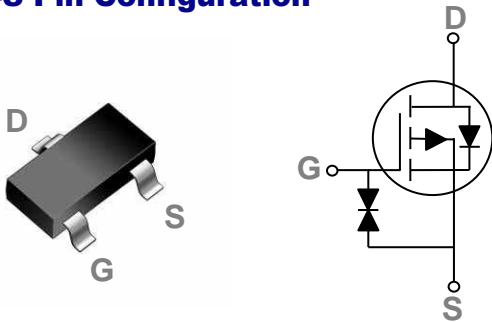


General Description

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-S Pin Configuration



BVDSS	RDSON	ID
-20V	600mΩ	-1A

Features

- -20V, -1A, $R_{DS(ON)} = 600m\Omega @ V_{GS} = -4.5V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- Suit for -1.5V 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	-20	V
V_{GS}	Gate-Source Voltage	± 8	V
I_D	Drain Current – Continuous ($T_A=25^\circ C$)	-1	A
	Drain Current – Continuous ($T_A=70^\circ C$)	-0.8	A
I_{DM}	Drain Current – Pulsed ¹	-4	A
P_D	Power Dissipation ($T_A=25^\circ C$)	1	W
	Power Dissipation – Derate above $25^\circ C$	8	mW/ $^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	125	$^\circ C/W$

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	-20	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.01	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =-20V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-16V, V _{GS} =0V, T _J =125°C	---	---	-10	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±8V, V _{DS} =0V	---	---	±20	uA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-4.5V, I _D =-0.3A	---	440	600	mΩ
		V _{GS} =-2.5V, I _D =-0.2A	---	610	850	
		V _{GS} =-1.8V, I _D =-0.1A	---	810	1200	
		V _{GS} =-1.5V, I _D =-0.1A	---	1020	1600	
		V _{GS} =-1.2V, I _D =-0.1A	---	1800	3000	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-0.3	-0.6	-1.0	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	3	---	mV/°C

Dynamic and switching Characteristics

Q _g	Total Gate Charge ^{2, 3}	V _{DS} =-10V, V _{GS} =-4.5V, I _D =-0.2A	---	1	2	nC
Q _{gs}	Gate-Source Charge ^{2, 3}		---	0.28	0.5	
Q _{gd}	Gate-Drain Charge ^{2, 3}		---	0.18	0.4	
T _{d(on)}	Turn-On Delay Time ^{2, 3}	V _{DD} =-10V, V _{GS} =-4.5V, R _G =10Ω I _D =-0.2A	---	8	16	ns
T _r	Rise Time ^{2, 3}		---	5.2	10	
T _{d(off)}	Turn-Off Delay Time ^{2, 3}		---	30	60	
T _f	Fall Time ^{2, 3}		---	18	36	
C _{iss}	Input Capacitance	V _{DS} =-10V, V _{GS} =0V, F=1MHz	---	40	78	pF
C _{oss}	Output Capacitance		---	15	30	
C _{rss}	Reverse Transfer Capacitance		---	6.5	13	

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	---	---	-1	A
I _{SM}	Pulsed Source Current		---	---	-2	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =-0.2A, T _J =25°C	---	---	-1	V

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.

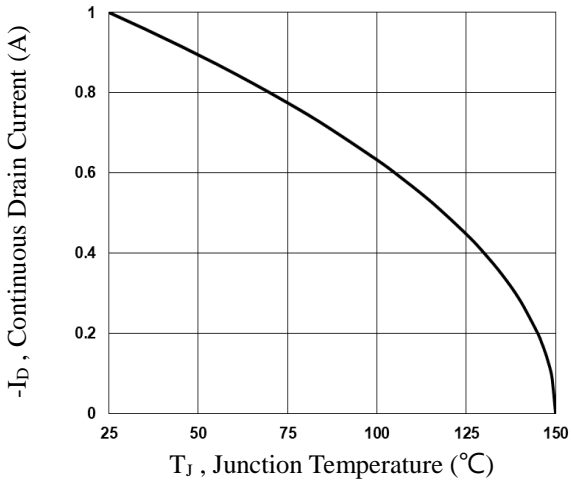


Fig.1 Continuous Drain Current vs. T_c

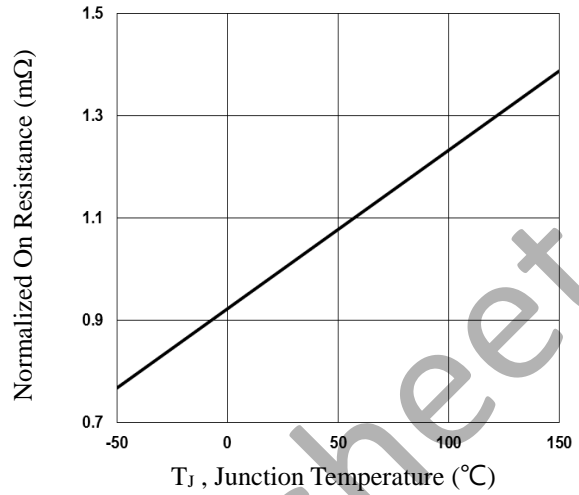


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

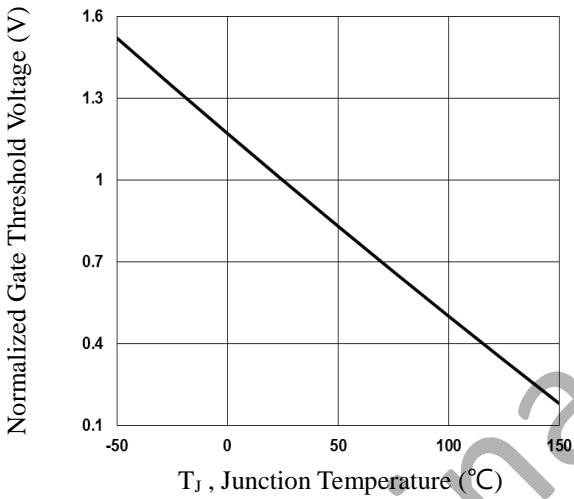


Fig.3 Normalized V_{th} vs. T_J

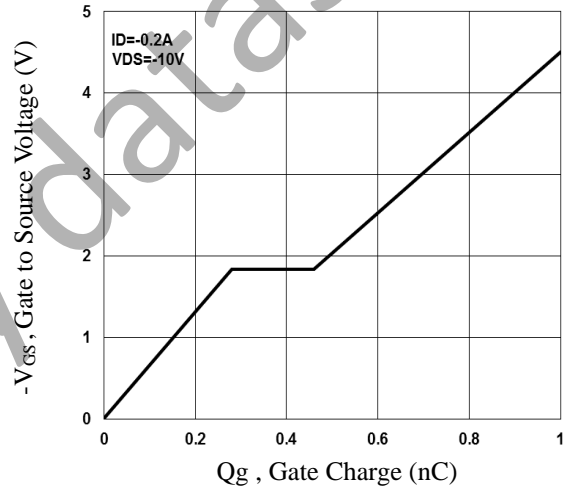


Fig.4 Gate Charge Waveform

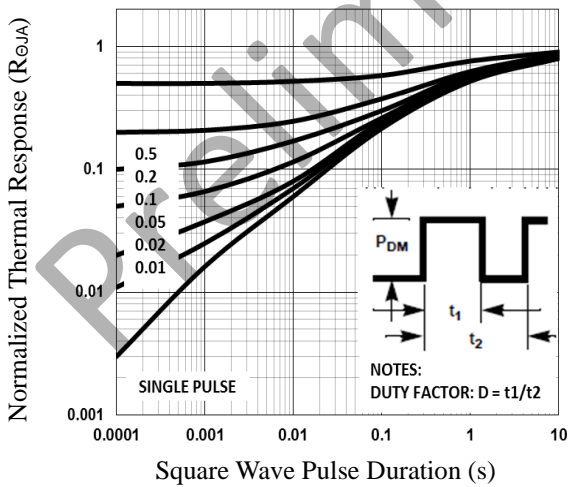


Fig.5 Normalized Transient Response

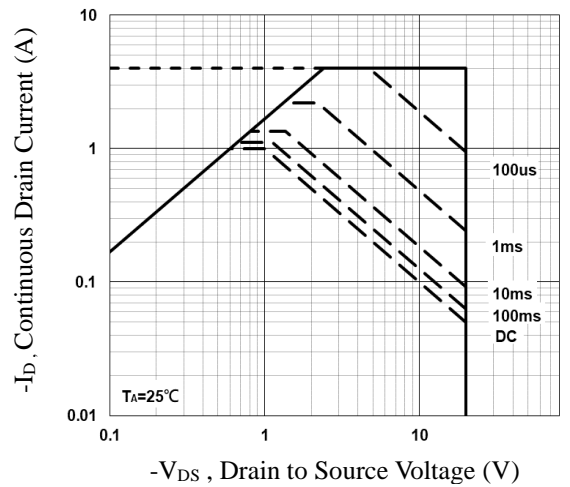


Fig.6 Maximum Safe Operation Area

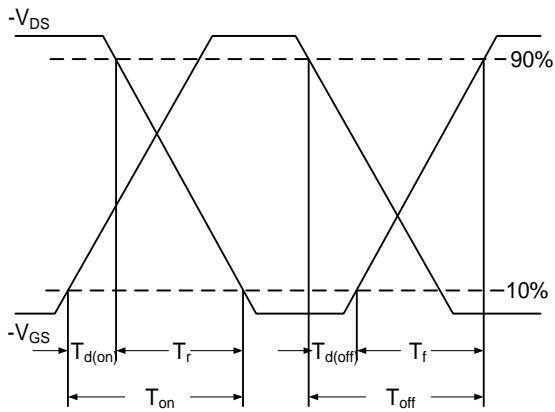


Fig.7 Switching Time Waveform

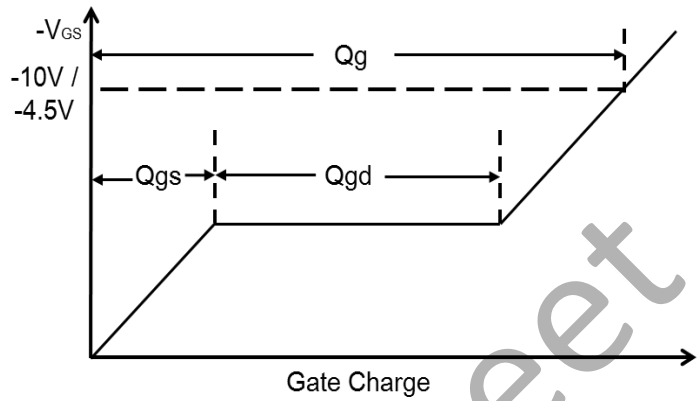
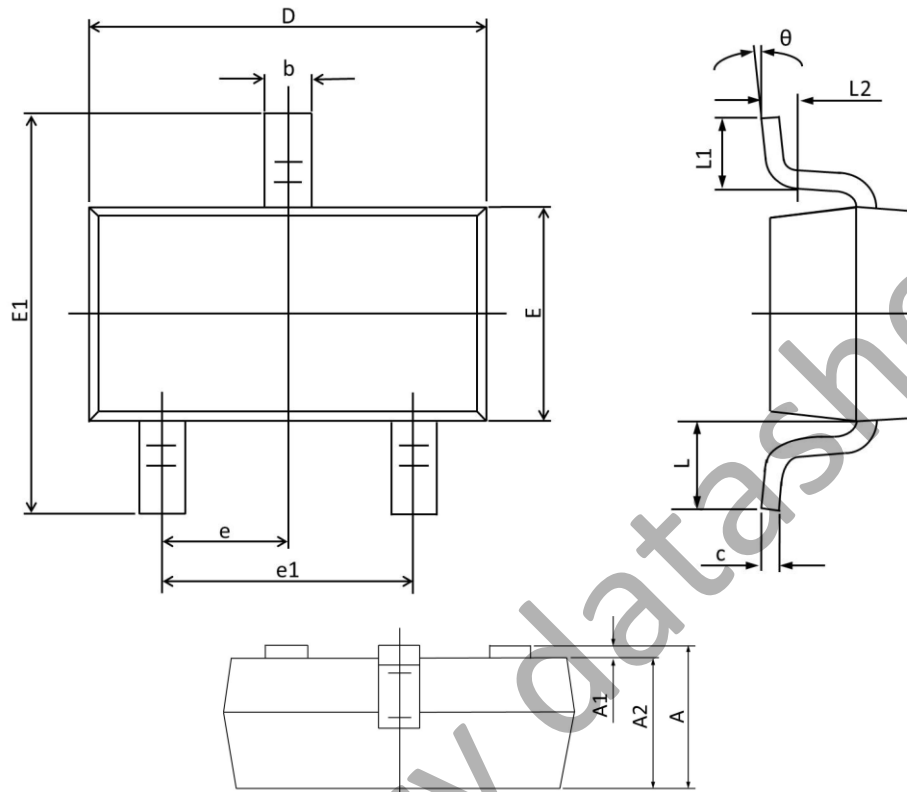


Fig.8 Gate Charge Waveform

Preliminary datasheet

SOT23-3S PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Max	Min	Max	Min
A	1.150	0.900	0.045	0.035
A1	0.100	0.000	0.004	0.000
A2	1.050	0.900	0.041	0.035
b	0.500	0.300	0.020	0.012
c	0.150	0.080	0.006	0.003
D	3.000	2.800	0.118	0.110
E	1.400	1.200	0.055	0.047
E1	2.550	2.250	0.100	0.089
e	0.95 TYP.		0.037 TYP.	
e1	2.000	1.800	0.079	0.071
L	0.55 REF.		0.022 REF.	
L1	0.500	0.300	0.020	0.012
L2	0.25 TYP.		0.01 TYP.	
θ	8°	0°	8°	0°