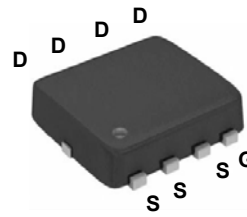
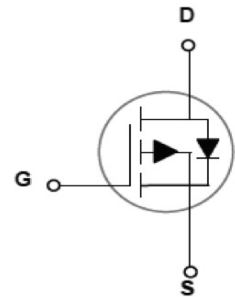


Main Product Characteristics

V_{BDSS}	-30V
$R_{DS(ON)}$	8.5mΩ
I_D	-50A



PPAK3x3



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for DC-DC converter, power management in portable battery, computer, printer, cellular and general purpose applications
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The SSFN3903 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 supplies and a wide variety of other applications.

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

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous ($T_C=25^{\circ}C$)	I_D	-50	A
Drain Current-Continuous ($T_C=100^{\circ}C$)		-32	
Drain Current-Pulsed ¹	I_{DM}	-200	A
Power Dissipation ($T_A=25^{\circ}C$)	P_D	2.2	W
Power Dissipation ($T_A=70^{\circ}C$)		1.3	W
Power Dissipation ($T_C=25^{\circ}C$)		59	W
Power Dissipation - Derate above 25°C		0.47	W/°C
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.1	°C/W

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250uA	-30	---	---	V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C, I _D =-1mA	---	-0.03	---	V/°C
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-24V, V _{GS} =0V, T _J =125°C	---	---	-10	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
On Characteristics						
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-10A	---	7.1	8.5	mΩ
		V _{GS} =-4.5V, I _D =-8A	---	11.5	14	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =-250uA	-1.2	-1.6	-2.5	V
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)}		---	4	---	mV/°C
Forward Transconductance	g _{fs}	V _{DS} =-10V, I _D =-10A	---	14	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2, 3}	Q _g	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-10A	---	35	56	nC
Gate-Source Charge ^{2, 3}	Q _{gs}		---	10.8	16	nC
Gate-Drain Charge ^{2, 3}	Q _{gd}		---	10.6	16	nC
Turn-On Delay Time ^{2, 3}	T _{d(on)}	V _{DD} =-15V, V _{GS} =-10V, R _G =6Ω, I _D =-1A	---	24.5	38	ns
Rise Time ^{2, 3}	T _r		---	10.5	16	ns
Turn-Off Delay Time ^{2, 3}	T _{d(off)}		---	156.8	230	ns
Fall Time ^{2, 3}	T _f		---	50	75	ns
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, F=1MHz	---	3300	4800	pF
Output Capacitance	C _{oss}		---	410	700	pF
Reverse Transfer Capacitance	C _{rss}		---	280	500	pF
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, F=1MHz	---	8.5	12	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I _S	V _G =V _D =0V, Force Current	---	---	-50	A
Pulsed Source Current	I _{SM}		---	---	-100	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1	V

Notes :

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristics

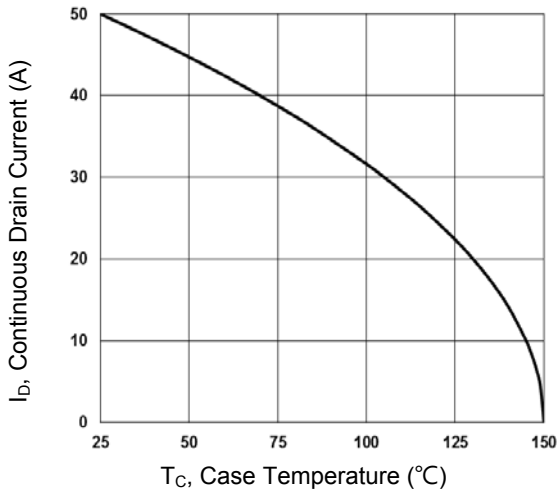


Figure 1. Continuous Drain Current vs. T_c

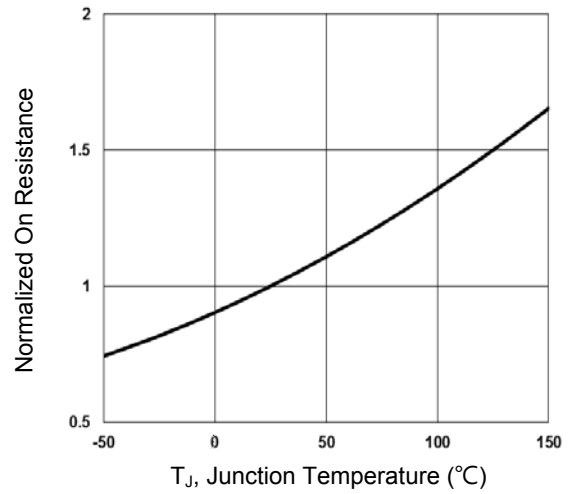


Figure 2. Normalized R_{DS(on)} vs. T_j

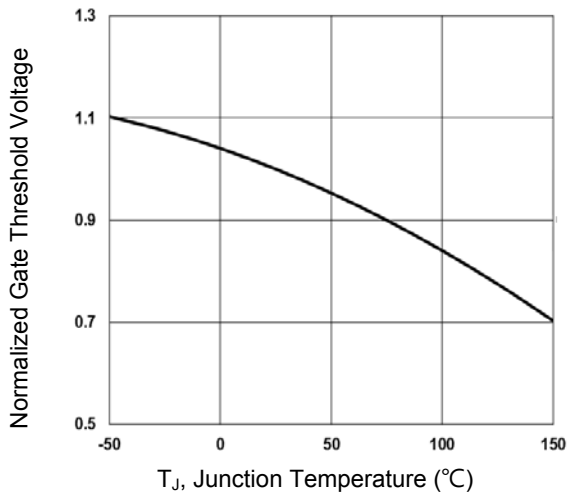


Figure 3. Normalized V_{th} vs. T_j

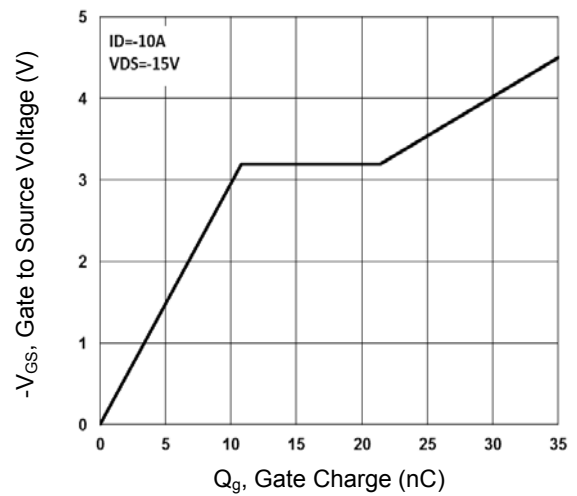


Figure 4. Gate Charge Waveform

Typical Electrical and Thermal Characteristics

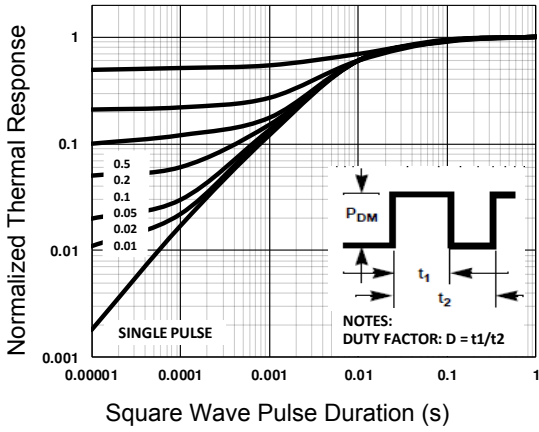


Figure 5. Normalized Transient Impedance

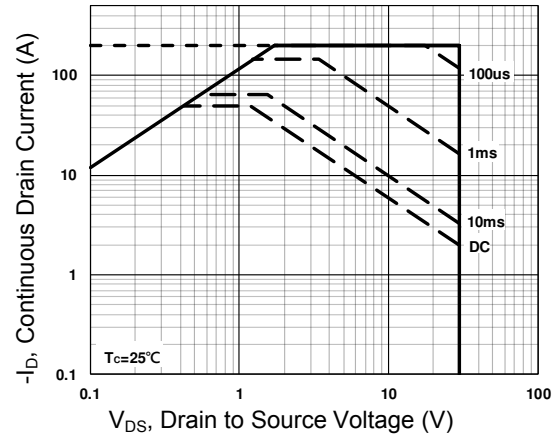


Figure 6. Maximum Safe Operation Area

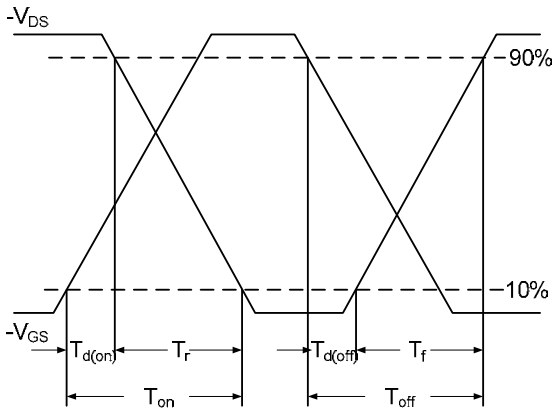


Figure 7. Switching Time Waveform

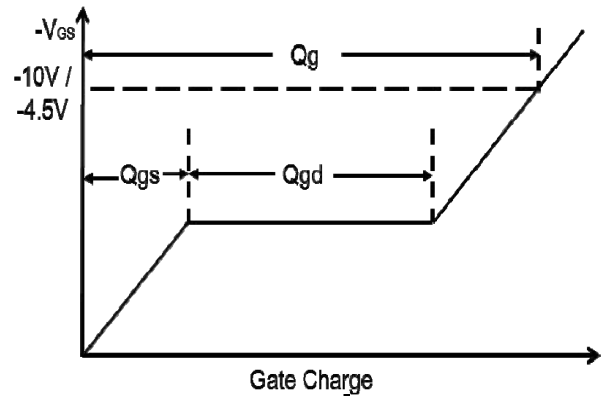
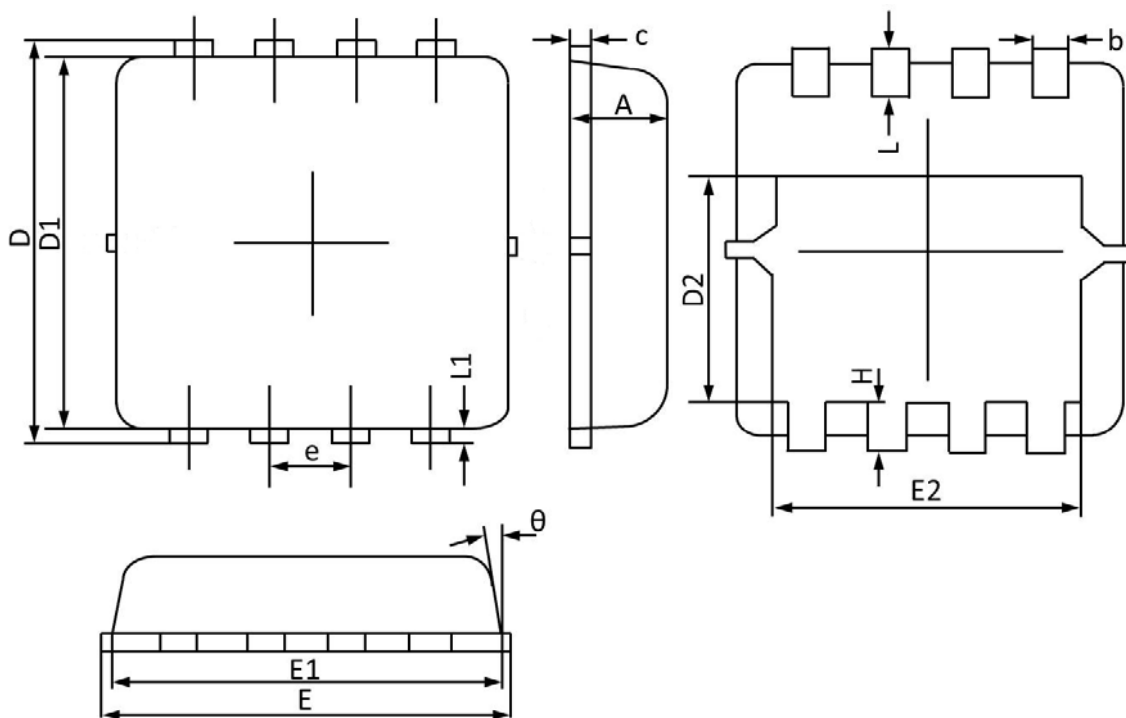


Figure 8. Gate Charge Waveform

Package Outline Dimensions (PPAK3x3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
b	0.250	0.350	0.010	0.014
c	0.100	0.250	0.004	0.010
D	3.050	3.500	0.120	0.138
D1	2.900	3.200	0.114	0.126
D2	1.350	1.950	0.053	0.077
E	3.000	3.400	0.118	0.134
E1	2.900	3.300	0.114	0.130
E2	2.350	2.600	0.093	0.102
e	0.65 BSC		0.026 BSC	
H	0.300	0.750	0.012	0.030
L	0.300	0.600	0.012	0.024
L1	0.060	0.200	0.002	0.008
θ	6°	14°	6°	14°

Suggested Pad Layout

