



Device Material Content

5555 NE Moore Ct. Hillsboro OR 97124 custreq@latticesemi.com		Package: Total Device Weight		256 csFBGA 148.2 Milligrams	Package Code: MG256	Assembly: ASEK Size (mm): 9 x 9 Lead pitch (mm): 0.5 MSL: 3 Reflow max (°C): 260		
April, 2020				Products: XO3L/LF				
	% of Total Pkg. Wt.	Weight (mg)	% of Total Pkg. Wt.	Weight (mg)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	5.88%	8.711	5.88%	8.711	Silicon chip	7440-21-3	100.00%	Die size: 4.452 x 4.364
Mold Compound	45.24%	67.044	5.43%	8.045	Epoxy Resins Phenol Resins Silica(Amorphous) Aluminum Hydroxide Carbon Black	-	12.00%	Sumitomo EME-G311SAC
			2.26%	3.352		-	5.00%	
			33.93%	50.283		7631-86-9	75.00%	
			3.39%	5.028		21645-51-2	7.50%	
			0.23%	0.335		1333-86-4	0.50%	
Substrate	16.40%	24.300	5.08%	7.533	BT Resins Glass fiber Bisphenol A*	-	31.00%	CCL-HL832NS
			11.15%	16.524		65997-17-3	68.00%	
			0.16%	0.243		80-05-7	1.00%	
Foil	12.02%	17.810	12.014%	17.805	Copper (Cu) OSP	7440-50-8	99.97%	
			0.003%	0.005		-	0.03%	
Solder Mask	1.08%	1.594	0.25%	0.375	Solvent naphtha (petroleum) Naphthalene Phosphin oxide derivative Talc Dipropylene glycol monomethyl Ether Epoxy Resin Barium Sulfate	64742-94-5	23.52%	Solder mask PSR4000 AUS 320
			0.06%	0.094		91-20-3	5.87%	
			0.16%	0.234		-	14.70%	
			0.16%	0.234		14807-96-6	14.70%	
			0.19%	0.281		34590-94-8	17.63%	
			0.16%	0.234		85954-11-6	14.70%	
			0.10%	0.142		7727-43-7	8.88%	
Bump	0.48%	0.706	0.067%	0.100	Tin (Sn) Silver (Ag) Nickel (Ni) Copper (Cu)	7440-31-5	14.16%	
			0.001%	0.002		7440-22-4	0.28%	
			0.388%	0.575		7440-02-0	81.44%	
			0.020%	0.029		7440-50-8	4.11%	
Polyamic Ester	0.10%	0.142	0.048%	0.071	4-Butyrolactone Polyamide 1-Methoxy-2-propyl acetate Photo Active Compound Proprietary Additives	96-48-0	50.00%	HD8820
			0.034%	0.050		-	35.00%	
			0.005%	0.007		108-65-6	5.00%	
			0.005%	0.007		-	5.00%	
			0.005%	0.007		-	5.00%	
RDL 1	0.007%	0.010	0.007%	0.010	Titanium (Ti)	7440-32-6	100.00%	
RDL 2	0.55%	0.811	0.55%	0.811	Copper (Cu)	7440-50-8	100.00%	
UBM	0.03%	0.049	0.007%	0.010	Titanium (Ti) Copper (Cu)	7440-32-6	20.41%	
			0.026%	0.039		7440-50-8	79.59%	
Solder Balls	18.23%	27.020	17.594%	26.074	Tin (Sn) Silver (Ag) Copper (Cu)	7440-31-5	96.50%	SAC305
			0.547%	0.811		7440-22-4	3.00%	
			0.091%	0.135		7440-50-8	0.50%	

Notes: * 0.16% max. concentration (of total pkg wt.) of Bisphenol A (CAS# 80-05-7), contained in substrate laminate material as impurity - not intentionally added.

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PCN#09A-19
Rev. D



Device Material Content

5555 NE Moore Ct. Hillsboro OR 97124 custreq@latticesemi.com		Package: 256 csFBGA Total Device Weight 0.137 Grams			Package Code: <div style="border: 1px solid black; padding: 2px; display: inline-block;">MG256</div>	Assembly: ATP Size (mm): 9 x 9 Lead pitch (mm): 0.5 MSL: 3 Reflow max (°C): 260		
August, 2019	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
					XO3			
Die	6.14%	0.0084	6.14%	0.0084	Silicon chip	7440-21-3	100.00%	Die size: 4.5 x 4.4 x 0.177mm
Mold Compound	43.87%	0.0601	7.90% 35.97%	0.01082 0.04928	Epoxy Resin Silica filler	Trade secret 60676-86-0	18.00% 82.00%	Hitachi(Nitto) GE-110BH83-FC
Cu Pillar	0.250%	0.00034	0.150% 0.098% 0.002%	0.00021 0.0001343 0.0000025	Pillar: Copper (Cu) Cap: Tin (Sn) Silver (Ag)	7440-50-8 7440-31-5 7440-22-4	60.09% 39.21% 0.73%	Oval Type
Sputter 1	0.002%	0.000003	0.000% 0.001% 0.001%	0.0000001 0.0000012 0.0000014	Titanium (Ti) Tungsten (W) Copper (Cu)	7440-32-6 7440-33-7 7440-50-8	4.98% 44.84% 50.18%	
Sputter 2	0.028%	0.000038	0.002% 0.026%	0.000003 0.000035	Titanium (Ti) Copper (Cu)	7440-32-6 7440-50-8	7.74% 92.26%	
RDL	0.259%	0.00035	0.26%	0.0004	Copper (Cu)	7440-50-8	100.00%	
Polyimide & PBO	0.160%	0.00022	0.144% 0.016%	0.000197 0.000022	Proprietary Polymer Additives	Trade secret Trade secret	90.00% 10.00%	
Solder Balls	19.58%	0.0268	18.895% 0.587% 0.098%	0.02589 0.00080 0.00013	Tin (Sn) Silver (Ag) Copper (Cu)	7440-31-5 7440-22-4 7440-50-8	96.50% 3.00% 0.50%	SAC305
Substrate	14.42%	0.0198	4.61% 9.80%	0.0063 0.0134	BT Resins Glass fiber	- 65997-17-3	32.00% 68.00%	BT Resin CCL-HL832NS*
Foil	10.28%	0.0141	7.09% 2.59% 0.60%	0.0097 0.0036 0.0008	Copper Nickel plating Gold plating	7440-50-8 7440-02-0 7440-57-5	68.91% 25.22% 5.87%	
Solder Mask	4.74%	0.0065	2.57% 0.35% 0.16% 0.14% 0.14% 0.01% 1.36%	0.00353 0.00048 0.00022 0.00019 0.00019 0.00002 0.00186	Quartz Dipropylene glycol monomethyl ether Morpholine derivative Silicon dioxide Silica, amorphous Carbon black Trade secret ingredients	14808-60-7 34590-94-8 71868-10-5 7631-86-9 112945-52-5 1333-86-4 -	54.37% 7.33% 3.32% 3.00% 3.00% 0.24% 28.74%	Solder mask PSR4000 AUS 308

Notes: * 0.14% max. concentration (of total pkg wt.) of Bisphenol A (CAS# 80-05-7), contained in substrate laminate material as impurity - not intentionally added.

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Rev. D



Device Material Content

5555 NE Moore Ct. Hillsboro OR 97124 custreq@latticesemi.com	Package: 256 csfBGA Total Device Weight 146.58 Milligrams	Package Code: <div style="border: 1px solid black; padding: 2px; display: inline-block; background-color: #e0e0e0;">MG256</div> Products: <div style="border: 1px solid black; padding: 2px; display: inline-block;">XO3</div>	Assembly: ATK Size (mm): 9 x 9 Lead pitch (mm): 0.5 MSL: 3 Reflow max (°C): 260
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	% of Total Pkg. Wt.	Weight (Mg)	% of Total Pkg. Wt.	Weight (Mg)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	3.98%	5.835	3.98%	5.8350	Silicon chip	7440-21-3	100.00%	Die size: 3.7 x 3.8 x 0.177 mm
Bumping (Cu Pillar)	0.324%	0.474	0.194% 0.127% 0.003%	0.2840 0.1860 0.0044	Copper Tin Silver	7440-50-8 7440-31-5 7440-22-4	59.86% 39.21% 0.92%	
Mold Compound	45.487%	66.677	2.27% 0.45% 0.45% 0.45% 0.45% 36.39% 4.55% 0.45%	3.3338 0.6668 0.6668 0.6668 0.6668 53.3414 6.6677 0.6668	Epoxy Resin A Epoxy Resin B Epoxy Resin C Phenol Resin A Phenol Resin B Silicon dioxide Aluminium hydroxide Carbon Black	Proprietary Proprietary Proprietary Proprietary Proprietary 7631-86-9 21645-51-2 1333-86-4	5.00% 1.00% 1.00% 1.00% 1.00% 80.00% 10.00% 1.00%	Sumitomo EME-G311SQ TYPE B
Solder Balls	18.283%	26.800	17.643% 0.548% 0.091%	25.8621 0.8040 0.1340	Tin Silver Copper	7440-31-5 7440-22-4 7440-50-8	96.50% 3.00% 0.50%	SAC305
Substrate (Core)	18.624%	27.300	9.312% 9.312%	13.6498 13.6498	Cured thermosetting resin (including inorganic filler) Continuous Filament Fiber Glass	Proprietary Proprietary	50.00% 50.00%	MGC CCL-HL832NS*
Substrate (Solder Mask)	2.183%	3.200	1.57% 0.46% 0.09% 0.00% 0.01% 0.03% 0.02%	2.3073 0.6688 0.1344 0.0064 0.0128 0.0416 0.0288	Cured Resin Barium sulfate Talc Colorant Silica Additives Misc	Proprietary 7727-43-7 14807-96-6 Proprietary Proprietary Proprietary Proprietary	72.10% 20.90% 4.20% 0.20% 0.40% 1.30% 0.90%	Taiyo Ink AUS320
Substrate (Cu plating)	11.119%	16.298	11.12%	16.2982	Copper (Cu)	7440-50-8	100.00%	

Notes: SVHC: * 0.13% max. concentration of Bisphenol A (CAS# 80-05-7) in substrate laminate material as impurity - not intentionally added.
 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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