25 Gbit/s 850-nm VCSEL

VERTICAL-CAVITY SURFACE-EMITTING LASER (VCSEL)

Designed for use in laboratory applications or for test and measurement of 25-Gbit/s datacom devices, the Model 1784 is an 850-nm, 25-Gbit/s, directly modulated, multimode vertical-cavity surface-emitting laser (VCSEL). The Model 1784 uses high-performance microwave circuitry to ensure clean delivery of the electrical input to the VCSEL chip, and the VCSEL's 50-µm output fiber enables the use of either 50-µm or 62.5-µm fiber. The AC-coupled input and internal bias circuitry allows connection to any high-speed 50-Ω SMA-compatible signal source without the need for additional bias circuitry. A 10-position switch allows for optimization of the VCSEL bias for different datacom applications. For applications requiring a receiver, the 22-GHz New Focus Model 1484-A-50 amplified photodiode is ideally suited for use with the Model 1784.

Advantages

- 50-µm fiber connection
- Convenient and easy to use
- Ideal in fiber and breadboard systems for characterizing datacom transceivers

Specifications	Model 1784
Wavelength	850 nm
Bit Rate	25 Gbit/s
Output Power	800 µW (typical) 750 µW (minimum)
Bandwidth, Small Signal	18 GHz
Low Frequency Cut-off in AC Coupled Mode	10 MHz
Small Signal Gain	1.0 mW/V (typical) 0.75 mW/V (minimum)
Impulse FWHM*	32 ps (typical) 35 ps (maximum)
RMS Noise	2.3 % (RMS, typical) 2.8 % (RMS, maximum)
Small Signal Input Impedance	90 Ω
RF Connector	2.92 mm (Wiltron K), male
Output Connector	FC/PC
Output Fiber	50 µm multimode
Power Requirements	+/-15 V, 50 mA
Operating Temperature	10 °C - 35 °C
Storage Temperature	-20 °C - 70 °C
Maximum Operating Altitude	2 km

*Input is negative impulse; high/low optical power ratio = 3 dB. Bias setting = 10.

New Focus™
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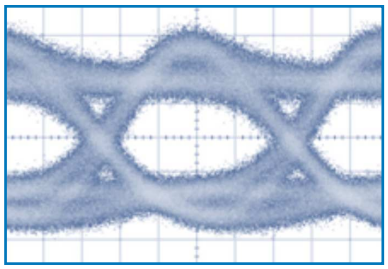
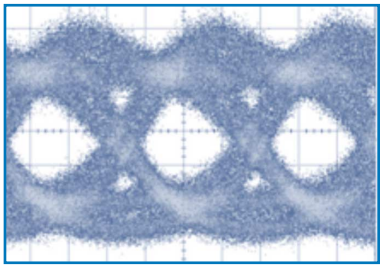
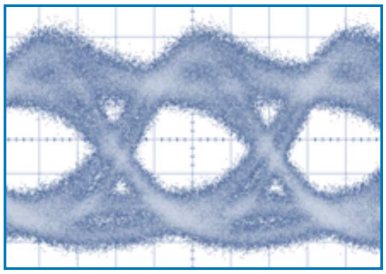
Typical Eye Diagrams



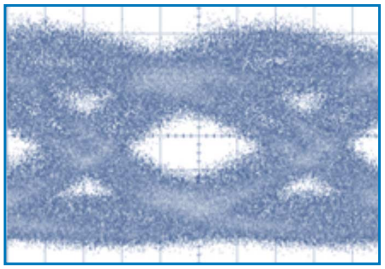
20 Gbps



30 Gbps



25 Gbps



35 Gbps

Eye diagrams are a good measure of system performance. The quality of the eye diagram will show if your source has good timing, power levels, proper synchronization, and long-term reliability. If the opening of the eye is larger it gives better certainty that, when the data is sampled, it is a 1 (top of the eye diagram) or a 0 (bottom of the eye diagram). We repeatedly sampled our VCSEL over a period of time at various speeds to obtain the eye diagrams shown above. By pairing Model 1784 VCSEL with Model 1484-A-50 photoreceiver, you can create your own baseline eye diagrams. With that baseline you can insert an optical component between the VCSEL and photoreceiver to test how they would affect data transmission.

www.newport.com/newfocus

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