

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

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

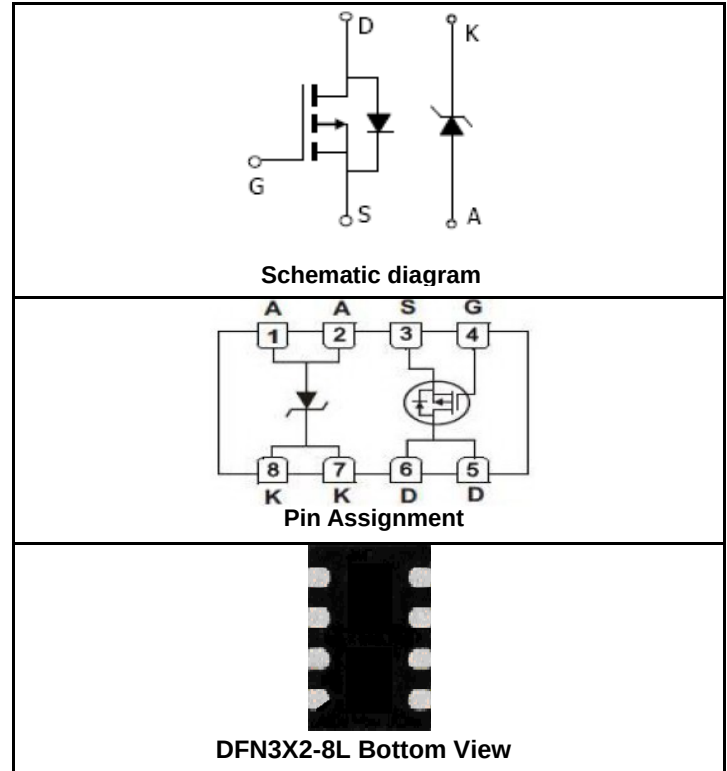
● SCHOTTKY

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

- 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($T_A = 25^\circ C$ 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	$^\circ C$

THERMAL CHARACTERISTICS

MOSFET			
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	75	$^\circ C/W$

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 =-250μA	-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} =±8V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.45	-0.7	-1	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-3.4A		73	90	mΩ
		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} =3Ω		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/μs		5.2	10	ns
Schottky Reverse Recovery Charge	Q _{rr}	I _F =1A, dI/dt=100A/μs		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)

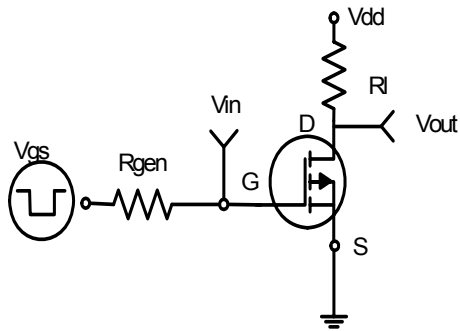


Figure1:Switching Test Circuit

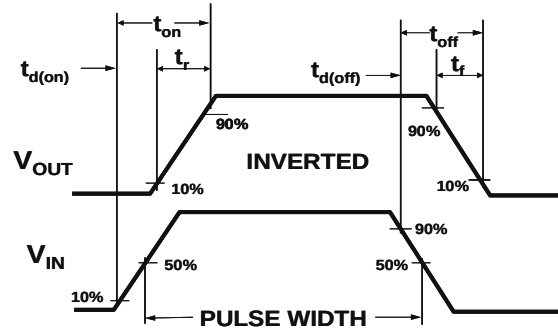


Figure 2:Switching Waveforms

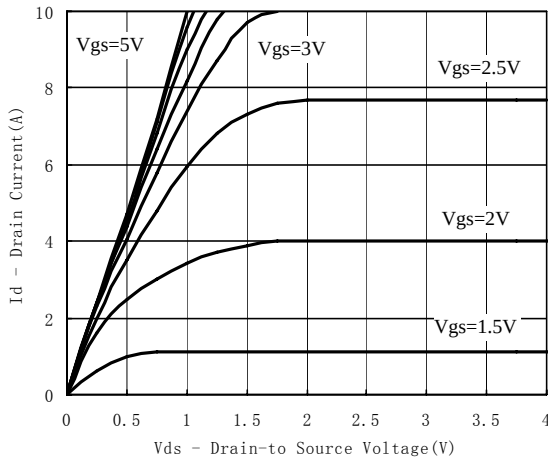


Figure 3:Output Characteristics

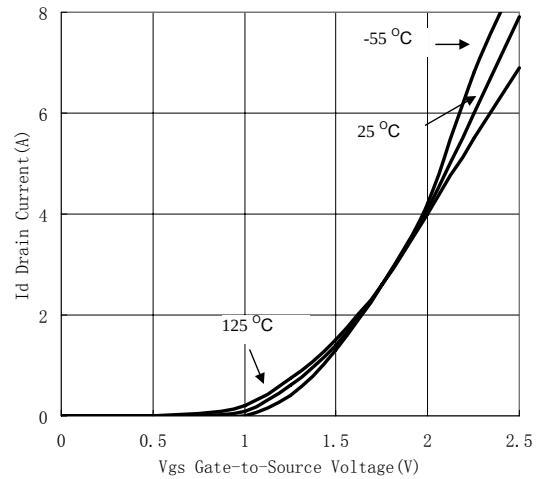


Figure 4:Transfer Characteristics

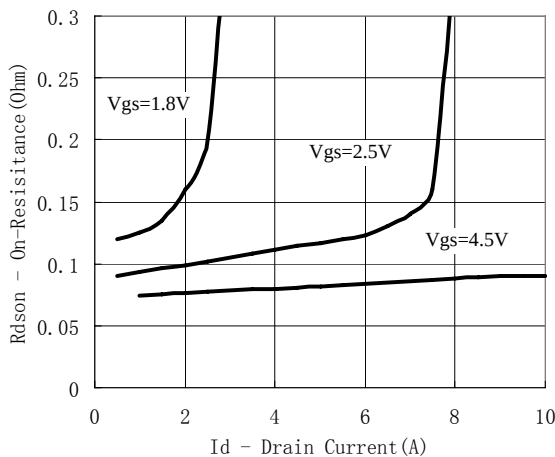


Figure 5:On-Resistance vs. Drain Current

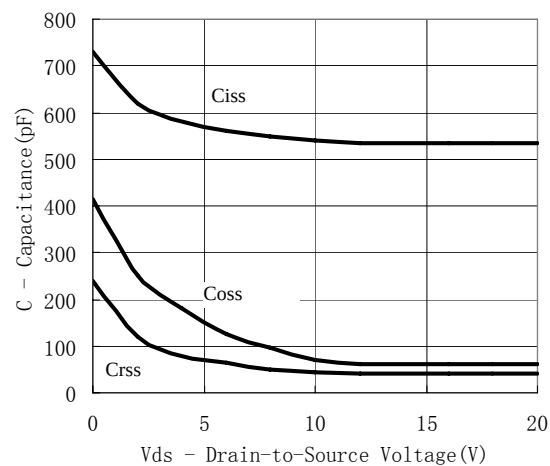
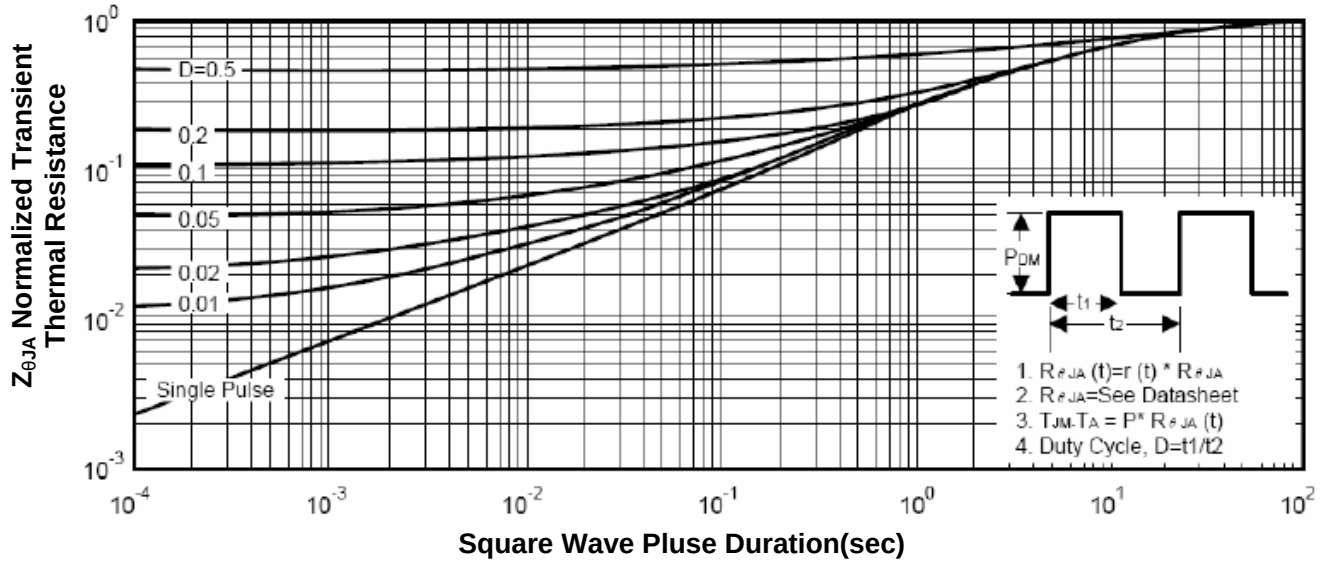
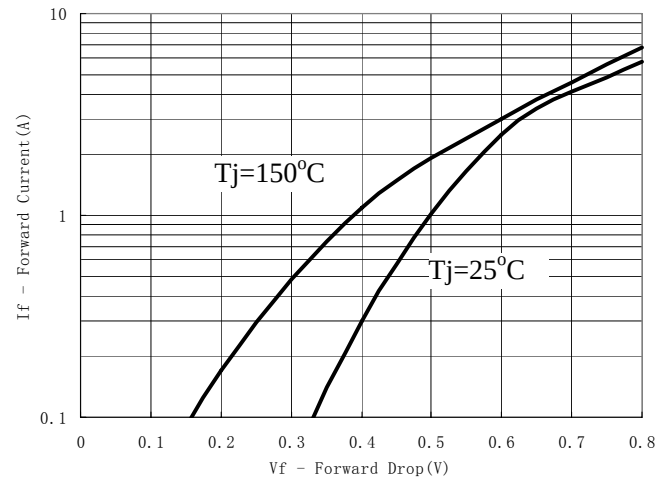
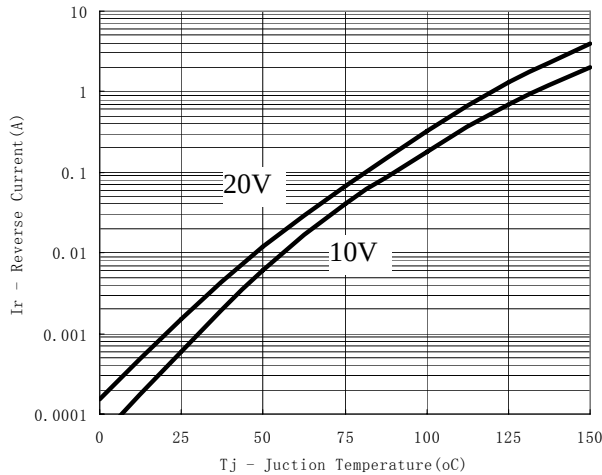


Figure 6: Capacitance

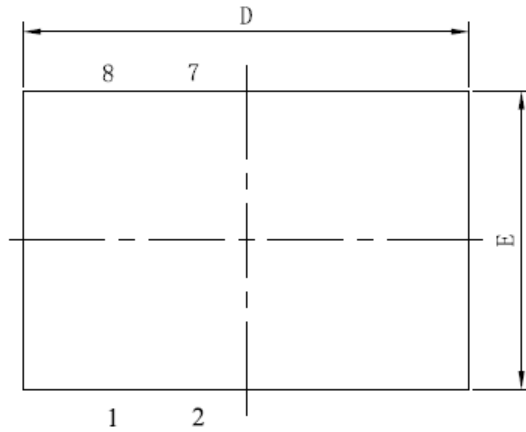


TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (SCHOTTKY)

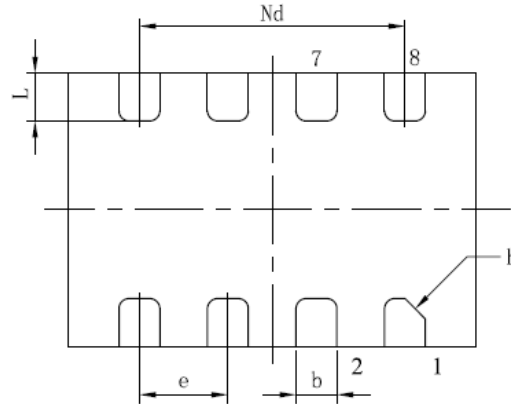


DFN3X2-8L PACKAGE INFORMATION

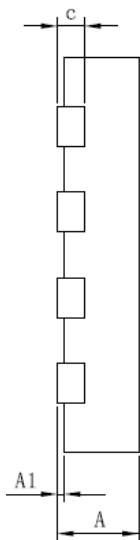
Dimensions in Millimeters (UNIT:mm)



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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