

P-Ch 150V Fast Switching MOSFETs

Description

- ★ Advanced Trench MOS Technology
- ★ Green Device Available

Product Summary

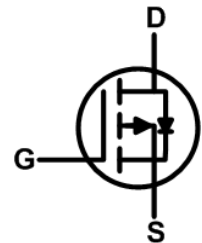
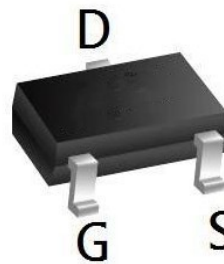


BVDSS	RDSON	ID
-150V	650mΩ	-1.2A

Applications

- ★ Load Switch.
- ★ Power Management.
- ★ LED Backlighting.
- ★ Networking application.

SOT23-3L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-150	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, $-V_{GS}$ @ $-10V^1$	-1.2	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, $-V_{GS}$ @ $-10V^1$	-0.88	A
I_{DM}	Pulsed Drain Current ²	-4.4	A
EAS	Single Pulse Avalanche Energy ³	12.5	mJ
I_{AS}	Avalanche Current	5	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ⁴	2	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	40	$^\circ\text{C/W}$

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Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-150	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V$, $I_D=-1A$	---	650	780	m Ω
		$V_{GS}=-6V$, $I_D=-0.5A$	---	700	980	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	-2.0	-3.0	-4.0	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-120V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	uA
		$V_{DS}=-120V$, $V_{GS}=0V$, $T_J=85^\circ\text{C}$	---	---	30	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	12	---	Ω
Q_g	Total Gate Charge	$V_{DS}=-75V$, $V_{GS}=-10V$, $I_D=-1A$	---	10.8	---	nC
Q_{gs}	Gate-Source Charge		---	3.1	---	
Q_{gd}	Gate-Drain Charge		---	2.2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-30V$, $V_{GS}=-10V$, $R_G=6\Omega$, $I_D=-1A$	---	21	---	ns
T_r	Rise Time		---	16	---	
$T_{d(off)}$	Turn-Off Delay Time		---	40	---	
T_f	Fall Time		---	18	---	
C_{iss}	Input Capacitance	$V_{DS}=-75V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	706	---	pF
C_{oss}	Output Capacitance		---	23	---	
C_{rss}	Reverse Transfer Capacitance		---	13	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	-1.2	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^\circ\text{C}$	---	---	-1.2	V

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=-50V$, $V_{GS}=-10V$, $L=1mH$, $I_{AS}=-5A$
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

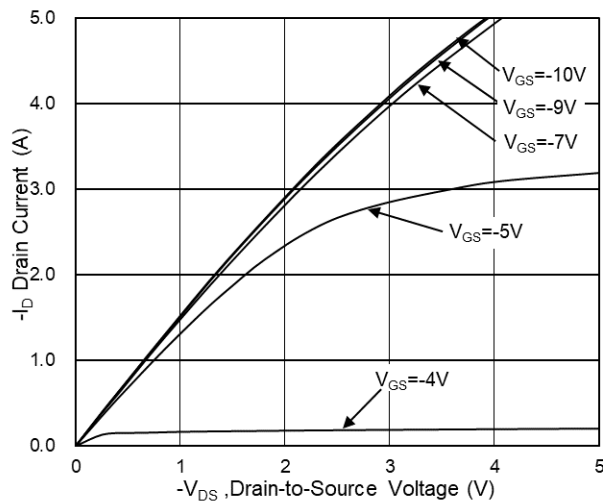


Fig.1 Typical Output Characteristics

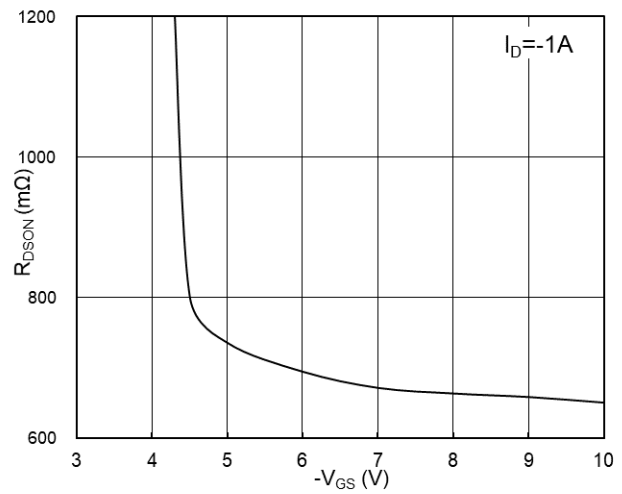


Fig.2 On-Resistance vs G-S Voltage

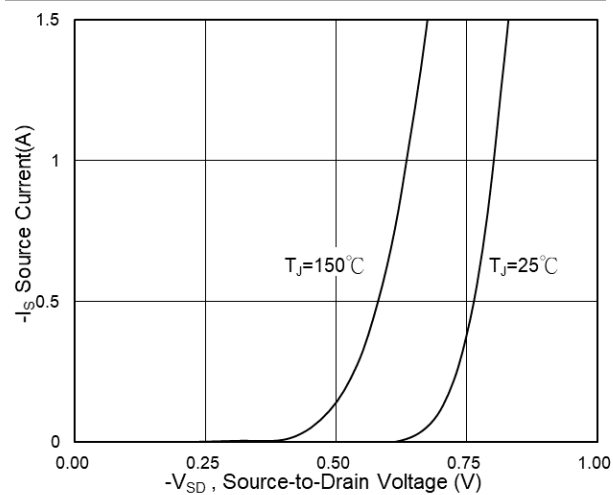


Fig.3 Source Drain Forward Characteristics

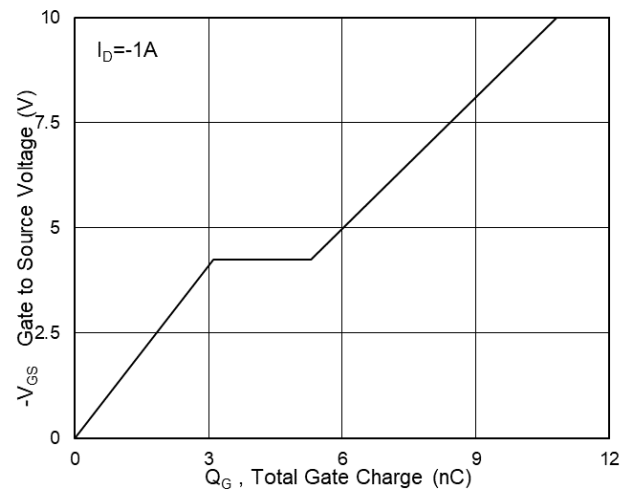


Fig.4 Gate-Charge Characteristics

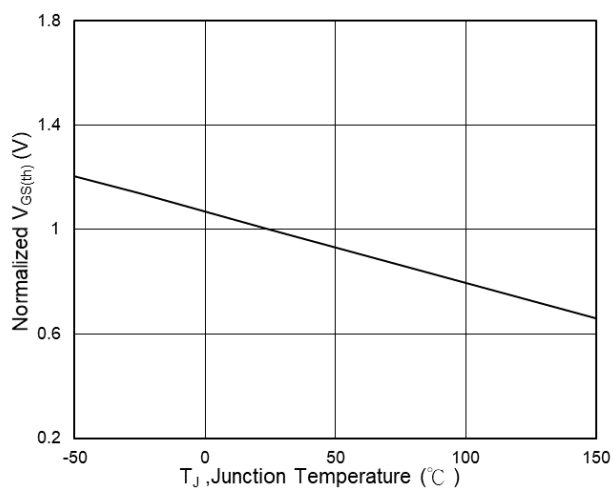


Fig.5 Normalized $V_{GS(th)}$ vs T_J

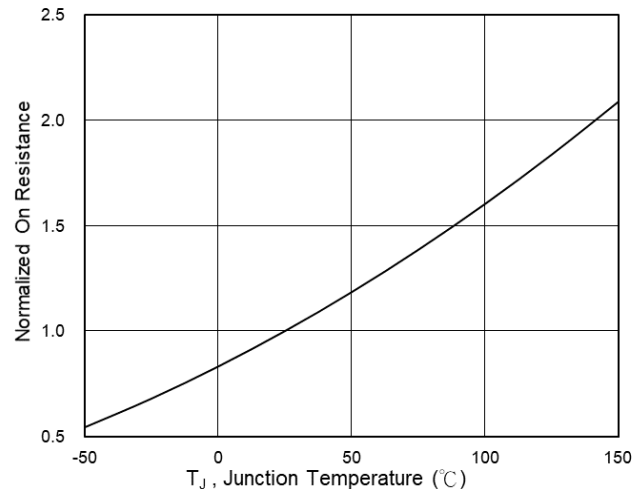


Fig.6 Normalized $R_{DS(on)}$ vs T_J

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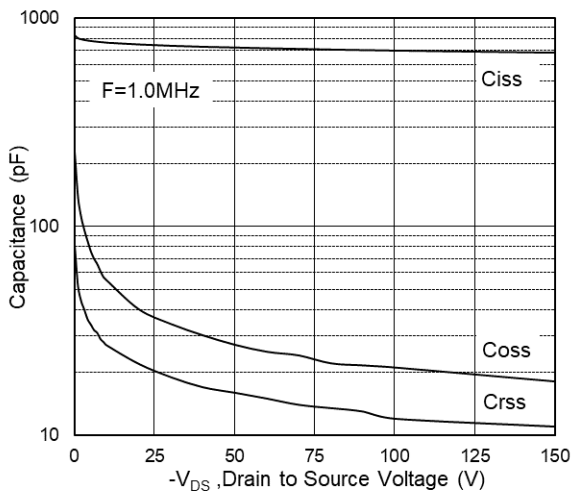


Fig.7 Capacitance

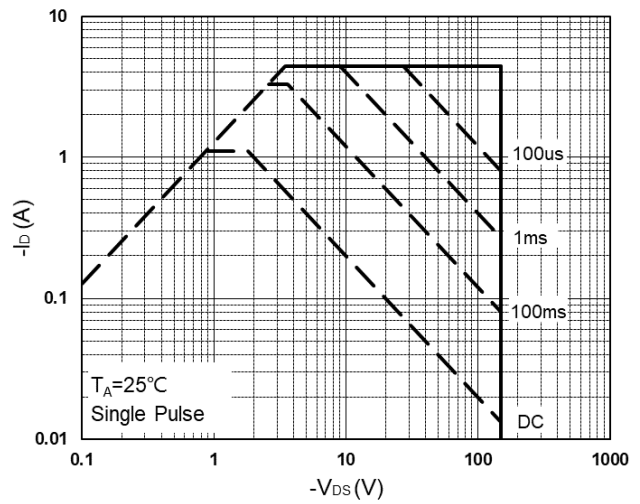


Fig.8 Safe Operating Area

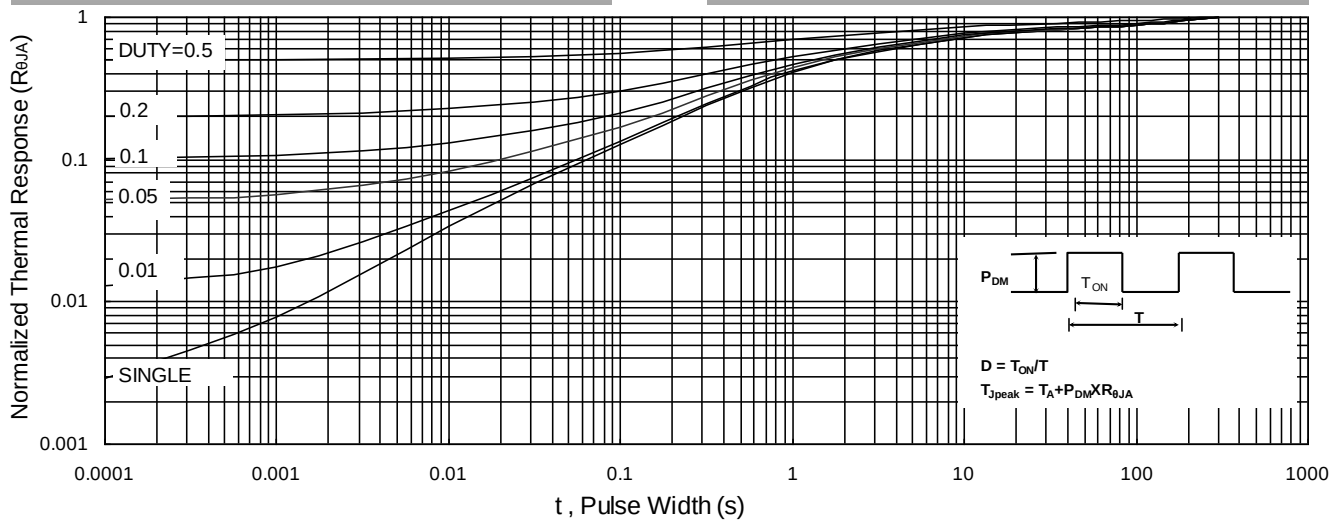


Fig.9 Normalized Maximum Transient Thermal Impedance

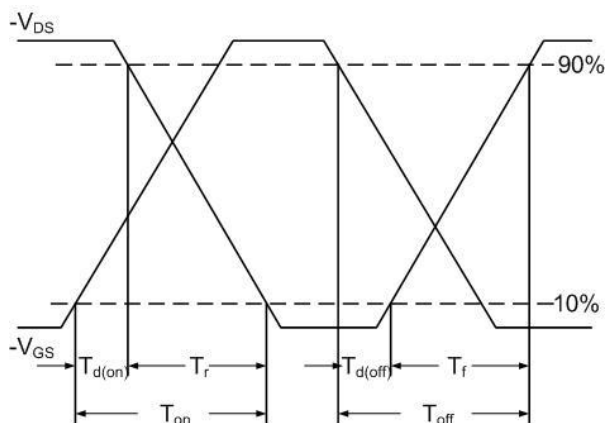


Fig.10 Switching Time Waveform

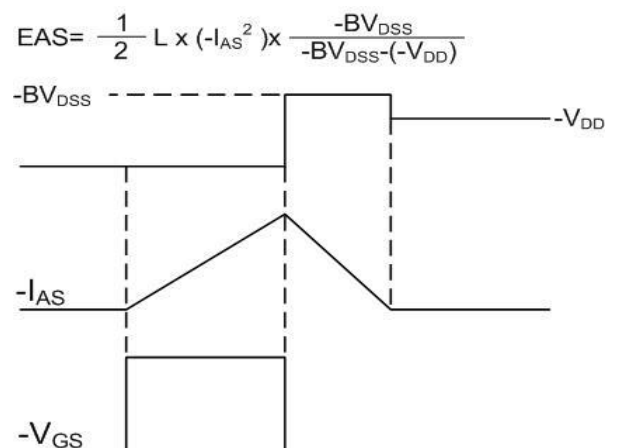
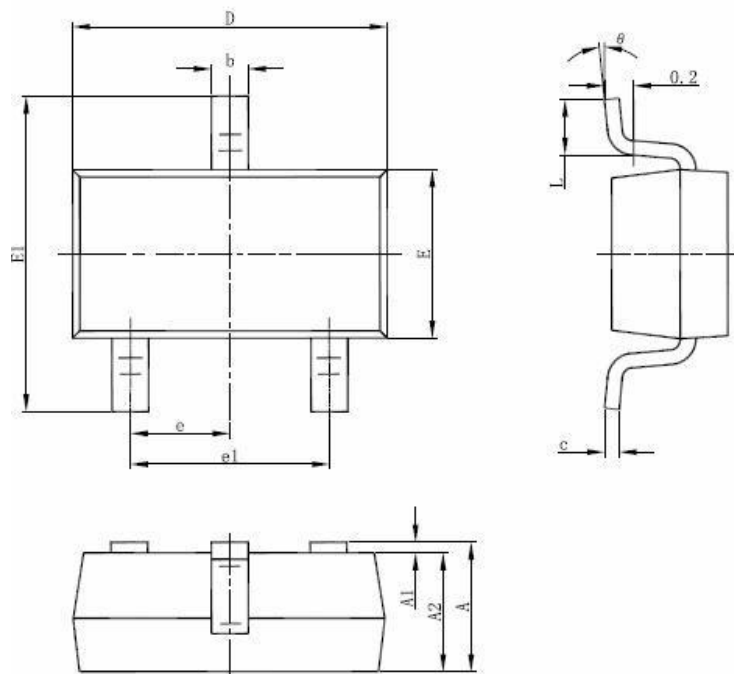


Fig.11 Unclamped Inductive Waveform

$$EAS = \frac{1}{2} L \times (-I_{AS}^2) \times \frac{-BV_{DSS}}{-BV_{DSS} - (-V_{DD})}$$

SOT-23-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°