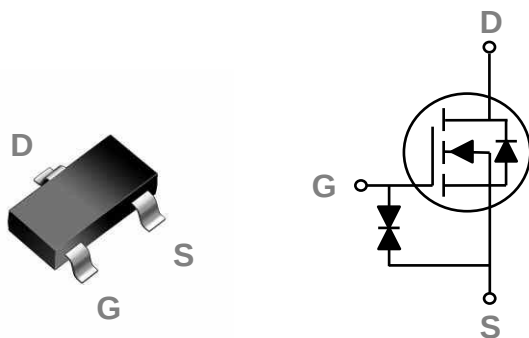


General Description

These 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.

SOT23-3 Pin Configuration



BVDSS	RDS(ON)	ID
100V	46mΩ	3.5A

Features

- 100V,3.5A, $R_{DS(ON)} = 46m\Omega$ @ $V_{GS} = 10V$
- Improved dv/dt capability
- Fast switching
- Green Device Available
- ESD Protection Diode Embedded

Applications

- Notebook
- Load Switch
- LED applications
- Hand-held Instruments

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_A=25^\circ\text{C}$)	3.5	A
	Drain Current – Continuous ($T_A=70^\circ\text{C}$)	2.7	A
I_{DM}	Drain Current – Pulsed ¹	14	A
P_D	Power Dissipation ($T_A=25^\circ\text{C}$)	1.56	W
	Power Dissipation – Derate above 25°C	12.5	mW/ $^\circ\text{C}$
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	$V_{GS}=0V$, $I_D=250\mu A$	100	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=100V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=80V$, $V_{GS}=0V$, $T_J=85^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 20	μA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=2A$	---	38	46	$m\Omega$
		$V_{GS}=4.5V$, $I_D=1.5A$	---	52	67	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.2	1.6	2.5	V

Dynamic and switching Characteristics²

Q_g	Total Gate Charge	$V_{DS}=50V$, $V_{GS}=10V$, $I_D=2A$	---	7	14	nC
		$V_{DS}=50V$, $V_{GS}=4.5V$, $I_D=2A$	---	4	8	
			---	0.7	1.5	
Q_{gs}	Gate-Source Charge	$V_{DS}=50V$, $V_{GS}=10V$, $R_G=6\Omega$	---	2	4	ns
Q_{gd}	Gate-Drain Charge		---	6	12	
$T_{d(on)}$	Turn-On Delay Time	$I_D=2A$	---	10	20	
T_r	Rise Time		---	20	40	
$T_{d(off)}$	Turn-Off Delay Time		---	13	25	
T_f	Fall Time	$V_{DS}=50V$, $V_{GS}=0V$, $F=1\text{MHz}$	---	360	700	pF
C_{iss}	Input Capacitance		---	80	150	
C_{oss}	Output Capacitance		---	6	12	
C_{rss}	Reverse Transfer Capacitance	$V_{GS}=0V$, $V_{DS}=0V$, $F=1\text{MHz}$	---	0.4	---	Ω
R_g	Gate resistance					

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	---	---	3.5	A
I_{SM}	Pulsed Source Current		---	---	7	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	$V_R=50V$, $I_S=2A$	---	40	---	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	50	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. Essentially independent of operating temperature.

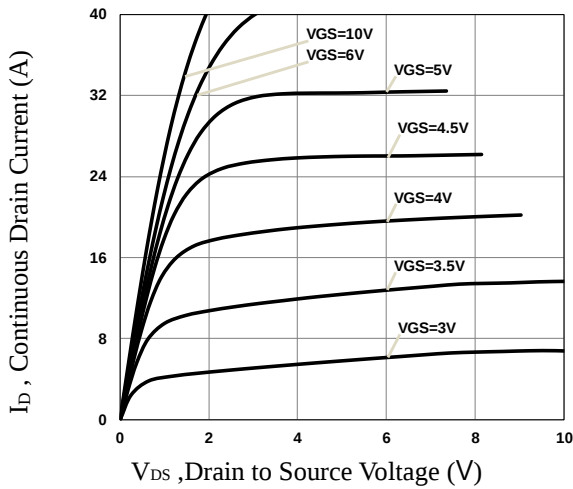


Fig.1 Typical Output Characteristics

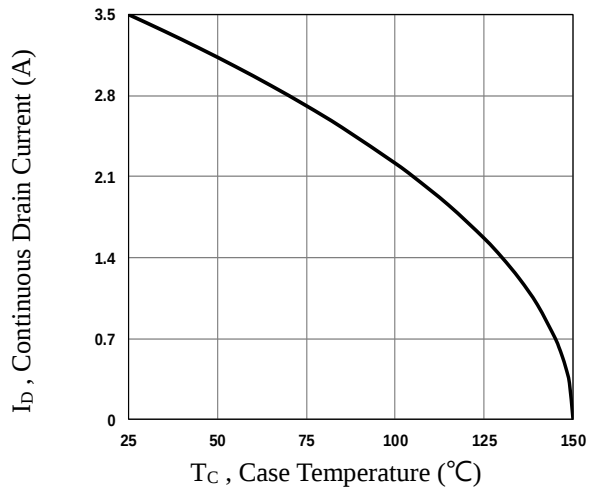


Fig.2 Continuous Drain Current vs. T_C

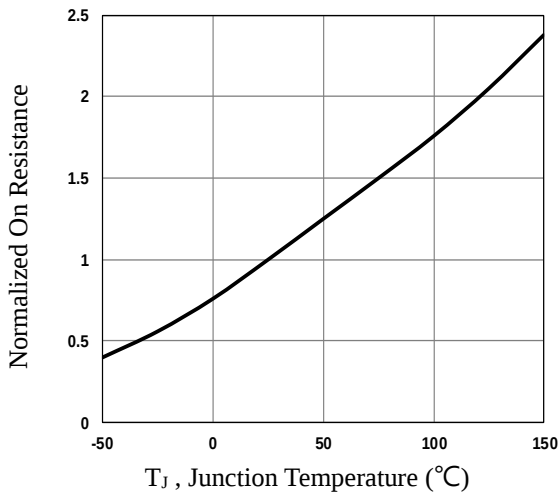


Fig.3 Normalized R_{DS(on)} vs. T_J

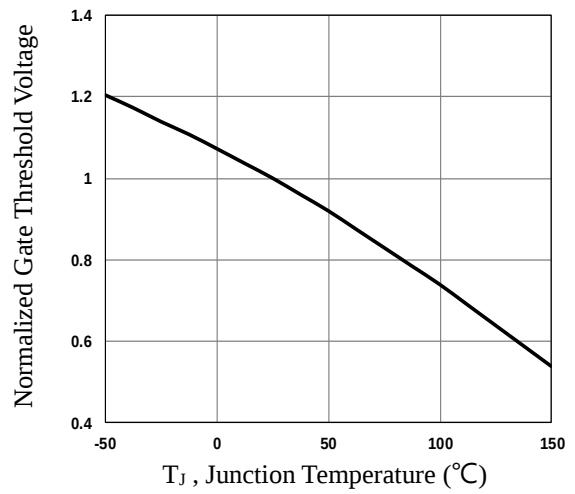


Fig.4 Normalized V_{th} vs. T_J

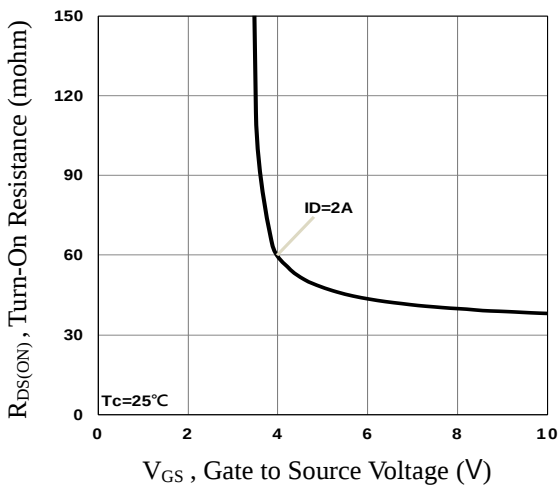


Fig.5 Turn-On Resistance vs. V_{GS}

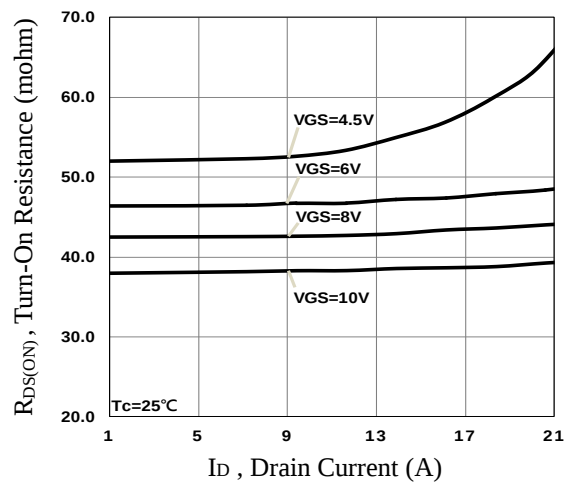
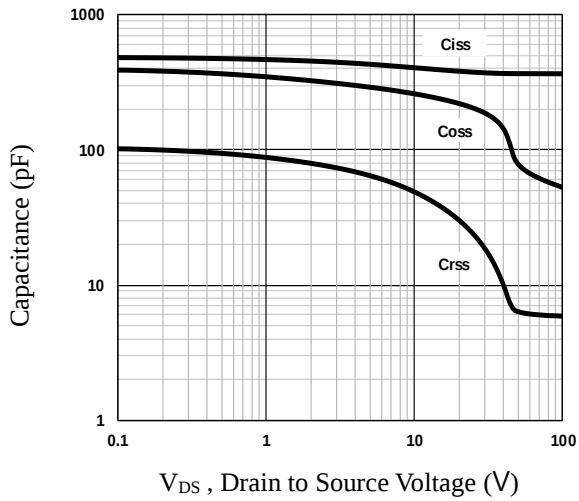
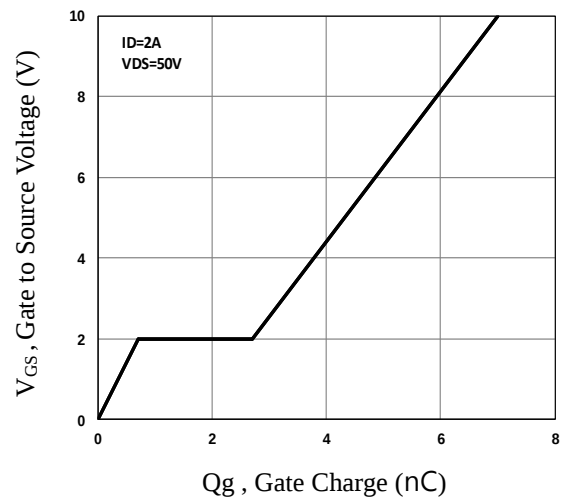
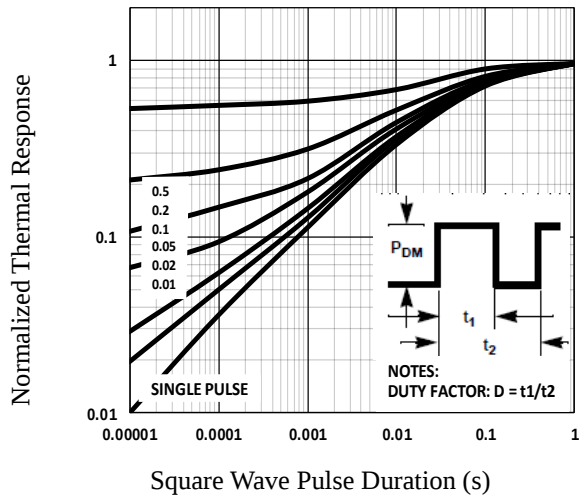
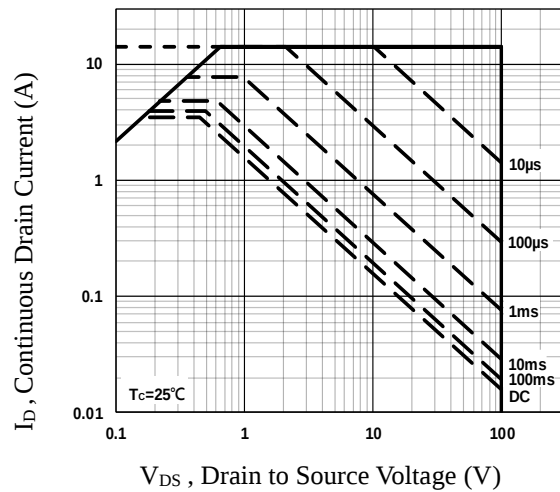
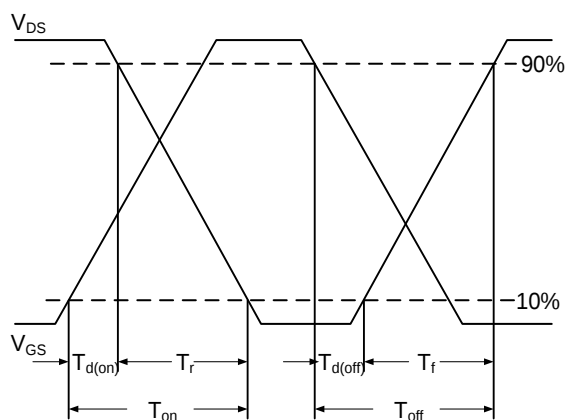
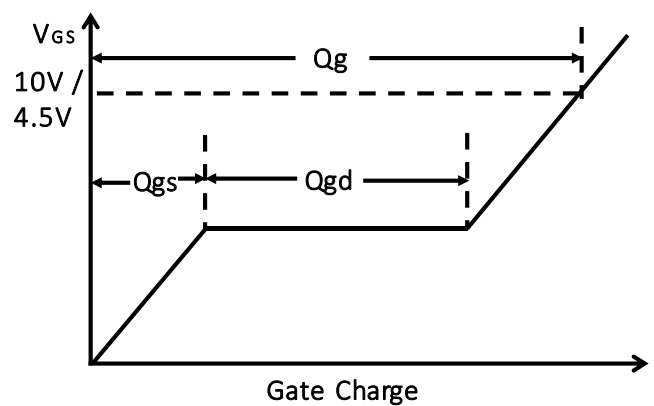
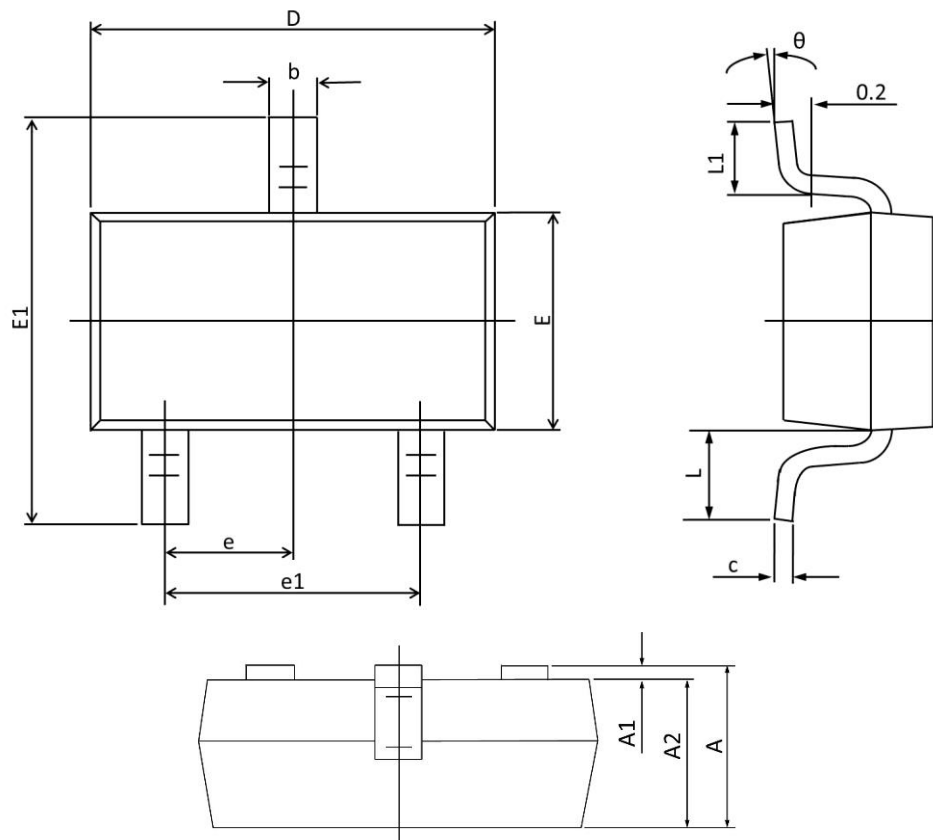


Fig.6 Turn-On Resistance vs. I_D

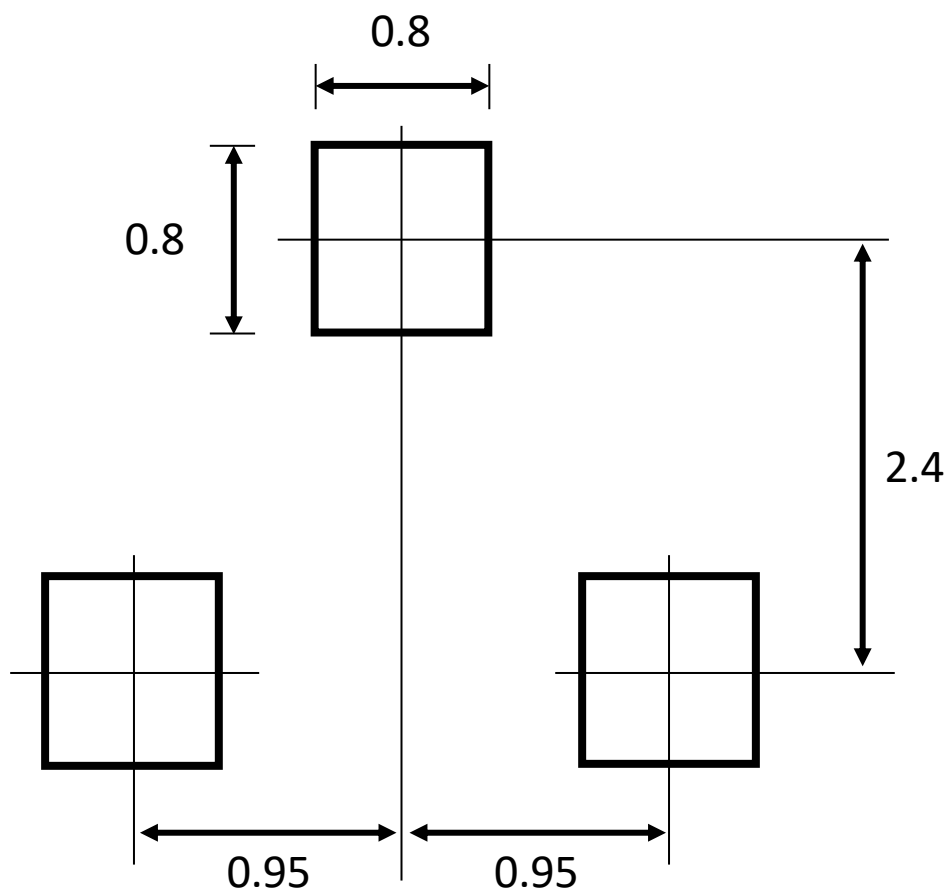

Fig.7 Capacitance Characteristics

Fig.8 Gate Charge Characteristics

Fig.9 Normalized Transient Impedance

Fig.10 Maximum Safe Operation Area

Fig.11 Switching Time Waveform

Fig.12 Gate Charge Waveform

SOT23-3 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.450	0.041	0.057
A1	---	0.150	---	0.006
A2	0.900	1.300	0.035	0.051
b	0.300	0.490	0.012	0.019
c	0.100	0.200	0.004	0.008
D	2.820	3.050	0.111	0.120
E	1.500	1.750	0.059	0.069
E1	2.600	3.000	0.102	0.118
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°

SOT23-3 RECOMMENDED LAND PATTERN



unit : mm