

## N-Channel MOSFET

### SOT- 23

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | $I_D$ |
|---------------|-----------------|-------|
| 100 V         | 234mΩ@10V       | 2A    |
|               | 267mΩ@ 6V       |       |
|               | 278mΩ@4.5V      |       |



#### FEATURE

- TrenchFET Power MOSFET
- LOW  $R_{DS(on)}$
- Surface Mount Package

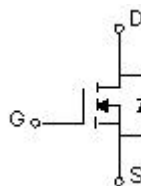
#### APPLICATION

- DC/DC Converters
- Load Switch
- LED Backlighting in LCD TVs

#### MARKING



#### Equivalent Circuit



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

| Parameter                                                        | Symbol          | Value    | Unit                 |
|------------------------------------------------------------------|-----------------|----------|----------------------|
| Drain-Source Voltage                                             | $V_{DS}$        | 100      | V                    |
| Gate-Source Voltage                                              | $V_{GS}$        | $\pm 20$ | V                    |
| Continuous Drain Current                                         | $I_D$           | 2        | A                    |
| Pulsed Drain Current                                             | $I_{DM}^*$      | 8        | A                    |
| Thermal Resistance from Junction to Ambient                      | $R_{\theta JA}$ | 357      | $^{\circ}\text{C/W}$ |
| Junction Temperature                                             | $T_J$           | 150      | $^{\circ}\text{C}$   |
| Storage Temperature                                              | $T_{STG}$       | -55~+150 | $^{\circ}\text{C}$   |
| Lead Temperature for Soldering Purposes(1/8" from case for 10 s) | $T_L$           | 260      | $^{\circ}\text{C}$   |

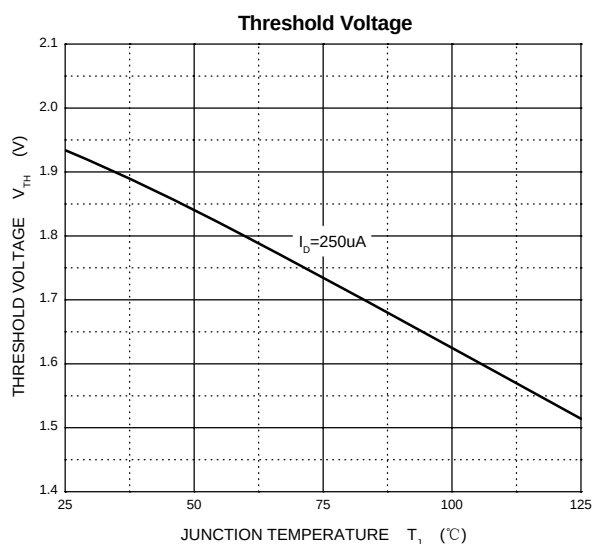
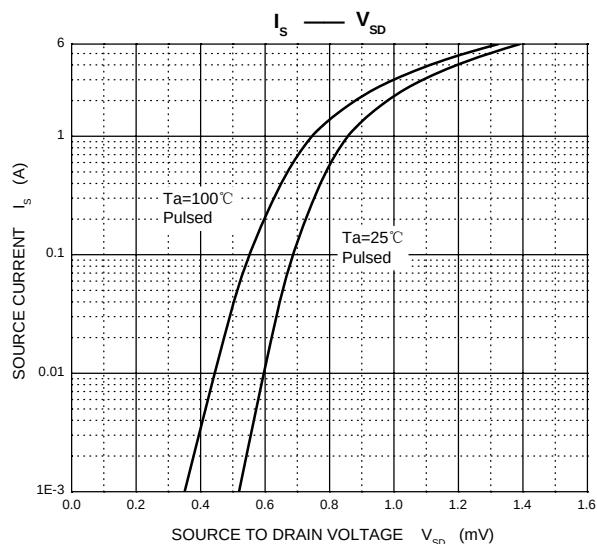
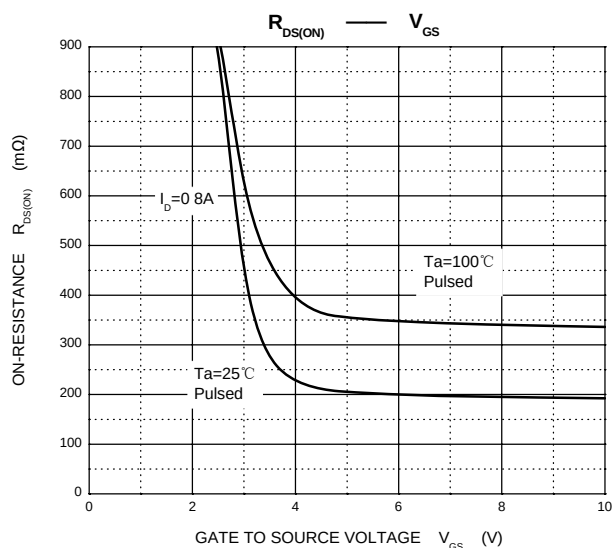
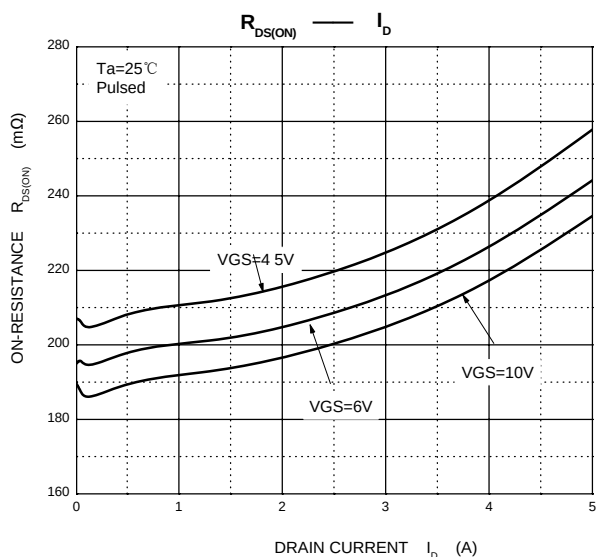
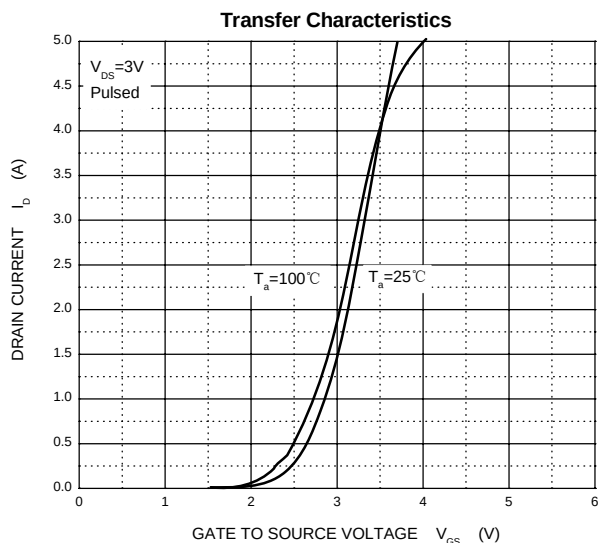
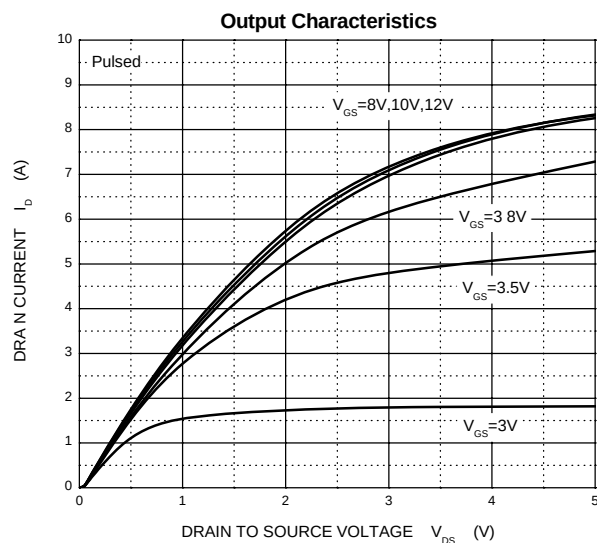
\*Repetitive rating: Pluse width limited by junction temperature.

**ELECTRICAL CHARACTERISTICS (Ta =25°C unless otherwise specified)**

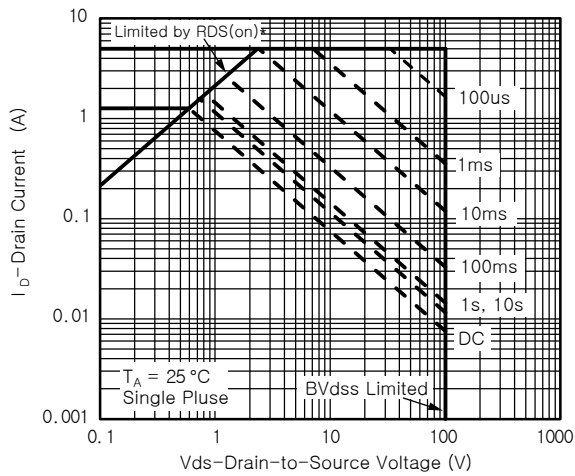
| Parameter                            | Symbol        | Test Condition                                                                | Min | Typ  | Max       | Unit       |
|--------------------------------------|---------------|-------------------------------------------------------------------------------|-----|------|-----------|------------|
| <b>STATIC PARAMETERS</b>             |               |                                                                               |     |      |           |            |
| Drain-source breakdown voltage       | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 250\mu A$                                                 | 100 |      |           | V          |
| Zero gate voltage drain current      | $I_{DSS}$     | $V_{DS} = 100V, V_{GS} = 0V$                                                  |     |      | 1         | $\mu A$    |
| Gate-body leakage current            | $I_{GSS}$     | $V_{GS} = \pm 20V, V_{DS} = 0V$                                               |     |      | $\pm 100$ | nA         |
| Gate threshold voltage(note 1)       | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\mu A$                                             | 1.2 |      | 2.8       | V          |
| Drain-source on-resistance (note 1)  | $R_{DS(on)}$  | $V_{GS} = 10V, I_D = 1.5A$                                                    |     |      | 234       | m $\Omega$ |
|                                      |               | $V_{GS} = 6V, I_D = 1A$                                                       |     |      | 267       | m $\Omega$ |
|                                      |               | $V_{GS} = 4.5V, I_D = 0.5A$                                                   |     |      | 278       | m $\Omega$ |
| Forward tranconductance (note 1)     | $g_{FS}$      | $V_{DS} = 20V, I_D = 1.5A$                                                    |     | 2    |           | S          |
| Diode forward voltage (note 1)       | $V_{SD}$      | $I_S = 1.3A, V_{GS} = 0V$                                                     |     |      | 1.2       | V          |
| <b>DYNAMIC PARAMETERS (note2)</b>    |               |                                                                               |     |      |           |            |
| Input Capacitance                    | $C_{iss}$     | $V_{DS} = 50V, V_{GS} = 0V, f = 1MHz$                                         |     | 190  |           | pF         |
| Output Capacitance                   | $C_{oss}$     |                                                                               |     | 22   |           | pF         |
| Reverse Transfer Capacitance         | $C_{rss}$     |                                                                               |     | 13   |           | pF         |
| Gate Resistance                      | $R_g$         | $F = 1MHz$                                                                    | 0.3 |      | 2.8       | $\Omega$   |
| <b>SWITCHING PARAMETERS (note 2)</b> |               |                                                                               |     |      |           |            |
| Turn-on delay time                   | $t_{d(on)}$   | $V_{DD} = 50V, V_{GEN} = 4.5V$<br>$R_L = 39\Omega, R_G = 1\Omega, I_D = 1.3A$ |     |      | 45        | ns         |
| Turn-on rise time                    | $t_r$         |                                                                               |     |      | 39        | ns         |
| Turn-off delay time                  | $t_{d(off)}$  |                                                                               |     |      | 26        | ns         |
| Turn-off fall time                   | $t_f$         |                                                                               |     |      | 20        | ns         |
| Total Gate Charge                    | $Q_g$         | $V_{DS} = 50V, V_{GS} = 4.5V, I_D = 1.6A$                                     |     |      | 5.8       | nC         |
| Gate-Source Charge                   | $Q_{gs}$      |                                                                               |     | 0.75 |           | nC         |
| Gate-Drain Charge                    | $Q_{gd}$      |                                                                               |     | 1.4  |           | nC         |

**Notes :** 1. Pulse Test : Pulse width $\leq 300\mu s$ , duty cycle $\leq 0.5\%$ .  
2. Guaranteed by design, not subject to production testing.

# Typical Characteristics



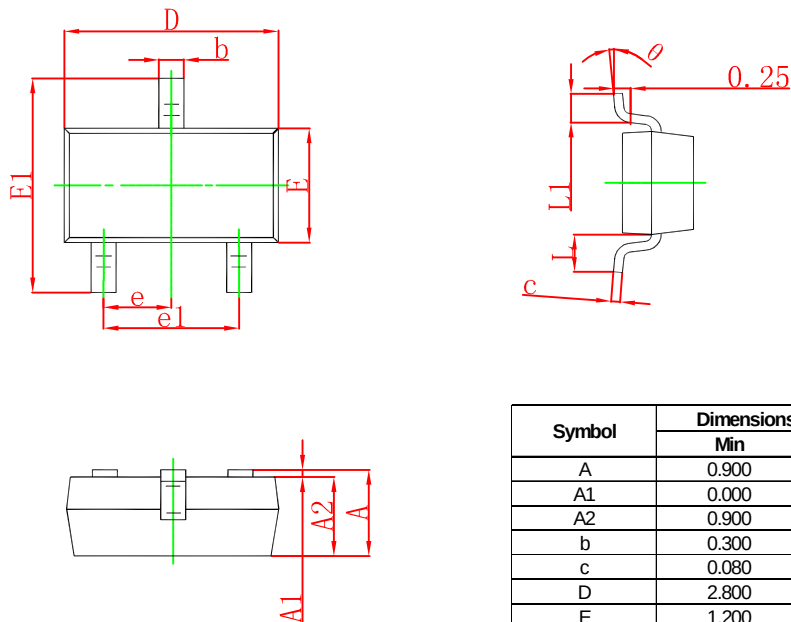
## Typical Characteristics



\*  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified

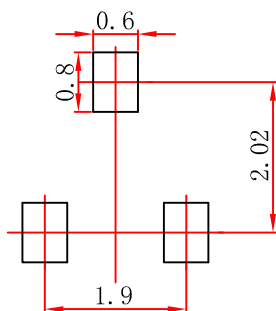
### Safe Operating Area

## SOT-23 Package Outline Dimensions



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.900                     | 1.150 | 0.035                | 0.045 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 0.900                     | 1.050 | 0.035                | 0.041 |
| b      | 0.300                     | 0.500 | 0.012                | 0.020 |
| c      | 0.080                     | 0.150 | 0.003                | 0.006 |
| D      | 2.800                     | 3.000 | 0.110                | 0.118 |
| E      | 1.200                     | 1.400 | 0.047                | 0.055 |
| E1     | 2.250                     | 2.550 | 0.089                | 0.100 |
| e      | 0.950 TYP                 |       | 0.037 TYP            |       |
| e1     | 1.800                     | 2.000 | 0.071                | 0.079 |
| L      | 0.550 REF                 |       | 0.022 REF            |       |
| L1     | 0.300                     | 0.500 | 0.012                | 0.020 |
| θ      | 0°                        | 8°    | 0°                   | 6°    |

## SOT-23 Suggested Pad Layout



Note:  
 1. Controlling dimension: in millimeters.  
 2. General tolerance:  $\pm 0.05\text{mm}$ .  
 3. The pad layout is for reference purposes only.