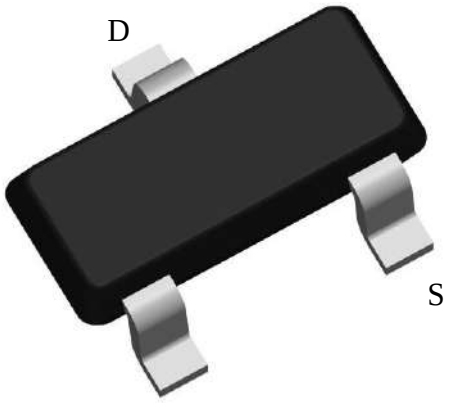
# 100V N-Channel Enhancement Mode MOSFET

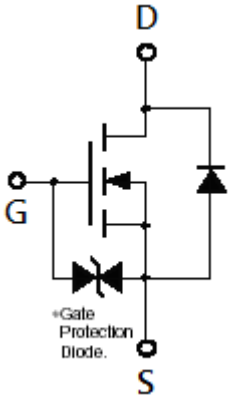
## Features:

- Simple drive requirement
- Small package outline
- ESD protected gate
- Pb-free lead plating and halogen-free package

SOT-23




| | |
|---|---|
| $BV_{DSS}$ | 100V |
| $I_D$@ $T_A$=25°C, $V_{GS}$=10V | 1.9A |
| $R_{DSON}$@$V_{GS}$=10V, $I_D$=1.7A | 140mΩ (typ) |




G：Gate　S：Source　D：Drain

## Ordering Information

| Device | Package | Shipping |
|---|---|---|
| KWE135N10KR | SOT-23<br>(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 | $V_{DS}$ | 100 | V |
| Gate-Source Voltage | $V_{GS}$ | ±20 | |
| Continuous Drain Current @ $T_A$=25°C, $V_{GS}$=10V (Note 3) | $I_D$ | 1.9 | A |
| Continuous Drain Current @ $T_A$=70°C, $V_{GS}$=10V (Note 3) | | 1.5 | |
| Pulsed Drain Current (Notes 1, 2) | $I_{DM}$ | 10 | |
| Maximum Power Dissipation@ $T_A$=25℃ (Note 3) | $P_D$ | 1.25 | W |
| Maximum Power Dissipation@ $T_A$=70℃ (Note 3) | | 0.8 | |
| Operating Junction and Storage Temperature Range | Tj ; Tstg | -55~+150 | °C |

Note : 1. Pulse width limited by maximum junction temperature.
2. Pulse width≤ 300μs, duty cycle≤2%.
3. Surface mounted on 1 in² copper pad of FR-4 board; 270°C/W when mounted on minimum copper pad

## Thermal Performance

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Thermal Resistance, Junction-to-Ambient, max | $R_{\theta JA}$ | 100 | °C/W |
| Thermal Resistance, Junction-to-Case, max | $R_{\theta JC}$ | 65 | |

Note : Surface mounted on 1 in² copper pad of FR-4 board; 270°C/W when mounted on minimum copper pad

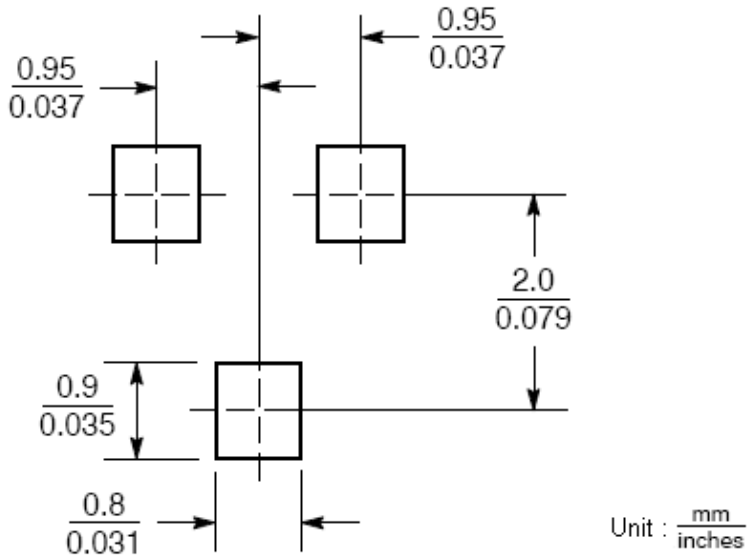
## Electrical Characteristics (Tj=25°C, unless otherwise noted)

| Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|---|---|---|---|---|---|
| **Static** | | | | | |
| $BV_{DSS}$ | 100 | - | - | V | $V_{GS}$=0V, $I_D$=250μA |
| $V_{GS(th)}$ | 2 | - | 4 | | $V_{DS}$=$V_{GS}$, $I_D$=250μA |
| $I_{GSS}$ | - | - | ±30 | μA | $V_{GS}$=±16V, $V_{DS}$=0V |
| $I_{DSS}$ | - | - | 1 | | $V_{DS}$=80V, $V_{GS}$=0V |
| | - | - | 10 | | $V_{DS}$=80V, $V_{GS}$=0V (Tj=85°C) |
| *$R_{DS(ON)}$ | - | 140 | 200 | mΩ | $V_{GS}$=10V, $I_D$=1.7A |
| *$G_{FS}$ | - | 1.9 | - | S | $V_{DS}$=10V, $I_D$=1A |
| **Dynamic** | | | | | |
| Ciss | - | 217 | - | pF | $V_{DS}$=50V, $V_{GS}$=0V, f=1MHz |
| Coss | - | 27 | - | | |
| Crss | - | 16 | - | | |
| $t_{d(ON)}$ | - | 5.6 | - | ns | $V_{DS}$=50V, $I_D$=1.7A, $V_{GS}$=10V, $R_G$=1Ω |
| $t_r$ | - | 6.2 | - | | |
| $t_{d(OFF)}$ | - | 11 | - | | |
| $t_f$ | - | 3.2 | - | | |

| | | | | | |
|---|---|---|---|---|---|
| Qg | - | 4.5 | - | nC | $V_{DS}$=50V, $I_D$=1.7A, $V_{GS}$=10V |
| Qgs | - | 1.4 | - | | |
| Qgd | - | 0.7 | - | | |
| **Source-Drain Diode** | | | | | |
| *$I_S$ | - | - | 1.9 | A | |
| *$I_{SM}$ | - | - | 10 | | |
| *$V_{SD}$ | - | 0.84 | 1.1 | V | $V_{GS}$=0V, $I_S$=1.7A |
| *trr | - | 18 | - | ns | $I_F$=1.7A, $dI_F/dt$=100A/μs |
| *Qrr | - | 14.2 | - | nC | |

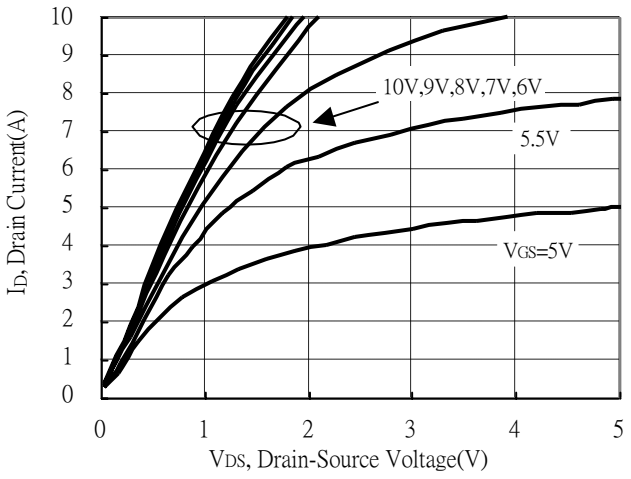
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

## Recommended Soldering Footprint

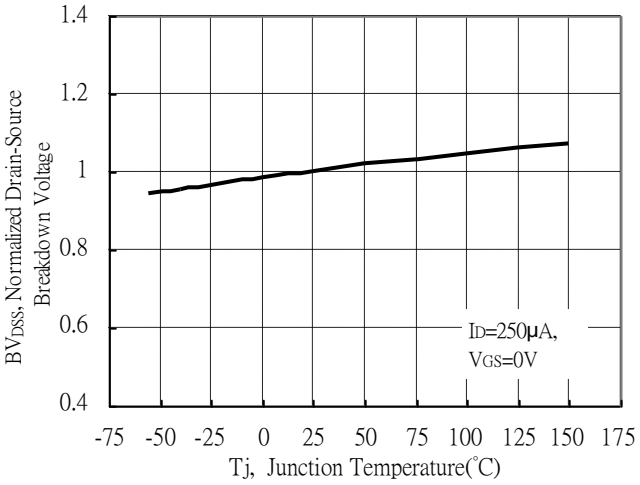


## Typical Characteristics

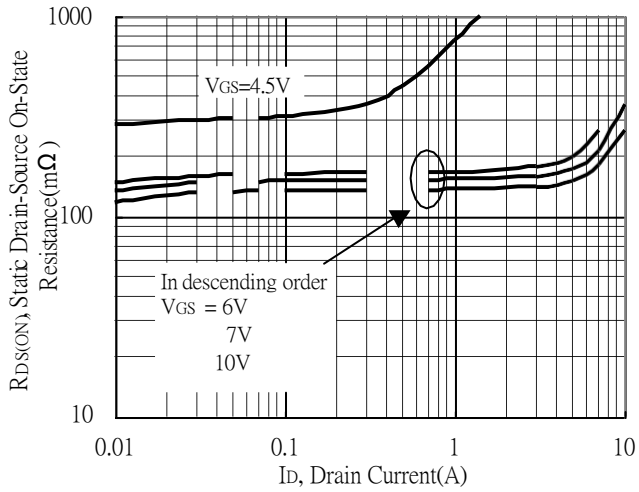
Typical Output Characteristics



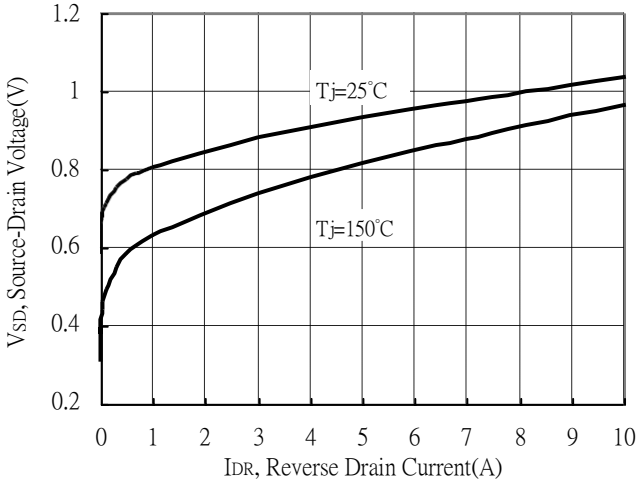

Brekdown Voltage vs Ambient Temperature



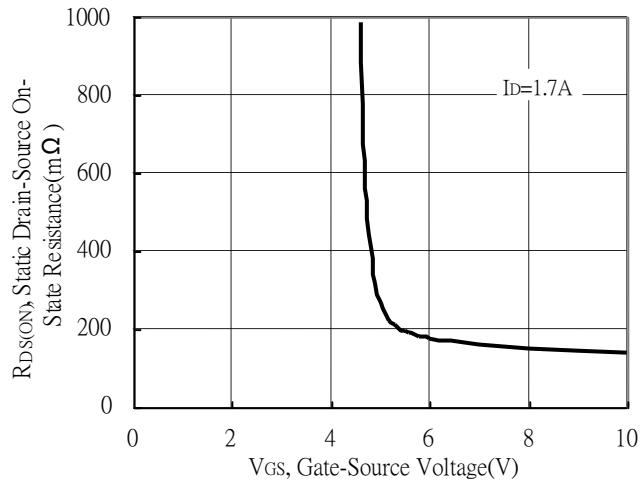

Static Drain-Source On-State resistance vs Drain Current



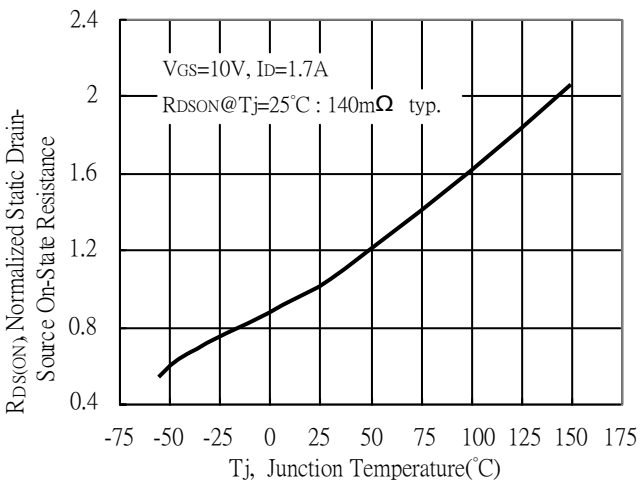

Reverse Drain Current vs Source-Drain Voltage




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

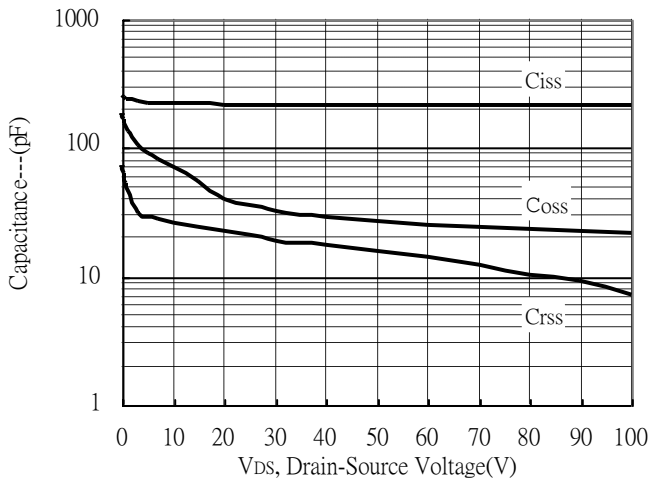



Drain-Source On-State Resistance vs Junction Tempearture

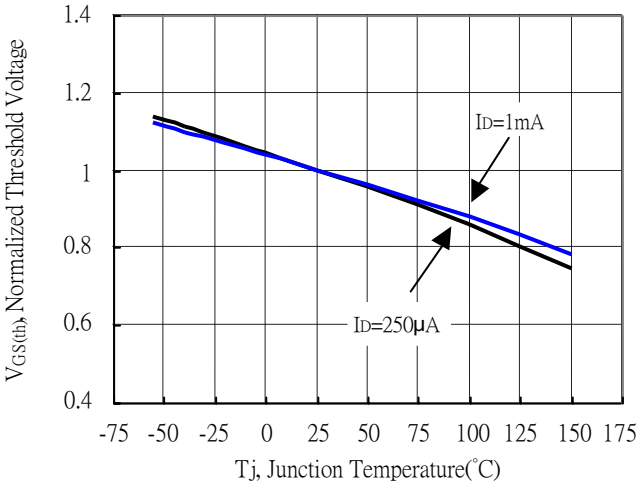


## Typical Characteristics(Cont.)

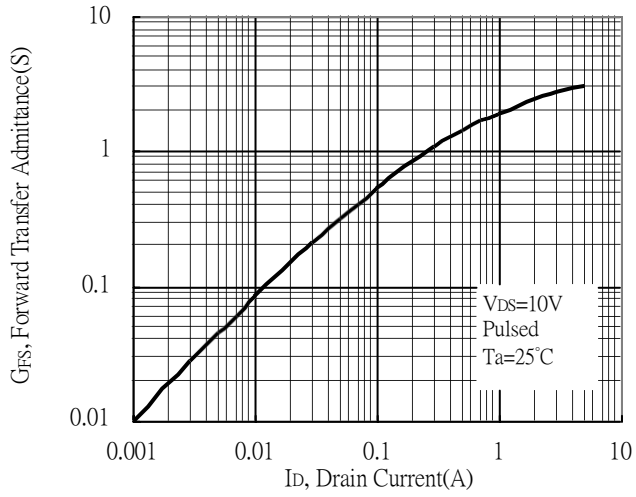
Capacitance vs Drain-to-Source Voltage



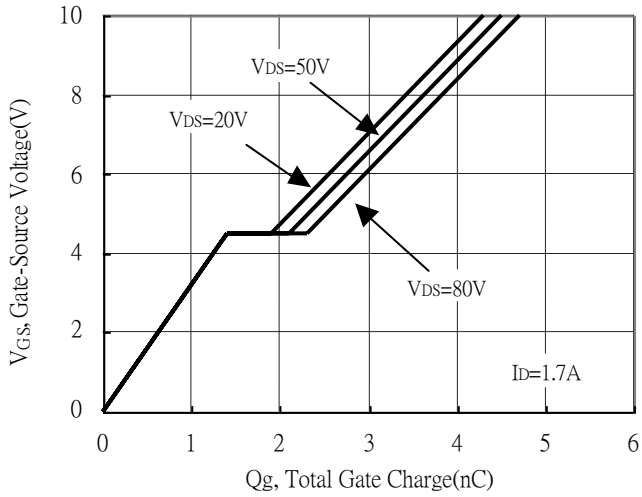

Threshold Voltage vs Junction Tempearture



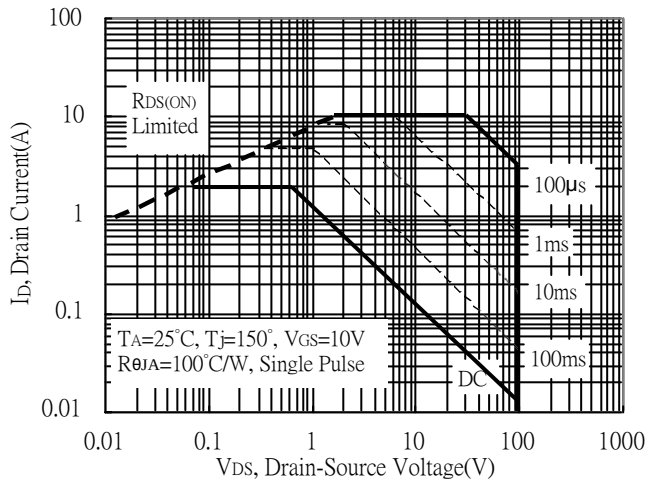

Forward Transfer Admittance vs Drain Current



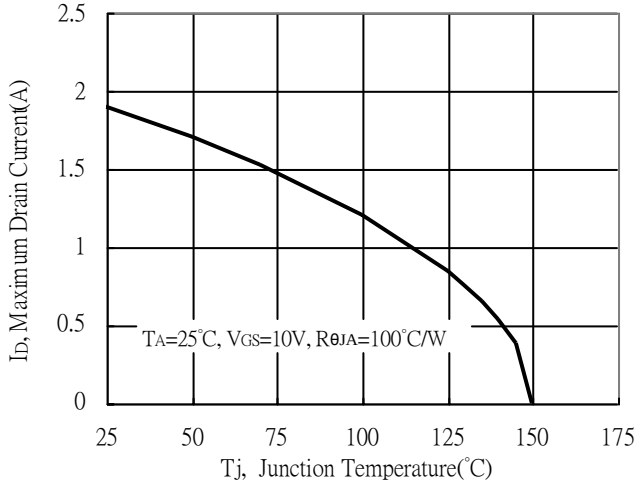

Gate Charge Characteristics




Maximum Safe Operating Area

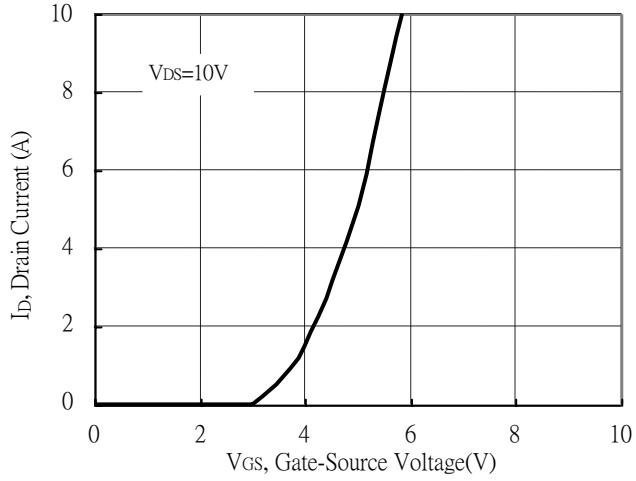



Maximum Drain Current vs Junction Temperature

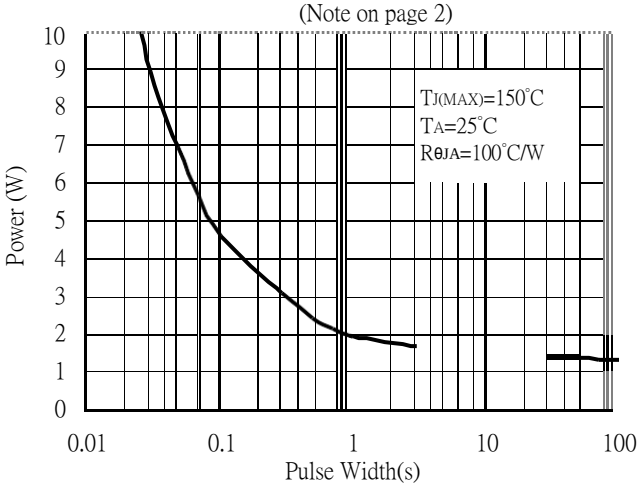


## Typical Characteristics(Cont.)

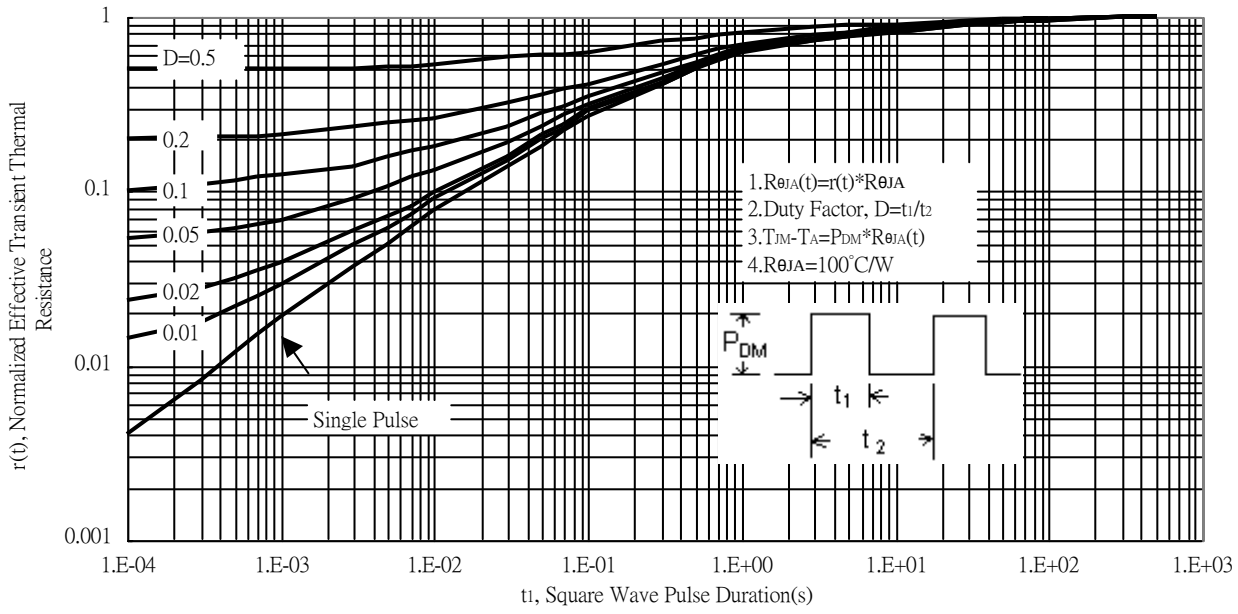
Typical TransferCharacteristics



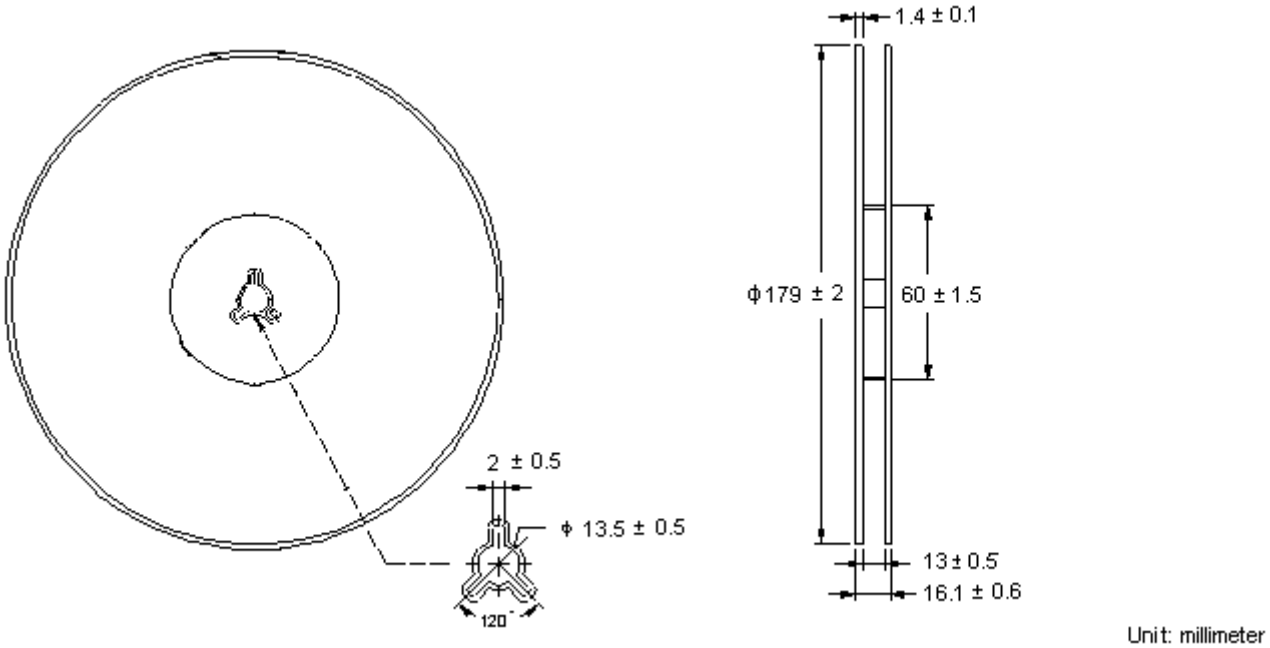

Single Pulse Power Rating, Junction to Ambient
(Note on page 2)




Transient Thermal Response Curves

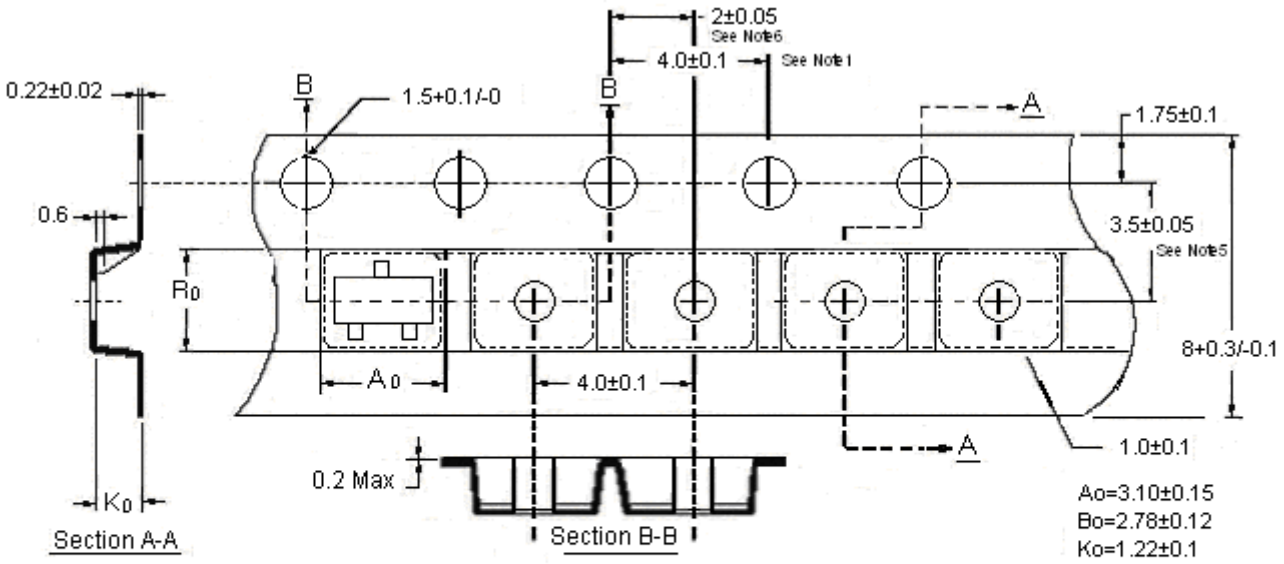


## Reel Dimension




Unit: millimeter

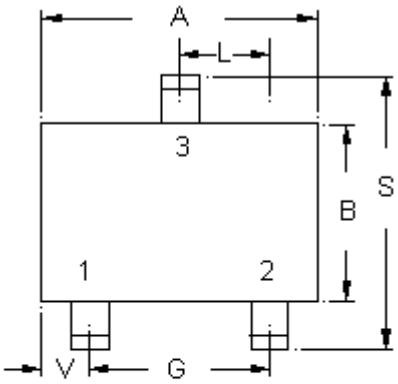
## Carrier Tape Dimension

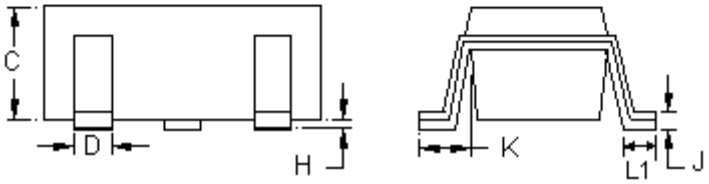



Notes:
1. 10 sprocket hole pitch cumulative tolerance ±0.2.
2. Camber not to exceed 1mm in 100mm.
3. Material : conductive Black Polystyrene.
4. Ao & Bo measured on a plane 0.3mm above the bottom of the pocket.
5. Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.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

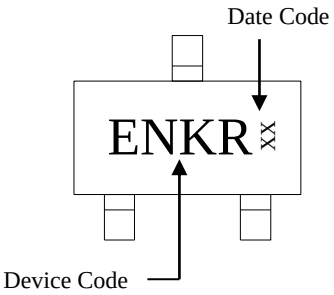
Unit : millimeter

## SOT-23 Dimension




Marking:




3-Lead SOT-23 Plastic
Surface Mounted Package

Style: Pin 1.Gate 2.Source 3.Drain

*: Typical

| DIM | Inches | | Millimeters | | DIM | Inches | | Millimeters | |
|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | | Min. | Max. | Min. | Max. |
| A | 0.1102 | 0.1204 | 2.80 | 3.04 | J | 0.0032 | 0.0079 | 0.08 | 0.20 |
| B | 0.0472 | 0.0551 | 1.20 | 1.40 | K | 0.0118 | 0.0266 | 0.30 | 0.67 |
| C | 0.0335 | 0.0512 | 0.89 | 1.30 | L | 0.0335 | 0.0453 | 0.85 | 1.15 |
| D | 0.0118 | 0.0197 | 0.30 | 0.50 | S | 0.0830 | 0.1004 | 2.10 | 2.55 |
| G | 0.0669 | 0.0910 | 1.70 | 2.30 | V | 0.0098 | 0.0256 | 0.25 | 0.65 |
| H | 0.0000 | 0.0040 | 0.00 | 0.10 | L1 | 0.0118 | 0.0197 | 0.30 | 0.50 |