March 21, 2007 CN 032107

Customer Notification

CX2751x-12 Material Set Change

Dear Valued Customer:

This notification is for the CX27511-11, CX27512-12, CX27513-12, CX27514-12, CX27512G-14.

Mindspeed's turnkey supplier has sent notification that all their BGA products will be manufactured using a standard material set compliant to the Halogen-free (green) and RoHS standards. Mindspeed standard products (contains lead), CX2751x-12, will have new substrates, solder mask, die attach and mold compound. The RoHS products, CX2751xG-12, will only have a new mold compound. See table below for details.

Part Number	**CX2751x-12**	**CX2751xG-12**
Current Substrate	HL832	HL832NX
New Substrate	HL832NX	HL832NX
Current Soldermask	PSR-4000 AUS5	PSR-4000 AUS308
New Soldermask	PSR-4000 AUS308	PSR-4000 AUS308
Current Die Attach	8355	2100
New Die Attach	2100	2100
Current Mold Compound	SMT-B-1	EME-G770
New Mold Compound	CEL9750HF10	CEL9750HF10

The following tables detail the changes to each component of the material set:

Substrate

Property	Current Material HL832 MGC	New Material HL832NX MGC
Grade	BT	BT
Flame retardant	Halogen-based	None
Peel strength, 12μm VLP Cu (N/mm)	0.88	0.74
T_g (°C)	210	220
CTE (PPM/°C), Z-axis, 60-120°C	55	30
CTE (PPM/°C), X,Y-axis, 60-120°C	15	14
Dielectric constant at 1 GHz	4.2	4.7
Dissipation factor at 1 GHz	0.012	0.013
Flexural strength (X/Y) @RT (N/mm^2)	490.5/490.5	490.5/490.5
Flexural modulus @RT (N/mm^2)	23544	27470
UL94-V0 Flammability	V-0	V-0
Thermal conductivity (W/mK)	0.35	0.53

MINDSPEED™
BUILD IT FIRST

March 21, 2007 CN 032107

Customer Notification
CX2751x-12 Material Set Change

Soldermask

Property	Current Material PSR-4000 AUS5 Taiyo	New Material PSR-4000 AUS308 Taiyo
Young's modulus (GPa)	3.5	2.4
Elongation (%)	1.1	3.0
Tensile strength (MPa)	30	50
T_g (°C) 1(ppm/°C) 2(ppm/°C)	104 50 1.5	103 60 1.3
Water absorption, 20°C/24hrs DI water (%)	101	170

Die Attach

Properties	Current Material Ablestik Ablebond 8355	New Material Ablestik Ablebond 2100
Adhesive Type	Epoxy	Hybrid
Filler	Silver	Silver
Volume Resistivity (ohm-cm)	2.5×10^9	0.05
Thermal Conductivity @121°C (W/mK)	0.94	1.2
Glass Transition Temp (°C)	27	60
Coefficient of Thermal Expansion -Below T_g (ppm/°C) -Above T_g (ppm/°C)	 80 154	 65 200
Ionic Data -Chlorine (ppm) -Sodium (ppm) -Potassium (ppm)	 ≤ 20 ≤ 10 ≤ 10	 1 1 1

Mold Compound

Property	Current Material Cookson SMT-B-1	Current Material Sumitomo EME-G770	New Material Hitachi CEL9750HF10
Resin type	Mult-functional	Multiaromatic/ biphenyl	Confidential low molecular weight biphenyl tpe
Hardener type	Confidential	Mult-aromatic/tough	Confidential low water abs/multifunctional spherical
Filler type	Spherical/flake (77.5)	Spherical (88)	Spherical (91)
Filler cut-ff size (μm)	93	75	53

MINDSPEED™
BUILD IT FIRST

March 21, 2007 CN 032107

Customer Notification

CX2751x-12 Material Set Change

Flame retardant system	TBBA (+Antimony – oxides)	None	None
T_g (°C)	225	140	135
Specific gravity 1(ppm/°C) 2(ppm/°C)	1.89 16 59	2.02 8 36-40	2.02 7 31
Flexural strength @RT (N/mm^2)	101	165-170	147
Flexural modulus @RT (N/mm^2)	12600	26000	24820
Flexural strength @260° (N/mm^2)	26	17-21	12.75
Flexural modulus @240° (N/mm^2)	4600	600-700	900
Dielectric constant at 1 MHz	4.0 (1 kHz)	4.2	3.6
Dissipation Factor at 1 MHz	-	0.01	0.01
Volume Resistivity @150°C (Ωm)	0.32×10^{13}	1×10^{13}	2×10^{13}
Thermal Conductivity (W/mK)	0.7	0.88	1.0
UL94-V) Flammability	1/8”	1/8”	1/8”
Polymer mass (%)	22.5	12	9

Purpose

To consolidate material sets for all BGA devices built by our turnkey supplier.

Change Schedule

Products will be manufactured to the new material sets beginning in September of 2007 but will not ship until January 1, 2008 (nine month notification).

Method to identify parts

The date code on parts will be greater than 0735.

Customer Impact

Reliability stress testing and construction analysis was completed on three lots each from three different package sizes. Tests included Preconditioning, UHAST, HAST, T/C, and HTSL. All tests passed and therefore, now customer impact is anticipated with these changes. Detailed qualification results are available upon request.

We are confident this change will allow Mindspeed Technologies to maintain its high standards for quality and reliability. We will be managing this change very closely to ensure minimum disruption to our customers. If, at any time, you have a need for further information, please contact your local Sales Representative.

March 21, 2007 CN 032107

Customer Notification

CX2751x-12 Material Set Change

The indicated Customer Notification letter was received and acknowledged by the undersigned authority.

Name: _____ _____
Signature Print

Company: _____ _____
Name Location

Title: _____

Date: _____

Comments/additional requests: _____

Thank you for your attention on this matter.

Please return the acknowledgment form to the attention of Ralph Crowther, MINDSPEED Technologies Inc., 4000 MacArthur Blvd, Newport Beach, Ca, 92660; FAX (949)579-5404.