

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRIAC

# TLP525G, TLP525G-2, TLP525G-4

TRIAC DRIVE

PROGRAMMABLE CONTROLLERS

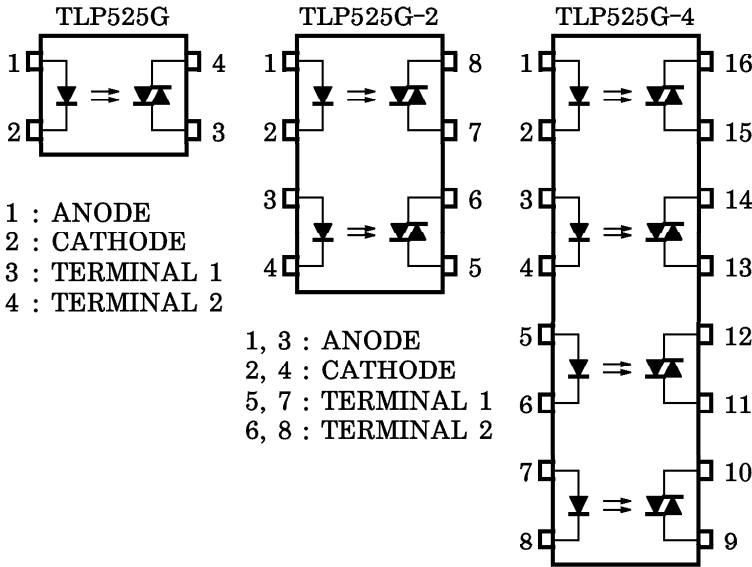
AC-OUTPUT MODULE

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-state Voltage : 400V (MIN.)
- Trigger LED Current : 10mA (MAX.)
- Peak On-state Current : 2Apk (MAX.)
- Isolation Voltage : 2500V<sub>rms</sub> (MIN.)
- UL Recognized : File No. E67349

PIN CONFIGURATIONS (TOP VIEW)

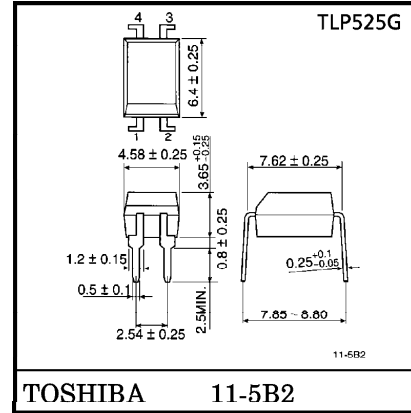


1 : ANODE  
2 : CATHODE  
3 : TERMINAL 1  
4 : TERMINAL 2

1, 3 : ANODE  
2, 4 : CATHODE  
5, 7 : TERMINAL 1  
6, 8 : TERMINAL 2

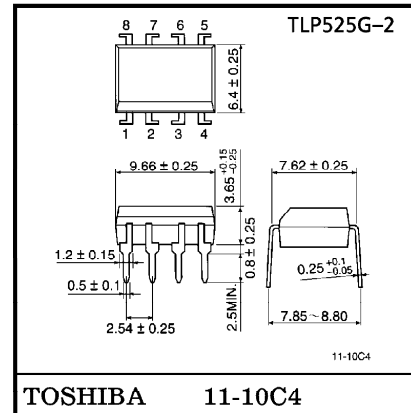
1, 3, 5, 7 : ANODE  
2, 4, 6, 8 : CATHODE  
9, 11, 13, 15 : TERMINAL 1  
10, 12, 14, 16 : TERMINAL 2

Unit in mm



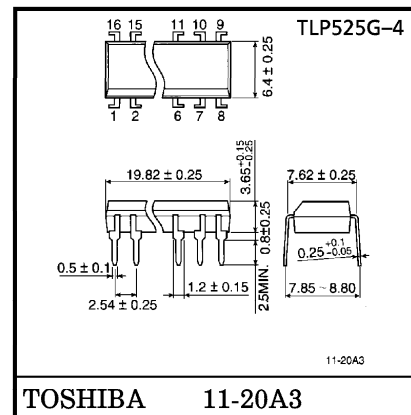
TOSHIBA 11-5B2

Weight : 0.26g



TOSHIBA 11-10C4

Weight : 0.54g



TOSHIBA 11-20A3

Weight : 1.1g

961001EAA2

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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 (P <sub>w</sub> = 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 <sub>rms</sub>	

(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	V <sub>ac</sub>
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	$I_{DRM}$	$V_{DRM} = 400\text{V}$	—	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	$dv/dt$	$V_{in} = 120\text{V}_{rms}, T_a = 85^\circ\text{C}$ (Figure 1)	200	500	—	$\text{V}/\mu\text{s}$
	Critical Rate of Rise of Commutating Voltage	$dv/dt(c)$	$V_{in} = 30\text{V}_{rms}, I_T = 15\text{mA}$ (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	$I_{FT}$	$V_T = 3\text{V}$	—	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	—	—	$V_{rms}$
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	$V_{dc}$

Fig.1  $dv/dt$  TEST CIRCUIT

