

## -20V/-2A P-Channel MOSFET

### Features

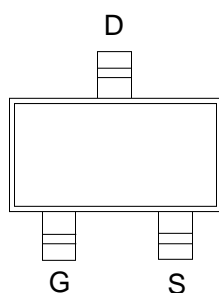
- Leading trench technology for low  $R_{DS(on)}$
- Low Gate Charge

### Product Summary

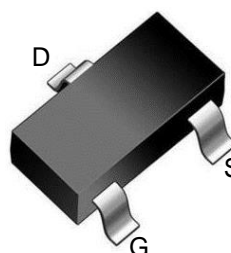
$V_{DS}$	$R_{DS(on)}$ MAX	$I_D$ MAX
-20V	70m $\Omega$ @-4.5V	-2A
	110m $\Omega$ @-2.5V	

### Application

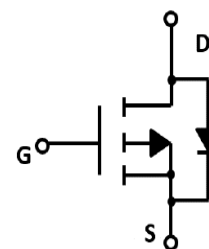
- Video monitor
- Power management



Marking and pin assignment



SOT-23 top view



Schematic diagram

Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)				
Symbol	Parameter		Rating	Unit
<b>Common Ratings (<math>T_C=25^\circ\text{C}</math> Unless Otherwise Noted)</b>				
$V_{DS}$	Drain-Source Breakdown Voltage		-20	V
$V_{GS}$	Gate-Source Voltage		$\pm 8$	V
$T_J$	Maximum Junction Temperature		150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range		-55 to 150	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$	-2	A
<b>Mounted on Large Heat Sink</b>				
$I_{DM}$	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	-10	A
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$	-2	A
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	0.5	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient		250	$^\circ\text{C/W}$

<b>Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)</b>						
<b>Symbol</b>	<b>Parameter</b>	<b>Condition</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>	<b>Unit</b>
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
BV <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	VGS=0V, ID=-250μA	-20	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	VDS=-16V, VGS=0V	--	--	-1	uA
I <sub>GSS</sub>	Gate-Body Leakage Current	VGS=±8V, VDS=0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	VDS=VGS, ID=-250μA	-0.4	-0.8	1.5	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	VGS=-4.5V, ID=-2.0A	--	60	70	mΩ
		VGS=-2.5V, ID=-1.7A	--	82	110	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>ISS</sub>	Input Capacitance	VDS=-10V, VGS=0V, f=1MHz	--	400	--	pF
C <sub>OSS</sub>	Output Capacitance		--	73	--	pF
C <sub>RSS</sub>	Reverse Transfer Capacitance		--	54	--	pF
<b>Switching Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	VDS=-10V, ID=-3A, VGS=-4.5V	--	5.3	--	nC
Q <sub>gs</sub>	Gate Source Charge		--	0.7	--	nC
Q <sub>gd</sub>	Gate Drain Charge		--	1.2	--	nC
t <sub>d(on)</sub>	Turn-on Delay Time	VDD=-10V, ID=-1A, VGS=-4.5V, RG=2.8Ω	--	11	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	35	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	28	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	10	--	nS
<b>Source- Drain Diode Characteristics</b>						
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>S</sub> =-2.0A,	--	--	-1.2	V

## Typical Operating Characteristics

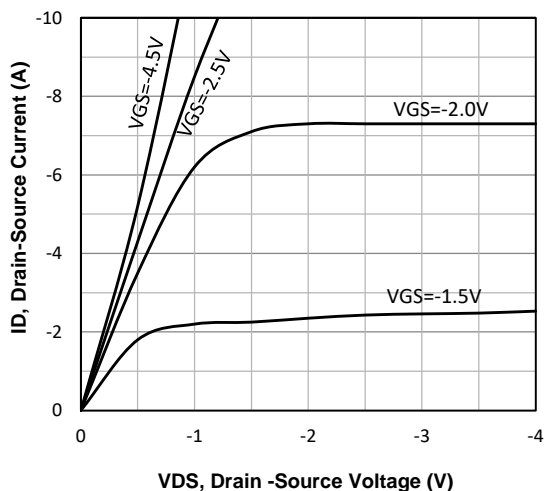


Fig1. Typical Output Characteristics

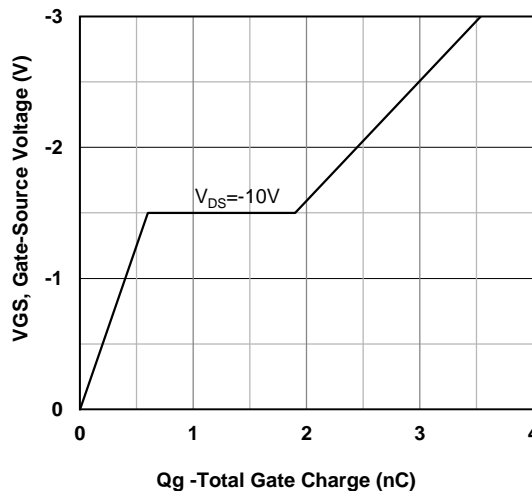


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

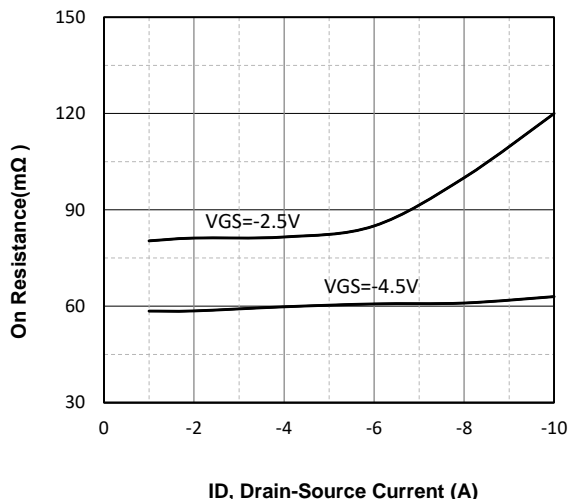


Fig3. Drain-Source on Resistance

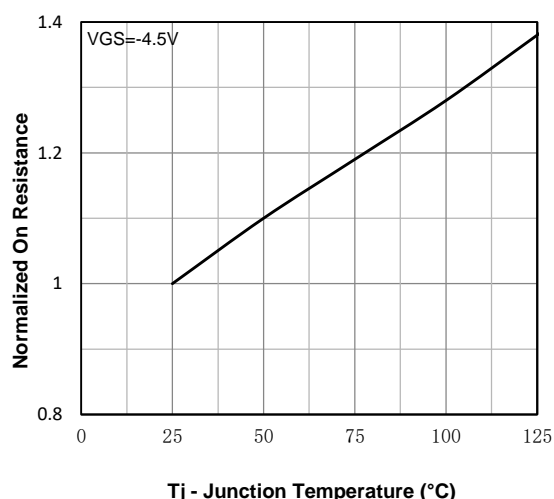


Fig4. Normalized On-Resistance Vs. Temperature

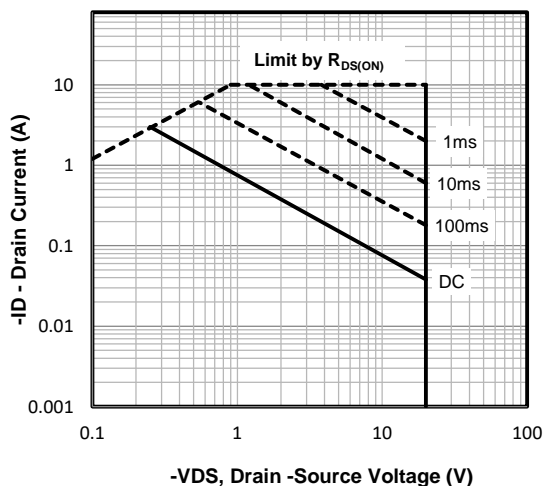


Fig5. Maximum Safe Operating Area

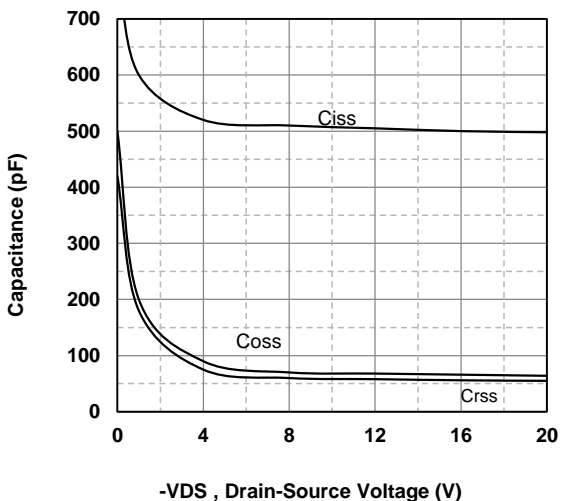
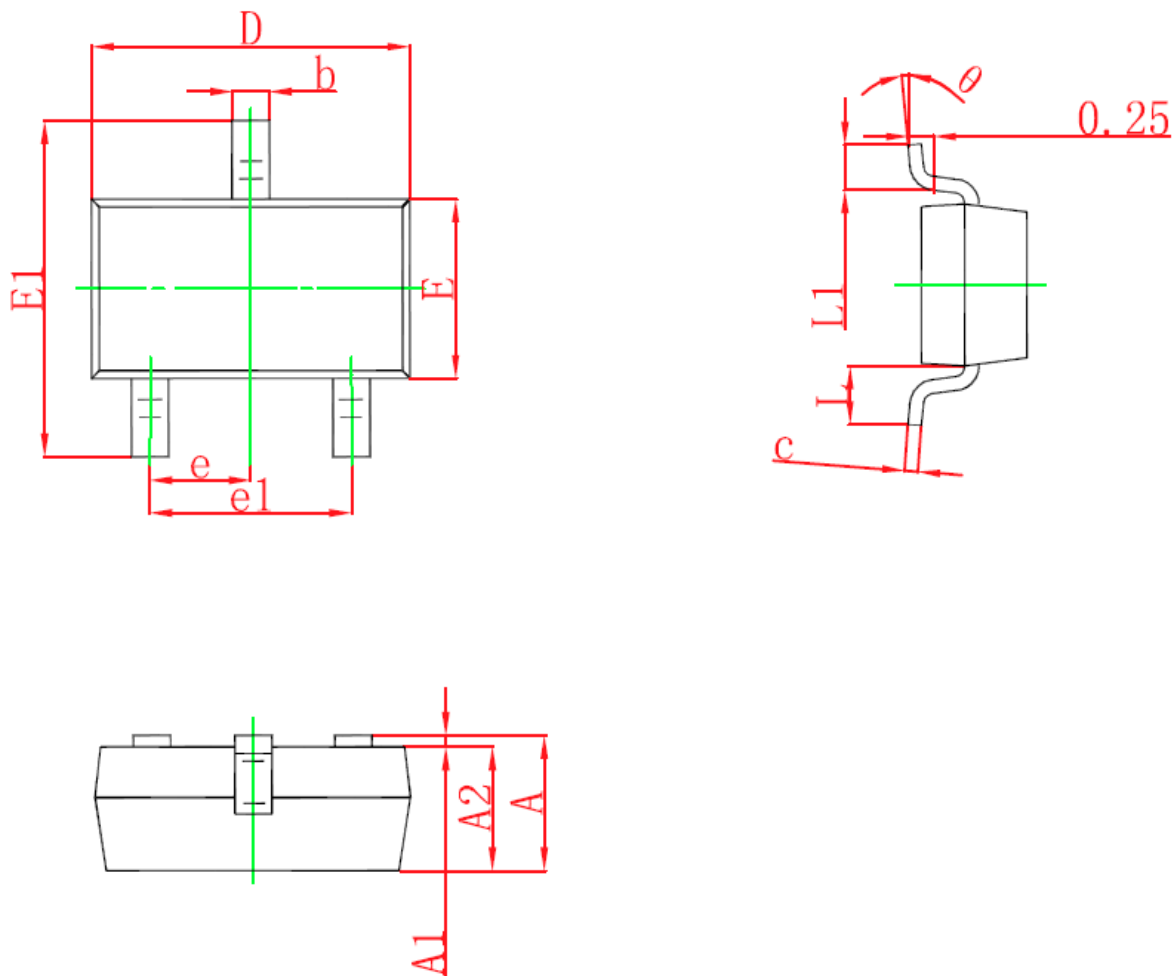


Fig6 Typical Capacitance Vs. Drain-Source Voltage

## SOT-23 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E1	2.250	2.550	0.088	0.100
E	1.200	1.400	0.047	0.055
e	0.950TYP		0.037TYP	
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
$\theta$	0°	8°	0°	8°