

DESCRIPTION

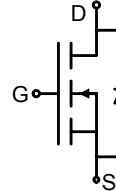
The SSF4414 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

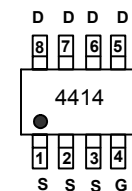
- $V_{DS} = 30V, I_D = 8.5A$
 $R_{DS(ON)} < 40m\Omega @ V_{GS}=4.5V$
 $R_{DS(ON)} < 26m\Omega @ V_{GS}=10V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

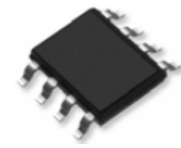
- PWM applications
- Load switch
- Power management



Schematic diagram



Marking and pin Assignment



SOP-8 top view

PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
4414	SSF4414	SOP-8	Ø330mm	12mm	3000 units

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	I_D	8.5	A
	I_{DM}	50	A
Maximum Power Dissipation	P_D	3	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	40	°C/W
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ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			±100	nA
ON CHARACTERISTICS (Note 3)						

Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.9	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=5A$		31	40	m Ω
		$V_{GS}=10V, I_D=8.5A$		20	26	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=5A$	10	17		S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V,$ $F=1.0MHz$		680	820	PF
Output Capacitance	C_{oss}			100		PF
Reverse Transfer Capacitance	C_{rss}			75		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=15V, V_{GS}=10V, R_{GEN}=3\Omega$ $R_L=1.8\Omega$		4.5	6.5	nS
Turn-on Rise Time	t_r			4.2	6.3	nS
Turn-Off Delay Time	$t_{d(off)}$			20	30	nS
Turn-Off Fall Time	t_f			4.9	7.5	nS
Total Gate Charge	Q_g	$V_{DS}=15V, I_D=8.5A, V_{GS}=10V$		13.8	17	nC
Gate-Source Charge	Q_{gs}			1.8		nC
Gate-Drain Charge	Q_{gd}			3.3		nC
Body Diode Reverse Recovery Time	T_{rr}	$I_F=8.5A, dI/dt=100A/\mu s$		17.2	21	nS
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=8.5A, dI/dt=100A/\mu s$		8.6	10	nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=1A$		0.76	1	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

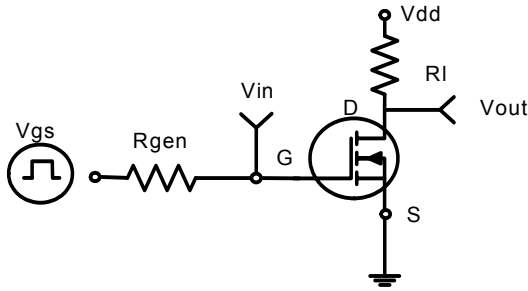


Figure 1: Switching Test Circuit

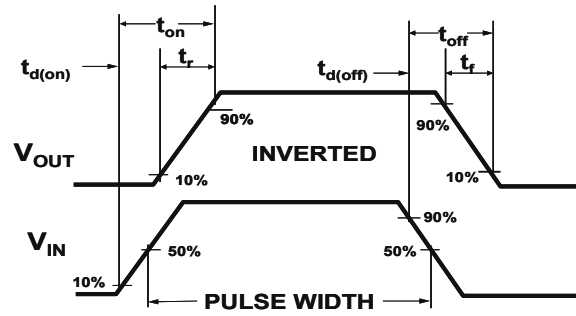


Figure 2: Switching Waveforms

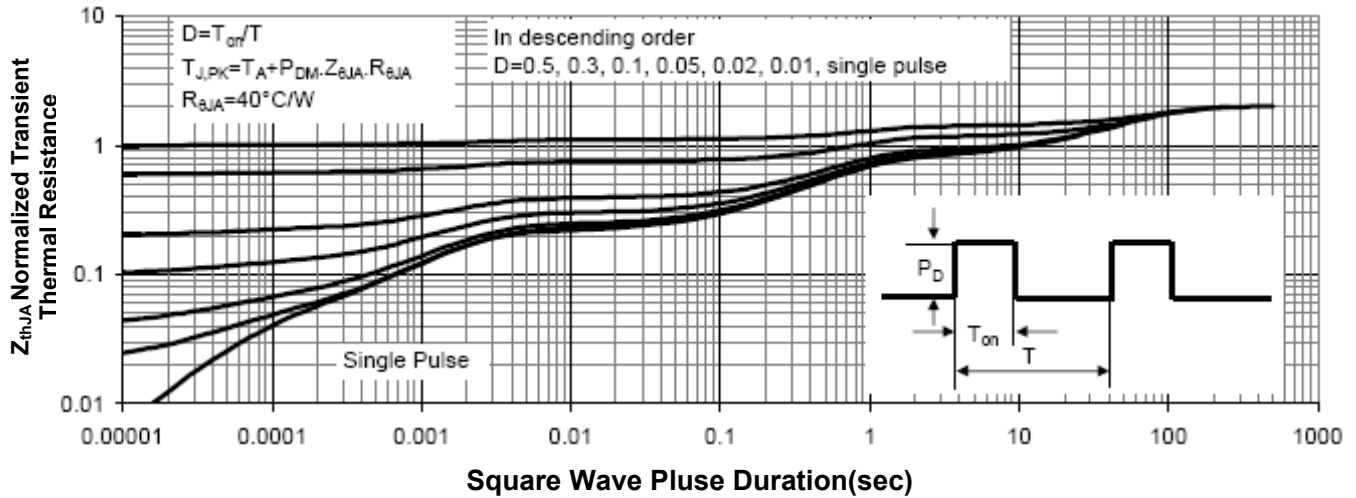
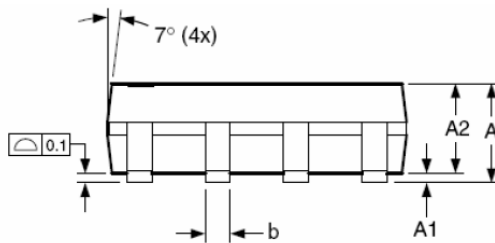
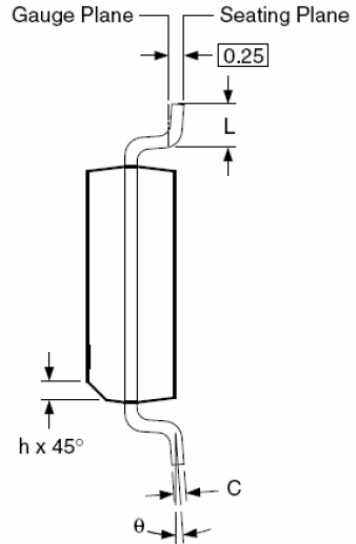
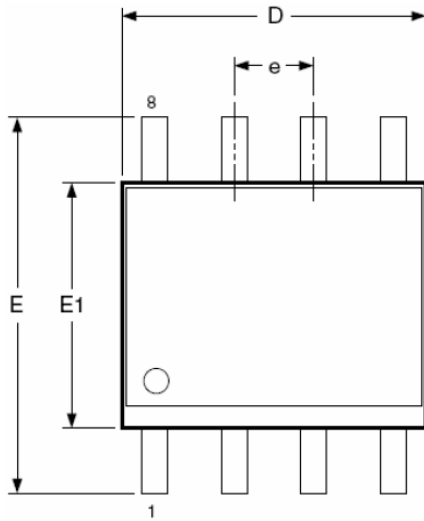
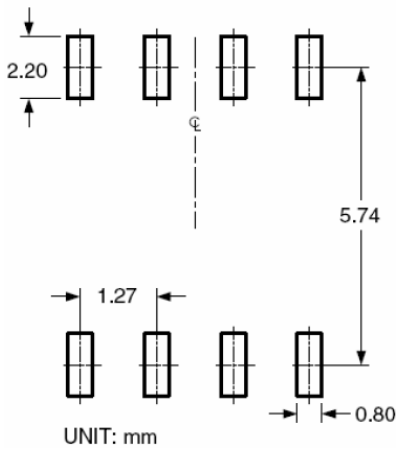


Figure 3: Normalized Maximum Transient Thermal Impedance

SOP-8 PACKAGE INFORMATION



RECOMMENDED LAND PATTERN



Dimensions in millimeters

Symbols	Min.	Nom.	Max.
A	1.35	1.65	1.75
A1	0.10	—	0.25
A2	1.25	1.50	1.65
b	0.31	—	0.51
c	0.17	—	0.25
D	4.80	4.90	5.00
E1	3.80	3.90	4.00
e	1.27 BSC		
E	5.80	6.00	6.20
h	0.25	—	0.50
L	0.40	—	1.27
θ	0°	—	8°

Dimensions in inches

Symbols	Min.	Nom.	Max.
A	0.053	0.065	0.069
A1	0.004	—	0.010
A2	0.049	0.059	0.065
b	0.012	—	0.020
c	0.007	—	0.010
D	0.189	0.193	0.197
E1	0.150	0.154	0.157
e	0.050 BSC		
E	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
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.

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