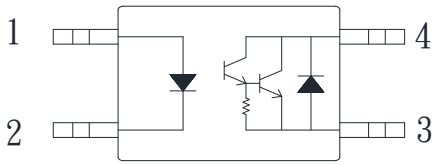
KT1400 Series

4PIN LSOP PHOTODARLINGTON PHOTOCOUPLER

Description

The KT1400 series consist of a photodarlington optically coupled to a gallium arsenide infrared-emitting diode in a 4 pin LSOP wide body package. Collector-emitter voltage is 300V. It features a high current transfer ratio, low coupling capacitance and high isolation voltage.

Schematic



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

Features

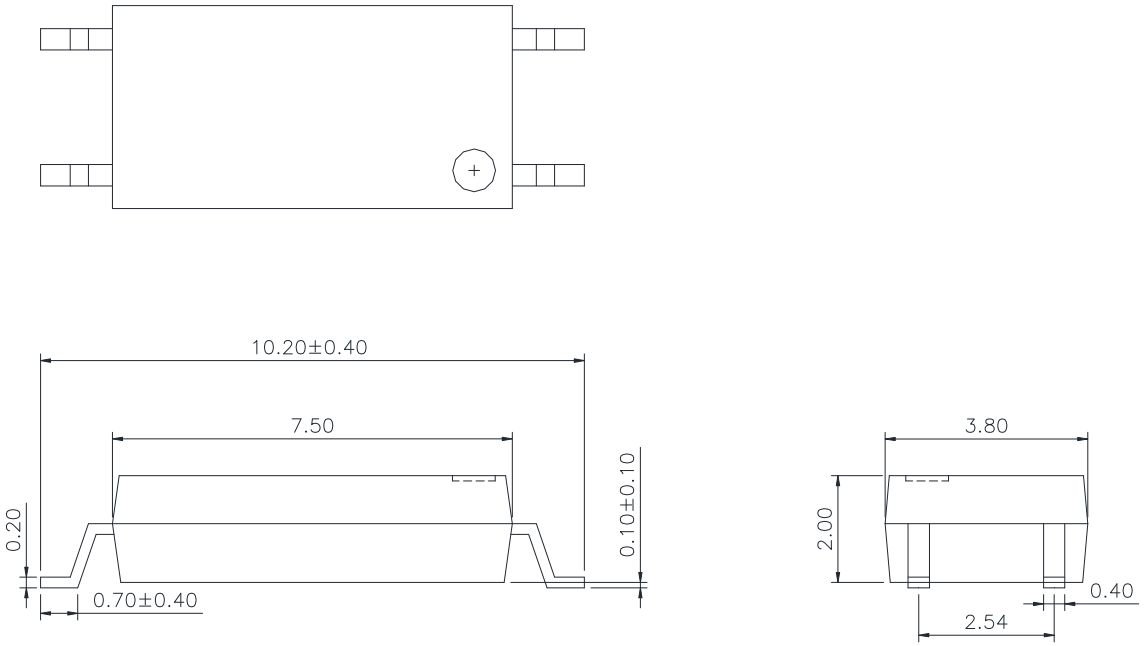
1. Pb free and RoHS compliant
2. Opaque type, SMD low profile 4 lead package
3. High collector-emitter voltage (V_{CEO} : 300V)
4. High current transfer ratio
   (CTR : Min.1000% at I_F =1mA,V_{CE} =2V)
5. High isolation voltage 5000Vrms
6. 8mm outer creepage distance
7. MSL class 1
8. Agency Approvals:
   - UL Approved (No. E169586): UL1577
   - c-UL Approved (No. E169586)
   - VDE Approved (No. 40031267): DIN EN60747-5-5
   - FIMKO Approved EN62368-1, EN60601-1
   - CQC Approved: GB8898-2011, GB4943.1-2011

Applications

- Telephone sets
- Copiers, facsimiles
- Interfaces with various power supply circuits, power distribution boards
- Hybrid substrates which require high density mounting

Outside Dimension

Unit : mm



TOLERANCE : ±0.2mm

Device Marking

Notes:

cosmo
140□ □:CTR rank
YWW Y: Year code / WW: Week code

● Absolute Maximum Ratings

(Ta=25℃)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	Peak forward current	I_{FP}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	PD	70	mW
Output	Collector-Emitter voltage	V_{CEO}	300	V
	Emitter-Collector voltage	V_{ECO}	0.1	V
	Collector current	I_C	150	mA
	Collector power dissipation	P_C	150	mW
Total power dissipation		Ptot	170	mW
Isolation voltage 1 minute		Viso	5000	Vrms
Operating temperature		Topr	-55 to +100	℃
Storage temperature		Tstg	-55 to +125	℃
Soldering temperature 10 second		Tsol	260	℃

● Electro-optical Characteristics

(Ta=25℃)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	V_F	I_F=20mA	-	1.2	1.4	V
	Reverse current	I_R	V_R=4V	-	-	10	uA
	Terminal capacitance	Ct	V=0, f=1KHz	-	30	-	pF
Output	Collector dark current	I_{CEO}	V_{CE}=200V, I_F=0	-	-	1	uA
	Collector-Emitter breakdown voltage	BV_{CEO}	Ic=0.1mA, I_F=0	300	-	-	V
Transfer charac-teristics	Current transfer ratio	CTR	I_F=1mA, V_{CE}=2V	1000	-	-	%
	Collector-Emitter saturation voltage	V_{CE}(sat)	I_F=1mA, Ic=2mA	-	-	1.5	V
	Isolation resistance	Riso	DC500V, 40 to 60%RH	$5x10^{10}$	10^{11}	-	Ω
	Floating capacitance	Cf	V=0, f=1MHz	-	0.6	1.0	pF
	Response time (Rise)	tr	Vcc=2V,Ic=20mA,R_L=100Ω	-	100	300	us
	Response time (Fall)	tf		-	20	100	us

Classification table of current transfer ratio is shown below.

CTR Rank	CTR (%)
KT1400	Min.1000

Fig.1 Current Transfer Ratio vs. Forward Current

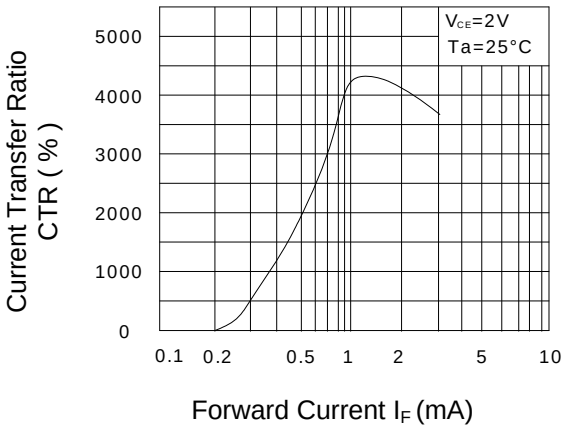


Fig.2 Collector Power Dissipation vs. Ambient Temperature

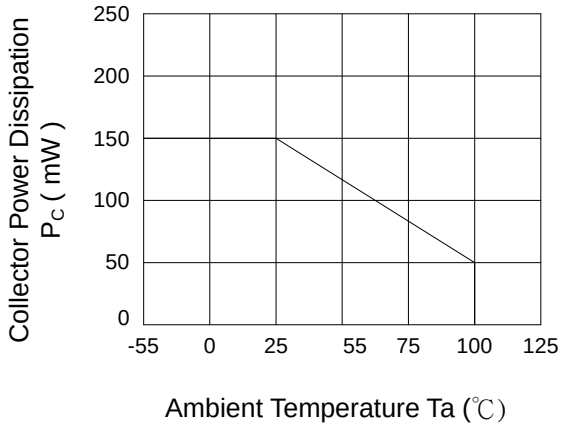


Fig.3 Collector Dark Current vs. Ambient Temperature

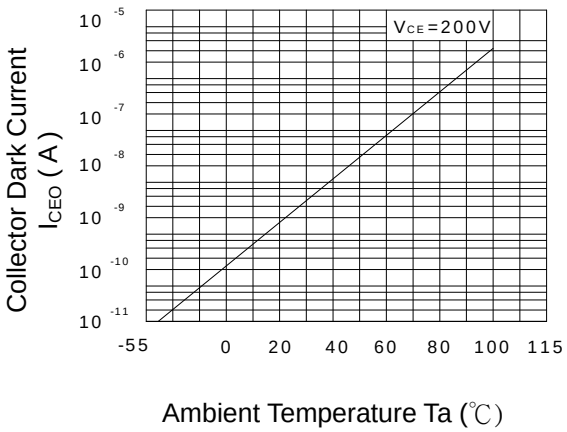


Fig.4 Forward Current vs. Ambient Temperature

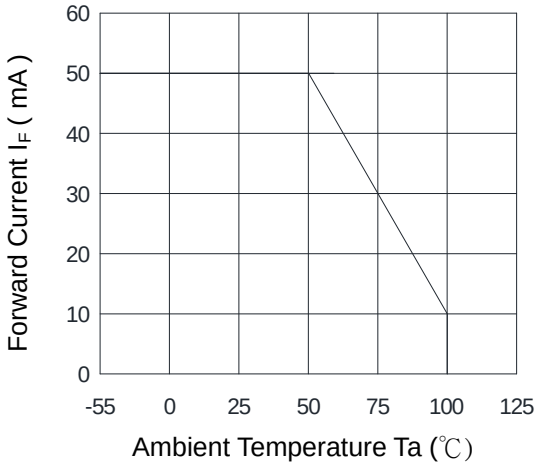


Fig.5 Forward Current vs. Forward Voltage

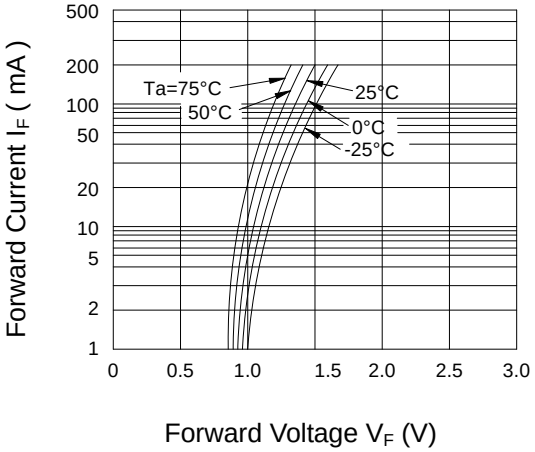


Fig.6 Collector Current vs. Collector-Emitter Voltage

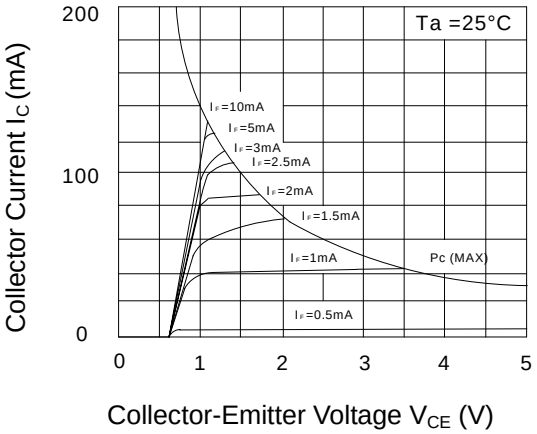


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

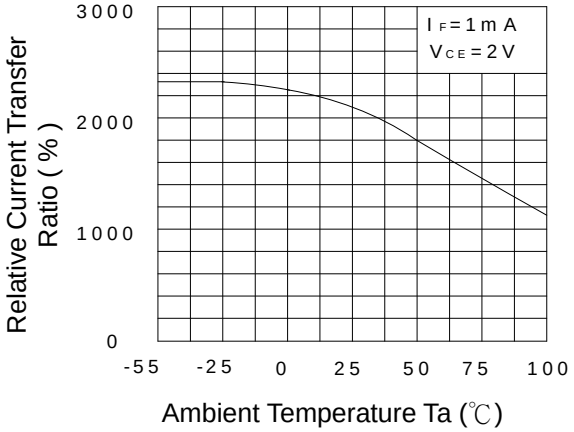


Fig.8 Collector-Emitter Saturation Voltage vs. Forward Current

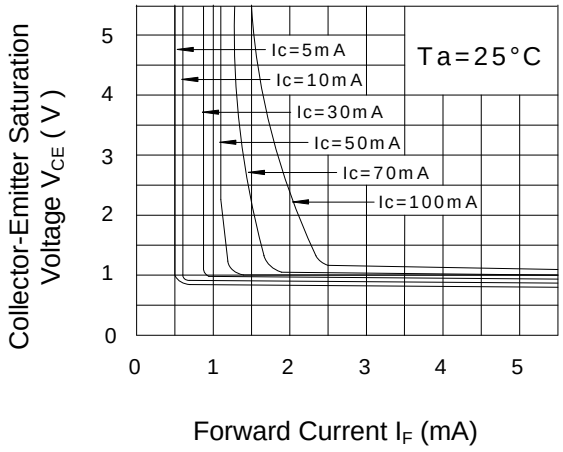
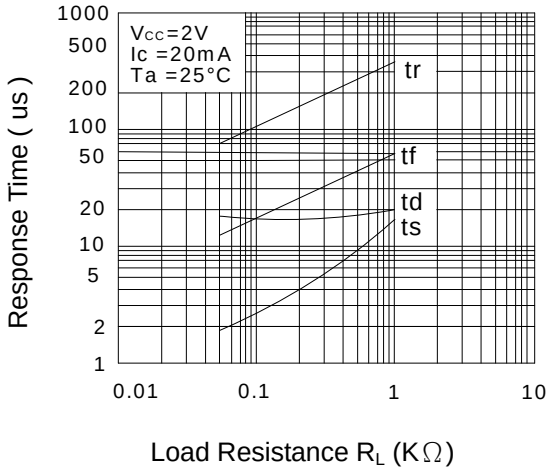
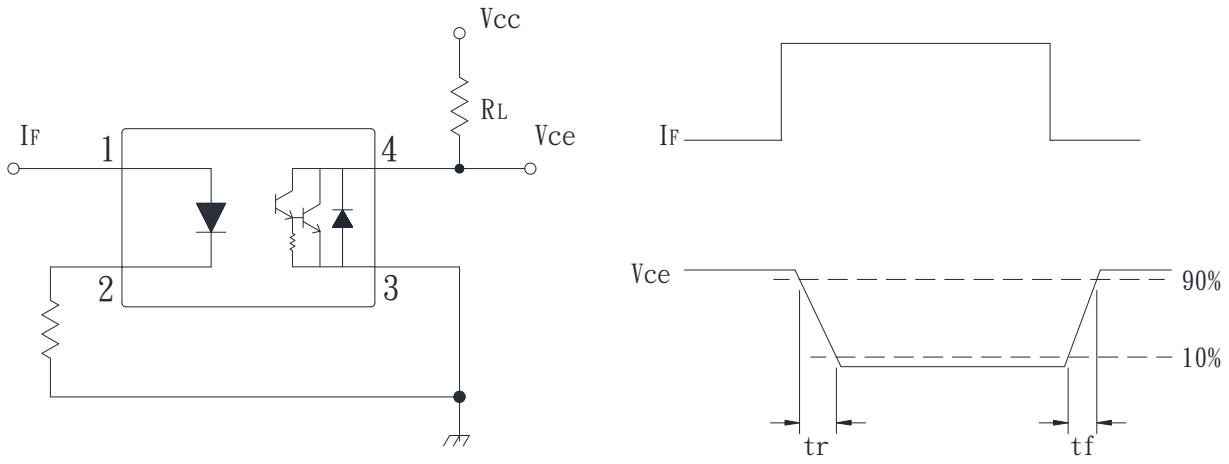


Fig.9 Response Time vs. Load Resistance



- **Test Circuit for Response Time**

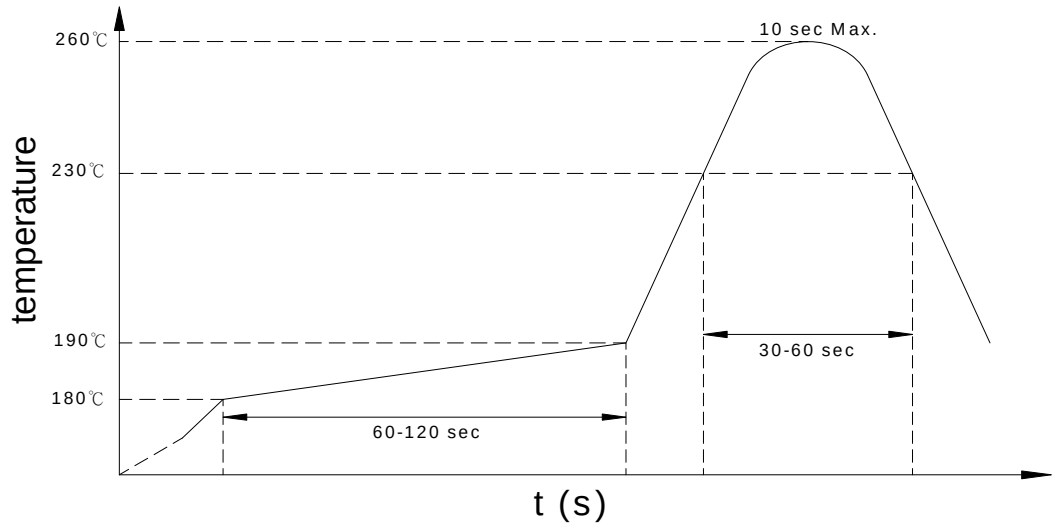


Recommended Soldering Conditions

(a) Infrared reflow soldering：

- Peak reflow soldering： 260℃ or below (package surface temperature)
- Time of peak reflow temperature： 10 sec
- Time of temperature higher than 230℃： 30-60 sec
- Time to preheat temperature from 180~190℃： 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℃ or below (molten solder temperature)
- Time： 10 seconds or less
- Preheating conditions： 120℃ 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**

KT1400 (Z)

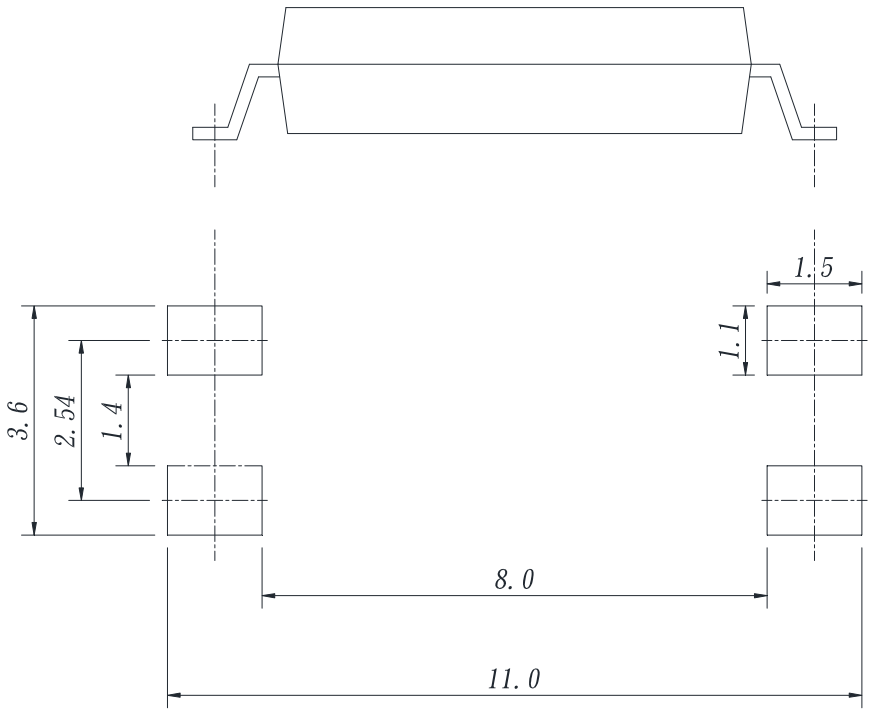
Notes:

KT1400= Part No.

Z = Tape and reel option (TLD、TRU)

Option	Description	Packing quantity
(TLD)	TLD tape & reel option	3000 units per reel
(TRU)	TRU tape & reel option	3000 units per reel

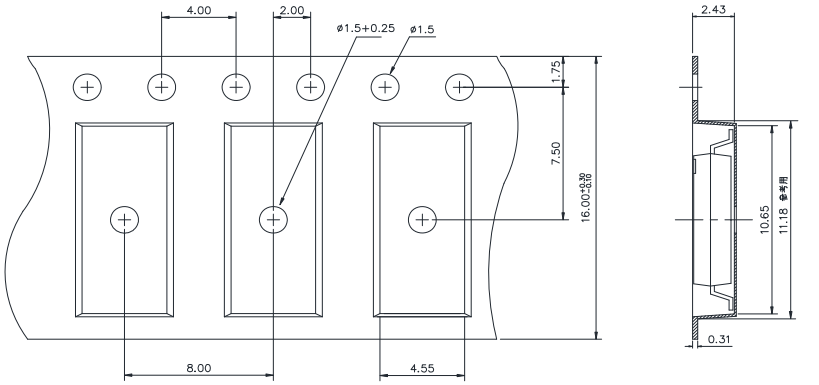
- **Recommended Pad Layout for Surface Mount Lead Form**



Unit : mm

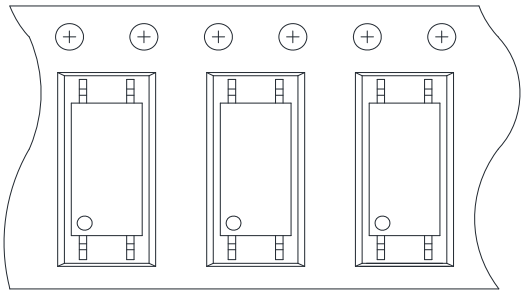
4-pin LSOP Carrier Tape & Reel

Unit: mm



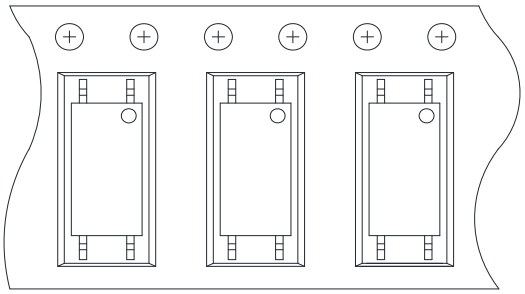
TOLERANCE：±0.2mm

TLD

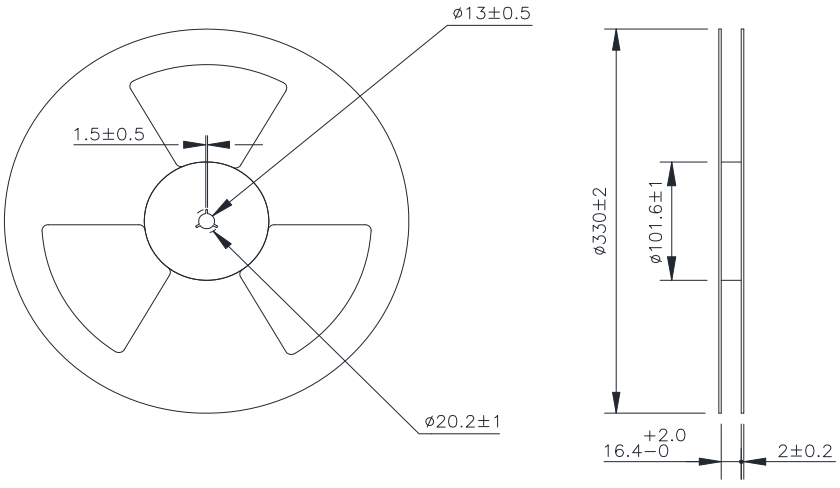


Direction of feed from reel

TRU



Direction of feed from reel



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