

850nm 2.5 Gb/s Multimode VCSEL in TO46 (Preliminary)

Bookham's high speed multimode 850nm VCSELs in hermetic TO46 are designed to meet stringent specifications for high speed data communications. The high performance, high reliability VCSELs are assembled with integrated monitor photodiode and can be modulated up to 2.5 Gb/s. The tilted window reduces feedback into the VCSEL and results in superior VCSEL noise and MPD tracking behavior. Typical bias currents of the VCSELs are in the range from 4-7 mA for modulation speeds up to 2.5 Gb/s.

Features

- 850nm multimode emission
- Data rates up to 2.5 Gb/s
- Extended temperature range operation (-40°C to +85°C)
- Bias currents between 4 and 7 mA
- Excellent reliability
- Hermetic TO46 package with tilted window cap
- Coated window cap
- Integrated monitor photodiode (MPD)
- Common-cathode configuration (other configurations available on request)

Applications

- Datacom applications up to 2.5 Gb/s
- Optical encoder applications

Product Code	Data Rate	Package	Configuration	MPD	Comment
APA7201013601	2.5Gb/s	TO46 tilted window cap	Common cathode	Yes	Coated Window



Electro-optical Characteristics*

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
VCSEL						
Threshold current	I_{th}	T = 25°C T = 85°C		2.0	2.5 4.0	mA mA
Optical output power	P_{out}	$I_{op} = 6mA$		0.65		mW
Slope efficiency	η	$I_{op} = 6mA$	0.08	0.16	0.25	mW/mA
Operating voltage	U_{op}	$I_{op} = 6mA$	1.4	1.9	2.2	V
Emission wavelength	λ	$I_{op} = 6mA$	840	850	860	nm
Spectral bandwidth, RMS	$\Delta\lambda$	$I_{op} = 6mA$			0.85	nm
Beam divergence	Θ	$I_{op} = 6mA$, Full width $1/e^2$		24	30	°
Differential resistance	R_d	$I_{op} = 6mA$	25	40	60	Ω
Bandwidth	f_{3dB}	$I_{op} = 6mA$	3.5	5		GHz
Rise time	t_r	$I_{op} = 6mA$, 20% - 80%, ER = 10dB			130	ps
Fall time	t_f				150	ps
Relative intensity noise	$RIN_{12(OMA)}$	$I_{op} = 6mA$, 1.0GHz BW			-122	dB/Hz
Monitor Photo Diode (MPD)						
Monitor current	I_{pd}	$P_{out} = 0.65 mW$	100	250	600	μA
Dark current	$I_{d,pd}$	Bias = 3V		1	30	nA
Capacitance	C_{pd}	Bias = 3V			100	pF

Thermal Characteristics

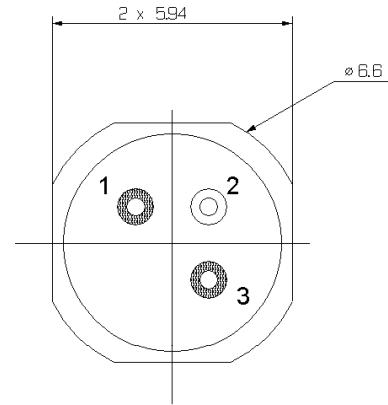
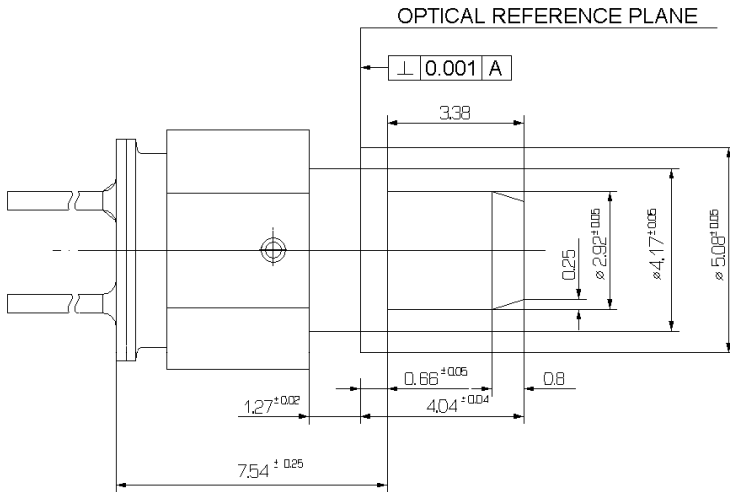
Parameter	Symbol	Ratings			Unit
		Min	Typ	Max	
Wavelength tuning co-efficient	$\delta\lambda/\delta T$		0.06		nm/K
Threshold current variation -40°C - 85°C	ΔI_{th}		1.2	2.5	mA

* T=25°C unless otherwise noted

Absolute Maximum Ratings

Parameter	Rating	Unit
Optical output power	3.5	mW
Peak forward current	15	mA
VCSEL reverse voltage	5	V
MPD reverse voltage	10	V
MPD forward current	10	mA
Operating temperature	-40 to +85	°C
Storage temperature	-40 to +100	°C
Lead solder temperature (for 10 sec)	260	°C

Package Outline and Electrical Connections



Pinout

- 1 - LD anode
- 2 - LD cathode, PD anode
- 3 - PD cathode

RoHS Compliance



Bookham is fully committed to environment protection and sustainable development and has set in place a comprehensive program for removing polluting and hazardous substances from all of its products. The relevant evidence of RoHS compliance is held as part of our controlled documentation for each of our compliant products.

Ordering Information

Product Code	Data Rate	Description
APA7201013601	2.5 Gb/s	2.5 Gb/s TO46 assembly with tilted window and monitor photodiode

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