

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-THYRISTOR

TLP541G, TLP542G

PROGRAMMABLE CONTROLLERS

AC-OUTPUT MODULE

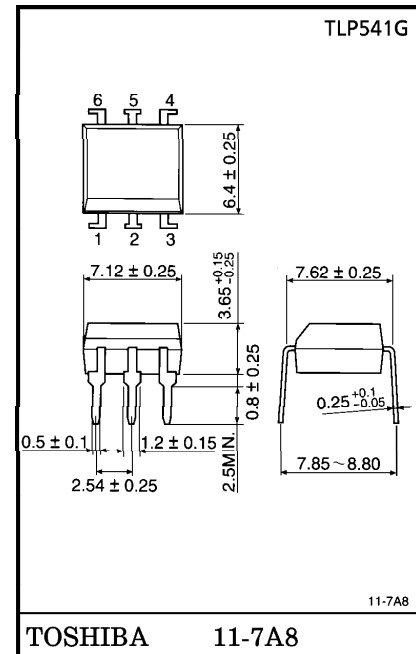
SOLID STATE RELAY

Unit in mm

The TOSHIBA TLP541G consists of a photo-thyristor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

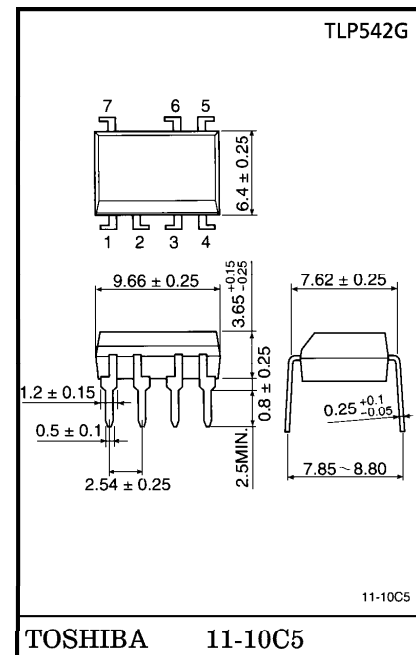
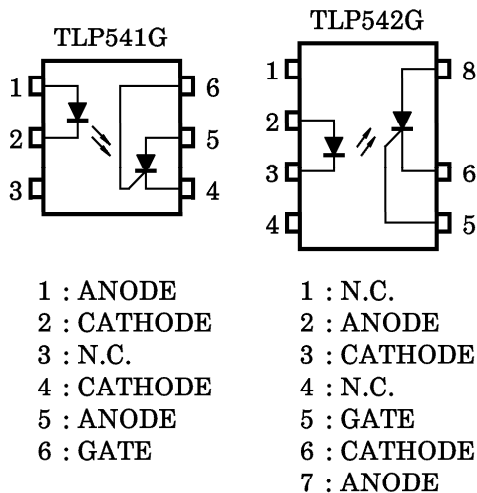
The TOSHIBA TLP542G consists of a photo-thyristor optically coupled to a gallium arsenide infrared emitting diode in a seven lead plastic DIP package.

- Peak Off-State Voltage : 400V (MIN.)
- Trigger LED Current : 7mA (MAX.)
- On-State Current : 150mA (MAX.)
- Isolation Voltage : 2500V_{rms} (MIN.)
- UL Recognized : UL1577, File No. E67349



Weight : 0.4g

PIN CONFIGURATION (TOP VIEW)



Weight : 0.53g

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MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I_F	70	mA
	Forward Current Derating (Ta ≥ 25°C)	$\Delta I_F / ^\circ\text{C}$	-0.7	mA / °C
	Peak Forward Current (100μs pulse, 100pps)	I_{FP}	1	A
	Reverse Voltage	V_R	5	V
	Junction Temperature	T_j	125	°C
DETECTOR	Peak Forward Voltage (RGK = 27kΩ)	V_{DRM}	400	V
	Peak Reverse Voltage (RGK = 27kΩ)	V_{RRM}	400	V
	On-State Current	$I_T (\text{RMS})$	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}	-30~100	°C
Lead Soldering Temperature (10s)		T_{sol}	260	°C
Isolation Voltage (AC, 1 min., R.H. ≤ 60%) (Note)		BV_S	2500	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	V_{ac}
Forward Current	I_F	10	16	25	mA
Operating Temperature	T_{opr}	-30	—	85	°C
Gate to Cathode Resistance	R_{GK}	—	27	33	kΩ
Gate to Cathode Capacity	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}	$V_{AK} = 400\text{V}$ $R_{GK} = 27\text{k}\Omega$	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	μA
	Reverse Current	I_{RRM}	$V_{KA} = 400\text{V}$ $R_{GK} = 27\text{k}\Omega$	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	μA
	On-State Voltage	V_{TM}	$I_{TM} = 100\text{mA}$		—	0.9	1.3	V
	Holding Current	I_H	$R_{GK} = 27\text{k}\Omega$		—	0.2	1	mA
	Off-State dv/dt	dv/dt	$V_{AK} = 280\text{V}, R_{GK} = 27\text{k}\Omega$		5	10	—	V/ μs
	Capacitance	C_j	V = 0, f = 1MHz 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}	$V_{AK} = 6\text{V}, R_{GK} = 27\text{k}\Omega$	1	4	7	mA
Turn-on Time	t_{on}	$I_F = 50\text{mA}, R_{GK} = 27\text{k}\Omega$	—	10	—	μs
Capacitance (Input to Output)	C_S	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500\text{V}, \text{R.H.} \leq 60\%$	—	10^{11}	—	Ω
Isolation Voltage	BV_S	AC, 1 minute	2500	—	—	V_{rms}

