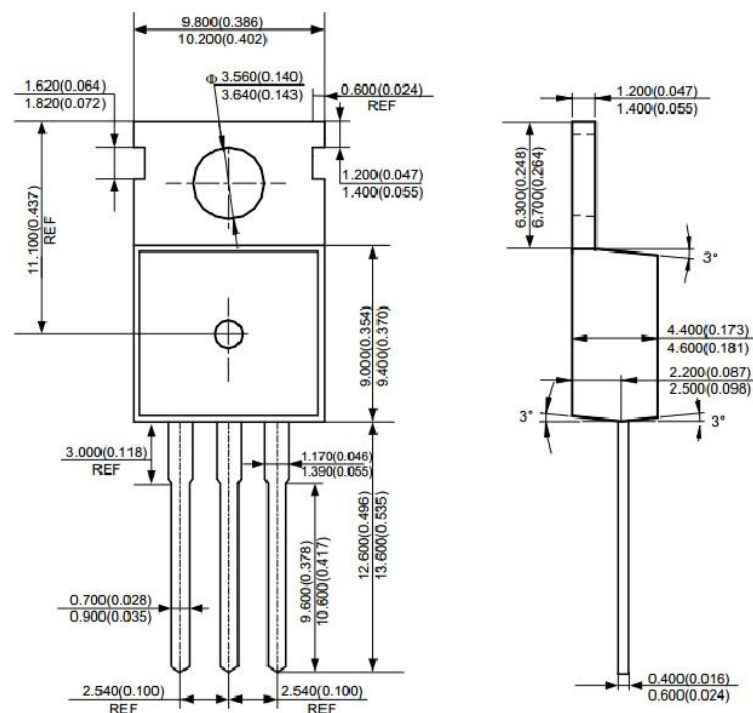
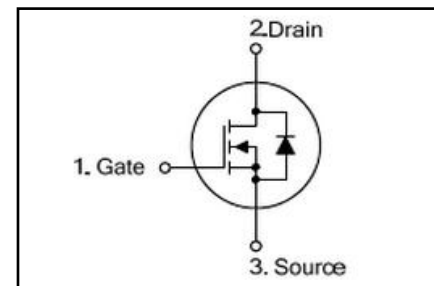
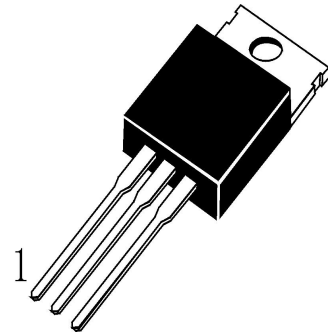


### ◆ Features:

- ✧ Fast switching speed  
开关速度快
- ✧ High input impedance and low level drive  
高输入阻抗和低电平驱动
- ✧ Avalanche energy tested  
雪崩能量测试
- ✧ Improved dv/dt capability, high ruggedness  
提高 dv/dt 能力, 高耐用性

### ◆ Applications

- ✧ High efficiency switch mode power supplies  
高效率开关电源
- ✧ Power factor correction  
功率因数校正
- ✧ Electronic lamp ballast  
电子整流器


**TO-220**


**◆ Absolute Maximum Ratings (Tc=25°C)**

| Symbol           | Parameters                                       | Ratings    | Unit |
|------------------|--------------------------------------------------|------------|------|
| V <sub>DSS</sub> | Drain-Source Voltage<br>漏源电压                     | <b>40</b>  | V    |
| V <sub>GS</sub>  | Gate-Source Voltage-Continuous<br>栅源电压           | <b>±20</b> | V    |
| I <sub>D</sub>   | Drain Current-Continuous (Note 2)<br>漏极持续电流      | <b>180</b> | A    |
| I <sub>DM</sub>  | Drain Current-Single Plused (Note 1)<br>漏极单次脉冲电流 | <b>720</b> | A    |
| P <sub>D</sub>   | Power Dissipation (Note 2)<br>功率损耗               | <b>220</b> | W    |
| T <sub>j</sub>   | Max.Operating junction temperature<br>最大结温       | <b>150</b> | °C   |

**◆ Electrical characteristics (Tc=25°C unless otherwise noted)**

| Symbo<br>l                    | Parameters                                                  | Min        | Typ        | Max         | Units | Conditions                                                          |
|-------------------------------|-------------------------------------------------------------|------------|------------|-------------|-------|---------------------------------------------------------------------|
| <b>Static Characteristics</b> |                                                             |            |            |             |       |                                                                     |
| B <sub>VDSS</sub>             | Drain-Source Breakdown<br>VoltageCurrent (Note 1)<br>漏极击穿电压 | <b>40</b>  | --         | --          | V     | I <sub>D</sub> =250μA,<br>V <sub>GS</sub> =0V, T <sub>J</sub> =25°C |
| V <sub>GS(th)</sub>           | Gate Threshold Voltage<br>栅极开启电压                            | <b>2.0</b> | --         | <b>4.0</b>  | V     | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA            |
| R <sub>DS(on)</sub>           | Drain-Source On-Resistance<br>漏源导通电阻                        | --         | <b>4.6</b> | --          | mΩ    | V <sub>GS</sub> =10V, I <sub>D</sub> =30A                           |
| I <sub>GSS</sub>              | Gate-Body Leakage Current<br>栅极漏电流                          | --         | --         | <b>±100</b> | nA    | V <sub>GS</sub> =±16V, V <sub>DS</sub> =0                           |
| I <sub>DSS</sub>              | Zero Gate Voltage Drain Current<br>零栅极电压漏极电流                | --         | --         | <b>1</b>    | μA    | V <sub>DS</sub> =40V, V <sub>GS</sub> =0                            |
| g <sub>fs</sub>               | Forward Transconductance<br>正向跨导                            | <b>45</b>  | --         | --          | S     | V <sub>DS</sub> =40V, I <sub>D</sub> =60A                           |

**IRF1404PBF****40V N-CHANNEL MOSFET**

| Switching Characteristics |                                                                          |    |      |      |      |                                                                                                  |
|---------------------------|--------------------------------------------------------------------------|----|------|------|------|--------------------------------------------------------------------------------------------------|
| T <sub>d (on)</sub>       | Turn-On Delay Time<br>开启延迟时间                                             | -- | 155  | --   | ns   | V <sub>DD</sub> =20V, I <sub>D</sub> =60A,<br>R <sub>G</sub> =4Ω,V <sub>GS</sub> =5V<br>(Note 2) |
| T <sub>r</sub>            | Rise Time<br>上升时间                                                        | -- | 720  | --   | ns   |                                                                                                  |
| T <sub>d (off)</sub>      | Turn-Off Delay Time<br>关闭延迟时间                                            | -- | 53   | --   | ns   |                                                                                                  |
| T <sub>f</sub>            | Fall Time<br>下降时间                                                        | -- | 55   | --   | ns   |                                                                                                  |
| Q <sub>g</sub>            | Total Gate Charge<br>栅极总电荷                                               | -- | --   | 130  | nC   | V <sub>D</sub> =32, V <sub>GS</sub> =5V,<br>I <sub>D</sub> =60A (Note 2)                         |
| Q <sub>gs</sub>           | Gate-Source Charge<br>栅源极电荷                                              | -- | --   | 30   | nC   |                                                                                                  |
| Q <sub>gd</sub>           | Gate-Drain Charge<br>栅漏极电荷                                               | -- | --   | 50   | nC   |                                                                                                  |
| Dynamic Characteristics   |                                                                          |    |      |      |      |                                                                                                  |
| C <sub>iss</sub>          | Input Capacitance<br>输入电容                                                | -- | 4500 | --   | pF   | V <sub>DS</sub> =25V, V <sub>GS</sub> =0,<br>f=1MHz                                              |
| C <sub>oss</sub>          | Output Capacitance<br>输出电容                                               | -- | 1550 | --   | pF   |                                                                                                  |
| C <sub>rss</sub>          | Reverse Transfer Capacitance<br>反向传输电容                                   | -- | 150  | --   | pF   |                                                                                                  |
| I <sub>S</sub>            | Continuous Drain-Source Diode<br>Forward Current (Note 2)<br>二极管导通正向持续电流 | -- | --   | 180  | A    |                                                                                                  |
| V <sub>SD</sub>           | Diode Forward On-Voltage<br>二极管正向导通电压                                    | -- | --   | 1.3  | V    | I <sub>S</sub> =60A, V <sub>GS</sub> =0                                                          |
| R <sub>th(j-c)</sub>      | Thermal Resistance, Junction to Case<br>结到外壳的热阻                          | -- | --   | 0.57 | °C/W |                                                                                                  |

Note 1: Repetitive Rating : Pulse width limited by maximum junction temperature

Note 2: Pulse test: PW ≤ 300us , duty cycle ≤ 2%.