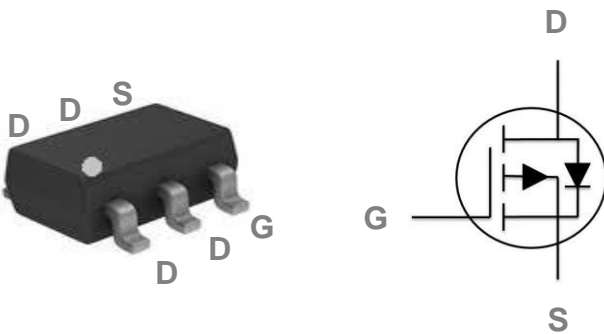


General Description

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.

SOT23-6L Pin Configuration



BVDSS	RDSON	ID
-20V	53mΩ	-4A

Features

- -20V,-4A, $R_{DS(ON)} = 53m\Omega @ V_{GS} = -4.5V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- Suit for -1.8V Gate Drive Applications

Applications

- Notebook
- Load Switch
- Networking

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 10	V
I_D	Drain Current – Continuous ($T_A=25^\circ C$)	-4	A
	Drain Current – Continuous ($T_A=70^\circ C$)	-3.2	A
I_{DM}	Drain Current – Pulsed ¹	-16	A
P_D	Power Dissipation ($T_A=25^\circ C$)	1.56	W
	Power Dissipation – Derate above 25°C	0.012	W/°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	---	80	°C/W

Electrical Characteristics ($T_J=25\text{ }^\circ\text{C}$, unless otherwise noted)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-20V, V_{GS}=0V, T_J=25^\circ C$	---	---	-1	μA
		$V_{DS}=-16V, V_{GS}=0V, T_J=125^\circ C$	---	---	-10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 10V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5V, I_D=-3A$	---	45	53	m Ω
		$V_{GS}=-2.5V, I_D=-2A$	---	58	75	
		$V_{GS}=-1.8V, I_D=-1.5A$	---	75	98	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.4	-0.6	-0.8	V
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_S=-3A$	---	6	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-2A$	---	6.4	9	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	0.9	1.5	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	1.6	3	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=-10V, V_{GS}=-4.5V, R_G=6\Omega$ $I_D=-2A$	---	5	9	nS
T_r	Rise Time ^{2, 3}		---	17.4	33	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	40.7	80	
T_f	Fall Time ^{2, 3}		---	11.4	23	
C_{iss}	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, F=1MHz$	---	540	810	pF
C_{oss}	Output Capacitance		---	80	120	
C_{rss}	Reverse Transfer Capacitance		---	75	115	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-4	A
I_{SM}	Pulsed Source Current		---	---	-8	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ C$	---	---	-1	V

Note :

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

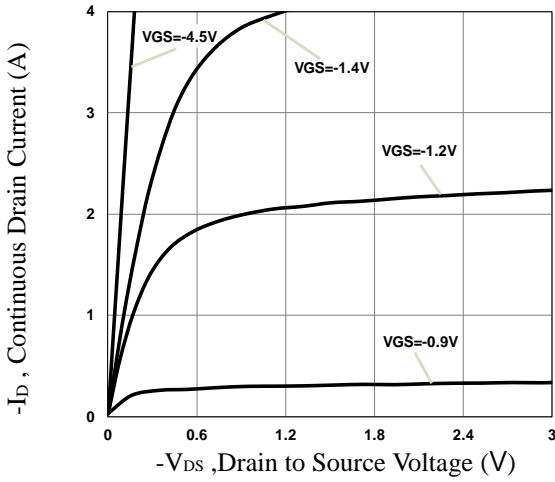


Fig.1 Typical Output Characteristics

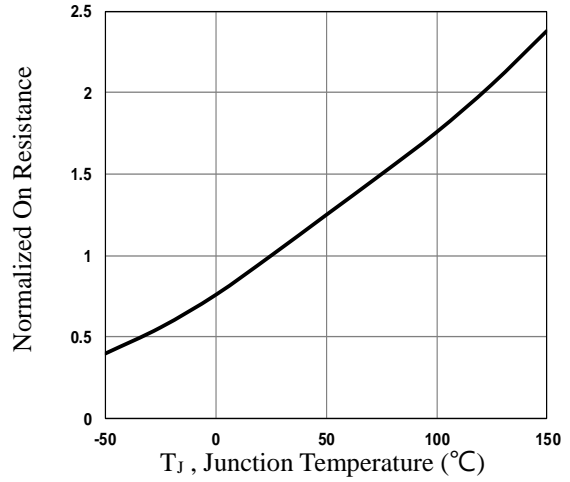


Fig.2 Normalized RDS(on) vs. TJ

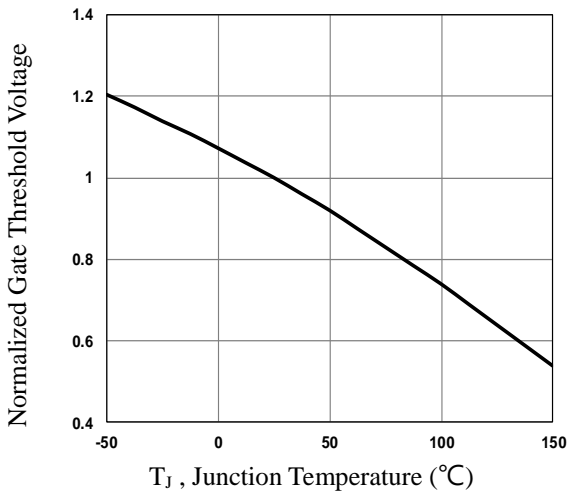


Fig.3 Normalized V_{th} vs. TJ

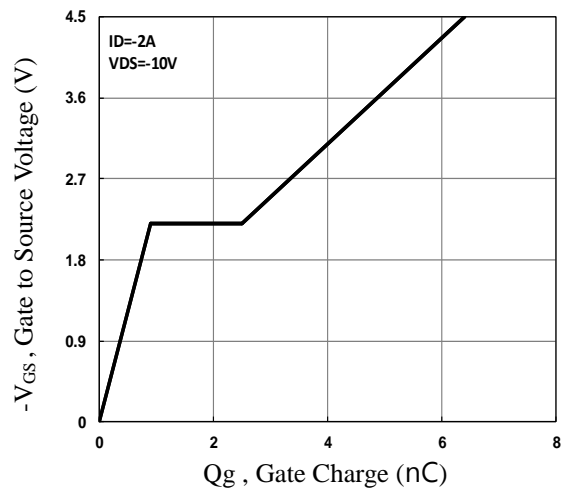


Fig.4 Gate Charge Waveform

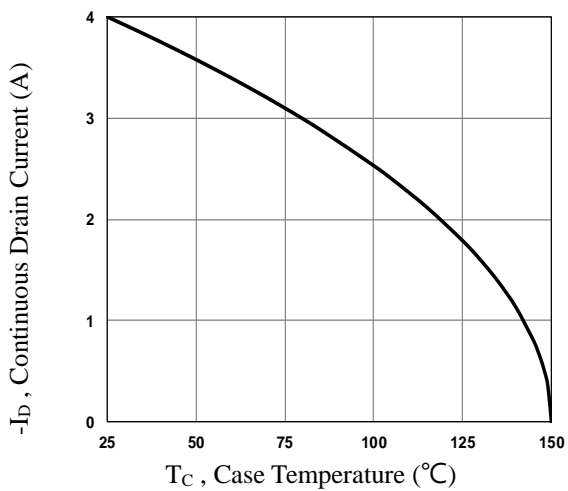


Fig.5 Continuous Drain Current vs. T_c

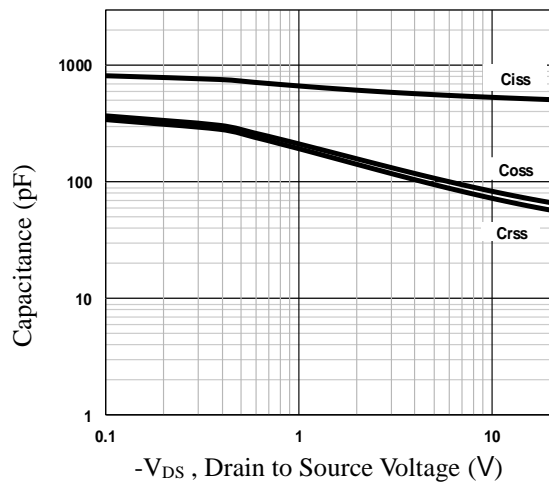


Fig.6 Capacitance Characteristics

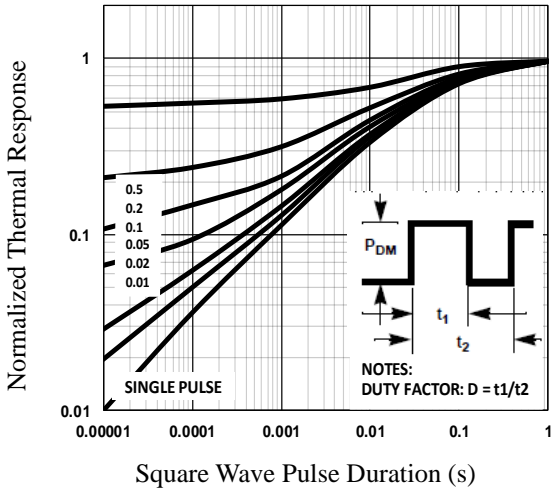


Fig.7 Normalized Transient Impedance

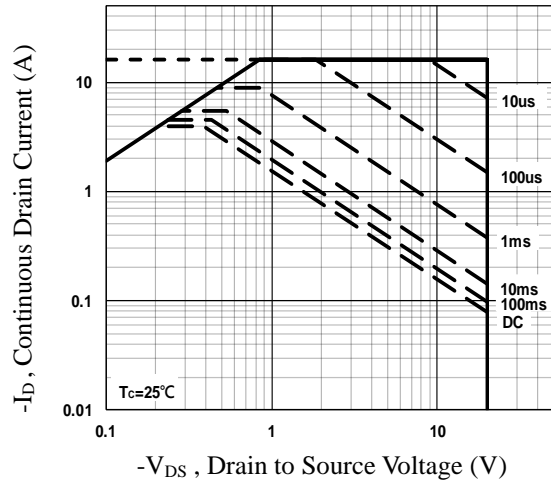


Fig.8 Maximum Safe Operation Area

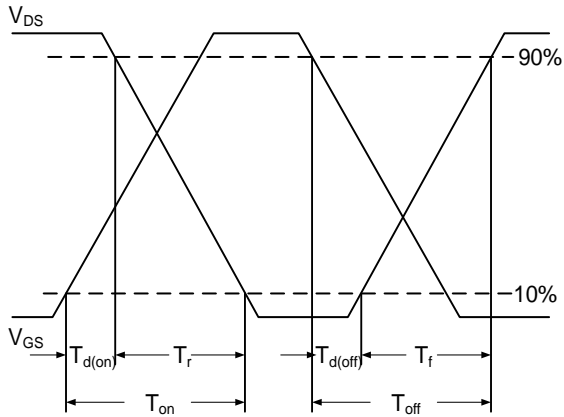


Fig.9 Switching Time Waveform

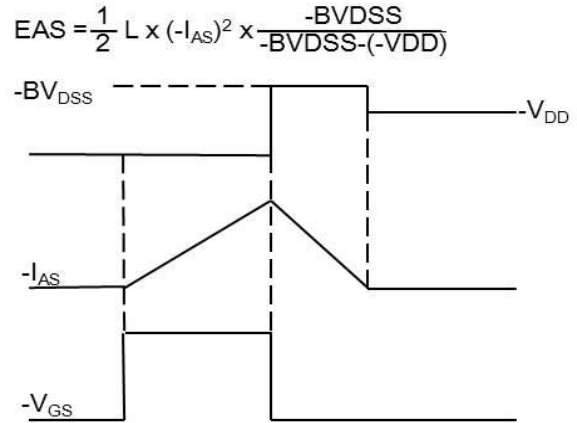
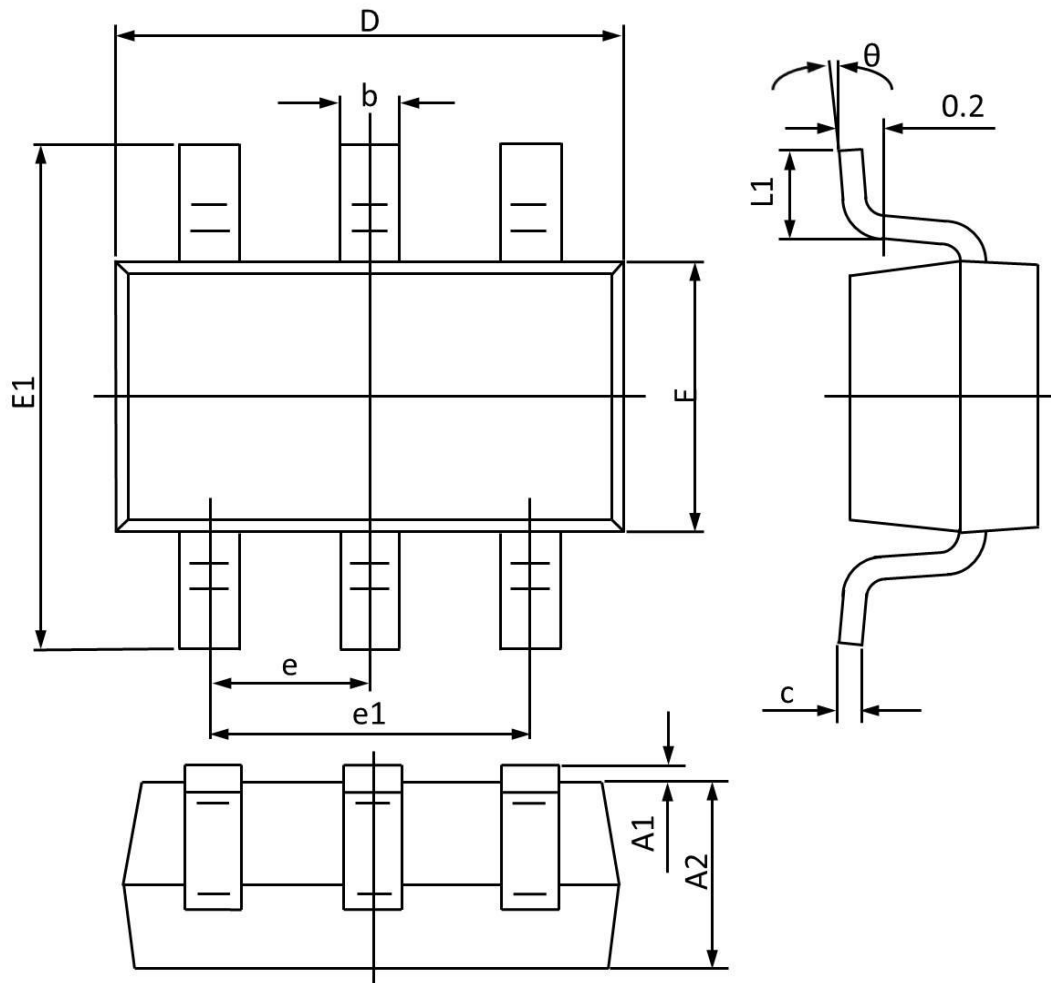


Fig.10 EAS Waveform

SOT23-6 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A1	---	0.150	---	0.006
A2	0.900	1.300	0.035	0.051
b	0.300	0.500	0.012	0.019
c	0.100	0.200	0.004	0.008
D	2.800	3.050	0.110	0.120
E1	2.600	3.000	0.103	0.118
F	1.500	1.800	0.059	0.071
e	0.950 TYP		0.037 TYP	
e1	1.900 TYP		0.075 TYP	
L1	0.250	0.600	0.010	0.024
θ	0°	8°	0°	8°