TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

CNY17-2, CNY17-3, CNY17-4

AC LINE / DIGITAL LOGIC ISOLATOR

DIGITAL LOGIC / DIGITAL LOGIC ISOLATOR

TELEPHONE LINE RECEIVER

TWISTED PAIR LINE RECEIVER

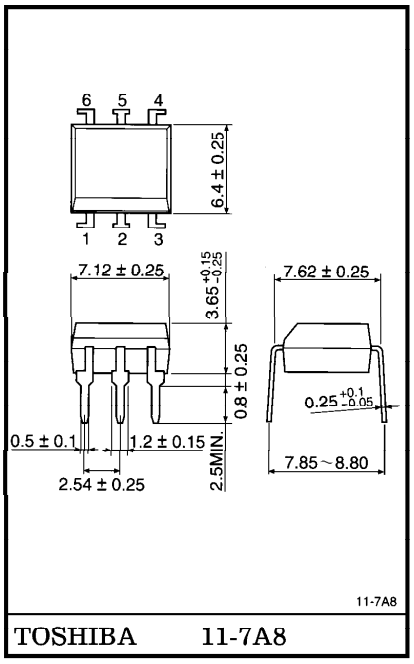
HIGH FREQUENCY POWER SUPPLY FEEDBACK CONTROL

RELAY CONTACT MONITOR

The TOSHIBA Corporation CNY17 consist of a gallium arsenide infrared emitting diode coupled with a silicon photo transistor in a dual in-line package.

- Small Package Size and Low Cost
- Fast Switching Speeds : 5μs (TYP.)
- High DC Current Transfer Ratio : CTR (I_F=10mA, V_{CE}=5V)
  CNY17-2 : 63~125%
  CNY17-3 : 100~200%
  CNY17-4 : 160~320%
- High Isolation Resistance : $10^{11}\Omega$ (TYP.)
- High Isolation Voltage : 4400V (MIN.)

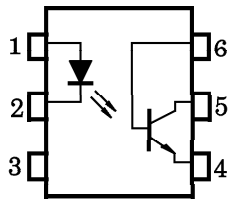
Unit in mm



TOSHIBA 11-7A8

Weight : 0.4g

PIN CONFIGURATION



1 : ANODE
2 : CATHODE
3 : N.C.
4 : EMITTER
5 : COLLECTOR
6 : BASE

961001EBC2

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- Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.
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MAXIMUM RATINGS (Ta = 25°C)

	CHARACTERISTIC	SYMBOL	RATING	UNIT
LED	Forward Current	I_F	60	mA
	Forward Current Derating	ΔI_F / °C	0.8 *	mA / °C
	Peak Forward Current (Note)	I_{PF}	3	A
	Power Dissipation	P_D	100	mW
	Power Dissipation Derating	ΔP_D / °C	1.33 *	mW / °C
	Reverse Voltage	V_R	6	V
PHOTO-TRANSISTOR	Collector-Emitter Voltage	BV_{CEO}	70	V
	Collector-Base Voltage	BV_{CBO}	70	V
	Emitter-Collector Voltage	BV_{ECO}	7	V
	Collector Current	I_C	100	mA
	Power Dissipation	P_C	150	mW
	Power Dissipation Derating	ΔP_C / °C	2.0 *	mW / °C
COUPLED	Storage Temperature	T_{stg}	−55~150	°C
	Operating Temperature	T_{opr}	−55~100	°C
	Lead Soldering Temperature (10s)	T_{sol}	260	°C
	Total Package Dissipation	P_T	200	mW
	Total Package Power Dissipation Derating	ΔP_T / °C	2.6 *	mW / °C

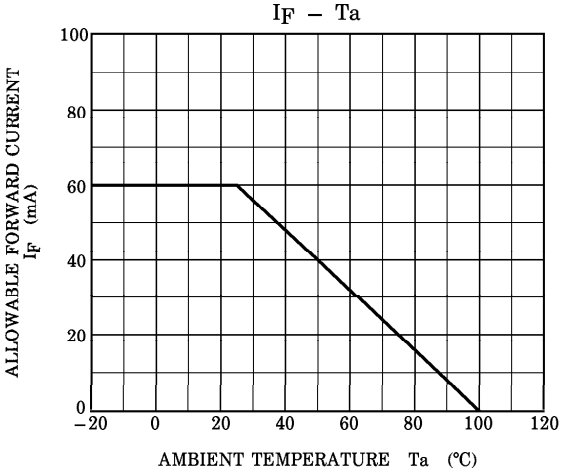
(Note) Pulse Width 1μs, 300pps.

* Above 25°C ambient.

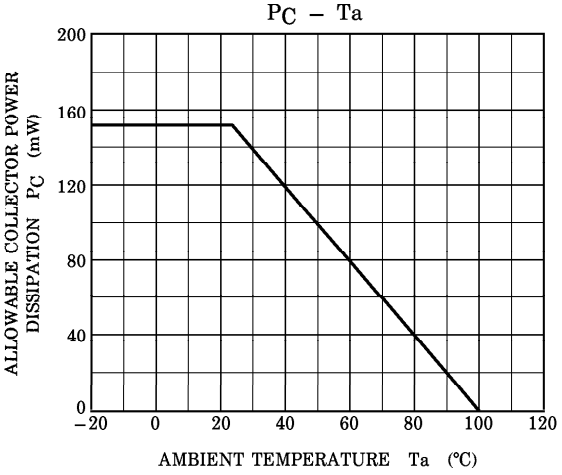
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

	CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
LED	Forward Voltage		V_F	I_F = 60mA	—	1.35	1.65	V
	Reverse Current		I_R	V_R = 3V	—	—	10	μA
	Capacitance		C_D	V = 0, f = 1MHz	—	30	—	pF
PHOTO−TRANSISTOR	DC Forward Current Gain		h_{FE}	V_{CE} = 5, I_C = 500μA	100	200	—	
	Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	I_C = 1mA, I_F = 0	70	—	—	V
	Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	I_C = 100μA, I_F = 0	70	—	—	V
	Emitter-Collector Breakdown Voltage		$V_{(BR)ECO}$	I_E = 100μA, I_F = 0	7	—	—	V
	Collector Dark Current		I_{CEO}	V_{CE} = 10V, I_F = 0	—	1	50	nA
	Collector Dark Current		I_{CBO}	V_{CB} = 10V, I_F = 0	—	0.1	20	nA
	Collector-Emitter Capacitance		C_{CE}	V = 0, f = 1MHz	—	10	—	pF
COUPLED	Current Transfer Ratio	CNY17-2	CTR	I_F = 10mA, V_{CE} = 5V	63	—	125	%
		CNY17-3			100	—	200	
		CNY17-4			160	—	320	
	Saturation Voltage		$V_{CE(sat)}$	I_F = 10mA, I_C = 2.5mA	—	—	0.4	V
	Capacitance Input to Output		C_S	V = 0, f = 1MHz	—	0.8	—	pF
	Isolation Resistance		R_S	V = 500V	—	10^{11}	—	Ω
	DC Isolation Voltage		BV_S	DC 1 minute	4400	—	—	V
	Rise Fall Time		t_r / t_f	V_{CE} = 10V, I_C = 2mA R_L = 100Ω	—	5	10	μs
	Rise / Fall Time Photo Diode		t_r / t_f	V_{CB} = 10V, I_{CB} = 50μA R_L = 100Ω	—	200	—	ns

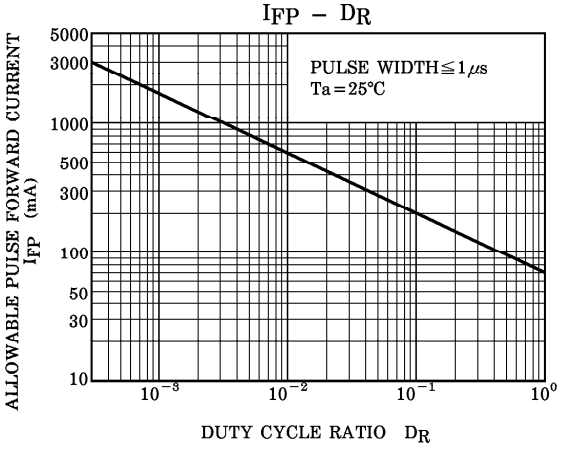
I_F – Ta



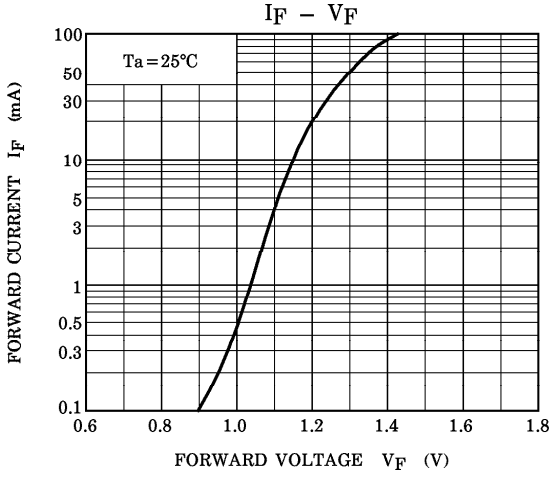
P_C – Ta



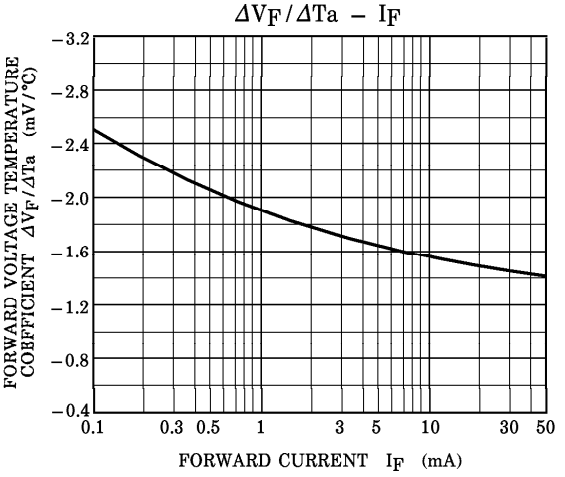
I_{FP} – D_R



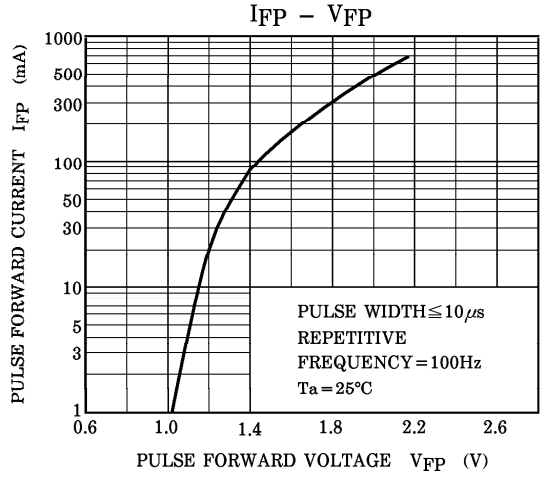
I_F – V_F



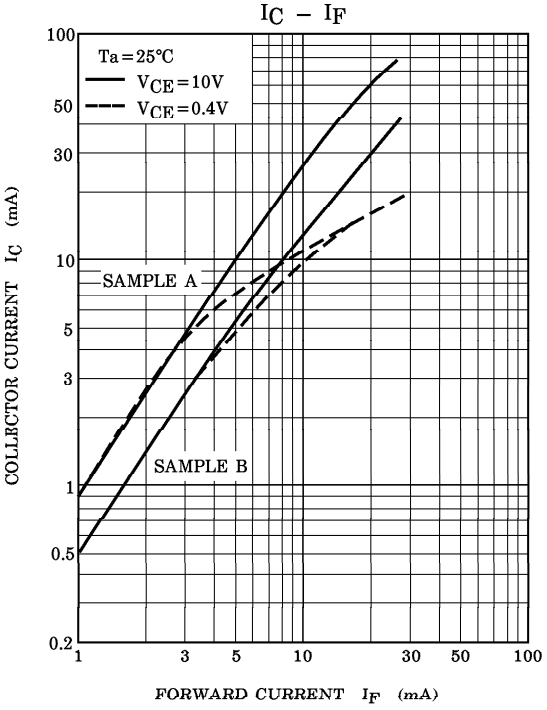
$\Delta V_F / \Delta Ta$ – I_F



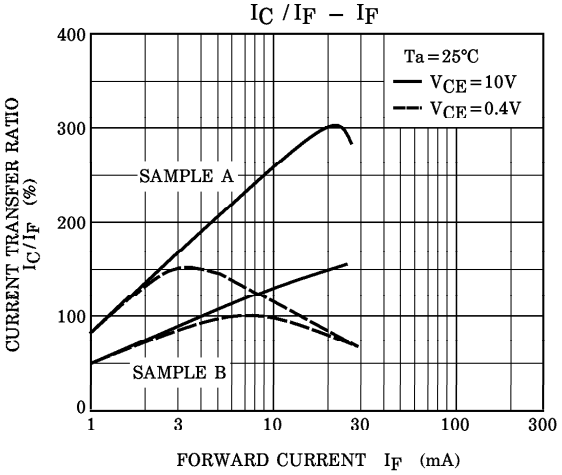
I_{FP} – V_{FP}



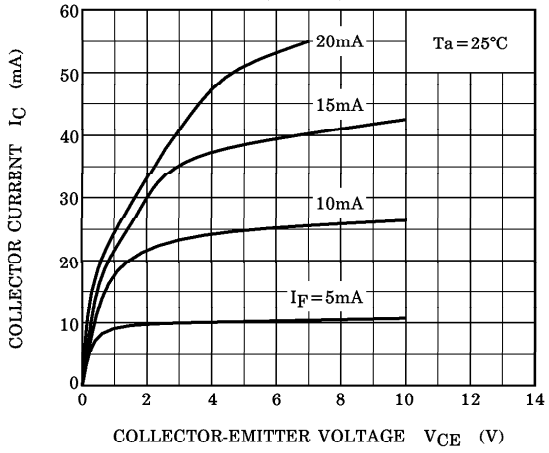
$I_C - I_F$



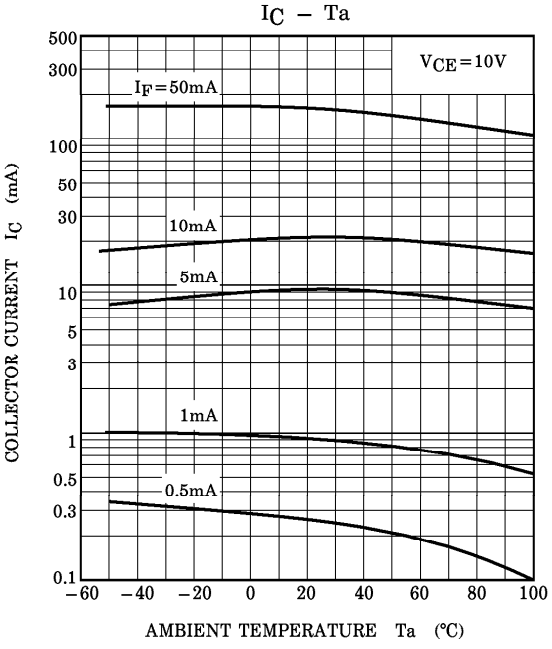
$I_C / I_F - I_F$



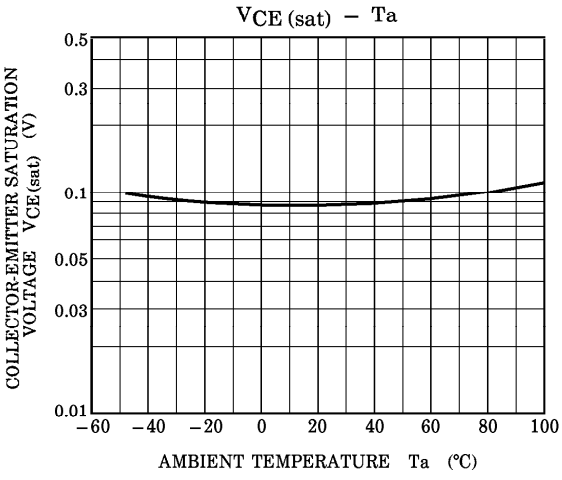
$I_C - V_{CE}$



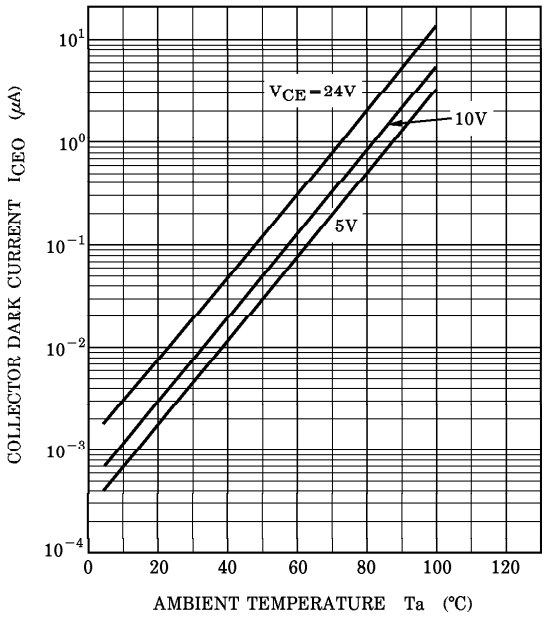
$I_C - Ta$



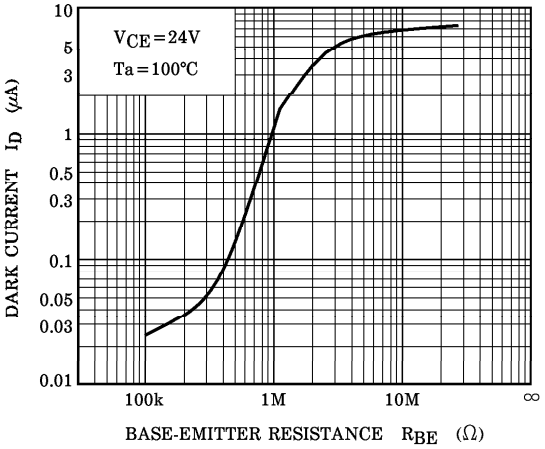
$V_{CE(sat)} - Ta$



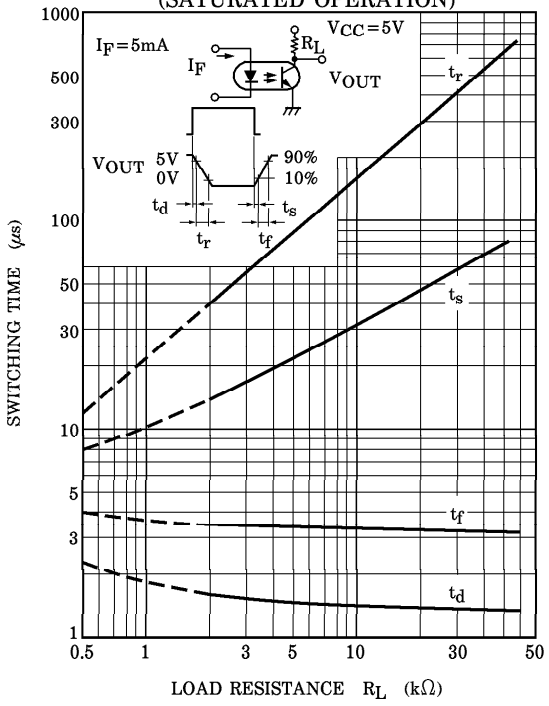
I_{CEO} – Ta



I_D – R_{BE}



SWITCHING CHARACTERISTICS – R_L
(SATURATED OPERATION)



R_{BE} – SWITCHING CHARACTERISTICS
(SATURATED OPERATION)

