

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
200V	580mΩ@10V	4.2A
	850mΩ@4.5V	

Feature

- Advanced trench technology
- Excellent $R_{DS(on)}$
- Low gate charge

Application

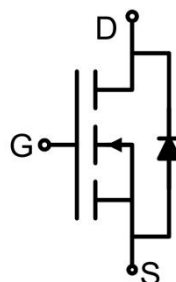
- Automotive lighting
- Load switch
- Uninterruptible power supply

Package



SOT-223

Circuit diagram



Marking



Absolute maximum ratings (Tc=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($V_{GS}=10V$)	I_D	4.2	A
Continuous Drain Current ($V_{GS}=10V$, $T_C=100^\circ C$)	$I_D(100^\circ C)$	2.8	A
Pulsed Drain Current ¹⁾	I_{DM}	10	A
Power Dissipation ³⁾	P_D	2	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	62.5	$^\circ C/W$
Junction Temperature	T_J	150	$^\circ C$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ C$

Electrical characteristics ($T_J=25^\circ C$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	200			V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=200V, V_{GS}=0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	2	2.5	V
Drain-source on-resistance ²⁾	$R_{DS(on)}$	$V_{GS}=10V, I_D=1A$		450	580	m Ω
		$V_{GS}=4.5V, I_D=1A$		680	850	
Dynamic characteristics ⁴⁾						
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1MHz$		900		pF
Output Capacitance	C_{oss}			130		
Reverse Transfer Capacitance	C_{rss}			4.6		
Total Gate Charge	Q_g	$V_{DS}=160V, V_{GS}=10V, I_D=1A$		15		nC
Gate-Source Charge	Q_{gs}			3		
Gate-Drain Charge	Q_{gd}			5.2		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=100V, V_{GS}=10V, I_D=1A$ $R_G=3\Omega$		22		nS
Turn-on rise time	t_r			34		
Turn-off delay time	$t_{d(off)}$			45		
Turn-off fall time	t_f			11		
Source-Drain Diode characteristics						
Diode Forward Current	I_S	$V_D=V_G=0V$, Force Current			4.2	A
Diode Forward voltage	V_{SD}	$V_{GS}=0V, I_S=1A$			1	V
Reverse Recovery Time	t_{rr}	$I_F=1A, di/dt=100A/us$		85		nS
Reverse Recovery Charge	Q_{rr}			257		nC

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ 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 temperature.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

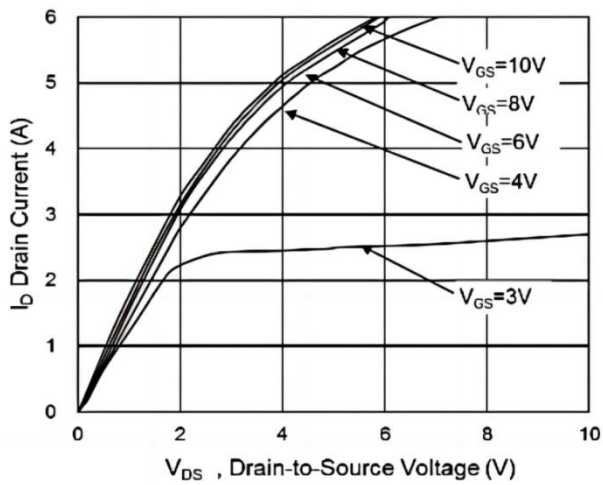


Fig.1 Typical Output Characteristics

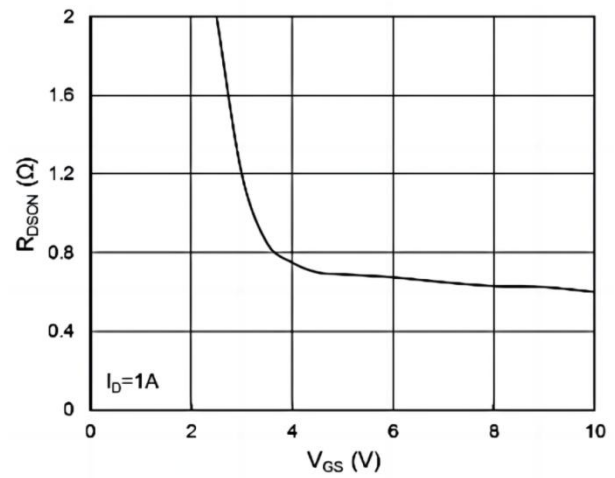


Fig.2 On-Resistance vs. G-S Voltage

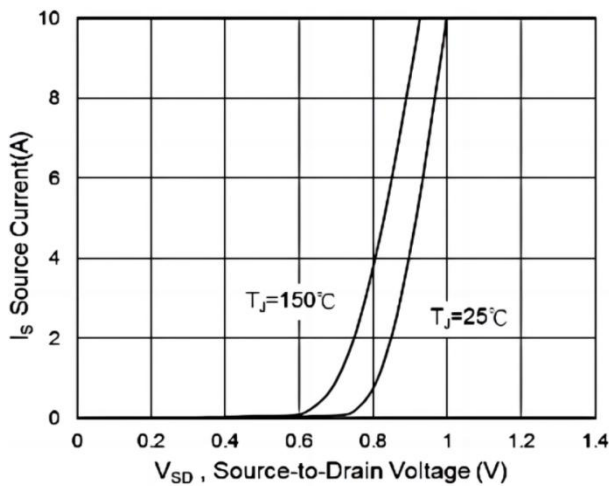


Fig.3 Forward Characteristics of Reverse

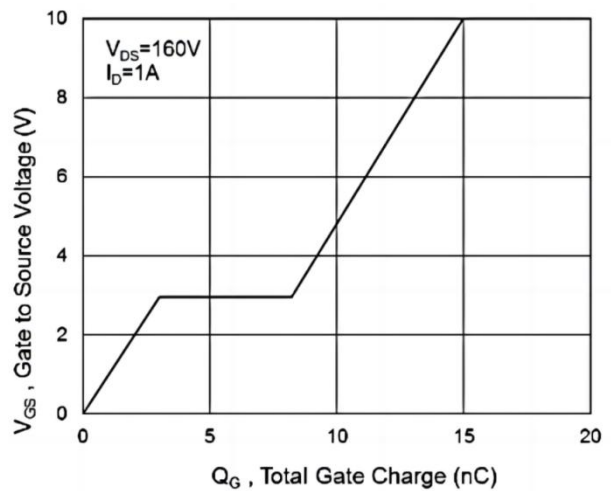


Fig.4 Gate-Charge Characteristics

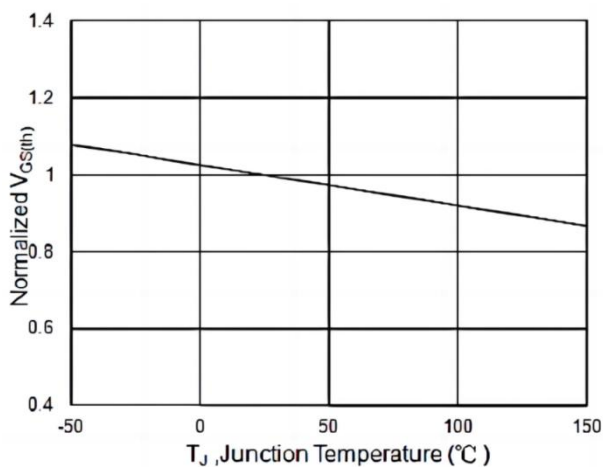


Fig.5 $V_{GS(th)}$ vs. T_J

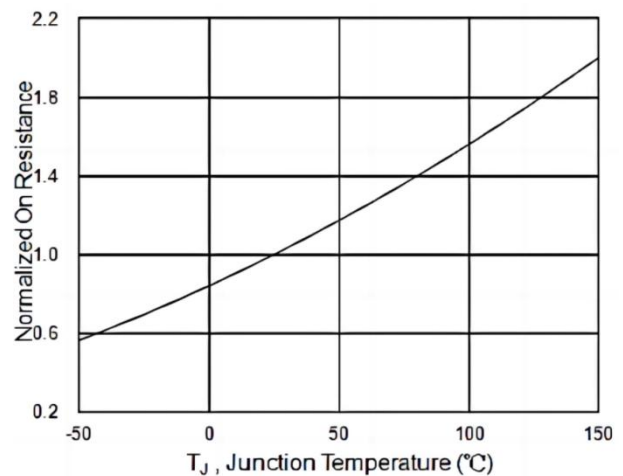


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

Typical Characteristics

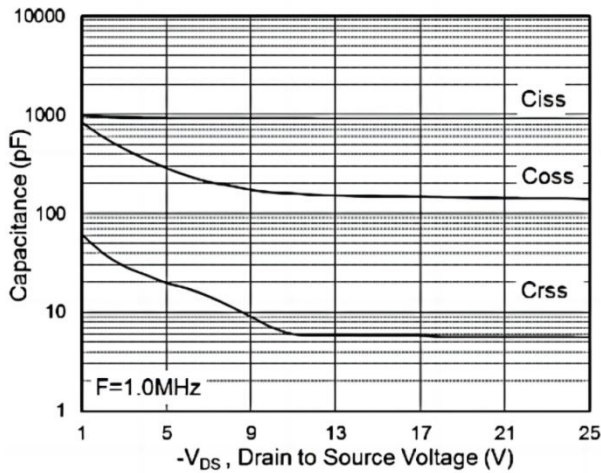


Fig.7 Capacitance

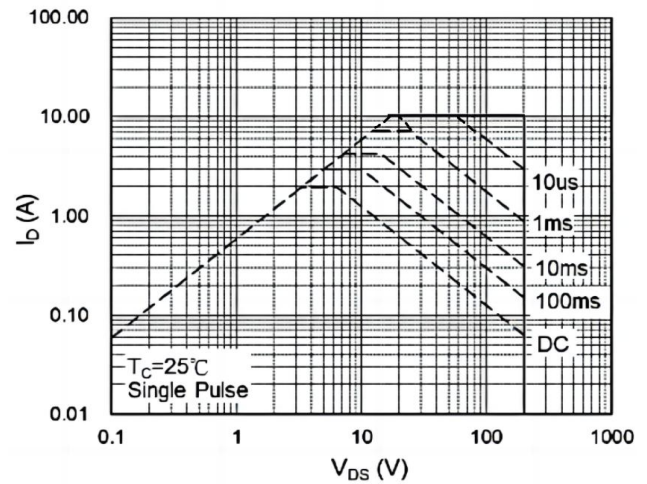


Fig.8 Safe Operating Area

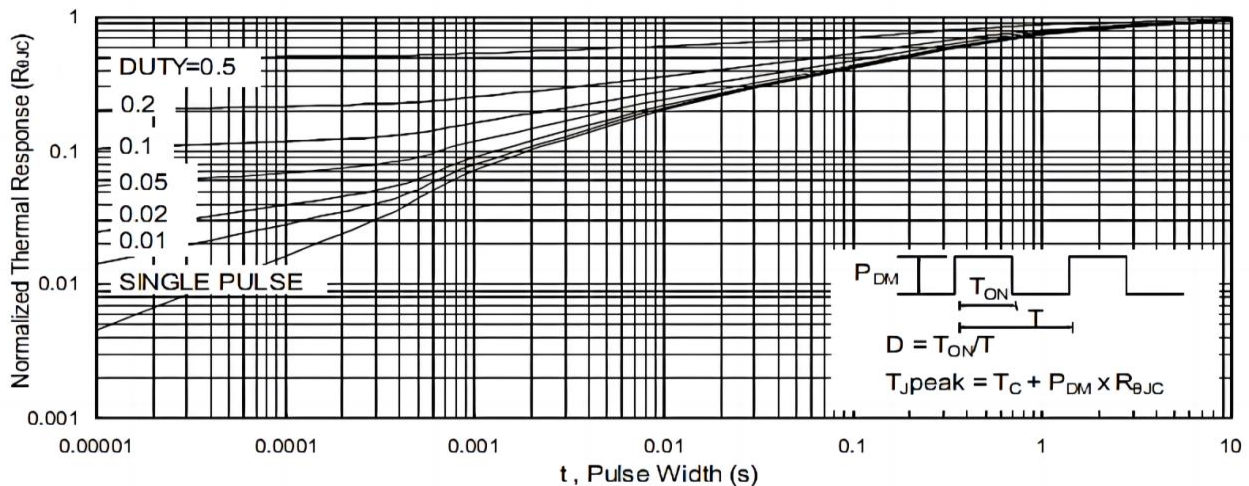


Fig.9 Normalized Maximum Transient Thermal Impedance

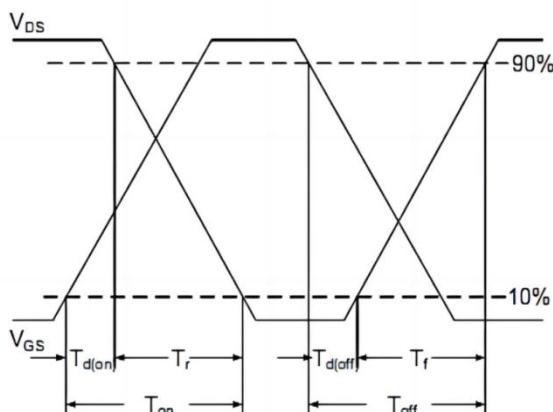


Fig.10 Switching Time Waveform

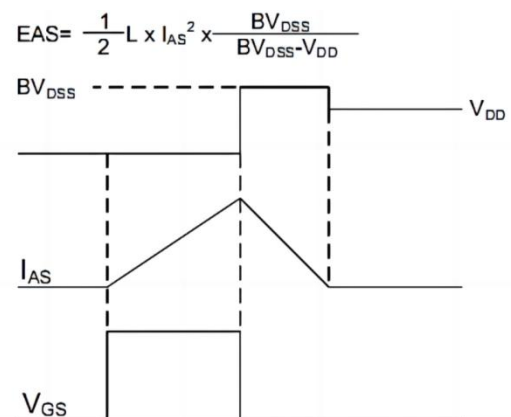
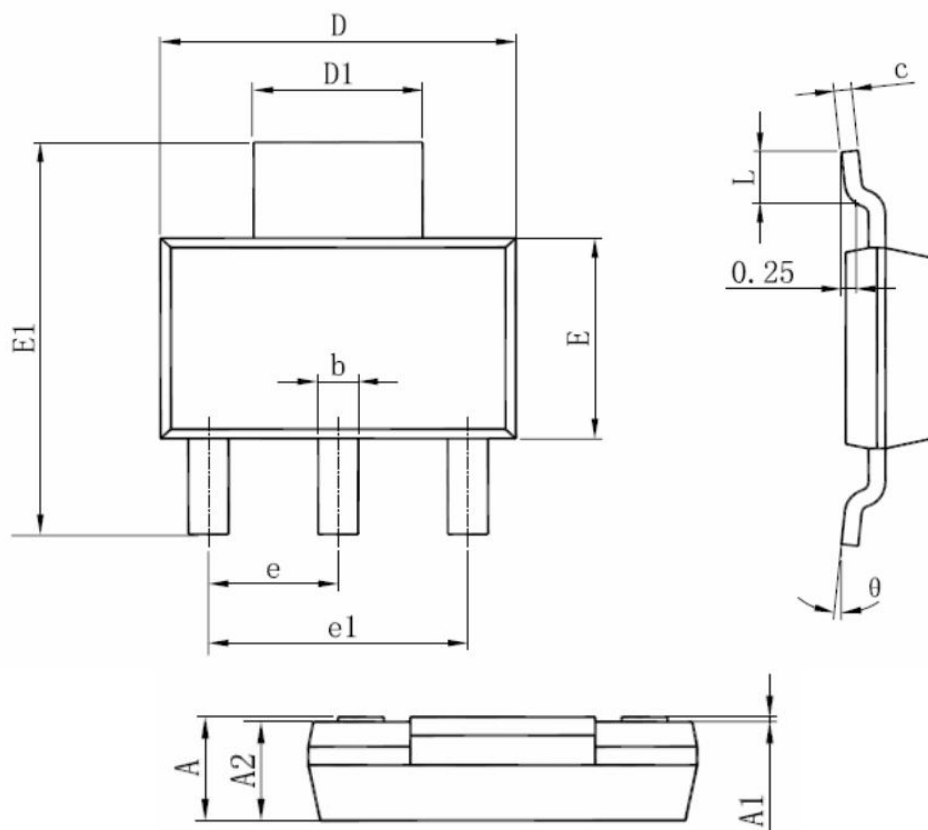


Fig.11 Unclamped Inductive Switching Waveform

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	0.120	0.000	0.005
A2	1.450	1.750	0.057	0.069
b	0.600	0.820	0.024	0.032
c	0.240	0.350	0.010	0.014
D	6.200	6.500	0.244	0.256
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°