



SME1400B-10

Broadband Surface Mount Mixer

Product Features

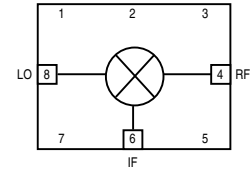
- +19 dBm Input IP3
- RF: 1 – 2200 MHz
- LO: 1 – 2200 MHz
- IF: 1 – 2000 MHz
- +10 dBm LO Drive Level
- No Internal Solder Connections
- RoHS-compliant SMT package
- No External Bias Required

Product Description

The SME1400B-10 is a passive double-balanced diode-ring mixer that provides high dynamic range performance in a RoHS-compliant surface mount package. The mixer is nominally driven with a LO input power of +10 dBm to optimize its performance. Other SME models are available for other LO drive levels.

Typical applications include frequency up/down conversion, modulation and demodulation for receivers and transmitters used in 2.5G and 3G GSM/CDMA/W-CDMA systems.

Functional Diagram



Top View

Applications

- Up/down frequency conversion

Specifications ⁽¹⁾

Parameter	Units	Min	Typ	Max	Notes
SSB Conversion Loss					
RF/LO = 10-1300 MHz, IF = 10-1000 MHz	dB		6.2	8.5	See note 1. Guaranteed at 8 dB max at 25 °C.
RF/LO = 10-2500 MHz, IF = 10-1000 MHz	dB		7.5	9.5	See note 1. Guaranteed at 9 dB max at 25 °C.
RF/LO = 1-2500 MHz, IF = 1-2000 MHz	dB		8.0		
Port-to-Port Isolation					
L-R = 10-2000 MHz	dB	24	35		
L-R = 10-2500 MHz	dB	18	25		
L-I = 10-2000 MHz	dB	20	26		
L-I = 10-2500 MHz	dB	16	22		
R-I = 10-2200 MHz	dB		25		
3 rd Order Input Intercept Point	dBm		+19		
1dB Input Compression Point	dBm		+6		
VSWR					
RF Port = 600-2000 MHz			1.7:1		
RF Port = 10-2500 MHz			2.0:1		
LO Port = 600-2000 MHz			1.6:1		
LO Port = 10-2500 MHz			2.0:1		
IF Port			1.8:1		
LO Drive Level	dBm		+10		

1. Measured in a 50 ohm system with a nominal LO drive of +10 dBm, low-side LO, in a downconversion application with LO = 400-2100 MHz, RF = 500-2200 MHz, IF = 100 MHz.

Absolute Maximum Rating

Parameter	Rating
Operating Case Temperature	-40 to +85 °C
Storage Temperature	-65 to +100 °C
RF Input Power	+16 dBm

Operation of this device above any of these parameters may cause permanent damage.

Ordering Information

Part No.	Description
SME1400B-10	Broadband Surface Mount Mixer
SME1400B-10F ⁽¹⁾	Broadband Surface Mount Mixer
SME1400B-10-PCB	Fully-Assembled Mixer Application Board

Note: 1. Compatible with 260 °C reflow processes.

Specifications and information are subject to change without notice

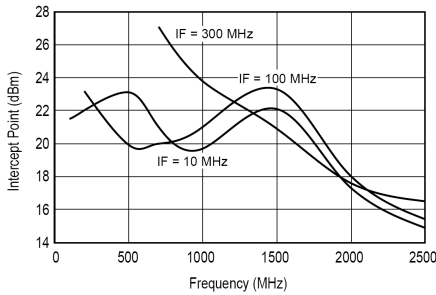


SME1400B-10

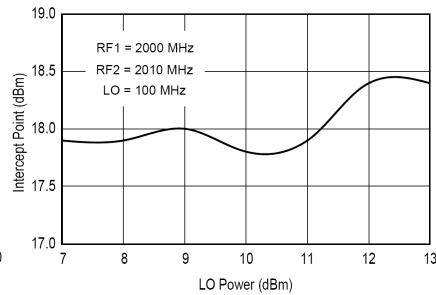
Broadband Surface Mount Mixer

Performance Charts

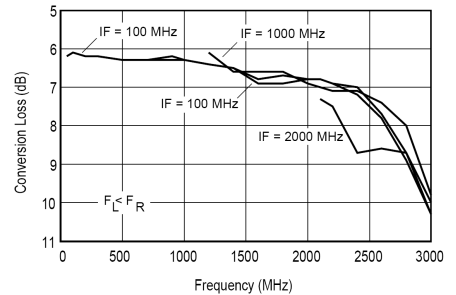
IIP3 vs. Frequency



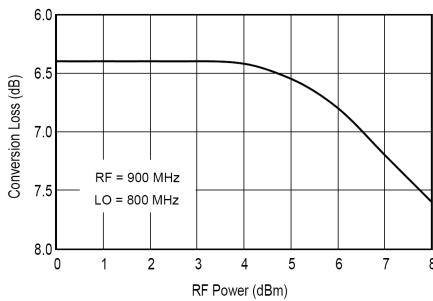
IIP3 vs. LO Power



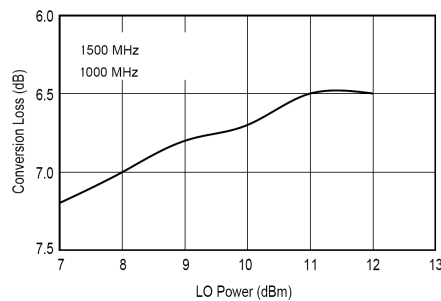
Conversion Loss vs. Frequency



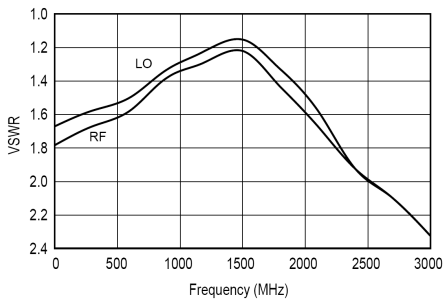
Conversion Loss vs. RF Power



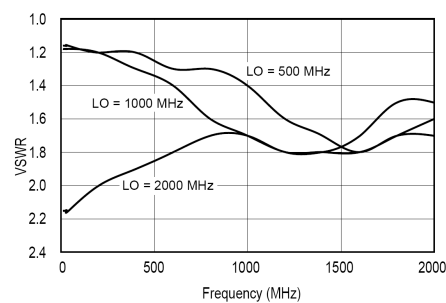
Conversion Loss vs. LO Power



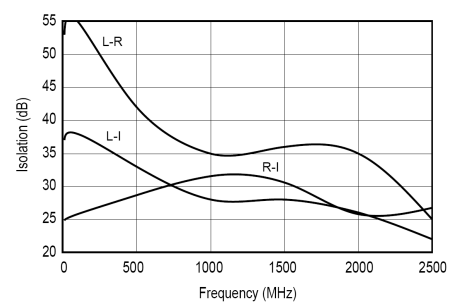
VSWR vs. Frequency



IF VSWR vs. Frequency



Isolation vs. Frequency





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Single-Tone IM Products

		Harmonics of fLO					
		0	1	2	3	4	5
Harmonics of fRF	0		34	44	46	57	53
	1	27	0	33	12	35	28
	2	63	55	56	55	59	59
	3	>80	69	>80	68	73	47
	4	77	>80	>80	>80	>80	>80
	5	>80	>80	>80	>80	>80	>80

LO Mult	RF Mult			IM Products	
		LO (MHz)	RF (MHz)	MHz	dBc
0	1	1950	2000	2000	27
0	2	1950	1000	2000	63
0	3	1950	700	2100	84
0	4	1950	600	2400	77
0	5	1950	400	2000	80
1	0	2000	1950	2000	34
-1	1	1950	2000	50	0
1	-2	2000	975	50	55
1	-3	2000	650	50	69
1	-4	2000	488	48	90
1	-5	2000	390	50	88
2	0	1000	1950	2000	44
-2	1	550	2000	900	33
2	-2	2000	1975	50	56
2	-3	2000	1317	49	89
2	-4	2000	988	48	90
2	-5	2000	790	50	89
3	0	700	1950	2100	46
-3	1	400	1550	350	12
3	-2	1500	1200	2100	55
3	-3	2000	1983	51	68
-3	4	2200	1700	200	80
3	-5	2000	1190	50	89
4	0	500	1950	2000	57
-4	1	420	2000	320	35
4	-2	800	1200	800	59
4	-3	1100	1200	800	73
4	-4	2000	1987	52	89
-4	5	2075	1700	200	88
5	0	400	1950	2000	53
-5	1	350	1950	200	28
5	-2	700	1200	1100	59
5	-3	1000	1200	1400	47
5	-4	1150	1200	950	86
5	-5	1710	1700	50	88

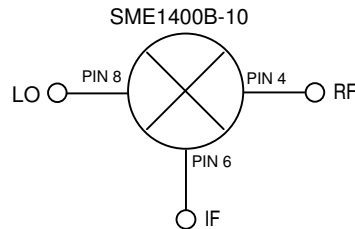
RF harmonics and intermodulation products are referenced to a desired signal produced by fRF = 2000 MHz and fLO = 1950 MHz

LO harmonics are referenced to the +10 dBm LO drive signal

SME1400B-10 Mechanical Information

This package is RoHS-compliant. The plating material on the leads is AgPdPt.
It is compatible with a tin-lead (maximum 235 °C reflow temperature) soldering processes.

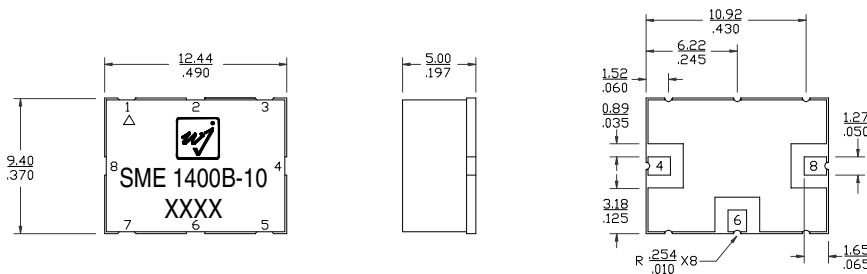
Application Circuit



Notes:

1. Circuit board material: .014" FR-4, 4 layers, .062" total thickness
2. Blocking capacitors are required on the ports (pins 2, 5, 7) if any dc signal is present.

Outline Drawing

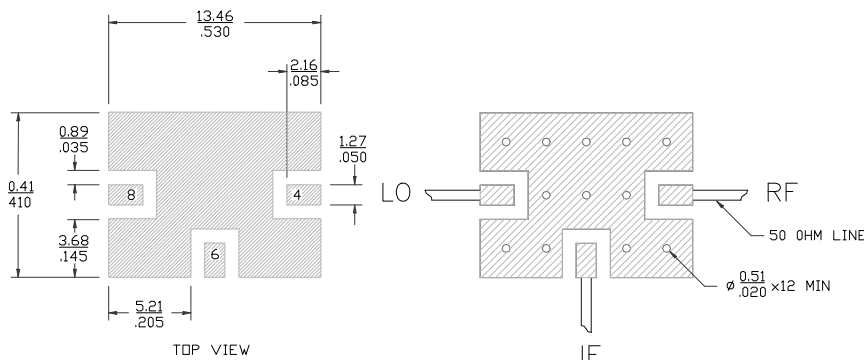


Product Marking

The component will be marked with an "SME1400B-10" designator followed by an alphanumeric lot code on the top surface of the package.

Tape and reel specifications for this part are located on the website in the "Application Notes" section.

Land Pattern / Mounting Configuration



Notes:

1. Ground vias are critical for RF grounding considerations.
2. A minimum of 12 ground vias underneath the device are required.
3. Trace width depends on the PC board material and thickness.

ESD Information

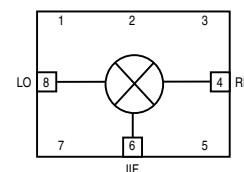


Caution! ESD sensitive device.

ESD Classification: Class 1C
Value: Passes $\geq 1000V$ to $<2000 V$
Test: Human Body Model (HBM)
Standard: JEDEC Standard JESD22-A114

ESD Classification: Class IV
Value: Passes $\geq 1000 V$
Test: Charged Device Model (CDM)
Standard: JEDEC Standard JESD22-C101

Functional Pin Layout

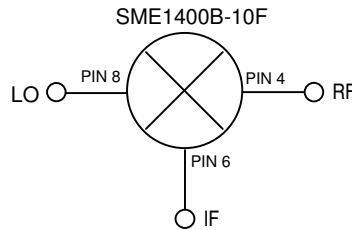


Pin No.	Function
4	RF
6	IF
8	LO
1, 2, 3, 5, 7 Backside Metal	GND

SME1400B-10F Mechanical Information

This package is RoHS-compliant. The plating material on the leads is AgPdPt. It is compatible with both lead-free (maximum 260 °C reflow temperature) and leaded (maximum 245 °C reflow temperature) soldering processes

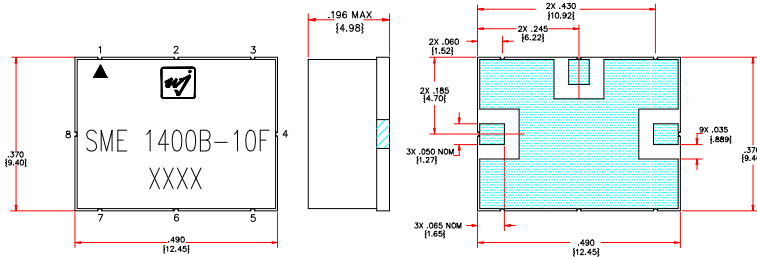
Application Circuit



Notes:

1. Circuit board material: .014" FR-4, 4 layers, .062" total thickness
2. Blocking capacitors are required on the ports (pins 2, 5, 7) if any dc signal is present.

Outline Drawing



Product Marking

The component will be marked with an "SME1400B-10F" designator followed by an alphanumeric lot code on the top surface of the package.

Tape and reel specifications for this part are located on the website in the "Application Notes" section.

ESD Information

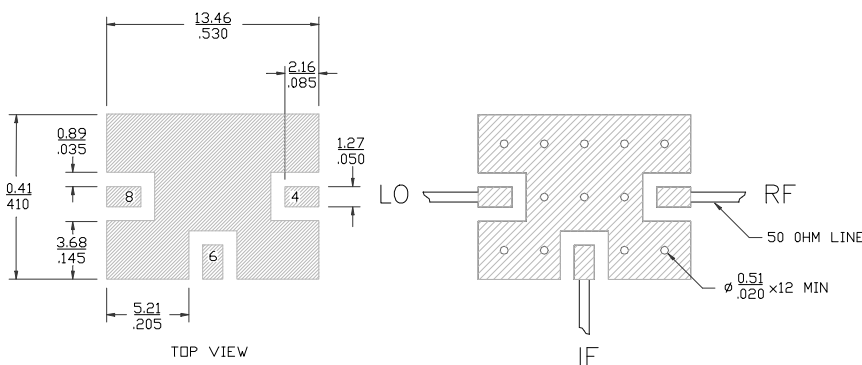


Caution! ESD sensitive device.

ESD Classification: Class 1C
 Value: Passes $\geq 1000V$ to $<2000 V$
 Test: Human Body Model (HBM)
 Standard: JEDEC Standard JESD22-A114

ESD Classification: Class IV
 Value: Passes $\geq 1000 V$
 Test: Charged Device Model (CDM)
 Standard: JEDEC Standard JESD22-C101

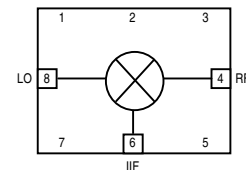
Land Pattern / Mounting Configuration



Notes:

1. Ground vias are critical for RF grounding considerations.
2. A minimum of 12 ground vias underneath the device are required.
3. Trace width depends on the PC board material and thickness.

Functional Pin Layout



Pin No.	Function
4	RF
6	IF
8	LO
1, 2, 3, 5, 7 Backside Metal	GND