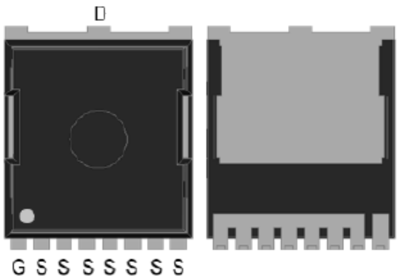
Single N Channel MOSFET

Features

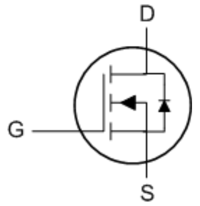
- Advanced Trench MOS Technology
- 100% EAS Guaranteed
- Fast Switching Speed
- Green Device Available

TOLL Pin Configuration



Applications

- Power Tools.
- Motor Control.
- UPS.
- Synchronous Rectification in SMPS.



Product Summary

BVDSS	RDSON	ID
100V	1.9mΩ	316A

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current[1,6]	316	A
I_D@T_C=100℃	Continuous Drain Current[1,6]	224	A
I_D@T_A=25℃	Continuous Drain Current[1]	34	A
I_D@T_A=70℃	Continuous Drain Current[1]	28	A
I_{DM}	Pulsed Drain Current[2]	1000	A
EAS	Single Pulse Avalanche Energy[3]	800	mJ
I_{AS}	Avalanche Current	40	A
P_D@T_C=25℃	Total Power Dissipation[4]	333	W
P_D@T_C=100℃	Total Power Dissipation[4]	166	W
P_D@T_A=25℃	Total Power Dissipation[4]	3.8	W
P_D@T_A=70℃	Total Power Dissipation[4]	2.6	W
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient[1]	---	40	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.45	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=90A	---	1.6	1.9	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=80V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=100℃	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A	---	75	---	S
Qg	Total Gate Charge	V_{DS}=50V , V_{GS}=10V , I_D=90A	---	212	---	nC
Qgs	Gate-Source Charge		---	59	---	
Qgd	Gate-Drain Charge		---	53	---	
Td(on)	Turn-On Delay Time	V_{DD}=50V , V_{GS}=10V , R_G=3Ω, I_D=20A	---	47	---	ns
Tr	Rise Time		---	28	---	
Td(off)	Turn-Off Delay Time		---	79	---	
Tf	Fall Time		---	18	---	
Ciss	Input Capacitance	V_{DS}=50V , V_{GS}=0V , f=1MHz	---	13362	---	pF
Coss	Output Capacitance		---	1917	---	
Crss	Reverse Transfer Capacitance		---	387	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5,6]	V_G=V_D=0V , Force Current	---	---	100	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.1	V
t_{rr}	Reverse Recovery Time	I_F=20A , di/dt=100A/μs , T_J=25℃	---	70	---	nS
Q_{rr}	Reverse Recovery Charge		---	580	---	nC

Note :

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}=50V, V_{GS}=10V, L=1.0mH, I_{AS}=40A
4. The power dissipation is limited by 175℃ 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.
6. Package limitation current is 300A.

Typical Characteristics

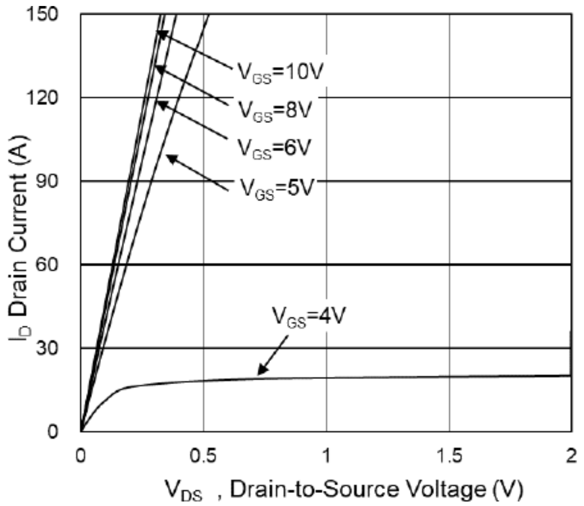


Fig.1 Typical Output Characteristics

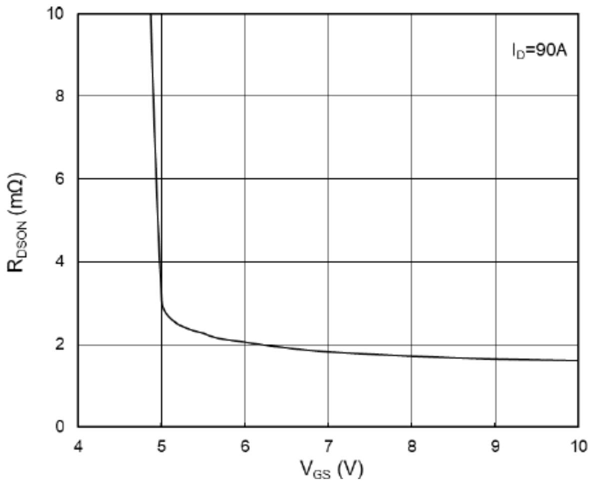


Fig.2 On-Resistance vs G-S Voltage

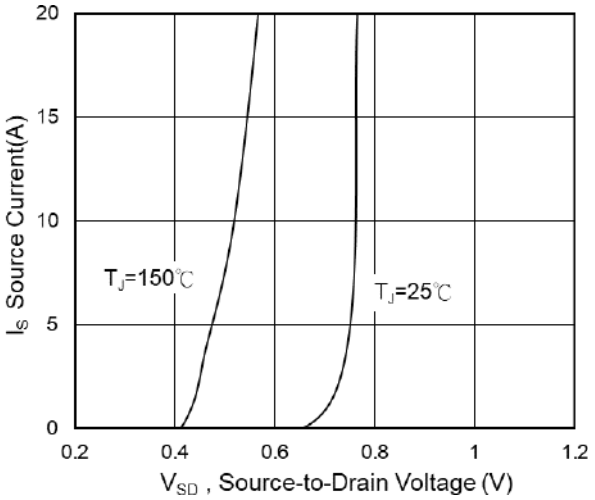


Fig.3 Source-Drain Forward Characteristics

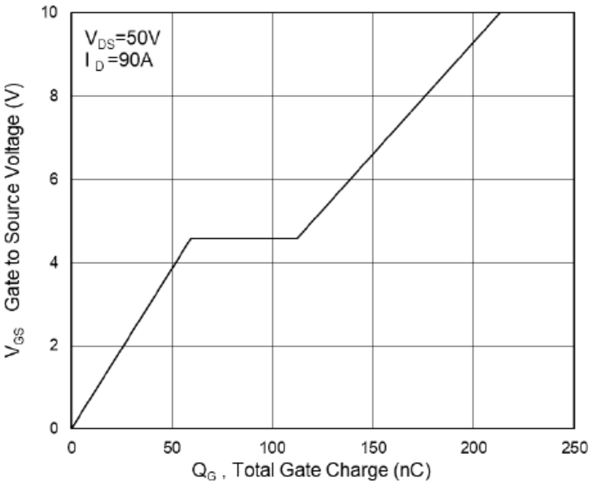
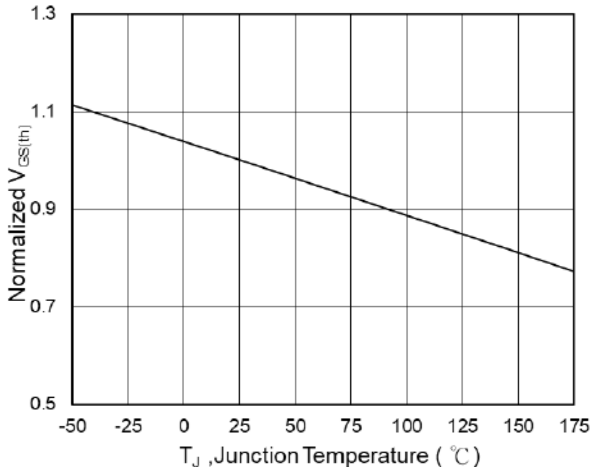


Fig.4 Gate-Charge Characteristics



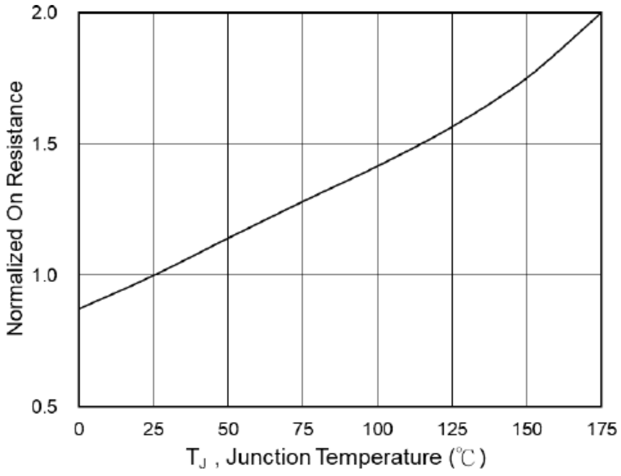


Fig.5 Normalized $V_{GS(th)}$ vs T_J

Fig.6 Normalized R_{DSON} vs T_J

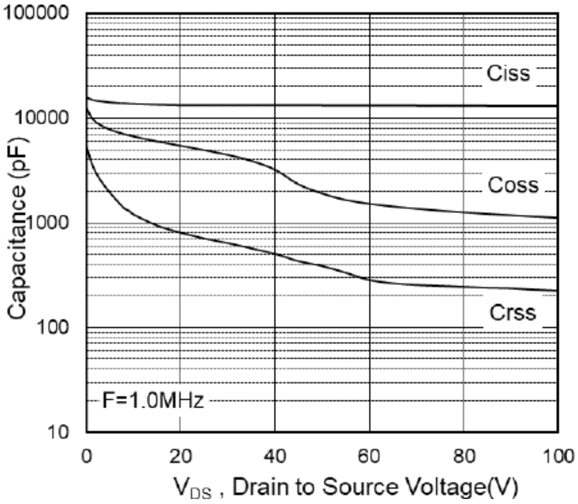


Fig.7 Capacitance

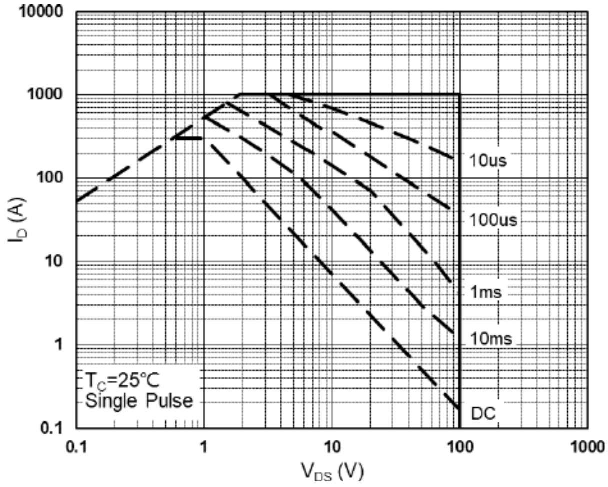


Fig.8 Safe Operating Area

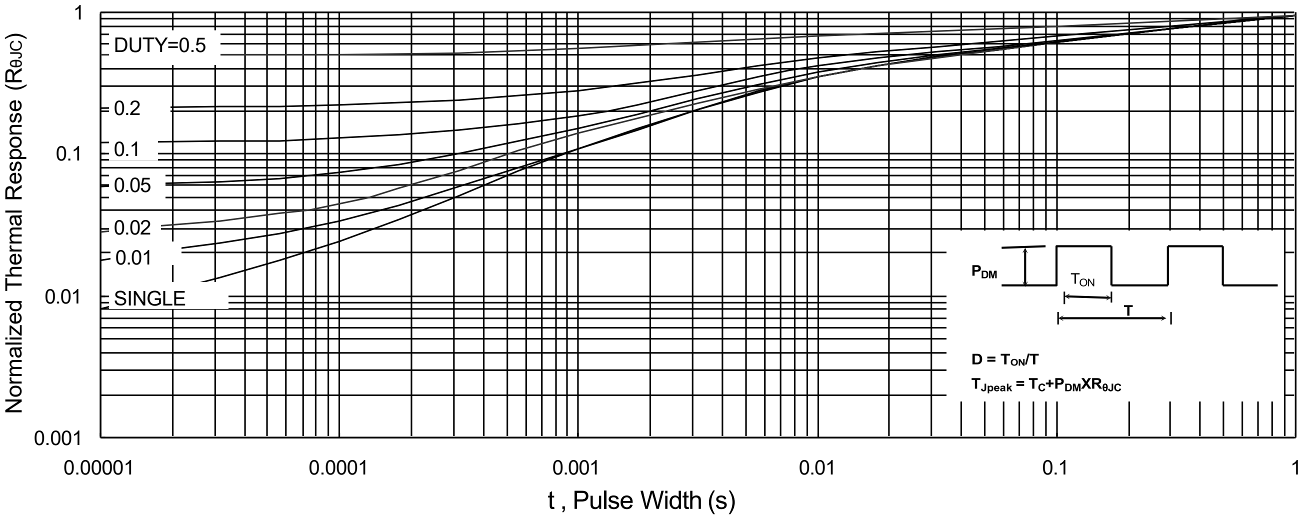


Fig.9 Normalized Maximum Transient Thermal Impedance

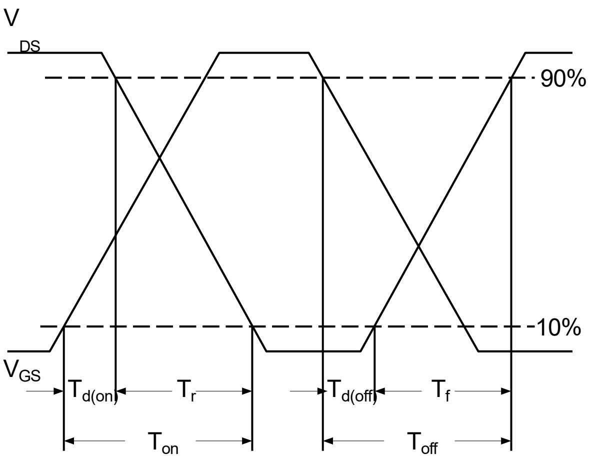


Fig.10 Switching Time Waveform

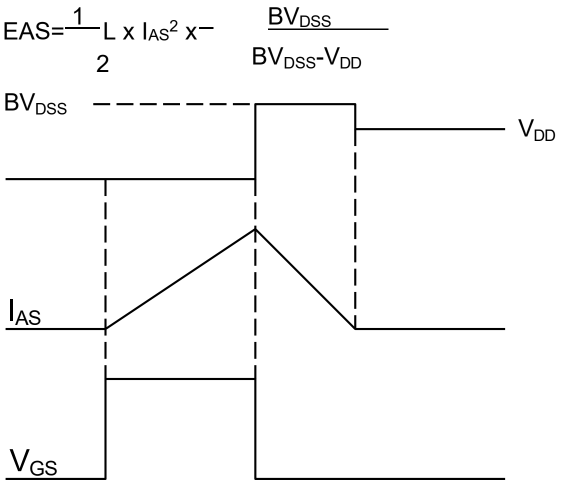


Fig.11 Unclamped Inductive Switching Waveform