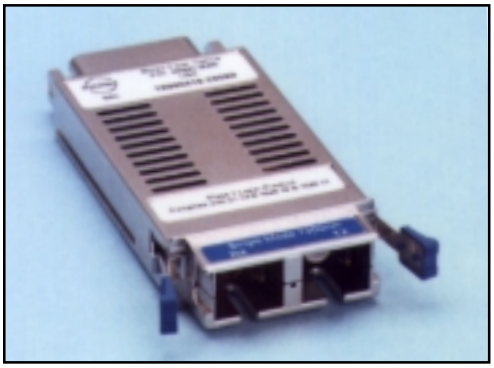
Fibre Channel Transceiver, 1300nm GBIC



Features & Benefits

- Complies with all Fibre Channel requirements
- Meets all requirements of GBIC specification
- Serial ID interface (Annex D, Mod Definition 4)
- Data rates to 1.063 Gbps
- Link distances up to 10km
- Single +5V power supply
- ECL/PECL compatible

Applications

- Data communication networks
- Telecommunication networks
- Broadband deployments
- Cross-connects
- ATM switches
- Disk array links
- Workstation & mainframe backbones
- Network interface cards

The Molex Fibre Channel 1300nm GBIC is a compact optical transceiver capable of gigabit optical transmission over singlemode fiber for distances up to 10km.

Innovative design principles allow this product to meet stringent EMI requirements as well as all CDRH and IEC 825-1 Class 1 eye safety requirements. The GBIC module provides complete serial ID (Annex D, Module Definition 4) compliance. A short wavelength version of this device is also available.

Optical Performance Specifications

Parameter		Symbol	Min.	Typ.	Max.	Units	Notes / Conditions
Data Rate		-	0.100	-	1.063	Gbps	-
Fiber Length		-	2	-	10,000	m	Fiber: 9μm core, singlemode, loss < 0.45 dB/km
Input DC Voltage		V_{cc}	+4.75	+5.0	+5.25	V	V_{cc} referenced to GND
Maximum DC Voltage		V_{max}	-	-	6	V	Laser safety circuit will operate from 0V to V_{max}
Supply Current (Transmitter and Receiver)		I_{tx}	-	-	300	mA	Steady state, after t_{init}
Surge Current		I_{surge}	-	-	30	mA	Hot plug, above actual steady state current
Input and Output Differential Impedance		Z_{in}/Z_{out}	-	-	-	Ω	Nominal: 150Ω
Input Voltage		V_{in}	650	-	2000	mV_{pp}	AC coupled ECL levels
Differential Skew		-	-	-	20	ps	-
Data Output Voltage		V_{out}	500	-	1000	mV_{pp}	AC coupled ECL levels
PECL Skew		-	-	-	205	ps	-
Transmitter Center Wavelength		λ_{tx}	1300	1310	1325	nm	Transmitter
Spectral Width (RMS)		$\Delta\lambda$	-	-	7.2	nm	Transmitter
Optical Output Power		P_o	-10	-	-3	dBm	Average power
Transmitter Extinction Ratio		-	9	-	-	dB	Transmitter
Eye Opening		-	57	-	-	%	-
Duty Cycle		-	-	52	-	%	-
Bit Error Rate		BER	-	-	10^{-12}	-	at P_{in} = -20 dBm
Jitter		-	-	-	-	-	100-SM-LC-L compliant
Optical Input Wavelength		λ_{rx}	1300	-	1325	nm	-
Control and Sense Signals From Host Board to GBIC	Low	V_{IL}	0	-	0.8	V	4.7K to 10K, pullup to $V_{dd}T$
	High	V_{IH}	2.0	-	V_{dd}+0.3		

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Optical Performance Specifications

Parameter		Symbol	Min.	Typ.	Max.	Units	Notes / Conditions
Control and Sense Signals From Host GBIC to Board	Low	V_{IL}	0.0	-	0.5	V	4.7K to 10K, pull-up to V_{cc} host, which can be either 3.3V or 5V
	High	V_{IL}	V_{cc}host -0.5		V_{cc}host +0.3		
Input Dynamic Range		P_I	-20	-	-3	dBm	-
Receiver Return Loss		P_{ret}	12	-	-	dB	-
Signal Detect Deasserted		P_d	-30	-	-20	dBm	-
Signal Detect Hysteresis		$P_a - P_d$	1	-	4	dB	No chattering
RX_LOS Assert Delay		t_{loss_on}	-	-	100	μs	From detection loss of light to assertion
RX_LOS Deassert Delay		t_{loss_off}	-	-	100	μs	From detection presence of light to deassertion
TX DISABLE Assert Time		t_{off}	-	-	10	μs	From rising edge of TX DISABLE to fall of output signal below 10% of nominal
TX DISABLE Deassert Time		t_{on}	-	-	1	ms	From falling edge of TX DISABLE to rise of output signal above 10% of nominal
Initialization Time, Including Reset of TX FAULT		t_{init}	-	-	300	ms	From power on or hot plug after V_{dd} > 4.75V or from negation of TX DISABLE during reset of TX FAULT
TX FAULT		t_{fault}	-	-	100	μs	From occurrence of fault (output safety violation or V_{dd} < 4.5V)
Optical Output TX DISABLE Asserted		-	-	-	-35	dBm	Into fiber, average, steady state
TX DISABLE		t_{reset}	10	-	-	μs	TX DISABLE HIGH before TX DISABLE set LOW
Operating Temp		T_{OP}	0	-	70	°C	-
Operating Humidity		-	8	-	80	%RH	-
Storage Temp		T_{STORE}	-40	-	85	°C	-
Relative Intensity Noise		RIN	-	-	-116	dB/Hz	-
Eye Safety		-	-	-	-	-	Class 1 laser product
GBIC Insertion Force		-	0	-	20	N	-
GBIC Extraction Force		-	0	-	15	N	-
GBIC Retention Force		-	130	N/A	N/A	N	-
Insertion/Removal Cycles		-	100	-	-	cycles	-
Average Failure Rate		AFR	-	-	-	-	TBD

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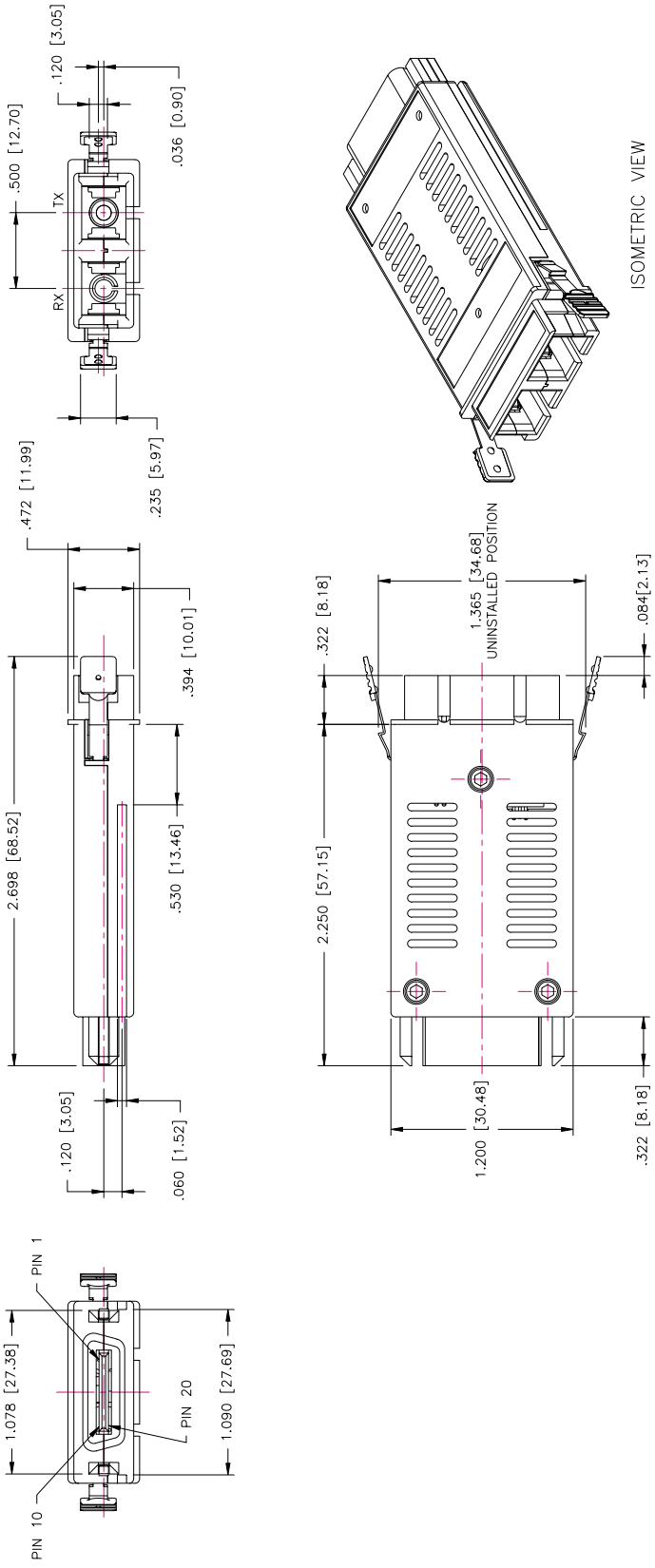
Mechanical Dimensions



All dimensions in INCHES [**mm**]

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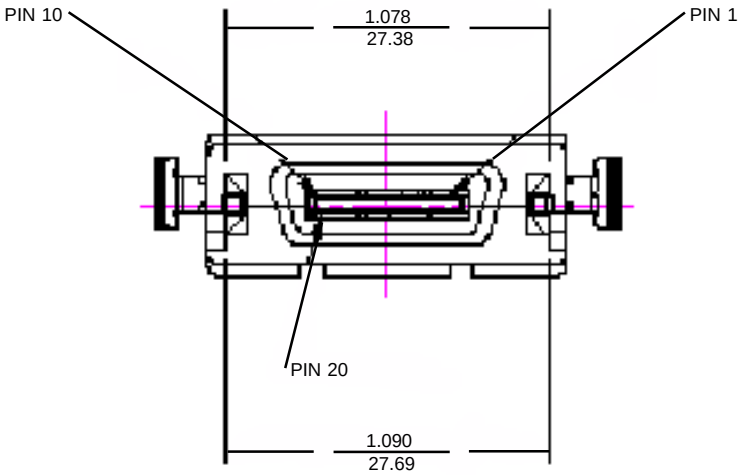


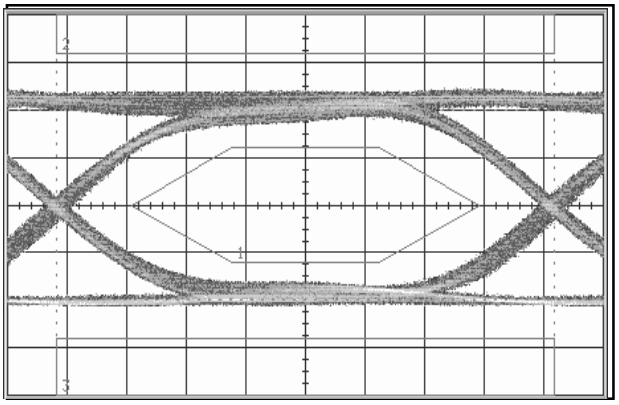
All dimensions in INCHES / **mm**

Pin Name*	Pin #	Sequence	Pin Name*	Pin #	Sequence
RX_LOS	1	2	RGND	11	1
RGND	2	2	-RX_DAT	12	1
RGND	3	2	+RX_DAT	13	1
MOD_DEF(0)**	4	2	RGND	14	1
MOD_DEF(1)**	5	2	$V_{DD}R$	15	2
MOD_DEF(2)**	6	2	$V_{DD}T$	16	2
TX_DISABLE	7	2	TGND	17	1
TGND	8	2	+TX_DAT	18	1
TGND	9	2	-TX_DAT	19	1
TX_FAULT	10	2	TGND	20	1

*For further explanation see the GBIC standard.
**Reference GBIC standard, Annex D: Module definition “4”

Eye Pattern

Typical Eye Pattern (Optical Eye)
Time Scale : 150 ps/div



1.0625 Gbps

Standard Part Numbers

Order Number	Description
86990-9065	Fibre Channel transceiver, 1300nm GBIC