

CUSTOMER ADVISORY

RQFP & TQFP MOISTURE RECLASSIFICATION

In ADV 9505, Altera announced that it had established dry packing requirements for the RQFP package, as well as for other QFP and PLCC packages. Dry packing enhances the shipping process by placing devices in vacuum-sealed moisture-barrier bags with desiccant. This packing procedure, standard for many semiconductor vendors, increases the quality and reliability of Altera's RQFP, QFP, and some PLCC packages, by reducing the potential for lead or moisture damage.

Based on a comprehensive re-characterization of the TQFP package per methods specified in IPC-SM-786A, Altera is now able to recommend a Level 3 moisture rating for all TQFP products. This upgrade is based solely on re-characterization; the TQFP assembly process and piece-parts remain unchanged.

Additionally, planned changes in the packaging process are allowing Altera to reclassify most of the MAX 7000, FLEX 8000, and MAX 9000 family devices offered in RQFP packages to a Level 3 moisture rating. Improvement in RQFP package is attributable to the use of an oxidized heat slug that has resulted in increased die adhesion. Thus, starting with seal date code of 9719, the new floor life of 120 hours will be specified on the labels affixed to moisture barrier bags.

Attached you will find a revised moisture rating matrix for Altera's products. Our process enhancement efforts will continue and we expect the FLEX 8000 products still rated as level 5 to be upgraded to level 3 by the end of 1997. During this transition, Altera may ship both level 3 and level 5 products until inventories are depleted.

If you have any questions about these enhancements, please contact Prakash Vaswani, Corporate Quality Manager, at (408) 894-7417.

Altera Product Moisture Classification

Package (Lead Count)	Products	EFFECTIVE DATE CODE	Moisture Class / Floor Life **
TQFP (32, 44, 100, 144)	ALL PRODUCTS	ALL	Level 3 / 120 hours ❶
PQFP (100, 160, 208, 240)	ALL PRODUCTS	ALL	Level 3 / 120 hours
PQFP (132)	EPX780	ALL	Level 5 / 48 hours
	EPX880	ALL	Level 3 / 120 hours
RQFP (208, 240, 304)	ALL MAX 7000 & MAX 9000 PRODUCTS	< 9719	Level 5 / 24 hours
		>= 9719	Level 3 / 120 hours ❷
	EPF81188(A) & EPF81500(A)	ALL	Level 5 / 24 hours
	EPF8636(A) & EPF8820(A)	ALL	Level 3 / 120 hours ❷
	EPF10K20, EPF10K30, EPF10K40	ALL	Level 5 / 24 hours
	EPF10K50(V)	< 9707	Level 6 / 2 hours
		>= 9707	Level 5 / 24 hours
EPF10K70	ALL	Level 6 / 2 hours	
PLCC (84)	EPF8452(A), EPF8636(A), EPM9320, EPM9400, EPX780, EPX880, EPF10K10	ALL	Level 3 / 120 hours
BGA (225)	EPF8820(A)	ALL	Level 5 / 24 hours
SBGA (356)	ALL PRODUCTS	ALL	Level 5 / 24 hours

- ** Per IPC-SM-786A. Floor life specified is in addition to the Manufacturer's Exposure Time (MET). For level 3 products, Altera's distributors have an additional 48 hours of floor life.
 - Please follow the guidelines available in Application Note 81 (Altera's Reflow Soldering Guidelines for Surface-Mount Devices) published in the 1996 Data Book.
 - Other surface-mount devices not listed in the table above meet Level 1 moisture classification and are shipped non-dry packed.
- ❶ TQFP has been reclassified as level 3 based on extensive moisture sensitivity analysis.
- ❷ RQFP processing has been enhanced. Effective seal date code of 9719, most products have been upgraded to level 3.