

KCP1017 Series

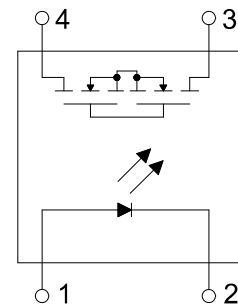
4PIN 60V N.O TYPE

SOLID STATE RELAY-MOSFET OUTPUT

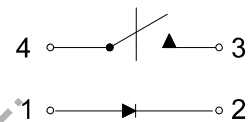
● Description

The KCP1017 series is robust, ideal for telecom and ground fault applications. It is a SPST normally open switch (1 Form A) that replaces electromechanical relays in many applications. It is constructed using a GaAlAs LED for actuation control and an integrated monolithic die for the switch output. The die, fabricated in a high-voltage dielectrically isolated technology, is comprised of a photodiode array, switch control circuitry and MOSFET switches.

● Schematic



1 FORM A
NORMALLY OPEN



● Features

1. Normally open, single pole single throw
2. Control 60V AC or DC Voltage
3. Switch 130mA Loads
4. Controls low-level analog signals
5. High sensitivity, low ON resistance
6. Low-level off-state leakage current
7. High isolation Voltage
8. Pb free and RoHS compliant
9. MSL class 1
10. Agency Approvals :
 - UL Approved (No. E108430): UL508
 - c-UL Approved (No. E108430)
 - FIMKO Approved: EN62368-1, EN60601-1
 - VDE Approved (No. 40053989): EN60747-5-5

● Application

- Telecommunications (PC, electronic notepad)
- Modem
- Telephone equipment
- Security equipment
- Sensors
- Measuring and testing equipment
- Factory automation equipment
- High speed inspection machines

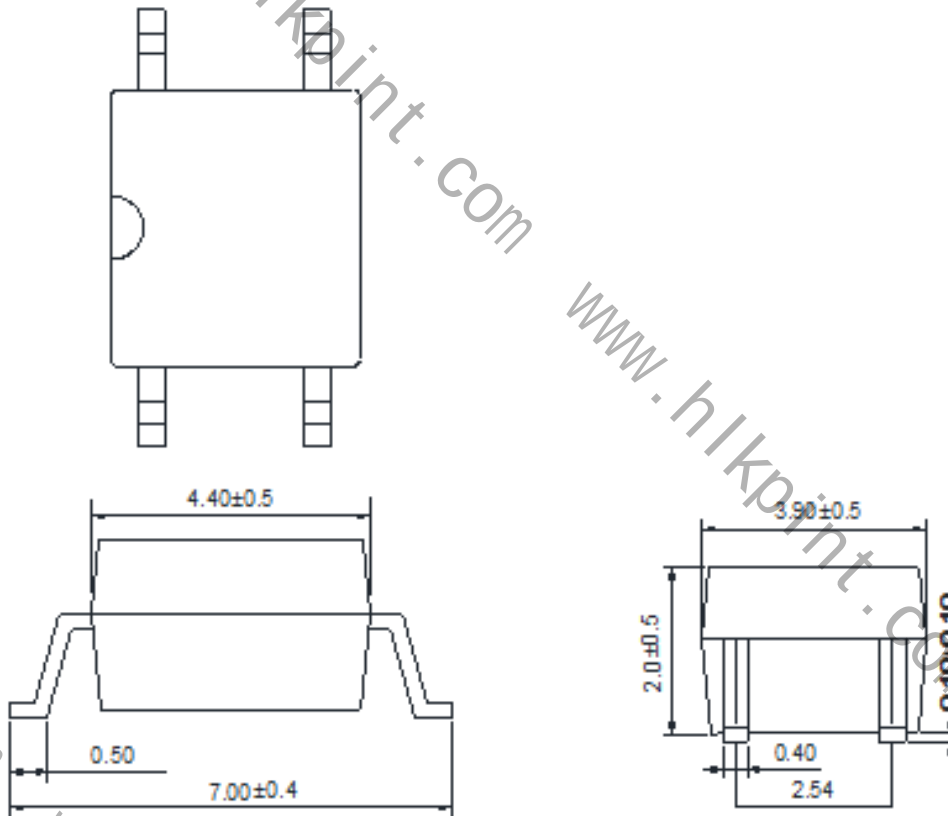
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● Outside Dimension

Unit : mm



TOLERANCE : ± 0.2 mm

● Device Marking



Notes :

cosmo

1017

YWW Y : Year code / W : Week code

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4PIN 60V N.O TYPE

SOLID STATE RELAY-MOSFET OUTPUT

● Absolute Maximum Ratings

(Ta=25°C)

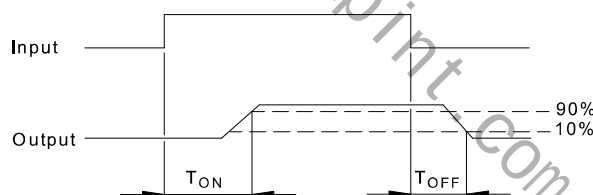
Item	Symbol	Rating	Unit
Input	Continuous forward current	I_F	50
	Peak forward current	I_{FP}	1
	Reverse voltage	V_R	5
	Power dissipation	P_{in}	100
	Derate linearly from 25°C	-	1.3
Output	Breakdown voltage	V_B	60
	Continuous load current	I_L	130
	Power dissipation	P_{out}	500
Isolation voltage		V_{iso}	1500
Isolation resistance ($V_{io}=500V$)		R_{iso}	$\geq 10^{10}$
Total power dissipation		P_t	550
Derate linearly from 25°C		-	2.5
Operating temperature		T_{opr}	-40 to +85
Storage temperature		T_{stg}	-40 to +125
Junction temperature		T_j	100
Soldering temperature 10 seconds		T_{sot}	260

● Electro-optical Characteristics

(Ta=25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	V_F	$I_F=10mA$	-	1.2	1.5
	Operation input current	I_{FON}	$V_L=20V, I_L=100mA$	-	-	1.0
	Recovery input Voltage	V_{FOFF}	$V_L=20V, I_L \leq 5\mu A$	0.5	-	-
Output	Breakdown voltage	V_B	$I_B=50\mu A$	60	-	-
	Off-state leakage current	I_{LEAK}	$V_L=60V, I_F=0mA$	-	0.2	1.0
I/O capacitance		C_{iso}	$V_B=0V, f=1MHz$	-	6	-
ON resistance		R_{ON}	$I_F=10mA, I_L=100mA$	-	7	16
Turn-on time		T_{ON}	$I_F=10mA, V_L=20V$	-	0.3	1.0
Turn-off time		T_{OFF}	$I_L=100mA, t=10ms$	-	0.1	1.0

● Turn-on / Turn-off Time

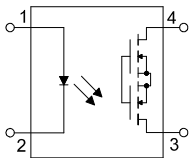
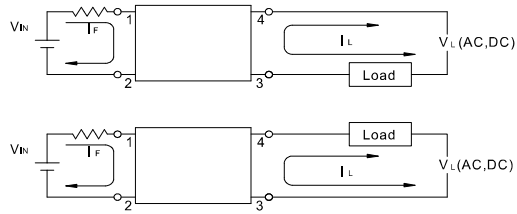


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4PIN 60V N.O TYPE

SOLID STATE RELAY-MOSFET OUTPUT

● Schematic and Wiring Diagrams

Schematic	Output Configuration	Load	Connection	Wiring Diagrams
	1a	AC DC	-	

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4PIN 60V N.O TYPE

SOLID STATE RELAY-MOSFET OUTPUT

Fig.1 Load Current vs. Ambient Temperature

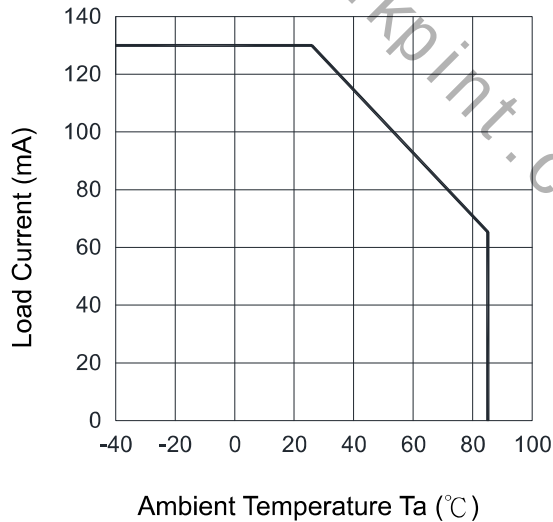


Fig.2 On Resistance vs. Ambient Temperature

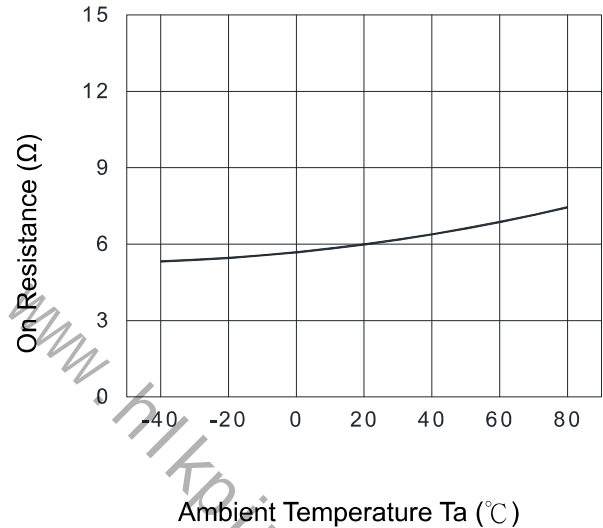


Fig.3 Turn-on Time vs. Ambient Temperature

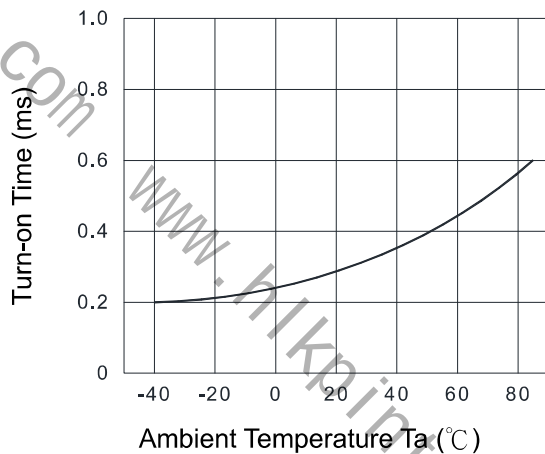


Fig.4 Turn-off Time vs. Ambient Temperature

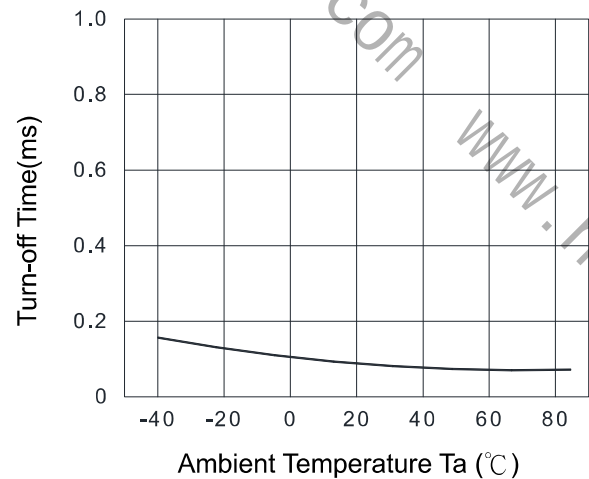


Fig.5 LED Operate Current vs. Ambient Temperature

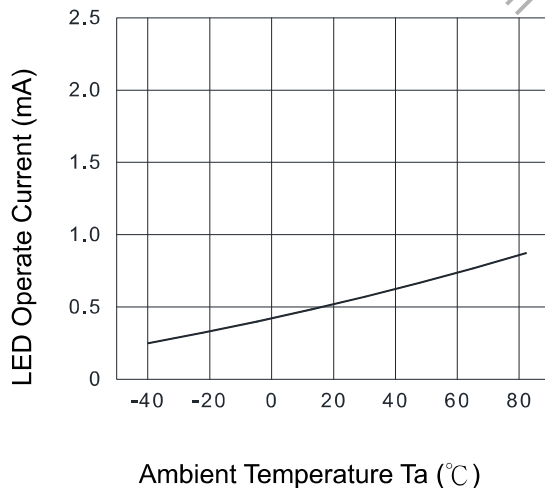
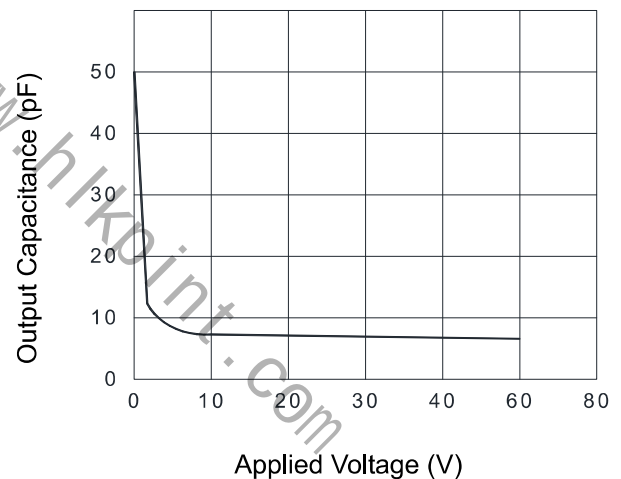


Fig.6 Output Capacitance vs. Applied Voltage



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Fig.7 LED Dropout Voltage vs. Ambient Temperature

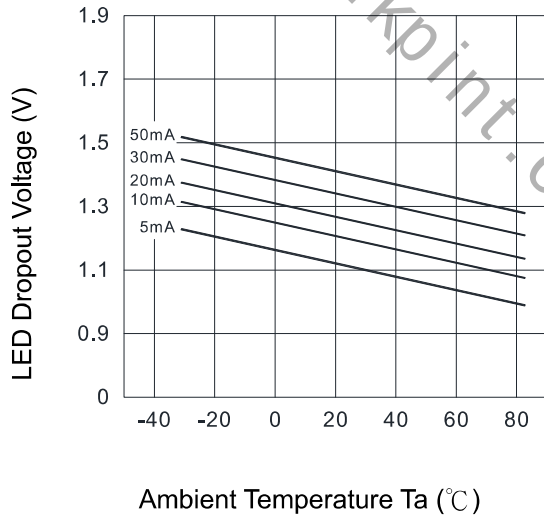


Fig.8 Voltage vs. Current Characteristics of Output at MOSFET Portion

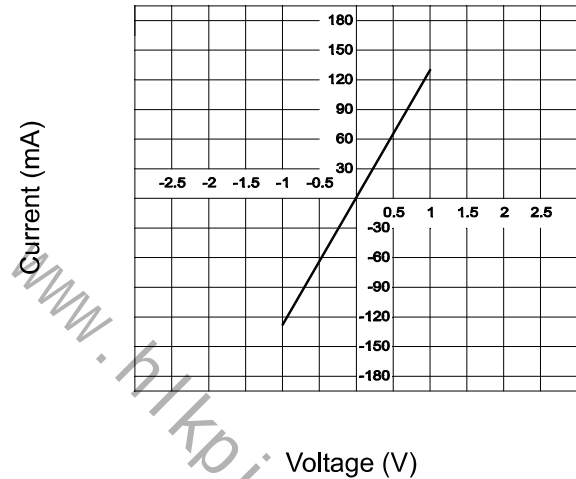


Fig.9 Turn-on Time vs. LED Forward Current

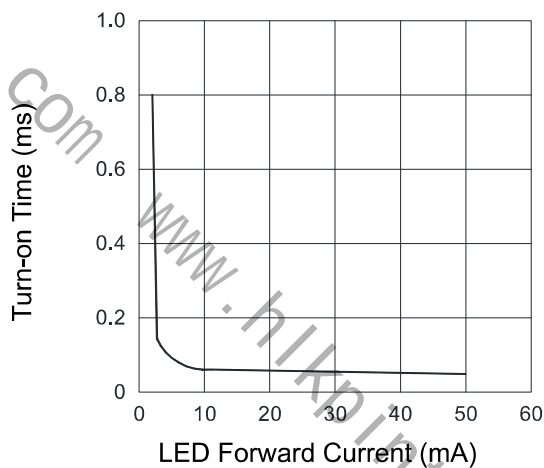


Fig.10 Off-state Leakage Current vs. Load Voltage

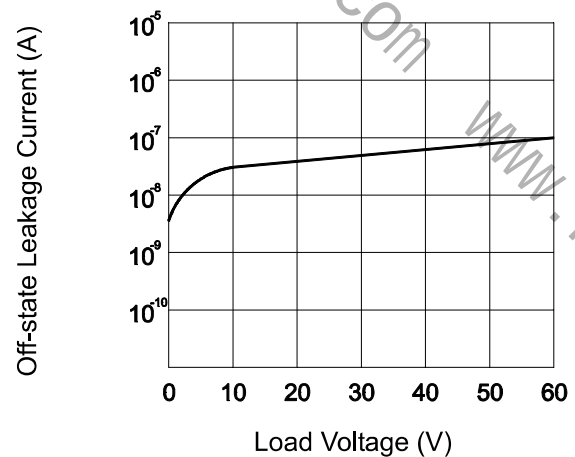
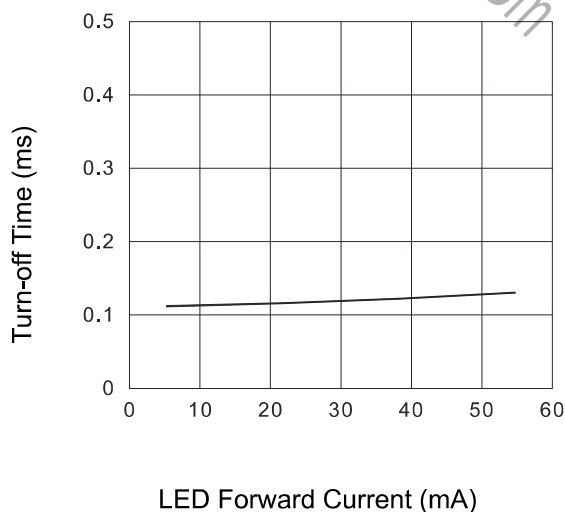


Fig.11 Turn-on Time vs. LED Forward Current



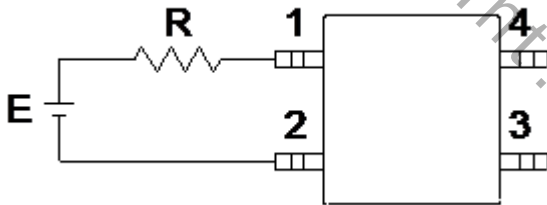
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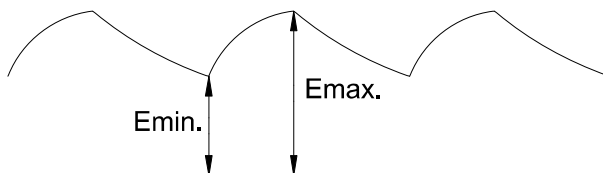
● Using Methods

Examples of resistance value to control LED forward current ($I_F=1\text{mA}$)

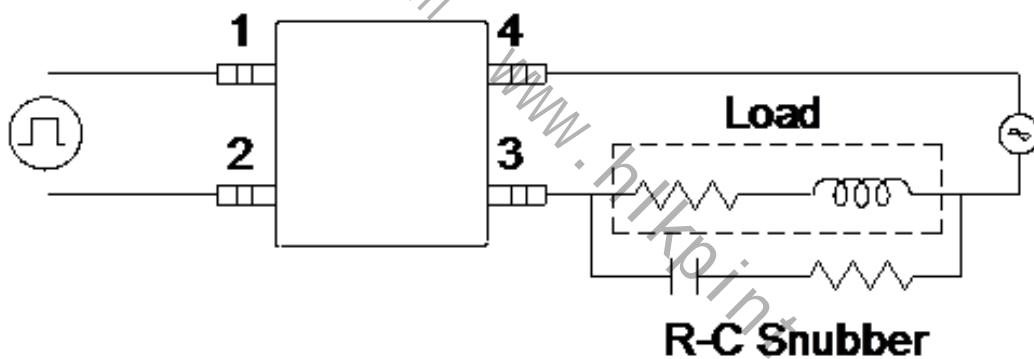
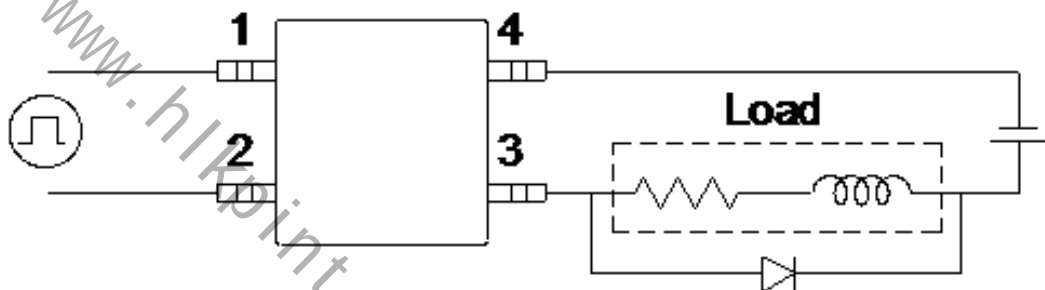


E	R
3.3V	Approx. 1.5K Ω
5V	Approx. 3.0K Ω
12V	Approx. 8.7K Ω
15V	Approx. 11.2K Ω
24V	Approx. 18.7K Ω

1. LED forward current must be more than 1mA , at E min.
2. LED forward current must be less than 50mA , at E max.



Regulate the spike voltage generated on the inductive load as follows :

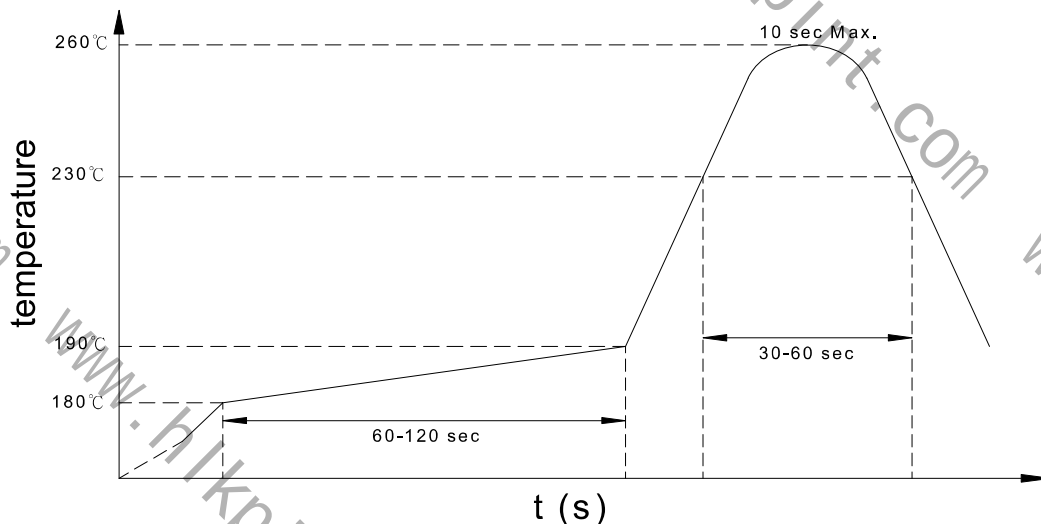


● Recommended Soldering Conditions

(a) Infrared reflow soldering :

- Peak reflow soldering : 260°C or below (package surface temperature)
- Time of peak reflow temperature: 10 sec
- Time of temperature higher than 230°C : 30-60 sec
- Time to preheat temperature from 180~190°C : 60-120 sec
- Number of reflows : Rosin flux containing small amount of chlorine
- Flux : (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

Recommended Temperature Profile of Infrared Reflow



(b) Wave soldering :

- Temperature : 260°C or below (molten solder temperature)
- Time : 10 seconds or less
- Preheating conditions: 120°C or below (package surface temperature)
- Number of times : One
- Flux : Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

(c) Cautions :

- Fluxes : Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.
- Avoid shorting between portion of frame and leads.

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- **Numbering System**

KCP1017 (X)

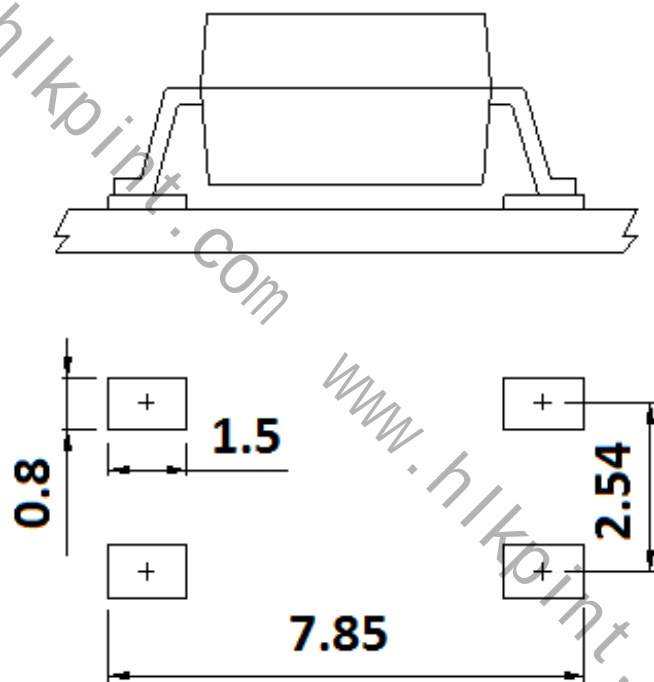
Note :

KCP1017 = Part No.

X = Tape and reel option (TLD 、 TRU)

Option	Description	Packing quantity
TLD	small outline for surface mount type package + TLD tape & reel option	3000 units per reel
TRU	small outline for surface mount type package + TRU tape & reel option	3000 units per reel

- **Recommended Pad Layout for Surface Mount Lead Form**



Unit : mm

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SOLID STATE RELAY-MOSFET OUTPUT

● 4-pin SOP Carrier Tape & Reel

