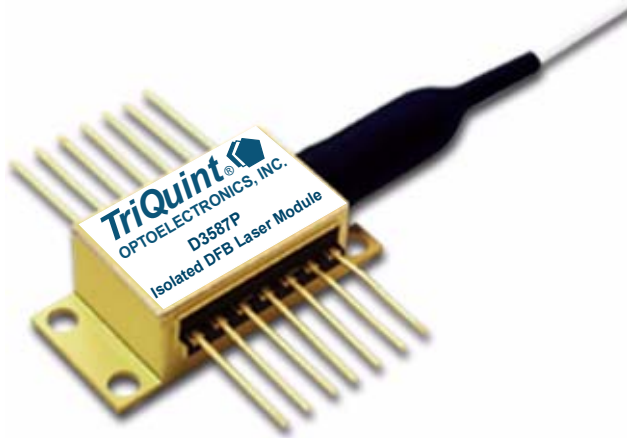


8 x 50 GHz Temperature-Tunable, High-Power D3587P-Type Isolated DFB Laser Modules with Wavelength Stabilizer



Featuring wavelength tunability and locking capabilities, the D3587P-type laser module combines convenient channel and wavelength control with high reliability. It is ideally suited for use with external lithium niobate modulators, and in high-power (20 mW) applications.

Features

- High-performance, multiquantum-well (MQW), distributed-feedback (DFB) laser
- Offered on 50 GHz ITU grid wavelengths ranging from 1528.77 nm—1610.06 nm
- Temperature tunable over a range of eight 50 GHz-spaced channels.
- Internal wavelength stabilizer, ± 2.5 GHz
- Polarization-maintaining fiber pigtail
- For use with lithium niobate modulators
- High optical power (20 mW, CW)
- Hermetic, industry-standard 14-pin butterfly package
- Low TEC power consumption, <3.5 W
- MSA compliant

Applications

- Telecommunications:
 - Dense WDM
 - SONET/SDH OC-192/STM-64
 - Extended and ultralong reach
 - Undersea systems
- Digital video

Benefits

- Simplifies inventory management
- Convenient wavelength and channel control
- Superior, long-term wavelength stability

Description

The D3587P-type DFB laser module is designed for use with external modulators, such as lithium niobate modulators, or in applications where high power (20 mW) is required. By controlling the laser temperature, the laser module can be tuned over eight channels at 50 GHz spacing. The versatile device can significantly reduce the number of single-channel lasers typically required for system redundancy and thereby helps simplify inventory management.

The use of an internal wavelength stabilizer greatly enhances long-term wavelength reliability. The etalon wavelength stabilizer used in D3587P-type laser module is temperature insensitive, which ensures superior long-term wavelength stability. The maximum frequency drift for the D3587P-type DFB laser module is ± 2.5 GHz over 20 years of lifetime.

Description (continued)

Controlled Wavelength (D3587P-Type)

The eight-channel, temperature-tunable D3587P-type DFB (ILM) package contains an internal wavelength-discriminating etalon and an associated photodiode. The output consists of analog signals suitable for controlling the electrical current of the thermoelectric cooler (TEC) and the DFB laser. The slope of the etalon signal, with respect to optical frequency, is positive.

TriQuint provides the beginning-of-life values for five parameters for each of the eight channels, including:

- Laser drive current
- Single-target, ITU channel frequency
- Laser thermistor resistance
- Power monitor current
- The ratio of the λ -monitor current to power monitor current, R(fi)

Controlled Feedback

The module contains an internal optical isolator that suppresses optical feedback in laser-based, fiber-optic systems. Light reflected back to the laser is attenuated by a minimum of 30 dB.

Controlled Temperature

An integral TEC provides stable thermal control and allows for heating and cooling of the laser chip to maintain laser temperature. The laser temperature is monitored by the internal thermistor, which can be used with external circuitry to control the laser chip temperature.

Controlled Power

An internal, InGaAs, PIN photodiode monitors emission from the rear facet of the laser. Used in conjunction with control circuitry, it controls optical power launched into the fiber. Normally, this configuration is used in a feedback arrangement to maintain consistent laser output power.

Standard Package

The laser module is fabricated in an industry-standard 14-pin, hermetic, metal/ceramic butterfly package.

The laser module is equipped with Fujikura® polarization-maintaining fiber (PMF). The fiber is PANDA type and has a mode field diameter of 10.5 μm , a cladding diameter of

125 $\mu\text{m} \pm 3 \mu\text{m}$ with a tight-buffered coating, all within a 900 μm diameter, loose-tube jacket. Figure 1 shows the orientation of polarization in the fiber without the loose tubing.

TriQuint optoelectronic components are being qualified to rigorous internal standards that are consistent with *Telcordia Technologies*™ TR-NWT-000468. All design and manufacturing operations are ISO® 9001 certified. The module is being fully qualified for central office applications.

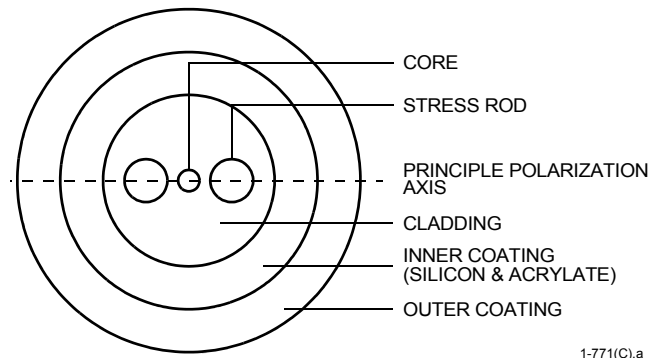


Figure 1. Polarization-Maintaining Fiber without Jacket

Pin Information

Table 1. Pin Descriptions

Pin	D3587P-Type
1	Thermistor
2	Thermistor
3	Laser Diode Cathode
4	Power Monitor PD Anode (-)
5	Common PD Cathode (+)
6	Thermoelectric Cooler (+) ¹
7	Thermoelectric Cooler (-) ¹
8	Case Ground
9	Case Ground
10	Wavelength Monitor PD Anode
11	Laser Diode Anode ²
12	Laser Diode Cathode
13	Laser Diode Anode ²
14	Not Connected

1. A positive current through the thermoelectric heat pump cools the laser.
2. Both leads should be grounded for optimum performance.

Description (continued)

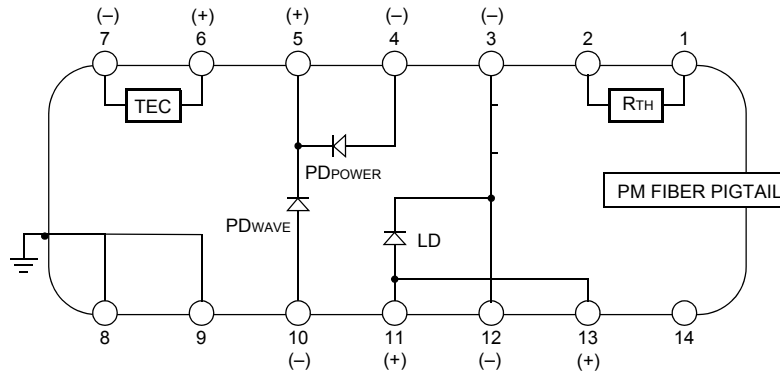
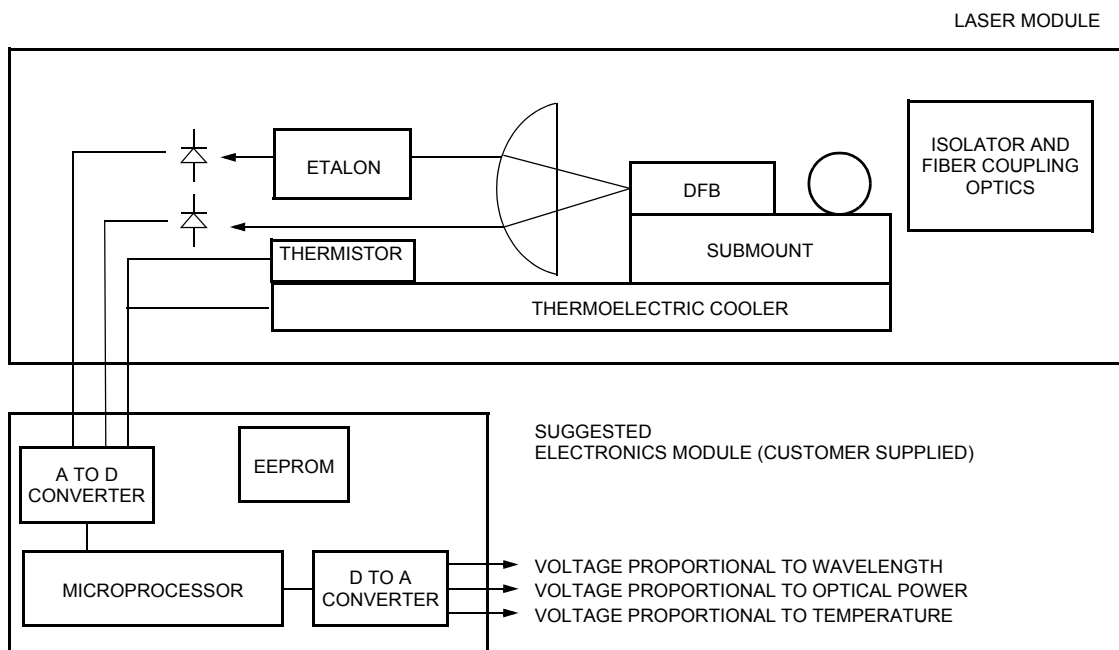


Figure 2. D3587P Circuit Schematic

Block Diagram



1-1129(F)

Figure 3. Optics and Electronics Block Diagram

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Min	Max	Unit
Laser dc Reverse Voltage	VRLMAX	—	2	V
Laser dc Forward Current	IFLMAX	—	250	mA
Operating Case Temperature Range	T _C	-5	75	°C
Storage Case Temperature Range ¹	T _{stg}	-40	85 ²	°C
Photodiode dc Reverse Voltage	V _{RPD} MAX	—	10	V
Photodiode dc Forward Current	I _{FPD} MAX	—	2	mA
Thermistor Temperature ³	—	—	100	°C
Thermoelectric Cooler in Heating Mode ³	I _{TEC}	—	0.5	A

1. Does not apply to shipping container.

2. Maximum 2000 hrs. at extreme conditions

3. To prevent package over-temperature conditions.

Handling Precautions

Power Sequencing

To avoid the possibility of damage to the laser module from power supply switching transients, use the following turn-on sequence:

1. All ground connections
2. Most negative supply
3. Most positive supply
4. All remaining connections

Reverse the order for the proper turn-off sequence.

Electrostatic Discharge

CAUTION: This device is susceptible to damage as a result of electrostatic discharge. Take proper precautions during both handling and testing. Follow guidelines such as JEDEC Publication No. 108-A (Dec. 1988).

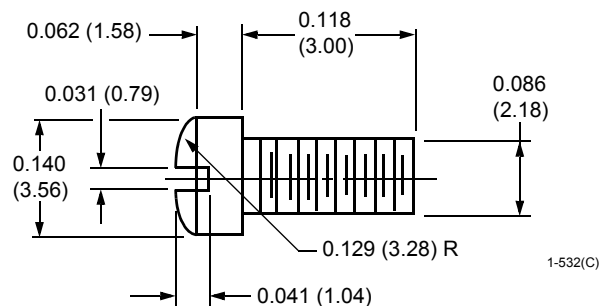
TriQuint employs a human-body model (HBM) for ESD-susceptibility testing and protection-design evaluation. ESD voltage thresholds are dependent on the critical parameters used to define the model. A standard HBM (resistance = 1.5 kΩ, capacitance = 100 pF) is widely used and, therefore, can be used for comparison purposes. The D3587P is Class 2 compliant per the described model.

Mounting Instructions

The minimum fiber bend radius is 1.0 in. (25.4 mm)

To avoid degradation in performance, mount the module on the board as follows:

1. Place the bottom flange of the module on a flat heat sink at least 0.5 in. x 1.180 in. (12.7 mm x 30 mm) in size. The surface finish of the heat sink should be better than 32 μin. (0.8 μm), and the surface flatness must be better than 0.001 in. (25.4 μm). Using thermal conductive grease is optional; however, thermal performance can be improved by up to 5% if conductive grease is applied between the bottom flange and the heat sink.
2. Mount four #2-56 screws with Fillister heads (M2-3 mm) at the four screw hole locations (see Outline Diagram). The Fillister head diameter must not exceed 0.140 in. (3.55 mm). Do not apply more than 1 in.-lb. of torque to the screws.



Note: Dimensions are in inches and (millimeters).

Figure 4. Fillister Head Screw

Characteristics

Minimum and maximum values are testing requirements. All parameters are beginning of life, unless otherwise specified.

Table 2. D3587-Type Electrical Characteristics (Values are measured at room temperature unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Max	Unit
Threshold Current	I _{TH}	—	—	35	mA
Operating dc Current:		L _F = 20 mW			
BOL	I _{OP-BOL}		—	200	mA
EOL	I _{OP-EOL}		—	250	mA
Laser Forward Voltage	V _{LF}	L _F = 20 mW (CW)	—	2.45	V
Laser Submount Temperature	T _{LASER}	L _F = 20 mW	10	52	°C
Monitor Reverse-bias Voltage ¹	V _{RMON}	—	3	10	V
Monitor Current:		P _O = 20 mW (CW) (on channel)			
Power Monitor PD	I _{RMON}		20	500	μA
λ Monitor PD	I _{λPD}		20	500	μA
Monitor Dark Currents	I _D	I _F = 0, V _{RMON} = 5 V	—	10	nA
Etalon Slope ²	—	—	1.6	4.0	%/GHz
Frequency Capture Range ³	CR		20	—	GHz
Total Capture Range ⁴	TCR		45	—	GHz
Locking Frequency Stability	Δf _c	–5 °C to +75 °C	—	1.25	GHz
Thermistor Current	I _{TC}	—	10	100	μA
Resistance Ratio ⁵	—	—	8.6	9.6	—
Thermistor Resistance	R _{TH}	T _L = 25 °C	9.5	10.5	kΩ
TEC Current	I _{TEC}	T _C = 75 °C	—	1.4	A
TEC Voltage	V _{TEC}	T _C = 75 °C	—	2.5	V
TEC Power	P _{TEC}	T _C = 75 °C	—	3.5	W

1. Standard operating condition is 5.0 V reverse bias.

2. The etalon slope is defined as the fractional rate change of the normalized etalon signal with respect to frequency, as indicated in the following formula:

$$Slope = \frac{1}{R(f)} \frac{dR}{df} \quad \text{where} \quad R(f) = \frac{I_{\lambda PD}(f)}{I_{RMON}(f)}$$

The etalon slope at each ITU channel is thus defined as:

$$Slope_i = \frac{1}{R(f_i)} \frac{dR(f_i)}{dR}$$

Note that the value of the this slope provides information on the precision required by the customer to maintain control of the ratio of the λ-monitor current and power monitor current, R(f), at each ITU frequency. For example, 1%/GHz minimum would mean that the R(f) ratio must be controlled to < ± 2.5% of its BOL to provide ± 2.5 GHz frequency stability for the module.

- The frequency capture range (CR) is the spectral range in which the emitted frequency (or wavelength) must be within before launching the automated wavelength control mode. This ensures that when the automatic wavelength control circuit is activated (or engaged), the laser frequency will converge to the targeted ITU channel. CR is the minimum of CR– and CR+ (see Figure 5). Note that the frequency corresponding to the specified thermistor resistance for each channel (f_{i,start}) provides the initial setting for the automated wavelength control loop, as depicted in Figure 5.
- The total capture range (TCR) is defined as the sum of CR– and CR+ (see Figure 5).
- Ratio of thermistor resistance at 0 °C to thermistor resistance at 50 °C.

Characteristics (continued)

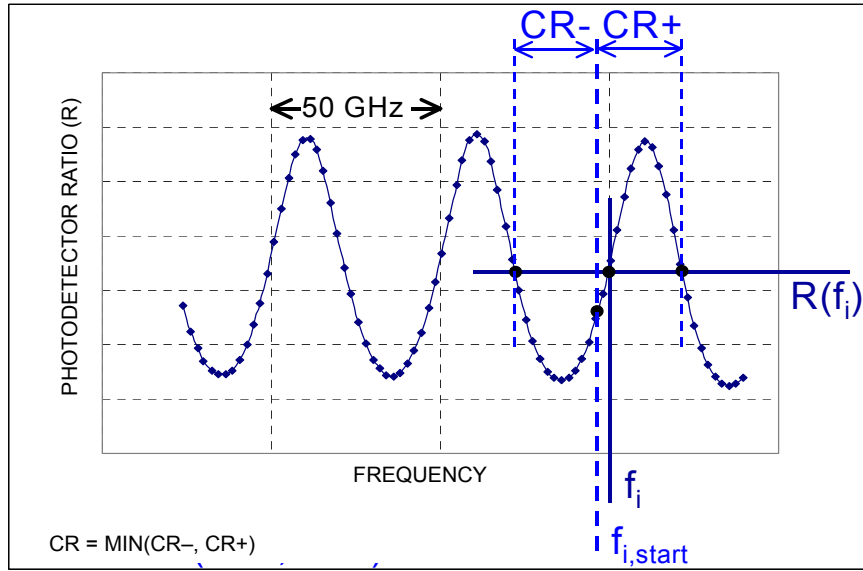


Figure 5. Definitions

Table 3. D3587-Type Optical Characteristics (at 25 °C laser temperature)

Parameter	Symbol	Test Conditions	Min	Max	Unit
Peak Optical Output Power	P_P	—	12.5	13.5	dBm
Wavelength	λ	—	1528.77	1610.06	nm
Line Width (3 dB full width)	Δf	CW, $P_F = 20$ mW	—	10	MHz
Side-mode Suppression Ratio	SMSR	CW	35	—	dB
Relative Intensity Noise	RIN	CW, at channel, $P_F = 20$ mW $200 \text{ MHz} < f < 10 \text{ GHz}$	—	-135	dB/Hz
Optical Isolation	—	-5 °C to +75 °C	30	—	dB
Optical Polarization Extinction Ratio ¹	—	-5 °C to +75 °C	20	—	dB
FM Efficiency	FM	$P_F = 20$ mW	100	—	MHz/mA
Frequency Drift (EOL) ²	Δf_c	Operation over 20-year lifetime	—	± 2.5	GHz

1. The ST ferrule key is not aligned to slow axis of fiber. Connector is intended for testing purposes only.

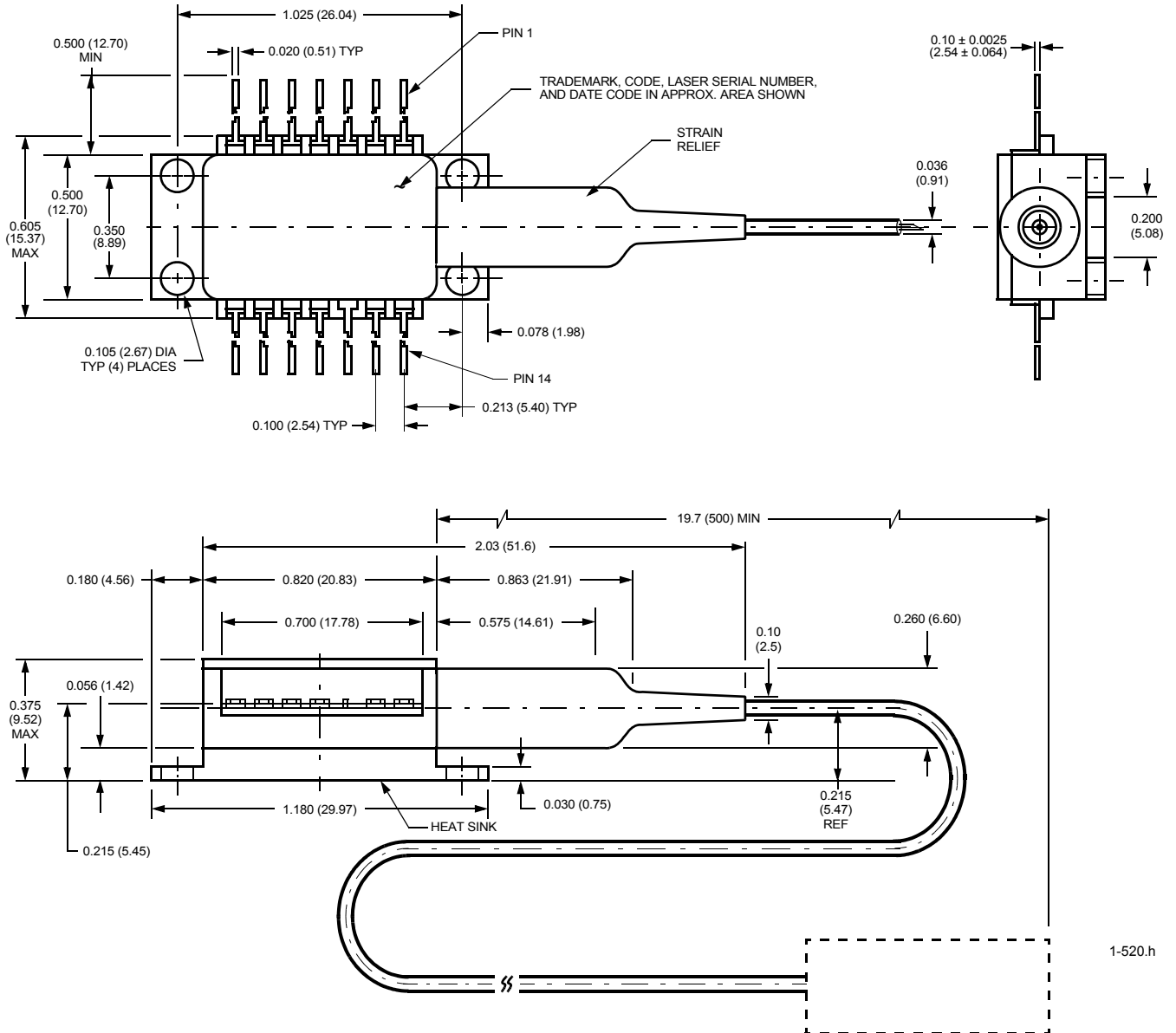
2. EOL (end of life) for a particular module is defined as the point in time when the laser drive current has increased by 25% from its BOL value at a constant power monitor current.

Table 4. D3587P Fiber Pigtail and Optical Connector Characteristics

Parameter	Symbol	Description	Min	Typ	Max	Unit
Pigtail Length	L	Fujikura PANDA or equivalent polarization-maintaining fiber	0.5	—	—	m
Connector Style	—	Unkeyed Test Plug	—	—	—	—

Outline Diagram

Dimensions are in inches and (millimeters). Tolerances are ± 0.005 in. (± 0.127 mm).



High-Power Product

Class IIIb Laser Product

FDA/CDRH Class IIIb laser product. All versions are Class IIIb laser products per CDRH, 21 CFR 1040 Laser Safety requirements. All versions are classified Class 3B laser products consistent with IEC[®] 60825-1: 1993. This device family has been classified with the FDA under accession number 8720010. Measurements were made to classify the product per IEC 60825-1: 1993.

This product complies with 21 CFR 1040.10 and 1040.11.

PANDA-type 10.5 μm /125 μm ± 3 μm single-mode fiber with a tight-buffered coating, all within a 900 μm diameter, loose-tube jacket. Connector is included.

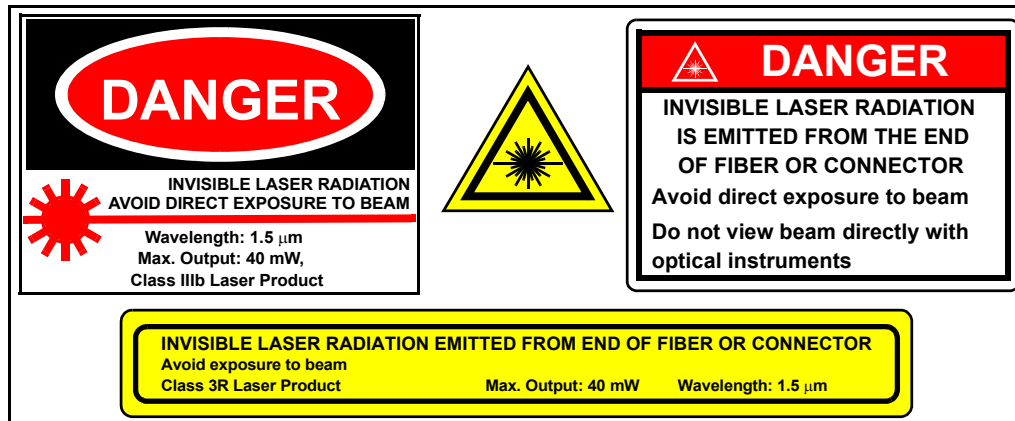
Wavelength range = 1528.77 nm—1610.06 nm.

Maximum power = 40 mW.

Because of size constraints, laser safety labeling (including an FDA Class IIIb label) is not affixed to the module but attached to the outside of the shipping carton.

Product is not shipped with power supply.

Caution: Use of controls, adjustments, and procedures other than those specified herein may result in hazardous laser radiation exposure.



Ordering Information

Table 5. Ordering Information

Part Number	Comcode	Channel 1 MIN Wavelength		Channel 8 MAX Wavelength	
		λ_1 (nm)	f ₁ (THz)	λ_8 (nm)	f ₈ (THz)
D3587P61	700038323	1528.77	196.1	1531.51	195.75
D3587P60	700038324	1529.55	196	1532.29	195.65
D3587P59	700038325	1530.33	195.9	1533.07	195.55
D3587P58	700038326	1531.12	195.8	1533.86	195.45
D3587P57	700038327	1531.9	195.7	1534.64	195.35
D3587P56	700038328	1532.68	195.6	1535.43	195.25
D3587P55	700038329	1533.47	195.5	1536.22	195.15
D3587P54	700038330	1534.25	195.4	1537	195.05
D3587P53	700038331	1535.04	195.3	1537.79	194.95
D3587P52	700038332	1535.82	195.2	1538.58	194.85
D3587P51	700038333	1536.61	195.1	1539.37	194.75
D3587P50	700038334	1537.4	195	1540.16	194.65
D3587P49	700038335	1538.19	194.9	1540.95	194.55
D3587P48	700038336	1538.98	194.8	1541.75	194.45
D3587P47	700038337	1539.77	194.7	1542.54	194.35
D3587P46	700038338	1540.56	194.6	1543.33	194.25
D3587P45	700038342	1541.35	194.5	1544.13	194.15
D3587P44	700038343	1542.14	194.4	1544.92	194.05
D3587P43	700038344	1542.94	194.3	1545.72	193.95
D3587P42	700038345	1543.73	194.2	1546.52	193.85
D3587P41	700038346	1544.53	194.1	1547.32	193.75
D3587P40	700038350	1545.32	194	1548.11	193.65
D3587P39	700038351	1546.12	193.9	1548.91	193.55
D3587P38	700038352	1546.92	193.8	1549.72	193.45
D3587P37	700038356	1547.72	193.7	1550.52	193.35
D3587P36	700038357	1548.51	193.6	1551.32	193.25
D3587P35	700038358	1549.32	193.5	1552.12	193.15
D3587P34	700038362	1550.12	193.4	1552.93	193.05
D3587P33	700038363	1550.92	193.3	1553.73	192.95
D3587P32	700038364	1551.72	193.2	1554.54	192.85
D3587P31	700038365	1552.52	193.1	1555.34	192.75
D3587P30	700038369	1553.33	193	1556.15	192.65
D3587P29	700038370	1554.13	192.9	1556.96	192.55
D3587P28	700038371	1554.94	192.8	1557.77	192.45
D3587P27	700038375	1555.75	192.7	1558.58	192.35
D3587P26	700038376	1556.55	192.6	1559.39	192.25

Ordering Information (continued)

Table 5. Ordering Information (continued)

Part Number	Comcode	Channel 1 MIN Wavelength		Channel 8 MAX Wavelength	
		λ_1 (nm)	f_1 (THz)	λ_8 (nm)	f_8 (THz)
D3587P25	700038377	1557.36	192.5	1560.2	192.15
D3587P24	700038381	1558.17	192.4	1561.01	192.05
D3587P23	700038386	1558.98	192.3	1561.83	191.95
D3587P22	700038387	1559.79	192.2	1562.64	191.85
D3587P21	700038391	1560.61	192.1	1563.45	191.75
D3587P20	700038392	1561.42	192	1564.27	191.65
D3587P19	700038393	1562.23	191.9	1565.09	191.55
D3587P18	700038400	1563.05	191.8	1565.9	191.45
D3587P17	700038401	1563.86	191.7	1566.72	191.35
D3587P916	700038429	1564.68	191.6	1567.54	191.25
D3587P915	700038433	1565.5	191.5	1568.36	191.15
D3587P914	700038435	1566.31	191.4	1569.18	191.05
D3587P913	700038436	1567.13	191.3	1570.01	190.95
D3587P912	700038440	1567.95	191.2	1570.83	190.85
D3587P911	700038445	1568.77	191.1	1571.65	190.75
D3587P910	700038449	1569.59	191	1572.48	190.65
D3587P909	700038450	1570.42	190.9	1573.3	190.55
D3587P908	700038454	1571.24	190.8	1574.13	190.45
D3587P907	700038455	1572.06	190.7	1574.95	190.35
D3587P906	700038456	1572.89	190.6	1575.78	190.25
D3587P905	700038459	1573.71	190.5	1576.61	190.15
D3587P904	700038464	1574.54	190.4	1577.44	190.05
D3587P903	700038465	1575.37	190.3	1578.27	189.95
D3587P902	700038466	1576.2	190.2	1579.1	189.85
D3587P901	700038467	1577.03	190.1	1579.93	189.75
D3587P900	700038468	1577.86	190	1580.77	189.65
D3587P899	700038470	1578.69	189.9	1581.6	189.55
D3587P898	700038473	1579.52	189.8	1582.44	189.45
D3587P897	700038474	1580.35	189.7	1583.27	189.35
D3587P896	700038475	1581.18	189.6	1584.11	189.25
D3587P895	700038477	1582.02	189.5	1584.95	189.15
D3587P894	700038478	1582.85	189.4	1585.78	189.05
D3587P893	700038479	1583.69	189.3	1586.62	188.95
D3587P892	700038481	1584.53	189.2	1587.46	188.85
D3587P891	700038483	1585.36	189.1	1588.3	188.75
D3587P890	700038484	1586.2	189	1589.15	188.65

Ordering Information (continued)

Table 5. Ordering Information (continued)

Part Number	Comcode	Channel 1 MIN Wavelength		Channel 8 MAX Wavelength	
		λ_1 (nm)	f ₁ (THz)	λ_8 (nm)	f ₈ (THz)
D3587P889	700038485	1587.04	188.9	1589.99	188.55
D3587P888	700038486	1587.88	188.8	1590.83	188.45
D3587P887	700038487	1588.73	188.7	1591.68	188.35
D3587P886	700038488	1589.57	188.6	1592.52	188.25
D3587P885	700038489	1590.41	188.5	1593.37	188.15
D3587P884	700038490	1591.26	188.4	1594.22	188.05
D3587P883	700038491	1592.1	188.3	1595.06	187.95
D3587P882	700038496	1592.95	188.2	1595.91	187.85
D3587P881	700038497	1593.79	188.1	1596.76	187.75
D3587P880	700038498	1594.64	188	1597.62	187.65
D3587P879	700038499	1595.49	187.9	1598.47	187.55
D3587P878	700038500	1596.34	187.8	1599.32	187.45
D3587P877	700038501	1597.19	187.7	1600.17	187.35
D3587P876	700038502	1598.04	187.6	1601.03	187.25
D3587P875	700038503	1598.89	187.5	1601.88	187.15
D3587P874	700038504	1599.75	187.4	1602.74	187.05
D3587P873	700038505	1600.6	187.3	1603.6	186.95
D3587P872	700038506	1601.46	187.2	1604.46	186.85
D3587P871	700038507	1602.31	187.1	1605.31	186.75
D3587P870	700038508	1603.17	187	1606.17	186.65
D3587P869	700038509	1604.03	186.9	1607.04	186.55
D3587P868	700038510	1604.88	186.8	1607.9	186.45
D3587P867	700038511	1605.74	186.7	1608.76	186.35
D3587P866	700038512	1606.6	186.6	1609.62	186.25

Ordering Information (continued)

Table 6. Ordering Information

Part Number	Comcode	Ch. 1 (THz)	Ch. 2 (THz)	Ch. 3 (THz)	Ch. 4 (THz)	Ch. 5 (THz)	Ch. 6 (THz)	Ch. 7 (THz)	Ch. 8 (THz)
D3587P61	700038323	196.1	196.05	196	195.95	195.9	195.85	195.8	195.75
D3587P60	700038324	196	195.95	195.9	195.85	195.8	195.75	195.7	195.65
D3587P59	700038325	195.9	195.85	195.8	195.75	195.7	195.65	195.6	195.55
D3587P58	700038326	195.8	195.75	195.7	195.65	195.6	195.55	195.5	195.45
D3587P57	700038327	195.7	195.65	195.6	195.55	195.5	195.45	195.4	195.35
D3587P56	700038328	195.6	195.55	195.5	195.45	195.4	195.35	195.3	195.25
D3587P55	700038329	195.5	195.45	195.4	195.35	195.3	195.25	195.2	195.15
D3587P54	700038330	195.4	195.35	195.3	195.25	195.2	195.15	195.1	195.05
D3587P53	700038331	195.3	195.25	195.2	195.15	195.1	195.05	195	194.95
D3587P52	700038332	195.2	195.15	195.1	195.05	195	194.95	194.9	194.85
D3587P51	700038333	195.1	195.05	195	194.95	194.9	194.85	194.8	194.75
D3587P50	700038334	195	194.95	194.9	194.85	194.8	194.75	194.7	194.65
D3587P49	700038335	194.9	194.85	194.8	194.75	194.7	194.65	194.6	194.55
D3587P48	700038336	194.8	194.75	194.7	194.65	194.6	194.55	194.5	194.45
D3587P47	700038337	194.7	194.65	194.6	194.55	194.5	194.45	194.4	194.35
D3587P46	700038338	194.6	194.55	194.5	194.45	194.4	194.35	194.3	194.25
D3587P45	700038342	194.5	194.45	194.4	194.35	194.3	194.25	194.2	194.15
D3587P44	700038343	194.4	194.35	194.3	194.25	194.2	194.15	194.1	194.05
D3587P43	700038344	194.3	194.25	194.2	194.15	194.1	194.05	194	193.95
D3587P42	700038345	194.2	194.15	194.1	194.05	194	193.95	193.9	193.85
D3587P41	700038346	194.1	194.05	194	193.95	193.9	193.85	193.8	193.75
D3587P40	700038350	194	193.95	193.9	193.85	193.8	193.75	193.7	193.65
D3587P39	700038351	193.9	193.85	193.8	193.75	193.7	193.65	193.6	193.55
D3587P38	700038352	193.8	193.75	193.7	193.65	193.6	193.55	193.5	193.45
D3587P37	700038356	193.7	193.65	193.6	193.55	193.5	193.45	193.4	193.35
D3587P36	700038357	193.6	193.55	193.5	193.45	193.4	193.35	193.3	193.25
D3587P35	700038358	193.5	193.45	193.4	193.35	193.3	193.25	193.2	193.15
D3587P34	700038362	193.4	193.35	193.3	193.25	193.2	193.15	193.1	193.05
D3587P33	700038363	193.3	193.25	193.2	193.15	193.1	193.05	193	192.95
D3587P32	700038364	193.2	193.15	193.1	193.05	193	192.95	192.9	192.85
D3587P31	700038365	193.1	193.05	193	192.95	192.9	192.85	192.8	192.75
D3587P30	700038369	193	192.95	192.9	192.85	192.8	192.75	192.7	192.65
D3587P29	700038370	192.9	192.85	192.8	192.75	192.7	192.65	192.6	192.55
D3587P28	700038371	192.8	192.75	192.7	192.65	192.6	192.55	192.5	192.45
D3587P27	700038375	192.7	192.65	192.6	192.55	192.5	192.45	192.4	192.35
D3587P26	700038376	192.6	192.55	192.5	192.45	192.4	192.35	192.3	192.25
D3587P25	700038377	192.5	192.45	192.4	192.35	192.3	192.25	192.2	192.15

Ordering Information (continued)

Table 6. Ordering Information (continued)

Part Number	Comcode	Ch. 1 (THz)	Ch. 2 (THz)	Ch. 3 (THz)	Ch. 4 (THz)	Ch. 5 (THz)	Ch. 6 (THz)	Ch. 7 (THz)	Ch. 8 (THz)
D3587P24	700038381	192.4	192.35	192.3	192.25	192.2	192.15	192.1	192.05
D3587P23	700038386	192.3	192.25	192.2	192.15	192.1	192.05	192	191.95
D3587P22	700038387	192.2	192.15	192.1	192.05	192	191.95	191.9	191.85
D3587P21	700038391	192.1	192.05	192	191.95	191.9	191.85	191.8	191.75
D3587P20	700038392	192	191.95	191.9	191.85	191.8	191.75	191.7	191.65
D3587P19	700038393	191.9	191.85	191.8	191.75	191.7	191.65	191.6	191.55
D3587P18	700038400	191.8	191.75	191.7	191.65	191.6	191.55	191.5	191.45
D3587P17	700038401	191.7	191.65	191.6	191.55	191.5	191.45	191.4	191.35
D3587P916	700038429	191.6	191.55	191.5	191.45	191.4	191.35	191.3	191.25
D3587P915	700038433	191.5	191.45	191.4	191.35	191.3	191.25	191.2	191.15
D3587P914	700038435	191.4	191.35	191.3	191.25	191.2	191.15	191.1	191.05
D3587P913	700038436	191.3	191.25	191.2	191.15	191.1	191.05	191	190.95
D3587P912	700038440	191.2	191.15	191.1	191.05	191	190.95	190.9	190.85
D3587P911	700038445	191.1	191.05	191	190.95	190.9	190.85	190.8	190.75
D3587P910	700038449	191	190.95	190.9	190.85	190.8	190.75	190.7	190.65
D3587P909	700038450	190.9	190.85	190.8	190.75	190.7	190.65	190.6	190.55
D3587P908	700038454	190.8	190.75	190.7	190.65	190.6	190.55	190.5	190.45
D3587P907	700038455	190.7	190.65	190.6	190.55	190.5	190.45	190.4	190.35
D3587P906	700038456	190.6	190.55	190.5	190.45	190.4	190.35	190.3	190.25
D3587P905	700038459	190.5	190.45	190.4	190.35	190.3	190.25	190.2	190.15
D3587P904	700038464	190.4	190.35	190.3	190.25	190.2	190.15	190.1	190.05
D3587P903	700038465	190.3	190.25	190.2	190.15	190.1	190.05	190	189.95
D3587P902	700038466	190.2	190.15	190.1	190.05	190	189.95	189.9	189.85
D3587P901	700038467	190.1	190.05	190	189.95	189.9	189.85	189.8	189.75
D3587P900	700038468	190	189.95	189.9	189.85	189.8	189.75	189.7	189.65
D3587P899	700038470	189.9	189.85	189.8	189.75	189.7	189.65	189.6	189.55
D3587P898	700038473	189.8	189.75	189.7	189.65	189.6	189.55	189.5	189.45
D3587P897	700038474	189.7	189.65	189.6	189.55	189.5	189.45	189.4	189.35
D3587P896	700038475	189.6	189.55	189.5	189.45	189.4	189.35	189.3	189.25
D3587P895	700038477	189.5	189.45	189.4	189.35	189.3	189.25	189.2	189.15
D3587P894	700038478	189.4	189.35	189.3	189.25	189.2	189.15	189.1	189.05
D3587P893	700038479	189.3	189.25	189.2	189.15	189.1	189.05	189	188.95
D3587P892	700038481	189.2	189.15	189.1	189.05	189	188.95	188.9	188.85
D3587P891	700038483	189.1	189.05	189	188.95	188.9	188.85	188.8	188.75
D3587P890	700038484	189	188.95	188.9	188.85	188.8	188.75	188.7	188.65
D3587P889	700038485	188.9	188.85	188.8	188.75	188.7	188.65	188.6	188.55
D3587P888	700038486	188.8	188.75	188.7	188.65	188.6	188.55	188.5	188.45

Ordering Information (continued)

Table 6. Ordering Information (continued)

Part Number	Comcode	Ch. 1 (THz)	Ch. 2 (THz)	Ch. 3 (THz)	Ch. 4 (THz)	Ch. 5 (THz)	Ch. 6 (THz)	Ch. 7 (THz)	Ch. 8 (THz)
D3587P887	700038487	188.7	188.65	188.6	188.55	188.5	188.45	188.4	188.35
D3587P886	700038488	188.6	188.55	188.5	188.45	188.4	188.35	188.3	188.25
D3587P885	700038489	188.5	188.45	188.4	188.35	188.3	188.25	188.2	188.15
D3587P884	700038490	188.4	188.35	188.3	188.25	188.2	188.15	188.1	188.05
D3587P883	700038491	188.3	188.25	188.2	188.15	188.1	188.05	188	187.95
D3587P882	700038496	188.2	188.15	188.1	188.05	188	187.95	187.9	187.85
D3587P881	700038497	188.1	188.05	188	187.95	187.9	187.85	187.8	187.75
D3587P880	700038498	188	187.95	187.9	187.85	187.8	187.75	187.7	187.65
D3587P879	700038499	187.9	187.85	187.8	187.75	187.7	187.65	187.6	187.55
D3587P878	700038500	187.8	187.75	187.7	187.65	187.6	187.55	187.5	187.45
D3587P877	700038501	187.7	187.65	187.6	187.55	187.5	187.45	187.4	187.35
D3587P876	700038502	187.6	187.55	187.5	187.45	187.4	187.35	187.3	187.25
D3587P875	700038503	187.5	187.45	187.4	187.35	187.3	187.25	187.2	187.15
D3587P874	700038504	187.4	187.35	187.3	187.25	187.2	187.15	187.1	187.05
D3587P873	700038505	187.3	187.25	187.2	187.15	187.1	187.05	187	186.95
D3587P872	700038506	187.2	187.15	187.1	187.05	187	186.95	186.9	186.85
D3587P871	700038507	187.1	187.05	187	186.95	186.9	186.85	186.8	186.75
D3587P870	700038508	187	186.95	186.9	186.85	186.8	186.75	186.7	186.65
D3587P869	700038509	186.9	186.85	186.8	186.75	186.7	186.65	186.6	186.55
D3587P868	700038510	186.8	186.75	186.7	186.65	186.6	186.55	186.5	186.45
D3587P867	700038511	186.7	186.65	186.6	186.55	186.5	186.45	186.4	186.35
D3587P866	700038512	186.6	186.55	186.5	186.45	186.4	186.35	186.3	186.25

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For the latest specifications, additional product information, worldwide sales and distribution locations, and information about TriQuint:

Web: www.triquint.com

Tel: (503) 615-9000

E-mail: info_opto@tqs.com

Fax: (503) 615-8902

For technical questions and additional information on specific applications:

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