2520 Pulsed Laser Diode Test System

LASER DIODE PULSE OR DC CURRENT SOURCE SPECIFICATIONS

DRIVE CURRENT					OFF CURRENT[4]			
SOURCE RANGE	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 0 – 5.0 A Pulse	100 µA	80 µA	0.2 + 4.5	800 µA	0-150 mA	10 µA	70 nA typ.	0.2 + 4.5

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

PULSE ON TIME [19]: 500ns to 5ms, 100ns programming resolution.

PULSE OFF TIME [19]: 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 resolution[5].

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	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	0.1%	1 µs	1.3 µs
5.00A	1.5Ω 1 Watt	Fast	1.0%	100 ns	130 ns
5.00A	1.5Ω 1 Watt	Slow	0.1%	1 µs	1.3 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	60 µV
10.00 V	0.66 mV	0.3% + 8 mV	120 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: 160mA 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)[1,2]	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: >10^9Ω.

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).

Tlink: 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 $\sqrt{\text{Duty Cycle}} \cdot 1$ exceeds 0.2, accuracy specifications must be derated with an additional error term as follows:

500mA Range: ±0.1% rdg. · $\sqrt{D} \cdot 1$

5A Range: ±0.3% rdg. · $\sqrt{D} \cdot 1$

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 ±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:

$$\text{Useful Resolution} = \frac{\text{Range}}{2^{14}} \cdot \frac{1}{\sqrt{\frac{\text{Pulse Width (ns)} - 400\text{ns}}{100\text{ns}} \cdot \text{Averaging Filter Setting}}}$$

[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 ($^{pw}/_{(pw+pd)}$): 4% max.

Specifications are subject to change without notice.

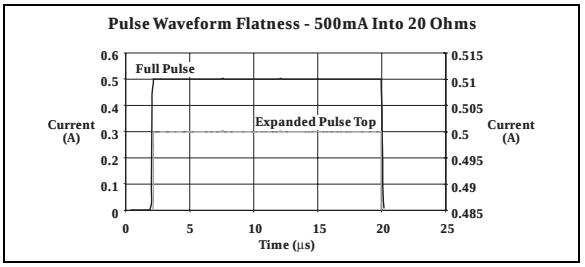

Figure 1

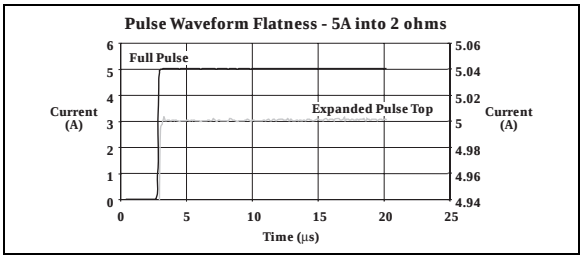

Figure 2

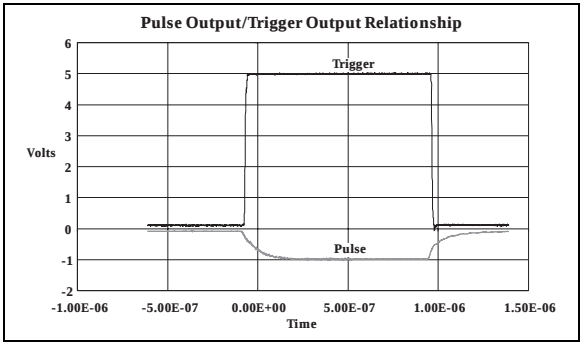

Figure 3