

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

MS2308A

Product specification

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.

BVDSS	RDSON	ID
60V	75mΩ	3A

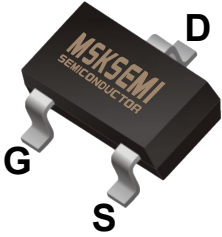
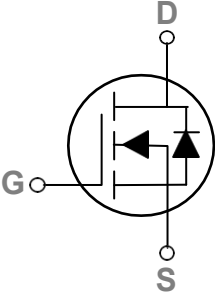

Features

- 60V,3A, $R_{DS(ON)} = 75m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

Applications

- Motor Drive
- Power Tools
- LED Lighting

Reference News

PACKAGE OUTLINE	N-Channel MOSFET	Marking
 SOT-23		

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ 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 ($T_C=25^\circ\text{C}$)	3.0	A
	Drain Current – Continuous ($T_C=100^\circ\text{C}$)	2	A
I_{DM}	Drain Current – Pulsed ¹	12.0	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	1.25	W
	Power Dissipation – Derate above 25°C	0.012	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-50 to 125	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	80	$^\circ\text{C/W}$

Electrical Characteristics (T_J=25℃, 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
$\Delta BV_{DSS}/\Delta T_J$	BV _{DSS} Temperature Coefficient	Reference to 25℃ , I _D =1mA	---	0.05	---	V/℃
I _{DSS}	Drain-Source Leakage Current	V _{DS} =60V , V _{GS} =0V , T _J =25℃	---	---	1	uA
		V _{DS} =48V , V _{GS} =0V , T _J =125℃	---	---	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	V _{GS} =10V , I _D =3A	---	75	95	mΩ
		V _{GS} =4.5V , I _D =2A	---	85	110	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.0	1.6	2.5	V
$\Delta V_{GS(th)}$	V _{GS(th)} Temperature Coefficient		---	-5	---	mV/℃
g _{fs}	Forward Transconductance	V _{DS} =10V , I _D =3A	---	7	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2, 3}	V _{DS} =48V , V _{GS} =10V , I _D =3A	---	9.3	---	nC
Q _{gs}	Gate-Source Charge ^{2, 3}		---	2.1	---	
Q _{gd}	Gate-Drain Charge ^{2, 3}		---	1.8	---	
T _{d(on)}	Turn-On Delay Time ^{2, 3}	V _{DD} =30V , V _{GS} =10V , R _G =3.3Ω I _D =1A	---	2.9	---	ns
T _r	Rise Time ^{2, 3}		---	9.5	---	
T _{d(off)}	Turn-Off Delay Time ^{2, 3}		---	18.4	---	
T _f	Fall Time ^{2, 3}		---	5.3	---	
C _{iss}	Input Capacitance	V _{DS} =15V , V _{GS} =0V , F=1MHz	---	500	---	pF
C _{oss}	Output Capacitance		---	45	---	
C _{rss}	Reverse Transfer Capacitance		---	16	---	
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	2	---	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	---	---	3.0	A
I _{SM}	Pulsed Source Current		---	---	6.0	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V , I _S =1A , T _J =25℃	---	---	1.2	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

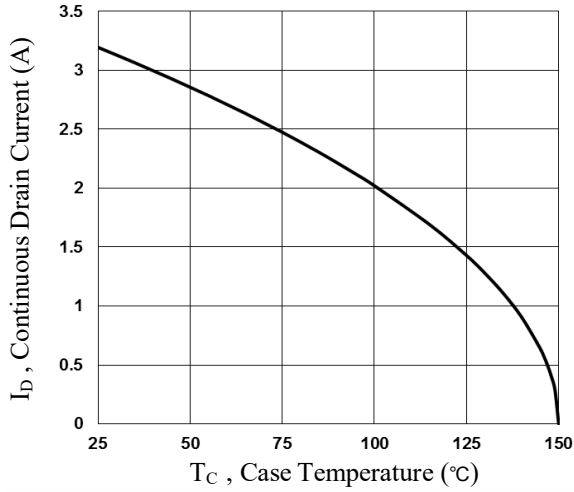


Fig.1 Continuous Drain Current vs. T_C

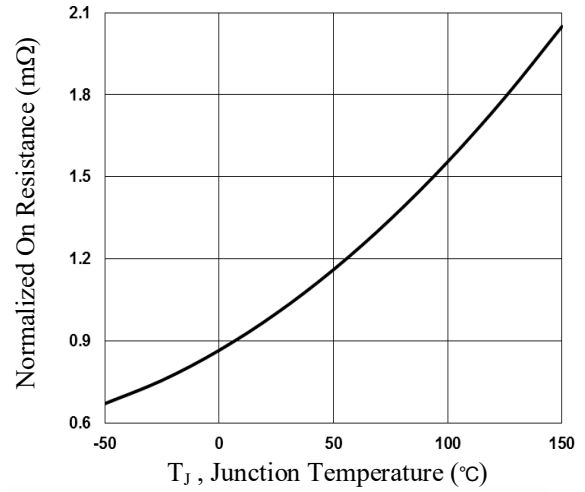


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

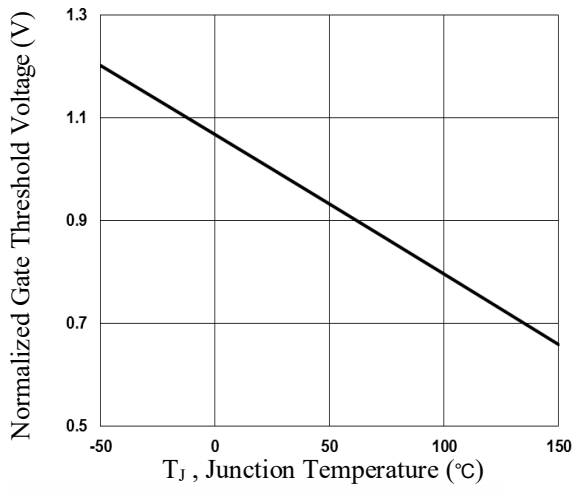


Fig.3 Normalized V_{th} vs. T_J

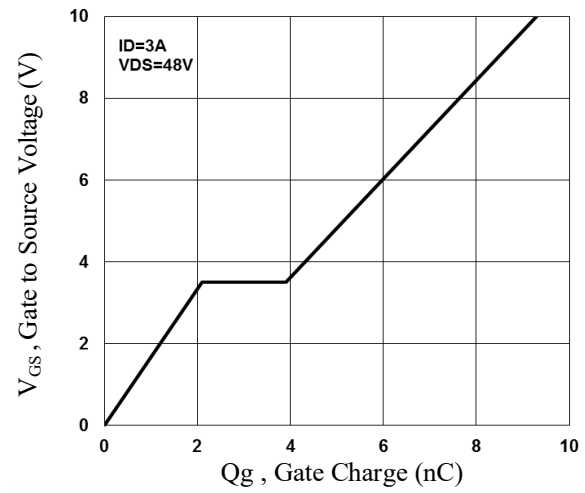


Fig.4 Gate Charge Waveform

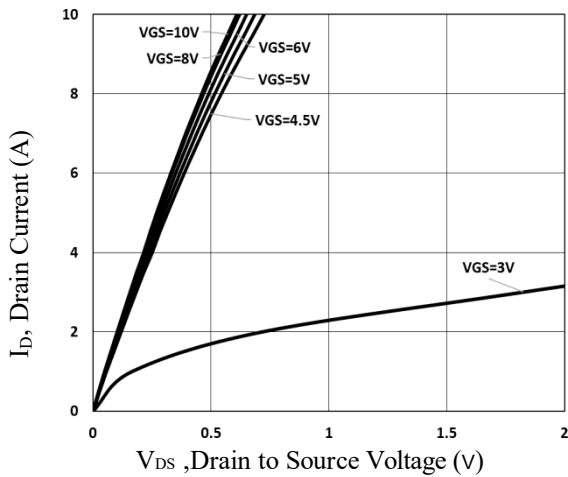


Fig.5 Typical Output Characteristics

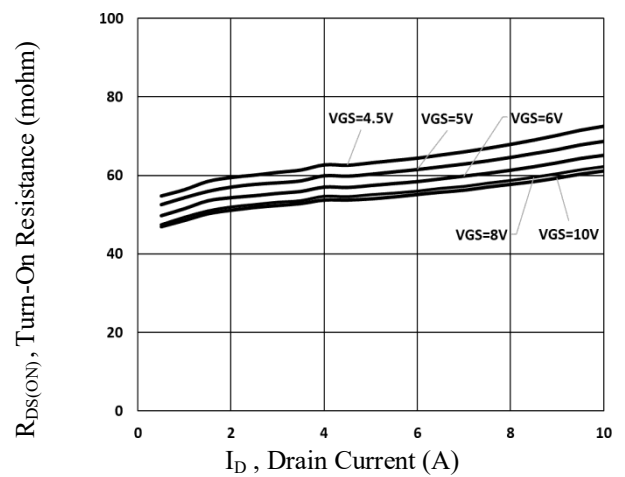


Fig.6 Turn-On Resistance vs. I_D

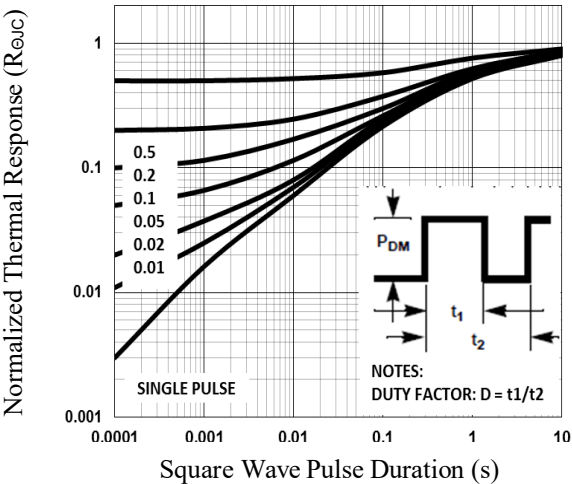


Fig.7 Normalized Transient Response

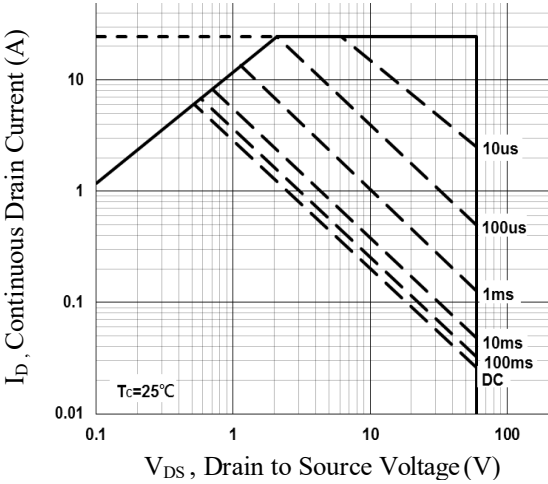


Fig.8 Maximum Safe Operation Area

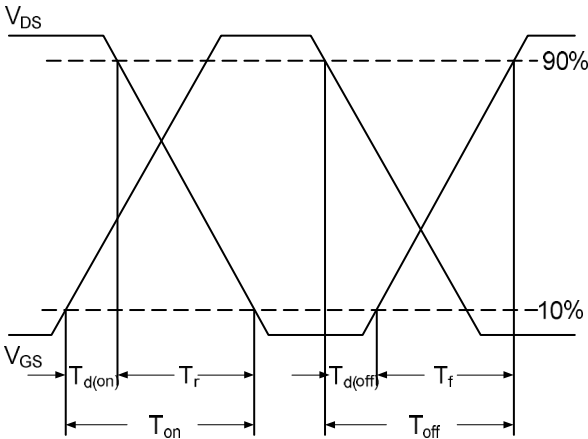
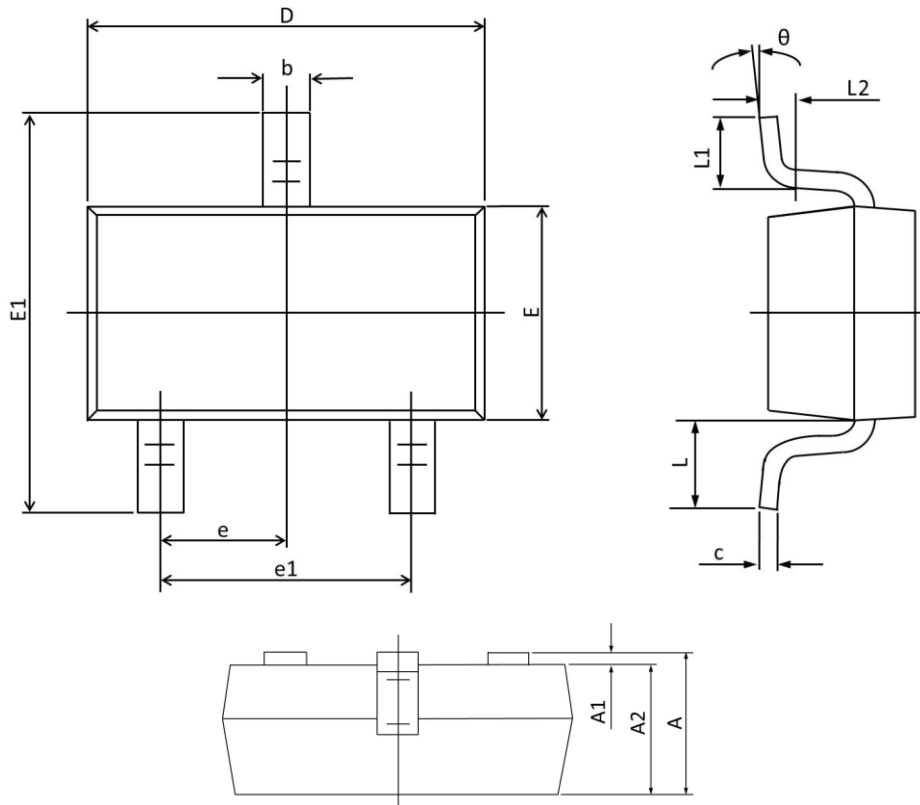


Fig.9 Switching Time Waveform

SOT-23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Max	Min	Max	Min
A	1.150	0.900	0.045	0.035
A1	0.100	0.000	0.004	0.000
A2	1.050	0.900	0.041	0.035
b	0.500	0.300	0.020	0.012
c	0.150	0.080	0.006	0.003
D	3.000	2.800	0.118	0.110
E	1.400	1.200	0.055	0.047
E1	2.550	2.250	0.100	0.089
e	0.95 TYP.		0.037 TYP.	
e1	2.000	1.800	0.079	0.071
L	0.55 REF.		0.022 REF.	
L1	0.500	0.300	0.020	0.012
L2	0.25 TYP.		0.01 TYP.	
θ	8°	0°	8°	0°

REEL SPECIFICATION

P/N	PKG	QTY
MS2308A	SOT-23	3000

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