

QDFI**High-Impedance Integrating
pinFET Receiver**

- Telecom trunk and junction applications
- High-impedance integrating circuit configuration
- 32 and 115 MHz bandwidths available
- Industry-standard 14-pin DIL package, multimode fiber

Description

The Lasertron QDFI pinFET module is a high-sensitivity detector and hybrid preamplifier module designed for fiber-optic receivers operating at data rates up to and exceeding 168 Mb/s at 1300 and 1550 nm wavelengths. The exceptional performance of the QDFI pinFET results from using an advanced GaInAs detector with a GaAs FET hybrid preamplifier of a high-impedance design. The detector element features a substrate illuminated construction having <0.5 pF capacitance, <20 nA leakage, and a responsivity of >0.75 A/W at 1300 and 1550 nm.

Sensitivities range from -54 dBm at 16 Mb/s to -44.0 dBm at 168 Mb/s. Optical dynamic range typically exceeds 22 dB. The model QDFI is packaged in a hermetically sealed low-profile 14-pin dual-in-line package and is pigtailed with multimode fiber.

The QDFI pinFET provides a significant improvement in sensitivity over transimpedance designs. The QDFI pinFET requires an active bias control circuit and equalization of the output signal. Typically, a simple RC equalizer is sufficient.

Specifications (T_{case}=25°C, except as noted)

QDFI-	0423-001			1683-001		
Noise filter bandwidth (MHz)	32			115		
Output voltage at Pmax (mV)	2000			400		
Sensitivity (dBm, avg.): Min.	-49			-42		
Typ.	-51			-43.5		
Max. input (dBm, Avg.): Min.	-28			-21		
Typ.	-26			-19		
	Min	Typ	Max	Min	Typ	Max
Common Specifications						
Sensitivity change 25 to 65°C (dB)	1.5			1.5		
Gain flatness 10 MHz to 3 dB bandwidth (measured into a 1K Ohm load, dB)	±1			±1		
Detector dark current (nA)	5			5		
Detector capacitance -5 V bias (pF)	0.3			0.3		
Load impedance (Ohms)	1000			1000		
Output voltage at Pmax (V)	2.3			2.3		
Measured output impedance (Ohms)	30			30		
Responsivity 1300 nm and -5 V bias (A/W)	0.75			0.75		
Responsivity change (dB, 25 to 65°C)	0.1			0.1		
Power consumption with implementation circuitry:						
+15 V supply (mW)	450			250		
-15 V supply (mW)	25			25		
Power consumption without implementation circuitry:						
+15 V supply (mW)	225			125		
-15 V supply (mW)	7			7		
Operating temperature range (°C)	-20			-20		
Storage temperature range (°C)	-40			-40		

Ordering Information

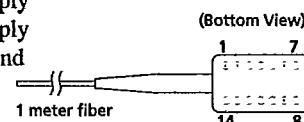
Base Model	Suffix	
QDFI-0423	No Connector	FC/PC
	-001	-050
QDFI-1683	-001	-050


**Receivers &
Detectors**
Absolute Maximum Ratings

Fiber coupled power (mW)	5
Reverse photocurrent (mA)	5
Reverse bias voltage (V)	15
Forward current (mA)	2
Lead soldering temperature (°C)	260
Lead soldering duration (sec)	10
Fiber yield strength (N, min)	10
Fiber bend radius (mm, min)	35

Pin Connections

- Case Ground
- Output voltage control (+7 V typ.)
- Case Ground
- +10 V supply
- +10 V supply
- Case Ground
- Output
- NC
- Case Ground
- NC
- Cascode bias (+4.7 V typ.)
- Drain current monitor
- FET gate bias
- Detector bias (+5 V)



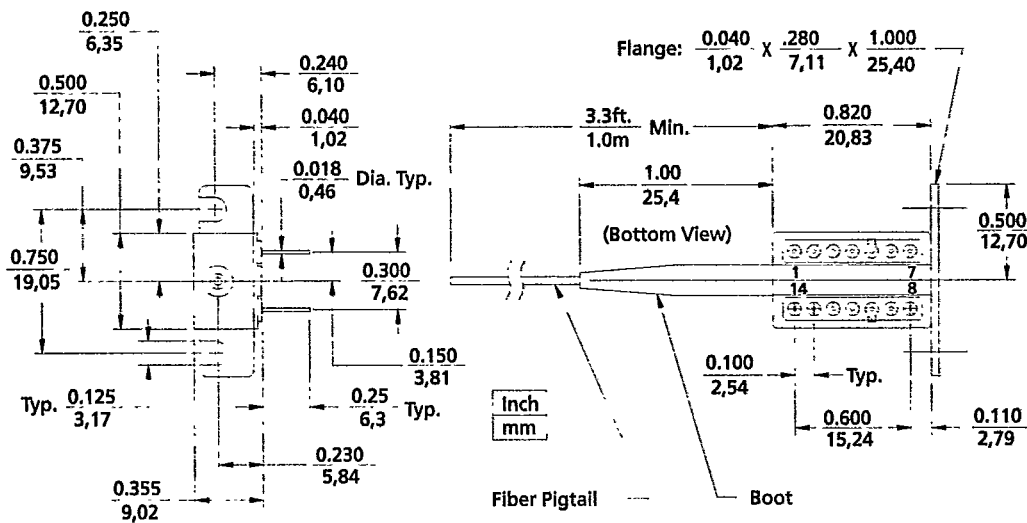
Package Specifications

T-91-20

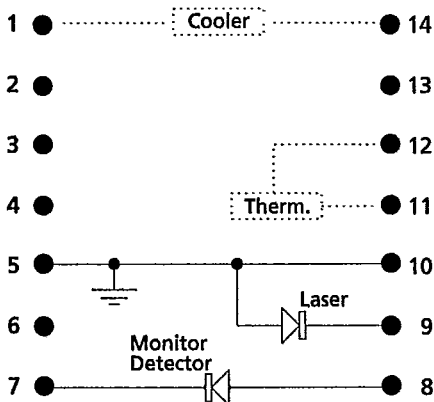
Lasertron uses a variety of industry-standard packages to house its products. The dimensions indicated here are common to all like packages; however, pin connections may differ between product families. Product-specific pin connections are provided in the individual data sheets in the Product Information section of this Product Guide.

Source Packages

14-pin DIL "Longhorn" (Lasers, LEDs)



LONGHORN SCHEMATIC

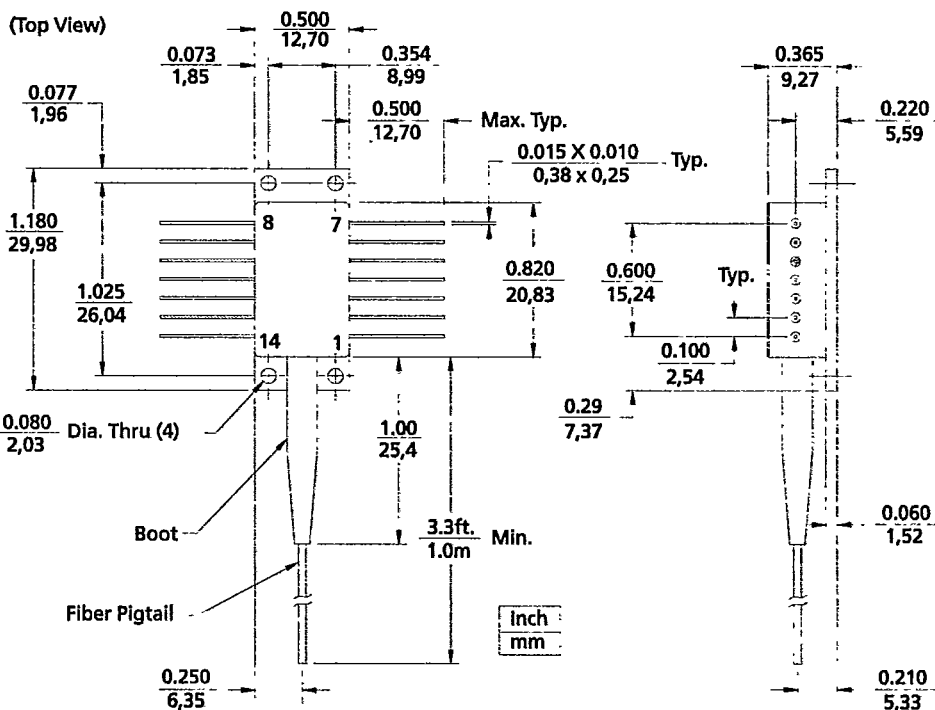
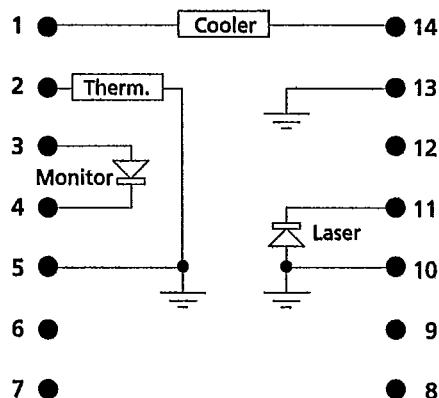


Note: Cooler and thermistor are not included in all modules.

Source Packages (continued)

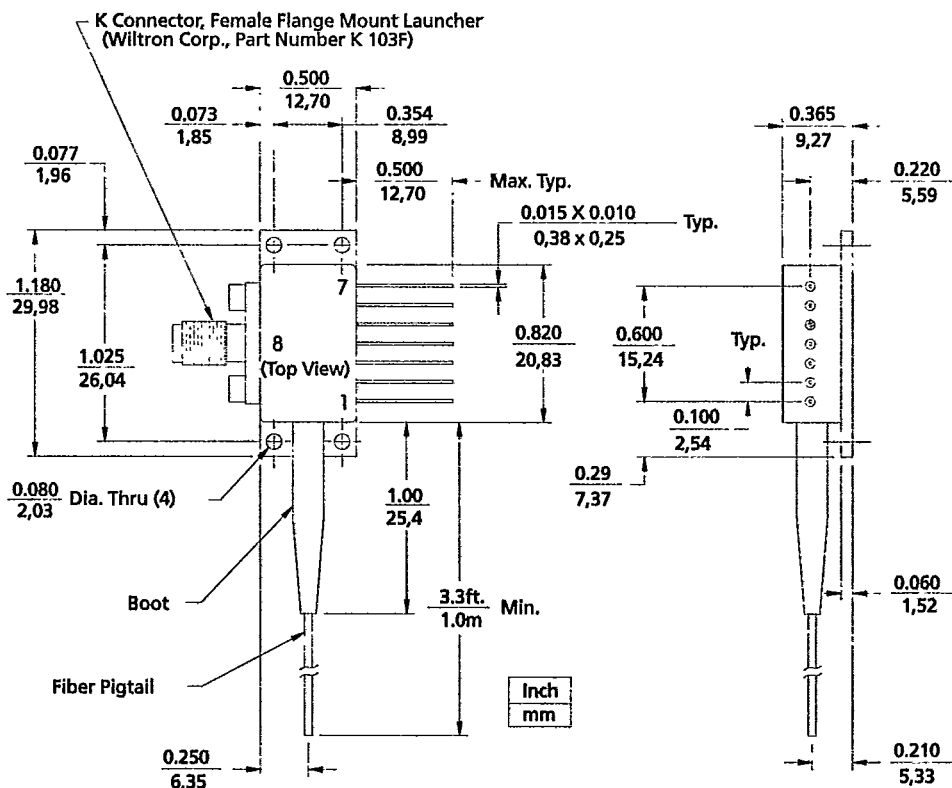
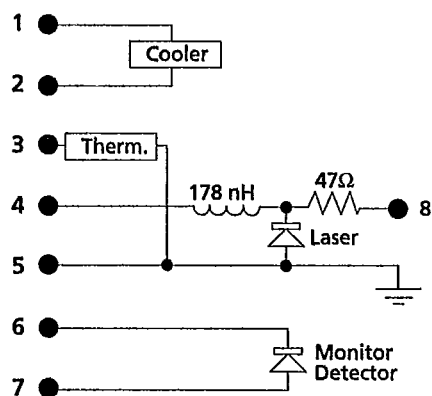
14-pin "Butterfly"

BUTTERFLY SCHEMATIC



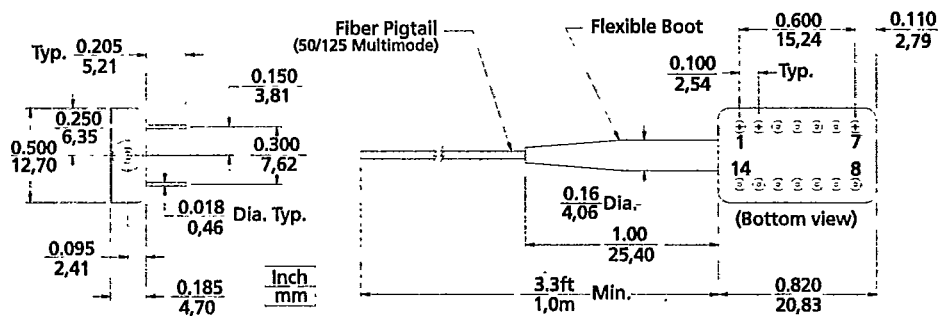
Microwave Laser

MICROWAVE LASER SCHEMATIC

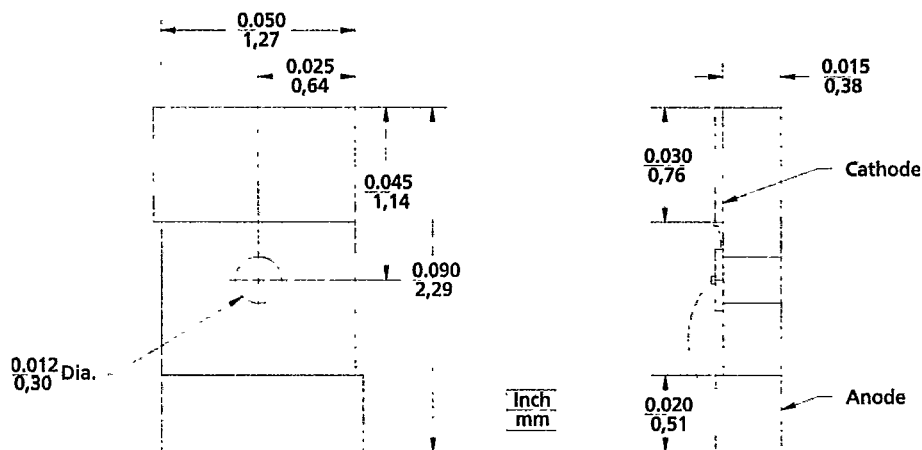


Detector Packages

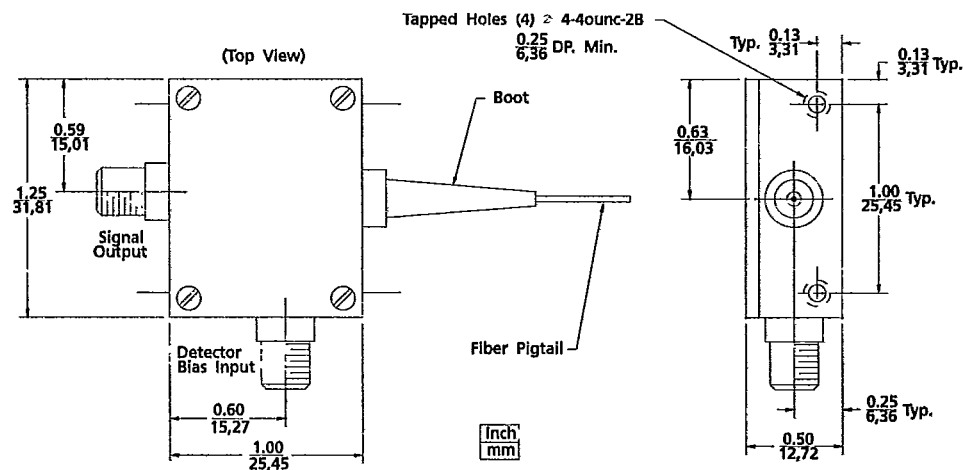
14-pin DIL PIN/pinFET

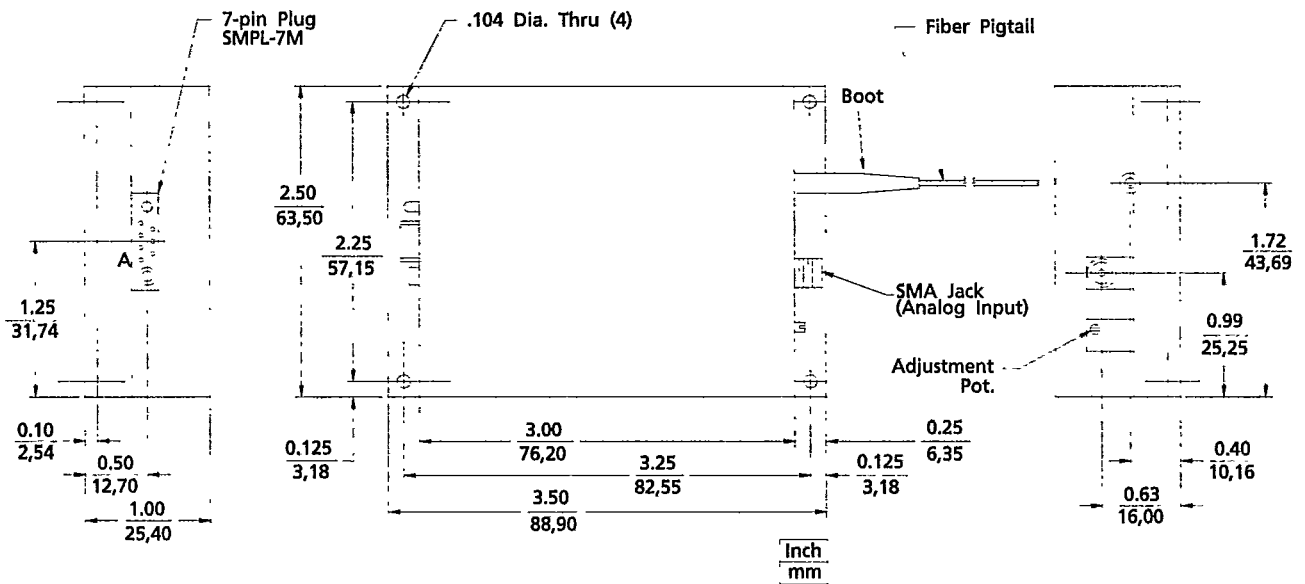


QDE035, QDE075



QDEMW1, QDEMW3 Microwave Detector



QTX Transmitter**QLXSMW Microwave Transmitter**