



### Description

The TD101X series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar phototransistor detector in a plastic LSOP4 package with the robust coplanar double mold structure. TD101X series provide the most stable isolation feature.

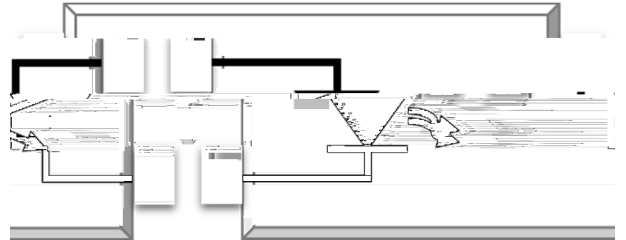
### Features

- High isolation (1000) \* +S
- Temperature stability available see order information
- DC input with transistor output
- Operating temperature range: (-40°C, to 110°C)
- I<sub>o</sub> = 50 mA, RoHS compliance
- UL class 1
- Regulatory Approvals
  - 2L : 2L1(33)
  - D1 : 1450313.(6)D10771.(8)
  - 9 : G ; !< != #1% G ; 77<7

### Applications

- Switch mode power supplies
- Programmable controllers
- Household appliances
- Office equipment

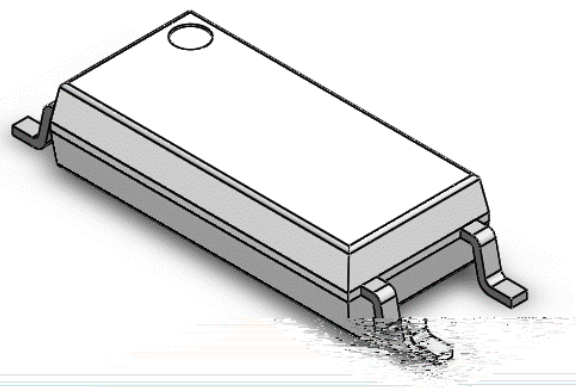
### SCHEMATIC



### PIN DEFINITION

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

### PAC A ! E O " T # I N E





LSOP4, DC Input, Photo Transistor Coupler

A ' SO# " TE MA (IM " M ) ATIN ! S				
A * A + 1 T 1 *	S @ + ; OL	) AL 2 1	2 4 AT	4 OT 1
A 4 2 T				
Borward , urrent	A <sub>B</sub>	50	mA	
ea" Borward , urrent	A <sub>B</sub>	1	A	1
* e&erse ) oltage	) *	5	)	
Anput ower Dissipation	A	100	m\$	
O 2 T 2 T				
, ollector . 1 mitter ) oltage	) , 1 0	70	)	
1 mitter . , ollector ) oltage	) 1 , 0	3	)	
, ollector , urrent	A ,	( 0	mA	
Output ower Dissipation	o	1 ( 0	m\$	
, O + + O 4				
Total ower Dissipation	tot	? ( 0	m\$	
Asolation ) oltage	) iso	( 000	) rms	?
Operating Temperature	Topr	. ( ( C 1 1 0	/ ,	
Storage Temperature	Tstg	. ( ( C 1 ? (	/ ,	
Soldering Temperature	Tsol	? 50	/ ,	

Note 1. 100µs pulse, 100 ! "#e\$uenc%

Note 2. A & ' o# 1 ( ) nute, R. . \* +0 , -0.



LSOP4, DC Input, Photo Transistor Coupler

ELECTRICAL CHARACTERISTICS at Ta=25°C							
Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions	Notes
$I_{F1}$	Forward Current	0	10	100	mA	$V_{CE} = 5V, I_C = 10mA$	
$I_{F2}$	Reverse Current	0	10	100	mA	$V_{CE} = 5V, I_C = 10mA$	
$C_{in}$	Input Capacitance	0	10	100	pF	$f = 1kHz, V_{CE} = 5V, I_C = 10mA$	
$I_{C1}$	Collector Current	0	100	100	mA	$V_{CE} = 5V, I_{F1} = 10mA$	
$I_{C1sat}$	Collector Saturation Current	0	10	100	mA	$V_{CE} = 5V, I_{F1} = 10mA$	
$R_{SO}$	Isolation Resistance	$10^8$	$10^8$	$10^8$	$\Omega$	$V_{CE} = 5V, I_{F1} = 10mA$	
$C_{blo}$	Bloating Capacitance	0	10	100	pF	$f = 1kHz, V_{CE} = 5V, I_C = 10mA$	
$f_{cut-off}$	Cutoff Frequency	0	70	100	Hz	$I_{F1} = 10mA, I_{C1} = 10mA$	
$t_{rise}$	Rise Time	0	17	17	ns	$I_{F1} = 10mA, I_{C1} = 10mA$	
$t_{fall}$	Fall Time	0	5	17	ns	$I_{F1} = 10mA, I_{C1} = 10mA$	

Note 1.  $I_{F1} = 10mA$   
 Note 2.  $I_{C1} = 10mA$



LSOP4, DC Input, Photo Transistor Coupler

CHARACTERISTIC CURVES

<p>Fig. 1 Forward Current vs. Ambient Temperature</p>	<p>Fig. 2 Collector Power Dissipation vs. Ambient Temperature</p>
<p>Fig. 3 Forward Current vs. Forward Voltage</p>	<p>Fig. 4 Collector Dark Current vs. Ambient Temperature</p>
<p>Fig. 5 Collector Current vs. Collector-Emitter Voltage</p>	<p>Fig. 6 Collector Current vs. Collector-Emitter Voltage</p>



CHARACTERISTICS - ES

Fig. 5 Normalized Current Transfer Ratio vs. Forward Current

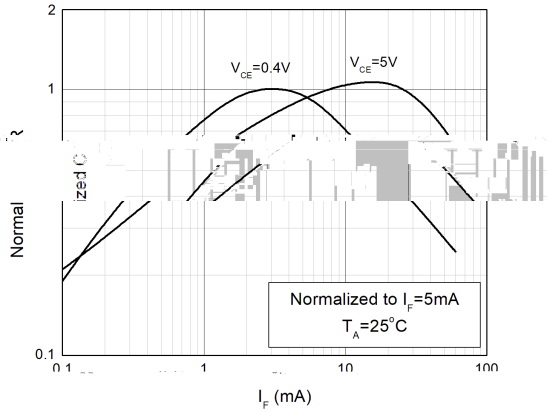


Fig. 8 Normalized Current Transfer Ratio vs. Ambient Temperature

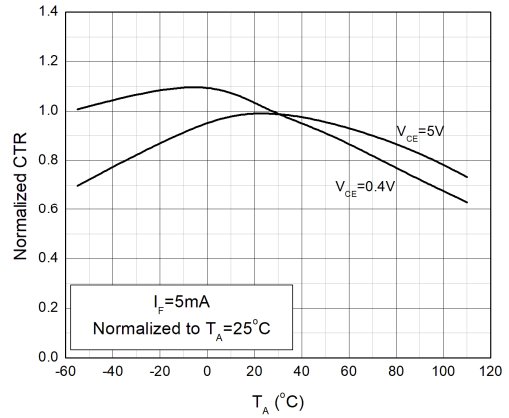


Fig. 9 Collector-Emitter Saturation Voltage vs. Ambient Temperature

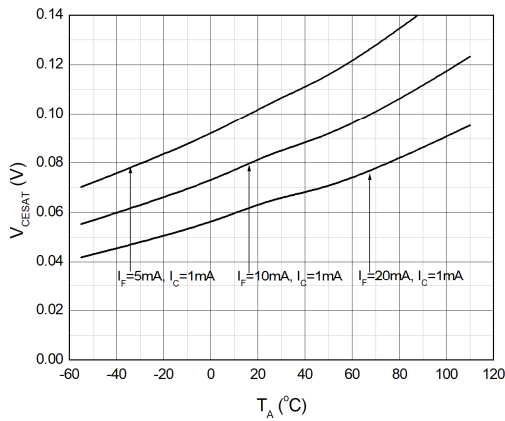


Fig. 10 Switching Time vs. Load Resistance

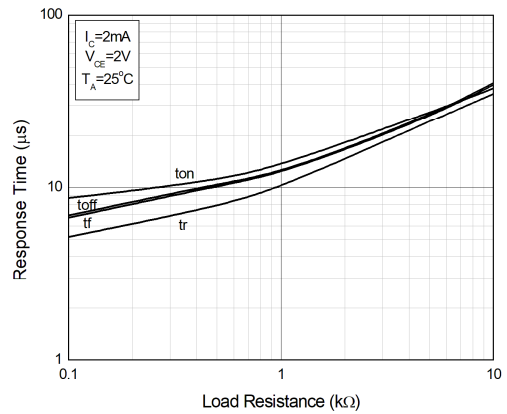
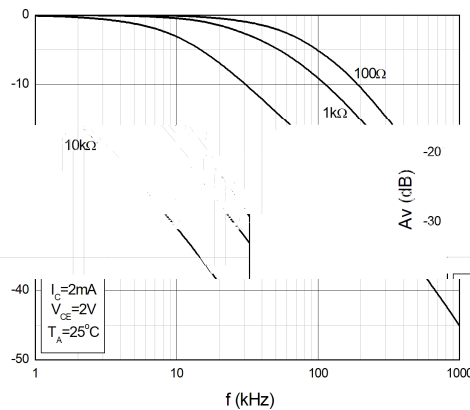


Fig. 11 Frequency Response



TEST CIRCUITS

Fig. 12 Test Circuit of Rise Time

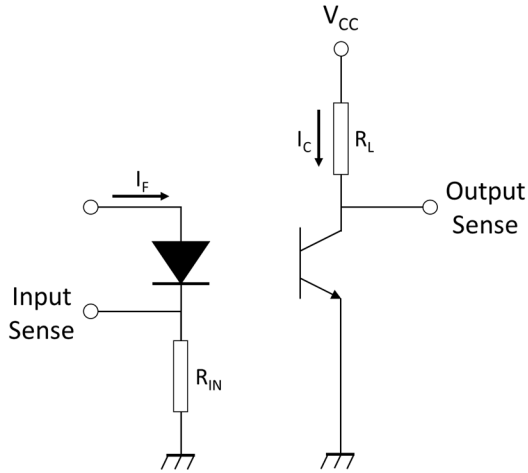


Fig. 13 Characteristic of Rise Time

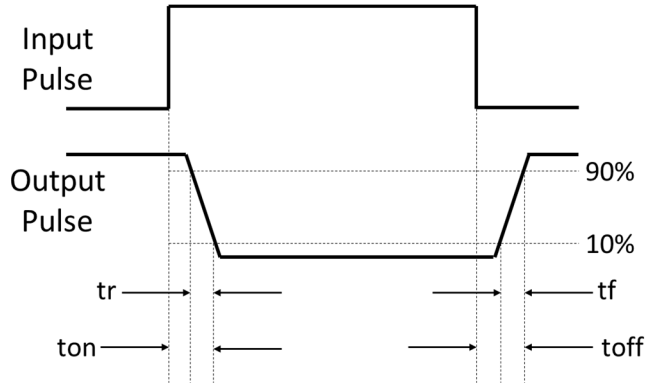
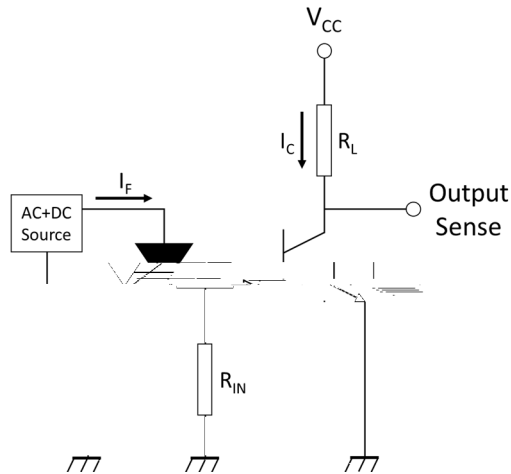
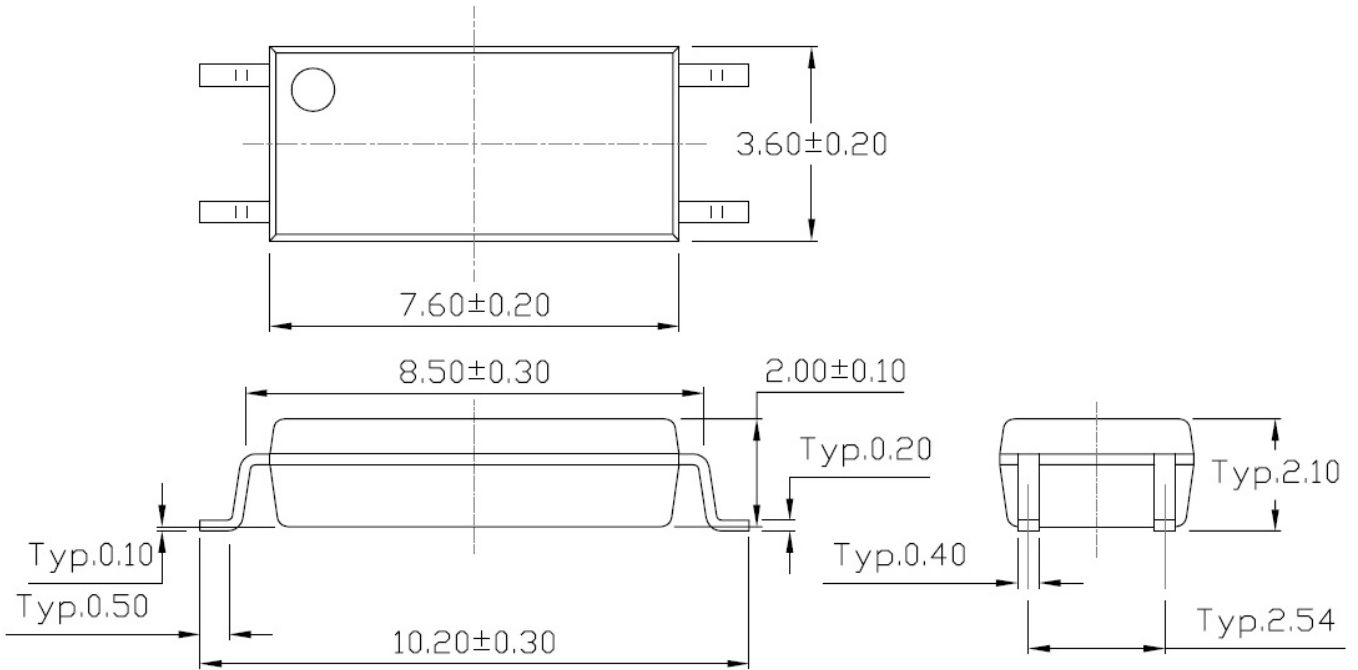


Fig. 14 Test Circuit of Frequency

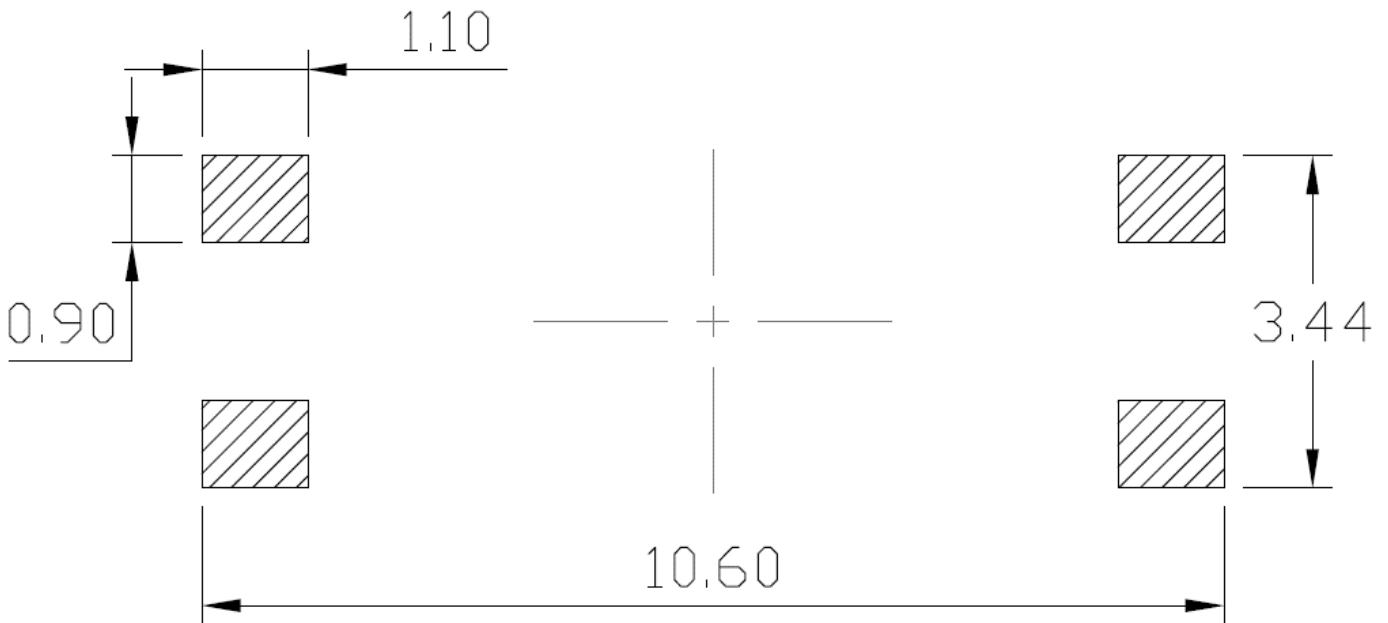




**PAC A E DIMENSIONS** Dimension in mm &le\$\$ other / i\$e \$stated=



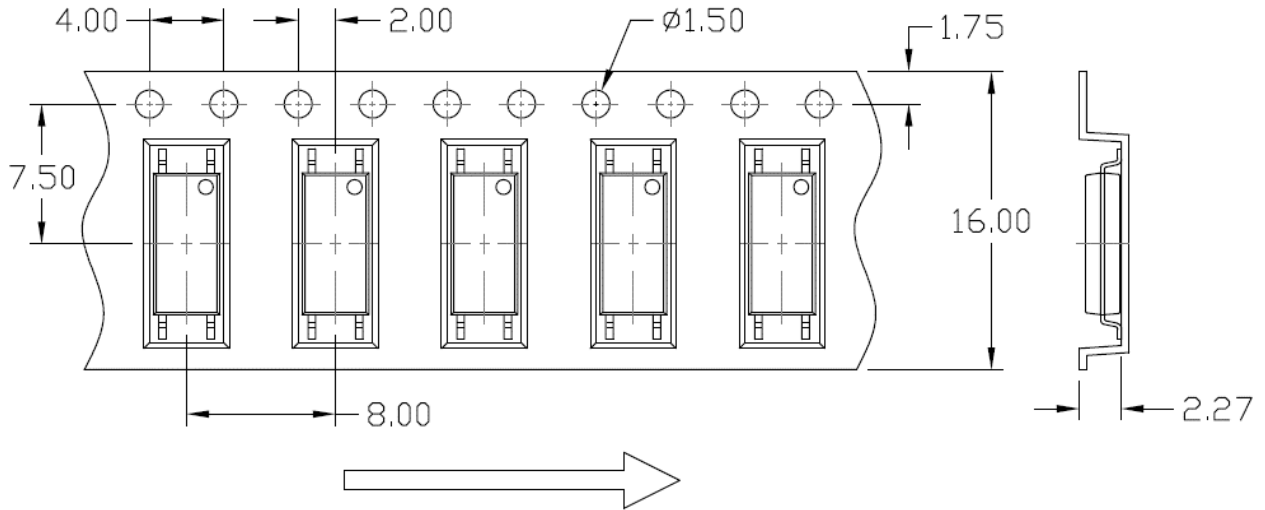
**RECOMMENDED SOLDER MASK** Dimension in mm &le\$\$ other / i\$e \$stated=



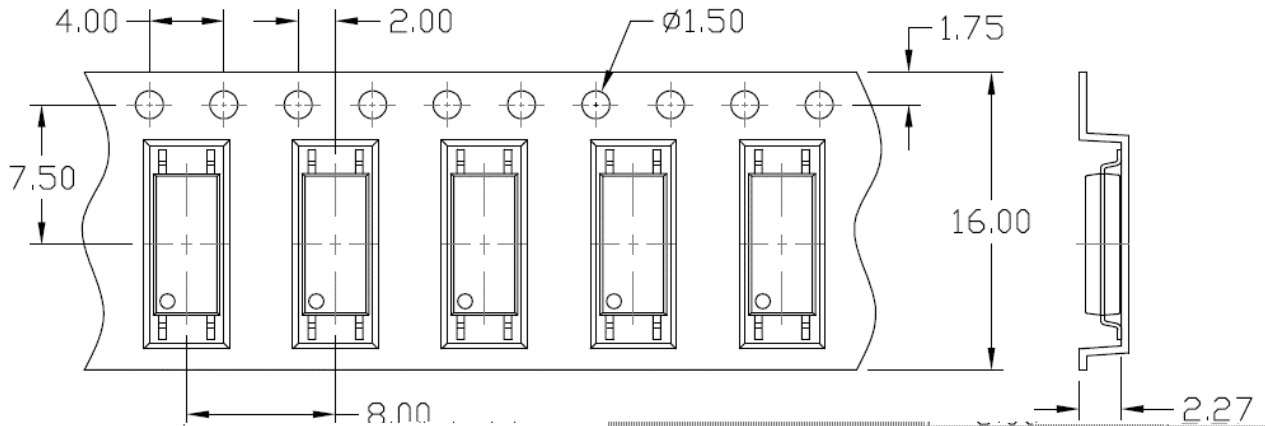


### TAPE SPECIFICATIONS Dimension\$ in mm & nle\$\$ other / i\$e \$tated=

Option T1



Option T2

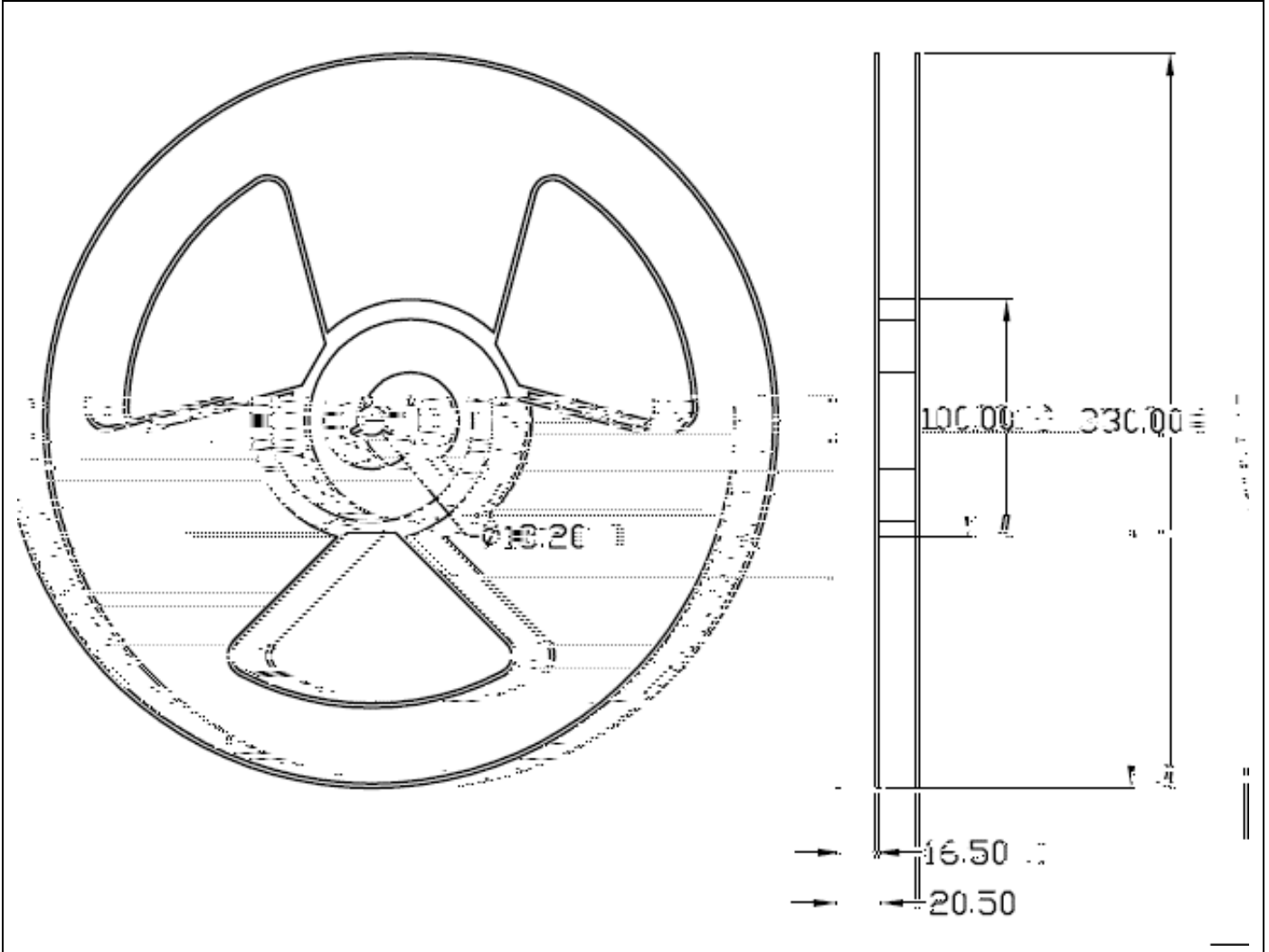






**MECHANICAL SPECIFICATIONS** Dimension in mm unless otherwise stated

Option T1 > T2





## LSOP4, DC Input, Photo Transistor Coupler

1. ELECTRICAL SPECIFICATIONS

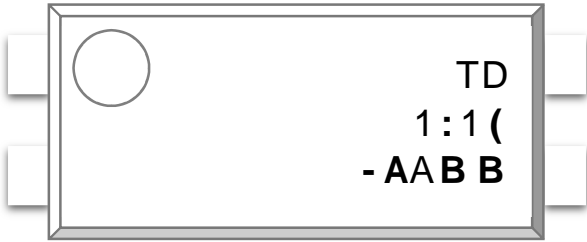
Inner Pin

2.3W ± 3% / -3cm ± 3% - 9cm



**ORDERING AND MARKING INFORMATION**

**MARKING INFORMATION**



**TD**      @ Company Abbr.  
**1:1 (**    @ Part Number  
**-**        @ -DE Option  
**A**        @ Fiscal Year  
**A**        @ Manufacturing Code  
**B B**      @ B or B2

**ORDERING INFORMATION**

**PACKAGE INFORMATION**

**TD1:1 (CD=3! -**

**TD** : , company Abbr#  
**101X** : \*an" 60J1J?J=J!J(J5J3J7J<8  
**K** : Tape and \*eel Option 6T1JT?8  
**G** : Green  
**)** : )D1 Option 6) or 4one8

**福建天电光电有限公司**  
FUJIAN LIGHTNING OPTOELECTRONIC CO., LTD.

Part No : XXXXXXXXXXXXX      Bin Code : X

Lot No : XXXXXXXXXXXX

Date Code : XXXX

Q'ty : XXXX pcs

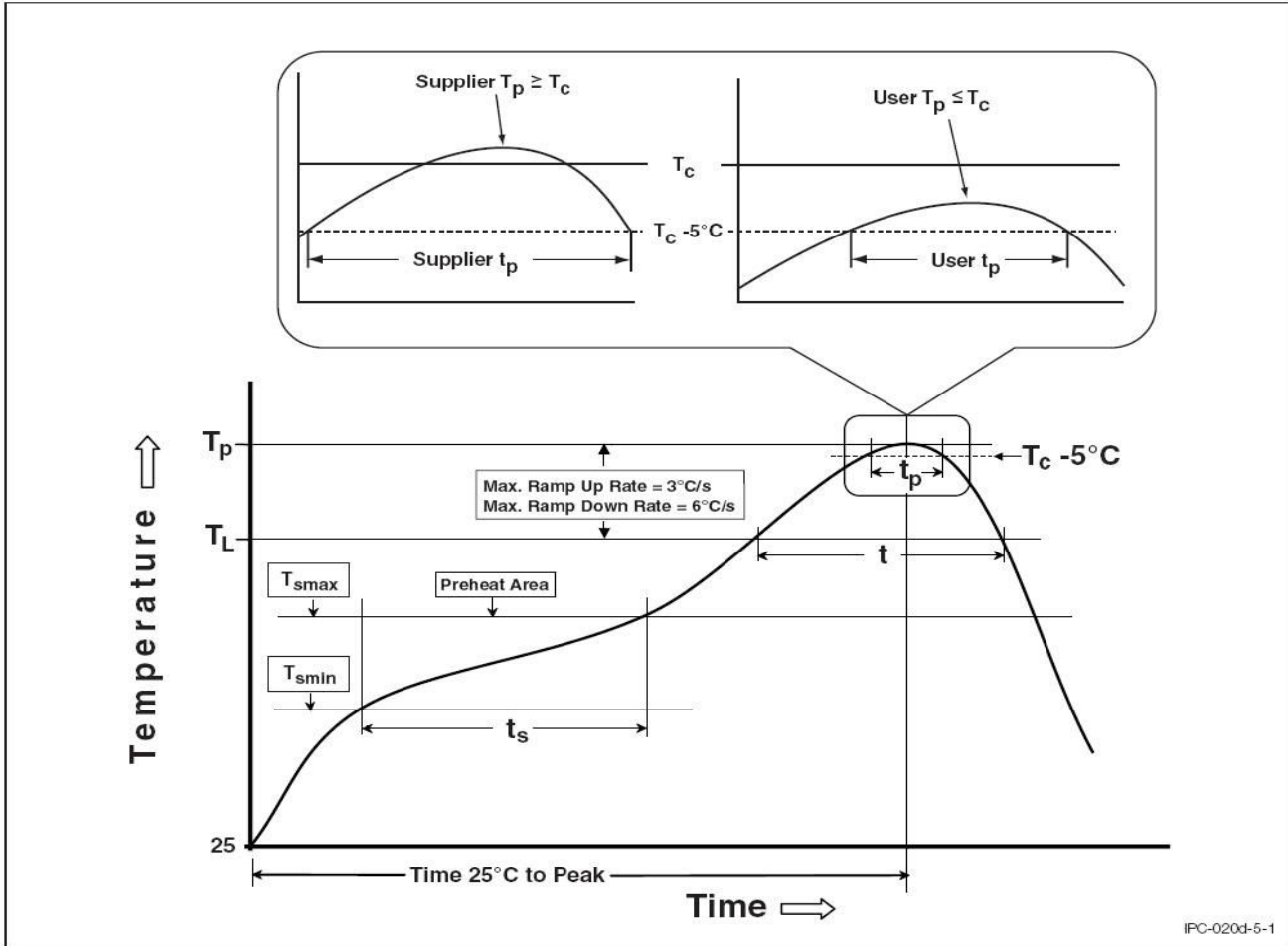
**PACKAGING INFORMATION**

Option	E&antit<	E&antit< F Inner 1o?	E&antit< F O&ter 1o?
T1	=000 2nitsJ *eel	= *eelsJanner bo-	( Anner bo-JOuter bo- D ! (" 2nits
T?	=000 2nitsJ *eel	= *eelsJanner bo-	( Anner bo-JOuter bo- D ! (" 2nits



OPERATIONAL INFORMATION

OPERATIONAL INFORMATION



IPC-020d-5-1

Profile Feature	Sn3P1 Assembly Profile	P13Free Assembly Profile
Temperature +in# 6T <sub>min</sub>	100	1 (0/ ,
Temperature +a-# 6T <sub>max</sub>	1 (0	?00/ ,
Time 6ts from 6T <sub>min</sub> to T <sub>max</sub>	50.1?0 seconds	50.1?0 seconds
* amp.up * ate 6t <sub>L</sub> to t 8	=/ , Jsecond ma-#	=/ , Jsecond ma-#
Liquidous Temperature 6TL	17=/ ,	?13/ ,
Time 6t <sub>L</sub> + aintained Abo&e 6TL	50 : 1 (0 seconds	50 : 1 (0 seconds
ea" ;ody ac"age Temperature	?=( / , L0/ , J.( / ,	?50/ , L0/ , J.( / ,
Time 6t 8 within ( / , of ?50/ ,	?0 seconds	=0 seconds
* amp.down * ate 6T to TL	5/ , Jsecond ma-	5/ , Jsecond ma-
Time ?( / , to ea" Temperature	5 minutes ma-#	7 minutes ma-#



## LSOP4, DC Input, Photo Transistor Coupler

### DISC#AIME )

LAG ' T4A4G is continually improving the quality, reliability, function and design. LAG ' T4A4G reserves the right to make changes without further notices.

The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.

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Please contact LAG ' T4A4G sales agent for special application request.

Immersion unit's body in solder paste is not recommended.

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Discoloration might be occurred on the package surface after soldering, reflow or long time use. It neither impacts the performance nor reliability.