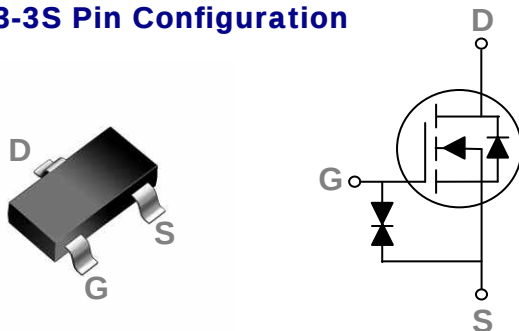


General Description

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



BVDSS	RDS(ON)	ID
60V	1.6Ω	0.3A

Features

- 60V,0.3A, $R_{DS(ON)} = 1.6\Omega @ V_{GS}=10V$
- Improved dv/dt capability
- Fast switching
- 100% EAS Guaranteed
- Green Device Available
- G-S ESD Protection Diode Embedded

Applications

- Motor Drive
- Power Tools
- LED Lighting

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current – Continuous ($T_C=25^\circ\text{C}$)	0.3	A
	Drain Current – Continuous ($T_C=100^\circ\text{C}$)	0.2	A
I_{DM}	Drain Current – Pulsed ¹	1.2	A
P_D	Power Dissipation ($T_C=25^\circ\text{C}$)	0.35	W
	Power Dissipation – Derate above 25°C	0.003	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-50 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-50 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	357	$^\circ\text{C/W}$

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	60	---	---	V
ΔBV _{DSS} /ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =1mA	---	0.04	---	V/°C
I _{DSS}	Drain-Source Leakage Current	V _{DS} =60V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =48V, V _{GS} =0V, T _J =125°C	---	---	100	uA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±10	uA

On Characteristics

R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =0.5A	---	1.2	1.6	Ω
		V _{GS} =4.5V, I _D =0.2A	---	1.8	3	Ω
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1	1.6	2.5	V
ΔV _{GS(th)}	V _{GS(th)} Temperature Coefficient		---	-4	---	mV/°C
gfs	Forward Transconductance	V _{DS} =10V, I _D =0.1A	---	0.24	---	S

Dynamic and switching Characteristics

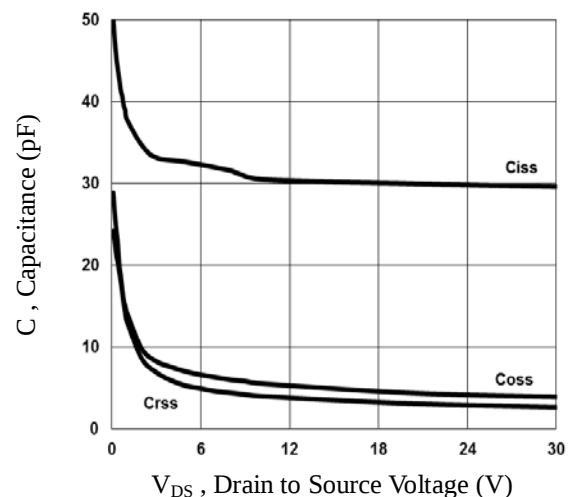
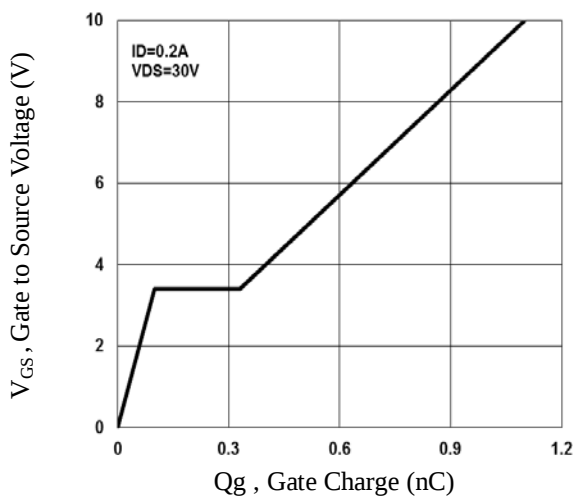
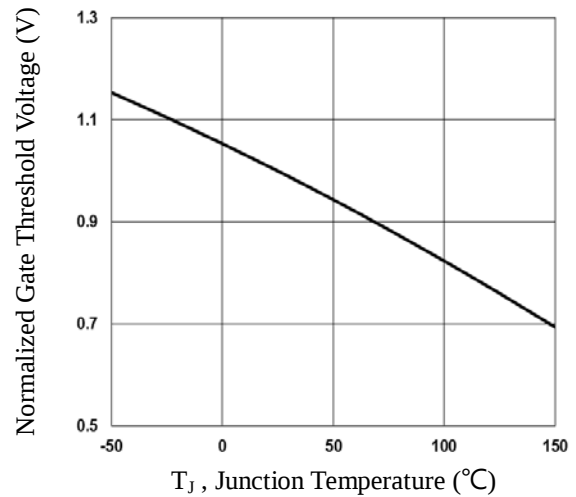
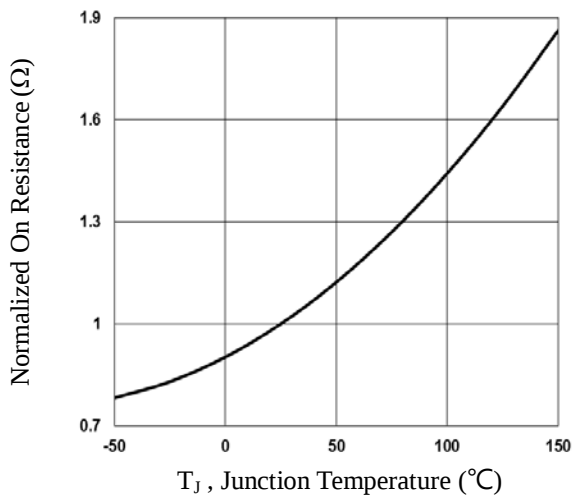
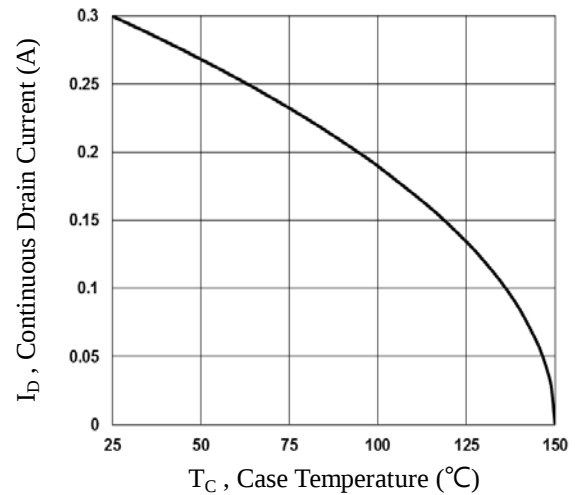
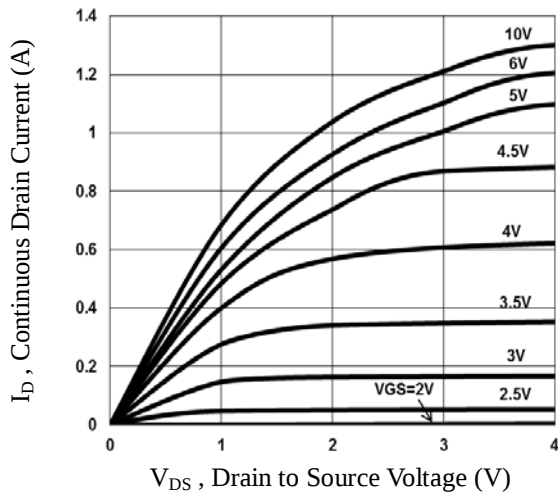
Q _g	Total Gate Charge ^{2,3}	V _{DS} =30V, V _{GS} =10V, I _D =0.2A	---	1.1	2	nC
Q _{gs}	Gate-Source Charge ^{2,3}		---	0.1	0.2	
Q _{gd}	Gate-Drain Charge ^{2,3}		---	0.23	0.5	
T _{d(on)}	Turn-On Delay Time ^{2,3}	V _{DD} =30V, V _{GS} =10V, R _G =6Ω I _D =0.2A	---	3	6	ns
T _r	Rise Time ^{2,3}		---	5	10	
T _{d(off)}	Turn-Off Delay Time ^{2,3}		---	14	27	
T _f	Fall Time ^{2,3}		---	9	17	
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, F=1MHz	---	30.6	45	pF
C _{oss}	Output Capacitance		---	5.5	10	
C _{rss}	Reverse Transfer Capacitance		---	4	8	

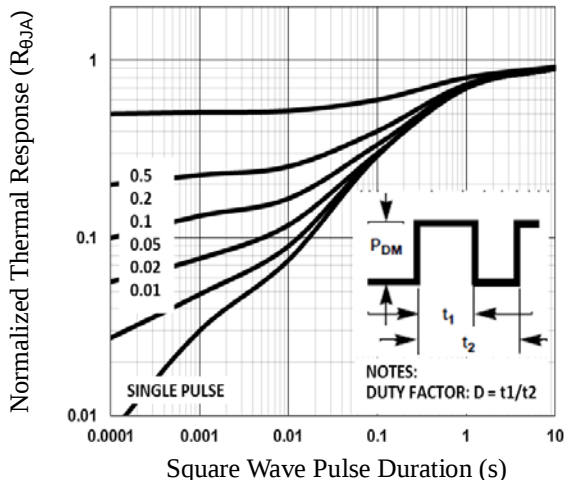
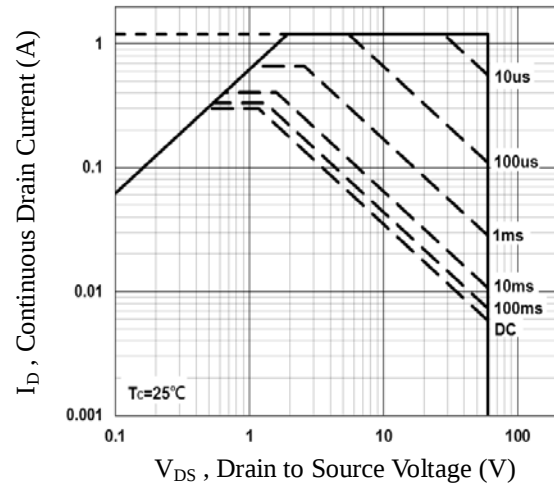
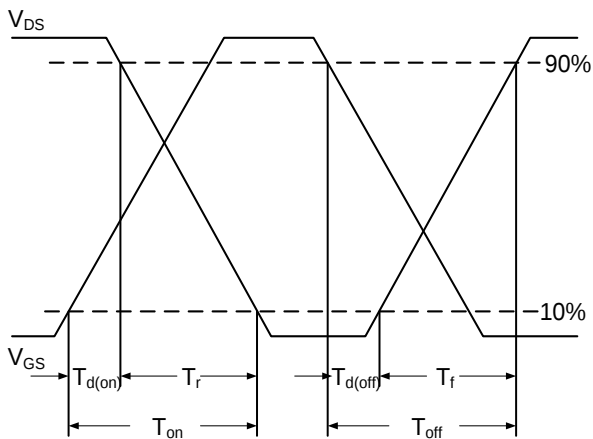
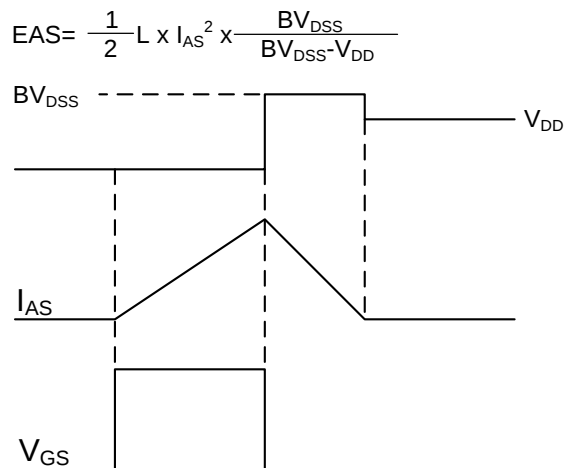
Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current	V _G =V _D =0V, Force Current	---	---	0.3	A
I _{SM}	Pulsed Source Current		---	---	1.2	A
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1	V
t _{rr}	Reverse Recovery Time ²	V _{GS} =30V, I _S =1A, dI/dt=100A/μs	---	---	---	ns
Q _{rr}	Reverse Recovery Charge ²	T _J =25°C	---	---	---	nC

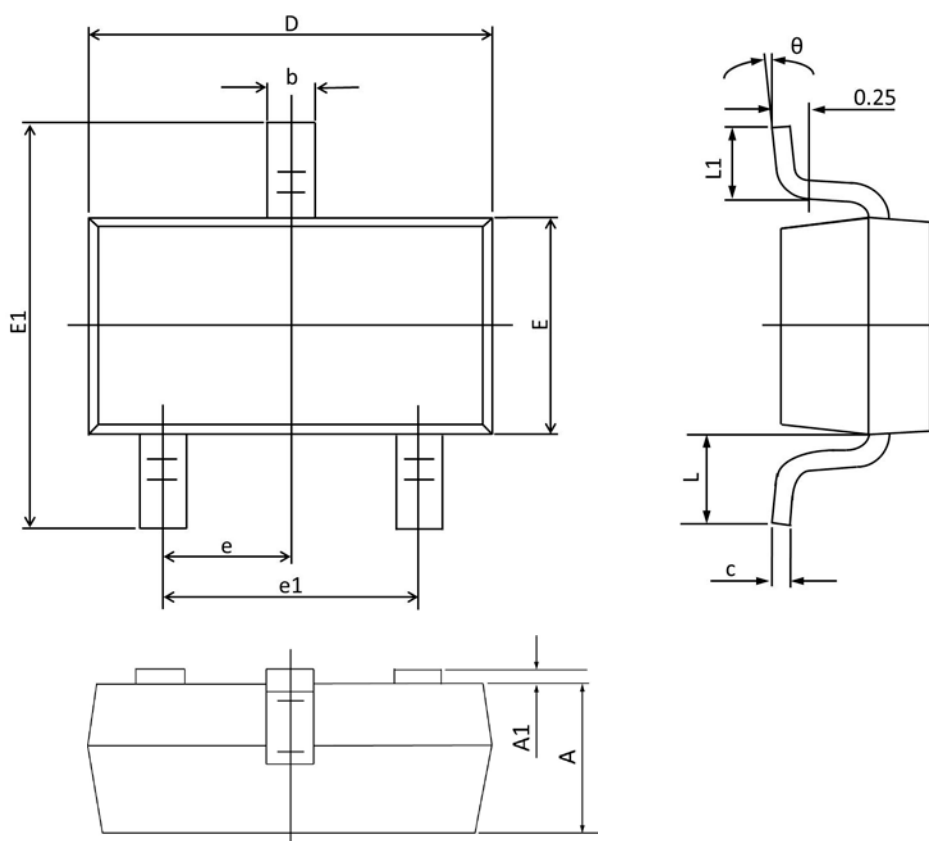
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V, V_{GS}=10V, L=1mH, I_{AS}=7A., R_G=25Ω, Starting T_J=25°C
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.




Fig.7 Normalized Transient Impedance

Fig.8 Maximum Safe Operation Area

Fig.9 Switching Time Waveform

Fig.10 EAS 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
θ	1°	7°	1°	7°