

## V Band: 50-65GHz IQ Mixer



### Description:

AT-IQM-5065H is a V Band up and down balance mixer. IF input is IQ port and can range from DC to 18GHz. LO/RF frequency range is 50-65GHz. LO RF isolation features -40dB. The imaging rejection is -23dB typical.

The mixer is a highly linear and can be used as both IQ modulator or demodulator. AT-AM4-5075C-18 is recommended as LO driver for this mixer.

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

### Feature

- ✓ RF/LO: 50-65GHz
- ✓ IF: DC-20GHz
- ✓ Low Conversion Loss
- ✓ High RF/LO Isolation

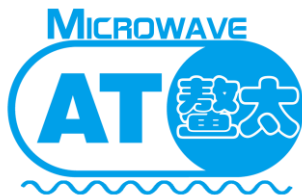
### Application

- ✓ V band Communication
- ✓ Test Equipment
- ✓ ROF (RF Over Fiber)
- ✓ Radar System

### Electronical Specifications:

| Parameter                  | Min | Typical  | Max   |
|----------------------------|-----|----------|-------|
| RF/LO Frequency            |     | 50-65GHz |       |
| IF Range                   |     | DC-20GHz |       |
| Conversion Loss Single I/Q |     | -12dB    | -15dB |
| LO Driver                  | +15 | +18dBm   | +21   |
| Imaging Rejection          | -18 | -23dBc   |       |
| LO/RF Isolation            | -30 | -40dBc   |       |
| Single-side Rejection      |     | -20dBc   |       |
| Bias                       |     | NO       |       |
| Spec Temp                  |     | 25C      |       |





# AT-IQM-5065H

50-65GHz IQ Mixer

## Mechanical Information

| Item          | Description |
|---------------|-------------|
| RF Port       | WR-15       |
| LO Port       | WR-15       |
| IF Port       | SMA Female  |
| Case Material | Copper      |
| Finish        | Gold Plated |
| Weight        | 130g        |
| Size:         | See outline |

## Absolute Maximum Ratings Table

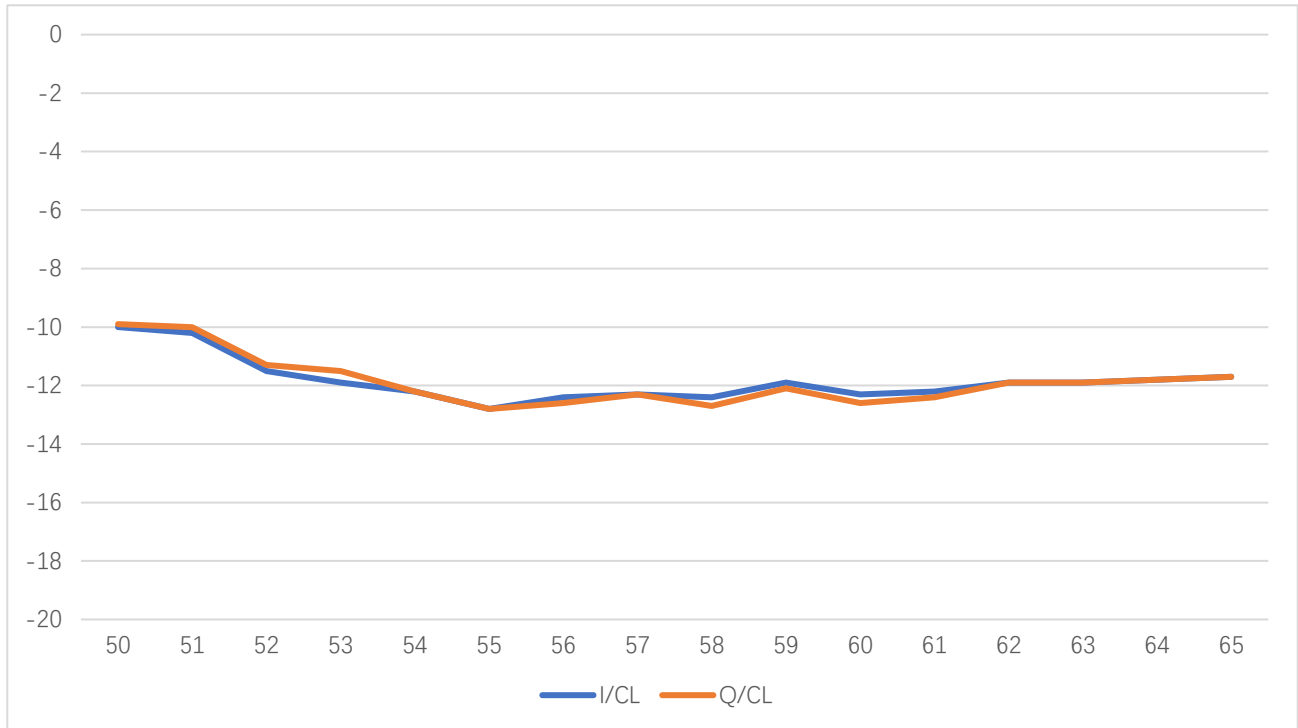
| Parameter             | Value       |
|-----------------------|-------------|
| IF Power              | +15dBm      |
| RF Power              | +15dBm      |
| LO Power              | +26dBm      |
| Operating Temperature | 0 to +50C   |
| Storage Temperature   | -45 to +85C |

## Notes:

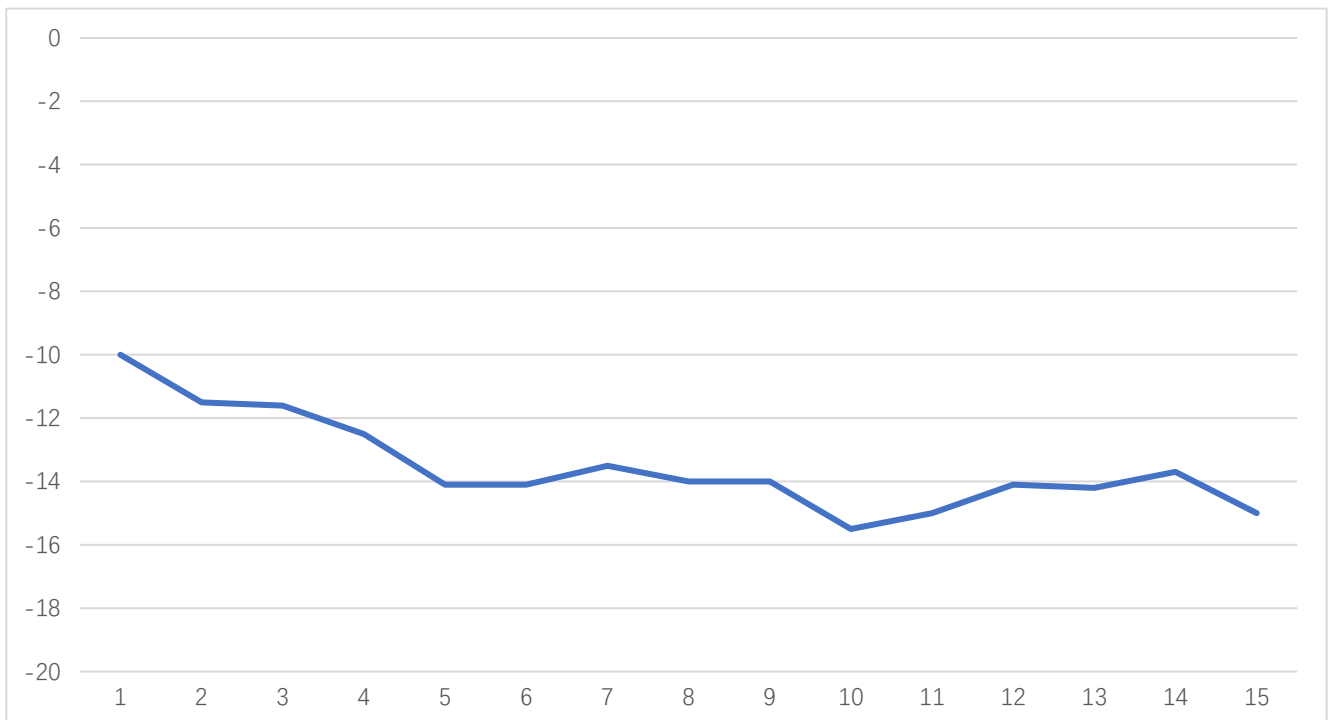
1. Datasheet may be changed according to update of MMIC, Raw materials , process, and so on.
2. This data is only for reference, not for guaranteed specifications.
3. Please contact AT Microwave team to make sure you have the most current data.



### Test Data(25C)

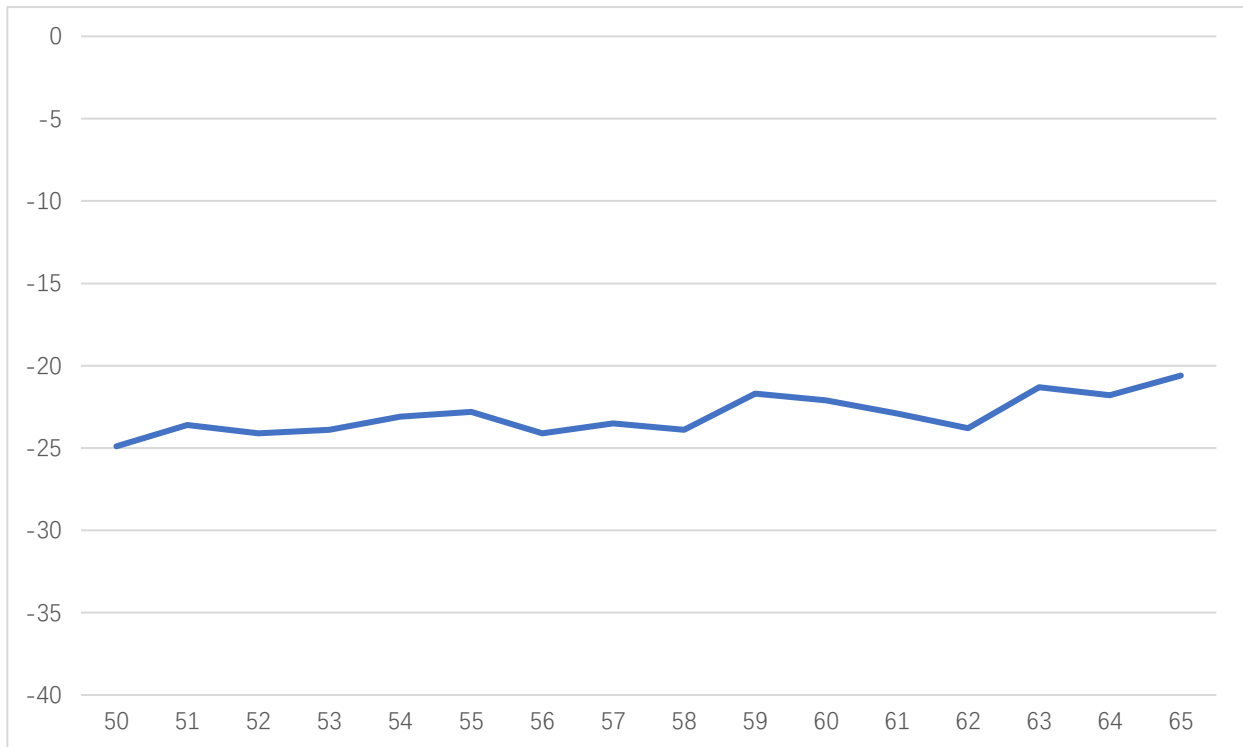


Conversion Loss vs Frequency, IF=1GHz, down-conversion test

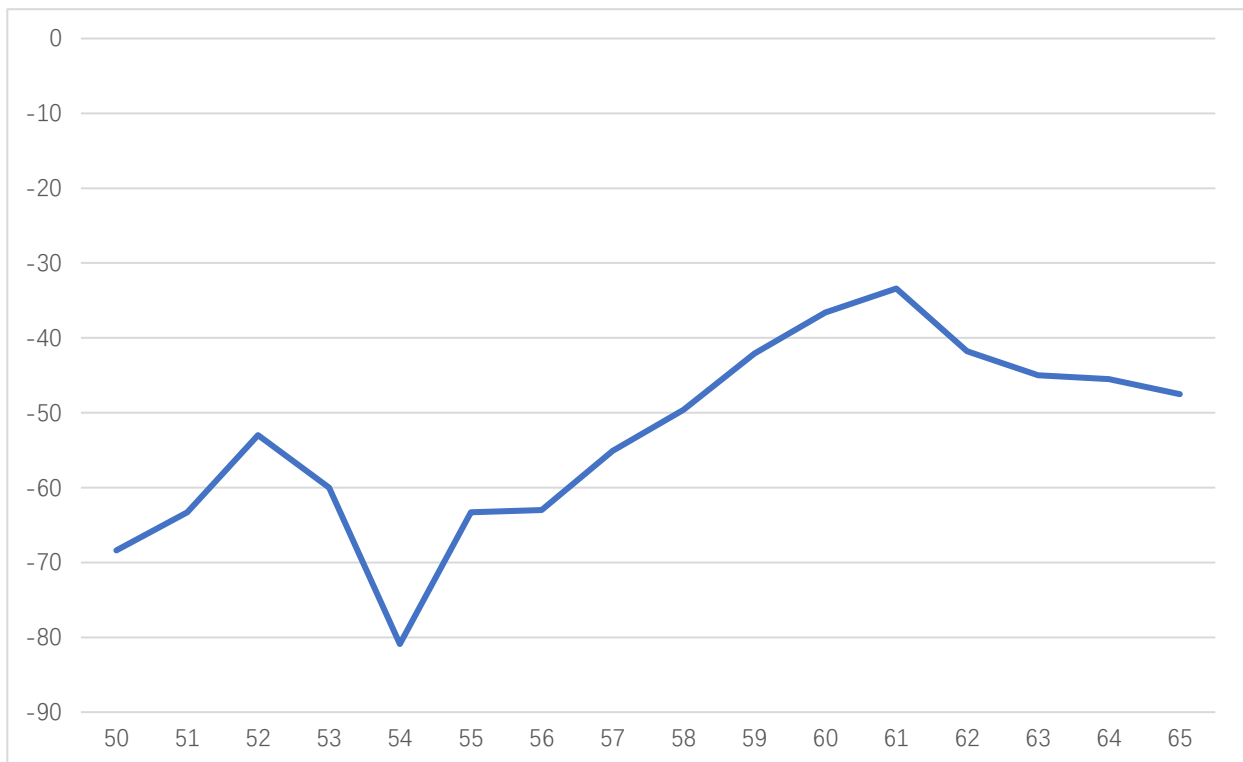


IF Response LO=50GHz, I port, down-conversion test



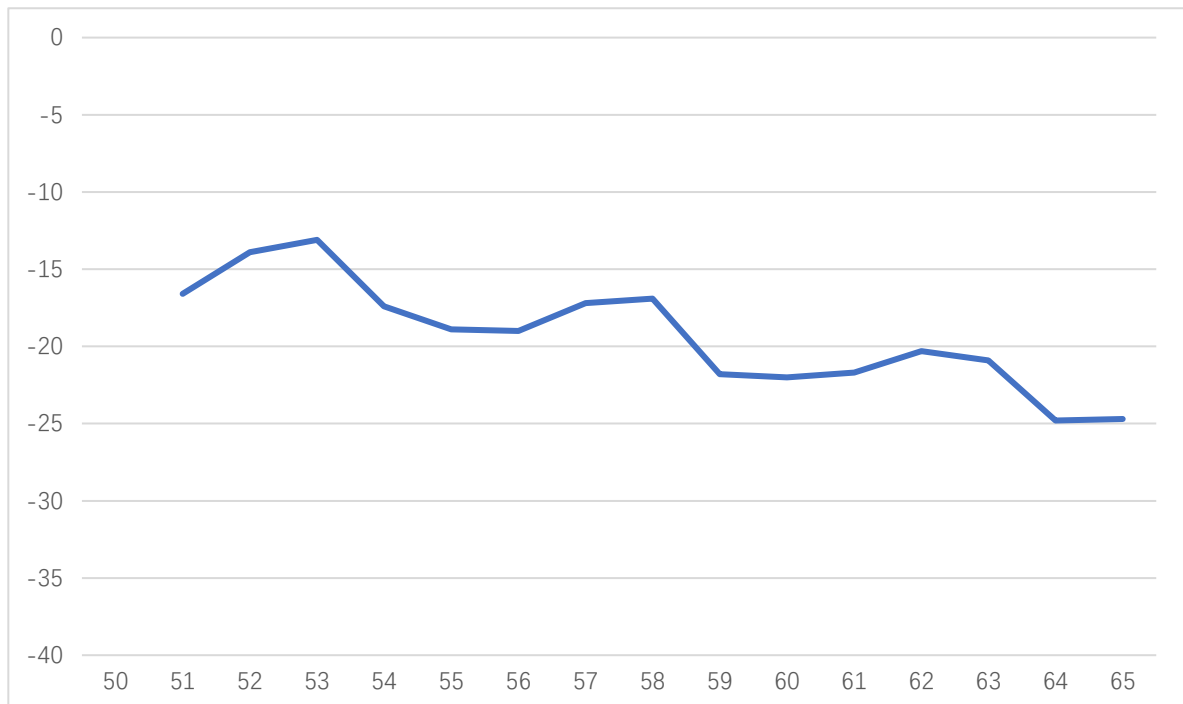


LSB Imaging Rejection vs Frequency, down-conversion test

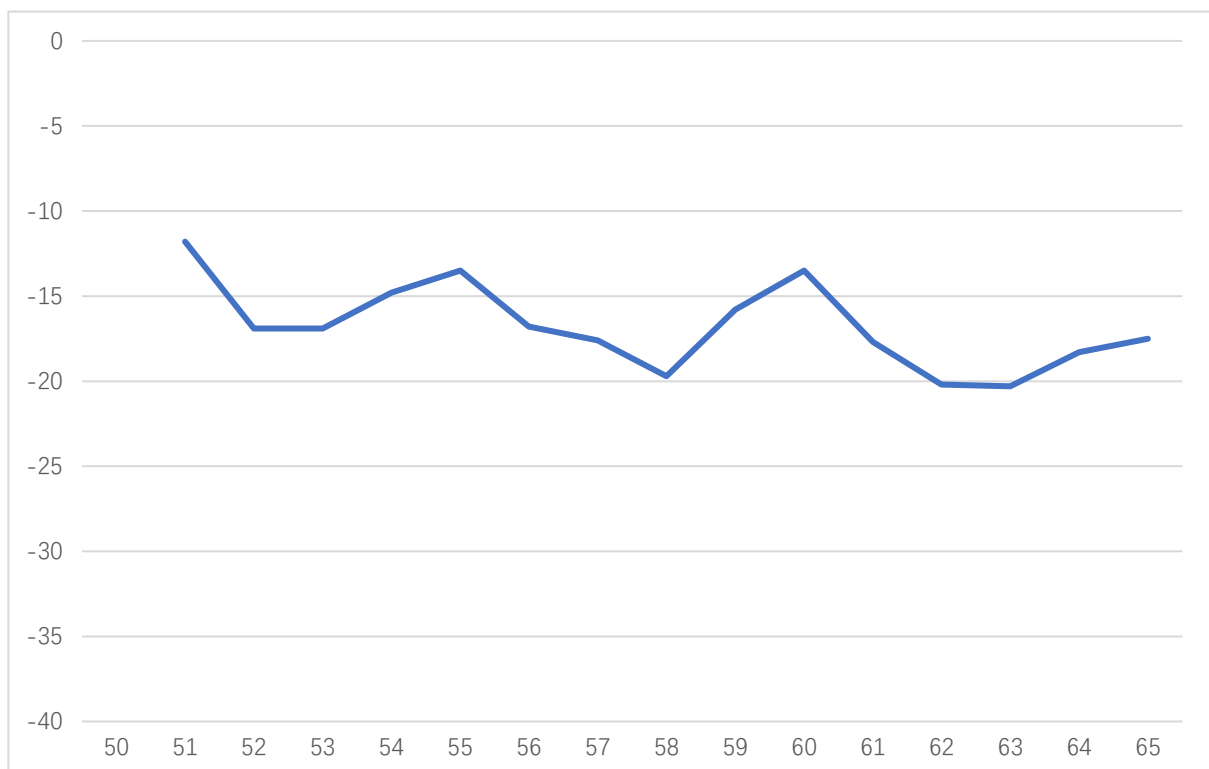


LO/RF Isolation up-conversion test





LSB Sideband Suppression vs Frequency



USB Sideband Suppression 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,  $IF = 2\text{GHz}$ ,  $LO = 60\text{GHz}$ , so there will be  $58\text{GHz}$  and  $62\text{GHz}$  at RF port with same power level.

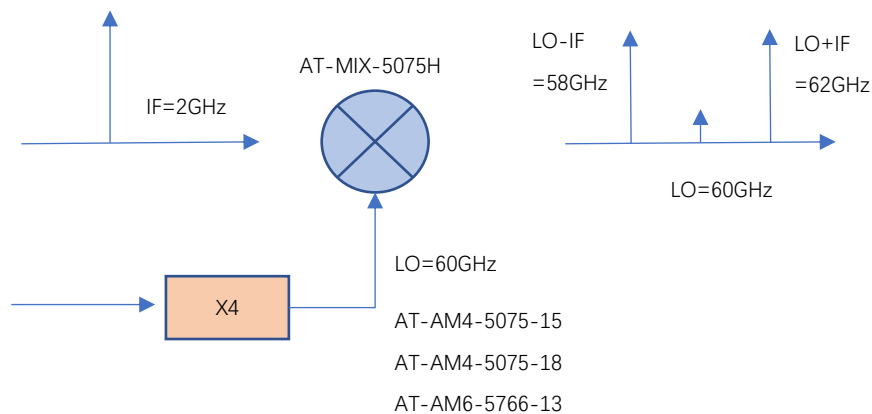


Figure A: General Balance Mixer with Both High and Low Side Output

### IQ Mixer used as side suppression Mixer

When  $IF = 2\text{GHz}$ , 90 degree hybrid is used at IF port, when IF applies to Input 1 Port of hybrid, you will have high end frequency  $RF = LO + IF = 62\text{GHz}$ , while have side suppression (say  $-25\text{dBc}$ ) at Low end frequency  $58\text{GHz}$ . When you need low end frequency  $58\text{GHz}$ , and make side suppression for high end frequency  $62\text{GHz}$ , just applies IF to Input 2 of the hybrid.

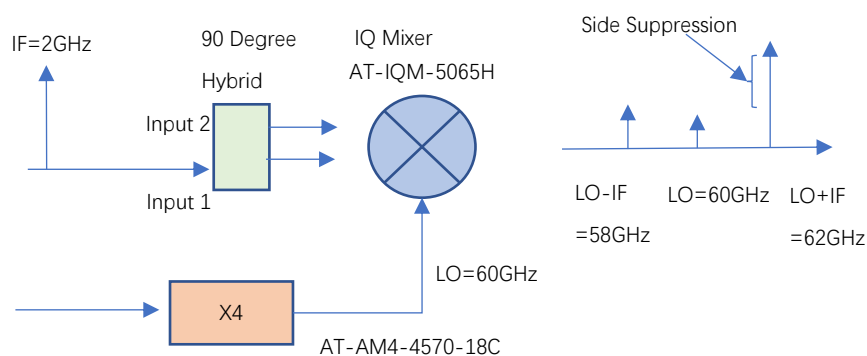


Figure B: IQ Mixer works as side suppression mixer



## Dimension(mm)

