

SOT-223 Plastic-Encapsulate MOSFETS

Features

- $V_{DS}=30V$
- $I_D=9A$
- $R_{DS(on)}@V_{GS}=10V < 14.3m\Omega$
- $R_{DS(on)}@V_{GS}=4.5V < 22.6m\Omega$
- High power and current handing capability
- Voltage controlled small signal switch
- Fast Switching Speedze

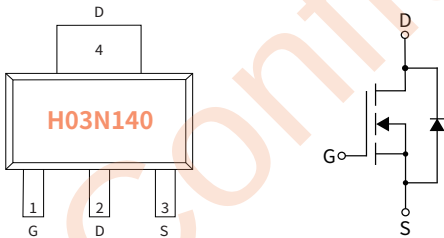
Applications

- Power Management Switches
- DC/DC converter

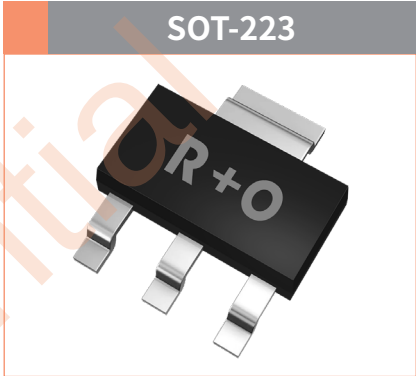
Mechanical Data

- Case: SOT-223  
Molding compound meets UL 94V-0 flammability rating, RoHS-compliant,halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750,Method 2026

Function Diagram



Drain-source Voltage  
30 V  
Drain Current  
9 Ampere



Ordering Information

| PACKAGE | PACKAGE CODE | UNIT WEIGHT(g) | REEL(pcs) | BOX(pcs) | CARTON(pcs) | DELIVERY MODE |
|---------|--------------|----------------|-----------|----------|-------------|---------------|
| SOT-223 | R3           | 0.125          | 2500      | 5000     | 40000       | 13"           |

Maximum Ratings (Ta=25°C Unless otherwise specified)

| PARAMETER                                             | SYMBOL          | UNIT   | VALUE     |
|-------------------------------------------------------|-----------------|--------|-----------|
| Drain-source Voltage                                  | $V_{DS}$        | V      | 30        |
| Gate-source Voltage                                   | $V_{GS}$        | V      | $\pm 20$  |
| Drain Current                                         | $I_D$           | A      | 9         |
| Pulsed Drain Current <sup>(1)</sup>                   | $I_{DM}$        | A      | 36        |
| Total Power Dissipation                               | $P_D$           | W      | 2.5       |
| Junction temperature                                  | $T_J$           | °C     | -55 ~+150 |
| Storage temperature                                   | $T_{stg}$       | °C     | -55 ~+150 |
| Thermal Resistance Junction-to-Ambient @ Steady State | $R_{\theta JA}$ | °C / W | 50        |

● Static Parameter Characteristics (Tj=25°C Unless otherwise specified)

| PARAMETER                                        | SYMBOL              | Condition                                                 | UNIT | Min | Typ  | Max  |
|--------------------------------------------------|---------------------|-----------------------------------------------------------|------|-----|------|------|
| Drain-Source Breakdown Voltage                   | BV <sub>DSS</sub>   | V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA               | V    | 30  | —    | —    |
| Zero Gate Voltage Drain Current                  | I <sub>DSS</sub>    | V <sub>DS</sub> =30V, V <sub>GS</sub> =0V                 | μA   | —   | —    | 1.0  |
| Gate-Body Leakage Current                        | I <sub>GSS</sub>    | V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V               | nA   | —   | —    | ±100 |
| Gate Threshold Voltage                           | V <sub>GS(th)</sub> | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA | V    | 1.0 | 1.5  | 2.5  |
| Static Drain-Source On-Resistance <sup>(2)</sup> | R <sub>DS(ON)</sub> | V <sub>GS</sub> =10V, I <sub>D</sub> =6A                  | mΩ   | —   | 9.5  | 14.3 |
|                                                  |                     | V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A                 |      | —   | 13.5 | 22.6 |

● Dynamic Parameters

| PARAMETER                    | SYMBOL           | Condition                                         | UNIT | Min | Typ | Max |
|------------------------------|------------------|---------------------------------------------------|------|-----|-----|-----|
| Input Capacitance            | C <sub>iss</sub> | V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHZ | pF   | —   | 985 | —   |
| Output Capacitance           | C <sub>oss</sub> |                                                   |      | —   | 135 | —   |
| Reverse Transfer Capacitance | C <sub>rss</sub> |                                                   |      | —   | 110 | —   |

● Switching Parameters

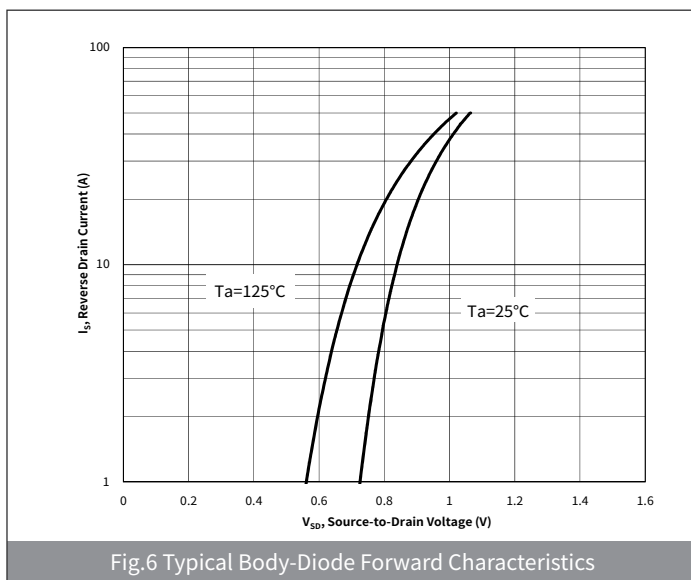
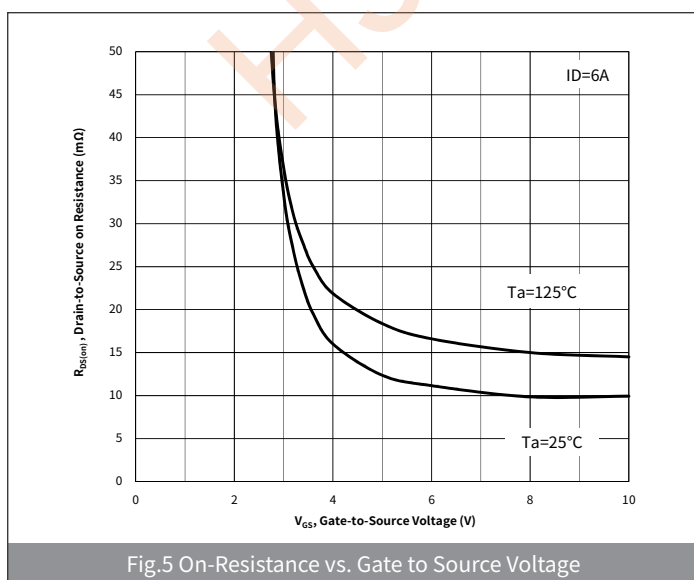
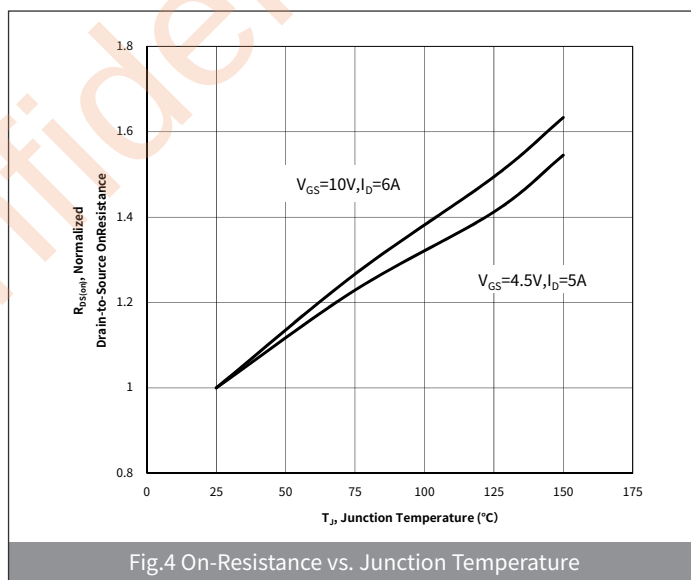
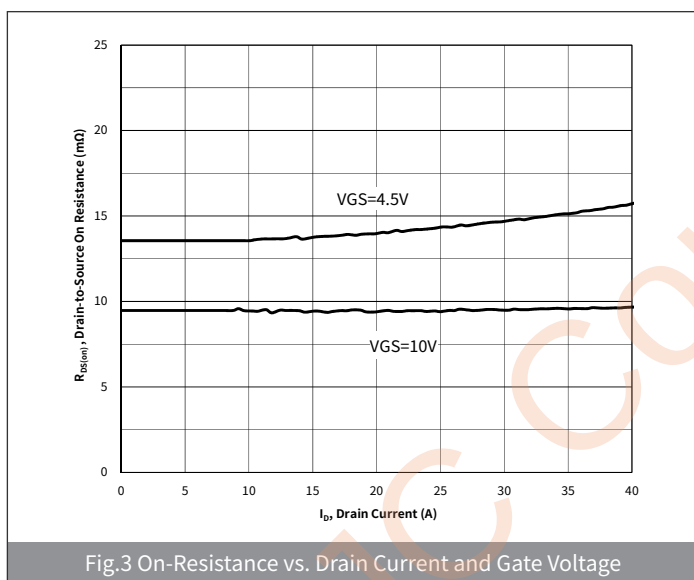
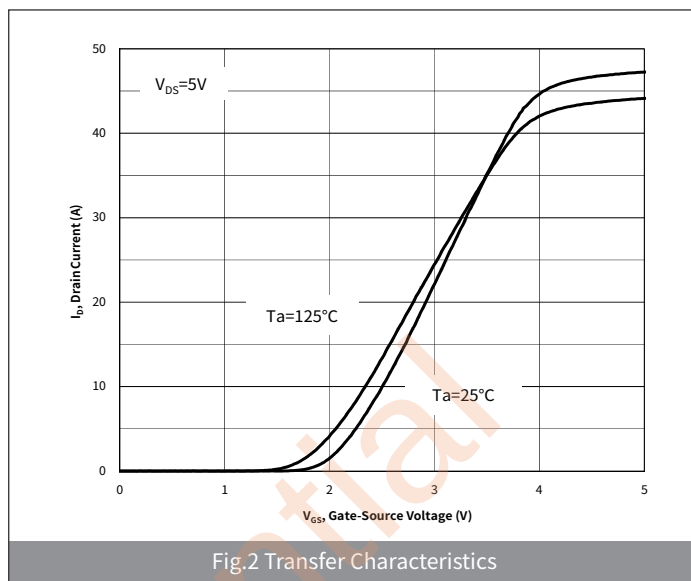
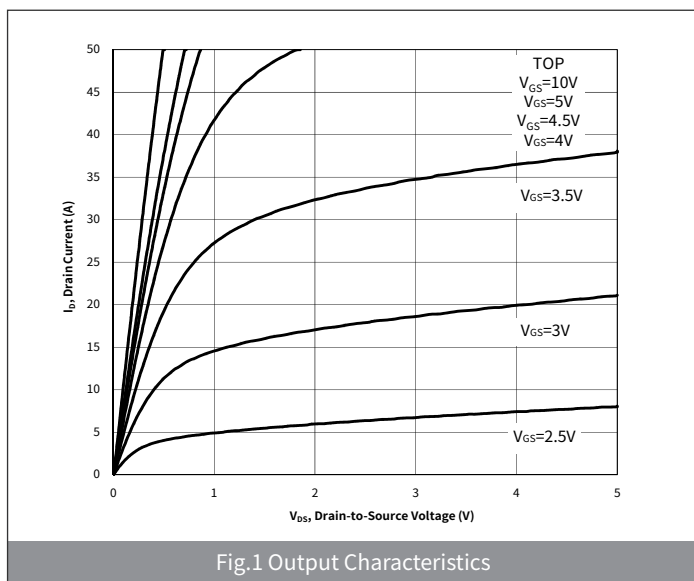
| PARAMETER           | SYMBOL              | Condition                                                                               | UNIT | Min | Typ | Max |
|---------------------|---------------------|-----------------------------------------------------------------------------------------|------|-----|-----|-----|
| Turn-on Delay Time  | t <sub>D(on)</sub>  | V <sub>GS</sub> =10V, V <sub>DD</sub> =15V,<br>I <sub>D</sub> =6A, R <sub>GEN</sub> =3Ω | nS   | —   | 6.4 | —   |
| Turn-on Rise Time   | t <sub>r</sub>      |                                                                                         | nS   | —   | 3.1 | —   |
| Turn-off Delay Time | t <sub>D(off)</sub> |                                                                                         | nS   | —   | 15  | —   |
| Turn-off fall Time  | t <sub>f</sub>      |                                                                                         | nS   | —   | 2.6 | —   |
| Total Gate Charge   | Q <sub>g</sub>      | V <sub>DS</sub> =15V, I <sub>D</sub> =6A<br>V <sub>GS</sub> =10V                        | nC   | —   | 9   | —   |
| Gate-Source Charge  | Q <sub>gs</sub>     |                                                                                         | nC   | —   | 1.6 | —   |
| Gate-Drain Charge   | Q <sub>gd</sub>     |                                                                                         | nC   | —   | 1.9 | —   |

● Drian-Source Diode Characteristics

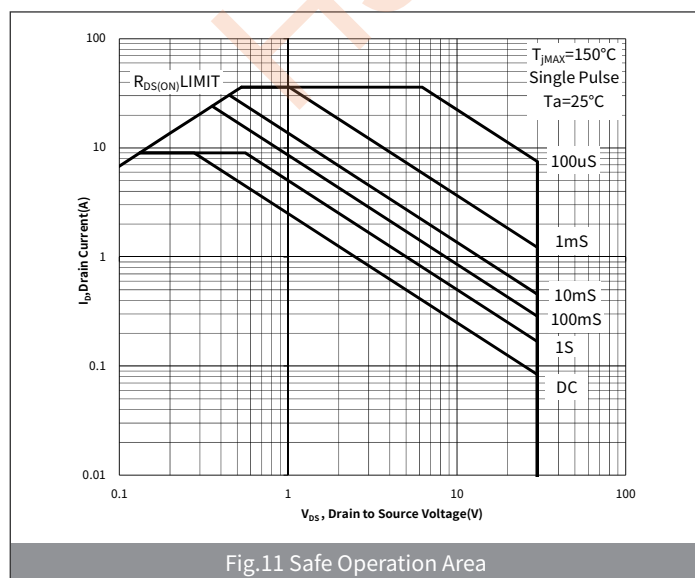
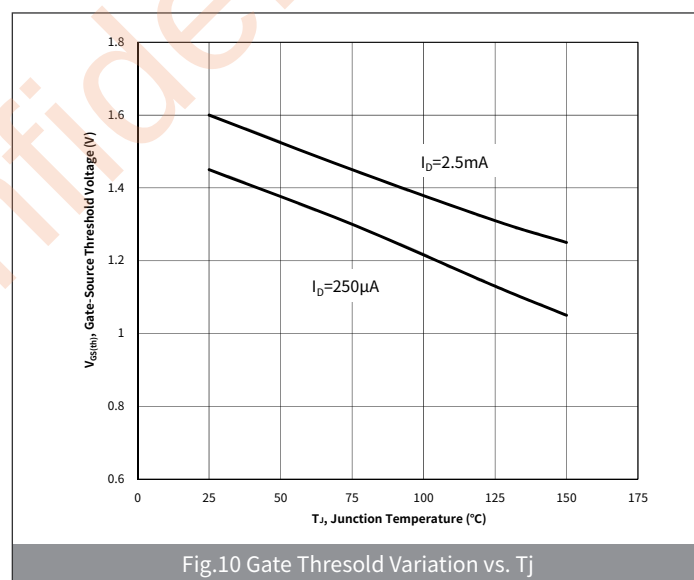
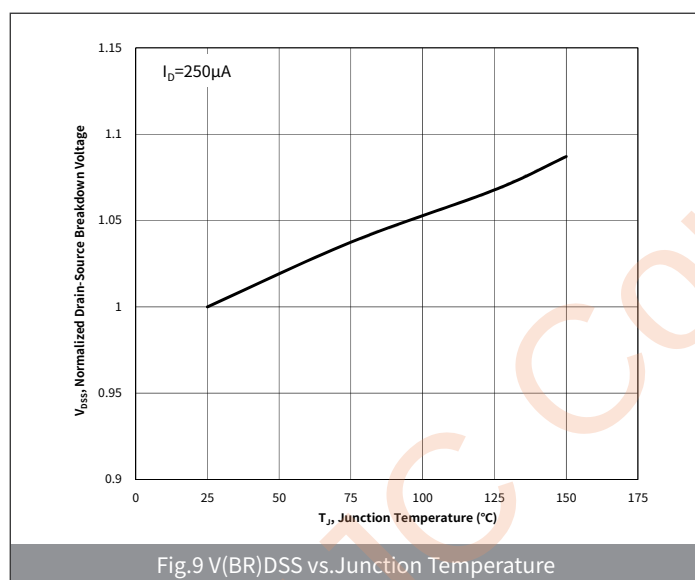
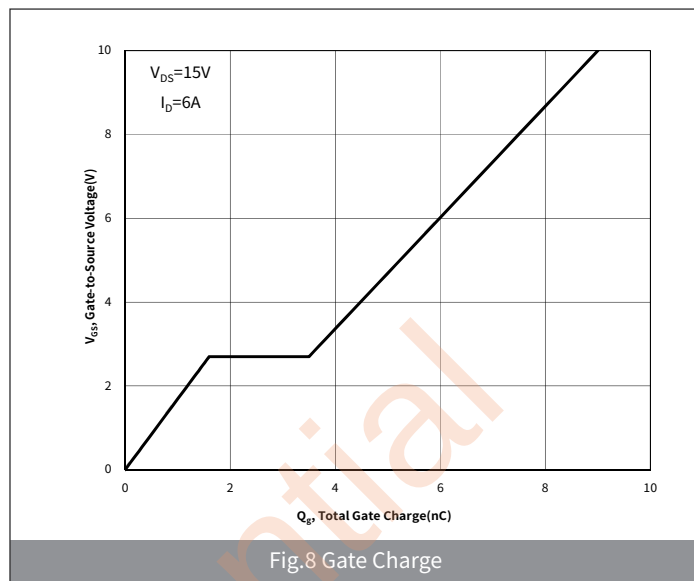
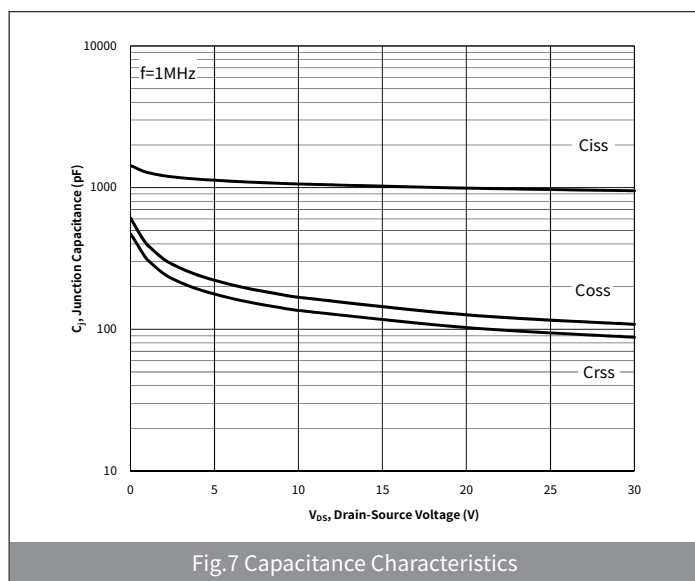
| PARAMETER                             | SYMBOL          | Condition                               | UNIT | Min | Typ | Max |
|---------------------------------------|-----------------|-----------------------------------------|------|-----|-----|-----|
| Diode Forward Voltage                 | V <sub>SD</sub> | I <sub>S</sub> =9A, V <sub>GS</sub> =0V | V    | —   | —   | 1.2 |
| Maximum Body-Diode Continuous Current | I <sub>S</sub>  | —                                       | A    | —   | —   | 9   |

Note :  
(1)Repetitive Rating: Pulse width limited by maximum junction temperature.  
(2)Pulse test: Pulse width ≤ 300us, duty cycle ≤ 2%.

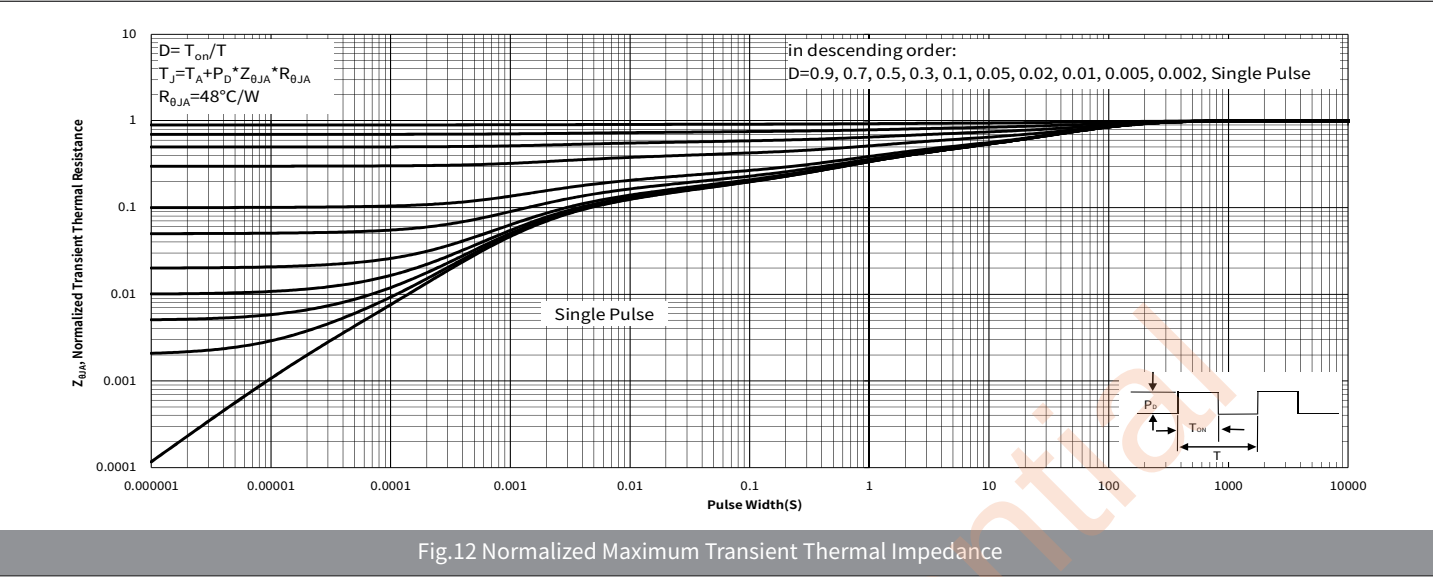
## ● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



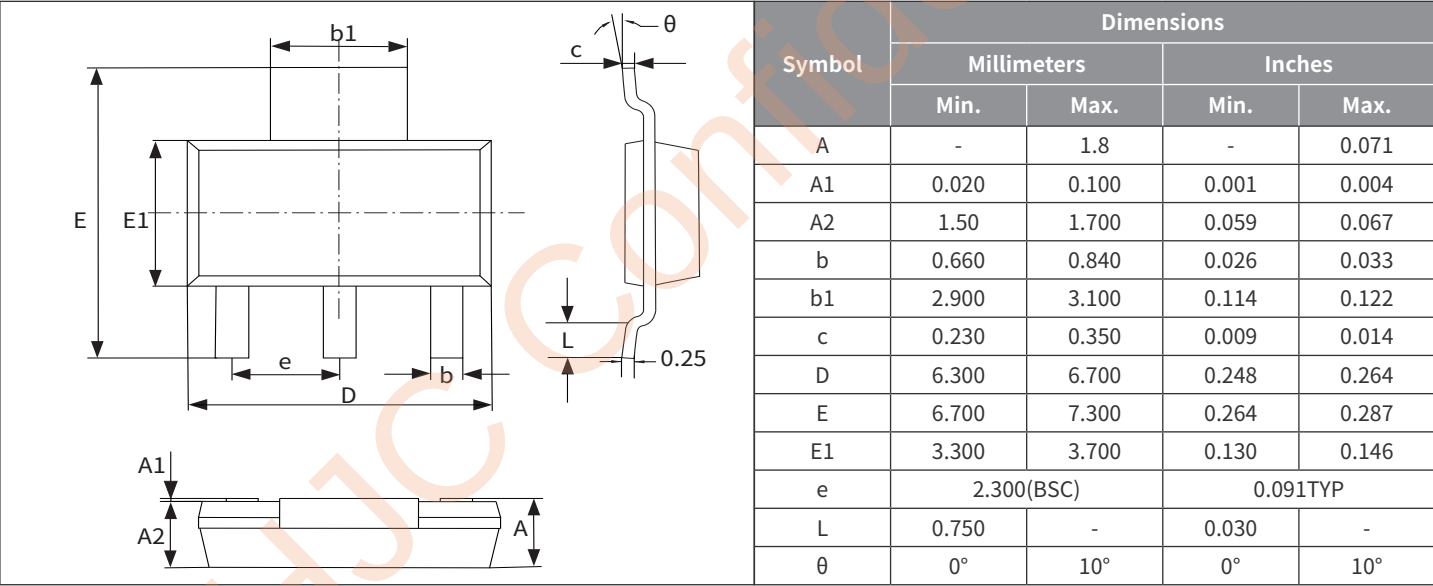
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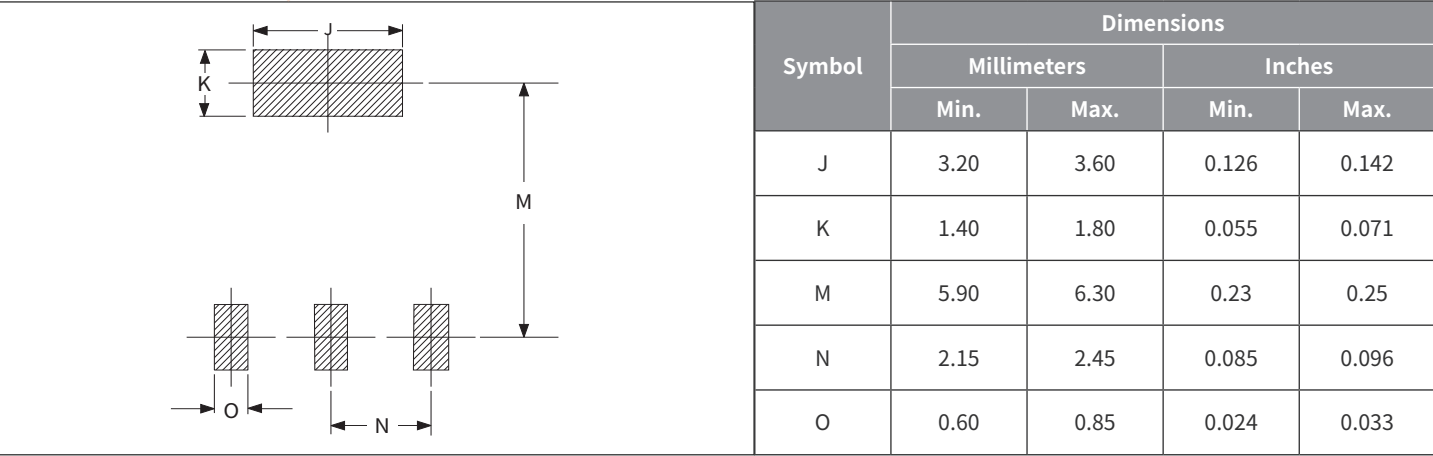
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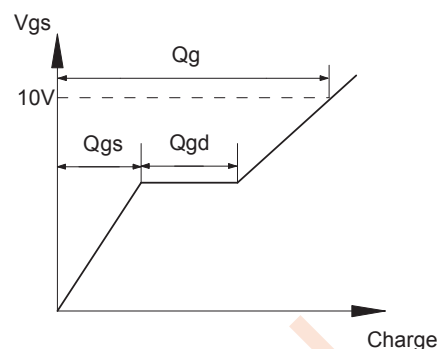
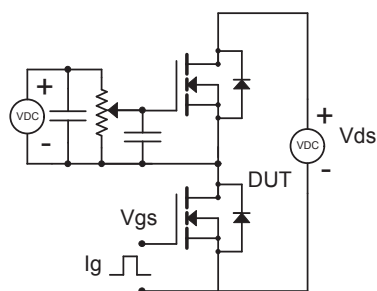
● Package Outline Dimensions (SOT-223)



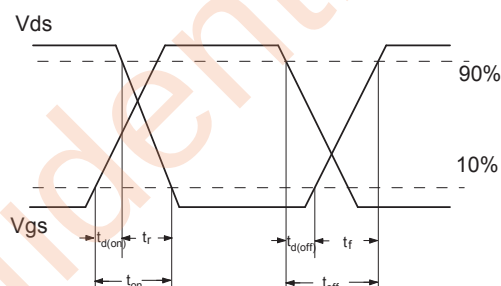
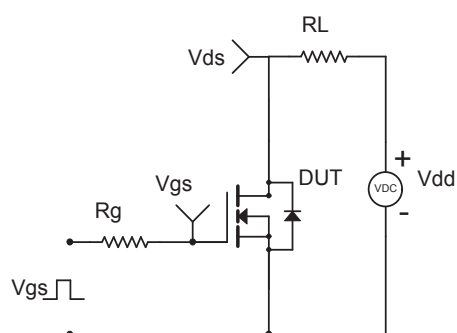
● Suggested Pad Layout



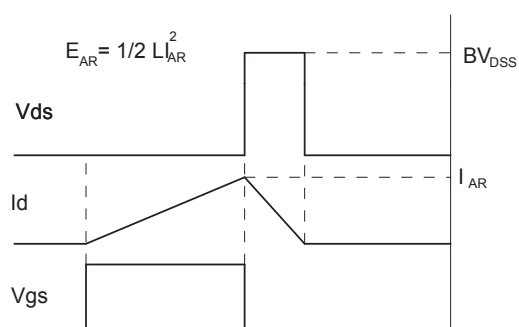
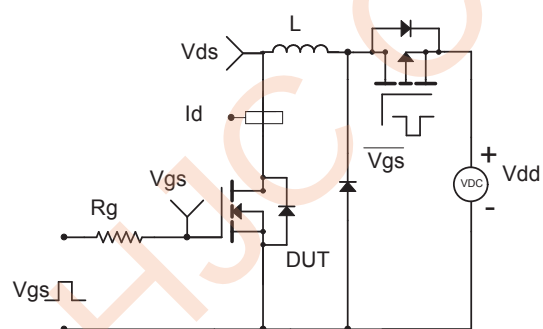
## 1. Gate Charge Test Circuit & Waveforms



## 2. Resistive Switching Test Circuit & Waveforms



## 3. Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



## 4. Diode Recovery Test Circuit & Waveforms

