

● Description

The KT1410 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.

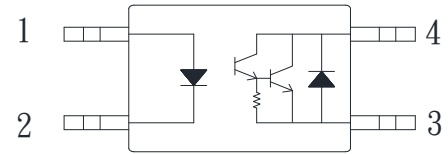
● Features

1. Pb free and RoHS compliant
2. Temperature range -55°C to 115°C
3. Opaque type, SMD low profile 4 lead package
4. High collector-emitter voltage ($V_{\text{CEO}} : 300\text{V}$)
5. High current transfer ratio
(CTR : Min.1000% at $I_{\text{F}} = 1\text{mA}, V_{\text{CE}} = 2\text{V}$)
6. High isolation voltage 5000Vrms
7. 8mm outer creepage distance
8. MSL class 1
9. 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

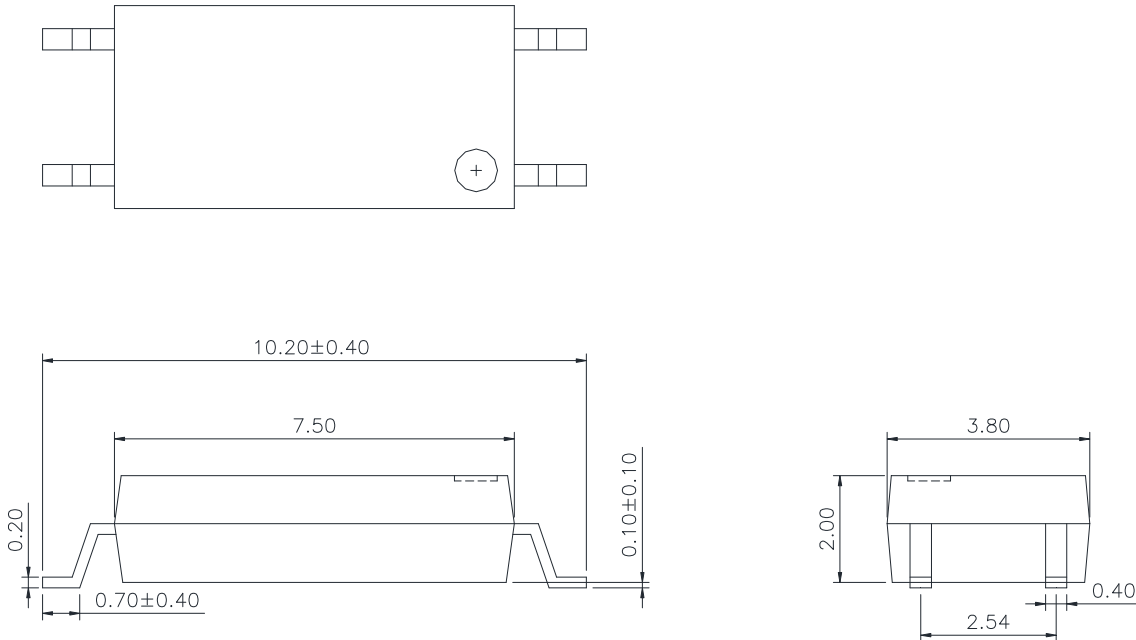
● Schematic



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

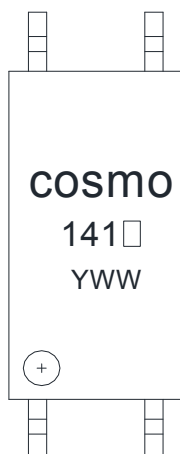
● **Outside Dimension**

Unit : mm



TOLERANCE : ± 0.2 mm

● **Device Marking**



Notes:

cosmo

141□

YWW

□: CTR rank

Y: Year code / WW: Week code

● **Absolute Maximum Ratings**

(Ta=25°C)

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	P _D	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		P _{tot}	170	mW
Isolation voltage 1 minute		V _{iso}	5000	V _{rms}
Operating temperature		T _{opr}	-55 to +115	°C
Storage temperature		T _{stg}	-55 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 =20mA	-	1.2	1.4	V
	Reverse current	I _R	V _R =4V	-	-	10	uA
	Terminal capacitance	C _t	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}	I _C =0.1mA, I _F =0	300	-	-	V
Transfer characteristics	Current transfer ratio	CTR	I _F =1mA, V _{CE} =2V	1000	-	-	%
	Collector-Emitter saturation voltage	V _{CE(sat)}	I _F =1mA, I _C =2mA	-	-	1.5	V
	Isolation resistance	R _{iso}	DC500V, 40 to 60%RH	5x10 ¹⁰	10 ¹¹	-	Ω
	Floating capacitance	C _f	V=0, f=1MHz	-	0.6	1.0	pF
	Response time (Rise)	t _r	V _{CC} =2V, I _C =20mA, R _L =100Ω	-	100	300	us
	Response time (Fall)	t _f		-	20	100	us

Classification table of current transfer ratio is shown below.

CTR Rank	CTR (%)
KT1410	Min.1000

Fig.1 Current Transfer Ratio vs. Forward Current

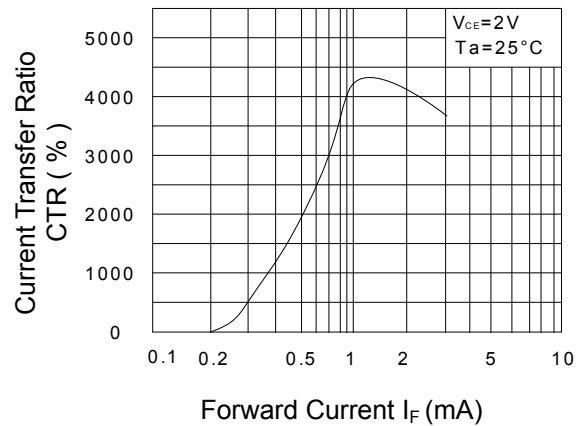


Fig.2 Collector Power Dissipation vs. Ambient Temperature

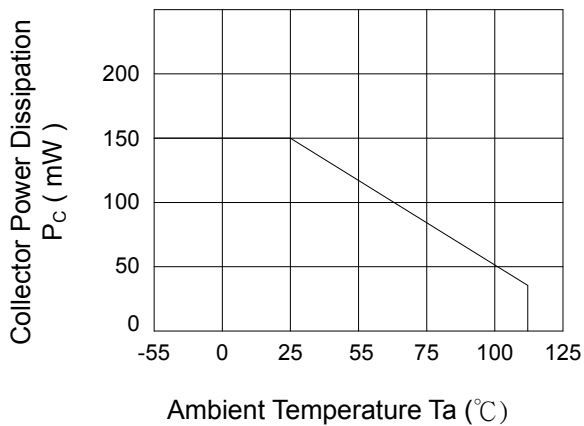


Fig.3 Collector Dark Current vs. Ambient Temperature

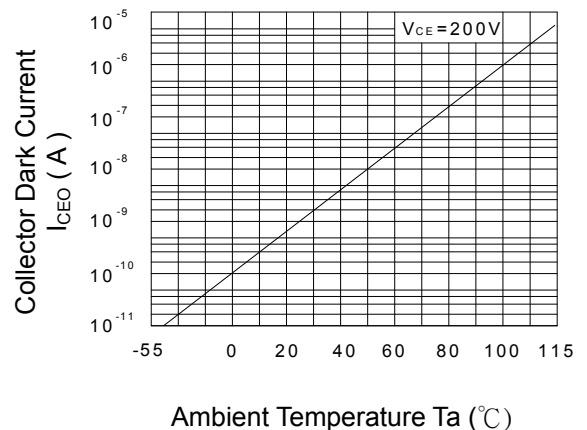


Fig.4 Forward Current vs. Ambient Temperature

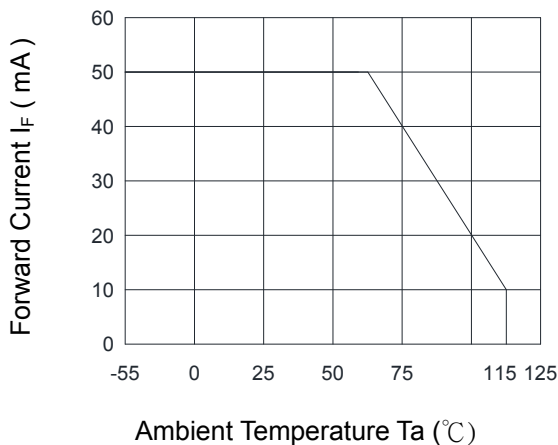


Fig.5 Forward Current vs. Forward Voltage

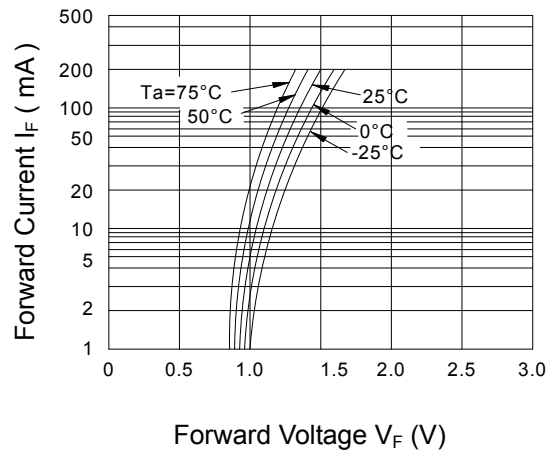


Fig.6 Collector Current vs. Collector-Emitter Voltage

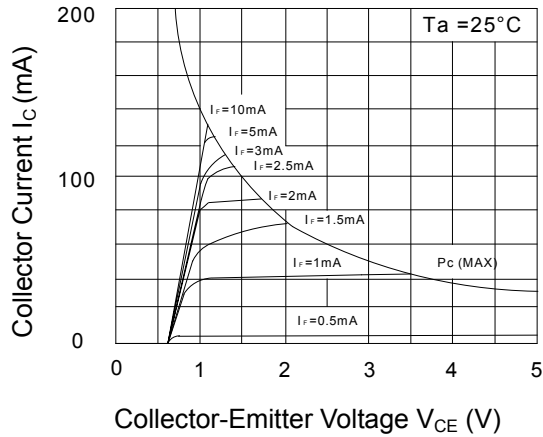


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

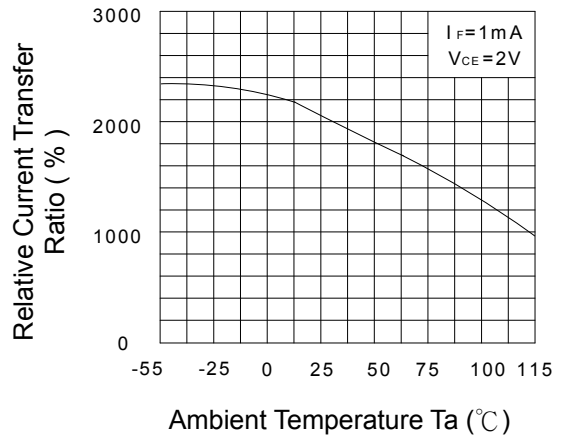


Fig.8 Collector-Emitter Saturation Voltage vs. Forward Current

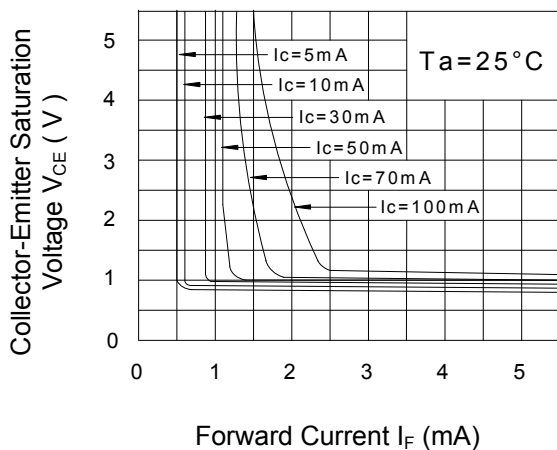
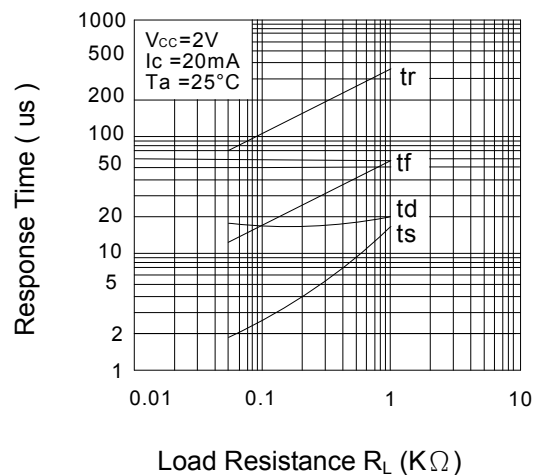
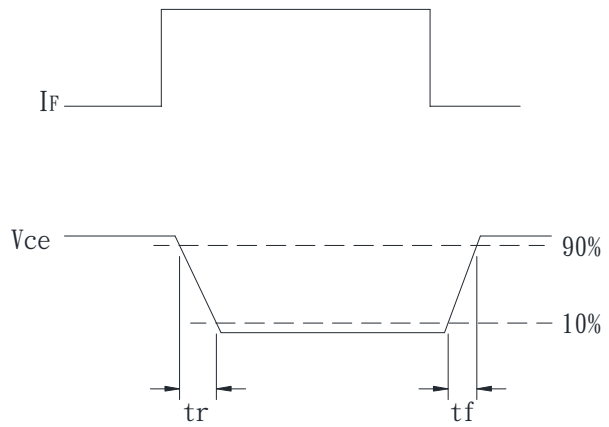
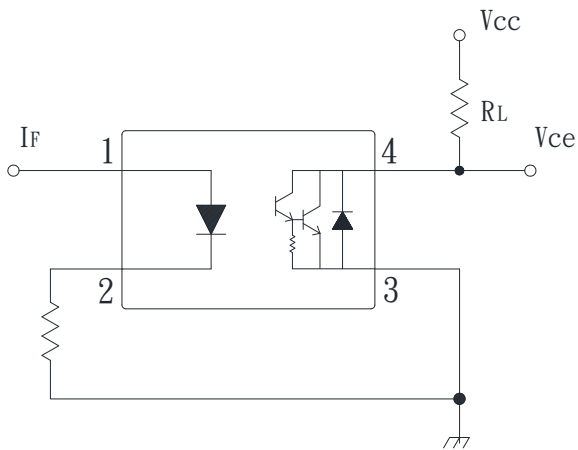


Fig.9 Response Time vs. Load Resistance



● **Test Circuit for Response Time**

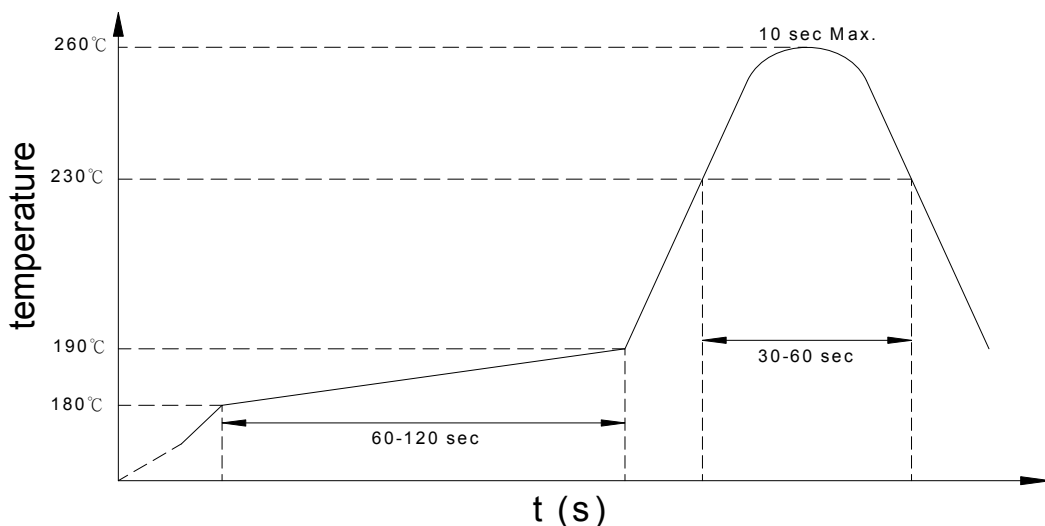


● Recommended Soldering Conditions

(a) Infrared reflow soldering :

- Peak reflow soldering : 260°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**

KT1410 (Z)

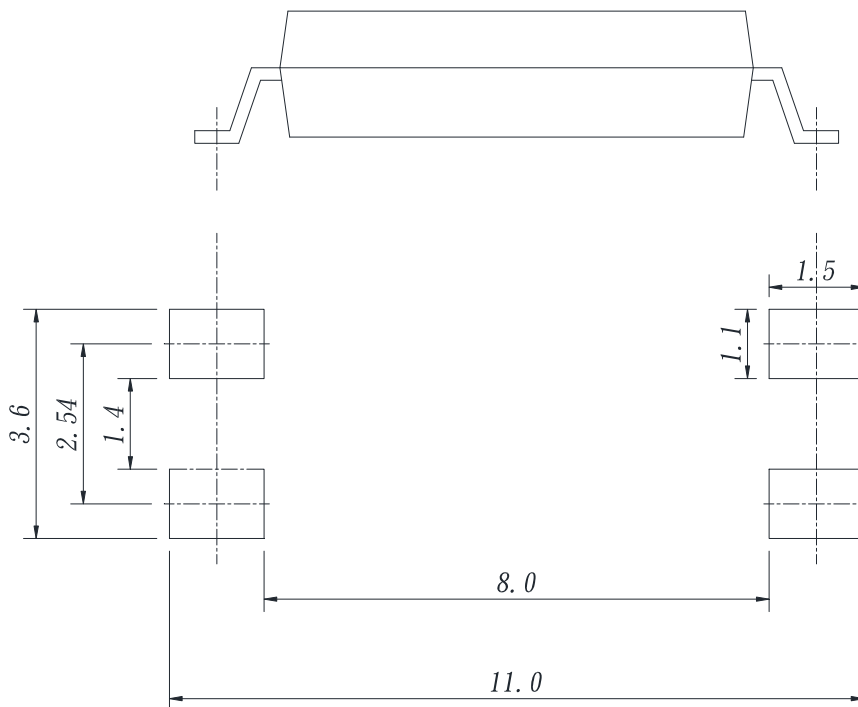
Notes:

KT1410 = Part No.

Z = Tape and reel option (TLD、TRU)

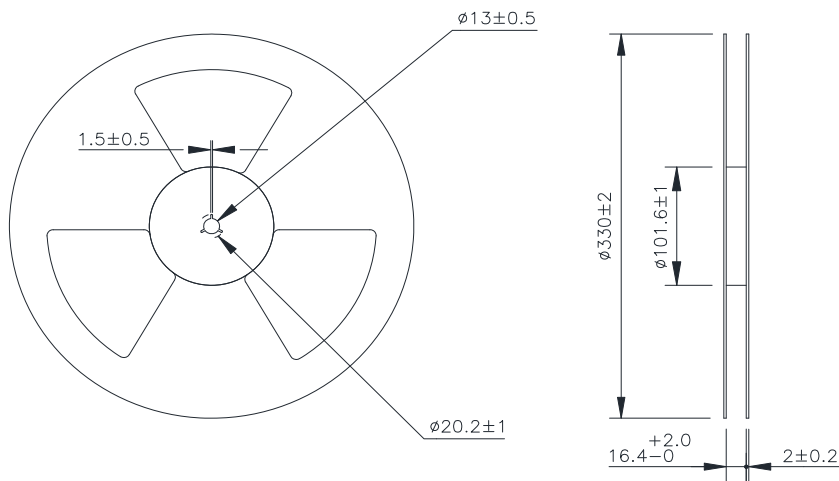
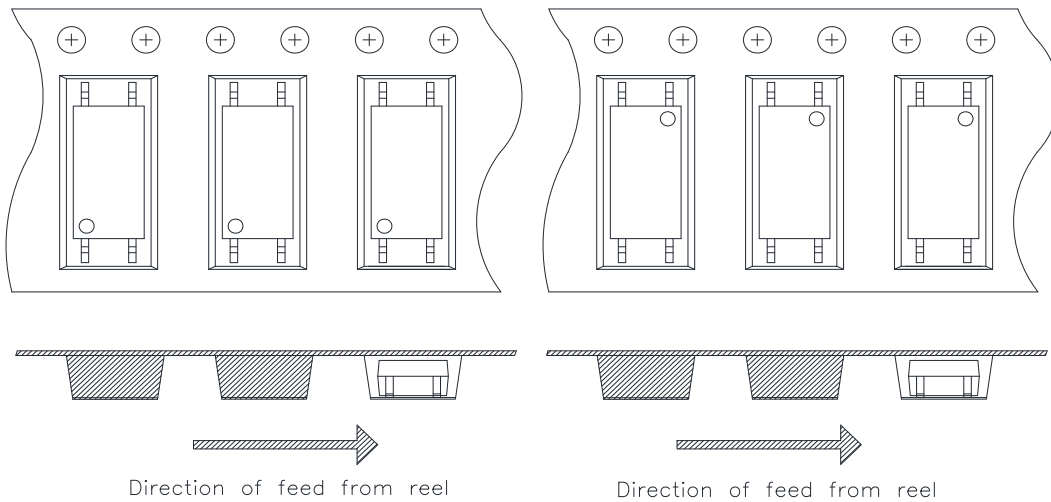
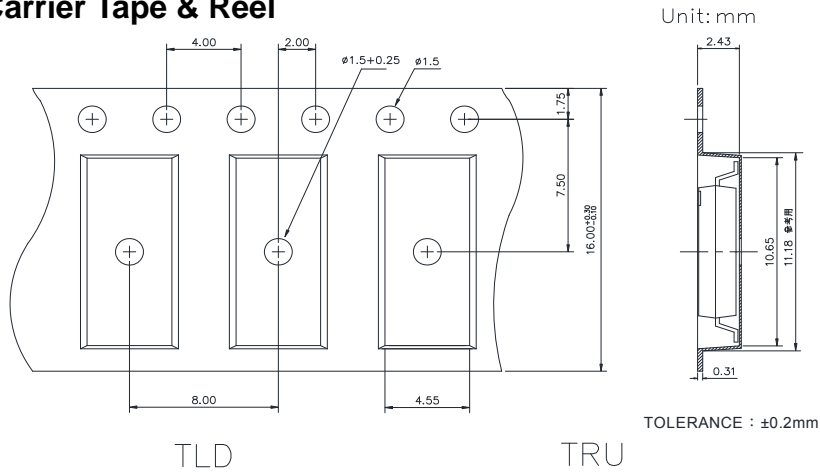
Option	Description	Packing quantity
TLD	TLD tape & reel option	3000 units per reel
TRU	TRU tape & reel option	3000 units per reel

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



Unit : mm

● 4-pin LSOP Carrier Tape & Reel



- **Application Notice**

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