X-Band Solid State Power Amplifier

With Block Upconverter

70W P1dB Medium Power, Antenna Mount Outdoor Unit



The MITEQ Solid State Power Amplifier (SSPA) Systems are designed for high performance satellite uplink applications. The antenna mount systems are constructed and tested to meet the requirements of extreme outdoor environmental conditions. These systems incorporate amplifier modules engineered using state-of-the-art GaAs FET technology, a high efficiency power supply and a microprocessor-based monitor and control system.

The systems provide for over-temperature, over-current and high output VSWR safety protection. Remote status and control is provided by an optional controller with RS422/485 and Ethernet interface bus. An event log is continuously updated with time-stamped records of significant events.

Model Number	Configuration	Power @ P1dB (dBm/Watts)	Linear Power (dBm/Watts)
	X-Band		
PA-S-7984-70	SSPA only	+48.5/70	+45.5/35
PA-B-7984-70	SSPA w/BUC	+48.5/70	+45.5/35

Linear Power IAW ARSTRAT Cerification Requirement Ver. 1.06, para. 5.6.1 (1): ≤-30 dBc power spectral density 1.0 symbol rate from center frequency.

Summary

- Lightweight
- Compact
- Tx output 7.9 to 8.4 GHz
- P1dB ≥ 70W
- 35W linear power to ARSTRAT requirements
- IF input 950 to 1450 MHz
- Phase noise superior to MIL-STD-188-164B

Applications

- Milsatcom
- Flyaway terminals
- VSAT network hubs
- Custom airborne and mobile mount versions

Features

- Compact system designs
- Low intermodulation distortion
- High gain 70 dB, and gain stability
- Forward/reflected power monitors
- Output monitor port
- Gain and mute control functions
- RF On/Off operating modes
- Contact closure summary alarm

Options

- Redundant configurations
- Auto switch internal reference
- Harmonic filter
- Input signal monitor
- Remote control panel
- RS422/485 and 10/100Base-T Ethernet controller

Specifications

RF Specifications

Model	SSPA Input/ Output Frequency (GHz)	SSPA w/BUC Input Frequency (MHz)	Output Power at 1 dB Compression (Minimum)	Linear Power* (Minimum)	Output Power at Saturation (Typical)
X-Band	7.9 - 8.4	950 - 1450	+48.5 dBm/70W	45.5 dBm/35W	+49.0 dBm/80W

* Linear Power IAW ARSTRAT Cerification Requirement Ver. 1.06, para. 5.6.1 (1): ≤-30 dBc power spectral density 1.0 symbol rate from Fc.

RF/IF frequency ..... 7.9 to 8.4 GHz/950 to 1450 MHz
Gain ..... 70 dB minimum at +25°C
Gain flatness ..... 2.0 dB peak-to-peak maximum full-band
Gain slope ..... ±0.4 dB/40 MHz maximum
Gain stability ..... 2.5 dB peak-to-peak maximum after 1/2 hour warm-up (-40 to +55°C)
Output power ..... Refer to table
Power input without damage ..... +15 dBm maximum
Noise figure ..... 15 dB typical (0 dB attenuation)
Impedance ..... 50 ohms
VSWR
  Input ..... 1.30:1 maximum
  Output ..... 1.30:1 maximum
  Monitor ..... 1.50:1 maximum
Noise power
  Transmit band ..... -75 dBw/4 kHz maximum
  Receive band ..... -75 dBw/4 kHz maximum
Residual AM noise
  Up to 10 kHz ..... -45 dBc
  10 kHz–500 kHz ..... -20 (1.25+logF) dBc
  500 kHz–1 MHz ..... -80 dBc
Phase noise

SSPA Only

Offset from carrier	dBc/Hz (maximum)
10 Hz	-90 dBc/Hz
100 Hz	-95 dBc/Hz
1 kHz	-105 dBc/Hz
10 kHz	-110 dBc/Hz
100 kHz	-115 dBc/Hz
1 MHz	-125 dBc/Hz

SSPA with L-Band BUC (UPBA)

Offset from carrier	dBc/Hz (maximum)
10 Hz	-50 dBc/Hz
100 Hz	-70 dBc/Hz
1 kHz	-80 dBc/Hz
10 kHz	-90 dBc/Hz
100 kHz	-103 dBc/Hz
1 MHz	-120 dBc/Hz

AM/PM conversion (at 3 dB back-off from P1dB) ..... 1°/dB maximum
Group delay (any 40 MHz)
  Linear ..... 0.03 ns/MHz maximum
  Parabolic ..... 0.003 ns/MHz^2 maximum
  Ripple ..... 1.0 ns peak-to-peak maximum
Intermodulation distortion
  (3 dB total back-off from rated P1dB output power) ..... -25 dBc maximum
Harmonics (at 3 dB back-off from P1dB) ..... -50 dBc maximum
Spurious (at P1dB) ..... -65 dBc maximum

General Specifications

Primary Power Requirements

Voltage	90-250 VAC
Frequency	47-63 Hz
Consumption	500W typical

Physical

AC input connector	CL1M1102*
Remote interface summary alarm connector	MS3112E12-10S*
10/100 Base-T Ethernet interface	RJ-45 RJF21G*
RF input	Type N female
RF output	
X-band	CPR112G
Output signal monitor	SMA female
Weight including BUC	20 pounds (9.07 Kg) nominal

Note: *Supplied with mating connectors.

Environmental

Operating	
Ambient temperature	-40 to +55°C
Relative humidity	Up to 100% condensing
Atmospheric pressure	Up to 10,000 feet
Nonoperating	
Temperature	-50 to +70°C
Atmospheric pressure	Up to 40,000 feet
Shock and vibration	Normal handling by commercial carriers

Model Number Configuration

MODEL NUMBER: **PA** /_____– 7 9 8 4 – 70 –_____

Type

S – SSPA, B – Block Upconverter (SSPA w/BUC)

Frequency

7984 – X-Band

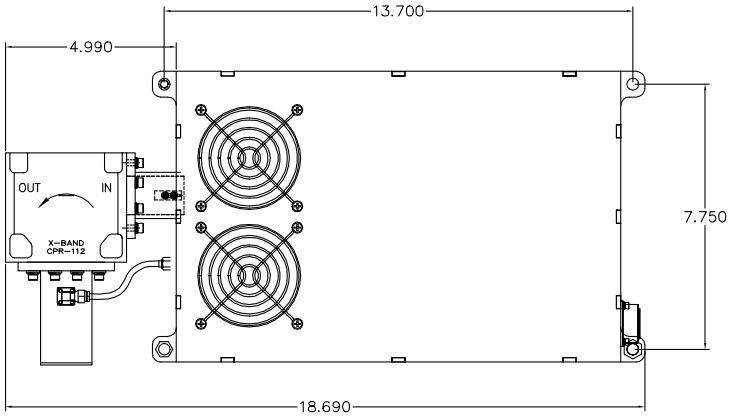
Power Levels

70 – X-Band

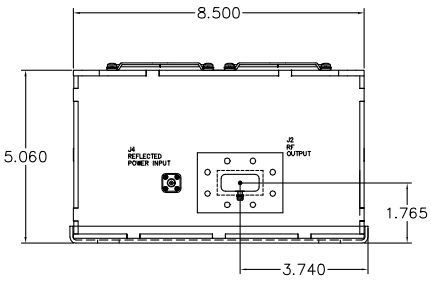
Options

IR – Automatic internal/external switchover 10 MHz internal reference
HF – Harmonic filter (-70 dBc minimum)
IM – Input signal monitor (-10 dBc nominal)
LI – LNB interface - Includes internal reference option, LNB reference output and LNB DC power interface with current monitor (X-band model only - used with MITEQ LNB)
IS – Output Isolator with reflected output power monitor port
CT – Controller - RS422/RS485 and 10/100Base-T Ethernet interface with web page browser for remote monitoring access. Refer to MITEQ Technical Note 25T060 for details.

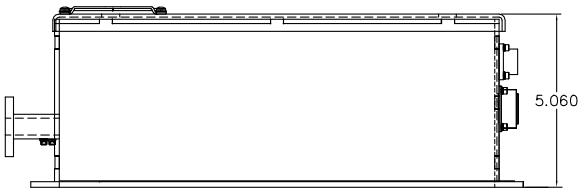
BUC/SSPA Outline Drawing



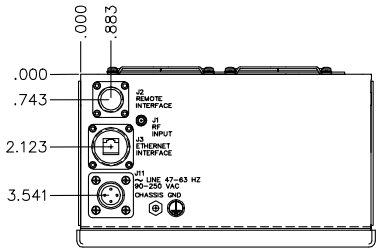
TOP VIEW



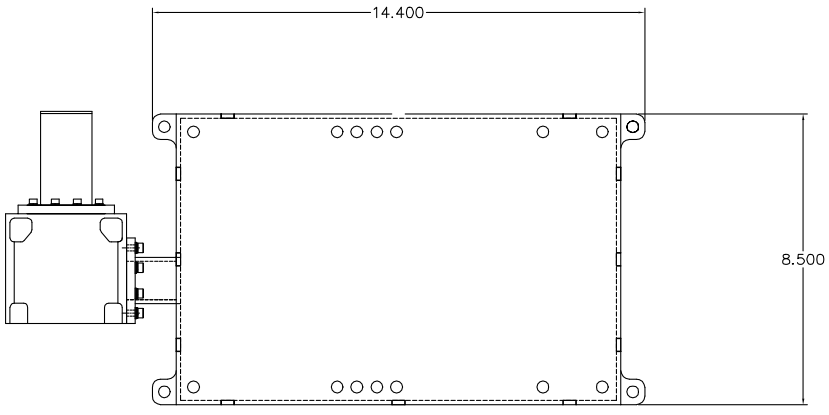
FRONT VIEW



RIGHT SIDE



BACK VIEW



100 Davids Drive, Hauppauge, NY 11788
TEL.: +1-631-436-7400 • FAX: +1-631-436-7431
www.miteq.com

Specifications are subject to change without notification.