

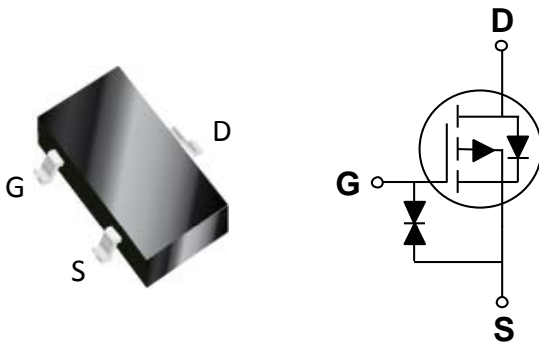


**General Description**

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.

<b>BV<sub>DSS</sub></b>	<b>R<sub>DS(ON)</sub></b>	<b>I<sub>D</sub></b>
-30 V	45 mΩ	-4.6 A

SOT-23S Pin Configuration



**Features**

- $R_{DS(ON)} \leq 45m\Omega @ V_{GS} = -10V$
- Fast switching
- Green Device Available
- Suit for -2.5V Gate Drive Applications

**Applications**

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

**Absolute Maximum Ratings  $T_c=25^\circ C$  unless otherwise noted**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-30	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D$	Drain Current - Continuous ( $T_A=25^\circ C$ )	-4.6	A
	Drain Current - Continuous ( $T_A=70^\circ C$ )	-3.7	A
$I_{DM}$	Drain Current - Pulsed (NOTE 1)	-18.4	A
$P_D$	Power Dissipation ( $T_A=25^\circ C$ )	1.56	W
	Power Dissipation – Derate above $25^\circ C$	0.0125	W/ $^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
Marking Code		Y	

**Thermal Characteristics**

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	---	80	$^\circ C/W$



**Electrical Characteristics (T<sub>J</sub>=25°C, unless otherwise noted)**

**Off Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V , I <sub>D</sub> = -250uA	-30	---	---	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> = -30V , V <sub>GS</sub> = 0V , T <sub>J</sub> =25°C	---	---	-1	uA
		V <sub>DS</sub> = -24V , V <sub>GS</sub> = 0V , T <sub>J</sub> =125°C	---	---	-10	uA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> = ±12V , V <sub>DS</sub> = 0V	---	---	±100	nA

**On Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> = -10V , I <sub>D</sub> = -4A	---	37	45	mΩ
		V <sub>GS</sub> = -4.5V , I <sub>D</sub> = -3A	---	43	56	
		V <sub>GS</sub> = -2.5V , I <sub>D</sub> = -2A	---	55	74	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> = -250uA	-0.5	-0.7	-1.2	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> = -10V , I <sub>D</sub> = -3A	---	6	---	S

**Dynamic and switching Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = -15V , V <sub>GS</sub> = -4.5V , I <sub>D</sub> = -4A (NOTE 2、3)	---	12	18	nC
Q <sub>gs</sub>	Gate-Source Charge		---	2.9	4.4	
Q <sub>gd</sub>	Gate-Drain Charge		---	2.1	3.2	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> = -15V , V <sub>GS</sub> = -10V , R <sub>G</sub> = 6Ω , I <sub>D</sub> = -1A (NOTE 2、3)	---	7.3	11	nS
T <sub>r</sub>	Rise Time		---	26	39	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	60	90	
T <sub>f</sub>	Fall Time		---	16	24	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = -15V , V <sub>GS</sub> = 0V , F= 1MHz	---	1585	2378	pF
C <sub>OSS</sub>	Output Capacitance		---	97	146	
C <sub>rSS</sub>	Reverse Transfer Capacitance		---	68	102	

**Drain-Source Diode Characteristics and Ratings**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> = V <sub>D</sub> = 0V , Force Current	---	---	-4.6	A
I <sub>SM</sub>	Pulsed Source Current		---	---	-9.2	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> = 0V , I <sub>S</sub> = -1A , T <sub>J</sub> = 25°C	---	---	-1	V

NOTES :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.



Characteristics Curves

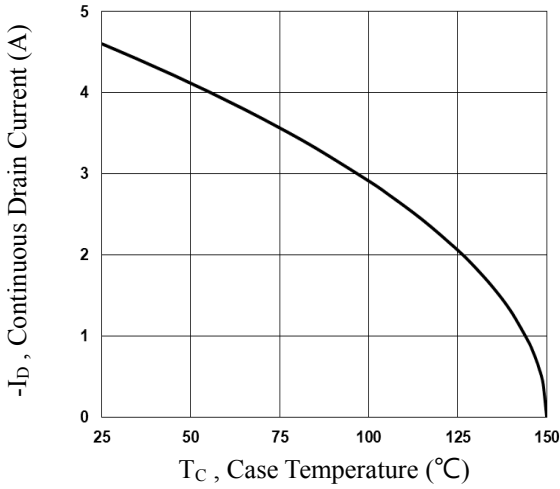


Fig.1 Continuous Drain Current vs.  $T_c$

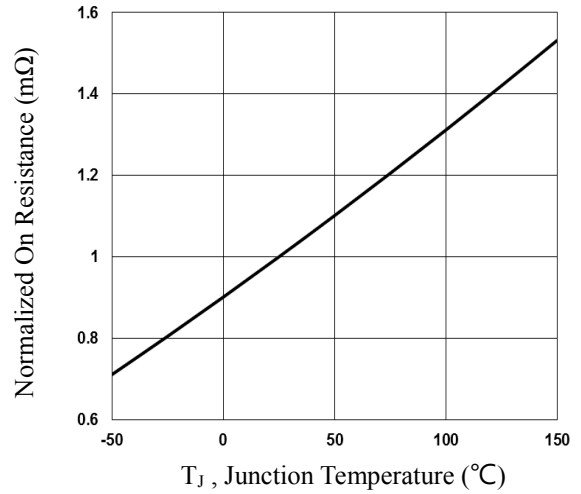


Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$

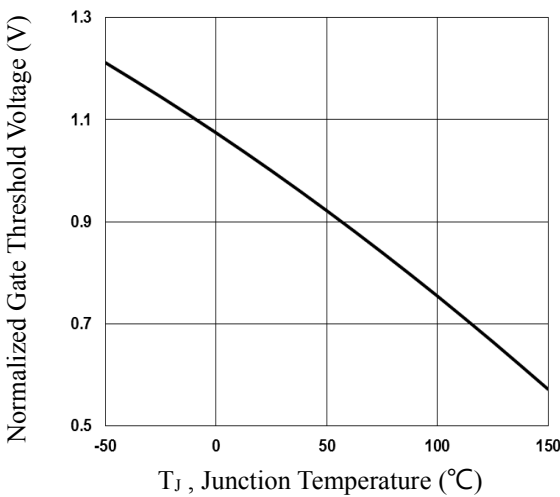


Fig.3 Normalized  $V_{th}$  vs.  $T_j$

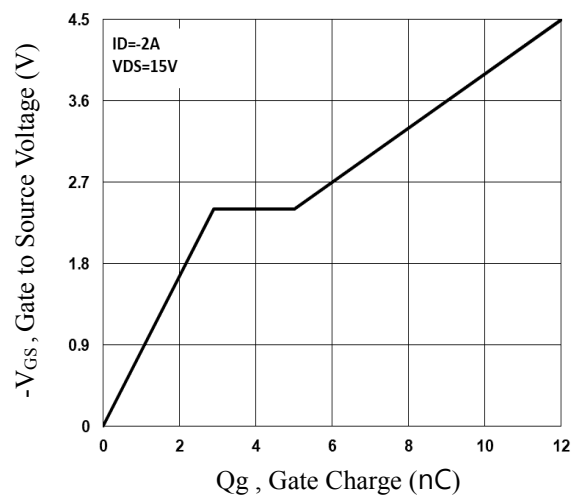


Fig.4 Gate Charge Waveform

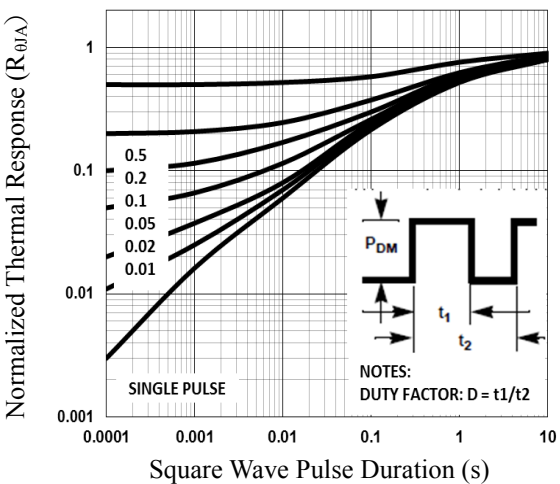


Fig.5 Normalized Transient Impedance

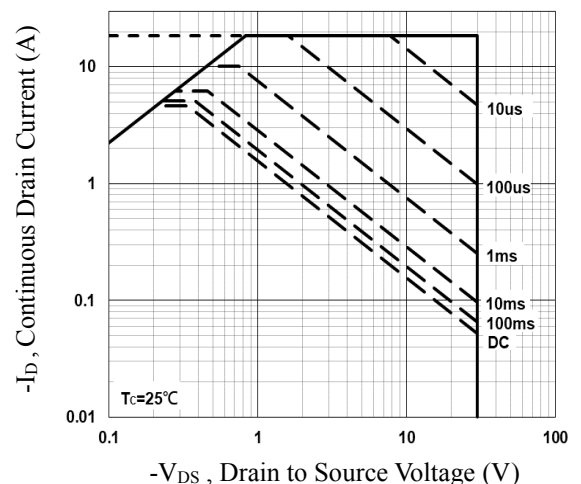


Fig.6 Maximum Safe Operation Area



Characteristics Curves

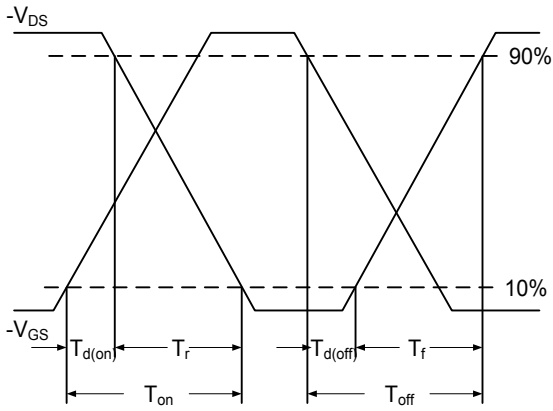


Fig.7 Switching Time Waveform

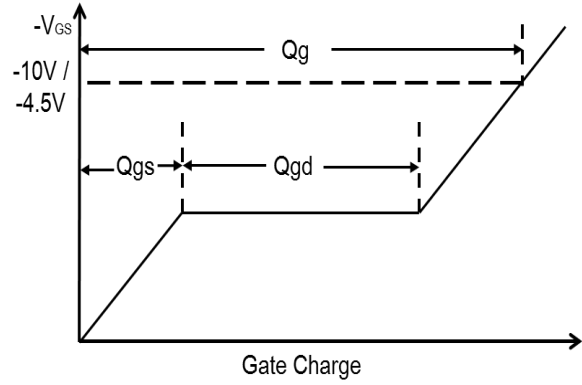
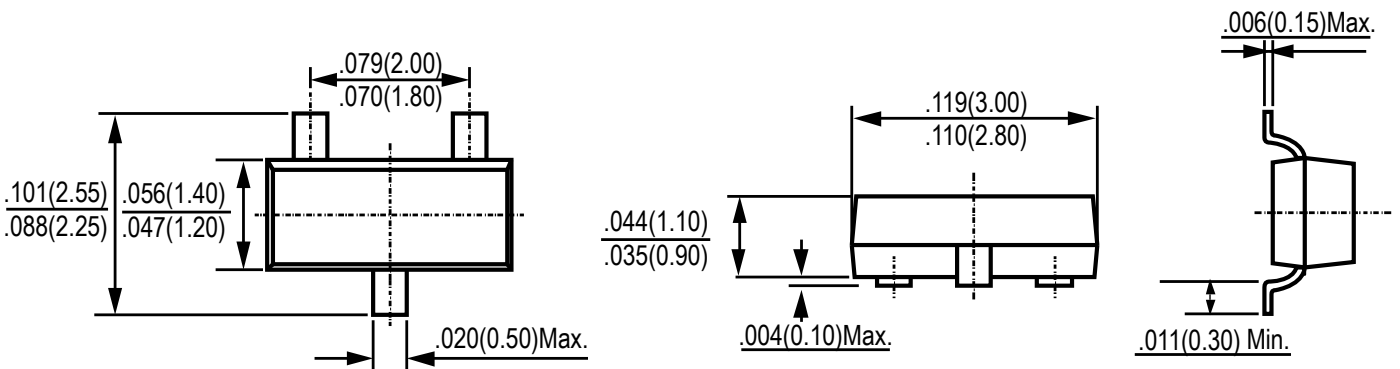


Fig.8 Gate Charge Waveform

Package Outline Dimensions



SOT-23S

Dimensions in inches and (millimeters)



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