

WIDEBAND FIXED ATTENUATOR FAMILY, DC - 25 GHz HMC656LP2E / HMC657LP2E / HMC658LP2E

Typical Applications

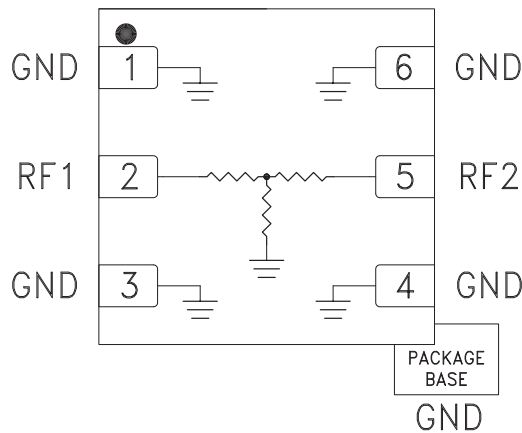
The HMC656LP2E - HMC658LP2E are ideal for:

- Fiber Optics
- Microwave Radio
- Military & Space
- Test & Measurement
- Scientific Instruments
- RF / Microwave Circuit Prototyping

Features

- 3 Attenuator Products:
10, 15, & 20 dB Fixed Attenuation Levels
- Wide Bandwidth: DC - 25 GHz
- Excellent Attenuation Accuracy
- Power Handling: +25 dBm
- 6 Lead 2x2mm SMT Package: 4mm²

Functional Diagrams



General Description

The HMC656LP2E / 657LP2E / 658LP2E are a line of wideband fixed value SMT 50 Ohm matched attenuators which offer relative attenuation levels of 10, 15 and 20 dB respectively. These passive attenuators are ideal for military, test equipment, and other wideband applications where extremely flat attenuation, and excellent VSWR vs. frequency are required.

These wideband attenuators handle up to +25 dBm of input power, and are compatible with high volume surface mount manufacturing techniques.

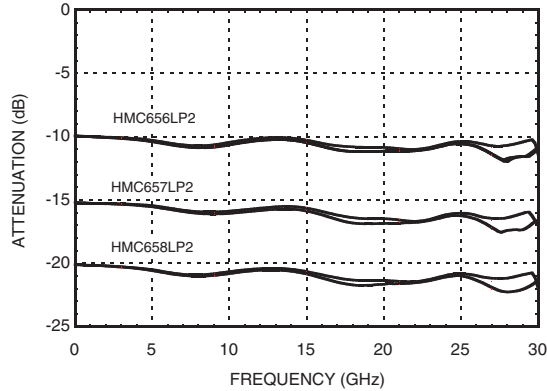
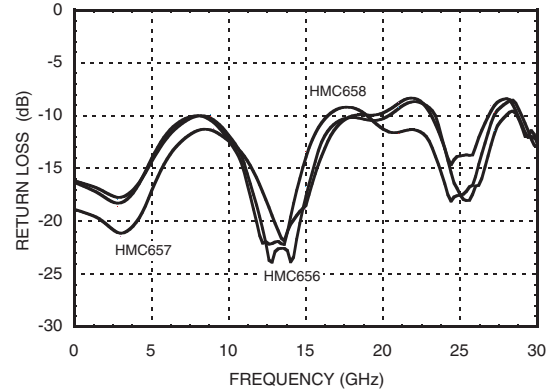
Electrical Specifications, $T_A = +25^\circ\text{C}$, 50 Ohm system

| Part Number | Attenuator Value | Return Loss (Min.) | Return Loss (Typ.) | Attenuation Tolerance [1] | Temperature Coefficient (Typical) [2] | Units |
|-------------|------------------|--------------------|--------------------|---------------------------|---------------------------------------|---------|
| | | | | | | DC - 25 |
| HMC656LP2E | 10 | 7 | 12 | ± 1.5 | 0.0004 | dB |
| HMC657LP2E | 15 | 7 | 14 | ± 2.0 | 0.0006 | dB |
| HMC658LP2E | 20 | 7 | 12 | ± 2.0 | 0.0004 | dB |

[1] Attenuation Tolerance is valid over temperature.

[2] Temperature Coefficient Units are dB/°C.

WIDEBAND FIXED ATTENUATOR FAMILY, DC - 25 GHz HMC656LP2E / HMC657LP2E / HMC658LP2E

Attenuation vs. Temperature

Return Loss

Absolute Maximum Ratings

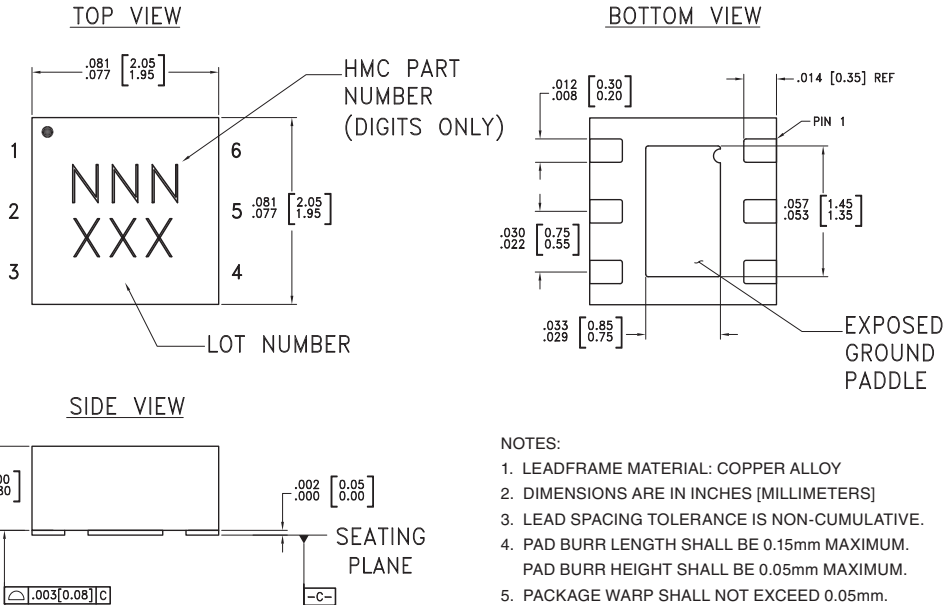
| Part Number | HMC656LP2E | HMC657LP2E | HMC658LP2E | Units |
|-----------------------|-------------|------------|------------|-------|
| RF Input Power (CW) | 25 | 25 | 25 | dBm |
| DC Voltage Terminated | 4.9 | 4.4 | 4.8 | V |
| DC Voltage Open | 5.3 | 4.6 | 4.9 | V |
| Storage Temperature | -65 to +150 | | | °C |
| Operating Temperature | -40 to +85 | | | °C |
| ESD Sensitivity (HBM) | Class 1B | Class 1B | Class 1B | |



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

**WIDEBAND FIXED ATTENUATOR FAMILY, DC - 25 GHz
HMC656LP2E / HMC657LP2E / HMC658LP2E**

Outline Drawing



- NOTES:
1. LEADFRAME MATERIAL: COPPER ALLOY
 2. DIMENSIONS ARE IN INCHES [MILLIMETERS]
 3. LEAD SPACING TOLERANCE IS NON-CUMULATIVE.
 4. PAD BURR LENGTH SHALL BE 0.15mm MAXIMUM. PAD BURR HEIGHT SHALL BE 0.05mm MAXIMUM.
 5. PACKAGE WARP SHALL NOT EXCEED 0.05mm.
 6. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.
 7. REFER TO HITTITE APPLICATION NOTE FOR SUGGESTED LAND PATTERN.

Package Information

| Part Number | Package Body Material | Lead Finish | MSL Rating | Package Marking ^[3] |
|-------------------------------|--|---------------|---------------------|--------------------------------|
| HMC656LP2 through HMC658LP2 | Low Stress Injection Molded Plastic | Sn/Pb Solder | MSL1 ^[1] | NNN XXX |
| HMC656LP2E through HMC658LP2E | RoHS-compliant Low Stress Injection Molded Plastic | 100% matte Sn | MSL1 ^[2] | NNN XXX |

[1] Max peak reflow temperature of 235 °C
 [2] Max peak reflow temperature of 260 °C
 [3] 3-Digit lot number XXX

Pin Descriptions

| Pin Number | Function | Description | Interface Schematic |
|------------|----------|--|---------------------|
| 1, 3, 4, 6 | GND | Package bottom must be connected to RF/DC ground. | |
| 2, 5 | RF1, RF2 | This pin is DC coupled and matched to 50 Ohms. Use DC Blocking capacitors if the input / output signals have non-zero DC potential | |

Information furnished by Analog Devices is believed to be accurate and reliable. However, no responsibility is assumed by Analog Devices for its use, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of Analog Devices. Trademarks and registered trademarks are the property of their respective owners.

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106 Phone: 781-329-4700 • Order online at www.analog.com Application Support: Phone: 1-800-ANALOG-D