



## Device Material Content

5555 NE Moore Ct.  
Hillsboro OR 97124  
[custreq@latticesemi.com](mailto:custreq@latticesemi.com)

November, 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 (°C): 260

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
<b>Die</b>	8.59%	0.00129	8.59%	0.0013	Silicon chip	7440-21-3	100.00%	Die size: 1.50 x 1.50mm
<b>Mold Compound</b>	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%	
<b>D/A Tape</b>	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%	
<b>Wire</b>	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%	
<b>Solder Balls</b>	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%	
<b>Substrate</b>	15.23%	0.0023	4.87%	0.00073	BT Resins	-	32.00%	BT Resin CCL-HL832NX-A
			10.36%	0.00155	Glass fiber	65997-17-3	68.00%	
<b>Foil</b>	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%	
<b>Solder Mask</b>	4.57%	0.0007	2.34%	0.00035	Quartz	14808-60-7	51.20%	Solder mask PSR4000 AUS 308
			0.69%	0.00010	3-methoxy-3-methylbutylacetate	103429-90-9	15.00%	
			0.96%	0.000144	Barium Sulfate	7727-43-7	21.00%	
			0.14%	0.000021	Talc	14807-96-6	3.00%	
			0.02%	0.000003	Naphthalene	91-20-3	0.50%	
			0.42%	0.00006	Trade secret ingredients	-	9.30%	

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Rev. G



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5555 NE Moore Ct. Hillsboro OR 97124 <a href="mailto:custreq@latticesemi.com">custreq@latticesemi.com</a>  November, 2020	<b>Package:</b> 49 ucBGA <b>Total Device Weight</b> 26.19 Milligrams	<b>Package Code:</b> <div style="border: 1px solid black; padding: 2px; display: inline-block; background-color: #e0e0e0;">CM49</div> <b>Products:</b> <div style="border: 1px solid black; padding: 2px; display: inline-block; background-color: #e0e0e0;">ICE40LM</div>	<b>Assembly:</b> ASEK Size (mm): 3 x 3 Lead pitch (mm): 0.4 MSL: 3 Reflow max (°C): 260
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	% of Total Pkg. Wt.	Weight (mg)	% of Total Pkg. Wt.	Weight (mg)	Substance	CAS #	% of Subst.	Notes / Assumptions:
<b>Die</b>	2.56%	0.670	2.56%	0.670	Silicon chip	7440-21-3	100.00%	Die size: 1.68 x 1.68mm
<b>Mold Compound</b>	66.64%	17.453	58.31%	15.271	Silica	60676-86-0	87.50%	Mold Compound: KE-G1250AAS (ULA)
			4.33%	1.134	Epoxy resin	-	6.50%	
			3.67%	0.960	Phenol Resin	-	5.50%	
			0.33%	0.087	Carbon Black	1333-86-4	0.50%	
<b>D/A Epoxy</b>	0.95%	0.249	0.49%	0.130	SiO2 Filler	99439-28-8	52.00%	Hitachi FH-SC13T-HR-5104
			0.13%	0.035	Acrylic Copolymer	-	14.00%	
			0.06%	0.015	Epoxy resin A	-	6.00%	
			0.13%	0.035	Epoxy resin B	-	14.00%	
			0.13%	0.035	Phenol Resin	-	14.00%	
<b>Wire</b>	1.79%	0.469	1.73%	0.453	Copper	7440-50-8	96.60%	0.7 Mil CuPdAu+
			0.06%	0.015	Palladium	7440-05-3	3.10%	
			0.01%	0.001	Gold	7440-57-5	0.30%	
<b>Solder Balls</b>	8.97%	2.349	8.83%	2.314	Tin (Sn)	7440-31-5	98.50%	SAC105
			0.09%	0.023	Silver (Ag)	7440-22-4	1.00%	
			0.04%	0.012	Copper (Cu)	7440-50-8	0.50%	
<b>Substrate</b>	6.24%	1.634	2.00%	0.523	BT Resins	-	32.00%	BT Resin CCL-HL832NX-A
			4.24%	1.111	Glass fiber	65997-17-3	68.00%	
<b>Foil</b>	11.46%	3.000	11.46%	3.000	Copper	7440-50-8	100.00%	
<b>Solder Mask</b>	1.40%	0.367	0.72%	0.188	Quartz	14808-60-7	51.20%	Solder mask PSR4000 AUS 308
			0.21%	0.055	3-methoxy-3-methylbutylacetate	103429-90-9	15.00%	
			0.29%	0.077	Barium Sulfate	7727-43-7	21.00%	
			0.04%	0.011	Talc	14807-96-6	3.00%	
			0.01%	0.002	Naphthalene	91-20-3	0.50%	
			0.13%	0.034	Trade secret ingredients	-	9.30%	

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Rev. G



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<b>Mold Compound</b>	55.74%	0.00836	3.90%	0.00059	Solid Epoxy Resin	-	7.00%	Mold Compound: Hitachi GE-110 (ULA)
			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%	
<b>D/A Tape</b>	0.42%	0.00006	0.34%	0.00005	Silver	7440-22-4	80.00%	Lintec LE5000 (DAF)
			0.08%	0.00001	Esters & resins	-	20.00%	
<b>Wire</b>	0.54%	0.00008	0.53%	0.000080	Copper	7440-50-8	98.50%	0.7 MIL Pd coated
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<b>Solder Balls</b>	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%	
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<b>Substrate</b>	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%	
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			0.69%	0.00010	3-methoxy-3-methylbutylacetate	103429-90-9	15.00%	
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			0.14%	0.000021	Talc	14807-96-6	3.00%	
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