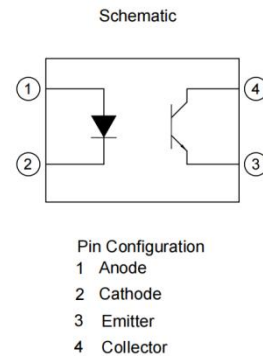


PC series

Product Specification PC-10XX



■ Description

The PC-10XX is a photoelectric coupler composed of light-emitting diode and phototransistor. It is packaged in a 4-pin LSOP 4 package .

■ Features

- Current transfer ratio(CTR : MIN. 50% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
- High input-output isolation voltage($V_{iso} = 5,000\text{V}_{rms}$)
- Operating Temperature: $-55^{\circ}\text{C} \sim 110^{\circ}\text{C}$
- Safety approval
(UL 1577, VDE DIN EN60747-5-5 (VDE 0884-5) , CQC11-471543-2022)
- RoHS
- MSL1

■ Applications

- Programmable controllers
- Switching power supply, intelligent meter
- Home appliances: such as air conditioners, fans, water heaters, etc

■ Product Nomenclature

The product name is designated as below:

PC - 10XX - XX - XX - XX
 ①② ③④ ⑤

Designation:

PC =Photo Coupler

10XX= Product Series(100X,101X)

① = Tape and Reel option₍₁₎

② = Lead frame Material₍₂₎

③ = VDE order option(fixed code “V”)

④ = Halogen free option(fixed code “G”)

⑤ = Customer code

Notes

1. Tape and Reel option:

Symbol	Description
TP&TP1	Tape and Reel Type

2. Lead frame Material

Symbol	Description
NONE	Copper

■ Marking Information

No Marking unless otherwise requested by the customer

■ Maximum Ratings

	Parameter	Symbol	Values	Unit
Input	Forward Current	I_F	50	mA
	Reverse Voltage	V_R	6	V
	Power Dissipation	P	70	mW
	Peak Forward Current (100μs pulse, 100Hz)	I_{FP}	1	A
	Thermal Resistance Junction-Ambient	R_{thJ-A}	325	°C/W
	Thermal Resistance Junction-Case	R_{thJ-C}	200	°C/W
Output	Collector - Emitter Voltage	V_{CEO}	80	V
	Emitter - Collector Voltage	V_{ECO}	6	V
	Collector Current	I_C	50	mA
	Collector Power Dissipation	P_C	150	mW
Operating temperature range		T_{op}	-55 ~ 110	°C
Storage temperature range		T_{stg}	-55 ~ 125	°C
Total Power consumption		P(W)	200	mW
Isolation Voltage ⁽¹⁾		V_{ISO}	5000	Vrms
Soldering Temperature ⁽²⁾		T_{SOL}	260	°C

Notes:

(1). AC for 1 minute, R.H.= 40 ~ 60% R.H. In this test, pins 1, 2 are shorted together, and pins 3, 4 are shorted together.

(2).For 10 seconds

■ Electronic Optical Characteristics

(TA = 25°C)

	Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditon
Input	Forward Voltage	V_F	-	1.2	1.4	V	$I_F=20mA$
	Reverse Current	I_R	-	-	10	μA	$V_R=4V$
	Terminal Capacitance	C_t	-	30	250	pF	$V=0, f=1KHz$
Output	Collector Dark Current	I_{CEO}	-	-	100	nA	$V_{CE}=20V, I_F=0$
	Collector-Emitter Breakdown Voltage	BV_{CEO}	80			V	$I_C=0.1mA, I_F=0$

PC-10XX
Photo Coupler

Emitter-Collector Breakdown Voltage	BV_{ECO}	7		V	$I_E=10\mu A$, $I_F=0$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		0.3	V	$I_F=10mA$, $I_C=1mA$
Isolation Resistance	R_{iso}	5×10^{10}	1×10^{11}	-	Ω DC500V, 40 ~ 60% R.H.
Floating Capacitance	C_f		0.6	1	pF $V=0$, $f=1MHz$
Response Time (Rise)	t_r		18	μs	$V_{CE}=5V$, $I_C=5mA$
Response Time (Fall)	t_f		18	μs	$RL=100\Omega$,

■ Rank Table Of Current Transfer Ratio

(CTR= $I_C/I_F \times 100\%$)

Rank Code	Symbol	Min	Max	Condition
PC-1010,1000	CTR	50	600	$I_F=5mA$, $V_{CE}=5V$, $T_a=25^\circ C$
PC-1017,1007		80	160	
PC-1018,1008		130	260	
PC-1019,1009		200	400	
PC-1012,1002	CTR	63	125	$I_F=10mA$, $V_{CE}=5V$, $T_a=25^\circ C$
PC-1013,1003		100	200	
PC-1014,1004		160	320	
PC-1012,1002	CTR	22		$I_F=1mA$, $V_{CE}=5V$, $T_a=25^\circ C$
PC-1013,1003		34		
PC-1014,1004		56		

■ Characteristics Curves

Fig.1 Relative Current Transfer Ratio vs. Forward Current

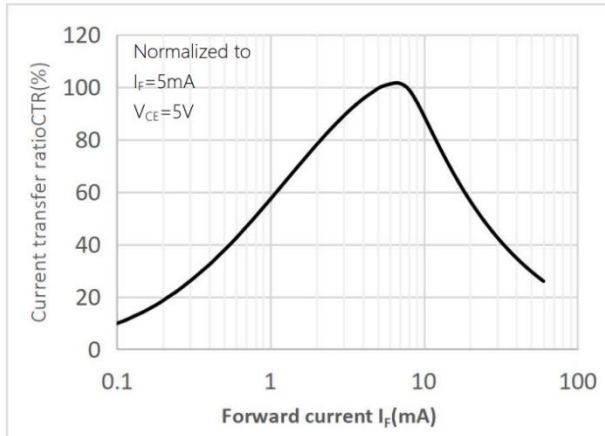


Fig.2 Forward Current vs. Forward Voltage

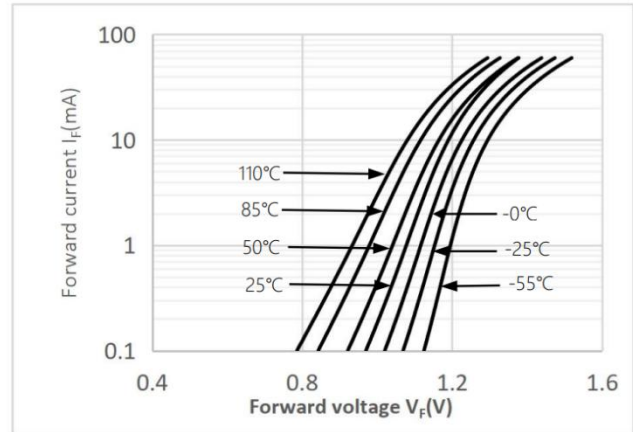


Fig.3 Collector Current vs. Collector-emitter Voltage

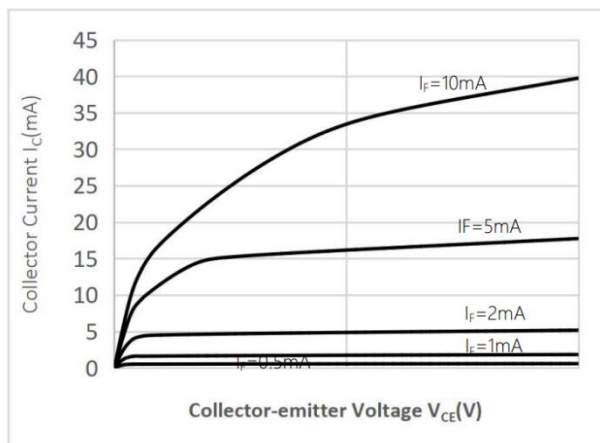


Fig.4 Relative Current Transfer Ratio vs. Ambient Temperature

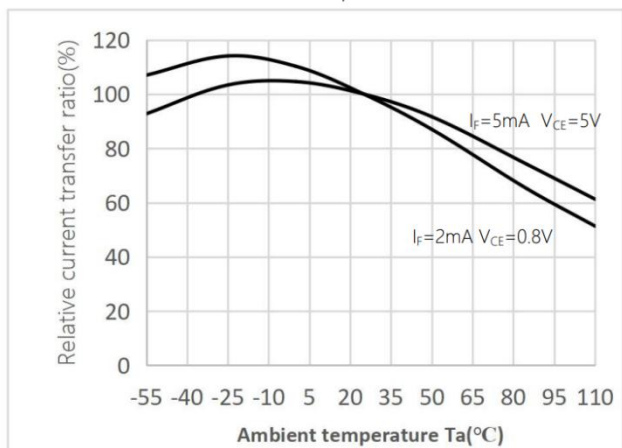


Fig.5 Collector-emitter Saturation Voltage vs. Ambient Temperature

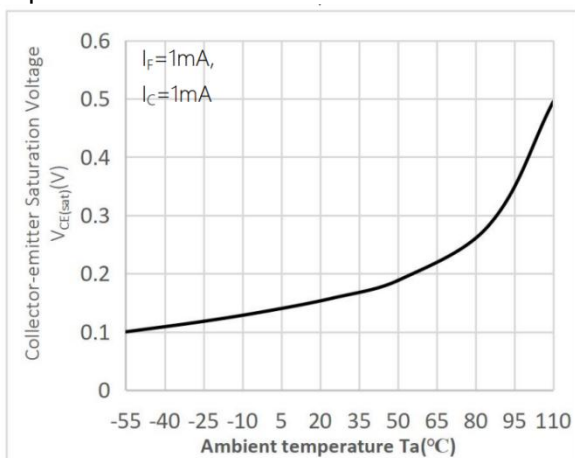


Fig.6 Collector Dark Current vs Ambient Temperature

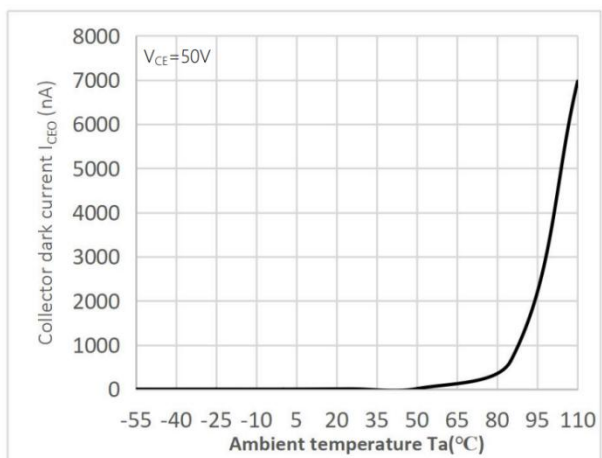


Fig.7 Response Time vs. Load Resistance

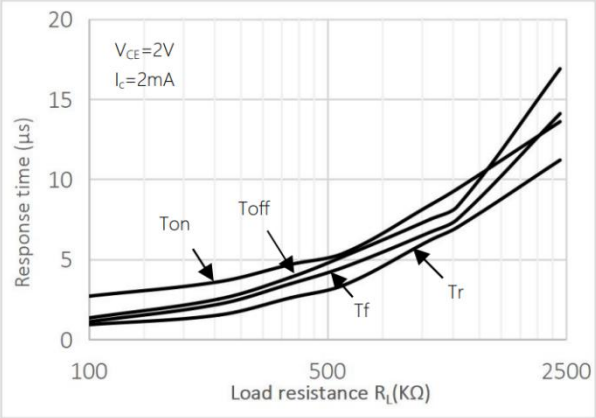


Fig.8 Frequency Response

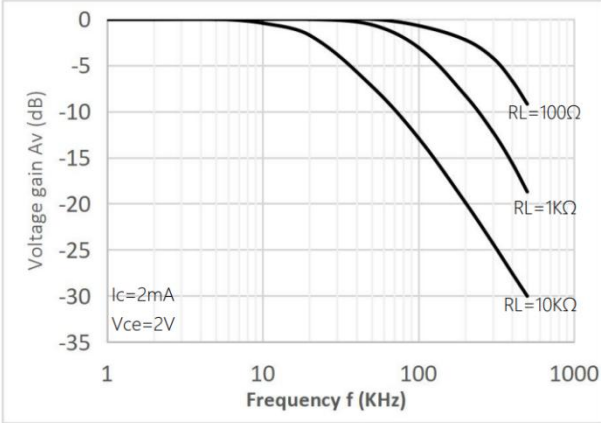


Fig.9 Collector-emitter Saturation Voltage vs Forward Current

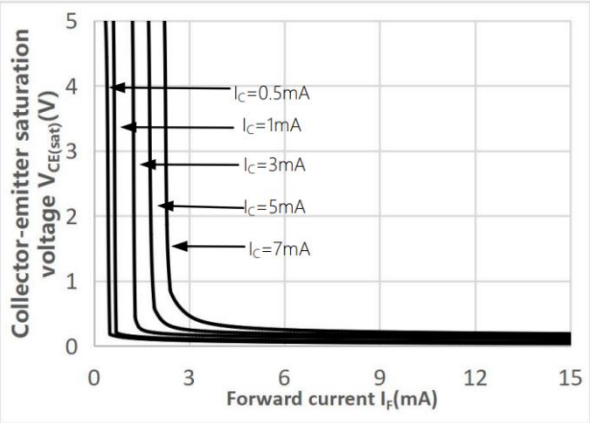
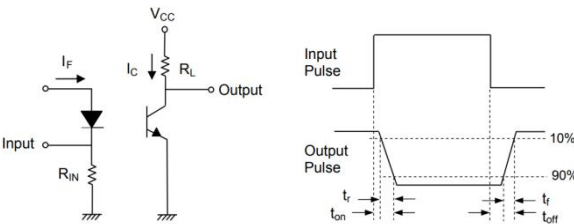
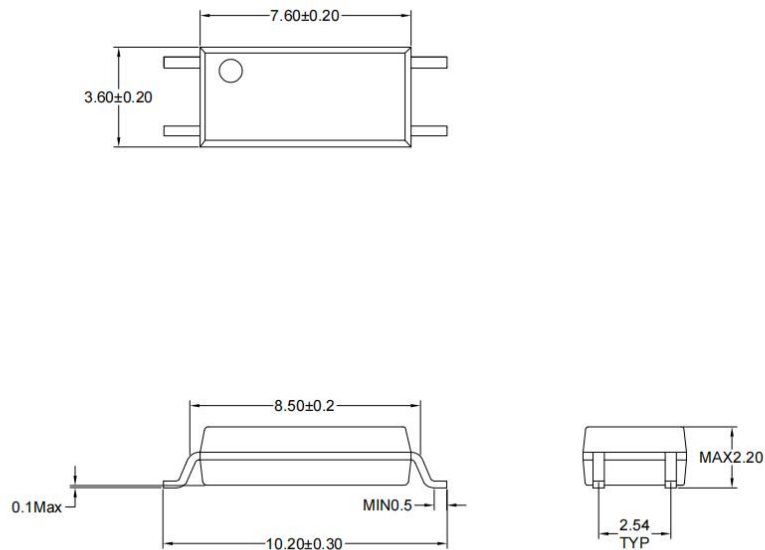


Fig.10 Switching Time Test Circuit & Waveforms



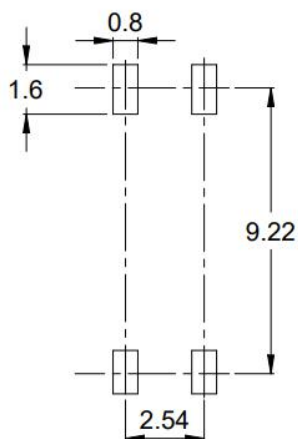
■ Outline Dimension



Unit: mm

Tolerance: $\pm 0.1 \text{ mm}$

■ Recommended solder pad Design



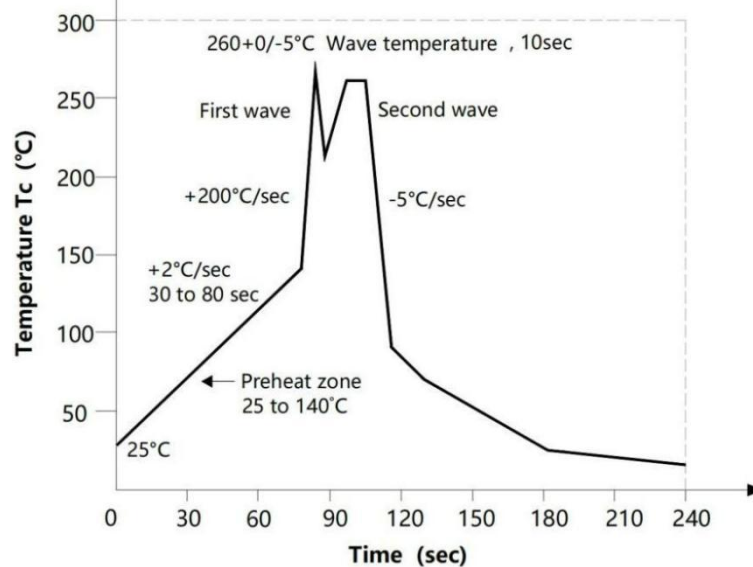
Unit: mm

Tolerance: $\pm 0.1 \text{ mm}$

■ Temperature Profile Of Soldering

1. IR Reflow soldering (JEDEC-STD-020 compliant)

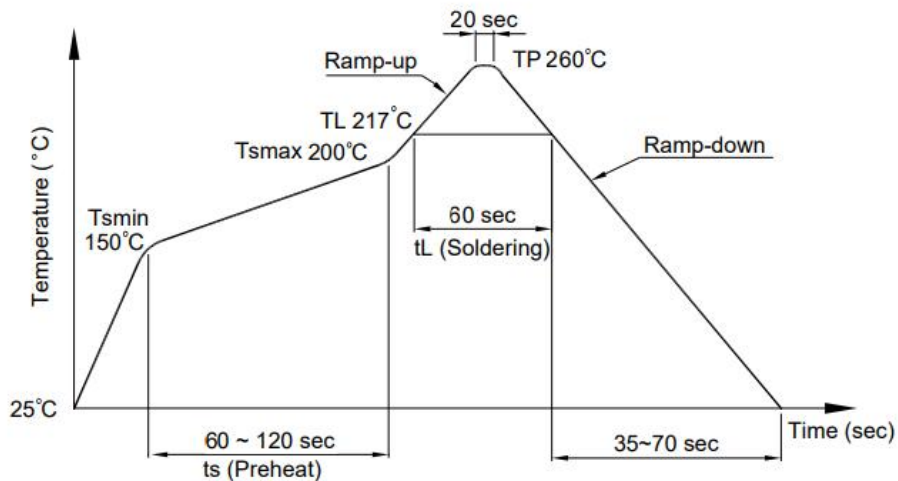
Profile item	Conditon
Preheat	
-Temperature Min (TSmin)	150°C
-Temperature Max (TSmax)	200°C
-Time (min to max) (ts)	90 ± 30 sec
Soldering zone	
-Temperature (TL)	217°C
-Time (tL)	60 sec
Peak Temperature (TP)	260°C
Ramp-up rate	3°C / sec max
Ramp-down rate	3~6°C/ sec



Notes:

One time soldering reflow is recommended within the condition of temperature and time profile shown below. Do not solder more than three times.

2. Wave soldering (JEDEC22A111 compliant)



3. Hand soldering by soldering iron

Allow single lead soldering in every single process. One time soldering is recommended.

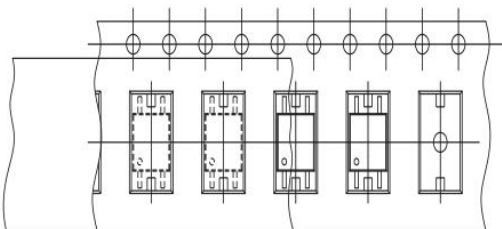
Temperature: $380 \pm 5^\circ\text{C}$

Time: 3 sec max.

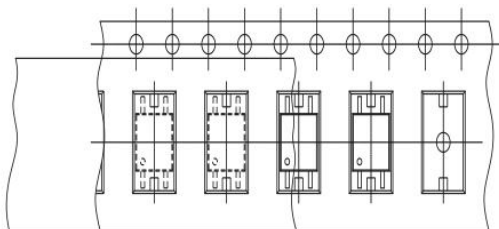
■ Packing

1. Tape and Reel

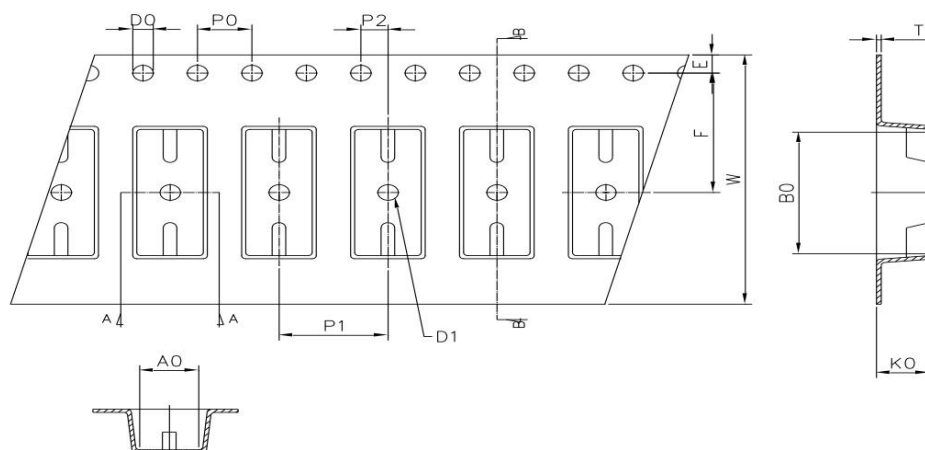
Option TP:



Option TP1:



PC-10XX
Photo Coupler



Deminsion/mm	W	E	F	P0	P1	P2
Packagetype:S	16 ± 0.2	1.75 ± 0.1	7.5 ± 0.1	4 ± 0.1	8 ± 0.1	2 ± 0.1

Deminsion/mm	A0	B0	D0	D1	K0	T
Packagetype:S	3.95 ± 0.1	10.82 ± 0.1	1.5 ± 0.1	1.5 ± 0.1	2.25 ± 0.1	0.4 ± 0.1

Packagetype:S	Reel	Inner carton	Outer carton
QTY/PCS	3K/reel	6K(2 reels)	60K

■ Attention:

- The products shown in this publication are designed for the general use in electronic applications such as office automation equipment, communications devices, audio/visual equipment, electrical application and instrumentation.
- For equipment/devices where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc, please contact our sales representatives.
- When requiring a device for any "specific" application, please contact our sales in advice.
- If there are any questions about the contents of this publication, please contact us at your convenience.