

v02.0913

ROHS V

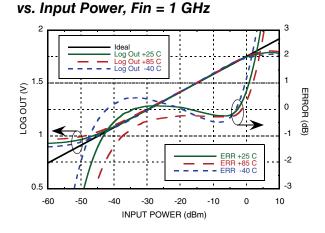
Electrical Specifications, (continued)

Parameter	Conditions	Min.	Тур.	Max.	Units
LOGOUT Interface					
Output Voltage Range		0.9		1.8	V
Output Rise Time ^[1] / Fall Time ^[2]	f = 10 GHz		5/7		ns
Power Supply (Vcc)					
Operating Voltage Range		3.15	3.3	3.45	V
Supply Current in Normal Mode			91		mA

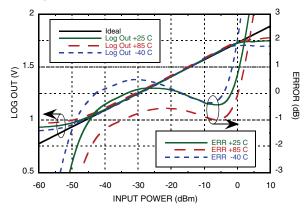
[1] 0 dBm Input Pulsed; measured from 10% to 90%

[2] 0 dBm Input Pulsed; measured from 90% to 10%

LOG OUT & Error



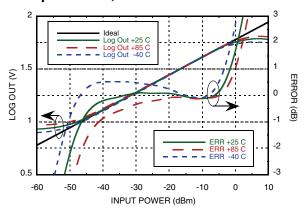
LOG OUT & Error vs. Input Power, Fin = 10 GHz



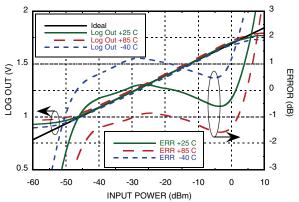
Unless otherwise noted: Vcc = +3.3V, T_A = +25 °C

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LOG OUT & Error vs. Input Power, Fin = 5 GHz







HMC948LP3E

54 dB, LOGARITHMIC DETECTOR, 1 - 23 GHz

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54 dB, LOGARITHMIC DETECTOR, 1 - 23 GHz

ERR +25 C

ERR ERR

-20

-85 -40

-10

0

error o

(dB)

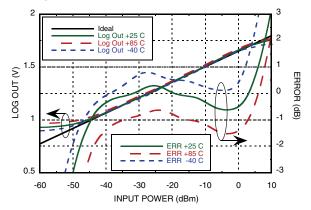
-2

-3

10

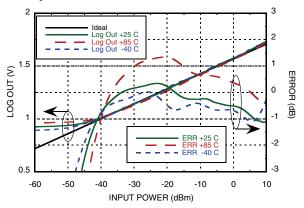


LOG OUT & Error vs. Input Power, Fin = 18 GHz



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LOG OUT & Error vs. Input Power, Fin = 23 GHz



LOG OUT vs. Frequency

-40

-30

INPUT POWER (dBm)

LOG OUT & Error

1.5

0.5

-60

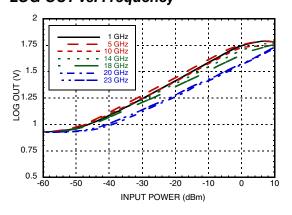
-50

LOG OUT (V)

vs. Input Power, Fin = 20 GHz

Ideal

Log Out +25 C Log Out +85 C Log Out -40 C



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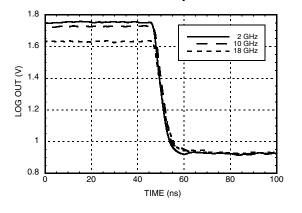
54 dB, LOGARITHMIC

DETECTOR, 1 - 23 GHz

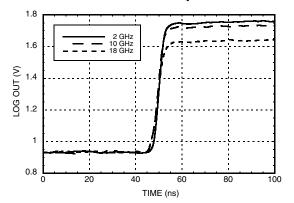
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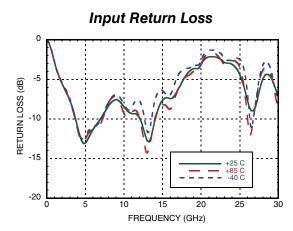


Fall Time for Various Frequencies @ 0 dBm



Rise Time for Various Frequencies @ 0 dBm





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Absolute Maximum Ratings

	5
Vcc	+3.6V
RF Input Power	+15 dBm
Junction Temperature	125 °C
Continuous Pdiss (T = 85°C) (Derate 11.62 mW/°C above 85°C)	0.46W
Thermal Resistance (R _{th}) (junction to ground paddle)	86.09 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A

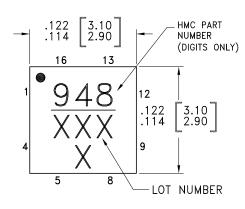


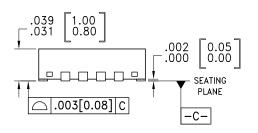
ELECTROSTATIC SENSITIVE DEVICE OBSERVE HANDLING PRECAUTIONS

HMC948LP3E

54 dB, LOGARITHMIC DETECTOR, 1 - 23 GHz

Outline Drawing





BOTTOM VIEW -.016 [0.40] REF PIN 16 0.30 0.18 .012 .008 [0.20] MIN PIN 1 0.56 0.44 022 .061 1.56 1.44 .017 EXPOSED .077 .059 1.95 1.50 GROUND PADDLE SQUARE

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 HMC APPLICATION NOTE FOR SUGGESTED PCB LAND PATTERN.

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking ^[1]
HMC948LP3E	HMC948LP3E RoHS-compliant Low Stress Injection Molded Plastic		MSL1 ^[2]	<u>948</u> XXX

[1] 4-Digit lot number XXXX

[2] Max peak reflow temperature of 260 °C

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Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 4, 5, 8, 9, 10, 12	N/C	No connection necessary. These pins may be connected to RF/DC ground without affecting performance.	
2	RFIN	RF input pin.	RFIN ESD
3, 6, 7	GND	These pins and the exposed package bottom must be connected to a high quality RF/DC ground.	
11	LOG OUT	Log out load should be at least 1K Ohm or higher.	↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
13 - 16	Vcc	Bias Supply. Connect supply voltage to these pins with appropriate filtering. To ensure proper start-up supply rise time should be faster than 100usec	Vcc ESD =

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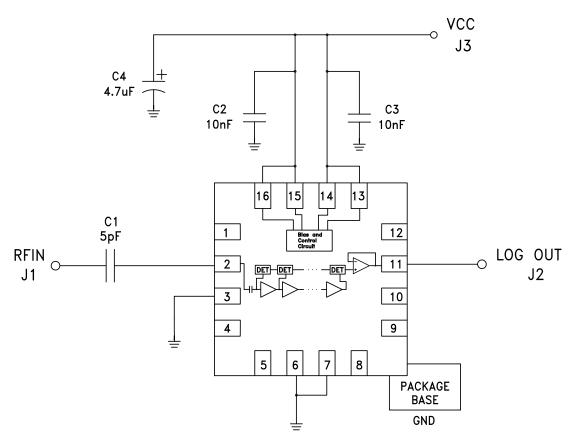


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Application & Evaluation PCB Schematic



Note: Log output load should be 1K Ohm or higher.

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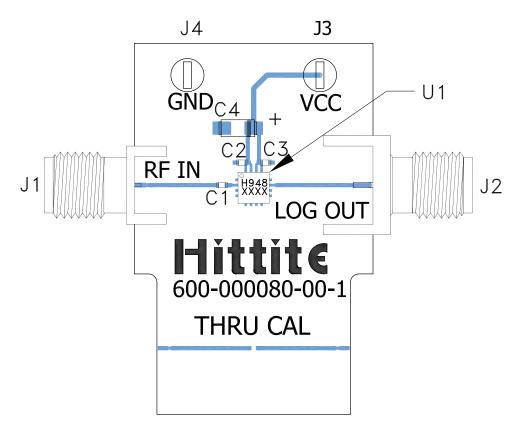
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Evaluation PCB



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List of Materials for Evaluation PCB 132032 [1]

Item	Description
J1	K-Type Connector
J2	SMA Connector
J3, J4	DC Pin
C1	5 pF Capacitor, 0402 Pkg.
C2, C3	10 nF Capacitor, 0402 Pkg.
C4	4.7 µF Tantalum Capacitor, CASE A Pkg.
U1	HMC948LP3E Log Detector
PCB ^[2]	600-00008-00 Evaluation PCB

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350 or Arlon 25 FR

The circuit board used in the application should use RF circuit design techniques. Signal lines should have 50 ohm impedance while the pckage ground leads and exposed paddle should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation circuit board shown is available from Hittite upon request. POWER DETECTORS - SMT