## De$cri%tion

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 LSO ! pac"age#

$ ith the robust coplanar double mold structure‰ TD101X series pro&ide the most stable isolation feature#

## Feat&re$

' igh isolation（000）* +S

, T* fle-ibility a&ailable see order information

D , input with transistor output

Operating temperature range . (( / , to 110 / ,

* o ' S 0 * 1A , ' , ompliance

+ SL class 1

* egulatory Appro&als

2L . 2L1(33

) D1 . 1 4503!3. (. ⑥) D1077!. (⑧

, 9 ,  : G ; !<!=#1‰ G ; 77<7

## A%%lication$

- Switch mode power supplies
- rogrammable controllers
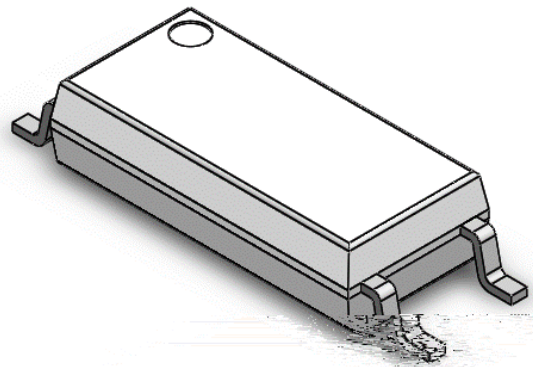- ' ousehold appliances
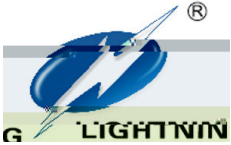- Office e>uipment

## SCHEMATIC
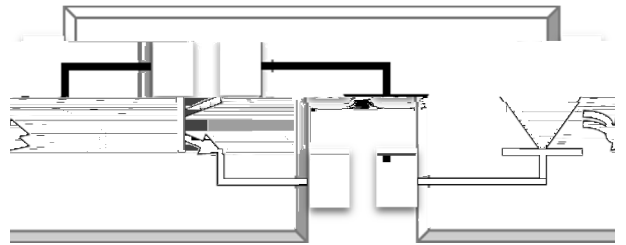


## PIN DEFINITION

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

## PAC  A ! E O " T#INE

| A'SO#"TE MA(IM"M)ATIN!S | | | | |
|---|---|---|---|---|
| A*A+1T1* | S@+;OL | )AL21 | 24AT | 4OT1 |
| A4 2T | | | | |
| Borward ,urrent | $A_B$ | 50 | mA | |
| ea" Borward ,urrent | $A_B$ | 1 | A | 1 |
| *e&erse )oltage | )* | 5 | ) | |
| Anput ower Dissipation | A | 100 | m$ | |
| O2T 2T | | | | |
| ,ollector . 1mitter )oltage | ),1O | 70 | ) | |
| 1mitter . ,ollector )oltage | )1,O | 3 | ) | |
| ,ollector ,urrent | A, | (0 | mA | |
| Output ower Dissipation | O | 1(0 | m$ | |
| ,O++O4 | | | | |
| Total ower Dissipation | tot | ?(0 | m$ | |
| Asolation )oltage | )iso | (000 | )rms | ? |
| Operating Temperature | Topr | .((C110 | /, | |
| Storage Temperature | Tstg | .((C1?( | /, | |
| Soldering Temperature | Tsol | ?50 | /, | |

Note 1. 100μs pulse, 100 !"#e$uenc%

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

| E#ECT ) ICA# OPTICA# CHA ) ACTE ) ISTICS at Ta*2+,C | | | | | | | |
|---|---|---|---|---|---|---|---|
| A*A+1T1* | S@+;OL | +A4# | T@ # | +AX# | 24AT | T1ST , O4DATAO4 | 4OT1 |
| A4 2T | | | | | | | |
| Borward ) oltage | )B | . | 1#!( | 1#5 | ) | ABD(0mA | |
| *e&erse , urrent | A* | . | . | 10 | EA | ) *D5 ) | |
| Anput , apacitance | , in | . | =0 | ?(0 | pB | )D0% fD1" ' F | |
| O2T 2T | | | | | | | |
| , ollector Dar" , urrent | A,1O | . | . | 100 | nA | ) ,1D?0 ) % ABD0 | |
| , ollector.1mitter ; rea"down ) oltage | ;),1O | 70 | . | . | ) | A,D0#1mA% ABD0 | |
| 1mitter., ollector ; rea"down ) oltage | ;)1,O | 3 | . | . | ) | A1D0#1mA% ABD0 | |
| T*A4SB1* ,'A*A,T1*ASTA,S | | | | | | | |
| , urrent Transfer *atio | TD1010 | =00 | . | 500 | G | ABD(mA% ) ,1D( ) | |
| | TD101( | (0 | . | 1(0 | | | |
| | TD1015 | 100 | . | =00 | | | |
| | TD1013 | 70 | . | 150 | | | |
| | TD1017 | 1=0 | . | ?50 | | | |
| | TD101< | ?00 | . | !00 | | | |
| | TD1011 | 50 | . | =00 | | ABD10mA% ) ,1D( ) | |
| | TD101? | 5= | . | 1?( | | | |
| | TD101= | 100 | . | ?00 | | | |
| | TD101! | 150 | . | =?0 | | | |
| | TD101? | ?? | . | . | | ABD1mA% ) ,1D( ) | |
| | TD101= | =! | . | . | | | |
| | TD101! | (5 | . | . | | | |
| ,T* | | | | | | | |
| , ollector.1mitter Saturation ) oltage | ) ,16sat8 | . | 0#1 | 0#= | ) | ABD10mA% A,D1mA | |
| Asolation *esistance | *ASO | 10H1? | 10H1! | . | I | D , (00 ) % !0 C 50G *#'# | |
| Bloating , apacitance | , AO | . | 0#! | 1 | pB | )D0% fD1+ ' F | |
| , ut.off Bre>uency | Bc | . | 70 | . | " ' F | ) ,1D? ) % A,D?mA *∟D100 I %.=d ; | = |
| *esponse Time 6*ise8 | Tr | . | ( | 17 | Es | ) ,1D? ) % A,D?mA | ! |
| *esponse Time 6Ball8 | Tf | . | 5 | 17 | Es | *∟D100 I | ! |

Note /. ')0.12 11/

Note +. ')0.1+

PNP Collector Current

**0$**. Collector3emitter **-**olta.e
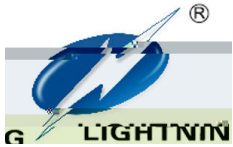
## CHA)ACTE)ISTIC C")-ES

### Fi..5 Normali6ed C&rrent Tran$7er )atio
### 0$. For /ard C&rrent

V_CE=0.4V    V_CE=5V

Normalized to $I_F$=5mA
$T_A$=25°C

$I_F$ (mA)

### Fi..8 Normali6ed C&rrent Tran$7er )atio
### 0$. Am1ient Tem%erat&re

Normalized CTR

V_CE=5V

V_CE=0.4V

$I_F$=5mA
Normalized to $T_A$=25°C

$T_A$ (°C)

### Fi..9 Collector3emitter Sat&ration -olta.e
### 0$. Am1ient Tem%erat&re

$V_{CESAT}$ (V)

$I_F$=5mA, $I_C$=1mA    $I_F$=10mA, $I_C$=1mA    $I_F$=20mA, $I_C$=1mA

$T_A$ (°C)

### Fi..1: S/itchin. Time
### 0$. #oad )e$i$tance

$I_C$=2mA
$V_{CE}$=2V
$T_A$=25°C

Response Time (μs)

ton
toff
tf
tr

Load Resistance (kΩ)

### Fi..11 Fre;&enc< )e$%on$e

100Ω
1kΩ
10kΩ

Av (dB)

$I_C$=2mA
$V_{CE}$=2V
$T_A$=25°C

f (kHz)
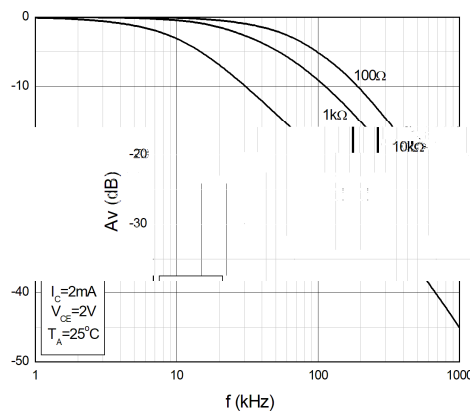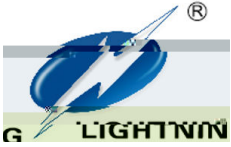
# TEST CIRCUITS

## Fig.12 Test Circuits of Response Time
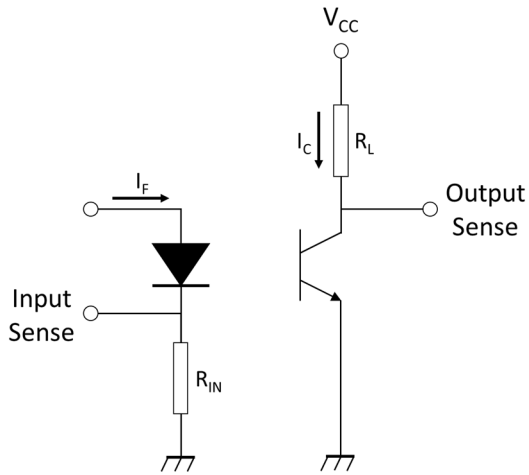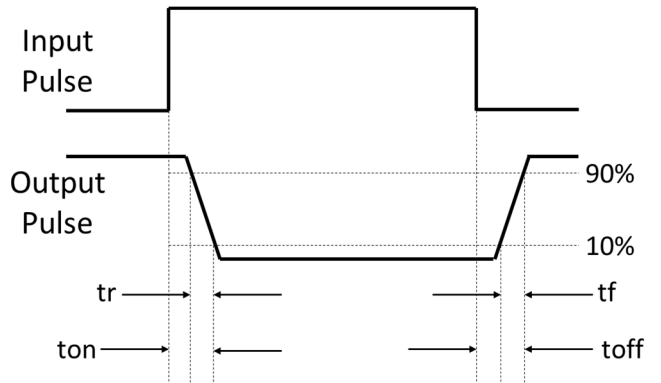
$V_{CC}$

$I_C$  $R_L$

$I_F$

Output Sense

Input Sense

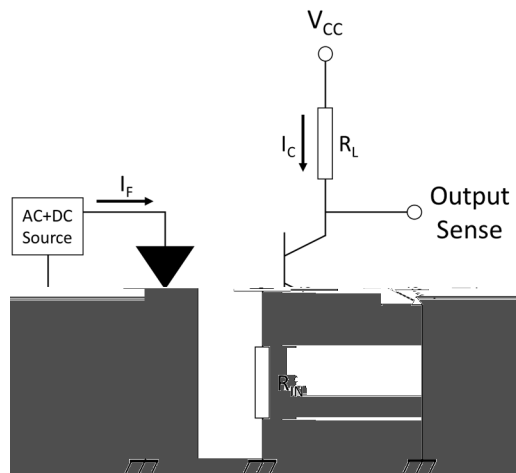$R_{IN}$

## Fig.13 Curves of Response Time

Input Pulse

Output Pulse

90%

10%

tr

tf

ton

toff

## Fig.14 Test Circuits of Frequency Response

$V_{CC}$

$I_C$  $R_L$

$I_F$

Output Sense

AC+DC Source

$R_{IN}$

**PAC A!E DIMENSIONS** Dimen$ion$ in mm &nle$$ other / i$e $tated=

3.60±0.20

7.60±0.20

8.50±0.30

2.00±0.10

Typ.0.20

Typ.2.10

Typ.0.10

Typ.0.40

Typ.0.50

Typ.2.54

0

10.20±0.3

**)ECOMMENDED SO#DE) MAS** Dimen$ion$ in mm &nle$$ other / i$e $tated=

1.10

0.90

3.44

10.60

---
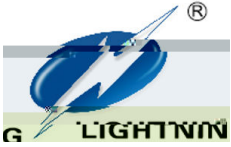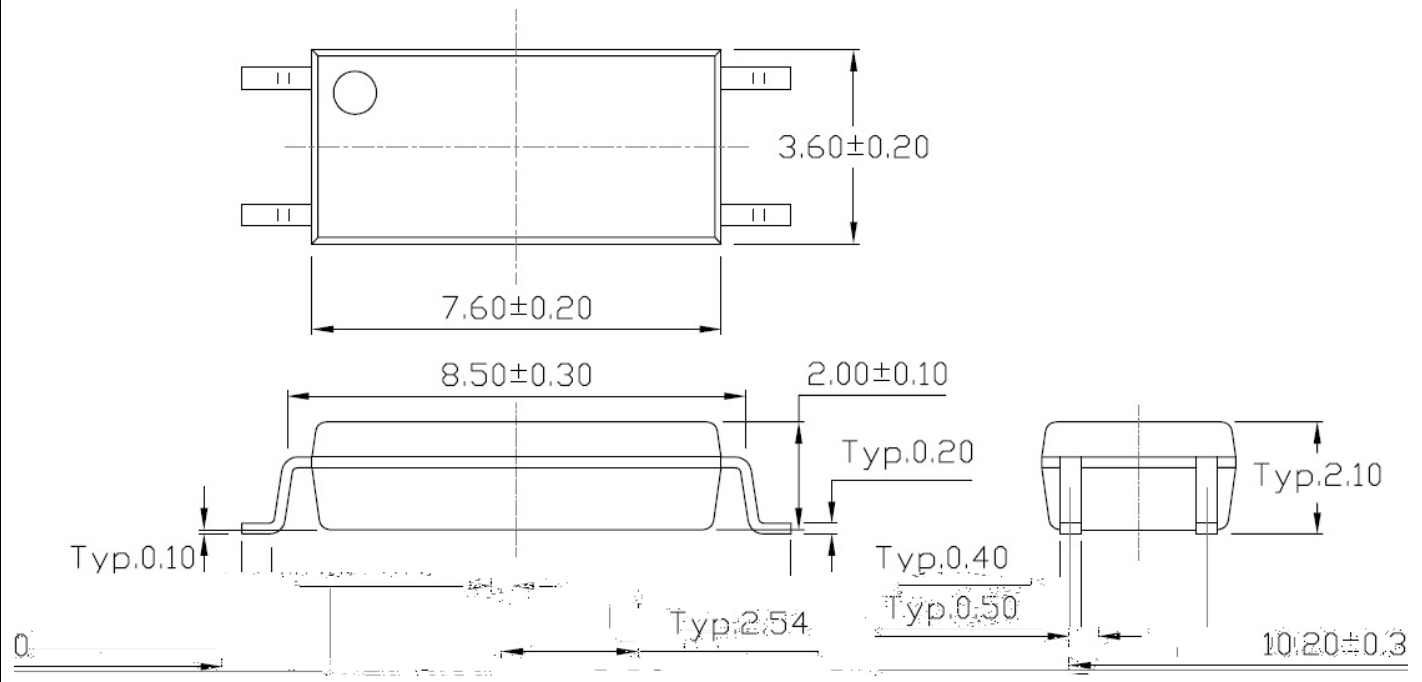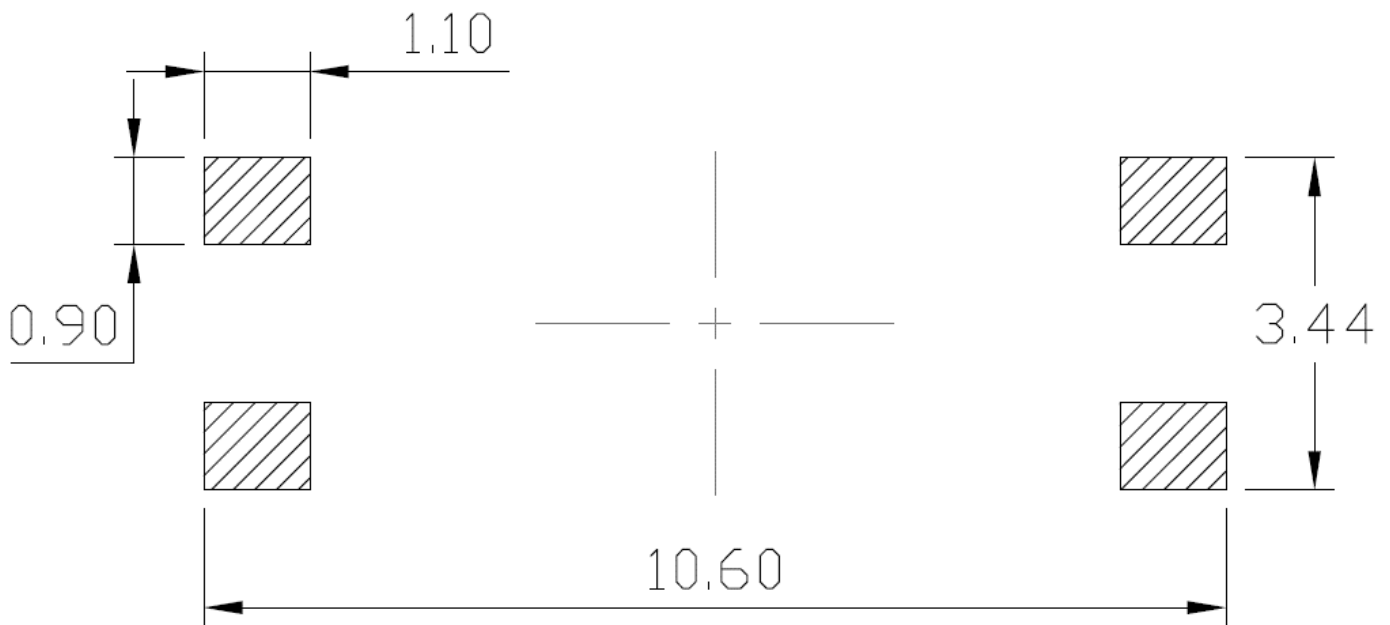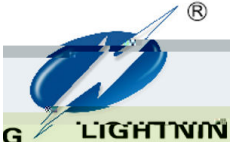
**CA))IE) TAPE SPECIFICATIONS** Dimen$ion$ in mm &nle$$ other / i$e $tated=

### O%tion T1



### O%tion T2

**) EE# SPECIFICATIONS**  Dimen$ion$ in mm &nle$$ other **/** i$e $tated=
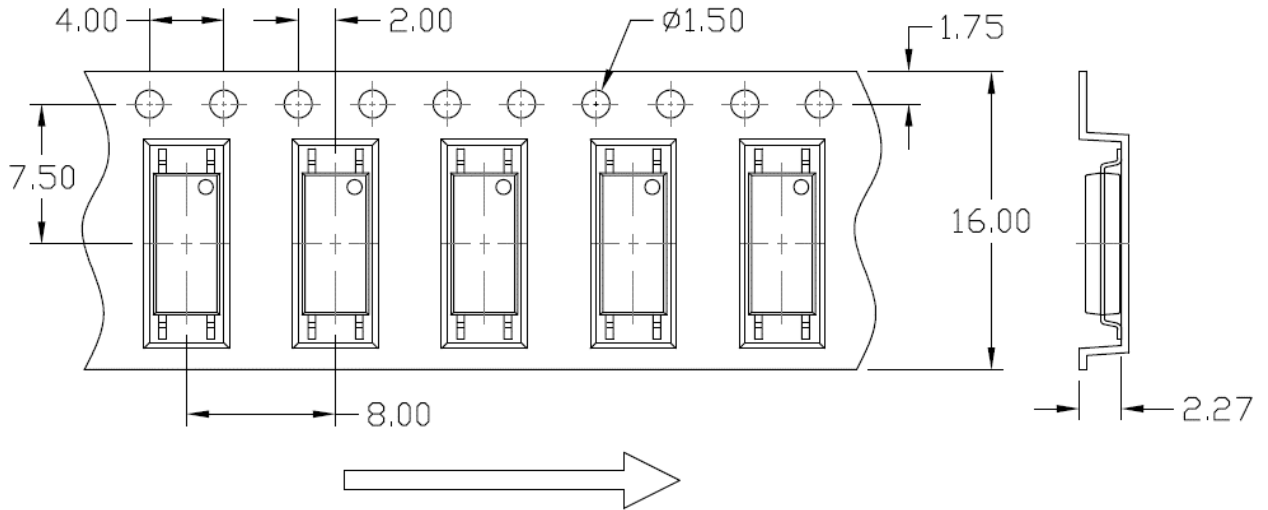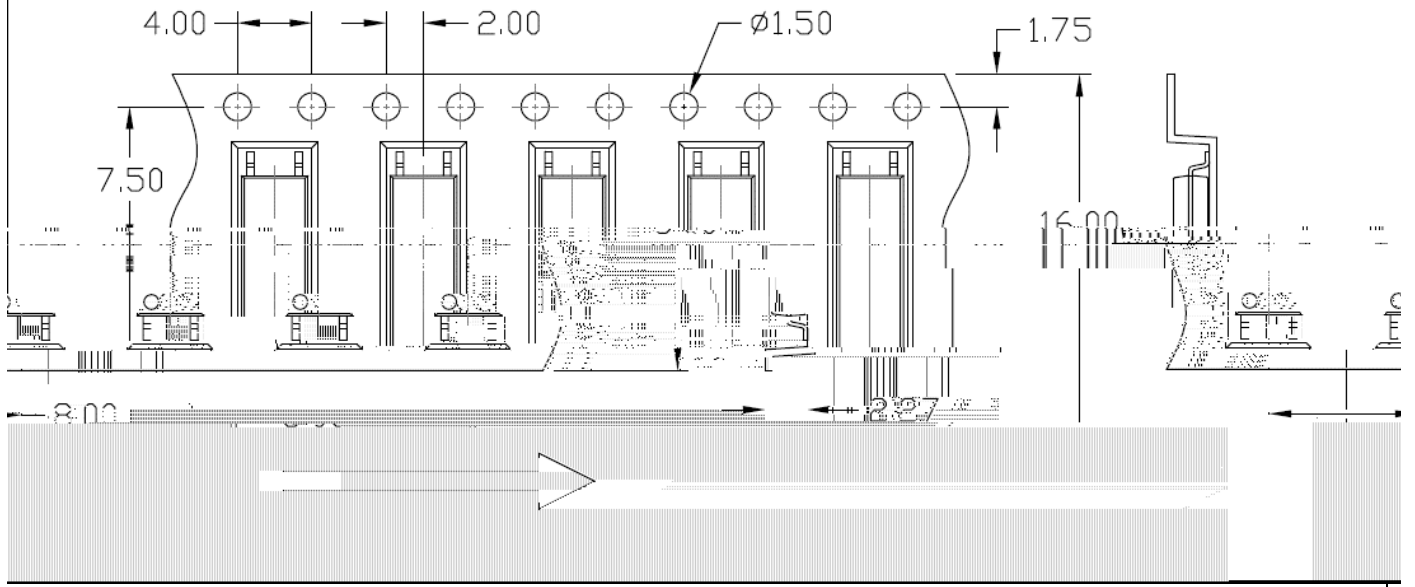
O%tion T1 **>** T2



330.00

φ13.20

100.0

16.5

20.3

**'O( SPECIFICATIONS )eel T<%e=**

Inner **'o?**

2 3 W 3    * / –cm 3 / –cm 3 –.9cm

| O)DE)IN! AND MA) IN! INFO)MATION |
|---|
| MA) IN! INFO)MATION |



TD  @ Com%an< A11r.
1:1(  @ Part N&m1er > )an2
-  @ -DE O%tion
A  @ Fi$cal Aear
A  @ Man&7act&rin. Code
BB  @ Bor2 Bee2

| O)DE)IN! INFO)MATION | #A'E# INFO)MATION |
|---|---|
| TD1:1(CD=3!- | |
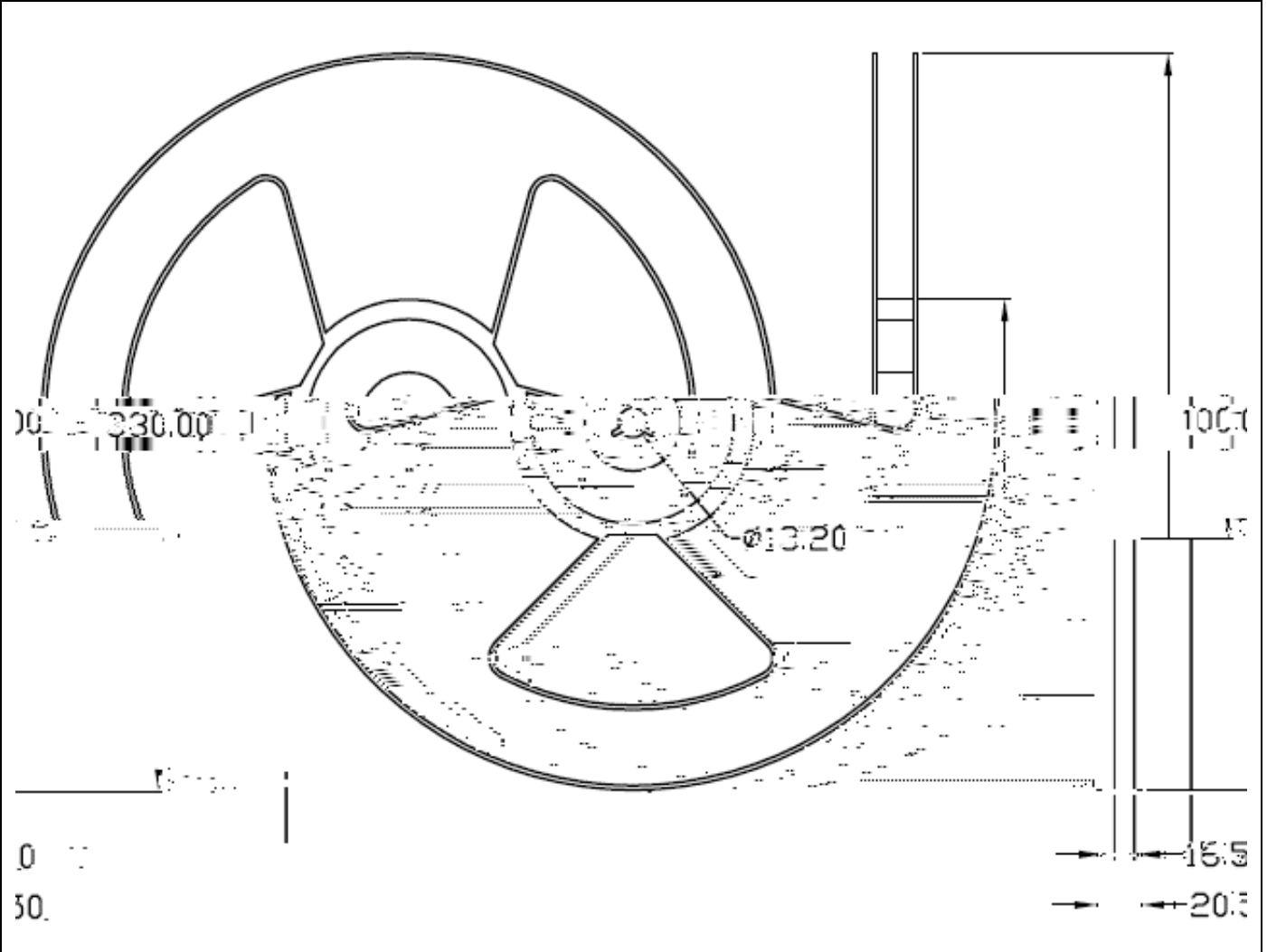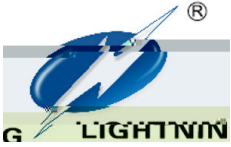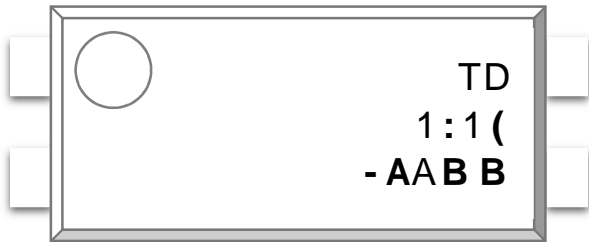
TD : ,ompany Abbr#

101X : *an" 6OJ1J?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.
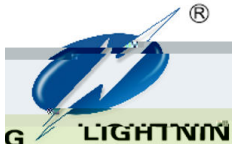Part No : XXXXXXXXXXXXX    Bin Code : X
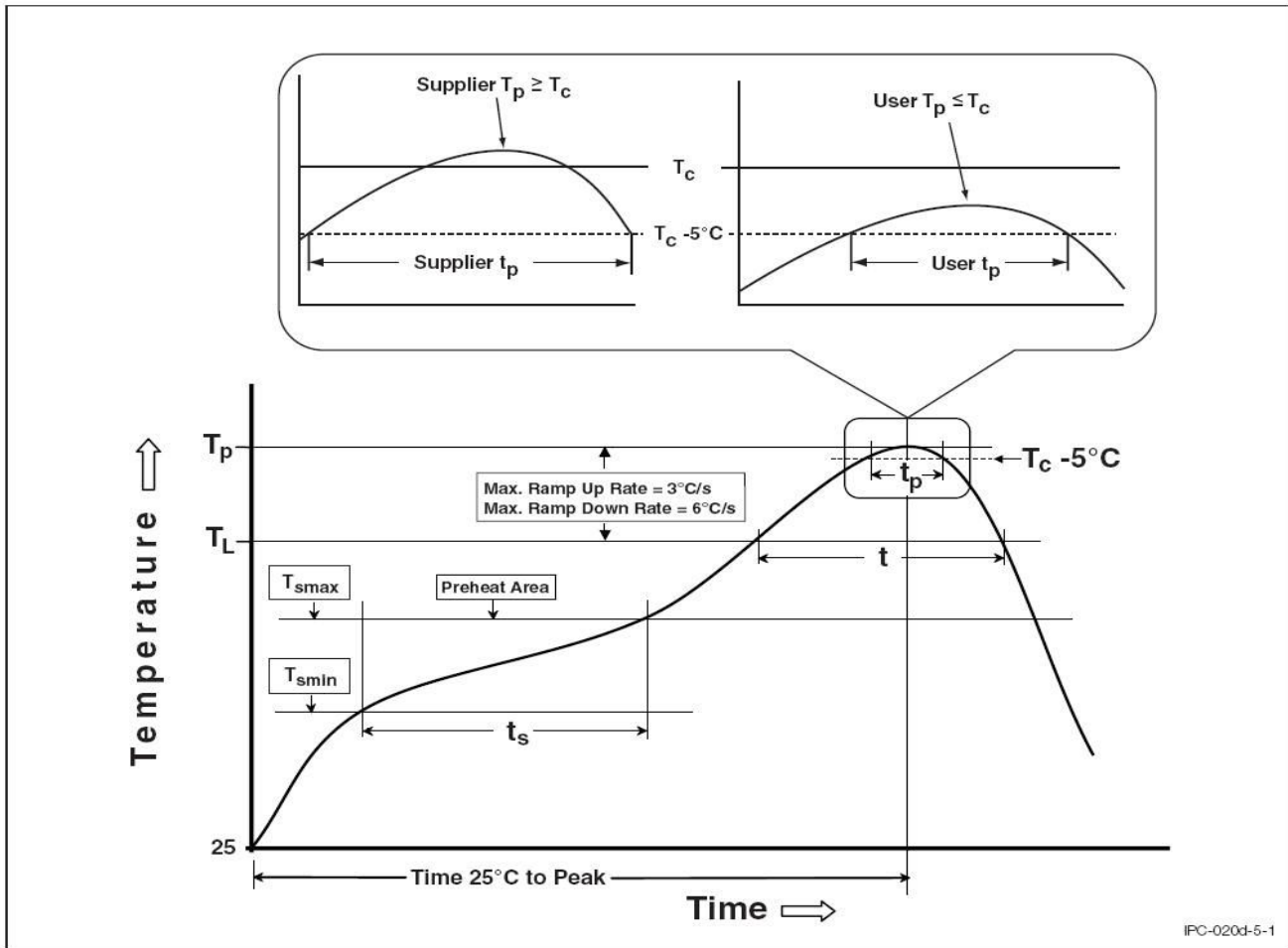Lot No : XXXXXXXXXX
Date Code : XXXX
Q'ty : XXXX pcs

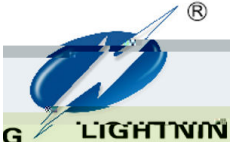| PAC IN! E"ANTITA | | | |
|---|---|---|---|
| O%tion | E&antit< | E&antit< F Inner 1o? | E&antit< F O&ter 1o? |
| T1 | =000 2nitsJ*eel | =*eelsJAnner bo- | (Anner bo-JOuter bo- D!(" 2nits |
| T? | =000 2nitsJ*eel | =*eelsJAnner bo- | (Anner bo-JOuter bo- D!(" 2nits |

## REFLOW INFORMATION
### REFLOW PROFILE



| Profile Feature | SnPb Assembly Profile | Pb-Free Assembly Profile |
|---|---|---|
| Temperature Min (Tsmin) | 100 | 150 |
| Temperature Max (Tsmax) | 150 | 200 |
| Time (ts) from (Tsmin to Tsmax) | 60-120 seconds | 60-120 seconds |
| Ramp-up Rate (tL to tp) | 3°C/second max | 3°C/second max |
| Liquidous Temperature (TL) | 183 | 217 |
| Time (tL) Maintained Above (TL) | 60 : 150 seconds | 60 : 150 seconds |
| Peak/body Package Temperature | 225+0/-5 | 250+0/-5 |
| Time (tp) within 5°C of 250 | 20 seconds | 30 seconds |
| Ramp-down Rate (Tp to TL) | 6°C/second max | 6°C/second max |
| Time 25°C to Peak Temperature | 5 minutes max | 7 minutes max |

**DISC#AIME )**

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ᴬmmerge unitⱡs body in solder paste is not recommended#

  arameters pro&ided in datasheets may &ary in different applications and performance may &ary o&er time# All operating parameters‰ including typical parameters‰ must be &alidated in each customer application by the customerⱡs technical e-perts#   roduct specifications do not e-pand or otherwise modify LᴬG ' T4ᴬ4Gⱡs terms and conditions of purchase‰ including but not limited to the warranty e-pressed therein#

Discoloration might be occurred on the pac"age surface after soldering‰ reflow or long.time use# ᴬt neither impacts the performance nor reliability#