

**EPITAXX****ETX 75FJ/FC-xx Series**  
**ETX 100Rxx Series**

## High Speed InGaAs Photodetector Modules Fibered and Connector Receptacle Packages

### Features

- Low capacitance for high bandwidth
- Low dark current for high sensitivity
- Bandwidth greater than 1 GHz
- Customer specified packages available
- Qualified to Bellcore STD TA-TSY-000468 and MIL-STD-883C

#### Fiber-Pigtailed:

- Rugged coaxial packaging
- Singlemode or multimode fiber
- Connectorized termination with FC, FC/PC, ST, BC, SMA, DIN connectors (optional)

#### Connector Receptacles:

- PC board mounting or back plane mounting
- Singlemode or multimode FC or ST receptacles

### Applications

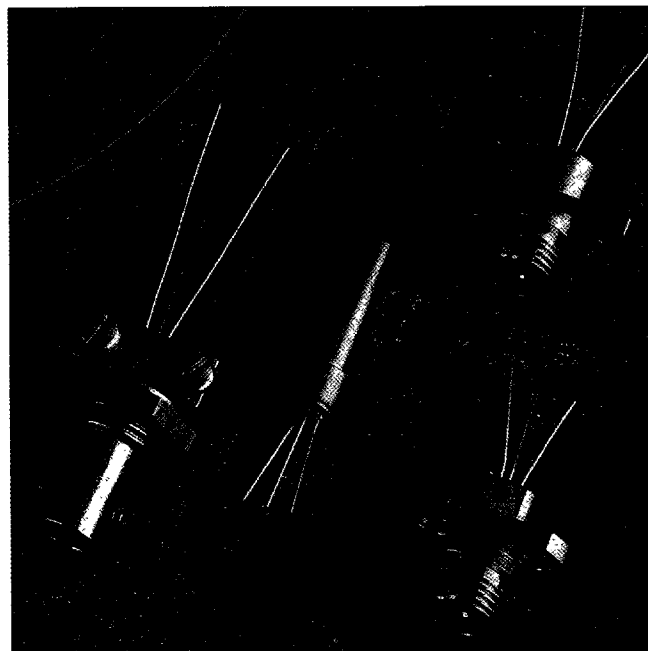
- Fiber optic networks
- Optical interconnects
- Datacommunications
- Telecommunications
- Digital receivers to 1.2 Gbps

### Description

The ETX 75FJ/FC-xx and ETX 100Rxx series are photodiode modules designed primarily for use in optical communication applications in which high speed and hermeticity are critical. These hermetically sealed modules feature bandwidths of at least 1 GHz and are designed for peak wavelength response at 1300 nm and 1550 nm.

The ETX 75FJ/FC-xx series are high speed pigtailed photodetector modules. The two modules making up the series incorporate a 75  $\mu\text{m}$  diameter InGaAs PIN photodiode coupled to a fiber pigtail using a proprietary lensing system. Each detector can be equipped with either a singlemode (8.7  $\mu\text{m}$  core diameter) or multimode (up to 62.5  $\mu\text{m}$  core diameter) fiber pigtail. The ETX 75FJ has a 1 meter fiber jacketed pigtail with an outer diameter of 900  $\mu\text{m}$ . The ETX 75FC has a 1 meter buffer reinforced cable pigtail with an outer diameter of 3 mm.

The fiber jacket (FJ) version of this detector is typically specified for applications where the customer desires easy handling and connectorization. In customer designs requiring enhanced pigtail durability, the fiber



cable (FC) is generally specified, as the reinforced sheathing offers greater protection from abrasion or mishandling. Both the jacketed and cabled pigtailed modules can be ordered terminated with fiber optic connectors. Standard fiber optic connectors (xx) available from EPITAXX are FC, FC/PC, ST, Biconic, DIN and SMA. EPITAXX will also evaluate a customer's requests for providing these modules with custom connectors.

The EPITAXX ETX 100Rxx series of detectors are high speed connector receptacle photodiode modules. Each module incorporates a 100  $\mu\text{m}$  diameter InGaAs PIN photodiode mounted in an industry standard, precision connector receptacle. Standard receptacles (xx) available include FC and ST. These modules will accept either singlemode or multimode connectorized fiber. At the customer's request, EPITAXX will also provide these detectors in other connector receptacles (DIN, SMA, etc.).

The connector receptacle design of the ETX 100Rxx is advantageous because it enables PC board or back plane mounting. The design also allows for exceptional connector mating repeatability. For applications requiring bandwidth greater than 1.5 GHz, a 75  $\mu\text{m}$  diameter InGaAs PIN photodiode can be mounted in the same package.

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**Specifications**

Model	ETX 75FJ			ETX 75FC			ETX 100RFC			ETX 100RST			Units
Conditions (unless noted)	25°C, $V_R = 5V$			25°C, $V_R = 5V$			25°C, $V_R = 5V$			25°C, $V_R = 5V$			
Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
Active Diameter	75			75			100			100			$\mu m$
Responsivity @ 1300 nm	0.75	0.85		0.75	0.85		0.65	0.72		0.65	0.72		A/W
Dark Current	0.15 0.60			0.15 0.60			0.30 1.0			0.30 1.0			nA
Total Capacitance <sup>1</sup>	0.55 0.75			0.55 0.75			0.9 1.0			0.9 1.0			pF
Bandwidth <sup>2</sup>	2.0			2.0			1.5			1.5			GHz
Rise Time <sup>3</sup>	150			150			180			180			ps

**Notes:**

- 1) Measured with case grounded.
- 2) -3dB point into a 50 $\Omega$  load.
- 3)  $R_{LOAD} = 50\Omega$ .

**Maximum Ratings**

Model	ETX 75FJ		ETX 75FC		ETX 100RFC		ETX 100RST		Units
Reverse Voltage	25		25		25		25		V
Reverse Current <sup>A</sup>	10		10		10		10		mA
Forward Current <sup>B</sup>	10		10		10		10		mA
Power Dissipation	100		100		100		100		mW
Operating Temp.	-40 / +85		-40 / +85		-40 / +85		-40 / +85		°C
Storage Temp.	-40 / +85		-40 / +85		-40 / +85		-40 / +85		°C

**Notes:**

- A) Under reverse bias, current at which device may be damaged.
- B) Under forward bias, current at which device may be damaged.

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Figure 1

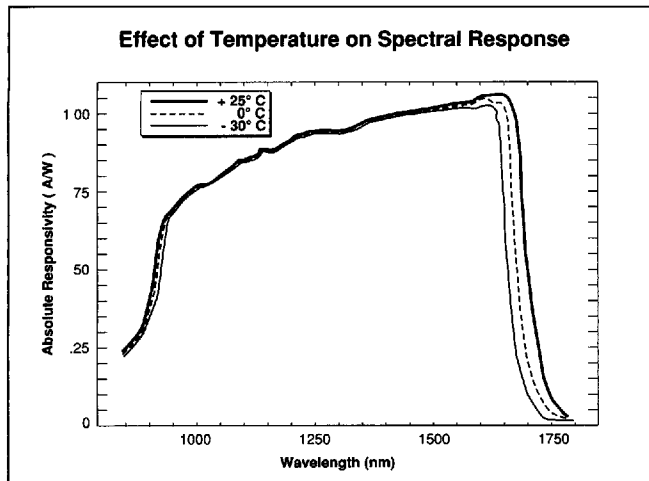


Figure 2

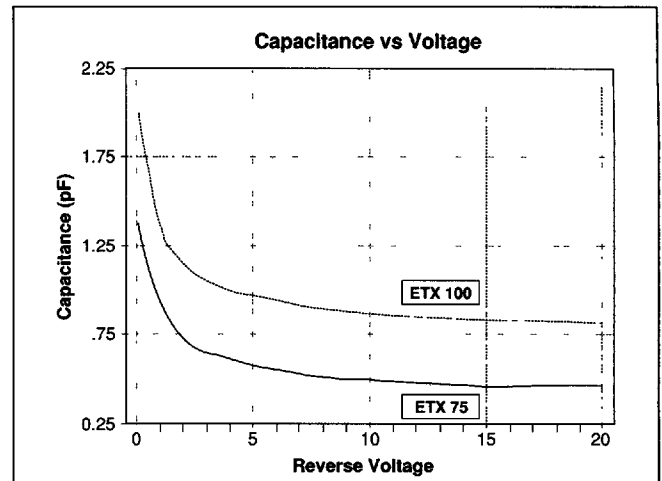


Figure 3

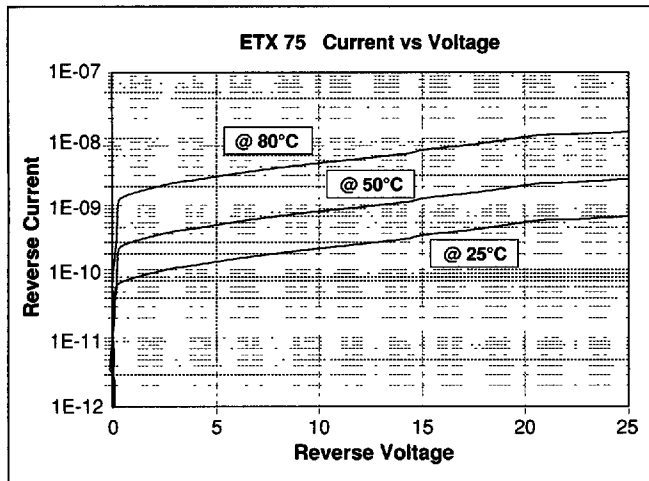


Figure 4

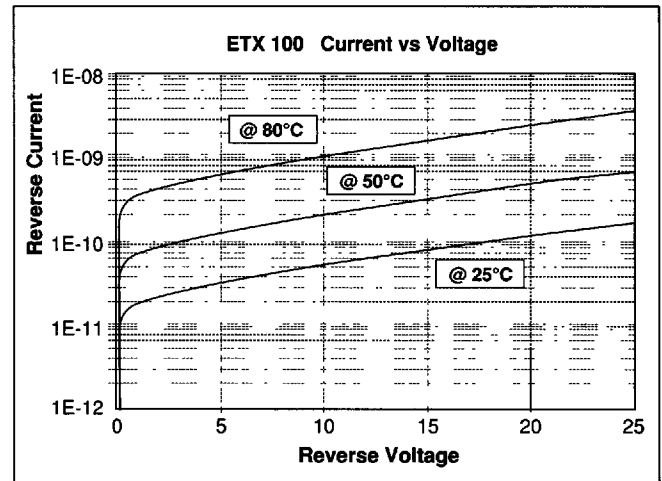
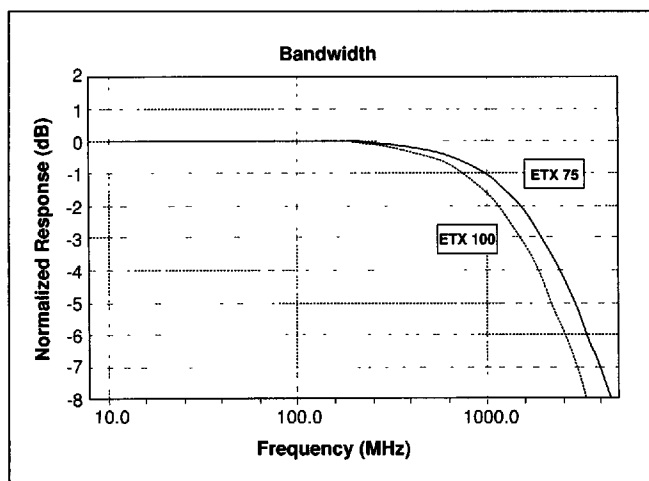


Figure 5



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**Rise/Fall Time Characteristics**

The total capacitances of these modules are such that the ETX 75FJ/FC-xx has a typical rise/fall time of 150 ps, the ETX 100Rxx, a response time of 180 ps. For data rates in excess of 1 Gbps, EPITAXX can screen devices for lower capacitances.

**Temperature Characteristics**

The spectral response of these devices is shown in Figure 1. As this diagram indicates, the cut-off wavelength increases approximately 1 nm with every degree Celcius rise in temperature. When operating these devices under reverse bias, a leakage, or dark, current is generated. This dark current is also temperature dependent: for every increase of 10°C, the dark current doubles.

**Options**

EPITAXX photodiodes are available in many configurations: singlemode or multimode pigtailed; any industry standard connector receptacle. Below are the standard options for configurations. In addition, EPITAXX is willing to discuss any custom requirements for special applications.

**Standard Module Configurations**

NAME	DESCRIPTION
ETX 75FJ-S-xx	Singlemode jacketed fiber with xx connector option
ETX 75FJ-M-xx	Multimode jacketed fiber with xx connector option
ETX 75FC-S-xx	Singlemode cabled fiber with xx connector option
ETX 75FC-M-xx	Multimode cabled fiber with xx connector option
ETX 100RFC	FC connector receptacle
ETX 100RST	ST connector receptacle

**Standard Connector Options**

NAME (xx)	DESCRIPTION
FC	FC Connector
FC/PC	FC physical contact connector
ST	ST connector
BC	Biconic connector
SMA	SMA connector
D4	D4 connector
DIN	DIN connector

Other connector options also available.

**Quality and Reliability**

EPITAXX maintains a strict quality program throughout the design and manufacturing process of the photodetectors. Before pigtailling or receptaciling, EPITAXX purges all photodiodes in TO cans at 200°C and -20 V for 20 hours. All pigtailed and receptacled photodiode modules are qualified to Military Standard 883C and Bellcore Standard TA-TSY-000468.

**Precautions for Use**

▪ **ESD PROTECTION IS IMPERATIVE.**

Use of grounding straps, anti-static mats, and other standard ESD protective equipment is recommended when handling or testing InGaAs photodetector modules.

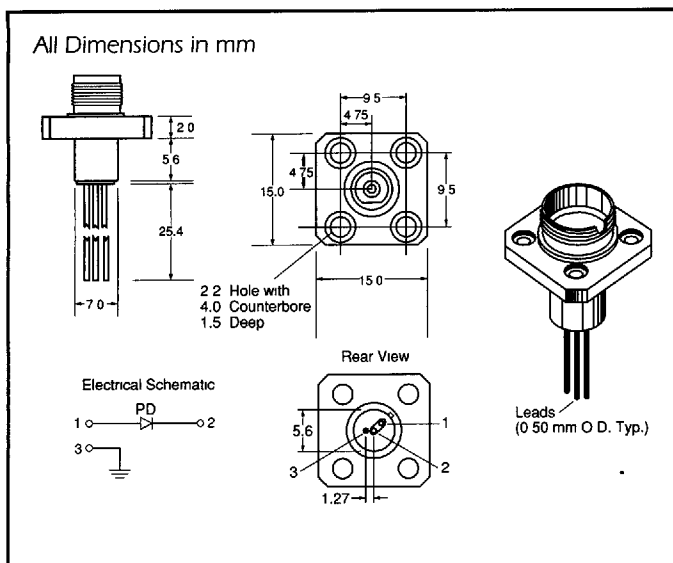
Maximum conditions for soldering leads:  
260°C for 10 sec.

Fiber pigtails should be handled with less than 10N pull and with bending radius over 1 inch.

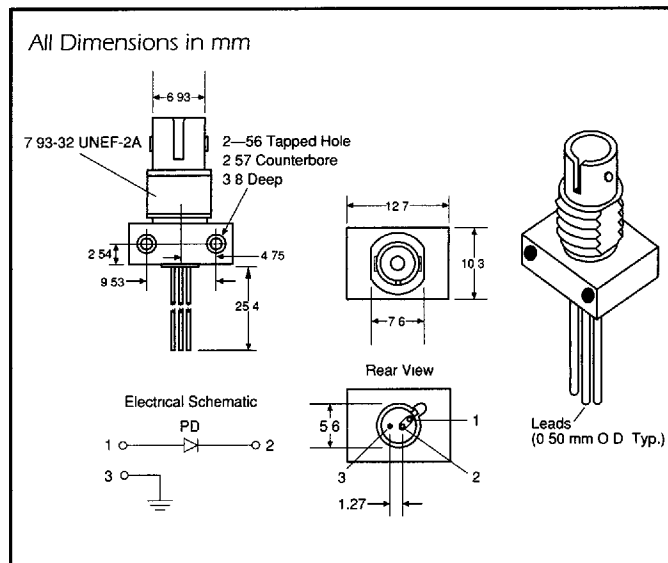
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**Mechanical Dimensions**

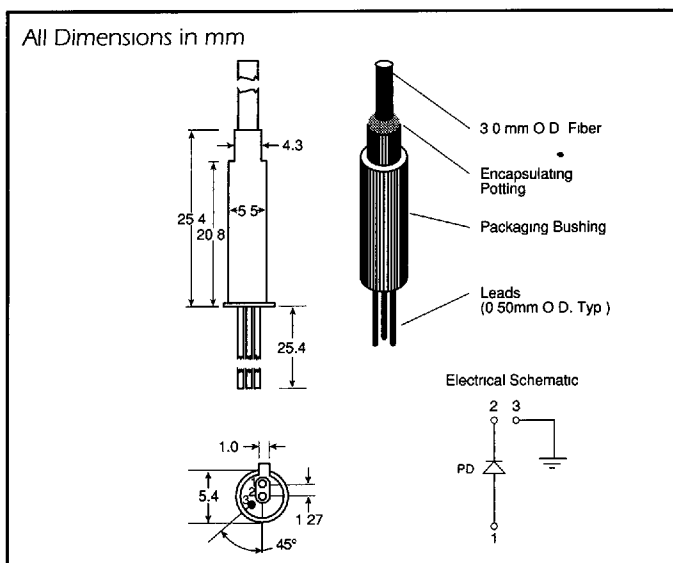
**ETX 100RFC**



**ETX 100RST**



**ETX 75FC**



**ETX 75FJ**

