

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

TLP620, TLP620-2, TLP620-4

PROGRAMMABLE CONTROLLERS

AC / DC-INPUT MODULE

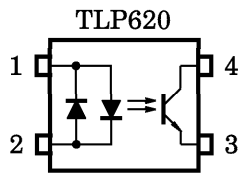
TELECOMMUNICATION

The TOSHIBA TLP620, -2 and -4 consists of a photo-transistor optically coupled to two gallium arsenide infrared emitting diode connected in inverse parallel.

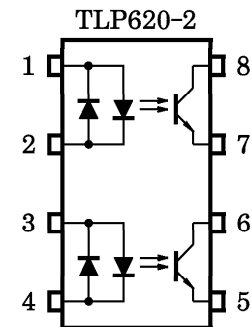
The TLP620-2 offers two isolated channels in an eight lead plastic DIP, while the TLP620-4 provides four isolated channels in a sixteen plastic DIP.

- Collector-Emitter Voltage : 55V (Min.)
- Current Transfer Ratio : 50% (Min.)
- Rank GB : 100% (Min.)

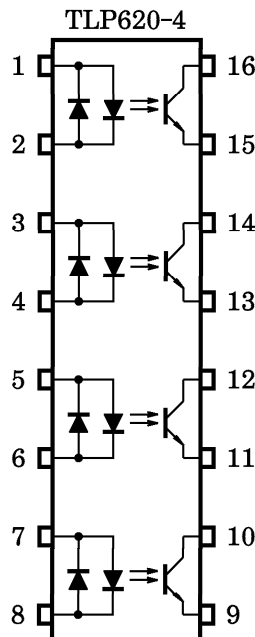
PIN CONFIGURATIONS (TOP VIEW)



TLP620
 1 : ANODE
 CATHODE
 2 : CATHODE
 ANODE
 3 : EMITTER
 4 : COLLECTOR

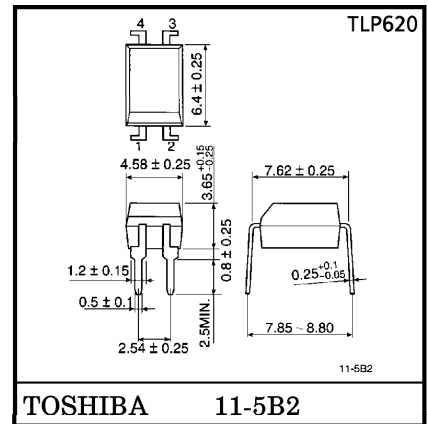


TLP620-2
 1, 3 : ANODE
 CATHODE
 2, 4 : CATHODE
 ANODE
 5, 7 : EMITTER
 6, 8 : COLLECTOR

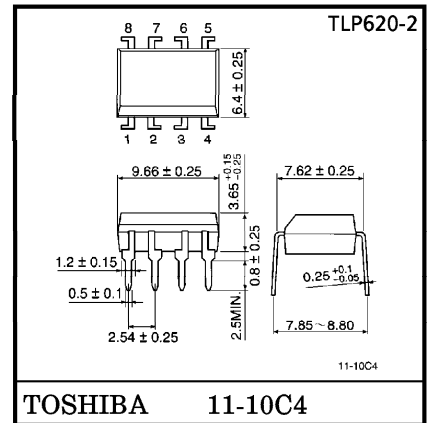


TLP620-4
 1, 3, 5, 7 : ANODE, CATHODE
 2, 4, 6, 8 : CATHODE, ANODE
 9, 11, 13, 15 : EMITTER
 10, 12, 14, 16 : COLLECTOR

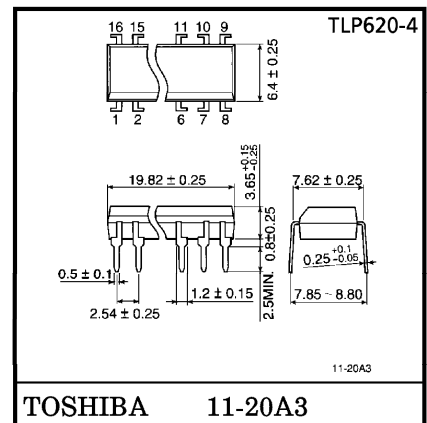
Unit in mm



Weight : 0.26g



Weight : 0.54g



Weight : 1.1g

	MADE IN JAPAN	MADE IN THAILAND
UL Recognized	E67349 *1	E152349 *1
BSI Approved	7426, 7427 *2	7426, 7427 *2

*1 UL1577

*2 BS EN60065 : 1994, BS EN60950 : 1992

- Isolation Voltage : 5000V_{rms} (Min.)
- Option (D4) type
VDE Approved : DIN VDE0884 / 06.92, Certificate No. 68384
Maximum Operating Insulation Voltage : 890V_{PK}
Highest Permissible Over Voltage : 8000V_{PK}

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

- Creepage Distance : 6.4mm (Min.)
Clearance : 6.4mm (Min.)
Insulation Thickness : 0.4mm (Min.)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING		UNIT
			TLP620	TLP620-2 TLP620-4	
LED	Forward Current	I _F (RMS)	60	50	mA
	Forward Current Derating	ΔI _F / °C	− 0.7 (Ta ≥ 39°C)	− 0.5 (Ta ≥ 25°C)	mA / °C
	Pulse Forward Current	I _{FP}	1 (100μs pulse, 100pps)		A
	Power Dissipation (1 Circuit)	P _D	100	70	mW
	Power Dissipation Derating	ΔP _D / °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 (1 Circuit) (Ta ≥ 25°C)	ΔP _C / °C	− 1.5	− 1.0	mW / °C
	Junction Temperature	T _j	125		°C
Storage Temperature Range		T _{stg}	− 55~125		°C
Operating Temperature Range		T _{opr}	− 55~100		°C
Lead Soldering Temperature		T _{sold}	260 (10s)		°C
Total Package Power Dissipation		P _T	250	150	mW
Total Package Power Dissipation Derating (Ta ≥ 25°C, 1 Circuit)		ΔP _T / °C	− 2.5	− 1.5	mW / °C
Isolation Voltage		BV _S	5000 (AC, 1 min., RH ≤ 60%)		V _{rms}

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	—	5	24	V
Forward Current	I_F (RMS)	—	16	20	mA
Collector Current	I_C	—	1	10	mA
Operating Temperature	T_{opr}	-25	—	85	°C

INDIVIDUAL ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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
	Forward 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}	$V_{CE} = 0, f = 1\text{MHz}$	—	10	—	pF

COUPLED ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Transfer Ratio	I_C / I_F	$I_F = \pm 5\text{mA}, V_{CE} = 5\text{V}$ Rank GB	50	—	600	%
			100	—	600	
Saturated CTR	I_C / I_F (sat)	$I_F = \pm 1\text{mA}, V_{CE} = 0.4\text{V}$ Rank GB	—	60	—	%
			30	—	—	
Collector-Emitter Saturation Voltage	V_{CE} (sat)	$I_C = 2.4\text{mA}, I_F = \pm 8\text{mA}$	—	—	0.4	V
		$I_C = 0.2\text{mA}, I_F = \pm 1\text{mA}$ Rank GB	—	0.2	—	
			—	—	0.4	
Off-State Collector Current	I_C (off)	$V_F = \pm 0.7\text{V}, V_{CE} = 24\text{V}$	—	1	10	μA
CTR Symmetry	I_C (ratio)	$I_C (I_F = -5\text{mA}) / I_C (I_F = +5\text{mA})$	0.33	1	3	—

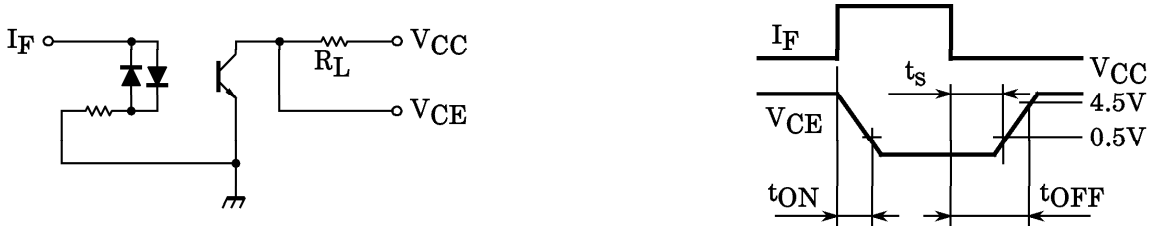
ISOLATION CHARACTERISTICS (Ta = 25°C)

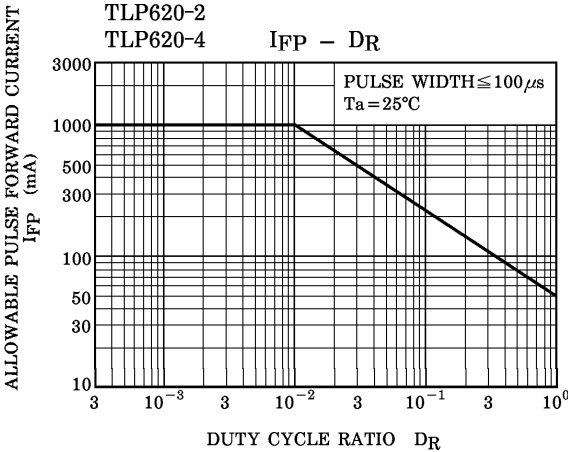
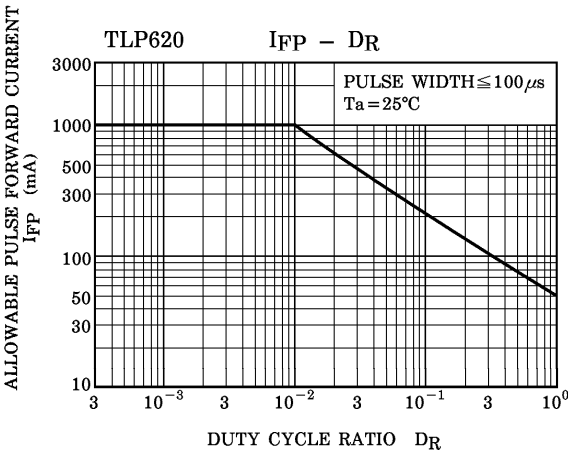
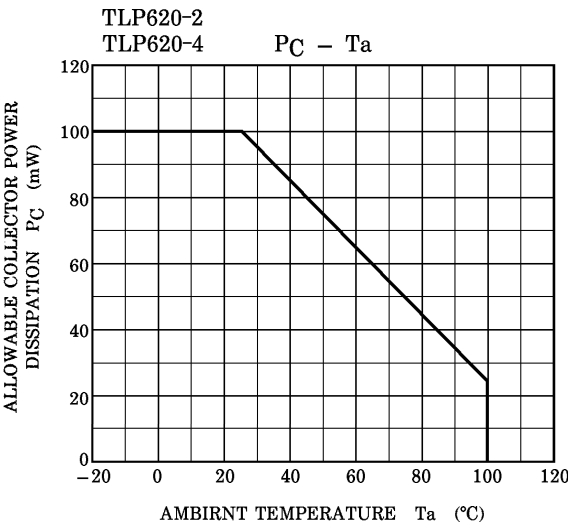
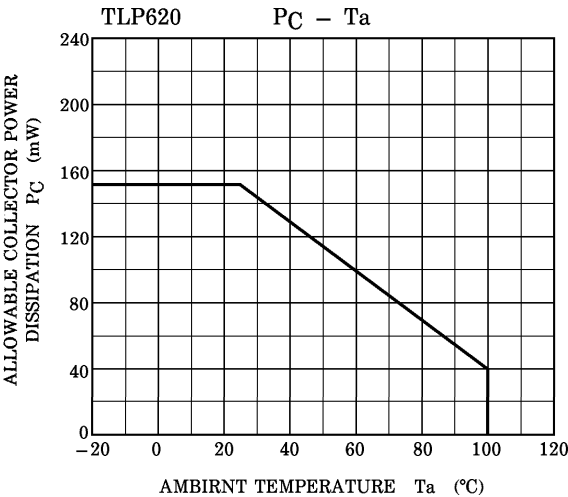
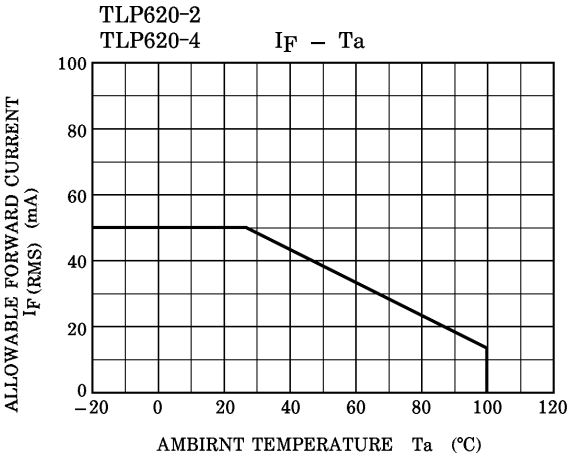
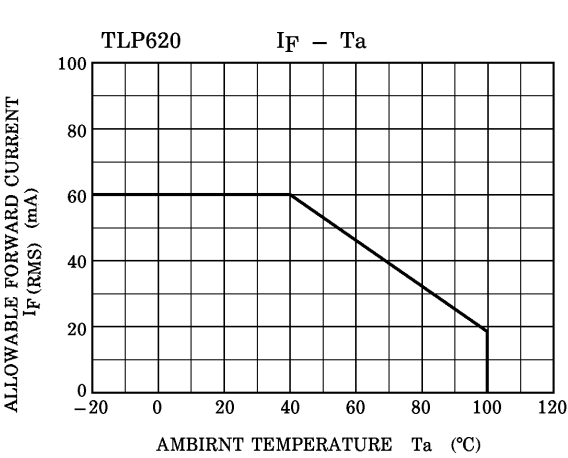
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	CS	VS=0, f=1MHz	—	0.8	—	pF
Isolation Resistance	RS	VS=500V	1×10 ¹²	10 ¹⁴	—	Ω
Isolation Voltage	BVS	AC, 1 minute	5000	—	—	Vrms
		AC, 1 second, in oil	—	10000	—	
		DC, 1 minute, in oil	—	10000	—	Vdc

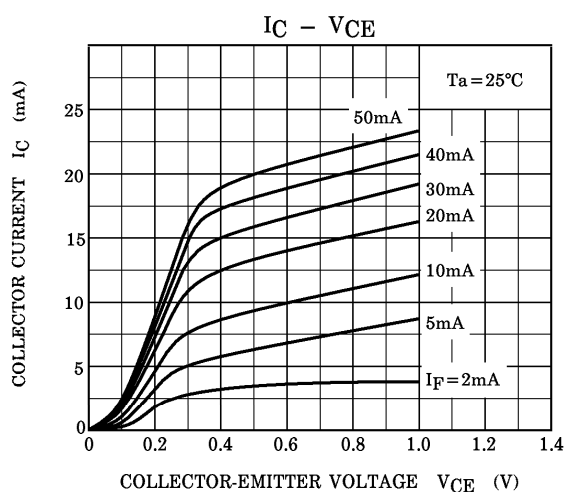
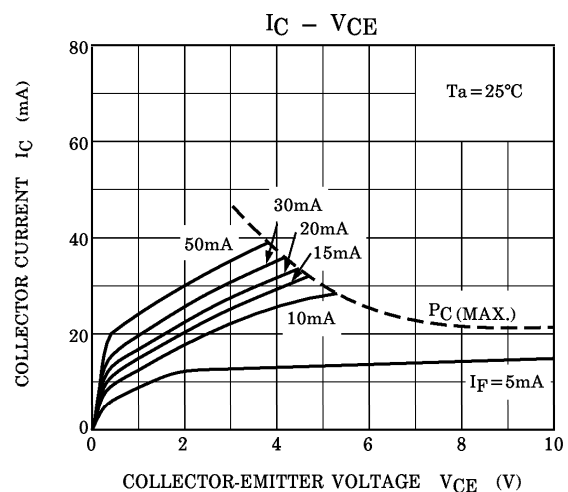
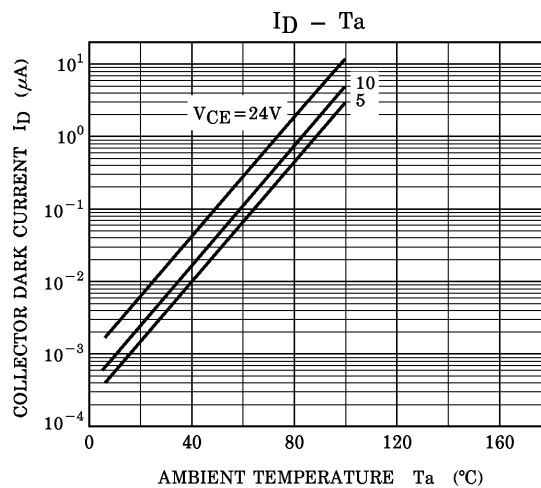
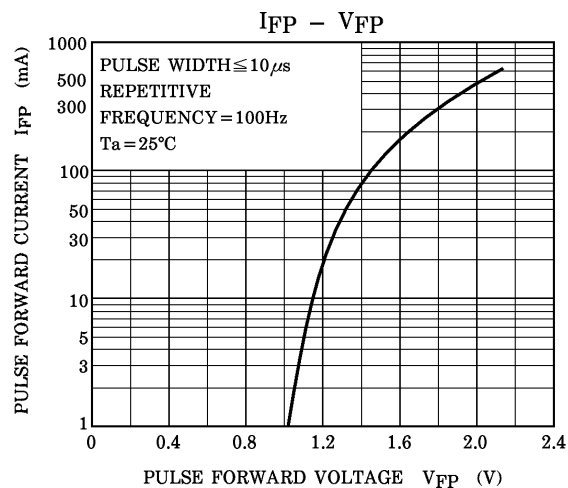
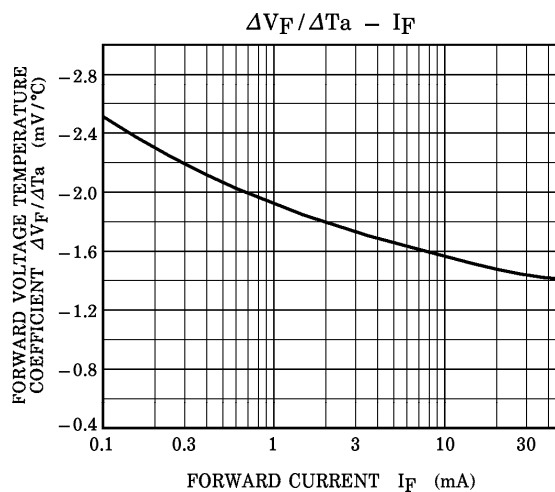
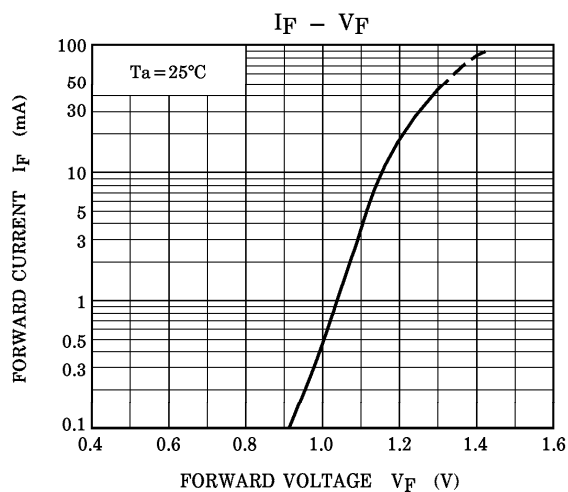
SWITCHING CHARACTERISTICS (Ta = 25°C)

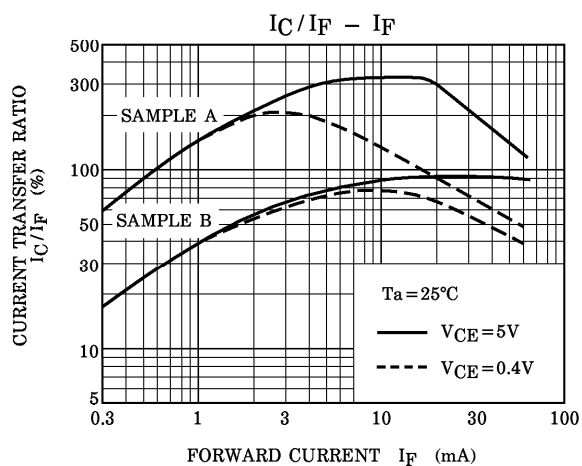
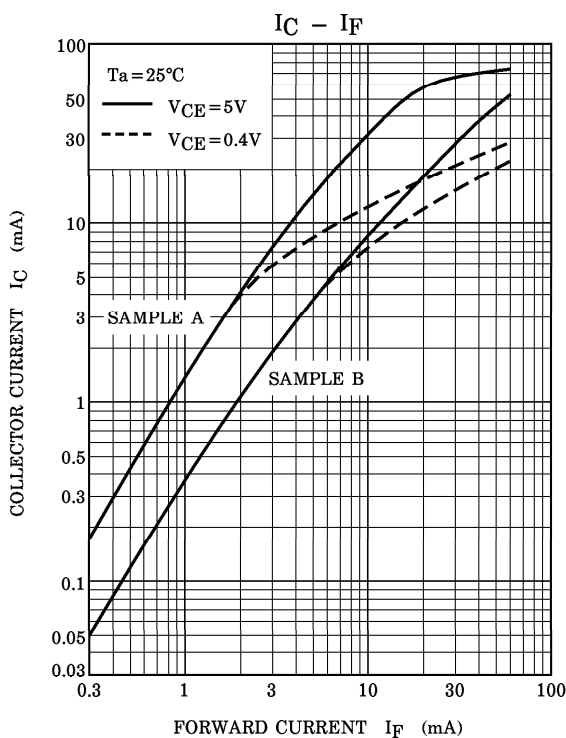
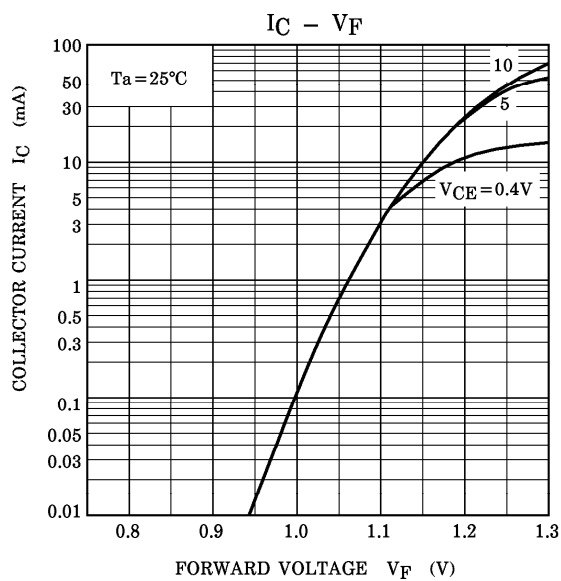
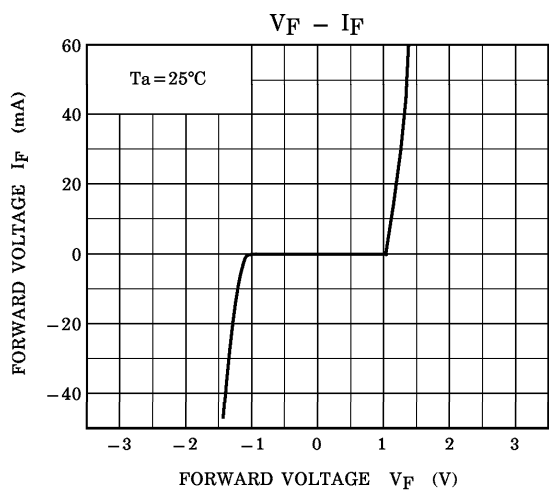
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	tr	VCC=10V IC=2mA RL=100Ω	—	2	—	μs
Fall Time	tf		—	3	—	
Turn-on Time	ton		—	3	—	
Turn-off Time	toff		—	3	—	
Turn-on Time	tON	RL=1.9kΩ (Fig.1) VCC=5V, IF=±16mA	—	2	—	μs
Storage Time	ts		—	15	—	
Turn-off Time	tOFF		—	25	—	

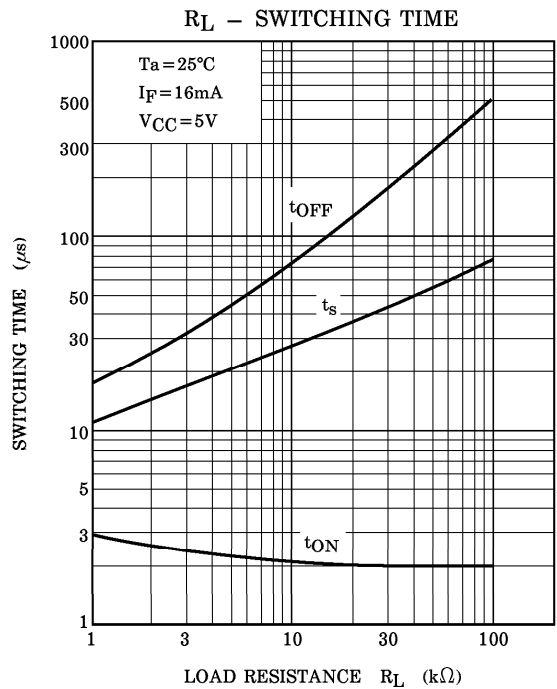
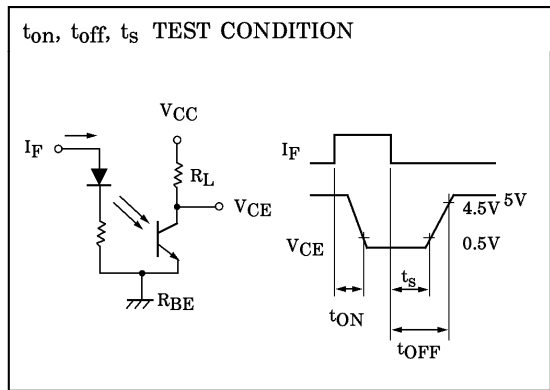
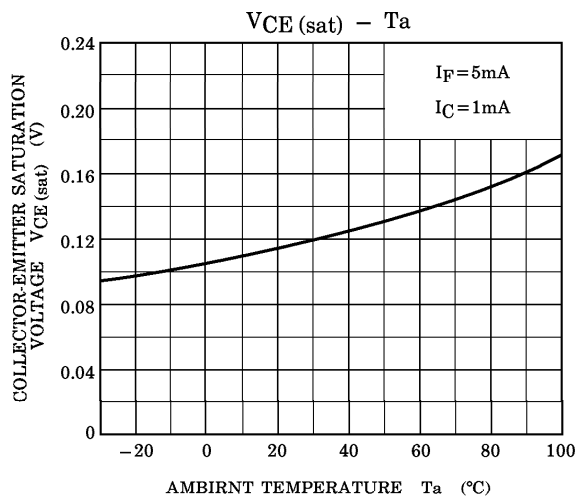
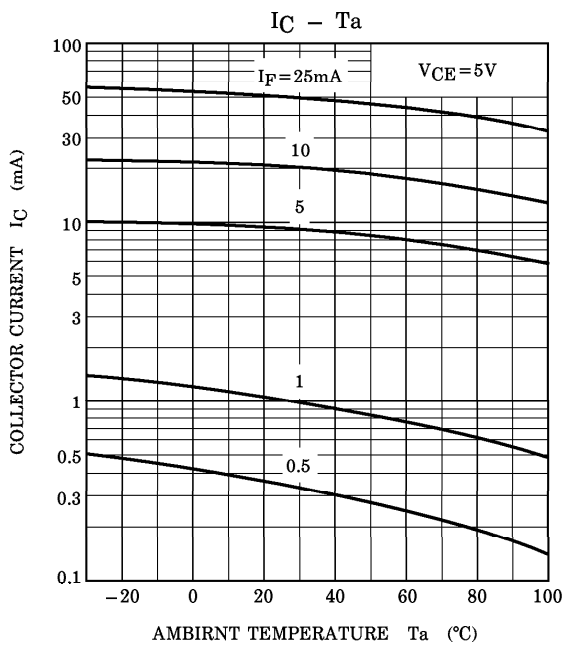
Fig.1 Switching Time Test Circuit











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000707EBC

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