## Description：

This N-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=10.3A,$R_{DS(ON)}$<8m Ω @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.
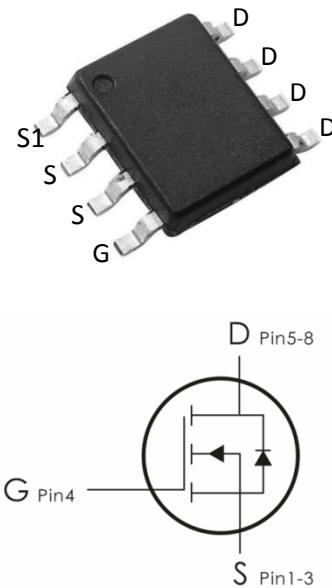
Absolute Maximum Ratings： (T$_C$=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current -Continuous[1] (T$_A$=25℃)	10.3	A
	Drain Current -Continuous[1] (T$_A$=70℃)	8.2	
I_{DM}	Drain Current – Pulsed[2]	42	
E_{AS}	Single Pulse Avalanche Energy[3]	61	mJ
I_{AS}	Avalanche Current	35	A
P_D	Power Dissipation[4] (T$_A$=25℃)	1.5	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]	36	℃/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient[1]	85	

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	30	---	---	V
I$_{DSS}$	Drain-Source Leakage Current	V$_{DS}$=24V , V$_{GS}$=0V,T$_J$=25℃	---	---	1	uA
		V$_{DS}$=24V , V$_{GS}$=0V,T$_J$=55℃	---	---	5	uA
I$_{GSS}$	Gate-Source Leakage Current	V$_{GS}$=±20V, V$_{DS}$=0V	---	---	±100	nA
On Characteristics[3]						
V$_{GS(th)}$	GATE-Source Threshold Voltage	V$_{GS}$=V$_{DS}$, I$_D$=250μA	1.2	1.5	2.5	V
R$_{DS(ON)}$	Static Drain-Source On Resistance[2]	V$_{GS}$=10V,I$_D$=10A	---	7	8	mΩ
		V$_{GS}$=4.5V,I$_D$=8A	---	11	14	mΩ
G$_{FS}$	Forward Transconductance	V$_{DS}$=5V, I$_D$=10A	---	5.8	---	S
Dynamic Characteristics						
C$_{iss}$	Input Capacitance	V$_{DS}$=15V, V$_{GS}$=0V, f=1MHz	---	1300	1840	pF
C$_{oss}$	Output Capacitance		---	160	225	
C$_{rss}$	Reverse Transfer Capacitance		---	130	180	
Switching Characteristics						
t$_{d(on)}$	Turn-On Delay Time	V$_{DD}$=15V,I$_D$=10A R$_G$=3.3Ω , V$_{GS}$=10V	---	6.2	12.4	ns
t$_r$	Rise Time		---	59	106	ns
t$_{d(off)}$	Turn-Off Delay Time		---	27.6	55	ns
t$_f$	Fall Time		---	8.4	16.8	ns
Q$_g$	Total Gate Charge	V$_{GS}$=4.5V, V$_{DS}$=15V, I$_D$=10A	---	12.6	17.6	nC
Q$_{gs}$	Gate-Source Charge		---	4.2	5.9	nC
Q$_{gd}$	Gate-Drain "Miller" Charge		---	5.1	7.1	nC
R$_G$	Gate Resistance	Gate Resistance	---	2.2	3.8	Ω

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Drain-Source Diode Characteristics

V_{SD}	Source-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	---	---	10.3	A
I_{SM}	Pulsed Source Current[2,5]		---	---	42	A
Trr	Body Diode Reverse Recovery Time	I_F=10A , dI/dt=100A/μs , T_J=25℃	---	12.5	---	Ns
Qrr	Body Diode Reverse Recovery Charge		---	5	---	Nc

Notes:

1.The data tested by surface mounted on a 1 inch[2] 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}=35A
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)
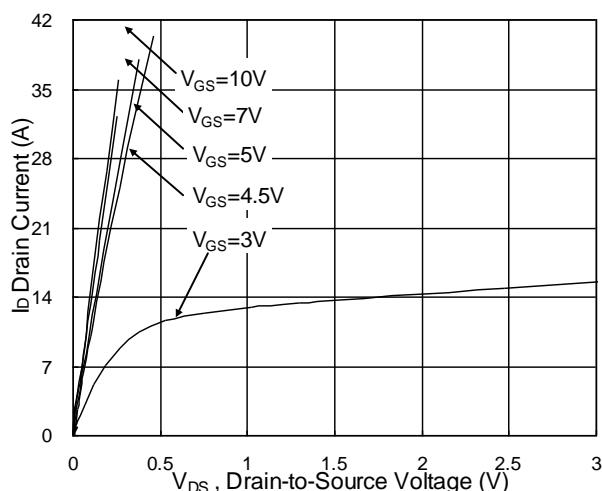
Fig.1 Typical Output Characteristics
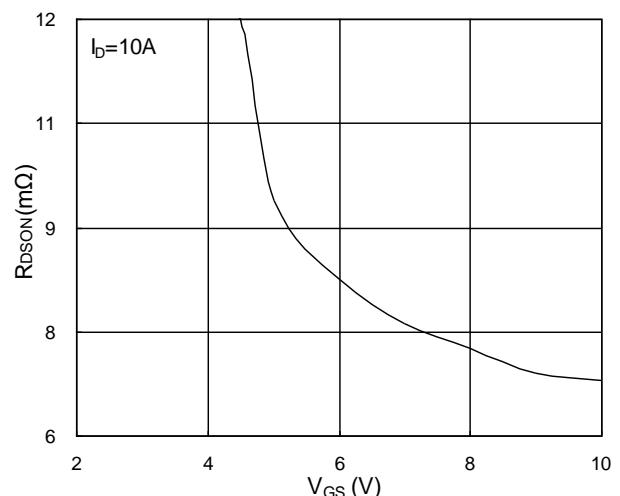
**Fig.2 On-Resistance vs. Gate-Source**
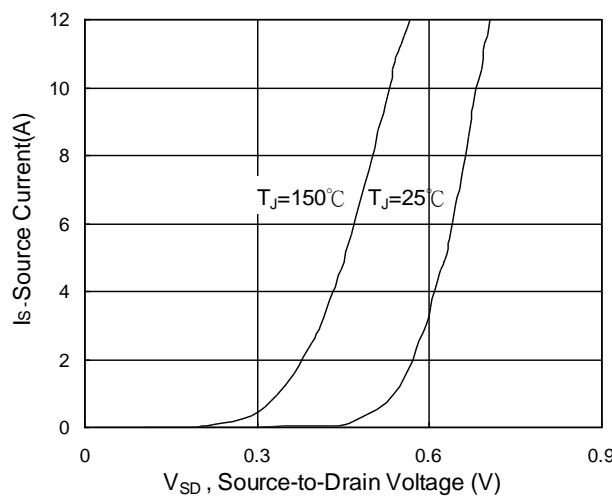
**Fig.3 Forward Characteristics of reverse**
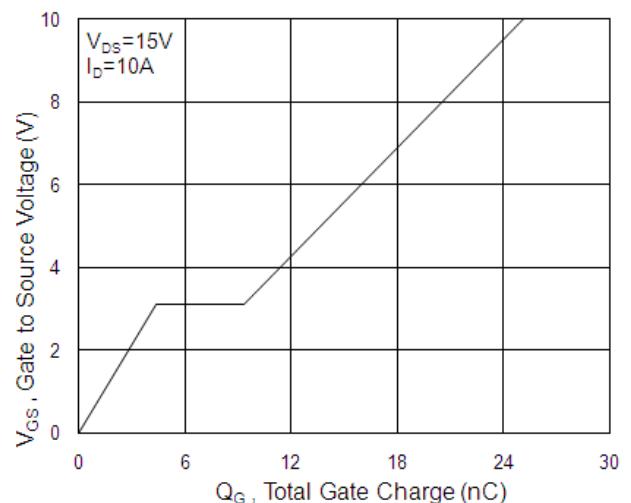

Fig.4 Gate-Charge Characteristics
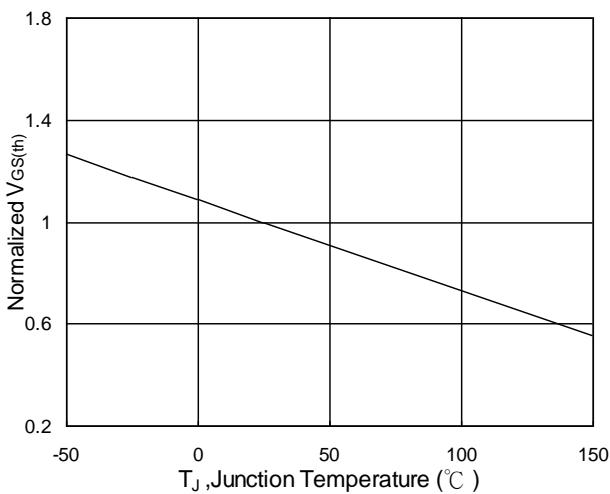
**Fig.5 Normalized $V_{GS(th)}$ vs. T_J**
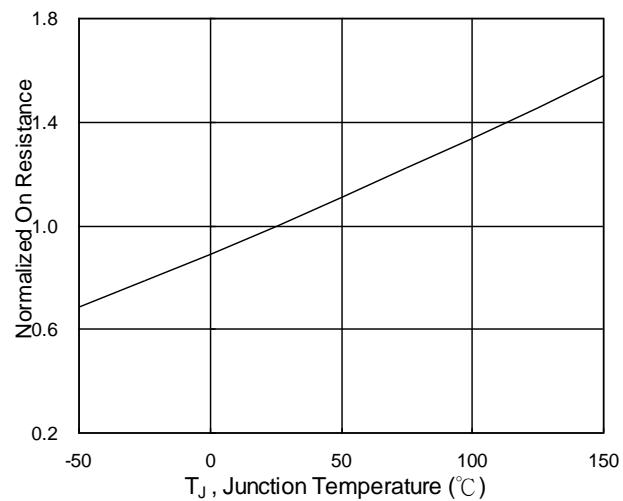
Fig.6 Normalized R_{DSON} vs. T_J
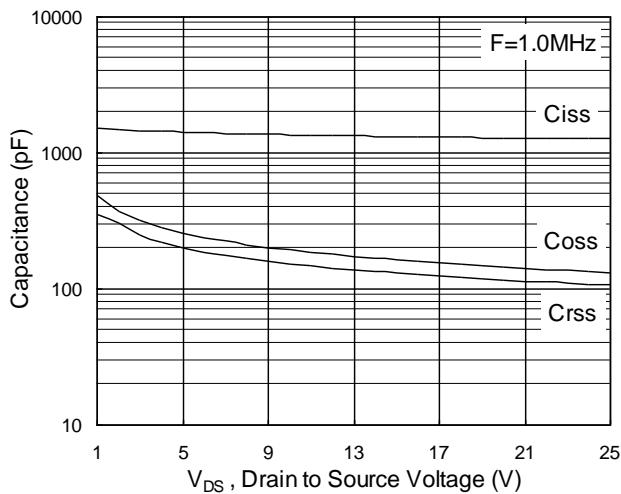
Fig.7 Capacitance
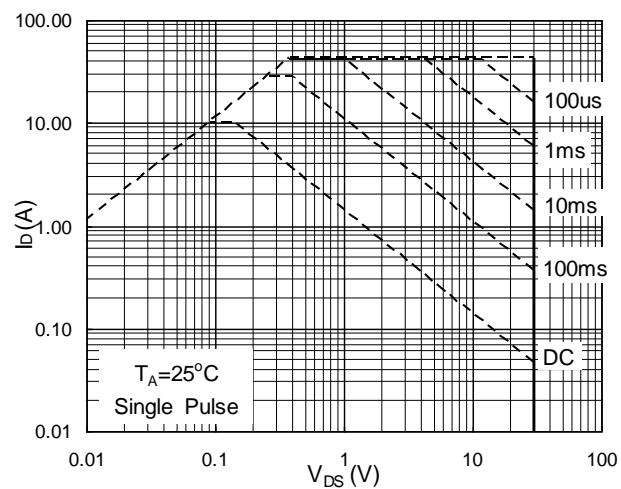
Fig.8 Safe Operating Area
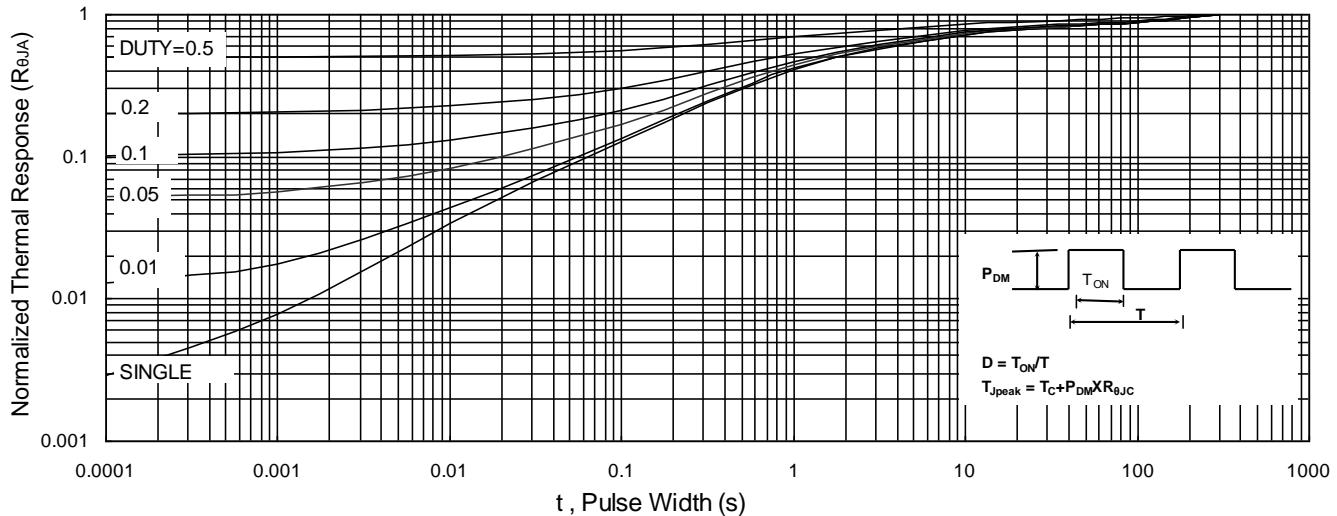
Fig.9 Normalized Maximum Transient Thermal Impedance

$$EAS= \frac{1}{2}L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$
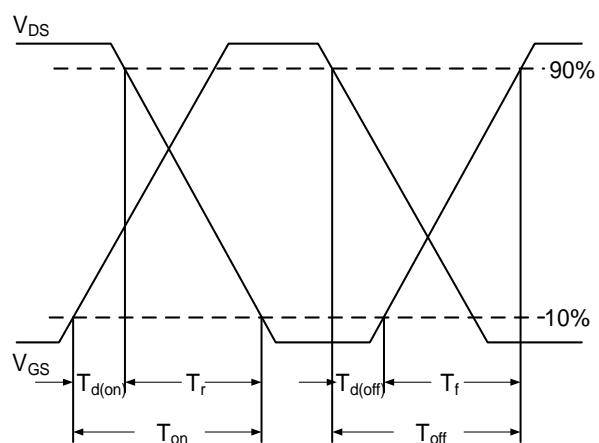
Fig.10 Switching Time Waveform
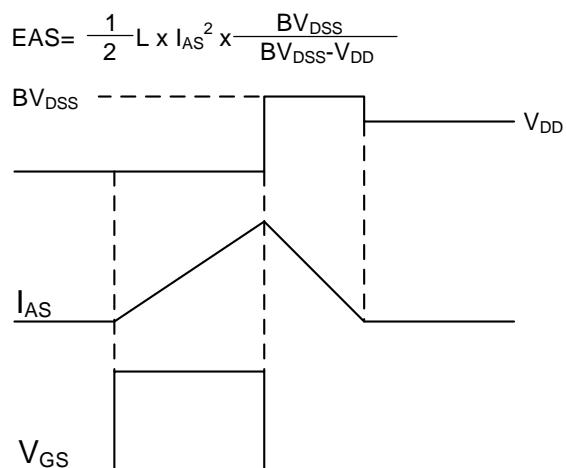
Fig.11 Unclamped Inductive Switching Waveform