

Product Features

Conversion Loss: 7.1dB@5.2GHz
 LO/RF Isolation: 42.5dB@5.2GHz
 LO/IF Isolation: 30dB@5.2GHz
 Input Third-Order Interception:
 17.8dBm@5.2GHz
 Package: eMSOP8

Application

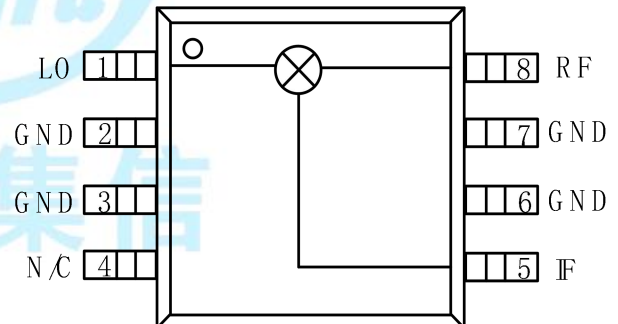
Base Station
 Repeaters and Access Points
 WiMAX, WiBN, Wireless
 Public Land Mobile Wireless Communication
 Public Safety and Telematics

Ordering Information

Part Number	Package	Description
BR9132EA	eMSOP8	3GHz ~ 8GHz Double-Balanced Mixer

General Description

The BR9132EA is a miniaturized MMIC double-balanced mixer manufactured using GaAs process composed of planar spiral balun and Schottky diodes. Covering the frequency range of 3GHz ~ 8GHz, the mixer mainly completes the conversion from RF to IF frequency, which can be used as an upconverter, downconverter, biphase modulator/demodulator or phase comparator. The chip has the advantage of high stability, low conversion loss, high isolation and wide IF bandwidth.

Functional Block Diagram


Electrical Specifications (Down Conversion Applications, PLO=+13dBm, IF=100MHz, TA=+25 °C)

Parameters	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
RF Frequency Range	3~4.5			4.5~6			6~8			GHz
LO Frequency Range	3~4.5			4.5~6			6~8			GHz
IF Frequency Range	DC-3			DC-3			DC-3			GHz
Conversion Loss	6.5	7.5	8.4	6.4	7.1	8.0	7.6	8.1	10.6	dB
IIP3	13.0	16.6	17.9	16.6	17.8	20.1	-	-	-	dBm
IIP2	42.3	46.4	51.9	49.3	53.4	57.1	-	-	-	dBm
IP1dB	10.0	10.6	11.9	10.7	11.3	12.5	11.4	12.5	13.9	dBm
LO to RF Isolation	38.3	38.3	44.0	40.7	42.5	48.0	29.4	36.2	47.2	dB
LO to IF Isolation	29.6	31.1	32.7	35.6	36.4	40.9	37.6	47.7	60.3	dB

Note: Unless otherwise stated, all test conditions are down conversion at high LO drive, PRF=-10dBm.

Absolute Maximum Ratings

Maximum RF input Power: +13dBm

Maximum LO Pin (dBm): +27dBm

Recommended Operating Conditions

Operating Temperature: -55°C ~ +125°C

Storage Temperature: -65°C ~ +150°C

Note: Operation of the device outside the parameter ranges given absolute-maximum-ratings conditions may cause permanent damage, and. exposure to absolute-maximum-ratings conditions for extended periods will affect the reliability.

ESD WARNING

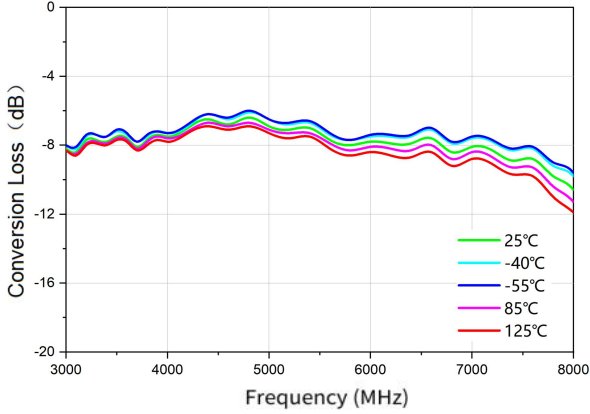

ELECTROSTATIC SENSITIVE DEVICE

OBSERVE HANDLING PRECAUTIONS

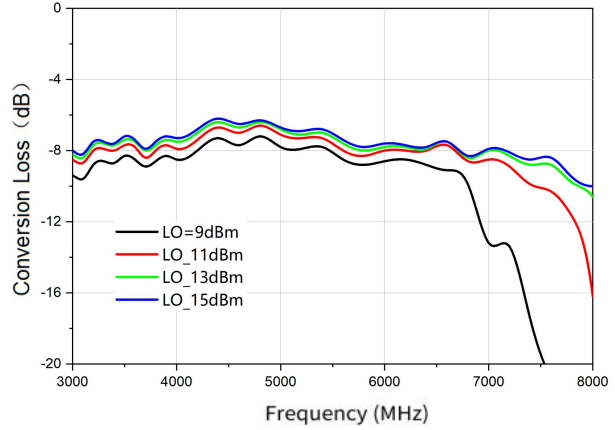
ESD Rating: Class 2

Typical Performance (Demonstration board test results, downconversion)

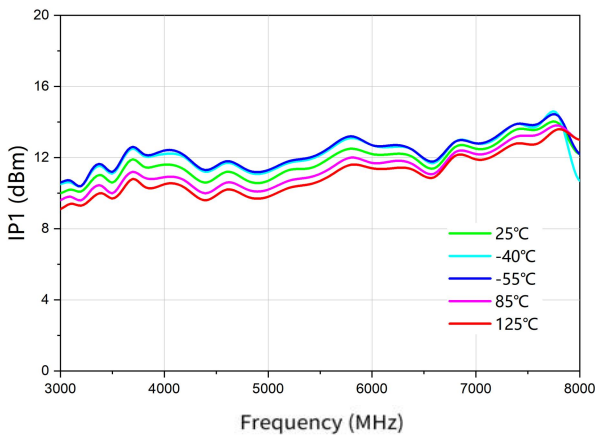
High LO, IF=100MHz, PRF=-10dBm



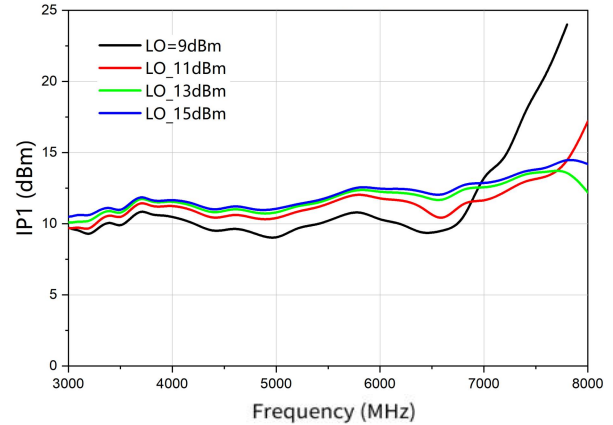
Conversion Loss @ PLO=13dBm



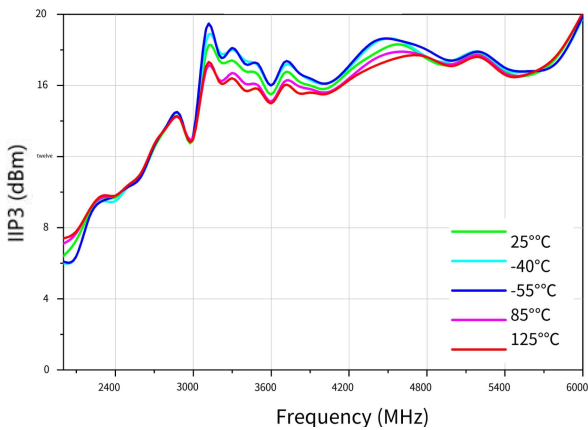
Conversion Loss vs LO Drive



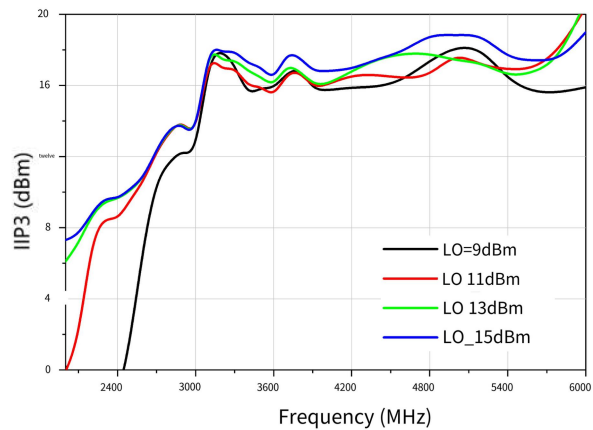
IP1dB@ PLO=13dBm



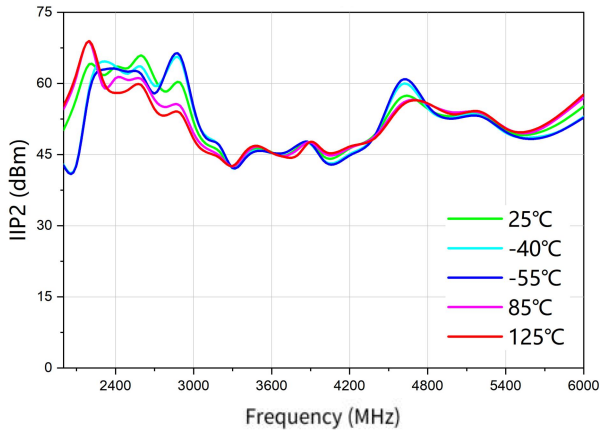
IP1dB vs LO Drive



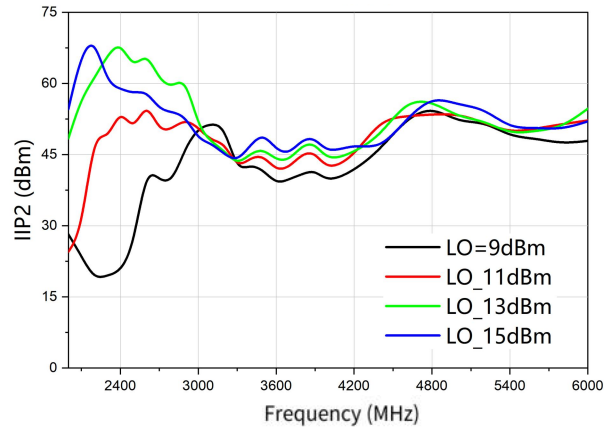
IIP3@ PLO=13dBm



IIP3 vs LO Drive

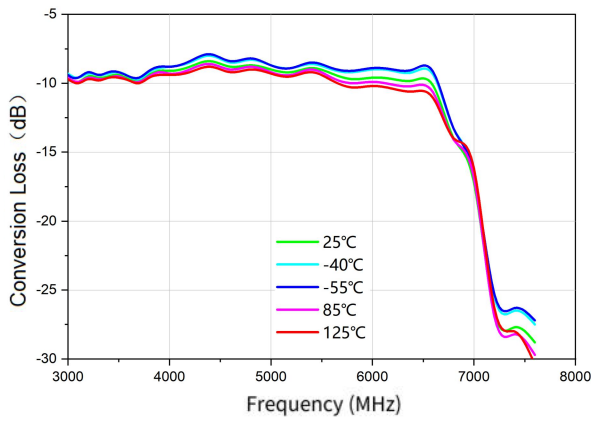


IIP2 @ PLO=13dBm

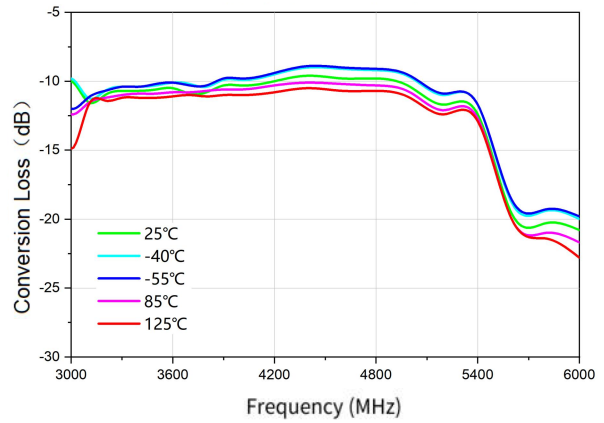


IIP2 vs LO Drive

High LO, RF=-10dBm, LO=13dBm

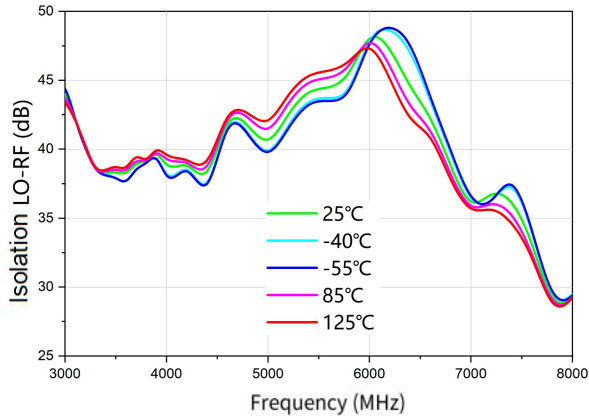


Conversion Loss @ IF=1.5GHz

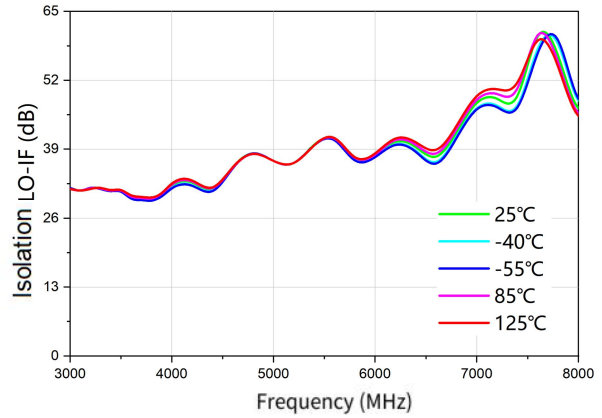


Conversion Loss @ IF=3GHz

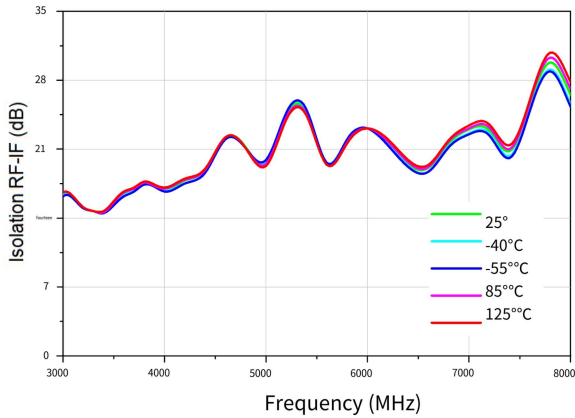
Isolation and Return Loss, LO=13dBm



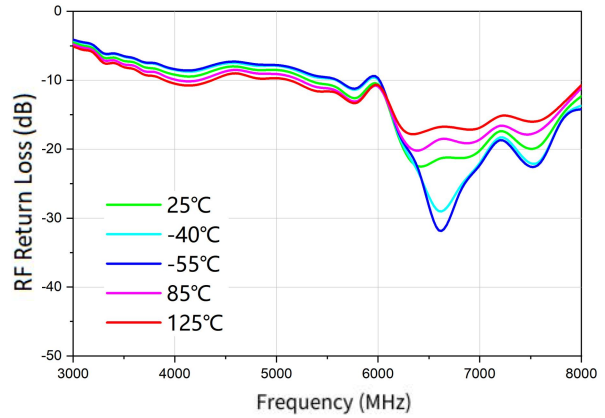
Isolation LO-RF



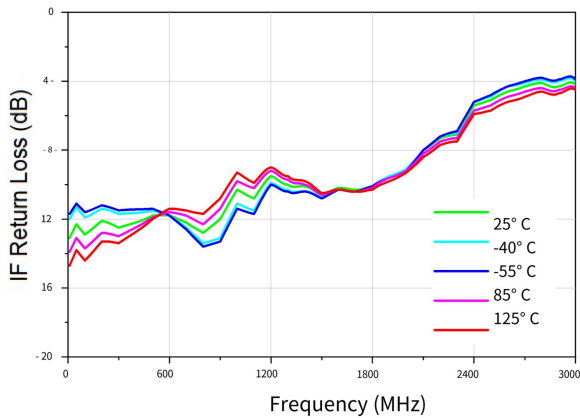
Isolation LO-IF



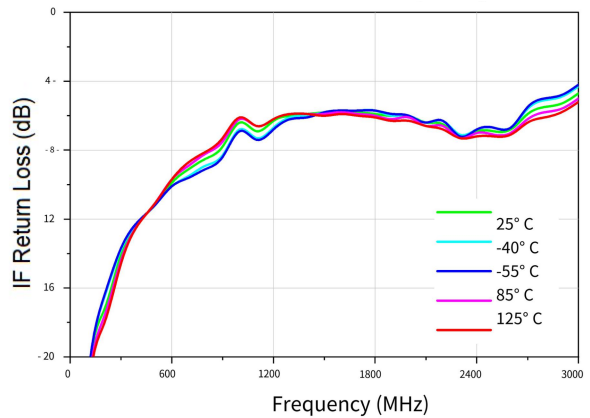
Isolation RF-IF



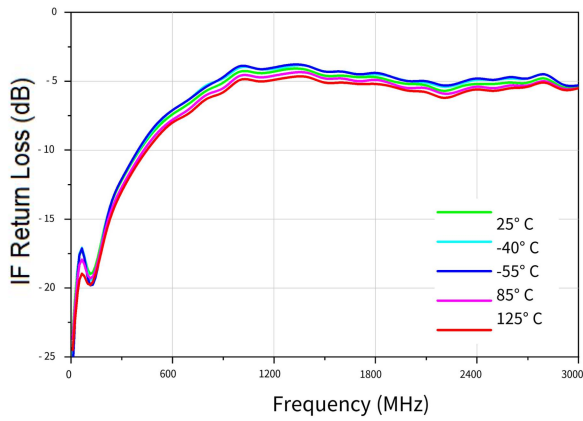
RF Return Loss



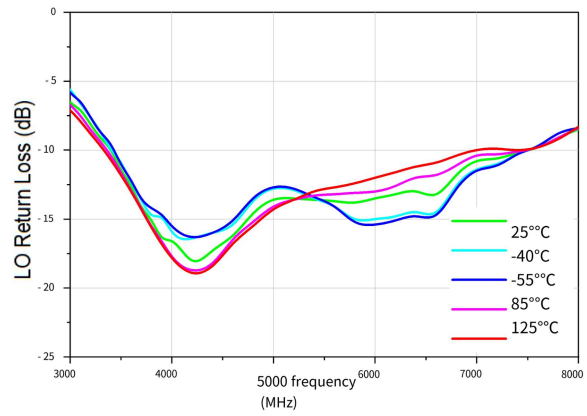
IF Return Loss @LO=3.5GHz



IF Return Loss @ LO=5GHz

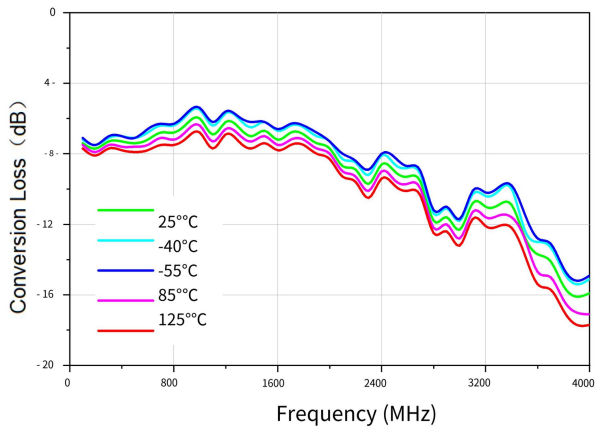


IF Return Loss@ LO=7.5GHz

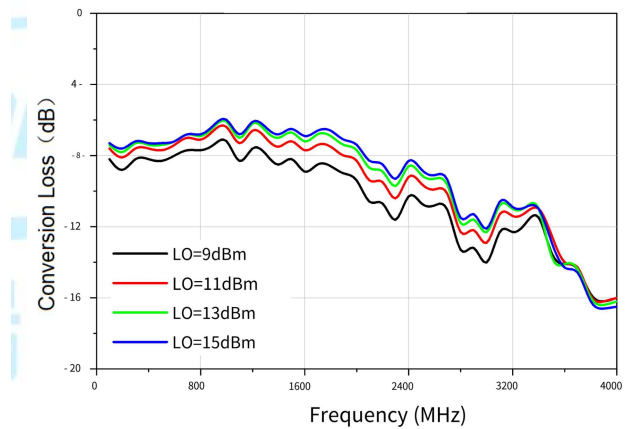


LO Return Loss

IF Bandwidth , PRF=-10dBm, LO=3.5GHz

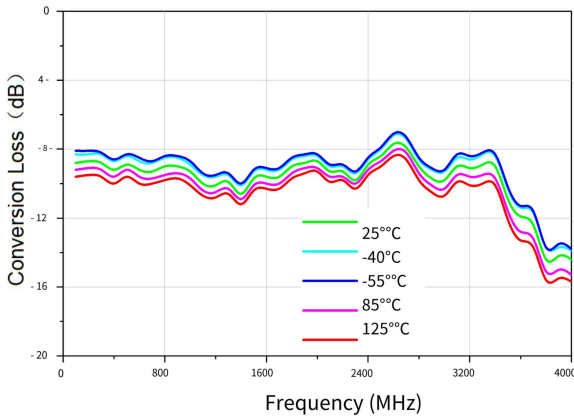


Conversion Loss @PLO=13dBm

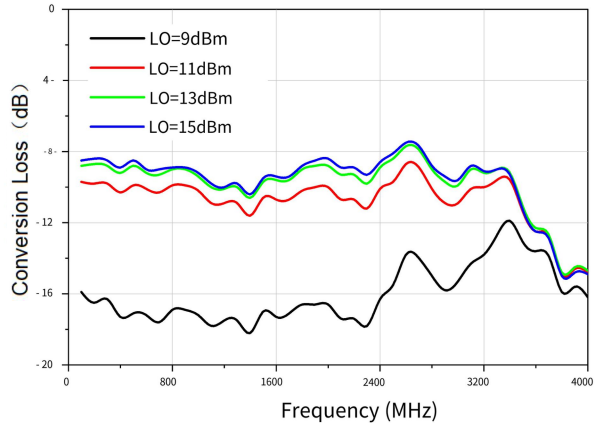


Conversion Loss vs LO Drive

IF Bandwidth, PRF=-10dBm, LO=7.5GHz



Conversion Loss @PLO=13dBm



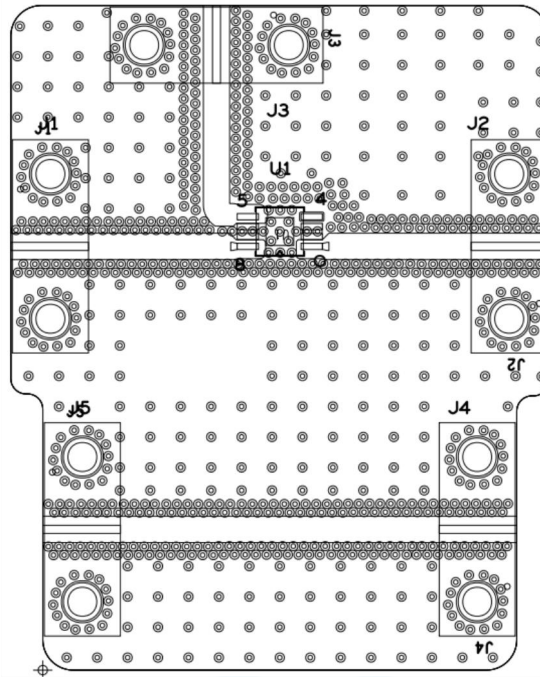
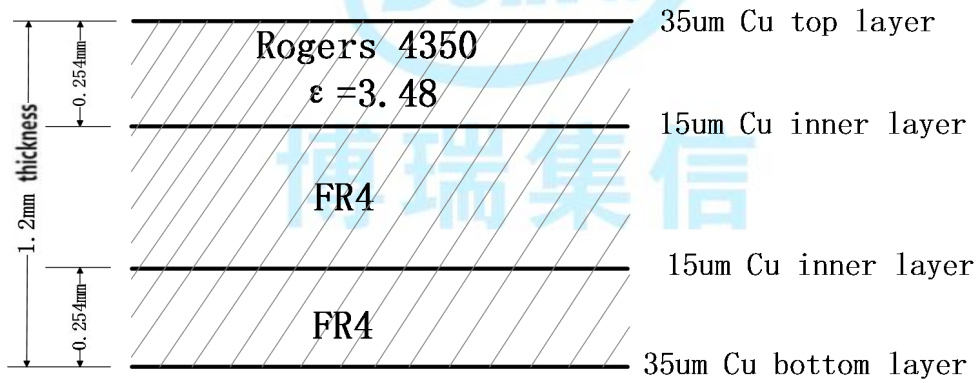
Conversion Loss vs LO Drive

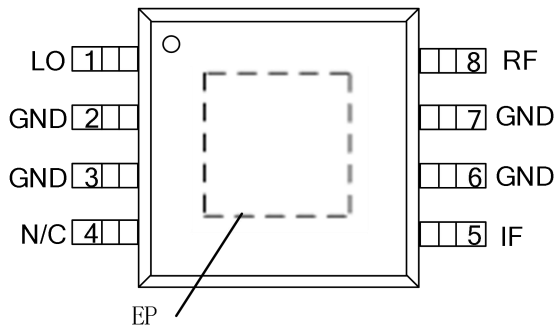
M*N Spurious Outputs (IF=100MHz)

Spurious Suppression (dBc)		nRF					
		0	1	2	3	4	5
mLO	0	-	6.4	40.8	26.4	34.8	33.4
	1	16.8	-	36.8	70.7	58.7	53.2
	2	73.3	70.8	69.0	79.1	95.0	83.4
	3	96.5	108.1	94.9	80.8	90.7	110.7
	4	98.1	107.9	109.3	112.9	111.7	110.9
	5	96.4	102.6	107.0	111.0	112.4	104.3

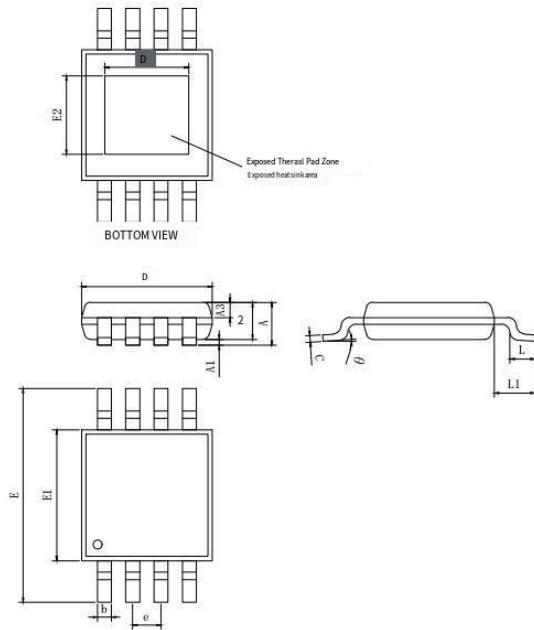
Test Condition: PRF=-10dBm@5.15GHz, PLO=+13dBm@5.25GHz, All values in dBc relative to the IF

Note: calculation formula $n \times RF - m \times LO$.

PCB Evaluation Board

PCB

50 ohms Impedance Signal Lines : width=0.53mm, spacing=0.53mm

Pin Configuration and Description


Pin Number	Pin Name	Description
1	LO	LO pin. DC Block is not required
2,3,6,7	GND	RF/DC ground pins. Connect to RF/DC ground.
4	N/C	No electrical connection. Provide grounded land pads for PCB mounting integrity.
5	IF	IF pin. A suitable series capacitor needs to be selected to filter out the DC signal for applications not requiring to DC.
8	RF	RF pin. DC Block is not required
-	EP	RF/DC ground. Use recommended via pattern to minimize inductance and thermal resistant; see PCB Mounting Pattern for suggested footprint.

Package Dimensions (mm)


SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	--	--	1.10
A1	0.00	--	0.13
A2	0.75	0.85	0.95
A3	0.30	0.35	0.40
b	0.28	--	0.36
c	0.15	--	0.19
D	2.90	3.00	3.10
E	4.68	--	5.08
E1	2.90	3.00	3.10
e	0.65BSC		
L	0.40	--	0.80
L1	0.95REF		
θ	0	--	8°
D2	1.93REF		
E2	1.57REF		



博瑞集信