

### Description

The 6N137, TD2601, TD2611 series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon high speed integrated photo-detector logic gate with a strobable output in a plastic DIP8 package with different lead forming options.

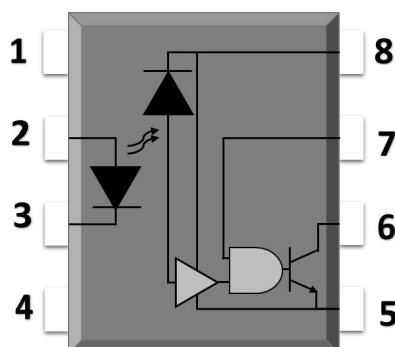
### Features

- High isolation 5000 VRMS
  - DC input with logic gate output
  - Operating temperature range - 55 °C to 100 °C
  - REACH compliance
  - Halogen free (Optional)
  - MSL class 1
  - Regulatory Approvals (Pending Approved)
    - UL - UL1577
    - VDE - EN60747-5-5(VDE0884-5)
    - CQC - GB4943.1, GB8898
    - cUL- CSA Component Acceptance
- Service Notice No. 5A

### Applications

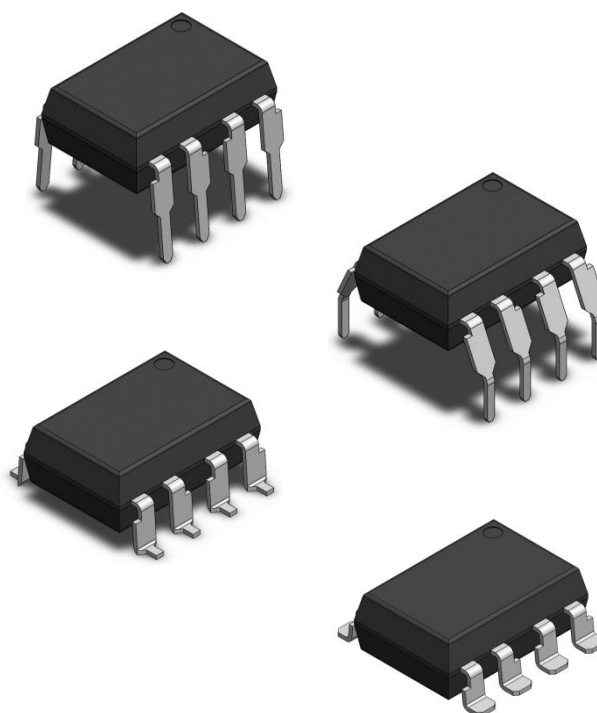
- Ground loop elimination
- LSTTL to TTL, LSTTL or CMOS
- Line receiver, data transmission
- Data multiplexing
- Switching power supply
- Pulse transformer replacement
- Computer-peripheral interface

### SCHEMATIC



### PIN DEFINITION

|           |       |
|-----------|-------|
| 1.NC      | 8.VCC |
| 2.Anode   | 7.VE  |
| 3.Cathode | 6.VO  |
| 4.NC      | 5.GND |





# 6N137,TD2601,TD2611 Series

## DIP8, 10Mbit/s High Speed Logic Gate Photo Coupler

### ABSOLUTE MAXIMUM RATINGS

| PARAMETER                | SYMBOL         | VALUE   | UNIT             | Note |
|--------------------------|----------------|---------|------------------|------|
| INPUT                    |                |         |                  |      |
| Forward Current          | $I_F$          | 25      | mA               |      |
| Peak Forward Current     | $I_{FP}$       | 50      | mA               | 1    |
| Peak Transient Current   | $I_{F(trans)}$ | 1       | A                | 2    |
| Reverse Voltage          | $V_R$          | 5       | V                |      |
| Enable Voltage           | $V_E$          | VCC+0.5 | V                |      |
| Input Power Dissipation  | $P_I$          | 100     | mW               |      |
| OUTPUT                   |                |         |                  |      |
| Supply Voltage           | $V_{CC}$       | 7       | V                |      |
| Output Voltage           | $V_O$          | 7       | V                |      |
| Output Current           | $I_O$          | 50      | mA               |      |
| Output Power Dissipation | $P_O$          | 85      | mW               |      |
| COMMON                   |                |         |                  |      |
| Total Power Dissipation  | $P_{tot}$      | 200     | mW               |      |
| Isolation Voltage        | $V_{iso}$      | 5000    | V <sub>rms</sub> | 3    |
| Operating Temperature    | $T_{opr}$      | -55~100 | °C               |      |
| Storage Temperature      | $T_{stg}$      | -55~125 | °C               |      |
| Soldering Temperature    | $T_{sol}$      | 260     | °C               | 4    |

Note 1. 50% duty, 1ms P.W

Note 2.  $\leq 1\mu s$  P.W, 300pps

Note 3. AC For 1 Minute, R.H. = 40 ~ 60%

Note 4. For 10 seconds



### RECOMMENDED OPERATION CONDITIONS

| PARAMETER                       | SYMBOL | MIN. | MAX. | UNIT      |
|---------------------------------|--------|------|------|-----------|
| Operating Temperature           | TA     | -40  | 100  | °C        |
| Supply Voltage                  | VCC    | 2.7  | 3.6  | V         |
|                                 | VCC    | 4.5  | 5.5  | V         |
| Low Level Input Current         | IFL    | 0    | 250  | μA        |
| High Level Input Current        | IFH    | 5    | 15   | mA        |
| Low Level Enable Voltage        | VEL    | 0    | 0.8  | V         |
| High Level Enable Voltage       | VEH    | 2    | VCC  | V         |
| Output Pull-up Resistor         | RL     | 330  | 4k   | Ω         |
| Fan Out (at RL=1kΩ per channel) | N      | -    | 5    | TTL Loads |

### ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C

| PARAMETER                                 | SYMBOL            | MIN.             | TYP.             | MAX. | UNIT | TEST CONDITION                                                                           | NOTE |
|-------------------------------------------|-------------------|------------------|------------------|------|------|------------------------------------------------------------------------------------------|------|
| INPUT                                     |                   |                  |                  |      |      |                                                                                          |      |
| Forward Voltage                           | V <sub>F</sub>    | -                | 1.38             | 1.8  | V    | I <sub>F</sub> =10mA                                                                     |      |
| Reverse Current                           | I <sub>R</sub>    | -                | -                | 10   | μA   | V <sub>R</sub> =5V                                                                       |      |
| Input Capacitance                         | C <sub>in</sub>   | -                | 13               | -    | pF   | V=0, f=1MHz                                                                              |      |
| OUTPUT                                    |                   |                  |                  |      |      |                                                                                          |      |
| High Level Supply Current                 | I <sub>CC</sub> H | -                | 6.3              | 10   | mA   | I <sub>F</sub> =0mA, V <sub>E</sub> =0.5V, V <sub>CC</sub> =5.5V                         |      |
| Low Level Supply Current                  | I <sub>CC</sub> L | -                | 8.3              | 13   | mA   | I <sub>F</sub> =10mA, V <sub>CC</sub> =5.5V                                              |      |
| High Level Enable Current                 | I <sub>EH</sub>   | -                | -0.52            | -1.6 | mA   | V <sub>E</sub> =2.0V, V <sub>CC</sub> =5.5V                                              |      |
| Low Level Enable Current                  | I <sub>EL</sub>   | -                | -0.75            | -1.6 | mA   | V <sub>E</sub> =0.5V, V <sub>CC</sub> =5.5V                                              |      |
| High Level Enable Voltage                 | V <sub>EH</sub>   | 2.0              | -                | -    | V    | I <sub>F</sub> =10mA, V <sub>CC</sub> =5.5V                                              |      |
| Low Level Enable Voltage                  | V <sub>EL</sub>   | -                | -                | 0.8  | V    | I <sub>F</sub> =10mA, V <sub>CC</sub> =5.5V                                              |      |
| TRANSFER CHARACTERISTICS (Ta=-40 to 85°C) |                   |                  |                  |      |      |                                                                                          |      |
| High Level Output Current                 | I <sub>OH</sub>   | -                | 0.73             | 100  | μA   | V <sub>CC</sub> =5.5V, V <sub>O</sub> =5.5V, I <sub>F</sub> =250μA, V <sub>E</sub> =2.0V |      |
| Low Level Output Voltage                  | V <sub>OL</sub>   | -                | 0.28             | 0.6  | V    | V <sub>CC</sub> =5.5V, I <sub>F</sub> =5mA, V <sub>E</sub> =2.0V, I <sub>CL</sub> =13mA  |      |
| Input Threshold Current                   | I <sub>FT</sub>   | -                | 2.5              | 5    | mA   | V <sub>CC</sub> =5.5V, V <sub>O</sub> =0.6V, V <sub>E</sub> =2.0V, I <sub>OL</sub> =13mA |      |
| Isolation Resistance                      | R <sub>iso</sub>  | 10 <sup>12</sup> | 10 <sup>14</sup> | -    | Ω    | DC500V, 40 ~ 60% R.H.                                                                    |      |
| Floating Capacitance                      | C <sub>io</sub>   | -                | 1.0              | -    | pF   | V=0, f=1MHz                                                                              |      |



### ELECTRICAL OPTICAL CHARACTERISTICS

| PARAMETER                                                                                                         |        | SYMBOL    | MIN.  | TYP. | MAX. | UNIT | TEST CONDITION                                                                                            | NOTE |
|-------------------------------------------------------------------------------------------------------------------|--------|-----------|-------|------|------|------|-----------------------------------------------------------------------------------------------------------|------|
| SWITCHING CHARACTERISTICS (Ta=-40 to 85°C, V <sub>CC</sub> =5V, I <sub>F</sub> =7.5mA unless specified otherwise) |        |           |       |      |      |      |                                                                                                           |      |
| Propagation Delay Time to Output Low Level                                                                        |        | TPHL      | -     | 35   | 75   | ns   | C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω, Ta=25°C                                                       |      |
| Propagation Delay Time to Output High Level                                                                       |        | TPLH      | -     | 40   | 75   | ns   | C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω, Ta=25°C                                                       |      |
| Pulse Width Distortion                                                                                            |        | TPHL-TPLH | -     | 5    | 35   | ns   | C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω                                                                |      |
| Rise Time                                                                                                         |        | tr        | -     | 27   | -    | ns   | C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω                                                                |      |
| Fall Time                                                                                                         |        | tf        | -     | 7    | -    | ns   | C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω                                                                |      |
| Enable Propagation Delay Time to Output Low Level                                                                 |        | TEHL      | -     | 15   | -    | ns   | I <sub>F</sub> =7.5mA, V <sub>EH</sub> =3.5V, C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω                  |      |
| Enable Propagation Delay Time to Output High Level                                                                |        | TELH      | -     | 15   | -    | ns   | I <sub>F</sub> =7.5mA, V <sub>EH</sub> =3.5V, C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω                  |      |
| Common Mode Transient Immunity at Logic High                                                                      | 6N137  | CMH       | -     | -    | -    | V/μs | I <sub>F</sub> = 7.5mA , V <sub>OH</sub> =2.0V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =10Vp-p  |      |
|                                                                                                                   | TD2601 |           | 5000  | -    | -    |      | I <sub>F</sub> = 7.5mA , V <sub>OH</sub> =2.0V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =50Vp-p  |      |
|                                                                                                                   | TD2611 |           | 10000 | -    | -    |      | I <sub>F</sub> = 7.5mA , V <sub>OH</sub> =2.0V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =400Vp-p |      |
| Common Mode Transient Immunity at Logic Low                                                                       | 6N137  | CML       | -     | -    | -    | V/μs | I <sub>F</sub> = 0mA , V <sub>OH</sub> =0.8V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =10Vp-p    |      |
|                                                                                                                   | TD2601 |           | 5000  | -    | -    |      | I <sub>F</sub> = 0mA , V <sub>OH</sub> =0.8V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =50Vp-p    |      |
|                                                                                                                   | TD2611 |           | 10000 | -    | -    |      | I <sub>F</sub> = 0mA , V <sub>OH</sub> =0.8V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =400Vp-p   |      |



# 6N137,TD2601,TD2611 Series

## DIP8, 10Mbit/s High Speed Logic Gate Photo Coupler

### ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C

| PARAMETER                                 | SYMBOL           | MIN.             | TYP.             | MAX. | UNIT | TEST CONDITION                                                                           | NOTE |
|-------------------------------------------|------------------|------------------|------------------|------|------|------------------------------------------------------------------------------------------|------|
| INPUT                                     |                  |                  |                  |      |      |                                                                                          |      |
| Forward Voltage                           | V <sub>F</sub>   | -                | 1.38             | 1.8  | V    | I <sub>F</sub> =10mA                                                                     |      |
| Reverse Current                           | I <sub>R</sub>   | -                | -                | 10   | μA   | V <sub>R</sub> =5V                                                                       |      |
| Input Capacitance                         | C <sub>in</sub>  | -                | 13               | -    | pF   | V=0, f=1MHz                                                                              |      |
| OUTPUT                                    |                  |                  |                  |      |      |                                                                                          |      |
| High Level Supply Current                 | I <sub>CCH</sub> | -                | 4.3              | 10   | mA   | I <sub>F</sub> =0mA, V <sub>E</sub> =0.5V, V <sub>CC</sub> =3.3V                         |      |
| Low Level Supply Current                  | I <sub>CCL</sub> | -                | 6.4              | 13   | mA   | I <sub>F</sub> =10mA, V <sub>CC</sub> =3.3V                                              |      |
| High Level Enable Current                 | I <sub>EH</sub>  | -                | -0.21            | -1.6 | mA   | V <sub>E</sub> =2.0V, V <sub>CC</sub> =3.3V                                              |      |
| Low Level Enable Current                  | I <sub>EL</sub>  | -                | -0.42            | -1.6 | mA   | V <sub>E</sub> =0.5V, V <sub>CC</sub> =3.3V                                              |      |
| High Level Enable Voltage                 | V <sub>EH</sub>  | 2.0              | -                | -    | V    | I <sub>F</sub> =10mA, V <sub>CC</sub> =3.3V                                              |      |
| Low Level Enable Voltage                  | V <sub>EL</sub>  | -                | -                | 0.8  | V    | I <sub>F</sub> =10mA, V <sub>CC</sub> =3.3V                                              |      |
| TRANSFER CHARACTERISTICS (Ta=-40 to 85°C) |                  |                  |                  |      |      |                                                                                          |      |
| High Level Output Current                 | I <sub>OH</sub>  | -                | 4.1              | 100  | μA   | V <sub>CC</sub> =3.3V, V <sub>O</sub> =3.3V, I <sub>F</sub> =250μA, V <sub>E</sub> =2.0V |      |
| Low Level Output Voltage                  | V <sub>OL</sub>  | -                | 0.29             | 0.6  | V    | V <sub>CC</sub> =3.3V, I <sub>F</sub> =5mA, V <sub>E</sub> =2.0V, I <sub>CL</sub> =13mA  |      |
| Input Threshold Current                   | I <sub>FT</sub>  | -                | 2.2              | 5    | mA   | V <sub>CC</sub> =3.3V, V <sub>O</sub> =0.6V, V <sub>E</sub> =2.0V, I <sub>OL</sub> =13mA |      |
| Isolation Resistance                      | R <sub>iso</sub> | 10 <sup>12</sup> | 10 <sup>14</sup> | -    | Ω    | DC500V, 40 ~ 60% R.H.                                                                    |      |
| Floating Capacitance                      | C <sub>IO</sub>  | -                | 1.0              | -    | pF   | V=0, f=1MHz                                                                              |      |

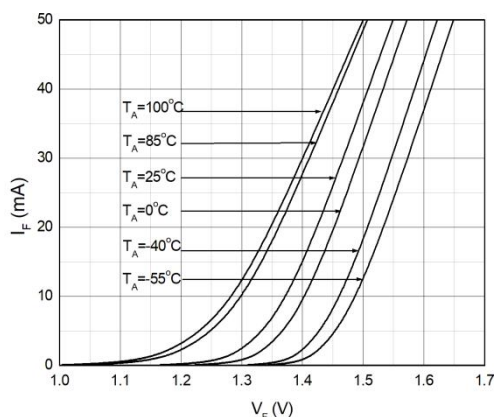


### ELECTRICAL OPTICAL CHARACTERISTICS

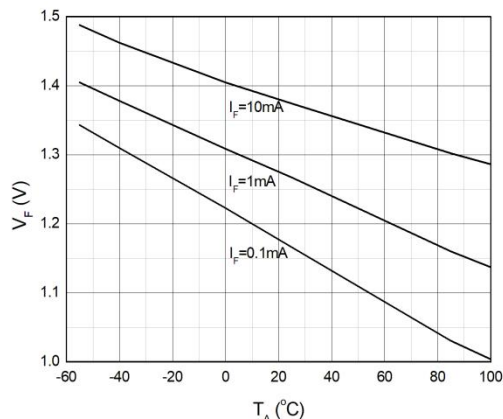
| PARAMETER                                                                                                           |        | SYMBOL    | MIN.  | TYP. | MAX. | UNIT | TEST CONDITION                                                                                            | NOTE |
|---------------------------------------------------------------------------------------------------------------------|--------|-----------|-------|------|------|------|-----------------------------------------------------------------------------------------------------------|------|
| SWITCHING CHARACTERISTICS (Ta=-40 to 85°C, V <sub>CC</sub> =3.3V, I <sub>F</sub> =7.5mA unless specified otherwise) |        |           |       |      |      |      |                                                                                                           |      |
| Propagation Delay Time to Output Low Level                                                                          |        | TPHL      | -     | 35   | 75   | ns   | C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω, Ta=25°C                                                       |      |
| Propagation Delay Time to Output High Level                                                                         |        | TPLH      | -     | 47   | 75   | ns   | C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω, Ta=25°C                                                       |      |
| Pulse Width Distortion                                                                                              |        | TPHL-TPLH | -     | 12   | 35   | ns   | C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω                                                                |      |
| Rise Time                                                                                                           |        | tr        | -     | 30   | -    | ns   | C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω                                                                |      |
| Fall Time                                                                                                           |        | tf        | -     | 8.5  | -    | ns   | C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω                                                                |      |
| Enable Propagation Delay Time to Output Low Level                                                                   |        | TEHL      | -     | 15   | -    | ns   | I <sub>F</sub> =7.5mA, V <sub>EH</sub> =3.3.3V, C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω                |      |
| Enable Propagation Delay Time to Output High Level                                                                  |        | TELH      | -     | 15   | -    | ns   | I <sub>F</sub> =7.5mA, V <sub>EH</sub> =3.3.3V, C <sub>L</sub> =15pF, R <sub>L</sub> =350Ω                |      |
| Common Mode Transient Immunity at Logic High                                                                        | 6N137  | CMH       | -     | -    | -    | V/μs | I <sub>F</sub> = 7.5mA , V <sub>OH</sub> =2.0V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =10Vp-p  |      |
|                                                                                                                     | TD2601 |           | 5000  | -    | -    |      | I <sub>F</sub> = 7.5mA , V <sub>OH</sub> =2.0V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =50Vp-p  |      |
|                                                                                                                     | TD2611 |           | 10000 | -    | -    |      | I <sub>F</sub> = 7.5mA , V <sub>OH</sub> =2.0V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =400Vp-p |      |
| Common Mode Transient Immunity at Logic Low                                                                         | 6N137  | CML       | -     | -    | -    | V/μs | I <sub>F</sub> = 0mA , V <sub>OH</sub> =0.8V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =10Vp-p    |      |
|                                                                                                                     | TD2601 |           | 5000  | -    | -    |      | I <sub>F</sub> = 0mA , V <sub>OH</sub> =0.8V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =50Vp-p    |      |
|                                                                                                                     | TD2611 |           | 10000 | -    | -    |      | I <sub>F</sub> = 0mA , V <sub>OH</sub> =0.8V, R <sub>L</sub> =350Ω, Ta=25°C<br>V <sub>CM</sub> =400Vp-p   |      |

### CHARACTERISTIC CURVES

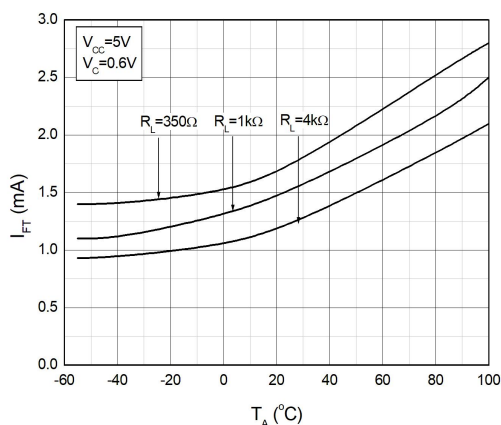
**Fig.1 Forward Current vs. Forward Voltage**



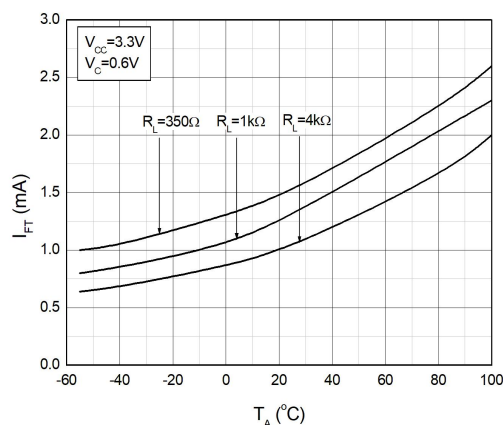
**Fig.2 Forward Voltage vs. Ambient Temperature**



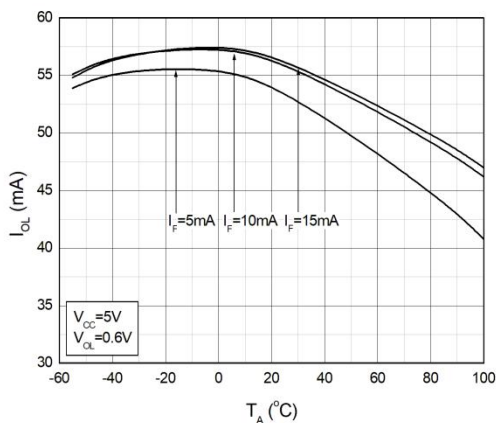
**Fig.3 Input Threshold Current vs. Ambient Temperature**



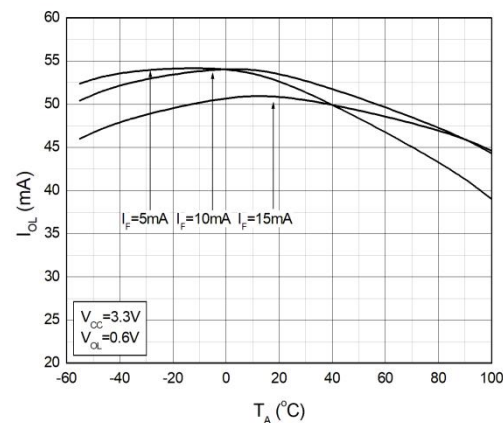
**Fig.4 Input Threshold Current vs. Ambient Temperature**



**Fig.5 Low Level Output Current vs. Ambient Temperature**

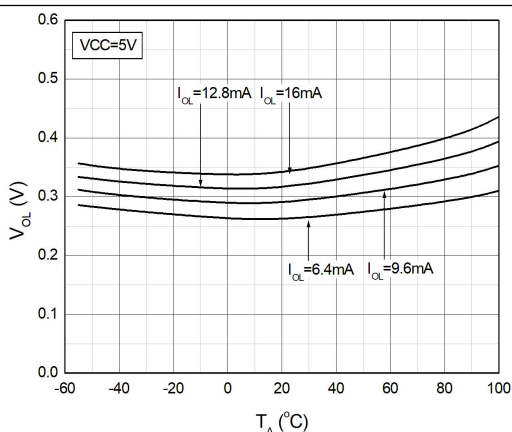


**Fig.6 Low Level Output Current vs. Ambient Temperature**

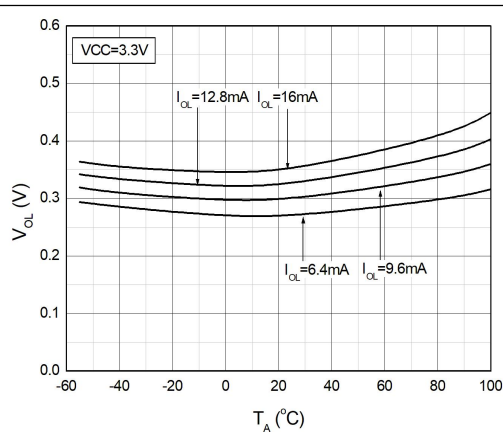


### CHARACTERISTIC CURVES

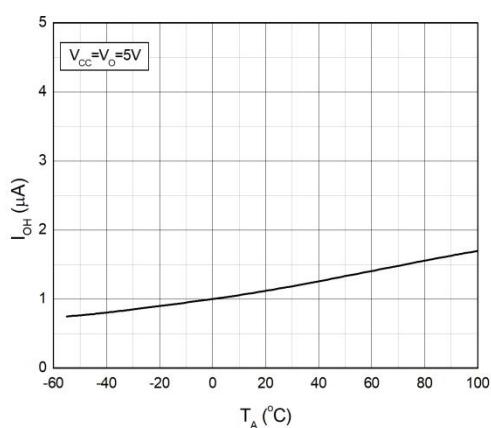
**Fig.7 Low Level Output Voltage vs. Ambient Temperature**



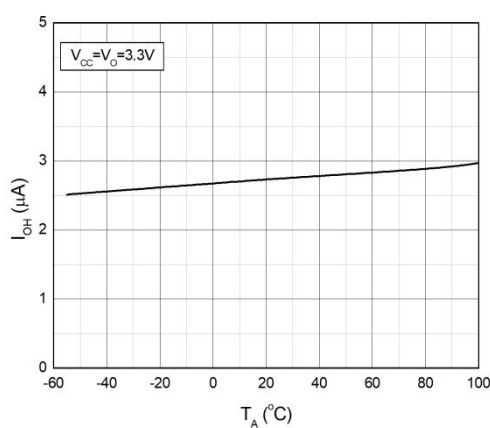
**Fig.8 Low Level Output Voltage vs. Ambient Temperature**



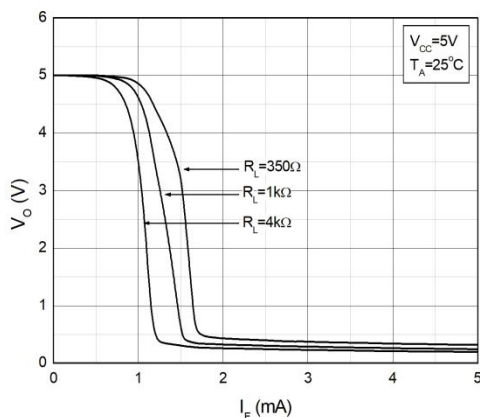
**Fig.9 High Level Output Current vs. Ambient Temperature**



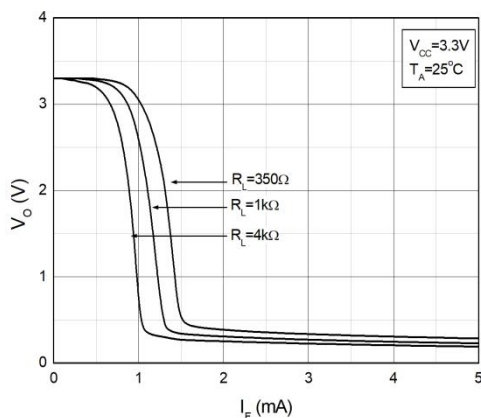
**Fig.10 High Level Output Current vs. Ambient Temperature**



**Fig.11 Output Voltage vs. Forward Current**



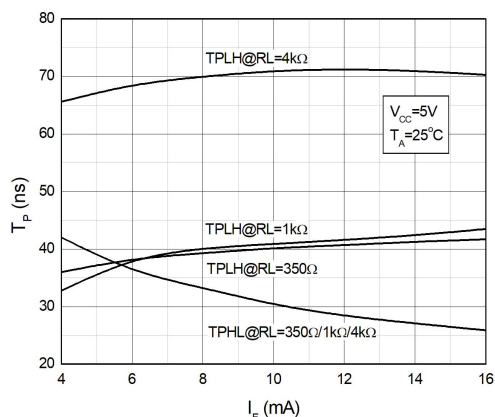
**Fig.12 Output Voltage vs. Forward Current**



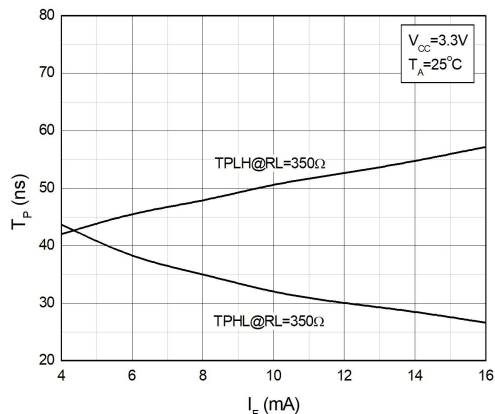


### CHARACTERISTIC CURVES

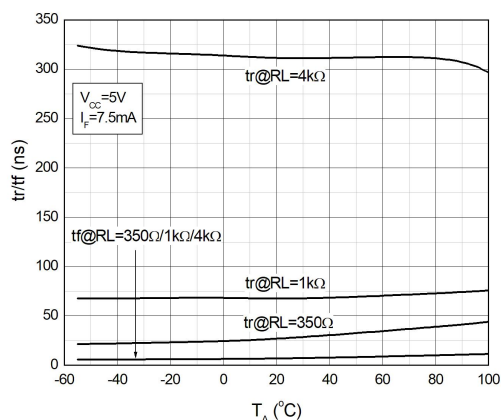
**Fig.13 Propagation Delay vs. Forward Current**



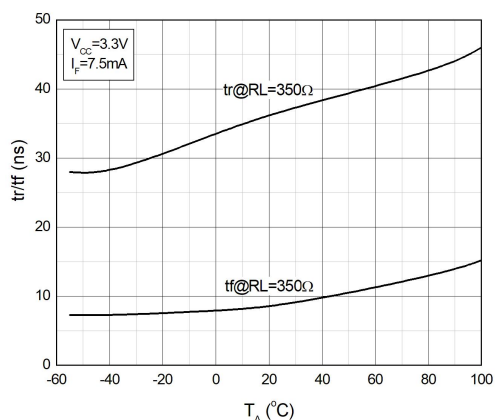
**Fig.14 Propagation Delay vs. Forward Current**



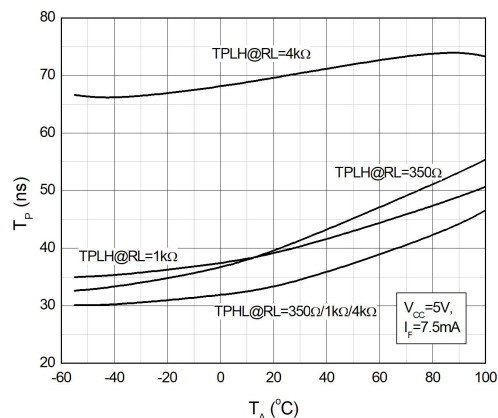
**Fig.15 Rise and Fall Time vs. Ambient Temperature**



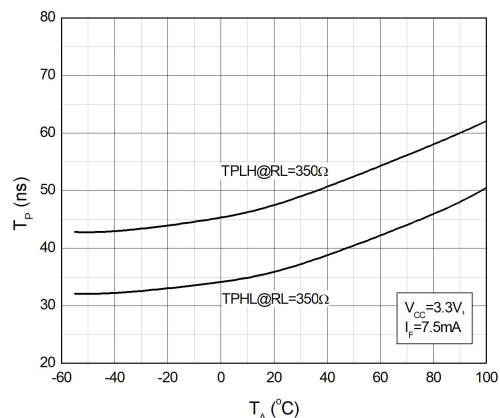
**Fig.16 Rise and Fall Time vs. Ambient Temperature**



**Fig.17 Propagation Delay vs. Ambient Temperature**

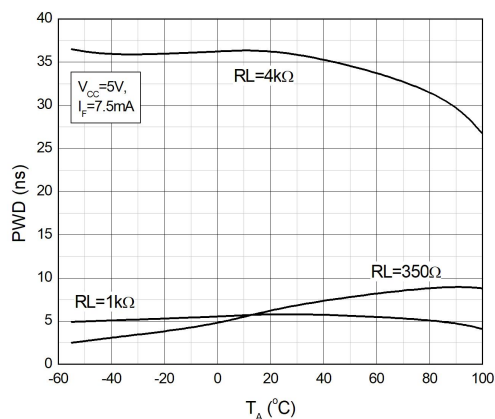


**Fig.18 Propagation Delay vs. Ambient Temperature**

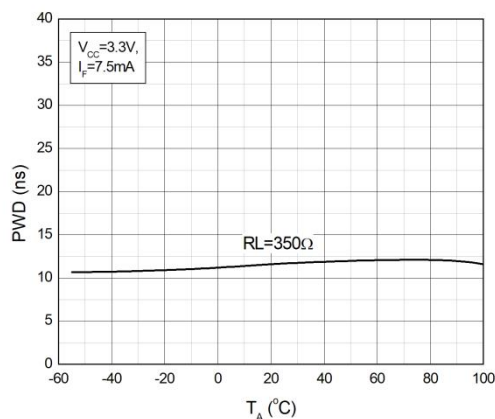


### CHARACTERISTIC CURVES

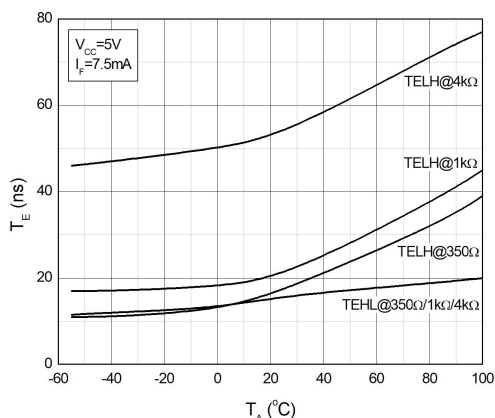
**Fig.19 Pulse Width Distortion vs. Ambient Temperature**



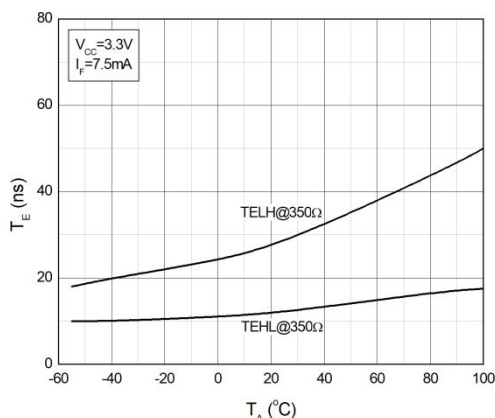
**Fig.20 Pulse Width Distortion vs. Ambient Temperature**



**Fig.21 Enable Propagation Delay vs. Ambient Temperature**

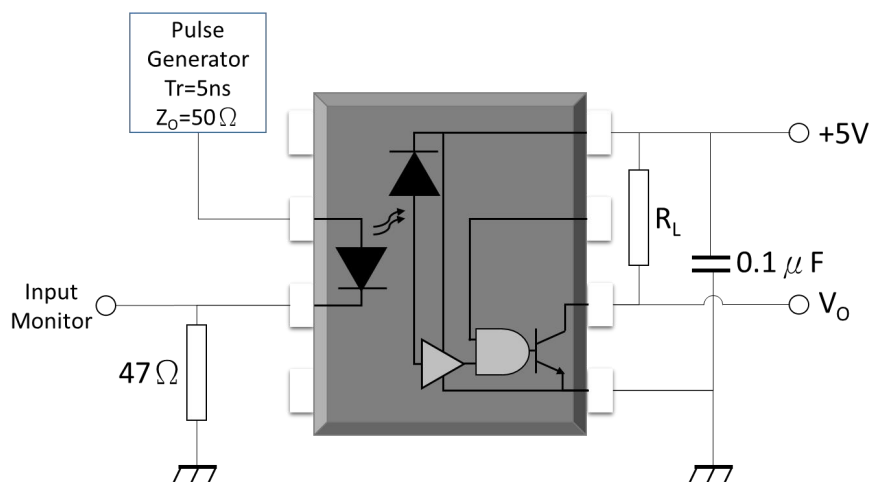


**Fig.22 Enable Propagation Delay vs. Ambient Temperature**

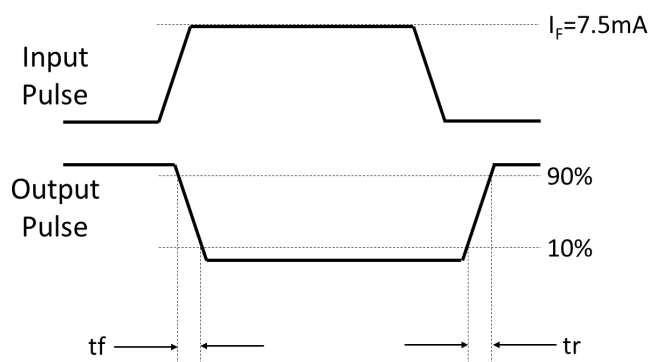
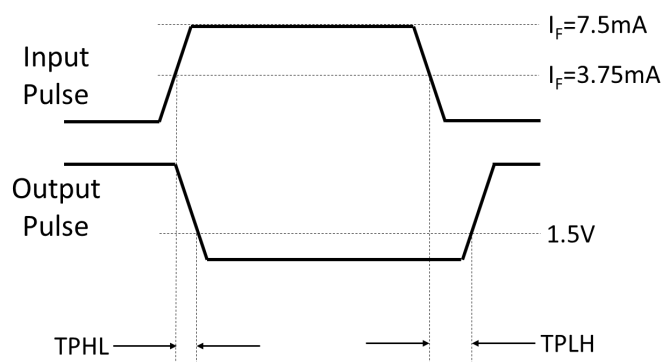


### TEST CIRCUITS

**Fig.23 Test Circuits for TPHL, TPLH, tr, tf**

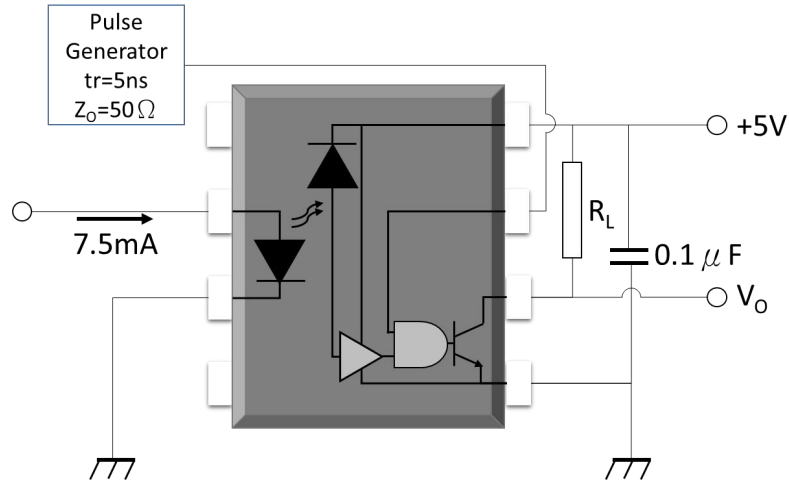


**Fig.24 Waveforms of TPHL, TPLH, tr, tf**

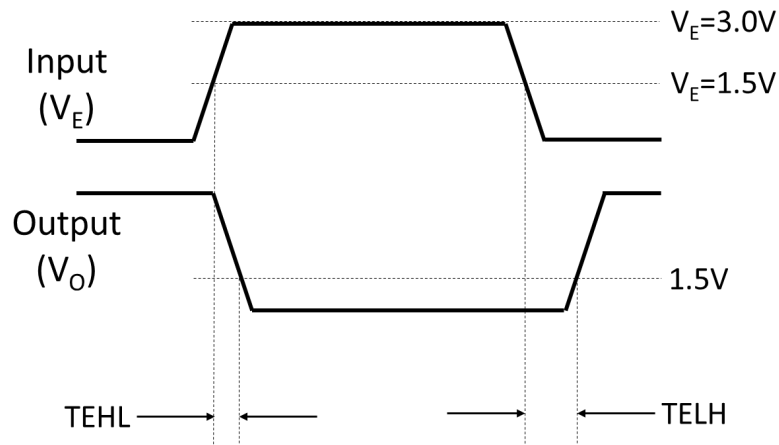


## TEST CIRCUITS

**Fig.25 Test Circuits for TEHL, TELH**

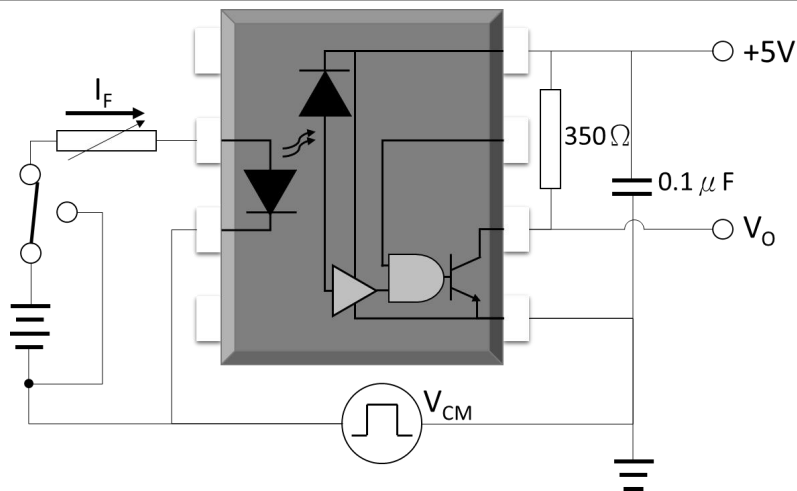


**Fig.26 Waveforms of TEHL, TELH**

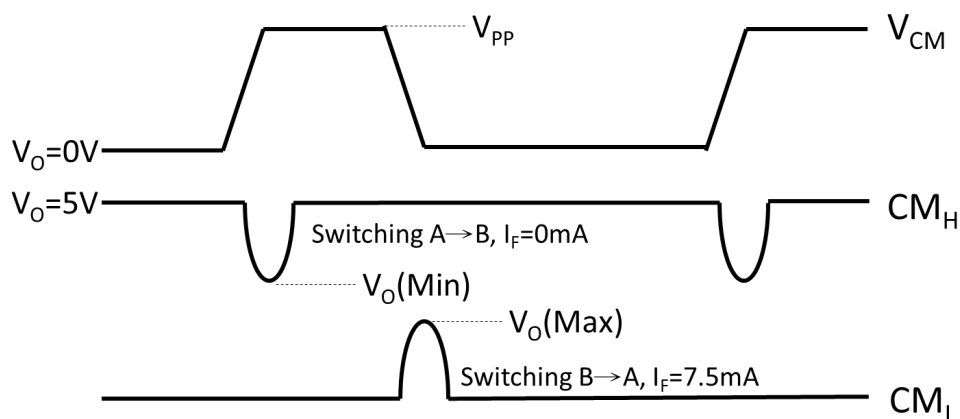


### TEST CIRCUITS

**Fig.25 Test Circuits for Common Mode Transient Immunity**

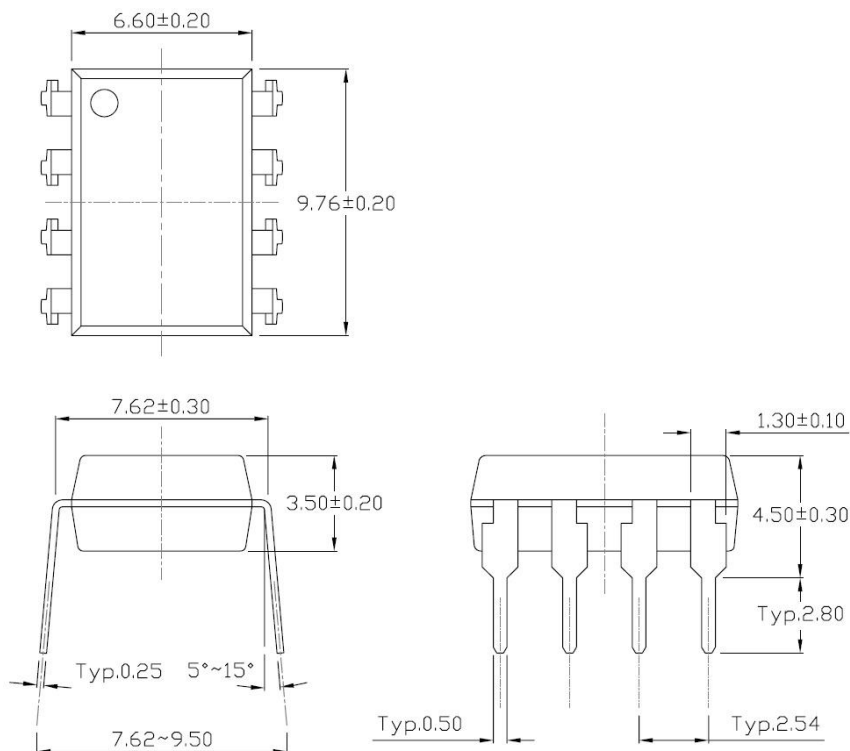


**Fig.26 Waveforms of Common Mode Transient Immunity**

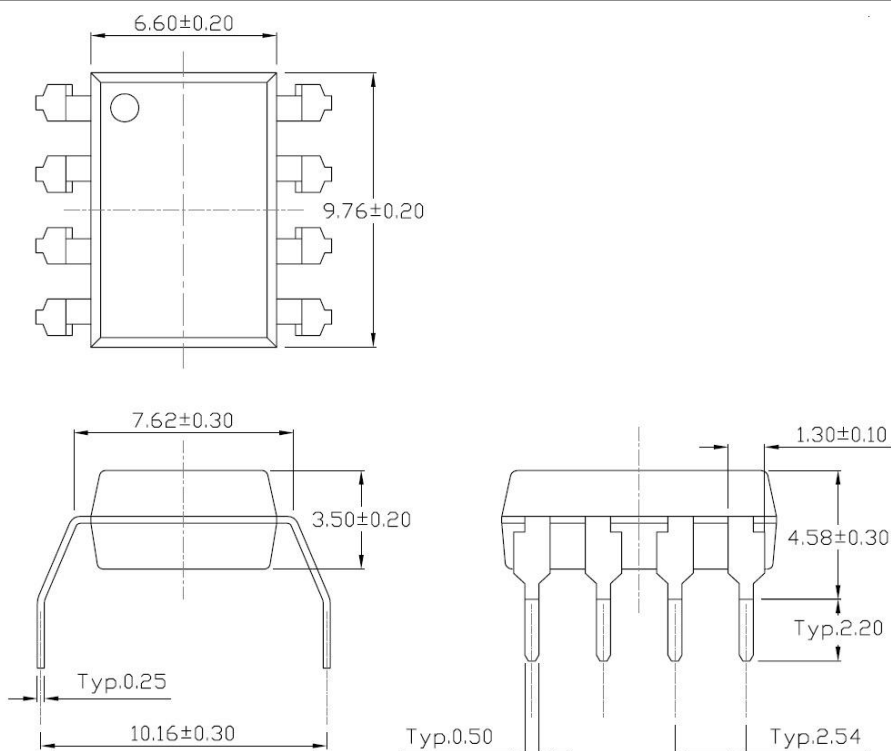


### PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

#### Standard DIP – Through Hole (DIP Type)

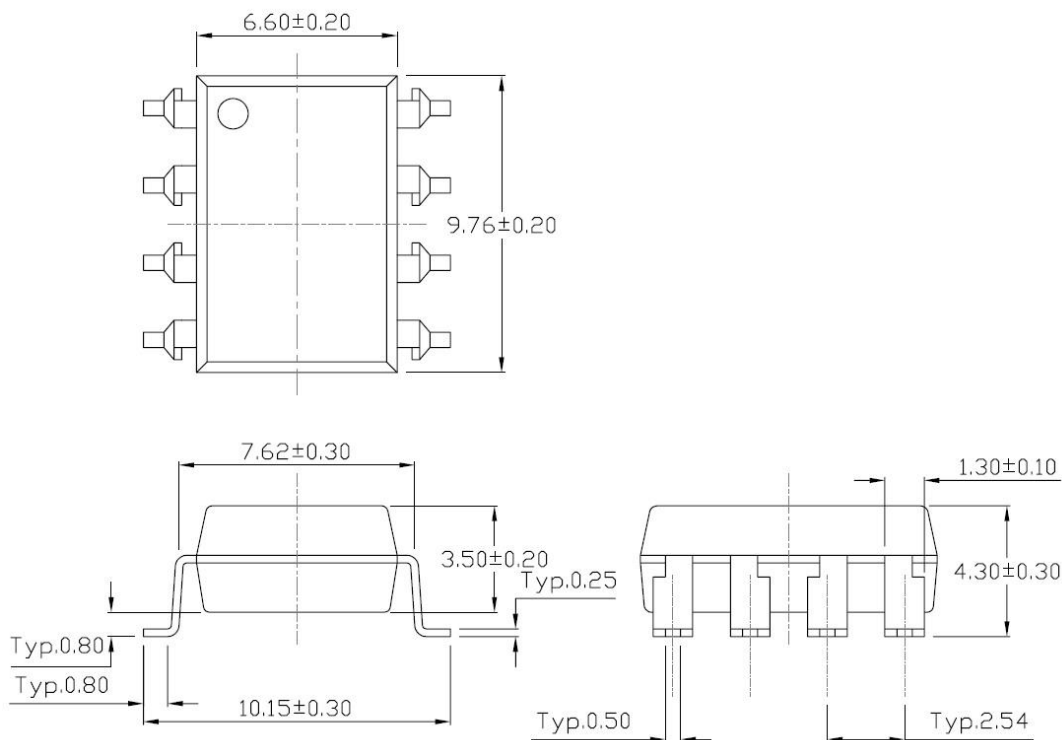


#### Gullwing (400mil) Lead Forming – Through Hole (M Type)

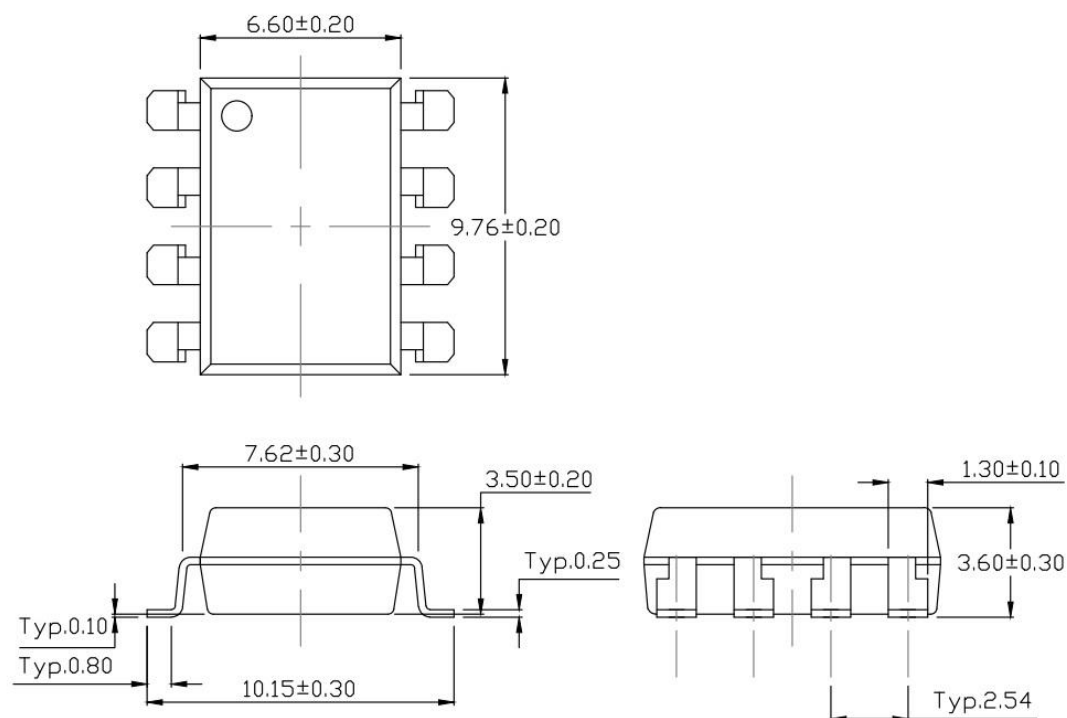


### PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

#### Surface Mount Lead Forming (S Type)

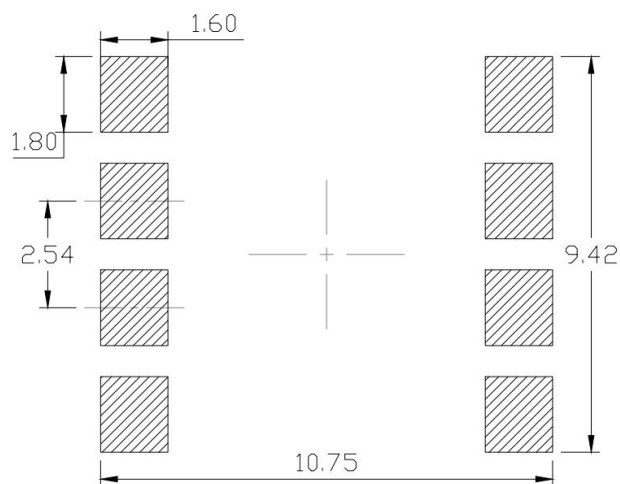


#### Surface Mount (Low Profile) Lead Forming (SL Type)

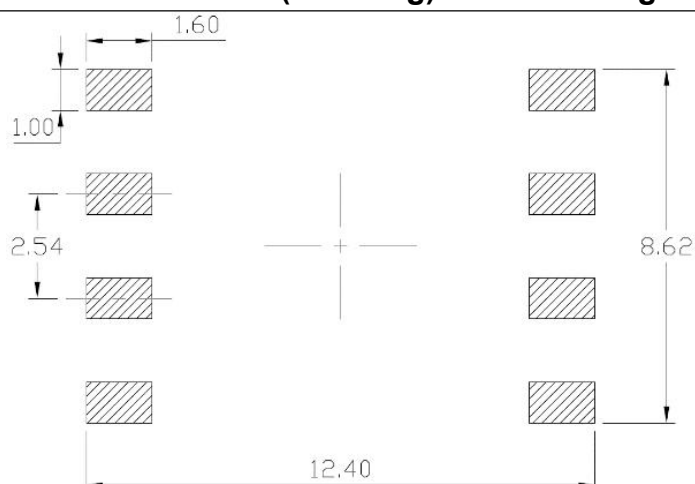


### Recommended Solder Mask (Dimensions in mm unless otherwise stated)

#### Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming



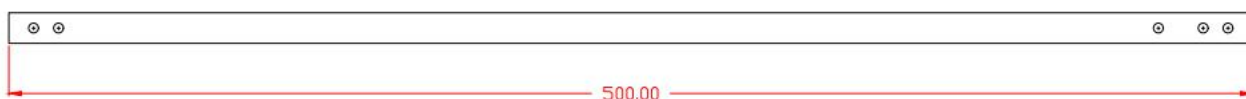
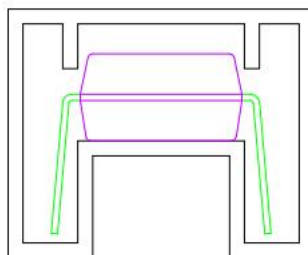
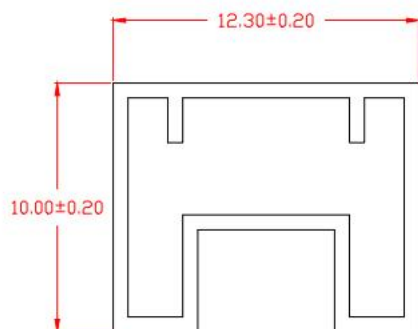
#### Surface Mount (Gullwing) Lead Forming



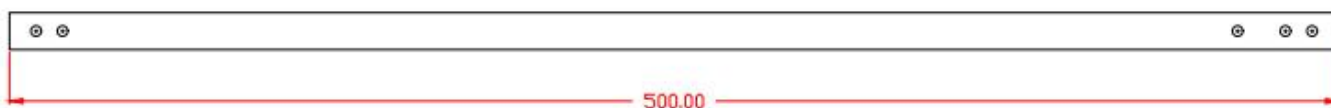
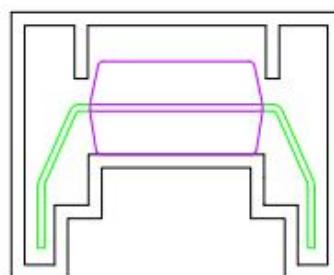
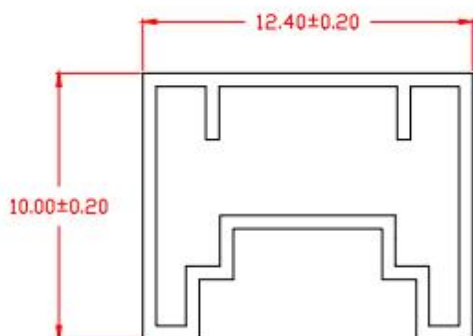


### TUBE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

#### Standard DIP



#### Option M



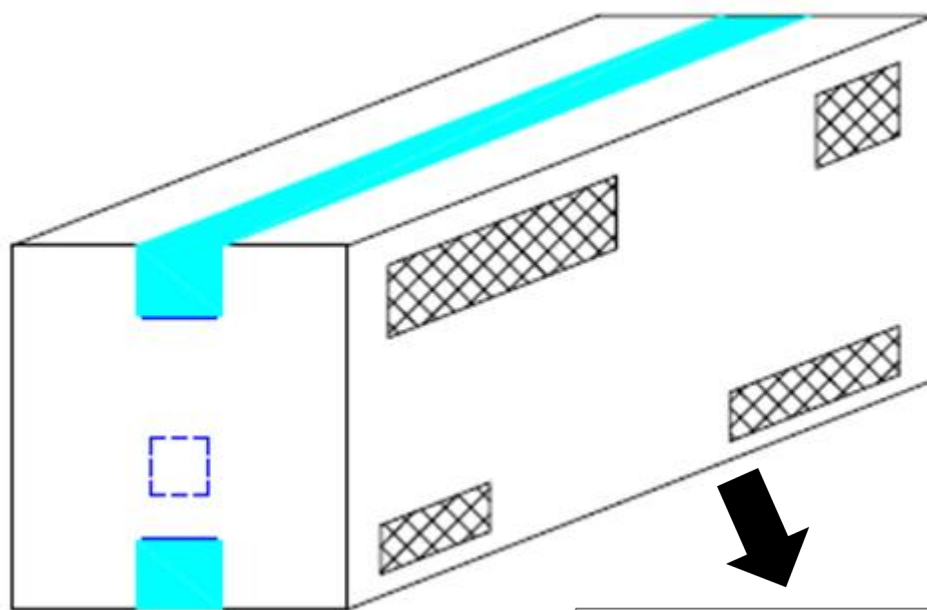
### BOX SPECIFICATIONS (Tube Type)

#### Inner Box

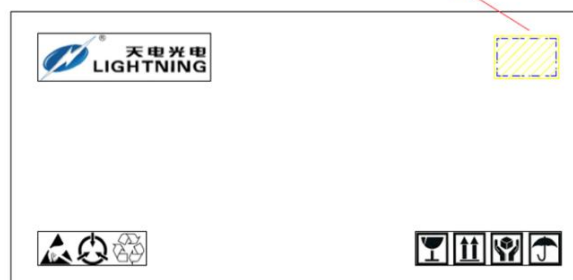


- L x W x H = 52.5cm x 10.7cm x 4.7cm

#### Outer Box

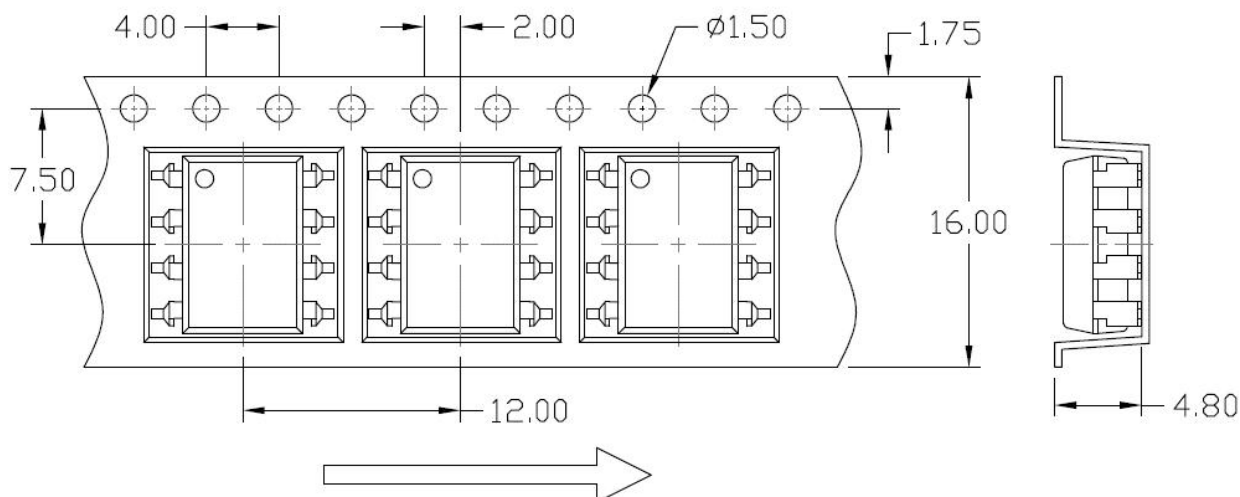


- L x W x H = 53.5cm x 23.5cm x 25.5cm

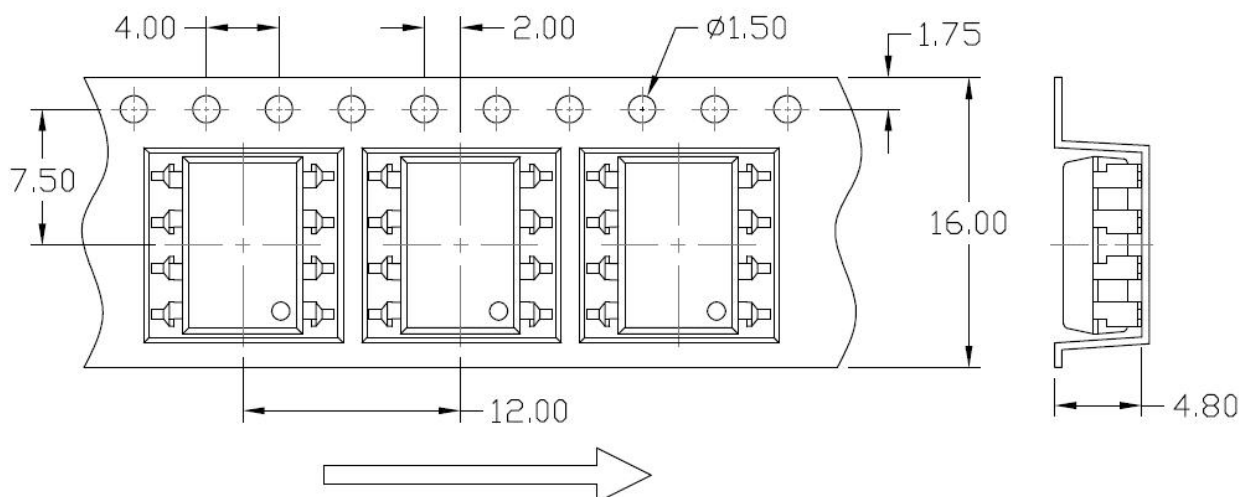


### Carrier Tape Specifications (Dimensions in mm unless otherwise stated)

#### Option S(T1) & SL(T1)

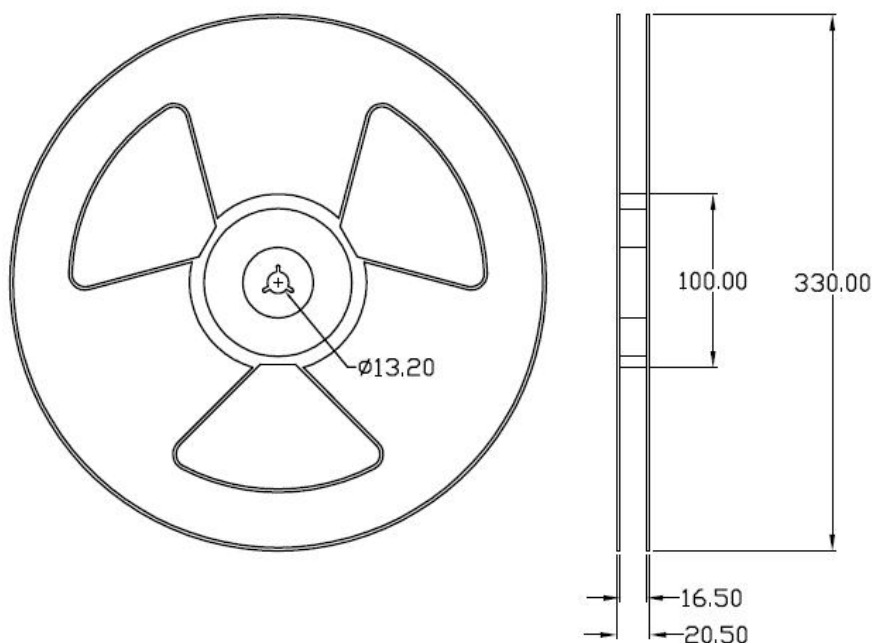


#### Option S(T2) & SL(T2)



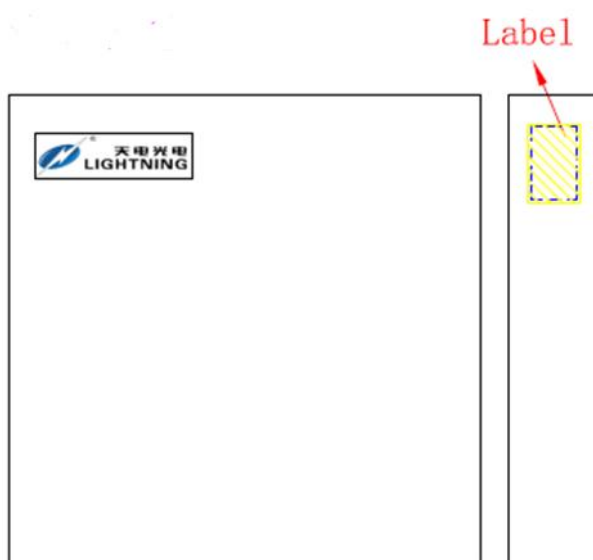
### REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)

#### Option S & Option SL



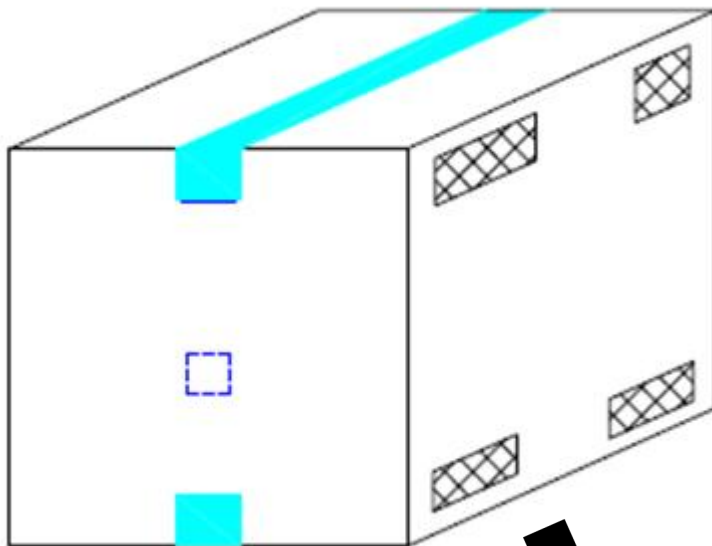
### BOX SPECIFICATIONS (Reel Type)

#### Inner Box

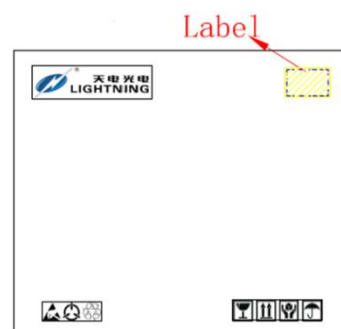


- L x W x H = 36cm x 36cm x 6.9cm

### Outer Box



- L x W x H = 45cm x 38cm x 38cm





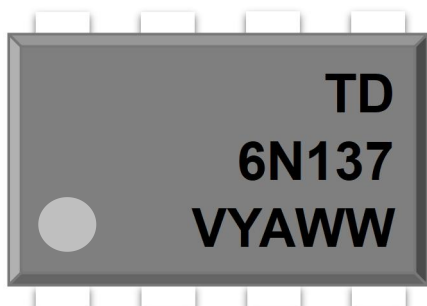
[www.tdled.com](http://www.tdled.com)

# 6N137,TD2601,TD2611 Series

## DIP8, 10Mbit/s High Speed Logic Gate Photo Coupler

### ORDERING AND MARKING INFORMATION

#### MARKING INFORMATION



TD : Company Abbr.  
 6N137 : Part Number  
 V : VDE Option  
 Y : Fiscal Year  
 A : Manufacturing Code  
 WW : Work Week

#### ORDERING INFORMATION

#### 6N137(Y)(Z)-GV

6N137 – Part Number

Y – Lead Form Option  
 (M/S/SL/None)

Z – Tape and Reel Option (T1/T2)

G – Material Option

(G: Green, None: Non-Green)

V – VDE Option (V or None)

#### LABEL INFORMATION



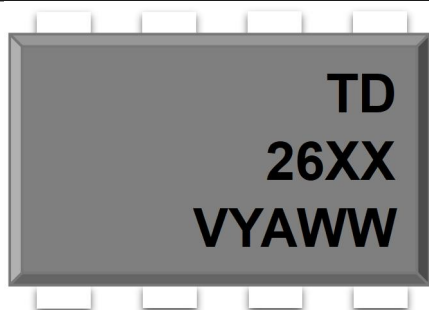
#### PACKING QUANTITY

| Option | Quantity        | Quantity – Inner box | Quantity – Outer box               |
|--------|-----------------|----------------------|------------------------------------|
| None   | 40 Units/Tube   | 30 Tubes/Inner box   | 10 Inner box/Outer box = 12k Units |
| M      | 40 Units/Tube   | 30 Tubes/Inner box   | 10 Inner box/Outer box = 12k Units |
| S(T1)  | 1000 Units/Reel | 3 Reels/Inner box    | 5 Inner box/Outer box = 15k Units  |
| S(T2)  | 1000 Units/Reel | 3 Reels/Inner box    | 5 Inner box/Outer box = 15k Units  |
| SL(T1) | 1000 Units/Reel | 3 Reels/Inner box    | 5 Inner box/Outer box = 15k Units  |
| SL(T2) | 1000 Units/Reel | 3 Reels/Inner box    | 5 Inner box/Outer box = 15k Units  |



### ORDERING AND MARKING INFORMATION

#### MARKING INFORMATION



**TD** : Company Abbr.  
**26XX** : Part Number & Rank  
**V** : VDE Option  
**Y** : Fiscal Year  
**A** : Manufacturing Code  
**WW** : Work Week

#### ORDERING INFORMATION

#### TD26XX(Y)(Z)-GV

TD – Company Abbr.  
 26XX – Rank (01/11)  
 Y – Lead Form Option  
 (M/S/SL/None)  
 Z – Tape and Reel Option (T1/T2)  
 G – Material Option  
 (G: Green, None: Non-Green)  
 V – VDE Option (V or None)

#### LABEL INFORMATION

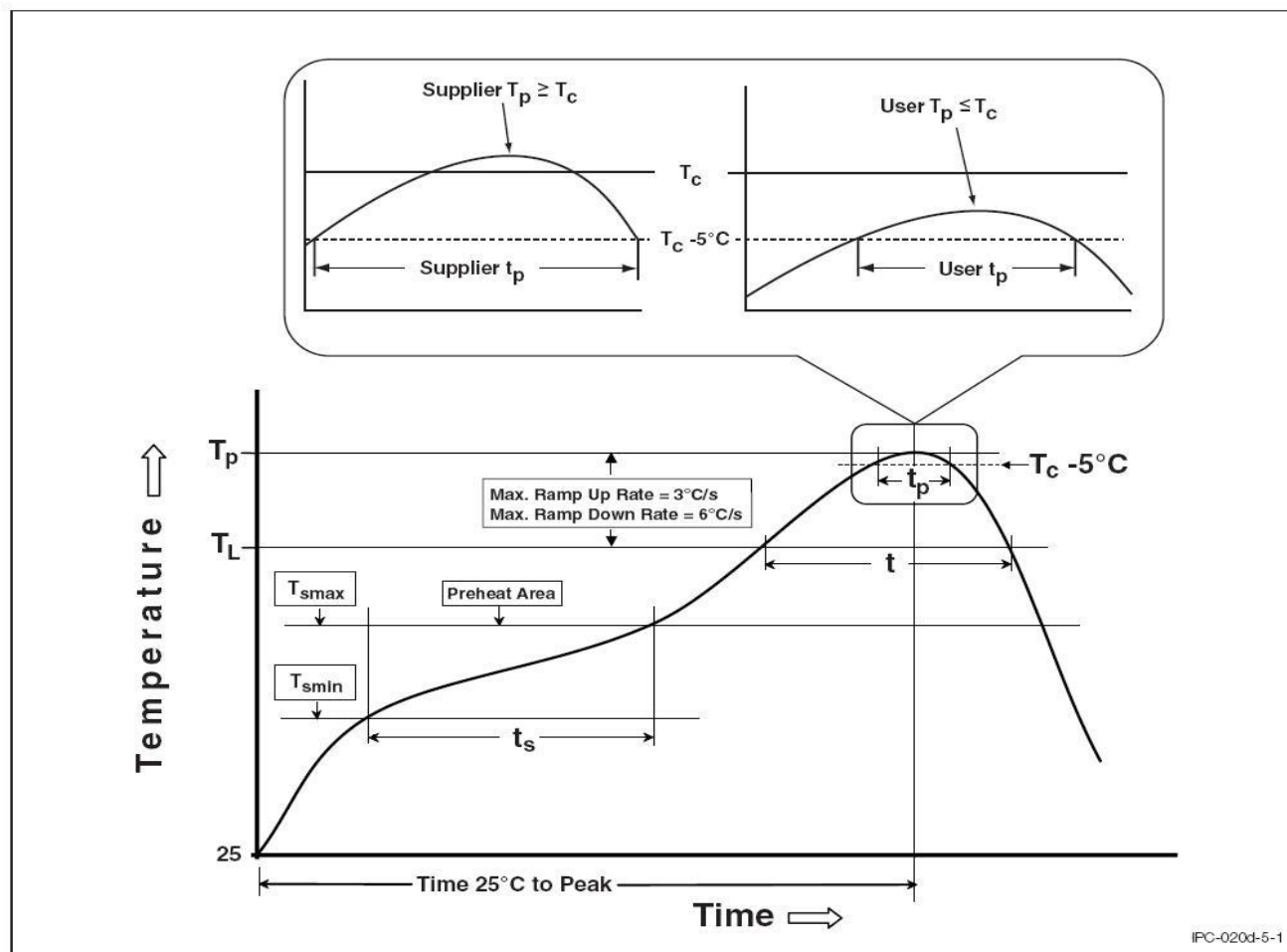


#### PACKING QUANTITY

| Option | Quantity        | Quantity – Inner box | Quantity – Outer box               |
|--------|-----------------|----------------------|------------------------------------|
| None   | 40 Units/Tube   | 30 Tubes/Inner box   | 10 Inner box/Outer box = 12k Units |
| M      | 40 Units/Tube   | 30 Tubes/Inner box   | 10 Inner box/Outer box = 12k Units |
| S(T1)  | 1000 Units/Reel | 3 Reels/Inner box    | 5 Inner box/Outer box = 15k Units  |
| S(T2)  | 1000 Units/Reel | 3 Reels/Inner box    | 5 Inner box/Outer box = 15k Units  |
| SL(T1) | 1000 Units/Reel | 3 Reels/Inner box    | 5 Inner box/Outer box = 15k Units  |
| SL(T2) | 1000 Units/Reel | 3 Reels/Inner box    | 5 Inner box/Outer box = 15k Units  |

### REFLOW INFORMATION

#### REFLOW PROFILE



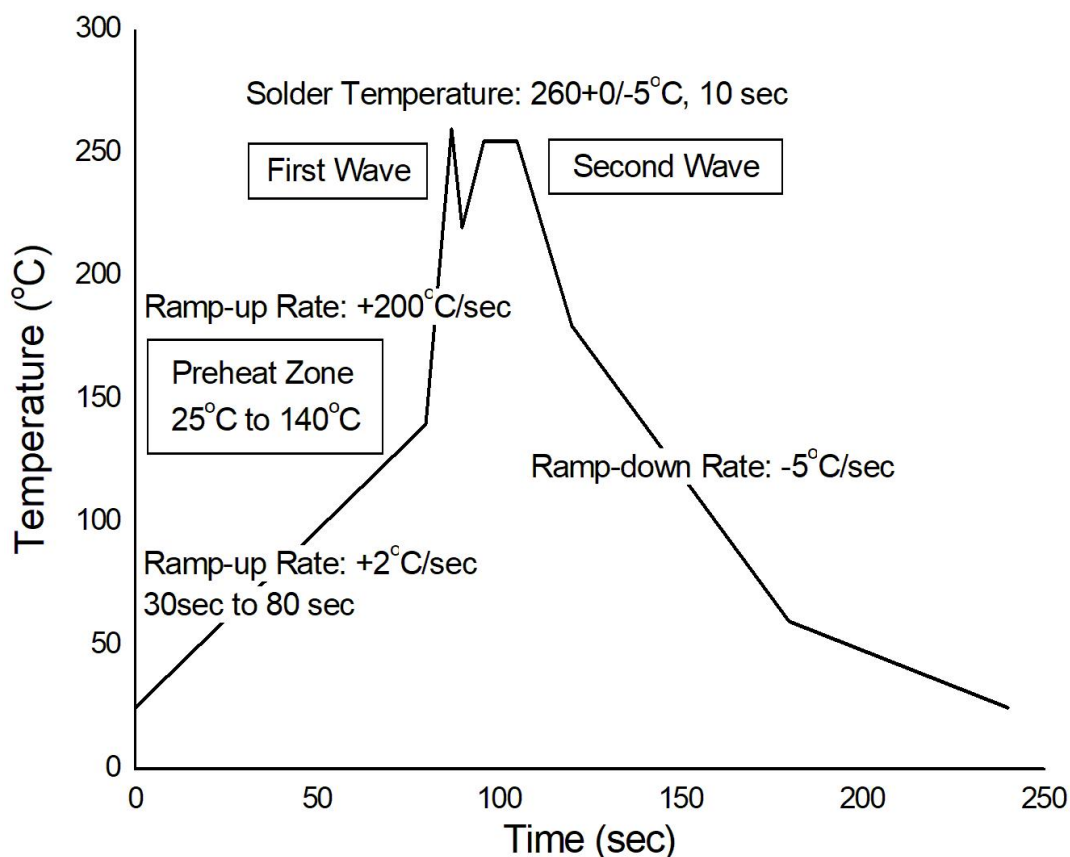
| Profile Feature                   | Sn-Pb Assembly Profile | Pb-Free Assembly Profile |
|-----------------------------------|------------------------|--------------------------|
| Temperature Min. (Tsmmin)         | 100                    | 150°C                    |
| Temperature Max. (Tsmmax)         | 150                    | 200°C                    |
| Time (ts) from (Tsmmin to Tsmmax) | 60-120 seconds         | 60-120 seconds           |
| Ramp-up Rate (tL to tP)           | 3°C/second max.        | 3°C/second max.          |
| Liquidous Temperature (TL)        | 183°C                  | 217°C                    |
| Time (tL) Maintained Above (TL)   | 60 – 150 seconds       | 60 – 150 seconds         |
| Peak Body Package Temperature     | 235°C +0°C / -5°C      | 260°C +0°C / -5°C        |
| Time (tp) within 5°C of 260°C     | 20 seconds             | 30 seconds               |
| Ramp-down Rate (TP to TL)         | 6°C/second max         | 6°C/second max           |
| Time 25°C to Peak Temperature     | 6 minutes max.         | 8 minutes max.           |





### TEMPERATURE PROFILE OF SOLDERING

#### WAVE SOLDERING (JESD22-A111 COMPLIANT)



#### HAND SOLDERING BY SOLDERING IRON

|                       |            |
|-----------------------|------------|
| Soldering Temperature | 380+0/-5°C |
| Soldering Time        | 3 sec max. |

- One time soldering is recommended for all soldering method.
- Do not solder more than three times for IR reflow soldering.



### DISCLAIMER

- LIGHTNING is continually improving the quality, reliability, function and design. LIGHTNING reserves the right to make changes without further notices.
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- Please contact LIGHTNING sales agent for special application request.
- Immerge unit's body in solder paste is not recommended.
- Parameters provided in datasheets may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated in each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify LIGHTNING's terms and conditions of purchase, including but not limited to the warranty expressed therein.
- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.