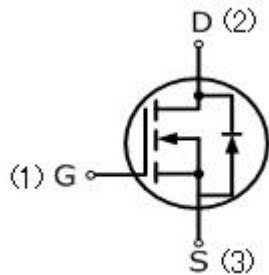


100N10NF

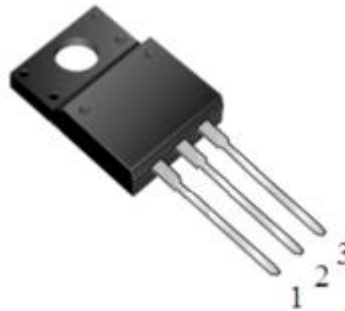
100 Amps, 100 Volts N-CHANNEL Power MOSFET

FEATURE

- 100A, 100V, $R_{DS(ON)MAX}=8.4m\Omega$ $V_{GS}=10V/20A$
- Low gate charge
- Low C_{iss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



TO-220NF



Absolute Maximum Ratings ($T_C=25^\circ\text{C}$, unless otherwise noted)

| Parameter | Symbol | 100N10NF | UNIT |
|---|----------------|-------------|------------------|
| Drain-Source Voltage | V_{DSS} | 100 | V |
| Gate-Source Voltage | V_{GSS} | ± 20 | |
| Continuous Drain Current | I_D | 100 | A |
| Pulsed Drain Current (Note 1) | I_{DM} | 400 | |
| Single Pulse Avalanche Energy (Note 2) | E_{AS} | 180 | mJ |
| Operating Junction and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |
| Channel Temperature | T_{CH} | 150 | $^\circ\text{C}$ |
| Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds | T_L | 260 | $^\circ\text{C}$ |

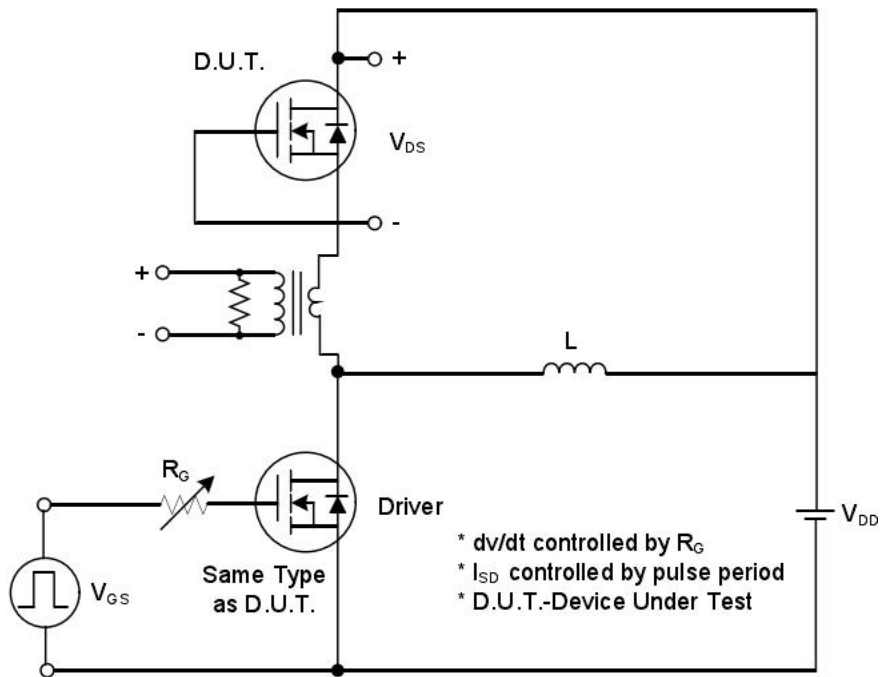
| Parameter | Symbol | TO-220NF | Units |
|-------------------------------------|----------------|----------|---------------------------|
| Thermal resistance, Channel to Case | $R_{th(ch-c)}$ | 2.53 | $^\circ\text{C}/\text{W}$ |
| Maximum Power Dissipation | P_D | 50 | W |

| Electrical Characteristics ($T_c=25^\circ\text{C}$, unless otherwise noted) | | | | | | |
|--|--------------|---|-----|------|-----------|------------|
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
| Off Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 100 | — | — | V |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=100V, V_{GS}=0V$ | — | — | 1 | μA |
| Gate-Body Leakage Current, Forward | I_{GSS} | $V_{GS}=\pm 20V, V_{DS}=0V$ | — | — | ± 100 | nA |
| On Characteristics | | | | | | |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=10V, I_D=250\mu A$ | 2.0 | — | 4.0 | V |
| Drain-Source On-State Resistance | $R_{DS(on)}$ | $V_{GS}=10V, I_D=20A$ | — | 7.5 | 8.4 | m Ω |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C_{iss} | $V_{DS}=50V, V_{GS}=0V,$ $f=1.0\text{MHZ}$ | — | 2605 | — | pF |
| Output Capacitance | C_{oss} | | — | 172 | — | pF |
| Reverse Transfer Capacitance | C_{rss} | | — | 14 | — | pF |
| Switching Characteristics | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | $V_{DD}=50V,$ $R_L=6.25\Omega,$ $R_{GEN}=3\Omega$ $V_{GS}=10V$ (Note3,4) | — | 7 | — | ns |
| Turn-On Rise Time | t_r | | — | 3 | — | ns |
| Turn-Off Delay Time | $t_{d(off)}$ | | — | 20 | — | ns |
| Turn-Off Fall Time | t_f | | — | 3 | — | ns |
| Total Gate Charge | Q_g | $V_{DS}=50V, I_D=20A,$ $V_{GS}=10V,$ (Note3,4) | — | 32 | — | nC |
| Gate-Source Charge | Q_{gs} | | — | 7 | — | nC |
| Gate-Drain Charge | Q_{gd} | | — | 4 | — | nC |
| Drain-Source Body Diode Characteristics and Maximum Ratings | | | | | | |
| Continuous Diode Forward Current | I_S | $V_G = V_D = 0V,$ Force Current | — | — | 100 | A |
| Pulsed Diode Forward Current | I_{SM} | | — | — | 400 | A |
| Diode Forward Voltage | V_{SD} | $I_S=20A, V_{GS}=0V$ | — | — | 1.3 | V |

Notes

1. Repetitive Rating: pulse width limited by maximum junction temperature.
2. $L=0.4\text{mH}, R_g=25\Omega, I_{AS}=30A$, starting $T_j=25^\circ\text{C}$.
3. $di/dt=200A/\mu s$, starting $T_j=25^\circ\text{C}$, Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.
4. Repetitive rating; pulse width limited by maximum junction temperature.

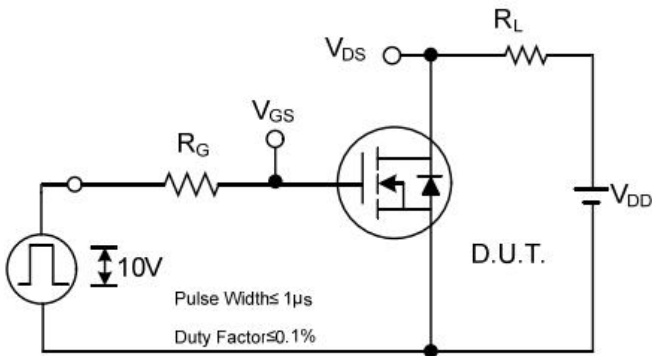
RATING AND CHARACTERISTIC CURVES



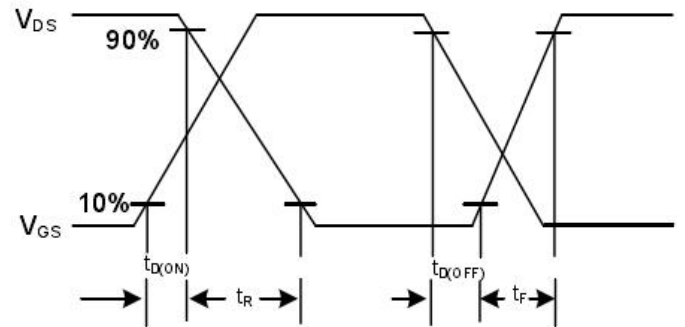
Peak Diode Recovery dv/dt Test Circuit



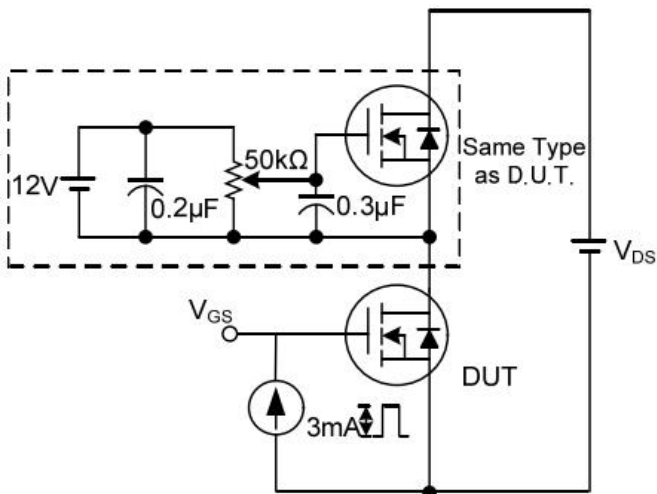
Peak Diode Recovery dv/dt Waveforms



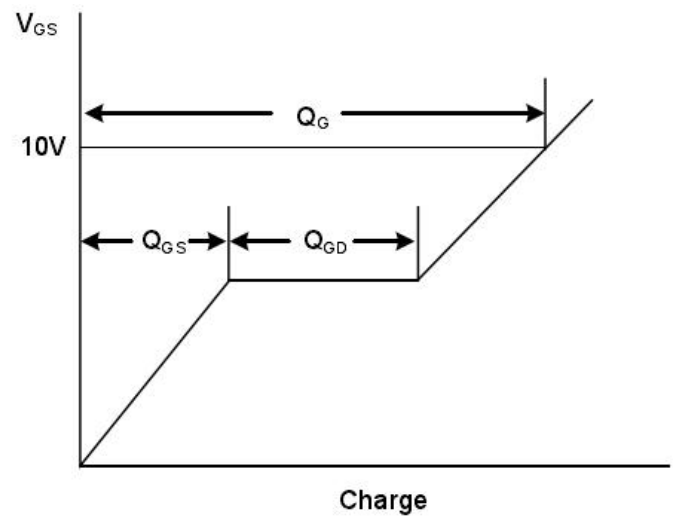
Switching Test Circuit



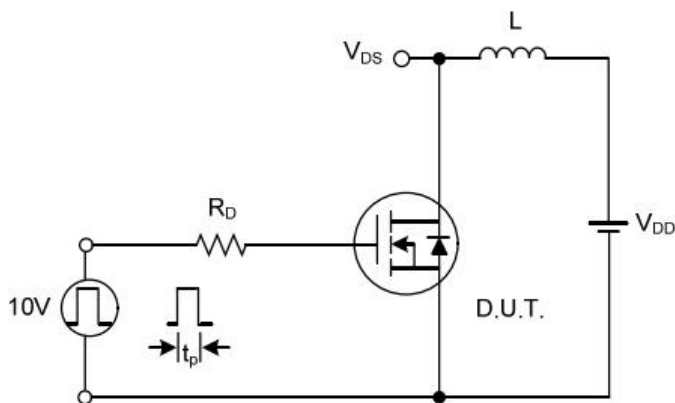
Switching Waveforms



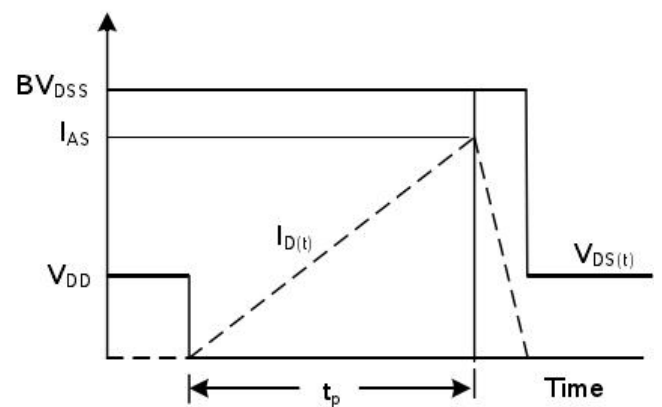
Gate Charge Test Circuit



Gate Charge Waveform

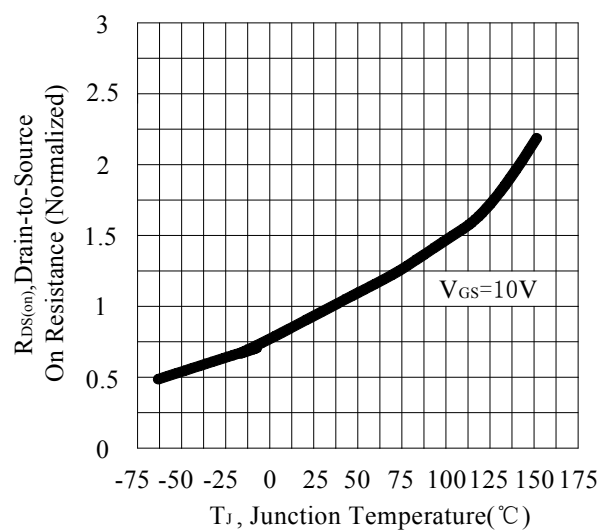
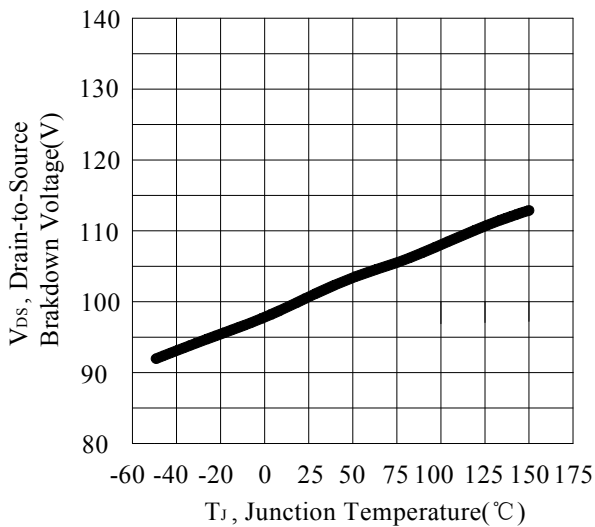
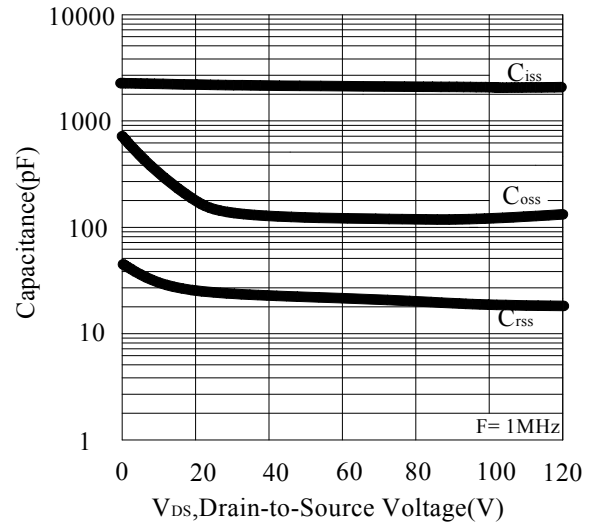
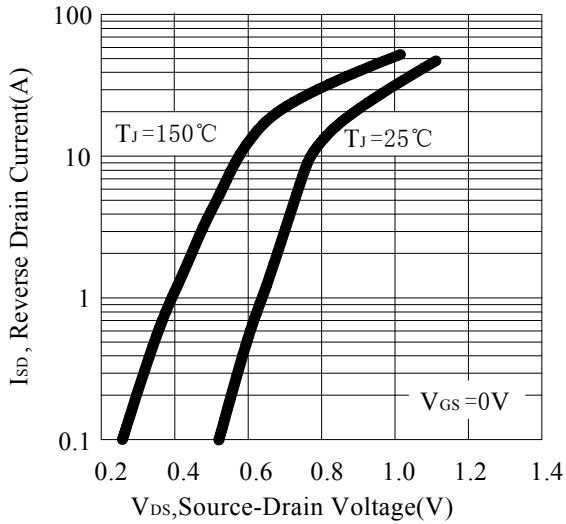
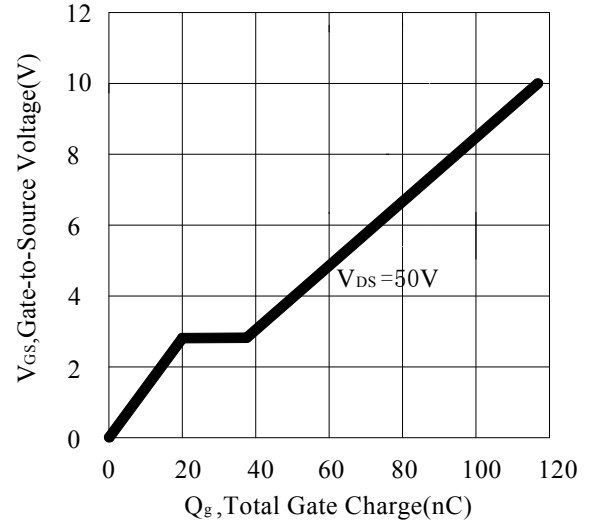
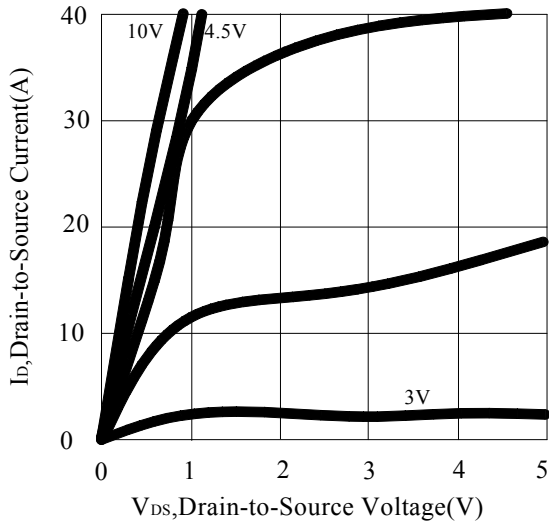


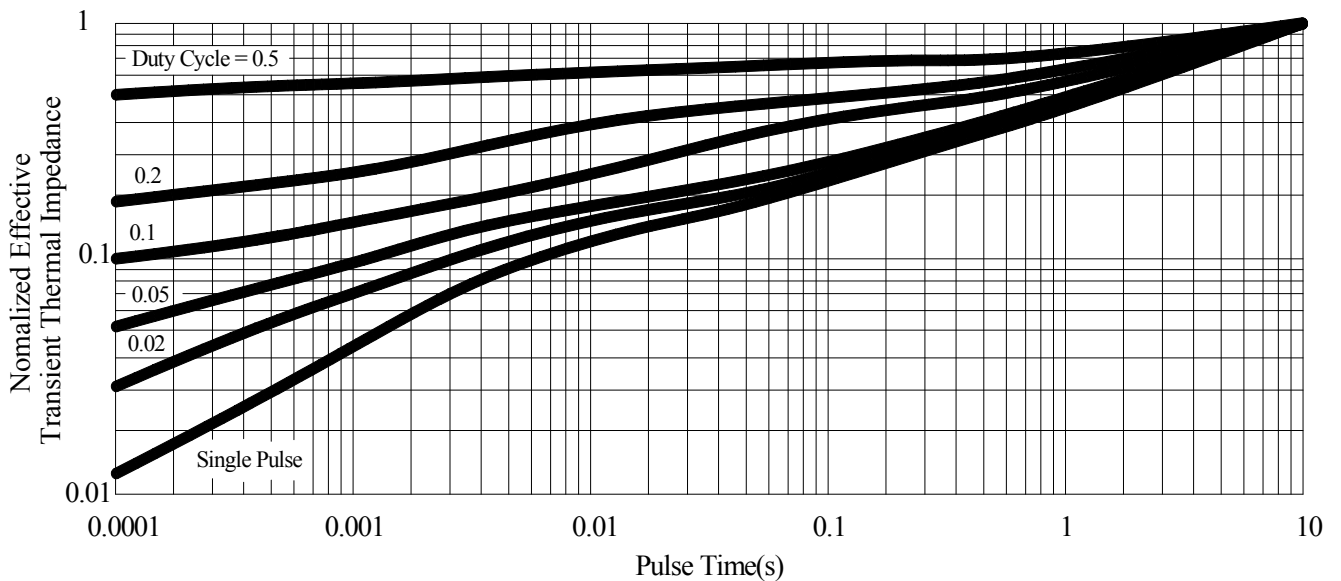
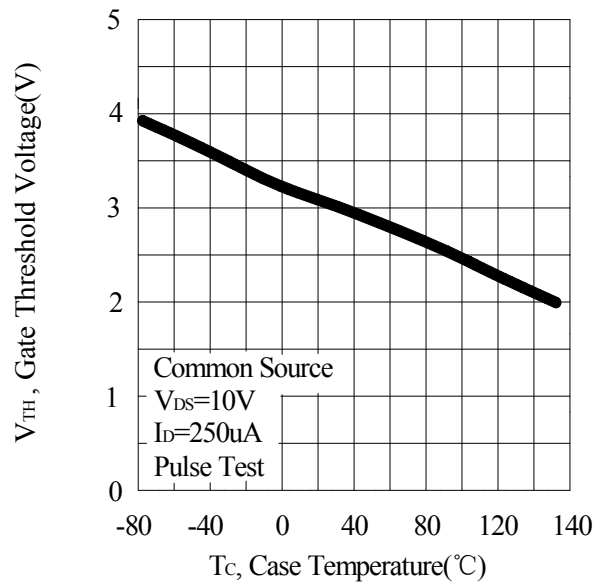
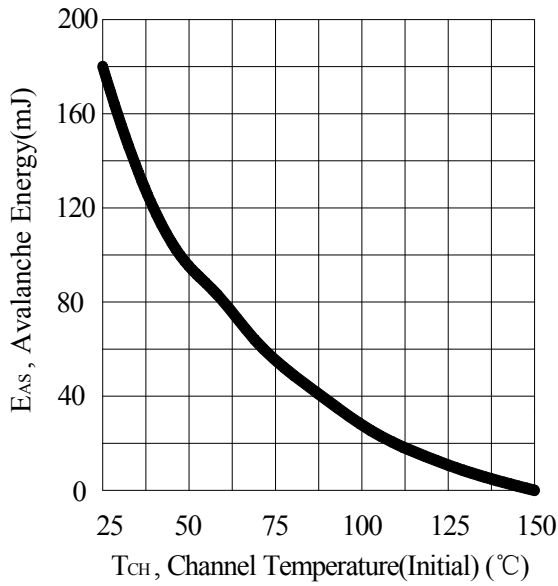
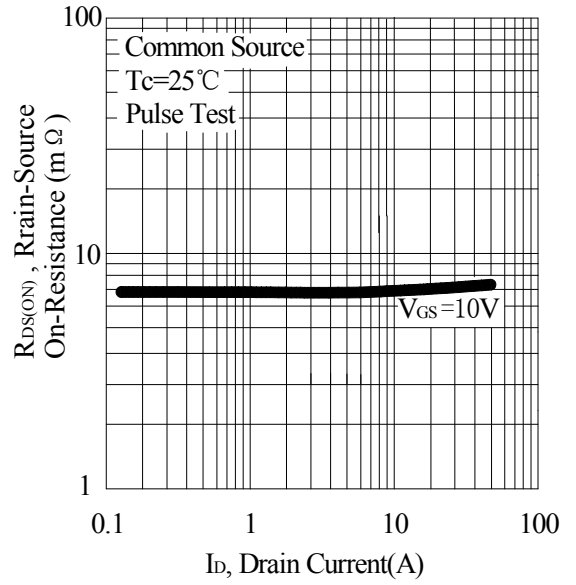
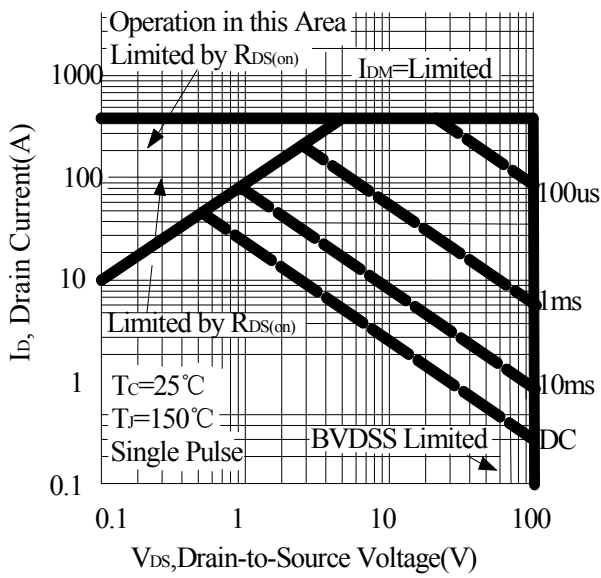
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

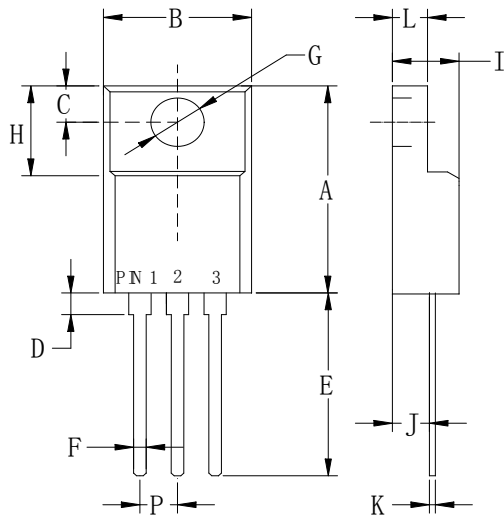
RATING AND CHARACTERISTIC CURVES





PACKAGE OUTLINE DIMENSIONS

TO-220NF



| TO-220NF | | |
|----------|-------------|-------------|
| Dim | Min | Max |
| A | .590 (15.0) | .650 (16.5) |
| B | .393 (10.0) | .414 (10.5) |
| C | .118 (3.00) | .138 (3.50) |
| D | .027 (0.7) | .038 (0.95) |
| E | .490 (12.5) | .531 (13.5) |
| F | .020 (0.53) | .029 (0.73) |
| G | .125 (3.20) | .146 (3.70) |
| H | .255 (6.50) | .280 (7.10) |
| I | .173 (4.40) | .197 (5.00) |
| J | .098 (2.50) | .114 (2.90) |
| K | .018 (0.45) | .026 (0.65) |
| L | .092 (2.35) | .109 (2.75) |
| P | .890 (2.25) | .113 (2.85) |