BT02000-AlphaS
100kHz-30MHz
2kW

- Scientific and Industrial Applications

The BT-AlphaS series is a range of class AB RF power amplifiers covering the 100kHz to 30MHz frequency range.
- Rugged, solid-state design - high reliability
- Extremely high phase and amplitude stability
- Very fast pulse rise/fall times
- High linearity
- Very low interpulse noise
- Competitively priced

### RF Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Class AB MOSFET</td>
</tr>
<tr>
<td>Rated Power</td>
<td>2000W minimum</td>
</tr>
<tr>
<td></td>
<td>PEP for input power of 0dBm</td>
</tr>
<tr>
<td>P1dB</td>
<td>1600W minimum</td>
</tr>
<tr>
<td></td>
<td>Minimum output power at P1dB compression</td>
</tr>
<tr>
<td>Gain</td>
<td>63dB minimum</td>
</tr>
<tr>
<td>Frequency</td>
<td>100kHz-30MHz</td>
</tr>
<tr>
<td>Gain flatness</td>
<td>±1.5dB maximum (measured at 1/10th rated output power)</td>
</tr>
<tr>
<td>Max. duty cycle</td>
<td>20% Maximum GATE duty cycle</td>
</tr>
<tr>
<td>Max. pulse width</td>
<td>10ms Maximum GATE pulse width</td>
</tr>
<tr>
<td>Rated power in CW mode</td>
<td>200W</td>
</tr>
<tr>
<td></td>
<td>CW operation is automatically available at output power level less than approx. 10% of full rated power</td>
</tr>
<tr>
<td>Pulse droop</td>
<td>0.5dB maximum</td>
</tr>
<tr>
<td></td>
<td>Measured at max. pulse width at P1dB level</td>
</tr>
<tr>
<td>Pulse rise and fall times</td>
<td>Rise time: 200ns typical</td>
</tr>
<tr>
<td></td>
<td>Fall time: 100ns typical</td>
</tr>
<tr>
<td></td>
<td>Using a pre-gated RF input signal</td>
</tr>
<tr>
<td>Gate rise and fall times</td>
<td>Rise time: 300ns typical</td>
</tr>
<tr>
<td></td>
<td>Fall time: 150ns typical</td>
</tr>
<tr>
<td>Gate delay</td>
<td>Rising edge: 1μs typical</td>
</tr>
<tr>
<td></td>
<td>Falling edge: 500ns typical</td>
</tr>
<tr>
<td></td>
<td>Rising edge measured from rising edge of GATE pulse to 90% RF output voltage</td>
</tr>
<tr>
<td></td>
<td>Falling edge measured from falling edge of GATE pulse to 10% RF output voltage</td>
</tr>
<tr>
<td>Harmonics</td>
<td>Odd: -20dBc typical, -10dBc max.</td>
</tr>
<tr>
<td></td>
<td>Even: -30dBc typical, -20dBc max.</td>
</tr>
<tr>
<td>Spurious</td>
<td>&lt;-70dBc maximum</td>
</tr>
<tr>
<td>Output noise (blanked)</td>
<td>&lt;10dB above thermal (100kHz bandwidth)</td>
</tr>
<tr>
<td>Phase change/power</td>
<td>&lt;1° from -40dB to full power</td>
</tr>
<tr>
<td>Phase stability</td>
<td>&lt;1° across 10ms pulse</td>
</tr>
<tr>
<td>Output sample</td>
<td>-60dB into 50 Ω (forward voltage sample)</td>
</tr>
<tr>
<td>Input/output impedance</td>
<td>50 Ω nominal</td>
</tr>
<tr>
<td>Load VSWR</td>
<td>Tolerates at least 3:1 @ full rated power without shut down</td>
</tr>
<tr>
<td>Gain control range</td>
<td>10dB minimum for 0-5V control voltage</td>
</tr>
<tr>
<td></td>
<td>Control via parallel interface</td>
</tr>
<tr>
<td>RF Input</td>
<td>0dBm nominal, 10dBm for no damage</td>
</tr>
<tr>
<td>GATE (blanking)</td>
<td>Logic low = Blank, logic high = unblank. CMOS and TTL compatible</td>
</tr>
</tbody>
</table>

### Electrical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains supply voltage</td>
<td>110-240V, 50-60Hz, single phase</td>
</tr>
<tr>
<td>Rated power</td>
<td>1kVA maximum per inlet</td>
</tr>
<tr>
<td>Mains inlet</td>
<td>2 x IEC Inlet</td>
</tr>
</tbody>
</table>
# RF Amplifier Data Sheet

## Mechanical Specifications

<table>
<thead>
<tr>
<th>Connectors</th>
<th>RF IN:</th>
<th>BNC female</th>
</tr>
</thead>
<tbody>
<tr>
<td>GATE:</td>
<td>BNC female</td>
<td></td>
</tr>
<tr>
<td>RF SAMPLE:</td>
<td>BNC female</td>
<td></td>
</tr>
<tr>
<td>RF OUT:</td>
<td>N type female</td>
<td></td>
</tr>
<tr>
<td>INTERFACE:</td>
<td>DB25 female</td>
<td></td>
</tr>
</tbody>
</table>

Other connectors types available on request

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Chassis size: 450mmW (17.7”W) x 500mmD (19.7”D) x 216mmH (8.5”H)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total size: 482mmW (19.0”W) x 563mm (22.2”D) x 220mm (8.7”H)</td>
</tr>
<tr>
<td></td>
<td>Rack compatibility: 19” 5RU</td>
</tr>
</tbody>
</table>

| Weight               | approx. 24kg (53lbs)                                            |

| Enclosure classification | IP20 |

---

![Diagram of the RF Amplifier](image_url)

---

[www.tomcorf.com](http://www.tomcorf.com)
## Protection

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Load VSWR</td>
<td>Tolerates up to VSWR 3:1 at full rated power without shutdown. Self-resetting shutdown protection activates if VSWR limits are exceeded.</td>
</tr>
<tr>
<td>Over temperature</td>
<td>Self-resetting shutdown protection activates if thermal limits are exceeded.</td>
</tr>
<tr>
<td>Duty cycle</td>
<td>Duty cycle limit is determined from the GATE signal duty cycle. Self-resetting shutdown protection activates if duty cycle limit is exceeded. If output power is less than approx. 10% of maximum rated power, duty cycle protection is disabled and auto-CW operation is available.</td>
</tr>
<tr>
<td>Pulse width</td>
<td>Pulse width limit is determined from the GATE signal pulse width. Self-resetting shutdown protection activates if pulse width limit is exceeded.</td>
</tr>
</tbody>
</table>

## Monitoring and Control

<table>
<thead>
<tr>
<th>Front panel switches</th>
<th>Power (turns on DC power)</th>
<th>Enable (enables RF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front panel LEDs</td>
<td>• DC POWER</td>
<td>• DC ERROR</td>
</tr>
<tr>
<td></td>
<td>• ENABLE</td>
<td>• MISMATCH</td>
</tr>
<tr>
<td></td>
<td>• RF POWER</td>
<td>• OVER TEMP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• OVER DUTY</td>
</tr>
<tr>
<td>Parallel interface</td>
<td>25-pin D-connector (pinout available at [<a href="http://www.tomcorf.com/pdf/interface.pdf">www.tomcorf.com/pdf/interface.pdf</a>]*</td>
<td></td>
</tr>
</tbody>
</table>

## Environmental

<table>
<thead>
<tr>
<th>General</th>
<th>Intended for use only in controlled, indoor environment. Non-consumer product for industrial and scientific use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling</td>
<td>Forced air, front to rear</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>+5°C to +40°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20°C to +60°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>80% for temperature up to 31°C, decreasing linearly to 50% relative humidity at 40°C</td>
</tr>
<tr>
<td>Operating altitude</td>
<td>Up to 2000m</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2</td>
</tr>
<tr>
<td>Transient voltage compatibility</td>
<td>Category II, in line with IEC 60364-4-44:2007</td>
</tr>
<tr>
<td>Electromagnetic compatibility</td>
<td>In line with IEC61326-1:2012 ISM equipment, Group 1, Class A For use only in shielded areas. ENCS011 (CISPR 11) limits exceeded by up to 60dB</td>
</tr>
<tr>
<td>Safety</td>
<td>In line with IEC61010-1:2010</td>
</tr>
<tr>
<td>Electromagnetic field strength</td>
<td>In line with ICNIRP Guidelines: 1998, occupational limits</td>
</tr>
</tbody>
</table>

*Some functions may be unavailable on select amplifier models*
<table>
<thead>
<tr>
<th>Document/Issue number</th>
<th>Originator</th>
<th>Date</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS006671A</td>
<td>JR</td>
<td>18/07/18</td>
<td>Original</td>
</tr>
<tr>
<td>DS006671B</td>
<td>JR</td>
<td>19/12/18</td>
<td>Pg1. Updated mains power</td>
</tr>
</tbody>
</table>