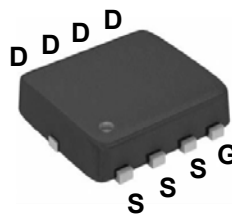
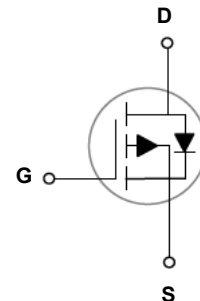


Main Product Characteristics

| | |
|---------------|------|
| $V_{(BR)DSS}$ | -30V |
| $R_{DS(ON)}$ | 17mΩ |
| I_D | -30A |



PPAK3X3



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 SSFN9907 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} | -30 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Drain Current – Continuous ($T_C=25^{\circ}C$) | I_D | -30 | A |
| Drain Current – Continuous ($T_C=100^{\circ}C$) | | -19 | A |
| Drain Current – Pulsed ¹ | I_{DM} | -120 | A |
| Power Dissipation ($T_C=25^{\circ}C$) | P_D | 27 | W |
| Power Dissipation – Derate above 25°C | | 0.22 | W/°C |
| Storage Temperature Range | T_{STG} | -55 to +150 | °C |
| Operating Junction Temperature Range | T_J | -55 to +150 | °C |

Thermal Characteristics

| Parameter | Symbol | Typ. | Max. | Unit |
|----------------------------------------|-----------------|------|------|------|
| Thermal Resistance Junction to Ambient | $R_{\theta JA}$ | --- | 62 | °C/W |
| Thermal Resistance Junction to Case | $R_{\theta JC}$ | --- | 4.6 | °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} | $V_{GS}=0V, I_D=-250\mu A$ | -30 | --- | --- | V |
| BV_{DSS} Temperature Coefficient | $\Delta BV_{DSS}/\Delta T_J$ | Reference to 25°C , $I_D=-1\text{mA}$ | --- | -0.03 | --- | $V/^\circ\text{C}$ |
| Drain-Source Leakage Current | I_{DSS} | $V_{DS}=-30V, V_{GS}=0V, T_J=25^\circ\text{C}$ | --- | --- | -1 | μA |
| | | $V_{DS}=-24V, V_{GS}=0V, T_J=125^\circ\text{C}$ | --- | --- | -10 | μA |
| Gate-Source Leakage Current | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| On Characteristics | | | | | | |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=-10V, I_D=-8A$ | --- | 13.5 | 17 | $\text{m}\Omega$ |
| | | $V_{GS}=-4.5V, I_D=-6A$ | --- | 23 | 28 | $\text{m}\Omega$ |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}=V_{DS}, I_D=-250\mu A$ | -1.2 | -1.6 | -2.5 | V |
| $V_{GS(th)}$ Temperature Coefficient | $\Delta V_{GS(th)}$ | | --- | 4 | --- | $\text{mV}/^\circ\text{C}$ |
| Forward Transconductance | g_{fs} | $V_{DS}=-10V, I_D=-8A$ | --- | 6.8 | --- | S |
| Dynamic and Switching Characteristics | | | | | | |
| Total Gate Charge ^{2, 3} | Q_g | $V_{DS}=-15V, V_{GS}=-4.5V, I_D=-5A$ | --- | 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} | $T_{d(on)}$ | $V_{DD}=-15V, V_{GS}=-10V, R_G=6\Omega, \dot{A}$ $I_D=-1A$ | --- | 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_{iss} | $V_{DS}=-15V, V_{GS}=0V, F=1\text{MHz}$ | --- | 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_F | $V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$ | --- | --- | -1 | V |

Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

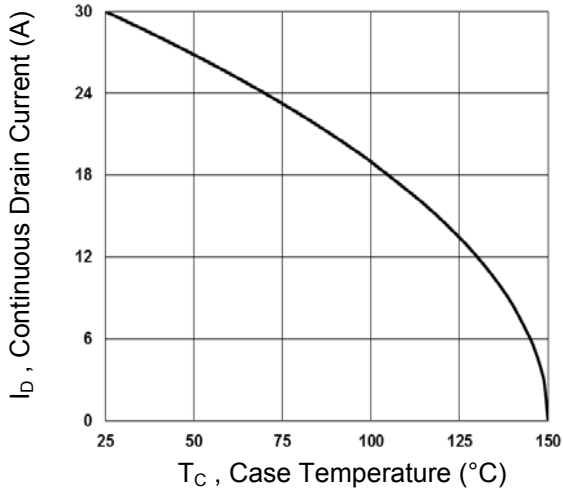


Fig.1 Continuous Drain Current vs. T_C

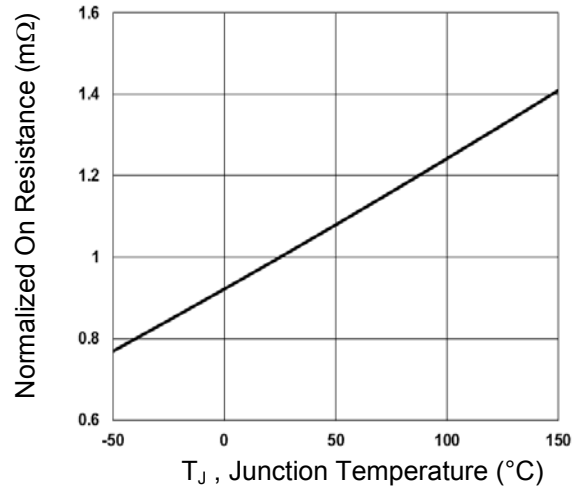


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

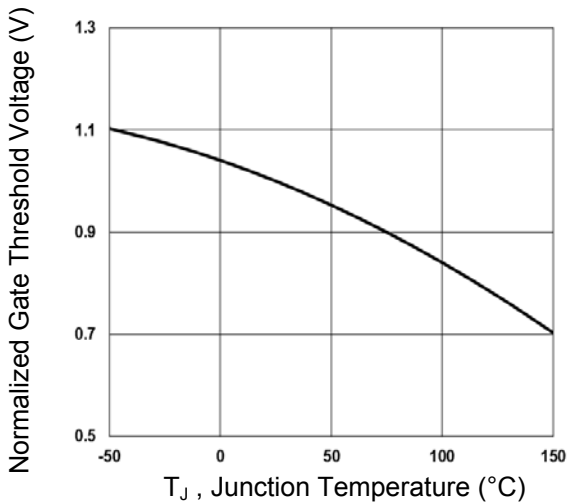


Fig.3 Normalized V_{th} vs. T_J

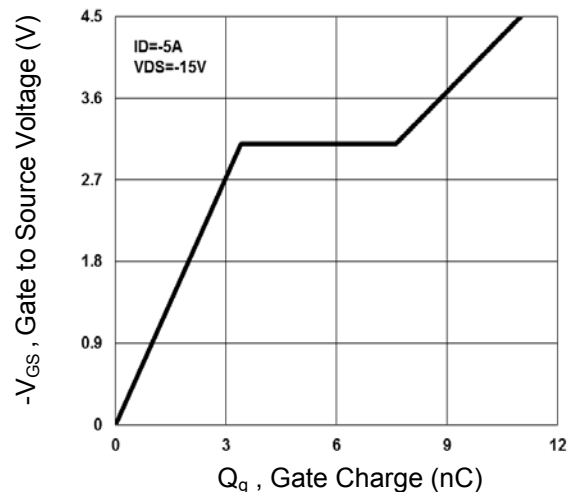


Fig.4 Gate Charge Waveform

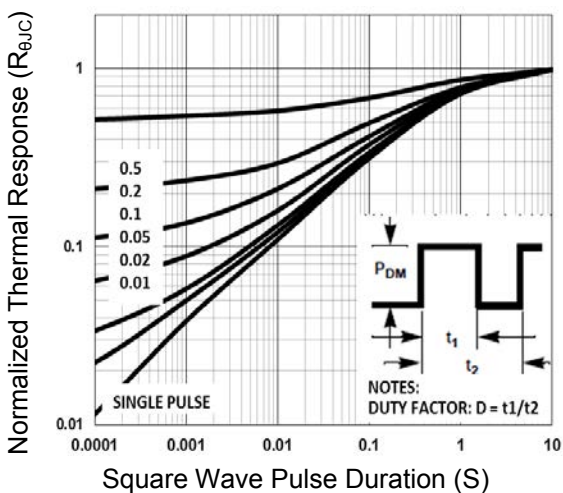


Fig.5 Normalized Transient Impedance

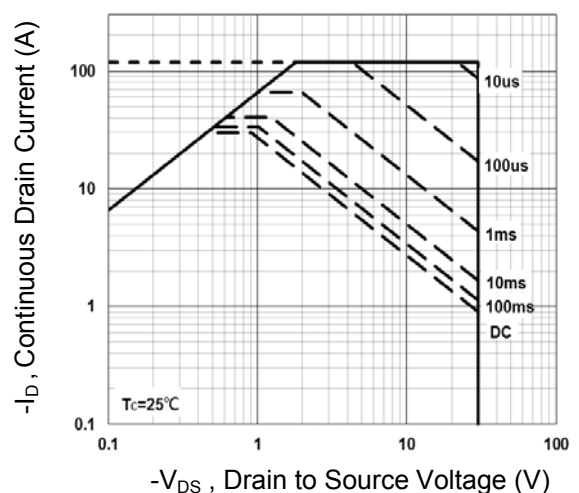


Fig.6 Maximum Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

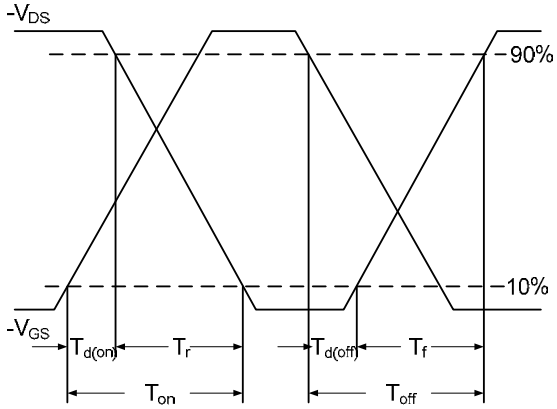


Fig.7 Switching Time Waveform

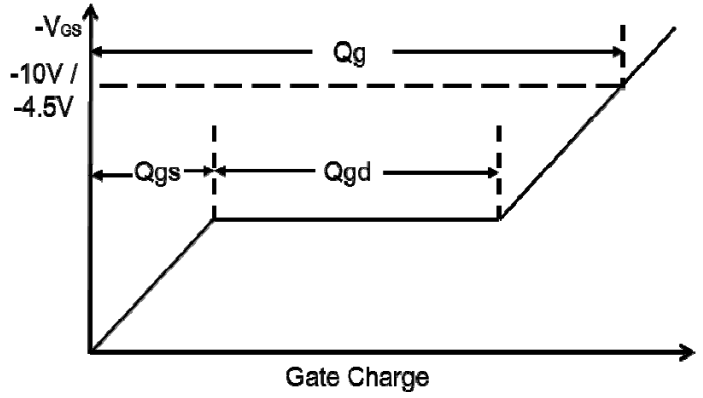
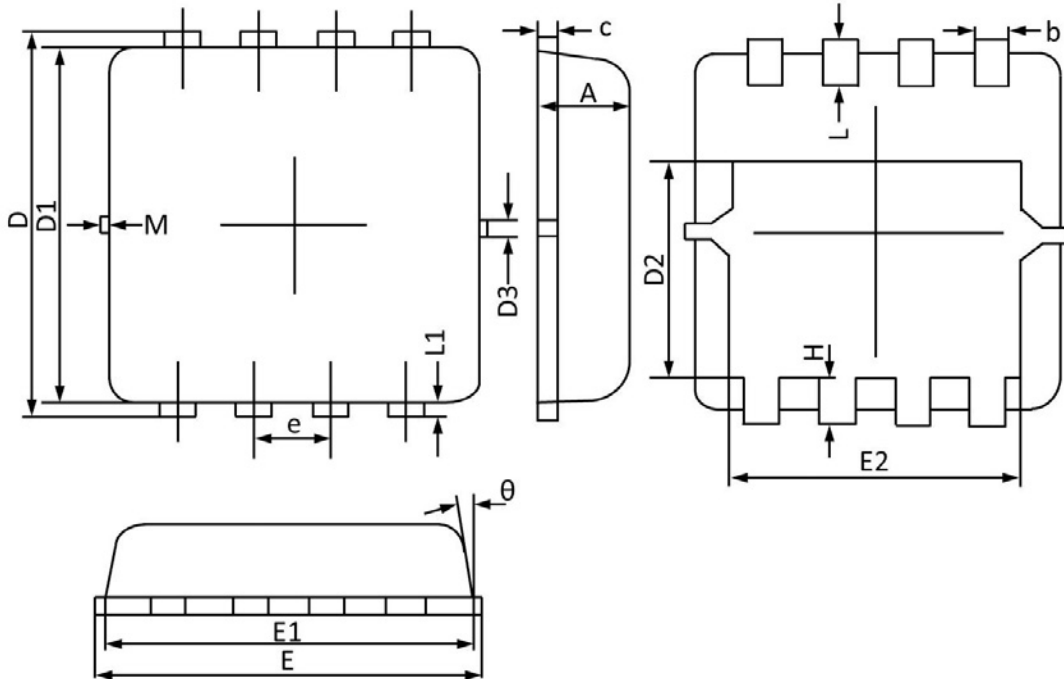


Fig.8 Gate Charge Waveform

Package Outline Dimensions

PPAK3X3



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 0.7 | 0.8 | 0.028 | 0.031 |
| b | 0.25 | 0.35 | 0.01 | 0.013 |
| c | 0.1 | 0.25 | 0.004 | 0.009 |
| D | 3.25 | 3.45 | 0.128 | 0.135 |
| D1 | 3 | 3.2 | 0.119 | 0.125 |
| D2 | 1.78 | 1.98 | 0.07 | 0.077 |
| D3 | 0.130 REF | | 0.005 REF | |
| E | 3.2 | 3.4 | 0.126 | 0.133 |
| E1 | 3 | 3.2 | 0.119 | 0.125 |
| E2 | 2.39 | 2.59 | 0.094 | 0.102 |
| e | 0.650 BSC | | 0.026 BSC | |
| H | 0.3 | 0.5 | 0.011 | 0.019 |
| L | 0.3 | 0.5 | 0.011 | 0.019 |
| L1 | 0.130 REF | | 0.005 REF | |
| theta | 0° | 12° | 0° | 12° |
| M | 0.150 REF | | 0.006 REF | |