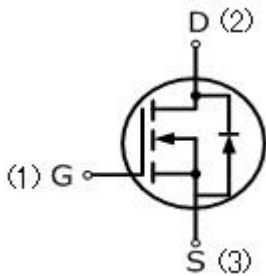


# 150N06Y

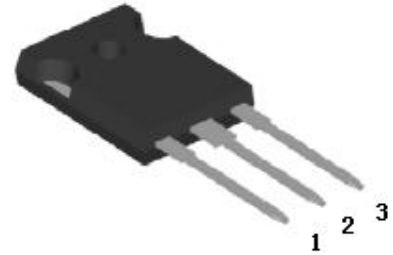
## 150 Amps,60 Volts N-CHANNEL MOSFET

### FEATURE

- 150A,60V, $R_{DS(ON)MAX}=6m\Omega @V_{GS}=10V/30A$
- Low gate charge
- Low  $C_{iss}$
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



### TO-247



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

| Parameter   | Symbol           | 150N06Y     | UNIT             |
|---|------------------|-------------|------------------|
| Drain-Source Voltage  | $V_{DSS}$        | 60          | V                |
| Gate-Source Voltage   | $V_{GSS}$        | $\pm 30$    |                  |
| Continuous Drain Current  | $I_D$            | 150         | A                |
| Pulsed Drain Current(Note1)   | $I_{DM}$         | 450         |                  |
| Single Pulse Avalanche Energy (Note 2)  | $E_{AS}$         | 450         | mJ               |
| Avalanche Current(Note1)  | $I_{AR}$         | 30          | A                |
| Reverse Diode dV/dt (Note 3)  | dv/dt            | 5.5         | V/ns             |
| Operating Junction and Storage Temperature Range                              | $T_J, T_{STG}$   | -55 to +150 | $^\circ\text{C}$ |
| Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds | $T_L$            | 260         | $^\circ\text{C}$ |
| Mounting Torque   | 6-32 or M3 screw | 10          | lbf • in         |
|   |                  | 1.1         | N • m            |

### Thermal Characteristics

| Parameter                             | Symbol        | TO-247 | Units                     |
|---------------------------------------|---------------|--------|---------------------------|
| Thermal resistance , Junction to Case | $R_{th(J-c)}$ | 0.8    | $^\circ\text{C}/\text{W}$ |
| Maximum Power Dissipation             | $P_D$         | 156    | W                         |

| <b>Electrical Characteristics</b> ( $T_c=25^\circ\text{C}$ , unless otherwise noted) |                                |  |     |      |      |                    |
|--|--------------------------------|--|-----|------|------|--------------------|
| Parameter  | Symbol                         | Test Conditions  | Min | Typ  | Max  | Units              |
| <b>Off Characteristics</b>   |                                |  |     |      |      |                    |
| Drain-Source Breakdown Voltage   | $BV_{DSS}$                     | $V_{GS}=0V, I_D=250\mu A$                              | 60  | —    | —    | V                  |
| Breakdown Temperature Coefficient  | $\Delta BV_{DSS} / \Delta T_J$ | Reference to $25^\circ\text{C}$ ,<br>$I_D=250\mu A$    | —   | 0.6  | —    | $V/^\circ\text{C}$ |
| Zero Gate Voltage Drain Current  | $I_{DSS}$                      | $V_{DS}=60V, V_{GS}=0V$                                | —   | —    | 1    | $\mu A$            |
| 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                 |
| <b>On Characteristics</b>  |                                |  |     |      |      |                    |
| Gate-Source Threshold Voltage  | $V_{GS(th)}$                   | $V_{DS}=10V, I_D=250\mu A$                             | 2   | —    | 4    | V                  |
| Drain-Source On-State Resistance   | $R_{DS(on)}$                   | $V_{GS}=10V, I_D=30A$                                  | —   | 4.5  | 6.0  | $m\Omega$          |
| <b>Dynamic Characteristics</b>   |                                |  |     |      |      |                    |
| Input Capacitance  | $C_{iss}$                      | $V_{DS}=30V, V_{GS}=0V,$<br>$f=1.0\text{MHZ}$          | —   | 4550 | —    | pF                 |
| Output Capacitance   | $C_{oss}$                      |  | —   | 625  | —    | pF                 |
| Reverse Transfer Capacitance   | $C_{rss}$                      |  | —   | 360  | —    | pF                 |
| <b>Switching Characteristics</b>   |                                |  |     |      |      |                    |
| Turn-On Delay Time   | $t_{d(on)}$                    | $V_{DD}=30V, I_D=30A,$<br>$R_G=0.4\Omega$ (Note4,5)    | —   | 78   | —    | ns                 |
| Turn-On Rise Time  | $t_r$                          |  | —   | 119  | —    | ns                 |
| Turn-Off Delay Time  | $t_{d(off)}$                   |  | —   | 692  | —    | ns                 |
| Turn-Off Fall Time   | $t_f$                          |  | —   | 310  | —    | ns                 |
| Total Gate Charge  | $Q_g$                          | $V_{DS}=30V, I_D=30A,$<br>$V_{GS}=10V,$ (Note4,5)      | —   | 217  | —    | nC                 |
| Gate-Source Charge   | $Q_{gs}$                       |  | —   | 45   | —    | nC                 |
| Gate-Drain Charge  | $Q_{gd}$                       |  | —   | 30   | —    | nC                 |
| <b>Drain-Source Body Diode Characteristics and Maximum Ratings</b>                   |                                |  |     |      |      |                    |
| Continuous Diode Forward Current   | $I_S$                          |  | —   | —    | 150  | A                  |
| Pulsed Diode Forward Current   | $I_{SM}$                       |  | —   | —    | 450  | A                  |
| Diode Forward Voltage  | $V_{SD}$                       | $I_S=30A, V_{GS}=0V$                                   | —   | —    | 1.3  | V                  |
| Reverse Recovery Time  | $t_{rr}$                       | $V_{GS}=0V, I_S=30A,$<br>$dI_F/dt=100A/\mu s,$ (Note4) | —   | 37   | —    | ns                 |
| Reverse Recovery Charge  | $Q_{rr}$                       |  | —   | 23   | —    | $\mu C$            |

#### Notes

1. Repetitive Rating; pulse width limited by maximum junction temperature.
2.  $L=0.1\text{mH}, R_g=25\Omega, I_{AS}=100A$ , starting  $T_J=25^\circ\text{C}$ .
3.  $I_{SD} \leq I_D, dI/dt=200A/\mu s, V_{DD} \leq BV_{DSS}$ , starting  $T_J=25^\circ\text{C}$ .
4. Pulse width  $\leq 300\mu s$ ; duty cycle  $\leq 2\%$ .
5. Repetitive rating; pulse width limited by maximum junction temperature.

## RATING AND CHARACTERISTIC CURVES



Peak Diode Recovery  $dv/dt$  Test Circuit



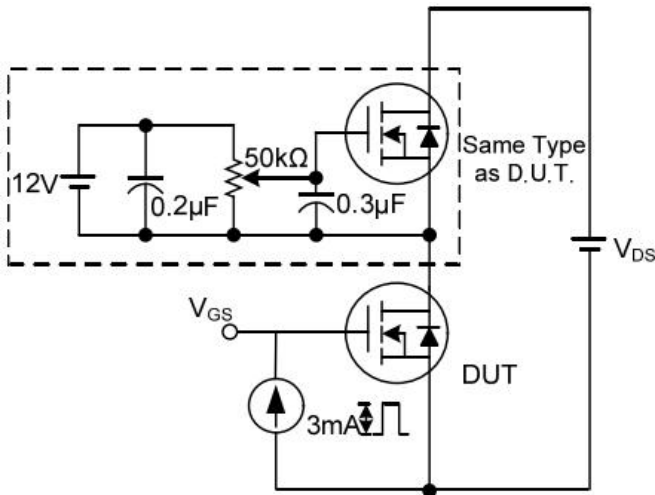
Peak Diode Recovery  $dv/dt$  Waveforms



**Switching Test Circuit**



**Switching Waveforms**



**Gate Charge Test Circuit**



**Gate Charge Waveform**

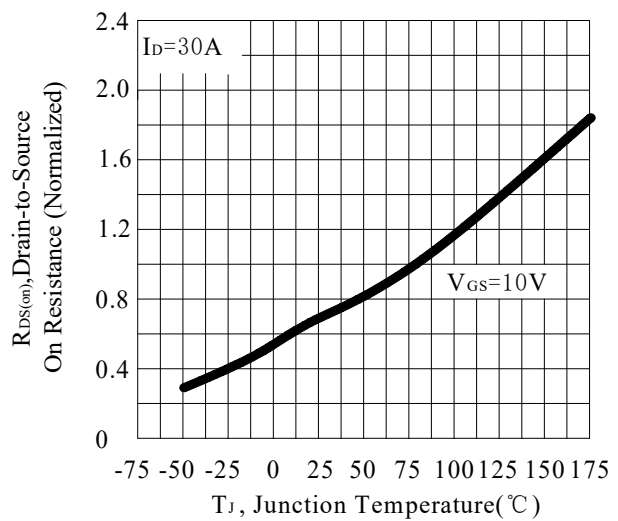
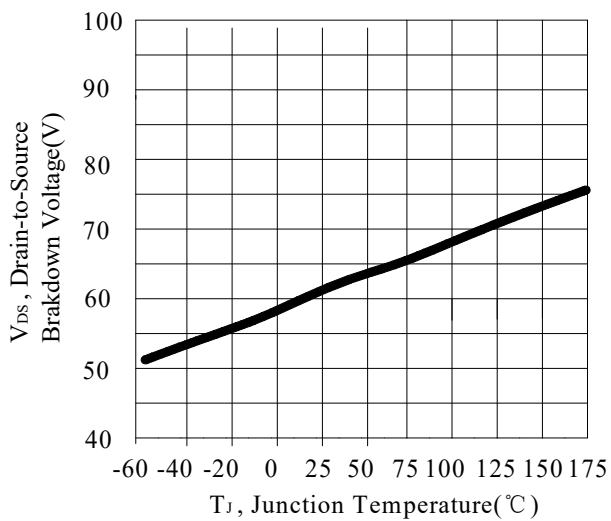
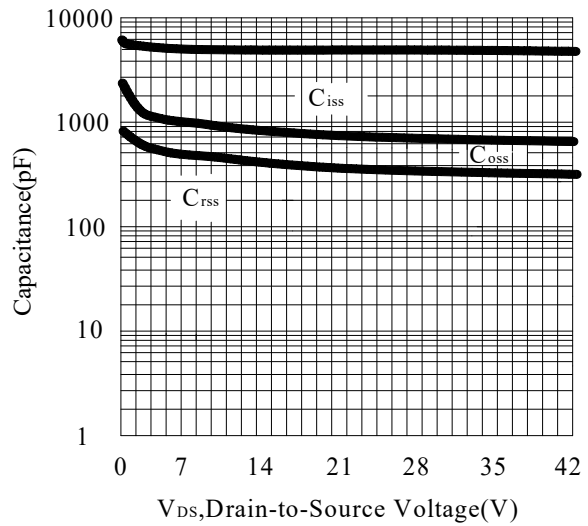
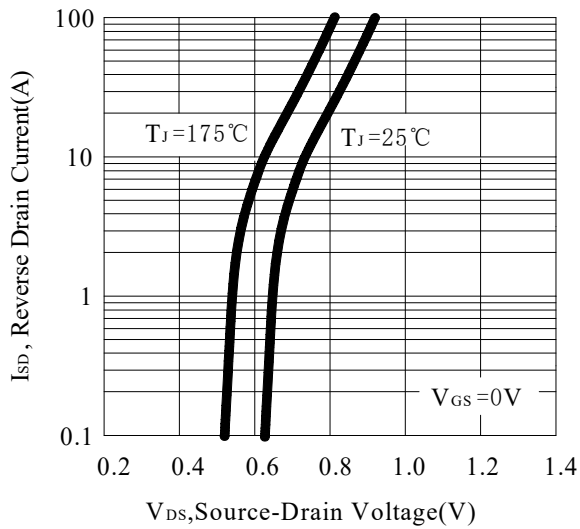
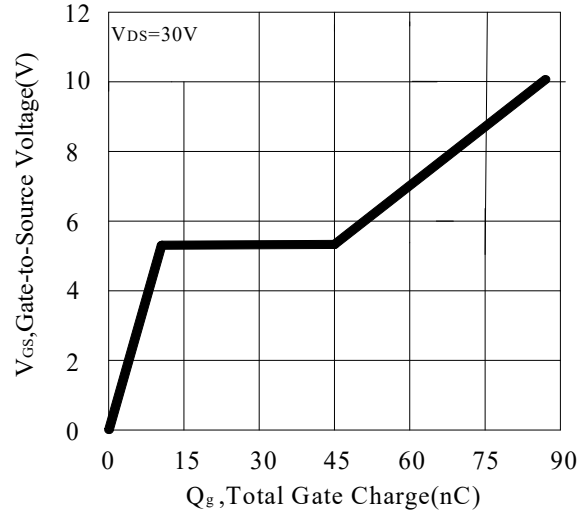
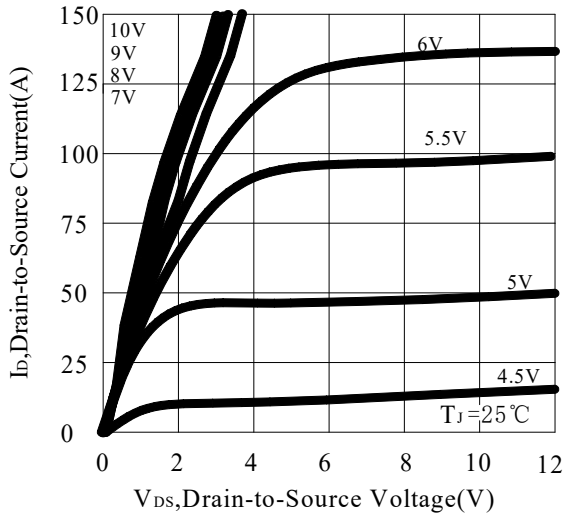


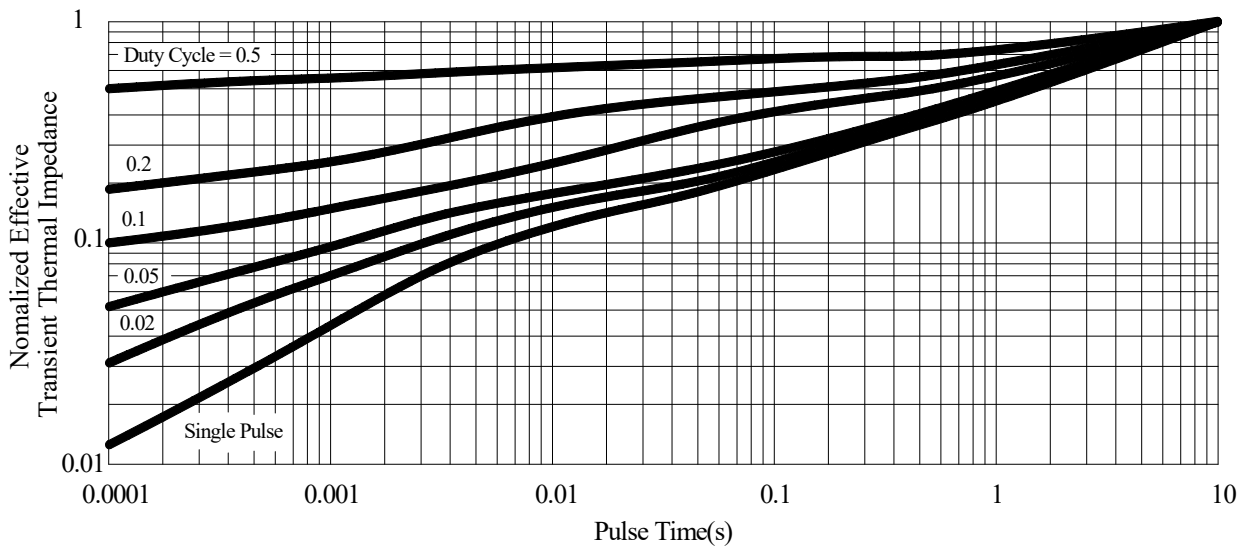
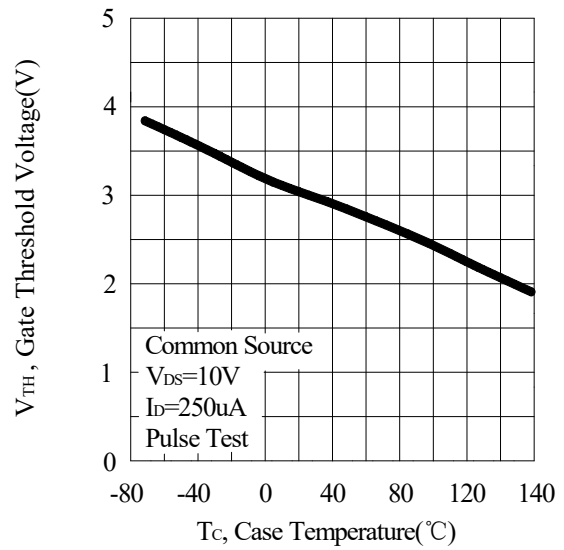
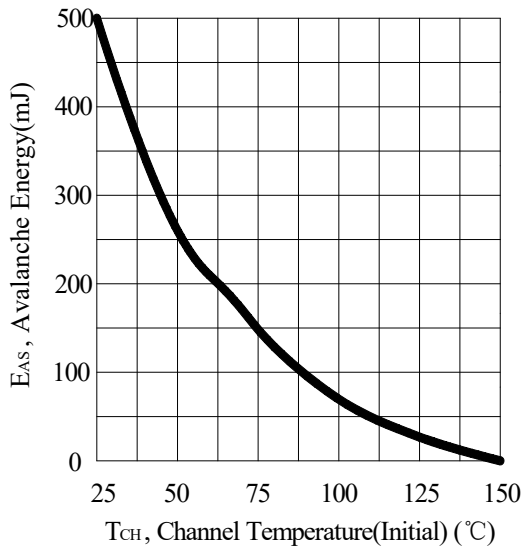
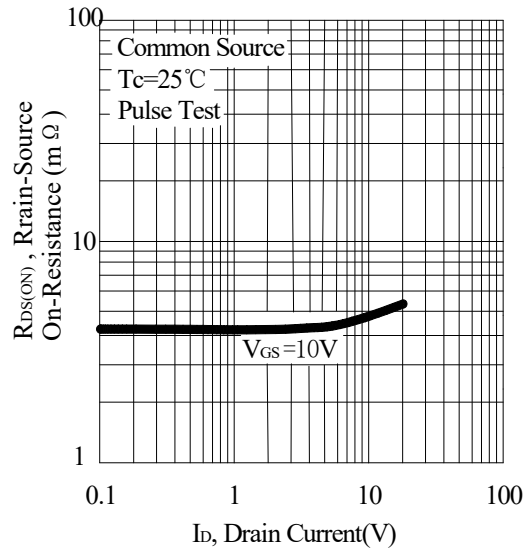
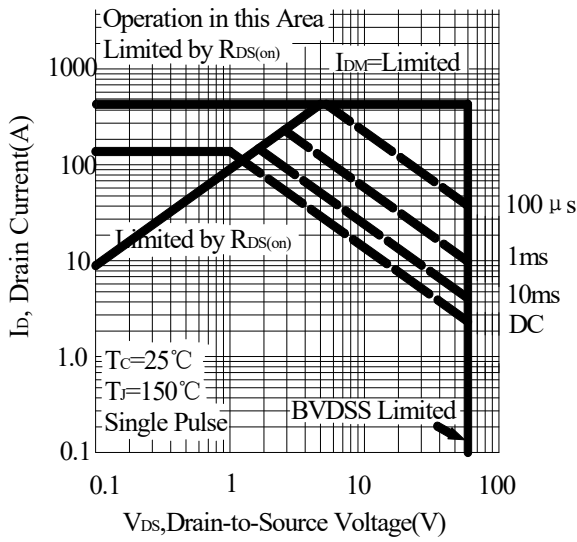
**Unclamped Inductive Switching Test Circuit**



**Unclamped Inductive Switching Waveforms**

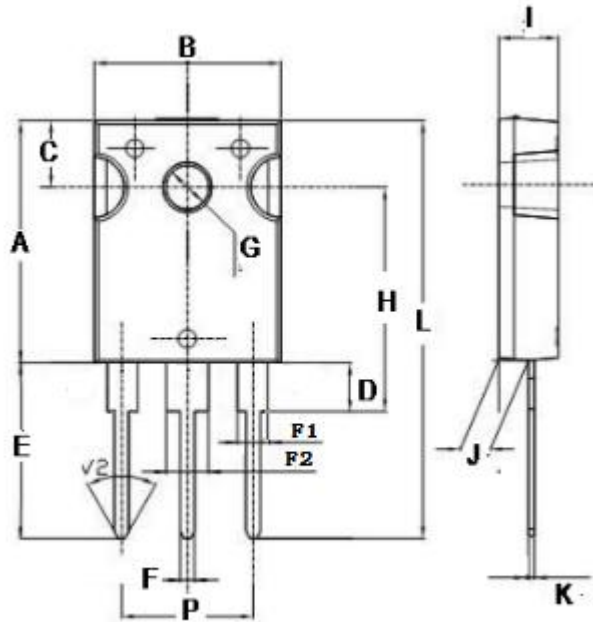
## RATING AND CHARACTERISTIC CURVES





**PACKAGE OUTLINE DIMENSIONS**

**TO-247**



| Dim | Min  | Max  |
|-----|------|------|
| A   | 20.0 | 22.0 |
| B   | 15.5 | 16.0 |
| C   | 5.7  | 6.3  |
| D   | 4.0  | 4.4  |
| E   | 19.0 | 21.0 |
| F   | 1.1  | 1.3  |
| G   | 3.5  | 3.8  |
| H   | 18.3 | 20.2 |
| I   | 4.9  | 5.2  |
| J   | 2.3  | 2.5  |
| K   | 0.55 | 0.65 |
| L   | 39.0 | 42.0 |
| P   | 10.7 | 10.9 |
| F1  | 1.9  | 2.1  |
| F2  | 2.9  | 3.1  |
| mm  |      |      |

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