N-Ch 100 V Fast Switching MOSFETs

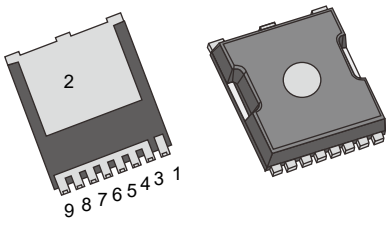
Features :

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

Applications :

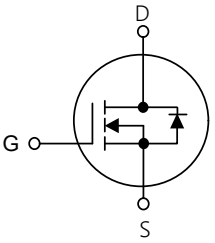
- Power Tools.
- Motor Control.
- UPS
- Synchronous Rectification in SMPS

TOLL Pin Configuration



Pin Definition:

1. Gate
2. Drain
3/4/5/6/7/8/9. Source



Product Summary

BVDSS	RDSON	ID
100V	2.2mΩ	308A

Table1 Absolute Maximum Ratings (T_C=25°C, unless otherwise specified)

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]	308	A
I_D@T_C=100℃	Continuous Drain Current[1,6]	218	A
I_{DM}	Pulsed Drain Current[2]	550	A
EAS	Single Pulse Avalanche Energy[3]	1012.5	mJ
I_{AS}	Avalanche Current	45	A
P_D@T_C=25℃	Total Power Dissipation[4]	429	W
T_{STG}	Storage Temperature Range	-55 to 175	℃
T_J	Operating Junction Temperature Range	-55 to 175	℃

Table 2.Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient[1]	---	60	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.35	℃/W

Table 3. Electrical Characteristics (T_J=25°C, unless otherwise specified)

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=30A	---	1.8	2.2	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=20A	---	200	---	nC
Qgs	Gate-Source Charge		---	53.3	---	
Qgd	Gate-Drain Charge		---	49	---	
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						
I_S	Continuous Source Current[1,5,6]	V_G=V_D=0V , Force Current	---	---	80	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}=45A
4.The power dissipation is limited by 175℃ junction temperature
5. The data is theoretically the same as I_D and I_S , in real applications , should be limited by total power dissipation.
6. Bonding wire limitation current is 120A.

Typical Characteristics

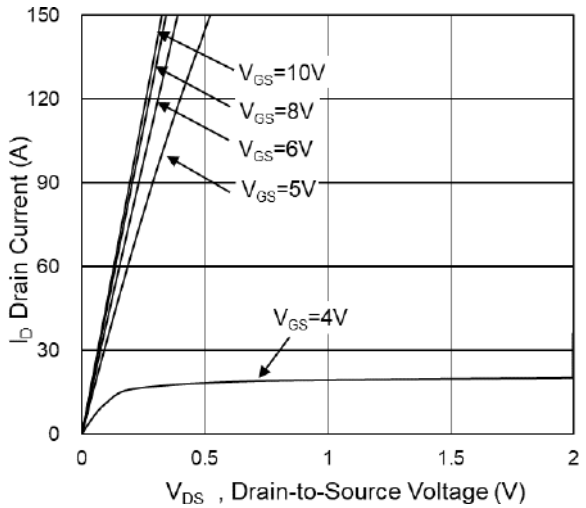


Fig.1 Typical Output Characteristics

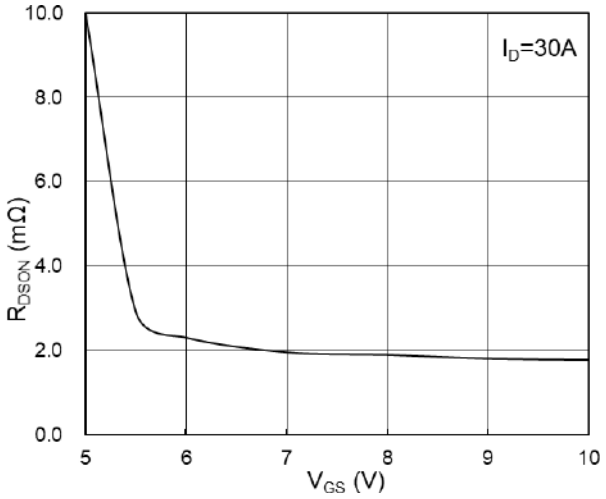


Fig.2 On-Resistance vs G-S Voltage

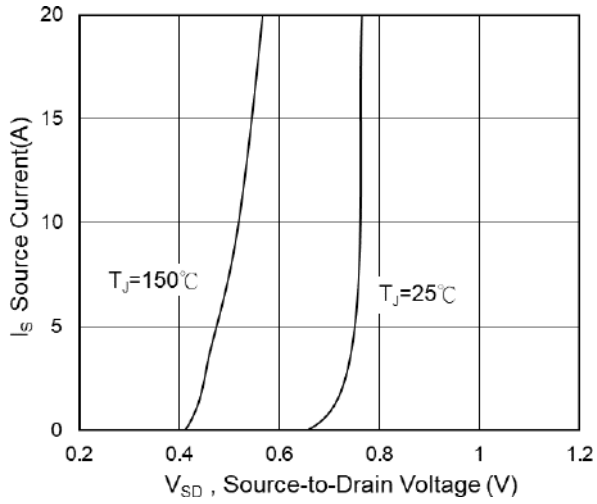


Fig.3 Source-Drain Forward Characteristics

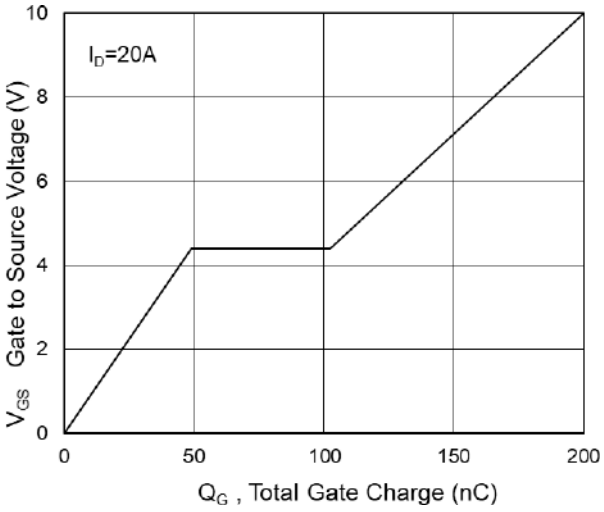


Fig.4 Gate-Charge Characteristics

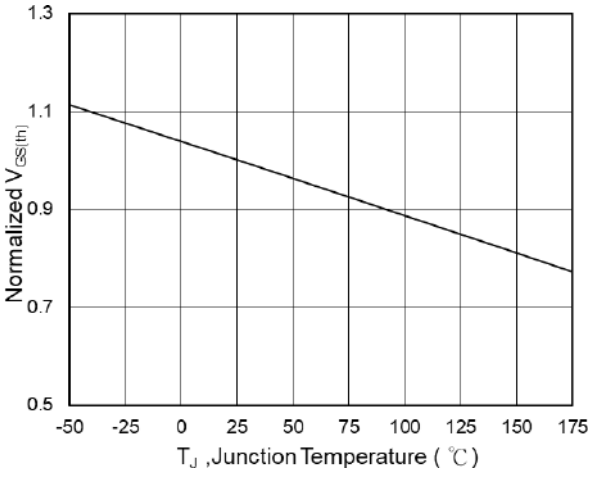


Fig.5 Normalized $V_{GS(th)}$ vs T_J

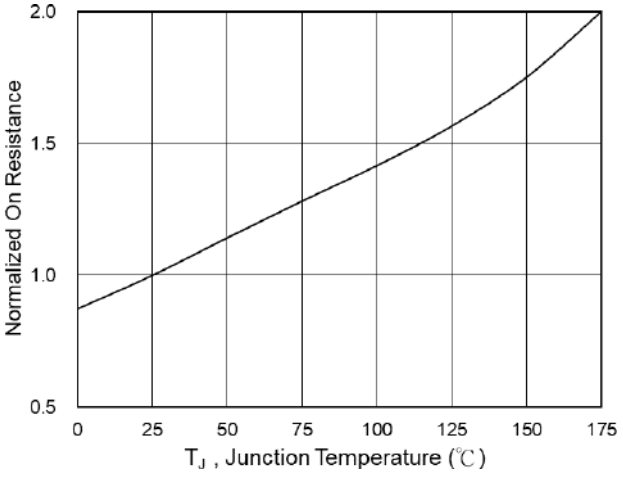


Fig.6 Normalized R_{DSON} vs T_J

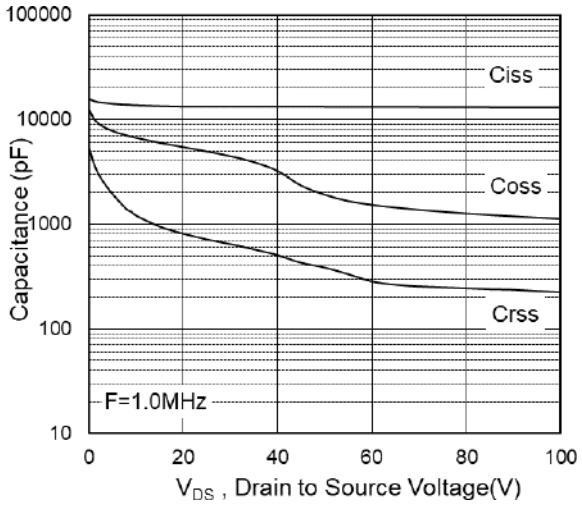


Fig.7 Capacitance

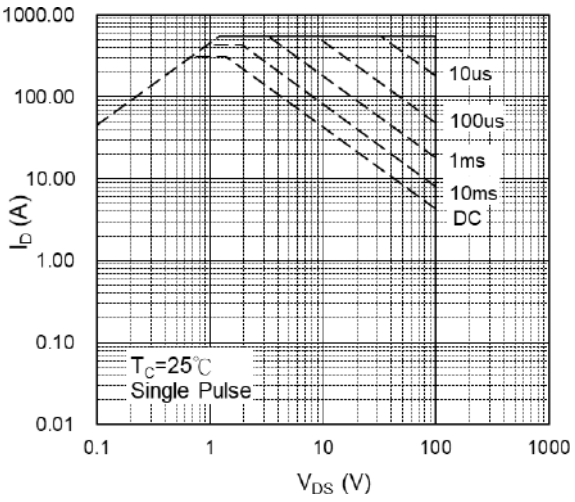


Fig.8 Safe Operating Area

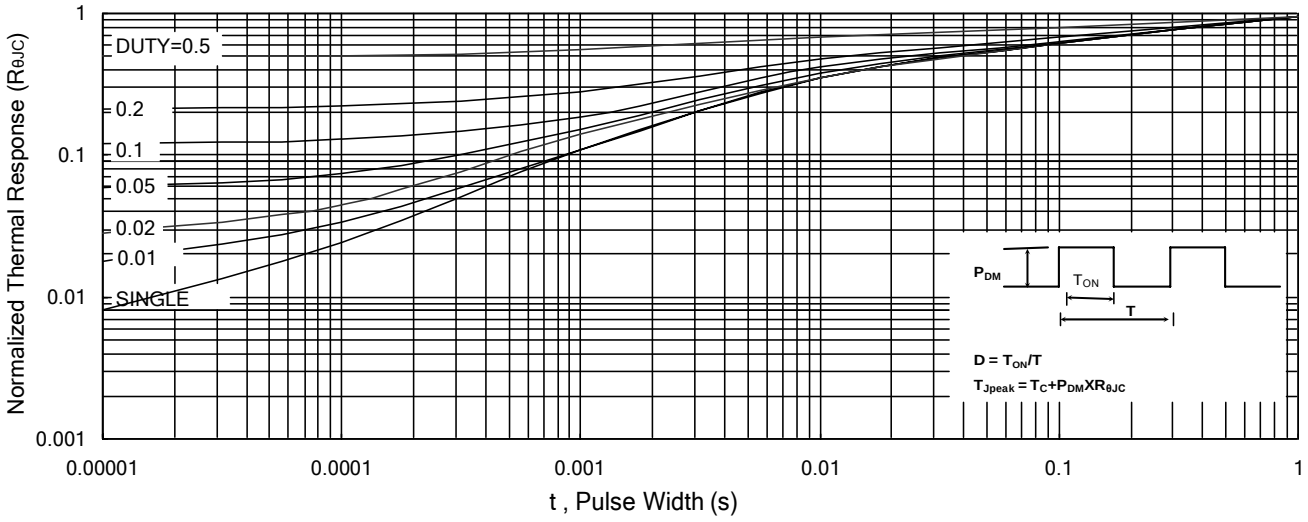


Fig.9 Normalized Maximum Transient Thermal Impedance

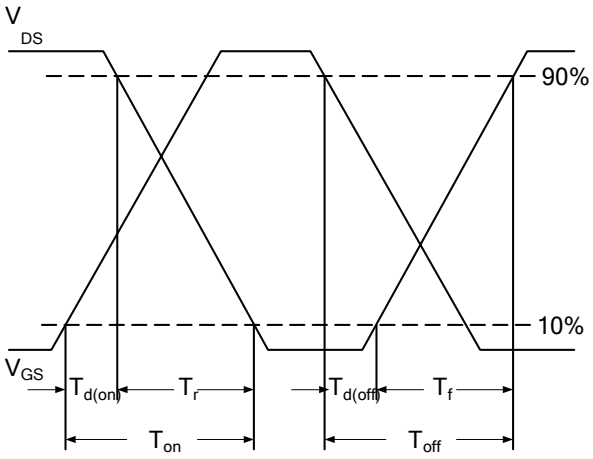


Fig.10 Switching Time Waveform

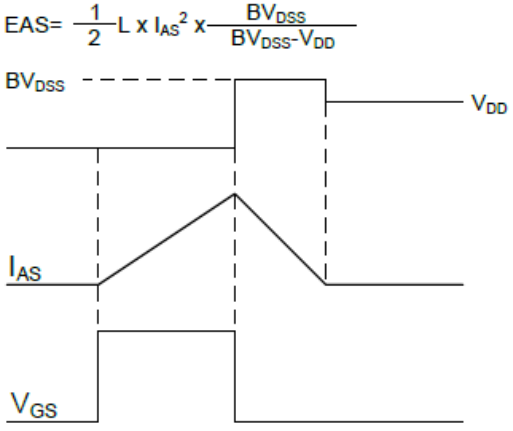
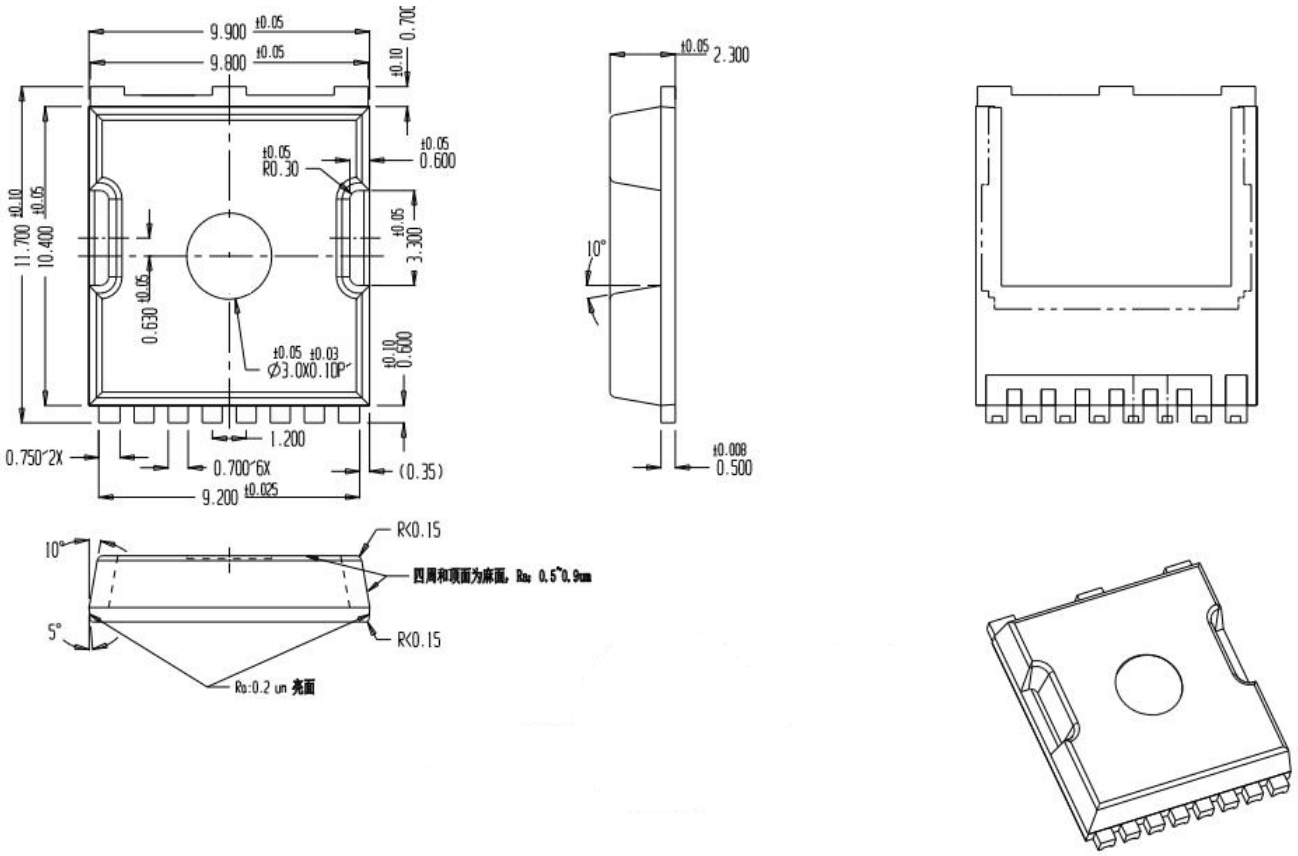


Fig.11 Unclamped Inductive Switching Waveform

Dimensions

TOLL PACKAGE OUTLINE DIMENSIONS



Suggested Pad Layout