Device Material Content

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

January, 2020

Package: 49 ucBGA
Total Device Weight 0.015 Grams

Package Code: CM49
Products: ICE40LP

Assembly: ASEM
Size (mm): 3 x 3
Lead pitch (mm): 0.4
MSL: 3
Reflow max (^{o}C): 260

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	8.59%	0.00129	8.59%	0.0013	Silicon chip	7440-21-3	100.00%	Die size: 1.50 x 1.50mm
Mold Compound	55.74%	0.00836	48.77%	0.00732	Silica	60676-86-0	87.50%	Mold Compound: Kyocera KE-G1250LKDS
			3.62%	0.00054	Epoxy resin	-	6.50%	
			3.07%	0.00046	Phenol Resin	-	5.50%	
			0.28%	0.00004	Carbon Black	1333-86-4	0.50%	
D/A Tape	0.42%	0.00006	0.34%	0.00005	Silver	7440-22-4	80.00%	Hitachi FH-900 HR-9004 series
			0.08%	0.00001	Esters & resins	-	20.00%	
Wire	0.54%	0.00008	0.53%	0.000080	Copper	7440-50-8	98.50%	0.7 MIL Pd coated
			0.01%	0.000001	Palladium	7440-05-3	1.50%	
Solder Balls	2.79%	0.00042	2.75%	0.000412	Tin (Sn)	7440-31-5	98.50%	SAC105
			0.03%	0.000004	Silver (Ag)	7440-22-4	1.00%	
			0.01%	0.000002	Copper (Cu)	7440-50-8	0.50%	
Substrate	15.23%	0.0023	4.87%	0.0007	BT Resins	-	32.00%	BT Resin CCL-HL832NX-A*
			10.36%	0.0016	Glass fiber	65997-17-3	68.00%	
Foil	12.12%	0.0018	9.67%	0.00145	Copper	7440-50-8	79.78%	
			2.25%	0.00034	Nickel plating	7440-02-0	18.58%	
			0.20%	0.00003	Gold plating	7440-57-5	1.64%	
Solder Mask	4.57%	0.0007	2.48%	0.00037	Quartz	14808-60-7	54.37%	Solder mask PSR4000 AUS 308
			0.33%	0.00005	Dipropylene glycol monomethyl ether	34590-94-8	7.33%	
			0.15%	0.000023	Morpholine derivative**	71868-10-5	3.32%	
			0.14%	0.000021	Silicon dioxide	7631-86-9	3.00%	
			0.14%	0.000021	Silica, amorphous	112945-52-5	3.00%	
			0.01%	0.000002	Carbon black	1333-86-4	0.24%	
			1.31%	0.00020	Trade secret ingredients	-	28.74%	

Notes: SVHC:
* 0.15% 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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Rev. E

Device Material Content

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January, 2020

Package: 49 ucBGA
Total Device Weight 0.015 **Grams**

Package Code: CM49
Products: ICE40LM

Assembly: ATP
Size (mm): 3 x 3
Lead pitch (mm): 0.4
MSL: 3
Reflow max (^{o}C): 260

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	8.59%	0.00129	8.59%	0.0013	Silicon chip	7440-21-3	100.00%	Die size: 1.50 x 1.50mm
Mold Compound	55.74%	0.00836						Mold Compound: Hitachi GE-110 (ULA)
			3.90%	0.00059	Solid Epoxy Resin	-	7.00%	
			2.79%	0.00042	Phenol Resin	-	5.00%	
			47.38%	0.00711	Silica	60676-86-0	85.00%	
			1.39%	0.00021	Metal Hydroxide	-	2.50%	
			0.28%	0.00004	Carbon Black	1333-86-4	0.50%	
D/A Tape	0.42%	0.00006						Lintec LE5000 (DAF)
			0.34%	0.00005	Silver	7440-22-4	80.00%	
			0.08%	0.00001	Esters & resins	-	20.00%	
Wire	0.54%	0.00008						0.7 MIL Pd coated
			0.53%	0.000080	Copper	7440-50-8	98.50%	
			0.01%	0.000001	Palladium	7440-05-3	1.50%	
Solder Balls	2.79%	0.00042						SAC105
			2.75%	0.000412	Tin (Sn)	7440-31-5	98.50%	
			0.03%	0.000004	Silver (Ag)	7440-22-4	1.00%	
			0.01%	0.000002	Copper (Cu)	7440-50-8	0.50%	
Substrate	15.23%	0.0023						BT Resin CCL-HL832NX-A*
			4.87%	0.0007	BT Resins	-	32.00%	
			10.36%	0.0016	Glass fiber	65997-17-3	68.00%	
Foil	12.12%	0.0018						
			9.67%	0.00145	Copper	7440-50-8	79.78%	
			2.25%	0.00034	Nickel plating	7440-02-0	18.58%	
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Solder Mask	4.57%	0.0007						Solder mask PSR4000 AUS 308
			2.48%	0.00037	Quartz	14808-60-7	54.37%	
			0.33%	0.00005	Dipropylene glycol monomethyl ether	34590-94-8	7.33%	
			0.15%	0.000023	Morpholine derivative**	71868-10-5	3.32%	
			0.14%	0.000021	Silicon dioxide	7631-86-9	3.00%	
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			0.01%	0.000002	Carbon black	1333-86-4	0.24%	
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Rev. E