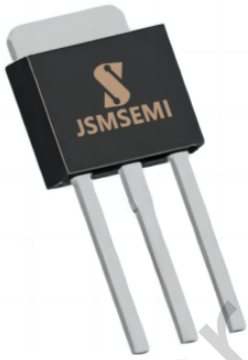
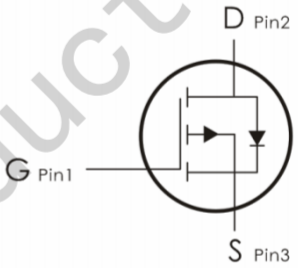
Description：

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}=-60V,I_D=-20A,$R_{DS(ON)}$<68mΩ @V_{GS}=-10V
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.

Absolute Maximum Ratings：(T_C=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current-TC=25℃[1]	-20	A
	Continuous Drain Current-TC=100℃[1]	-11	A
I_{DM}	Pulsed Drain Current[2]	-36	A
E_{AS}	Single Pulse Avalanche Energy[3]	35.4	mJ
P_D	Total Power Dissipation-TC=25℃[4]	34.7	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case[1]	3.6	℃/W
$R_{\theta JA}$	Thermal Resistance- Junction to Ambient[1]	62	℃/W

Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	-60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=-48V,T_J=25℃	---	---	1	μA
		V_{GS}=0V, V_{DS}=-48V,T_J=55℃	---	---	5	μA
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=250μA	-1.2	---	-2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance[2]	V_{GS}=-10V,I_D=-12A	---	---	68	mΩ
		V_{GS}=-4.5V,I_D=-8A	---	---	105	mΩ
G_{FS}	Forward Transconductance	V_{DS}=-5V , I_D=-12A	---	15.4	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-15V, V_{GS}=0V, f=1MHz	---	1440	---	pF
C_{oss}	Output Capacitance		---	97	---	
C_{rss}	Reverse Transfer Capacitance		---	65	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=-15V, I_D=-1A, V_{GS}=-10V, R_G=3.3Ω	---	28.8	---	ns
t_r	Rise Time		---	19.8	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	60.8	---	ns
t_f	Fall Time		---	7.2	---	ns
Q_g	Total Gate Charge	V_{GS}=-4.5V, V_{DS}=-48V, I_D=-10A	---	9.86	---	nC
Q_{gs}	Gate-Source Charge		---	3.08	---	nC

Q_{gd}	Gate-Drain "Miller" Charge		---	2.95	---	nC
R_G	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	13.5	---	Ω
Drain-Source Diode Characteristics						
V_{SD}	Drain Diode Forward Voltage [2]	V_{GS}=0V,I_S=-1A,T_J=25℃	---	---	-1.2	V
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	-20	A
I_{SM}	Pulsed Source Current[2,5]		---	---	-36	A

Notes:

1.The data tested by surface mounted on a 1 inch FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.1mH,I_{AS}=-26.6A
4.The power dissipation is limited by 150℃ junction temperature
5.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_C=25℃ unless otherwise noted)

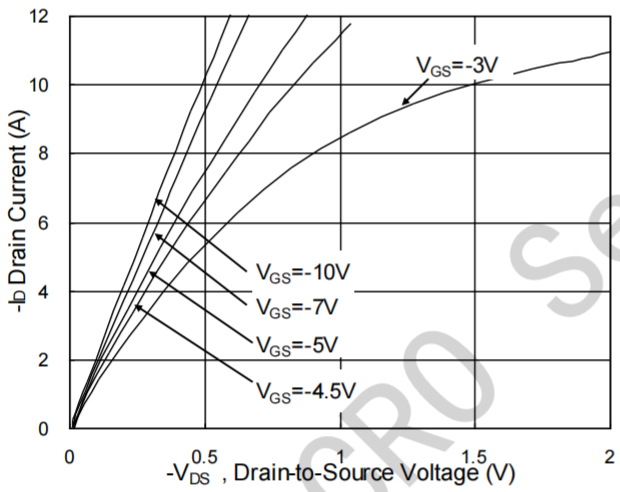


Fig.1 Typical Output Characteristics

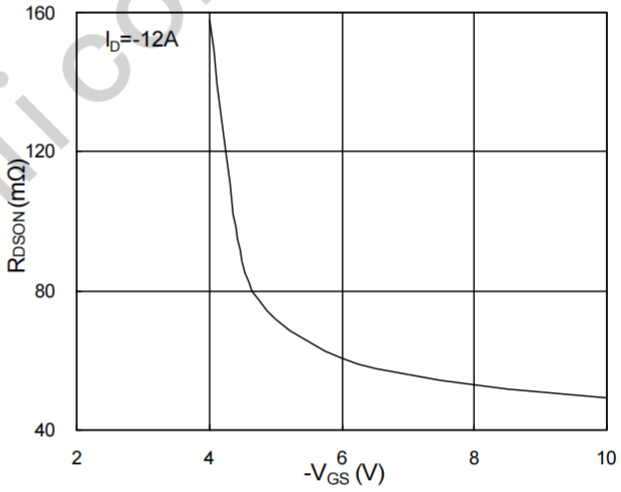


Fig.2 On-Resistance v.s Gate-Source

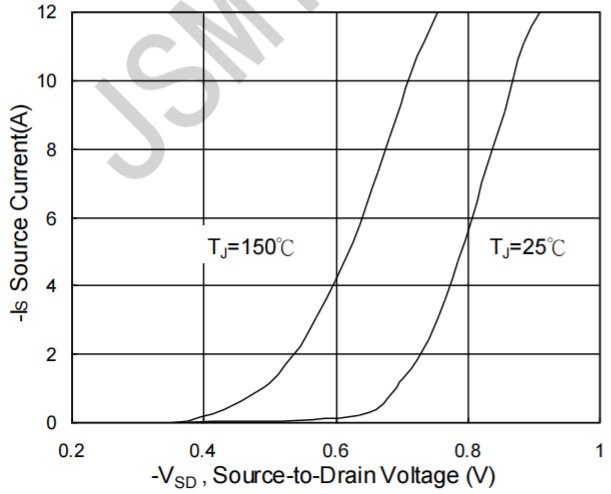


Fig.3 Forward Characteristics of Reverse

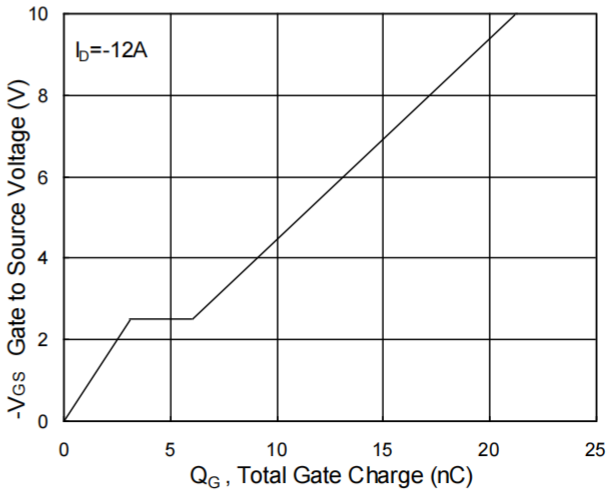


Fig.4 Gate-Charge Characteristics

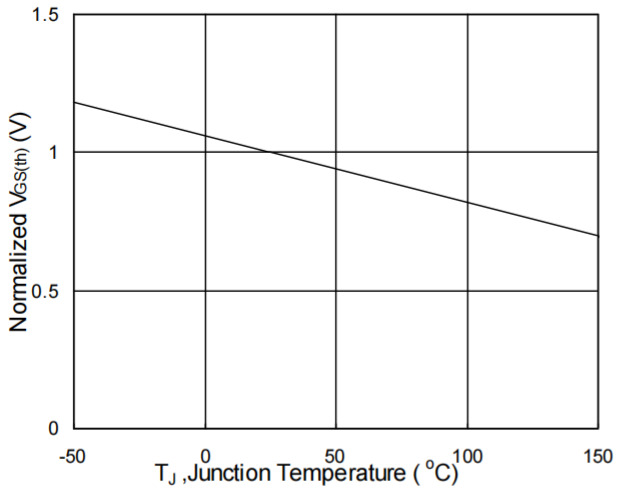


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

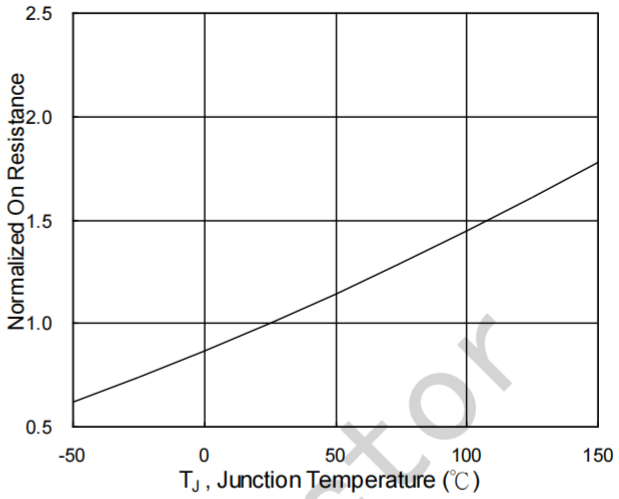


Fig.6 Normalized R_{DSON} v.s T_J

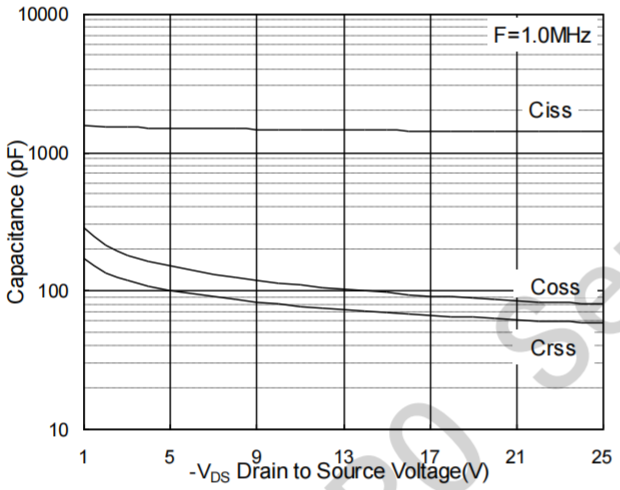


Fig.7 Capacitance

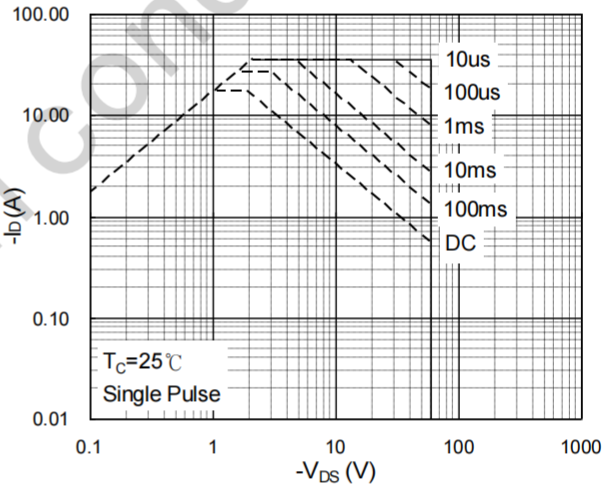


Fig.8 Safe Operating Area

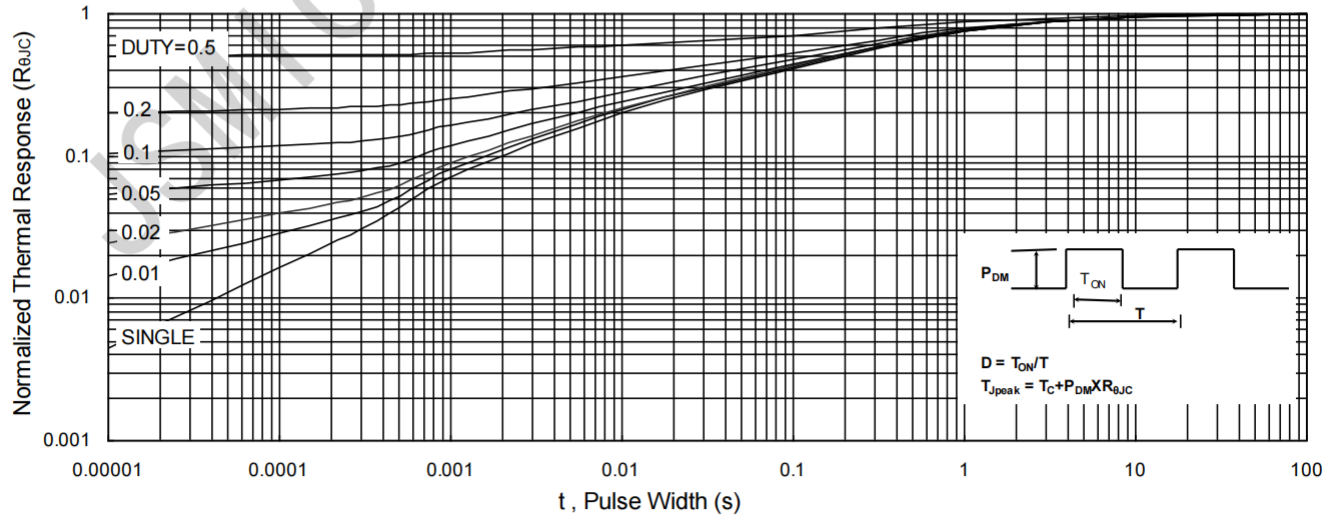


Fig.9 Normalized Maximum Transient Thermal Impedance

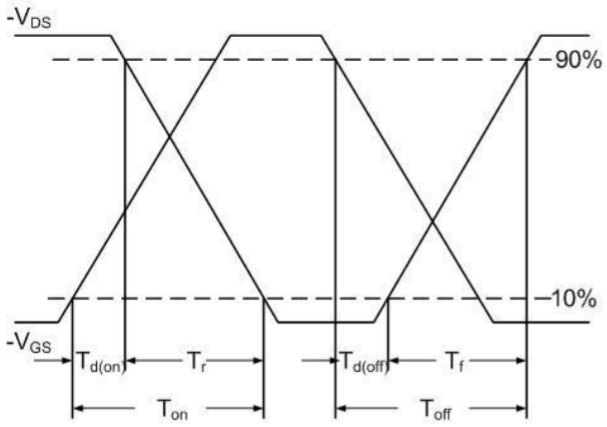


Fig.10 Switching Time Waveform

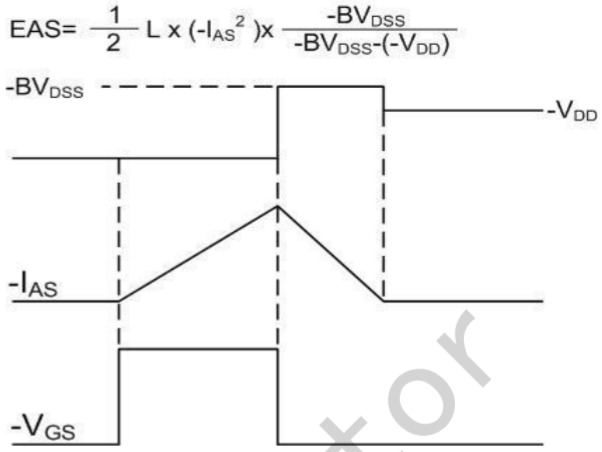
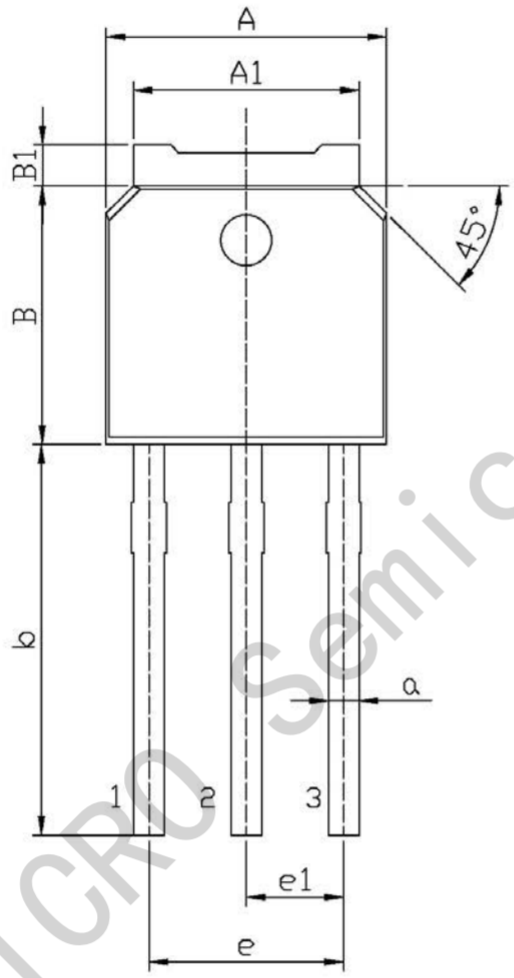


Fig.11 Unclamped Inductive Waveform

Package Information

TO-251

TO-251



单位：mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	6.45	6.75	a	0.70	0.90
A1	5.20	5.40	b	9.00	9.40
B	5.95	6.25	c	0.45	0.55
B1	0.95	1.25	c1	0.45	0.55
C	2.20	2.40	e1	2.24	2.34
C1	0.95	1.15	e	4.43	4.73