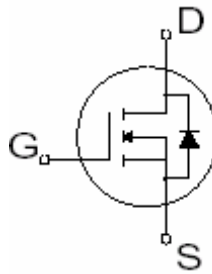


- Extremely high dv/dt capability
- Low Gate Charge Qg results in Simple Drive Requirement
- 100% avalanche tested
- Gate charge minimized
- Very low intrinsic capacitances
- Very good manufacturing repeatability



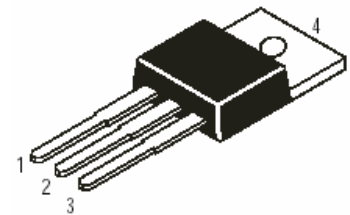
$$V_{DSS} = 600V$$

$$I_{D25} = 4.5A$$

$$R_{DS(ON)} = 2.5 \Omega$$

Description

StarMOS is a new generation of high voltage N-Channel enhancement mode power MOSFETs. This new technology minimises the JFET effect, increases packing density and reduces the on-resistance. StarMOS also achieves faster switching speeds through optimised gate layout with planar stripe DMOS technology.



Pin1-Gate
Pin2-Drain
Pin3-Source

Application

- Switching application

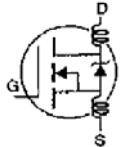
Absolute Maximum Ratings

| | Parameter | Max. | Units |
|-----------------------|--|----------------------|-------|
| $I_D@T_C=25^\circ C$ | Continuous Drain Current, $V_{GS}@10V$ | 4.5 | A |
| $I_D@T_C=100^\circ C$ | Continuous Drain Current, $V_{GS}@10V$ | 2.6 | |
| I_{DM} | Pulsed Drain Current ① | 18 | |
| $P_D@T_C=25^\circ C$ | Power Dissipation | 100 | W |
| | Linear Derating Factor | 0.8 | W/°C |
| V_{GS} | Gate-to-Source Voltage | ± 30 | V |
| E_{AS} | Single Pulse Avalanche Energy ② | 210 | mJ |
| I_{AR} | Avalanche Current ① | 4.5 | A |
| E_{AR} | Repetitive Avalanche Energy ① | 10 | mJ |
| dv/dt | Peak Diode Recovery dv/dt ③ | 4.5 | V/ns |
| T_J T_{STG} | Operating Junction and Storage Temperature Range | - 55 to +150 | °C |
| | Soldering Temperature, for 10 seconds | 300(1.6mm from case) | |
| | Mounting Torque, 6-32 or M3 screw | 10 lbf.in(1.1N.m) | |

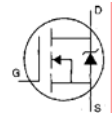
Thermal Resistance

| | Parameter | Min. | Typ. | Max. | Units |
|-----------------|-------------------------------------|------|------|------|-------|
| $R_{\theta JC}$ | Junction-to-case | — | — | 1.25 | °C/W |
| $R_{\theta CS}$ | Case-to-Sink, Flat, Greased Surface | — | 0.50 | — | |
| $R_{\theta JA}$ | Junction-to-Ambient | — | — | 62.5 | |

Electrical Characteristics @T_J=25 °C(unless otherwise specified)

| | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|--|--------------------------------------|------|------|------|-------|---|
| V _{(BR)DSS} | Drain-to-Source Breakdown Voltage | 600 | — | — | V | V _{GS} =0V, I _D =250μA |
| ΔV _{(BR)DSS} /ΔT _J | Breakdown Voltage Temp.Coefficient | — | 0.6 | — | V/°C | Reference to 25°C, I _D =250μA |
| R _{DS(on)} | Static Drain-to-Source On-resistance | — | 2.0 | 2.5 | Ω | V _{GS} =10V, I _D =2.25A ④ |
| V _{GS(th)} | Gate Threshold Voltage | 2.0 | — | 4.0 | V | V _{DS} =V _{GS} , I _D =250μA |
| g _{fs} | Forward Transconductance | — | 4.7 | — | S | V _{DS} =40V, I _D =2.25A |
| I _{DSS} | Drain-to-Source Leakage current | — | — | 1 | μA | V _{DS} =600V, V _{GS} =0V |
| | | — | — | 10 | | V _{DS} =480V, V _{GS} =0V, T _J =150°C |
| I _{GSS} | Gate-to-Source Forward leakage | — | — | 100 | nA | V _{GS} =30V |
| | Gate-to-Source Reverse leakage | — | — | -100 | | V _{GS} =-30V |
| Q _g | Total Gate Charge | — | 15 | 19 | nC | I _D =4.5A |
| Q _{gs} | Gate-to-Source charge | — | 2.5 | — | | V _{DS} =480V |
| Q _{gd} | Gate-to-Drain("Miller") charge | — | 6.6 | — | | V _{GS} =10V |
| t _{d(on)} | Turn-on Delay Time | — | 10 | 30 | nS | V _{DD} =300V |
| t _r | Rise Time | — | 42 | 90 | | I _D =4.5A |
| t _{d(off)} | Turn-Off Delay Time | — | 38 | 85 | | R _G =25Ω |
| t _f | Fall Time | — | 46 | 100 | | |
| L _D | Internal Drain Inductance | — | 4.5 | — | nH | Between lead, 6mm(0.25in.) from package and center of die contact |
| L _S | Internal Source Inductance | — | 7.5 | — | |  |
| C _{iss} | Input Capacitance | — | 515 | 670 | pF | V _{GS} =0V |
| C _{oss} | Output Capacitance | — | 55 | 72 | | V _{DS} =25V |
| C _{rss} | Reverse Transfer Capacitance | — | 6.5 | 8.5 | | f=1.0MHz |

Source-Drain Ratings and Characteristics

| | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|-----------------|---|---|------|------|-------|--|
| I _S | Continuous Source Current (Body Diode) | — | — | 4.5 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| I _{SM} | Pulsed Source Current (Body Diode) ① | — | — | 18 | | |
| V _{SD} | Diode Forward Voltage | — | — | 1.4 | V | T _J =25°C, I _S =4.5A, V _{GS} =0V ④ |
| t _{rr} | Reverse Recovery Time | — | 300 | — | nS | T _J =25°C, I _F =4.5A |
| Q _{rr} | Reverse Recovery Charge | — | 2.2 | — | nC | di/dt=100A/μs ④ |
| t _{on} | Forward Turn-on Time | Intrinsic turn-on time is negligible (turn-on is dominated by L _S + L _D) | | | | |

Notes:

- ① Repetitive rating; pulse width limited by max.junction temperature(see figure 11)
- ② L = 18.9mH, I_{AS} =4.5 A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C
- ③ I_{SD} ≤ 4.5A, di/dt ≤ 200A/μS, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 25°C
- ④ Pulse width ≤ 300 μS; duty cycle ≤ 2%