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.

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Configuration</th>
<th>Power @ P1dB (dBm/Watts)</th>
<th>Linear Power (dBm/Watts)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PA-S-7984-70</td>
<td>SSPA only</td>
<td>+48.5/70</td>
<td>+45.5/35</td>
</tr>
<tr>
<td>PA-B-7984-70</td>
<td>SSPA w/BUC</td>
<td>+48.5/70</td>
<td>+45.5/35</td>
</tr>
</tbody>
</table>

Linear Power IAW ARSTRAT Certification 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

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

* Linear Power IAW ARSTRAT Certification 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
- Transmit band noise: -75 dBw/4 kHz maximum
- Receive band noise: -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/MHz² 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
X-Band Solid State Power Amplifier With Block Upconverter - Outdoor Unit

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.
Solid State Power Amplifier With Block Upconverter - Outdoor Unit

Specifications are subject to change without notification.