

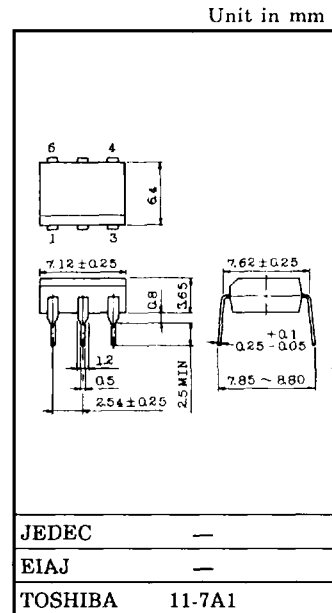
4N35, 36, 37(Short) GaAs IRED & PHOTO-TRANSISTOR

(4N35(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.

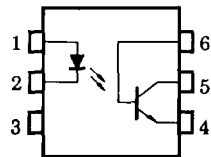
The TOSHIBA 4N35 (Short) through 4N37 (Short) consists of a gallium arsenide infrared emitting diode coupled with a silicon phototransistor in a dual in-line package.

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



Weight : 0.4g

PIN CONFIGURATIONS (TOP VIEW)



- 1 : ANODE
- 2 : CATHODE
- 3 : NC
- 4 : EMITTER
- 5 : COLLECTOR
- 6 : BASE

(4N35(Short))

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT	
LED	Forward Current (Continuous)	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	
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	300	mW	
	Power Dissipation Derating	ΔP _C /°C	4.0*	mW/°C	
COUPLED	Storage Temperature	T _{stg}	-55~150	°C	
	Operating Temperature	T _{opr}	-55~100	°C	
	Lead Soldering Temperature (at 10 sec.)	T _{sold}	260	°C	
	Total Package Power Dissipation	P _T	300	mW	
	Total Package Power Dissipation Derating	ΔP _T /°C	3.3*	mW/°C	
	Input to Output Isolation Voltage (AC, 1 Minute)		BV _S	2500	V _{rms}
		4N35	BV _S **	2500/3550	V _{rms} / V _{pk}
4N36		1750/2500			
4N37	1050/1500				

Note : Pulse width 1μs, 300pps

* Above 25°C ambient.

** JEDEC registered maximum BV_S, however, TOSHIBA specifies a maximum BV_S of 2500V_{rms}, 1 minute.



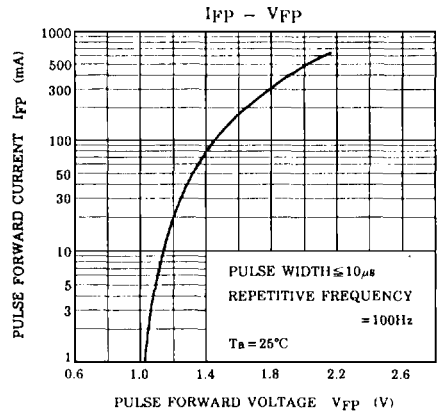
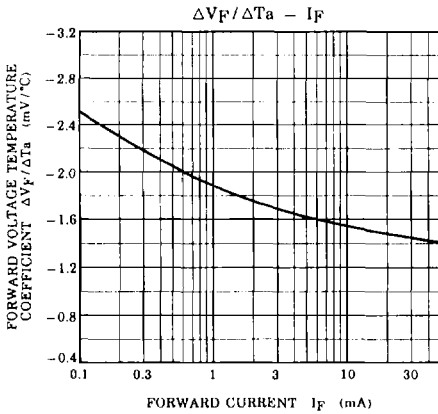
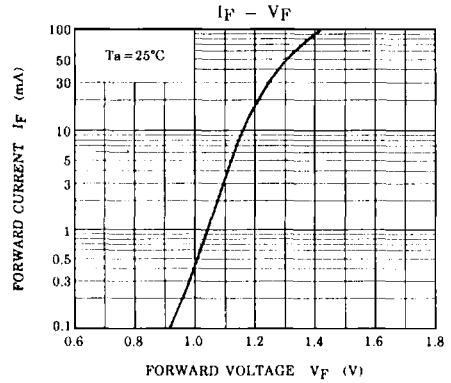
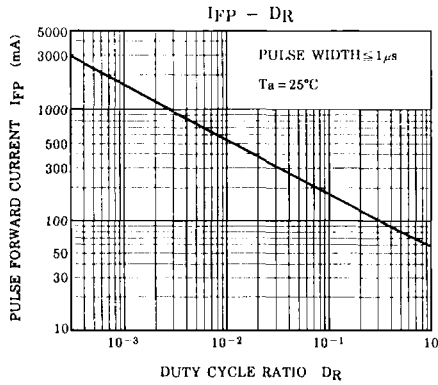
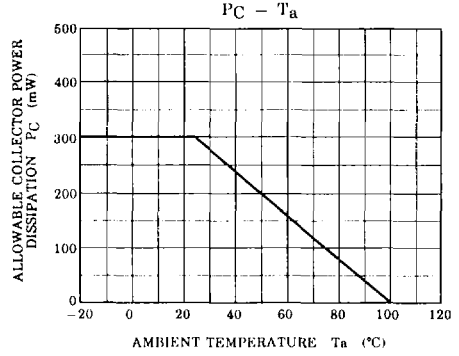
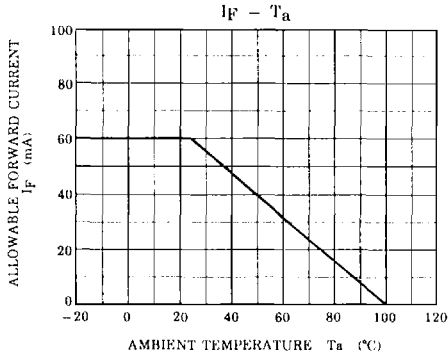
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

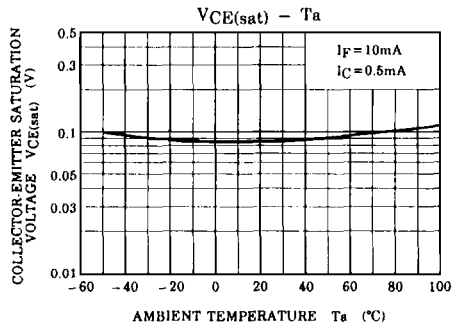
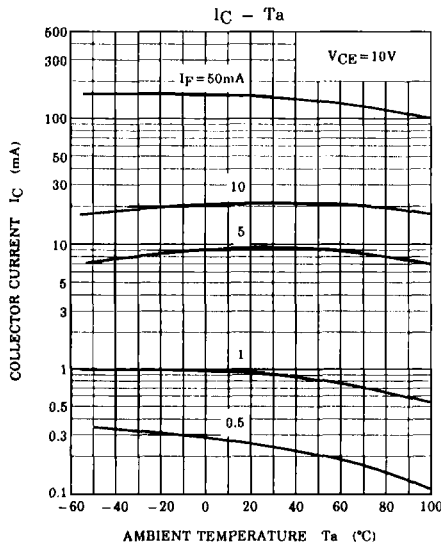
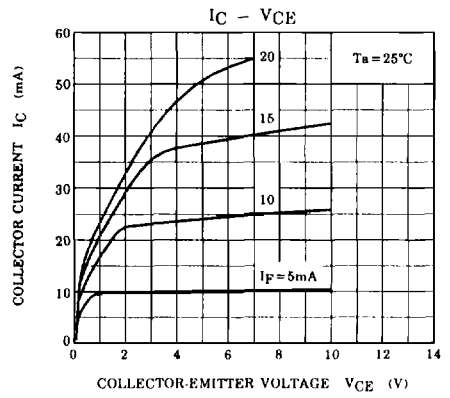
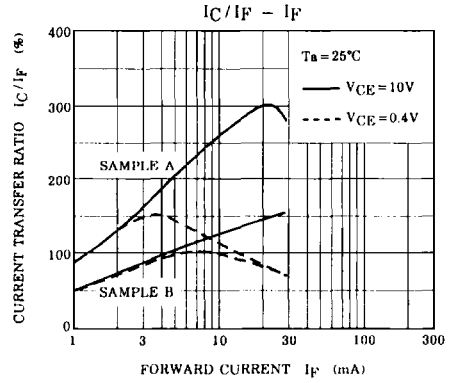
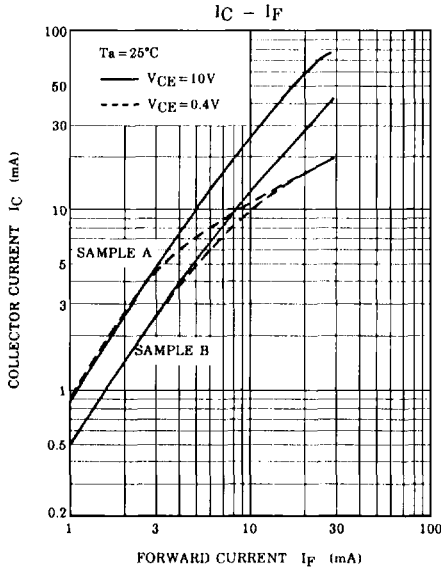
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT			
LED	Forward Voltage	V _F	I _F = 10mA	0.8	1.15	1.5	V			
			I _F = 10mA, Ta = -55°C	0.9	—	1.7				
			I _F = 10mA, Ta = 100°C	0.7	—	1.4				
	Reverse Current	I _R	V _R = 6V	—	—	10	μA			
	Capacitance	C _D	V = 0, f = 1MHz	—	30	100	pF			
DETECTOR	DC Forward Current Gain	h _{FE}	V _{CE} = 5V, I _C = 500μA	—	200	—	—			
	Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	I _C = 10mA	30	—	—	V			
	Collector-Base Breakdown Voltage	V _{(BR)CBO}	I _C = 100μA	70	—	—	V			
	Emitter-Collector Breakdown Voltage	V _{(BR)ECO}	I _E = 100μA	7	—	—	V			
	Collector Dark Current	I _{CEO}	V _{CE} = 10V	—	1	50	nA			
	Collector Dark Current	I _{CEO}	V _{CE} = 30V, Ta = 100°C	—	—	500	μA			
	Collector-Emitter Capacitance	C _{CE}	V = 0, f = 1MHz	—	10	—	pF			
COUPLED	Current Transfer Ratio	I _C / I _F	I _F = 10mA, V _{CE} = 10V	100	—	—	%			
			I _F = 10mA, V _{CE} = 10V Ta = -55°C	40	—	—				
			I _F = 10mA, V _{CE} = 10V Ta = 100°C	40	—	—				
	Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _F = 10mA, I _C = 0.5mA	—	0.1	0.3	V			
	Capacitance Input to Output	C _S	V _S = 0, f = 1MHz	—	0.8	2.5	pF			
	Isolation Resistance	R _S	V _S = 500V, R. H. ≤ 60%	10 ¹¹	—	—	Ω			
	Input to Output Isolation Current (Pulse Widtn = 8ms)	I _{IO}	4N35	V _{IO} = 3550Vpk	—	—	100			
4N36			V _{IO} = 2500Vpk					—	—	100
4N37			V _{IO} = 1500Vpk					—	—	100
	Turn-on Time	t _{on}	V _{CC} = 10V, I _C = 2mA	—	3	10	μs			
	Turn-off Time	t _{off}	R _L = 100Ω	—	3	10				

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