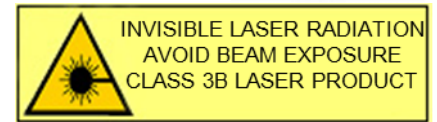
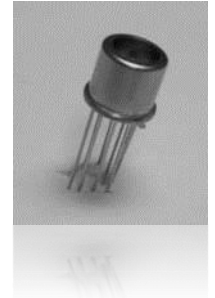


TO5 & TEC

- Vertical Cavity Surface-Emitting Laser
- internal TEC and Thermistor, ESD protection
- Narrow linewidth
- 2 nm tunability with TEC
- High performance and reliability



PRELIMINARY

ELECTRO-OPTICAL CHARACTERISTICS

T = 20°C unless otherwise stated

PARAMETER	SYMBOL	UNITS	MIN	TYP	MAX	TEST CONDITIONS
Emission wavelength	λ_R	different wavelength selections are specified on the next page				
Threshold current	I_{TH}	mA		0.5		
Output power	P_{opt}	mW	0.25			
Threshold voltage	U_{TH}	V		1.8		
Laser current	I_{OP}	mA			2	$P_{opt} = 0.3$ mW
Laser voltage	U_{OP}	V		2		$P_{opt} = 0.3$ mW
Wallplug efficiency	η_{WP}	%		12		$P_{opt} = 0.3$ mW
Slope efficiency	η_S	W/A		0.3		
Differential series resistance	R_S	Ω		250		$P_{opt} = 0.3$ mW
3dB modulation bandwidth	ν_{3dB}	GHz	0.1			$P_{opt} = 0.3$ mW (due to ESD protection diode)
Relative intensity noise	RIN	dB/Hz		-130	-120	$P_{opt} = 0.3$ mW @ 1 GHz
Wavelength tuning over current		nm/mA		0.6		
Wavelength tuning over temperature		nm/K		0.06		
Thermal resistance (VCSEL chip)	$R_{thermal}$	K/mW	3		5	
Side mode suppression		dB	25			I = 2 mA
Beam divergence	θ	°	10		25	$P_{opt} = 0.3$ mW, full width 1/e ²
Spectral bandwidth		MHz		100		$P_{opt} = 0.3$ mW
TEC/THERMISTOR CHARACTERISTICS		UNITS	MIN	TYP	MAX	TEST CONDITIONS
TEC current		mA	-150		+300	proper heatsink required
			for heating		for cooling	
NTC Thermistor Resistance		k Ω	9.5	10.0	10.5	T = 25°C
NTC Temperature Dependence		k Ω	10/exp[3892·(1/298K - 1/T _{op})]			

NOTICE: Stresses greater than those listed under „Absolute Maximum Ratings“ may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated for extended periods of time may effect device reliability.



ATTENTION: Electrostatic Sensitive Devices
Observe Precautions for Handling

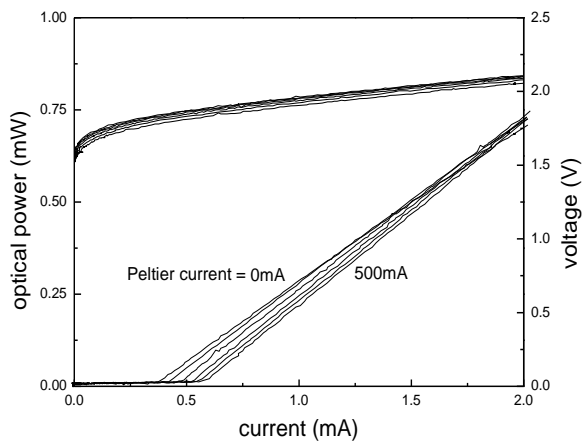
Absolute Maximum Ratings

Storage Temperature	-40 ... 125°C
Operating Temperature	-40 ... 85°C
Electrical Power Dissipation	5 mW
Continuous forward laser current	2 mA
Continuous reverse current	10 mA
Soldering Temperature*	270°C

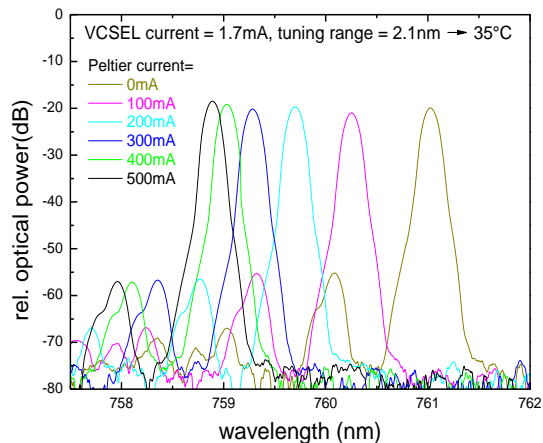
(*TEC temperature must be below 150°C)

WAVELENGTH SELECTION CRITERIA			
Emission wavelength λ_R	@ T = 20°C, I _{TEC} = 0, P _{OP} = 0.3 mW		
760 nm range	MIN	MAX	UNITS
± 1 nm	759.0	761.0	nm
± 3 nm	757.0	763.0	nm
763 nm range			
± 1 nm	762.0	764.0	nm
± 3 nm	760.0	766.0	nm

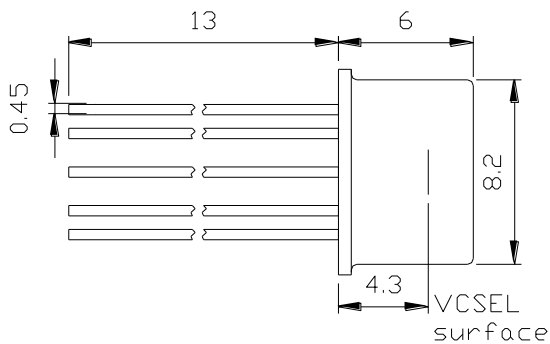
LIV



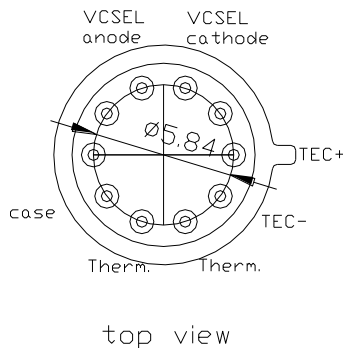
Spectral characteristics



TO dimensions



Pin configuration



Unit: mm

For order please use:	
± 1 nm	± 3 nm
ULM760-01-TN-S05FTT	ULM760-03-TN-S05FTT
ULM763-01-TN-S05FTT	ULM763-03-TN-S05FTT

OPTION:

- Customer specific wavelength selection on request



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