

TOSHIBA PHOTOCOUPLER GaAs IRED & PHOTO-TRANSISTOR

## 4N25(Short), 4N25A(Short), 4N26(Short), 4N27(Short), 4N28(Short)

AC LINE /DIGITAL LOGIC ISOLATOR.

DIGITAL LOGIC /DIGITAL LOGIC ISOLATOR.

TELEPHONE LINE RECEIVER.

TWISTED PAIR LINE RECEIVER.

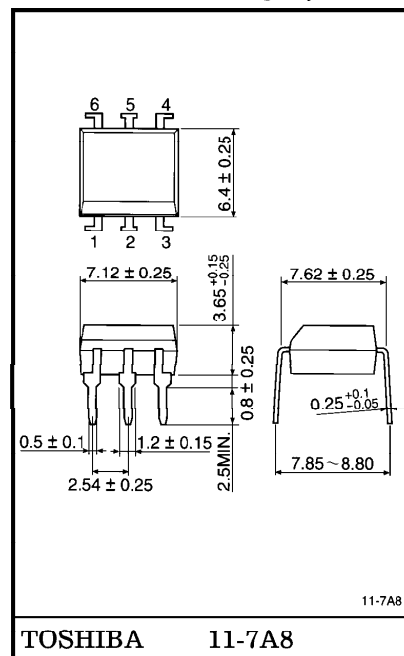
HIGH FREQUENCY POWER SUPPLY FEEDBACK CONTROL.

RELAY CONTACT MONITOR.

The TOSHIBA 4N25 (Short) through 4N28 (Short) consists of a gallium arsenide infrared emitting diode coupled with a silicon phototransistor in a dual in-line package.

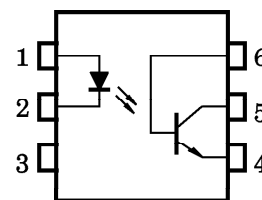
- Switching Speeds :  $3\mu s$  (Typ.)
- DC Current Transfer Ratio : 100% (Typ.)
- Isolation Resistance :  $10^{11}\Omega$  (Min.)
- Isolation Voltage : 2500Vrms (Min.)
- UL Recognized : UL1577, File No. E67349

Unit in mm



Weight : 0.4g

### PIN CONFIGURATIONS (Top view)



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

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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 (Continuous)	$I_F$	80	mA
	Forward Current Derating	$\Delta I_F / ^\circ C$	1.07 (*)	mA / °C
	Peak Forward Current (Note 1)	$I_{PF}$	3	A
	Power Dissipation	$P_D$	150	mW
	Power Dissipation Derating	$\Delta P_D / ^\circ C$	2.0 (*)	mW / °C
	Reverse Voltage	$V_R$	3	V
DETECTOR	Collector-Emitter Voltage	$BV_{CEO}$	30	V
	Collector-Base Voltage	$BV_{CBO}$	70	V
	Emitter-Collector Voltage	$BV_{ECO}$	7	V
	Collector Current (Continuous)	$I_C$	100	mA
	Power Dissipation	$P_C$	150	mW
	Power Dissipation Derating	$\Delta P_C / ^\circ C$	2.0 (*)	mW / °C
COUPLED	Storage Temperature Range	$T_{stg}$	-55~150	°C
	Operating Temperature Range	$T_{opr}$	-55~100	°C
	Lead Soldering Temperature (10s)	$T_{sol}$	260	°C
	Total Package Power Dissipation	$P_T$	250	mW
	Total Package Power Dissipation Derating	$\Delta P_T / ^\circ C$	3.3 (*)	mW / °C

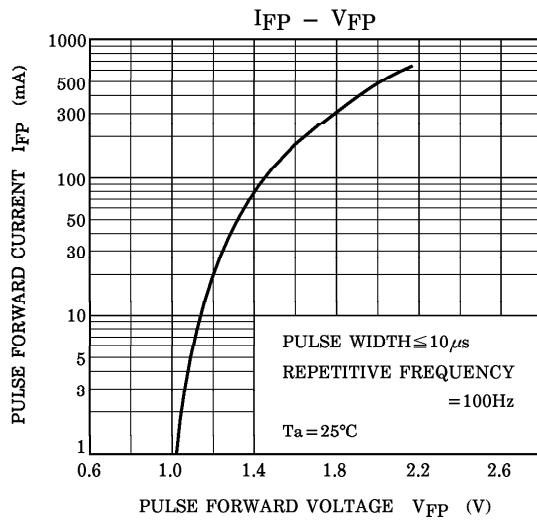
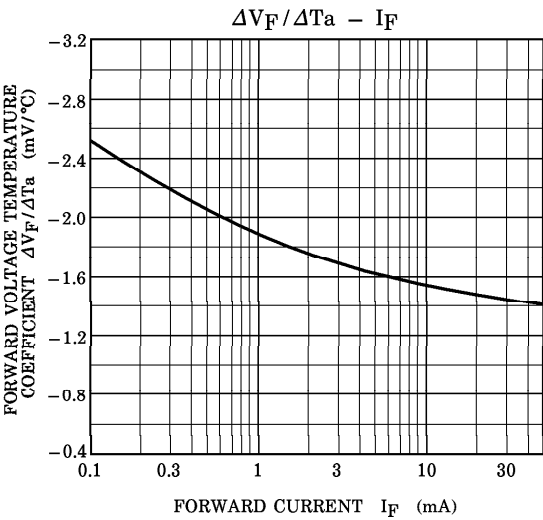
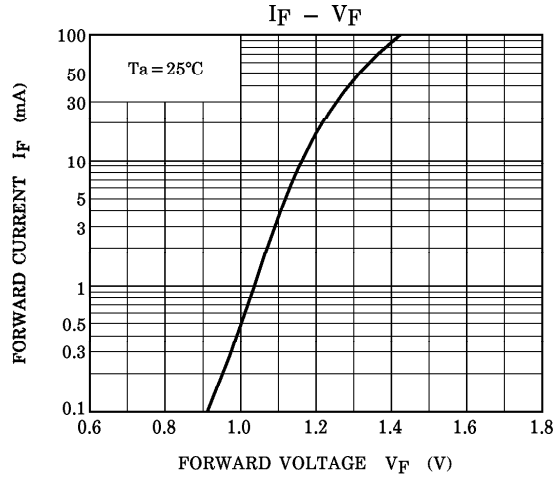
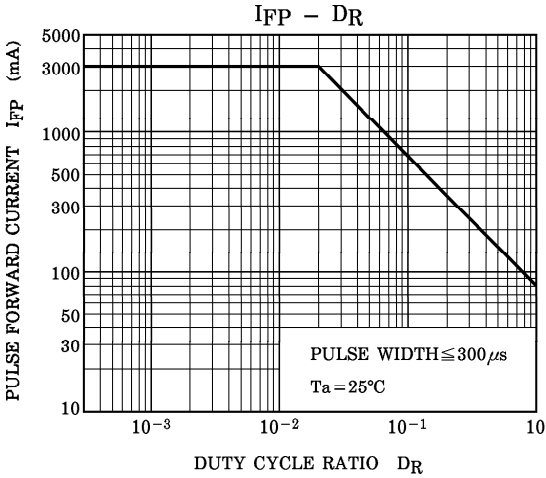
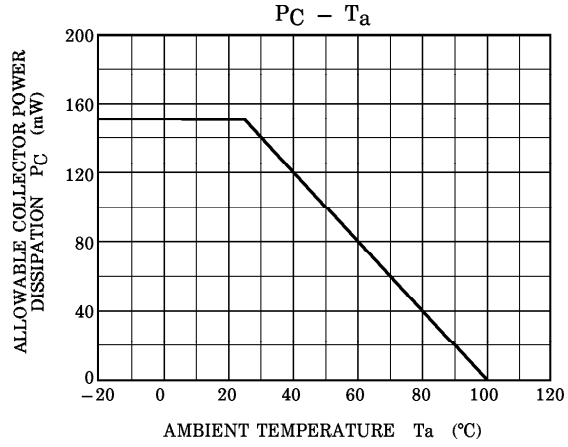
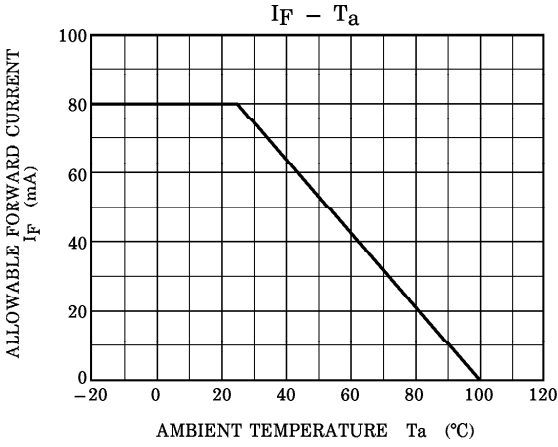
(Note 1) Pulse width 300 $\mu$ s, 2% duty cycle.

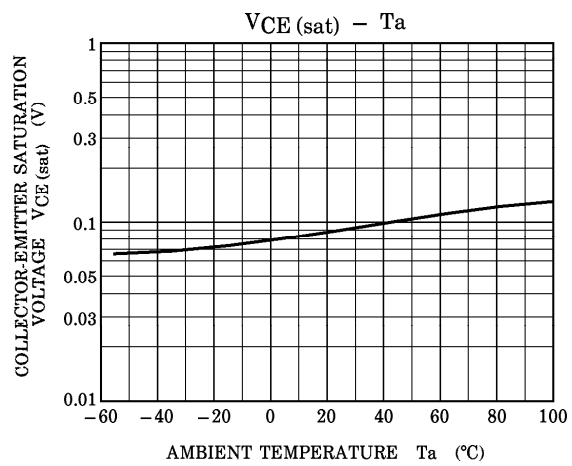
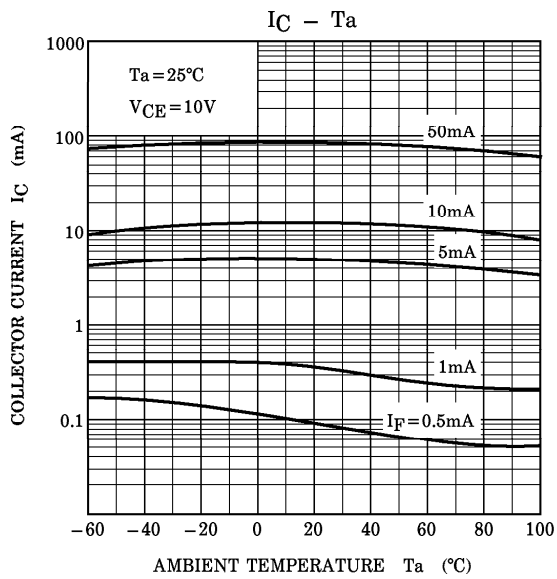
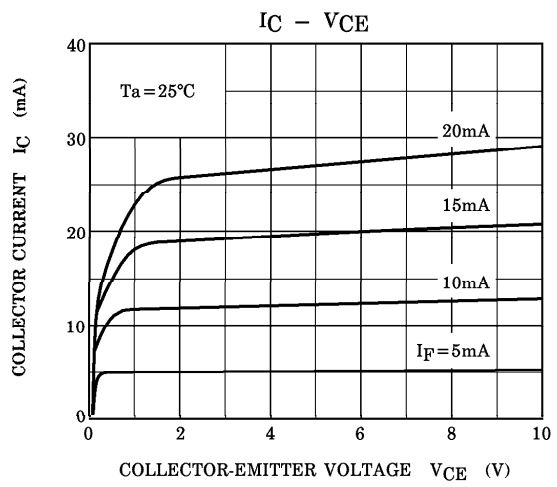
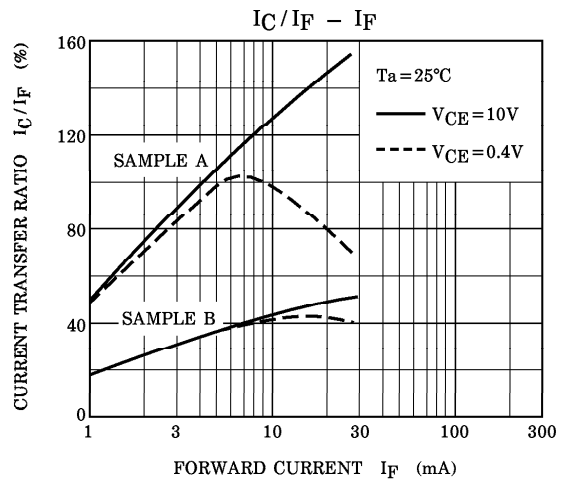
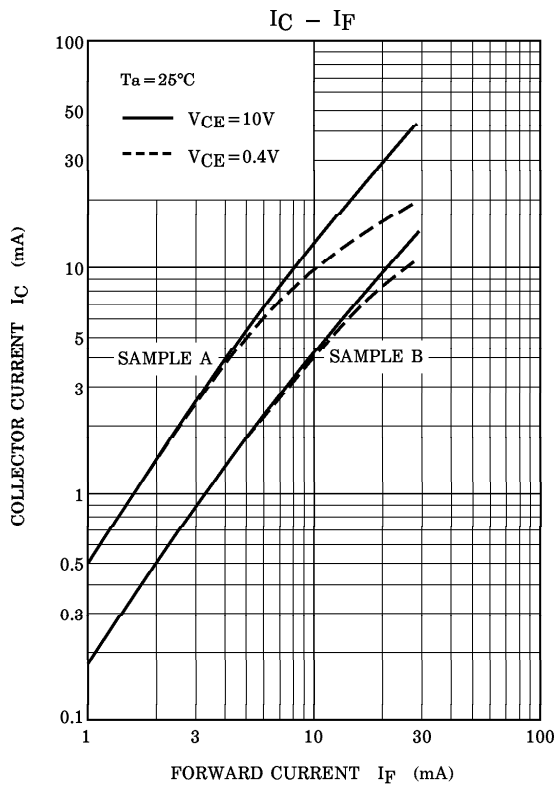
(\*) Above 25°C ambient.

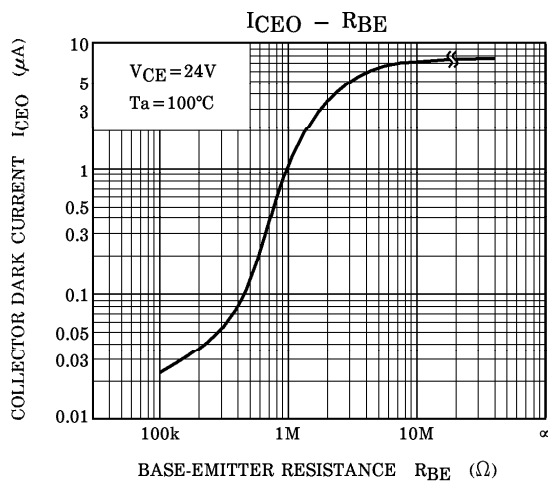
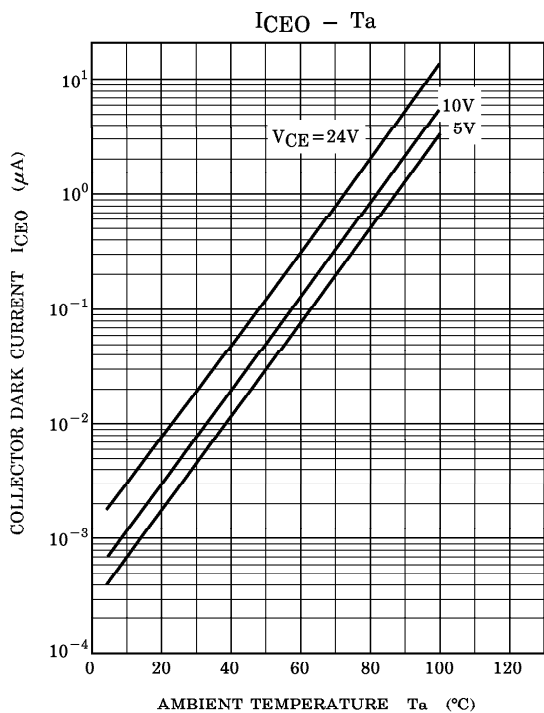
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
LED	Forward Voltage	$V_F$	$I_F = 10\text{mA}$	—	1.15	1.5	V	
	Reverse Current	$I_R$	$V_R = 3\text{V}$	—	—	100	$\mu\text{A}$	
	Capacitance	$C_D$	$V = 0, f = 1\text{MHz}$	—	30	—	pF	
DETECTOR	DC Forward Current Gain	$h_{FE}$	$V_{CE} = 5\text{V}, I_C = 500\mu\text{A}$	—	200	—	—	
	Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_F = 0$	30	—	—	V	
	Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$	70	—	—	V	
	Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 100\mu\text{A}$	7	—	—	V	
	Collector Dark Current	$I_{CEO}$	$V_{CE} = 10\text{V}$	—	1	50	nA	
	Collector Dark Current	$I_{CBO}$	$V_{CB} = 10\text{V}$	—	0.1	20	nA	
	Collector-Emitter Capacitance	$C_{CE}$	$V = 0, f = 1\text{MHz}$	—	10	—	pF	
	Current Transfer Ratio	$I_C / I_F$	$I_F = 10\text{mA}, V_{CE} = 10\text{V}$	20	100	—	%	
COUPLED	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 50\text{mA}, I_C = 2\text{mA}$	—	0.1	0.5	V	
	Capacitance Input to Output	$C_S$	$V_S = 0, f = 1\text{MHz}$	—	0.8	—	pF	
	Isolation Resistance	$R_S$	$V_S = 500\text{V}, R. H. \leq 60\%$	$10^{11}$	—	—	$\Omega$	
	Isolation Voltage		$BV_S$	AC, 1 minute	2500	—	—	Vrms
			$BV_S(*)$	AC, Peak	2500	—	—	Vpk
					1500	—	—	
					500	—	—	
				AC, 1 second	1775	—	—	Vrms
Rise / Fall Time	$t_r / t_f$	$V_{CE} = 10\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega$	—	2	—	$\mu\text{s}$		
Rise / Fall Time	$t_r / t_f$	$V_{CB} = 10\text{V}, I_{CB} = 50\mu\text{A}$ $R_L = 100\Omega$	—	200	—	ns		

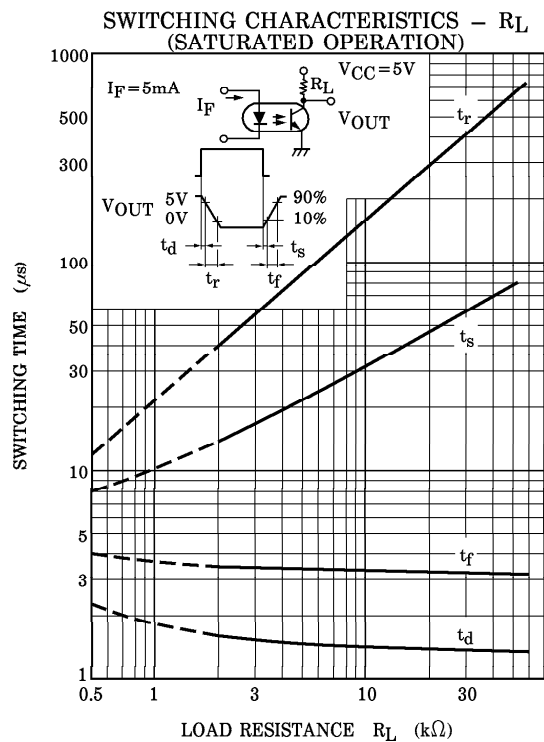
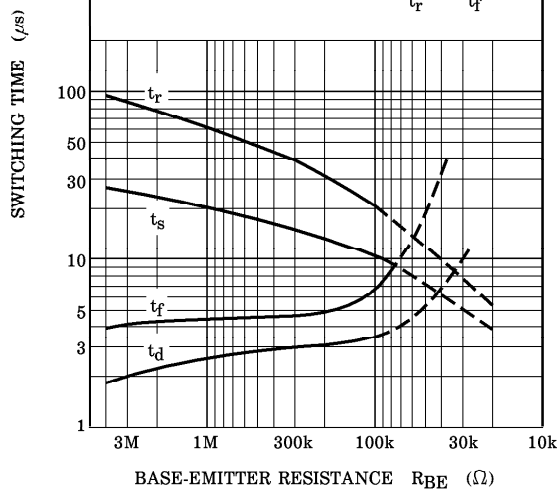
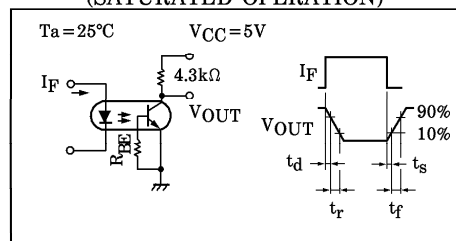
(\*) JEDEC registered minimum  $BV_S$ , however, TOSHIBA specifies a minimum  $BV_S$  of 2500Vrms, 1 minute.







**SWITCHING CHARACTERISTICS -  $R_{BE}$  (SATURATED OPERATION)**



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