

C-BAND TWT POWER AMPLIFIER

2100TC3.0 SERIES

- For Satellite Communication Service
- Nominal 3.0 kW Output Power
- Automatic Unattended Operation
- Full Control and Monitor Capability using On-Board Microprocessor for Local and Remote Operation
- Continuous Display of System Status via Electroluminescent (EL) Display on Front Panel
- Standard IEEE-488 and RS-232, RS-422 (RS-485 Multidrop) Interfaces
- Plug-In Circuit Card Assemblies
- Digital Gain Control
- Complete Front Access for Maintenance
- Built-In-Test Diagnostics for Fault Isolation
- Remote Modem Provides On-Line Diagnostic Capability of all Critical Parameters.

APPLICATION

The 2100TC3.0 Series TWT High Power Amplifiers are high performance units designed for SATCOM uplink applications in the 5.85 to 6.425 GHz C-Band. The Model 2100TC3.0 TWTA is packaged in a self-contained, single cabinet design. PTI's standard power supplies, used in hundreds of HPAs worldwide, are used to provide efficient, clean and reliable power to the TWT.

The TWTA can be operated as a stand-alone unit or remotely controlled via a PC. Optional configurations of the TWTA include 1:N redundancy and improved RF performance using an integral linearizer assembly.

The amplifier contains a forced air-cooled TWT with self-protected power supplies. The regulated anode supply uses a high speed vacuum relay for optimum protection during fault conditions. Other components include a solid-state amplifier and input and output isolators. An optional harmonic filter is also available and can be installed in the cabinet.

DESCRIPTION

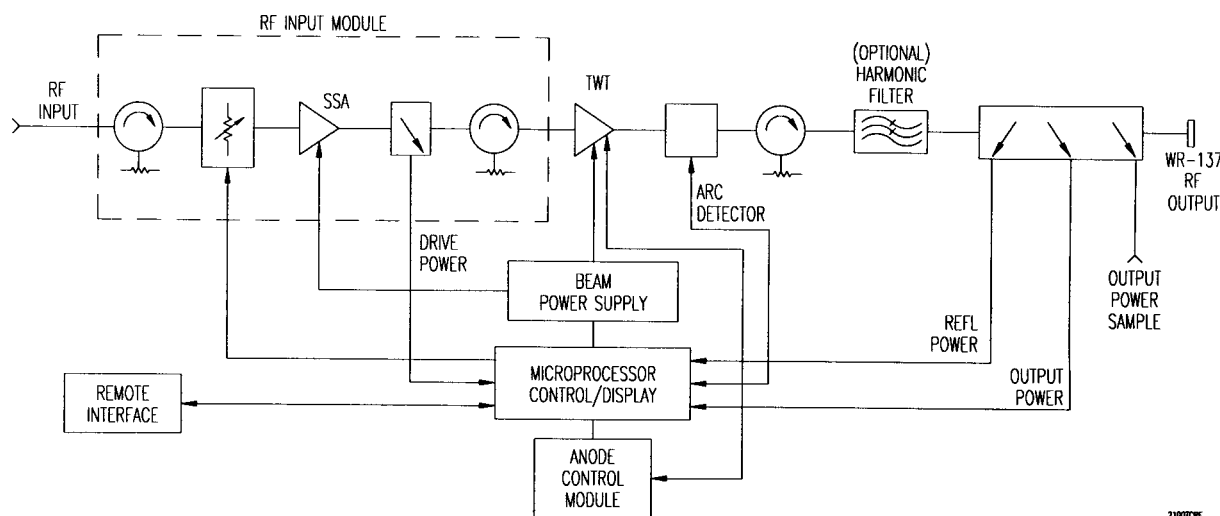
Local Control/Display Panel Assembly - The Local Control/Display Panel Assembly utilizes an on-board, field proven microprocessor design that provides fail-safe system operation during turn-on, normal operation and automatic fault recycle/ fault reset/operational restart. Adjustable limits, entered via keyboard, cannot exceed the manufacturer's factory preset limits. The microprocessor operational status is saved in non-volatile memory during power shut down. The EL display is clear and easy to read, displays all faults and alarms and the selectable menus for system control, monitoring, Built-In Test (BIT) and maintenance. Critical analog functions and limits are continuously displayed and updated. Forward output power is digitally controlled via the front keyboard.

RF Section - The RF input section consists of an input isolator, a solid state amplifier with PIN diode attenuator for fast RF inhibit, and RF power monitor ports. The tube is a depressed collector, ppm, focused, forced-air cooled design. The RF output section consists of an isolator, optional harmonic filter (for -70 dBc harmonic attenuation) and output coupler.

Power Supply - PTI's standard Variable Voltage Transfer type High Voltage Power Supply is used for the collector to cathode power supply. PTI's standard series resonant TWT power supply provides the required cathode to helix voltage. Both converters are self-protecting and monitored by the microprocessor control unit for extensive fault and maintenance reporting.



TWTA BLOCK DIAGRAM



SYSTEM SPECIFICATIONS

ELECTRICAL PARAMETER SPECIFICATION

Frequency Range:	5.85 to 6.425 GHz
Output Power:	2.5 kW at amplifier flange
Gain:	75 dB min. at rated output
RF Level Adjustment:	25 dB min.
Gain Stability:	± 0.25 dB/24 hrs., after 4 hrs. warm-up period at constant load VSWR
Gain Variation:	1 dB max. at 2.5 kW output 4 dB max. at 250 W output (2 dB max. with linearizer)
Gain Slope:	±0.03 dB/MHz at -4 dB from rated output
Residual AM	
Below 4 kHz:	-35 dBc
4 to 500 kHz:	-20 (1.2 + Log f) dBc
Above 500 kHz:	-80 dBc
AM/PM Conversion:	6°/dB max. at rated output 3°/dB max. at 6 dB below rated output.
Noise and Spurious	
5.7 to 6.7 GHz:	-70 dBw max.
4.29 to 5.70 GHz:	Linear decrease to -135 dBw
3.60 to 4.29 GHz:	-135 dBw max.
Group Delay	
Linear:	0.02 ns/MHz max.
Parabolic:	0.01 ns/MHz ² max.
Ripple:	0.05 ns (p-p) max. in any 50 MHz band.
Intermodulation:	-25 dB for two 250 W carriers, at a total output power -7 dB below rated output. -31 dB for two 250 W carriers, at a total output power -7 dB below rated output.
Input VSWR:	1.20:1 max.
Output VSWR:	1.20:1 max.
Load VSWR:	1.50:1 for full spec. compliance self-protecting above 2.0:1 levels.
RF Connections	
Input:	Type N female
Output:	W/G Flange, CPR137F

Primary Power Voltage: Either 208/120 V, 220/380 V, or 240/415 V ±5%, 3 phase, 4 wire 47 to 63 Hz, 16 kVA max.

MECHANICAL PARAMETER SPECIFICATION

Dimensions (WxHxD): 24 x 72 x 30 in. (61 x 183 x 76 cm)
Weight: 1,100 lbs. nominal (500 kg)

ENVIRONMENTAL

Temperature: 32° to 104°F (0° to 40°C)
Humidity: 95% non-condensing
Altitude: 7,000 ft (2133 m)

OPTIONS

- Remote PC terminal with application software.
- Output harmonic filter.
- Input/output switching and/or combining subsystem.
- Integral linearizer for maximum fidelity in multi-carrier applications.
- Equalizer to reduce TWT gain variation.
- Input powerline filter.

POWER TECHNOLOGIES, INC. CAPABILITIES

- TWT amplifiers in C, Ka, Ku, L, X and Tri-band in power ranges from 100 W to 3 kW.
- Klystron amplifiers in C, DBS, Ka, Ku, L, S, and X bands up to 3.3 kW.
- Custom low and high voltage power supplies.
- Repair and servicing of PTI and Aydin brand HPA's.
- 1:N redundancy switching networks.