

# 140-164GHz Compact IQ Receiver LO with X12 Amplified Multiplier Chain

2023-4-25



### Description:

AT-DRX-140164 is a compact D Band receiver covering 140-164GHz. The LO link is with X6 AMC Amplified Multiplier Chain, and IF Frequency range is DC-6GHz.

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](http://www.atmicrowave.com)

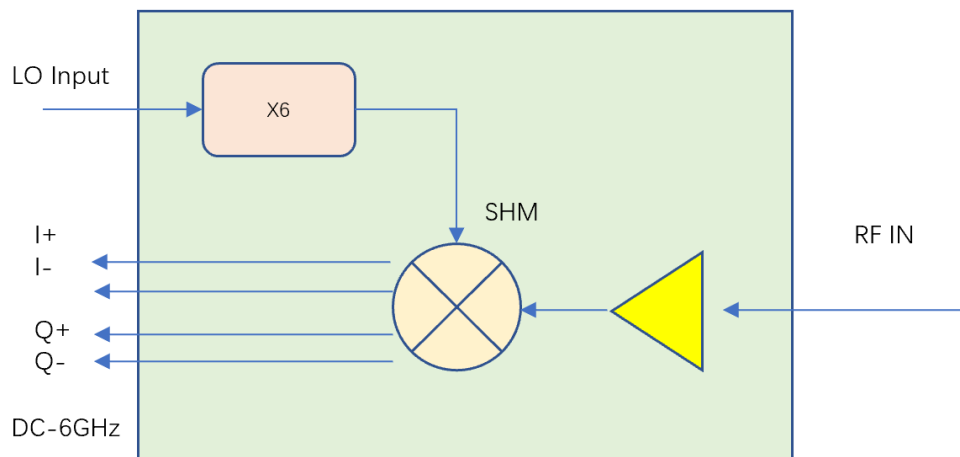
### Feature

- ✓ RF: 140-164GHz
- ✓ LO: 11.67-13.67GHz
- ✓ 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





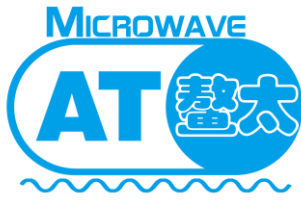
# AT-DRX-140164

140-164GHz Compact IQ Receiver

## Electrical Specifications:

Parameter	Min	Typical	Max
RF		140-164 GHz	
LO		11.6-13.67 GHz	
LO Driver	+3	+5 dBm	+10
LO AMC Multiplier		X6	
6XLO Frequency Range		70-82GHz	
Mixer Type		Sub-Harmonic Mixer	
IF Range		DC-6 GHz	
RF Input P1dB		-20dBm	
Conversion Gain	-10dB	-6dB/ch	
Imaging Rejection		-15 dBc	
NF		10dB	14dB
Power Supply		+5V/ 180mA	
Spec Temp		25C	





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## Mechanical Information

Parameter	Description
RF Port	WR-06
LO Port	SMA Female
IF Port	SMA Female
Case Material (Note)	Copper
Finish	Gold Plated
Weight	315g
Dimension	See outline

Note: Aluminium for lighter weight is available according to request

## Absolute Maximum Ratings Table

Parameter	Value
RF Power	+7dBm
LO Port	+15dBm
Power Supply	+7V
Operating Temperature	0 to +50C
Storage Temperature	-45 to +85C

## 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.



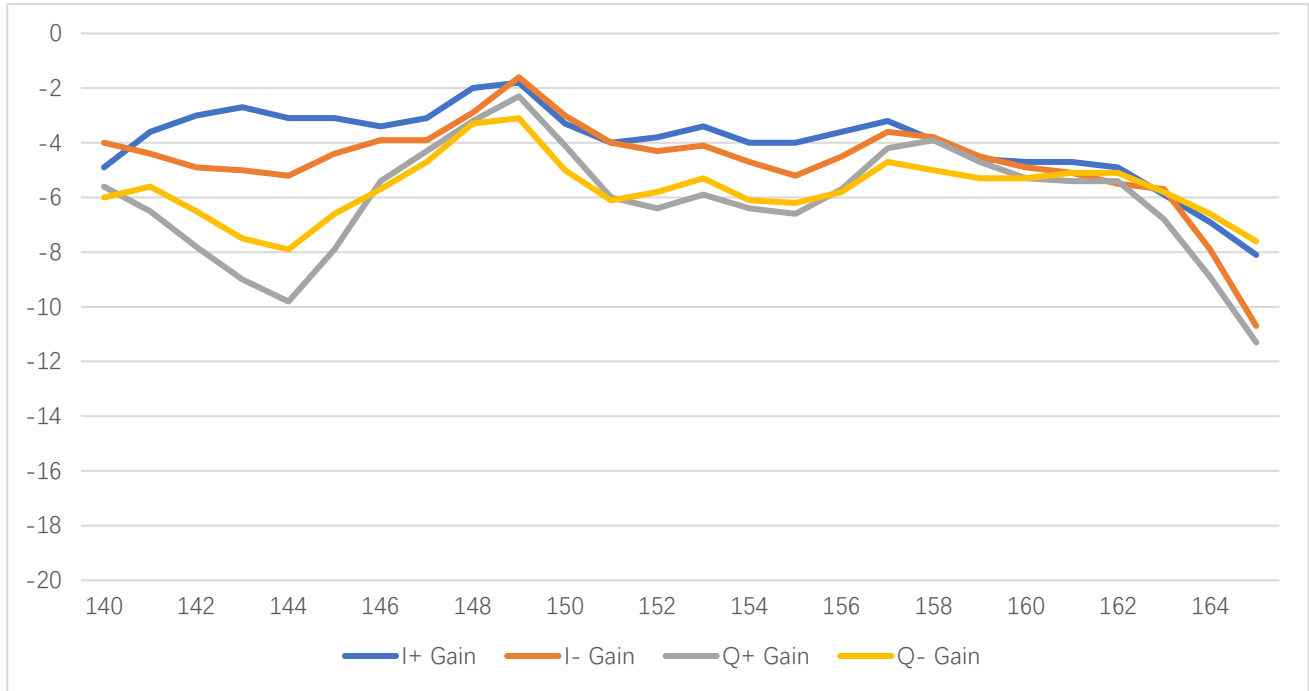


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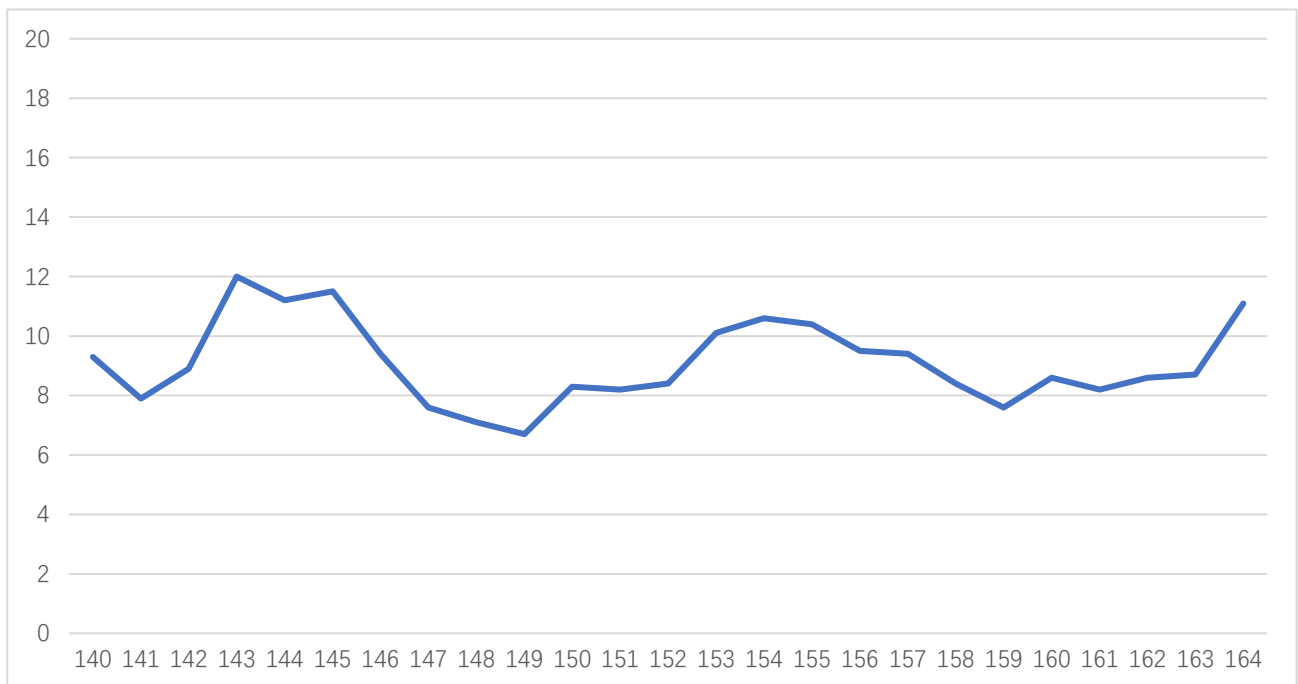
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## Test Data(25C)

RF Pin=-30dBm, IF=1GHz



Conversion Gain per channel vs Frequency  
Adding 6dB is combine 4ch together



NF vs Frequency



### Application Note

Mixer is a three-ports 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,  $IF=2GHz$ ,  $LO=94GHz$ , so there will be  $92GHz$  and  $96GHz$  at RF port with same power level.

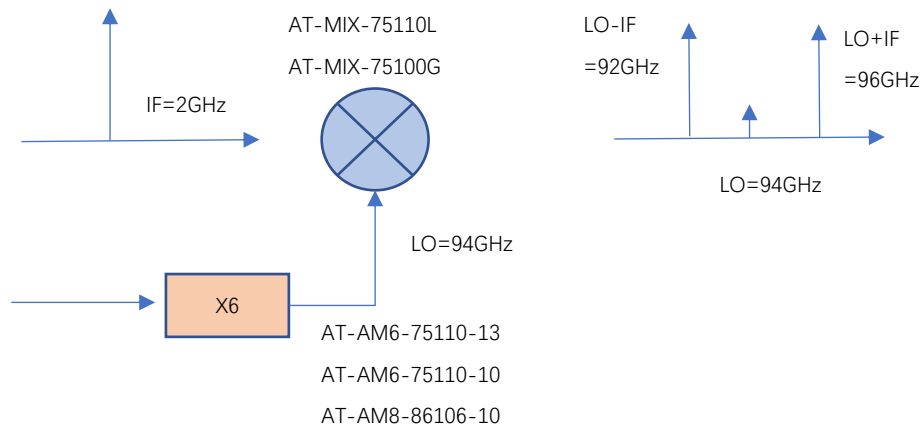


Figure A: General Balance Mixer with Both High and Low Side Output

#### IQ Mixer used as side suppression Mixer

When  $IF=2GHz$ , 90-degree hybrid is used at IF port, and IF applies to Input 1 Port of hybrid, you will have high end frequency  $RF = LO + IF = 96GHz$ , 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.

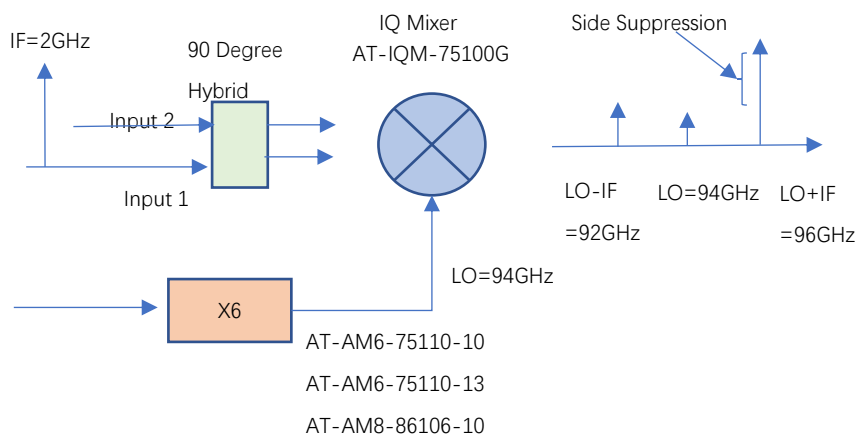


Figure B: IQ Mixer works as side suppression mixer



### Dimension (mm)

