



# SPN4436W

## N-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPN4436W is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application , notebook computer power management and other battery powered circuits where high-side switching .

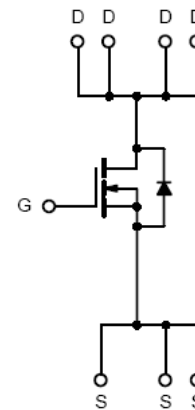
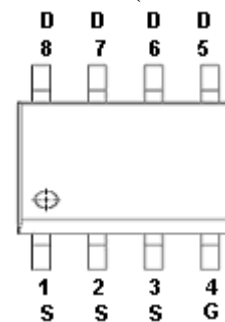
### FEATURES

- ◆ 60V/8.0A,  $R_{DS(ON)} = 38m\Omega @ V_{GS} = 10V$
- ◆ 60V/6.0A,  $R_{DS(ON)} = 44m\Omega @ V_{GS} = 4.5V$
- ◆ Super high density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ SOP – 8P package design

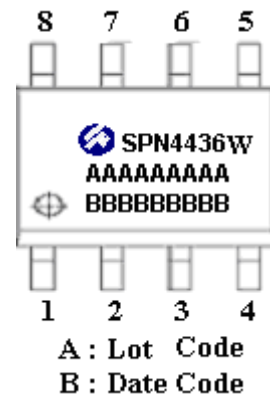
### APPLICATIONS

- DC/DC Converter
- Load Switch

### PIN CONFIGURATION(SOP – 8P)



### PART MARKING





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### PIN DESCRIPTION

Pin	Symbol	Description
1	S	Source
2	S	Source
3	S	Source
4	G	Gate
5	D	Drain
6	D	Drain
7	D	Drain
8	D	Drain

### ORDERING INFORMATION

Part Number	Package	Part Marking
SPN4436WS8RGB	SOP- 8P	SPN4436W

※ SPN4436WS8RGB : 13" Tape Reel ; Pb – Free ; Halogen – Free

### ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	V <sub>DSS</sub>	60	V	
Gate –Source Voltage	V <sub>GSS</sub>	±20	V	
Continuous Drain Current(T <sub>J</sub> =150°C)	I <sub>D</sub>	TA=25°C	8.0	A
		TA=70°C	7.2	
Pulsed Drain Current	I <sub>DM</sub>	35	A	
Avalanche Current	I <sub>AS</sub>	15	A	
Power Dissipation	P <sub>D</sub>	TA=25°C	2.5	W
		TA=70°C	1.6	
Operating Junction Temperature	T <sub>J</sub>	-55/150	°C	
Storage Temperature Range	T <sub>STG</sub>	-55/150	°C	
Thermal Resistance-Junction to Ambient	R <sub>θJA</sub>	80	°C/W	



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### ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.8		2.0	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=48V, V_{GS}=0V$			1	uA
		$V_{DS}=48V, V_{GS}=0V$ $T_J=55^\circ C$			5	
On-State Drain Current	$I_{D(on)}$	$V_{DS}\geq 5V, V_{GS}=10V$	30			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=8A$		0.034	0.038	$\Omega$
		$V_{GS}=4.5V, I_D=6A$		0.038	0.044	
Forward Transconductance	$g_{fs}$	$V_{DS}=15V, I_D=5.3A$		24		S
Diode Forward Voltage	$V_{SD}$	$I_S=2.0A, V_{GS}=0V$		0.8	1.2	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=30V, V_{GS}=5V$ $I_D=5.3A$		10	15	nC
Gate-Source Charge	$Q_{gs}$			3.5		
Gate-Drain Charge	$Q_{gd}$			3.6		
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V$ $f=1MHz$		890		pF
Output Capacitance	$C_{oss}$			85		
Reverse Transfer Capacitance	$C_{rss}$			48		
Turn-On Time	$t_{d(on)}$	$V_{DD}=30V, R_L=6.8\Omega$ $I_D=4.4A, V_{GEN}=10V$ $R_G=1\Omega$		10	15	nS
	$t_r$			12	20	
Turn-Off Time	$t_{d(off)}$			25	35	
	$t_f$			10	15	

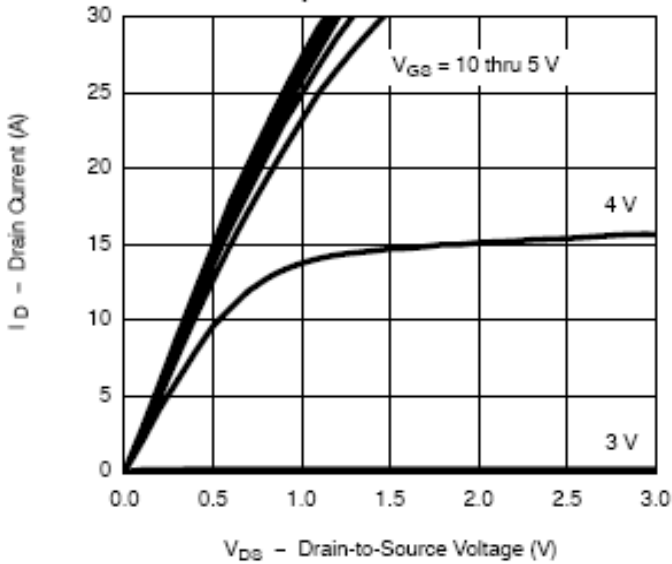


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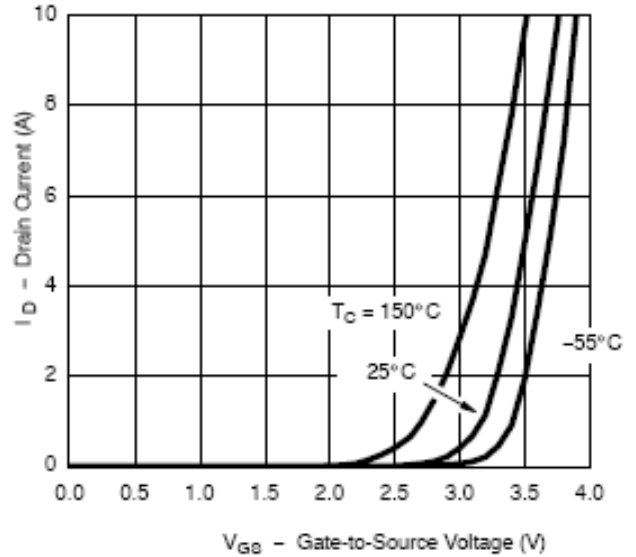
## N-Channel Enhancement Mode MOSFET

### TYPICAL CHARACTERISTICS

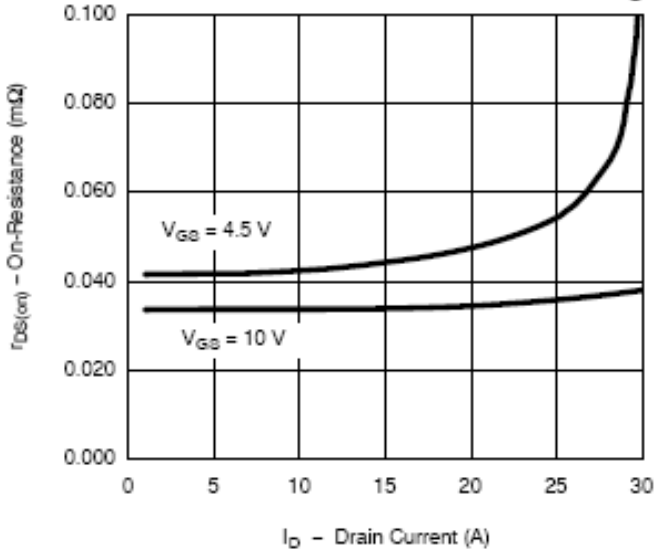
Output Characteristics



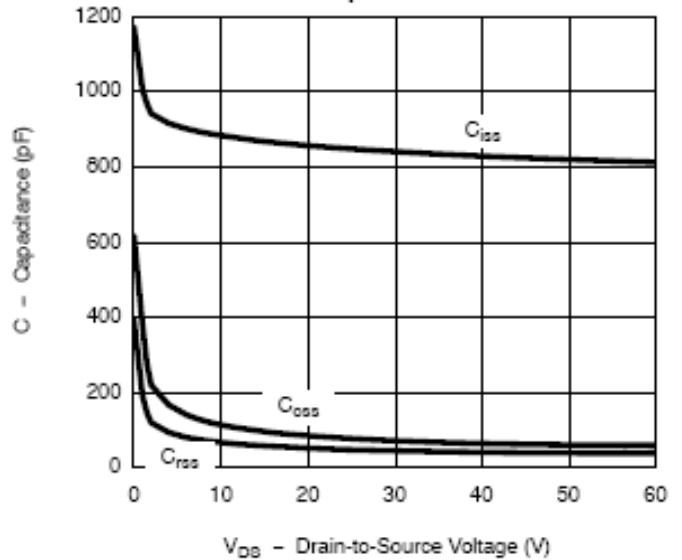
Transfer Characteristics



On-Resistance vs. Drain Current and Gate Voltage



Capacitance

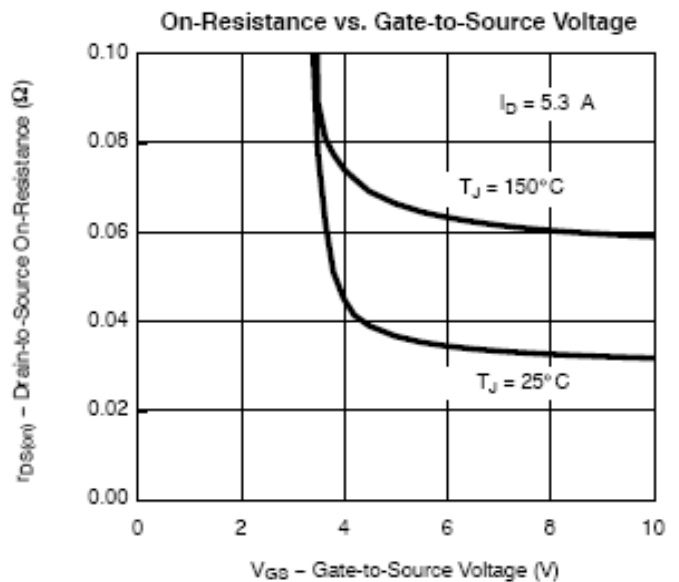
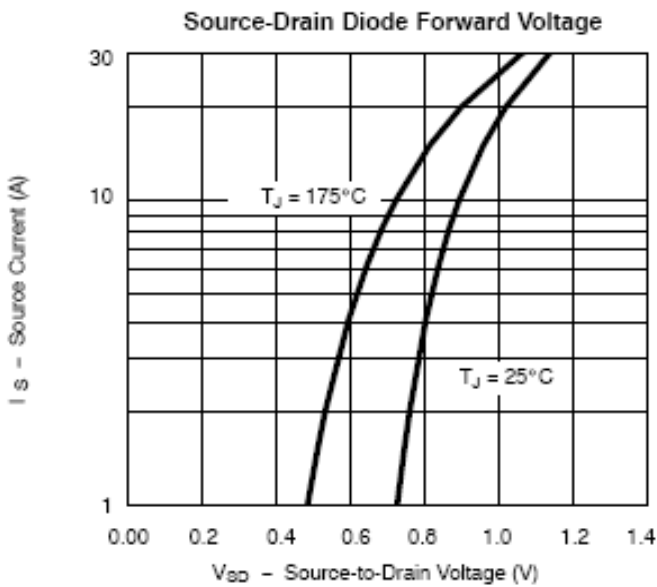
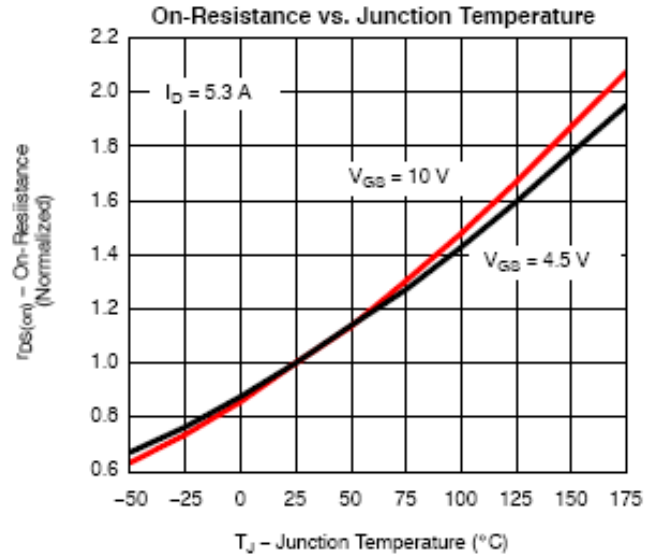
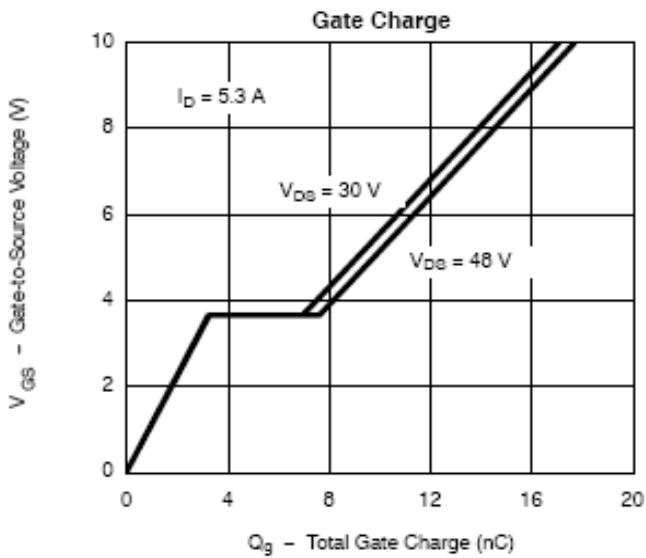




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### TYPICAL CHARACTERISTICS



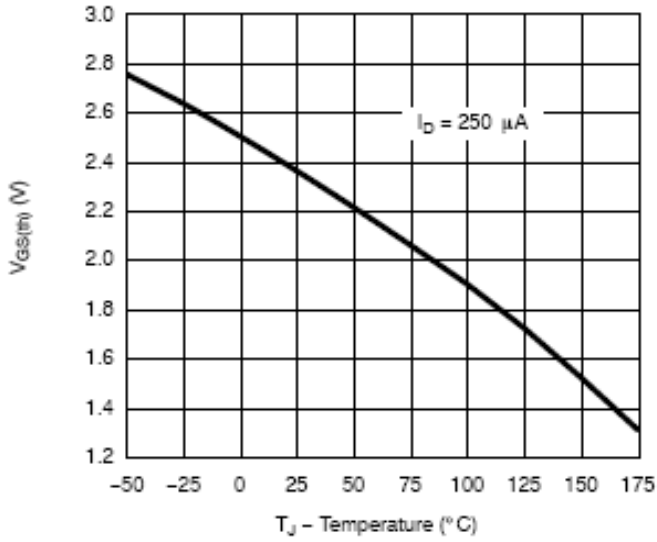


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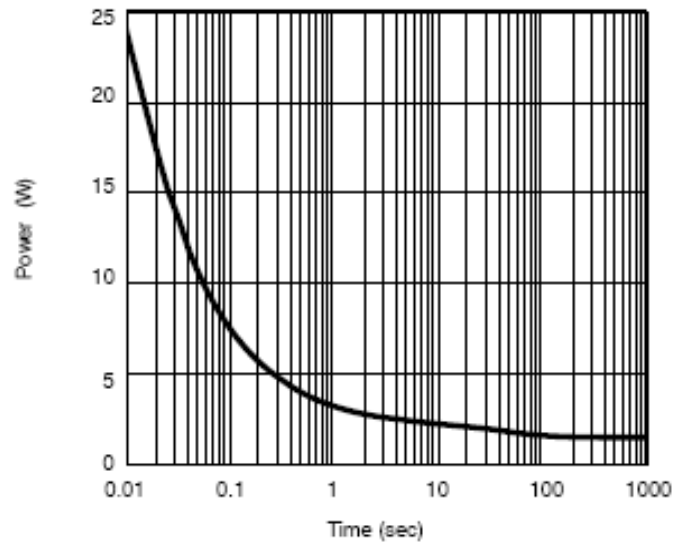
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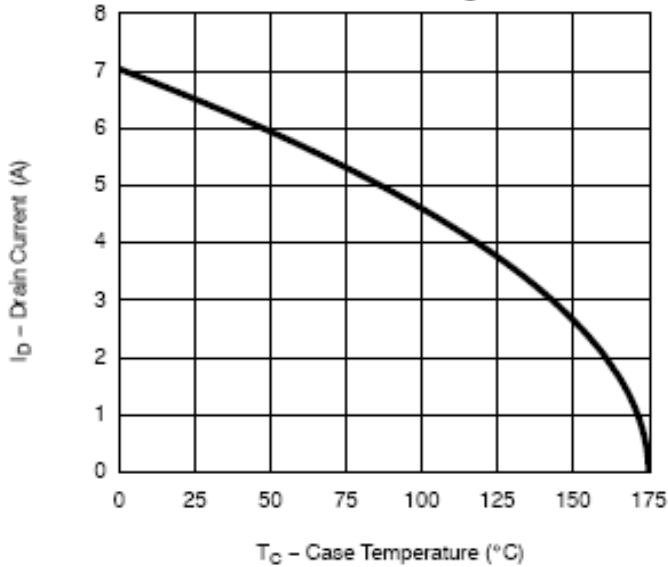
Threshold Voltage



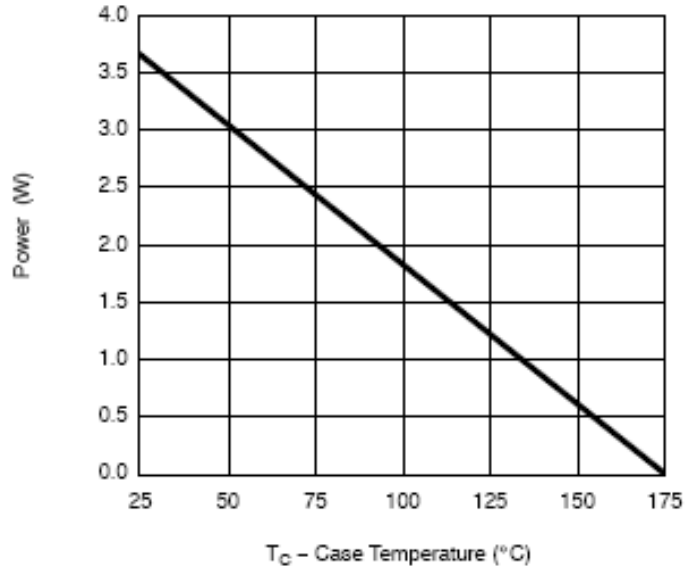
Single Pulse Power, Junction-to-Ambient



Current De-Rating\*



Power, Junction-to-Case

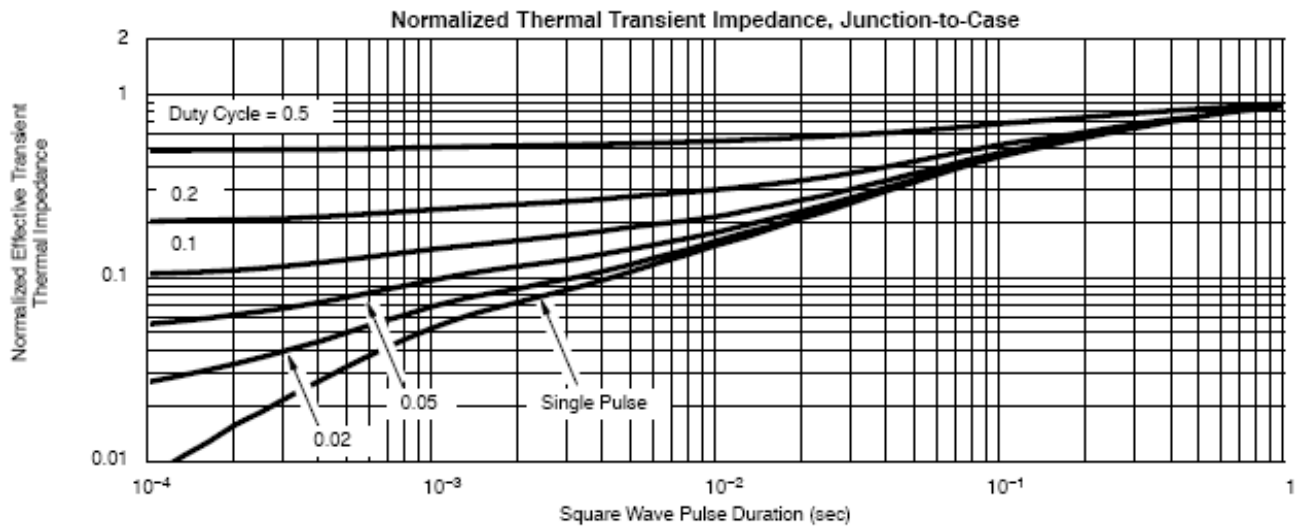
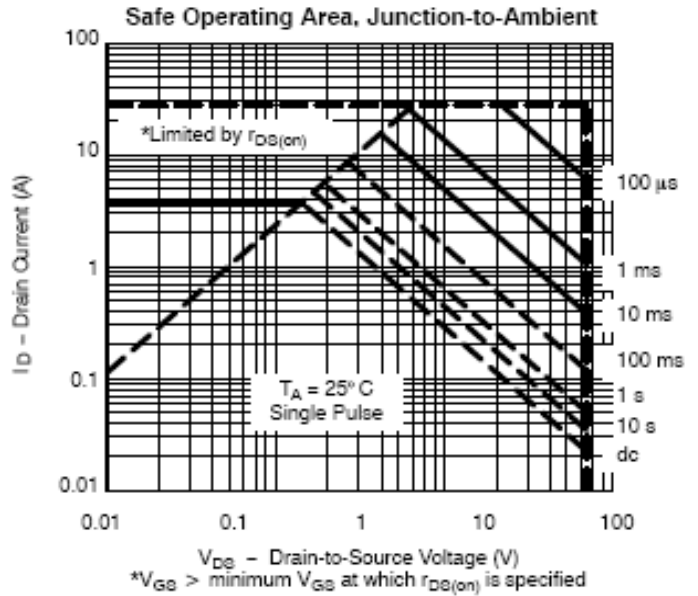
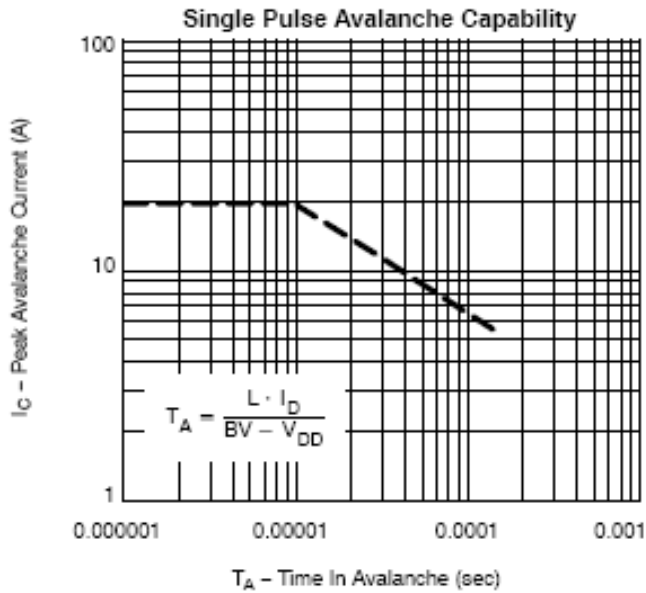




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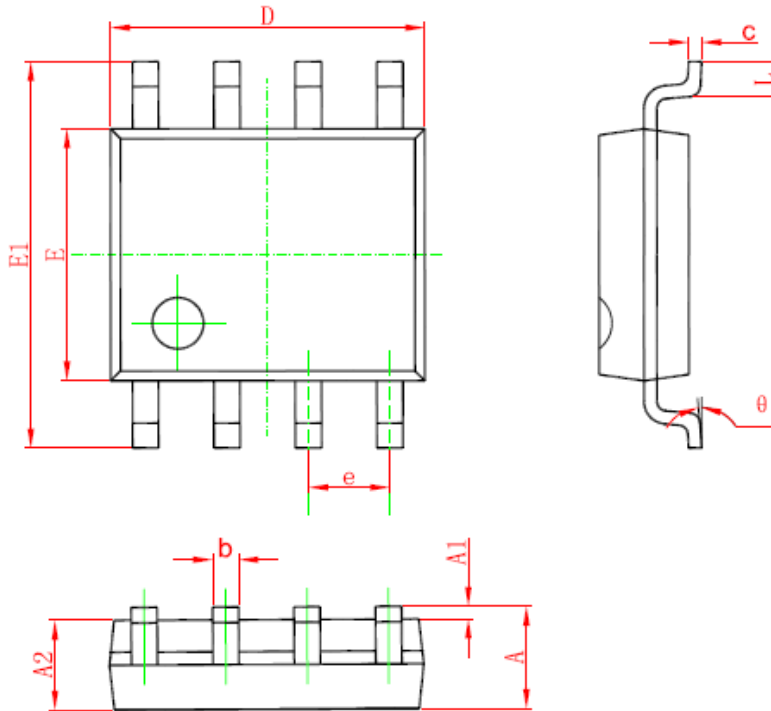




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### SOP-8 PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	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	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°





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