

2021-5-30

140-170GHz IQ Mixer



Description:

AT-IQHM-140170 is an up and down mixer covering D band 140-170GHz. IF inputs with I+/I- Q+/Q- is IQ port and can range from DC to 6GHz. RF frequency range is 140-170GHz. LO link is with X12 Multiplier.

The mixer has high image rejection, low input/output return loss and flat conversion response. It's suitable for D band point to point communication, instrumentation, sensing, security and high resolution imaging applications.

For more information, please visit www.atmicrowave.com

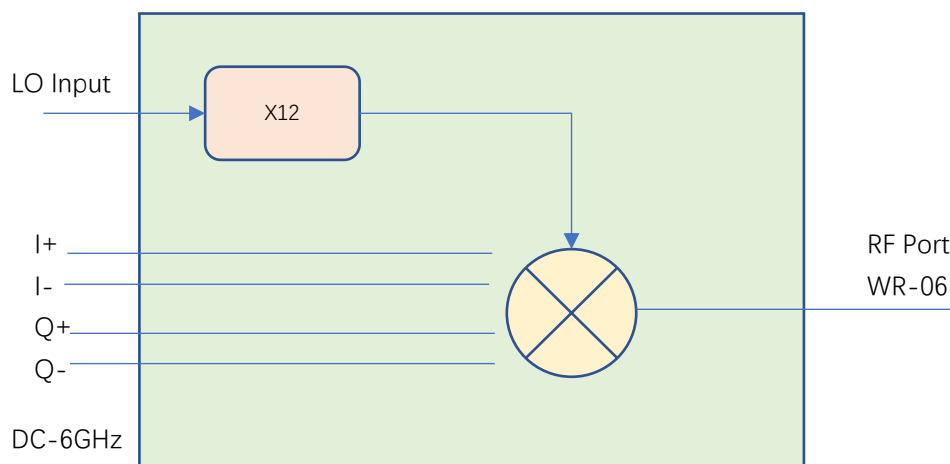
Feature

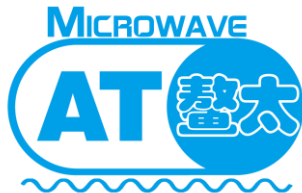
- ✓ RF: 140-170GHz
- ✓ D Band Mixer with X12 LO
- ✓ IF: DC-6GHz
- ✓ Low Conversion Loss
- ✓ Low LO power requirement

Application

- ✓ D band Imaging
- ✓ FOD (Foreigner Objects Debris)
- ✓ Test Equipment
- ✓ ROF (RF Over Fiber)
- ✓ Radar System

Diagram Block





AT-IQHM-140170

140-170GHz IQ Mixer

Electrical Specifications:

Parameter	Min	Typical	Max
RF		140-164 GHz	170GHz
LO		11.6-13.66 GHz	14.16GHz
LO Driver		+5 dBm	+10
LO E Band Multiplier		X12	
IF Range		DC-6 GHz	
Conversion Loss(140-160GHz)		-15 dB	
Imaging Rejection		-15 dBc	
12LO-RF Isolation		-20 dBc	
Power Supply		+5V/ 180mA	
RF Port		WR-06	
LO Port		SMA Female	
IF Port		SMA Female	

Absolute Maximum Ratings Table

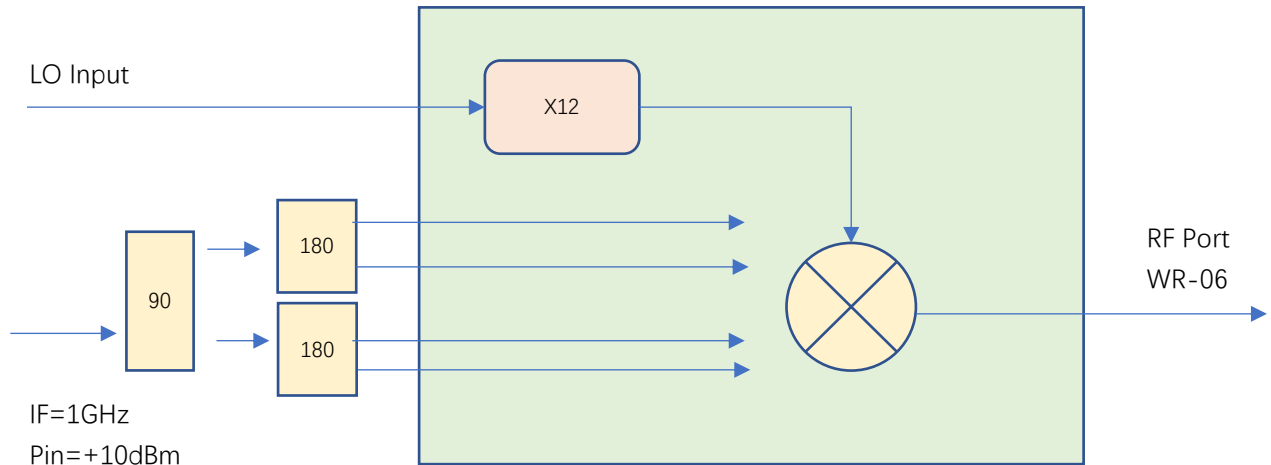
Parameter	Value
IF Power	+7dBm
RF Port	+0dBm
LO Port	+15dBm
Operating Temperature	0 to +50C
Storage Temperature	-65 to +150C

Notes:

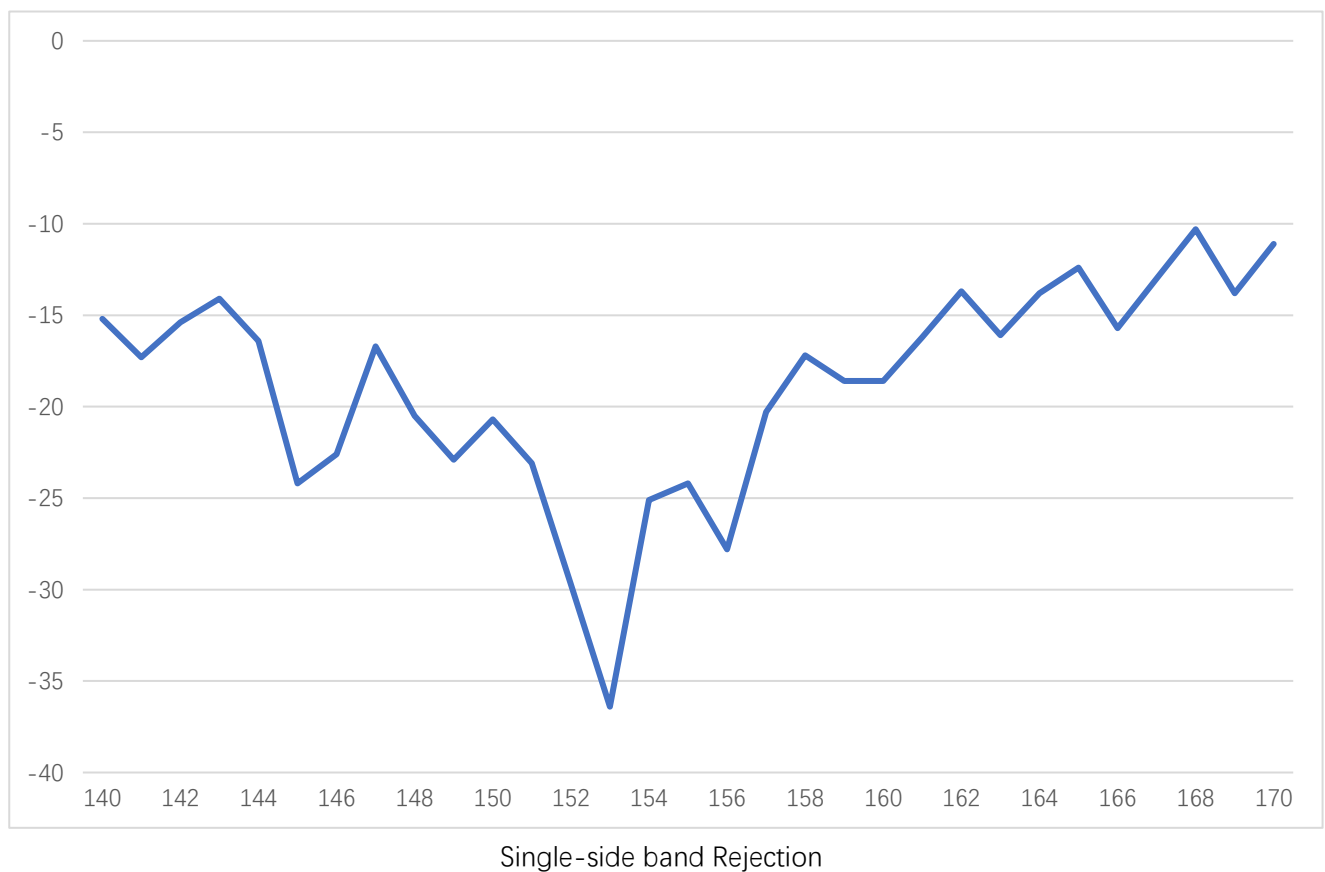
1. Datasheet may be changed according to update of MMIC, Raw materials , process, and so on.
2. This data is only for reference, not for guaranteed specifications.
3. Please contact AT Microwave team to make sure you have the most current data.



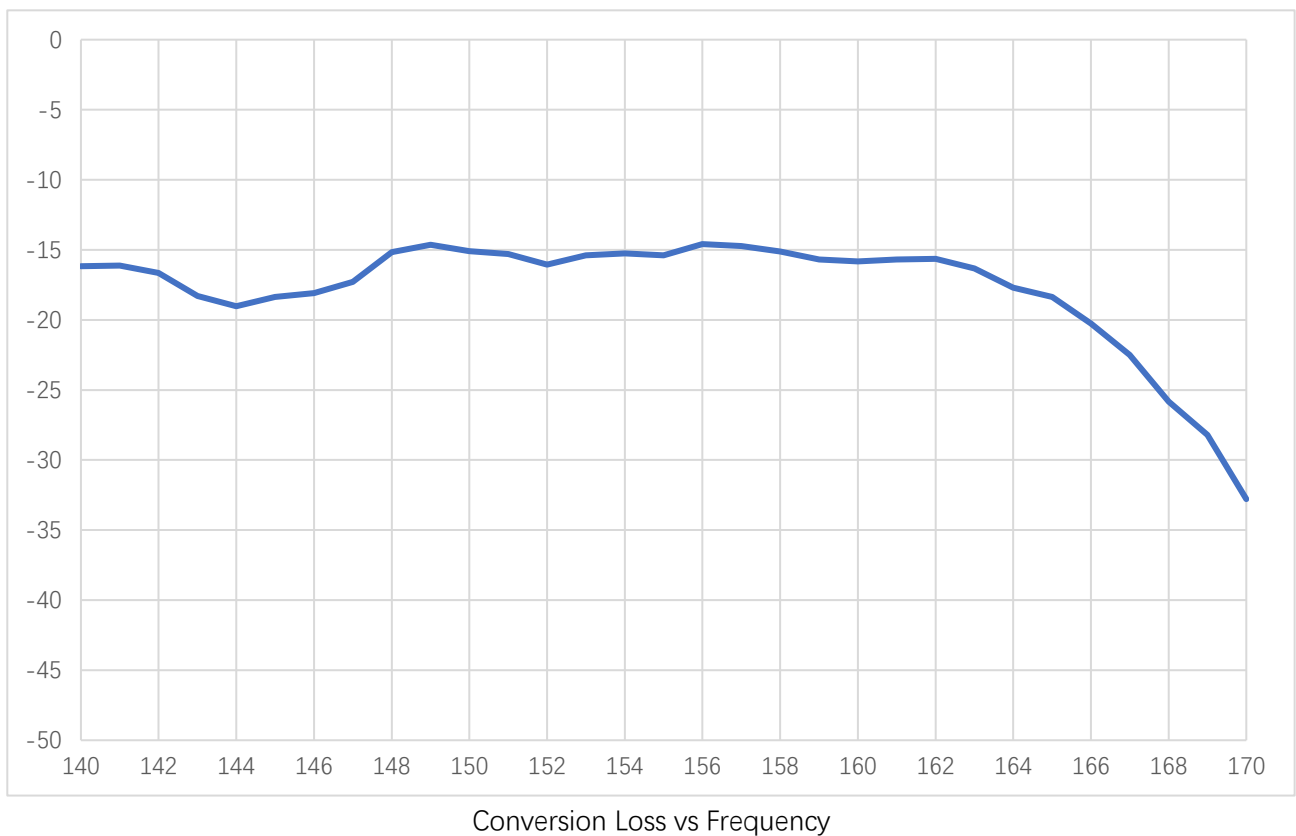
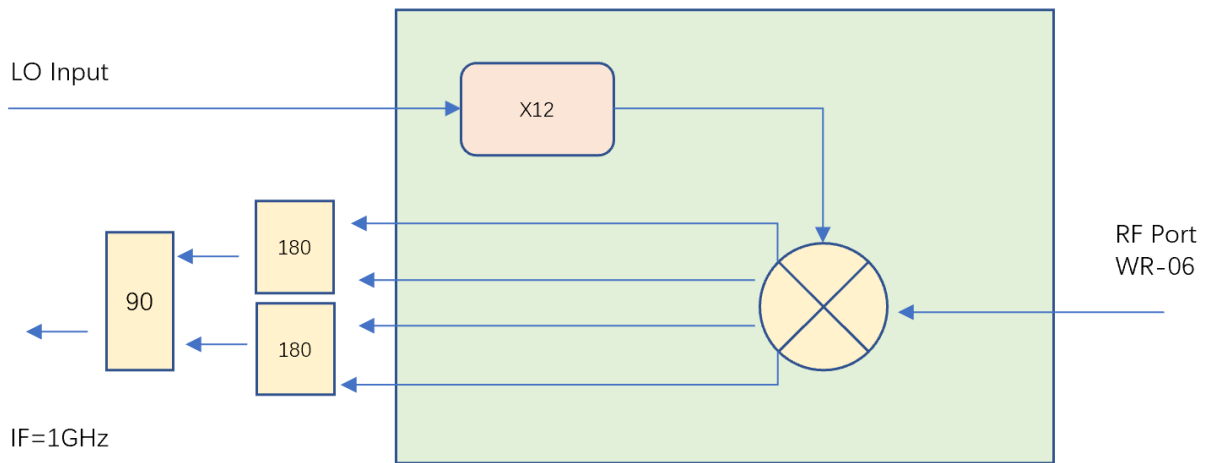
Up-converter Test:

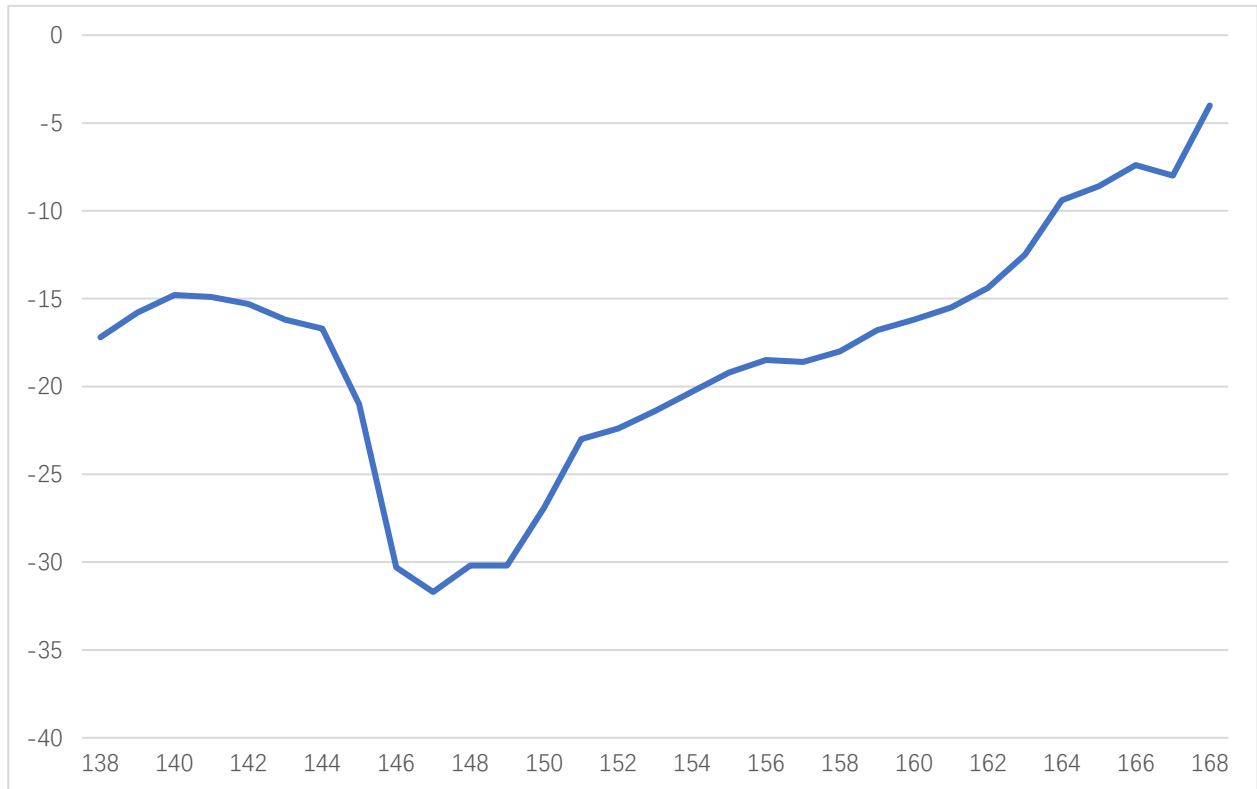


Tx Test Set-up, IF=1GHz, Input=0dBm/ch

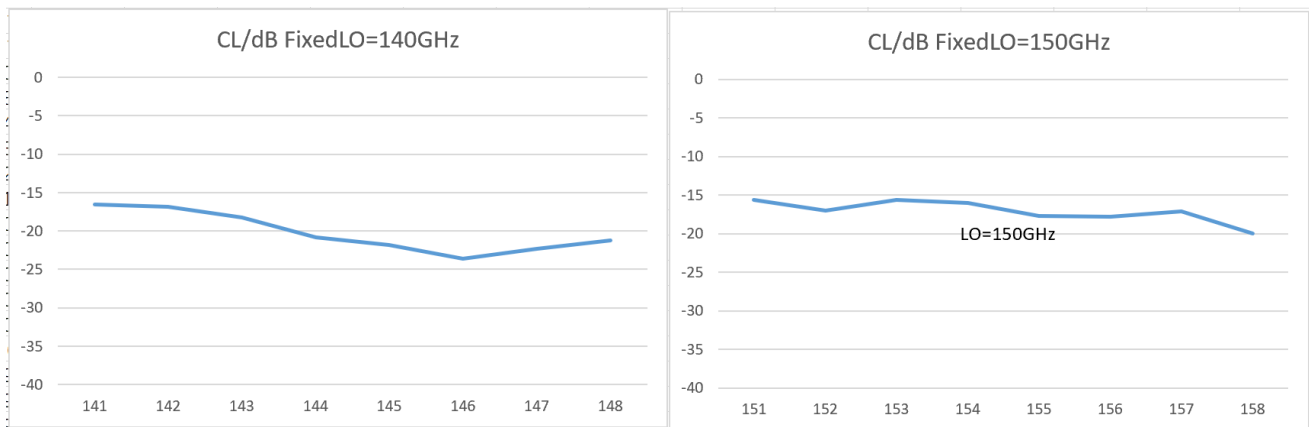


Down-converter Test:





Imaging Rejection vs Imaging Frequency, IF=1GHz



IF Response, LO=140GHz, 150GHz



Application Note

Mixer is a three port component with RF, LO and IF ports. Normally, a mixer can be used both up and down converter application. Take up converter for example:

General Balance Mixer

For general balance mixer, $RF = LO \pm IF$. There will be both high end $LO + IF$ and Low End $LO - IF$.

Take for example, $IF = 2\text{GHz}$, $LO = 94\text{GHz}$, so there will be 92GHz and 96GHz at RF port with same power level.

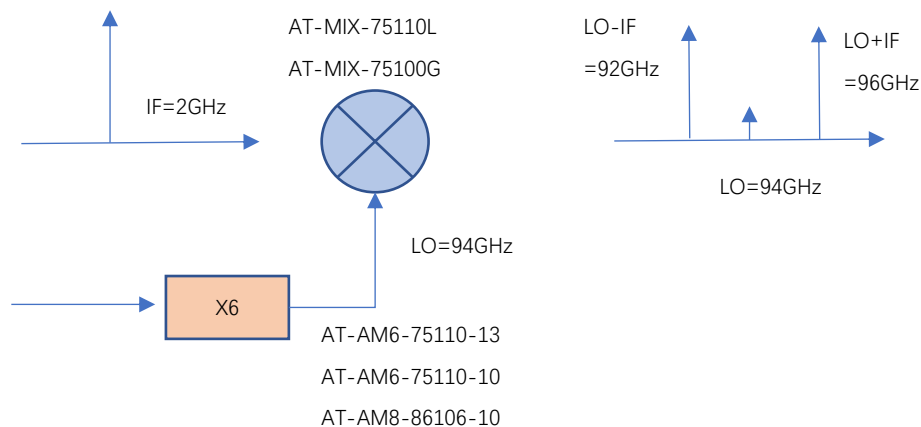


Figure A: General Balance Mixer with Both High and Low Side Output

IQ Mixer used as side suppression Mixer

When $IF = 2\text{GHz}$, 90 degree hybrid is used at IF port, and IF applies to Input 1 Port of hybrid, you will have high end frequency $RF = LO + IF = 96\text{GHz}$, while have side suppression (say -25dBc) at Low end frequency 92GHz .

When you need low end frequency 92GHz , and make side suppression for high end frequency 96GHz , just applies IF to Input 2 of the hybrid.

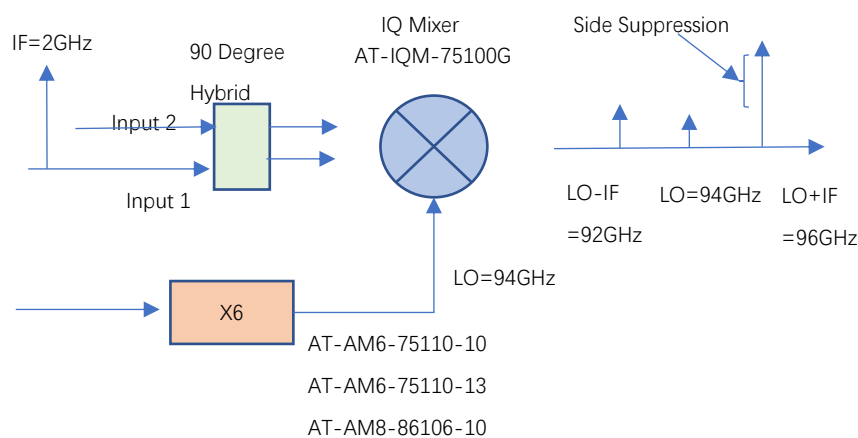


Figure B: IQ Mixer works as side suppression mixer



Dimension (mm)

