



HL9438/9 Series DC Blocks (160 kHz to 110 GHz)

Features and Technical Specifications¹ (HL9439 shown)

Bandwidth	160 kHz to 110 GHz (opt. -11) 280 kHz to 110 GHz (opt. -30)
Amplitude Match	± 0.1 dB, $f \leq 110$ GHz (opt. -M)
Phase Match	$\pm 4^\circ$, $f = 40$ GHz (opt. -M)
Insertion Loss	< 2 dB, $f \leq 110$ GHz, all options See Fig. 1
Return Loss	15 dB, $160\text{ kHz} < f \leq 60$ GHz, all options 10 dB, $60\text{ GHz} < f < 110$ GHz, all options See Fig. 3
Breakdown Voltage	11 V, max (opt. -11) 30 V, max (opt. -30)
Group Delay	≈ 98 ps See Fig. 4
Rise Time (10-90%)	3.2 ps, all options
Connectors (PORT 1 / PORT 2)	1.0 mm, jack/jack (opt. -JJ) 1.0 mm, jack/plug (opt. -JP) 1.0 mm, plug/plug (opt. -PP)
Temperature Limits	-40° to $+70^\circ$ C, operating
RoHS Compliant	Yes, assembled with lead-free solder
REACH Compliant	Yes
Warranty	1 year, see website

NOTE 1 - Unless otherwise noted, the specifications in this table are typical for Model Number HL9439. See page 2 for full specifications.

PRODUCT SUMMARY

The HL9438 and HL9439 are ultra-broadband DC Blocks with a typical insertion loss of < 2 dB throughout the specified bandwidth range.

The DC block will remove DC bias from the input signal to prevent damage to DC-sensitive devices or equipment.

These devices are suitable for use in 224 Gbps PAM4 communications systems, optical communication systems, high-speed data systems, level shifting, cascading, and interfacing between devices with incompatible DC operating points.

They can also be used to improve RF power measurements when a power meter with DC sensitivities is used.

MODELS & OPTIONS

The following models are available:

- HL9438**, 95 GHz
- HL9439**, 110 GHz

The following options are available:

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

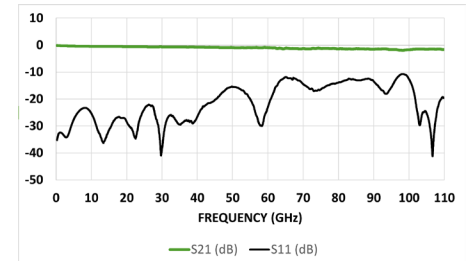
- 11**, 11 V breakdown
- 30**, 30 V breakdown

- JJ**, jack RF 1 and RF 2
- JP**, jack RF 1, plug RF 2
- PP**, plug RF 1 and RF 2

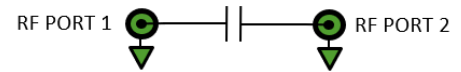
1.85 mm connectors are available, if needed, on either port to eliminate the need for a 1.0 to 1.85 mm adapter in the test setup. Please request at time of order.



HL9439, Option -M-11-JP shown



Typical HL9439 Insertion and Return Loss



HL9438/9 Schematic and Port Assignments

HL9438 and HL9439 Full Specifications

Parameter	HL9438	HL9439	Comments
Upper Frequency Limit	> 95 GHz	> 110 GHz	3 dB roll-off point, relative to nominal insertion loss
Lower Frequency Limit See Fig. 2	160 kHz (opt. -11) 280 kHz (opt. -30)		3 dB roll-off point
Breakdown Voltage	11 V, max (opt. -11) 30 V, max (opt. -30)		
Amplitude Match	± 0.1 dB, f ≤ 110 GHz, all options		Typical, opt. -M
Phase Match	± 4°, f = 40 GHz (opt. -M)		Typical, opt. -M
Insertion Loss See Fig. 1	1.5 dB 160 kHz ≤ f ≤ 85 GHz	2.0 dB 160 kHz ≤ f ≤ 110 GHz	Typical
Return Loss See Fig. 3	15 dB, f ≤ 60 GHz 10 dB, 60 GHz < f < 110 GHz		Typical, within specified operating frequency
Rise Time	3.7 ps	3.2 ps	Typical
Group Delay See Fig. 4	98 ps	98 ps	All options
Capacitance	10 nF (opt. -11) 5.6 nF (opt. -30)		
Impedance	50 Ω		Input and Output
Connectors	1.0 mm, jack/jack 1.0 mm, jack/plug 1.0 mm, plug/plug		According to specified option -JJ, -JP, or -PP 1.85 mm available on one port upon request
Dimensions (W x D x H)	1.141" x 0.377" x 0.377" 29.0 x 9.57 x 9.57 mm		Package including connectors
Weight	8 g (0.28 oz.)		
Operating Temperature	-40° to +70° C		Case temperature
RoHS Compliant	Yes, assembled with lead-free solder		
REACH Compliant	Yes		
Warranty	1 year, repair or replacement; see website for details		



HL9439 Bandwidth and Insertion Loss

Figure 1 shows the insertion loss and bandwidth of the HL9439 from 10 MHz to 110 MHz.

Figure 2 shows the low-frequency response to 100 Hz.

Other models show similar performance within their respective specified bandwidths.

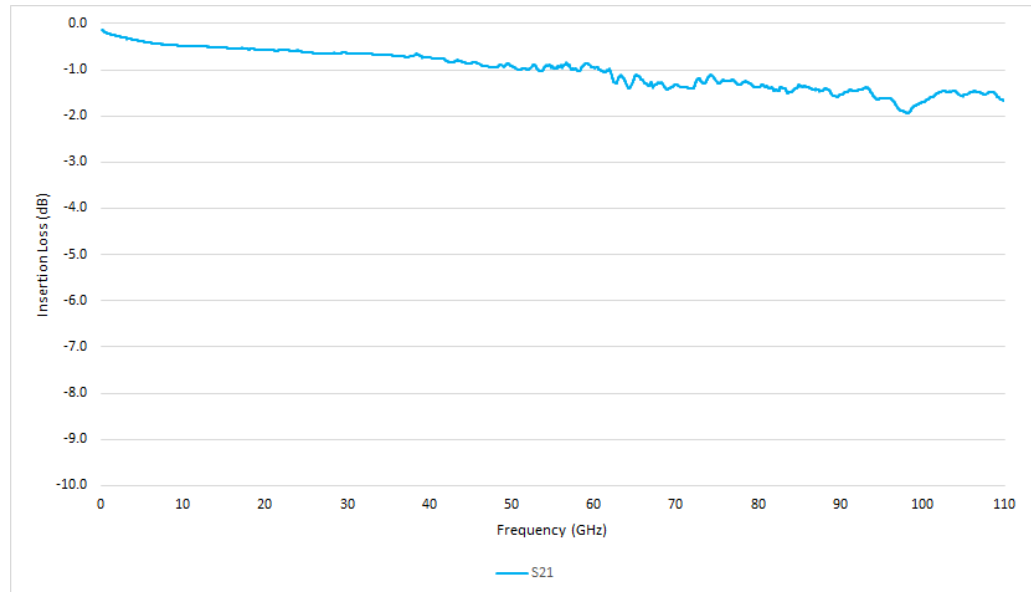


Figure 1: Typical HL9439 Bandwidth and Insertion loss

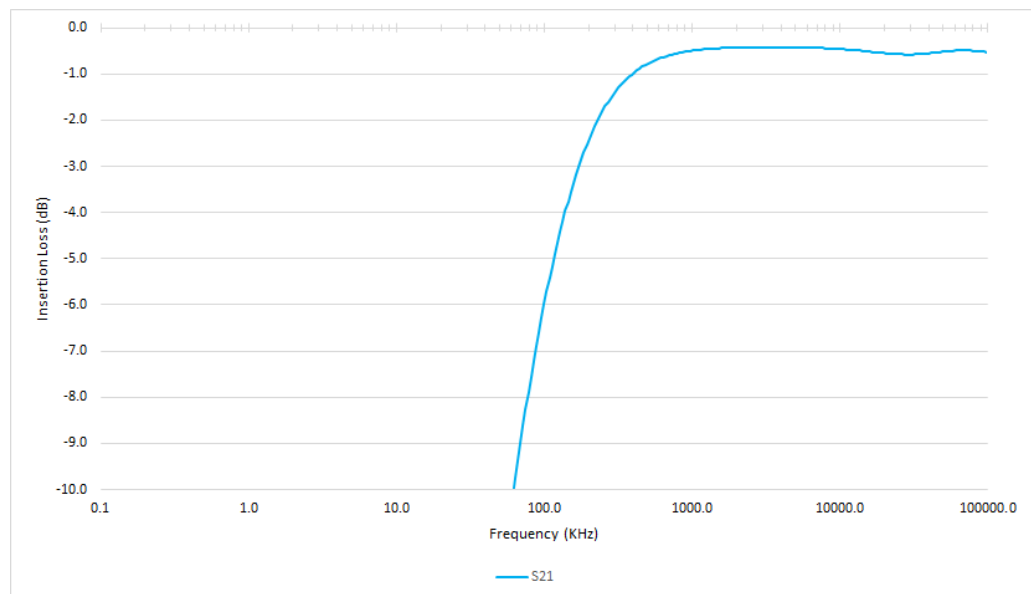


Figure 2: Typical HL9439 Low-frequency Performance



HL9439 Return Loss and Group Delay

Figure 3 shows return loss and Figure 4 shows the typical HL9439 Group Delay from 10 MHz to 110 MHz.

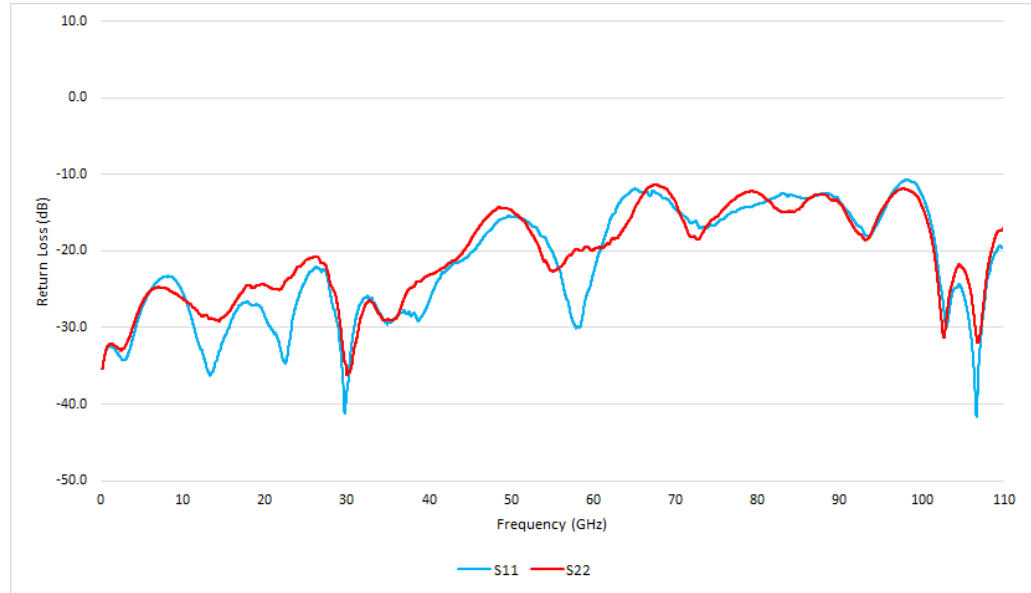


Figure 3: Typical HL9439 Return Loss

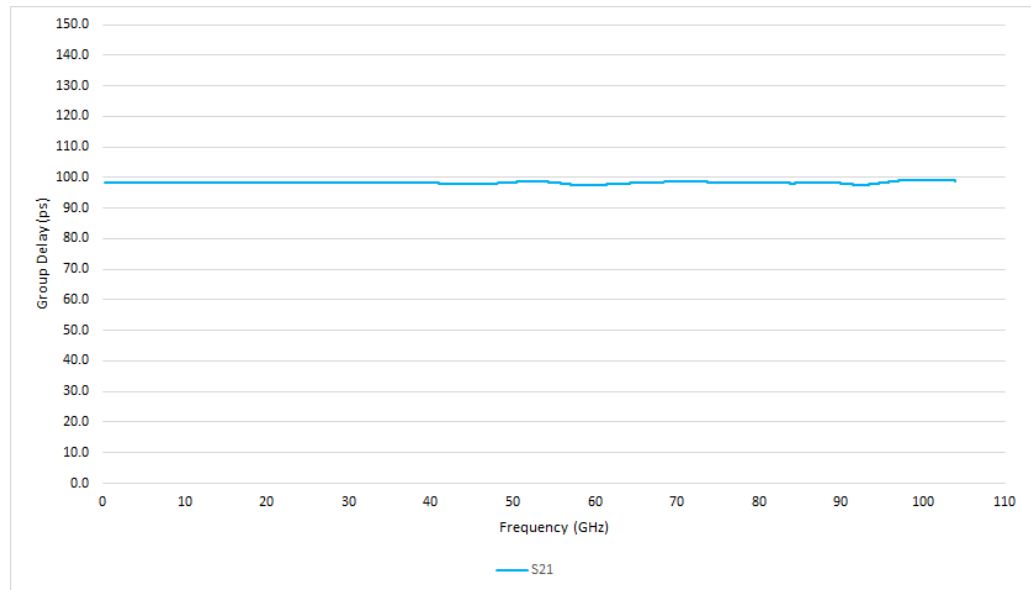


Figure 4: Typical HL9439 Group Delay



HL9439 Dimensional Drawing

Figure 5 shows a mechanical drawing of an HL9439-JJ. Unless otherwise noted, all units are in inches. See page 2 for full dimensions.

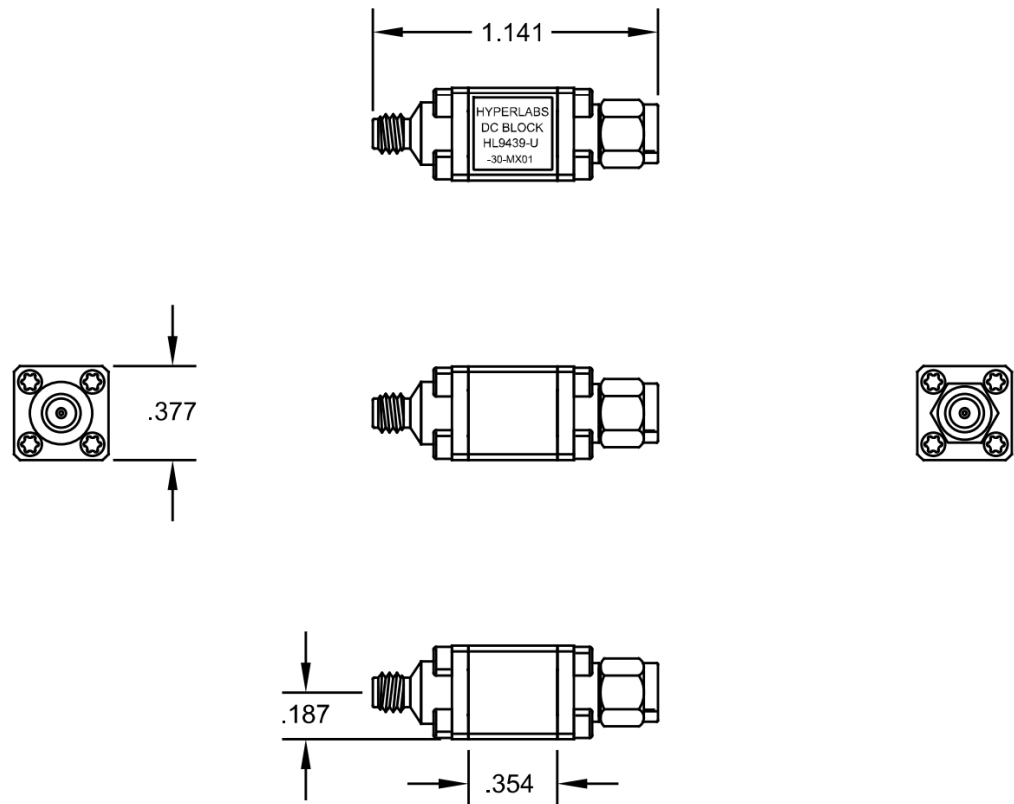


Fig 5: HL9439 Mechanical Drawing