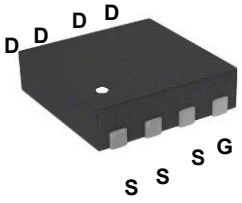
GOOD-ARK SEMICONDUCTOR

SSFN3907

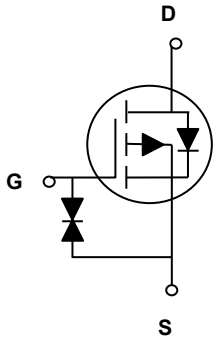
30V P-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	-30V
$R_{DS(ON)}$	20mq
I_D	-30A



DFN3x3



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- 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 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=25ÁC unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	Ñ20	V
Drain Current-Continuous (T_C=25ÁC)	I_D	-30	A
Drain Current-Continuous (T_C=100ÁC)		-19	A
Drain Current-Pulsed[1]	I_{DM}	-120	A
Power Dissipation (T_C=25ÁC)	P_D	27	W
Power Dissipation-Derate Above 25ÁC		0.22	W/ÁC
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	ÁC/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4.6	ÁC/W
Storage Temperature Range	T_{STG}	-55 To +150	ÁC
Operating Junction Temperature Range	T_J	-55 To +150	ÁC

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=-250μA	-30	-	-	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25°C, I_D=-1mA	-	-0.03	-	V/°C
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-27V , V_{GS}=0V, T_J=25°C	-	-	-1	μA
		V_{DS}=-24V , V_{GS}=0V, T_J=125°C	-	-	-10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±20	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-8A	-	16	20	mΩ
		V_{GS}=-4.5V, I_D=-5A	-	28	37	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1.2	-1.6	-2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		-	4	-	mV/°C
Forward Transconductance	g_{fs}	V_{DS}=-10V, I_D=-3A	-	6.3	-	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{DS}=-15V, I_D=-5A, V_{GS}=-4.5V	-	11	17	nC
Gate-Source Charge[2,3]	Q_{gs}		-	3.4	6	
Gate-Drain Charge[2,3]	Q_{gd}		-	4.2	8	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=-15V, V_{GS}=-10V, I_D=-1A, R_G=6Ω	-	5.8	11	nS
Rise Time[2,3]	t_r		-	18.8	36	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	46.9	90	
Fall Time[2,3]	t_f		-	12.3	23	
Input Capacitance	C_{lss}	V_{DS}=-15V, V_{GS}=0V, F=1MHz	-	1250	2500	pF
Output Capacitance	C_{oss}		-	160	320	
Reverse Transfer Capacitance	C_{rss}		-	90	180	
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}		-	-	-60	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. Pluse test: pulse width ≦ 300us, duty cycle ≦ 2%.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

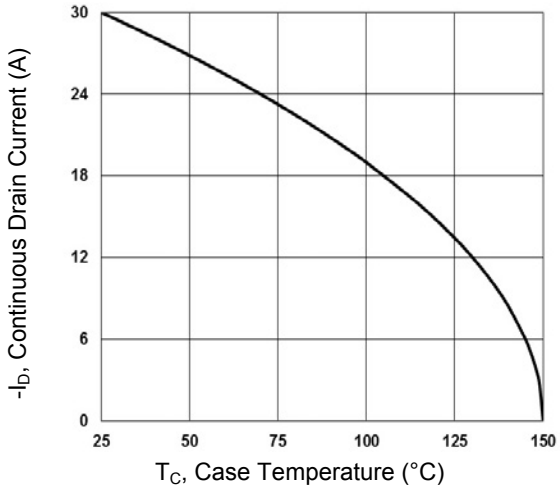


Figure 1. Continuous Drain Current vs. T_C

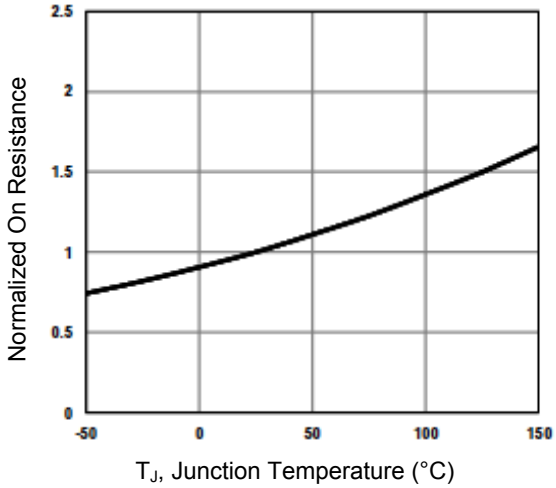


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

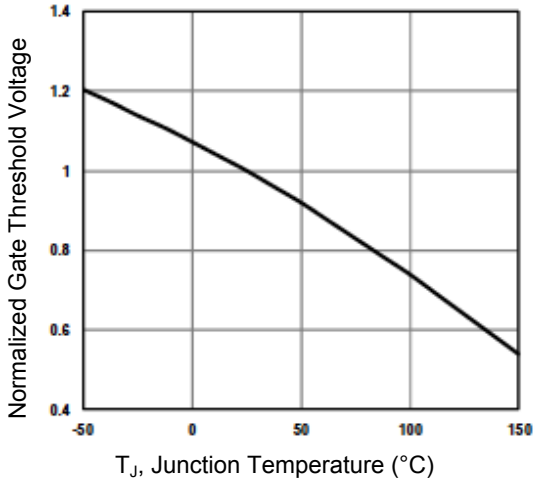


Figure 3. Normalized V_{th} vs. T_J

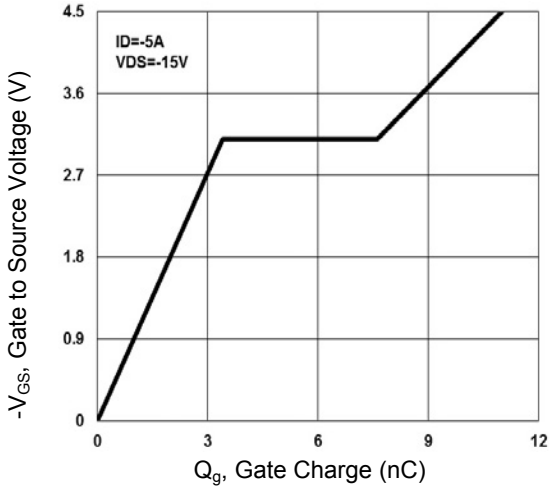


Figure 4. Gate Charge Characteristics

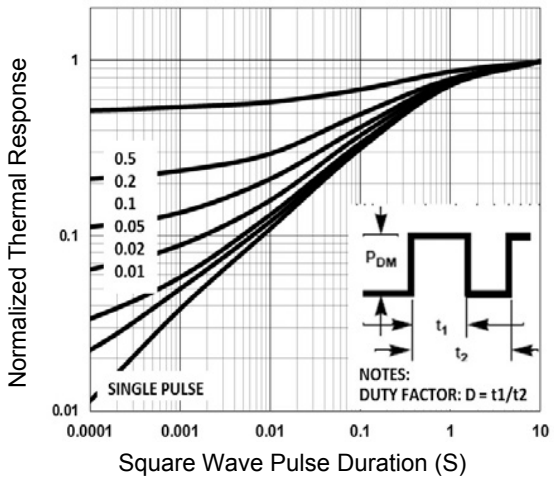


Figure 5. Normalized Transient Impedance

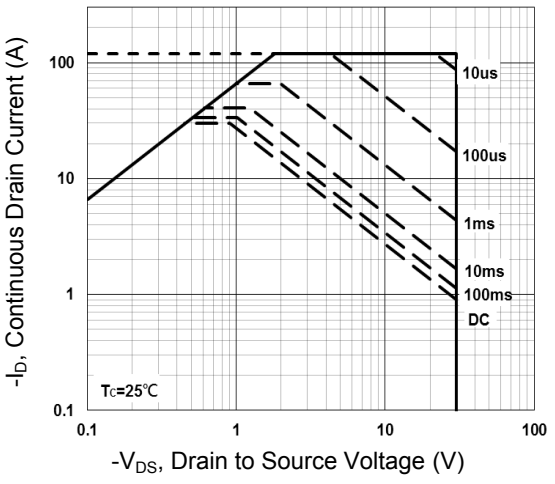


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

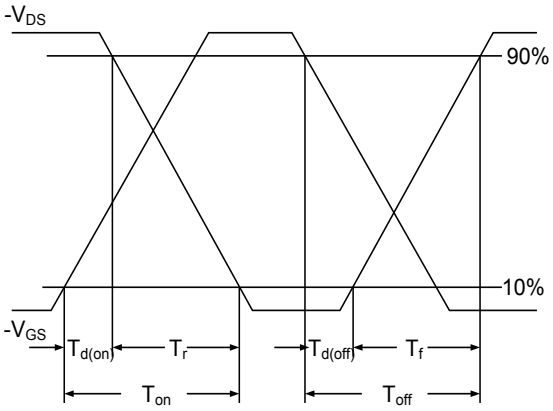


Figure 7. Switching Time Waveform

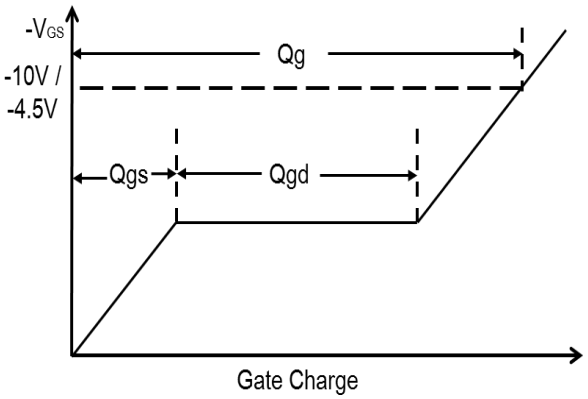
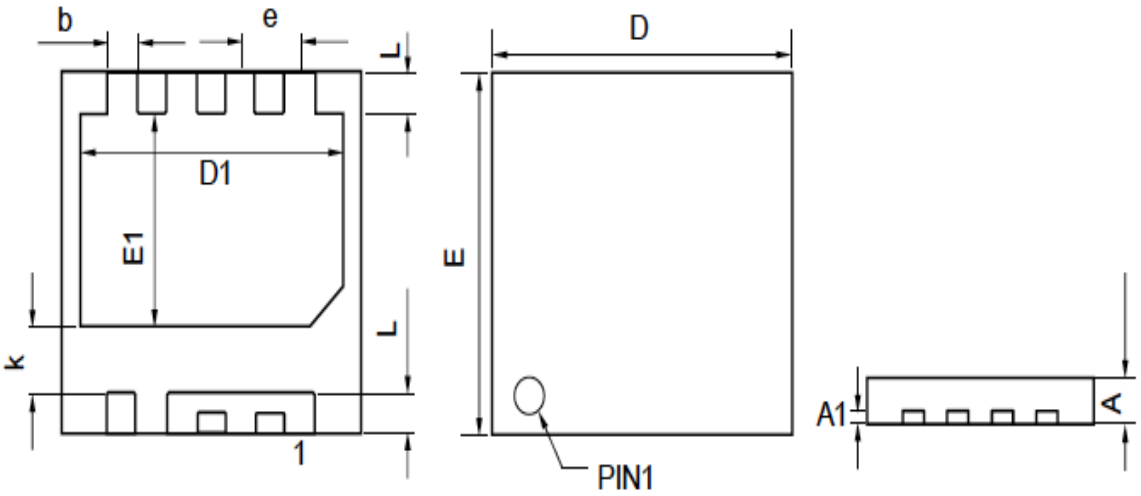


Figure 8. Gate Charge Waveform

Package Outline Dimensions (DFN3x3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031
A1	0.150	0.255	0.006	0.010
D	2.900	3.100	0.114	0.122
E	2.900	3.100	0.114	0.122
D1	2.300	2.500	0.091	0.098
E1	1.650	1.850	0.065	0.073
b	0.300	0.400	0.012	0.016
L	0.300	0.500	0.012	0.020
k	0.400	-	0.016	-
e	0.650 BSC		0.026BSC	