

TOSHIBA Photocoupler GaAs Ired & Photo-Transistor

TLP620, TLP620-2, TLP620-4

Programmable Controllers

AC / DC-Input Module

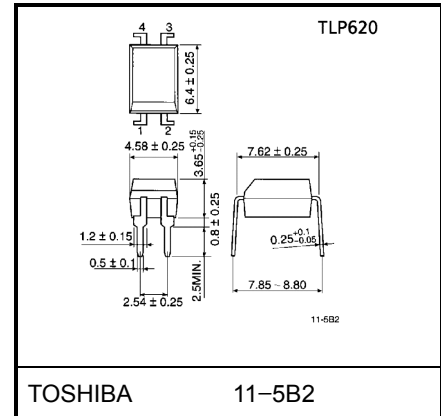
Telecommunication

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.

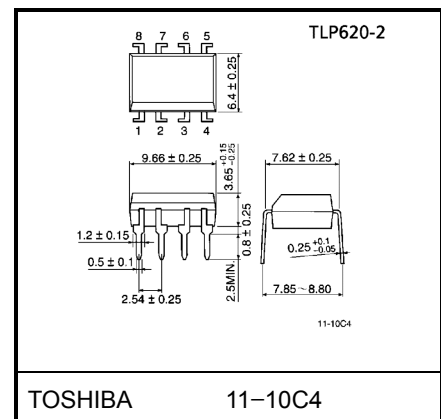
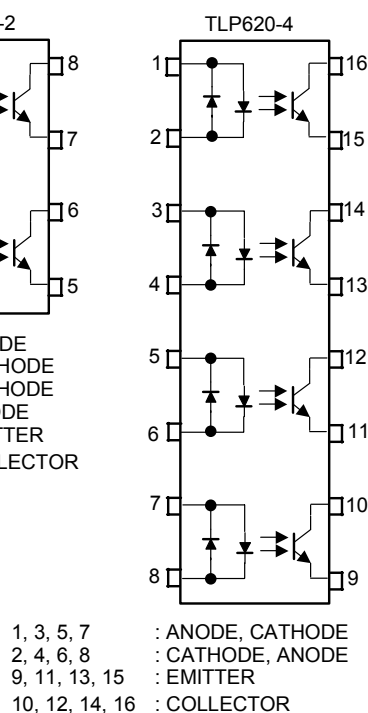
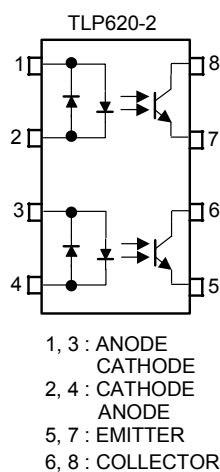
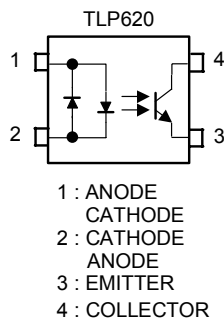
- Collector-emitter voltage: 55V (min.)
- Current transfer ratio: 50% (min.)
- Rank GB: 100% (min.)

Unit in mm

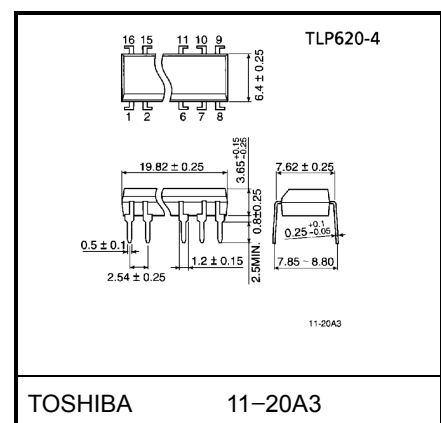


Weight: 0.26 g

Pin Configurations (top view)



Weight: 0.54 g



Weight: 1.1 g

	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	—

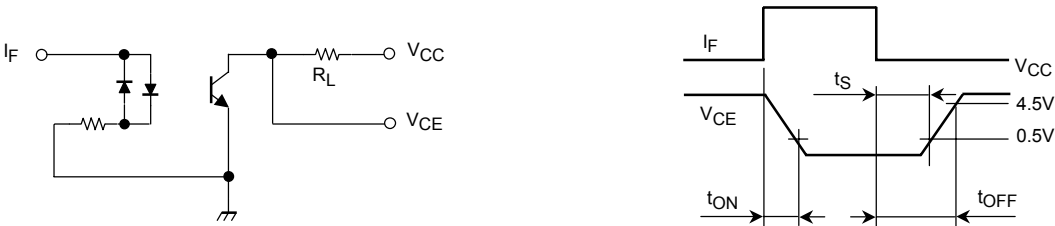
Isolation Characteristics (Ta = 25°C)

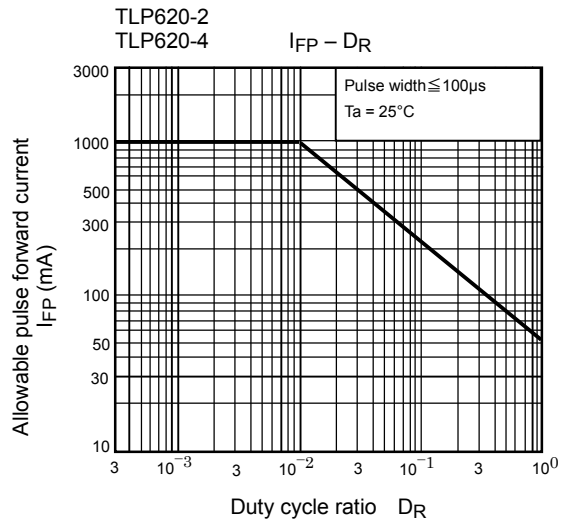
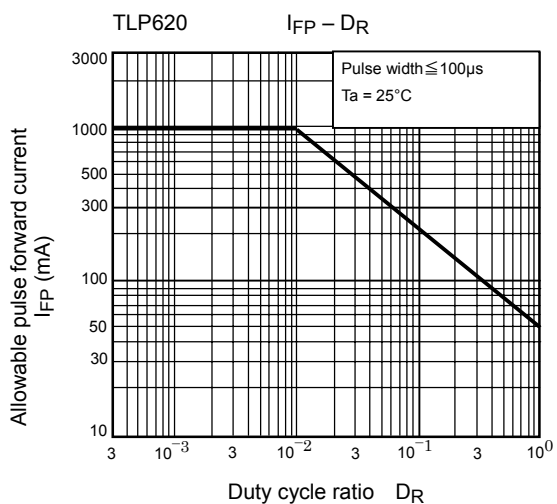
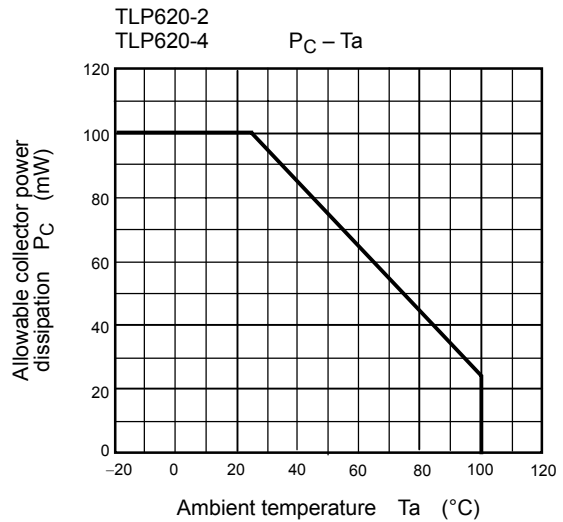
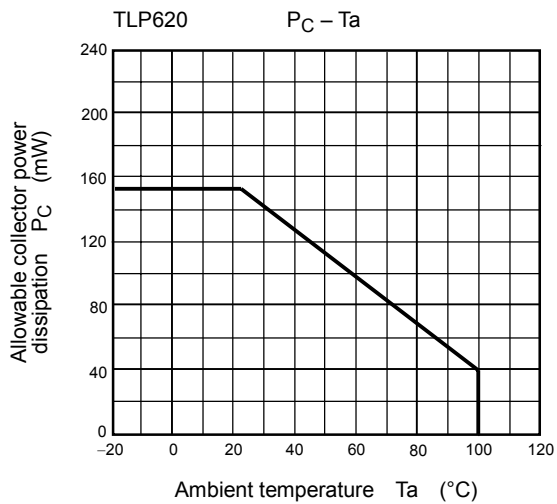
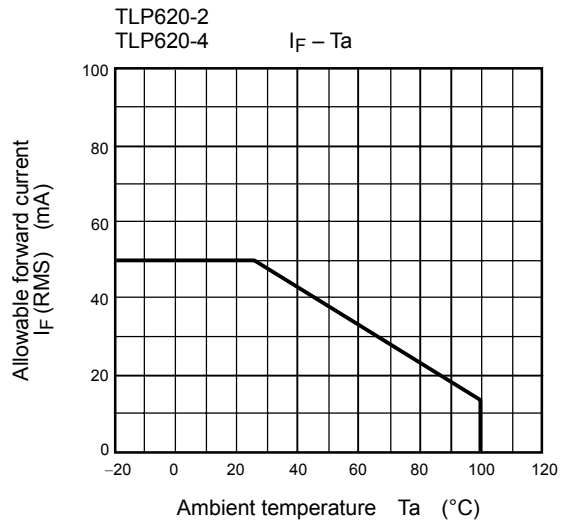
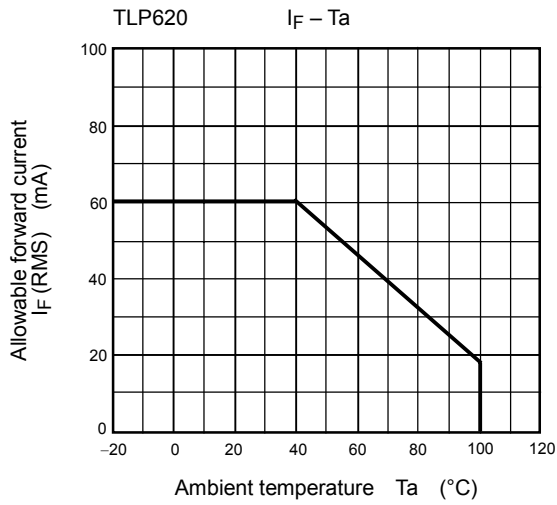
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance input to output	C_S	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF
Isolation resistance	R_S	$V_S = 500\text{V}$	1×10^{12}	10^{14}	—	Ω
Isolation voltage	BV_S	AC, 1 minute	5000	—	—	V_{rms}
		AC, 1 second, in oil	—	10000	—	
		DC, 1 minute, in oil	—	10000	—	V_{dc}

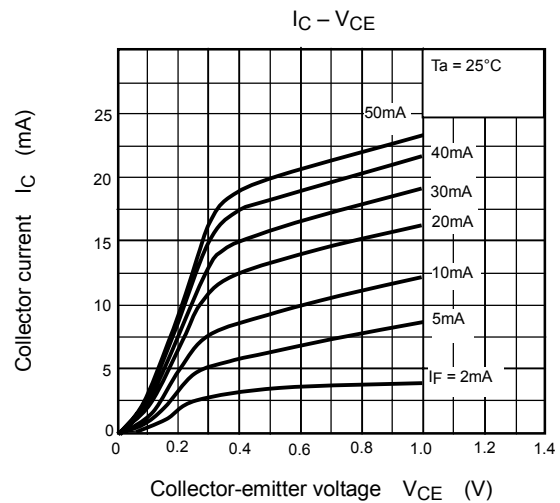
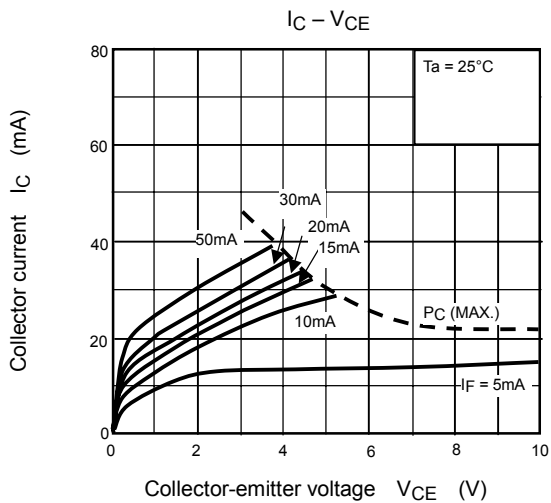
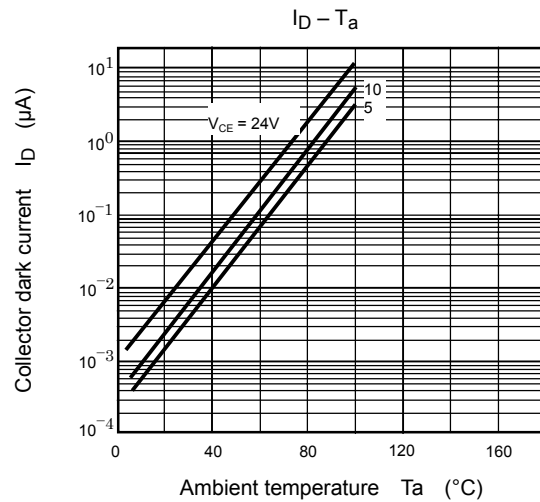
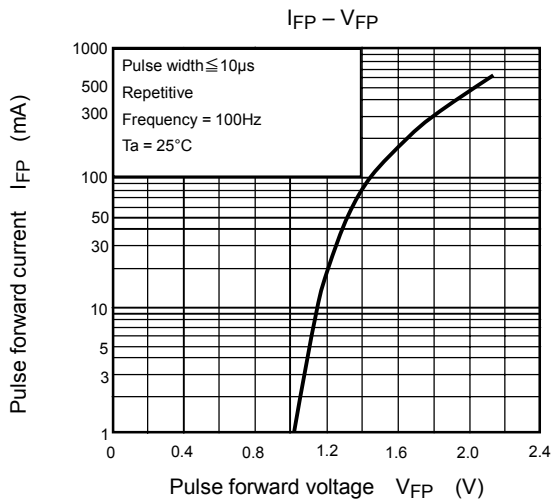
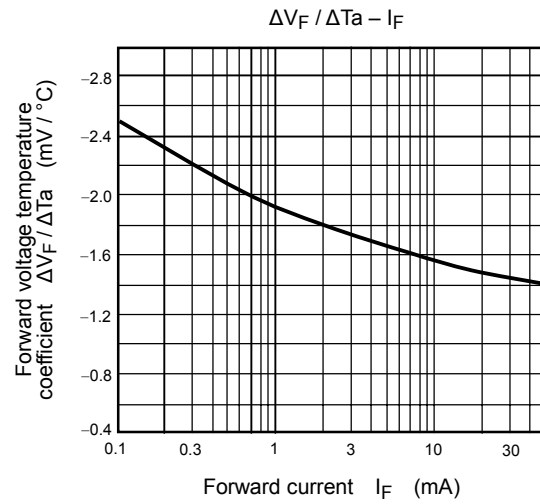
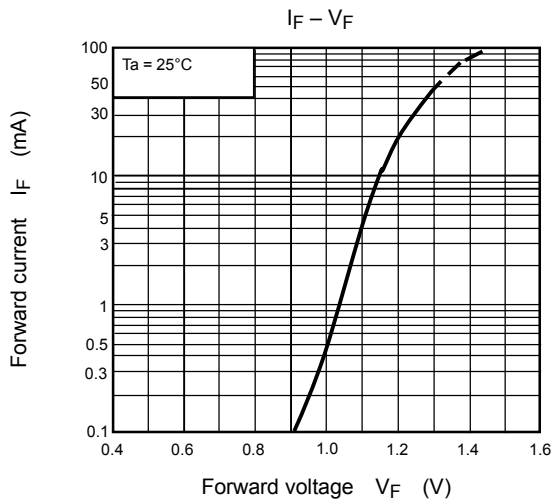
Switching Characteristics (Ta = 25°C)

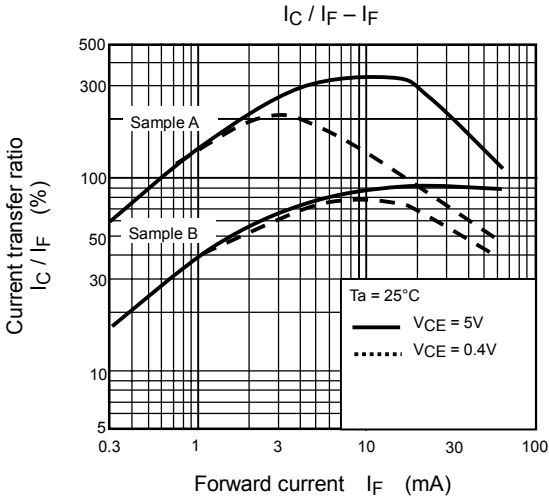
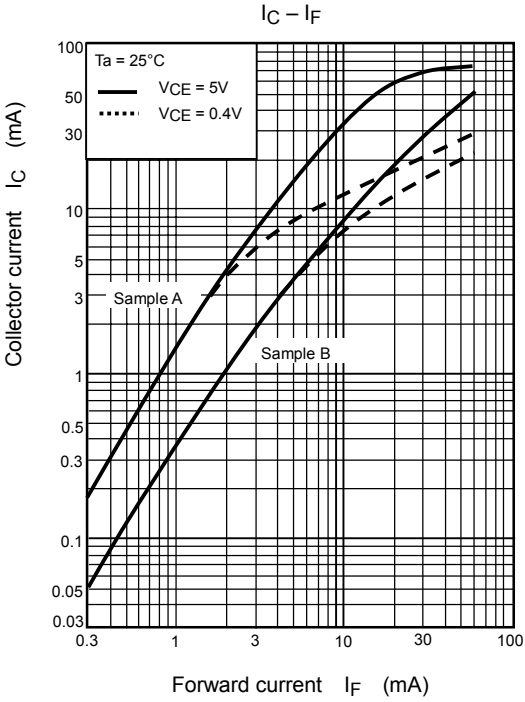
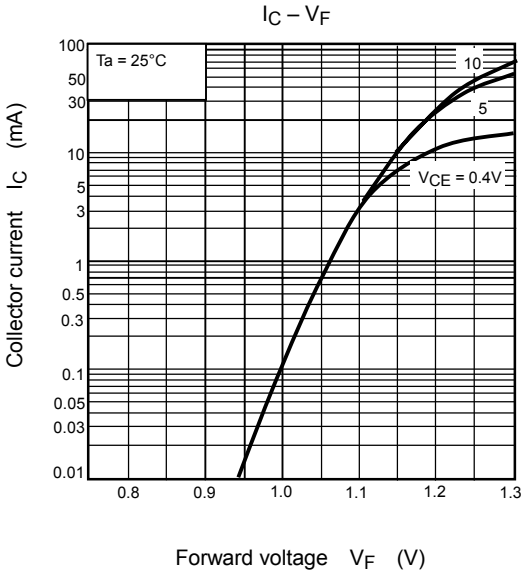
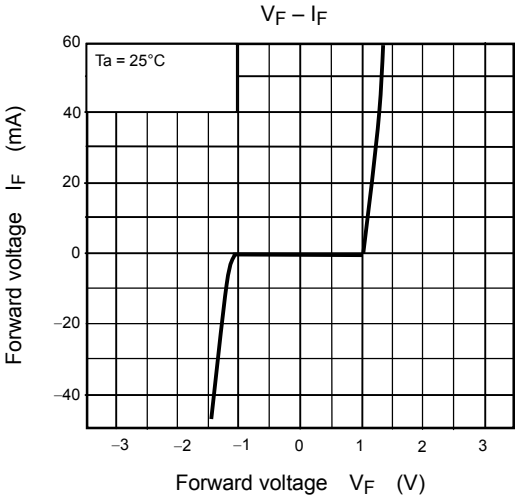
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Rise time	t_r	$V_{CC} = 10\text{V}$ $I_C = 2\text{mA}$ $R_L = 100\Omega$	—	2	—	μs
Fall time	t_f		—	3	—	
Turn-on time	t_{on}		—	3	—	
Turn-off time	t_{off}		—	3	—	
Turn-on time	t_{ON}	$R_L = 1.9\text{k}\Omega$ $V_{CC} = 5\text{V}, I_F = \pm 16\text{mA}$ (Fig.1)	—	2	—	μs
Storage time	t_s		—	15	—	
Turn-off time	t_{OFF}		—	25	—	

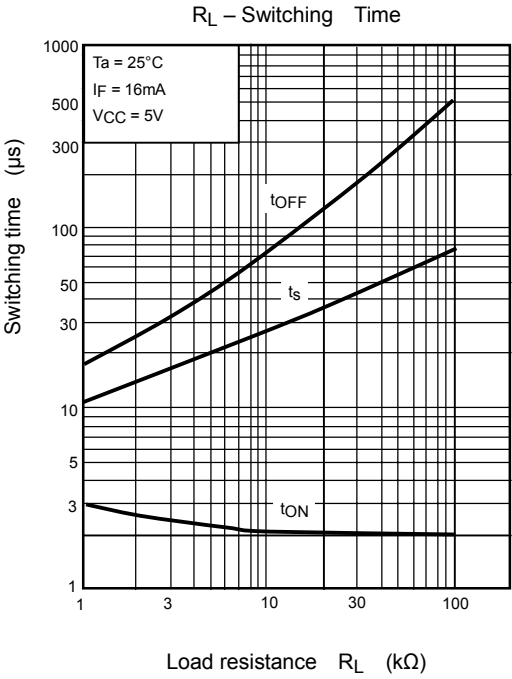
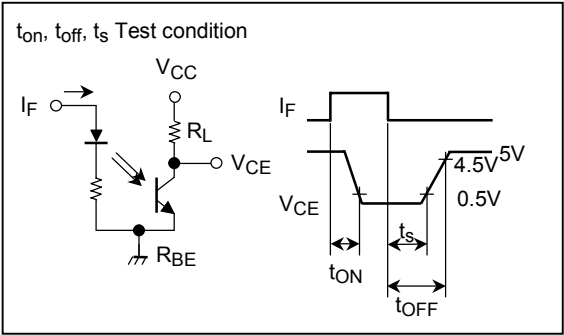
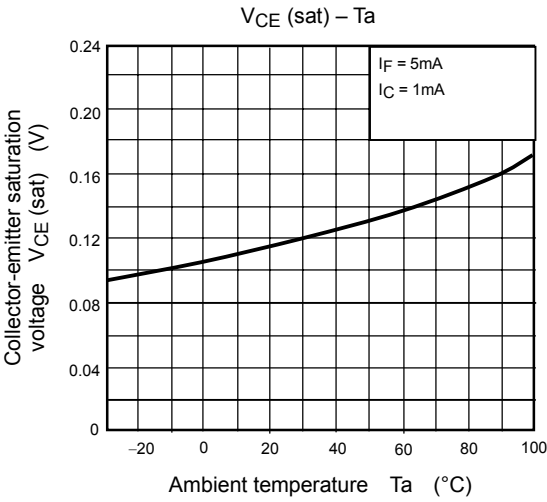
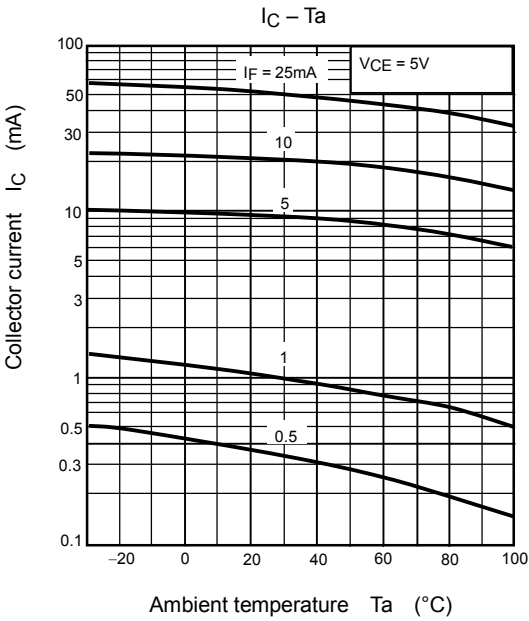
Fig. 1 Switching time test circuit











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