N-Channel Super Trench Power MOSFET

Features

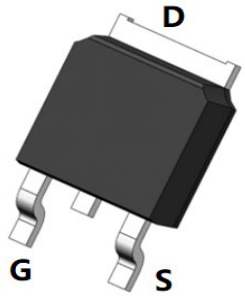
- V_{DS}= 100V, I_D= 78 A
  $R_{DS(ON)}$ < 9.0mΩ @ V_{GS} = 10V
  $R_{DS(ON)}$ < 12 mΩ @ V_{GS} =4.5V

General Features

- Advanced Trench Technology
- Provide Excellent RDS(ON) and Low Gate Charge
- Lead Free and Green Available

100% UIS TESTED!
100% ΔVds TESTED!

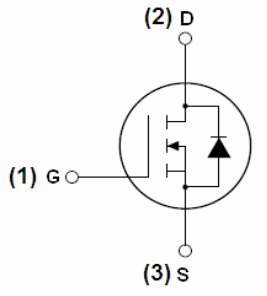
RoHS



TO-252-2L Top View



Pin Assignment



Schematic Diagram

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	78	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	60	A
Pulsed Drain Current	I_{DM}	320	A
Maximum Power Dissipation	P_D	125	W
Derating factor		0.83	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	320	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta JC}$	1.2	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	100		-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1.2		3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=39A	-		9.0	mΩ
		V_{GS}=4.5V, I_D=39A	-		12	mΩ
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=39A	40	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=50V,V_{GS}=0V, F=1.0MHz	-	4200	5480	PF
Output Capacitance	C_{oss}		-	354	425	PF
Reverse Transfer Capacitance	C_{rss}		-	23	30	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=50V,I_D=39A V_{GS}=10V,R_G=4.7Ω	-	15	-	nS
Turn-on Rise Time	t_r		-	10	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	41	-	nS
Turn-Off Fall Time	t_f		-	6	-	nS
Total Gate Charge	Q_g	V_{DS}=50V,I_D=39A, V_{GS}=10V	-	65		nC
Gate-Source Charge	Q_{gs}		-	15.3		nC
Gate-Drain Charge	Q_{gd}		-	9		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=78A	-		1.2	V
Diode Forward Current (Note 2)	I_S		-	-	78	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F = I_S di/dt = 100A/μs (Note3)	-	101		nS
Reverse Recovery Charge	Qrr		-	193		nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : Tj=25℃,V_{DD}=50V,V_G=10V,L=0.5mH,Rg=25Ω

Typical Electrical and Thermal Characteristics

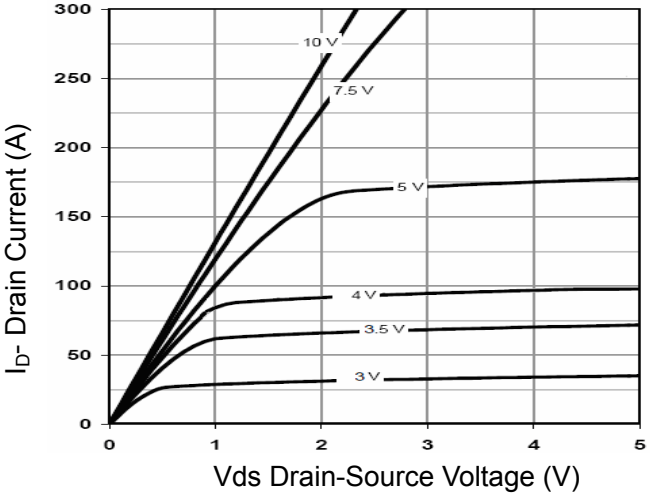


Figure 1 Output Characteristics

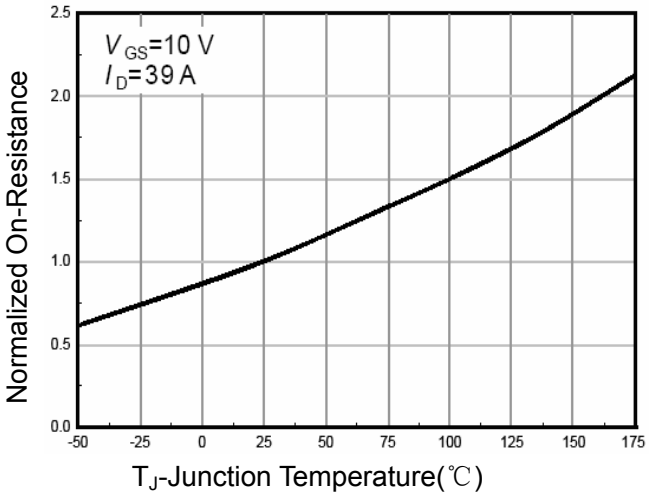


Figure 4 Rdson-JunctionTemperature

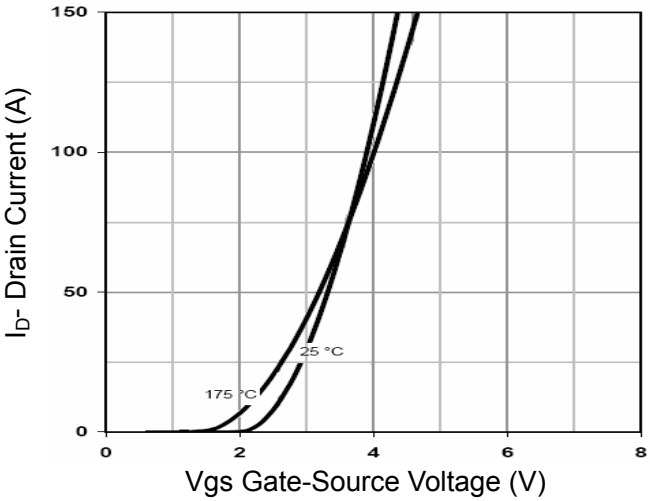


Figure 2 Transfer Characteristics

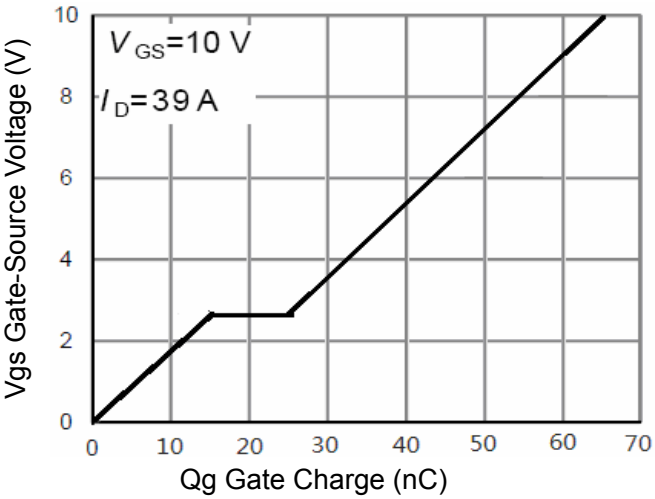


Figure 5 Gate Charge

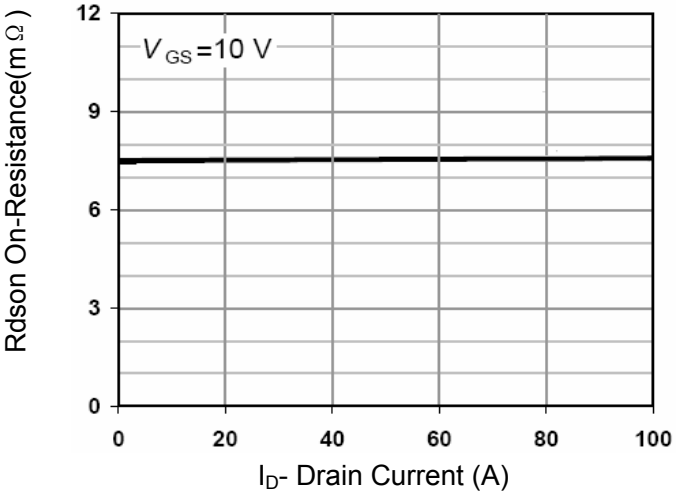


Figure 3 Rdson- Drain Current

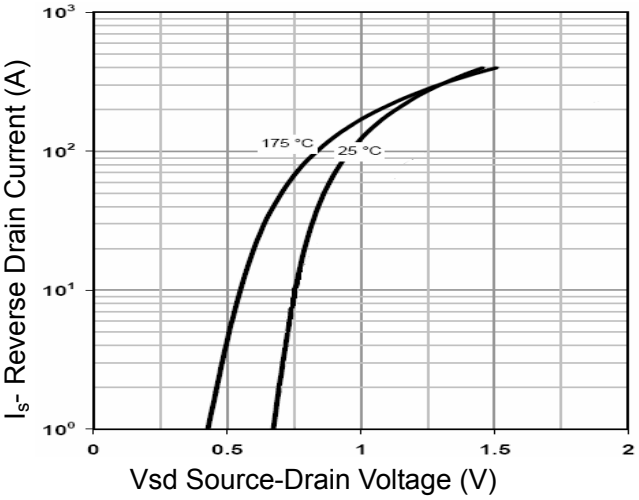


Figure 6 Source- Drain Diode Forward

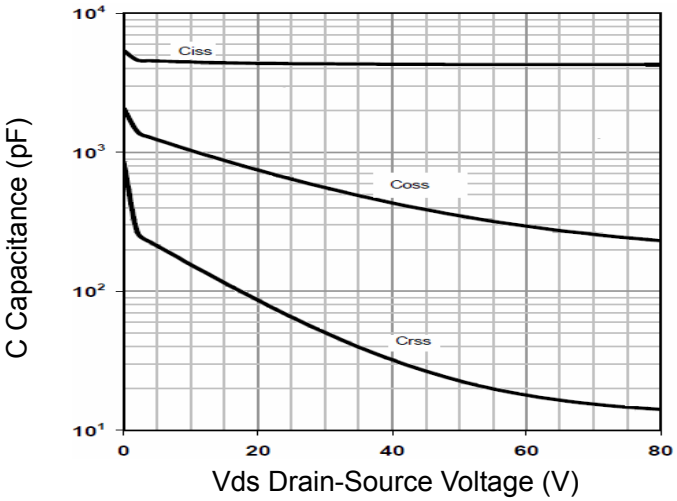


Figure 7 Capacitance vs Vds

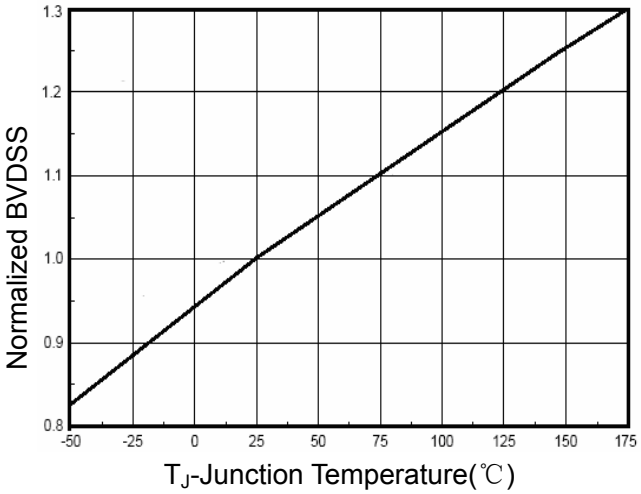


Figure 9 BV_{DSS} vs Junction Temperature

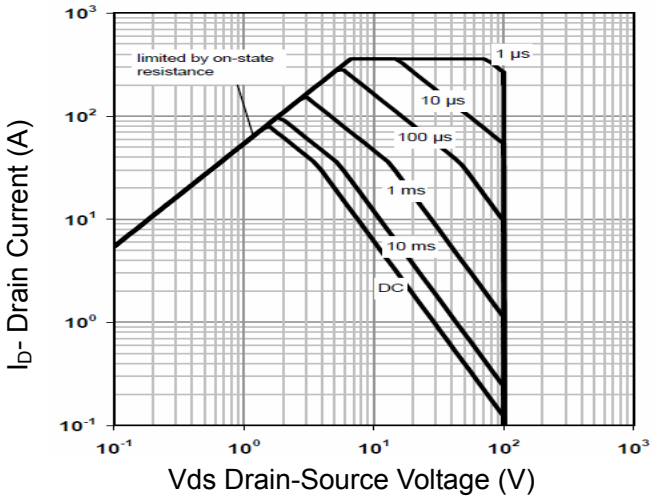


Figure 8 Safe Operation Area

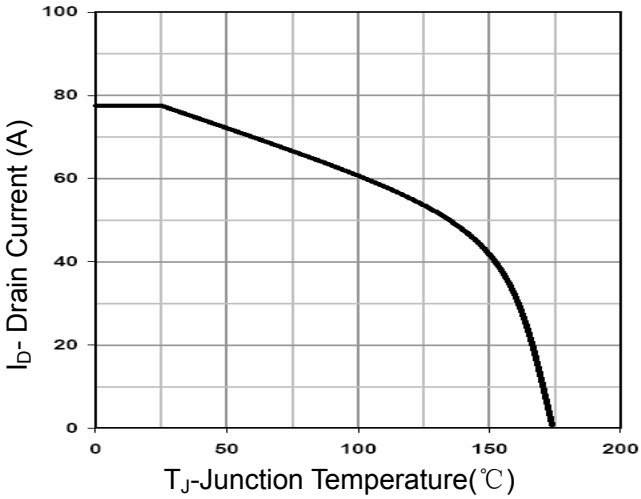


Figure 10 Current De-rating

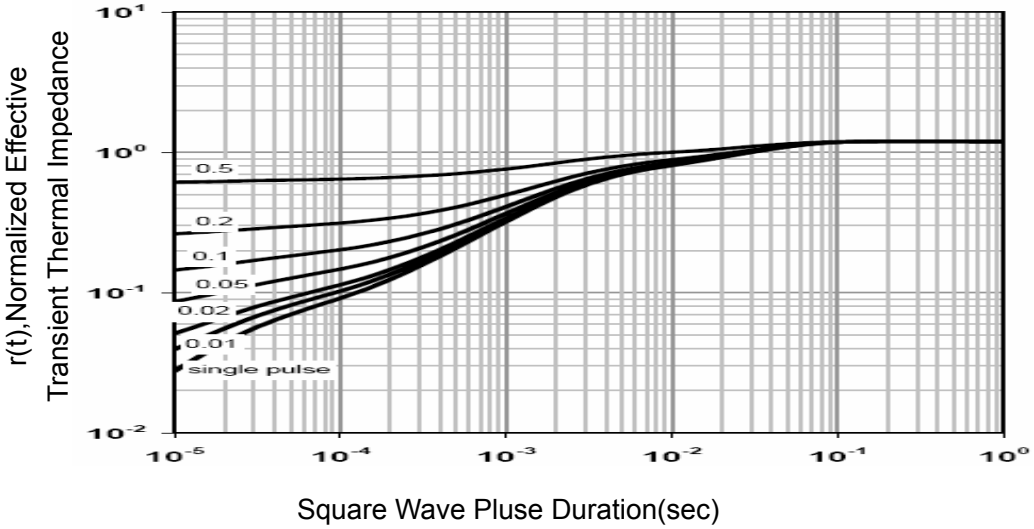


Figure 11 Normalized Maximum Transient Thermal Impedance