



## **SERIES HBM BALANCED MIXERS**

### **DESCRIPTION**

The HBM series broadband balanced mixers cover the waveguide bands from 18–110 GHz. They utilize a low loss structure mated to a matched pair of GaAs Schottky beam lead diodes for minimum conversion loss and maximum bandwidth. Superior LO noise suppression and LO-RF isolation values are inherent design features. Biased versions are available for use with lower LO drive levels. Options include IF Amplifiers, LO frequency multipliers and Gunn local oscillators. An integrated assembly with an IF amplifier and a Gunn local oscillator with isolator can also be provided. An upconverter version of this mixer is available as series HBUC.



### **Applications**

- Frequency Converters**
- Signal Processing**
- General RF Detection**
- Receiver Front Ends**
- Frequency Measurement**

### **Features**

- High IF Bands**
- Low LO Drive Level**
- Compact Design**
- Low Conversion Loss**
- Optional IF Amplifiers**



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Specifications @ 35°C T<sub>CASE</sub>.. Specifications subject to change w/o notice.

Model Number	Frequency* (GHz)	Waveguide	SSB Conversion Loss (typical) Fixed LO		SSB Conversion Loss (typical) Swept LO
			$F_{IF}$ 0.01- 8 GHz	$F_{IF}$ 0.1-18 GHz	$F_{IF}$ = 0.01- 8 GHz
HBM42	18.0 – 26.5	WR – 42	7.0 dB	N/A	8.0 dB
HBM28	26.5 – 40.0	WR – 28	7.0 dB	7.5 dB	8.0 dB
HBM22	33.0 – 50.0	WR – 22	7.0 dB	7.5 dB	9.0 dB
HBM19	40.0 – 60.0	WR – 19	7.5 dB	8.0 dB	9.5 dB
HBM15	50.0 – 75.0	WR – 15	7.5 dB	8.0 dB	9.5 dB
HBM12	60.0 – 90.0	WR – 12	8.0 dB	8.5 dB	10.0 dB
HBM10	75.0 – 110.0	WR – 10	8.0 dB	9.0 dB	10.0dB

**\*Notes:**

1. The frequency ranges listed above are for reference only. Better performance can be provided for narrow bandwidth requirements.
2. Please specify desired RF, LO and IF frequency ranges when inquiring about balanced mixers.



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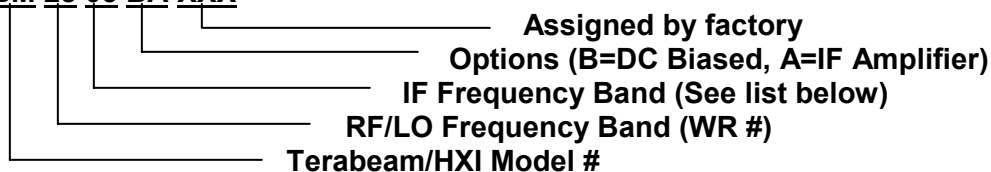
## General Specifications

LO to RF Isolation	20 dB typical
VSWR (RF, LO, IF)	2.0:1 typical
LO Drive Level ( $P_{LO}$ ) unbiased	+10 dBm minimum, +13 dBm typical
LO Drive Level, biased	+3 dBm minimum, +7 dBm typical
$P_{1dB}$ compression point	+3 dBm typical with +13 dBm LO Drive
$P_{RF}$ Maximum	+20 dBm CW, + 24 dBm pulsed
Diode Bias (option)	+5.0 VDC @ 5 mA
Amplifier Bias (option)	+10 VDC @ 80 mA
Operating Temperature	-20 to +60°C

## Requesting quotes

When requesting a quote for HBM Balanced Mixers, please specify required RF, LO and IF frequency ranges and any other required specifications. The part number guide below can also be used as a reference for requesting quotes.

### HBM 28 05 BA-XXX



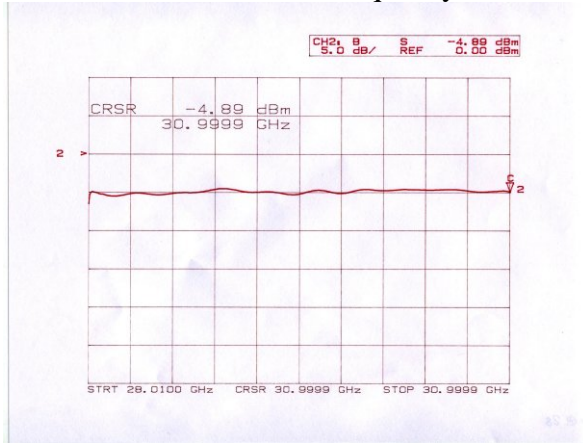
For UG-383/U Flange in B & U bands - add /383 after options

### IF Frequency Band Options:

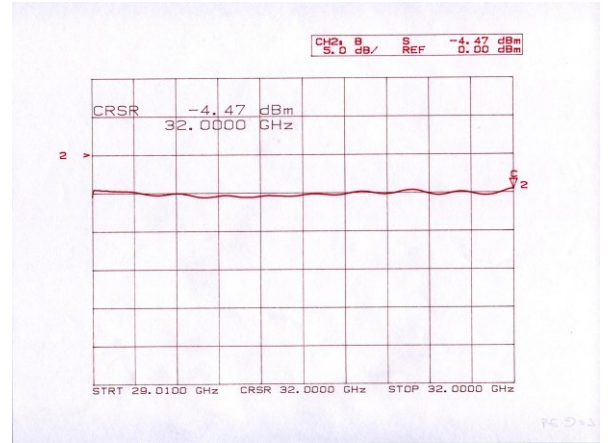
01 (1-100 MHz)	02 (1-500 MHz)	03 (1-1000 MHz)	04 (1-1500 MHz)
05 (1-4 GHz)	06 (1-6 GHz)	08 (1-8 GHz)	L (1-2 GHz)
S (2-4 GHz)	C (4-8 GHz)	X (8-12.4 GHz)	Ku (12.4-18)

Others IF bands available upon request.

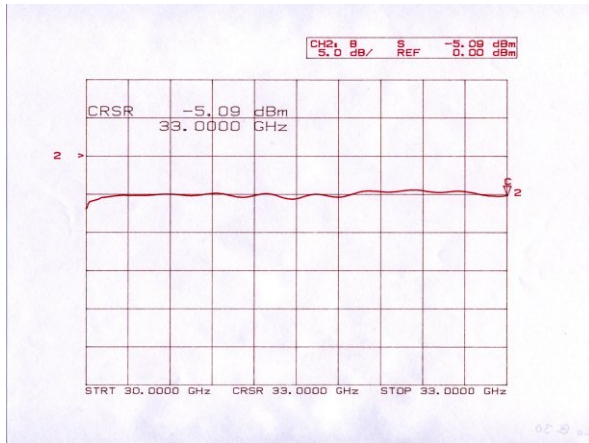
Conversion Loss vs. LO Frequency



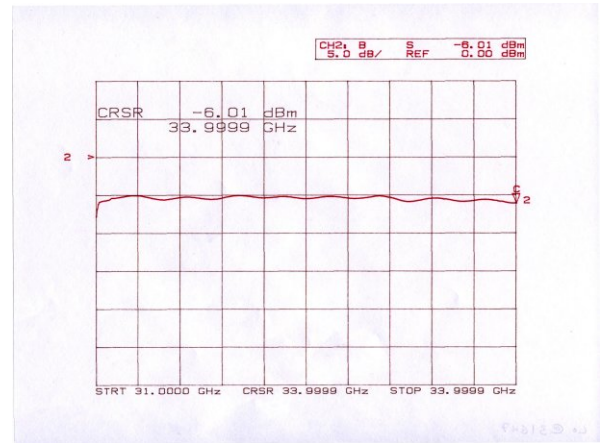
RF SWEPT 28.0GHZ to 31.0GHZ  
LO @ 28.0GHZ IF 0.01 to 3.0GHZ



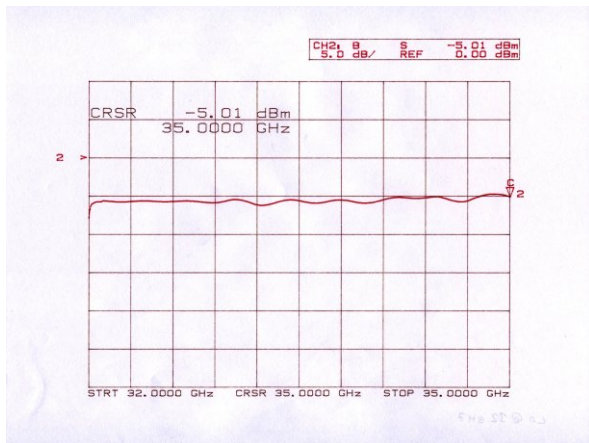
RF SWEPT 29.0GHZ to 32.0GHZ  
LO @ 29.0GHZ IF 0.01 to 3.0GHZ



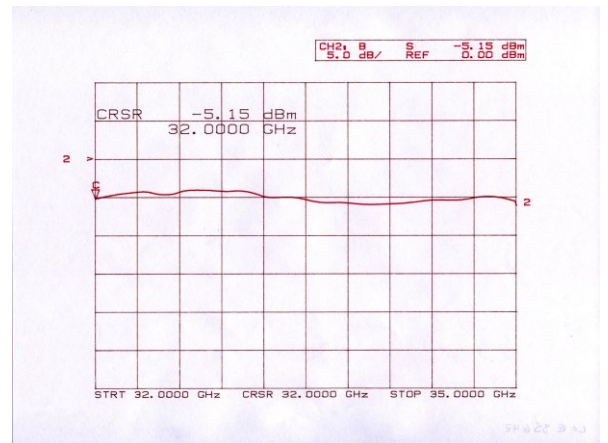
RF SWEPT 30.0GHZ to 33.0GHZ  
LO @ 30.0GHZ IF 0.01 to 3.0GHZ



RF SWEPT 31.0GHZ to 34.0GHZ  
LO @ 31.0GHZ IF 0.01 to 3.0GHZ



RF SWEPT 32.0GHZ to 35.0GHZ  
LO @ 32.0GHZ IF 0.01 to 3.0GHZ



RF SWEPT 32.0GHZ to 35GHZ  
LO @ 35.0GHZ IF 0.01 to 3.0GHZ