

Model 2520 Pulsed Laser Diode Test System

LASER DIODE PULSE OR DC CURRENT SOURCE SPECIFICATIONS

SOURCE RANGE	DRIVE CURRENT				OFF CURRENT ¹			
	PROGRAMMING RESOLUTION	APPROX. ELECTRICAL RESOLUTION	ACURACY ^{1,6} ± (% rdg. + mA) ^{2,3}	RMS NOISE (typical) (1kHz-20MHz)	RANGE	PROGRAMMING RESOLUTION	APPROX. ELECTRICAL RESOLUTION	ACURACY ¹ ± (% rdg. + mA)
0-500 mA	10 µA	8 µA	0.2 + 0.45	70 µA	0-15 mA	1 µA	7 nA typ.	0.2 + 0.45
0 – 1.0 A DC	100 µA	80 µA	0.2 + 4.5	800 µA	0-150 mA	10 µA	70 nA typ.	0.2 + 4.5
0 – 5.0 A Pulse								

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

PULSE ON TIME¹⁹: 500ns to 5ms, 100ns programming resolution.

PULSE OFF TIME¹⁹: 20µs to 500ms, 10µs programming resolution.

PULSE DUTY CYCLE^{19, 20, 21}: 0 to 99.6% for ≤ 1.0A; 0 to 4% for > 1.0A.

VOLTAGE COMPLIANCE: 3V to 10V, 10mV programming resolution⁵.

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

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

SETTING AND RANGE	LOAD ⁷	PULSE MODE	PULSE OVERSHOOT MAX. ^{6,8,9}	RISE/FALL TIME ^{6,8,9,10}	
				TYPICAL	MAX.
500mA	10Ω ¼ Watt	Fast	1.0%	55 ns	80 ns
500mA	10Ω ¼ Watt	Slow	0.2%	1.1 µs	1.4 µs
5.00A	1.5Ω 1 Watt	Fast	1.75%	100 ns	130 ns
5.00A	1.5Ω 1 Watt	Slow	0.2%	1.2 µs	1.5 µs

LASER DIODE VOLTAGE MEASURE SPECIFICATIONS

RANGE	MINIMUM RESOLUTION	ACURACY ± (% rdg. + volts) ^{1,12}	RMS NOISE (typical) ¹³
5.00 V	0.33 mV	0.3% + 6.5 mV	90 µV
10.00 V	0.66 mV	0.3% + 8 mV	160 µV

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 RESOLUTION: 10mV.

ACCURACY: ±(1% + 50mV).

CURRENT: 170mA max. with V-Bias shorted to I-Measure.

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

PHOTODIODE CURRENT MEASURE SPECIFICATIONS (each channel)

RANGE	MINIMUM RESOLUTION ⁴	DC INPUT IMPEDANCE	ACURACY ± (% rdg. + current) ^{1,12}	RMS NOISE (typical) ³
10.00 mA	0.7 µA	< 10 Ω	0.3% + 20 µA	90 nA
20.00 mA	1.4 µA	< 6 Ω	0.3% + 65 µA	180 nA
50.00 mA	3.4 µA	< 3 Ω	0.3% + 90 µA	420 nA
100.00 mA	6.8 µA	< 2.5 Ω	0.3% + 175 µA	840 nA

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}

Number of Source Points ¹⁷	To Memory	To GPIB
1	5.3	6.8
10 ^[18]	9.5	18
100 ^[18]	48	120
1000 ^[18]	431	1170

GENERAL SPECIFICATIONS

DCFLOATING VOLTAGE: User may float common ground up to ±10VDC from chassis ground.

COMMON MODE ISOLATION: >10°Ω.

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).

Trink: 6 programmable trigger input/outputs.

Pulse Trigger Out BNC: +5V, 50Ω output impedance, output trigger corresponding to current source pulse; pulse to trigger delay <100ns. See Figure 3.

MAINS INPUT: 100V to 240V rms, 50-60Hz, 140VA.

WARRANTY: 1 year.

EMC: Conforms to European Union Directive 89/336/EEC (EN61326-1).

SAFETY: Conforms to European Union Directive 73/23/EEC (EN61010-1) CAT 1.

VIBRATION: MIL-PRF-28800F Class 3, Random.

WARM-UP: 1 hour to rated accuracy.

DIMENSIONS, WEIGHT:

Main Chassis, bench configuration (with handle & feet): 105mm 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 (with interlock key installed) × 216mm wide (3 1/2 in. × 7 in. × 8 1/2 in.). 1.23kg (2.70 lbs).

ENVIRONMENT:

Operating: 0°-50°C, 70% R.H. up to 35°C. Derate 3% R.H./°C, 35°-50°C.

Storage: -25° to 65°C.

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Notes

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

This derating must also be applied for a period equal to the time that $\sqrt{D} \cdot I$ 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
- ⁹ Per ANSI/IEEE Std 181-1977.
- ¹⁰ Per ANSI/IEEE Std 181-1977 10% to 90%.
- ¹¹ DC accuracy $\pm 700\text{mV}$ @ output terminal. 0.2Ω typical output impedance.
- ¹² At DC, $10\mu\text{s}$ measurement pulse width, Filter off.
- ¹³ Standard deviation of 10,000 readings with $10\mu\text{s}$ 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:

$$\text{Useful Resolution} = \frac{\text{Range}}{2^{14}} \cdot \frac{1}{\sqrt{\frac{\text{Pulse Width (ns)} - 400\text{ns}}{100\text{ns}} \cdot \text{Averaging Filter Setting}}}$$
- ¹⁵ Excluding total programmed (Pulse ON time + Pulse OFF time).
- ¹⁶ Front panel off, calc off, filter off, duty cycle < 10%, binary communications.
- ¹⁷ Returning 1 voltage and 2 current measurements for each source point.
- ¹⁸ Sweep mode.
- ¹⁹ Valid for both continuous pulse and sweep modes.
- ²⁰ Shown is the Power Distribution % based on current settings.
- ²¹ Timing Cycle ($P^{pw}/(pw+pd)$): 4% max.

Specifications are subject to change without notice.

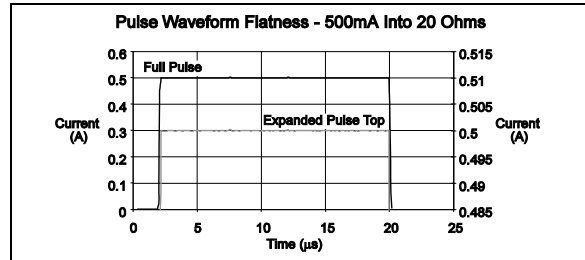


Figure 1

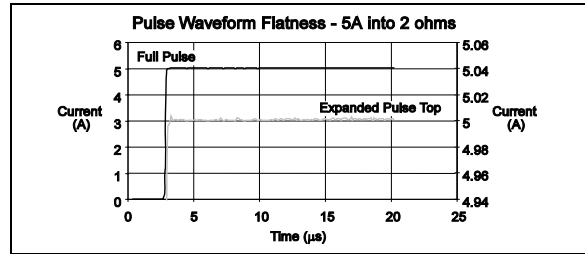
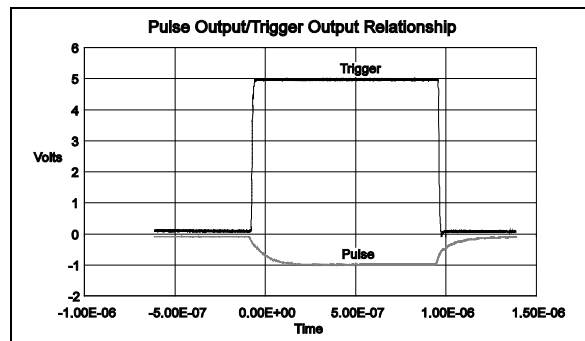


Figure 2



Figure