



MT3400

ANTENNA MOUNT TRAVELING WAVE TUBE
MEDIUM POWER AMPLIFIER

THE RUGGED AND ECONOMICAL
SOLUTION FOR UPLINK APPLICATIONS

C-BAND: 400W
X-BAND: 400W
Ku-BAND: 400W
DBS-BAND: 225W



AVAILABLE SYSTEM OPTIONS:

MT3411 1 + 1 Redundant System

MT3412 1 + 2 Redundant System

MT34PC Phase Combined, Single Path Redundant System

Other Configurations Available Upon Request

AVAILABLE AMPLIFIER OPTIONS:

SSA With Gain Control

Block Upconverter

Switchover Control

Linearizer

Mounting Configurations

Extended Band Operations

Remote Controller

Handheld Local Controller

FEATURES:

Weather Resistant Antenna Mount TWT Amplifier

Phase Noise 10 dB Below IESS-308

Extensive Built-In Diagnostic Capabilities

Advanced Thermal Design

Rugged Construction For Extreme Environments

Optional Handheld Controller For Total Local Monitoring And Control

THE MT3400 antenna mount TWT amplifier is available for applications in C-Band, X-Band and Ku-Band up to 400W, and the DBS-Band up to 225W. This weather-resistant amplifier is a compact, rugged power amplifier designed for extremely reliable operation. Always keeping our customers' needs in mind, MCL has designed the MT3400 to be easily integrated in both new and existing outdoor amplifier installations.

MCL has incorporated the latest design technologies available to provide the most robust and efficient thermal design. Moreover, the MT3400's innovative high voltage power supply design results in an extremely efficient, stable and noise immune power system.

To compliment the high voltage power supply, MCL has incorporated a new digital M & C system internal to the HPA to allow our customers a higher level of system monitoring and control. Easy access to these new monitoring and control capabilities can be achieved by available RS485 M & C based systems or through the use of a portable handheld device.

ISO 9001



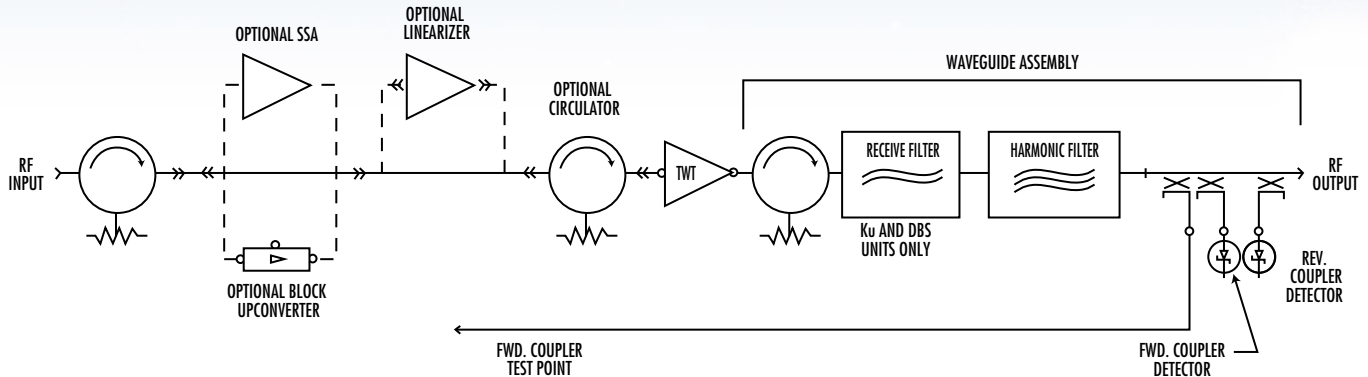
MT3400

TRAVELING WAVE TUBE MEDIUM POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS	C-BAND	X-BAND	Ku-BAND	DBS-BAND
	400 W	400 W	400 W	225 W
Frequency Range (F ₀) (Standard): (Extended): (Extended):	5.850 - 6.650 GHz Option: 5.850 - 7.025 GHz Option: 5.850 - 7.100 GHz	7.9 - 8.4 GHz	13.75 - 14.5 GHz Option: 12.75 - 14.5 GHz	17.3 - 18.4 GHz
Output Power (min.): Tube Output Flange: HPA Rated Output:	400 W (56.0 dBm) 360 W (55.5 dBm)	400 W (56.0 dBm) 360 W (55.5 dBm)	400 W (56.0 dBm) 360 W (55.5 dBm)	225 W (53.5 dBm) 190 W (52.8 dBm)
Gain:				
Large Signal (min.):	46 dB	48 dB	48 dB	41 dB
Small Signal Gain (SSG) (min.):	52 dB	54 dB	54 dB	46 dB
SSG with optional SSA (min.):			75 dB	
Attenuation Range with optional SSA:			25 dB	
Maximum SSG Variation Over:				
Narrow Band:	.5 dB/40 MHz	1.0 dB/40 MHz	1.0 dB/80 MHz	1.0 dB/80 MHz
Full Band:	2.5 dB	2.5 dB	2.5 dB/500 MHz	2.5 dB/500 MHz
Slope, Max.:			±0.04 dB/MHz	
Gain Stability:			±0.25 dB/24 hr. max.	
Stability, Any Freq. -40 to 50°C:			±1.0 dB typ.	
Stability, Any Freq. ±10°C Max.:			±0.75 dB	
Input VSWR:			1.20:1 max. with respect to 50 ohms	
Output VSWR:			1.25:1 max.	
Load VSWR:			2.0:1 without damage	
AM/PM Conversion:				
At Rated Power:			6.0°/dB	
6 dB Below Rated Power:			2.5°/dB	
Residual AM Noise, Max.:				
To 10 kHz:			-50 dBc	
10 - 500 kHz:			-20 (1.5 + Log f kHz) dBc	
Above 500 kHz:			-85 dBc	
Harmonic Output, Max.:			-60 dBc	
Noise & Spurious, Max.:				
Receive Band (Standard):	-150 dBW/4 kHz, 3.4 - 4.2 GHz	-150 dBW/4 kHz, 7.25-7.75 GHz	-150 dBW/4 kHz, 10.7-12.75 GHz	-150 dBW/4 kHz, 10.70-12.75 GHz
(Extended):	-150 dBW/4 kHz, 3.4 - 4.2 GHz	N/A	-150 dBW/4 kHz, 10.7-11.70 GHz	N/A
Transmit Band (F ₀):	-70 dBW/4 kHz	-70 dBW/4 kHz	-70 dBW/4 kHz	-65 dBW/4 kHz
Phase Noise:			10 dB below IESS Phase Noise Profile	
AC Fundamental:			-50 dBc	
Sum of All Spurs:			-47 dBc	
Intermodulation (for 2 equal carriers relative to single carrier rated output):		Total P ₀	IM Product	
		-1.5 dB	-11 dBc	
		-4 dB	-18 dBc	
		-7 dB	-23 dBc	
Typical Linearizer Option Performance:		-4 dB	-27 dBc	
Group Delay:	Any 40 MHz Bandwidth		Any 80 MHz Bandwidth	
Linear:			0.01 ns/MHz	
Parabolic:			0.005 ns/MHz ²	
Ripple:			0.5 ns p-p	
Prime Power:				
Voltage:		100 - 260 VAC, 1-phase, 47 - 63 Hz		
Power Consumption:		1.5 KVA typ.		
Power Factor:		0.95 min.		
In-Rush:		30A max.		
Input Transients:		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



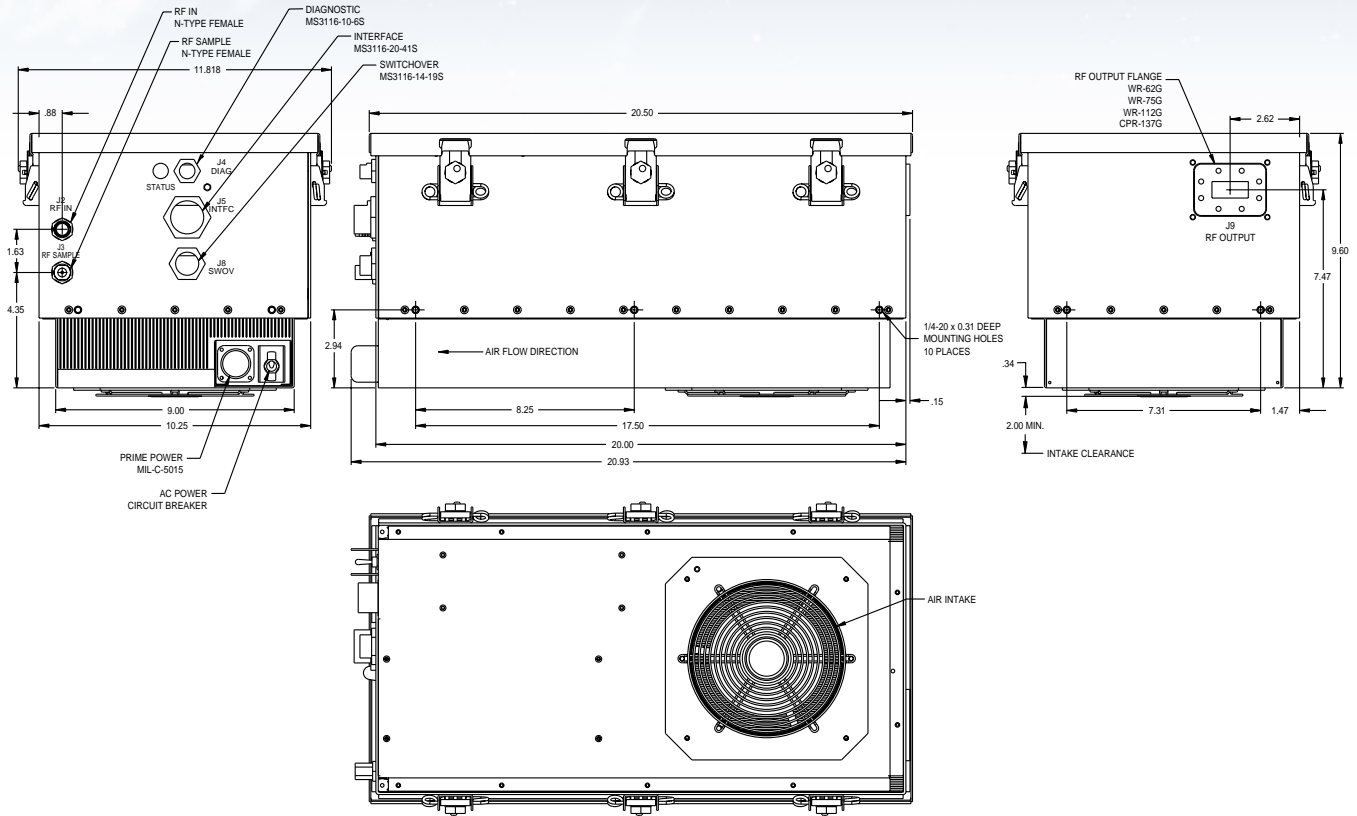
CONTROL AND STATUS CAPABILITIES

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 User Interlock	WG Pressure Helix Surge Current HV Over Volt	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

*Function available with optional SSA

MT3400

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
Output: (Waveguide Flange)
C-Band: CPR137G
X-Band: CPR112G
Ku-Band: WR75
DBS-Band: WR62

Installed Weight:
65 lbs. nominal/29.5 kg

Cooling:
Forced air, 2.0" clearance required

Acoustic Noise:
<68 dBA Max. at 1 Meter

PHYSICAL SPECIFICATIONS

Dimensions:
9.60" H
10.25" W
20.5" L

Air Flow:
C, X, Ku-Band 150 CFM
DBS-Band 100 CFM