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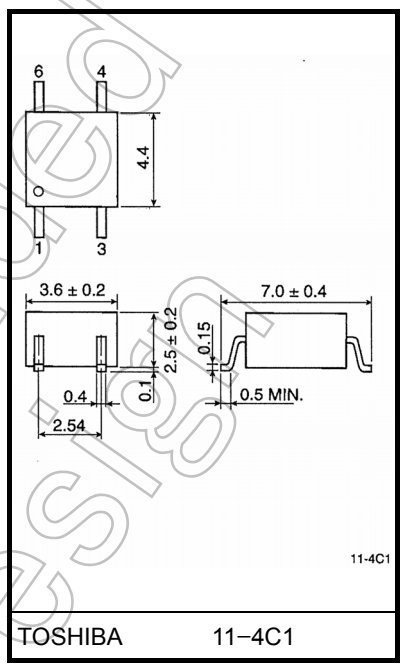
TOSHIBA Photocoupler GaAs IRED + Photo-Triac

TLP260J

Triac Drivers
Programmable Controllers
AC-Output Modules
Solid-State Relays

Unit: mm



TOSHIBA 11−4C1

Weight: 0.09 g (typ.)

The TOSHIBA mini-flat coupler TLP260J is a small-outline coupler suitable for surface mount assembly.

The TLP260J 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 : 3000 Vrms (min)
- UL-recognized : UL1577, file No. E67349
- Option (V4) type
  VDE-approved : EIN EN 60747-5-2 satisfied
  Maximum operating insulation voltage : 565 Vpk
  Highest permissible overvoltage : 6000 Vpk

Note: When an EN 60747-5-2 approved type is needed, be sure to specify “Option (V4)”.

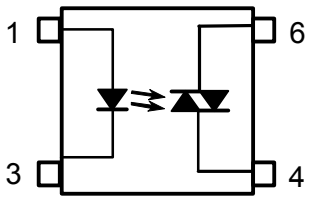
- Construction Mechanical Rating
  Creepage distance : 4.0 mm (min)
  Clearance : 4.0 mm (min)
  Insulation thickness : 0.4 mm (min)

Trigger LED Current

Classification*	Trigger LED Current (mA) V_T = 6 V, Ta = 25°C		Product Classification Marking
	Min	Max	
Standard	—	10	Blank

Note: Be sure to use standard product type names when submitting type names for safety certification testing, i.e., TLP260J.

Pin Configuration



1. Anode
3. Cathode
4. Terminal 1
6. Terminal 2

Start of commercial production
1996/07

Absolute 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 (100 μs pulse, 120 pps)		I_{TP}	2	A
	Peak nonrepetitive surge current (PW = 10 ms)		I_{TSM}	1.2	A
	Junction temperature		T_j	100	°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 minute, R.H. ≤ 60%) (Note 1)			BV_S	2500	Vrms

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Device considered as 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

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

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

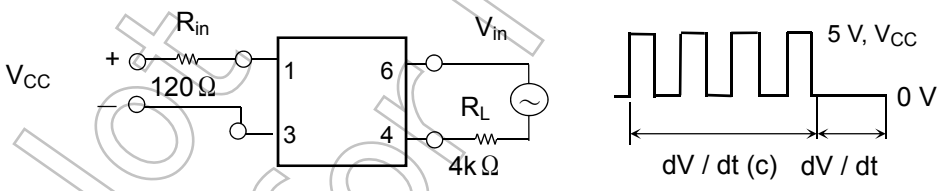
Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED current	I_{FT}	V_T = 6 V	—	5	10	mA
Turn−on time	t_{ON}	V_D = 6→4 V, R_L = 100Ω I_F = rated I_{FT} × 1.5	—	30	100	μs

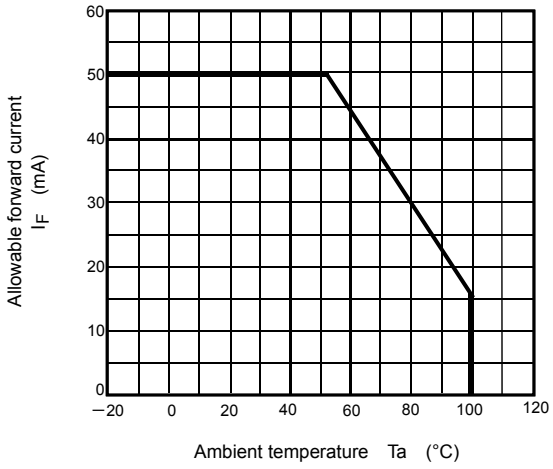
Isolation Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
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%	5×10^{10}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	3000	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	Vdc

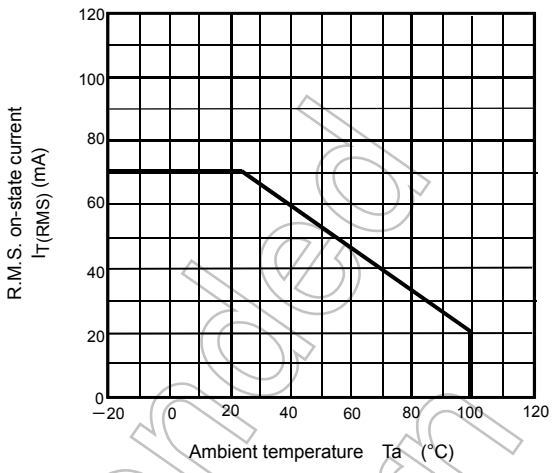
Fig. 1: dv / dt test circuit



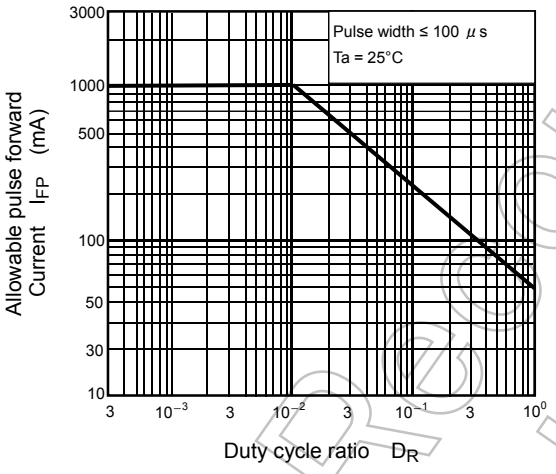
I_F – Ta



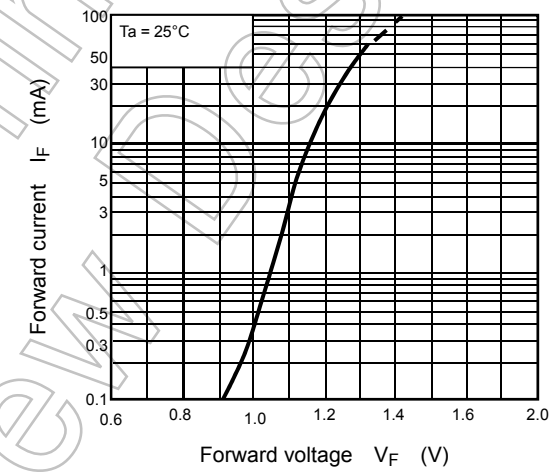
$I_{T(RMS)}$ – Ta



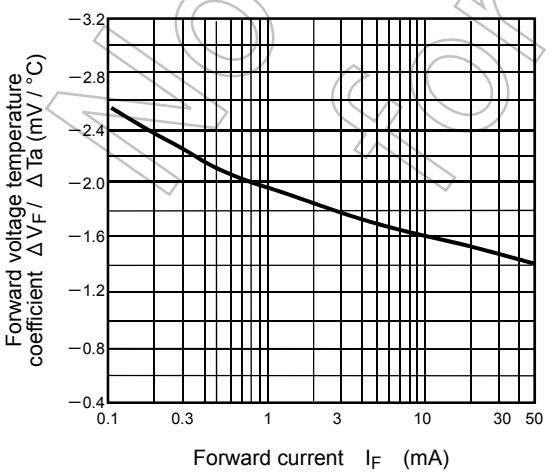
I_{FP} – D_R



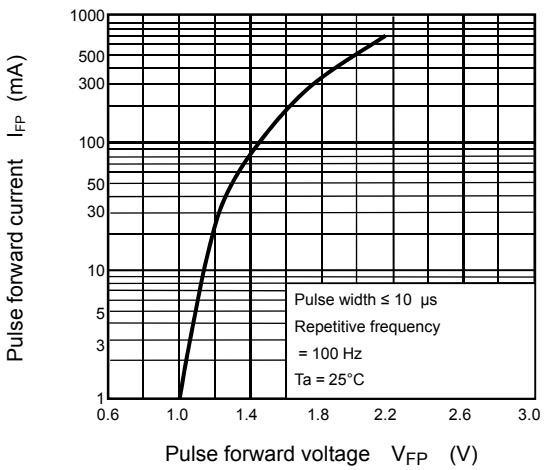
I_F – V_F



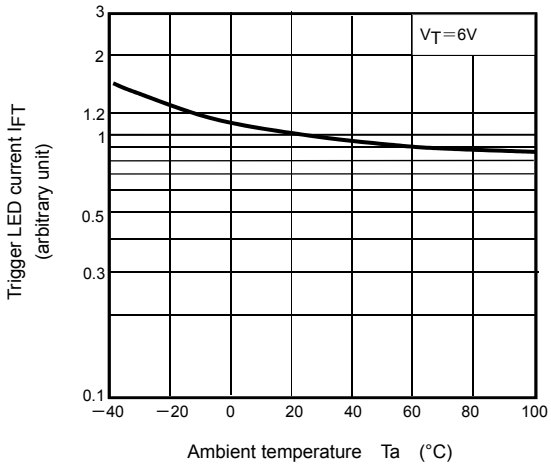
$\Delta V_F / \Delta Ta$ – I_F



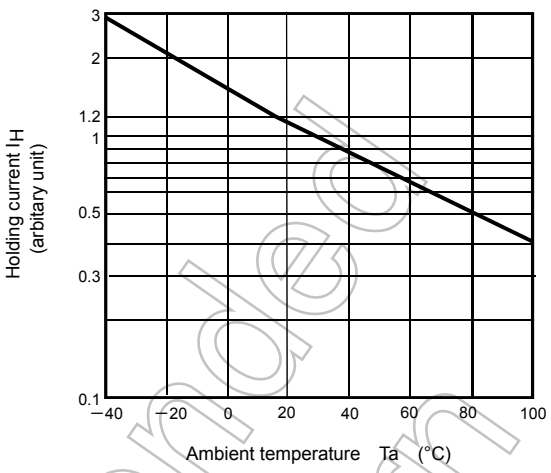
I_{FP} – V_{FP}



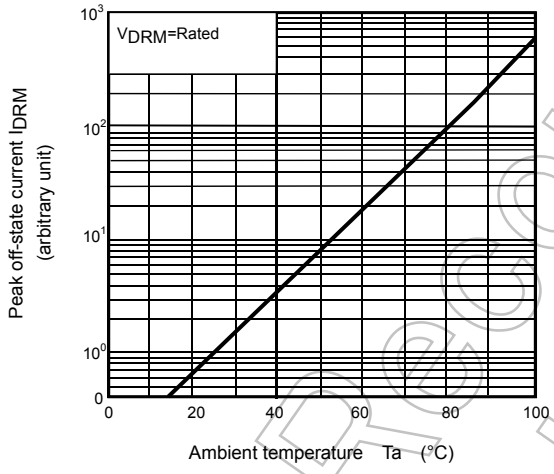
Normalized I_{FT} – Ta



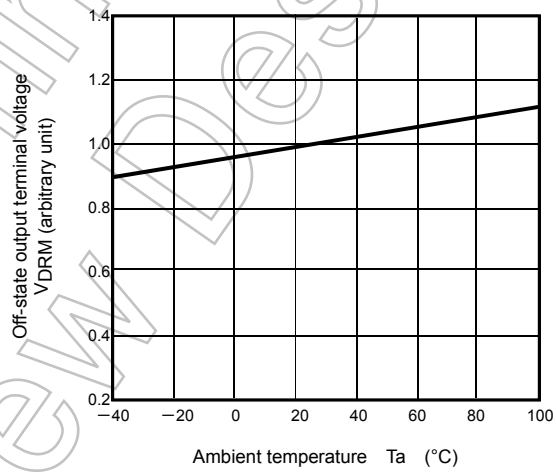
Normalized I_H – Ta



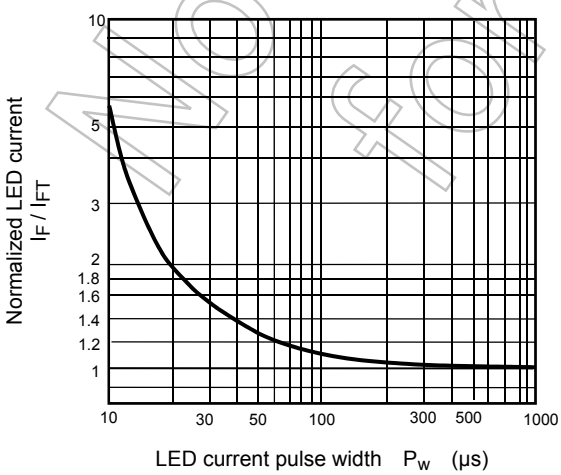
Normalized I_{DRM} – Ta



Normalized V_{DRM} – Ta



Normalized LED Current
−LED Current Pulse Width



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