

# TLP161G

Triac Drive

Programmable Controllers

AC-Output Module

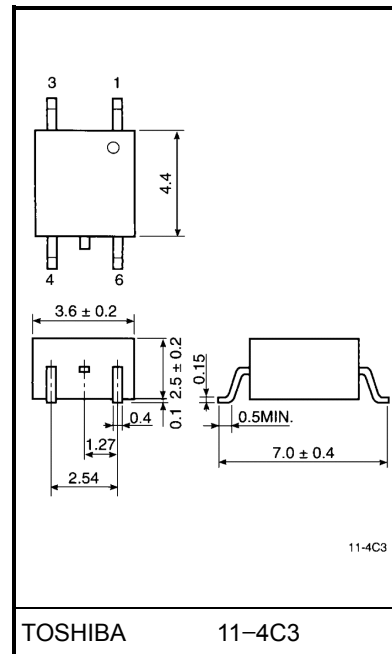
Solid State Relay

The TOSHIBA mini flat coupler TLP161G is a small outline coupler, suitable for surface mount assembly.

The TLP161G consists of a photo triac, optically coupled to a gallium arsenide infrared emitting diode.

- Zero-voltage crossing turn-on
- 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

Unit in mm



Weight: 0.09 g

## Trigger LED Current

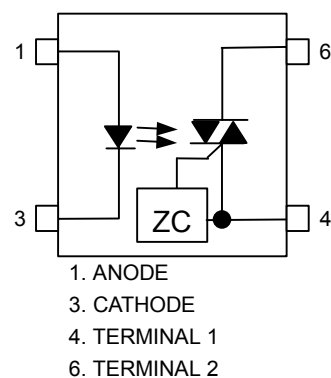
Classi- fication*	Trigger LED Current (mA)		Marking Of Classification
	V <sub>T</sub> =3V, T <sub>a</sub> =25°C		
	Min.	Max.	
(IFT5)	—	5	T5
(IFT7)	—	7	T5, T7
Standard	—	10	T5, T7, blank

\*Ex. (IFT5); TLP161G(IFT5)

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

TLP161G(IFT5); TLP161G

## Pin Configurations



**Maximum Ratings (Ta = 25°C)**

Characteristic			Symbol	Rating	Unit
LED	Forward current		I <sub>F</sub>	50	mA
	Forward current derating (Ta ≥ 53℃)		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	℃
Detector	Off-state output terminal voltage		V <sub>DRM</sub>	400	V
	On-state RMS current	Ta=25℃	I <sub>T(RMS)</sub>	70	mA
		Ta=70℃		40	
	On-state current derating (Ta ≥ 25℃)		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	℃
Storage temperature range			T <sub>stg</sub>	−55~125	℃
Operating temperature range			T <sub>opr</sub>	−40~100	℃
Lead soldering temperature (10s)			T <sub>sol</sub>	260	℃
Isolation voltage (AC, 1min., R.H.≤ 60%) (Note)			BV <sub>S</sub>	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

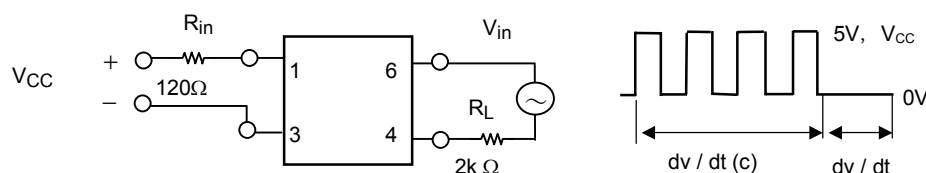
## Individual Electrical Characteristics (Ta = 25°C)

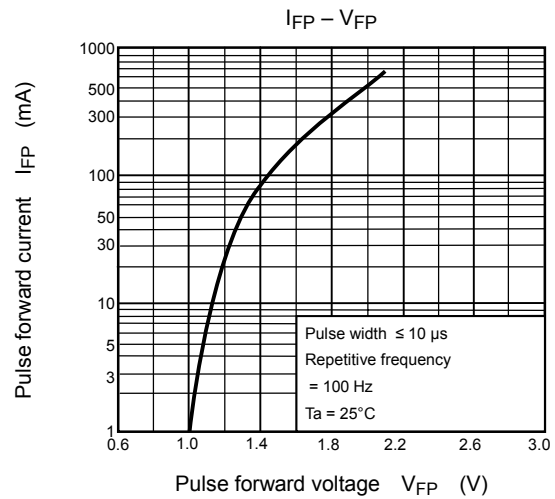
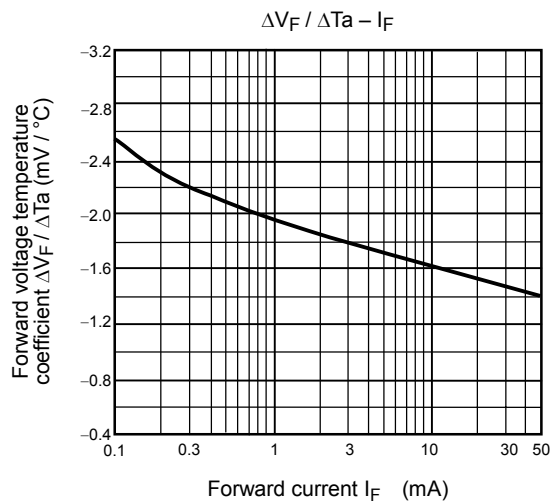
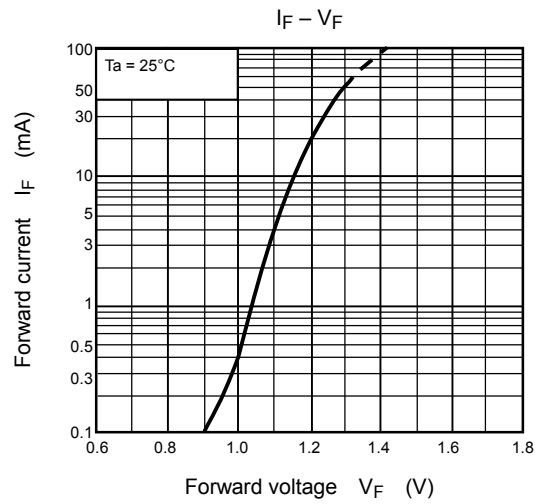
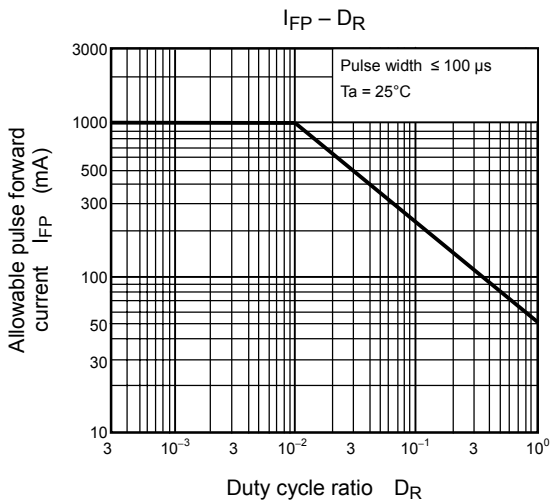
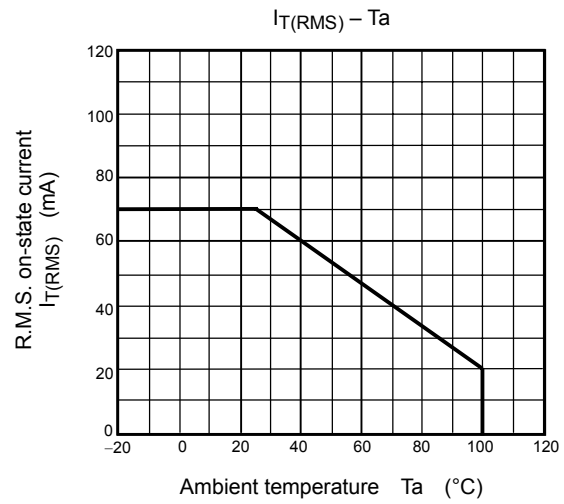
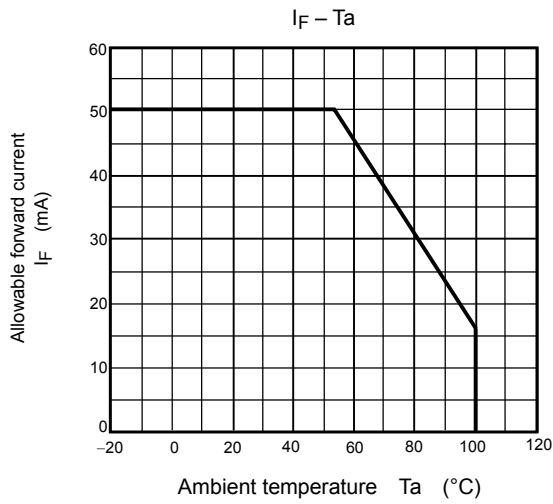
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	$V_F$	$I_F=10\text{mA}$	1.0	1.15	1.3	V
	Reverse current	$I_R$	$V_R=5\text{V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V=0, f=1\text{MHz}$	—	30	—	pF
Detector	Peak off-state current	$I_{\text{DRM}}$	$V_{\text{DRM}}=400\text{V}$	—	10	1000	nA
	Peak on-state voltage	$V_{\text{TM}}$	$I_{\text{TM}}=70\text{ mA}$	—	1.7	2.8	V
	Holding current	$I_H$	—	—	0.6	—	mA
	Critical rate of rise of off-state voltage	$dv / dt$	$V_{\text{in}}=120\text{Vrms}, T_a=85^\circ\text{C}$ (Fig.1)	200	500	—	V / $\mu\text{s}$
	Critical rate of rise of commutating voltage	$dv / dt(c)$	$V_{\text{in}}=30\text{Vrms}, I_T=15\text{mA}$ (Fig.1)	—	0.2	—	V / $\mu\text{s}$

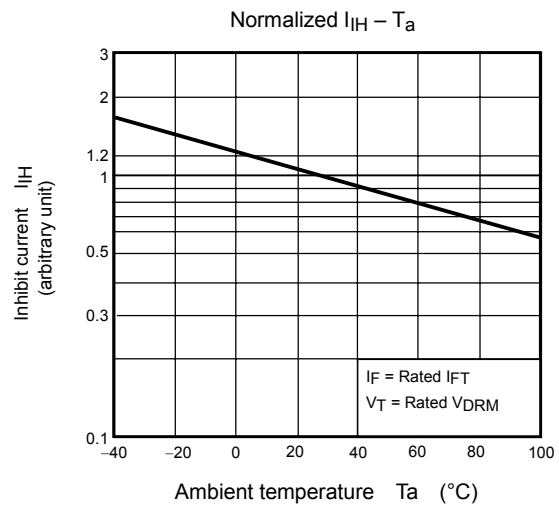
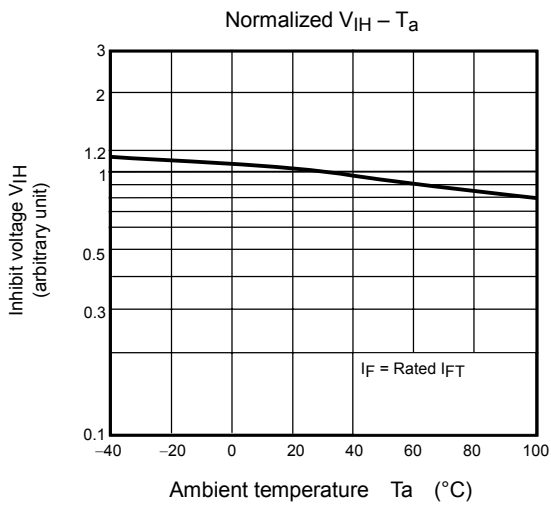
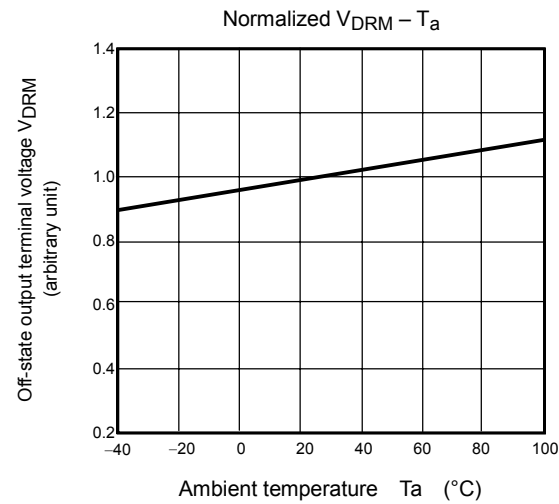
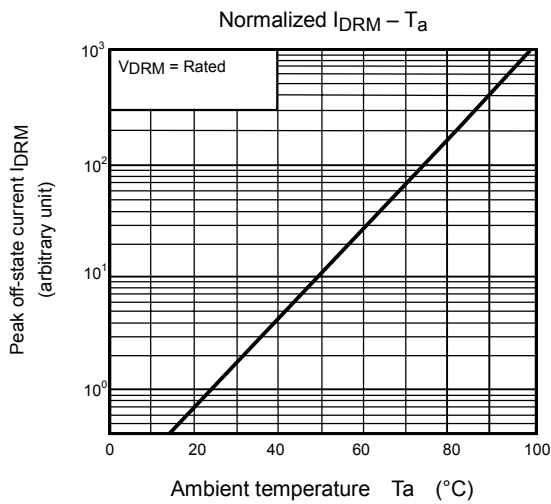
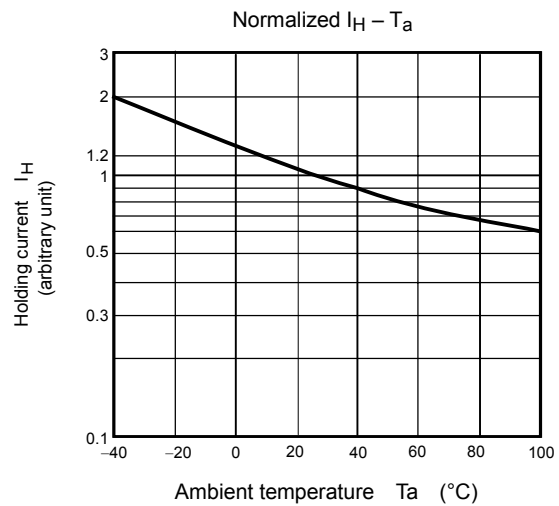
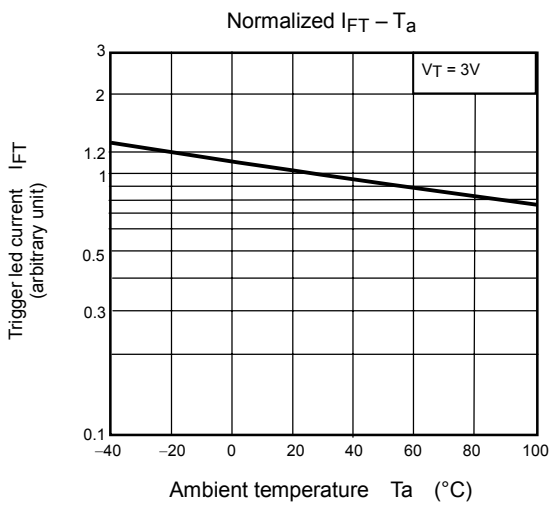
## Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	$I_{\text{FT}}$	$V_T=3\text{V}$	—	5	10	mA
Inhibit voltage	$V_{\text{IH}}$	$I_F=\text{rated } I_{\text{FT}}$	—	—	40	V
Leakage in inhibited state	$I_{\text{IH}}$	$I_F=\text{rated } I_{\text{FT}}$ $V_T=\text{rated } V_{\text{DRM}}$	—	100	300	$\mu\text{A}$
Capacitance (input to output)	$C_S$	$V_S=0, f=1\text{MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S=500\text{V}, \text{R.H.} \leq 60\%$	$1 \times 10^{12}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	2500	—	—	Vrms
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	Vdc

Fig.1  $dv / dt$  test circuit







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