

Keysight Technologies

11636C Power Divider, DC to 50 GHz

Technical Overview



Key Features

- Broad operating frequency range up to 50 GHz eliminates the need for multiple dividers
- Excellent amplitude (± 0.3 dB) and phase tracking ($\pm 2^\circ$) ensures highly accurate power division
- Low SWR minimizes measurement uncertainty

Description

The Keysight Technologies, Inc. 11636C power divider provides good matching and excellent tracking characteristics for highly accurate power division, signal routing and matrix testing from DC to 50 GHz. Offering excellent output power symmetry between the two outputs ports, the 11636C is recommended for applications such as power combining and transmission line fault testing using a network analyzer. The excellent source match of all three ports improves fault location measurements by reducing reflections. These power dividers are not recommended for ratio or source leveling applications.

The Keysight 11636C provides a symmetrical 6 dB power division. It can also be used as power combiner: when signal is input at the two output ports, the sum of the two signals appears at the input port.

Applications

Power dividing

The Keysight 11636C power divider uses three $16\frac{2}{3}\ \Omega$ resistors for direct power dividing applications such as splitting one source into two parts for separate measurements or distributing low power signals into two or more antennas.

The power divider can also be used for broadband independent signal sampling in test systems. Using a power divider the test system simultaneously measures two different characteristics of a signal, such as frequency and power. Figure 1 shows a power divider used in a simple power dividing application.

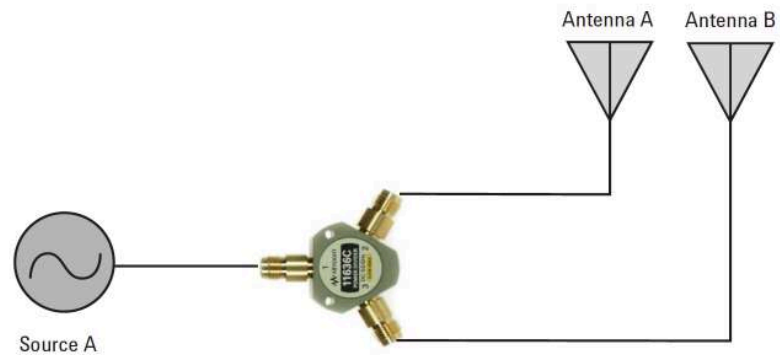


Figure 1. Test setup for power dividing application

Power combining

Power dividers also can act as a power combiner. Figure 2 shows the Keysight 11636C power divider combining the two signals from the different sources into the DUT. The power divider provides a good impedance match at both the output arms when the input is terminated in the system's characteristic impedance ($50\ \Omega$). Once a good source match has been achieved, the three resistor power divider may be used to divide the output into equal signals for comparison measurements.

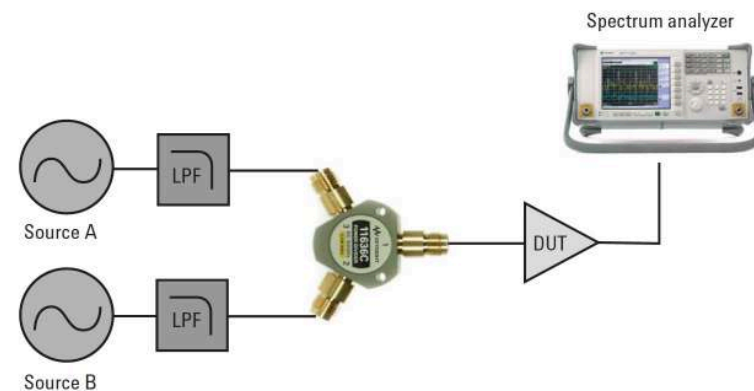


Figure 2. Test setup for power combining application

Specifications

Specifications describe the product's warranted performance. Supplemental and typical characteristics are intended to provide typical but non-warranted performance parameters. These are denoted as "typical", "nominal" or "approximate".

Parameter	Specifications
Frequency range	DC to 50 GHz
Max input power	0.5 W
Max phase tracking	$\pm 2^\circ$
Connectors	2.4 mm (f) on all ports
Insertion loss	6.5 dB, DC to 18 GHz 7 dB, 18 GHz to 26.5 GHz 8 dB, 26.5 GHz to 40 GHz 8.5 dB, 40 GHz to 50 GHz
Return loss (SWR)	20 dB (1.22), DC to 18 GHz 16 dB (1.38), 18 GHz to 26.5 GHz 14 dB (1.50), 26.5 GHz to 40 GHz 12 dB (1.67), 40 GHz to 50 GHz
Amplitude tracking	± 0.3 dB, DC to 50 GHz

Environmental Test Specifications

The 11636C is designed to fully comply with Keysight Technologies' product operating environment specifications. The following summarizes the environmental specifications for these products.

Temperature

Operating -45° C to +70° C
 Non-operating -65° C to +85° C
 Cycling -65° C to +150° C, 10 cycles @ 20° C per minute ramp rate, 20 minutes dwell time per MIL-STD-833F, Method 1010.8, Condition C (modified)

Humidity

Non-operating 90% RH @ 65° C, 24 hours
 Operating 50% to 95% RH @ 40° C, 24 hour cycling, 5 times

Shock

Half sine, smoothed 1000 G @ 0.5 ms, 3 shock pulses per orientation, 18 total per MIL-STD-833F, Method 2002.4, Condition B (modified)

Vibration

Broadband random 2.41 G rms, 10 min/axis

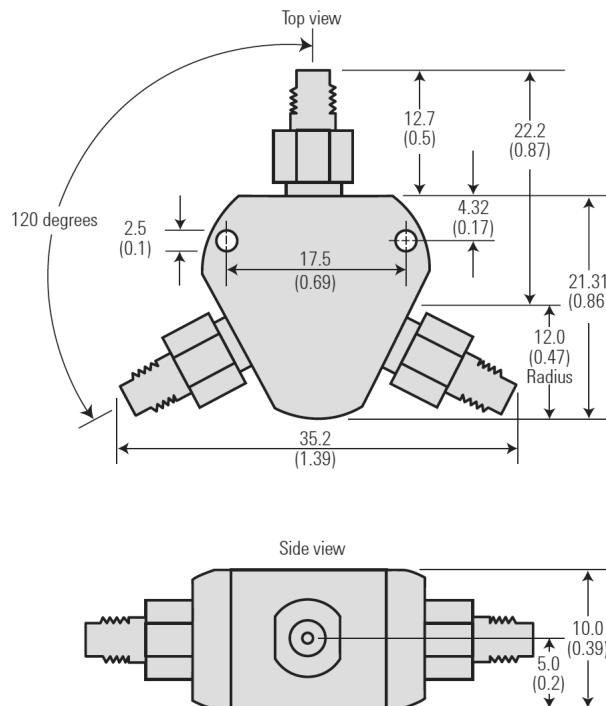
Altitude

Storage ≤ 4600 meters (15,000 feet)

ESD immunity

Direct discharge 4 kV (to center conductor)
 15 kV (to outer conductor)

Mechanical Dimensions



Dimensions are in mm (inches) nominal, unless otherwise specified.

Figure 3. 11636C mechanical dimensions

Typical Performance

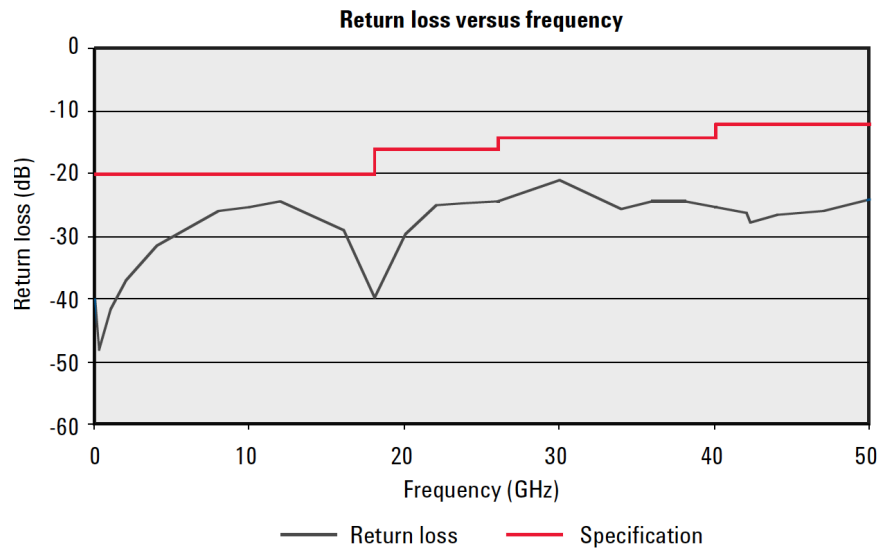


Figure 4. 11636C return loss versus frequency (typical)

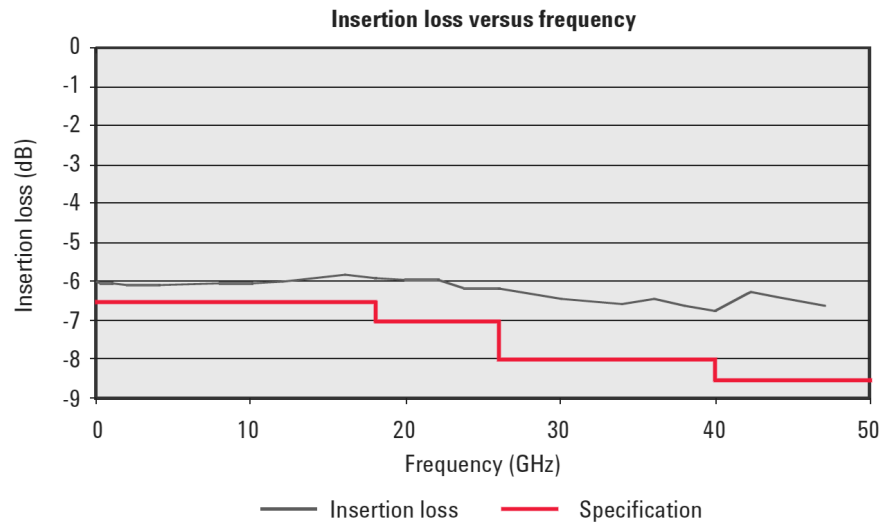


Figure 5. 11636C insertion loss versus frequency (typical)

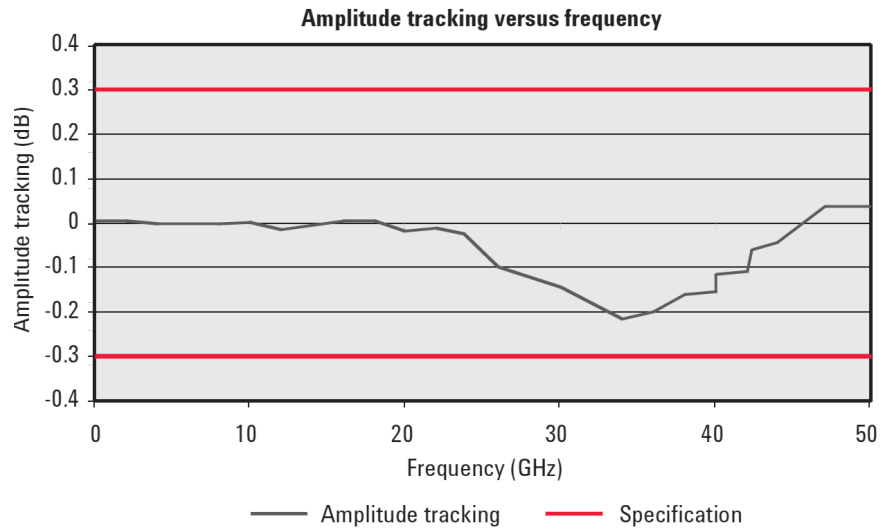


Figure 6. 11636C amplitude tracking versus frequency (typical)

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