Wideband 50 Ω Termination
DC - 50 GHz

ENGFD00076
Rev. V1

Features

- Wideband Performance: DC - 50 GHz
- Excellent Return Loss: >20 dB
- RF Power Handling: >4 W
- Wire Bondable
- Die Size:
  0.76 x 0.76 x 0.25 mm
  0.030 x 0.030 x 0.010inch
- RoHS* Compliant

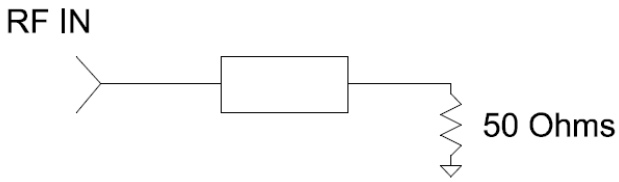
Applications

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

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



Ordering Information

Part Number	Package
ENGFD00076	Die

* Restrictions on Hazardous Substances, compliant to current RoHS EU directive.

Electrical Specifications: Freq. = DC - 50 GHz, T_A = +25°C

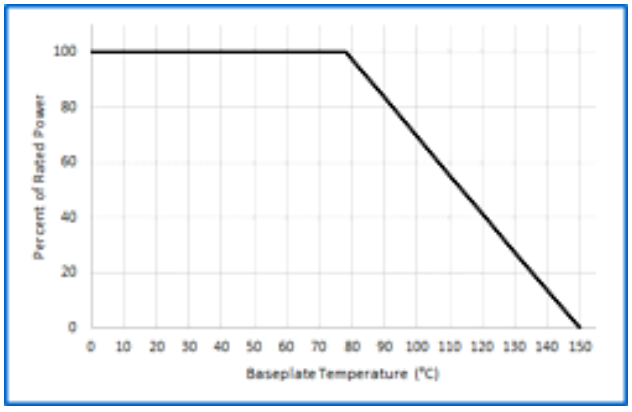
Parameter	Units	Min.	Typ.	Max.
Return Loss[1]	dB	—	18	—
Resistance	Ω	47.5	50.0	52.5
Temperature Coefficient of Resistance	ppm / °C	—	±100	—
Thermal Resistance[2]	°C/W	—	18	—
Power Handling[3]	W	—	4	—

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[4,5]

Parameter	Absolute Maximum
RF & DC Input Power	6 W
Operating Temperature	-55°C to +85°C
Storage Temperature	-65°C to +150°C

4. Exceeding any one or combination of these limits may cause permanent damage to this device.
5. MACOM does not recommend sustained operation near these survivability limits.



Handling Procedures

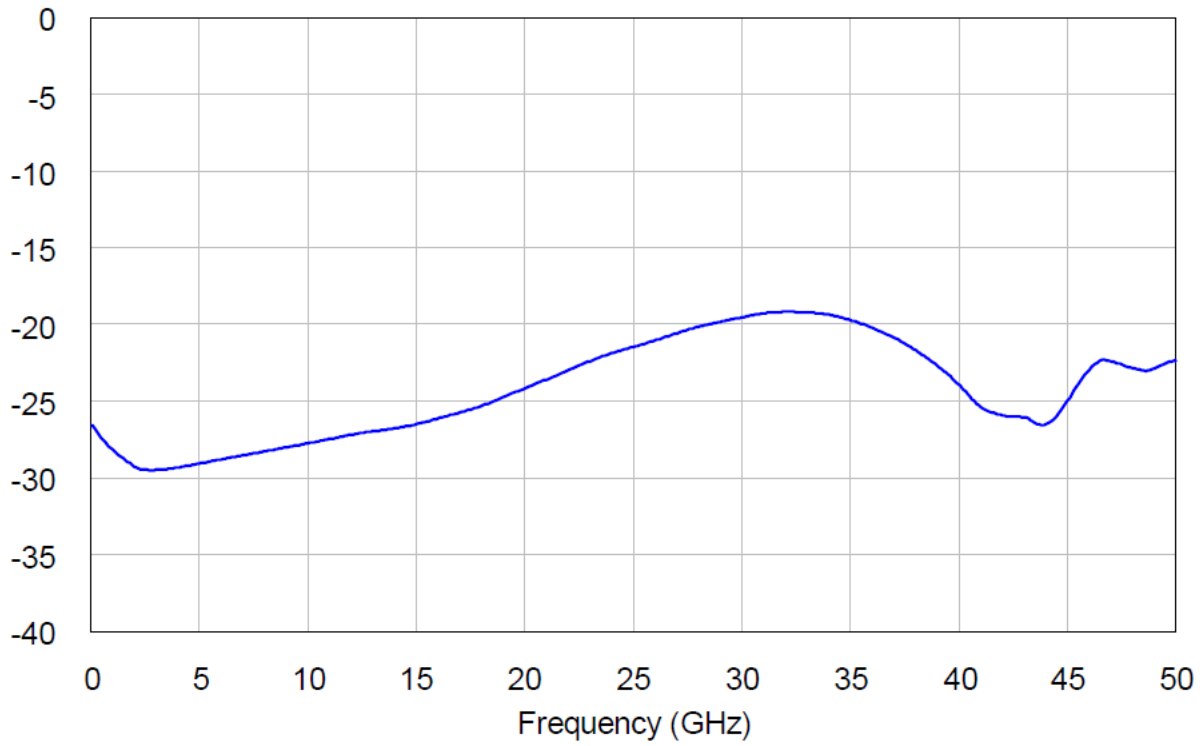
Please observe the following precautions to avoid damage:

Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

RF Data With Wirebonds and External Flare Pads

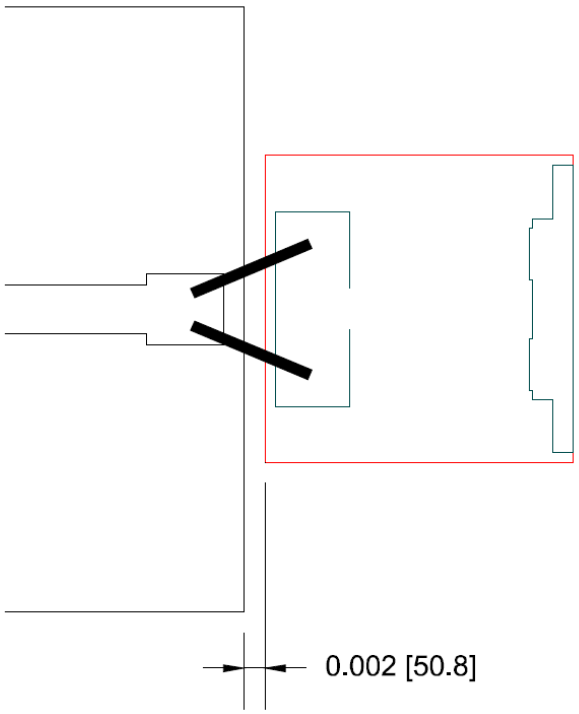
Return Loss



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

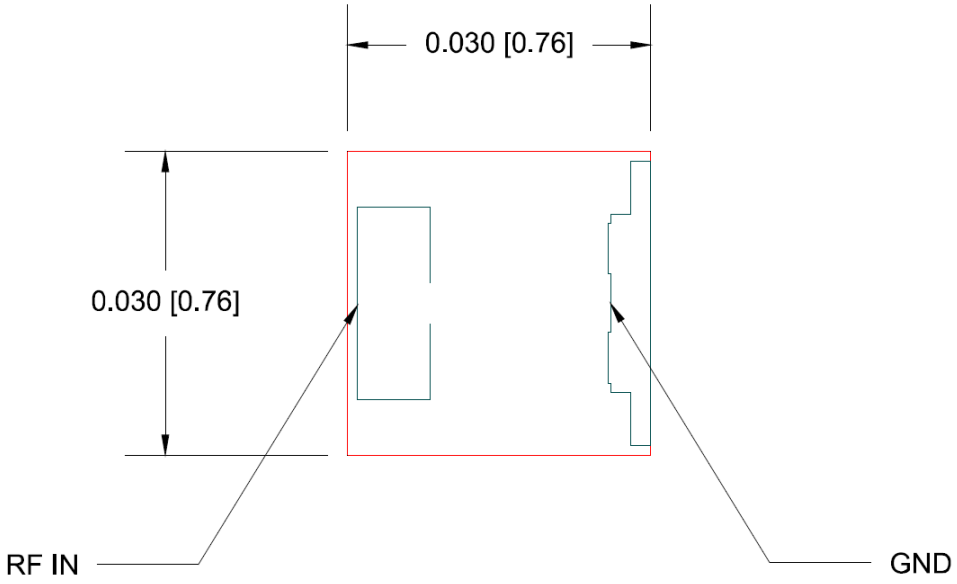
S-parameters can be supplied at DIE level such that optimal flare dimensions can be made for the substrate connection medium used (if different from 5-mil Alumina).

Flare Length (mils)	Flare Width (mils)	Flare Length (µm)	Flare Width (µm)	Wire Inductance (nH)	Wire Length (mils)	Wire Length (µm)
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.

Outline Drawing



Notes:
Dimensions: Inches [mm]
Substrate size tolerance: +/- 0.001” [0.025mm]
Substrate thickness: 0.010” [0.254mm].
RF IN bond pad size: 0.019” x 0.007” [0.483 mm x 0.178 mm]
Backside metallization is gold.
Bond pad metallization is gold.