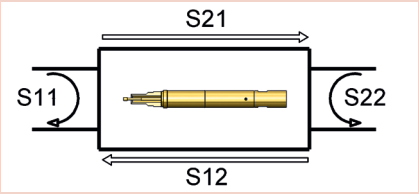
Radio Frequency Probes from FEINMETALL

Design of RF-Probes
Spring contact probes for RF-applications are coaxial probes. The inner and outer conductors are designed and dimensioned according the RF specific requirements. That means the signals within a wide frequency band are transmitted with a minimum loss. For evaluation of RF-probes various definitions and parameters are relevant.

Two-Port Network
The common two-port network describes the characteristics of possible transmission paths. These can be wires, radio transmissions or RF-contact probes.

S-Parameters
In radio frequency technology the transmission characteristics of two-port networks are described by S-parameters (scattering parameters). The S-parameters are typically specified as attenuation given in decibel [dB].
S11: Reflection input side (matching)
S21: Transmission loss forward
S12: Transmission loss backward
S22: Reflection output side

Matching
The matching respectively the reflection characteristic always refers to the impedance of the DUT and its RF related environment.

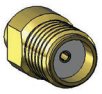


The more constant the impedance on the transmission path is, the better is the matching and the transmission of the signal. For RF testing always the complete transmission path of DUT, RF-probe and connecting element has to be considered. A major part of the signal loss is caused by mismatching between RF probe and DUT. The frequency response charts in the specification sheets of the probes HF860 include the probe as well as an RF-connector (representing the DUT) and a connecting element with connected cable. The type and length of the cable is also influencing the transmission of the signal and may lead to a reduced bandwidth.
For reference, the values S21 and S11 for the HF860 without DUT and connecting element are shown as well.

Transmission loss
The transmission loss describes the transmission behavior of a two-port network and is represented by the value S21.
Very often the 3dB cutoff frequency is used as characteristic value. This is the frequency with an attenuation of -3dB. At this frequency the power has reduced by 50% and the voltage by 30%.

HF860 Variants for Common RF-Connector Types

The overview is a selection of the FEINMETALL RF Probe Program. Further versions on request.

 SMA-Female	 HF86002B0001G530	 MCX-Male
 SMB-Male	 HF86005B0004G530	 MCX-Male
 SMB-Female	 HF86002B0005G530	 MCX-Male
 SMC-Male	 HF86005B0003G530	 MCX-Male
 U.FL-Male	 HF86005B0002G530	 MCX-Male
 RF-Male	 HF86005B0007G530	 MCX-Male