

iDFC™ Micro-OTDR SFP Transceiver ***Fast Fiber Fault Finder™***

*Optical Supervisory Channel (OSC),
CWDM and Point-to-Point Applications*
Automatically Detects, Locates and Reports Optical Fiber Faults.

Major Features and Benefits

- Integral Micro-OTDR SFP Transceiver - ***iDFC™***
 - Dual Fiber, Full Duplex, SFP
 - -20°C to +70°C T_{OP} Commercial
 - -40°C to +85°C T_{OP} Industrial *
 - TIA-598-C ZonuColor™ Code
 - Dead Zone of 50 meters or Less
 - Resolution of 10 meters or Better
 - Accuracy of ± 50 meters or Better
 - Minimum 34 dB Link Budget for FE ZX Data Model
 - Minimum 23 dB Link Budget for GbE ZX Data Model
 - Typical 65 dB Dynamic Range for the *TxOTDR™*
 - Automatically Measures ORL and Optical SNR
 - Operates Anywhere Conventional SFPs Operate
- * CWDM Operation Limited by Optical Mux/Dmux Pass-Band.

Major Benefits

- Physical Layer Fault Detection
- Distributed Remote Fiber Monitoring
- Reduce Network Mean-Time-To-Repair (MTTR)
- No Additional Special Equipment
- Eliminates Fault Detection Delay

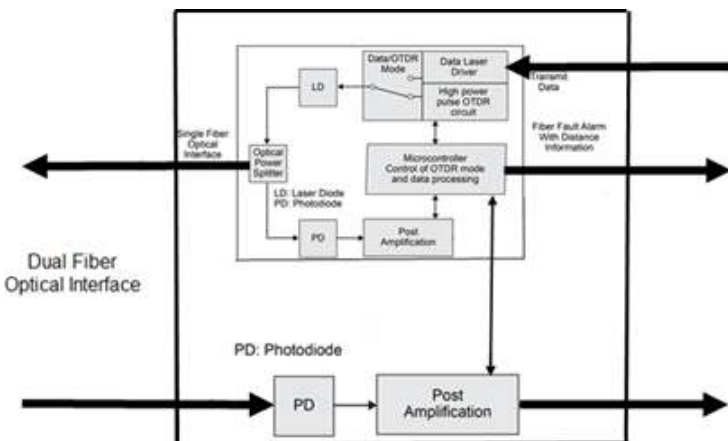
Recommended Applications

- Optical Supervisory Channel (OSC)
- Network Monitoring
- Network Maintenance
- Business Class Service
- Metro-Ethernet Direct

iDFC™ Series SFP Transceivers transmit and receive full duplex data over conventional two-fiber optical data links. Upon disruption of the optical fiber data link, or failure to connect, the Transmitter Section of the SFP unit switches into ***TxOTDR™*** Mode.

Optical fiber faults and intermittent connections present optical reflections of varying intensities. The reflection intensity of a fiber break has a known statistical distribution. Monitoring multiple fibers in the same cable trunk increases the detection probability (each fiber break reflects differently).

An optical fiber link may be monitored from one side, or both sides, when ring topology is utilized. (See Chart last page.)



Model Selection Guide

(See Performance Specifications on next page.)

Reach Category:	Ultra-Long Reach 100 Km Class	Ultra-Long Reach 80 Km Class
Model Series:	S-Series (FastE / OC-3 / STM-1)	C-Series (GbE)
Part Nomenclature:	AF6-DxxFZ-LU	AF6-DxxGZ-LU

iDFC™ SFP Transceiver Characteristics

Specific Characteristics (-20°C to +70°C)								
Reach Category:		Ultra-Long Reach 100 Km Class			Ultra-Long Reach 80 Km Class			
Model Series:		S-Series (FastE / OC-3 / STM-1)			C-Series (FastE / GbE)			
Part Nomenclature:	Duplex LC/UPC Receptacle:	AF6-DxxFZ-LU			AF6-DxxGZ-LU			
Transmitter								
Parameter	Sym	Min	Typ	Max	Min	Typ	Max	Units
Average Optical Output Power – FastE	P _O	-2	0	1	-2	0	1	dBm
Output Eye Conformance		IEEE 802.3-2008 SONET OC-3 SDH STM-1			IEEE 802.3-2008			
Receiver (Ethernet Sensitivity/Overload referenced to BER < 10E-12 with 2^7-1 PRBS; SONET/SDH Sensitivity and Overload referenced to BER < 10E-10 with 2^23-1 PRBS.)								
Parameter	Sym	Min	Typ	Max	Min	Typ	Max	Units
Average Optical Input Power – FastE	P _{Min}	-	-	-35	-	-	-27	dBm
Loss Of Signal De-Asserted – FastE	P _D	-	-34	-	-	-26	-	dBm
Loss Of Signal Asserted – FastE	P _A	-	-35	-	-	-27	-	dBm
Output Eye Conformance		IEEE 802.3-2008 SONET OC-3 SDH STM-1			IEEE 802.3-2008			
Link (* Note: For optimized FastE order AF6-DxxFZ-LU.)								
Parameter at Specified Bit Rate (Mbps)	Sym	125	-	156	125	-	1250	Units
Minimum Data Sheet Optical Power Budget		33	-	33	25	-	25	dB
Minimum Planning Optical Power Budget		31	-	31	23	-	23	dB

Micro-OTDR Mode Characteristics (-20°C to +70°C)					
Parameter	Sym	Min	Typ	Max	Units
Dynamic Range	DR	-	65	-	dB
Dead Zone		-	-	30	m
Resolution		-	-	10	m
Accuracy		-	-	50	m

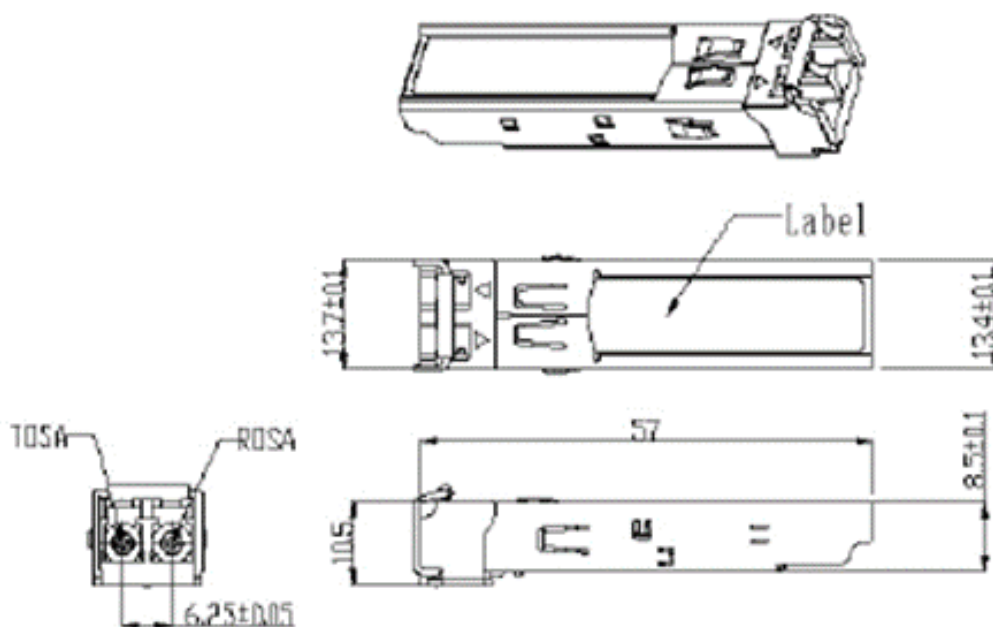
Absolute Maximum Ratings				
Parameter	Sym	Min	Max	Units
Storage Temperature (Case)	T _S	-40	+85	°C
Operating Temperature (Case)	T _O	-20	+70	°C
Relative Humidity	RH	5	95	%
Power Supply Voltage	V _{CC}	0	3.6	V
Input Voltage		GND	V _{CC}	V

Common Characteristics (-20°C to +70°C)					
Transmitter					
Parameter	Sym	Min	Typ	Max	Units
Power Supply Voltage	V _{CCTX}	3.15	3.3	3.45	V
Power Supply Current	I _{CCTX}	-	-	140	mA
Operating Wavelength	λ	-	CC	-	nm
Spectral Width (RMS)	Δλ _{RMS}	-	-	0.1	nm
Optical Power When Disabled	P _{DISABLE}	-	-	-30	dBm
TX Enable Timing		-	-	0.1	ms
TX Enable Voltage		-	V _{CCTX}	-	V
TX Disable Voltage		0	-	0.8	V
TX Alarm Voltage (No Alarm Condition)		0	-	0.8	V
TX Alarm Voltage (Alarm Condition)		-	V _{CCTX}	-	V
Optical Extinction Ratio	E _R	9	-	-	dB
Total Jitter	T _J	-	-	0.3	UI

Laser Δλ = 0.1 nm per °C			
TOP	°C	Δλ _C (nm)	Δλ (nm)
High	+85	λ _C + 6.0	+6.0
Room	+25	λ _C	-
Low	-40	λ _C - 6.5	-6.5

Common Characteristics (-20°C to +70°C)					
Receiver					
Parameter	Sym	Min	Typ	Max	Units
Power Supply Voltage	V _{CCRX}	3.15	3.3	3.45	V
Power Supply Current	I _{CCRX}	-	-	110	mA
Operating Wavelength	λ	1260	-	1635	nm
Average Maximum Input Power	P _{MAX}	1	-	-	dBm
Loss Of Signal Hysteresis	P _D - P _A	1	-	-	dB
CML Data Output Level HIGH	R _D	V _{CCRX} -0.020	V _{CCRX} -0.005	V _{CCRX}	V
CML Data Output Level LOW	R _D	V _{CCRX} -0.475	V _{CCRX} -0.400	V _{CCRX} -0.350	V
Total Jitter	T _J	-	-	0.35	UI

Duplex LC Receptacle Configuration: AF6-DxxFZ-LU and AF6-DxxGZ-LU:



Ordering Information: Part Numbers and ZonuColor™ Code – CWDM:

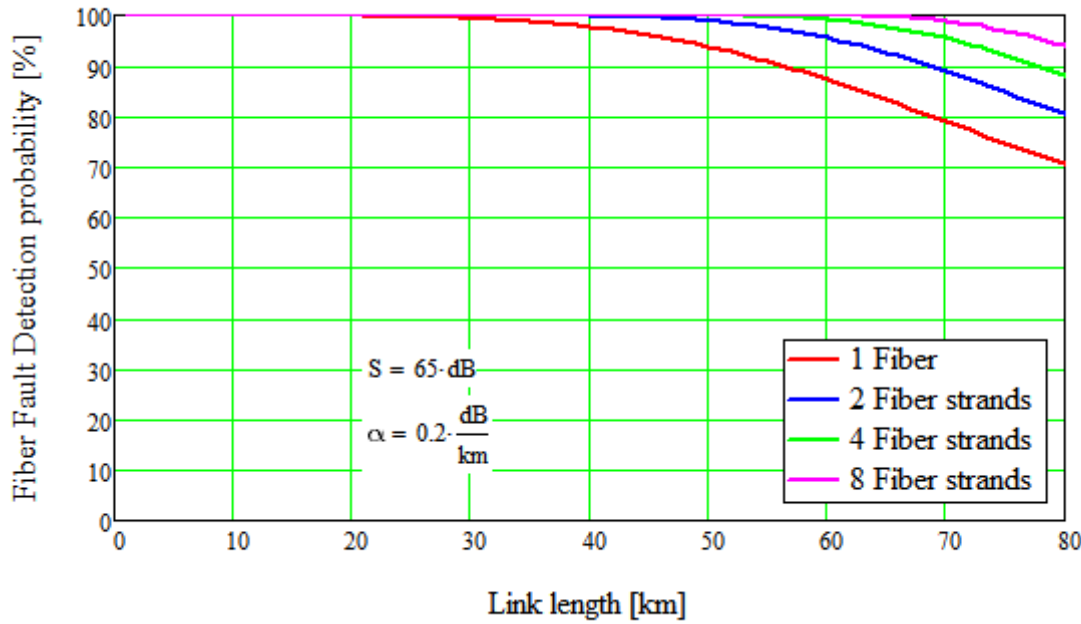
ITU Ch	Ac nm	OZC PN	Color	Verbal	Laser
-	1625	AF6-D62xZ-LU	MA	Magenta	DFB
18	1611	AF6-D61xZ-LU	BR	Brown	DFB
17	1591	AF6-D59xZ-LU	YL	Yellow	DFB
16	1571	AF6-D57xZ-LU	OR	Orange	DFB
15	1551	AF6-D55xZ-LU	BK	Black	DFB
14	1531	AF6-D53xZ-LU	RD	Red	DFB
13	1511	AF6-D51xZ-LU	WH	White	DFB
12	1491	AF6-D49xZ-LU	BL	Blue	DFB
11	1471	AF6-D47xZ-LU	SL	Slate	DFB
10	1451	AF6-D45xZ-LU	GR	Green w Black Tracer	DFB
9	1431	AF6-D43xZ-LU	BR	Brown w Black Tracer	DFB
8	1411	AF6-D41xZ-LU	YL	Yellow w Black Tracer	DFB
7	1391	AF6-D39xZ-LU	OR	Orange w Black Tracer	DFB
6	1371	AF6-D37xZ-LU	BK	Black w Yellow Tracer	DFB
5	1351	AF6-D35xZ-LU	RD	Red w Black Tracer	DFB
4	1331	AF6-D33xZ-LU	WH	White w Black Tracer	DFB
3	1311	AF6-D31xZ-LU	GR	Green	DFB
2	1291	AF6-D29xZ-LU	BL	Blue w Black Tracer	DFB
1	1271	AF6-D27xZ-LU	SL	Slate w Black Tracer	DFB

Pin Assignments		
Pin #	Pin Name	Pin Function
1	VeeT	Transmitter Ground
2	TX Fault	Transmitter Fault Indication
3	TX Disable	Transmitter Disable
4	MOD-DEF2	Module Definition 2
5	MOD-DEF1	Module Definition 1
6	MOD_DEF0	Module Definition 0
7	NC	(No Connection)
8	LOS	Loss of Signal
9	VeeR	Receiver Ground
10	VeeR	Receiver Ground
11	VeeR	Receiver Ground
12	RD-	Inverted Received Data Out
13	RD+	Received Data Out
14	VeeR	Received Ground
15	VccR	Receive Power
16	VccT	Transmitter Power
17	VeeT	Transmitter Ground
18	TD+	Transmitted Data In
19	TD-	Inverted Transmit Data In
20	VeeT	Transmitter Ground

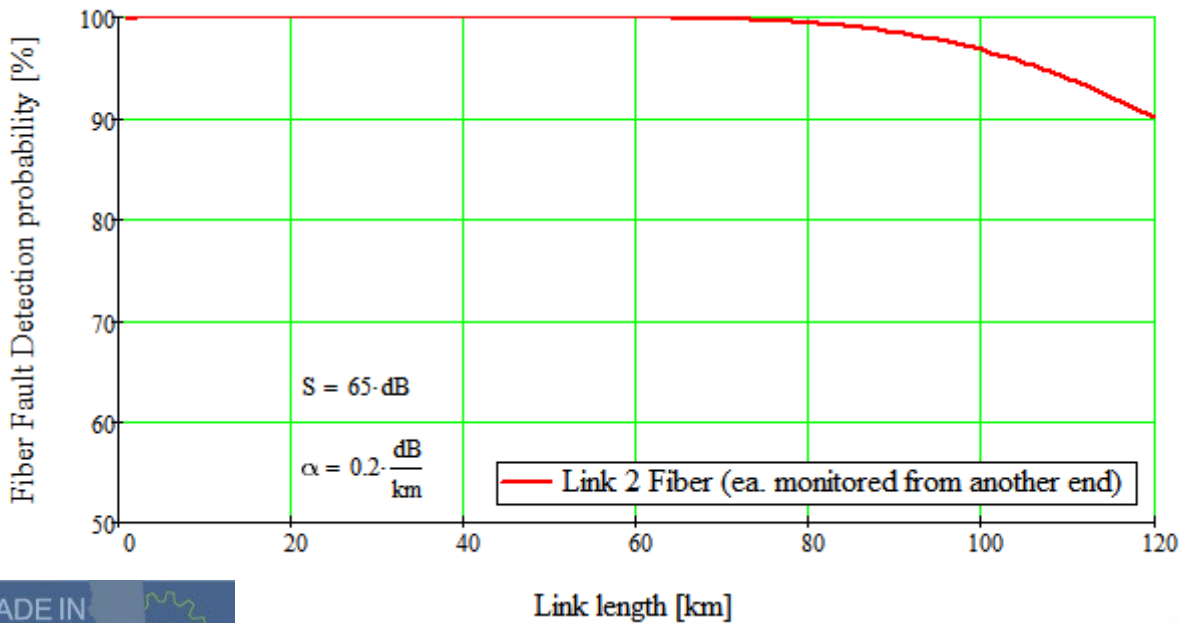
Note: Below -30 dBm input optical power, DDM Measured Rx Input Power readings in *Byte 104 and Byte 105 of Page A2h* become inaccurate and unusable.

Fiber Fault Detection – Randomly Distributed Faults

Fiber Fault Detection from one end - randomly distributed fault



Fiber Fault Detection from at least one end



Link length [km]

For More Information

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