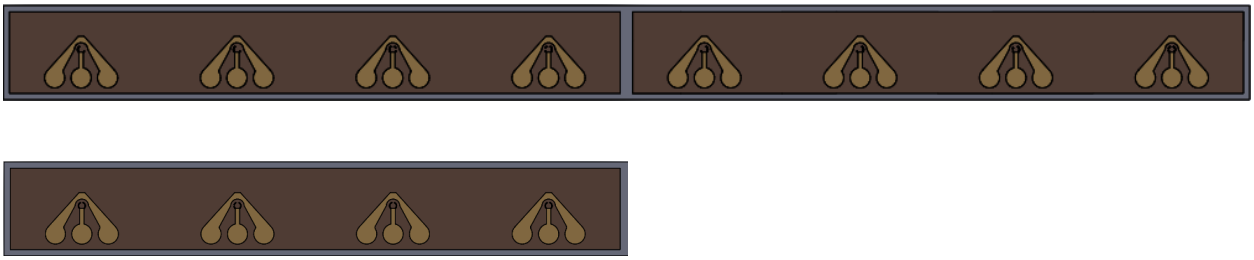
Optoelectronic Devices

100 Gbps PAM4 1x8/1x4 500 µm PITCH PIN PHOTODIODE ARRAY CHIP

INP05KK82D101
INP05KK42D101



FEATURES

- Top-illuminated device with optical illumination aperture diameter of 20 µm
- Both P and N pads on top for easy of assembly
- Die-level self-hermetic
- Responds to 1260 nm to 1620 nm
- Typical responsivity at 1310 nm is 0.8 A/W
- Low capacitance of 80 fF
- Low dark current and high reliability
- Operating temperature -40 °C to 85 °C
- RoHS compliant

APPLICATIONS

- 50G(NRZ)/100G (PAM4) Ethernet
- Single-mode datacom and telecom
- Fiber-optic transceiver, receivers and transponders

SHIPPING REQUIREMENTS

- Tested and inspected chips on UV tape with grip ring Ø 150 mm

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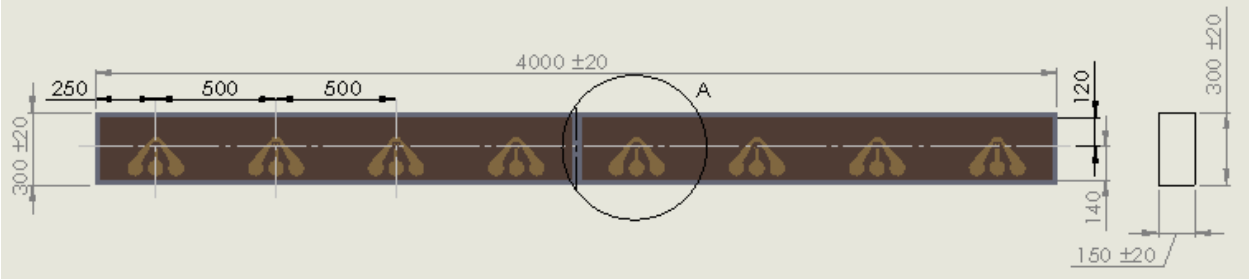
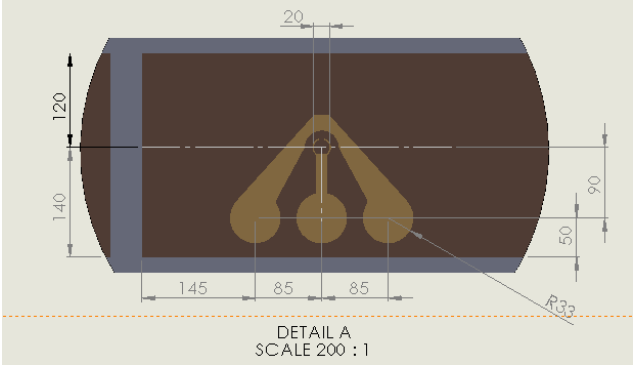
Specifications

Electro-Optical Characteristics	Symbol	Condition	Min.	Typical	Max.
Responsivity (A/W)	R	1310 nm, V_R = 2.5 V, 25 °C	0.8		
Dark Current (nA)	Id	V_R = 5 V, 25 °C			1
Capacitance (fF)	C	V_R = 2.5 V, 25 °C		80	
O/E Bandwidth (GHz)	f-3dB	V_R = 2.5 V, 25 °C (measured with TIA)		28	
Absolute Maximum Ratings	**Symbol**	**Rating**			
Reverse Bias Voltage (V)	Vr	20			
Reverse Current (mA)	Ir	10			
Forward Current (mA)	If	10			
Optical Input Power (dBm)	P_{in}	10			
Environmental Exposure Ratings	**Symbol**	**Rating**			
Operating Temperature (°C)	Top	-40 to 85			
Storage Temperature (°C)	Tstg	-40 to 120			
ESD Threshold (HBM) (V)	$V_{ESD\ th}$	>50			

Mechanical Specifications

1x8 Array Chip Dimensions





Parameter	Min.	Nominal	Max.
Chip Width (µm)	280	300	320
Chip Length (µm)	3980	4000	4020
Array Pitch (µm)		500	
Chip Thickness (µm)	130	150	170
Bond Pad Diameter (µm)		65	

Note:
(1) All units in micrometers.
(2) Wire bond pad size: 65 µm in diameter.
(3) Top metal surface for wire bonding: 1.0 microns Au.
(4) Rear surface finishing: lapping without polishing.
(5) Chip nominal or on-mask size: 300 µm x 4000 µm, actual size centered at ~290 µm x 3990 µm after dicing with a dicing kerf width ~10 µm.
(6) Chip size not measured and the provided dimensioning in drawing only for reference.

Mechanical Specifications

1x4 Array Chip Dimensions

Parameter	Min.	Nominal	Max.
Chip Width (µm)	280	300	320
Chip Length (µm)	1980	2000	2020
Array Pitch (µm)		500	
Chip Thickness (µm)	130	150	170
Bond Pad Diameter (µm)		65	

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

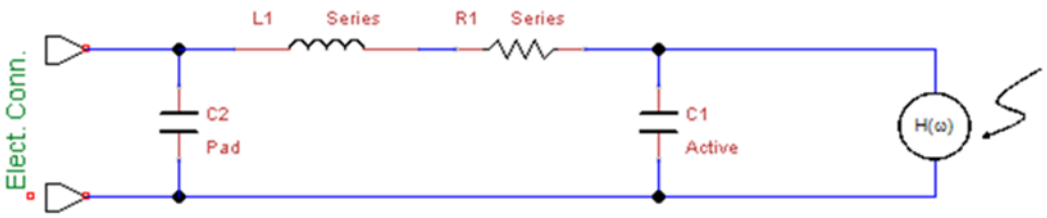
Product Code	Wavelength	Description	Shipment Packaging
INP05KK82D101	1250 to 1650 nm	1x8 PD Array Die	Chips on Grip ring [1]
INP05KK42D101	1250 to 1650 nm	1x4 PD Array Die	Chips on Grip ring [1]

[1] Tested and inspected chips on UV tape on grip ring Ø 150mm (standard high volume).

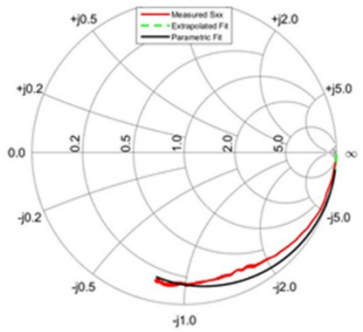
Important Notice

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.

Appendix: Small Signal Equivalent Circuit Model



Typical S22-Smith Chart



Extracted Typical Parameters from S22

PD Parameter	Symbol	Min.	Typ.	Max.
Pad Capacitance (fF)	C2		20	
Junction Capacitance (fF)	C1		60	
Series Resistance (Ohms)	R1		10	
Series Inductance (pH)	L1		70	

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