

## 30V/10.5A N-Channel MOSFET

### Features

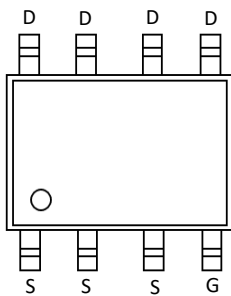
- High density cell design for ultra low  $R_{DS(ON)}$
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation

### Product Summary

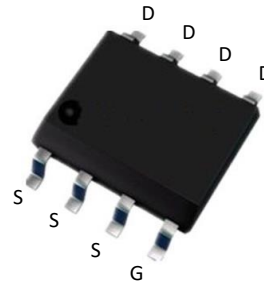
$V_{DS}$	$R_{DS(ON)}$ MAX	$I_D$ MAX
30V	19m $\Omega$ @10V	10.5A
	27m $\Omega$ @4.5V	

### Application

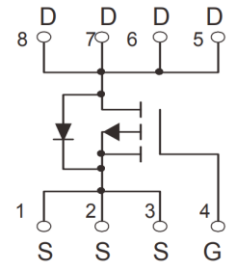
- Power switching application



Marking and pin assignment



SOP-8 top view



Schematic diagram



Halogen-Free

### 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	30	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-50 to 155	$^\circ\text{C}$
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 10.5	A
<b>Mounted on Large Heat Sink</b>			
$I_{DM}$	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 50	A
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$ 10.5	A
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 2.5	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	75	$^\circ\text{C/W}$

<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	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	30	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	--	--	1.0	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2.5	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =10.5A	--	14	19	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =9A	--	20	27	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>ISS</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	--	572	--	pF
C <sub>OSS</sub>	Output Capacitance		--	81	--	pF
C <sub>RSS</sub>	Reverse Transfer Capacitance		--	65	--	pF
<b>Switching Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> =15V, I <sub>D</sub> =10A, V <sub>GS</sub> =10V	--	6.2	--	nC
Q <sub>gs</sub>	Gate Source Charge		--	2.4	--	nC
Q <sub>gd</sub>	Gate Drain Charge		--	2.5	--	nC
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =30V, I <sub>D</sub> =10A, V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω	--	3	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	7.5	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	20	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	4	--	nS
<b>Source- Drain Diode Characteristics</b>						
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>S</sub> =10.5A,	--	0.8	1.2	V

## Typical Operating Characteristics

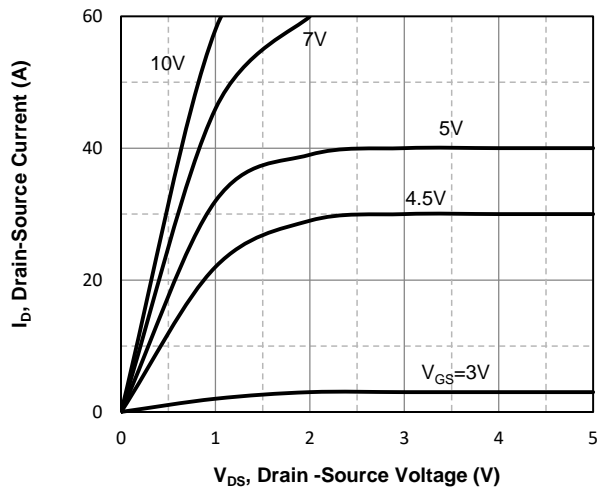


Fig1. Typical Output Characteristics

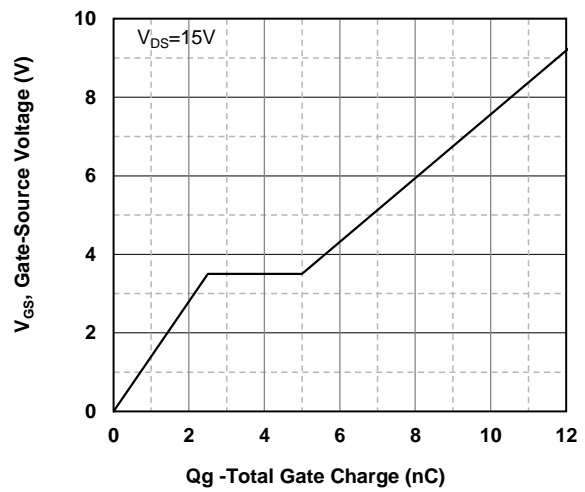


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

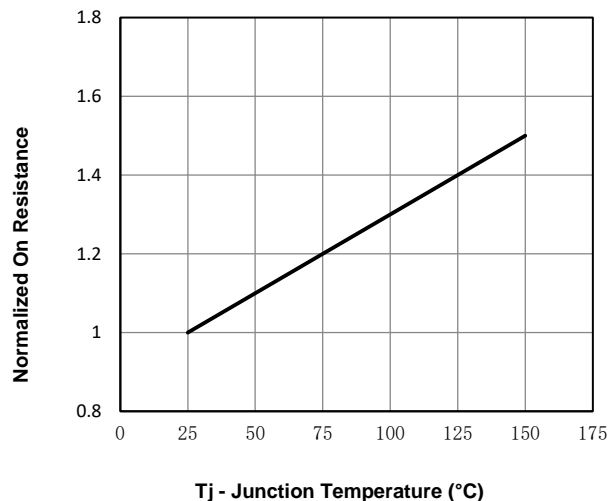


Fig3. Normalized On-Resistance Vs. Temperature

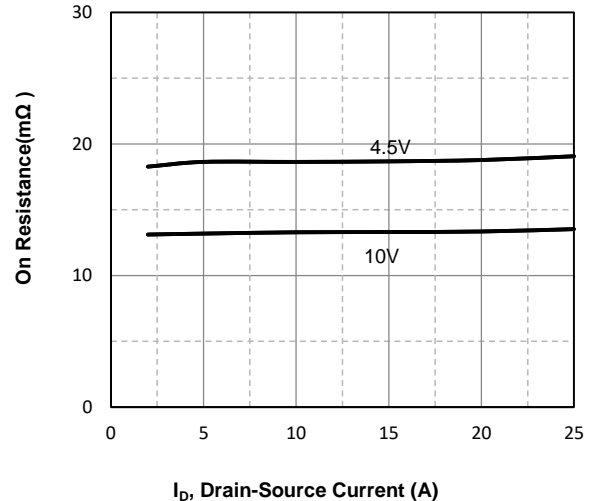


Fig4. On-Resistance Vs. Drain-Source Current

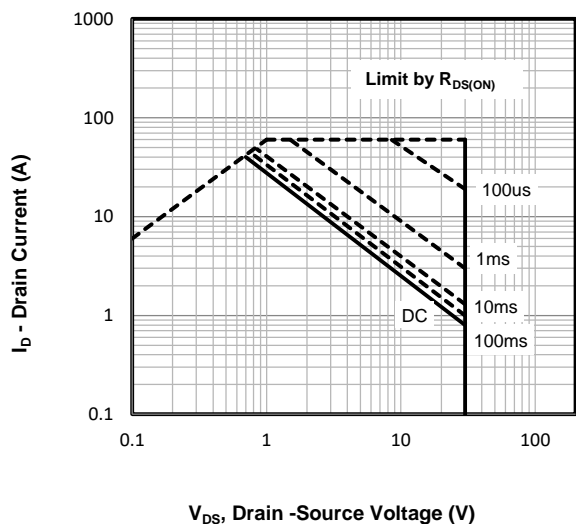


Fig5. Maximum Safe Operating Area

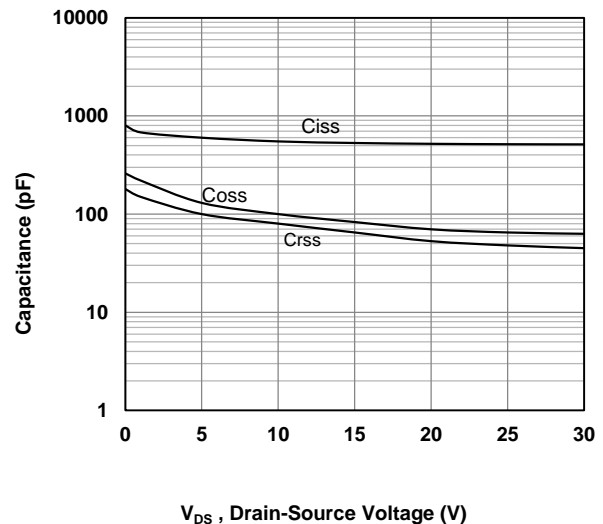
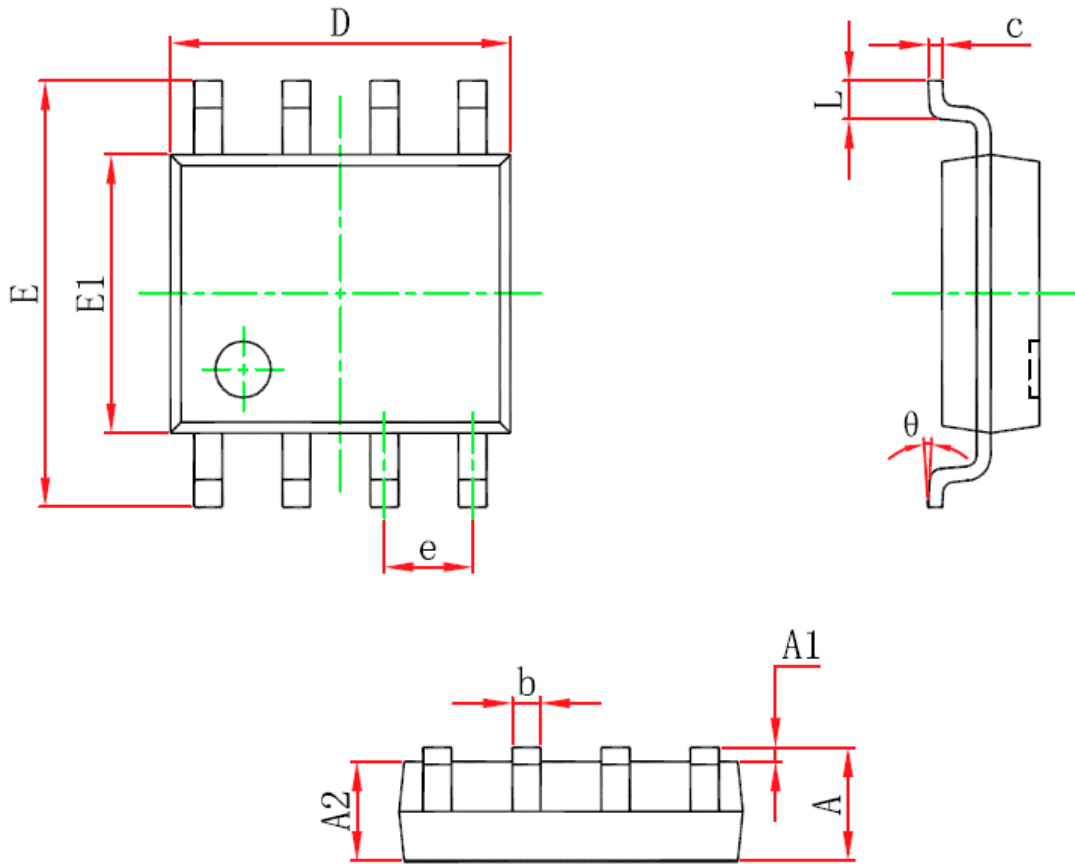


Fig6. Typical Capacitance Vs. Drain-Source

**SOP-8 Package information**



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	1.450	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
e	1.270(BSC)		0.050(BSC)	
E	5.800	6.200	0.028	0.035
E1	3.800	4.000	0.057	0.069
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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