



# MT3600

ANTENNA MOUNT TRAVELING WAVE TUBE  
POWER AMPLIFIER

FOR SATELLITE UPLINK APPLICATIONS



Ka-BAND: 175W  
250W PK

Q-BAND: 120W  
180W

## AVAILABLE SYSTEM OPTIONS:

MT3611 1 + 1 Redundant System

MT3612 1 + 2 Redundant System

MT36PC Phase Combined  
Single Path Redundant System

Other Configurations Available Upon Request

## AVAILABLE AMPLIFIER OPTIONS:

Low Gain IPA

L-Band Block Upconverter (Internal to HPA)

Linearizer (Internal to HPA)

Ethernet Interface (Internal to HPA)

Switchover Control

Mounting Configurations

Chassis Color

Remote Controller

Harmonic Filter

WR34 Output Flange

## FEATURES:

Field-Proven Reliability

Weather Resistant Antenna Mount TWT Amplifier

Design for Military Applications

Event Log

Dual Communications Interfaces

Continuous Attenuator Adjustment in dB

Auto Power Control and Status

Automatic Standby Filament Shutdown

Sample Port Coupling Factor Screen

Industry-Leading Operations Temp Range

ISO 9001



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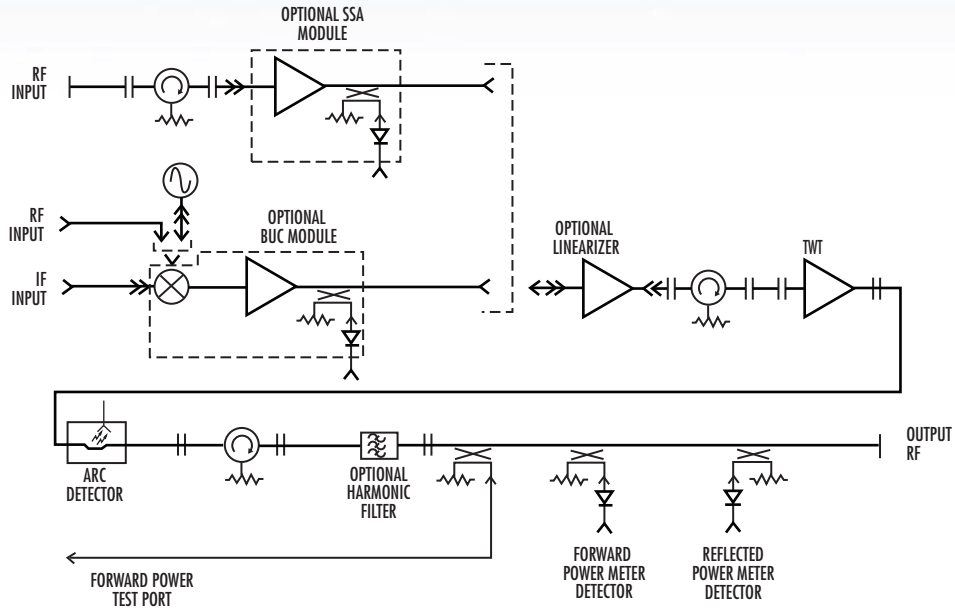
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## TRAVELING WAVE TUBE MEDIUM POWER AMPLIFIER

ELECTRICAL SPECIFICATIONS	Ka-BAND			Q-BAND	
	175 W	250 W PK/175 W CW		120 W	180 W
Frequency Range (F <sub>0</sub> ):	27.5 - 30.0 GHz 30.0 - 31.0 GHz			43.5 - 45.5 GHz	
Output Power (min.):					
Tube Output Flange (CW):	175 W (52.4 dBm)	250 W (54.0 dBm) Pk/175 W (52.4 dBm)		120 W (50.8 dBm)	180 W (52.6 dBm)
HPA Rated Output (CW):	150 W (51.8 dBm)	150 W (51.8 dBm) Pk/208 W (53.2 dBm)		104 W (50.2 dBm)	156 W (51.9 dBm)
Gain:					
Large Signal (min.):	38 dB	37 dB		N/A	
Small Signal Gain (SSG) (min.):	41 dB	40 dB		N/A	
SSG with optional SSA (min.):	74 dB	73 dB		65 dB	
Attenuation Range with optional SSA (min.):	20 dB				
Maximum SSG Variation Over:					
Narrow Band:	0.8 dB/60 MHz			1.5 dB/125 MHz	
Full Band:	2.5 dB/1 GHz			2.5 dB/1 GHz	
Slope, Max.:	Less than 0.04 dB/MHz			Less than 0.04 dB/MHz	
Gain Stability:	0.25 dB			0.25 dB	
Stability, Any Freq. -40 to 50°C:	±1.0 dB typ.			±2.0	
Stability, Any Freq. ±10°C Max.:	±0.75 dB			±1.50 dB	
Input VSWR:	1.3:1 max.				
Output VSWR:	1.3:1 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 <sub>f</sub> kHz) dBc				
Above 500 kHz:	-85 dBc				
Harmonic Output, Max.:	-60 dBc max. (with optional filter)				
Noise & Spurious, Max.:					
Receive Band:	-150 dBW/4 kHz, <21.2 GHz				
Transmit Band (F <sub>0</sub> ):	-70 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):					
	(27.5 - 30.0 GHz)		(30.0 - 31.0 GHz)		
	Total P <sub>0</sub>	IM Product	IM Product	IM Product	
	-4 dB	-18 dBc	-17 dBc	-22 dBc	Contact MCL
	-7 dB	-24 dBc	-23 dBc	-28 dBc	Contact MCL
Linearizer Option:	-4 dB	-27 dBc	-26 dBc	-29 dBc	Contact MCL
Group Delay:	Any 60 MHz Bandwidth				
Linear:	0.01 ns/MHz				
Parabolic:	0.005 ns/MHz <sup>2</sup>				
Ripple:	0.500 ns p-p				
Prime Power:					
Voltage:	100 - 264 VAC, 1-phase 2-Wire, 47 - 63 Hz				
Power Consumption:	*TBD				
Power Factor:	0.95 min.				
In-Rush:	13A max.				

Note: Performance information is subject to change without notification. Contact MCL for the latest specifications. (TN3600-1)

## RF BLOCK DIAGRAM



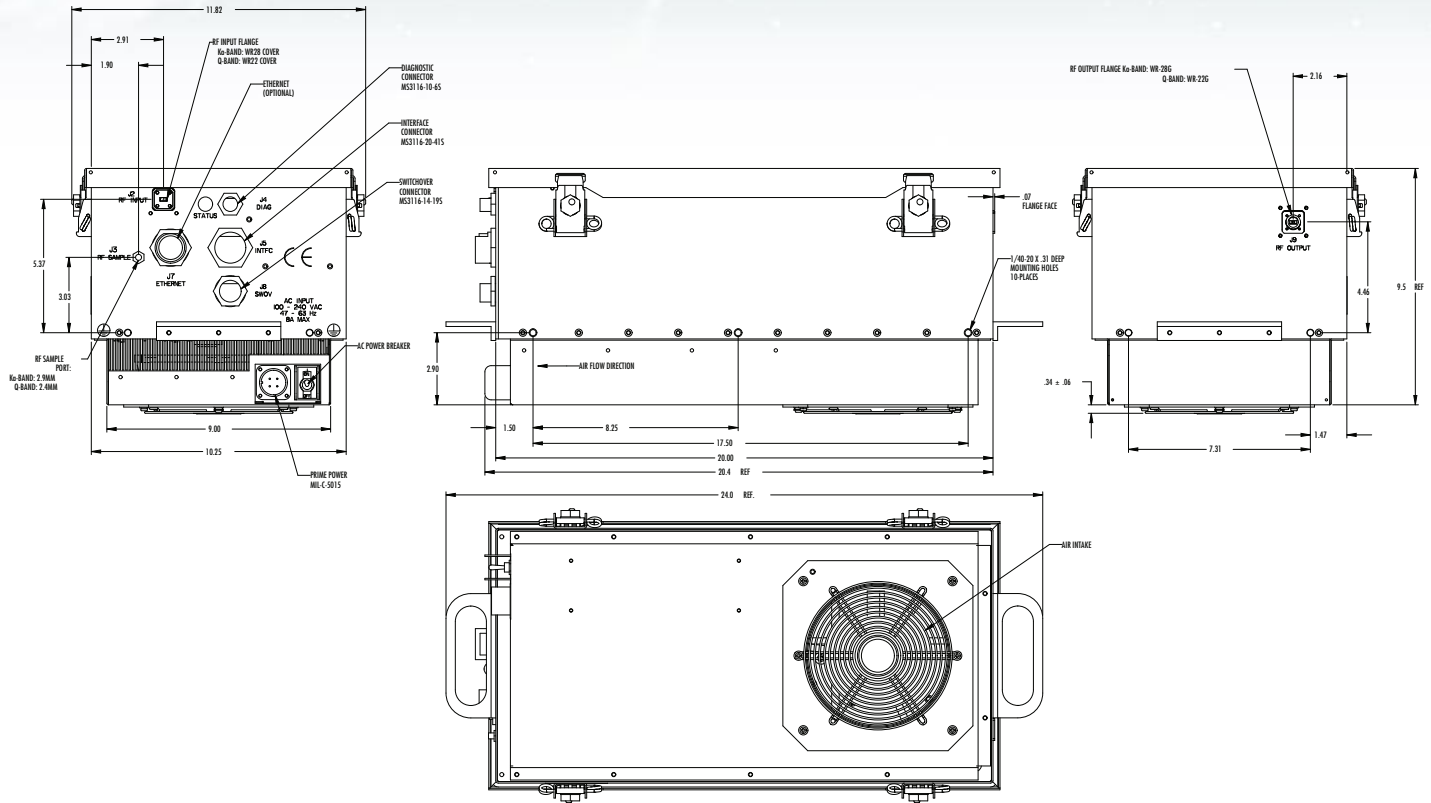
## CONTROL AND STATUS CAPABILITIES

TYPE	FUNCTION		
Controls	Power ON Reset Units Select Time & Date	Filament OFF Remote/Computer Attenuation* Transmit/Standby	RF Inhibit Auto Power* Clear Event Log
Remote & Computer Only	RF Inhibit RF Reflected Power Filament Current PS Temp	Tube Drive Power Helix Voltage Tube Temp	RF Forward Power Helix Current Filament Delay
Adjustable Parameters	Auto Power* Tube Temp Alarm PS Temp Alarm	Tube Overdrive Alarm RF Low Alarm Attenuation	RF Reflected Power Alarm RF High Alarm
Alarms	RF Low Tube Overdrive Tube Temp	RF High Power Supply Temp BUC Module	RF Reflected Power Summary
Faults	Summary WG Pressure Helix Surge Current HV Over Volt BCE	Tube Overdrive Power Supply Temp Helix Run Current Filament Under Current	RF Reflected Power Tube Temp HV Under Volt User Interlock

\* Function available with optional SSA.

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## OUTLINE DRAWING



### ENVIRONMENTAL SPECIFICATIONS

#### Operating Temperature:

-40°C to +60°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, Proc. 1, Cat. 1

#### Shock:

10g, 11ms half sine

### MECHANICAL SPECIFICATIONS

#### RF Connectors:

Input: WR-28G (Ka-Band) WR-22 (Q-Band)  
Output: WR-28G (Ka-Band) WR-22 (Q-Band)

#### Installed Weight:

47 lbs. nominal/23.4 kg

#### Cooling:

Forced air, 2.0" clearance required

#### Acoustic Noise:

<68 dBA max. at 1 meter

### PHYSICAL SPECIFICATIONS

#### Dimensions:

9.60" H (243.8 mm)  
11.8" W (299.7 mm)  
20.5" L (520.7 mm)

#### Air Flow:

Specific to tube option