Lattice Semiconductor Corporation

Device Material Content

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Package: **388 fpBGA** **with SnPb Solder Balls**
Total Device Weight **2.14** **Grams**

MSL: 3
Peak Reflow Temp: 225°C

November, 2009	**% of Total Pkg. Wt.**	**Weight (g)**	**% of Total Pkg. Wt.**	**Weight (g)**	**Substance**	**CAS #**	**Notes / Assumptions:**
Die	1.82%	0.0389			Silicon chip	7440-21-3	Die size: 7.8 x 6.9 mm
Mold	27.63%	0.591					Mold Compound composition:
			21.69%	0.464	Silica (Fused or Amorphous)	60676-86-0	65 to 95% Silica (LSC uses 78.5% in our calculation)
			3.87%	0.083	Epoxy/Phenol Resin	-	5 to 22% Epoxy/Phenol Resin (LSC uses 14% in our calculation)
			0.28%	0.006	Brominated Epoxy Resin	68928-70-1	0 to 2% Brominated Epoxy Resin (LSC uses 1% in our calculation)
			0.69%	0.015	Antimony Trioxide	1309-64-4	0 to 5% Antimony Trioxide (LSC uses 2.5% in our calculation)
			0.28%	0.006	Antimony Pentoxide	1314-60-9	0 to 1.5% Antimony Pentoxide (LSC uses 1% in our calculation)
			0.69%	0.015	Siloxanes	-	0 to 5% Siloxanes (LSC uses 2.5% in our calculation)
			0.14%	0.003	Carbon Black	1333-86-4	0 to 1% Carbon Black (LSC uses 0.5% in our calculation)
							Mold Compound Density between 1.8 and 2.1 grams/cc
D/A Epoxy	0.26%	0.0055					Die attach epoxy Density: 4 grams/cc
			0.20%	0.0044	Silver (Ag)	7440-22-4	60 to 100% Silver (LSC uses 80% in our calculation)
			0.05%	0.0011	Organic esters and resins	-	7 to 30% Organic Esters and Resins (LSC uses 20% in our calculation)
Wire	0.53%	0.0114			Gold (Au)	7440-57-5	1.00 mil diameter; 1 wire per solder ball
Solder Balls	20.89%	0.447					
			13.16%	0.282	Tin (Sn)	7440-31-5	Solder ball composition Sn63/Pb37
			7.73%	0.165	Lead (Pb)	7439-92-1	
Substrate	23.47%	0.502					
			15.96%	0.342	Glass fiber	65997-17-3	60 to 75% glass fiber (LSC uses 68% in our calculation)
			7.51%	0.161	BT Resins	-	
Foil	25.40%	0.544			Copper (Cu)	7440-50-8	

Notes:
The values listed above are nominal values based on studies of representatives of this particular package type, and are believed to be as accurate as possible.
Constituent substances and proportions in epoxy materials are before curing.
The information provided above is representative of the package as of the date listed, and is subject to change at any time.

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