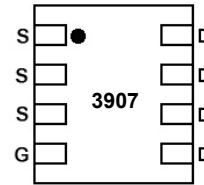


### Main Product Characteristics

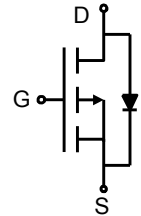
$V_{(BR)DSS}$	-30V
$R_{DS(on)}$	18m $\Omega$
$I_D$	-30A



DFN3x3-8L



Marking and Pin Assignment



Schematic Diagram

### Features and Benefits

- Advanced MOSFET process technology
- Ideal for MB/VGA/Vcore, load switch, POL and LED applications
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



### Description

The SSFN3907 utilizes the latest 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 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	Value	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	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 <sup>1</sup>	$I_{DM}$	-120	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	27	W
Power Dissipation – Derate above $25^\circ\text{C}$	$P_D$	0.22	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	$R_{\theta JC}$	---	4.6	$^\circ\text{C}/\text{W}$

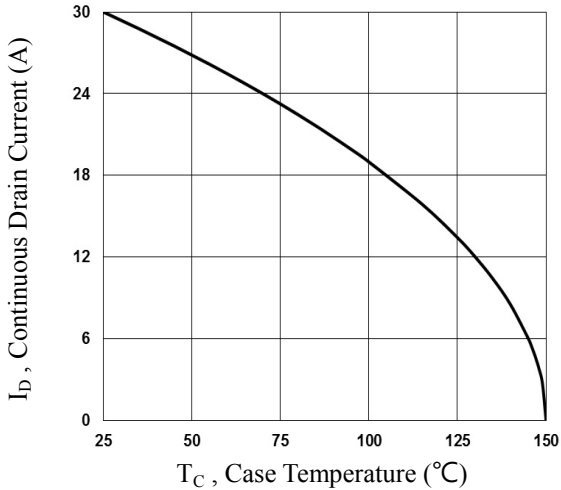
### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V , I <sub>D</sub> =-250uA	-30	---	---	V
BV <sub>DSS</sub> Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Reference to 25°C , I <sub>D</sub> =-1mA	---	-0.03	---	V/°C
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =-27V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	---	---	-1	uA
		V <sub>DS</sub> =-24V , V <sub>GS</sub> =0V , T <sub>J</sub> =125°C	---	---	-10	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V	---	---	±100	uA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V , I <sub>D</sub> =-8A	---	14.5	18	mΩ
		V <sub>GS</sub> =-4.5V , I <sub>D</sub> =-6A	---	23	30	
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-1.2	-1.6	-2.5	V
V <sub>GS(th)</sub> Temperature Coefficient	ΔV <sub>GS(th)</sub>		---	4	---	mV/°C
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =-10V , I <sub>S</sub> =-8A	---	6.8	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2, 3</sup>	Q <sub>g</sub>	V <sub>DS</sub> =-15V , V <sub>GS</sub> =-4.5V , I <sub>D</sub> =-5A	---	11	17	nC
Gate-Source Charge <sup>2, 3</sup>	Q <sub>gs</sub>		---	3.4	6	
Gate-Drain Charge <sup>2, 3</sup>	Q <sub>gd</sub>		---	4.2	8	
Turn-On Delay Time <sup>2, 3</sup>	T <sub>d(on)</sub>	V <sub>DD</sub> =-15V , V <sub>GS</sub> =-10V , R <sub>G</sub> =6Ω I <sub>D</sub> =-1A	---	5.8	11	nS
Rise Time <sup>2, 3</sup>	T <sub>r</sub>		---	18.8	36	
Turn-Off Delay Time <sup>2, 3</sup>	T <sub>d(off)</sub>		---	46.9	90	
Fall Time <sup>2, 3</sup>	T <sub>f</sub>		---	12.3	23	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-15V , V <sub>GS</sub> =0V , F=1MHz	---	1250	2500	pF
Output Capacitance	C <sub>oss</sub>		---	160	320	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	90	180	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	I <sub>S</sub>	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	---	---	-30	A
Pulsed Source Current	I <sub>SM</sub>		---	---	-60	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V , I <sub>S</sub> =-1A , T <sub>J</sub> =25°C	---	---	-1	V

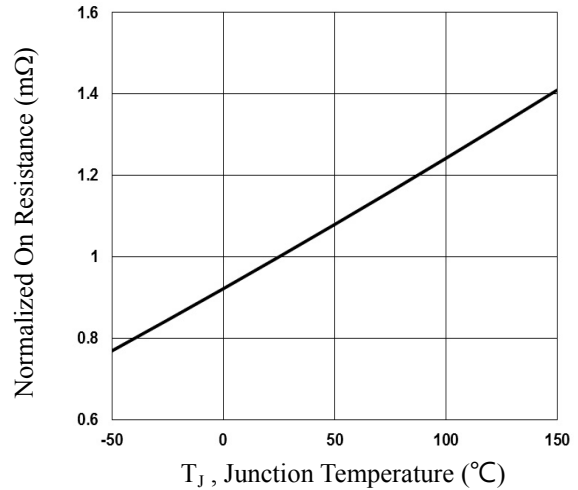
**Notes:**

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.

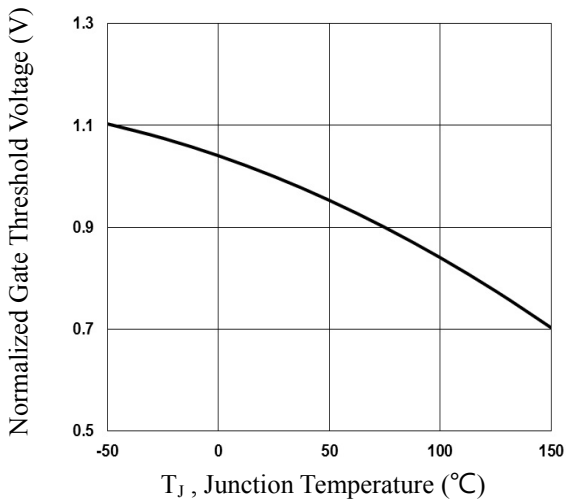
**Typical Electrical and Thermal Characteristic Curves**



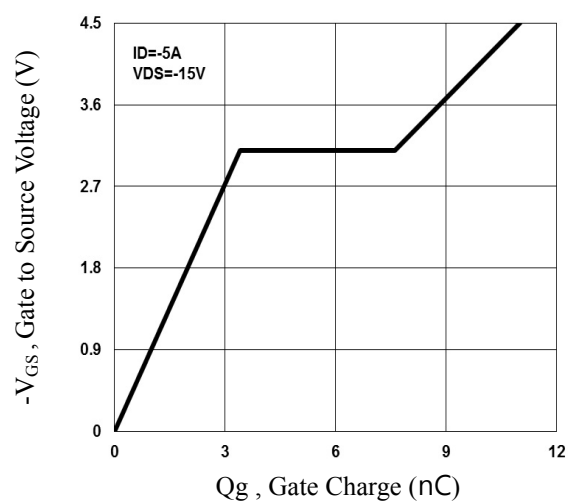
**Fig.1 Continuous Drain Current vs.  $T_c$**



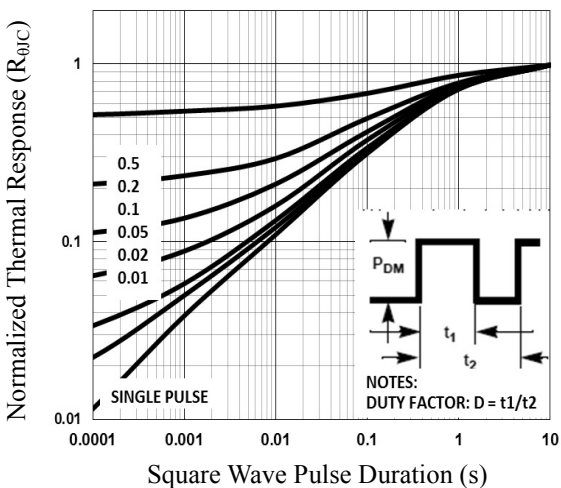
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



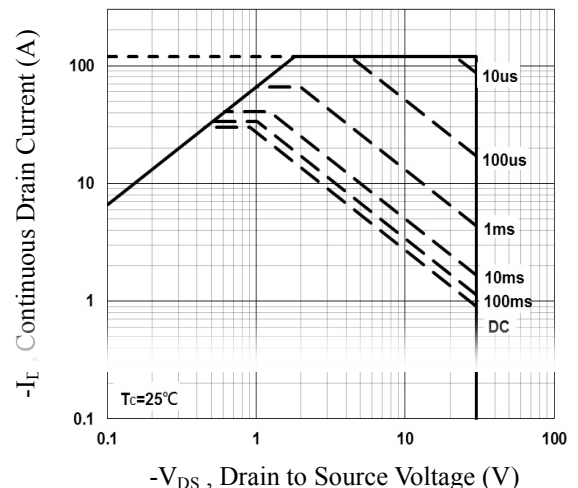
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



**Fig.4 Gate Charge Waveform**

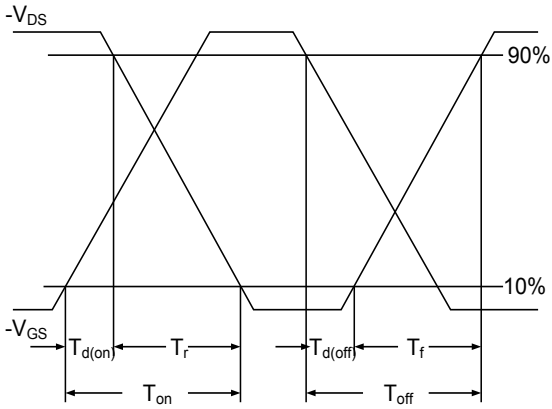


**Fig.5 Normalized Transient Impedance**

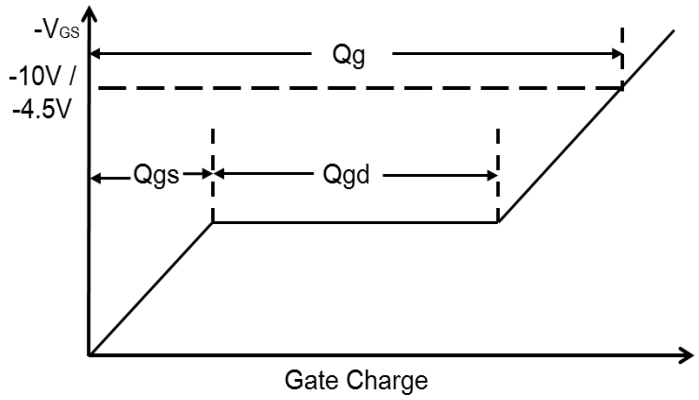


**Fig.6 Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristic Curves**



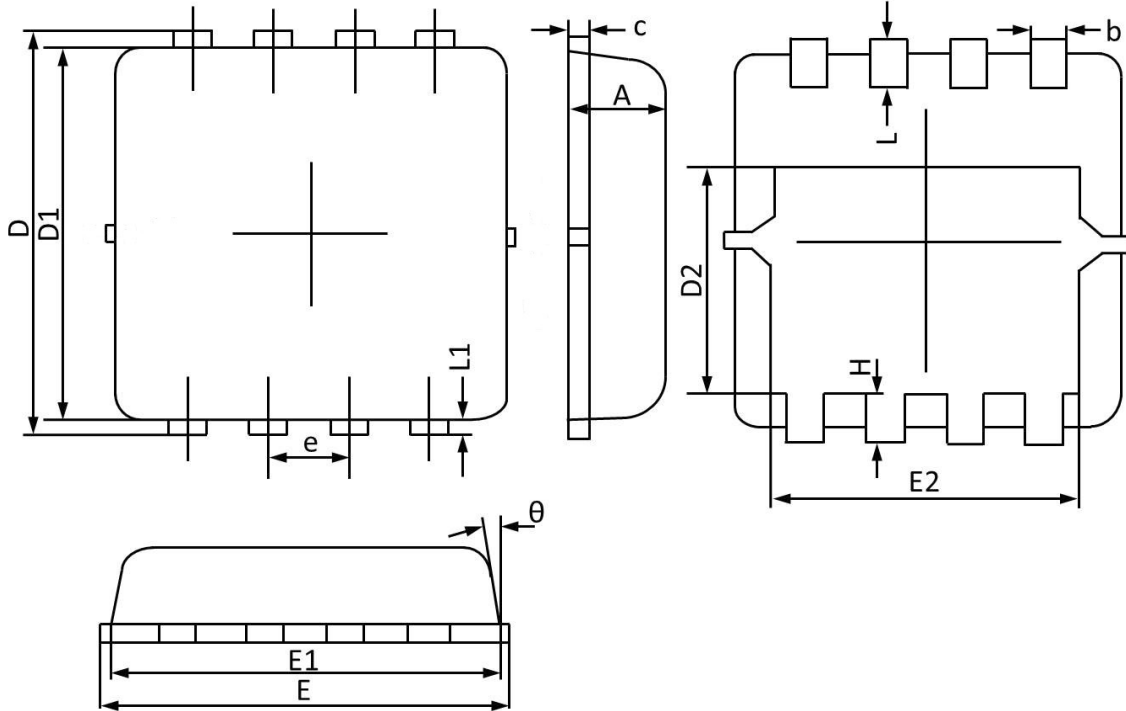
**Fig.7 Switching Time Waveform**



**Fig.8 Gate Charge Waveform**

**Package Outline Dimensions**

**PPAK3x3**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.900	0.700	0.035	0.028
b	0.350	0.240	0.014	0.009
c	0.250	0.100	0.010	0.004
D	3.450	3.050	0.136	0.120
D1	3.200	2.900	0.126	0.114
D2	1.850	1.350	0.073	0.053
E	3.400	3.000	0.134	0.118
E1	3.250	2.900	0.128	0.114
E2	2.600	2.350	0.102	0.093
e	0.65BSC		0.026BSC	
H	0.500	0.300	0.020	0.012
L	0.500	0.300	0.020	0.012
L1	0.200	0.070	0.008	0.003
θ	12°	0°	12°	0°