



VISHAY INTERTECHNOLOGY, INC.

## LINEAR FILM RESISTORS

### RF Behavior of Resistors

Figures below show the following:

- Typical values of the actual impedance related to the nominal resistance  $|Z|/R$  depending on the frequency
  - Whether the impedance is mainly influenced by inductive or capacitive parasitic elements
  - Whether the impedance is lower or higher than the nominal resistance

The resistors were measured using a vector network analyzer (S-parameter measurement).

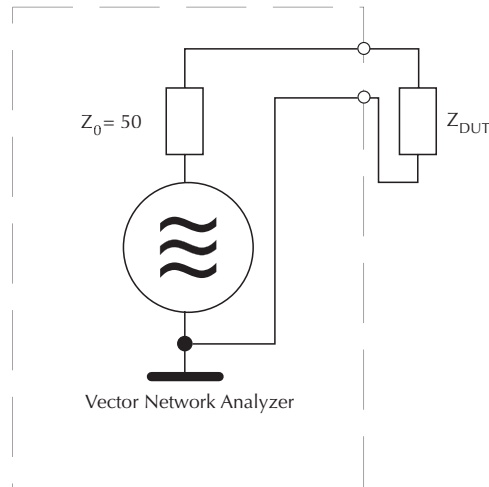
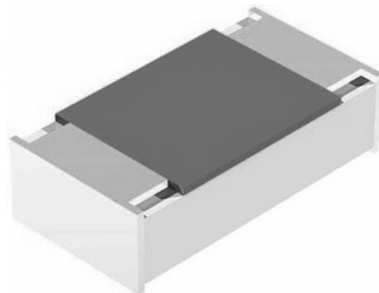
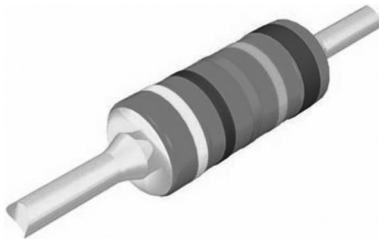


Figure 1. S11 test circuit

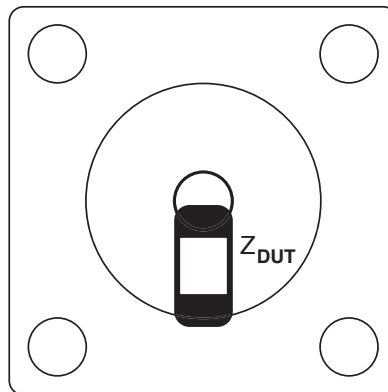
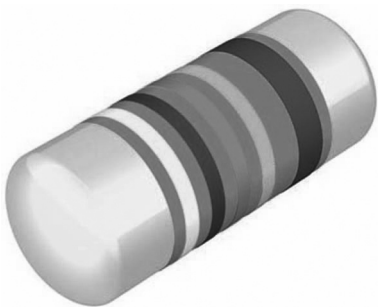


Figure 2. Device under test (DUT)

# Linear Resistors



## Vishay

Other related parameters such as:

reflection coefficient  $r = \frac{Z - Z_0}{Z + Z_0}$

return loss  $RL = 20 \lg |r|$

and standing wave ratio  $SWR = \frac{1 + |r|}{1 - |r|}$

can be calculated using the relevant diagrams in the data specifications. The table below gives some typical impedance values for a given return loss.

Typical impedance values for a given return loss				
R.L. (dB)	r	SWR 1:	Z(Ω)	
0	1	∞	∞	0
-6	0.5	≈ 3	150	17
-10	≈ 0.3	≈ 2	96	26
-20	0.1	≈ 1.2	61	41
-30	0.03	1.07	53	47

VSD-TN0007-0407  
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