N-Channel Enhancement Mode Field Effect Transistor

Product Summary

V_{DS}	80V
I_D	120A
$R_{DS(ON)}$(at V_{GS}=10V)	4.8mohm
100% UIS Tested	
100% V_{DS} Tested	

General Description

Split gate trench MOSFET technology
Excellent package for heat dissipation
High density cell design for low $R_{DS(ON)}$

Applications

Battery protection
Load switch
Uninterruptible power supply

Absolute Maximum Ratings (T_A=25 unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	80	V
Gate-source Voltage		V_{GS}	20	V
Drain Current	T_C=25	I_D	120	A
	Tc=100		76	
Pulsed Drain Current [A]		I_{DM}	480	A
Avalanche energy [B]		E_{AS}	702	mJ
Total Power Dissipation [C]	Tc=25	P_D	190	W
	Tc=100		75.8	
Junction and Storage Temperature Range		T_J ,T_{STG}	-55 +150	

Thermal resistance

Parameter	Symbol	Limit	Units
Thermal Resistance Junction-to-Ambient [D] t 10S	R	16	

Electrical Characteristics (T_J=25 unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250	80	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V,V_{GS}=0V	-	-	1	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= 20V, V_{DS}=0V	-	-	100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250	2.0	3.0	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	3.9	4.8	m
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V	-	0.8	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	120	A
Gate resistance	R_G	f=1MHz, Open drain	-	2	-	
Transconductance	Gfs	VDS=10V,ID=50A		71.5		S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=40V,V_{GS}=0V,f=1MHZ	-	5666	-	pF
Output Capacitance	C_{oss}		-	860	-	
Reverse Transfer Capacitance	C_{rss}		-	7.5	-	
Switching Parameters						
Total Gate Charge	Q_g	VDS=40V , VGS=10V , ID=50A	-	73	-	nC
Gate-Source Charge	Q_{gs}		-	25	-	
Gate-Drain Charge	Q_{gd}		-	12	-	
Reverse Recovery Chrage	Q_{rr}	IF=50A , dI/dt=100A/us	-	50	-	
Reverse Recovery Time	t_{rr}		-	44	-	ns
Turn-on Delay Time	$t_{D(on)}$	VDS=40V , VGS ID=50A	-	27	-	
Turn-on Rise Time	t_r		-	32	-	
Turn-off Delay Time	$t_{D(off)}$		-	54	-	
Turn-off fall Time	t_f		-	17	-	

A. Repetitive rating; pulse width limited by max. junction temperature.
B. T_J=25 , V_{DD}=50V, V_{GS}=10V, L=2mH Ias=26.5A.
C. P_d is based on max. junction temperature, using junction-case thermal resistance.
D. The value of R is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25 C.

Typical Performance Characteristics

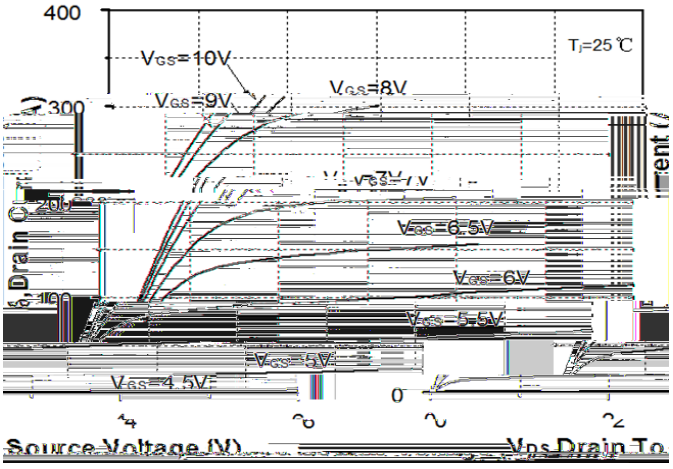


Figure1. Output Characteristics

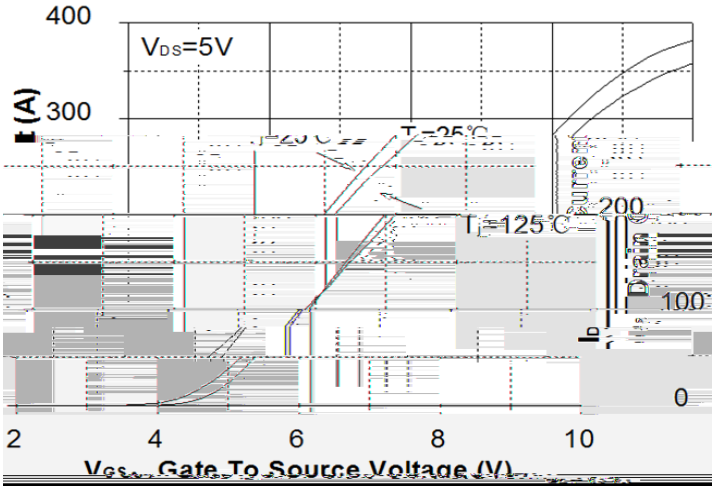


Figure2. Transfer Characteristics

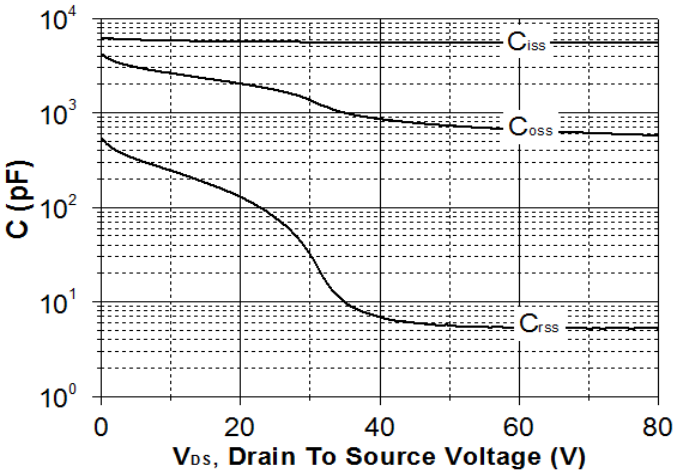


Figure3. Capacitance Characteristics

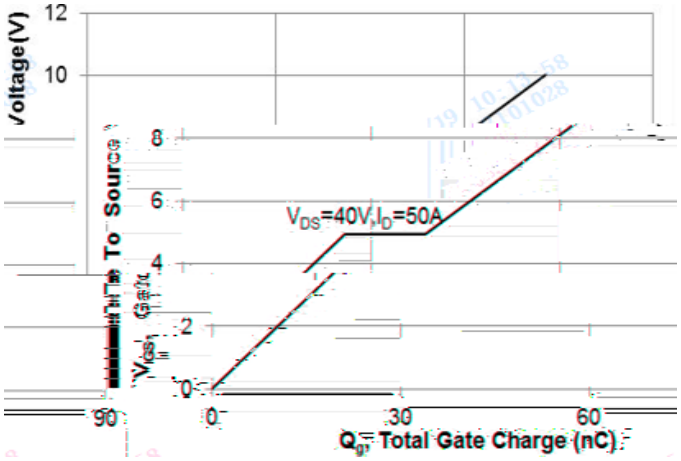


Figure4. Gate Charge

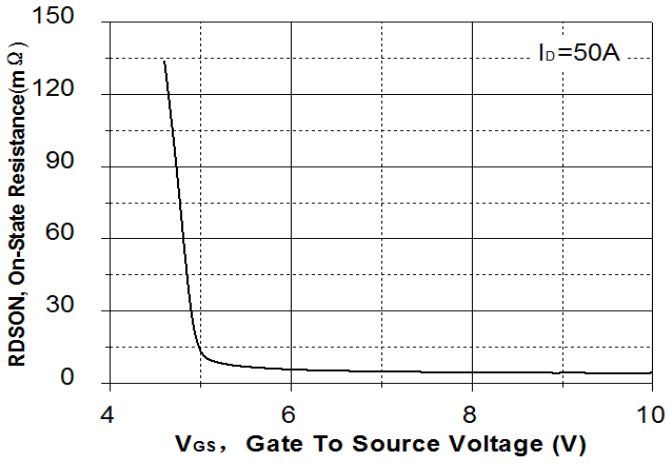


Figure5. On-Resistance vs. Gate to Source Voltage

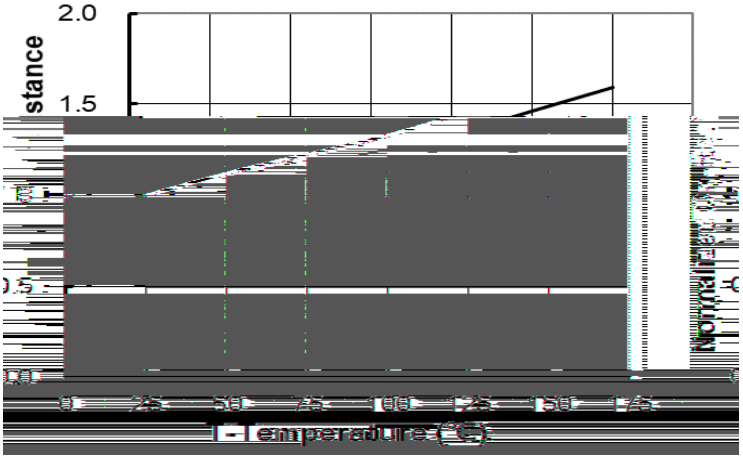
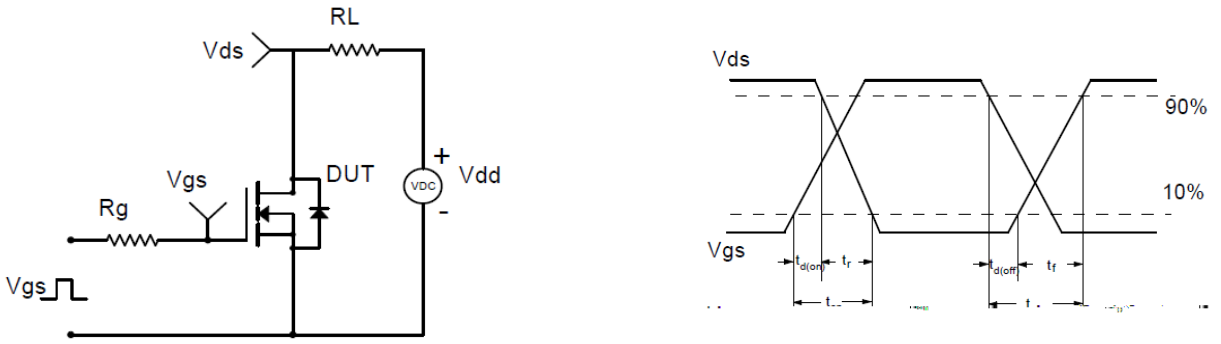
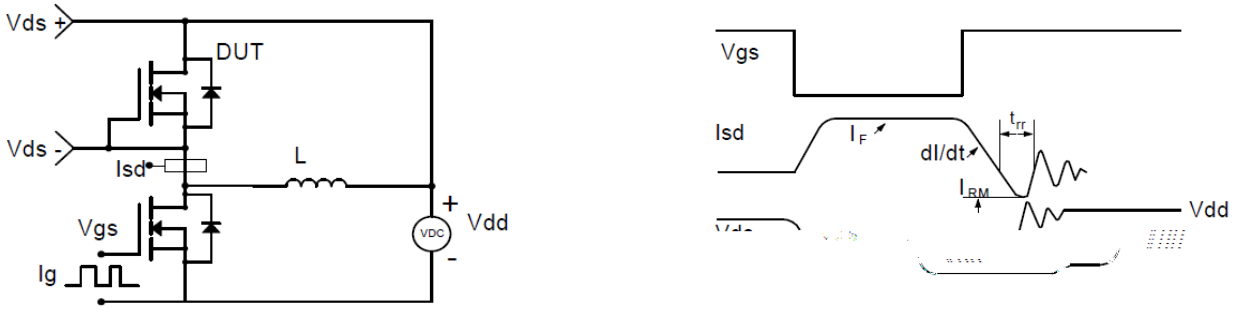


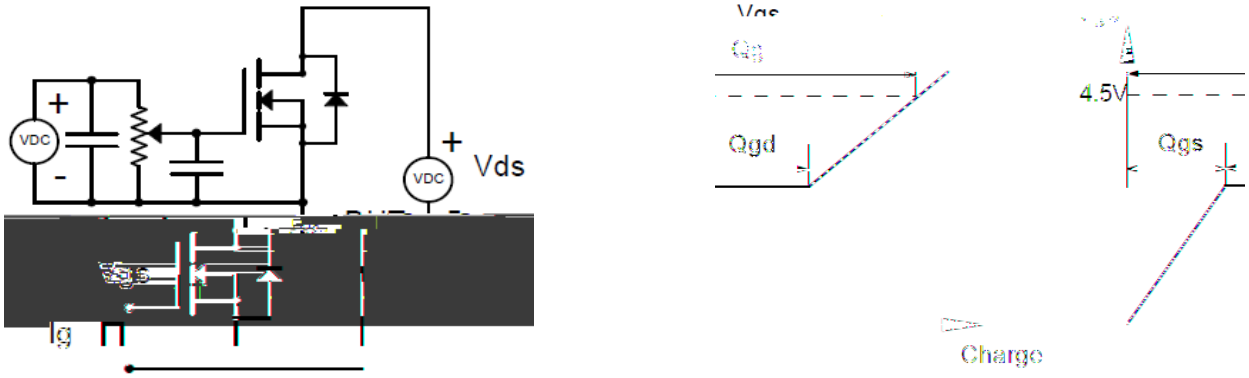
Figure6.Normalized On-Resistance



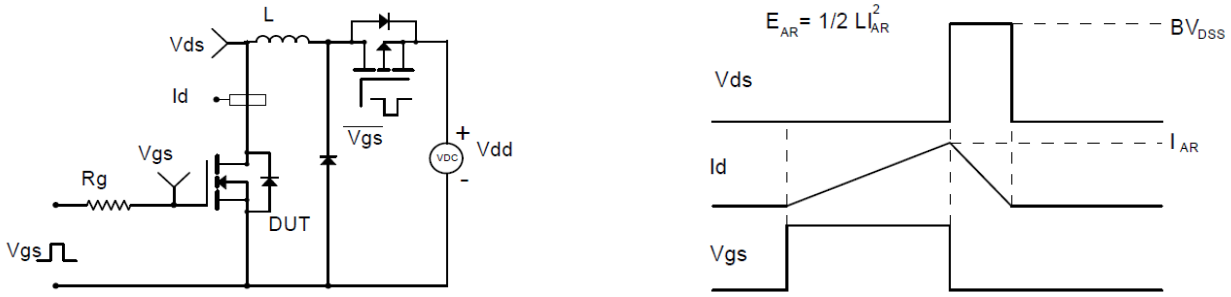
Resistive Switching Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

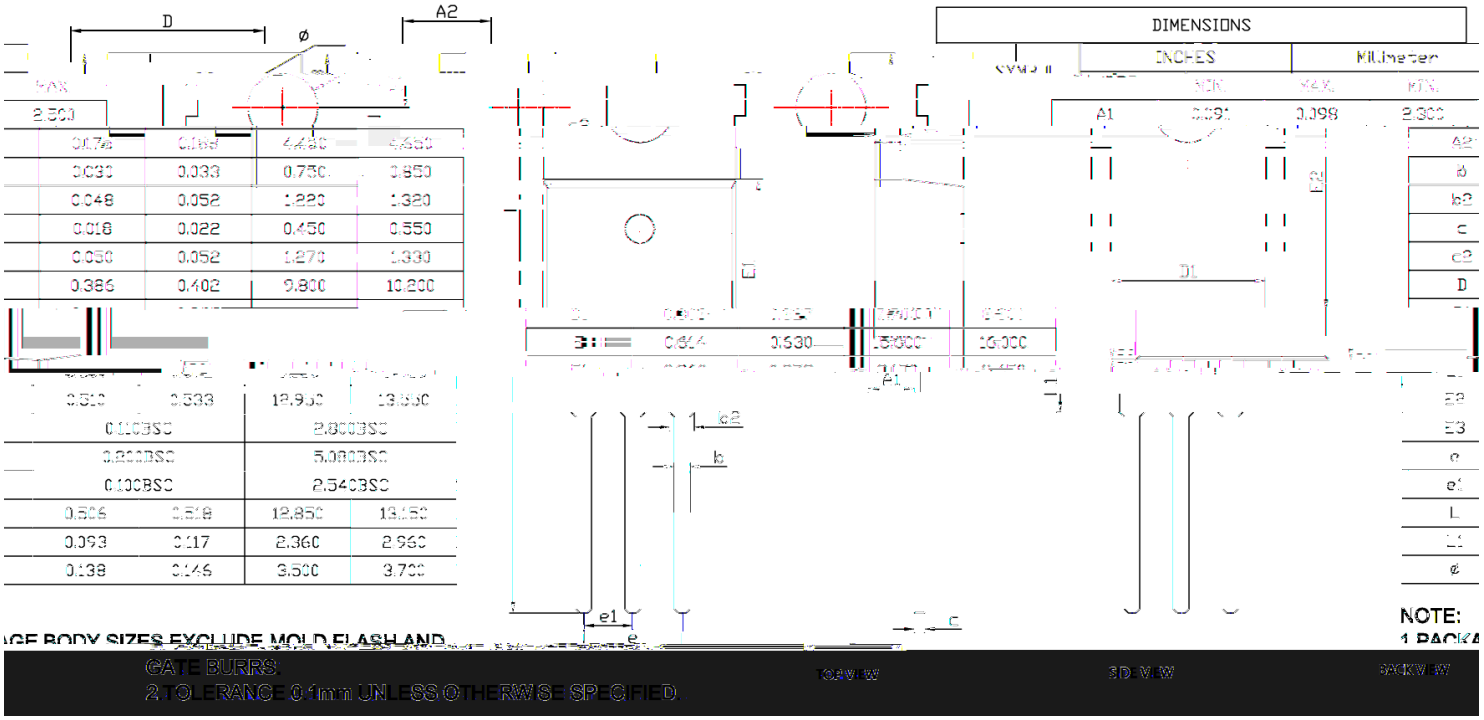


Gate Charge Test Circuit & Waveform



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

TO-220AB-D Package information



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