Anritsu Advancing beyond

Optical Pulse Output Spectrum Measurement Solution

Facilitates Stable Production of High-Power LDs

Optical Spectrum Analyzer MS9740B
Pulsed Light Measurement MS9740B-020/320

Recently, symbol rates are being increased to support faster network speeds and larger capacities but with a trend towards lower modulation rates. High-output laser diodes with powers exceeding several 10 mW are being developed for use by the latest optical communications transceivers to compensate for these lower modulation rates. Additionally, high-performance and high-function LDs are being developed for sensing applications while LiDAR for self-driving vehicles and smart city uses LDs with powers exceeding 1 W. Consequently, there is increasing demand for high-output LDs in both communications and non-communications fields.

On the other hand, heat generated by high-output LDs is not easily lost by the chip, which causes noticeable changes in optical spectrum characteristics, such as wavelength drift, reduced power level, etc. (Fig. 1). Pulse driving is one method for solving the issue of rising LD temperatures. This technology periodically switches the power on and off alternately to emit LD light periodically, helping suppress rising LD chip temperature in comparison to CW-driven LDs (Fig. 2).

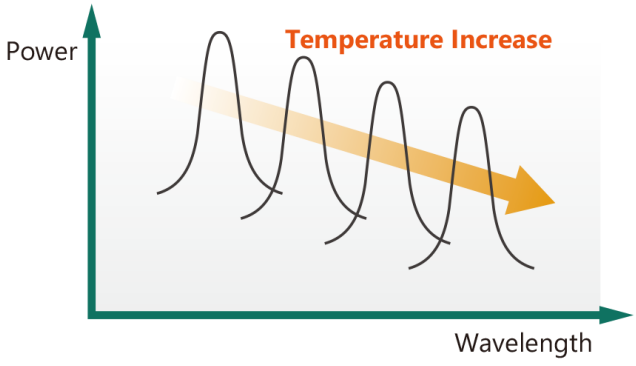


Fig. 1. Spectrum by LD chip Temperature Increase

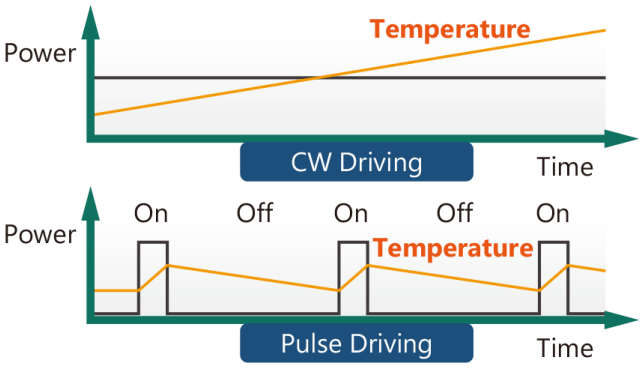
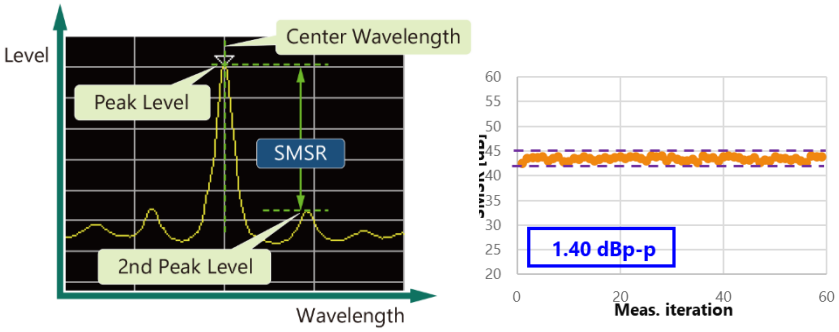


Fig. 2. LD Chip Temperature Increase for CW and Pulse Driving

Due to this future trend towards use of high-output LDs, generation of optical pulses will be a key point in measuring and inspecting optical spectrum characteristics.

To solve this issue, Anritsu has developed a new optical pulse measurement option for its MS9740B. Installing this option in the MS9740B supports an optical pulse measurement mode that captures the spectrum of optical pulses from the LD asynchronously without trigger signal input in the same measurement time as when measuring a CW optical spectrum.
The key Side Mode Suppression Ratio (SMSR) required for manufacturing and inspection achieves a repeatability of ±1.4 dB* (Fig. 3).



*With MS9740B-020 Option, ±1.8 dB (with MS9740B-009)
10 dBm input at Peak Power, DFB-LD, Wavelength 1550 nm, SMSR ≤ 45 dB, No Polarization, SM Fiber, Pulse conditions: Pulse Oscillation Conditions ≥5 kHz, duty >1%, Pulse Mode on, VBW=1 kHz, RBW= 0.1 nm, span ≤ 10 nm, Sampling Point 501, 23°C±5°C

Fig. 3. SMSR Measurement Test Results

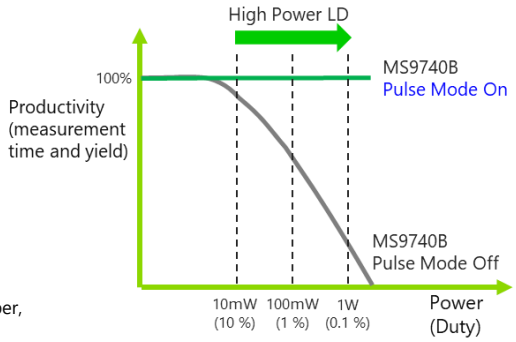


Fig. 4. Improved Productivity

The high reproducibility measurements achieved using this solution, increase inspection yields for LDs, especially high-output LDs, by reducing total tact time through elimination of repeat measurement to improve production-line throughput.

Ordering Information

Please specify the model/order number, name and quantity when ordering.
The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name. Contact your sales representative for more details.

Model	Name
MS9740B	Optical Spectrum Analyzer
MS9740B-020	Pulsed Light Measurement*1
Options	
MS9740B-009	Multimode Fiber Interface (50/62.5 µm)*2
MS9740B-001	GPIB Interface
MS9740B-002	Light Source for Wavelength Calibration

*1: Retrofit (MS9740B-320) supports previously shipped MS9740B units. Retrofit not supported for MS9740A.
*2: Factory shipment option but post-shipment retrofit not supported.

Visit the following web page for more product details.
MS9740B: https://www.anritsu.com/en-us/test-measurement/products/ms9740b

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