

N-Ch 100V Fast Switching MOSFETs

General Description

- 100% EAS Guaranteed
- Green Device Available
- Super Low $R_{DS(ON)}$
- Advanced high cell density Trench technology

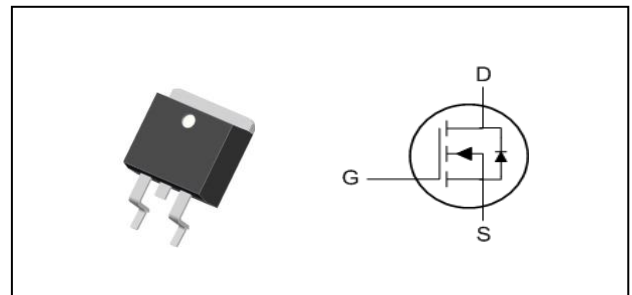
Applications

- MOTOR Driver.
- BMS.
- High frequency switching and synchronous rectification.

Product Summary

V_{DS}	100	V
$R_{DS(ON),typ}$	1.9	$m\Omega$
I_D	250	A

TO263 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	$\pm 20/-12$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	250	A
$I_D@T_C=100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^{1,6}$	158	A
I_{DM}	Pulsed Drain Current ²	1000	A
EAS	Single Pulse Avalanche Energy ³	940	mJ
I_{AS}	Avalanche Current	135	A
$P_D@T_C=25^\circ C$	Total Power Dissipation ⁴	411	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	0.3	$^\circ C/W$

Electrical Characteristics ($T_J=25\text{ }^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=40A$	---	1.9	2.3	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	3.0	4.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=100V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=85^\circ\text{C}$	---	---	10	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=10V, I_D=3A$	---	20	---	S
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	1.1	---	Ω
Q_g	Total Gate Charge (10V)	$V_{DS}=50V, V_{GS}=10V, I_D=10A$	---	195	---	nC
Q_{gs}	Gate-Source Charge		---	21	---	
Q_{gd}	Gate-Drain Charge		---	30	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=50V, V_{GS}=10V, R_G=3.3\Omega, I_D=1A$	---	21	---	ns
T_r	Rise Time		---	21	---	
$T_{d(off)}$	Turn-Off Delay Time		---	69	---	
T_f	Fall Time		---	120	---	
C_{iss}	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, f=1\text{MHz}$	---	10150	---	pF
C_{oss}	Output Capacitance		---	2100	---	
C_{rss}	Reverse Transfer Capacitance		---	55	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	250	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1	V
t_{rr}	Reverse Recovery Time	$I_F=10A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	95	---	nS
Q_{rr}	Reverse Recovery Charge		---	670	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=50V, V_{GS}=10V, L=0.1mH, R_g=25\Omega, I_{AS}=138A$
- 4.The power dissipation is limited by 150 $^\circ\text{C}$ 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.

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Typical Characteristics

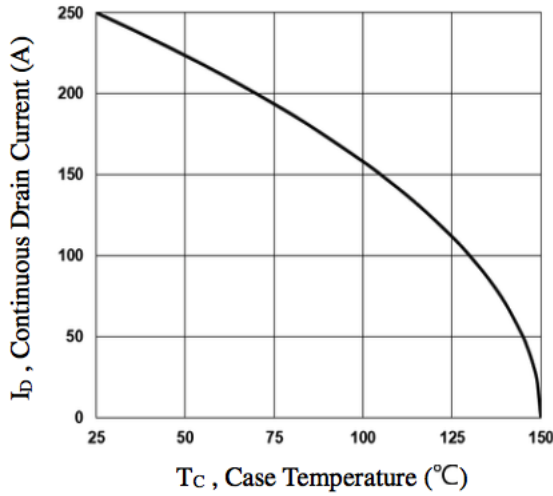


Fig.1 Continuous Drain Current vs. T_c

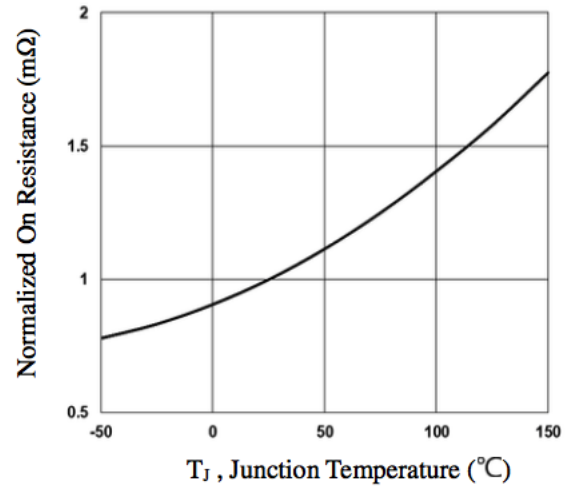


Fig.2 Normalized RDSON vs. T_J

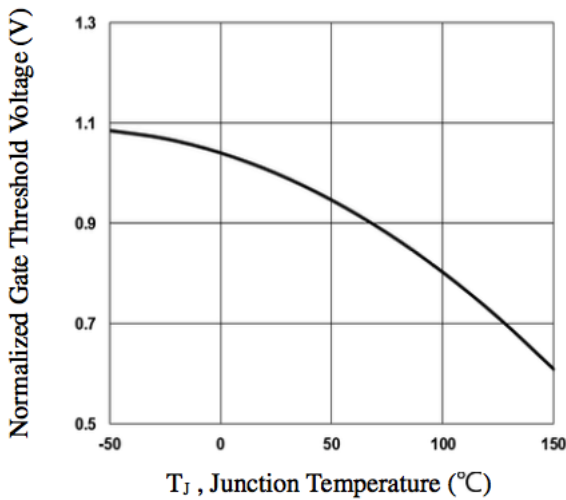


Fig.3 Normalized V_{th} vs. T_J

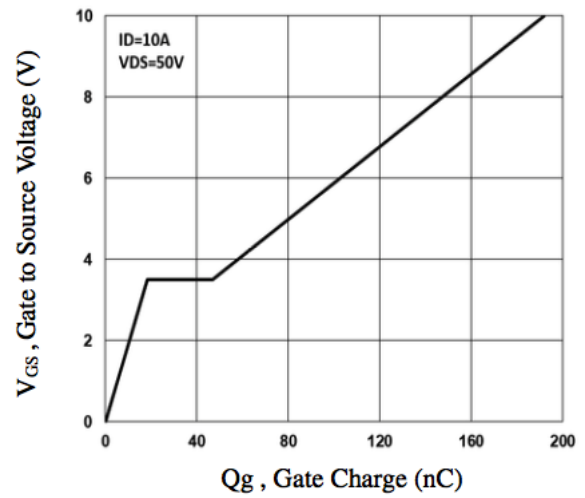


Fig.4 Gate Charge Characteristics

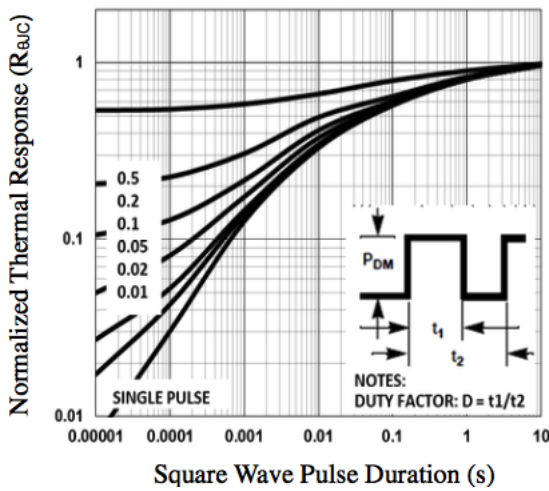


Fig.5 Normalized Transient Impedance

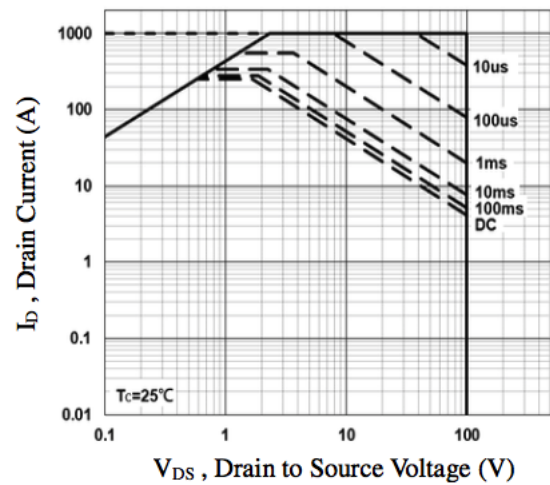


Fig.6 Maximum Safe Operation Area

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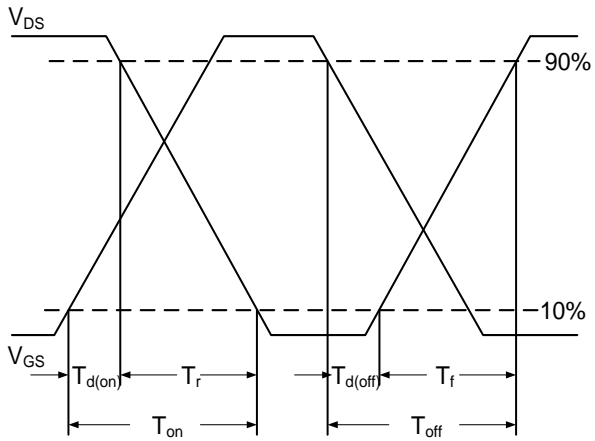


Fig.7 Switching Time Waveform

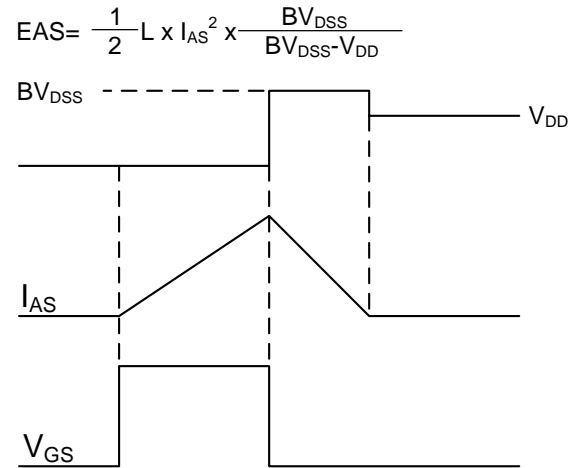
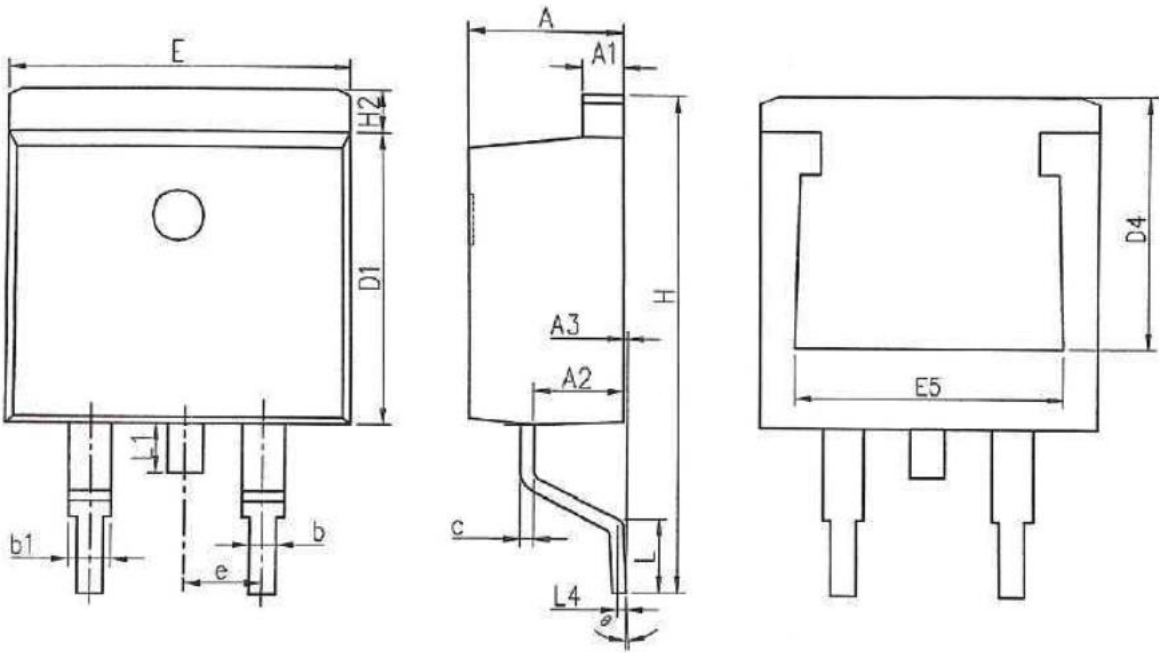


Fig.8 Unclamped Inductive Switching Waveform



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.370	4.770	0.172	0.188
A1	1.220	1.420	0.048	0.056
A2	2.200	2.890	0.087	0.114
A3	0.000	0.250	0.000	0.010
b	0.700	0.960	0.028	0.038
b1	1.170	1.470	0.046	0.058
c	0.300	0.530	0.012	0.021
D1	8.500	9.300	0.335	0.366
D4	6.600	-	0.260	-
E	9.860	10.36	0.388	0.408
E5	7.060	-	0.278	-
e	2.540 BSC		0.100 BSC	
H	14.70	15.70	0.579	0.618
H2	1.070	1.470	0.042	0.058
L	2.000	2.600	0.079	0.102
L1	1.400	1.750	0.055	0.069
L4	0.250 BSC		0.010 BSC	
θ	0°	9°	0°	9°