

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRIAC

# TLP160J

TRIAC DRIVE

PROGRAMMABLE CONTROLLERS

AC-OUTPUT MODULE

SOLID STATE RELAY

The TOSHIBA MINI FLAT COUPLER TLP160J is a small outline coupler, suitable for surface mount assembly.

The TLP160J consists of a photo triac, optically coupled to a gallium arsenide infrared emitting diode.

- Peak Off-State Voltage : 600V (MIN.)
- Trigger LED Current : 10mA (MAX.)
- On-State Current : 70mA (MAX.)
- Isolation Voltage : 2500Vrms (MIN.)
- UL Recognized : UL1577, File No. E67349

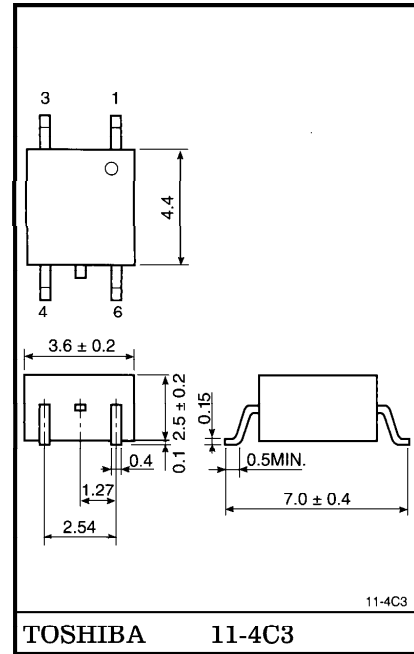
TRIGGER LED CURRENT

CLASSIFICATION*	TRIGGER LED CURRENT (mA)		MARKING OF CLASSIFICATION
	$V_T = 6V, T_a = 25^\circ C$		
	MIN.	MAX.	
(IFT7)	—	7	T7
Standard	—	10	T7, Blank

\*Ex. (IFT7) ; TLP160J (IFT7)

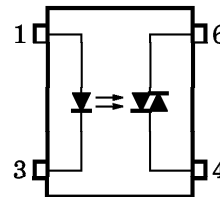
(Note) Application type name for certification test, please use standard product type name, i.e.  
TLP160J (IFT7) : TLP160J

Unit in mm



Weight : 0.09g

PIN CONFIGURATIONS



1. ANODE
3. CATHODE
4. TERMINAL 1
6. TERMINAL 2

961001EBC2

● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

● Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.

● The products described in this document are subject to foreign exchange and foreign trade control laws.

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● The information contained herein is subject to change without notice.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	$I_F$	50	mA
	Forward Current Derating (Ta ≥ 53°C)	$\Delta I_F / ^\circ C$	-0.7	mA / °C
	Peak Forward Current (100µs pulse, 100pps)	$I_{FP}$	1	A
	Reverse Voltage	$V_R$	5	V
	Junction Temperature	$T_j$	125	°C
DETECTOR	Off-State Output Terminal Voltage	$V_{DRM}$	600	V
	On-State RMS Current	Ta = 25°C	70	mA
		Ta = 70°C	40	
	On-State Current Derating (Ta ≥ 25°C)	$\Delta I_T / ^\circ C$	-0.67	mA / °C
	Peak On-State Current (100µs pulse, 120pps)	$I_{TP}$	2	A
	Peak Nonrepetitive Surge Current (PW = 10ms, DC = 10%)	$I_{TSM}$	1.2	A
	Junction Temperature	$T_j$	115	°C
Storage Temperature Range	$T_{stg}$	-55~125	°C	
Operating Temperature Range	$T_{opr}$	-40~100	°C	
Lead Soldering Temperature (10s)	$T_{sol}$	260	°C	
Isolation Voltage (AC, 1 min., R.H. ≤ 60%) (Note)	$BV_S$	2500	Vrms	

(Note) Device considered a two terminal device : Pins 1 and 3 shorted together and pins 4 and 6 shorted together.

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	$V_{AC}$	—	—	240	Vac
Forward Current	$I_F$	15	20	25	mA
Peak On-State Current	$I_{TP}$	—	—	1	A
Operating Temperature	$T_{opr}$	-25	—	85	°C

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	$V_F$	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse Current	$I_R$	$V_R = 5\text{V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1\text{MHz}$	—	30	—	pF
DETECTOR	Peak Off-State Current	$I_{DRM}$	$V_{DRM} = 600\text{V}$	—	10	1000	nA
	Peak On-State Voltage	$V_{TM}$	$I_{TM} = 70\text{mA}$	—	1.7	2.8	V
	Holding Current	$I_H$	—	—	1.0	—	mA
	Critical Rate of Rise of Off-State Voltage	$dv/dt$	$V_{in} = 240\text{Vrms}, T_a = 85^\circ\text{C}$ (Fig.1)	—	500	—	$\text{V}/\mu\text{s}$
	Critical Rate of Rise of Commutating Voltage	$dv/dt(c)$	$I_T = 15\text{mA}, V_{in} = 60\text{Vrms}$ (Fig.1)	—	0.2	—	$\text{V}/\mu\text{s}$

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	$I_{FT}$	$V_T = 6\text{V}$	—	5	10	mA
Capacitance Input to Output	$C_S$	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation Resistance	$R_S$	$V_S = 500\text{V}, \text{R.H.} \leq 60\%$	$1 \times 10^{12}$	$10^{14}$	—	$\Omega$
Isolation Voltage	$BV_S$	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	Vdc
Turn-on Time	$t_{ON}$	$V_D = 6 \rightarrow 4\text{V}, R_L = 100\Omega$ $I_F = \text{Rated } I_{FT} \times 1.5$	—	30	100	$\mu\text{s}$

Fig.1 dv/dt TEST CIRCUIT

