

Features

- Advanced Trench MOS Technology
- Fast Switching Speed
- Green Device Available
- Super Low Gate Charge

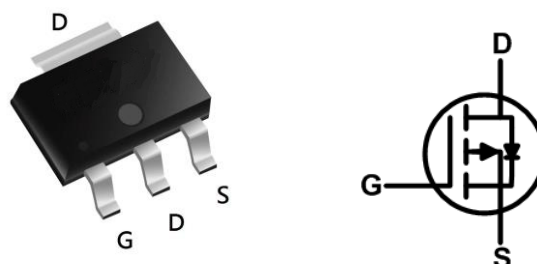
Product Summary

BVDSS	RDSON	ID
-60V	130mΩ	-4.3A

Applications

- Motor Control.
- DC-DC Converters.
- Power Management Functions

SOT223 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	-4.3	A
$I_D @ T_A = 70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	-3.5	A
I_{DM}	Pulsed Drain Current ²	-14	A
$P_D @ T_A = 25^\circ\text{C}$	Total Power Dissipation ³	2	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	62.5	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹ ; $t \leq 10\text{sec}$	---	32	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	10	$^\circ\text{C/W}$

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =-250uA	-60	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =-10V , I _D =-2A	---	110	130	mΩ
		V _{GS} =-4.5V , I _D =-1.5A	---	140	190	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.0	---	-2.5	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-48V , V _{GS} =0V , T _J =25°C	---	---	1	uA
		V _{DS} =-48V , V _{GS} =0V , T _J =150°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V , V _{DS} =0V	---	---	±100	nA
g _{fs}	Forward Transconductance	V _{DS} =-5V , I _D =-2A	---	5.8	---	S
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-20V , V _{GS} =-4.5V , I _D =-2A	---	5.9	---	nC
Q _{gs}	Gate-Source Charge		---	2.9	---	
Q _{gd}	Gate-Drain Charge		---	1.8	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =-12V , V _{GS} =-10V , R _G =3.3Ω, I _D =-1	---	10	---	ns
T _r	Rise Time		---	17	---	
T _{d(off)}	Turn-Off Delay Time		---	22	---	
T _f	Fall Time		---	21	---	
C _{iss}	Input Capacitance	V _{DS} =-15V , V _{GS} =0V , F=1MHz	---	715	---	pF
C _{oss}	Output Capacitance		---	51	---	
C _{rss}	Reverse Transfer Capacitance		---	34	---	
Diode Characteristics						
I _S	Continuous Source Current ^{1,5}	V _G =V _D =0V , Force Current	---	---	-4	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V , I _S =-1A , T _J =25°C	---	---	-1.2	V

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$ 3.The power dissipation is limited by 150°C junction temperature4.The data is theoretically the same as I_D and I_S , in real applications , should be limited by total power dissipation.

P-Channel Typical Characteristics

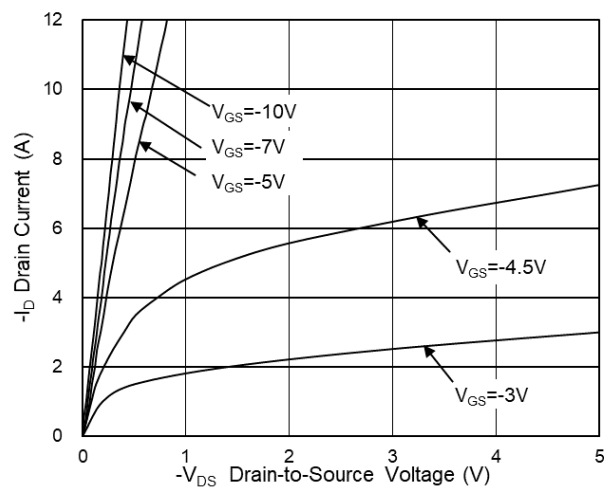


Fig.1 Typical Output Characteristics

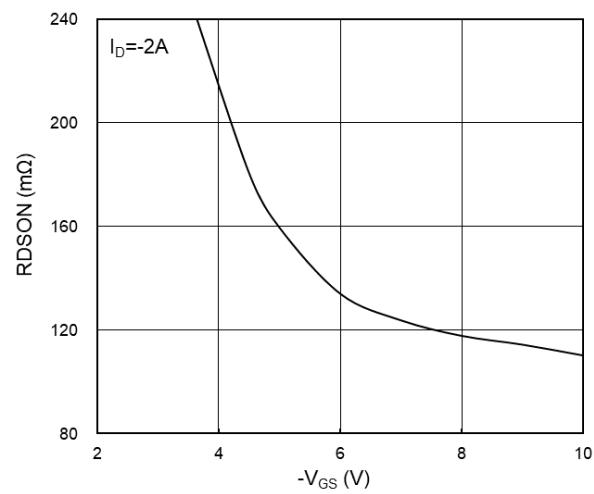


Fig.2 On-Resistance vs G-S Voltage

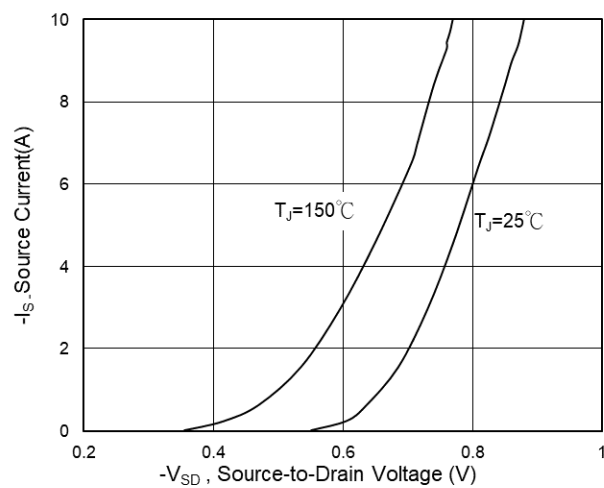


Fig.3 Source Drain Forward Characteristics

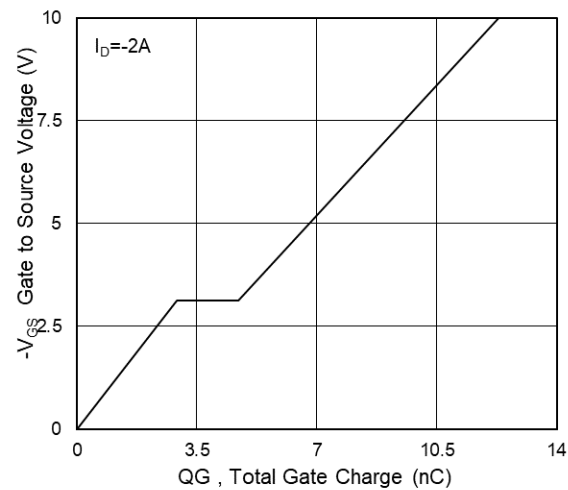


Fig.4 Gate-Charge Characteristics

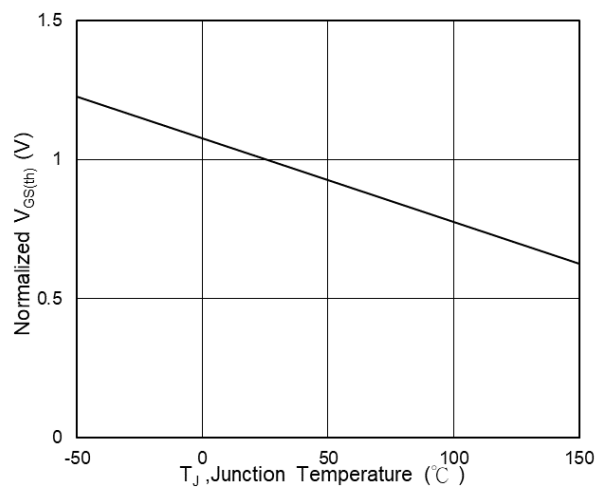


Fig.5 Normalized $V_{GS(th)}$ vs T_J

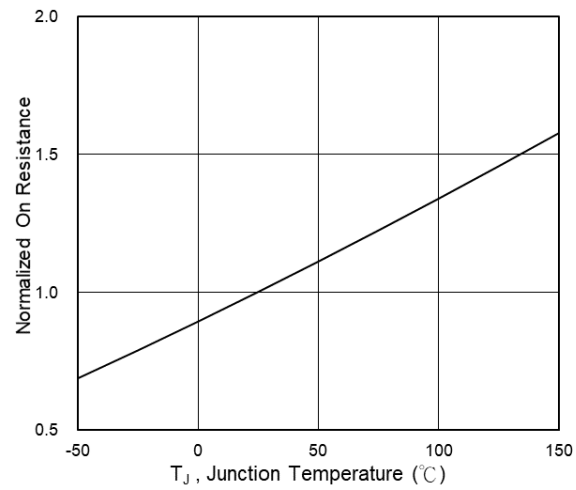


Fig.6 Normalized $R_{DS(on)}$ vs T_J

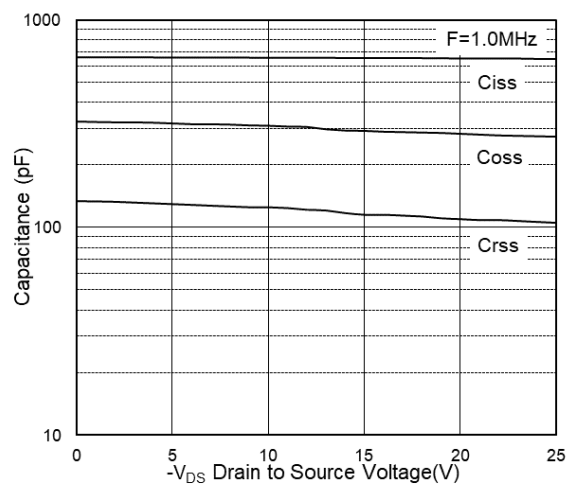


Fig.7 Capacitance

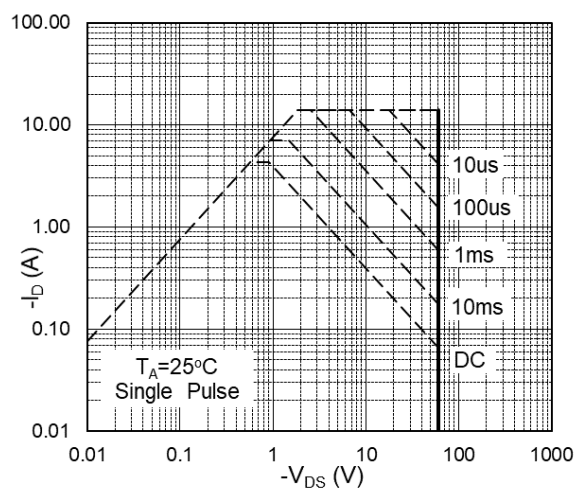


Fig.8 Safe Operating Area

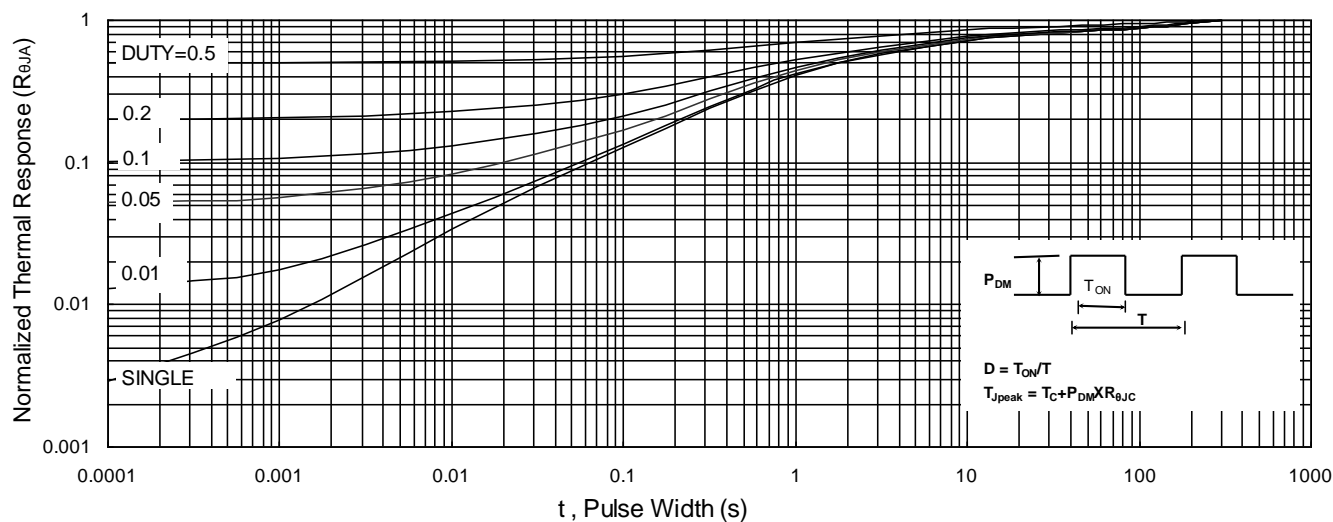


Fig.9 Normalized Maximum Transient Thermal Impedance

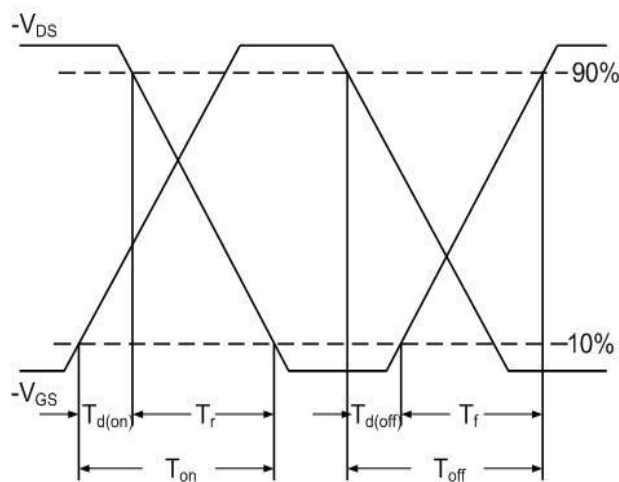


Fig.10 Switching Time Waveform

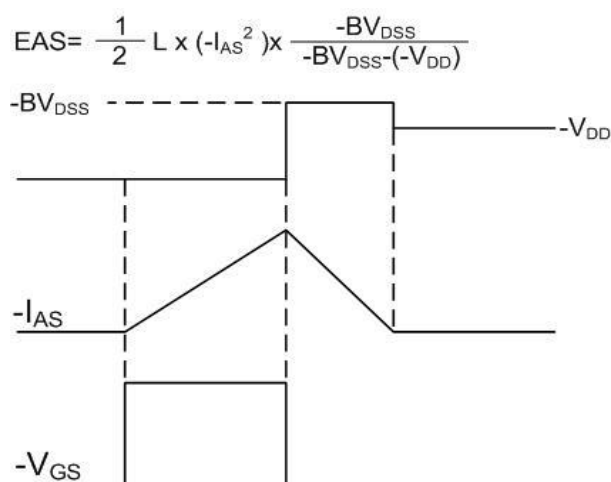
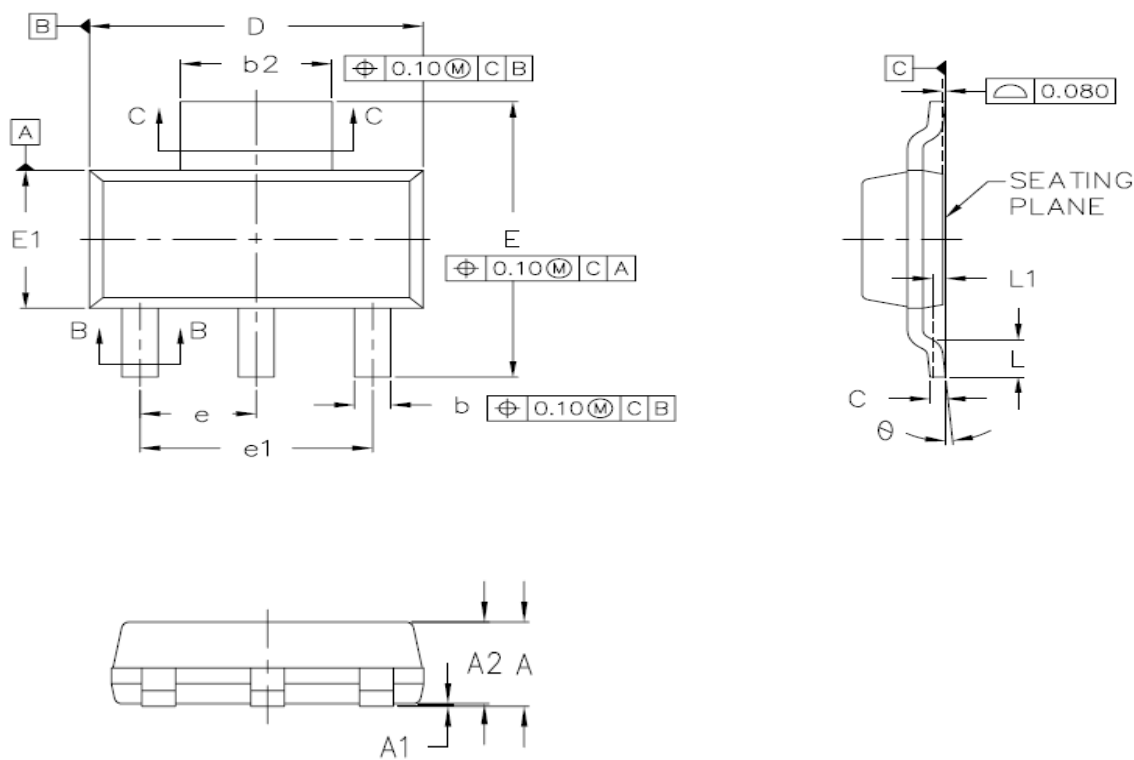


Fig.11 Unclamped Inductive Waveform

SOT-223 Package Outline



DIMENSIONS	COMMON			
	MM		INCH	
	MIN.	MAX.	MIN.	MAX.
A	—	1.80	—	0.071
A1	0.02	0.10	0.001	0.004
A2	1.50	1.70	0.059	0.067
b	0.66	0.84	0.026	0.033
b1	0.60	0.79	0.024	0.031
b2	2.90	3.10	0.114	0.122
b3	2.84	3.05	0.112	0.120
c	0.23	0.35	0.009	0.014
c1	0.23	0.33	0.009	0.013
D	6.30	6.70	0.248	0.264
E	6.70	7.30	0.264	0.287
E1	3.30	3.70	0.130	0.146
e	2.30 BSC.		0.091 BSC.	
e1	4.60 BSC.		0.182 BSC.	
L	0.81	—	0.032	—
L1	0.25 BSC.		0.010 BSC.	
θ	0°	10°	0°	10°

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