

DESCRIPTION

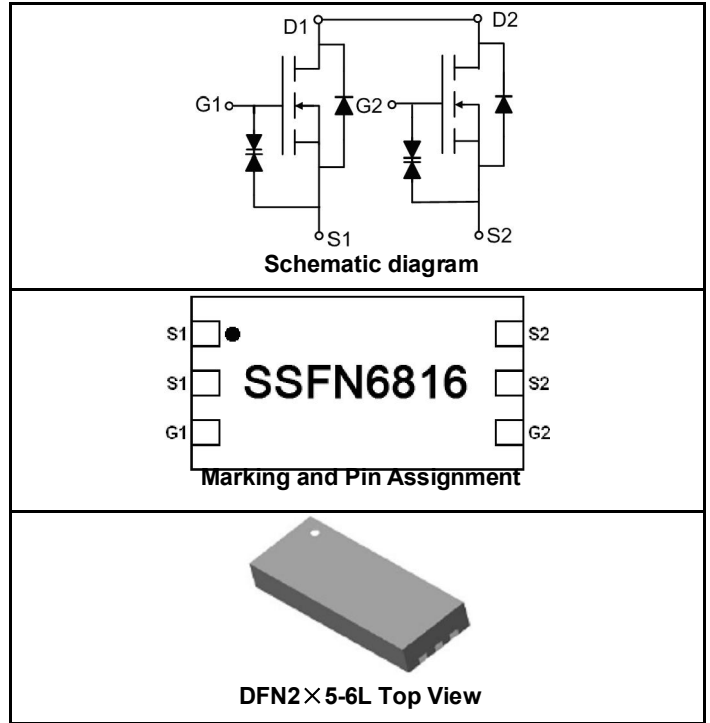
The SSFN6816 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V while retaining a 12V $V_{GS(MAX)}$ rating. It is ESD protected. This device is suitable for use as a uni-directional or bi-directional load switch, facilitated by its common-drain configuration.

GENERAL FEATURES

- $V_{DS} = 30V, I_D = 8A$
- $R_{DS(ON)} < 30m\Omega @ V_{GS}=2.5V$
- $R_{DS(ON)} < 24m\Omega @ V_{GS}=3.1V$
- $R_{DS(ON)} < 22m\Omega @ V_{GS}=4.0V$
- $R_{DS(ON)} < 20m\Omega @ V_{GS}=4.5V$
- $R_{DS(ON)} < 17m\Omega @ V_{GS}=10V$

ESD Rating: 2000V HBM

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



PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape Width	Quantity
SSFN6816	SSFN6816	DFN2x5-6L			3000 units

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	I_D	8	A
	I_{DM}	45	A
Maximum Power Dissipation	P_D	1.7	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)	$R_{\theta JA}$	40	$^\circ C/W$
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ELECTRICAL CHARACTERISTICS ($T_A=25^\circ C$ 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}	$V_{DS}=30V, V_{GS}=0V$			1	μA



SSFN6816

30V Dual N-Channel MOSFET

Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$			10	μA
Gate-Source Breakdown Voltage	BV_{GSO}	$V_{DS}=0V, I_G=\pm 250\mu A$	± 12			V
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.6	1	1.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=8A$		14	17	m Ω
		$V_{GS}=4.5V, I_D=6A$		17	20	
		$V_{GS}=4.0V, I_D=4A$		18	22	
		$V_{GS}=3.1V, I_D=4A$		20	24	
		$V_{GS}=2.5V, I_D=3A$		23	30	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=8A$		17		S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V, F=1.0MHz$		870		PF
Output Capacitance	C_{oss}			130		PF
Reverse Transfer Capacitance	C_{rss}			100		PF
Gate resistance	R_g	$V_{DS}=0V, V_{GS}=0V, F=1.0MHz$		1.5		Ω
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=15V, V_{GS}=10V, R_{GEN}=3\Omega, R_L=1.25\Omega$		4		nS
Turn-on Rise Time	t_r			10		nS
Turn-Off Delay Time	$t_{d(off)}$			28		nS
Turn-Off Fall Time	t_f			7		nS
Total Gate Charge	Q_g	$V_{DS}=15V, I_D=8A, V_{GS}=4.5V$		10.5		nC
Gate-Source Charge	Q_{gs}			1.9		nC
Gate-Drain Charge	Q_{gd}			4.1		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=1A$		0.76	0.9	V
Diode Forward Current (Note 2)	I_S				4.5	A

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

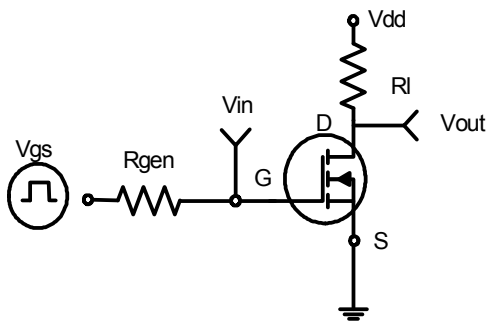


Figure 1: Switching Test Circuit

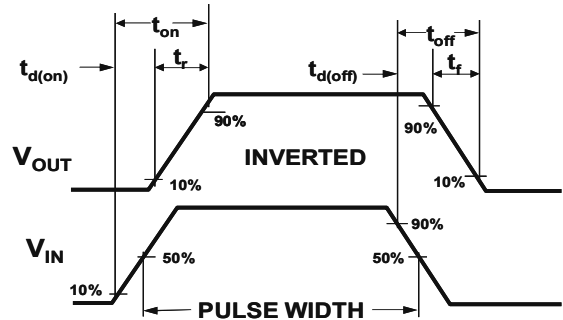


Figure 2: Switching Waveforms

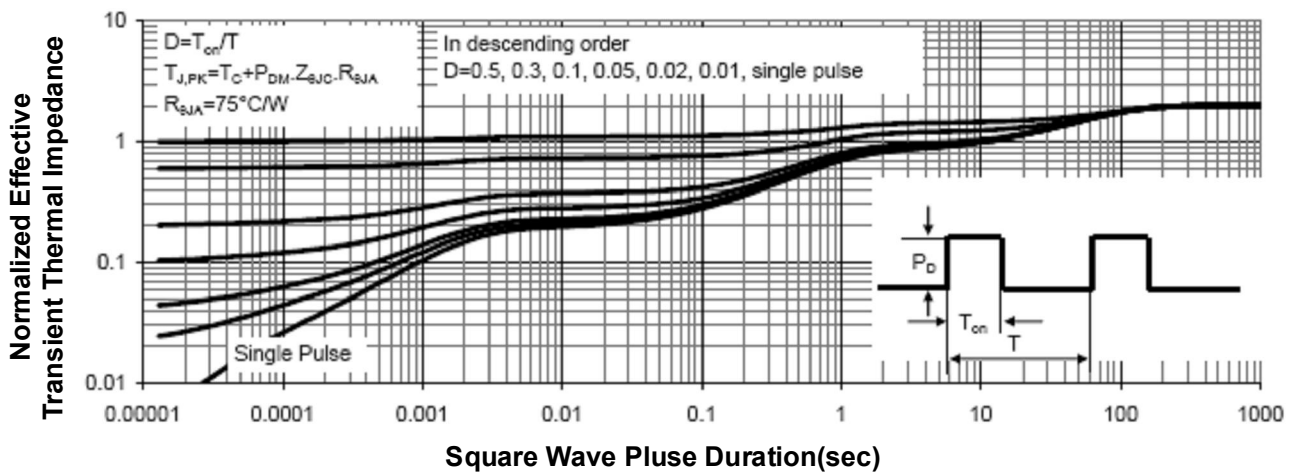
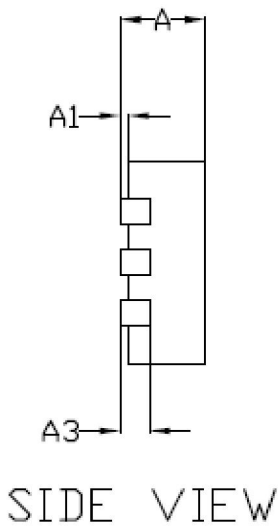
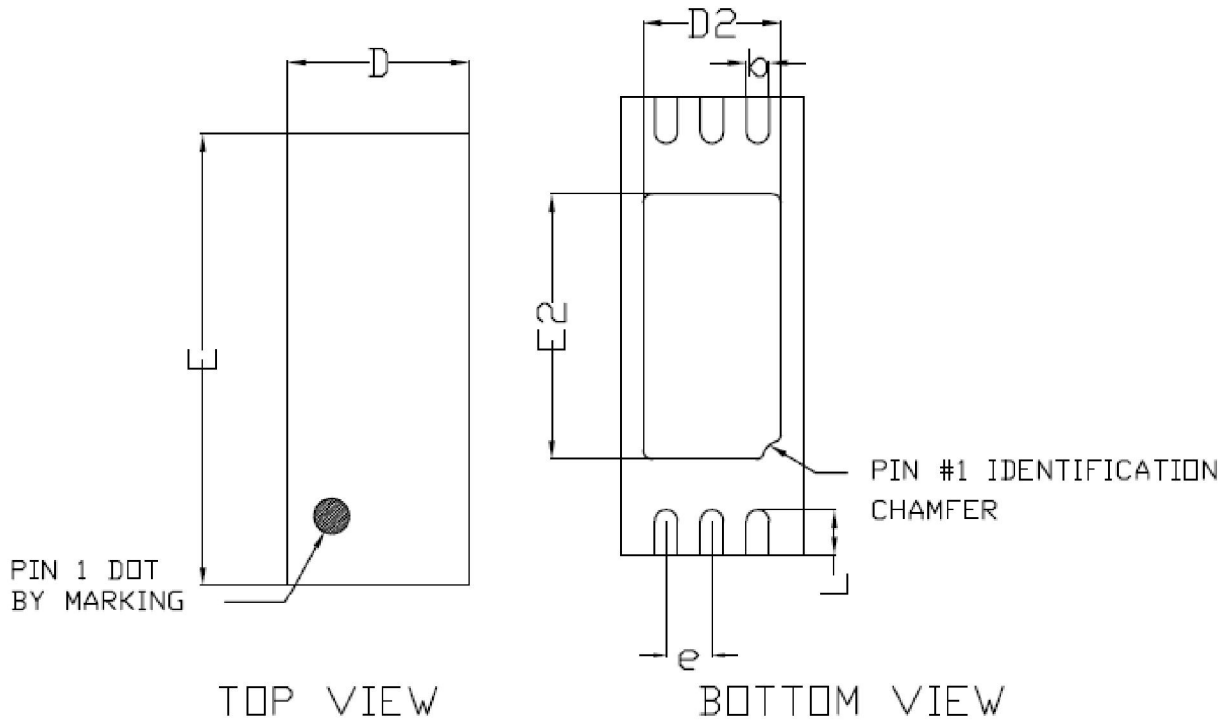


Figure 3: Normalized Maximum Transient Thermal Impedance

DFN2×5-6L PACKAGE INFORMATION

Dimensions in Millimeters (UNIT: mm)



COMMON DIMENSIONS(MM)			
PKG.	W:VERY VERY THIN		
REF.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
A1	0.00	—	0.05
A3	0.2 REF.		
D	1.95	2.00	2.05
E	4.95	5.00	5.05
D2	1.35	1.50	1.60
E2	2.75	2.90	3.00
L	0.40	0.50	0.60
b	0.20	0.25	0.30
e	0.5 BCS.		

NOTES

- All dimensions are in millimeters.
- Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
- Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
- Dimension L is measured in gauge plane.
- Controlling dimension is millimeter, converted inch dimensions are not necessarily exact