

# PC450T11

## Photocoupler with Built-in Breakdown Diode for Surge Voltage Absorption

### ■ Features

1. Built-in breakdown diode for absorption of surge voltage
2. High current transfer ratio  
(CTR: MIN. 1500% at  $I_F = 5\text{mA}$ )
3. Mini-flat package
4. Applicable to soldering reflow
5. Available tape-packaged products

### ■ Applications

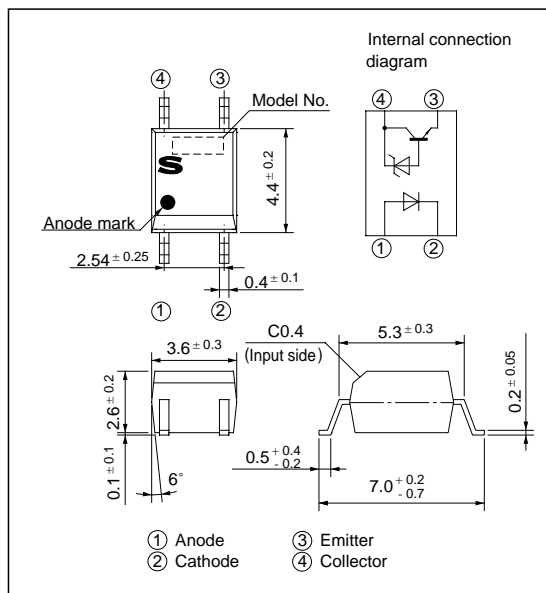
1. Programmable controllers

### ■ Package Specifications

Model No.	Package Specification
PC450T11	Taping diameter 178mm(750pcs. )

### ■ Outline Dimensions

( Unit : mm )



### ■ Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	*1 Peak forward current	$I_{FM}$	1	A
	Reverse voltage	$V_R$	6	V
	Power dissipation	$P$	70	mW
Output	Emitter-collector voltage	$V_{ECO}$	6	V
	*2 Surge endurance	$E_{sj}$	20	mJ
	Collector current	$I_C$	150	mA
	Collector power dissipation	$P_C$	150	mW
	Total power dissipation	$P_{tot}$	170	mW
*3 Isolation voltage		$V_{iso}$	3.75	kV <sub>rms</sub>
Operating temperature		$T_{opr}$	- 30 to + 100	$^\circ\text{C}$
Storage temperature		$T_{stg}$	- 40 to + 125	$^\circ\text{C}$
*4 Soldering temperature		$T_{sol}$	260	$^\circ\text{C}$

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

\*2  $E_{sj} = 40\text{V} (V_{CEO}) \times 100\text{mA} (I_C) \times 10\text{ms} \times 1/2$

\*3 AC for 1 min., 40 to 60% RH,  $f = 60\text{Hz}$

\*4 For 10 seconds

## Electro-optical Characteristics

(Ta = 25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	$V_F$	$I_F = 20\text{mA}$	-	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	$I_{CEO}$	$V_{CE} = 20\text{V}, I_F = 0$	-	-	5	$\mu\text{A}$	
	Collector-emitter breakdown voltage	$BV_{CEO}$	$I_F = 0$ $I_C = 0.1\text{mA}$	40	-	60	V	
	Emitter-collector breakdown voltage	$BV_{ECO}$	$I_E = 10\mu\text{A}, I_F = 0$	6	-	-	V	
	Collector current	$I_C$	$V_{CE} = 2\text{V}, I_F = 5\text{mA}$	75	-	-	mA	
Transfer characteristics	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F = 10\text{mA}$ $I_C = 100\text{mA}$	-	-	0.5	V	
	Isolation resistance	$R_{ISO}$	DC500V, 40 to 60% RH	$5 \times 10^{10}$	$10^{11}$	-	$\Omega$	
	Floating capacitance	$C_f$	$V = 0, f = 1\text{MHz}$	-	0.6	1.0	pF	
	Response time	Rise time	$t_r$	$V_{CE} = 2\text{V}, I_C = 2\text{mA}$	-	50	-	$\mu\text{s}$
		Fall time	$t_f$	$R_L = 100\Omega$	-	30	-	$\mu\text{s}$

Fig. 1 Forward Current vs. Ambient Temperature

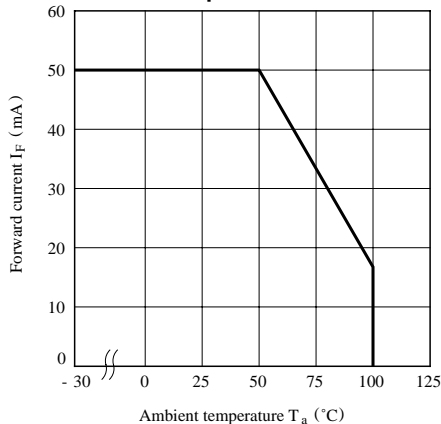
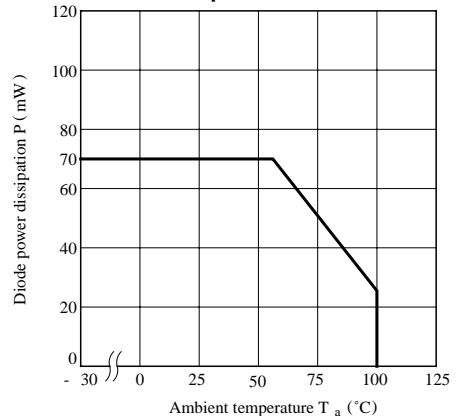
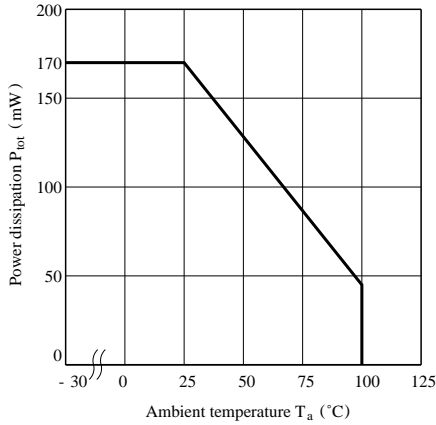


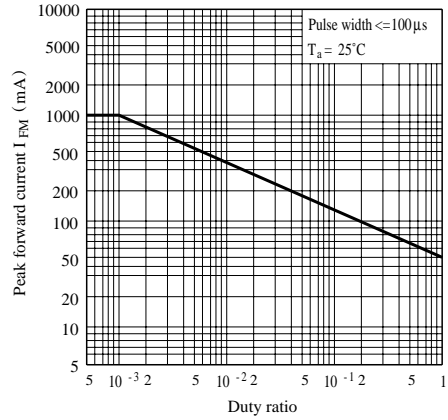
Fig. 2 Diode Power Dissipation vs. Ambient Temperature



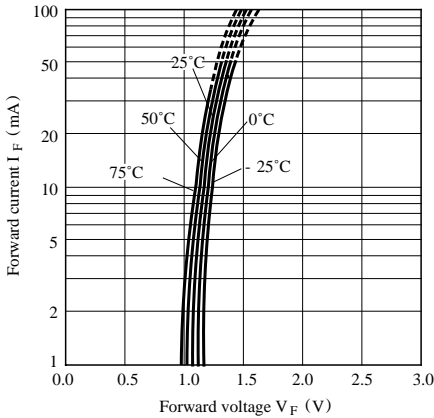
**Fig. 3 Power Dissipation vs. Ambient Temperature**



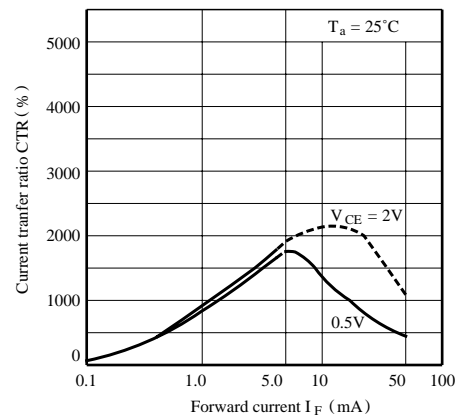
**Fig. 4 Peak Forward Current vs. Duty Ratio**



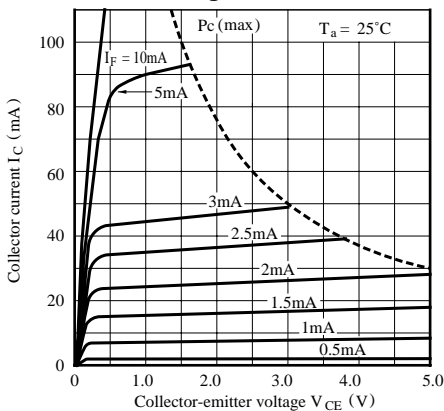
**Fig. 5 Forward Current vs. Forward Voltage**



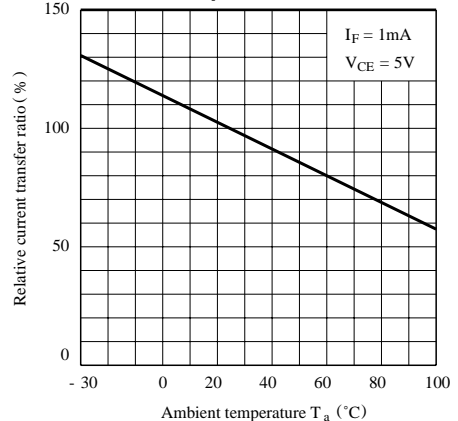
**Fig. 6 Current Transfer Ratio vs. Forward Current**



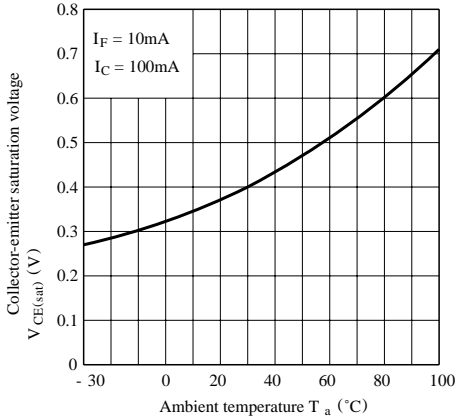
**Fig. 7 Collector Current vs. Collector-emitter Voltage**



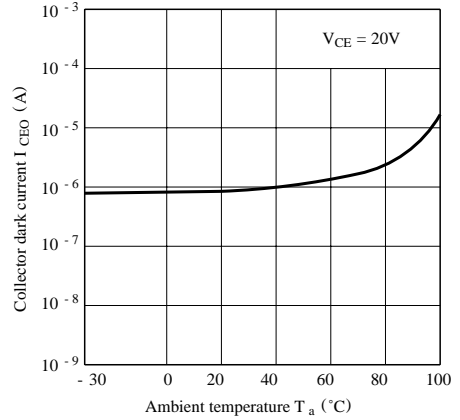
**Fig. 8 Relative Current Transfer Ratio vs. Ambient Temperature**



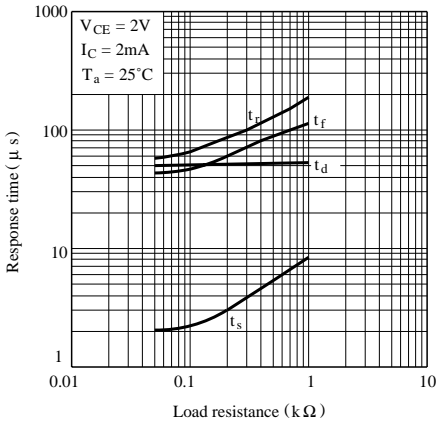
**Fig.9 Collector-emitter Saturation Voltage vs. Ambient Temperature**



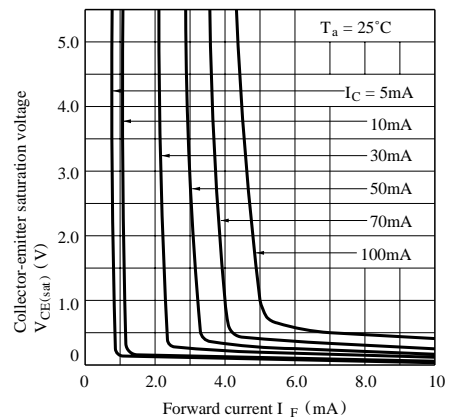
**Fig.10 Collector Dark Current vs. Ambient Temperature**



**Fig.11 Response Time vs. Load Resistance**



**Fig.12 Collector-emitter Saturation Voltage vs. Forward Current**



●Please refer to the chapter “Precautions for Use.”

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