

N-Channel Logic Level Enhancement Mode MOSFET

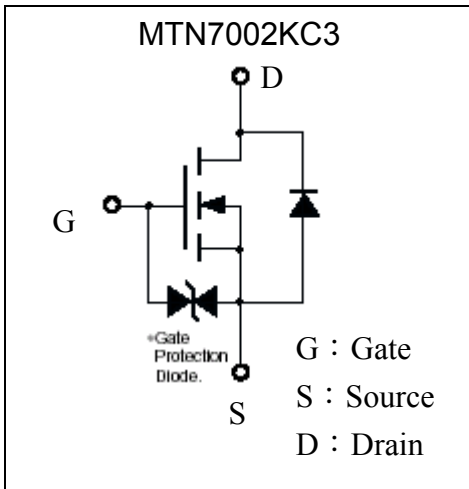
MTN7002KC3

| | |
|--|-----------|
| BV _{DSS} | 60V |
| I _D | 230mA |
| R _{DS(on)} @V _{GS} =10V | 1.2Ω typ. |
| R _{DS(on)} @V _{GS} =4.5V | 1.8Ω typ. |

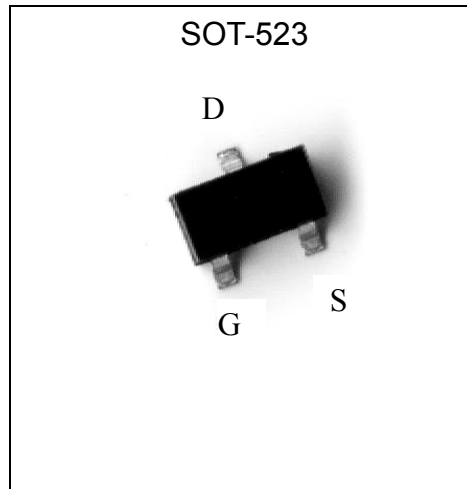
Features

- Low on-resistance
- High ESD
- High speed switching
- Low-voltage drive
- Easily designed drive circuits
- Easy to use in parallel
- Pb-free lead plating and halogen-free package

Symbol

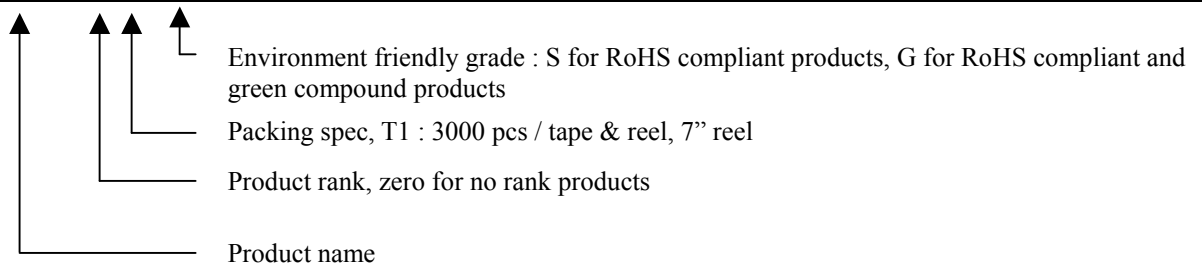


Outline



Ordering Information

| Device | Package | Shipping |
|-------------------|--|------------------------|
| MTN7002KC3-0-T1-G | SOT-523 (Pb-free lead plating and halogen-free package) | 3000 pcs / Tape & Reel |





Absolute Maximum Ratings (Ta=25°C)

| Parameter | | Symbol | Limits | Unit |
|--------------------------------------|------------|------------------|----------|------|
| Drain-Source Voltage | | V _{DSS} | 60 | V |
| Gate-Source Voltage | | V _{GSS} | ±20 | |
| Drain Current | Continuous | I _D | 230 | mA |
| | Pulsed | I _{DP} | 800 *1 | |
| Drain Reverse Current | Continuous | I _{DR} | 230 | |
| | Pulsed | I _{DRP} | 800 *1 | |
| Total Power Dissipation | | P _D | 150 *2 | mW |
| ESD susceptibility | | V _{ESD} | 1550 *3 | V |
| Operating Junction Temperature Range | | T _J | -55~+150 | °C |
| Storage Temperature Range | | T _{stg} | -55~+150 | |

Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|---|------------------|--------|------|
| Thermal Resistance, Junction to Ambient | R _{θJA} | 833 *2 | °C/W |

Note : *1. Pulse Width ≤ 300μs, Duty cycle ≤ 2%

*2. When the device is mounted on a glass epoxy board with area measuring 1×0.75×0.62 inch

*3. Human body model, 1.5kΩ in series with 100pF

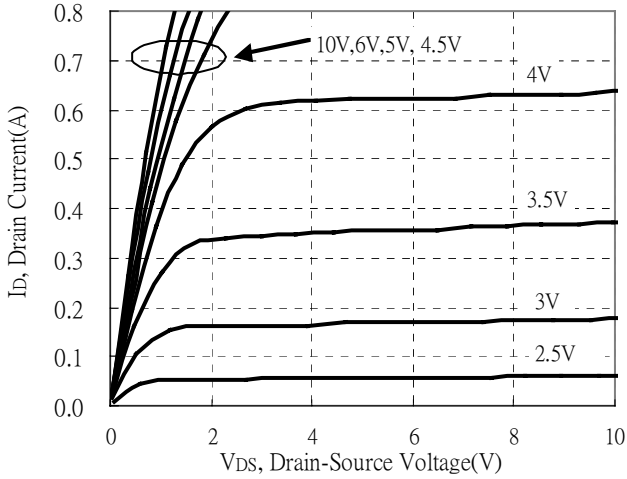
Electrical Characteristics (Ta=25°C)

| Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|-----------------------|------|------|------|------|--|
| BV _{DSS} * | 60 | - | - | V | V _{GS} =0V, I _D =10μA |
| V _{GS(th)} | 1 | 1.6 | 2.5 | | V _{DS} =V _{GS} , I _D =250μA |
| I _{GSS} | - | - | ±10 | μA | V _{GS} =±20V, V _{DS} =0V |
| I _{DSS} | - | - | 1 | | V _{DS} =60V, V _{GS} =0V |
| R _{DS(ON)} * | - | 1.2 | 2.5 | Ω | I _D =500mA, V _{GS} =10V |
| | - | 1.8 | 3 | | I _D =100mA, V _{GS} =4.5V |
| G _{FS} | 100 | 240 | - | mS | V _{DS} =10V, I _D =100mA |
| C _{iss} | - | 30.6 | - | pF | V _{DS} =10V, V _{GS} =0V, f=1MHz |
| C _{oss} | - | 5.5 | - | | |
| C _{rss} | - | 4 | - | | |
| t _{d(ON)} | - | 3 | - | ns | V _{DS} =30V, I _D =200mA, V _{GS} =10V, R _G =6Ω |
| t _r | - | 5 | - | | |
| t _{d(OFF)} | - | 14 | - | | |
| t _f | - | 9 | - | | |
| Q _g | - | 1.1 | - | nC | V _{DS} =30V, I _D =200mA, V _{GS} =10V |
| Q _{gs} | - | 0.1 | - | | |
| Q _{gd} | - | 0.23 | - | | |

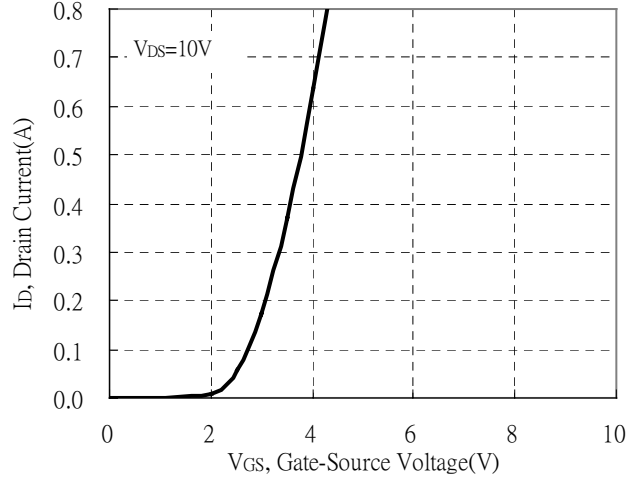
*Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%

Typical Characteristics

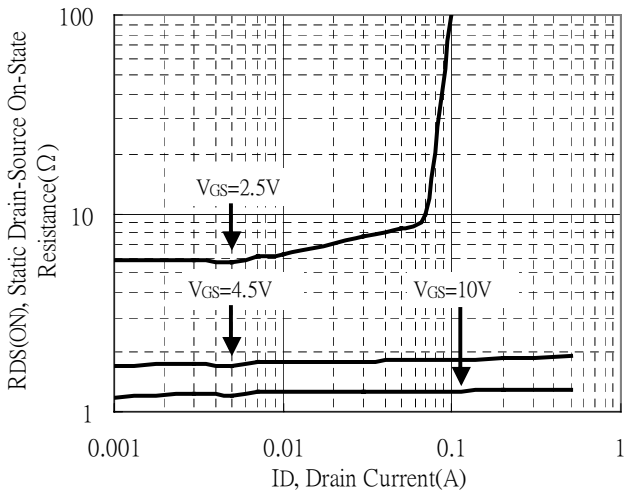
Typical Output Characteristics



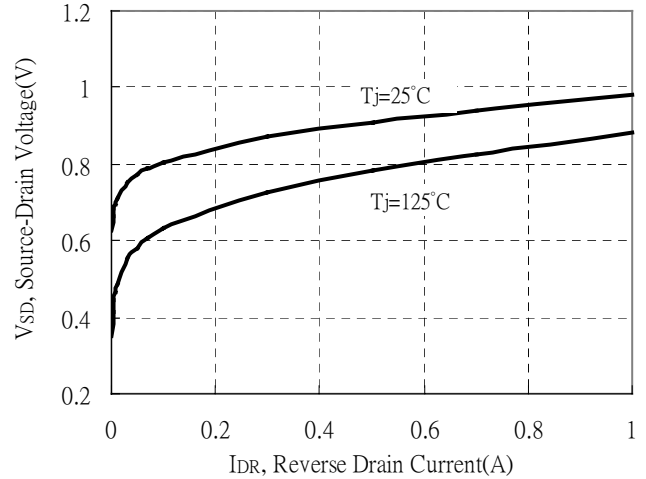
Typical Transfer Characteristics



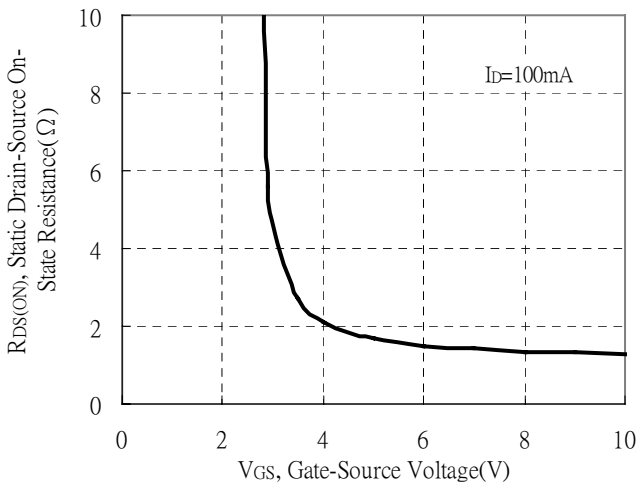
Static Drain-Source On-State resistance vs Drain Current



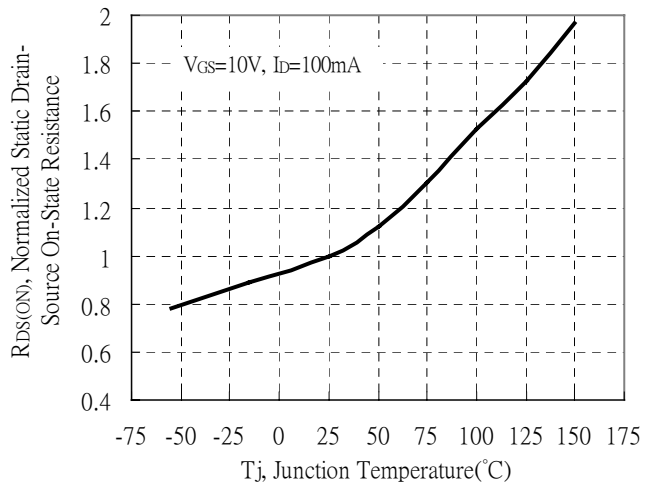
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage



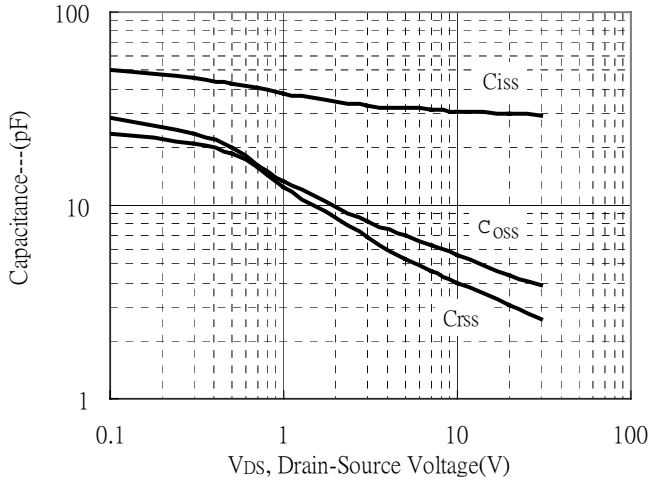
Drain-Source On-State Resistance vs Junction Temperature



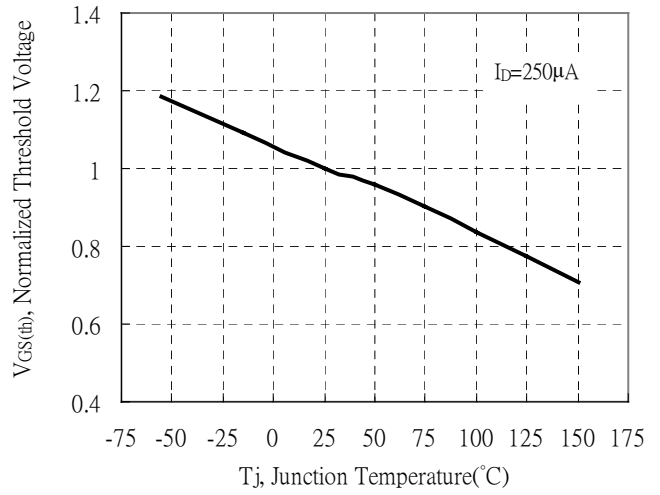


Typical Characteristics(Cont.)

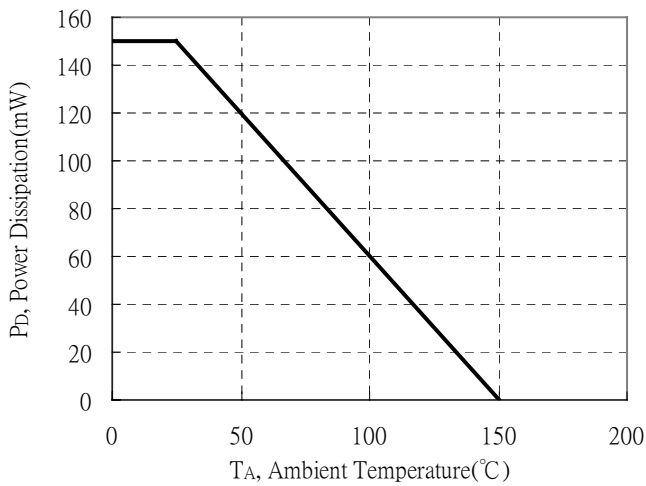
Capacitance vs Drain-to-Source Voltage



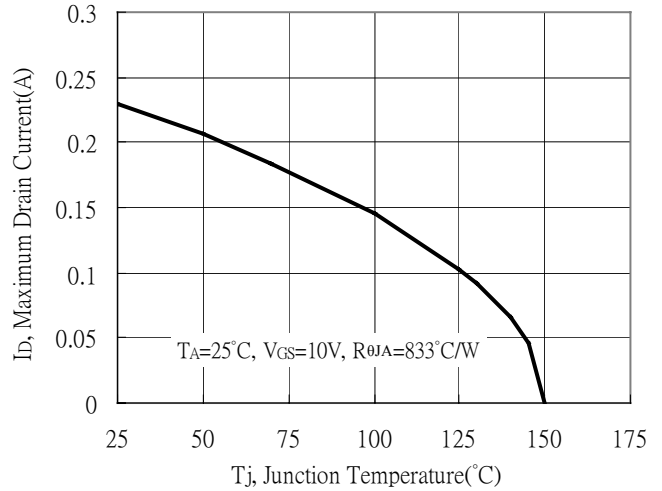
Threshold Voltage vs Junction Temperature



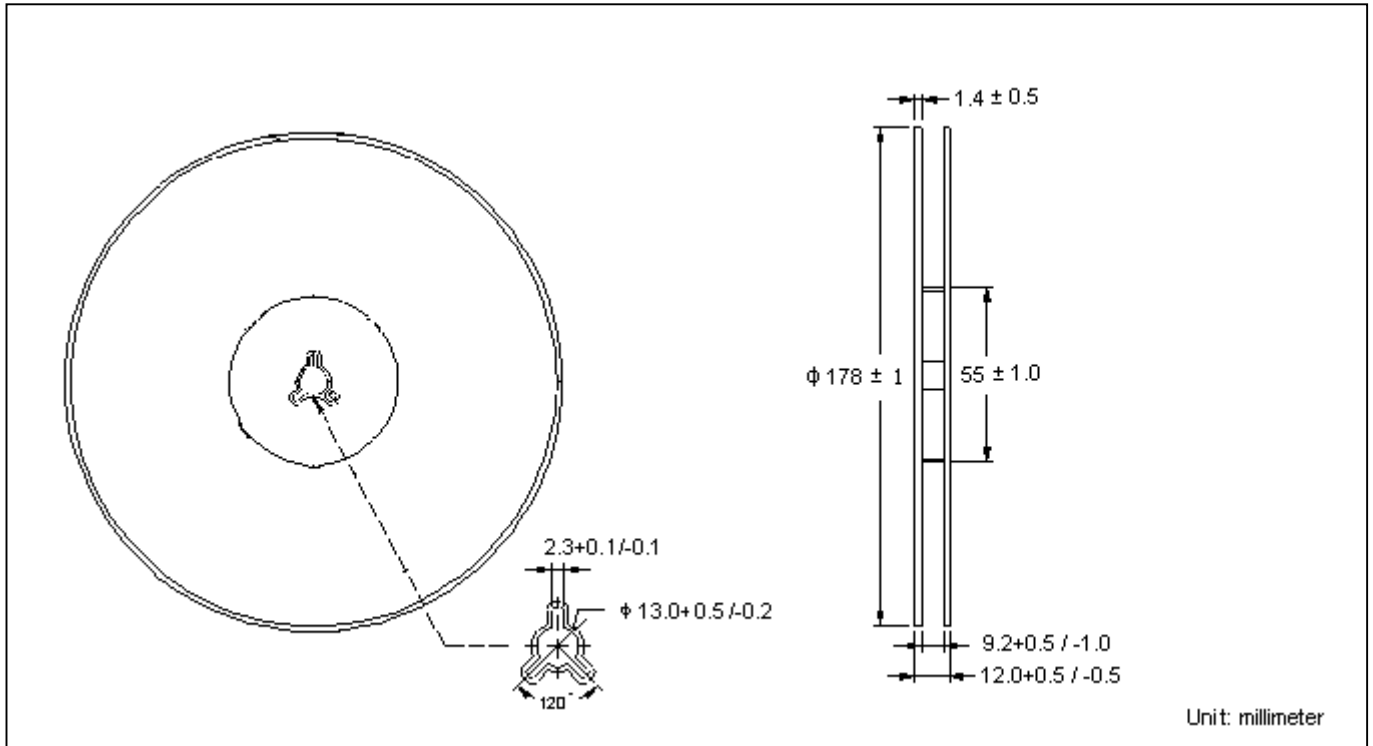
Power Derating Curve



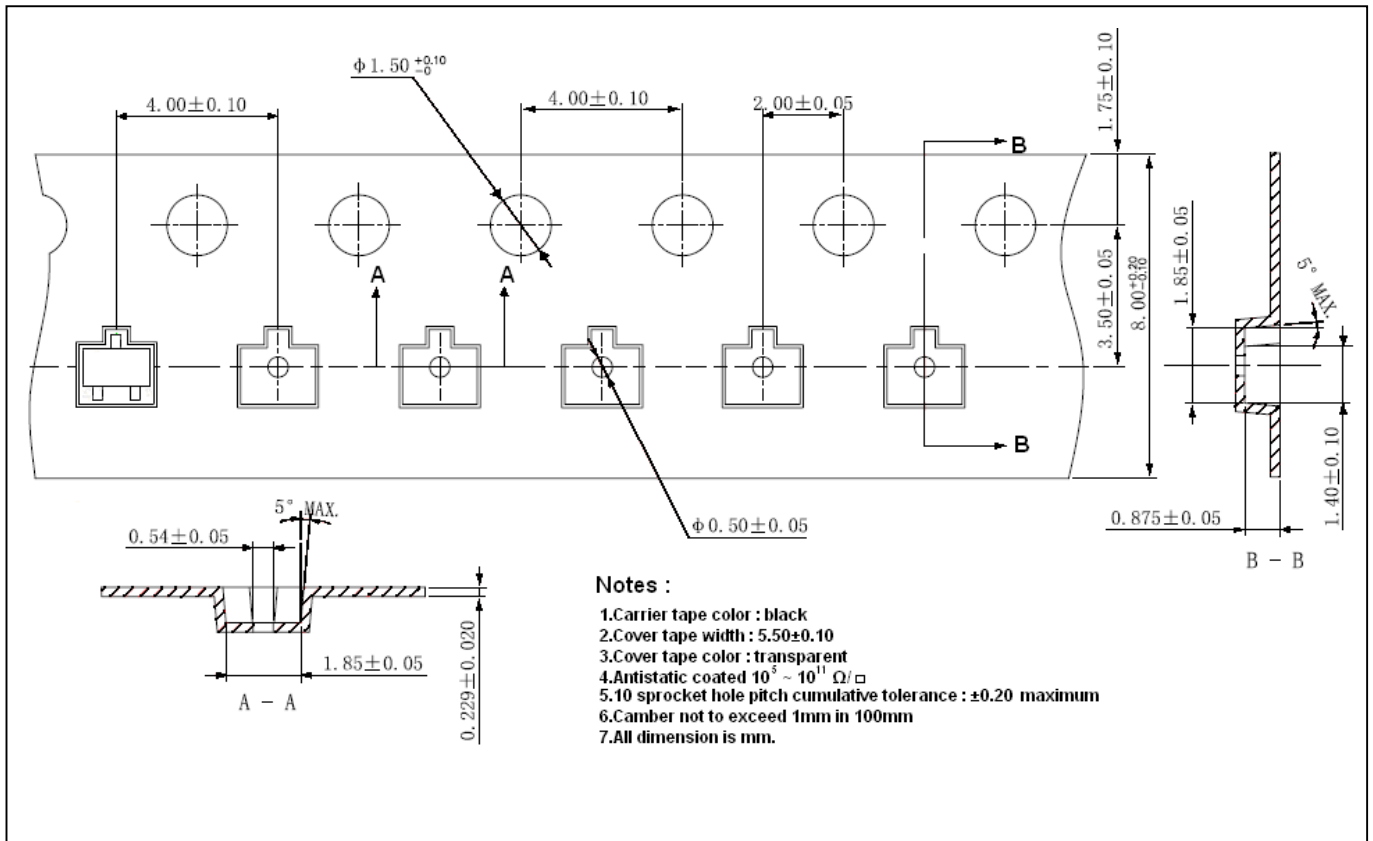
Maximum Drain Current vs Junction Temperature



Reel Dimension



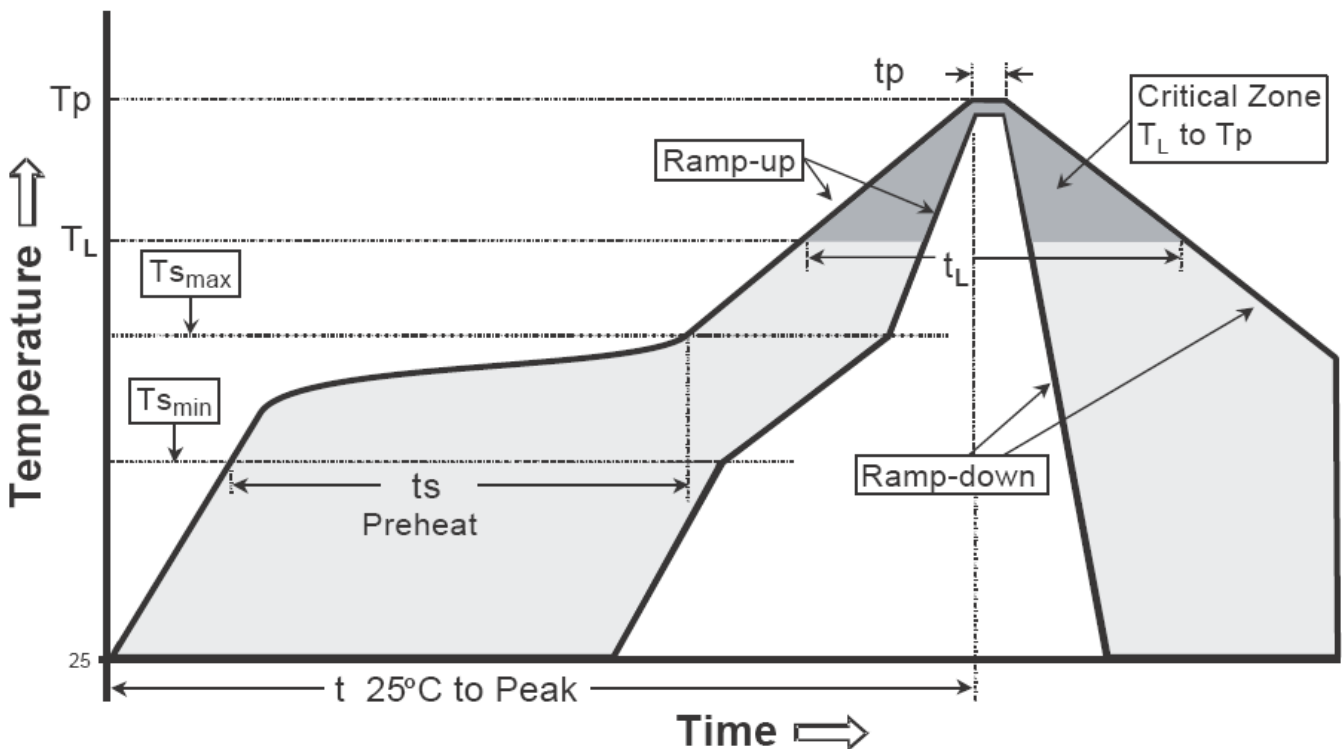
Carrier Tape Dimension



Recommended wave soldering condition

| | | |
|-----------------|------------------|-----------------|
| Product | Peak Temperature | Soldering Time |
| Pb-free devices | 260 +0/-5 °C | 5 +1/-1 seconds |

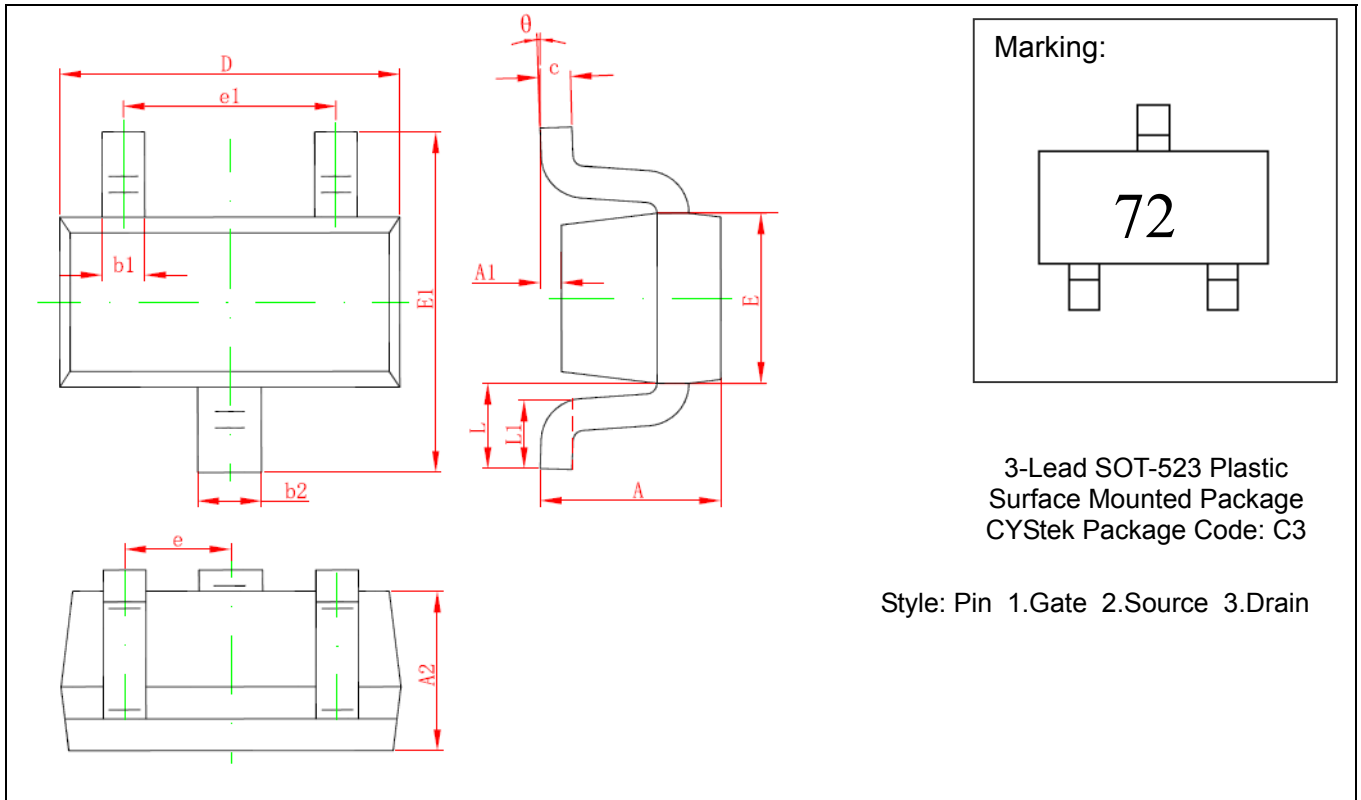
Recommended temperature profile for IR reflow



| Profile feature | Sn-Pb eutectic Assembly | Pb-free Assembly |
|--|-------------------------|------------------|
| Average ramp-up rate (Tsmax to Tp) | 3°C/second max. | 3°C/second max. |
| Preheat | | |
| -Temperature Min(Ts min) | 100°C | 150°C |
| -Temperature Max(Ts max) | 150°C | 200°C |
| -Time(ts min to ts max) | 60-120 seconds | 60-180 seconds |
| Time maintained above: | | |
| -Temperature (Tl) | 183°C | 217°C |
| - Time (tl) | 60-150 seconds | 60-150 seconds |
| Peak Temperature(Tp) | 240 +0/-5 °C | 260 +0/-5 °C |
| Time within 5°C of actual peak temperature(tp) | 10-30 seconds | 20-40 seconds |
| Ramp down rate | 6°C/second max. | 6°C/second max. |
| Time 25 °C to peak temperature | 6 minutes max. | 8 minutes max. |

Note : All temperatures refer to topside of the package, measured on the package body surface.

SOT-523 Dimension



| DIM | Millimeters | | Inches | | DIM | Millimeters | | Inches | |
|-----|-------------|-------|--------|-------|-----|-------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.900 | 0.028 | 0.035 | E | 0.700 | 0.900 | 0.028 | 0.035 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 | E1 | 1.450 | 1.750 | 0.057 | 0.069 |
| A2 | 0.700 | 0.800 | 0.028 | 0.031 | e | 0.500 | TYP | 0.020 | TYP |
| b1 | 0.150 | 0.250 | 0.006 | 0.010 | e1 | 0.900 | 1.100 | 0.035 | 0.043 |
| b2 | 0.250 | 0.350 | 0.010 | 0.014 | L | 0.400 | REF | 0.016 | REF |
| c | 0.100 | 0.200 | 0.004 | 0.008 | L1 | 0.260 | 0.460 | 0.010 | 0.018 |
| D | 1.500 | 1.700 | 0.059 | 0.067 | θ | 0° | 8° | 0° | 8° |

Notes: 1.Controlling dimension: millimeters.
 2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
 3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: Pure tin plated
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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