



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	-	12.00%	Sumitomo EME-G311SAC	
			2.26%	3.352	Phenol Resins	-	5.00%		
			33.93%	50.283	Silica(Amorphous)	7631-86-9	75.00%		
			3.39%	5.028	Aluminum Hydroxide	21645-51-2	7.50%		
			0.23%	0.335	Carbon Black	1333-86-4	0.50%		
Substrate	16.40%	24.300	5.08%	7.533	BT Resins	-	31.00%	CCL-HL832NS	
			11.15%	16.524	Glass fiber	65997-17-3	68.00%		
			0.16%	0.243	Bisphenol A*	80-05-7	1.00%		
Foil	12.02%	17.810	12.014%	17.805	Copper (Cu)	7440-50-8	99.97%		
			0.003%	0.005	OSP	-	0.03%		
Solder Mask	1.08%	1.594	0.25%	0.375	Solvent naphtha (petroleum)	64742-94-5	23.52%	Solder mask PSR4000 AUS 320	
			0.06%	0.094	Naphthalene	91-20-3	5.87%		
			0.16%	0.234	Phosphinooxide derivative	-	14.70%		
			0.16%	0.234	Talc	14807-96-6	14.70%		
			0.19%	0.281	Dipropylene glycol monomethyl Ether	34590-94-8	17.63%		
			0.16%	0.234	Epoxy Resin	85954-11-6	14.70%		
			0.10%	0.142	Barium Sulfate	7727-43-7	8.88%		
Bump	0.48%	0.706	0.067%	0.100	Tin (Sn)	7440-31-5	14.16%		
			0.001%	0.002	Silver (Ag)	7440-22-4	0.28%		
			0.388%	0.575	Nickel (Ni)	7440-02-0	81.44%		
			0.020%	0.029	Copper (Cu)	7440-50-8	4.11%		
Polyamic Ester	0.10%	0.142	0.048%	0.071	4-Butyrolactone	96-48-0	50.00%	HD8820	
			0.034%	0.050	Polyamide	-	35.00%		
			0.005%	0.007	1-Methoxy-2-propyl acetate	108-65-6	5.00%		
			0.005%	0.007	Photo Active Compound	-	5.00%		
			0.005%	0.007	Proprietary Additives	-	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)	7440-32-6	20.41%		
			0.026%	0.039	Copper (Cu)	7440-50-8	79.59%		
Solder Balls	18.23%	27.020	17.594%	26.074	Tin (Sn)	7440-31-5	96.50%	SAC305	
			0.547%	0.811	Silver (Ag)	7440-22-4	3.00%		
			0.091%	0.135	Copper (Cu)	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.

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 subcontract 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.

PCN#09A-19
Rev. A



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					Products: XO3			
	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
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: Cap: Copper (Cu) 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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Device Material Content

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

Package: 256 csfBGA
Total Device Weight 146.584 Milligrams

Package Code:

MG256

Products:

XO3

Assembly: ATK
Size (mm): 9 x 9
Lead pitch (mm): 0.5
MSL: 3
Reflow max (°C): 260

August-18

	% of Total Pkg. Wt.	Weight (Mg)	% of Total Pkg. Wt.	Weight (Mg)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	3.98%	5.8350	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%	0.4744	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%	66.6767	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%	26.8001	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%	27.2997	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%	3.2001	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%	16.2982	11.12%	16.2982	Copper (Cu)	7440-50-8	100.00%	

Notes: 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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Rev. A