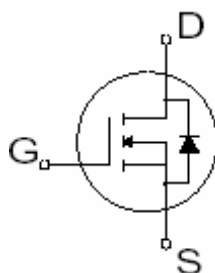


- Extremely high dv/dt capability
- Low Gate Charge Qg results in Simple Drive Requirement
- 100% avalanche tested
- Gate charge minimized
- Very low intrinsic capacitances
- Very good manufacturing repeatability



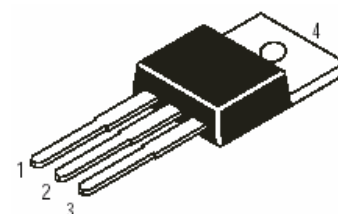
$$V_{DSS} = 500V$$

$$I_{D25} = 20A$$

$$R_{DS(ON)} = 0.25 \Omega$$

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
Pin1-Source

Application

- Switching application

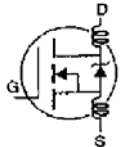
Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS}@10V$	20	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS}@10V$	12	
I_{DM}	Pulsed Drain Current ①	80	
$P_D@T_C=25^\circ C$	Power Dissipation	280	W
	Linear Derating Factor	2.2	W/°C
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy ②	330	mJ
I_{AR}	Avalanche Current ①	20	A
E_{AR}	Repetitive Avalanche Energy ①	28	mJ
dv/dt	Peak Diode Recovery dv/dt ③	6.9	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)	

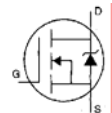
Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case	—	—	0.45	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	—	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient	—	—	58	

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

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	500	—	—	V	V _{GS} =0V, I _D =250μA
ΔV _{(BR)DSS} /ΔT _J	Breakdown Voltage Temp.Coefficient	—	0.61	—	V/°C	Reference to 25°C, I _D =1mA
R _{DS(on)}	Static Drain-to-Source On-resistance	—	0.21	0.25	Ω	V _{GS} =10V, I _D =12A ④
V _{GS(th)}	Gate Threshold Voltage	3.0	—	5.0	V	V _{DS} =V _{GS} , I _D =250μA
g _{fs}	Forward Transconductance	11	—	—	S	V _{DS} =50V, I _D =12A
I _{DSS}	Drain-to-Source Leakage current	—	—	50	μA	V _{DS} =500V, V _{GS} =0V
		—	—	250		V _{DS} =400V, 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	—	—	110	nC	I _D =20A
Q _{gs}	Gate-to-Source charge	—	—	33		V _{DS} =400V
Q _{gd}	Gate-to-Drain("Miller") charge	—	—	54		V _{GS} =10V
t _{d(on)}	Turn-on Delay Time	—	22	—	nS	V _{DD} =250V
t _r	Rise Time	—	74	—		I _D =20A
t _{d(off)}	Turn-Off Delay Time	—	45	—		R _G =7.5Ω
t _f	Fall Time	—	33	—		V _{GS} =10V
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	—	2870	—	pF	V _{GS} =0V
C _{oss}	Output Capacitance	—	320	—		V _{DS} =25V
C _{rss}	Reverse Transfer Capacitance	—	34.0	—		f=1.0MHz

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I _S	Continuous Source Current (Body Diode)	—	—	20	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	80		
V _{SD}	Diode Forward Voltage	—	—	1.5	V	T _J =25°C, I _S =20A, V _{GS} =0V ④
t _{rr}	Reverse Recovery Time	—	520	780	nS	T _J =25°C, I _F =20A
Q _{rr}	Reverse Recovery Charge	—	5.3	8.0	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
- ② L = 1.6mH, I_{AS} = 20 A, R_G = 25Ω, Starting T_J = 25°C

- ③ I_{SD} ≤ 20A, di/dt ≤ 350A/μs, V_{DD} ≤ V_{(BR)DSS}, T_J ≤ 25°C

- ④ Pulse width ≤ 300 μs; duty cycle ≤ 2%