

TOSHIBA Photocoupler GaAs IRed & Photo-Triac

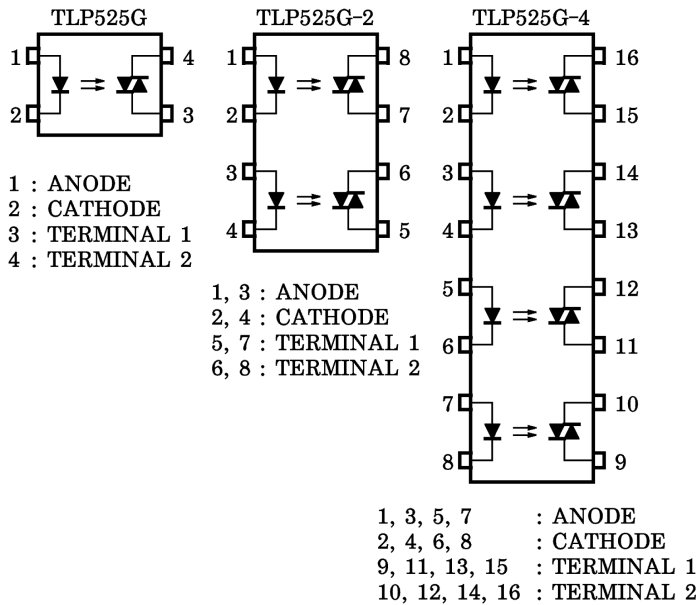
TLP525G, TLP525G-2, TLP525G-4

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

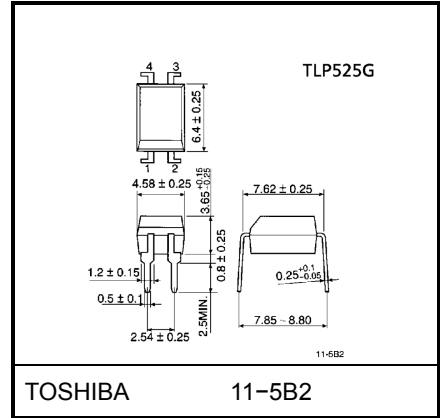
The TOSHIBA TLP525G, -2 and -4 consist of a photo-triac optically coupled to a gallium arsenide infrared emitting diode. The TLP525G-2 offers two isolated channels in an eight lead plastic DIP package, while the TLP525G-4 provides four isolated channels in a sixteen lead plastic DIP package.

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

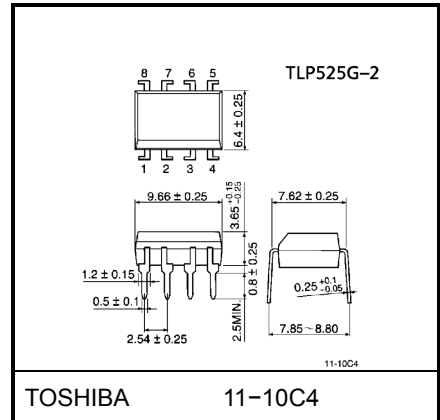
Pin Configurations (top view)



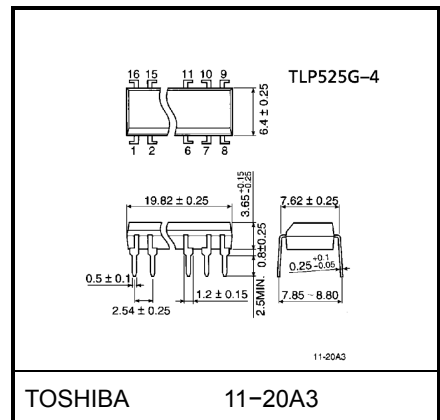
Unit in mm



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

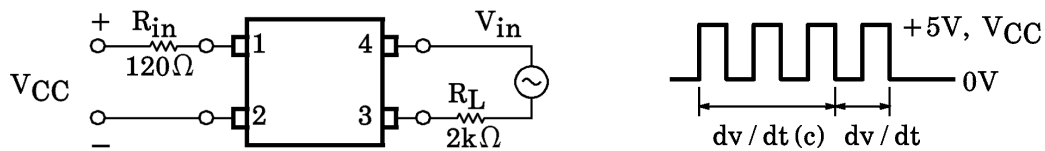
Individual Electrical Characteristics (Ta = 25°C)

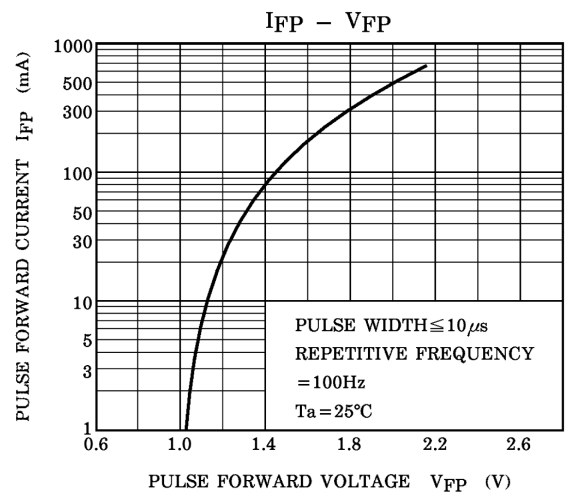
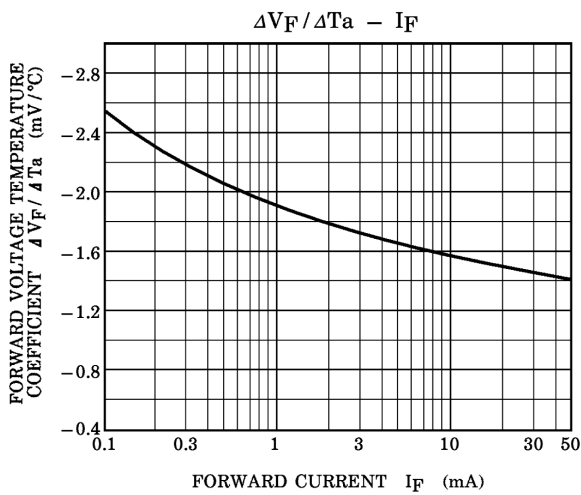
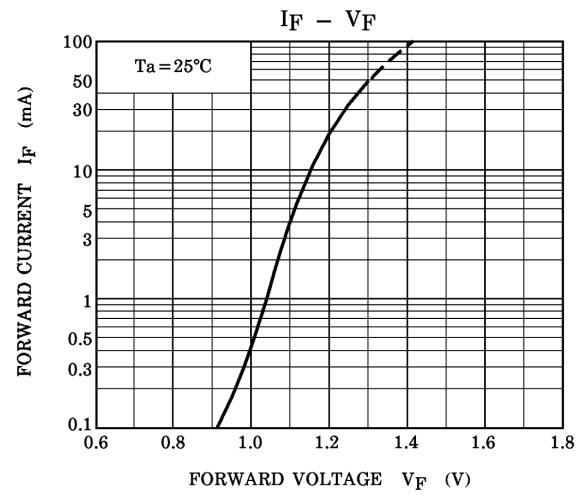
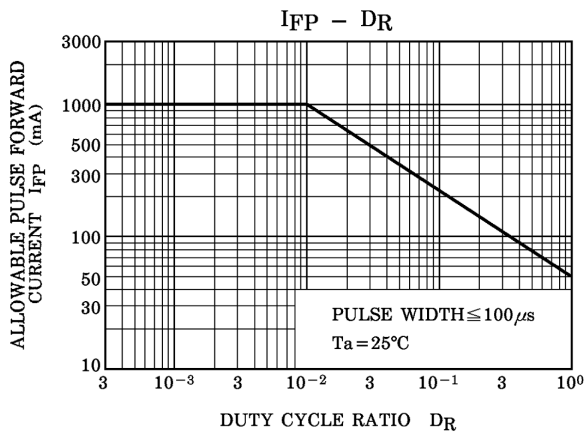
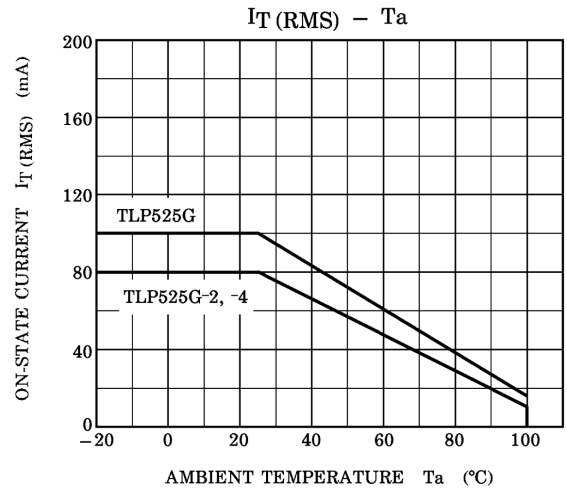
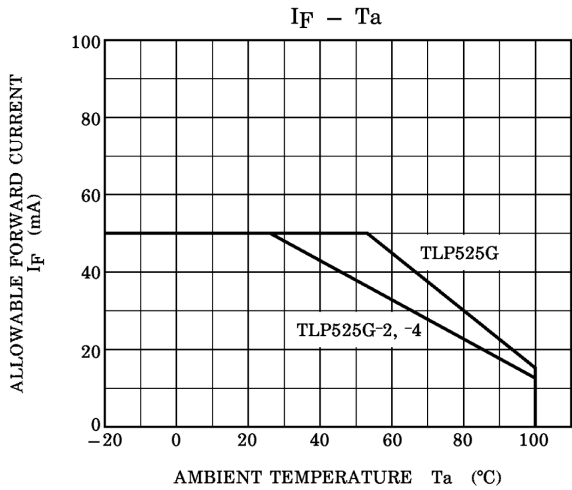
Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	$I_F = 10\text{mA}$	1.0	1.15	1.3	V
	Reverse current	I_R	$V_R = 5\text{V}$	—	—	10	μA
	Capacitance	C_T	$V = 0, f = 1\text{MHz}$	—	30	—	pF
Detector	Peak off-state current	I_{DRM}	$V_{DRM} = 400\text{V}$	—	10	100	nA
	Peak on-state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

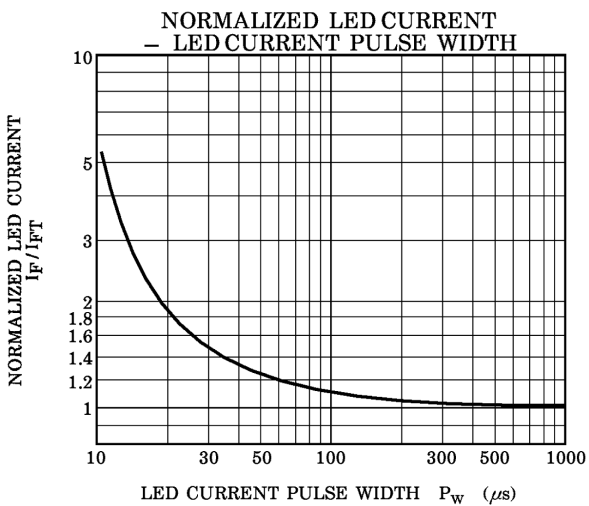
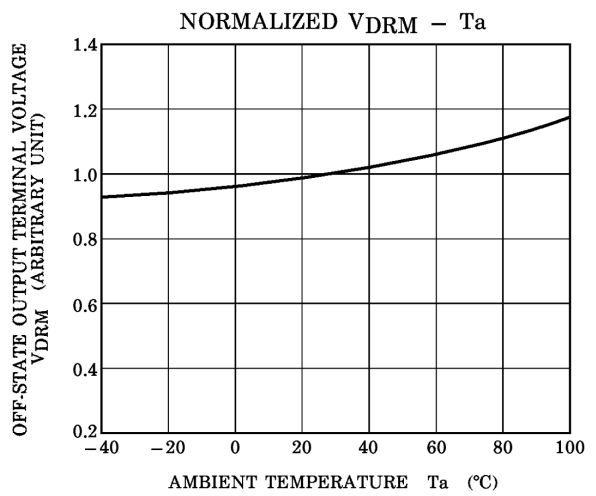
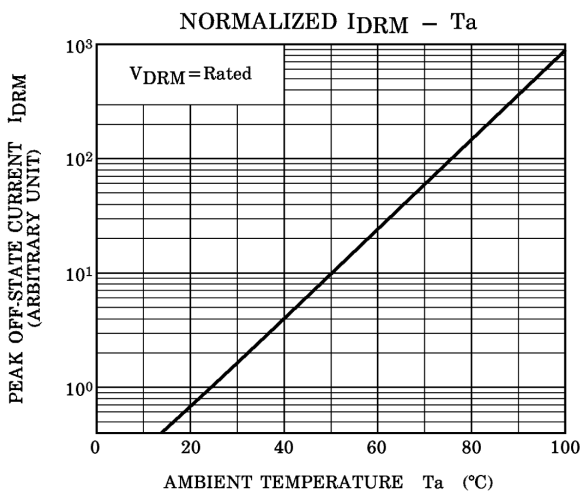
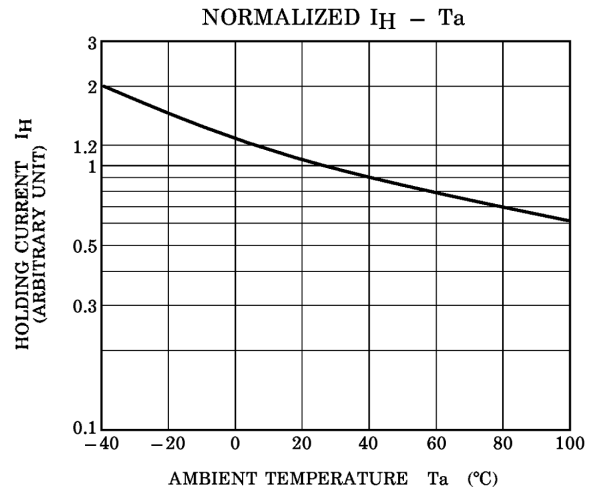
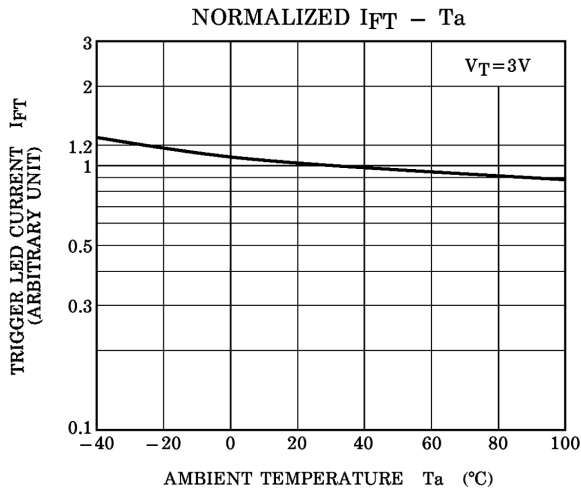
Coupled Electrical Characteristics (Ta = 25°C)

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

Fig.1 dv / dt Test Circuit







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