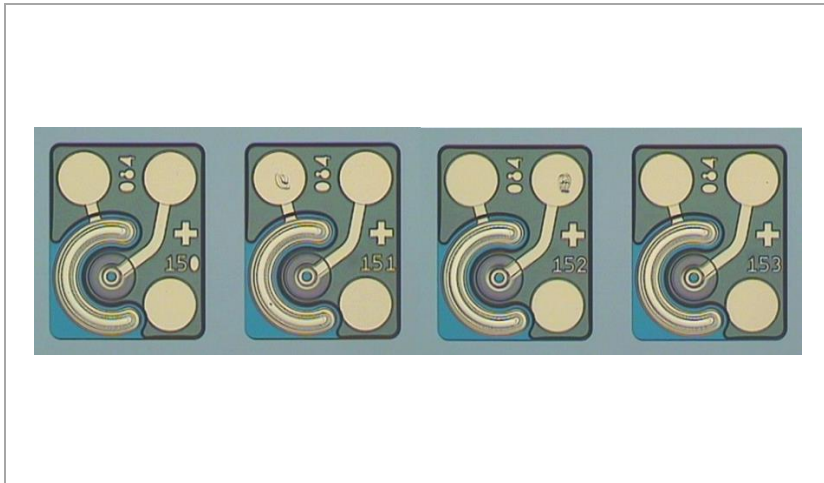



850nm 10Gb/s Multimode Dual Top Contact VCSEL Array

APA4301010002, APA4301040002, APA4301120002



Features:

- 850nm multimode emission
- Low spectral width
- Low threshold and operation current
- High reliability
- High humidity robustness compliant with GR468
- Low electrical parasitics
- Data rates from DC to 10 Gb/s
- Dual top contact configuration with common cathode electrodes
- Available as single chip, 4 and 12 channel array
- RoHS compliant 

Applications

- Single channel and parallel fiber optical communication links at 10Gb/s up to 300m.
- Smart cables, HDMI

Shipment packaging options:

- Diced wafer on UV tape on metal lead frame
- Grip ring
- Gel-Pak

Electro-Optical Characteristics

T=25°C unless otherwise noted

Parameter	Symbol	Conditions	Ratings			Unit
			Min	Typ	Max	
Threshold current	I_{th}			0.8	1.1	mA
Slope efficiency	η	$I=4mA$	0.34	0.43	0.52	mW/mA
Optical output power	P_{out}	$I_{op}=5mA$	1.4	1.8	2.2	mW
Operating voltage	U_{op}	$I_{op}=5mA$		1.9	2.1	V
Differential resistance	R_d	$I_{op}=5mA$	45	60	75	Ω
Emission wavelength	λ	$I_{op}=5mA, T=-10^{\circ}C - 85^{\circ}C$	840	850	860	nm
Spectral width, RMS	$\Delta\lambda$	$I_{op}=5mA, T=-10^{\circ}C - 85^{\circ}C$			0.4	nm
Modulation bandwidth	f_{3dB}	$I_{op}=5mA$	9			GHz
Rise time	t_r	$I_{op}=5mA, ER=5dB, 20\% - 80\%$		30	35	ps
Fall time	t_f	$I_{op}=5mA, ER=5dB, 20\% - 80\%$		40	45	ps
Capacitance	C	$I_{op}=5mA$		0.2	0.3	pF
Beam divergence	Θ	$I_{op}=5mA, Full\ width\ 1/e^2$		24	30	$^{\circ}$
Relative Intensity Noise	RIN(OMA)	$I_{op} = 5mA, ER=5dB, 7.7GHz\ bandwidth$			-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	$\delta\lambda/\delta T$		0.06		nm/K
Slope efficiency variation 25°C - 85°C	$\Delta\eta_T$	-0.5	-0.3	-0.1	%/K
Thermal impedance	Z_{th}		3.0		K/mW

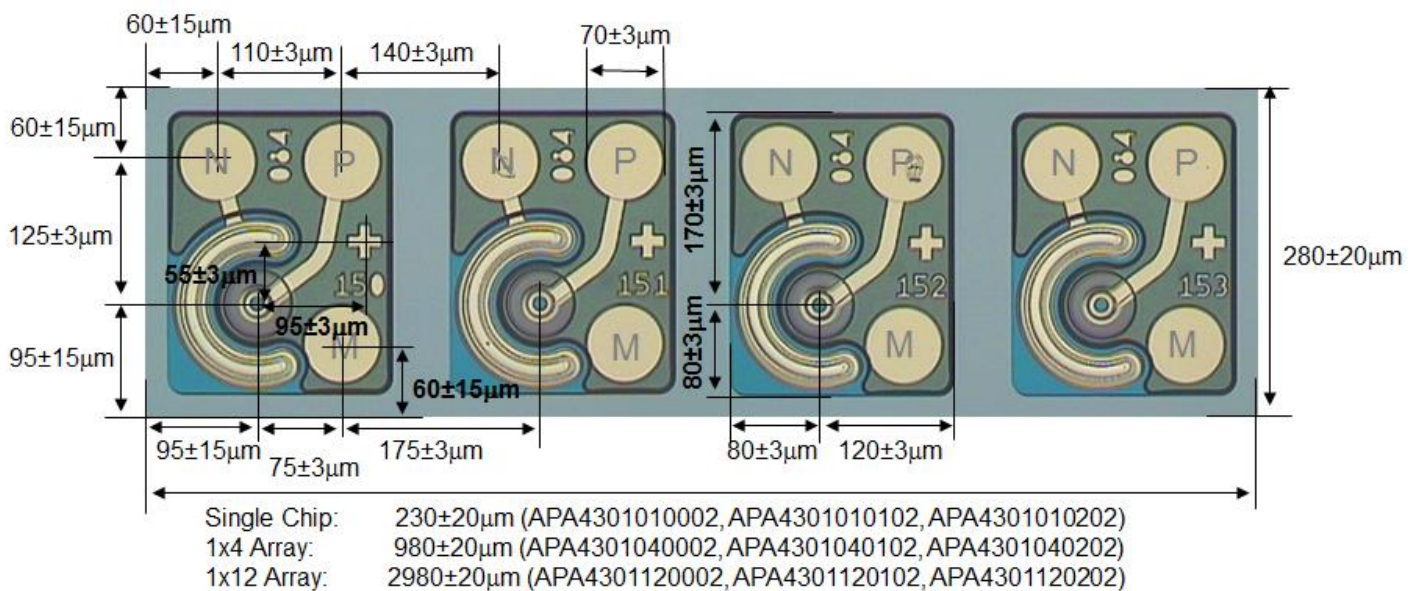
Absolute Maximum Ratings

Parameter	Rating	Unit
Optical output power	8	mW
Peak forward current (max. 10sec)	12	mA
VCSEL reverse voltage	5	V
Operating temperature	-10 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, APA4301010002, APA4301010102, APA4301010202	210	230	250	µm
Die length, APA4301040002, APA4301040102, APA4301040202	960	980	1000	µm
Die length, APA4301120002, APA4301120102, APA4301120202	2960	2980	3000	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

RoHS Compliance



II-VI Laser Enterprise 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
APA4301010002	10Gb/s	850nm 10G MM DTC VCSEL chip	Diced wafer on metal lead frame ⁽¹⁾
APA4301040002	10Gb/s	850nm 10G MM 1x4 DTC VCSEL array	Diced wafer on metal lead frame ⁽¹⁾
APA4301120002	10Gb/s	850nm 10G MM 1x12 DTC VCSEL array	Diced wafer on metal lead frame ⁽¹⁾
APA4301010102	10Gb/s	850nm 10G MM DTC VCSEL chip	Grip ring ⁽²⁾
APA4301040102	10Gb/s	850nm 10G MM 1x4 DTC VCSEL array	Grip ring ⁽²⁾
APA4301120102	10Gb/s	850nm 10G MM 1x12 DTC VCSEL array	Grip ring ⁽²⁾
APA4301010202	10Gb/s	850nm 10G MM DTC VCSEL chip	Gel-Pak ⁽³⁾
APA4301040202	10Gb/s	850nm 10G MM 1x4 DTC VCSEL array	Gel-Pak ⁽³⁾
APA4301120202	10Gb/s	850nm 10G MM 1x12 DTC VCSEL array	Gel-Pak ⁽³⁾

- ⁽¹⁾ Full diced 3" wafer on UV tape on metal lead frame Ø 230mm, electronic wafermap provided (standard high volume)
- ⁽²⁾ Known Good Dies on UV tape on grip ring Ø 150mm (medium volume)
- ⁽³⁾ Known Good Dies in 2" Gel-Pak (low volume)

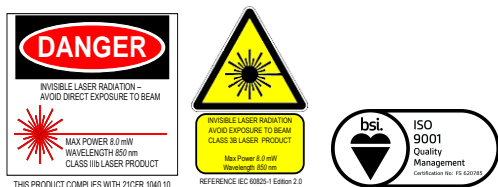
Contact Information

www.laserenterprise.com

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 Laser Enterprise before they become applicable to any particular order or contract. In accordance with the II-VI Laser Enterprise policy of continuous improvement specifications may change without notice. Further details are available from any II-VI Laser Enterprise sales representative.

Safety Labels



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