

TOSHIBA Photocoupler GaAs IRed & Photo-Triac

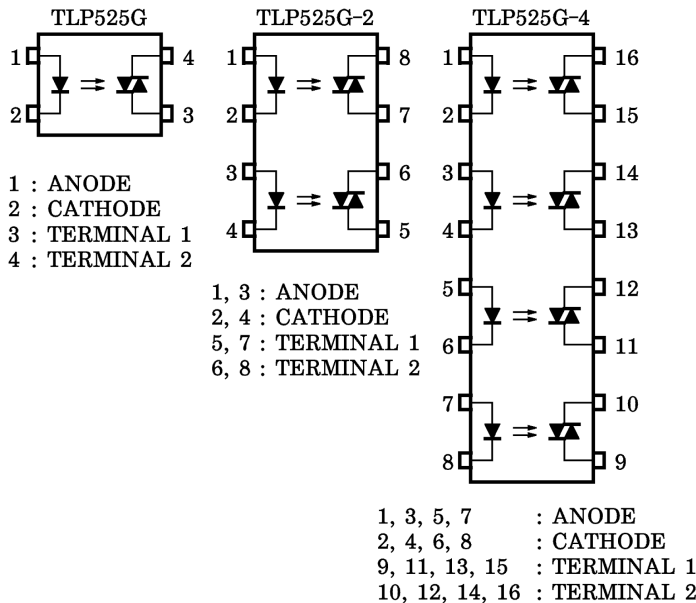
# TLP525G, TLP525G-2, TLP525G-4

- Triac Drive
- Programmable Controllers
- AC-Output Module
- Solid State Relay

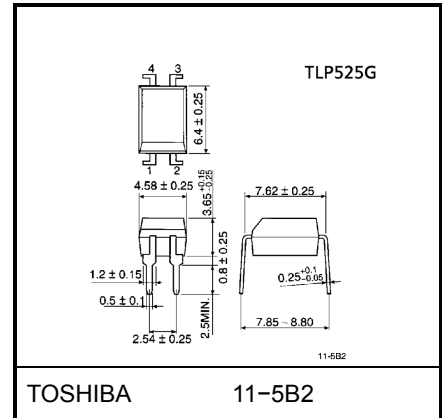
The TOSHIBA TLP525G, -2 and -4 consist of a photo-triac optically coupled to a gallium arsenide infrared emitting diode. The TLP525G-2 offers two isolated channels in an eight lead plastic DIP package, while the TLP525G-4 provides four isolated channels in a sixteen lead plastic DIP package.

- Peak off-stage voltage: 400V (min.)
- Trigger LED current: 10mA (max.)
- Peak on-stage current: 2Apk (max.)
- Isolation voltage: 2500V<sub>rms</sub> (min.)
- UL recognized: File no.E67349

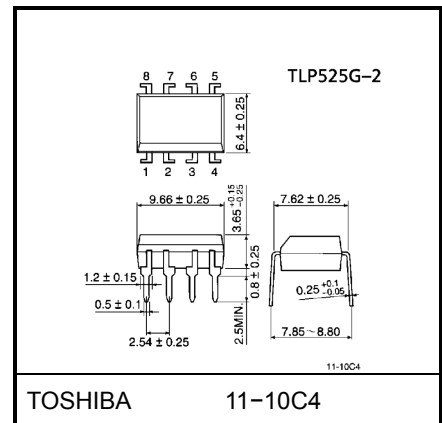
## Pin Configurations (top view)



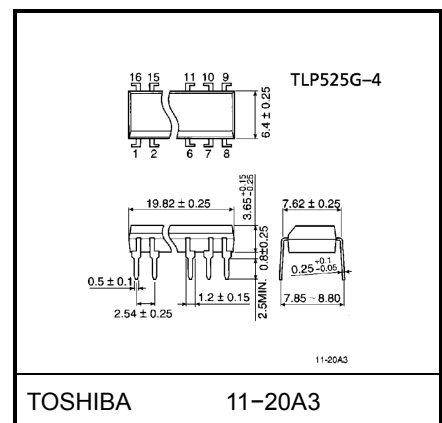
Unit in mm



Weight: 0.26g



Weight: 0.54g



Weight: 1.1g

## Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating		Unit	
			TLP525G	TLP525G-2 TLP525G-4		
LED	Forward current	$I_F$	50	50	mA	
	Forward current derating	$I_F / ^\circ\text{C}$	-0.7 (Ta ≥ 53°C)	-0.5 (Ta ≥ 25°C)	mA / °C	
	Pulse forward current	$I_{FP}$	1 (100µs pulse, 100pps)		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	$I_T$ (RMS)	Ta = 25°C	100	80	mA
			Ta = 70°C	50	40	
	On-state current derating (Ta ≥ 25°C)	$I_T / ^\circ\text{C}$	-1.1	-0.9	mA / °C	
	Peak on state current	$I_{TP}$	2 (100µs pulse, 120pps)		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	$T_{sol}$	260 (10s)		°C		
Isolation voltage (Note)	$BV_S$	2500 (AC, 1min., R.H. ≤ 60%)		$V_{rms}$		

(Note) Device considered a two terminal device: LED side pins shorted together and detector side pins 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

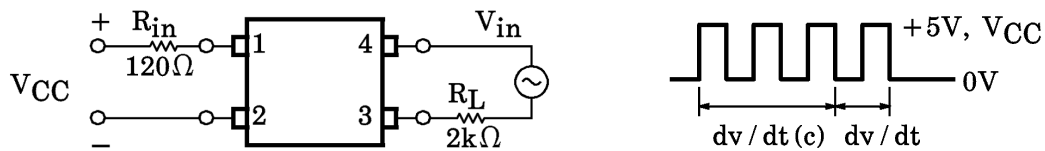
## Individual Electrical Characteristics (Ta = 25°C)

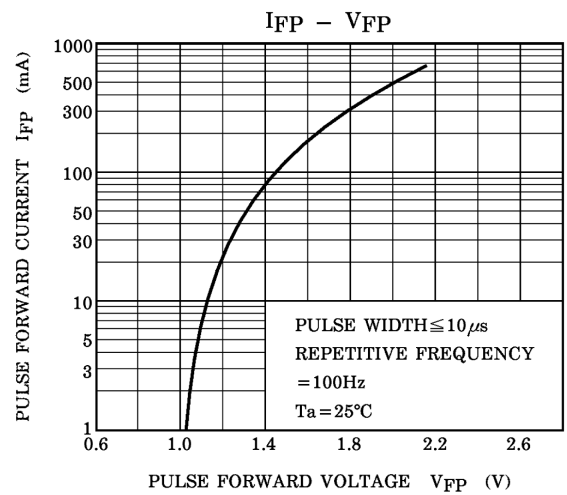
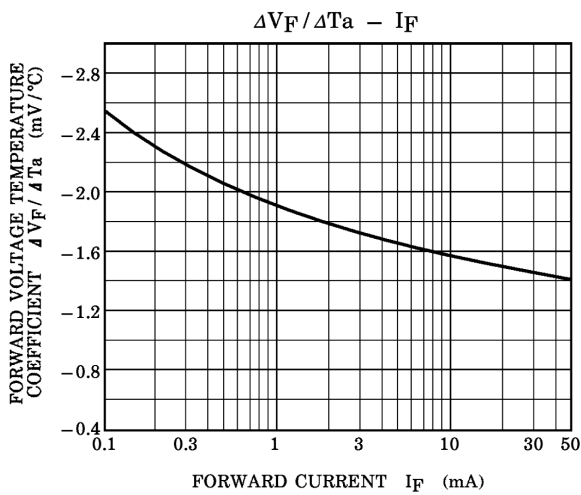
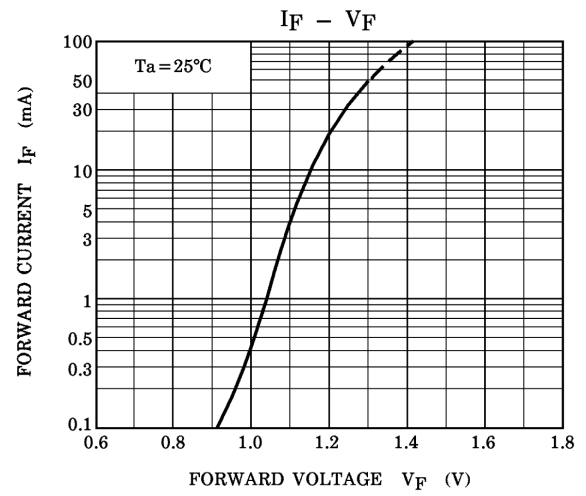
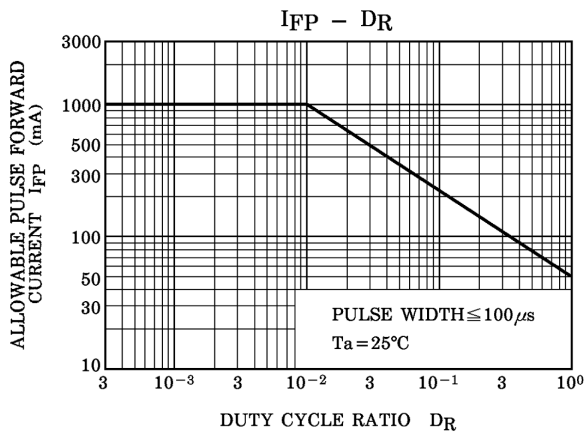
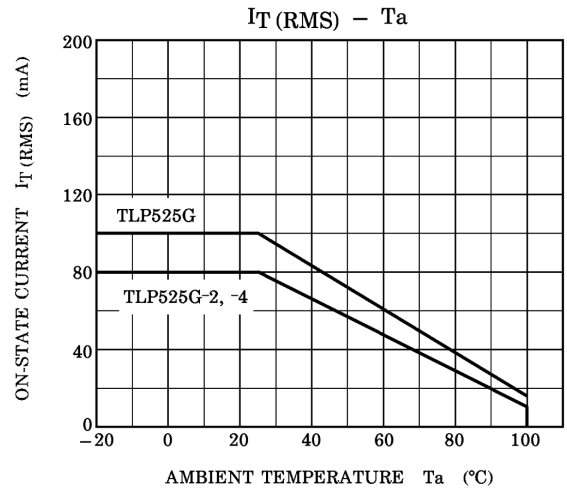
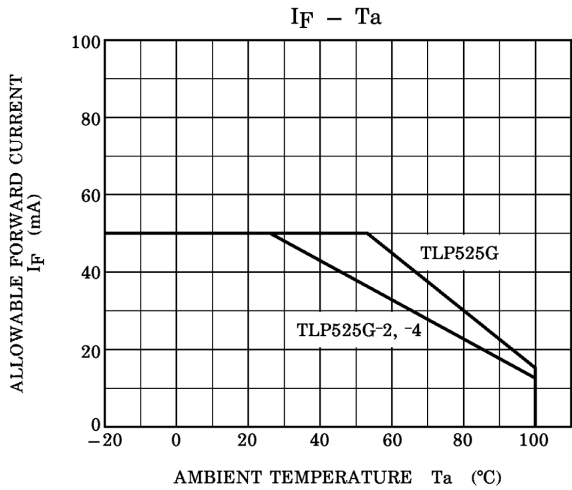
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	$V_F$	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse current	$I_R$	$V_R = 5\text{V}$	—	—	10	$\mu\text{A}$
	Capacitance	$C_T$	$V = 0, f = 1\text{MHz}$	—	30	—	pF
Detector	Peak off-state current	$I_{\text{DRM}}$	$V_{\text{DRM}} = 400\text{V}$	—	10	100	nA
	Peak on-state voltage	$V_{\text{TM}}$	$I_{\text{TM}} = 100\text{mA}$	—	1.7	3.0	V
	Holding current	$I_H$	—	—	0.2	—	mA
	Critical rate of rise of off-state voltage	$dv/dt$	$V_{\text{in}} = 120\text{V}_{\text{rms}}, T_a = 85^\circ\text{C}$ (Figure 1)	200	500	—	$\text{V}/\mu\text{s}$
	Critical rate of rise of commutating voltage	$dv/dt(c)$	$V_{\text{in}} = 30\text{V}_{\text{rms}}, I_T = 15\text{mA}$ (Figure 1)	—	0.2	—	$\text{V}/\mu\text{s}$

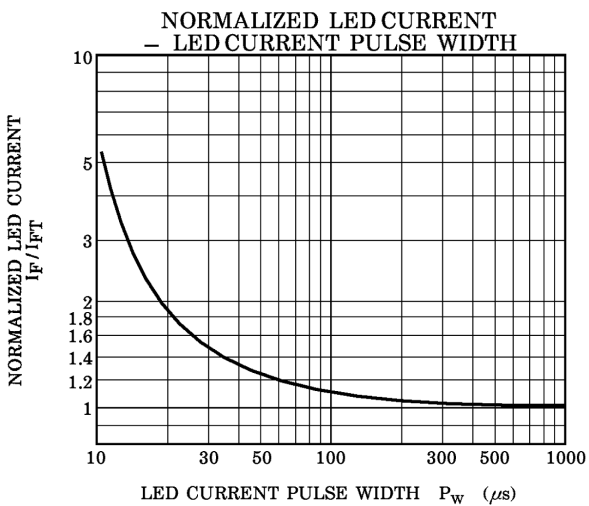
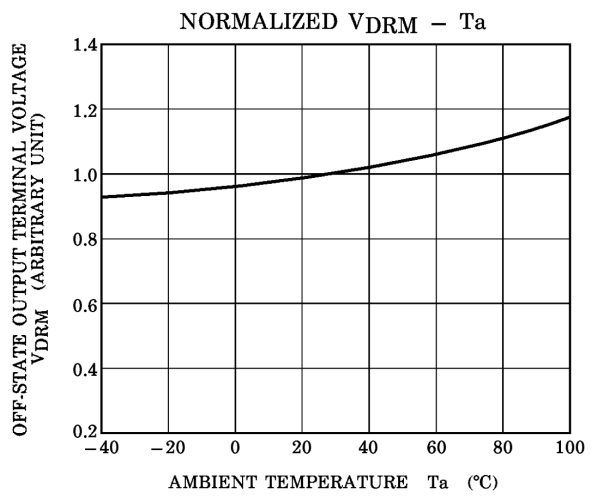
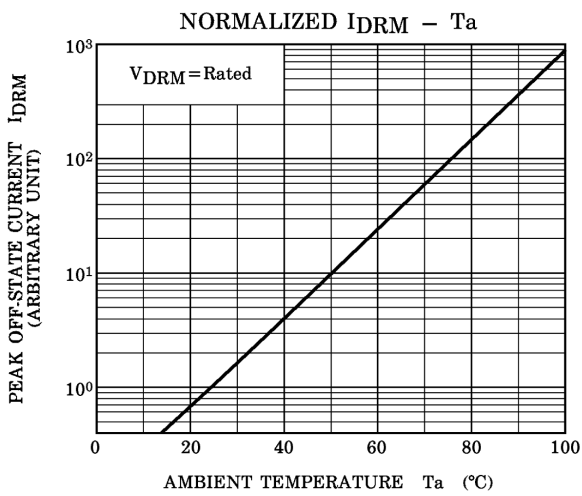
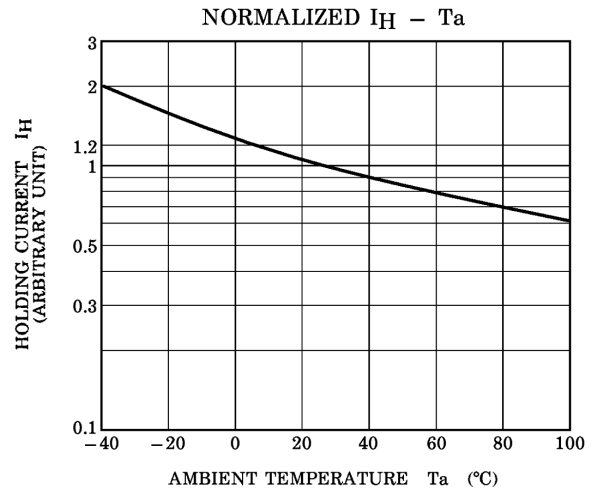
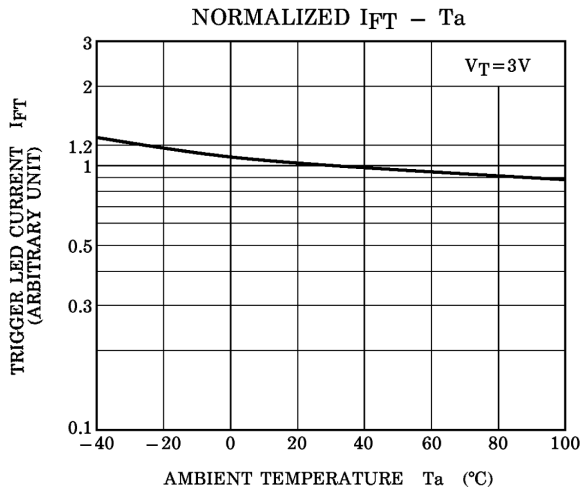
## Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Trigger LED current	$I_{\text{FT}}$	$V_T = 3\text{V}$	—	5	10	mA
Capacitance input to output	$C_S$	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation resistance	$R_S$	$V_S = 500\text{V}, \text{R.H.} \leq 60\%$	$5 \times 10^{10}$	$10^{14}$	—	$\Omega$
Isolation voltage	$BV_S$	AC, 1 minute	2500	—	—	$V_{\text{rms}}$
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	$V_{\text{dc}}$

Fig.1  $dv/dt$  Test Circuit







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