



# SSF4703DC

## 20V P-Channel MOSFET

### 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

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

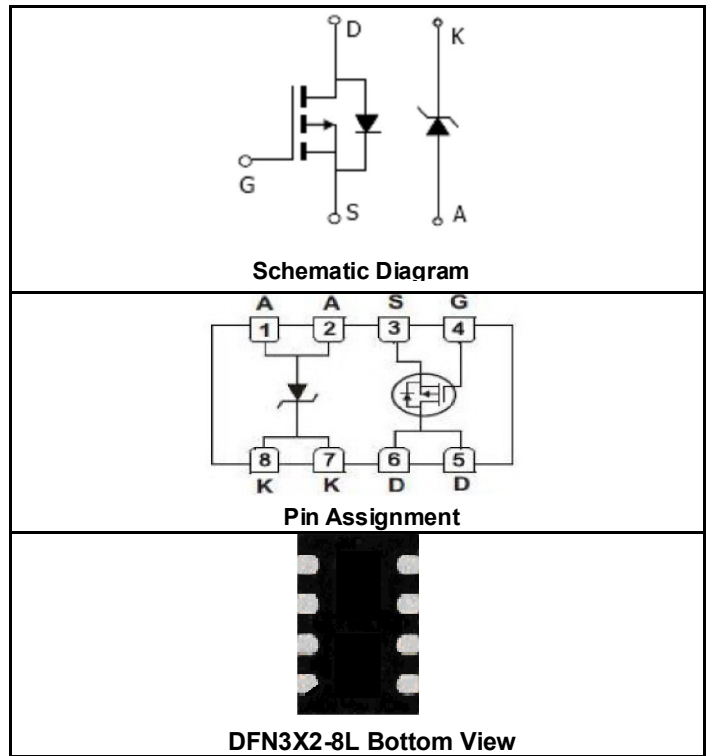
#### ● SCHOTTKY

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

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

### APPLICATIONS

- 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	$V_{GS}$	$\pm 8$		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	$^\circ C/W$



# SSF4703DC

## 20V P-Channel MOSFET

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

### ELECTRICAL CHARACTERISTICS ( $T_A=25^{\circ}C$ 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  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production testing.

### TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (MOSFET)

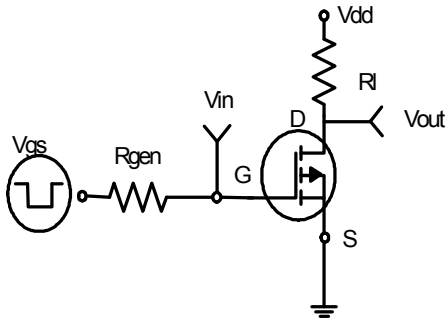


Figure 1: Switching Test Circuit

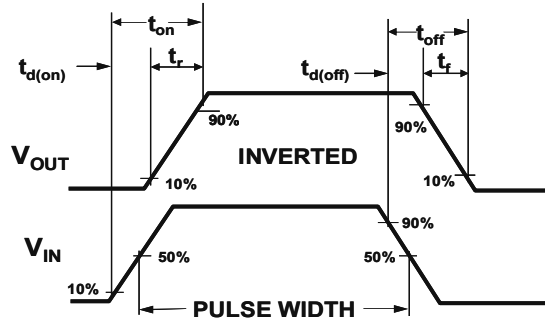


Figure 2: Switching Waveforms

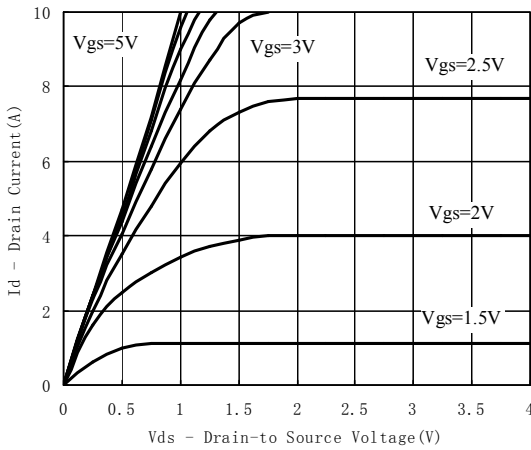


Figure 3: Output Characteristics

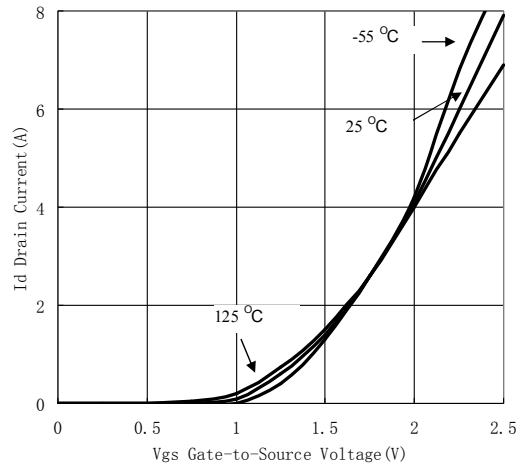


Figure 4: Transfer Characteristics

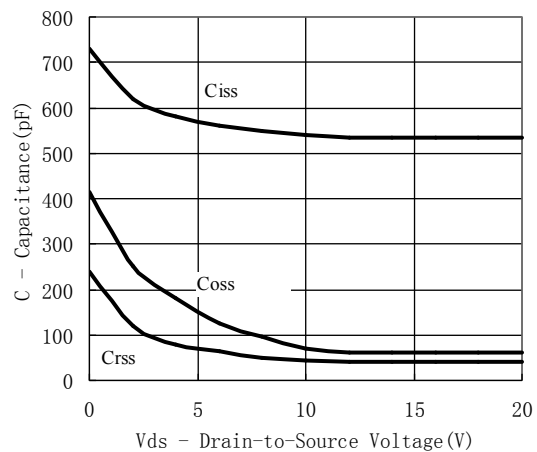
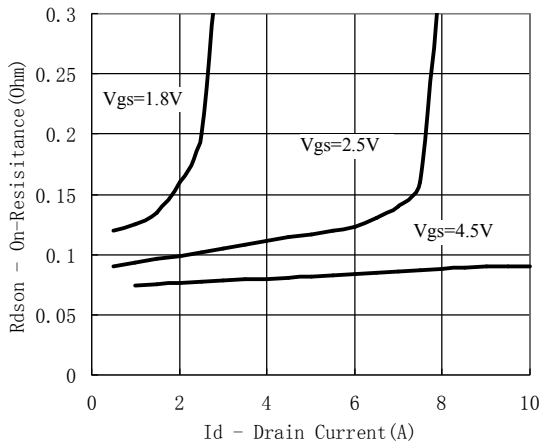


Figure 5: On-Resistance vs. Drain Current

Figure 6: Capacitance

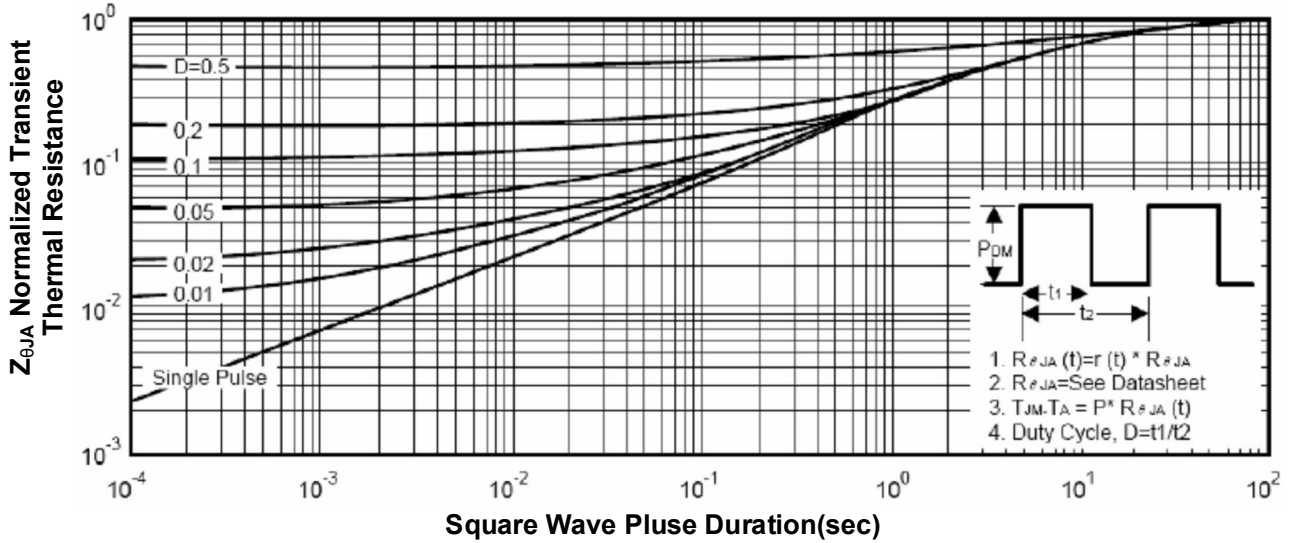


Figure 7: Normalized Maximum Transient Thermal Impedance

### TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (SCHOTTKY)

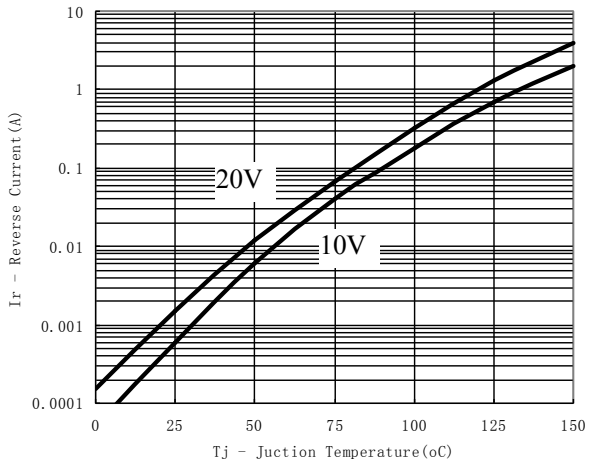


Figure 8: Reverse Current vs. Junction Temperature

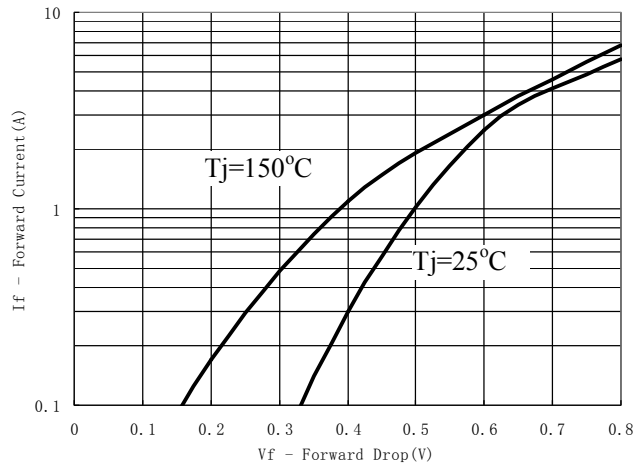
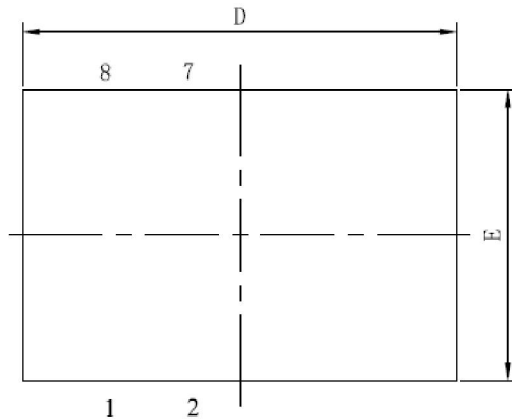


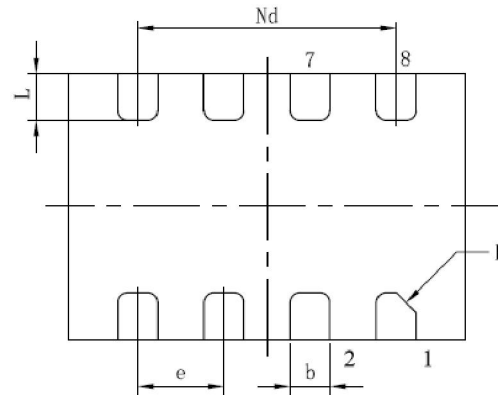
Figure 9: Forward Voltage Drop

**DFN3X2-8L PACKAGE INFORMATION**

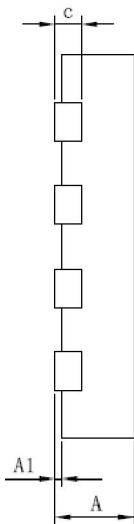
Dimensions in Millimeters (UNIT: mm)



**Top View**



**Bottom View**



**Side View**

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

**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.