



Device Material Content

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

Assembly: ASEM
Size (mm): 19 x 19

Package: 324 ftBGA
Total Device Weight 1.14 Grams

Package Code:

FTN324

Lead pitch (mm): 1.0

MSL: 3

Reflow max (°C): 260

August, 2019

Products:

XO

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	0.87%	0.0099	0.87%	0.0099	Silicon chip	7440-21-3	100.00%	Die size: 4.08 x 3.85 mm
Mold Compound	46.36%	0.5285	2.32%	0.0264	Epoxy Resin A	-	5.00%	Mold Compound: Sumitomo G750SE (ULA)
			0.70%	0.0079	Epoxy Resin B	-	1.50%	
			2.32%	0.0264	Phenol Novolac	9003-35-4	5.00%	
			2.32%	0.0264	Metal Hydroxide	-	5.00%	
			0.14%	0.0016	Carbon Black	1333-86-4	0.30%	
			38.57%	0.4397	Silica Fused	60676-86-0	83.20%	
D/A Epoxy	0.14%	0.0016	0.11%	0.00128	Silver	7440-22-4	80.00%	Die attach epoxy: Henkel (Ablebond) 2100A
			0.03%	0.00032	Esters & resins	-	20.00%	
Wire	0.39%	0.0044	0.38%	0.0043	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	29.04%	0.3311	28.03%	0.3195	Tin (Sn)	7440-31-5	96.50%	SAC305
			0.87%	0.0099	Silver (Ag)	7440-22-4	3.00%	
			0.15%	0.0017	Copper (Cu)	7440-50-8	0.50%	
Substrate	13.69%	0.1560	4.38%	0.0499	BT Resins	-	32.00%	BT Resin CCL-HL832NX-A*
			9.31%	0.1061	Glass fiber	65997-17-3	68.00%	
Foil	6.22%	0.0710	5.10%	0.0582	Copper	7440-50-8	82.00%	
			0.94%	0.0107	Nickel plating	7440-02-0	15.10%	
			0.18%	0.0021	Gold plating	7440-57-5	2.91%	
Solder Mask	3.29%	0.0375	1.79%	0.0204	Quartz	14808-60-7	54.37%	Solder mask PSR4000 AUS 308
			0.24%	0.0027	Dipropylene glycol monomethyl ether	34590-94-8	7.33%	
			0.11%	0.0012	Morpholine derivative	71868-10-5	3.32%	
			0.10%	0.0011	Silicon dioxide	7631-86-9	3.00%	
			0.10%	0.0011	Silica, amorphous	112945-52-5	3.00%	
			0.01%	0.0001	Carbon black	1333-86-4	0.24%	
			0.94%	0.0108	Trade secret ingredients	-	28.74%	

Notes: * 0.14% 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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Device Material Content

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Package Code:

FTN324

Assembly: ASET
Size (mm): 19 x 19

Lead pitch (mm): 1.0

MSL: 3

Reflow max (°C): 260

Package: 324 ftBGA

Total Device Weight 1.14 Grams

Products:

XO

August, 2019

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	0.87%	0.0099	0.87%	0.0099	Silicon chip	7440-21-3	100.00%	Die size: 4.08 x 3.85 mm
Mold Compound	46.36%	0.5285	40.56%	0.4624	Silica	60676-86-0	87.50%	Mold Compound: Kyocera KE-G2250 series (ULA)
			3.01%	0.0344	Epoxy resin	-	6.50%	
			2.55%	0.0291	Phenol Resin	-	5.50%	
			0.23%	0.0026	Carbon Black	1333-86-4	0.50%	
D/A Epoxy	0.14%	0.0016	0.11%	0.00128	Silver	7440-22-4	80.00%	Die attach epoxy: Henkel (Ablebond) 2100A
			0.03%	0.00032	Esters & resins	-	20.00%	
Wire	0.39%	0.0044	0.38%	0.0043	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	29.04%	0.3311	28.61%	0.3261	Tin (Sn)	7440-31-5	98.50%	SAC105
			0.29%	0.0033	Silver (Ag)	7440-22-4	1.00%	
			0.15%	0.0017	Copper (Cu)	7440-50-8	0.50%	
Substrate	13.69%	0.1560	4.38%	0.0499	BT Resins	-	32.00%	BT Resin CCL-HL832NX-A*
			9.31%	0.1061	Glass fiber	65997-17-3	68.00%	
Foil	6.22%	0.0710	5.10%	0.0582	Copper	7440-50-8	82.00%	
			0.94%	0.0107	Nickel plating	7440-02-0	15.10%	
			0.18%	0.0021	Gold plating	7440-57-5	2.91%	
Solder Mask	3.29%	0.0375	1.79%	0.0204	Quartz	14808-60-7	54.37%	Solder mask PSR4000 AUS 308
			0.24%	0.0027	Dipropylene glycol monomethyl ether	34590-94-8	7.33%	
			0.11%	0.0012	Morpholine derivative	71868-10-5	3.32%	
			0.10%	0.0011	Silicon dioxide	7631-86-9	3.00%	
			0.10%	0.0011	Silica, amorphous	112945-52-5	3.00%	
			0.01%	0.0001	Carbon black	1333-86-4	0.24%	
			0.94%	0.0108	Trade secret ingredients	-	28.74%	

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.

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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Assembly: ATP
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MSL: 3
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Package: 324 ftBGA
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FTN324

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August, 2019

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Die	0.87%	0.0099	0.87%	0.0099	Silicon chip	7440-21-3	100.00%	Die size: 4.08 x 3.85 mm
Mold Compound	46.36%	0.5285	3.24%	0.0370	Solid Epoxy Resin	-	7.00%	Mold Compound: Hitachi GE-110LS-V (ULA)
			2.32%	0.0264	Phenol Resin	-	5.00%	
			39.40%	0.4492	Silica	60676-86-0	85.00%	
			1.16%	0.0132	Metal Hydroxide	-	2.50%	
			0.23%	0.0026	Carbon Black	1333-86-4	0.50%	
D/A Epoxy	0.14%	0.0016	0.11%	0.00128	Silver	7440-22-4	80.00%	Die attach epoxy: Henkel (Ablebond) 2100A
			0.03%	0.00032	Esters & resins	-	20.00%	
Wire	0.39%	0.0044	0.38%	0.0043	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	29.04%	0.3311	27.74%	0.3162	Tin (Sn)	7440-31-5	95.50%	SAC405
			1.16%	0.0132	Silver (Ag)	7440-22-4	4.00%	
			0.15%	0.0017	Copper (Cu)	7440-50-8	0.50%	
Substrate	13.69%	0.1560	4.38%	0.0499	BT Resins	-	32.00%	BT Resin CCL-HL832NX-A*
			9.31%	0.1061	Glass fiber	65997-17-3	68.00%	
Foil	6.22%	0.0710	5.10%	0.0582	Copper	7440-50-8	82.00%	
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