



SSF2816EBK

20V Dual N-Channel MOSFET

DESCRIPTION

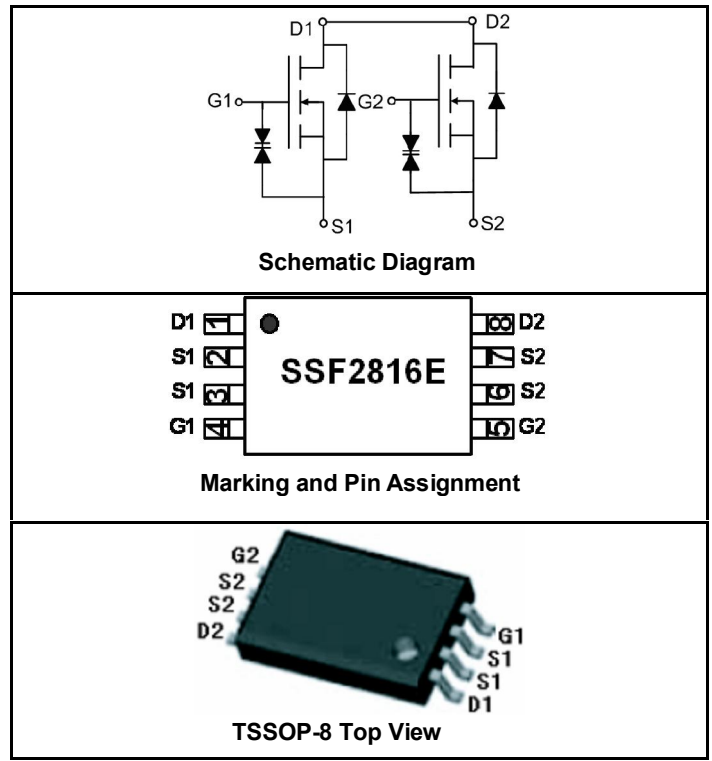
The SSF2816EBK uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V.

GENERAL FEATURES

- $V_{DS} = 20V, I_D = 7A$
 $R_{DS(ON)} < 30m\Omega @ V_{GS}=2.5V$
 $R_{DS(ON)} < 26m\Omega @ V_{GS}=3.1V$
 $R_{DS(ON)} < 23m\Omega @ V_{GS}=4V$
 $R_{DS(ON)} < 22m\Omega @ V_{GS}=4.5V$
- ESD Rating: 2000V HBM
- High Power and current handling capability
- Lead free product
- Surface Mount Package

APPLICATIONS

- Battery protection
- Load switch
- Power management



PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape Width	Quantity
SSF2816E	SSF2816EBK	TSSOP-8	Ø330mm	12mm	3000 units

ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	I_D	7	A
	I_{DM}	25	A
Maximum Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	83	$^\circ C/W$
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ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 4.5V, V_{DS}=0V$			± 200	nA
		$V_{GS}=\pm 10V, V_{DS}=0V$			± 10	μA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.6	0.75	1.2	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=6.5A$		16.5	22	$m\Omega$
		$V_{GS}=4V, I_D=6A$		17	23	$m\Omega$
		$V_{GS}=3.1V, I_D=5.5A$		19	26	$m\Omega$
		$V_{GS}=2.5V, I_D=5.5A$		22	30	$m\Omega$
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=6.5A$		6.6		S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{iss}	$V_{DS}=8V, V_{GS}=0V, F=1.0MHz$		600		PF
Output Capacitance	C_{oss}			330		PF
Reverse Transfer Capacitance	C_{rss}			140		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=1A, V_{GS}=4.5V, R_{GEN}=6\Omega$		10	20	nS
Turn-on Rise Time	t_r			11	25	nS
Turn-Off Delay Time	$t_{d(off)}$			35	70	nS
Turn-Off Fall Time	t_f			30	60	nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=7A, V_{GS}=4.5V$		10	15	nC
Gate-Source Charge	Q_{gs}			2.3		nC
Gate-Drain Charge	Q_{gd}			3		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=1.5A$		0.84	1.2	V

NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production testing.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

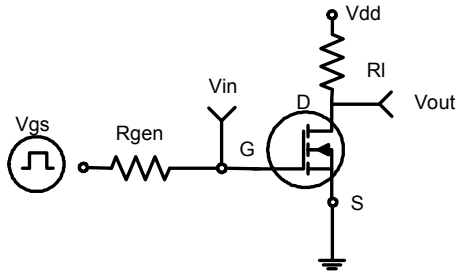


Figure 1: Switching Test Circuit

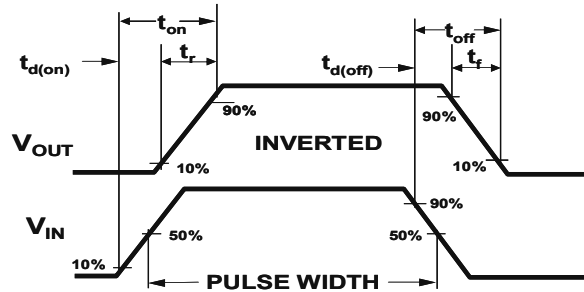


Figure 2: Switching Waveforms

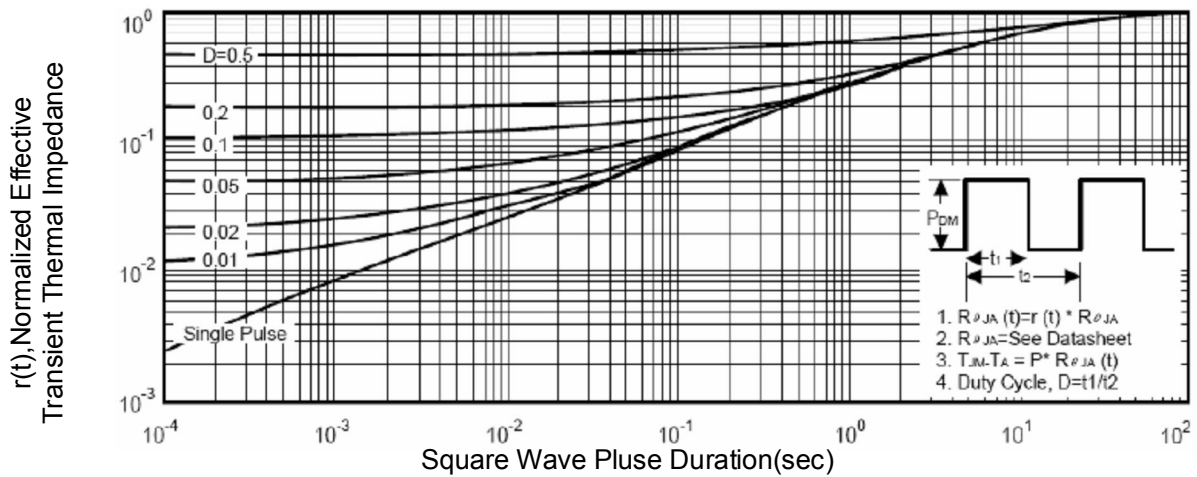
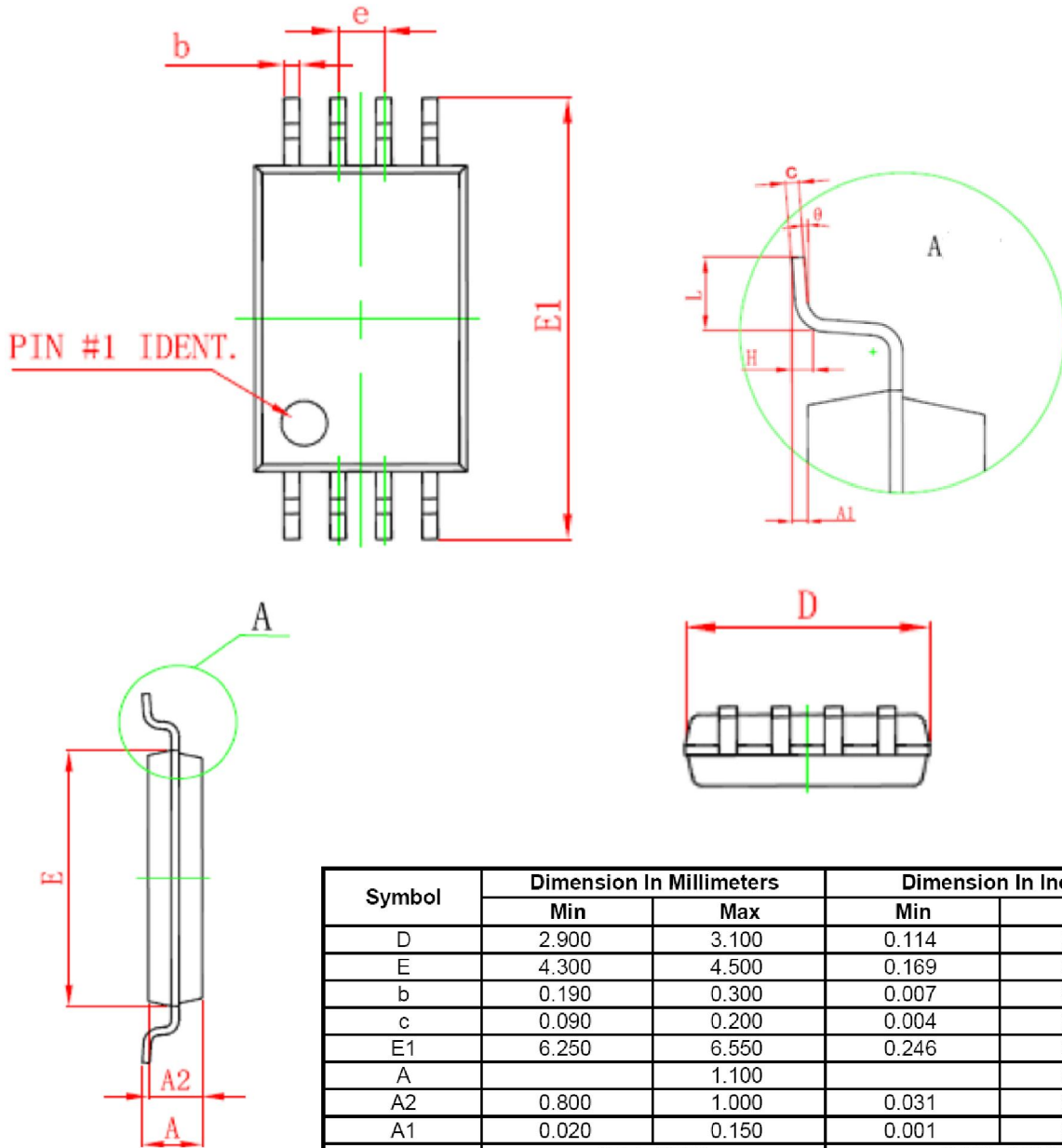


Figure 3 Normalized Maximum Transient Thermal Impedance

TSSOP-8 PACKAGE INFORMATION



Symbol	Dimension In Millimeters		Dimension In Inches	
	Min	Max	Min	Max
D	2.900	3.100	0.114	0.122
E	4.300	4.500	0.169	0.177
b	0.190	0.300	0.007	0.012
c	0.090	0.200	0.004	0.008
E1	6.250	6.550	0.246	0.258
A		1.100		0.043
A2	0.800	1.000	0.031	0.039
A1	0.020	0.150	0.001	0.006
e	0.65 (BSC)		0.026 (BSC)	
L	0.500	0.700	0.020	0.028
H	0.25 TYP		0.01 TYP	
theta	1 ^o	7 ^o	1 ^o	7 ^o

NOTES:

1. Dimensions are inclusive of plating
2. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 6 mils.
3. Dimension L is measured in gauge plane.
4. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.