Phototransistor

PC101X-E Series

Features

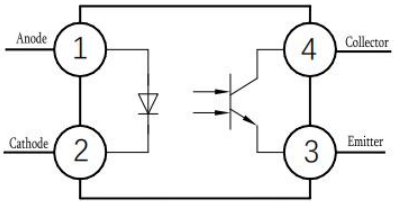
HF

- Current transfer ratio

(CTR: 50~600% at I_F = 5mA, V_{CE} = 5V)

(CTR: 63~320% at IF = 10mA,VCE=5V)

- High isolation voltage between input and output (Viso =5000V rms)
- Collector - emitter breakdown voltage BVCEO ≥ 80V
- Operating Temperature: -55℃~110℃



Applications

- Programmable controllers
- System appliances, measuring instruments
- Telecommunication equipments
- Home appliances, such as Fan Heaters, etc
- Signal transmission between circuits of different potentials and impedances



Mechanical Data

- Case:LSOP-4L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

PC	101	X	(G)	-	E
①	②	③	④		⑤

① Brand(PC)
② Product series(101)
③ CTR Bank(0、2、3、4、7、8、9)
④ Halogen option(None :Halogen free)
⑤ Product Versions: E

Part Number	Package	Shipping Quantity	Marking Code
PC101X*1-E	LSOP-4L	3000 pcs / Reel	PC101X*1...E

Notes 1：X denotes CTR Rank : 0, 2, 3, 4 , 7, 8, 9.

Marking Information

- "PC" denotes brand
- "X" denotes CTR Rank : 0、2、3、4、7、8、9
- "Y" denotes Year : A(2024), B(2025), C(2026) .....
- "WW" denotes Week's number
- "N" denotes the day of Week.
- "E" fixed



Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter		Symbol	Value	Unit
Input	Forward Current	I_F	60	mA
	Peak Forward Current *1	I_{FM}	1.5	A
	Reverse Voltage	V_R	6	V
	Power Dissipation	P_D	100	mW
Output	Collector Power Dissipation	P_C	150	mW
	Collector Current	I_C	50	mA
	Collector-Emitter Voltage	V_{CEO}	80	V
	Emitter-Collector Voltage	V_{ECO}	7	V

Thermal Characteristics

Parameter	Symbol	Value	Unit
Total Power Dissipation	P_{TOT}	250	mW
Isolation Voltage *2	V_{ISO}	5000	Vrms
Operating Temperature	T_{OPR}	-55 ~ +110	°C
Storage Temperature Range	T_{STG}	-55 ~ +125	°C
Soldering Temperature *3	T_{SOL}	260	°C

Notes:
1. Pulse width≤1μs, Duty ratio: 0.001
2. 40 to 60% RH, AC for 1 minute
3. For 10 seconds

Electrical Characteristics (@ T_A = 25°C unless otherwise specified)

Parameter		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	I_F = 50mA	-	1.3	1.5	V
	Reverse Current	I_R	V_R = 6V	-	-	10	μA
	Input Capacitance	C_{in}	V_R = 0V, f = 1kHz	-	50	-	pF
Output	Collector-Emitter Dark Current	I_{CEO}	V_{CE} = 20V, I_F = 0	-	-	100	nA
	Collector-Emitter Breakdown Voltage	BV_{CEO}	I_C = 0.1mA, I_F = 0	80	-	-	V
	Emitter-Collector Breakdown Voltage	BV_{ECO}	I_E = 0.1mA, I_F = 0	7	-	-	V
Transfer Characteristics	Current Transfer Ratio	CTR	I_F = 5 mA, V_{CE} = 5V	50	-	600	%
			I_F = 10 mA, V_{CE} = 5V	63	-	320	%
			I_F = 1 mA ,V_{CE} = 5V	22	-	-	%
	Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F = 10mA, I_C = 1mA	-	0.1	0.3	V
	Isolation Resistance	R_{IO}	V_{IO} = 500Vdc 40~60% R.H.	1×10^{12}	-	-	Ω
	Floating Capacitance	C_{IO}	V_{IO} = 0, f = 1MHz	-	-	1.0	pF
	Turn On Time	T_{on}	V_{CE}=5V I_C=5mA RL= 100Ω	1	4	19	μs
	Turn Off Time	T_{off}		1	3	19	
	Rise Time	t_r		-	-	18	
	Fall Time	T_f		-	-	18	

Rank Table of Current Transfer Ratio CTR

Rank Mark	Min. (%)	Max. (%)	Condition
PC1010-E	50	600	I_F=5mA ,V_{CE}=5V
PC1017-E	80	160	
PC1018-E	130	260	
PC1019-E	200	400	
PC1012-E	63	125	I_F=10mA ,V_{CE}=5V
PC1013-E	100	200	
PC1014-E	160	320	
PC1012-E	22	-	I_F=1mA ,V_{CE}=5V
PC1013-E	34	-	
PC1014-E	56	-	

Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

Fig.1 Allowable Forward Current vs. Ambient Temperature

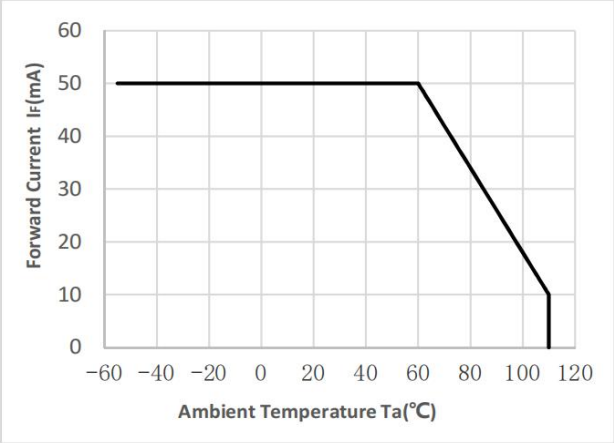


Fig.2 Allowable collector power disspation vs. Ambient Temperature(℃)

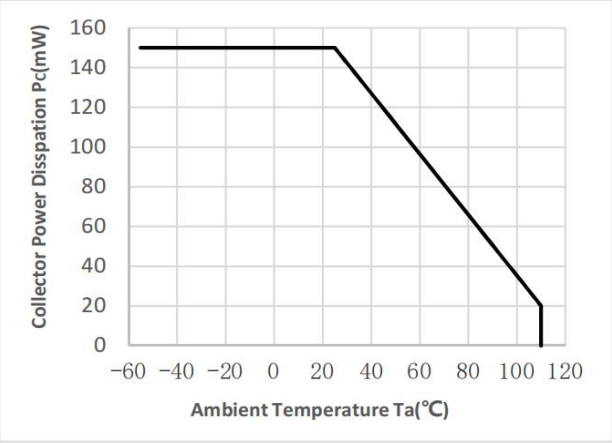


Fig.3 Relative Current Transfer Ratio vs. Forward Current

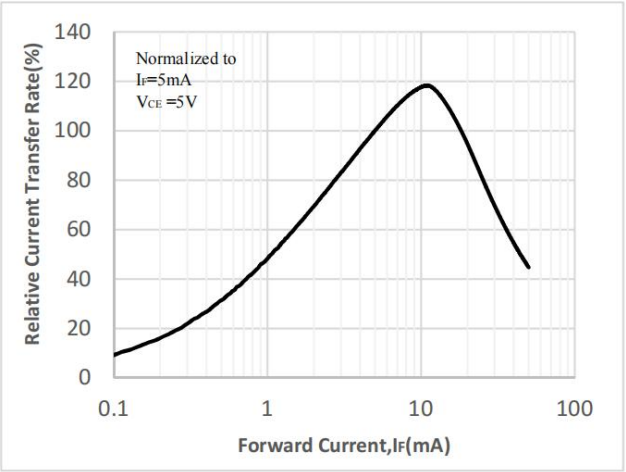


Fig4 Forward Current vs. Forward Voltage

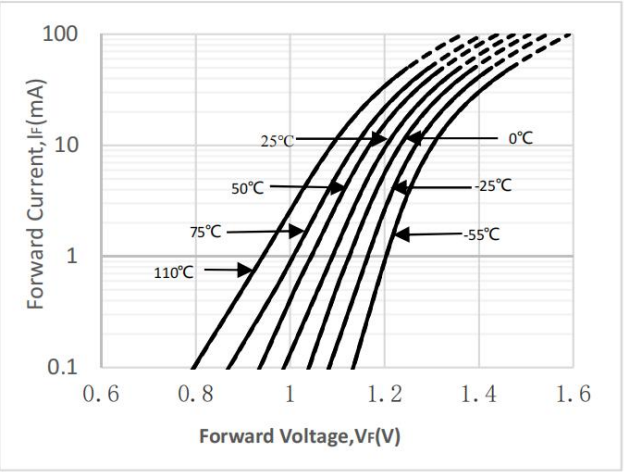


Fig.5 Collector Current vs. Collector-emitter Voltage

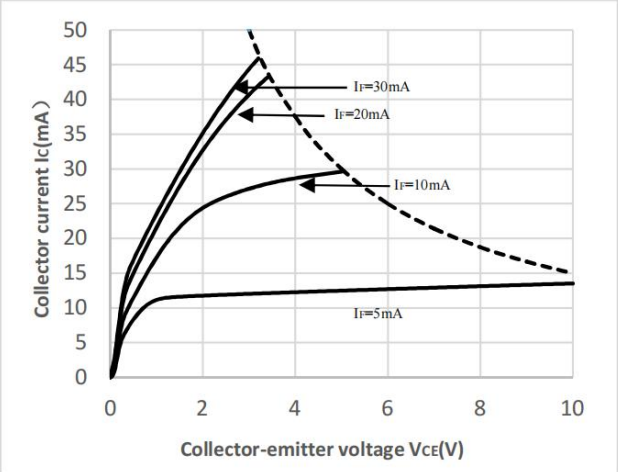


Fig.6 Relative Current Transfer Ratio vs. Ambient Temperature

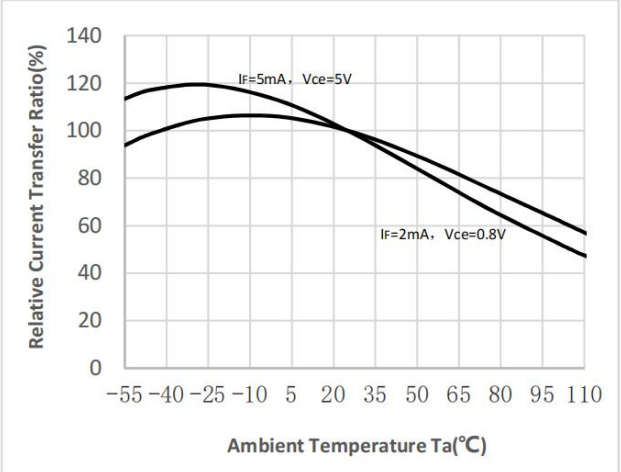


Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

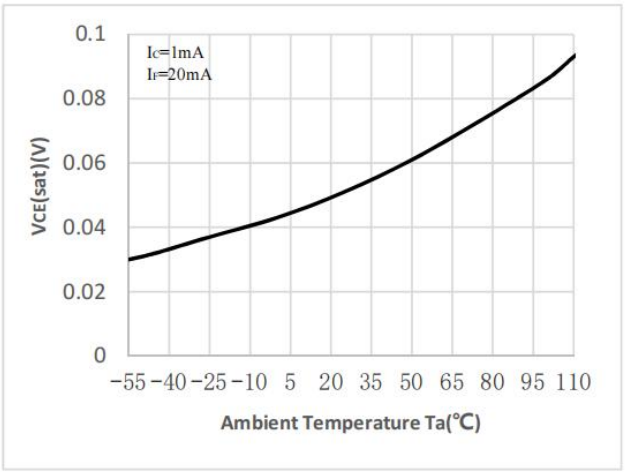


Fig.8 Collector Dark Current vs. Ambient Temperature

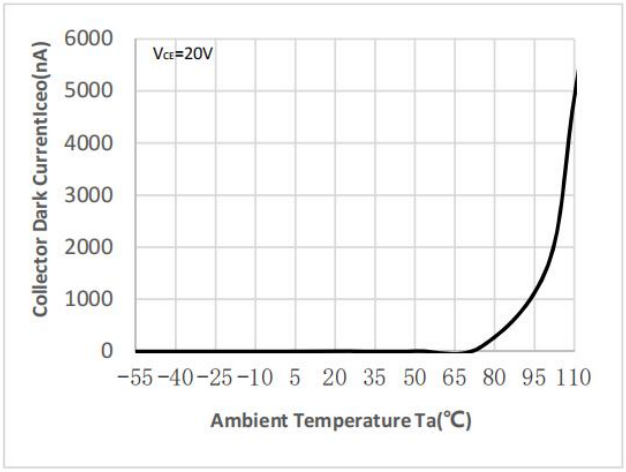


Fig.9 Response Time vs. Load Resistance

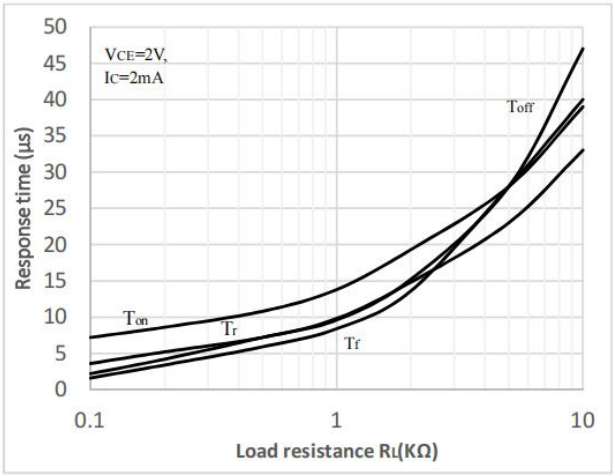


Fig.10 Frequency Response

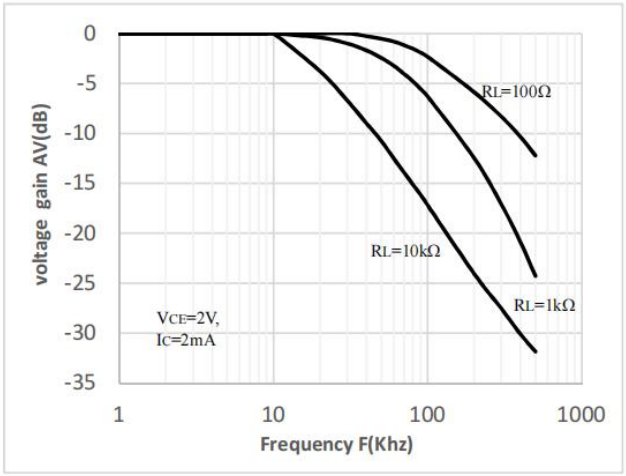


Fig.11 Collector-emitter Saturation Voltage vs. Forward Current

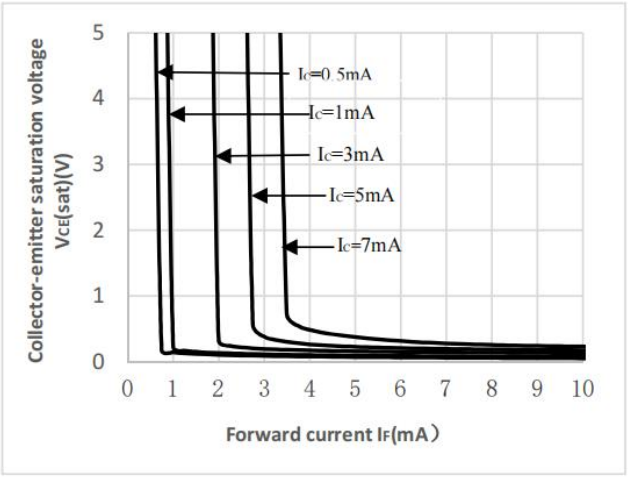
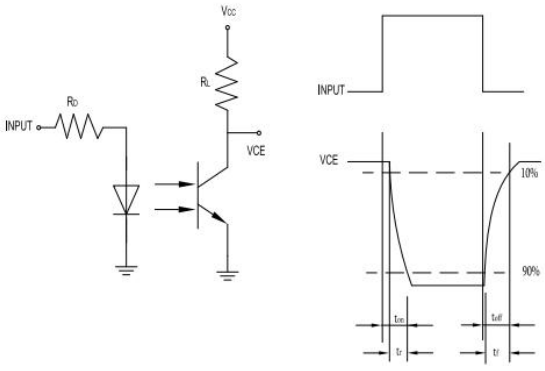
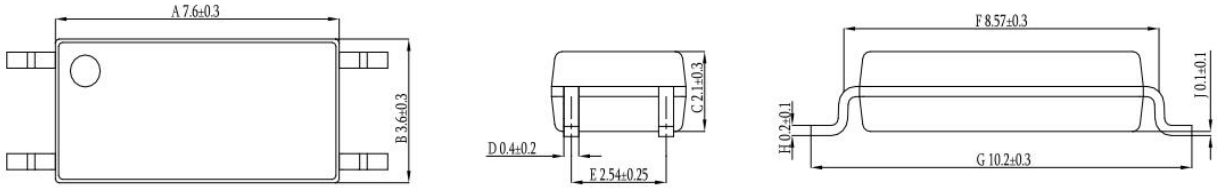


Fig.12 Switching Time Test Circuit & Waveforms

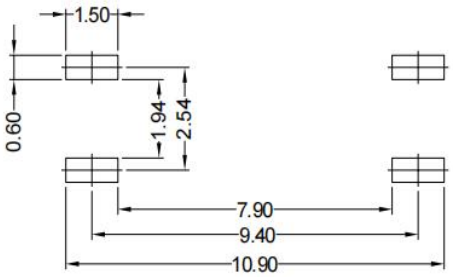


Package Outline Dimensions (unit: mm)

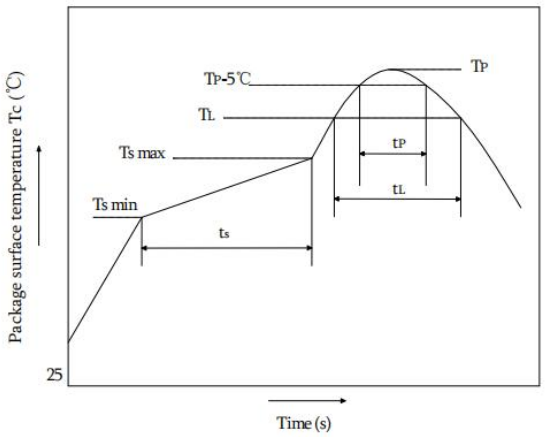
LSOP-4L



SOLDERING FOOTPRINT (unit: mm)



Reflow soldering

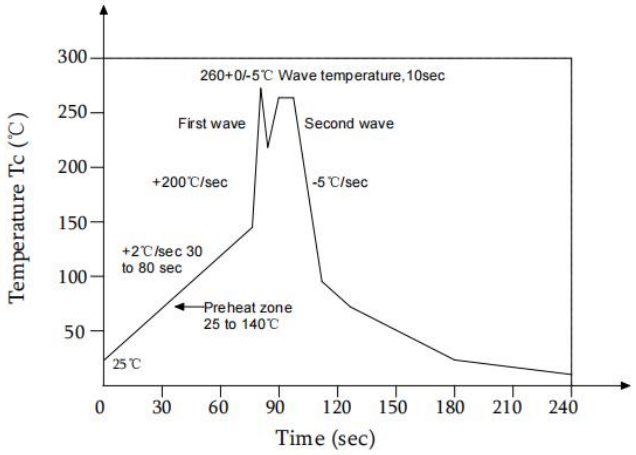


	Symbol	Min	Max	Unit
Preheat temperature	Ts	150	200	℃
Preheat time	ts	60	120	s
Ramp-up rate(T_L to T_P)			3	℃/s
Liquidus temperature	T_L	217		℃
Time above T_L	t_L	60	150	s
Peak temperature	Tp		260	℃
Time during which Tc is between (T_P-5) and T_P	t_p		30	s
Ramp-down rate(T_P to T_L)			6	℃/s

Note:

Reflow soldering is recommended at the temperatures and times shown, no more than three times.

Wave soldering



Profile feature	
Average ramp-up rate	~200℃/s
Heating rate during preheat	1℃/s to 2℃/s typical;4℃/s maximum
Final preheat temperature Ts	~130℃
Preheat time (25℃ to Ts)	>60s
Peak temperature Tp	260℃
Time within peak temperature tp	10s
Ramp-down rate	5℃/s maximum

Soldering with hand soldering iron

Hand soldering iron is only used for product rework or sample testing.

Hand soldering iron requirements:Temperature:360 ℃+5℃ within 3s.

Packing

Package Type	Packing Form	Quantity per Tube &Reel	Quantity per Box	Quantity per Carton	Antistatic Bag Specification	Box Specification	Carton Specification	Note
LSOP-4L	Reel(ϕ330mm)	3000 pcs/reel	2 reels /box	5 boxes /ctn	380*420mm	350*340*60mm	365*330*370mm	Leave 25 Spaces at the beginning and 50 Spaces at the end

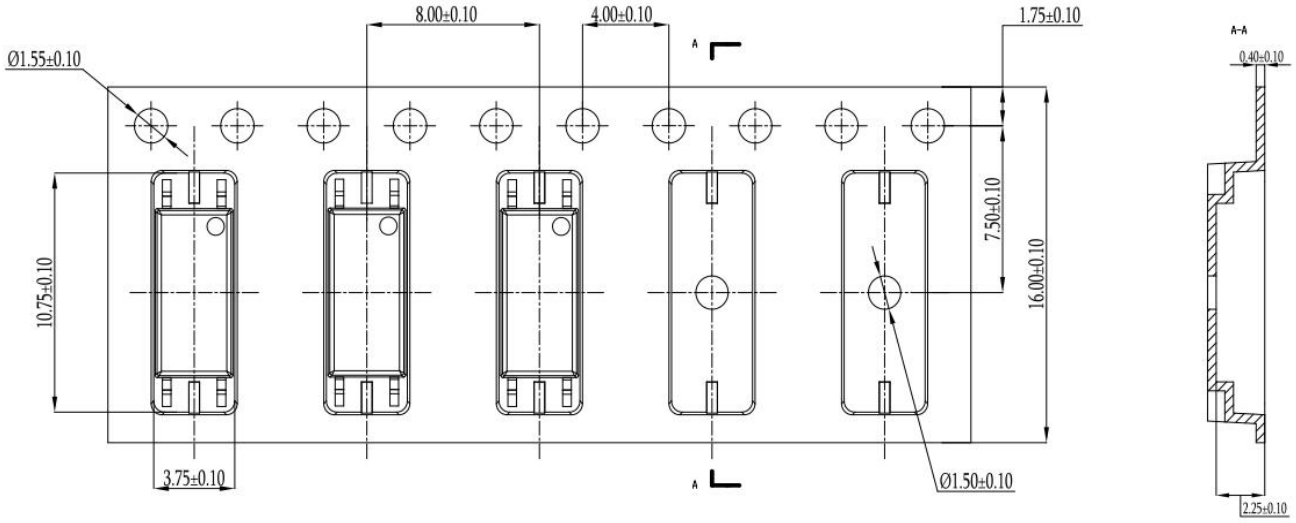
■Summary table

■LSOP-4L (Reel)

Qty/reel: 3000 pcs. Qty/box: 6000 pcs.

Qty/ctn : 30000 pcs.

Schematic: (unit:mm)



IMPORTANT NOTICE

TAIWEI semiconductor reserves the right to make changes without further notice to any product herein to make corrections, modifications, improvements, or other changes. TAIWEI semiconductor does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights ,nor the rights of others .