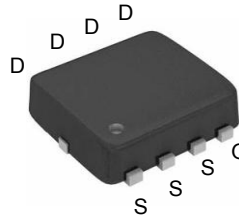
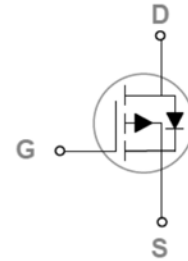


Main Product Characteristics

| | |
|--------------|------|
| BV_{DSS} | -60V |
| $R_{DS(ON)}$ | 72mΩ |
| I_D | -12A |



PPAK 3x3



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 SSFN6907 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 ($T_C=25^{\circ}C$ unless otherwise specified)

| Parameter | Symbol | Rating | Unit |
|---|-----------|-------------|------|
| Drain-Source Voltage | V_{DS} | -60 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Drain Current – Continuous ($T_C=25^{\circ}C$) | I_D | -12 | A |
| Drain Current – Continuous ($T_C=100^{\circ}C$) | | -7.6 | A |
| Drain Current – Pulsed ¹ | I_{DM} | -13.2 | A |
| Single Pulse Avalanche Energy ² | E_{AS} | 31 | mJ |
| Single Pulse Avalanche Current ² | I_{AS} | -25 | A |
| Power Dissipation ($T_C=25^{\circ}C$) | P_D | 33.8 | W |
| Power Dissipation – Derate above 25°C | | 0.27 | W/°C |
| Storage Temperature Range | T_{STG} | -50 to +150 | °C |
| Operating Junction Temperature Range | T_J | -50 to +150 | °C |

Thermal Characteristics

| Parameter | Symbol | Typ. | Max. | Unit |
|--|-----------------|------|------|------|
| Thermal Resistance Junction to Case | $R_{\theta JC}$ | --- | 62 | °C/W |
| Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | --- | 3.7 | °C/W |

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

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|------------------------------|---|------|-------|-----------|----------------------------|
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=-250\mu A$ | -60 | --- | --- | V |
| BV_{DSS} Temperature Coefficient | $\Delta BV_{DSS}/\Delta T_J$ | Referce to 25°C , $I_D=-1\text{mA}$ | --- | -0.05 | --- | $V/^\circ\text{C}$ |
| Drain-Source Leakage Current | I_{DSS} | $V_{DS}=-60V, V_{GS}=0V, T_J=25^\circ\text{C}$ | --- | --- | -1 | μA |
| | | $V_{DS}=-48V, V_{GS}=0V, T_J=125^\circ\text{C}$ | --- | --- | -10 | μA |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| On characteristics | | | | | | |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=-10V, I_D=-8A$ | --- | 54 | 68 | m Ω |
| | | $V_{GS}=-4.5V, I_D=-6A$ | --- | 72 | 85 | m Ω |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}=V_{DS}, I_D=-250\mu A$ | -1.2 | -1.6 | -2.2 | V |
| $V_{GS(th)}$ Temperature Coefficient | $\Delta V_{GS(th)}$ | | --- | 5 | --- | $\text{mV}/^\circ\text{C}$ |
| Forward Transconductance | g_{fs} | $V_{DS}=-10V, I_D=-3A$ | --- | 8.5 | --- | S |
| Dynamic and Switching Characteristics | | | | | | |
| Total Gate Charge ^{3,4} | Q_g | $V_{DS}=-30V, V_{GS}=-10V, I_D=-3A$ | --- | 16.4 | 23 | nC |
| Gate-Source Charge ^{3,4} | Q_{gs} | | --- | 2.8 | 4 | |
| Gate-Drain Charge ^{3,4} | Q_{gd} | | --- | 3.6 | 6 | |
| Turn-On Delay Time ^{3,4} | $T_{d(on)}$ | $V_{DD}=-30V, V_{GS}=-10V, R_G=6\Omega, I_D=-1A$ | --- | 8.3 | 16 | nS |
| Rise Time ^{3,4} | T_r | | --- | 29.6 | 56 | |
| Turn-Off Delay Time ^{3,4} | $T_{d(off)}$ | | --- | 51.7 | 98 | |
| Fall Time ^{3,4} | T_f | | --- | 15.6 | 30 | |
| Input Capacitance | C_{iss} | $V_{DS}=-30V, V_{GS}=0V, F=1\text{MHz}$ | --- | 870 | 1260 | pF |
| Output Capacitance | C_{oss} | | --- | 70 | 100 | |
| Reverse Transfer Capacitance | C_{rss} | | --- | 42 | 60 | |
| Gate Resistance | R_g | $V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$ | --- | 16 | 32 | Ω |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| Continuous Source Current | I_S | $V_G=V_D=0V, \text{Force Current}$ | --- | --- | -12 | A |
| Pulsed Source Current | I_{SM} | | --- | --- | -24 | A |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$ | --- | --- | -1 | V |

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=-25V, V_{GS}=-10V, L=0.1\text{mH}, I_{AS}=-25A, R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$.
3. The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

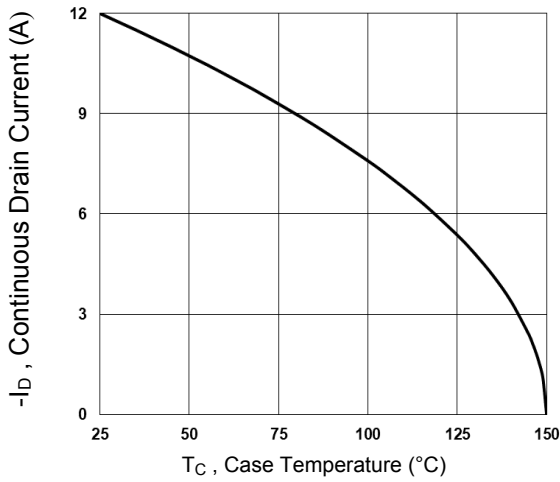


Fig.1 Continuous Drain Current vs. T_c

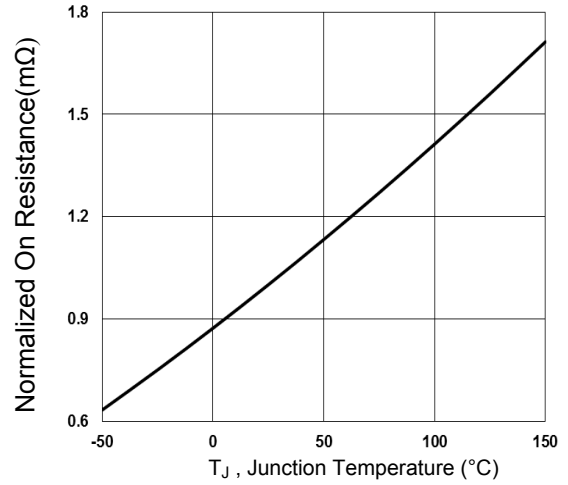


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

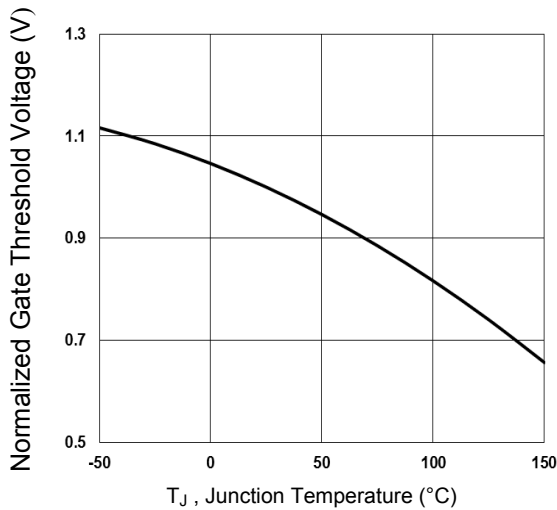


Fig.3 Normalized V_{th} vs. T_J

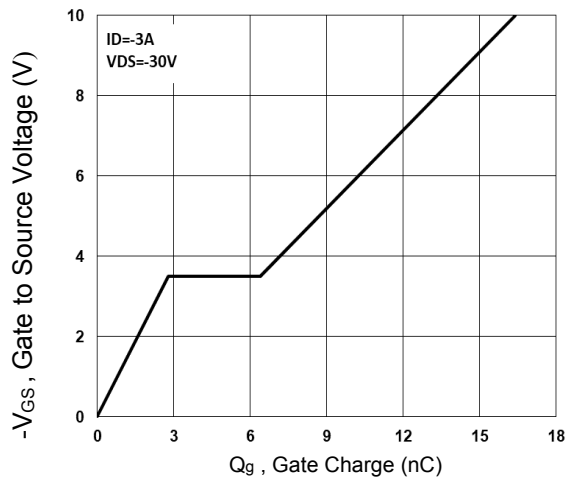


Fig.4 Gate Charge Waveform

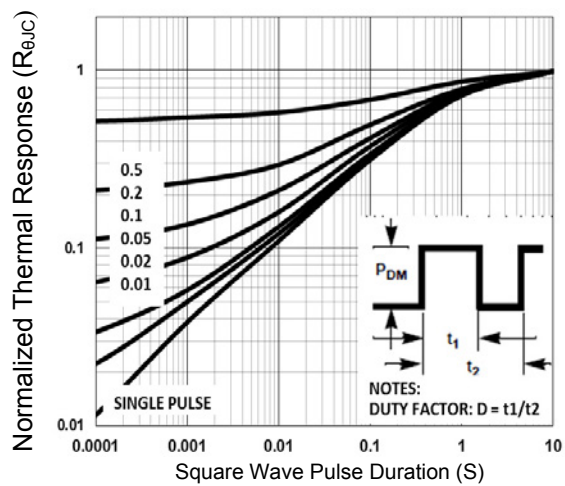


Fig.5 Normalized Transient Impedance

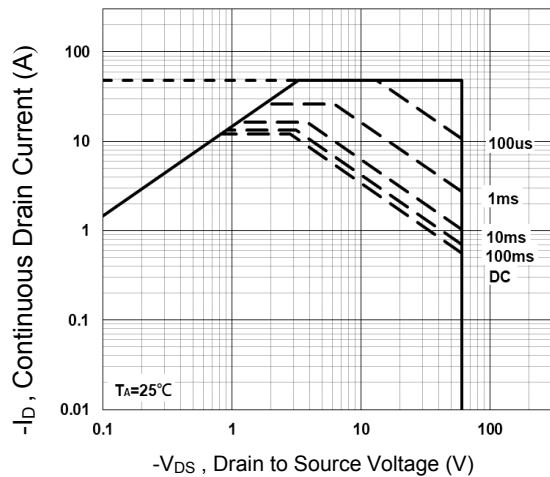


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

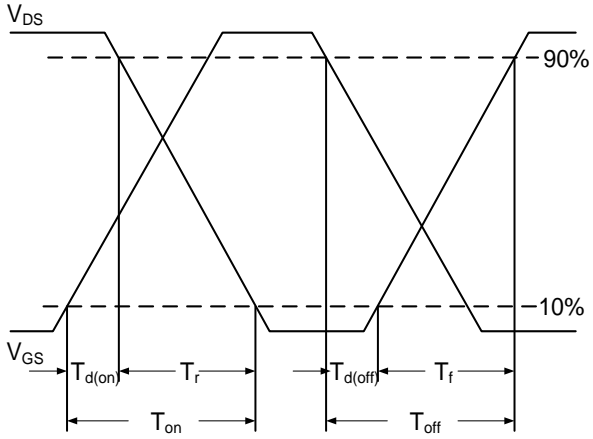


Fig.7 Switching Time Waveform

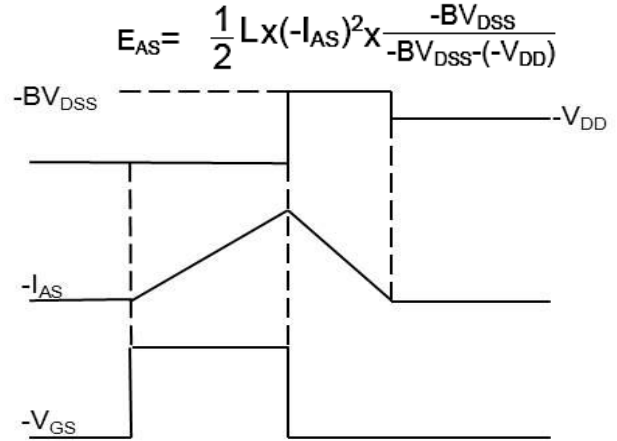
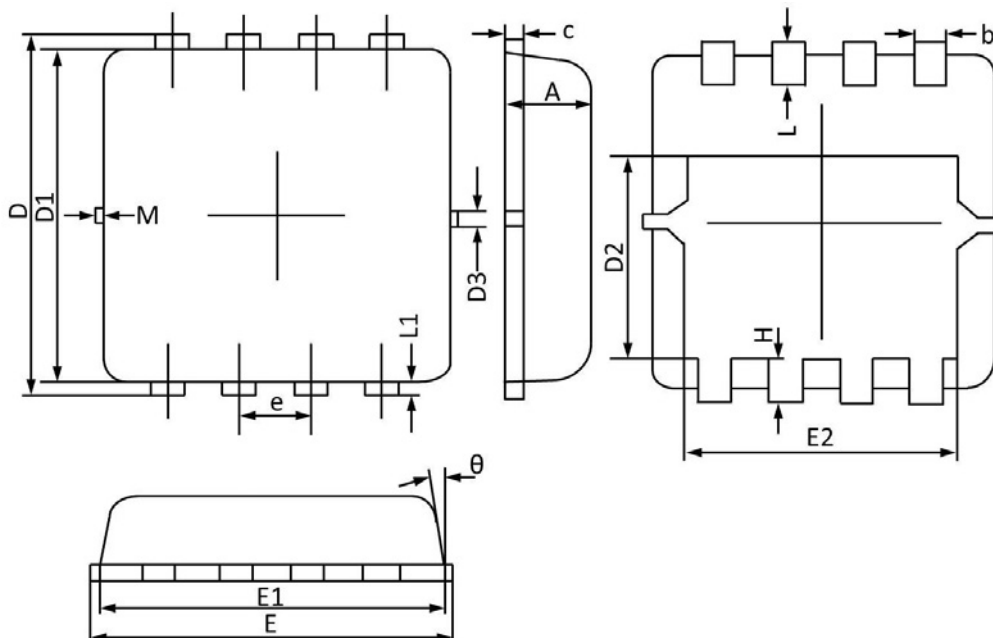


Fig.8 E_{AS} Waveform

Package Outline Dimensions

PPAK3x3



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | | Max | Min | Max |
| A | 0.700 | 0.800 | 0.028 | 0.031 |
| b | 0.250 | 0.350 | 0.010 | 0.013 |
| c | 0.100 | 0.250 | 0.004 | 0.009 |
| D | 3.250 | 3.450 | 0.128 | 0.135 |
| D1 | 3.000 | 3.200 | 0.119 | 0.125 |
| | 1.780 | 1.980 | 0.070 | 0.077 |
| D3 | 0.130 REF | | 0.005 REF | |
| E | 3.200 | 3.400 | 0.126 | 0.133 |
| E1 | 3.000 | 3.200 | 0.119 | 0.125 |
| E2 | 2.390 | 2.590 | 0.094 | 0.102 |
| e | 0.650 BSC | | 0.026 BSC | |
| H | 0.300 | 0.500 | 0.011 | 0.019 |
| L | 0.300 | 0.500 | 0.011 | 0.019 |
| L1 | 0.130 REF | | 0.005 REF | |
| θ | 0° | 12° | 0° | 12° |
| M | 0.150 REF | | 0.006 REF | |