Data Sheet
June 2008

1625/26 - Series XMD MSA-compatible 10 Gb/s Cooled EML TOSA



CyOptics' 1625/26-series 10Gb/s TOSA with flex connect

Features

- Ultra small form-factor 8-pin XMD MSA TOSA
- Data rates up to 10.7Gb/s
- For use up to 80km (1600 ps/nm) at 10 Gb/s
- Up to +2 dBm typical optical output power
- Wavelength selectable to ITU-T standards covering the full C-band
- Suitable for use in 100GHz channel spacing in DWDM systems
- Temperature stabilized
- Very low TEC power consumption
- LC, SC receptacle or pigtailed versions available
- 50Ω single-ended data input
- Case operating temperature range options: -5 to +80C (standard TDM versions), -5 to +75C (standard DWDM versions), -40 to +90C (extended temperature versions)

Description

The 1625 (40km) and 1626 (80km) - Series XMD MSA compatible 10 Gb/s transmitter optical subassembly (TOSA) integrates a high-speed electroabsorptive (EML) laser, a monitor photodiode and a micro-TEC in a small form-factor metallized ceramic package. It is designed for use in small form-factor pluggable (XFP) transceivers and other types of optical modules for high-speed telecommunication and data applications including WDM SONET OC-192, SDH STM-64 and 10 Gibabit Ethernet.

The 1625/26 -Series is available in the full range of C-band ITU-T wavelengths operating at 10 Gb/s per channel. The device exhibits excellent wavelength stability, supporting operation at 100 GHz channel spacing over 20 years (assuming an end-of-life aging condition of <±90 pm), with low hazard rates (~100FIT wearout over 20 yrs.).

Applications

- XFP, X2, XENPAK and other Transceivers, 300 pin Transponders for DWDM and SONET/SDH, 10 GbE interfaces
- Line cards

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 operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Conditions	Min	Max	Unit
Laser Diode Reverse Voltage	CW	—	2	V
Laser Diode Forward Current	CW	—	150	mA
Optical Output Power	CW	—	10	mW
EA Modulator Reverse Bias Voltage	—	—	3	V
Monitor Diode Reverse Voltage	—	—	10	V
Monitor Diode Forward Current	—	—	2	mA
Storage Temperature Range	—	–40	85	°C
Case Temperature (Standard version) Case Temperature (Extended temp version)	— —	-5 -40	80 90	°C °C
TEC Voltage	—	—	2	V
TEC Current	—	—	1.5	A
Flex pad soldering temperature	(*)	—	260	°C
Flex pad soldering duration	—	—	10	s

(*) Local heating only

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).

CyOptics 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 = 100pF) is widely used and can be used for comparison purposes.

Electrical/Optical Characteristics

Table 1. Optical and Electrical Specifications (Chip operating temp. = 30 to 40C, except where noted. Nominal 50% duty cycle data signal, except where noted.). All parameters are end of life (EOL) unless stated otherwise.

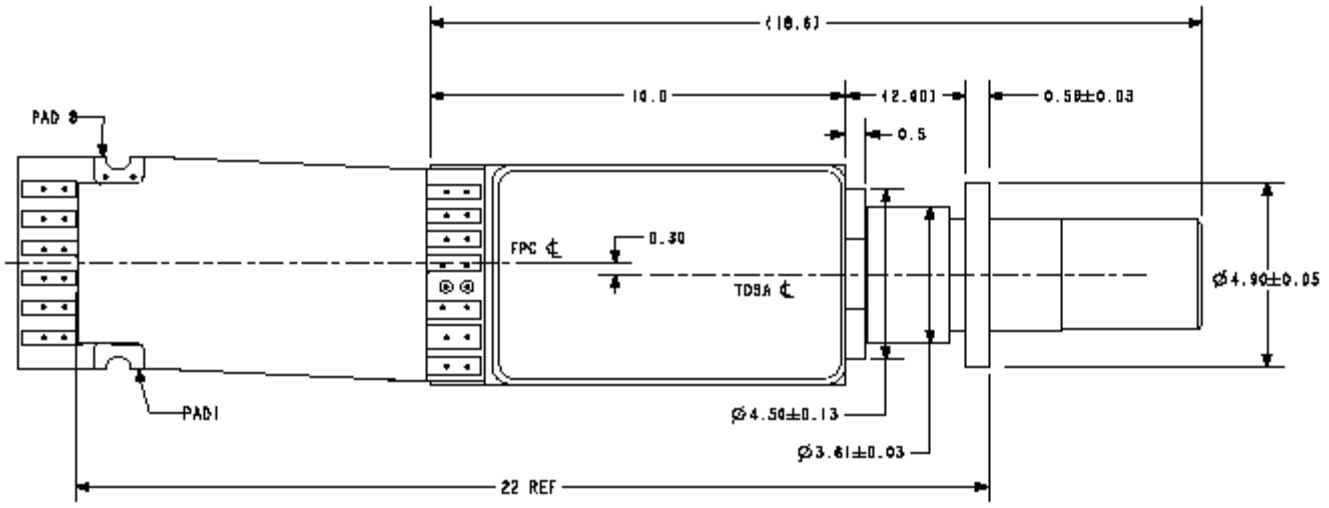
Parameter	Symbol	Conditions	Min	Max	Unit
Laser Operating Temperature	T_{op}	T_{CASE} = -40 to +90C (extended temp versions) T_{CASE} = -5 to +75C (other versions)	30	40	C
Threshold Current (BOL)	I_{TH}	—	—	30	mA
Laser Forward Voltage	V_F	$I_F = I_{OP}$ @ T_{OP}	—	1.6	V
Operating Current	I_{OP}	—		110	mA
Threshold Power	P_{TH}	$I_F = I_{TH}$	—	80	µW
Relative Intensity Noise	RIN	0-10GHz		-135	dB/Hz
Fiber Output Power (average): 40km (1625) (BOL) 40km (1625) (EOL) 80km (1626) (BOL) 80km (1626) (EOL)	P_{AVG}	$I_F = I_{OP}$ @ T_{OP} V_{EA}, V_{PP}	 0 -0.5 +1 +0.5	 +2 +2 +4 +4	 dBm dBm dBm dBm
On-state voltage (EA section)	V_{EA}	—	-2	0	V
P-P Modulation voltage (EA section)	V_{PP}	—		2.5	V
Center Wavelength (per ITU grid) Center Wavelength (TDM versions)	λc	CW, T_{LASER} = 30-40C CW, T_{LASER} = 35-40C	1528.7 1530	1563.9 1565	nm nm
Center Wavelength tuning coefficient	—	—	—	0.13	nm/C
Linewidth (3 dB FWHM)	$\Delta\lambda_{3dB}$	CW, $I_{bias} = I_{OP}$	—	15	MHz
Side-mode Suppression Ratio	SMSR	CW, $I_{bias} = I_{OP}$	35	—	dB
Extinction Ratio (40km codes) (BOL) Extinction Ratio (80km codes) (BOL)	ER ER	V_{EA}, V_{PP}	9.2 10		dB dB
Rise/ fall time	Tr, Tf	20-80%, filtered eye		40	ps
Center wavelength stability	$\Delta\lambda_D$	Specified T_{CASE} range	-90	90	pm
Dispersion Penalty at 9.95Gb/s 1625 (800 ps/nm) 1626 (1600 ps/nm)	DP	9.95Gb/s, ER, $I_F = I_{OP}$@ T_{OP}, BER = $1x10^{-12}$	 — —	 2.0 2.0	 dB dB
Dispersion Penalty at 10.7Gb/s 1625 (800 ps/nm) 1626 (1600 ps/nm)	DP	10.7Gb/s, ER, $I_F = I_{OP}$@ T_{OP}, BER = $1x10^{-12}$	 — —	 2.0 3.0	 dB dB
RF Characteristics					
Input Impedance	Z_{IN}	—	48	52	Ω
Monitor Diode					
Monitor Voltage	V_{rmon}	—	3	10	V
Monitor Current	I_{BD}	Iop, Top	0.2	1.8	mA
Dark Current	I_D	I_F = 0, V_{rmon} = 5V	—	0.1	µA
Tracking Error	TE		-0.5	0.5	dB
Thermistor					
Resistance (standard 10kΩ@25C thermistor)	R_{THERM}	T = 35C	6.4	6.6	kΩ
Thermistor B-constant	B		3800	4000	K
Thermistor Current	I_{TC}	—	10	100	µA
Thermoelectric Cooler (TEC)					

Parameter	Symbol	Conditions	Min	Max	Unit
TEC Current	I_{TEC}	T_{CASE}=-40 to +90C (extended temp versions) T_{CASE}=-5 to +75C (other versions) T_{OP}, I_{OP}, V_{PP}	—	0.8	A
TEC Voltage	V_{TEC}		—	1.8	V
TEC Power (40km version), TDM	P_{TEC}	T_{CASE}=-5 to +75C T_{OP}, I_{OP}, V_{PP}		0.4	W
TEC Power (40km version), TDM, extended temperature version	P_{TEC}	T_{CASE}=-40 to +90C T_{OP}, I_{OP}, V_{PP}		0.9	W
TEC Power (40km version), DWDM	P_{TEC}	T_{CASE}=-5 to +75C T_{OP}, I_{OP}, V_{PP}		0.55	W
TEC Power (80km version), TDM or DWDM	P_{TEC}	T_{CASE}=-5 to +75C T_{OP}, I_{OP}, V_{PP}		0.6	W
TEC Power (40km version), DWDM, extended temperature version	P_{TEC}	T_{CASE}=-40 to +90C T_{OP}, I_{OP}, V_{PP}		1.2	W
TEC Power (80km version), TDM or DWDM, extended temperature version	P_{TEC}	T_{CASE}=-40 to +90C T_{OP}, I_{OP}, V_{PP}		1.3	W
TEC Capacity	ΔT	Standard versions Extended temp versions	-50 -80	45 60	C C
Optical Isolation					
Optical Isolation	—	T_{CASE} = 80C	30	—	dB
Package					
Center Wavelength Drift vs. Case Temperature	$\Delta\lambda_c/\Delta T_c$	T_{CASE} = -5C to +80C	—	0.35	pm/C

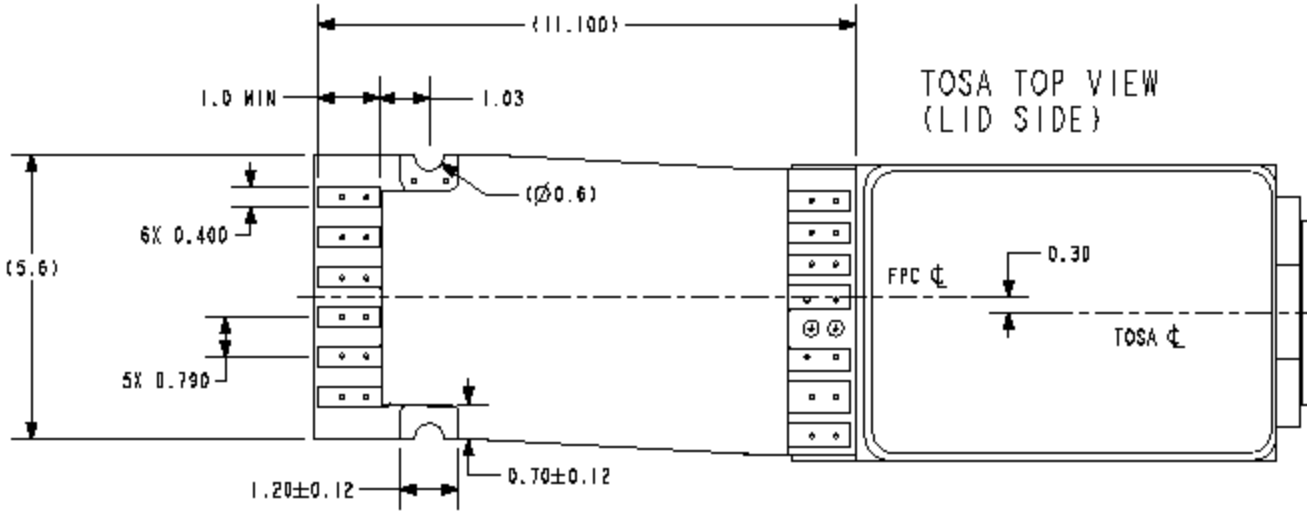
Outline Diagram and Pin Assignment

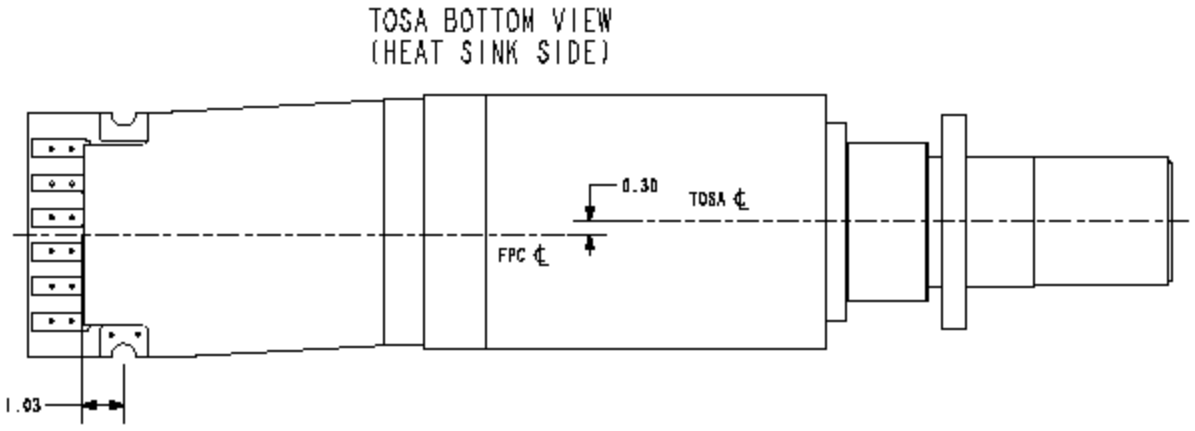
Dimensions are in millimeters

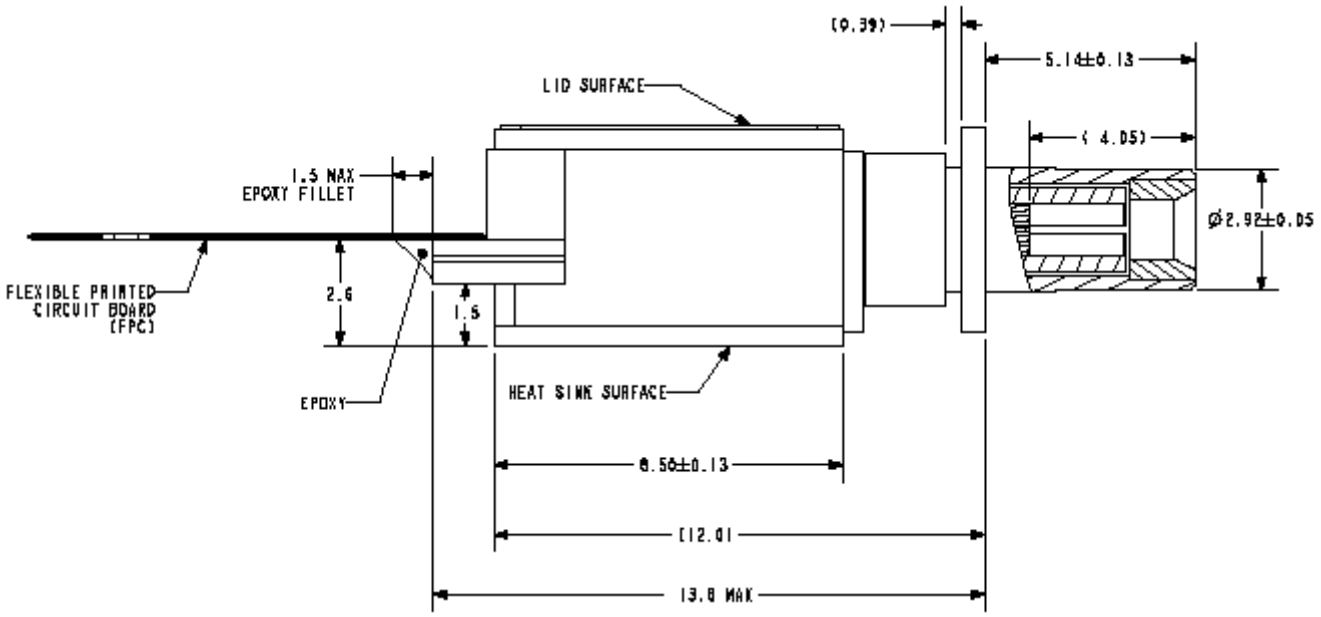
LC Connector Version (162xLxx):

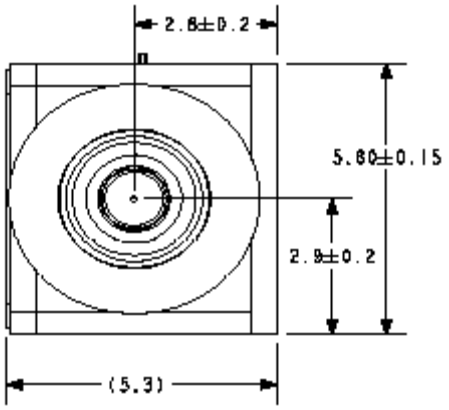


Detail of flex connect contacts (top side):



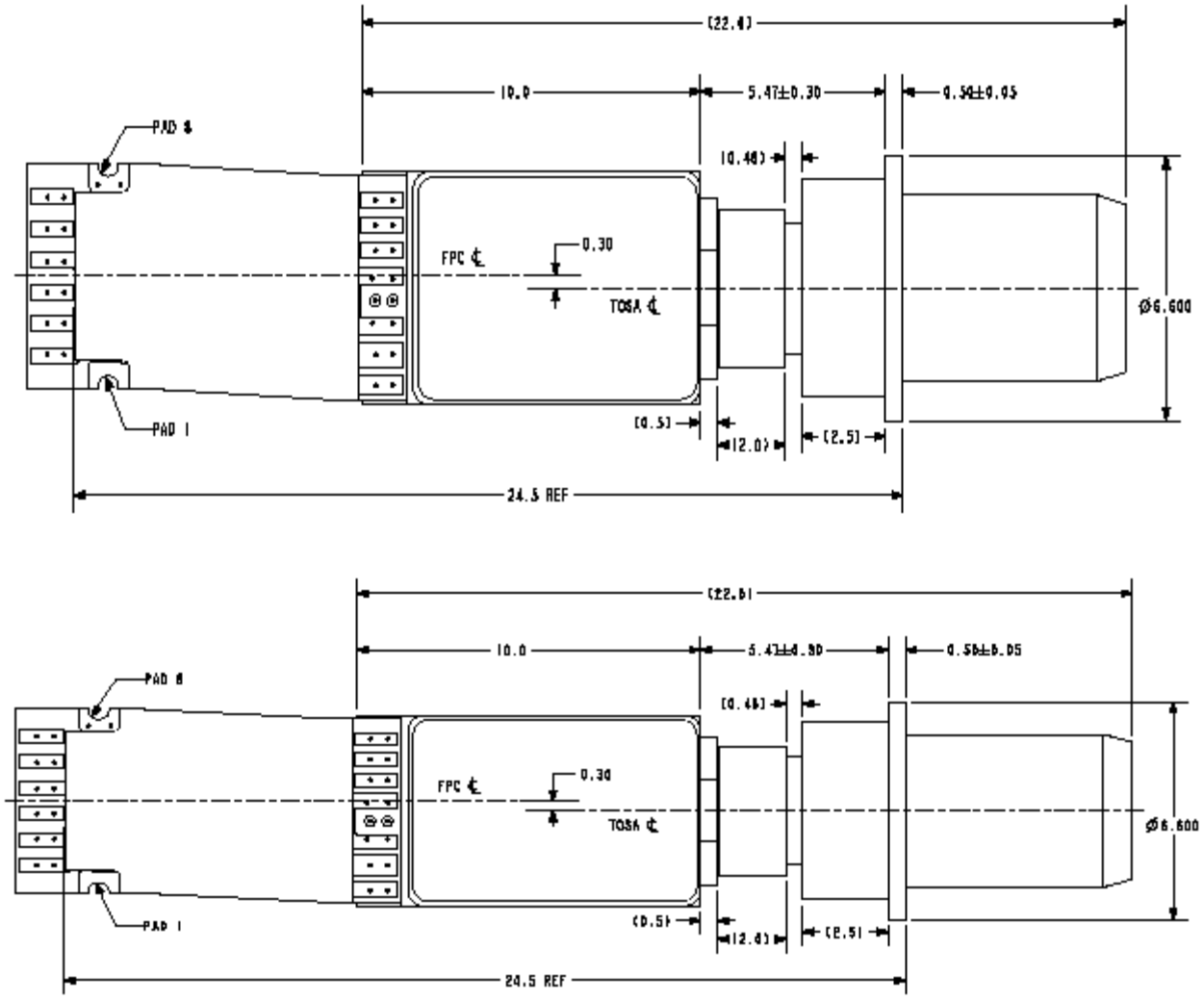




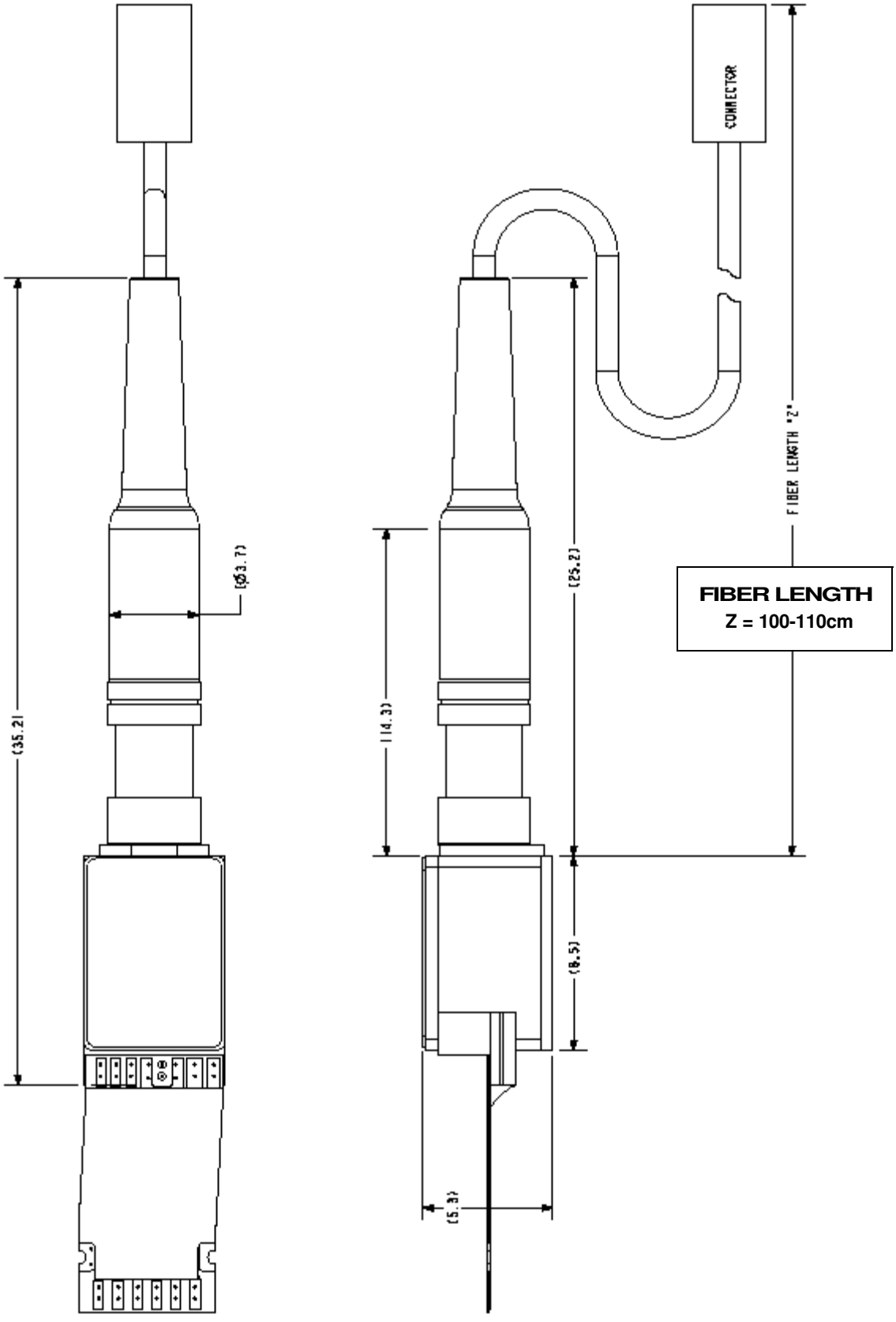


PAD	PAD ASSIGNMENT
1	TEC (-)
2	TEC (+)
3	SIGNAL GROUND
4	MODULATOR ANODE
5	SIGNAL GROUND
6	PD ANODE
7	LD ANODE
8	THERMISTOR

SC Connector Version detail (162xSxx):



Fiber Pigtailed Version detail (162xFxx):



Ordering Information (LC Receptacle versions, Standard Temperature)

40km Version Standard Temperature	80km Version Standard Temperature	ITU-T Frequency (THz)	Center Wavelength (nm)
1625L0	1626L0	TDM version	TDM version (Table 1)
1625L061	1626L061	196.1	1528.77
1625L060	1626L060	196.0	1529.55
1625L059	1626L059	195.9	1530.33
1625L058	1626L058	195.8	1531.12
1625L057	1626L057	195.7	1531.90
1625L056	1626L056	195.6	1532.68
1625L055	1626L055	195.5	1533.47
1625L054	1626L054	195.4	1534.25
1625L053	1626L053	195.3	1535.04
1625L052	1626L052	195.2	1535.82
1625L051	1626L051	195.1	1536.61
1625L050	1626L050	195.0	1537.40
1625L049	1626L049	194.9	1538.19
1625L048	1626L048	194.8	1538.98
1625L047	1626L047	194.7	1539.77
1625L046	1626L046	194.6	1540.56
1625L045	1626L045	194.5	1541.35
1625L044	1626L044	194.4	1542.14
1625L043	1626L043	194.3	1542.94
1625L042	1626L042	194.2	1543.73
1625L041	1626L041	194.1	1544.53
1625L040	1626L040	194.0	1545.32
1625L039	1626L039	193.9	1546.12
1625L038	1626L038	193.8	1546.92
1625L037	1626L037	193.7	1547.72
1625L036	1626L036	193.6	1548.51
1625L035	1626L035	193.5	1549.32
1625L034	1626L034	193.4	1550.12
1625L033	1626L033	193.3	1550.92
1625L032	1626L032	193.2	1551.72
1625L031	1626L031	193.1	1552.52
1625L030	1626L030	193.0	1553.33
1625L029	1626L029	192.9	1554.13
1625L028	1626L028	192.8	1554.94
1625L027	1626L027	192.7	1555.75
1625L026	1626L026	192.6	1556.56
1625L025	1626L025	192.5	1557.36
1625L024	1626L024	192.4	1558.17
1625L023	1626L023	192.3	1558.98
1625L022	1626L022	192.2	1559.79
1625L021	1626L021	192.1	1560.61
1625L020	1626L020	192.0	1561.42
1625L019	1626L019	191.9	1562.23
1625L018	1626L018	191.8	1563.05
1625L017	1626L017	191.7	1563.86

Ordering Information (LC Receptacle versions, Extended Temperature)

40km Version Extended Temperature	80km Version Extended Temperature	ITU-T Frequency (THz)	Center Wavelength (nm)
1625L3	1626L3	TDM version	TDM version (Table 1)
1625L361	1626L361	196.1	1528.77
1625L360	1626L360	196.0	1529.55
1625L359	1626L359	195.9	1530.33
1625L358	1626L358	195.8	1531.12
1625L357	1626L357	195.7	1531.90
1625L356	1626L356	195.6	1532.68
1625L355	1626L355	195.5	1533.47
1625L354	1626L354	195.4	1534.25
1625L353	1626L353	195.3	1535.04
1625L352	1626L352	195.2	1535.82
1625L351	1626L351	195.1	1536.61
1625L350	1626L350	195.0	1537.40
1625L349	1626L349	194.9	1538.19
1625L348	1626L348	194.8	1538.98
1625L347	1626L347	194.7	1539.77
1625L346	1626L346	194.6	1540.56
1625L345	1626L345	194.5	1541.35
1625L344	1626L344	194.4	1542.14
1625L343	1626L343	194.3	1542.94
1625L342	1626L342	194.2	1543.73
1625L341	1626L341	194.1	1544.53
1625L340	1626L340	194.0	1545.32
1625L339	1626L339	193.9	1546.12
1625L338	1626L338	193.8	1546.92
1625L337	1626L337	193.7	1547.72
1625L336	1626L336	193.6	1548.51
1625L335	1626L335	193.5	1549.32
1625L334	1626L334	193.4	1550.12
1625L333	1626L333	193.3	1550.92
1625L332	1626L332	193.2	1551.72
1625L331	1626L331	193.1	1552.52
1625L330	1626L330	193.0	1553.33
1625L329	1626L329	192.9	1554.13
1625L328	1626L328	192.8	1554.94
1625L327	1626L327	192.7	1555.75
1625L326	1626L326	192.6	1556.56
1625L325	1626L325	192.5	1557.36
1625L324	1626L324	192.4	1558.17
1625L323	1626L323	192.3	1558.98
1625L322	1626L322	192.2	1559.79
1625L321	1626L321	192.1	1560.61
1625L320	1626L320	192.0	1561.42
1625L319	1626L319	191.9	1562.23
1625L318	1626L318	191.8	1563.05
1625L317	1626L317	191.7	1563.86

Ordering Information (SC Receptacle versions)

40km Version Standard Temperature	80km Version Standard Temperature	ITU-T Frequency (THz)	Center Wavelength (nm)
1625S0	1626S0	TDM version	TDM version (Table 1)
1625S061	1626S061	196.1	1528.77
1625S060	1626S060	196.0	1529.55
1625S059	1626S059	195.9	1530.33
1625S058	1626S058	195.8	1531.12
1625S057	1626S057	195.7	1531.90
1625S056	1626S056	195.6	1532.68
1625S055	1626S055	195.5	1533.47
1625S054	1626S054	195.4	1534.25
1625S053	1626S053	195.3	1535.04
1625S052	1626S052	195.2	1535.82
1625S051	1626S051	195.1	1536.61
1625S050	1626S050	195.0	1537.40
1625S049	1626S049	194.9	1538.19
1625S048	1626S048	194.8	1538.98
1625S047	1626S047	194.7	1539.77
1625S046	1626S046	194.6	1540.56
1625S045	1626S045	194.5	1541.35
1625S044	1626S044	194.4	1542.14
1625S043	1626S043	194.3	1542.94
1625S042	1626S042	194.2	1543.73
1625S041	1626S041	194.1	1544.53
1625S040	1626S040	194.0	1545.32
1625S039	1626S039	193.9	1546.12
1625S038	1626S038	193.8	1546.92
1625S037	1626S037	193.7	1547.72
1625S036	1626S036	193.6	1548.51
1625S035	1626S035	193.5	1549.32
1625S034	1626S034	193.4	1550.12
1625S033	1626S033	193.3	1550.92
1625S032	1626S032	193.2	1551.72
1625S031	1626S031	193.1	1552.52
1625S030	1626S030	193.0	1553.33
1625S029	1626S029	192.9	1554.13
1625S028	1626S028	192.8	1554.94
1625S027	1626S027	192.7	1555.75
1625S026	1626S026	192.6	1556.56
1625S025	1626S025	192.5	1557.36
1625S024	1626S024	192.4	1558.17
1625S023	1626S023	192.3	1558.98
1625S022	1626S022	192.2	1559.79
1625S021	1626S021	192.1	1560.61
1625S020	1626S020	192.0	1561.42
1625S019	1626S019	191.9	1562.23
1625S018	1626S018	191.8	1563.05
1625S017	1626S017	191.7	1563.86

Ordering Information (Fiber Pigtail versions with FC/PC connector)

40km Version Standard Temperature	80km Version Standard Temperature	ITU-T Frequency (THz)	Center Wavelength (nm)
1625F0	1626F0	TDM version	TDM version (Table 1)
1625F061	1626F061	196.1	1528.77
1625F060	1626F060	196.0	1529.55
1625F059	1626F059	195.9	1530.33
1625F058	1626F058	195.8	1531.12
1625F057	1626F057	195.7	1531.90
1625F056	1626F056	195.6	1532.68
1625F055	1626F055	195.5	1533.47
1625F054	1626F054	195.4	1534.25
1625F053	1626F053	195.3	1535.04
1625F052	1626F052	195.2	1535.82
1625F051	1626F051	195.1	1536.61
1625F050	1626F050	195.0	1537.40
1625F049	1626F049	194.9	1538.19
1625F048	1626F048	194.8	1538.98
1625F047	1626F047	194.7	1539.77
1625F046	1626F046	194.6	1540.56
1625F045	1626F045	194.5	1541.35
1625F044	1626F044	194.4	1542.14
1625F043	1626F043	194.3	1542.94
1625F042	1626F042	194.2	1543.73
1625F041	1626F041	194.1	1544.53
1625F040	1626F040	194.0	1545.32
1625F039	1626F039	193.9	1546.12
1625F038	1626F038	193.8	1546.92
1625F037	1626F037	193.7	1547.72
1625F036	1626F036	193.6	1548.51
1625F035	1626F035	193.5	1549.32
1625F034	1626F034	193.4	1550.12
1625F033	1626F033	193.3	1550.92
1625F032	1626F032	193.2	1551.72
1625F031	1626F031	193.1	1552.52
1625F030	1626F030	193.0	1553.33
1625F029	1626F029	192.9	1554.13
1625F028	1626F028	192.8	1554.94
1625F027	1626F027	192.7	1555.75
1625F026	1626F026	192.6	1556.56
1625F025	1626F025	192.5	1557.36
1625F024	1626F024	192.4	1558.17
1625F023	1626F023	192.3	1558.98
1625F022	1626F022	192.2	1559.79
1625F021	1626F021	192.1	1560.61
1625F020	1626F020	192.0	1561.42
1625F019	1626F019	191.9	1562.23
1625F018	1626F018	191.8	1563.05
1625F017	1626F017	191.7	1563.86

Ordering Information (Fiber Pigtail versions with LC/PC connector)

40km Version Standard Temperature	80km Version Standard Temperature	ITU-T Frequency (THz)	Center Wavelength (nm)
1625F2	1626F2	TDM version	TDM version (Table 1)
1625F261	1626F261	196.1	1528.77
1625F260	1626F260	196.0	1529.55
1625F259	1626F259	195.9	1530.33
1625F258	1626F258	195.8	1531.12
1625F257	1626F257	195.7	1531.90
1625F256	1626F256	195.6	1532.68
1625F255	1626F255	195.5	1533.47
1625F254	1626F254	195.4	1534.25
1625F253	1626F253	195.3	1535.04
1625F252	1626F252	195.2	1535.82
1625F251	1626F251	195.1	1536.61
1625F250	1626F250	195.0	1537.40
1625F249	1626F249	194.9	1538.19
1625F248	1626F248	194.8	1538.98
1625F247	1626F247	194.7	1539.77
1625F246	1626F246	194.6	1540.56
1625F245	1626F245	194.5	1541.35
1625F244	1626F244	194.4	1542.14
1625F243	1626F243	194.3	1542.94
1625F242	1626F242	194.2	1543.73
1625F241	1626F241	194.1	1544.53
1625F240	1626F240	194.0	1545.32
1625F239	1626F239	193.9	1546.12
1625F238	1626F238	193.8	1546.92
1625F237	1626F237	193.7	1547.72
1625F236	1626F236	193.6	1548.51
1625F235	1626F235	193.5	1549.32
1625F234	1626F234	193.4	1550.12
1625F233	1626F233	193.3	1550.92
1625F232	1626F232	193.2	1551.72
1625F231	1626F231	193.1	1552.52
1625F230	1626F230	193.0	1553.33
1625F229	1626F229	192.9	1554.13
1625F228	1626F228	192.8	1554.94
1625F227	1626F227	192.7	1555.75
1625F226	1626F226	192.6	1556.56
1625F225	1626F225	192.5	1557.36
1625F224	1626F224	192.4	1558.17
1625F223	1626F223	192.3	1558.98
1625F222	1626F222	192.2	1559.79
1625F221	1626F221	192.1	1560.61
1625F220	1626F220	192.0	1561.42
1625F219	1626F219	191.9	1562.23
1625F218	1626F218	191.8	1563.05
1625F217	1626F217	191.7	1563.86

Telcordia Technologies is a trademark of Telcordia Technologies, Inc.
IEC is a registered trademark of The International Electrotechnical Commission.

For additional information, contact your CyOptics Account Manager or the following:
INTERNET: http://www.cyoptics.com
Telephone: 484-397-3800
Fax: 484-397-3592
Email: mailto:sales@cyoptics.com
Info Email: mailto:sales@cyoptics.com

The information enclosed (including but not limited to technical specifications, recommendations, and application notes) relating to the products herein is believed to be reliable and accurate and is subject to change without notice. No risk and liability is assumed for use of the products and its applications. CyOptics, Inc. reserves the right to change without notice design, specification, form, fit or function relating to the products herein.

.

Copyright © 2005 CyOptics, Inc.
All Rights Reserved

June 2008
DS08-037