

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

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

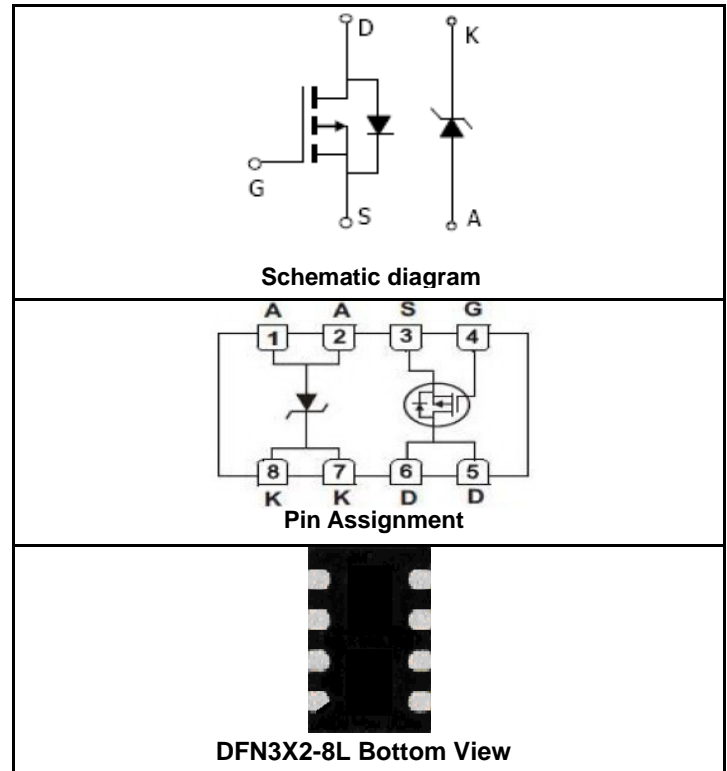
● SCHOTTKY

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

- 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

Schottky			
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
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	-0.7	-1	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.4A$		73	90	m Ω
		$V_{GS}=-2.5V, I_D=-2.5A$		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
DYNAMIC CHARACTERISTICS (Note4)						
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
SWITCHING CHARACTERISTICS (Note 4)						
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
DRAIN-SOURCE DIODE CHARACTERISTICS						
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
SCHOTTKY PARAMETERS						
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 (MOSFET)

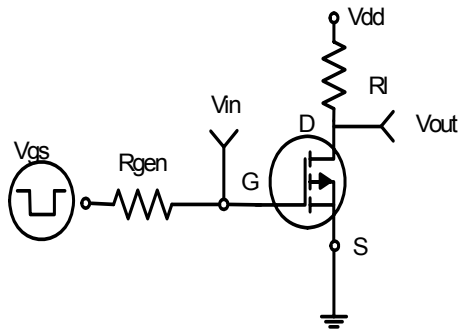


Figure 1: Switching Test Circuit

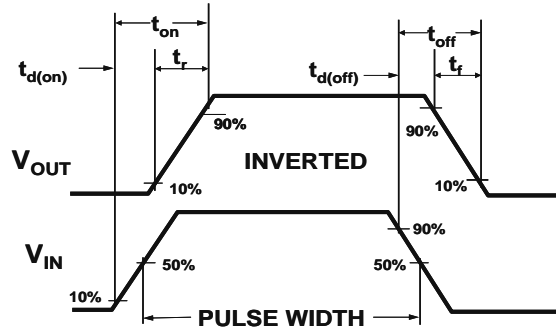


Figure 2: Switching Waveforms

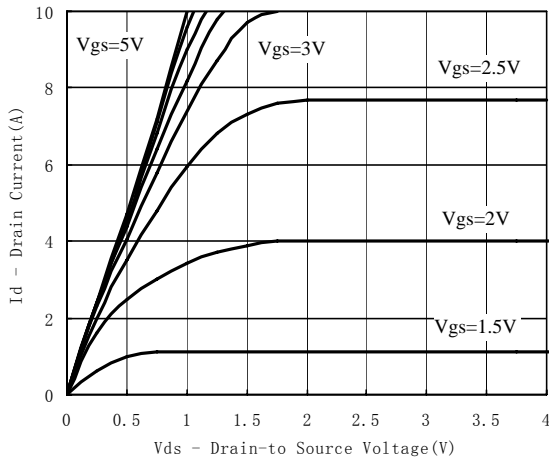


Figure 3: Output Characteristics

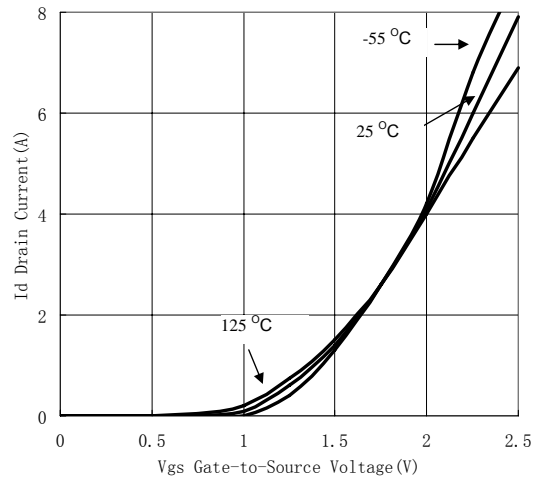


Figure 4: Transfer Characteristics

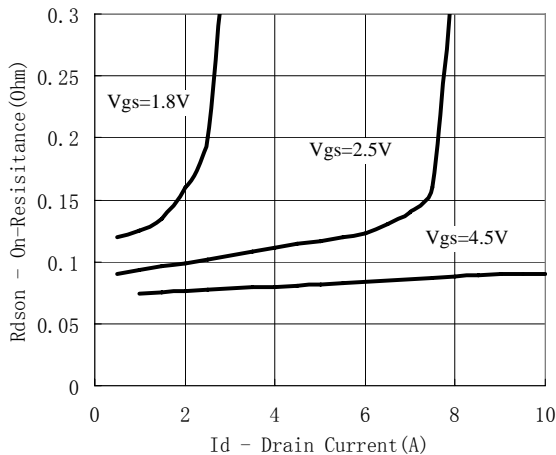


Figure 5: On-Resistance vs. Drain Current

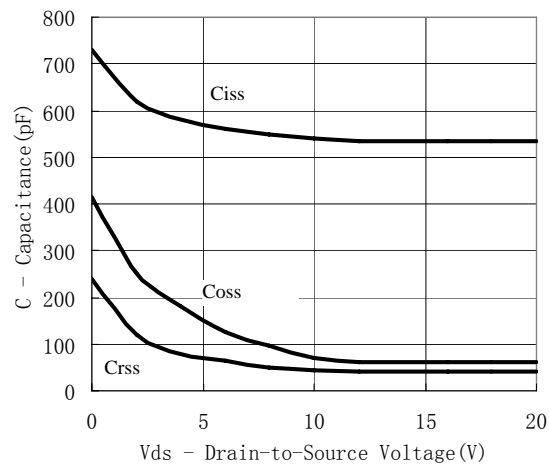
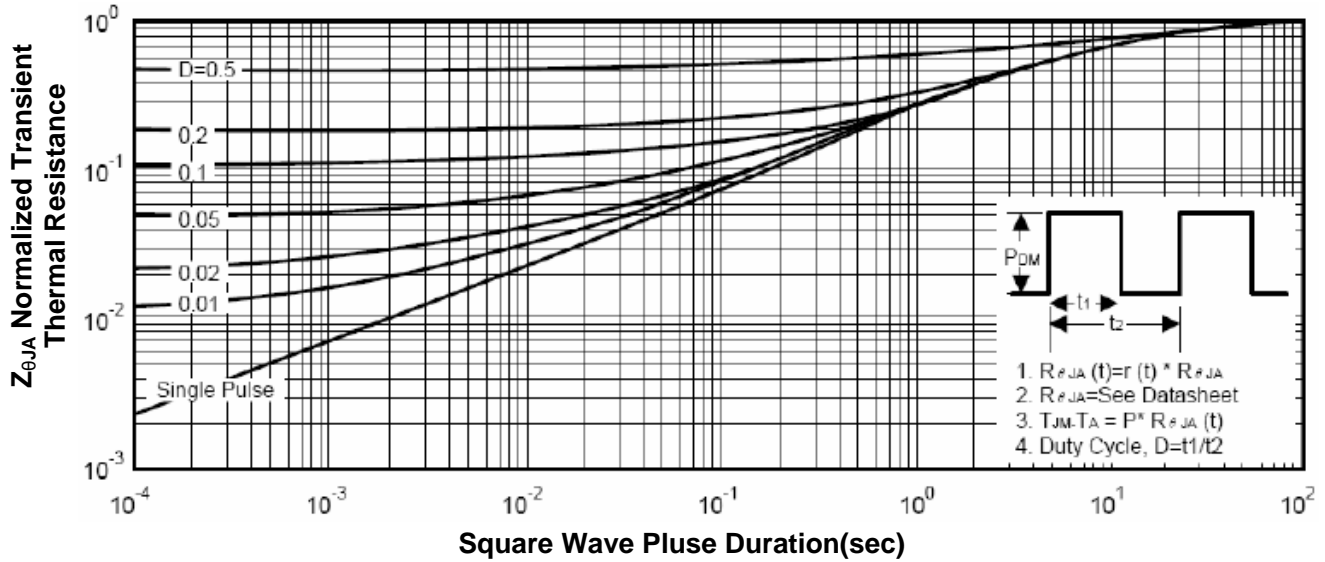


Figure 6: Capacitance



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (SCHOTTKY)

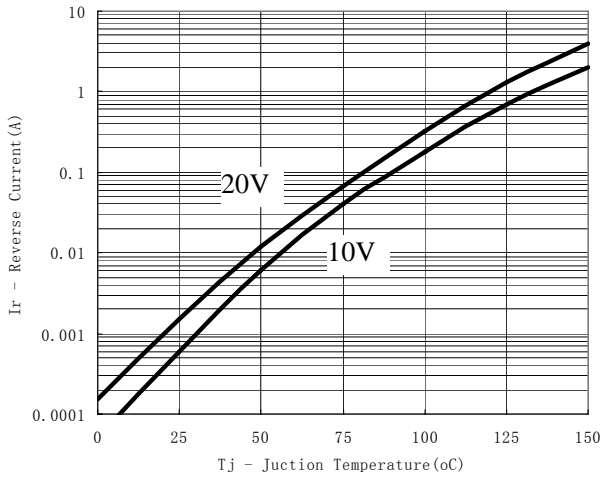


Figure 8:
Reverse Current vs. Junction Temperature

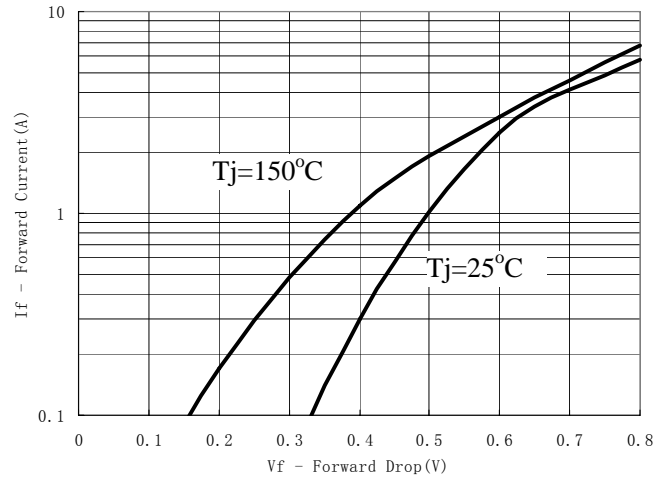
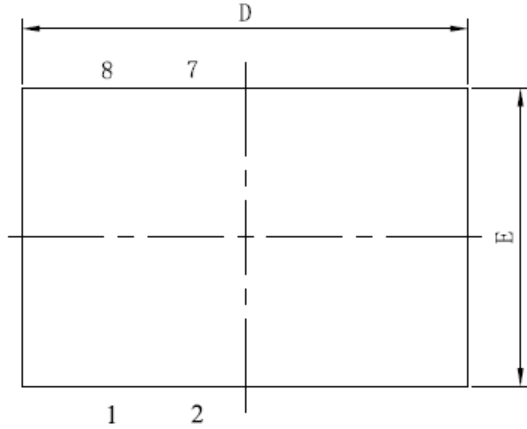


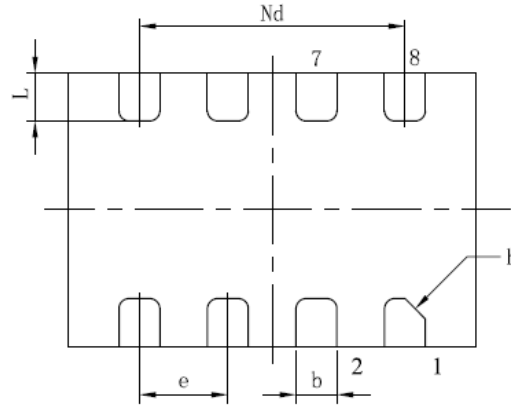
Figure 9: Forward Voltage Drop

DFN3X2-8L PACKAGE INFORMATION

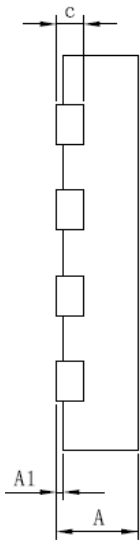
Dimensions in Millimeters (UNIT:mm)



Top View



Bottom View



Side View

SYMBOL	COMMON DIMENSIONS(MM)		
	MIN.	NOM.	MAX.
A	0.70	0.75	0.80
A1	—	0.02	0.05
b	0.25	0.30	0.35
c	0.18	0.20	0.25
D	2.90	3.00	3.10
e	0.65 BCS.		
Nd	1.95 BCS.		
E	1.90	2.00	2.10
L	0.28	0.35	0.42
h	0.15X45°		

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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