A-FGG256A
A54SX32A-FG256I	A54SX32A-PQ208M	A54SX32A-FTQ176	A54SX72A-FG256M
A54SX32A-FGG256I	A54SX32A-PQG208M	A54SX32A-FTQG176	A54SX72A-FGG256M
A54SX32A-1FG256I	A54SX32A-1PQ208M	A54SX32A-ITQ176	A54SX72A-1FG256M
A54SX32A-1FGG256I	A54SX32A-1PQG208M	A54SX32A-ITQG176	A54SX72A-1FGG256M
A54SX32A-2FG256I	A54SX32A-TQ100	A54SX32A-2TQ176	A54SX72A-FG484
A54SX32A-2FGG256I	A54SX32A-TQG100	A54SX32A-2TQG176	A54SX72A-FGG484
A54SX32A-FG256A	A54SX32A-FTQ100	A54SX32A-TQ176I	A54SX72A-FFG484
A54SX32A-FGG256A	A54SX32A-FTQG100	A54SX32A-TQG176I	A54SX72A-FFGG484



Table 1. Class 0 ESD SX-A Device Family Part Numbers (Continued)

SX-A Device Part Numbers			
A54SX32A-FG256M	A54SX32A-ITQ100	A54SX32A-ITQ176I	A54SX72A-1FG484
A54SX32A-FGG256M	A54SX32A-ITQG100	A54SX32A-ITQG176I	A54SX72A-1FGG484
A54SX32A-1FG256M	A54SX32A-2TQ100	A54SX32A-2TQ176I	A54SX72A-2FG484
A54SX32A-1FGG256M	A54SX32A-2TQG100	A54SX32A-2TQG176I	A54SX72A-2FGG484
A54SX32A-FG484	A54SX32A-TQ100I	A54SX32A-TQ176M	A54SX72A-FG484I
A54SX32A-FGG484	A54SX32A-TQG100I	A54SX32A-TQG176M	A54SX72A-FGG484I
A54SX32A-FFG484	A54SX32A-ITQ100I	A54SX32A-ITQ176M	A54SX72A-1FG484I
A54SX32A-FFGG484	A54SX32A-ITQG100I	A54SX32A-ITQG176M	A54SX72A-1FGG484I
A54SX32A-1FG484	A54SX32A-2TQ100I	A54SX32A-CQ84	A54SX72A-2FG484I
A54SX32A-1FGG484	A54SX32A-2TQG100I	A54SX32A-1CQ84	A54SX72A-2FGG484I
A54SX32A-2FG484	A54SX32A-TQ100A	A54SX32A-CQ84M	A54SX72A-FG484A
A54SX32A-2FGG484	A54SX32A-TQG100A	A54SX32A-1CQ84M	A54SX72A-FGG484A
A54SX72A-FG484M	A54SX72A-1PQ208	A54SX72A-2PQ208I	A54SX72A-CQ208
A54SX72A-FGG484M	A54SX72A-1PQG208	A54SX72A-2PQG208I	A54SX72A-1CQ208
A54SX72A-1FG484M	A54SX72A-2PQ208	A54SX72A-PQ208A	A54SX72A-CQ208M
A54SX72A-1FGG484M	A54SX72A-2PQG208	A54SX72A-PQG208A	A54SX72A-1CQ208M
A54SX72A-PQ208	A54SX72A-PQ208I	A54SX72A-PQ208M	A54SX72A-CQ256
A54SX72A-PQG208	A54SX72A-PQG208I	A54SX72A-PQG208M	A54SX72A-1CQ256
A54SX72A-FPQ208	A54SX72A-1PQ208I	A54SX72A-1PQ208M	A54SX72A-CQ256M
A54SX72A-FPQG208	A54SX72A-1PQG208I	A54SX72A-1PQG208M	A54SX72A-1CQ256M

Table 2. Class 0 ESD SX-A SMD Device Part Numbers

A54SX32A Device Part Numbers	DSCC SMD Numbers	A54SX72A Device Part Numbers	DSCC SMD Numbers
A54SX32A-CQ208B	5962-0151801QYC	A54SX72A-CQ208B	5962-0054301QYC
A54SX32A-1CQ208B	5962-0151802QYC	A54SX72A-1CQ208B	5962-0054302QYC
A54SX32A-CQ256B	5962-0151801QXC	A54SX72A-CQ256B	5962-0054301QXC
A54SX32A-1CQ256B	5962-0151802QXC	A54SX72A-1CQ256B	5962-0054302QXC
A54SX32A-CQ84B	5962-0151801QZC		
A54SX32A-1CQ84B	5962-0151802QZC		



Table 3. Class 0 ESD eX Device Part Numbers

eX Device Part Numbers			
eX64-CS49	eX64-PTQ100	eX128-PTQ64I	eX256-TQ100
eX64-CSG49	eX64-PTQG100	eX128-PTQG64I	eX256-TQG100
eX64-FCS49	eX64-TQ100I	eX128-TQ64A	eX256-FTQ100
eX64-FCSG49	eX64-TQG100I	eX128-TQG64A	eX256-FTQG100
eX64-PCS49	eX64-PTQ100I	eX128-TQ100	eX256-PTQ100
eX64-PCSG49	eX64-PTQG100I	eX128-TQG100	eX256-PTQG100
eX64-CS49I	eX64-TQ100A	eX128-FTQ100	eX256-TQ100I
eX64-CSG49I	eX64-TQG100A	eX128-FTQG100	eX256-TQG100I
eX64-PCS49I	eX128-CS49	eX128-PTQ100	eX256-PTQ100I
eX64-PCSG49I	eX128-CSG49	eX128-PTQG100	eX256-PTQG100I
eX64-CS49A	eX128-FCS49	eX128-TQ100I	eX256-TQ100A
eX64-CSG49A	eX128-FCSG49	eX128-TQG100I	eX256-TQG100A
eX64-CS128	eX128-PCS49	eX128-PTQ100I	
eX64-CSG128	eX128-PCSG49	eX128-PTQG100I	
eX64-FCS128	eX128-CS49I	eX128-TQ100A	
eX64-FCSG128	eX128-CSG49I	eX128-TQG100A	
eX64-PCS128	eX128-PCS49I	eX256-CS128	
eX64-PCSG128	eX128-PCSG49I	eX256-CSG128	
eX64-CS128I	eX128-CS49A	eX256-FCS128	
eX64-CSG128I	eX128-CSG49A	eX256-FCSG128	
eX64-PCS128I	eX128-CS128	eX256-PCS128	
eX64-PCSG128I	eX128-CSG128	eX256-PCSG128	
eX64-CS128A	eX128-FCS128	eX256-CS128I	
eX64-CSG128A	eX128-FCSG128	eX256-CSG128I	
eX64-TQ64	eX128-PCS128	eX256-PCS128I	
eX64-TQG64	eX128-PCSG128	eX256-PCSG128I	
eX64-FTQ64	eX128-CS128I	eX256-CS128A	
eX64-FTQG64	eX128-CSG128I	eX256-CSG128A	
eX64-PTQ64	eX128-PCS128I	eX256-CS180	
eX64-PTQG64	eX128-PCSG128I	eX256-CSG180	
eX64-TQ64I	eX128-CS128A	eX256-FCS180	
eX64-TQG64I	eX128-CSG128A	eX256-FCSG180	
eX64-PTQ64I	eX128-TQ64	eX256-PCS180	
eX64-PTQG64I	eX128-TQG64	eX256-PCSG180	
eX64-TQ64A	eX128-FTQ64	eX256-CS180I	
eX64-TQG64A	eX128-FTQG64	eX256-CSG180I	
eX64-TQ100	eX128-PTQ64	eX256-PCS180I	
eX64-TQG100	eX128-PTQG64	eX256-PCSG180I	
eX64-FTQ100	eX128-TQ64I	eX256-CS180A	
eX64-FTQG100	eX128-TQG64I	eX256-CSG180A	