

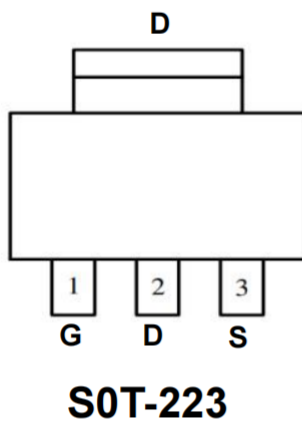
### Product Summary

- $V_{DS}$  250 V
- $I_{DS}$  0.5A
- $R_{DS(ON)}$  (at  $V_{GS}=10$ )  $\leq 2.6\Omega$  (Typ)
- Low Gate Charge Minimize Switching Loss

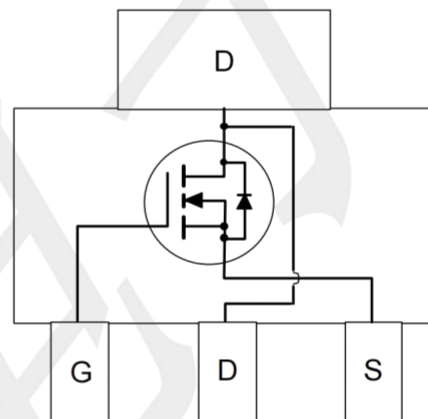
### Application

- Adaptor
- Charger
- Power management
- SMPS Standby Power

### Package and Pin Configuration



### Circuit diagram



### Absolute Maximum Ratings

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

| PARAMETER                                           | SYMBOL          | Value       | UNIT               |
|-----------------------------------------------------|-----------------|-------------|--------------------|
| Drain-Source Voltage                                | $V_{DS}$        | 250         | V                  |
| Gate-Source Voltage                                 | $V_{GS}$        | $\pm 20$    | V                  |
| Continuous Drain Current                            | $I_D$           | 0.5         | A                  |
| Continuous Drain Current ( $T_C=70^\circ\text{C}$ ) | $I_D$           | 0.4         | A                  |
| Pulsed Drain Current (Note 1)                       | $I_{DM}$        | 1.5         | A                  |
| Maximum Power Dissipation @ $T_A=25^\circ\text{C}$  | $P_D$           | 2           | W                  |
| Operating Junction Temperature Range                | $T_J$           | +150        | $^\circ\text{C}$   |
| Storage Temperature Range                           | $T_{stg}$       | -55 to +150 | $^\circ\text{C}$   |
| Thermal Resistance, Junction to Case                | $R_{\theta JC}$ | 63          | $^\circ\text{C/W}$ |

Note : When mounted on 1" square PCB (FR4 material).

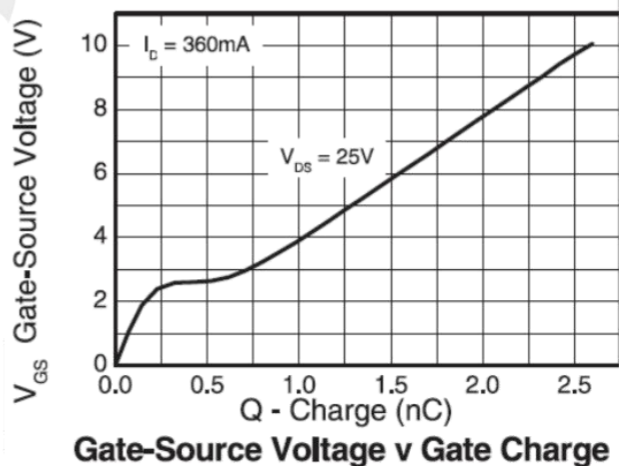
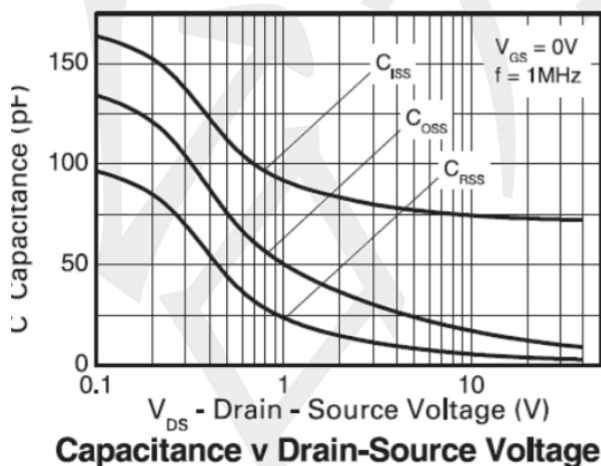
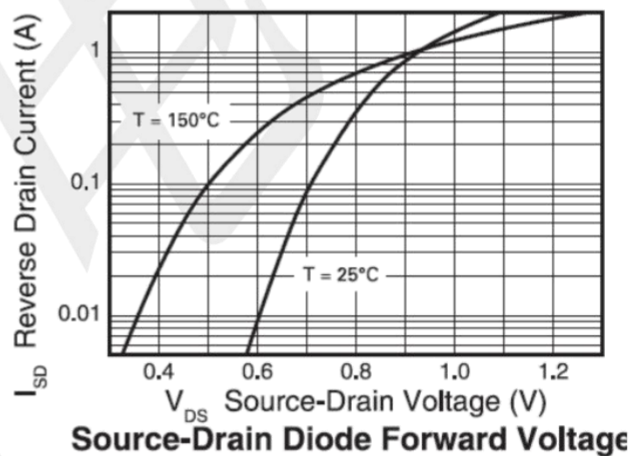
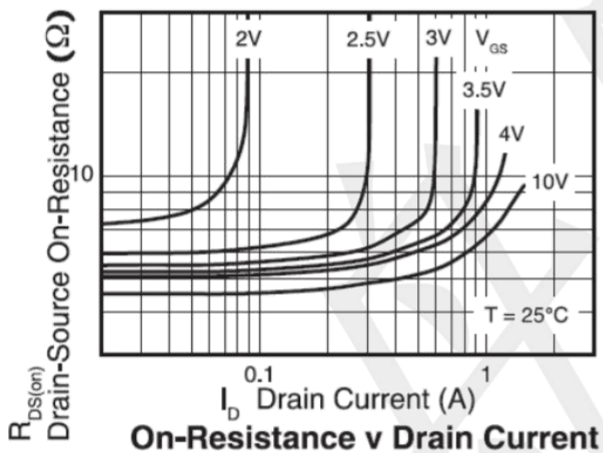
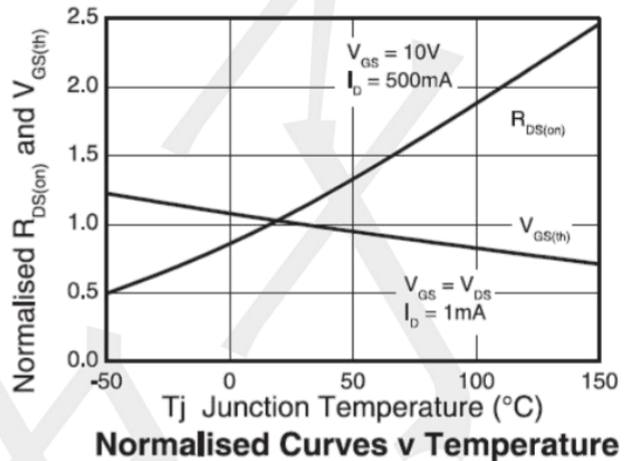
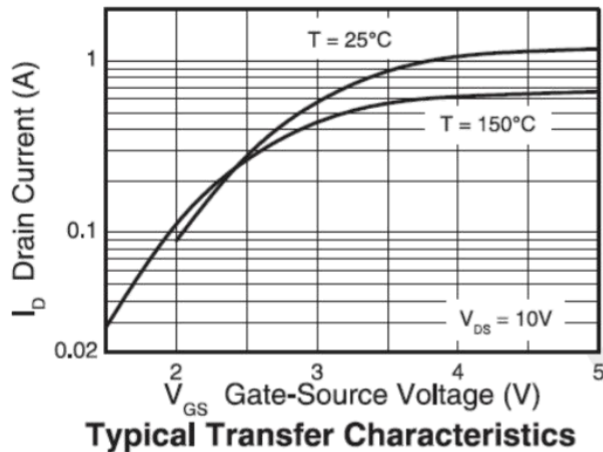
**Electrical Characteristics** ( $T_A=25^{\circ}\text{C}$  unless otherwise noted)

| PARAMETER                                               | CONDITIONS                                                           | SYMBOL       | MIN | TYP  | MAX       | UNIT     |
|---------------------------------------------------------|----------------------------------------------------------------------|--------------|-----|------|-----------|----------|
| Static                                                  |                                                                      |              |     |      |           |          |
| Drain-Source Breakdown Voltage                          | $V_{GS}=0V, I_D=250\mu A$                                            | $BV_{DSS}$   | 240 | 250  | --        | V        |
| Gate-Source Threshold Voltage                           | $V_{DS}=V_{GS}, I_D=250\mu A$                                        | $V_{GS(th)}$ | 1.0 | 1.3  | 3.0       | V        |
| Gate-Source Leakage                                     | $V_{DS}=0V, V_{GS}= \pm 20V$                                         | $I_{GSS}$    | --  | --   | $\pm 100$ | nA       |
| Zero Gate Voltage Drain Current                         | $V_{DS}= 200V, V_{GS}=0V$                                            | $I_{DSS}$    | --  | --   | 0.6       | $\mu A$  |
| Drain-Source On-State Resistance                        | $V_{GS}= 10V, I_D= 0.5A$                                             | $R_{DS(on)}$ | --  | 2.6  | 3.5       | $\Omega$ |
|                                                         | $V_{GS}= 4.5V, I_D= 0.5A$                                            |              | --  | 3.0  | 4.5       |          |
| Forward Trans conductance                               | $V_{DS}=10V, I_D=0.5A$                                               | $g_{FS}$     | --  | 0.5  | --        | S        |
| Dynamic (Note 2)                                        |                                                                      |              |     |      |           |          |
| Total Gate Charge (Note 3)                              | $V_{DS}= 25V,$<br>$I_D=0.36A,$<br>$V_{GS}= 10V$                      | $Q_g$        | --  | 2.6  | --        | nC       |
| Gate-Source Charge (Note 3)                             |                                                                      | $Q_{gs}$     | --  | 0.2  | --        |          |
| Gate-Drain Charge (Note 3)                              |                                                                      | $Q_{gd}$     | --  | 0.5  | --        |          |
| Input Capacitance                                       | $V_{DS}= 25V, V_{GS}= 0V,$<br>$F= 1.0MHz$                            | $C_{iss}$    | --  | 72   | --        | pF       |
| Output Capacitance                                      |                                                                      | $C_{oss}$    | --  | 11   | --        |          |
| Reverse Transfer Capacitance                            |                                                                      | $C_{rss}$    | --  | 3.6  | --        |          |
| Switching                                               |                                                                      |              |     |      |           |          |
| Turn-On Delay Time (Note 3)                             | $V_{DD}= 30V,$<br>$I_D= 0.36A,$<br>$V_{GS}= 10V,$<br>$R_G= 25\Omega$ | $t_{d(on)}$  | --  | 1.26 | --        | nS       |
| Rise Time (Note 3)                                      |                                                                      | $t_r$        | --  | 1.71 | --        |          |
| Turn-Off Delay Time (Note 3)                            |                                                                      | $t_{d(off)}$ | --  | 11.4 | --        |          |
| Fall Time (Note 3)                                      |                                                                      | $t_f$        | --  | 3.52 | --        |          |
| Source-Drain Diode Ratings and Characteristics (Note 2) |                                                                      |              |     |      |           |          |
| Forward Voltage                                         | $V_{GS}= 0V, I_S= 0.5A$                                              | $V_{SD}$     | --  | 0.8  | 1.2       | V        |
| Continuous Source Current                               | Integral reverse diode in the MOSFET                                 | $I_S$        | --  | --   | 0.5       | A        |
| Pulsed Current (Note 1)                                 |                                                                      | $I_{SM}$     | --  | --   | 1.5       | A        |

Notes:

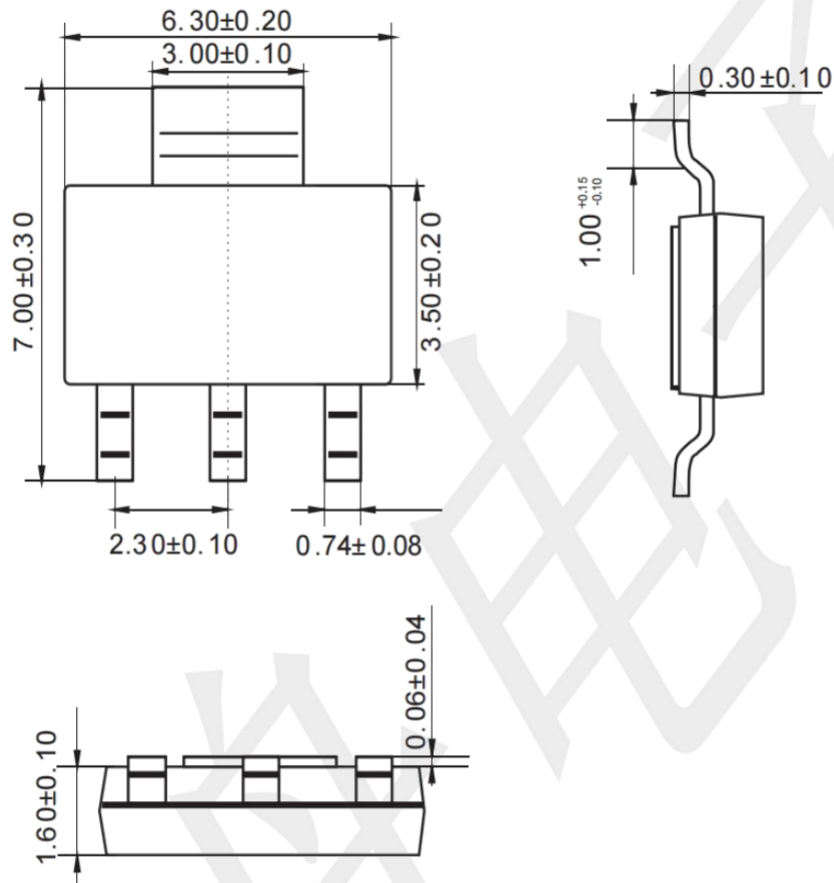
1. Pulse test; pulse width  $\leq 300 \mu\text{s}$ , duty cycle  $\leq 1\%$ .
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature

**TYPICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)



**Package Outline Dimensions (unit: mm)**

SOT-223



**Mounting Pad Layout (unit: mm)**

