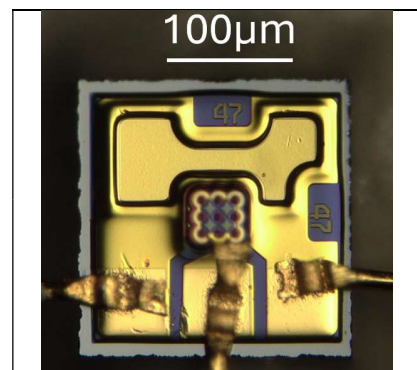


High Power VCSEL: Sensing, datacom LiFi applications

Product Code: V-MA HP 850C1 1x1 chip
V-MA HP-940C1 1x1 chip



Example of wire bonding to HF package
Actual product may vary in appearance.

Product Description

Compact high brightness ×4 multi-aperture (11µm pitch) VCSEL at a high modulation speed (f-3dB ~18GHz) suitable for sensing and optical wireless applications. The VCSELs are contacted on the top-surface individually using ground-source-ground (GSG) microprobes or wire bonds.

Features

- Beyond 25Gbaud
- Chip size 250 x 250 µm
- Suitable for wire bonding
- High coupling efficiency to multimode fibre
- RMS<0.7nm

Applications

- Optical wireless
- Coherent LIDAR
- Short pulse TOF LIDAR
- High loss optical fibre

Parameter	Typical	Notes
Emission wavelength	850 nm 940 nm	range 844 – 858 nm range 934 – 948 nm
Modulation bandwidth	18GHz	> 15mA
Data rate	Up to 40 Gbaud	56 Gb/s PAM4
Threshold current	< 2 mA	
Roll over output power	15 mW	Silver paste test

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

Datasheet

V-MA-HP-C1



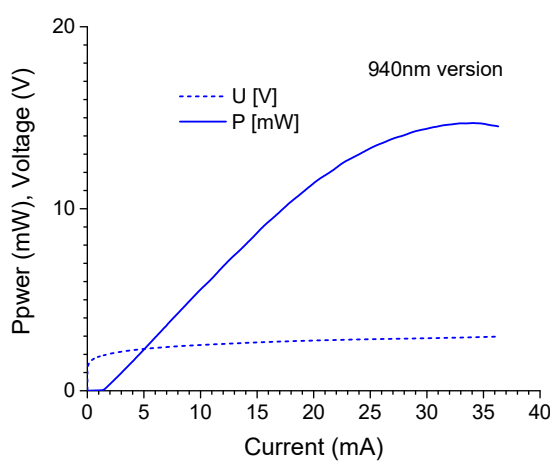
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Electro-optical characteristics (T = 0 to 85 °C)

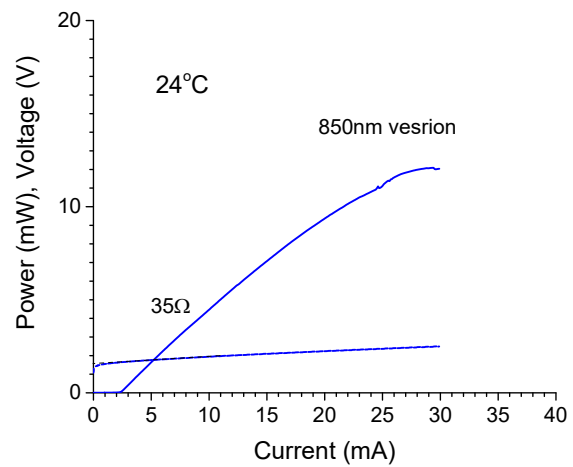
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Data rate	BR	PAM-2		25	28	Gbaud
Optical bandwidth	BW (f_{3dB})	15 mA	16	16	18	GHz
Slope efficiency	η	10-20 mA		0.7		W/A
Threshold current	I_{th}			1.5	3	mA
Differential resistance	R_d	10-20 mA		35		Ω
Beam divergence (12-29mA)	θ	1/e2	20	29	30	°
Peak CW output power	P_{max}	30mA	12	15	16*	mW
Spectral width (RMS)	$\Delta\lambda_{RMS}$	6mA		0.7	1.0	nm

*Up to 20mW on demand

LIV data



940nm



850nm

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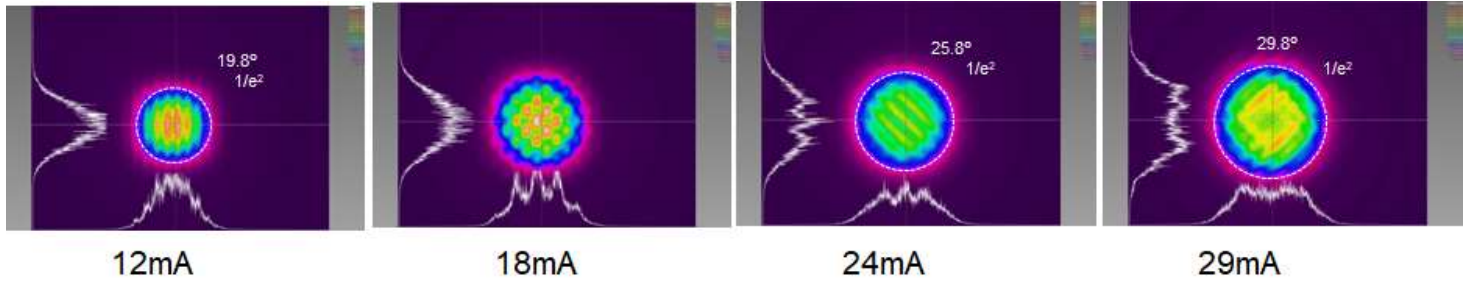
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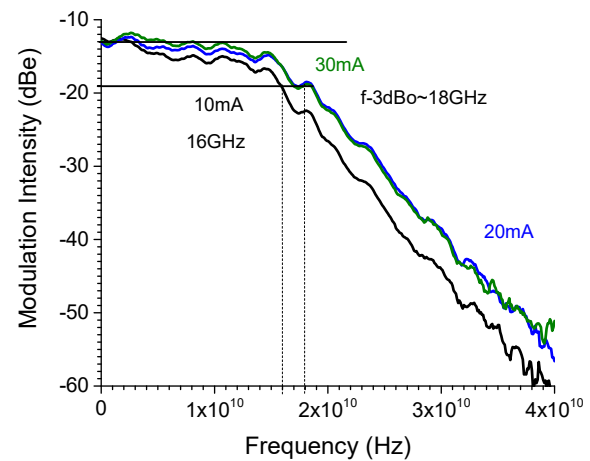
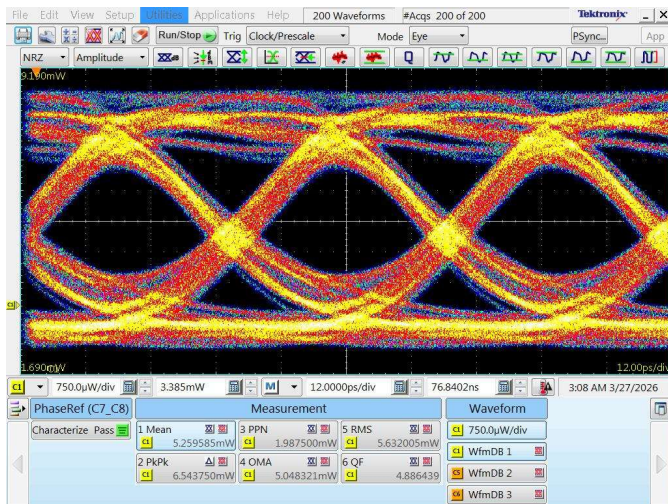


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Far Field data



Frequency Response



25 Gb/s NRZ PRBS15 10mA (above similar)

Absolute Maximum Ratings

Parameter	Symbol	Test Condition	Min	Max	Unit
Peak forward current	I_f			8	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

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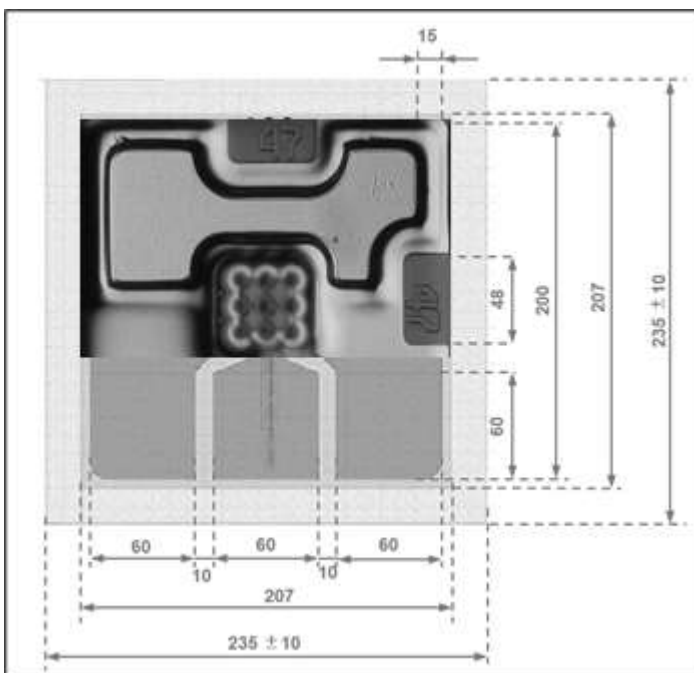


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Mechanical Dimensions

Parameter	Type	Min	Typ	Max	Unit
Length 1x1 VCSEL chip			210	250	μm
	All	140	150	160	μm
Height	All		210	250	μm

Dimensions



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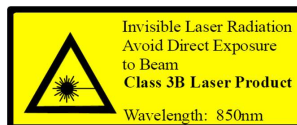
V-MA-HP-C1



Vertically Integrated Systems

Qualification Notification

The VMA HP VCSELs were tested for reliability within an 18h aging period at elevated temperatures (150°C) at high current densities ($>20\text{kA}/\text{cm}^2$). The chip in the series has been tested to meet specifications outlined in this data sheet at above room temperature. However, the chips did not undergo full qualification testing and therefore may not meet the performance specifications over all extremes.



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