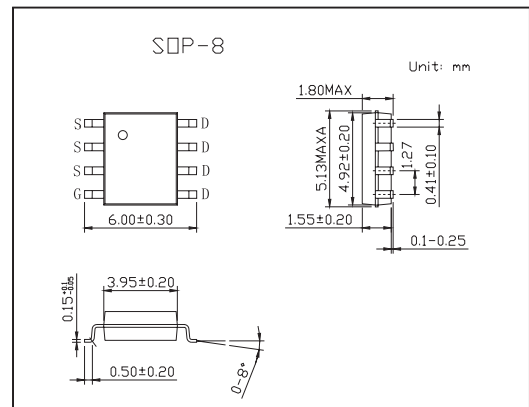


HEXFET Power MOSFET

IRF7821

■ Features

- Very Low RDS(on) at 4.5V VGS
- Low Gate Charge
- Fully Characterized Avalanche Voltage and Current

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

| Parameter | Symbol | Max. | Unit |
|--|-----------------|--------------|---------------------------|
| Drain- Source Voltage | V_{DS} | 30 | V |
| Gate-to-Source Voltage | V_{GS} | ± 20 | |
| Continuous Drain Current, VGS @ 10V @ $T_A = 25^\circ\text{C}$ | I_D | 13.6 | A |
| Continuous Drain Current, VGS @ 10V @ $T_A = 70^\circ\text{C}$ | I_D | 11 | |
| Pulsed Drain Current ① | I_{DM} | 100 | |
| Power Dissipation ④ @ $T_A = 25^\circ\text{C}$ | P_D | 2.5 | W |
| Power Dissipation ④ @ $T_A = 70^\circ\text{C}$ | P_D | 1.6 | |
| Linear Derating Factor | | 0.02 | $\text{W}/^\circ\text{C}$ |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 to + 155 | $^\circ\text{C}$ |
| Junction-to-Drain Lead ④ | $R_{\theta JL}$ | 20 | $^\circ\text{C}/\text{W}$ |
| Junction-to-Ambient ④⑤ | $R_{\theta JA}$ | 50 | |

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■ Electrical Characteristics Ta = 25°C

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---------------------------------|---|---|-------|------|-------|
| Drain-to-Source Breakdown Voltage | BV _{DSS} | V _{GS} = 0V, I _D = 250 μA | 30 | | | V |
| Breakdown Voltage Temp. Coefficient | $\Delta V(BR)_{DSS}/\Delta T_J$ | Reference to 25°C, I _D = 1mA | | 0.025 | | V/°C |
| Static Drain-to-Source On-Resistance | R _{DS(on)} | V _{GS} = 10V, I _D = 13A ③ | | 7.0 | 9.1 | mΩ |
| | | V _{GS} = 4.5V, I _D = 10A ③ | | 9.5 | 12.5 | |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250 μA | 1.0 | | | V |
| Gate Threshold Voltage Coefficient | $\Delta V_{GS(th)}$ | | | -4.9 | | mV/°C |
| Drain-to-Source Leakage Current | I _{DSS} | V _{DS} = 24V, V _{GS} = 0V | | | 1.0 | μA |
| | | V _{DS} = 24V, V _{GS} = 0V, T _J = 125°C | | | 150 | |
| Gate-to-Source Forward Leakage | I _{GSS} | V _{GS} = 20V | | | 100 | nA |
| Gate-to-Source Reverse Leakage | | V _{GS} = -20V | | | -100 | |
| Forward Transconductance | g _{fs} | V _{DS} = 15V, I _D = 10A | 22 | | | S |
| Total Gate Charge | Q _g | V _{DS} = 15V V _{GS} = 4.5V I _D = 10A | | 9.3 | 14 | nC |
| Pre-V _{th} Gate-to-Source Charge | Q _{gs1} | | | 2.5 | | |
| Post-V _{th} Gate-to-Source Charge | Q _{gs2} | | | 0.8 | | |
| Gate-to-Drain Charge | Q _{gd} | | | 2.9 | | |
| Gate Charge Overdrive | Q _{godr} | | | 3.1 | | |
| Switch Charge (Q _{gs2} + Q _{gd}) | Q _{sw} | | | 3.7 | | |
| Output Charge | Q _{oss} | | V _{DS} = 10V, V _{GS} = 0V | | 6.1 | |
| Turn-On Delay Time | t _{d(on)} | V _{DD} = 15V, V _{GS} = 4.5V ③ I _D = 10A Clamped Inductive Load | | 6.3 | | ns |
| Rise Time | t _r | | | 2.7 | | |
| Turn-Off Delay Time | t _{d(off)} | | | 9.7 | | |
| Fall Time | t _f | | | 7.3 | | |
| Input Capacitance | C _{iss} | V _{GS} = 0V | | 1010 | | pF |
| Output Capacitance | C _{oss} | V _{DS} = 15V | | 360 | | |
| Reverse Transfer Capacitance | C _{rss} | f = 1.0kHz | | 110 | | |
| Single Pulse Avalanche Energy ②⑥ | E _{AS} | | | | 44 | mJ |
| Avalanche Current ① | I _{AR} | | | | 10 | A |
| Continuous Source Current(Body Diode) | I _S | MOSFET symbol showing the integral reverse p-n junction diode. | | | 3.1 | |
| Pulsed Source Current(Body Diode) ①⑥ | I _{SM} | | | | 100 | |
| Diode Forward Voltage | V _{SD} | T _J = 25°C, I _S = 10A, V _{GS} = 0V ③ | | | 1 | V |
| Reverse Recovery Time | t _{rr} | T _J = 25°C, I _F = 10A, V _{DD} = 10V | | 28 | 42 | ns |
| Reverse Recovery Charge | Q _{rr} | di/dt = -100A/μs ③ | | 23 | 35 | nC |