

SHARP

PC3H71x NIP Series/PC3Q71x NIP Series

# PC3H71x NIP Series PC3Q71x NIP Series

## ■ Features

1. Low input current type ( $I_F=0.5\text{mA}$ )
2. High resistance to noise due to high common rejection voltage (CMR:MIN.  $10\text{kV}/\mu\text{s}$ )
3. Mini-flat package
4. Isolation voltage (Viso): $2.5\text{kVrms}$
5. Recognized by UL, file No. E64380

## ■ Applications

1. Programmable controllers
2. Facsimiles
3. Telephones

## ■ Rank Table

Model No.	Rank mark	Ic (mA)	Conditions
PC3H710NIP	A, B or no mark	0.5 to 3.5	$I_F=0.5\text{mA}$ $V_{CE}=5\text{V}$ $T_a=25^\circ\text{C}$
PC3H711NIP	A	0.7 to 1.75	
PC3H712NIP	B	1.0 to 2.5	
PC3H715NIP	A or B	0.7 to 2.5	
Model No.	Rank mark	Ic (mA)	Conditions
PC3Q710NIP	A or no mark	0.5 to 3.0	$I_F=0.5\text{mA}$ $V_{CE}=5\text{V}$ $T_a=25^\circ\text{C}$
PC3Q711NIP	A	1.0 to 2.5	

## ■ Absolute Maximum Ratings (Ta=25°C)

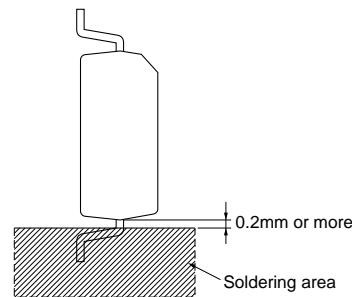
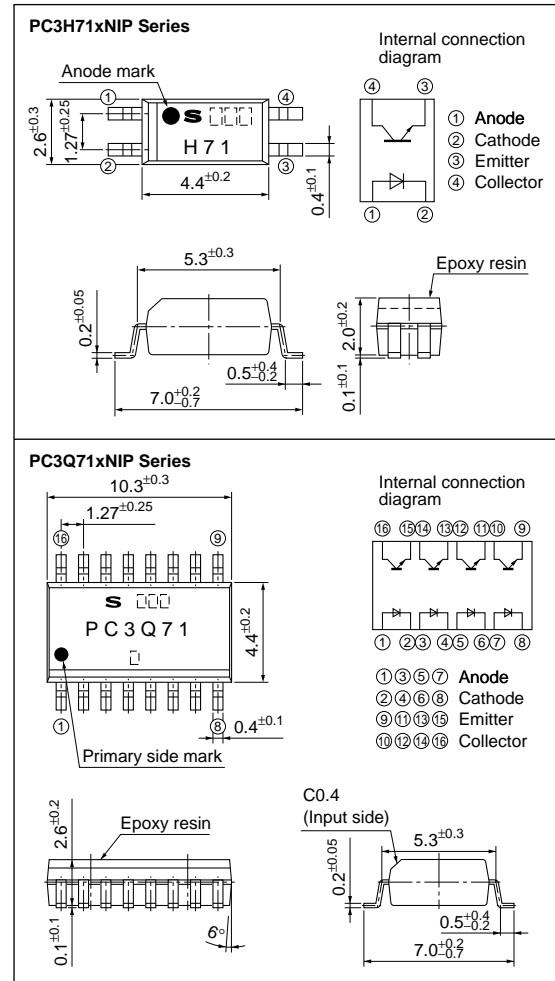
Parameter	Symbol	Rating	Unit	
Input	Forward current	$I_F$	10	mA
	*1 Peak forward current	$I_{FM}$	200	mA
	Reverse voltage	$V_R$	6	V
	Power dissipation	P	15	mW
Output	Collector-emitter voltage	$V_{CEO}$	70	V
	Emitter-collector voltage	$V_{ECO}$	6	V
	Collector current	$I_C$	50	mA
	Collector power dissipation	$P_C$	150	mW
Total power dissipation	$P_{tot}$	170	mW	
Operating temperature	$T_{opr}$	-30 to +100	°C	
Storage temperature	$T_{stg}$	-40 to +125	°C	
*2 Isolation voltage	$V_{iso}$	2.5	kV <sub>rms</sub>	
*3 Soldering temperature	$T_{sol}$	260	°C	

\*1 Pulse width $\leq 100\mu\text{s}$ , Duty ratio=0.001  
\*2 40 to 60%RH, AC for 1 minute, f=60Hz  
\*3 For 10s

## Low Input Current Type Photocoupler

## ■ Outline Dimensions

(Unit : mm)



Notice In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.  
Internet Internet address for Electronic Components Group <http://www.sharp.co.jp/ecg/>

■ Electro-optical Characteristics

(Ta=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	$V_F$	$I_F=10\text{mA}$	-	1.2	1.4	V	
	Reverse current	$I_R$	$V_R=4\text{V}$	-	-	10	$\mu\text{A}$	
	Terminal capacitance	$C_t$	$V=0, f=1\text{kHz}$	-	30	250	pF	
Output	Collector dark current	$I_{CEO}$	$V_{CE}=50\text{V}, I_F=0$	-	-	100	nA	
	Collector-emitter breakdown voltage	$BV_{CEO}$	$I_C=0.1\text{mA}, I_F=0$	70	-	-	V	
	Emitter-collector breakdown voltage	$BV_{ECO}$	$I_E=10\mu\text{A}, I_F=0$	6	-	-	V	
Transfer characteristics	Collector current	$I_C$	$I_F=0.5\text{mA}, V_{CE}=5\text{V}$	0.5	-	3.5	mA	
						3.0		
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F=10\text{mA}, I_C=1\text{mA}$	-	-	0.2	V	
	Isolation resistance	$R_{ISO}$	DC500V 40 to 60% RH	$5 \times 10^{10}$	$1 \times 10^{11}$	-	$\Omega$	
	Floating capacitance	$C_f$	$V=0, f=1\text{MHz}$	-	0.6	1.0	pF	
	Response time	Rise time	$t_r$	$V_{CE}=2\text{V}, I_C=2\text{mA}, R_L=100\Omega$	-	4	18	$\mu\text{s}$
		Fall time	$t_f$		-	3	18	$\mu\text{s}$
*1 Common mode rejection voltage		CMR	Ta=25°C, $R_L=470\Omega, V_{CM}=1.5\text{kV (peak)}, I_F=0\text{mA}, V_{CC}=9\text{V}, V_{np}=100\text{mV}$	10	-	-	kV/ $\mu\text{s}$	

\*1 Refer to Fig.1.

Fig.1 Test Circuit for Common Mode Rejection Voltage

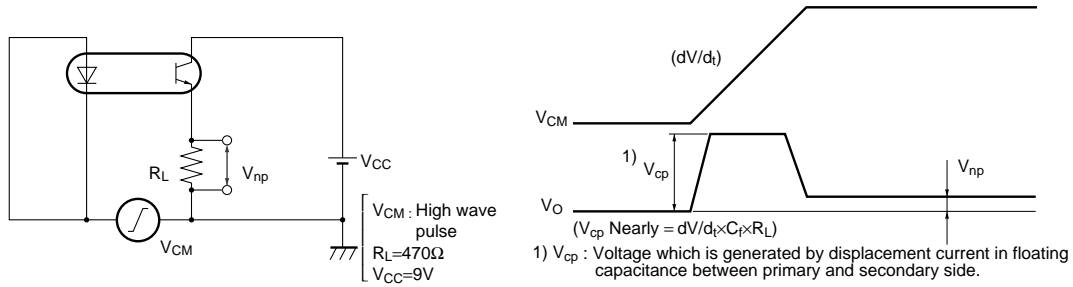


Fig.2 Forward Current vs. Ambient Temperature

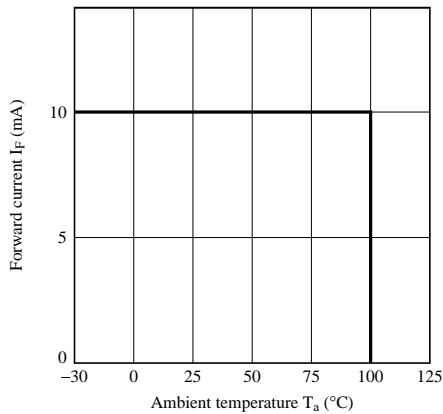
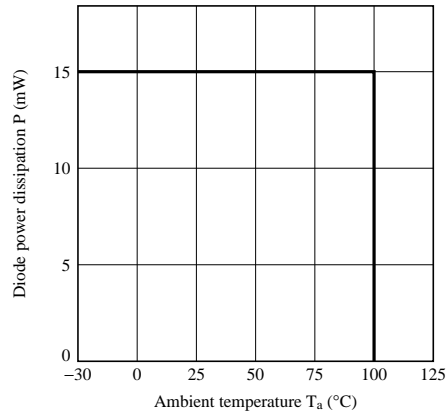
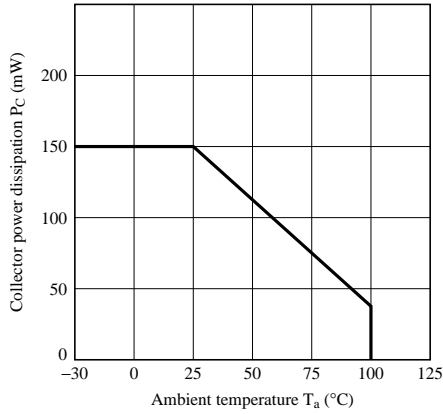


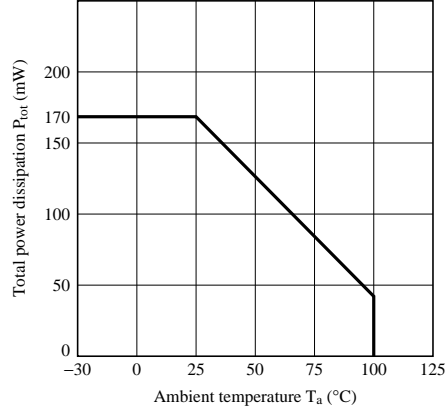
Fig.3 Diode Power Dissipation vs. Ambient Temperature



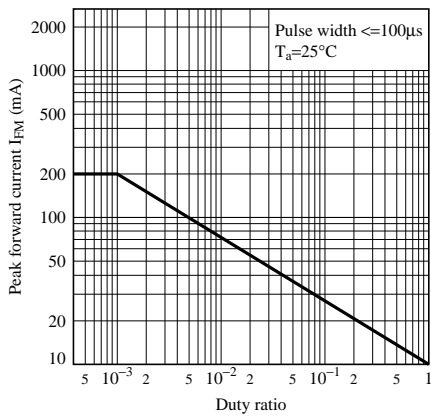
**Fig.4 Collector Power Dissipation vs. Ambient Temperature**



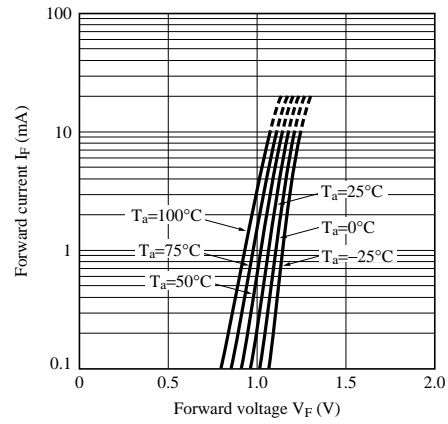
**Fig.5 Total Power Dissipation vs. Ambient Temperature**



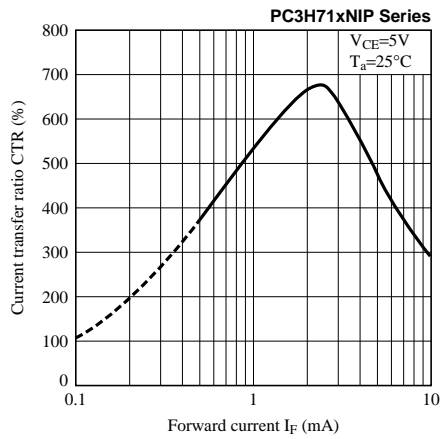
**Fig.6 Peak Forward Current vs. Duty Ratio**



**Fig.7 Forward Current vs. Forward Voltage**



**Fig.8 Current Transfer Ratio vs. Forward Current**



**Fig.9 Current Transfer Ratio vs. Forward Current**

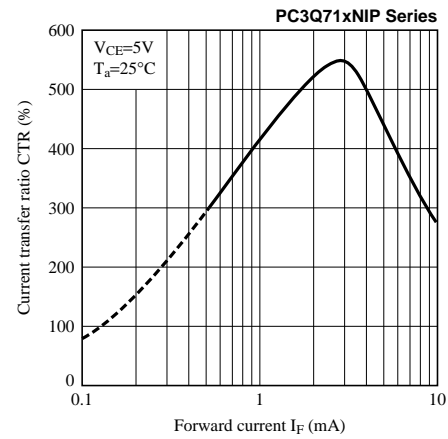


Fig.10 Collector Current vs. Collector-emitter Voltage

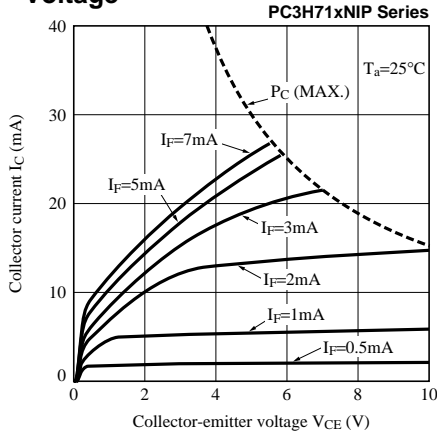


Fig.11 Collector Current vs. Collector-emitter Voltage

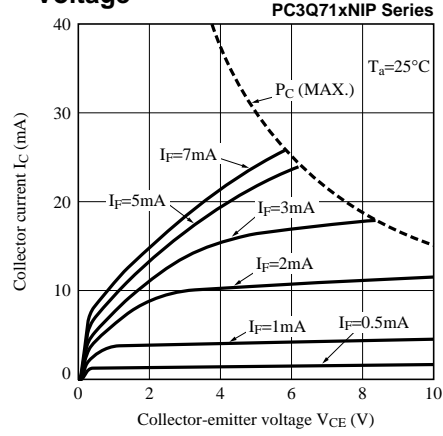


Fig.12 Relative Current Transfer Ratio vs. Ambient Temperature

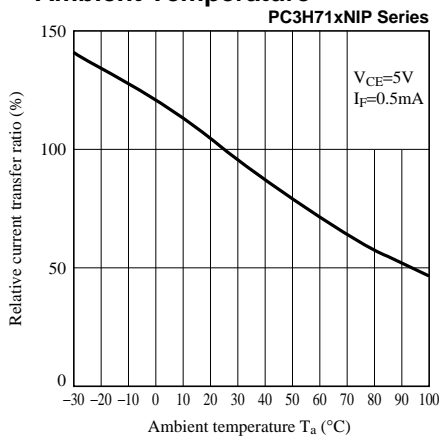


Fig.13 Relative Current Transfer Ratio vs. Ambient Temperature

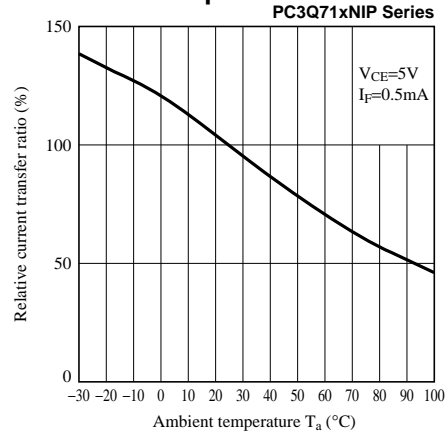


Fig.14 Collector-emitter Saturation Voltage vs. Ambient Temperature

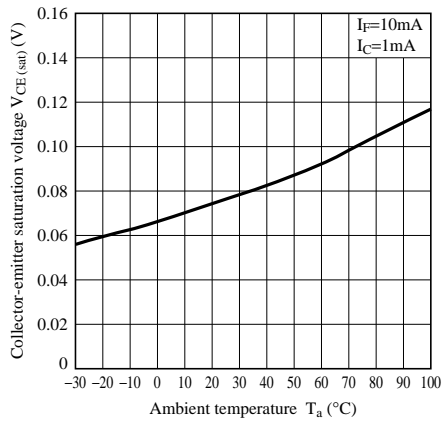


Fig.15 Collector Dark Current vs. Ambient Temperature

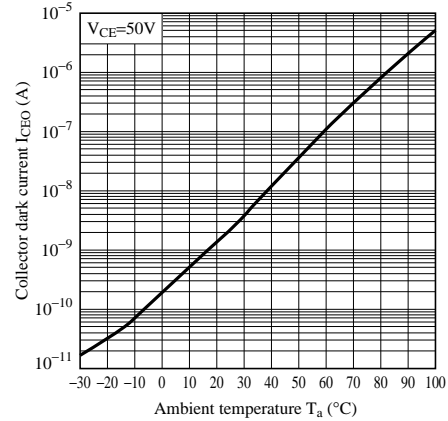


Fig.16 Response Time vs. Load Resistance

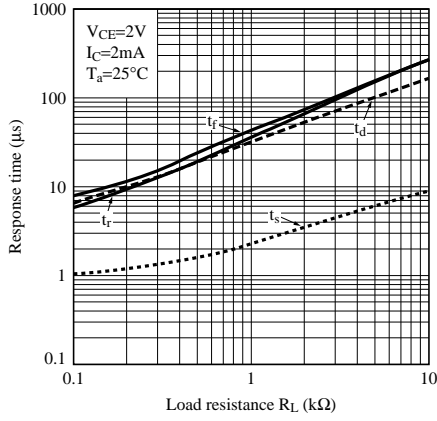


Fig.17 Response Time vs. Load Resistance (Saturation)

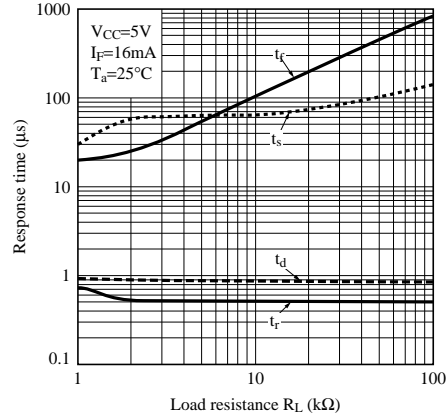


Fig.18 Test Circuit for Response Time

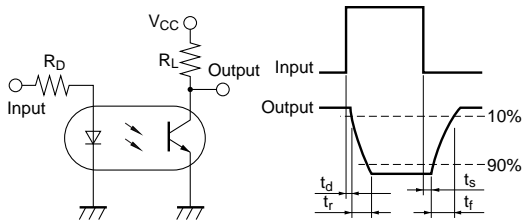


Fig.19 Voltage Gain vs Frequency

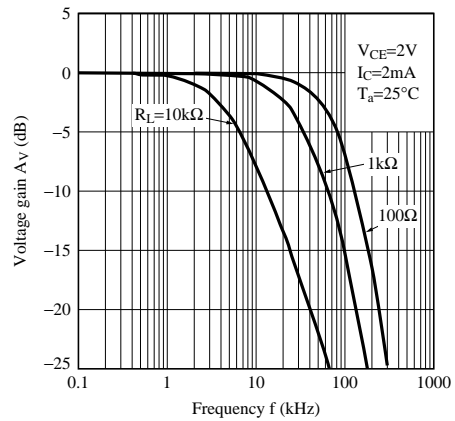


Fig.20 Collector-emitter Saturation Voltage vs. Forward Current

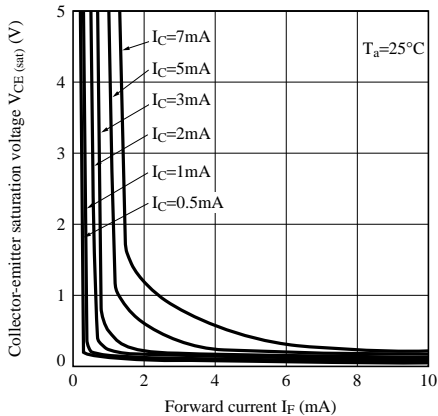


Fig.21 Reflow Soldering

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

