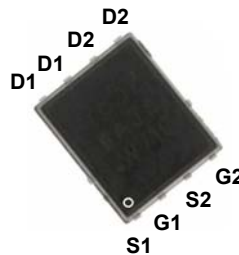
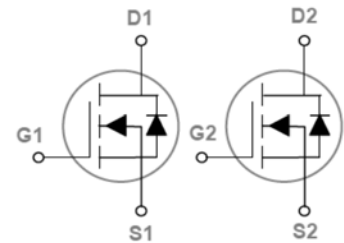


### Main Product Characteristics

$V_{(BR)DSS}$	40V
$R_{DS(ON)}$	9m $\Omega$
$I_D$	30A



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 SSFP4806 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	Rating	Unit
Drain-Source Voltage	$V_{DS}$	40	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
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	64	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	36	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	46	W
Power Dissipation – Derate above $25^\circ\text{C}$		0.37	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	$R_{\theta JC}$	---	2.7	$^\circ\text{C}/\text{W}$

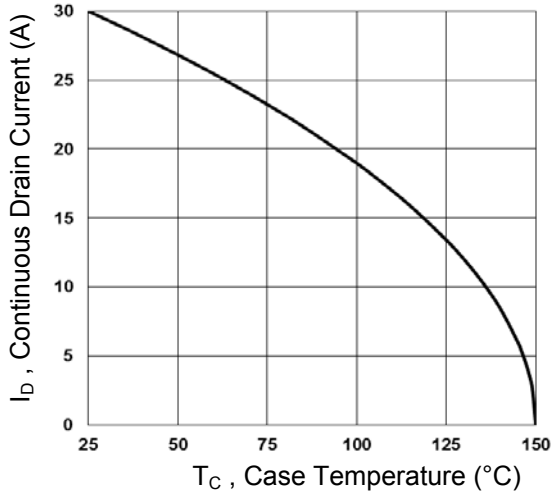
### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Static State Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	40	---	---	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>Ds</sub> =40V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>Ds</sub> =32V, 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	nA
Static Drain-Source On-Resistance <sup>3</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =8A	---	7.2	9	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A	---	9.5	12	mΩ
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>Ds</sub> , I <sub>D</sub> =250uA	1	1.6	2.5	V
Forward Transconductance	g <sub>fs</sub>	V <sub>Ds</sub> =10V, I <sub>D</sub> =10A	---	13	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	Q <sub>g</sub>	V <sub>Ds</sub> =20V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A	---	12.2	24	nC
Gate-Source Charge <sup>3,4</sup>	Q <sub>gs</sub>		---	3.3	7	
Gate-Drain Charge <sup>3,4</sup>	Q <sub>gd</sub>		---	6.7	13	
Turn-On Delay Time <sup>3,4</sup>	T <sub>d(on)</sub>	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, R <sub>G</sub> =3.3Ω, I <sub>D</sub> =1A	---	13.2	25	nS
Rise Time <sup>3,4</sup>	T <sub>r</sub>		---	2.2	5	
Turn-Off Delay Time <sup>3,4</sup>	T <sub>d(off)</sub>		---	72	130	
Fall Time <sup>3,4</sup>	T <sub>f</sub>		---	4.5	10	
Input Capacitance	C <sub>iss</sub>	V <sub>Ds</sub> =25V, V <sub>GS</sub> =0V, F=1MHz	---	1220	2200	pF
Output Capacitance	C <sub>oss</sub>		---	130	250	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	55	110	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>Ds</sub> =0V, F=1MHz	---	2.2	---	Ω
<b>Guaranteed Avalanche Energy</b>						
Single Pulse Avalanche Energy	E <sub>AS</sub>	V <sub>DD</sub> =25V, L=0.1mH, I <sub>AS</sub> =6A	1.8	---	---	mJ
<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 <sup>3</sup>	I <sub>SM</sub>		---	---	120	A
Diode Forward Voltage <sup>3</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1	V

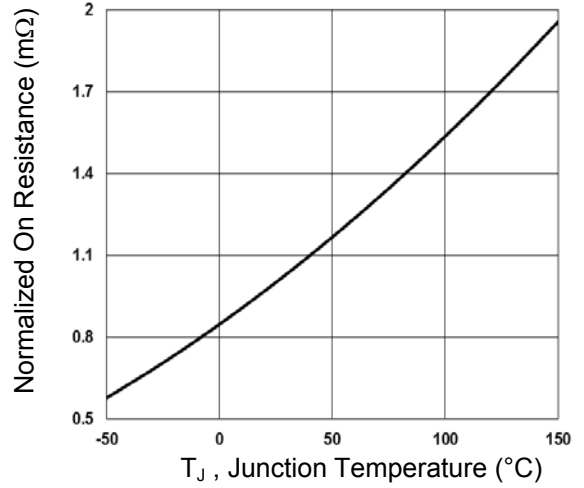
**Note:**

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=25V, V<sub>GS</sub>=10V, L=0.1mH, I<sub>AS</sub>=36A, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.
3. The data tested by pulsed, pulse width ≤ 300uS, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

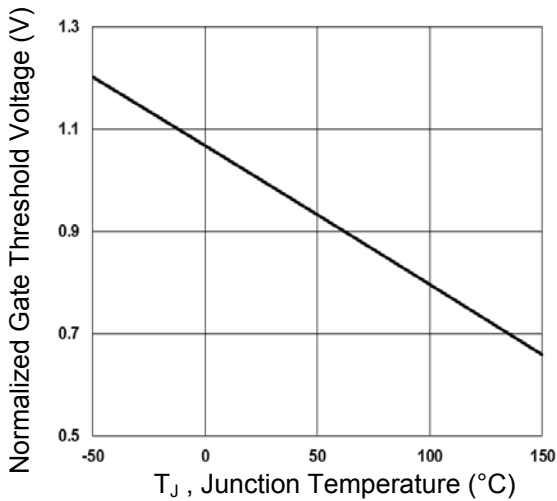
### Typical Electrical and Thermal Characteristic Curves



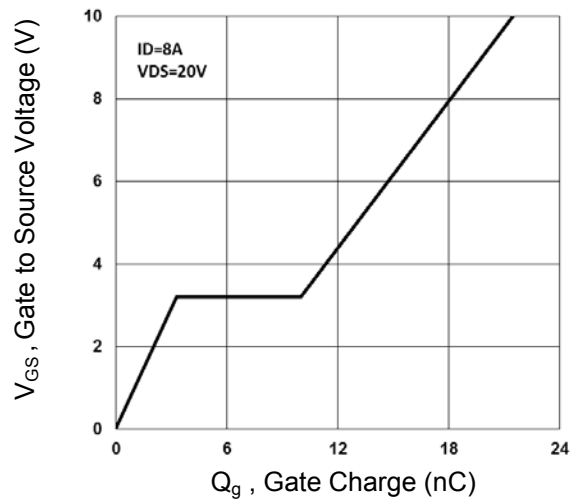
**Fig.1 Continuous Drain Current vs.  $T_C$**



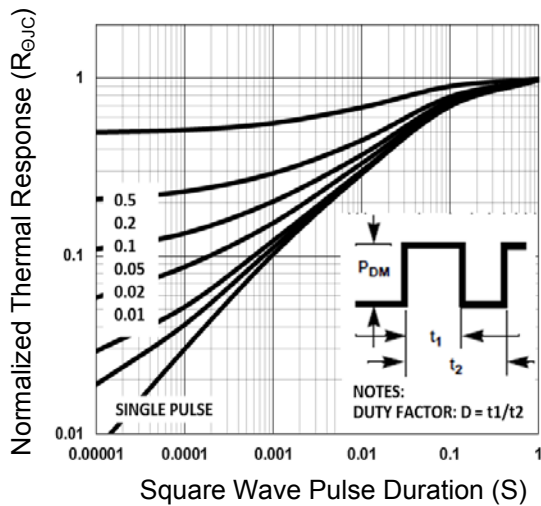
**Fig.2 Normalized  $R_{DS(ON)}$  vs.  $T_J$**



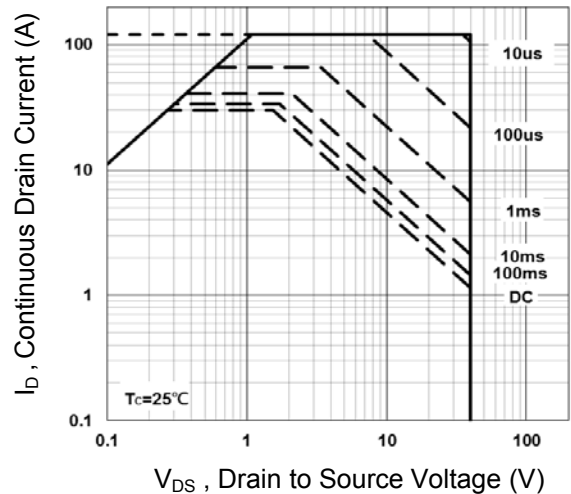
**Fig.3 Normalized  $V_{th}$  vs.  $T_J$**



**Fig.4 Gate Charge Waveform**



**Fig.5 Normalized Transient Impedance**



**Fig.6 Maximum Safe Operation Area**

## Typical Electrical and Thermal Characteristic Curves

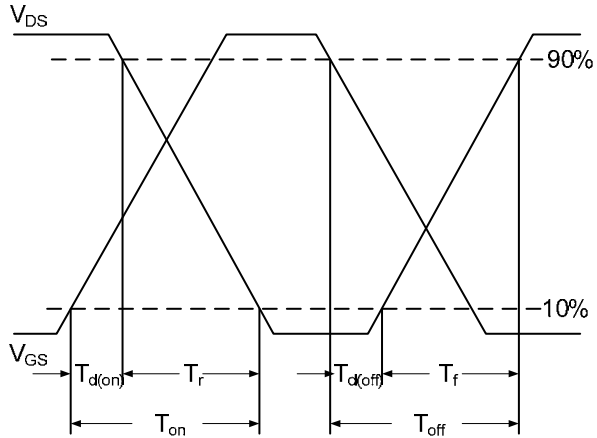


Fig.7 Switching Time Waveform

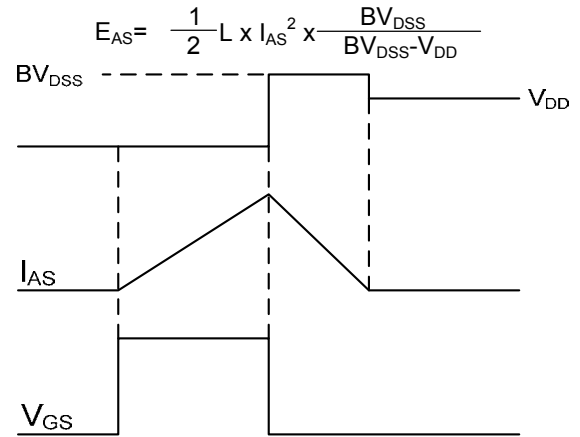
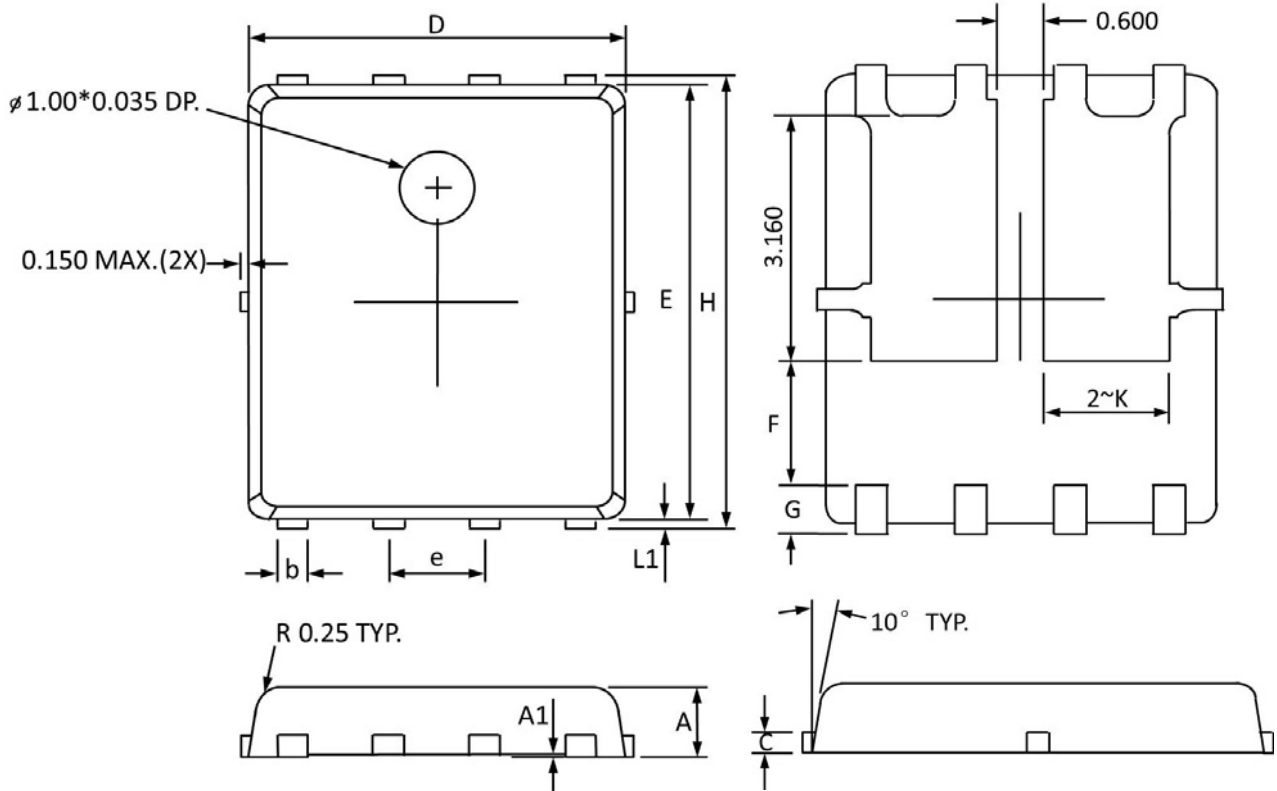


Fig.8  $E_{AS}$  Waveform

## Package Outline Dimensions

## PPAK5x6



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.800	1.000	0.032	0.039
A1	0.000	0.005	0.000	0.000
b	0.350	0.490	0.014	0.019
C	0.254 Ref		0.254 Ref	
D	4.900	5.100	0.193	0.200
E	5.700	5.900	0.225	0.232
e	1.27 BSC		1.27 BSC	
F	1.600 Ref		1.600 Ref	
G	0.600 Ref		0.600 Ref	
H	5.950	6.200	0.235	0.244
L1	0.100	0.180	0.004	0.007
K	1.600 Ref		1.600 Ref	