TOSHIBA Photocoupler GaAs Ired & Photo−Transistor

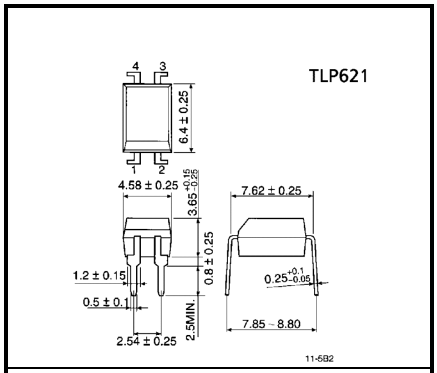
TLP621,TLP621−2,TLP621−4

Programmable Controller

AC / DC−Input Module

Solid State Relay

Unit in mm



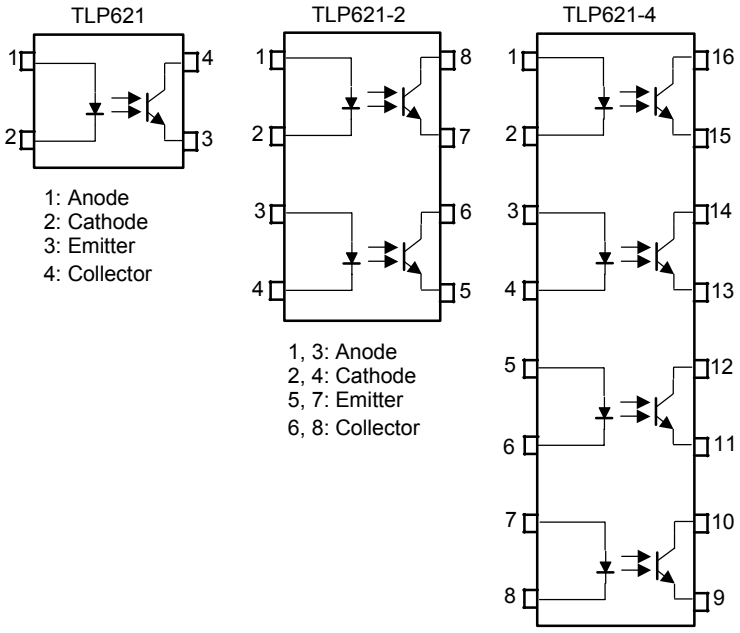
TOSHIBA 11−5B2

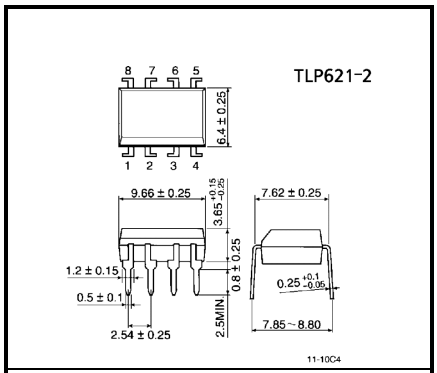
Weight: 0.26 g

The TOSHIBA TLP621, −2 and −4 consists of a photo−transistor optically coupled to a gallium arsenide infrared emitting diode.
The TLP621−2 offers two isolated channels in an eight lead plastic DIP, which the TLP621−4 provides four isolated channels in a sixteen plastic DIP.

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

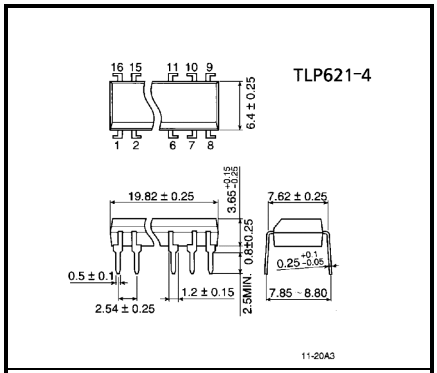
Pin Configurations (top view)





TOSHIBA 11−10C4

Weight: 0.54 g



TOSHIBA 11−20A3

Weight: 1.1 g

● Current Transfer Ratio

Type	Classification *1	Current Transfer Ratio (%) (I_C / I_F) I_F = 5mA, V_{CE} = 5V, Ta = 25°C		Marking Of Classification
		Min.	Max.	
TLP621	(None)	50	600	Blank, Y, Y■, G, G■, B, B■, GB
	Rank Y	50	150	Y, Y■
	Rank GR	100	300	G, G■
	Rank BL	200	600	B, B■
	Rank GB	100	600	G, G■, B, B■, GB
TLP621−2 TLP621−4	(None)	50	600	Blank, GR, BL, GB
	Rank GB	100	600	GR, BL, GB

*1: Ex. rank GB: TLP621 (GB)

(Note) Application type name for certification test, please use standard product type name, i.e.
TLP621 (GB): TLP621
TLP621−2 (GB): TLP621−2

	Made In Japan		Made In Thailand	
UL recognized	E67349	*2	E152349	*2
BSI approved	6508, 7445	*3	6505, 7445	*3
SEMKO approved	9735090 / 01	*4	—	

*2 UL1577
*3 BS EN60065: 1994, BS EN60950: 1992
*4 EN60950 (approved is TLP621 only)

- Option (D4) type

  VDE approved: DIN VDE0884 / 06.92, certificate no. 68384

  Maximum operating insulation voltage: 890 V_{PK}

  Highest permissible over voltage: 8000 V_{PK}

  (Note) When a VIDE0884 approved type is needed, please disignate the “Option (D4)”

	7.62 mm pich standard type	10.16 mm pich (LF2) type
• Creepage distance	: 6.4 mm (min.)	8.0 mm (min)
Clearance	: 6.4 mm (min.)	8.0 mm (min)
Insulation thickness	: 0.4 mm (min.)	0.4 mm (min)

Maximum Ratings (Ta = 25°C)

Characteritic		Symbol	Rating		Unit
			TLP621	TLP621−2 TLP621−4	
LED	Forward current	I_F	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	P_D	100	70	mW
	Power dissipation derating	ΔP_D /°C	−1.0	−0.7	mW /°C
	Reverse voltage	V_R	5		V
	Junction temperature	T_j	125		°C
Detector	Collector−emitter voltage	V_{CEO}	55		V
	Emitter−collector valtage	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_{sol}	260 (10 s)		°C
Total package power dissipation		P_T	250	150	mW
Total package power dissipation derating (Ta ≥ 25°C)		ΔP_T /°C	−2.5	−1.5	mW /°C
Isolation voltage	(Note 1)	BV_S	5000 (AC, 1min., R.H.≤ 60%)		V_{rms}

(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	—	16	20	mA
Collector current	I_C	—	1	10	mA
Operating temperature	T_{opr}	−25	—	85	°C

Individual Electrical Characteristics (Ta = 25°C)

	Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
LED	Forward voltage	V_F	I_F = 10 mA	1.0	1.15	1.3	V
	Reverse current	I_R	V_R = 5 V	—	—	10	μA
	Capacitance	C_T	V = 0, f = 1 MHz	—	30	—	pF
Detector	Collector−emitter breakdown voltage	$V_{(BR)\ CEO}$	I_C = 0.5 mA	55	—	—	V
	Emitter−collector breakdown voltage	$V_{(BR)\ ECO}$	I_E = 0.1 mA	7	—	—	V
	Collector dark current	I_{CEO}	V_{CE} = 24 V	—	10	100	nA
			V_{CE} = 24 V, Ta = 85°C	—	2	50	μA
	Capacitance (collector to emitter)	C_{CE}	V = 0, f = 1 MHz	—	10	—	pF

Coupled Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	MIn.	Typ.	Max.	Unit
Current transfer ratio	I_C / I_F	I_F = 5 mA, V_{CE} = 5 V	50	—	600	%
		Rank GB	100	—	600	
Saturated CTR	I_C / $I_{F\ (sat)}$	I_F = 1 mA, V_{CE} = 0.4 V	—	60	—	%
		Rank GB	30	—	—	
Collector−emitter saturation voltage	$V_{CE\ (sat)}$	I_C = 2.4 mA, I_F = 8 mA	—	—	0.4	V
		I_C = 0.2 mA, I_F = 1 mA	—	0.2	—	
		Rank GB	—	—	0.4	

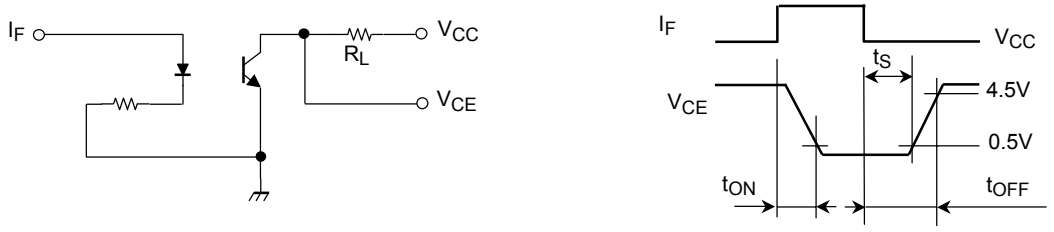
Isolation Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance (input to output)	C_S	V_S = 0, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R_S	V_S = 500 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}

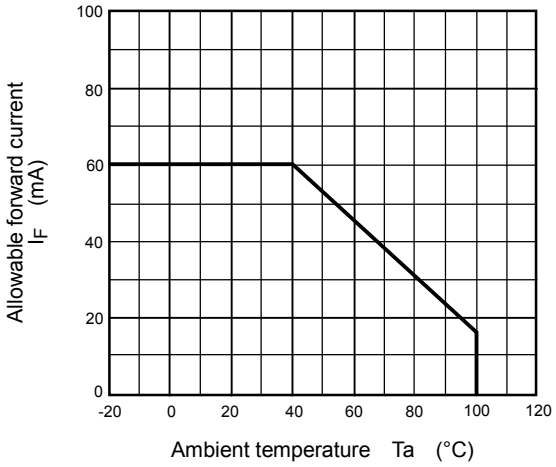
Switching Characteristics (Ta = 25°C)

Characterictic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Rise time	t_r	V_{CC} = 10 V, I_C = 2 mA R_L = 100Ω	—	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 kΩ (Fig.1) V_{CC} = 5 V, I_F = 16 mA	—	2	—	μs
Storage time	t_S		—	15	—	
Turn−off time	t_{OFF}		—	25	—	

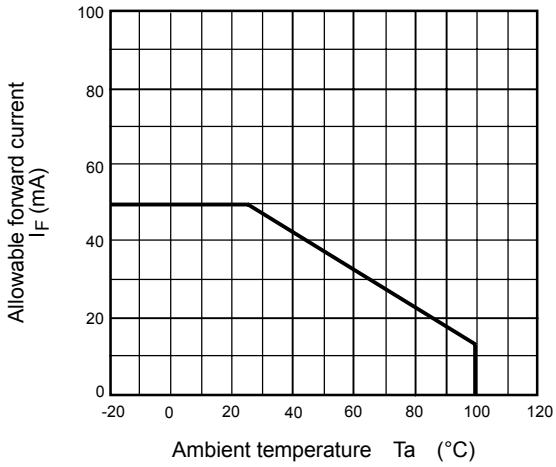
Fig. 1 Switching time test circuit



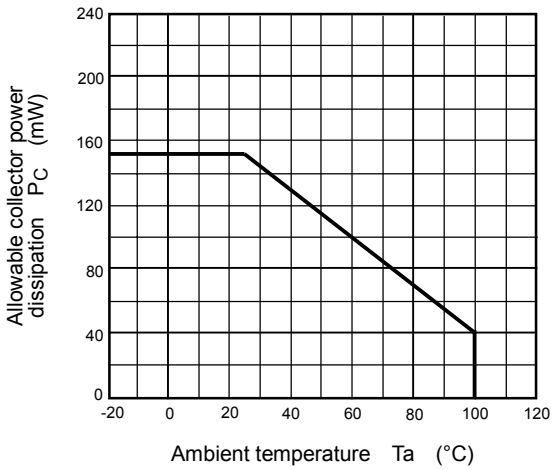
TLP621 $I_F - T_a$



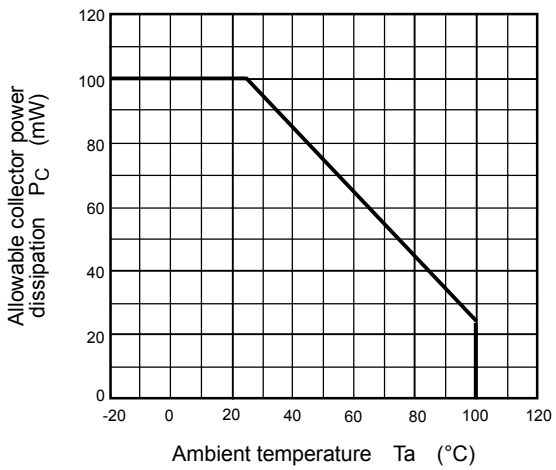
TLP621-2
TLP621-4 $I_F - T_a$



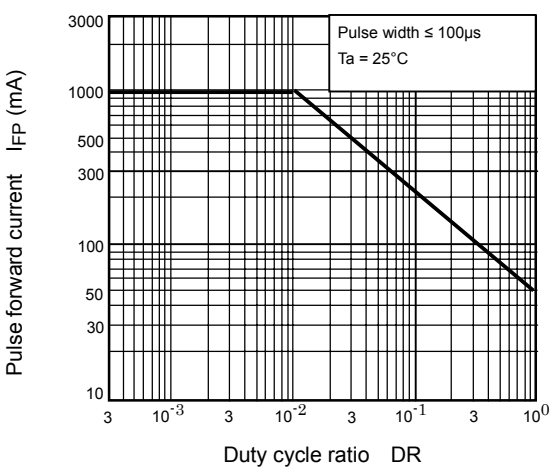
TLP621 $P_C - T_a$



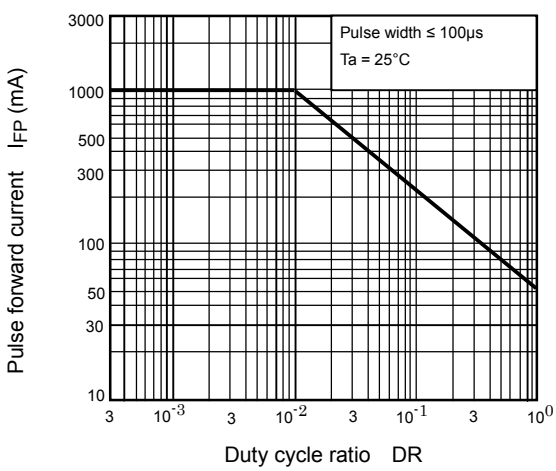
TLP621-2
TLP621-4 $P_C - T_a$



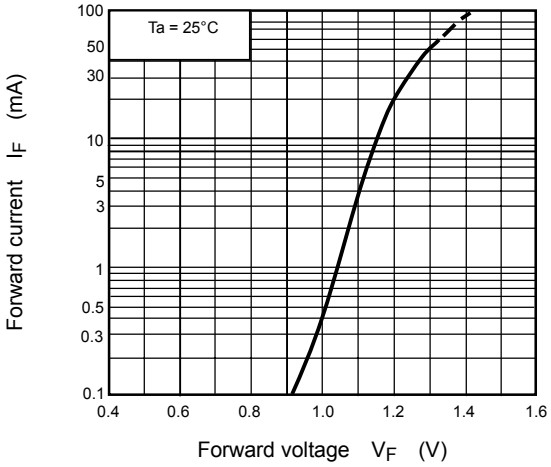
TLP621 $I_{FP} - D_R$



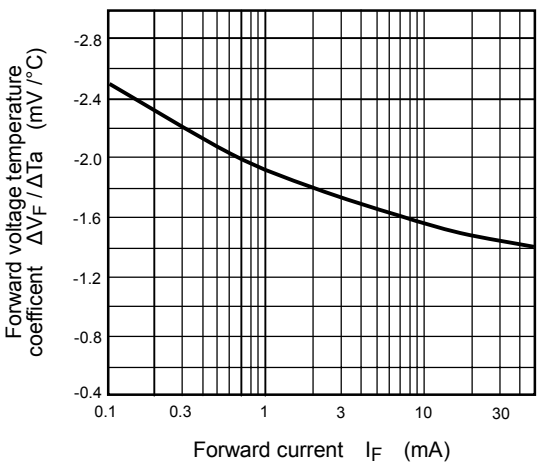
TLP621-2
TLP621-4 $I_{FP} - D_R$



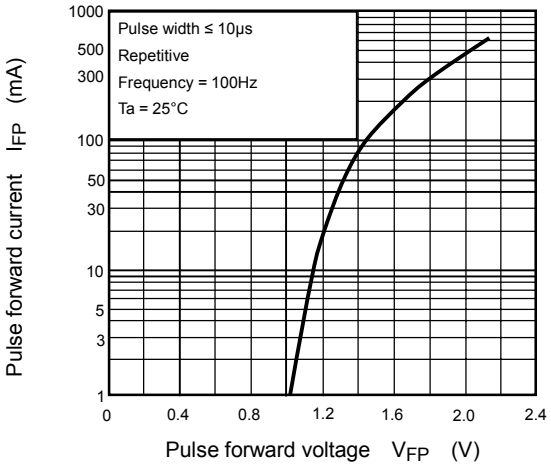
$I_F - V_F$



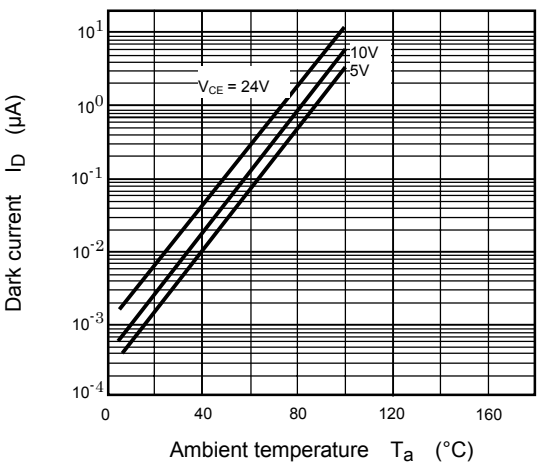
$\Delta V_F / \Delta Ta - I_F$



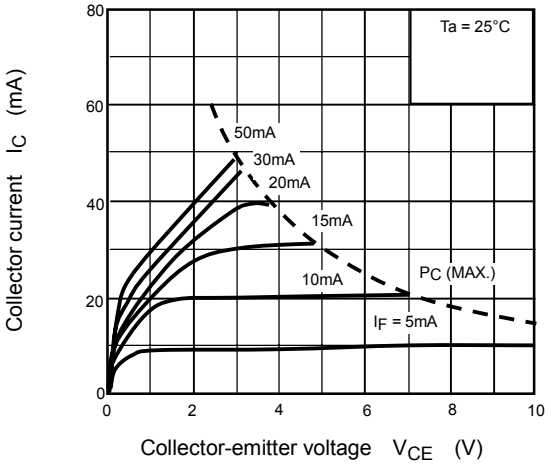
$I_{FP} - V_{FP}$



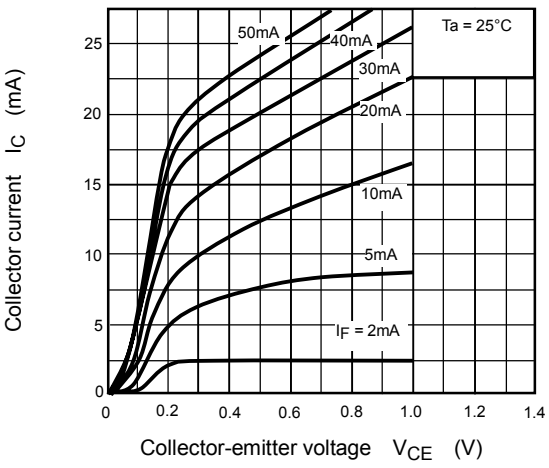
$I_D - T_a$



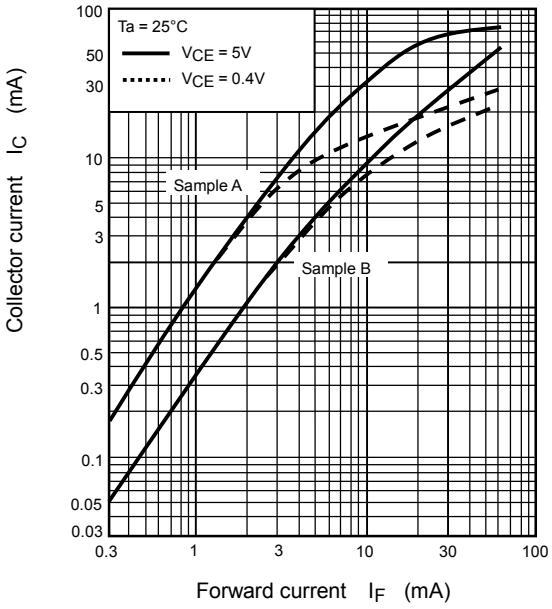
$I_C - V_{CE}$



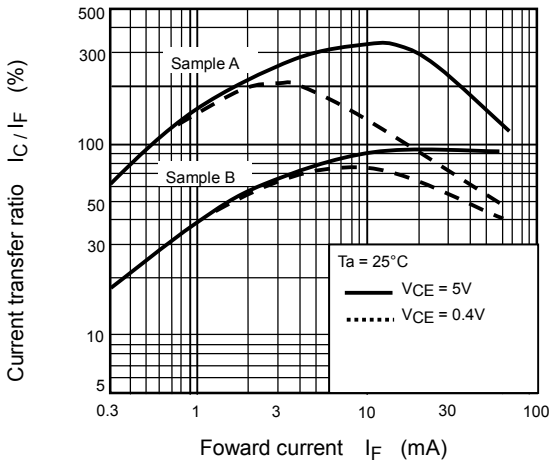
$I_C - V_{CE}$



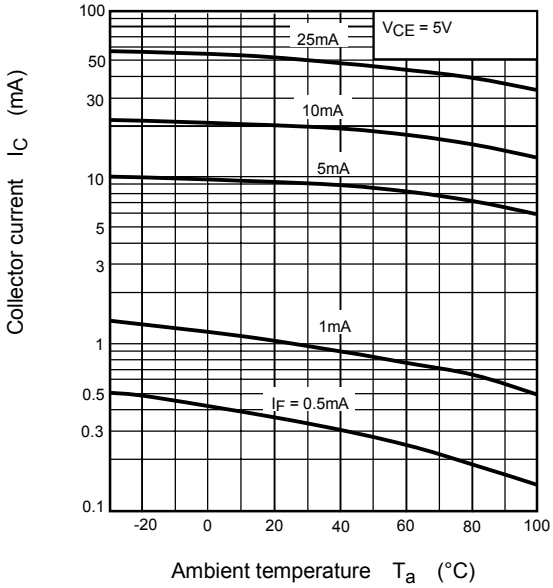
$I_C - I_F$



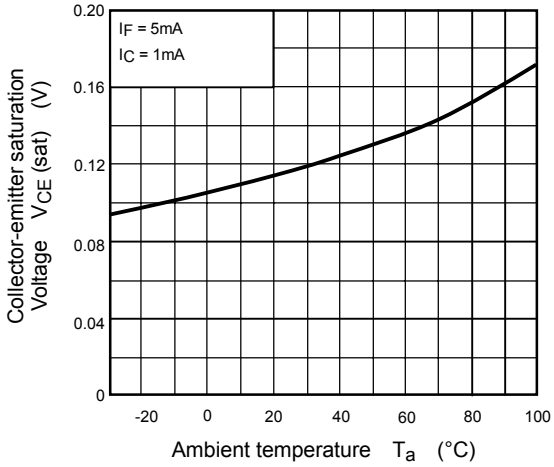
$I_C / I_F - I_F$



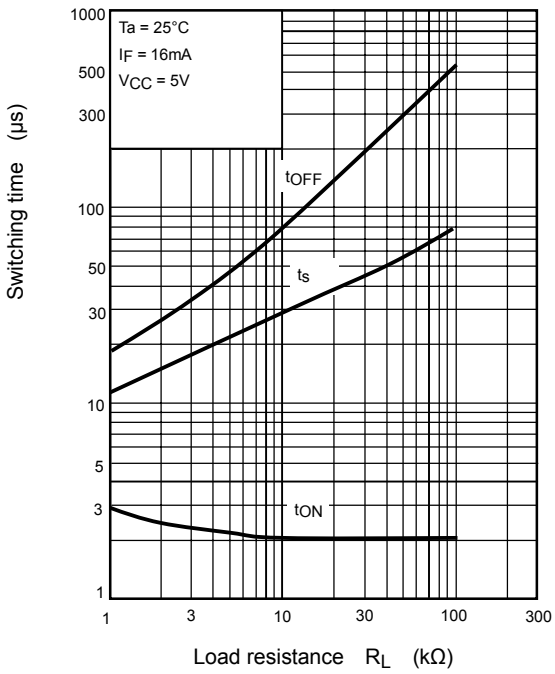
$I_C - T_a$



V_{CE} (sat) – T_a



Switchingtime – R_L



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000707EBC

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