



MT 4400

ANTENNA MOUNT TRAVELING WAVE TUBE
MEDIUM POWER AMPLIFIER

FOR SATELLITE UPLINK APPLICATIONS



C-BAND: 750W
Ku-BAND: 750W
DBS-BAND: 500W
OTHER AVAILABLE FREQUENCIES
TRI-BAND
DUAL-BAND
X-BAND

AVAILABLE SYSTEM OPTIONS:

MT4411 1 + 1 Redundant System

MT4412 1 + 2 Redundant System

MT44PC Phase Combined, Single Path Redundant System

MT44PC2 Phase Combined, Dual Path Redundant System

Other Configurations Available Upon Request

AVAILABLE AMPLIFIER OPTIONS:

Block Upconverter

10 MHz Reference

Linearizer

Switchover Control

Mounting Configurations

Extended Band Operations

Remote Controller

Hand-Held Local Controller

FEATURES:

Weather-Resistant Antenna Mount TWT Amplifier

Phase Noise 10 dB Below IESS-308

Extensive Built-In Diagnostic Capabilities

Advanced Thermal Design

Optional Integrated Block Upconverter

Rugged Construction For Extreme Environments

Optional Hand-Held Controller For Total Local Monitoring And Control

Prime Power Interfaces To A Wide Variety Of Voltages And Frequencies

Downloadable Maintenance And Event Logs From Diagnostic Port

Field Replaceable Modules For Unsurpassed Serviceability

ISO 9001



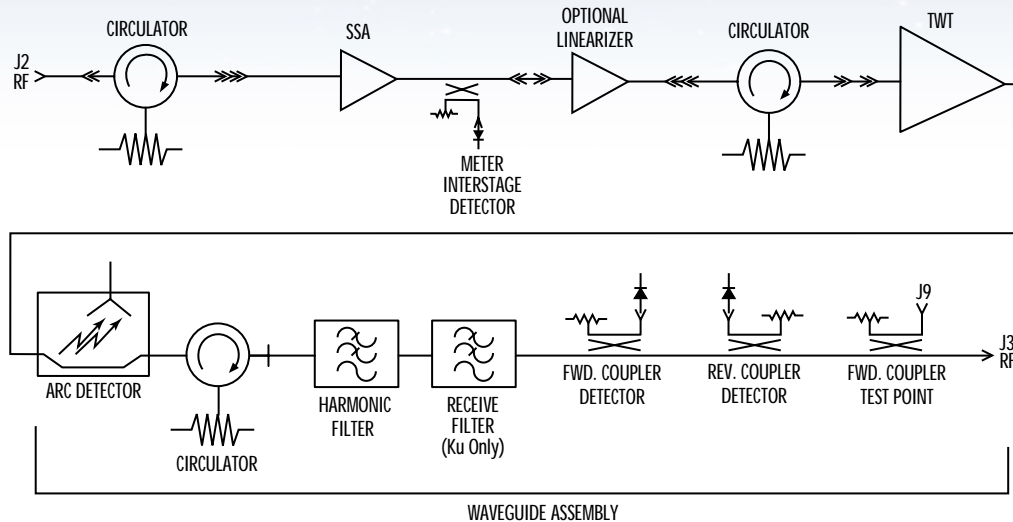
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TRAVELING WAVE TUBE MEDIUM POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS	C-BAND	Ku-BAND	DBS-BAND
	750 W	750 W	500 W
Frequency Range (F ₀) (Standard): (Extended): (Extended): (Extended):	5.850 - 6.425 GHz Option: 5.850 - 7.100 GHz Option: 5.850 - 6.750 GHz Option: 5.725 - 6.525 GHz	13.75 - 14.50 GHz Option: 12.75 - 14.50 GHz	17.3 - 18.4 GHz
Output Power (min.): Tube Output Flange: HPA Output Flange:	750 W (58.75 dBm) 665 W (58.25 dBm)	750 W (58.75 dBm) 665 W (58.25 dBm)	500 W (57 dBm) 420 W (56.23 dBm)
Gain: At Rated Power (min.): Small Signal Gain (SSG) (min.): Attenuation Range: Maximum SSG Variation Over: Narrow Band: Per 500 MHz: Slope, Max.: Gain Stability: Stability, Any Freq. Over Entire Temp.: Stability, Any Freq. ±10°C:	72 dB 77 dB 30 dB (0.10 Step) .5 dB/40 MHz 2.5 dB ±0.04 dB/MHz ±1.0 dB typ. ±0.75 dB max.	72 dB 77 dB 30 dB (0.10 Step) 1.0 dB/80 MHz 2.5 dB ±.04 dB/MHz ±1.0 dB typ. ±0.75 dB max.	65 dB 71 dB 30 dB (0.10 Step) 1.0 dB/80 MHz 4.0 dB ±.04 dB/MHz ±1.0 dB typ. ±0.75 dB max.
Input VSWR:	1.20:1 max. with respect to 50 Ohms		
Output VSWR:	1.25:1 max.		
Load VSWR:	2.0:1 max. without damage, continuous		
AM/PM Conversion: At Rated Power: 6 dB Below Rated Power:	6.0°/dB max. 2.5°/dB max.	6.0°/dB max. 2.5°/dB max.	8.0°/dB max. 3.0°/dB max.
Residual AM Noise, Max.: To 10 kHz: 10 - 500 kHz: Above 500 kHz:	-50 dBc -20 (1.5 + Logf kHz) dBc -85 dBc		
Harmonic Output, Max.:	-60 dBc		
Noise & Spurious, Max.: Receive Band (Standard): (Extended): Transmit Band (F ₀):	-150 dBW/4 kHz, 3.4 - 4.2 GHz -150 dBW/4 kHz, 3.4 - 4.2 GHz -70 dBW/4 kHz	-150 dBW/4 kHz, 10.7 - 12.75 GHz -150 dBW/4 kHz, 10.7 - 11.7 GHz -70 dBW/4 kHz	-150 dBW/4 kHz, 10.7 - 12.75 GHz N/A -65 dBW/4 kHz
Phase Noise, Max.: AC Fundamental: Sum Of All Except AC Fundamental:	10 dB below IESS Phase Noise Profile -50 dBc -47 dBc		
Intermodulation (for 2 equal carriers relative to single carrier rated output):	Total P ₀ -4 dBc -7 dBc	IM Product max. -18 dBc -24 dBc	Total P ₀ -4 dBc -7 dBc -23 dBc
Linearizer Option:	-4 dBc	-27 dBc	-4 dBc -26 dBc
Group Delay, Max.: Linear: Parabolic: Ripple:	Any 40 MHz Bandwidth 0.01 ns/MHz 0.005 ns/MHz ² 0.5 ns p-p	Any 80 MHz Bandwidth 0.01 ns/MHz 0.005 ns/MHz ² 0.5 ns p-p	Any 80 MHz Bandwidth 0.01 ns/MHz 0.005 ns/MHz ² 0.5 ns p-p
Prime Power: Voltage: Power Consumption: Power Factor: In-Rush: Input Transients:	180 - 264 VAC, 1-phase, 47 - 63 Hz 2.4 KVA typ. at rated power out/1.65 KVA typ. at rated power -10 dB (input power will increase if the HPA is driven to saturation) 0.95 min. 28A max. EN61000-4-4,4-5,4-11 (Surge, Fast Transients, Line Dropout)		

Note: Performance information is subject to change without notification. Contact MCL for the latest specifications.

RF BLOCK DIAGRAM

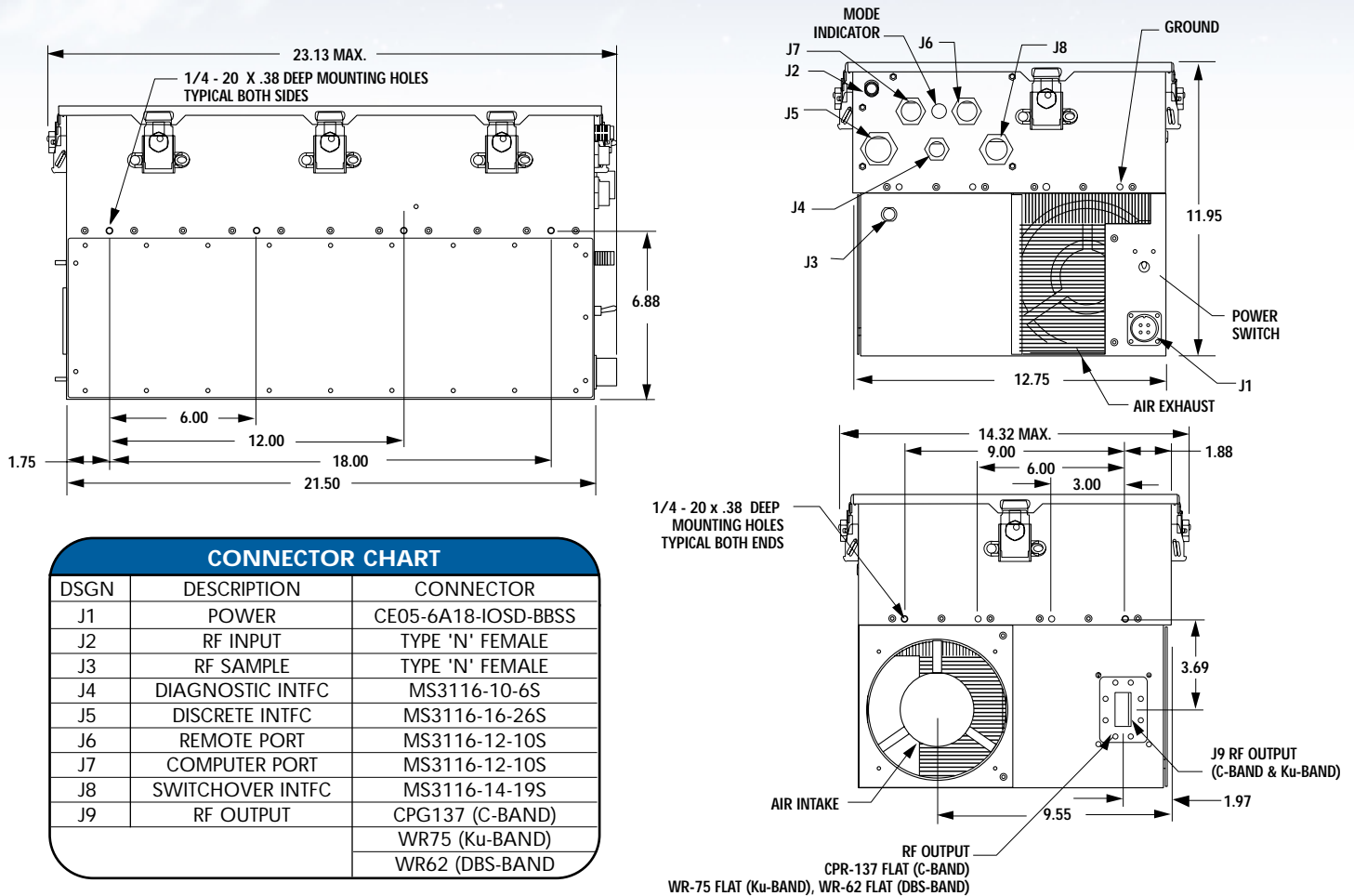


CONTROL AND STATUS CAPABILITIES

TYPE	FUNCTION		
Controls	Filament ON/OFF Transmit/Standby RF ON/OFF Reset Attenuation	Units Select Hold Power ON/OFF Auto Switching (1:1) Manual Switching (1:1)	Fault Counter ON/OFF Antenna Position (1:1) Load Position (1:1) Local Remote Computer
Adjustable Parameters	Auto Power Tube Temperature Alarm RF Low Alarm Comm Address Date	Tube Overdrive Alarm RF Reflected Power Alarm RF High Alarm Comm Band Rate Time	Tube Overdrive Fault RF Reflected Power Fault Filament Under Current Fault Comm Protocol
Meters	RF Forward Power Helix Voltage Filament Delay	Tube Drive Helix Current Tube Temperature	RF Reflected Power Filament Current PS Temperature
Faults	Tube Temperature Switch Tube Temperature Analog Helix Run Current HV Under Volt	WG Pressure Helix Surge Current HV Over Volt User Interlock	Arc Test Failed PS Temperature Chassis Interlock Filament Under Current
Alarms	RF High RF Reflected Blower Failed Exciter	RF Low Tube Temperature AC Low Line	Tube Overdrive PS Temperature RF Switch Failed
Additional Status	Delay Summary Alarm Maintenance Log	Transmit Selected Summary Fault Event Log	Sampler Port Cal Table RF Low Switching ON/Off Fault Log

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OUTLINE DRAWING



ENVIRONMENTAL SPECIFICATIONS

Operating Temperature:
-40°C to +50°C (derated 1.9°C per 1,000 ft. above sea level)

Non-Operating Temperature:
-50°C to +70°C

Relative Humidity:
100%, condensing

Operating Altitude:
10,000 ft. above sea level (3,048 m)

Non-Operating Altitude:
50,000 ft. above sea level (15,240 m)

Vibration:
MIL-STD-810E, Method 514-4

Shock:
10g, 11ms half sine

MECHANICAL SPECIFICATIONS

RF Connectors:
Input: Type N female
Output: (Waveguide Flange)
C-Band: CPR137G
Ku-Band: WR75
DBS-Band: WR62

Installed Weight:
79 lbs./36 kg typical

Cooling:
Forced air, 2.0" clearance required

Acoustic Noise:
<68 dBA max. at 1 meter

PHYSICAL SPECIFICATIONS

Dimensions:
(not including connectors and hardware)
11.95" H
12.75" W
21.50" L

Air Flow:
220 CFM