



懋聲微科技

MPVX18N50B Series

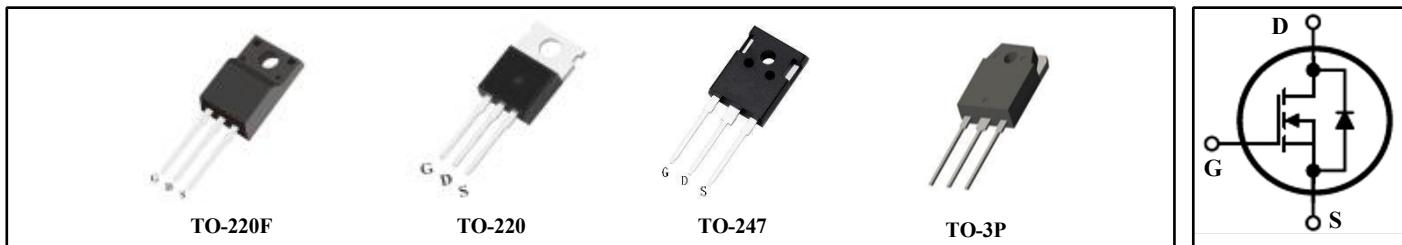
Power MOSFET

FEATURES

- BV_{DSS} : 500V, $I_D=18A$
- $R_{DS(on)}$: 0.34Ω(Max) @ $V_{GS}=10V$
- Very Low FOM ($R_{DS(on)} * Q_g$)
- Excellent stability and uniformity

APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC to DC Converters



Ordering Information

| Type NO. | Marking | Package Code |
|------------|------------|--------------|
| MPVA18N50B | MPVA18N50B | TO-220F |
| MPVP18N50B | MPVP18N50B | TO-220 |
| MPVW18N50B | MPVW18N50B | TO-247 |
| MPVT18N50B | MPVT18N50B | TO-3P |

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted

| Parameter | Symbol | Value | | Unit |
|--|----------------|----------|------------|------|
| | | 220F | 220-247-3P | |
| Drain-Source Voltage ($V_{GS}=0V$) | V_{DSS} | 500 | | V |
| Continuous Drain Current | I_D | 18 | | A |
| Pulsed Drain Current (note1) | I_{DM} | 70 | | A |
| Gate-Source Voltage | V_{GSS} | ±30 | | V |
| Single Pulse Avalanche Energy (note2) | E_{AS} | 978 | | mJ |
| Avalanche Current (note1) | I_{AR} | 12 | | A |
| Repetitive Avalanche Energy (note1) | E_{AR} | 64 | | mJ |
| Power Dissipation ($T_C=25^\circ C$) | P_D | 98 | 210 | W |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55~+150 | | °C |

Thermal Resistance

| Parameter | Symbol | Value | | Unit |
|---|------------|-------|------------|------|
| | | 220F | 220-247-3P | |
| Thermal Resistance, Junction-to-Case | R_{thJC} | 1.27 | 0.6 | °C/W |
| Thermal Resistance, Junction-to-Ambient | R_{thJA} | 62.5 | 60.0 | |



懋昌电源

MPVX18N50B Series

Power MOSFET

Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted

| Parameter | Symbol | Test Conditions | Value | | | Unit |
|--|-----------------------------|--|-------|------|-----------|---------------|
| | | | Min. | Typ. | Max. | |
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(\text{BR})\text{DSS}}$ | $V_{\text{GS}} = 0\text{V}, I_D = 250\mu\text{A}$ | 500 | -- | -- | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{\text{DS}} = 500\text{V}, V_{\text{GS}} = 0\text{V}, T_J = 25^\circ\text{C}$ | -- | -- | 1 | μA |
| Gate-Source Leakage | I_{GSS} | $V_{\text{GS}} = \pm 30\text{V}$ | -- | -- | ± 100 | nA |
| Gate-Source Threshold Voltage | $V_{\text{GS}(\text{th})}$ | $V_{\text{DS}} = V_{\text{GS}}, I_D = 250\mu\text{A}$ | 3.0 | -- | 4.0 | V |
| Drain-Source On-Resistance (Note4) | $R_{\text{DS}(\text{on})}$ | $V_{\text{GS}} = 10\text{V}, I_D = 9.0\text{A}$ | -- | 0.26 | 0.34 | Ω |
| Dynamic | | | | | | |
| Input Capacitance | C_{iss} | $V_{\text{GS}} = 0\text{V}, V_{\text{DS}} = 25\text{V}, f = 1.0\text{MHz}$ | -- | 2900 | -- | pF |
| Output Capacitance | C_{oss} | | -- | 215 | -- | |
| Reverse Transfer Capacitance | C_{rss} | | -- | 15 | -- | |
| Total Gate Charge | Q_g | $V_{\text{DD}} = 400\text{V}, I_D = 18.0\text{A}, V_{\text{GS}} = 10\text{V}$ | -- | 73 | -- | nC |
| Gate-Source Charge | Q_{gs} | | -- | 10 | -- | |
| Gate-Drain Charge | Q_{gd} | | -- | 30 | -- | |
| Turn-on Delay Time | $t_{\text{d}(\text{on})}$ | $V_{\text{DD}} = 250\text{V}, I_D = 18.0\text{A}, R_G = 25\Omega$ | -- | 30 | -- | ns |
| Turn-on Rise Time | t_r | | -- | 45 | -- | |
| Turn-off Delay Time | $t_{\text{d}(\text{off})}$ | | -- | 165 | -- | |
| Turn-off Fall Time | t_f | | -- | 60 | -- | |
| Drain-Source Body Diode Characteristics | | | | | | |
| Continuous Body Diode Current | I_S | $T_C = 25^\circ\text{C}$ | -- | -- | 18 | A |
| Pulsed Diode Forward Current | I_{SM} | | -- | -- | 72 | |
| Body Diode Voltage | V_{SD} | $T_J = 25^\circ\text{C}, I_{\text{SD}} = 18.0\text{A}, V_{\text{GS}} = 0\text{V}$ | -- | -- | 1.4 | V |
| Reverse Recovery Time | t_{rr} | $V_{\text{GS}} = 0\text{V}, I_F = 18.0\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$ | -- | 410 | -- | ns |
| Reverse Recovery Charge | Q_{rr} | | -- | 6.3 | -- | μC |

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{\text{AS}} = 12\text{A}, V_{\text{DD}} = 50\text{V}, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 1\%$
4. Essentially independent of operating temperature

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics

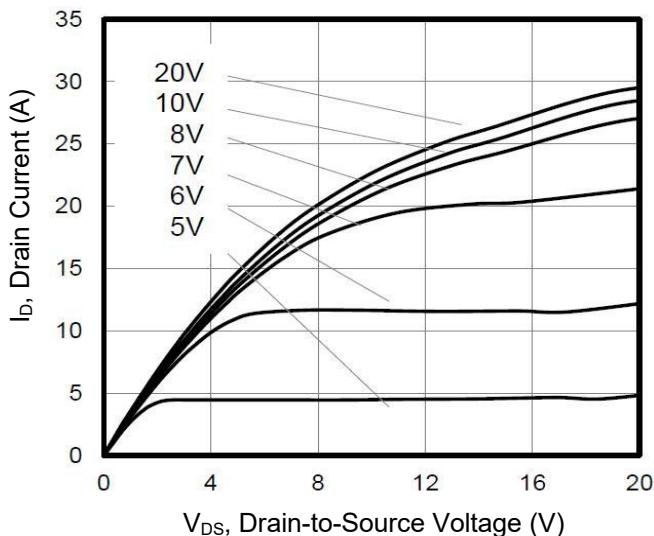


Figure 2. Transfer Characteristics

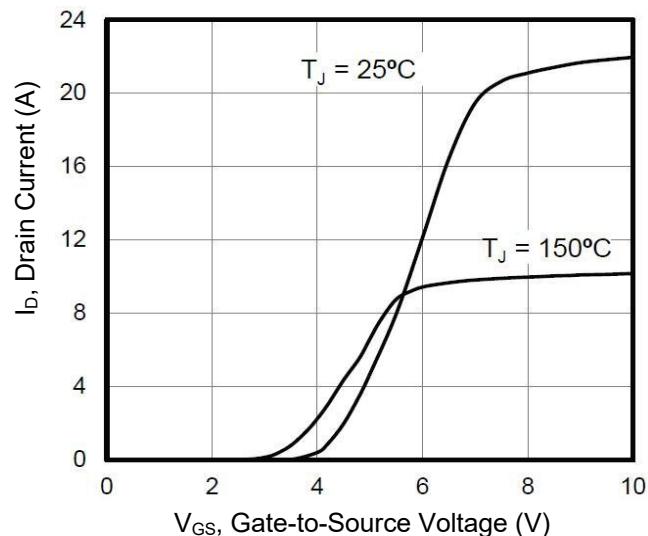


Figure 3. Drain Current vs. Temperature

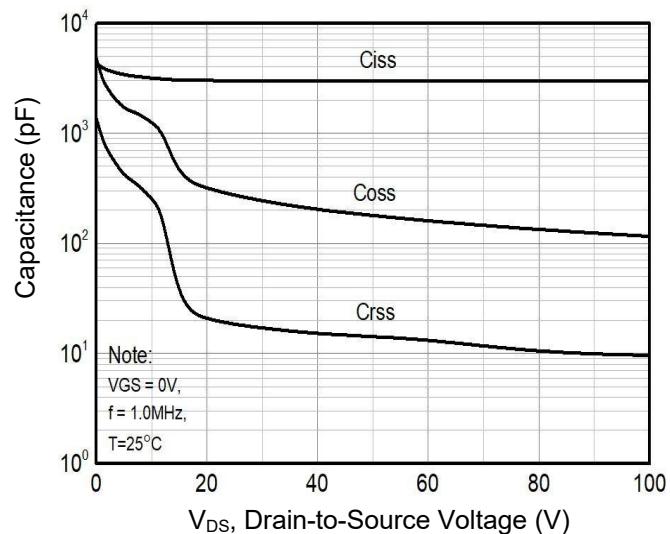
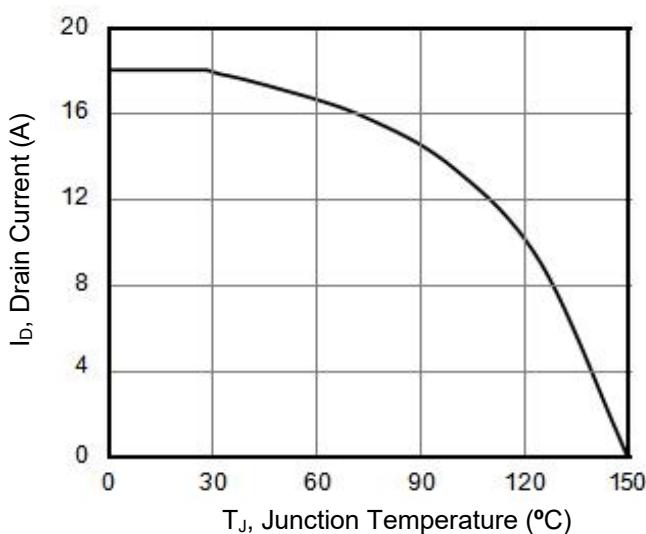


Figure 5. Gate Charge

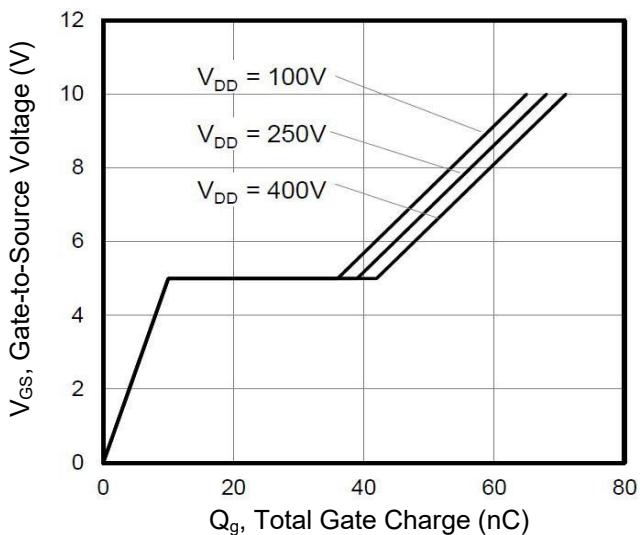
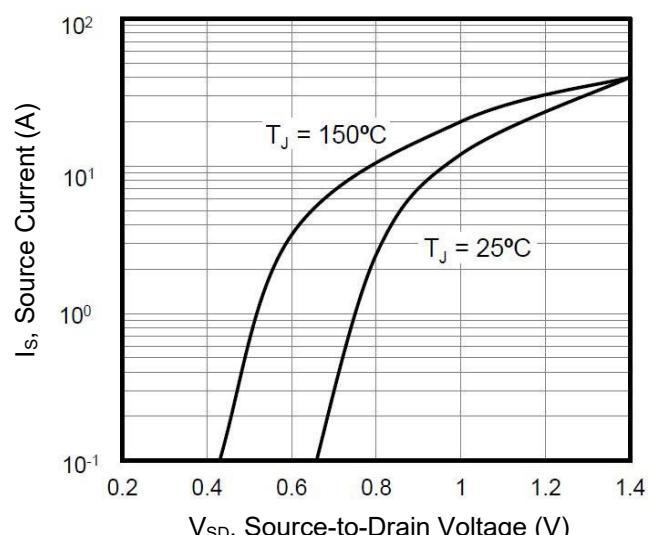


Figure 6. Body Diode Forward Voltage



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. On-Resistance vs. Temperature

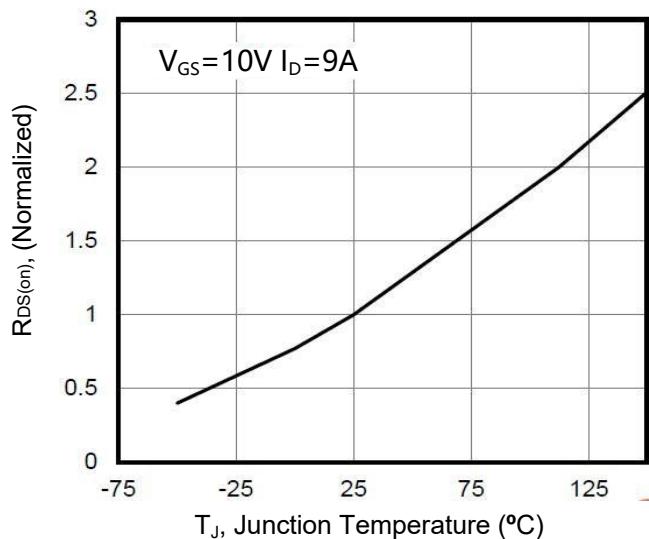
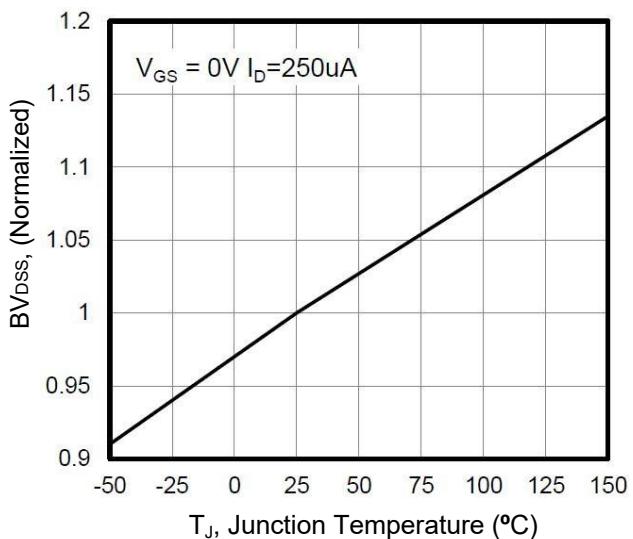
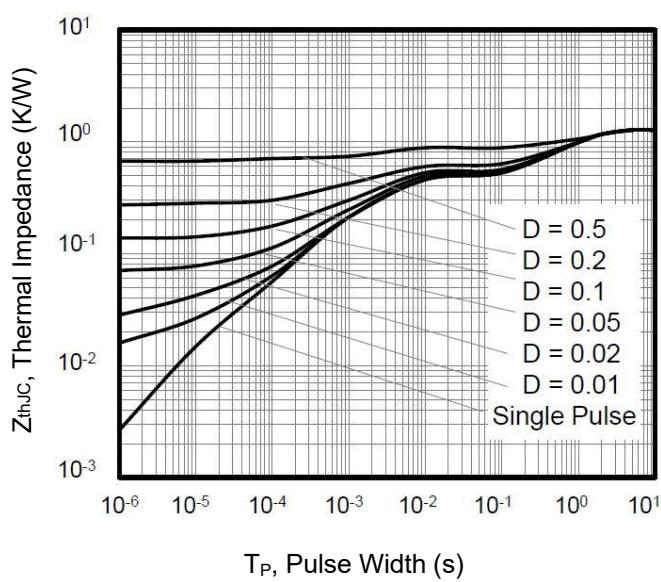


Figure 8. BV_{DSS} vs. Temperature



**Figure 9. Transient Thermal Impedance
(TO-220F)**



**Figure 10. Transient Thermal Impedance
(TO-220 TO-247 TO-3P)**

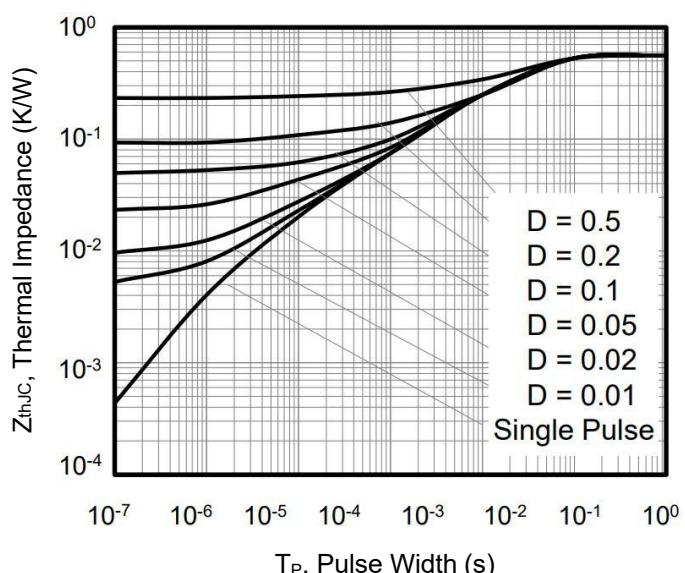
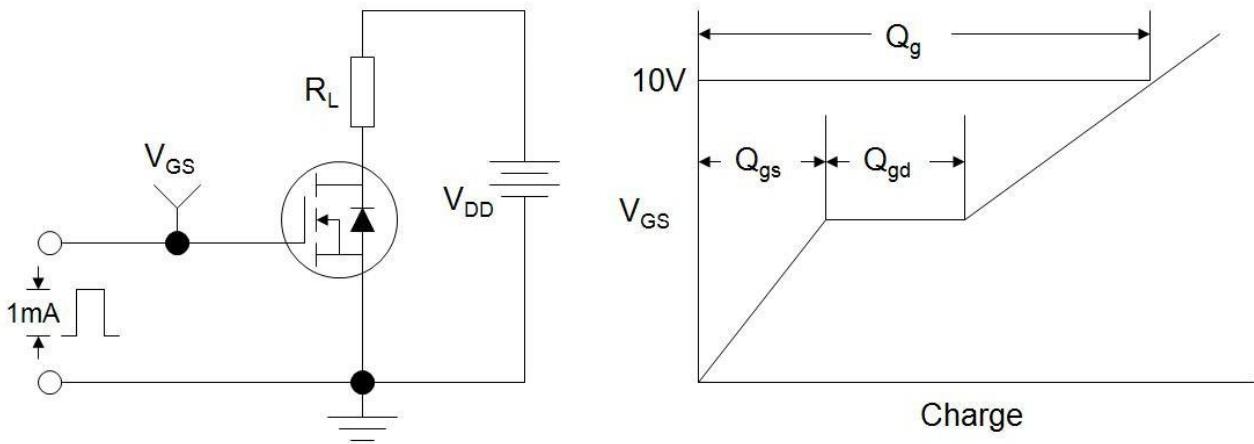
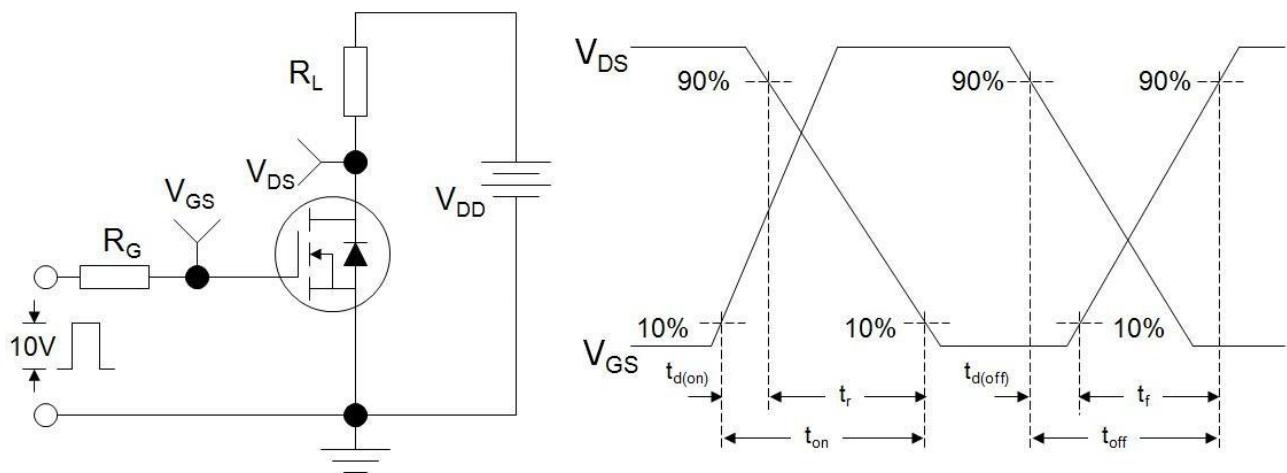
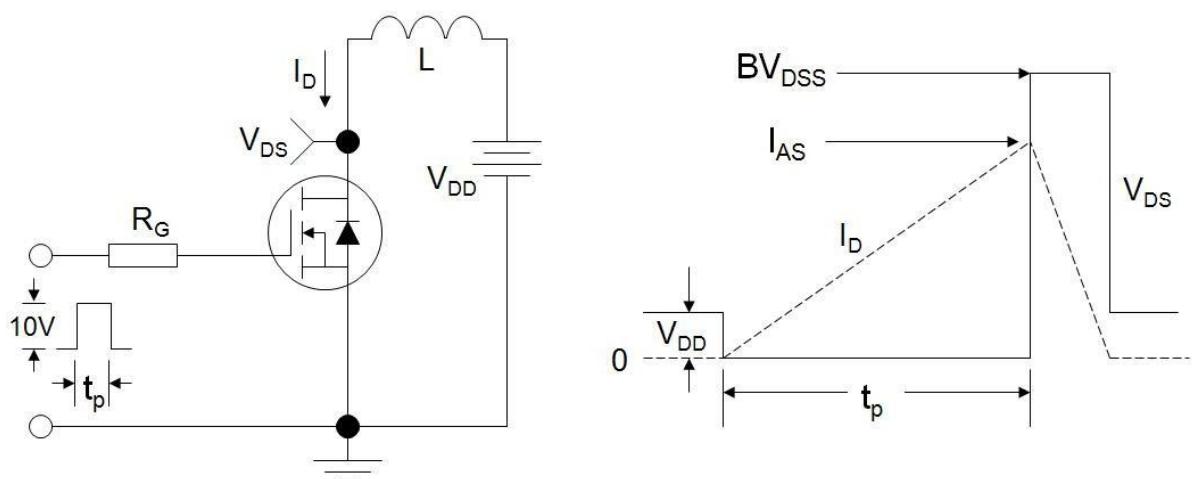
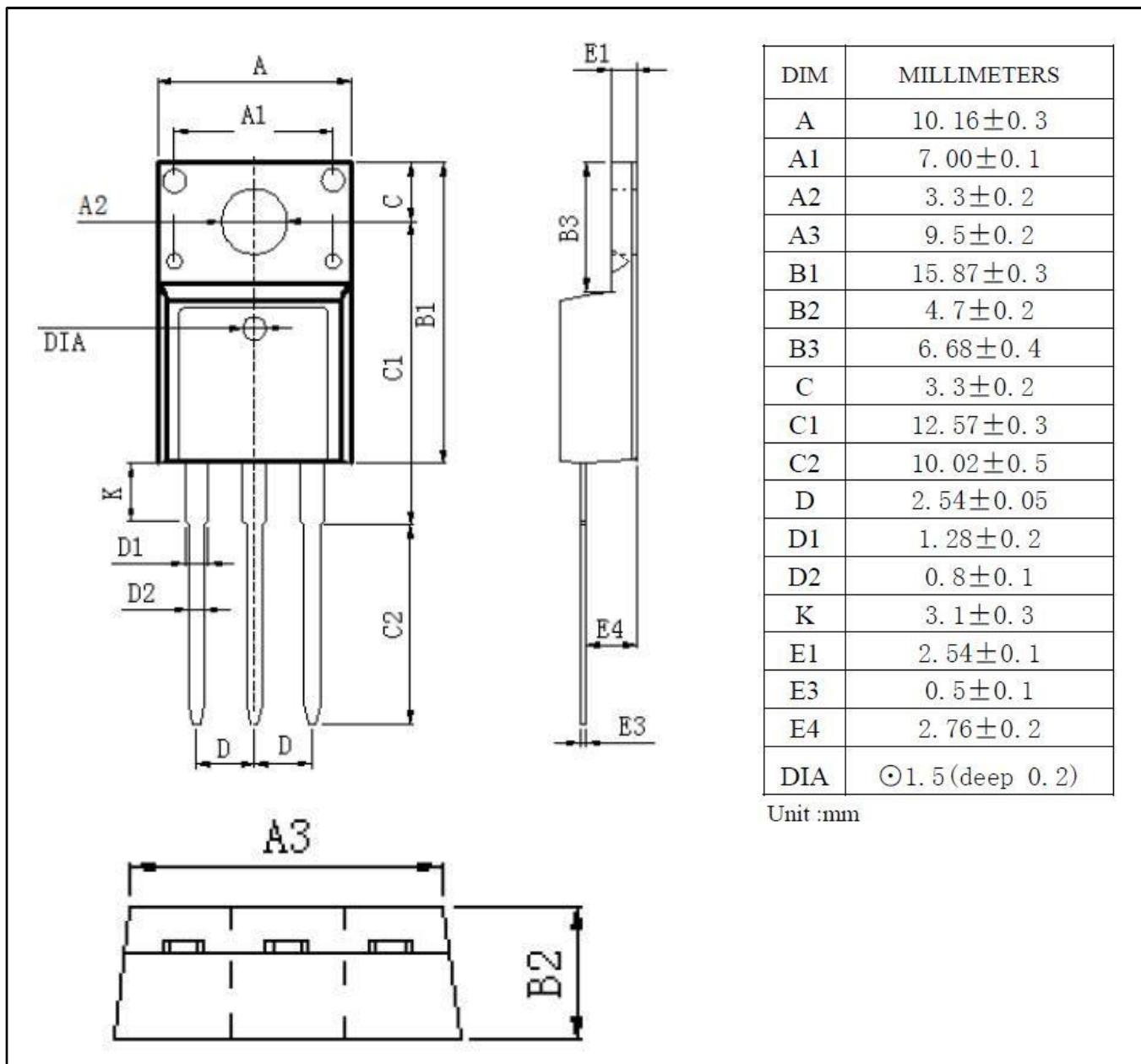


Figure A: Gate Charge Test Circuit and Waveform

Figure B: Resistive Switching Test Circuit and Waveform

Figure C: Unclamped Inductive Switching Test Circuit and Waveform


Outline Dimension

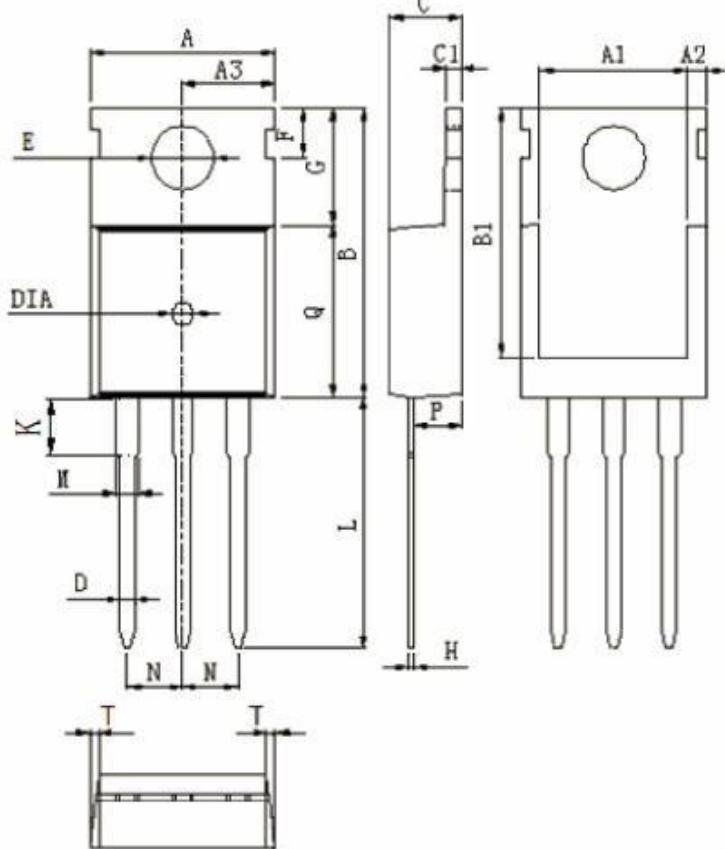
Unit: mm

TO-220F



Outline Dimension

Unit: mm

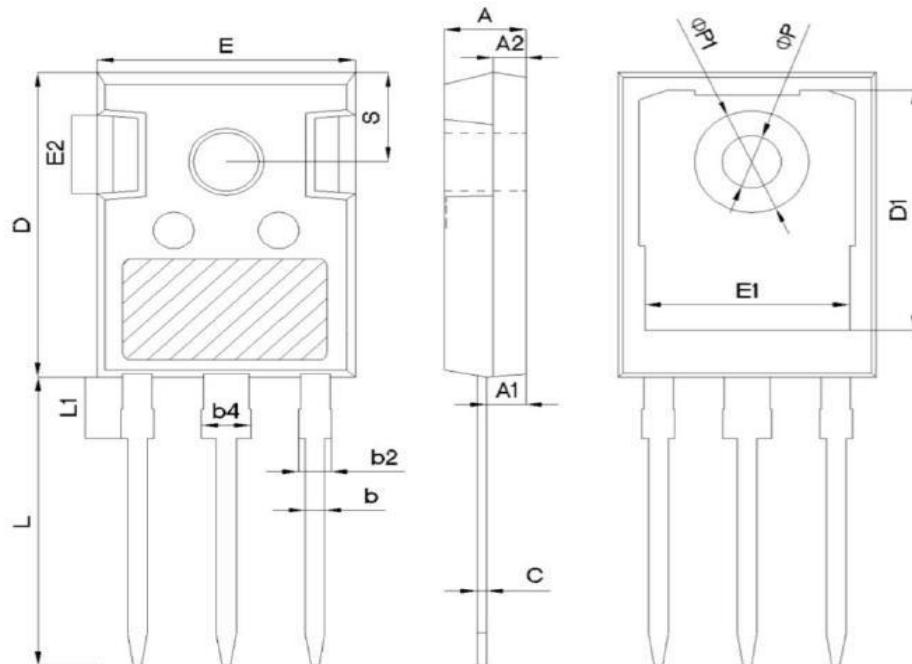
TO-220


| DIM | MILLIMETERS |
|-----|----------------|
| A | 10.0±0.3 |
| A1 | 8.64±0.2 |
| A2 | 1.15±0.1 |
| A3 | 5.0±0.2 |
| B | 15.8±0.4 |
| B1 | 13.2±0.3 |
| C | 4.56±0.1 |
| C1 | 1.3±0.2 |
| D | 0.8±0.2 |
| E | 3.6±0.2 |
| F | 2.95±0.3 |
| G | 6.5±0.3 |
| H | 0.5±0.1 |
| K | 3.1±0.2 |
| L | 13.2±0.4 |
| M | 1.25±0.1 |
| N | 2.54±0.1 |
| P | 2.4±0.3 |
| Q | 9.0±0.3 |
| T | W:0.35 |
| DIA | ◎1.5(deep 0.2) |

Unit :mm

Outline Dimension

Unit: mm

TO-247


| SYMBOL | mm | | |
|--------|----------|-------|-------|
| | MIN | NOM | MAX |
| A | 4.80 | 5.00 | 5.20 |
| A1 | 2.21 | 2.41 | 2.61 |
| A2 | 1.85 | 2.00 | 2.15 |
| b | 1.11 | 1.21 | 1.36 |
| b2 | 1.91 | 2.01 | 2.21 |
| b4 | 2.91 | 3.01 | 3.21 |
| c | 0.51 | 0.61 | 0.75 |
| D | 20.70 | 21 | 21.30 |
| D1 | 16.25 | 16.55 | 16.85 |
| E | 15.50 | 15.80 | 16.10 |
| E1 | 13.00 | 13.30 | 13.60 |
| E2 | 4.80 | 5.00 | 5 |
| E3 | 2.30 | 2.50 | 2.70 |
| e | 5.44B SC | | |
| L | 19.62 | 19.92 | 20.22 |
| L1 | — | — | 4.30 |
| ΦP | 3.40 | 3.60 | 3.80 |
| ΦP1 | — | — | 7.30 |
| S | 6.15B SC | | |

Outline Dimension

Unit: mm

TO-3P

