

TENTATIVE

TOSHIBA Photocoupler GaAs Ired & Photo-Transistor

TLP141G

Programmable Controllers

AC-Output Module

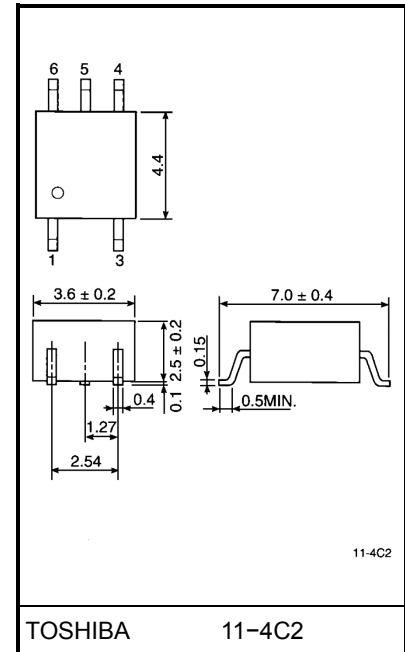
Solid State Relay

The TOSHIBA mini flat coupler TLP141G is a small outline coupler, suitable for surface mount assembly.

The TLP141G consists of a photo thyristor, optically coupled to a gallium arsenide infrared emitting diode.

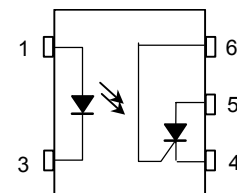
- Peak off-state voltage: 400 V (min.)
- Trigger LED current: 10 mA (max.)
- On-state current: 150 mA (max.)
- Isolation voltage: 2500 Vrms (min.)
- UL recognized: UL1577, file no. E67349

Unit in mm



Weight: 0.09 g

Pin Connections



- 1 : Anode
- 3 : Cathode
- 4 : Cathode
- 5 : Anode
- 6 : Gate

Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
LED	Forward current	I_F	50	mA
	Forward current derating (Ta ≥ 53°C)	$\Delta I_F / ^\circ\text{C}$	-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	Peak forward voltage($R_{GK} = 27\text{k}\Omega$)	V_{DRM}	400	V
	Peak reverse voltage($R_{GK} = 27\text{k}\Omega$)	V_{DRM}	400	V
	On-state current	$I_{T(RMS)}$	150	mA
	On-state current derating (Ta ≥ 25°C)	$\Delta I_T / ^\circ\text{C}$	-2.0	mA / °C
	Peak one cycle surge current	I_{TSM}	2	A
	Peak reverse gate voltage	V_{GM}	5	V
	Junction temperature	T_j	100	°C
Storage temperature range		T_{stg}	-55~125	°C
Operating temperature range		T_{opr}	-55~100	°C
Lead soldering temperature (10 s)		T_{sol}	260	°C
Isolation voltage (AC, 1 min., RH ≤ 60%) (Note 1)		BV_S	2500	Vrms

(Note 1) Device considered a two terminal device: pins 1 and 3 shorted together and pins 4, 5 and 6 shorted together.

Recommended Operating Conditions

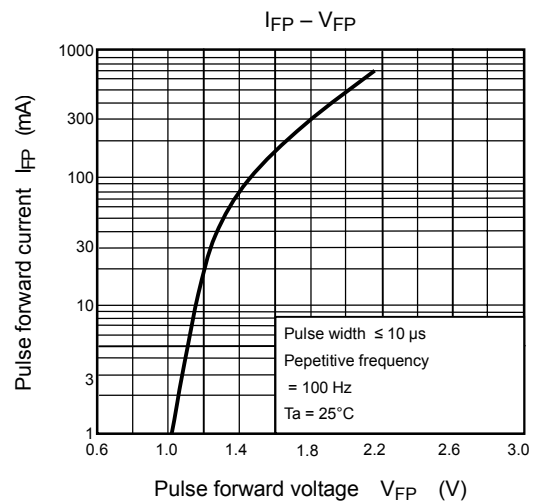
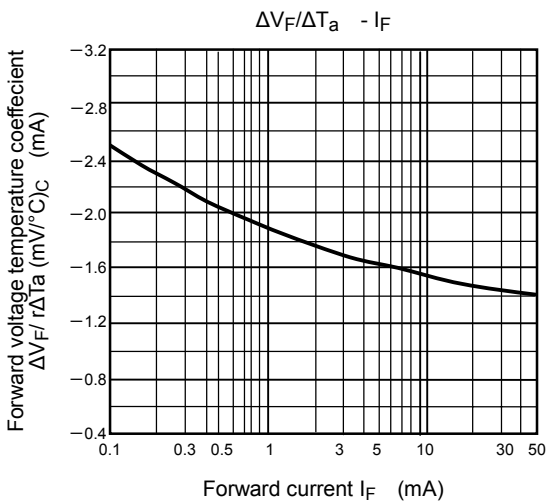
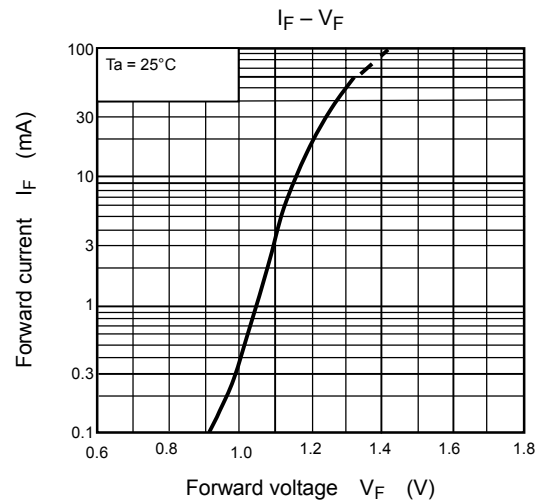
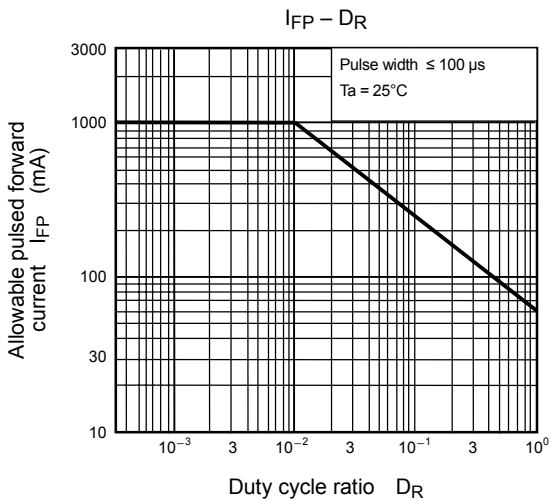
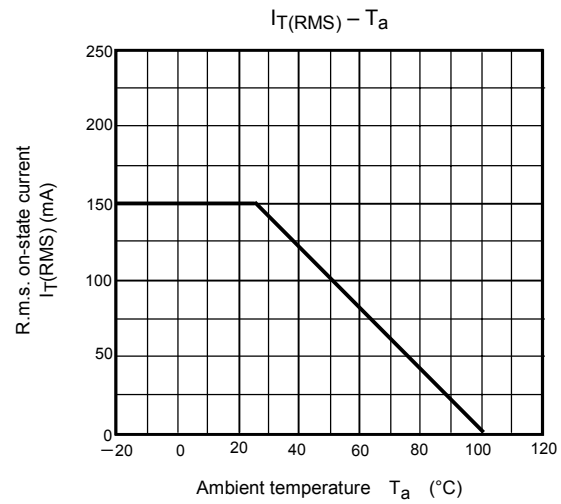
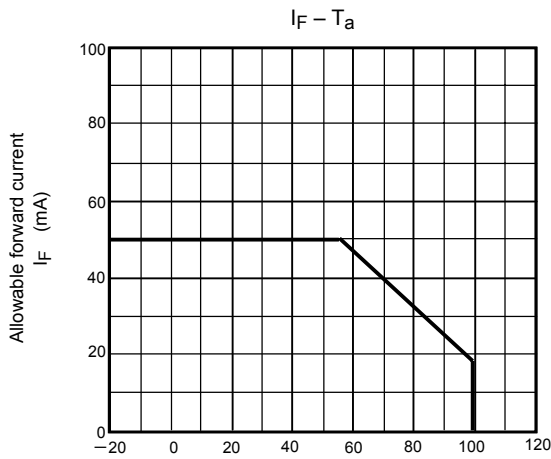
Characteristic	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{AC}	—	—	120	Vac
Forward current	I_F	15	20	25	mA
Operating temperature	T_{opr}	-25	—	85	°C
Gate to cathode resistance	R_{GK}	—	27	33	kΩ
Gate to cathode capacitance	C_{GK}	—	0.01	0.1	μF

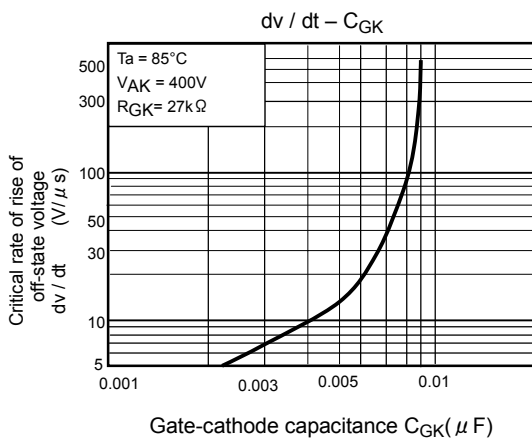
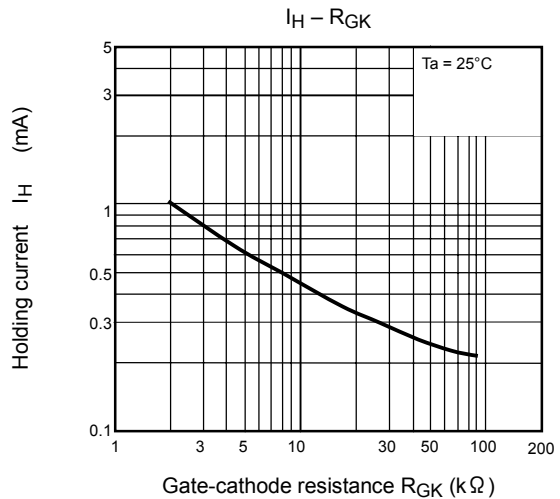
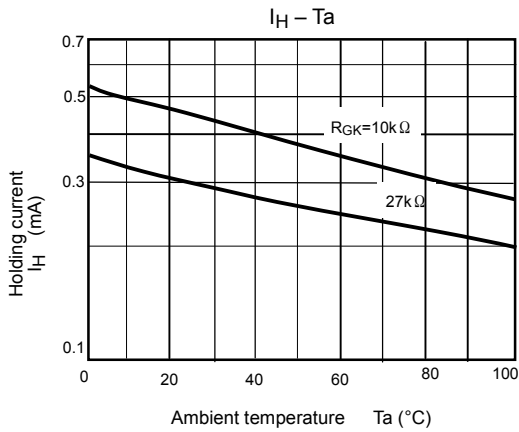
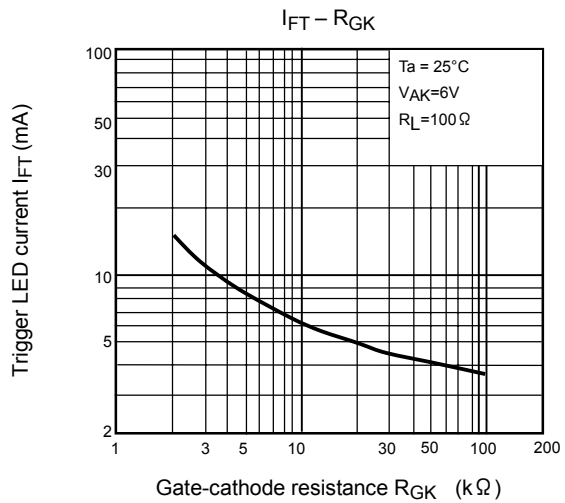
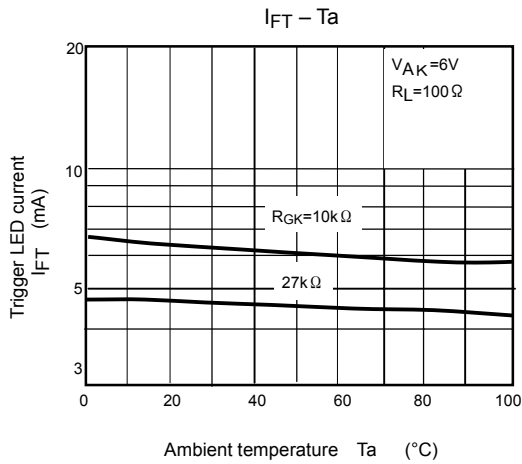
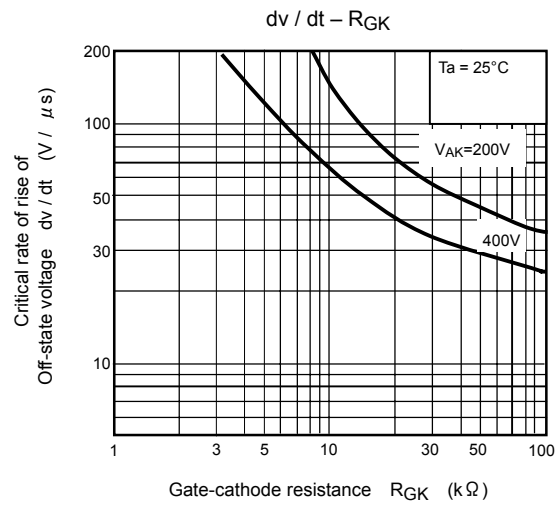
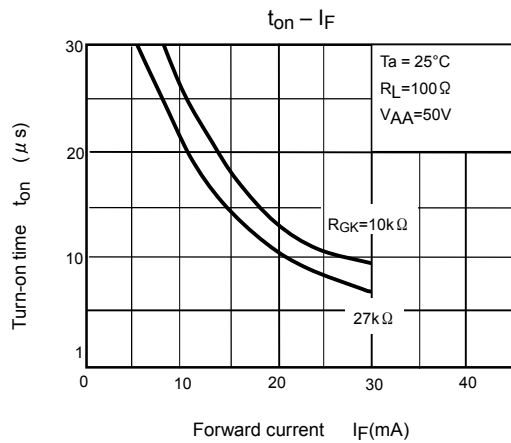
Individual Electrical Characteristics (Ta = 25°C)

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	Off-state current	I_{DRM}	$V_{\text{AK}} = 400 \text{ V}$ $R_{\text{GK}} = 27 \text{ k}\Omega$	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	μA
	Reverse current	I_{RRM}	$V_{\text{KA}} = 70 \text{ mA}$ $R_{\text{GK}} = 27 \text{ k}\Omega$	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	μA
	On-state voltage	V_{TM}	$I_{\text{TM}} = 100 \text{ mA}$		—	0.9	1.3	V
	Holding current	I_{H}	$R_{\text{GK}} = 27 \text{ k}\Omega$		—	0.2	1	mA
	Off-state dv / dt	dv/dt	$V_{\text{AK}} = 280 \text{ V}, R_{\text{GK}} = 27 \text{ k}\Omega$		5	10	—	V / μs
	Capacitance	C_j	$V = 0, f = 1 \text{ MHz}$	Anode to gate	—	20	—	pF
				Gate to cathode	—	350	—	

Coupled Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	I_{FT}	$V_{\text{AK}} = 6 \text{ V}, R_{\text{GK}} = 27 \text{ k}\Omega$	—	4	10	mA
Turn-on time	t_{on}	$I_F = 50 \text{ mA}, R_{\text{GK}} = 27 \text{ k}\Omega$	—	10	—	μs
Coupled dv / dt	dv/dt	$V_S = 500 \text{ V}, R_{\text{GK}} = 27 \text{ k}\Omega$	500	—	—	V / μs
Capacitance (input to output)	C_S	$V_S = 0, f = 1 \text{ MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500 \text{ V}, \text{R.H.} \leq 60\%$	5×10^{10}	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





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