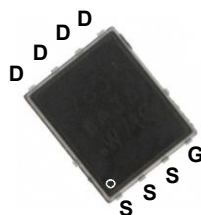
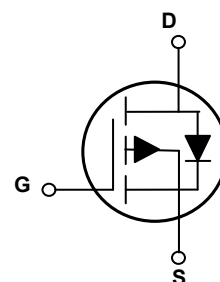


Main Product Characteristics

| | |
|--------------|------|
| BV_{DSS} | -30V |
| $R_{DS(ON)}$ | 10mΩ |
| I_D | -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 GSFP0371 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 | Max. | 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 | -70 | A |
| Drain Current-Continuous ($T_C=100^{\circ}C$) | | -45 | A |
| Drain Current-Pulsed ¹ | I_{DM} | -280 | A |
| Single Pulse Avalanche Energy ² | E_{AS} | 125 | mJ |
| Single Pulse Avalanche Current ² | I_{AS} | 50 | A |
| Power Dissipation ($T_C=25^{\circ}C$) | P_D | 82 | W |
| Power Dissipation-De-rate Above 25°C | | 0.65 | W/°C |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 62 | °C/W |
| Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 1.53 | °C/W |
| Storage Temperature Range | T_{STG} | -55 To +150 | °C |
| Operating Junction Temperature Range | T_J | -55 To +150 | °C |

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 |
| 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 | $R_{DS(ON)}$ | $V_{GS}=-10V, I_D=-15A$ | - | 8.5 | 10 | m Ω |
| | | $V_{GS}=-4.5V, I_D=-10A$ | - | 13.5 | 17.7 | m Ω |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}=V_{GS}, I_D=-250\mu A$ | -1.2 | -1.6 | -2.5 | V |
| Forward Transconductance | g_{fs} | $V_{DS}=-10V, I_D=-3A$ | - | 10 | - | S |
| Dynamic and Switching Characteristics | | | | | | |
| Total Gate Charge ^{3,4} | Q_g | $V_{DS}=-15V, I_D=-35A, V_{GS}=-10V$ | - | 34 | 50 | nC |
| Gate-Source Charge ^{3,4} | Q_{gs} | | - | 5.2 | 7.8 | |
| Gate-Drain Charge ^{3,4} | Q_{gd} | | - | 7.9 | 12 | |
| Turn-On Delay Time ^{3,4} | $t_{d(on)}$ | $V_{DD}=-15V, R_G=6\Omega, V_{GS}=-10V, I_D=-35A$ | - | 20 | 30 | nS |
| Rise Time ^{3,4} | t_r | | - | 15 | 22 | |
| Turn-Off Delay Time ^{3,4} | $t_{d(off)}$ | | - | 40 | 60 | |
| Fall Time ^{3,4} | t_f | | - | 30 | 45 | |
| Input Capacitance | C_{iss} | $V_{DS}=-15V, V_{GS}=0V, F=1\text{MHz}$ | - | 2020 | 3000 | pF |
| Output Capacitance | C_{oss} | | - | 305 | 460 | |
| Reverse Transfer Capacitance | C_{rss} | | - | 245 | 370 | |
| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
| Continuous Source Current | I_S | $V_G=V_D=0V,$ | - | - | -70 | A |
| Pulsed Source Current | I_{SM} | Force Current | - | - | -140 | A |
| Diode Forward Voltage | V_{SD} | $V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$ | - | - | -1 | V |
| Reverse Recovery Time | T_{rr} | $V_R=-30V, I_R=-10A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$ | - | 80 | - | nS |
| Reverse Recovery Charge | Q_{rr} | | - | 170 | - | nC |

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=25V, V_{GS}=10V, L=0.1\text{mH}, I_{AS}=50A, R_G=25\Omega,$ starting $T_J=25^\circ\text{C}$.
3. Pulse test: pulse width $\leq 300\mu s,$ duty cycle $\leq 2\%$.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

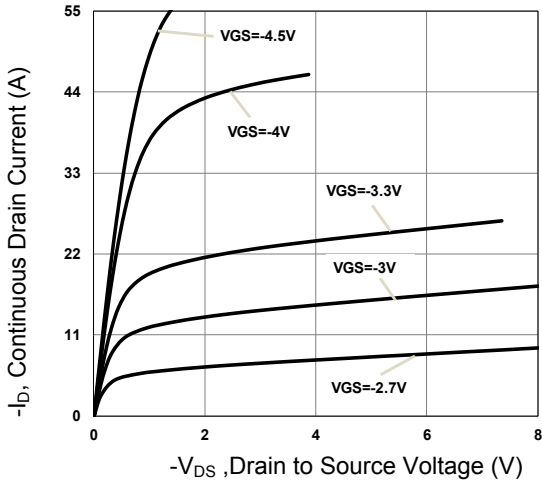


Fig.1 Typical Output Characteristics

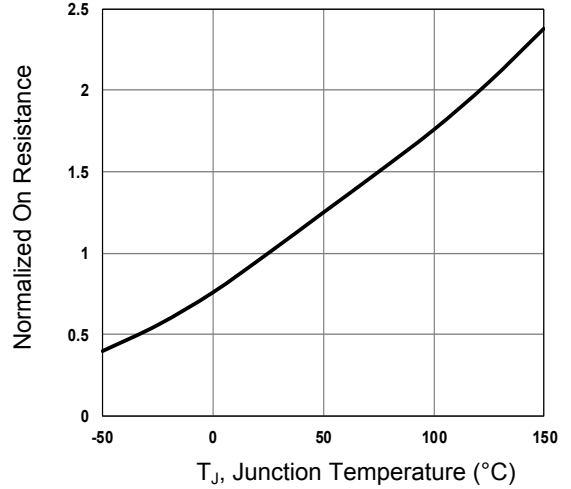


Fig.2 Normalized $R_{DS(ON)}$ vs. T_J

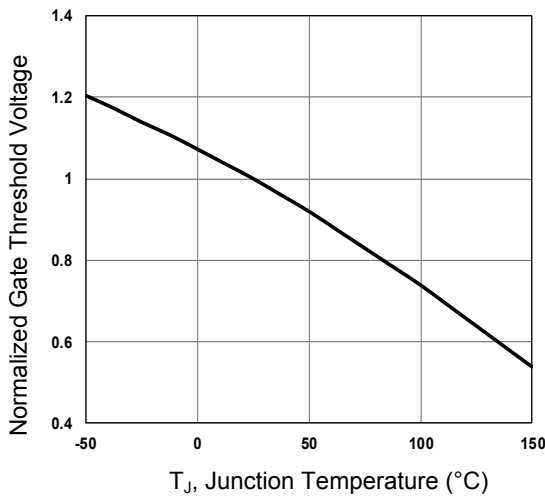


Fig.3 Normalized V_{th} vs. T_J

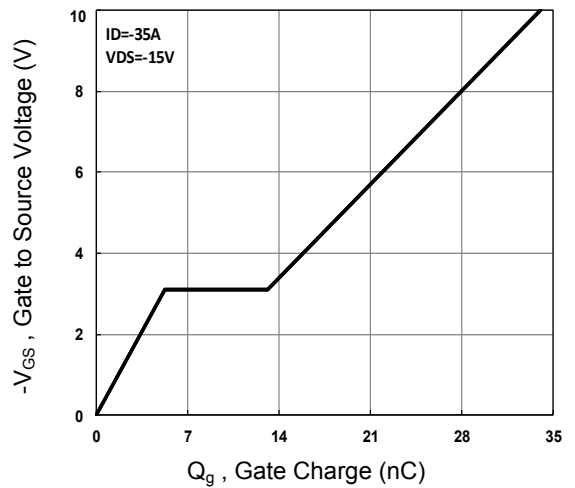


Fig.4 Gate Charge Waveform

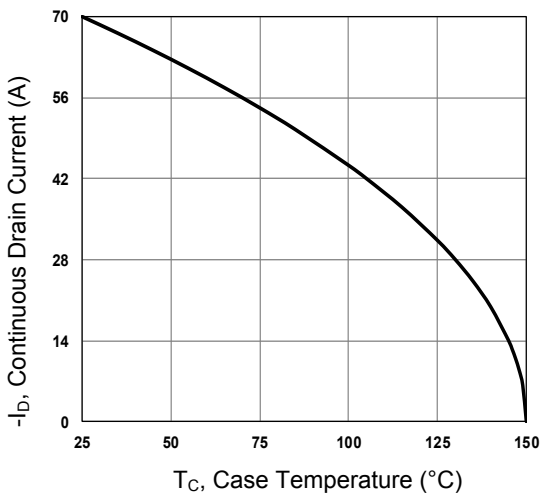


Fig.5 Continuous Drain Current vs. T_C

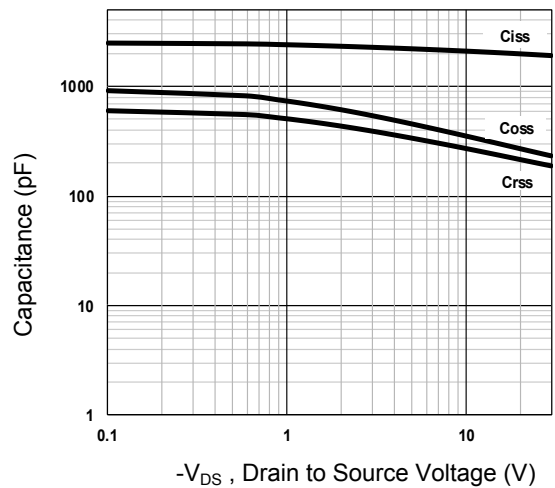


Fig.6 Capacitance Characteristics

Typical Electrical and Thermal Characteristic Curves

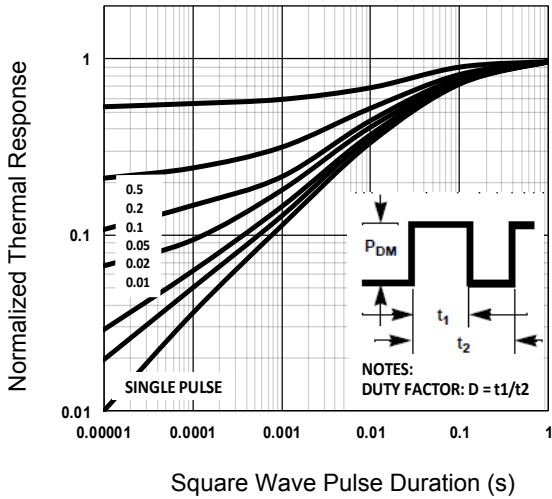


Fig.7 Normalized Transient Impedance

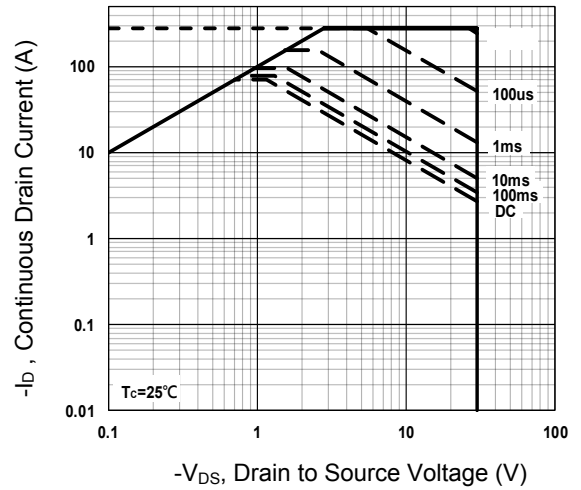


Fig.8 Maximum Safe Operation Area

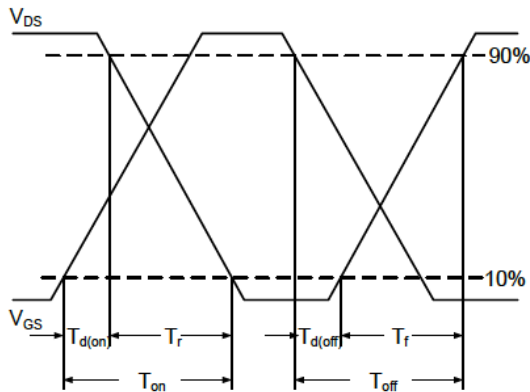


Fig.9 Switching Time Waveform

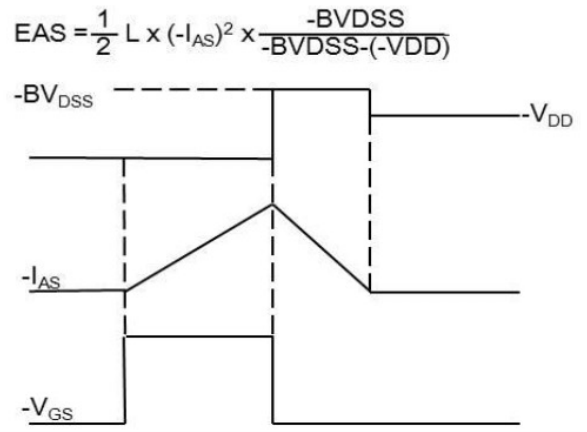
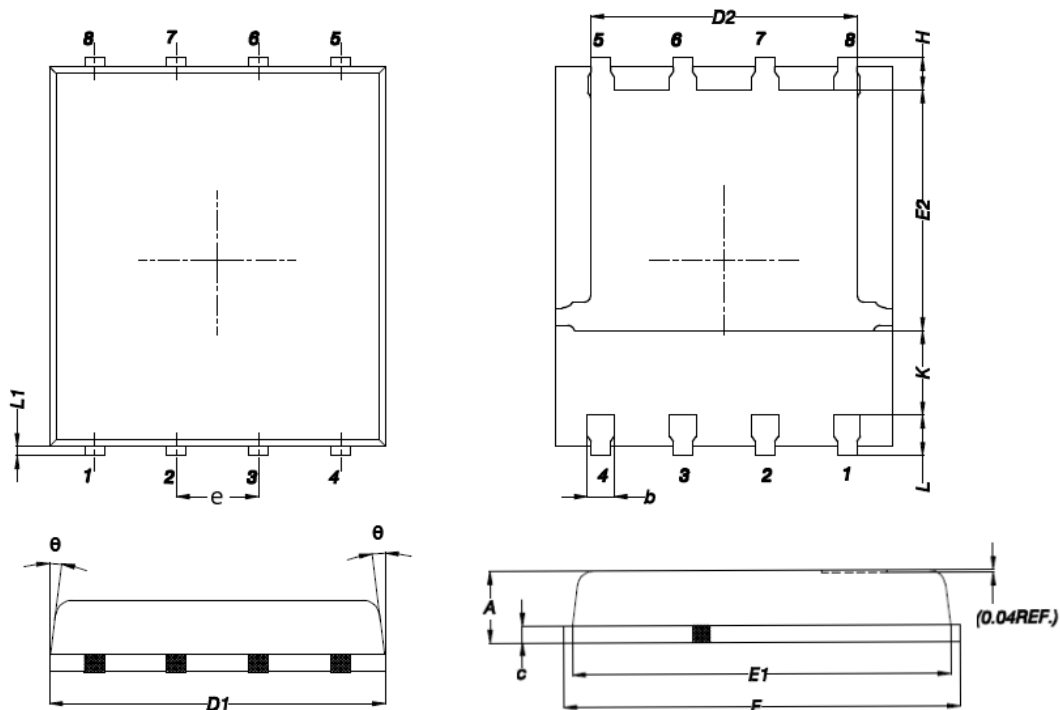


Fig.10 EAS Waveform

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 |
| θ | 12° | 0° | 12° | 0° |