

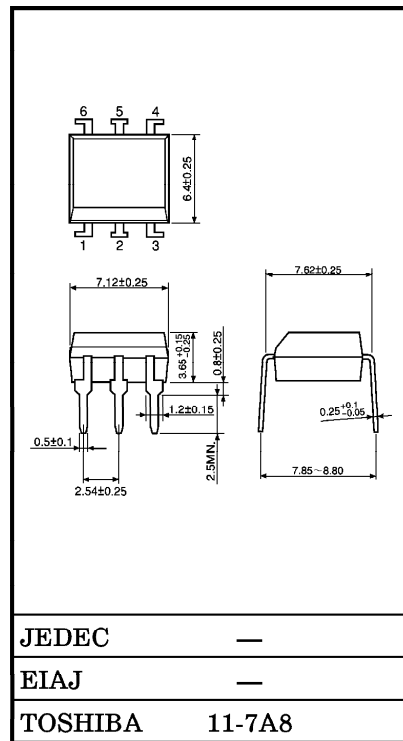
(4N38(Short))

- 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.

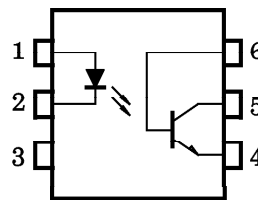
The TOSHIBA 4N38 (Short) through 4N38 (Short) consists of a gallium arsenide infrared emitting diode coupled with a silicon phototransistor in a dual in-line package.

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

Unit in mm



PIN CONFIGURATIONS (TOP VIEW)



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

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(4N38(Short))

MAXIMUM RATINGS (Ta = 25°C)

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

Note : Pulse width 300 μ s, 2% duty cycle.

* Above 25°C ambient.

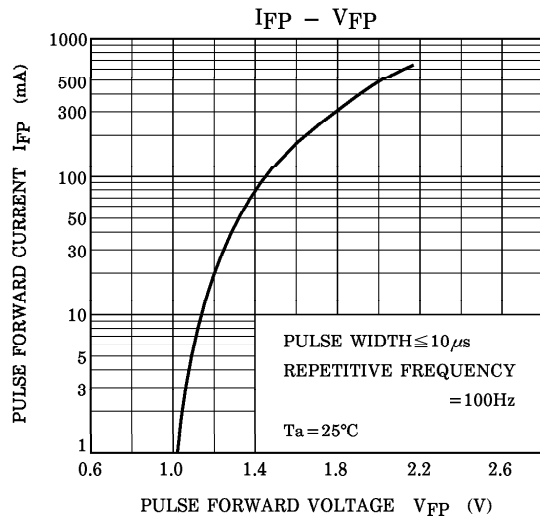
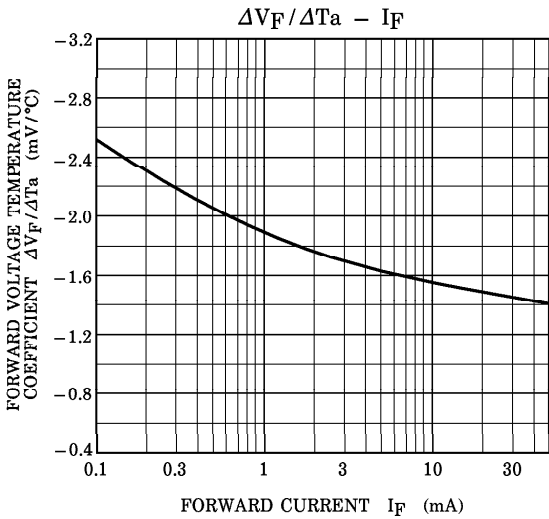
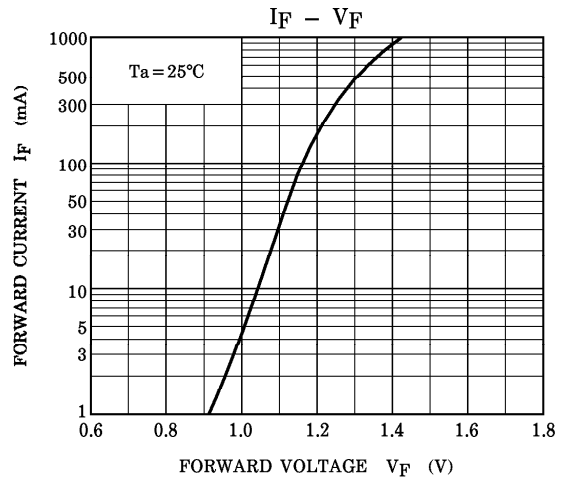
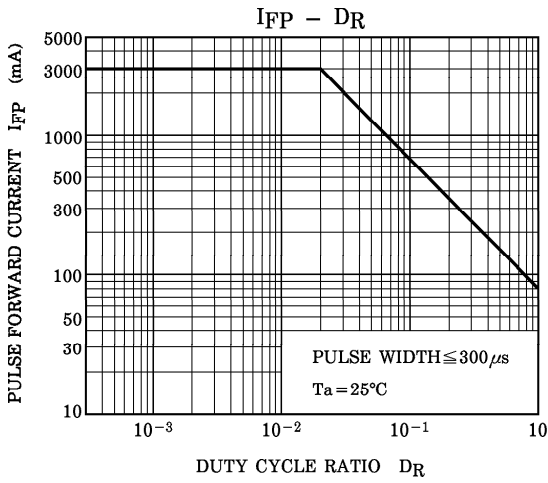
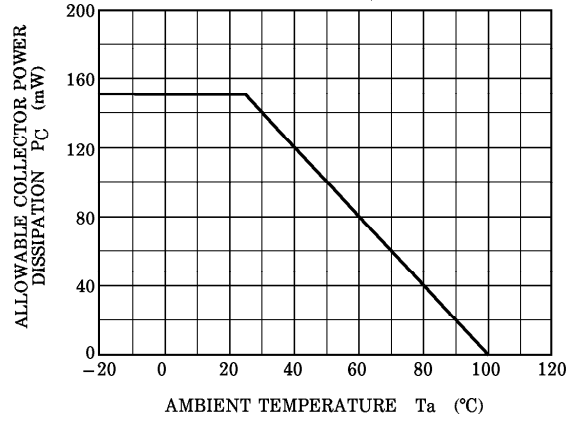
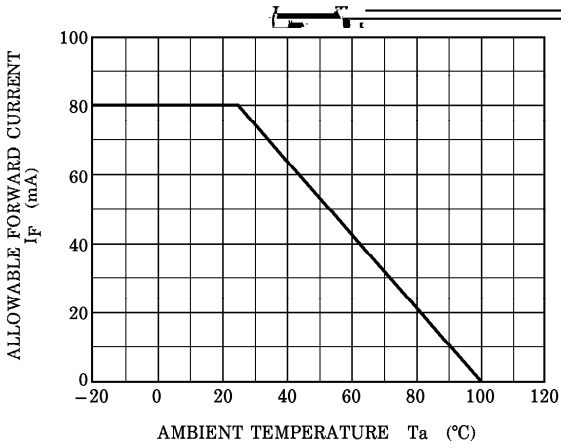
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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

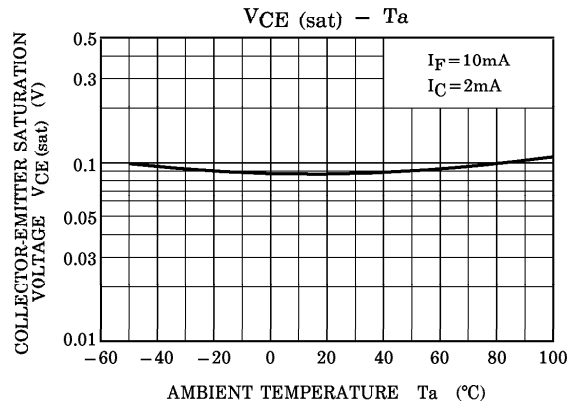
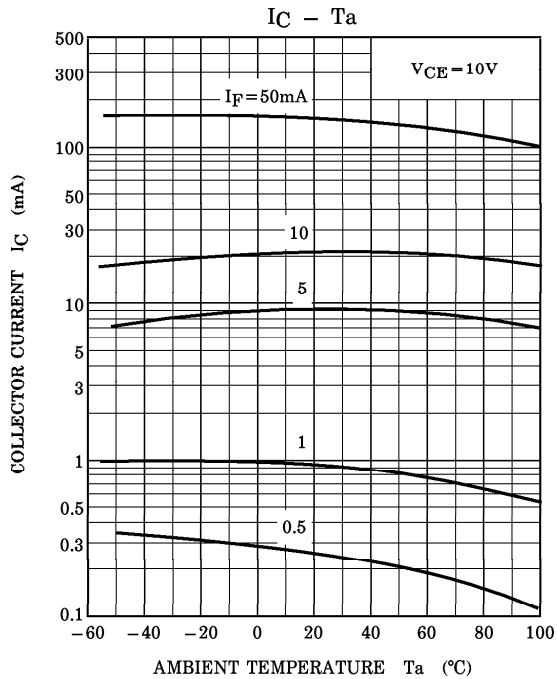
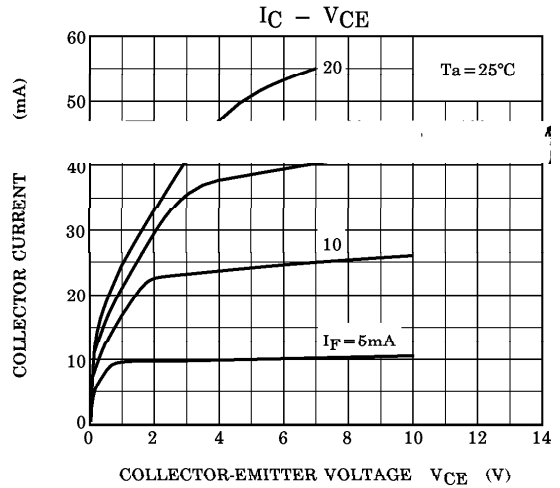
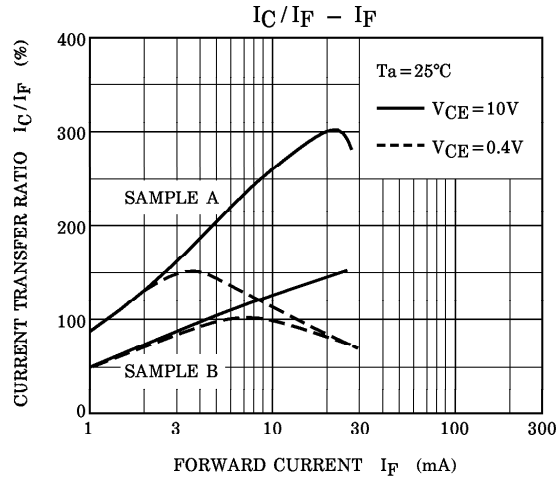
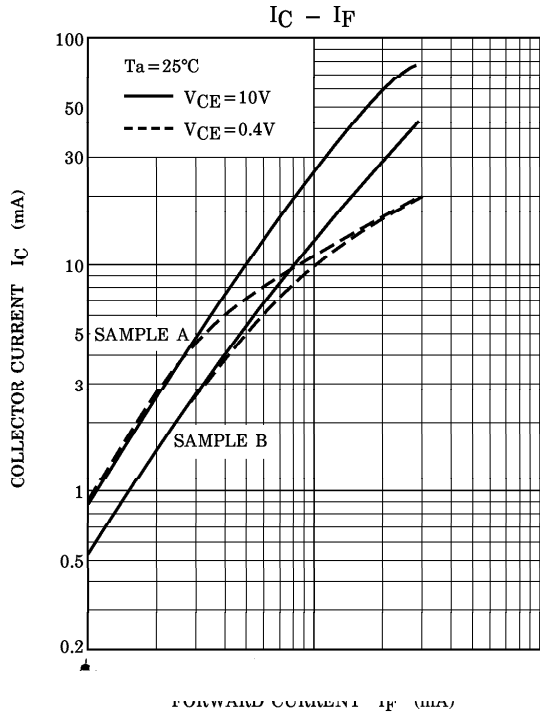
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
LED	Forward Voltage	V _F	I _F = 10mA	—	1.15	1.5	V	
	Reverse Current	I _R	V _R = 3V	—	—	100	μA	
	Capacitance	C _D	V = 0, f = 1MHz	—	30	—	pF	
DETECTOR	DC Forward Current Gain	h _{FE}	V _{CE} = 5V, I _C = 500μA	—	200	—	—	
	Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	I _C = 1mA	80	—	—	V	
	Collector-Base Breakdown Voltage	V _{(BR)CBO}	I _C = 100μA	80	—	—	V	
	Emitter-Collector Breakdown Voltage	V _{(BR)ECO}	I _E = 100μA	7	—	—	V	
	Collector Dark Current	I _{CEO}	V _{CE} = 60V	—	1	50	nA	
	Collector Dark Current	I _{CBO}	V _{CB} = 60V	—	0.1	20	nA	
	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	10	100	—	%	
	Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _F = 20mA, I _C = 4mA	—	—	1.0	V	
	Capacitance Input to Output	C _S	V _S = 0, f = 1MHz	—	0.8	—	pF	
	Isolation Resistance	R _S	V _S = 500V, R.H. ≤ 60%	10 ¹¹	—	—	Ω	
	Isolation Voltage	BV _S *	BV _S	AC, 1 minute	2500	—	—	V _{rms}
			4N38	AC, Peak	1500	—	—	V _{pk}
					4N38A	2500	—	
	4N38A	AC, 1 second	1775	—	—	V _{rms}		
Turn-on Time	t _{on}	V _{CE} = 10V, I _C = 2mA R _L = 100Ω	—	3	—	μs		
Turn-off Time	t _{off}		—	3	—			

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

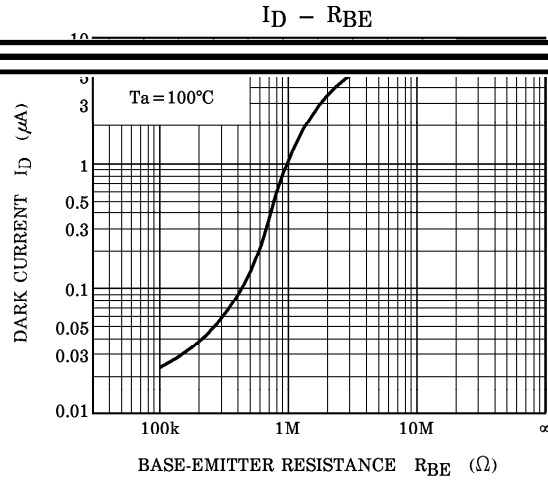
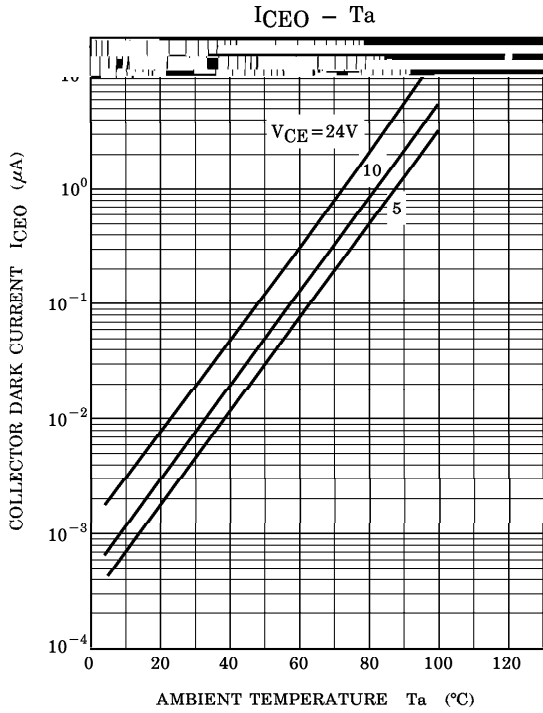
(4N38(Short))



(4N38(Short))



(4N38(Short))



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

