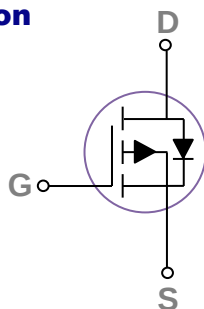
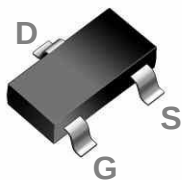


General Description

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.

SOT23-3S Pin Configuration



BVDSS	RDS(ON)	ID
-30V	65mΩ	-4.1A

Features

- -30V, -4.1A, $R_{DS(ON)} = 65m\Omega @ V_{GS} = -10V$
- AEC-Q101 qualified
- Fast switching
- Green Device Available
- Suit for -2.5V Gate Drive Applications

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	± 12	V
I_D	Drain Current – Continuous ($T_A=25^\circ\text{C}$)	-4.1	A
	Drain Current – Continuous ($T_A=70^\circ\text{C}$)	-3.3	A
I_{DM}	Drain Current – Pulsed ¹	-16.4	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	1.56	W
	Power Dissipation – Derate above 25°C	0.012	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	---	80	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-30	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-30V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-24V$, $V_{GS}=0V$, $T_J=125^\circ\text{C}$	---	---	-10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V$, $V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-10V$, $I_D=-4A$	---	55	65	$m\Omega$
		$V_{GS}=-4.5V$, $I_D=-3A$	---	65	75	$m\Omega$
		$V_{GS}=-2.5V$, $I_D=-2A$	---	85	100	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-0.4	-0.7	-0.9	V

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=-15V$, $V_{GS}=-4.5V$, $I_D=-4A$	---	8	11	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	1.9	3	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	1.4	3	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=-15V$, $V_{GS}=-10V$, $R_G=6\Omega$ $I_D=-1A$	---	5.4	10	ns
T_r	Rise Time ^{2, 3}		---	19.4	37	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	45.9	87	
T_f	Fall Time ^{2, 3}		---	12.4	24	
C_{iss}	Input Capacitance	$V_{DS}=-15V$, $V_{GS}=0V$, $F=1\text{MHz}$	---	810	1175	pF
C_{oss}	Output Capacitance		---	85	125	
C_{rss}	Reverse Transfer Capacitance		---	50	75	

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	---	---	-4.1	A
I_{SM}	Pulsed Source Current		---	---	-16.4	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^\circ\text{C}$	---	---	-1	V
t_{rr}	Reverse Recovery Time	$V_R=-30V$, $I_S=-2A$	---	115	---	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	150	---	nC

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.

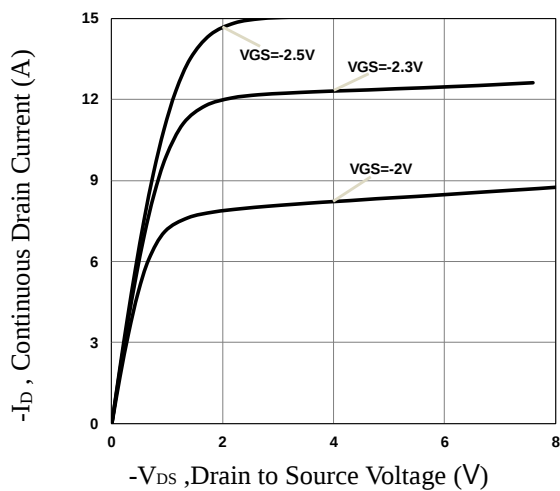


Fig.1 Typical Output Characteristics

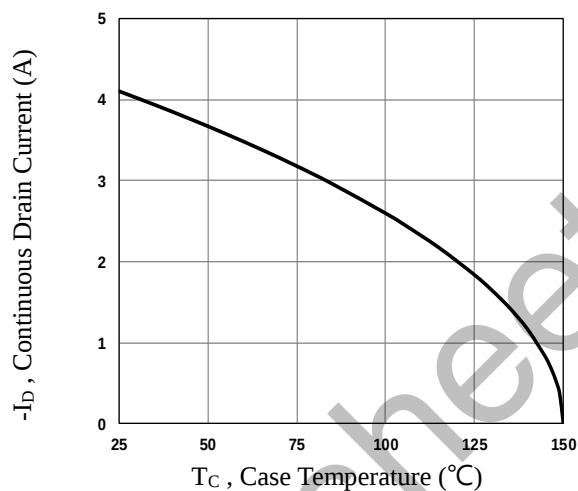


Fig.2 Continuous Drain Current vs. T_C

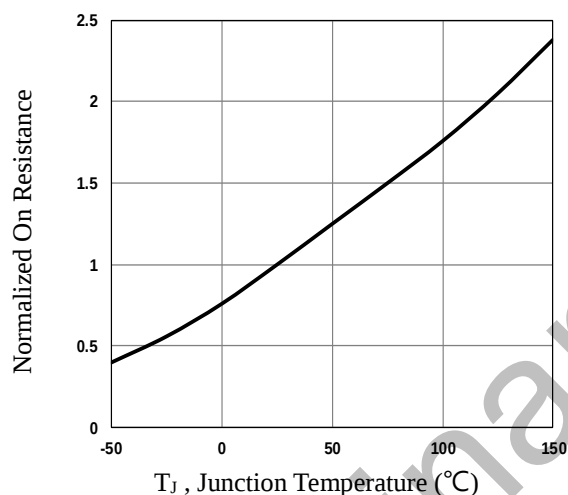


Fig.3 Normalized $R_{DS(on)}$ vs. T_J

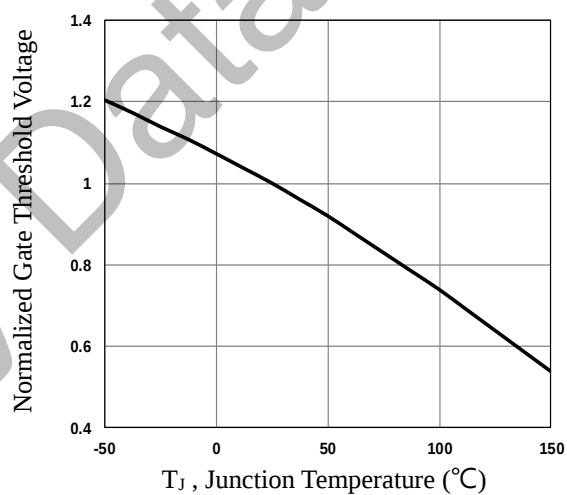


Fig.4 Normalized V_{th} vs. T_J

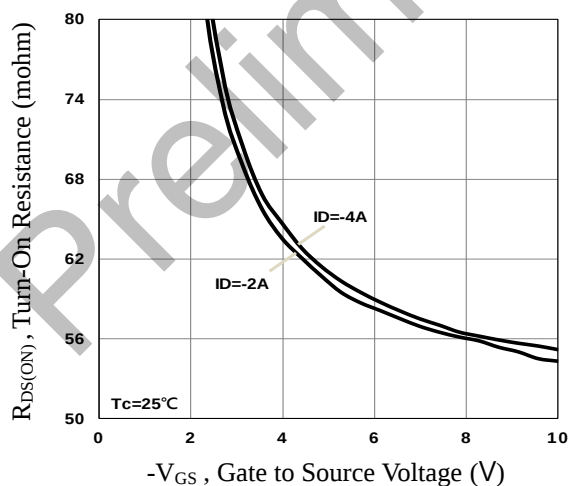


Fig.5 Turn-On Resistance vs. V_{GS}

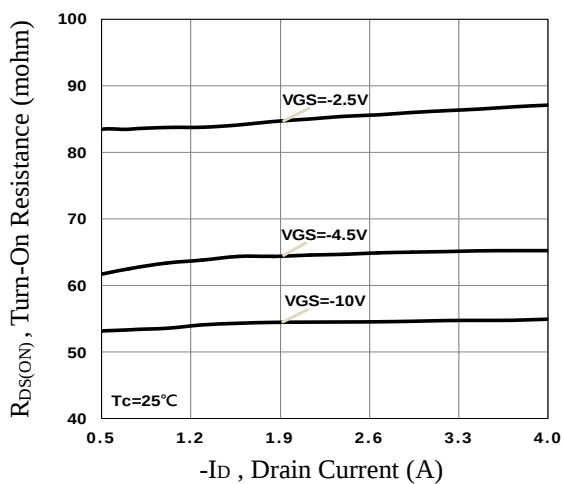
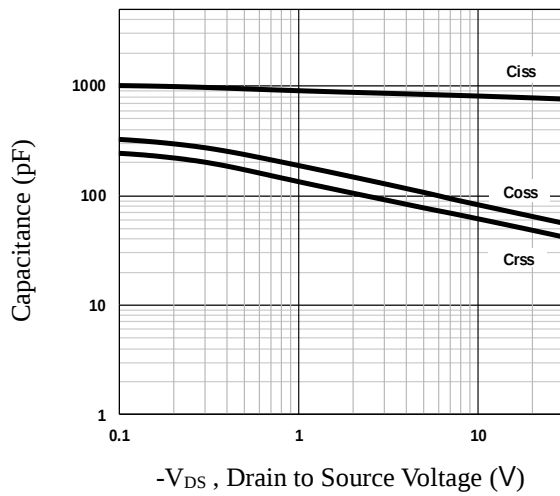
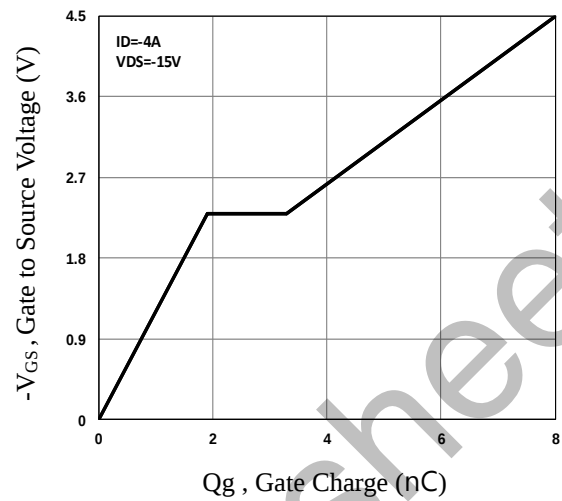
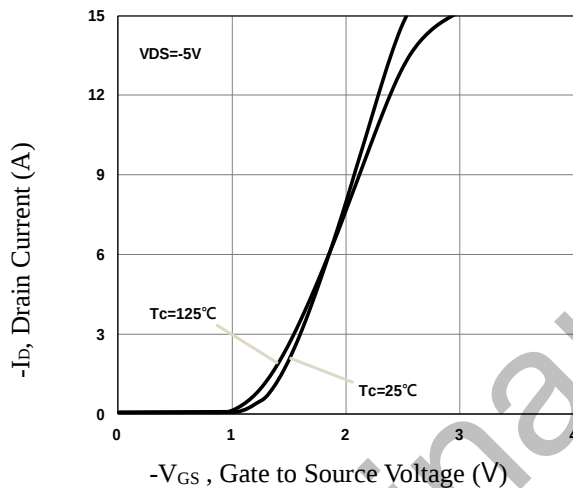
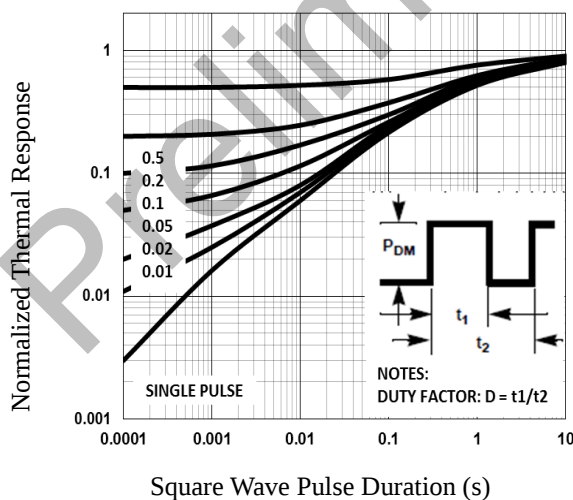
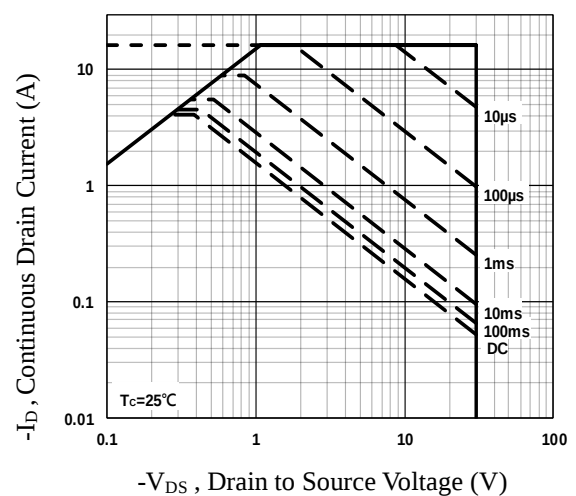
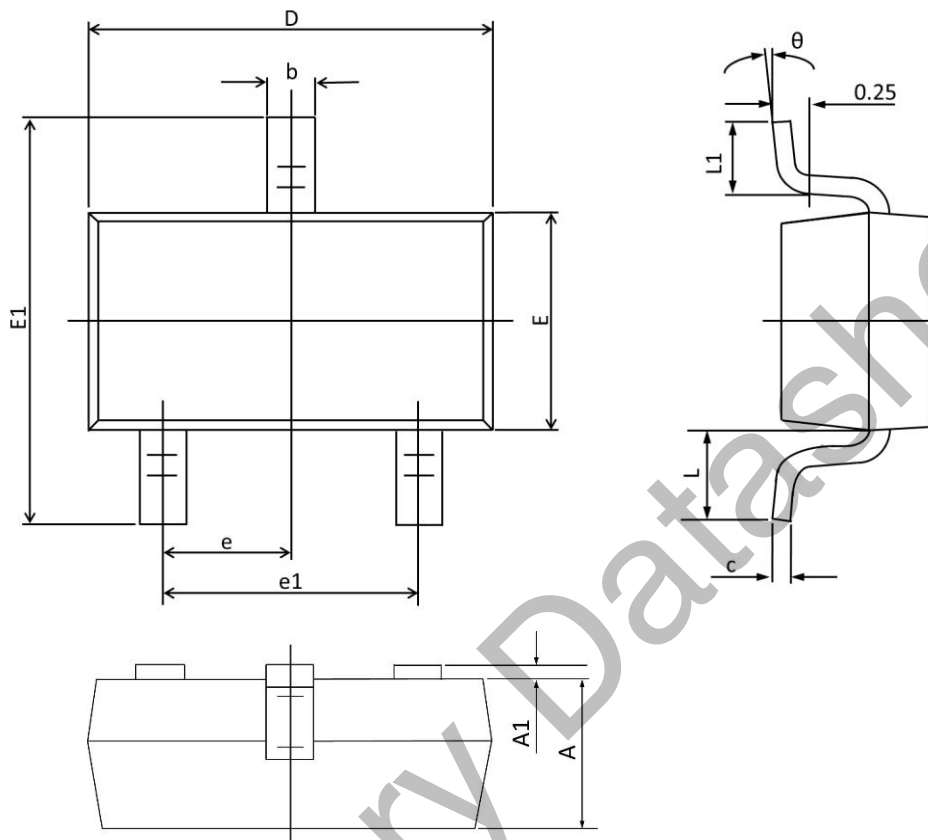


Fig.6 Turn-On Resistance vs. I_D

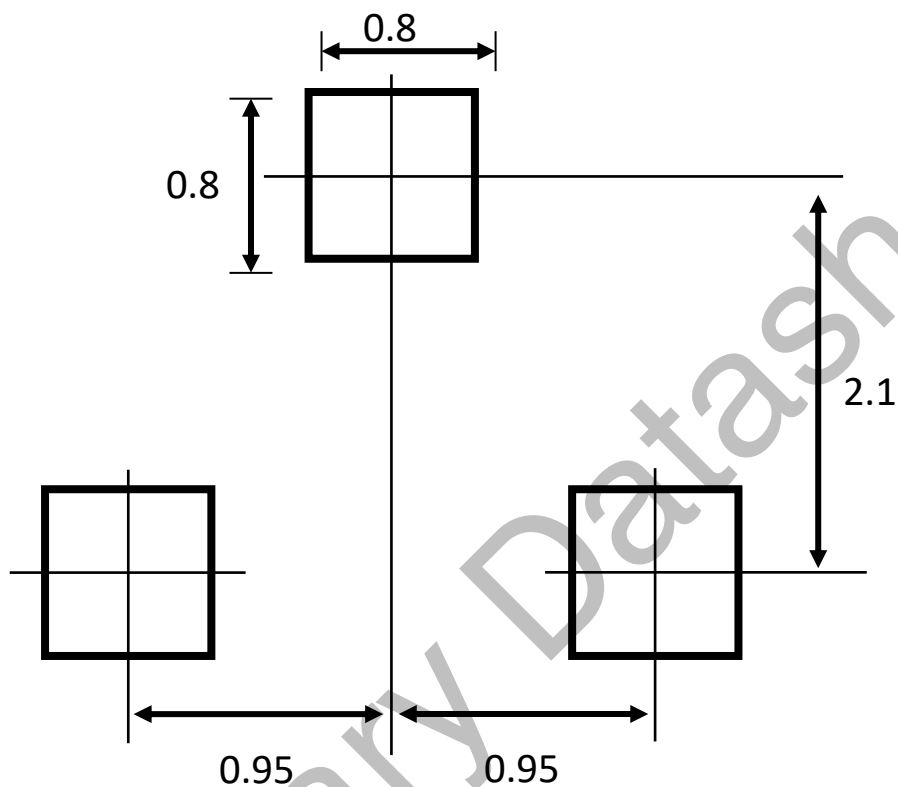

Fig.7 Capacitance Characteristics

Fig.8 Gate Charge Characteristics

Fig.9 Transfer Characteristics

Fig.10 Normalized Transient Impedance

Fig.11 Maximum Safe Operation Area

SOT23-3S PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.001	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.080	0.180	0.003	0.008
D	2.700	3.100	0.106	0.122
E	1.100	1.500	0.043	0.059
E1	2.100	2.640	0.080	0.104
e	0.950 TYP.		0.037 TYP.	
e1	1.780	2.040	0.070	0.080
L	0.550 REF.		0.022 REF.	
L1	0.100	0.500	0.004	0.020
θ	1°	10°	1°	10°

SOT23-3S RECOMMENDED LAND PATTERN



unit : mm