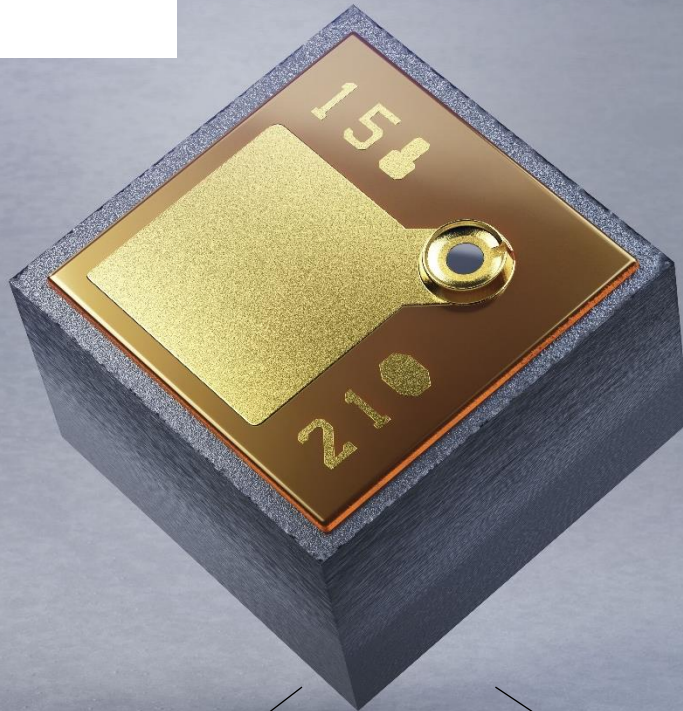


VCSEL

5 Gbps  
850 nm



> Vertical-Cavity  
Surface-Emitting  
Laser

> High reliability

> Unsealed 85% r.H.  
/ 85°C certified

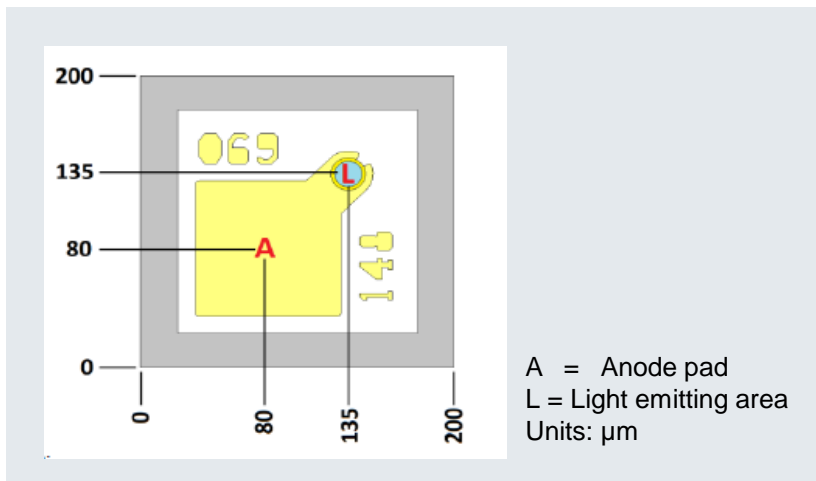
> High speed up to  
5 Gbps

# Datasheet: 5 Gbps VCSEL

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

Parameter	Symbol	Units	Min	Typ	Max	Test Condition
Emission wavelength	$\lambda$	nm	830	850	860	$I_F = 6 \text{ mA}$
Threshold current	$I_{TH}$	mA	0.40	0.90	1.40	$T = -40^\circ\text{C to } 90^\circ\text{C}$
			0.40		2.50	
Optical output power	$P_{opt}$	mW		2		$I_F = 6 \text{ mA}$
Slope efficiency	$\eta_S$	W/A	0.27		0.55	
Variation of $\eta_S$ over temp.	$\Delta\eta_S/\eta_S/\Delta T$	%/K		0.45	0.60	$T = -40 \text{ to } 25^\circ\text{C}$ & $T = 25^\circ\text{C to } 90^\circ\text{C}$
Differential series resistance	$R_S$	$\Omega$	25	50	65	$I_F = 6 \text{ mA}$
3 dB modulation bandwidth	$f_{3 \text{ dB}}$	GHz	3			$I_F = 6 \text{ mA}$
Rise and fall time	$t_r, t_f$	ps		70	80	20% to 80%; ER = 5 dB; $I_F = 6 \text{ mA}$
Relative intensity noise	RIN	dB/Hz		-130	-120	$I_F = 6 \text{ mA}$
Spectral bandwidth	$\Delta\lambda$	nm		0.30	0.65	$I_F = 6 \text{ mA, RMS}$
Beam divergence	$\Theta$	$^\circ$		25	30	$I_F = 6 \text{ mA,}$ full width $1/e^2$

## Dimensions of 5G VCSEL:



Type	Single chip
Part number	TVT-5(1)-850-A0
Ordering number	ULM850-05-TN-N0101L
Dimensions	235 x 235 x 150 $\mu\text{m}$
Wiring	Backside cathode

For more information visit  
[www.trumpf.com/s/VCSEL-solutions](http://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

TRUMPF Photonic Components GmbH

Lise-Meitner-Straße 13 · 89081 Ulm · Germany

E-mail: [photonic.components@trumpf.com](mailto:photonic.components@trumpf.com) · Homepage: [www.trumpf.com/s/VCSEL-solutions](http://www.trumpf.com/s/VCSEL-solutions)

September 2021

