

# Ku-Band Gen III Klystron High Power Amplifier for Satellite Communications

## The Gen III High Power Amplifier

*Ku-Band Gen III—provides up to 2.45 kW of power in a single-rack package*

### **A unique combination of power, performance and ease of use**

The Ku-Band Gen III High Power Amplifier continues the CPI tradition of quality and reliability in satellite uplink communications performance. Its modular design employs a minimum of components for exceptional reliability. All system subassemblies are housed in a single, easily transportable cabinet.

### **More efficient. Easy to maintain.**

CPI's Ku-Band amplifier provides up to 2.45 kW of power in a single-rack cabinet and delivers the best power/reliability ratio for its price on the market. Its easy maintenance features represent a lower than ever lifetime cost of ownership. And now, with the new Power Saver Option, customers can realize up to 45% in additional power savings.

### **Global applications**

The Gen III accommodates all global power sources without the need for a separate line adapter transformer. It also meets the stringent International Transmitter Safety Standard EN60215 and International EMI Standard EMC 89/336. Since the introduction of the Gen III, thousands have been installed and are still running in earth stations around the world—more than any other brand.

**Ku-Band**



**Ku-Band**

### **CPI Satcom Worldwide Support**

CPI is renowned for its impressive reliability record and is the preferred choice of major video uplinkers worldwide. With over two decades of satellite communications experience, CPI's worldwide customer support can be relied upon 24 hours a day, 7 days a week. Customers can obtain technical assistance by phone from any of CPI's nine regional Factory Service Centers.

**Gen III Klystron High Power Amplifier**

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## SPECIFICATIONS, Ku-Band Gen III

### Electrical

Frequency Ranges	13.75 -14.5 GHz, others available as options
Klystron Power Output	2.45 kW
Amplifier Output <sup>1</sup> at flange with harmonic filter	33.1 dBW, min.
Channel Selector Options	Standard (~15 seconds or less), Fast (~4 seconds or less). The Fast option is only available in the 13.75 - 14.5 GHz frequency range
Bandwidth	85 MHz
Power Adjustability	0 to -23 dB of output with $\pm 0.1$ dB typical resolution
Gain Stability vs. Time	$\pm 0.25$ dB/24 hr. max. at constant drive and temperature
Gain Stability vs. Temp.	1 dB max. from 20° to 40°C; $\pm 2.5$ dB max from 0° to 50°C (at constant drive)
Gain Slope (at rated power)	0.04 dB/MHz max. over $F_o \pm 30$ MHz
Gain Variation (at rated power)	0.4 dB pk-pk $\pm 30$ MHz
Input VSWR	1.2:1 maximum
Output VSWR	1.25:1 maximum
Load VSWR	2.0:1 max. for full spec. compliance; any value for operation without damage
Residual AM	-50 dBc maximum up to 400 Hz -60 dBc maximum, 400 Hz to 2 kHz -80 dBc maximum, 2 kHz to 500 kHz
Residual FM	90 dB below 4 MHz pk-pk deviation in any 5 MHz band
AM/PM Conversion (at rated power)	4°/dB maximum
Harmonic Output with filter: without filter:	-80 dBc -35 dBc, second
Noise and Spurious (at rated gain)	-135 dBW/4 kHz, 11.7 to 12.7 GHz -65 dBW/4 kHz, in passband -110 dBW/MHz, 12.7 to 40 GHz (excluding passband)
Phase Noise	Exceeds requirements of INTELSAT Standard IESS-308/309 by -3 dB.
Intermodulation	-28 dBc with two equal carriers at total output 7 dB below rated single-carrier output
Group Delay	In any 72 MHz band: 0.10 ns/MHz linear max. 0.02 ns/MHz <sup>2</sup> parabolic max. 2.0 ns pk-pk ripple max.

<sup>1</sup>Harmonic filter can be removed as an option. Add 0.3 dB to amplifier output for units ordered without harmonic filter.

### Electrical (continued)

Primary Power	208/120 V $\pm 10\%$ , 50 or 60 Hz $\pm 5\%$ , 3-phase with neutral and ground. Other voltages available: 380/220 V, 400/230 V, 415/240 V
Power Consumption	11.5 kVA typical, 12.0 kVA maximum; Up to 45% less with power saver option, depending on usage.
Power Factor	0.9 minimum
Inrush Current, peak	180% of normal line current peak max. (first half cycle only)

### Mechanical

RF Input Connection	UG 419/U (optional: Type N female)
RF Output Connection	UG 419/U cover flange
RF Power Monitors	Type N female
Dimension (W x H x D)	23.5 x 72.0 x 34 in. (597 x 1829 x 864 mm)
Weight	850 lbs (386 kg)
Cooling	Forced air with integral blower and fans; klystron collector cooling separated from cabinet ventilation and klystron body cooling
Air Flow Rate, Klystron	300 cfm nominal, at sea level
External Ducts Backpressure	0.5 inch water gauge total, maximum
Typical Klystron Heat Loss At rated RF output: At no RF output	6500 watts 9000 watts
Typical Cabinet Heat Loss	1000 watts
Acoustic Noise	68 dBA nominal, measured 3 ft. from front of equipment

### Environmental

Ambient Temperature	-10° to +50° operating; -40° to +80° non-operating
Relative Humidity	95%, non-condensing
Altitude operating:	10,000 ft (3000 m) with standard adiabatic temp derating of 2°C/1000 ft. or 6.5°C/km
non-operating:	40,000 ft (12,000 m)
Shock and Vibration	As normally encountered in satellite earth stations and shipping

### OPTIONS:

- *Power Saver*
- *Motorized Channel Selector:  
Standard and fast versions*
- *Remote Control Panel*
- *Protection Switching*



Please check CPI's web site to ensure most current data sheet.

For more detailed information, please refer to the corresponding CPI Technical Description.

**Note:** Specifications may change without notice as a result of additional data or product refinement.

Please contact CPI before using this information for system design.