

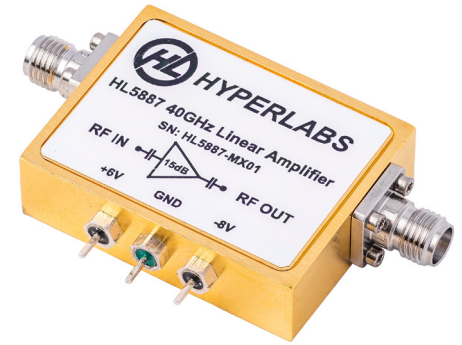


HL5887 Broadband Linear Amplifier (40 GHz)

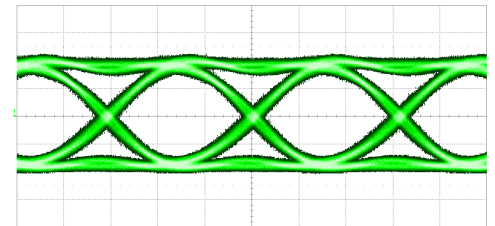
Key Features and Technical Specifications¹

Bandwidth (3 dB)	42 kHz to 40 GHz
Small Signal Gain	15 dB See Fig. 1
Amplitude Deviation	± 3%, 0-60° C See Fig. 3
XP Deviation	± 2%, 0-60° C See Fig. 4
Return Loss	10 dB, input 9 dB, output See Fig. 2
Max Power Out (-1 dB gain comp.)	16 dBm
Dimensions	55.9 x 33.7 x 10.2 mm (opt. -29-JJ) 2.2" x 1.326" x 0.400"
Weight	25 g (0.88 oz)
Temperature Limits	0° to +60° C, operating
RoHS Compliant	Yes, assembled with lead-free solder
REACH Compliant	Yes
Warranty	1 year, see website

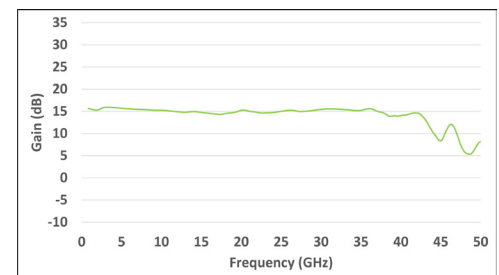
NOTE 1 - The specifications in this table are typical. Full specifications, are available on Pages 2-3 of this datasheet.



HL5887, option -29-JJ similar shown



32 Gbps PRBS11 pattern on the RF Out port of HL5887-29-JJ; see also Figs. 5-10



Typical Small Signal Gain of HL5887-29-JJ; see also Fig. 1

PRODUCT SUMMARY

The HL5887 is an ultra-broadband, thermally-compensated linear amplifier that demonstrates exceptional gain flatness over a typical bandwidth of 42 kHz to 40 GHz.

This amplifier is optimized as a data driver to amplify signals with a minimum amount of eye distortion. This is ideal for use as a linear gain block in applications such as fiber optic receiver channels or 64 Gbps PAM4 signaling.

DEPLOYMENT NOTES

All specifications contained herein are typical unless otherwise noted.

S-PARAMETERS

S-parameters files are available on our website.

AVAILABLE OPTIONS

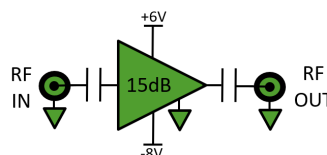
The following options and configurations are available for this product:

- 24, 2.4 mm connectors
- 29, 2.92 mm connectors

- PP, plug in & out
- PJ, plug in, jack out
- JJ, jack in & out
- JP, jack in, plug out

DEVICE PORT ASSIGNMENTS

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



HL5887 Full Specifications

Parameter	Conditions	Minimum	Typical	Maximum	Comments
Upper 3 dB Frequency		38 GHz	40 GHz		3 dB roll-off point, relative to avg. gain from 35 MHz to 2 GHz
Lower 3 dB Frequency			42 kHz		3 dB roll-off point
Small Signal Gain		14 dB	15 dB	16 dB	Avg. from 35 MHz to 2 GHz
Gain Flatness			± 1 dB	± 1.5 dB	50 MHz < f < 32 GHz
Deviation from Linear Phase			5 deg.		50 MHz < f < 20 GHz
Return Loss, Input			10 dB		50 MHz < f < 32 GHz
Return Loss, Output			9 dB		50 MHz < f < 32 GHz
Group Delay			300 ps		
Input Referred Noise Voltage			125 μ V rms		20 GHz broadband measurement
Noise Figure			6 dB	6.5 dB	f = 1 GHz
Max Power Out	1 dB gain compression		16 dBm		32 GHz input signal
Psat Out			21 dBm		32 GHz input signal
IP3 Out			33 dBm		16 GHz input fundamental, measured 3rd harmonic
Impedance			50 Ω		
Polarity	Inverting				
Coupling	AC, input and output				
Supply Voltage (+)		+5.5 V _{DC}	+6 V _{DC}	+10 V _{DC}	
Supply Voltage (-)		-8.5 V _{DC}	-8 V _{DC}	-7.5 V _{DC}	
Supply Current (+)			225 mA		
Supply Current (-)			25 mA		
Power Dissipation			1.5 W	2.5 W	

HL5887 Full Specifications (continued)

Parameter	Conditions	Minimum	Typical	Maximum	Comments
Damage Threshold Input				15 dBm	Input damage threshold
Input DC Bias Range		-20 V _{DC}		+20 V _{DC}	Input is AC coupled
Output DC Bias Range		-20 V _{DC}		+20 V _{DC}	Output is AC coupled
Operating Temperature		0° C		60° C	Ambient temperature
Storage Temperature		-40° C		125° C	
RF Connectors	2.92 mm jack/female (opt. -29) 2.4 mm jack/female (opt. -24)				
DC Connector	Solder pins				
Dimensions (W x D x H)	55.9 x 33.7 x 10.2 mm (opt. -29-JJ) 2.2" x 1.326" x 0.400"				
Weight	25 g. (0.88 oz.)				
RoHS Compliant	Yes, assembled with lead-free solder				
REACH Compliant	Yes				
Warranty	1 year, repair or replacement; see website for details				

HL5887 Gain

Figure 1 shows the small signal gain of the HL5887 to 50 GHz.

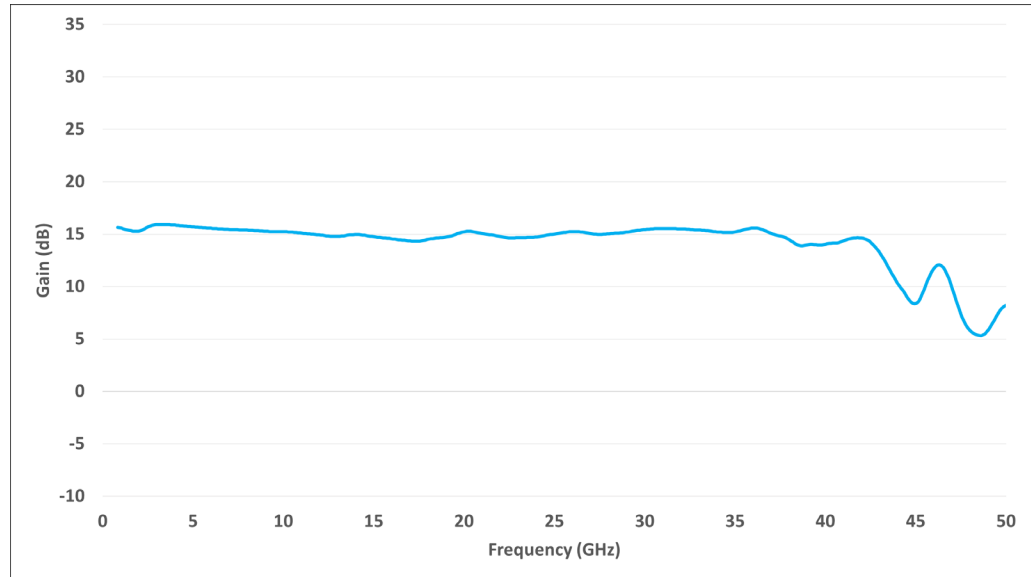


Figure 1: HL5887 Gain (opt. -29-JJ)

HL5887 Return Loss

Figure 2 shows the return loss of the HL5887 to 50 GHz.

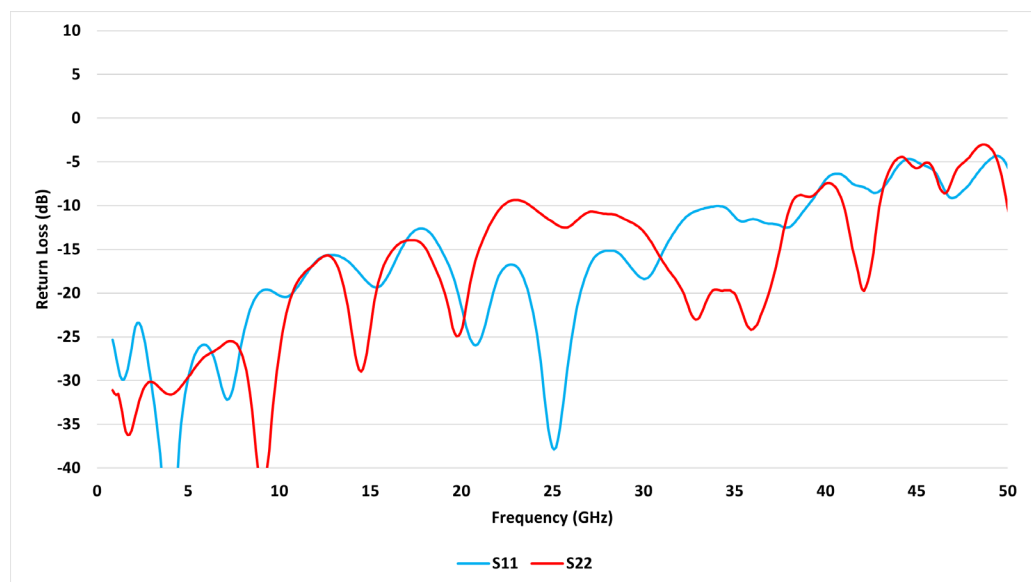


Figure 2: HL5887 Return Loss (opt. -29-JJ)



HL5887 Performance Over Temperature

Figures 3-4 show the typical amplitude deviation and the typical crossing point (XP) deviation, respectively, over the operating temperature range of 0 to +60 °C.

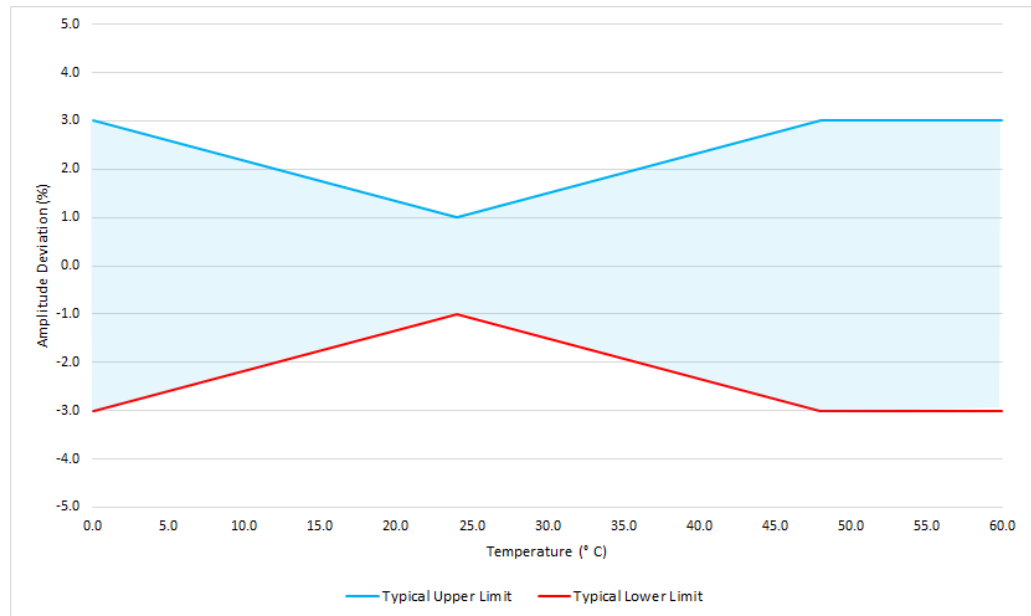


Figure 3: HL5887 Amplitude Deviation

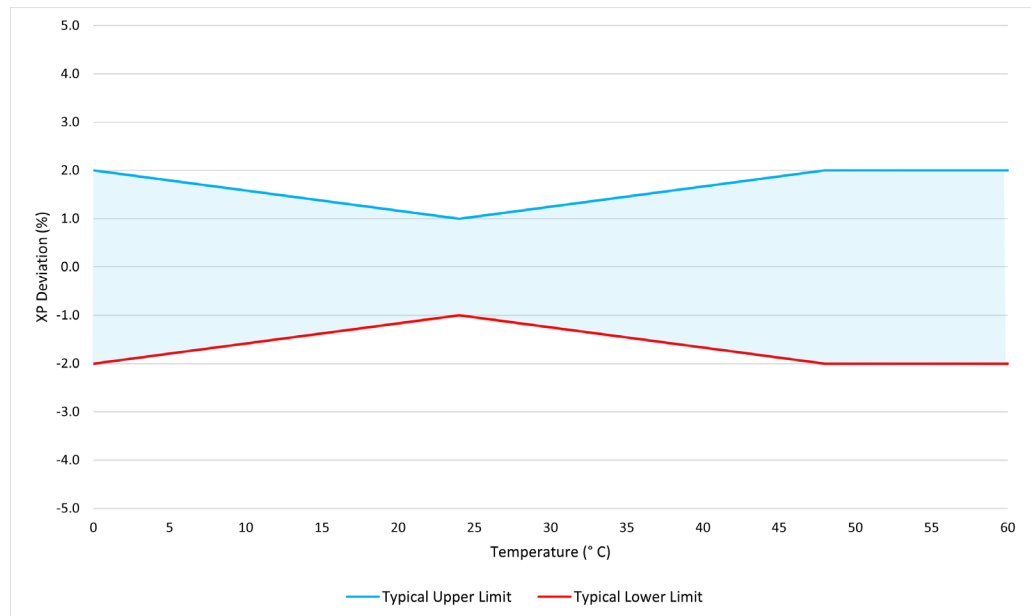


Figure 4: HL5887 Crossing Point Deviation



HL5887 Eye Diagrams

Figures 5 and 6 show input and output signals of 32 Gbps PRBS11 NRZ pattern.

Figures 7 and 8 show input and output signals of 56 Gbps PAM4 pattern.

Figures 9 and 10 show input and output signals of 64 Gbps PAM4 pattern.

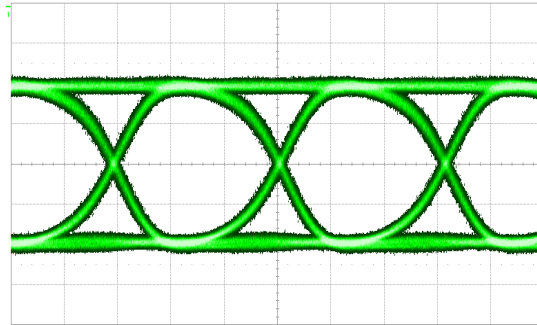


Fig. 5: 32 Gbps PRBS11 pattern on RF In, 100mV/div.

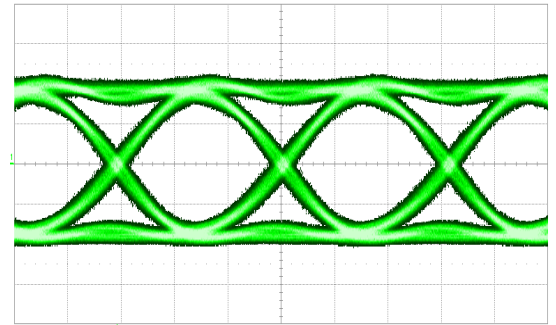


Fig. 6: 32 Gbps PRBS11 pattern on RF Out, 600mV/div.

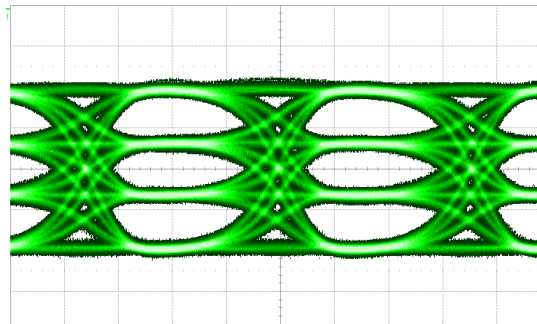


Fig. 7: 56 Gbps PAM4 pattern on RF In, 100mV/div.

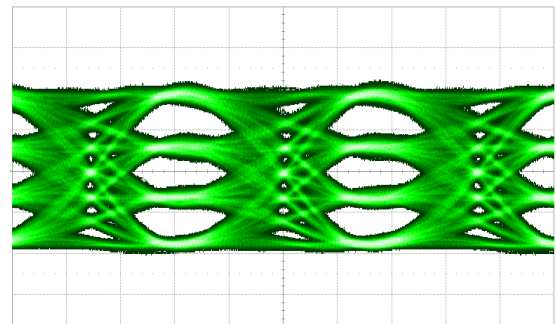


Fig. 8: 56 Gbps PAM4 pattern on RF Out, 600mV/div.

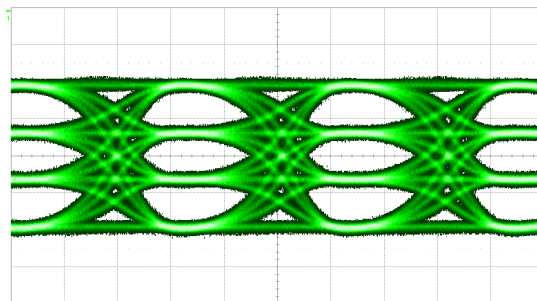


Fig. 9: 64 Gbps PAM4 pattern on RF In, 100mV/div.

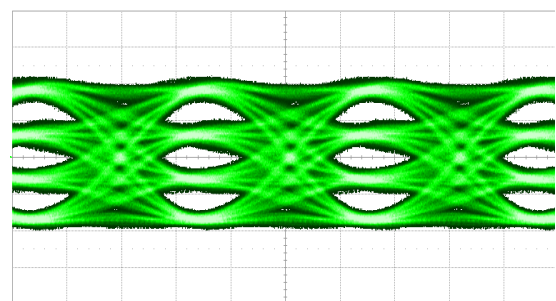


Fig. 10: 64 Gbps PAM4 pattern on RF Out, 600mV/div.

Note: All signals measured using a 50 GHz sampling head.

HL5887 Dimensional Drawing

Figure 11 shows a mechanical drawing of an HL5887, option -29-JJ. Unless otherwise noted, all units are in inches.

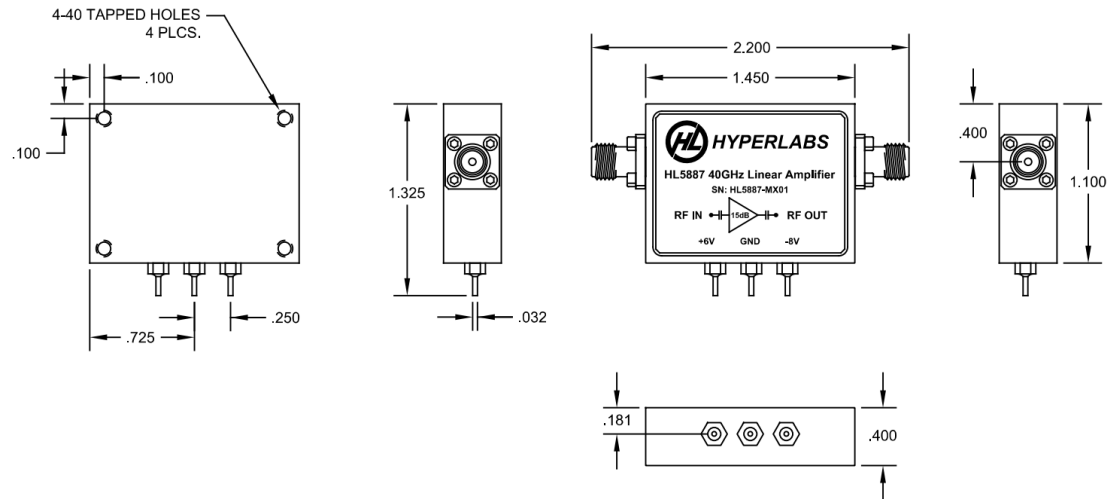


Figure 11: HL5887 mechanical drawing (opt. -29-JJ), inches