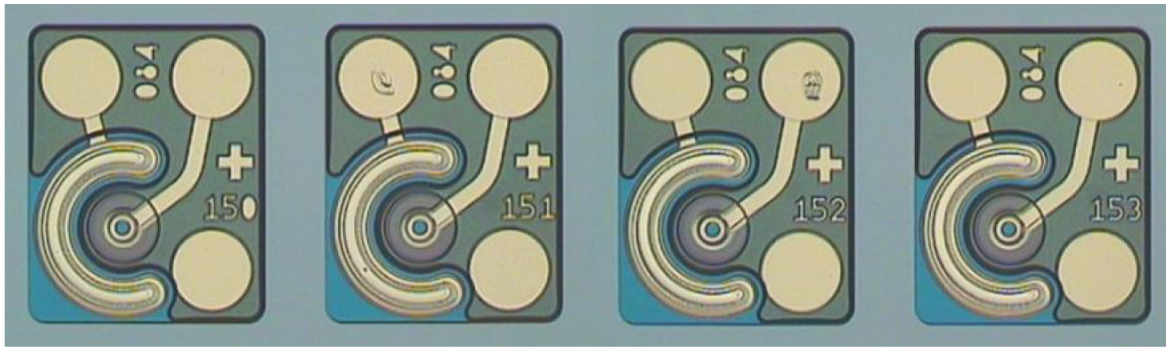



850 nm 25 Gbps DUAL TOP CONTACT MULTIMODE VCSEL ARRAY

APA4501010002

APA4501040002



FEATURES

- Low spectral width
- 850 nm 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

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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	η	$I = I_{th} + 1$ mA, T = 25 °C	0.3	0.45		mW/mA
		$I = I_{th} + 1$ mA, T = 85 °C	0.25	0.35		
Optical output power	P_{out}	$I_{op} = 6.0$ mA, T = 25 °C	1.8	2.2		mW
		$I_{op} = 7.0$ mA, T = 85 °C	1.5			
Operating voltage	U_{op}	$I_{op} = 6$ mA		2.1	2.2	V
Differential resistance	R_d	$I_{op} = 6$ mA, T = 0 °C - 85 °C		80	90	Ω
Emission wavelength	λ	$I_{op} = 6.0$ mA, T = 0 °C - 85 °C	840	850	860	nm
Spectral width, RMS	$\Delta\lambda$	$I_{op} = 6$ mA			0.6	nm
Modulation bandwidth	f_{3dB}	$I_{op} = 6$ mA, T = 25 °C	13	14.5		GHz
		$I_{op} = 7$ mA, T = 80 °C	12.5	13.5		
Beam divergence	Θ	$I_{op} = 6.0$ mA, Full width 1/e ²		28	33	°
Relative intensity noise	$RIN_{(OMA)}$	$I_{op} = 7.0$ mA, ER = 4 dB, 19 GHz BW		-130	-128	dB/Hz
Threshold uniformity	ΔI_{th}	Range across 1x4 and 1x12 array chips			0.15	mA
Slope efficiency uniformity	$\Delta\eta$				0.05	mW/mA

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_{th}		3.0		K/mW

Absolute Maximum Ratings

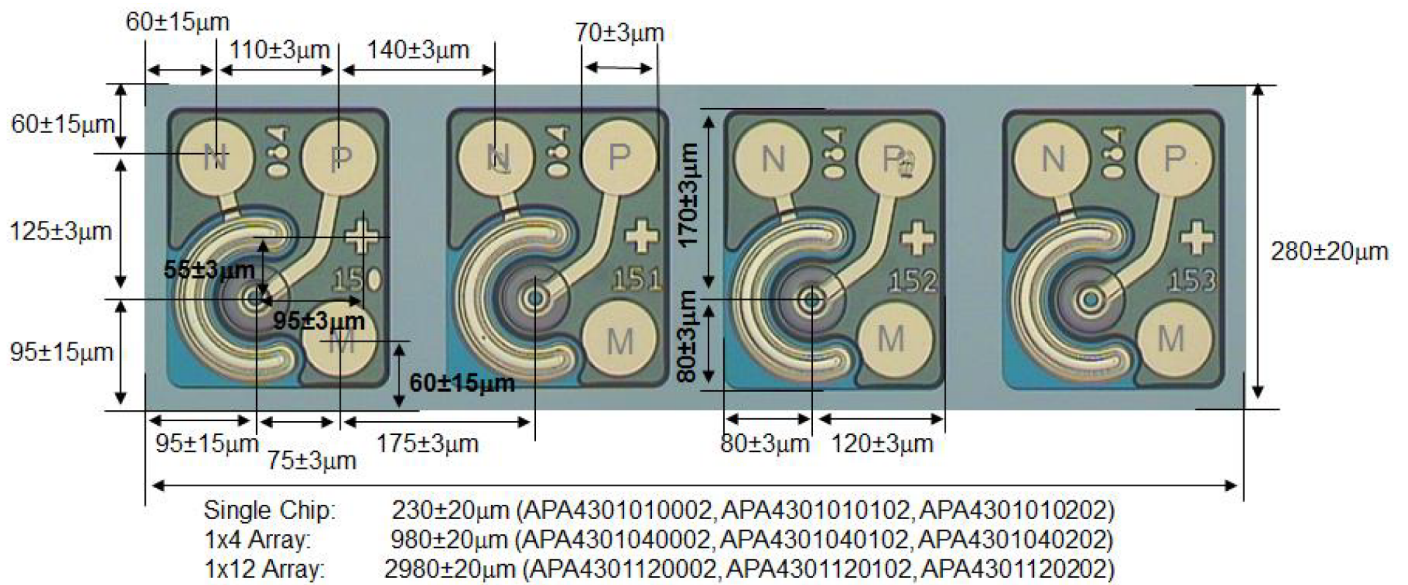
Parameter	Rating	Unit
Optical output power	8	mW
Peak forward current (max. 10sec)	12	mA
VCSEL reverse voltage	5	V
Operating temperature	0 to +85	°C
Storage temperature	-40 to +100	°C
Mounting temperature (max. 10sec)	260	°C

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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

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RoHS Compliance

Coherent 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	25 Gb/s	850 nm 25 G MM DTC VCSEL chip	Diced wafer on metal lead frame ⁽¹⁾
APA4501040002	25 Gb/s	850 nm 25 G MM 1x4 DTC VCSEL array	Diced wafer on metal lead frame ⁽¹⁾

⁽¹⁾ Full diced 3" wafer on UV tape on metal lead frame Ø 230 mm, 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 Coherent before they become applicable to any particular order or contract. In accordance with the Coherent policy of continuous improvement specifications may change without notice. Further details are available from any Coherent sales representative.

Safety Labels



Caution - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.