Obsolete Product – not recommended for new design

LX3055

Coplanar InGaAs/InP PIN Photo Diode

PRODUCTION DATA SHEET

DESCRIPTION

Microsemi's InGaAs/InP PIN Photo Diode chips are ideal for high bandwidth 1310nm and 1550nm optical networking applications.

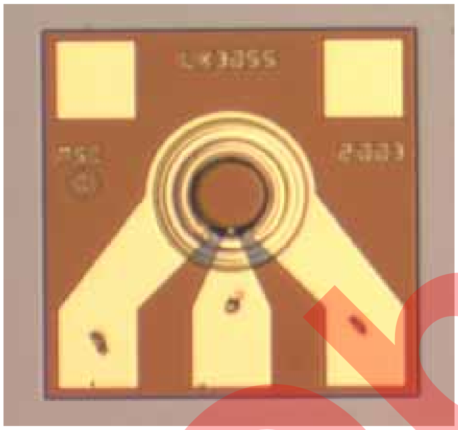
The device series offers high responsivity, low dark current, and high bandwidth for high performance and low sensitivity receiver design.

The LX3055 4 Gbps coplanar waveguide photodiode is currently offered in die form allowing manufacturers the versatility of custom assembly configurations including traditional wirebond or flip chip assembly

This device is ideal for manufacturers of optical receivers, transponders, optical transmission modules and combination PIN photo diode – transimpedance amplifier.

IMPORTANT: For the most current data, consult *MICROSEMI*'s website: http://www.microsemi.com

PRODUCT HIGHLIGHT



- Coplanar Design (gnd-signal-gnd) 50Ω characteristic impedance
- 125µm standard pad pitch for ease of test
- Large 75µm x 75µm pad size for ease of packaging
- Wire bond or Flip Chip capability

KEY FEATURES

- LX3055 single die
- Coplanar Waveguide , 50Ω
- High Responsivity
- Low Dark Current
- High Bandwidth
- Anode/Cathode on Illuminated Side
- 125µm Pad pitch
- Die good for bond wire or flip chip applications

APPLICATIONS

- 4 Gigabit Fiber Channel
- 1310nm CATV Optical Applications
- SONET/SDH OC-48, ATM
- 2.5Gb/s or 3.125Gb/s Ethernet
- 1310nm VCSEL receivers
- Optical Backplane

BENEFITS

- Large wire bond contact pads
- Low contact resistance
- Wire bond or flip chip applications
- Ground- Signal-Ground pad configuration for standard RF test probes

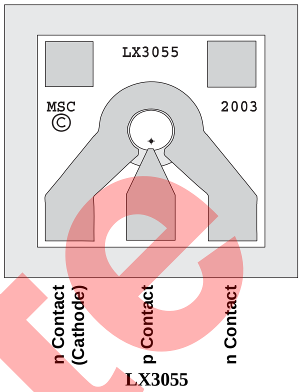
Rev. 1.1, 2005-09-15

ABSOLUTE MAXIMUM RATINGS

Operating Junction Temperature .... -20 to +85 °C
Storage Temperature Range .... -55 to +125 °C
Maximum Soldering Temperature (10 seconds maximum) .... 260 °C

Note: Exceeding these ratings could cause damage to the device.

PACKAGE PIN OUT



ELECTRICAL CHARACTERISTICS

Test conditions: $T_A = 25°C$, $V_R = 2V$

Parameter	Symbol	Test Conditions	LX3055			Units
			Min	Typ	Max	
ELECTRICAL CHARACTERISTICS						
Active Area Diameter				60		µm
Responsivity [1]	*R*	VR = 2V, λ = 1550nm	0.85	1.0		A/W
		VR = 2V, λ = 1310nm	0.80	0.90		
Dark Current	I_D	VR = 5V		0.6	6	nA
Breakdown Voltage	BV_R	IR = 10µA	30	44		V
Capacitance	C	VR = 2V		0.35	0.40	pF
Bandwidth [2]	BW	VR = 2V, λ = 1550nm @ - 3dB	6.5	8		GHz

Note: 1. Antireflective coating is ¼ wavelength @ 1430nm covering 1310 and 1550nm applications
2. Bandwidth is measured @ -3dB electrical power (photocurrent drops to 71% of DC value)

APPLICATION CIRCUITS

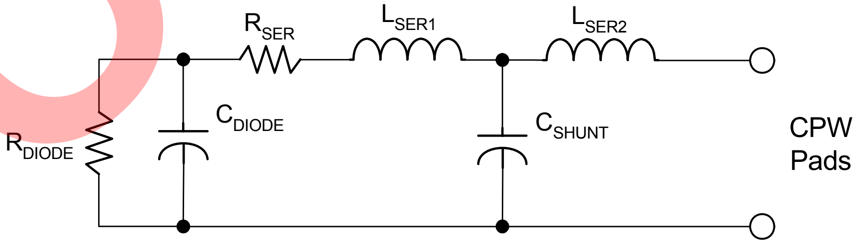
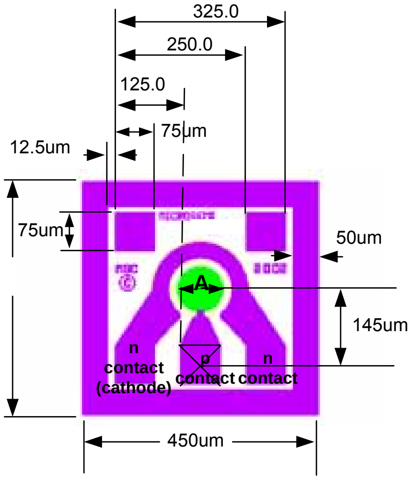
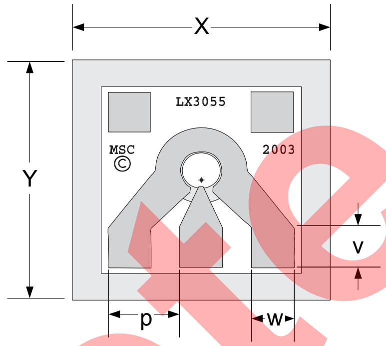


Figure x – Typical VRM Application

Results	RSET (Ohm)	LSER1 (pH)	LSER2 (pH)	CSHUNT (fF)	CDIODE (fF)	RDIODE (M Ohm)
LX3055	20.1	1.6	1.5	7.1	311	730

SPARE TABLE



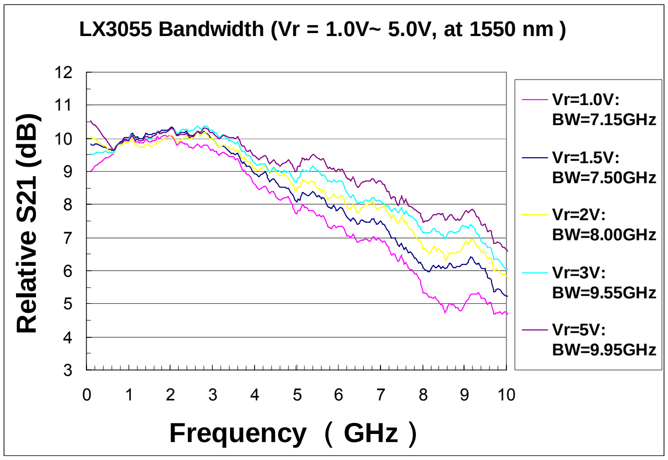


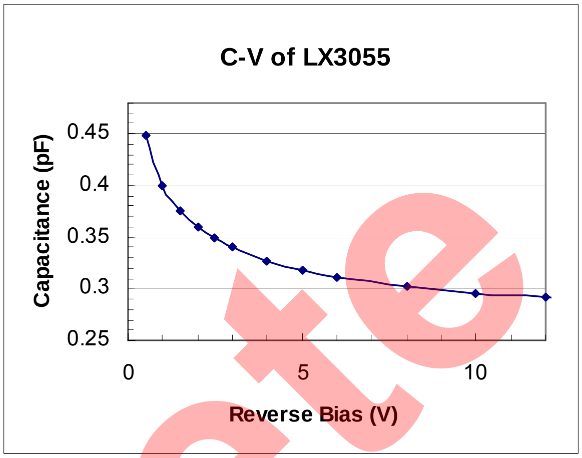
Active Area, µm (A)	Die Dimension, µm		Pad Dimension, µm		Pad Pitch, µm (p)	Die thickness, µm
	Y	X	w	v		
60	450	450	75	75	125	152

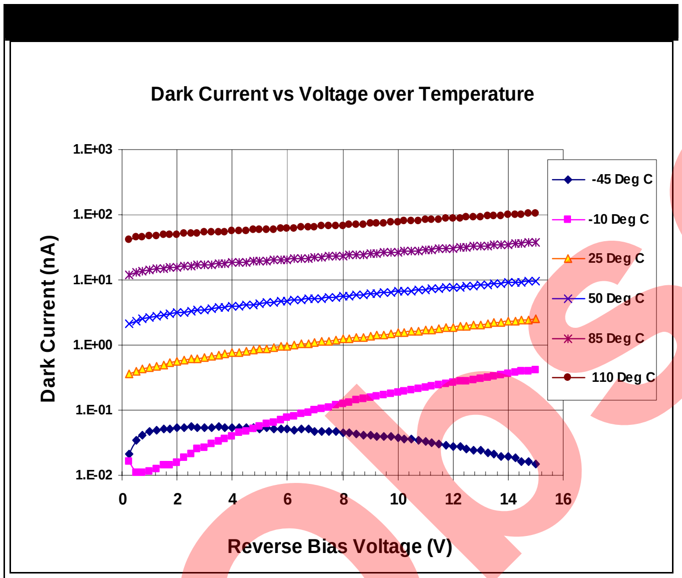
NOTES

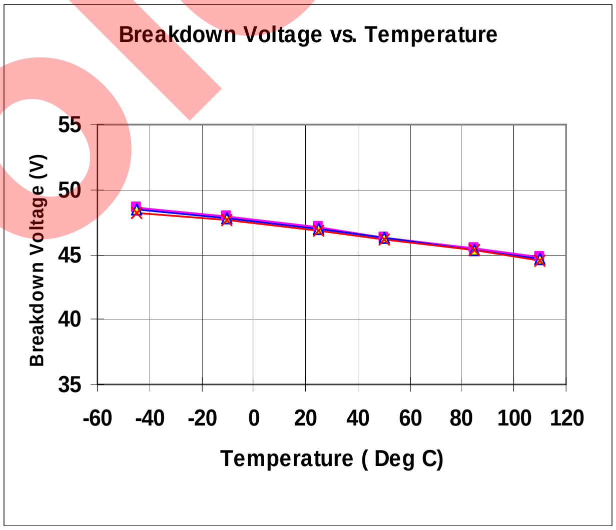
PRECAUTIONS FOR USE

ESD protection is important. Standard ESD protection procedures should be employed whenever handling InGaAs PIN photo diode.


LX3055 Bandwidth (Vr = 1.0V~ 5.0V, at 1550 nm)
Relative S21 (dB)
12
11
10
9
8
7
6
5
4
3
0
1
2
3
4
5
6
7
8
9
10
Frequency (GHz)
Vr=1.0V: BW=7.15GHz
Vr=1.5V: BW=7.50GHz
Vr=2V: BW=8.00GHz
Vr=3V: BW=9.55GHz
Vr=5V: BW=9.95GHz


C-V of LX3055
Capacitance (pF)
0.45
0.4
0.35
0.3
0.25
0
5
10
Reverse Bias (V)


Dark Current vs Voltage over Temperature
Dark Current (nA)
1.E+03
1.E+02
1.E+01
1.E+00
1.E-01
1.E-02
0
2
4
6
8
10
12
14
16
Reverse Bias Voltage (V)
-45 Deg C
-10 Deg C
25 Deg C
50 Deg C
85 Deg C
110 Deg C


Breakdown Voltage vs. Temperature
Breakdown Voltage (V)
55
50
45
40
35
-60
-40
-20
0
20
40
60
80
100
120
Temperature (Deg C)