12V N+N-Channel Enhancement Mode MOSFET

General Description

The SX8804DF is the highest performance trench N-ch MOSFETs with extreme high cell density,

which provide excellent RDSON and gate charge for most of the small power switching and

load switch applications. The meet the RoHS and Product requirement with full function reliability approved.

General Features

V_{DS} = 12V I_D = 40A

$R_{DS(ON)}$ < 4.3mΩ @ V_{GS}=4.5V $R_{DS(ON)}$ < 5.6mΩ @ V_{GS}=2.5V

ESD=2KV HBM

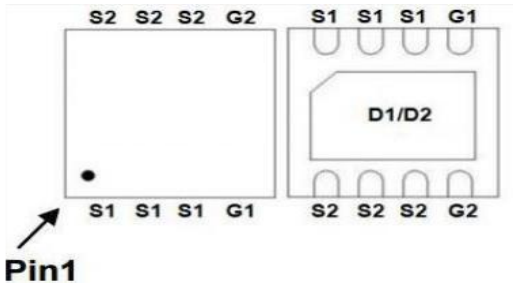
Application

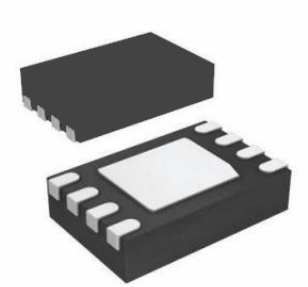
Battery

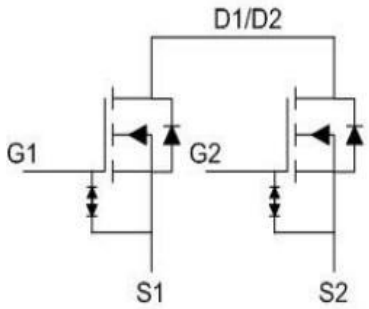
protection Load

switch

Uninterruptible power supply







Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	12	V
V_{GS}	Gate-Source Voltage	±8	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 4.5V[1]	40	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 4.5V[1]	35.6	A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 4.5V[1]	19	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 4.5V[1]	15	A
I_{DM}	Pulsed Drain Current[2]	100	A
P_D@T_C=25℃	Total Power Dissipation[1]	31	W
P_D@T_A=25℃	Total Power Dissipation[1]	3.6	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	35	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	4	℃/W

MOSFET N-Channel Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V，I_D=250uA	12	18	21	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=4.5V，I_D=3A	2.3	3.3	4.3	mΩ
		V_{GS}=4.0V，I_D=3A	2.4	3.4	4.4	
		V_{GS}=3.1V，I_D=3A	2.6	3.6	4.7	
		V_{GS}=2.5V，I_D=3A	3	4	5.6	
		V_{GS}=1.8V，I_D=3A	4	5.4	7.6	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS}，I_D =250uA	0.4	0.6	1.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=12V，V_{GS}=0V，T_J=25℃	---	---	1	uA
		V_{DS}=12V，V_{GS}=0V，T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±8V，V_{DS}=0V	---	---	±10	uA
gfs	Forward Transconductance	V_{DS}=5V，I_D=3A	---	42	---	S
Q_g	Total Gate Charge (4.5V)	V_{DS}=10V，I_D=3A	---	38	---	nC
	Total Gate Charge (3.9V)		---	33	---	
Q_{gs}	Gate-Source Charge		---	4.5	---	
Q_{gd}	Gate-Drain Charge		---	12	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=10V，V_{GS}=4.5V，R_G=6Ω I_D=3A	---	22	---	ns
T_r	Rise Time		---	41	---	
$T_{d(off)}$	Turn-Off Delay Time		---	77	---	
T_f	Fall Time		---	21	---	
C_{iss}	Input Capacitance	V_{DS}=10V，V_{GS}=0V，f=1MHz	---	3165	---	pF
C_{oss}	Output Capacitance		---	380	---	
C_{rss}	Reverse Transfer Capacitance		---	325	---	
I_S	Continuous Source Current[1]	V_G=V_D=0V，Force Current	---	---	30	A
I_{SM}	Pulsed Source Current[2]		---	---	100	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V，I_S=3A，T_J=25℃	---	---	1.2	V

Note：
1 .The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, t ≤10s.
2.The data tested by pulsed，pulse width ≤ 10us，duty cycle ≤ 1%

Typical Characteristics

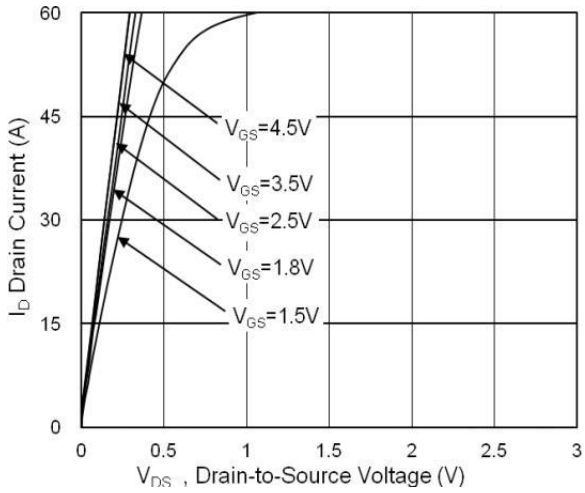


Fig.1 Typical Output Characteristics

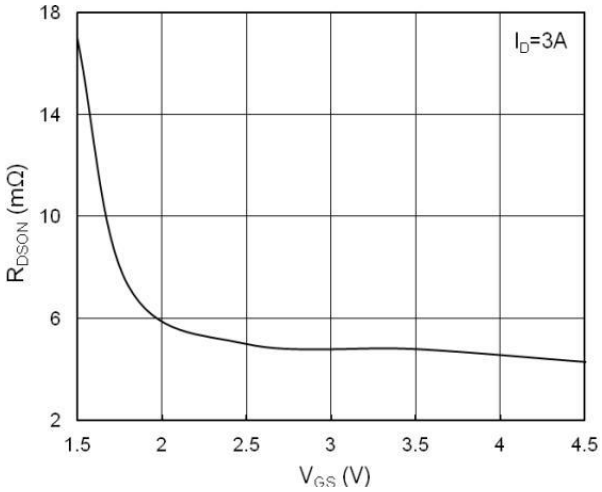


Fig.2 On-Resistance vs. Gate-Source Voltage

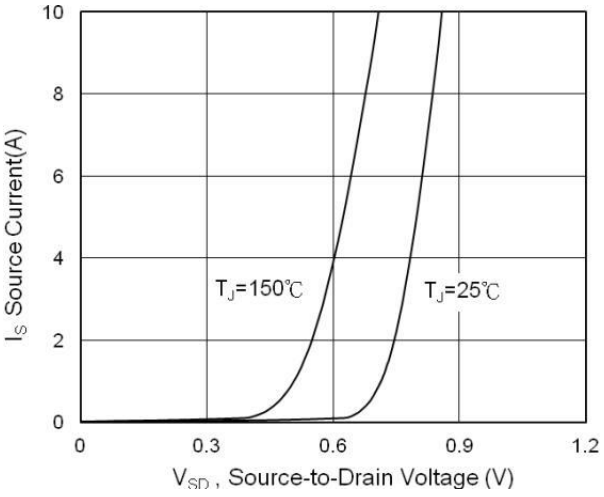


Fig.3 Source Drain Forward Characteristics

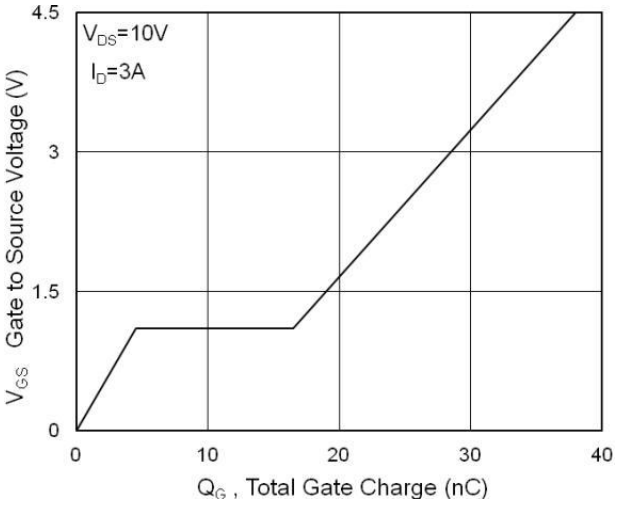


Fig.4 Gate-Charge Characteristics

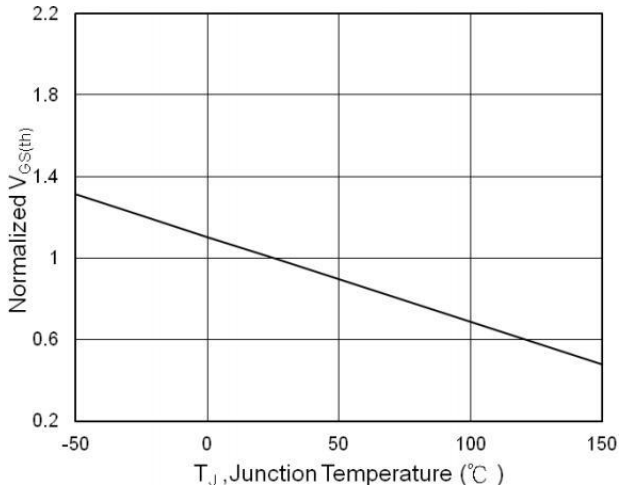


Fig.5 $V_{GS(th)}$ vs. T_J

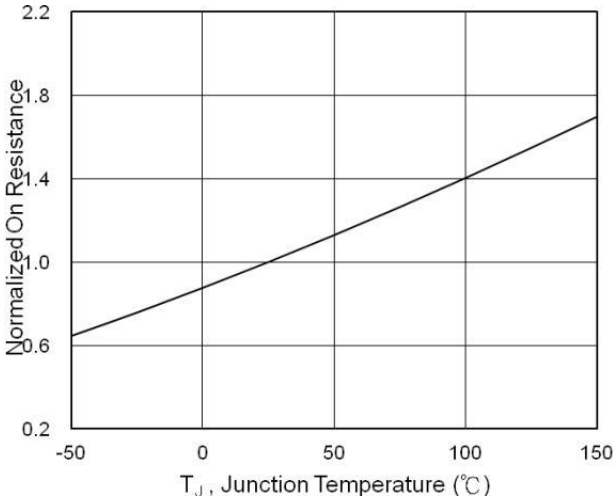


Fig.6 Normalized R_{DSON} vs. T_J

Typical Characteristics

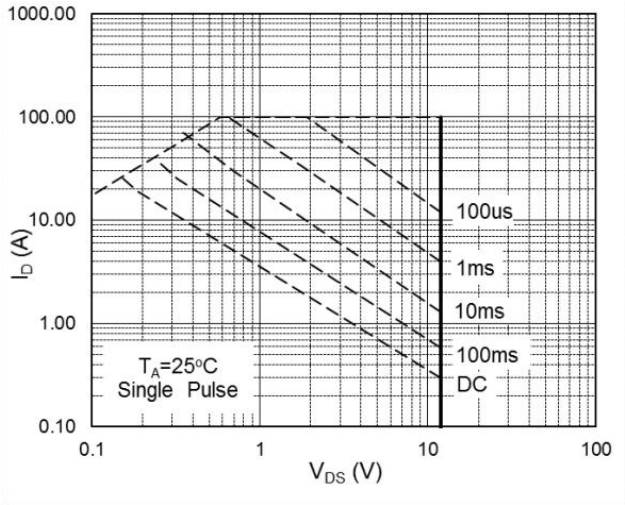


Fig.7 Safe Operating Area

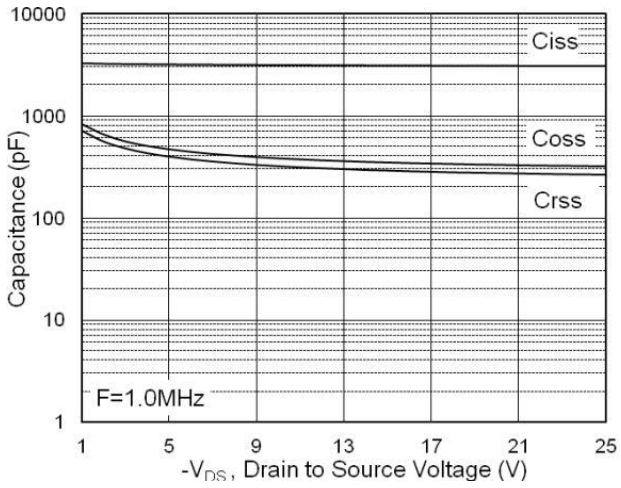


Fig.8 Capacitance

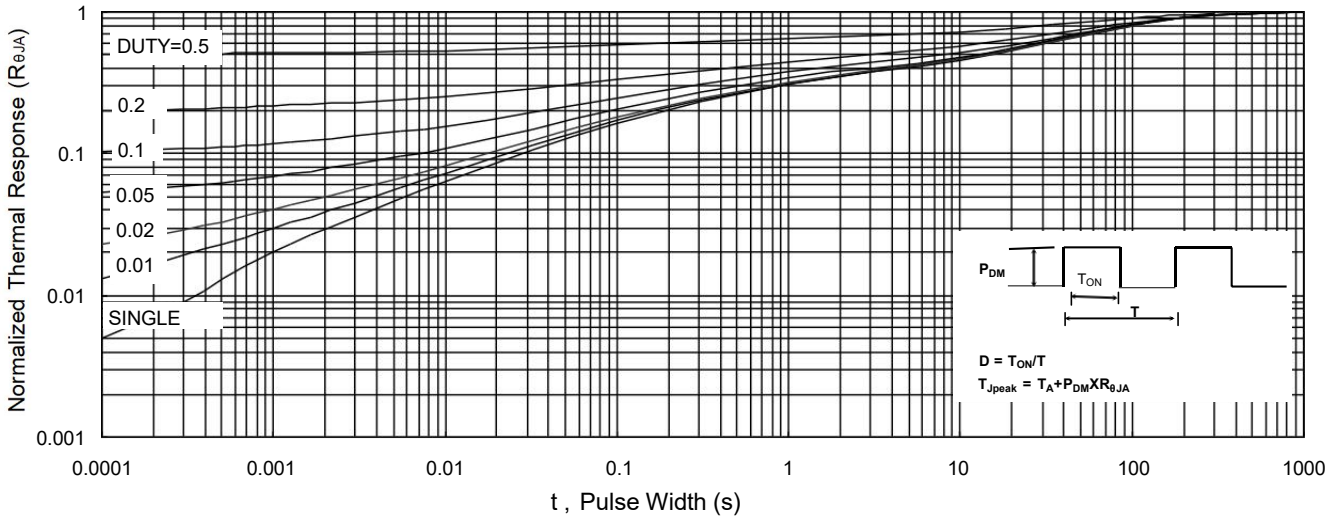


Fig.9 Normalized Maximum Transient Thermal Impedance

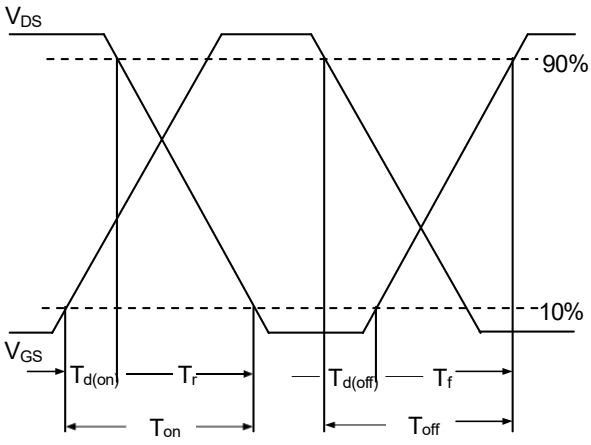


Fig.10 Switching Time Waveform

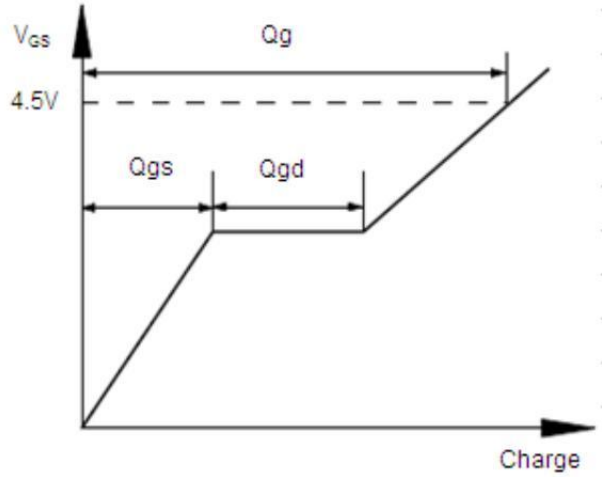
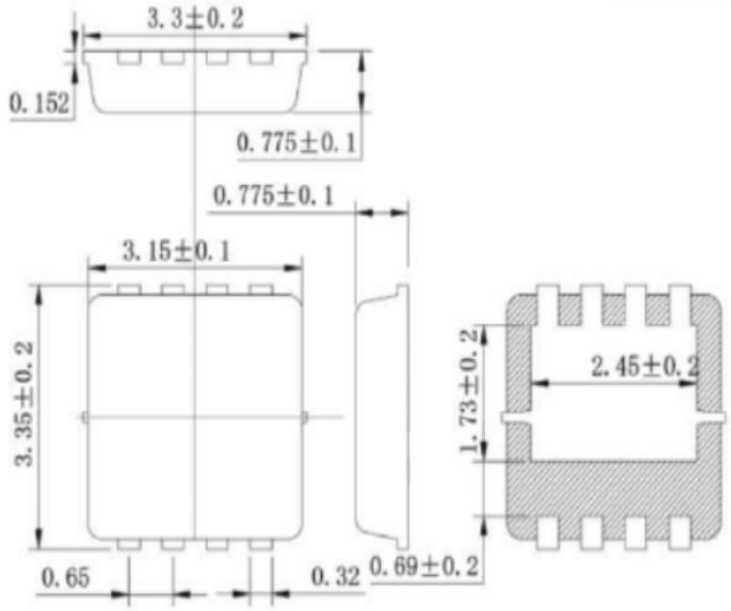


Fig.11 Gate Charge Waveform

DFN3*3-XW-01



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
TAPING	WQDFN3*3-8L		5000