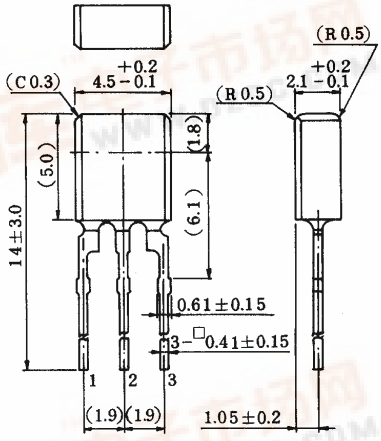
TOSHIBA PHOTO IC SILICON EPITAXIAL PLANAR

TPS823

PHOTO IC FOR PLASTIC FIBER / POLYMER CLAD FIBER

Unit in mm



( ) = REFERENCE VALUE

JEDEC	—
EIAJ	—
TOSHIBA	0-5H2

Weight : 0.12g (TYP.)

TPS823 contains a light receiving IC integrating photo diode, amplifier circuit, open collector output circuit, in 1 chip.

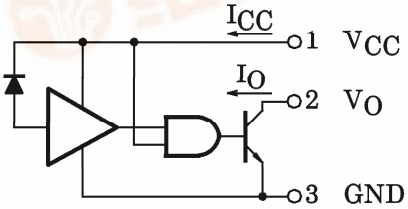
Output is directly connectable to IC as it changes digitally.

When light is received, output becomes low level.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	5.5	V
Output Voltage	V_O	5.5	V
Output Current	I_O	50	mA
Output Collector Power Dissipation	P_O	85	mW
Operating Temperature Range	T_{opr}	−25~85	°C
Storage Temperature Range	T_{stg}	−40~100	°C
Lead Temperature : Time	T_{sol}	260°C·3s	

PIN CONNECTION



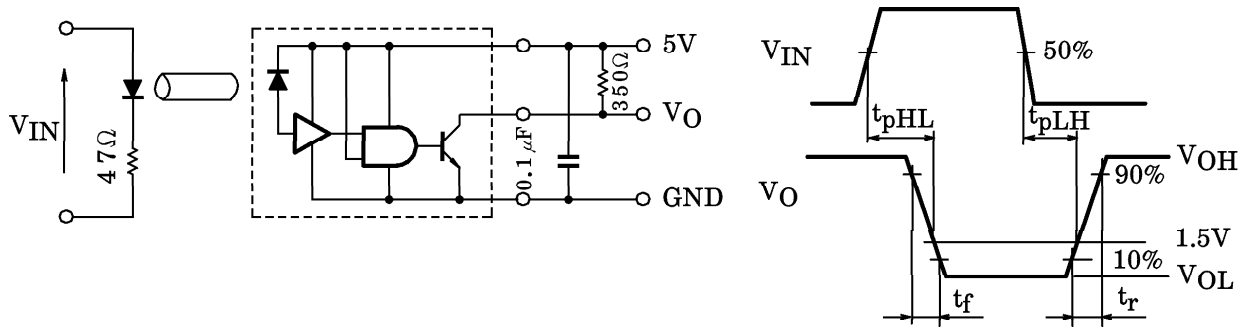
961001EAA2

OPTO-ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC			SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Supply Voltage			V_{CC}	Ta = 25°C	4.5	5.0	5.5	V
Output Current	Low Level		V_{OL}	I_{OL} = 13mA, V_{CC} = 5.5V, P_f = 120μW	—	0.4	0.6	V
	High Level		I_{OH}	V_{CC} = V_O = 5.5V	—	0.001	250	μA
Supply Current	Low Level		I_{CCL}	V_{CC} = 5.5V, P_f = 120μW	—	12	18	mA
	High Level		I_{CCH}	V_{CC} = 5.5V	—	7	15	
"L"→"H" Threshold Radiant Incidence (Note)			P_{fHL}	V_{CC} = 5.5V, Ta = 25°C, λp = 660nm, V_O = 1.5V	—	26	60	μW
					—	−15.9	−12.3	dBm
Switching Time	Propagation Delay Time	"L"→"H"	t_{pLH}	Ta = 25°C, V_{CC} = 5V, R_L = 350Ω, P_f = 0⇆120μW	—	70	—	ns
		"H"→"L"	t_{pHL}		—	80	—	
	Rise Time		t_r		—	20	—	
	Fall Time		t_f		—	45	—	

Note : Equivalent to the optical output at the end of a plastic fiber in the core diameter 980μm.

SWITCHING TIME TEST CIRCUIT

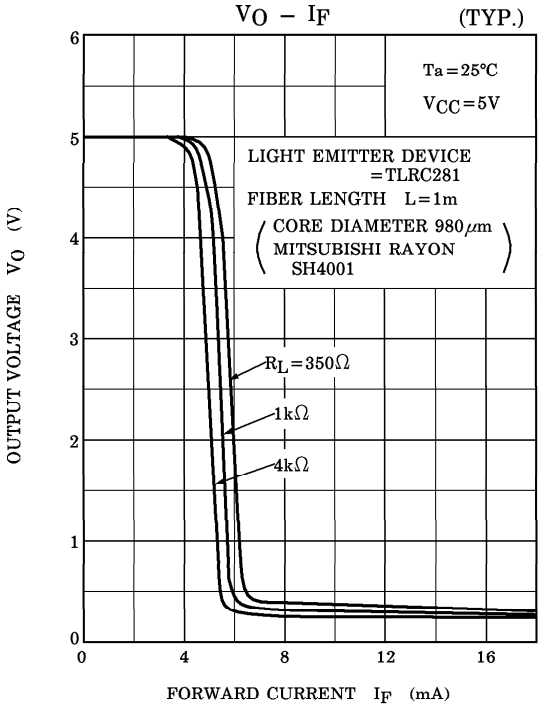


PRECAUTION

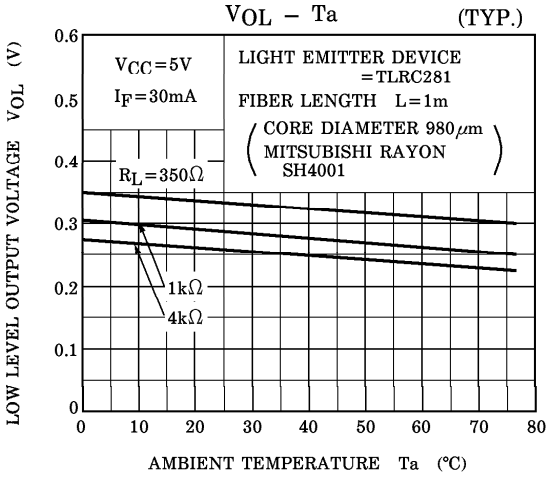
Please be careful of the followings.

1. Soldering temperature : 260°C MAX. Soldering time : 3s MAX.
   (Soldering portion of lead : above 2mm from the body of the device).
2. As the output photo IC contains a very high sensitivity amplifier, a bypass capacitor 0.1μF having good high frequency characteristic shall be mounted between Pins 1 and 3 at a position within 1cm from the pins for preventing oscillation. It not, proper speed or ON / OFF operation may not be obtained.
3. Pin surge voltage (Note) : MAX 150V
   (Note) Surge voltage chargeable between optional 2 pins at storage charge below 200pF.
4. Tensile strength of lead : MAX 100g

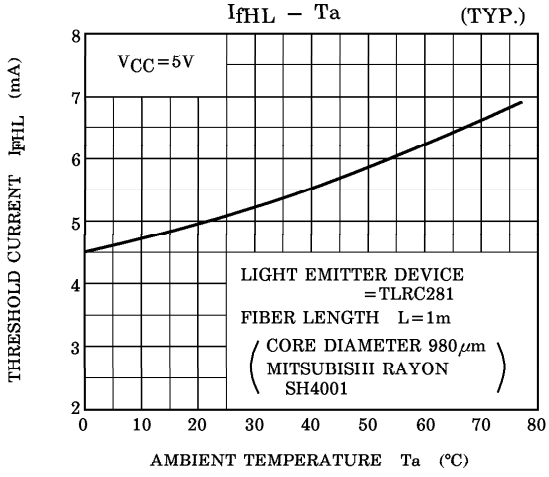
$V_O - I_F$ (TYP.)



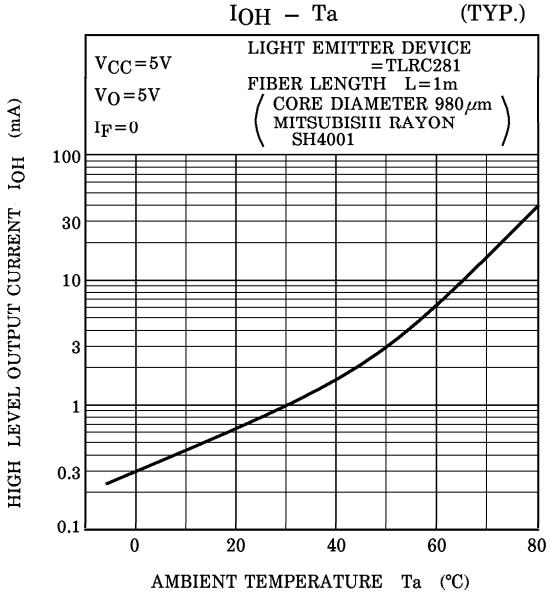
$V_{OL} - Ta$ (TYP.)



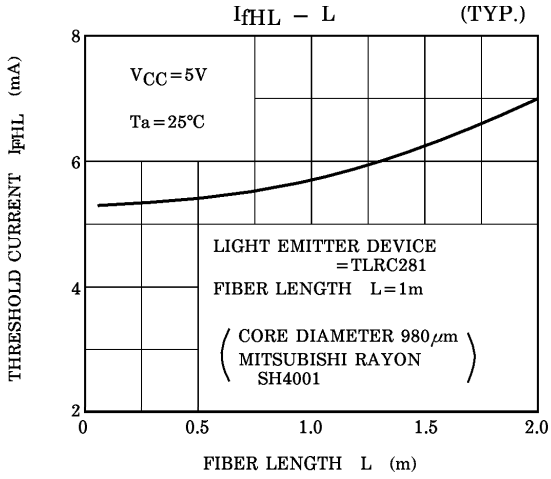
$I_{fHL} - Ta$ (TYP.)

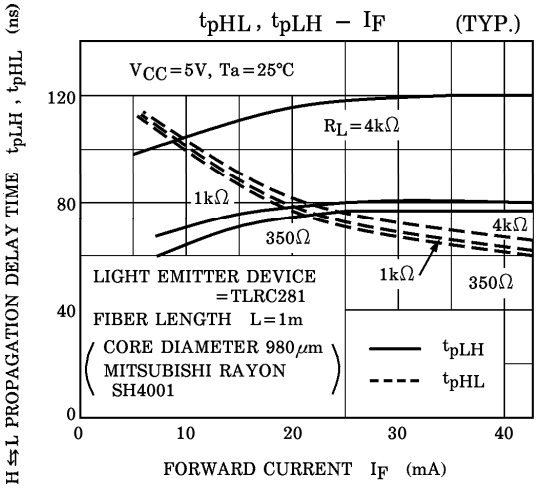


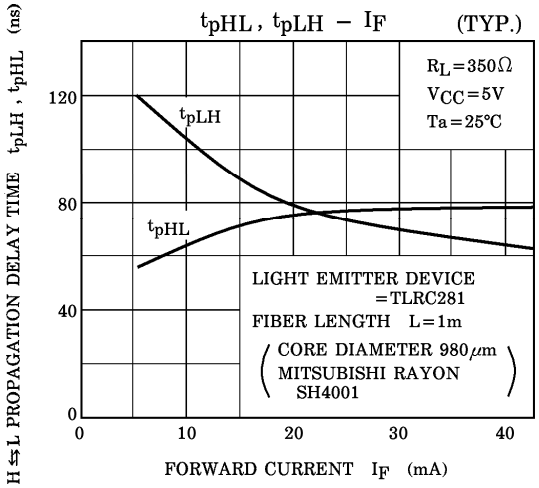
$I_{OH} - Ta$ (TYP.)

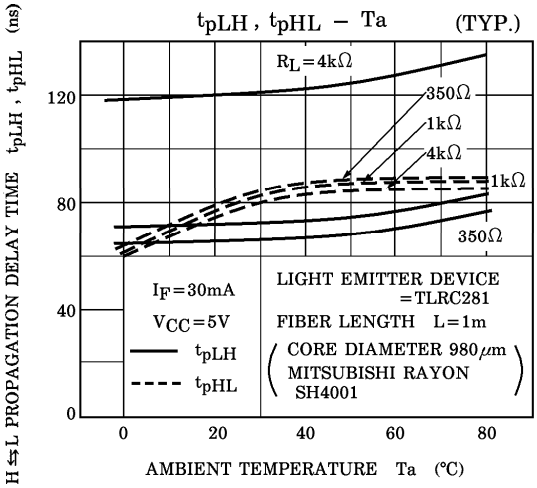


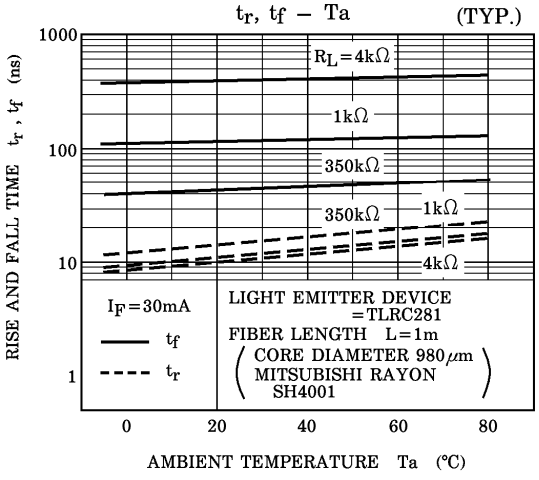
$I_{fHL} - L$ (TYP.)

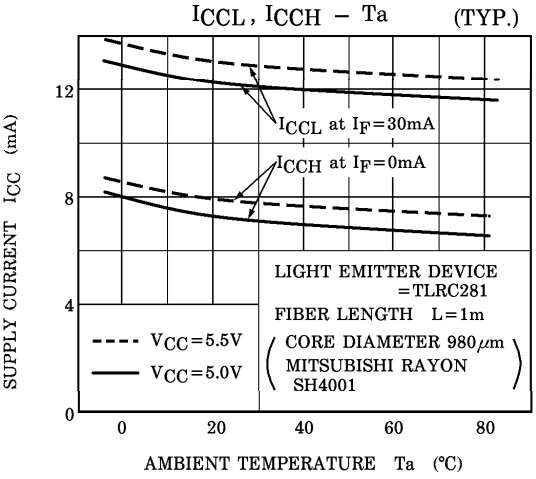


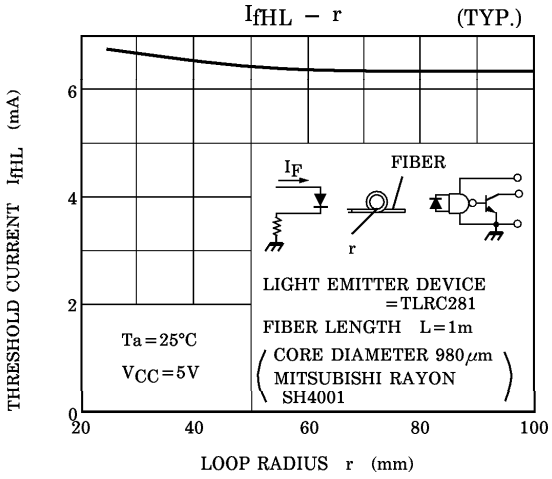

tpHL , tpLH − IF (TYP.)
VCC=5V, Ta=25°C
RL=4kΩ
1kΩ
350Ω
4kΩ
1kΩ
350Ω
LIGHT EMITTER DEVICE =TLRC281
FIBER LENGTH L=1m
CORE DIAMETER 980μm
MITSUBISHI RAYON SH4001
tpLH
tpHL
H⇆L PROPAGATION DELAY TIME tpLH , tpHL (ns)
FORWARD CURRENT IF (mA)


tpHL , tpLH − IF (TYP.)
RL=350Ω
VCC=5V
Ta=25°C
tpLH
tpHL
LIGHT EMITTER DEVICE =TLRC281
FIBER LENGTH L=1m
CORE DIAMETER 980μm
MITSUBISHI RAYON SH4001
H⇆L PROPAGATION DELAY TIME tpLH , tpHL (ns)
FORWARD CURRENT IF (mA)


tpLH , tpHL − Ta (TYP.)
RL=4kΩ
350Ω
1kΩ
4kΩ
1kΩ
350Ω
IF=30mA
VCC=5V
tpLH
tpHL
LIGHT EMITTER DEVICE =TLRC281
FIBER LENGTH L=1m
CORE DIAMETER 980μm
MITSUBISHI RAYON SH4001
H⇆L PROPAGATION DELAY TIME tpLH , tpHL (ns)
AMBIENT TEMPERATURE Ta (°C)


tr, tf − Ta (TYP.)
RL=4kΩ
1kΩ
350kΩ
350kΩ
1kΩ
4kΩ
IF=30mA
tf
tr
LIGHT EMITTER DEVICE =TLRC281
FIBER LENGTH L=1m
CORE DIAMETER 980μm
MITSUBISHI RAYON SH4001
RISE AND FALL TIME tr , tf (ns)
AMBIENT TEMPERATURE Ta (°C)


ICCL , ICCH − Ta (TYP.)
ICCL at IF=30mA
ICCH at IF=0mA
VCC=5.5V
VCC=5.0V
LIGHT EMITTER DEVICE =TLRC281
FIBER LENGTH L=1m
CORE DIAMETER 980μm
MITSUBISHI RAYON SH4001
SUPPLY CURRENT ICC (mA)
AMBIENT TEMPERATURE Ta (°C)


IfHL − r (TYP.)
IF
FIBER
r
Ta=25°C
VCC=5V
LIGHT EMITTER DEVICE =TLRC281
FIBER LENGTH L=1m
CORE DIAMETER 980μm
MITSUBISHI RAYON SH4001
THRESHOLD CURRENT IfHL (mA)
LOOP RADIUS r (mm)