



**Package Material Composition and Mass Calculation**

Customer: GSI  
 Package: 14X22 HFC BGA 260L  
 Device Type: GS8673EQ18BK  
 Die Size: 10.80x13.42 mm  
 Total Pck. Weight (mg): 2336.8

Provided By: Larry Chen  
 Date: 2009/12/16

	name	composition	CAS No.	%	mg (ave)	mg.	%	PPM				
underfill	ASE UA03	Bisphenol A type liquid epoxy resin	25068-38-6	5>	0.50	<u>10</u>	<u>0.428</u>	4,279				
		Bisphenol F type liquid epoxy resin	9003-36-5	20~30	2.50		0.02	214				
		Phenolic resin	9003-35-4	10~20	1.50		0.06	642				
		Organic acid anhydride compound	trade secret	15~25	1.75		0.07	749				
		Amine type hardener	trade secret	5>	0.50		0.02	214				
		Silicon dioxide	60676-86-0	50~60	5.50		0.24	2,354				
		Carbon black	1333-86-4	1>	0.10		0.00	43				
		Additive	2530-83-8	5>	0.50		0.02	214				
		<b>Substrate</b>							<b>381.1</b>	<b>16.31</b>	<b>163,086</b>	
		Substrate	Solder Mask	Modified Resin				4.10		0.18	1,755	
Phthalcyanine Green and others							0.00	0				
Barium Sulfate and others					3.10		0.13	1,327				
Aromatic Carbonyl Compound					0.40		0.02	171				
Amine Compound							0.00	0				
Levelling Agents & Others					0.20		0.01	86				
Diethylene Glycol Monomethyl Ether Acetate					1.20		0.05	514				
Aromatic Hydrocarbon					1.20		0.05	514				
Dipropylene Glycol Monomethyl Ether					1.40		0.06	599				
Acrylic Esters Monomer					0.70		0.03	300				
Epoxy Resin					2.10		0.09	899				
Barium Sulfate					1.20		0.05	514				
Core(HL832NX-A(HS))	Core(HL832NX-A(HS))			Continuous Filament Fiber Glass	65997-17-3		97.00		4.15	41,510		
				Bismaleimide	105391-33-1		30.10		1.29	12,881		
				Triazine	25722-66-1		30.10		1.29	12,881		
				Epoxy Resin	9003-36-5		28.00		1.20	11,982		
				Epoxy Resin	NA		28.00		1.20	11,982		
				Inorganic filler	21645-51-2		1.10		0.05	471		
				Inorganic filler	NA		1.10		0.05	471		
				Cu plating	7440-50-8		72.90		3.12	31,197		
		Cu foil	7440-50-8		77.20		3.30	33,037				
		<b>Thermally conductive silicone a AD01</b>							<b>10</b>	<b>0.428</b>	<b>4,279</b>	
Thermally conductive silicone a AD01		Aluminum oxide	1344-28-1	45	4.50		0.19	1,926				
		Vinylpolydimethylsiloxane	68083-19-2	27.5	2.75		0.12	1,177				
		Vinyl containing resin	68584-83-8	3	0.30		0.01	128				
		Treated Filler	68909-20-6	24.5	2.45		0.10	1,048				
Die	Silicon	Silicon	7440-21-3	100	319.90	319.9	13.690	136,897				
Bump				100	1.50	1.5	0.064	641,903				
		Sn	7440-31-5	63	0.95		0.040	404,399				
		Pb	7439-92-1	37	0.56		0.024	237,504				
Solder ball	Solder Ball(Sn63/Pb37)_0.6mm			100		228.8	9.791	97,912				
		Sn	7440-31-5	63	144.14		6.17	61,684				
		Pb	7439-92-1	37	84.66		3.62	36,227				
Heatslug	(Copper/Nickel/Chrome)			100.0		1385	59.269	592,691				
		Copper	7440-50-8	99.35	1376.00		58.88	588,838				
		Nickel	7440-02-0	0.6	8.31		0.36	3,556				
		Chrome	-	0.05	0.69		0.03	296				
Ink	Marken 4461			100		0.5	0.021	214				
		Carbon black	1333-86-4	60	0.30		0.0128	128				
		Triethyl phosphate triethyl	78-40-0	13	0.07		0.0028	28				
		Formaldehyde	50-00-0	13	0.07		0.0028	28				
		Isobutyl alcohol	78-83-1	3	0.02		0.0006	6				
		Phenol	108-92-5	3	0.02		0.0006	6				
		Propylene glycol monomethyl ether acetate	108-65-6	8	0.04		0.0017	17				
<b>Total</b>					<b>2336.800</b>	<b>100</b>	<b>1000000</b>					