

DESCRIPTION

The SSF2616E uses advanced trench technology to provide excellent $R_{\rm DS(ON)}$, 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 Ω @ V_{GS} =2.5V

 $R_{DS(ON)} < 26m\Omega @ V_{GS} = 3.1V$

 $R_{DS(ON)} < 23m\Omega @ V_{GS}=4V$

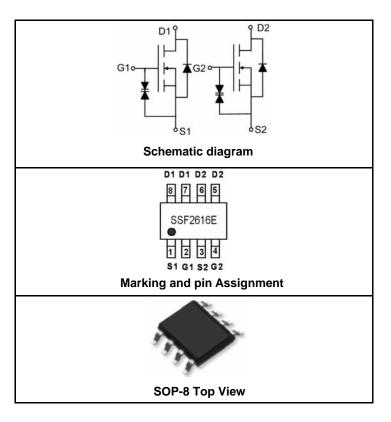
 $R_{DS(ON)} < 22m\Omega @ V_{GS} = 4.5V$

ESD Rating: 2000V HBM

- High Power and current handing 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
SSF2616E	SSF2616E	SOP-8	Ø330mm	12mm	2500 units

ABSOLUTE MAXIMUM RATINGS(TA=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±12	V
	I _D (25℃)	7	А
Drain Current-Continuous@ Current-Pulsed (Note 1)	I _D (70℃)	5	А
	I _{DM}	25	А
Maximum Power Dissipation	P _D	1.5	W
Operating Junction and Storage Temperature Range	T_{J}, T_{STG}	-55 To 150	$^{\circ}$

THERMAL CHARACTERISTICS

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

Parameter	Symbol	Condition	Min	Тур	Max	Unit
OFF CHARACTERISTICS						



Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =20V,V _{GS} =0V			1	μΑ
Cata Badis Laglaga Compant	1	V _{GS} =±4.5V,V _{DS} =0V			±200	nA
Gate-Body Leakage Current	I_{GSS}	V _{GS} =±10V,V _{DS} =0V			±10	uA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V _{DS} =V _{GS} ,I _D =250μA	0.6	0.75	1.2	V
		V _{GS} =4.5V, I _D =6.5A		16.5	22	mΩ
Drain-Source On-State Resistance	D	V _{GS} =4V, I _D =6A		17	23	mΩ
Dialii-Source Oil-State Resistance	R _{DS(ON)}	V _{GS} =3.1V, I _D =5.5A		19	26	mΩ
		V _{GS} =2.5V, I _D =5.5A		22	30	mΩ
Forward Transconductance	g FS	V _{DS} =10V,I _D =6.5A		6.6		S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{lss}	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)}			10	20	nS
Turn-on Rise Time	t _r	V _{DD} =10V,I _D =1A		11	25	nS
Turn-Off Delay Time	$t_{d(off)}$	V_{GS} =4.5V, R_{GEN} =6 Ω		35	70	nS
Turn-Off Fall Time	t _f			30	60	nS
Total Gate Charge	Qg			10	15	nC
Gate-Source Charge	Q_gs	V_{DS} =10V, I_{D} =7A, V_{GS} =4.5V		2.3		nC
Gate-Drain Charge	Q_{gd}	35		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:

- Repetitive Rating: Pulse width limited by maximum junction temperature.
 Surface Mounted on 1in² FR4 Board, t ≤ 10 sec.
 Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.
 Guaranteed by design, not subject to production testing.



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

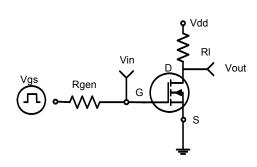


Figure 1:Switching Test Circuit

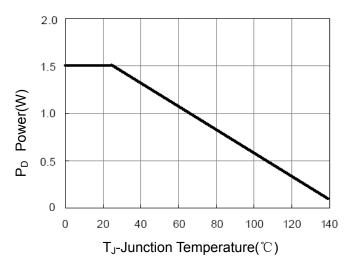


Figure 3 Power Dissipation

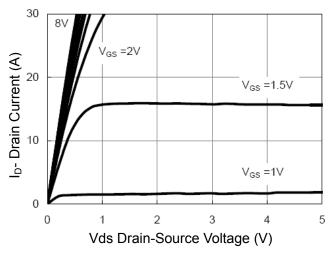


Figure 5 Output CHARACTERISTICS

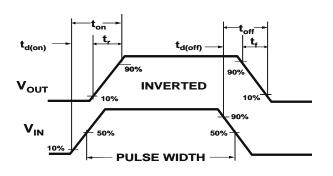


Figure 2:Switching Waveforms

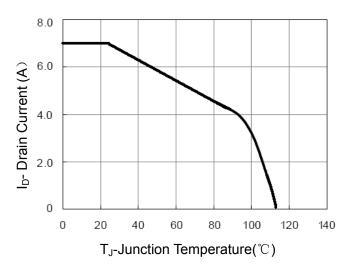


Figure 4 Drain Current

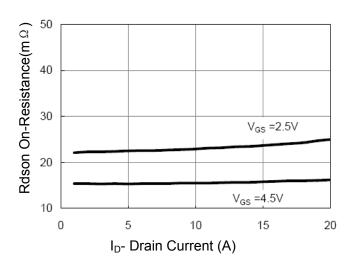


Figure 6 Drain-Source On-Resistance



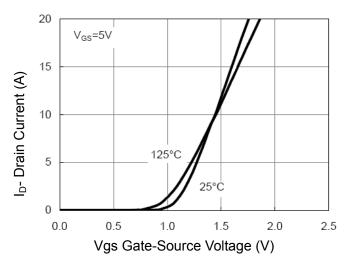


Figure 7 Transfer Characteristics

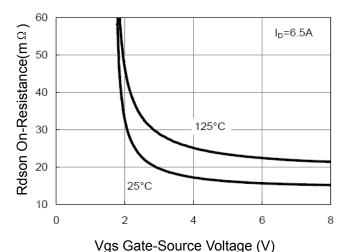


Figure 9 Rdson vs Vgs

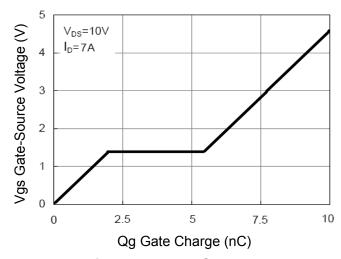


Figure 11 Gate Charge

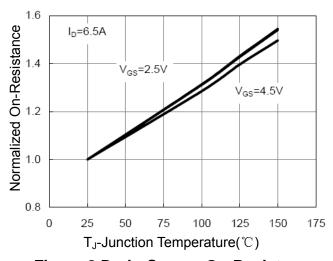


Figure 8 Drain-Source On-Resistance

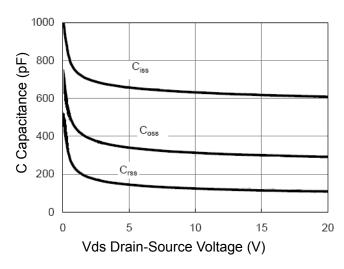


Figure 10 Capacitance vs Vds

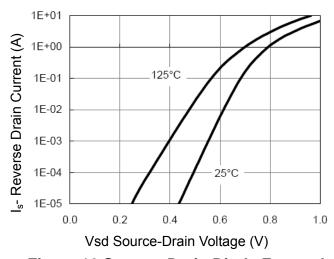


Figure 12 Source- Drain Diode Forward



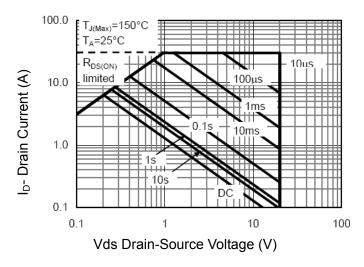


Figure 13 Safe Operation Area

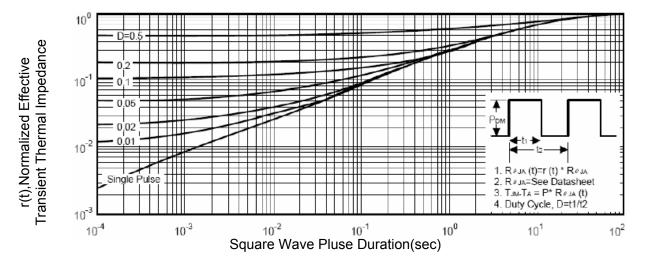
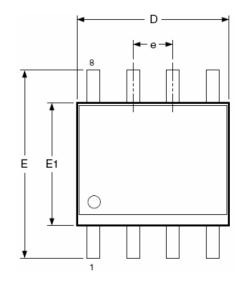
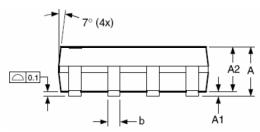


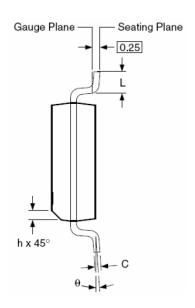
Figure 14 Normalized Maximum Transient Thermal Impedance



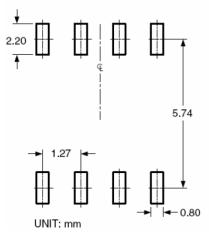
SOP-8 PACKAGE INFORMATION







RECOMMENDED LAND PATTERN



Dimensions in millimeters Symbols Min. Nom. Max. 1.35 1.65 1.75 0.10 0.25

A2	1.25	1.50	1.65		
b	0.31	_	0.51		
С	0.17	_	0.25		
D	4.80	4.90	5.00		
E1	3.80	3.90	4.00		
е	1.27 BSC				
Е	5.80	6.00	6.20		
h	0.25	_	0.50		
L	0.40	_	1.27		
θ	0°	_	8°		

Dimensions in inches

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Symbols	Min.	Nom.	Max.			
Α	0.053	0.065	0.069			
A1	0.004	_	0.010			
A2	0.049	0.059	0.065			
b	0.012	_	0.020			
С	0.007	_	0.010			
D	0.189	0.193	0.197			
E1	0.150	0.154	0.157			
е	0	С				
Ε	0.228	0.236	0.244			
h	0.010	_	0.020			
L	0.016	_	0.050			
θ	0 °	_	8°			

NOTES:

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



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