Preliminary

Fiber Optic Transceiving Module for

High-Speed Data Transmission

Features

- Data rate: up to 155 Mb/s (NRZ code)
- Transmission distance: up to 10m at 155 Mb/s with APF
  up to 20m at 125 Mb/s with APF
- P-ECL interface
- JIS F07 type optical connector

Absolute Maximum Ratings (Ta = 25°C)

ITEM	SYMBOL	RATINGS	UNIT
Storage Temperature	T_{STG}	-40 to 85	°C
Operating Temperature	T_{OP}	-40 to 85	°C
Supply Voltage	V_{CC}	-0.5 to 7	V
Input Voltage	V_{IN}	-0.5 to V_{CC}	°C
Differential Input Voltage	V_D	MAX. 1.4	V
Soldering Temperature	T_{SOL}	260(1)	°C

Note (1) Soldering time ≤ 3seconds.
(More than 1mm apart from package)

Recommended Operating Conditions

ITEM	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{EE}	4.75	5.0	5.25	V
Output Load	R_L	–	50	–	Ω
Data Rate		10	–	155	Mb/s
Mark Ratio		–	50	–	%

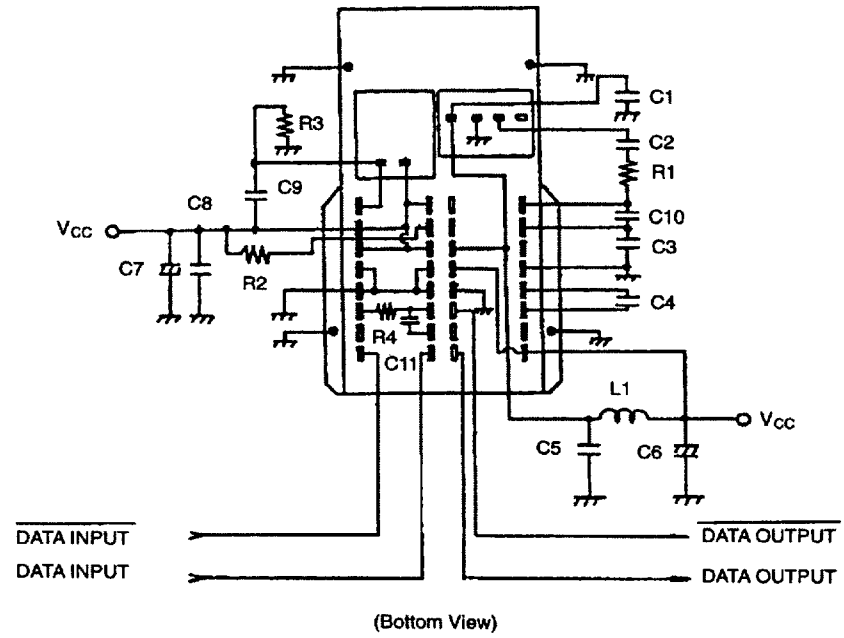
Electrical and Optical Characteristics

(Ta = 25°C, V_{EE} = -5.2V)

ITEM		SYMBOL	CONDITIONS		MIN.	TYP.	MAX.	UNIT
Data Rate			NRZ code		10	–	155	Mb/s
Transmission Distance			Note 7	at 155Mb/s	–	–	50	m
			Using PCF (2)	at 125Mb/s	–	–	100	m
Pulse Width Distortion (3)		Δtw	155Mb/s, Duty 50%		-1.5	–	1.5	ns
			125Mb/s, Duty 50%		-2.0	–	2.0	ns
Fiber Output Power (4)		Pf	PCF 2m (5)		-15	–	-14	dBm
Peak Emission Wavelength		λp			–	830	–	nm
Maximum Receivable Power (4)		P_{MAX}	155Mb/s, Duty 50% (6)		–	-8	–	dBm
			125Mb/s, Duty 50% (7)		–	-8	–	dBm
Minimum Receivable Power (4)		P_{MAX}	155Mb/s, Duty 50% (6)		–	-22	–	dBm
			125Mb/s, Duty 50% (7)		–	-24	–	dBm
Current Consumption	(Transmitter)	I_{RR} (T)			–	120	150	mA
	(Receiver)	I_{RR} (R)			–	50	60	mA
High Level Input Voltage		$V_{CC} - V_{IH}$			-1.13	–	-0.81	V
Low Level Input Voltage		$V_{CC} - V_{IL}$			-1.95	–	-1.63	V
High Level Output Voltage		V_{OH}			-0.98	–	-0.81	V
Low Level Output Voltage		V_{OL}			-1.13	–	-1.63	V

Note (2) Plastic cladding silica fiber (200/300μm) with polished surface.
(3) Between input of TODX2202 (155M) and output of TODX2202 (155M).
(4) Average value.
(5) Measure with a standard optical fiber with optical connectors.
(6) 2^7 - 1 random pattern. BER ≤ 10^{-9}.
(7) FDDI test pattern. BER ≤ 10^{-9}.

Recommended Circuit Diagram



(Bottom View)

C1 : 0.01μF	C6 : 47μF	R1 : 100Ω
C2 : 0.1μF	C7 : 47μF	R2 : 1.2kΩ
C3 : 0.1μF	C8 : 0.1μF	R3 : 330Ω
C4 : 1000pF	C9 : 68pF	R4 : 51Ω
C5 : 0.1μF	C10: 20pF	L1 : 100Ω
	C11: 10pF	

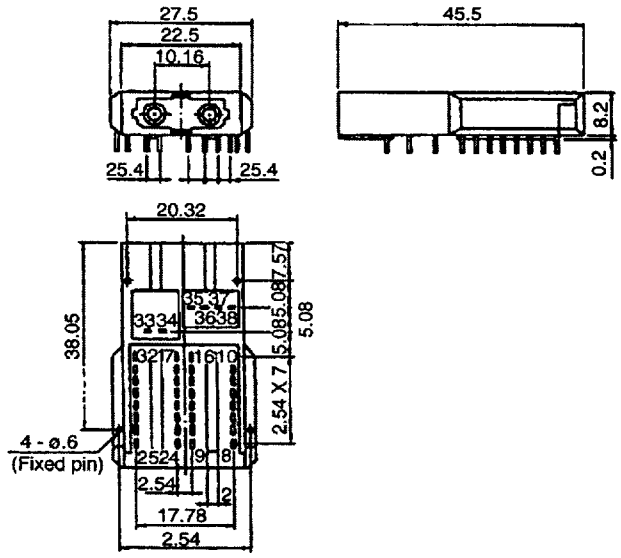
Notes

1. Place termination resistors near receiving input data point.
2. Make differential paths short and of the same length with the equal termination to V_{CC} - 2 volts.
3. Signal trace should be 50 ohm transmission lines (microstrip or stripline). Use ground plane (or multi-layer) printed circuit board for best high frequency performance.
4. Use high-frequency monolithic ceramic bypass capacitors and low DC resistance indictors. Locate power supply filter components close to fiber optic module.
5. Do not directly connect fiber optic module ECL outputs to GND without proper current limiting impedance.
6. All power supply voltages for the fiber optic module should be applied simultaneously to prevent possible damage to device.
7. GND pins should be directly and individually connected to ground.

Output Drawing and Pin Assignment

(1) Module

Unit in mm



(Receiving IC)
1. Input of receiving IC
2. Input of receiving IC
3. Open
4. GND
5. Feedback of circuit IC
6. Feedback of circuit IC
7. Open
8. Vcc
9. Data output
10. Open
11. Data output
12. GND
13. Vcc
14. Vcc
15. Open
16. Open

(Transmitting IC)
17. Vcc
18. I_F control
19. Vcc
20. GND
21. GND
22. Peaking Circuit
23. Peaking Circuit
24. Data input
25. Data input
26. Open
27. Peaking Circuit
28. GND
29. GND
30. Vcc
31. Vcc
32. LED drive circuit

(LED)
33. Input of receiving IC
34. Anode

(Receiving Unit)
35. Vcc
36. GND
37. OUTput
38. NC

Applicable Optical Fiber with Fiber Optic Connectors

TOCP200Q- B, TOCP200X- B

Precautions for Operation

(1) The absolute maximum ratings show the limits, which must not be exceeded even momentarily regardless of the external condition. Operation beyond the limit of the maximum rating may cause failure of the devices. Therefore, special attention should be given to the maximum ratings.

(2) Do not use acid or alkaline soldering flux cleaner solvent. Please be careful not to inject solvent into module through the fiber optic connector hole. If some solvent happens to be injected into the module, wipe it off with a cotton ball.

(3) Do not directly connect fiber optic module ECL outputs to GND without proper current limiting impedance.

(4) Fixed pins of TODX2202 (155M) are the ground pin of housing. This housing is made of conductive plastic for shielding purposes. Connect these pins to GND for efficient shielding.

(5) Additional precaution is necessary to ensure that conductive housing does not touch other potential patterns.

(6) Do not connect any circuit to "Open" terminals.