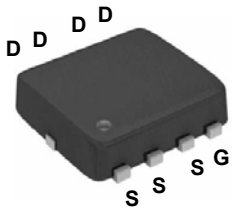
GOOD-ARK SEMICONDUCTOR

SSFN3905

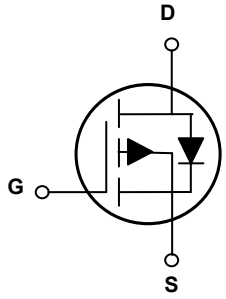
30V P-Channel MOSFET

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 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°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°C)	I_D	-30	A
Drain Current-Continuous(T_C=100°C)		-19	
Drain Current-Pulsed[1]	I_{DM}	-120	A
Power Dissipation (T_C=25°C)	P_D	23	W
Power Dissipation-Derate above 25°C		0.18	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	5.4	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-30	-	-	V
BV_{DSS} Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	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	μA
		V_{DS}=-24V, V_{GS}=0V, T_J=125°C	-	-	-10	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-8A	-	13	15	mΩ
		V_{GS}=-4.5V, I_D=-6A	-	22	25	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250μA	-1.2	-1.6	-2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	4	-	mV/°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, I_D=-8A, V_{GS}=-4.5V	-	14.6	21	nC
Gate-Source Charge[2,3]	Q_{gs}		-	4.1	6	
Gate-Drain Charge[2,3]	Q_{gd}		-	6.3	9	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=-15V, R_G=1Ω, V_{GS}=-10V, I_D=-10A	-	9	15	nS
Rise Time[2,3]	t_r		-	11	17	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	26	40	
Fall Time[2,3]	t_f		-	10	15	
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, F=1MHz	-	1730	2510	pF
Output Capacitance	C_{oss}		-	180	260	
Reverse Transfer Capacitance	C_{rss}		-	125	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}		-	-	-120	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. Pulsed test: pulse width ≦ 300us, duty cycle ≦ 2 % .
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristics

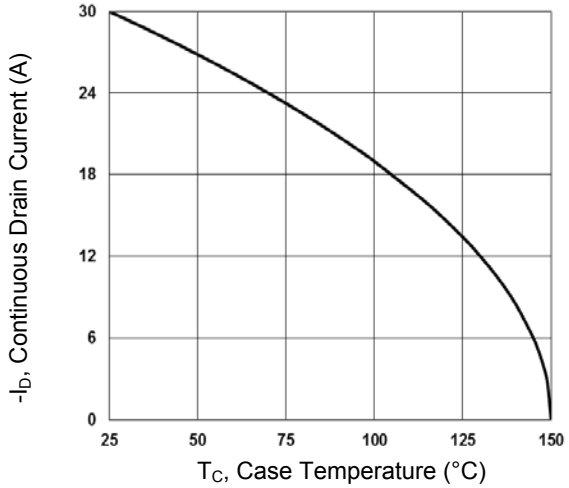


Figure 1. Continuous Drain Current vs. T_C

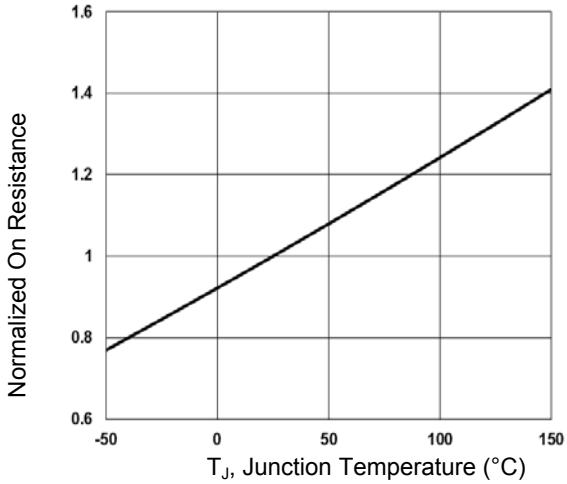


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

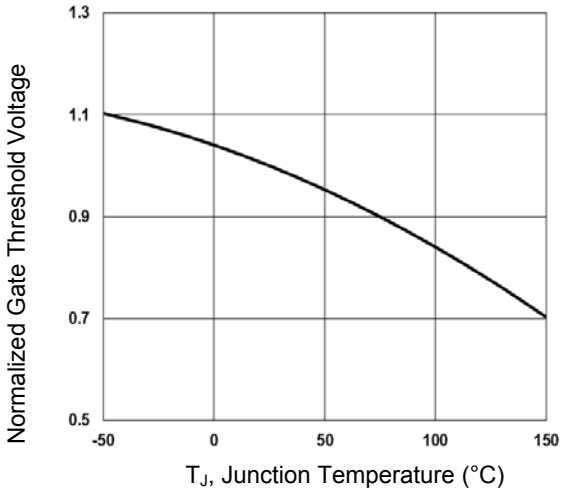


Figure 3. Normalized V_{th} vs. T_J

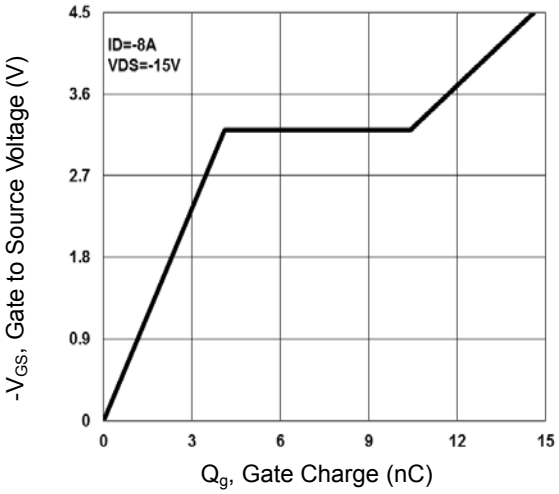


Figure 4. Gate Charge Characteristics

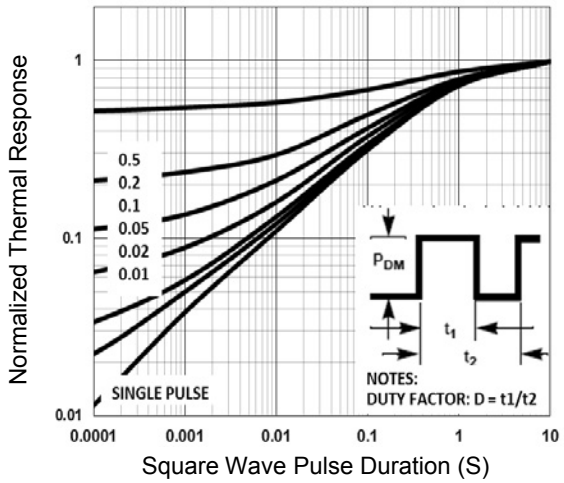


Figure 5. Normalized Transient Impedance

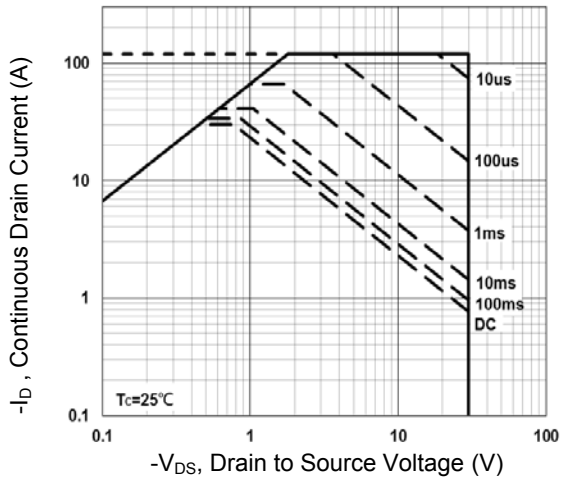


Figure 6. Maximum Safe Operation Area

Typical Electrical and Thermal Characteristics

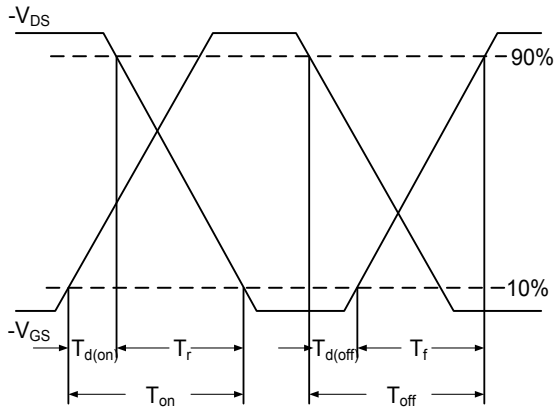


Figure 7. Switching Time Waveform

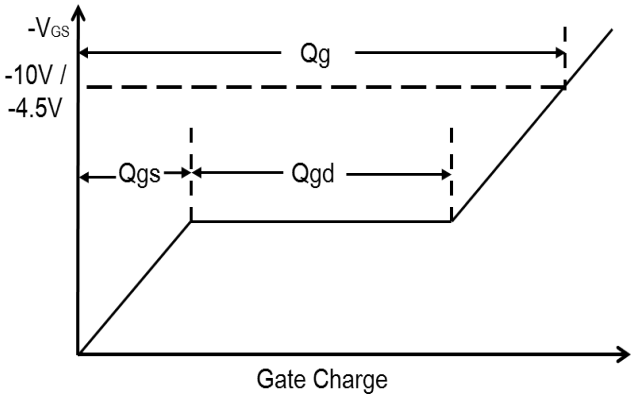
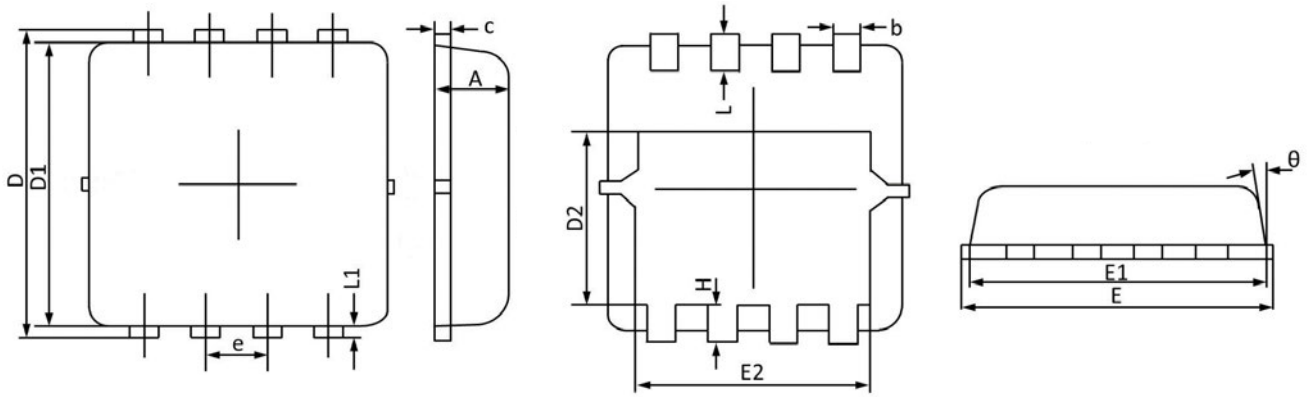


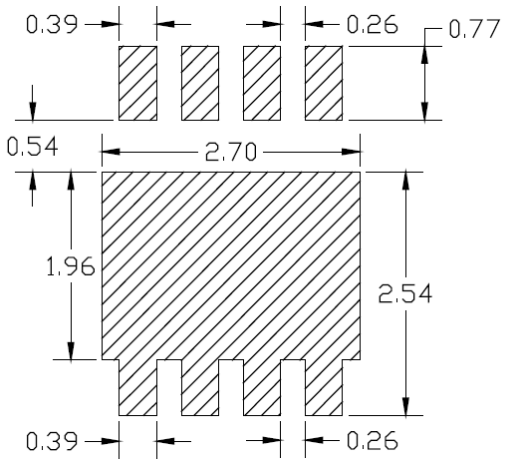
Figure 8. Gate Charge Waveform

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	0.650 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°

Recommended Pad Layout



unit: mm