



100V N-Channel MOSFETs

General Description

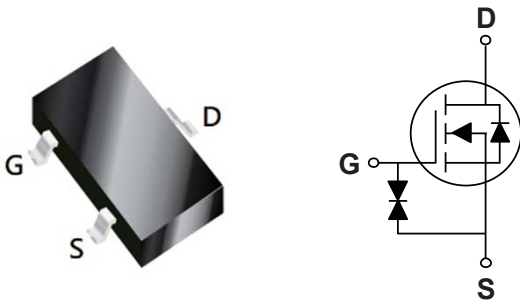
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
100 V	6 Ω	170 mA

Features

- $R_{DS(ON)} \leq 6\Omega @ V_{GS}=10V$
- Improved dv/dt Capability
- Fast Switching
- Green Device Available
- G-S ESD Protection Diode Embedded
- ESD protected 2kV HBM

SOT-23 Pin Configuration



Applications

- Logic Level
- Power MOSFET Gate Drivers
- Relay Driver
- Small Servo Motor Control

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

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_C=25^\circ\text{C}$)	170	mA
I_{DM}	Drain Current - Pulsed (NOTE 1)	680	mA
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	0.31	W
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Min.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	400	$^\circ\text{C/W}$



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

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu\text{A}$	100	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 10	μA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=0.2A$	---	---	6	Ω
		$V_{GS}=4.5V, I_D=0.2A$	---	---	9	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	1.5	---	2.5	V

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	$V_{DS}=30V, V_{GS}=10V, I_D=0.2A$	---	1.8	---	nC
Q_{gs}	Gate-Source Charge		---	0.4	---	
Q_{gd}	Gate-Drain Charge		---	0.3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=30V, V_{GS}=10V, R_{GEN}=6\Omega, I_D=0.2A$	---	3.4	---	nS
T_r	Rise Time		---	19	---	
$T_{d(off)}$	Turn-Off Delay Time		---	8.2	---	
T_f	Fall Time		---	20	---	
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	45	---	pF
C_{oss}	Output Capacitance		---	14	---	
C_{rss}	Reverse Transfer Capacitance		---	7.8	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=0.4A$	---	---	1.3	V

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.



Characteristics Curves

FIG. 1-Transfer Characteristics

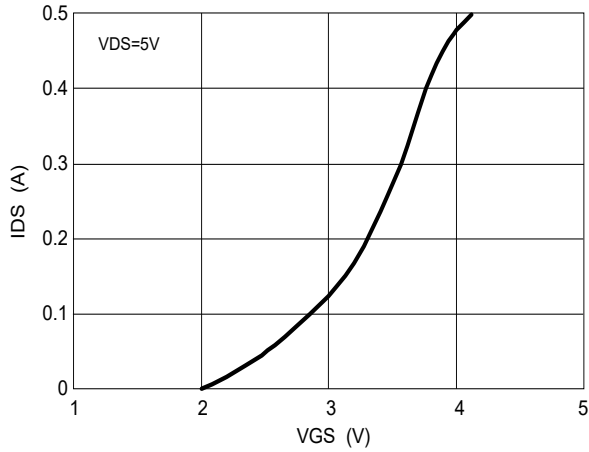


FIG. 2-Normalized $R_{DS(ON)}$ vs T_J

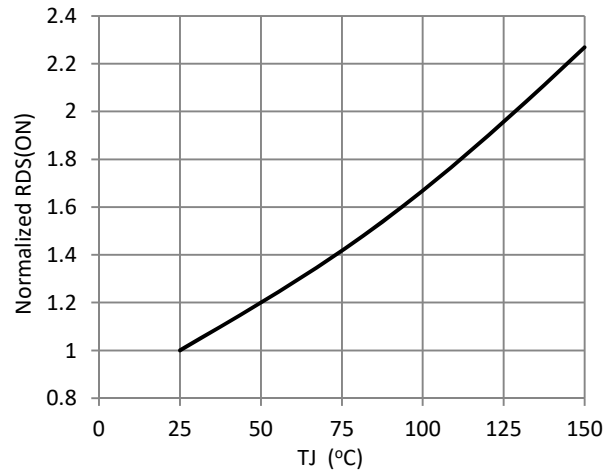


FIG. 3- $R_{DS(ON)}$ vs V_{GS}

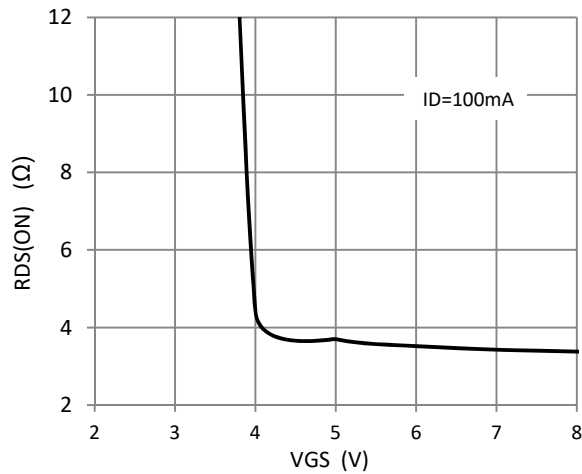


FIG. 4- $R_{DS(ON)}$ vs I_D

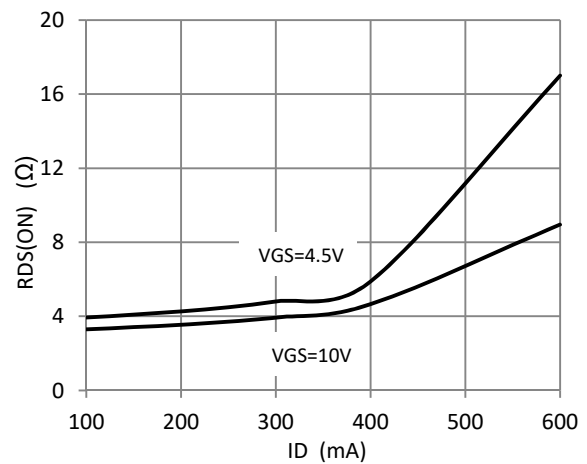


FIG. 5-Gate Charge Characteristics

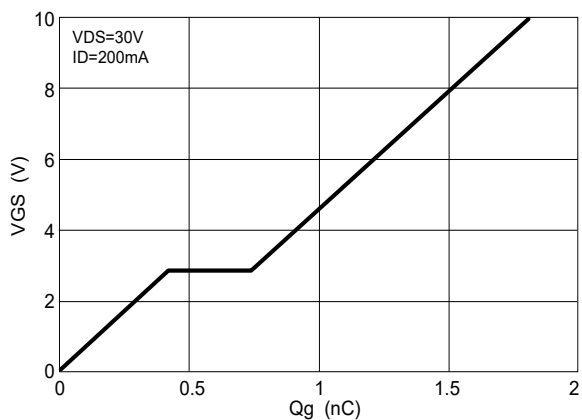
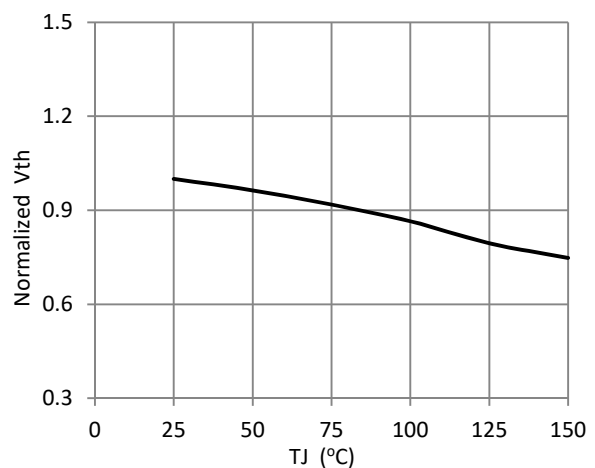


FIG. 6-Normalized V_{th} vs T_J





Characteristics Curves

FIG. 7-Source-Drain Diode Forward Voltage

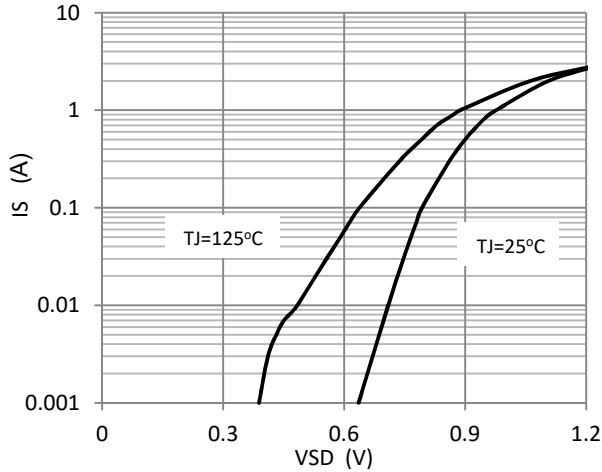


FIG. 8-Switching Time Waveform

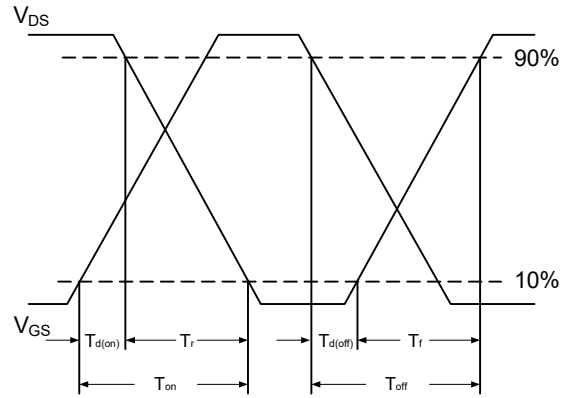
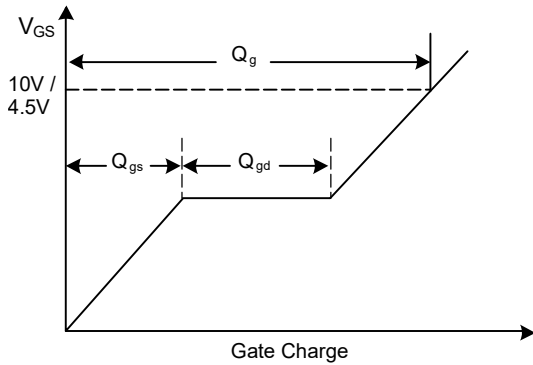
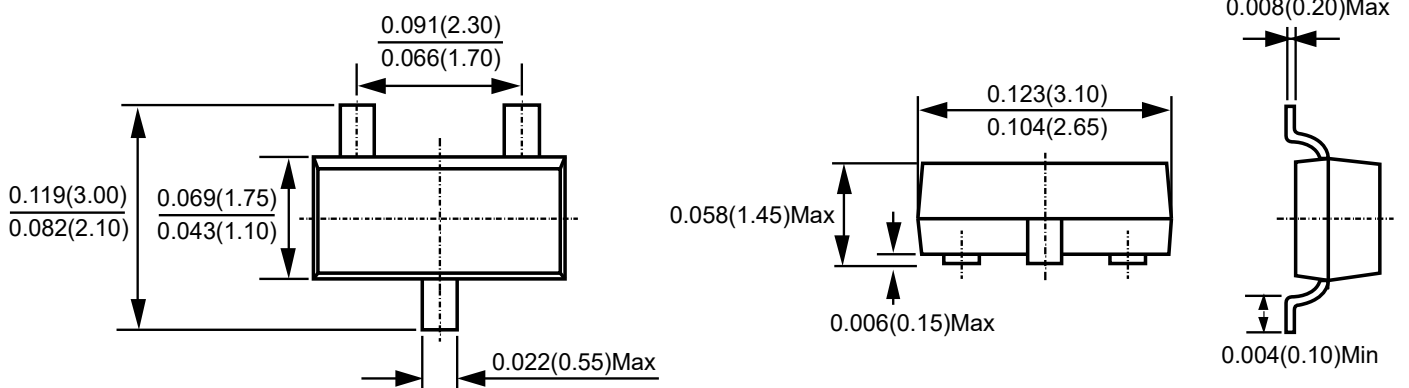


FIG. 9-Gate Charge Waveform



Package Outline Dimensions



SOT-23

Dimensions in inches and (millimeters)



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