



## 60V N-Channel MOSFETs

### General Description

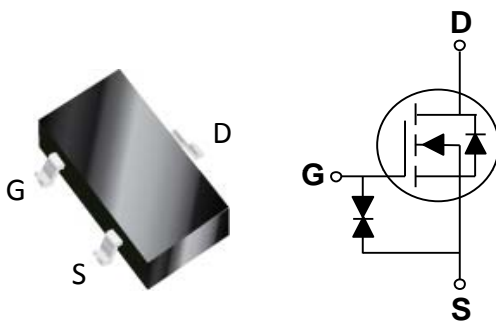
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These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

$BV_{DSS}$	$R_{DS(ON)}$	$I_D$
60 V	3 $\Omega$	300 mA

### Features

- 60V, 300mA,  $R_{DS(ON)}=3\ \Omega$  @  $V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available

SOT-523 Pin Configuration



### Applications

- Notebook
- Load Switch
- Hand-held Instruments
- Battery Protection

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

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	60	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Drain Current - Continuous ( $T_A=25^\circ\text{C}$ )	300	mA
	Drain Current - Continuous ( $T_A=70^\circ\text{C}$ )	240	mA
$I_{DM}$	Drain Current - Pulsed (NOTE 1)	1.2	A
$P_D$	Power Dissipation ( $T_c=25^\circ\text{C}$ )	313	mW
	Power Dissipation - Derate above $25^\circ\text{C}$	2.5	mW/ $^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-50 to 150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-50 to 150	$^\circ\text{C}$
Marking Code		J	

### Thermal Characteristics

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

**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	$V_{GS}=0V, I_D=250\mu\text{A}$	60	---	---	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=48V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	$\mu\text{A}$
		$V_{DS}=48V, V_{GS}=0V, T_J=85^\circ\text{C}$	---	---	10	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 20$	$\mu\text{A}$

**On Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=0.3A$	---	1.1	3	$\Omega$
		$V_{GS}=4.5V, I_D=0.2A$	---	1.3	4	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	1.2	2.0	2.5	V

**Dynamic and switching Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$C_{ISS}$	Input Capacitance	$V_{DS}=30V, V_{GS}=0V, F=1\text{MHz}$	---	23	46	pF
$C_{OSS}$	Output Capacitance		---	16	32	
$C_{RSS}$	Reverse Transfer Capacitance		---	10	20	

**Drain-Source Diode Characteristics and Ratings**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V, \text{Force Current}$	---	---	300	mA
$I_{SM}$	Pulsed Source Current		---	---	600	mA
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=0.2A, T_J=25^\circ\text{C}$	---	---	1	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

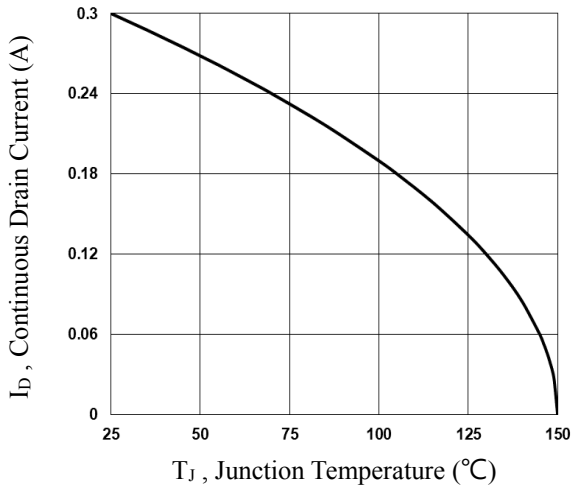


Fig.1 Continuous Drain Current vs. T<sub>J</sub>

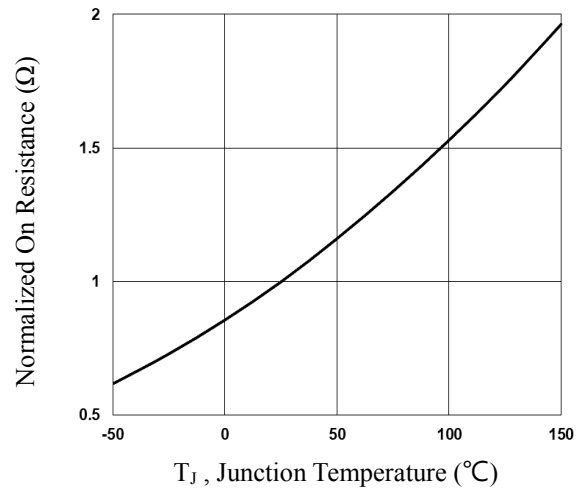


Fig.2 Normalized R<sub>DS(on)</sub> vs. T<sub>J</sub>

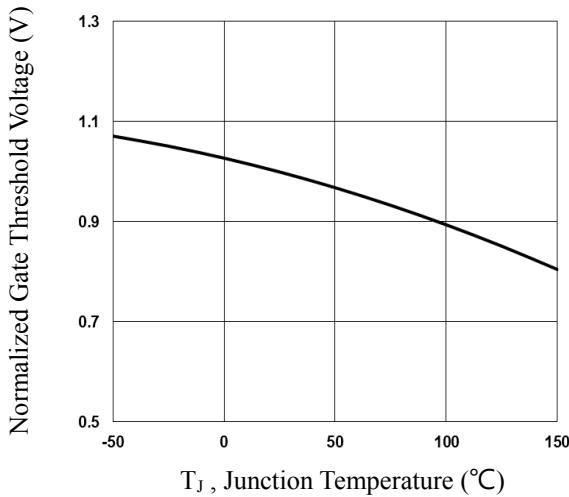


Fig.3 Normalized V<sub>th</sub> vs. T<sub>J</sub>

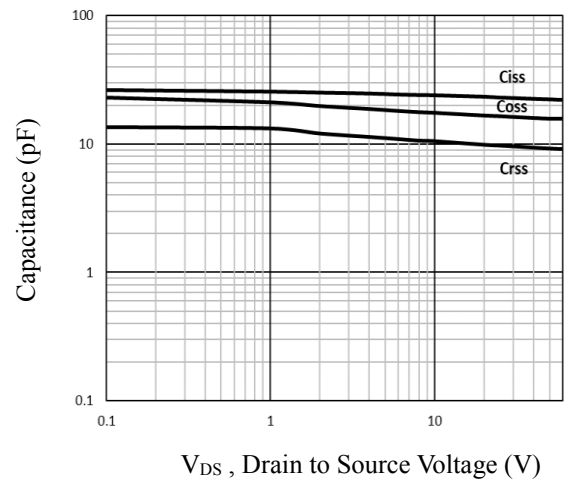


Fig.4 Capacitance Characteristics

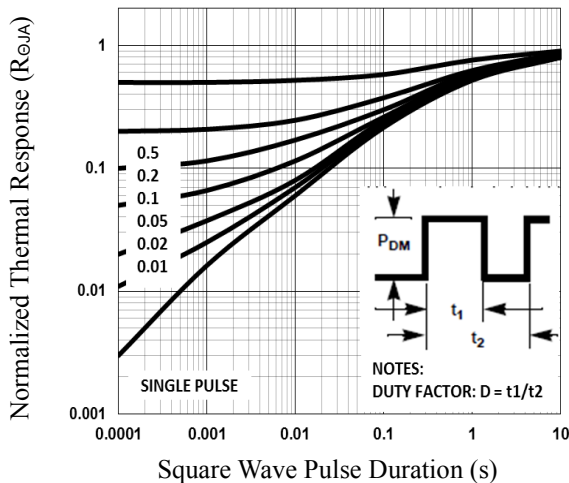


Fig.5 Normalized Transient Response

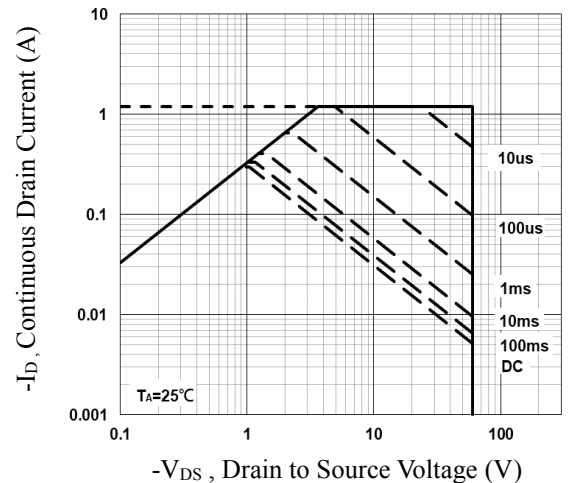


Fig.6 Maximum Safe Operation Area



Characteristics Curves

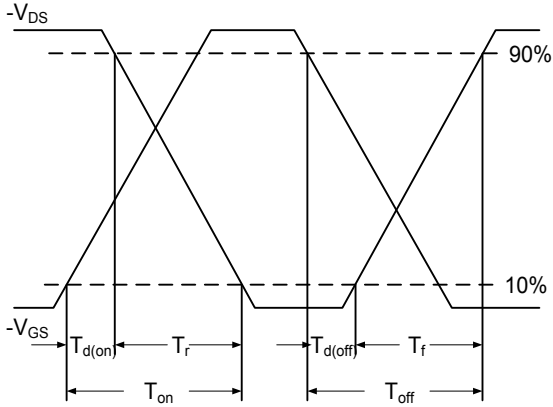


Fig.7 Switching Time Waveform

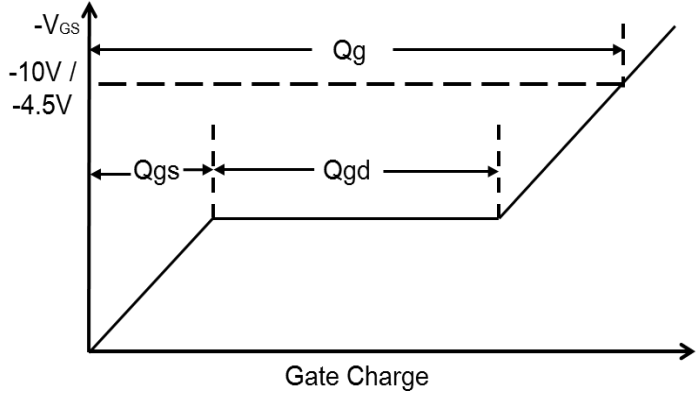
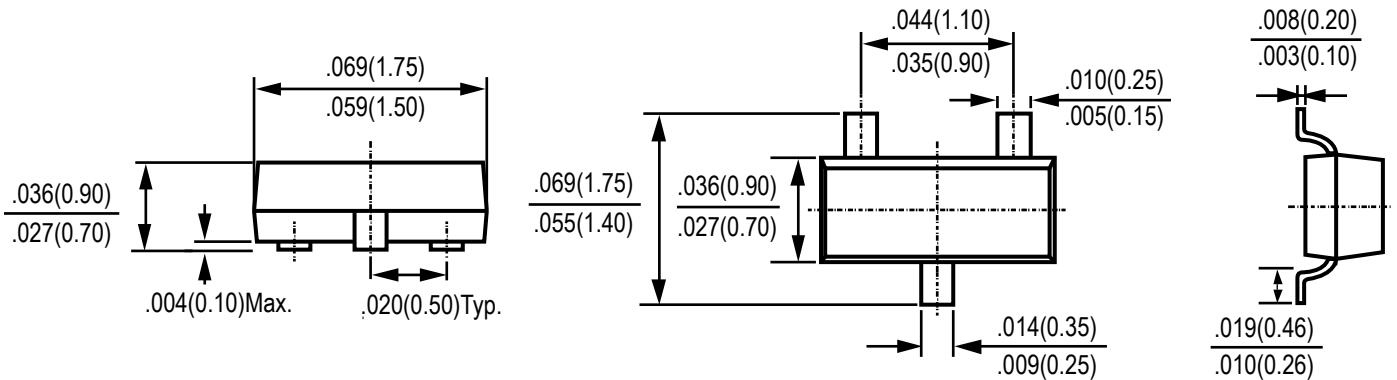


Fig.8 Gate Charge Waveform

Package Outline Dimensions



SOT-523

Dimensions in inches and (millimeters)



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