



30V P-Channel MOSFETs

General Description

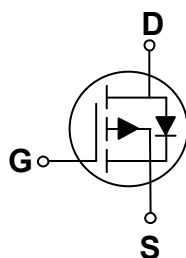
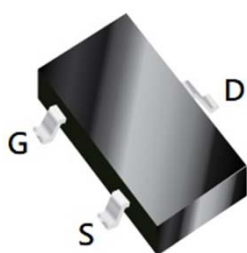
These P-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

BV_{DSS}	$R_{DS(ON)}$	I_D
-30 V	32 m Ω	-12 A

Features

- $R_{DS(ON)} \leq 32m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available

SOT-23 Pin Configuration



Applications

- Boost Driver
- Brushless Motor

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_c=25^\circ\text{C}$)	-12	A
I_{DM}	Drain Current - Pulsed (NOTE 1)	-36	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	1.14	W
T_J	Operating Junction Temperature Range	-50 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ\text{C}$
Marking Code		3409M	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	125	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	110	$^\circ\text{C/W}$

**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	$V_{GS}=0V, I_D=-250\mu\text{A}$	-30	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-24V, V_{GS}=0V$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-7A$	---	---	32	m Ω
		$V_{GS}=-4.5V, I_D=-5A$	---	---	54	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu\text{A}$	-1.0	---	-2.5	V
gfs	Forward Transconductance	$V_{DS}=-5V, I_D=-7A$	---	15	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	$V_{DS}=-20V, V_{GS}=-4.5V, I_D=-7A$	---	9.8	---	nC
Q_{gs}	Gate-Source Charge		---	2.2	---	
Q_{gd}	Gate-Drain Charge		---	3.4	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V, V_{GS}=-10V, R_G=3.3\Omega, I_D=-5A$	---	16.4	---	nS
T_r	Rise Time		---	20.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	55	---	
T_f	Fall Time		---	10	---	
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, F=1\text{MHz}$	---	930	---	pF
C_{oss}	Output Capacitance		---	148	---	
C_{riss}	Reverse Transfer Capacitance		---	115	---	
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, F=1\text{MHz}$		15		Ω

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-8	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A$	---	---	-1.2	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-Forward Characteristics of Body Diode

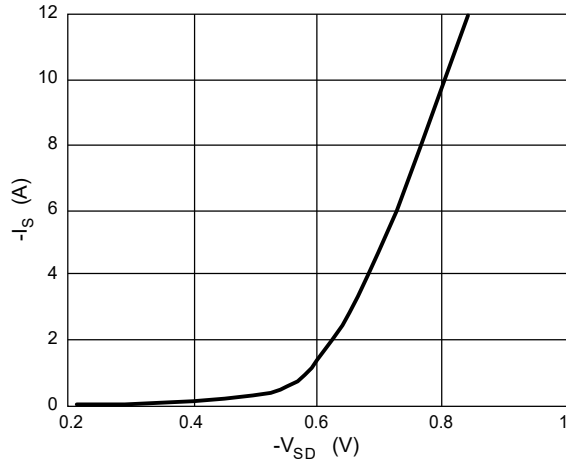


FIG. 2-Normalized $V_{GS(th)}$ vs T_J

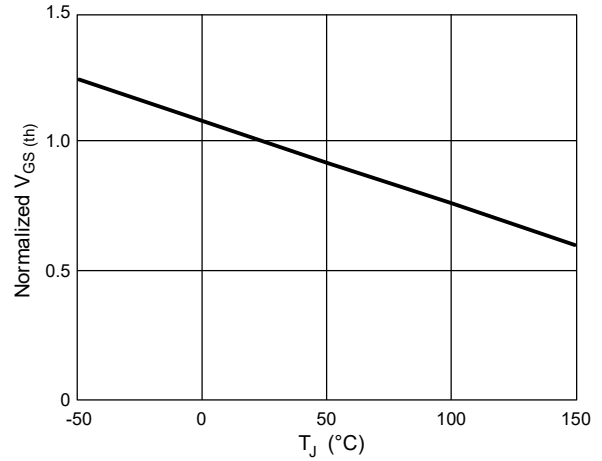


FIG. 2-Normalized $R_{DS(on)}$ vs T_J

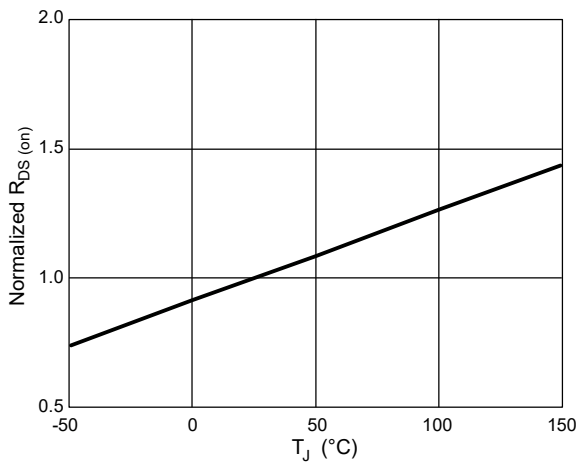


FIG. 4-Gate Charge Characteristics

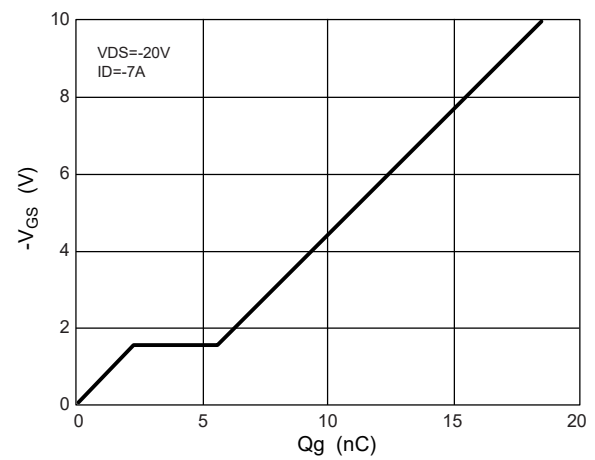


FIG. 5-Safe Operation Area

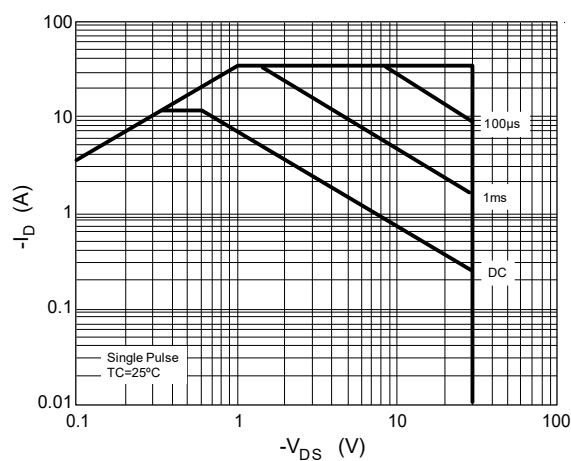
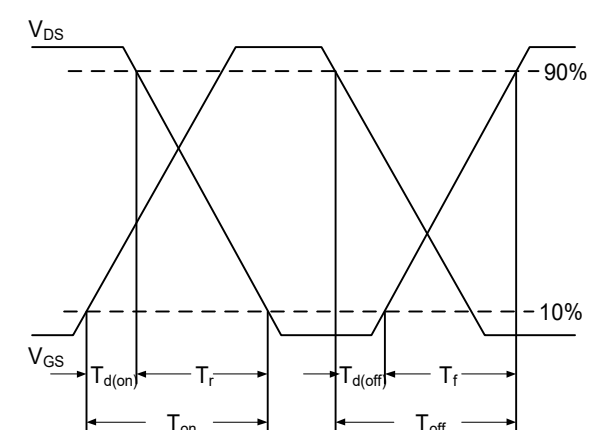
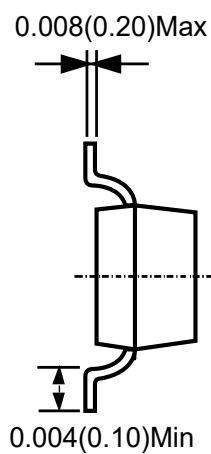
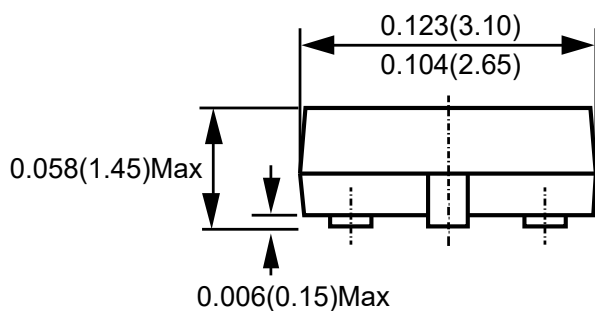
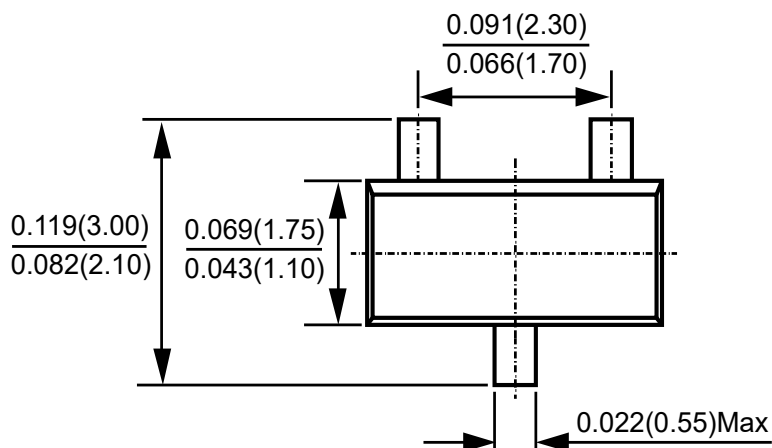


FIG. 6-Switching Time Waveform





Package Outline Dimensions



SOT-23

Dimensions in inches and (millimeters)



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