HYPERLABS™
Innovation at Hyperspeed since 1992

HL9450 Transition Time Converters (< 1 GHz)

Options and Technical Specifications

Option	Rise Time	Bandwidth (-3 dB fc)
-373	373 ps	938 MHz
-375	375 ps	933 MHz
-417	417 ps	840 MHz
-439	439 ps	797 MHz
-749	749 ps	467 MHz
-900	900 ps	388 MHz
-1000	1.0 ns	350 MHz
-1300	1.3 ns	270 MHz
-2000	2.0 ns	175 MHz
-2990	2.99 ns	117 MHz
-5000	5.0 ns	70 MHz
-9000	9.0 ns	38.0 MHz
-10000	10.0 ns	35 MHz
-20000	20.0 ns	17.5 MHz
-xxx	Custom	Custom

HL9450

Common Specifications	
Insertion Loss	~ 0.1 to 0.14 dB (varies by option) *See full specifications on pg. 2*
Group Delay (100 MHz to fc)	510 ps (opt. -373) *See full specifications on pg. 2*
Return Loss (DC to 3 fc)	~17 dB (all options) *See full specifications on pg. 2*
Max Input Power	1 W
Impedance	50 Ω
Connectors	SMA, -JP, Jack/Plug (standard) Other configurations available upon request for additional charge
Dimensions	1.80” x 0.60” x 0.40” 45.72 x15.24 x 10.16 mm
Weight	14 g (0.49 oz.)
Temperature Limits	-40° to +40° C, operating
RoHS Compliance	RoHS compliant; made with lead-free solder
Warranty	1 year, see website

PRODUCT SUMMARY

The HL9450 family of Tranistion Time Converters is based on low-pass absorptive rise time filters to provide superior return loss and flat group delay at frequencies below 1 GHz.

Designed using a proprietary absorptive filtering, these filters offer similar frequency response as 4th order Bessel-Thompson filters.

These filters are suitable for OEM use in high-speed telecom and digital networks, as anti-aliasing filters in digital oscilloscopes, and to limit the RF bandwidth to known values.

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.

These devices are bidirectional.

ORDERING DETAILS

Please specify rise time and connector options at time of order.

Eg., HL9450-375-JP

CUSTOM FILTERS

In addition to the options listed in this datasheet, HYPERLABS offers customers quick-turn custom filter designs up to 45 GHz.

Please contact us for more information about these custom designs.

HL9450 Full Specifications

Option	Rise Time	Bandwidth (-3 dB fc)	Insertion Loss (dB)	Return Loss (dB)	Group Delay
-373	373 ps	938 MHz	0.01	16	511 ps
-375	375 ps	933 MHz	0.02	15	508 ps
-417	417 ps	840 MHz	0.03	17	510 ps
-439	439 ps	797 MHz	0.03	18	548 ps
-749	749 ps	467 MHz	0.04	19	918 ps
-900	900 ps	388 MHz	0.05	21	1055 ps
-1000	1.0 ns	350 MHz	0.08	18	1151 ps
-1300	1.3 ns	270 MHz	0.1	18	1260 ps
-2000	2.0 ns	175 MHz	0.12	16	1572 ps
-2990	2.99 ns	117 MHz	0.14	18	2.7 ns
-5000	5.0 ns	70 MHz	0.25	18	5.2 ns
-9000	9.0 ns	38.0 MHz	0.36	14	4.2 ns
-10000	10.0 ns	35 MHz	0.36	14	3.8 ns
-20000	20.0 ns	17.5 MHz	1.25	12	18 ns
-xxx	Custom	Custom			

Parameter	Common Specifications	Comments
Max Input Power	1 W (+30 dBm)	
Impedance	50 Ω	Input and Output
Connector Configuration (specify when ordering)	SMA, Jack/Plug (standard) Other connector sizes (2.92 and 2.4 mm) available for additional charge	-JP -PP -JJ
Dimensions (W x D x H)	1.80” x 0.60” x 0.40” 45.72 x15.24 x 10.16 mm	Package including connectors
Weight	14 g (0.49 oz.)	
Operating Temp.	-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	

Note: All specifications are based on test results using the standard connector configuration. Specifications may vary slightly for other configurations.

HL9450 Plot Diagrams

Figures 1-4 show the typical characteristics for various HL9450 rise time options. Other options show similar performance within their respective specified rise times.

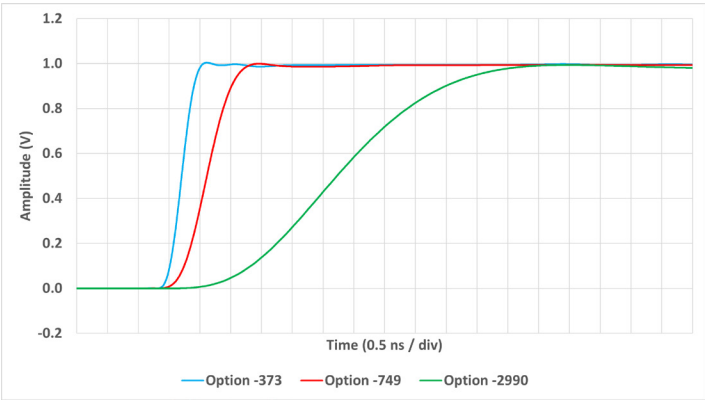

Figure 1: Typical HL9450 step response, various

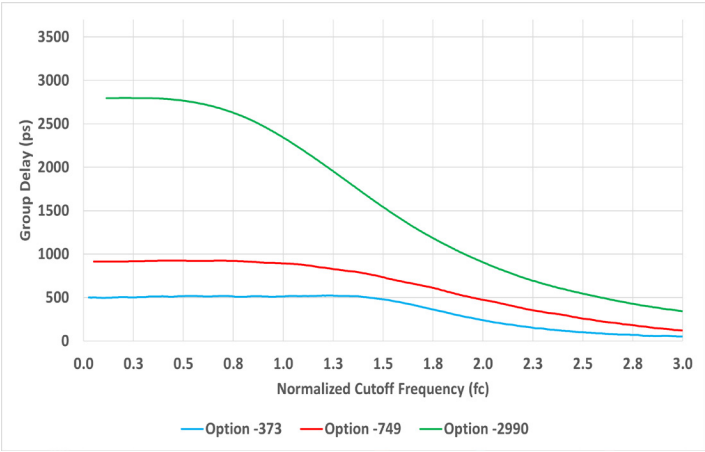

Figure 2: Typical HL9450 group delay, various options

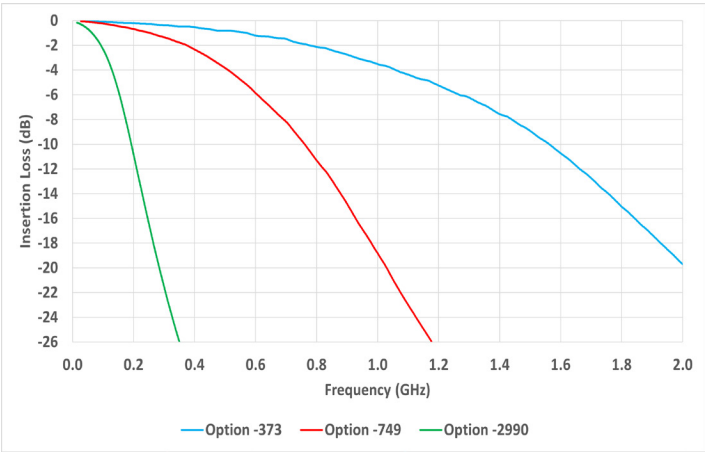

Figure 3: Typical HL9450 insertion loss, various

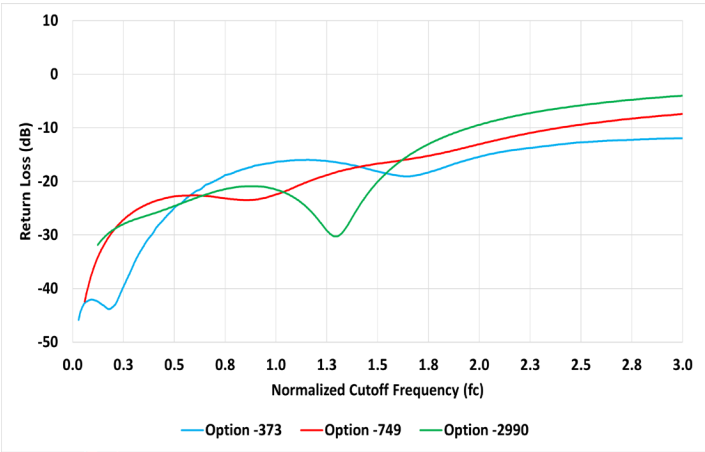

Figure 4: Typical HL9450 return loss, various options

HL9450 Dimensional Drawing

Figure 8 shows a mechanical drawing of an HL9450. Unless otherwise noted, all units are in inches. See page 2 for full dimensions.

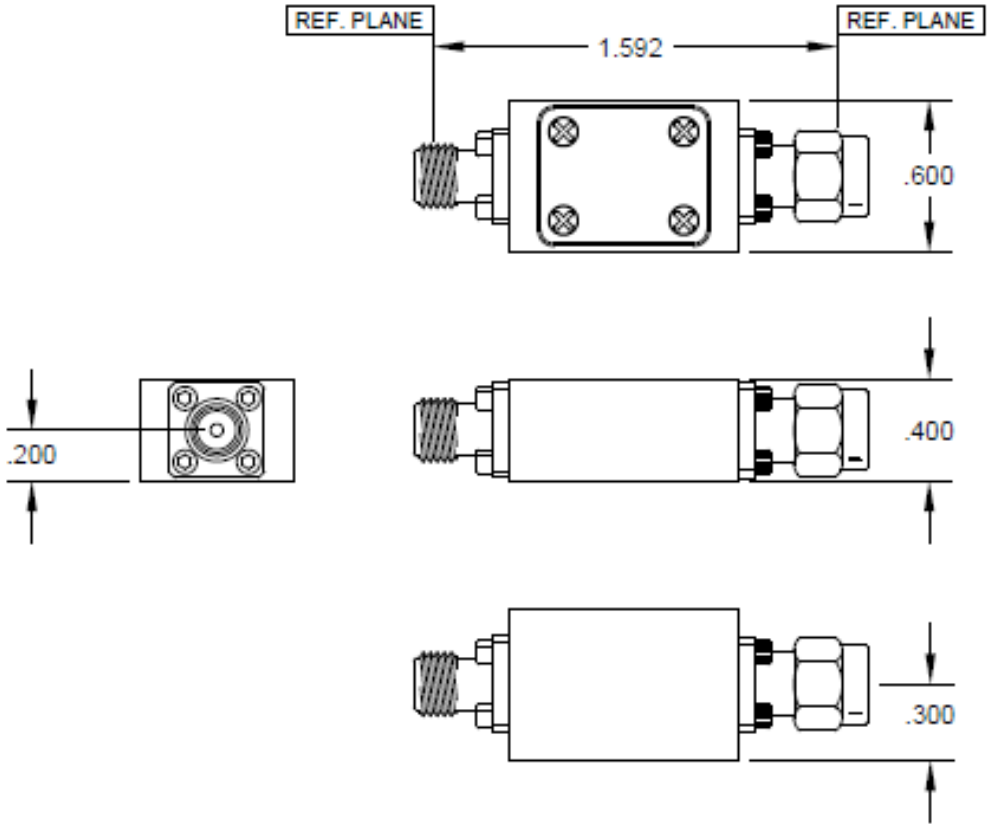

Fig 8: HL9450 Mechanical Drawing