

HL9467 Broadband Z-matched Pick-off Tee (67 GHz)

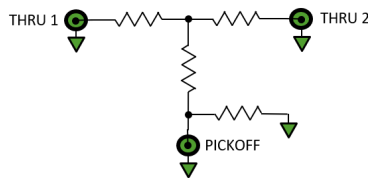
Key Features and Technical Specifications¹

Bandwidth	DC to 67 GHz, thru line DC to 55 GHz (3 dB), pick-off line
Insertion Loss	4.0 ± 0.75 dB, thru line 10.0 ± 1 dB, pick-off line See Fig. 1
Amplitude Match (opt. -M only)	± 0.25 dB See Figs. 3-4
Phase Match (opt. -M only)	± 2°, f = 10 GHz ± 5°, f = 20 GHz
Return Loss	< 25 dB, f ≤ 25 GHz, thru line < 15 dB, f > 25 GHz, thru line < 15 dB, f ≤ 30 GHz, pick-off line < 10 dB, f > 30 GHz, pick-off line See Fig. 5
Group Delay	≈ 115 ps, thru line (opt. -JJJ) ≈ 125 ps, thru line (opt. -JPJ) ≈ 125 ps, pick-off line (all opts.) See Fig. 2
Connectors	1.85 mm jack, all ports (opt. -JJJ) 1.85 mm jack, Thru 1 and Pick-off; 1.85 mm plug, Thru 2 (opt. -JPJ)
Unit Dimensions	30.75 x 24.23 x 13.59 mm 1.21" x 0.95" x 0.54"
RoHS Compliant	Yes
REACH Compliant	Yes

NOTE 1 - The specification in this table are typical. Full specifications are available on Page 2 of this datasheet.

DEVICE PORT ASSIGNMENTS

For the purposes of this datasheet, the below port assignments are used.



PRODUCT SUMMARY

The HL9467 is an impedance-matched pick-off tee with a flat frequency response from DC to 67 GHz on the thru line and 55 GHz bandwidth (-3 dB) on the pick-off line.

It is suitable as a trigger source with minimum perturbation of the thru signal path.

Digital oscilloscope applications include pre-scaler triggering, synchronization, and clock/data recovery.

DEPLOYMENT NOTES

Some of the specifications in this datasheet are only applicable to matched pairs of devices and are labeled accordingly.

S-PARAMETERS

S-parameters are available on our website.

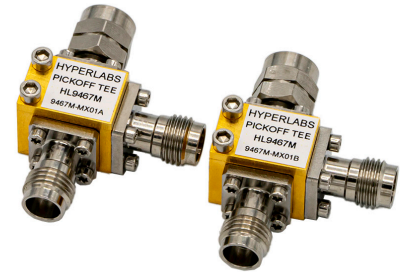
AVAILABLE OPTIONS

The following options and configurations are available for this product:

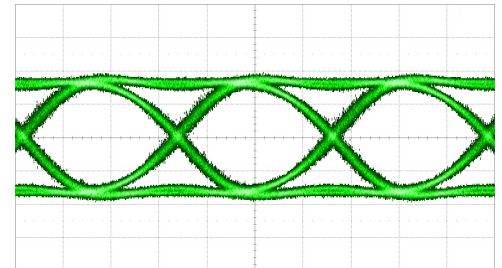
- M, matched pair
- U, unmatched part(s)

-JJJ, jack (female), all ports

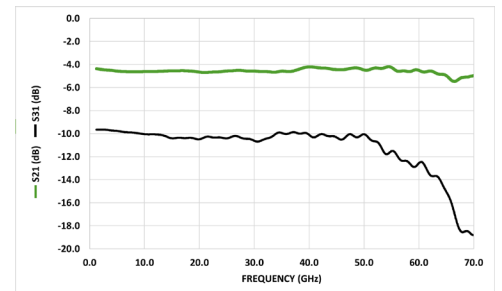
-JPJ, jack (female) thru in and pick-off; plug (male) thru out



HL9467, option -M-JPJ shown



28 Gbps PRBS31 pattern on the Thru Out port of HL9467-JPJ; see also Figs. 7-12



Typical Insertion Loss on thru and pick-off lines of HL9467 (opt. -JPJ); see also Fig. 1



HL9467 Full Specifications

Parameter	Minimum	Typical	Maximum	Comments
Bandwidth		DC to 67 GHz, thru DC to 55 GHz (-3 dB), pick-off		3 dB roll-off point, relative to nominal insertion loss
Insertion Loss		4.0 ± 0.75 dB, thru 10.0 ± 1 dB, pick-off		All options
Amplitude Match		± 0.25 dB		Matched pair (opt. -M) only
Phase Match		± 2.5°, f = 10 GHz ± 5°, f = 20 GHz		Matched pair (opt. -M) only
Return Loss, Thru		< 20 dB, f ≤ 25 GHz < 15 dB, f > 25 GHz		
Return Loss, Pick-off		< 15 dB, f ≤ 30 GHz < 10 dB, f > 30 GHz		
Rise Time		5.2 ps, thru 7.0 ps, pick-off		
Group Delay		115 ps, thru (opt. -JJJ) 125 ps, thru (opt. -JPJ) 125 ps, pick-off (all options)		
Max Input Power		+30 dBm		
Impedance		50 Ω, all ports		
Connectors		1.85 mm jack/jack/jack (opt. -JJJ) 1.85 mm jack/plug/jack (opt. -JPJ)		Thru 1 / Thru 2 / Pick-off
Dimensions (W x D x H)		30.75 x 24.23 x 13.59 mm 1.21" x 0.95" x 0.54"		Single unit (opt. -U)
Weight		12.5 g 0.44 oz		Single unit (opt. -U)
Operating Temperature	-40° C		+85° C	Case temperature
Storage Temperature	-40° C		125° C	
RoHS Compliant	Yes, assembled with lead-free solder			
REACH Compliant	Yes			
Warranty	1 year, repair or replacement; see website for details			



HL9467 Insertion Loss

Figure 1 shows the typical insertion loss of the HL9467 along the thru and pick-off lines from DC to 70 GHz.

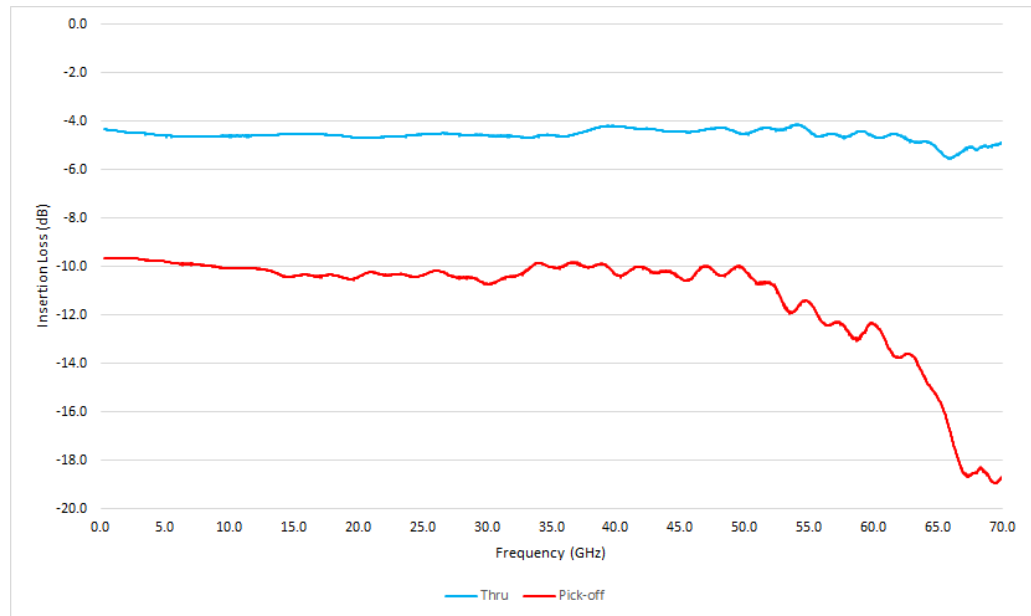


Figure 1: HL9467 Insertion Loss (opt. -JPJ)

HL9467 Group Delay

Figure 2 shows the typical group delay of the HL9467 along the thru and pick-off lines to 70 GHz.

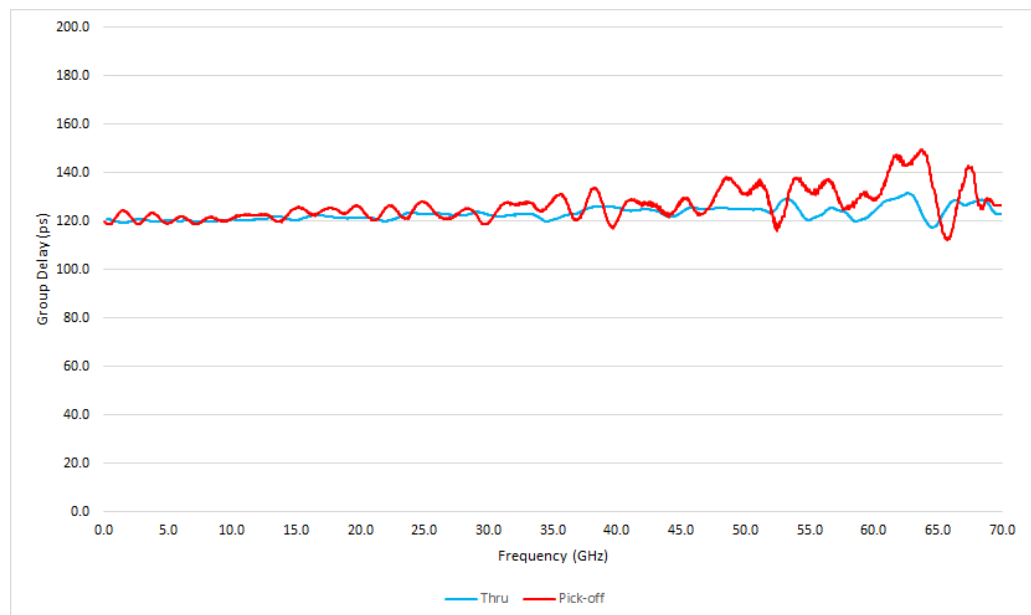


Figure 2: HL9467 Group Delay (opt. -JPJ)

HL9467 Amplitude Match

Figures 3-4 show the amplitude match of two matched HL9467 devices along the thru and pick-off lines, respectively, from DC to 70 GHz.

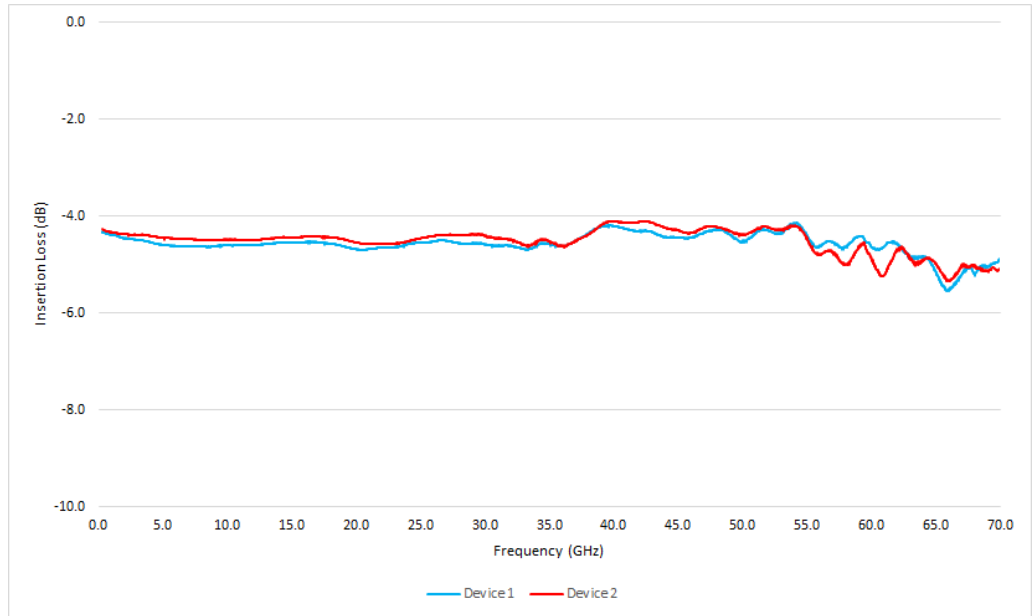


Figure 3: HL9467 Thru Amplitude Match (opt. -M-JPJ)

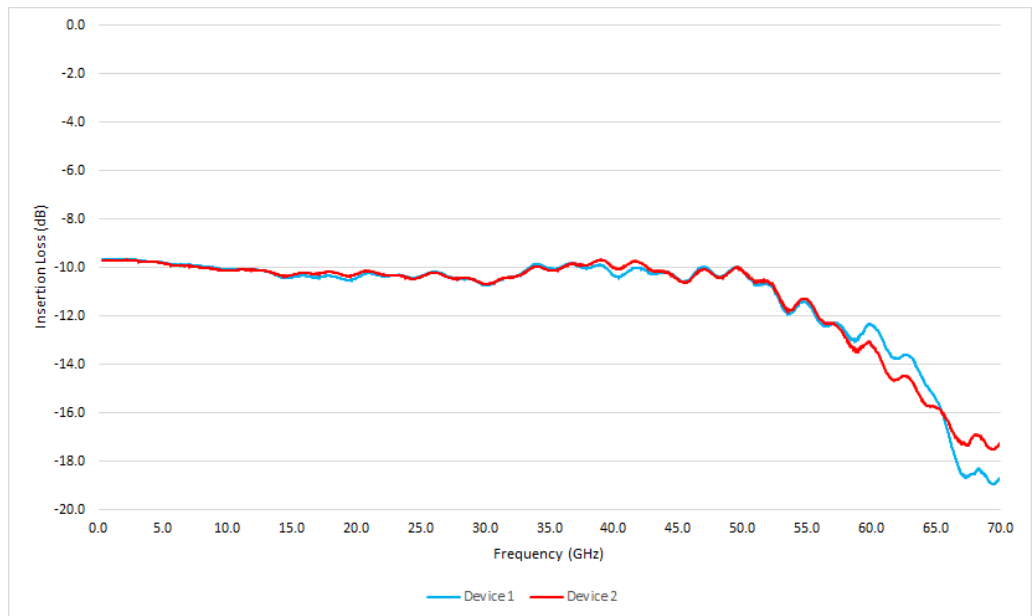


Figure 4: HL9467 Pick-off Amplitude Match (opt. -M-JPJ)

HL9467 Return Loss and VSWR

Figure 5 shows typical return loss on all ports of an HL9467 from DC to 70 GHz. Figure 6 shows the corresponding Voltage Standing Wave Ratio (VSWR).

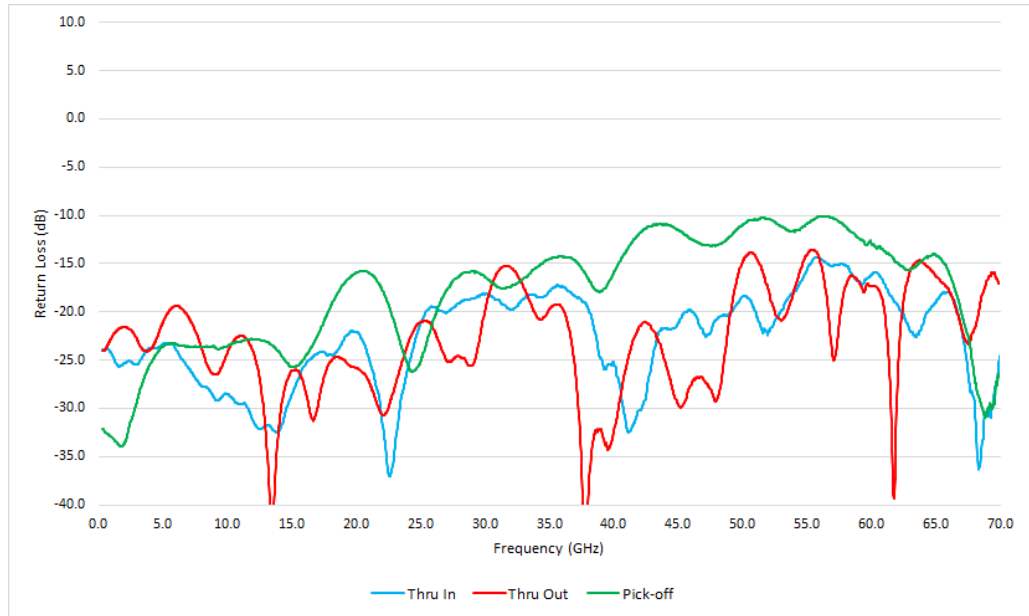


Figure 5: HL9467 Return Loss (opt. -JPJ)

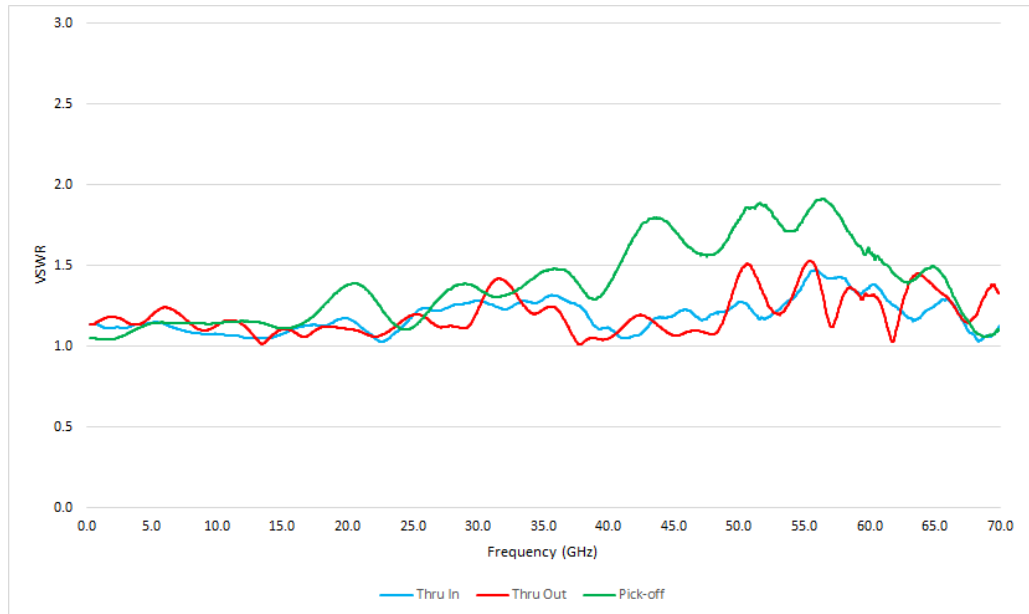


Figure 6: HL9467 VSWR (opt. -JPJ)



HL9467 Eye Diagrams

The eye diagrams in *Figures 7-9* show a PRBS31 pattern at 28 Gbps. The input signal has a 1.53 V amplitude and is shown at 450 mV/div. The thru and pick-off outputs are shown at 275 mV/div.

Figures 10-12 were generated by a PRBS31 pattern at 12.5 Gbps. The input signal has amplitude of 1.49 V and is shown at 450 mV/div. The thru and pick-off outputs are shown at 275 mV/div.

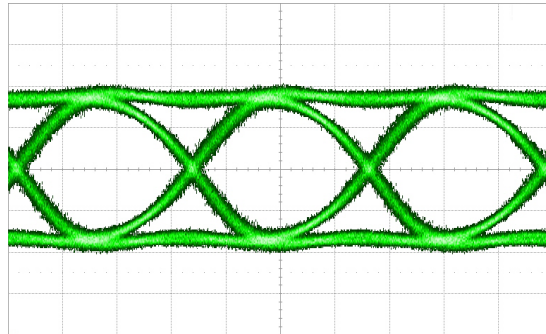


Figure 7: 28 Gbps PRBS31 pattern on RF In

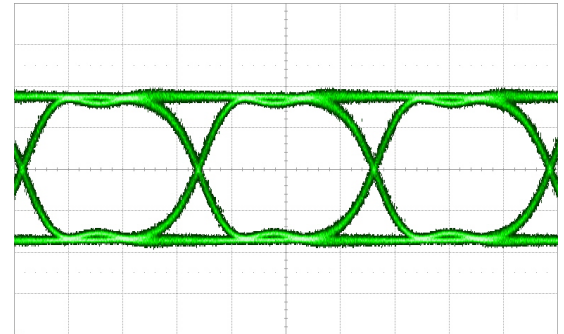


Figure 10: 12.5 Gbps PRBS31 pattern on RF In

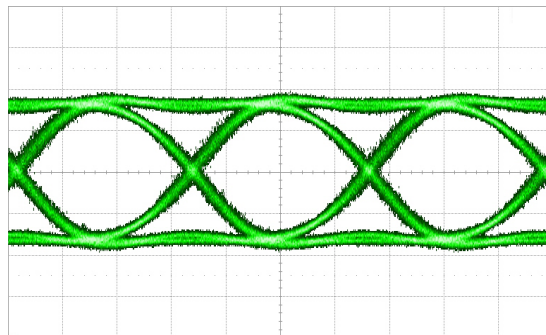


Figure 8: 28 Gbps PRBS31 pattern on Thru Out

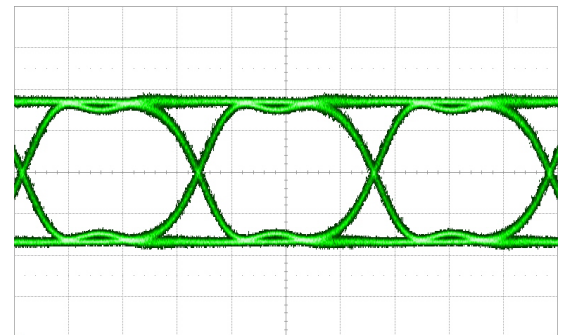


Figure 11: 12.5 Gbps PRBS31 pattern on Thru Out

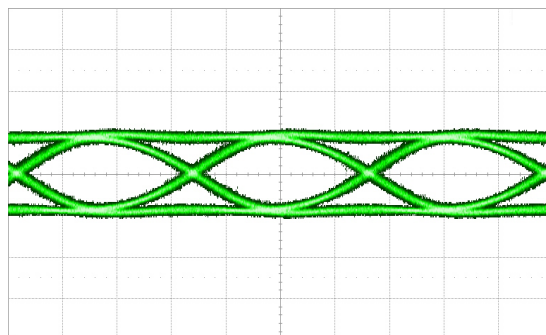


Figure 9: 28 Gbps PRBS31 pattern on Pick-off Out

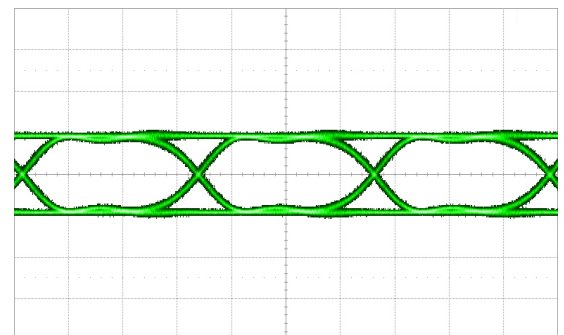


Figure 12: 12.5 Gbps PRBS31 pattern on Pick-off Out

HL9467 Dimensional Drawing

Figure 13 shows a mechanical drawing of an HL9467, option -JPJ. Unless otherwise noted, all units are in inches.

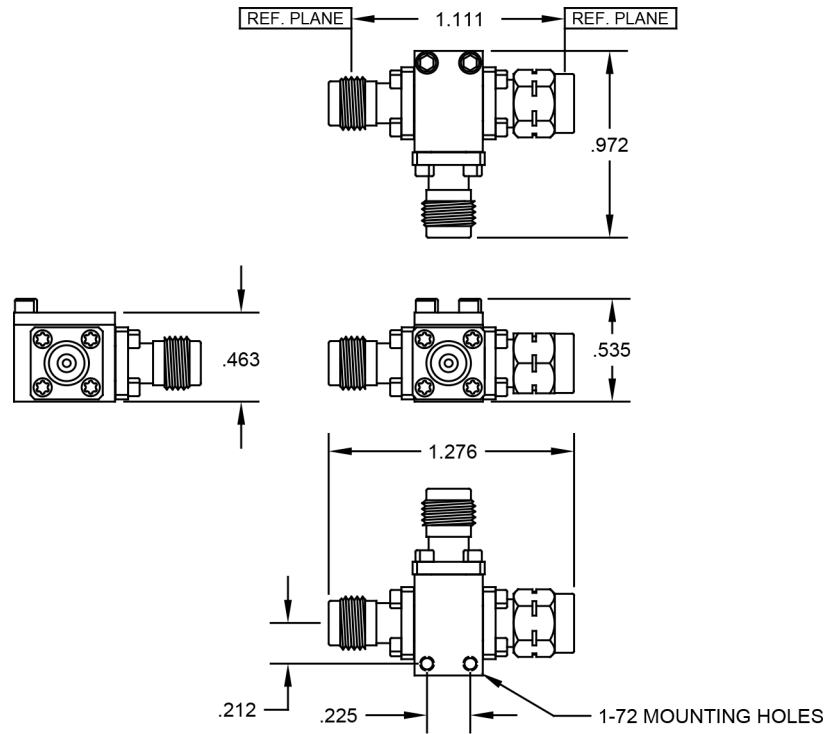


Figure 13: HL9467 mechanical drawing (opt. -JPJ)