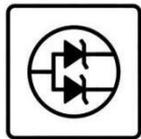


MSKSEMI 美森科

SEMICONDUCTOR



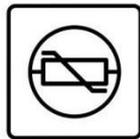
ESD



TVS



TSS



MOV



GDT



PLED

MS50N06

Product specification

General Description

These N-Channel enhancement mode power field effect transistors are using trench 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 fast switching applications.

Features

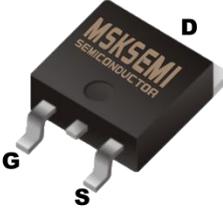
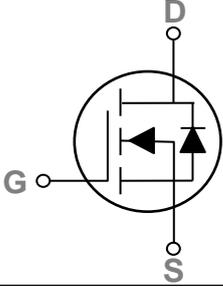
- 60V,50A,RDS(ON)=12mΩ@VGS = 10V
- Improved dv/dt capability
- Fast switching
- Green Device Available

BVDSS	RDSON	ID
60V	12mΩ	50A

Applications

- Motor Drive
- Power Tools
- LED Lighting

Reference News

PACKAGE OUTLINE	N-Channel MOSFET	Marking
 <p>TO-252</p>		

Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D	Drain Current - Continuous (T _C =25°C)	50	A
	Drain Current - Continuous (T _C =100°C)	35	A
I _{DM}	Drain Current - Pulsed ¹	200	A
P _D	Power Dissipation (T _C =25°C)	65	W
	Power Dissipation - Derate above 25°C	0.5	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	---	62	°C/W
R _{θJC}	Thermal Resistance Junction to Case	---	2	°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 =250uA	60	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25 °C , I _D =1mA	---	0.03	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =60V , V _{GS} =0V , T _J =25 °C	---	---	1	uA
		V _{DS} =48V , V _{GS} =0V , T _J =125 °C	---	---	10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} = ±20V , V _{DS} =0V	---	---	±100	nA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance ³	V _{GS} =10V , I _D =20A	---	12	16	mΩ
		V _{GS} =4.5V , I _D =10A	---	16	20	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-4	---	mV/°C
g _{fs}	Forward Transconductance	V _{DS} =10V , I _D =6A	---	11.7	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{3, 4}	V _{DS} =30V , V _{GS} =10V , I _D =10A	---	39.2	---	nC
Q _{gs}	Gate-Source Charge ^{3, 4}		---	5.9	---	
Q _{gd}	Gate-Drain Charge ^{3, 4}		---	8.8	---	
T _{d(on)}	Turn-On Delay Time ^{3, 4}	V _{DD} =15V , V _{GS} =10V , R _G =6Ω I _D =1A	---	9.6	---	ns
T _r	Rise Time ^{3, 4}		---	28.2	---	
T _{d(off)}	Turn-Off Delay Time ^{3, 4}		---	45.3	---	
T _f	Fall Time ^{3, 4}		---	10.9	---	
C _{iss}	Input Capacitance	V _{DS} =25V , V _{GS} =0V , F=1MHz	---	2100	---	pF
C _{oss}	Output Capacitance		---	165	---	
C _{rss}	Reverse Transfer Capacitance		---	80	---	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	1.6	---	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	---	---	50	A
I _{SM}	Pulsed Source Current ³		---	---	100	A
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V , I _S =1A , T _J =25 °C	---	---	1.2	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=35A., R_G=25Ω, Starting T_J=25 °C.
3. The data tested by pulsed , pulse width ≅ 300us , duty cycle ≅ 2%.
4. Essentially independent of operating temperature

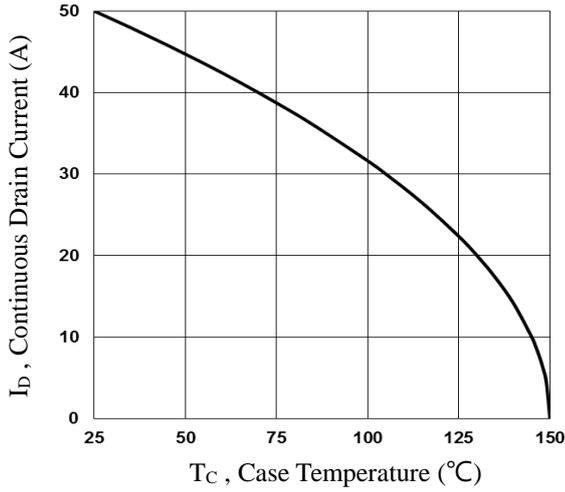


Fig.1 Continuous Drain Current vs. T_c

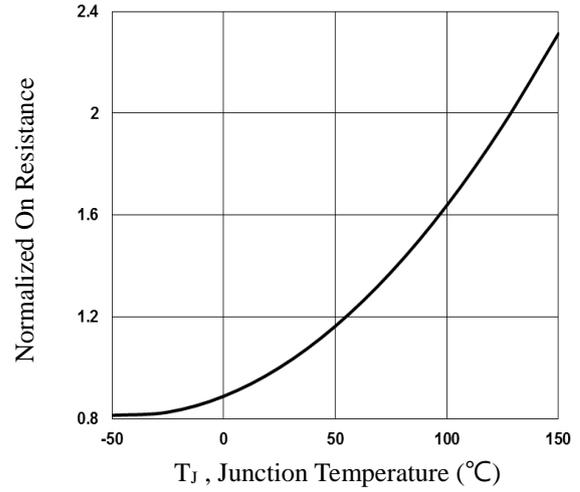


Fig.2 Normalized R_{DS(on)} vs. T_j

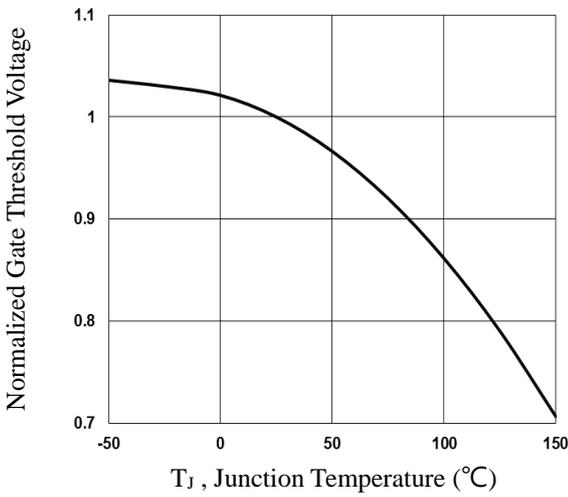


Fig.3 Normalized V_{th} vs. T_j

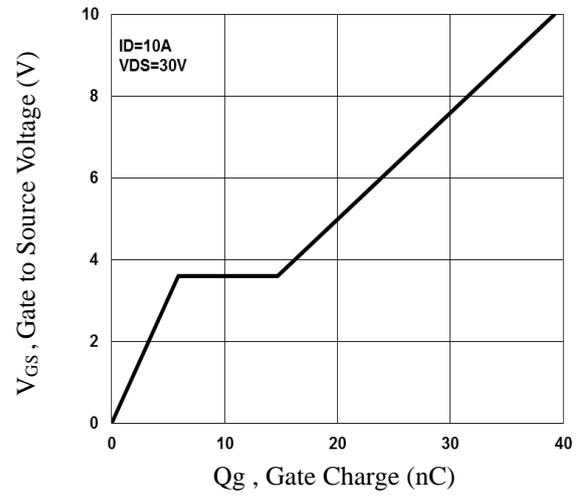


Fig.4 Gate Charge Waveform

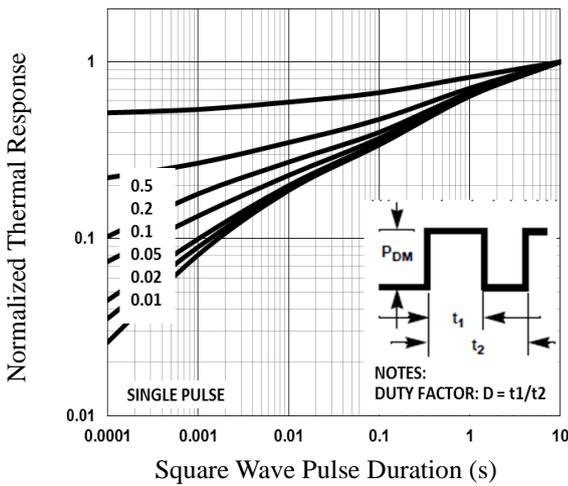


Fig.5 Normalized Transient Response

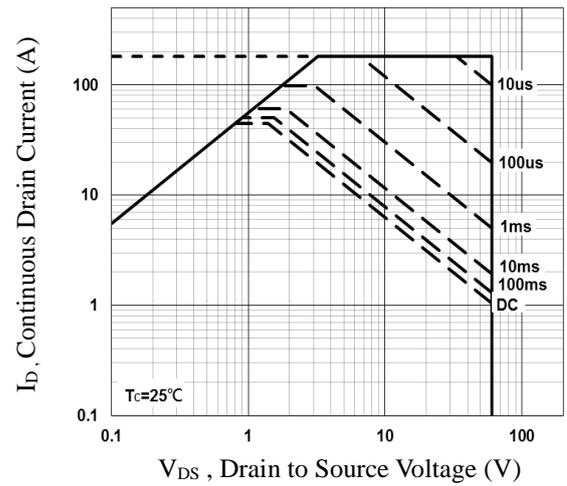


Fig.6 Maximum Safe Operation Area

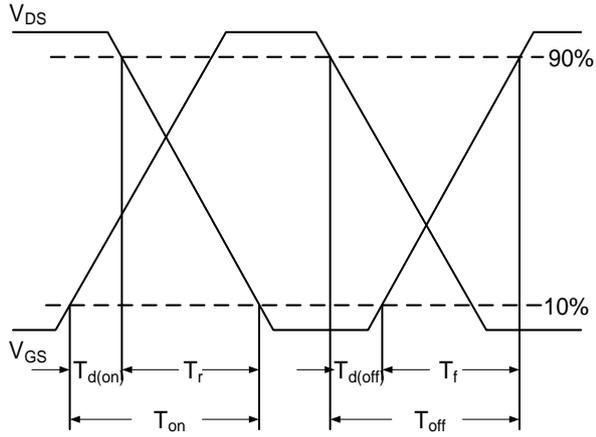
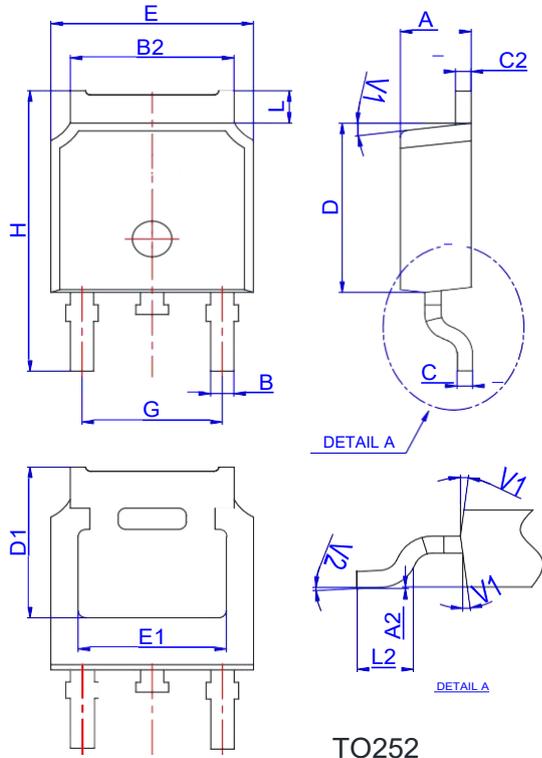


Fig.7 Switching Time Waveform

TO252 PACKAGE INFORMATION



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

TO252

REELSPECIFICATION

P/N	PKG	QTY
MS50N06	TO-252	2500

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