

PVT 110 – Pulsed VCSEL Tester

Driving & Sensing Module

Key features at a glance

- ▲ High spectral resolution (≥ 0.12 nm)
- ▲ Very short pulse trains down to 1 ns and up to 15 A driving pulses
- ▲ Test pulse trains with more than 100 MHz repetition rate
- ▲ Optical measurements traceable to the PTB (German National Laboratory)
- ▲ Flexible pulse trains
- ▲ LIV sweeps and detailed pulse train analysis mode
- ▲ Temperature tuning of DUT

\\ MEASUREMENT RESULTS

» Spectral data

Full spectral information of the DUT (e.g. peak wavelength, average optical power, spectral bandwidth)

» Temporal optical data

Pulse shape, pulse peak power, pulse energy, pulse duration, duty cycle, frame pattern

» Temporal electrical data (driver)

Pulse shape, pulse peak current, pulse duration, duty cycle, frame pattern

\\ TECHNICAL SPECIFICATIONS

PVT 110 - Detection	
Optical spectrum ¹⁾	
Spectral range	800 - 1000 nm
Spectral resolution (typical)	0.12 - 0.4 nm
Data point interval (typical)	0.05 - 0.16 nm
Filter wheel with optical density filters (typical)	OD 0.5/1/1.5/2/2.5
Measuring ranges (typical)	80 - 160 nm
Wavelength accuracy	± 0.05 nm
Integration time	4 ms - 65 s
Temporal behaviour (electrical driving & optical pulses)	
Max. sampling rate	10 GSa/s/ch (4 channel mode)
Memory depth	400 MSa/ch (4 channel mode)
Max. measurable pulse train at max. sampling rate	40 ms/ch
Signal resolution	10 Bit
Max. SNR	30 dBc
Max. radiant power on photodiode	> 20 W/sr ²⁾
Fastest detectable rise/fall time (10 % - 90 %) of optical signals	250 ps

PVT 110 - Driving	
Electrical parameters	
Supply voltage (max.)	15 V ³⁾
Peak current (max.)	15 A
Average current (max.)	1.5 A
Rise/fall time driving pulse (10 % - 90 %)	< 300 ps
Pulse train	
Driving pulse duration (min. - max. FWHM)	1 ns - 50 μ s ⁴⁾
Pulse duration increment	~ 83 ps (12 GHz)
Driving repetition period (min. - max.)	< 10 ns - 100 μ s ⁴⁾
Repetition period increment	< 10 ns - 400 ns: ~ 83 ps (12 GHz)
	400 ns - 4 μ s: ~ 670 ps (1.5 GHz)
	4 μ s - 100 μ s: ~ 5.3 ns (0.1875 GHz)
Duty cycle	0.001 % - 50 %
Measurement uncertainties (for typical operation parameters) ⁵⁾	
Average optical power	2.2 % (k = 2)
LIV mode: Peak current	7.4 % (k = 2)
LIV mode: Optical peak power	7.6 % (k = 2)
LIV mode: VCSEL forward voltage (peak)	7.4 % (k = 2)
Analysis mode: Optical power uncertainty	3.4 % (k = 2)
Analysis mode: Electrical power uncertainty	10.6 % (k = 2)
Operating conditions	
Temperature tuning of DUT (min. - max.)	20 °C - 70 °C
PVT 110 - Mechanical	
ISP Integrating Sphere	
Max. DUT beam divergence	120°
Inner diameter of ISP	100 mm
ISP DUT port diameter	33 mm

¹⁾ Exact specifications depend on the chosen high-resolution CAS model.

²⁾ Corresponds to max. 10 mW on PD with 2.5 mm aperture in an ISP 100.

³⁾ Corresponds typically to a forward voltage of 7 V at the DUT.

⁴⁾ Longer pulse durations possible upon customer request.

⁵⁾ Pulse duration = 10 ns; duty cycle = 1%; temporal resolution = 10 GS/s; number of pulses = 100; peak current = 8 A; peak power = 7 W; VCSEL forward voltage = 3.5 V; VCSEL with diffuser; ISP with standard protection window.

Instrument Systems is continually working to develop and improve its products. Technical changes, errors or misprints do not constitute grounds for compensation. The company's terms of delivery and payment apply in all other respects. Product images are for representation purposes only and may differ from the actual product.