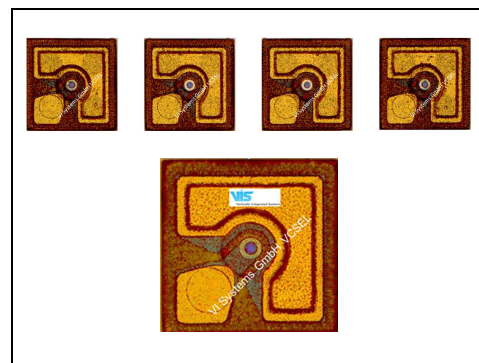


## Up to 56 Gbit/s NRZ VCSEL (850nm)

Product Code:	V50-850C1	1x1 chip
	V50-850C4	1x4 array
	V50-850C12	1x12 array



Actual product may vary in appearance.

## Preliminary

### Product Description

These compact and very high modulation rate top-emitting GaAs-based vertical cavity surface emitting laser (VCSEL) chips and 1xN (N=4,12) arrays are available as engineering samples for use in the development and evaluation of optical interconnections, optical backplanes and integrated waveguides, and next-generation optical data communications systems. The VCSELs are contacted on the top-surface individually using ground-source (GS) microprobes, wire bonds, or flip-chip bonds.

### Features

- Up to 12 parallel channels
- Up to 56 Gbit/s per channel
- High temperature stability
- Device-to-device pitch of 250  $\mu\text{m}$
- Suitable for wire or flip-chip bonding

### Applications

- Ethernet
- Proprietary optical interconnects
- Active Optical Cables (AOC)
- Short-reach 100G Ethernet
- Short-reach 400G Ethernet

Parameter	Typical	Notes
Emission wavelength	850 nm (available 835 – 865 nm)	
Data rate	Up to 56 Gbit/s	
Threshold current	< 0.5 mA	
Peak output power	4 mW	

All product specifications and descriptions are subject to change without notice.

Please contact our sales department for additional information and to receive a quotation: [sales@v-i-systems.com](mailto:sales@v-i-systems.com)

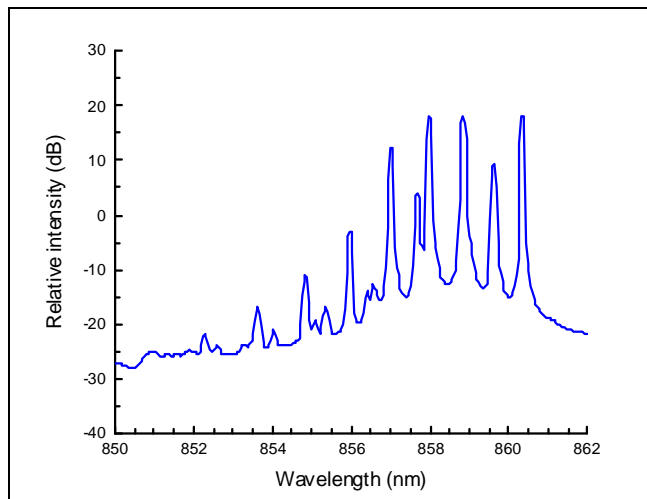
# Datasheet

## V50-850C

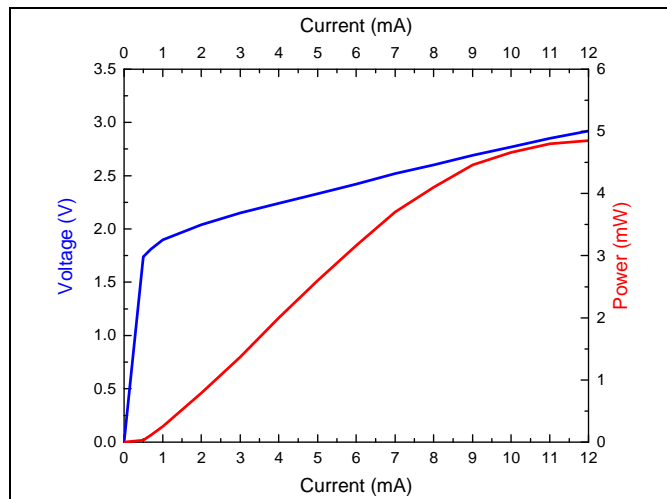


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### Optical spectrum



### L-I-V Diagram



### Electro-optical characteristics (T = 0 to 85 °C)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Emission wavelength	$\lambda$		835		865	nm
Maximum data rate	BR	NRZ, 4-PAM		50	56	Gbit/s
Bandwidth	BW ( $f_{3dB}$ )			21		GHz
Rise / Fall time	$\tau_R / \tau_F$	20%-80%		12 / 12		ps
Slope efficiency	$\eta$	5-10 mA	0.3		0.45	W/A
Threshold current	$I_{th}$				0.5	mA
Differential resistance	$R_d$	5-10 mA		80	120	$\Omega$
Capacitance	C			300		fF
Beam divergence	$\theta$	FWHM		20		°
Peak output power	$P_{max}$				4	mW
Threshold uniformity	$\Delta I_{th}$			0.1		mA
Slope efficiency uniformity	$\Delta \eta$			0.1		W/A
Slope efficiency variation	$\Delta \eta_T$			$\leq -0.5$		%/K
Thermal resistance	$R_{thermal}$			2		°C/mW
Optical spectrum				Multi mode		
Spectral bandwidth (RMS)	$\Delta \lambda_{RMS}$		0.2	0.4	0.6	nm

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[www.v-i-systems.com](http://www.v-i-systems.com)

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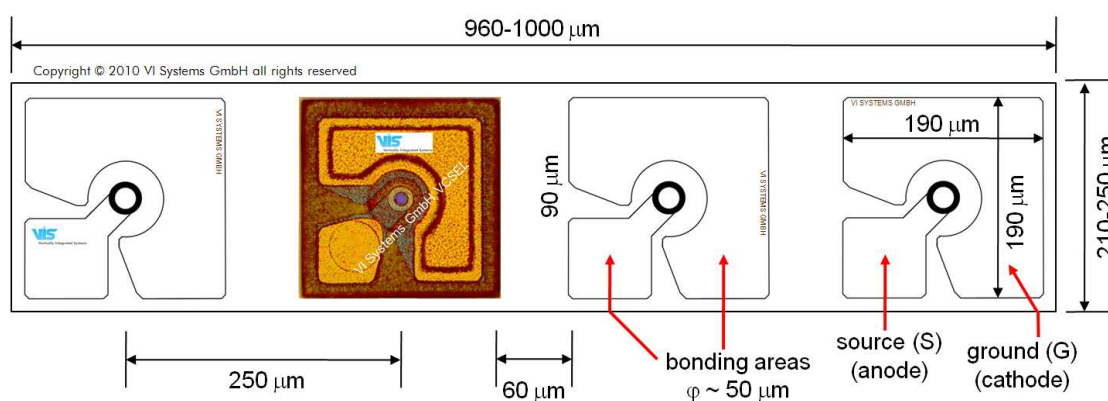
### Absolute Maximum Ratings

Parameter	Symbol	Test Condition	Min	Max	Unit
Peak forward current	$I_f$			9	mA
Maximum reverse voltage	$V_{rv}$			5	V
Operating temperature	$T_{op}$			85	°C
Storage temperature	$T_{st}$		-40	100	°C
Soldering temperature	$T_{sl}$	max 260 sec		150	°C

### Mechanical Dimensions

Parameter	Type	Min	Typ	Max	Unit
VCSEL pitch	All		250		$\mu\text{m}$
Length 1x1 VCSEL chip	V50-850C1		210	250	$\mu\text{m}$
Length 1x4 VCSEL array	V50-850C4		960	1000	$\mu\text{m}$
Length 1x12 VCSEL array	V50-850C12		2960	3000	$\mu\text{m}$
Height	All	140	150	160	$\mu\text{m}$
Width	All		210	250	$\mu\text{m}$

### Dimensions



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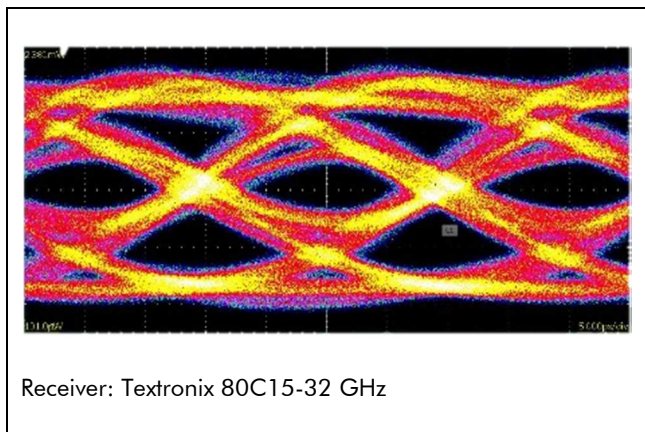
# Datasheet

## V50-850C

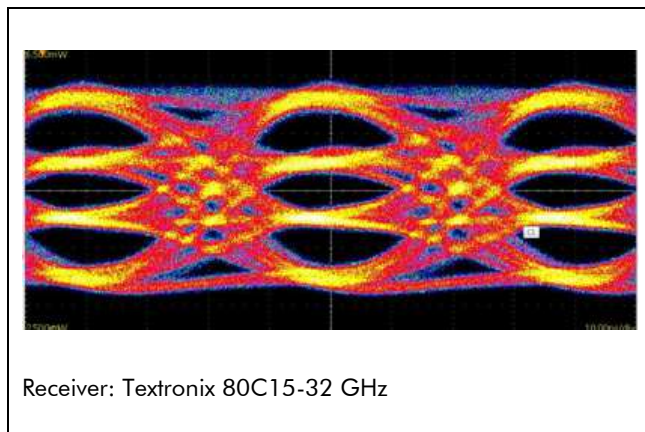


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### Eye diagram at 50 Gbit/s NRZ

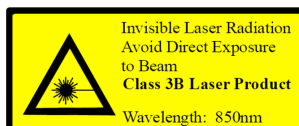


### Eye diagram at 25GBaud 4-PAM



### Qualification Notification

The V50-850Cx has been tested to meet specifications outlined in this data sheet at room temperature. However, it has not undergone full qualification testing or characterization and therefore may not meet the performance specifications over all extremes.



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