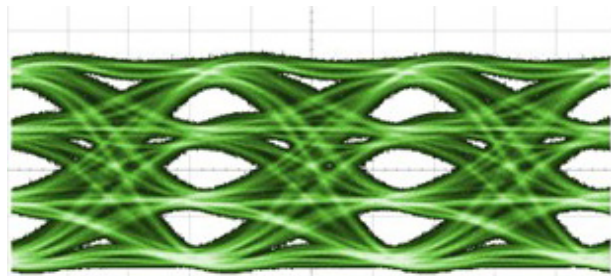




## OPEN YOUR EYES: COMPONENTS DESIGNED FOR HIGH-SPEED DATA

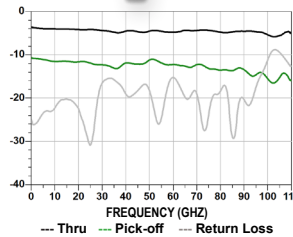
### HL5897 Linear Amp (63 GHz)

- Exceptionally flat bandwidth (70 kHz to 63 GHz)
- 14 dB gain
- Optimized as data driver
- 112 Gbps PAM4 signaling
- Small form factor



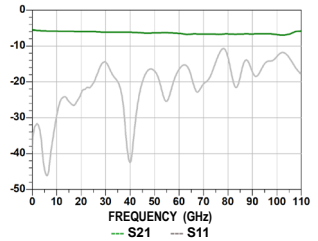
### NEW: HL9469 Pick-off Tee

- Ultra-broadband (DC to 110 GHz)
- Suitable for 224 Gbps PAM4
- Available in matched pairs

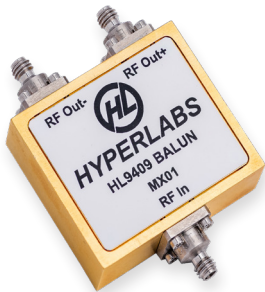


### NEW: HL9429 Attenuators

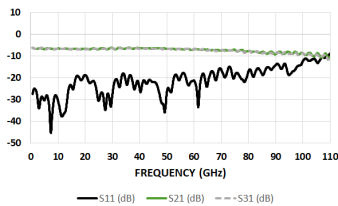
- Ultra-broadband (DC to 110 GHz)
- Exceptional price for performance
- 6 dB available now; other values Q4 2023



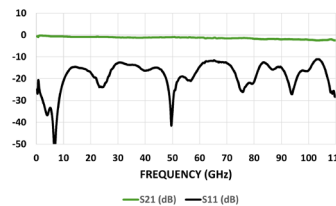
## ULTRA-BROADBAND PARTS FOR 112 & 224 GBPS PAM4 APPLICATIONS



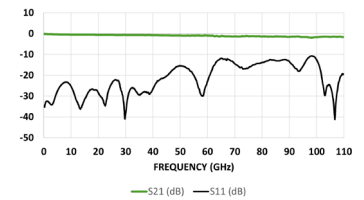
HL9409 BALUN (500 kHz-100 GHz)



HL9449 BIAS TEE (160 kHz-110 GHz)



HL9439 DC BLOCK (160 kHz-110 GHz)



### Also Available:

- HL9479 2-Way Power Divider from DC to 110 GHz (3 dB)
- HL945x Transition Time Converters up to 50 GHz (7 ps)
- HL9577 4-Way Power Divider from DC to 67+ GHz (3 dB)

Visit our website for baluns, pick-off tees, power dividers, risetime filters, DC blocks, amplifiers, and more!



## PUT HYPERLABS IN YOUR LAB

### ULTRA-BROADBAND

We offer some of the broadest band components on the market.

Our engineers are constantly working on new designs and expanding our product line.

Components that are "invisible" with regards to bandwidth roll-off and jitter performance keep pulse and eye fidelity at their best.

We design our products specifically to achieve these goals over the broadest band possible.

### DEMOS AVAILABLE

Demos are in stock for most offerings, and we will get them in your lab quickly for a "hands on" evaluation.

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Don't see exactly what you need? Our engineers may be able to help.

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### HL OREGON

13830 SW Rawhide Ct.  
Beaverton, OR 97008

### HL COLORADO

315 W South Boulder Rd.  
Suite 206  
Louisville, CO 80027

AMPLIFIERS		F-MIN	F-MAX
HL5867	Linear Amplifier; 13 dB gain; 12.5 dBm max. output	35 kHz	30 GHz
HL5887	Linear Amplifier; 15 dB gain; 15.5 dBm max output	35 kHz	40 GHz
HL5877	Limiting Amplifier; 27 dB gain; 1.05 Vp-p max. output	35 kHz	27 GHz
HL5897	Linear Amplifier; 13 dB gain; 17.3 dBm max. output	70 kHz	65 GHz

BALUNS - 1 Watt Max Input		F-MIN	F-MAX
HL9401	Match: $\pm 0.1$ dB (20 GHz), $\pm 6^\circ$ (20 GHz); 6 dB I.L.	100 MHz	20 GHz
HL9402	Match: $\pm 0.1$ dB, $\pm 4^\circ$ (20 GHz); 6 dB I.L.	500 kHz	26.5 GHz
HL9404	Match: $\pm 0.1$ dB, $\pm 4^\circ$ (20 GHz); 6 dB I.L.	500 kHz	40 GHz
HL9405	Match: $\pm 0.1$ dB, $\pm 8^\circ$ (40 GHz); 6 dB I.L.	500 kHz	50 GHz
HL9407	Match: $\pm 0.25$ dB (>50 GHz), $\pm 8^\circ$ (40 GHz); 6 dB I.L.	500 kHz	67 GHz
HL9408	Match: $\pm 0.5$ dB (>50 GHz), $\pm 15^\circ$ (40 GHz); 6.5 dB I.L.	500 kHz	85 GHz
HL9409	Match: $\pm 0.5$ dB (>50 GHz), $\pm 15^\circ$ (80 GHz); 6.5 dB I.L.	500 kHz	100 GHz

INTEGRATED BALUNS - DC Block at all ports / 1W Max Input		F-MIN	F-MAX
HL9502	Match: $\pm 0.1$ dB, $\pm 4^\circ$ (20 GHz); 6 dB I.L.	500 kHz	26.5 GHz
HL9504	Match: $\pm 0.1$ dB, $\pm 4^\circ$ (20 GHz); 6 dB I.L.	500 kHz	40 GHz
HL9505	Match: $\pm 0.25$ dB (>40GHz), $\pm 8^\circ$ (40 GHz); 6 dB I.L.	500 kHz	50 GHz

DC BLOCKS		F-MIN	F-MAX
HL9434 <sup>1</sup>	Match: $\pm 0.1$ dB, $\pm 4^\circ$ (20 GHz); <1 dB I.L. (40 GHz)	35 kHz	40 GHz
HL9435 <sup>1</sup>	Match: $\pm 0.1$ dB, $\pm 4^\circ$ (20 GHz); <1 dB I.L. (50 GHz)	35 kHz	50 GHz
HL9437 <sup>1</sup>	Match: $\pm 0.1$ dB, $\pm 4^\circ$ (20 GHz); <1 dB I.L. (67 GHz)	35 kHz	67 GHz
HL9438 <sup>2</sup>	Match: $\pm 0.1$ dB, (<110 GHz), $\pm 4^\circ$ (40 GHz); <1.5 dB I.L. (85 GHz)	160 kHz	95 GHz
HL9439 <sup>2</sup>	Match: $\pm 0.1$ dB, (<110 GHz), $\pm 4^\circ$ (40 GHz); <1.5 dB I.L. (85 GHz)	160 kHz	110 GHz
HL8334	Removes DC Bias; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <0.75 dB I.L.	20 kHz	40 GHz

BIAS TEES (Sense port option available)		F-MIN	F-MAX
HL9444 <sup>1</sup>	175 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <1.55 dB I.L. (40 GHz)	35 kHz	40 GHz
HL9445 <sup>1</sup>	175 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <1.55 dB I.L. (50 GHz)	35 kHz	50 GHz
HL9447 <sup>1</sup>	175 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <1.55 dB I.L. (67 GHz)	35 kHz	67 GHz
HL9448 <sup>2</sup>	175 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <2.5 dB I.L. (95 GHz)	160 kHz	95 GHz
HL9449 <sup>2</sup>	175 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <2.5 dB I.L. (110 GHz)	160 kHz	110 GHz
HL9544 <sup>3</sup>	400 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <1.5 dB I.L. (40 GHz)	50 kHz	40 GHz
HL9545 <sup>3</sup>	400 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <1.5 dB I.L. (50 GHz)	50 kHz	50 GHz
HL9547 <sup>3</sup>	400 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <1.5 dB I.L. (67 GHz)	50 kHz	67 GHz
HL9644 <sup>4</sup>	1000 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <2.3 dB I.L. (40 GHz)	125 kHz	40 GHz
HL9645 <sup>4</sup>	1000 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <2.3 dB I.L. (50 GHz)	125 kHz	50 GHz
HL9647 <sup>4</sup>	1000 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (40 GHz); <2.3 dB I.L. (67 GHz)	125 kHz	67 GHz
HL8342	500 mA IMAX; Match: $\pm 0.1$ dB, $\pm 4^\circ$ (20 GHz); <0.5 dB I.L.	5 kHz	28 GHz
HL8442	2000 mA IMAX; Match: $\pm 0.2$ dB, $\pm 4^\circ$ (15 GHz); <0.75 dB I.L.	7.5 kHz	23 GHz

TRANSITION TIME CONVERTERS / LOW PASS FILTERS		F-MAX
HL9450	Specify Maximum (-3 dB) Frequency and/or Risetime ( $T_r > 350$ ps)	< 1 GHz
HL9452	Specify Maximum (-3 dB) Frequency and/or Risetime ( $350$ ps $> T_r > 24$ ps)	1 - 15 GHz
HL9454	Specify Maximum (-3 dB) Frequency and/or Risetime ( $24$ ps $> T_r > 12.5$ ps)	15 - 28 GHz
HL9457	Specify Maximum (-3 dB) Frequency and/or Risetime ( $T_r < 12.5$ ps)	> 28 GHz

INSTRUMENTATION	
HL1101	TDR: Single Ended, 200ps Rise Time, USB Powered (Single Channel)
HL1302	Cable Skew Tester (2 channel), 1-200 ps Delay/Skew, 0.5 ps Resolution
HL2202	TDR / Signal Path Analyzer: Differential, 35 ps Risetime, Signal Path Analyzer (Single Channel)
HL2204	TDR / Signal Path Analyzer: Differential, 35 ps Risetime, Signal Path Analyzer (Dual Channel)
HL9101	Impulse Generator: Triggerable, 100 ps Rise Time, 100 ps Fall Time, 200 ps Pulse Width, Trigger Rate 10 Hz - 50 MHz
HL9201	Impulse Generator: Triggerable, 50 ps Rise Time, 50 ps Fall Time, 70 ps Pulse Width, Trigger Rate 10 Hz - 10 MHz
HL9600	Calibration Standard Substrate. Includes Single-Ended and Differential SOLT Traces. Intended for use with HYPERLABS' Instrument Products

PICK-OFF TEES (standard)		F-MIN	F-MAX
HL9562 <sup>5</sup>	Match: $\pm 0.1$ dB, $\pm 2^\circ$ (10 GHz); I.L. (see Note 5)	DC	26.5 GHz
HL9564 <sup>6</sup>	Match: $\pm 0.1$ dB, $\pm 2^\circ$ (10 GHz); I.L. (see Note 6)	DC	40 GHz
HL9565 <sup>6</sup>	Match: $\pm 0.1$ dB, $\pm 2^\circ$ (10 GHz); I.L. (see Note 6)	DC	50 GHz

PICK-OFF TEES - Z Matched - 50 $\Omega$ all ports		F-MIN	F-MAX
HL9462	Match: $\pm 0.1$ dB, $\pm 5^\circ$ (20 GHz); I.L. 3.5 dB thru, 10.5 dB p.off	DC	26.5 GHz
HL9464	Match: $\pm 0.1$ dB, $\pm 5^\circ$ (20 GHz); I.L. 3.5 dB thru, 10.5 dB p.off	DC	40 GHz
HL9465	Match: $\pm 0.1$ dB, $\pm 5^\circ$ (20 GHz); I.L. 3.5 dB thru, 10.5 dB p.off	DC	50 GHz
HL9467	Match: $\pm 0.25$ dB, $\pm 5^\circ$ (20 GHz); I.L. 4 dB thru, 10 dB p.off	DC	67 GHz
HL5567	100Gb/s PAM4 Encoder. 2:1 Weighted Summing. (ref: HL9467)	DC	67 GHz
HL9469	Match: $\pm 0.5$ dB, $\pm 5^\circ$ (60 GHz); I.L. 4.5 dB thru, 11 dB p.off	DC	110GHz

POWER DIVIDERS (2:1)		F-MIN	F-MAX
HL9472	Match: $\pm 0.5$ dB, $\pm 4^\circ$ (20 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	26.5 GHz
HL9474	Match: $\pm 0.5$ dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	40 GHz
HL9475	Match: $\pm 0.5$ dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	50 GHz
HL9477	Match: $\pm 0.5$ dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	67 GHz
HL9479	Match: $\pm 0.5$ dB, $\pm 10^\circ$ (80 GHz); 6.0 dB I.L.AC; 7 dB I.L.DC	DC	110 GHz

POWER DIVIDERS (4:1)		F-MIN	F-MAX
HL9572	Match: $\pm 0.5$ dB, $\pm 4^\circ$ (20 GHz); 12 dB I.L.AC; 6 dB I.L.DC	DC	26.5 GHz
HL9574	Match: $\pm 0.5$ dB, $\pm 8^\circ$ (40 GHz); 12 dB I.L.AC; 6 dB I.L.DC	DC	40 GHz
HL9575	Match: $\pm 0.5$ dB, $\pm 8^\circ$ (40 GHz); 12 dB I.L.AC; 6 dB I.L.DC	DC	50 GHz
HL9577	Match: $\pm 0.5$ dB, $\pm 8^\circ$ (40 GHz); 12 dB I.L.AC; 6 dB I.L.DC	DC	67 GHz

POWER SPLITTERS (2:1)		F-MIN	F-MAX
HL9482	Match: $\pm 0.1$ dB, $\pm 4^\circ$ (20 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	26.5 GHz
HL9484	Match: $\pm 0.1$ dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	40 GHz
HL9485	Match: $\pm 0.1$ dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	50 GHz
HL9487	Match: $\pm 0.1$ dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	67 GHz

ATTENUATORS (6 dB)		F-MIN	F-MAX
HL9427	Match: $\pm 0.2$ dB, $\pm 2^\circ$ (10 GHz); I.L. 6 dB	DC	70 GHz
HL9429	Match: $\pm 0.5$ dB, $\pm 2^\circ$ (10 GHz); I.L. 6 dB	DC	110 GHz

SURFACE MOUNT COMPONENTS		F-MIN	F-MAX
HL7041	SMD Bias Tee (R-handed): 175 mA IMAX, <2.5 dB I.L. (20GHz)	35 MHz	30 GHz
HL7042	SMD Bias Tee (L-handed): 175 mA IMAX, <2.5 dB I.L. (20GHz)	35 MHz	30 GHz
HL7061 <sup>7</sup>	SMD Pick-Off Tee - Z-Matched: I.L. 4 dB thru, 13 dB p.off	DC	30 GHz
HL7062 <sup>7</sup>	SMD Pick-Off Tee: I.L. 1 dB thru, 15 dB p.off	DC	30 GHz
HL7071 <sup>7</sup>	SMD Power Divider: Match: $\pm 0.3$ dB, $\pm 6^\circ$ (20 GHz)	DC	30 GHz
HL9491 <sup>7</sup>	SMD Balun: Match: $\pm 0.4$ dB (20 GHz), $\pm 5^\circ$ (10 GHz); 7 dB I.L.	1 MHz	20 GHz
HL9492 <sup>7</sup>	SMD Balun: Match: $\pm 0.4$ dB (20 GHz), $\pm 5^\circ$ (10 GHz); 8 dB I.L.	3 MHz	30 GHz

Refer to Note 7 (below) for Evaluation Board Options

SAMPLERS		F-MIN	F-MAX
HL9333 <sup>8</sup>	Sampler / Harmonic Mixer IC	DC	15/19 GHz

Refer to Note 8 (below) for Evaluation Board Options

<sup>1</sup> 11 V Option (-11): fLOW = 35 kHz; 30 V Option (-30): fLOW = 70 kHz  
<sup>2</sup> 11 V Option (-11): fLOW = 160 kHz; 30 V Option (-30): fLOW = 200 kHz  
<sup>3</sup> 11 V Option (-11): fLOW = 50 kHz; 30 V Option (-30): fLOW = 75 kHz  
<sup>4</sup> 11 V Option (-11): fLOW = 125 kHz; 30 V Option (-30): fLOW = 150 kHz  
<sup>5</sup> 14 dB Option (-14): I.L. = 1.1 dB thru, 14.5 dB pick-off; 20 dB Option (-20): I.L. = 0.4 dB thru, 20.5 dB pick-off  
<sup>6</sup> 14 dB Option (-14): I.L. = 0.9 dB thru, 14.5 dB pick-off; 20 dB Option (-20): I.L. = 0.45 dB thru, 20.5 dB pick-off  
<sup>7</sup> Evaluation Boards Available: add -EVAL to Part No. (HL7061, HL7062, HL7071, HL9491 only)  
<sup>8</sup> Evaluation Boards Available: add -EVAL-MA to Part No. for MACOM Balun (2 GHz fmin)  
add -EVAL-HL to Part No. for HyperLabs Balun (1 MHz fmin)