



MSOP 8 {MS8, MS8G} GaAs
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: MSOP8, 8G Plastic Encapsulated Microcircuit					
	Product Name	Surface Mount GaAs Semiconductor					
	Product Mass	Grams:	Min 0.022671	Max 0.027709	Nominal	0.02519	
	Product Note						

Material Composition Information

Component	Sub- Part Name	Material	Material Trade Name	Material Mass (g) <i>Minimum</i>	Material Mass (g) <i>Maximum</i>	Percent of product (%) <i>Minimum</i>	Percent of product (%) <i>Maximum</i>
A	Lead Frame	Metal	Copper Lead Frame	0.0079	0.0105	35.0%	38.0%
B	Mold Compound	Polymer	Sumitomo EME6600D	0.0107	0.0136	47.0%	49.0%
C	Epoxy, Die attach	84-1LMIT1	ABLESTIK	0.0005	0.0011	2.0%	4.0%
D	Semiconductor, GaAs	Non- metal, Non- polymer	Crystalline Gallium Arsenide	0.0005	0.0011	2.0%	4.0%
E	Bond Wire, Gold	Metal	Wire	0.0001	0.0003	0.5%	1.0%
F	Solder, Lead Finish	Sn/Pb	Plating Coat	0.0005	0.0011	2.0%	4.0%
Substance	Sub-part Name and Substance	Sub Part Substance CAS#	Substance Note	Substance Mass (g) <i>Minimum</i>	Substance Mass (g) <i>Maximum</i>	Percent of Substance (%) <i>Minimum</i>	Percent of Substance (%) <i>Maximum</i>
A	Copper Lead Frame						
A1	Cu	7440-50-8	n/a	0.007697	0.010319	97.00%	98.00%
A2	Fe	7439-89-6	n/a	0.000245	0.000326	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	0.007459	0.012220	70.00%	90.00%
B2	Epoxy Resin	(Trade Secret)	n/a	0.000533	0.001765	5.00%	13.00%
B3	Phenol Resin	(Trade Secret)	n/a	0.000000	0.000339	0.00%	2.50%
B4	Phenol Novolac	9003-35-4	n/a	0.000107	0.001086	1.00%	8.00%
B5	Antimony Trioxide	1309-64-4	n/a	0.000053	0.000407	0.50%	3.00%
B6	Brominated Epoxy Resin	68541-56-0	n/a	0.000016	0.000475	0.15%	3.50%
B7	Carbon Black	1333-86-4	n/a	0.000011	0.000068	0.10%	0.50%
C	Die Attach Epoxy						
C1	Silver	7440-22-4	n/a	0.000317	0.000942	70.00%	85.00%
C2	1,4-Bis (2,3-epoxypropoxy) butane	2425-79-8	n/a	0.000005	0.000111	1.00%	10.00%
C3	Aromatic Amine	PROPRIETARY	n/a	0.000005	0.000111	1.00%	10.00%
C4	Epoxy Resin	PROPRIETARY	n/a	0.000045	0.000333	10.00%	30.00%
D	GaAs Semiconductor						
D1	Ga	1303-00-0/7440-55-3	n/a	0.000209	0.000554	46.00%	50.00%
D2	As	1303-00-0/7440-38-2	n/a	0.000227	0.000599	50.00%	54.00%
E	Bond Wire						
E1	Gold (Au)	7440-57-5	Die Attach, wirebond	0.000113	0.000277	99.99%	100.00%
F	Solder						
F1	Tin	7440-31-5	Tin, Lead solder	0.000381	0.000953	84.00%	86.00%
F2	Lead	7439-92-1	Tin, Lead solder	0.000063	0.000177	14.00%	16.00%

NOTE: CAS is 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 PROPRIETARY 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.



MSOP 8 (MS8E, MS8GE) GaAs

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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	0.007459	0.012899	70.00%	95.00%
B2	Epoxy Resin	(Trade Secret)	n/a	0.000213	0.001358	2.00%	10.00%
B3	Epoxy, Cresol Novolac	29690-82-2	n/a	0.000000	0.000407	0.00%	3.00%
B4	Phenol Resin	(Trade Secret)	n/a	0.000213	0.001086	2.00%	8.00%
B5	Carbon Black	1333-86-4	n/a	0.000011	0.000068	0.10%	0.50%
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