PC8110xNSZ Series

Photocoupler with Built-in Schottky Barrier Diode

■ Features

1. High speed response at turn-off time due to built-in schottky barrier diode
2. 4-pin DIP package
3. Isolation voltage (Viso : 5kVrms)

■ Applications

1. Refrigerators
2. Air conditioners
3. Various home appliances

■ Rank Table

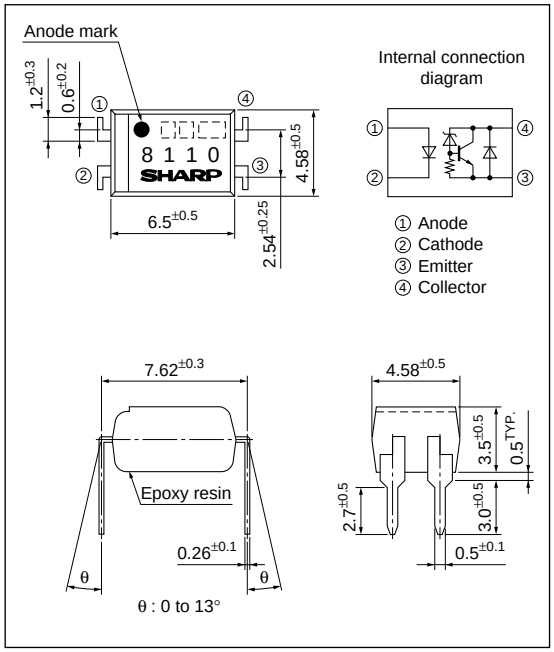
Model No.	Rank mark	Ic (mA)	Conditions
PC81100NSZ	A, B, C or no mark	2.5 to 20	IF=5mA VCE=5V Ta=25°C
PC81101NSZ	A	3.0 to 6.0	
PC81102NSZ	B	5.0 to 10	
PC81103NSZ	C	7.5 to 15	
PC81105NSZ	A or B	3.0 to 10	
PC81106NSZ	B or C	5.0 to 15	
PC81108NSZ	A, B or C	3.0 to 15	

■ Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	IF	50	mA
	*1 Peak forward current	IFM	1.0	A
	Reverse voltage	VR	6	V
	Power dissipation	P	70	mW
Output	Collector-emitter voltage	VCEO	70	V
	Emitter-collector voltage	VECO	0.1	V
	Collector current	IC	30	mA
	Collector power dissipation	PC	150	mW
Total power dissipation		Ptot	200	mW
Operating temperature		Topr	−30 to +100	°C
Storage temperature		Tstg	−55 to +125	°C
*2 Isolation voltage		Viso	5	kVrms
*3 Soldering temperature		Tsol	260	°C

*1 Pulse width<=100μs, Duty ratio=0.001
*2 40 to 60%RH, AC for 1 minute, f=60Hz
*3 For 10 seconds

■ Outline Dimensions (Unit : mm)



■ Electro-optical Characteristics

(Ta=25°C)

Parameter				Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage			V_F	I_F=20mA	–	1.2	1.4	V
	Peak forward voltage			V_{FM}	I_{FM}=0.5A	–	–	3.0	V
	Reverse current			I_R	V_R=4V	–	–	10	μA
	Terminal capacitance			C_t	V=0, f=1kHz	–	30	250	pF
Output	Collector dark current			I_{CEO}	V_{CE}=50V, I_F=0	–	–	100	nA
	*4 Collector-emitter breakdown voltage			BV_{CEO}	I_C=0.1mA, I_F=0	70	–	–	V
Transfer characteristics	Collector current			I_C	I_F=5mA, V_{CE}=5V	2.5	–	20	mA
	Collector-emitter saturation voltage			$V_{CE\ (sat)}$	I_F=20mA, I_C=1mA	–	0.15	0.35	V
	Isolation resistance			R_{ISO}	DC500V, 40 to 60%RH	5×10^{10}	1×10^{11}	–	Ω
	Floating capacitance			C_f	V=0, f=1MHz	–	0.6	1.0	pF
	Response time	Not saturated	Rise time	tr	V_{CE}=2V, I_C=2mA, R_L=100Ω	–	3	20	μs
			Fall time	tf		–	2	10	
		Saturated 1	Turn-on time	t_{on}	V_{CC}=5V, I_F=20mA, R_L=10kΩ	–	2	13	
			Storage time	t_s		–	9	50	
			Turn-off time	t_{off}		–	23	90	
		Saturated 2	Turn-on time	t_{on}	V_{CC}=5V, I_F=20mA, R_L=100kΩ	–	3	13	
			Storage time	t_s		–	10	50	
			Turn-off time	t_{off}		–	27	100	

*4 It has negative resistance characteristics due to built-in base-emitter resistance.
Please be careful not to apply voltage that exceed absolute maximum rating.

Fig.1 Forward Current vs. Ambient Temperature

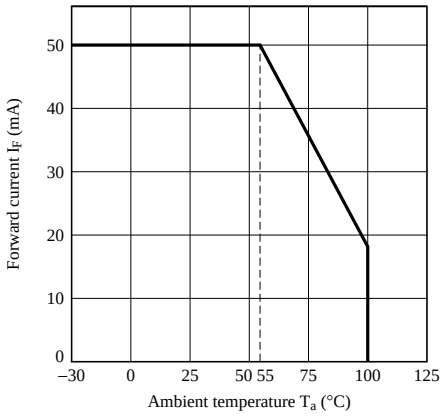


Fig.2 Diode Power Dissipation vs. Ambient Temperature

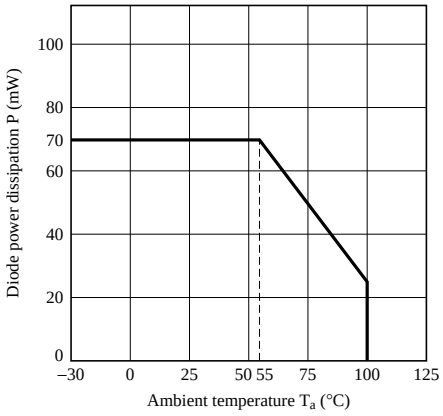


Fig.3 Collector Power Dissipation vs. Ambient Temperature

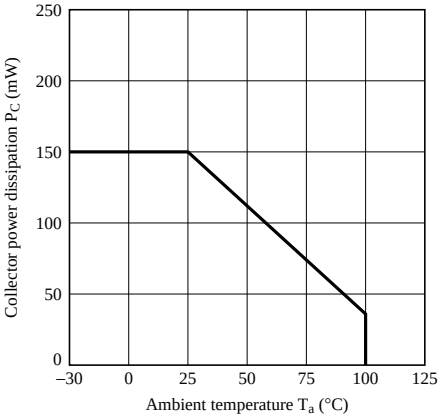


Fig.4 Total Power Dissipation vs. Ambient Temperature

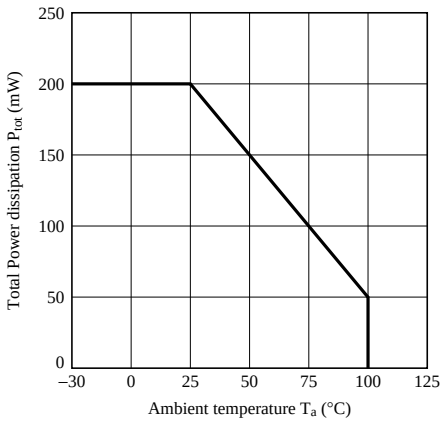


Fig.5 Peak Forward Current vs. Duty Ratio

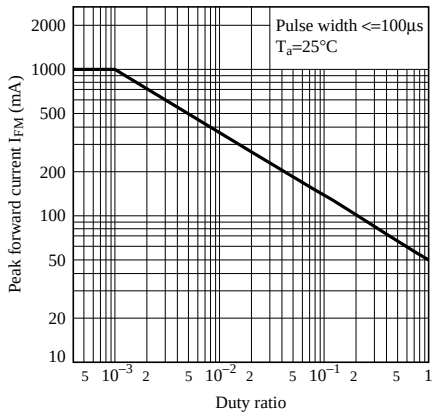


Fig.6 Forward Current vs. Forward Voltage

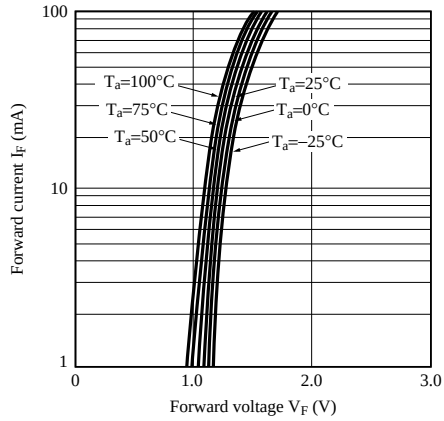


Fig.7 Current Transfer Ratio vs. Forward Current

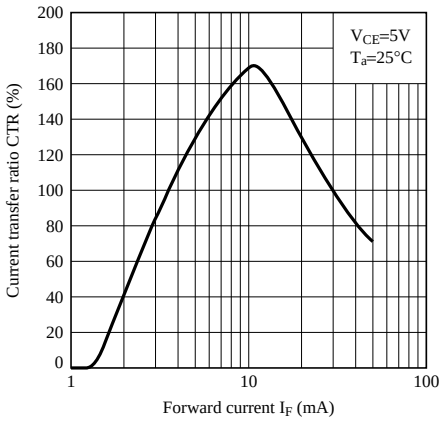


Fig.8 Collector Current vs. Collector-emitter Voltage

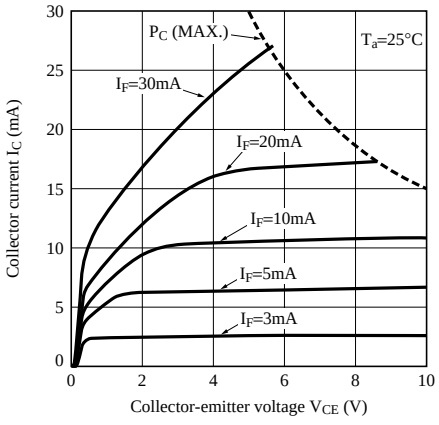


Fig.9 Relative Current Transfer Ratio vs. Ambient Temperature

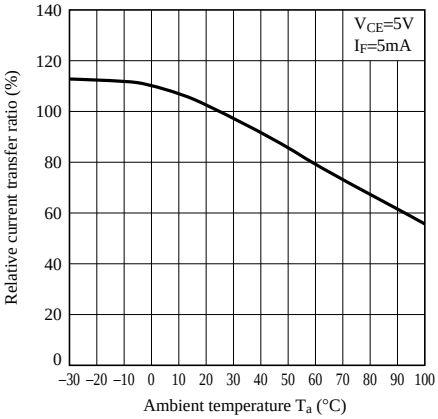


Fig.10 Collector - emitter Saturation Voltage vs. Ambient Temperature

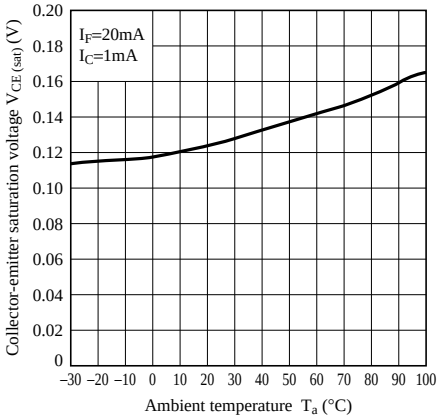


Fig.11 Collector Dark Current vs. Ambient Temperature

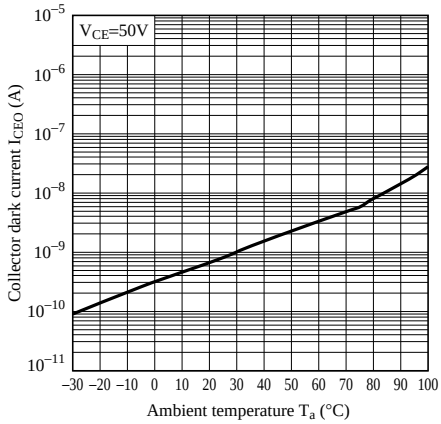


Fig.12 Response Time vs. Load Resistance (saturated mode)

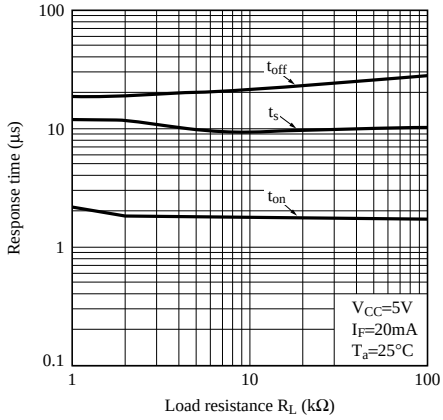


Fig.13 Response Time vs. Load Resistance (not saturated made)

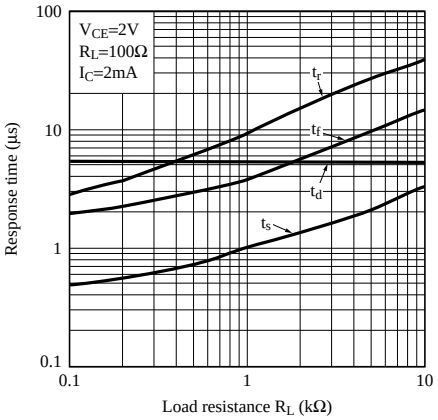


Fig.14 Voltage gain vs Frequency

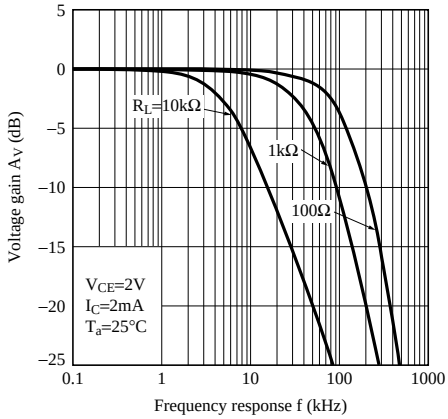


Fig.15 Collector-emitter Saturation Voltage vs. Forward Current

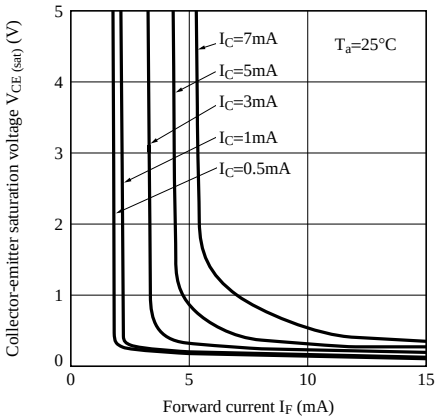
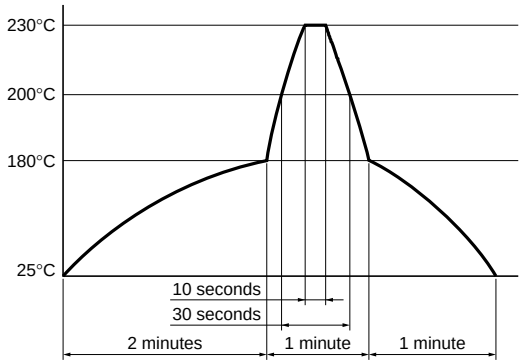


Fig.16 Reflow Soldering

Only one time soldering is recommended within the temperature profile shown below.



Application Circuits

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- Consumer electronics

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