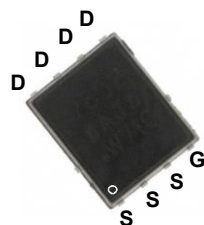
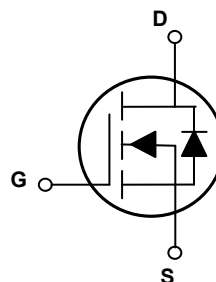


**Main Product Characteristics**

|               |            |
|---------------|------------|
| $V_{(BR)DSS}$ | 100V       |
| $R_{DS(ON)}$  | 19mΩ(max.) |
| $I_D$         | 45A        |



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 GSFP19010 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 supplies 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  | $V_{DS}$        | 100         | V    |
| Gate-Source Voltage   | $V_{GS}$        | ±20         | V    |
| Drain Current-Continuous, at Steady-State, ( $T_C=25^{\circ}C$ ) <sup>1</sup> | $I_D$           | 45          | A    |
| Drain Current-Continuous, at Steady-State, ( $T_C=100^{\circ}C$ )             |                 | 32          |      |
| Drain Current-Pulsed <sup>2</sup>   | $I_{DM}$        | 180         | A    |
| Single Pulse Avalanche Energy <sup>3</sup>                                    | $E_{AS}$        | 81          | mJ   |
| Power Dissipation ( $T_C=25^{\circ}C$ )                                       | $P_D$           | 60          | W    |
| Linear Derating Factor ( $T_C=25^{\circ}C$ )                                  |                 | 0.48        |      |
| Junction-to-Ambient (PCB Mounted, Steady-State) <sup>4</sup>                  | $R_{\theta JA}$ | 62          | °C/W |
| Thermal Resistance, Junction-to-Case  | $R_{\theta JC}$ | 2.1         | °C/W |
| Operating Junction Temperature Range  | $T_J$           | -55 To +150 | °C   |
| Storage Temperature Range   | $T_{STG}$       | -55 To +150 | °C   |

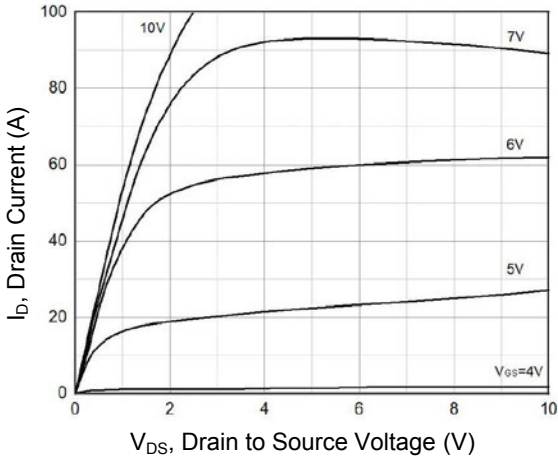
**Electrical Characteristics** ( $T_C=25^\circ\text{C}$  unless otherwise specified)

| Parameter   | Symbol        | Conditions   | Min. | Typ. | Max.      | Unit       |
|---|---------------|--|------|------|-----------|------------|
| <b>On / Off Characteristics</b>                               |               |  |      |      |           |            |
| Drain-Source Breakdown Voltage                                | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=250\mu A$                                      | 100  | -    | -         | V          |
| Drain-Source Leakage Current                                  | $I_{DSS}$     | $V_{DS}=100V, V_{GS}=0V$                                       | -    | -    | 1         | $\mu A$    |
|   |               | $T_J=125^\circ\text{C}$  | -    | -    | 20        |            |
| Gate-Source Forward Leakage                                   | $I_{GSS}$     | $V_{GS}=\pm 20V$   | -    | -    | $\pm 100$ | nA         |
| Static Drain-Source On-Resistance                             | $R_{DS(ON)}$  | $V_{GS}=10V, I_D=33A$  | -    | 15   | 19        | m $\Omega$ |
|   |               | $V_{GS}=6V, I_D=16A$   | -    | 19   | 34        |            |
| Gate Threshold Voltage  | $V_{GS(th)}$  | $V_{GS}=V_{DS}, I_D=250\mu A$                                  | 2.1  | 3.0  | 3.8       | V          |
| <b>Dynamic and Switching Characteristics</b>                  |               |  |      |      |           |            |
| Total Gate Charge   | $Q_g$         | $V_{DS}=50V, I_D=33A$<br>$V_{GS}=10V$                          | -    | 23   | -         | nC         |
| Gate-Source Charge  | $Q_{gs}$      |  | -    | 10   | -         |            |
| Gate-Drain ("Miller") Charge                                  | $Q_{gd}$      |  | -    | 4.9  | -         |            |
| Turn-On Delay Time  | $t_{d(on)}$   | $V_{DS}=50V, R_{GEN}=2\Omega$<br>$V_{GS}=10V, I_D=33A$         | -    | 8.4  | -         | nS         |
| Rise Time   | $t_r$         |  | -    | 28.5 | -         |            |
| Turn-Off Delay Time   | $t_{d(off)}$  |  | -    | 22.4 | -         |            |
| Fall Time   | $t_f$         |  | -    | 7.8  | -         |            |
| Input Capacitance   | $C_{iss}$     | $V_{DS}=50V, V_{GS}=0V,$<br>$F=1\text{MHz}$                    | -    | 1355 | -         | pF         |
| Output Capacitance  | $C_{oss}$     |  | -    | 171  | -         |            |
| Reverse Transfer Capacitance                                  | $C_{rss}$     |  | -    | 4    | -         |            |
| Gate Threshold Resistance                                     | $R_g$         | $F=1\text{MHz}$  | -    | 2.2  | -         | $\Omega$   |
| <b>Drain-Source Diode Characteristics and Maximum Ratings</b> |               |  |      |      |           |            |
| Continuous Source Current (Body Diode)                        | $I_S$         | MOSFET symbol showing the integral reverse p-n junction diode. | -    | -    | 45        | A          |
| Pulsed Source Current (Body Diode)                            | $I_{SM}$      |  | -    | -    | 180       | A          |
| Diode Forward Voltage   | $V_{SD}$      | $V_{GS}=0V, I_S=45A$   | -    | 1.0  | 1.2       | V          |
| Reverse Recovery Time   | $T_{rr}$      | $I_F=45A, T_J=25^\circ\text{C},$<br>$di/dt=100A/\mu s$         | -    | 56   | -         | ns         |
| Reverse Recovery Charge                                       | $Q_{rr}$      |  | -    | 0.09 | -         | $\mu C$    |

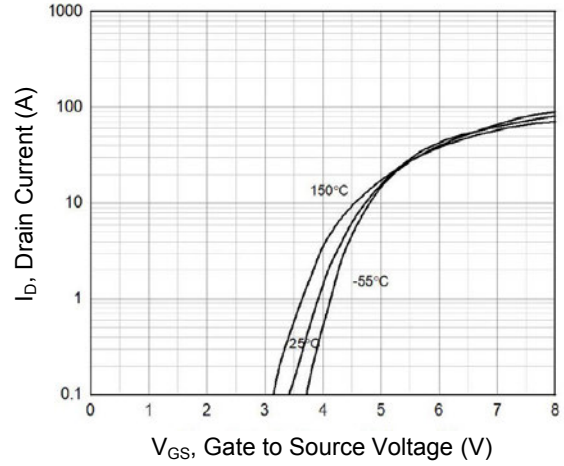
Note:

1. Pulse test: pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
2. Repetitive rating: Pulsed width limited by maximum junction temperature.
3.  $L=0.5\text{mH}, V_{DD}=80V, I_{AS}=18A, R_G=25\Omega, T_J=25^\circ\text{C}$ .
4. Device mounted on FR-4 PCB, 1inch x 0.85inch x 0.062inch.

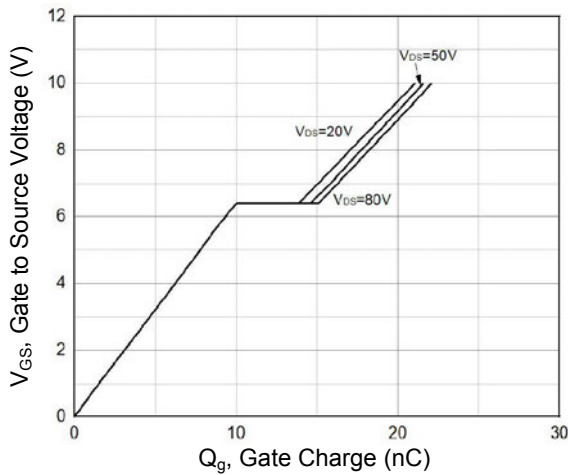
**Typical Electrical and Thermal Characteristic Curves**



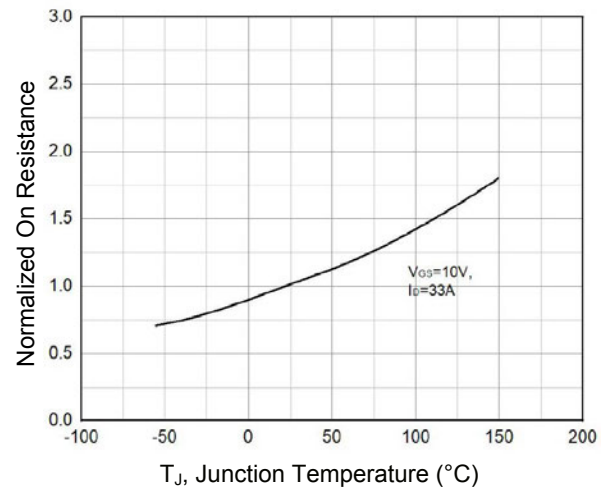
**Figure 1. Typical Output Characteristics**



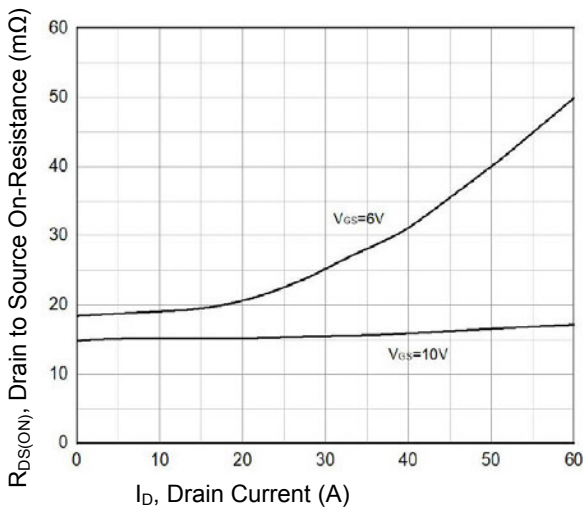
**Figure 2. Transfer Characteristics**



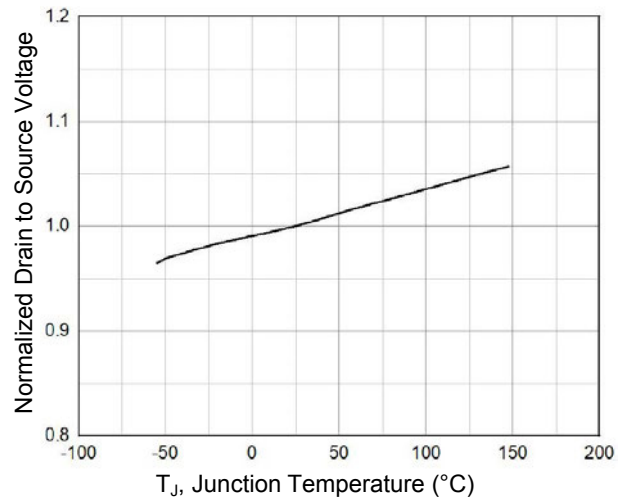
**Figure 3. Gate Charge Characteristics**



**Figure 4. Normalized  $R_{DS(ON)}$  vs. Junction Temperature**

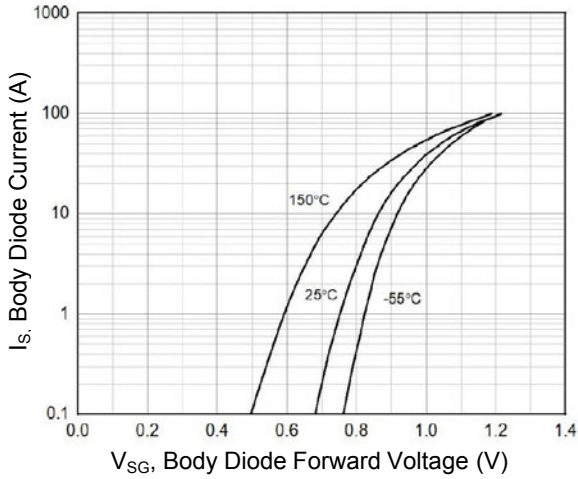


**Figure 5. On-Resistance vs. Drain Current**

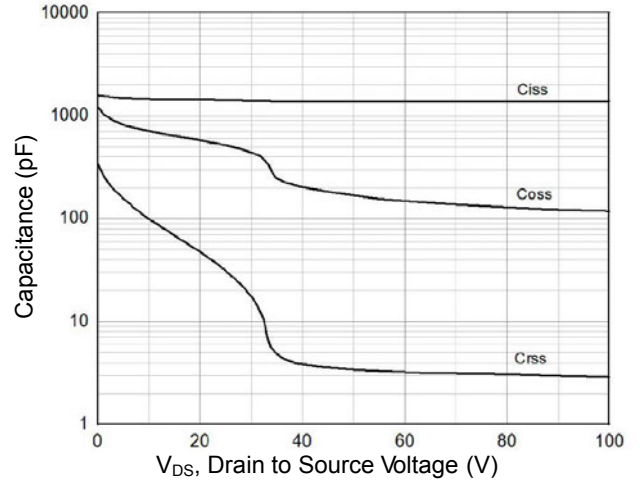


**Figure 6. Normalized  $BV_{DSS}$  vs. Junction Temperature**

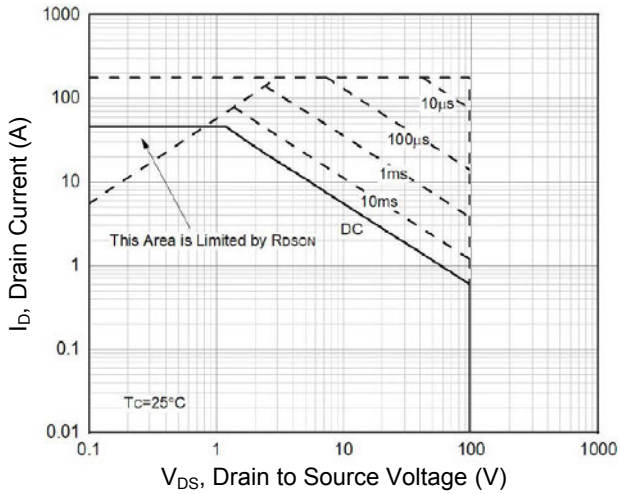
**Typical Electrical and Thermal Characteristic Curves**



**Figure 7. Body Diode Characteristics**

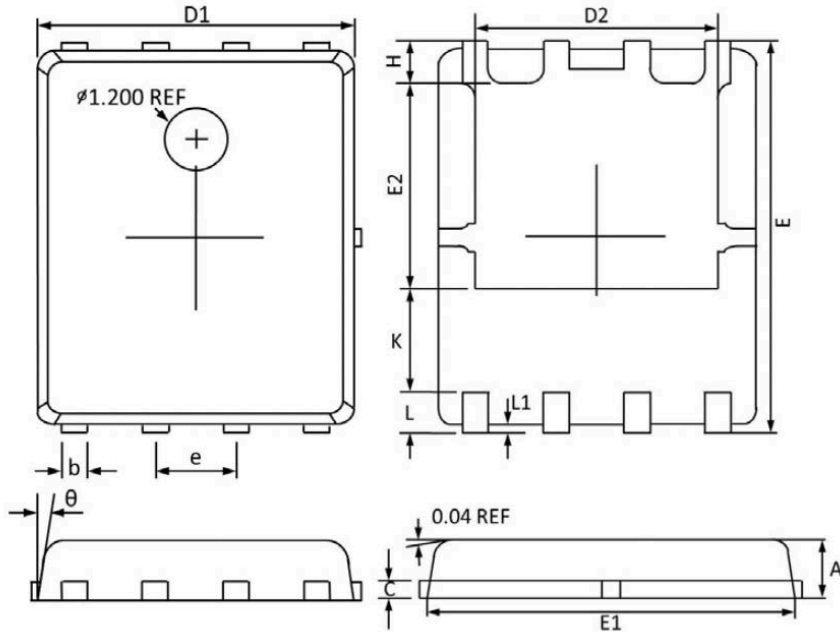


**Figure 8. Capacitance Characteristics**



**Figure 9. Safe Operation Area**

**Package Outline Dimensions (PPAK5x6)**



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 0.800                     | 1.100 | 0.031                | 0.043 |
| b      | 0.330                     | 0.510 | 0.013                | 0.020 |
| C      | 0.200                     | 0.300 | 0.008                | 0.012 |
| D1     | 4.800                     | 5.100 | 0.189                | 0.201 |
| D2     | 3.610                     | 4.100 | 0.142                | 0.161 |
| E      | 5.900                     | 6.200 | 0.232                | 0.244 |
| E1     | 5.700                     | 5.900 | 0.224                | 0.232 |
| E2     | 3.350                     | 3.780 | 0.132                | 0.149 |
| e      | 1.27 BSC                  |       | 0.05 BSC             |       |
| H      | 0.410                     | 0.700 | 0.016                | 0.028 |
| K      | 1.100                     | 1.500 | 0.043                | 0.059 |
| L      | 0.510                     | 0.710 | 0.020                | 0.028 |
| L1     | 0.060                     | 0.200 | 0.002                | 0.008 |
| Φ      | 0°                        | 12°   | 0°                   | 12°   |