

TENTATIVE

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

TLP141G

PROGRAMMABLE CONTROLLERS

AC-OUTPUT MODULE

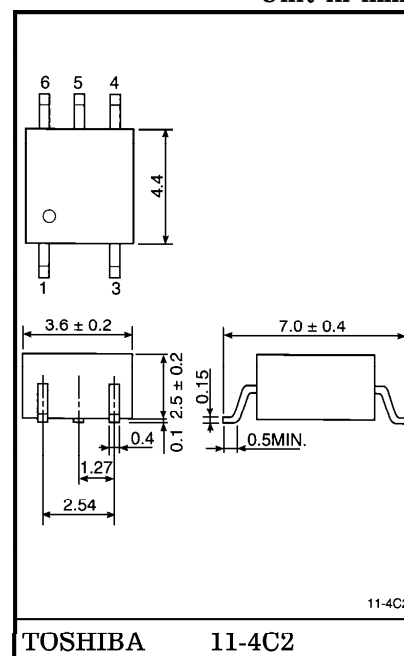
SOLID STATE RELAY

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.

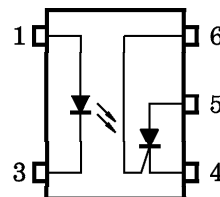
- Peak Off-State Voltage : 400V (MIN.)
- Trigger LED Current : 10mA (MAX.)
- On-State Current : 150mA (MAX.)
- Isolation Voltage : 2500Vrms (MIN.)
- UL Recognized : UL1577, File No. E67349

Unit in mm



Weight : 0.09g

PIN CONNECTIONS



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

961001EBC2

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- 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.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I_F	50	mA
	Forward Current Derating (Ta ≥ 53°C)	$\Delta I_F / ^\circ\text{C}$	-0.7	mA / °C
	Peak Forward Current (100 μs pulse, 100pps)	I_{FP}	1	A
	Reverse Voltage	V_R	5	V
	Junction Temperature	T_j	125	°C
DETECTOR	Peak Forward Voltage (R _{GK} = 27kΩ)	V_{DRM}	400	V
	Peak Reverse Voltage (R _{GK} = 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}	-55~100	°C
Lead Soldering Temperature (10s)		T_{sol}	260	°C
Isolation Voltage (AC, 1 min., RH ≤ 60%) (Note 1)		BV_S	2500	V _{rms}

(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_{AC}	—	—	120	V _{ac}
Forward Current	I_F	15	20	25	mA
Operating Temperature	T_{opr}	-25	—	85	°C
Gate to Cathode Resistance	R_{GK}	—	27	33	kΩ
Gate to Cathode Capacitance	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	$V = 0, f = 1\text{MHz}$	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}	$V_{AK} = 6\text{V}, R_{GK} = 27\text{k}\Omega$	—	4	10	mA
Turn-on Time	t_{on}	$I_F = 50\text{mA}, R_{GK} = 27\text{k}\Omega$	—	10	—	μs
Coupled dv/dt	dv/dt	$V_S = 500\text{V}, R_{GK} = 27\text{k}\Omega$	500	—	—	V / μs
Capacitance (Input to Output)	C_S	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation Resistance	R_S	$V_S = 500\text{V}, \text{R.H.} \leq 60\%$	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	—	Vdc

