

# PC8172xNSZ Series

## Low Input Current Type Photocoupler

### ■ Features

1. Low input current type. ( $I_F=0.1\text{mA}$ )
2. High resistance to noise due to high common rejection voltage. (CMR:MIN.  $10\text{kV}/\mu\text{s}$ )
3. Compact dual-in line package.
4. Isolation voltage. ( $V_{\text{iso (rms)}}:5\text{kV}$ )

### ■ Applications

1. Programmable controllers.
2. Facsimiles.
3. Telephones.

### ■ Absolute Maximum Ratings ( $T_a=25^\circ\text{C}$ )

Parameter	Symbol	Rating	Unit	
Input	Forward current	$I_F$	10	mA
	*1 Peak forward current	$I_{FM}$	200	mA
	Reverse voltage	$V_R$	6	V
	Power dissipation	$P$	15	mW
Output	Collector-emitter voltage	$V_{CEO}$	70	V
	Emitter-collector voltage	$V_{ECO}$	6	V
	Collector current	$I_C$	50	mA
	Collector power dissipation	$P_C$	150	mW
Total power dissipation	$P_{\text{tot}}$	170	mW	
Operating temperature	$T_{\text{opr}}$	-30 to +100	$^\circ\text{C}$	
Storage temperature	$T_{\text{stg}}$	-55 to +125	$^\circ\text{C}$	
*2 Isolation voltage	$V_{\text{iso (rms)}}$	5	kV	
*3 Soldering temperature	$T_{\text{sol}}$	260	$^\circ\text{C}$	

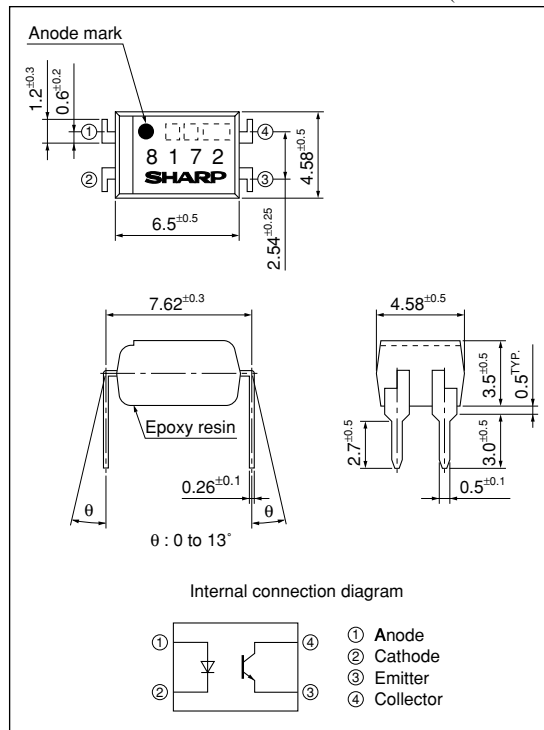
\*1 Pulse width $\leq 100\mu\text{s}$ , Duty ratio=0.001

\*2 40 to 60%RH, AC for 1 minute,  $f=60\text{Hz}$

\*3 For 10s

### ■ Outline Dimensions

(Unit : mm)



■ Electro-optical Characteristics

(T<sub>a</sub>=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> =5mA	-	1.2	1.4	V	
	Reverse current	I <sub>R</sub>	V <sub>R</sub> =4V	-	-	10	μA	
	Terminal capacitance	C <sub>t</sub>	V=0, f=1kHz	-	30	250	pF	
Output	Collector dark current	I <sub>CEO</sub>	V <sub>CE</sub> =50V, I <sub>F</sub> =0	-	-	100	nA	
	Collector-emitter breakdown voltage	BV <sub>CEO</sub>	I <sub>C</sub> =0.1mA, I <sub>F</sub> =0	70	-	-	V	
	Emitter-collector breakdown voltage	BV <sub>EBO</sub>	I <sub>E</sub> =10μA, I <sub>F</sub> =0	6	-	-	V	
Transfer characteristics	Collector current	I <sub>C</sub>	I <sub>F</sub> =0.1mA, V <sub>CE</sub> =5V	0.1	-	0.5	mA	
	Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>F</sub> =5mA, I <sub>C</sub> =1mA	-	0.1	0.3	V	
	Isolation resistance	R <sub>ISO</sub>	DC500V 40 to 60%RH	5×10 <sup>10</sup>	1×10 <sup>11</sup>	-	Ω	
	Floating capacitance	C <sub>f</sub>	V=0, f=1MHz	-	0.6	1.0	pF	
	Response time	Rise time	t <sub>r</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω	-	4	18	μs
		Fall time	t <sub>f</sub>		-	3	18	μs
	*4 Common mode rejection voltage		CMR	T <sub>a</sub> =25°C, R <sub>L</sub> =470Ω, V <sub>CM</sub> =1.5kV (peak), I <sub>F</sub> =0mA, V <sub>CC</sub> =9V, V <sub>np</sub> =100mV	10	-	-	kV/μs

\*4 Refer to Fig.1.

Fig.1 Test Circuit for Common Mode Rejection Voltage

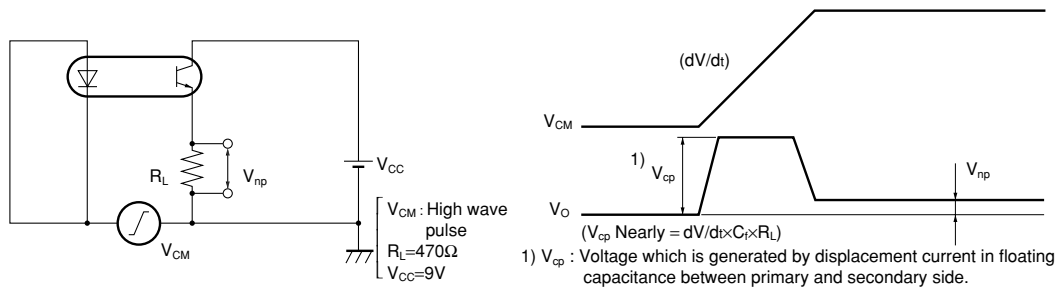


Fig.2 Forward Current vs. Ambient Temperature

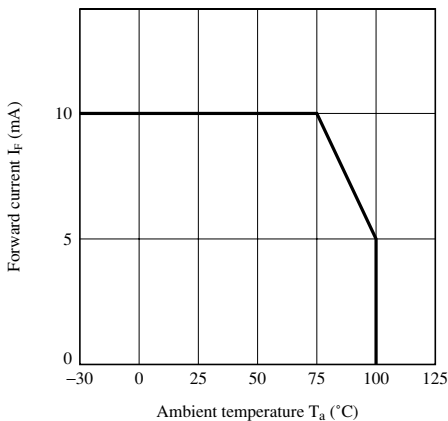
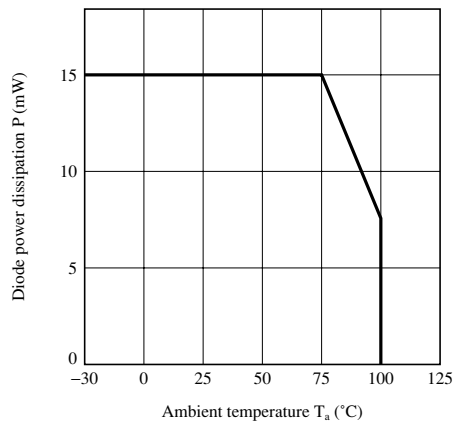
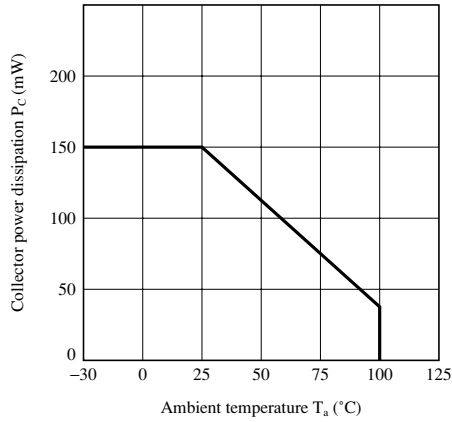


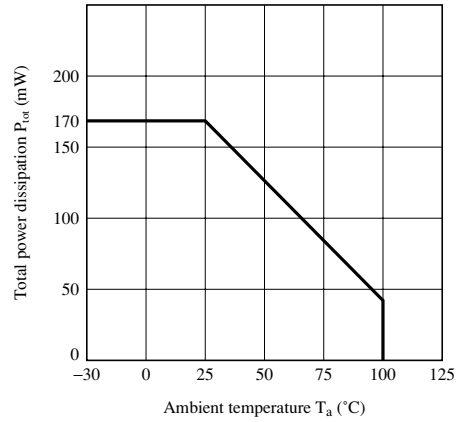
Fig.3 Diode Power Dissipation vs. Ambient Temperature



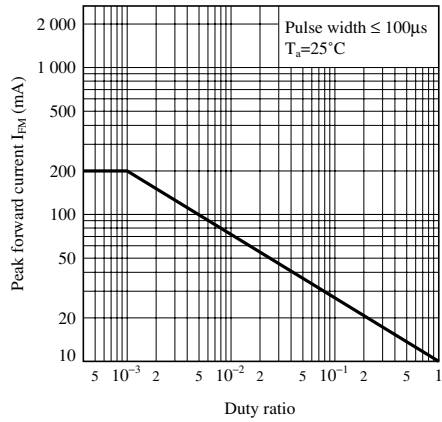
**Fig.4 Collector Power Dissipation vs. Ambient Temperature**



**Fig.5 Total Power Dissipation  $P_{tot}$  vs. Ambient Temperature**



**Fig.6 Peak Forward Current vs. Duty Ratio**



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