Solid State Broadband High Power Amplifier

The BBM3K5KKO (SKU 1189) is suitable for broadband mobile Jamming and band specific high power linear applications in the P/L/S frequency bands. This compact module utilizes high power advanced GaN devices that provide excellent power density, high efficiency, wide dynamic range and low distortions. Exceptional performance, long term reliability and high efficiency are achieved by employing advanced broadband RF matching networks and combining techniques, EMI/RFI filters, machined housings and qualified components. Empower RF’s ISO9001 Quality Assurance Program assures consistent performance and the highest reliability.

- Solid-state Class AB design
- Instantaneous ultra broadband
- Suitable for CW, AM, and FM (Consult factory for other modulation types)
- Small and lightweight
- 50 ohm input/output impedance
- High reliability and ruggedness
- Built-in control, monitoring and protection circuits

ELECTRICAL SPECIFICATIONS @ +28.0VDC, 25°C, 50Ω System

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Frequency</td>
<td>BW</td>
<td>500</td>
<td></td>
<td>2500</td>
<td>MHz</td>
</tr>
<tr>
<td>Output Power CW</td>
<td>P_{SAT}</td>
<td>100</td>
<td>125</td>
<td></td>
<td>Watt</td>
</tr>
<tr>
<td>Output Power @ 1dB Gain Compression</td>
<td>P_{1dB}</td>
<td>50</td>
<td></td>
<td></td>
<td>Watt</td>
</tr>
<tr>
<td>Power Gain @ P_{1dB}</td>
<td>G_p</td>
<td>50</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Input Power for Rated P_{SAT}</td>
<td>P_{IN}</td>
<td>0</td>
<td>3</td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td>Gain Flatness @ Rated P_{SAT}</td>
<td>ΔG_p</td>
<td>±1.0</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Input Return Loss</td>
<td>S_{11}</td>
<td>-10</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>NF</td>
<td>10</td>
<td></td>
<td></td>
<td>dB</td>
</tr>
<tr>
<td>Third Order Intercept Point</td>
<td>IP3</td>
<td>+50</td>
<td></td>
<td></td>
<td>dBm</td>
</tr>
<tr>
<td>Harmonics @ P_{OUT} = 100W</td>
<td>H</td>
<td>-20</td>
<td></td>
<td></td>
<td>dBC</td>
</tr>
<tr>
<td>Spurious Signals</td>
<td>Spur</td>
<td>-70</td>
<td>-60</td>
<td></td>
<td>dBC</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>V_{DC}</td>
<td>26</td>
<td>28</td>
<td>30</td>
<td>Volt</td>
</tr>
<tr>
<td>Current Consumption @ P_{OUT} = 100W</td>
<td>I_{DQ}</td>
<td>10</td>
<td>12</td>
<td></td>
<td>Amp</td>
</tr>
<tr>
<td>Quiescent Current</td>
<td>I_{DQ}</td>
<td>1.5</td>
<td>2.0</td>
<td></td>
<td>Amp</td>
</tr>
<tr>
<td>Current Consumption @ Shutdown</td>
<td>I_{SD}</td>
<td>300</td>
<td></td>
<td></td>
<td>mA</td>
</tr>
<tr>
<td>Switching Time @ 1kHz TTL, P_{IN} = 0dBm</td>
<td>T_{ON/OFF}</td>
<td>2.0</td>
<td>5.0</td>
<td>5.0</td>
<td>uSec</td>
</tr>
</tbody>
</table>

MECHANICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>187.96 x 91.44 x 26.924 (7.4 x 3.6 x 1.06)</td>
</tr>
<tr>
<td>Weight</td>
<td>2</td>
</tr>
<tr>
<td>RF Connectors Input/Output</td>
<td>Type-SMA, Female</td>
</tr>
<tr>
<td>DC Interface Connector</td>
<td>D-Sub 9-Pin, Male</td>
</tr>
<tr>
<td>Cooling</td>
<td>External Heatsink (Not Supplied)</td>
</tr>
</tbody>
</table>

ENVIRONMENTAL CHARACTERISTICS (Design to Meet)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Case Temperature</td>
<td>T_C</td>
<td>-40</td>
<td></td>
<td>+85</td>
<td>°C</td>
</tr>
<tr>
<td>Non-operating Temperature</td>
<td>T_{STG}</td>
<td>-40</td>
<td></td>
<td>+85</td>
<td>°C</td>
</tr>
<tr>
<td>Relative Humidity (non-condensing)</td>
<td>RH</td>
<td>95</td>
<td></td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Altitude (MIL-STD-810F Method 500.4)</td>
<td>ALT</td>
<td>30,000</td>
<td></td>
<td></td>
<td>Feet</td>
</tr>
<tr>
<td>Vibration/Shock</td>
<td>VI/SH</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIL-STD-810F - Method 514.5/516.5 – Proc I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RoHS Compliant available
SKU# 1189-0003
**Solid State Broadband High Power Amplifier**

1189 – BBM3K5KKO  

500 – 2500 MHz / 100 Watts

### LIMITS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input RF drive level without damage</td>
<td>+10 dBm</td>
</tr>
<tr>
<td>Load VSWR @ $P_{OUT} = 100W$</td>
<td>$\leq$ @ all load phase &amp; amplitude for duration of 1 minute</td>
</tr>
<tr>
<td></td>
<td>3:1 @ all load phase &amp; amplitude continuous</td>
</tr>
<tr>
<td>Thermal Overload</td>
<td>85°C Graceful Degradation</td>
</tr>
</tbody>
</table>

### DC INTERFACE CONNECTOR – D-sub, 9-Pin, Male

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Current Monitor</td>
<td>Analog voltage relative to $I_{DD}$ @ 25mV/100mA</td>
</tr>
<tr>
<td>3</td>
<td>Temp. Sense</td>
<td>Analog voltage relative to Unit’s Temperature @ 10mV/°C (500mV OFFSET) Formule: $(V_{MEASURED} - 0.5V)/0.01 = °C$, or e.g. $(0.75V-0.5V)/0.01 = 25°C$</td>
</tr>
<tr>
<td>5</td>
<td>Shutdown</td>
<td>Amplifier Disable: TTL Logic High (5V) (Internally Pulled-Low)</td>
</tr>
<tr>
<td>1, 6, 7</td>
<td>VDD</td>
<td>+26.0-30.0V_{DC}</td>
</tr>
<tr>
<td>4, 8, 9</td>
<td>GND</td>
<td>Ground</td>
</tr>
</tbody>
</table>

**OUTLINE DRAWING**
TYPICAL PERFORMANCE PLOTS

Plot 1 – Small Signal Gain and $P_{1dB}$
Top Curve: Small Signal Gain @ $P_{IN} = -20$dBm
Middle Curve: Power Gain @ $P_{1dB}$, $P_{IN} = -7$dBm
Bottom Curve: Input Return Loss
Reference: 53dB, 1dB/div.

Plot 2 – Small Signal Gain and $P_{SAT}$
Top Curve: Small Signal Gain @ $P_{IN} = -20$dBm
Middle Curve: Power Gain @ $P_{SAT}$, $P_{IN} = 0$dBm
Bottom Curve: Input Return Loss
Reference: 53dB, 1dB/div.

Plot 3 – Noise Figure
Noise Figure Curve
Reference: 7dB, 1dB/div.