

General Description

These dual N Channel enhancement mode power field effect transistors are using trench DMOS technology.

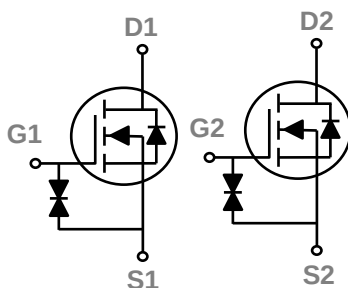
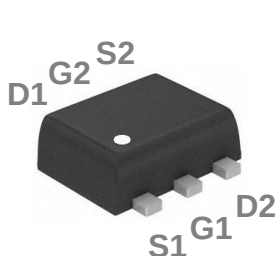
This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

BVDSS	RDSON	ID
20V	300mΩ	800mA

Features

- Fast switching
- Green Device Available
- Suit for 1.5V Gate Drive Applications

SOT963 Dual Pin Configuration



Applications

- Notebook
- Load Switch
- Networking
- Hand-held Instruments

Absolute Maximum Ratings $T_c=25^{\circ}\text{C}$ 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 ($T_c=25^{\circ}\text{C}$)	800	mA
	Drain Current – Continuous ($T_c=100^{\circ}\text{C}$)	510	mA
I_{DM}	Drain Current – Pulsed ¹	3.2	A
P_D	Power Dissipation ($T_c=25^{\circ}\text{C}$)	275	mW
	Power Dissipation – Derate above 25°C	2.2	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	---	450	$^{\circ}\text{C/W}$

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	$V_{GS}=0V$, $I_D=250\mu A$	20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1mA$	---	-0.01	---	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=20V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=16V$, $V_{GS}=0V$, $T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 6V$, $V_{DS}=0V$	---	---	± 20	μA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V$, $I_D=0.5A$	---	200	300	$m\Omega$
		$V_{GS}=2.5V$, $I_D=0.4A$	---	235	400	
		$V_{GS}=1.8V$, $I_D=0.2A$	---	295	550	
		$V_{GS}=1.5V$, $I_D=0.1A$	---	365	800	
		$V_{GS}=1.2V$, $I_D=0.1A$	---	600	1500	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.3	0.6	1.0	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	3	---	$mV/^\circ\text{C}$

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2, 3}	$V_{DS}=10V$, $V_{GS}=4.5V$, $I_D=0.5A$	---	1	2	nC
Q_{gs}	Gate-Source Charge ^{2, 3}		---	0.26	0.5	
Q_{gd}	Gate-Drain Charge ^{2, 3}		---	0.2	0.4	
$T_{d(on)}$	Turn-On Delay Time ^{2, 3}	$V_{DD}=10V$, $V_{GS}=4.5V$, $R_G=10\Omega$ $I_D=0.5A$	---	5	10	ns
T_r	Rise Time ^{2, 3}		---	3.5	7	
$T_{d(off)}$	Turn-Off Delay Time ^{2, 3}		---	14	28	
T_f	Fall Time ^{2, 3}		---	6	12	
C_{iss}	Input Capacitance	$V_{DS}=10V$, $V_{GS}=0V$, $F=1MHz$	---	38.2	75	pF
C_{oss}	Output Capacitance		---	14.4	28	
C_{rss}	Reverse Transfer Capacitance		---	6	12	

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	---	---	0.8	A
I_{SM}	Pulsed Source Current		---	---	1.6	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=0.2A$, $T_J=25^\circ\text{C}$	---	---	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.

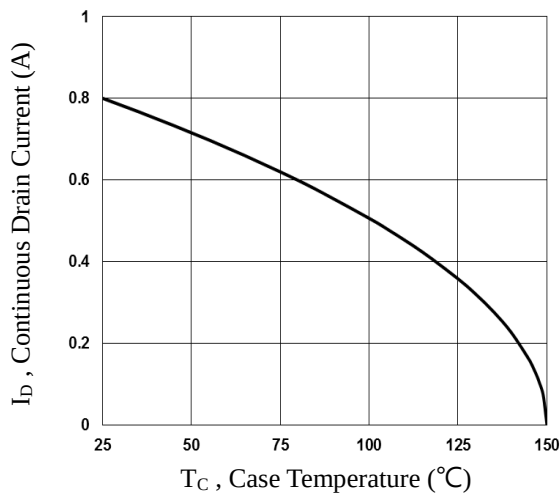


Fig.1 Continuous Drain Current vs. T_c

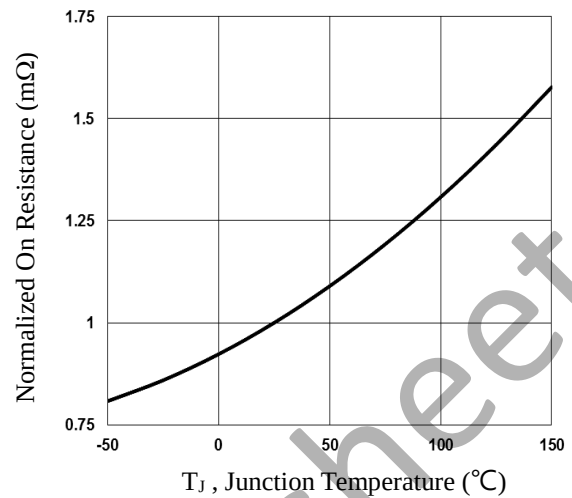


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

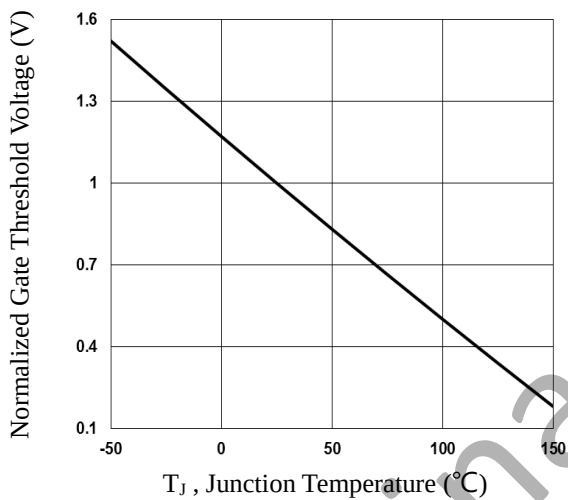


Fig.3 Normalized V_{th} vs. T_j

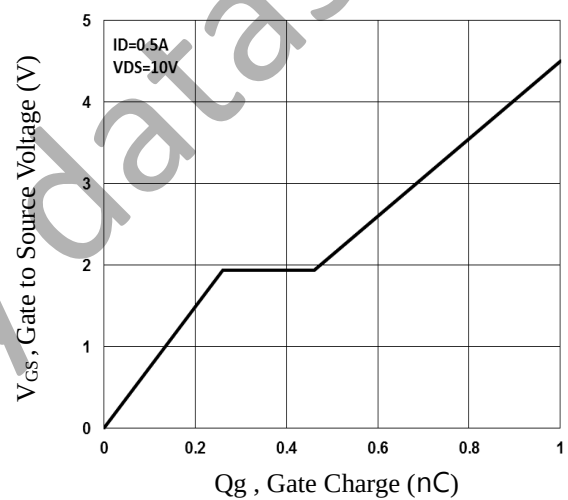


Fig.4 Gate Charge Waveform

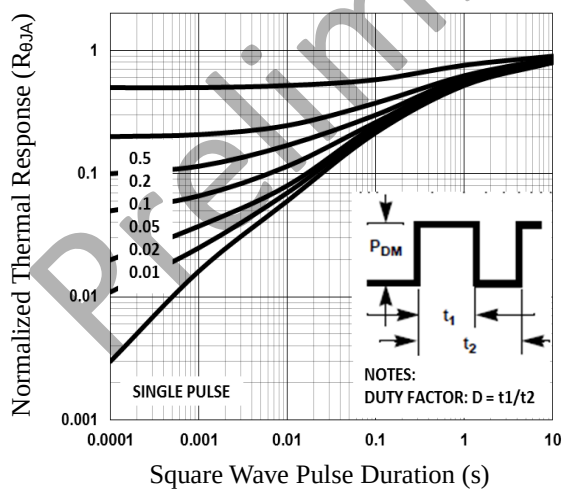


Fig.5 Normalized Transient Impedance

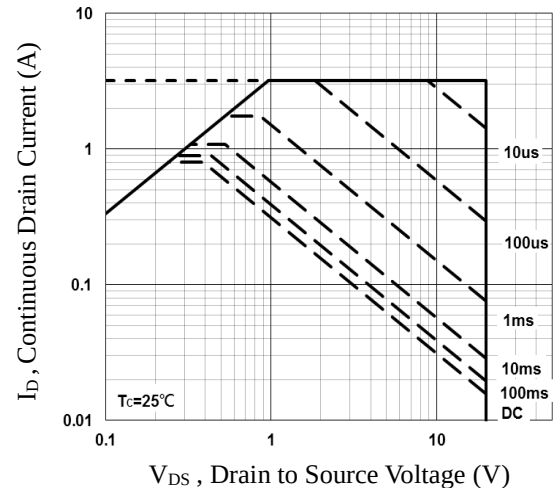
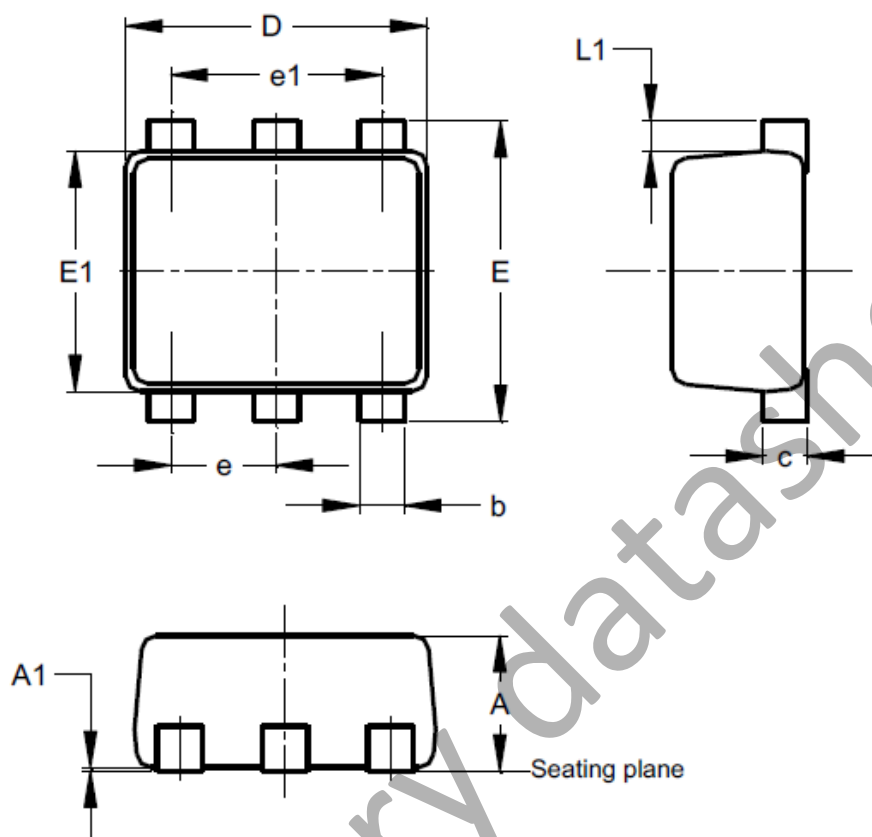


Fig.6 Maximum Safe Operation Area

SOT963 Dual PACKAGE INFORMATION



SOT963			
Dim	Min	Max	Typ
A	0.40	0.50	0.45
A1	0.00	0.05	--
b	0.10	0.20	0.15
c	0.120	0.180	0.150
D	0.95	1.05	1.00
E	0.95	1.05	1.00
E1	0.75	0.85	0.80
e	--	--	0.35
e1	--	--	0.70
L1	0.05	0.15	0.10
All Dimensions in mm			