



CUSTOMER ADVISORY PLCC MOISTURE SENSITIVITY LEVEL RECLASSIFICATION

Altera's internal reliability monitors indicate a drift in the Moisture Sensitivity Level (MSL) of its non-dry-packed 44-, 68- and 84-pin PLCC packages that have seal date codes of 98XX. While our evaluations do not support a MSL 1 rating* per JEDEC-Std-020, they do support a MSL 2 rating. Consistent with the MSL 2 rating is the fact that of the over 10 million 98XX PLCC units shipped to-date, no customer has reported a field failure related to moisture sensitivity or in surface mounting the product. PLCC control groups of 97XX seal date codes continue to meet MSL 1 specifications. Since this drift has been observed on 98XX PLCC products manufactured in two completely different assembly locations, and there have been no intended or known changes to the PLCC process flow or materials used, we believe that changes may have occurred in the properties of the molding compound.

In light of this observation, Altera has decided to temporarily start dry-packing all 44-, 68- and 84-lead PLCC products, beginning with the topside date code of 9837. Since 98XX PLCC products still meet MSL 2 specifications, it is not necessary to dry-pack material already in customer or distributor warehouses. MSL 2 non-dry-packed PLCC products can be successfully mounted within one year of the seal date. In the rare instance where a product cannot be mounted within a year of its seal date, a 12-hour bake at 125°C is recommended. Altera marks the seal date code on the bottom side of the product.

Altera is aggressively working with its assembly subcontractors to restore the desired MSL 1 status. Altera is currently evaluating an alternative PLCC mold compound, Nitto's MP8000, which is already in use for assembly of most of our FLEX QFP products. Upon completion of this evaluation, Altera will start shipping PLCC products assembled with MP8000. Full qualification is anticipated by October 15, 1998, and Altera plans to revert to non-dry-packing effective seal date code of 9843.

If you have any questions, you may contact Paul Weis at (408) 544-7563, or Prakash Vaswani at (408)544-7417.

* EPM5192LC84 supports MSL 3 rating and for this device a bake is recommended if not mounted within three months of seal date code. PLCC products currently dry-packed as MSL 3 remain unaffected.