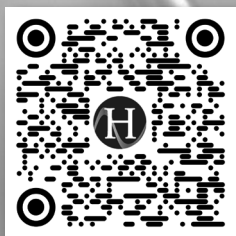




HASCO
COMPONENTS

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BROADBAND AMPLIFIERS

An amplifier boosts the loss experienced by a microwave signal.

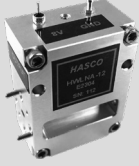
A Low Noise Amplifier is placed near the input of a receiver. The noise figure measures how much the LNA degrades the signal-to-noise ratio of the received signal. The other important characteristics of the LNA is its linearity, survivable power and DC dissipation.

Power Amplifiers are used to boost a small signal to a large signal based on the frequency.

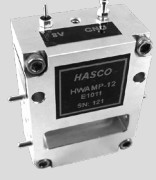
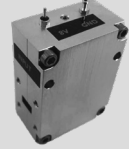
HASCO's line of amplifiers are high performance LNA (Low Noise Amplifiers) and power amplifier designs with extremely low noise and broadband performance in Waveguide Amplifier and MMIC Amplifier options.

Our amplifiers operate from 17 GHz up to 110 GHz with up to 32 dB of gain or a Psat of 27 dBm, depending on the design. The LNA designs can achieve a noise figure down to 3.5 dB in the mmWave bands.

LOW NOISE AMPLIFIERS

PHOTO	TYPE/PART #	OUTPUT FREQUENCY	GAIN	NOISE FACTOR	DC	MATERIALS
	W-Band, WR-10 HWLNA10-W10045	75-110 GHz	75-105 GHz: 20 dB Typ 106-110 GHz: Gain may drop slightly 110- GHz: 10 dB Typ	4.5 dB Typ.	+8V @ 100 mA Typ. or +7V to +12V	● Waveguide: Gold Plated Aluminum ● WR-10, UG-387/U-M
	E-Band, WR-12 HWLNA12-E2304	67-90 GHz	23 dB Typ.	4.5 dB Typ.	+7.5V to 12V @ 75 mA Typ.	● Waveguide: Gold Plated Aluminum ● WR-12, UG-3387/U
	V-Band, WR-15 HWLNA15-V2004	53-65 GHz	-10° - +65°C	4 dB Typ.	+8V @ 100 mA Typ. or +7V to +12V	● Waveguide: Gold Plated Aluminum ● WR-15, UG-385U

POWER AMPLIFIERS

PHOTO	TYPE/PART #	OUTPUT FREQUENCY	GAIN	PSAT	DC	MATERIALS
	W-Band, WR-10 HWAMP10-W1712	75-110 GHz	17 dB Typ	75-105 GHz: +12 dBm Typ. 110 GHz: +8 dBm Typ.	+8V @ 300 mA Typ. or +7V to +12V	● Waveguide: Gold Plated Aluminum ● WR-10, UG-387/U-M
	E-Band, WR-12 HWAMP12-E1011	71-860 GHz	25 dB Typ.	+11 dBm to +13 dBm	+7.5V to 12V @ 150 mA Typ.	● Waveguide: Gold Plated Aluminum ● WR-12, UG-3387/U
	V-Band, WR-15 HWAMP15-V2012	50-75 GHz	20 dB Typ.	12 dBm Typ.	+8V @ 300 mA Typ. or +7V to +12V	● Waveguide: Gold Plated Aluminum ● WR-15, UG-385U
	U-Band, WR-19 HWAMP19-U1820	40-60 GHz	18 dB Typ.	20 dBm Typ.	+8V @ 300 mA Typ.	● Waveguide: Gold Plated Aluminum ● WR-19, UG-383/U
	Q-Band, WR-22 HWAMP22-Q1821	33-48 GHz	18 dB Typ.	21 dBm Typ	+8V @ 450 mA Typ.	● Waveguide: Gold Plated Aluminum ● WR-22, UG-383/U
	Ka-Band, WR-28 HWAMP28-KA2222	26.5-40 GHz	22 dB Typ.	22 dBm Typ	+8V @ 200 mA Typ.	● Waveguide: Gold Plated Aluminum ● WR-28, UG-599/U