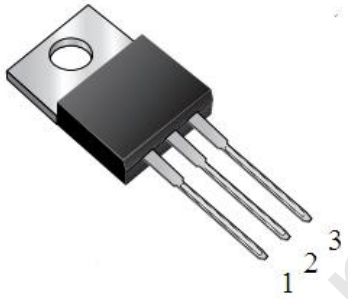
## FEATURE

- 20A,60V,RDS(ON)=36mΩ@VGS
- =10V/10A Low gate charge
- Low Ciss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

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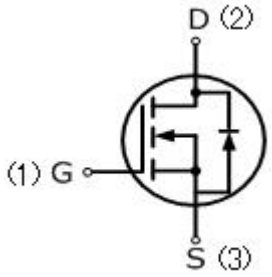


**Absolute Maximum Ratings**($T_C$=25℃,unless otherwise noted)

| Parameter | | Symbol | IRF9Z24NPBF | UNIT |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DSS}$ | 60 | V |
| Gate-Source Voltage | | $V_{GSS}$ | ±20 | |
| Continuous Drain Current | | $I_D$ | 20 | A |
| Pulsed Drain Current(Note1) | | $I_{DM}$ | 80 | |
| Single Pulse Avalanche Energy (Note 2) | | $E_{AS}$ | 155 | mJ |
| Avalanche Current(Note1) | | $I_{AR}$ | 20 | A |
| Repetitive Avalanche Energy (Note1) | | $E_{AR}$ | 5.3 | mJ |
| Reverse Diode dV/dt (Note 3) | | dv/dt | 7.0 | V/ns |
| Operating Junction and Storage Temperature Range | | $T_J$,$T_{STG}$ | -55 to +150 | ℃ |
| Maximum lead temperature for soldering purposes, 1/8″from case for 5 seconds | | $T_L$ | 260 | ℃ |
| Mounting Torque | 6-32 or M3 screw | | 10 | lbf • in |
| | | | 1.1 | N • m |

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**Electrical Characteristics** ($T_c$=25℃,unless otherwise noted)

| Parameter | Symbol | Test Conditions | Mix | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{GS}$=0V,$I_D$=250uA | 60 | — | — | V |
| Breakdown Temperature Coefficient | $\Delta BV_{DSS}$ /$\Delta T_J$ | Reference to 25℃, $I_D$=250uA | — | 0.5 | — | V/℃ |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=60V,$V_{GS}$=0V | — | — | 1 | uA |
| Gate-Body Leakage Current,Forward | $I_{GSSF}$ | $V_{GS}$=20V,$V_{DS}$=0V | — | — | 100 | nA |
| Gate-Body Leakage Current,Reverse | $I_{GSSR}$ | $V_{GS}$=-20V,$V_{DS}$=0V | — | — | -100 | nA |
| **On Characteristics** | | | | | | |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=10V,$I_D$=250uA | 1.0 | — | 3.0 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}$=10V,$I_D$=10A | — | — | 36 | mΩ |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=25V,$V_{GS}$=0V, f=1.0MHZ | — | 450 | 590 | pF |
| Output Capacitance | $C_{oss}$ | | — | 170 | 220 | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | — | 25 | 35 | pF |
| **Switching Characteristics** | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}$=30V,$I_D$=10A, $R_G$=25Ω (Note4,5) | — | 5 | 20 | ns |
| Turn-On Rise Time | $t_r$ | | — | 45 | 100 | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | — | 20 | 50 | ns |
| Turn-Off Fall Time | $t_f$ | | — | 25 | 60 | ns |
| Total Gate Charge | Qg | $V_{DS}$=48V,$I_D$=20A, $V_{GS}$=10V, (Note4,5) | — | 11.5 | 15 | nC |
| Gate-Source Charge | Qgs | | — | 3 | — | nC |
| Gate-Drain Charge | Qgd | | — | 4.5 | — | nC |
| **Drain-Source Body Diode Charcteristics and Maximum Ratings** | | | | | | |
| Continuous Diode Forward Current | $I_S$ | | — | — | 20 | A |
| Pulsed Diode Forward Current | $I_{SM}$ | | — | — | 80 | A |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=20A,$V_{GS}$=0V | — | — | 1.5 | V |
| Reverse Recovery Time | $t_{rr}$ | $V_{GS}$=0V,$I_S$=20A, $dI_F/dt$=100A/us, (Note4) | — | 43 | — | ns |
| Reverse Recovery Charge | $Q_{rr}$ | | — | 50 | — | uC |

**Notes**

1. Repetitive Rating:pulse width limited by maximum junction temperature.
2. $V_{DD}$=10V,L=1mH,$R_g$=25Ω,$I_{AS}$=20A , $T_J$=25℃.
3. $I_{SD}$≤$I_D$,dI/dt=200A/us,$V_{DD}$≤$BV_{DSS}$,starting $T_J$=25℃.
4. Pulse width≤300us;duty cycle≤2%.
5. Repetitive rating; pulse width limited by maximum junction temperature.

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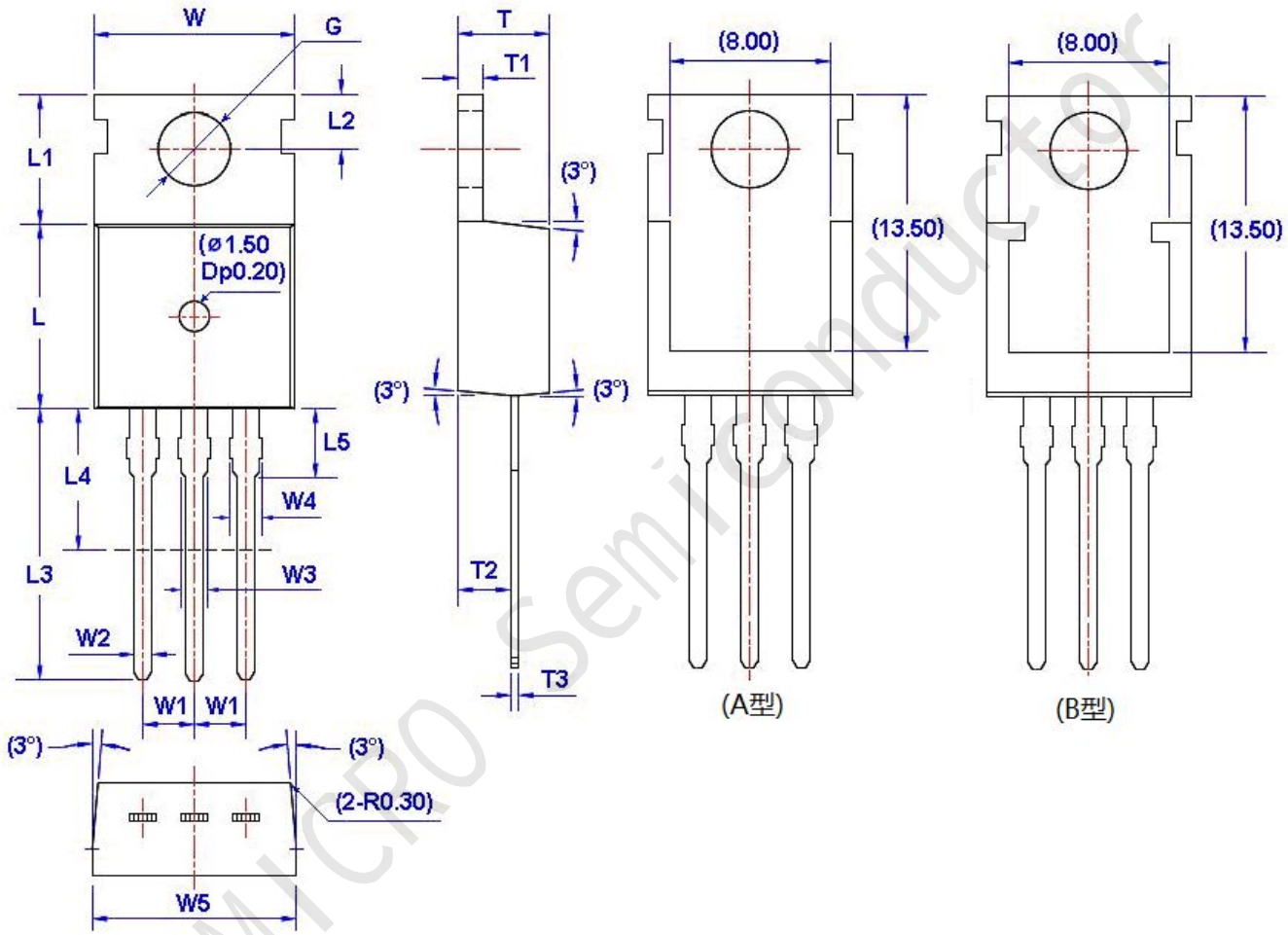
Unit: mm




| Symbol | Size | | Symbol | Size | | Symbol | Size | | Symbol | Size | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min | Max | | Min | Max | | Min | Max | | Min | Max |
| W | 9.66 | 10.28 | W5 | 9.80 | 10.20 | L4** | 6.20 | 6.60 | T3 | 0.45 | 0.60 |
| W1 | 2.54（TYP） | | L | 9.00 | 9.40 | L5 | 2.79 | 3.30 | G(Φ) | 3.50 | 3.70 |
| W2 | 0.70 | 0.95 | L1 | 6.40 | 6.80 | T | 4.30 | 4.70 | | | |
| W3 | 1.17 | 1.37 | L2 | 2.70 | 2.90 | T1 | 1.15 | 1.40 | | | |
| W4* | 1.32 | 1.72 | L3 | 12.70 | 14.27 | T2 | 2.20 | 2.60 | | | |

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