S100N04AC

100V N-Channel MOSFETs

General Description

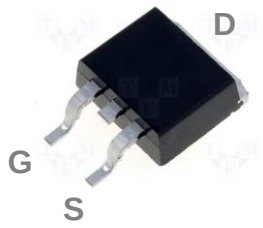
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

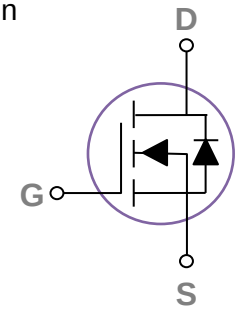
BV_{DSS}	$R_{DS(ON)}$Max.	I_D
100V	4.2mΩ	150A

Features

- *100V,150A, $R_{DS(ON)}$Max. =4.2mΩ@V_{GS} = 10V*
- *Improved dv/dt capability*
- *Fast switching*
- *Green Device Available*

TO-263 Pin Configuration





Applications

- *Networking*
- *Load Switch*
- *LED applications*
- *Quick Charger*

Absolute Maximum Ratings **Tc=25℃ unless otherwise noted**

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current – Continuous (T_C=25℃)	150	A
	Drain Current – Continuous (T_C=100℃)	95	A
I_{DM}	Drain Current – Pulsed[1]	600	A
E_{AS}	Single Pulse Avalanche Energy[2]	378	mJ
I_{AS}	Single Pulse Avalanche Current[2]	87	A
P_D	Power Dissipation (T_C=25℃)	350	W
T_{STG}	Storage Temperature Range	-50 to 150	℃
T_J	Operating Junction Temperature Range	-50 to 150	℃

Note 1: Exceed these limits to damage to the device.
Note 2: Exposure to absolute maximum rating conditions may affect device reliability.

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	100			V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=100V , V_{GS}=0V , T_J=25℃			1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=85℃			10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=20V , V_{DS}=0V			100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=20A		3.5	4.2	mΩ
		V_{GS}=6V , I_D=15A		4.5	6.0	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.4	2.5	2.75	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient			-8		mV/℃
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A		90		S

Dynamic and switching Characteristics

Q_g	Total Gate Charge[3,4]	V_{DS}=80V , V_{GS}=10V , I_D=10A		110		nC
Q_{gs}	Gate-Source Charge[3,4]			11.5		
Q_{gd}	Gate-Drain Charge[3,4]			28		
$T_{d(on)}$	Turn-On Delay Time[3,4]	V_{DD}=50V , V_{GS}=10V , R_G=6Ω I_D=1A		23		ns
T_r	Rise Time[3,4]			32		
$T_{d(off)}$	Turn-Off Delay Time[3,4]			157		
T_f	Fall Time[3,4]			115		
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz		5218		pF
C_{oss}	Output Capacitance			1223		
C_{rss}	Reverse Transfer Capacitance			62		
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz		1.9		Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current			150	A
I_{SM}	Pulsed Source Current				300	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃			1	V

Note :
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=87A.,R_G=25Ω, Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

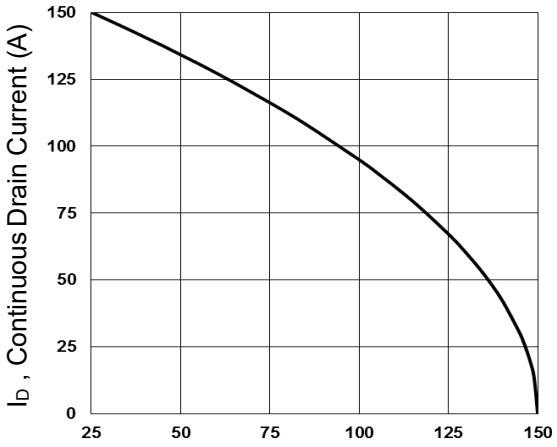


Fig.1 Continuous Drain Current vs. T_C

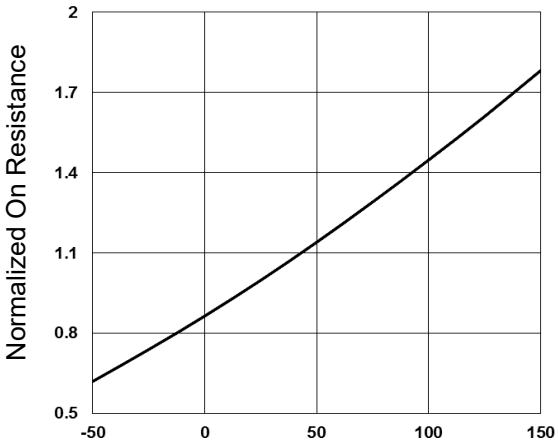


Fig.2 Normalized RDSON vs. T_J

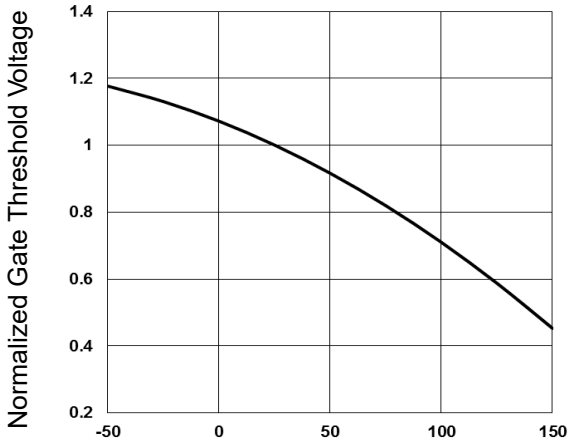


Fig.3 Normalized Vth vs. T_J

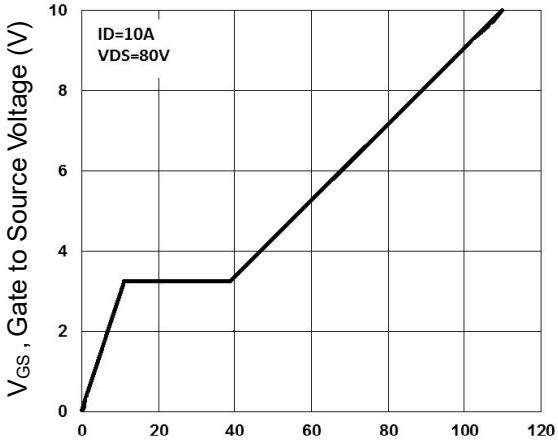


Fig.4 Gate Charge Characteristics

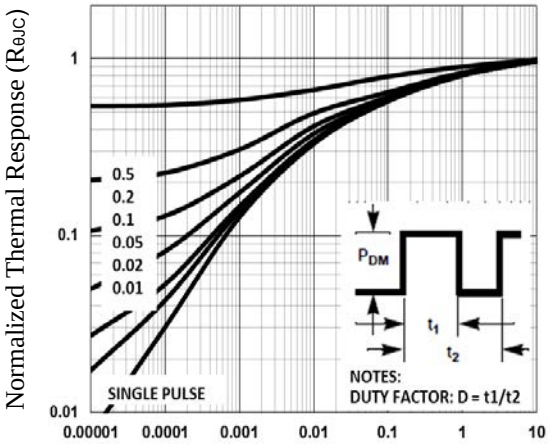


Fig.5 Normalized Transient Impedance

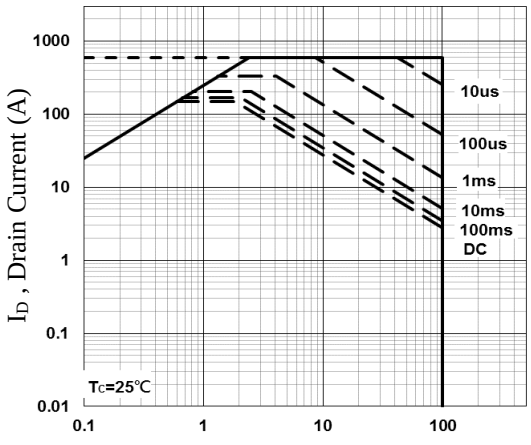


Fig.6 Maximum Safe Operation Area

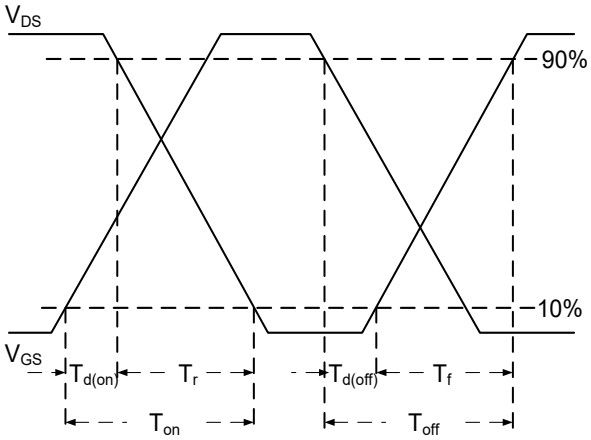


Fig.7 Switching Time Waveform

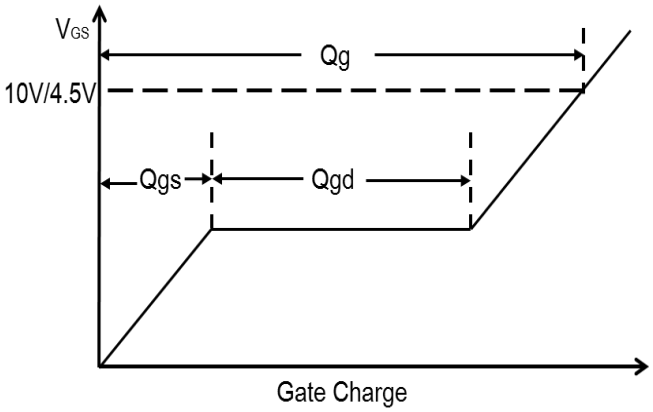


Fig.8 Gate Charge Waveform

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