

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.

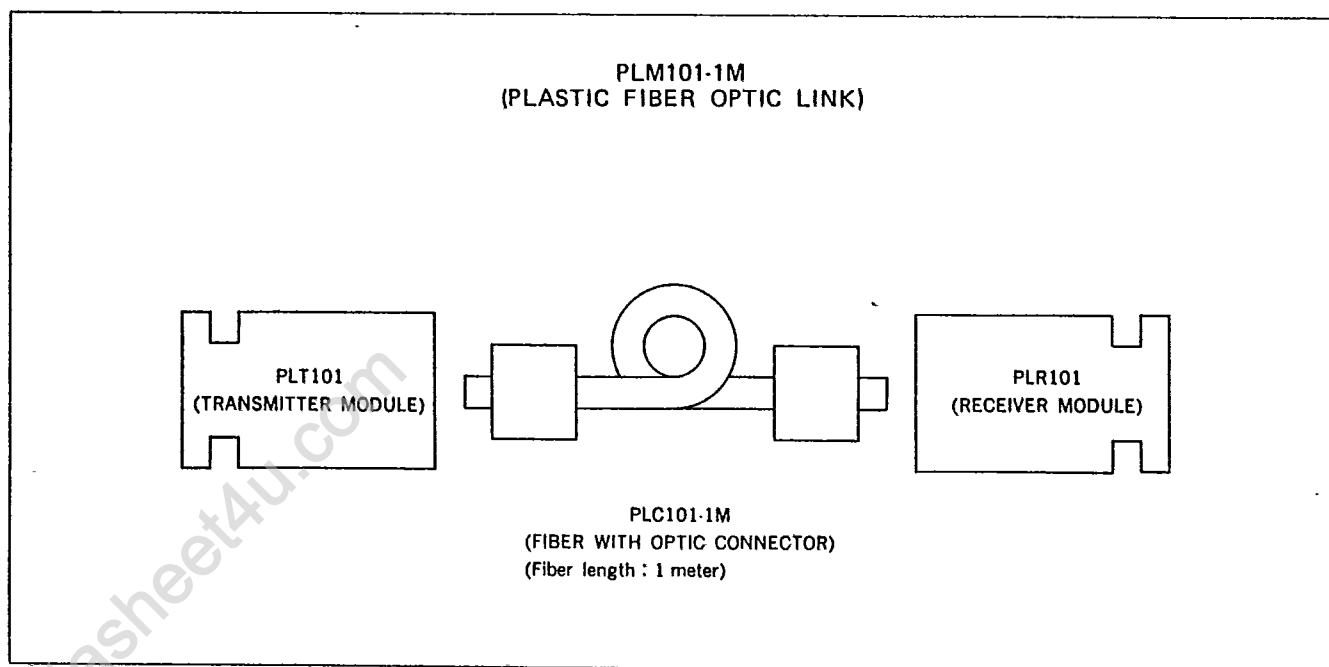
FEATURES

- 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

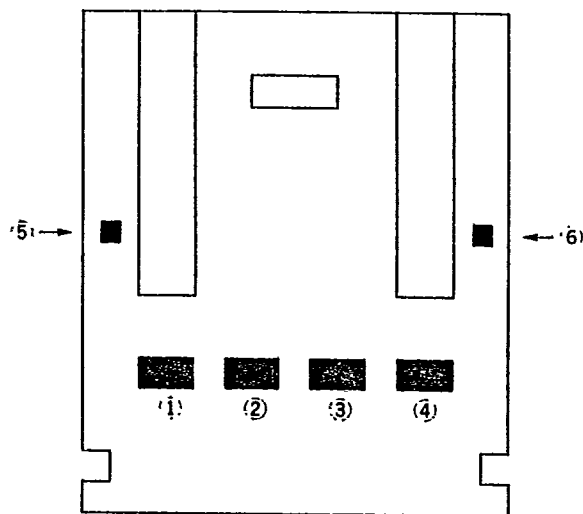
CONSTRUCTION OF PLM 101-1M



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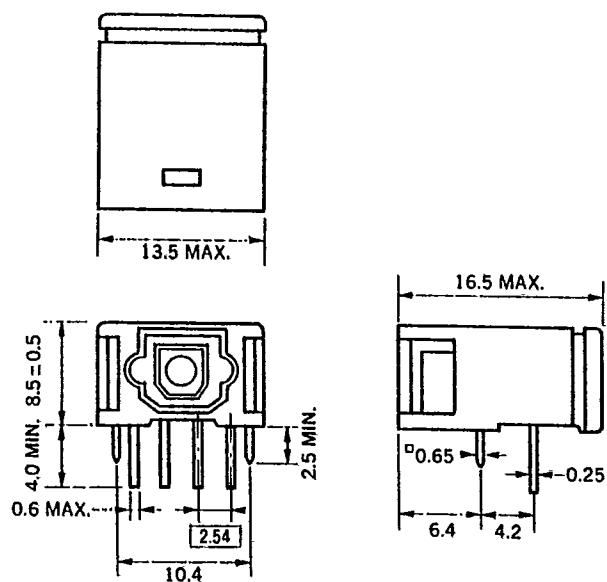
PIN CONNECTIONS (Bottom View)



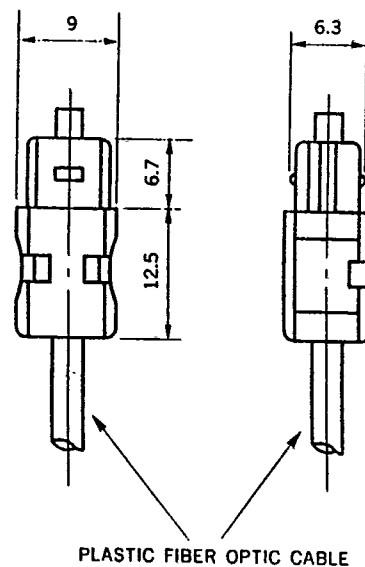
PLT101 (TRANSMITTER MODULE)	
(1)	INPUT
(2)	VCC
(3)	CURRENT CONTROL
(4)	GND
(5)	NC
(6)	NC

PLR101 (RECEIVER MODULE)	
(1)	Cathode
(2)	VCC
(3)	GND
(4)	OUTPUT
(5)	NC
(6)	NC

PACKAGE DIMENSIONS (Unit: mm)

TRANSMITTER MODULE
RECEIVER MODULE

OPTIC CONNECTOR



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ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

(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	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +80	$^\circ\text{C}$
Lead Soldering Temp.	T_{sol}	260 (Time ≤ 10 s)	$^\circ\text{C}$

(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	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +80	$^\circ\text{C}$
Lead Soldering Temp.	T_{sol}	260 (Time ≤ 10 s)	$^\circ\text{C}$

(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	$^\circ\text{C}$
Storage Temperature		T_{stg}	-40 to +70	$^\circ\text{C}$

TRUTH TABLE (POSITIVE LOGIC)

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

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F-18-07-11ELECTRICAL/OPTICAL CHARACTERISTICS ($T_a = T_{opt}$, $V_{CC} = 5V$)

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

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

*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	$R_L = 8.2 k\Omega$ $^{*3)}$
High Level Input Current	I_{IH}	—	—	100	μA	$V_{CC} = 5.25 V$, $V_{IH} = 2.7 V$, $R_L = 8.2 k\Omega$
Low Level Input Current	I_{IL}	—	—	-400	μA	$V_{CC} = 5.25 V$, $V_{IL} = 0.4 V$, $R_L = 8.2 k\Omega$
High Level Input Voltage	V_{IH}	2.0	—	—	V	$R_L = 8.2 k\Omega$
Low Level Input Voltage	V_{IL}	—	—	0.8	V	$R_L = 8.2 k\Omega$
Peak Emission Wavelength	λ_p	—	660	—	nm	$I_F = 20 mA$, $R_L = 8.2 k\Omega$, $T_a = 25^\circ C$
Transmitter Output Power	P_f	-21	—	-11	dBm	APF = 1 m, $R_L = 8.2 k\Omega$, $T_a = 25^\circ C$ $^{*4)}$
Transmission Distance		0.2	—	5	m	With PLR101 and APF, $R_L = 8.2 k\Omega$, $T_a = 25^\circ C$

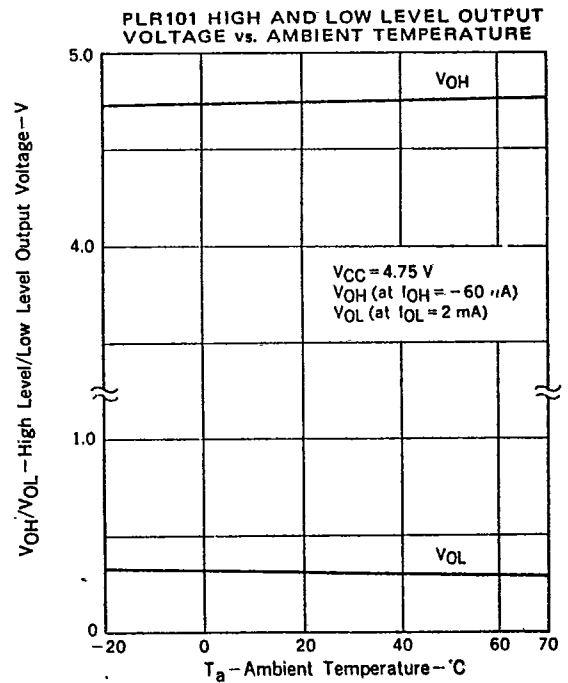
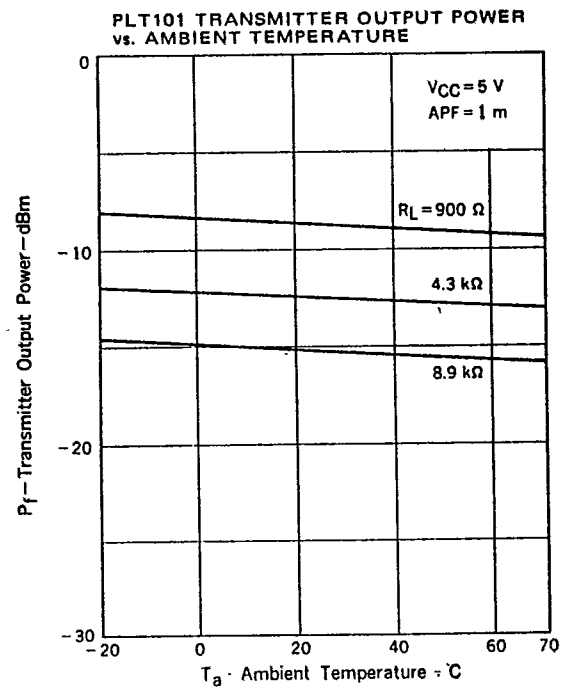
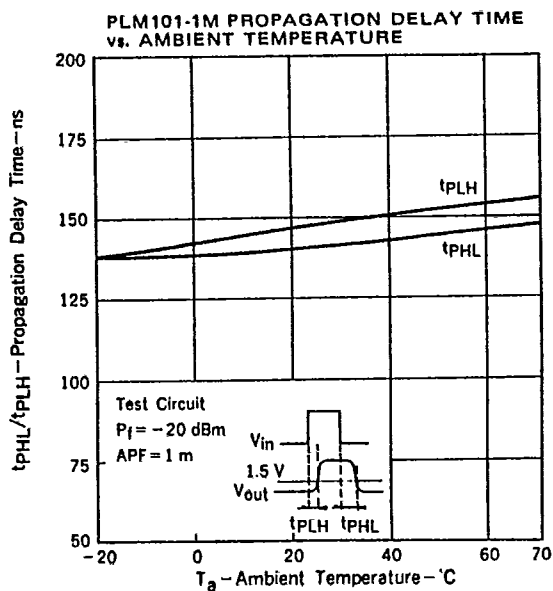
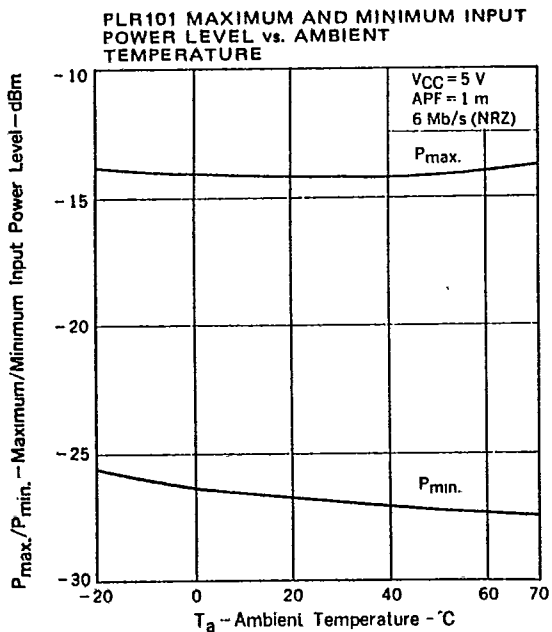
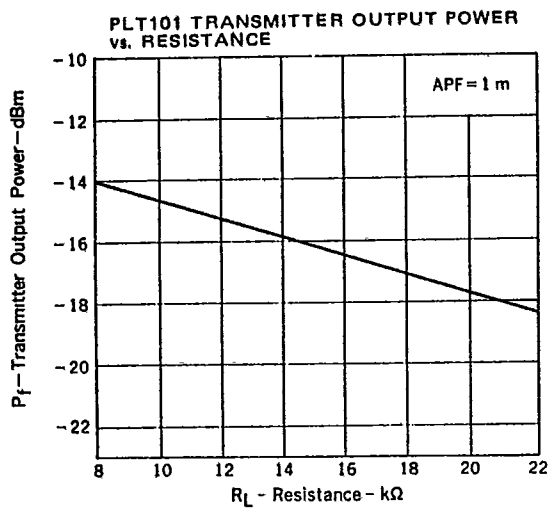
*3) R_L (Resistance for control of LED current) is connected from pin 2 to pin 3.*4) It is able to change the Transmitter Output Level (P_f) by Resistance (R_L) Variation.

(3) PLR101 (RECEIVER MODULE)

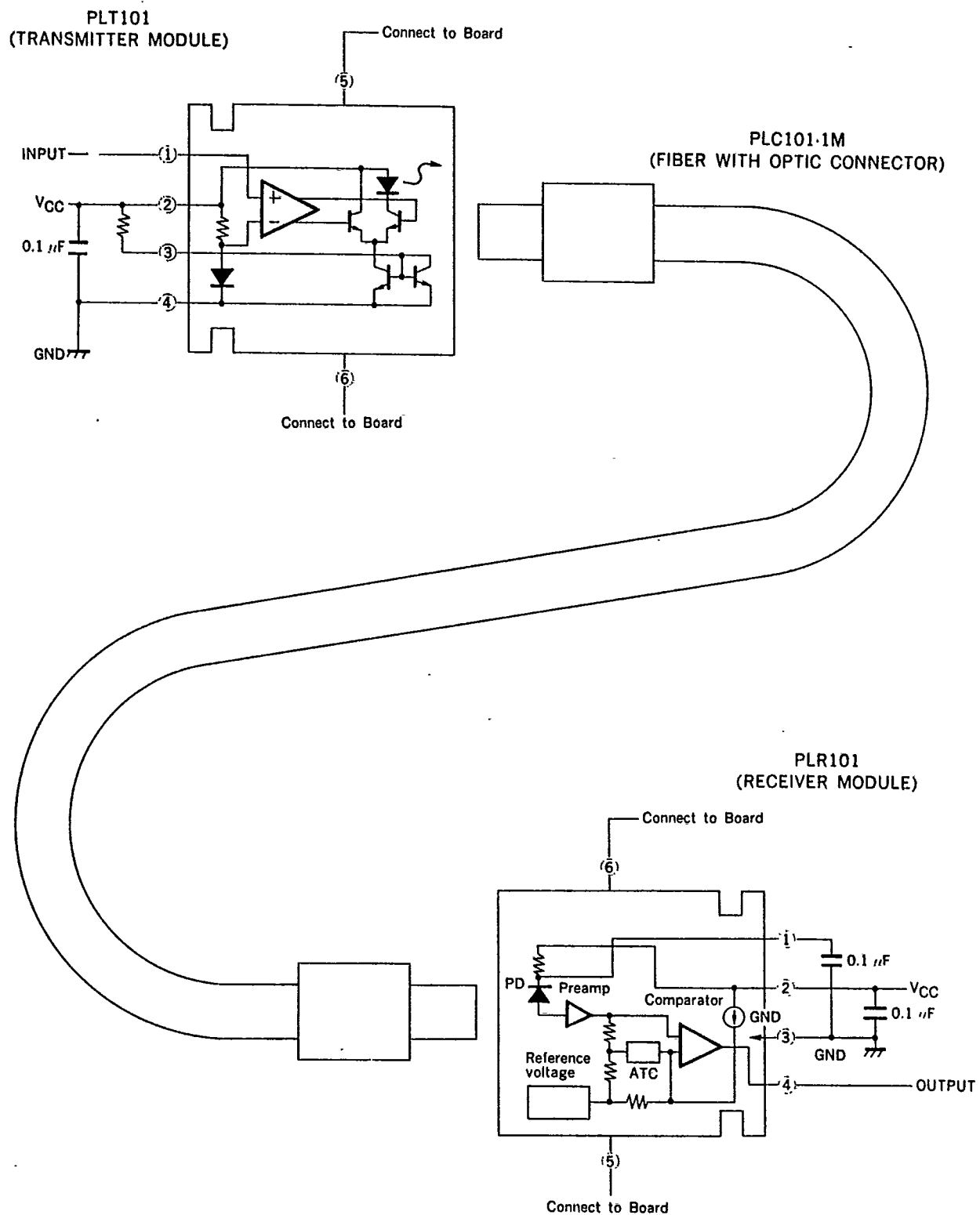
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Supply Current	I_{CC}	—	25	40	mA	
High Level Output Voltage	V_{OH}	4.4	—	—	V	$V_{CC} = 4.75 V$, $I_{OH} = 60 \mu A$
Low Level Output Voltage	V_{OL}	—	—	0.5	V	$V_{CC} = 4.75 V$, $I_{OL} = 2 mA$
Maximum Input Power Level	$P_{max.}$	-14.5	—	—	dBm	APF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

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TYPICAL CHARACTERISTIC ($T_a = 25^\circ\text{C}$)

TYPICAL CIRCUIT CONFIGURATION

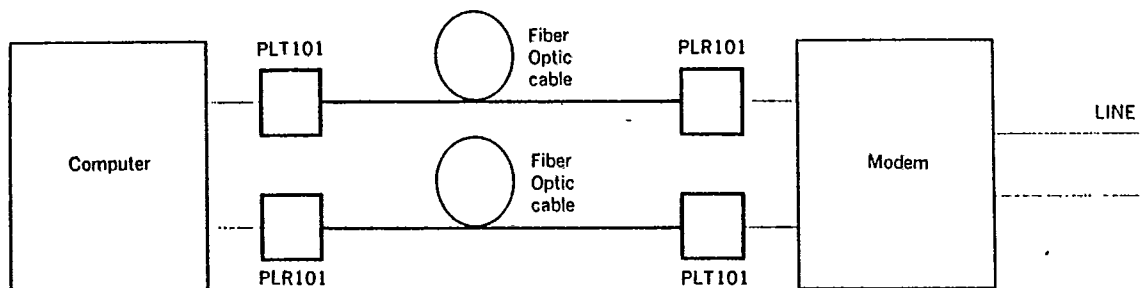


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APPLICATIONS OF PLM101-M

• COMPUTER (SECURE DATA COMMUNICATIONS)



• AUTOMOBILE (SECURE DATA COMMUNICATIONS)

