

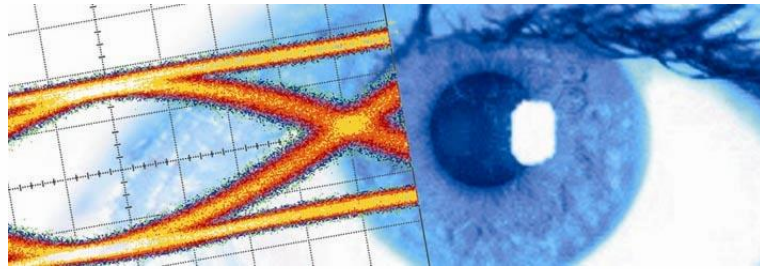


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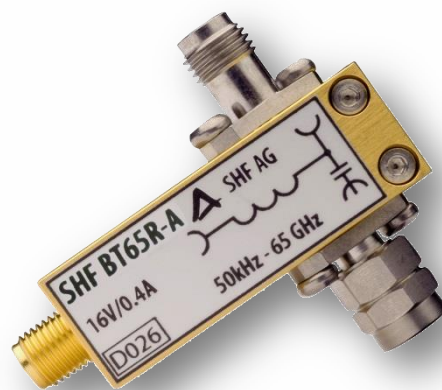
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Datasheet

SHF BT65R

65 GHz Broadband Bias-Tee





Description

The SHF BT65R bias tee is the RoHS compliant successor of the SHF BT65. 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 DC¹.

Based on SHF's air line construction, it offers resonance-free transmission up to 65 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: 1.85 mm male, AC+DC port: 1.85 mm female
- B - AC port: 1.85 mm female, AC+DC port: 1.85 mm male
- C - AC port: 1.85 mm male, AC+DC port: 1.85 mm male
- D - AC port: 1.85 mm female, AC+DC port: 1.85 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)
- EM - Extended Measurement (inspection report up to 110 GHz)

¹ 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 BT65R

Parameter	Unit	Symbol	Min	Typ	Max	Conditions	
Absolute Maximum Ratings							
Maximum RF Input w/o option	dBm	$P_{in\ max}$			30	average power of a continuous ² signal, 50 Ω load and $f \geq 100$ kHz	
Maximum RF Input with Opt. HV100	dBm	$P_{in\ max}$			30	average power of a continuous ² signal, 50 Ω load and $f \geq 10$ MHz	
Maximum DC Voltage w/o option	V		-16		16	difference between ports and between ports to ground	
Maximum DC Voltage with Opt. HV100	V		-100		100	difference between ports and between ports to ground	
Maximum DC Current	mA		-400		400		
Case Temperature	T_{case}	$^{\circ}C$	10	25	50		
Electrical Characteristics (At 25$^{\circ}C$ case temperature, unless otherwise specified)							
High Frequency 3 dB Point	GHz	f_{HIGH}	65				
Low Frequency 3 dB Point w/o option	kHz	f_{LOW}		10	15	with 1 V_{DC} applied	
				40	50	with 16 V_{DC} applied	
Low Frequency 3 dB Point opt. HV100	MHz	f_{LOW}		1	1.5	with 1 V_{DC} applied	
					2.8	3.0	with 100 V_{DC} applied
Insertion loss	dB	S_{21}			1.5	< 65 GHz	
Input Reflection	dB	S_{11}			-17	>40 MHz <15 GHz	
						-15	<30 GHz
						-9	<65 GHz
Isolation		dB			-40		
DC Resistance	Ω			3.5		DC to RF port	
Mechanical Characteristics							
Connector	Ω			50		1.85mm (V)	
Dimensions	mm					please see page 7	

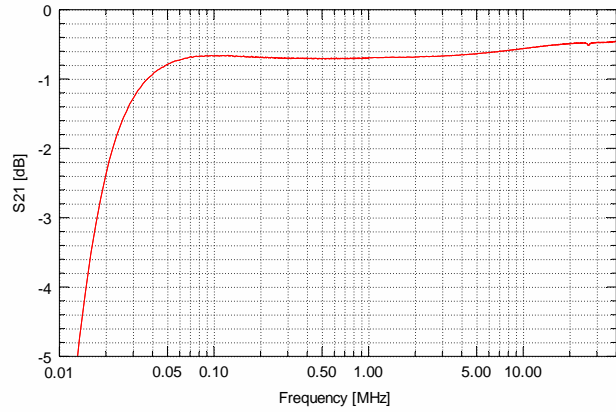
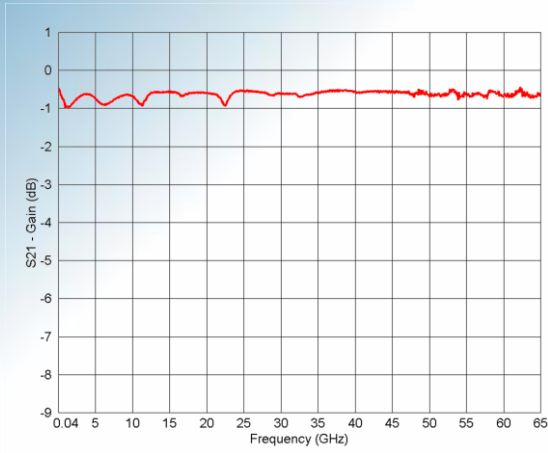
² 30 dBm (1 W) equals 20 V peak to peak for continuous sinusoidal signals. A pulsed excitation with an average of 1 W and thus having significantly higher peaks is possible.

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

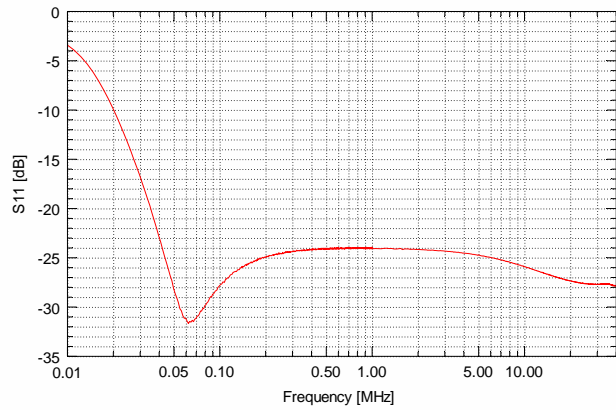
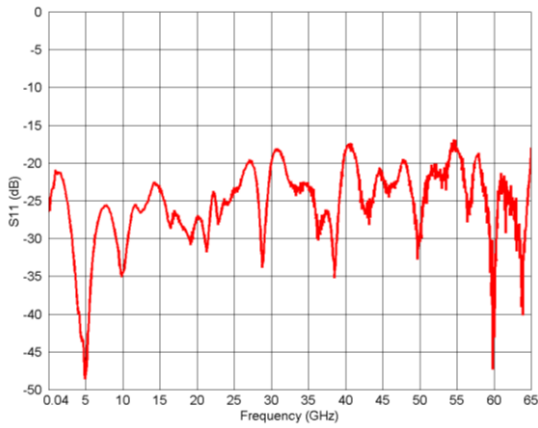


Typical S-Parameters for a BT65R without Option

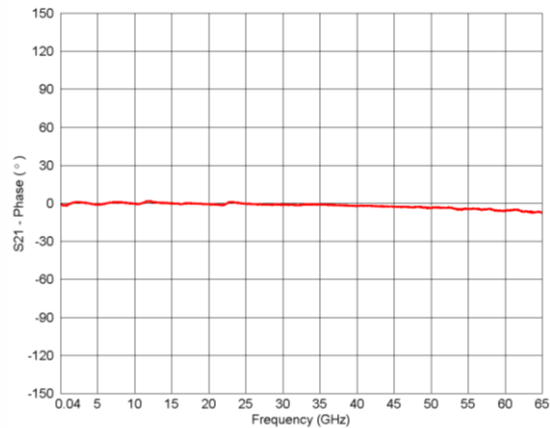
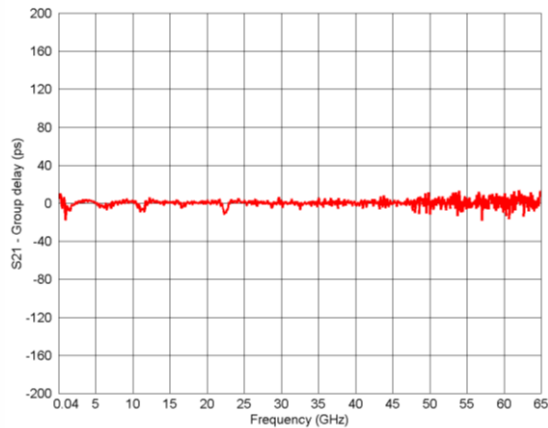
Insertion loss



Input return loss



Group delay and phase response



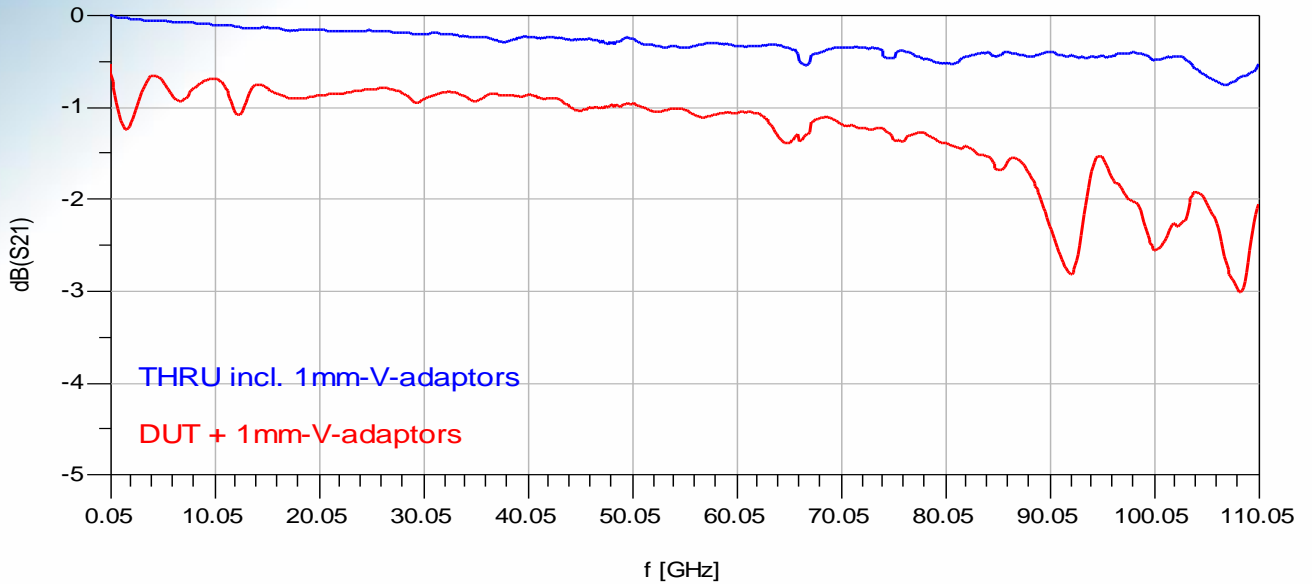
Aperture of group delay measurement: 100MHz



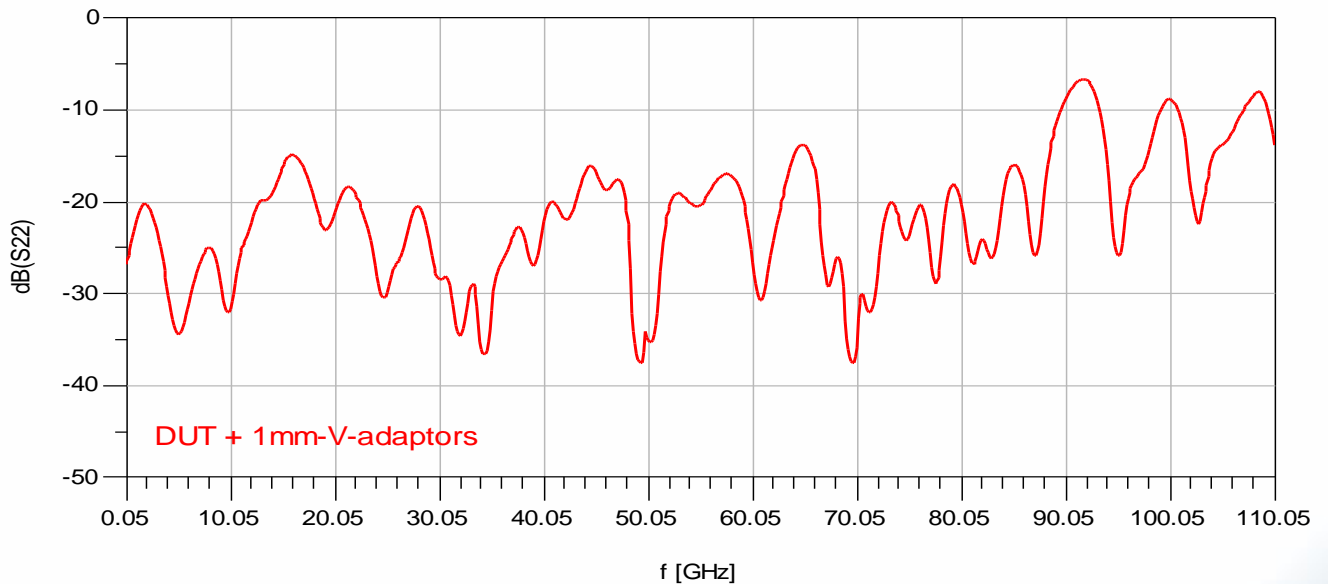
Typical S-Parameters for a BT65R with Option EM

When selecting the option EM the performance of the bias tee is measured up to 110GHz. The spikes at ~67 GHz and ~75 GHz are due to moding of the V connectors.

Insertion loss



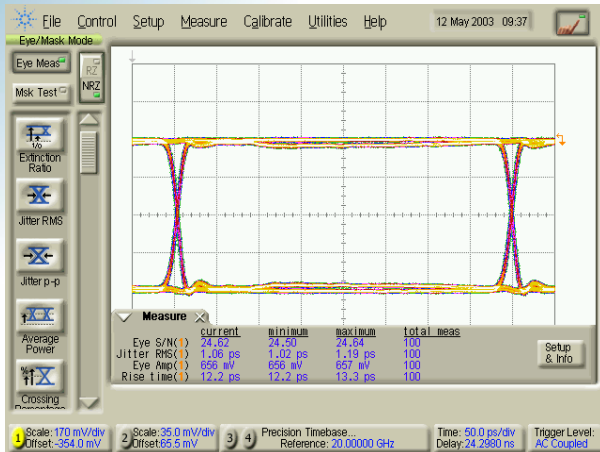
Return loss



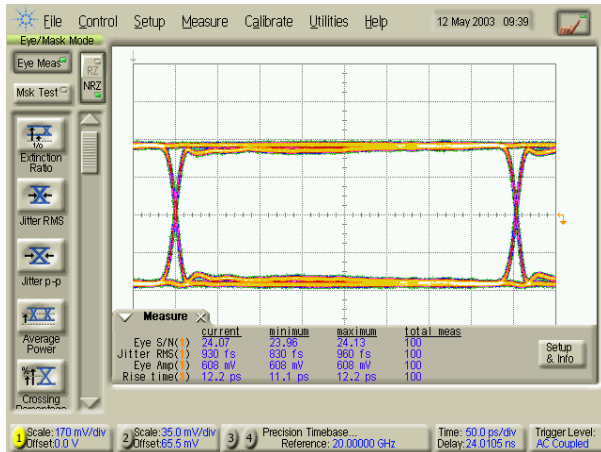


Typical Eye Diagrams at 2.5 Gbps

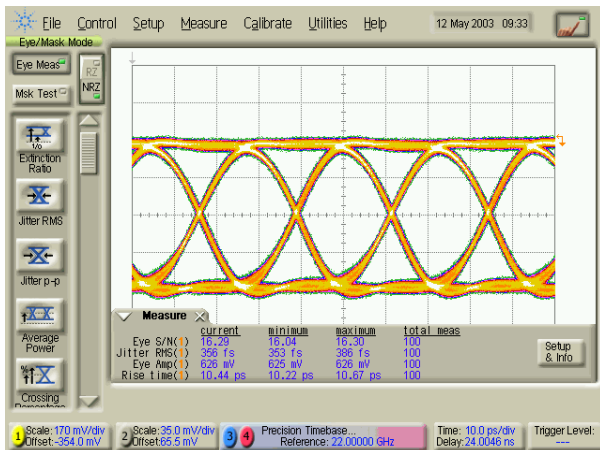
- Input signal generated by SHF BPG 44 Opt. LJ NRZ, PRBS $2^{23}-1$, measured with Digital Communications Analyzer Agilent 86100B / 83484A
- 50 cm Sucoflex 102EA + 3 dB V-Gold attenuator between the generator and the sampling head input
- Output signal measured with Digital Communications Analyzer Agilent 86100B / 83484A
- 50 cm Sucoflex 102EA between the generator and the bias tee
- 3 dB V-Gold attenuator before the sampling head input



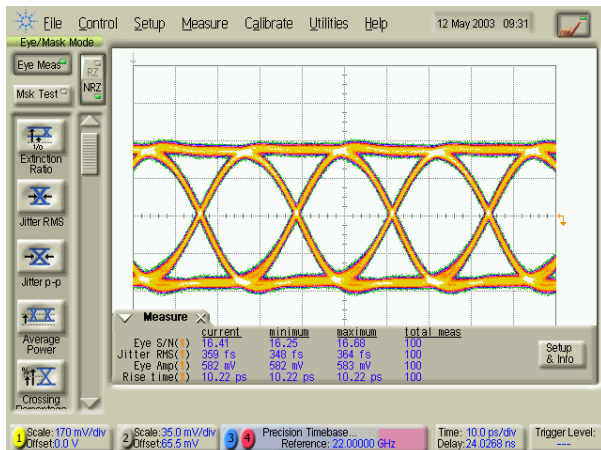
Input Signal @ 2.5 Gbps



Output Signal @ 2.5 Gbps



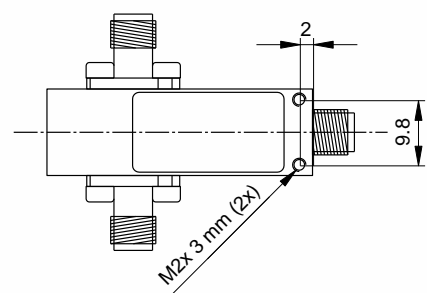
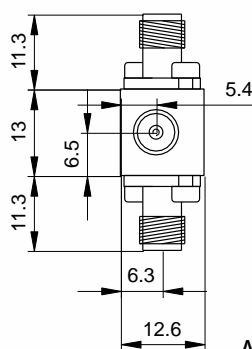
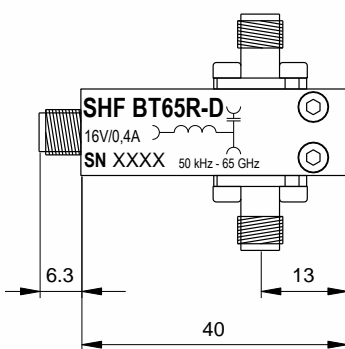
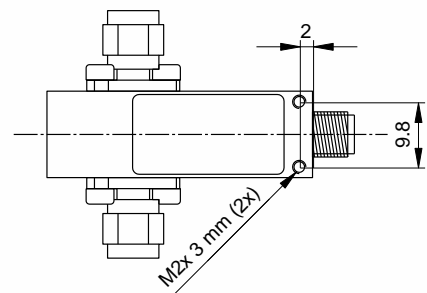
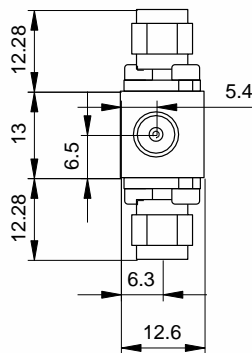
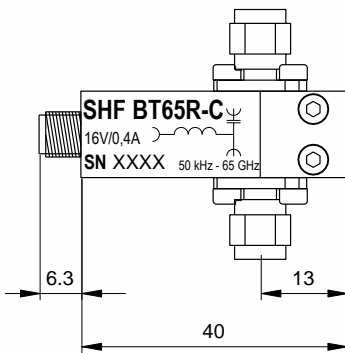
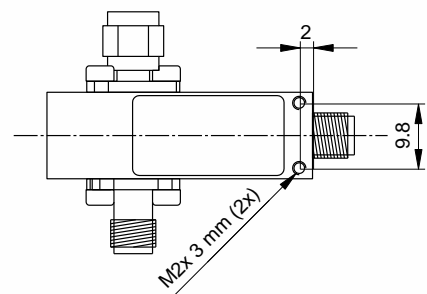
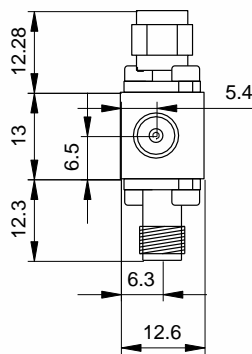
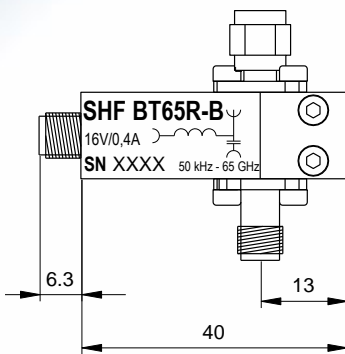
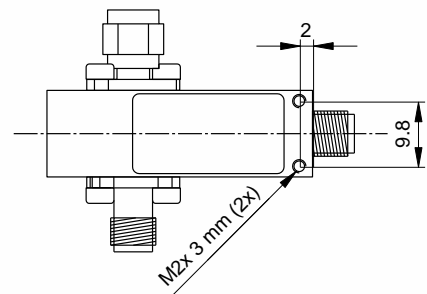
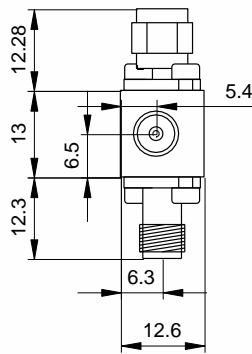
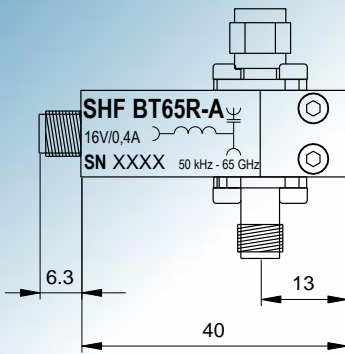
Input Signal @ 44 Gbps



Output Signal @ 44 Gbps



Mechanical Drawing



All dimensions in mm