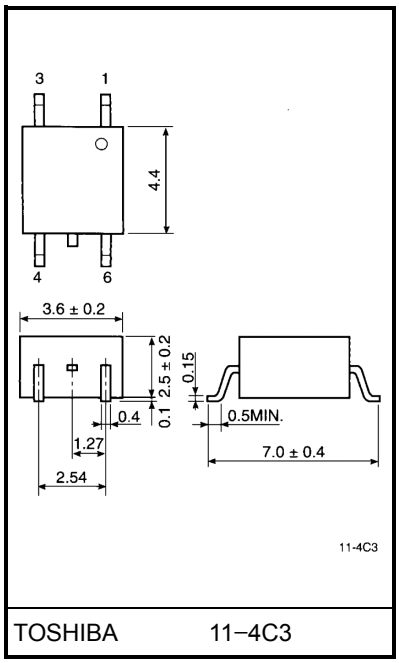
TOSHIBA Photocoupler GaAs Ired & Photo−Triac

TLP160J

Triac Drive
Programmable Controllers
AC−Output Module
Solid State Relay

Unit in mm



TOSHIBA 11−4C3

Weight: 0.09 g

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: 600 V (min.)
- Trigger LED current: 10 mA (max.)
- On−state current: 70 mA (max.)
- Isolation voltage: 2500 Vrms (min.)
- UL recognized: UL1577, file No. E67349

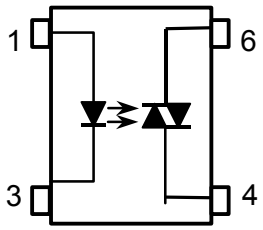
Trigger LED Current

Classi−fication*	Trigger LED Current (mA) V_T=6V, Ta=25°C		Marking Of Classification
	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

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_F	50	mA
	Forward current derating (Ta ≥ 53°C)		ΔI_F / °C	−0.7	mA / °C
	Peak forward current (100 μs pulse, 100 pps)		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	$I_{T(RMS)}$	70	mA
		Ta=70°C		40	
	On−state current derating (Ta ≥ 25°C)		ΔI_T / °C	−0.67	mA / °C
	Peak on−state current (100μs pluse, 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 (10 s)			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

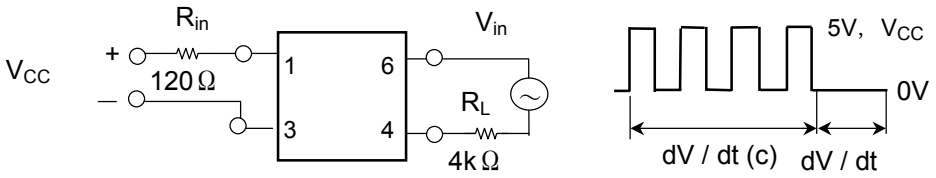
Individual Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	I_F = 10 mA	1.0	1.15	1.3	V
	Reverse current	I_R	V_R = 5 V	—	—	10	μA
	Capacitance	C_T	V = 0, f = 1 MHz	—	30	—	pF
Detector	Peak off−state current	I_{DRM}	V_{DRM} = 600 V	—	10	1000	nA
	Peak on−state voltage	V_{TM}	I_{TM} = 70 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 Vrms, Ta = 85°C (Fig.1)	—	500	—	V / μs
	Critical rate of rise of commutating voltage	dv / dt(c)	I_T = 15 mA, V_{in} = 60 Vrms (Fig.1)	—	0.2	—	V / μs

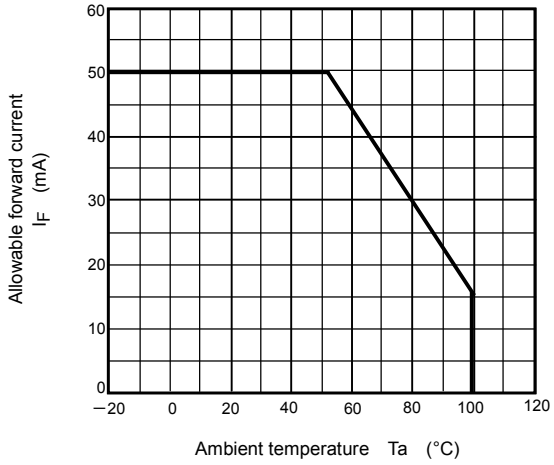
Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	V_T = 6 V	—	5	10	mA
Capacitance input to output	C_S	V_S = 0, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500 V, R.H. ≤ 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→4V, R_L = 100Ω I_F = rated I_{FT} × 1.5	—	30	100	μs

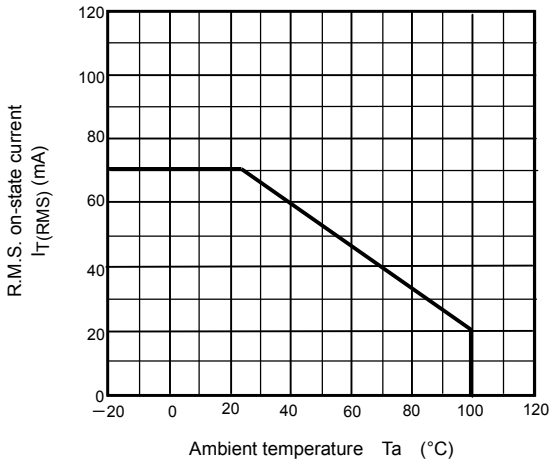
Fig.1 dv / dt test circuit



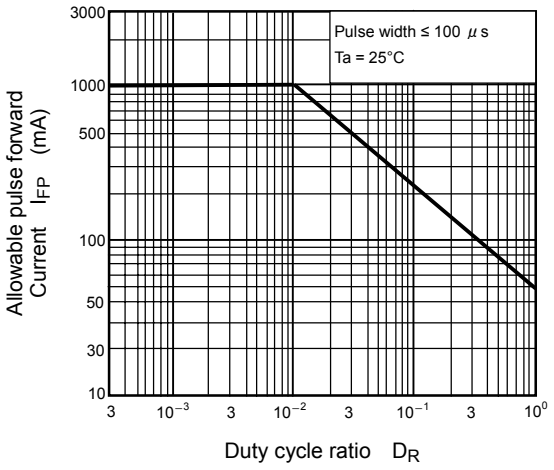
I_F – Ta



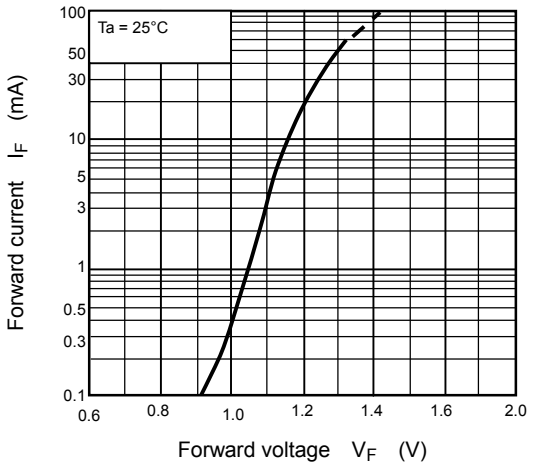
$I_{T(RMS)}$ – Ta



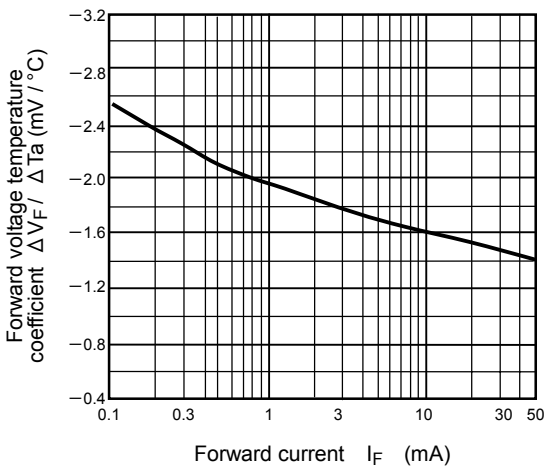
I_{FP} – D_R



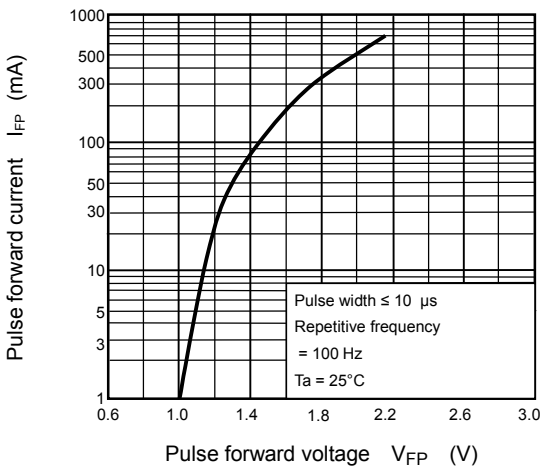
I_F – V_F



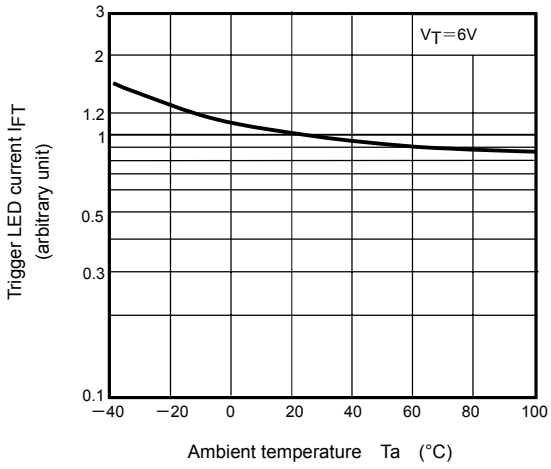
$\Delta V_F / \Delta Ta$ – I_F



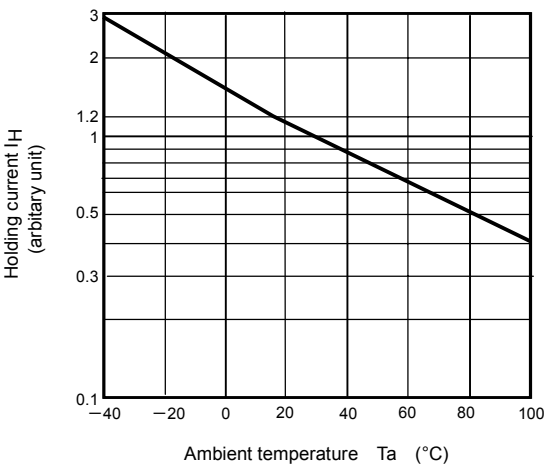
I_{FP} – V_{FP}



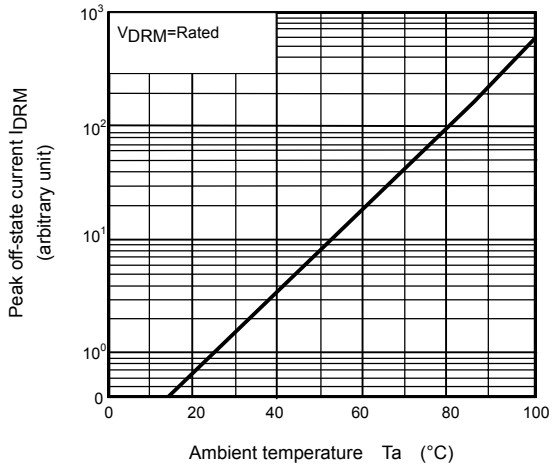
Normalized I_{FT} – Ta



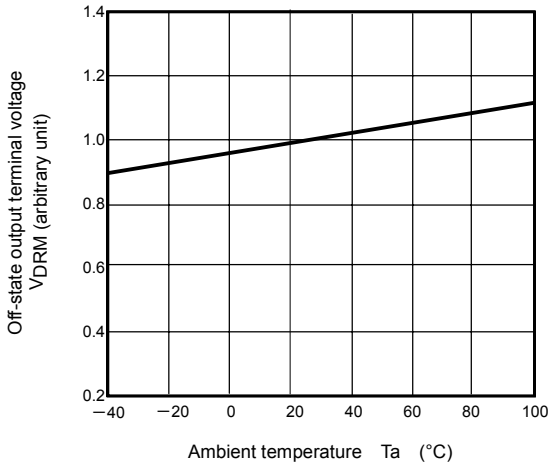
Normalized I_H – Ta



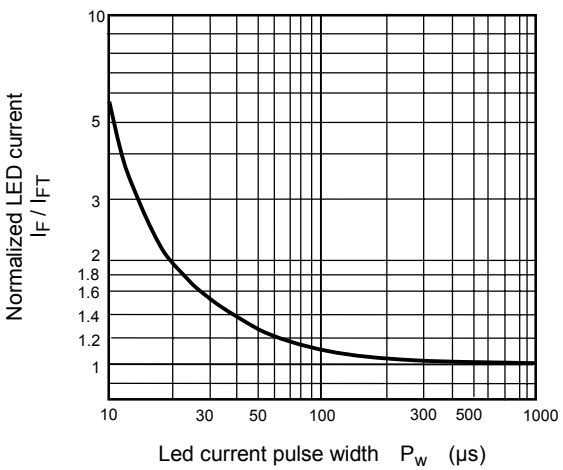
Normalized I_{DRM} – Ta



Normalized V_{DRM} – Ta



Normalized LED Current
−LED Current Pulse Width



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