

MSD09N66

N-Channel 100V MOSFETs

Description

These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Features

- 100V, 45A, $R_{DS(ON)} = 18m\Omega @ V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available
- RoHS compliant package

Applications

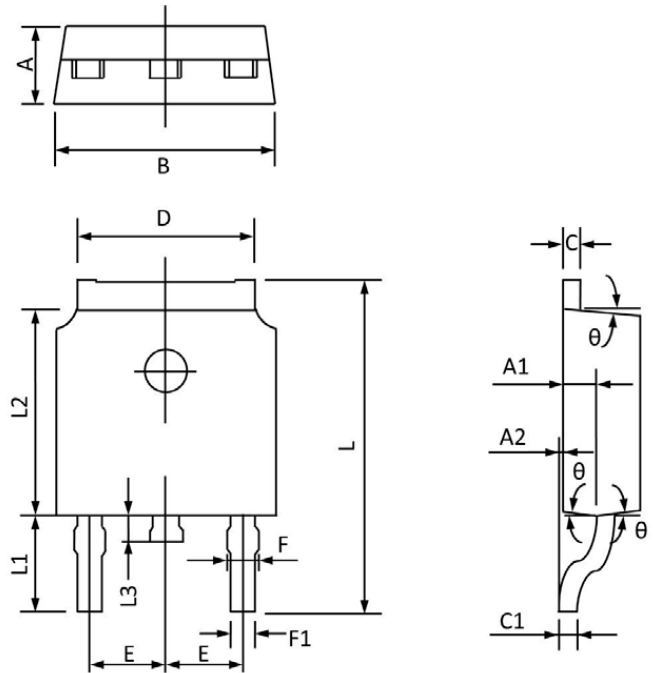
- Networking
- Load Switch
- LED applications

Package type : TO-252

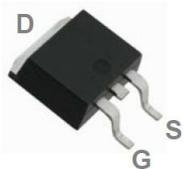
Packing & Order Information

R : 2,500/Reel

T : 80/Tube ; 4,000/Box

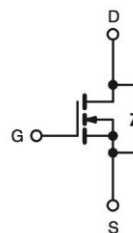


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	2.20	2.40	0.087	0.094
A1	0.91	1.11	0.036	0.044
A2	0.00	0.15	0.000	0.006
B	6.50	6.70	0.256	0.264
C	0.46	0.580	0.018	0.230
C1	0.46	0.580	0.018	0.030
D	5.10	5.46	0.201	0.215
E	2.186	2.386	0.086	0.094
F	0.74	0.94	0.029	0.037
F1	0.660	0.860	0.026	0.034
L	9.80	10.40	0.386	0.409
L1	2.9REF		0.114REF	
L2	6.00	6.20	0.236	0.244
L3	0.60	1.00	0.024	0.039
theta	3°	9°	3°	9°



**RoHS
COMPLIANT**

Graphic symbol



MSD09N66

N-Channel 100V MOSFETs

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_C=25^\circ\text{C}$)	45	A
	Drain Current - Continuous ($T_C=100^\circ\text{C}$)	28	A
I_{DM}	Drain Current - Pulsed ¹	180	A
E_{AS}	Single Pulse Avalanche Energy ²	45	mJ
I_{AS}	Single Pulse Avalanche Current ²	30	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	102	W
	Power Dissipation - Derate above 25°C	0.82	W/ $^\circ\text{C}$
T_J	Storage Temperature Range	-50 to +150	$^\circ\text{C}$
T_{STG}	Operating Junction Temperature Range	-50 to +150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance Junction to ambient	--	62	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance Junction to Case	--	1.22	

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

Off Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = V_{GS}, I_D = 250\mu\text{A}$	100			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D = 1\text{mA}$		0.05		V/ $^\circ\text{C}$
I_{GSS}	Gate-Source Leakage Current	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$			± 100	nA
I_{DSS}	Drain-Source Leakage Current	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}, T_J = 25^\circ\text{C}$ $V_{DS} = 80\text{V}, V_{GS} = 0\text{V}, T_J = 125^\circ\text{C}$			1 10	μA

On Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$R_{DS(on)}$	Drain-Source On-Resistance ³	$V_{GS} = 10\text{V}, I_D = 25\text{A}$ $V_{GS} = 6\text{V}, I_D = 15\text{A}$ $V_{GS} = 4.5\text{V}, I_D = 6\text{A}$		15 17 25	18 22 38	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	1	2	3	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$		-5		mV/ $^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS} = 10\text{V}, I_D = 3\text{A}$		10		S

MSD09N66

N-Channel 100V MOSFETs

Dynamic and switching Characteristics						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge ^{3,4}	$V_{DS} = 50\text{ V}$, $I_D = 5\text{ A}$, $V_{GS} = 10\text{ V}$	--	36.8	68	nC
Q_{gs}	Gate-Source Charge ^{3,4}		--	9.3	18	nC
Q_{gd}	Gate-Drain Charge ^{3,4}		--	9.8	19	nC
$t_{d(on)}$	Turn-On Delay Time ^{3,4}	$I_D = 1\text{ A}$, $R_G = 6\ \Omega$, $V_{GS} = 10\text{ V}$, $V_{DD} = 50\text{ V}$	--	20	40	ns
t_r	Rise Time ^{3,4}		--	15	30	ns
$t_{d(off)}$	Turn-Off Delay Time ^{3,4}		--	45	80	ns
t_f	Fall Time ^{3,4}		--	21	40	ns
C_{iss}	Input Capacitance	$V_{DS} = 50\text{ V}$ $f = 1\text{ MHz}$, $V_{GS} = 0\text{ V}$	--	1820	3300	pF
C_{oss}	Output Capacitance		--	170	340	pF
C_{rSS}	Reverse Transfer Capacitance		--	90	180	pF
R_g	Total Gate Charge		$V_{DS} = 0\text{ V}$, $f = 1\text{ MHz}$, $V_{GS} = 0\text{ V}$	--	1.35	2.6

Drain-Source Diode Characteristics and Maximum Ratings						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
I_s	Continuous Source Current	$V_G = V_D = 0\text{ V}$, Force Current	--	--	45	A
I_{SM}	Pulsed Source Current		--	--	90	A
V_{SD}	Diode Forward Voltage	$V_{GS} = 0\text{ V}$, $I_s = 1\text{ A}$, $T_J = 25^\circ\text{C}$	--	--	1	V
t_{rr}	Reverse Recovery Time	$I_s = 1\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$, $T_J = 25^\circ\text{C}$				ns
Q_{rr}	Reverse Recovery Charge					nC

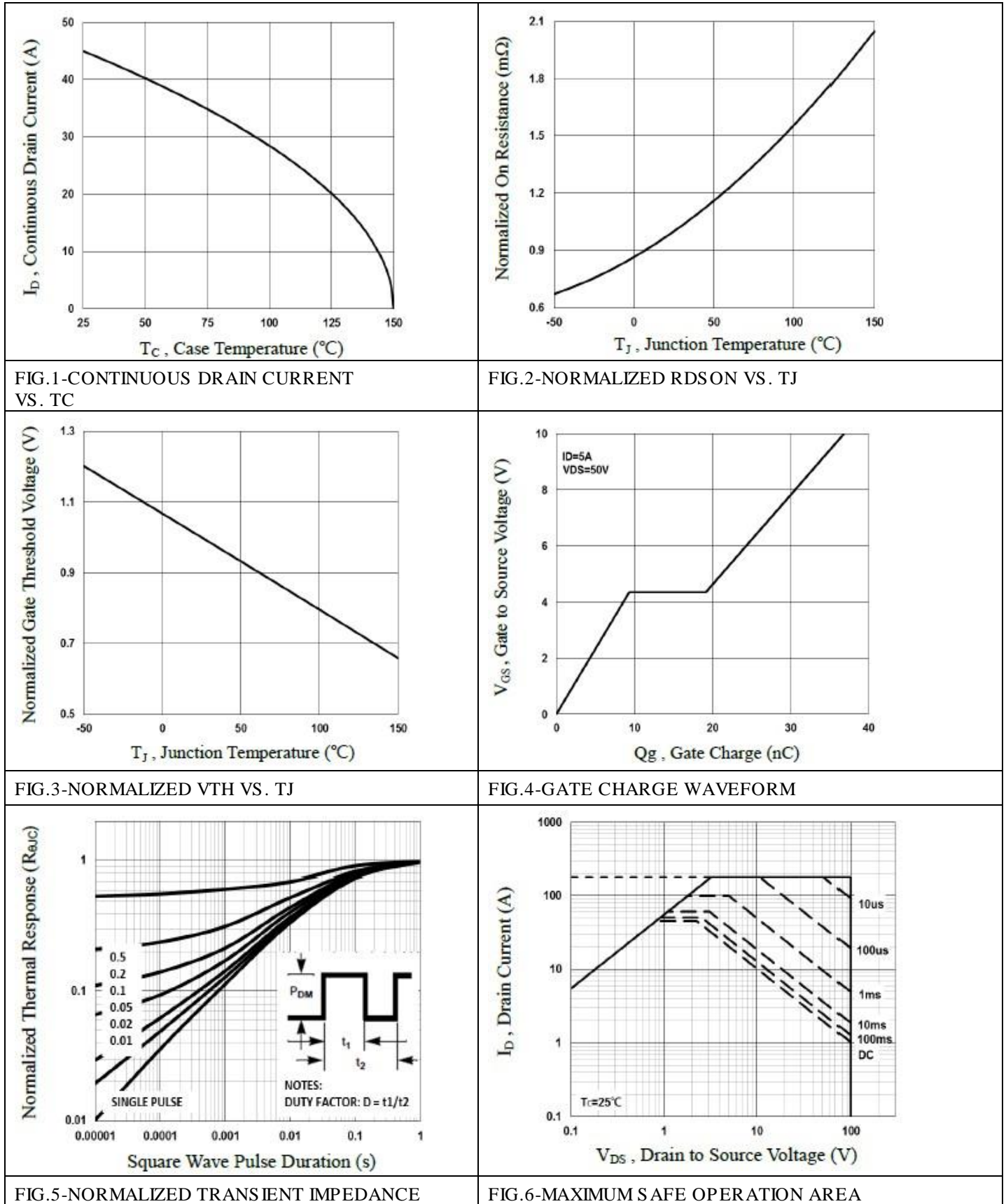
Note :

- 1.Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $L=0.1\text{mH}$, $I_{AS}=30\text{A}$, $R_G=25\Omega$,Starting $T_J=25^\circ\text{C}$.
- 3.The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- 4.Essentially independent of operating temperature.

MSD09N66

N-Channel 100V MOSFETs

■ Characteristics Curve



MSD09N66

N-Channel 100V MOSFETs

■ Characteristics Curve

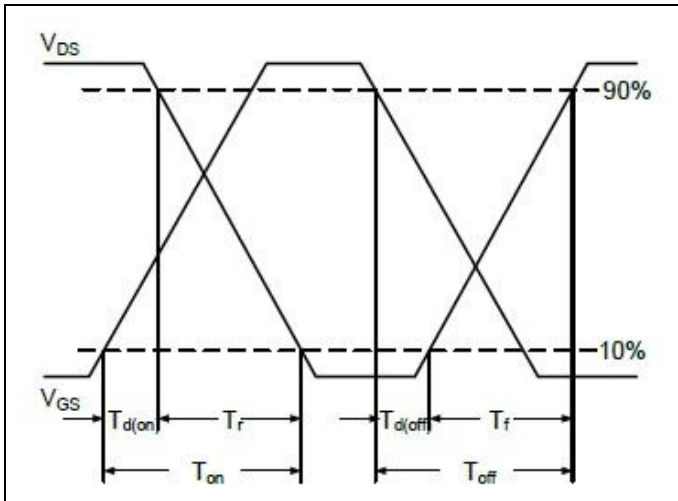


FIG.7-SWITCHING TIME WAVEFORM

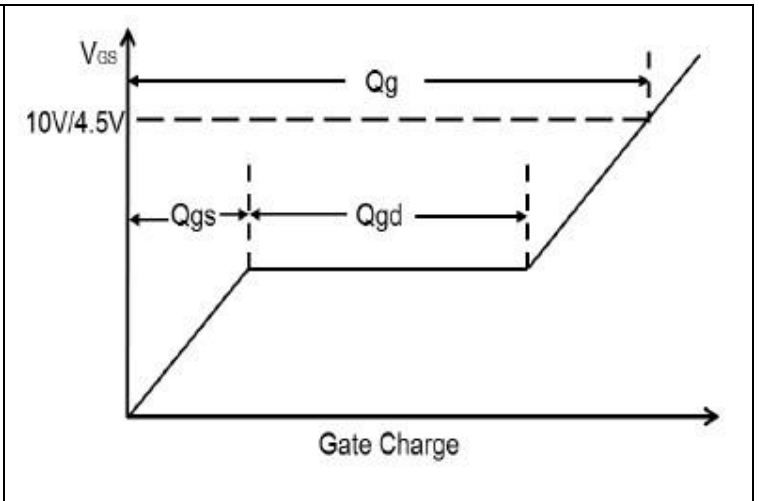


FIG.8-EAS WAVEFORM

MS D09N66

N-Channel 100V MOSFETs

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE

WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Bruckewell Technology Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Bruckewell"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Bruckewell makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Bruckewell disclaims

- (i) Any and all liability arising out of the application or use of any product.
- (ii) Any and all liability, including without limitation special, consequential or incidental damages.
- (iii) Any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Bruckewell's knowledge of typical requirements that are often placed on Bruckewell products in generic applications.

Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time.

Product specifications do not expand or otherwise modify Bruckewell's terms and conditions of purchase, including but not limited to the warranty expressed therein.