

TLP621, TLP621-2, TLP621-4

Programmable Controller

AC / DC-Input Module

Solid State Relay

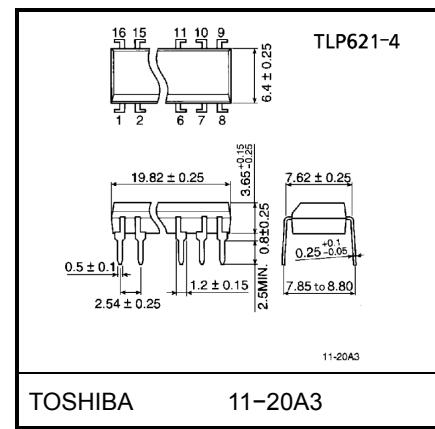
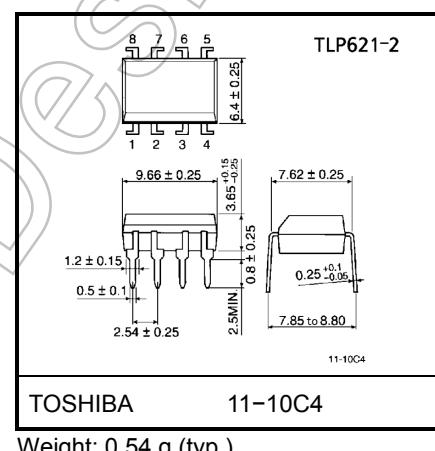
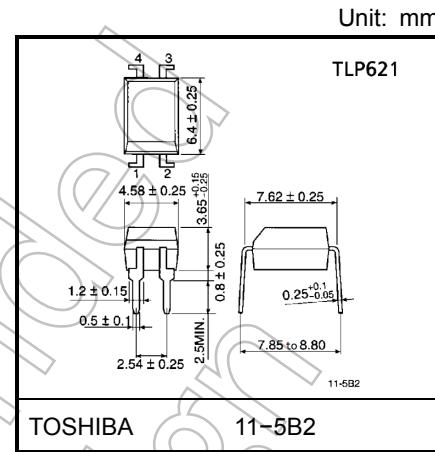
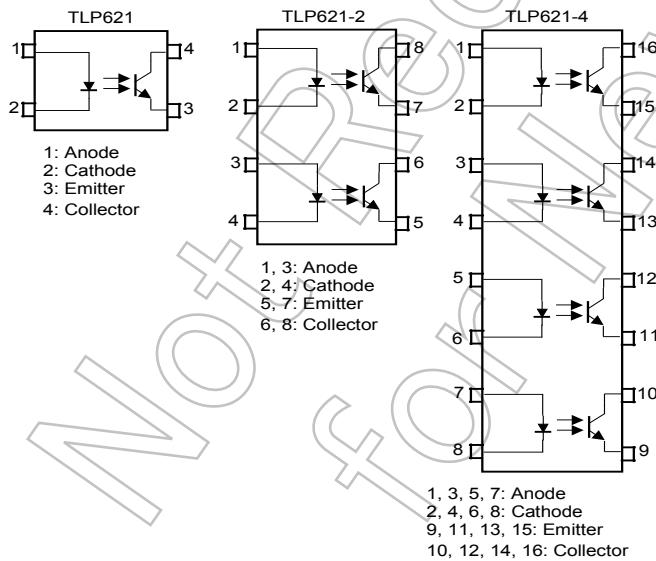
The TOSHIBA TLP621, -2 and -4 consists of a photo-transistor optically coupled to an infrared emitting diode.

The TLP621-2 offers two isolated channels in an eight lead plastic DIP, which the TLP621-4 provides four isolated channels in a sixteen lead plastic DIP.

- Collector-emitter voltage: 55 V (min.)
- Current transfer ratio: 50% (min.)
Rank GB: 100% (min.)
- Isolation voltage : 5000Vrms(min)
- UL-recognized: UL 1577, File No.E67349
- cUL-approved: CSA Component Acceptance Service No.5A
File No.E67349
- VDE-approved: EN 60747-5-5 (Note 1)

Note 1 :When a VDE approved type is needed,
please designate the **Option (D4)**.

Pin Configurations (top view)



	7.62 mm pitch standard type	10.16 mm pitch TLPxxxF 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.)

Start of commercial production
1983-02

• Current Transfer Ratio

Type	Classi- fication *1	Current Transfer Ratio (%) (I_C / I_F)		Marking Of Classification	
		$I_F = 5mA, V_{CE} = 5V, Ta = 25^\circ C$			
		Min.	Max.		
TLP621	(None)	50	600	Blank, Y [■] , YE, G, G [■] , GR, B, BL, GB	
	Rank Y	50	150	YE, Y [■]	
	Rank GR	100	300	GR, G, G [■]	
	Rank BL	200	600	BL, B	
	Rank GB	100	600	GB, GR, G, G [■] , BL, B	
	Rank YH	75	150	Y [■]	
	Rank GRL	100	200	G	
	Rank GRH	150	300	G [■]	
	Rank BLL	200	400	B	
TLP621-2 TLP621-4	(None)	50	600	Blank, GR, BL, GB	
	Rank GB	100	600	GB, GR, BL	

*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

Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating		Unit
		TLP621	TLP621-2 TLP621-4	
LED	Forward current	IF	60	50
	Forward current derating (Note 1)	ΔIF /°C	-0.7 (Ta ≥ 39°C)	-0.5 (Ta ≥ 25°C)
	Pulse forward current	IFP	1 (100μs pulse, 100pps)	A
	Power dissipation	PD	100	70
	Power dissipation derating	ΔPD /°C	-1.0(Ta ≥ 39°C)	-0.7(Ta ≥ 25°C)
	Reverse voltage	VR	5	V
Detector	Junction temperature	Tj	125	°C
	Collector-emitter voltage	VCEO	55	V
	Emitter-collector voltage	VECO	7	V
	Collector current	Ic	50	mA
	Collector power dissipation (1 circuit)	Pc	150	100
	Collector power dissipation derating (1 circuit, Ta ≥ 25°C)	ΔPc /°C	-1.5	-1.0
	Junction temperature	Tj	125	°C
	Storage temperature range	Tstg	-55 to 125	°C
	Operating temperature range	Topr	-55 to 100	°C
	Lead soldering temperature	Tsol	260 (10 s)	°C
	Total package power dissipation	PT	250	150
	Total package power dissipation derating (Ta ≥ 25°C)	ΔPT /°C	-2.5	-1.5
Isolation voltage (Note 2)		BVs	5000 (AC, 60 s., R.H.≤ 60 %)	Vrms

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

Note 1 : Pw = 100 μs(max), f = 100 Hz

Note 2 : 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	VCC	—	5	24	V
Forward current	IF	—	16	20	mA
Collector current	Ic	—	1	10	mA
Operating temperature	Topr	-25	—	85	°C

Note: Recommended operating conditions are given as a design guideline to obtain expected performance of the device. Additionally, each item is an independent guideline respectively. In developing designs using this product, please confirm specified characteristics shown in this document.

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 V, 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 V, 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	%
			100	—	600	
Saturated CTR	I _C / I _F (sat)	I _F = 1 mA, V _{CE} = 0.4 V	—	60	—	%
			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	—	
			—	—	0.4	

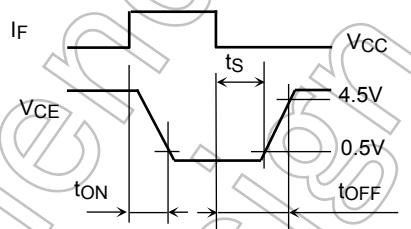
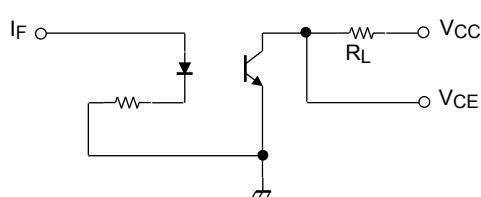
Isolation Characteristics (Ta = 25°C)

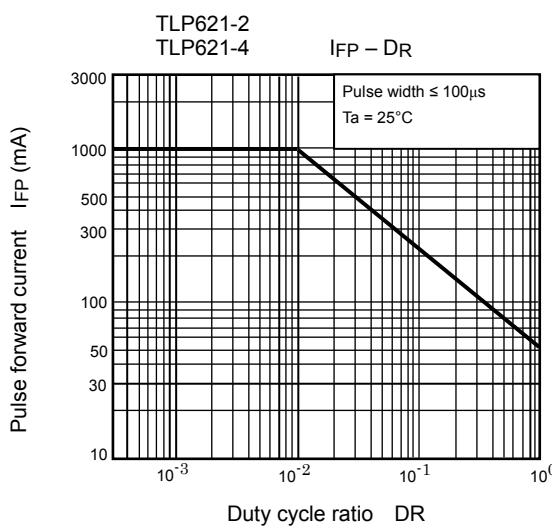
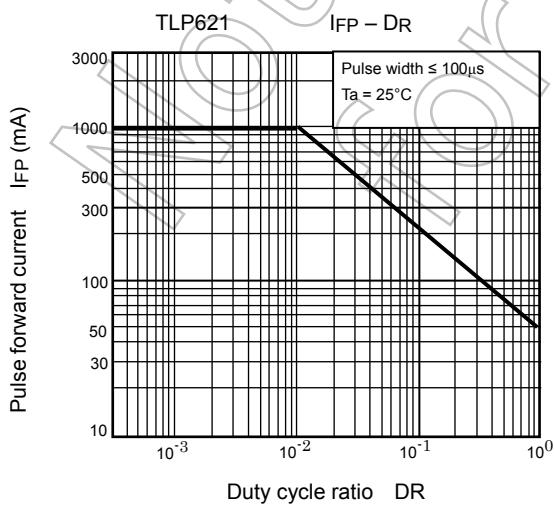
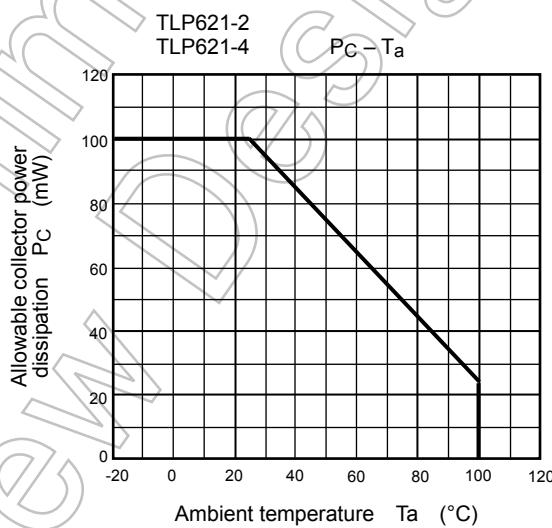
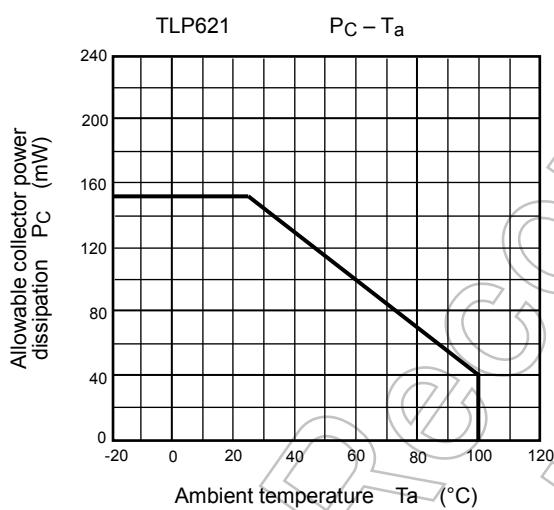
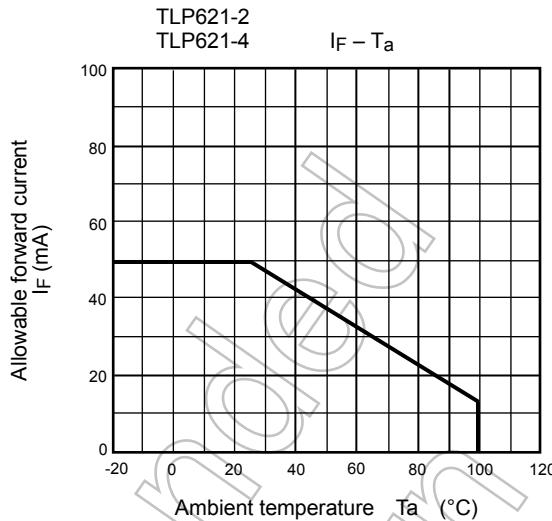
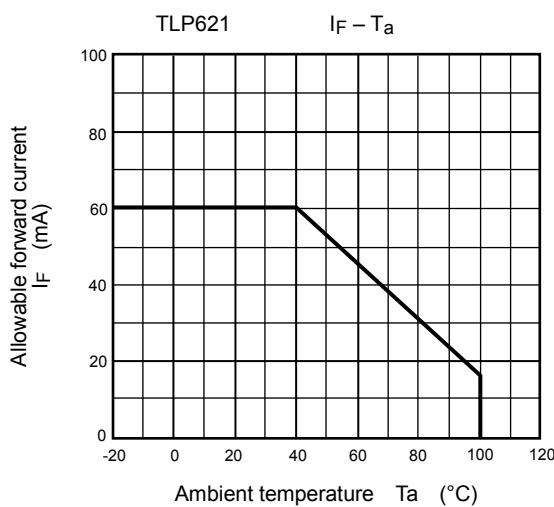
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Capacitance (input to output)	C _S	V _S = 0 V, f = 1 MHz	—	0.8	—	pF
Isolation resistance	R _S	V _S = 500 V, R.H. ≤ 60 %	1×10 ¹²	10 ¹⁴	—	Ω
Isolation voltage	BV _S	AC, 60 s	5000	—	—	V _{rms}

Switching Characteristics ($T_a = 25^\circ\text{C}$)

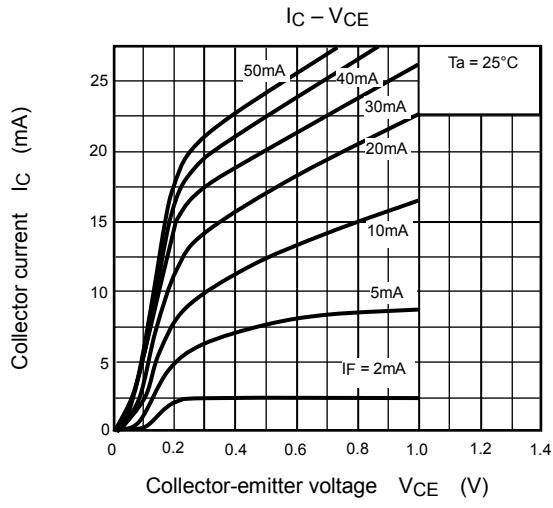
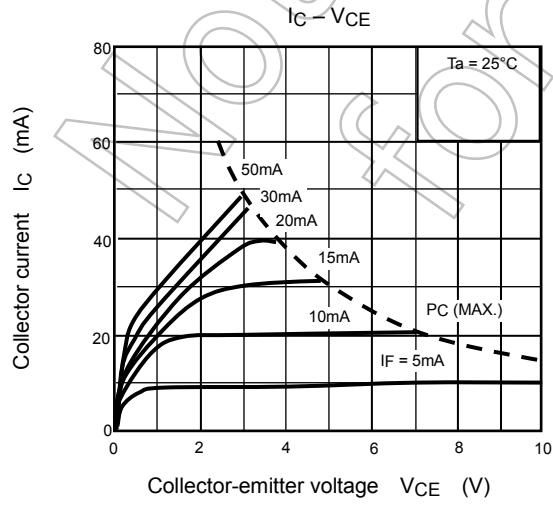
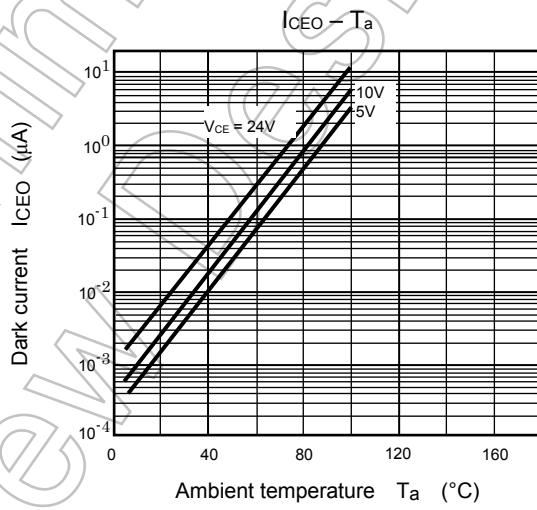
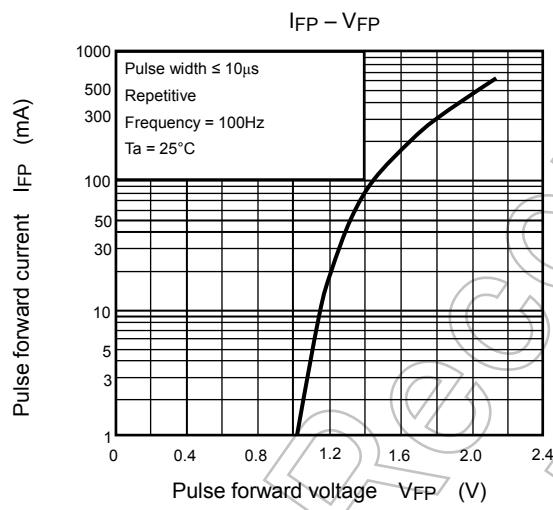
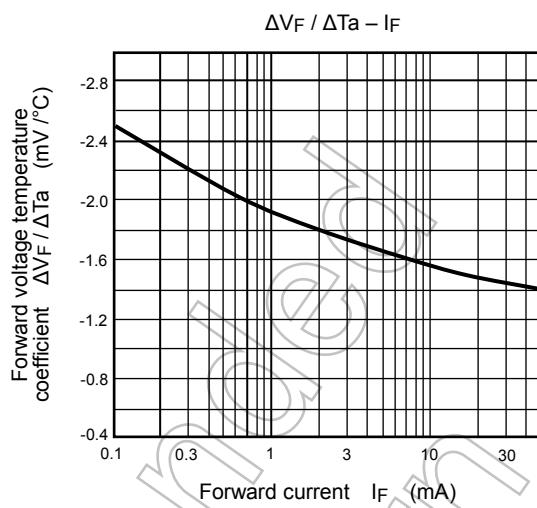
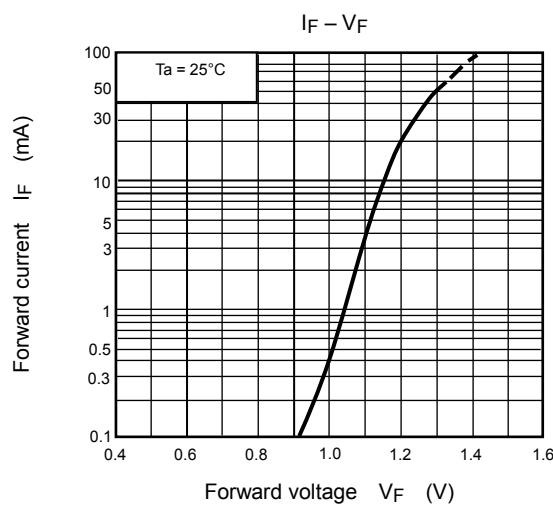
Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Rise time	t_r	$V_{CC} = 10\text{ V}, I_C = 2\text{ mA}$ $R_L = 100\text{ }\Omega$	—	2	—	μs
Fall time	t_f		—	3	—	
Turn-on time	t_{on}		—	3	—	
Turn-off time	t_{off}		—	3	—	
Turn-on time	t_{ON}	$R_L = 1.9\text{ k}\Omega$ $V_{CC} = 5\text{ V}, I_F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

Note 1 Switching time test circuit

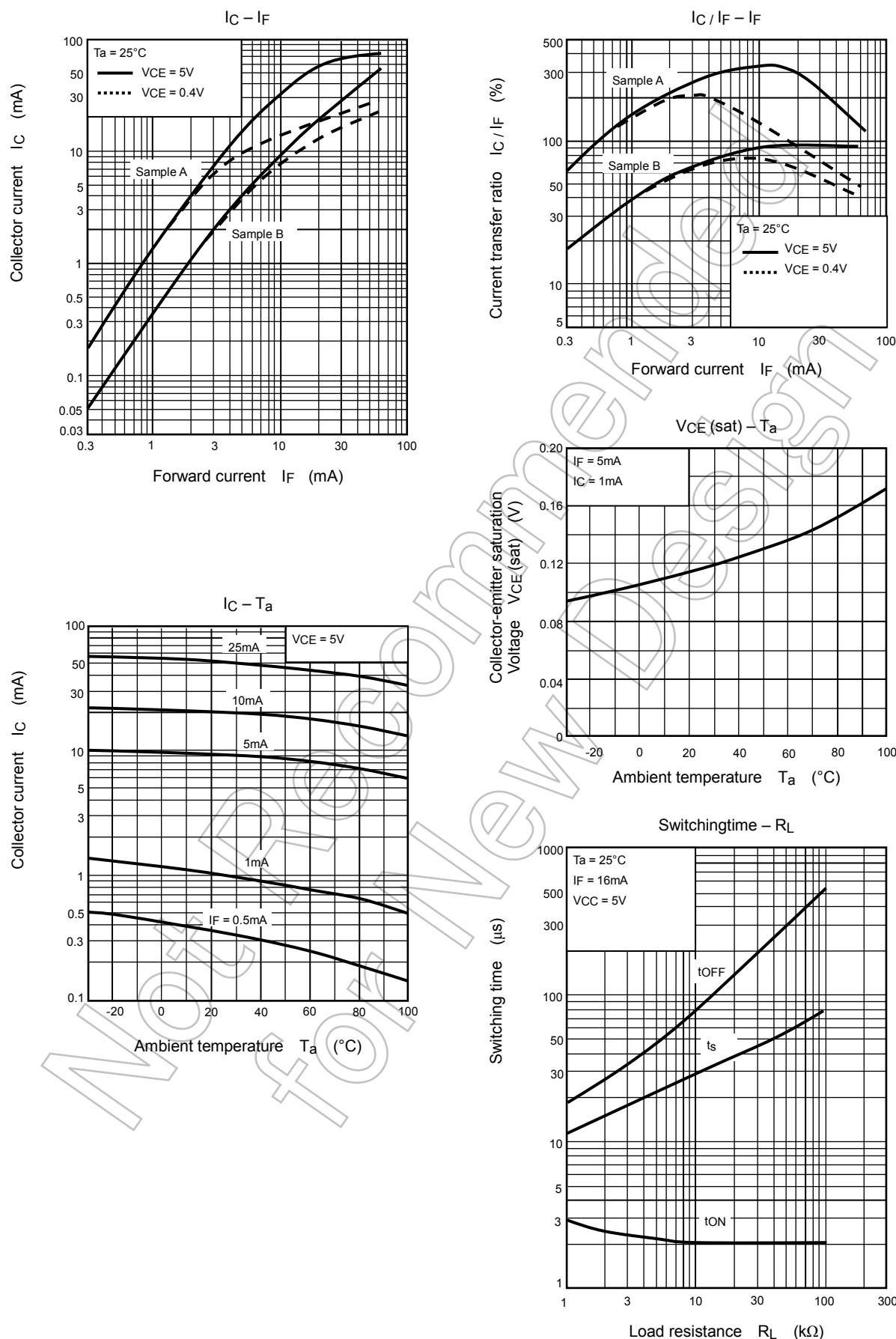




NOTE: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.



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