CPI V-Band TWTA for Satellite Uplink Communications

Provides 80 watts of minimum power in a rugged and compact weatherproof package, digital ready, for wideband single- and multicarrier satellite service over a 4.2 GHz bandwidth (5.2 GHz bandwidth optional) within the V-band frequency band. Ideal for fixed earth station applications.

Cost Effective and Efficient

Mounting at the antenna improves performance by reducing IFL losses and saves cost in system design. Provides 80 W of linear power at the amplifier flange.

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. User-friendly microprocessor-controlled logic with integrated Ethernet computer interface.

Meets Global Requirements

Meets International Safety Standard EN-60215, Electromagnetic Compatibility 2014/30/EU and Harmonic Standard EN-61000-3-2 to satisfy worldwide requirements. CE certified. SNMP enabled.

Worldwide Support

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



CPI 250 W V-band TWTA, provides up to 80 watts of linear power at the flange

FEATURES:

- Ethernet interface with integral web server for easy monitoring and control
- SNMP interface (v1, v2, or v3)
- EMC Directive 2014/30/EU
- Harmonic Standard EN-61000-3-2

OPTIONS:

- 5.2 GHz operation from 47.2 to 52.4 GHz
- Remote control panel
- Integral linearizer
- Integral 1:1 switch control and drive
- Liquid cooling (please see CPI doc. MKT-492 for dimensions and specifications)
- Redundant systems
- Harmonic filter
 - optional for 51.4 GHz version
 - standard on 52.4 GHz version
- Serial interface (RS232/422)
- Uplink Power Control

Quality Management System - ISO 9001:2015





to the sum of two carriers -26 BCR mix. at total output power of 80 W with optional linearizer of 2 equalcarriers NPR (with linearizer option) 19 dB at 80 W output power (75 W with optional himanizer) 19 dB at 75 W output power (75 W with optional himanizer) 19 dB at 75 W output power 10 dB min; 64 dB typ, at 3 dB backoff from rated CW power RF Level Adjust Range 10 to 30 dB (via RNH close) attenuator) typ, 0.1 dB steps 20 attenuation 20 attenuation and attenuation and attenuator by 0.1 dB steps 20 attenuation and attenuation an	Specification		CPI Model TL02VO-A1 - 250 W	Peak Power V-Band TWTA		
Peak TWT Flange Power 250 W (53.97 dBm)						
Peak Amplifier Flange Power 200 W (\$3.00 dBm) Rated Linear Amplifier Flange Power 200 W (\$9.00 dBm) 28 dBc max, at total output power of 80 W with optional linearizer 28 dBc max, at total output power of 80 W with optional linearizer 25 dBc max, at total output power of 80 W with optional linearizer 25 dBc max, at total output power of 80 W with optional linearizer 19 dB at 75 W output power 27 dBc max, at total output power of 80 W with optional linearizer 19 dB at 75 W output power 27 dBc max, at total output power of 80 W with optional linearizer 19 dB at 75 W output power 27 dBc max, at total output power of 80 W with optional linearizer 19 dB at 75 W output power 27 dBc max, at total output power 27 dBc max, at total output power 28 dBc max, at total output power 28 dBc max, at total output power 29 dB at 75 W output power 29 dB at 75 W output power 29 dB at 75 W output power 29 dBc max, at total output 29 dBc max, across the 42 GBc back 3 dB at max, across the 52 GBc max, at total output 20 dB max, over any 1 GHz band; 1 dB pc pc max, across the 42 GBc back; 3 dB pc pc max, across the 52 GBc max, over any 250 MHz 1 dB pc pc max, across the 52 GBc max, across the 42 GBc back; 4 dB pc pc max, across the 52 GBc max, across the 42 GBc back; 4 dBc sum of all spurs 4 dB bc sum of all spurs 4 dBc sum of all spurs 4 dBc sum of a	Output Frequency		47.2 to 51.4 GHz	47.2 to 52.4 GHz		
Rated Linear Amplifier Flange Power 80 W (49.03 dBm)	Peak TWT Flange Power		250 W (53.97 dBm)			
1.25 dBc max. at total output power of 80 W with optional linearizer	Peak Amplifier Flange Power		200 W (53.00 dBm)			
to the sum of two carriers -26 BCR mix. at total output power of 80 W with optional linearizer of 2 equalcarriers NPR (with linearizer option) 19 dB at 80 W output power (75 W with optional himanizer) 19 dB at 75 W output power (75 W with optional himanizer) 19 dB at 75 W output power 10 dB min; 64 dB typ, at 3 dB backoff from rated CW power RF Level Adjust Range 10 to 30 dB (via RNH close) attenuator) typ, 0.1 dB steps 20 attenuation 20 attenuation and attenuation and attenuator by 0.1 dB steps 20 attenuation and attenuation an	Rated Linear Amplifier Flange Power		80 W (49.03 dBm)			
19 dB at 75 W output power of each within optional innealizer	Intermodulation - with respect to the sum of two carriers		-28 dBc max. at total output power of 80 W with optional linearizer			
75 W with optional harmonic filter 19 dB at 75 W output power			-25 dBc max. at total output power of 80 W with optional linearizer			
Spectral Regrowth	NPR (with linearizer option)		· · ·	19 dB at 75 W output power		
Gain 60 dB min; 64 dB typ. at 3 dB backoff from rated CW power	Spectral Regro	wth	†			
RF Level Adjust Range						
Sain Stability						
Small Signal Gain Variation 2.5 dB max. across the 4.2 GHz band; 3.0 dB max. across the 5.2 GHz band; 1.5 dB pk-pk max. across the 5.2 GHz band; 1.5 dB pk-pk max. over any 1 GHz band; 1.5 dB pk-pk max. over any 250 MHz Input/Output VSWR 1.3:1 max. 2.0:1 max. operational; any value for operation without damage Phase Noise 2.0:1 dB below IESS-308 continuous mask; -45 dBc AC fundamental; -45 dBc sum of all spurs AM/PM Conversion 2.0°/dB max. for a single carrier up to 4 dB 0BO from rated CW power (at rated CW power with optional linearizer) Harmonic Output -0:0 dBc with harmonic filter option -0:0 dBc Noise Density -0:5 dBW/4 kHz with optional linearizer Group Delay (over 40 MHz) 0.01 ns/MHz linear max; 0.001 ns/MHz2 parabolic max; 0.5 ns pk-pk ripple max. Primary Power Voltage: Single phase, 100-240 VAC ± 10%; Frequency: 47-63 Hz Power Consumption 1100 VA max Power Factor 0.95 min; 0.99 typ. MECHANICAL SPECIFICATIONS Cooling Forced air with integral blower RF output monitor MR22 grooved flange waveguide (WR-19 optional) MR19 grooved flange waveguide MR2 Interface Ethernet (serial interface optional - RS232/422) Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) Weight 65 Ibs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature 40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating						
Small Signal Gain Variation 2.5 dB max. over any 1 GHz band; 1 dB pk-pk max. over any 250 MHz 1.3:1 max. Load VSWR 2.0:1 max. operational; any value for operation without damage Phase Noise -12 dB below IESS-308 continuous mask; -45 dBc AC fundamental; -45 dBc sum of all spurs AM/PM Conversion 2.0"dB max. for a single carrier up to 4 dB OBO from rated CW power (at rated CW power with optional linearizer) Harmonic Output -60 dBc with harmonic filter option -60 dBc Noise Density -150 dBW/4 kHz below 31.4 GHz; <-150 dBW/4 kHz from 37.5 to 42.5 GHz; <-70 dBW/4 kHz max. in passband; -65 dBW/4 kHz with optional linearizer Group Delay (over 40 MHz) 0.01 ns/MHz linear max; 0.001 ns/MHz2 parabolic max; 0.5 ns pk-pk ripple max. Primary Power Voltage: Single phase, 100-240 VAC ± 10%; Frequency: 47-63 Hz Power Consumption 1100 VA max Power Factor 0.95 min; 0.99 typ. MECHANICAL SPECIFICATIONS Conling Forced air with integral blower RF output: WR22 cover flange waveguide (WR-19 optional) WR19 cover flange waveguide RF output: WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide RF output monitor 1.85mm coaxial, Female Ethernet (serial interface optional - RS232/422) Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) Weight 65 lbs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating	Gain Stability			<u>'</u>		
Input/Output VSWR	Small Signal Gain Variation		2.5 dB max. over any 1 GHz band;	3.0 dB max. over any 1 GHz band;		
Load VSWR 2.0:1 max. operational; any value for operation without damage Phase Noise -12 dB below IESS-308 continuous mask; -45 dBc AC fundamental; -45 dBc sum of all spurs AM/PM Conversion 2.0°/dB max. for a single carrier up to 4 dB OBO from rated CW power (at rated CW power with optional linearizer) Harmonic Output -60 dBc with harmonic filter option -60 dBc Noise Density <150 dBW/4 kHz below 31.4 GHz; <-150 dBW/4 kHz from 37.5 to 42.5 GHz; <-70 dBW/4 kHz max. in passband; -65 dBW/4 kHz with optional linearizer Group Delay (over 40 MHz) 0.01 ns/MHz linear max; 0.001 ns/MHz2 parabolic max; 0.5 ns pk-pk ripple max. Primary Power Voltage: Single phase, 100-240 VAC ±10%; Frequency: 47-63 Hz Power Consumption 1100 VA max Power Factor 0.95 min; 0.99 typ. MECHANICAL SPECIFICATIONS Cooling Forced air with integral blower RF input: WR22 cover flange waveguide (WR-19 optional) WR19 cover flange waveguide RF output monitor 1.85mm coaxial, Female M&C Interface Ethernet (serial interface optional - RS232/422) Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) Weight 65 lbs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating	Input/Output VSWP		i	1.5 db pk-pk max. over any 250 MHz		
Phase Noise -12 dB below IESS-308 continuous mask; -45 dBc AC fundamental; -45 dBc sum of all spurs AM/PM Conversion 2.0°/dB max. for a single carrier up to 4 dB OBO from rated CW power (at rated CW power with optional linearizer) Harmonic Output -60 dBc with harmonic filter option -60 dBc Noise Density -61 dBW/4 kHz below 31.4 GHz; <-150 dBW/4 kHz from 37.5 to 42.5 GHz; <-70 dBW/4 kHz max. in passband; -65 dBW/4 kHz with optional linearizer Group Delay (over 40 MHz) 0.01 ns/MHz linear max; 0.001 ns/MHz2 parabolic max; 0.5 ns pk-pk ripple max. Primary Power Voltage: Single phase, 100-240 VAC ±10%; Frequency: 47-63 Hz Power Consumption 1100 VA max Power Factor 0.95 min; 0.99 typ. MECHANICAL SPECIFICATIONS Cooling Forced air with integral blower WR22 cover flange waveguide (WR-19 optional) WR19 cover flange waveguide RF input: WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide RF output: WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide RF output monitor 1.85mm coaxial, Female Ethernet (serial interface optional - RS232/422) Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) Weight 65 lbs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating						
AM/PM Conversion 2.0°/dB max. for a single carrier up to 4 dB OBO from rated CW power (at rated CW power with optional linearizer) Harmonic Output -60 dBc with harmonic filter option -60 dBc Noise Density -55 dBW/4 kHz below 31.4 GHz; <-150 dBW/4 kHz from 37.5 to 42.5 GHz; <-70 dBW/4 kHz max. in passband; -65 dBW/4 kHz with optional linearizer Group Delay (over 40 MHz) 0.01 ns/MHz linear max; 0.001 ns/MHz2 parabolic max; 0.5 ns pk-pk ripple max. Primary Power Voltage: Single phase, 100-240 VAC ±10%; Frequency: 47-63 Hz Power Consumption 1100 VA max Power Factor 0.95 min; 0.99 typ. MECHANICAL SPECIFICATIONS Cooling Forced air with integral blower WR22 cover flange waveguide (WR-19 optional) WR19 cover flange waveguide RF output: WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide RF output monitor 1.85mm coaxial, Female M&C Interface Ethernet (serial interface optional - RS232/422) Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) Weight 65 lbs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating						
Harmonic Output -60 dBc with harmonic filter option -60 dBc Noise Density -50 dBW/4 kHz below 31.4 GHz; <150 dBW/4 kHz from 37.5 to 42.5 GHz; <70 dBW/4 kHz max. in passband; -65 dBW/4 kHz with optional linearizer Group Delay (over 40 MHz) -65 dBW/4 kHz with optional linearizer Voltage: Single phase, 100-240 VAC ±10%; Frequency: 47-63 Hz Power Consumption 1100 VA max Power Factor 0.95 min; 0.99 typ. MECHANICAL SPECIFICATIONS Cooling Forced air with integral blower RF input: WR22 cover flange waveguide (WR-19 optional) WR19 cover flange waveguide RF output: WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide RF output: Serioutput: Seriout				'		
Noise Density 				<u> </u>		
Group Delay (over 40 MHz) O.01 ns/MHz linear max; 0.001 ns/MHz2 parabolic max; 0.5 ns pk-pk ripple max. Primary Power Voltage: Single phase, 100-240 VAC ±10%; Frequency: 47-63 Hz Power Consumption 1100 VA max 0.95 min; 0.99 typ. MECHANICAL SPECIFICATIONS Cooling Forced air with integral blower RF input: WR22 cover flange waveguide (WR-19 optional) WR19 cover flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide RF output: WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide WR20 Interface Ethernet (serial interface optional - RS232/422) Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) Weight 65 lbs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating	·		<-150 dBW/4 kHz below 31.4 GHz; <-150 dBW/4 kHz from 37.5 to 42.5 GHz; <-70 dBW/4 kHz max. in passband;			
Power Consumption 1100 VA max Power Factor 0.95 min; 0.99 typ. MECHANICAL SPECIFICATIONS Cooling Forced air with integral blower RF input: WR22 cover flange waveguide (WR-19 optional) WR19 cover flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide RF output: WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide MRC Interface Ethernet (serial interface optional - RS232/422) Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) Weight 65 lbs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating	Group Delay (over 40 MHz)					
Power Consumption 1100 VA max 0.95 min; 0.99 typ. MECHANICAL SPECIFICATIONS Cooling Forced air with integral blower WR22 cover flange waveguide (WR-19 optional) WR19 cover flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide WR20 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide WR20 grooved flange waveguide WR20 grooved flange waveguide WR21 grooved flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR20 grooved flange waveguide WR21 grooved flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR21 grooved flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR21 grooved flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR21 grooved flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR21 grooved flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR21 grooved flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR22						
MECHANICAL SPECIFICATIONS Cooling Forced air with integral blower WR22 cover flange waveguide (WR-19 optional) WR19 cover flange waveguide RF output: WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide RF output monitor 1.85mm coaxial, Female M&C Interface Ethernet (serial interface optional - RS232/422) Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) Weight 65 lbs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating						
MECHANICAL SPECIFICATIONS Cooling Forced air with integral blower MRSC interface Ethernet (serial interface optional - RS232/422) Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) MECHANICAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating	Power Factor		0.95 min; 0.99 typ.			
Connections RF input: WR22 cover flange waveguide (WR-19 optional) WR19 cover flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide WR29 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide WR19 grooved flange waveguide Transport (Serial interface optional - RS232/422) Dimensions, W x H x D Transport (Serial interface optional - RS232/422) Weight Transport (Serial interface optional - RS232/422) Transport (Serial interface optional - RS232/422) Transport (Serial interface optional - RS232/422) Weight Transport (Serial interface optional - RS232/422)						
Connections RF input: WR22 cover flange waveguide (WR-19 optional) WR19 cover flange waveguide WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide WR29 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide WR19 grooved flange waveguide Transport (Serial interface optional - RS232/422) Dimensions, W x H x D Transport (Serial interface optional - RS232/422) Weight Transport (Serial interface optional - RS232/422) Transport (Serial interface optional - RS232/422) Transport (Serial interface optional - RS232/422) Weight Transport (Serial interface optional - RS232/422)	Cooling		Forced air with integral blower			
Connections RF output: WR22 grooved flange waveguide (WR-19 optional) WR19 grooved flange waveguide M&C Interface Ethernet (serial interface optional - RS232/422) Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) Weight 65 lbs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating		RF input:		WR19 cover flange waveguide		
M&C Interface Ethernet (serial interface optional - RS232/422) Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) Weight 65 lbs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating		RF output:		WR19 grooved flange waveguide		
Dimensions, W x H x D 10.25 x 11.37 x 22.25 inches (261 x 289 x 566 mm) Weight 65 lbs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating		•	·			
Weight 65 lbs (29.5 kg) nominal, with options ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating						
ENVIRONMENTAL SPECIFICATIONS Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating	Dimensions, W	xHxD				
Ambient Temperature -40°C to +55°C operating in direct sunlight (to +60°C out of direct sunlight); -54°C to +71°C non-operating						
	ENVIRONMEN	NTAL SPECIFICATION	S			
Relative Humidity 100% condensing	Ambient Temp	erature	-40°C to +55°C operating in direct sunlight (to +60°C out of direct	sunlight); -54°C to +71°C non-operating		
100 % Condensing	Relative Humidity		100% condensing			
Altitude 10,000 ft. with standard adiabatic derating of 2°C/1000 ft. operating; 50,000 ft. non-operating	Altitude		10,000 ft. with standard adiabatic derating of 2°C/1000 ft. operating; 50,000 ft. non-operating			
Shock and Vibration 20 G, 11 ms 1/2 sine; 2.1 g _m , 5 to 500 Hz (non-operational)	Shock and Vibration		20 G, 11 ms 1/2 sine; 2.1 g, 5 to 500 Hz (non-operational)			
Heat Dissipation 1000 W max.	Heat Dissipation		-			
Acoustic noise 68 dBA as measured at 3 feet, nom.	Acoustic noise		68 dBA as measured at 3 feet, nom.			



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For more detailed information, please refer to the corresponding CPI technical description if one has been published, or contact CPI. 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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