

TENTATIVE

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

# TLP141G

PROGRAMMABLE CONTROLLERS

AC-OUTPUT MODULE

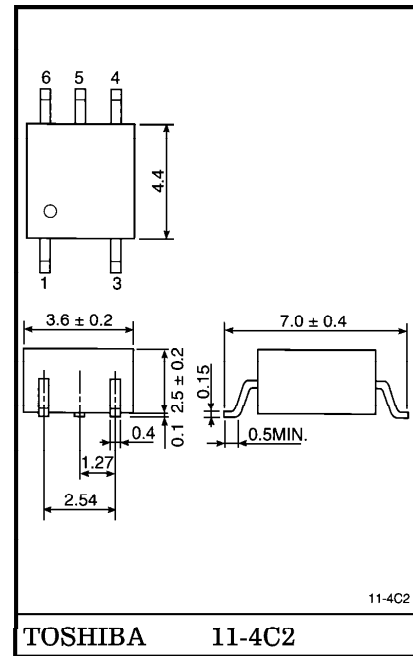
SOLID STATE RELAY

The TOSHIBA MINI FLAT COUPLER TLP141G is a small outline coupler, suitable for surface mount assembly.

The TLP141G consists of a photo thyristor, optically coupled to a gallium arsenide infrared emitting diode.

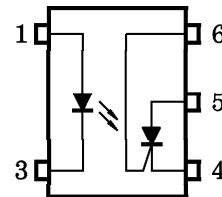
- Peak Off-State Voltage : 400V (MIN.)
- Trigger LED Current : 10mA (MAX.)
- On-State Current : 150mA (MAX.)
- Isolation Voltage : 2500Vrms (MIN.)
- UL Recognized : UL1577, File No. E67349

Unit in mm



Weight : 0.09g

### PIN CONNECTIONS



1. ANODE
3. CATHODE
4. CATHODE
5. ANODE
6. GATE

961001EBC2

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● Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.

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## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I <sub>F</sub>	50	mA
	Forward Current Derating (Ta ≥ 53°C)	ΔI <sub>F</sub> / °C	-0.7	mA / °C
	Peak Forward Current (100 μs pulse, 100pps)	I <sub>FP</sub>	1	A
	Reverse Voltage	V <sub>R</sub>	5	V
	Junction Temperature	T <sub>j</sub>	125	°C
DETECTOR	Peak Forward Voltage (R <sub>GK</sub> = 27kΩ)	V <sub>DRM</sub>	400	V
	Peak Reverse Voltage (R <sub>GK</sub> = 27kΩ)	V <sub>RRM</sub>	400	V
	On-State Current	I <sub>T(RMS)</sub>	150	mA
	On-State Current Derating (Ta ≥ 25°C)	ΔI <sub>T</sub> / °C	-2.0	mA / °C
	Peak One Cycle Surge Current	I <sub>TSM</sub>	2	A
	Peak Reverse Gate Voltage	V <sub>GM</sub>	5	V
	Junction Temperature	T <sub>j</sub>	100	°C
Storage Temperature Range		T <sub>stg</sub>	-55~125	°C
Operating Temperature Range		T <sub>opr</sub>	-55~100	°C
Lead Soldering Temperature (10s)		T <sub>sol</sub>	260	°C
Isolation Voltage (AC, 1 min., RH ≤ 60%) (Note 1)		BV <sub>S</sub>	2500	V <sub>rms</sub>

(Note 1) Device considered a two terminal device : Pins 1 and 3 shorted together and pins 4, 5 and 6 shorted together.

## RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sub>AC</sub>	—	—	120	V <sub>ac</sub>
Forward Current	I <sub>F</sub>	15	20	25	mA
Operating Temperature	T <sub>opr</sub>	-25	—	85	°C
Gate to Cathode Resistance	R <sub>GK</sub>	—	27	33	kΩ
Gate to Cathode Capacitance	C <sub>GK</sub>	—	0.01	0.1	μF

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
LED	Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 10mA	1.0	1.15	1.3	V	
	Reverse Current	I <sub>R</sub>	V <sub>R</sub> = 5V	—	—	10	μA	
	Capacitance	C <sub>T</sub>	V = 0, f = 1MHz	—	30	—	pF	
DETECTOR	Off-State Current	I <sub>IDRM</sub>	V <sub>AK</sub> = 400V R <sub>GK</sub> = 27kΩ	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	μA
	Reverse Current	I <sub>IRRM</sub>	V <sub>KA</sub> = 400V R <sub>GK</sub> = 27kΩ	Ta = 25°C	—	10	5000	nA
				Ta = 100°C	—	1	100	μA
	On-State Voltage	V <sub>TM</sub>	I <sub>TM</sub> = 100mA	—	0.9	1.3	V	
	Holding Current	I <sub>H</sub>	R <sub>GK</sub> = 27kΩ	—	0.2	1	mA	
	Off-State dv/dt	dv/dt	V <sub>AK</sub> = 280V, R <sub>GK</sub> = 27kΩ	5	10	—	V / μs	
Capacitance	C <sub>j</sub>	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 <sub>FT</sub>	V <sub>AK</sub> = 6V, R <sub>GK</sub> = 27kΩ	—	4	10	mA
Turn-on Time	t <sub>on</sub>	I <sub>F</sub> = 50mA, R <sub>GK</sub> = 27kΩ	—	10	—	μs
Coupled dv/dt	dv/dt	V <sub>S</sub> = 500V, R <sub>GK</sub> = 27kΩ	500	—	—	V / μs
Capacitance (Input to Output)	C <sub>S</sub>	V <sub>S</sub> = 0, f = 1MHz	—	0.8	—	pF
Isolation Resistance	R <sub>S</sub>	V <sub>S</sub> = 500V, R.H. ≤ 60%	5 × 10 <sup>10</sup>	10 <sup>14</sup>	—	Ω
Isolation Voltage	B <sub>V</sub> S	AC, 1 minute	2500	—	—	V <sub>rms</sub>
		AC, 1 second, in oil	—	5000	—	
		DC, 1 minute, in oil	—	5000	—	V <sub>dc</sub>

