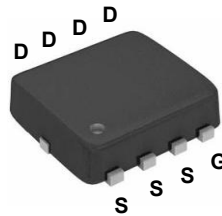
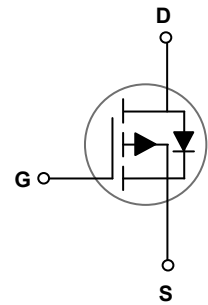


Main Product Characteristics

$BV_{(BR)DSS}$	-40V
$R_{DS(ON)}$	14m Ω
I_D	-38A



PPAK3x3



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for hand-held devices, battery protection and load switch
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The SSFN4903 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings ($T_c=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous ($T_c=25^\circ\text{C}$)	I_D	-38	A
Drain Current – Continuous ($T_c=100^\circ\text{C}$)		-24	A
Drain Current – Pulsed ¹	I_{DM}	-152	A
Single Pulse Avalanche Energy ²	E_{AS}	130	mJ
Single Pulse Avalanche Current ²	I_{AS}	51	A
Power Dissipation ($T_c=25^\circ\text{C}$)	P_D	52	W
Power Dissipation – Derate above 25°C		0.42	W/ $^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	2.4	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	---	62	$^\circ\text{C}/\text{W}$

Electrical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-40	---	---	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-40V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-32V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
On characteristics						
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=15A$	---	11.3	14	$m\Omega$
		$V_{GS}=-4.5V, I_D=-8A$	---	15.6	21	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1	-1.6	-2.5	V
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-4A$	---	11	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=-32V, V_{GS}=-4.5V, I_D=-10A$	---	22.2	40	nC
Gate-Source Charge ^{3,4}	Q_{gs}		---	8.2	16	
Gate-Drain Charge ^{3,4}	Q_{gd}		---	8.8	16	
Turn-On Delay Time ^{3,4}	$T_{d(on)}$	$V_{DD}=-20V, V_{GS}=-10V, R_G=6\Omega, I_D=-1A$	---	23	40	nS
Rise Time ^{3,4}	T_r		---	10	20	
Turn-Off Delay Time ^{3,4}	$T_{d(off)}$		---	135	250	
Fall Time ^{3,4}	T_f		---	46	90	
Input Capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V, F=1\text{MHz}$	---	2757	4000	pF
Output Capacitance	C_{oss}		---	240	360	
Reverse Transfer Capacitance	C_{rss}		---	137	200	
Drain-Source Diode Characteristics and Maximum Ratings						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	$V_G=V_D=0V, \text{Force Current}$	---	---	-38	A
Pulsed Source Current	I_{SM}		---	---	-76	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=51A, R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}.$
3. The data tested by pulsed, pulse width $\leq 300\mu\text{S}$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

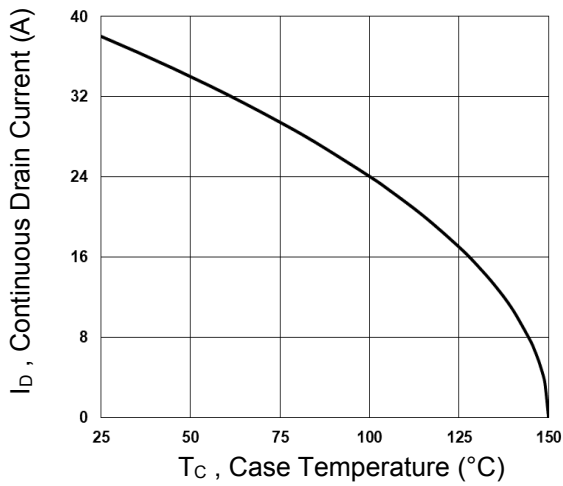


Fig.1 Continuous Drain Current vs. T_C

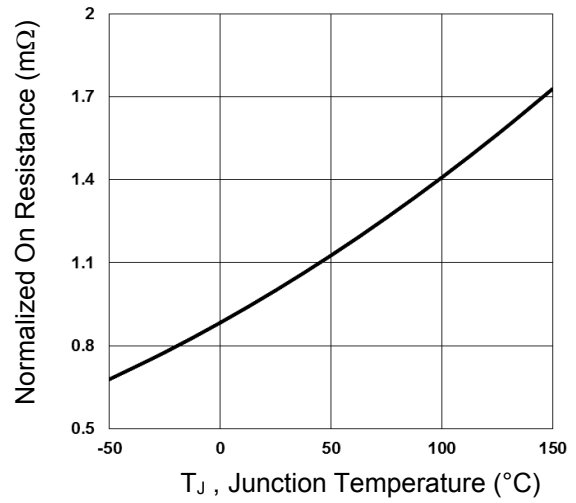


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

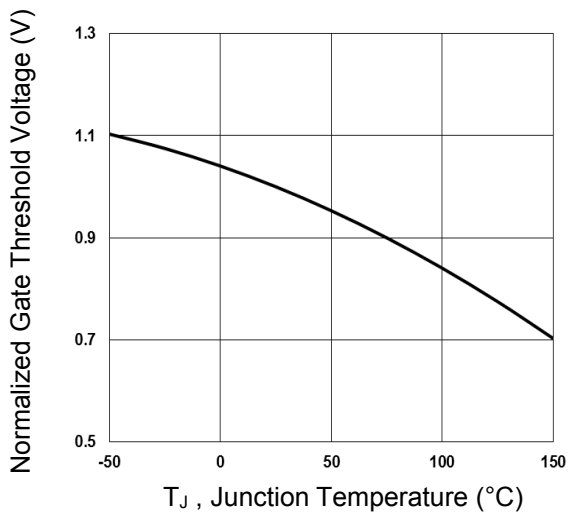


Fig.3 Normalized V_{th} vs. T_J

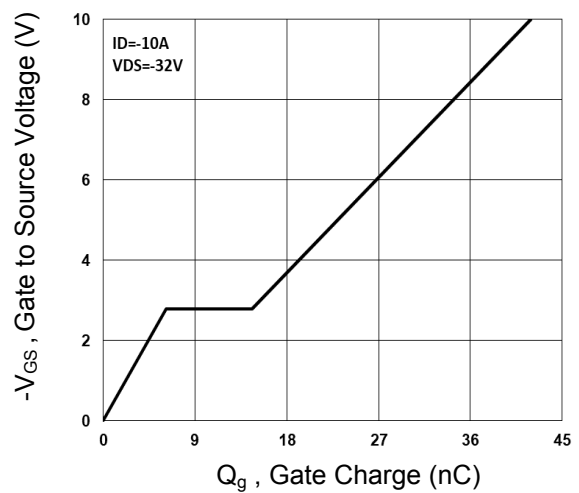


Fig.4 Gate Charge Waveform

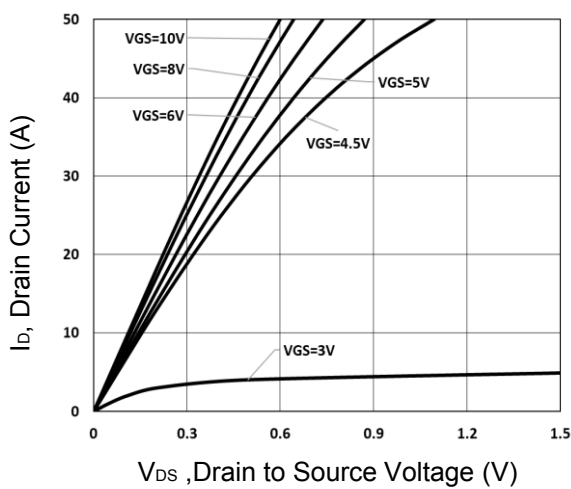


Fig.5 Typical Output Characteristics

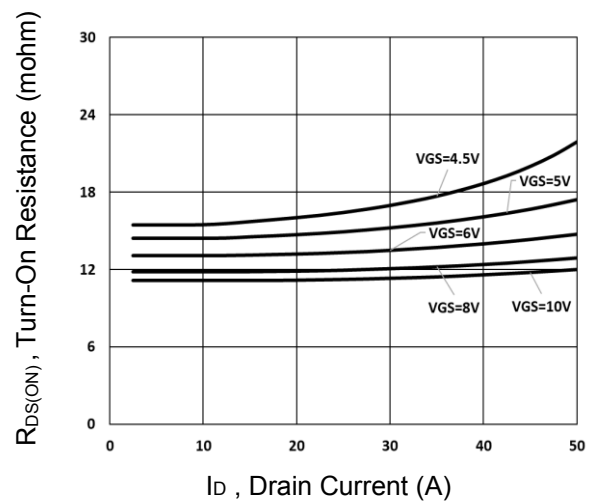


Fig.6 Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

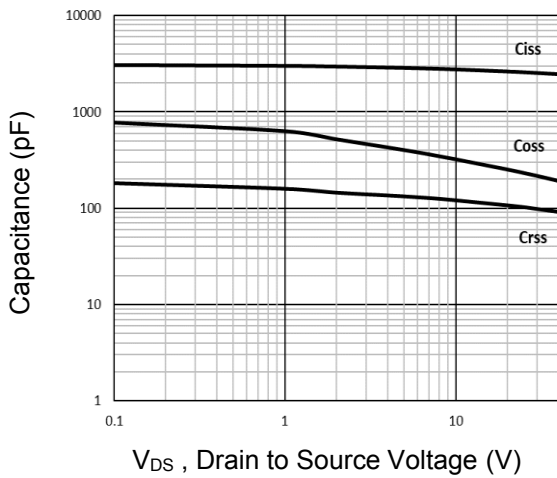


Fig.7 Capacitance Characteristics

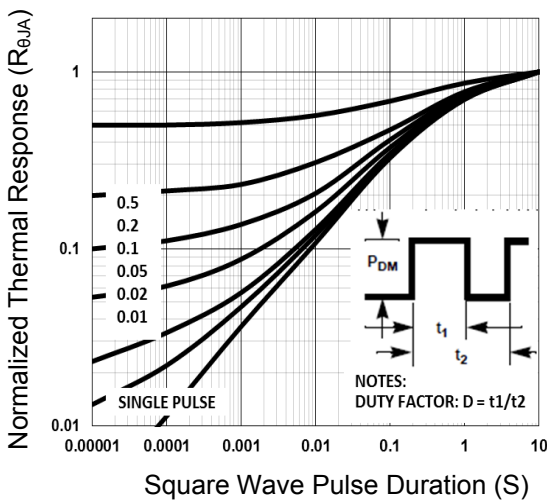


Fig.8 Normalized Transient Impedance $-V_{DS}$

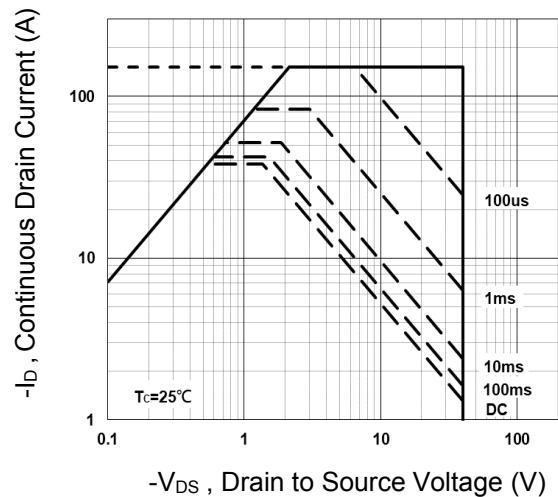


Fig.9 Maximum Safe Operation Area

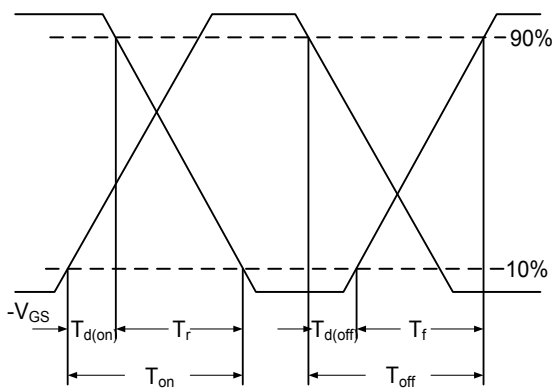


Fig.10 Switching Time Waveform

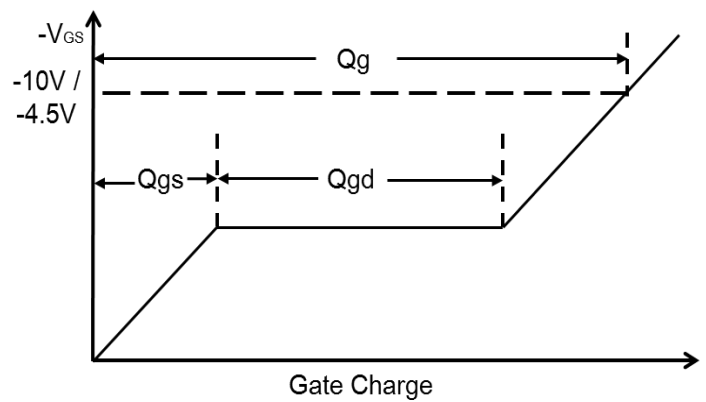
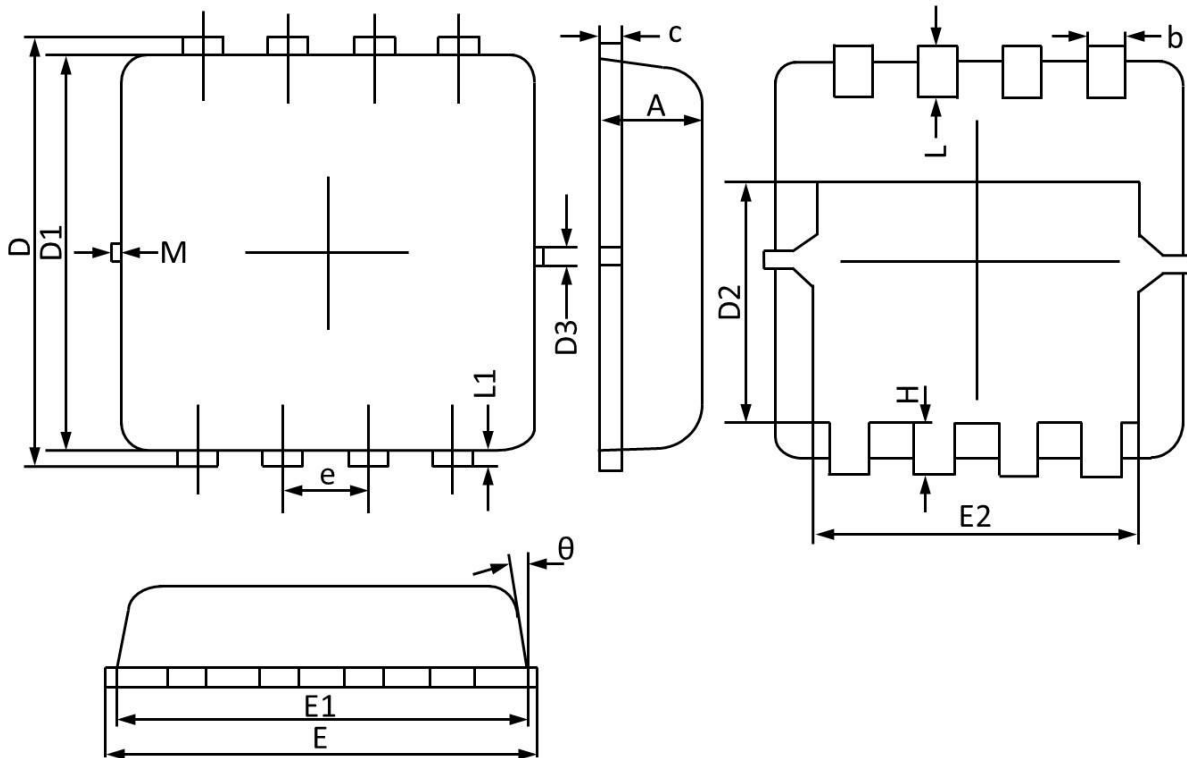


Fig.11 Gate Charge Waveform

Package Outline Dimensions

PPAK3x3



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
b	0.250	0.350	0.010	0.013
c	0.100	0.250	0.004	0.009
D	3.250	3.450	0.128	0.135
D1	3.000	3.200	0.119	0.125
D2	1.780	1.980	0.070	0.077
D3	0.130 REF		0.005 REF	
E	3.200	3.400	0.126	0.133
E1	3.000	3.200	0.119	0.125
E2	2.390	2.590	0.094	0.102
e	0.650 BSC		0.026 BSC	
H	0.300	0.500	0.011	0.019
L	0.300	0.500	0.011	0.019
L1	0.130 REF		0.005 REF	
theta	0°	12°	0°	12°
M	0.150 REF		0.006 REF	