

N-CHANNEL MOSFET

MTN2328M3

| | |
|---|--------------------|
| BV_{DSS} | 100V |
| I_D | 3A |
| R_{DS(on)}@V_{GS}=10V, I_D=3A | 130mΩ (typ) |
| R_{DS(on)}@V_{GS}=4.5V, I_D=3A | 136mΩ (typ) |

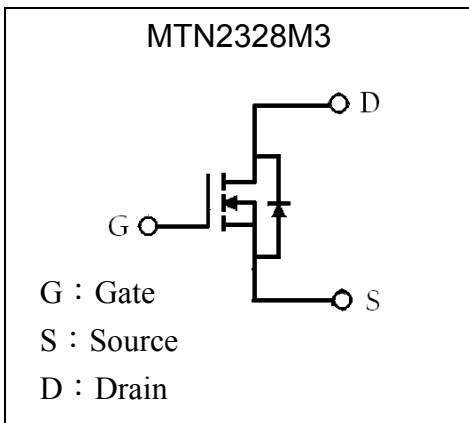
Description

The MTN2328M3 is a N-channel enhancement-mode MOSFET.

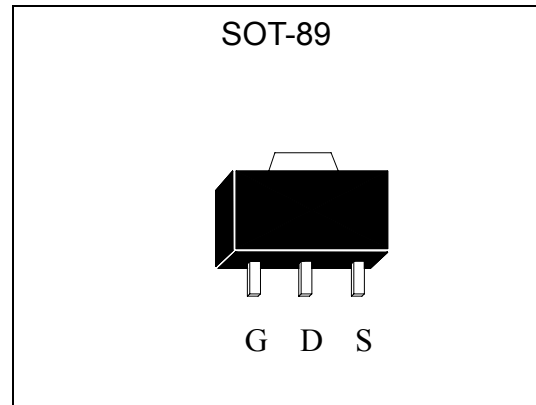
Features

- Low on-resistance
- High speed switching
- Low-voltage drive
- Easily designed drive circuits
- Pb-free lead plating package

Symbol



Outline



Absolute Maximum Ratings (Ta=25°C)

| Parameter | Symbol | Limits | Unit |
|---|-----------------------------------|----------|------|
| Drain-Source Voltage | V _{DSS} | 100 | V |
| Gate-Source Voltage | V _{GSS} | ±20 | V |
| Continuous Drain Current @V _{GS} =10V, T _A =25°C | I _D | 3 | A |
| Continuous Drain Current @V _{GS} =10V, T _A =100°C | I _D | 1.9 | A |
| Pulsed Drain Current | I _{DM} | 12 *1 | A |
| Total Power Dissipation | P _D | 2.1 *2 | W |
| Operating Junction and Storage Temperature Range | T _j ; T _{stg} | -55~+150 | °C |

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

*2. When the device is surface mounted on 1 in² copper pad of FR-4 board with 2 oz. copper.



Thermal Performance

| Parameter | Symbol | Limit | Unit |
|---|--------|-------|------|
| Thermal Resistance, Junction-to-Ambient | Rth,ja | 60 | °C/W |

Note : Surface mounted on 1 in² copper pad of FR-4 board.

Electrical Characteristics (Ta=25°C)

| Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---------------------------|------|------|------|------|--|
| Static | | | | | |
| BV _{DSS} * | 100 | - | - | V | V _{GS} =0, I _D =10μA |
| V _{GS(th)} | 1 | 1.8 | 2.5 | V | V _{DS} =V _{GS} , I _D =250μA |
| I _{GSS} | - | - | ±100 | nA | V _{GS} =±20V, V _{DS} =0 |
| I _{DSS} | - | - | 1 | μA | V _{DS} =100V, V _{GS} =0 |
| R _{DSON} * | - | 130 | 150 | mΩ | I _D =3A, V _{GS} =10V |
| | - | 136 | 160 | | I _D =3A, V _{GS} =4.5V |
| G _{FS} | - | 5 | - | S | V _{DS} =10V, I _D =3A |
| Dynamic | | | | | |
| C _{iss} | - | 1188 | - | pF | V _{DS} =25V, V _{GS} =0, f=1MHz |
| C _{oss} | - | 30 | - | | |
| C _{rss} | - | 17 | - | | |
| td(ON) | - | 7 | - | ns | V _{DS} =50V, I _D =3A, V _{GS} =10V, R _{GEN} =6Ω |
| tr | - | 3.2 | - | | |
| td(OFF) | - | 29 | - | | |
| tf | - | 5 | - | | |
| Qg | - | 18.4 | - | nC | V _{DS} =50V, I _D =3A, V _{GS} =10V |
| Qgs | - | 4 | - | | |
| Qgd | - | 7.5 | - | | |
| Source-Drain Diode | | | | | |
| *I _S | - | - | 3 | A | |
| *I _{SM} | - | - | 12 | | |
| *V _{SD} | - | - | 1.2 | V | V _{GS} =0V, I _S =3A |
| *trr | - | 45 | - | ns | I _F =3A, dI _F /dt=100A/μs |
| *Qrr | - | 70 | - | nC | |

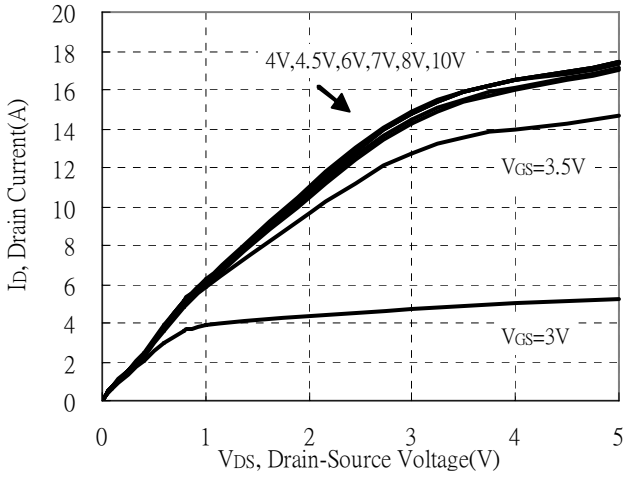
*Pulse Test : Pulse Width ≤380μs, Duty Cycle ≤2%

Ordering Information

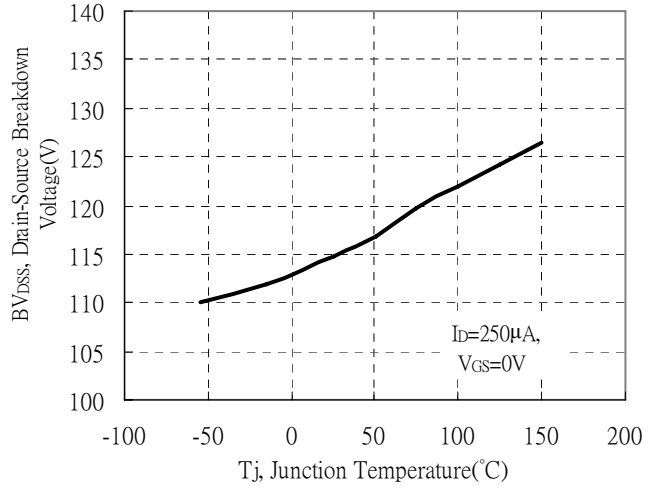
| Device | Package | Shipping | Marking |
|-----------|--|------------------------|---------|
| MTN2328M3 | SOT-89 (Pb-free lead plating package) | 1000 pcs / Tape & Reel | 2328 |

Typical Characteristics

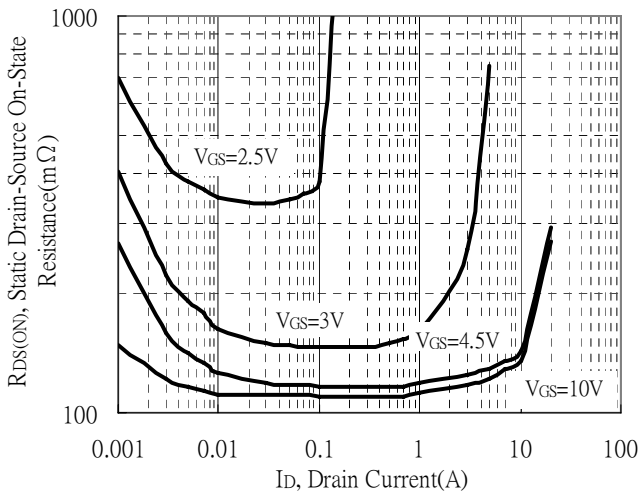
Typical Output Characteristics



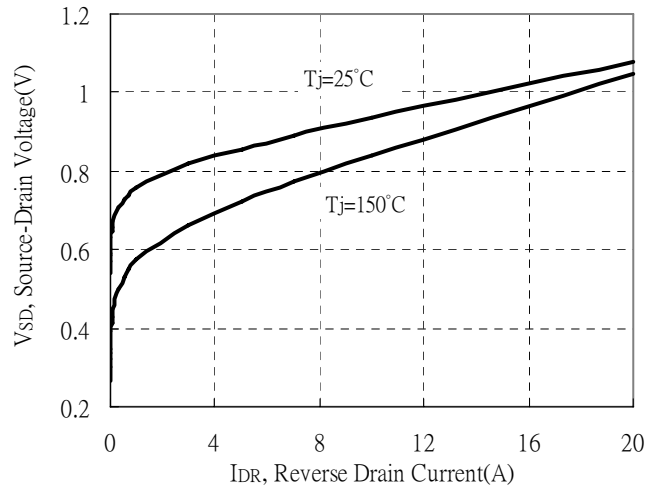
Breakdown Voltage vs Ambient Temperature



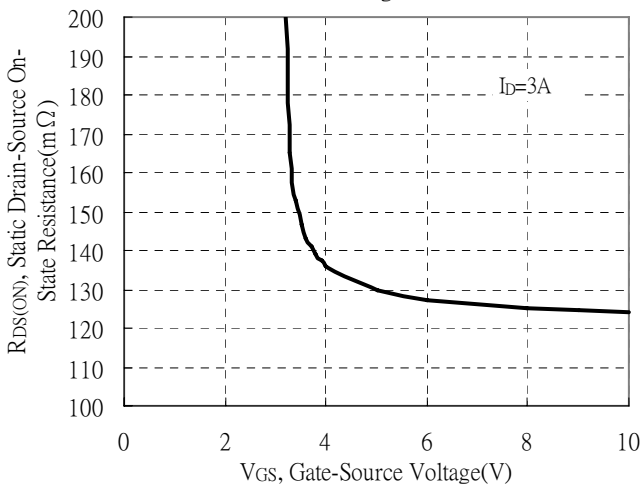
Static Drain-Source On-State resistance vs Drain Current



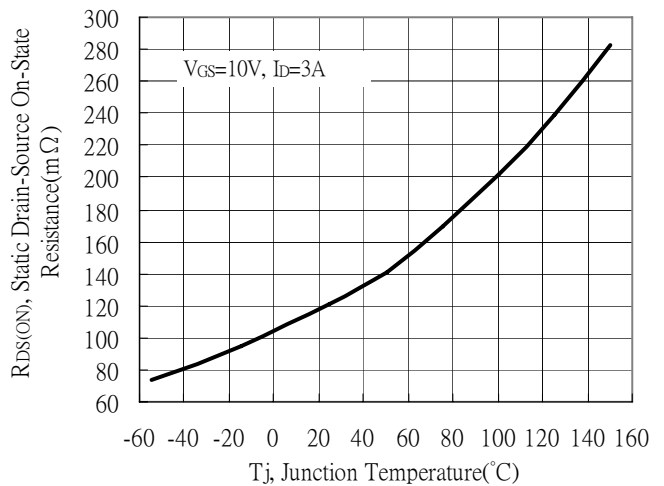
Reverse Drain Current vs Source-Drain Voltage



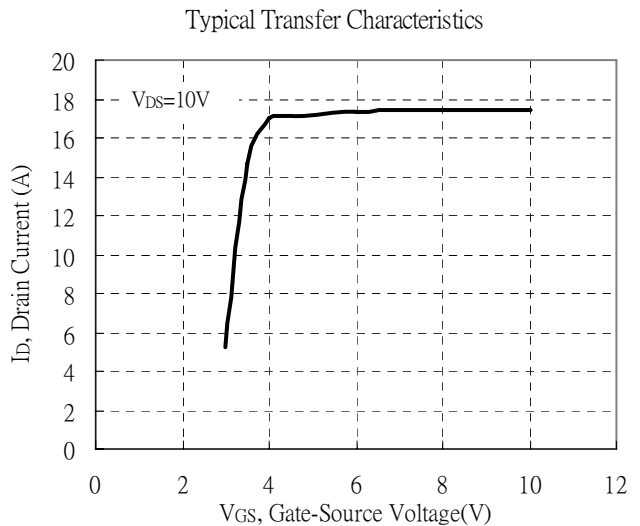
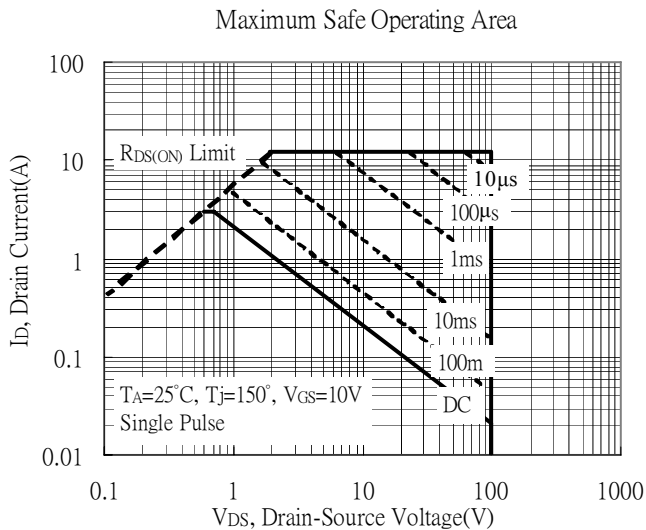
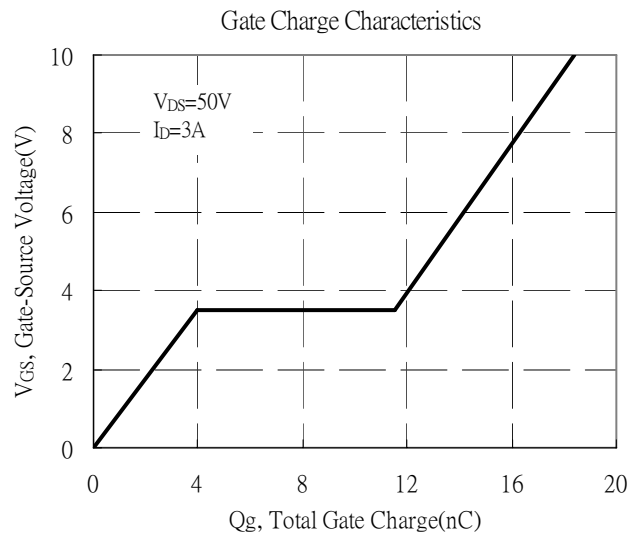
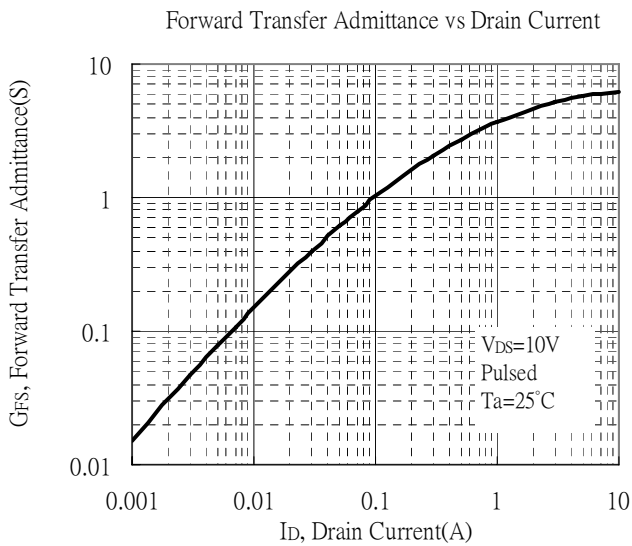
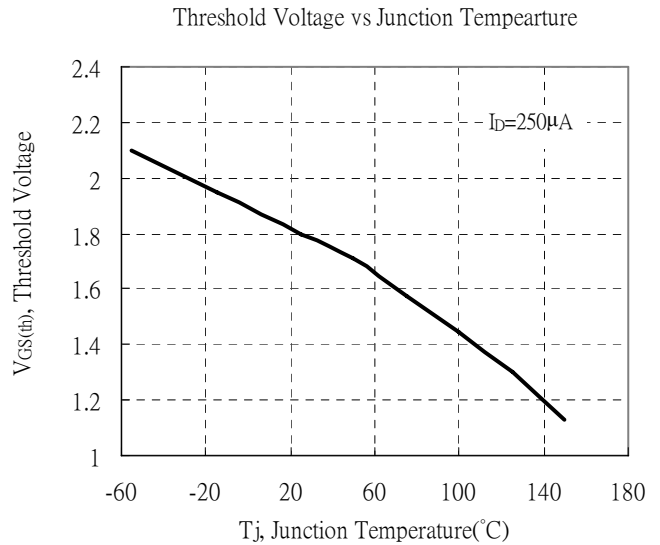
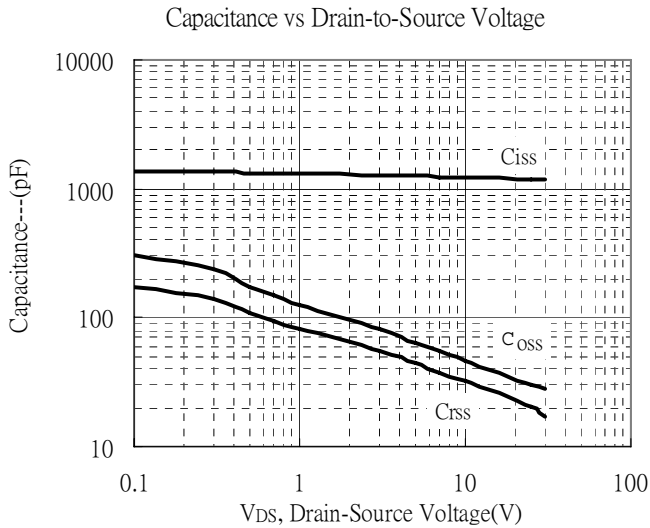
Static Drain-Source On-State Resistance vs Gate-Source Voltage



Drain-Source On-State Resistance vs Junction Temperature

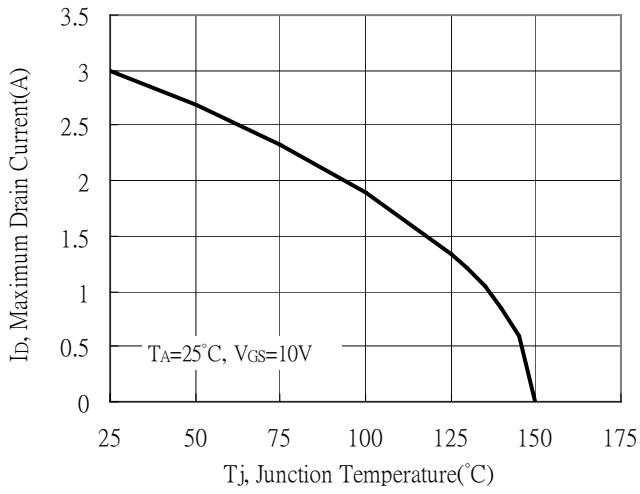


Typical Characteristics(Cont.)

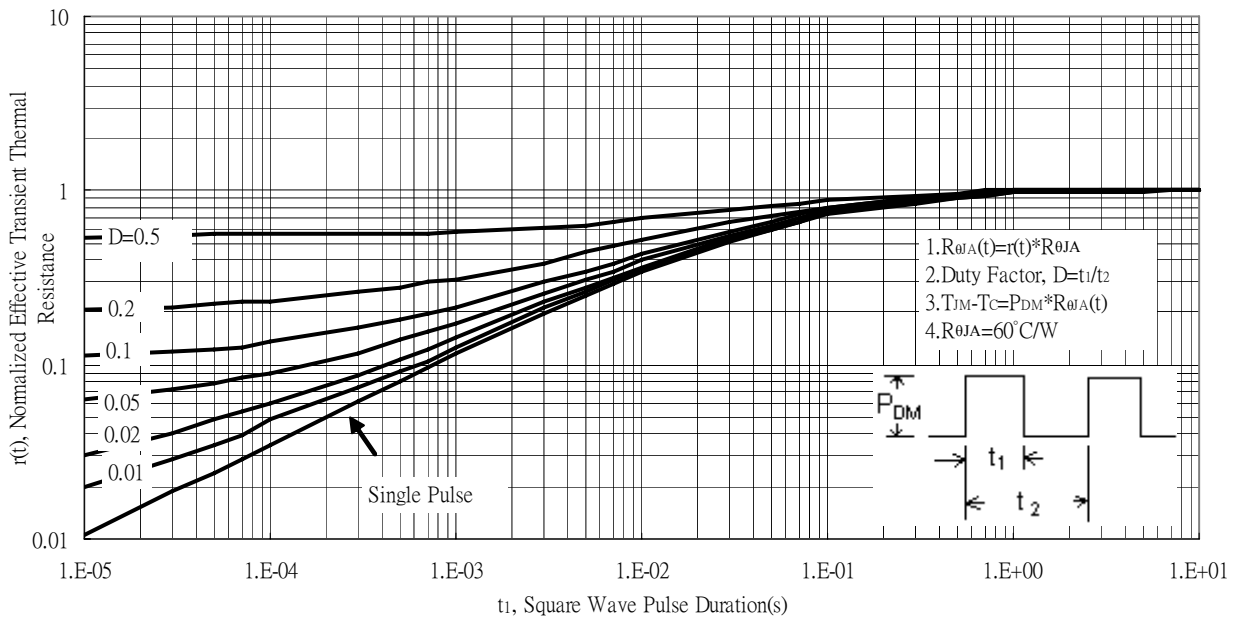


Typical Characteristics(Cont.)

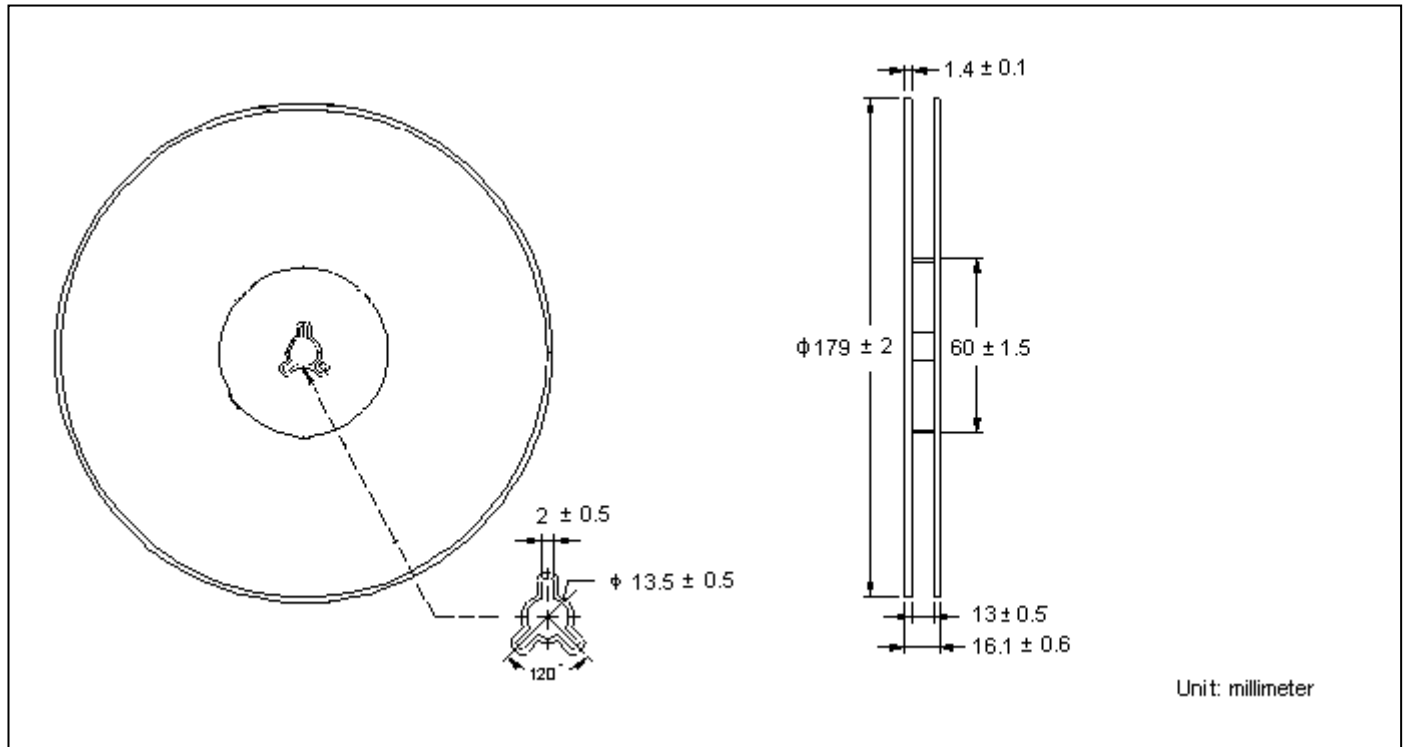
Maximum Drain Current vs Junction Temperature



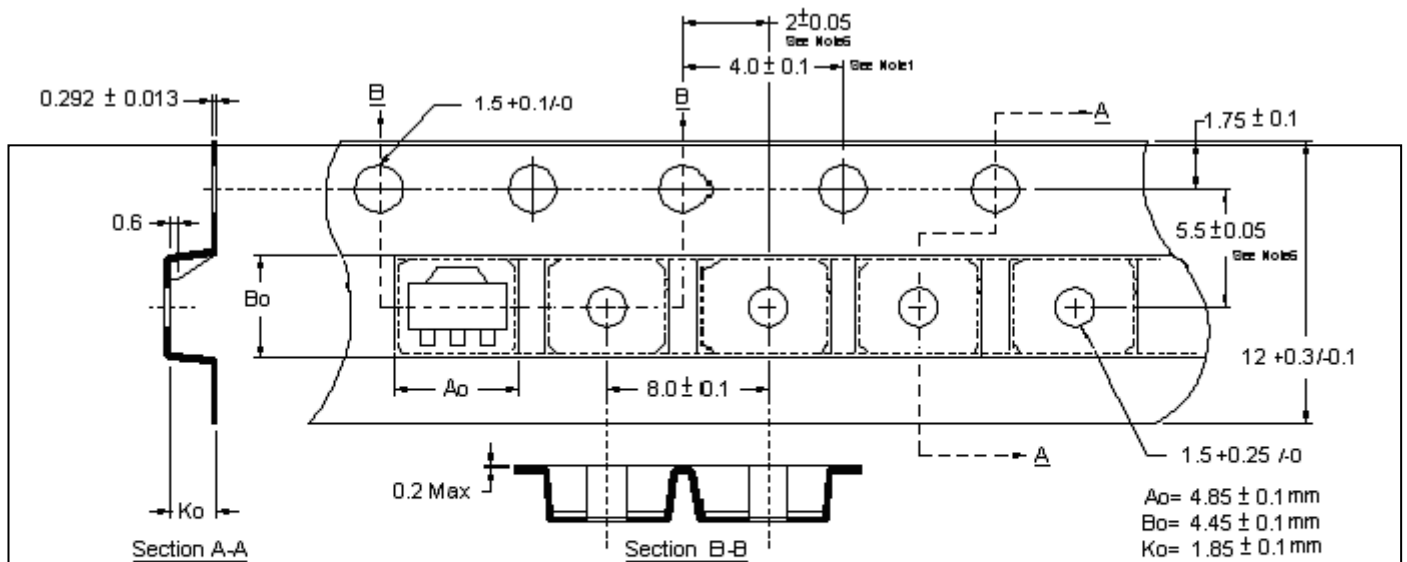
Transient Thermal Response Curves



Reel Dimension



Carrier Tape Dimension



Notes:

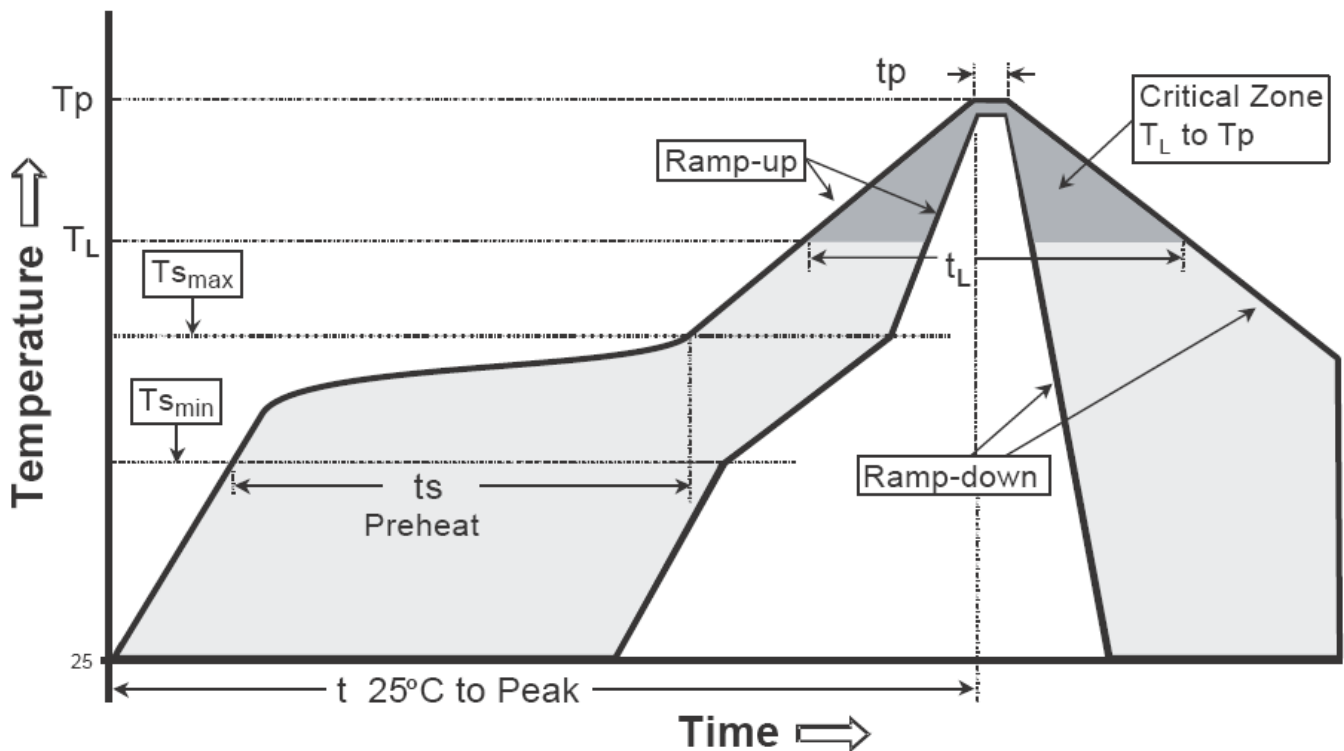
1. 10 sprocket hole pitch cumulative tolerance ± 0.2 .
2. Camber not to exceed 1mm in 100mm.
3. Material: Conductive Black Advantek Polystyrene.
4. A_o & B_o measured on a plane 0.3mm above the bottom of the pocket.
5. K_o measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
6. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.

Unit : millimeter

Recommended wave soldering condition

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

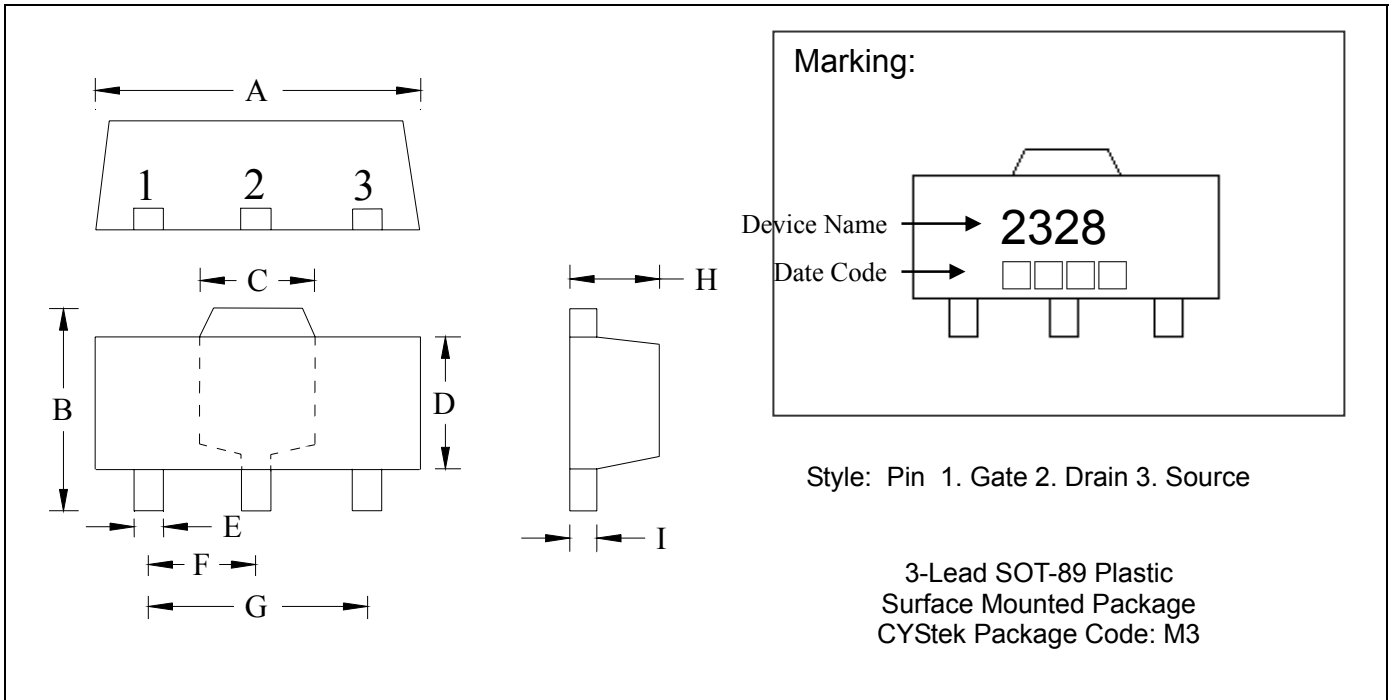
Recommended temperature profile for IR reflow



| 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-89 Dimension



*: Typical

| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|-----|--------|--------|-------------|------|-----|--------|--------|-------------|------|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.1732 | 0.1811 | 4.40 | 4.60 | F | 0.0591 | TYP | 1.50 | TYP |
| B | 0.1551 | 0.1673 | 3.94 | 4.25 | G | 0.1181 | TYP | 3.00 | TYP |
| C | 0.0610 | REF | 1.55 | REF | H | 0.0551 | 0.0630 | 1.40 | 1.60 |
| D | 0.0906 | 0.1024 | 2.30 | 2.60 | I | 0.0138 | 0.0173 | 0.35 | 0.44 |
| E | 0.0126 | 0.0205 | 0.32 | 0.52 | | | | | |

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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