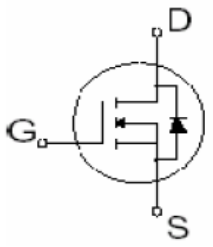
Taiwan Goodark Technology Co.,Ltd

SSFP11N40

StarMOS^T Power MOSFET

- 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} = 400V

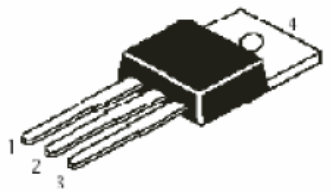
I_{D25} = 11A

$R_{DS(ON)}$ = 0.55 Ω

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.

TO-220



Pin1–Gate
Pin2–Drain
Pin1–Source

Application

- Switching application

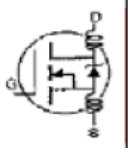
Absolute Maximum Ratings

	Parameter	Max.	Units
I_D@Tc=25℃	Continuous Drain Current,V_{GS}@10V	11.0	A
I_D@Tc=100℃	Continuous Drain Current,V_{GS}@10V	6.9	
I_{DM}	Pulsed Drain Current ①	44.0	
P_D@Tc=25℃	Power Dissipation	150	W
	Linear Derating Factor	1.2	W/℃
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Energy ②	480	mJ
I_{AR}	Avalanche Current ①	11	A
E_{AR}	Repetitive Avalanche Energy ①	15	mJ
dv/dt	Peak Diode Recovery dv/dt ③	4.0	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	- 55 to +150	℃
	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	—	—	0.83	℃/W
$R_{\theta CS}$	Case-to-Sink,Flat,Greased Surface	—	0.24	—	
$R_{\theta JA}$	Junction-to-Ambient	—	—	40	

Electrical Characteristics @T_J=25 ℃(unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	400	—	—	V	V_{GS}=0V,I_D=250μA
$\triangle V_{(BR)DSS}/\triangle T_J$	Breakdown Voltage Temp.Coefficient	—	0.49	—	V/℃	Reference to 25℃,I_D=1mA
$R_{DS(on)}$	Static Drain-to-Source On-resistance	—	—	0.55	Ω	V_{GS}=10V,I_D=6.6A ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	V_{DS}= 5V,I_D=250μA
gfs	Forward Transconductance	7.7	—	—	S	V_{DS}=50V,I_D=6.6A
I_{DSS}	Drain-to-Source Leakage current	—	—	250	μA	V_{DS}=400V,V_{GS}=0V
		—	—	100		V_{DS}=320V,V_{GS}=0V,T_J=125℃
I_{GSS}	Gate-to-Source Forward leakage	—	—	100	nA	V_{GS}=30V
	Gate to Source Reverse leakage	—	—	100		V_{GS}= -30V
Qg	Total Gate Charge	—	—	62	nC	I_D=10A
Qgs	Gate-to-Source charge	—	—	10		V_{DS}=320V
Qgd	Gate-to-Drain("Miller") charge	—	—	30		V_{GS}=10V
td(on)	Turn-on Delay Time	—	14	—	nS	V_{DD}=200V
tr	Rise Time	—	27	—		I_D=10A
td(off)	Turn-Off Delay Time	—	50	—		R_G=9.1Ω
tf	Fall Time	—	24	—		R_D=20Ω
L_D	Internal Drain Inductance	—	5.0	—	nH	Between lead, 6mm(0.25in.) from package and center of die contact 
L_S	Internal Source Inductance	—	13	—		
Ciss	Input Capacitance	—	1400	—	pF	V_{GS}=0V
Coss	Output Capacitance	—	400	—		V_{DS}=25V
Crss	Reverse Transfer Capacitance	—	130	—		f=1.0MHz

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	11	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	44		
V_{SD}	Diode Forward Voltage	—	—	2.0	V	T_J=25℃,I_S=11A,V_{GS}=0V ④
trr	Reverse Recovery Time	—	330	660	nS	T_J=25℃,I_F=10A
Qrr	Reverse Recovery Charge	—	2.5	5.9	nC	di/dt=100A/μs ④
ton	Forward Turn-on Time	Intrinsic turn-on time is negligible (turn-on is dominated by Ls + LD)				

Notes:

① Repetitive rating;pulse width limited by max.junction temperature

② L = 6.9mH, IAS = 11 A, R_G = 25Ω, Starting TJ = 25°C

③ I_{SD}≤11A,di/dt≤120A/μS,V_{DD}≤$V_{(BR)DSS}$, TJ≤150℃

④ Pulse width≤300μS; duty cycle≤2%