PROCESS CHANGE NOTIFICATION PCN0515
MOLD COMPOUND CHANGE FOR FBGA PACKAGES

Change Description:

Altera is adopting the Sumitomo G770 series mold compound as the standard mold material on Altera® FineLine BGA® (FBGA) device packages. Devices in FBGA packages currently molded with Nitto HC-100 series material will transition to the Sumitomo G770 series mold compound. This mold material had been fully qualified by Altera. The qualification data and the material properties of the mold compounds are attached in Appendixes 1 through 3.

This change will not affect the form, fit, or function of the devices and does not change the current moisture sensitivity rating level of these packages.

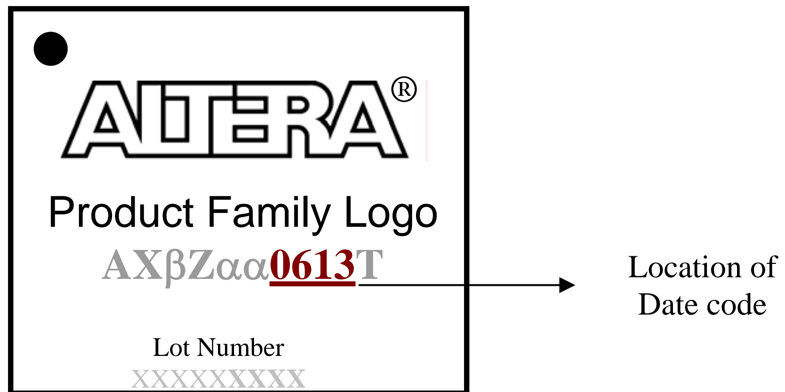
Reason for Change:

Altera is standardizing the mold compound of its products in all FPBGA packages to the Sumitomo G770 series mold compound.

Product Traceability and Transition Dates:

Customers may receive products packaged with the Sumitomo G770 series mold compound beginning with FBGA packages carrying a top mark date code of 0613.

Date Code Marking



Contact:

For more information on this change, contact your local Altera sales representative or Altera Customer Quality Engineering at customer-quality@altera.com.

Products Affected:

Package	Pin	Product Line
FBGA	100	EPF6016A
		EPM7064AE
		EPM7064B
		EPM7128A
		EPM7128AE
		EPM7128B
		EPM7256AE
	144	EP20K100E
		EP20K30E
		EP20K60E
	256	EP1C12
		EP1C6
		EP1K10
		EP1K100
		EP1K30
		EP1K50
		EPF10K100A
		EPF10K100E
		EPF10K30A
		EPF10K30E
		EPF10K50E
		EPF10K50S
		EPF6016A
		EPF6024A
		EPM1270
		EPM1270G
		EPM2210
		EPM2210G
		EPM3128A
		EPM3256A
		EPM3512A
		EPM570
		EPM570G
		EPM7128AE
		EPM7128B
		EPM7256A
		EPM7256AE
		EPM7256B
		EPM7512AE
		EPM7512B
		EPM7KA
		EPM7KAE

Package	Pin	Product Line
FBGA	324	EP1C12
		EP1C20
		EP1C4
		EP20K100
		EP20K100E
		EP20K30E
		EP20K60E
		EPM2210
		EPM2210G
	400	EP1C20
		EP1C4
	484	EP1K100
		EP1K50
		EP20K160E
		EP20K200
		EP20K200C
		EP20K200E
		EPF
		EPF10K100E
		EPF10K130E
		EPF10K200S
		EPF10K30A
		EPF10K30E
		EPF10K50E
		EPF10K50S
		EPF10K50V
		EPXA1
		MP1K100
		MPF10K130E
	672	EP1S10
		EP1S20
		EP1S25
		EP20K200E
		EP20K300E
		EPF10K130E
		EPF10K200E
		EPF10K200S

Appendix 1 – Qualification Data

Representative Package	Qualification Test	Read Out	Results
FBGA672	130° C/85% RH Unbiased HAST	168 hrs	0/50
	PCL 3 and 130 °C/85% RH Biased HAST	96 hrs	0/25
	PCL 3 and Temperature Cycle Condition B	1000 cyc	0/100
	150 °C Bake Test	2000 hrs	0/184
	1.45-V, 3.6-V, 125° C Static Life Test	48 hrs	0/556
		1000 hrs	0/142
	PCL 3 and 85° C/85% RH Temperature Humidity Biased	1000 hrs	0/50
FBGA400	130° C/85% RH Unbiased HAST	168 hrs	0/25
	PCL 3 and 130° C/85% RH Biased HAST	96 hrs	0/25
	PCL 3 and Temperature Cycle Condition B	1000 cyc	0/25

Appendix 2 – Material Properties for SUMITOMO G770 series

Material Properties	Unit	Sumitomo G770 series
Spiral Flow	Cm	150.000
Gel Time	sec	36.000
Koka's Viscosity	Pa-s	9.000
CTE-1	$x10^{-5}$/C	0.800
CTE-2	$x10^{-5}$/C	4.000
Tg	C	130.000
Flex. Strength (@ 25° C)	N/mm^2	165.000
Flex. Strength (@ 240° C)	N/mm^2	23.000
Flex. Strength (@ 260° C)	N/mm^2	21.000
Flex. Modulus (@ 25° C)	$x10^2 N/mm^2$	255.000
Flex. Modulus (@ 240° C)	$x10^2 N/mm^2$	8.000
Flex. Modulus (@ 260° C)	$x10^2 N/mm^2$	7.000
Stress Index (-65° C ~ 175° C)	E2 (@240° C) N/mm^2	-26.195
Stress Index (-65° C ~ 175° C)	E2 (@260° C) N/mm^2	-26.028
CTE1 x E1		0.204
Specific Gravity	-	2.010
Water Absorption (boil 24 hrs)	%	0.170
UL Flammability (3.2 mmt)	UL-94	V-0
Volume Resistivity @ 150° C	Ohm-cm	$1x10^{11}$
Thermal Conductivity	W/mK	0.900
Voltage Breakdown	kV/mm	15.000
Dielectric Constant (@ 1 MHz)	-	4.000
Dissipation Factor (@ 1 MHz)	-	0.005

Appendix 3 – Material Properties for Nitto HC-100 series

Material Properties	Unit	Nitto HC-100 series
Spiral Flow	cm	135-150
Gel Time	sec	33-36
Viscosity	poise	50-60
CTE-1	ppm	8
CTE-2	ppm	34-35
Tg	^{o}C	140
Flex. Strength (@ 25° C)	kg/mm^2	17
Flex. Modulus (@ 25° C)	kg/mm^2	2700
Specific Gravity	-	2.01
Volume Resistivity @ 100° C	ohm.cm	30
Volume Resistivity @ 150° C	ohm.cm	20