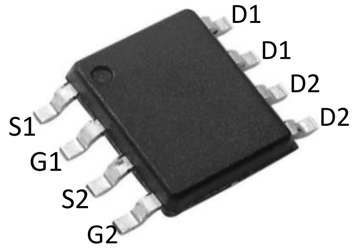
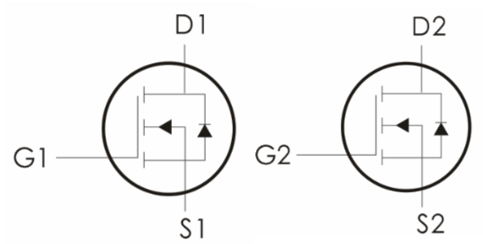
Description:

This Dual 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}=60V,I_D=5A, $R_{DS(ON)}$<36mΩ @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_a=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 -T_A=25℃[1]	5	A
	Continuous Drain Current- T_A=70℃[1]	3.5	
I_{DM}	Drain Current-Pulsed[2]	18	A
E_{AS}	Single Pulse Avalanche Energy[3]	22	mJ
I_{AS}	Avalanche Current	21	A
P_D	Power Dissipation[4]	1.5	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient[1]	85	℃/W

$R_{θJC}$	Thermal Resistance Junction-Case[1]	25	℃/W

Package Marking and Ordering Information：

Part NO.	Marking	Package
DOS5DN06	5DN06	SOP-8D

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	---	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=4A	---	30	36	mΩ
		V_{GS}=4.5V,I_D=3A	---	34	45	
G_{FS}	Forward Transconductance	V_{DS}=5V, I_D=4A	---	28.3	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	---	1020	---	pF
C_{oss}	Output Capacitance		---	60	---	
C_{rss}	Reverse Transfer Capacitance		---	45	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V, I_D=4A R_G=3.3Ω. V_{GS}=10V,	---	3	---	ns
t_r	Rise Time		---	34	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	23	---	ns
t_f	Fall Time		---	6	---	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=48V, I_D=4A	---	19	---	nC
Q_{gs}	Gate-Source Charge		---	2.6	---	nC

Q_{gd}	Gate-Drain "Miller" Charge		---	4.1	---	nC
R_G	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.5	---	Ω
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	---	---	4.5	A
I_{SM}	Pulsed Source Current[2,5]		---	---	18	A
T_{rr}	Reverse Recovery Time	I_F=4A , dI/dt=100A/µs , T_J=25℃	---	12.1	---	ns
Q_{rr}	Reverse Recovery Charge		---	6.7	---	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 ≦ 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}=21A
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)

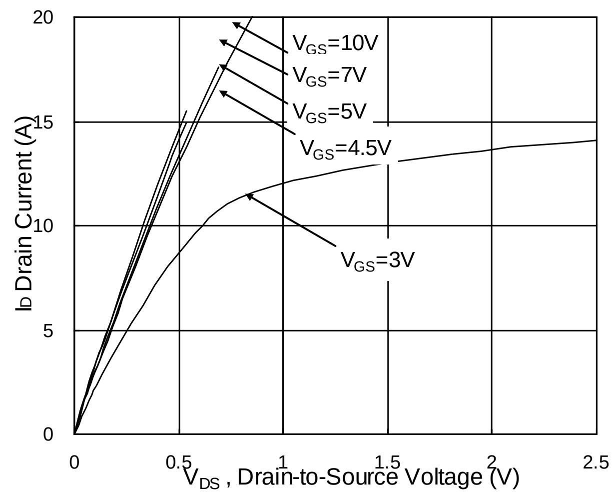


Fig.1 Typical Output Characteristics

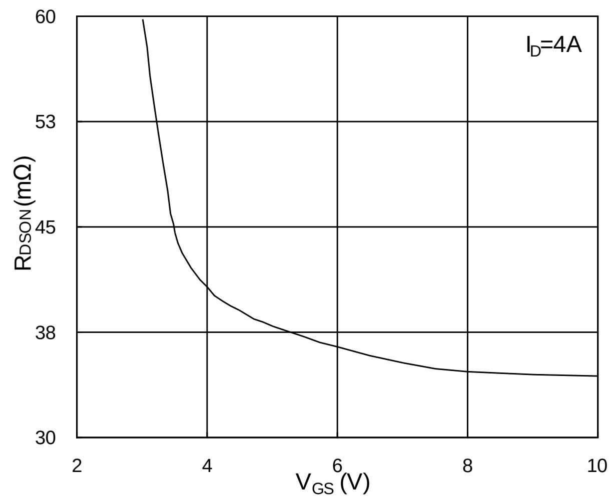


Fig.2 On-Resistance vs. Gate-Source

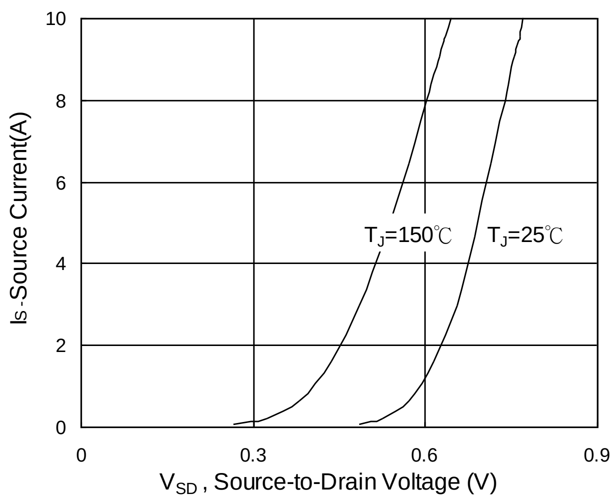


Fig.3 Forward Characteristics Of Reverse

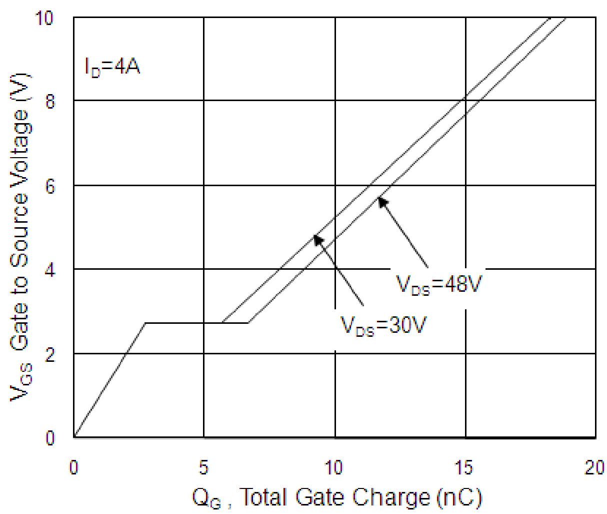


Fig.4 Gate-Charge Characteristics

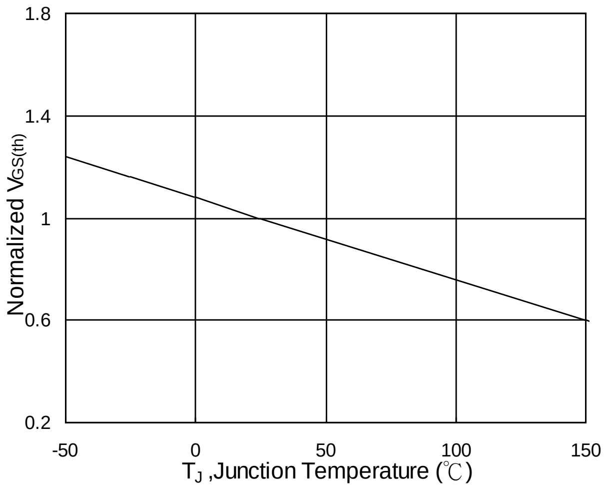


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

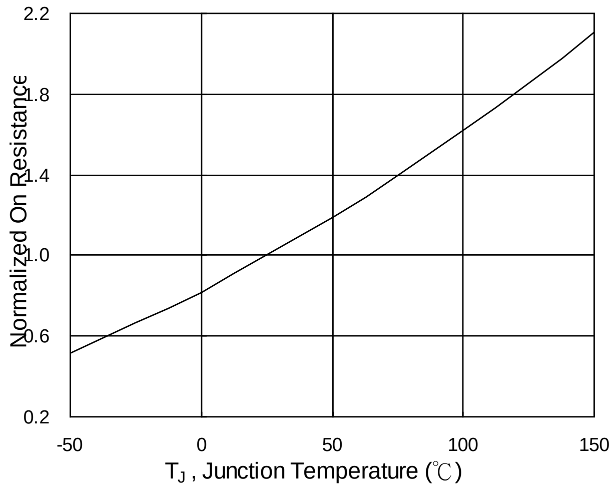


Fig.6 Normalized R_{DSON} vs. T_J

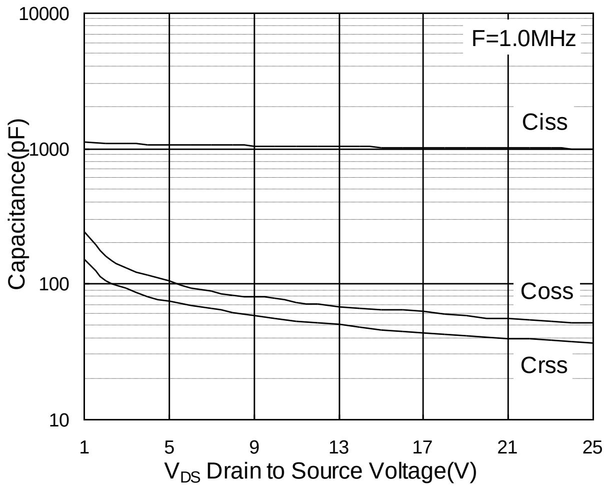


Fig.7 Capacitance

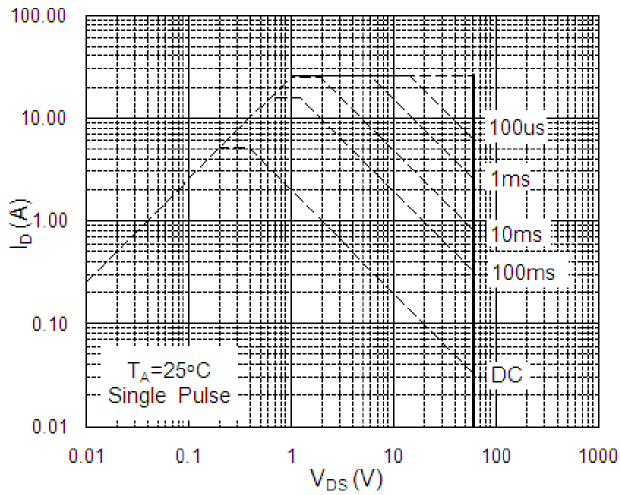


Fig.8 Safe Operating Area

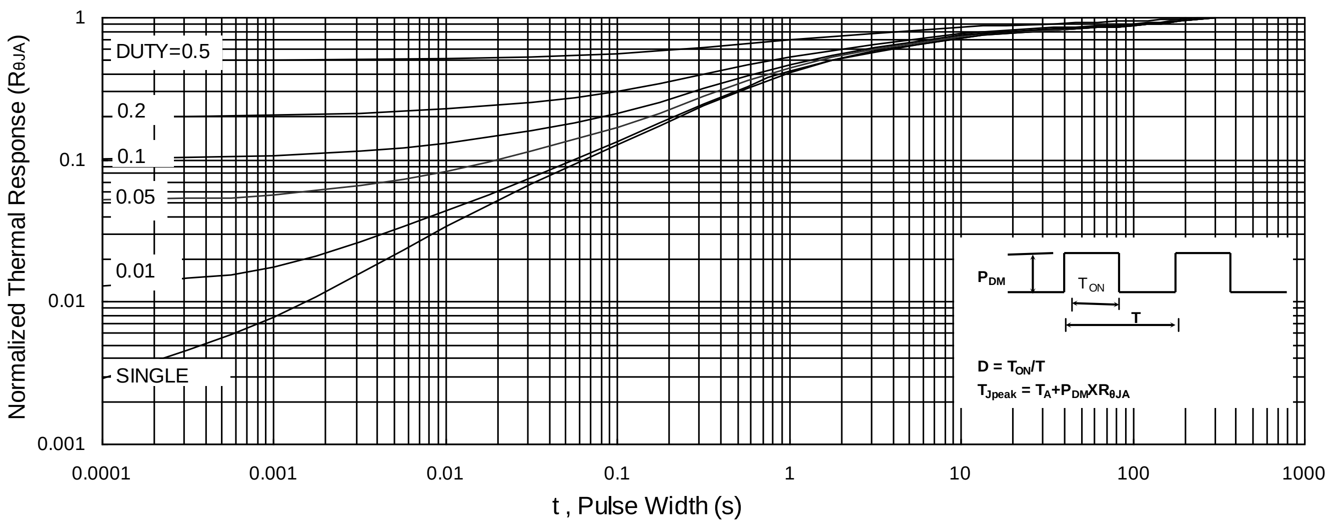


Fig.9 Normalized Maximum Transient Thermal Impedance

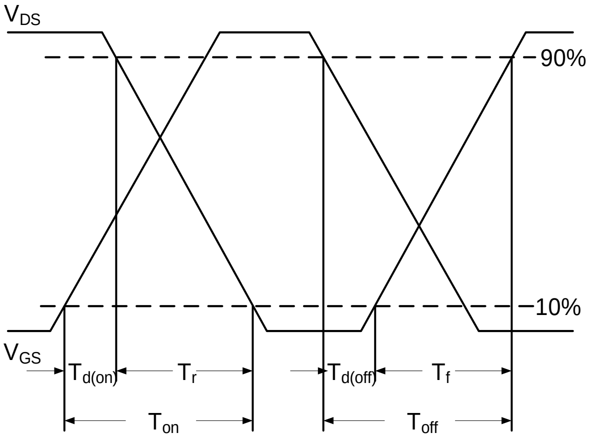


Fig.10 Switching Time Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$

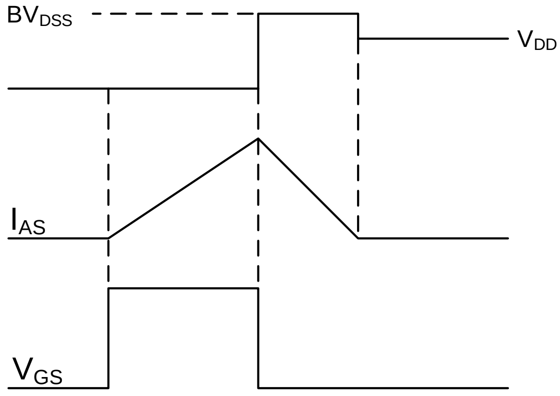


Fig.11 Unclamped Inductive Switching Waveform