Avantek Products

Double Balanced Mixer 3700 to 4200 MHz

Technical Data

UMX-4220

Features

- **1.5:1 VSWR**
- **4.5 dB Conversion Loss/ Noise Figure**
- **Low Cost**

Applications

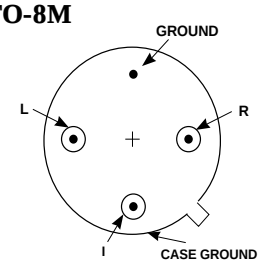
- **Low Cost, High Performance**
- **3.7 to 4.2 GHz Downconverter in TVRO Applications**
- **Instrumentation and Test Equipment**

Description

The UMX Series double-balanced mixers feature exceptionally high isolation and good harmonically-related intermodulation product suppression. They are packaged in compact easy-to-use hermetically sealed TO-8 cans. The UMX-4220 is a microwave mixer designed to meet the need for a low cost, high performance 3.7 to 4.2 GHz downconverter in TVRO applications. Typical conversion loss is 4.5 dB with a low-side LO and 5.0 with a high-side LO for either an 880 or 1125 MHz IF frequency. LO to RF isolation exceeds 30 dB.

Pin Configuration

TO-8M



Maximum Ratings

Parameter	Maximum
Peak Input Current @ 25°C	100 mA DC
Pin Temperature	260°C for 10 seconds
Operating Case Temperature	–55°C to +100°C
Storage Temperature	–65°C to +100°C
Continuous RF Input Power	200 mW @ +25°C 100 mW @ +100°C

Weight: (typical) 0.06 oz.

Electrical Specifications

(Measured in a 50 Ω system)

Symbol	Characteristic	Operating Frequencies MHz f_{LO}	f_{RF}	f_{IF}	Power Level LO Port dBm (typ)	Model Suffix	RF Port dBm	Specifications Typical T_C = 25°C	Guaranteed T_C = –55° to +100°C	Unit
BW	Operating Frequency Range	2.4-5.5	3.7-4.2	DC-1.3						GHz
CL	SSB Conversion Loss	> f_{RF}	3.7-4.2	DC-1.3	+7-+10			5.0	6.0	dB
		< f_{RF}	3.7-4.2	DC-1.3	+7-+10			4.5	6.0	max
—	Conversion Loss Flatness over any 40 MHz segment of f_{RF} 3.7 to 4.2 GHz peak-to-peak	2.3-5.5	3.7-4.2	DC-1.3	+7-+10			0.1	—	dB typ
NF	SSB Noise Figure	> f_{RF}	3.7-4.2	0.03-1.3	+6-+8			5.0	6.0	dB
		< f_{RF}	3.7-4.2	0.03-1.3	+6-+8			4.5	6.0	max
ISOL	Isolation Port-to-Port L-R	2.4-5.5	—	—				35	25	dB
	R-L	—	3.7-4.2	—				35	—	min
	R-I	—	3.7-4.2	—				20	—	
	L-I	2.4-5.5	—	—				25	20	
—	VSWR (50 ohm) L	2.4-5.5	—	—				1.5:1		max
	R	—	3.7-4.2	—				1.5:1		
	I	—	—	0.01-1.3				1.5:1		
CC	Conversion Compression Point (1 dB)	2.3-5.5	3.7-4.2	≤1.3	≥+7			+1		dBm typ
IP_3	Third-Order Two-Tone Intercept Point	2.4-5.5	3.7-4.2	≤1.3	≥+7		—	+12	—	dBm typ

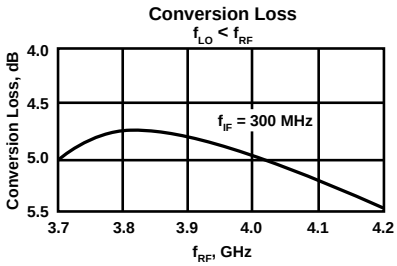
Note: Guaranteed specifications apply with LO input power of +7 dBm.

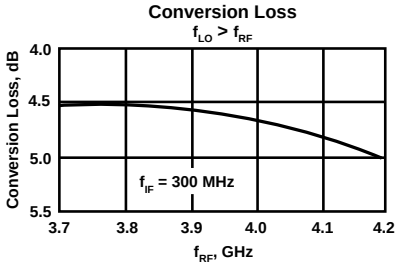
Typical Performance At 25°C Temperature

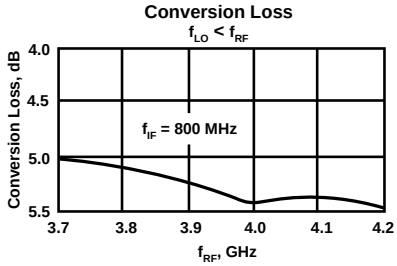
Typical Single Tone Intermodulation Harmonic Suppression at 25°C (dB below desired output)

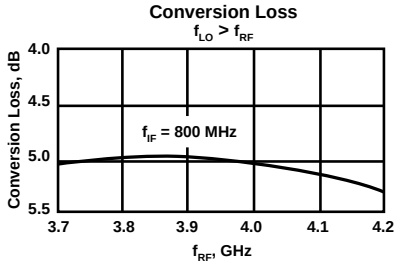
Harmonics of f_{RF}	Harmonics of f_{LO} 1	2	3	4
4	>70	>70	>70	>70
3	65	>70	55	>70
2	50	55	50	58
1	0	25	18	40

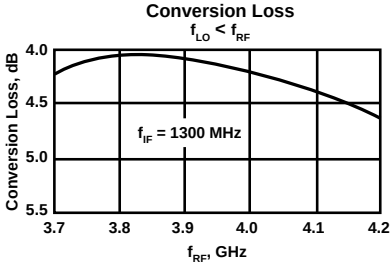
Typical Harmonic Intermodulation Suppression for mixer generated harmonics of input signals. Suppression numbers are for a f_{RF} signal level at –10 dBm and f_{LO} signal level of +7 dBm.

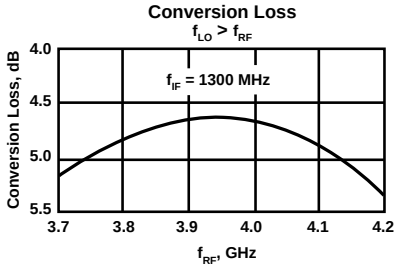


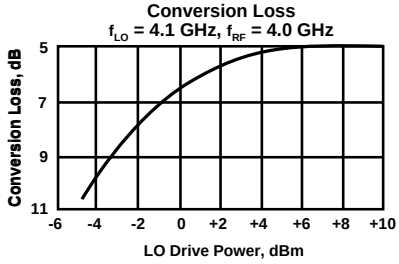


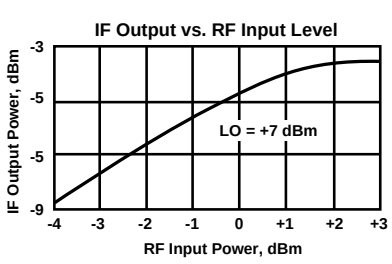


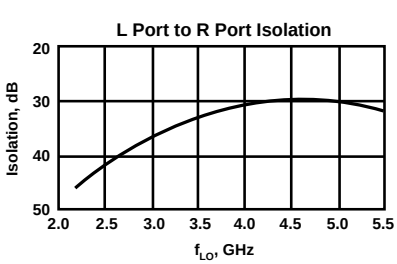


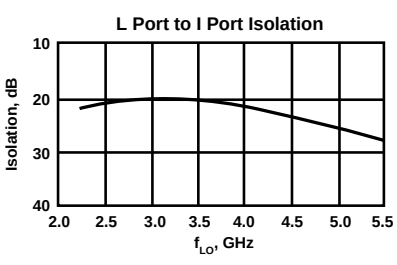


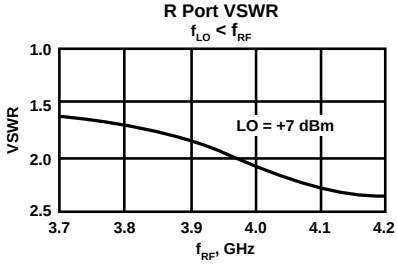


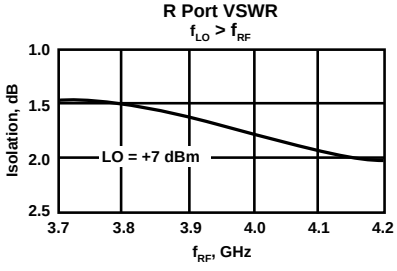


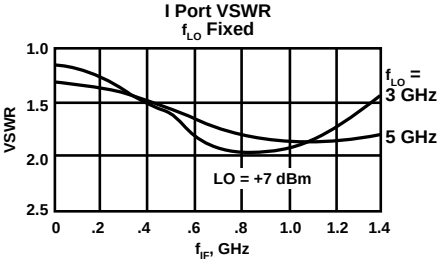


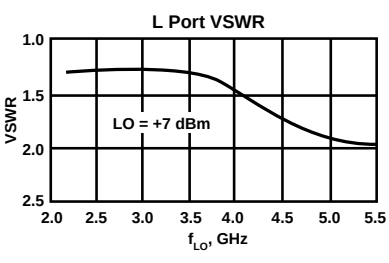




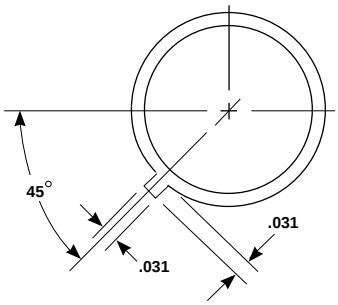


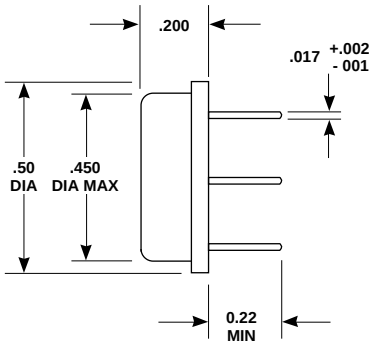


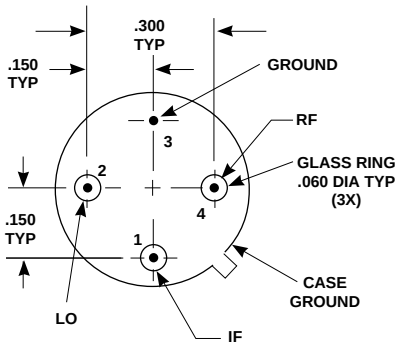




Case Drawings
TO-8M







APPROXIMATE WEIGHT 2.1 GRAMS

NOTES (UNLESS OTHERWISE SPECIFIED):
1. **DIMENSIONS ARE SPECIFIED IN INCHES**
2. **TOLERANCES: xx ± .02**
   xxx ± .010

For more information:

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