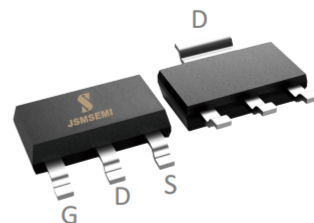


Description:

This P-Channel MOSFET uses advanced trench technology and

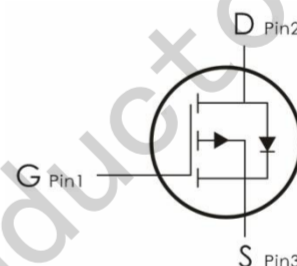
design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.



Features:

- 1) $V_{DS}=-30V, I_D=-6A, R_{DS(on)}<60m\ \Omega$ @ $V_{GS}=-10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_A=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_A=25^\circ C^1$	-6	A
	Continuous Drain Current- $T_C=70^\circ C^1$	-3.1	
I_{DM}	Pulsed Drain Current ²	-16	
P_D	Power Dissipation ³	1.5	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ¹	60	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ¹	85	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	-30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-24V	---	---	-1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	±100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	-1	-1.5	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance ²	V _{GS} =-10V, I _D =-3A	---	55	60	m Ω
		V _{GS} =-4.5V, I _D =-1.5A	---	90	120	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	462	---	pF
C _{oss}	Output Capacitance		---	81	--	
C _{rss}	Reverse Transfer Capacitance		---	67	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =-15V, I _D =-1A, R _{ENG} =3.3 Ω ,V _{GS} =-10V	---	18.3	---	ns
t _r	Rise Time		---	11.3	---	ns
t _{d(off)}	Turn-Off Delay Time		---	39.3	---	ns
t _f	Fall Time		---	5.1	---	ns
Q _g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-20V, I _D =-3A	---	5.21	---	nc
Q _{gs}	Gate-Source Charge		---	1.24	---	nc
Q _{gd}	Gate-Drain “Miller” Charge		---	2.2	---	nc
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _{SD} =-1A	---	---	-1	V
I _S	Continuous Drain Curren ^{1,4}	VD=VG=0V	---	---	-6	A
I _{SM}	Pulsed Drain Current ^{2,4}		---	---	-16	A

Notes:

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 temperature
4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

Typical Characteristics: ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

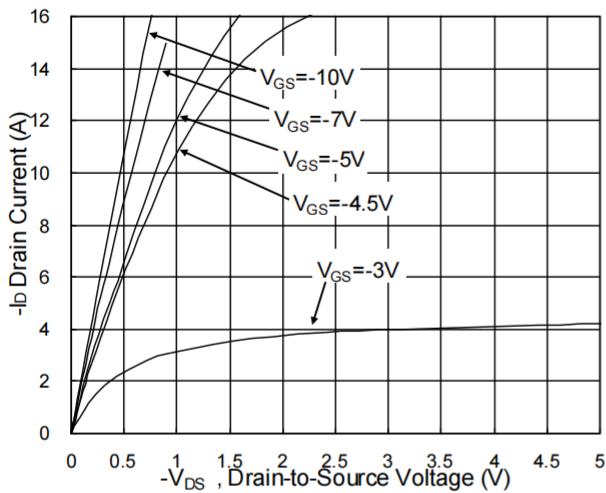


Fig.1 Typical Output Characteristics

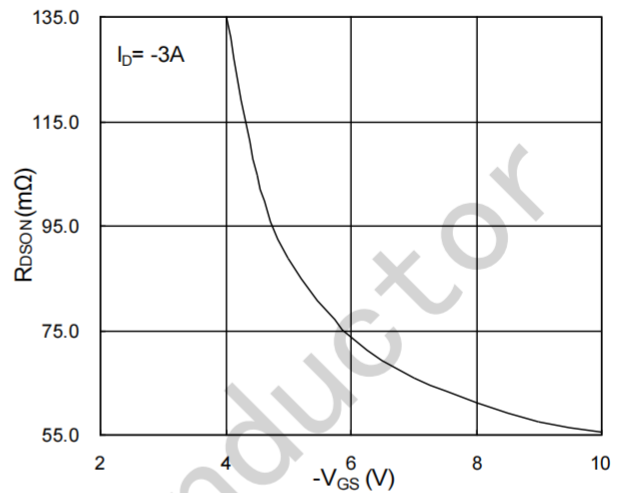


Fig.2 On-Resistance vs. G-S Voltage

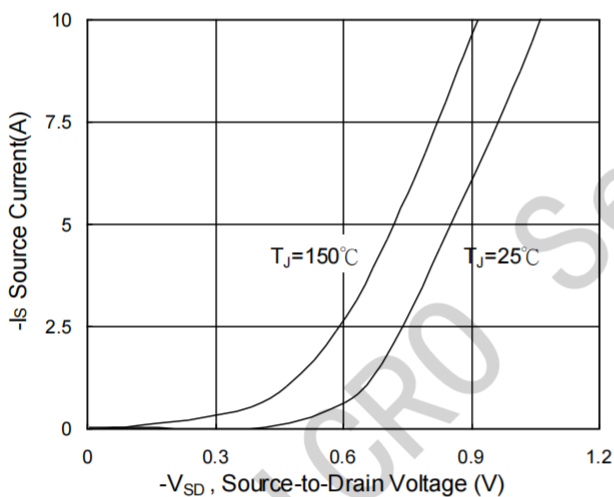


Fig.3 Forward Characteristics of Reverse

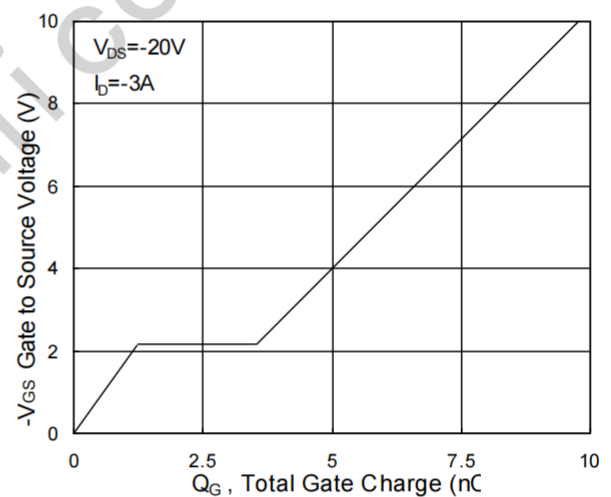


Fig.4 Gate-Charge Characteristics

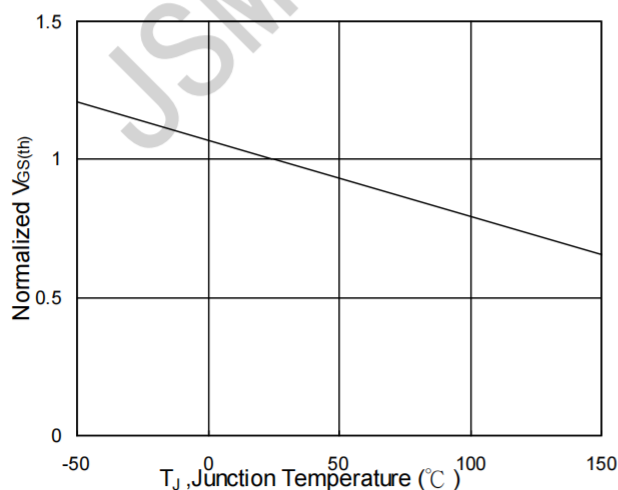


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

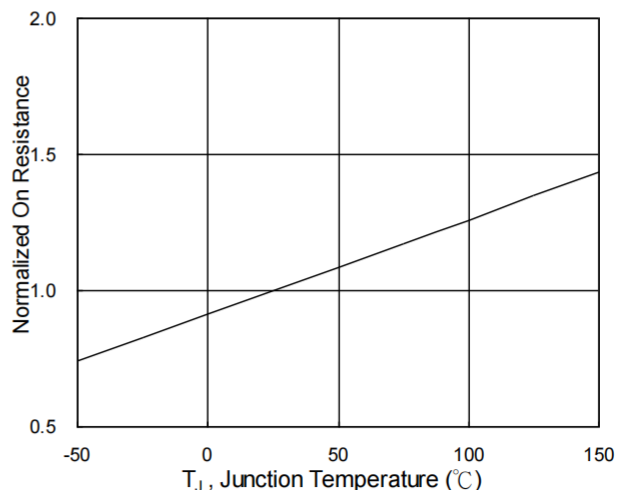


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

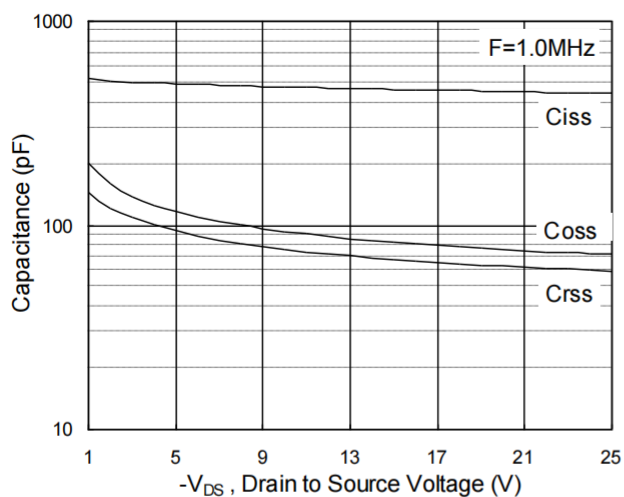


Fig.7 Capacitance

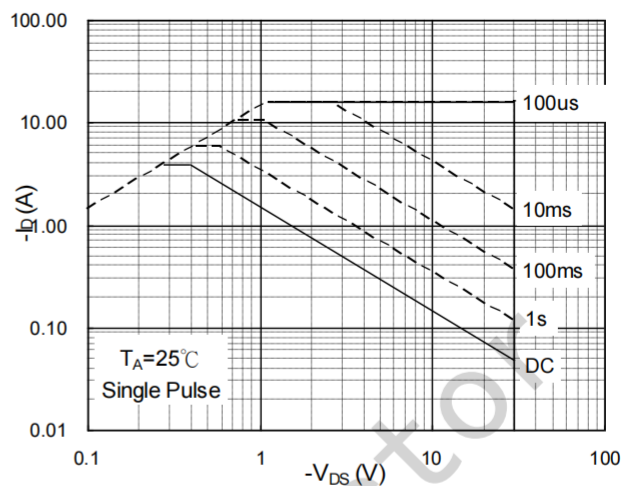


Fig.8 Safe Operating Area

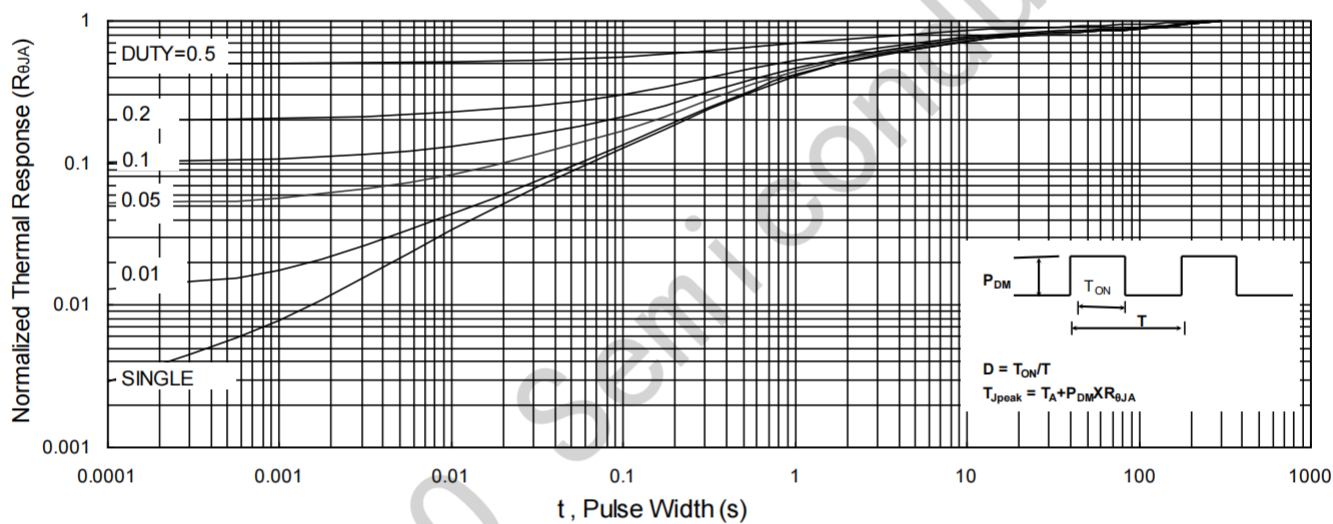


Fig.9 Normalized Maximum Transient Thermal Impedance

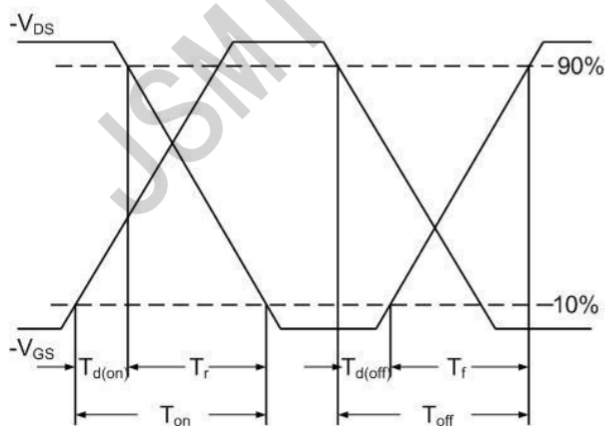


Fig.10 Switching Time Waveform

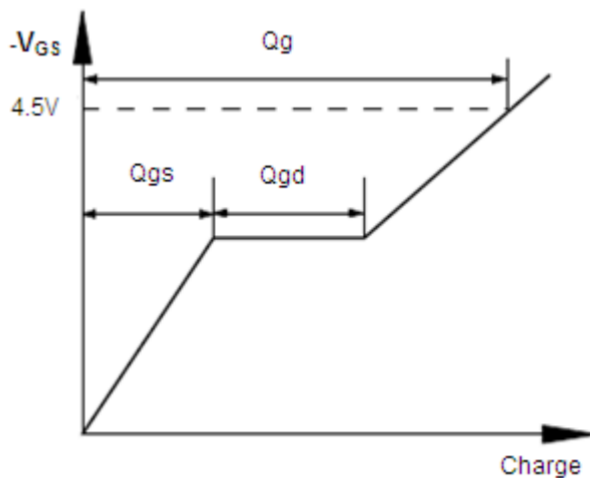
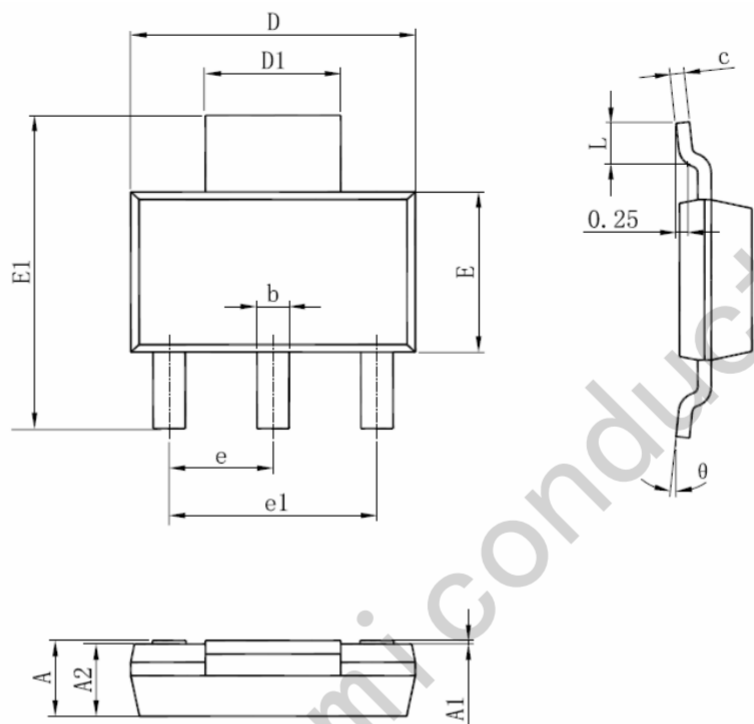


Fig.11 Gate Charge Waveform

Package Information

SOT-223



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°