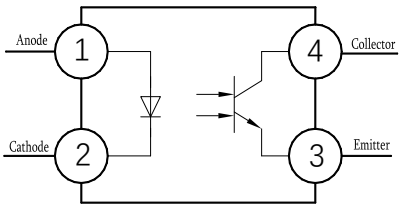
Features

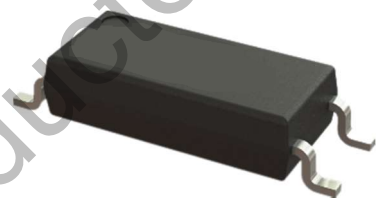
HF

- Current transfer ratio
  (CTR: 50~600% at I_F = 5mA, V_{CE} = 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

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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 = 10uA, 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	-	3	-	μs
	Turn Off Time	T_{off}		-	3	-	
	Rise Time	t_r		-	3	-	
	Fall Time	T_f		-	3	-	

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Rank Table of Current Transfer Ratio CTR

Rank Mark	Min. (%)	Max. (%)	Condition
1010	50	600	I_F=5mA ,V_{CE}=5V
1017	80	160	
1018	130	260	
1019	200	400	
1012	63	125	I_F=10mA ,V_{CE}=5V
1013	100	200	
1014	160	320	
1012	22	-	I_F=1mA ,V_{CE}=5V
1013	34	-	
1014	56	-	

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

Fig.1 Allowable Forward Current vs. Ambient Temperature

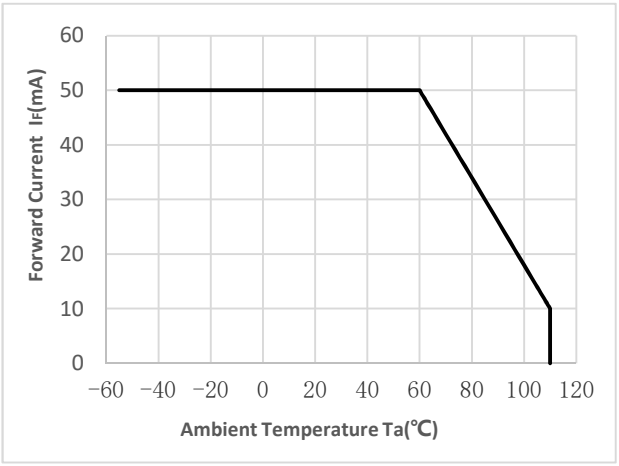

Fig.2 Allowable collector power disspation vs. Ambient Temperature(℃)

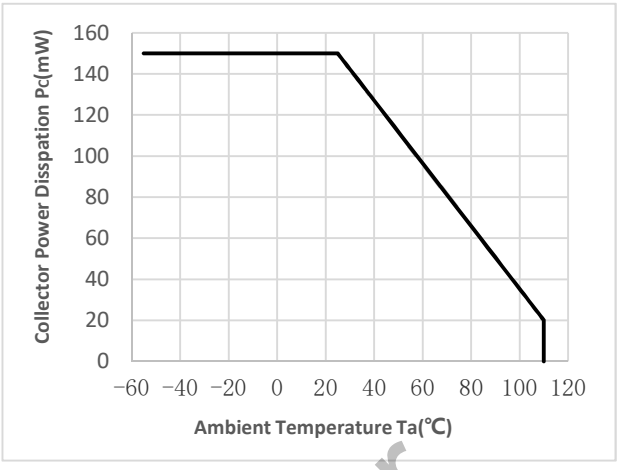

Fig.3 Relative Current Transfer Ratio vs. Forward Current

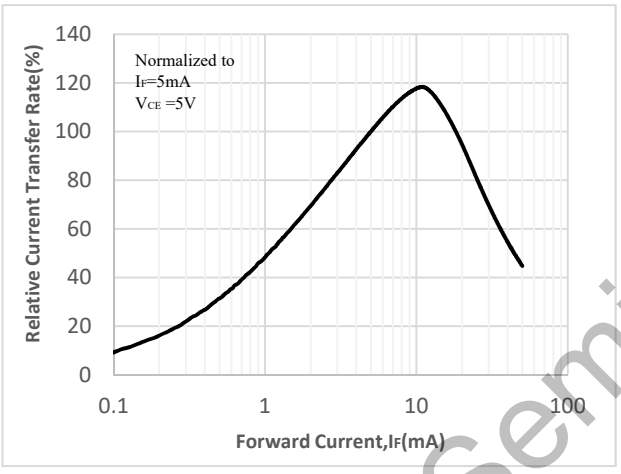

Fig4 Forward Current vs. Forward Voltage

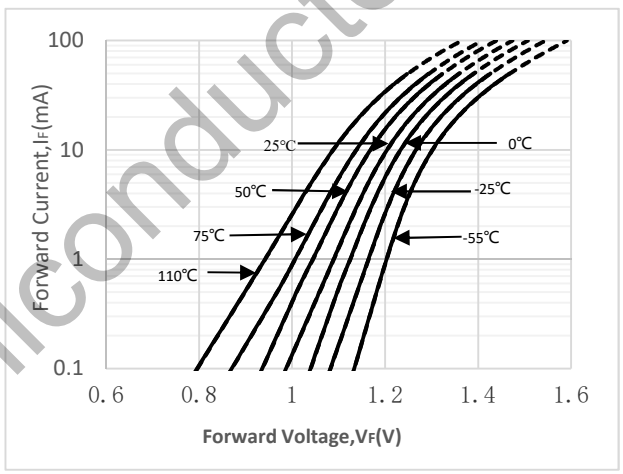

Fig.5 Collector Current vs. Collector-emitter Voltage

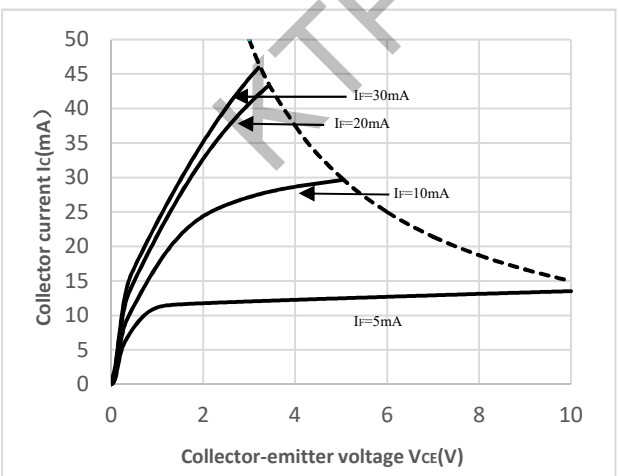

Fig.6 Relative Current Transfer Ratio vs. Ambient Temperature

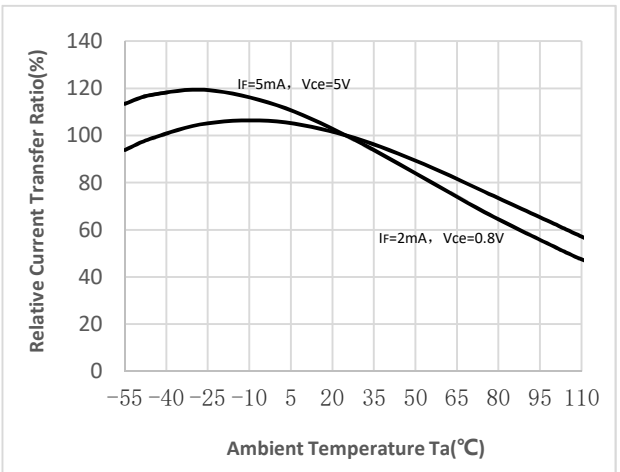

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Fig.7 Collector-emitter Saturation Voltage vs. Ambient Temperature

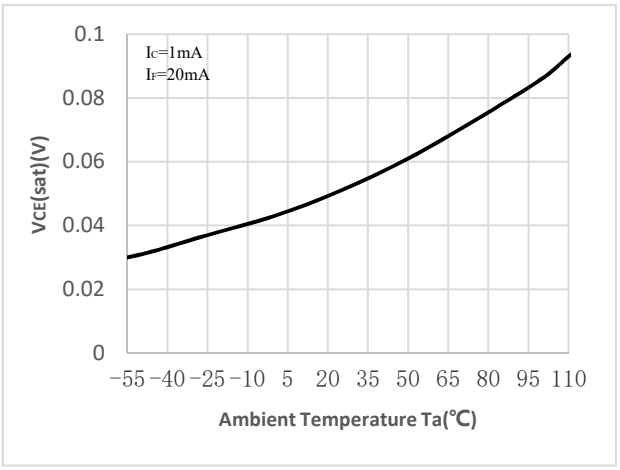


Fig.8 Collector Dark Current vs. Ambient Temperature

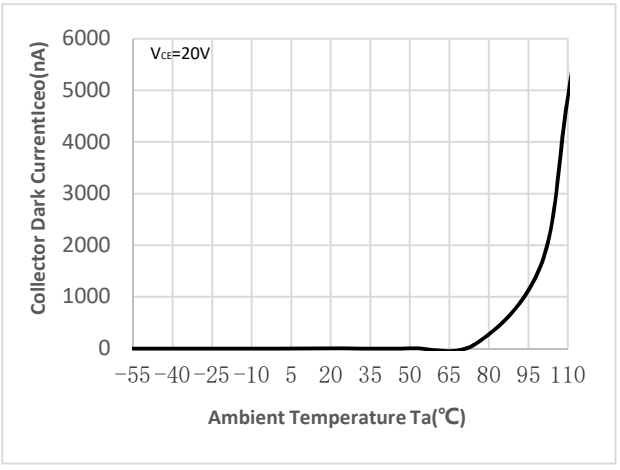


Fig.9 Response Time vs. Load Resistance

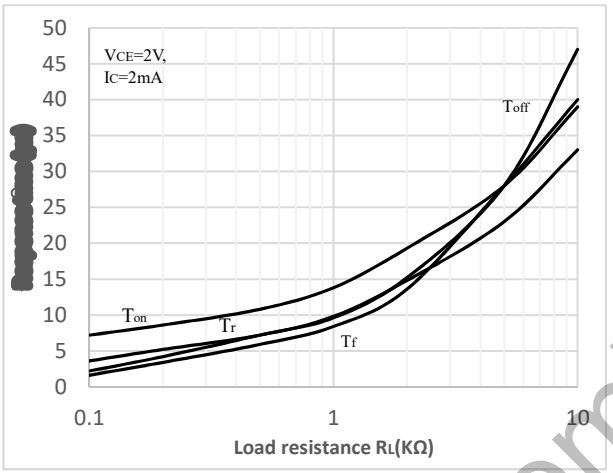


Fig.10 Frequency Response

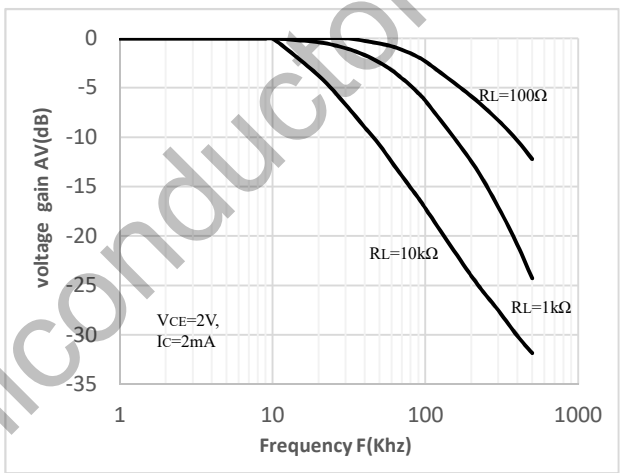


Fig.11 Collector-emitter Saturation Voltage vs. Forward Current

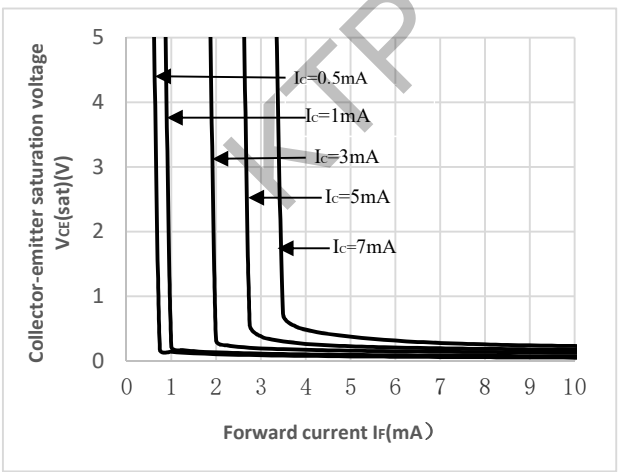
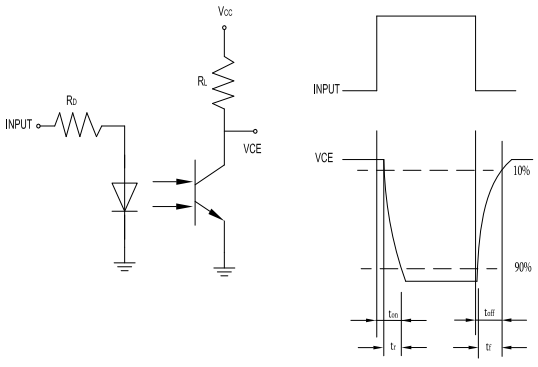


Fig.12 Switching Time Test Circuit & Waveforms



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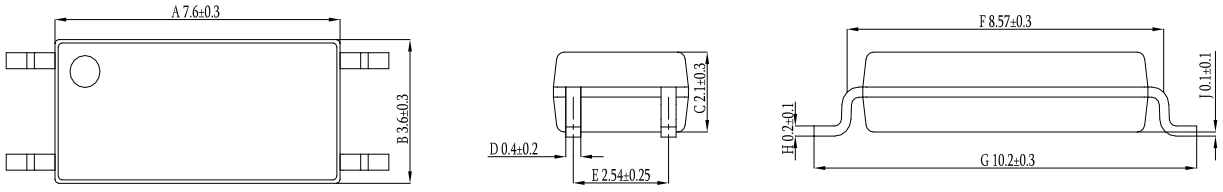
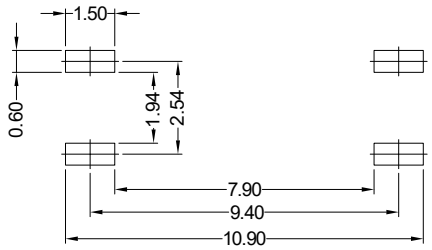
Package Outline Dimensions (unit: mm)

LSOP-4L



SOLDERING FOOTPRINT (unit: mm)



Ordering Information

KTP-101 X - X - AW
① ② ③

Product series

① X:0,2,3,4,7,8,9;

② X:Tape and reel option TA

③ AW:Internal Identification code

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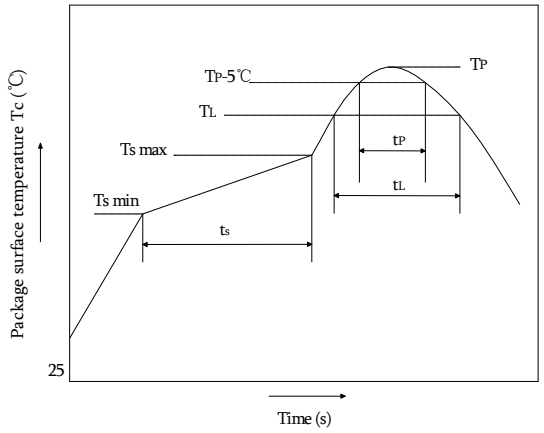
Reflow soldering

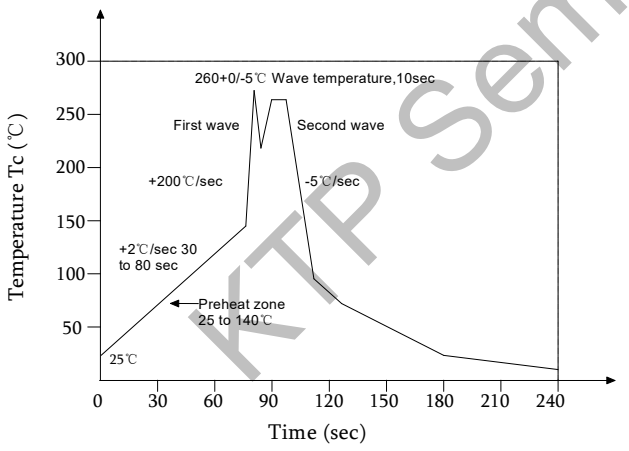


	Symbol	Min	Max	Unit
Preheat temperature	Ts	150	200	℃
Preheat time	ts	60	120	s
Ramp-up rate(T_L to T_P)			3	℃/s
Liquidus temperature	T_L	217		℃
Time above T_L	t_L	60	150	s
Peak temperature	Tp		260	℃
Time during which Tc is between (T_P-5) and T_P	t_p		30	s
Ramp-down rate(T_P to T_L)			6	℃/s

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.

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