

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRIAC

TLP160G

TRIAC DRIVE

PROGRAMMABLE CONTROLLERS

AC-OUTPUT MODULE

SOLID STATE RELAY

The TOSHIBA MINI FLAT COUPLER TLP160G is a small outline coupler, suitable for surface mount assembly.

The TLP160G consists of a photo triac, optically coupled to a gallium arsenide infrared emitting diode.

- Peak Off-State Voltage : 400V (MIN.)
- Trigger LED Current : 10mA (MAX.)
- On-State Current : 70mA (MAX.)
- Isolation Voltage : 2500Vrms (MIN.)
- UL Recognized : UL1577, File No. E67349

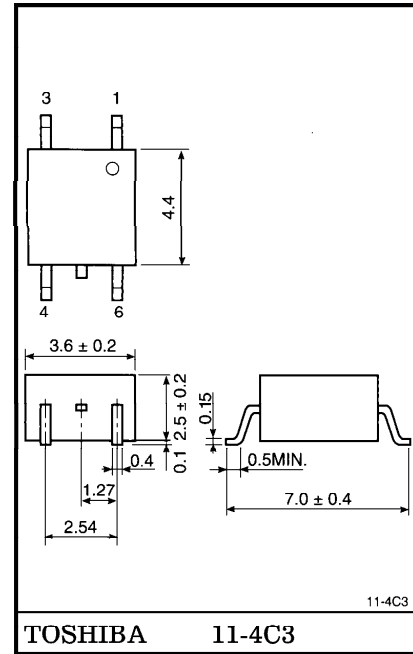
TRIGGER LED CURRENT

CLASSIFICATION*	TRIGGER LED CURRENT (mA)		MARKING OF CLASSIFICATION
	$V_T = 3V, T_a = 25^\circ C$		
	MIN.	MAX.	
(IFT5)	—	5	T5
(IFT7)	—	7	T5, T7
Standard	—	10	T5, T7, Blank

*Ex. (IFT5) ; TLP160G (IFT5)

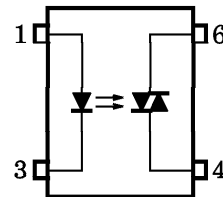
(Note) Application type name for certification test, please use standard product type name, i.e. TLP160G (IFT5) : TLP160G

Unit in mm



Weight : 0.09g

PIN CONFIGURATIONS



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

961001EAA2

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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}	400	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}	—	—	120	Vac
Forward Current	I_F	15	20	25	mA
Peak On-State Current	I_{TP}	—	—	1	A
Operating Temperature	T_{opr}	-25	—	85	°C

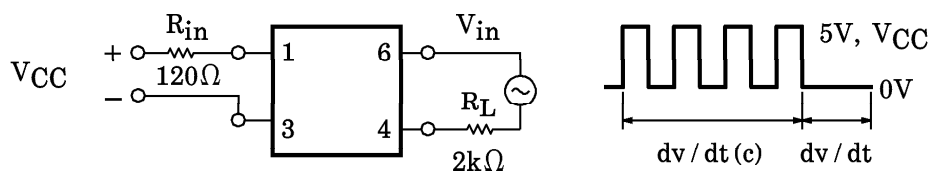
INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

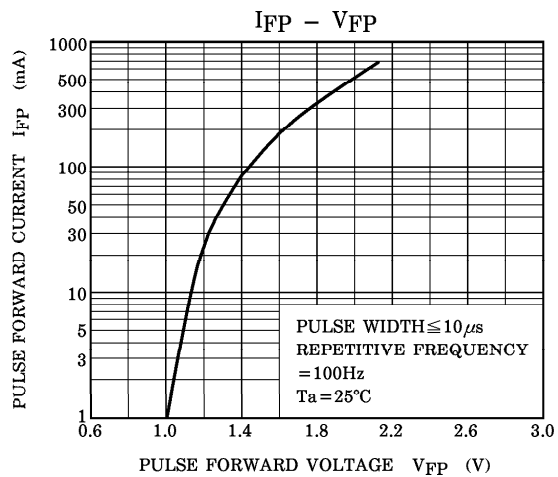
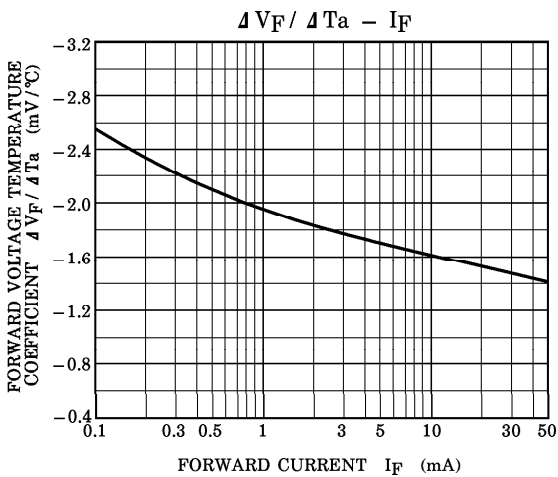
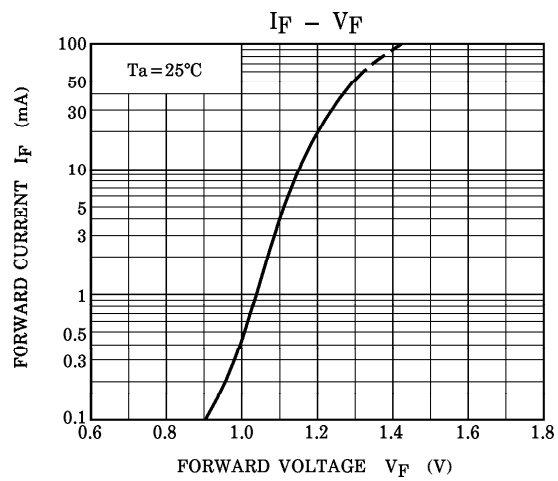
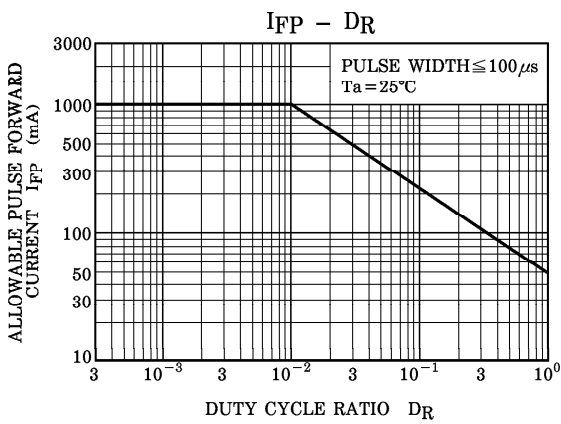
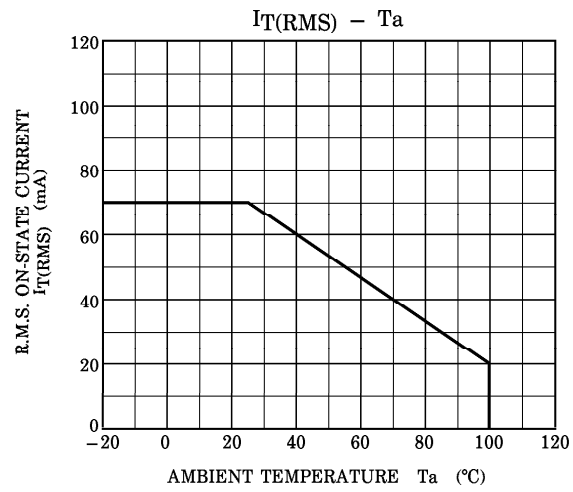
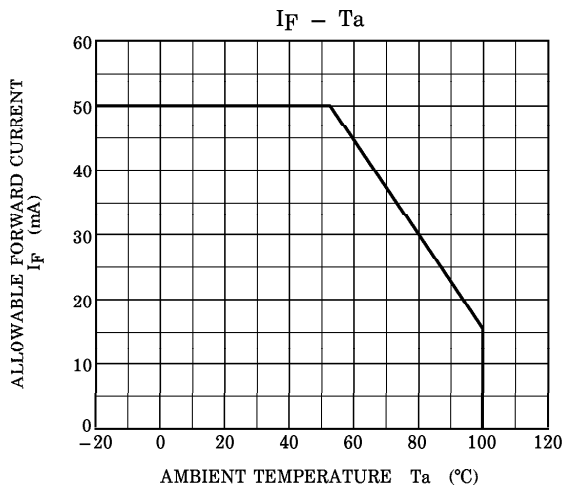
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V_F	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse Current	I_R	$V_R = 5\text{V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1\text{MHz}$	—	30	—	pF
DETECTOR	Peak Off-State Current	I_{DRM}	$V_{DRM} = 400\text{V}$	—	10	1000	nA
	Peak On-State Voltage	V_{TM}	$I_{TM} = 70\text{mA}$	—	1.7	2.8	V
	Holding Current	I_H	—	—	0.6	—	mA
	Critical Rate of Rise of Off-State Voltage	dv/dt	$V_{in} = 120\text{Vrms}, T_a = 85^\circ\text{C}$ (Fig.1)	200	500	—	$\text{V}/\mu\text{s}$
	Critical Rate of Rise of Commutating Voltage	$dv/dt(c)$	$I_T = 15\text{mA}, V_{in} = 30\text{Vrms}$ (Fig.1)	—	0.2	—	$\text{V}/\mu\text{s}$

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

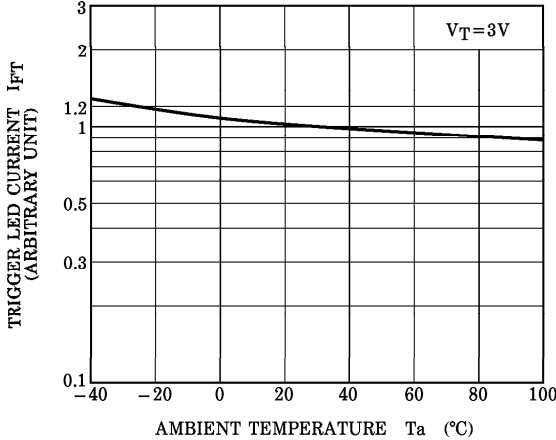
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Trigger LED Current	I_{FT}	$V_T = 3\text{V}$	—	5	10	mA
Capacitance Input to Output	C_S	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500\text{V}, \text{R.H.} \leq 60\%$	1×10^{12}	10^{14}	—	Ω
Isolation Voltage	BV_S	AC, 1 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	μs

Fig.1 dv/dt TEST CIRCUIT

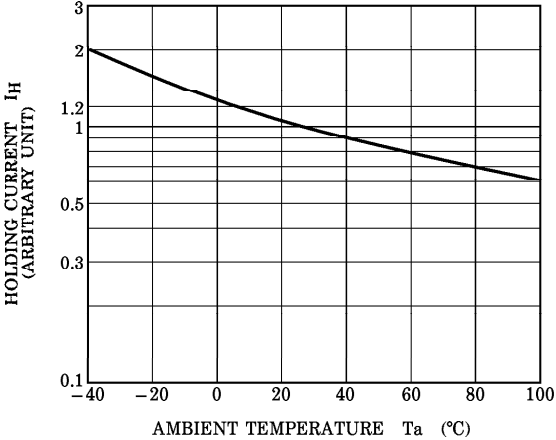




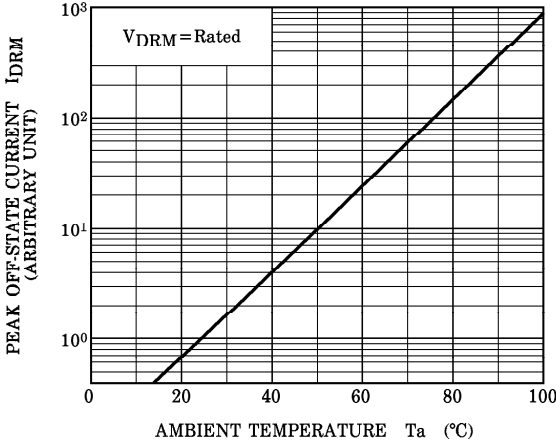
NORMALIZED I_{FT} - T_a



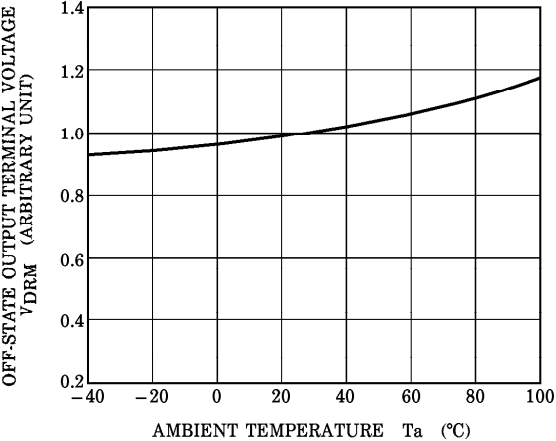
NORMALIZED I_H - T_a



NORMALIZED I_{DRM} - T_a



NORMALIZED V_{DRM} - T_a



NORMALIZED LED CURRENT - LED CURRENT PULSE WIDTH

