GaAs IRED & PHOTO-THYRISTOR

TLP741G

Unit in mm

Office Machine

Household Use Equipment

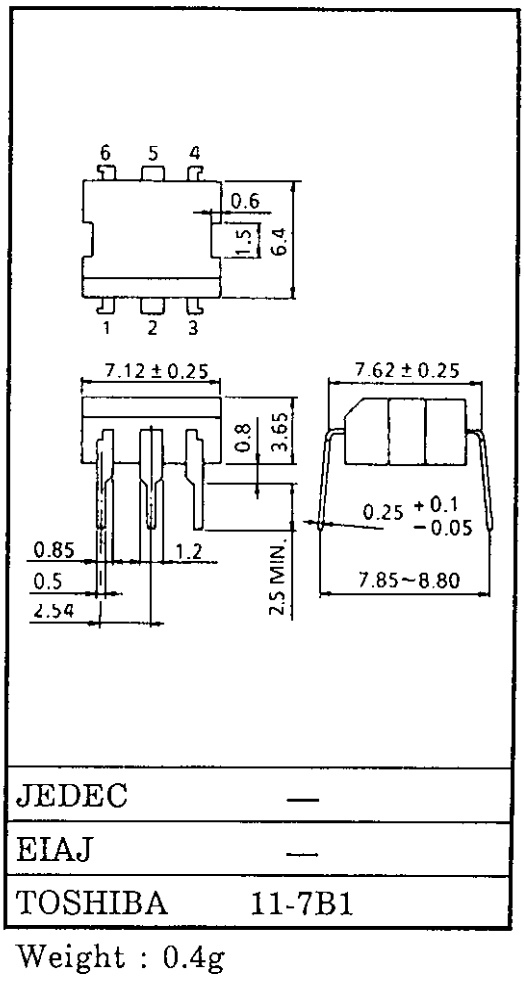
Solid State Relay

Switching Power Supply

The Toshiba TLP741G consists of a photo-thyristor optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

- Peak Off-State Voltage : 400V (Min.)
- Trigger LED Current : 10mA (Max.)
- On-State Current : 150mA (Max.)
- Isolation Voltage : 4000V_{rms}(Min.)
- Guaranteed Requirements of IEC380/VDE0806
- Climatic Test Class : 55/150/21
- Isolation Creepage Path : 8.2mm (Min.)
- Isolation Clearance : 7.6mm (Min.)
- Isolation Operating Voltage : 500V_{ac} or 600V_{dc} for : Isolation Group C. *1
- Creeping Current Resistance : Group I*2
- TUV Approved for DIN57883/VDE0883/6.80

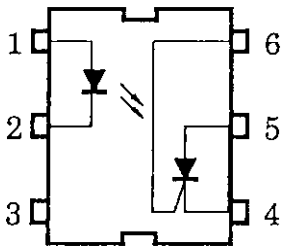
*1: According to VDE0110, Table 4
*2: According to VDE0110, Table 3



JEDEC	—
EIAJ	—
TOSHIBA	11-7B1

Weight : 0.4g

Pin Configuration (Top View)



1 : ANODE
2 : CATHODE
3 : NC
4 : CATHODE
5 : ANODE
6 : GATE

Supplementary Information	Page (s)
Lead Form Options	31-32
Tape and Reel	39-40

Maximum Ratings (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
LED	Forward Current	I_F	60	mA
	Forward Current Derating (Ta ≥ 39°C)	ΔI_F/°C	-0.7	mA/°C
	Peak Forward Current (100μs pulse, 100pps)	I_{PF}	1	A
	Power Dissipation	P_D	100	mW
	Power Dissipation Derating (Ta ≥ 25°C)	ΔP_D/°C	-1.0	mW/°C
	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	$I_{T(RMS)}$	150	mA
	On-State Current Derating (Ta ≥ 25°C)	ΔI_T/°C	-2.0	mA/°C
	Peak On-State Current (100μs pulse, 120pps)	I_{TP}	3	A
	Peak One Cycle Surge Current	I_{TSM}	2	A
	Peak Reverse Gate Voltage	V_{GM}	5	V
	Power Dissipation	P_D	150	mW
	Power Dissipation Derating (Ta ≥ 25°C)	ΔP_D/°C	-2.0	mW/°C
	Junction Temperature	T_j	100	°C
Storage Temperature Range		T_{stg}	-55~150	°C
Operating Temperature Range		T_{opr}	-55~100	°C
Lead Soldering Temperature (10s)		T_{sol}	260	°C
Total Package Power Dissipation		P_T	250	mW
Total Package Power Dissipation Derating (Ta ≥ 25°C)		ΔP_T/°C	-3.3	mW/°C
Isolation Voltage (AC, 1 min., R.H. ≤ 60%)		BV_S	4000	Vrms

Individual Electrical Characteristics (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN.	TYP.	MX.	UNIT
LED	Forward Voltage	V_F	I_F = 10mA		1.0	1.15	1.3	V
	Reverse Current	I_R	V_R = 5V		–	–	10	μA
	Capacitance	C_T	V = 0, f = 1MHz		–	30	–	pF
DETECTOR	Off-State Current	I_{DRM}	V_{AK} = 400V, R_{GK} = 27kΩ	Ta = 25°C	–	10	5000	nA
				Ta = 100°C	–	1	100	μA
	Reverse Current	I_{RRM}	V_{KA} = 400V, R_{GK} = 27kΩ	Ta = 25°C	–	10	5000	nA
				Ta = 100°C	–	1	100	μA
	On-State Voltage	V_{TM}	I_{TM} = 100mA		–	0.9	1.3	V
	Holding Current	I_H	R_{GK} = 27kΩ		–	0.2	–	mA
	Off-State dv/dt	dv/dt	V_D = 280V, R_{GK} = 27kΩ		5	10	–	V/μs
	Capacitance	C_j	V = 0, f = 1MHz	Anode to Gate	–	20	–	pF
				Gate to Cathode	–	350	–	

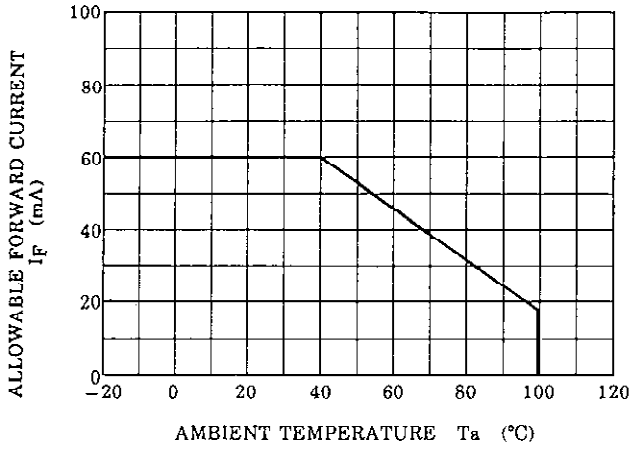
Coupled Characteristics (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MX.	UNIT
Trigger LED Current	I_{FT}	V_{AK} = 6V, R_{GK} = 27kΩ	–	4	10	mA
Turn-on Time	t_{on}	I_F = 30mA, V_{AA} = 50V, R_{GK} = 27kΩ	–	10	–	μs
Coupled dv/dt	dv/dt	V_S = 500V, R_{GK} = 27kΩ	500	–	–	V/μs
Capacitance (Input to Output)	C_S	V_S = 0, f = 1MHz	–	0.8	–	pF
Isolation Resistance	R_S	V_S = 500V	5 x 10^{10}	10^{14}	–	Ω
Isolation Voltage	BV_S	AC, 1 minute	4000	–	–	V_{rms}
		AC, 1 second, in oil	–	10000	–	
		DC, 1 minute, in oil	–	10000	–	V_{dc}

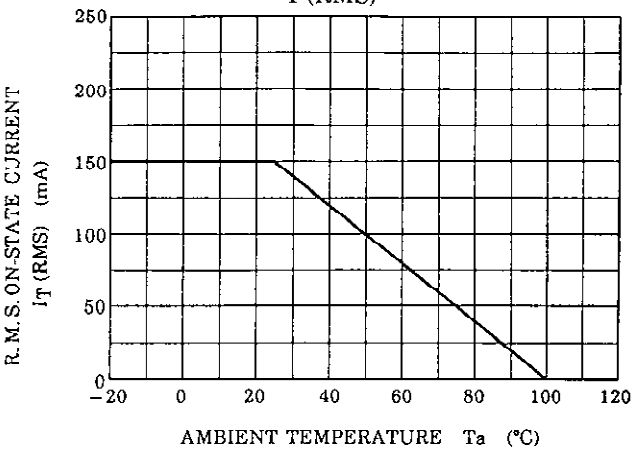
Recommended Operating Conditions

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MX.	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 Capacity	C_{GK}	–	0.01	0.1	μF

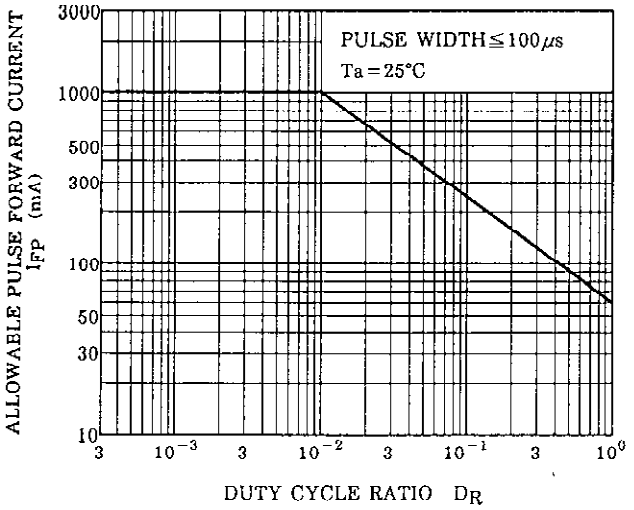
I_F – Ta



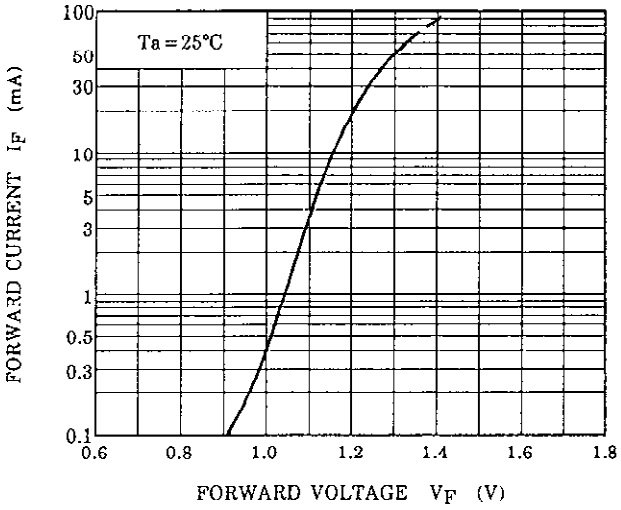
$I_{T\,(RMS)}$ – Ta



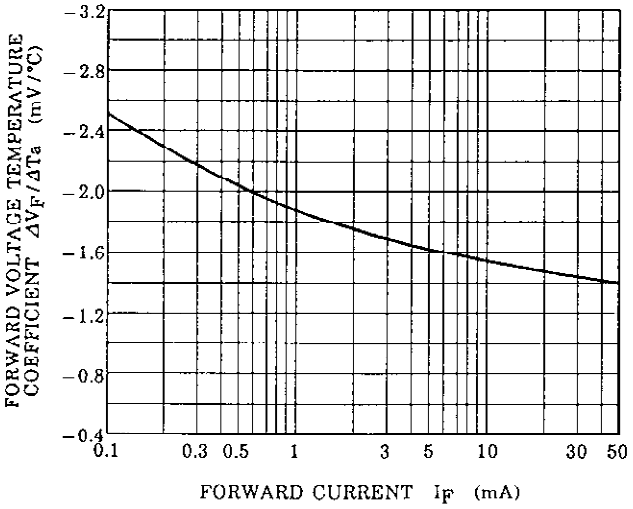
I_{FP} – D_R



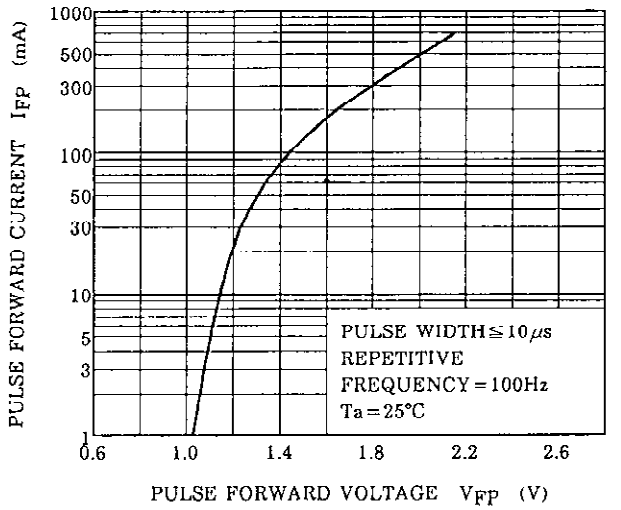
I_F – V_F



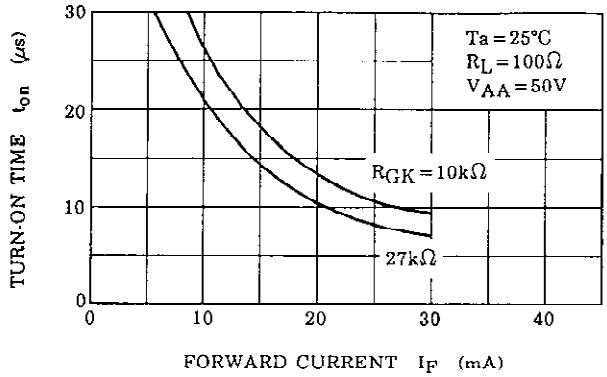
$\Delta V_F / \Delta Ta$ – I_F



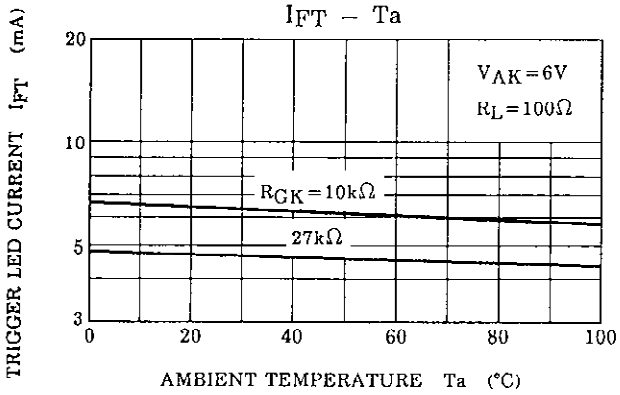
I_{FP} – V_{FP}



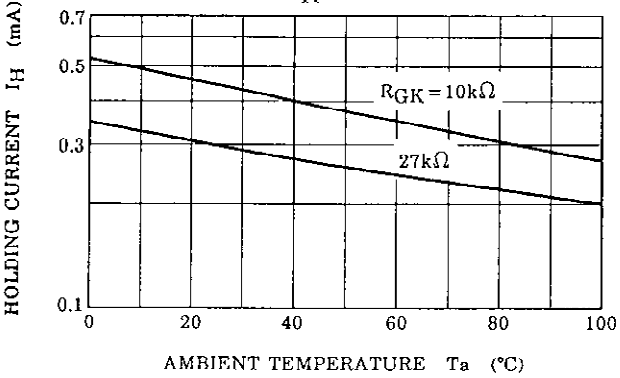
t_{on} – I_F



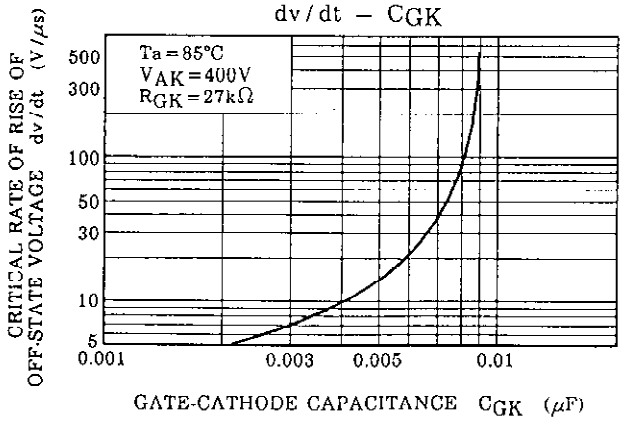
I_{FT} – Ta



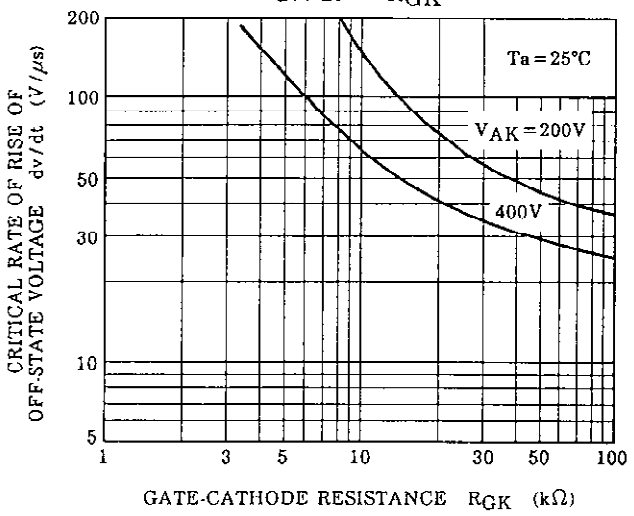
I_H – Ta



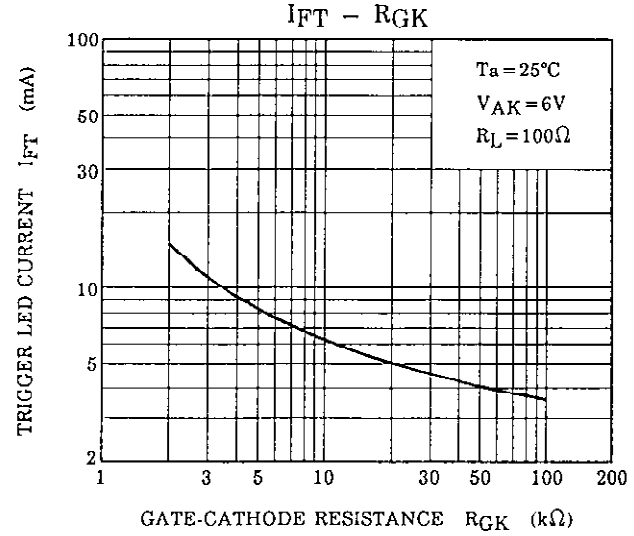
dv/dt – C_{GK}



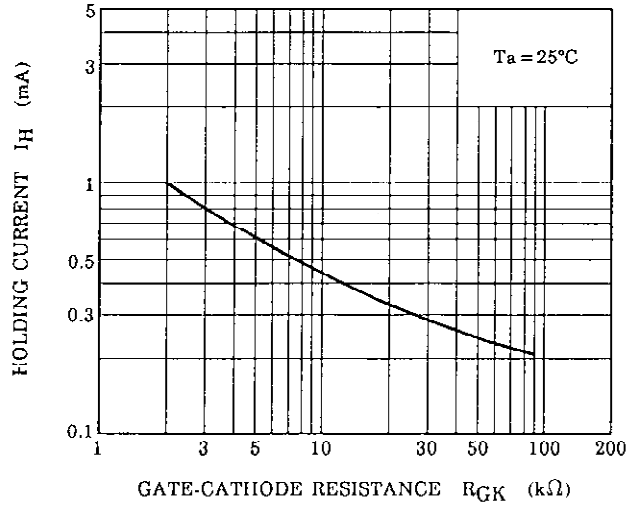
dv/dt – R_{GK}



I_{FT} – R_{GK}



I_H – R_{GK}



Notes