

General Description

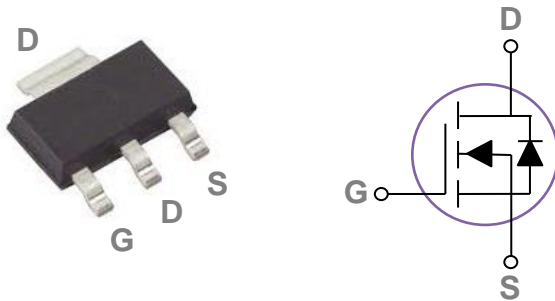
These N-Channel enhancement mode power field effect transistors are planar stripe, DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switch mode power supply

| | | |
|-------|-------|----|
| BVDSS | RDSON | ID |
| 200V | 0.46Ω | 5A |

Features

- Improved dv/dt capability
- Fast switching
- Green Device Available

SOT223 Pin Configuration



Applications

- High efficient switched mode power supplies
- TV Power
- Adapter/charger
- Server Power
- Networking

Absolute Maximum Ratings Tc=25°C unless otherwise noted

| Symbol | Parameter | Rating | Units |
|------------------|--|------------|-------|
| V _{DS} | Drain-Source Voltage | 200 | V |
| V _{GS} | Gate-Source Voltage | ±30 | V |
| I _D | Drain Current – Continuous (T _C =25°C) | 5 | A |
| | Drain Current – Continuous (T _C =100°C) | 3.1 | A |
| I _{DM} | Drain Current – Pulsed ¹ | 20 | A |
| P _D | Power Dissipation (T _C =25°C) | 8.3 | W |
| | Power Dissipation – Derate above 25°C | 0.66 | W/°C |
| T _{STG} | Storage Temperature Range | -55 to 150 | °C |
| T _J | Operating Junction Temperature Range | -55 to 150 | °C |

Thermal Characteristics

| Symbol | Parameter | Typ. | Max. | Unit |
|------------------|--|------|------|------|
| R _{θJA} | Thermal Resistance Junction to ambient | --- | 70 | °C/W |
| R _{θJC} | Thermal Resistance Junction to Case | --- | 15 | °C/W |

Electrical Characteristics (T_J=25 °C, unless otherwise noted)
Off Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-------------------------------------|---|---|------|------|------|------|
| BV _{DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250μA | 200 | --- | --- | V |
| ΔBV _{DSS} /ΔT _J | BV _{DSS} Temperature Coefficient | Reference to 25°C, I _D =1mA | --- | 0.5 | --- | V/°C |
| I _{DSS} | Drain-Source Leakage Current | V _{DS} =200V, V _{GS} =0V, T _J =25°C | --- | --- | 1 | μA |
| | | V _{DS} =160V, V _{GS} =0V, T _J =125°C | --- | --- | 10 | μA |
| I _{GSS} | Gate-Source Leakage Current | V _{GS} =±30V, V _{DS} =0V | --- | --- | ±100 | nA |

On Characteristics

| | | | | | | |
|----------------------|---|--|-----|-----|------|-------|
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} =10V, I _D =4A | --- | 0.4 | 0.46 | Ω |
| V _{GS(th)} | Gate Threshold Voltage | V _{GS} =V _{DS} , I _D =250μA | 3 | 4 | 5 | V |
| ΔV _{GS(th)} | V _{GS(th)} Temperature Coefficient | | --- | -8 | --- | mV/°C |
| g _{fs} | Forward Transconductance | V _{DS} =10V, I _D =2A | --- | 3.6 | --- | S |

Dynamic and switching Characteristics

| | | | | | | |
|---------------------|------------------------------------|--|-----|-----|-----|----|
| Q _g | Total Gate Charge ^{2,3} | V _{DS} =100V, V _{GS} =10V, I _D =5A | --- | 9.4 | 18 | nC |
| Q _{gs} | Gate-Source Charge ^{2,3} | | --- | 2.5 | 5 | |
| Q _{gd} | Gate-Drain Charge ^{2,3} | | --- | 3.7 | 7 | |
| T _{d(on)} | Turn-On Delay Time ^{2,3} | V _{DD} =100V, V _{GS} =10V, R _G =25Ω I _D =1A | --- | 22 | 44 | ns |
| T _r | Rise Time ^{2,3} | | --- | 78 | 160 | |
| T _{d(off)} | Turn-Off Delay Time ^{2,3} | | --- | 20 | 40 | |
| T _f | Fall Time ^{2,3} | | --- | 56 | 120 | |
| C _{iss} | Input Capacitance | V _{DS} =25V, V _{GS} =0V, F=1MHz | --- | 337 | 500 | pF |
| C _{oss} | Output Capacitance | | --- | 58 | 100 | |
| C _{rss} | Reverse Transfer Capacitance | | --- | 33 | 60 | |
| R _g | Gate resistance | V _{GS} =0V, V _{DS} =0V, F=1MHz | --- | 3 | 6 | Ω |

Drain-Source Diode Characteristics and Maximum Ratings

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|-----------------|---------------------------|---|------|------|------|------|
| I _S | Continuous Source Current | V _G =V _D =0V, Force Current | --- | --- | 5 | A |
| I _{SM} | Pulsed Source Current | | --- | --- | 10 | A |
| V _{SD} | Diode Forward Voltage | V _{GS} =0V, I _S =1A, T _J =25°C | --- | --- | 1 | V |

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

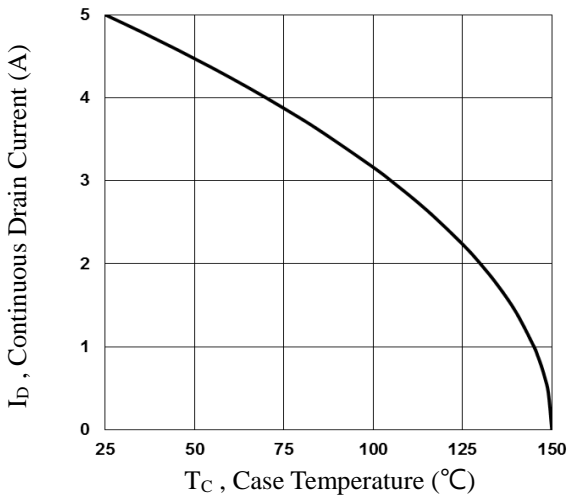


Fig.1 Continuous Drain Current vs. T_c

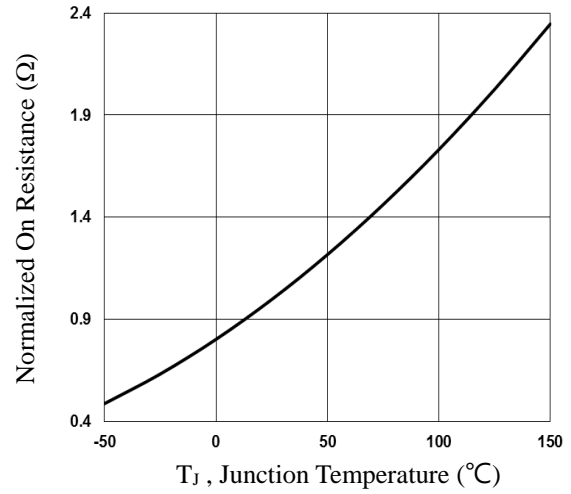


Fig.2 Normalized R_{DS(on)} vs. T_j

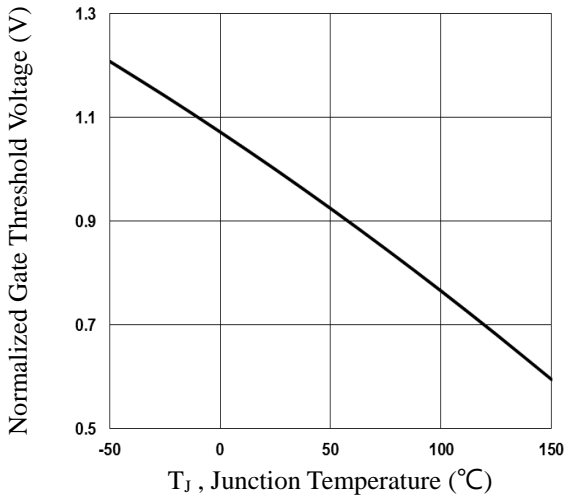


Fig.3 Normalized V_{th} vs. T_j

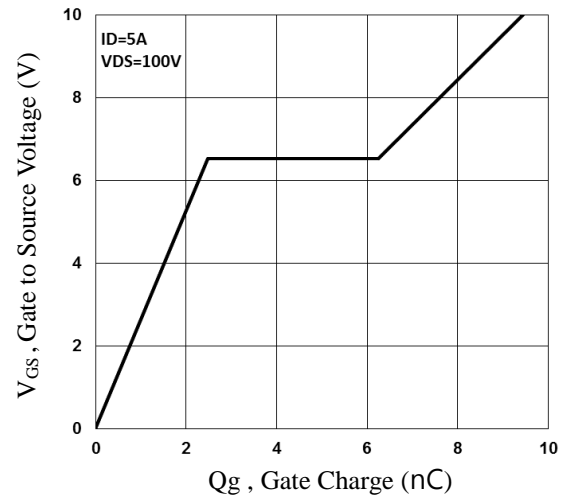


Fig.4 Gate Charge Waveform

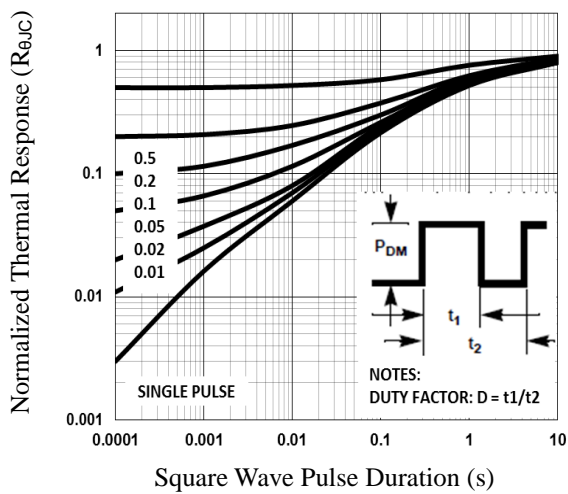


Fig.5 Normalized Transient Impedance

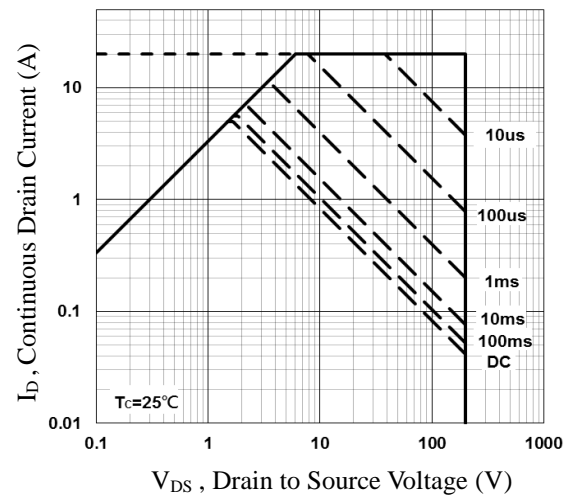


Fig.6 Maximum Safe Operation Area

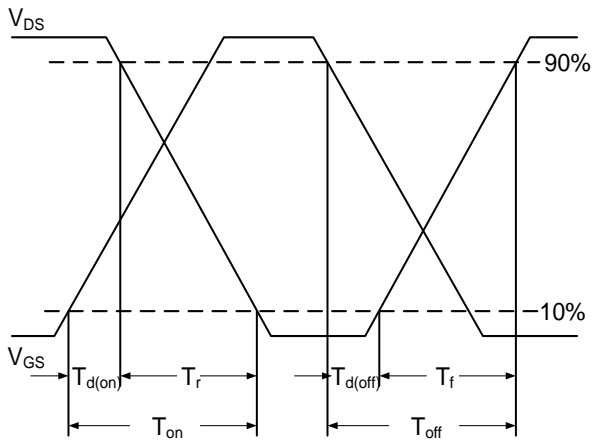


Fig.7 Switching Time Waveform

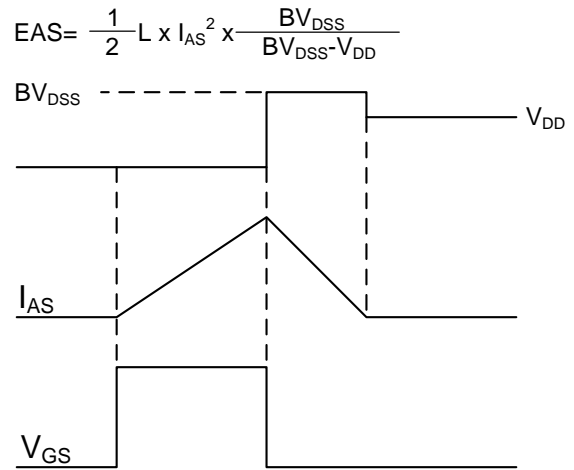
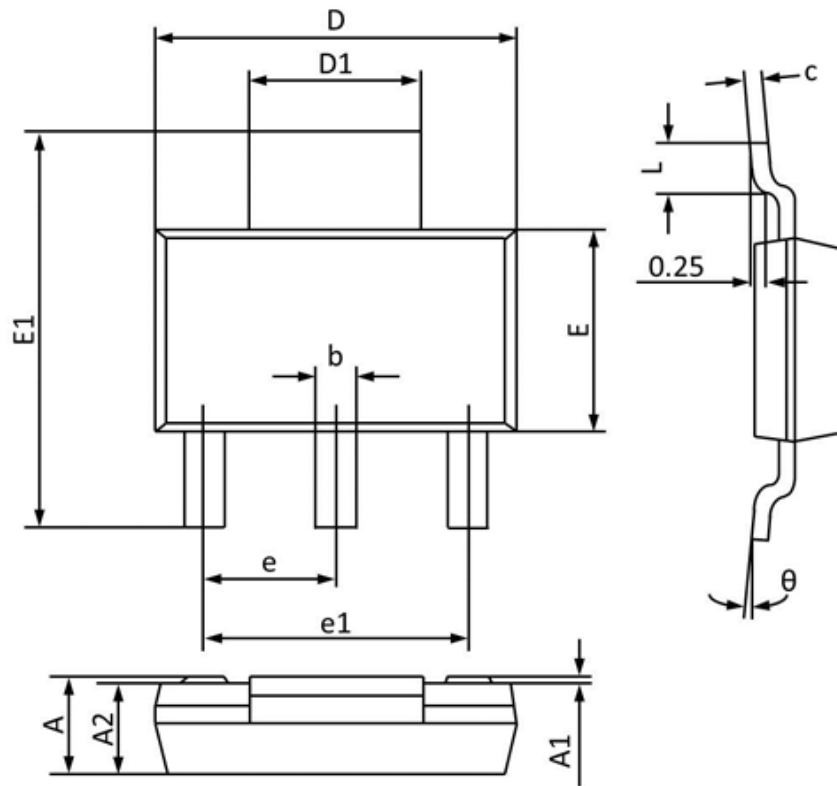


Fig.8 EAS Waveform

SOT223 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° |