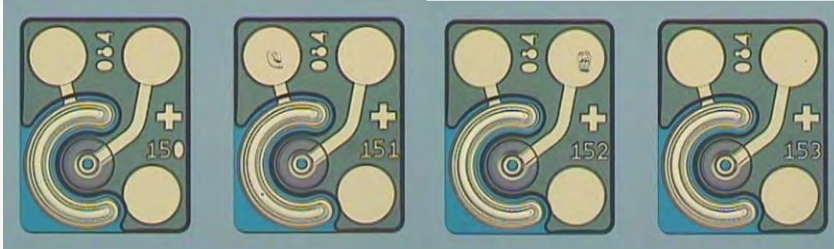



II-VI



APA4501010002  
 APA4501040002

## 850nm 25Gb/s Dual Top Contact Multimode VCSEL Array

### Features:

- Low spectral width
- 850nm multimode emission
- Data rates from DC to 25 Gb/s
- Dual top contact configuration with common cathode electrodes
- Available as single chip and 4 channel array
- High reliability
- High humidity robustness compliant with GR468
- RoHS compliant 

### Applications:

- Single channel and parallel fiber optical communication links
- Transceivers

### Shipment packaging options:

- Diced wafer on UV tape on metal lead frame

# 850nm 25Gb/s Multimode Dual Top Contact VCSEL Array

## Electro-Optical Characteristics

T=25°C unless otherwise noted

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Threshold current	$I_{th}$	T=25°C		0.7	0.9	mA
		T=0°C - 85°C			1.2	
Slope efficiency	$\eta$	I=I <sub>th</sub> +1mA, T=25°C	0.3	0.45		mW/mA
		I=I <sub>th</sub> +1mA, T=85°C	0.25	0.35		
Optical output power	P <sub>out</sub>	I <sub>op</sub> = 6.0mA, T=25°C	1.8	2.2		mW
		I <sub>op</sub> = 7.0mA, T=85°C	1.5			
Operating voltage	U <sub>op</sub>	I <sub>op</sub> =6mA		2.1	2.2	V
Differential resistance	R <sub>d</sub>	I <sub>op</sub> =6mA, T=0°C - 85°C		80	90	Ω
Emission wavelength	$\lambda$	I <sub>op</sub> = 6.0mA, T=0°C - 85°C	840	850	860	nm
Spectral width, RMS	$\Delta\lambda$	I <sub>op</sub> =6mA			0.6	nm
Modulation bandwidth	f <sub>3dB</sub>	I <sub>op</sub> =6mA, T=25°C	13	14.5		GHz
		I <sub>op</sub> =7mA, T=80°C	12.5	13.5		
Beam divergence	$\Theta$	I <sub>op</sub> = 6.0mA, Full width 1/e <sup>2</sup>		28	33	°
Relative intensity noise	RIN <sub>(OMA)</sub>	I <sub>op</sub> = 7.0mA, ER=4dB, 19GHz BW, T=80°C		-130	-128	dB/Hz
Threshold uniformity	$\Delta I_{th}$	Range across 1x4 array			0.15	mA
Slope efficiency uniformity	$\Delta\eta$				0.05	

## Thermal Characteristics

Parameter	Symbol	Ratings			Unit
		Min	Typ	Max	
Wavelength tuning coefficient 0°C - 85°C	$\delta\lambda/\delta T$		0.06		nm/K
Slope efficiency variation 0°C - 85°C	$\Delta\eta_T$		-0.35		%/K
Thermal impedance	Z <sub>th</sub>		3.0		K/mW

# 850nm 25Gb/s Multimode Dual Top Contact VCSEL Array

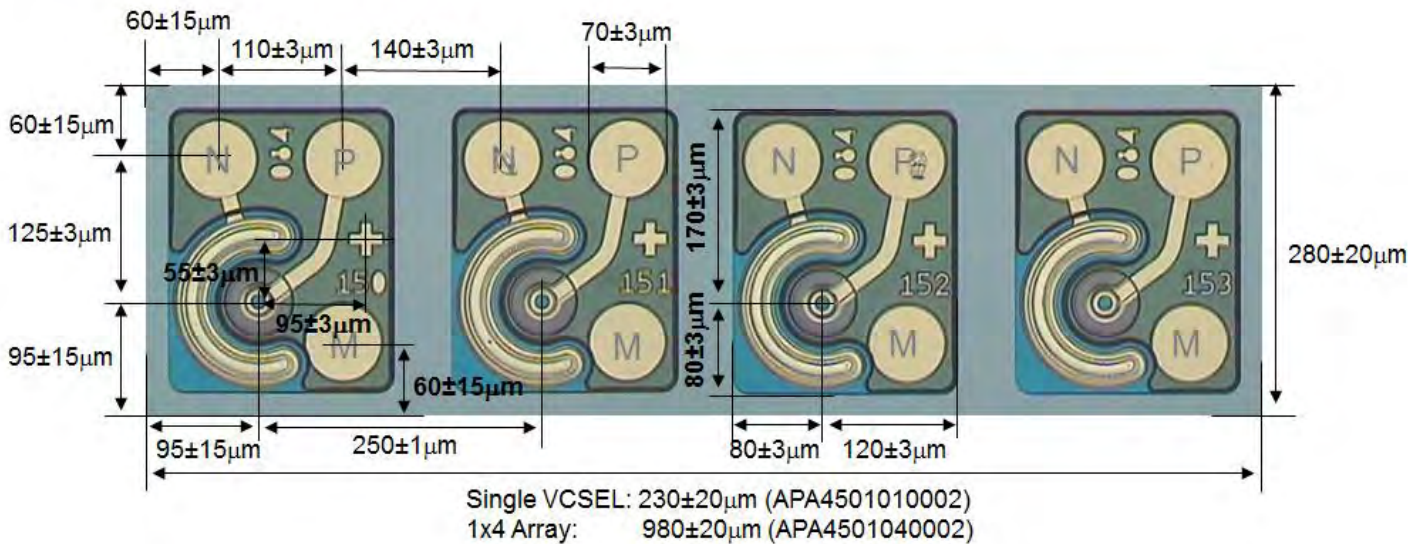
## Absolute Maximum Ratings

Parameter	Rating	Unit
Optical output power	8	mW
Peak forward current (max. 10sec)	12	mA
VCSEL reverse voltage	5	V
Operating temperature	0 to +85	°C
Storage temperature	-40 to +100	°C
Mounting temperature (max. 10sec)	260	°C

## Chip Outer Dimensions

Parameter	Min	Typ	Max	Unit
Die length (APA4501040002)	960	980	1000	μm
Die length (APA4501010002)	210	230	250	μm
Die width	260	280	300	μm
Die height	135	150	165	μm

## Chip Layout



N: n-contact (common cathode)  
 P: p-contact (anode)  
 M: mechanical pad

# 850nm 25Gb/s Multimode Dual Top Contact VCSEL Array

## RoHS Compliance

II-VI 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. RoHS compliance parts are available to order, please refer to the ordering information section for further details.

## Ordering Information

Product Code	Data Rate	Description	Shipment Packaging
APA4501010002	25Gb/s	850nm 25G MM DTC VCSEL chip	Diced wafer on metal lead frame <sup>(1)</sup>
APA4501040002	25Gb/s	850nm 25G MM 1x4 DTC VCSEL array	Diced wafer on metal lead frame <sup>(1)</sup>

<sup>(1)</sup> Full diced 3" wafer on UV tape on metal lead frame Ø 230mm, electronic wafermap provided (standard high volume)

## Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by II-VI before they become applicable to any particular order or contract. In accordance with the II-VI policy of continuous improvement specifications may change without notice. Further details are available from any II-VI sales representative.

## Safety Labels

