



# LC3 LC3B GaAs

## Product Environmental Data Sheet

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|                            |                            |  |     |        |     |        |         |       |
|----------------------------|----------------------------|--|-----|--------|-----|--------|---------|-------|
| <b>Product Information</b> | <b>Date/Time Revision:</b> | September 14, 2006                             |     |        |     |        |         |       |
|                            | <b>Manufacture site:</b>   | Chelmsford, MA                                 |     |        |     |        |         |       |
|                            | <b>Product Number</b>      | Generic: LC3B, Ceramic Air Cavity Microcircuit |     |        |     |        |         |       |
|                            | <b>Product Name</b>        | Surface Mount GaAs Semiconductor               |     |        |     |        |         |       |
|                            | <b>Product Mass</b>        | Grams:   | Min | 0.0188 | Max | 0.0230 | Nominal | 0.021 |
|                            | <b>Product Note</b>        |  |     |        |     |        |         |       |

### Material Composition Information

| Component | Sub- Part Name                            | Material                                       | Material Trade Name          | Material Mass (g)<br><i>Minimum</i>  | Material Mass (g)<br><i>Maximum</i>  | Percent of product (%)<br><i>Minimum</i>   | Percent of product (%)<br><i>Maximum</i>   |
|-----------|---|--|------------------------------|--------------------------------------|--------------------------------------|--|--|
| A         | Ceramic Package Body                      | HTCC Alumina (Al <sub>2</sub> O <sub>3</sub> ) | NTK BA-914                   | 0.008109                             | 0.012071                             | 43.2%                                      | 52.5%                                      |
| B         | Ceramic Lid                               | HTCC Alumina (Al <sub>2</sub> O <sub>3</sub> ) | Kyocera A476                 | 0.007547                             | 0.009914                             | 40.2%                                      | 43.1%                                      |
| C         | Epoxy, Die Attach                         | Conductive Epoxy                               | Ablebond 84-1LMI             | 0.000025                             | 0.000404                             | 0.1%                                       | 1.8%                                       |
| D         | Semiconductor, GaAs                       | Non-Metal, Non-Polymer                         | Crystalline Gallium Arsenide | 0.000042                             | 0.000889                             | 0.2%                                       | 3.9%                                       |
| E         | Bond Wire, Gold                           | Metal  | Wire                         | 0.000008                             | 0.000100                             | 0.0%                                       | 0.4%                                       |
| F         | Plating, Pad Finish                       | Gold over Nickel                               | Plating Coat                 | 0.001138                             | 0.001920                             | 6.1%                                       | 8.4%                                       |
| Substance | Sub-part Name and Substance               | Sub Part Substance CAS#                        | Substance Note               | Substance Mass (g)<br><i>Minimum</i> | Substance Mass (g)<br><i>Maximum</i> | Percent of Substance (%)<br><i>Minimum</i> | Percent of Substance (%)<br><i>Maximum</i> |
| <b>A</b>  | <b>Ceramic Package Body</b>               |  |                              |                                      |                                      |  |  |
| A1        | Alumina (Al <sub>2</sub> O <sub>3</sub> ) | 1344-28-1                                      |                              | 0.007379                             | 0.011105                             | 91.0%                                      | 92.0%                                      |
| A2        | Inorganic Binders                         | (Proprietary)                                  |                              | 0.000649                             | 0.001086                             | 8.0%                                       | 9.0%                                       |
| <b>B</b>  | <b>Ceramic Lid</b>                        |  |                              |                                      |                                      |  |  |
| B1        | Alumina (Al <sub>2</sub> O <sub>3</sub> ) | 1344-28-1                                      |                              | 0.007169                             | 0.009518                             | 95.0%                                      | 96.0%                                      |
| B2        | Epoxy, B-Stage                            | (Proprietary)                                  |                              | 0.000075                             | 0.000297                             | 1.0%                                       | 3.0%                                       |
| B3        | Inorganic Binders                         | (Proprietary)                                  |                              | 0.000302                             | 0.000496                             | 4.0%                                       | 5.0%                                       |
| <b>C</b>  | <b>Epoxy, Die Attach</b>                  |  |                              |                                      |                                      |  |  |
| C1        | Silver                                    | 7440-22-4                                      |                              | 0.000017                             | 0.000343                             | 70.0%                                      | 85.0%                                      |
| C2        | 1,4 Bis(2,3-epoxypropoxy)butane           | 2425-79-8                                      |                              | 0.000000                             | 0.000081                             | 1.0%                                       | 20.0%                                      |
| C3        | Diglycidylether of bisphenol-F            | 54208-63-8                                     |                              | 0.000000                             | 0.000081                             | 1.0%                                       | 20.0%                                      |
| C4        | Aromatic Amine                            | (Proprietary)                                  |                              | 0.000000                             | 0.000040                             | 1.0%                                       | 10.0%                                      |
| <b>D</b>  | <b>Semiconductor, GaAs</b>                |  |                              |                                      |                                      |  |  |
| D1        | Gallium (Ga)                              | 1303-00-0 / 7440-55-3                          |                              | 0.000019                             | 0.000444                             | 46.0%                                      | 50.0%                                      |
| D2        | Arsenic (As)                              | 1303-00-0 / 7440-38-2                          |                              | 0.000021                             | 0.000480                             | 50.0%                                      | 54.0%                                      |
| <b>E</b>  | <b>Bond Wire, Gold</b>                    |  |                              |                                      |                                      |  |  |
| E1        | Gold (Au)                                 | 7440-57-5                                      |                              | 0.000008                             | 0.000100                             | 99.99%                                     | 100.0%                                     |
| <b>F</b>  | <b>Plating, Pad Finish</b>                |  |                              |                                      |                                      |  |  |
| F1        | Tungsten (W)                              | 7440-33-7                                      |                              | 0.000888                             | 0.001637                             | 78.1%                                      | 85.3%                                      |
| F2        | Nickel (Ni)                               | 7440-02-0                                      |                              | 0.000064                             | 0.000116                             | 5.6%                                       | 6.1%                                       |
| F3        | Gold (Au)                                 | 7440-57-5                                      |                              | 0.000098                             | 0.000314                             | 8.7%                                       | 16.3%                                      |

**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 PROPRIETARY or TRADE SECRET will be documented

### Flammability

The ceramic used for this device is non-flammable.

### 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

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