

## D Band: 125-140GHz Compact Transmitter

2023-4-25

### LO with X12 Amplified Frequency Multiplier Chain



(Picture for reference only)

#### Description:

AT-DTX-125140SIF is compact D Band Tx with RF frequency from 125-140GHz. LO link is with x12 amplified multiplier chain with input of 10.41-11.66GHz. IF inputs frequency range is dc-12GHz

It's suitable for D band point to point communication, instrumentation, sensing, security and high resolution imaging applications. AT Microwave also provides D band power amplifiers and band pass filter for communication application.

For more information, please visit [www.atmicrowave.com](http://www.atmicrowave.com)

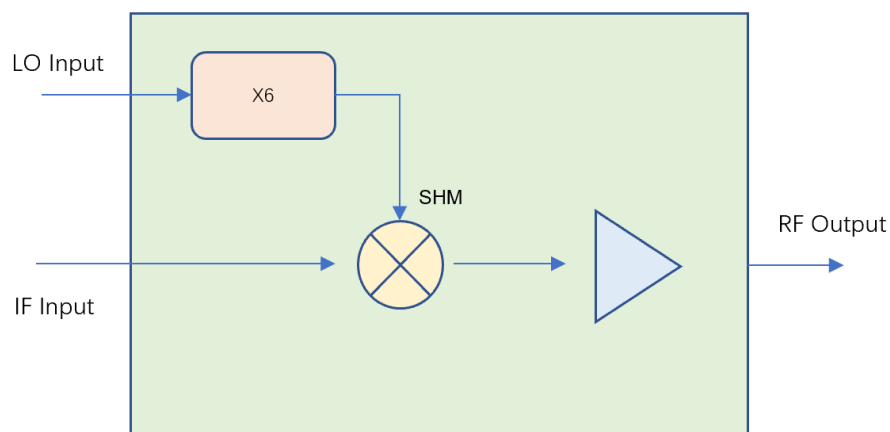
#### Feature

- ✓ RF: 125-140GHz
- ✓ LO: 10.41-11.66GHz with X12 Multiplier
- ✓ IF: DC-12GHz
- ✓ RF Output P1dB: -3dBm
- ✓ Low LO power requirement

#### Application

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

#### Diagram Block





# AT-DTX-125140SIF

125-140GHz D Band Transmitter

## Electrical Specifications:

Parameter	Min	Typical	Max
RF		125-140 GHz	
LO		10.41-11.66 GHz	
LO Driver	+3dBm	+5 dBm	+10
LO AMC (Amplified Multiplier Chain)		X6	
6XLO Frequency Range		62.5-70GHz	
Mixer Type		Sub-harmonic Mixer	
Conversion Gain		5dB	
RF Output P1dB		-3dBm	
RF Output Psat		0dBm	
Power Supply		+5V/ 150mA	
Temp Spec		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	180g
Dimension	See outline

Note: Aluminium for lighter weight is available according to request

## Absolute Maximum Ratings Table

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



### 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,  $IF=2GHz$ ,  $LO=94GHz$ , so there will be  $92GHz$  and  $96GHz$  at RF port with same power level.

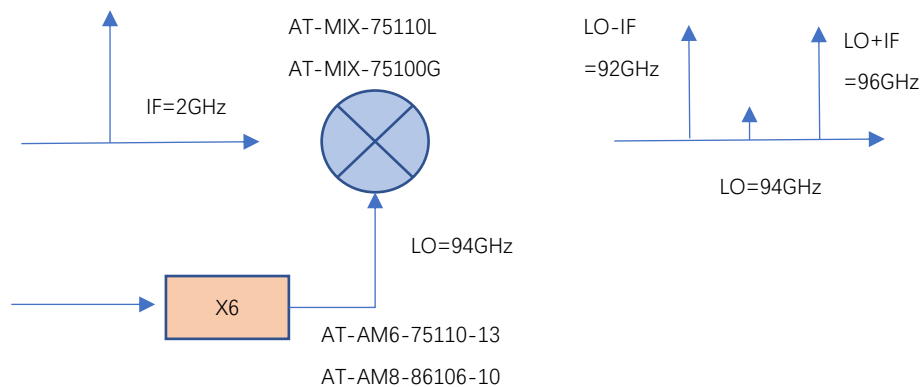


Figure A: General Balance Mixer with Both High and Low Side Output

#### 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.

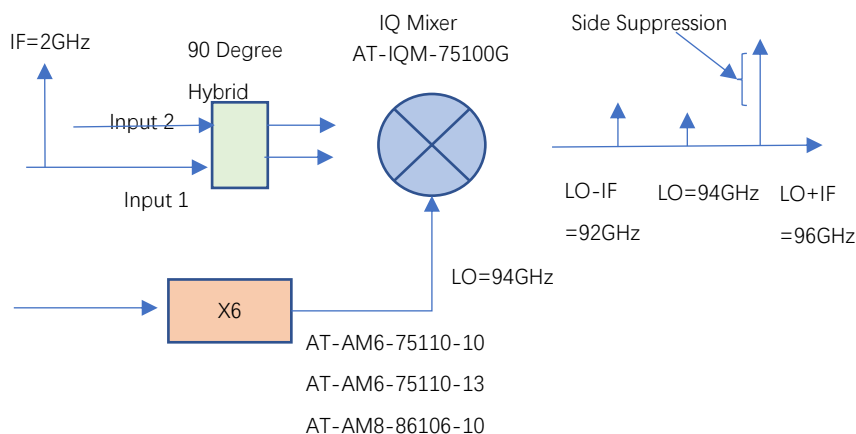


Figure B: IQ Mixer works as side suppression mixer

