



Device Material Content

5555 NE Moore Ct. Hillsboro OR 97124 custreq@latticesemi.com November, 2020		Package: 324 csfBGA Total Device Weight 294.9 Milligrams		Package Code: MG324 Products: XO3L/LF		Assembly: ASEK Size (mm): 9 x 9 Lead pitch (mm): 0.5 MSL: 3 Reflow max (°C): 260		
	% of Total Pkg. Wt.	Weight (mg)	% of Total Pkg. Wt.	Weight (mg)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	2.95%	8.711	2.95%	8.711	Silicon chip	7440-21-3	100.00%	Die size: 4.452 x 4.364
Mold Compound	67.45%	198.886	8.09%	23.866	Epoxy Resins Phenol Resins Silica(Amorphous) Aluminum Hydroxide Carbon Black	-	12.00%	Sumitomo EME-G311SAC
			3.37%	9.944		-	5.00%	
			50.59%	149.165		7631-86-9	75.00%	
			5.06%	14.916		21645-51-2	7.50%	
			0.34%	0.994	1333-86-4	0.50%		
Substrate	10.17%	30.000	3.26%	9.600	BT Resins Glass fiber	-	32.00%	CCL-HL832NS
			6.92%	20.400		65997-17-3	68.00%	
Foil	6.56%	19.335	6.039%	17.805	Copper (Cu) OSP	7440-50-8	92.09%	
			0.002%	0.005		-	0.03%	
Solder Mask	0.67%	1.977	0.16%	0.465	Solvent naphtha (petroleum) Naphthalene Phosphinooxide derivative Talc Dipropylene glycol monomethyl Ether Epoxy Resin Barium Sulfate	64742-94-5	23.52%	Solder mask PSR4000 AUS 320
			0.04%	0.116		91-20-3	5.87%	
			0.10%	0.291		-	14.70%	
			0.10%	0.291		14807-96-6	14.70%	
			0.12%	0.349		34590-94-8	17.63%	
			0.10%	0.291		85954-11-6	14.70%	
			0.06%	0.176		7727-43-7	8.88%	
Bump	0.25%	0.727	0.034%	0.100	Tin (Sn) Silver (Ag) Nickel (Ni) Copper (Cu)	7440-31-5	13.76%	
			0.001%	0.002		7440-22-4	0.28%	
			0.195%	0.575		7440-02-0	79.09%	
			0.010%	0.029		7440-50-8	3.99%	
Polyamic Ester	0.05%	0.142	0.024%	0.071	4-Butyrolactone Polyamide 1-Methoxy-2-propyl acetate Photo Active Compound Proprietary Additives	96-48-0	50.00%	HD8820
			0.017%	0.050		-	35.00%	
			0.002%	0.007		108-65-6	5.00%	
			0.002%	0.007		-	5.00%	
			0.002%	0.007		-	5.00%	
RDL 1	0.003%	0.010	0.003%	0.010	Titanium (Ti)	7440-32-6	100.00%	
RDL 2	0.28%	0.811	0.28%	0.811	Copper (Cu)	7440-50-8	100.00%	
UBM	0.02%	0.049	0.003%	0.010	Titanium (Ti) Copper (Cu)	7440-32-6	20.41%	
			0.013%	0.039		7440-50-8	79.59%	
Solder Balls	11.60%	34.200	11.193%	33.003	Tin (Sn) Silver (Ag) Copper (Cu)	7440-31-5	96.50%	SAC305
			0.348%	1.026		7440-22-4	3.00%	
			0.058%	0.171		7440-50-8	0.50%	

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Device Material Content

5555 NE Moore Ct. Hillsboro OR 97124 custreq@latticesemi.com		Package: 324 csfBGA		Package Code: MG324	Assembly: ATP			
November, 2020		Total Device Weight 0.1704 Grams		Products: XO3	Size (mm): 9 x 9		Lead pitch (mm): 0.5	
					MSL: 3		Reflow max (°C): 260	
	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	3.51%	0.0060	3.51%	0.0060	Silicon chip	7440-21-3	100.00%	Die size: 3.7 x 3.8 x 0.177mm
Mold Compound	46.46%	0.0792	8.36% 38.10%	0.01425 0.06492	Epoxy Resin Silica filler	- 60676-86-0	18.00% 82.00%	Hitachi(Nitto) GE-110BH83-FC
Cu Pillar	0.212%	0.00036	0.128% 0.084% 0.002%	0.00022 0.00014 0.0000026	Pillar: Cap: Copper (Cu) Tin (Sn) Silver (Ag)	7440-50-8 7440-31-5 7440-22-4	60.39% 39.42% 0.72%	Oval Type
Sputter 1	0.002%	0.000003	0.000% 0.001% 0.001%	0.0000001 0.0000012 0.0000013	Titanium (Ti) Tungsten (W) Copper (Cu)	7440-32-6 7440-33-7 7440-50-8	4.98% 44.84% 50.18%	
Sputter 2	0.015%	0.000026	0.001% 0.014%	0.000002 0.000024	Titanium (Ti) Copper (Cu)	7440-32-6 7440-50-8	7.74% 92.26%	
RDL	0.140%	0.000238	0.14%	0.00024	Copper (Cu)	7440-50-8	100.00%	
Polymide & PBO	0.095%	0.000162	0.086% 0.010%	0.000146 0.000016	Proprietary Polymer Additives	- -	90.00% 10.00%	
Solder Balls	19.91%	0.0339	19.211% 0.597% 0.100%	0.03274 0.00102 0.00017	Tin (Sn) Silver (Ag) Copper (Cu)	7440-31-5 7440-22-4 7440-50-8	96.50% 3.00% 0.50%	SAC305
Substrate	14.30%	0.0244	4.58% 9.72%	0.0078 0.0166	BT Resins Glass fiber	- 65997-17-3	32.00% 68.00%	BT Resin CCL-HL832NS
Foil	10.20%	0.0174	7.03% 2.57% 0.60%	0.0120 0.0044 0.0010	Copper Nickel plating Gold plating	7440-50-8 7440-02-0 7440-57-5	68.91% 25.22% 5.87%	
Solder Mask	4.70%	0.0080	2.64% 0.75% 1.03% 0.14% 0.02% 0.11%	0.00450 0.00128 0.00176 0.00024 0.00004 0.00018	Quartz 3-methoxy-3-methylbutylacetate Barium Sulfate Talc Naphthalene Trade secret ingredients	14808-60-7 103429-90-9 7727-43-7 14807-96-6 91-20-3 -	56.20% 16.00% 22.00% 3.00% 0.50% 2.30%	Solder mask PSR4000 AUS 308

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