

IPD12_C15Z: 15 GHz PIN Diode Chip

Applications

The series IPD12 PINs are applicable for building up high bit rate (10 Gbit/s NRZ and RZ) opto-electronic receivers for SONET/SDH and Ethernet applications.

Features

- High bandwidth of 15 GHz (-3 dB)
- High optical input power (+6 dBm)
- High linear phase characteristic
- Low bias voltage (< 6 V)
- Low leakage current
- On-chip biasing: IPD12_C15B
- External biasing: IPD12_C15N
- Customized layouts possible

Optical / Electrical Parameters

Parameter	Symbol	Min	Typ	Max	Unit	Remarks
Optical Wavelength	λ	1520		1620	nm	typ. 1550 nm
Optical Input Power	$P_{o,in}$			6	dBm	@ 1 dB compression
Polarization Dependence				± 0.1	dB	
Responsivity	R	0.65			A/W	@ B = 15 GHz ¹⁾
Small Signal Bandwidth	B		15	20	GHz	f_{3dB}
Lower Frequency Limit	f_{cl}	1	2		GHz	²⁾
Group Delay Time Variations	τ_{grp}		± 4	± 5	ps	
Bias Voltage ⁴⁾	V_{pin}	-5	-5.5	-6 ³⁾	V	
Leakage Current	I_{rev}		10	100	nA	@ $V_{pin} = -5.5$ V

1) and 1550 nm optical wavelength

2) external blocking capacitor enables lower frequency limits down to 100 kHz

3) this is the maximum bias voltage to achieve the desired responsivity, see also Maximum Ratings

4) on-chip IPD12_C15B biasing or external biasing IPD12_C15N

Optical / Electrical Maximum Ratings

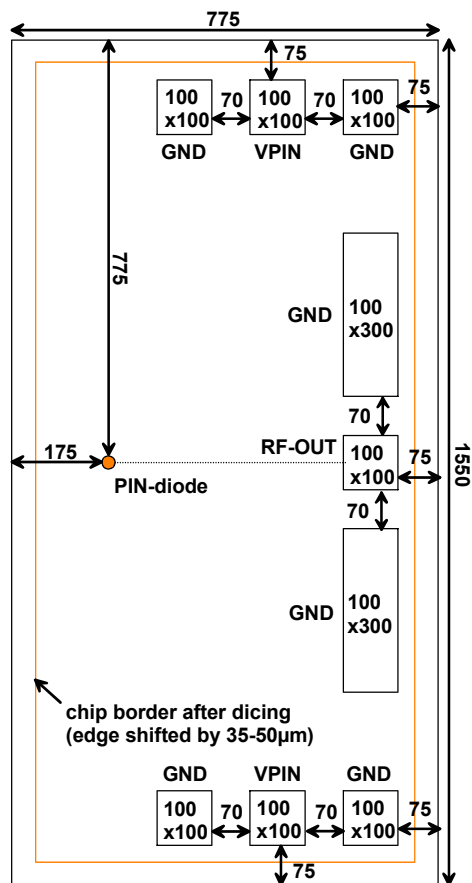
Parameter	Symbol	Min	Max	Unit	Remarks
Maximum Optical Input Power	$P_{o,max}$		10	dBm	
Maximum Reverse Voltage	$V_{r,max}$	10		V	
Maximum Forward Current	$I_{f,max}$		2	mA	
Storage Temperatures	t_{st}	-10	+80	°C	
Operating Temperatures	t_{op}	0	+80	°C	+150 °C short term
Peak Temperature (unbiased)	t_{pe}		+300	°C	30 sec.
Humidity		5	65	% r.h.	

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Mechanical Parameters

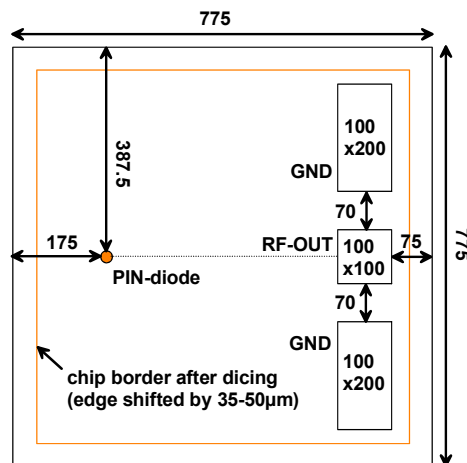
Parameter	Typ.	Unit	Remarks
Chip size: IPD12_C15B IPD12_C15N	775 x 1550 775 x 775	µm	changes after dicing ¹⁾
Thickness	500	µm	
Pad sizes: IPD12_C15B IPD12_C15N	100 x 100	µm	300 x 100 for RF-OUT GND 200 x 100 for RF-OUT GND
Active Optical Region Radius	6	µm	

1) absolute chip size varies within ± 100 µm, rf-out pads are always as close as possible to edge of chip



IPD12_C15B

note: all coordinates are center-coordinates relative to the center of the PIN diode (all coordinates in µm)



IPD12_C15N

note: all coordinates are center-coordinates relative to the center of the PIN diode (all coordinates in µm)

Small signal models for the description of the PIN diode frequency behaviour are available on request.

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