

● Description

The KTLP160J series consist of a GaAs infrared emitting diode optically coupled to a on-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.

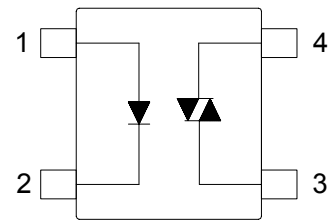
● Features

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

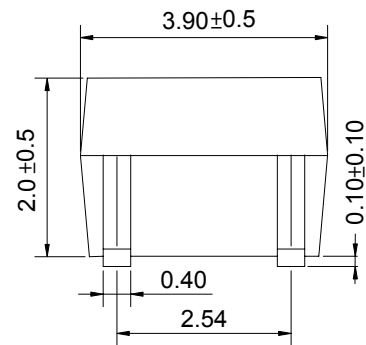
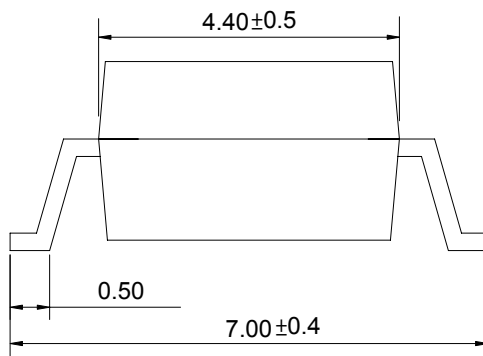
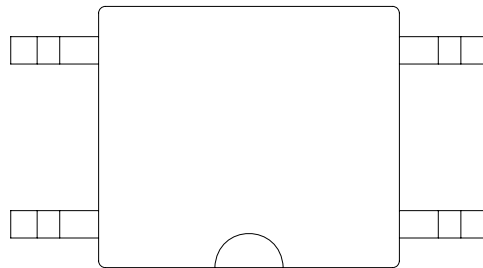
● Schematic



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

● **Outside Dimension**

Unit : mm



TOLERANCE : ±0.2mm

● **Device Marking**



Notes :

COSMO
160J
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	μA	
Output	Peak blocking current	I_{DRM}	V_{DRM} Rated	-	-	1	μA	
	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/ μs	
	Isolation resistance	R_{iso}	DC500V	5×10^{10}	10^{11}	-	Ω	
	Minimum trigger current	I_{FT}	Main Terminal Voltage=3V	KTLP160J1	-	-	10	mA
				KTLP160J2	-	-	7	mA
KTLP160J3				-	-	5	mA	
Turn-on time	T_{on}	$V_D=6V, R_L=100\Omega, I_F=20mA$	-	-	100	μs		

● Static dv/dt Test Circuit

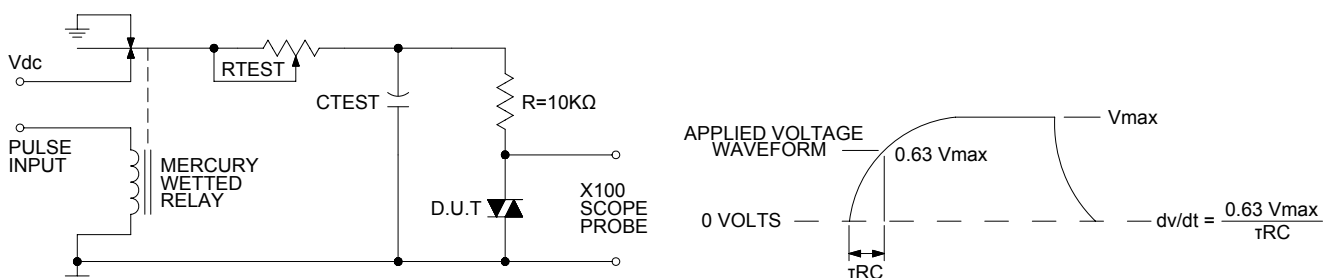


Fig.1 Forward Current I_F vs. Ambient Temperature

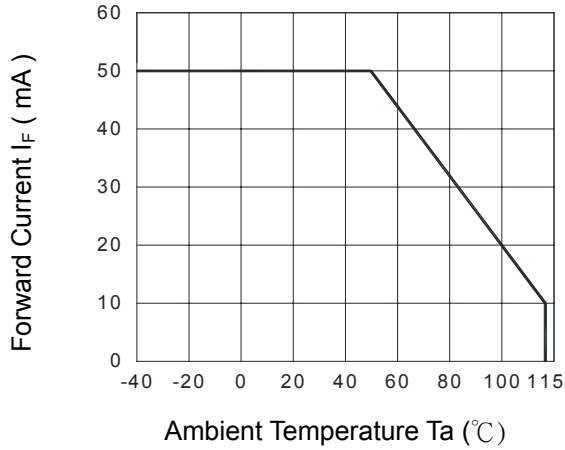


Fig.2 Diode Power Dissipation P_D vs. Ambient Temperature

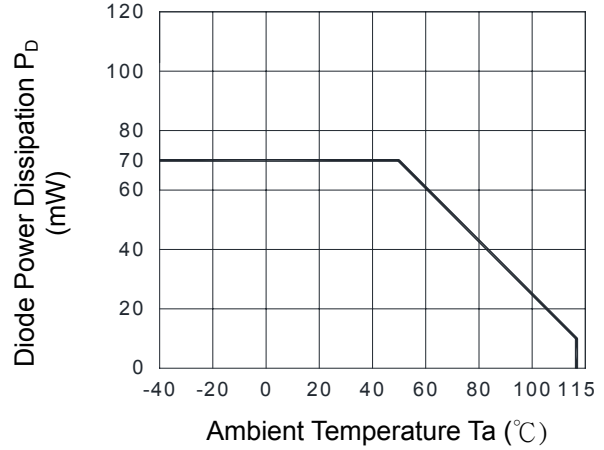


Fig.3 On-state R.M.S. Current I_{TM} vs. Ambient Temperature

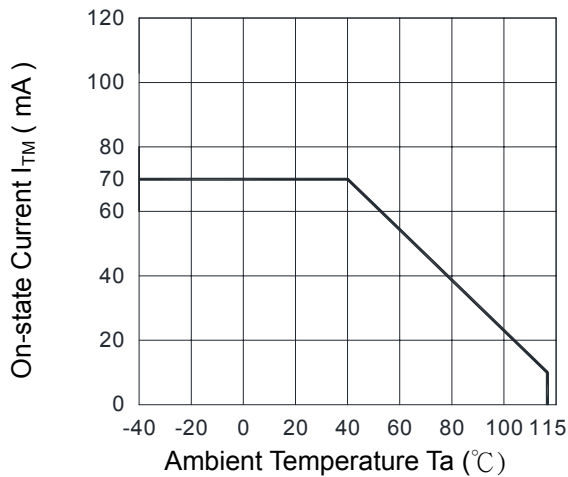


Fig.4 Total Power Dissipation P_D vs. Ambient Temperature

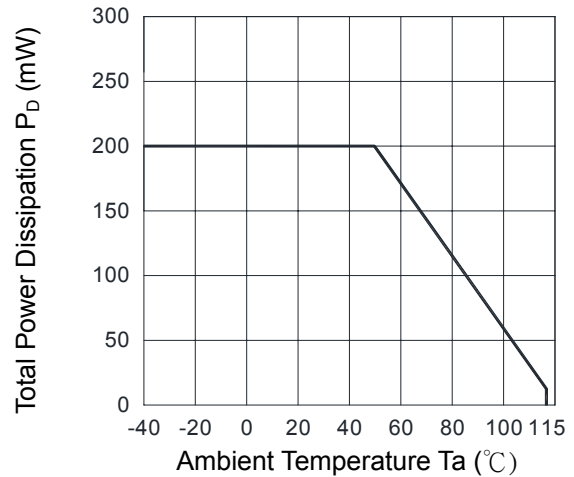


Fig.5 Peak Forward Current I_{FT} vs. Duty Ratio

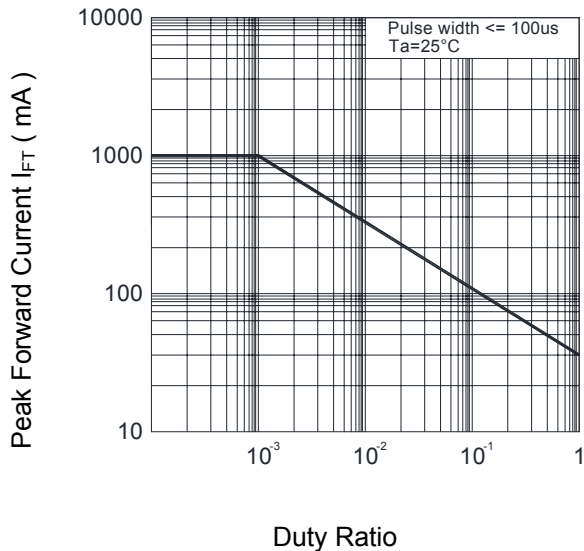


Fig.6 Forward Current I_F vs. Forward Voltage

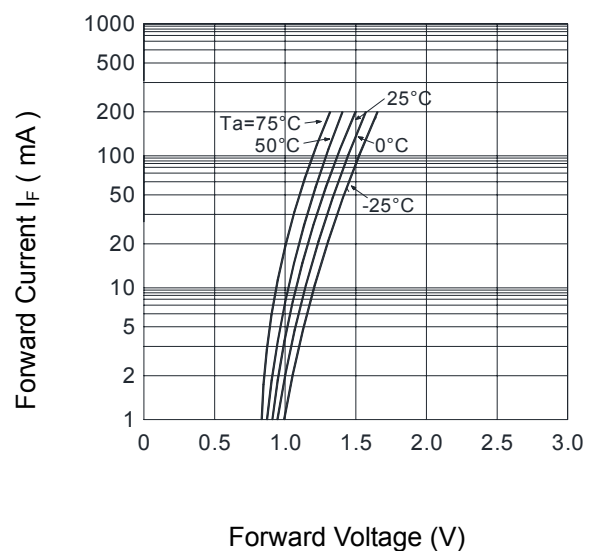


Fig.7 On-state Characteristics

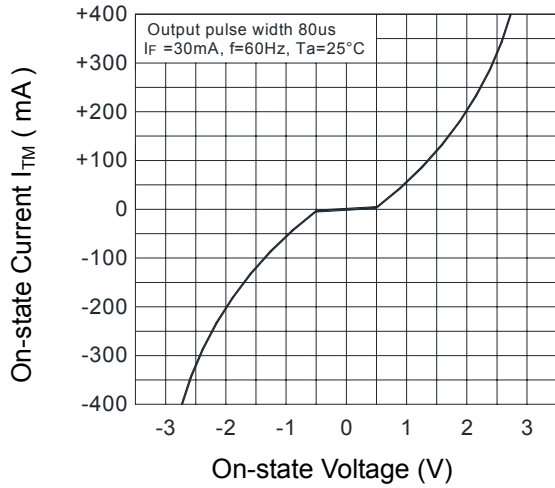


Fig.8 Leakage with LED off vs. Ambient Temperature

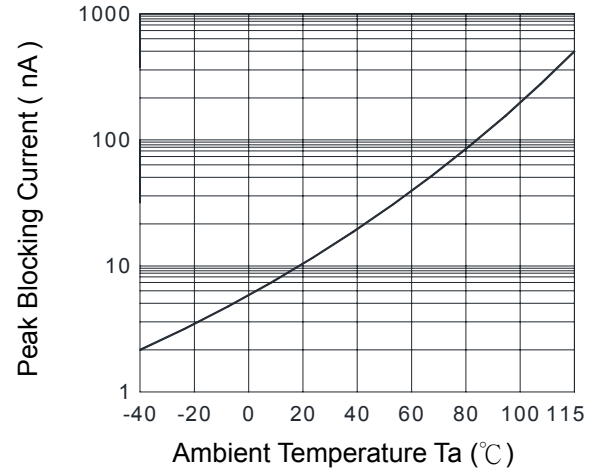
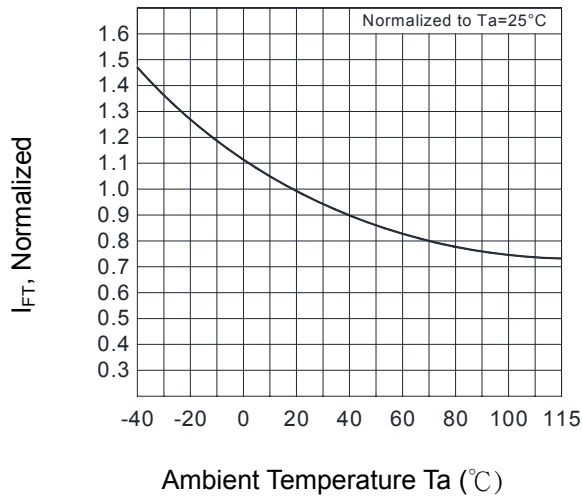


Fig.9 Trigger Current vs. Ambient Temperature

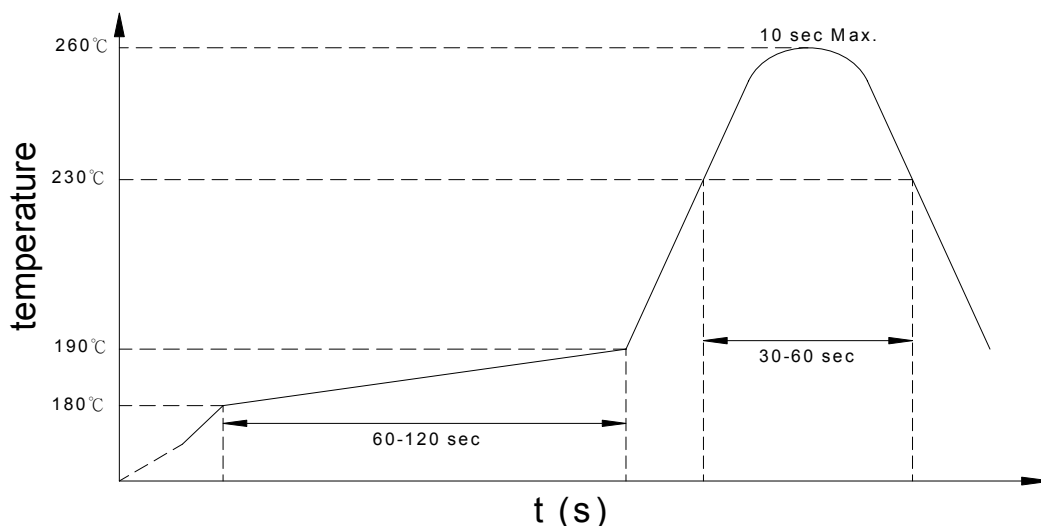


● Recommended Soldering Conditions

(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**

KTLP160J(X)(Y)

Notes :

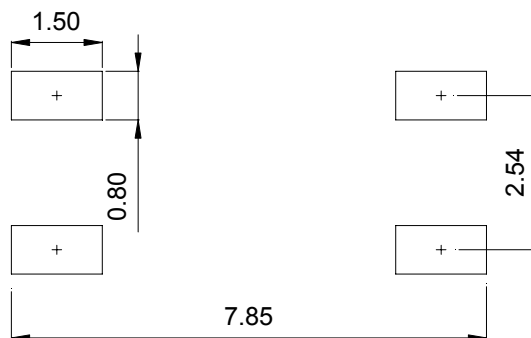
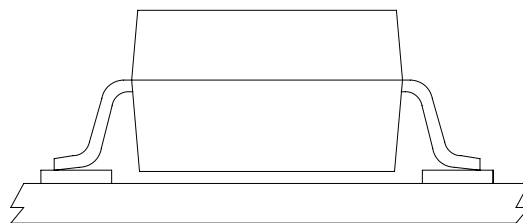
KTLP160J = Part No.

X = IFT option (1,2,3)

Y = 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

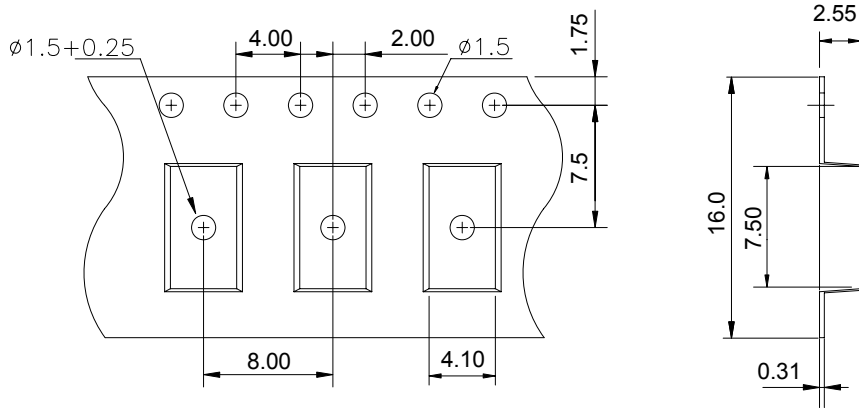
- **Recommended Pad Layout for Surface Mount Lead Form**



Unit : mm

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

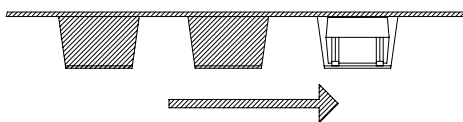
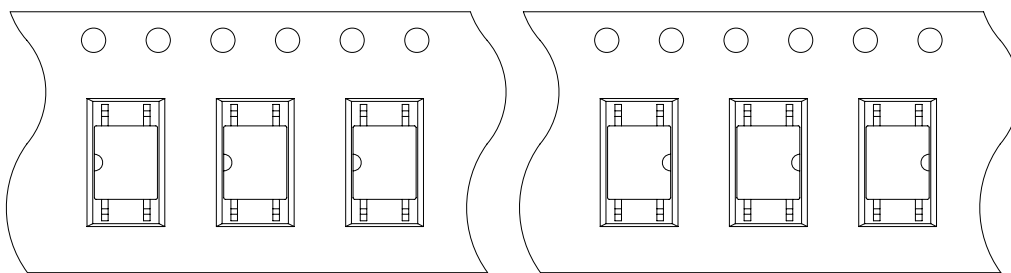
Unit : mm



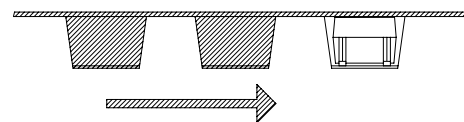
TOLERANCE : $\pm 0.2\text{mm}$

TLD

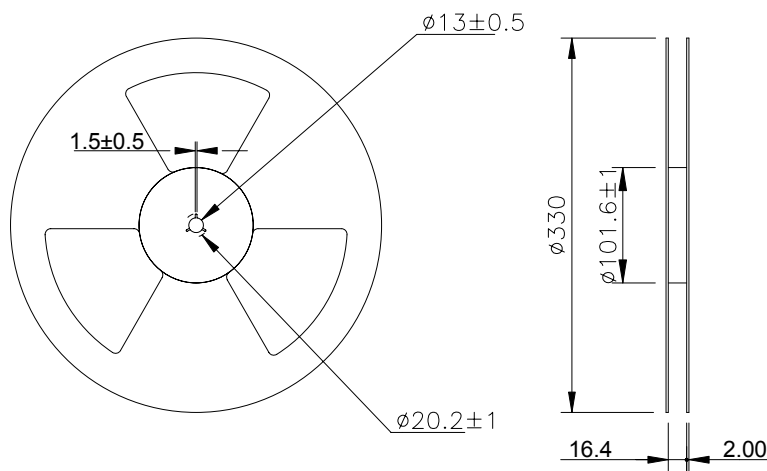
TRU



Direction of feed from reel



Direction of feed from reel





● **Application Notice**

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