LATTICE SEMICONDUCTOR

Device Material Content

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

September, 2019

Package: **48 QFNS (v1)**
Total Device Weight **0.150** **Grams**

Package Code: **SN48**
Products: PAC-CLK

Assembly: Unisem
Size (mm): 7 x 7 x 0.9
Lead pitch (mm): 0.5
MSL: 1
Reflow max (ºC): 260

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	19.03%	0.0285						Die size: 3.00 x 3.04 mm
			19.03%	0.0285	Silicon chip	7440-21-3	100.00%	
Mold Compound	30.99%	0.0465						Mold Compound: Sumitomo EME-G770
			27.27%	0.0409	Silica Fused	60676-86-0	88.00%	
			1.55%	0.0023	Epoxy Resin	-	5.00%	
			1.55%	0.0023	Phenol Resin	-	5.00%	
			0.54%	0.0008	Metal Hydroxide	-	1.75%	
			0.08%	0.0001	Carbon Black	1333-86-4	0.25%	
D/A Epoxy	3.32%	0.0050						Die attach: Sumitomo CRM1066 series
			2.51%	0.00376	Silver (Ag)	7440-22-4	75.50%	
			0.33%	0.00050	Epoxy Resin A	9003-36-5	10.00%	
			0.50%	0.00075	Esters & resins	-	15.00%	
Wire	0.72%	0.0011						0.8 mil wire diameter; 1 wire for each package lead
			0.72%	0.0011	Gold (Au)	7440-57-5	100.00%	
Plating	0.34%	0.0005						Plating is 100% Matte Sn; thickness is >10.2µm
			0.34%	0.0005	Tin (Sn)	7440-31-5	100.00%	
Leadframe	45.60%	0.0684						C194 FH
			44.16%	0.0662	Copper (Cu)	7440-50-8	96.84%	
			0.04%	0.0001	Phosphorus (P)	7723-14-0	0.08%	
			0.06%	0.0001	Zinc (Zn)	7440-66-6	0.13%	
			1.07%	0.0016	Iron (Fe)	7439-89-6	2.35%	
			0.05%	0.0001	Silver (Ag)	7440-22-4	0.10%	
			0.23%	0.0003	Conducting salt	-	0.50%	

Notes:

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Constituent substances and proportions in epoxy materials are before curing.

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Br/Cl/Sb Pb lead-free RoHS

Rev. C1

LATTICE SEMICONDUCTOR

Device Material Content

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

May, 2018

Package: **48 QFNS (v2)**
Total Device Weight **0.115** **Grams**

Package Code: **SG48**
Products: L-ASC10

Assembly: ASEM
Size (mm): 7 x 7 x 0.9
Lead pitch (mm): 0.5
MSL: 3
Reflow max (ºC): 260

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	4.23%	0.0049						Die size: 2.9 x 2.9 mm
			4.23%	0.0049	Silicon chip	7440-21-3	100.00%	
Mold Compound	36.65%	0.0421						Mold Compound: Hitachi CEL9240HF
			2.31%	0.0027	Epoxy Resin	-	6.30%	
			1.65%	0.0019	Phenol Resin	-	4.50%	
			0.07%	0.0001	Carbon Black	1333-86-4	0.20%	
			32.25%	0.0371	Silica	60676-86-0	88.00%	
			0.37%	0.0004	Others	-	1.00%	
D/A Epoxy	0.65%	0.0007						Die attach: Sumitomo CRM-1076DS
			0.50%	0.00058	Silver (Ag)	7440-22-4	77.00%	
			0.08%	0.00009	Epoxy Resin	9003-36-5	12.50%	
			0.04%	0.00005	t-Butyl phenyl glycidyl ether	3101-60-8	6.50%	
			0.02%	0.00002	Phenolic resin	9003-35-4	2.80%	
			0.01%	0.00001	Epoxy silane	2530-83-8	1.20%	
Wire	0.70%	0.0008						0.8 mil GPG-2
			0.69%	0.0008	Gold (Au)	7440-57-5	99.00%	
			0.01%	0.0000	Palladium (Pd)	7440-05-3	1.00%	
Plating	5.33%	0.0061						100% Matte Sn (annealed)
			5.33%	0.0061	Tin (Sn)	7440-31-5	100.00%	
Leadframe	52.44%	0.0603						C194 FH
			50.78%	0.0584	Copper (Cu)	7440-50-8	96.84%	
			0.04%	0.0000	Phosphorus (P)	7723-14-0	0.08%	
			0.07%	0.0001	Zinc (Zn)	7440-66-6	0.13%	
			1.23%	0.0014	Iron (Fe)	7439-89-6	2.35%	
			0.05%	0.0001	Silver (Ag)	7440-22-4	0.10%	
			0.26%	0.0003	Conducting salt	-	0.50%	

Notes:

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Br/Cl/Sb

Pb lead-free

RoHS

Rev. C

Device Material Content

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

May, 2018

Package: **48 QFNS (v2)**
Total Device Weight **0.143** **Grams**

Package Code: **SG48**
Products: ICE40UP, ICE5LP

Assembly: ASEM
Size (mm): 7 x 7 x 0.9
Lead pitch (mm): 0.5
MSL: 3
Reflow max (ºC): 260

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	2.26%	0.0032	2.26%	0.0032	Silicon chip	7440-21-3	100.00%	Die size: 2.09 x 2.51 x 0.254 mm
Mold Compound	38.78%	0.0555	2.44%	0.0035	Epoxy Resin	-	6.30%	Mold Compound: Sumitomo EME-G770HCD
			1.75%	0.0025	Phenol Resin	-	4.50%	
			0.08%	0.0001	Carbon Black	1333-86-4	0.20%	
			34.13%	0.0488	Silica	60676-86-0	88.00%	
			0.39%	0.0006	Others	-	1.00%	
D/A Tape	0.11%	0.0002	0.02%	0.00002	Epoxy Resin	-	15.00%	Hitachi FH-900 HR-9004 series
			0.02%	0.00002	Phenol Resin	-	15.00%	
			0.01%	0.00001	SiO2 Filler	99439-28-8	5.00%	
			0.07%	0.00010	(Meta)Acrylic Copolymer	-	65.00%	
Wire	0.33%	0.0005	0.32%	0.000463	Copper (Cu)	7440-50-8	97.85%	0.8 mil Pd Coated Cu
			0.01%	0.000010	Palladium (Pd)	7440-05-3	2.15%	
Plating	4.27%	0.0061	4.27%	0.0061	Tin (Sn)	7440-31-5	100.00%	100% Matte Sn (annealed)
Leadframe	54.25%	0.0776	52.54%	0.07513	Copper (Cu)	7440-50-8	96.84%	C194 FH
			0.04%	0.00006	Phosphorus (P)	7723-14-0	0.08%	
			0.07%	0.00010	Zinc (Zn)	7440-66-6	0.13%	
			1.27%	0.00182	Iron (Fe)	7439-89-6	2.35%	
			0.05%	0.00008	Silver (Ag)	7440-22-4	0.10%	
			0.27%	0.00039	Conducting salt	-	0.50%	

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Rev. C

Device Material Content

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May, 2018

Package: **48 QFNS (v2)**
Total Device Weight **0.144** **Grams**

Package Code: **SG48**
Products: LIF-UC

Assembly: ASEM
Size (mm): 7 x 7 x 0.9
Lead pitch (mm): 0.5
MSL: 3
Reflow max (ºC): 260

	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	% of Subst.	Notes / Assumptions:
Die	1.48%	0.00214						Die size: 2.08 x 2.08 mm
			1.48%	0.0021	Silicon chip	7440-21-3	100.00%	
Mold Compound	52.11%	0.07504						Mold Compound: Sumitomo EME-G770HCD
			3.28%	0.0047	Epoxy Resin	-	6.30%	
			2.34%	0.0034	Phenol Resin	-	4.50%	
			0.10%	0.0002	Carbon Black	1333-86-4	0.20%	
			45.86%	0.0660	Silica	60676-86-0	88.00%	
			0.52%	0.0008	Others	-	1.00%	
D/A Tape	0.07%	0.00010						Hitachi FH-900 HR-9004 series
			0.01%	0.00002	Epoxy Resin	-	15.00%	
			0.01%	0.00002	Phenol Resin	-	15.00%	
			0.00%	0.00001	SiO2 Filler	99439-28-8	5.00%	
			0.05%	0.00007	(Meta)Acrylic Copolymer	-	65.00%	
Wire	0.36%	0.00052						0.8 mil Pd Coated Cu
			0.35%	0.00051	Copper (Cu)	7440-50-8	97.85%	
			0.01%	0.00001	Palladium (Pd)	7440-05-3	2.15%	
Plating	4.24%	0.00611						100% Matte Sn (annealed)
			4.24%	0.0061	Tin (Sn)	7440-31-5	100.00%	
Leadframe	41.74%	0.06011						C194 FH
			40.42%	0.05821	Copper (Cu)	7440-50-8	96.84%	
			0.03%	0.00005	Phosphorus (P)	7723-14-0	0.08%	
			0.05%	0.00008	Zinc (Zn)	7440-66-6	0.13%	
			0.98%	0.00141	Iron (Fe)	7439-89-6	2.35%	
			0.04%	0.00006	Silver (Ag)	7440-22-4	0.10%	
			0.21%	0.00030	Conducting salt	-	0.50%	

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