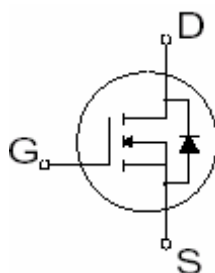


- Extremely high dv/dt capability
- Low Gate Charge Qg results in Simple Drive Requirement
- 100% avalanche tested
- Gate charge minimized
- Very low intrinsic capacitances
- Very good manufacturing repeatability



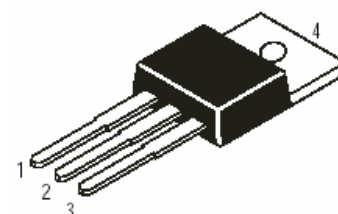
$$V_{DSS} = 500V$$

$$I_{D25} = 14A$$

$$R_{DS(ON)} = 0.45 \Omega$$

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

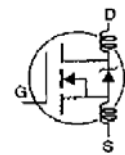
	Parameter	Max.	Units
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, $V_{GS}@10V$	14	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, $V_{GS}@10V$	9.1	
I_{DM}	Pulsed Drain Current ①	56	
$P_D@T_C=25^{\circ}C$	Power Dissipation	250	W
	Linear Derating Factor	2.0	W/ $^{\circ}C$
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy ②	560	mJ
I_{AR}	Avalanche Current ①	14	A
E_{AR}	Repetitive Avalanche Energy ①	25	mJ
dv/dt	Peak Diode Recovery dv/dt ③	9.2	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	- 55 to +150	$^{\circ}C$
	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	—	—	0.50	$^{\circ}C/W$
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	—	0.50	—	
$R_{\theta JA}$	Junction-to-Ambient	—	—	62	

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	—	0.55	—	V/°C	Reference to 25°C, I _D =1mA
R _{DS(on)}	Static Drain-to-Source On-resistance	—	—	0.45	Ω	V _{GS} =10V, I _D =8.4A ④
V _{GS(th)}	Gate Threshold Voltage	2.0	—	4.0	V	V _{DS} =V _{GS} , I _D =250μA
g _{fs}	Forward Transconductance	8.1	—	—	S	V _{DS} =50V, I _D =8.4A
I _{DSS}	Drain-to-Source Leakage current	—	—	25	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	—	—	81	nC	I _D =14A
Q _{gs}	Gate-to-Source charge	—	—	20		V _{DS} =400V
Q _{gd}	Gate-to-Drain("Miller") charge	—	—	36		V _{GS} =10V
t _{d(on)}	Turn-on Delay Time	—	15	—	nS	V _{DD} =250V
t _r	Rise Time	—	39	—		I _D =14A
t _{d(off)}	Turn-Off Delay Time	—	39	—		R _G =7.5Ω
t _f	Fall Time	—	31	—		V _{GS} =10V
L _D	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6mm(0.25in.)
L _S	Internal Source Inductance	—	7.5	—		from package and center of die contact
C _{iss}	Input Capacitance	—	1910	—	pF	V _{GS} =0V
C _{oss}	Output Capacitance	—	290	—		V _{DS} =25V
C _{rss}	Reverse Transfer Capacitance	—	11.0	—		f=1.0MHz


Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I _S	Continuous Source Current (Body Diode)	—	—	14	A	MOSFET symbol showing the integral reverse p-n junction diode.
I _{SM}	Pulsed Source Current (Body Diode) ①	—	—	56		
V _{SD}	Diode Forward Voltage	—	—	1.5	V	T _J =25°C, I _S =14A, V _{GS} =0V ④
t _{rr}	Reverse Recovery Time	—	370	550	nS	T _J =25°C, I _F =14A
Q _{rr}	Reverse Recovery Charge	—	4.4	6.5	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 = 5.7mH, I_{AS} = 14 A, R_G = 25Ω, Starting T_J = 25°C

③ I_{SD} ≤ 14A, di/dt ≤ 250A/μS, V_{DD} ≤ V_(BR)DSS, T_J ≤ 25°C

④ Pulse width ≤ 300 μS; duty cycle ≤ 2%