Wideband 50 Ohm Termination, DC to 50 GHz

ENGFD00076

Typical Applications

- Military and Commercial SATCOM
- Electronic Warfare Circuits
- Receive or Transmit Circuits
- Telecom Infrastructure
- Test and Measurement Systems

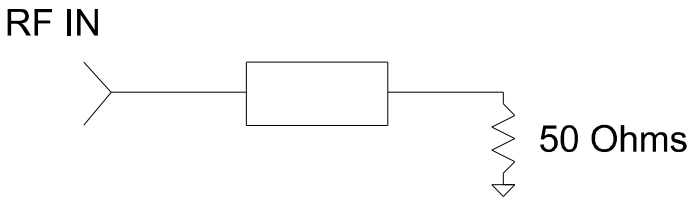
Features

- DC to 50 GHz band coverage
- Excellent return loss (20 dB typ.)
- High power handling (> 4 W)
- Wirebondable
- Size
  - 0.030 x 0.030 x 0.010 inch
  - 0.76 x 0.76 x 0.25 mm

Description

The ENGFD00076 is a wideband AlN 50 ohm termination across DC to 50 GHz. The design is 50 ohm matched and offers a typical 20 dB return loss to 50 GHz. The termination can handle an RF CW signal greater than 4 W. The termination has gold top and backside metallization and is designed to be silver epoxy or gold-tin solder attached. The RF interconnects are suitable for wire and ribbon bonding. No additional ground interconnects are required.

Functional Block Diagram



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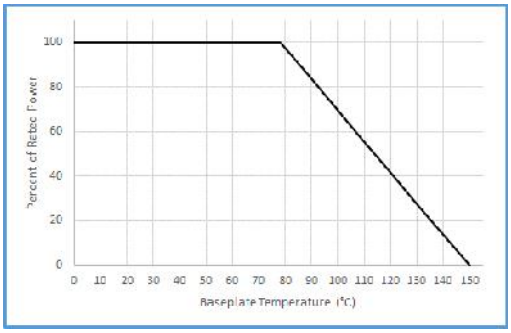
Electrical Specifications, T = 25 °C

Parameter	Min	Typ	Max	Units
Frequency Range		DC – 50.0		GHz
Return Loss(1)		20		dB
Resistance	47.5	50	52.5	Ohm
Temperature Coefficient of Resistance		±100		ppm / °C
Thermal Resistance(2)		18		°C / W
Rated Power(3)		4		W

Notes:

1. ***Return loss performance can vary based on wire bond lengths and bonding substrate***
2. ***Based on thermal measurements with high conductivity epoxy and eutectic solder attachment***
3. ***Apply power de-rating curve based on baseplate temperature***

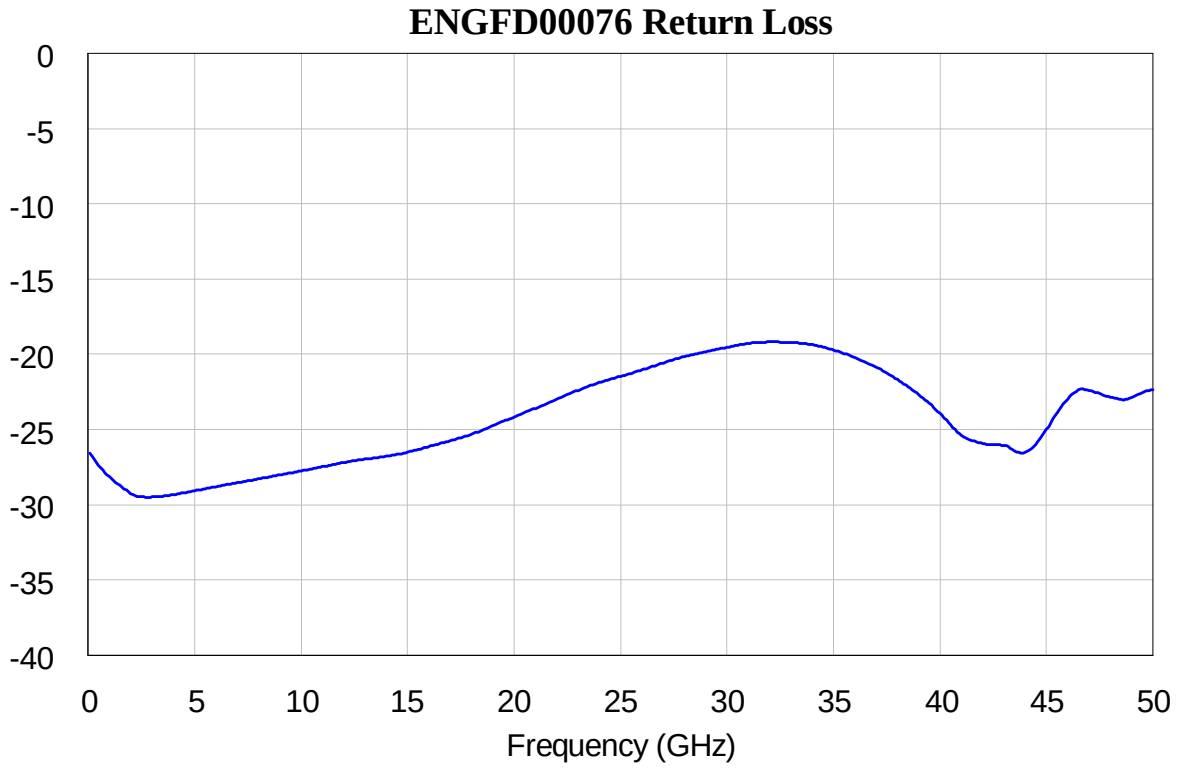


Absolute Maximum Ratings

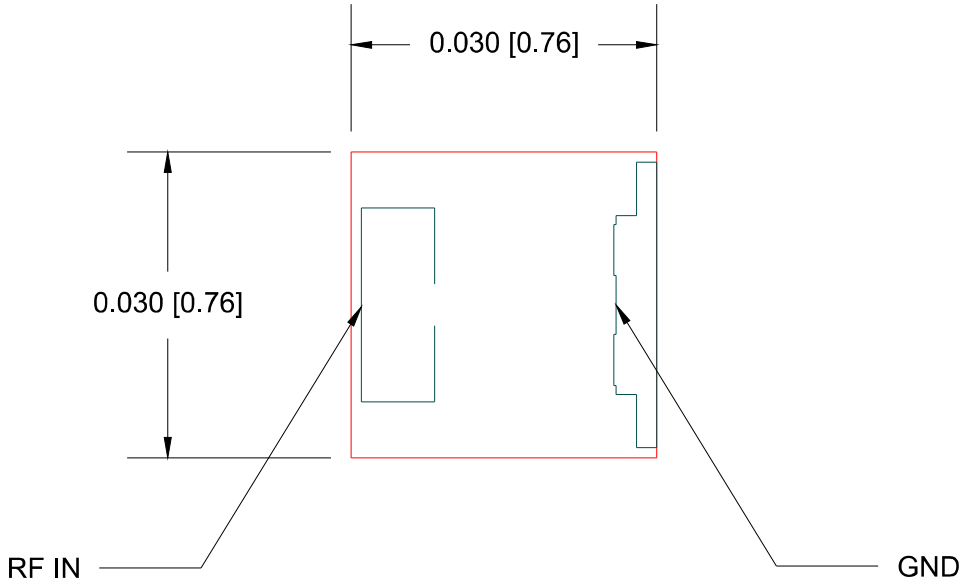
Parameter	Max level
RF and DC Input Power	6 W
Operating Temperature	-55 °C to +85 °C
Storage Temperature	-65 °C to +150 °C

Measured Return Loss (dB) with wirebonds and external microstrip flare pad

Room temperature



Outline Drawing



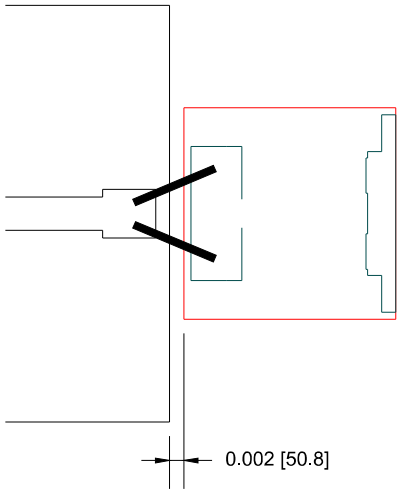
Notes:

1. ***Dimensions: Inches [mm]***
2. ***Substrate size tolerance: +/- 0.001" [0.025mm]***
3. ***Substrate thickness: 0.010" [0.254mm].***
4. ***RF IN bond pad size: 0.019" x 0.007" [0.483 mm x 0.178 mm]***
5. ***Backside metallization is gold.***
6. ***Bond pad metallization is gold.***

External Microstrip Flare Dimensions (on 5-mil Alumina) and Input RF Bond Wire Inductance for Optimum Return Loss Performance

S-parameters can be supplied at device level such that optimal flare dimensions can be made for the substrate connection medium used (if different from 5-mil Alumina).

RF Input - External Microstrip Flare on 5-mil Alumina						
Flare Length x-dim (mils)	Flare Width y-dim (mils)	Flare Length x-dim (um)	Flare Width y-dim (um)	Wire Inductance (nH)	Wire Length (mils)	Wire Length (um)
7.5	6.9	191	175	0.010	12	305



Notes:

1. ***Dimensions: Inches [µm]***
2. ***To achieve bond wire inductance noted, bond the number of wires shown from external flare to the associated RF bond pad as shown above.***
3. ***Gold Wire details:***
   a) ***Diameter: 1 mil (25.4 µm)***
   b) ***Spacing: 13 mils (~ 330 µm) typical at device RF bond pad***
   c) ***Wire loop height above device: 5 mils (~ 127 µm) typical (wedge bonds)***
   d) ***Wire length: 12 mils (~ 305 µm) typical***
4. ***Wire Length is total length if the wire were made perfectly straight.***

Packaging and Handling Guidelines

Device is susceptible to Electrostatic Discharge (ESD). Use appropriate precautions when handling.

Handling devices with tweezers or vacuum pencil is acceptable.

Devices are not moisture sensitive, but it is recommended to store devices in a dry box or equivalent prior to use.

Devices will be packaged in waffle pack configuration.

Assembly Guidelines

The backside metallization is RF/DC ground. Attachment should be accomplished with electrically and thermally conductive epoxy, or with gold-tin (AuSn) solder. This device supports high frequency performance.

Gold wire of 1 mil diameter (25.4 µm) is recommended for bonds. Gold ribbon can be used in place of wire for RF bonds. Care should be made to following the wire bond dimensions as shown in the flare diagram.

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