LP4 LP4C GaAs and SiGe

Product Environmental Data Sheet

20 Alpha Rd
Chelmsford MA 01824
Tel:{978} 250-3343
Fax: {978} 250-3373

Product Information					
Date/Time Revision:	February 25, 2005				
Manufacture site:	Chelmsford MA				
Product Number	Generic: LP4, Plastic Encapsulated Microcircuit				
Product Name	Surface Mount GaAs and SiGe Semiconductor				
Product Mass	Grams:	Min 0.038627	Max 0.047211	Nominal	0.042919
Product Note					

Material Composition Information

Component	Mateial Part Name	Material	Material Trade Name	Material Mass (g) *Minimum*	Material Mass (g) *Maximum*	Percent of product (%) *Minimum*	Percent of product (%) *Maximum*
A	Lead Frame	Metal	Copper Lead Frame	0.0155	0.0212	40.0%	45.0%
B	Mold Compound	Polymer	Sumitomo EME7730LF	0.0178	0.0236	46.0%	50.0%
C	Epoxy, Die attach	Epoxy	Sumitomo CRM1076DJ	0.0004	0.0009	1.0%	2.0%
D	Semiconductor, GaAs	Non- metal, Non- polymer	Crystalline Gallium Arsenide	0.0004	0.0009	1.0%	2.0%
E	Semiconductor, SiGe	Non- metal, Non- polymer	Silicon Germanium	0.0004	0.0009	1.0%	2.0%
F	Bond Wire, Gold	Metal	Wire	0.0002	0.0005	0.5%	1.0%
G	Solder, Lead Finish	Sn/Pb	Plating Coat	0.0004	0.0009	1.0%	2.0%
Substance	**Substance Name**	**Substance CAS#**	**Substance Note**	**Substance Mass (g) *Minimum***	**Substance Mass (g) *Maximum***	**Percent of Substance (%) *Minimum***	**Percent of Substance (%) *Maximum***
A	**Copper Lead Frame**						
A1	Cu	7440-50-8	n/a	0.014987	0.020820	97.00%	98.00%
A2	Fe	7439-89-6	n/a	0.000409	0.000567	2.30%	2.40%
A3	Zn	7440-66-6	n/a	0.000000	0.000001	0.11%	0.13%
A4	P	7723-14-0	n/a	0.000000	0.000000	0.02%	0.04%
B	**Mold Compound**						
B1	Silica Fused	60676-86-0	n/a	0.013326	0.022425	75.00%	95.00%
B2	Epoxy Resin	(Trade Secret)	n/a	0.000711	0.002361	4.00%	10.00%
B3	Phenol Resin	(Trade Secret)	n/a	0.000178	0.001416	1.00%	6.00%
B4	Antimony Trioxide	1309-64-4	n/a	0.000018	0.000212	0.10%	0.90%
B5	Brominated Epoxy Resin	40039-93-8	n/a	0.001777	0.000236	10.00%	1.00%
B6	Carbon Black	1333-86-4	n/a	0.000018	0.000118	0.10%	0.50%
C	**Die Attach Epoxy**						
C1	Silver	7440-22-4	n/a	0.000251	0.000803	65.00%	85.00%
C2	Epoxy Resin	9003-36-5	n/a	0.000058	0.000236	15.00%	25.00%
C3	t-Butyl phenyl glycidyl ether	3101-60-8	n/a	0.000019	0.000094	5.00%	10.00%
C4	Phenolic hardener	92-88-6	n/a	0.000004	0.000019	1.00%	2.00%
C5	Butyl cellosolve acetate	112-07-2	n/a	0.000002	0.000014	0.50%	1.50%
D	**GaAs Semiconductor**						
D1	Ga	1303-00-0/7440-55-3	n/a	0.000178	0.000472	46.00%	50.00%
D2	As	1303-00-0/7440-38-2	n/a	0.000193	0.000510	50.00%	54.00%
E	**SiGe Semiconductor**						
E1	Si	7440-21-3	n/a	0.000290	0.000803	75.00%	85.00%
E2	Ge	7440-56-4	n/a	0.000058	0.000236	15.00%	25.00%
F	**Bond Wire**						
F1	Gold (Au)	7440-57-5	Die Attach, wirebond	0.000193	0.000472	99.99%	100.00%
G	**Solder**						
G1	Tin	7440-31-5	Tin, Lead solder	0.000324	0.000812	84.00%	86.00%
G2	Lead	7439-92-1	Tin, Lead solder	0.000054	0.000151	14.00%	16.00%

NOTE: *CAS in not available for proprietary substances.All percentages are calculated from mass data declared. Material trade names are not applicable to some common materials for constant composition. When CAS is unavailable, vendor supplier comments such as PROPRIATARY or TRADE SECRET will be documented*

Flammability

The plastic mold compound used for this device has been tested for flammability of plastic materials used for parts in devices and appliances and is classified as UL-94 V0.

Absence of Hazardous Substances

Our material composition policy is to declare all substances intentionally added in our products and documented by our vendors. Additionally we confirm the following regulated substances known to be in electronics are not intentionally added or knowingly present in our semiconductor products or product packaging: Cadmium and cadmium compounds, mercury and mercury compounds, hexavalent chromium compounds, polychlorinated biphenyl (PCB), polychlorinated naphthalenes (PCN), polybrominated diphenyl ether (PBDE), decabromodiphenyl ether(DecaBDE), short chain paraffins (CP) (C10-13) (Cl = 50 wt% or more), mirex (perchlordecone), TBBP-A-bis, organic tin compounds (tributyl tin compounds / triphenyl tin compounds) Asbestos, formaldehyde and Azo compounds.

Product Life Cycle Information

Our devices are often incorporated into printed circuit boards and then assembled with other parts into electronic systems. In the U.S.A., end-of-life printed circuit boards {waste}, are considered scrap metal by the Environmental Protection Agency {EPA} when they are recycled {USEPA Mgt. memo, Regulatory Status or Printed Circuit Boards, Aug 26, 1992}. If any of our products are disposed of as part of a printed circuit board, the entire assembly is treated as scrap metal. Approved printed circuit recycling companies either have proper facilities or have access to secondary metal smelters and refiners which can safely recycle scrap electronic components or assemblies

The information presented in this document is believed accurate and reliable. The information provided is a result of review of numerous sources including vendor submitted datasheets. Data is the most current available to Hittite Microwave Corporation at the time of preparation and is issued as a matter of reference information only. No warranty as to accuracy or completeness is expressed or implied. The information in this document is subject to change without notice.

LP4 LP4C E GaAs and SiGe

Product Environmental Data Sheet

20 Alpha Rd
Chelmsford MA 01824
Tel:{978} 250-3343
Fax: {978} 250-3373

Product Information				
Date/Time Revision:	February 25, 2005			
Manufacture site:	Chelmsford MA			
Product Number	Generic: LP4, Plastic Encapsulated Microcircuit			
Product Name	Surface Mount GaAs and SiGe Semiconductor			
Product Mass	Grams:	Min 0.038627	Max 0.047211	Nominal 0.042919
Product Note				

Material Composition Information

Component	Mateial Part Name	Material	Material Trade Name	Material Mass (g) *Minimum*	Material Mass (g) *Maximum*	Percent of product (%) *Minimum*	Percent of product (%) *Maximum*
A	Lead Frame	Metal	Copper Lead Frame	0.0155	0.0212	40.0%	45.0%
B	Mold Compound	Polymer	Sumitomo G770	0.0178	0.0236	46.0%	50.0%
C	Epoxy, Die attach	Epoxy	Sumitomo CRM1076DJ	0.0004	0.0009	1.0%	2.0%
D	Semiconductor, GaAs	Non- metal, Non- polymer	Crystalline Gallium Arsenide	0.0004	0.0009	1.0%	2.0%
E	Semiconductor, SiGe	Non- metal, Non- polymer	Silicon Germanium	0.0004	0.0009	1.0%	2.0%
F	Bond Wire, Gold	Metal	Wire	0.0002	0.0005	0.5%	1.0%
G	Lead Finish	Sn	Plating Coat	0.0004	0.0009	1.0%	2.0%
Substance	**Substance Name**	**Substance CAS#**	**Substance Note**	**Substance Mass (g) *Minimum***	**Substance Mass (g) *Maximum***	**Percent of Substance (%) *Minimum***	**Percent of Substance (%) *Maximum***
A	**Copper Lead Frame**						
A1	Cu	7440-50-8	n/a	0.014987	0.020820	97.00%	98.00%
A2	Fe	7439-89-6	n/a	0.000409	0.000567	2.30%	2.40%
A3	Zn	7440-66-6	n/a	0.000000	0.000001	0.11%	0.13%
A4	P	7723-14-0	n/a	0.000000	0.000000	0.02%	0.04%
B	**Mold Compound**						
B1	Silica Fused	60676-86-0	n/a	0.013326	0.022425	75.00%	95.00%
B2	Epoxy Resin A	(Trade Secret)	n/a	0.000178	0.001180	1.00%	5.00%
B3	Epoxy Resin B	(Trade Secret)	n/a	0.000178	0.001180	1.00%	5.00%
B4	Phenol Resin A	(Trade Secret)	n/a	0.000178	0.001180	1.00%	5.00%
B5	Phenol Resin B	(Trade Secret)	n/a	0.000178	0.001180	1.00%	5.00%
B6	Metal Hydroxide	(Trade Secret)	n/a	0.000089	0.000590	0.50%	2.50%
B7	Carbon Black	1333-86-4	n/a	0.000018	0.000118	0.10%	0.50%
C	**Die Attach Epoxy**						
C1	Silver	7440-22-4	n/a	0.000251	0.000803	65.00%	85.00%
C2	Epoxy Resin	9003-36-5	n/a	0.000058	0.000236	15.00%	25.00%
C3	t-Butyl phenyl glycidyl ether	3101-60-8	n/a	0.000019	0.000094	5.00%	10.00%
C4	Phenolic hardener	92-88-6	n/a	0.000004	0.000019	1.00%	2.00%
C5	Butyl cellosolve acetate	112-07-2	n/a	0.000002	0.000014	0.50%	1.50%
D	**GaAs Semiconductor**						
D1	Ga	1303-00-0/7440-55-3	n/a	0.000178	0.000472	46.00%	50.00%
D2	As	1303-00-0/7440-38-2	n/a	0.000193	0.000510	50.00%	54.00%
E	**SiGe Semiconductor**						
E1	Si	7440-21-3	n/a	0.000290	0.000803	75.00%	85.00%
E2	Ge	7440-56-4	n/a	0.000058	0.000236	15.00%	25.00%
F	**Bond Wire**						
F1	Gold (Au)	7440-57-5	Die Attach, wirebond	0.000193	0.000472	99.99%	100.00%
G	**Solder**						
G1	Tin	7440-31-5	Tin, Lead solder	0.000386	0.000944	99.99%	100.00%

NOTE: *CAS in not available for proprietary substances.All percentages are calculated from mass data declared. Material trade names are not applicable to some common materials for constant composition. When CAS is unavailable, vendor supplier comments such as PROPRIATARY or TRADE SECRET will be documented*

Flammability

The plastic mold compound used for this device has been tested for flammability of plastic materials used for parts in devices and appliances and is classified as UL-94 V0.

Absence of Hazardous Substances

Our material composition policy is to declare all substances intentionally added in our products and documented by our vendors. Additionally we confirm the following regulated substances known to be in electronics are not intentionally added or knowingly present in our semiconductor products or product packaging: Cadmium and cadmium compounds, mercury and mercury compounds, hexavalent chromium compounds, polychlorinated biphenyl (PCB), polychlorinated naphthalenes (PCN), polybrominated diphenyl ether (PBDE), decabromodiphenyl ether(DecaBDE), short chain paraffins (CP) (C10-13) (Cl = 50 wt% or more), mirex (perchlordecone), TBBP-A-bis, organic tin compounds (tributyl tin compounds / triphenyl tin compounds) Asbestos, formaldehyde and Azo compounds.

Product Life Cycle Information

Our devices are often incorporated into printed circuit boards and then assembled with other parts into electronic systems. In the U.S.A., end-of-life printed circuit boards {waste}, are considered scrap metal by the Environmental Protection Agency {EPA} when they are recycled {USEPA Mgt. memo, Regulatory Status or Printed Circuit Boards, Aug 26, 1992}. If any of our products are disposed of as part of a printed circuit board, the entire assembly is treated as scrap metal. Approved printed circuit recycling companies either have proper facilities or have access to secondary metal smelters and refiners which can safely recycle scrap electronic components or assemblies

The information presented in this document is believed accurate and reliable. The information provided is a result of review of numerous sources including vendor submitted datasheets. Data is the most current available to Hittite Microwave Corporation at the time of preparation and is issued as a matter of reference information only. No warranty as to accuracy or completeness is expressed or implied. The information in this document is subject to change without notice.