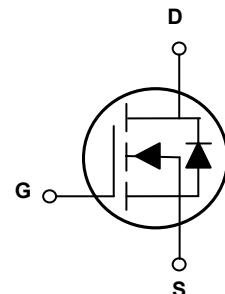
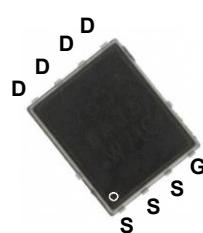


## Main Product Characteristics

BVDSS	40V
R <sub>DS(ON)</sub>	8.5mΩ
I <sub>D</sub>	70A



PPAK5x6

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 SSFP4906 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 ( $T_c=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current-Continuous ( $T_c=25^\circ\text{C}$ )	I <sub>D</sub>	70	A
Drain Current-Continuous ( $T_c=100^\circ\text{C}$ )		44	
Drain Current-Pulsed <sup>1</sup>	I <sub>DM</sub>	280	A
Single Pulse Avalanche Energy <sup>2</sup>	E <sub>AS</sub>	76	mJ
Single Pulse Avalanche Current <sup>2</sup>	I <sub>AS</sub>	39	A
Power Dissipation ( $T_c=25^\circ\text{C}$ )	P <sub>D</sub>	72.3	W
Power Dissipation-Derate above 25°C		0.58	W/°C
Thermal Resistance, Junction-to-Ambient	R <sub>θJA</sub>	62	°C/W
Thermal Resistance, Junction-to-Case	R <sub>θJC</sub>	1.73	°C/W
Operating Junction Temperature Range	T <sub>J</sub>	-55 To +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 To +150	°C

### Electrical Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_D=250\mu\text{A}$	40	-	-	V
$\text{BV}_{\text{DSS}}$ Temperature Coefficient	$\Delta \text{BV}_{\text{DSS}}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $\text{I}_D=1\text{mA}$	-	0.03	-	$\text{V}/^\circ\text{C}$
Drain-Source Leakage Current	$\text{I}_{\text{DS}(\text{SS})}$	$\text{V}_{\text{DS}}=40\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$
		$\text{V}_{\text{DS}}=32\text{V}, \text{V}_{\text{GS}}=0\text{V}, T_J=85^\circ\text{C}$	-	-	10	$\mu\text{A}$
Gate-Source Leakage Current	$\text{I}_{\text{GSS}}$	$\text{V}_{\text{GS}}=\pm 20\text{V}, \text{V}_{\text{DS}}=0\text{V}$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance	$\text{R}_{\text{DS}(\text{ON})}$	$\text{V}_{\text{GS}}=10\text{V}, \text{I}_D=15\text{A}$	-	6.5	8.5	$\text{m}\Omega$
		$\text{V}_{\text{GS}}=4.5\text{V}, \text{I}_D=8\text{A}$	-	9	12	
Gate Threshold Voltage	$\text{V}_{\text{GS}(\text{th})}$	$\text{V}_{\text{GS}}=\text{V}_{\text{DS}}, \text{I}_D=250\mu\text{A}$	1.2	1.6	2.5	V
$\text{V}_{\text{GS}(\text{th})}$ Temperature Coefficient	$\Delta \text{V}_{\text{GS}(\text{th})}$		-	-5	-	$\text{mV}/^\circ\text{C}$
Forward Transconductance	$\text{g}_{\text{fs}}$	$\text{V}_{\text{DS}}=10\text{V}, \text{I}_D=10\text{A}$	-	13	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$\text{Q}_g$	$\text{V}_{\text{DS}}=20\text{V}, \text{I}_D=10\text{A}, \text{V}_{\text{GS}}=10\text{V}$	-	19.7	30	nC
Gate-Source Charge <sup>3,4</sup>	$\text{Q}_{\text{gs}}$		-	2.8	4.2	
Gate-Drain Charge <sup>3,4</sup>	$\text{Q}_{\text{gd}}$		-	5.1	7.6	
Turn-On Delay Time <sup>3,4</sup>	$\text{t}_{\text{d}(\text{on})}$	$\text{V}_{\text{DD}}=15\text{V}, \text{R}_G=3.3\Omega, \text{V}_{\text{GS}}=10\text{V}, \text{I}_D=1\text{A}$	-	13.2	25	nS
Rise Time <sup>3,4</sup>	$\text{t}_r$		-	2.2	5	
Turn-Off Delay Time <sup>3,4</sup>	$\text{t}_{\text{d}(\text{off})}$		-	72	130	
Fall Time <sup>3,4</sup>	$\text{t}_f$		-	4.5	10	
Input Capacitance	$\text{C}_{\text{iss}}$	$\text{V}_{\text{DS}}=25\text{V}, \text{V}_{\text{GS}}=0\text{V}, \text{F}=1\text{MHz}$	-	1278	2200	pF
Output Capacitance	$\text{C}_{\text{oss}}$		-	135	250	
Reverse Transfer Capacitance	$\text{C}_{\text{rss}}$		-	87	170	
Gate Resistance	$\text{R}_g$	$\text{V}_{\text{GS}}=0\text{V}, \text{V}_{\text{DS}}=0\text{V}, \text{F}=1\text{MHz}$	-	2.2	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$\text{I}_s$	$\text{V}_G=\text{V}_D=0\text{V}, \text{Force Current}$	-	-	70	A
Pulsed Source Current	$\text{I}_{\text{SM}}$		-	-	140	A
Diode Forward Voltage	$\text{V}_{\text{SD}}$	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_s=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	$\text{t}_{\text{rr}}$	$\text{V}_{\text{GS}}=0\text{V}, \text{I}_s=1\text{A}, \text{di/dt}=100\text{A}/\mu\text{s}, T_J=25^\circ\text{C}$	-	17	-	nS
Reverse Recovery Charge	$\text{Q}_{\text{rr}}$		-	2.8	-	nC

Note:

- Repetitive rating: Pulsed width limited by maximum junction temperature.
- $\text{V}_{\text{DD}}=25\text{V}, \text{V}_{\text{GS}}=10\text{V}, \text{L}=0.1\text{mH}, \text{I}_{\text{AS}}=39\text{A}, \text{R}_G=25\Omega, \text{starting } T_J=25^\circ\text{C}$ .
- Pulse test: pulse width  $\leq 300\text{us}$ , duty cycle  $\leq 2\%$ .
- Essentially independent of operation temperature.

## Typical Electrical and Thermal Characteristic Curves

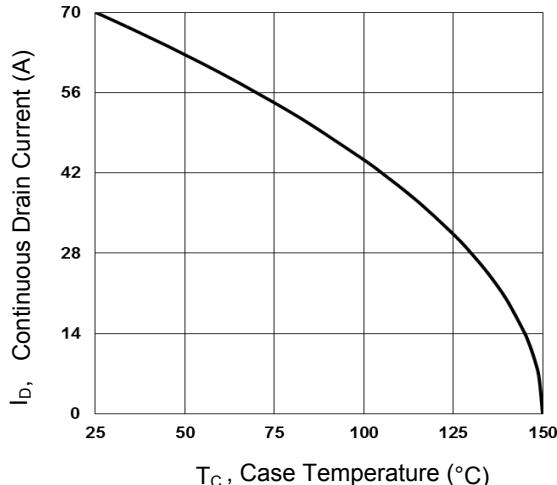


Figure 1. Continuous Drain Current vs. T<sub>c</sub>

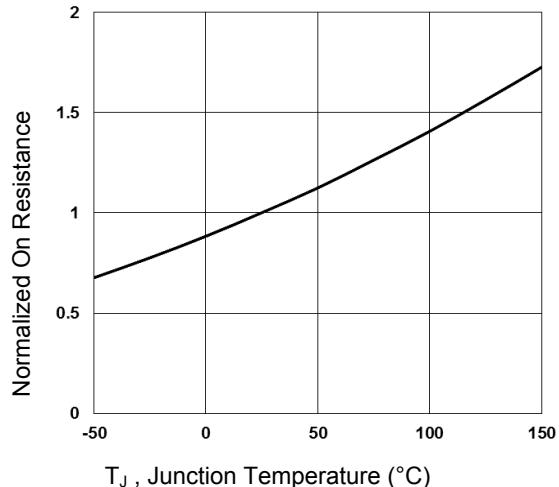


Figure 2. Normalized R<sub>DS(ON)</sub> vs. T<sub>j</sub>

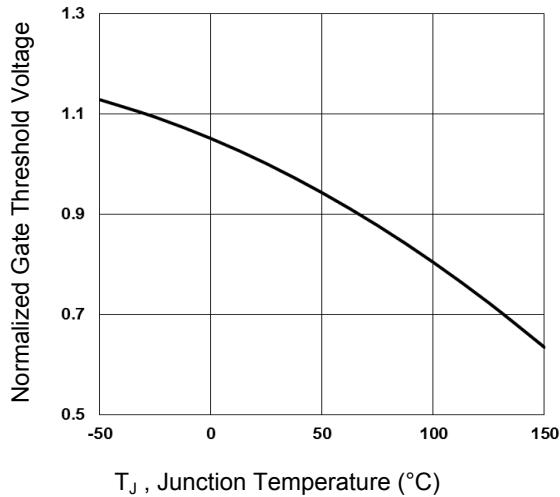


Figure 3. Normalized V<sub>th</sub> vs. T<sub>j</sub>

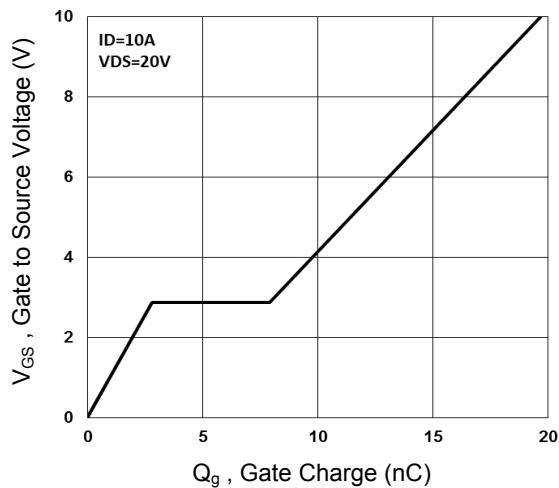


Figure 4. Gate Charge Waveform

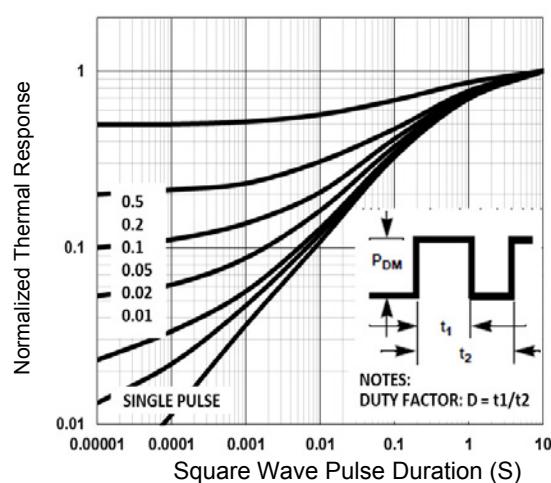


Figure 5. Normalized Transient Impedance

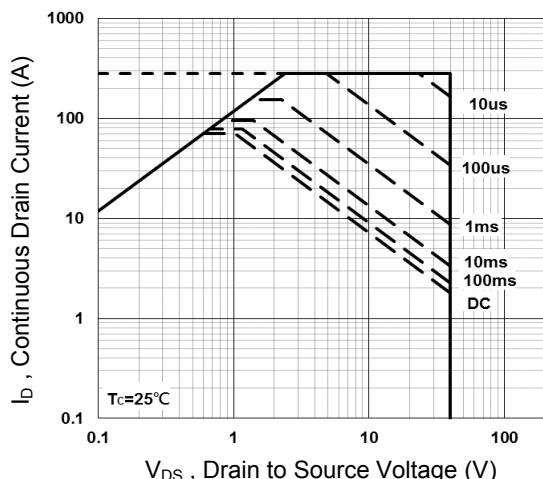


Figure 6. Maximum Safe Operation Area

## Typical Electrical and Thermal Characteristic Curves

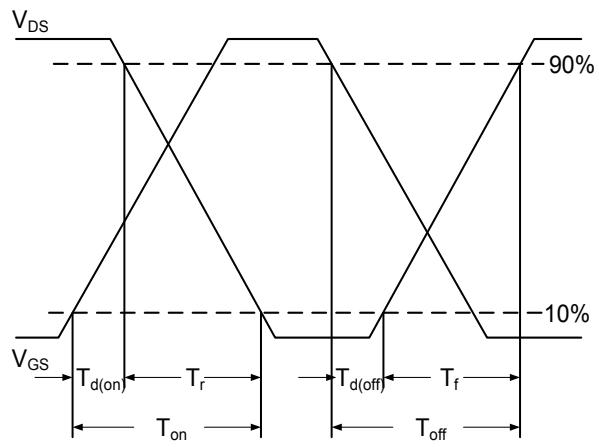


Figure 7. Switching Time Waveform

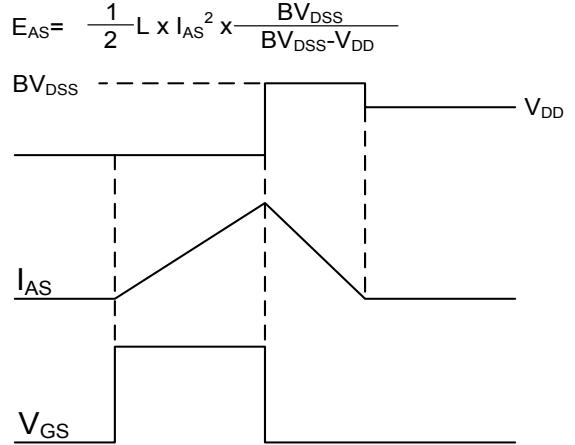
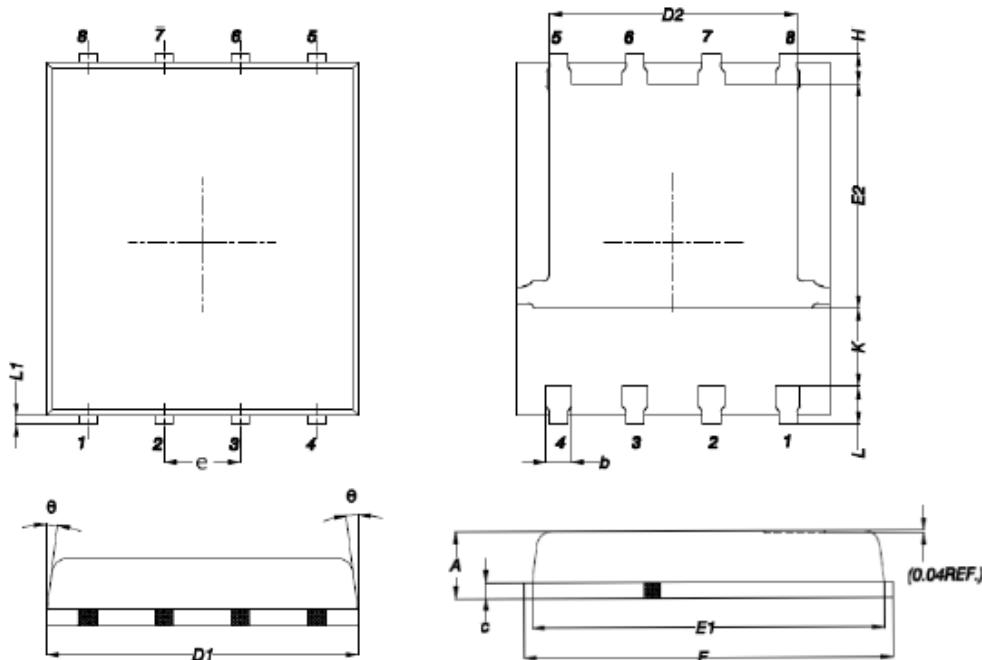


Figure 8. EAS Waveform

**Package Outline Dimensions**

**PPAK5x6**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.200	0.850	0.047	0.031
b	0.510	0.300	0.020	0.012
C	0.300	0.200	0.012	0.008
D1	5.400	4.800	0.212	0.189
D2	4.310	3.610	0.170	0.142
E	6.300	5.850	0.248	0.230
E1	5.960	5.450	0.235	0.215
E2	3.920	3.300	0.154	0.130
e	1.27BSC		0.05BSC	
H	0.650	0.380	0.026	0.015
K	-	1.100	-	0.043
L	0.710	0.380	0.028	0.015
L1	0.250	0.050	0.009	0.002
$\theta$	12°	0°	12°	0°