General Specification
of
High Linearity Coaxial PIN Photodiode

PDCS985 Series

DC ~ 2000MHz

Applications for:

- CATV Receivers
- Fiber Sensors

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1. Scope

These specifications are applied for PDCS985 Series.

2. General Instruction

PDCS985 Series are Plane structure InGaAs PIN photodiode modules designed for fiber optic CATV receiver and other high-speed analog receiver. These modules have low inter-modulation distortion low dark current and high responsivity at 1310nm and 1550nm, and are ideally suitable for wide frequency range receiver up to 880MHz.

A photodiode is mounted into a low capacitance coaxial package integrated with a single mode fiber pigtail. The module can be produced with a variety of industry standard connector, and also be available with a horizontal mounting bracket.

3. Package Dimension and Pin Assignment

(See attached appendix.)

4. Absolute Maximum Ratings (Tc=+25 °C, unless otherwise noted.)

Parameter	Symbol	Ratings	Unit
Storage Temperature	Tstg	-40~+85	°C
Operating Case Temperature	Top	-40~+85	°C
Reverse Voltage	Vr	15	V
Reverse Current	Ir	5	mA
Forward Current	If	50	mA
Soldering Temperature (@5.5 sec)	Stemp	250	°C
Soldering Time	St	5.5	S
Optical Input Power	Pi	3	mW
Tensile Strength	Ts	5	N

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5. Electrical and Optical Characteristics

(Vr=15V, Tc=+25 °C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Type	Max	Units
Response Wavelength	λ		1100		1650	nm
Responsivity	R1310	λ = 1310	0.85/0.90			A/W
	R1550	λ = 1550	0.90			A/W
Second Order Inter-Modulation Distortion	IM2	λ =1310(*1)			-70	dBc
		λ =1550(*1)			-70	dBc
Third Order Inter-Modulation Distortion	IM3	λ =1310(*1)			-80	dBc
		λ =1550(*1)			-80	dBc
Optical Return Loss	RL	λ =1310			-40	dB
		λ =1550			-40	dB
Capacitance	C	Vr = 5V, f = 1MHz (*2)			0.5	pF
Dark Current	Id				1	nA
		Tc=85 °C			80	nA
Bandwidth	BW	-3dB point, RL=50Ω, at 1310nm	1.5	2		GHz
		-3dB point, RL=50Ω, at 1550nm	1.5	2		GHz
Operating Voltage	Vcc		-20	-15	-5	V

Note: 1. Two tone two laser test (55MHz, 505MHz), OMI=40%, 0.5mW per laser,
IMD2: 55MHz + 505MHz; IMD3: 505MHz – 2 x 55MHz

2. Measured at anode-cathode, case open and not grounded.

6. Specifications for Fiber Pigtail

Parameter	Min.	Typ.	Max.	Unit
Type		Single Mode		
Fiber Color		Yellow		
Mode Field Diameter at 1310nm	8.5	9.0	10.5	μm
Cladding Diameter	122	125	128	μm
Outer Jacket Diameter	0.8	0.9	1.0	mm
Bending Radius	30			mm
Fiber Length	1.15	1.20	1.25	m

7. Ordering Information

Part Number	Responsivity	Connector Type	Flange Type (Hole Pitch)
PDCS985-NCH	0.85A/W	SC/SPC	Horizontal (13.4mm)
PDCS985-NQH		SC/APC	
PDCS985-NSH		*SSC/SPC	
PDCS985-HCH	0.90A/W	SC/SPC	
PDCS985-HQH		SC/APC	
PDCS985-HSH		*SSC/SPC	

* SSC: *Simplified SC (HIROSE ELECTRIC HSC2-FK-A1255)*

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8. Precautions

(1) The modules should be handled in the same manner as ordinary semiconductor devices to prevent the electro-static damages. For safety of storage and movement, the modules should be packaged with ESD proof material. To assemble the modules on PCB, the workbench, the soldering iron and the human body should be grounded.

(2) The stress to the fiber pigtail may cause the damage on the performance. The fiber pigtail may snap off by dropping the module.

(3) Please pay special attention to the atmosphere condition because the dew on the module may cause some electrical damages.

(4) Under such a strong vibration environment as in automobile, the performance and reliability are not guaranteed.

9. Reliability Report (Example for Reference)

Test	Qualification	Conditions	Sample	Test Result
Mechanical Shock	MIL-STD_883D Method: 2002.3	Condition B 1500G, 0.5ms, 5 times/axis	11	Passed
Vibration	MIL-STD_883D Method: 2007.2	Condition A 20G, 20-2000Hz, 4 minutes/cycle	11	Passed
Temperature Cycling	BELLCORETR-NWT-000468	-40°C to +85°C, 100 cycles	11	Passed
Anti-Damp Cycling	MIL-STD_883D Method: 1004	Operating voltage 65°C, 100%RH, 10°C, 65°C, -10°C, 10 times	11	Passed
Low Temperature Storage	BELLCORETR-NWT-000468	-40 °C, 2000 hrs	11	Passed
High Temperature. Aging	BELLCORETR-NWT-000468	85 °C, 5000hrs	11	Passed
Fiber Pull	The Same Production of **Corning** Standard	500G, 3 times, 10 sec	11	Passed

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10. PDCS985 (PIN Chip-Level) FITs

PARAMETER	MEASURED VALUE		
Median Life (ML)@35 °C	Years		68
Standard Deviation (σ)			0.65
Maximum Wear-Out Failure Rate (λmax)	FITS	@65 °C	210
		@35 °C	32
Wear-Out Activation Energy (Ea)			0.60
Random Failure Rate (λR)	FITS	@65 °C	180
		@35 °C	39
Random Failure Activation Energy (Ea)	EV		0.40

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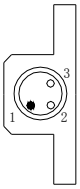
11. Appendix

P/N: PDCS985 --- ☐ ☐ ☐

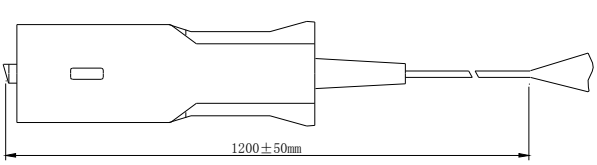
Code	Responsivity
N	0.85A/W
H	0.90A/W

Code	Connector type
C	SC/SPC
Q	SC/APC
S	SSC/SPC

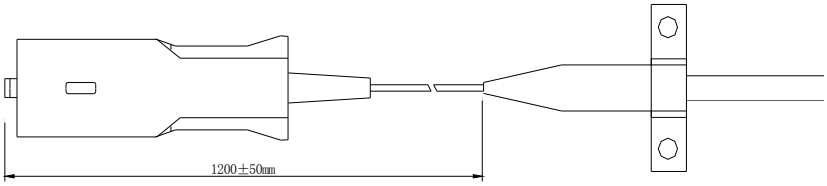
Code	Flange type
H	Horizontal



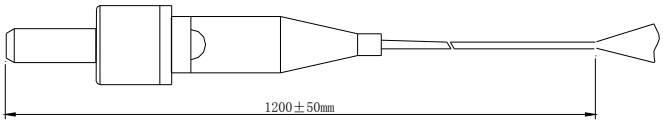
Pin No.	Pin function
1	CASE
2	PD Cathode
3	PD Anode



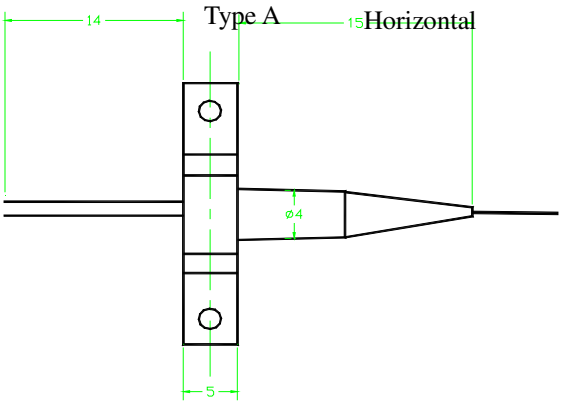
SC/APC connector
Return loss: >60dB

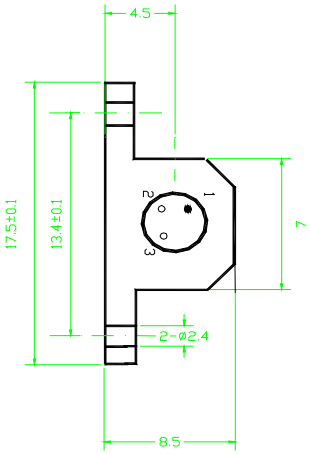


SC/SPC connector
Return loss: >40dB



SSC/SPC connector
Return loss: >40dB





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12. Test Report

PERFORMANCE TEST RESULTS

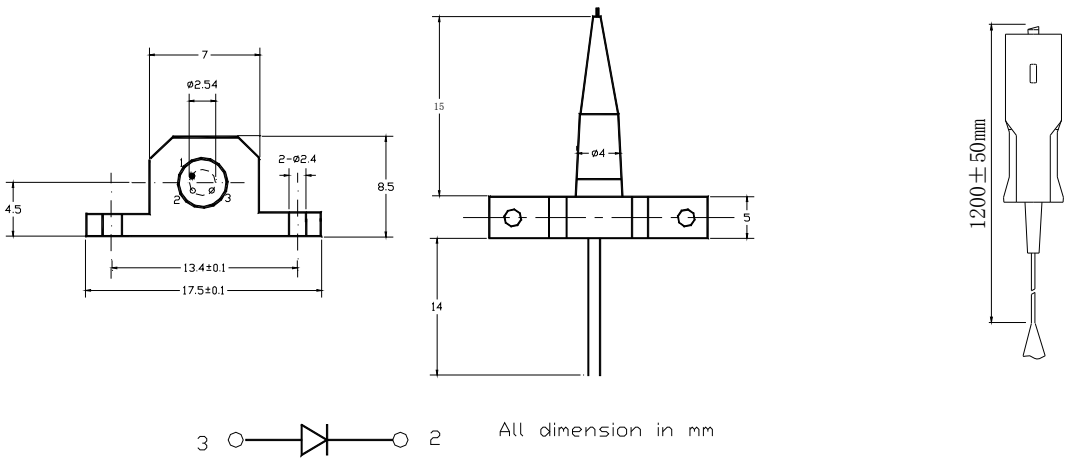
TYPE: Mini-Coaxial PIN Photodetector

Part No: PDCS985-xxx

Specifications

Parameters	Conditions	Result	Unit
Capacitance	@-15V bias	≤ 0.5	pF
Dark Current	@-15V bias	< 1	nA
Response Wavelength	@-15V bias	1100 ~ 1650	nm
Bandwidth (-3dB)		1.5	GHz
Operating Voltage		-15	V
Operating Temperature		-40 ~ +85	°C

Spec. / S/N.	Fiber length 1200 ± 50mm	R(A/W) > 0.85	RL(dB) > 40	CSO(dB) < -70	CTB(dB) < -80



Absolute Maximum Ratings

Input optical power	3	mW
Reverse detector bias voltage	-20	V
Lead Soldering Temperature	250	°C
Lead Soldering Duration	5.5	S

DOCUMENTATION CERTIFIED BY _____ Date: _____

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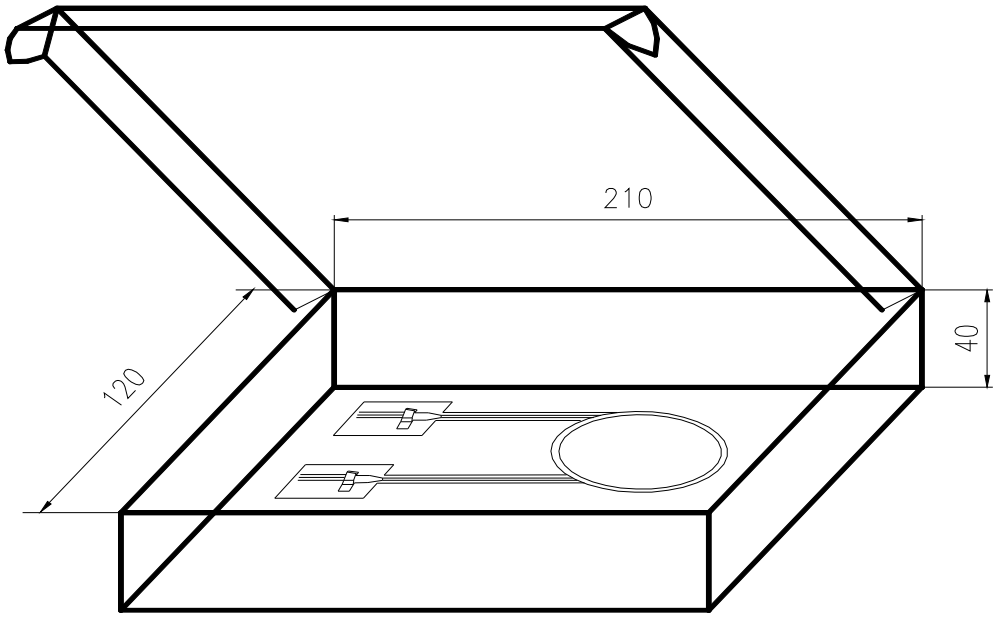
13. Packaging Style



Name	**Pin packing box**		
Filling Material	**Anti-static sponge**		
Dimension	**210 x 120 x 40 (L x W x H)**		
Quantity	**2pcs/Box**		
Picture Code	**RCPKG01**	**Version**	**A**

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