JDS Uniphase

Device Specification and Operational Notes

JDSU Part Number:	**10130484-308**
Oracle Description	**FTDC-670L-40-LT2**
Serial Number:	**FE001924**
Product description:	Single Channel Tunable Dispersion Compensator
Application:	40 Gbit/sec Network System

Table 1: Function Parameters

OPTICAL PARAMETERS			
Operating ITU Channel	186.7		THz
Reflection Spectrum at High / Low Dispersion	See Attached Plot		
Dispersion Tuning Range	300 to 700		ps/nm
ELECTRICAL/OPERATIONAL PARAMETERS			
TEC1 and TEC2[1]	Absolute Max Temperature	120	°C
	Current Limit	1.3	A
	Voltage Limit	2.9	V
	Maximum Power	3.8	W
Heater	Maximum Power	950	mW
MECHANICAL & PACKAGING PARAMETERS			
Package Size[2]	(W x H x L)	17 x 12 x 150	mm
Fiber Type	SMF (grating and Pigtails)	9/125	µm
Connectors		none	
Pigtail Length		1.5	m
ENVIRONMENTAL PERFORMANCE			
Operating Temperature Range	Heat Sink Temperature	-5 to 75	°C
Operating Relative Humidity		5 to 85	%
Storage Temperature Range		-40 to 85	°C
Storage Relative Humidity		5 to 95	%

[1]Specification pertains to individual TEC

[2]All packages are hermetically sealed

Table 2: Final Test Results

Temperature	**-5 °C**		**Room Temperature**		**75 °C**	
Parameters	**High Disp**	**Low Disp**	**High Disp**	**Low Disp**	**High Disp**	**Low Disp**
Max ILoss (dB)	-0.27	-0.75	-0.53	-0.78	-0.18	-0.69
ILoss Ripple (dB)	0.29	0.27	0.39	0.40	0.20	0.27
Min Filter GDR (ps)	-2.70	-1.58	-2.42	-1.73	-3.61	-1.68
Max Filter GDR (ps)	2.61	1.52	1.97	1.66	2.57	1.57
Min Raw GDR (ps)	-12.71	-6.88	-14.69	-7.66	-14.27	-7.40
Max Raw GDR (ps)	15.34	6.74	14.25	7.30	14.52	6.63
Dispersion (ps/nm)	705.90	298.68	708.42	298.83	709.39	299.22

Table 3: Electrical Measurements

Temperature	-5 °C		Room Temperature		75 °C	
Parameters	High Disp.	Low Disp.	High Disp.	Low Disp.	High Disp.	Low Disp.
TEC1 Current (A)	-0.93	-0.36	-0.75	-0.09	-0.47	0.60
TEC2 Current (A)	-0.35	-0.90	-0.05	-0.75	0.55	0.42
TEC1 Voltage (V)	-3.20	-1.00	-2.60	-0.30	-1.60	1.60
TEC2 Voltage (V)	-1.00	-3.00	-0.20	-2.60	1.50	-1.40
TEC1 Power (W)	2.98	0.36	1.95	0.03	0.75	0.96
TEC2 Power (W)	0.35	2.70	0.01	1.95	0.83	0.59
Current $_{TEC1+TEC2}$ (A)	1.28	1.26	0.80	0.84	1.02	1.02
Heater Power (mW)	779.20	816.72	505.68	579.60	88.56	106.20

TEC Control

The dispersion characteristic of the TDC is thermally manipulated. Thermal control is accomplished by using two TECs with RTD feedback. Please refer to the pin-out diagram (Appendix A) for positions of TEC and RTD terminals. In our characterizations we have used the Wavelength Electronics LFI-3751 Temperature Controllers for closed loop control of the TECs.

RTD 1 provides feedback for TEC1 and RTD 3 for TEC2.

Heater Control

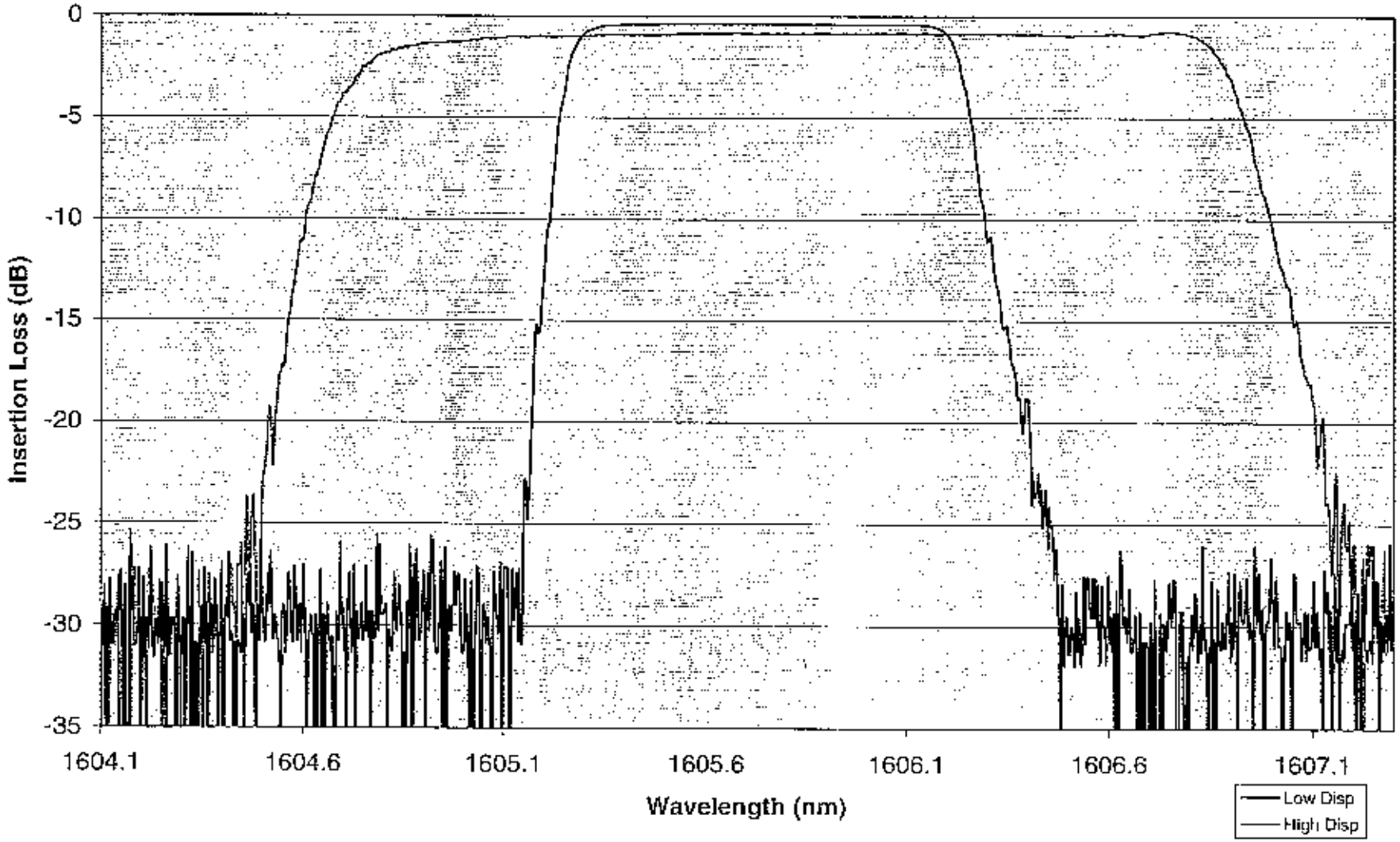
A compensatory heater is required for operation of the device. The compensatory heater requires a voltage load from a DC power supply. The heater operates using feedback from the RTD #2, which is located at the center of the device. When operating the device you will maintain RTD #2 at a constant resistance, or in other words you will maintain a constant temperature at the center of the device (as seen in the Control Table).

This device employs RTD 00385 - 1000 Ohm. The resistance versus temperature table is included in this package (Appendix B). The following control table indicates the device dispersion as a function of applied temperature and/or resistance at TEC1, TEC2 and the heater.

Table 4: Control Table

Dispersion (ps/nm)	TEC1 Temp (°C)	TEC1 Res (Ω)	TEC2 Temp (°C)	TEC2 Res (Ω)	Heater Temp (°C)	Heater Res (Ω)
708.42	117.20	1450	45.77	1178	82.64	1319
500.34	96.33	1371	66.90	1259	82.64	1319
413.51	81.07	1313	81.96	1316	82.64	1319
298.83	47.08	1183	115.90	1445	82.64	1319

Sign Off: _____ Date: June 18th 2002


Reflection Spectrum
Insertion Loss (dB)
0
-5
-10
-15
-20
-25
-30
-35
1604.1
1604.6
1605.1
1605.6
1606.1
1606.6
1607.1
Wavelength (nm)
Low Disp
High Disp

Heat Sinking

The FTDC should be attached to a heat sink. It is important that the FTDC be sufficiently heat sunk. The base of the package is a flange, which is there to facilitate attachment of a heat sink. Thermally conductive pad (Sil-Pad 900S) is mounted to the base. To attach the FTDC to the heat sink use a 3lbin torque screw driver. It is possible that too small a heat sink can be thermally saturated by the FTDC. Select a heat sink whose temperature will not exceed the ambient temperature by more than two degrees with continuous operation of the FTDC (recommended max thermal resistance of the heat sink is 0.5°C/W).

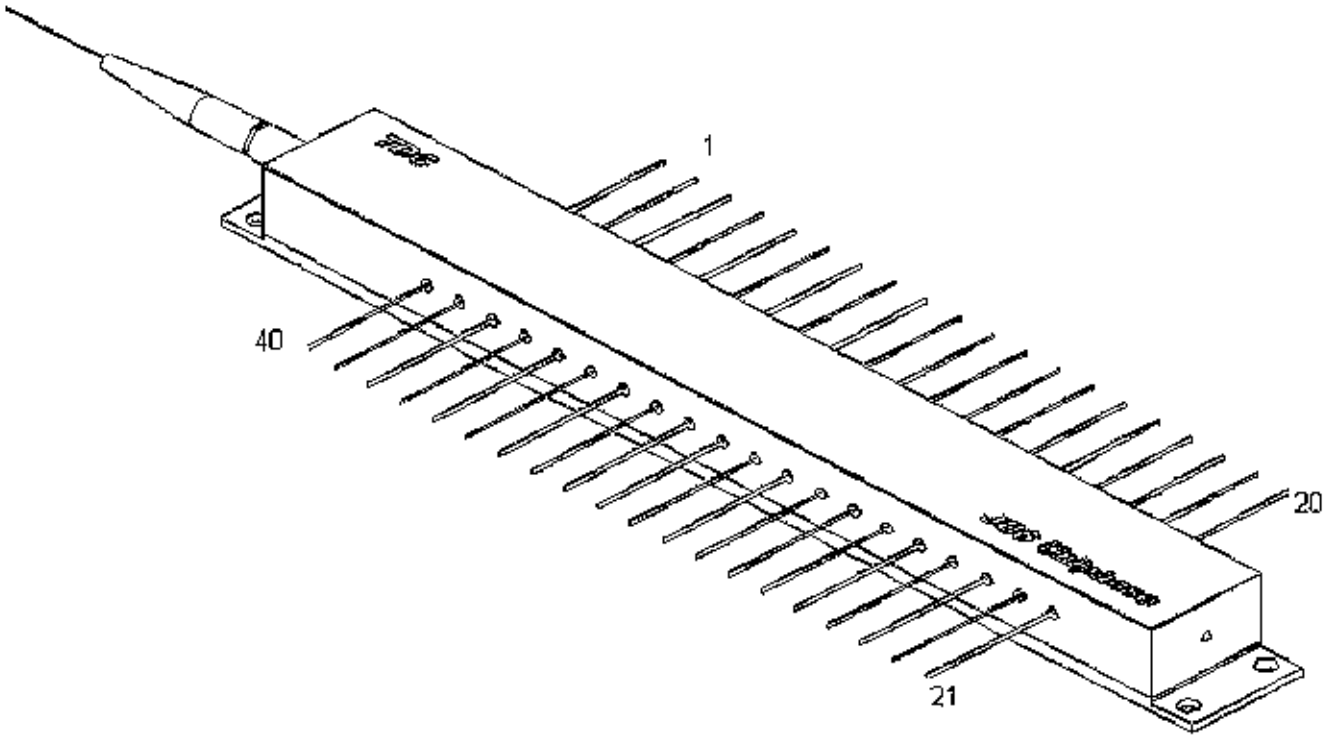


Figure 1: Functional Schematic of the FBG-TDC

Pin-Out Table	
Pin#	**Name**
2	RTD1
3	RTD1
4	TEC1+
9	RTD2
10	RTD2
14	TEC2-
16	RTD3
17	RTD3
27	TEC2+
29	Heater+
36	Heater-
37	TEC1-
7, 13, 28, 34	Permanent Ground

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RTD 00385 -1000 Ohm

Temp (°C)	Resistance (Ω)	Temp (°C)	Resistance (Ω)	Temp (°C)	Resistance (Ω)	Temp (°C)	Resistance (Ω)
0	1000.0	38	1147.7	76	1293.7	114	1438.0
1	1003.9	39	1151.5	77	1297.5	115	1441.8
2	1007.8	40	1155.4	78	1301.3	116	1445.6
3	1011.7	41	1159.3	79	1305.2	117	1449.4
4	1015.6	42	1163.1	80	1309.0	118	1453.1
5	1019.5	43	1167.0	81	1312.8	119	1456.9
6	1023.4	44	1170.8	82	1316.6	120	1460.7
7	1027.3	45	1174.7	83	1320.4	121	1464.4
8	1031.2	46	1178.6	84	1324.2	122	1468.2
9	1035.1	47	1182.4	85	1328.0	123	1472.0
10	1039.0	48	1186.3	86	1331.8	124	1475.8
11	1042.9	49	1190.1	87	1335.7	125	1479.5
12	1046.8	50	1194.0	88	1339.5	126	1483.3
13	1050.7	51	1197.8	89	1343.3	127	1487.0
14	1054.6	52	1201.7	90	1347.1	128	1490.8
15	1058.5	53	1205.5	91	1350.9	129	1494.6
16	1062.4	54	1209.4	92	1354.7	130	1498.3
17	1066.3	55	1213.2	93	1358.5	131	1502.1
18	1070.2	56	1217.1	94	1362.3	132	1505.8
19	1074.0	57	1220.9	95	1366.1	133	1509.6
20	1077.9	58	1224.7	96	1369.9	134	1513.3
21	1081.8	59	1228.6	97	1373.7	135	1517.1
22	1085.7	60	1232.4	98	1377.5	136	1520.8
23	1089.6	61	1236.3	99	1381.3	137	1524.6
24	1093.5	62	1240.1	100	1385.1	138	1528.3
25	1097.3	63	1243.9	101	1388.8	139	1532.1
26	1101.2	64	1247.8	102	1392.6	140	1535.8
27	1105.1	65	1251.6	103	1396.4	141	1539.6
28	1109.0	66	1255.4	104	1400.2	142	1543.3
29	1112.9	67	1259.3	105	1404.0	143	1547.1
30	1116.7	68	1263.1	106	1407.8	144	1550.8
31	1120.6	69	1266.9	107	1411.6	145	1554.6
32	1124.5	70	1270.8	108	1415.4	146	1558.3
33	1128.3	71	1274.6	109	1419.1	147	1562.0
34	1132.2	72	1278.4	110	1422.9	148	1565.8
35	1136.1	73	1282.2	111	1426.7	149	1569.5
36	1140.0	74	1286.1	112	1430.5		
37	1143.8	75	1289.9	113	1434.3		