Assembly: ASEM

Device Material Content

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

Package: **32 QFNS** **with matte Sn Plating**
Total Device Weight **0.072** **Grams** ICE40LP

MSL: 3
Peak Reflow Temp: 260°C

January, 2016	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	Notes / Assumptions:
Die	0.36%	0.00026			Silicon chip	7440-21-3	Die size: 1.04 x 1.07 mm
Mold	46.61%	0.03352					Mold Compound: Sumitomo EME-G770
			55.79%	0.03347	Silica (fused)	60676-86-0	75 to 95% Fused silica filler (LSC uses 88% in our calculation)
			3.17%	0.00190	Epoxy Resin	-	2 to 10% Epoxy resin (LSC uses 5% in our calculation)
			3.17%	0.00190	Phenol Resin	-	2 to 10% Phenol resin (LSC uses 5% in our calculation)
			1.11%	0.00067	Metal Hydroxide	-	1 to 2% Metal Hydroxide (LSC uses 1.75% in our calculation)
			0.16%	0.00010	Carbon Black	1333-86-4	0.1 to 0.5% Carbon Black (LSC uses 0.25% in our calculation)
Die attach	0.06%	0.00004					Die attach (tape): Hitachi FH-900 HR-9004 series
			0.01%	0.000006	Epoxy Resin	-	15%
			0.01%	0.000006	Phenol Resin	-	15%
			0.00%	0.000002	SiO2 Filler	99439-28-8	5%
			0.04%	0.00003	(Meta)Acrylic Copolymer	-	65%
Wire	0.36%	0.00026					Pd coated Cu - Assume 1 wire per lead
			0.355%	0.00026	Copper (Cu)	7440-50-8	98.25%
			0.006%	0.000005	Palladium (Pd)	7440-05-3	1.75%
Plating	3.91%	0.00281			Tin (Sn)	7440-31-5	Tin plating is 400 to 800 microinches (LSC uses 600 microinches in our calculation)
Leadframe	48.71%	0.03503					C194
			47.48%	0.03414	Copper (Cu)	7440-50-8	97.46%
			1.14%	0.00082	Iron (Fe)	7439-89-6	2.35%
			0.03%	0.00002	Phosphorus (P)	7723-14-0	0.07%
			0.06%	0.00004	Zinc (Zn)	7440-66-6	0.12%

Notes:
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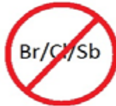

Rev. D

Assembly: Unisem

Device Material Content

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

Package: **32 QFNS** **with matte Sn Plating**
Total Device Weight **0.1126** **Grams** PAC-POWR, PAC-CLK

MSL: 1
Peak Reflow Temp: 260°C

January, 2016	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	Notes / Assumptions:
Die	1.70%	0.00192			Silicon chip	7440-21-3	Die size: 1.80 x 1.75 x 0.254 mm
Mold	68.90%	0.07760					Mold Compound: Sumitomo G770
			55.79%	0.03347	Silica (fused)	60676-86-0	75 to 95% Fused silica filler (LSC uses 88% in our calculation)
			3.17%	0.00190	Epoxy Resin	-	2 to 10% Epoxy resin (LSC uses 5% in our calculation)
			3.17%	0.00190	Phenol Resin	-	2 to 10% Phenol resin (LSC uses 5% in our calculation)
			1.11%	0.00067	Metal Hydroxide	-	1 to 2% Metal Hydroxide (LSC uses 1.75% in our calculation)
			0.16%	0.00010	Carbon Black	1333-86-4	0.1 to 0.5% Carbon Black (LSC uses 0.25% in our calculation)
Die attach	0.43%	0.00048					Die attach epoxy: Sumitomo CRM1066 series
			0.32%	0.00036	Silver (Ag)	7440-22-4	75.00%
			0.04%	0.00005	Epoxy Resin A	9003-36-5	10.00%
			0.06%	0.00007	Organic esters and resins	-	15.00%
Wire	0.38%	0.00043			Gold (Au)	7440-57-5	1.0mil diameter. Assume 1 wire per lead
Plating	1.24%	0.00140			Tin (Sn)	7440-31-5	Tin plating is 400 to 800 microinches (LSC uses 600 microinches in our calculation)
Leadframe	27.35%	0.03080					A194
			26.66%	0.03003	Copper	7440-50-8	97.50%
			0.60%	0.00067	Iron	7439-89-6	2.19%
			0.02%	0.00002	Phosphorus	7723-14-0	0.08%
			0.03%	0.00004	Zinc	7440-66-6	0.12%
			0.03%	0.00004	Silver	7440-22-4	0.12%

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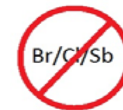

Rev. D

Assembly: ASET

Device Material Content

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

Package: **32 QFNS** **with matte Sn Plating**
Total Device Weight **0.056** **Grams** LCMXO2

MSL: 3
Peak Reflow Temp: 260°C

January, 2016	% of Total Pkg. Wt.	Weight (g)	% of Total Pkg. Wt.	Weight (g)	Substance	CAS #	Notes / Assumptions:
Die	3.68%	0.0021			Silicon chip	7440-21-3	Die size: 1.88 x 1.88 mm
Mold	68.05%	0.0380					Mold Compound: Sumitomo G631H
			5.44%	0.0030	Epoxy Resin	-	8.00%
			5.44%	0.0030	Phenol Resin	-	8.00%
			47.63%	0.0266	Silica(Amorphous) A	60676-86-0	70.00%
			6.80%	0.0038	Silica(Amorphous) B	7631-86-9	10.00%
			2.04%	0.0011	Metal Hydroxide		3.00%
			0.68%	0.0004	Carbon Black	1333-86-4	1.00%
Die attach	0.64%	0.0004					Die attach (tape): Hitachi FH-900 HR-9004 series
			0.10%	0.00005	Epoxy Resin	-	15%
			0.10%	0.00005	Phenol Resin	-	15%
			0.03%	0.00002	SiO2 Filler	99439-28-8	5%
			0.42%	0.00023	(Meta)Acrylic Copolymer	-	65%
Wire	1.29%	0.0007			Gold (Au)	7440-57-5	Assume 1 wire per lead
Plating	0.60%	0.0003			Tin (Sn)	7440-31-5	Tin plating is 400 to 800 microinches (LSC uses 600 microinches in our calculation)
Leadframe	33.07%	0.0185					C194
			32.23%	0.01802	Copper (Cu)	7440-50-8	97.46%
			0.78%	0.00043	Iron (Fe)	7439-89-6	2.35%
			0.02%	0.00001	Phosphorus (P)	7723-14-0	0.07%
			0.04%	0.00002	Zinc (Zn)	7440-66-6	0.12%

Notes:
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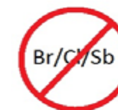

Rev. D