Device Material Content

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

June, 2022

Package: 328 csBGA
Total Device Weight 0.31 Grams

Package Code: MG328
Products: FE3

Assembly: ASEM
Size (mm): 10 x 10
Lead pitch (mm): 1.0
MSL: 3
Reflow max (°C): 250

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	4.49%	0.0139						Die size: 4.60 x 5.20 mm
			4.49%	0.0139	Silicon chip	7440-21-3	100.00%	
Mold Compound	50.20%	0.1556						Mold Compound: Sumitomo G750SE (ULA)
			2.51%	0.0078	Epoxy Resin A	-	5.00%	
			0.75%	0.0023	Epoxy Resin B	-	1.50%	
			2.51%	0.0078	Phenol Novolac	9003-35-4	5.00%	
			2.51%	0.0078	Metal Hydroxide	-	5.00%	
			0.15%	0.0005	Carbon Black	1333-86-4	0.30%	
			41.76%	0.1295	Silica Fused	60676-86-0	83.20%	
D/A Epoxy	0.69%	0.0021						Die attach epoxy: Henkel (Ablebond) 2100A
			0.55%	0.0017	Silver	7440-22-4	80.00%	
			0.14%	0.0004	Esters & resins	-	20.00%	
Wire	0.77%	0.0024						0.8 mil diameter; 1 wire per solder ball
			0.76%	0.0024	Copper	7440-50-8	98.50%	
			0.01%	0.0000	Palladium	7440-05-3	1.50%	
Solder Balls	11.11%	0.0344						SAC305
			10.72%	0.0332	Tin (Sn)	7440-31-5	96.50%	
			0.33%	0.0010	Silver (Ag)	7440-22-4	3.00%	
			0.06%	0.0002	Copper (Cu)	7440-50-8	0.50%	
Substrate	15.98%	0.0495						BT Resin CCL-HL832NX-A
			5.11%	0.0158	BT Resins	-	32.00%	
			10.86%	0.0337	Glass fiber	65997-17-3	68.00%	
Foil	11.56%	0.0358						
			8.02%	0.0249	Copper	7440-50-8	69.41%	
			2.88%	0.0089	Nickel	7440-02-0	24.93%	
			0.65%	0.0020	Gold	7440-57-5	5.67%	
Solder Mask	5.21%	0.0161						Solder mask PSR4000 AUS 308
			2.93%	0.0091	Quartz	14808-60-7	56.20%	
			0.83%	0.0026	3-methoxy-3-methylbutylacetate	103429-90-9	16.00%	
			1.15%	0.0036	Barium Sulfate	7727-43-7	22.00%	
			0.16%	0.0005	Talc (containing no asbestiform fibers)	14807-96-6	3.00%	
			0.15%	0.0005	Trade secret ingredients	-	2.80%	

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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Br/Cl/Sb

Pb lead-free RoHS

Rev. S1

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Size (mm): 10 x 10
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	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	4.49%	0.0139						Die size: 4.60 x 5.20 mm
			4.49%	0.0139	Silicon chip	7440-21-3	100.00%	
Mold Compound	50.20%	0.1556						Mold Compound: Kyocera KE-G2250 series (ULA)
			43.92%	0.1362	Silica	60676-86-0	87.50%	
			3.26%	0.0101	Epoxy resin	-	6.50%	
			2.76%	0.0086	Phenol Resin	-	5.50%	
			0.25%	0.0008	Carbon Black	1333-86-4	0.50%	
D/A Epoxy	0.69%	0.0021						Die attach epoxy: Henkel (Ablebond) 2100A
			0.55%	0.0017	Silver	7440-22-4	80.00%	
			0.14%	0.0004	Esters & resins	-	20.00%	
Wire	0.77%	0.0024						0.8 mil diameter; 1 wire per solder ball
			0.76%	0.00237	Copper	7440-50-8	98.50%	
			0.01%	0.00004	Palladium	7440-05-3	1.50%	
Solder Balls	11.11%	0.0344						SAC105
			10.95%	0.0339	Tin (Sn)	7440-31-5	98.50%	
			0.11%	0.0003	Silver (Ag)	7440-22-4	1.00%	
			0.06%	0.0002	Copper (Cu)	7440-50-8	0.50%	
Substrate	15.98%	0.0495						BT Resin CCL-HL832NX-A
			5.11%	0.01585	BT Resins	-	32.00%	
			10.86%	0.03368	Glass fiber	65997-17-3	68.00%	
Foil	11.56%	0.0358						
			8.02%	0.02487	Copper	7440-50-8	69.41%	
			2.88%	0.00893	Nickel	7440-02-0	24.93%	
			0.65%	0.00203	Gold	7440-57-5	5.67%	
Solder Mask	5.21%	0.0161						Solder mask PSR4000 AUS 308
			2.93%	0.00907	Quartz	14808-60-7	56.20%	
			0.83%	0.00258	3-methoxy-3-methylbutylacetate	103429-90-9	16.00%	
			1.15%	0.00355	Barium Sulfate	7727-43-7	22.00%	
			0.16%	0.00048	Talc (containing no asbestiform fibers)	14807-96-6	3.00%	
			0.15%	0.00045	Trade secret ingredients	-	2.80%	

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