Device Material Content

5555 NE Moore Ct.
Hillsboro OR 97124
custreq@latticesemi.com

January, 2020

Package: 256 caBGA
Total Device Weight 0.532 **Grams**

Package Code: BG256
Products: XO2, XO3, ECP5

Assembly: ASEM
Size (mm): 14 x 14
Lead pitch (mm): 0.8
MSL: 3
Reflow max (ºC): 260

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	1.74%	0.0093	1.74%	0.0093	Silicon chip	7440-21-3	100.00%	Die size: 3.53 x 4.17 mm
Mold Compound	51.18%	0.2723	3.58%	0.0191	Epoxy Resin	-	7.00%	Mold Compound: Sumitomo G750SE (ULA)
			2.56%	0.0136	Phenol Novolac	9003-35-4	5.00%	
			2.56%	0.0136	Metal hydroxide	-	5.00%	
			0.26%	0.0014	Carbon Black	1333-86-4	0.50%	
			42.23%	0.2246	Silica Fused	60676-86-0	82.50%	
D/A Epoxy	0.28%	0.0015	0.22%	0.00120	Silver	7440-22-4	80.00%	Die attach epoxy: Henkel (Ablebond) 2100A
			0.06%	0.00030	Epoxy Resin	-	20.00%	
Wire	0.65%	0.0035	0.64%	0.0034	Copper	7440-50-8	98.50%	0.8 mil diameter; 1 wire per solder ball
			0.01%	0.0001	Palladium	7440-05-3	1.50%	
Solder Balls	18.26%	0.0971	17.62%	0.0937	Tin (Sn)	7440-31-5	96.50%	SAC305
			0.55%	0.0029	Silver (Ag)	7440-22-4	3.00%	
			0.09%	0.0005	Copper (Cu)	7440-50-8	0.50%	
Substrate	17.53%	0.0933	5.61%	0.0298	BT Resins	-	32.00%	BT Resin CCL-HL832NX-A*
			11.92%	0.0634	Glass fiber	65997-17-3	68.00%	
Foil	6.17%	0.0328	4.82%	0.0256	Copper	7440-50-8	78.16%	
			1.13%	0.0060	Nickel plating	7440-02-0	18.31%	
			0.22%	0.0012	Gold plating	7440-57-5	3.53%	
Solder Mask	4.18%	0.0222	2.27%	0.0121	Quartz	14808-60-7	54.37%	Solder mask PSR4000 AUS 308
			0.31%	0.0016	Dipropylene glycol monomethyl ether	34590-94-8	7.33%	
			0.14%	0.0007	Morpholine derivative**	71868-10-5	3.32%	
			0.13%	0.0007	Silicon dioxide	7631-86-9	3.00%	
			0.13%	0.0007	Silica, amorphous	112945-52-5	3.00%	
			0.01%	0.0001	Carbon black	1333-86-4	0.24%	
			1.20%	0.0064	Trade secret ingredients	-	28.74%	

Notes: SVHC:

*	0.18%	max. concentration of Bisphenol A (CAS# 80-05-7), contained in substrate laminate material as impurity - not intentionally added.
**	0.14%	max. concentration of Morpholine derivative (CAS# 71868-10-5), contained in solder mask material.

Lattice regards this materials information to be correct but makes no guarantee as to its accuracy or completeness, including, but not limited to, with respect to its compliance with applicable environmental laws and regulations. Lattice subcontracts the production, test and assembly of hardware devices to independent third-party vendors and materials suppliers ("Contractors"). All data provided hereunder is based on information received from Contractors. Lattice has not independently verified the accuracy or completeness of this information which is provided solely for your reference in connection with the use of Lattice products.

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Rev. N

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Package: 256 caBGA
Total Device Weight 0.532 **Grams**

Package Code: BG256
Products: XO2

Assembly: ASEK
Size (mm): 14 x 14
Lead pitch (mm): 0.8
MSL: 3
Reflow max (^{o}C): 260

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	1.74%	0.0093						Die size: 3.53 x 4.17 mm
			1.74%	0.0093	Silicon chip	7440-21-3	100.00%	
Mold Compound	51.18%	0.2723						Kyocera KE-G2250 series (ULA)
			44.78%	0.2383	Silica	60676-86-0	87.50%	
			3.33%	0.0177	Epoxy resin	-	6.50%	
			2.82%	0.0150	Phenol Resin	-	5.50%	
			0.26%	0.0014	Carbon Black	1333-86-4	0.50%	
D/A Epoxy	0.28%	0.0015						Die attach epoxy: Henkel (Ablebond) 2100A
			0.22%	0.00120	Silver	7440-22-4	80.00%	
			0.06%	0.00030	Epoxy Resin	-	20.00%	
Wire	0.65%	0.0035						0.8 mil diameter; 1 wire per solder ball
			0.64%	0.0034	Copper	7440-50-8	98.50%	
			0.01%	0.0001	Palladium	7440-05-3	1.50%	
Solder Balls	18.26%	0.0971						SAC105
			17.99%	0.0957	Tin (Sn)	7440-31-5	98.50%	
			0.18%	0.0010	Silver (Ag)	7440-22-4	1.00%	
			0.09%	0.0005	Copper (Cu)	7440-50-8	0.50%	
Substrate	17.53%	0.0933						BT Resin CCL-HL832NX-A*
			5.61%	0.0298	BT Resins	-	32.00%	
			11.92%	0.0634	Glass fiber	65997-17-3	68.00%	
Foil	6.17%	0.0328						
			4.82%	0.0256	Copper	7440-50-8	78.16%	
			1.13%	0.0060	Nickel plating	7440-02-0	18.31%	
			0.22%	0.0012	Gold plating	7440-57-5	3.53%	
Solder Mask	4.18%	0.0222						Solder mask PSR4000 AUS 308
			2.27%	0.0121	Quartz	14808-60-7	54.37%	
			0.31%	0.0016	Dipropylene glycol monomethyl ether	34590-94-8	7.33%	
			0.14%	0.0007	Morpholine derivative**	71868-10-5	3.32%	
			0.13%	0.0007	Silicon dioxide	7631-86-9	3.00%	
			0.13%	0.0007	Silica, amorphous	112945-52-5	3.00%	
			0.01%	0.0001	Carbon black	1333-86-4	0.24%	
			1.20%	0.0064	Trade secret ingredients	-	28.74%	

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Mold Compound	51.18%	0.2723	3.58%	0.0191	Solid Epoxy Resin	-	7.00%	Mold Compound: Hitachi GE-110LS-V (ULA)
			2.56%	0.0136	Phenol Resin	-	5.00%	
			43.50%	0.2314	Silica	60676-86-0	85.00%	
			1.28%	0.0068	Metal Hydroxide	-	2.50%	
			0.26%	0.0014	Carbon Black	1333-86-4	0.50%	
D/A Epoxy	0.28%	0.0015	0.22%	0.00120	Silver	7440-22-4	80.00%	Die attach epoxy: Henkel (Ablebond) 2300
			0.06%	0.00030	Esters & resins	-	20.00%	
Wire	0.65%	0.0035	0.64%	0.0034	Copper	7440-50-8	98.50%	0.8 mil diameter; 1 wire per solder ball
			0.01%	0.0001	Palladium	7440-05-3	1.50%	
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