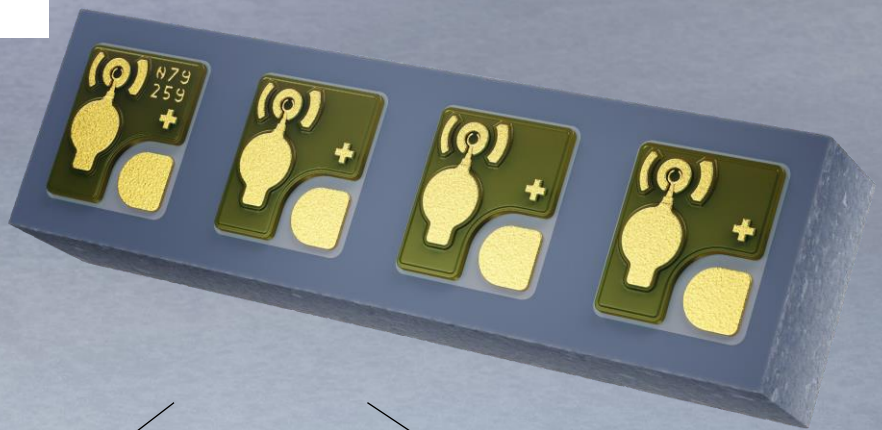


VCSEL

56Gbps PAM4
850 nm



Vertical-Cavity
Surface-Emitting
Laser

High speed up to
56 Gbps PAM4

High reliability

Fully
encapsulated chip

Available in
1x1, 1x4, 1x12

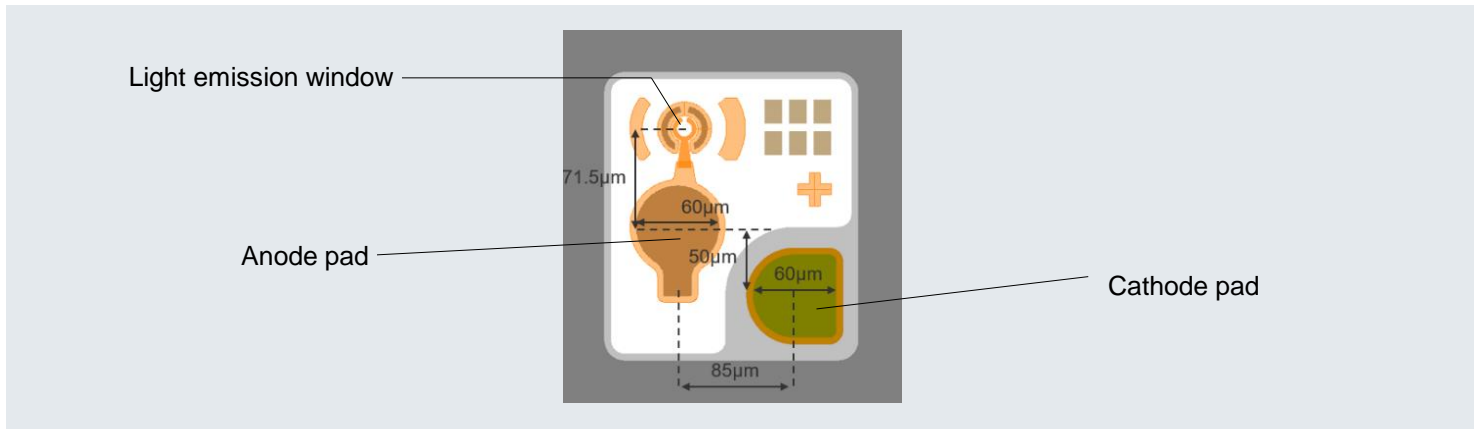
Low power
consumption

Datasheet: 56 Gbps VCSEL

Electro-Optical Characteristics (T = 25°C unless otherwise stated)

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Substrate Temperature	Ts	5	70	75	°C	
Threshold Current	I _{th}	—	1.0	—	mA	Ts = 70°C
Slope Efficiency	SE	—	0.5	—	W/A	Ts = 70°C
Slope Efficiency Temperature Variation	ΔSE/SE/ΔT	—	-0.3	—	%/°C	Ts = 0°C to 85°C
Output Power	LOP	—	3.0	—	mW	Ts = 70°C, I _f = 7mA
Differential Resistance	R _{diff}	—	70	—	Ω	Ts = 70°C
Average Operating Current	I _f	—	7	—	mA	
Forward Voltage	V _f	—	2.2	—	V	Ts = 70°C, I _f = 7mA
Center Emission Wavelength	λ	845	850	857	nm	Ts = 70°C, I _f = 7mA
Center Emission Wavelength Temperature Variation	Δλ/ΔT	—	0.065	—	nm/°C	
Beam divergence	θ	—	21	—	deg	Ts = 70°C, I _f = 7mA, 1/e ² cutoff
Spectral Width (RMS)	RMS	0.2	0.3	0.6	nm	Ts = 70°C, I _f = 7mA
Relative Intensity Noise	RIN	—	-140	—	dB/Hz	Ts = 70°C, I _f = 7mA
Small Signal Bandwidth	f _{3dB7mA}	—	19	—	GHz	Ts = 70°C, I _f = 7mA
Small Signal Bandwidth	f _{3dB5mA}	—	17	—	GHz	Ts = 70°C, I _f = 5mA

Dimensions of 56G VCSEL:



Product variants

Type	Single chip	1 x 4 line array	1 x 12 line array
Part number	TVT-56(1)-850-B0	TVT-56(04)-850-B0	TVT-56(12)-850-B0
Ordering number	ULM850-56-TT-W0101U	ULM850-56-TT-W0104U	ULM850-56-TT-W0112U
Dimensions	250 x 225 x 150 µm	250 x 975 x 150 µm	235 x 2925 x 150 µm

For more information visit
www.trumpf.com/s/VCSEL-solutions

Safety information:

- ⚠ Invisible laser radiation / avoid beam exposure / class 3B laser product
- ⚠ Electrostatic sensitive devices / observe precautions for handling

