

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

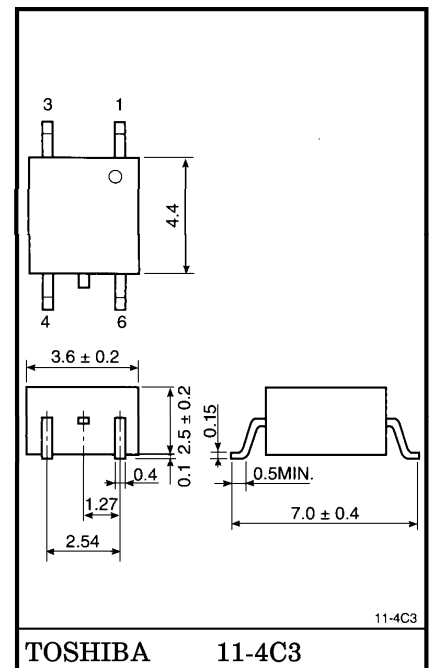
**TRIGGER LED CURRENT**

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)

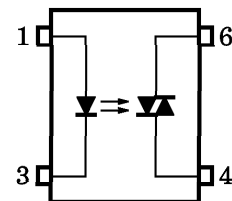
(Note) Application type name for certification test, please use standard product type name, i.e.  
TLP160J (IFT7) : TLP160J

Unit in mm



Weight : 0.09g

**PIN CONFIGURATIONS**



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

## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I <sub>F</sub>	50	mA
	Forward Current Derating (Ta ≥ 53°C)	ΔI <sub>F</sub> / °C	-0.7	mA / °C
	Peak Forward Current (100μs pulse, 100pps)	I <sub>FP</sub>	1	A
	Reverse Voltage	V <sub>R</sub>	5	V
	Junction Temperature	T <sub>j</sub>	125	°C
DETECTOR	Off-State Output Terminal Voltage	V <sub>DRM</sub>	600	V
	On-State RMS Current	Ta = 25°C	70	mA
		Ta = 70°C	40	
	On-State Current Derating (Ta ≥ 25°C)	ΔI <sub>T</sub> / °C	-0.67	mA / °C
	Peak On-State Current (100μs pulse, 120pps)	I <sub>TP</sub>	2	A
	Peak Nonrepetitive Surge Current (PW = 10ms, DC = 10%)	I <sub>TSM</sub>	1.2	A
	Junction Temperature	T <sub>j</sub>	115	°C
Storage Temperature Range	T <sub>stg</sub>	-55~125	°C	
Operating Temperature Range	T <sub>opr</sub>	-40~100	°C	
Lead Soldering Temperature (10s)	T <sub>sol</sub>	260	°C	
Isolation Voltage (AC, 1 min., R.H. ≤ 60%) (Note)	BV <sub>S</sub>	2500	V <sub>rms</sub>	

(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 <sub>AC</sub>	—	—	240	V <sub>ac</sub>
Forward Current	I <sub>F</sub>	15	20	25	mA
Peak On-State Current	I <sub>TP</sub>	—	—	1	A
Operating Temperature	T <sub>opr</sub>	-25	—	85	°C

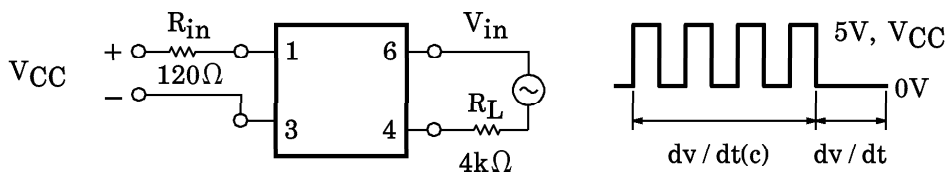
INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

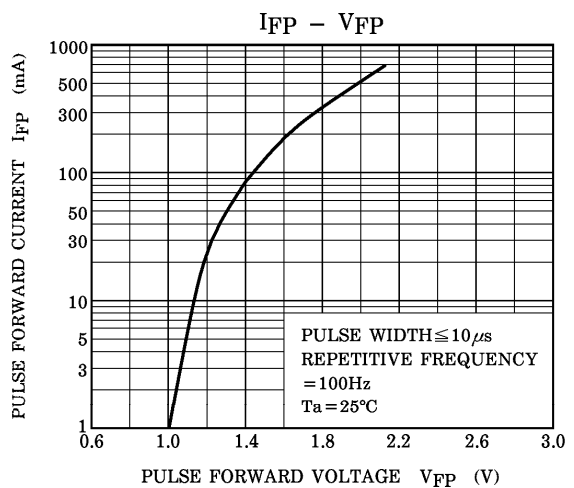
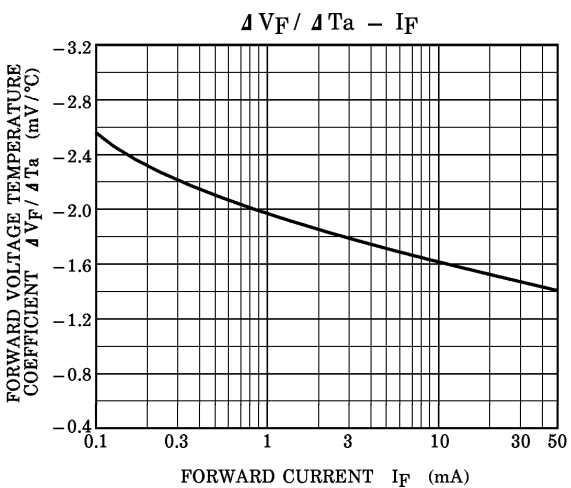
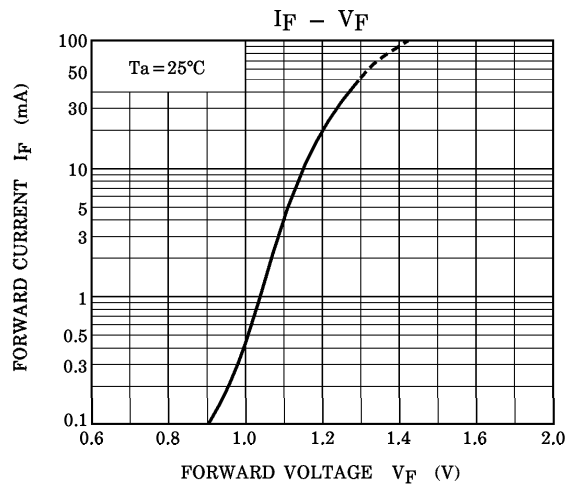
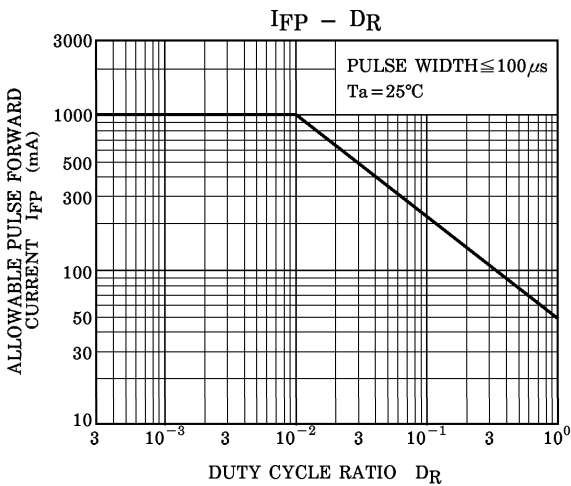
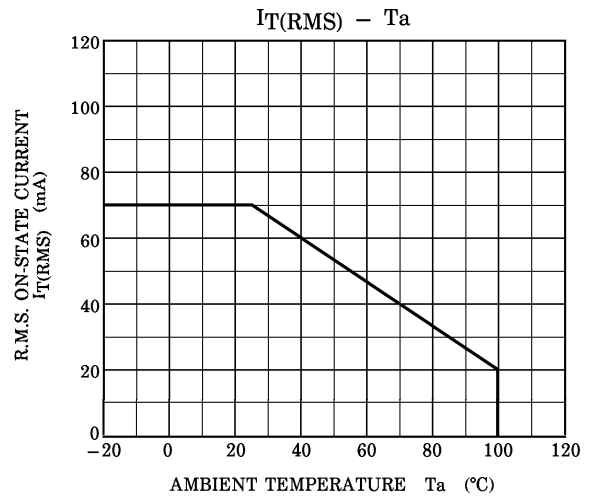
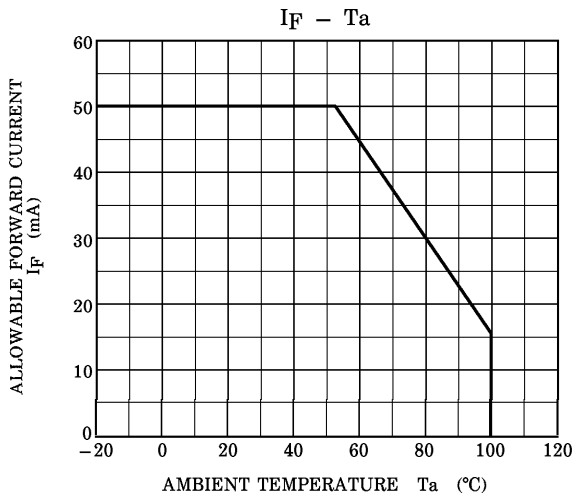
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10mA	1.0	1.15	1.3	V
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5V	—	—	10	μA
	Capacitance	C <sub>T</sub>	V = 0, f = 1MHz	—	30	—	pF
DETECTOR	Peak Off-State Current	I <sub>DRM</sub>	V <sub>DRM</sub> = 600V	—	10	1000	nA
	Peak On-State Voltage	V <sub>TM</sub>	I <sub>TM</sub> = 70mA	—	1.7	2.8	V
	Holding Current	I <sub>H</sub>	—	—	1.0	—	mA
	Critical Rate of Rise of Off-State Voltage	dv / dt	V <sub>in</sub> = 240Vrms, Ta = 85°C (Fig.1)	—	500	—	V / μs
	Critical Rate of Rise of Commutating Voltage	dv / dt(c)	I <sub>T</sub> = 15mA, V <sub>in</sub> = 60Vrms (Fig.1)	—	0.2	—	V / μs

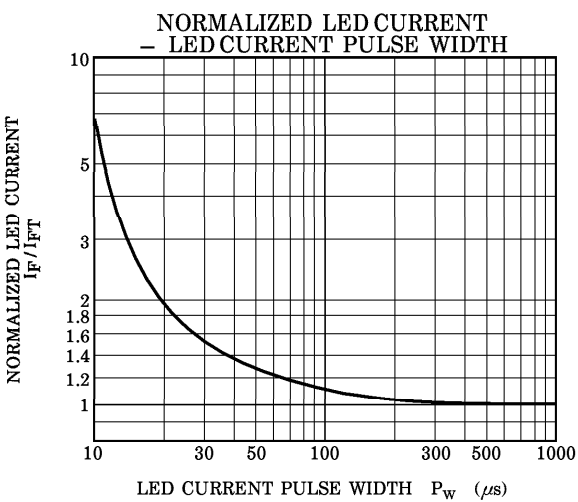
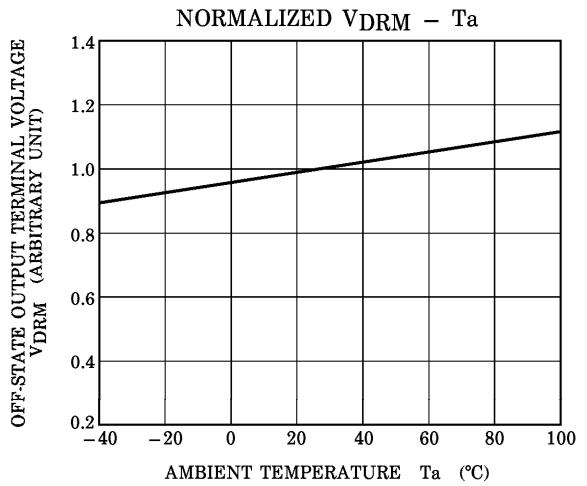
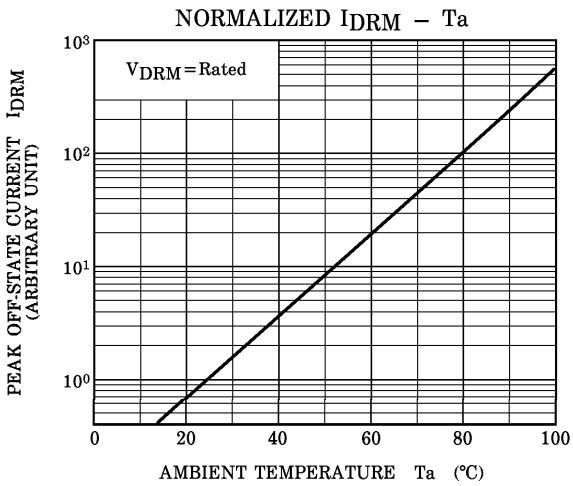
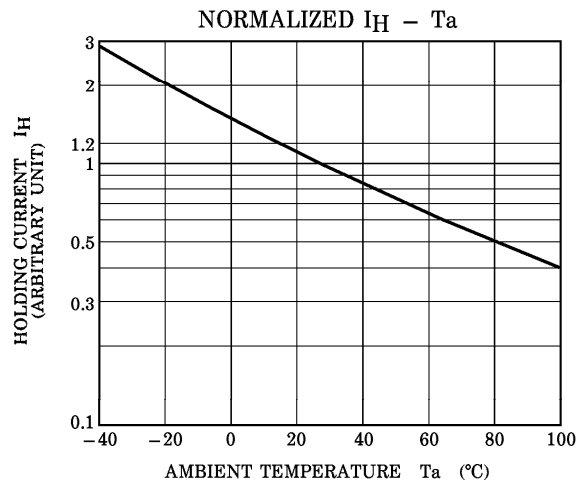
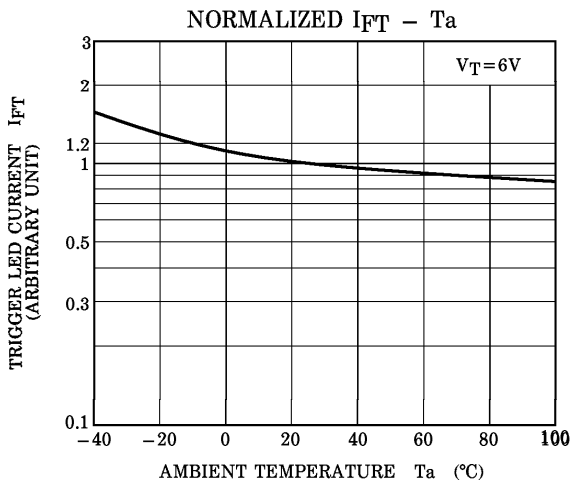
COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	I <sub>FT</sub>	V <sub>T</sub> = 6V	—	5	10	mA
Capacitance Input to Output	C <sub>S</sub>	V <sub>S</sub> = 0, f = 1MHz	—	0.8	—	pF
Isolation Resistance	R <sub>S</sub>	V <sub>S</sub> = 500V, R.H. ≤ 60%	1 × 10 <sup>12</sup>	10 <sup>14</sup>	—	Ω
Isolation Voltage	BV <sub>S</sub>	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	—
		DC, 1 minute, in oil	—	5000	—	—
Turn-on Time	t <sub>ON</sub>	V <sub>D</sub> = 6 → 4V, R <sub>L</sub> = 100Ω I <sub>F</sub> = Rated I <sub>FT</sub> × 1.5	—	30	100	μs

Fig.1 dv/dt TEST CIRCUIT







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