

## Dual N-Channel Power MOSFET

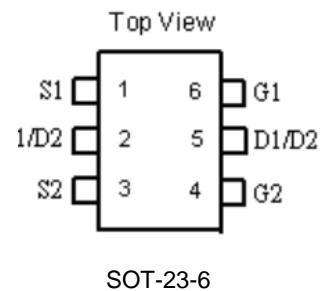
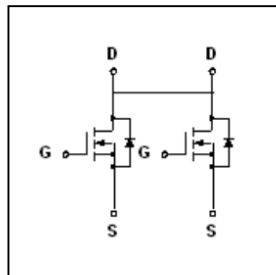
### FEATURES

- 20V 5A N-channel Trench Mosfet
- $R_{DS(on)} \leq 27m\Omega$  @  $V_{GS}=4.5V, I_D=5A$
- $R_{DS(on)} \leq 36m\Omega$  @  $V_{GS}=2.5V, I_D=3A$
- Low gate Charge
- Fast switching capability
- High reliability and rugged

### APPLIATION

- Portable Equipment
- Battery Powered System

### SYMBOL



### ABSOLUTE MAXIMUM RATINGS

| Parameter                                       | Symbol            | Rating     | Unit         |   |
|---|-------------------|------------|--------------|---|
| Drain-Source Voltage                            | $V_{DSS}$         | 20         | V            |   |
| Gate-Source Voltage                             | $V_{GSS}$         | $\pm 12$   | V            |   |
| Drain Current(Note1)                            | Continuous        | $I_D$      | 5            | A |
|   | Pulsed            | $I_{DM}$   | 20           | A |
| Power Dissipation ( $T_A=25^\circ C$ ) (Note 2) | $T_A=25^\circ C$  | $P_D$      | 0.83         | W |
|   | $T_A=100^\circ C$ |            | 0.3          |   |
| Thermal Resistance-Junction to Ambient          | $R_{\theta JA}$   | 150        | $^\circ C/W$ |   |
| Maximum Junction Temperature                    | $T_J$             | 150        | $^\circ C$   |   |
| Storage Temperature Range                       | $T_{STG}$         | -55 to 150 | $^\circ C$   |   |

Note: 1. Pulse Test: Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$

2. Pulse width limited by  $T_J(MAX)$

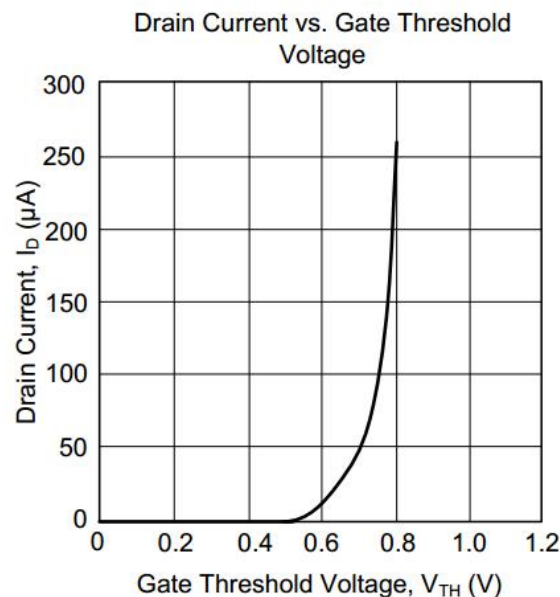
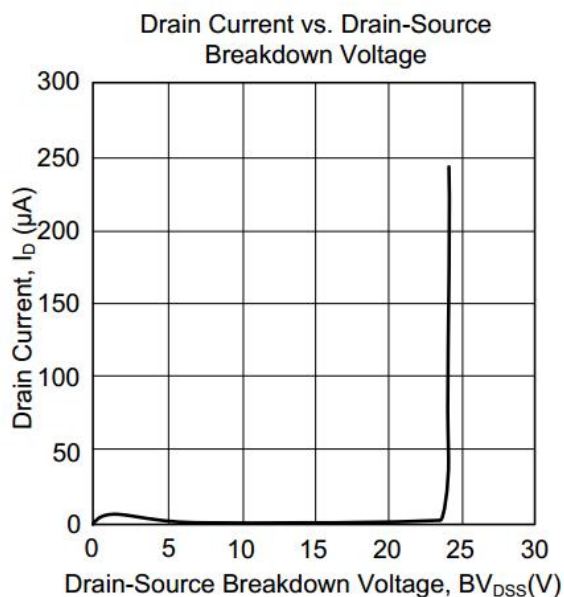
### ELECTRICAL CHARACTERISTICS ( $T_J=25^\circ C$ , unless otherwise Noted)

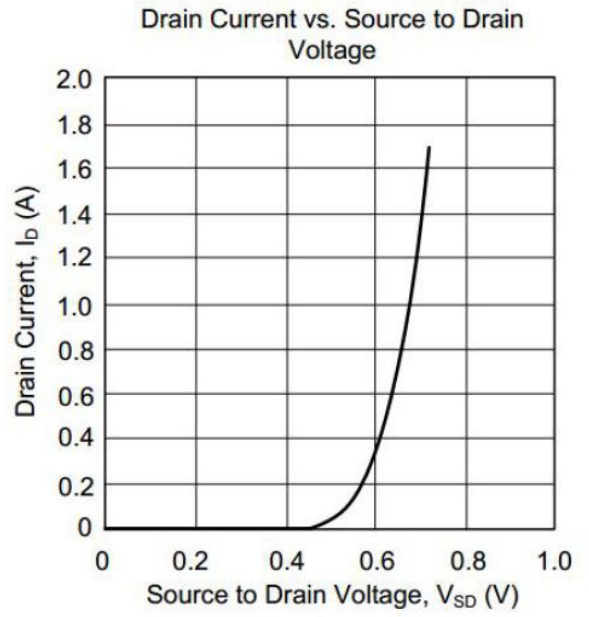
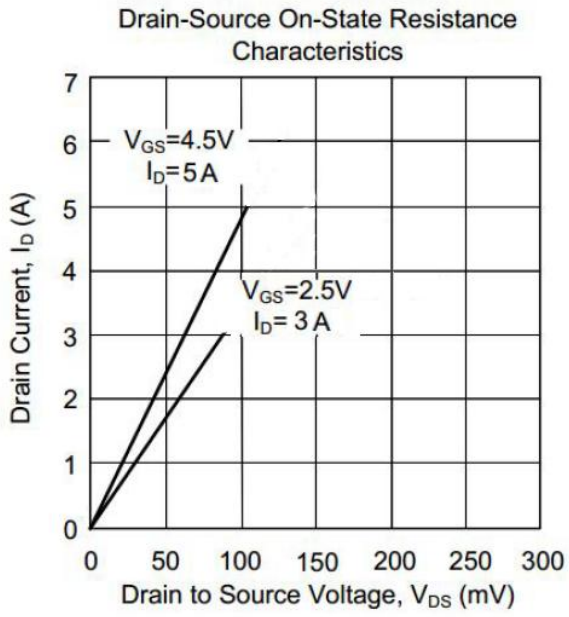
| Parameter                        | Symbol       | Test Condition                | Min. | Typ. | Max.      | Unit      |
|----------------------------------|--------------|-------------------------------|------|------|-----------|-----------|
| <b>OFF CHARACTERISTICS</b>       |              |                               |      |      |           |           |
| Drain-Source Breakdown Voltage   | $BV_{DSS}$   | $V_{GS}=0V, I_D=250\mu A$     | 20   |      |           | V         |
| Drain-Source Leakage Current     | $I_{DSS}$    | $V_{DS}=20V, V_{GS}=0V$       |      |      | 1         | $\mu A$   |
| Gate-Source Leakage Current      | $I_{GSS}$    | $V_{GS}=\pm 8V$               |      |      | $\pm 100$ | nA        |
| <b>ON CHARACTERISTICS</b>        |              |                               |      |      |           |           |
| Gate Threshold Voltage           | $V_{GS(TH)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 0.5  |      | 1.2       | V         |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}=4.5V, I_D=5.0A$       |      | 22   | 27        | $m\Omega$ |
|                                  |              | $V_{GS}=2.5V, I_D=3A$         |      | 28   | 36        | $m\Omega$ |

## ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C, unless otherwise Noted)

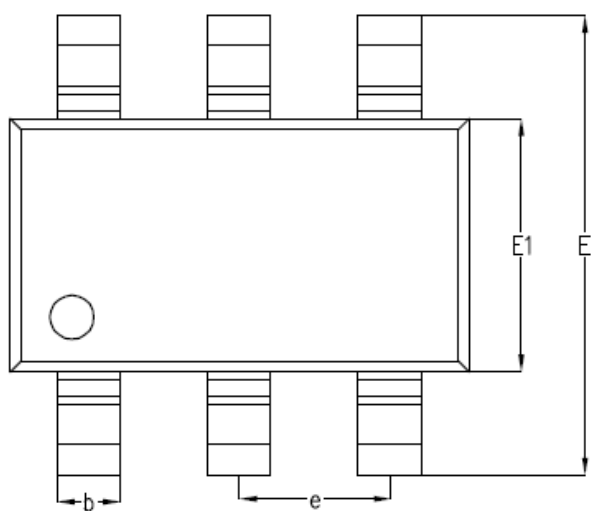
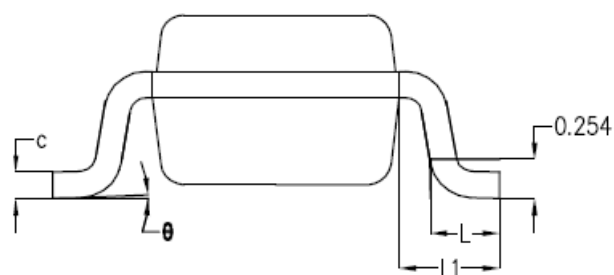
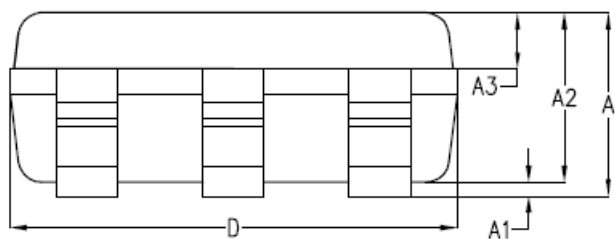
| Parameter  | Symbol              | Test Condition                               | Min. | Typ. | Max. | Unit |
|--|---------------------|--|------|------|------|------|
| <b>DYNAMIC PARAMETERS</b>                              |                     |  |      |      |      |      |
| Input Capacitance                                      | C <sub>ISS</sub>    | VDS=10V, VGS=0V,<br>f=1.0MHz                 |      | 630  |      | pF   |
| Output Capacitance                                     | C <sub>OSS</sub>    |  |      | 312  |      | pF   |
| Reverse Transfer Capacitance                           | C <sub>RSS</sub>    |  |      | 145  |      | pF   |
| <b>SWITCHING PARAMETERS</b>                            |                     |  |      |      |      |      |
| Turn-ON Delay Time (Note)                              | t <sub>D(ON)</sub>  | VGS=4V, VDS=10V,<br>RD=10Ω,<br>RG=10Ω, ID=1A |      | 18   |      | ns   |
| Turn-ON Rise Time                                      | t <sub>R</sub>      |  |      | 5    |      | ns   |
| Turn-OFF Delay Time                                    | t <sub>D(OFF)</sub> |  |      | 42   |      | ns   |
| Turn-OFF Fall-Time                                     | t <sub>F</sub>      |  |      | 19   |      | ns   |
| Total Gate Charge(Note)                                | Q <sub>G</sub>      | VDS =20V, VGS =5V,<br>ID =5.0A               |      | 23   |      | nC   |
| Gate Source Charge                                     | Q <sub>GS</sub>     |  |      | 4.5  |      | nC   |
| Gate Drain Charge                                      | Q <sub>GD</sub>     |  |      | 6.8  |      | nC   |
| <b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b> |                     |  |      |      |      |      |
| Drain-Source Diode Forward Voltage                     | V <sub>SD</sub>     | IS=1.7A, VGS=0V                              |      | 1.2  |      | V    |
| Diode Continuous Forward Current                       | I <sub>S</sub>      | VD=VG, VS=1.3V                               |      | 1.5  |      | A    |

## TYPICAL CHARACTERISTICS





## SOT-23-6 Package Information



| SYMBOL   | MILLIMETER |      |      |
|----------|------------|------|------|
|          | MIN        | NOM  | MAX  |
| A        | -          | 1.19 | 1.24 |
| A1       | -          | 0.05 | 0.09 |
| A2       | 1.05       | 1.10 | 1.15 |
| A3       | 0.31       | 0.36 | 0.41 |
| b        | 0.35       | 0.40 | 0.45 |
| c        | 0.12       | 0.17 | 0.22 |
| D        | 2.85       | 2.90 | 2.95 |
| E        | 2.80       | 2.90 | 3.00 |
| E1       | 1.55       | 1.60 | 1.65 |
| e        | 0.95BSC    |      |      |
| L        | 0.37       | 0.45 | 0.53 |
| L1       | 0.65BSC    |      |      |
| $\theta$ | 0°         | 2°   | 8°   |

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