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Product Environmental Information Sheet

Agilent Technologies

Semiconductor Products Group

Agilent Technologies, Incorporated
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Palo Alto, California, USA 94043

	Date/Time Revision	20050314T1100 9.0
	Manufacturing site	Penang
Product Information	**Product Number:**	HEMT-3xxx, HLMP-0xxx (except HLMP-0103), 3xxx, 4xxx, Axxx, Bxxx, Cxxx, Dxxx, Exxx, Fxxx, Gxxx, Rxxx, Wxxx, HLMA-SHxx
	Product Name:	Through Hole LED 'Lamps'
	Product Mass	0.2500 to 0.4000 **gram (min, max)**
	Product Note:	This product (weight and materials) information applies to 'Through Hole' T1 3/4 LEDs. These products are RoHS compliant. Terminal finish is e1.

Material Composition Information:

Sub part ref	Sub-part Name	Material	Material Trade Name	Material Mass (g) *Minimum*	Material Mass (g) *Maximum*	Percent of product(%) Minimum	Percent of product(%) Maximum
SPA	Encapsulation	Polymer	Epoxy	0.1250	0.2400	50.00%	60.00%
SPB	Leadframe	Metal	Mild Steel	0.1000	0.2000	40.00%	50.00%
SPC	Terminal finish	Metal	plating / coating	0.0001	0.0020	0.05%	0.50%
SPD	Active device	Non Metal Non Polymer	Electronic crystal	0.0000	0.0004	0.01%	0.10%
Sub part	**Sub-part Name & Substance**	**Sub-part Substance CAS #**	**Substance Note**	**Substance Mass (g) *Minimum***	**Substance Mass (g) *Maximum***	**Percent of Subpart(%) Minimum**	**Percent of Subpart(%) Maximum**
SPA	Encapsulation						
SPA1	bisphenol-A-epichlorohydrin	25068-38-6	n.a.	0.050000	0.120000	40.00%	50.00%
SPA2	hexahydrophthalic anhydride	85-42-7	n.a.	0.050000	0.120000	40.00%	50.00%
SPA3	Al_2O_3	1344-28-1	InGaN SiC only	0.000000	0.024000	0.00%	10.00%
SPB	Leadframe						
SPB1	Fe	7439-89-6	n.a.	0.099400	0.199000	99.40%	99.50%
SPB2	C	7440-44-0	n.a.	0.000080	0.000240	0.08%	0.12%
SPB3	Mn	7439-96-5	n.a.	0.000400	0.001000	0.40%	0.50%
SPC	Terminal Finish						
SPC1	Sn	7440-31-5	Pb free terminal finish	0.000121	0.001930	96.50%	96.50%
SPC2	Ag	7440-22-4	Pb free terminal finish	0.000004	0.000060	3.00%	3.00%
SPC3	Cu	7440-50-8	Pb free terminal finish	0.000001	0.000010	0.50%	0.50%
SPD	Active Device						
SPD1	GaP / GaAs / GaN	12063-98-8 / 1303-00-0 / 9999-99-9	Die substrate type A	0.000000	0.000320	0.00%	80.00%
SPD2	Silicon / Silicon Carbide	7440-21-3 / 409-21-2	Die substrate type B	0.000000	0.000320	0.00%	80.00%
SPD3	InGaN / GaAsP / AlGaAs / AlInGaP	9999-99-9	epi	0.000000	0.000080	0.00%	20.00%
SPD4	Ag, Au	7440-22-4, 7440-57-5	die attach, wirebond	0.000000	0.000020	0.00%	5.00%

Note Percentages are calculated from mass data declared. Material Trade names are not applicalble to some common materials of constant composition. When CAS is unavailable 9999-99-9 is assigned.

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Absence of Hazardous Substances

Our material composition policy is to declare all substances intentionally added in our products. Additionally we confirm the following regulated substances known to be in electronics are not intentionally added or knowingly present in our semiconductor products:

Asbestos, Azo Colorants, Cadmium and its compounds, Hexavalent Chromium and its compounds, Mercury and its compounds, Ozone Depleting Substances (CFCs, HCFCs, HBFCs, carbon tetrachloride, etc.), Tributyl Tin Oxide (TBTO), Tributyl Tin (TBT) and Triphenyl Tin (TPT), Polychlorinate Biphenyls (PCBs), Polychlorinate Terphenyls (PCTs), Polychloronated Naphthalenes (more than 3 chlorine atoms), Short chain Chlorinated Paraffins (SCCPs), Polybrominated biphenyls (PBBs), Polybrominated diphenylethers (PBDEs) and Radio-active Substances

Dopants

Some of the commonly used dopant elements are toxic, but they are only required in very small amounts, well below the one part per billion [1ppb] level. None of our devices contain these toxic materials as "free elements". All such substances are combined during processing with other elements and become constituents of either the compound-semiconductor materials, the semiconductor devices, or of the metal alloys that are used as contact materials.

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 of Printed Circuit Boards, August 26,1992). If any of our products are disposed of as part of a printed circuit board, the entire board assembly is treated as scrap metal. Approved printed circuit board recycling companies either have the proper facilities or have access to secondary metal smelters and refiners which can safely recycle scrap electronic components or assemblies.

Lead-free RoHS Compliance

Agilent's Semiconductor Products Group (SPG) has a full range of lead-free products compliant with the RoHS directive. Certain SPG product families are exempted from lead restrictions in the RoHS Directive - these products may contain compliant lead in accordance with the exemptions. SPG standard products do not contain any intentionally added RoHS substances above permitted maximum thresholds. ***Product families with no lead in the table of material composition are by definition both lead-free and compliant with RoHS lead restrictions.*** For product availability and compliance information, please contact Agilent distributors or Agilent Sales & Marketing via RoHS_Enquiry-SPG@agilent.com. For product technical information (termination finish, temperature profile, product substance content etc.) please contact: Pb-free_SPG@agilent.com

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