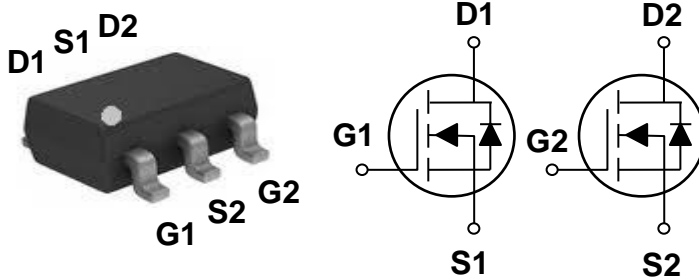


### General Description

These dual 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.

### SOT23-6 Dual Pin Configuration



BVDSS	RDSON	ID
20V	60mΩ	3.6A

### Features

- 20V, 3.6A,  $R_{DS(ON)} = 60m\Omega @ V_{GS} = 4.5V$
- Improved  $dv/dt$  capability
- Fast switching
- Green Device Available
- Suit for 1.8V Gate Drive Applications

### Applications

- Notebook
- Load Switch
- Hand-Held Instruments



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

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	20	V
$V_{GS}$	Gate-Source Voltage	$\pm 10$	V
$I_D$	Drain Current – Continuous ( $T_A=25^\circ\text{C}$ )	3.6	A
	Drain Current – Continuous ( $T_A=70^\circ\text{C}$ )	2.9	A
$I_{DM}$	Drain Current – Pulsed <sup>1</sup>	14.4	A
$P_D$	Power Dissipation ( $T_A=25^\circ\text{C}$ )	1.25	W
	Power Dissipation – Derate above $25^\circ\text{C}$	0.01	W/ $^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	100	$^\circ\text{C/W}$

**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	20	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BV <sub>DSS</sub> Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	0.02	---	V/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	μA
		V <sub>DS</sub> =16V, 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> =±10V, V <sub>DS</sub> =0V	---	---	±100	nA

**On Characteristics**

R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A	---	50	60	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =2A	---	60	80	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =1A	---	85	110	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250μA	0.3	0.5	1	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	2	---	mV/°C
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V, I <sub>S</sub> =2A	---	4.4	---	S

**Dynamic and switching Characteristics**

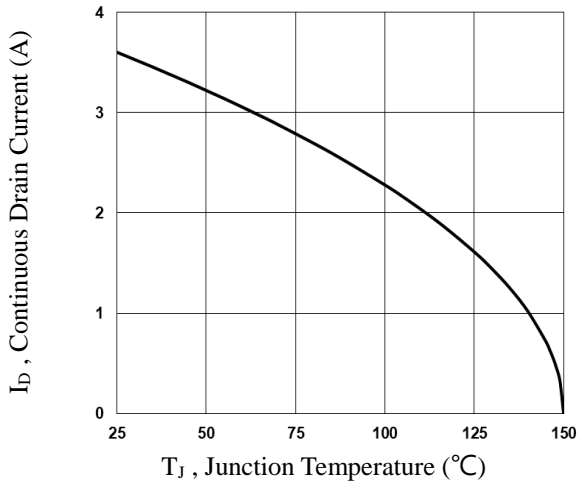
Q <sub>g</sub>	Total Gate Charge <sup>2,3</sup>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =1A	---	3.6	7.2	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>2,3</sup>		---	0.38	0.76	
Q <sub>gd</sub>	Gate-Drain Charge <sup>2,3</sup>		---	0.6	1.2	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>2,3</sup>	V <sub>DD</sub> =10V, V <sub>GS</sub> =4.5V, R <sub>G</sub> =25Ω I <sub>D</sub> =1A	---	1.8	5	nS
T <sub>r</sub>	Rise Time <sup>2,3</sup>		---	5.6	12	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>2,3</sup>		---	11.3	24	
T <sub>f</sub>	Fall Time <sup>2,3</sup>		---	3.2	7	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, F=1MHz	---	180	360	pF
C <sub>oss</sub>	Output Capacitance		---	32	64	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	26	52	

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

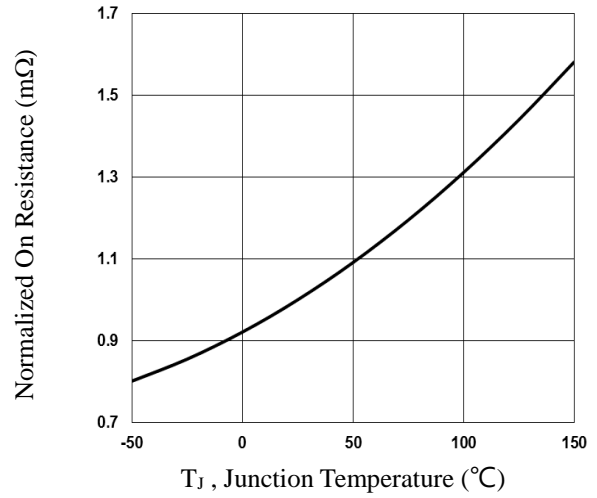
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	3.6	A
I <sub>SM</sub>	Pulsed Source Current		---	---	7.2	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1	V

Note :

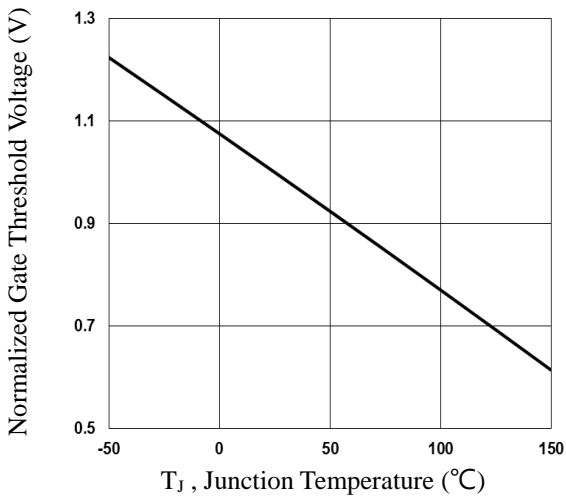
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%.
3. Essentially independent of operating temperature.



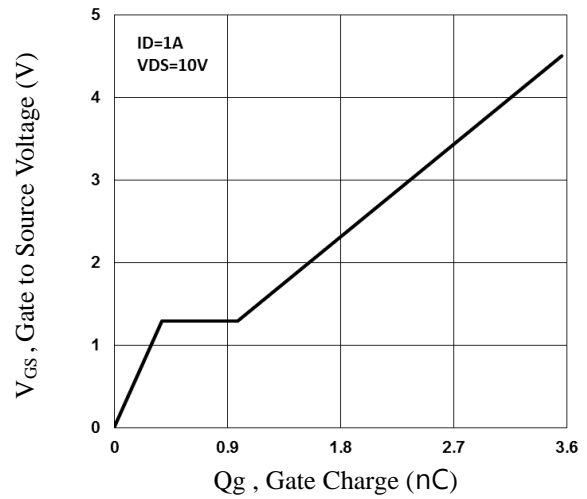
**Fig.1 Continuous Drain Current vs.  $T_J$**



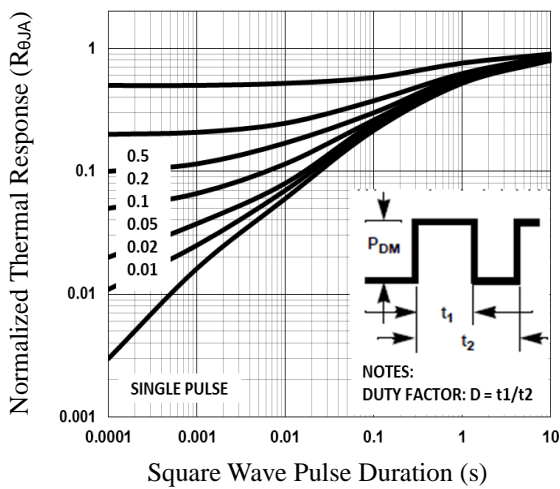
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_J$**



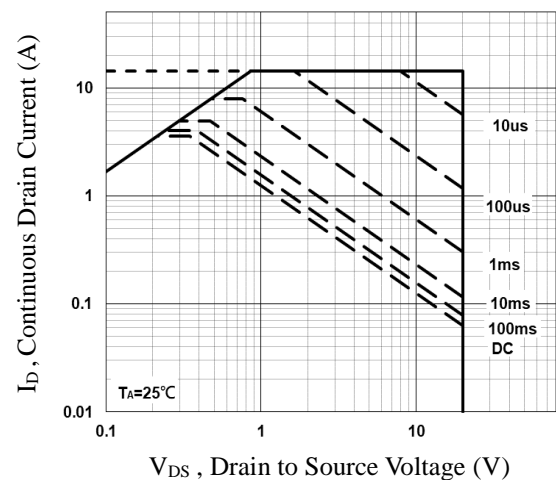
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



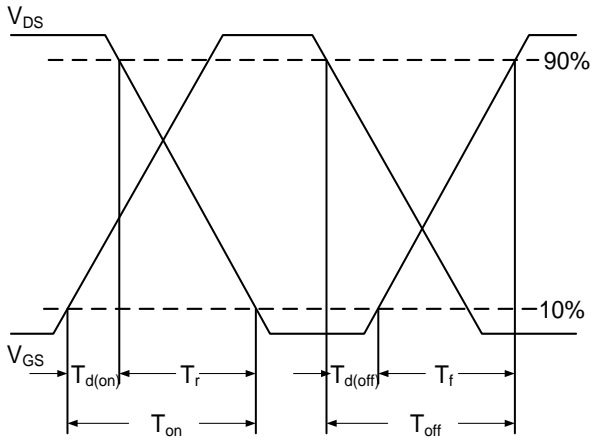
**Fig.4 Gate Charge Waveform**



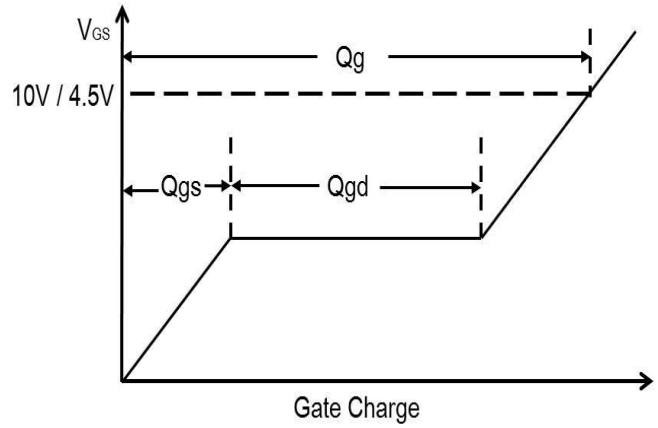
**Fig.5 Normalized Transient Impedance**



**Fig.6 Maximum Safe Operation Area**



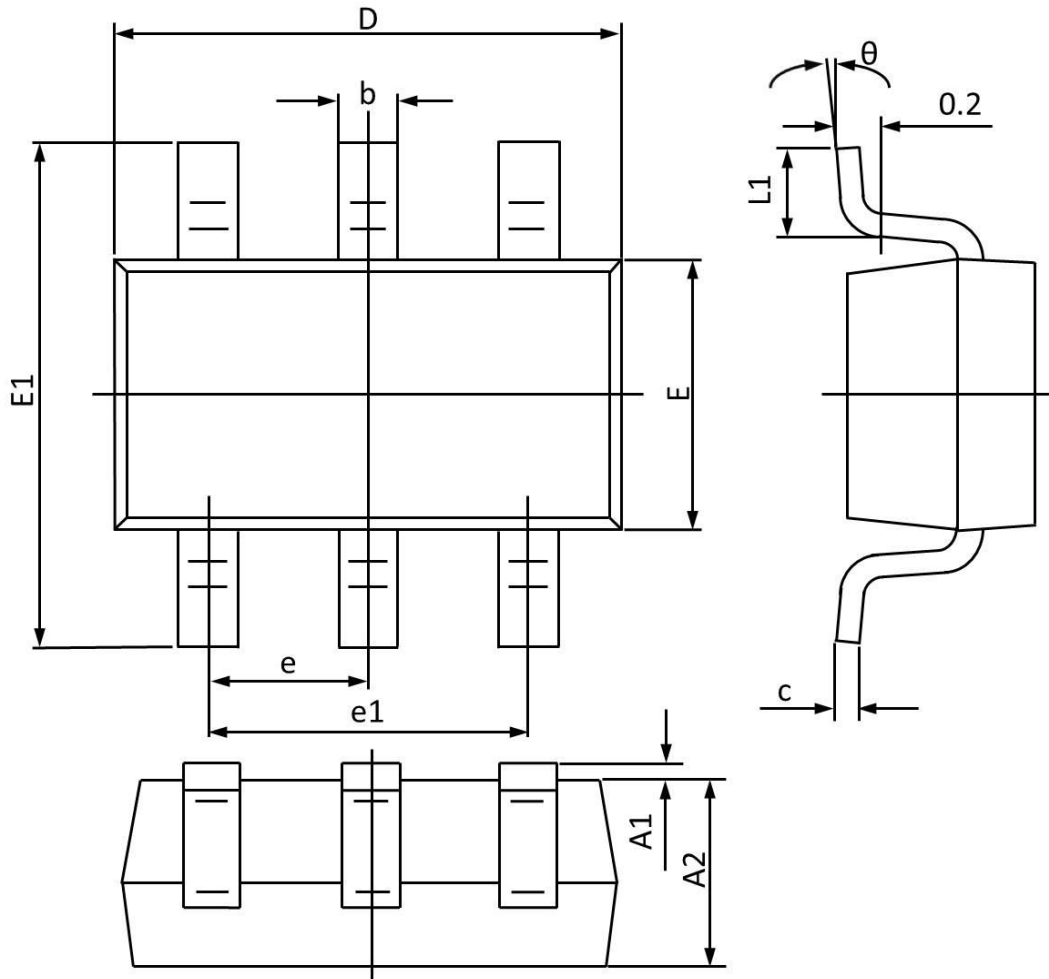
**Fig.7 Switching Time Waveform**



**Fig.8 Gate Charge Waveform**



SOT23-6 Dual PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A1	0.000	0.100	0.000	0.004
A2	1.000	1.200	0.040	0.047
b	0.300	0.500	0.012	0.019
c	0.047	0.207	0.002	0.008
D	2.800	3.000	0.110	0.118
E	1.500	1.800	0.059	0.070
E1	2.600	3.000	0.103	0.118
e	0.950 TYP		0.037 TYP	
e1	1.900 TYP		0.075 TYP	
L1	0.250	0.550	0.010	0.021
$\theta$	0°	8°	0°	8°