F-18-07-11

OPTIC LINK

PLM101-1M

PLM101-1M : PLASTIC FIBER OPTIC LINK
PLT101 : TRANSMITTER MODULE
PLR101 : RECEIVER MODULE

NEPOC Series

DESCRIPTION

PLM101-1M includes a transmitter module (PLT101), receiver module (PLR101), and a plastic fiber optic cable (1 meter).

Transmitter module incorporates a 660 nm LED and a LED driver. Receiver module incorporates an integrated photo detector and wide bandwidth dc amplifier. Plastic fiber optic cable (1 mm core) is terminated in snap-in plastic connectors.

The combination of PLT101 and PLR101 has guaranteed performance over −20 to 70 degrees centigrade from DC to 6 Mb/s (NRZ) up to 5 meters.

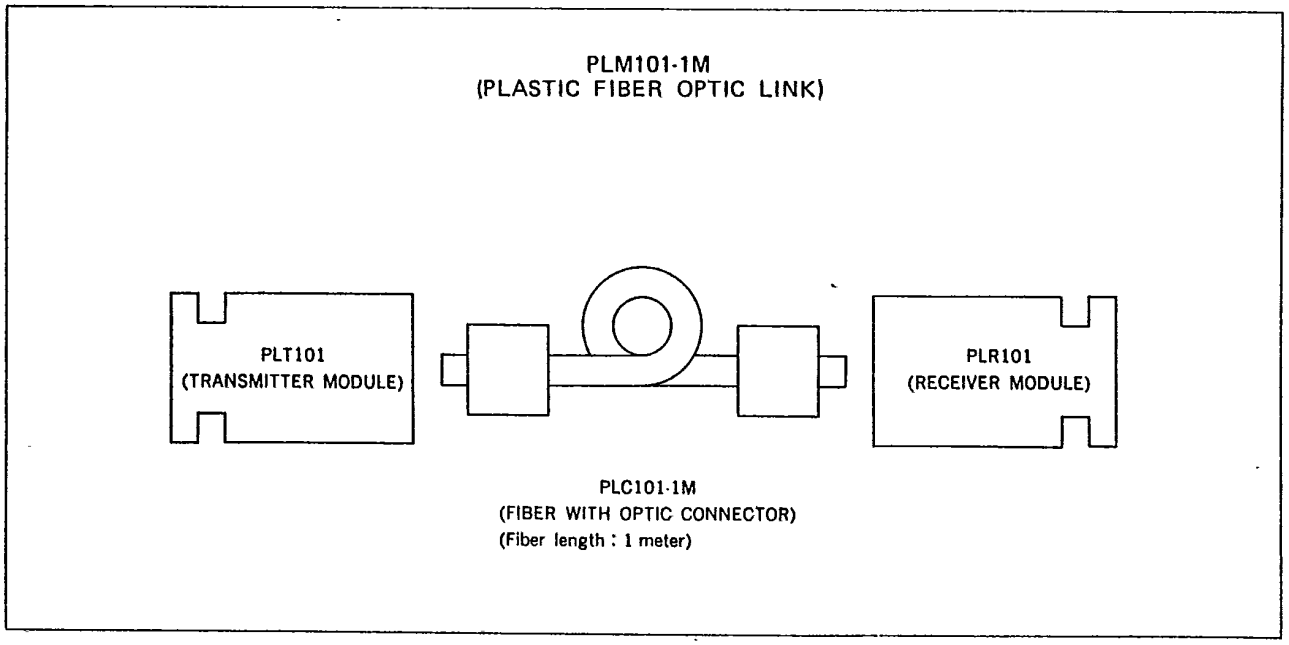
FEATURES

- Small Package
- Snap-in Connector
- TTL Compatible Output Level
- DC to 6 Mb/s (NRZ) Data Rate
- Single +5 V Power Supply
- Low Power Dissipation

APPLICATION

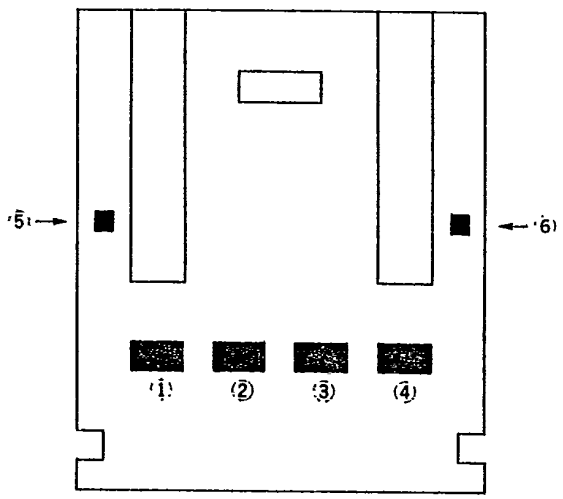
- Local Area Networks
- Computer to Peripheral Links
- Digital Audio Interface
- Factory Data Highways

CONSTRUCTION OF PLM 101-1M



F-18-07-11

PIN CONNECTIONS (Bottom View)

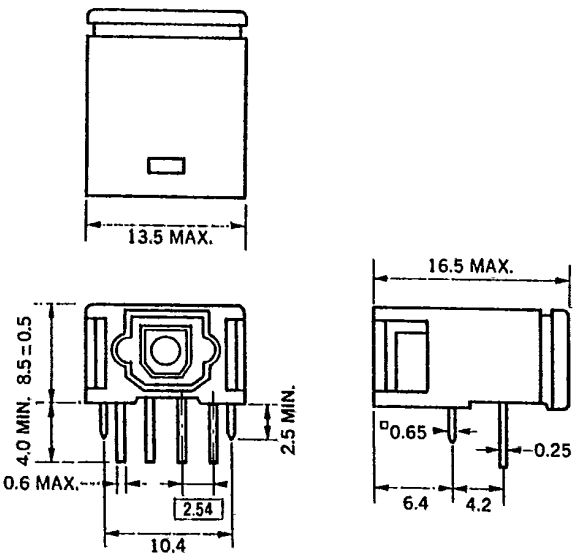


PLT101 (TRANSMITTER MODULE)	
(1)	INPUT
(2)	V_{CC}
(3)	CURRENT CONTROL
(4)	GND
(5)	NC
(6)	NC

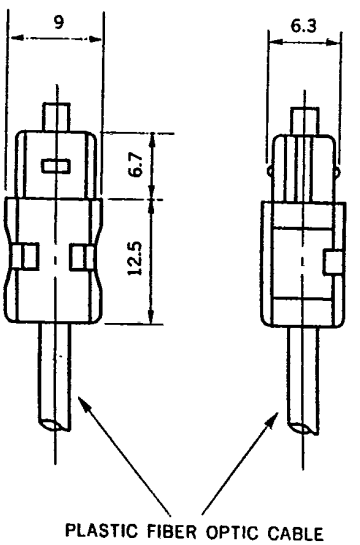
PLR101 (RECEIVER MODULE)	
(1)	Cathode
(2)	V_{CC}
(3)	GND
(4)	OUTPUT
(5)	NC
(6)	NC

PACKAGE DIMENSIONS (Unit: mm)

TRANSMITTER MODULE
RECEIVER MODULE



OPTIC CONNECTOR



T-41-91

F-18-07-11

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

(1) PLT101 (TRANSMITTER MODULE)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	−0.5 to +7	V
Input Voltage	V_{in}	−0.5 to +5.5	V
Operating Temperature	T_{opt}	−20 to +70	°C
Storage Temperature	T_{stg}	−40 to +80	°C
Lead Soldering Temp.	T_{sol}	260 (Time ≦ 10 s)	°C

(2) PLR101 (RECEIVER MODULE)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	−0.7 to +7	V
Low Level Output Current	I_{OL}	20	mA
High Level Output Current	I_{OH}	−1	mA
Operating Temperature	T_{opt}	−20 to +70	°C
Storage Temperature	T_{stg}	−40 to +80	°C
Lead Soldering Temp.	T_{sol}	260 (Time ≦ 10 s)	°C

(3) PLC101-1M (FIBER WITH OPTIC CONNECTOR)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Tensile Force	Cable	T_F	5 (50)	kgf(N)
	Cable/Connector	T_{CF}	2 (20)	kgf(N)
Bend Radius		r	25 (MIN.)	mm
Operating Temperature		T_{opt}	−20 to +70	°C
Storage Temperature		T_{stg}	−40 to +70	°C

TRUTH TABLE (POSITIVE LOGIC)

Input	TRANSMITTER MODULE	Output (RECEIVER MODULE)
H	LED ON	H
L	LED OFF	L

T-41-91
F-18-07-11

ELECTRICAL/OPTICAL CHARACTERISTICS ($T_a = T_{opt}$, V_{CC} = 5 V)

(1) PLM101-1M (LINK: Fiber Length = 1 meter)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Data Rate	–	–	–	6	Mb/s	NRZ, T_a = 25°C
Propagation Delay Time (Low to High)	t_{PLH} *1)	–	–	250	ns	APF = 1 m *2), T_a = 25 °C
Propagation Delay Time (High to Low)	t_{PHL} *1)	–	–	250	ns	APF = 1 m, T_a = 25 °C
Pulse Width Distortion	Δt_W	–	–	±30	ns	PW = 165 ns, Duty Cycle 50 %, T_a = 25 °C

*1) Between Input of PLT101 and Output of PLR101
*2) APF: Plastic Fiber Optic Cable

(2) PLT101 (TRANSMITTER MODULE)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Supply Current	I_{CC}	–	15	25	mA	R_L = 8.2 kΩ *3)
High Level Input Current	I_{IH}	–	–	100	μA	V_{CC} = 5.25 V, V_{IH} = 2.7 V, R_L = 8.2 kΩ
Low Level Input Current	I_{IL}	–	–	−400	μA	V_{CC} = 5.25 V, V_{IL} = 0.4 V, R_L = 8.2 kΩ
High Level Input Voltage	V_{IH}	2.0	–	–	V	R_L = 8.2 kΩ
Low Level Input Voltage	V_{IL}	–	–	0.8	V	R_L = 8.2 kΩ
Peak Emission Wavelength	λ_P	–	660	–	nm	I_F = 20 mA, R_L = 8.2 kΩ, T_a = 25 °C
Transmitter Output Power	P_f	−21	–	−11	dBm	APF = 1 m, R_L = 8.2 kΩ, T_a = 25 °C *4)
Transmission Distance		0.2	–	5	m	With PLR101 and APF, R_L = 8.2 kΩ, T_a = 25 °C

*3) R_L (Resistance for control of LED current) is connected from pin 2 to pin 3.
*4) It is able to change the Transmitter Output Level (P_f) by Resistance (R_L) Variation.

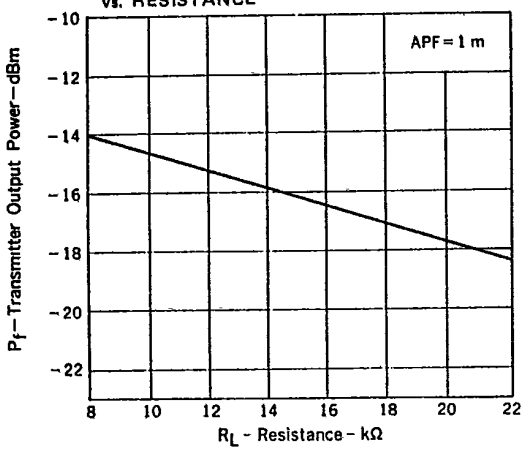
(3) PLR101 (RECEIVER MODULE)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Supply Current	I_{CC}	–	25	40	mA	
High Level Output Voltage	V_{OH}	4.4	–	–	V	V_{CC} = 4.75 V, I_{OH} = 60 μA
Low Level Output Voltage	V_{OL}	–	–	0.5	V	V_{CC} = 4.75 V, I_{OL} = 2 mA
Maximum Input Power Level	$P_{max.}$	−14.5	–	–	dBm	APF = 1 m, 6 Mb/s (NRZ), T_a = 25 °C
Minimum Input Power Level	$P_{min.}$	–	–	−24	dBm	APF = 1 m, 6 Mb/s (NRZ), T_a = 25 °C
Rise Time	t_r	–	50	100	ns	P_f = −20 dBm, T_a = 25 °C
Fall Time	t_f	–	20	70	ns	APF = 1 m, T_a = 25 °C
Transmission Distance		0.2	–	5	m	With PLT101 and APF, R_L = 8.2 kΩ, T_a = 25 °C

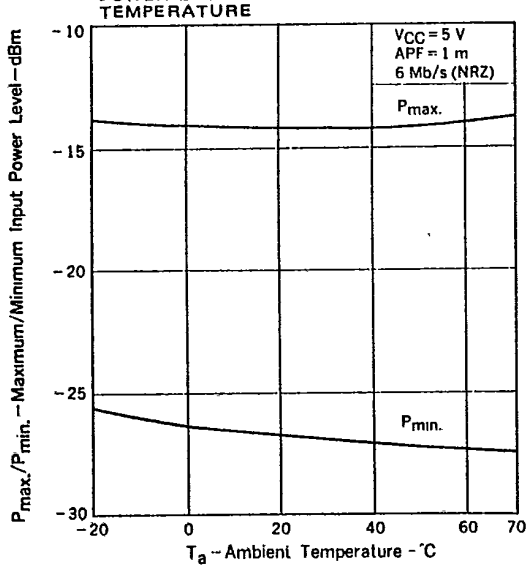
T-41-91
F-18-07-11

TYPICAL CHARACTERISTIC (T_a = 25 °C)

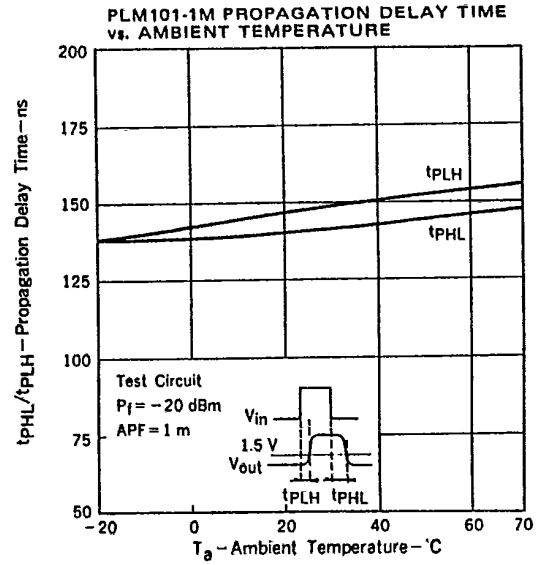
PLT101 TRANSMITTER OUTPUT POWER vs. RESISTANCE



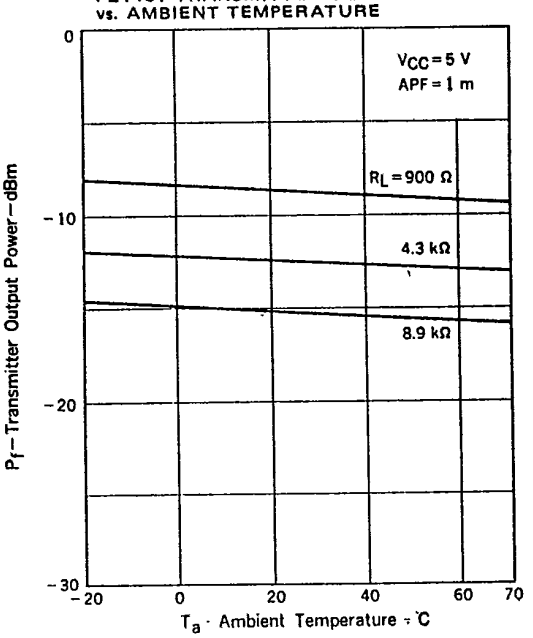
PLR101 MAXIMUM AND MINIMUM INPUT POWER LEVEL vs. AMBIENT TEMPERATURE



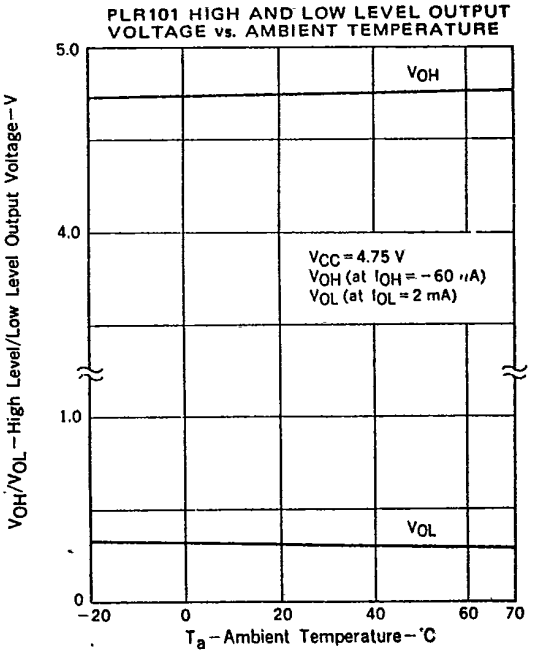
PLM101-1M PROPAGATION DELAY TIME vs. AMBIENT TEMPERATURE



PLT101 TRANSMITTER OUTPUT POWER vs. AMBIENT TEMPERATURE

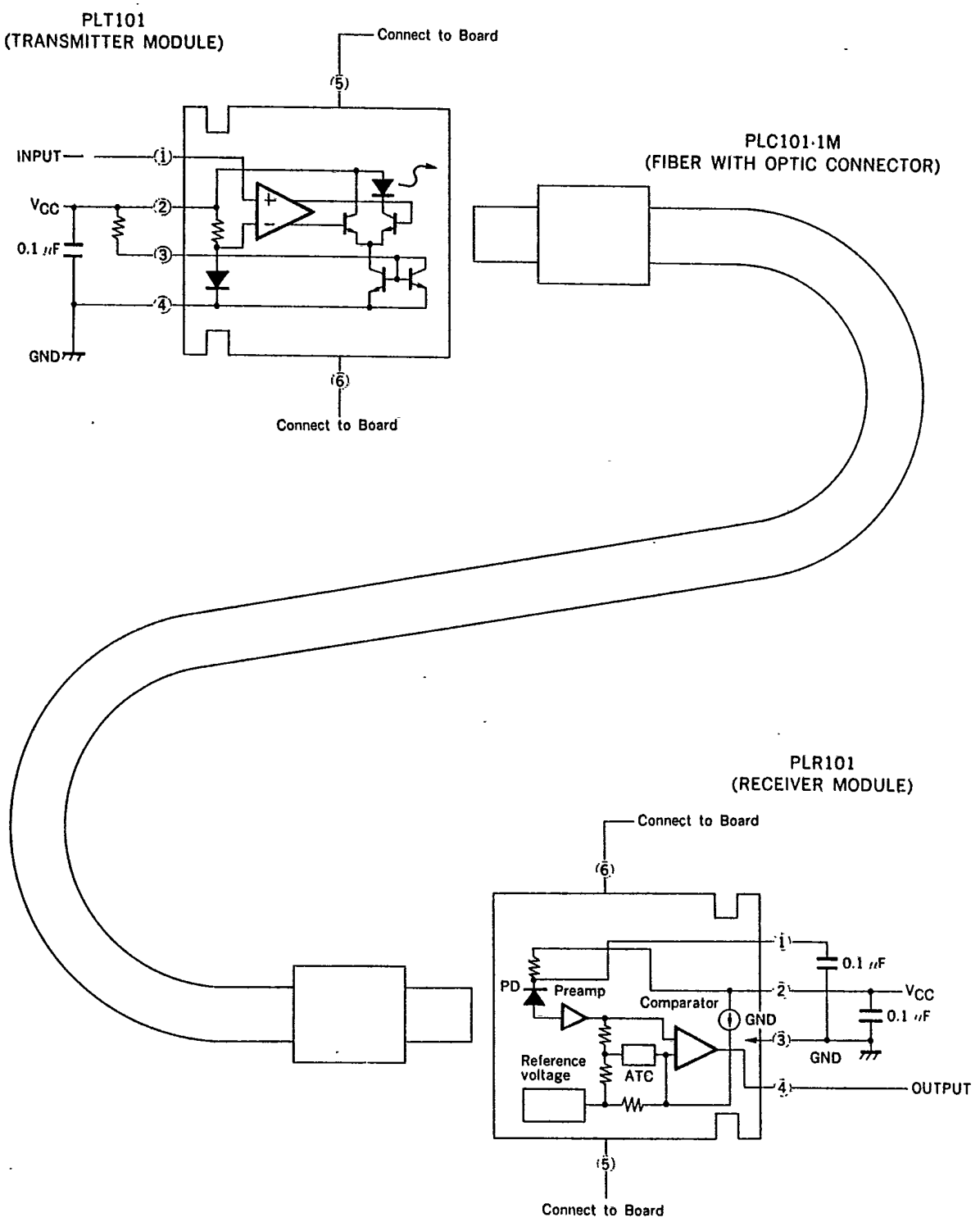


PLR101 HIGH AND LOW LEVEL OUTPUT VOLTAGE vs. AMBIENT TEMPERATURE



F-18-07-11

TYPICAL CIRCUIT CONFIGURATION

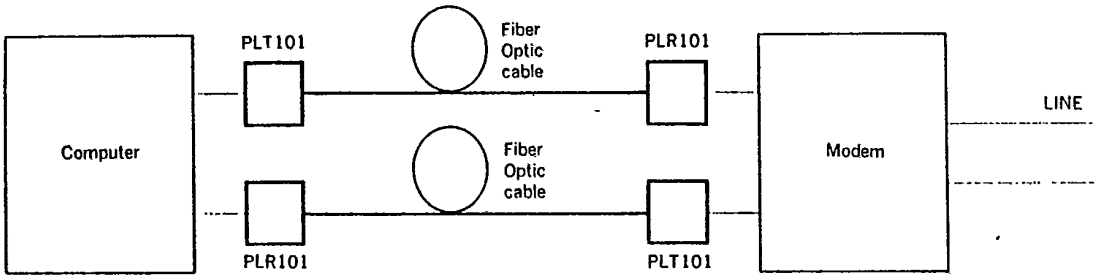


T-41-91

F-18-07-11

APPLICATIONS OF PLM101-*M

- COMPUTER (SECURE DATA COMMUNICATIONS)



- AUTOMOBILE (SECURE DATA COMMUNICATIONS)