

General Description

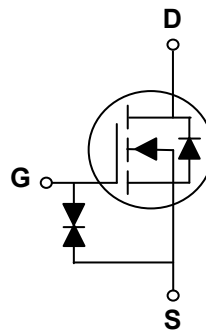
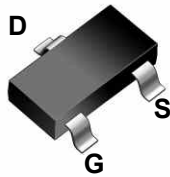
These N-Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Features

V_{DS}	20V
I_D (at $V_{GS}=4.5V$)	7A
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	13m Ω (Typ)

ESD protected up to 2KV

SOT23



Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted

Parameter	Symbol	Maximum	Units	
Drain-Source Voltage	V_{DS}	20	V	
Gate-Source Voltage	V_{GS}	± 12	V	
Drain Current-Continuous	TC=25 $^\circ C$	I_D	7.0	A
	TC=100 $^\circ C$	I_D	4.0	A
Drain Current – Pulsed	I_{DM}	40	A	
Maximum Power Dissipation	P_D	1.1	W	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$	

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance junction-case	$R_{\theta Jc}$		80	$^\circ C / W$
Thermal Resistance junction-to-Ambient	$R_{\theta JA}$		125	$^\circ C / W$

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	20			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=20V, V_{GS}=0V$			1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$			± 15	μA
		$V_{GS}=\pm 10V, V_{DS}=0V$			± 10	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.45	0.6	1.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS}=4.5V, I_D=7.0A$		13	18	m Ω
		$V_{GS}=2.5V, I_D=4.0A$		17	22	m Ω
		$V_{GS}=1.8V, I_D=1.5A$		27	39	m Ω
DYNAMIC PARAMETERS						
C_{ISS}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V,$ $F=1.0MHz$		610		pF
C_{OSS}	Output Capacitance			130		pF
C_{RSS}	Reverse Transfer Capacitance			110		pF
SWITCHING PARAMETERS						
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V$ $V_{DD}=10V$ $I_D=7A$ $R_G=2.2\Omega$		4		nS
t_r	Turn-on Rise Time			15		nS
$t_{d(off)}$	Turn-Off Delay Time			18		nS
t_f	Turn-Off Fall Time			8		nS
Q_g	Total Gate Charge	$V_{DS}=10V, I_D=7.0A,$ $V_{DS}=10V$		12		nC
Q_{gs}	Gate-Source Charge			2.0		nC
Q_{gd}	Gate-Drain Charge			2.5		nC
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_{SD}=5A$			1.2	V

Note:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\cong 300\mu s$, duty cycle $\cong 2\%$.
3. Essentially independent of operating temperature.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

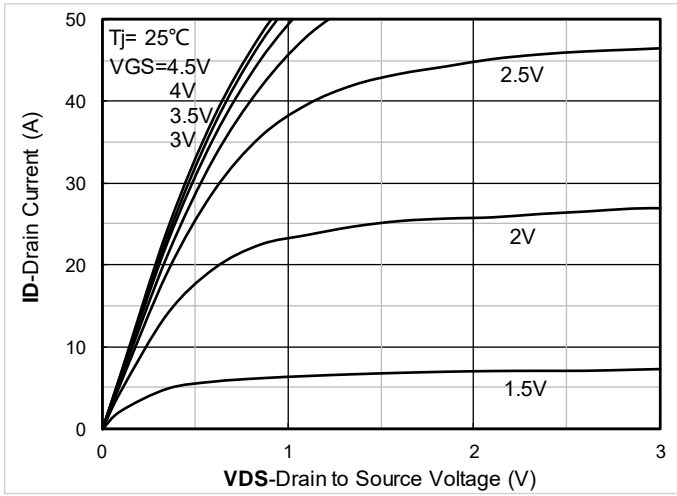


Figure1. Output Characteristics

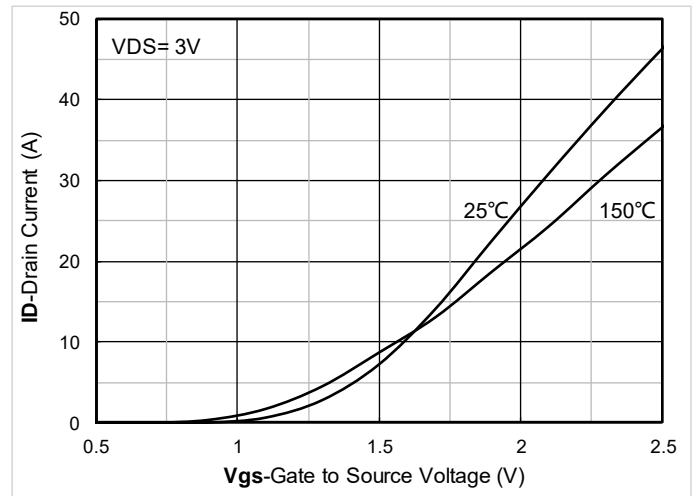


Figure2. Transfer Characteristics

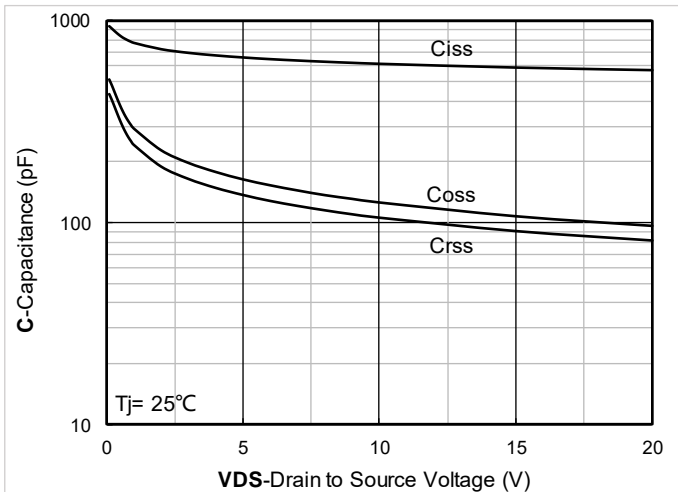


Figure3. Capacitance Characteristics

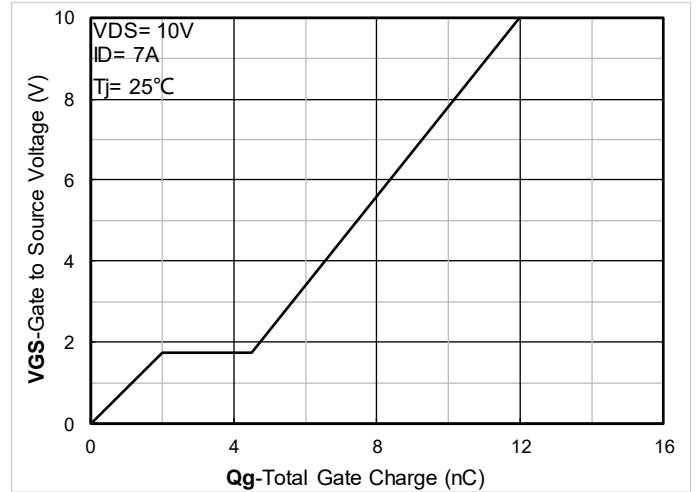


Figure4. Gate Charge

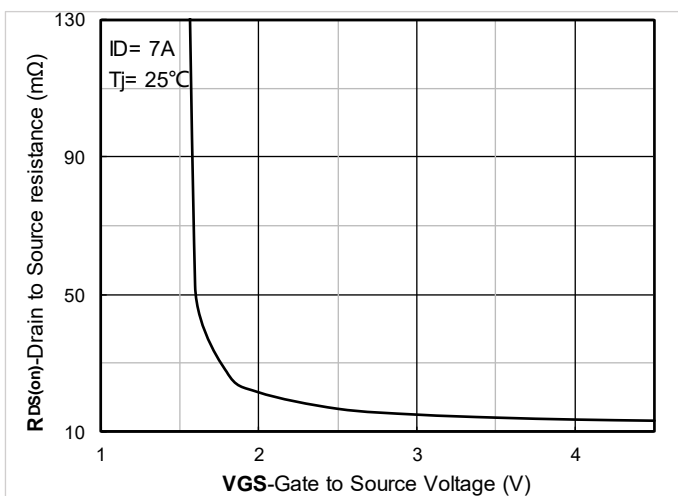


Figure 5. On-Resistance vs Gate to Source Voltage

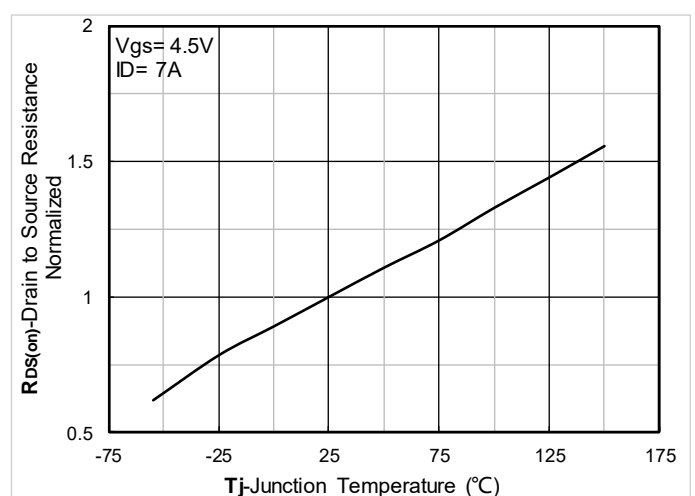


Figure 6. Normalized On-Resistance

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

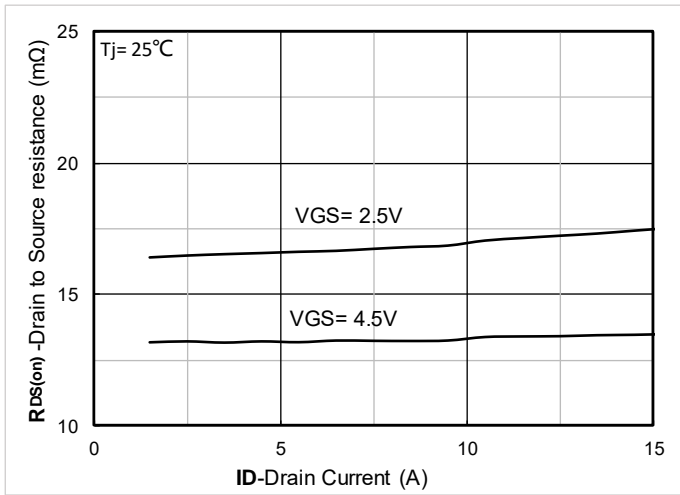


Figure 7. $R_{DS(on)}$ VS Drain Current

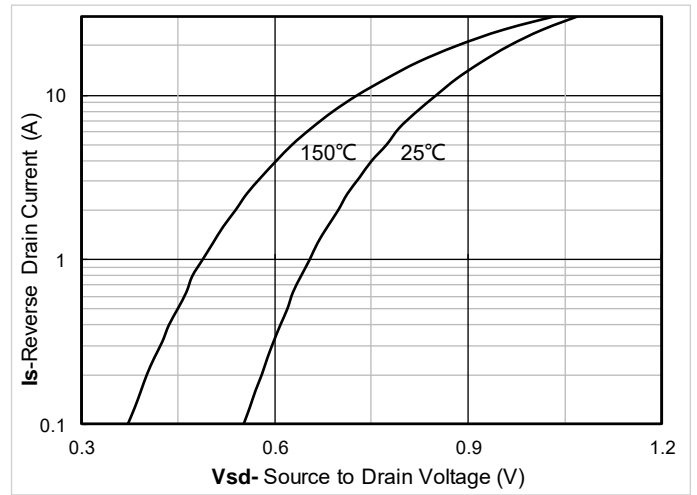


Figure 8. Forward characteristics of reverse diode

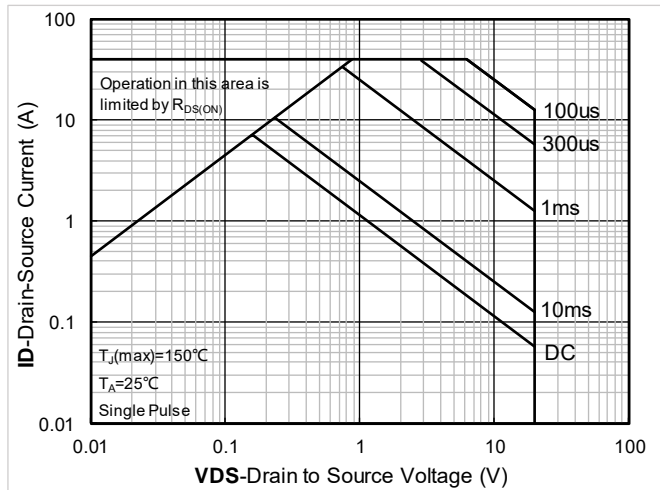


Figure9. Safe Operation Area

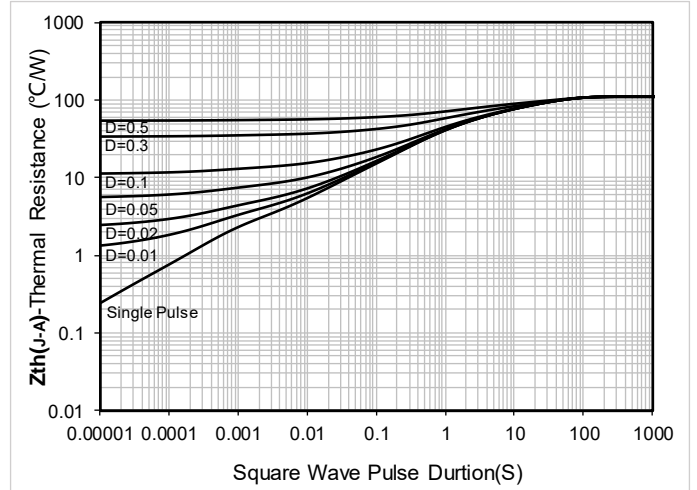
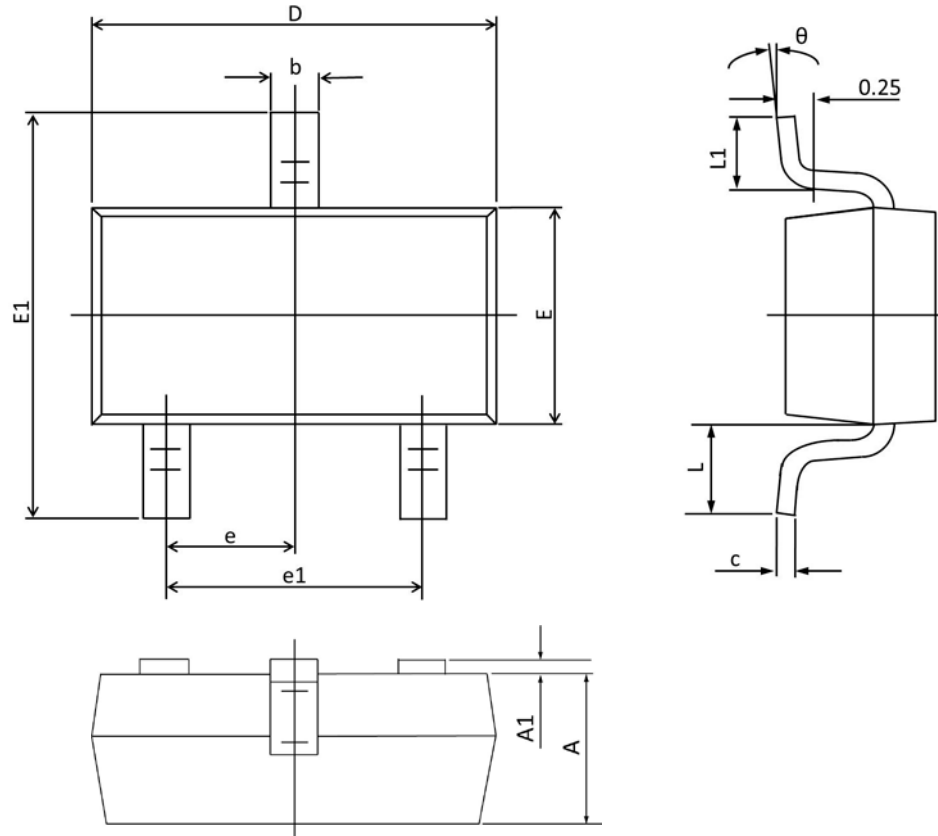


Figure10. Maximum Transient Thermal Impedance

SOT23 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°