200V N-Channel MOSFETs

General Description

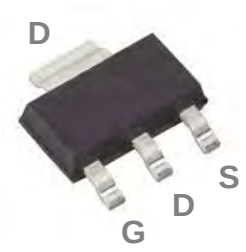
These N-Channel enhancement mode power field effect transistors are planar stripe, DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switch mode power supply

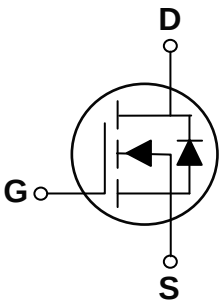
BVDSS	RDSON	ID
200V	0.85Ω	3A

Features

- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*

SOT-223 Pin Configuration





Applications

- *High efficient switched mode power supplies*
- *TV Power*
- *Adapter/charger*
- *Server Power*
- *Networking*

Absolute Maximum Ratings (Tc=25℃ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Drain Current – Continuous (T_C=25℃)	3	A
	Drain Current – Continuous (T_C=100℃)	1.9	A
I_{DM}	Drain Current – Pulsed[1]	12	A
P_D	Power Dissipation (T_C=25℃)	1.78	W
	Power Dissipation – Derate above 25℃	0.014	W/℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	70	℃/W
$R_{\theta JC}$	Thermal Resistance Junction to Case	---	20	℃/W

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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	200	---	---	V
$\triangle BV_{DSS}/\triangle T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	0.5	---	V/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=200V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=160V , V_{GS}=0V , T_J=125℃	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=± 30V , V_{DS}=0V	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=2A	---	0.7	0.85	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	3	4	5	V
$\triangle V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-8	---	mV/℃
gfs	Forward Transconductance	V_{DS}=10V , I_D=2A	---	3.6	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[3,4]	V_{DS}=160V , V_{GS}=10V , I_D=1A	---	4.8	9	nC
Q_{gs}	Gate-Source Charge[3,4]		---	2	4	
Q_{gd}	Gate-Drain Charge[3,4]		---	0.8	2	
$T_{d(on)}$	Turn-On Delay Time[3,4]	V_{DD}=100V , V_{GS}=10V , R_G=25Ω I_D=1A	---	10	20	ns
T_r	Rise Time[3,4]		---	35	70	
$T_{d(off)}$	Turn-Off Delay Time[3,4]		---	10	20	
T_f	Fall Time[3,4]		---	28	56	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	266	500	pF
C_{oss}	Output Capacitance		---	160	300	
C_{rss}	Reverse Transfer Capacitance		---	55	110	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	1.5	3	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	A
I_{SM}	Pulsed Source Current		---	---	6	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
t_{rr}	Reverse Recovery Time[3]	V_{GS}=0V,I_S=1A , dI/dt=100A/μs	---	---	---	ns
Q_{rr}	Reverse Recovery Charge[3]	T_J=25℃	---	---	---	uC

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.

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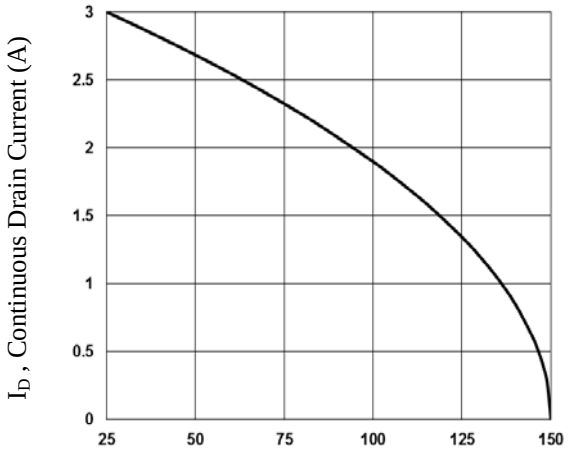


Fig.1 Continuous Drain Current vs. T_C

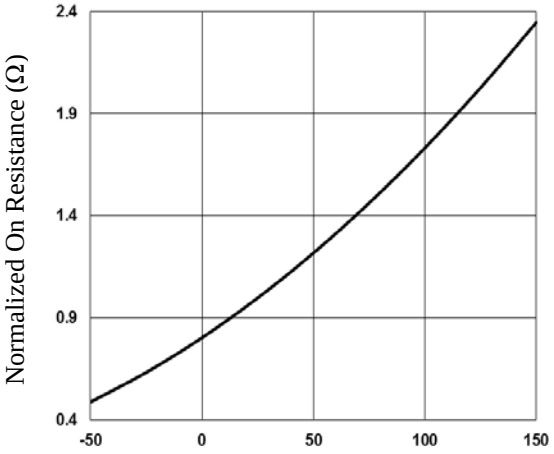


Fig.2 Normalized RDSON vs. T_J

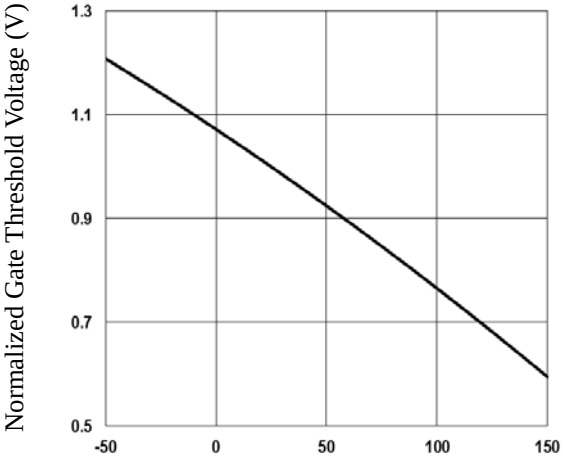


Fig.3 Normalized V_{th} vs. T_J

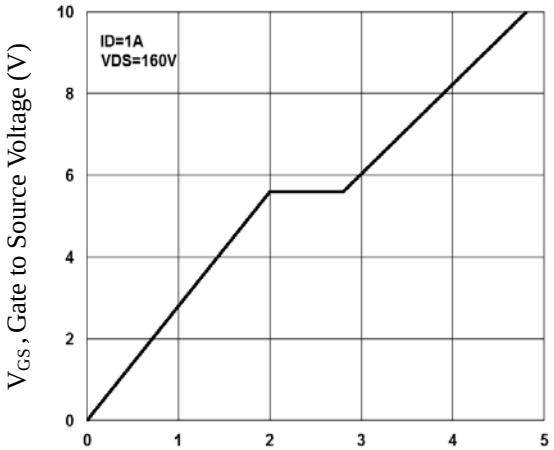


Fig.4 Gate Charge Waveform

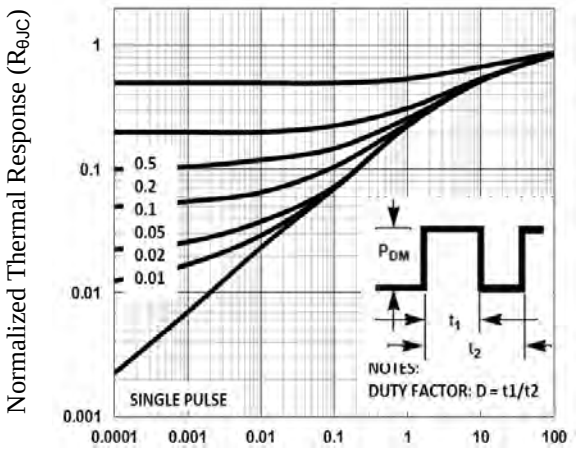


Fig.5 Normalized Transient Impedance

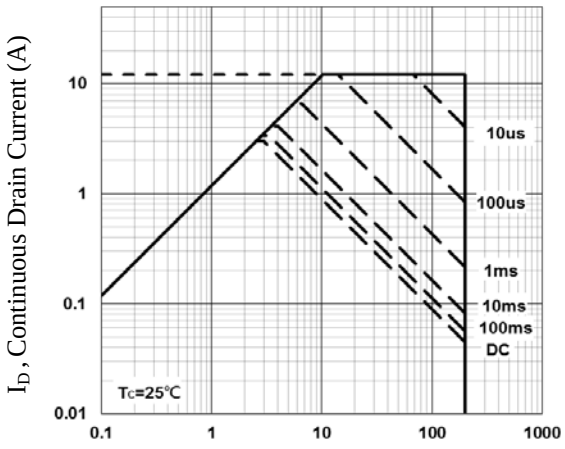


Fig.6 Maximum Safe Operation Area

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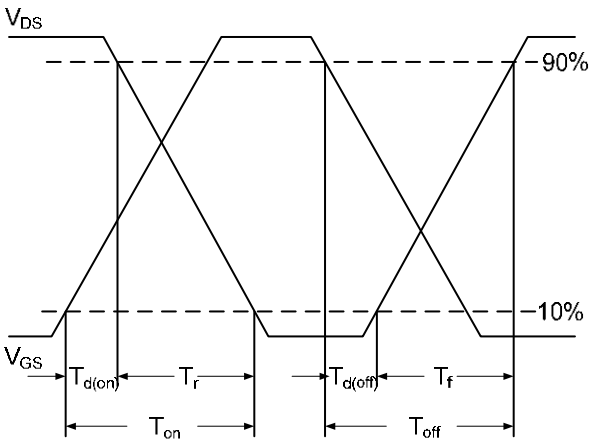


Fig.7 Switching Time Waveform

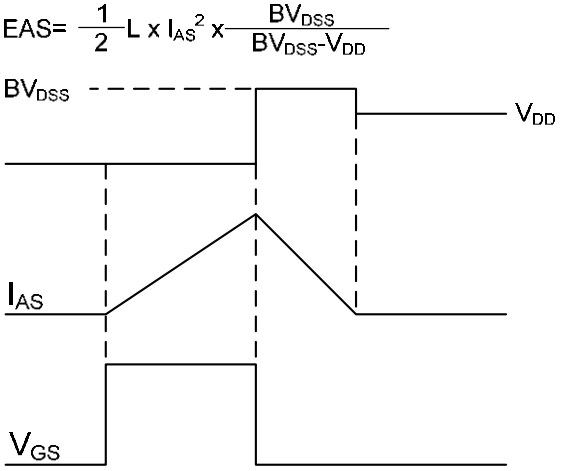
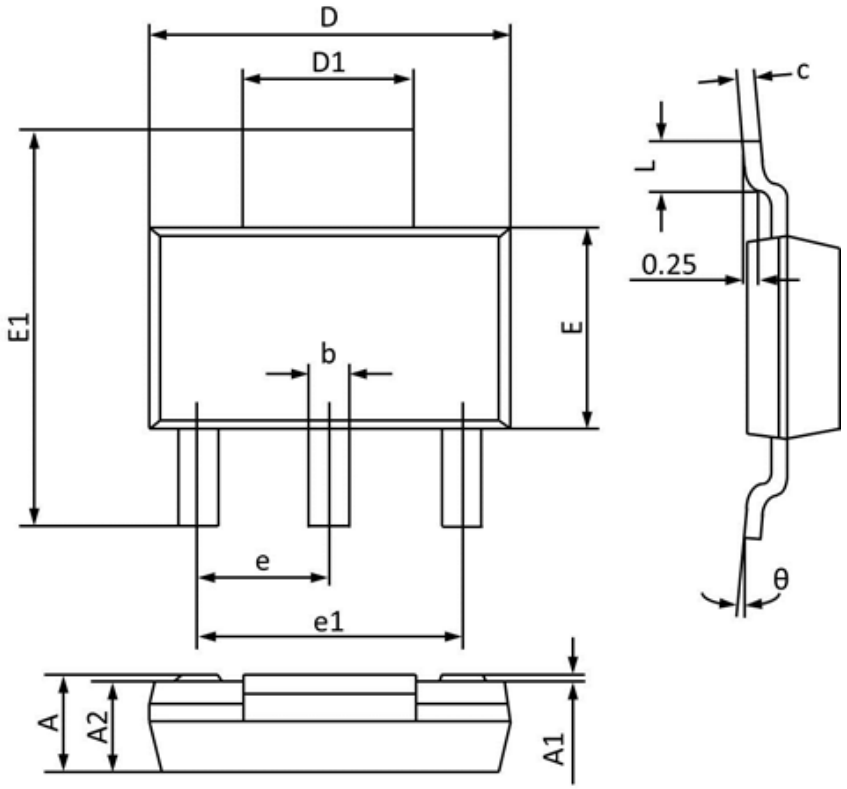


Fig.8 EAS Waveform

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SOT-223 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300 (BSC)		0.091 (BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°