400W Outdoor TWT Medium Power Amplifier for Satellite Communications

Ku-Band

The T04UO Series

400 Watt TWT Medium Power Amplifier — high efficiency in an environmentally sealed compact package designed for outdoor operation

Plays in the Rain
Provides 400 watts of power in a rugged and compact weatherproof package, digital ready, for wideband, single- and multi-carrier satellite service in the 13.75-14.50 GHz frequency band. Ideal for transportable and fixed earth station applications.

Cost Effective and Efficient
Mounting at the antenna improves performance through minimized cable losses and saves cost in system design. Employs a high efficiency, dual-depressed collector helix traveling wave tube, reducing operating costs.

Reliable
Designed and built to survive in extremely adverse environmental conditions and features increased cooling margin for longer life.

Simple to Operate
User-friendly microprocessor-controlled logic with integrated RS422/485 computer interface. Digital metering, pin diode attenuation and optional integrated linearizer for improved intermodulation performance.

Easy to Maintain
Modular design and built-in fault diagnostic capability via remote monitor and control.

Global Applications
Meets International Safety Standard EN-60215, Electromagnetic Compatibility 89/336/EEC and Harmonic Standard EN-61000-3-2 to satisfy worldwide requirements.

Worldwide Support
Backed by over two decades of satellite communications experience, and CPI's worldwide 24-hour customer support network that includes twelve regional factory service centers.

satcom division

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OPTIONS:

- *Remote Control Panel*
- *Extended Frequency (12.75-14.5 GHz)*
- *Redundant and Power Combined Subsystems*
- *External Receive Band Reject Filter (Increases loss by a minimum 60 dB up to 12.7 GHz)*
- *Solid State Intermediate Power Amplifier (SSIPA)*
- *SSIPA with Variable Attenuator (provides RF Level Adjust Range of 0 to 30 dB)*
- *Integral Linearizer (requires SSIPA w/ attenuator option)*
- *Integrated 1:1 switch control and drive*
- *L-Band Block Upconverter (BUC)*

SPECIFICATIONS, T04UO

Electrical

Frequency	13.75 to 14.50 GHz
Output Power	
TWT	400 W min. (56.02 dBm)
Flange	350 W min. (55.44 dBm)
Bandwidth	750 MHz
Gain	47 dB min. at rated power output (73 dB with SSIPA); 52 dB min. at small signal (78 dB with SSIPA)
Gain Stability	±0.25 dB/24hr max. (at constant drive and temp.)
Small Signal Gain Slope	±0.02 dB/MHz max.
Small Signal Gain Variation	1.0 dB pk-pk across any 80 MHz band; 2.5 dB pk-pk across the 750 MHz band
Input VSWR	1.3:1 max.
Output VSWR	1.3:1 max.
Load VSWR	2.0 max. continuous operation; any value for operation without damage
Residual AM	-50 dBc below 10 kHz -20 [1.3 +log F(kHz)] dBc, 10 kHz to 500 kHz -85 dBc above 500 kHz
Phase Noise	12 dB below IESS-308 continuous mask
AM/PM Conversion	2.0°/dB max. for a single carrier up to 7 dB below rated power (2.5°/dB max. at 3 dB below rated with linearizer)
Harmonic Output	-60 dBc at rated power
Noise and Spurious (at rated gain)	<-130 dBW/4 kHz from 10.9 to 12.7 GHz <-70 dBW/4 kHz from 13.75 to 18.0 GHz <-105 dBW/4 kHz from 18.0 to 26.0 GHz <-125 dBW/4 kHz from 26.0 to 40.0 GHz
Noise Figure	35 dB max., 10 dB with SSIPA
Intermodulation	-24 dBc max. with two equal carriers at total output power 7 dB (4 dB with optional integral linearizer) below rated single-carrier output

Electrical (continued)

Group Delay (in any 80 MHz band)	0.01 ns/MHz linear max. 0.001 ns/MHz^2 parabolic max. 0.5 ns pk-pk ripple max.
Primary Power	90-264 VAC, single phase; 47-63 Hz
Power Consumption	1.35 kW, typ. 1.5 kW, max.
Power Factor	0.95 min.

Environmental (Operating)

Ambient Temperature	-40°C to +50°C operating -40°C to +75°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 pk, 11 msec, 2 sine
Acoustic Noise	65 dBA @ 3 ft. from amplifier

Mechanical

Cooling	Forced air with integral blower
RF Input Connection	Type N female
RF Output Connection	WR 75 waveguide flange, grooved with UNC 2B 6-32 threaded holes
RF Output Monitor	Type N female
Dimensions (W x H x D)	10.25 x 10.4 x 20.5 in. (260 x 264 x 521 mm)
Weight	55 lbs (25.0 kg) max., with no options

ISO 9001

KEEPING YOU ON THE AIR
not up in the air

Communications & Power Industries

satcom division

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.

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