

HL9447 Broadband Bias Tee (67 GHz, 175 mA)

Features and Technical Specifications

PRODUCT SUMMARY

The HL9447 is an ultra-broadband bias tee with maximum insertion loss of 1.25 dB to 67 GHz.

The HL9447 blocks any existing DC signal and allows for the insertion of a DC bias current into a circuit with minimal perturbation of the impedance of a 50 ohm transmission line.

These devices can be used for biasing amplifiers, lasers, optical modulators, and other devices.

Applications include optical communication systems, high-speed data systems, level shifting, cascading, and interfacing between devices with incompatible DC operating points.

PRODUCT OPTIONS

The following options and configurations are available for this product:

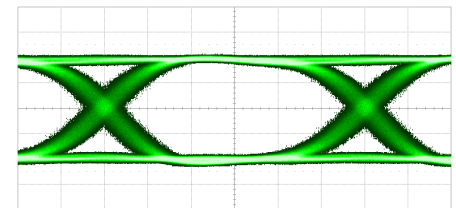
- M, matched pair
- U, unmatched part(s)

- 11, 11 V breakdown
- 30, 30 V breakdown

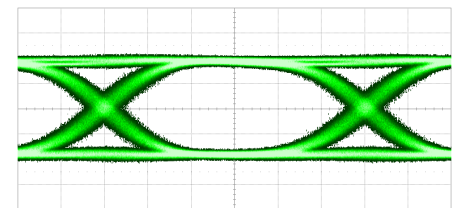
- PP, 1.85 mm plug AC, 1.85 mm plug AC+DC
- PJ, 1.85 mm plug AC, 1.85 mm jack AC+DC
- JJ, 1.85 mm jack AC, 1.85 mm jack AC+DC

For example, a matched pair of devices with 30 V breakdown voltage and two jack connectors would be: **HL9447-M-30-JJ**

Bandwidth (-3 dB guaranteed)	35 kHz to > 67 GHz (opt. -11) 70 kHz to > 67 GHz (opt. -30)
Insertion Loss	1.25 dB to 67 GHz, max (opt. -JJ) See Fig. 1 below
Low Frequency Cutoff	35 kHz (opt -11) 70 kHz (opt. -30)
Maximum Current	175 mA
Return Loss	15 dB to 35 GHz (all options) 10 dB to 67 GHz (all options) See Fig. 3 below
Amplitude Match	± 0.1 dB (opt. -M) See Fig. 5 below
Phase Match	± 4° at 40 GHz (opt. -M)
Breakdown Voltage	± 11 V, max (opt. -11) ± 30 V, max (opt. -30)
Rise Time (10-90%)	5 ps, all options
Group Delay	110 ps, ± 10 ps ripple, all options See Fig. 4 below
Impedance	50 Ω
DC Resistance	2 Ω, DC to AC+DC
Connectors (AC-AC/DC)	1.85 mm, plug-plug (opt. -PP) 1.85 mm, plug-jack (opt. -PJ) 1.85 mm, jack-jack (opt. -JJ)
Dimensions	49.53 x 33.02 x 13.46 mm 1.95" x 1.30" x 0.53"
Weight	24 g (0.85 oz.)
Temperature Limits	-40° to +40° C, operating
RoHS Compliance	RoHS compliant; lead-free solder
Warranty	1 year, see website



32 Gbps PRBS31 pattern at AC port of HL9447-U-30-JJ; see also Figs. 6-7 below



32 Gbps PRBS31 pattern at AC+DC port of HL9447-U-30-JJ

DEPLOYMENT NOTES

All specifications contained herein are typical unless otherwise noted.

S-parameter files and higher resolution versions of the plots on the following pages are available on our website.

Data contained herein are representative of common options. For data on any specific configuration, please see our website or contact HYPERLABS.

HL9447 Bandwidth and Insertion Loss

Figure 1 shows the insertion loss and bandwidth of the HL9447-30-JJ configuration (30 V breakdown, jack-jack connectors) from 10 MHz to 67 GHz. Figure 2 shows the low-frequency response of this same configuration to 1 MHz.

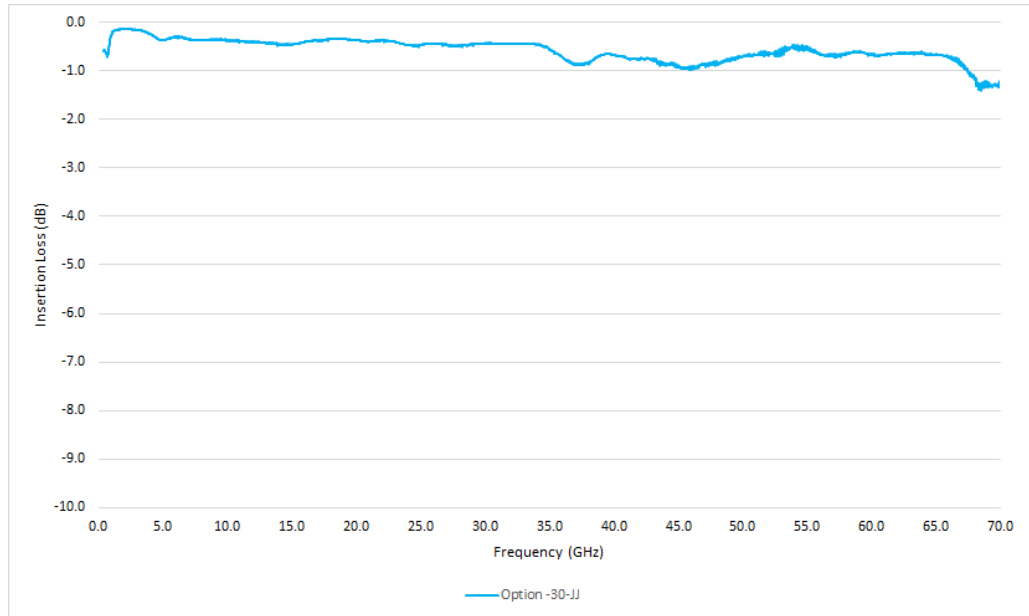


Figure 1: Typical HL9447 insertion loss, option -30-JJ

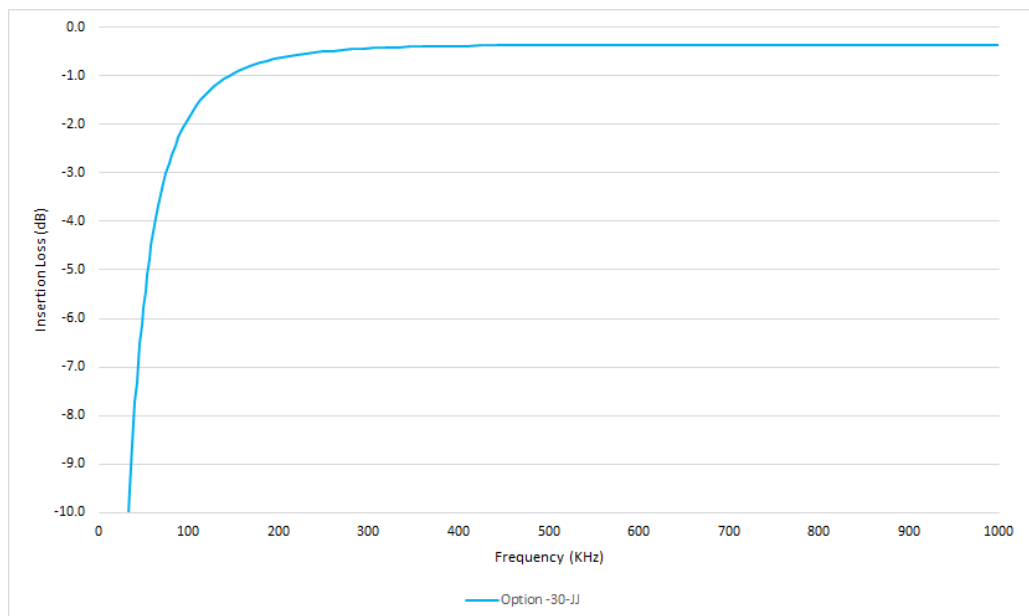


Figure 2: Typical HL9447 low-frequency insertion loss, option -30-JJ

HL9447 Return Loss and Group Delay

Figure 3 shows the Return Loss and Figure 4 shows the Group Delay on a typical HL9447 with option -30-JJ (30 V breakdown, jack-jack connectors) from 10 MHz to 67 GHz.

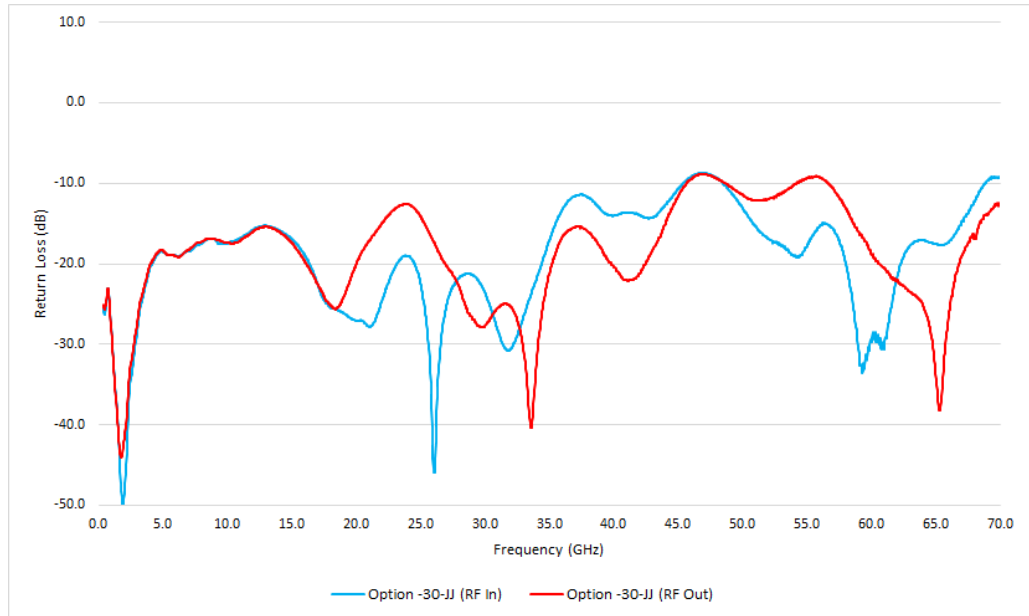


Figure 3: Typical HL9447 return loss, option -30-JJ

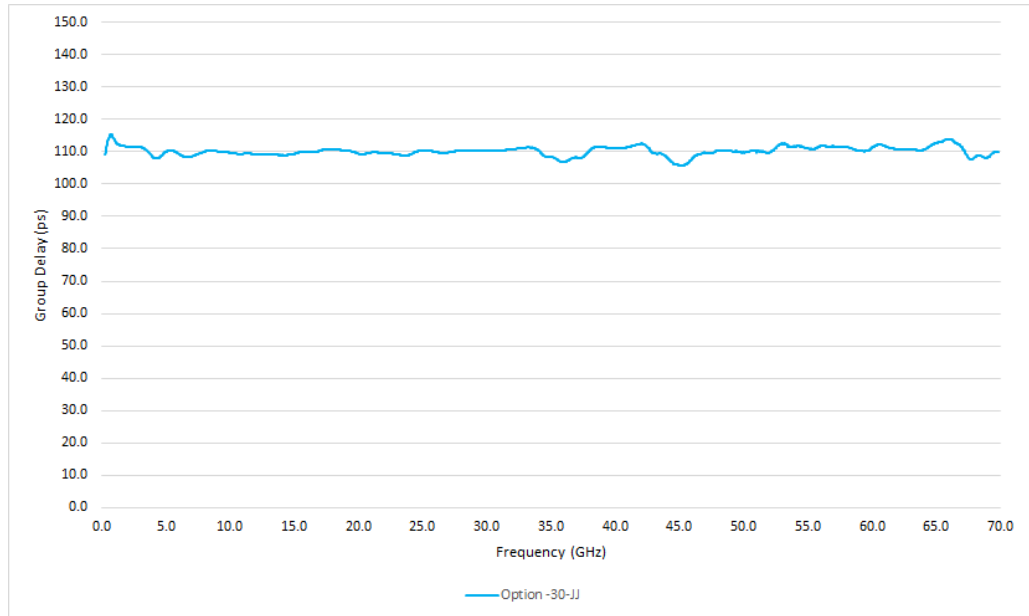


Figure 4: Typical HL9447 group delay, option -U-30-JJ



HL9447 Matching

When two HL9447 devices are purchased as a matched pair (P/N HL9447M), the devices will be amplitude and phase matched as per the specifications in this datasheet. *Figure 5* shows the typical amplitude of a pair of HL9447 devices, option -M-30-JJ (30 V breakdown, jack-jack connectors), from 10 MHz to 67 GHz.

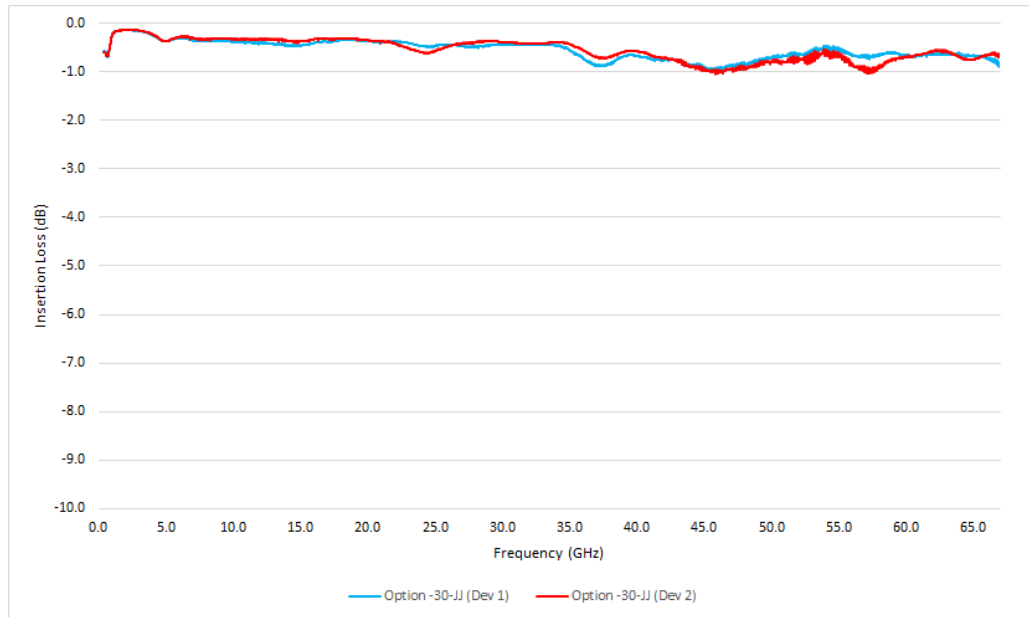


Figure 5: Typical HL9447 amplitude of matched pair of devices, option -M-30-JJ



HL9447 Eye Diagrams

Figure 5 shows a 32 Gbps PRBS31 pattern on the RF Input of option HL9447-U-30-JJ and Figure 6 shows the same pattern at the RF Output.

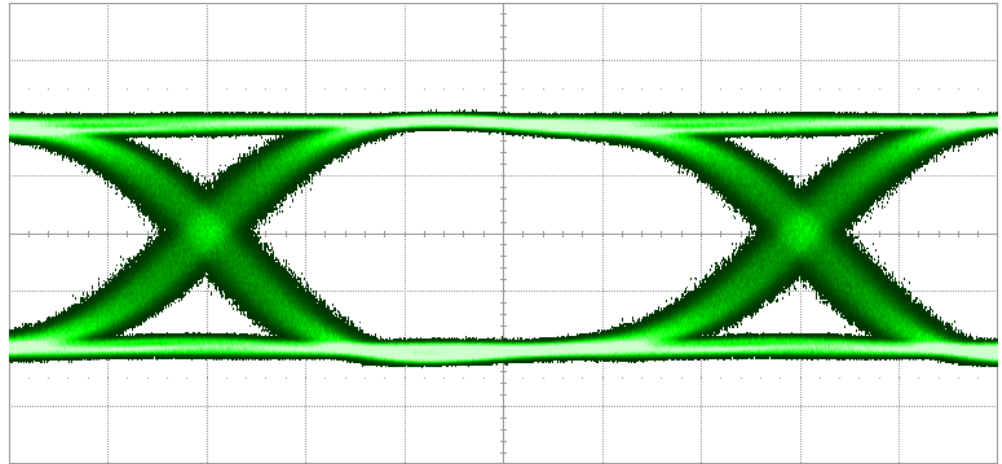


Figure 6: Typical eye diagram of a 32 Gbps PRBS31 pattern on option HL9447-U-30-JJ, AC port

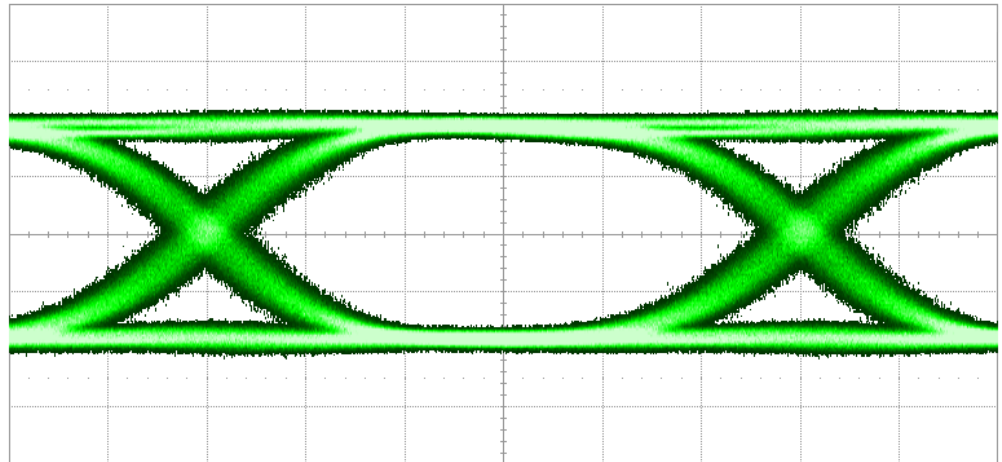


Figure 7: Typical eye diagram of a 32 Gbps PRBS31 pattern on option HL9447-U-30-JJ, AC+DC port