



JOC852 Series

DC Input, Photo Darlington Transistor Coupler

Description

The JOC852 series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar darlington phototransistor detector in a plastic DIP4 package with different lead forming options. With the robust coplanar double mold structure, JOC852 series provide the most stable isolation feature.

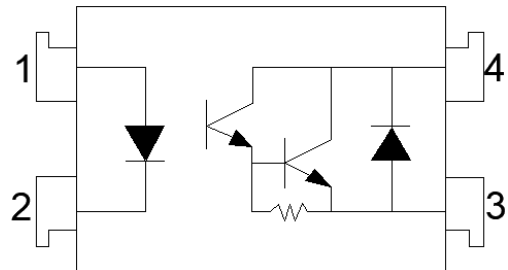
Features

- High isolation 5000 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- Operating temperature range - 55 °C to 110 °C
- REACH compliance
- Halogen free
- MSL class 1
- Regulatory Approvals
 - UL
 - VDE
 - CQC

Applications

- Sequence controller
- Telephone/FAX
- System appliances, measuring instrument
- Programmable logic controller

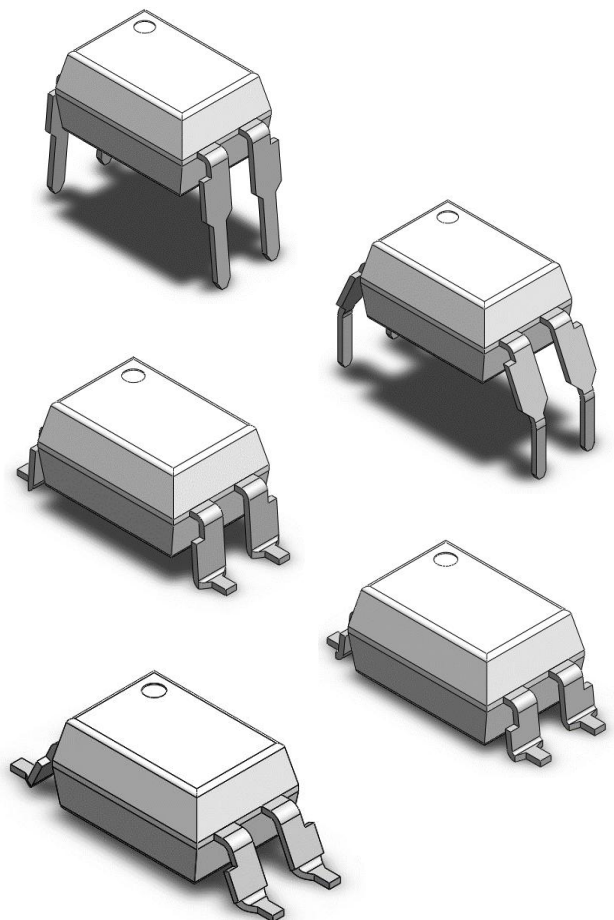
SCHEMATIC



PIN DEFINITION

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

PACKAGE OUTLINE



ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | VALUE | UNIT | NOTE |
|-----------------------------|-----------|---------|------------------|------|
| INPUT | | | | |
| Forward Current | I_F | 60 | mA | |
| Peak Forward Current | I_{FP} | 1 | A | 1 |
| Reverse Voltage | V_R | 6 | V | |
| Input Power Dissipation | P_I | 100 | mW | |
| OUTPUT | | | | |
| Collector - Emitter Voltage | V_{CEO} | 350 | V | |
| Emitter - Collector Voltage | V_{ECO} | 0.1 | V | |
| Collector Current | I_C | 150 | mA | |
| Output Power Dissipation | P_O | 150 | mW | |
| COMMON | | | | |
| Total Power Dissipation | P_{tot} | 200 | mW | |
| Isolation Voltage | V_{iso} | 5000 | V _{rms} | 2 |
| Operating Temperature | T_{opr} | -55~100 | °C | |
| Storage Temperature | T_{stg} | -55~125 | °C | |
| Soldering Temperature | T_{sol} | 260 | °C | |

Note 1. 100 μ s pulse, 100Hz frequency

Note 2. AC For 1 Minute, R.H. = 40 ~ 60%

| ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C | | | | | | | |
|-----------------------------------------------|---------------|-----------|-----------|-------|----------|------------------------------------------|------|
| PARAMETER | SYMBOL | MIN | TYP. | MAX. | UNIT | TEST CONDITION | NOTE |
| INPUT | | | | | | | |
| Forward Voltage | V_F | - | 1.24 | 1.4 | V | IF=10mA | |
| Reverse Current | I_R | - | - | 10 | μ A | VR=6V | |
| Input Capacitance | C_{in} | - | 10 | - | pF | V=0, f=1kHz | |
| OUTPUT | | | | | | | |
| Collector Dark Current | I_{CEO} | - | - | 200 | nA | VCE=200V, IF=0 | |
| Collector-Emitter Breakdown Voltage | BV_{CEO} | 350 | - | - | V | IC=0.1mA, IF=0 | |
| Emitter-Collector Breakdown Voltage | BV_{ECO} | 0.1 | - | - | V | IE=0.1mA, IF=0 | |
| TRANSFER CHARACTERISTICS | | | | | | | |
| Current Transfer Ratio | CTR | 1000 | - | 15000 | % | IF=1mA, VCE=2V | |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | - | - | 1.2 | V | IF=20mA, IC=100mA | |
| Isolation Resistance | R_{ISO} | 10^{12} | 10^{14} | - | Ω | DC500V, 40 ~ 60% R.H. | |
| Floating Capacitance | C_{IO} | - | 0.6 | 1 | pF | V=0, f=1MHz | |
| Response Time (Rise) | t_r | - | 3 | 18 | μ s | VCE=2V, IC=2mA | 3 |
| Response Time (Fall) | t_f | - | 4 | 18 | μ s | RL=100 Ω | 3 |
| Cut-off Frequency | f_c | - | 80 | - | kHz | VCE=2V, IC=2mA RL=100 Ω , -3dB | 4 |

Note 3. Fig.12&13

Note 4. Fig.14

CHARACTERISTIC CURVES

Fig.1 Forward Current vs. Ambient Temperature

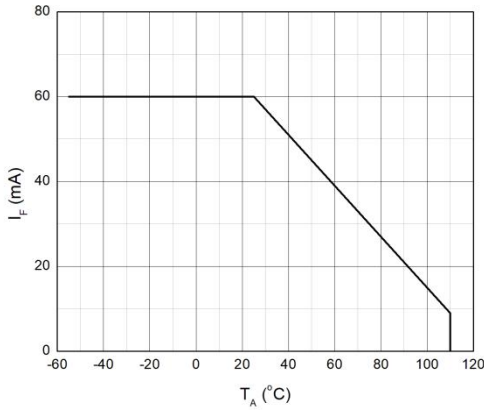


Fig.2 Collector Power Dissipation vs. Ambient Temperature

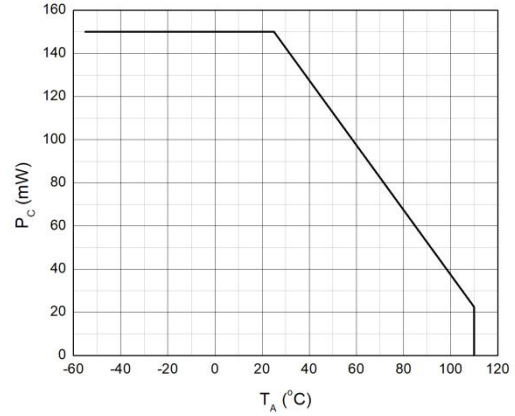


Fig.3 Forward Current vs. Forward Voltage

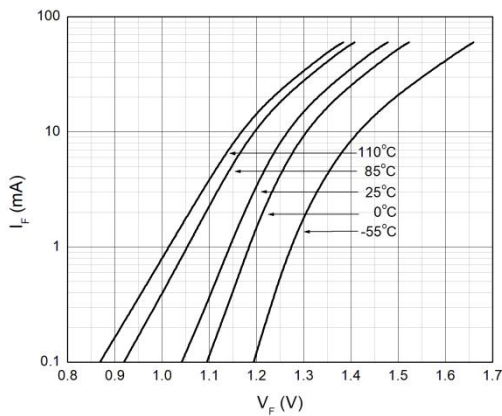


Fig.4 Collector Dark Current vs. Ambient Temperature

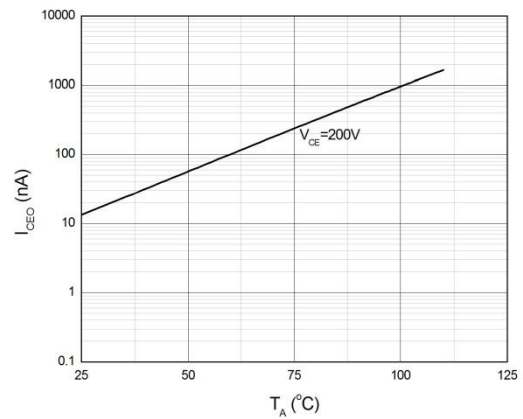


Fig.5 Collector-emitter Saturation Voltage vs. Forward Current

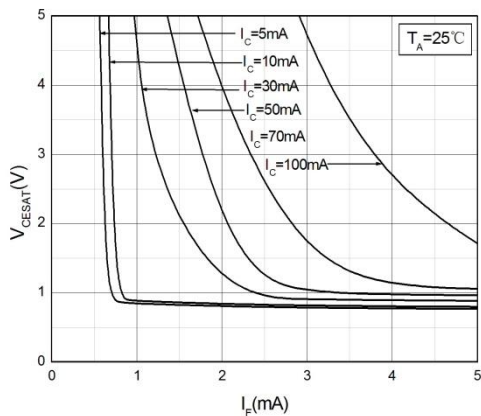
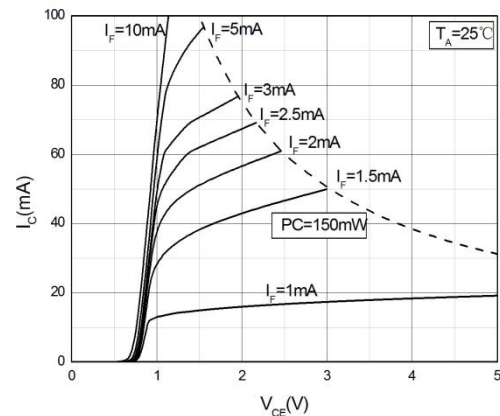


Fig.6 Collector Current vs. Collector-emitter Voltage



CHARACTERISTIC CURVES

Fig.7 Normalized Current Transfer Ratio vs. Forward Current

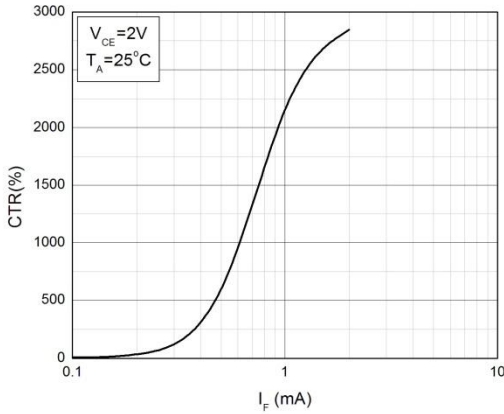


Fig.8 Normalized Current Transfer Ratio vs. Ambient Temperature

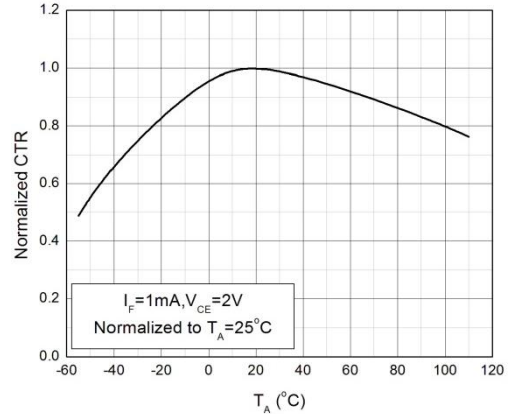


Fig.9 Collector-emitter Saturation Voltage vs. Ambient Temperature

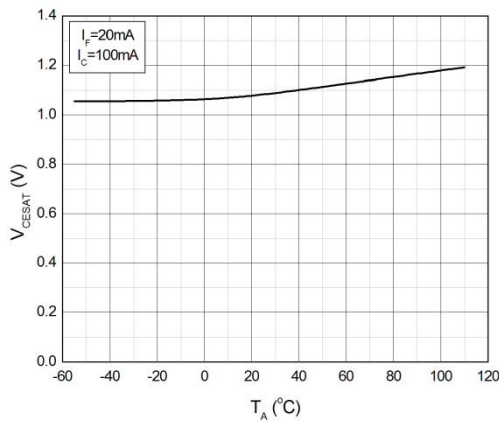


Fig.10 Switching Time vs. Load Resistance

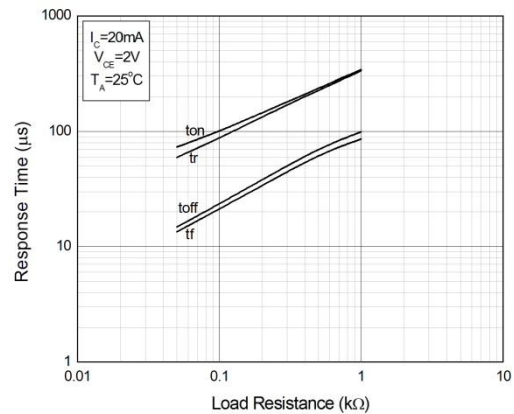
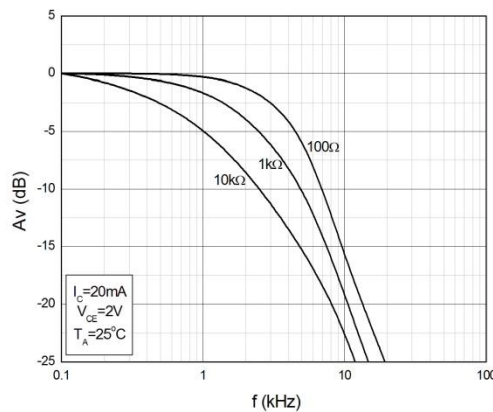


Fig.11 Frequency Response



TEST CIRCUITS

Fig.12 Test Circuits of Response Time

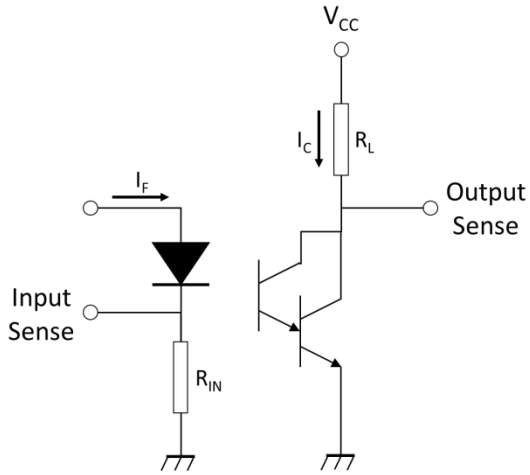


Fig.13 Curves of Response Time

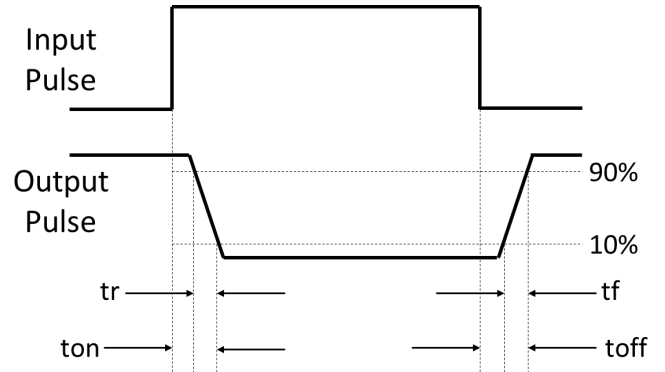
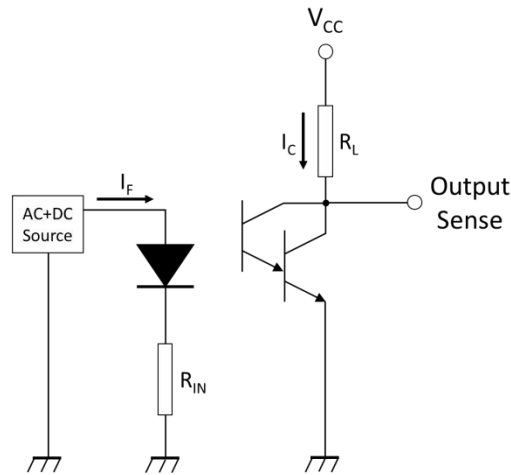
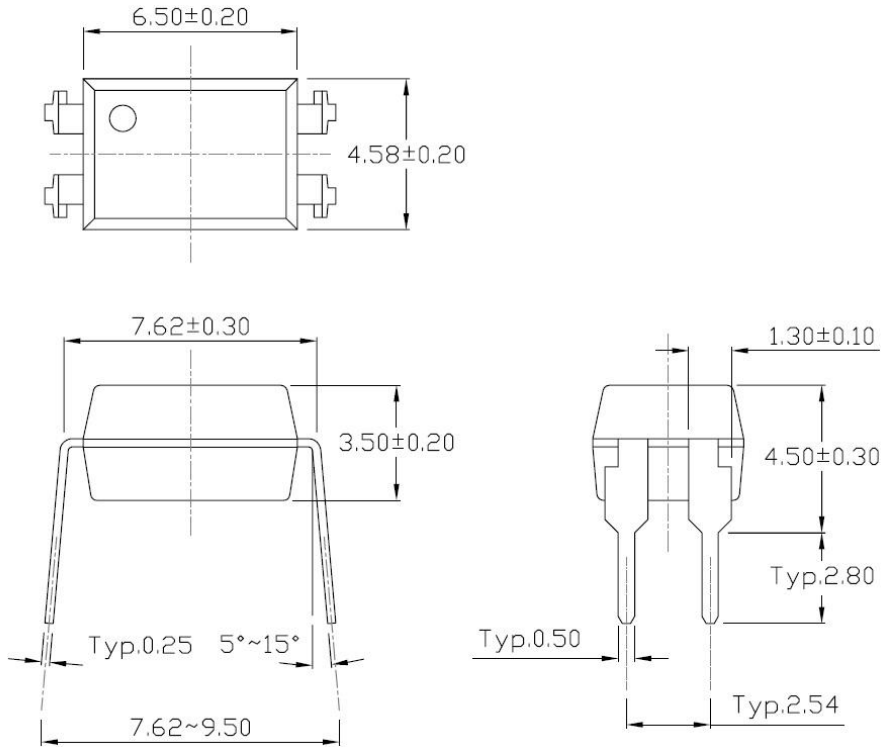


Fig.14 Test Circuits of Frequency Response

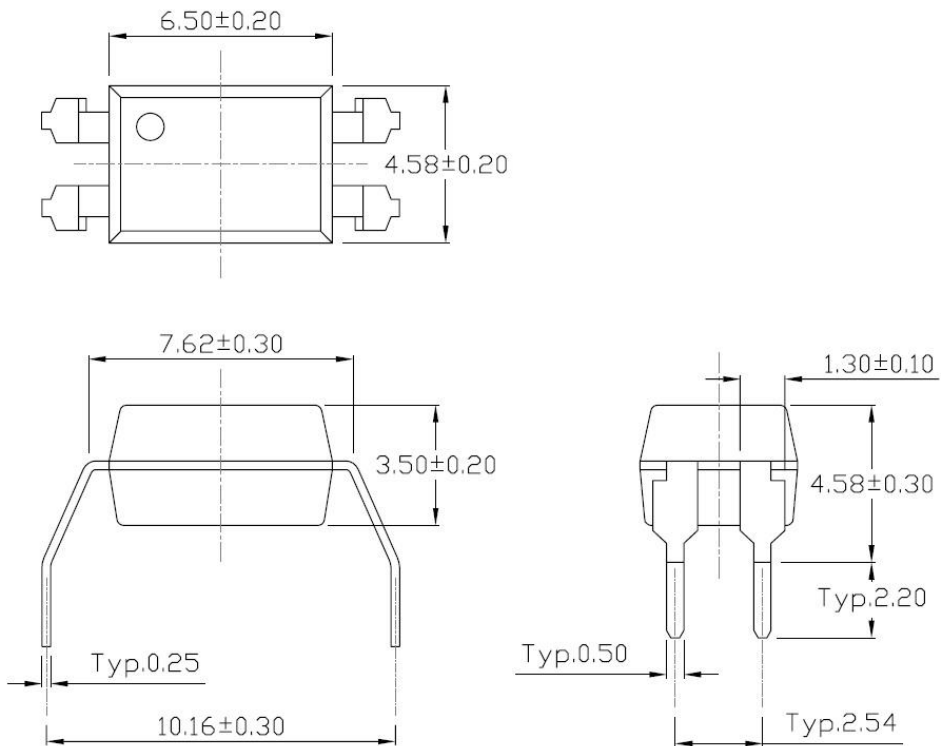


PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Standard DIP – Through Hole (DIP Type)

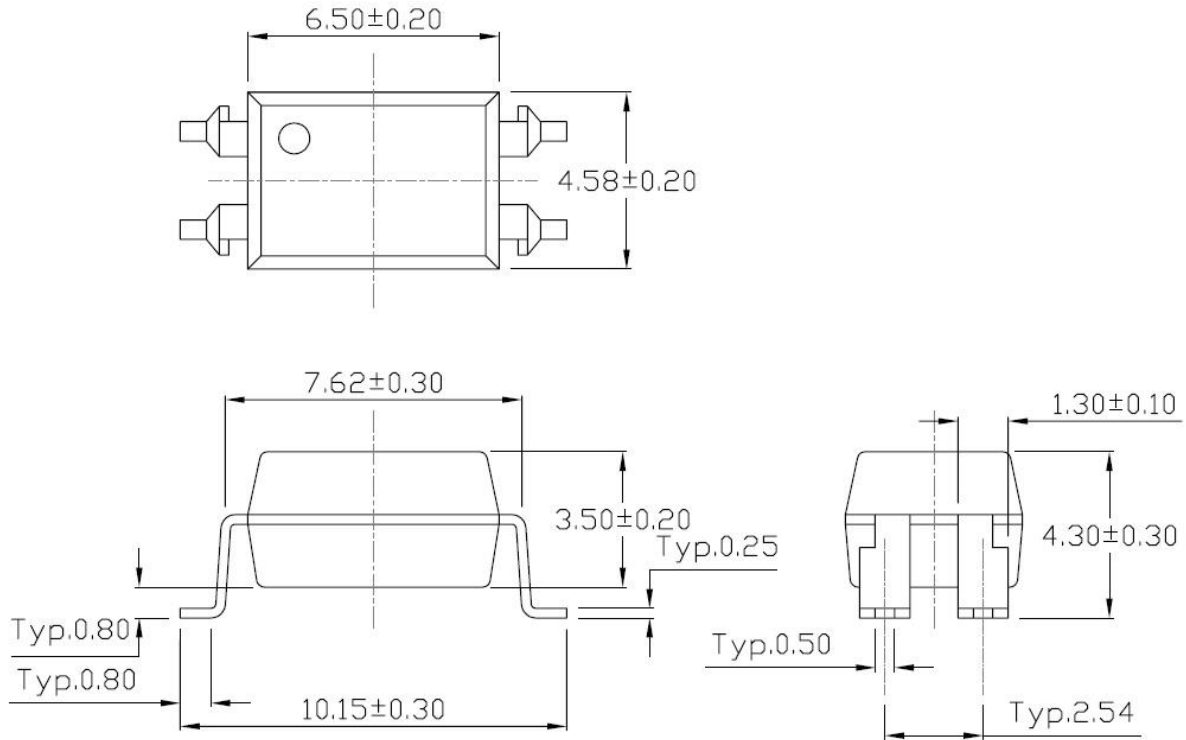


Gullwing (400mil) Lead Forming – Through Hole (M Type)

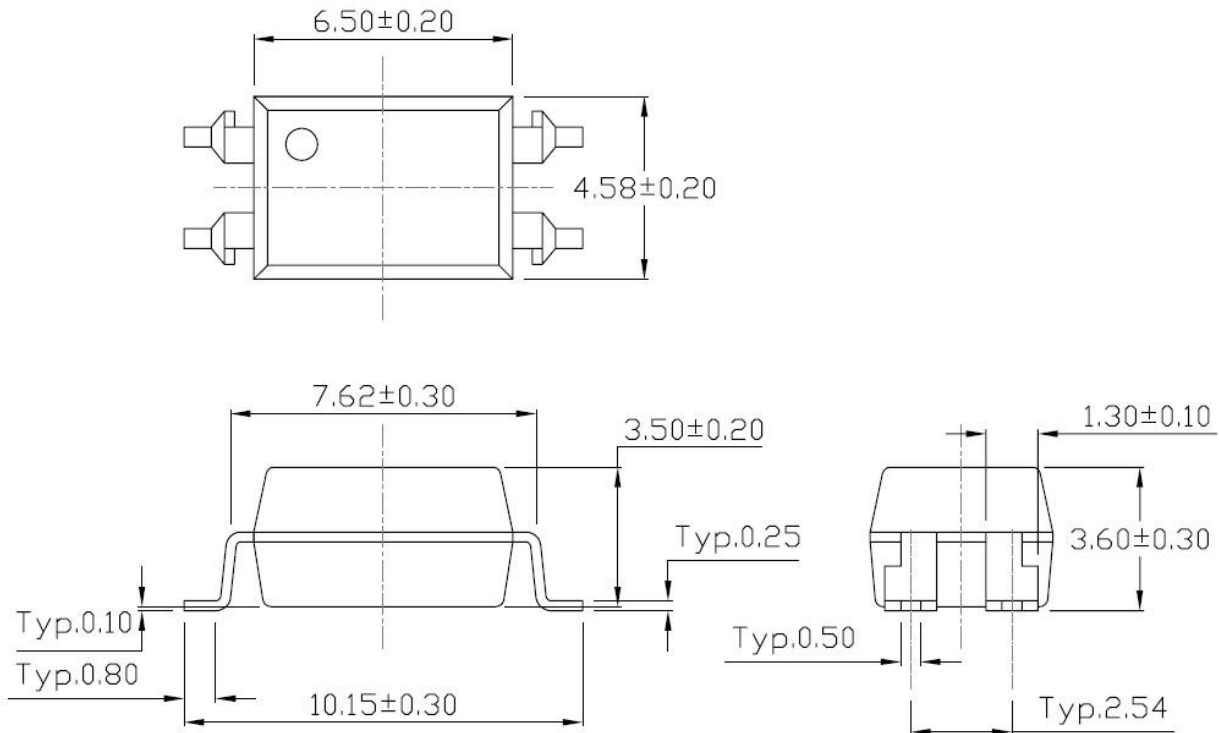


PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming (S Type)

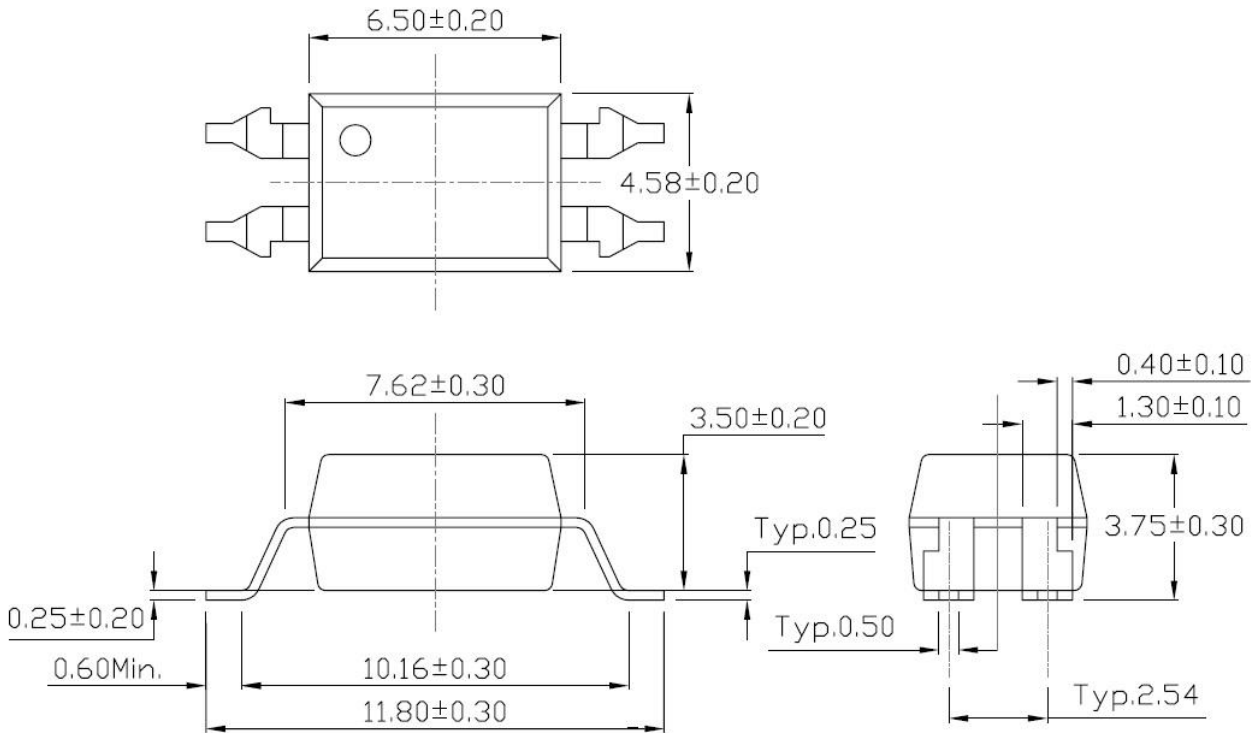


Surface Mount (Low Profile) Lead Forming (SL Type)



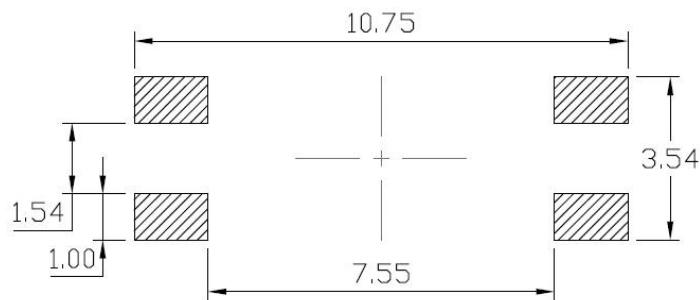
PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Surface Mount (Gullwing) Lead Forming (SLM Type)

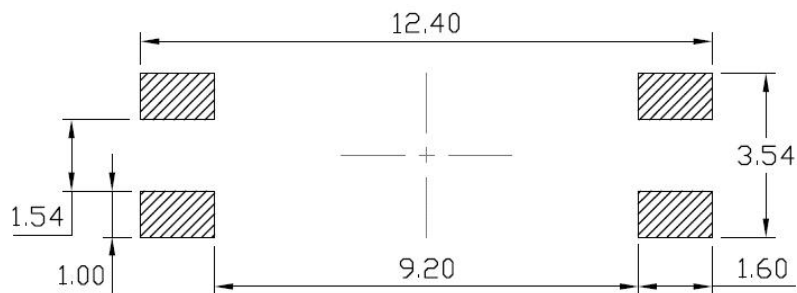


RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)

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

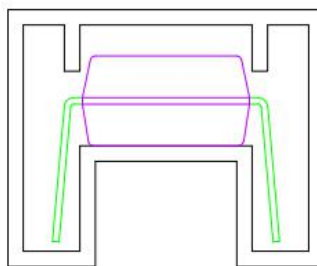
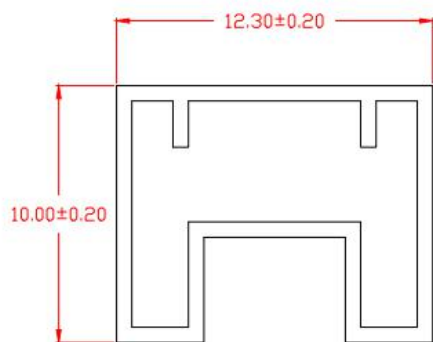


Surface Mount (Gullwing) Lead Forming



TUBE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Standard DIP / M



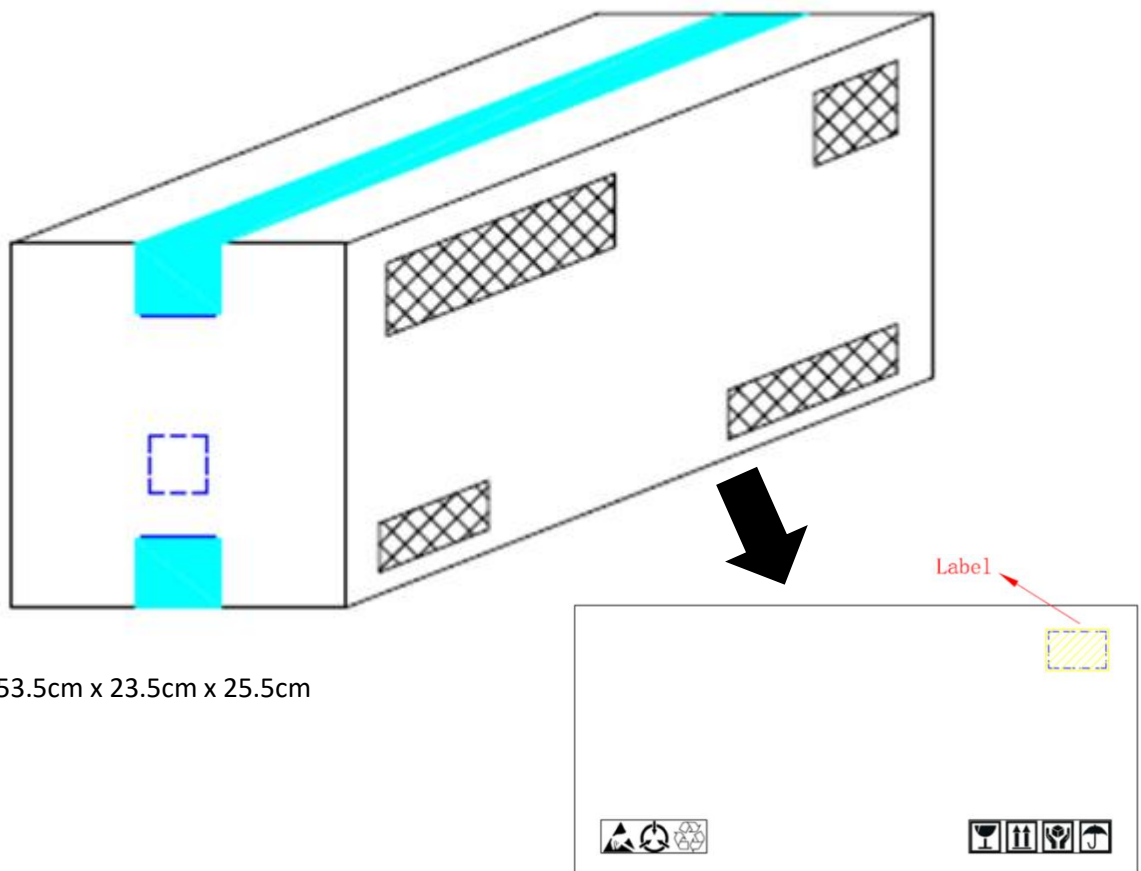
BOX SPECIFICATIONS (Tube Type)

Inner Box



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

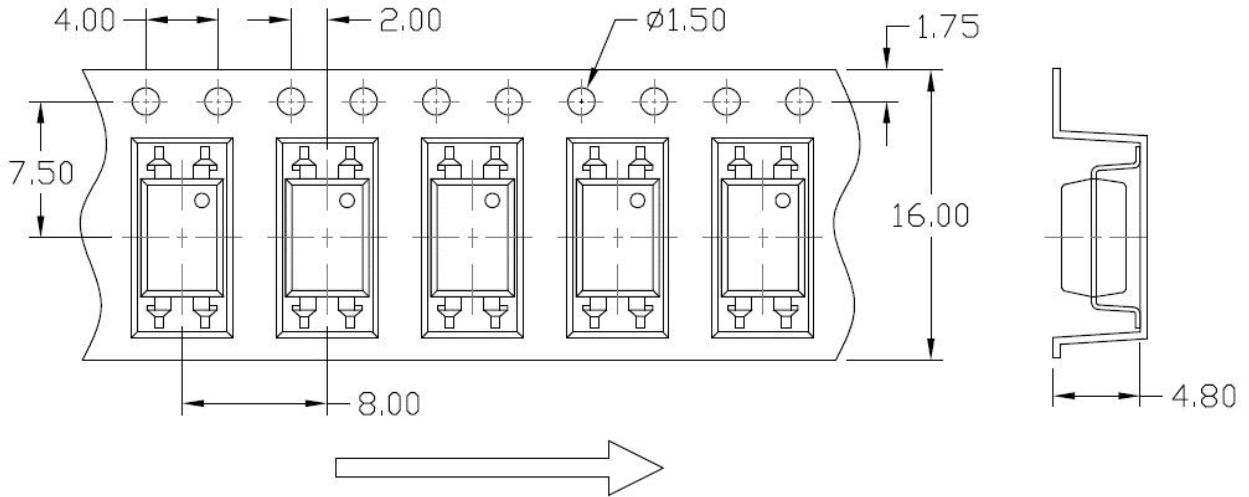
Outer Box



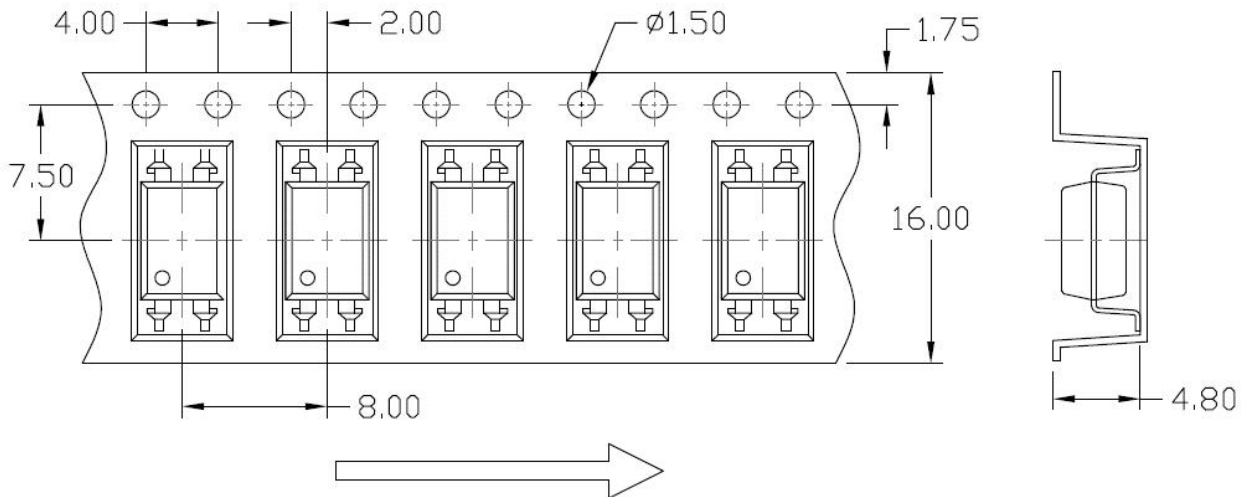
- L x W x H = 53.5cm x 23.5cm x 25.5cm

CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S(T1) & SL(T1)

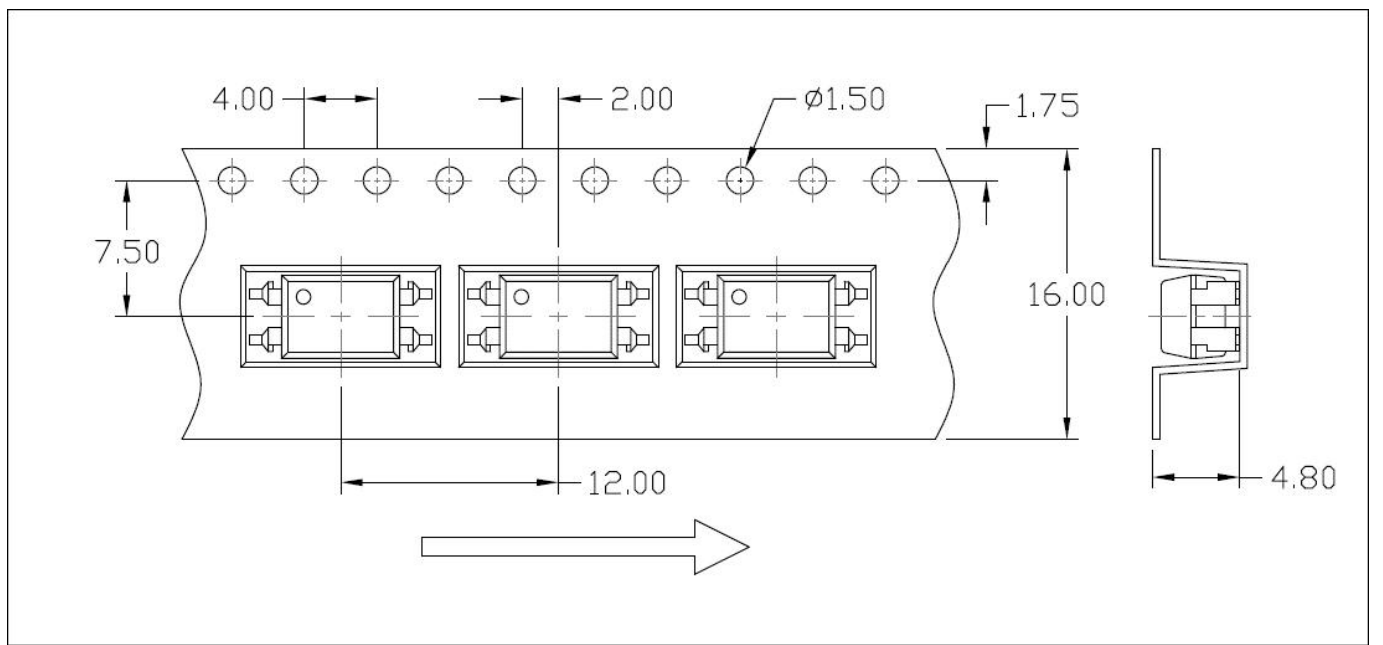


Option S(T2) & SL(T2)

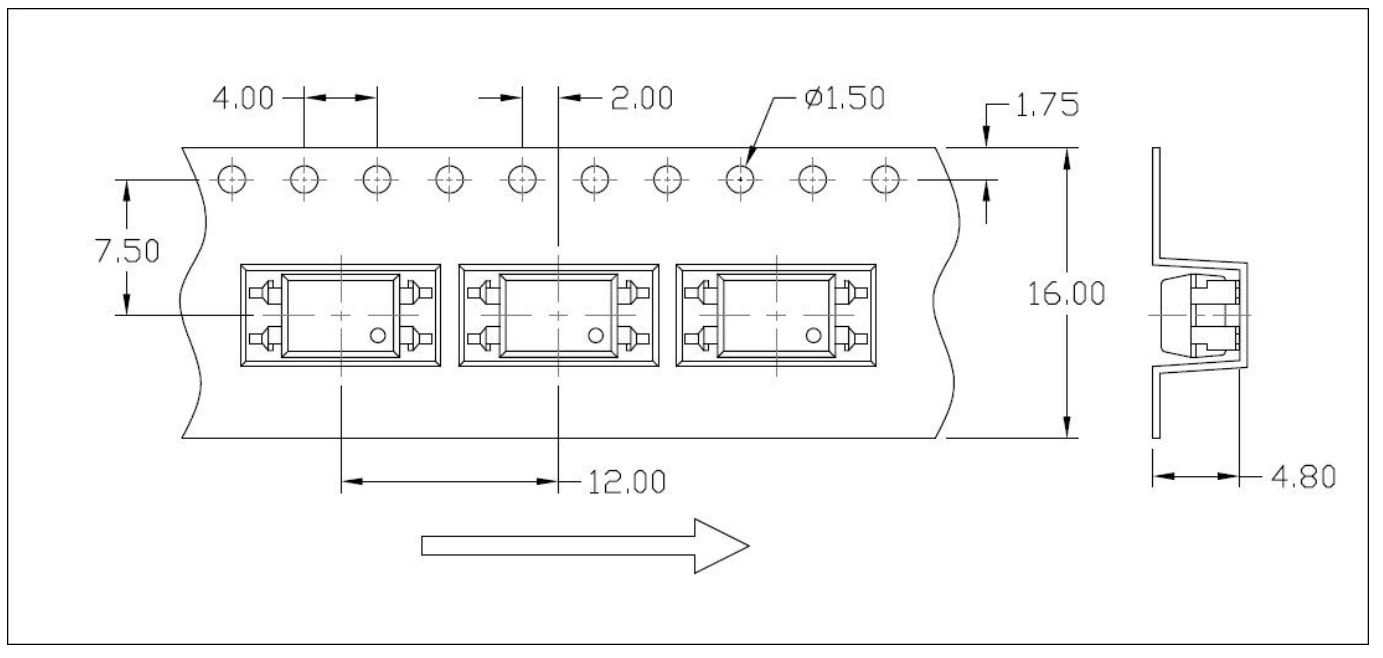


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S(T3) & SL(T3)

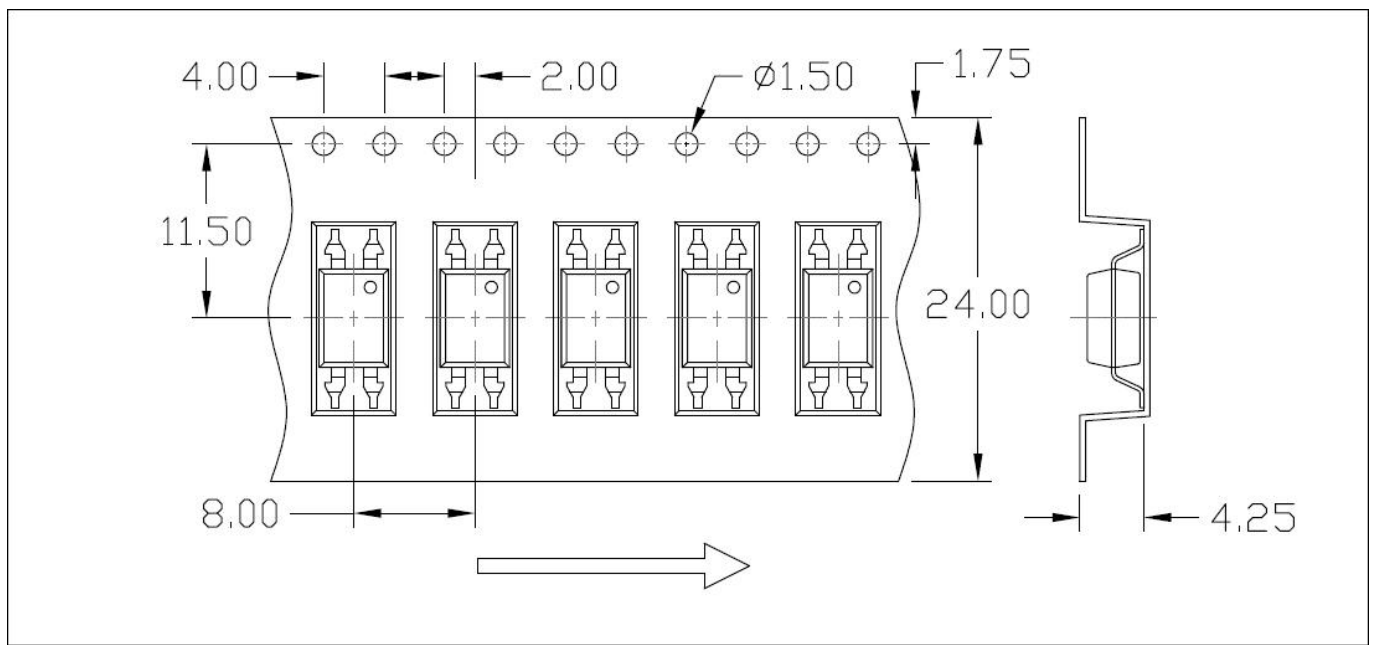


Option S(T4) & SL(T4)

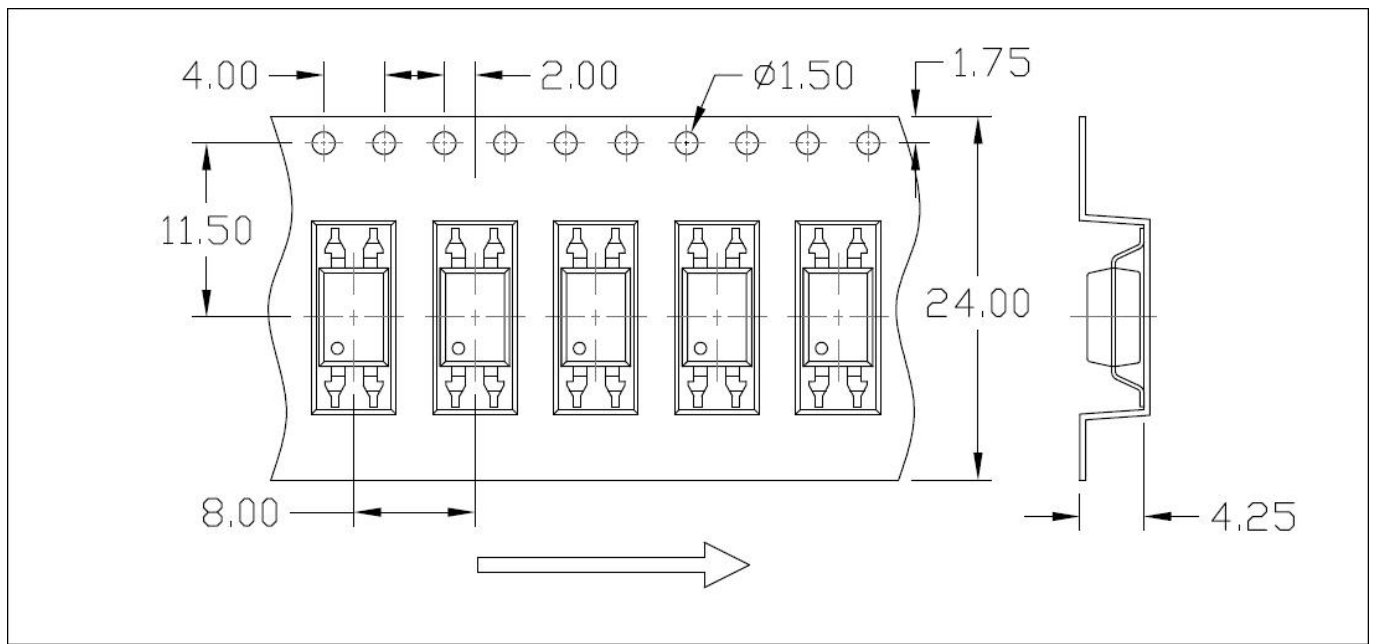


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option SLM(T1)

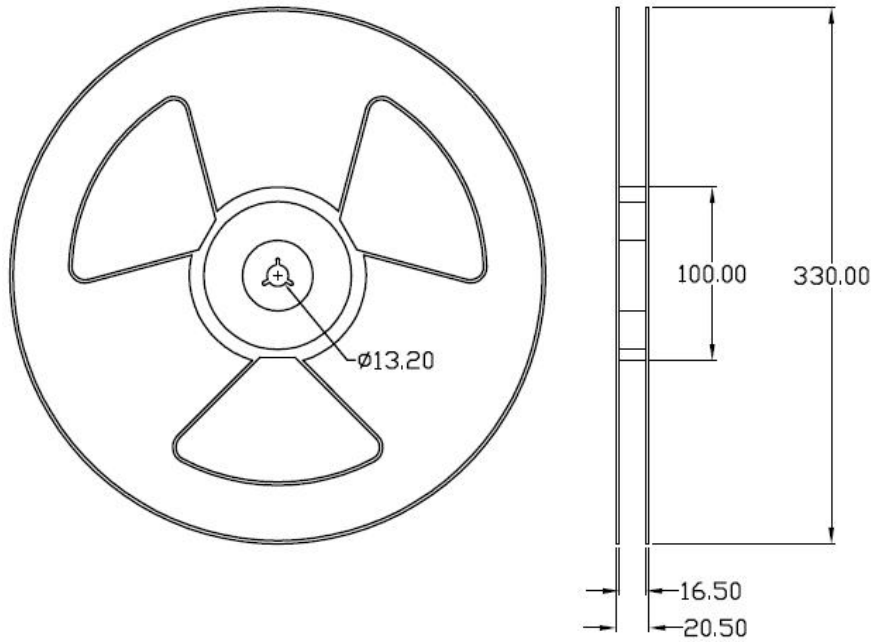


Option SLM(T2)

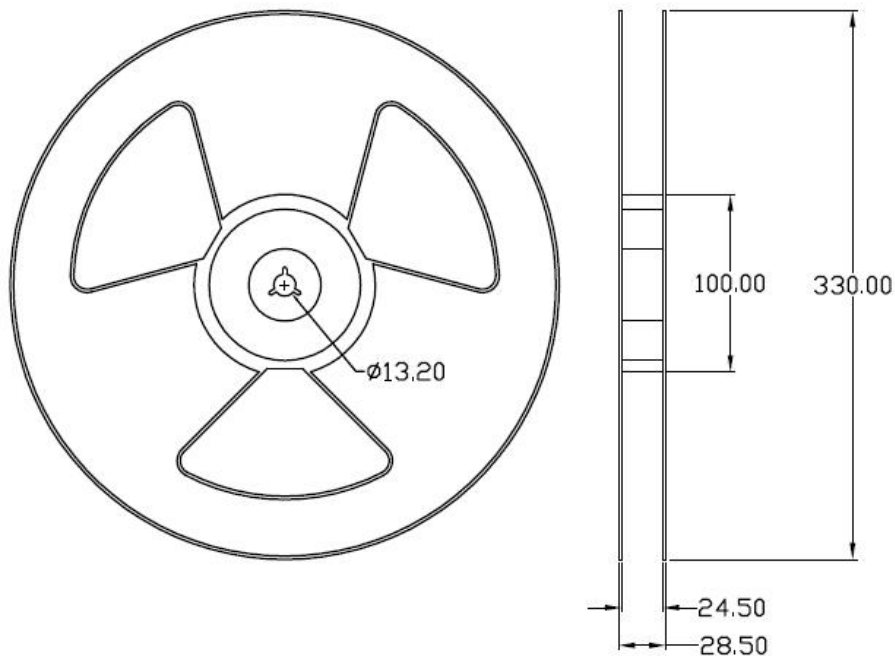


REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S & Option SL

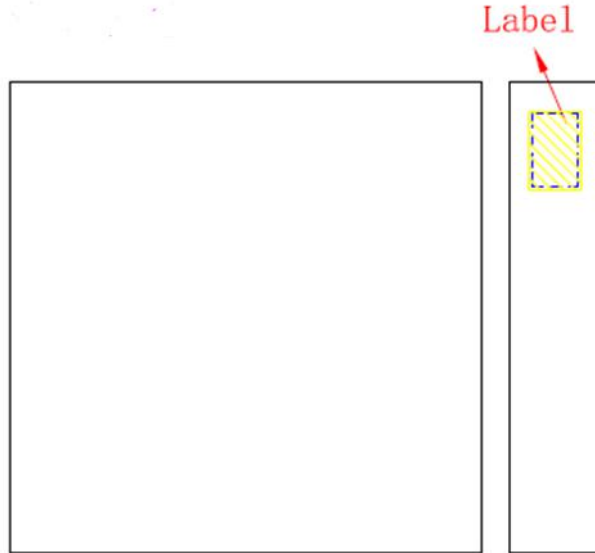


Option SLM



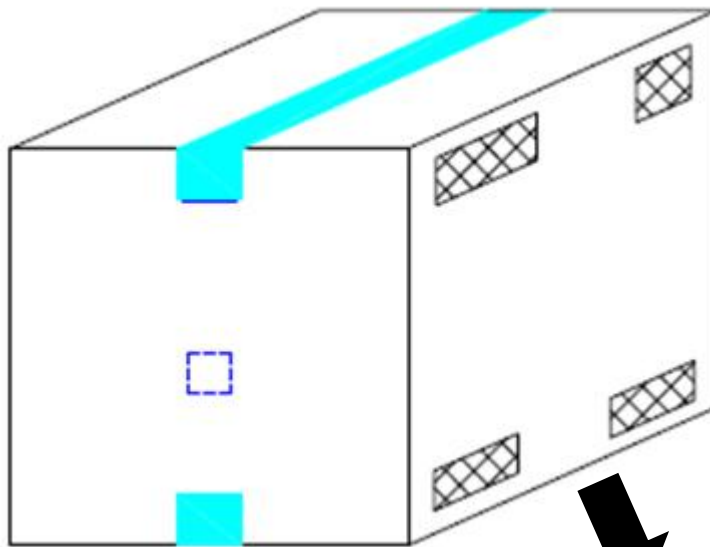
BOX SPECIFICATIONS (Reel Type)

Inner Box

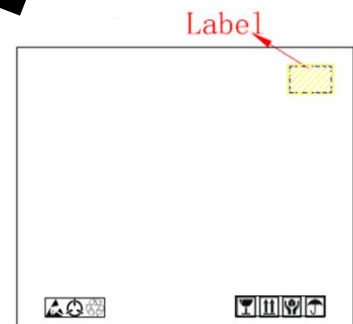


- L x W x H = 36cm x 36cm x 6.9cm

Outer Box



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



ORDERING AND MARKING INFORMATION

MARKING INFORMATION



JOC : Company Abbr.
852 : Part Number
V : VDE Option
Y : Fiscal Year
A : Manufacturing Code
WW : Work Week

ORDERING INFORMATION

ORDERING INFORMATION

JOC852(Y)(Z)-GV

JOC – Company Abbr.
852 – Part Number
Y – Lead Form Option (M/S/SL/SLM/None)
Z – Tape and Reel Option (T1/T2)
G – Green
V – VDE Option (V or None)

LABEL INFORMATION

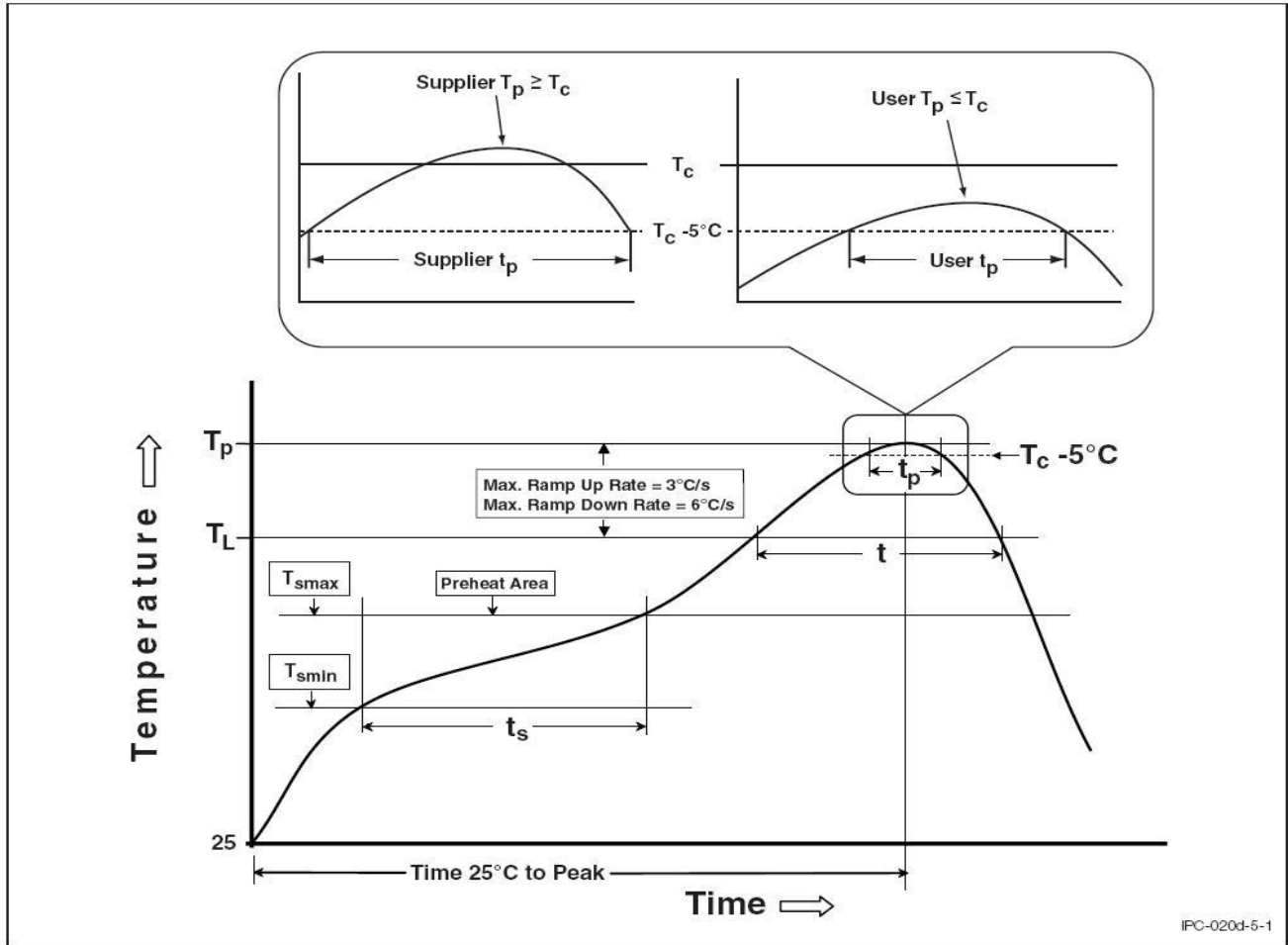


Packing Quantity

| Option | Quantity | Quantity – Inner box | Quantity – Outer box |
|---------|-----------------|----------------------|-------------------------------------|
| None | 100 Units/Tube | 32 Tubes/Inner box | 10 Inner box/Outer box = 32k Units |
| M | 100 Units/Tube | 28 Tubes/Inner box | 10 Inner box/Outer box = 28k Units |
| S(T1) | 1500 Units/Reel | 3 Reels/Inner box | 5 Inner box/Outer box = 22.5k Units |
| S(T2) | 1500 Units/Reel | 3 Reels/Inner box | 5 Inner box/Outer box = 22.5k Units |
| S(T3) | 1000 Units/Reel | 3 Reels/Inner box | 5 Inner box/Outer box = 15k Units |
| S(T4) | 1000 Units/Reel | 3 Reels/Inner box | 5 Inner box/Outer box = 15k Units |
| SL(T1) | 1500 Units/Reel | 3 Reels/Inner box | 5 Inner box/Outer box = 22.5k Units |
| SL(T2) | 1500 Units/Reel | 3 Reels/Inner box | 5 Inner box/Outer box = 22.5k Units |
| SL(T3) | 1000 Units/Reel | 3 Reels/Inner box | 5 Inner box/Outer box = 15k Units |
| SL(T4) | 1000 Units/Reel | 3 Reels/Inner box | 5 Inner box/Outer box = 15k Units |
| SLM(T1) | 1000 Units/Reel | 3 Reels/Inner box | 5 Inner box/Outer box = 15k Units |
| SLM(T2) | 1000 Units/Reel | 3 Reels/Inner box | 5 Inner box/Outer box = 15k Units |

REFLOW INFORMATION

REFLOW PROFILE



IPC-020d-5-1

| Profile Feature | Sn-Pb Assembly Profile | Pb-Free Assembly Profile |
|---------------------------------|------------------------|--------------------------|
| Temperature Min. (Tsmin) | 100 | 150°C |
| Temperature Max. (Tsmax) | 150 | 200°C |
| 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°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. |

DISCLAIMER

- JIEJIE is continually improving the quality, reliability, function and design. JIEJIE reserves the right to make changes without further notices.
- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
- JIEJIE makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, JIEJIE disclaims (a) any and all liability arising out of the application or use of any product, (b) any and all liability, including without limitation special, consequential or incidental damages, and (c) any and all implied warranties, including warranties of fitness for particular
- The products shown in this publication are designed for the general use in electronic applications such as office automation, equipment, communications devices, audio/visual equipment, electrical application and instrumentation purpose, non-infringement and merchantability.
- This product is not intended to be used for military, aircraft, automotive, medical, life sustaining or lifesaving applications or any other application which can result in human injury or death.
- Please contact JIEJIE 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 JIEJIE'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.