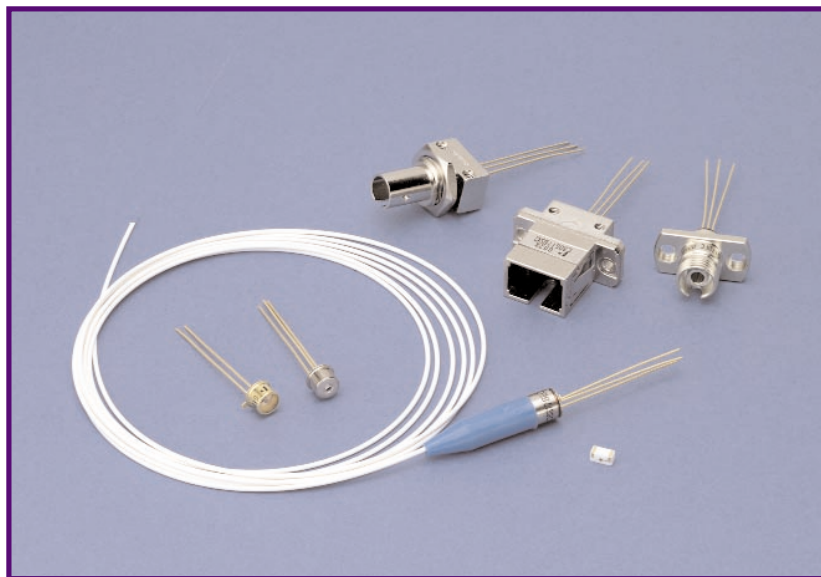


High-Speed InGaAs PIN C30616, C30637, C30617, C30618 InGaAs PIN Photodiodes



Description

These high-speed InGaAs photodiodes are designed for use in OEM fiber-optic communications systems and high-speed receiver applications including trunk line, LAN, fiber-in-the-loop and data communications. Ceramic submount packages are available for easy integration into high-speed SONET, FDDI, datalink receiver modules, or as back-facet power monitors in laser diode modules. Available in hermetic TO-18 packages, fibered packages, or in connectorized receptacle packages with industry standard ST, FC or SC connectors, these photodiodes are designed to function with either single or multimode fibers. Receptacle and fibered packages use a ball-lens TO-18 package to maximize coupling efficiency. All devices are planar passivated and feature proven high reliability mounting and contacting.

An MTTF of $>10^9$ hours (approximately 105 years) at 50°C has been demonstrated to date from standard production samples.

Certified to meet ISO 9001, PerkinElmer Optoelectronics is committed to supplying the highest quality products to our customers. This series of receiver modules comply to MIL-Q-9858A and AQAP-1 quality standards. Process control is maintained through annual requalification of production units and includes extensive electrical, thermal and mechanical stress, as well as an extended life test. Additionally, every wafer lot is individually qualified to meet responsivity, capacitance and dark current specifications. Reliability is demonstrated with an extended high temperature burn-in at 200°C for 168 hours ($V_R=10\text{V}$), ensuring an MTTF $>10^7$ hours at 50°C ($E_A=0.7\text{eV}$). Finally, all production devices are screened with a 16 hour, 200°C burn-in ($V_R=10\text{V}$) and tested to meet responsivity, spectral noise and dark current specifications.

Applications

- High-speed communications
- SONET/ATM, FDDI
- Datalinks and LANs

Features

- 50, 75, 100, 350 μm diameters
- High responsivity at 1300 and 1550 nm
- Low capacitance for high bandwidths (to 3.5 GHz)
- Available in various packages



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Specifications (at $V_R=V_{OP}$ typical), 22° C

PARAMETER	C30616			C30637			Units
	Min	Typ	Max	Min	Typ	Max	
Operating voltage	1	5	10	1	5	10	V
Breakdown voltage	25	60		25	60		V
Active diameter		50			75		μm
Responsivity at 1300 nm Ceramic (Fig. 1)	0.80	0.90		0.80	0.90		A/W
Responsivity at 1550 nm Ceramic (Fig. 1)	0.85	0.95		0.85	0.95		A/W
Dark current		<1.0	2.0		<1.0	2.0	nA
Spectral noise current (10 kHz, 1.0 Hz)		<0.02	0.15		<0.02	0.15	pA/√Hz
Capacitance at $V_R = V_{OP}$ (typ) Ceramic (Fig. 1)		0.35	0.55		0.40	0.60	pF
Rise-and-fall time (10% to 90%)		0.07	0.5		0.07	0.5	ns
Bandwidth (-3 dB, $R_L = 50\Omega$)	2.5	3.5		2.5	3.5		GHz
Available package types: See corresponding figures.	1			1			

Maximum Ratings

	Min	Typ	Max	Min	Typ	Max	Units
Maximum forward current			10			10	mA
Power dissipation			100			100	mW
Storage temperature	-60		125	-60		125	°C
Operating temperature	-40		125	-40		125	°C

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Specifications (at $V_R=V_{OP}$ typical), 22° C

PARAMETER	C30617			C30618			Units
	Min	Typ	Max	Min	Typ	Max	
Operating voltage	1	5	10	1	5	10	V
Breakdown voltage	25	60		25	60		V
Active diameter		100			350		µm
Responsivity at 1300 nm: Ceramic (Fig. 1)/ TO - 18 (Fig. 3)	0.80	0.90		0.80	0.90		A/W
Fiber (Fig. 7)/ST, FC, SC Receptacles (Fig. 4, 5 & 6) ¹	0.65	0.75		0.65	0.75		
Responsivity at 1550 nm : Ceramic (Fig.1)/TO-18 (Fig. 3)	0.85	0.95		0.85	0.95		A/W
Fiber (Fig. 7)/ST, FC, SC Receptacles (Fig. 4, 5 & 6) ¹	0.70	0.80		0.70	0.80		
Dark current		<1.0	2.0		2.0	5.0	nA
Spectral noise current (10 kHz, 1.0 Hz)		<0.02	0.15		0.02	0.20	pA/√Hz
Capacitance at $V_R = V_{OP}$ (typ) Figures 1,3,4,5,6 & 7		0.6	0.8		4.0	6.0	pF
TO-18 (Fig. 3)		0.8	1.0		4.0	6.0	pF
Rise-and-Fall time (10% to 90%)		0.07	0.5		0.5	1.0	ns
Bandwidth (-3 dB, $R_L = 50\Omega$)	2.0	3.5			0.75		GHz
Available package types: See corresponding figures	1,3,4,5,6,7			2,4,5,6			

Maximum Ratings

	Min	Typ	Max	Min	Typ	Max	Units
Maximum forward current			10			10	mA
Power dissipation			100			100	mW
Storage temperature ²	-60		125	-60		125	°C
Operating temperature ²	-40		125	-40		125	°C

Note 1. Coupled from 62.5 µm, 0.28 NA graded index multi-mode fiber using 1300 nm SLED source.
Responsivity is 10% higher with 9µm fiber.

Note 2. Maximum storage and operating temperature for connectorized and fibered devices is +85° C

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Standard Packages

Figure 1: Ceramic Submount

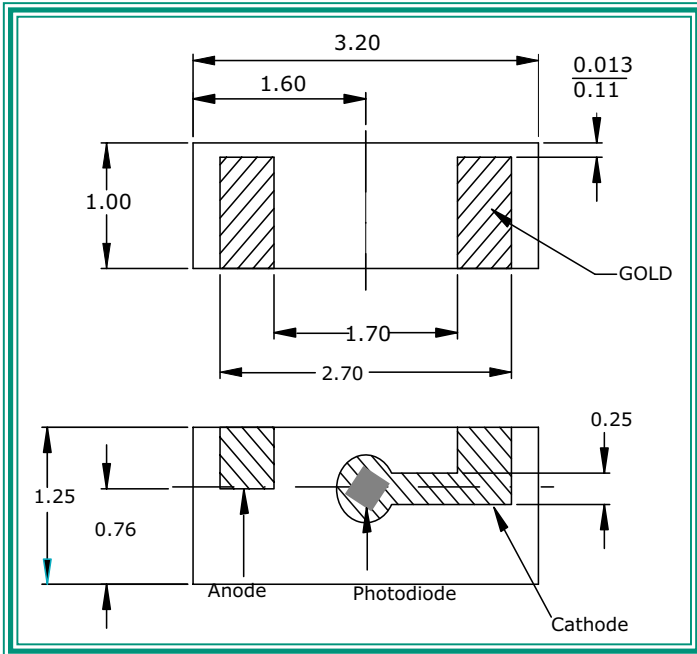


Figure 2: T0-18 Flat Window

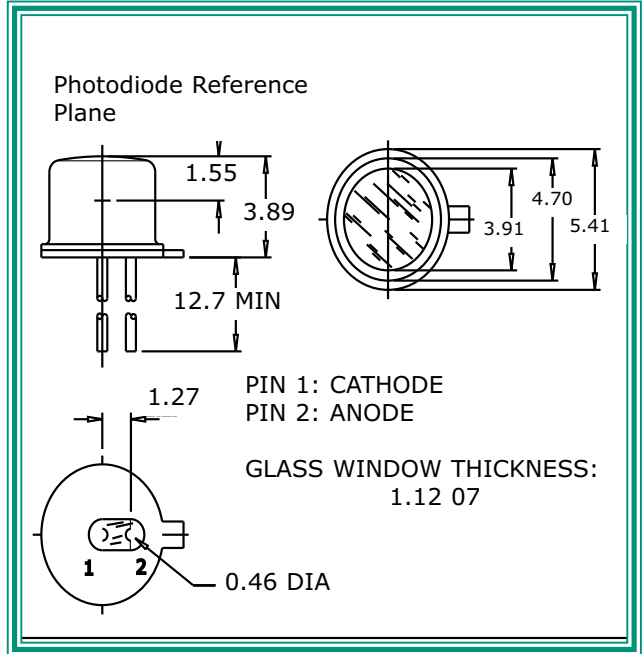


Figure 3: T0-18 Ball Lens Package

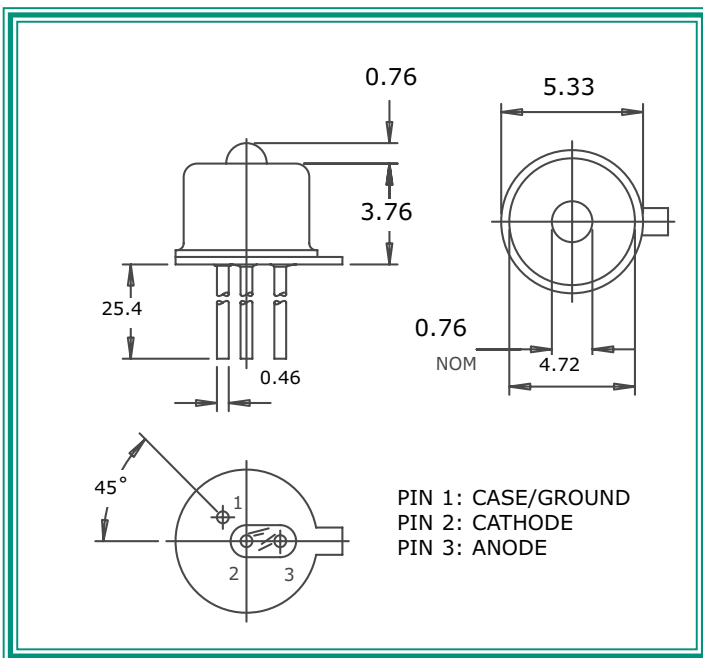
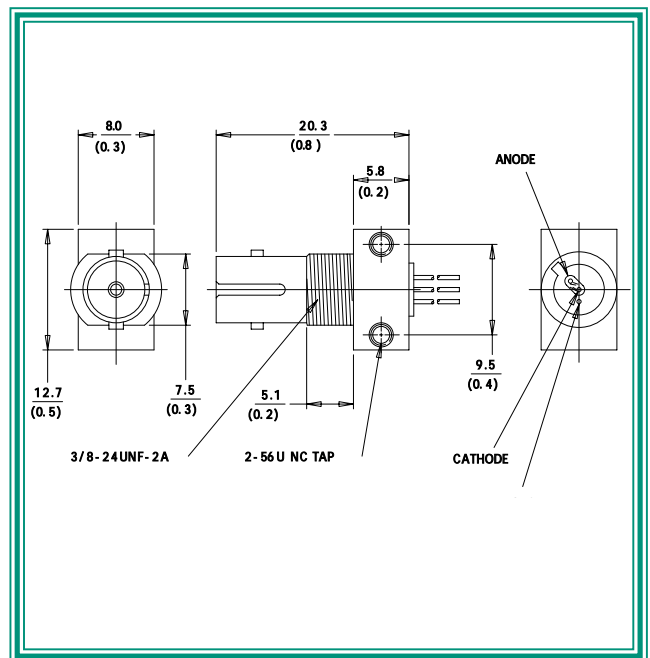


Figure 4: ST Receptacle Package



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Figure 5: FC Receptacle Module

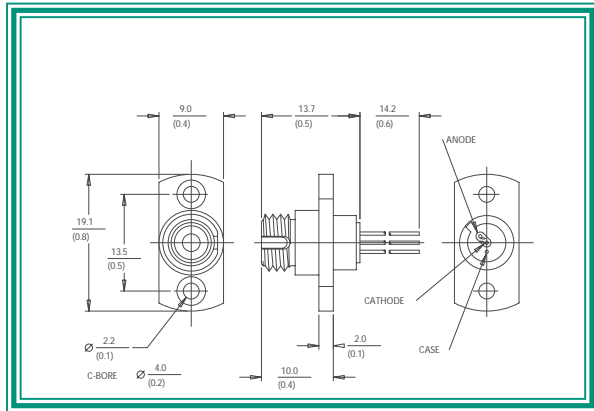


Figure 6: SC Receptacle Package

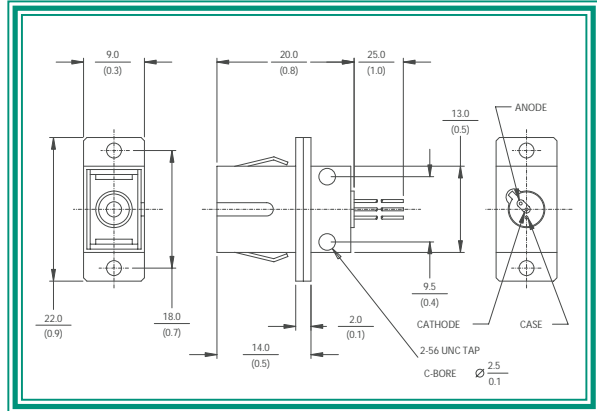


Figure 7: Fibered Detector Module

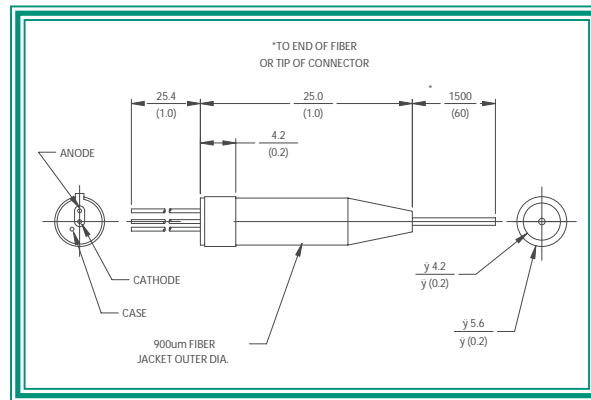


Figure 8: Typical Spectral Responsivity vs. Wavelength. Dotted line shows response in Fig. 2 package (silicon window).

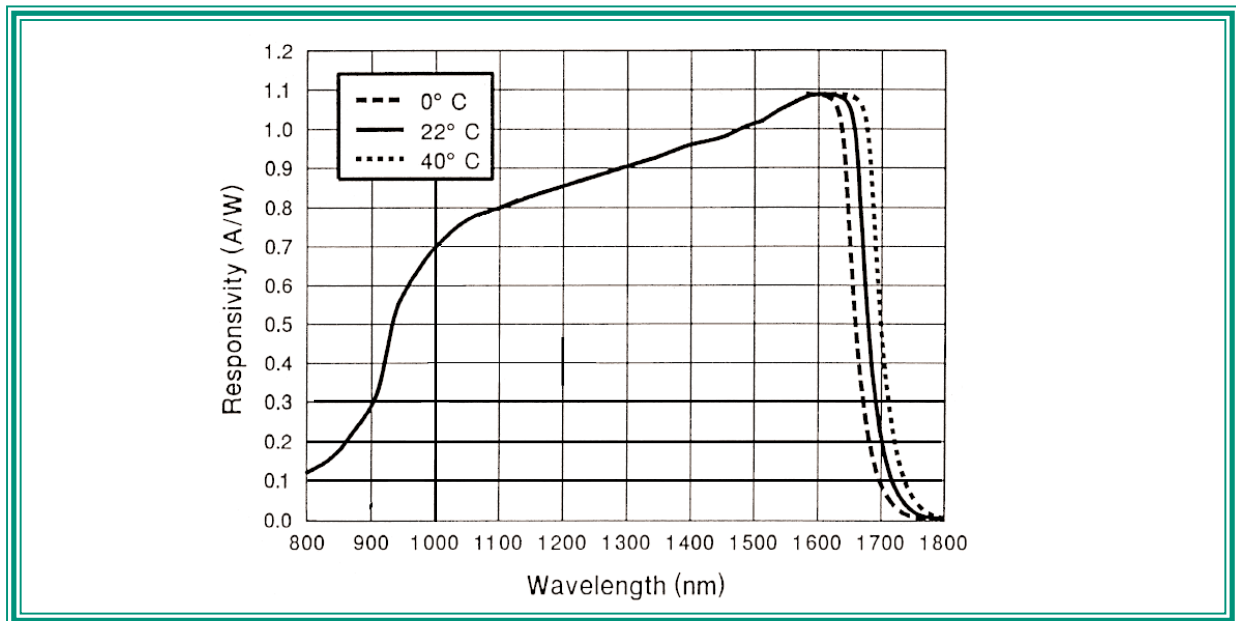


Figure 9: Typical Capacitance vs. Operating Voltage. (Ceramic submount)

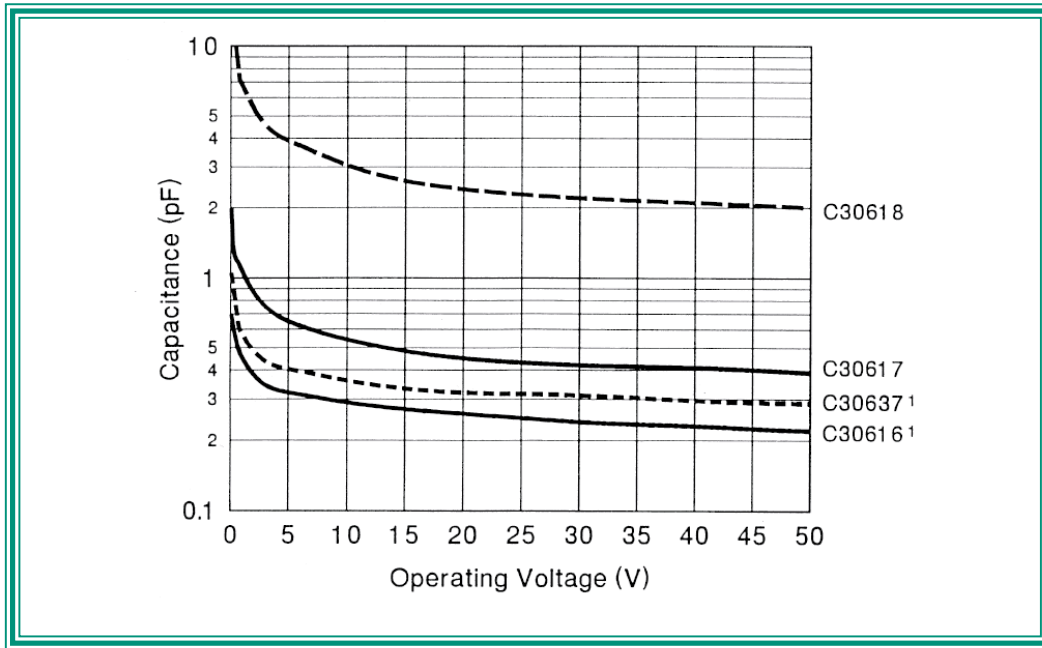
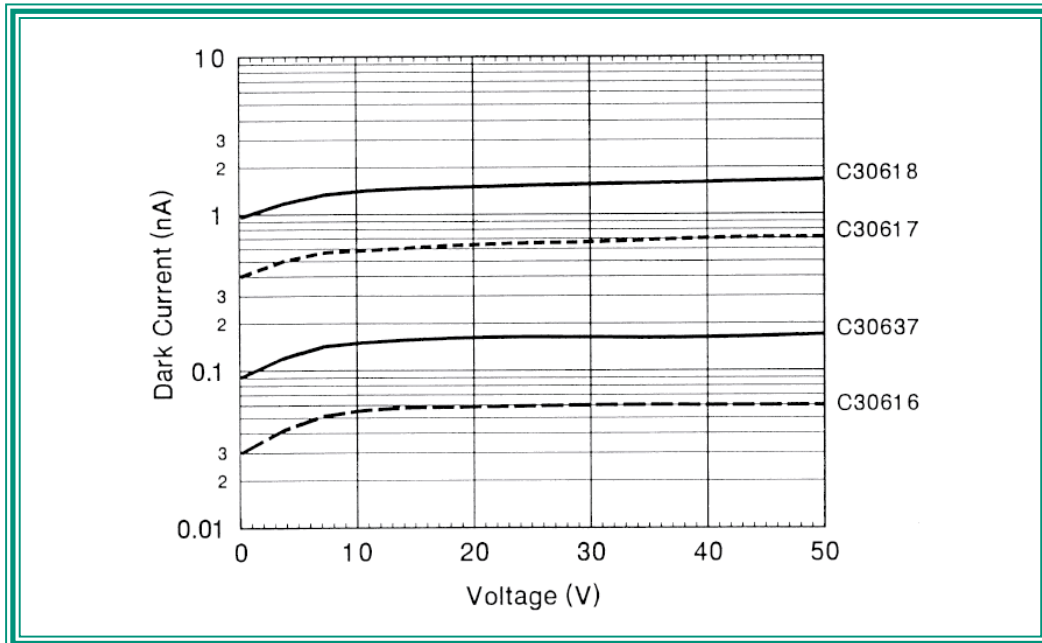


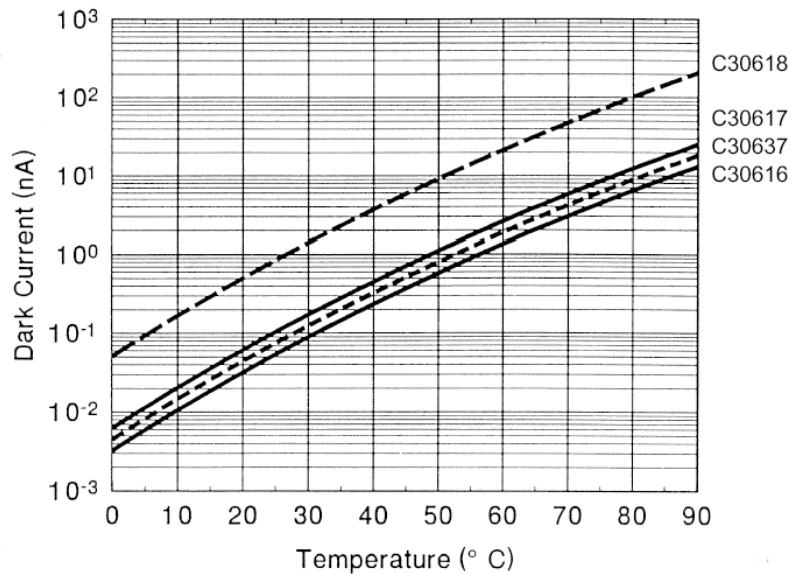
Figure 10: Typical Dark Current vs. Voltage



PerkinElmer Optoelectronics reserve the right to change or amend specifications and/or configurations at any time without notice.

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Figure 11: Typical Dark Current vs. Temperature at $V_{OP} = -5V$.



Ordering Guide

Generic Device Types:

Ceramic Submount
C30XXXEMCERL

TO-18 Package
C30YYYYL

Receptacle Package
C30YYYYBPP

TO-18 Package with Fiber Pigtail
C30617BQC-FF-CC

Chip Type (XXX)

616
617
637

Chip Type (YYY):

617
618

Lens Type (L):

B: Ball Lens (with the 617 chip only)
G: Flat Window (with the 618 chip only)

Package Type (PP):

FC: FC Receptacle
SC: SC Receptacle
ST: ST Receptacle

Fiber Type (core/cladding/buffer) (FF):

02: 50/125/900 μm
04: 62.5/125/900 μm
07: 09/125/900 μm

Connector Type (CC):

FC: FC Connector
SC: SC Connector
ST: ST Connector

Fiber pigtailed device may be ordered without a connector as C30617BQC-FF

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