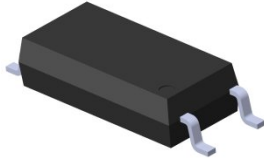
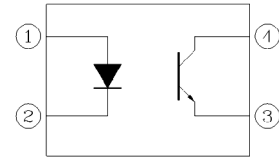


DATASHEET

4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER



Schematic



Pin Configuration

1. Anode
2. Cathode
3. Emitter
4. Collector

Features:

- Compliance Halogen Free
(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)
- Current transfer ratio
(CTR: 50~600% at $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$)
(CTR: 63~320% at $I_F = 10\text{mA}$, $V_{CE} = 5\text{V}$)
- High isolation voltage between input and output (Viso=5000 V rms)
- Compact 4 Pin SOP with a 2.0 mm profile
- Compliance with EU REACH
- 8mm long creepage distance
- Pb free and RoHS compliant
- UL and cUL approved (No. E214129)
- VDE approved (No. 40028391)
- SEMKO approved
- NEMKO approved
- DEMKO approved
- FIMKO approved

Description

The KTP-10XX-G series devices consist of an infrared emitting diode, optically coupled to a phototransistor detector. Compound use free halogens and Sb_2O_3 . They are packaged in a 4-pin SOP package

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

DATASHEET**4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER****Absolute Maximum Ratings (Ta=25 °C)**

	Parameter	Symbol	Rating	Unit
Input	Forward current	I_F	60	mA
	Peak forward current (1us, pulse)	I_{FP}	1.5	A
	Reverse voltage	V_R	6	V
	Power dissipation	P_D	100	mW
Output	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
	Total Power Dissipation	P_{TOT}	250	mW
	Isolation Voltage* ¹	V_{ISO}	5000	Vrms
	Operating Temperature	T_{OPR}	-55 to 110	°C
	Storage Temperature	T_{STG}	-55 to 125	°C
	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

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4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER

Electro-Optical Characteristics (Ta=25 unless specified otherwise)

Input

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Voltage	V_F	-	1.45	1.5	V	$I_F = 50\text{mA}$
Reverse current	I_R	-	-	10	μA	$V_R = 6\text{V}$
Input capacitance	C_{in}	-	50	-	pF	$V = 0, f = 1\text{kHz}$

Output

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Collector-Emitter dark current	I_{CEO}	-	-	100	nA	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$
Collector-Emitter breakdown voltage	BV_{CEO}	80	-	-	V	$I_C = 0.1\text{mA}$
Emitter-Collector breakdown voltage	BV_{ECO}	7	-	-	V	$I_E = 0.1\text{mA}$

Transfer Characteristics

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Current Transfer ratio	KTP-1010	50	-	600		$I_F = 5\text{mA}, V_{CE} = 5\text{V}$
	KTP-1017	80	-	160		
	KTP-1018	130	-	260		
	KTP-1009	200	-	400		
	KTP-1019	63	-	125		
	KTP-1012	100	-	200	%	$I_F = 10\text{mA}, V_{CE} = 5\text{V}$
	KTP-1013	160	-	320		
	KTP-1014	22	-	-		
	KTP-1012	34	-	-		
	KTP-1013	56	-	-		
Collector-Emitter saturation voltage	$V_{CE(sat)}$	-	-	0.3	V	$I_F = 10\text{mA}, I_C = 1\text{mA}$
Isolation resistance	R_{IO}	5×10^{10}	-	-	Ω	$V_{IO} = 500\text{Vdc}, 40\sim 60\% \text{ R.H.}$
Floating capacitance	C_{IO}	-	-	1.0	pF	$V_{IO} = 0, f = 1\text{MHz}$

DATASHEET**4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER****Transfer Characteristics**

Parameter	Symbol	Min	Typ.	Max.	Unit	Condition
Turn on time	Ton	-	4	-	μs	V _{CE} = 5V, I _C = 5mA, R _L = 100Ω
Turn off time	Toff	-	3	-		
Rise time	t _r	-	2	18	μs	V _{CE} = 5V, I _C = 5mA, R _L = 100Ω
Fall time	t _f	-	3	18		

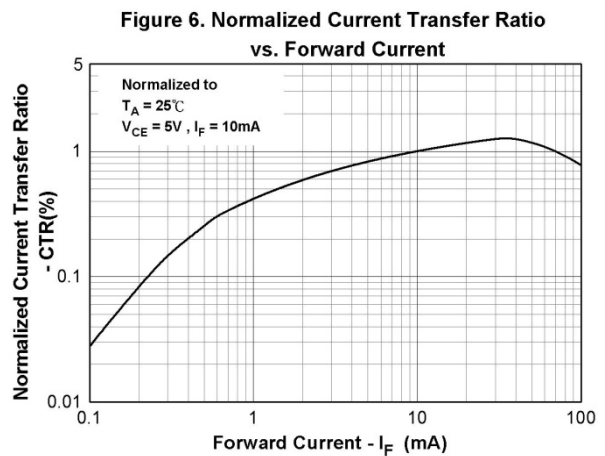
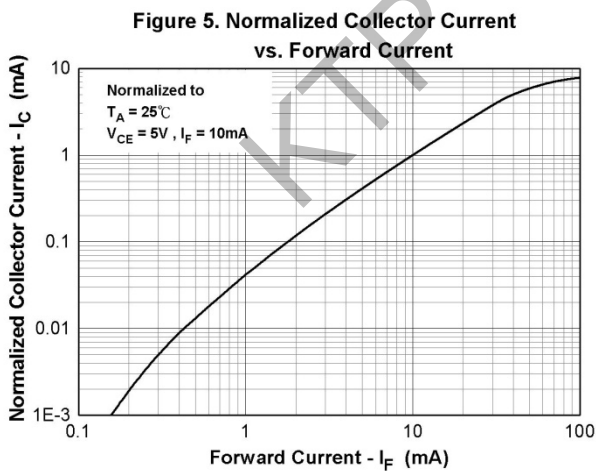
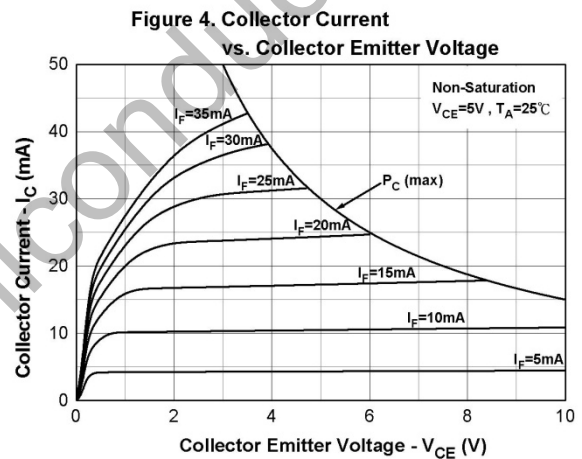
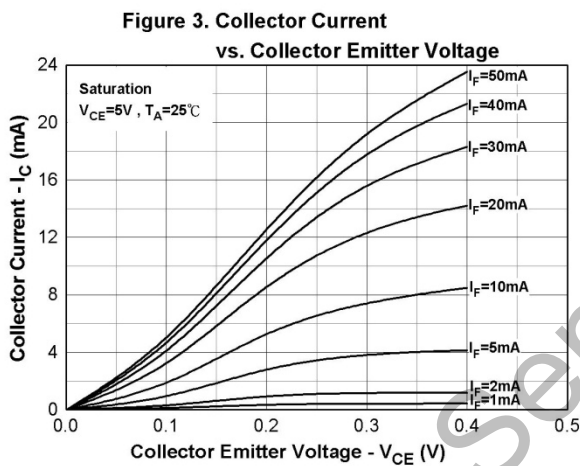
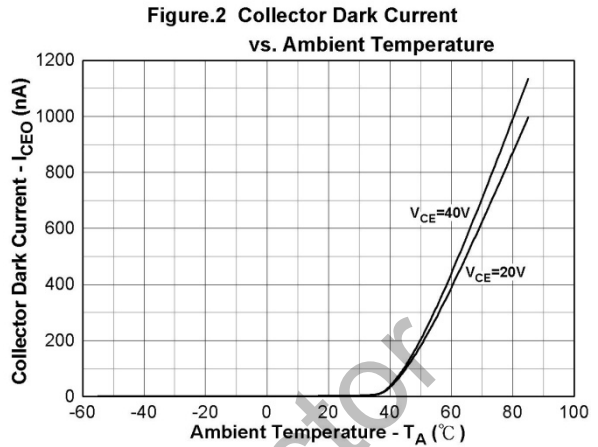
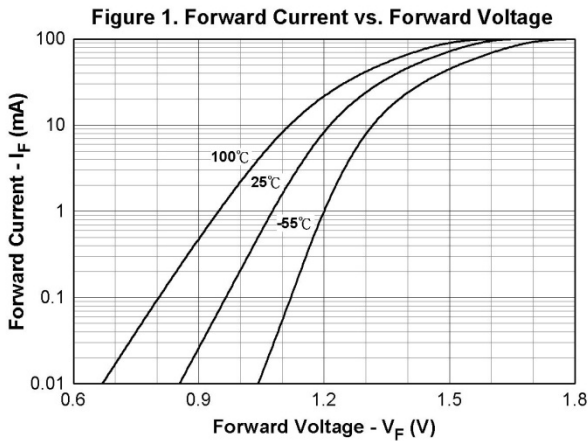
* Typical values at T_a = 25°C

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4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER

Typical Electro-Optical Characteristics Curves



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4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER

Figure 7. Normalized Current Transfer Ratio vs. Ambient Temperature

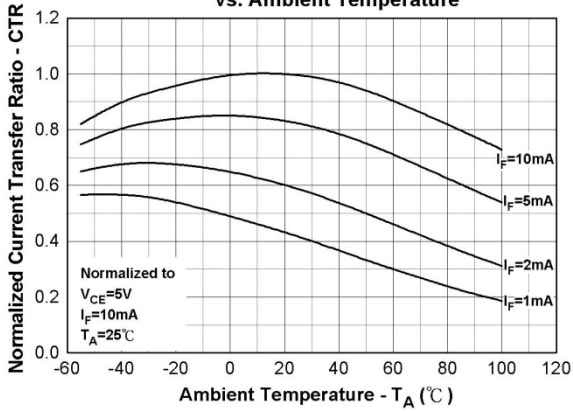


Figure 8. Normalized Current Transfer Ratio vs. Ambient Temperature

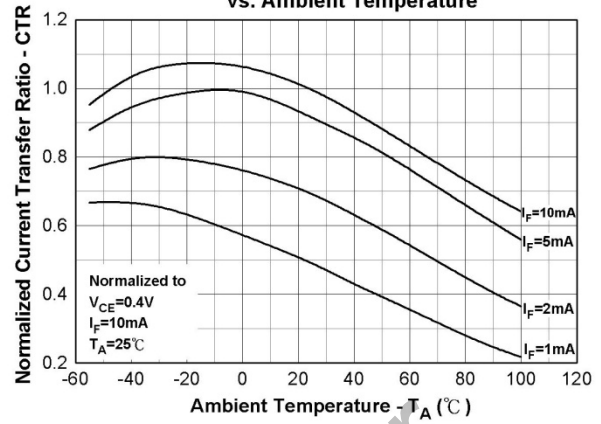


Figure 9. Turn on/off Time vs. Collector Current

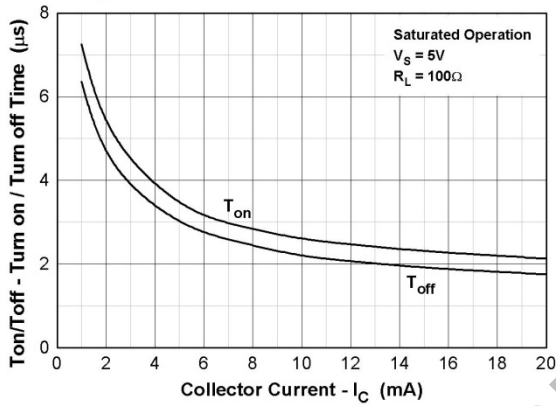


Figure 10. Turn on/off Time vs. Forward Current

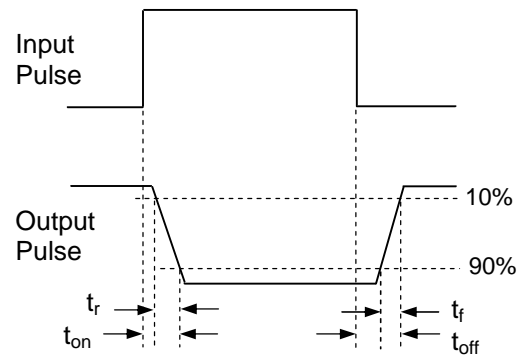
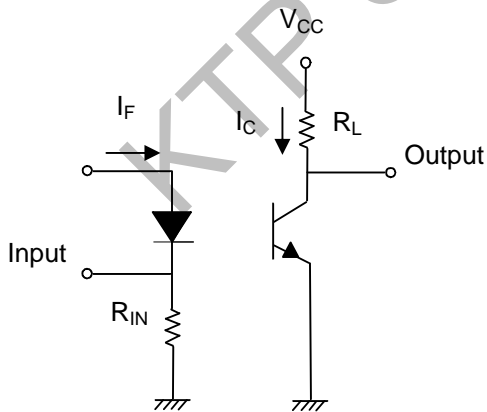
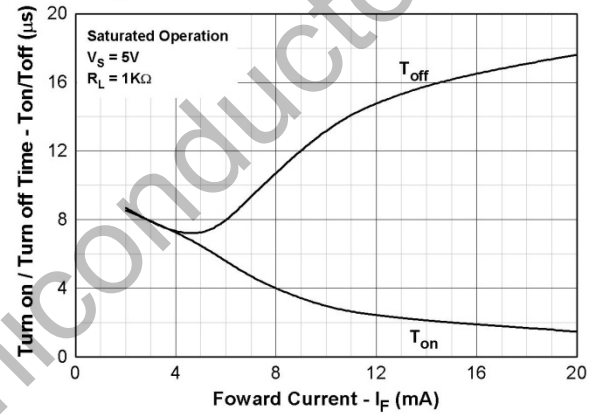


Figure 11. Switching Time Test Circuit & Waveforms

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4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER

Order Information

Part Number

KTP-10XX(Y)-VG

Note

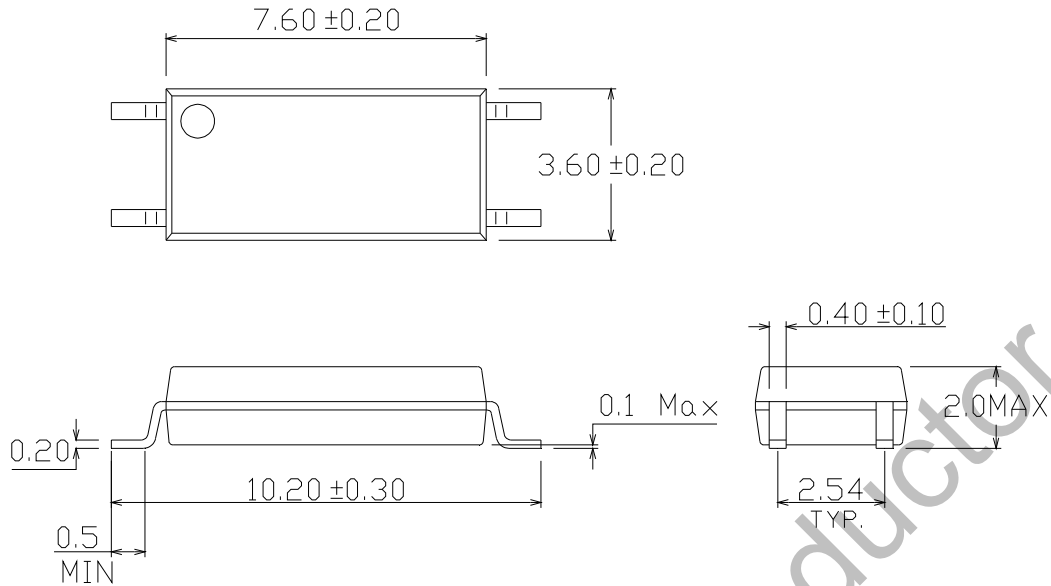
- X = Part No.for KTP-1009
- X = Part No.for KTP-101X (0, 2, 3, 4, 7, 8 or 9)
- Y = Tape and reel option (TA, TB or none)
- V = VDE safety (optional)
- G = Halogens free

Option	Description	Packing quantity
None	Standard SMD option	100 units per tube
-V	Standard SMD option + VDE	100 units per tube
(TA)	TA Tape & reel option	3000 units per reel
(TB)	TB Tape & reel option	3000 units per reel
(TA)-V	TA Tape & reel option + VDE	3000 units per reel
(TB)-V	TB Tape & reel option + VDE	3000 units per reel

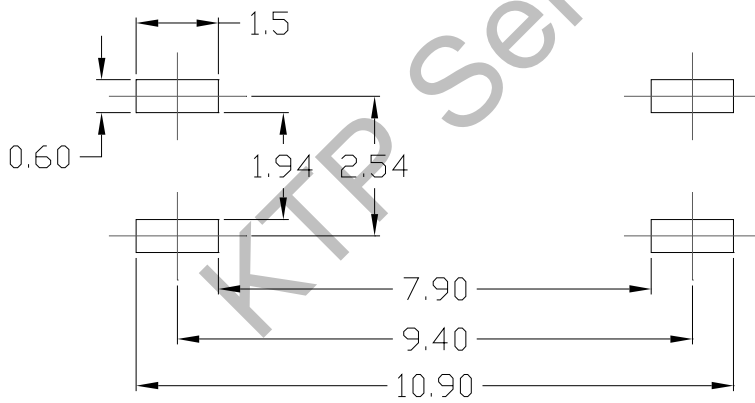
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4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER

Package Dimension (Dimensions in mm)



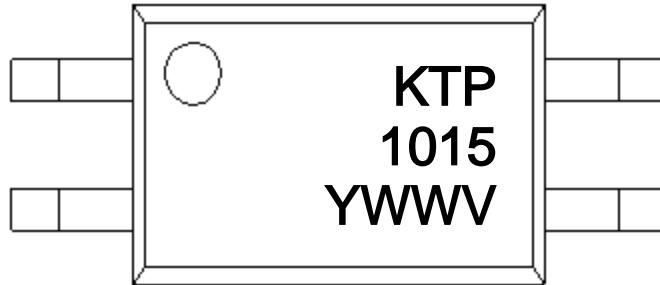
Recommended pad layout for surface mount leadform



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4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER

Device Marking



Notes

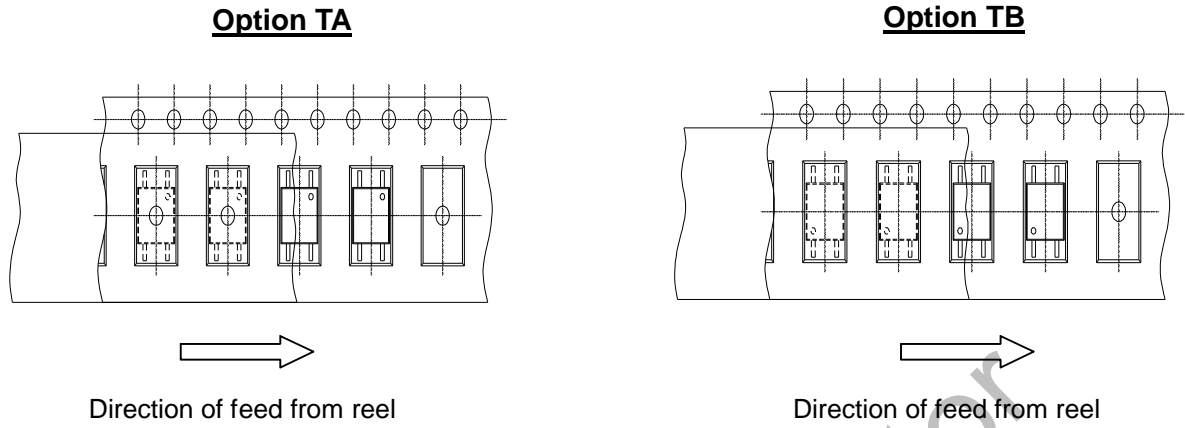
KTP	denotes Brand LOGO
1015	denotes Device Number
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code
V	denotes VDE (optional)

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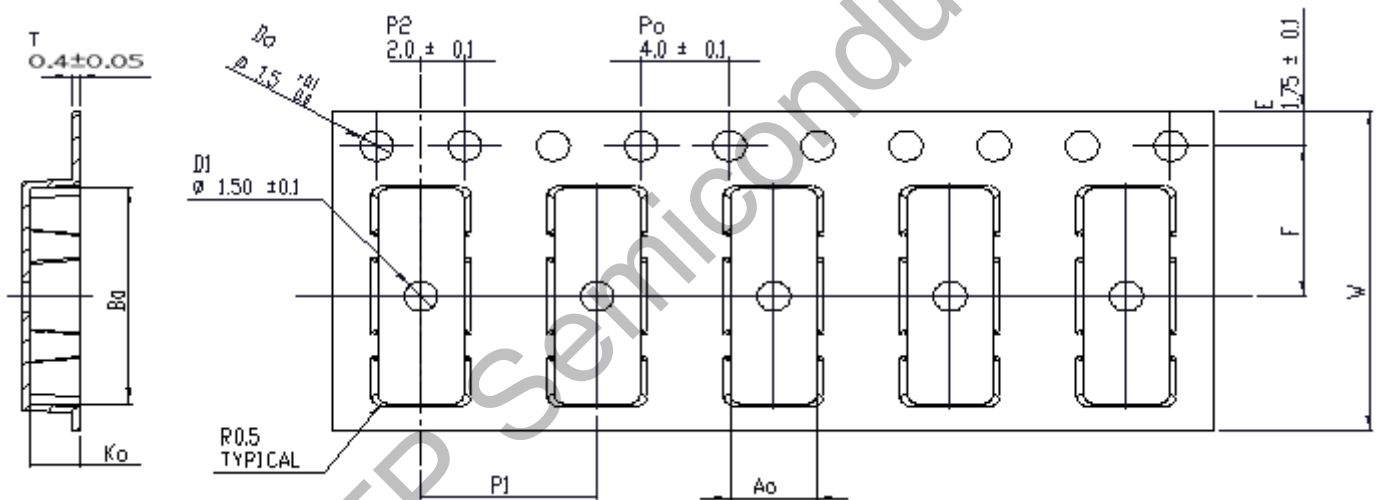
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Tape & Reel Packing Specifications



Tape dimensions



Dimension No.	Ao	Bo	Do	D1	E	F
Dimension (mm)	3.9 ± 0.10	10.75 ± 0.10	1.5 + 0.1/-0	1.5 ± 0.10	1.75 ± 0.10	7.5 ± 0.10
Dimension No.	Po	P1	P2	T	W	Ko
Dimension (mm)	4.0 ± 0.10	8.0 ± 0.10	2.0 ± 0.10	0.4 ± 0.05	16.0 ± 0.30	2.25 ± 0.10

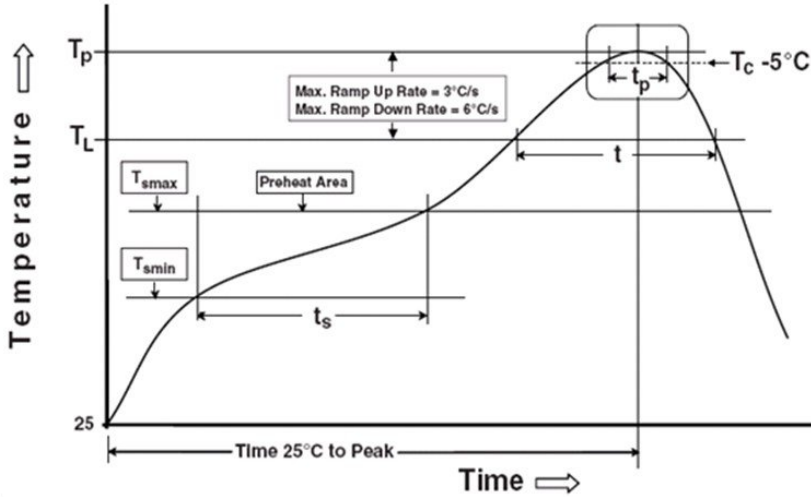
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4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER

Precautions for Use

1. Soldering Condition

1.1 (A) Maximum Body Case Temperature Profile for evaluation of Reflow Profile



Note:

Reference: IPC/JEDEC J-STD-020D

Preheat

Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200°C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max

Other

Liquidus Temperature (T_L)	217 °C
Time above Liquidus Temperature (t_L)	60-100 sec
Peak Temperature (T_p)	260°C
Time within 5 °C of Actual Peak Temperature: $T_p - 5^\circ\text{C}$	30 s
Ramp- Down Rate from Peak Temperature	6°C /second max.
Time 25°C to peak temperature	8 minutes max.
Reflow times	3 times.

DATASHEET**4 PIN LONG CREEPAGE SOP PHOTOTRANSISTOR PHOTOCOUPLER**

DISCLAIMER

1. Above specification may be changed without notice. KTP will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. KTP assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.

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