

## Product Description

ATEK750N3 is a wideband frequency mixer covering 5 to 28 GHz RF and LO, DC to 8 GHz IF frequency range. Mixer can be used for both upconversion and downconversion applications.

ATEK750N3 provides low loss over wideband. This allows users to easily realize wideband receiver frontends.

Mixer is housed in a compact 3x3 mm low cost SMD package, input and output are matched to 50 ohms internally.

Evaluation Board, bare die, custom package, and module options are available upon request.

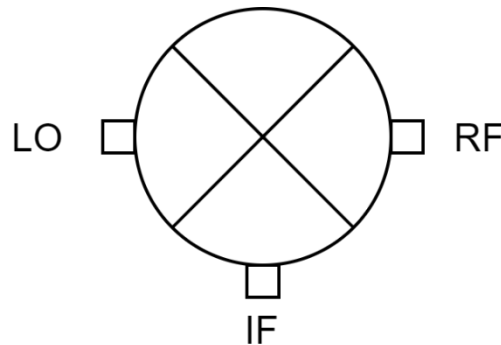
## Product Features

- Frequency Range: 5 - 28 GHz
- Low Loss: 8 dB
- 3x3 mm compact size

## Applications

- Wideband Receivers
- SDR
- Test Equipment
- Radar

## Functional Block Diagram



## Electrical Specifications

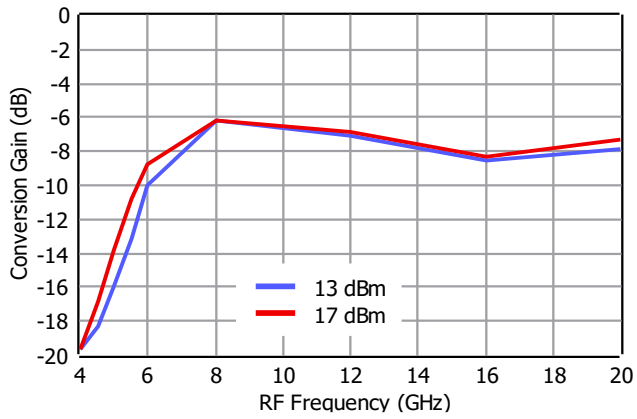
Conditions unless otherwise specified: Typical, T=25 C, CW.

Parameter		Min	Typ	Max	Units
Operational Frequency Range	RF	5		28	GHz
	LO	5		28	
	IF	DC		8	
Conversion Gain LO=13dBm	6 GHz		-10		dB
	12 GHz		-7		
	16 GHz		-8.5		
	20 GHz		-7.8		
	26 GHz		-9.9		
RF Return Loss			-8		dB
LO Return Loss			-8		dB
IF Return Loss			-10		dB
Input IP3					dBm
Operating Temperature		-40		85	°C

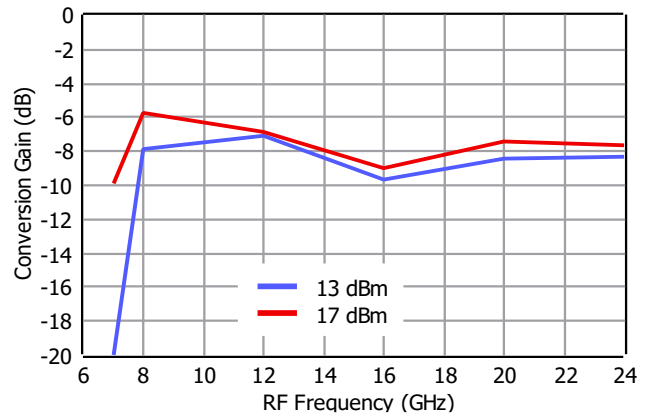
## Typical Performance Plots

Conditions unless otherwise specified: Typical, T =25 C, CW. Downconverter.

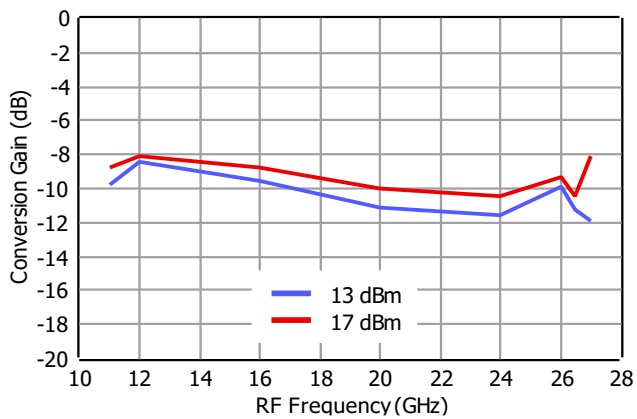
Conversion Gain vs. LO Power, IF=1 GHz,  
Lower Sideband



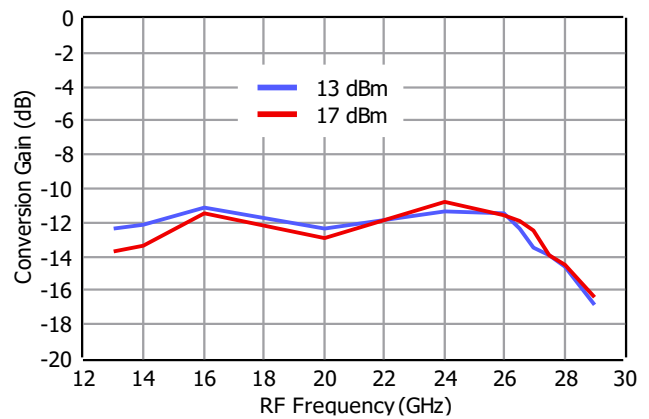
Conversion Gain vs. LO Power, IF=3 GHz,  
Upper Sideband



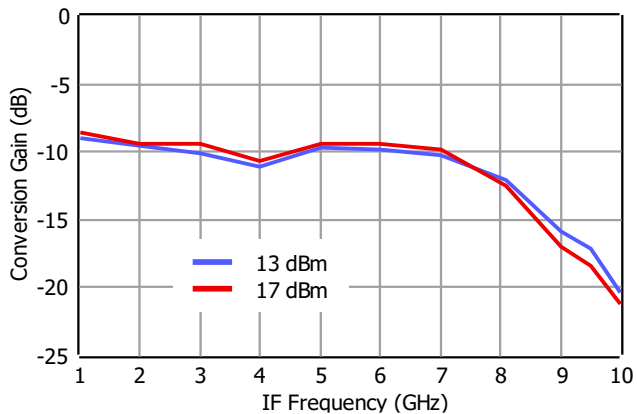
Conversion Gain vs. LO Power, IF=6 GHz,  
Upper Sideband



Conversion Gain vs. LO Power, IF=8 GHz,  
Upper Sideband



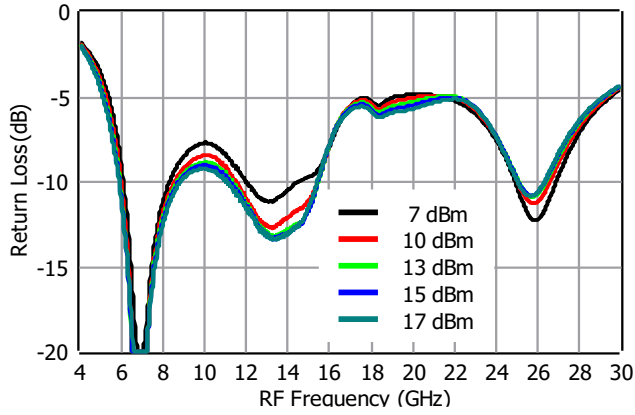
Conversion Gain vs. IF Frequency, LO Power  
Upper Sideband, RF=16 GHz



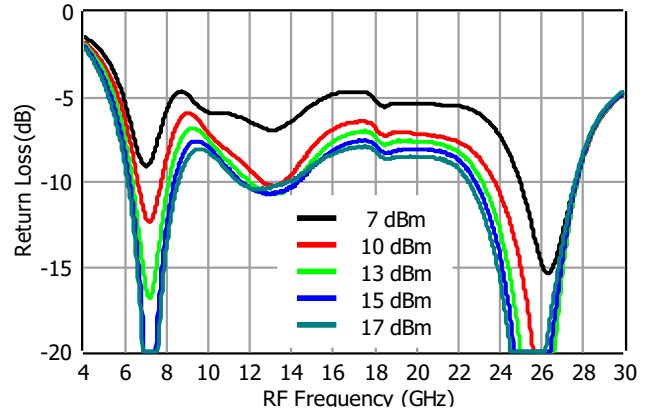
## Typical Performance Plots

Conditions unless otherwise specified: Typical, T=25 C, CW. Downconverter, Upper Sideband

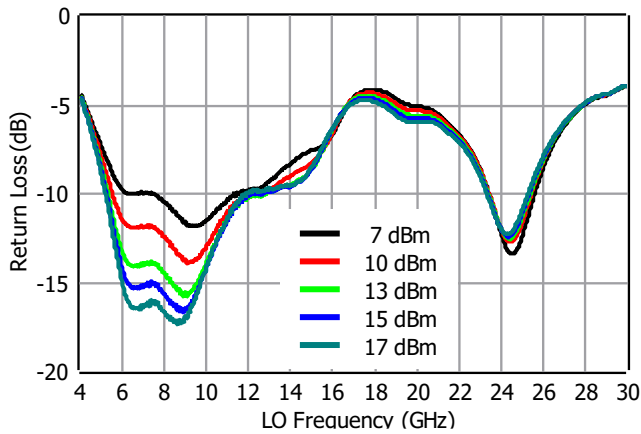
RF Return Loss vs. LO Power, LO=8 GHz



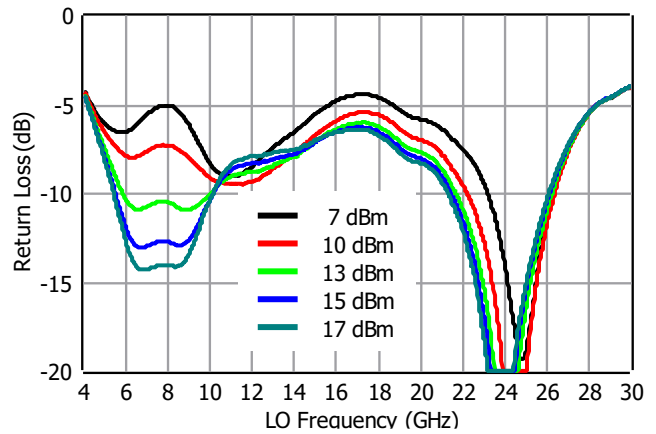
RF Return Loss vs. LO Power, LO=18 GHz



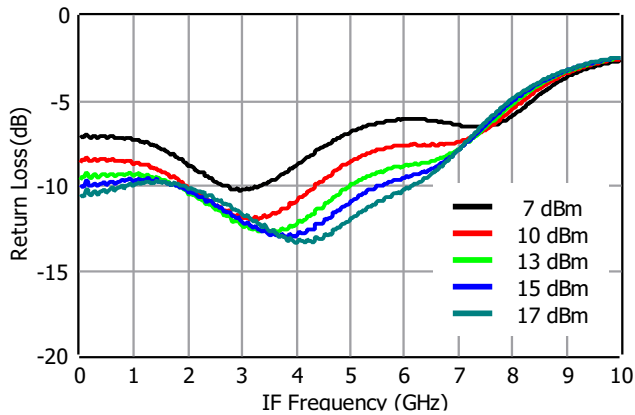
LO Return Loss vs. RF Power, RF=8 GHz



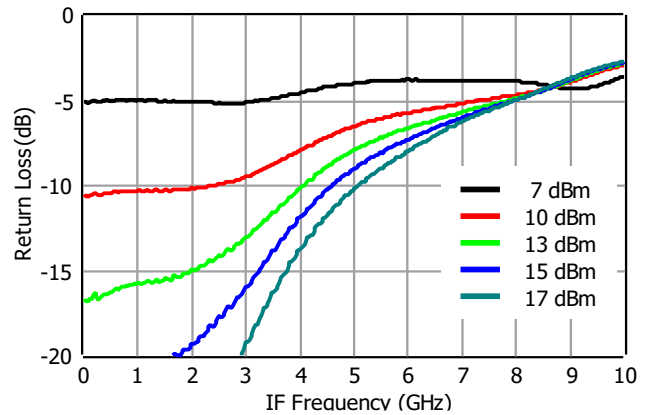
LO Return Loss vs. RF Power, RF=18 GHz



IF Return Loss vs. RF Power, RF=8 GHz



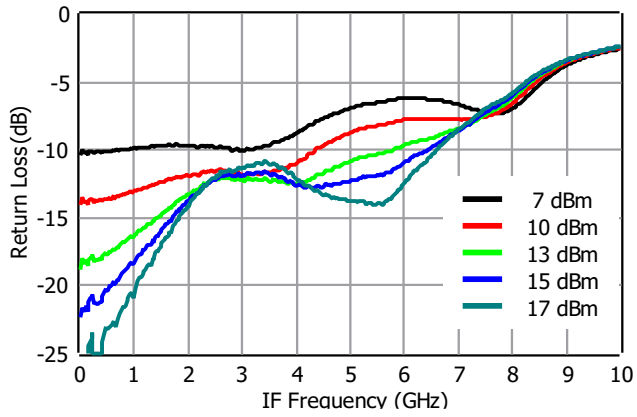
IF Return Loss vs. RF Power, RF=18 GHz



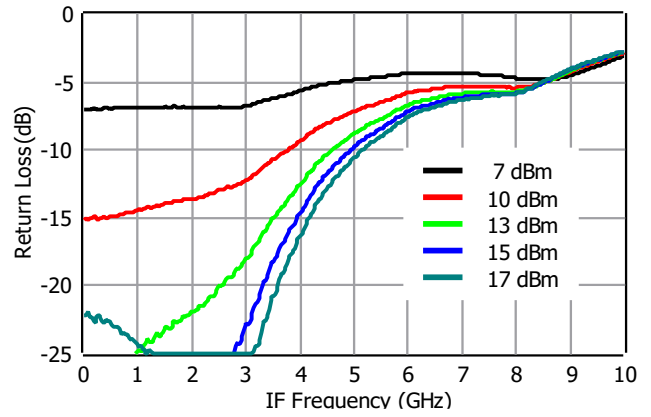
**Typical Performance Plots**

Conditions unless otherwise specified: Typical, T=25 C, CW. Downconverter, Upper Sideband

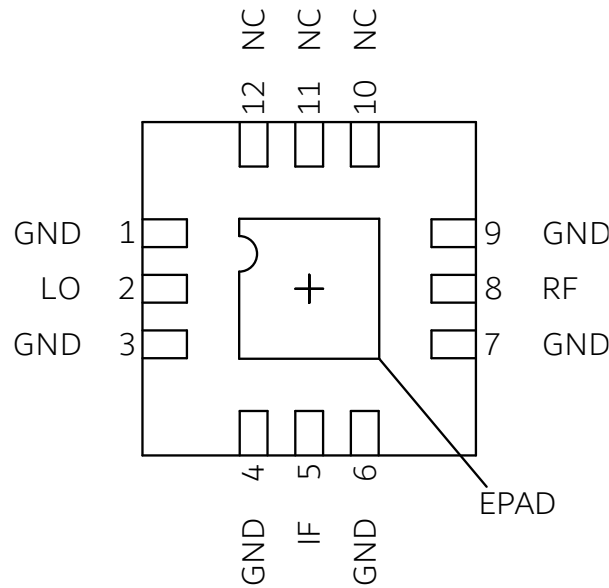
IF Return Loss vs. LO Power, LO=8 GHz



IF Return Loss vs. LO Power, LO=18 GHz



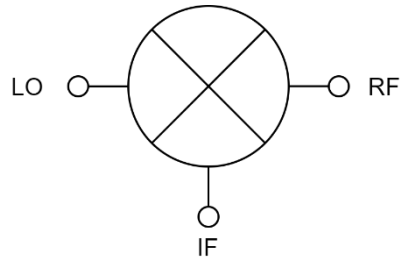
**Pin Description**



Pin Number	Pin Name	Description
2	LO	LO input/output pin. This pin is AC coupled.
5	IF	RF input/output pin. If the DC voltage level on IF line is not equal to 0 V, an external DC block capacitor is required.
8	RF	RF input/output pin. If the DC voltage level on RF line is not equal to 0 V, an external DC block capacitor is required.
10-12	NC	These pins are not internally connected. Can be grounded on the PCB.
1, 3, 4, 6, 7, 9	GND	Ground.
17	EPAD	Exposed Pad on the bottom of the package should be connected to ground with multiple number of vias to reduce the inductance to the GND.

## Applications Information

Typical application schematic to operate the mixer is given below.



ATEK750N3 mixer can be used for both frequency up conversion and down conversion applications.

For frequency up conversion applications input signal is applied to IF pin, LO signal is applied to LO pin. Frequency upconverted signal goes to RF pin as an output.

For frequency down conversion applications input signal is applied to RF pin, LO signal is applied to LO pin. Frequency down converted signal goes to IF pin as an output. LO and RF ports are interchangeable.

All datasheet plots are generated by using a connectorized evaluation board (EVB) with the application schematic provided above. PCB transmission line losses are de-embedded to plot the Conversion Gain data.

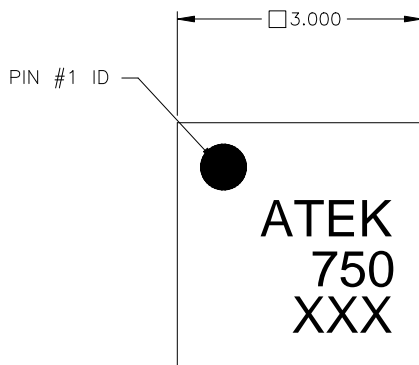
The NC pins of the Mixer are connected to the GND on the PCBs used to generate the plots shown in this document.

## Absolute Maximum Ratings

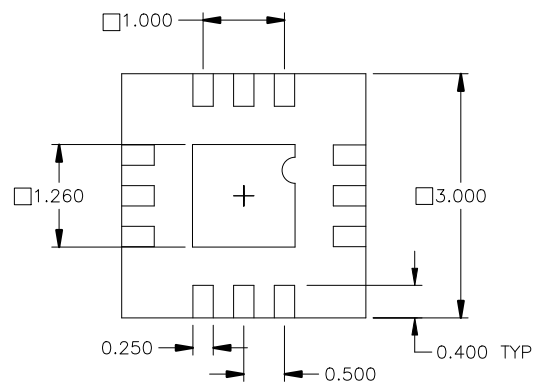
Parameter	Value/Range
IF Sink/Source Current	TBD
RF, LO, IF Input Power	TBD
Storage Temperature	-55 to +125°C

Operation of this device outside the parameter ranges given above may cause damage. These parameters should not be applied simultaneously.

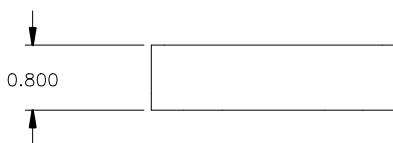
## Mechanical and Marking Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

### NOTES

1. JEDEC OUTLINE: MO-220
2. ALL DIMENSIONS IN MM
3. TOLERANCE IN X.XX=  $\pm 0.15$  X.XXX=  $\pm 0.050$



## Handling Precautions



Caution!  
ESD-Sensitive Device  
Handle Accordingly

## Contact Information

For the latest specifications, additional product information, support, and sales.

Web: [www.atekmidas.com](http://www.atekmidas.com)

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Email: [support@atekmidas.com](mailto:support@atekmidas.com)

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## Revisions

Revision No	Revision Date	Revision Reason	Section / Page No
1.0	05.07.2021	Initial Version	