

D Band: 140-160GHz Compact Transmitter

2023-4-25

LO with X12 Amplified Frequency Multiplier Chain



(Picture for reference only)

Description:

AT-DTX-140160SIF is compact D Band Tx with RF frequency from 140-160GHz. LO link is with x12 amplified multiplier chain with input of 11.66-13.33GHz. 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

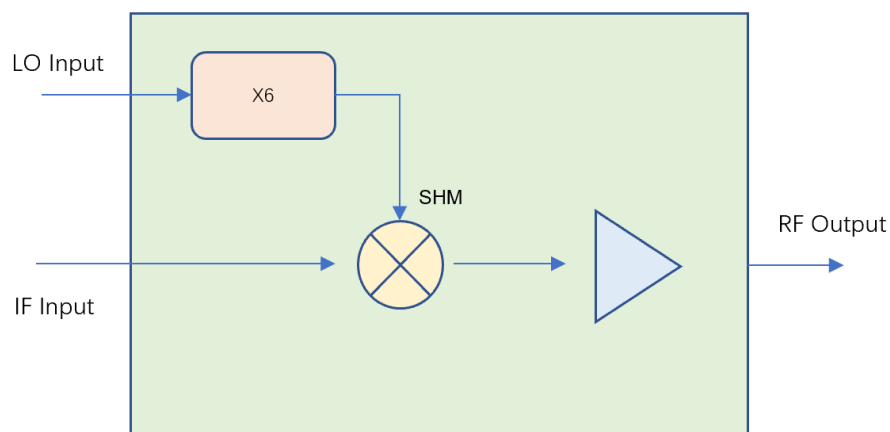
Feature

- ✓ RF: 140-160GHz
- ✓ LO: 11.66-13.33GHz 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-140160SIF

140-160GHz D Band Transmitter

Electrical Specifications:

Parameter	Min	Typical	Max
RF		140-160 GHz	
LO		11.66-13.33 GHz	
LO Driver	+3dBm	+5 dBm	+10
LO AMC (Amplified Multiplier Chain)		X6	
6XLO Frequency Range		70-80GHz	
Mixer Type		Sub-harmonics 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.

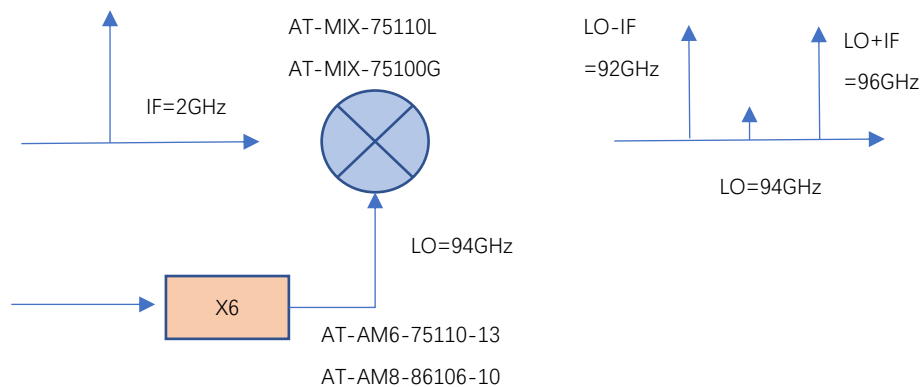


Figure A: General Balance Mixer with Both High and Low Side Output

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.

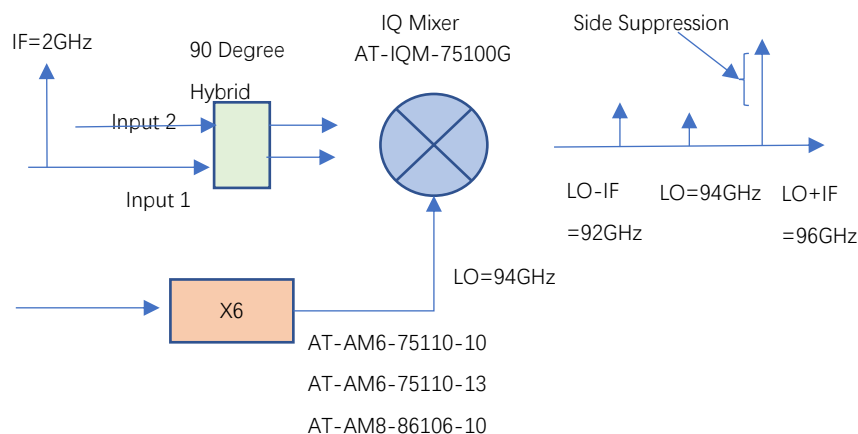


Figure B: IQ Mixer works as side suppression mixer

