

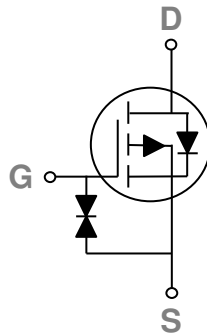
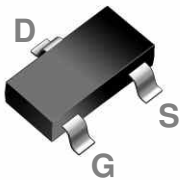
General Description

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.

BVDSS	RDSON	ID
-30V	34mΩ	-5A

Features

- -30V, -5A, $R_{DS(ON)} = 34m\Omega @ V_{GS} = -10V$
- Fast switching
- ESD Protection Diode Embedded
- Green Device Available
- Suit for -4.5V Gate Drive Applications

SOT23 Pin Configuration

Applications

- Notebook
- Load Switch
- 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	± 20	V
I_D	Drain Current – Continuous ($T_A=25^\circ\text{C}$)	-5	A
	Drain Current – Continuous ($T_A=70^\circ\text{C}$)	-3.1	A
I_{DM}	Drain Current – Pulsed ¹	-20	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	1.56	W
	Power Dissipation – Derate above 25°C	0.0125	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-50 to 150	$^\circ\text{C}$

Thermal Characteristics

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

Electrical Characteristics (T_J=25 °C, unless otherwise noted)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-30	---	---	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-30V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-24V, V _{GS} =0V, T _J =85°C	---	---	-10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±20	uA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-2A	---	28.5	34	mΩ
		V _{GS} =-4.5V, I _D =-1.5A	---	43	55	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-1.2	-1.6	-2.5	V
g _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-1A	---	3.5	---	S

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2,3}	V _{DS} =-15V, V _{GS} =-10V, I _D =-3A	---	9.8	15	nC
Q _{gs}	Gate-Source Charge ^{2,3}		---	0.82	1.2	
Q _{gd}	Gate-Drain Charge ^{2,3}		---	2.4	3.6	
T _{d(on)}	Turn-On Delay Time ^{2,3}	V _{DD} =-15V, V _{GS} =-10V, R _G =6Ω I _D =-1A	---	9.2	18	ns
T _r	Rise Time ^{2,3}		---	28	56	
T _{d(off)}	Turn-Off Delay Time ^{2,3}		---	68	136	
T _f	Fall Time ^{2,3}		---	36	72	
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, F=1MHz	---	410	820	pF
C _{oss}	Output Capacitance		---	120	240	
C _{rss}	Reverse Transfer Capacitance		---	58	116	

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	---	---	-5	A
I _{SM}	Pulsed Source Current		---	---	-10	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1	V
T _{rr}	Reverse Recovery Time	V _{GS} =0V, I _S =-5A,	---	175	---	ns
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs, T _J =25°C	---	400	---	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.

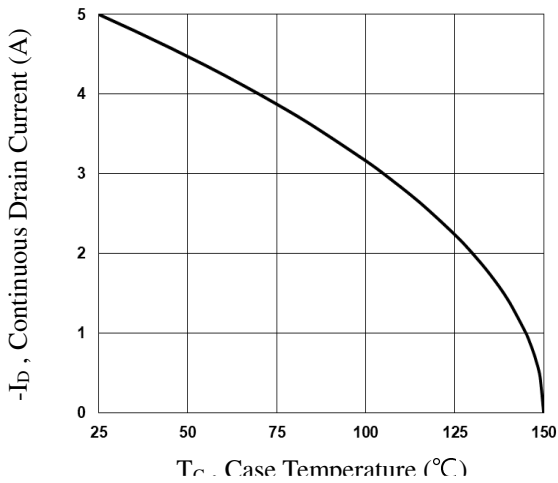


Fig.1 Continuous Drain Current vs. T_c

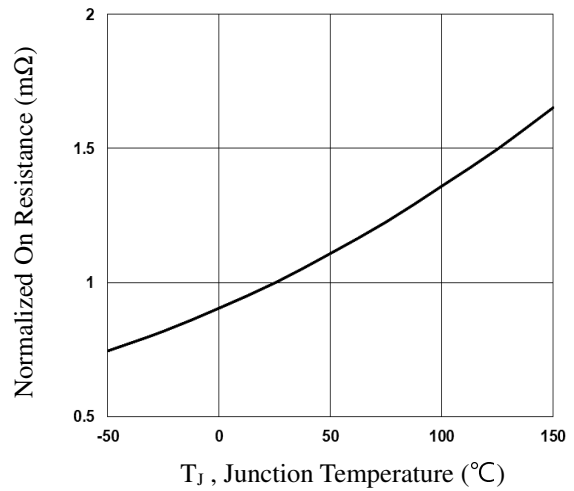


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

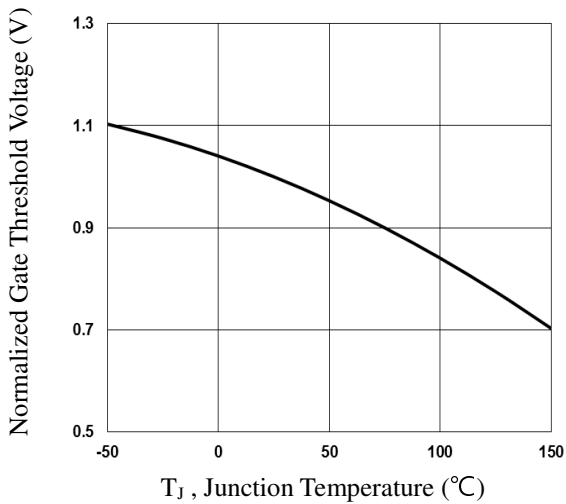


Fig.3 Normalized V_{th} vs. T_j

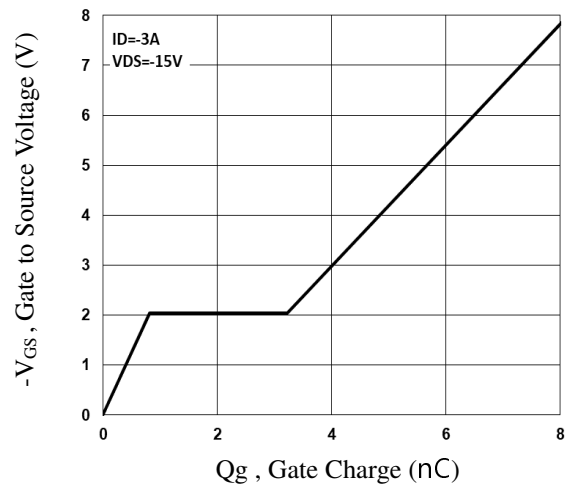


Fig.4 Gate Charge Waveform

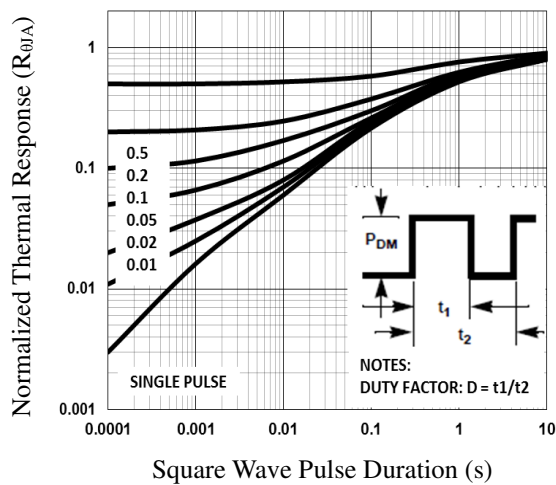


Fig.5 Normalized Transient Impedance

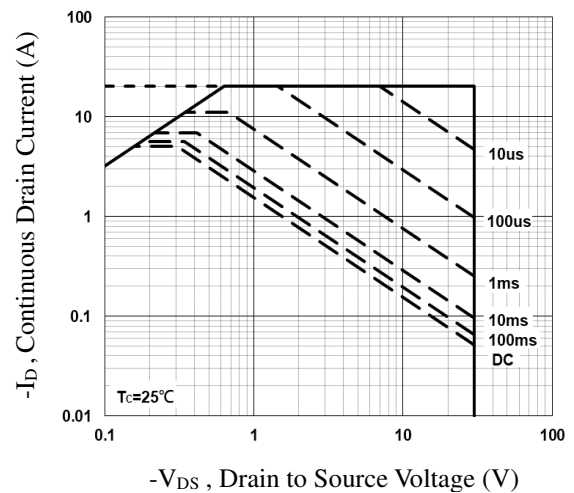


Fig.6 Maximum Safe Operation Area

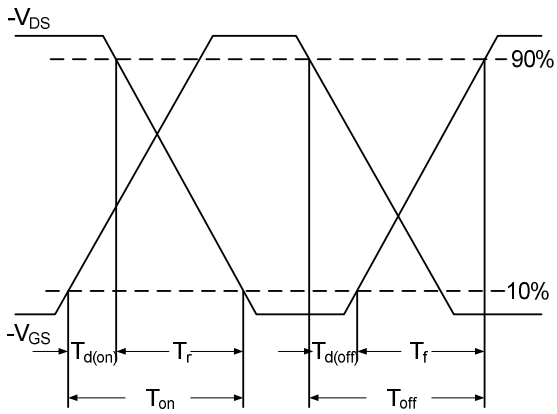


Fig.7 Switching Time Waveform

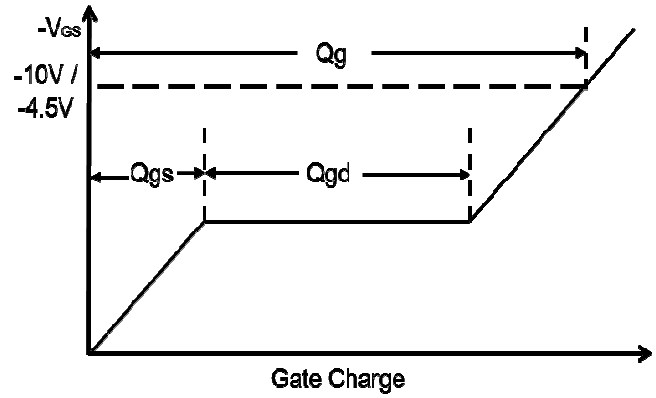
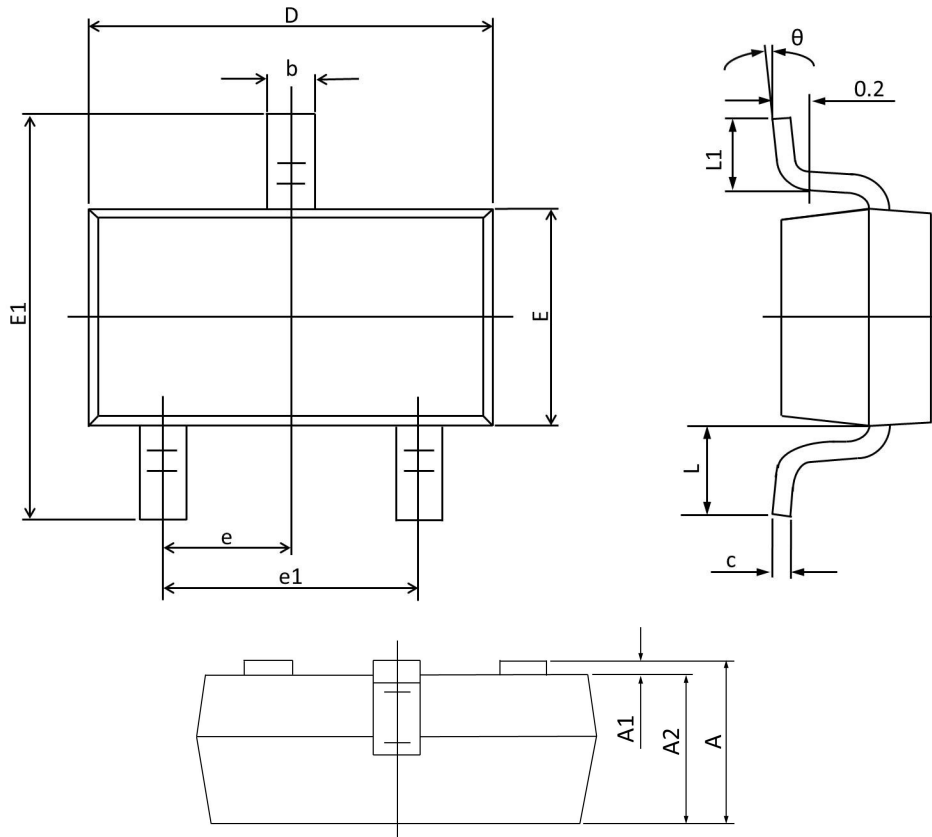


Fig.8 Gate Charge Waveform

SOT23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.400	0.012	0.016
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.700 REF.		0.028 REF.	
L1	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°