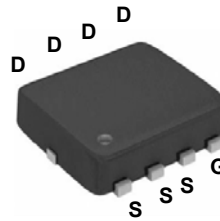
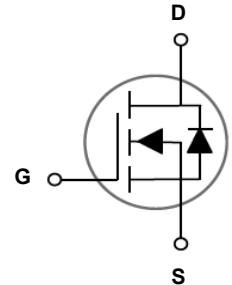


**Main Product Characteristics**

|               |       |
|---------------|-------|
| $V_{(BR)DSS}$ | 30V   |
| $R_{DS(ON)}$  | 3.8mΩ |
| $I_D$         | 80A   |



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 GSFN3904 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)

| DUFLa YHf                                  | Gna Vc` | FU]b[         | I b]h |
|--|---------|---------------|-------|
| Ö!æ] ÆÜ[ ~ !&ÁX[  æè^                      | Xóú     | H€            | X     |
| Öæ^ÆÜ[ ~ !&ÁX[  æè^                        | Xóú     | † G€          | X     |
| Ö!æ] ÁÖ` !!^} óÁ ÁÖ[ ] ç` [ ~ •ÁÇ/óMGí »ÖD | Q       | ì €           | CE    |
| Ö!æ] ÁÖ` !!^} óÁ ÁÖ[ ] ç` [ ~ •ÁÇ/óMF€€»ÖD | Q       | í F           | CE    |
| Ö!æ] ÁÖ` !!^} óÁ ÁÜ`  •^âF                 | Q†      | HG€           | CE    |
| Ùä * ÁÜ`  •^ÁÇççç &@ÁÖ) !^*^G              | Öœú     | FGí           | { R   |
| Ùä * ÁÜ`  •^ÁÇççç &@ÁÖ` !!^} €             | Qœú     | í €           | CE    |
| Ú[ , ^!ÁÖã •ä ççç } ÁÇ/óMGí »ÖD            | Úó      | î î           | Y     |
| Ú[ , ^!ÁÖã •ä ççç } Á Ö^!æ^Áæ[ ç^ÁGí »Ö    | Úó      | €€ H          | Y ĐÖ  |
| Úç  æ^ÁV^ [ ] ^!æè  ^ÁÜç *^                | Vúvó    | Ë í Áç ÁÉFí í | »Ö    |
| U] ^!æç *ÁR` } &ç } ÁV^ [ ] ^!æè  ^ÁÜç *^  | Vr      | Ë í Áç ÁÉFí í | »Ö    |

**Thermal Characteristics**

| DUFLa YHf   | Gna Vc` | Hnd" | AU " | I b]h |
|---|---------|------|------|-------|
| $V_{@}\{ \text{æÁÜ}^{\cdot} \text{ã çç} \& \text{ÁR} \} \& \text{ç} \} \text{Áç} \text{ÁÇ} \text{àã} \} \text{c}$ | Ü rœ    | €€   | î G  | »ÖËY  |
| $V_{@}\{ \text{æÁÜ}^{\cdot} \text{ã çç} \& \text{ÁR} \} \& \text{ç} \} \text{Áç} \text{ÁÖæ}^{\wedge}$             | Ü rÖ    | €€   | G    | »ÖËY  |

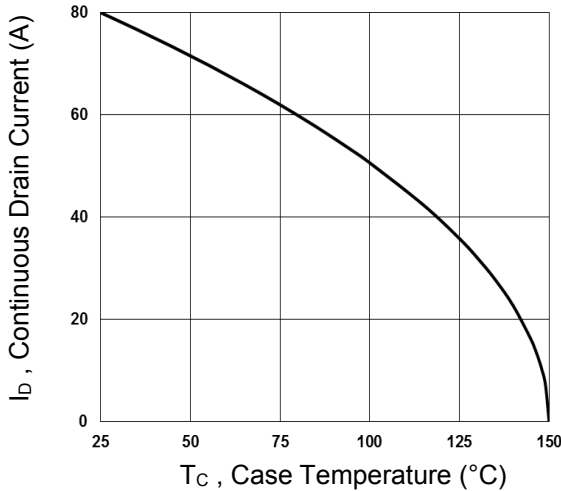
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$  unless otherwise specified)

| DUfUa YHf                                | Gna Vc`   | 7 cbX]hcbg                             | A]b" | Hnd" | AU " | I b]h |
|--|-----------|--|------|------|------|-------|
| <b>GHUHWGHUH`7\ UFUWHf]ghVg</b>          |           |  |      |      |      |       |
| Öiæß EÜ[ ~ !&ÁÓ!^æ á[ , }ÁX[  æ^         | ÓXóúú     | XóúMEXÉQMG € CE                        | H€   | EE   | EE   | X     |
| ÓXóúúAV^ { ] ^!æ !^ÁÓ[ ^-æ} c            | ΔÓXóúúAVR | Ü^!^} &Áq Áq »ÖÉQMF{ CE                | EE   | EH   | EE   | XBÓ   |
| Öiæß EÜ[ ~ !&ÁŠ^æ æ^ÁÓ~ !!^} c           | Qúú       | XóúMEXÉQMG XóúMEXÉVRMG »Ö              | EE   | EE   | F    | ~ CE  |
|  |           | XóúMG XÉXóúMEXÉVRMG »Ö                 | EE   | EE   | F€   | ~ CE  |
| Öæß EÜ[ ~ !&ÁŠ^æ æ^ÁÓ~ !!^} c            | Qúú       | XóúMEXÉQMG XóúMEX                      | EE   | EE   | f F€ | } CE  |
| ÜæßÁÓ:æß EÜ[ ~ !&ÁÚ} EÜ^•ã çæ &^H        | ÜóúçD     | XóúMEXÉQMG CE                          | EE   | G    | H€   | {     |
|  |           | XóúM É XÉQMGCE                         | EE   | I H  | í E  | {     |
| ÖæßÁV^• @  áÁX[  æ^                      | Xóúçæ     | XóúMEXÉQMG € CE                        | F€   | F€   | G€   | X     |
| XóúçæAV^ { ] ^!æ !^ÁÓ[ ^-æ} c            | ΔXóúçæ    | XóúMEXÉQMG € CE                        | EE   | E    | EE   | { XBÓ |
| Q[ , æáÁV!æ • & [ ] á~ &çæ &             | *•        | XóúMEXÉQMG€CE                          | EE   | G    | EE   | Ü     |
| <b>8 mbUa ]W7\ UFUWHf]ghVg</b>           |           |  |      |      |      |       |
| V[ çæÁÓæÁÓ@æ*^H€                         | Ü•        | XóúMFÍ XÉXóúM É XÉQMG CE               | EE   | G    | H    | } Ó   |
| Öæß EÜ[ ~ !&ÁÓ@æ*^H€                     | Ü••       |  | EE   | I €  | í    |       |
| Öæß EÜ:æß ÁÓ@æ*^H€                       | Ü•á       |  | EE   | FH   | Fí   |       |
| V^!} EÜ} ÁÓ æß ÁVá ^H€                   | VaçD      | XóúMFÍ XÉXóúMEXÉVRMG XóúMÉH ÉÁ QMFÍ CE | EE   | F€   | G    | } Ü   |
| Üá^ÁVá ^H€                               | Ví        |  | EE   | FJ€  | Hí   |       |
| V^!} EÜ-ÁÓ æß ÁVá ^H€                    | Vaç-D     |  | EE   | I €  | ì F  |       |
| QæßÁVá ^H€                               | V-        |  | EE   | FH€  | G    |       |
| Q[ ~ óÓçæ ææææ &                         | Ö••       | XóúMG XÉXóúMEXÉQMF P:                  | EE   | G€   | HJ€  | } Ø   |
| U^q ~ óÓçæ ææææ &                        | Ö!••      |  | EE   | G €  | I €í |       |
| Ü^ç^!•^ÁV!æ •-!ÁÓçæ ææææ &               | Ö!••      |  | EE   | Fí   | G í  |       |
| Öæß ÁV^•ã çæ &                           | Ü•        | XóúMEXÉXóúMEXÉQMF P:                   | EE   | G    | I    |       |
| <b>; i UFUbHYX`5 j U UbW Y9bYf[ m</b>    |           |  |      |      |      |       |
| Üá *  ^ÁÚ^  •^ÁÓçææ &@ÁÓ) ^!••           | Öúú       | XóúMG XÉŠMÉF{ PÉQMG CE                 | H€   | EE   | EE   | { R   |
| <b>8 fU]b!Gci fW`8]cXY7\ UFUWHf]ghVg</b> |           |  |      |      |      |       |
| Ó[ ] çæ [ ~ •ÁÚ[ ~ !&ÁÓ~ !!^} c          | Q         | XóúMEXÉQMG !&ÁÓ~ !!^} c                | EE   | EE   | í €  | CE    |
| Ü^!•^ÁÁÚ[ ~ !&ÁÓ~ !!^} c^H               | QT        |  | EE   | EE   | H€   | CE    |
| Öá á^ÁQ[ , æáÁX[  æ^H                    | Xúó       | XóúMEXÉQMGÉVRMG »Ö                     | EE   | EE   | F    | X     |

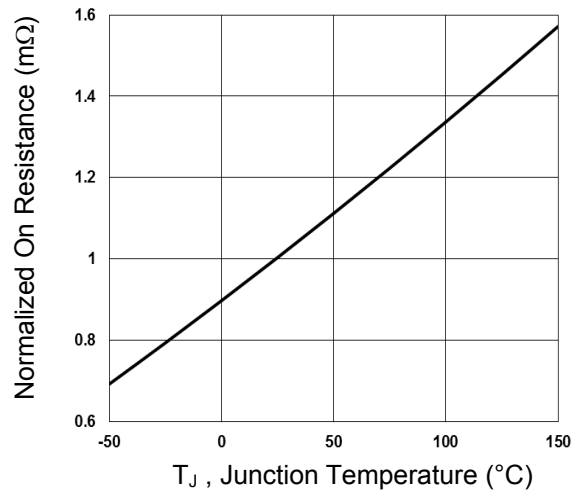
Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=25V$ ,  $V_{GS}=10V$ ,  $L=0.1mH$ ,  $I_{AS}=50A$ ,  $R_G=25\Omega$ , 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.

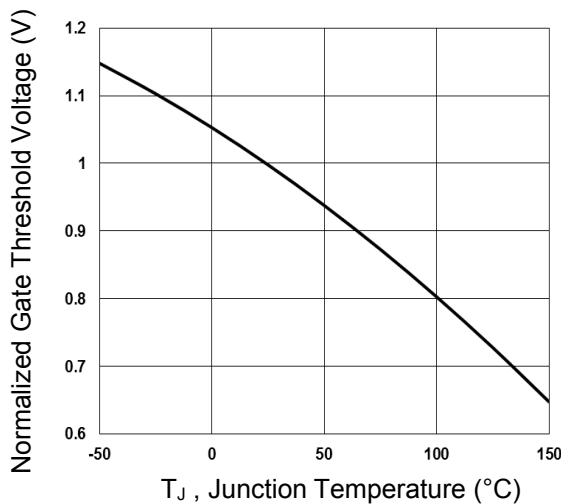
**Typical Electrical and Thermal Characteristic Curves**



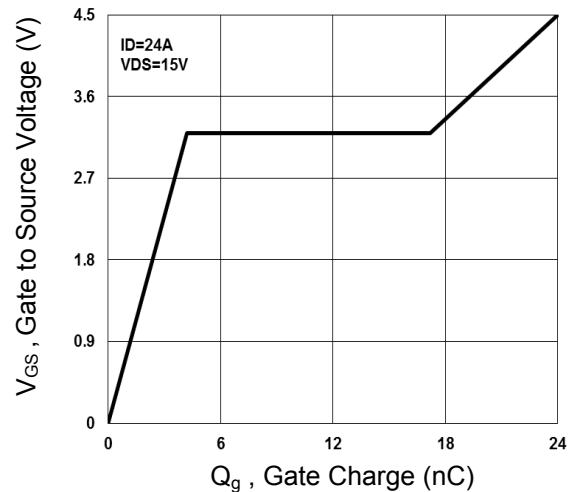
**Fig.1 Continuous Drain Current vs.  $T_c$**



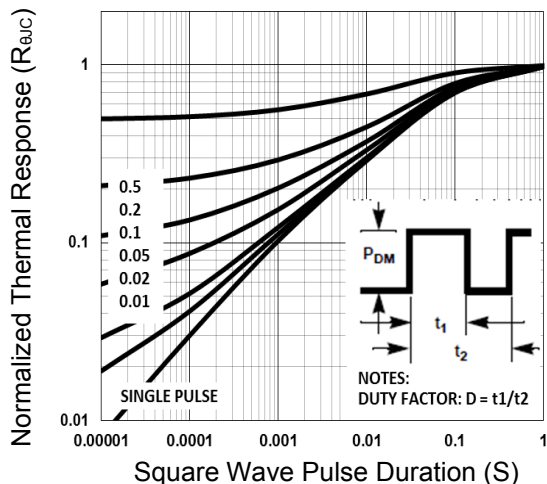
**Fig.2 Normalized  $R_{DS(ON)}$  vs.  $T_j$**



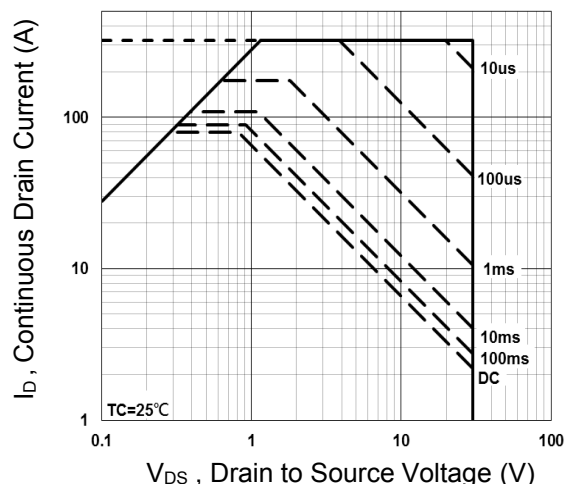
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



**Fig.4 Gate Charge Waveform**

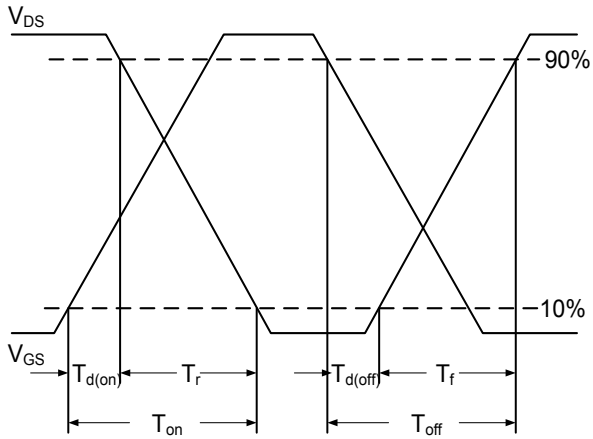


**Fig.5 Normalized Transient Impedance**

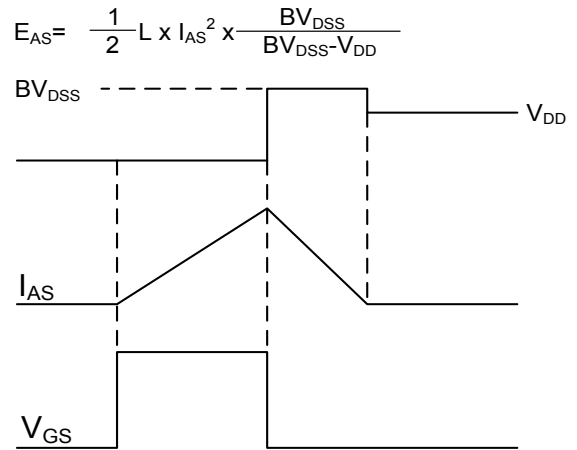


**Fig.6 Maximum Safe Operation Area**

**Typical Electrical and Thermal Characteristic Curves**



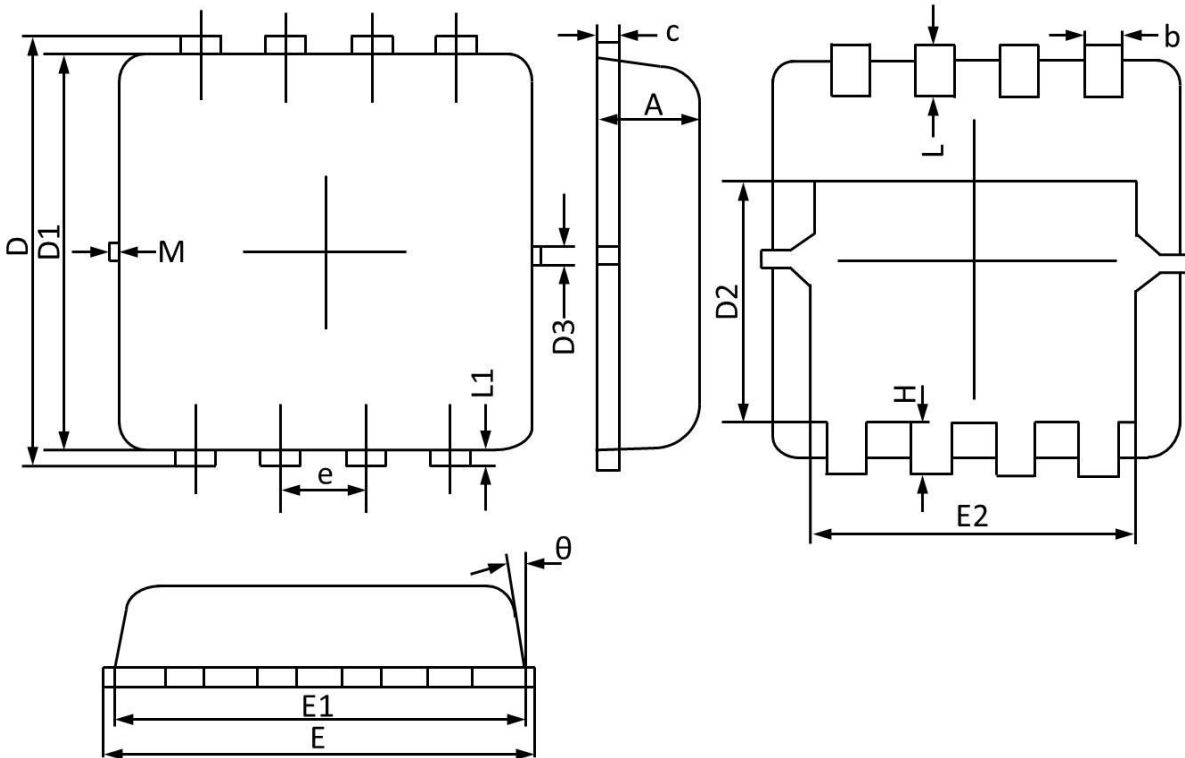
**Fig.7 Switching Time Waveform**



**Fig.8  $E_{AS}$  Waveform**

**Package Outline Dimensions**

**PPAK3X3**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | 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 |
| D2     | 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            |       |
| theta  | 0°                        | 12°   | 0°                   | 12°   |
| M      | 0.150 REF                 |       | 0.006 REF            |       |