TR Series

50V – 800V, 50mW - 300mW
TEMPERATURE COMPENSATION, PCB MOUNTABLE
HIGH VOLTAGE POWER SUPPLIES FOR APD

■ FEATURES
- Built-in temperature compensation circuit
- +5 volt operation
- Low ripple noise
- Remote programmable
- Continuous output short circuit protected

■ SUMMARY
TR Series are temperature compensated DC-DC converters ideally suited for biasing APD and photodetectors.
The bias voltage is compensated with signal from sensing diode which should be thermo-coupled directly to the APD to keep the APD gain constant.

■ LINEUP

<table>
<thead>
<tr>
<th>Output voltage (Vdc)</th>
<th>Model</th>
<th>Rated load</th>
<th>Ripple</th>
<th>Input current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive polar</td>
<td>Negative polar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 50</td>
<td>TR-0.05P</td>
<td>TR-0.05N</td>
<td>50kΩ</td>
<td>50mA</td>
</tr>
<tr>
<td>0 to 100</td>
<td>TR-0.1P</td>
<td>TR-0.1N</td>
<td>100kΩ</td>
<td>65mA</td>
</tr>
<tr>
<td>0 to 200</td>
<td>TR-0.2P</td>
<td>TR-0.2N</td>
<td>200kΩ</td>
<td>90mA</td>
</tr>
<tr>
<td>0 to 300</td>
<td>TR-0.3P</td>
<td>TR-0.3N</td>
<td>300kΩ</td>
<td>120mA</td>
</tr>
<tr>
<td>0 to 500</td>
<td>TR-0.5P</td>
<td>TR-0.5N</td>
<td>1MΩ</td>
<td>150mA</td>
</tr>
<tr>
<td>0 to 700</td>
<td>TR-0.7P</td>
<td>TR-0.7N</td>
<td>3.5MΩ</td>
<td></td>
</tr>
<tr>
<td>0 to 800</td>
<td>TR-0.8P</td>
<td>TR-0.8N</td>
<td>4MΩ</td>
<td></td>
</tr>
</tbody>
</table>

Less than 10mVp-p
Less than 20mVp-p

■ SPECIFICATIONS

Input Voltage +5Vdc ±5%
Output Voltage By an external potentiometer of 5kΩ or by an external voltage control (Vcon-in) 0 to 3V. (Input imped. 10kΩ)
Regulation Line : 0.01% of max voltage for Vcc ±5%
Load : 0.01% of max voltage for load change of 100%
Temp. coefficient 0.01%/°C
Temp. compensation By an external potentiometer of 1kΩ
0 to +0.5V/°C for 50V, 100V output model
0 to +1V/°C for 200V, 300V output model
0 to +2.5V/°C for 500V output model
0 to +6V/°C for 700V, 800V output model
Protection Continuous output short circuit.
Temp. range -10°C to 60°C
Weight 60g

■ DIMENSIONS inch (mm)

<table>
<thead>
<tr>
<th>Top View</th>
<th>Bottom View</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.04(1)Ø</td>
<td>0.04(1)Ø</td>
</tr>
<tr>
<td>0.20(5)min</td>
<td>0.20(5)min</td>
</tr>
<tr>
<td>2(50.8)</td>
<td>1.60(40.6)</td>
</tr>
<tr>
<td>1 (25.4)</td>
<td></td>
</tr>
<tr>
<td>1 (25.4)</td>
<td></td>
</tr>
<tr>
<td>1.40(35.5)</td>
<td></td>
</tr>
</tbody>
</table>

Subject to change without notice, errors expected / Änderungen und Irrtum vorbehalten

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## CONNECTION DIAGRAM

![Connection Diagram](image)

*Temp. Sense diode example:
- Lead type: Panasonic MA2B161, Toshiba 1S1588
- SMD type: Panasonic MA3S133, Toshiba 1SS360

*General small signal si-diode with for example
  – $V_r=50V$, $I_r=50mA$ ($V_r=6x0.1V$ at $I_r=1mA$) can be also used.

*Pins ②, ⑤, ⑬, ⑯ are internally connected.

*Output voltage and temperature compensation ability will fluctuate depending on the thermal sensing diode.
  - Individual adjustment is recommended.

*Leave pin ⑭ and ⑮ open when TC circuit is not used. (When possible, extra lead wires should be disconnected.
  - Lead wires should be kept away from pulse noise. Using lead wires less than 30cm long is recommended.)

*Rp of about $100k\Omega$ is recommended for protection of APD.

*C of about 1nF is recommended for application with more than several MHz.