

## DESCRIPTION

The SSF4703DC 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

- $V_{DS} = -20V, I_D = -3.4A$
- $R_{DS(ON)} < 160m\Omega @ V_{GS} = -1.8V$
- $R_{DS(ON)} < 120m\Omega @ V_{GS} = -2.5V$
- $R_{DS(ON)} < 90m\Omega @ V_{GS} = -4.5V$

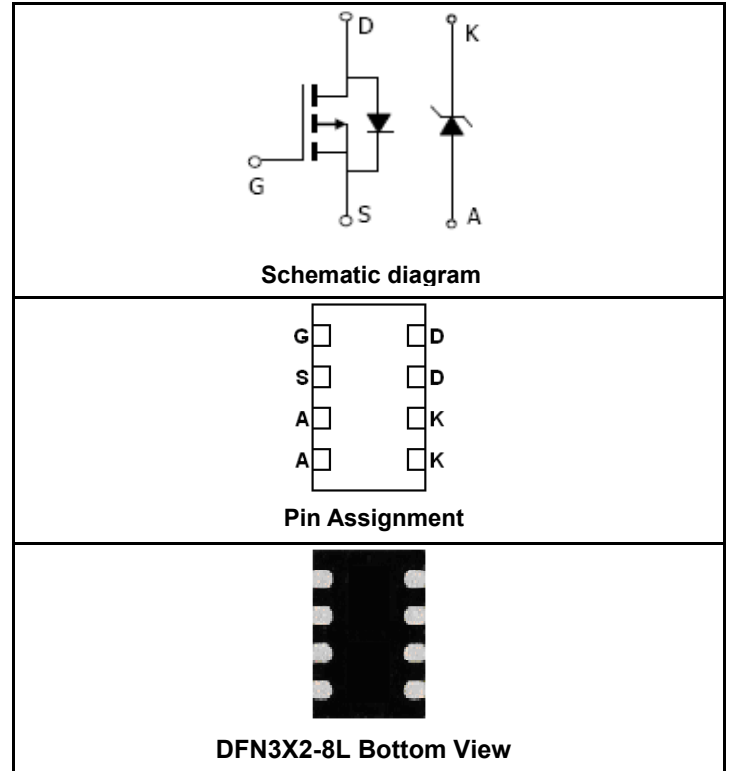
### ● SCHOTTKY

- $V_R = 20V, I_F = 1A, V_F < 0.5V @ 0.5A$

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

## Application

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



## PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
4703DC	SSF4703DC	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)	$I_D$	-3.4		A
	$I_{DM}$	-15		A
Schottky reverse voltage	$V_R$		20	V
Continuous Forward Current	$I_F$		1.9	A
Pulsed Forward Current	$I_{FM}$		7	A
Maximum Power Dissipation	$P_D$	1.7	0.96	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)	$R_{\theta JA}$	75	°C/W

<b>Schottky</b>			
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	80	$^{\circ}\text{C/W}$

## ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
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	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 8V, V_{DS}=0V$			$\pm 100$	nA
<b>ON CHARACTERISTICS (Note 3)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.45	-0.7	-1	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.4A$		73	90	m $\Omega$
		$V_{GS}=-2.5V, I_D=-2.5A$		99	120	
		$V_{GS}=-1.8V, I_D=-1.5A$		133	160	
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V, I_D=-3.4A$	4	7		S
<b>DYNAMIC CHARACTERISTICS (Note4)</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-10V, V_{GS}=0V,$ $F=1.0MHz$		540		PF
Output Capacitance	$C_{oss}$			70		PF
Reverse Transfer Capacitance	$C_{rss}$			50		PF
<b>SWITCHING CHARACTERISTICS (Note 4)</b>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-3.4A$ $V_{GS}=-4.5V, R_{GEN}=3\Omega$		10		nS
Turn-on Rise Time	$t_r$			12		nS
Turn-Off Delay Time	$t_{d(off)}$			44		nS
Turn-Off Fall Time	$t_f$			22		nS
Total Gate Charge	$Q_g$	$V_{DS}=-10V, I_D=-3.4A, V_{GS}=-4.5V$		6.1		nC
Gate-Source Charge	$Q_{gs}$			0.6		nC
Gate-Drain Charge	$Q_{gd}$			1.6		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=-1A$		-0.83	-1	V
Diode Forward Current (Note 2)	$I_S$				-2	A
<b>SCHOTTKY PARAMETERS</b>						
Forward Voltage Drop	$V_F$	$I_F=0.5A$		0.39	0.5	V
Maximum reverse leakage current	$I_{rm}$	$V_R=16V$			0.1	mA
Junction Capacitance	$C_T$	$V_R=10V$		34		pF
Schottky Reverse Recovery Time	$t_{rr}$	$I_F=1A, dI/dt=100A/\mu s$		5.2	10	ns
Schottky Reverse Recovery Charge	$Q_{rr}$	$I_F=1A, dI/dt=100A/\mu s$		0.8		nC

## 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

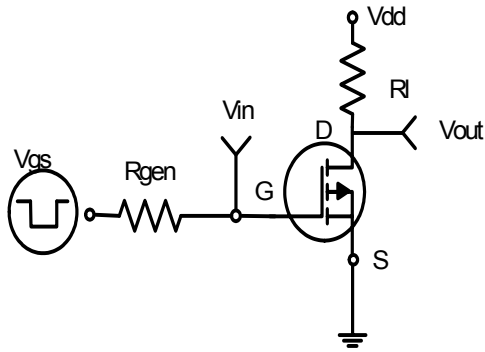


Figure1:Switching Test Circuit

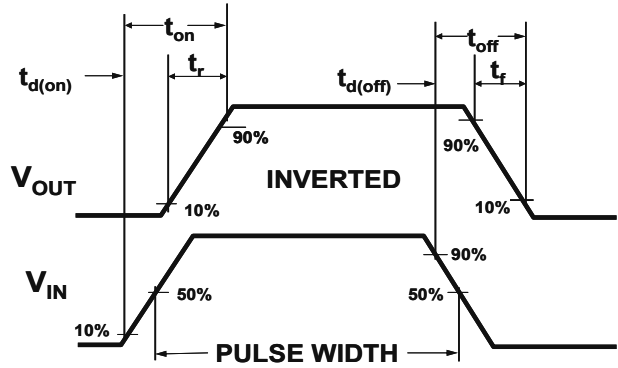


Figure 2:Switching Waveforms

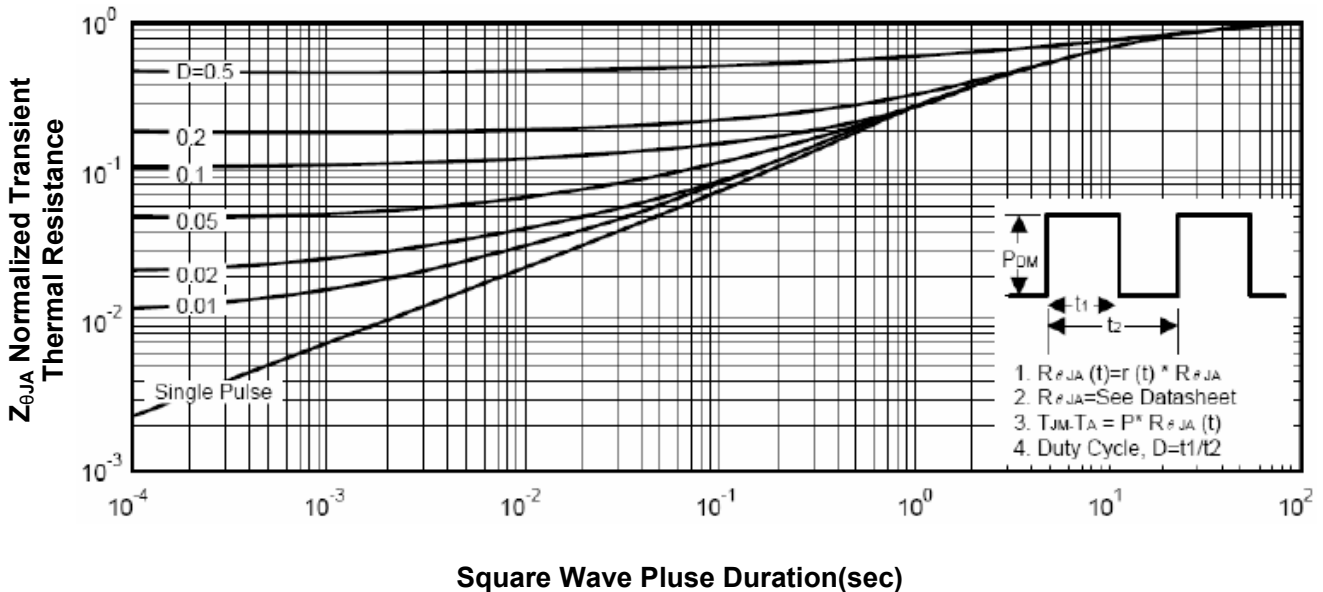
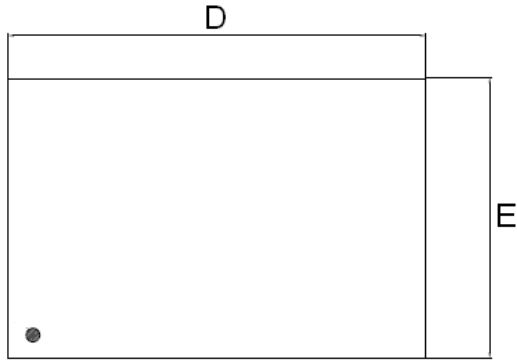


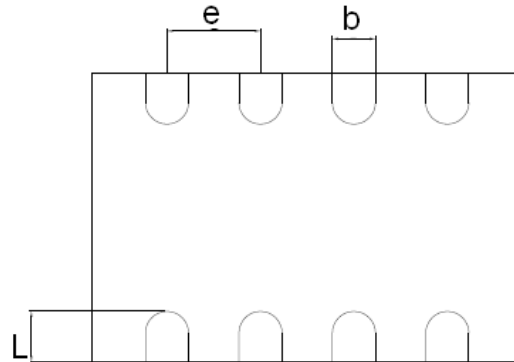
Figure 3: Normalized Maximum Transient Thermal Impedanc

## DFN3X2-8L PACKAGE INFORMATION

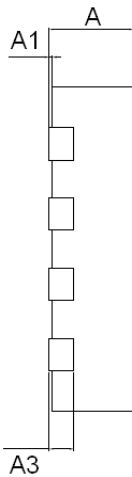
Dimensions in Millimeters (UNIT:mm)



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	0.42
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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