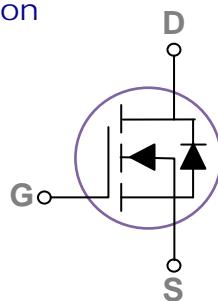
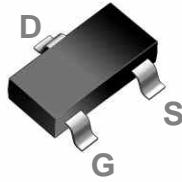


General Description

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.

SOT23-3S Pin Configuration



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	± 10	V
I_D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	6.7	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	4.2	A
I_{DM}	Drain Current – Pulsed ¹	26.8	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	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	$^\circ\text{C}/\text{W}$

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	$V_{\text{GS}}=0\text{V}$, $I_D=250\mu\text{A}$	20	---	---	V
$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1\text{mA}$	---	0.02	---	$\text{V}/^\circ\text{C}$
$I_{\text{DS}(\text{off})}$	Drain-Source Leakage Current	$V_{\text{DS}}=20\text{V}$, $V_{\text{GS}}=0\text{V}$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{\text{DS}}=16\text{V}$, $V_{\text{GS}}=0\text{V}$, $T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{\text{GS}}=\pm 10\text{V}$, $V_{\text{DS}}=0\text{V}$	---	---	± 100	nA

On Characteristics

$R_{\text{DS}(\text{ON})}$	Static Drain-Source On-Resistance	$V_{\text{GS}}=4.5\text{V}$, $I_D=4\text{A}$	---	15	19	$\text{m}\Omega$
		$V_{\text{GS}}=2.5\text{V}$, $I_D=3\text{A}$	---	18	24	
		$V_{\text{GS}}=1.8\text{V}$, $I_D=2\text{A}$	---	23	32	
$V_{\text{GS}(\text{th})}$	Gate Threshold Voltage	$V_{\text{GS}}=V_{\text{DS}}$, $I_D=250\mu\text{A}$	0.3	0.6	0.8	V
$\Delta V_{\text{GS}(\text{th})}$	$V_{\text{GS}(\text{th})}$ Temperature Coefficient		---	2	---	$\text{mV}/^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{\text{DS}}=10\text{V}$, $I_S=4\text{A}$	---	9.5	---	S

Dynamic and switching Characteristics

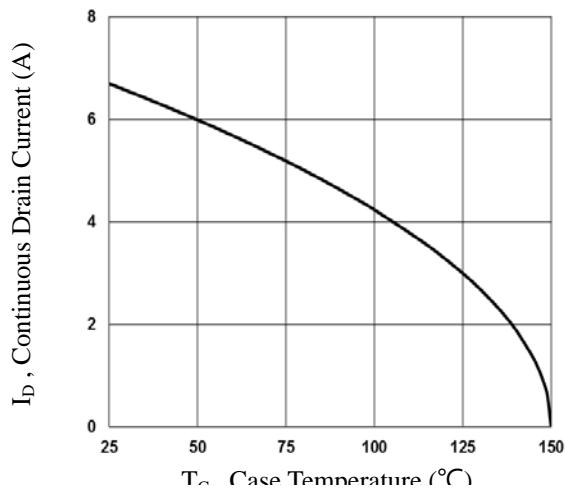
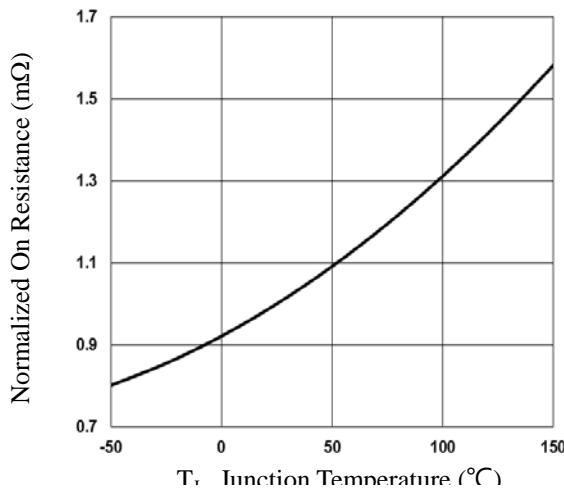
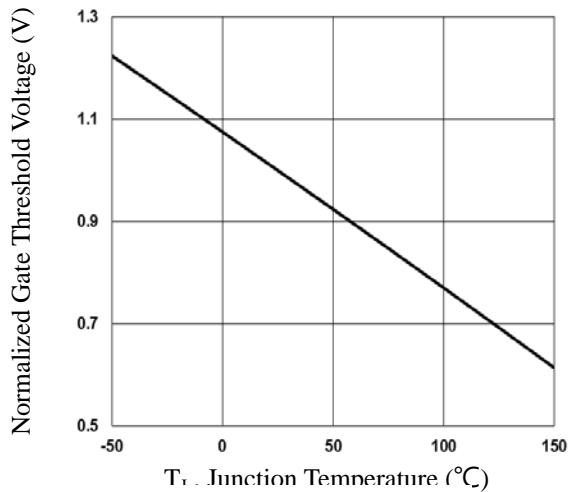
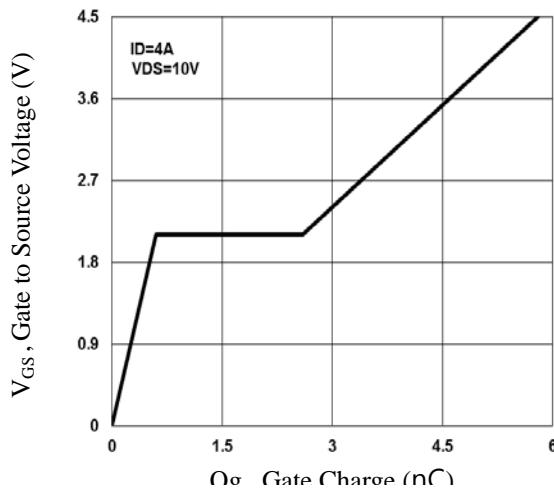
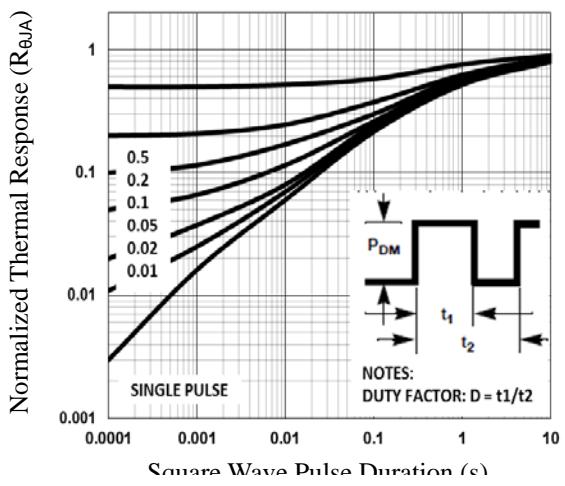
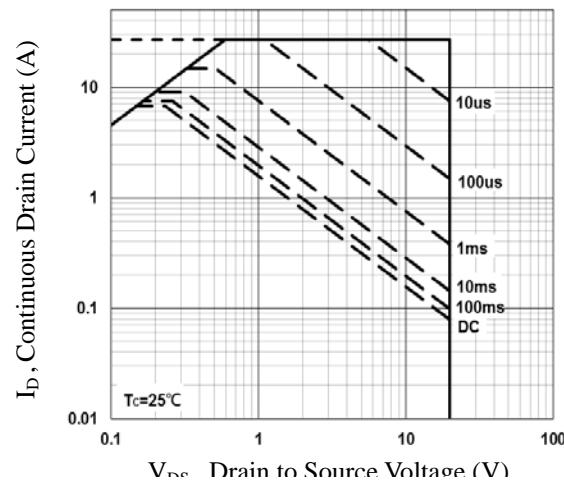
Q_g	Total Gate Charge ^{2,3}	$V_{\text{DS}}=10\text{V}$, $V_{\text{GS}}=4.5\text{V}$, $I_D=4\text{A}$	---	5.8	8	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	0.6	1	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	2	4	
$T_{\text{d(on)}}$	Turn-On Delay Time ^{2,3}	$V_{\text{DD}}=10\text{V}$, $V_{\text{GS}}=4.5\text{V}$, $R_G=25\Omega$ $I_D=1\text{A}$	---	5.0	9	nS
T_r	Rise Time ^{2,3}		---	14.4	27	
$T_{\text{d(off)}}$	Turn-Off Delay Time ^{2,3}		---	30.0	55	
T_f	Fall Time ^{2,3}		---	9.2	17	
C_{iss}	Input Capacitance	$V_{\text{DS}}=10\text{V}$, $V_{\text{GS}}=0\text{V}$, $F=1\text{MHz}$	---	600	870	pF
C_{oss}	Output Capacitance		---	70	100	
C_{rss}	Reverse Transfer Capacitance		---	45	65	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_s	Continuous Source Current	$V_G=V_D=0\text{V}$, Force Current	---	---	6.7	A
I_{SM}	Pulsed Source Current		---	---	26.8	A
V_{SD}	Diode Forward Voltage	$V_{\text{GS}}=0\text{V}$, $I_s=1\text{A}$, $T_J=25^\circ\text{C}$	---	---	1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\text{us}$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.


Fig.1 Continuous Drain Current vs. T_c

Fig.2 Normalized RDS(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

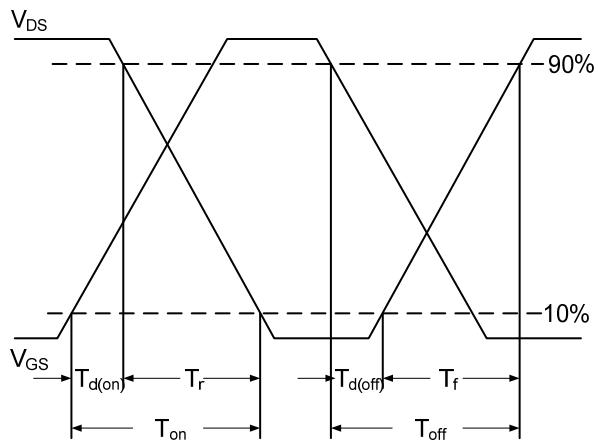


Fig.7 Switching Time Waveform

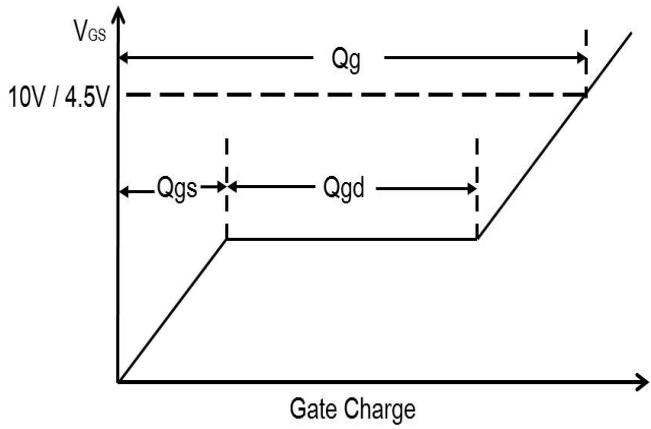
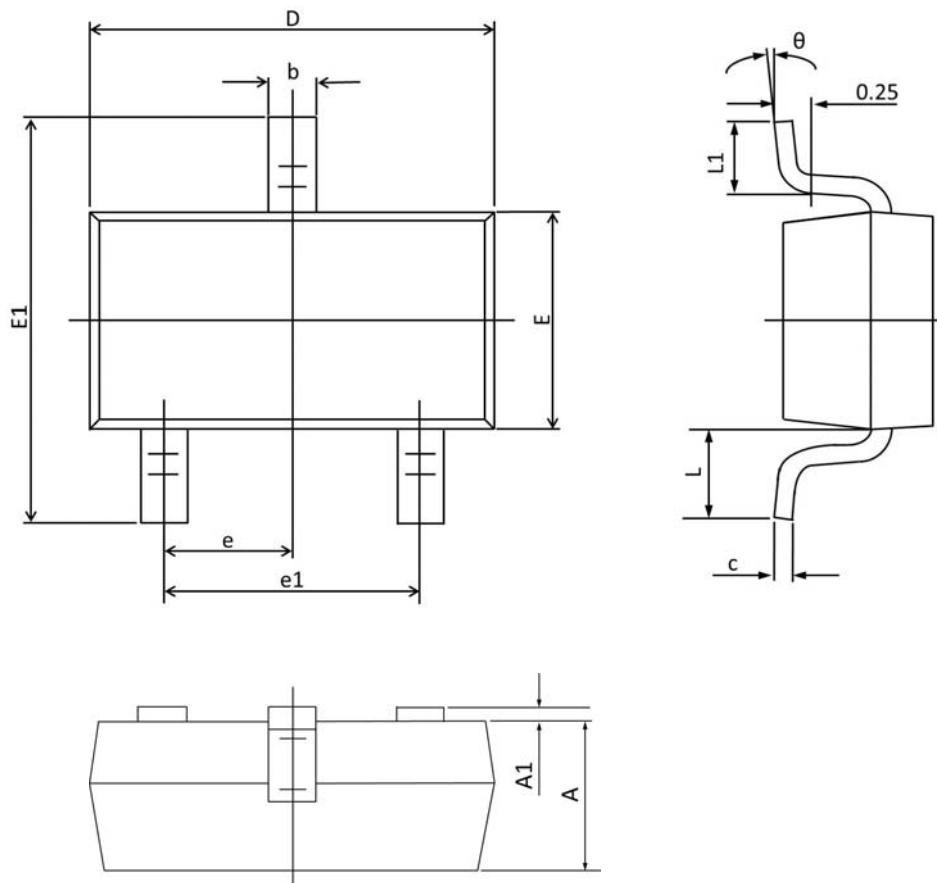


Fig.8 Gate Charge Waveform

SOT23-3S PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.000	0.035	0.039
A1	0.000	0.100	0.000	0.004
b	0.300	0.500	0.012	0.020
c	0.090	0.110	0.003	0.004
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
theta	1°	7°	1°	7°