

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

TLP626, TLP626-2, TLP626-4

PROGRAMMABLE CONTROLLERS
AC/DC-INPUT MODULE
TELECOMMUNICATION

The TOSHIBA TLP626, -2 and -4 consist of gallium arsenide infrared emitting diodes connected in inverse parallel, optically coupled to a photo-transistor.

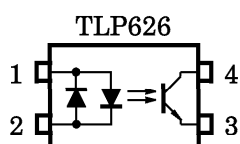
The TLP626-2 offers two isolated channels in an eight lead plastic DIP, while the TLP626-4 provides four isolated channels in a sixteen lead plastic DIP.

- Collector-Emitter Voltage : 55V (Min.)
- Current Transfer Ratio

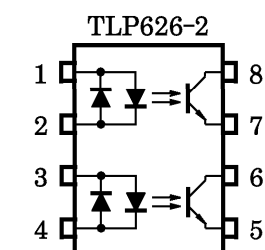
CLASSIFICATION	CURRENT TRANSFER RATIO (Min.)			MARKING OF CLASSIFICATION
	Ta = 25°C		Ta = -25~75°C	
	If = ±1mA VCE = 0.5V	If = ±0.5mA VCE = 1.5V	If = ±1mA VCE = 0.5V	
Rank BV	200%	100%	100%	BV
Standard	100%	50%	50%	BV, Blank

- Isolation Voltage : 5000V_{rms} Min.
- UL Recognized : UL1577, File No. E67349
- BSI Approved : BS EN60065 : 1994 Certificate No.7426
BS EN60950 : 1992 Certificate No.7427
- Note : Application type name for certification test,
please use standard product type name, i.e.
TLP626 (BV) : TLP626

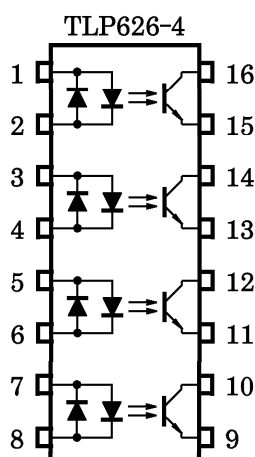
PIN CONFIGURATIONS (TOP VIEW)



1 : ANODE
2 : CATHODE
3 : EMITTER
4 : COLLECTOR

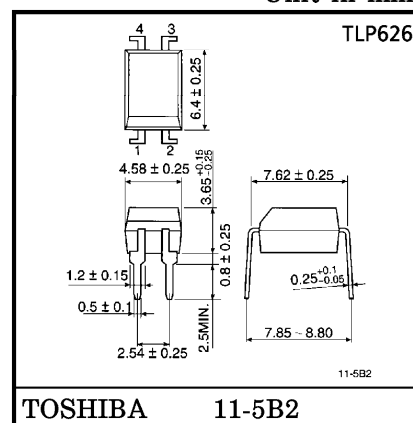


1, 3 : ANODE
2, 4 : CATHODE
5, 7 : EMITTER
6, 8 : COLLECTOR

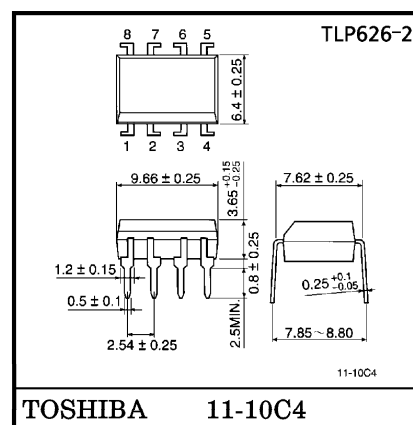


1, 3, 5, 7 : ANODE, CATHODE
2, 4, 6, 8 : CATHODE, ANODE
9, 11, 13, 15 : EMITTER
10, 12, 14, 16 : COLLECTOR

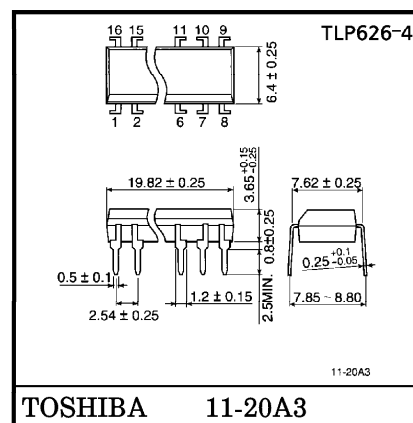
Unit in mm



Weight : 0.26g



Weight : 0.54g



Weight : 1.1g

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING		UNIT
			TLP626	TLP626-2 TLP626-4	
LED	Forward Current	I_F	60	50	mA
	Forward Current Derating	$\Delta I_F / ^\circ\text{C}$	-0.7 (Ta $\geq$ 39°C)	-0.5 (Ta $\geq$ 25°C)	mA / °C
	Pulse Forward Current	I_{FP}	1 (100 μ s pulse, 100pps)		A
	Power Dissipation (1 Circuit)	P_D	100	70	mW
	Power Dissipation Derating (Ta $\geq$ 25°C, 1 Circuit)	$\Delta P_D / ^\circ\text{C}$	-1.0	-0.7	mW / °C
	Junction Temperature	T_j	125		°C
DETECTOR	Collector-Emitter Voltage	V_{CEO}	55		V
	Emitter-Collector Voltage	V_{ECO}	7		V
	Collector Current	I_C	50		mA
	Collector Power Dissipation (1 Circuit)	P_C	150	100	mW
	Collector Power Dissipation Derating (Ta $\geq$ 25°C, 1 Circuit)	$\Delta P_C / ^\circ\text{C}$	-1.5	-1.0	mW / °C
	Junction Temperature	T_j	125		°C
Storage Temperature Range		T_{stg}	-55~125		°C
Operating Temperature Range		P_{opr}	-55~100		°C
Lead Soldering Temperature		T_{sol}	260 (10s)		°C
Total Package Power Dissipation (1 Circuit)		P_T	250	150	mW
Total Package Power Dissipation Derating (Ta $\geq$ 25°C, 1 Circuit)		$\Delta P_T / ^\circ\text{C}$	-2.5	-1.5	mW / °C
Isolation Voltage (Note 1)		BV_S	5000 (AC, 1min., RH $\leq$ 60%)		Vrms

(Note 1) Device considered a two terminal : LED side pins shorted together, and
DETECTOR side pins shorted together.

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	—	5	24	V
Forward Current	I_F (RMS)	—	1.6	20	mA
Collector Current	I_C	—	1	10	mA
Operating Temperature	T_{opr}	-25	—	75	°C

INDIVIDUAL ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage	V_F	$I_F = \pm 10\text{mA}$	1.0	1.15	1.3	V
	Reverse Current	I_F	$V_F = \pm 0.7\text{V}$	—	2.5	20	μA
	Capacitance	C_T	$V = 0, f = 1\text{MHz}$	—	60	—	pF
DETECTOR	Collector-Emitter Breakdown Voltage	$V_{(BR) CEO}$	$I_C = 0.5\text{mA}$	55	—	—	V
	Emitter-Collector Breakdown Voltage	$V_{(BR) ECO}$	$I_E = 0.1\text{mA}$	7	—	—	V
	Collector Dark Current	I_{CEO}	$V_{CE} = 24\text{V}$	—	10	100	nA
			$V_{CE} = 24\text{V}, T_a = 85^\circ\text{C}$	—	2	50	μA
	Capacitance Collector to Emitter	C_{CE}	$V = 0, f = 1\text{MHz}$	—	12	—	pF

COUPLED ELECTRICAL CHARACTERISTICS (Ta = 25°C)

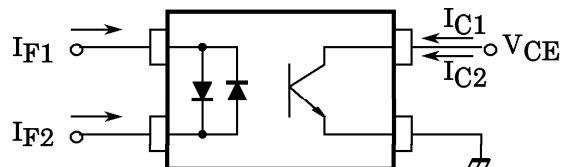
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I_C / I_F	$I_F = \pm 1\text{mA}, V_{CE} = 0.5\text{V}$ Rank BV	100	—	1200	%
			200	—	1200	
Low Input CTR	$I_C / I_F (\text{low})$	$I_F = \pm 0.5\text{mA}, V_{CE} = 1.5\text{V}$ Rank BV	50	—	—	%
			100	—	—	
Collector-Emitter Saturation Voltage	$V_{CE} (\text{sat})$	$I_C = 0.5\text{mA}, I_F = \pm 1\text{mA}$	—	—	0.4	V
		$I_C = 1\text{mA}, I_F = \pm 1\text{mA}$	—	0.2	—	
		Rank BV	—	—	0.4	
Off-State Collector Current	$I_C (\text{off})$	$V_F = \pm 0.7\text{V}, V_{CE} = 24\text{V}$	—	1	10	μA
CTR Symmetry *1	$I_C (\text{ratio})$	$I_C(I_F = -1\text{mA}) / I_C(I_F = 1\text{mA})$	0.5	—	2	—

COUPLED ELECTRICAL CHARACTERISTICS (Ta = -25~75°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I_C / I_F	$I_F = 1\text{mA}, V_{CE} = 0.5\text{V}$ Rank BV	50	—	—	%
			100	—	—	
Low Input CTR	$I_C / I_F (\text{low})$	$I_F = 0.5\text{mA}, V_{CE} = 1.5\text{V}$ Rank BV	—	50	—	%
			—	100	—	

*1

$$I_C (\text{ratio}) = \frac{I_{C2} (I_F = I_{F2}, V_{CE} = 5\text{V})}{I_{C1} (I_F = I_{F1}, V_{CE} = 5\text{V})}$$



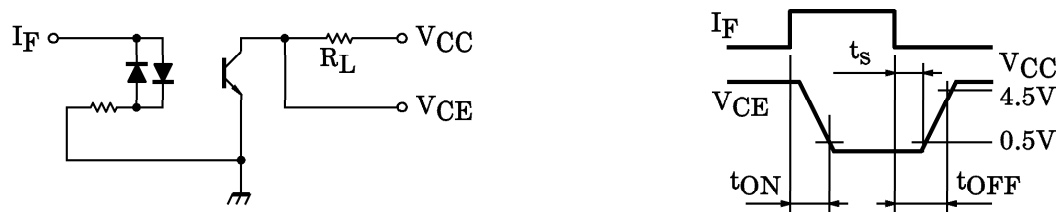
ISOLATION CHARACTERISTICS (Ta = 25°C)

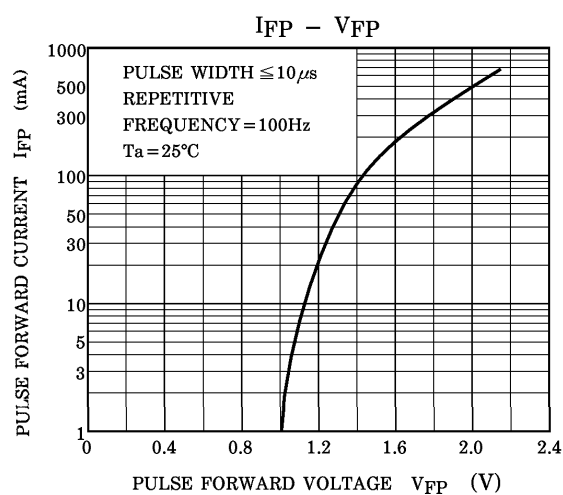
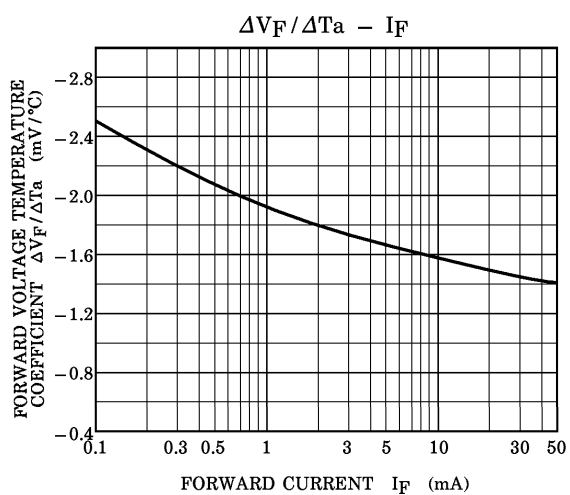
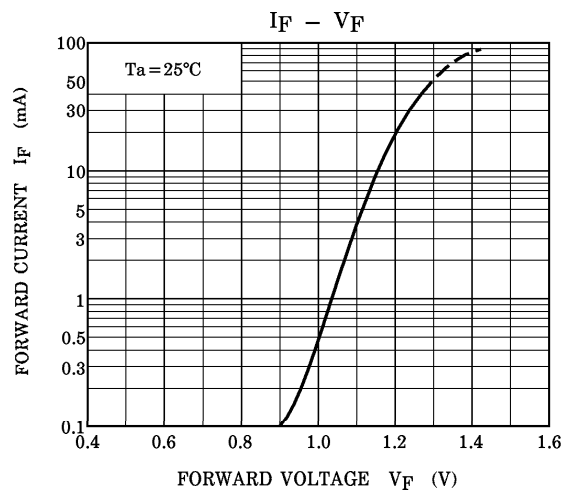
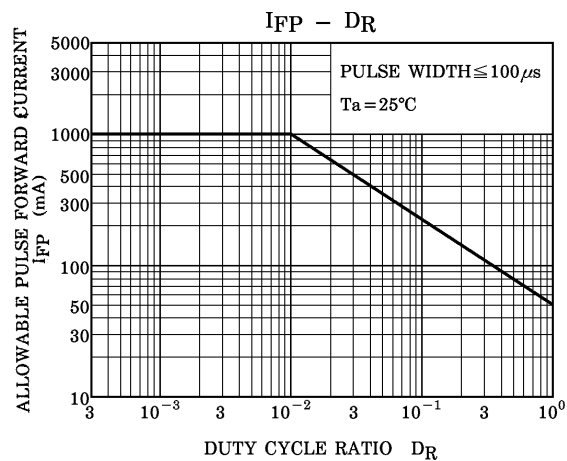
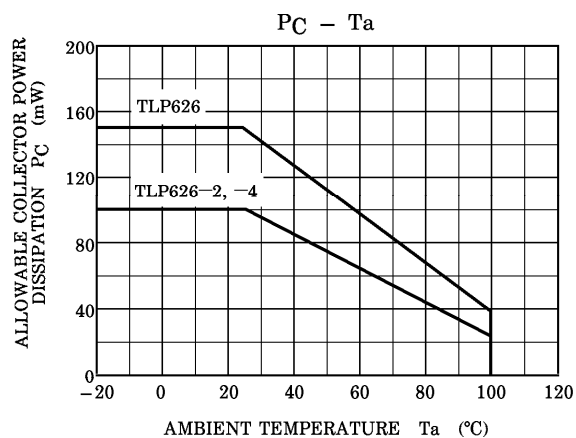
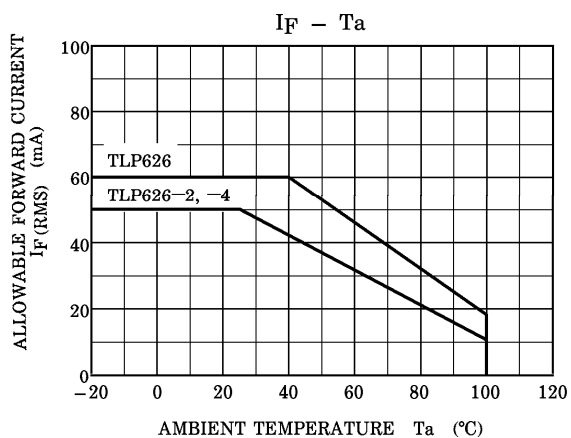
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	CS	VS=0, f=1MHz	—	0.8	—	pF
Isolation Resistance	RS	VS=500V	5×10 ¹⁰	10 ¹⁴	—	Ω
Isolation Voltage	BVS	AC, 1 minute	5000	—	—	Vrms
		AC, 1 second, in oil	—	10000	—	
		DC, 1 minute, in oil	—	10000	—	Vdc

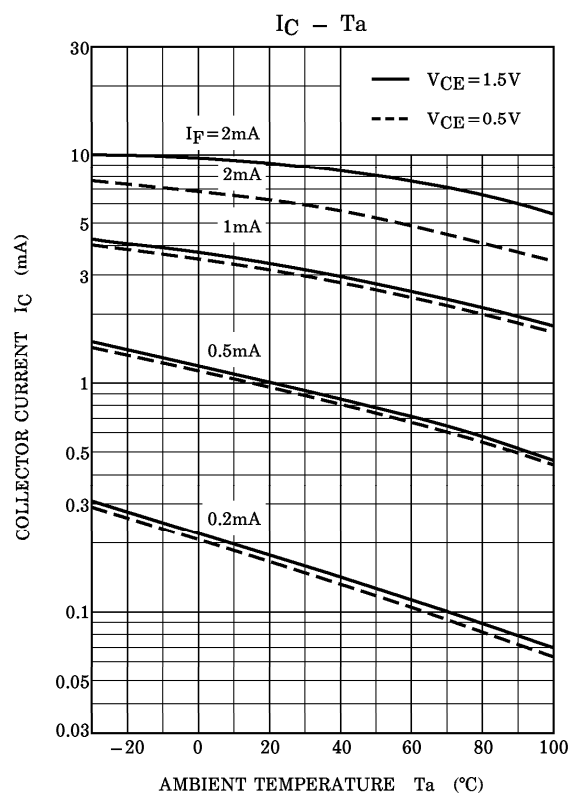
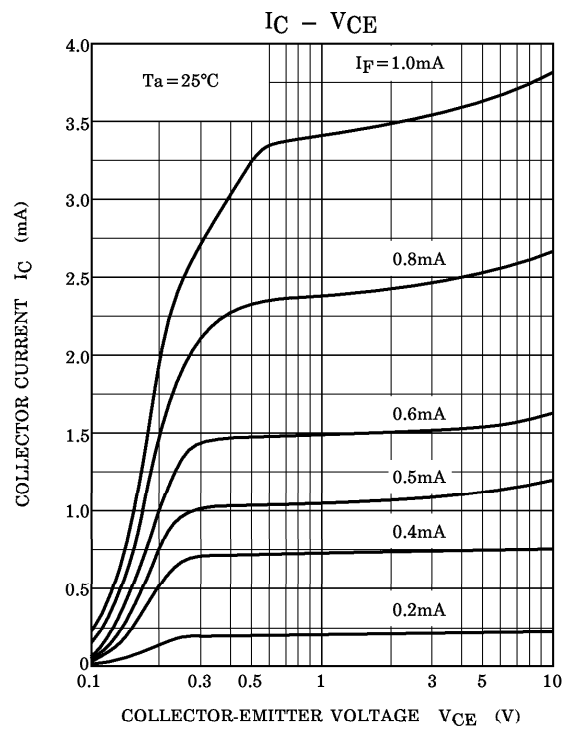
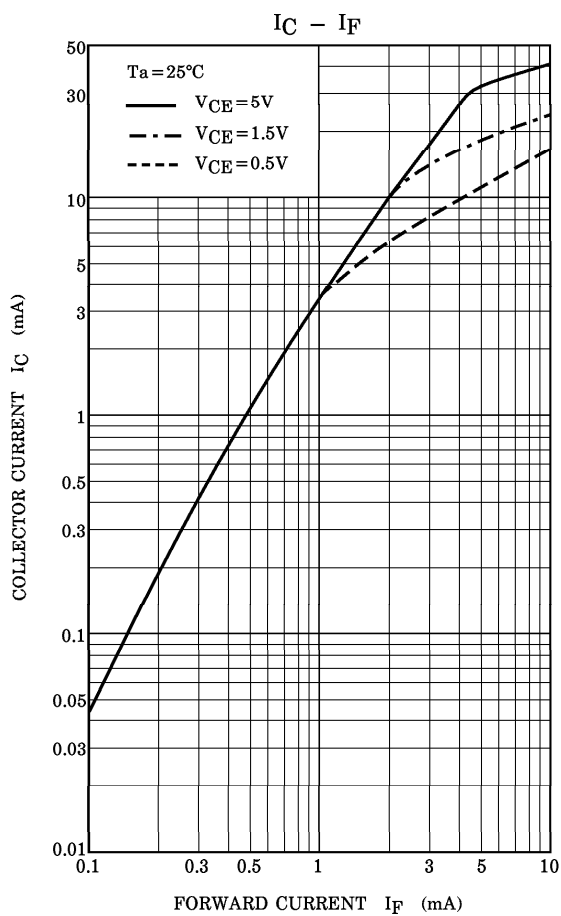
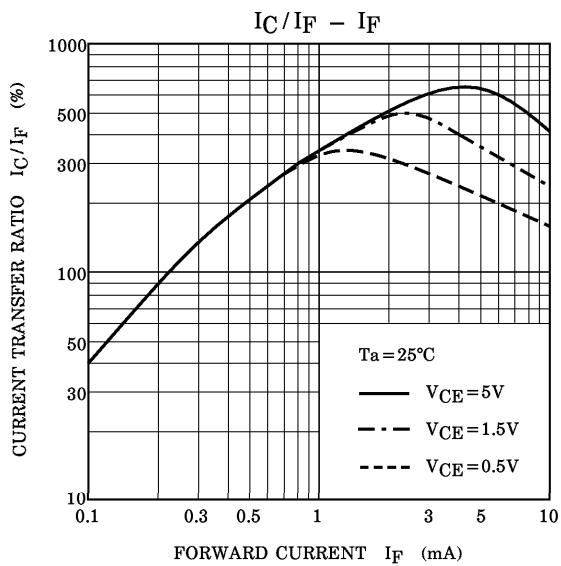
SWITCHING CHARACTERISTICS (Ta = 25°C)

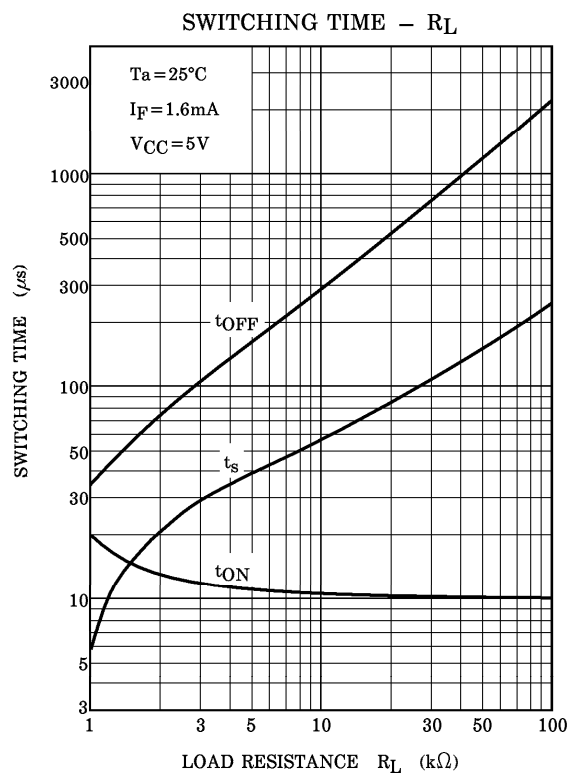
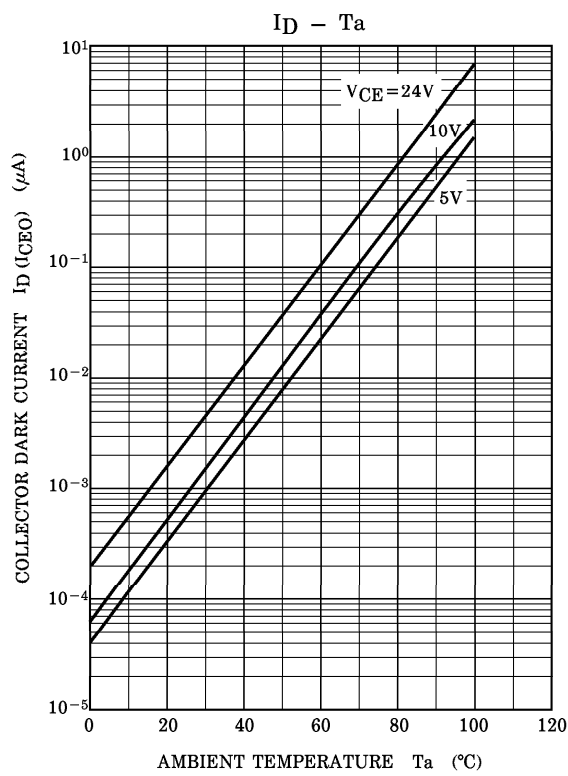
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	tr	VCC=10V, IC=2mA RL=100Ω	—	8	—	μs
Fall Time	tf		—	8	—	
Turn-on Time	ton		—	10	—	
Turn-off Time	toff		—	8	—	
Turn-on Time	tON	RL=4.7kΩ (Fig.1) VCC=5V, IF=±1.6mA	—	10	—	μs
Storage Time	ts		—	50	—	
Turn-off Time	TOFF		—	300	—	

Fig. 1 SWITCHING OPERATING CONDITIONS









RESTRICTIONS ON PRODUCT USE

000707EBC

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