

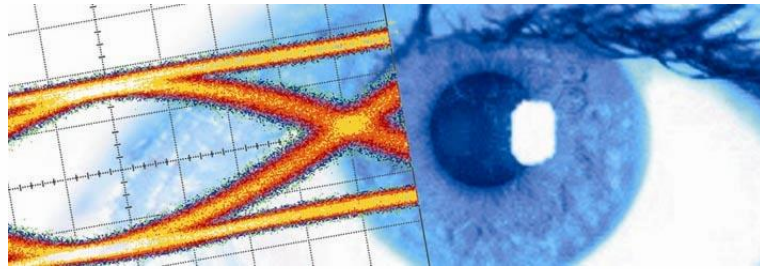


## SHF Communication Technologies AG

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# Datasheet

## SHF BT110R

### 110 GHz Broadband Bias-Tee





## Description

The SHF BT110R bias tee is the RoHS compliant successor of the SHF BT110. 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 110 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: 1.00 mm male, AC+DC port: 1.00 mm female
- B - AC port: 1.00 mm female, AC+DC port: 1.00 mm male
- C - AC port: 1.00 mm male, AC+DC port: 1.00 mm male
- D - AC port: 1.00 mm female, AC+DC port: 1.00 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

- HV25 - High Voltage (maximum DC voltage extended to 25 V)

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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 BT110R

| 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>2</sup> signal, 50 $\Omega$ load and $f \geq 300$ kHz |
| Maximum RF Input with Opt. HV25  | dBm        | $P_{in\ max}$ |      |     | 30         | average power of a continuous <sup>2</sup> signal, 50 $\Omega$ load and $f \geq 6$ MHz   |
| Maximum DC Voltage w/o option  | V          |               | -10  |     | 10         | difference between ports and between ports to ground                                     |
| Maximum DC Voltage with Opt. HV25  | V          |               | -25  |     | 25         | 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        | $f_{HIGH}$    | 110  |     |            |  |
| Low Frequency 3 dB Point w/o option  | kHz        | $f_{LOW}$     |      |     | 50<br>150  | with 0 $V_{DC}$ applied<br>with 10 $V_{DC}$ applied                                      |
| Low Frequency 3 dB Point opt. HV25   | MHz        | $f_{LOW}$     |      |     | 1.0        | with 0 $V_{DC}$ applied  |
| Insertion loss   | dB         | $S_{21}$      |      | 1.5 |            | >20 GHz <70 GHz  |
| Input Reflection   | dB         | $S_{11}$      |      |     | -15<br>-10 | >40 MHz <10 GHz<br>>10 GHz <90 GHz   |
| DC Resistance  | $\Omega$   |               |      | 3.5 |            | DC to RF port  |
| <b>Mechanical Characteristics</b>  |            |               |      |     |            |  |
| Connector  | $\Omega$   |               |      | 50  |            | 1.00 mm  |
| Dimensions   | mm         |               |      |     |            | please see page 5  |

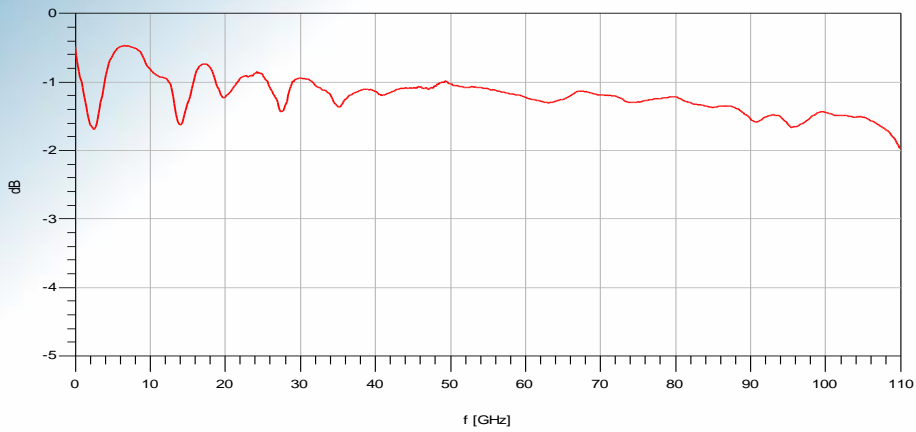
<sup>2</sup> 30 dBm (1 W) equals 20 V peak to peak for continuous sinusoidal signals. A pulsed excitation with an average of 1 W and thus having significantly higher peaks is possible.

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

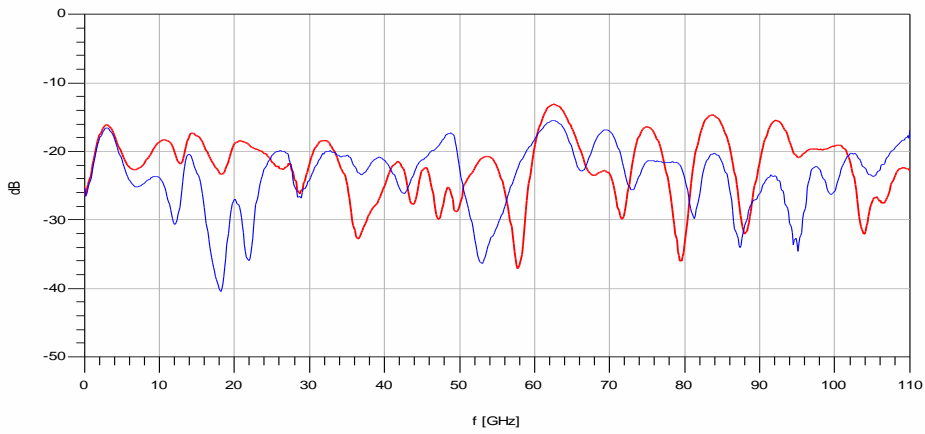


# Typical S-Parameters for a BT65R without Option

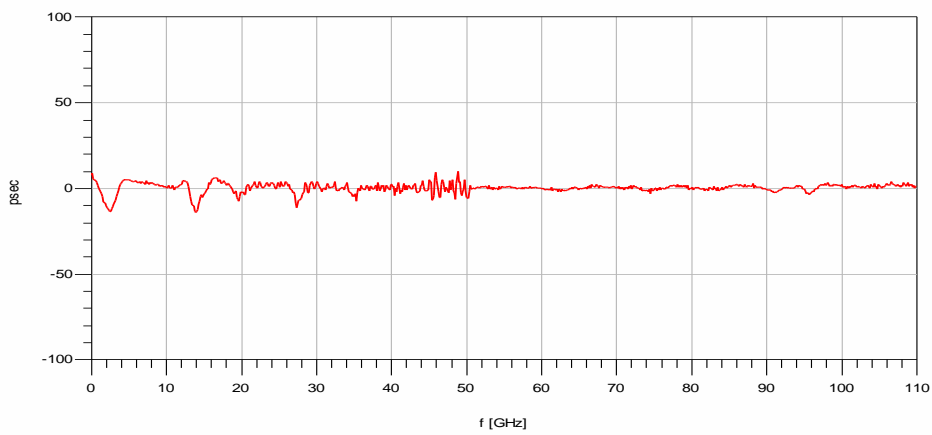
## Insertion Loss ( $S_{21}$ )



## Return Loss ( $S_{11}$ red, $S_{22}$ blue)

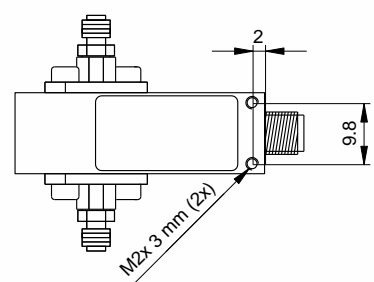
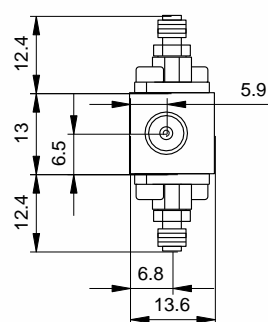
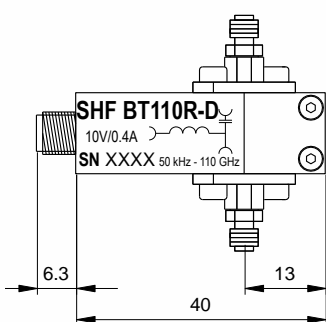
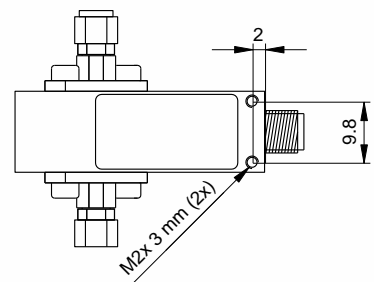
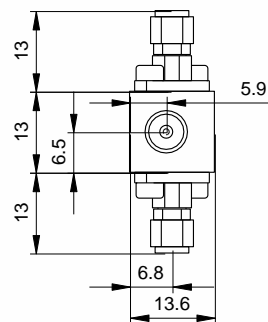
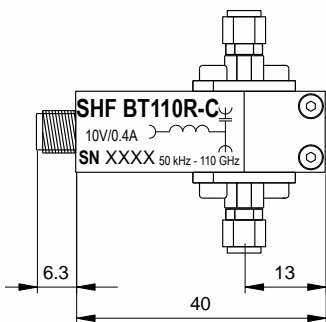
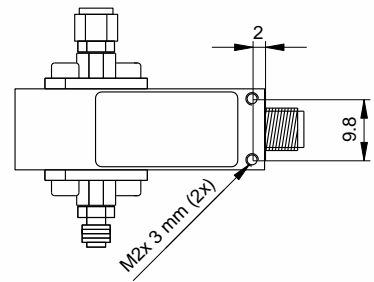
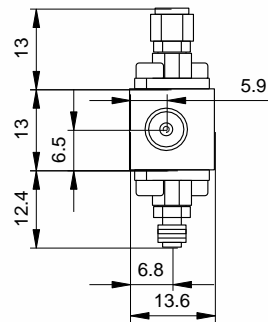
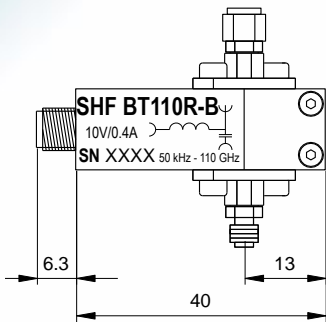
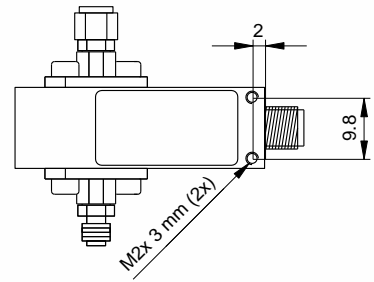
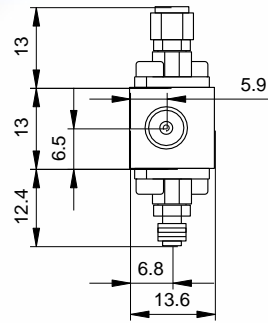
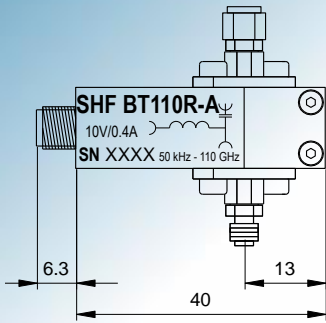


## Group Delay





# Mechanical Drawing



All dimensions in mm