IOR International Rectifier



PQFN 5X6

RoHS Compliance Document

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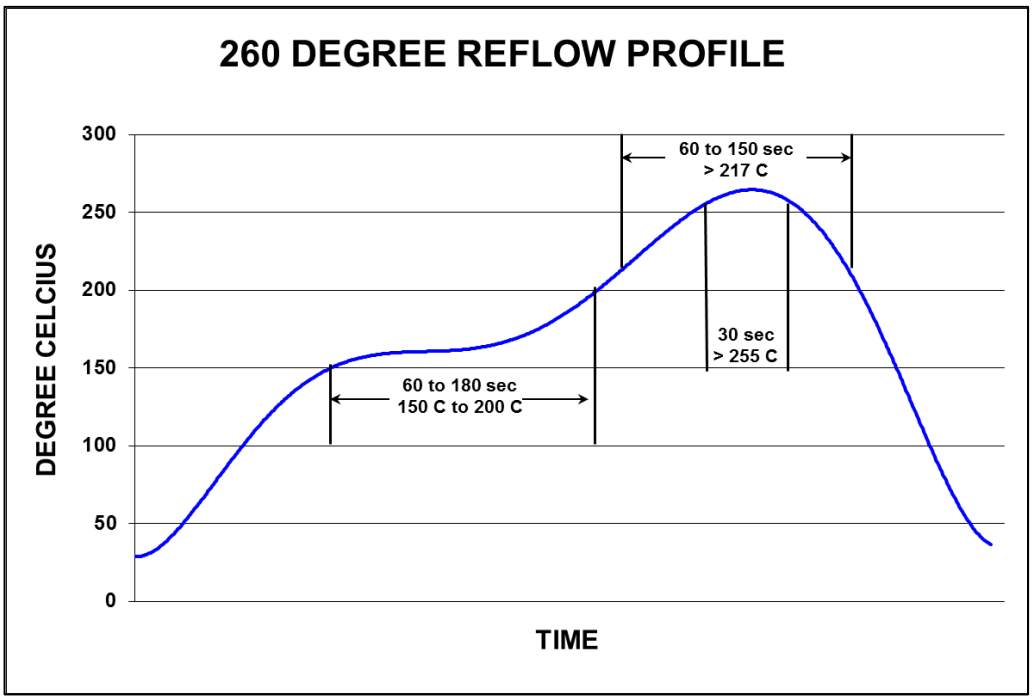
IOR International Rectifier



PQFN 5X6 BOM 1 Copper Clip

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.5%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	37.8%
			Epoxy	90598-46-2	0.00413	11%	4.6%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	41.3%
			Fe	7439-89-6	0.00089	2%	1.0%
Die Attach	Silver Epoxy	0.00083	Pb	7439-92-1	0.00077	92.5%	0.9%
			Sn	7440-31-5	0.00004	5%	0.0%
			Ag	7440-22-4	0.00002	2.5%	0.0%
Copper Clip	Copper	0.00995	Cu	7440-50-8	0.00995	100%	11.0%
Wire Bond	Copper	0.00031	Cu	7440-50-8	0.00031	100%	0.3%
Lead Finish	Matte Tin*	0.00146	Sn	7440-31-5	0.00146	100%	1.6%
			Total Weight (g)		**0.09024**		

*Tin whisker mitigation strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



This part is compliant with EU Directive 2011/65/EU (RoHS Directive) and does not contain lead, mercury, cadmium (0.01%), hexavalent chromium, PBB or PBDE in concentrations greater than 0.1%, except as permitted by Annex III. Further part complies with 3 reflow cycles per JEDEC J-STD-020

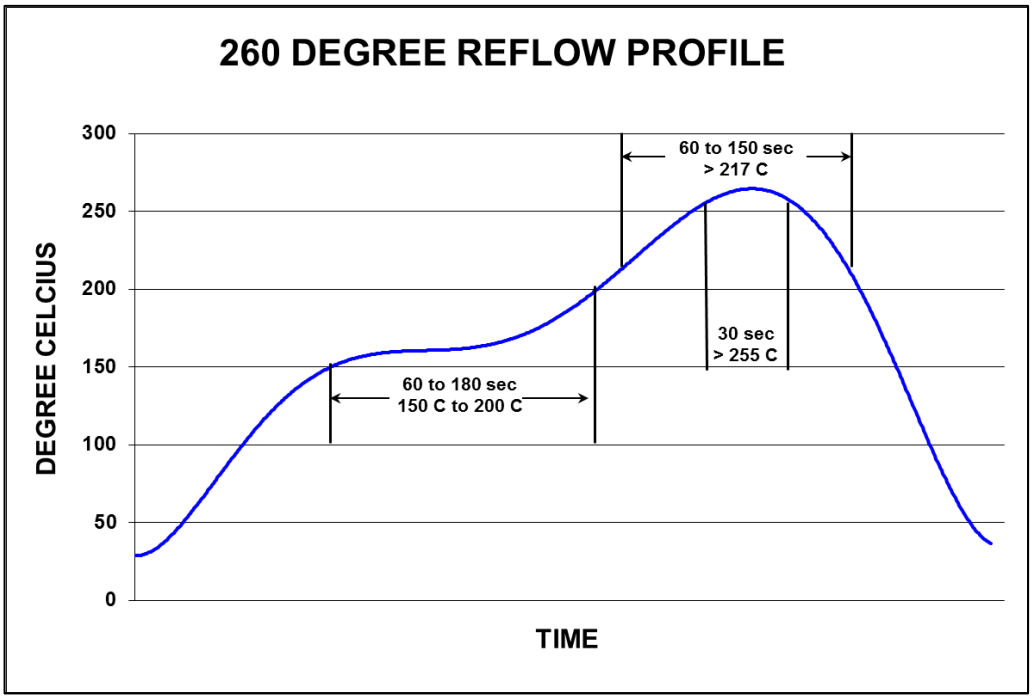
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November 2015

PQFN 5X6 BOM 2 Copper Clip

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.5%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	37.8%
			Epoxy	90598-46-2	0.00413	11%	4.6%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	41.3%
			Fe	7439-89-6	0.00089	2%	1.0%
Die Attach	Sold Solder	0.00083	Pb	7439-92-1	0.00077	92.5%	0.9%
			Sn	7440-31-5	0.00004	5%	0.0%
			Ag	7440-22-4	0.00002	2.5%	0.0%
Copper Clip	Copper	0.00995	Cu	7440-57-5	0.00995	100%	11.0%
Wire Bond	Gold	0.00031	Au	7440-50-8	0.00031	100%	0.3%
Lead Finish	Matte Tin*	0.00146	Sn	7440-31-5	0.00146	100%	1.6%
			Total Weight (g)		**0.09024**		

*Tin whisker mitigation strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



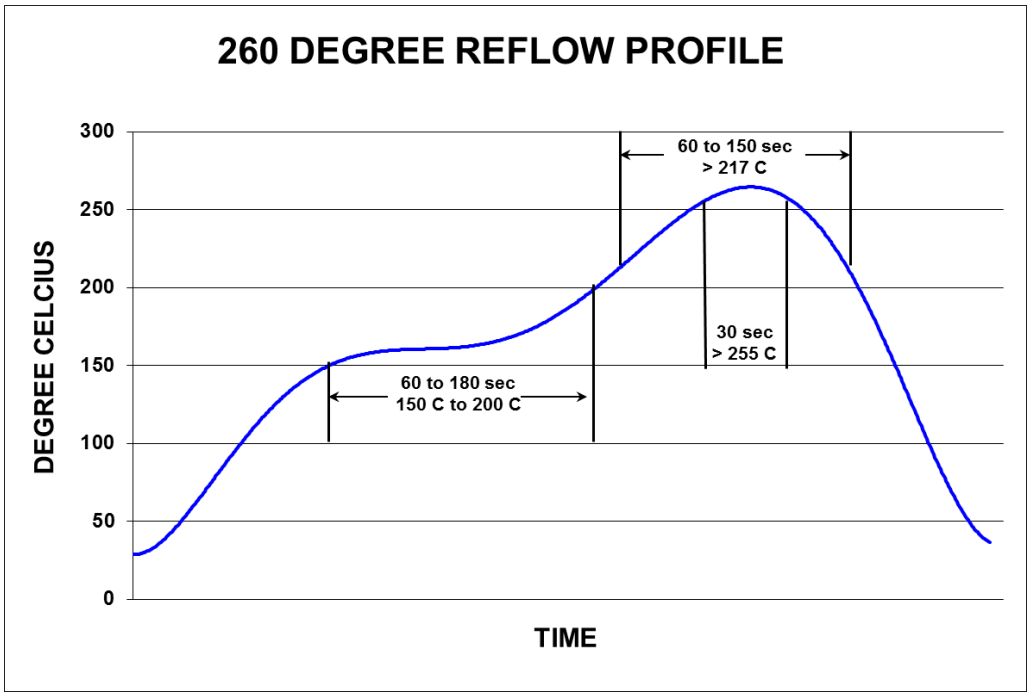
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PQFN 5X6 BOM 3 Copper Clip

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.5%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	37.8%
			Epoxy	90598-46-2	0.00413	11%	4.6%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	41.3%
			Fe	7439-89-6	0.00089	2%	1.0%
Die Attach	Soft Solder	0.00083	Pb	7439-92-1	0.00079	95%	0.9%
			Sn	7440-31-5	0.00004	5%	0.0%
Copper Clip	Copper	0.00995	Cu	7440-50-8	0.00995	100%	11.0%
Wire Bond	Gold	0.00031	Au	7440-57-5	0.00031	100%	0.3%
Lead Finish	Ni/Pd/Au	0.00146	Ni	7440-02-0	0.00135	92.4%	1.7%
			Pd	7440-05-3	0.00009	6.3%	0.1%
			Au	7440-57-5	0.00002	1.3%	0.0%
			Total Weight (g)		**0.09024**		

*Tin whisker mitigation strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



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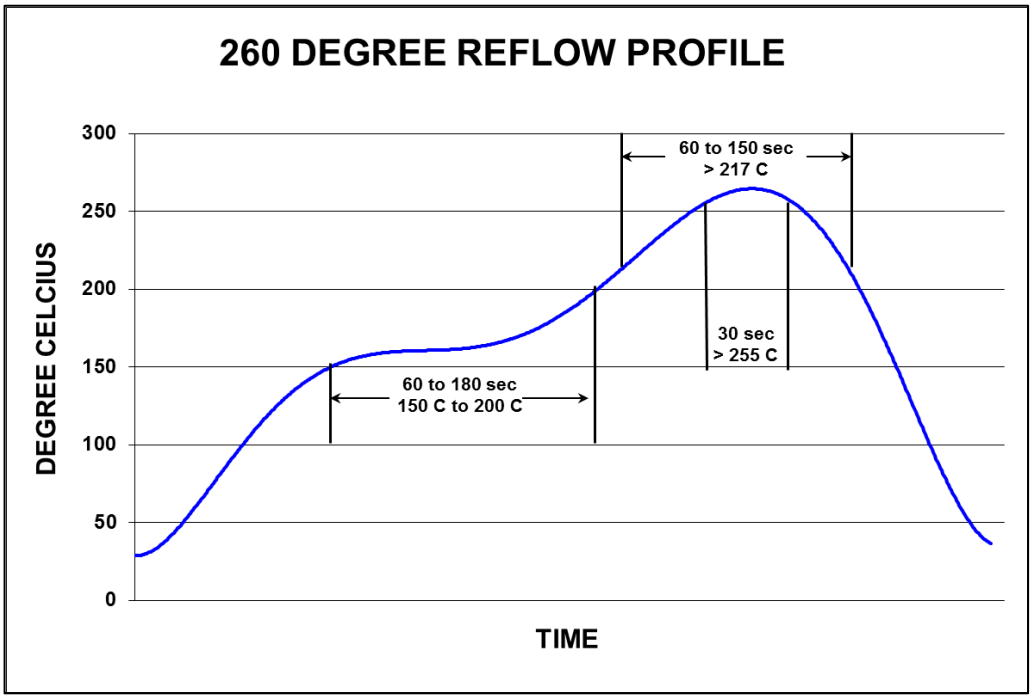
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PQFN 5X6 BOM 4 Copper Clip

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.5%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	37.8%
			Epoxy	90598-46-2	0.00413	11%	4.6%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	41.3%
			Fe	7439-89-6	0.00089	2%	1.0%
Die Attach	Soft Solder	0.00083	Pb	7439-92-1	0.00079	95%	0.9%
			Sn	7440-31-5	0.00004	5%	0.0%
Copper Clip	Copper	0.00995	Cu	7440-50-8	0.00995	100%	11.0%
Wire Bond	Copper	0.00031	Cu	7440-50-8	0.00031	100%	0.3%
Lead Finish	Matte Tin*	0.00146	Sn	7440-31-5	0.00146	100%	1.6%
			Total Weight (g)		**0.09024**		

*Tin whisker mitigation strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



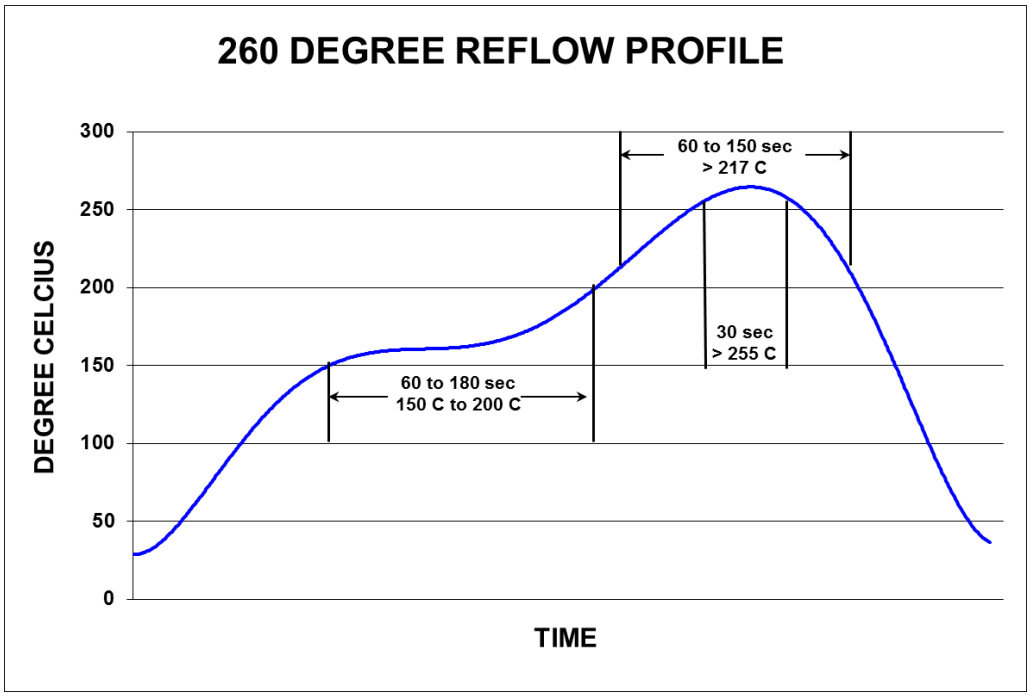
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PQFN 5X6 BOM 5 Ribbon

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.6%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	42.0%
			Epoxy	90598-46-2	0.00413	11%	5.1%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	45.9%
			Fe	7439-89-6	0.00089	2%	1.1%
Die Attach	Soft Solder	0.00083	Pb	7439-92-1	0.00077	92.5%	0.9%
			Sn	7440-31-5	0.00004	5%	0.0%
			Ag	7440-22-4	0.00002	2.5%	0.0%
Wire Bond	Aluminum Ribbon	0.00093	Al	7429-90-5	0.00093	100%	1.1%
Wire Bond	Copper	0.00031	Cu	7440-50-8	0.00031	100%	0.4%
Lead Finish	Matte Tin*	0.00146	Sn	7440-31-5	0.00146	100%	1.8%
			Total Weight (g)		**0.08122**		

*Tin whisker mitigation strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



This part is compliant with EU Directive 2011/65/EU (RoHS Directive) and does not contain lead, mercury, cadmium (0.01%), hexavalent chromium, PBB or PBDE in concentrations greater than 0.1%, except as permitted by Annex III. Further part complies with 3 reflow cycles per JEDEC J-STD-020

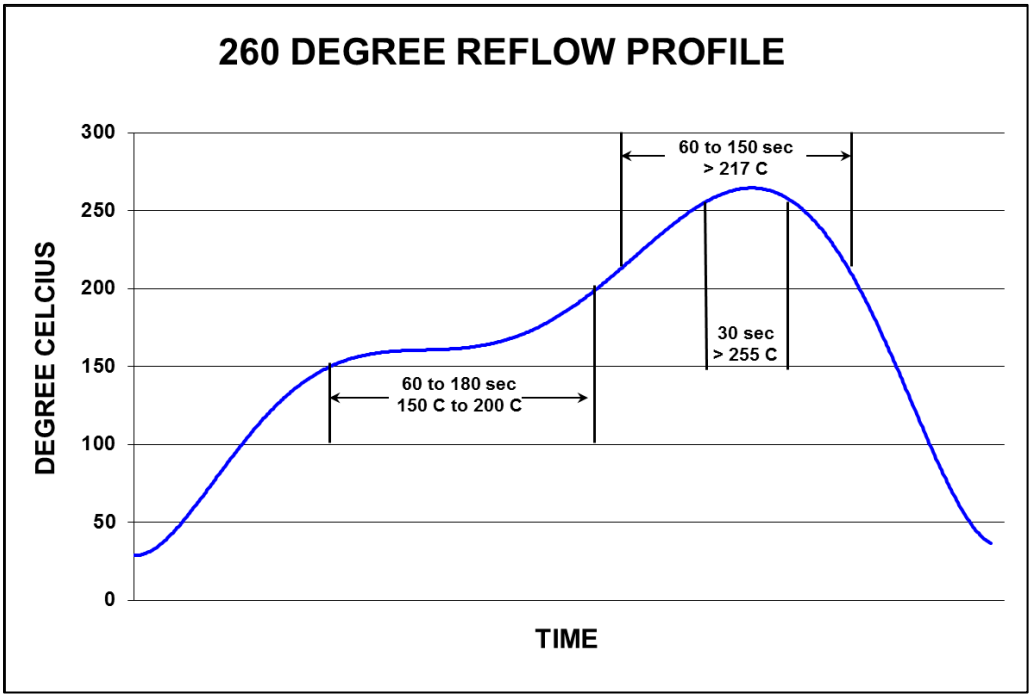
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PQFN 5X6 BOM 6 Ribbon

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.6%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	42.0%
			Epoxy	90598-46-2	0.00413	11%	5.1%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	45.9%
			Fe	7439-89-6	0.00089	2%	1.1%
Die Attach	Soft Solder	0.00083	Pb	7439-92-1	0.00079	92.5%	0.9%
			Sn	7440-31-5	0.00002	5%	0.0%
			Ag	7440-22-4	0.00002	2.5%	0.0%
Wire Bond	Aluminum Ribbon	0.00093	Al	7429-90-5	0.00093	100%	1.1%
Wire Bond	Gold	0.00031	Au	7440-57-5	0.00031	100%	0.4%
Lead Finish	Matte Tin*	0.00146	Sn	7440-31-5	0.00146	100%	1.8%
			Total Weight (g)		**0.08122**		

*Tin whisker mitigation strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



This part is compliant with EU Directive 2011/65/EU (RoHS Directive) and does not contain lead, mercury, cadmium (0.01%), hexavalent chromium, PBB or PBDE in concentrations greater than 0.1%, except as permitted by Annex III. Further part complies with 3 reflow cycles per JEDEC J-STD-020

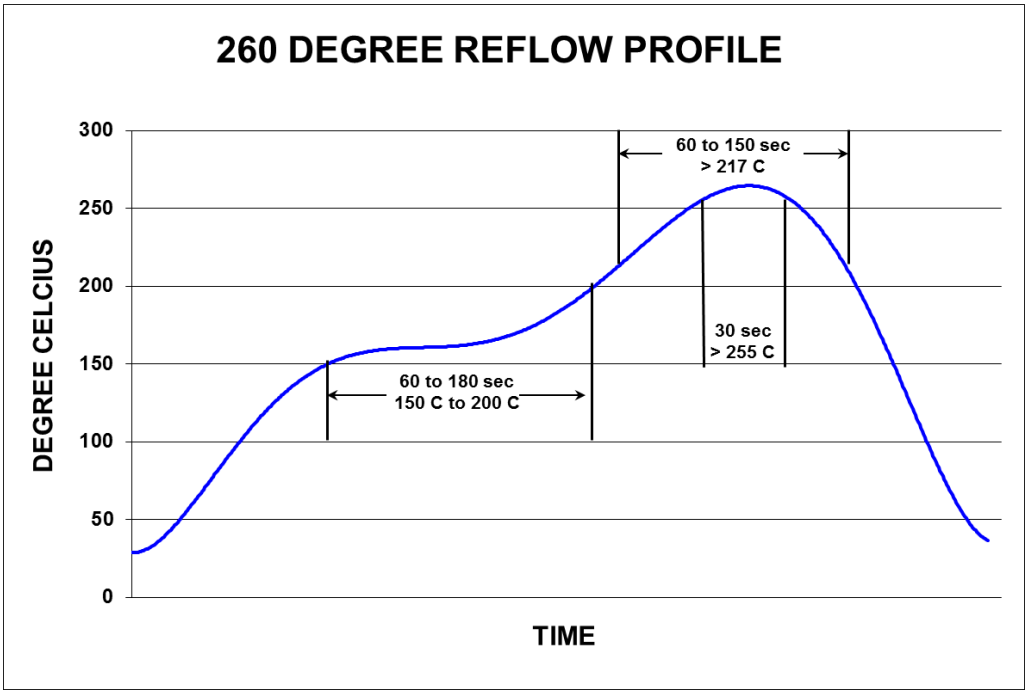
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PQFN 5X6 BOM 7 Ribbon

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.6%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	42.5%
			Epoxy	90598-46-2	0.00413	11%	5.1%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	46.4%
			Fe	7439-89-6	0.00089	2%	1.1%
Die Attach	Soft Solder	0.00083	Pb	7439-92-1	0.00079	92.5%	1.0%
			Sn	7440-31-5	0.00002	5%	0.0%
			Ag	7440-22-4	0.00002	2.5%	0.1%
Wire Bond	Aluminum Ribbon	0.00093	Al	7429-90-5	0.00093	100%	1.1%
Wire Bond	Copper	0.00031	Cu	7440-50-8	0.00031	100%	0.4%
Lead Finish	Matte Tin*	0.00146	Sn	7440-31-5	0.00146	100%	1.8%
			Total Weight (g)		**0.08122**		

*Tin whisker mitigation strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



This part is compliant with EU Directive 2011/65/EU (RoHS Directive) and does not contain lead, mercury, cadmium (0.01%), hexavalent chromium, PBB or PBDE in concentrations greater than 0.1%, except as permitted by Annex III. Further part complies with 3 reflow cycles per JEDEC J-STD-020

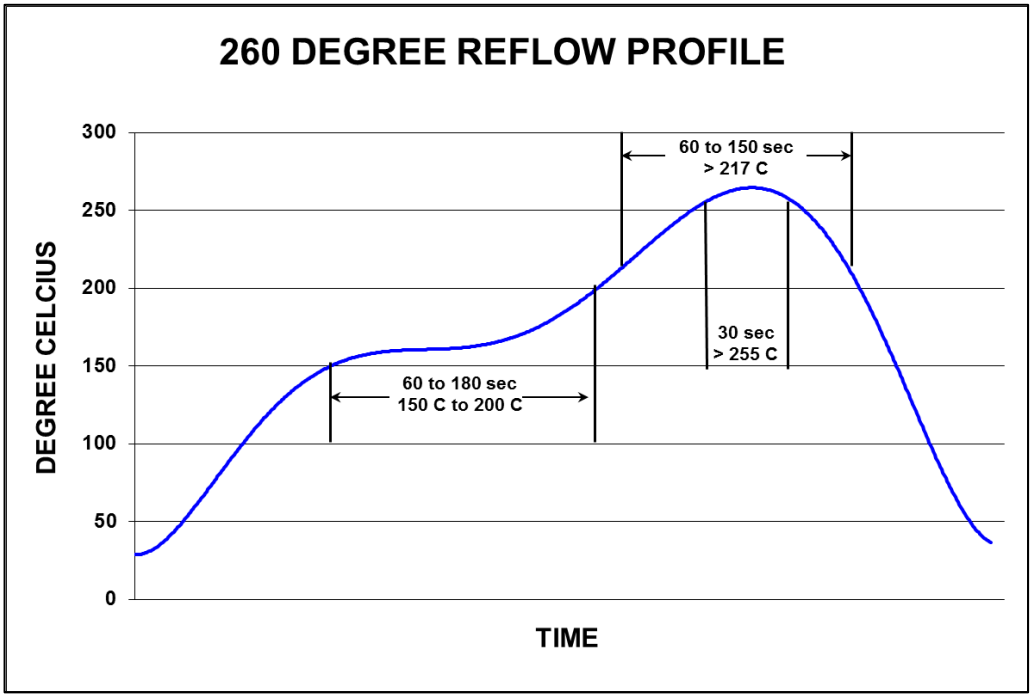
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PQFN 5X6 BOM 8

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.6%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	42.5%
			Epoxy	90598-46-2	0.00413	11%	5.1%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	46.4%
			Fe	7439-89-6	0.00089	2%	1.1%
Die Attach	Soft Solder	0.00083	Pb	7439-92-1	0.00079	95.5%	1.0%
			Sn	7440-31-5	0.00002	2%	0.0%
			Ag	7440-22-4	0.00002	2.5%	0.1%
Wire Bond	Copper	0.00031	Cu	7440-50-8	0.00031	100%	0.4%
Lead Finish	Matte Tin*	0.00146	Sn	7440-31-5	0.00146	100%	1.8%
			Total Weight (g)		**0.08029**		

*Tin whisker mitigation strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



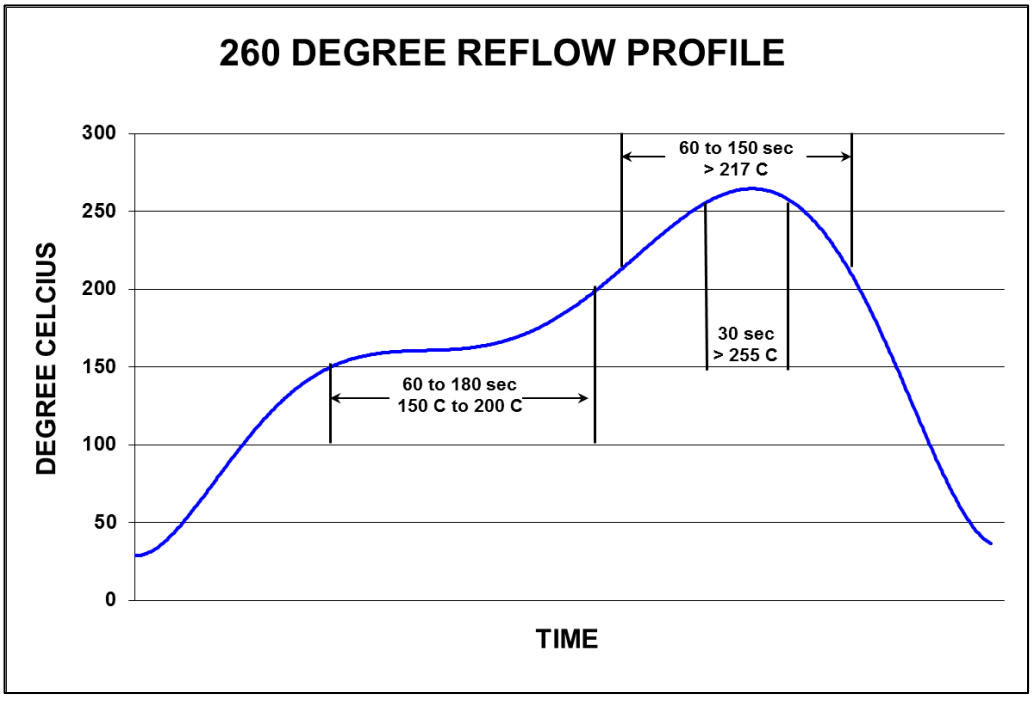
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PQFN 5X6 BOM 9

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.6%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	42.5%
			Epoxy	90598-46-2	0.00413	11%	5.1%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	46.4%
			Fe	7439-89-6	0.00089	2%	1.1%
Die Attach	Soft Solder	0.00083	Pb	7439-92-1	0.00077	92.5%	1.0%
			Sn	7440-31-5	0.00004	5%	0.1%
			Ag	7440-22-4	0.00002	2.5%	0.0%
Wire Bond	Copper	0.00031	Cu	7440-50-8	0.00031	100%	0.4%
Lead Finish	Matte Tin*	0.00146	Sn	7440-31-5	0.00146	100%	1.8%
			Total Weight (g)		**0.08029**		

*Tin whisker mitigation strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



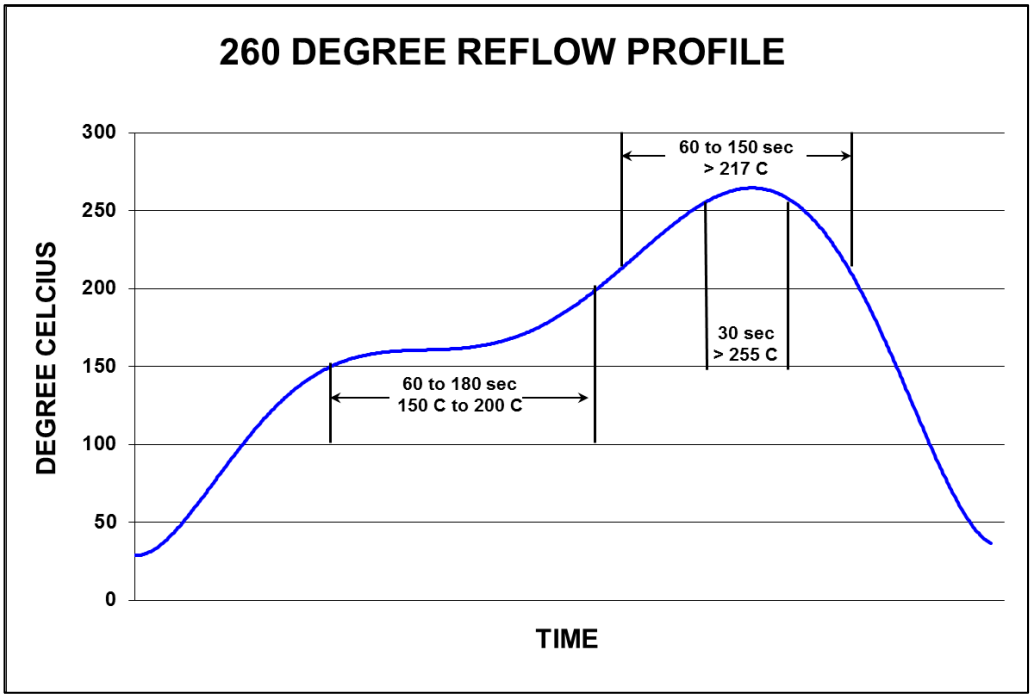
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PQFN 5X6 BOM 10

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.6%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	42.5%
			Epoxy	90598-46-2	0.00413	11%	5.1%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	46.4%
			Fe	7439-89-6	0.00089	2%	1.1%
Die Attach	Silver Epoxy	0.00083	Ag	7440-22-4	0.00060	72%	0.7%
			Epoxy	90598-46-2	0.00023	28%	0.3%
Wire Bond	Copper	0.00031	Cu	7440-50-8	0.00031	100%	0.4%
Lead Finish	Matte Tin*	0.00146	Sn	7440-31-5	0.00146	100%	1.8%
			Total Weight (g)		**0.08029**		

*Tin whisker mitigation strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



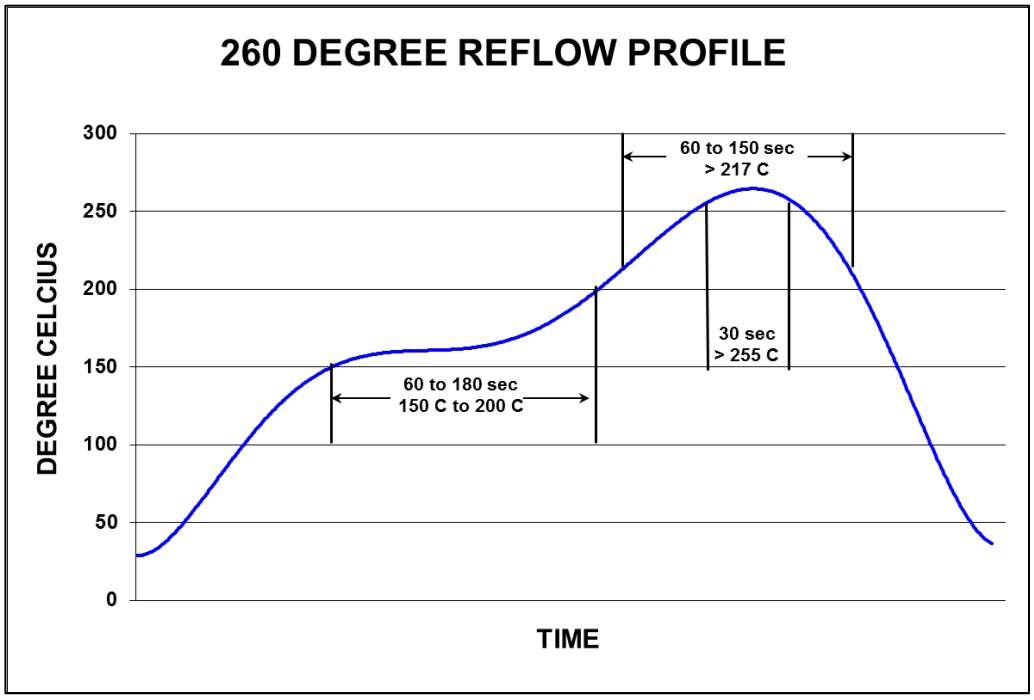
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PQFN 5X6 BOM 11

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.6%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	42.5%
			Epoxy	90598-46-2	0.00413	11%	5.1%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	46.4%
			Fe	7439-89-6	0.00089	2%	1.1%
Die Attach	Silver Epoxy	0.00083	Ag	7440-22-4	0.00060	72%	0.7%
			Epoxy	90598-46-2	0.00023	28%	0.3%
Wire Bond	Copper	0.00031	Cu	7440-50-8	0.00031	100%	0.4%
Lead Finish	Ni/Pd/Au	0.00146	Ni	7440-02-0	0.00135	92.4%	1.7%
			Pd	7440-05-3	0.00009	6.3%	0.1%
			Au	7440-57-5	0.00002	1.3%	0.0%
			Total Weight (g)		**0.08029**		

*Tin whisker strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



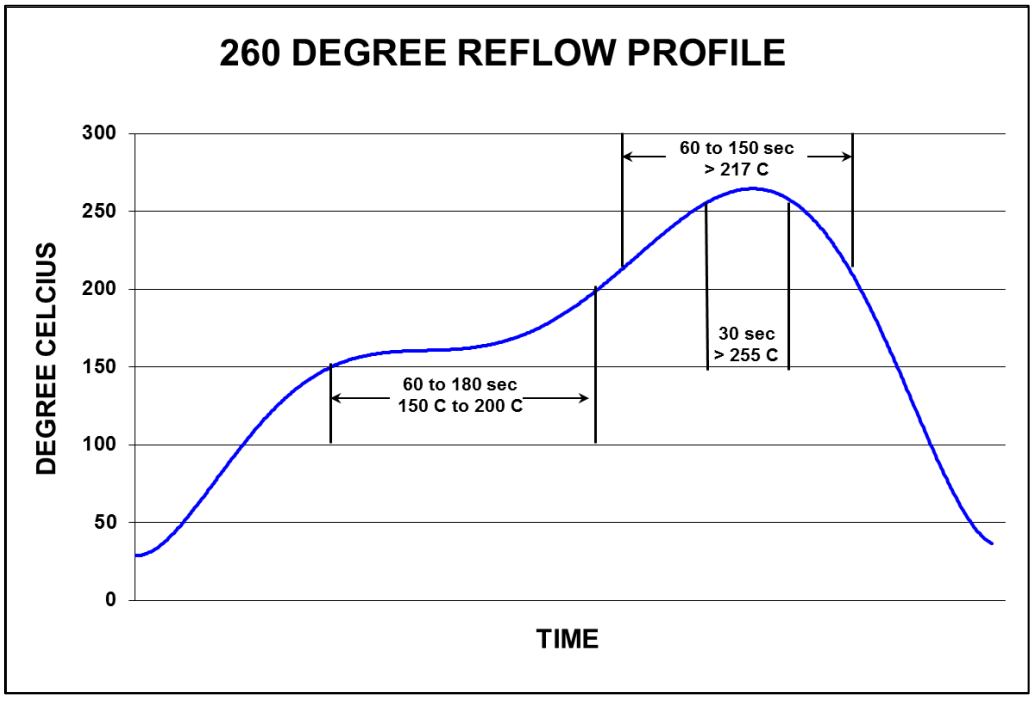
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PQFN 5X6 BOM 12 Copper Clip

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.5%
Encapsulant	Epoxy Resin	0.03822	SiO_2	7631-86-9	0.03409	89%	37.8%
			Epoxy	90598-46-2	0.00413	11%	4.6%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	41.3%
			Fe	7439-89-6	0.00089	2%	1.0%
Die Attach	Soft Solder	0.00083	Pb	7439-92-1	0.00079	95%	0.9%
			Sn	7440-31-5	0.00004	5%	0.0%
Copper Clip	Copper	0.00995	Cu	7440-50-8	0.00995	100%	11.0%
Wire Bond	Gold	0.00031	Au	7440-57-5	0.00031	100%	0.3%
Lead Finish	Matte Tin*	0.00146	Sn	7440-31-5	0.00146	100%	1.6%
			Total Weight (g)		**0.09024**		

*Tin whisker mitigation strategy is 150 °C, 1 hour anneal within 24 hours of tin plating.



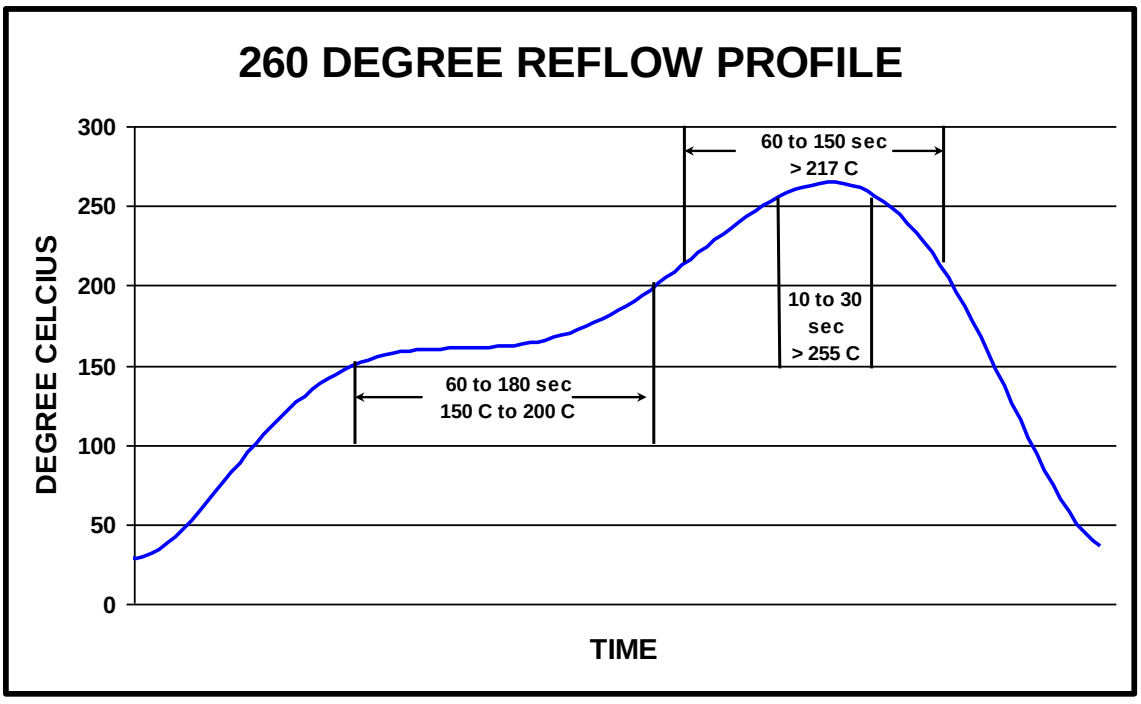
This part is compliant with EU Directive 2011/65/EU (RoHS Directive) and does not contain lead, mercury, cadmium (0.01%), hexavalent chromium, PBB or PBDE in concentrations greater than 0.1%, except as permitted by Annex III. Further part complies with 3 reflow cycles per JEDEC J-STD-020

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PQFN 5X6 BOM 13 Au/Cu Wire

Component	Material Name	Material Mass (g)	Element Name Composition	CAS #	Substance Mass (g)	Material Analysis Weight (%)	% of Total Weight
Chip	Silicon	0.00131	Si	7440-21-3	0.00131	100%	1.62%
Encapsulant	Epoxy Resin	0.03822	SiO2	7631-86-9	0.03409	89%	42.13%
			Epoxy	90598-46-2	0.00413	11%	5.10%
Lead Frame	Copper	0.03816	Cu	7440-50-8	0.03727	98%	46.06%
			Fe	7439-89-6	0.00089	2%	1.10%
Die Attach	Silver Epoxy	0.00083	Ag	7440-22-4	0.0006	72%	0.74%
			Epoxy	90598-46-2	0.00023	28%	0.28%
Wire Bond	Gold	0.0004	Au	7440-57-5	0.0004	100%	0.49%
Wire Bond	Copper	0.00053	Cu	7440-50-8	0.00053	100%	0.66%
Lead Finish	NiPdAu	0.00146	Ni	7440-02-0	0.00135	92.40%	1.67%
			Pd	7440-05-3	0.00009	6.30%	0.11%
			Au	7440-57-5	0.00002	1.30%	0.02%
			Total Weight (g)		**0.08091**		

* No tin whisker mitigation strategy since there is no tin.



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Test Definition	Test Conditions	Inspection Interval Class 1 and 2 Products	Total Duration Class 1 and 2 Products	Maximum Whisker Length (µm)
Room Temperature Humidity	30± 2°C/60± 3% RH	1000 hours	4000 hours	20
Temperature Humidity Unbiase	55± 3°C/85± 3% RH	1000 hours	4000 hours	20
Temperature Cycling	-40 to 55°C to 80 to 95°C, air to air, 10 min soak, approx 3	500 cycles	1500 cycles	45

Tin Whisker testing per JESD201, Environmental Acceptance Requirements for Tin Whisker Susceptibility of Tin and Tin Alloy Surface Finish

Tin Whisker Results (number of failing whiskers)

Test	1000 Hours	2000 Hours	3000 Hours	4000 Hours
Room Temperature Humidity Storage	0/24	0/24	0/24	0/24
Temperature Humidity	0/24	0/24	0/24	0/24
Test	**500 Cycles**	**1000 Cycles**	**1500 Cycles**	
Temperature Cycling	0/24	0/24	0/24	

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