

Photocoupler

KODENSHI

K4N38 • K4N38A

These Photocouplers consist of a Gallium Arsenide Infrared Emitting Diode and a Silicon NPN Phototransistor in a 6-pin package.

DIMENSION

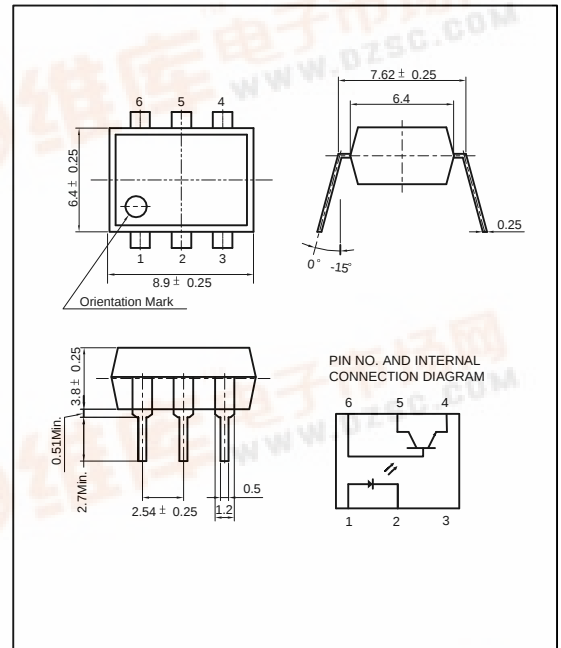
(Unit : mm)

FEATURES

- Switching Time - Typ. 3 μ s
- Collector-Emitter Voltage : Min.80V
- Current Transfer Ratio : Typ.100% (at $I_F=10\text{mA}$, $V_{CE}=10\text{V}$)
- Electrical Isolation Voltage : AC2500V_{rms}
- UL Recognized File No. E107486

APPLICATIONS

- Interface between two circuits of different potential
- Vending Machine, Voltage Regulator
- Traffic Controller System
- Programmable Controller



MAXIMUM RATINGS

(Ta=25 °C)

Parameter		Symbol	Rating	Unit
Input	Forward Current	I_F	60	mA
	Reverse Voltage	VR	5	V
	Peak Forward Current *1	I_{FP}	3	A
	Power Dissipation	P_D	70	mW
Output	Collector-Emitter Breakdown Voltage	BV_{CEO}	80	V
	Emitter-Collector Breakdown Voltage	BV_{ECO}	6	V
	Collector-Base Breakdown Voltage	BV_{CBO}	80	V
	Collector Current	I_C	100	mA
	Collector Power Dissipation	P_C	150	mW
Input to Output Isolation Voltage*2		V_{iso}	AC2500	V_{rms}
Storage Temperature		T_{stg}	-55~+125	
Operating Temperature		T_{opr}	-30~+100	
Lead Soldering Temperature*3		T_{sol}	260	
Total Power Dissipation		P_{tot}	200	mW

*1. Input current with 100 μ s pulse width, 1% duty cycle

*2. Measured at RH=40~60% for 1min

*3. 1/16 inch form case for 10sec

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ELECTRO-OPTICAL CHARACTERISTICS

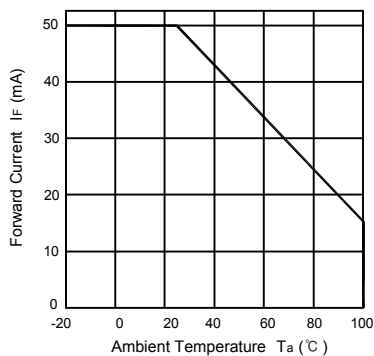
(Ta=25 , unless otherwise noted)

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit.
Input	Forward Voltage	V _F	I _F =10mA	-	1.15	1.30	V
	Reverse Current	I _R	V _R =5V	-	-	10	μA
	Capacitance	C _T	V=0, f=1MHz	-	30	-	pF
Output	Collector-Emitter Breakdown Voltage	BV _{CEO}	I _c =1mA	80	-	-	V
	Emitter-Collector Breakdown Voltage	BV _{ECO}	I _E =0.1mA	6	-	-	V
	Collector-Base Breakdown Voltage	BV _{CBO}	I _c =0.1mA	70	-	-	V
	Collector Dark Current	I _{CEO}	I _F =0, V _{CE} =10V	-	-	50	nA
	Capacitance	C _{CE}	V _{CE} =0, f=1MHz	-	10	-	pF
Coupled	Current Transfer Ratio ^{*4}	CTR	I _F =10mA, V _{CE} =10V	10	-	-	%
	Collector-Emitter Saturation Voltage	V _{CE(SAT)}	I _F =10mA, I _c =0.5mA	-	0.15	0.3	V
	Input-Output Capacitance	C _{IO}	V=0, f=1MHz	-	1	-	pF
	Input-Output Isolation Resistance	R _{IO}	RH=40~60%, V=500V	-	10 ¹¹	-	Ω
	Rise Time	t _r	V _{CE} =10V, R _L =100Ω	-	3	10	μs
	Fall Time	t _f	I _c =2mA	-	3	10	μs

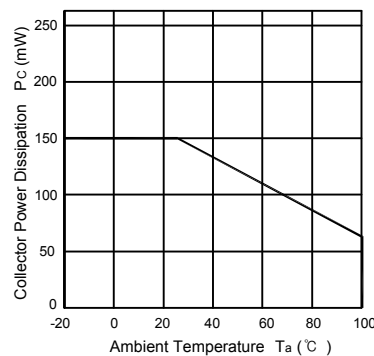
*4. CTR=(I_c/I_F) X 100 (%)

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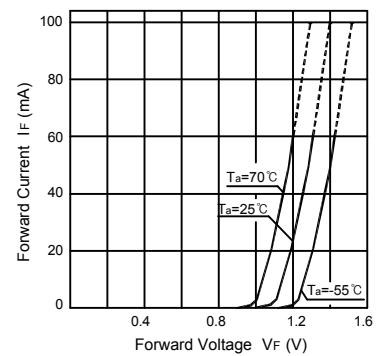
Forward Current vs. Ambient Temperature



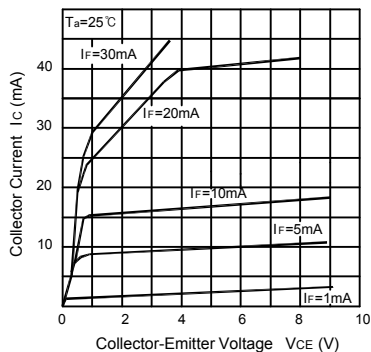
Collector Power Dissipation vs. Ambient Temperature



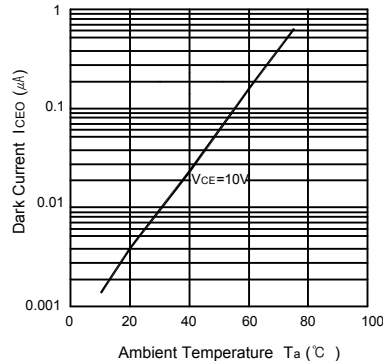
Forward Current vs. Forward Voltage



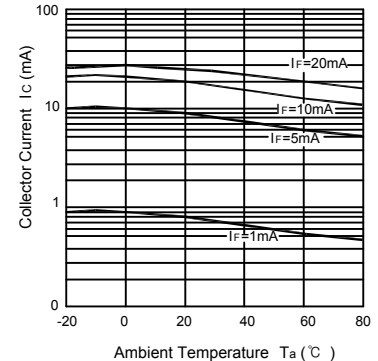
Collector Current vs. Collector-Emitter Voltage



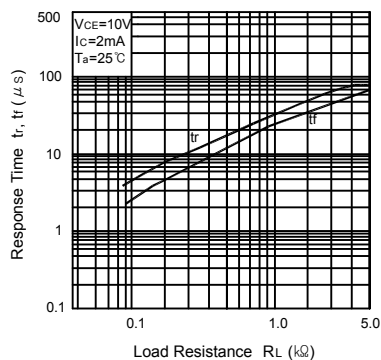
Dark Current vs. Ambient Temperature



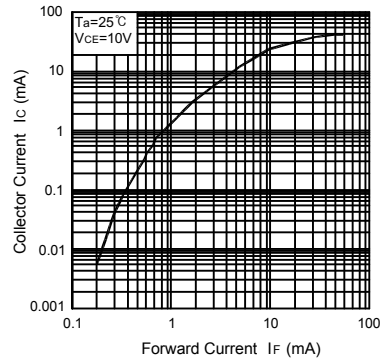
Collector Current vs. Ambient Temperature



Response Time vs. Load Resistance



Collector Current vs. Forward Current



Switching Time Test Circuit

