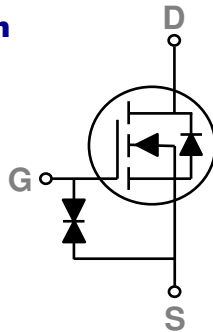
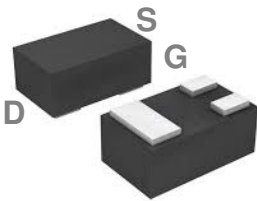


### General Description

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.

### SOT883 Pin Configuration



BVDSS	RDSON	ID
30V	560mΩ	400mA

### Features

- 30V,400mA,  $R_{DS(ON)} = 560m\Omega @ V_{GS} = 4.5V$
- Worldwide Smallest Package : 1x0.6x0.45 mm
- Fast switching
- Green Device Available
- 2KV HBM ESD Capability

### Applications

- Notebook
- Smartphone
- Battery Protection
- Hand-held Instruments

### 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	$\pm 12$	V
$I_D$	Drain Current – Continuous ( $T_c=25^\circ\text{C}$ )	400	mA
	Drain Current – Continuous ( $T_c=100^\circ\text{C}$ )	250	mA
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	1600	mA
$P_D$	Power Dissipation ( $T_c=25^\circ\text{C}$ )	155	mW
	Power Dissipation – Derate above 25°C	1.25	mW/°C
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	800	°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> =250μA	30	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C , I <sub>D</sub> =1mA	---	-0.03	---	V/°C
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	μA
		V <sub>DS</sub> =24V , V <sub>GS</sub> =0V , T <sub>J</sub> =125°C	---	---	10	μA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±12V , V <sub>DS</sub> =0V	---	---	±20	μA

**On Characteristics**

R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =4.5V , I <sub>D</sub> =0.2A	---	465	560	mΩ
		V <sub>GS</sub> =2.5V , I <sub>D</sub> =0.1A	---	575	750	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA	0.5	0.8	1.2	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	-1.74	---	mV/°C
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =4V , I <sub>D</sub> =0.3A	---	1	---	S

**Dynamic and switching Characteristics**

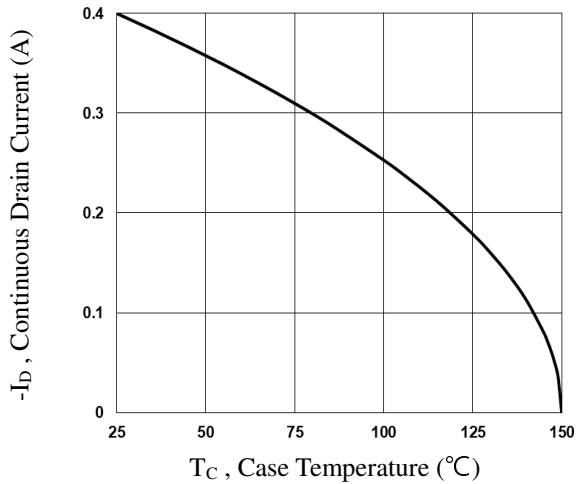
Q <sub>g</sub>	Total Gate Charge <sup>2, 3</sup>	V <sub>DS</sub> =15V , V <sub>GS</sub> =4.5V , I <sub>D</sub> =0.3A	---	2.6	5.2	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>2, 3</sup>		---	0.9	1.8	
Q <sub>gd</sub>	Gate-Drain Charge <sup>2, 3</sup>		---	0.6	1.2	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>2, 3</sup>	V <sub>DD</sub> =15V , V <sub>GS</sub> =4.5V , R <sub>G</sub> =10Ω I <sub>D</sub> =0.3A	---	5.5	11	ns
T <sub>r</sub>	Rise Time <sup>2, 3</sup>		---	4	8	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>2, 3</sup>		---	14.5	29	
T <sub>f</sub>	Fall Time <sup>2, 3</sup>		---	6.5	13	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V , V <sub>GS</sub> =0V , F=1MHz	---	72.9	146	pF
C <sub>oss</sub>	Output Capacitance		---	18.3	36.6	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	7.4	14.8	

**Drain-Source Diode Characteristics and Maximum Ratings**

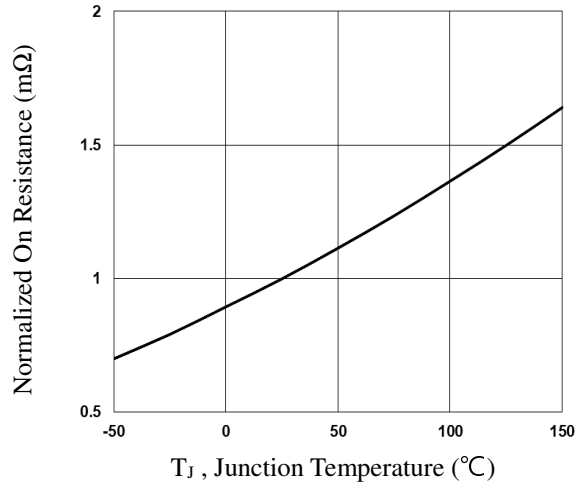
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	400	mA
I <sub>SM</sub>	Pulsed Source Current		---	---	800	mA
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V , I <sub>S</sub> =0.2A , T <sub>J</sub> =25°C	---	---	1	V
T <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> =0V , I <sub>S</sub> =0.3A	---	13	---	ns
Q <sub>rr</sub>	Reverse Recovery Charge	di/dt=100A/μs T <sub>J</sub> =25°C	---	6	---	nC

Note :

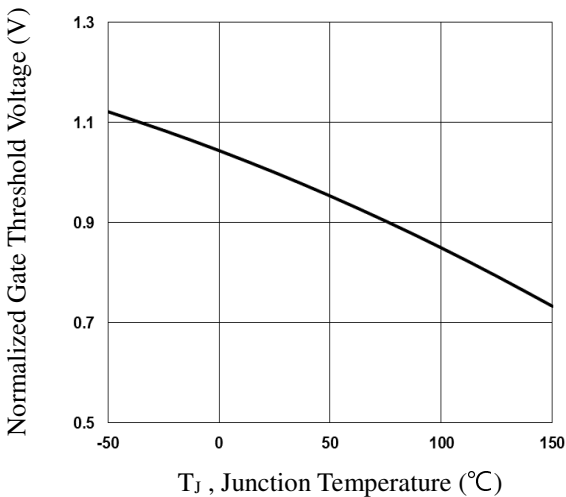
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
3. Essentially independent of operating temperature.



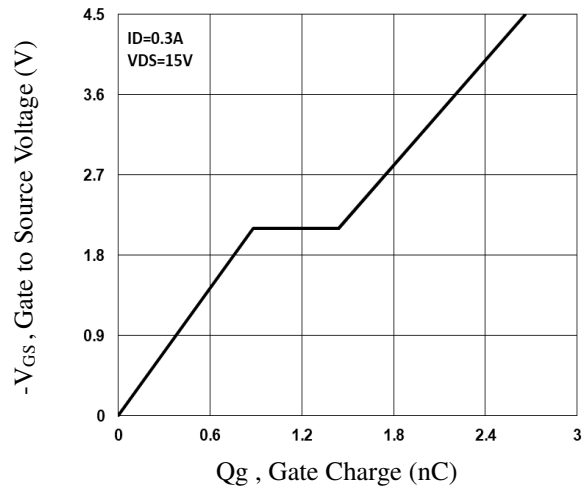
**Fig.1 Continuous Drain Current vs.  $T_c$**



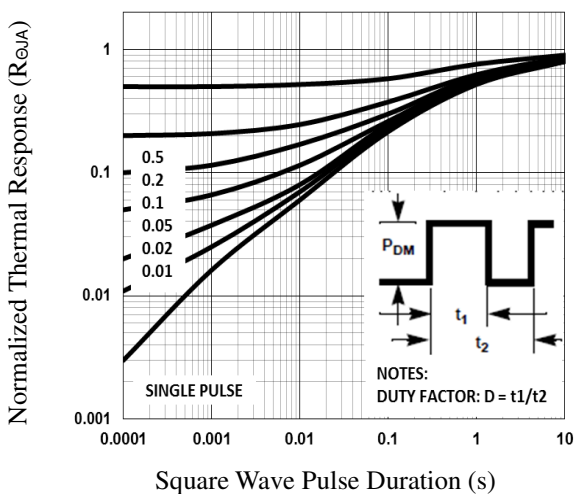
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



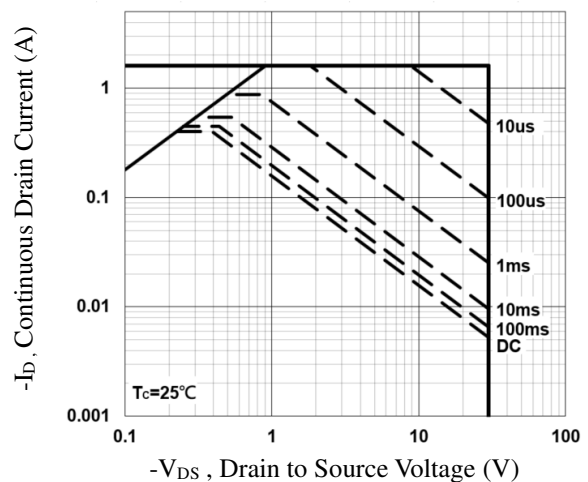
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



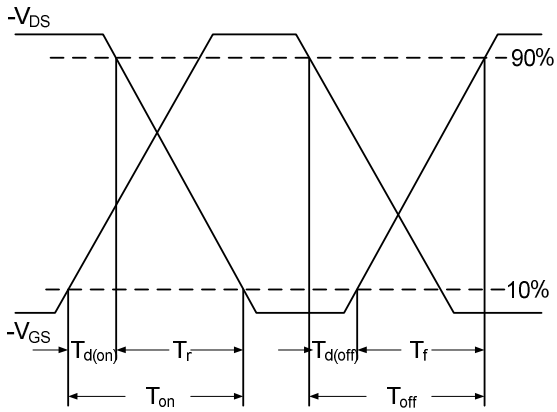
**Fig.4 Gate Charge Waveform**



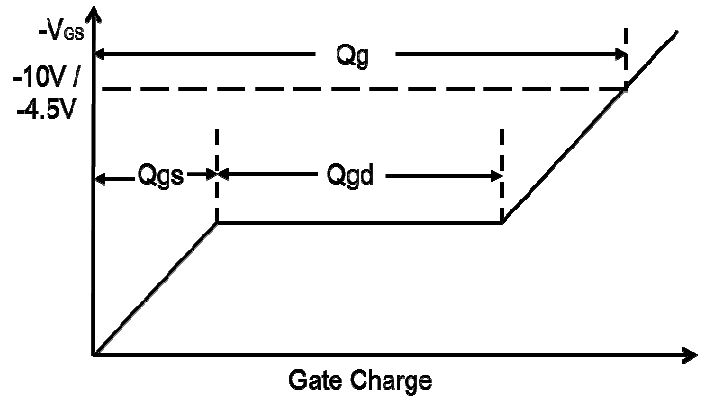
**Fig.5 Normalized Transient Response**



**Fig.6 Maximum Safe Operation Area**

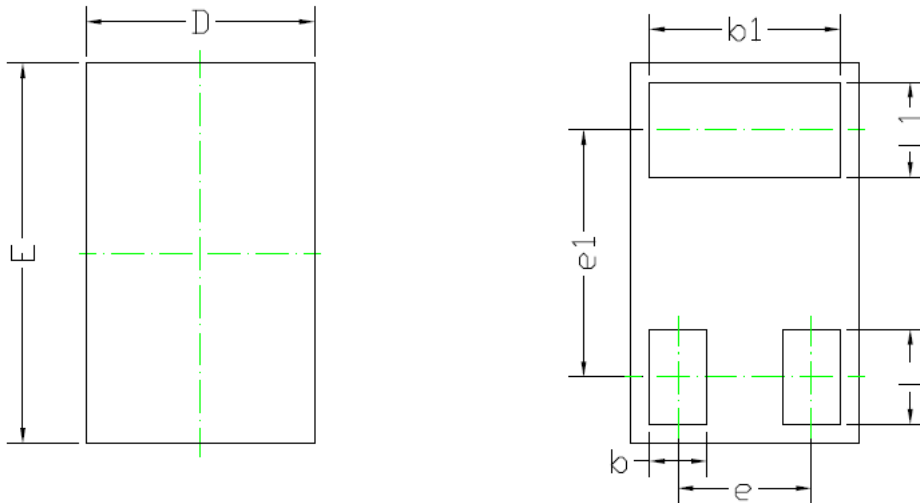


**Fig.7 Switching Time Waveform**

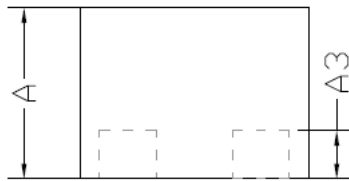


**Fig.8 Gate Charge Waveform**

## SOT883 PACKAGE INFORMATION



SIDE VIEW



SYMBOL	COMMON DIMENSIONS MILLIMETER		
	MIN	NOM.	MAX
	A	0.40	0.45
A3	0.127 BSC		
D	0.55	0.60	0.65
E	0.95	1.00	1.05
e	0.35 BSC		
e1	0.65 BSC		
b	0.13	0.15	0.18
b1	0.45	0.50	0.55
L	0.20	0.25	0.30
L1	0.20	0.25	0.30