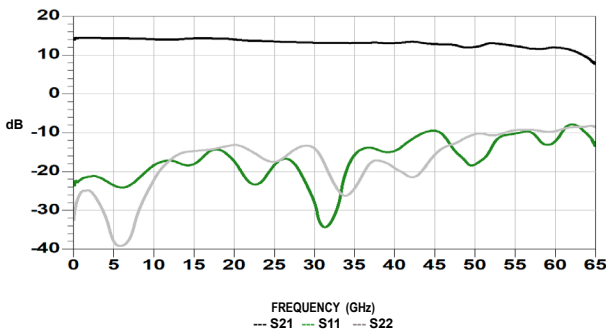




## NEW: AMPLIFIER TO 65 GHz; PICK-OFF TEE AND ATTENUATORS TO 110 GHz

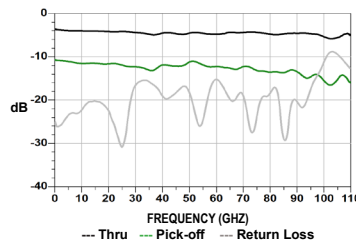
### HL5897 65 GHz Amplifier

- Exceptionally flat bandwidth (70 kHz to 65 GHz)
- 13 dB Gain
- Optimized as a data driver
- 112 Gbps PAM4 Signaling
- Small Form Factor



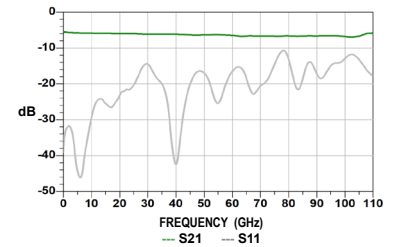
### HL9469 Pick-off Tee

- Ultra-broadband (DC to 110 GHz)
- Insertion Loss: 4.5dB, thru line
- Insertion Loss: 11 dB, pick-off line



### HL9429 Attenuator

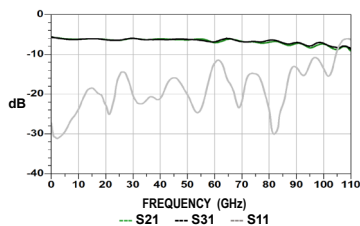
- Ultra-broadband (DC to 110 GHz)
- Exceptional price/performance
- 6 dB
- Other values under development



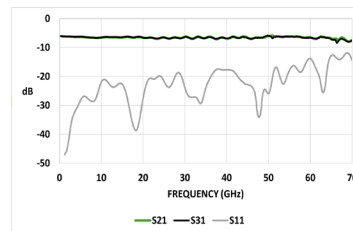
## NEW: POWER DIVIDERS TO 110 GHz



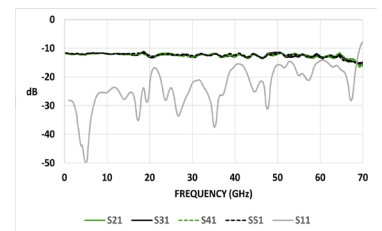
### HL9479 2-WAY POWER DIVIDER



### HL9487 2-WAY POWER SPLITTER



### HL9577 4-WAY POWER DIVIDER



### Available Models:

- HL9479 2-Way Power Divider from DC to 110+ GHz
- HL9487 2-Way Power Splitter from DC to 67+ GHz
- HL9577 4-Way Power Divider from DC to 67+ GHz

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



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### ULTRA-BROADBAND

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

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

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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)