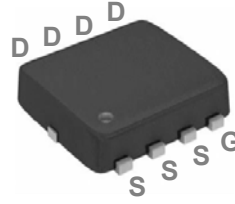
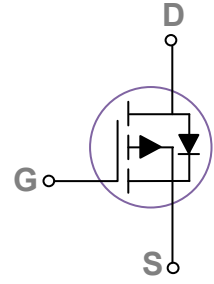


Main Product Characteristics

V_{BDSS}	-30V
$R_{DS(on)}$	15mΩ@-10V
I_D	-30A



PPAK3x3



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for battery operated systems, load switching, power converters and other general purpose applications
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The SSFN3905 utilizes the latest trench processing techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. These features make this device extremely efficient and reliable for use in battery protection, power switching and a wide variety of other applications.

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current – Continuous ($T_C=25^\circ\text{C}$)	I_D	-30	A
Drain Current – Continuous ($T_C=100^\circ\text{C}$)		-19	A
Drain Current – Pulsed ¹	I_{DM}	-120	A
Power Dissipation ($T_C=25^\circ\text{C}$)	P_D	23	W
Power Dissipation – Derate above 25°C		0.18	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 Ambient	$R_{\theta JA}$	---	62	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	5.4	$^\circ\text{C}/\text{W}$

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}	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25°C , $I_D=-1\text{mA}$	---	-0.03	---	$V/^\circ\text{C}$
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-24V, V_{GS}=0V$, $T_J=125^\circ\text{C}$	---	---	-10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-8A$	---	13	15	$m\Omega$
		$V_{GS}=-4.5V, I_D=-6A$	---	22	25	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-1.2	-1.6	-2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		---	4	---	$mV/^\circ\text{C}$
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-8A$	---	10.5	---	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{2,3}	Q_g	$V_{DS}=-15V, V_{GS}=-4.5V$, $I_D=-8A$	---	14.6	21	nC
Gate-Source Charge ^{2,3}	Q_{gs}		---	4.1	6	nC
Gate-Drain Charge ^{2,3}	Q_{gd}		---	6.3	9	nC
Turn-On Delay Time ^{2,3}	$T_{d(on)}$	$V_{DD}=-15V, V_{GS}=-10V$, $R_G=6\Omega, I_D=-1A$	---	9	17	ns
Rise Time ^{2,3}	T_r		---	21.8	41	ns
Turn-Off Delay Time ^{2,3}	$T_{d(off)}$		---	59.8	114	ns
Fall Time ^{2,3}	T_f		---	14.4	27	ns
Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V$, $F=1\text{MHz}$	---	1730	2510	pF
Output Capacitance	C_{oss}		---	180	260	pF
Reverse Transfer Capacitance	C_{rss}		---	125	180	pF
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V$, Force Current	---	---	-30	A
Pulsed Source Current	I_{SM}		---	---	-120	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1A$, $T_J=25^\circ\text{C}$	---	---	-1	V

Notes :

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

Typical Electrical and Thermal Characteristics

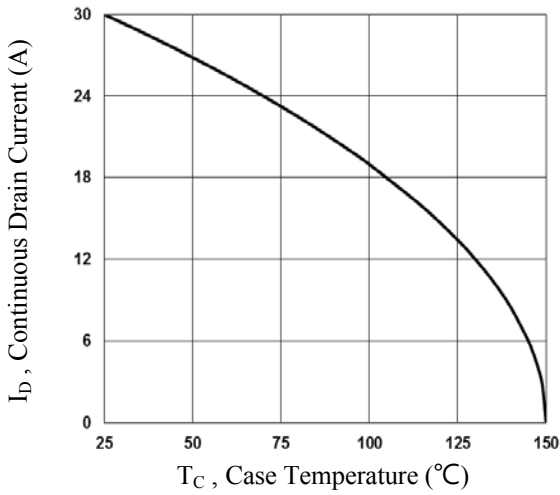


Fig.1 Continuous Drain Current vs. T_c

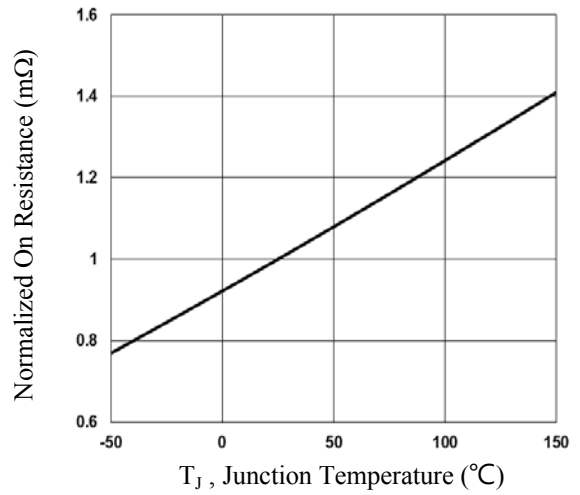


Fig.2 Normalized R_{DS(on)} vs. T_j

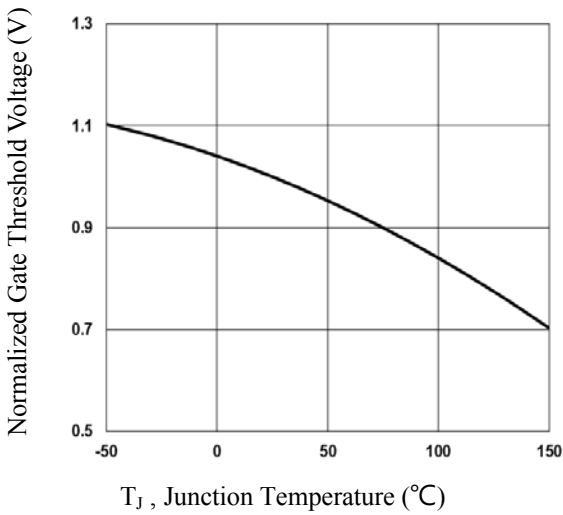


Fig.3 Normalized V_{th} vs. T_j

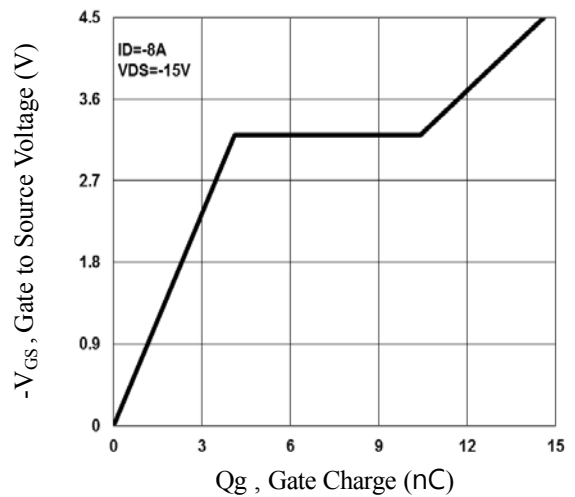


Fig.4 Gate Charge Waveform

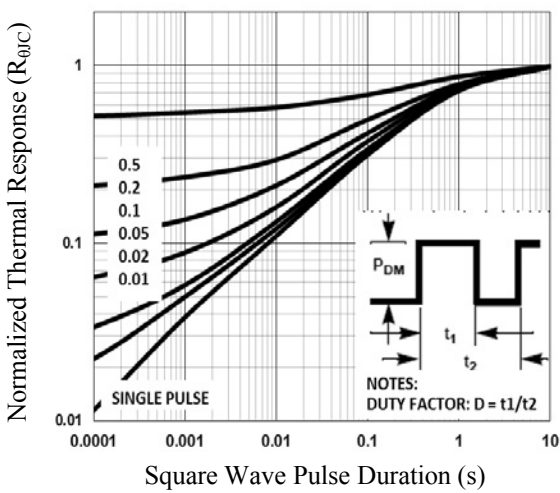


Fig.5 Normalized Transient Impedance

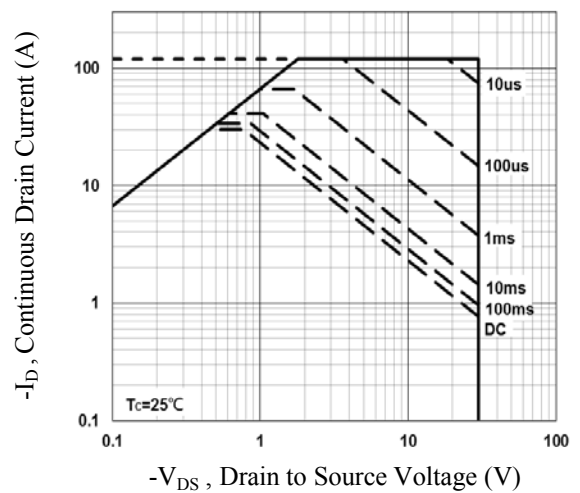


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristics

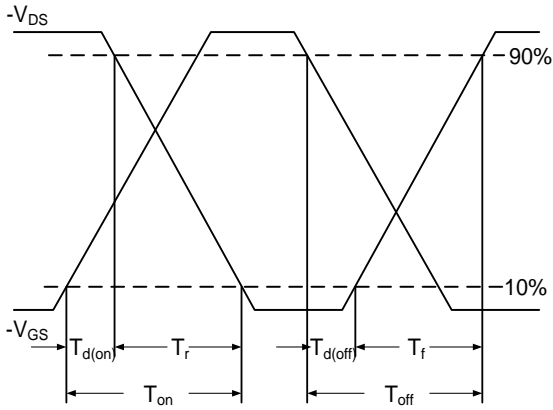


Fig.7 Switching Time Waveform

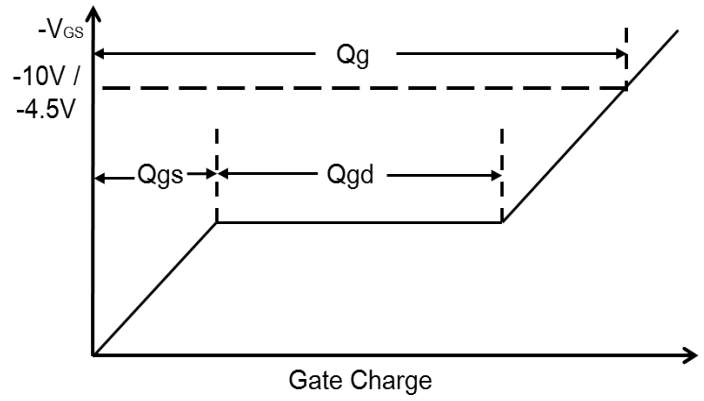
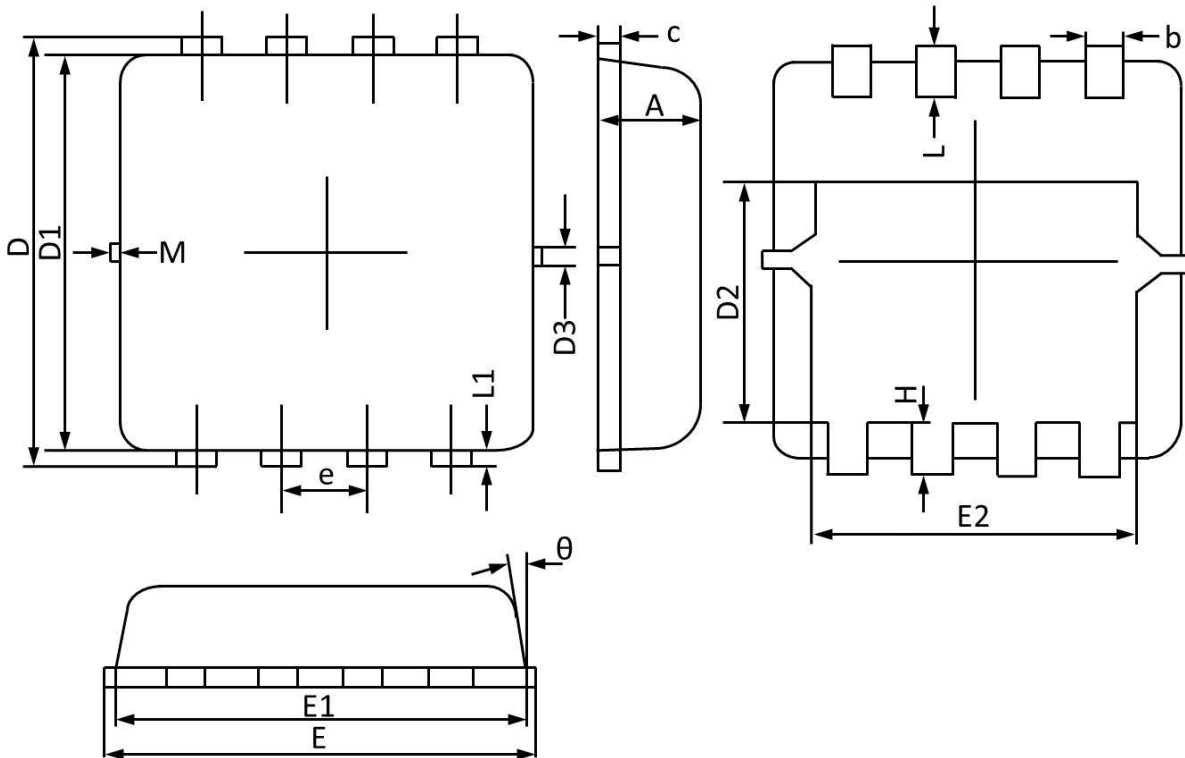


Fig.8 Gate Charge Waveform

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	
θ	0°	12°	0°	12°
M	0.150 REF		0.006 REF	