

Description

The PS2501-1 series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar phototransistor detector in a plastic 4Pin package with different lead forming options.

With the robust coplanar double mold structure, PS2501-1 series provide the most stable isolation feature.

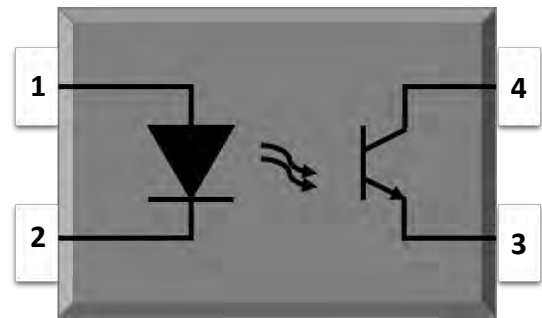
Features

- High isolation 5300 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- Operating temperature range - 55 °C to 110 °C
- RoHS & REACH Compliance
- MSL class 1
- Halogen free (Optional)
- Regulatory Approvals
 - UL - UL1577
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC - GB4943.1, GB8898
 - cUL- CSA Component Acceptance Service Notice No. 5A

Applications

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

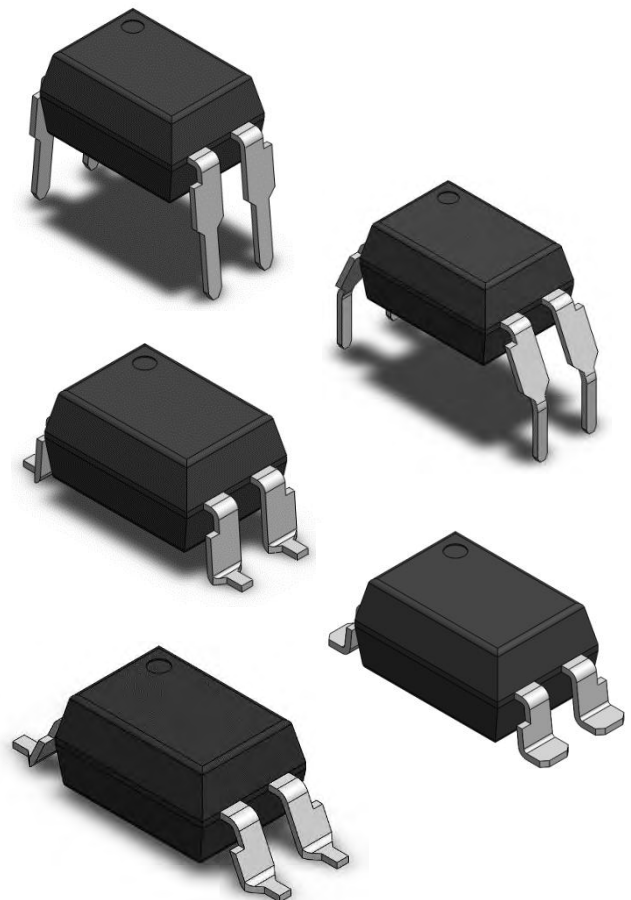
SCHEMATIC

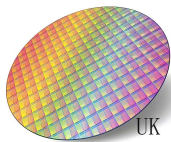


PIN DEFINITION

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} | 35 | V | |
| Emitter - Collector Voltage | V_{ECO} | 6 | V | |
| Collector Current | I_C | 50 | 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} | -55~110 | °C | |
| Storage Temperature | T_{stg} | -55~125 | °C | |
| Soldering Temperature | T_{sol} | 260 | °C | |

Note 1. 100µs pulse, 100Hz frequency

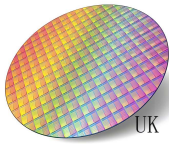
Note 2. AC For 1 Minute, R.H. = 40 ~ 60%

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 | μA | VR=6V | |
| Input Capacitance | C _{in} | - | 10 | - | pF | V=0, f=1kHz | |
| OUTPUT | | | | | | | |
| Collector Dark Current | I _{CEO} | - | - | 100 | nA | VCE=20V, IF=0 | |
| Collector-Emitter Breakdown Voltage | BV _{CEO} | 35 | - | - | V | IC=0.1mA, IF=0 | |
| Emitter-Collector Breakdown Voltage | BV _{ECO} | 6 | - | - | V | IE=0.1mA, IF=0 | |
| TRANSFER CHARACTERISTICS | | | | | | | |
| Current Transfer Ratio | 2501-1 | CTR | 80 | - | 600 | % | IF=5mA, VCE=5V |
| | 2501-1GR | | 100 | - | 300 | | |
| | 2501-1L | | 200 | - | 400 | | |
| | | | - | - | - | | |
| | | | - | - | - | | |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | - | 0.06 | 0.2 | V | IF=20mA, IC=1mA | |
| Isolation Resistance | R _{ISO} | 10 ¹² | 10 ¹⁴ | - | Ω | DC500V, 40 ~ 60% R.H. | |
| Floating Capacitance | C _{IO} | - | 0.4 | 1 | pF | V=0, f=1MHz | |
| Response Time (Rise) | t _r | - | 3 | 18 | μs | VCE=2V, IC=2mA | 3 |
| Response Time (Fall) | t _f | - | 4 | 18 | μs | RL=100Ω | 3 |
| Cut-off Frequency | f _c | - | 80 | - | kHz | VCE=2V, IC=2mA RL=100Ω, -3dB | 4 |

Note 3. Fig.12&13

Note 4. Fig.14



CHARACTERISTIC CURVES

Fig.1 Forward Current vs. Ambient Temperature

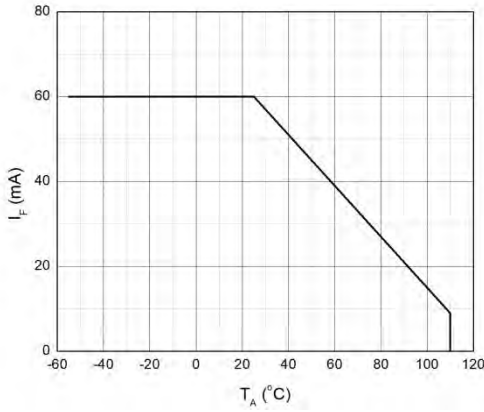


Fig.2 Collector Power Dissipation vs. Ambient Temperature

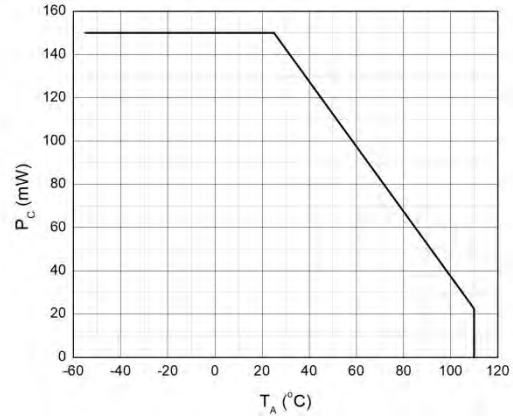


Fig.3 Forward Current vs. Forward Voltage

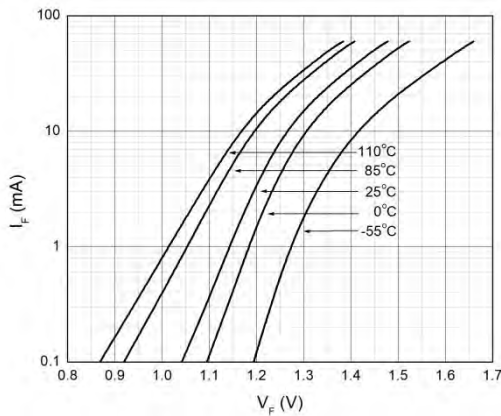


Fig.4 Collector Dark Current vs. Ambient Temperature

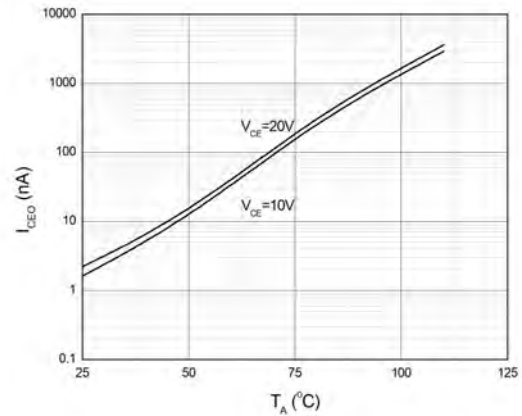


Fig.5 Collector Current vs. Collector-emitter Voltage

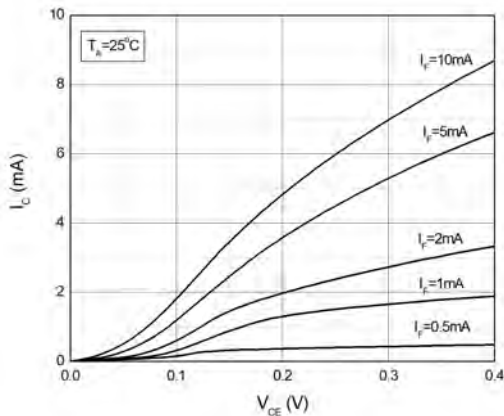
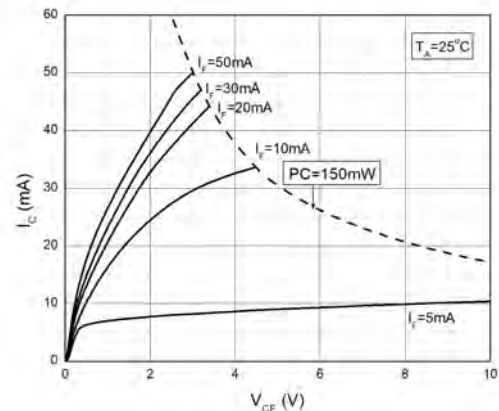


Fig.6 Collector Current vs. Collector-emitter Voltage



CHARACTERISTIC CURVES

Fig.7 Normalized Current Transfer Ratio vs. Forward Current

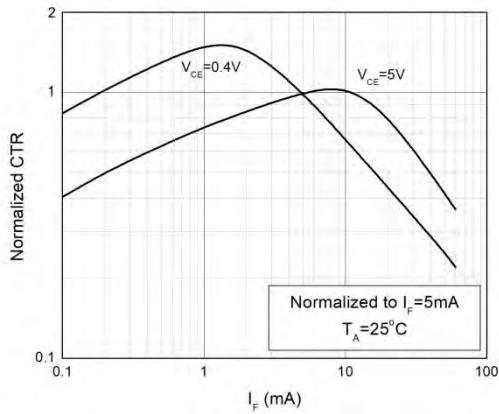


Fig.8 Normalized Current Transfer Ratio vs. Ambient Temperature

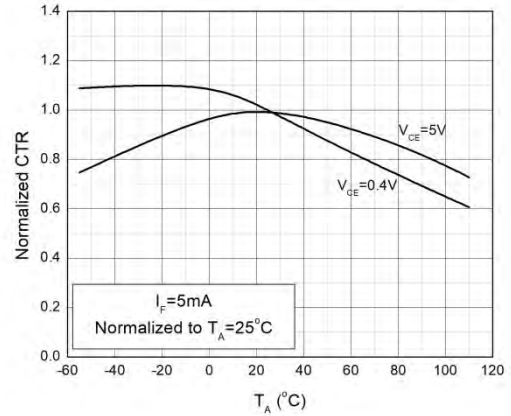


Fig.9 Collector-emitter Saturation Voltage vs. Ambient Temperature

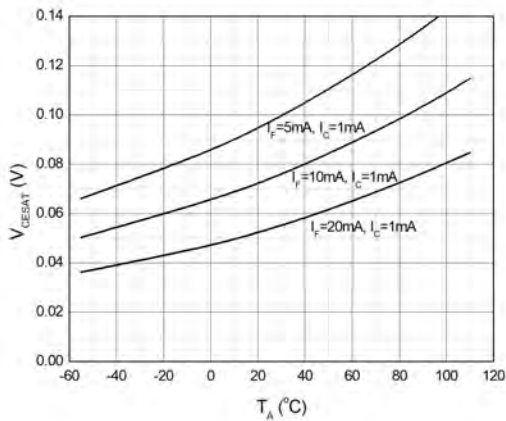


Fig.10 Switching Time vs. Load Resistance

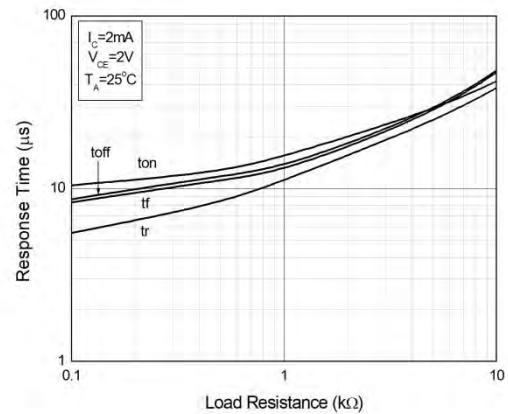
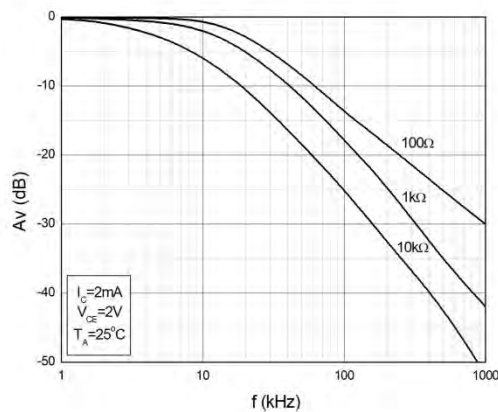
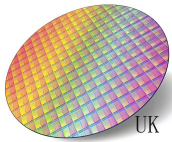


Fig.11 Frequency Response





TEST CIRCUITS

Fig.12 Test Circuits of Response Time

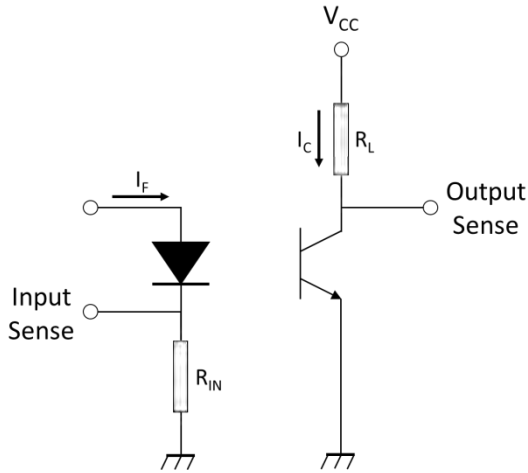


Fig.13 Curves of Response Time

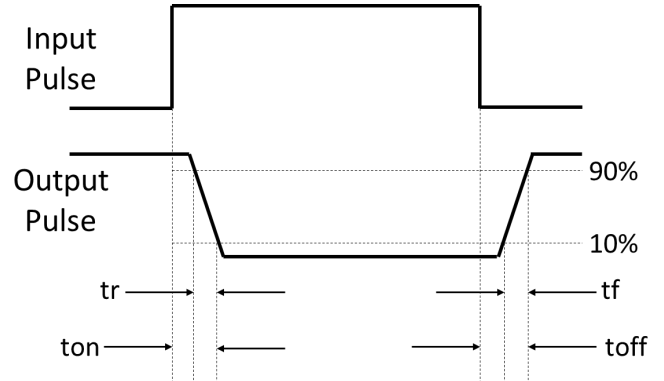
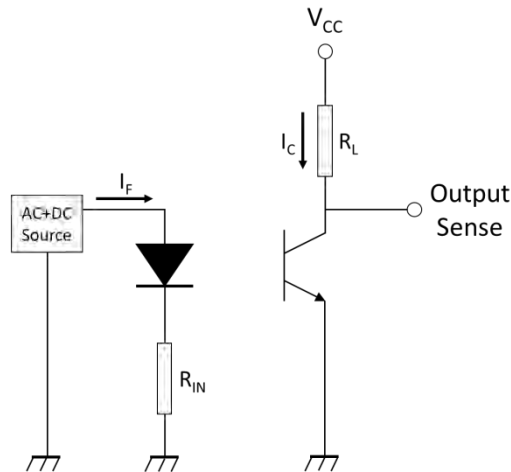
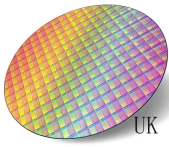


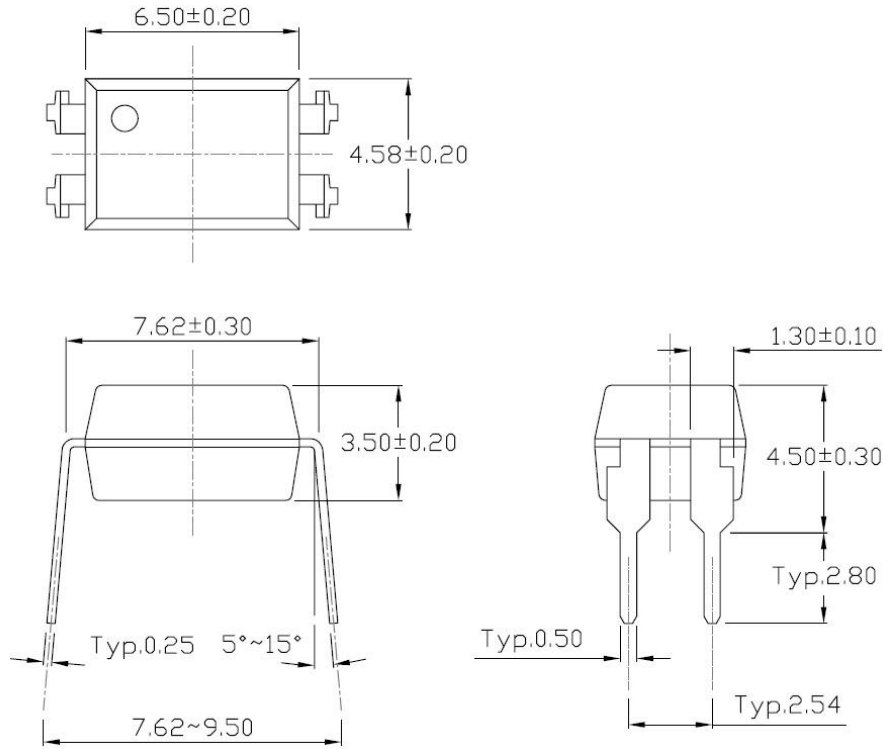
Fig.14 Test Circuits of Frequency Response



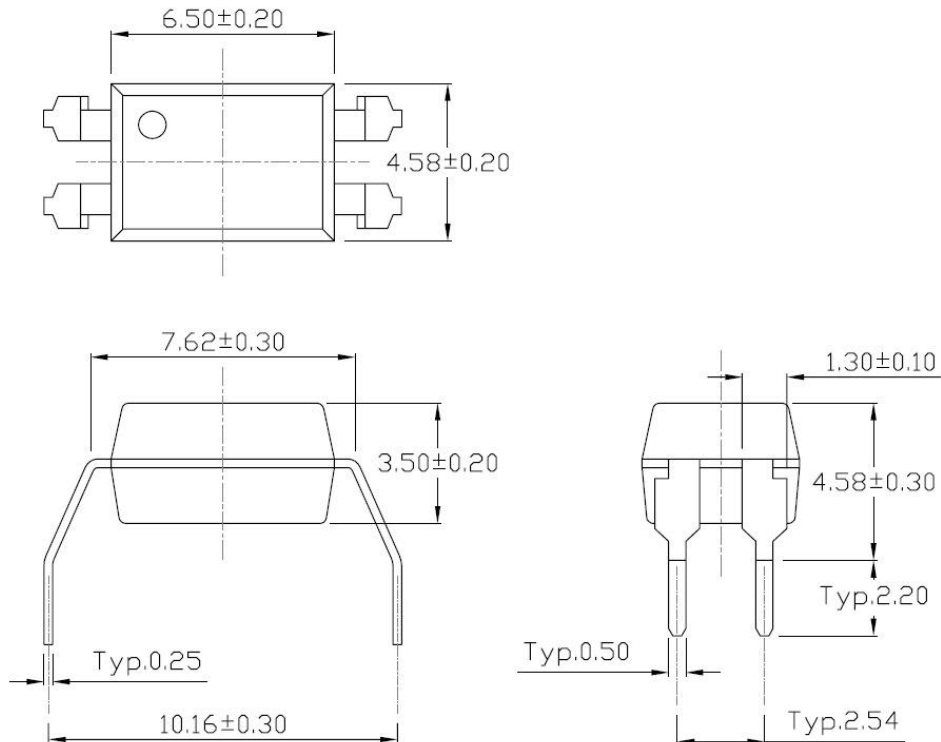


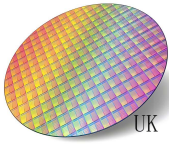
PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Standard DIP – Through Hole (DIP Type)



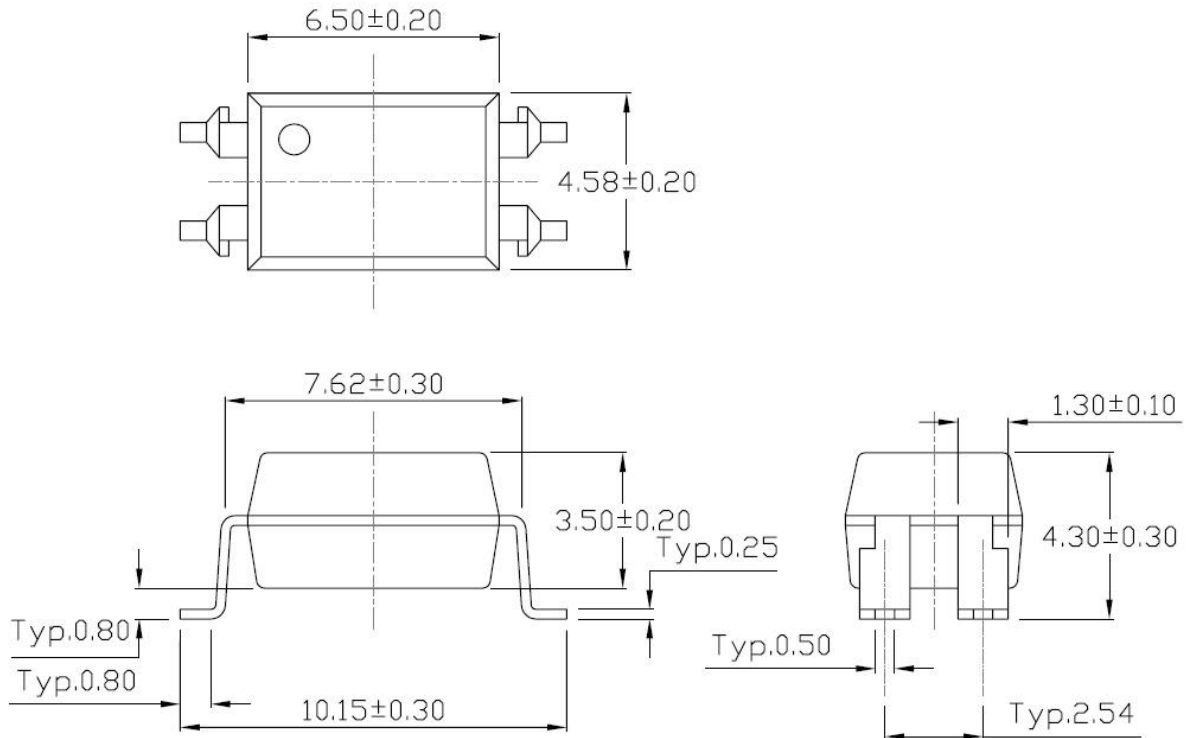
Gullwing (400mil) Lead Forming – Through Hole (M Type)



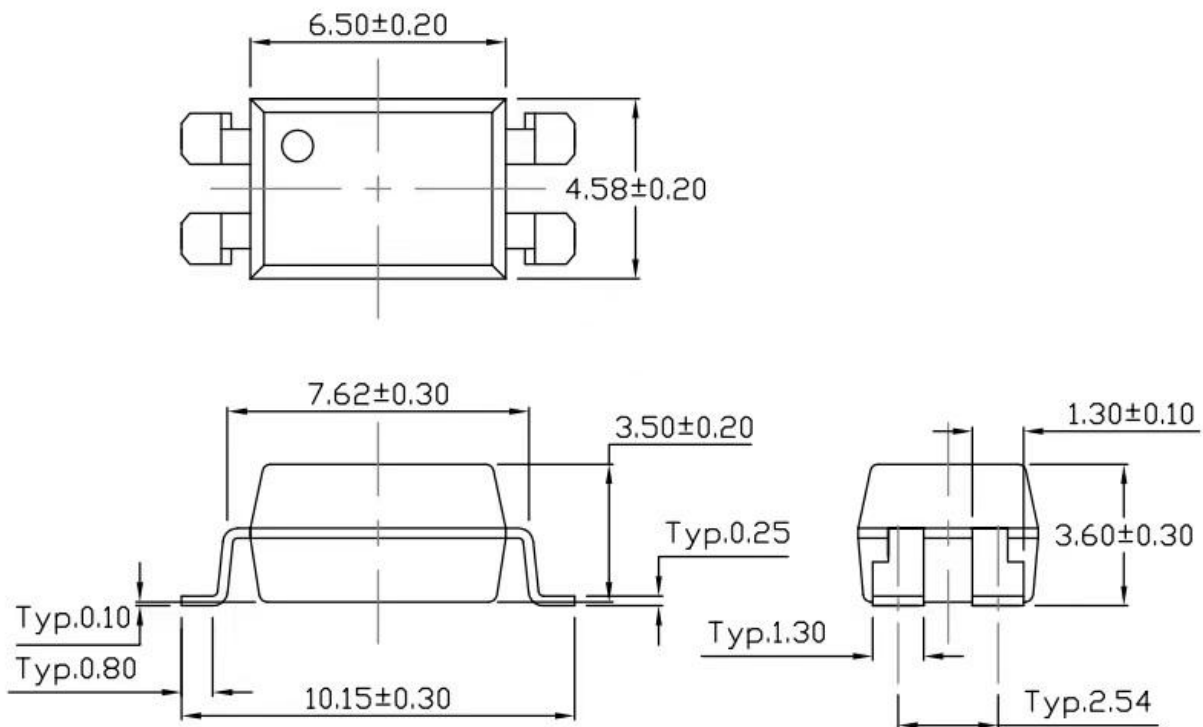


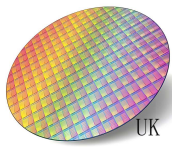
PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming (S Type)



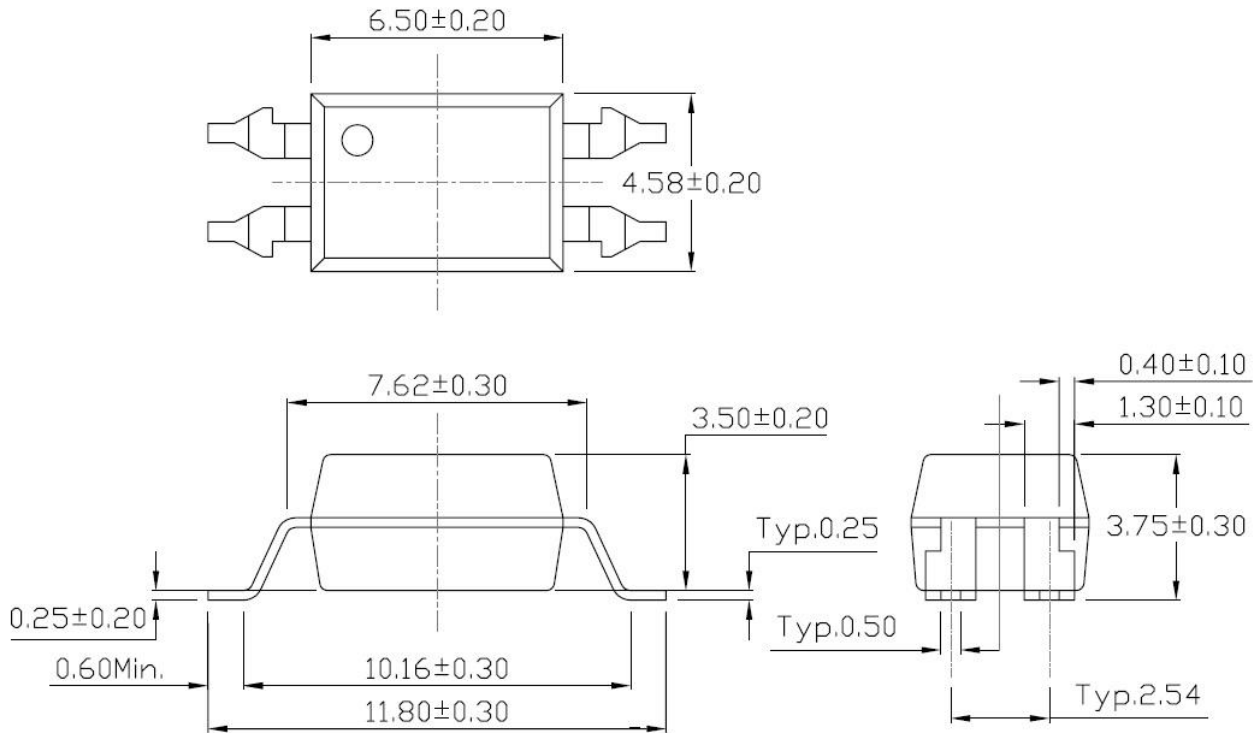
Surface Mount (Low Profile) Lead Forming (SM Type)





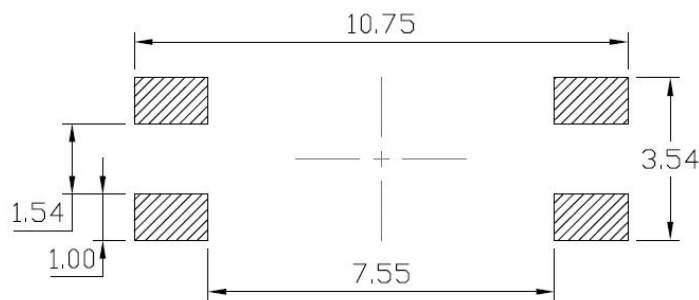
PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Surface Mount (Gullwing) Lead Forming (SLM Type)

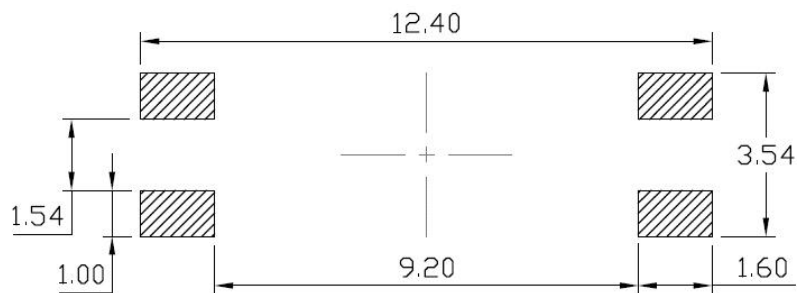


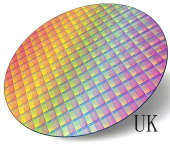
RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)

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



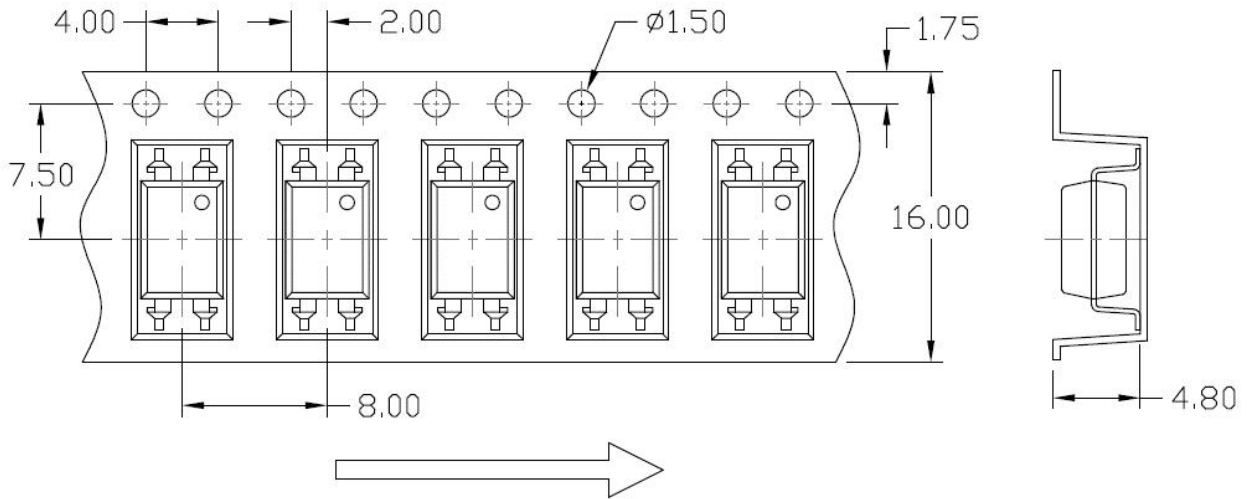
Surface Mount (Gullwing) Lead Forming



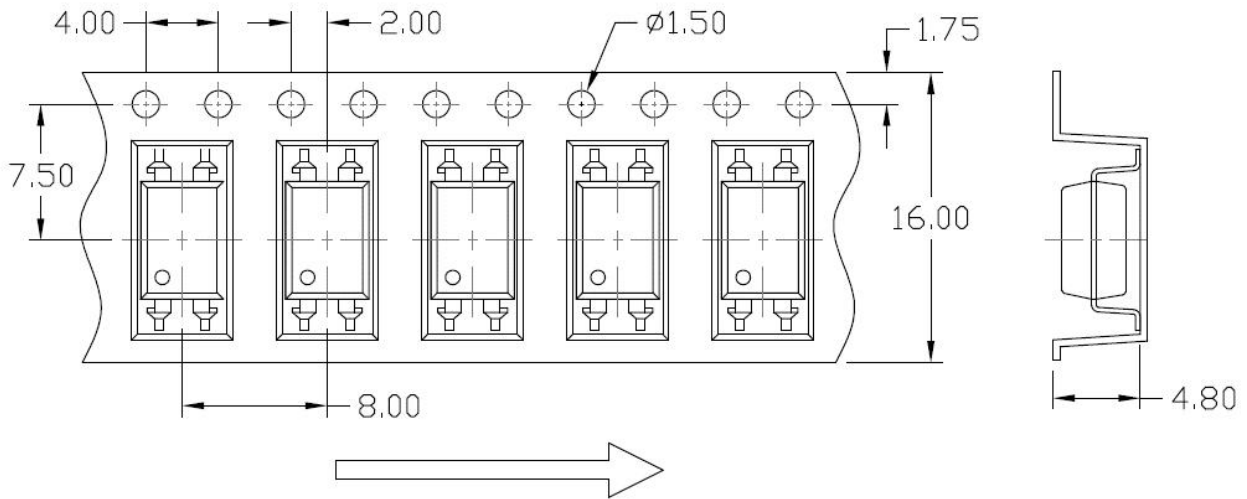


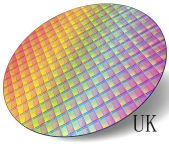
CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S(T1) & SM(T1)



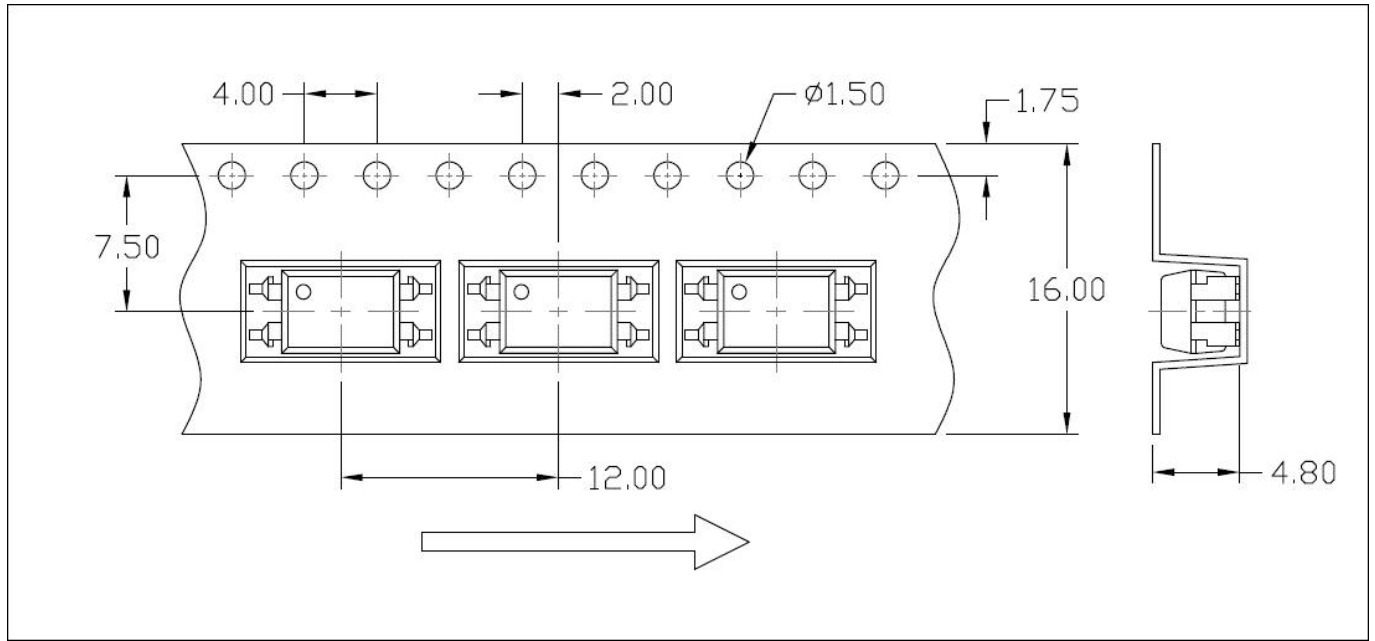
Option S(T2) & SM(T2)



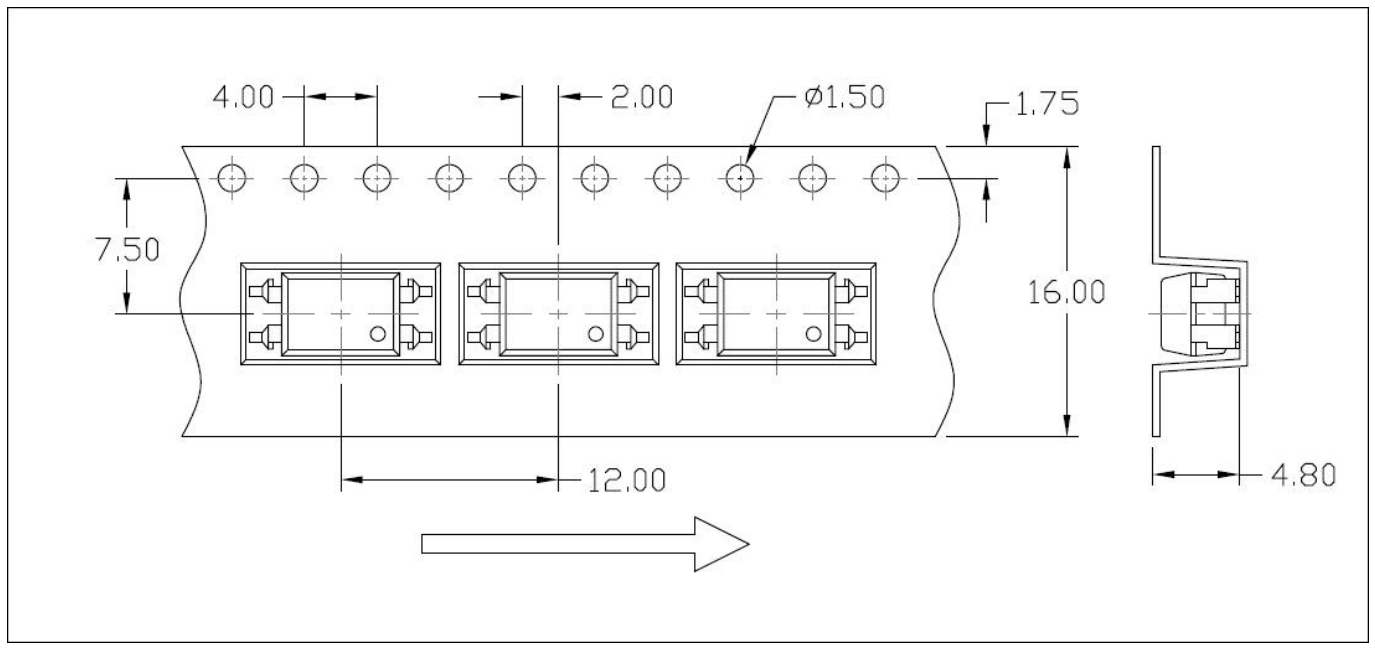


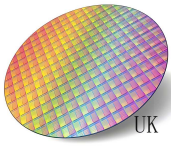
CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S(T3) & SM(T3)



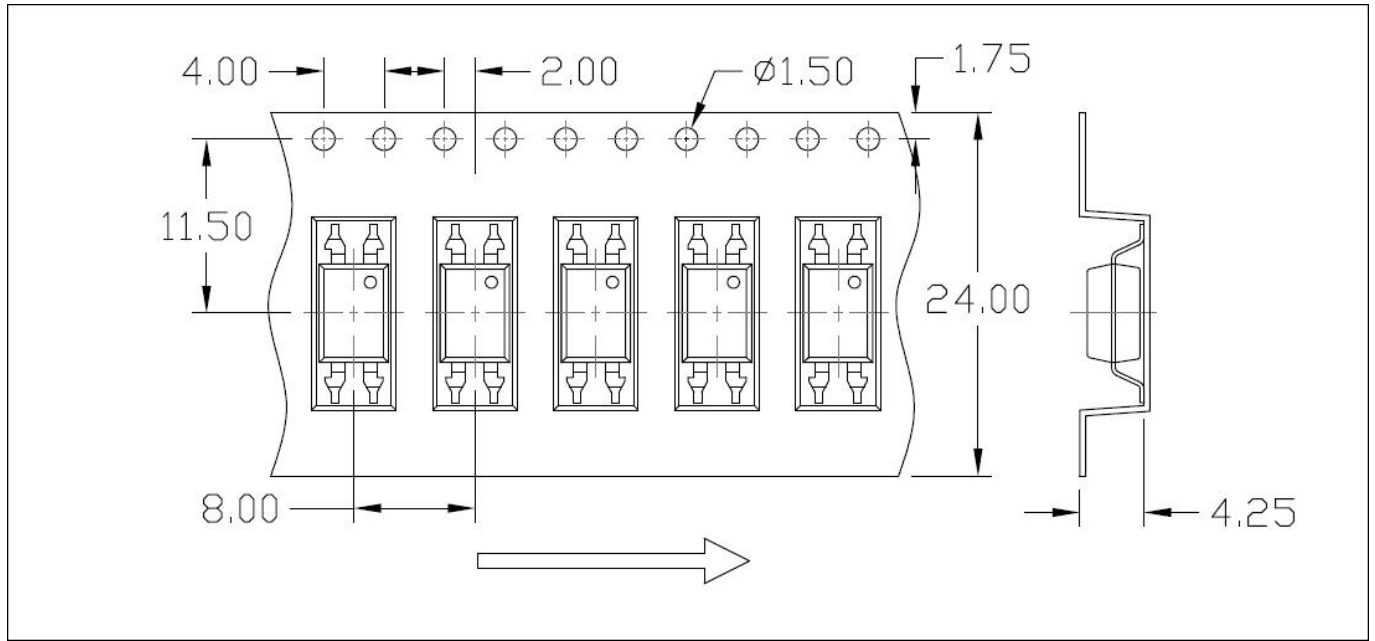
Option S(T4) & SM(T4)



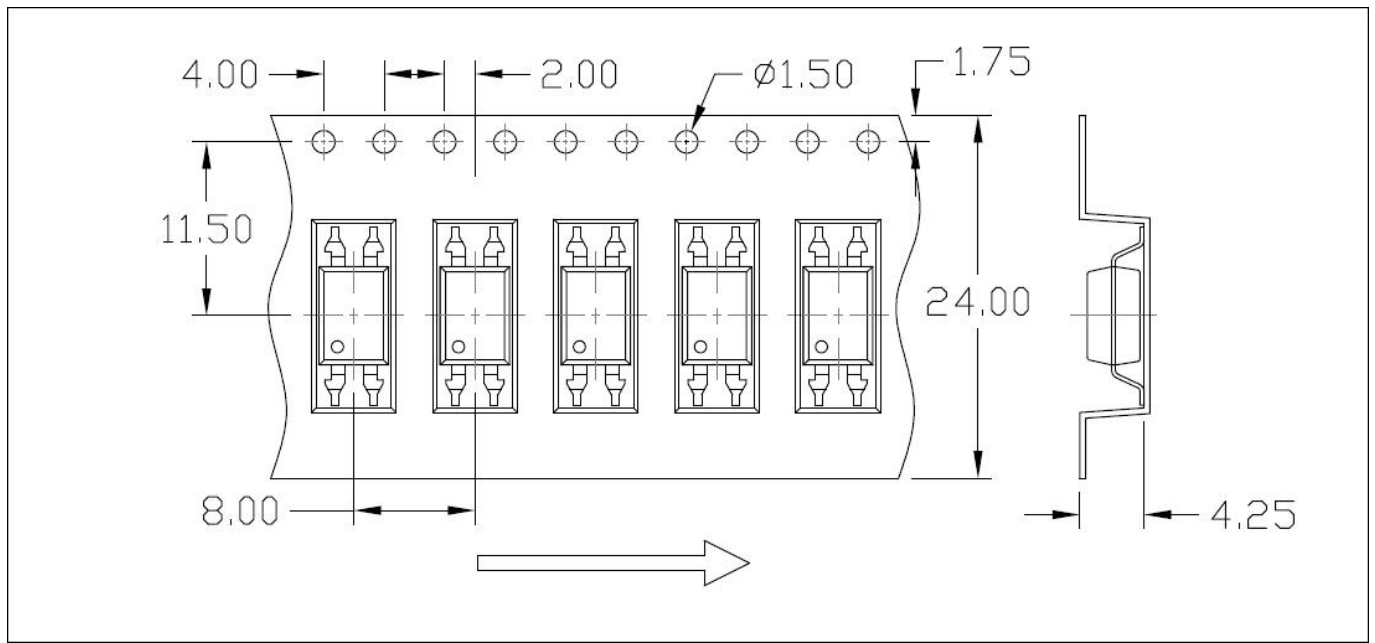


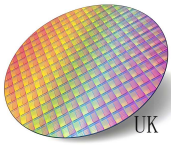
CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option SLM(T1)



Option SLM(T2)





ORDERING AND MARKING INFORMATION

MARKING INFORMATION



2501-1 : Part Number
X : CTR Rank
/ : Company Abbr.
YY : Year
WW : Work Week
EE : Manufacturing Code

ORDERING INFORMATION

LABEL INFORMATION

PS2501-1(XXX)(L)(T&R)

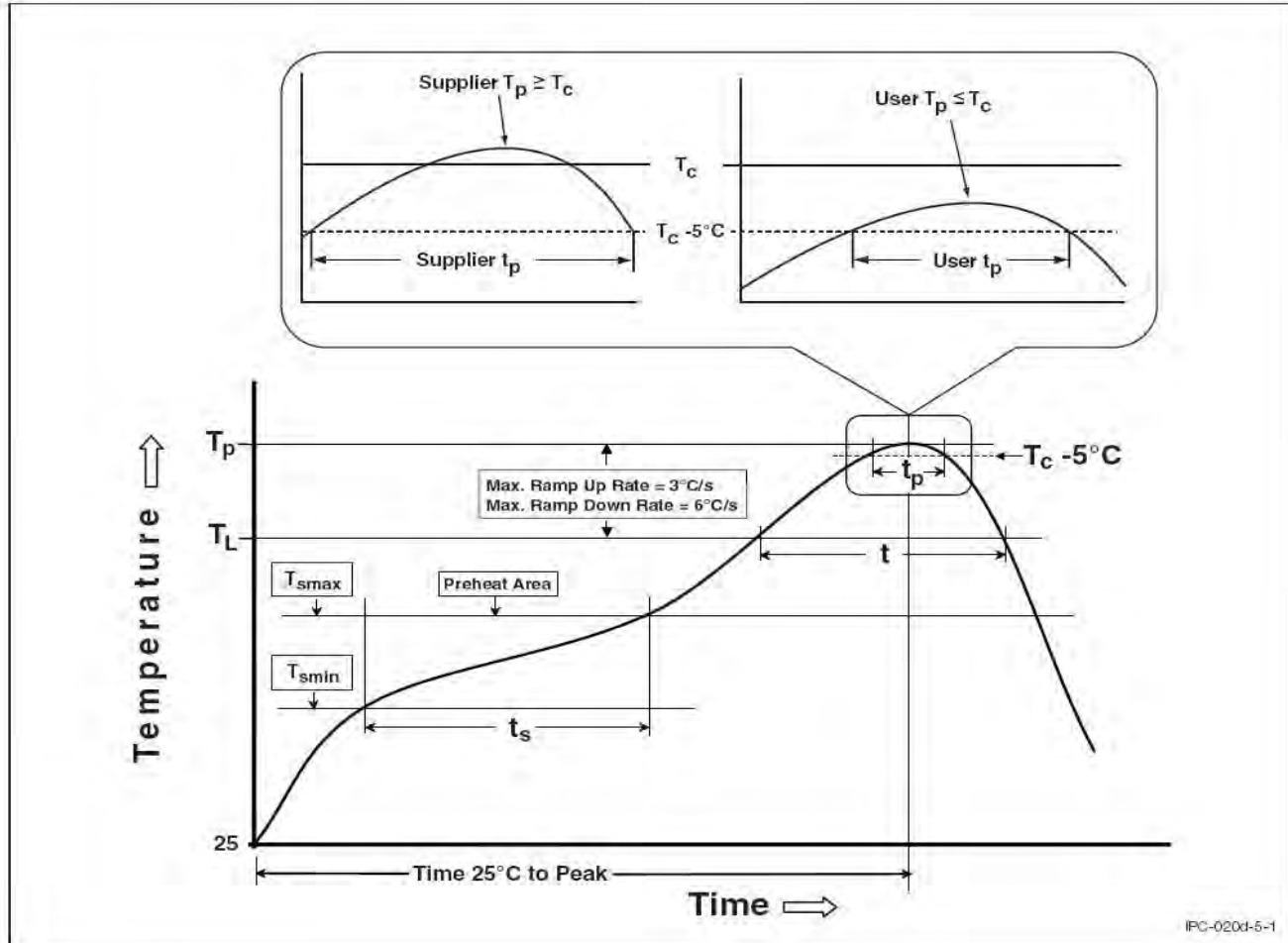
PS2501-1 – Part Number
 XXX – Rank (None/xGR/xBL/xGB)
 L – Lead Form Option (M/S/SM/SLM/None)
 T&R – Tape and Reel Option (T1/T2/T3/T4)

Packing Quantity

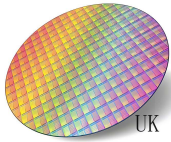
| Option | Quantity | Quantity – Inner box | Quantity – Outer box |
|---------|-----------------|----------------------|------------------------------------|
| None | 100 Units/Tube | 20 Tubes/Inner box | 10 Inner box/Outer box = 20k Units |
| M | 100 Units/Tube | 20 Tubes/Inner box | 10 Inner box/Outer box = 20k Units |
| S(T1) | 2000 Units/Reel | 2 Reels/Inner box | 5 Inner box/Outer box = 20k Units |
| S(T2) | 2000 Units/Reel | 2 Reels/Inner box | 5 Inner box/Outer box = 20k Units |
| S(T3) | 1000 Units/Reel | 2 Reels/Inner box | 5 Inner box/Outer box = 10k Units |
| S(T4) | 1000 Units/Reel | 2 Reels/Inner box | 5 Inner box/Outer box = 10k Units |
| SM(T1) | 2000 Units/Reel | 2 Reels/Inner box | 5 Inner box/Outer box = 20k Units |
| SM(T2) | 2000 Units/Reel | 2 Reels/Inner box | 5 Inner box/Outer box = 20k Units |
| SM(T3) | 1000 Units/Reel | 2 Reels/Inner box | 5 Inner box/Outer box = 10k Units |
| SM(T4) | 1000 Units/Reel | 2 Reels/Inner box | 5 Inner box/Outer box = 10k Units |
| SLM(T1) | 2000 Units/Reel | 2 Reels/Inner box | 5 Inner box/Outer box = 20k Units |
| SLM(T2) | 2000 Units/Reel | 2 Reels/Inner box | 5 Inner box/Outer box = 20k Units |

REFLOW INFORMATION

REFLOW PROFILE



| Profile Feature | Sn-Pb Assembly Profile | Pb-Free Assembly Profile |
|---|------------------------|--------------------------|
| Temperature Min. (T _{smin}) | 100 | 150°C |
| Temperature Max. (T _{smax}) | 150 | 200°C |
| Time (t _s) from (T _{smin} to T _{smax}) | 60-120 seconds | 60-120 seconds |
| Ramp-up Rate (t _L to t _P) | 3°C/second max. | 3°C/second max. |
| Liquidous Temperature (T _L) | 183°C | 217°C |
| Time (t _L) Maintained Above (T _L) | 60 – 150 seconds | 60 – 150 seconds |
| Peak Body Package Temperature | 235°C +0°C / -5°C | 260°C +0°C / -5°C |
| Time (t _P) within 5°C of 260°C | 20 seconds | 30 seconds |
| Ramp-down Rate (T _P to T _L) | 6°C/second max | 6°C/second max |
| Time 25°C to Peak Temperature | 6 minutes max. | 8 minutes max. |



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- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
- ASG 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, ASG 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
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- 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 ASG sales agent for special application request.
- Immerge unit's body in solder paste is not recommended.
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