

# 250 W SuperLinear® Outdoor TWT BUC

## Built for Outdoor Applications

Provides 250 watts of peak power in a rugged and compact weatherproof package, digital ready, for wideband single- and multi-carrier satellite service over up to 3.5 GHz within the Ka-band frequency band. Ideal for both transportable and fixed earth station applications.

## Cost Effective and Highly Efficient

As part of the SuperLinear TWTA product line, this is the most efficient and compact amplifier in its class. Both the tube and HPA are optimized for efficient operation at linear power output levels.

## Rugged and Easy to Maintain

Built-in fault diagnostic capability via remote monitor and control. Easy access enclosure for improved serviceability. CAN-Bus architecture improves reliability and improves noise immunity.

## Meets Global Requirements

Meets International Safety Standard EN-60215, Electromagnetic Compatibility 2004/108/EC and Harmonic Standard EN-61000-3-2 to satisfy worldwide requirements. CE certified. Meets EMI per MIL-STD-461F RE102 and CS114-116 Army Ground Profile.

## Worldwide Support

Backed by over three decades of satellite communications experience, and CPI's worldwide 24-hour customer support network that includes more than 20 regional factory service centers.



### Model TL02KO

250 watt Ka-band outdoor TWTB for satellite uplink applications

#### OPTIONS

- Remote control panel
- Internal 1:1 switch control and drive
- Redundant or power combined subsystems
- Integral single- or multi-band L-Band Block Upconverter (BUC) - contact CPI or consult document TD-193 for specifications when BUC is included
- RS-422/485 serial interface
- This product is also available without a block upconverter - contact CPI for specifications



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## 250 W SuperLinear Ka-Band Outdoor TWTB

Specification	Model TLO2KO
Output Frequency	Up to 3500 MHz instantaneous bandwidth within the 27.0 to 31.0 GHz frequency band (multi-band BUC option allows for two different, factory-set frequency ranges, each up to 1 GHz - contact CPI for more information)
TWT Peak Power <sup>1</sup>	250 W (54.0 dBm)
Flange Peak Power <sup>1</sup>	220 W (53.4 dBm)
Linear Power at Flange <sup>1</sup>	110 W (50.4 dBm) min with linearizer
CW Power at Flange	130 W (51.1 dBm)
Intermodulation - with respect to the sum of two carriers	-25 dBc max. at total output power of 50 W (at 110 W with linearizer)
Gain	64 dB min. (67 dB typ. at small signal)
RF Level Adjust Range	0 to 30 dB (via PIN diode attenuator) typ, 0.1 dB steps
Gain Stability	±0.25 dB/24 hour max,max. at constant drive and temperature, after 30 minute warmup ±2.0 dB max. from -40°C to +60°C
Small Signal Gain Slope	±0.04 dB/MHz max.
Small Signal Gain Variation	1.0 dB pk-pk max. across any 80 MHz segment; 3.0 dB pk-pk max. across 1 GHz segment
Input/Output VSWR	1.5:1 max/1.3:1 max.
Load VSWR	2.0:1 max. continuous operation, any value operation without damage
MUXed External 10 MHz Reference Phase Noise Required (L-Band Input 950 to 1700 MHz)	-120 dBc/Hz at 10 Hz -140 dBc/Hz at 100 Hz -145 dBc/Hz at 1 kHz -150 dBc/Hz at ≥10 kHz
Single Sideband Phase Noise	-33 dBc at 10 Hz offset; -63 dBc at 100 Hz offset; -73 dBc at 1 kHz offset; -83 dBc at 10 kHz offset; -93 dBc at 100 kHz offset; -103 dBc at 1 MHz offset; -113 dBc at ≥10 MHz offset
Spurious	-60 dBc max.
AM/PM Conversion	2.0°/dB max. with optional linearizer
Harmonic Output	-60 dBc with optional filter
Noise Density	<-150 dBW/4 kHz below 21.2 GHz; <-65 dBW/4 kHz max. in passband; <-60 dBW/4 kHz max. in passband with linearizer option
Spectral Regrowth	-30 dBc max. @ 1 symbol rate
Group Delay (over 40 MHz)	0.01 ns/MHz linear max; 0.001 ns/MHz <sup>2</sup> parabolic max; 0.5 ns pk-pk ripple max.
Primary Power	100 to 240 VAC +/-10% single phase, 47-63 Hz
Power Consumption	700 VA max; 600 VA typ.
Power Factor	0.95 min; 0.99 typ.
Amplitude and Phase Linearity	Exceeds MIL-STD-188-164B
Ambient Temperature	-40°C to +60°C operating in direct sunlight (to +65°C out of direct sunlight); -54°C to +71°C non-operating
Relative Humidity	100% condensing
Altitude	10,000 ft. with standard adiabatic derating of 2°C/1000 ft. operating; 50,000 ft. non-operating
Shock and Vibration	20 G at 11 ms (1/2 sine pulse in non-operating condition); 2.1 g rms, 50 to 500 MHz
Cooling	Forced Air with integral blower
Connections	L-Band RF Input: N-type female; RF output: WR-34G (WR-28G optional); RF output monitor: 2.9mm SMA Female
M&C Interface	Ethernet (RS422/485 serial optional)
Dimensions, W x H x D	10.5 x 8.5 x 17.0 inches (267 x 216 x 432 mm)
Weight	32 lbs (14.6 kg) with no options
Acoustic noise	65 dBA (as measured at 3 ft.) nom.
Note 1	Peak power specs are provided so that desired backoff can more easily be calculated. The amplifier's actual guaranteed minimum output at the flange, CW power, is 110 W.