



#### Description

#### P-channel MOSFET

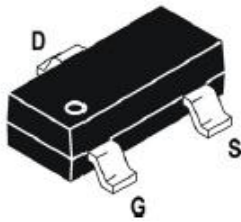
##### Features

- $V_{DS} = -30V$ ,  $I_D = -4.2A$
- $R_{DS(ON)} < 90\ m\Omega$  @  $V_{GS} = -2.5V$   
 $R_{DS(ON)} < 75m\Omega$  @  $V_{GS} = -4.5V$   
 $R_{DS(ON)} < 55m\Omega$  @  $V_{GS} = -10V$
- High Power and Current Handling Capability
- Lead Free Product is Acquired
- Surface Mount Package

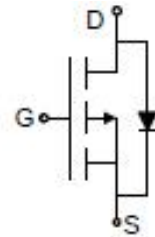
##### Application

- PWM Applications
- Load Switch
- Power Management

##### Package



SOT-23



Schematic Diagram

#### Absolute Maximum Ratings ( $T_C = 25^\circ C$ unless otherwise specified)

| Symbol          | Parameter                               | Max.                | Units        |
|-----------------|---|---------------------|--------------|
| $V_{DSS}$       | Drain-Source Voltage                    | -30                 | V            |
| $V_{GSS}$       | Gate-Source Voltage                     | $\pm 12$            | V            |
| $I_D$           | Continuous Drain Current                | $T_C = 25^\circ C$  | -4.2         |
|                 |   | $T_C = 100^\circ C$ | -2.7         |
| $P_D$           | Power Dissipation                       | $T_C = 25^\circ C$  | 1.2          |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 104                 | $^\circ C/W$ |
| $T_J, T_{STG}$  | Operating and Storage Temperature Range | -55 to +150         | $^\circ C$   |



**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  unless otherwise specified)

| Symbol  | Parameter   | Test Condition  | Min. | Typ. | Max.      | Units      |
|---|---|---|------|------|-----------|------------|
| <b>Off Characteristic</b>                                     |   |   |      |      |           |            |
| $V_{(BR)DSS}$   | Drain-Source Breakdown Voltage                            | $V_{GS}=0V, I_D = -250\mu A$                                      | -30  | -    | -         | V          |
| $I_{DSS}$   | Zero Gate Voltage Drain Current                           | $V_{DS} = -24V, V_{GS} = 0V,$                                     | -    | -    | -1        | $\mu A$    |
| $I_{GSS}$   | Gate to Body Leakage Current                              | $V_{DS}=0V, V_{GS} = \pm 10V$                                     | -    | -    | $\pm 100$ | nA         |
| <b>On Characteristics</b>                                     |   |   |      |      |           |            |
| $V_{GS(th)}$  | Gate Threshold Voltage                                    | $V_{DS}= V_{GS}, I_D = -250\mu A$                                 | -0.7 | -0.9 | -1.3      | V          |
| $R_{DS(on)}$  | Static Drain-Source on-Resistance<br><small>note2</small> | $V_{GS} = -10V, I_D = -4.2A$                                      | -    | 48   | 55        | m $\Omega$ |
|   |   | $V_{GS} = -4.5V, I_D = -4A$                                       | -    | 55   | 75        |            |
|   |   | $V_{GS} = -2.5V, I_D = -1A$                                       | -    | 72   | 90        |            |
| $g_{FS}$  | Forward Transconductance                                  | $V_{DS} = -5V, I_D = -4.2A$                                       | -    | 10   | -         | S          |
| <b>Dynamic Characteristics</b>                                |   |   |      |      |           |            |
| $C_{iss}$   | Input Capacitance   | $V_{DS} = -15V, V_{GS} = 0V, f = 1.0MHz$                          | -    | 882  | -         | pF         |
| $C_{oss}$   | Output Capacitance  |   | -    | 106  | -         | pF         |
| $C_{rss}$   | Reverse Transfer Capacitance                              |   | -    | 68   | -         | pF         |
| $Q_g$   | Total Gate Charge   | $V_{DS} = -15V, I_D = -4.2A,$<br>$V_{GS} = -4.5V$                 | -    | 8.6  | -         | nC         |
| $Q_{gs}$  | Gate-Source Charge  |   | -    | 1.9  | -         | nC         |
| $Q_{gd}$  | Gate-Drain("Miller") Charge                               |   | -    | 2.9  | -         | nC         |
| <b>Switching Characteristics</b>                              |   |   |      |      |           |            |
| $t_{d(on)}$   | Turn-on Delay Time  | $V_{DD} = -15V, I_D = -4.2A,$<br>$V_{GS} = -10V, R_{GEN}=6\Omega$ | -    | 8    | -         | ns         |
| $t_r$   | Turn-on Rise Time   |   | -    | 4    | -         | ns         |
| $t_{d(off)}$  | Turn-off Delay Time                                       |   | -    | 32   | -         | ns         |
| $t_f$   | Turn-off Fall Time  |   | -    | 14   | -         | ns         |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |   |   |      |      |           |            |
| $I_S$   | Maximum Continuous Drain to Source Diode Forward Current  |   | -    | -    | -4.2      | A          |
| $V_{SD}$  | Drain to Source Diode Forward Voltage                     | $V_{GS} = 0V, I_S = -4.2A$  | -    | -    | -1.2      | V          |

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 2\%$

**Typical Performance Characteristics**

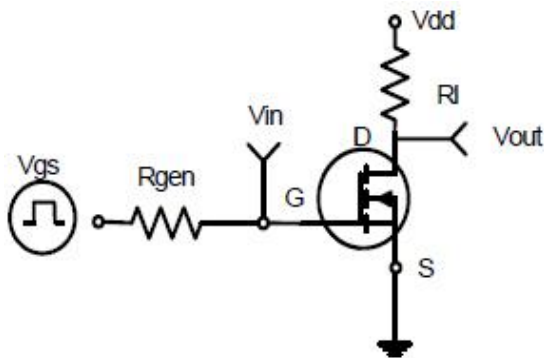


Figure1: Switching Test Circuit

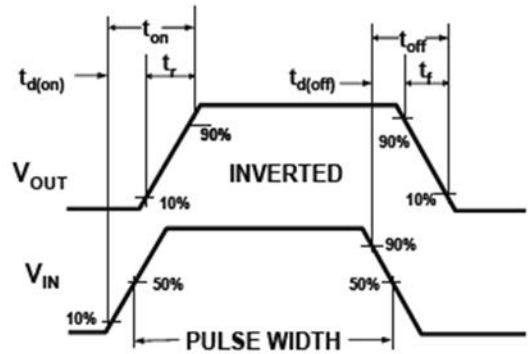
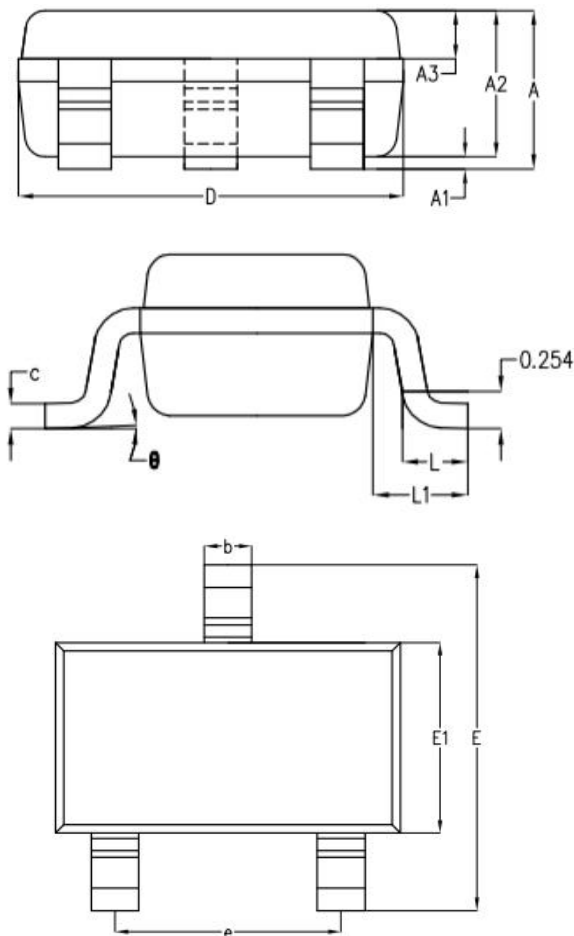


Figure2: Switching Waveforms

**Package Information.**

➤ SOT23-3(大)



| 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        | 1.90BSC    |      |      |
| L        | 0.37       | 0.45 | 0.53 |
| L1       | 0.65BSC    |      |      |
| $\theta$ | 0°         | 2°   | 8°   |

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