BII-5120 Series Power Amplifier
Driving Sonar and HIFU Transducer / Projector

DESCRIPTION
BII-5120 series power amplifiers can work as class AB linear amplifiers or Class D switching amplifiers. The SINE, Pulse and Square waveforms are acceptable to BII-5120 series. To achieve higher efficiency and higher power delivery to load, pulse or square waveform is recommended. Forced-air cooling by a fan is a must to cool down the amplifier in service of full power and continuous waveform. Besides the loads of 50Ω and 70Ω transducers, BII-5126 can be customized to drive other loads such as 60Ω transducers, 100Ω transducers etc.

APPLICATIONS
Source Level Capability: 191 + Di (dB re µPa) in Water
Underwater Wireless Communication, Modem FSK, PSK and Spread Spectrum System
Image Sonar, HIFU Transducer
Phantom Echo Generation, Generation of Clicks, Whistles and Pulse Trains
Underwater Sound Velocimeter/Sound Velocity Probe
Bioacoustics and Biological Research (Whales/Dolphins)
Short Range Navigation, Inspection and Survey
Object Avoidance/Tracking, Distance Gage
Transmitting Array Shading
Driving Ultrasonic Air Transducers

ABSOLUTE MAXIMUM RATINGS

<table>
<thead>
<tr>
<th>DC Supply Voltage:</th>
<th>+36 VDC for Linear Mode; +33 VDC for Switch Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Peak Current:</td>
<td>11 A at Pulse Width ≤1ms</td>
</tr>
<tr>
<td>Shut-down Control Voltage:</td>
<td>-0.2 to +12 VDC</td>
</tr>
<tr>
<td>Input Voltage:</td>
<td>20Vpp</td>
</tr>
</tbody>
</table>

SPECIFICATIONS

<table>
<thead>
<tr>
<th>BII-5120 Series</th>
<th>BII-5121</th>
<th>BII-5126/50</th>
<th>BII-5126/70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size:</td>
<td>Round PCB, ØDxH=101.6x48 mm</td>
<td>Rectangular PCB, LxWxH=110x72x48mm</td>
<td>Rectangular PCB, LxWxH=110x72x48mm</td>
</tr>
<tr>
<td>Gain:</td>
<td>29.5dB or 30</td>
<td>22dB or 12.5</td>
<td>22dB or 12.5</td>
</tr>
<tr>
<td>Power Bandwidth (-3dB):</td>
<td>200Hz to 2MHz</td>
<td>≥ fs/3</td>
<td>≥ fs/3</td>
</tr>
<tr>
<td>Operating Frequency fs:</td>
<td>N/A</td>
<td>50 kHz to 3MHz</td>
<td>50 kHz to 3MHz</td>
</tr>
<tr>
<td>Load:</td>
<td>Minimum Load: 0.70Ω+12VDC Power Supply; 1.60Ω+24 VDC Power Supply; 2.80Ω+35 VDC Power Supply</td>
<td>50Ω Transducer at fs</td>
<td>70Ω Transducer at fs</td>
</tr>
<tr>
<td>Max. Output Current:</td>
<td>8.0 A</td>
<td>3.2 A</td>
<td>2.7A</td>
</tr>
<tr>
<td>Maximum Output Level: (Vp: Peak Voltage)</td>
<td>Linear Mode: Supply Voltage Vc -4Vp.</td>
<td>160Vp Maximum</td>
<td>189.3Vp Maximum</td>
</tr>
<tr>
<td>Cable:</td>
<td>0.15m or 6” wires</td>
<td>1. Default: 0.15m or 6” wires</td>
<td>0.15m or 6” wires</td>
</tr>
<tr>
<td>Cable Connector:</td>
<td>Wire Leads</td>
<td>2. Customized: 50Ω female BNC</td>
<td></td>
</tr>
<tr>
<td>Weight in Air:</td>
<td>79 grams</td>
<td>&gt; 100 grams</td>
<td>&gt; 100 grams</td>
</tr>
</tbody>
</table>

Miscellaneous:

Signal Type:
1. Burst SINE, Pulse and Square waveform.
2. Chirp/FM, Arbitrary Waveform
3. Spread Spectrum FSK and PSK Signals
4. Continuous Waveform
5. Marine Animal Sound, Clicks, Whistles and Pulse Trains

Maximum Input Level: Linear Mode (SINE Waveform): Maximum Output Level/Gain or 2Vpp, whichever is less.
Switch Mode (Pulse and Square Waveform): TTL/CMOS Level or 2Vpp to 5Vpp.

Input Impedance: 1. Default: 20kΩ || 6pF; 2. Customized for high frequency use: 50Ω || 6pF

Linear RMS Power Capability: 45W@±12VDC Power Supply; 102W@±24VDC Power Supply; 176W@±35VDC Power Supply.
Switching RMS Power Capability: 72W@±12VDC Power Supply; 168W@±24VDC Power Supply; 256W@±32VDC Power Supply.

Shut-down Control Voltage: TTL/CMOS Compatible: Shut-down: Logic Low or 0 to +0.4 VDC; Active: Logic High or +0.8 to +5VDC

Shut-down Control: On-board ON/OFF Switch: Manually or Digitally

Supply Voltage: Linear Mode: +6 to +35VDC; Switching Mode: +6 to +32VDC

Quiescent Current: Active: 65mA; Stand-by (Shut-down): 6mA

Suggested DC Supply: Marine Battery, Automobile Battery, Fixed DC Linear Power Supply, Not Included.
DO NOT use variable power supply whose maximum supply voltage is higher than the above rated voltage.
DO NOT use switching mode DC power supply.

Mounting: 4xØD4.87mm through-holes

Operating Temperature: -40°C to 85°C
Storage Temperature: -50°C to 85°C
BII-5121 ST-BY SWITCH

OFF Position: BII-5121 is in operating mode.
DIO Position: TTL/CMOS Logic High -> BII-5121 is in operating mode.
TTL/CMOS Logic Low -> BII-5121 is in Stand-by mode.

BII-5121 TERMINALS and WIRINGS

Input and ST-BY Terminal
Pin 1: ST-BY, White, 6" Wire
Pin 2: COM, Black, 6" Wire
Pin 3: IN+, Blue, 6" Wire
Pin 4: IN-, Yellow, 6" Wire
Pin 5: COM, Black, 6" Wire

Output and Power Supply Terminal
Pin 1: +Vs, Red, 6" Wire
Pin 2: +Vs, Red, 6" Wire
Pin 3: COM, Black, 6" Wire
Pin 4: OUT+, Blue, 6" Wire
Pin 5: OUT-, Yellow, 6" Wire

BII-5121 SHIPMENT:

1. Assembled BII-5121 board Qty.: 1
2. Input and ST-BY Plug with 6" wires Qty.: 1
3. Output and Power Supply plug with 6" wires Qty.: 1

Note: 50Ω Female BNC mounted on PCB is available upon request (customization) for BII-5126/50.

BII-5126/50 and BII-5126/70 TERMINALS and WIRINGS

Input and ST-by Terminal
Pin 1: ST-BY, White, 6" Wire
Pin 2: COM, Black, 6" Wire
Pin 3: IN+, Blue, 6" Wire
Pin 4: IN-, Yellow, 6" Wire
Pin 5: COM, Black, 6" Wire

Output and Power Supply Terminal
Pin 1: +Vs, Red, 6" Wire
Pin 2: +Vs, Red, 6" Wire
Pin 3: COM, Black, 6" Wire
Pin 4: OUT, Blue, 6" Wire
Pin 5: OUT COM, Yellow, 6" Wire

BII-5121 Physical Size:

4 - Ø4.9mm (0.192 inch) mounting holes
Equally Spaced on 86.4mm (3.4inch) P.C.D.
P.C.D.: Pitch Circle Diameter
Ø101.6mm (4 inch)
BII-5126/50 and BII-5126/70 Physical Size: LxWxH=110x72x48mm

BII-5121 SUGGESTED WIRING:

Signal Source
TTL/CMOS Signal
DC Power Supply
Load

IN +
IN -
ST-BY
COM
+Vs
+Vs
COM
COM
OUT +
OUT - , DO NOT Connect Out - to COM.

BII-5126/50 and BII-5126/70 SUGGESTED WIRING:

Signal Source
TTL/CMOS Signal
DC Power Supply
Load

IN +
IN -
ST-BY
COM
+Vs
+Vs
COM
COM
OUT
OUT COM.

SHIPMENT:
1. Assembled board Qty.: 1
2. Input and ST-BY Plug with 6” wires Qty.: 1
3. Output and Power Supply plug with 6” wires Qty.: 1