

DESCRIPTION

The SSF8521 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. A Schottky diode is provided to facilitate the implementation of a bidirectional blocking switch, or for DC-DC conversion applications.

GENERAL FEATURES

● MOSFET

$V_{DS} = -20V, I_D = -4.4A$
 $R_{DS(ON)} < 170m\Omega @ V_{GS} = -1.8V$
 $R_{DS(ON)} < 110m\Omega @ V_{GS} = -2.5V$
 $R_{DS(ON)} < 80m\Omega @ V_{GS} = -4.5V$

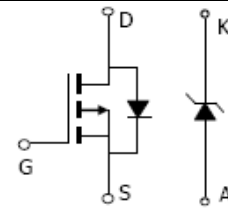
● SCHOTTKY

$V_R = 20V, I_F = 4.1A, V_F < 0.575V @ 1.0A$

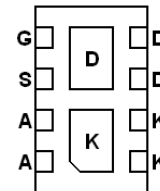
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

Application

- DC-DC conversion applications
- Load switch
- Power management



Schematic diagram



Marking and pin Assignment



DFN3X2-8L Bottom View

PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
8521	SSF8521	DFN3X2-8L	—	—	—

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

Parameter	Symbol	MOSFET	Schottky	Unit
Drain-Source Voltage	V_{DS}	-20		V
Gate-Source Voltage	V_{GS}	±8		V
Drain Current-Continuous@ Current-Pulsed (Note 1)	I_D	-4.4		A
	I_{DM}	-13		A
Schottky reverse voltage	V_R		20	V
Continuous Forward Current	I_F		4.1	A
Maximum Power Dissipation	P_D	2.1		W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	-55 To 150	°C

THERMAL CHARACTERISTICS

MOSFET

Thermal Resistance, Junction-to-Ambient (Note 2)

$R_{\theta JA}$

100

$^{\circ}\text{C/W}$

ELECTRICAL CHARACTERISTICS (TA=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}	$V_{DS}=-16V, V_{GS}=0V$			-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0V$			± 100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.45		-1.2	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-3.2A$		64	80	m Ω
		$V_{GS}=-2.5V, I_D=-2.2A$		85	110	
		$V_{GS}=-1.8V, I_D=-1.0A$		120	170	
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-2.9A$		8		S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V, F=1.0MHz$		680		PF
Output Capacitance	C_{oss}			100		PF
Reverse Transfer Capacitance	C_{rss}			70		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-3.2A, V_{GS}=-4.5V, R_{GEN}=2.4\Omega$		5.8		nS
Turn-on Rise Time	t_r			11.7		nS
Turn-Off Delay Time	$t_{d(off)}$			16		nS
Turn-Off Fall Time	t_f			12.4		nS
Total Gate Charge	Q_g	$V_{DS}=-10V, I_D=-3.2A, V_{GS}=-4.5V$		7.4		nC
Gate-Source Charge	Q_{gs}			1.4		nC
Gate-Drain Charge	Q_{gd}			2.5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=-2.5A$		-0.8	-1.2	V
Reverse Recovery Time	T_{rr}	$V_{GS}=0V, I_S=-1.0A, di_S/dt=100A/\mu s$		13.5		nS
Reverse Recovery Charge	Q_{rr}			6.5		nC

SCHOTTKY DIODE PARAMETERS

Forward Voltage Drop	V_F	$I_F=1.0A$		0.51	0.575	V
Maximum reverse leakage current	I_{rm}	$V_R=20V$			5	μA

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

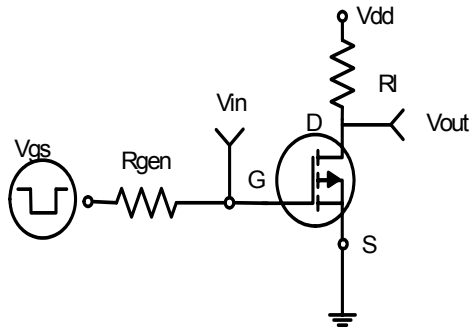


Figure1:Switching Test Circuit

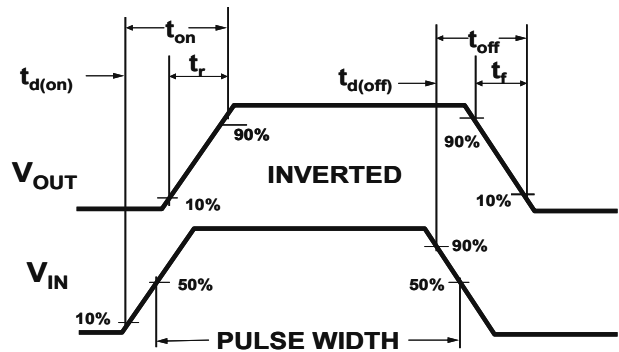


Figure 2:Switching Waveforms

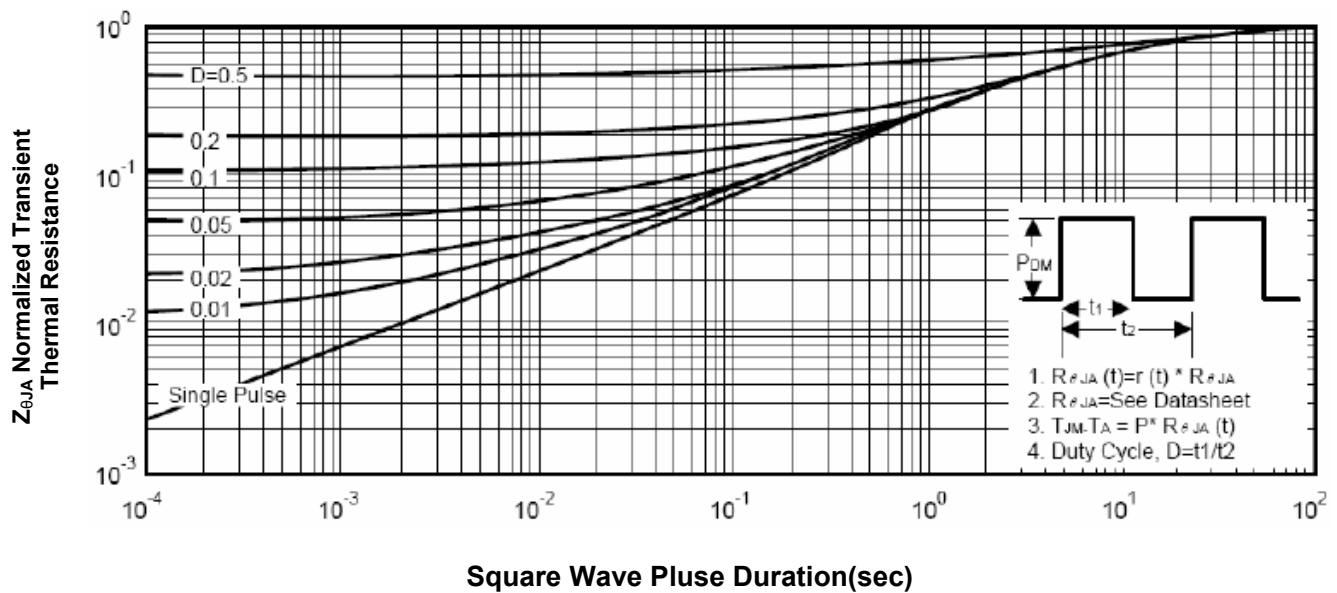
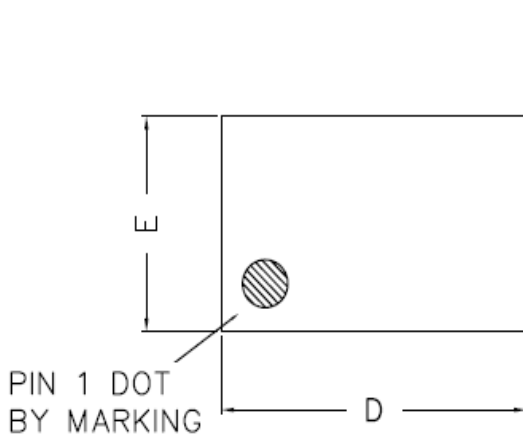


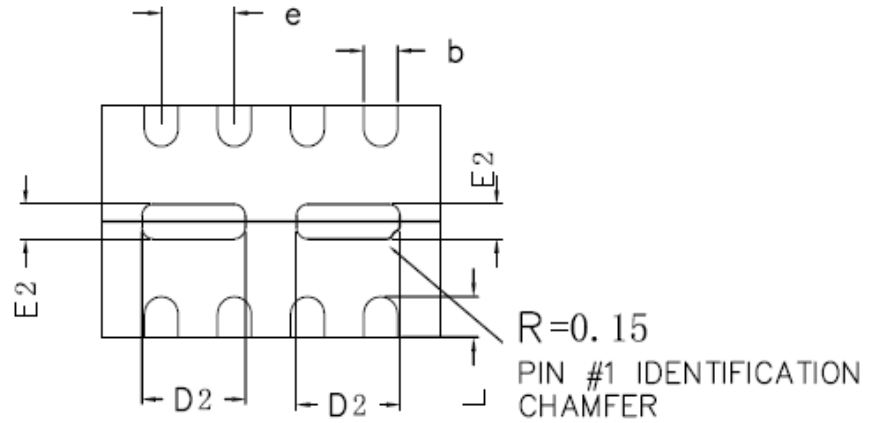
Figure 3: Normalized Maximum Transient Thermal Impedance

DFN3X2-8L PACKAGE INFORMATION

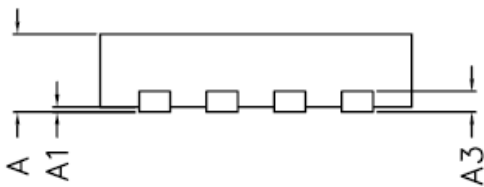
Dimensions in Millimeters (UNIT:mm)



TOP VIEW



BOTTOM VIEW



SIDE VIEW

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	2.95	3.00	3.05
E	1.95	2.00	2.05
b	0.25	0.30	0.35
L	0.28	0.35	0.43
D2	0.77	0.92	1.02
E2	0.20	0.30	0.40
e	0.65 BCS.		

NOTES:

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

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