

## SOT-23 Plastic-Encapsulate MOSFETs

## ● Features

- $V_{DS} = -20V$
- $I_D = -5.6A$
- $R_{DS(on)}@V_{GS} = -4.5V < 42m\Omega$
- $R_{DS(on)}@V_{GS} = -2.5V < 55m\Omega$
- Trench Power MV MOSFET technology
- Voltage controlled small signal switch
- Fast Switching Speed

## Drain-source Voltage

-20 V

## Drain Current

-5.6 Ampere

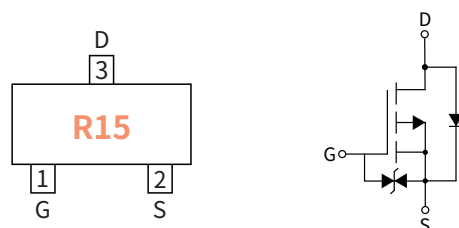
- Applications

- Battery operated systems
- Solid-state relays
- Direct logic-level interface: TTL/CMOS

- **Mechanical Data**

- Case: SOT-23  
Molding compound meets UL 94V-0 flammability rating, RoHS-compliant, halogen-free
- Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

- **Reference News**



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

| PARAMETER                                                            |                                         | SYMBOL          | UNIT                          | VALUE     |
|----------------------------------------------------------------------|-----------------------------------------|-----------------|-------------------------------|-----------|
| Drain-source Voltage                                                 |                                         | $V_{DS}$        | V                             | -20       |
| Gate-source Voltage                                                  |                                         | $V_{GS}$        | V                             | $\pm 12$  |
| Drain Current                                                        | $T_A=25^{\circ}\text{C}$ @ Steady State | $I_D$           | A                             | -5.6      |
| Pulsed Drain Current <sup>(1)</sup>                                  |                                         | $I_{DM}$        | A                             | -23       |
| Total Power Dissipation @ $T_A=25^{\circ}\text{C}$                   |                                         | $P_D$           | W                             | 1.3       |
| ESD Protected Up to                                                  |                                         | ESD(HBM)        | kV                            | 2.0       |
| Thermal Resistance Junction-to-Ambient @ Steady State <sup>(2)</sup> |                                         | $R_{\theta JA}$ | $^{\circ}\text{C} / \text{W}$ | 98        |
| Junction and Storage Temperature Range                               |                                         | $T_J, T_{STG}$  | $^{\circ}\text{C}$            | -55 ~+150 |

Note :

(1) The power dissipation PD is based on  $T_J(\text{MAX})=150^\circ\text{C}$ , using  $\leq 10\text{s}$  junction-to-ambient thermal resistance.

## ● Ordering Information

| PACKAGE | PACKAGE CODE | UNIT WEIGHT(g) | REEL(pcs) | BOX(pcs) | CARTON(pcs) | DELIVERY MODE |
|---------|--------------|----------------|-----------|----------|-------------|---------------|
| SOT-23  | R1           | 0.008          | 3000      | 45000    | 180000      | 7"            |

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

| PARAMETER                         | SYMBOL       | Condition                      | UNIT       | Min  | Typ   | Max      |
|-----------------------------------|--------------|--------------------------------|------------|------|-------|----------|
| Drain-Source Breakdown Voltage    | $BV_{DSS}$   | $V_{GS}=0V, I_D=-250\mu A$     | V          | -20  | —     | —        |
| Zero Gate Voltage Drain Current   | $I_{DSS}$    | $V_{DS}=-20V, V_{GS}=0V$       | $\mu A$    | —    | —     | -1.0     |
| Gate-Body Leakage Current         | $I_{GSS}$    | $V_{GS}=\pm 10V, V_{DS}=0V$    | $\mu A$    | —    | —     | $\pm 15$ |
| Gate Threshold Voltage            | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=-250\mu A$ | V          | -0.4 | -0.62 | -1.0     |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}=-4.5V, I_D=-5.0A$      | m $\Omega$ | —    | 31    | 42       |
|                                   |              | $V_{GS}=-2.5V, I_D=-4.0A$      |            | —    | 41    | 55       |
| Forward Transconductance          | $g_{fs}$     | $V_{DS}=-5.0V, I_D=-4.0A$      | S          | —    | 20    | —        |
| Diode Forward Voltage             | $V_{SD}$     | $I_S=-5.0A, V_{GS}=0V$         | V          | —    | —     | -1.2     |

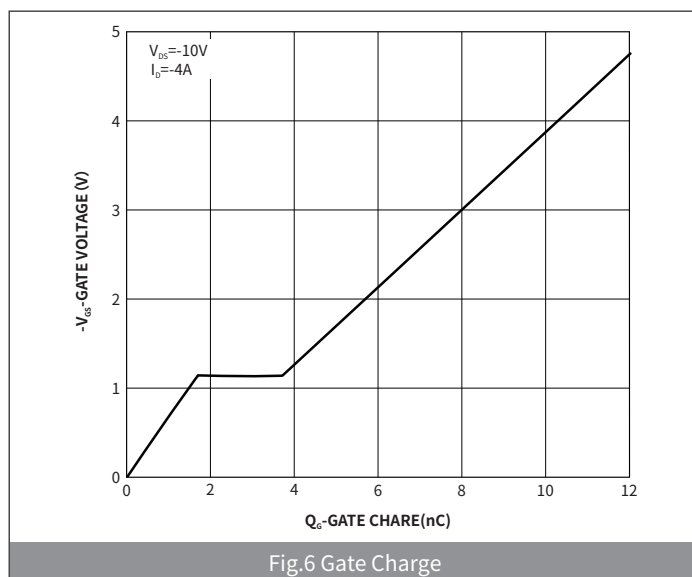
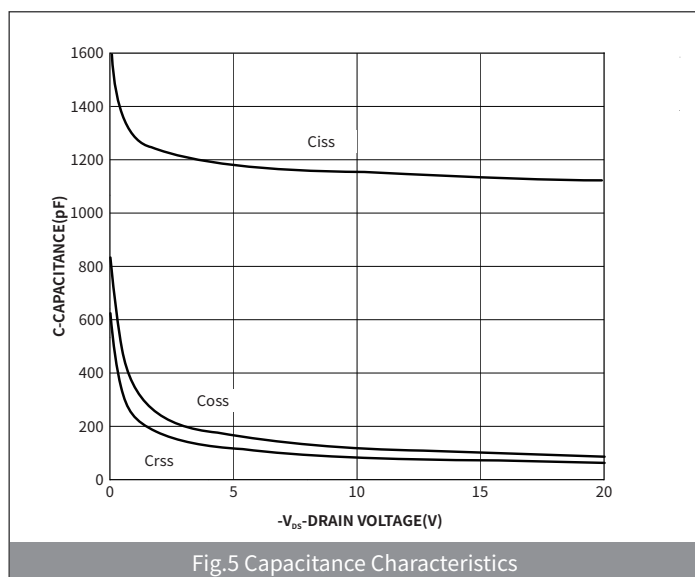
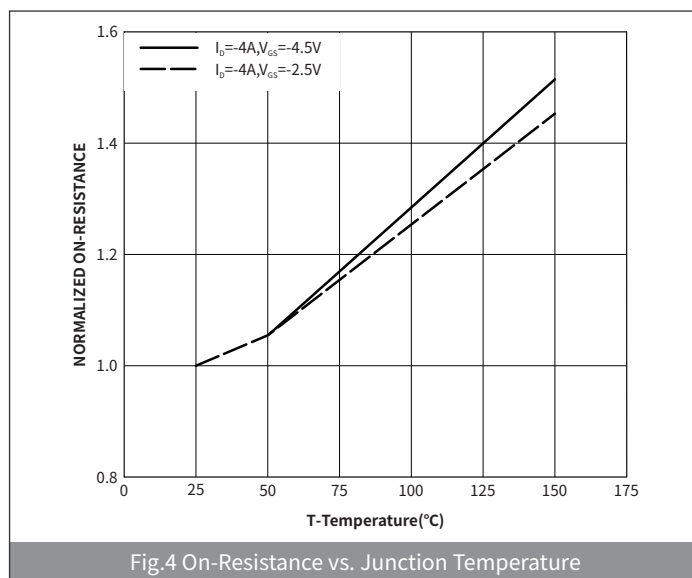
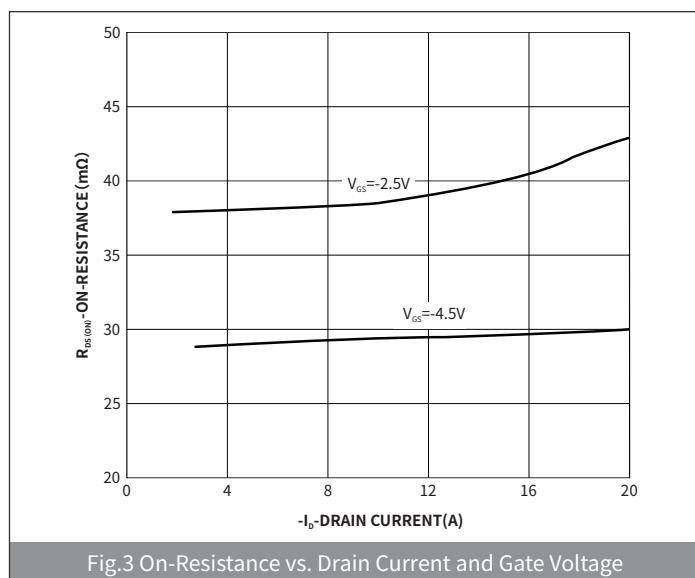
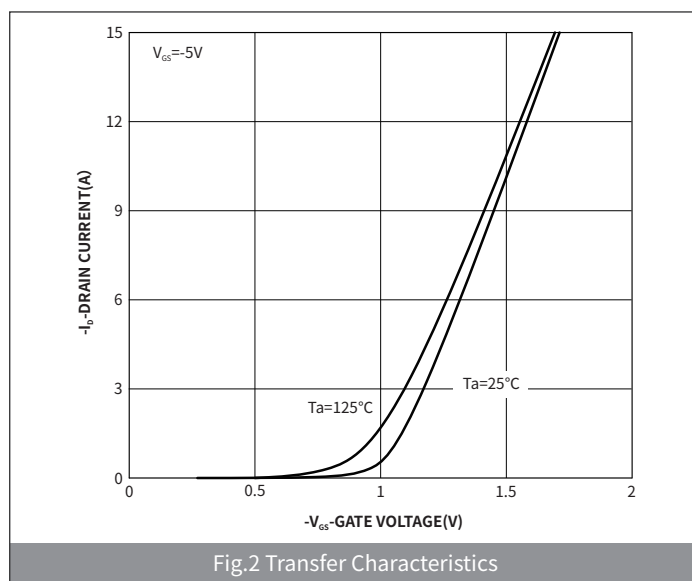
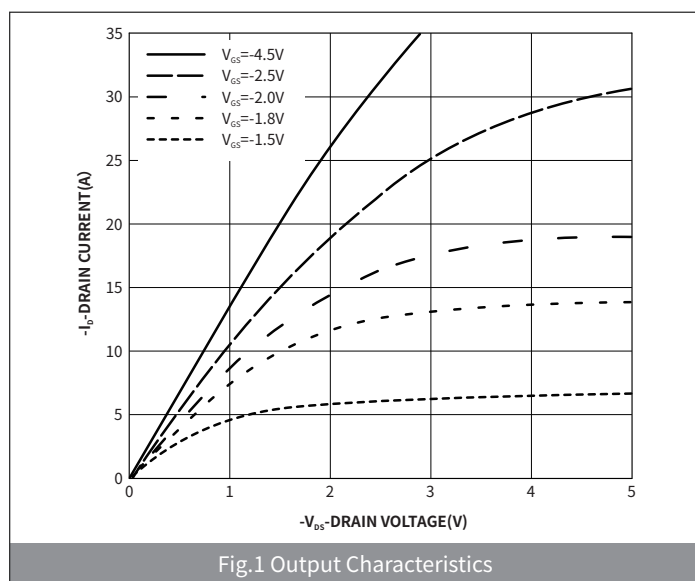
### ● Dynamic Parameters (Ta=25°C Unless otherwise specified)

| PARAMETER                    | SYMBOL    | Condition                                | UNIT | Min | Typ  | Max |
|------------------------------|-----------|------------------------------------------|------|-----|------|-----|
| Input Capacitance            | $C_{iss}$ | $V_{GS}=0V$<br>$V_{DS}=-10V$<br>$f=1MHz$ | pF   | —   | 1180 | —   |
| Output Capacitance           | $C_{oss}$ |                                          |      | —   | 125  | —   |
| Reverse Transfer Capacitance | $C_{rss}$ |                                          |      | —   | 88   | —   |

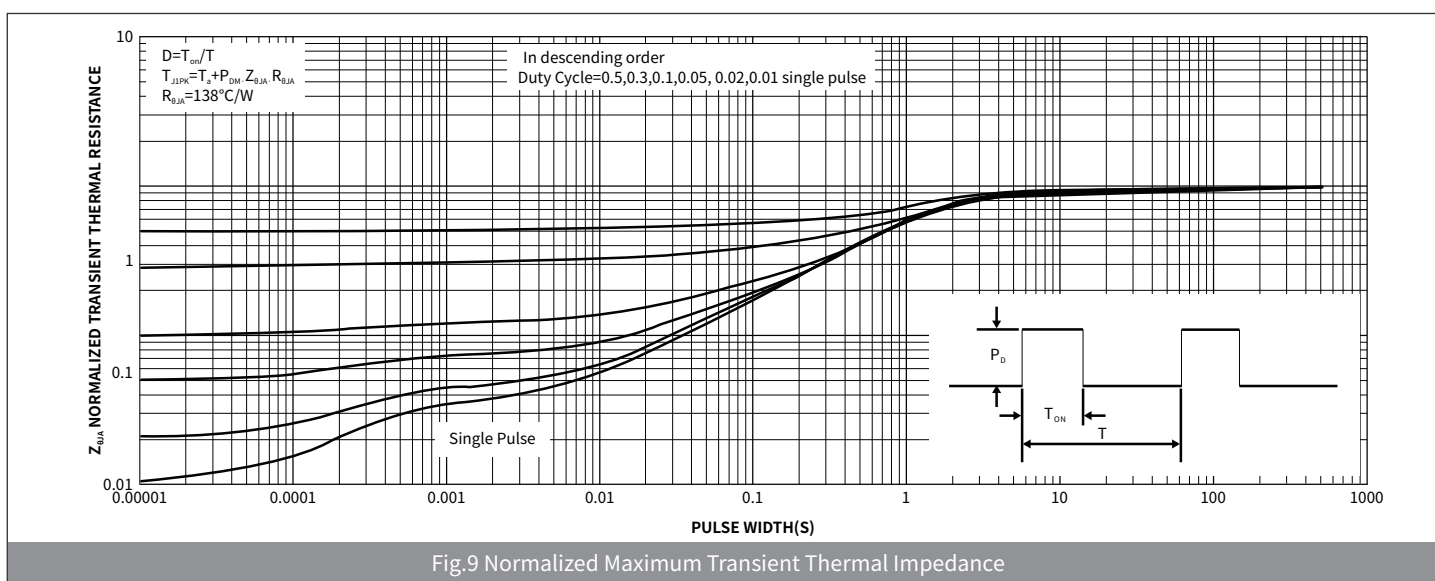
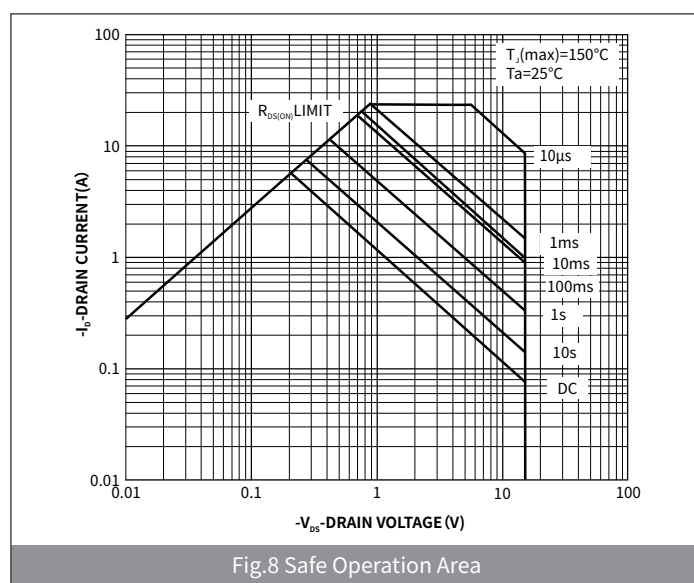
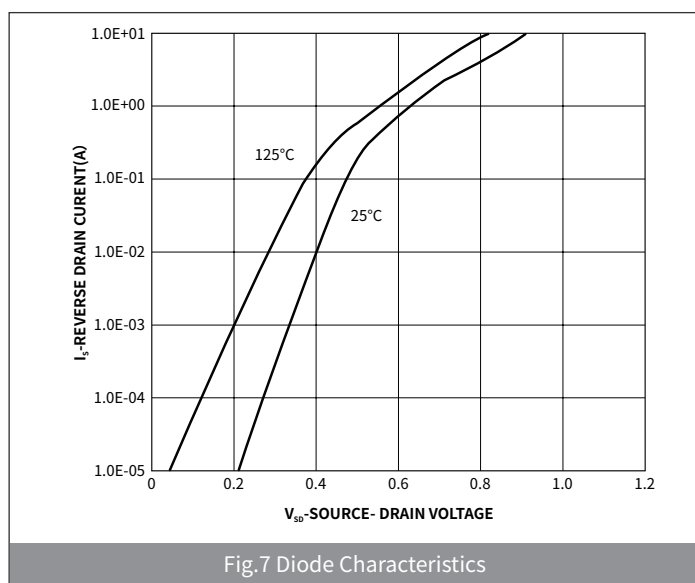
### ● Switching Parameters (Ta=25°C Unless otherwise specified)

| PARAMETER               | SYMBOL              | Condition                                                                                             | UNIT | Min | Typ  | Max |
|-------------------------|---------------------|-------------------------------------------------------------------------------------------------------|------|-----|------|-----|
| Total Gate Charge       | Q <sub>g</sub>      | V <sub>GS</sub> = -4.5V<br>V <sub>DS</sub> = -10V<br>I <sub>D</sub> = -4.0A                           | nC   | —   | 11   | —   |
| Gate-Source Charge      | Q <sub>gs</sub>     |                                                                                                       |      | —   | 2.0  | —   |
| Gate-Drain Charge       | Q <sub>gd</sub>     |                                                                                                       |      | —   | 3.0  | —   |
| Reverse Recovery Charge | Q <sub>rr</sub>     | I <sub>F</sub> = -4.0A<br>di/dt=100A/us                                                               |      | —   | 13.8 | —   |
| Reverse Recovery Time   | t <sub>rr</sub>     |                                                                                                       | —    | 31  | —    |     |
| Turn-on Delay Time      | t <sub>D(on)</sub>  | V <sub>GS</sub> = -4.5V<br>V <sub>DS</sub> = -10V<br>I <sub>D</sub> = -1.0A<br>R <sub>GEN</sub> =2.5Ω | ns   | —   | 14   | —   |
| Turn-on Rise Time       | t <sub>r</sub>      |                                                                                                       |      | —   | 10   | —   |
| Turn-off Delay Time     | t <sub>D(off)</sub> |                                                                                                       |      | —   | 20   | —   |
| Turn-off fall Time      | t <sub>f</sub>      |                                                                                                       |      | —   | 30   | —   |

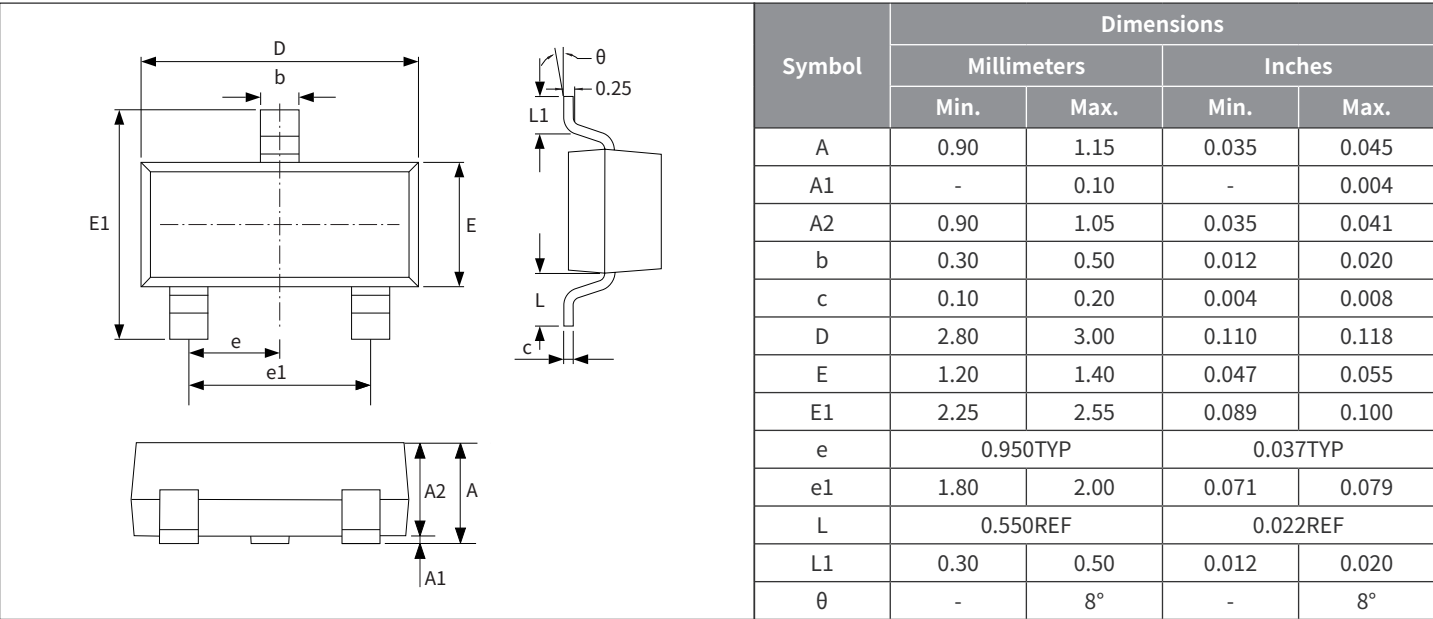
## ● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



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● Package Outline Dimensions (SOT-23)



● Suggested Pad Layout

