

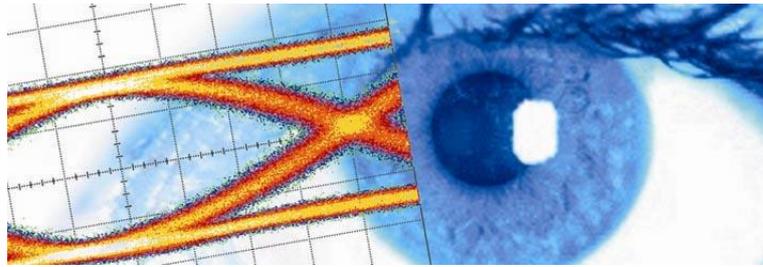


## SHF Communication Technologies AG

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# Datasheet

## SHF DF45R

### 45 GHz Broadband DC Feeder





## Description

The SHF DF45R DC feeder allows supplying a DC voltage or current to a RF transmission line. The inductance in the DC path rejects any unwanted frequency components beyond its cutoff frequency. The superposition of the AC and DC signals is available at both RF ports. 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
- Research and Development
- Data Transmission

## Configurations

- A - Port 1: 2.92 mm female, Port 2: 2.92 mm male
- C - Port 1: 2.92 mm male, Port 2: 2.92 mm male
- D - Port 1: 2.92 mm female, Port 2: 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

- HV50 - High Voltage (maximum DC voltage extended to 50 V)



## Specifications - SHF DF45R

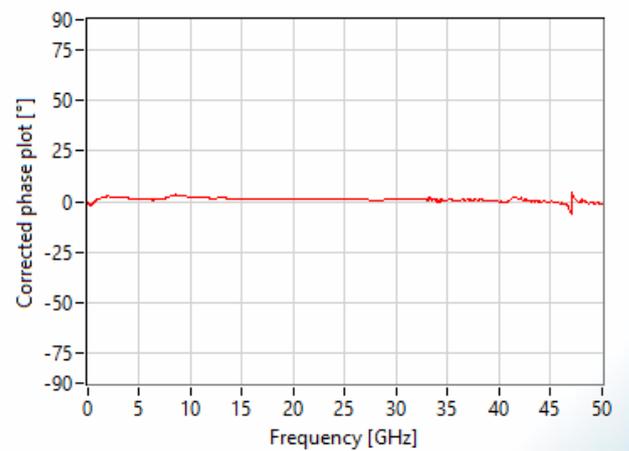
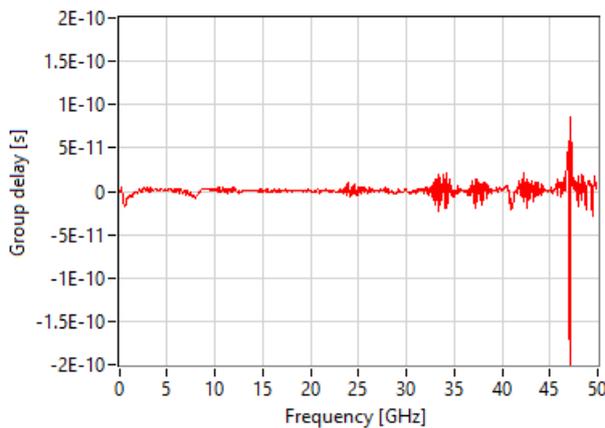
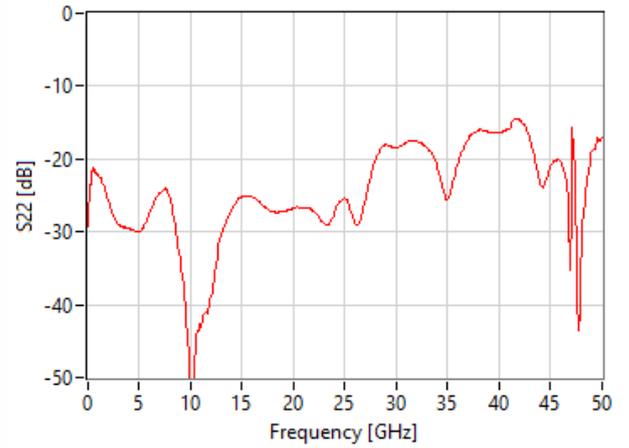
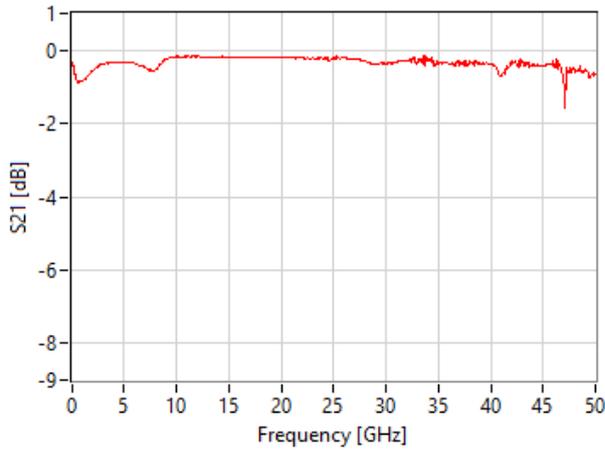
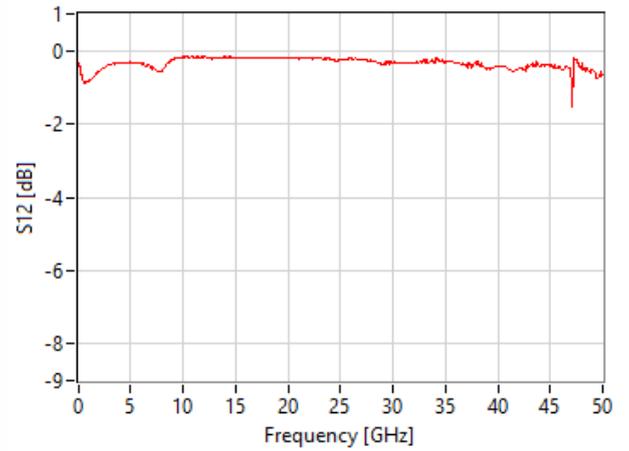
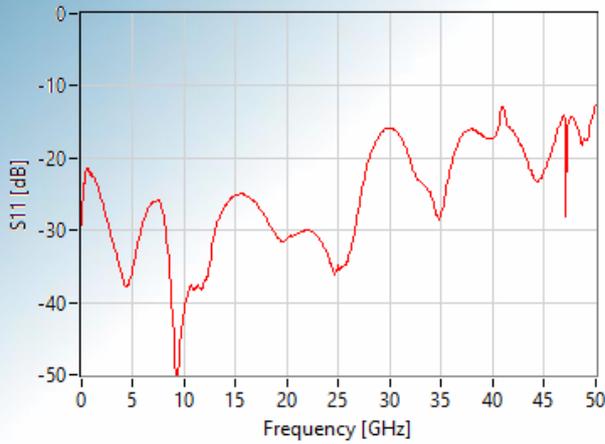
Parameter	Unit	Symbol	Min	Typ	Max	Conditions
<b>Absolute Maximum Ratings</b>						
Maximum RF Input w/o option	dBm	$P_{in\ max}$			30	average power of a continuous <sup>1</sup> signal, 50 $\Omega$ load and $f \geq 300$ kHz
Maximum RF Input with Opt. HV50	dBm	$P_{in\ max}$			30	average power of a continuous <sup>1</sup> signal, 50 $\Omega$ load and $f \geq 6$ MHz
Maximum DC Voltage w/o option	V		-16		16	difference between ports and between ports to ground
Maximum DC Voltage with Opt. HV50	V		-50		50	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 (At 25<math>^{\circ}C</math> case temperature, unless otherwise specified)</b>						
High Frequency 3 dB Point	GHz	$f_{HIGH}$	45			
Low Frequency 3 dB Point	kHz	$f_{LOW}$				depends on the device connected to the dc port, please see page 5
Insertion loss	dB	$S_{21}$			2	>50 MHz <45 GHz
Reflection	dB	$S_{11}; S_{22}$			-15 -10	>50 MHz <25 GHz >25 GHz <45 GHz
Group Delay Ripple	ps				$\pm 50$	>50 MHz <30 GHz, 160 MHz aperture
Isolation	dB		18			>50 MHz <45 GHz, please see page 5
DC Resistance	$\Omega$			3.5		DC to RF port
<b>Mechanical Characteristics</b>						
Connector AC + DC DC	$\Omega$			50		2.92 mm SMA
Dimensions	mm					please see page 6
Weight	g			25		

<sup>1</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 DF45R



Aperture of group delay measurement: 160 MHz

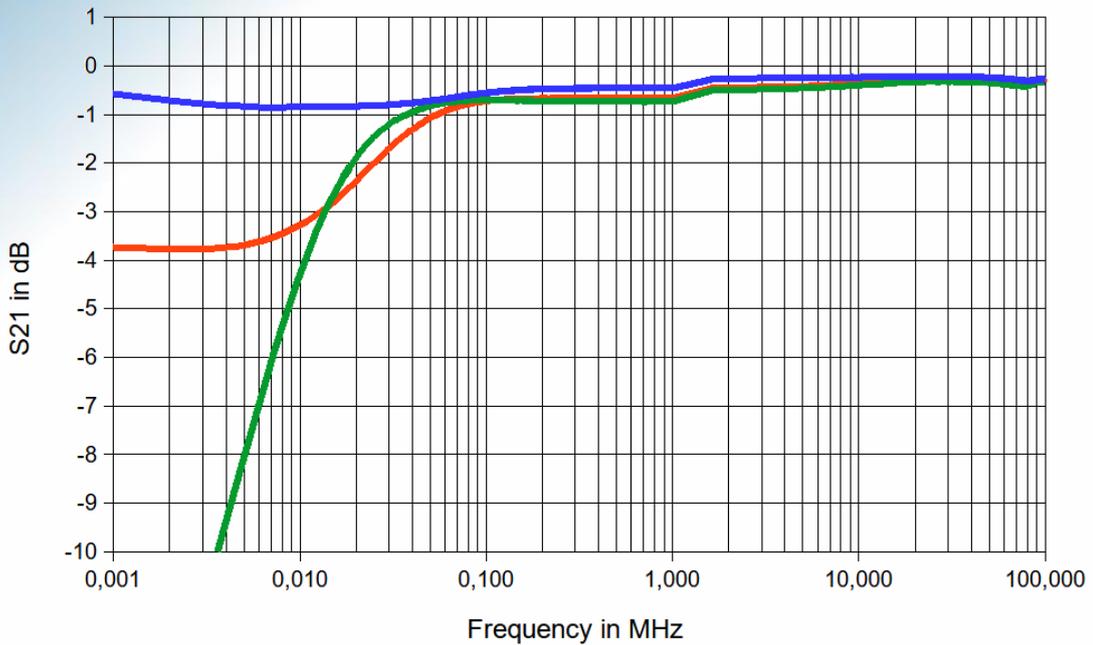
S21 phase measurement has been compensated by propagation delay to visualize phase linearity.



## Typical Low Frequency Response of AC + DC Path

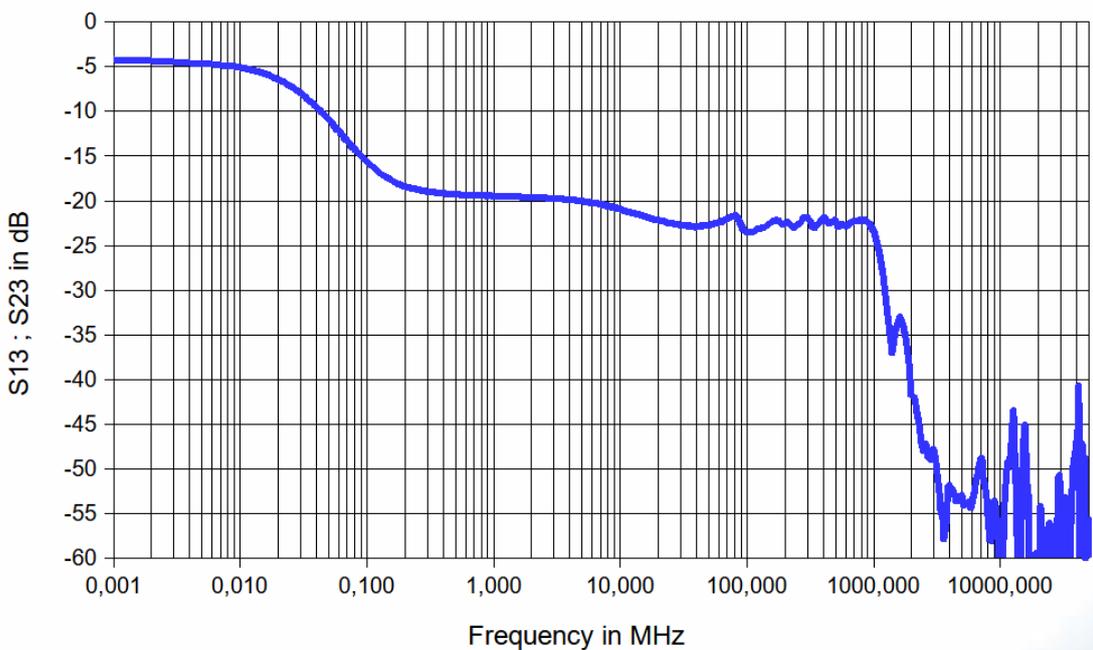
Measurements show how the low frequency response depending on the device connected to the dc port.

**Open:** blue ; **50  $\Omega$  Load:** red ; **Short:** green



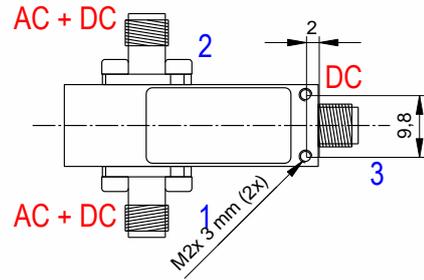
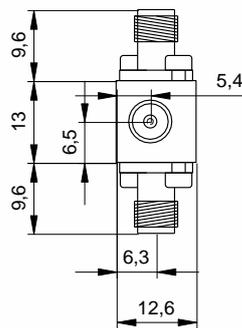
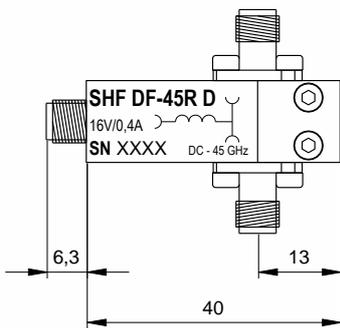
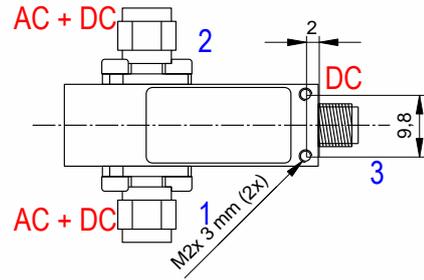
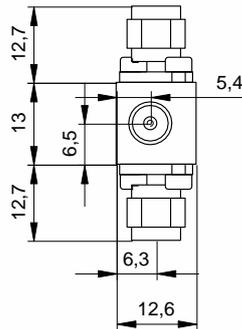
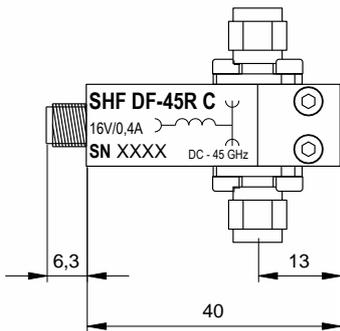
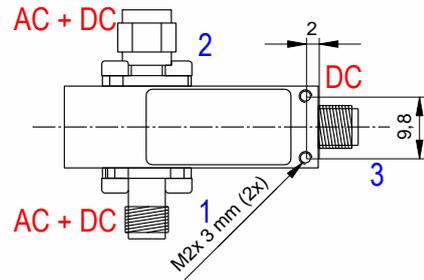
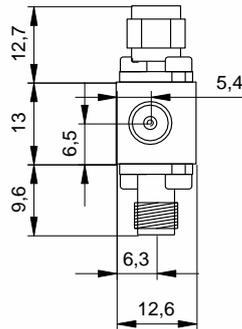
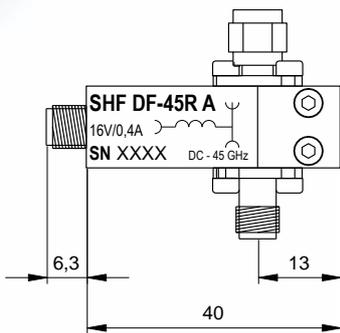
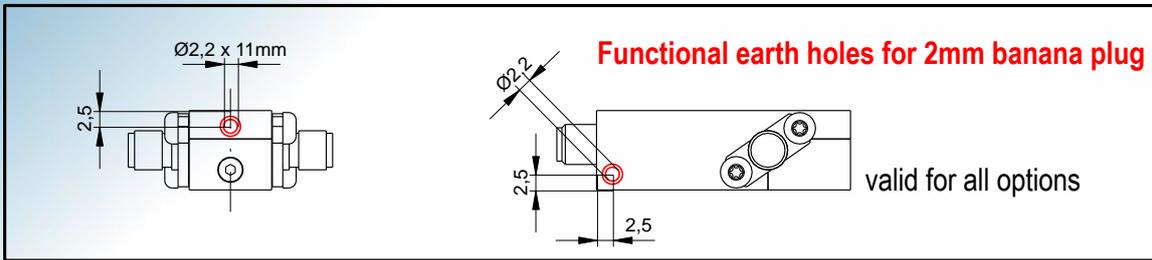
## Typical Frequency Response of DC Path

This plot shows the isolation between DC and AC + DC ports. Measurement without applied DC voltage.





# Mechanical Drawing



All dimensions in mm