

KEEP YOUR EYES WIDE OPEN™

PRODUCTS DESIGNED FOR HIGH-SPEED DATA AND BEYOND



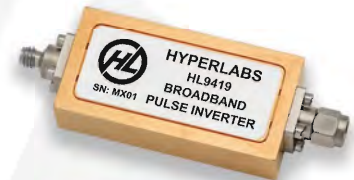
ULTRA-BROADBAND COMPONENTS TO 110GHz +



PREVIEW: HL9607
67GHz Isolation Balun



NEW: HL9349
110GHz DC Feeder



NEW: HL9419
100GHz Pulse Inverter



HL9409
100GHz Balun



HL9577
67GHz Power Divider



HL9429 / HL9529
110GHz Attenuator / Load



HL5897
63GHz Amplifier



HL8439
110GHz DC Block



HL9469
110GHz Pickoff Tee

PREVIEW: HL10300 PULSE GENERATOR

- 16V_{pp} Differential Outputs (DC Coupled)
- Risettime/Falltime: < 30ps
- Analog Bandwidth: > 10GHz
- Jitter (Typical): < 400fs
- Programming: GUI, SCPI, LabVIEW, etc.



AMPLIFIERS		F-MIN	F-MAX
HL5810	Limiting Amplifier, 60 dB gain, 10 Vp-p max. output	100 kHz	15 GHz
HL5867	Linear Amplifier; 13 dB gain; 12.5 dBm max. output	35 kHz	30 GHz
HL5877	Limiting Amplifier, 27 dB gain, 1.05 Vp-p max. output	35 kHz	27 GHz
HL5887	Linear Amplifier; 15 dB gain; 15.5 dBm max. output	35 kHz	40 GHz
HL5897	Linear Amplifier; 14 dB gain; 17.3 dBm max. output	70 kHz	63 GHz

BALUNS - 1 Watt Max Input		F-MIN	F-MAX
HL9302	Match: ± 0.1 dB, $\pm 4^\circ$ (20 GHz); 6 dB I.L.	8 MHz	26.5 GHz
HL9304	Match: ± 0.1 dB, $\pm 4^\circ$ (20 GHz); 6 dB I.L.	8 MHz	40 GHz
HL9305	Match: ± 0.1 dB, $\pm 4^\circ$ (20 GHz); 6 dB I.L.	8 MHz	50 GHz
HL9307	Match: ± 0.25 dB (>50 GHz), $\pm 8^\circ$ (40 GHz); 6 dB I.L.	8 MHz	67 GHz

BALUNS - 1 Watt Max Input		F-MIN	F-MAX
HL9401	Match: ± 0.1 dB (20 GHz), $\pm 6^\circ$ (20 GHz); 6 dB I.L.	100 MHz	20 GHz
HL9402	Match: ± 0.1 dB, $\pm 4^\circ$ (20 GHz); 6 dB I.L.	500 kHz	26.5 GHz
HL9404	Match: ± 0.1 dB, $\pm 4^\circ$ (20 GHz); 6 dB I.L.	500 kHz	40 GHz
HL9405	Match: ± 0.1 dB, $\pm 8^\circ$ (40 GHz); 6 dB I.L.	500 kHz	50 GHz
HL9407	Match: ± 0.25 dB (>50 GHz), $\pm 8^\circ$ (40 GHz); 6 dB I.L.	500 kHz	67 GHz
HL9408	Match: ± 0.5 dB (>50 GHz), $\pm 15^\circ$ (40 GHz); 6.5 dB I.L.	500 kHz	85 GHz
HL9409	Match: ± 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: ± 0.1 dB, $\pm 4^\circ$ (20 GHz); 6 dB I.L.	500 kHz	26.5 GHz
HL9504	Match: ± 0.1 dB, $\pm 4^\circ$ (20 GHz); 6 dB I.L.	500 kHz	40 GHz
HL9505	Match: ± 0.25 dB (>40GHz), $\pm 8^\circ$ (40 GHz); 6 dB I.L.	500 kHz	50 GHz

ISOLATION BALUNS - (17 dB isolation)		F-MIN	F-MAX
HL9602	Match: ± 1 dB, $\pm 5^\circ$; 1 dB I.L.	150 kHz	26.5 GHz
HL9604	Match: ± 1 dB, $\pm 7^\circ$; 2 dB I.L.	150 kHz	40 GHz
HL9605	Match: ± 1 dB, $\pm 9^\circ$; 2.5 dB I.L.	150 kHz	50 GHz
HL9607	Match: ± 1 dB, $\pm 12^\circ$; 3 dB I.L.	150 kHz	67 GHz

PULSE INVERTERS		F-MIN	F-MAX
HL9417	2 dB I.L.	150 kHz	67 GHz
HL9419	2 dB I.L.	150 kHz	100 GHz

DC BLOCKS		F-MIN	F-MAX
HL9434	Match: ± 0.1 dB, $\pm 4^\circ$ (20 GHz); <1 dB I.L.; 10, 11, or 30 V	16 kHz	40 GHz
HL9435	Match: ± 0.1 dB, $\pm 4^\circ$ (20 GHz); <1 dB I.L.; 10, 11, or 30 V	16 kHz	50 GHz
HL9437	Match: ± 0.1 dB, $\pm 4^\circ$ (20 GHz); <1 dB I.L.; 10, 11, or 30 V	16 kHz	67 GHz
HL9438	Match: ± 0.1 dB, (<95 GHz), $\pm 4^\circ$ (40 GHz); <1.5 dB I.L. (85 GHz)	160 kHz	95 GHz
HL9439	Match: ± 0.1 dB, (<110 GHz), $\pm 4^\circ$ (40 GHz); <1.5 dB I.L. (85 GHz)	160 kHz	110 GHz
HL8435	Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <1.5 dB I.L.; 10 V, 220 nF	7kHz	50 GHz
HL8437	Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <1.5 dB I.L.; 10 V, 220 nF	7 kHz	67 GHz
HL8439	Match: ± 0.1 dB, $\pm 4^\circ$; <2 dB I.L.; 10 V, 100 nF	16 kHz	110 GHz
HL8334	Removes DC Bias; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <0.75 dB I.L.	7 kHz	40 GHz

BIAS TEES (SMA port or pins available for DC bias)		F-MIN	F-MAX
HL9444	175 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <1.55 dB I.L. (40 GHz)	35 kHz	40 GHz
HL9445	175 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <1.55 dB I.L. (50 GHz)	35 kHz	50 GHz
HL9447	175 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <1.55 dB I.L. (67 GHz)	35 kHz	67 GHz
HL844x	<i>Above also available as Kelvin Bias Tees (with sense port)</i>		
HL9448	175 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <2.5 dB I.L. (95 GHz)	160 kHz	95 GHz
HL9449	175 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <2.5 dB I.L. (110 GHz)	160 kHz	110 GHz
HL9544	400 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <1.5 dB I.L. (40 GHz)	50 kHz	40 GHz
HL9545	400 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <1.5 dB I.L. (50 GHz)	50 kHz	50 GHz
HL9547	400 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <1.5 dB I.L. (67 GHz)	50 kHz	67 GHz
HL9644	1000 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <2.3 dB I.L. (40 GHz)	125 kHz	40 GHz
HL9645	1000 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <2.3 dB I.L. (50 GHz)	125 kHz	50 GHz
HL9647	1000 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); <2.3 dB I.L. (67 GHz)	125 kHz	67 GHz
HL8342	500 mA IMAX; Match: ± 0.1 dB, $\pm 4^\circ$ (20 GHz); < 2 dB I.L.	5 kHz	28 GHz
HL8442	2000 mA IMAX; Match: ± 0.2 dB, $\pm 4^\circ$ (15 GHz); < 2 dB I.L.	7.5 kHz	23 GHz

DC FEEDERS (SMA or pins available for DC bias)		F-MIN	F-MAX
HL9348	175 mA; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); < 2 dB I.L.	13 kHz	90 GHz
HL9349	175mA; Match: ± 0.1 dB, $\pm 4^\circ$ (40 GHz); < 2.5 dB I.L.	13 kHz	110 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

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

PICK-OFF TEES (standard)		F-MIN	F-MAX
HL9562	Match: ± 0.1 dB, $\pm 2^\circ$ (10 GHz); I.L.	DC	26.5 GHz
HL9564	Match: ± 0.1 dB, $\pm 2^\circ$ (10 GHz); I.L.	DC	40 GHz
HL9565	Match: ± 0.1 dB, $\pm 2^\circ$ (10 GHz); I.L.	DC	50 GHz

POWER DIVIDERS (2:1)		F-MIN	F-MAX
HL9472	Match: ± 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: ± 0.5 dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	40 GHz
HL9475	Match: ± 0.5 dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	50 GHz
HL9477	Match: ± 0.5 dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	67 GHz
HL9479	Match: ± 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: ± 0.5 dB, $\pm 4^\circ$ (20 GHz); 12 dB I.L.AC; 6 dB I.L.DC	DC	26.5 GHz
HL9574	Match: ± 0.5 dB, $\pm 8^\circ$ (40 GHz); 12 dB I.L.AC; 6 dB I.L.DC	DC	40 GHz
HL9575	Match: ± 0.5 dB, $\pm 8^\circ$ (40 GHz); 12 dB I.L.AC; 6 dB I.L.DC	DC	50 GHz
HL9577	Match: ± 0.5 dB, $\pm 8^\circ$ (40 GHz); 12 dB I.L.AC; 6 dB I.L.DC	DC	67 GHz

WILKINSON POWER DIVIDERS (2:1)		F-MIN	F-MAX
HL9674	Match: ± 0.1 dB, $\pm 1^\circ$; 4 dB I.L.; 15 dB Isolation	1 GHz	40 GHz
HL9675	Match: ± 0.1 dB, $\pm 1^\circ$; 4 dB I.L.; 15 dB Isolation	1 GHz	50 GHz
HL9677	Match: ± 0.1 dB, $\pm 2^\circ$; 4 dB I.L.; 15 dB Isolation	1 GHz	67 GHz

POWER SPLITTERS (2:1)		F-MIN	F-MAX
HL9482	Match: ± 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: ± 0.1 dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	40 GHz
HL9485	Match: ± 0.1 dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	50 GHz
HL9487	Match: ± 0.1 dB, $\pm 8^\circ$ (40 GHz); 6.0 dB I.L.AC; 6 dB I.L.DC	DC	67 GHz
HL9489	Match: ± 0.1 dB, $\pm 4^\circ$ (70 GHz); 7.0 dB I.L.AC; 6 dB I.L.DC	DC	100 GHz

ATTENUATORS (opt. -3, -6, or -10)		F-MIN	F-MAX
HL9427	Match: ± 0.2 dB, $\pm 2^\circ$ (10 GHz); I.L. 3, 6, or 10 dB; 1 W input	DC	70 GHz
HL9429	Match: ± 0.5 dB, $\pm 2^\circ$ (10 GHz); I.L. 3, 6, or 10 dB; 250 mW input	DC	110 GHz

TERMINATIONS (50 Ω)		F-MIN	F-MAX
HL9524	2.92 mm connector	DC	40 GHz
HL9525	2.40 mm connector	DC	50 GHz
HL9527	1.85 mm connector	DC	70 GHz
HL9529	1.0 mm connector	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	
HL7061	SMD Pick-Off Tee - Z-Matched: I.L. 4 dB thru, 13 dB p.off	DC	
HL7062	SMD Pick-Off Tee: I.L. 1 dB thru, 15 dB p.off	DC	
HL7071	SMD Power Divider: Match: ± 0.3 dB, $\pm 6^\circ$ (20 GHz)	DC	
HL9491	SMD Balun: Match: ± 0.4 dB (20 GHz), $\pm 5^\circ$ (10 GHz); 7 dB I.L.	1 MHz	20 GHz
HL9492	SMD Balun: Match: ± 0.4 dB (20 GHz), $\pm 5^\circ$ (10 GHz); 8 dB I.L.	3 MHz	30 GHz

NOTE: Some specifications may vary depending on the selected option(s). Please visit www.hyperlabs.com for datasheets and full specifications.