MT3200

TRAVELING WAVE TUBE MEDIUM POWER AMPLIFIER

FOR SATELLITE UPLINK APPLICATIONS

C-BAND: 400W
X-BAND: 400W
KU-BAND: 200W, 400W

FEATURES:

Field Replaceable Modules For Unsurpassed Serviceability

Closed-loop Forced Air Cooling

Typical Phase Noise 12 dB Below IESS-308

Control Dial For Easy Set-up And Adjustment

AVAILABLE SYSTEM OPTIONS:

MT3211	1 + 1 Redundant System
MT3212	1 + 2 Redundant System
MT32PC	Phase Combined, Single Path Redundant System
MT32PC2	Phase Combined, Dual Path Redundant System

Special Configurations Available Upon Request

AVAILABLE AMPLIFIER OPTIONS:

- Controller Bypass
- Parallel Remote Interface
- Manual Attenuator
- Internal Linearizer
- Extended Band Operations
- SLIM/R Remote Panel

THE MT3200 medium power TWT amplifier is available for C-Band, X-Band or Ku-Band applications up to 400W. The unique design of the MT3200 incorporates five standard field replaceable modules including the Simplified Logic Interface Module (SLIM), the RF assembly, the Prime Power Converter, the HV Power Supply and the HV Filter assembly. All modules are housed in a compact 3RU (5.25") cabinet mount drawer.

The RF field replaceable module operates using dual depressed collector TWTs. This and other modules of the MT3200 are cooled using a closed-loop cooling system incorporating proven forced air and bonded fin heatsink technology. All high voltage circuitry is fully encapsulated to eliminate corona and other environmental influences.

Prime power interface to a wide variety of voltages and frequencies is available without the need to make modifications. Power factor correction provides near unity (greater than 0.95 PF) power transfer for the most efficient use of prime power.

The Simplified Logic Interface Module of the MT3200 provides the user with alpha-numeric feedback on system status and diagnostics through a four-line, twenty character, vacuum florescent display (VFD). LED indicators and buttons provide for additional visual status. The MT3200 offers a single communications port for either RS232 or RS422/485 serial bus interface. This allows for communications with a SLIM/R remote control or computer.

ISO 9001

MCL INC A MITEQ COMPANY

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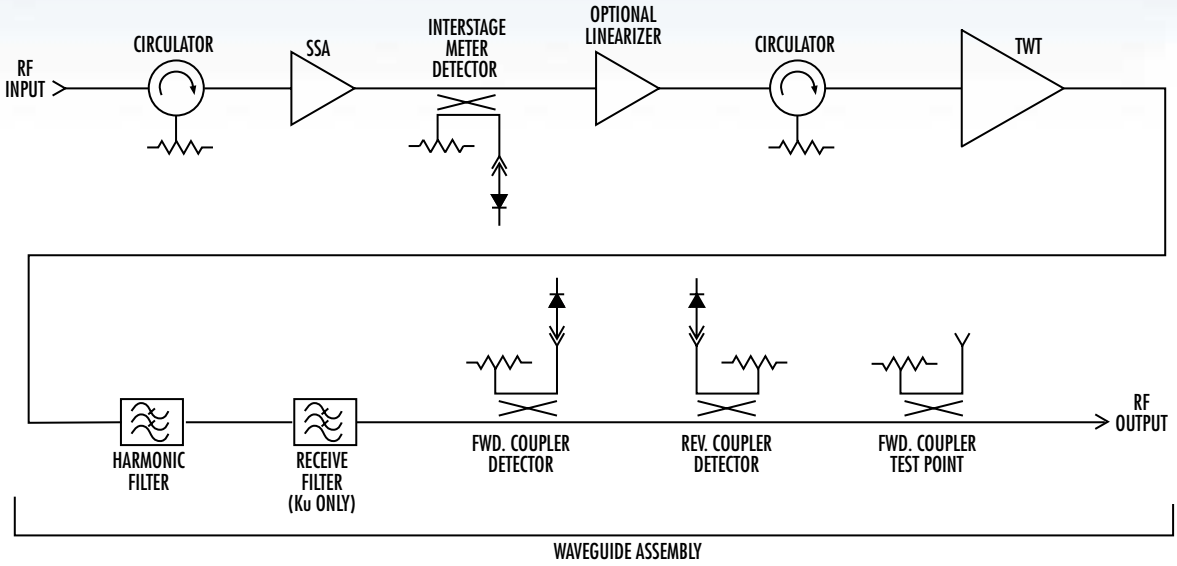
ELECTRICAL SPECIFICATIONS	C-BAND 400 W	X-BAND 400 W	KU-BAND 200 W	400 W
Frequency Range (F_0) (Standard):	5.850 - 6.650 GHz	7.90 - 8.40 GHz	13.75 - 14.5 GHz	13.75 - 14.50 GHz
(Extended):	Option: 5.850 - 7.025 GHz			Option: 12.75 - 14.50 GHz
Output Power (min.):				
Tube Output Flange:	400 W (56.0 dBm)	400 W (56.0 dBm)	200 W (53.0 dBm)	400 W (56 dBm)
HPA Output Flange:	360 W (55.5 dBm)	360 W (55.5 dBm)	180 W (52.5 dBm)	360 W (55.5 dBm)
Gain:				
At Rated Power (min.):	73 dB	77 dB	66 dB	73 dB
Small Signal Gain (SSG) (min.):	77 dB	81 dB	71 dB	77 dB
Attenuation Range:	32 dB (0.1 Inc.)			
Maximum SSG Variation Over:				
Narrow Band:	1.0 dB/40 MHz		1.0 dB/80 MHz	
Per 500 MHz:	2.5 dB			
Slope, Max.:	±0.3 dB/MHz		±0.4 dB/MHz	
Gain Stability:	±0.25 dB/24 hr. max. (constant drive, line voltage and temp.)			
Stability, Any Freq. Over Entire Temp.:	±1 dB typ.			
Stability, Any Freq. ±10°C:	±0.75 dB max.			
Input VSWR:	1.20:1 max. with respect to 50 Ohms			
Output VSWR:	1.60:1 max. with respect to 50 Ohms			
Load VSWR:	2.0:1 max. without damage, continuous			
AM/PM Conversion:				
At Rated Power:	6.0°/dB			
6 dB Below Rated Power:	2.5°/dB			
Residual AM Noise, Max.:				
Below 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):	-130 dBW/4 kHz, 3.4 - 4.2 GHz	-130 dBW/4 kHz, 7.25 - 7.75 GHz	-130 dBW/4 kHz, 10.7 - 12.75 GHz	-130 dBW/4 kHz, 10.7 - 12.75 GHz
(Extended):	-130 dBW/4 kHz, 3.4 - 4.2 GHz	N/A	N/A	-130 dBW/4 kHz, 10.7 - 11.7 GHz
Transmit Band (F_0):	-65 dBW/4 kHz	-65 dBW/4 kHz	-65 dBW/4 kHz	-65 dBW/4 kHz
Phase Noise:	10 dB below IESS Phase Noise Profile			
AC Fundamental:	-50 dBc			
Sum Of All Except AC Fundamental:	-47 dBc			
Intermodulation	Total P_0	IM Product		
(for 2 equal carriers relative	-4 dBc	-18 dBc		
to single carrier rated output):	-7 dBc	-24 dBc		
Linearizer Option:	-4 dBc	-27 dBc		
Group Delay:	Any 40 MHz Bandwidth		Any 80 MHz Bandwidth	
Linear:	0.01 ns/MHz		0.01 ns/MHz	
Parabolic:	0.001 ns/MHz^2		0.005 ns/MHz^2	
Ripple:	0.5 ns p-p		0.5 ns p-p	
Prime Power:				
Voltage:	100 - 264 VAC, 1-phase, 47 - 63 Hz			
Power Consumption (at Rated RF Out):	1.5 KVA Typ. (1.1 KVA for 200W)			
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	
Local Controls	Power On RF ON/OFF Local/Remote/Computer Attenuation (Gain)	Transmit/Standby Reset Switchover
Displays	Tube Drive Power RF Forward Power Helix Voltage Filament Delay	Forward Power Sample Port RF Reflected Power Helix Current
Adjustable Parameters	RF High Alarm	RF Low Alarm
Alarms (Notification Only)	RF High	RF Low
Faults (Notification, RF & HV Shutdown)	Summary RF Reflected Power Tube Temperature Helix Surge Current HV Under Voltage Power Supply Temperature	Tube Overdrive Chassis Interlock User Interlock Helix Run Current HV Over Voltage External Interlock

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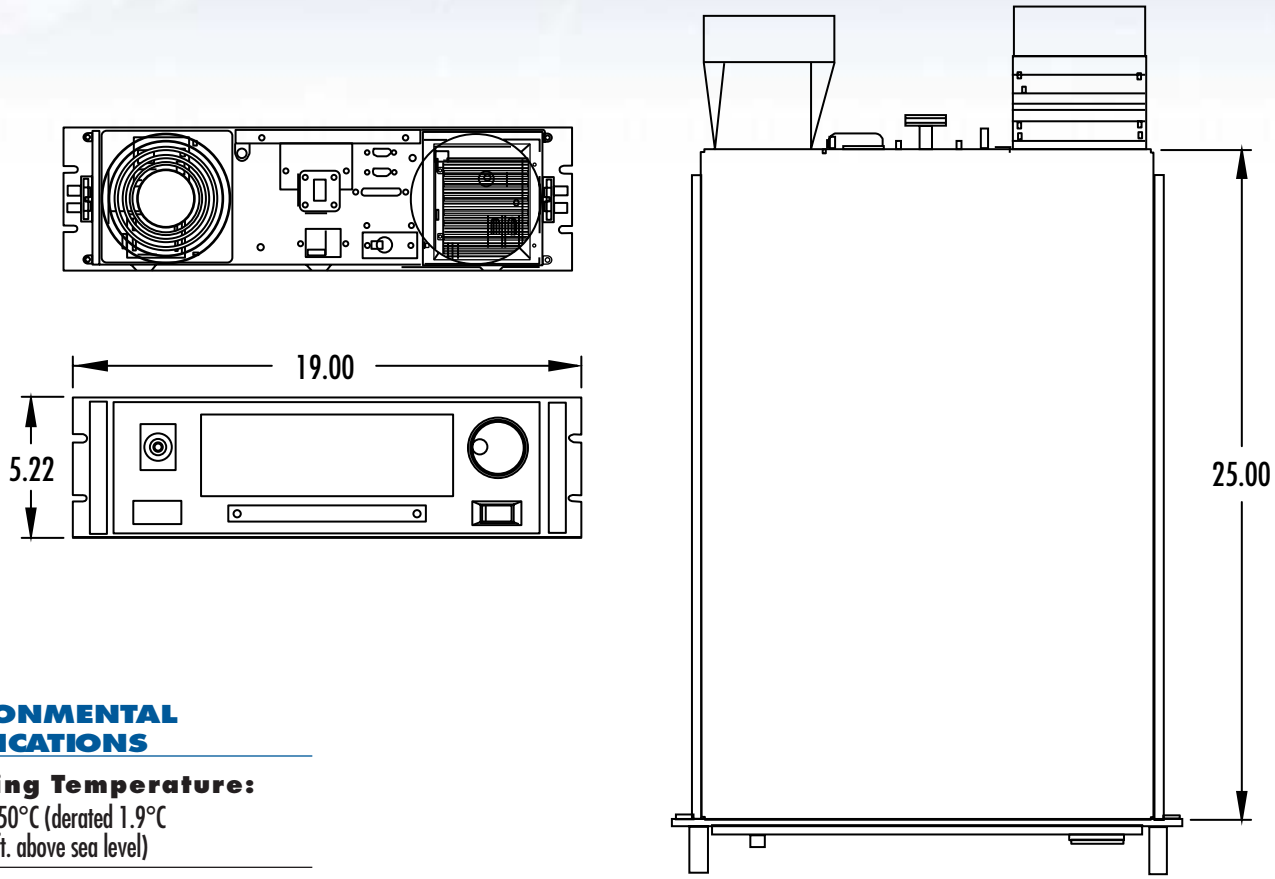
OUTLINE DRAWING



ENVIRONMENTAL SPECIFICATIONS

Operating Temperature:
-10°C to +50°C (derated 1.9°C per 1,000 ft. above sea level)

Non-Operating Temperature:
-20°C to +70°C

Relative Humidity:
95%, non-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:
Meets the vibratory extremes Specified in MIL-STD-810, Method 514.3, Procedure 1

Shock:
Meets Performance Specifications after 15 g for 11ms Shock Specified in MIL-STD-810, Method 516.4, Procedure VI

Maximum Backpressure:
0.5 inches of water (exhaust air)

MECHANICAL SPECIFICATIONS

RF Connectors:
Input: Type SMA female
Output: (Waveguide Flange)
C-Band: CPR137F
X-Band: WR112F
Ku-Band: WR75F

Installed Weight:
78 lbs. maximum

Cooling:
Closed-loop forced air with integral blower

Acoustic Noise:
< 65 dBA at 1 Meter (from front panel)

PHYSICAL SPECIFICATIONS

Dimensions:
5.25" H (3RU)
19.00" W
25.00" L (nom.)

Air Flow:
110 CFM

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