

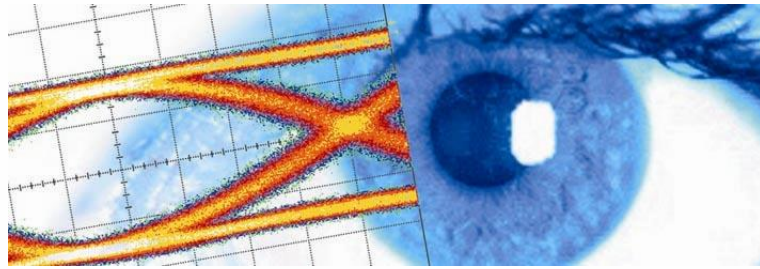


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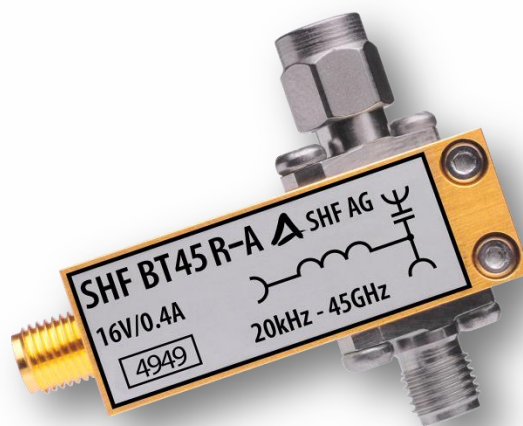
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# Datasheet

## SHF BT45R

### 45 GHz Broadband Bias-Tee





## Description

The SHF BT45R bias tee is the RoHS compliant successor of the SHF BT45. It outputs the superposition of the signals applied to the AC and to the DC port. Any existing DC content is blocked from its AC input while the DC input is practically only allowing transmission of pure DC<sup>1</sup>.

Based on SHF's air line construction, it offers resonance-free transmission up to 45 GHz. In addition to the low insertion loss, all products have an extremely low group delay ripple.

## Applications

- Optical Communications
- High-Speed Pulse Experiments
- Satellite Communications
- Research and Development
- Antenna Measurements
- Data Transmission

## Configurations

- A - AC port: 2.92 mm male, AC+DC port: 2.92 mm female
- B - AC port: 2.92 mm female, AC+DC port: 2.92 mm male
- C - AC port: 2.92 mm male, AC+DC port: 2.92 mm male
- D - AC port: 2.92 mm female, AC+DC port: 2.92 mm female

One of above configurations has to be chosen. For more information, please be referred to the mechanical drawing on the last page of this data sheet. The DC-port is always SMA female.

## Options

- HV100 - High Voltage (maximum DC voltage extended to 100 V)
- HV200 - High Voltage (maximum DC voltage extended to 200 V)
- HC600 - High Current (maximum DC current extended to 600 mA)
- HC1000 - High Current (maximum DC current extended to 1 A)
- HC2000 - High Current (maximum DC current extended to 2 A)
- HVC100/1000 - High Voltage & Current (maximum DC voltage extended to 100 V and maximum DC current extended to 1 A)

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<sup>1</sup> In case a low- and a high frequency signal should be combined a SHF Diplexer (essentially a bias tee with a certain bandwidth in the low frequency path) would be the right choice.



# Specifications - SHF BT45R

Parameter	Unit	Symbol	Min	Typ	Max	Conditions
<b>Absolute Maximum Ratings for SHF BT45R without Option</b>						
Maximum RF Input	dBm	$P_{in\ max}$			30	average power of a continuous <sup>2</sup> signal, 50 $\Omega$ load and $f \geq 2 \times f_{LOW}$
Maximum DC Voltage	V		-16		16	difference between ports and between ports to ground
Maximum DC Current	mA		-400		400	
Case Temperature	$T_{case}$	$^{\circ}C$	10	25	50	
<b>Electrical Characteristics SHF BT45R without Option (At 25<math>^{\circ}C</math> case temperature)</b>						
High Frequency 3 dB Point	GHz	$f_{HIGH}$	45			
Low Frequency 3 dB Point	kHz	$f_{LOW}$			20	
Insertion loss	dB	$S_{21}$			1.5	< 40 GHz
Input Reflection	dB	$S_{11}$			-17 -15 -10	>40 MHz <15 GHz <20 GHz <45 GHz
Isolation		dB			-40	
DC Resistance	$\Omega$			3.5		DC to RF port
<b>Mechanical Characteristics</b>						
Connector	$\Omega$			50		2.92mm (K)
Dimensions	mm					please see page 5

In case an option is chosen the following variations to above specifications apply:

Parameter	Unit	No option	HV 100	HV 200	HC 600	HC 1000	HC 2000	HV 100/1000
Maximum DC Voltage	V	-16...+16	-100...+100	-200...+200	-16...+16	-16...+16	-16...+16	-100...+100
Maximum DC Current	A	-0.4...+0.4	-0.4...+0.4	-0.4...+0.4	-0.6... +0.6	-1... +1	-2... +2	-1... +1
Max. Low Frequency 3 dB Point	MHz	0.02	0.4	2	0.02	300	1000	300
Typical DC Resistance	$\Omega$	3.5	3.5	3.5	3	0.1	0.1	0.1

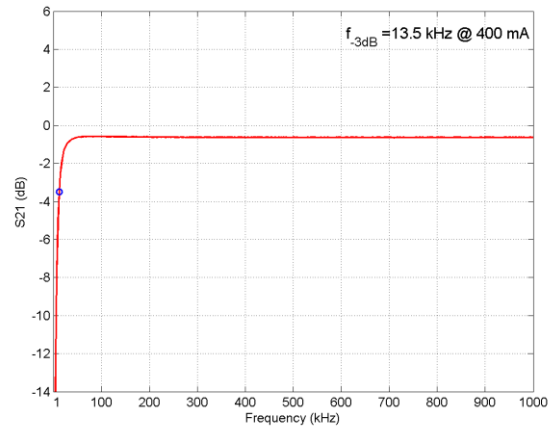
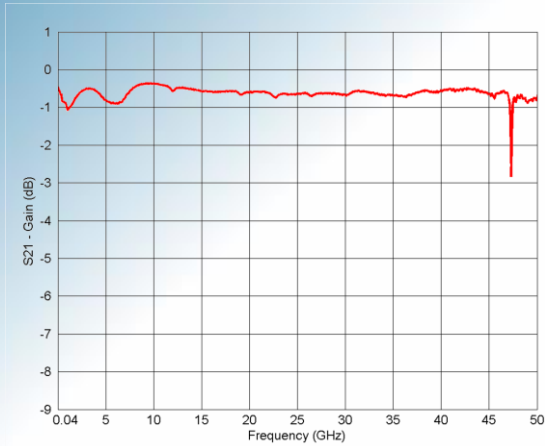
<sup>2</sup> 30 dBm (1 W) equals 20 V peak to peak for continuous sinusoidal signals. A pulsed excitation with an average of 1 W and thus having significantly higher peaks is possible.

The maximum RF input power does not change in case a signal is applied to the DC port.

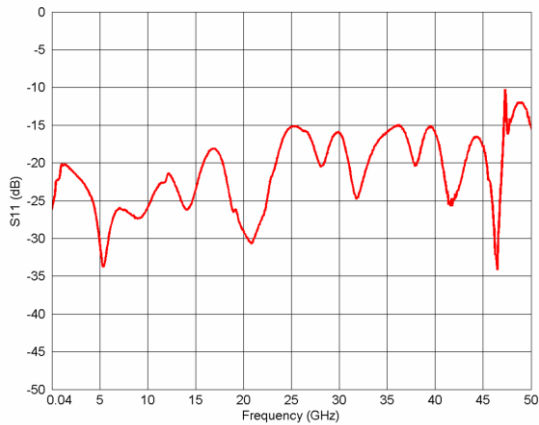


# Typical S-Parameters for a BT45R without Option

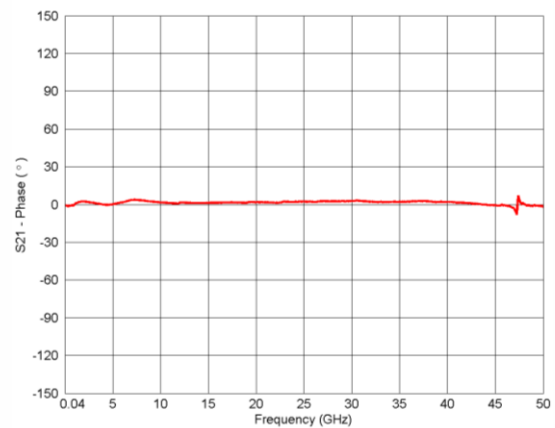
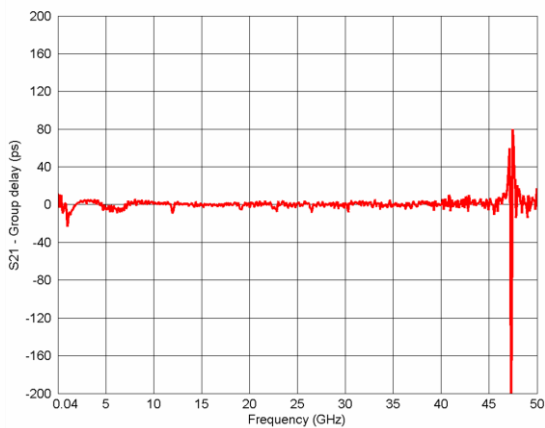
## Insertion loss



## Input return loss



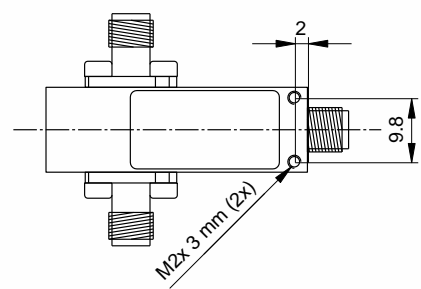
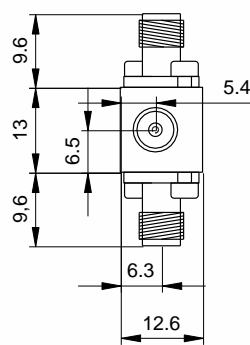
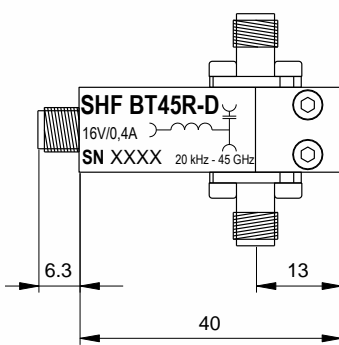
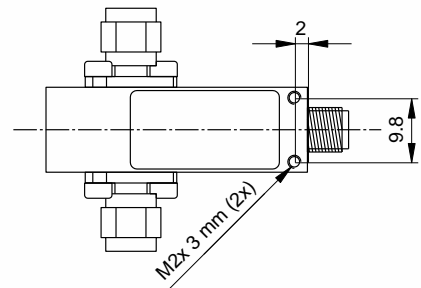
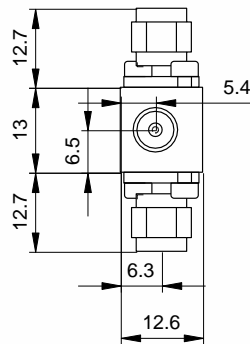
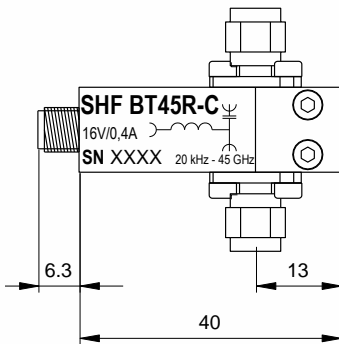
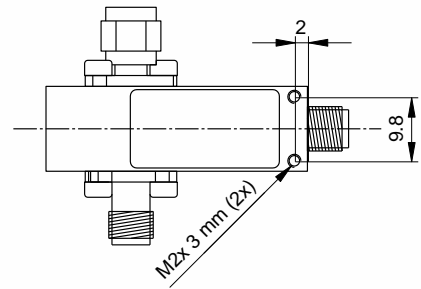
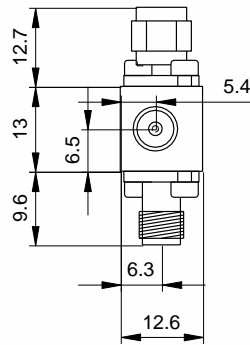
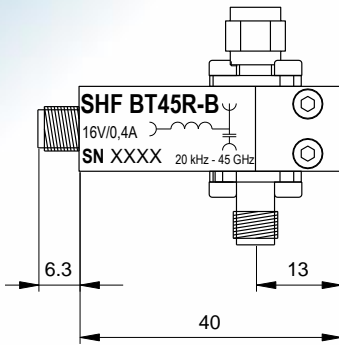
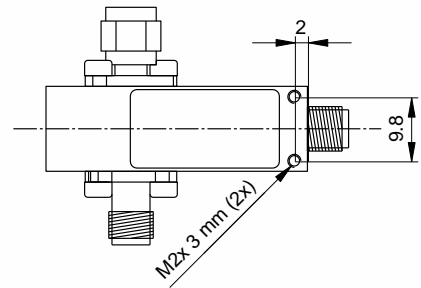
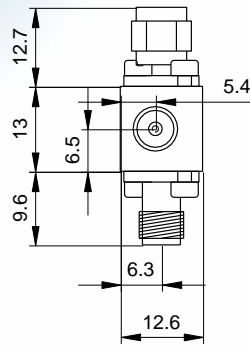
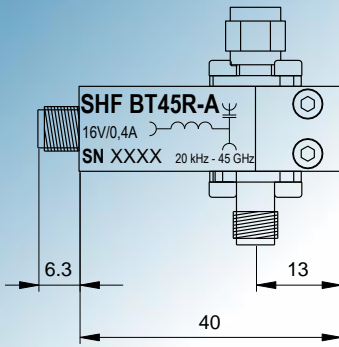
## Group delay and phase response



Aperture of group delay measurement: 100MHz



# Mechanical Drawing



All dimensions in mm