TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

TLP627,TLP627-2,TLP627-4

Unit in mm

PROGRAMMABLE CONTROLLERS
DC-OUTPUT MODULE
TELECOMMUNICATION

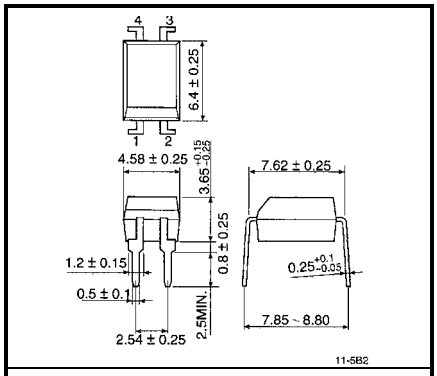
The TOSHIBA TLP627,-2 and -4 consists of a gallium arsenide infrared emitting diode optically coupled to a darlington connected phototransistor which has an integral base-emitter resistor to optimize switching speed and elevated temperature characteristics.

The TLP627-2 offers two isolated channels in a eight lead plastic DIP, while the TLP627-4 provide four isolated channels per package.

- Collector-Emitter Voltage : 300V(Min)
- Current Transfer Ratio : 1000%(Min)
- Isolation Voltage : 5000Vrms(Min)
- UL Recognized : UL1577,File No.E67349

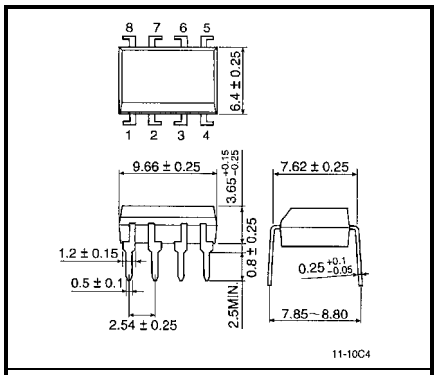
	MADE IN JAPAN		MADE IN THAILAND	
UL Recognized	E67349	*1	E152349	*1
BSI Approved	7426, 7426	*2	7426, 7426	*2

*1 UL1577
*2 BS EN60065 : 1994,BS EN60950: 1992



TOSHIBA 11−5B2

Weight: 0.26 g

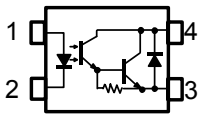


TOSHIBA 11−10C4

Weight: 0.54 g

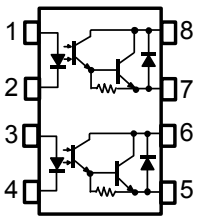
PIN CONFIGURATION (TOP VIEW)

TLP627



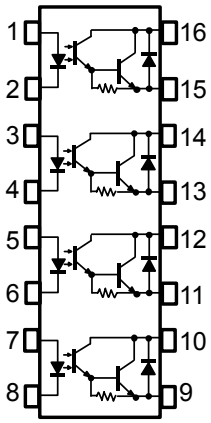
1: ANODE
2: CATHODE
3: EMITTER
4:COLLECTOR

TLP627-2

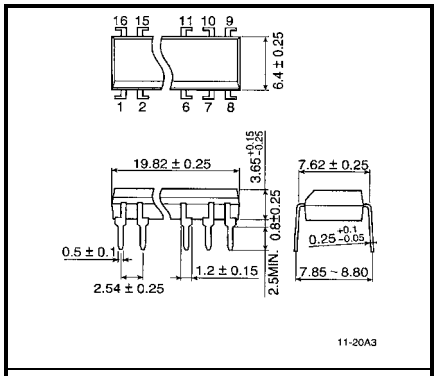


1,3: ANODE
2,4: CATHODE
5,7: EMITTER
6,8:COLLECTOR

TLP627-4



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



TOSHIBA 11−20A3

Weight: 1.1 g

MAXIMUM RATINGS(Ta=25°C)

CHARACTERISTIC			SYMBOL	RATING		UNIT
				TLP627	TLP627-2 TLP627-4	
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	(1 Circuit)	P_D	100	70	mW
	Power Dissipation Derating (Ta≥25°C,1 Circuit)		ΔP_D /°C	-1.0	-0.7	mW /°C
	Reverse Voltage		V_R	5		V
	Junction Temperature		Tj	125		°C
DETECTOR	Collector-Emitter Voltage		V_{CEO}	300		V
	Emitter -Collector Voltage		V_{ECO}	0.3		V
	Collector Current		I_C	150		mA
	Collector Power Dissipation	(1 Circuit)	P_C	150(*300)	100	mW
	Collector Power Dissipation Derating	(Ta≥25°C,1 Circuit)	ΔP_c /°C	-1.5(*-3.5)	-1.0	mW /°C
	Junction Temperature		T_j	125		°C
Operating Temperature Range			T_{opr}	−55~100		°C
Storage Temperature Range			T_{stg}	−55~125		°C
Lead Soldering Temperature (10s)			T_{sold}	260(10sec)		°C
Total Package Power Dissipation			P_T	250(*320)	150	mW
Total Package Power Dissipation Derating		(Ta≥25°C,1 Circuit)	ΔP_T/°C	-2.5(*-3.2)	-1.5	mW /°C
Isolation Voltage	(AC,1min. , R.H.≤60%)	(Note1)	BV_S	5000		Vrms

*IF=20mA Max

(Note1)Device considered a two terminal device : LED side pins Shorted together and DETECTOR side pins shorted together.

RECOMMENDED OPERATING CONDITIONS

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}	—	—	200	V
Forward Current	I_F	—	16	25	mA
Collector Current	I_C	—	—	120	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=1MHz	—	30	—	pF
DETECTOR	Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	IC = 0.1mA	300	—	—	V
	Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	IE = 0.1mA	0.3	—	—	V
	Collector Dark Current	I_{CEO}	V_{CE} = 200V	—	10	200	nA
			V_{CE} = 200V , Ta = 85°C	—	—	20	μA
	Capacitance Collector to Emitter	C_{CE}	V=0 , f=1MHz	—	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=1mA , V_{CE}=1V	1000	4000	—	%
Saturated CTR	I_C/I_F(sat)	I_F=10mA , V_{CE}=1V	500	—	—	%
Collector-Emitter Saturation Voltage	V_{CE}(sat)	I_C=10mA , I_F=1mA	—	—	1.0	V
		I_C=100mA , I_F=10mA	0.3	—	1.2	

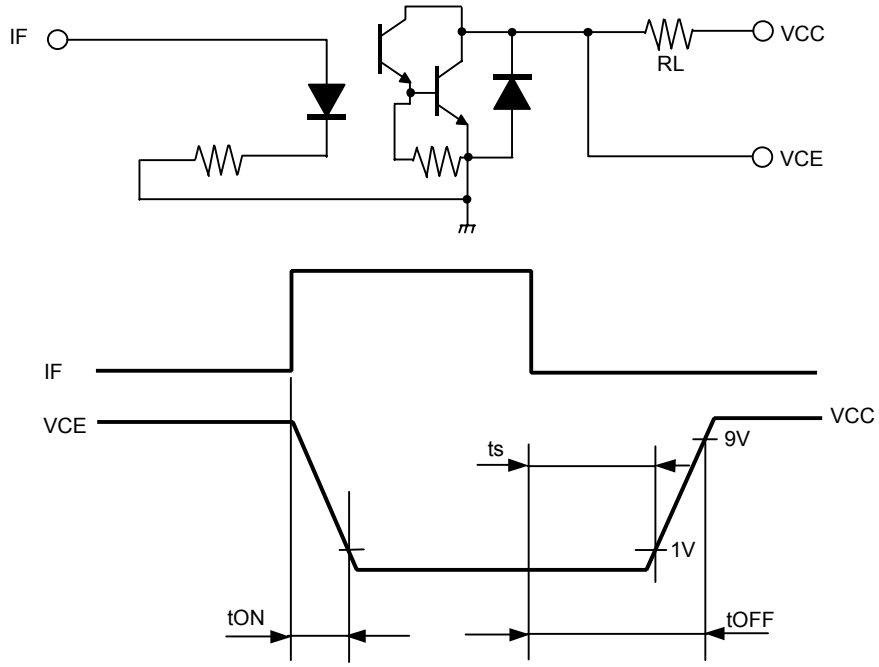
ISOLATION ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Capacitance Input to Output	C_S	V_S=0 , f=1MHz	—	0.8	—	pF
Isolation Resistance	R_S	V_S=500V , R.H.≤60%	5×10^{10}	10^{14}	—	Ω
Isolation Voltage	BVs	AC, 1minute	5000	—	—	Vrms
		AC, 1second, in oil	—	10000	—	
		DC, 1 minute, in oil	—	10000	—	Vdc

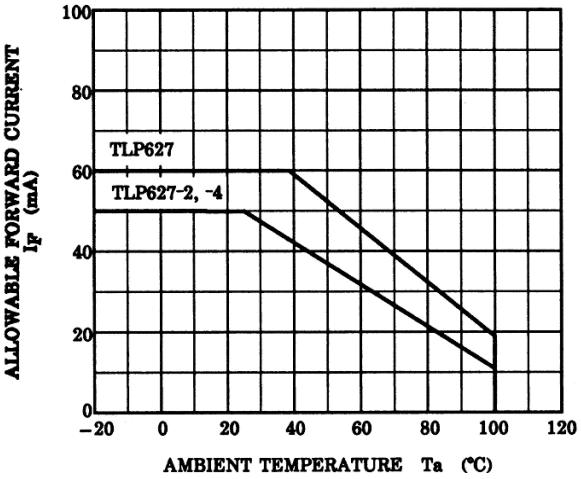
SWITCHING CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Rise Time	tr	V_{CC}=10V I_C=10mA R_L=100Ω	—	40	—	μs
Fall Time	tf		—	15	—	
Turn-on Time	ton		—	50	—	
Turn-off Time	toff		—	15	—	
Turn-on Time	tON	R_L=180Ω (Fig.1) V_{CC}=10V , I_F=16mA	—	5	—	
Strage Time	ts		—	40	—	
Turn-off Time	tOFF		—	80	—	

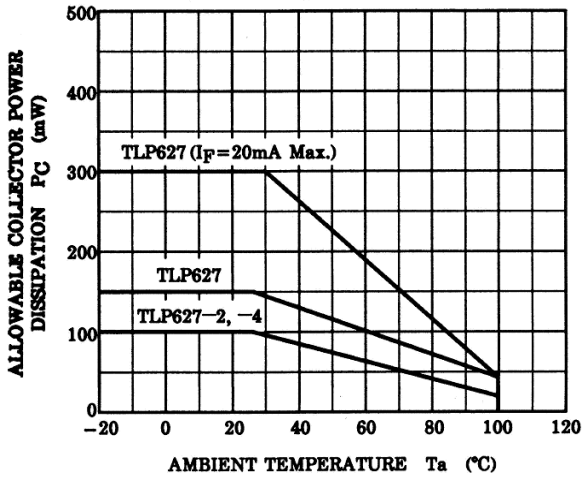
Fig.1 SWITCHING TIME TEST CIRCUIT



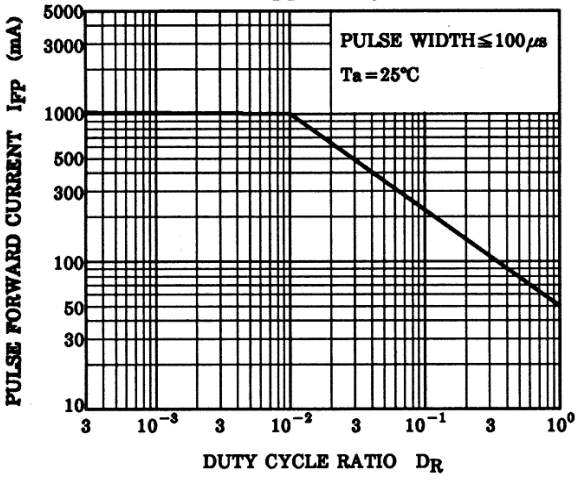
I_F – Ta



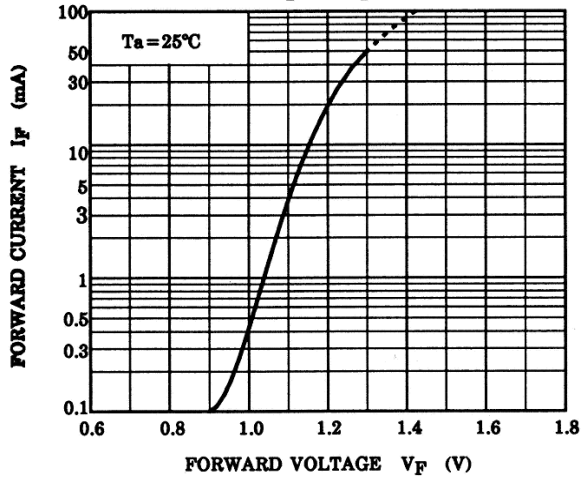
P_C – Ta



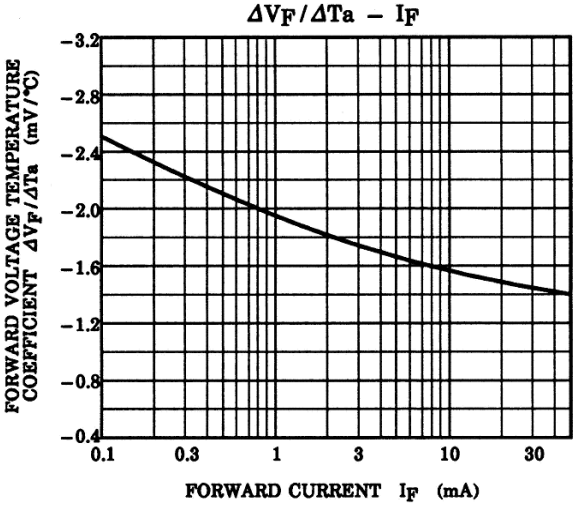
I_{FP} – D_R



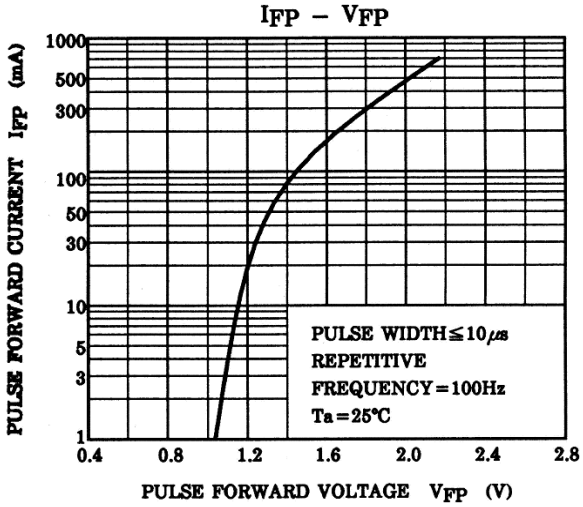
I_F – V_F

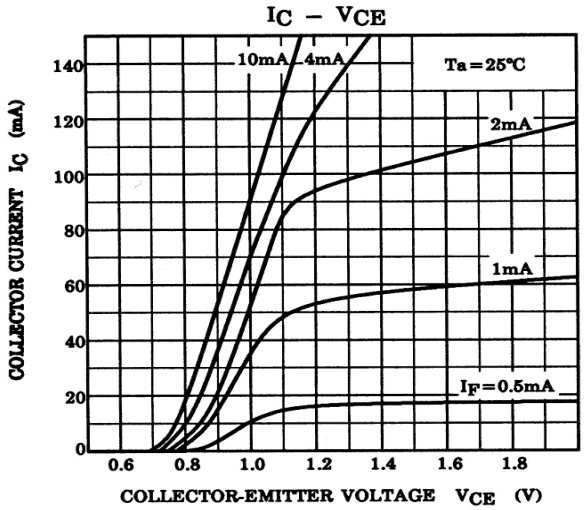


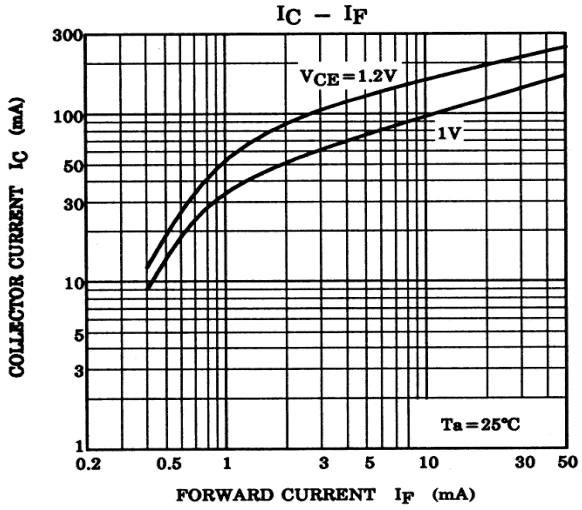
$\Delta V_F / \Delta Ta$ – I_F

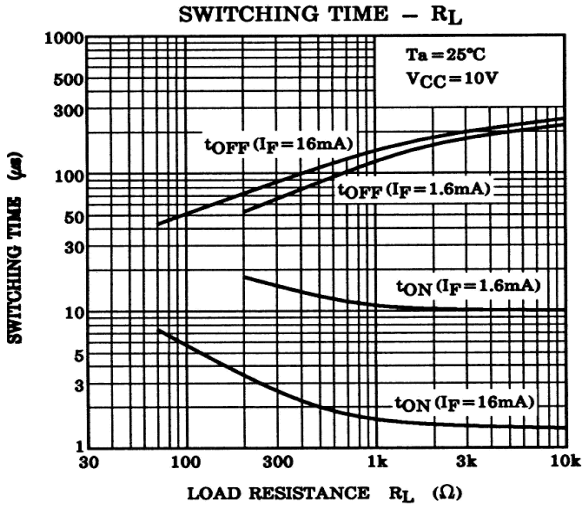


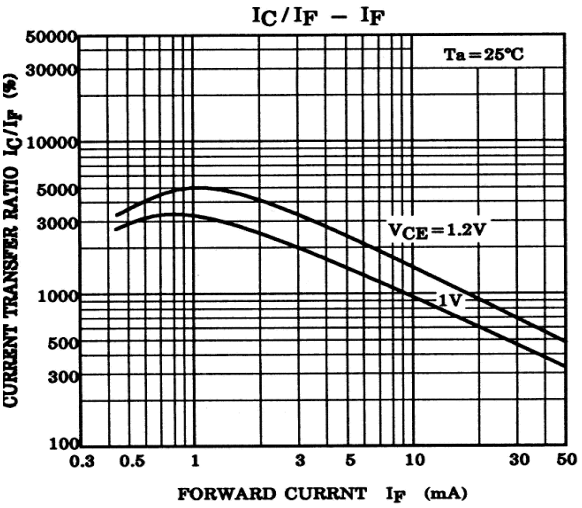
I_{FP} – V_{FP}



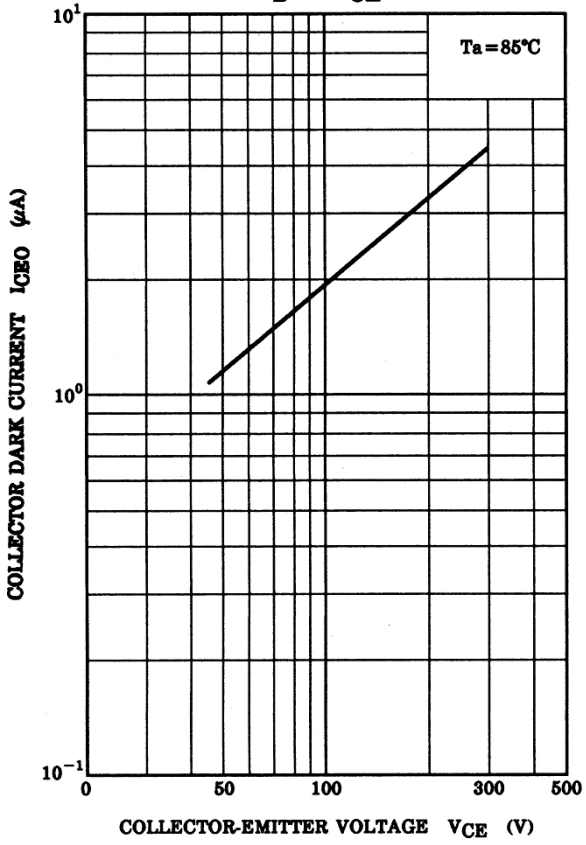

I_C – V_{CE}
Ta = 25°C
10mA
4mA
2mA
1mA
I_F = 0.5mA
COLLECTOR CURRENT I_C (mA)
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)


I_C – I_F
V_{CE} = 1.2V
1V
Ta = 25°C
COLLECTOR CURRENT I_C (mA)
FORWARD CURRENT I_F (mA)

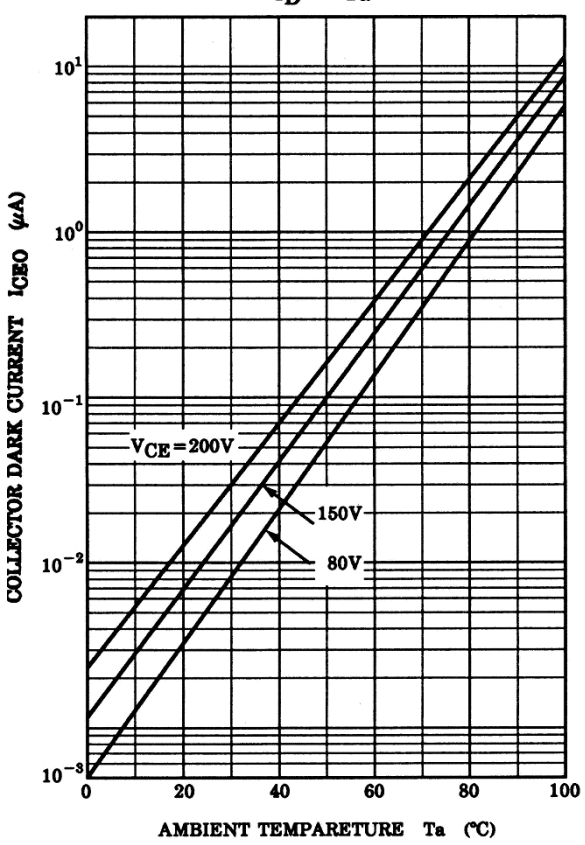

SWITCHING TIME – R_L
Ta = 25°C
V_{CC} = 10V
t_{OFF} (I_F = 16mA)
t_{OFF} (I_F = 1.6mA)
t_{ON} (I_F = 1.6mA)
t_{ON} (I_F = 16mA)
SWITCHING TIME (μs)
LOAD RESISTANCE R_L (Ω)


I_C/I_F – I_F
Ta = 25°C
V_{CE} = 1.2V
1V
CURRENT TRANSFER RATIO I_C/I_F (%)
FORWARD CURRNT I_F (mA)

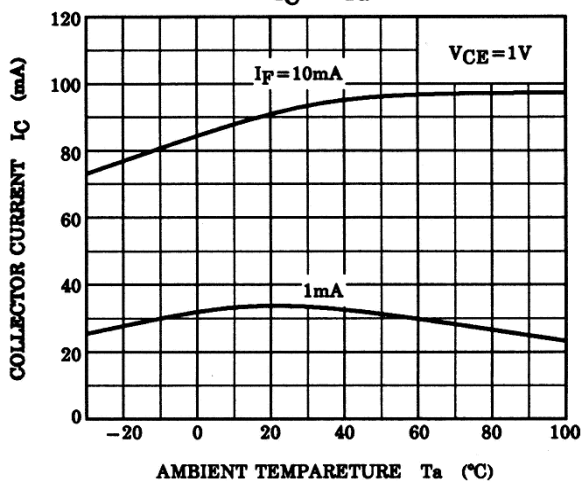
I_D – V_{CE}



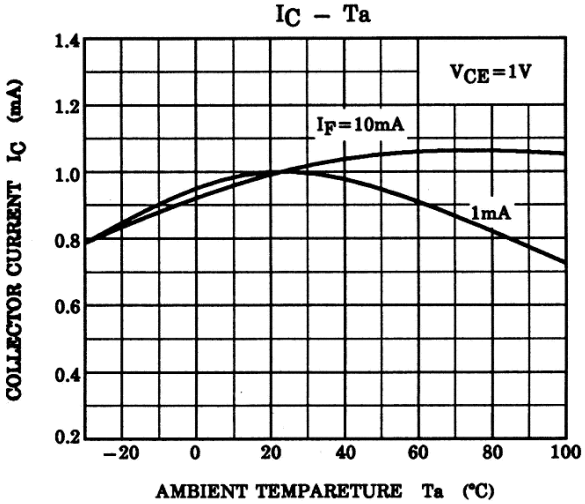
I_D – Ta



I_C – Ta



I_C – Ta



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