

6.5 GHz WiFi 6E Coexistence BAW Filter

A10165

Description

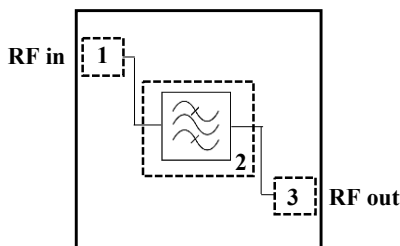
Akoustis’ A10165 is a high performance, ultra-wide bandwidth BAW RF Filter for use in WiFi 6E applications covering U-NII-5 thru U-NII-8 bands. A10165 utilizes Akoustis’ patented, XBAW technology which provides leading RF filter performance. This BAW RF filter provides low insertion loss and meets the stringent rejection requirements enabling coexistence with U-NII-1 thru 3. This device exhibits high-power handling capabilities necessary for demanding power requirements of the latest WiFi 6E standards. A10165 is a fully integrated, 50 ohm module using standard laminate packaging and is compatible with high volume, lead-free SMT soldering processes.

- Small form factor 3.5mm x 3.5mm x 1.73mm
- Single ended Tx/Rx ports.
- Ultra-wide passband covering 1180MHz
- High rejection enables coexistence with adjacent WiFi UNII bands
- High power rating, maximum +27dBm
- Low insertion loss band pass filter
- Performance over -40 C to +85C
- RoHS compliant, Pb-free package

Applications

- WiFi 6E tri band routers, integrated cable modem
- WiFi 6E tri band access points
- LTE/LAA small cells

Functional Block Diagram



| Pin # | Description |
|-------|-------------|
| 1 | RF Input |
| 2 | Ground |
| 3 | RF Output |

Ordering Information

| Part Number | Description |
|-------------|--------------------|
| A10165EVB | Evaluation board |
| A10165SP | (5) Loose pcs |
| A10165SR | (100) Short Reel |
| A10165TR1 | (1000) Tape & Reel |
| A10165TR2 | (2500) Tape & Reel |

Absolute Maximum Ratings

| Parameter | Rating |
|---------------------|---------------|
| Storage Temperature | -40 to 125 °C |
| Input Power | +29 dBm |

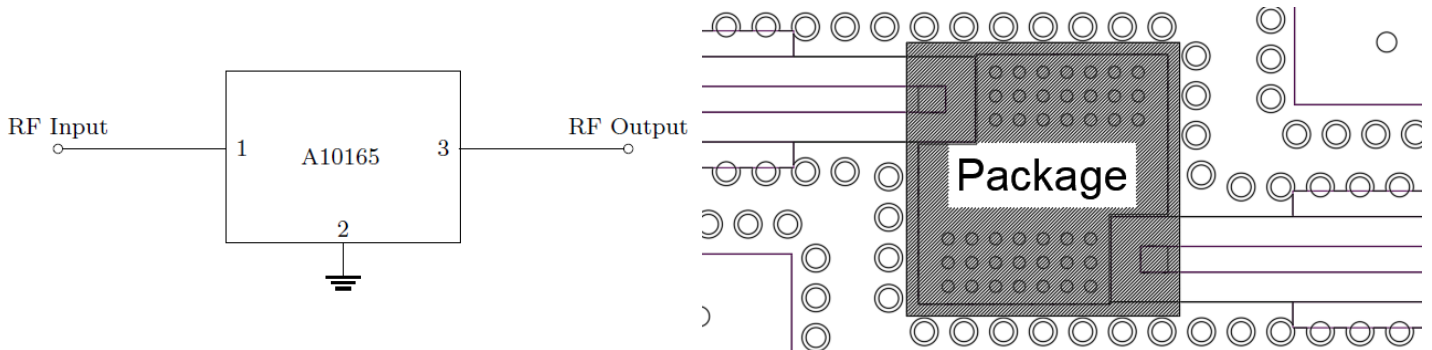
Nominal Operating Parameters (Simulations)

| Parameter | Units | Min. | Typ. | Max. |
|---|-------|------|--------------------|------|
| Center Frequency (Fc) | MHz | | 6535 | |
| Pass bandwidth | MHz | | 5945 - 7125 | |
| Insertion Loss | | | | |
| 5945 – 7125 MHz | dB | | 1.8 ⁽¹⁾ | 3.8 |
| Amplitude Variation | | | | |
| 5945 – 7125 MHz | dB | | 1.5 | 1.8 |
| Attenuation | | | | |
| 30 – 1000 MHz | dB | 44 | 45 | |
| 1000 - 3300 MHz | dB | 21 | 22 | |
| 3300 – 4000 MHz | dB | 13 | 14 | |
| 5170 – 5815 MHz | dB | 45 | 46 | |
| 5815 – 5835 MHz | dB | 33 | 40 | |
| 8500 - 12000 MHz | dB | 13 | 14 | |
| Return Loss | | | | |
| 5945 – 7125 MHz | | 10 | 15 ⁽¹⁾ | |
| Operating Temperature | C | -40 | | 85 |
| Load Impedance | Ohm | | 50 | |
| Power Handling: 802.11ax MCS10, 80 MHz BW, PAR 11dB | dBm | | | 27 |

Note:

1. S-parameter averaged over specified pass band frequency at room temperature

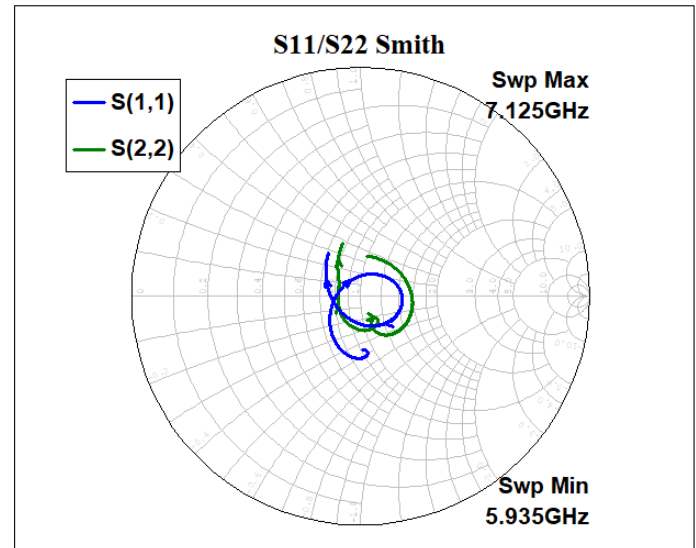
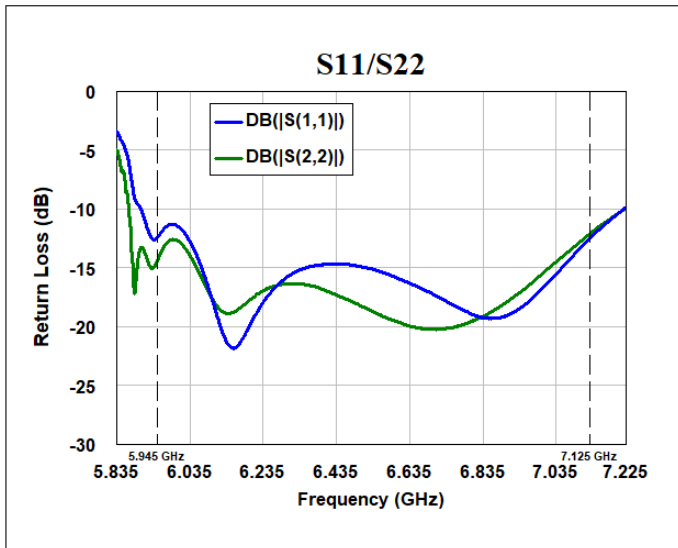
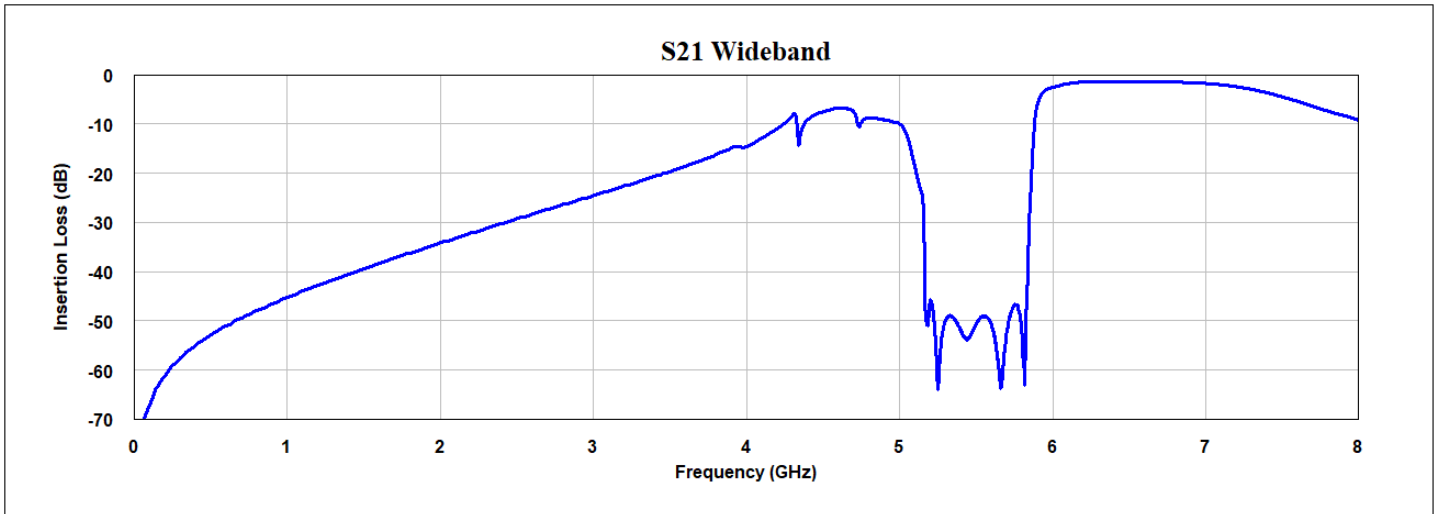
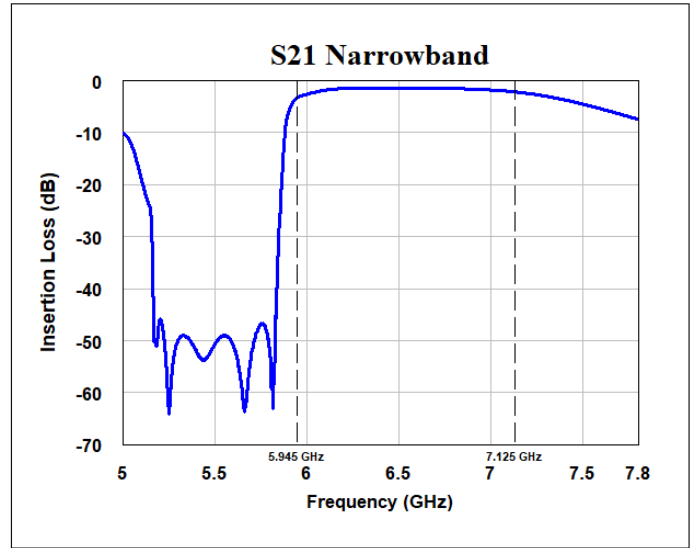
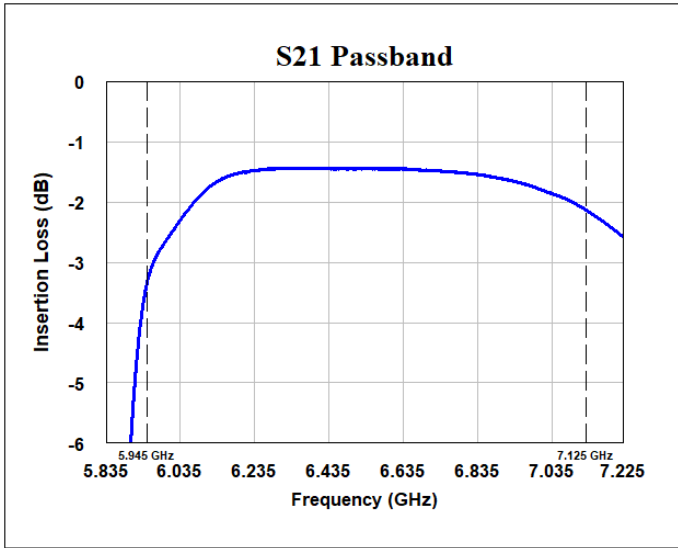
Schematic



Bill of Materials

| Reference Des. | Value | Description | Manufacturer | Part Number |
|----------------|-------|---------------------|--------------|-------------|
| PCB | N/A | 4 layer | Multiple | |
| U1 | N/A | 6.53 GHz BAW Filter | Akoustis | A10165 |

Performance Plots

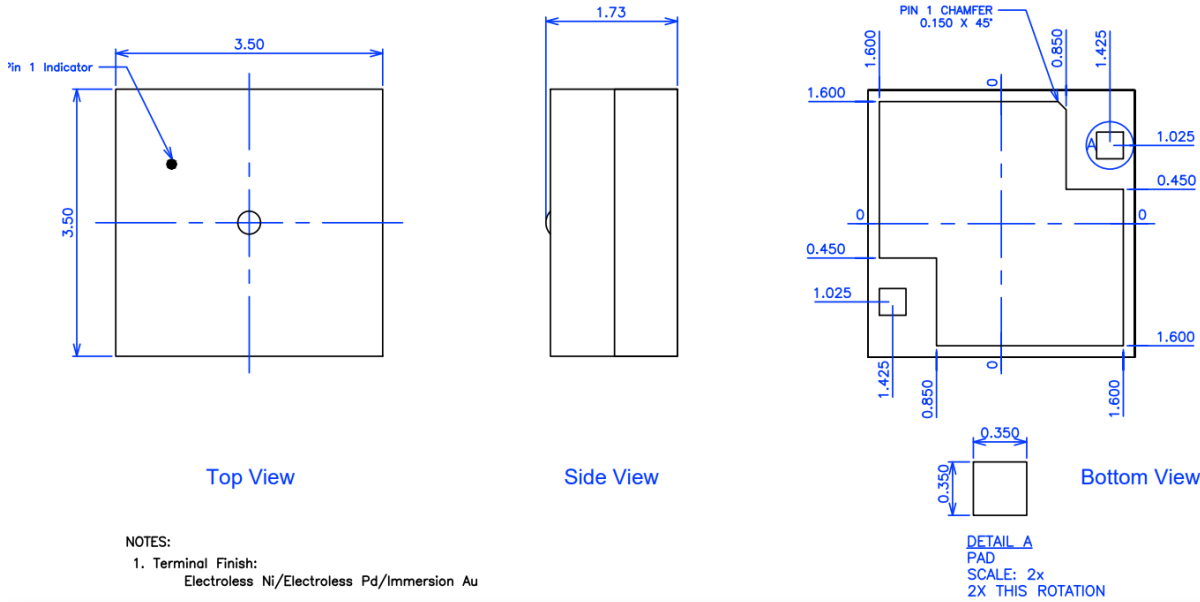


PRELIMINARY A10165

Package Drawing & Pin Description

Notes:

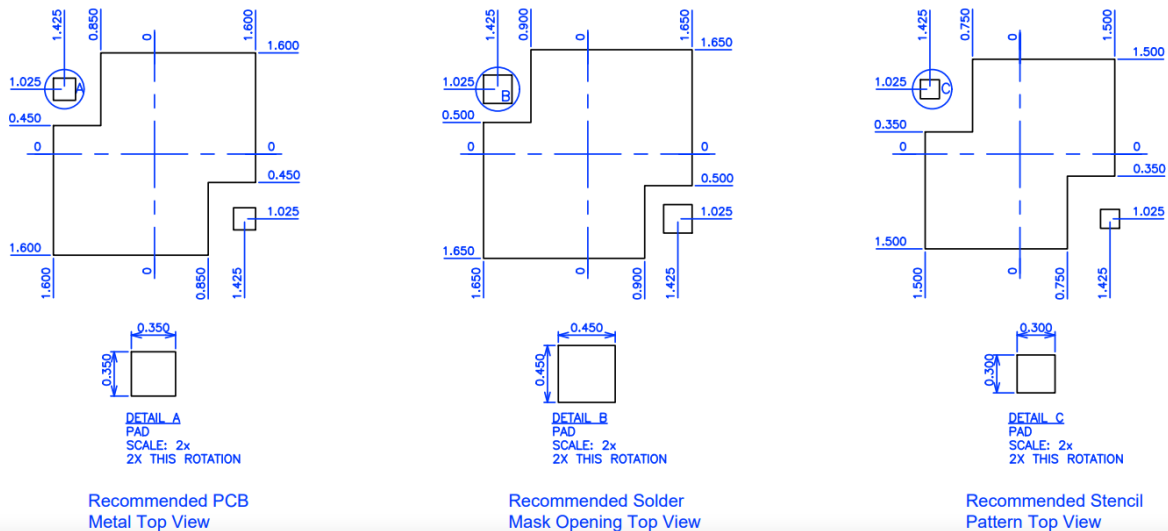
- All Units are in mm unless otherwise stated
- General Tolerance:
Linear X.XXX = $\pm 0.050\text{mm}$
X.XX = $\pm 0.10\text{mm}$



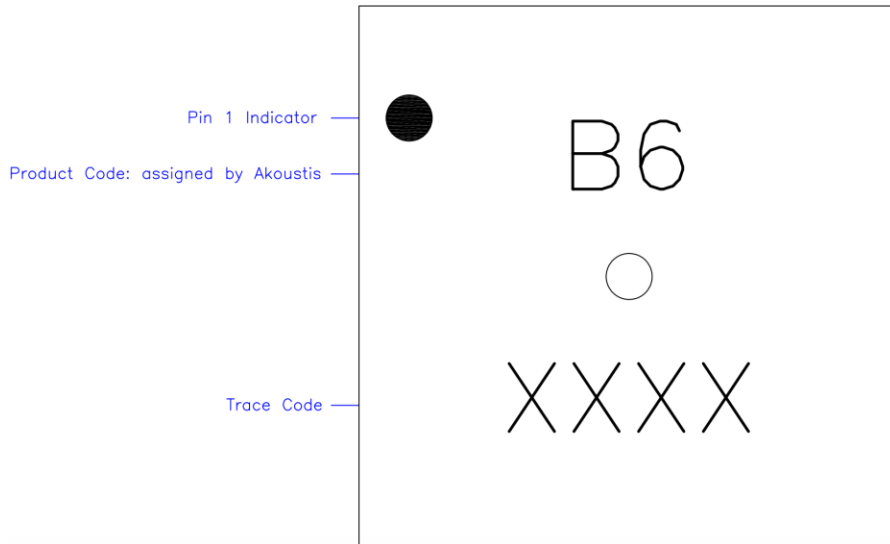
PCB Mounting Pattern

Notes:

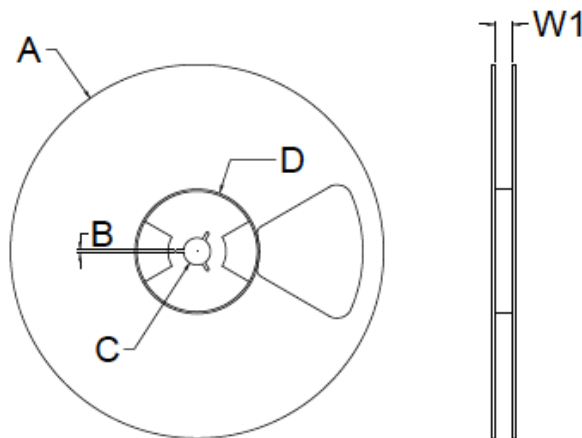
- All Units are in mm unless otherwise stated
- General Tolerance:
Linear X.XXX = $\pm 0.050\text{mm}$
X.XX = $\pm 0.10\text{mm}$



Typical Part Marking

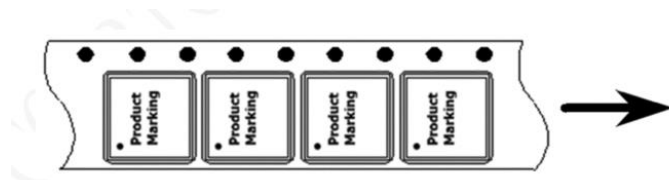
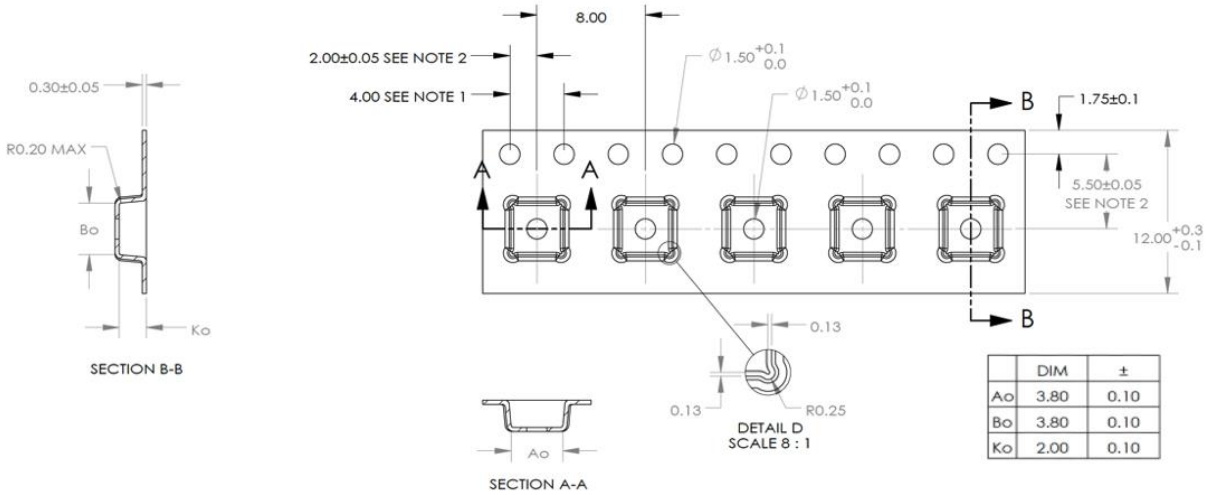


Reel Dimension For 12mm Tape Width



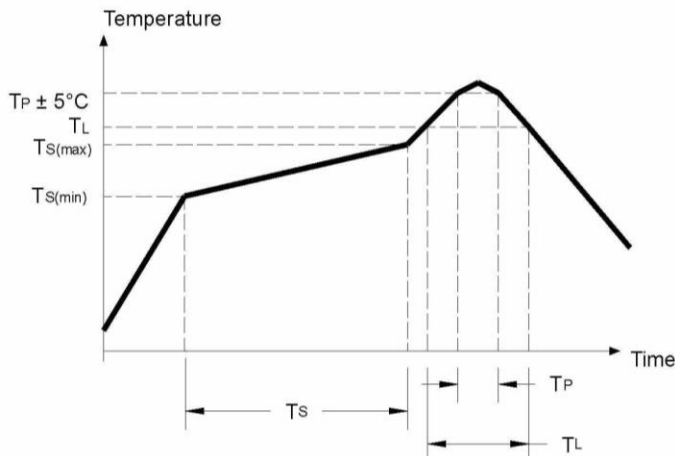
| Reel Dimensions | | | | | |
|-----------------|----------------|-----------|--------------------|---------|---------------------|
| Tape Width | A | B | C | D | W1 *measured at hub |
| 8 mm | 180 +0/-2.0 mm | 1.5mm Min | 13.0 + 0.5 / -0 mm | 60.0 mm | 8.40 + 1.5 / -0 mm |
| 12 mm | 180 +0/-2.0 mm | 1.5mm Min | 13.0 + 0.5 / -0 mm | 60.0 mm | 12.40 + 2.0 / -0 mm |
| 16 mm | 180 +0/-2.0 mm | 1.5mm Min | 13.0 + 0.5 / -0 mm | 60.0 mm | 16.40 + 2.0 / -0 mm |

Tape Dimension



Recommended Solder Profile

| Parameter | Eutectic Sn/Pb | Pb Free |
|--|-----------------|-----------------|
| Max Ramp Up Rate | 6 Deg C/Second | 6 Deg C/Second |
| Soak Temp Time $T_S(\text{min}) - T_S(\text{max})$ | 135 - 155 Deg C | 150-200 Deg C |
| Max Soak Time T_S | 2 minutes | 3 minutes |
| Liquidous Temp T_L | 183 Deg C | 220 Deg C |
| Max Time Above T_L | 150 Seconds | 150 Seconds |
| Max Peak Temperature T_P | 225 Deg C | 260 Deg C |
| Max Time at Peak T_P | 30 Seconds | 30 Seconds |
| Max Ramp Down Rate | 10 Deg C/Second | 10 Deg C/Second |



Product Compliance Information

ESD Sensitivity Ratings

Human Body Model (HBM) Test

Rating: TBD

Standard: ANSI/ESDA/JEDEC JS-001-2017

Charged Device Model (CDM)

Rating: TBD

Standard: ANSI/ESDA/JEDEC JS-002-2018

MSL Rating

TBD

RoHS

This part is compliant with 2011/65EU RoHS directive on the restrictions of the use of certain hazardous substances in electrical and electronics equipment as amended by Directive (EU) 2015/863

Contact Information

All contents specified in datasheet are subject to change. Please contact Akoustis for the latest on our products and company information.

Email: sales@akoustis.com

Website: www.akoustis.com

Telephone: +1 704.997.5735

Fax: +1 704.997.5734