

DESCRIPTION

The SSF2814E 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

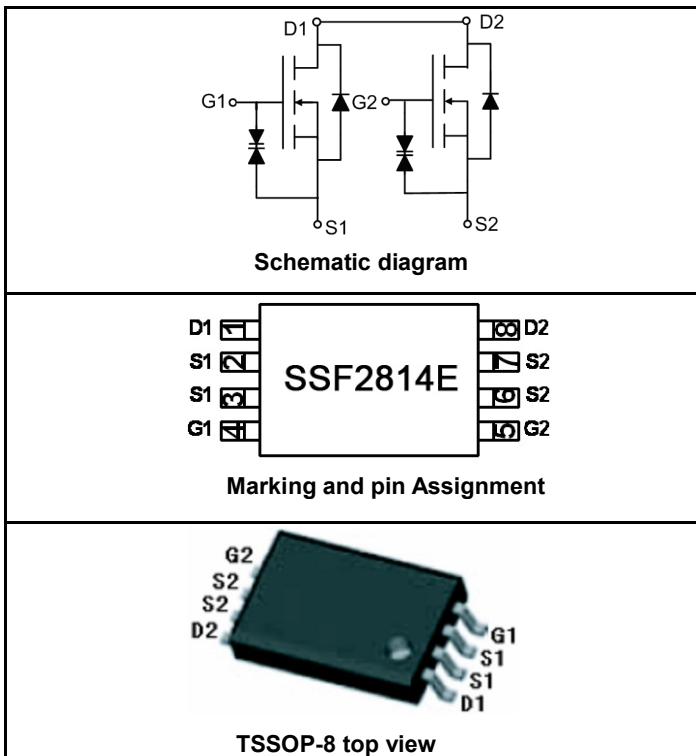
- $V_{DS} = 20V, I_D = 7A$
 $R_{DS(ON)} < 28m\Omega @ V_{GS}=2.5V$
 $R_{DS(ON)} < 26m\Omega @ V_{GS}=3.1V$
 $R_{DS(ON)} < 22m\Omega @ V_{GS}=4V$
 $R_{DS(ON)} < 20m\Omega @ V_{GS}=4.5V$

ESD Rating: 2000V HBM

- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

- Battery protection
- Load switch
- Power management



PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
SSF2814E	SSF2814E	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 (TA=25℃ 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	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=6.5A$		14	20	m Ω
		$V_{GS}=4V, I_D=6A$		16	22	m Ω
		$V_{GS}=3.1V, I_D=5.5A$		19	26	m Ω
		$V_{GS}=2.5V, I_D=5.5A$		24	28	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=6.5A$		6.6		S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{iss}	$V_{DS}=8V, V_{GS}=0V, F=1.0MHz$		650		PF
Output Capacitance	C_{oss}			360		PF
Reverse Transfer Capacitance	C_{rss}			154		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=10V, I_D=1A, V_{GS}=4.5V, R_{GEN}=6\Omega$		11	22	nS
Turn-on Rise Time	t_r			12	28	nS
Turn-Off Delay Time	$t_{d(off)}$			35	73	nS
Turn-Off Fall Time	t_f			33	65	nS
Total Gate Charge	Q_g	$V_{DS}=10V, I_D=7A, V_{GS}=4.5V$		11	16	nC
Gate-Source Charge	Q_{gs}			2.5		nC
Gate-Drain Charge	Q_{gd}			3.2		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

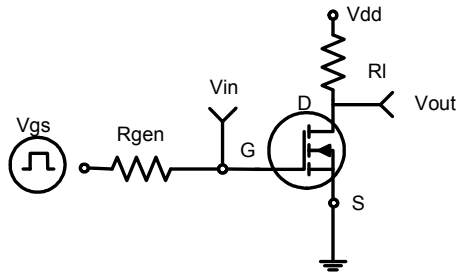


Figure 1: Switching Test Circuit

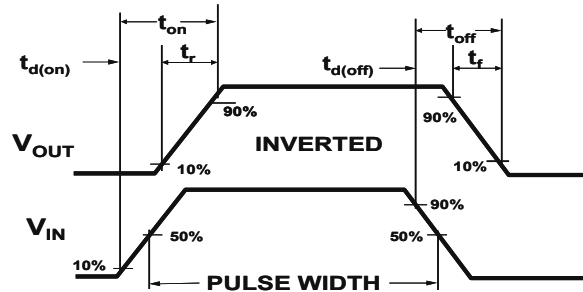


Figure 2: Switching Waveforms

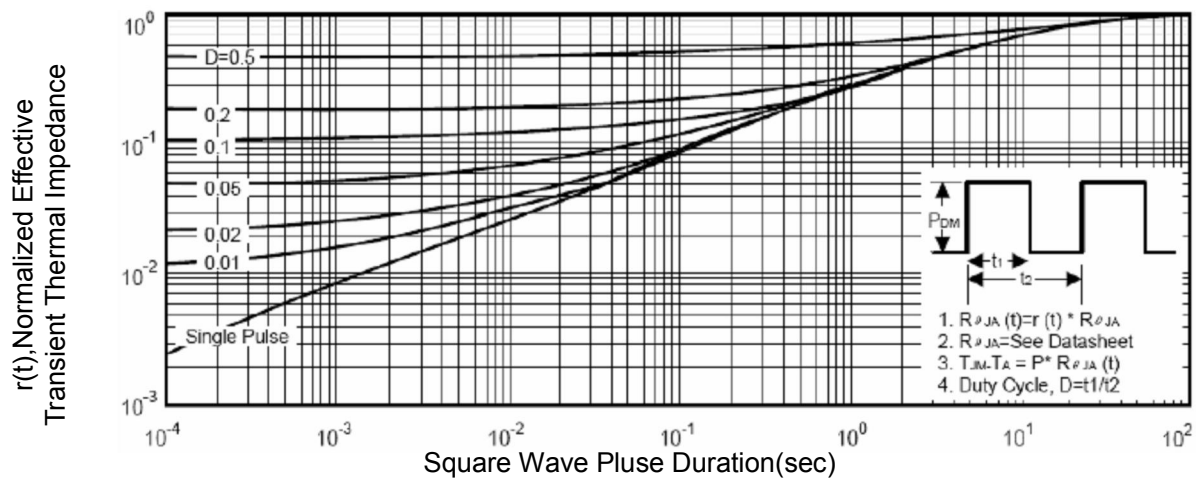
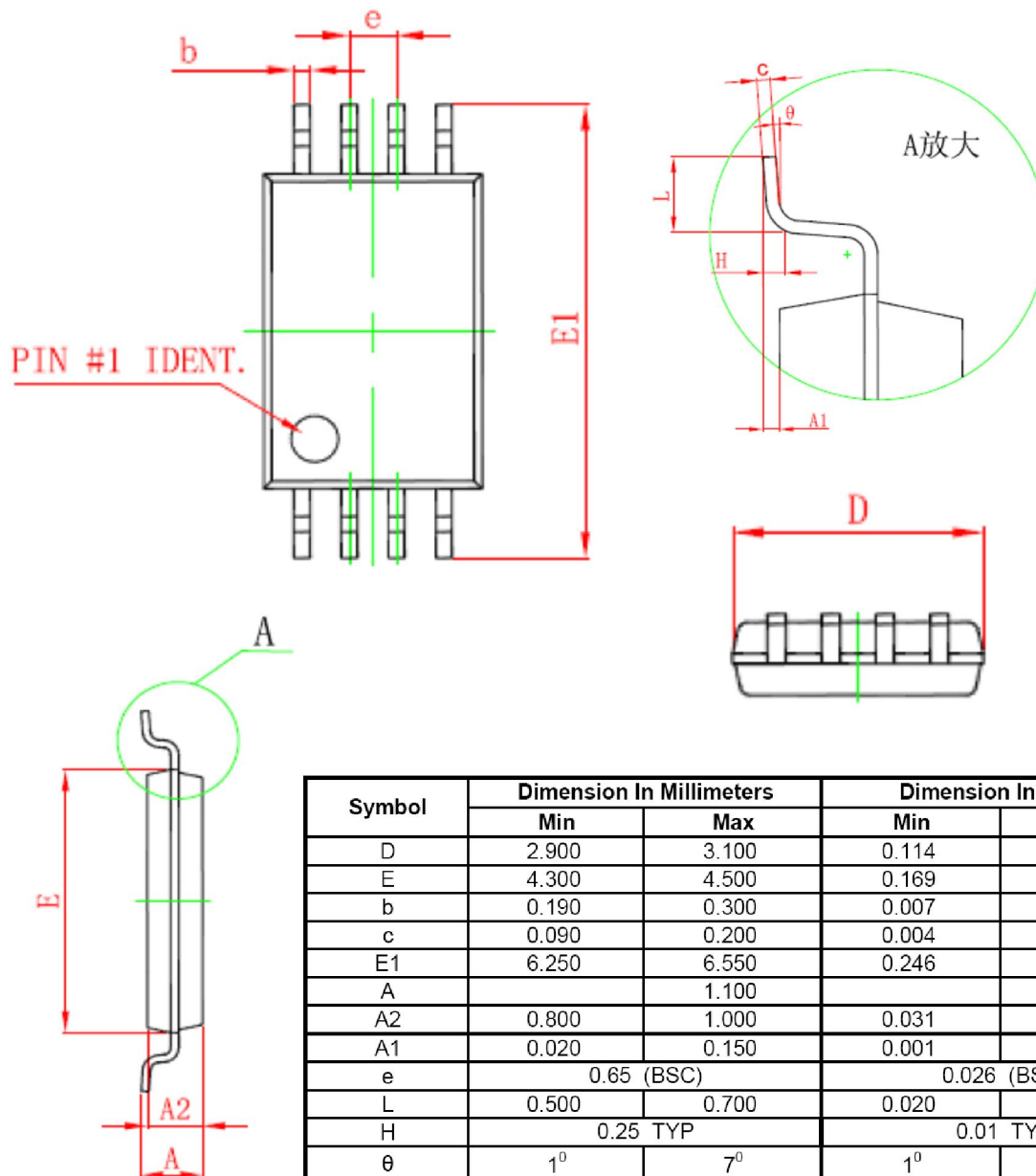


Figure 3 Normalized Maximum Transient Thermal Impedance

TSSOP-8 PACKAGE INFORMATION



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.