PDCS60T-USB

HIGH SPEED INGAAS/INP DUAL WAVELENGTH PIN PHOTO DIODE CHIP

TOP ILLUMINATED

SPECIFICATION SHEET
REV 0.1

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A. DESCRIPTION

The PDCS60T-USB is an InGaAs/InP high speed, dual wavelength photodiode chip that combines a large aperture with a high speed of response and allows operation at both 850 and 1310 nm wavelengths. The top-illuminated p-i-n photodiode structure has a 60 um optical aperture allowing easy alignment to single mode as well as multimode fibers. Despite the large aperture, the photodiode has a low capacitance and can be used for applications up to 10 Gb/s. The photodiode is manufactured with a dual wavelength AR coating, offering an excellent responsivity at both 850 nm and 1310 nm and is therefore highly suitable for usage in optical USB interfaces. The chip is available with a pad metallization optimized for wire-bonding.

B. ABSOLUTE MAXIMUM RATINGS

Stresses beyond the absolute maximum ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Parameter	Symbol	Cond.	Unit	Min	Max
Reverse voltage	U_R		V		25
Forward current	I_F		mA		10
Forward voltage	U_F		V		1.5
Optical input power	P_{max}		dBm		10
Storage temperature	T_{stg}		°C	-40	125
Operating temperature	T_{op}		°C	-40	85
Storage humidity (no condensation)			% r.h.		85
Soldering process temperature	T_{so}	60s	°C		320
Process temperature	T_p	24h	°C		150

Notes:

- Avoid ESD , the device may be permanently damaged

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C. CHARACTERISTICS (T = 25°C)

Parameter (Condition)		Symbol	U_R	Unit	Min	Typ	Max
Diameter of light sensitive area		Ø		µm	58	60	
Responsivity	λ = 850nm	R	2.5	A/W	0.46		
Responsivity	λ = 1310 nm	R	2.5	A/W	0.75	0.85	
Surface reflectivity	λ = 850 nm	R_S		%		4	6
Surface reflectivity	λ = 1310 nm	R_S		%		4	6
Dark current	T = 25°C T = 65°C	I_D	5	nA		2	10 100
Temperature coefficient of dark current		dI_D/T	5	%/K		5	
Rise- / fall time (10% -90%, R_L = 50 Ω)		$T_{r,f}$	2.5	ps		40	45
O/E bandwidth		B	2.5	GHz	8		
Total capacitance		C	2.5	fF			250
Isolation resistance (contact side-backside)		R_I		GΩ	0.1		
Linearity [1]		CSO CTB	10	dBc			-70 -75

1. Pf1 = -3 dBm, Pf2 = -3dBm, f1 = 47 MHz, f2 = 199 MHz, modulation index 40%

D. CHIP DIMENSIONS

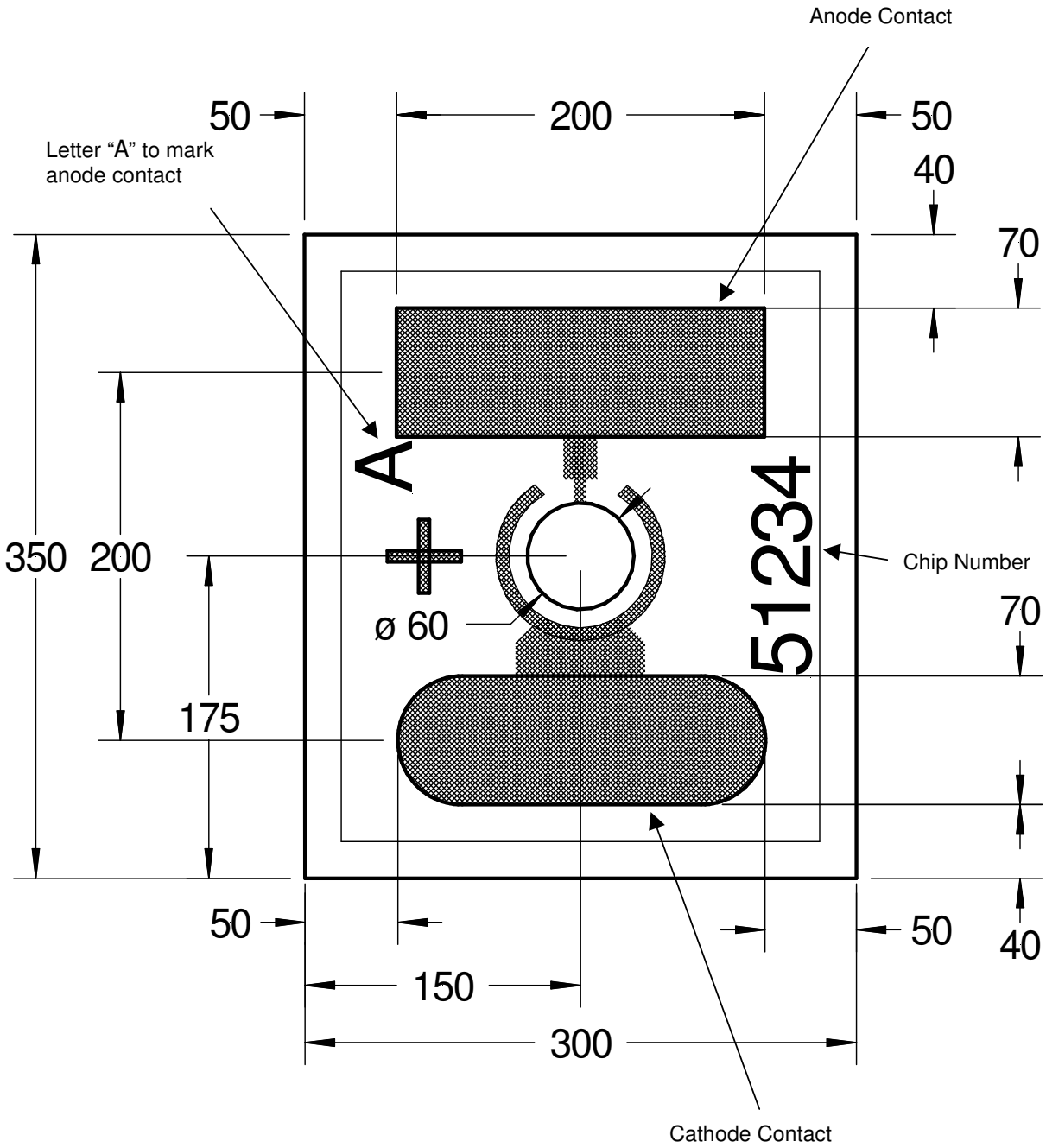
Parameter	Symbol	Unit	Min	Typ	Max
Number of pin photodiode elements	N			1	
Chip length	l	µm	340	350	360
Chip width	w	µm	290	300	310
Chip thickness	t	µm	145	150	155
Pad geometry			see layout		
Alignment features			see layout		

E. TEST PROCEDURE

Dark current, forward current and capacitance will be tested on 100% of the devices. Furthermore, all devices will undergo visual inspection. Parts that fail one test or more will be inked. Responsivity is tested at both 850 nm and 1310 nm on at least 50 samples each. Finally, a total of 24 samples will be tested for wire bond adhesion.

F. CHIP LAYOUT

Top view: all units in micrometer



G. ORDERING INFORMATION

Please use the following code system to order products from Albis Optoelectronics:

P	D	1	0	F	1	-	T	7	W

H. REVISIONS HISTORY

Rev.	Description	ECN Number	Date (ECN)	Released
0.1	Draft			2008-05-19
0.2	Test procedure added			2008-05-22

Confidentiality: **Confidential**