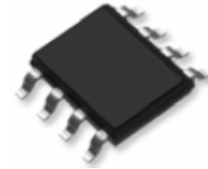


### Description

The LM8S15N10 uses advanced trench technology to provide excellent  $R_{DS(ON)}$ , low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

### Dimensions SOP-8



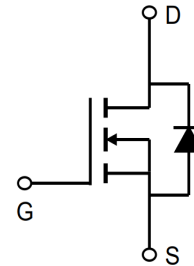
### General Features

- $V_{DS} = 100V$   $I_D = 15A$
- $R_{DS(ON)} < 120m\Omega$  @  $V_{GS} = 10V$

### Application

- Battery protection
- Load switch
- Uninterruptible power supply

### Pin Configuration



### Package Marking and Ordering Information

Device	Device Marking	Device Package	Reel Size	Tape width	Quantity
LM8S15N10	AP15N10S	SOP-8	Ø330mm	12mm	3000 units

### Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	15	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	7	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	30	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	6.1	mJ
$I_{AS}$	Avalanche Current	11	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation <sup>3</sup>	1.5	W
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup>	85	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	36	°C/W

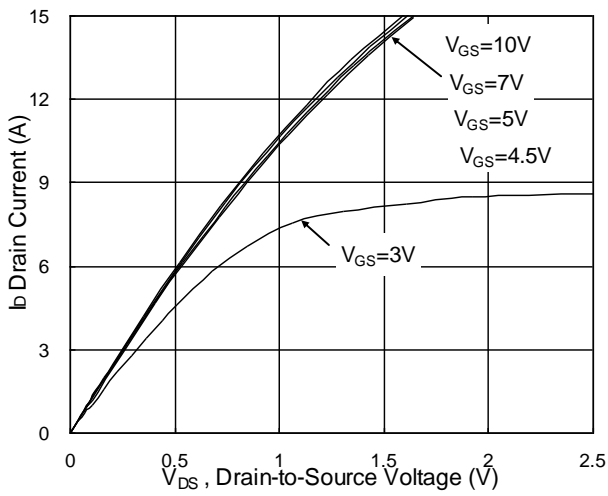
## Electrical Characteristics (T<sub>J</sub>=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BVDSS Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	0.098	---	V/°C
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =2A	---	90	112	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =1A	---	95	120	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.0	1.5	2.5	V
ΔV <sub>GS(th)</sub>	V <sub>GS(th)</sub> Temperature Coefficient		---	-4.57	---	mV/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	10	uA
		V <sub>DS</sub> =80V, V <sub>GS</sub> =0V, T <sub>J</sub> =55°C	---	---	100	
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =2A	---	12	---	S
R <sub>g</sub>	Gate Resistance	V <sub>DS</sub> =0V, V <sub>GS</sub> =0V, f=1MHz	---	2	4	
Q <sub>g</sub>	Total Gate Charge (10V)	V <sub>DS</sub> =60V, V <sub>GS</sub> =10V, I <sub>D</sub> =2A	---	19.5	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	3.2	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	3.6	---	
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =50V, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3, I <sub>D</sub> =1A	---	16.2	---	ns
T <sub>r</sub>	Rise Time		---	3	---	
T <sub>d(off)</sub>	Turn-Off Delay Time		---	44	---	
T <sub>f</sub>	Fall Time		---	2.6	---	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz	---	1535	---	pF
C <sub>oss</sub>	Output Capacitance		---	60	---	
C <sub>riss</sub>	Reverse Transfer Capacitance		---	37.4	---	
I <sub>s</sub>	Continuous Source Current <sup>1,5</sup>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	4	A
I <sub>SM</sub>	Pulsed Source Current <sup>2,5</sup>		---	---	8	A
V <sub>SD</sub>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1.2	V

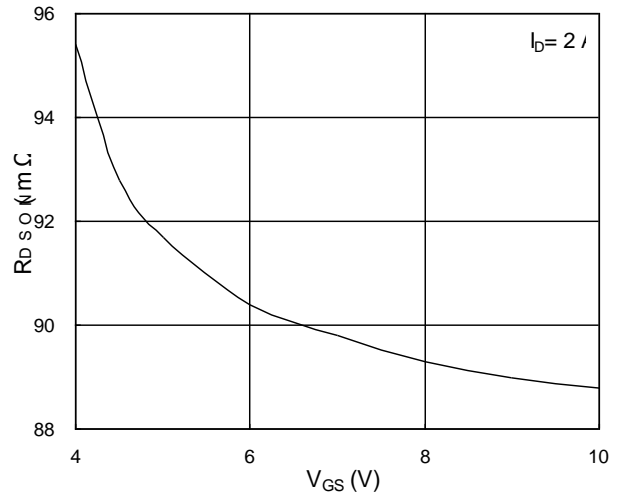
Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is VDD=25V,VGS=10V,L=0.1mH,IAS=11A
- 4.The power dissipation is limited by 175°C junction temperature
- 5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation

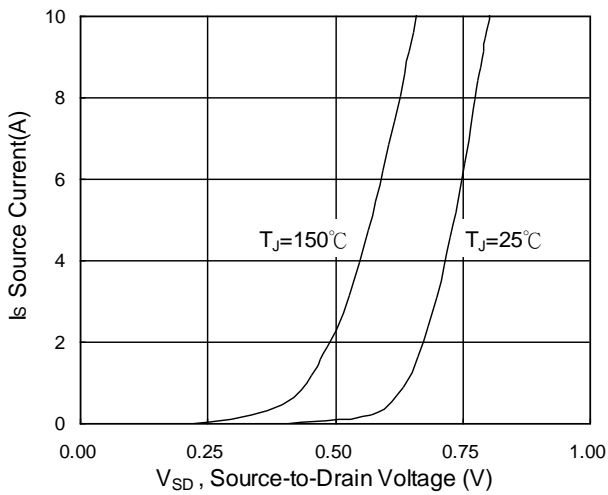
## Typical Electrical and Thermal Characteristics



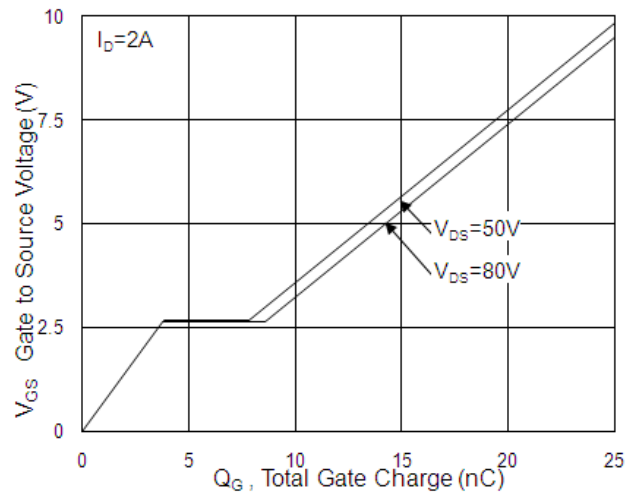
**Fig.1 Typical Output Characteristics**



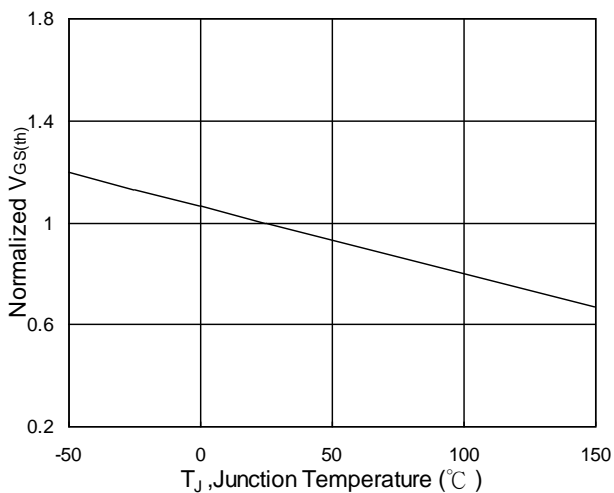
**Fig.2 On-Resistance vs. Gate-Source**



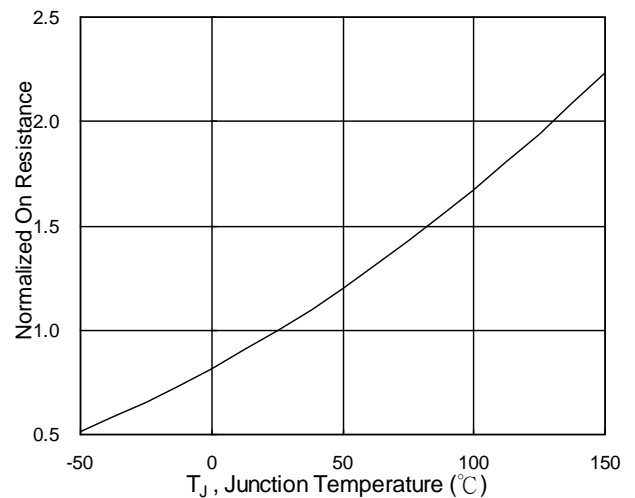
**Fig.3 Forward Characteristics Of Reverse**



**Fig.4 Gate-Charge Characteristics**



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



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

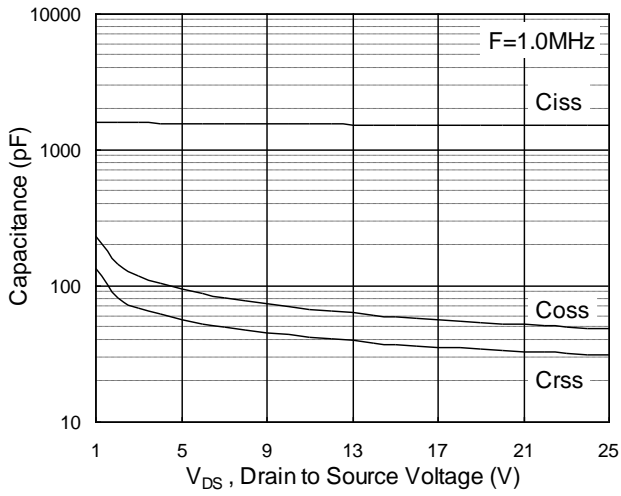


Fig.7 Capacitance

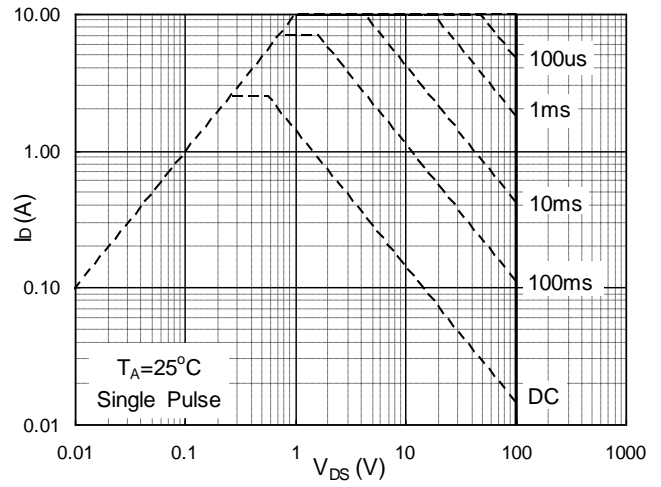


Fig.8 Safe Operating Area

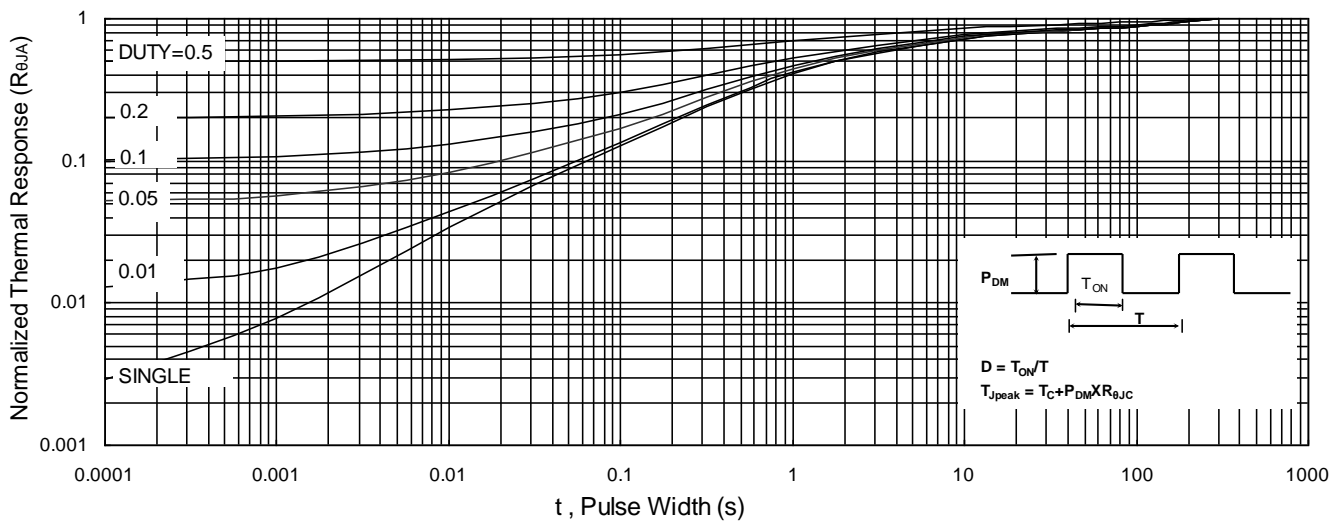


Fig.9 Normalized Maximum Transient Thermal Impedance

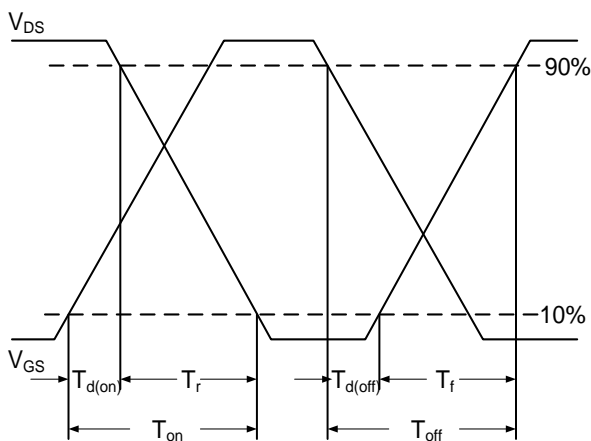


Fig.10 Switching Time Waveform

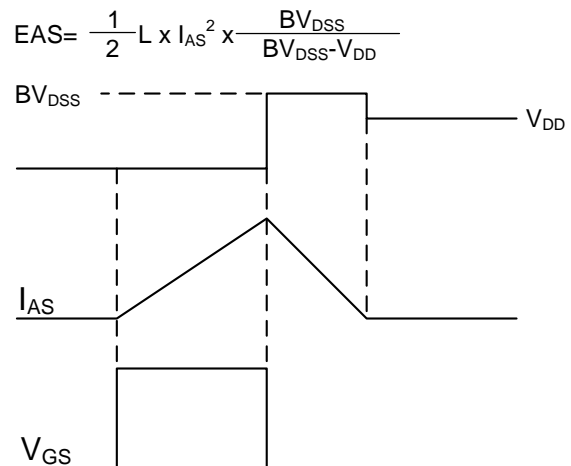
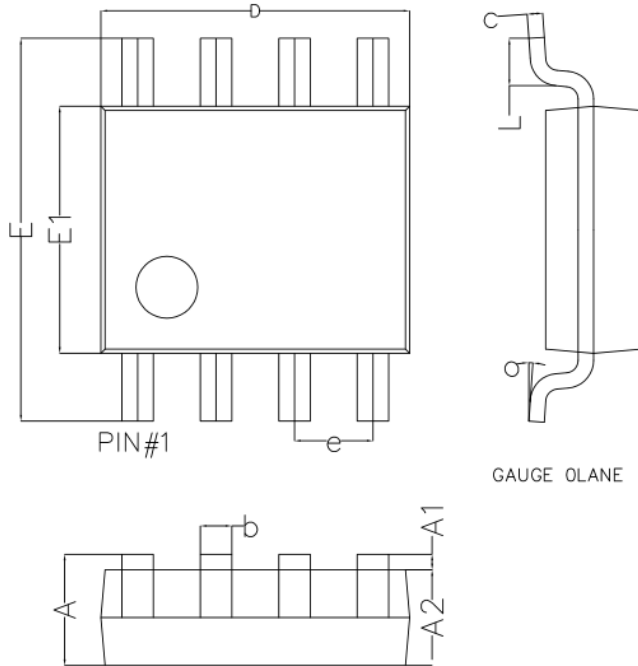


Fig.11 Unclamped Inductive Switching Waveform

## Package Mechanical Data-SOP-8

SOP8 Package outline



Symbol	Dim in mm		
	Min	Nor	Max
A	1.350	1.550	1.750
A1	0.100	0.175	0.250
A2	1.350	1.450	1.550
b	0.330	0.420	0.510
c	0.170	0.210	0.250
D	4.800	4.900	5.000
e	1.270 (BSC)		
E	5.800	6.000	6.200
E1	3.800	3.900	4.000
L	0.400	0.835	1.2700
o	0°	4°	8°