

# 125-160GHz Sub-Harmonics Mixer



### Description:

AT-SHM-125160 is sub-harmonics mixer covering 125-160GHz. RF frequency range 125-160GHz with WR-06 waveguide, LO port is 62.5-80GHz with WR-12, and IF port is DC-25GHz with SMA Female.

The mixer can be used as both up and down convertor. AT Microwave also provides active frequency multipliers for this mixer.

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

### Feature

- ✓ RF: 125-160GHz
- ✓ LO: 62.5-80GHz
- ✓ IF: DC-25GHz
- ✓ Low LO power requirement

### Application

- ✓ High Speed Communication
- ✓ Test Equipment
- ✓ ROF (RF Over Fiber)
- ✓ Radar System

### Electronical Specifications:

Parameter	Min	Typical	Max
RF Frequency Range		125-160GHz	
LO Frequency Range		62.5-80GHz	
IF Range		DC-25GHz	
LO Driver	+11dBm	+13dBm	+15dBm
Conversion Loss/IF=100MHz		-15dB	-20dB
IF Input P1dB		0dBm	
RF Input P1dB		-3dBm	
Spec Temp		25C	





# AT-SHM-125160

125-160GHz Band Sub-harmonics Mixer

## Mechanical Information

Item	Description
RF Port	WR-06
LO Port	WR-12
IF Port	SMA Female
Case Material	Copper
Finish	Gold Plated
Weight	30g
Size:	See outline

## Absolute Maximum Ratings Table

Parameter	Value
IF Port Power	+7dBm
RF Port Power	+5dBm
LO Port Power	+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.





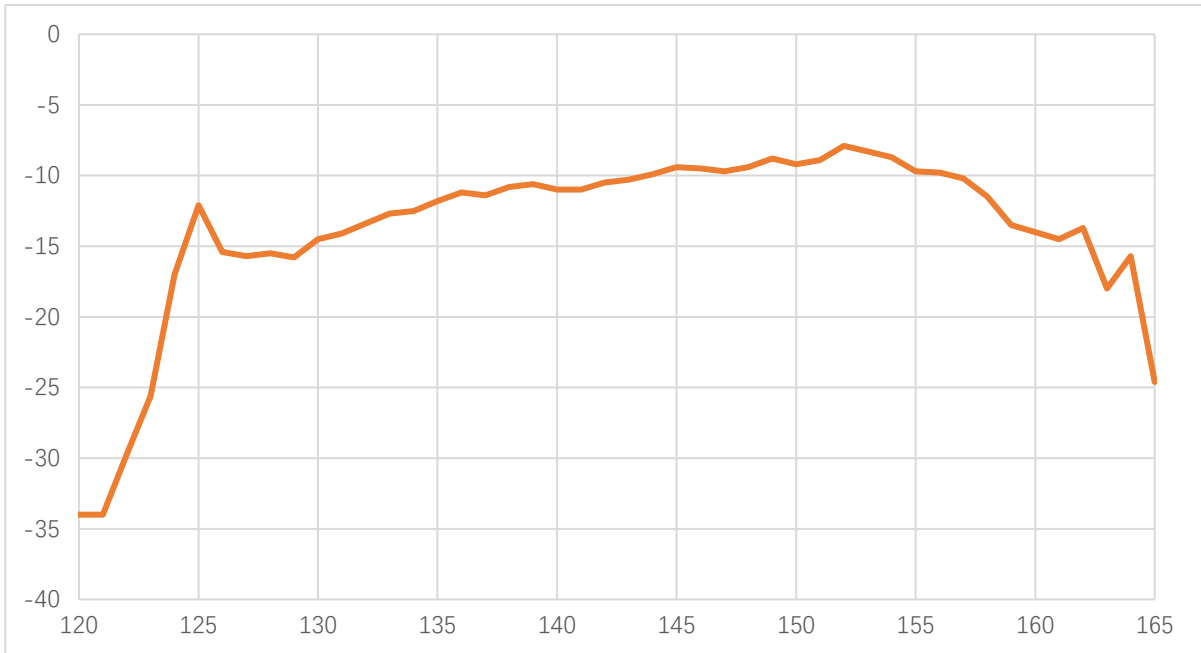
# AT-SHM-125160

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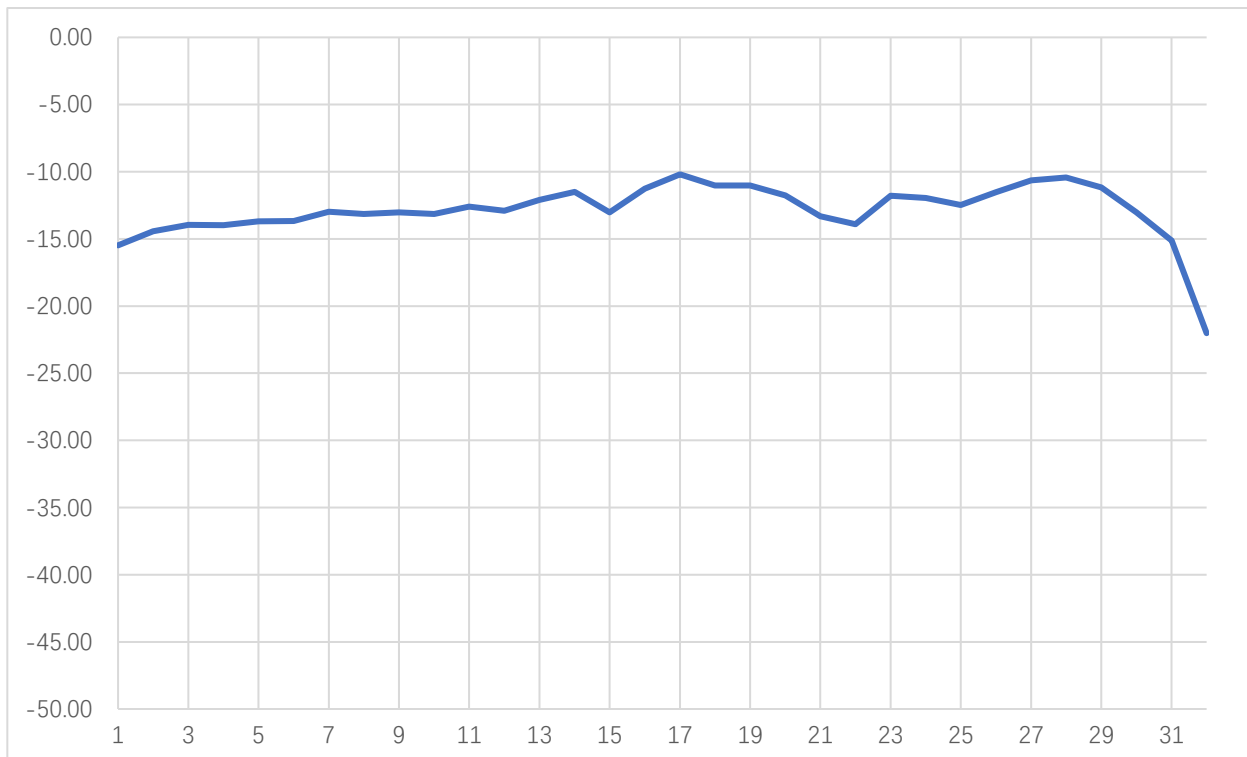
## Test Data:

Test Condition:

IF=100MHz, RF Input Power=-20dBm, 25C



Down-converter Conversion Loss vs Frequency, IF=100MHz



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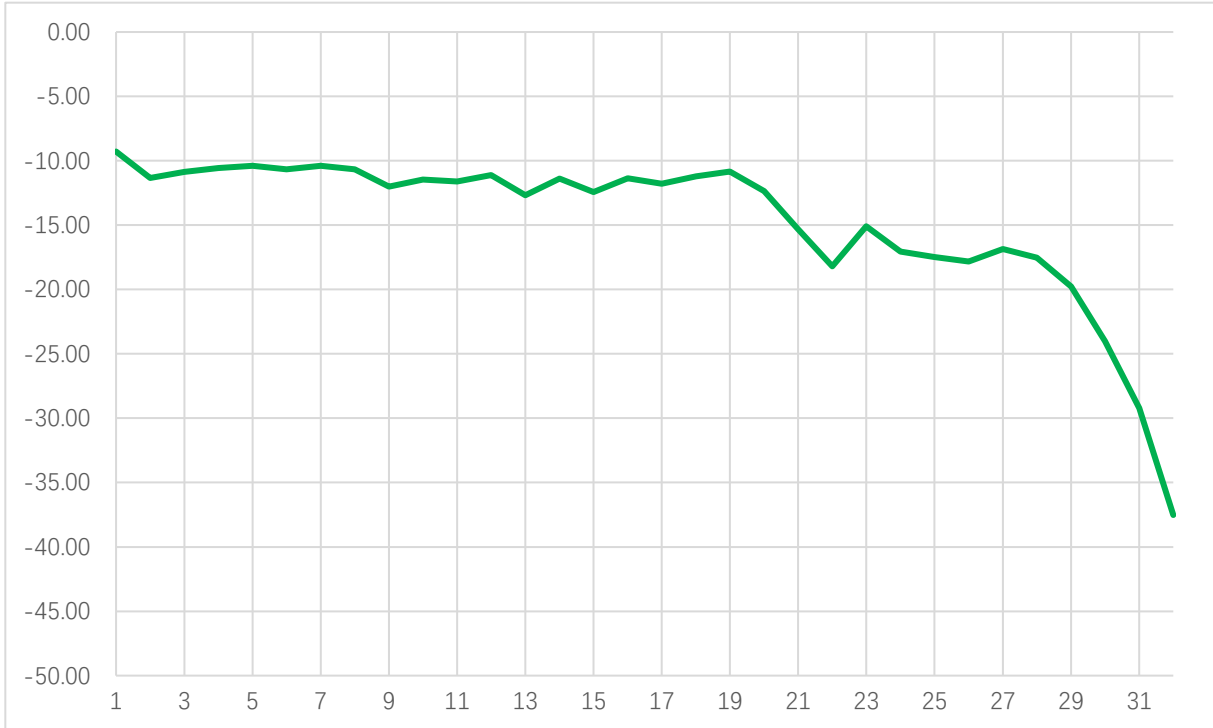




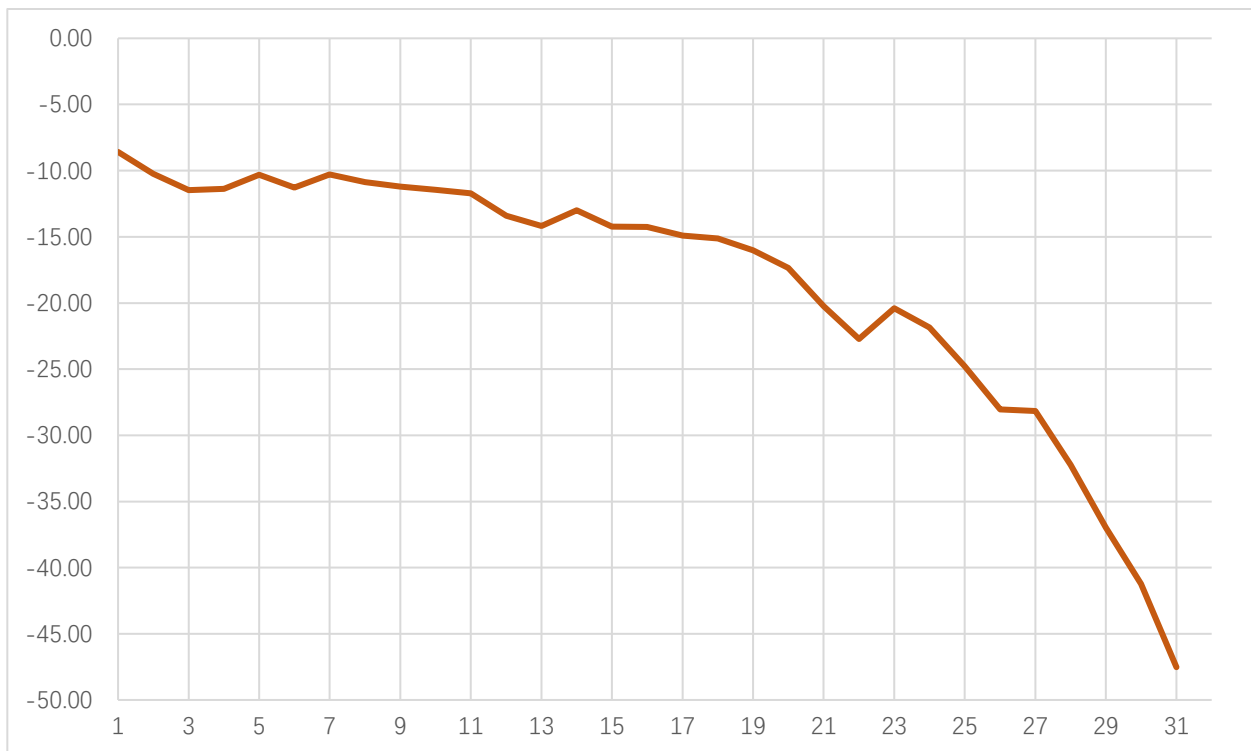
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## 125-160GHz Band Sub-harmonics Mixer

IF Response 1-32GHz, Fixed LO=125GHz



IF Response 1-32GHz, Fixed LO=135GHz



IF Response 1-32GHz, Fixed LO=140GHz



### 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.

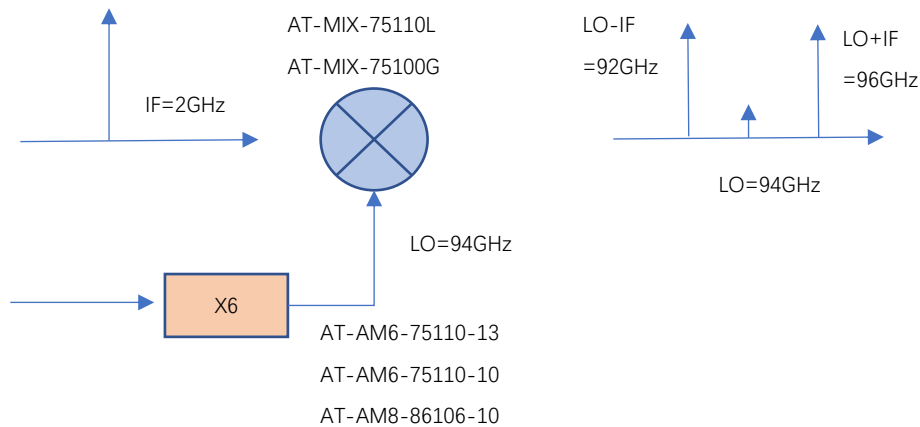


Figure A: General Balance Mixer with Both High and Low Side Output

#### 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.

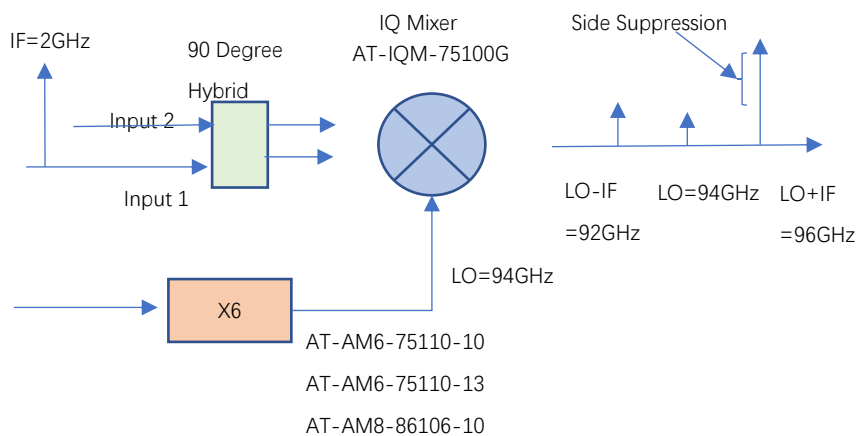


Figure B: IQ Mixer works as side suppression mixer



### Dimension (mm)

