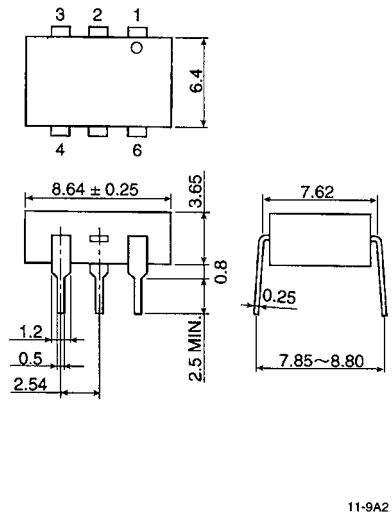
TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRIAC

TLP3020,TLP3021,TLP3022,TLP3023

Unit: mm



JEDEC	—
EIAJ	—
TOSHIBA	11-9A2

Weight: 0.44g

OFFICE MACHINE
HOUSEHOLD USE EQUIPMENT
TRIAC DRIVER
SOLID STATE RELAY

The TOSHIBA TLP3020, TLP3021, TLP3022 and TLP3023 consist of a photo-triac optically coupled to a gallium arsenide infrared emitting diode in a six lead plastic DIP package.

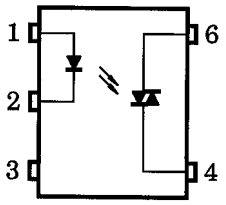
- Peak Off-State Voltage : 400 V (Min.)
- Trigger LED Current : 30mA (Max.) (TLP3020)
  15 mA (Max.) (TLP3021)
  10 mA (Max.) (TLP3022)
  5 mA (Max.) (TLP3023)
- On-State Current : 100 mA (Max.)
- UL Recognized : UL1577, File No. E67349
- Isolation Voltage : 5000 Vrms (Min.)
- Option (D4) Type
- VDE Approved : DIN VDE0884 / 08.87,
  Certificate No. 68329

Maximum Operating Insulation Voltage: 630 VPK
Highest Permissible Over Voltage: 6000 VPK

Note: When a VDE0884 approved type is needed, please designate the " Option (D4) "

		7.62mm pich standard type	10.16 mm pich (LF2) type
Creepage Distance	:	7.0 mm (Min.)	8.0 mm (Min.)
Clearance	:	7.0 mm (Min.)	8.0 mm (Min.)
Insulation Thickness	:	0.5 mm (Min.)	0.5 mm (Min.)

PIN CONFIGURATION (TOP VIEW)



1: ANODE
2: CATHODE
3: N.C.
4: TERMINAL 1
6: TERMINAL 2

MAXIMUM RATINGS (Ta=25°C)

CHARACTERISTIC			SYMBOL	RATING	UNIT
LED	Forward Current		I_F	50	mA
	Forward Current Derating (Ta ≥ 53°C)		ΔI_F/°C	−0.7	mA/°C
	Peak Forward Current (100μs pulse, 100pps)		I_{FP}	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		Tj	125	°C
DETECTOR	Off-State Output Terminal Voltage		V_{DRM}	400	V
	On-Stage RMS Current	Ta=25°C	$I_{T(RMS)}$	100	mA
		Ta=70°C		50	
	On-State Current Derating (Ta ≥ 25°C)		ΔI_T/°C	−1.1	mA/°C
	Peak On-Stage Current (100μs pulse, 120pps)		I_{TP}	2	A
	Peak Nonrepetitive Surge Current (P_W=10ms, DC=10%)		I_{TSM}	1.2	A
	Power Dissipation		P_D	300	mW
	Power Dissipation Derating (Ta ≥ 25°C)		ΔP_D/°C	−4.0	mW/°C
	Junction Temperature		Tj	115	°C
Storage Temperature Range			T_{stg}	−55 ~ 150	°C
Operating Temperature Range			T_{opr}	−40 ~ 100	°C
Lead Soldering Temperature (10s)			T_{sol}	260	°C
Total Package Power Dissipation			P_T	330	mW
Total Package Power Dissipation Derating (Ta ≥ 25°C)			ΔP_T/°C	−4.4	mW/°C
Isolation Voltage (AC, 1 min., R.H. ≤ 60%) (Note 1)			BV_S	5000	Vrms

Note 1: Device considered a two terminal device :Pins 1, 2 and 3 shorted together and pins 4 and 6 shorted together.

RECOMMENDED OPERATING CONDISTIONS

CHARACTERISTICS	SYMBOL	MIN	TYP.	MAX	UNIT
Supply Voltage	V_{AC}	—	—	120	Vac
Forward Current	I_F*	15	20	25	mA
Peak On-Stage Current	I_{TP}	—	—	1	A
Operating Temperature	T_{opr}	−25	—	85	°C

*: In the case of TLP3022

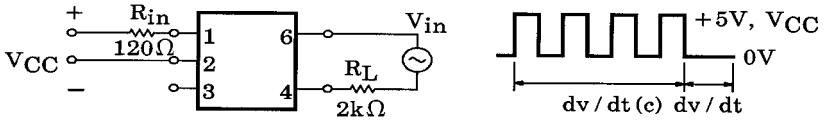
INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta=25°C)

	CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX	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	—	10	—	pF
DETECTOR	Peak Off-State Current	I_{DRM}	V_{DRM}=400V	—	10	100	nA
	Peak On-Stage Voltage	V_{TM}	I_{TM}=100mA	—	1.7	3.0	V
	Holding Current	I_H	—	—	0.6	—	mA
	Critical Rate of Rise of Off-State Voltage	dv / dt	V_{in}=120Vrms, Ta=85°C (Fig.1)	200	500	—	V/μs
	Critical Rate of Rise of Commutating Voltage	dv / dt(c)	V_{in}=30Vrms, IF=15mA (Fig.1)	—	0.2	—	V/μs

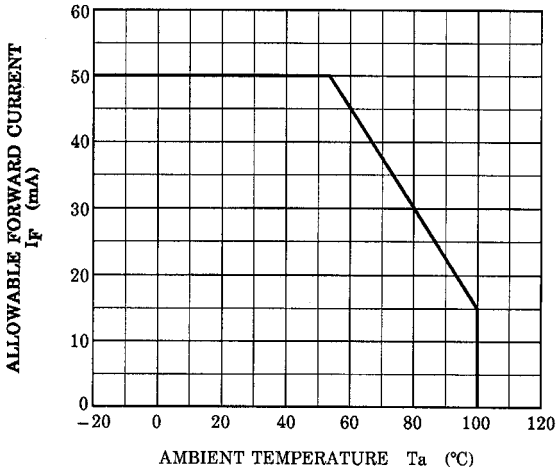
COUPLED ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	TYP.	MAX	UNIT
Trigger LED Current	TLP3020	I_{FT}	V_T=3V	—	—	30	mA
	TLP3021			—	—	15	
	TLP3022			—	5	10	
	TLP3023			—	—	5	
Capacitance Input to Output		C_S	V_S=0, f=1MHz	—	0.8	—	pF
Isolation Resistance		R_S	V_S=500V (R.H. ≤ 60%)	5×10^{10}	10^{14}	—	Ω
Isolation Voltage		B_{VS}	AC, 1 minute		—	—	V_{rms}
			AC, 1 second (in oil)	—	10000	—	V_{dc}
			DC, 1 minute (in oil)	—	10000	—	

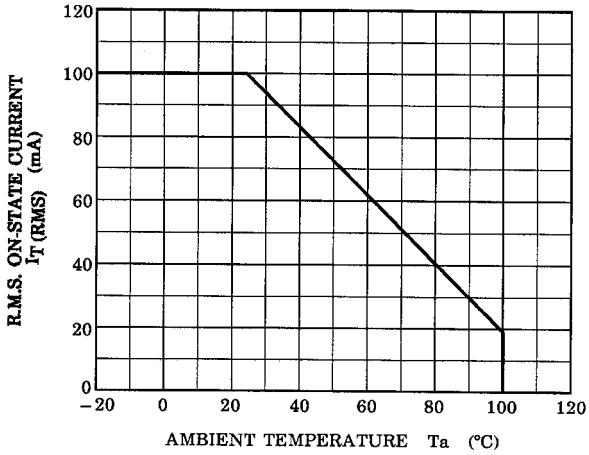
Fig. 1 dv/dt TEST CIRCUIT



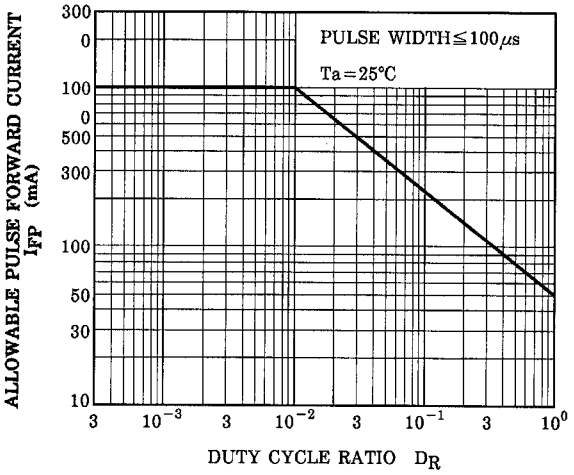
I_F – Ta



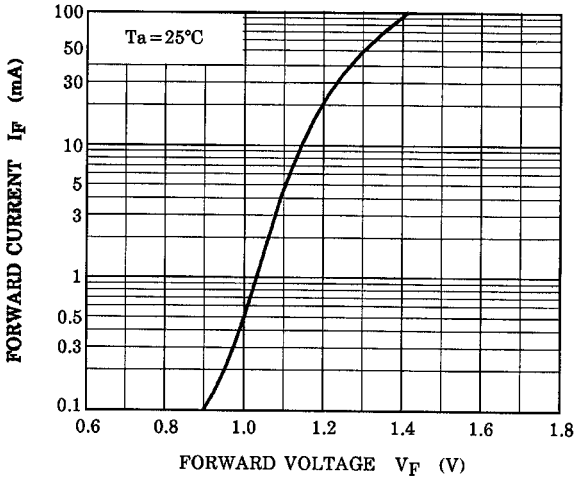
$I_{T\ (RMS)}$ – Ta



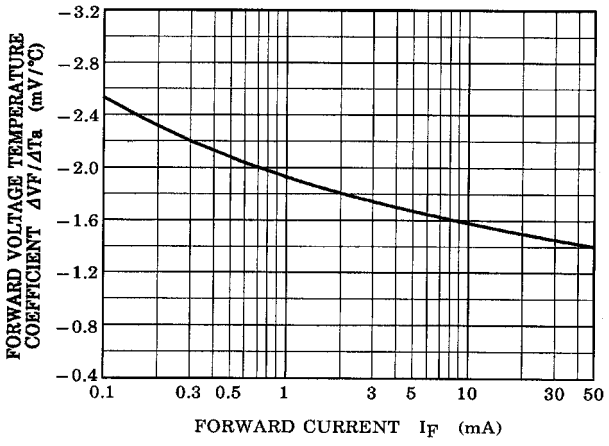
I_{FP} –D_R



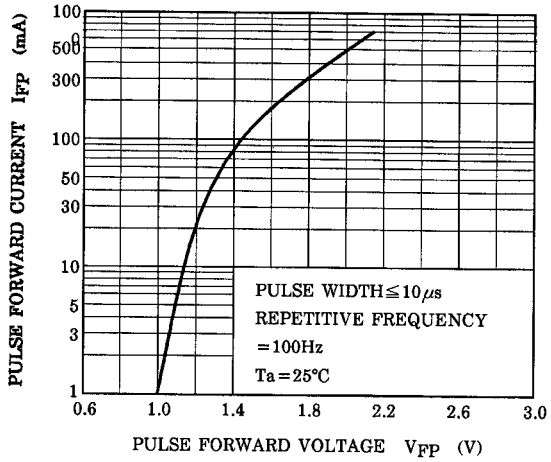
I_F – V_F



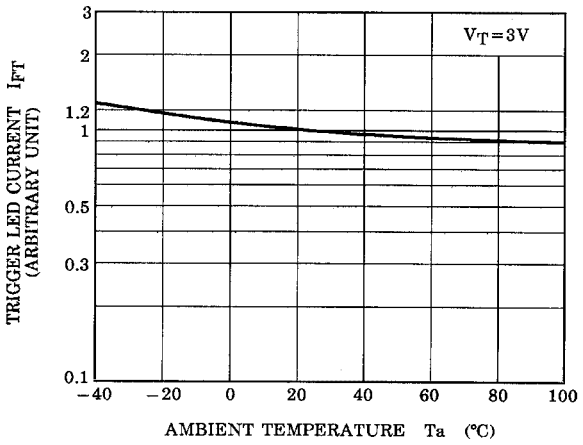
$\Delta V_F/\Delta Ta$ – I_F



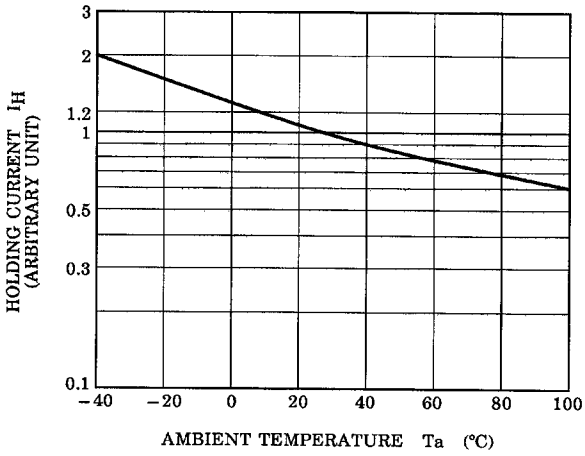
I_{FP} – V_{FP}



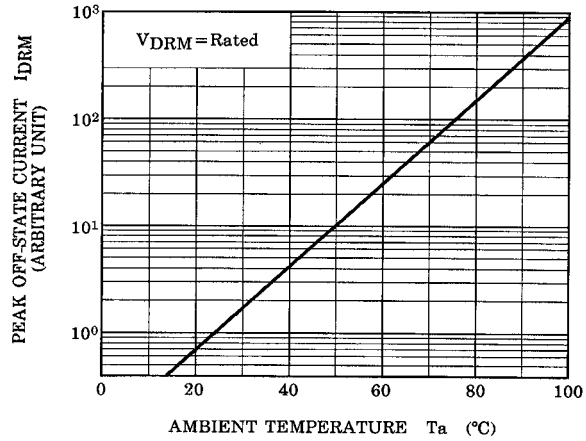
NORMALIZED I_{FT} – Ta



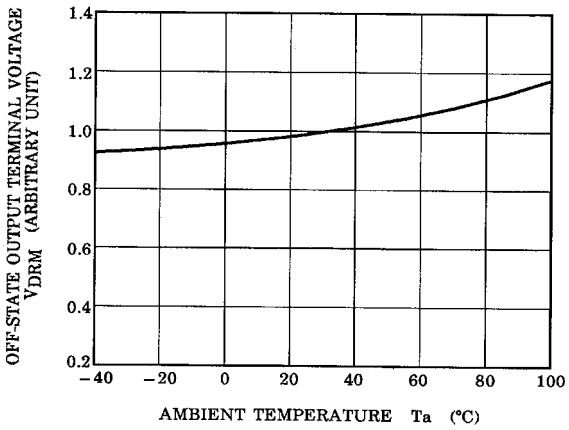
NORMALIZED I_H – Ta



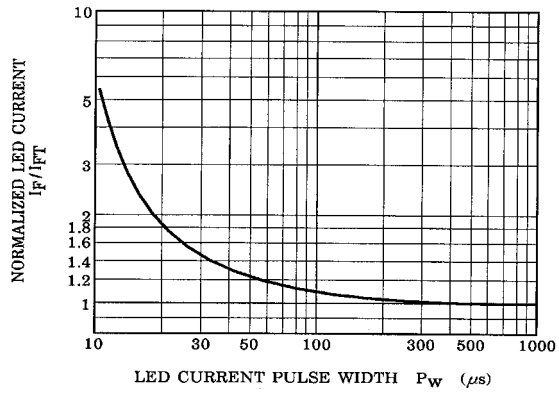
NORMALIZED I_{DRM} – Ta



NORMALIZED V_{DRM} – Ta



NORMALIZED LED CURRENT
– LED CURRENT PULSE WIDTH



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000707EBC

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