Device Material Content

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

January, 2020

Package: 484 fpBGA
Total Device Weight 2.214 **Grams**

Package Code: FN484
Products: FE2, FE3, XP2

Assembly: ASEM
Size (mm): 23 x 23
Lead pitch (mm): 1.0
MSL: 3
Reflow max (^oC): 250

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	0.99%	0.0219	0.99%	0.0219	Silicon chip	7440-21-3	100.00%	Die size: 5.66 x 6.71mm
Mold Compound	34.35%	0.7604	2.23%	0.0494	Epoxy Resin	-	6.50%	Mold Compound: Sumitomo G750SE
			1.72%	0.0380	Phenol Novolac	9003-35-4	5.00%	
			1.72%	0.0380	Metal Hydroxide	-	5.00%	
			0.10%	0.0023	Carbon Black	1333-86-4	0.30%	
			28.58%	0.6327	Silica Fused	60676-86-0	83.20%	
D/A Epoxy	0.14%	0.0032	0.12%	0.00255	Silver	7440-22-4	80.00%	Die attach epoxy: Henkel (Ablebond) 2100A
			0.03%	0.00064	Esters & resins	-	20.00%	
Wire	0.22%	0.0050	0.22%	0.0049	Copper	7440-50-8	98.55%	0.8 mil diameter; 1 wire per solder ball
			0.00%	0.0001	Palladium	7440-05-3	1.45%	
Solder Balls	21.21%	0.4696	20.47%	0.4531	Tin (Sn)	7440-31-5	96.50%	SAC305
			0.64%	0.0141	Silver (Ag)	7440-22-4	3.00%	
			0.11%	0.0023	Copper (Cu)	7440-50-8	0.50%	
Substrate	20.15%	0.4460	6.45%	0.1427	BT Resins	-	32.00%	BT Resin CCL-HL832NX-A*
			13.70%	0.3033	Glass fiber	65997-17-3	68.00%	
Foil	18.31%	0.4053	16.70%	0.3696	Copper	7440-50-8	91.18%	
			1.54%	0.0340	Nickel plating	7440-02-0	8.40%	
			0.08%	0.0017	Gold plating	7440-57-5	0.42%	
Solder Mask	4.61%	0.1021	2.51%	0.0555	Quartz	14808-60-7	54.37%	Solder mask PSR4000 AUS 308
			0.34%	0.0075	Dipropylene glycol monomethyl ether	34590-94-8	7.33%	
			0.15%	0.0034	Morpholine derivative**	71868-10-5	3.32%	
			0.14%	0.0031	Silicon dioxide	7631-86-9	3.00%	
			0.14%	0.0031	Silica, amorphous	112945-52-5	3.00%	
			0.01%	0.0002	Carbon black	1333-86-4	0.24%	
			1.33%	0.0293	Trade secret ingredients	-	28.74%	

Notes: SVHC:
* 0.20% max. concentration of Bisphenol A (CAS# 80-05-7), contained in substrate laminate material as impurity - not intentionally added.
** 0.15% max. concentration of Morpholine derivative (CAS# 71868-10-5), contained in solder mask material.

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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Package: 484 fpBGA
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Package Code: FN484
Products: FE2, FE3, XP2

Assembly: ASEK
Size (mm): 23 x 23
Lead pitch (mm): 1.0
MSL: 3
Reflow max (^oC): 250

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	0.99%	0.0219	0.99%	0.0219	Silicon chip	7440-21-3	100.00%	Die size: 5.66 x 6.71mm
Mold Compound	34.35%	0.7604	1.72%	0.0380	Epoxy Resin	-	5.00%	Mold Compound: Hitachi CEL-9750ZHF10AKL-U
			1.72%	0.0380	Phenol Resin	-	5.00%	
			0.07%	0.0015	Carbon Black	1333-86-4	0.20%	
			30.16%	0.6676	Silica	60676-86-0	87.80%	
			0.69%	0.0152	Others	-	2.00%	
D/A Epoxy	0.14%	0.0032	0.12%	0.00255	Silver	7440-22-4	80.00%	Die attach epoxy: Henkel (Ablebond) 2100A
			0.03%	0.00064	Esters & resins	-	20.00%	
Wire	0.22%	0.0050	0.22%	0.0049	Copper	7440-50-8	98.55%	0.8 mil diameter; 1 wire per solder ball
			0.00%	0.0001	Palladium	7440-05-3	1.45%	
Solder Balls	21.21%	0.4696	20.47%	0.4531	Tin (Sn)	7440-31-5	96.50%	Ag 3.5
			0.74%	0.0164	Silver (Ag)	7440-22-4	3.50%	
Substrate	20.15%	0.4460	6.45%	0.1427	BT Resins	-	32.00%	BT Resin CCL-HL832NX-A*
			13.70%	0.3033	Glass fiber	65997-17-3	68.00%	
Foil	18.31%	0.4053	16.70%	0.3696	Copper	7440-50-8	91.18%	
			1.54%	0.0340	Nickel plating	7440-02-0	8.40%	
			0.08%	0.0017	Gold plating	7440-57-5	0.42%	
Solder Mask	4.61%	0.1021	2.51%	0.0555	Quartz	14808-60-7	54.37%	Solder mask PSR4000 AUS 308
			0.34%	0.0075	Dipropylene glycol monomethyl ether	34590-94-8	7.33%	
			0.15%	0.0034	Morpholine derivative**	71868-10-5	3.32%	
			0.14%	0.0031	Silicon dioxide	7631-86-9	3.00%	
			0.14%	0.0031	Silica, amorphous	112945-52-5	3.00%	
			0.01%	0.0002	Carbon black	1333-86-4	0.24%	
			1.33%	0.0293	Trade secret ingredients	-	28.74%	

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Assembly: ATP
Size (mm): 23 x 23
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MSL: 3
Reflow max (^oC): 250

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	0.99%	0.0219	0.99%	0.0219	Silicon chip	7440-21-3	100.00%	Die size: 5.66 x 6.71mm
Mold Compound	34.35%	0.7604	2.40%	0.0532	Solid Epoxy Resin	-	7.00%	Mold Compound: Hitachi (Nitto) GE-110LS-V
			1.72%	0.0380	Phenol Resin	-	5.00%	
			29.20%	0.6464	Silica	60676-86-0	85.00%	
			0.86%	0.0190	Metal Hydroxide	-	2.50%	
			0.17%	0.0038	Carbon Black	1333-86-4	0.50%	
D/A Epoxy	0.14%	0.0032	0.12%	0.00255	Silver	7440-22-4	80.00%	Die attach epoxy: Henkel (Ablebond) 2300
			0.03%	0.00064	Esters & resins	-	20.00%	
Wire	0.22%	0.0050	0.22%	0.0049	Copper	7440-50-8	98.55%	0.8 mil diameter; 1 wire per solder ball
			0.00%	0.0001	Palladium	7440-05-3	1.45%	
Solder Balls	21.21%	0.4696	20.26%	0.4484	Tin (Sn)	7440-31-5	95.50%	SAC405
			0.85%	0.0188	Silver (Ag)	7440-22-4	4.00%	
			0.11%	0.0023	Copper (Cu)	7440-50-8	0.50%	
Substrate	20.15%	0.4460	6.45%	0.1427	BT Resins	-	32.00%	BT Resin CCL-HL832NX-A*
			13.70%	0.3033	Glass fiber	65997-17-3	68.00%	
Foil	18.31%	0.4053	16.70%	0.3696	Copper	7440-50-8	91.18%	
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Solder Mask	4.61%	0.1021	2.51%	0.0555	Quartz	14808-60-7	54.37%	Solder mask PSR4000 AUS 308
			0.34%	0.0075	Dipropylene glycol monomethyl ether	34590-94-8	7.33%	
			0.15%	0.0034	Morpholine derivative**	71868-10-5	3.32%	
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			0.14%	0.0031	Silica, amorphous	112945-52-5	3.00%	
			0.01%	0.0002	Carbon black	1333-86-4	0.24%	
			1.33%	0.0293	Trade secret ingredients	-	28.74%	

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