For APD bias application

Ultra Compact High Voltage Power Supplies

TR series

Max. output voltage: 50 to 800 Vdc

Overwhelming small size to minimize mounting area!
Temperature compensation circuit supports stabilization of APD multiplication factor
Compatible with external output voltage control

www.matsusada.com
**TR series**

*Ultra Compact High Voltage Power Supplies for APD Bias Application*

Temperature compensation is available.

---

**FEATURES**

- PCB mountable type power supply for applying bias voltage to APD and PD
- Built-in temperature compensation circuit
- I/O stabilization type
- High stability, Low ripple noise
- +5Vdc operation

---

**SUMMARY**

TR series is a compact high voltage power supply for exclusive use of PD or APD. By applying temperature compensation to the bias voltage to be applied, it contributes to the stabilization of the multiplication factor of APD, which is particularly susceptible to temperature. Output voltage can be controlled by external voltage or external potentiometer. The output voltage is stabilized and low ripple.

---

**LINEUP**

<table>
<thead>
<tr>
<th>Max. Output voltage (Vdc)</th>
<th>Model</th>
<th>Rated load</th>
<th>Ripple</th>
<th>Input voltage</th>
<th>Input current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Positive polar output</td>
<td>Negative polar output</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>TR-0.05P</td>
<td>TR-0.05N</td>
<td>50 kΩ</td>
<td>Less than 10 mVp-p</td>
<td>5 Vdc</td>
</tr>
<tr>
<td>100</td>
<td>TR-0.1P</td>
<td>TR-0.1N</td>
<td>100 kΩ</td>
<td></td>
<td>65 mA</td>
</tr>
<tr>
<td>200</td>
<td>TR-0.2P</td>
<td>TR-0.2N</td>
<td>200 kΩ</td>
<td></td>
<td>90 mA</td>
</tr>
<tr>
<td>300</td>
<td>TR-0.3P</td>
<td>TR-0.3N</td>
<td>300 kΩ</td>
<td></td>
<td>120 mA</td>
</tr>
<tr>
<td>500</td>
<td>TR-0.5P</td>
<td>TR-0.5N</td>
<td>1 MΩ</td>
<td>Less than 20 mVp-p</td>
<td></td>
</tr>
<tr>
<td>700</td>
<td>TR-0.7P</td>
<td>TR-0.7N</td>
<td>3.5 MΩ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>TR-0.8P</td>
<td>TR-0.8N</td>
<td>4 MΩ</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**SPECIFICATIONS**

**Output Voltage Control**
- By an external potentiometer of 5 kΩ or by an external voltage control (Vcon-in) 0 to 3 Vdc. (Input imp. 10 kΩ)
- Line : 0.01 % of max voltage for Vcc ±5 %
- Load : 0.01 % of max voltage for load change of 100 %

**Regulation**
- Stability : 0.01 % / °H
- Temp. coefficient : 0.01 % / °C typ.
  (When there is no temperature compensation.)

**Temp. compensation**
- By an external potentiometer of 1 kΩ
- 0 to +0.5 V / °C for 50 V, 100 V output model
- 0 to +1 V / °C for 200 V, 300 V output model
- 0 to +2.5 V / °C for 500 V output model
- 0 to +6 V / °C for 700 V, 800 V output model

**Protection**
- Continuous output short circuit.

**Temp. range**
- Operating : -10 °C to 60 °C
- Storage : -20 °C to +60 °C

**Weight**
- Approx. 60 g
**DIMENSIONS** inch(mm) CaseNo.C-53M

**BOTTOM VIEW**

**CONNECTION DIAGRAM**

* Temp. Sense diode : A small signal silicon diode can be used. The representative one is 1N4148 (Fairchild Co., Ltd.). However, \( V_i = 50 \) to 100 V, \( I_r = 0.1 \) A (\( V_f = 0.6 \) V ± 0.1 V / 1 mA) can be used as compatible products.

* Pins 2, 6, 15, 16 are internally connected.

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

* Leave pin 6 and 16 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 1.18-inch (30 cm) long is recommended.) Also short pin 6 and 16.

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

* C of about 1 nF is recommended for application with more than several MHz.
Customer Inquiry Sheet (TR series)

Please copy this page and above fax number after filling out form below.

I would like

- [ ] A quotation
- [ ] An explanation of product
- [ ] A demonstration
- [ ] To purchase
- [ ] Other ( )

Give us your requirement / comment

Please fill in below.

Address:
Company:
Dept.: Title:
Name:
Tel: Fax:
E-mail:

Manufacturer warranty

We warrant the specification, unless otherwise specified, at max. rated output after warm up, and scope of application is between 10 % and 100 % of max. rated output. We warrant that products contained in this catalog (hereinafter, the "Products") are free from defects in material and workmanship under normal use for a period of one (1) year from the date of shipment thereof. However, the warranty period for X-ray detectors and X-ray source shall be either one (1) year from the date of shipment or 1,000 hours, whichever shorter. The above warranty shall not apply to any Product which, at our sole judgment, has been: i) Repaired or altered by persons unauthorized by us; or ii) Connected, installed, adjusted or used otherwise than in accordance with the instructions furnished by us (including being used in an inappropriate installation environment, such as in corrosive gas, high temperature and humidity). We are not liable for any loss, damage or failure of the Products after the shipment thereof caused by external factors such as disasters. We will not inspect, adjust or repair any of our power supply products in the field or at any customer site. If you suspect that there has been a power supply failure in the field, please inspect your whole unit by yourself in an effort to determine that the problem is, in fact, arising out of our power supply products. If it is found that the problem is arising out of such power supply product after inspection, please contact your local sales office for additional troubleshooting. A "Return Merchandise Authorization" is required in case the power supply must be sent back to the factory in Japan for inspection and repair. We, at our sole discretion repair or replace such defective products at no cost to the purchaser. We assume no liability to the purchaser or any third party for special, incidental, consequential, or other damages resulting from a breach of the foregoing warranty. This warranty excludes any and all other warranties not set forth herein, express or implied, including without limitation the implied warranties of merchantability or fitness for a particular purpose. The Products are not designed and produced for such applications as requiring extremely high reliability and safety, or involving human lives (such as nuclear power, aerospace, social infrastructure facility, medical equipment, etc.). The use under such environment is not covered by this warranty and may require additional design and manufacturing processes. No modification or supplement of this warranty shall be binding unless in writing and signed by a duly authorized officer of Matsusada. Matsusada reserves the right to make any changes in the contents of catalogs or specifications at any time without advance notice. Due to compelling reason such as unavailability of components used, products might be un available or unable to repair. The products specified in catalogs or specifications are designed for use by the person who has enough expertise or under the control of such person, and not for general consumers. Schematics of products shall not be submitted to users. Test result or test data for the products shall be available upon request with charge.

Make sure you read the specification in the latest catalog before you order. Contact nearby sales office for the latest catalog.

http://www.matsusada.com/site/warranty.html

Please see the link below for the complete warranty terms