

### ● Description

The KTLP165J series consist of a GaAs infrared emitting diode optically coupled to a non-zero-crossing silicon bilateral AC switch (TRIAC). These devices isolate low voltage logic from 115/240 VAC lines to provide random phase control of high current TRIACs or thyristors. These devices feature greatly enhanced static dv/dt capability to ensure stable switching performance of inductive loads.

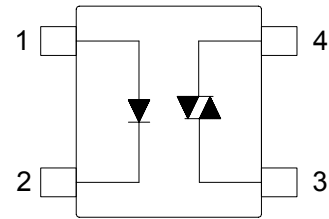
### ● Features

1. Pb free and RoHS compliant
2. 600V peak blocking voltage
3. Subminiature type (The volume is smaller than that of our conventional DIP type by as far as 30%)
4. Simplifies logic control of 115/240 VAC power
5. Non zero voltage crossing
6. Isolation voltage between input and output (Viso : 3750Vms)
7. MSL class 1
8. Agency Approvals :
  - UL Approved (No. E169586): UL1577
  - c-UL Approved (No. E169586)
  - VDE Approved (No. 40009235): DIN EN60747-5-5
  - CQC Approved: GB8898-2011, GB4943.1-2011

### ● Applications

- Solenoid/Valve controls
- Lighting controls
- Static power switches
- AC motor drives
- Temperature controls
- E.M contactors
- AC motor contactors
- Solid state relay
- Programmable controllers

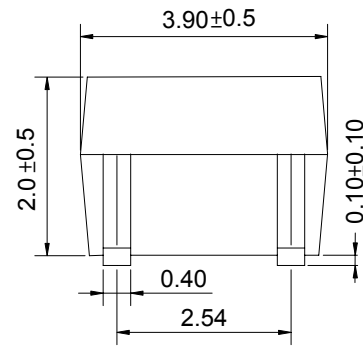
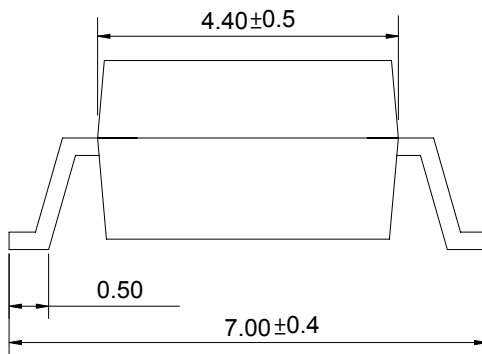
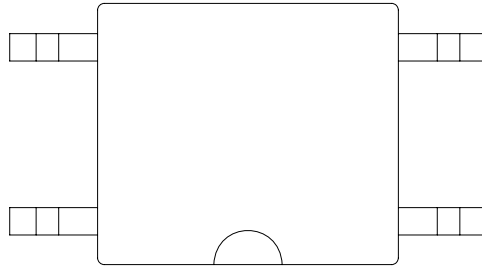
### ● Schematic



1. Anode
2. Cathode
3. Main terminal
4. Main terminal

● **Outside Dimension**

Unit : mm



TOLERANCE : ±0.2mm

● **Device Marking**



**Notes :**

**COSMO**

**165J**

**YWW**

Y : Year code / W : Week code

### ● Absolute Maximum Ratings

(Ta=25°C)

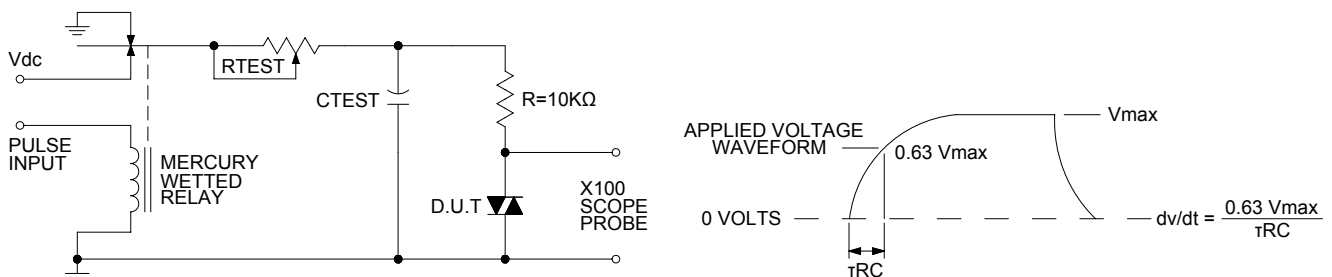
Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	Peak forward current	$I_{FM}$	1	A
	Reverse voltage	$V_R$	6	V
	Power dissipation	$P_D$	70	mW
Output	Off-state output terminal voltage	$V_{DRM}$	600	$V_{PEAK}$
	On-state R.M.S. current	$I_{T(RMS)}$	70	mA
	Peak repetitive surge current (PW=10ms.DC 10%)	$I_{TSM}$	1	A
	Power dissipation	$P_D$	150	mW
Total power dissipation		$P_{tot}$	200	mW
Isolation voltage 1 minute		$V_{iso}$	3750	Vrms
Operating temperature		$T_{opr}$	-40 to +115	°C
Storage temperature		$T_{stg}$	-50 to +125	°C
Soldering temperature 10 seconds		$T_{sol}$	260	°C

### ● Electro-optical Characteristics

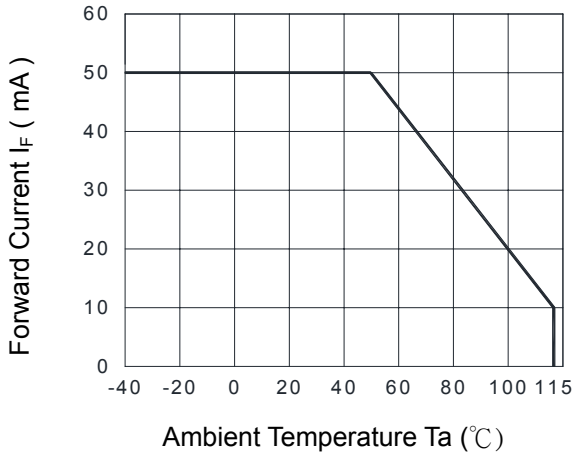
(Ta=25°C)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	$V_F$	$I_F=10mA$	-	1.2	1.4	V
	Reverse current	$I_R$	$V_R=4V$	-	-	10	$\mu A$
Output	Peak blocking current	$I_{DRM}$	$V_{DRM}$ Rated	-	-	1	$\mu A$
	On-state voltage	$V_{TM}$	$I_{TM}=70mA$	-	1.6	3	V
Transfer characteristics	Holding current	$I_H$		-	0.1	-	mA
	Critical rate of rise of off-state voltage	dv/dt	$V_{DRM}=(1/\sqrt{2})*\text{Rated}$	1000	-	-	V/ $\mu s$
	Isolation resistance	$R_{iso}$	DC500V	$5 \times 10^{10}$	$10^{11}$	-	$\Omega$
	Minimum trigger current	$I_{FT}$	Main terminal voltage=3V	-	-	10	mA
	Turn-on time	$T_{on}$	$V_D=6V, R_L=100\Omega, I_F=20mA$	-	-	100	$\mu s$

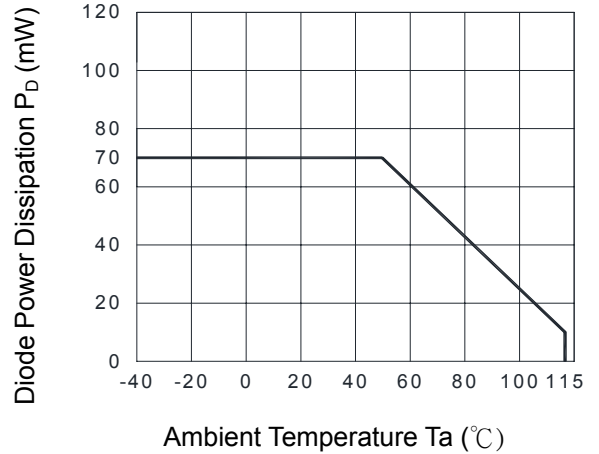
### ● Static dv/dt Test Circuit



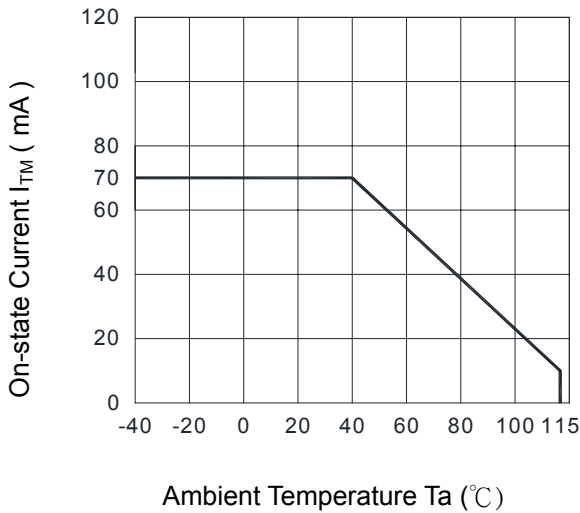
**Fig.1 Forward Current  $I_F$  vs. Ambient Temperature**



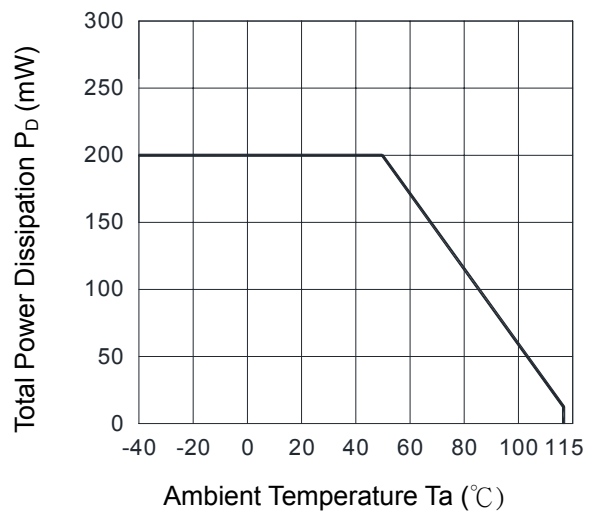
**Fig.2 Diode Power Dissipation  $P_D$  vs. Ambient Temperature**



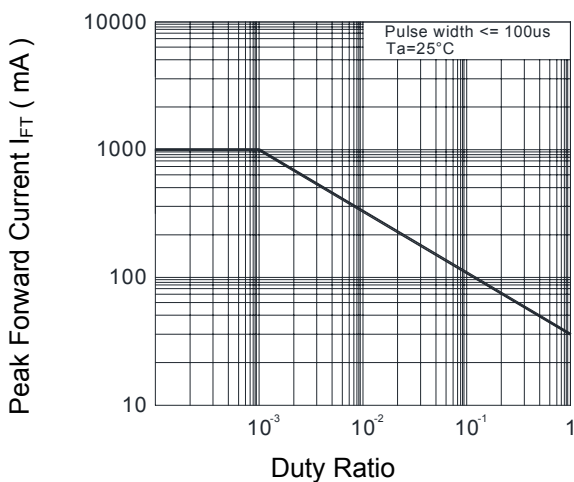
**Fig.3 On-state R.M.S. Current  $I_{RMS}$  vs. Ambient Temperature**



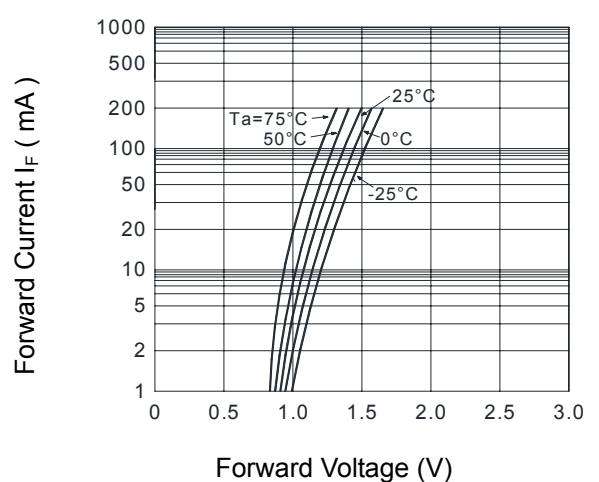
**Fig.4 Total Power Dissipation  $P_D$  vs. Ambient Temperature**



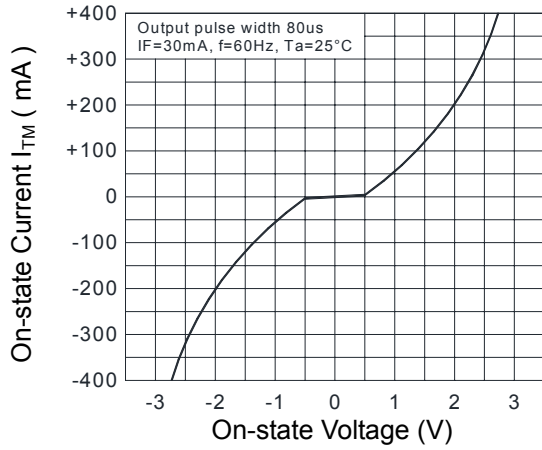
**Fig.5 Peak Forward Current  $I_{FT}$  vs. Duty Ratio**



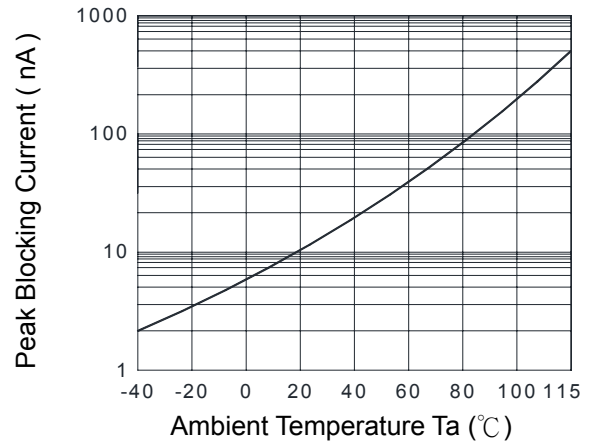
**Fig.6 Forward Current  $I_F$  vs. Forward Voltage**



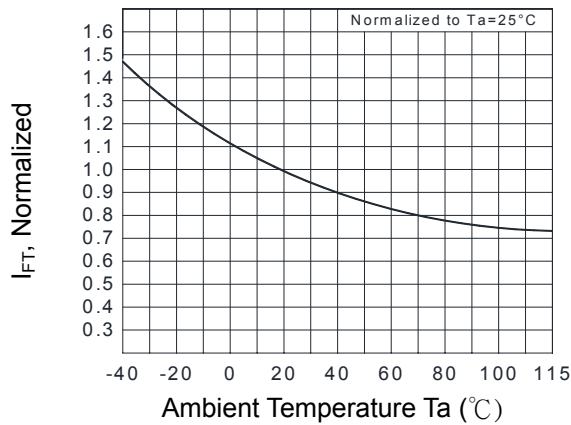
**Fig.7 On-state Characteristics**



**Fig.8 Leakage with LED off vs. Ambient Temperature**



**Fig.9 Trigger Current vs. Ambient Temperature**

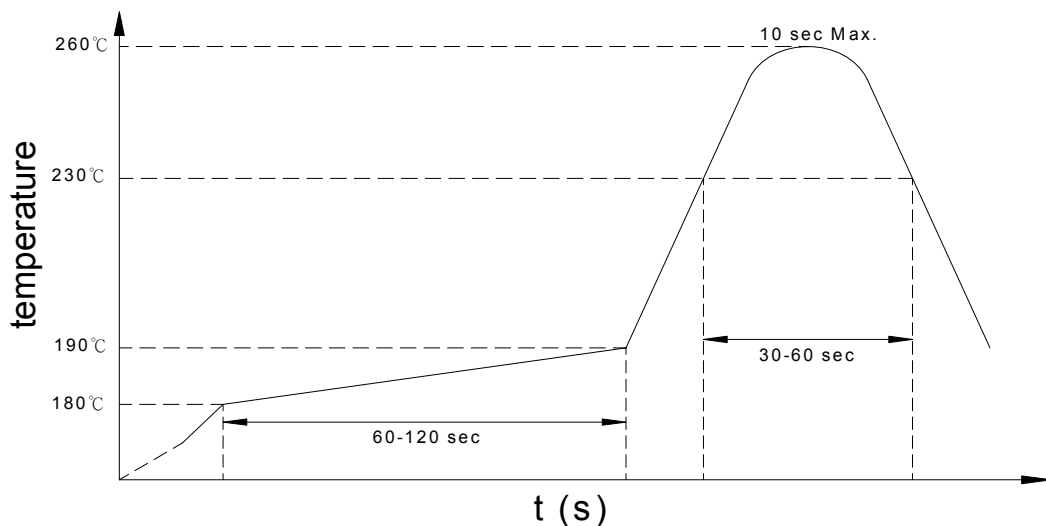


### ● Recommended Soldering Conditions

#### (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
- Time(s) of reflow : Two
- Flux : Rosin flux containing small amount of chlorine (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)
- Time(s) of reflow : 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.

- **Numbering System**

## KTLP165J (X)

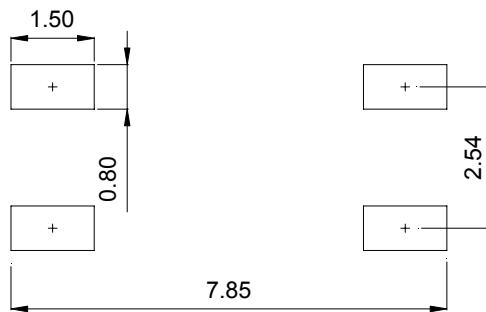
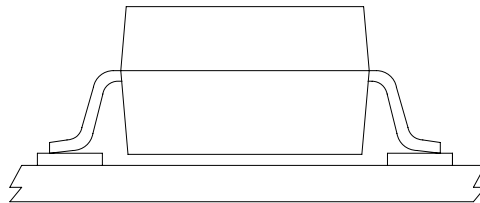
**Notes :**

KTLP165J = Part No.

X = Tape and reel option ( TLD 、 TRU )

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

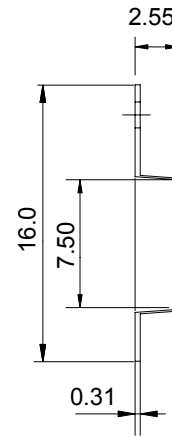
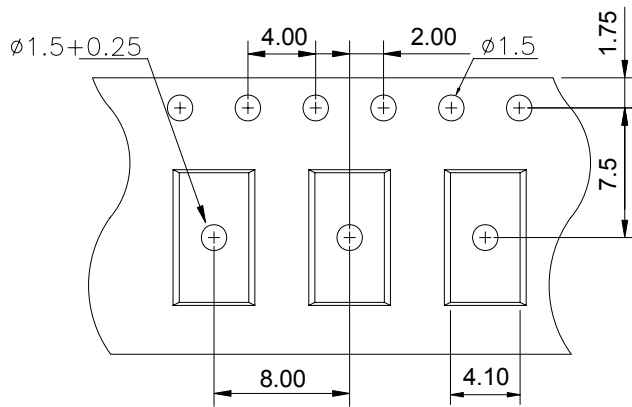
- **Recommended Pad Layout for Surface Mount Lead Form**



Unit : mm

● 4-pin Mini-Flat TLD/TRU Carrier Tape & Reel

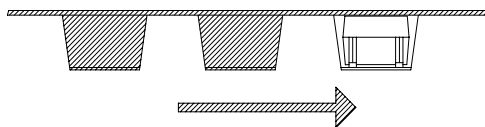
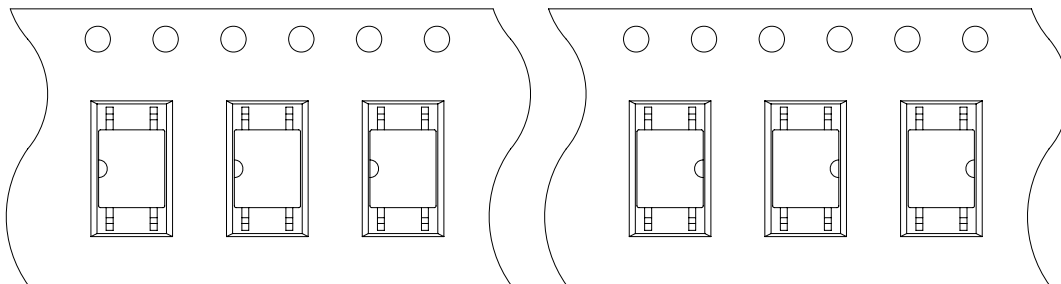
Unit : mm



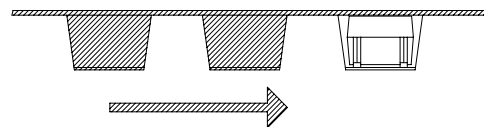
TOLERANCE :  $\pm 0.2\text{mm}$

TLD

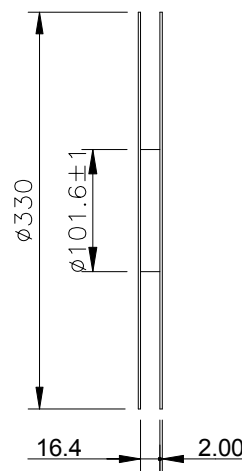
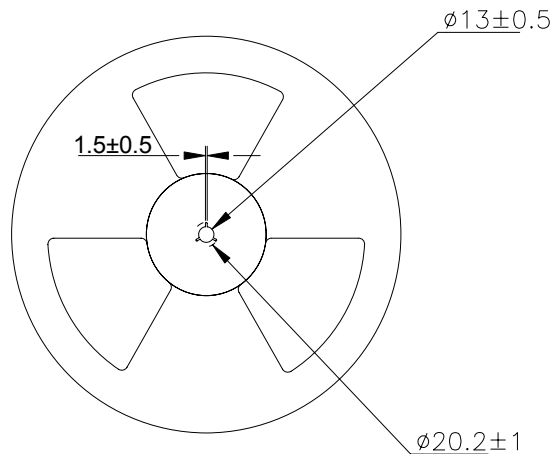
TRU



Direction of feed from reel



Direction of feed from reel







● **Application Notice**

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