

N-Channel Super Trench Power MOSFET

Features

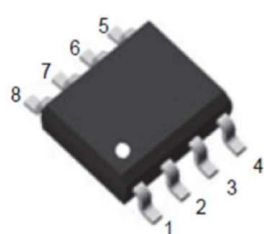
- $V_{DS} = 150V$, $I_D = 5.1A$
 $R_{DS(ON)} < 55\text{ m}\Omega$ @ $V_{GS} = 10V$
 $R_{DS(ON)} < 65\text{ m}\Omega$ @ $V_{GS} = 4.5V$

General Features

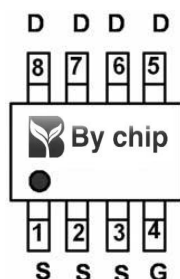
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free and Green Available

100% UIS TESTED!

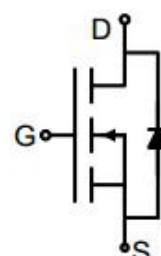
100% ΔV_{DS} TESTED!



SOP-8



pin assignment



Schematic diagram

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V _{DS}	150	V
Gate-Source Voltage		V _{GS}	±20	V
Drain Current-Continuous		I _D	5.1	A
Drain Current-Continuous(T _C =100 °C)		I _D (100 °C)	3.6	A
Pulsed Drain Current ^(Note 1)		I _{DM}	20	A
Single pulse avalanche energy ^(Note 5)		E _{AS}	60	mJ
Maximum Power Dissipation	T _C = 25 °C	P _D	5	W
	T _A = 25 °C		3	W
Operating Junction and Storage Temperature Range		T _J , T _{STG}	-55 To 150	°C

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient ^(Note 2)	$R_{\theta JA}$	41.7	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case ^(Note 2)	$R_{\theta JC}$	25	

Electrical Characteristics (T_A=25°C unless otherwise noted)

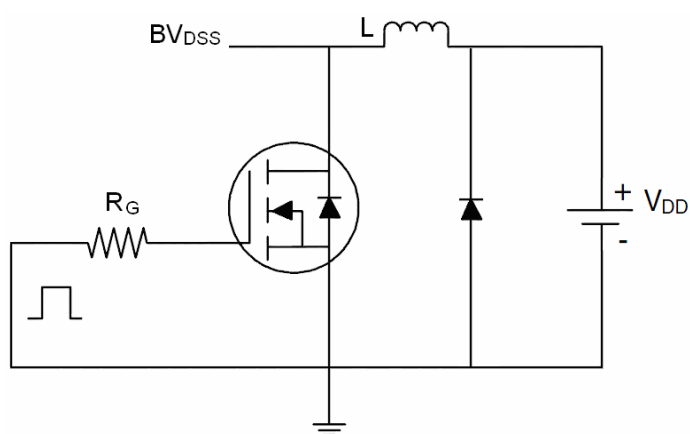
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	150	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =150V,V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =250μA	2.0		4.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =5.1A	-		55	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V,I _D =5.1A	-	12.5	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C _{iss}	V _{DS} =75V,V _{GS} =0V, F=1.0MHz	-	618	850	PF
Output Capacitance	C _{oss}		-	81	105	PF
Reverse Transfer Capacitance	C _{rss}		-	6.5	9	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =75V, I _D =5.1A V _{GS} =10V,R _G =3Ω	-	12.8	14	nS
Turn-on Rise Time	t _r		-	1.4	8.5	nS
Turn-Off Delay Time	t _{d(off)}		-	12.5	21	nS
Turn-Off Fall Time	t _f		-	2.5	8.0	nS
Total Gate Charge	Q _g	V _{DS} =75V,I _D =5.1A, V _{GS} =10V	-	12.8	18.0	nC
Gate-Source Charge	Q _{gs}		-	5		nC
Gate-Drain Charge	Q _{gd}		-	3.6		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V,I _S =5.1A	-	-	1.2	V
Diode Forward Current (Note 2)	I _S		-	-	5.1	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = I _S di/dt = 100A/μs (Note3)	-	58	95	nS
Reverse Recovery Charge	Q _{rr}		-	69	110	nC

Notes:

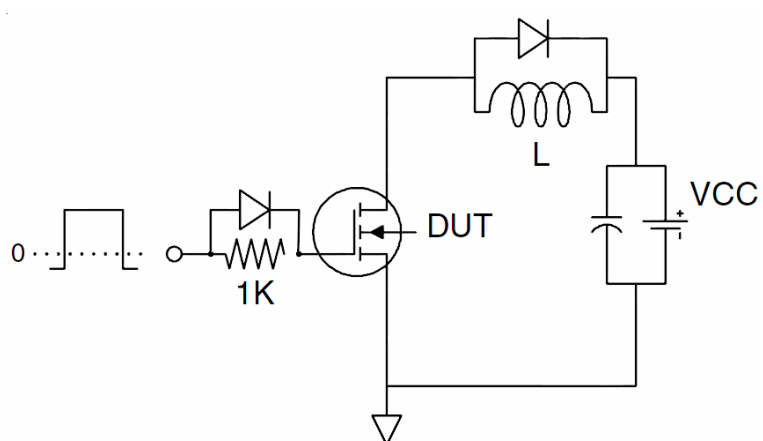
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. The value of R_{θJA} is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition : T_J=25°C, V_{DD}=50V, V_G=10V, L=0.5mH, R_G=25Ω

Test Circuit

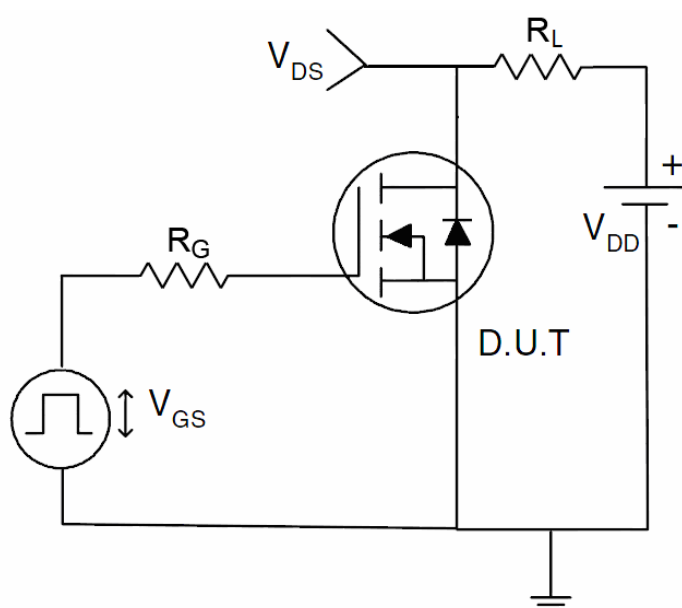
1) E_{AS} test Circuit



2) Gate charge test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves)

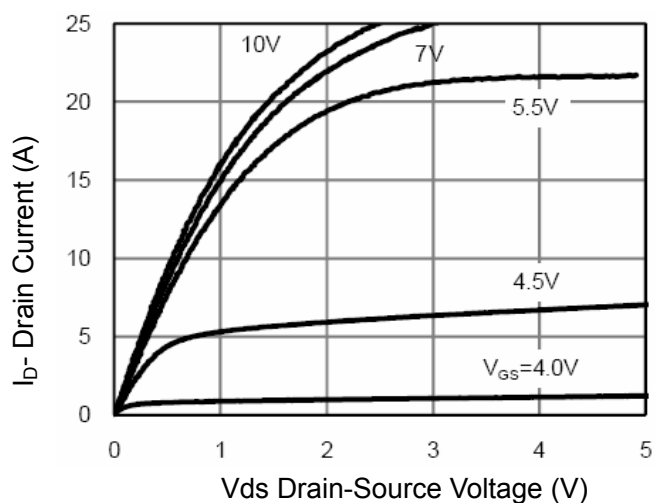


Figure 1 Output Characteristics

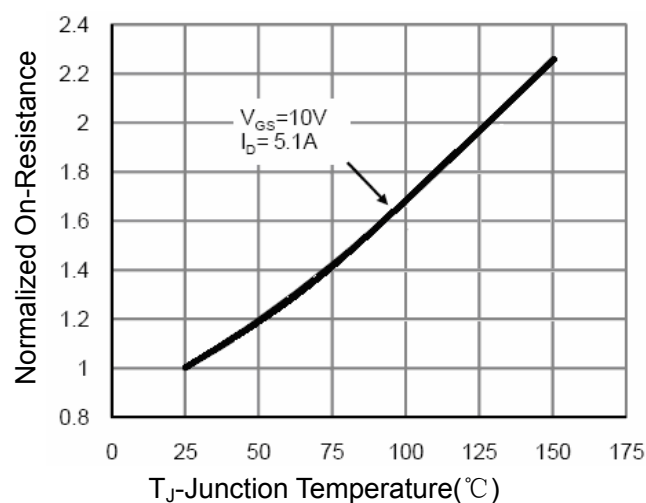


Figure 4 $R_{DS(on)}$ -Junction Temperature

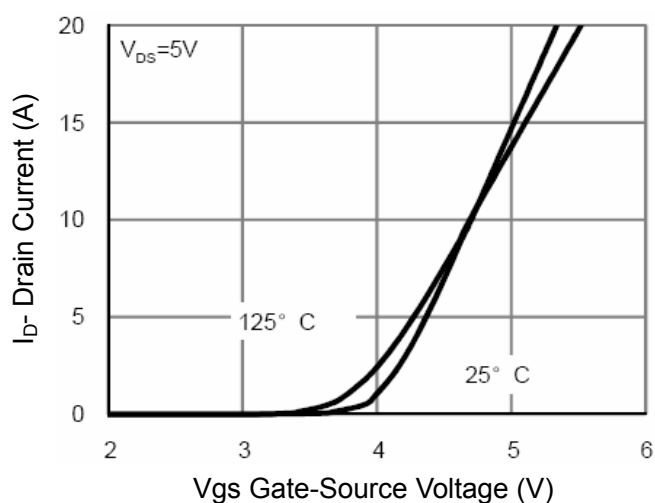


Figure 2 Transfer Characteristics

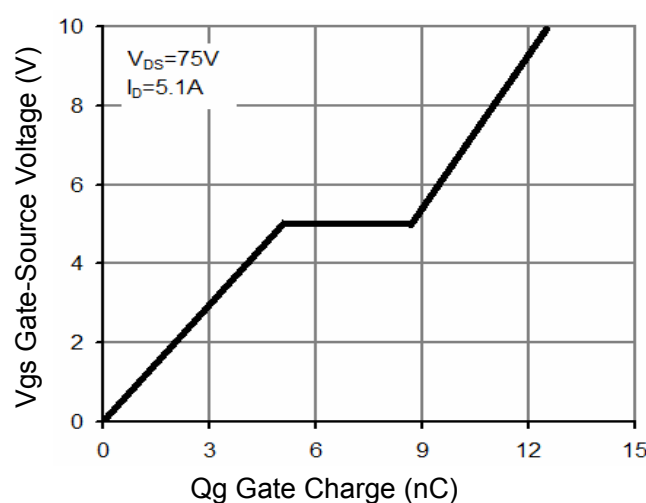


Figure 5 Gate Charge

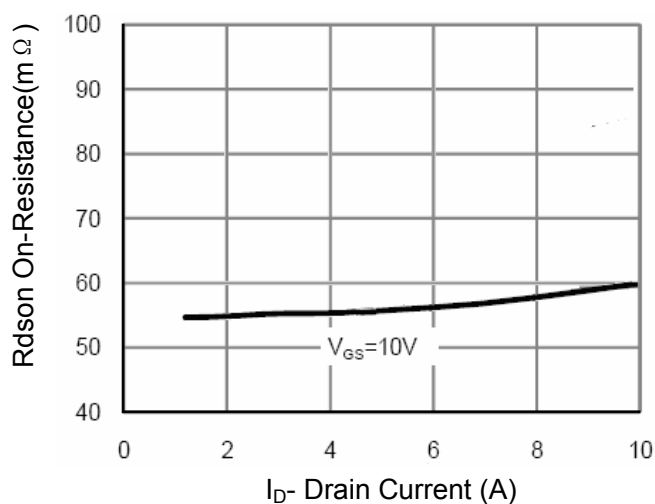


Figure 3 $R_{DS(on)}$ - Drain Current

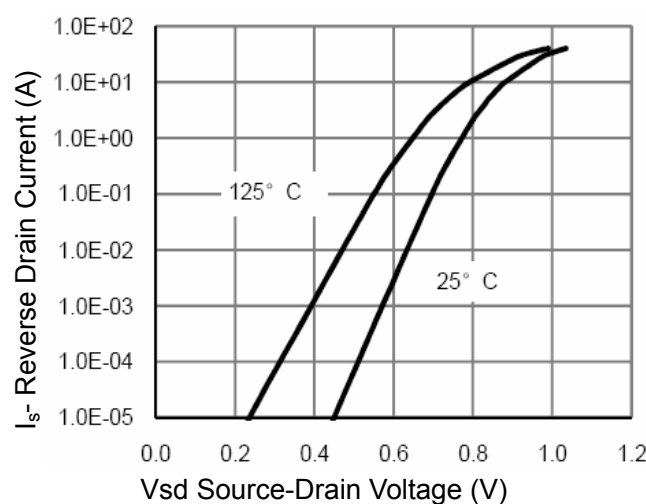


Figure 6 Source- Drain Diode Forward

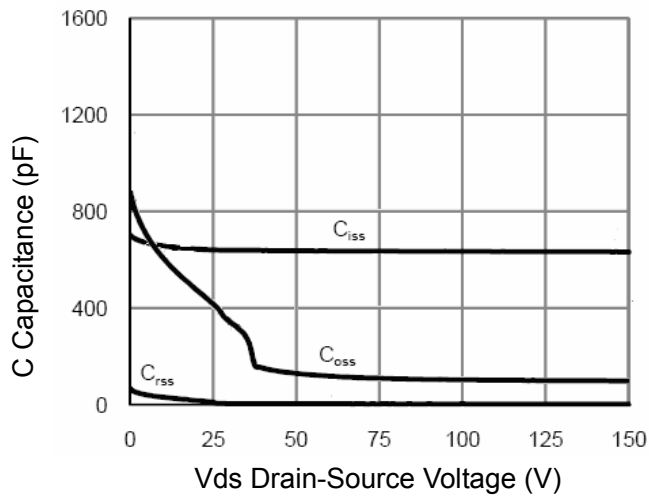


Figure 7 Capacitance vs Vds

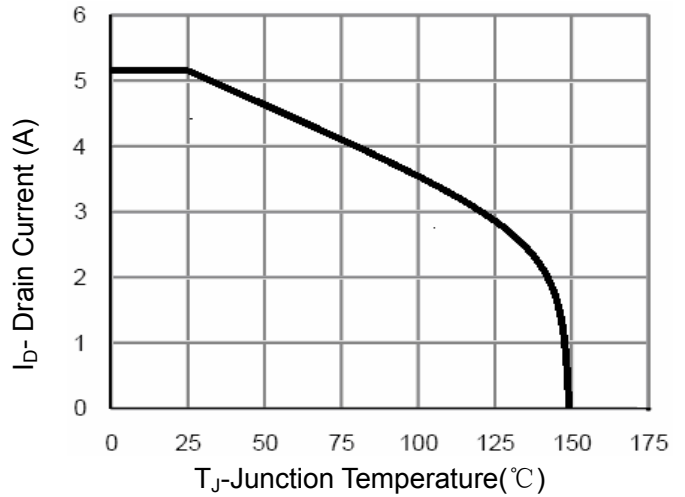


Figure 9 Current De-rating

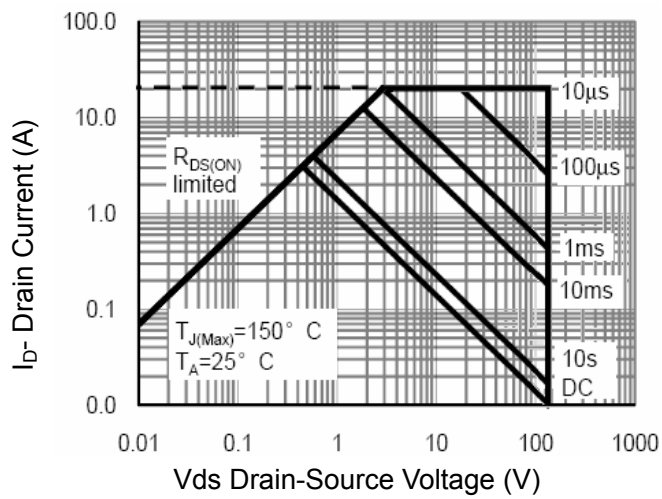


Figure 8 Safe Operation Area

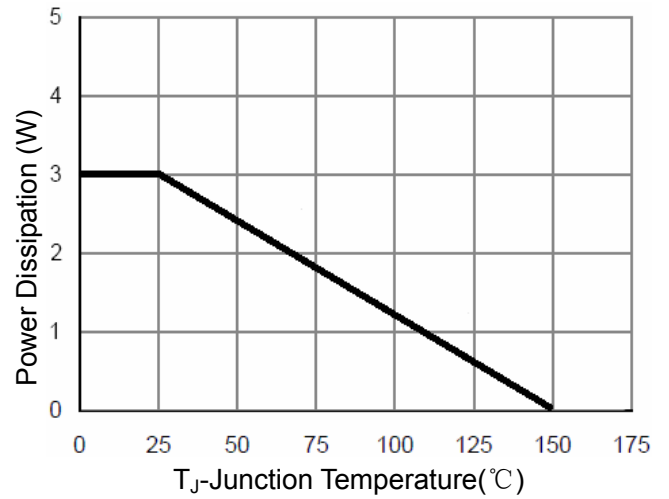


Figure 10 Power De-rating

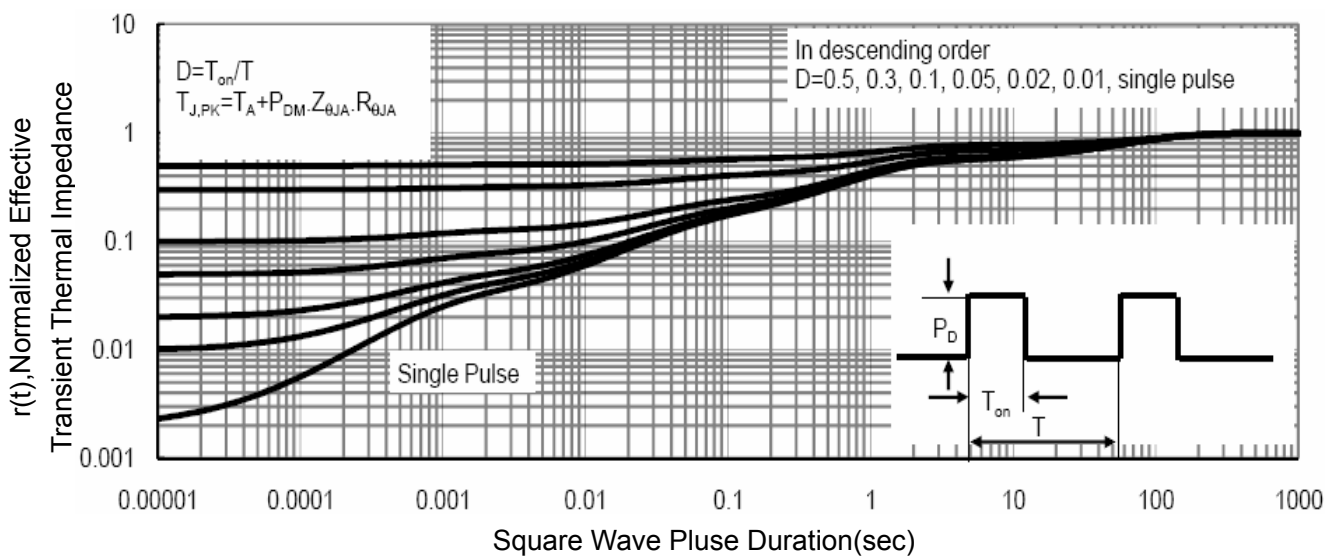


Figure 11 Normalized Maximum Transient Thermal Impedance