

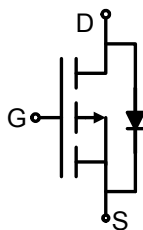
## P-Channel Enhancement Mode MOSFET

### FEATURES

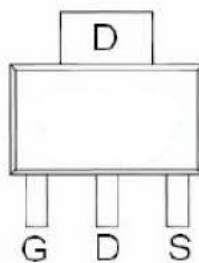
- ◆  $R_{DS(Typ.)} < 250\text{ m}\Omega @ V_{GS} = -10\text{ V}$
- ◆  $R_{DS(Typ.)} < 300\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$
- ◆ Gross Die = 9600

### APPLICATIONS

- ◆ Battery Charge
- ◆ Load Switching
- ◆ Power Converter



Schematic diagram



SOT-223 top view

Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$  unless otherwise noted)

| Parameter                                                        | Symbol          | Ratings     | Unit               |
|------------------------------------------------------------------|-----------------|-------------|--------------------|
| Drain-Source Voltage                                             | $V_{DS}$        | -100        | V                  |
| Gate-Source Voltage                                              | $V_{GS}$        | $\pm 20$    | V                  |
| Drain Current-Continuous @ $T_A = 25^\circ\text{C}$              | $I_D$           | -5          | A                  |
| Drain Current-Pulsed @ $T_A = 25^\circ\text{C}$ <sup>Note1</sup> | $I_{DM}$        | -15         | A                  |
| Maximum Power Dissipation                                        | $P_D$           | 2.1         | W                  |
| Storage Temperature Range                                        | $T_{STG}$       | -55 to +150 | $^\circ\text{C}$   |
| Operating Junction Temperature Range                             | $T_J$           | -55 to +150 | $^\circ\text{C}$   |
| Thermal Resistance, Junction-to-Ambient <sup>Note2</sup>         | $R_{\theta JA}$ | 60          | $^\circ\text{C/W}$ |

Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

| Parameter                          | Symbol              | Conditions                                                             | Min. | Typ. | Max. | Unit |
|------------------------------------|---------------------|------------------------------------------------------------------------|------|------|------|------|
| OFF Characteristics                |                     |                                                                        |      |      |      |      |
| Drain-Source Breakdown Voltage     | BV <sub>DSS</sub>   | V <sub>GS</sub> =0V , I <sub>DS</sub> =-250μA                          | -100 | -    | -    | V    |
| Zero Gate Voltage Drain Current    | I <sub>DSS</sub>    | V <sub>GS</sub> =0V , V <sub>DS</sub> =-80V                            | -    | -    | -1   | uA   |
| Gate-Body Leakage                  | I <sub>GSS</sub>    | V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V                            | -    | -    | ±100 | nA   |
| ON Characteristics                 |                     |                                                                        |      |      |      |      |
| Gate Threshold Voltage             | V <sub>TH</sub>     | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =-250μA             | -1   | -    | -2.0 | V    |
| Drain-Source On-State Resistance   | R <sub>DS</sub>     | V <sub>GS</sub> =-10V , I <sub>DS</sub> =-2A                           | -    |      | 250- | mΩ   |
|                                    |                     | V <sub>GS</sub> =-4.5V , I <sub>DS</sub> =-2A                          | -    |      | 300- |      |
| Dynamic Characteristics            |                     |                                                                        |      |      |      |      |
| Input Capacitance                  | C <sub>iss</sub>    | V <sub>DS</sub> =-50V<br>V <sub>GS</sub> =0V<br>Freq.=1MHz             | -    | 890  | -    | pF   |
| Output Capacitance                 | C <sub>oss</sub>    |                                                                        | -    | 60   | -    |      |
| Reverse Transfer Capacitance       | C <sub>rss</sub>    |                                                                        | -    | 25   | -    |      |
| Switching Characteristics          |                     |                                                                        |      |      |      |      |
| Turn-On Delay Time                 | t <sub>d(on)</sub>  | V <sub>DS</sub> =-50V<br>V <sub>GS</sub> =-10V<br>R <sub>G</sub> =3Ω   | -    | 12   | -    | ns   |
| Rise Time                          | t <sub>r</sub>      |                                                                        | -    | 32   | -    |      |
| Turn-Off Delay Time                | t <sub>d(off)</sub> |                                                                        | -    | 30   | -    |      |
| Fall Time                          | t <sub>f</sub>      |                                                                        | -    | 10   | -    |      |
| Total Gate Charge at 10V           | Q <sub>g</sub>      | V <sub>DS</sub> =-50V<br>V <sub>GS</sub> =-10V<br>I <sub>DS</sub> =-5A | -    | 24   | -    | nC   |
| Gate to Source Gate Charge         | Q <sub>gs</sub>     |                                                                        | -    | 5    | -    |      |
| Gate to Drain “Miller” Charge      | Q <sub>gd</sub>     |                                                                        | -    | 8    | -    |      |
| Drain-Source Diode Characteristics |                     |                                                                        |      |      |      |      |
| Drain-Source Diode Forward Voltage | V <sub>SD</sub>     | V <sub>GS</sub> =0V , I <sub>S</sub> =-1A                              | -0.4 | -    | -1.0 | V    |

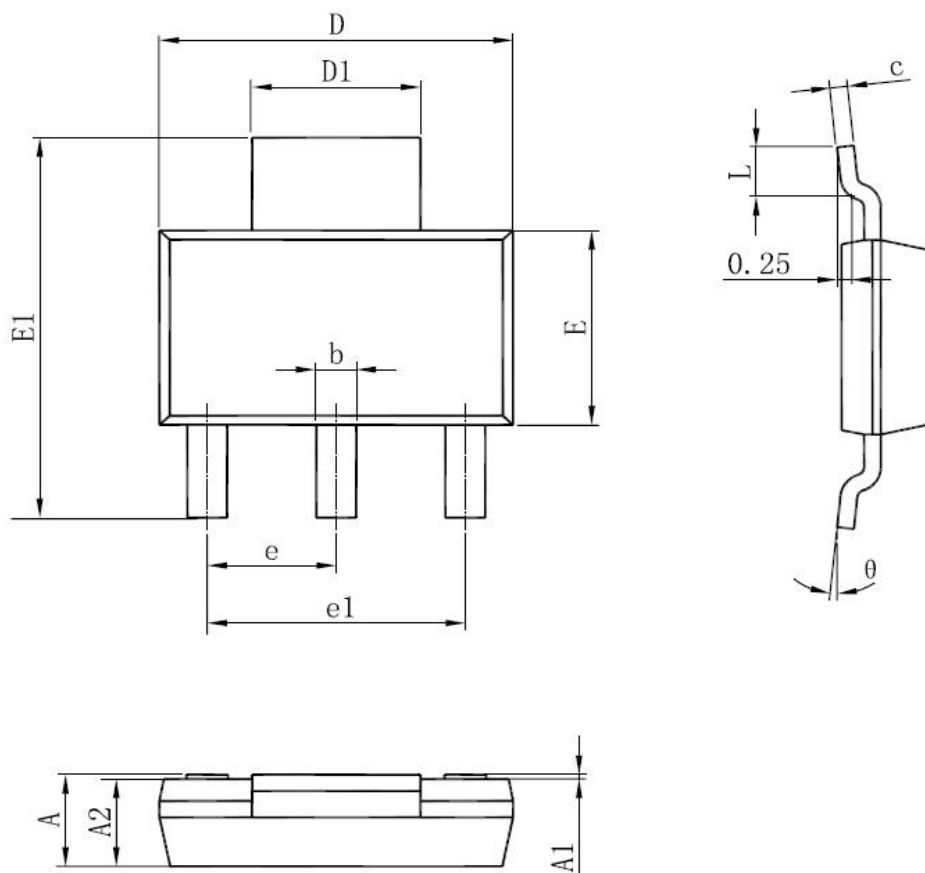
Notes:

1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

2. R<sub>θJA</sub> is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.

R<sub>θJC</sub> is guaranteed by design while R<sub>θCA</sub> is determined by the user's board design. R<sub>θJA</sub> shown below for single device operation on FR-4 in still air.

**Package Information:**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.520                     | 1.800 | 0.060                | 0.071 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 1.500                     | 1.700 | 0.059                | 0.067 |
| b      | 0.660                     | 0.820 | 0.026                | 0.032 |
| c      | 0.250                     | 0.350 | 0.010                | 0.014 |
| D      | 6.200                     | 6.400 | 0.244                | 0.252 |
| D1     | 2.900                     | 3.100 | 0.114                | 0.122 |
| E      | 3.300                     | 3.700 | 0.130                | 0.146 |
| E1     | 6.830                     | 7.070 | 0.269                | 0.278 |
| e      | 2.300(BSC)                |       | 0.091(BSC)           |       |
| e1     | 4.500                     | 4.700 | 0.177                | 0.185 |
| L      | 0.900                     | 1.150 | 0.035                | 0.045 |
| θ      | 0°                        | 10°   | 0°                   | 10°   |

SOT-223 Package