2520 Pulsed Laser Diode Test System

**LASER DIODE PULSE OR DC CURRENT SOURCE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Drive Current</th>
<th>Off Current*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SOURCE RANGE</strong></td>
<td><strong>PROGRAMMING RESOLUTION</strong></td>
</tr>
<tr>
<td>0–500 mA</td>
<td>10 µA</td>
</tr>
<tr>
<td>0–1.0 A DC</td>
<td></td>
</tr>
<tr>
<td>0–5.0 A Pulse</td>
<td>100 µA</td>
</tr>
<tr>
<td><strong>RANGE</strong></td>
<td><strong>PROGRAMMING RESOLUTION</strong></td>
</tr>
<tr>
<td>0–15 mA</td>
<td>1 µA</td>
</tr>
<tr>
<td>0–150 mA</td>
<td>10 µA</td>
</tr>
</tbody>
</table>

**TEMPERATURE COEFFICIENT (0°-18°C & 28°-50°C):** ±(0.15 x accuracy specification)/°C.

**PULSE ON TIME:** 0.1 ms to 5ms, 100ns programming resolution.

**PULSE OFF TIME:** 0.1 µs to 500ms, 10µs programming resolution.

**PULSE DUTY CYCLE:** 0 to 99.9 % for ≤ 1.0 A;

**VOLTAGE COMPLIANCE:** 3V to 10V, 10mV programming resolution.

**POLARITY:** 1 quadrant source, polarity reversal available through internal relay inversion.

**OUTPUT OFF:** <200mA short across laser diode; measured at Remote Test Head connector.

**LASER DIODE VOLTAGE MEASURE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>RANGE</th>
<th>MINIMUM RESOLUTION</th>
<th>ACURACY</th>
<th>RMS NOISE (typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.00 V</td>
<td>0.33 mV</td>
<td>± ( % rdg. + volts)</td>
<td>60 µV</td>
</tr>
<tr>
<td>10.00 V</td>
<td>0.66 mV</td>
<td></td>
<td>120 µV</td>
</tr>
</tbody>
</table>

**TEMPERATURE COEFFICIENT (0°-18°C & 28°-50°C):** ±(0.15 x accuracy specification)/°C.

**MAX. LEAD RESOLUTION:** 100Ω for rated accuracy.

**INPUT IMPEDANCE:** 2MΩ differential, 1MΩ from each input to common. Input bias current <7.5µA max.

**PHOTODIODE VOLTAGE BIAS SOURCE SPECIFICATIONS**

(each channel)

**RANGE:** 0 to ±20VDC.

**PROGRAMMING:** 10mV.

**ACURACY:** ±(1% + 50mV).

**CURRENT:** 160mA max. with V-Bias shorted to I-Measure.

**RMS NOISE** (1kHz to 5MHz): 1mV typical.

**PHOTODIODE CURRENT MEASURE SPECIFICATIONS**

(each channel)

<table>
<thead>
<tr>
<th>RANGE</th>
<th>MINIMUM RESOLUTION</th>
<th>DC INPUT IMPEDANCE</th>
<th>ACURACY</th>
<th>RMS NOISE (typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.00 mA</td>
<td>0.7 µA</td>
<td>&lt; 10 Ω</td>
<td>± ( % rdg. + current)</td>
<td>90 nA</td>
</tr>
<tr>
<td>20.00 mA</td>
<td>1.4 µA</td>
<td>&lt; 6 Ω</td>
<td></td>
<td>180 nA</td>
</tr>
<tr>
<td>50.00 mA</td>
<td>3.4 µA</td>
<td>&lt; 3 Ω</td>
<td></td>
<td>420 nA</td>
</tr>
<tr>
<td>100.00 mA</td>
<td>6.8 µA</td>
<td>&lt; 2.5 Ω</td>
<td></td>
<td>840 nA</td>
</tr>
</tbody>
</table>

**TEMPERATURE COEFFICIENT (0°-18°C & 28°-50°C):** ±(0.15 x accuracy specification)/°C.

**INPUT PROTECTION:** The input is protected against shorting to the associated channel’s internal bias supply. The input is protected for shorts to external supplies up to 20V for up to 1 second with no damage, although calibration may be affected.

**SYSTEM SPEEDS**

Reading Rates (ms)15,16

<table>
<thead>
<tr>
<th>Number of Source Points17</th>
<th>To Memory</th>
<th>To GPIB</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5.3</td>
<td>6.8</td>
</tr>
<tr>
<td>10 [1]</td>
<td>9.5</td>
<td>18</td>
</tr>
<tr>
<td>100 [1]</td>
<td>48</td>
<td>120</td>
</tr>
<tr>
<td>1000 [1]</td>
<td>431</td>
<td>1170</td>
</tr>
</tbody>
</table>

**SPECIFICATIONS**

**GENERAL SPECIFICATIONS**

**DC FLOATING VOLTAGE:** User may float common ground up to ±100VDC from chassis ground.

**COMMON MODE ISOLATION:** >1000V.

**OVERRANGE:** 105% of range on all measurements and voltage compliance.

**SOURCE OUTPUT MODES:**

- Fixed DC Level
- Fixed Pulse Level
- DC Sweep (linear, log and list)
- Pulse Sweep (linear, log and list)

Continuous Pulse (continuous – low jitter)

**PROGRAMMABILITY:**

- IEEE-488 (SCPI-1995.0), RS-232, 5 user-definable power-up states plus factory default and *RST.

**DIGITAL INTERFACE:**

- Safety Interlock: External mechanical contact connector and removable key switch.
- Aux. Supply: +5V @ 300mA supply.
- Digital I/O: 2 trigger input, 4 TTL/Relay Drive outputs (33V @ 500mA max., diode clamped).
- Pulse Sweep: 6 programmable trigger input/outputs.
- Pulse Trigger Out BNC: +5V, 50µΩ output impedance, output trigger corresponding to current source pulse; pulse to trigger delay <100ns. See Figure 3.

**SAFETY:**


**VIBRATION:**

- MIL-PRF-28808 Class 3, Random.

**WARM-UP:**

1 hour to rated accuracy.

**DIMENSIONS, WEIGHT:**

- Main Chassis, bench configuration (with handle & feet):
  - Storage: 95mm high × 238mm wide × 416mm deep (4 1/8 in. × 9 3/8 in. × 16 3/8 in.). 2.67kg (5.90 lbs).
  - Remote Test Head: 95mm high × 178mm deep (3 1/2 in. × 7 in. × 8 1/2 in.). 1.23kg (2.70 lbs).

-WARRANTY:

- 1 year.


**SAFETY:**


- VIBRATION: MIL-PRF-28808 Class 3, Random.

- WARM-UP: 1 hour to rated accuracy.

**DIMENSIONS, WEIGHT:**

- Main Chassis, bench configuration (with handle & feet):
  - Storage: 95mm high × 238mm wide × 416mm deep (4 1/8 in. × 9 3/8 in. × 16 3/8 in.). 2.67kg (5.90 lbs).
  - Remote Test Head: 95mm high × 178mm deep (3 1/2 in. × 7 in. × 8 1/2 in.). 1.23kg (2.70 lbs).

- WARRANTY:

- 1 year.
2520 Pulsed Laser Diode Test System

Notes
1. 1 year, 23°C ±5°C.
2. If \( \sqrt{\text{Duty Cycle} \cdot 1} \) exceeds 0.2, accuracy specifications must be derated with an additional error term as follows:
   - 500mA Range: ±0.1% rdg. \( \cdot \sqrt{\text{Duty Cycle} \cdot 1} \)
   - 5A Range: ±0.3% rdg. \( \cdot \sqrt{\text{Duty Cycle} \cdot 1} \)
   where: I = current setting
   D = duty cycle

   This derating must also be applied for a period equal to the time that \( \sqrt{\text{Duty Cycle}} \) was ≥ 0.2.
3. Not including overshoot and setting time.
4. Pulse mode only.
5. Output: 500mA DC on 500mA range and 1A DC on 5A range.
6. Refer to 2520 Service Manual for test setup of current accuracy.
7. Figures 1 and 2 are typical pulse outputs into resistive loads.
8. Typical
10. Per ANSI/IEEE Std 181-1977 10% to 90%.
11. DC accuracy ±700mV @ output terminal. 0.2Ω typical output impedance.
12. At DC, 10μs measurement pulse width, Filter off.
13. Standard deviation of 10,000 readings with 10μs pulse width, filter off, with I source set to 0 amps DC.
14. The A/D converter has 14 bit resolution. The useful resolution is improved by reading averaging. The useful resolution is:
   \[ \text{Useful Resolution} = \frac{1}{2^{14}} \times \left( \frac{\text{Pulse Width (ms) + 400ms}}{100ms} \right) \times \text{Averaging Filter Setting} \]
   Excluding total programmed (Pulse ON time + Pulse OFF time).
15. Front panel off, calc off, filter off, duty cycle < 10%, binary communications.
16. Returning 1 voltage and 2 current measurements for each source point.
17. Sweep mode.
18. Valid for both continuous pulse and sweep modes.
19. Shown is the Power Distribution % based on current settings.
20. Timing Cycle (\( t_{\text{ON}}/(t_{\text{OFF}}+t_{\text{ON}}) \)) 4% max.

Specifications are subject to change without notice.