

## Plastic-Encapsulate MOSFETs

### P-CHANNEL MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$  |
|---------------|-----------------|--------|
| -50 V         | 8Ω@-10V         | -0.13A |
|               | 10Ω@ -5V        |        |

### DESCRIPTION

These miniature surface mount MOSFETs reduce power loss conserve energy, making this device ideal for use in small power management circuitry.

### FEATURE

- Energy Efficient
- Low Threshold Voltage
- High-speed Switching
- Miniature Surface Mount Package Saves Board Space

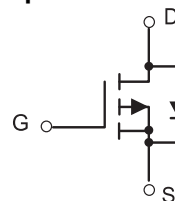
### APPLICATION

- DC-DC converters, load switching, power management in portable and battery-powered products such as computers, printers, cellular and cordless telephones.

### MARKING



### Equivalent Circuit



### MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ unless otherwise noted)

| Parameter                                                                | Symbol          | Value    | Unit               |
|--------------------------------------------------------------------------|-----------------|----------|--------------------|
| Drain-Source Voltage                                                     | $V_{DS}$        | -50      | V                  |
| Gate-Source Voltage                                                      | $V_{GS}$        | $\pm 20$ | V                  |
| Continuous Drain Current                                                 | $I_D$           | -0.13    | A                  |
| Pulsed Drain Current (note 1) @ $t_p < 10 \mu\text{s}$                   | $I_{DM}$        | -0.52    | A                  |
| Power Dissipation                                                        | $P_D$           | 200      | mW                 |
| Thermal Resistance from Junction to Ambient (note 2)                     | $R_{\theta JA}$ | 556      | $^\circ\text{C/W}$ |
| Junction Temperature                                                     | $T_J$           | 150      | $^\circ\text{C}$   |
| Storage Temperature                                                      | $T_{STG}$       | -55~+150 | $^\circ\text{C}$   |
| Maximum Lead Temperature for Soldering Purposes , Duration for 5 Seconds | $T_L$           | 260      | $^\circ\text{C}$   |

### MOSFET ELECTRICAL CHARACTERISTICS

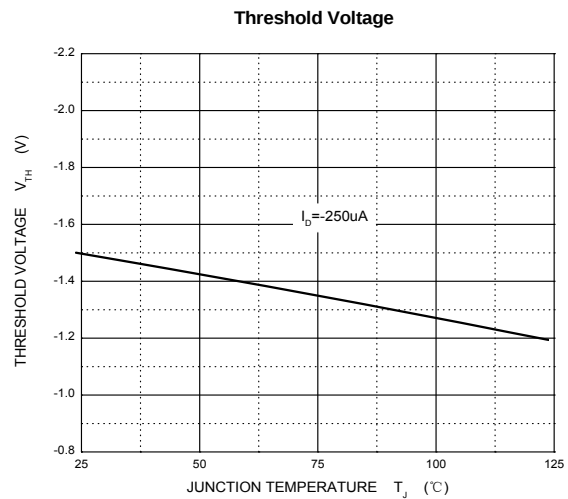
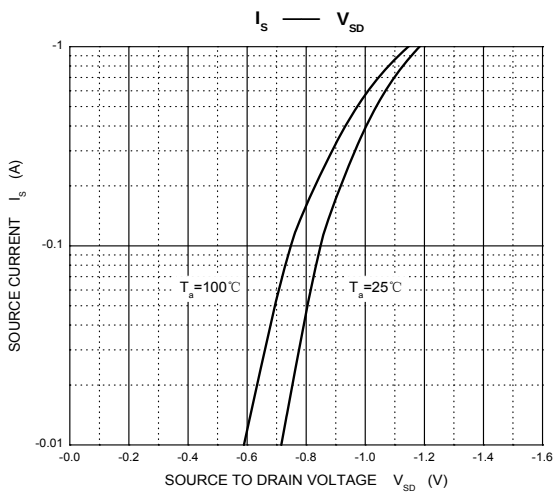
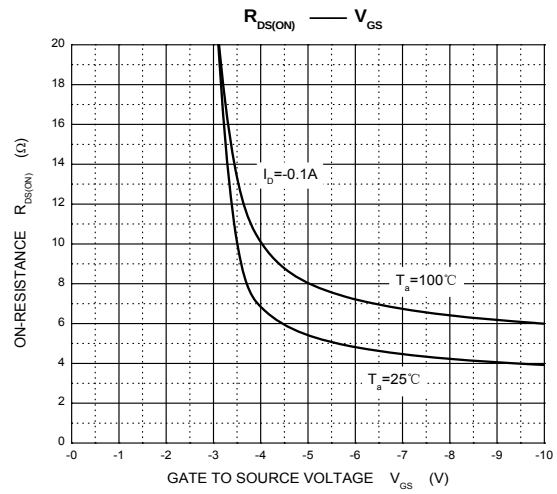
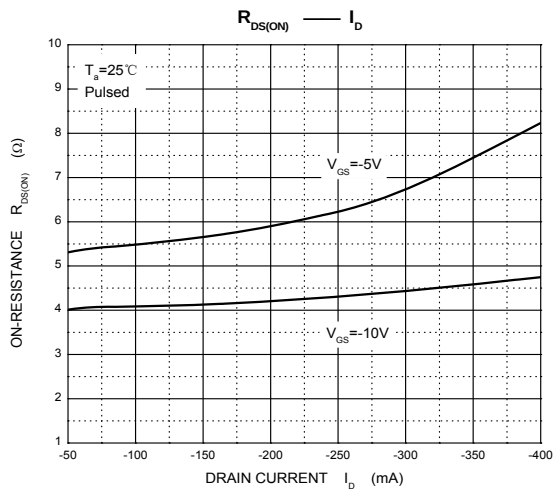
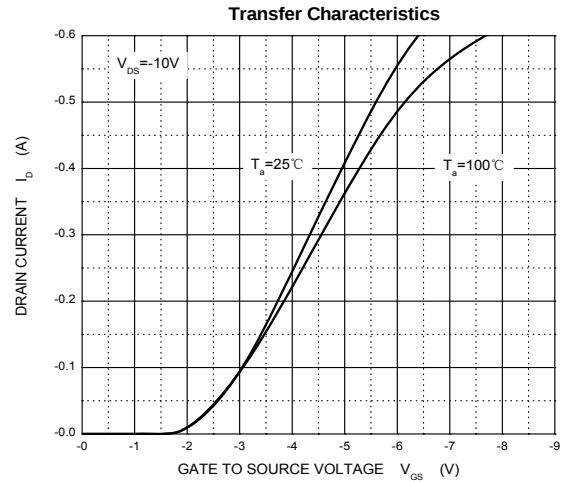
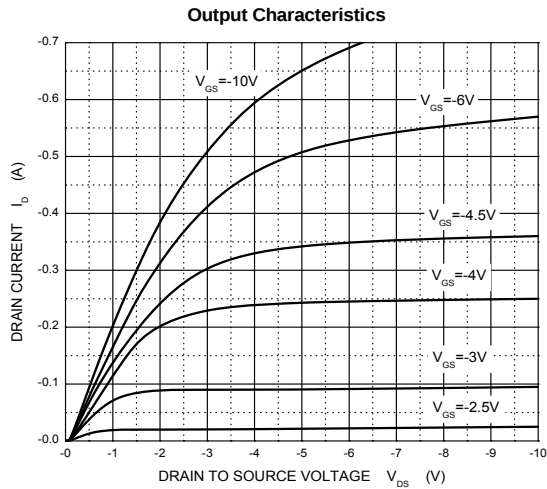
$T_a = 25^\circ\text{C}$  unless otherwise specified

| Parameter                           | Symbol        | Test Condition                                    | Min  | Typ  | Max     | Unit     |
|-------------------------------------|---------------|---------------------------------------------------|------|------|---------|----------|
| STATIC CHARACTERISTICS              |               |                                                   |      |      |         |          |
| Drain-source breakdown voltage      | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = -250\mu A$                    | -50  |      |         | V        |
| Zero gate voltage drain current     | $I_{DSS}$     | $V_{DS} = -50V, V_{GS} = 0V$                      |      |      | -15     | $\mu A$  |
|                                     |               | $V_{DS} = -25V, V_{GS} = 0V$                      |      |      | -0.1    | $\mu A$  |
| Gate-body leakage current           | $I_{GSS}$     | $V_{GS} = \pm 20V, V_{DS} = 0V$                   |      |      | $\pm 5$ | $\mu A$  |
| Gate threshold voltage (note 3)     | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = -250\mu A$                | -0.9 | -1.6 | -2      | V        |
| Drain-source on-resistance (note 3) | $R_{DS(on)}$  | $V_{GS} = -5V, I_D = -0.1A$                       |      | 5.8  | 10      | $\Omega$ |
|                                     |               | $V_{GS} = -10V, I_D = -0.1A$                      |      | 4.5  | 8       | $\Omega$ |
| Forward transconductance (note 1)   | $g_{FS}$      | $V_{DS} = -25V; I_D = -100mA$                     | 50   |      |         | mS       |
| DYNAMIC CHARACTERISTICS (note 4)    |               |                                                   |      |      |         |          |
| Input capacitance                   | $C_{iss}$     | $V_{DS} = 5V, V_{GS} = 0V, f = 1MHz$              |      | 30   |         | pF       |
| Output capacitance                  | $C_{oss}$     |                                                   |      | 10   |         | pF       |
| Reverse transfer capacitance        | $C_{rss}$     |                                                   |      | 5    |         | pF       |
| SWITCHING CHARACTERISTICS (note 4)  |               |                                                   |      |      |         |          |
| Turn-on delay time                  | $t_{d(on)}$   | $V_{DD} = -15V,$<br>$R_L = 50\Omega, I_D = -2.5A$ |      | 2.5  |         | ns       |
| Turn-on rise time                   | $t_r$         |                                                   |      | 1    |         | ns       |
| Turn-off delay time                 | $t_{d(off)}$  |                                                   |      | 16   |         | ns       |
| Turn-off fall time                  | $t_f$         |                                                   |      | 8    |         | ns       |
| SOURCE-DRAIN DIODE CHARACTERISTICS  |               |                                                   |      |      |         |          |
| Continuous Current                  | $I_S$         |                                                   |      |      | -0.13   | A        |
| Pulsed Current                      | $I_{SM}$      |                                                   |      |      | -0.52   | A        |
| Diode forward voltage (note 3)      | $V_{SD}$      | $I_S = -0.13A, V_{GS} = 0V$                       |      |      | -2.2    | V        |

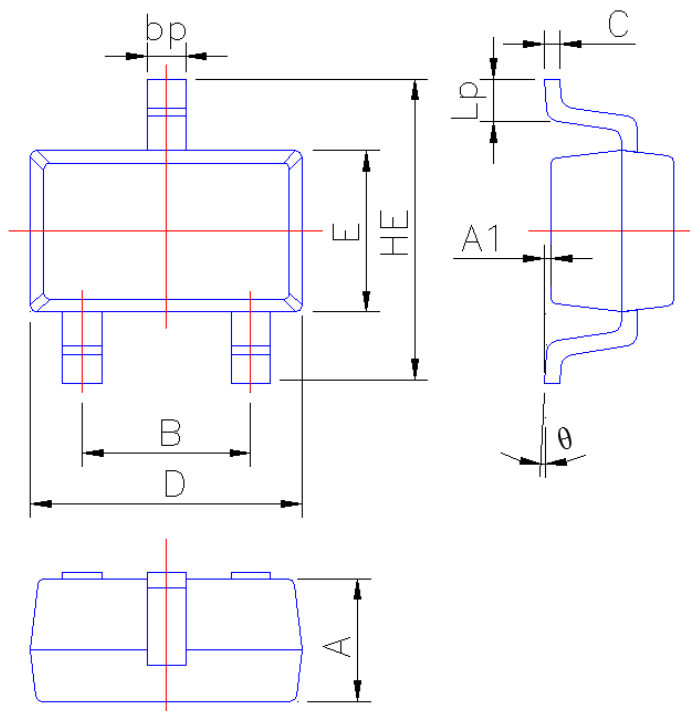
**Notes :**

1. Repetitive rating : Pulse width limited by junction temperature.
2. Surface mounted on FR4 board ,  $t \leq 10s$ .
3. Pulse Test : Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to producing.

### Typical Characteristics



### SOT-323 Package Outline Dimensions



| Symbol | Dimension in Millimeters |       |
|--------|--------------------------|-------|
|        | Min                      | Max   |
| A      | 0.90                     | 1.00  |
| A1     | 0.010                    | 0.100 |
| B      | 1.20                     | 1.40  |
| bp     | 0.25                     | 0.45  |
| C      | 0.09                     | 0.15  |
| D      | 2.00                     | 2.20  |
| E      | 1.15                     | 1.35  |
| HE     | 2.15                     | 2.55  |
| Lp     | 0.25                     | 0.46  |
| θ      | 0°                       | 6°    |