

Features

- $R_{DS(ON)} < 1.2\Omega @ V_{GS}=10V$
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.
- Green molding compound

Mechanical Data

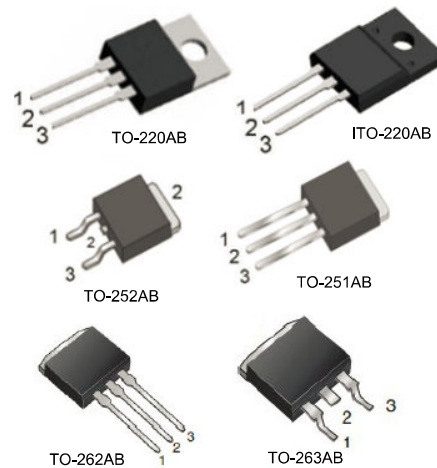
- Case: TO-251AB, TO-252AB, TO-220, ITO-220AB, TO-262AB, TO-263AB Package

Ordering Information

| Part No. | Package | Packing |
|----------|-----------|--------------------|
| AU8N60S | TO-251AB | 75pcs / Tube |
| AD8N60S | TO-252AB | 2.5Kpcs / 13" Reel |
| AT8N60S | TO-220AB | 50pcs / Tube |
| AF8N60S | ITO-220AB | 50pcs / Tube |
| AK8N60S | TO-262AB | 50pcs / Tube |
| AG8N60S | TO-263AB | 800pcs / 13" Reel |

PRODUCT SUMMARY

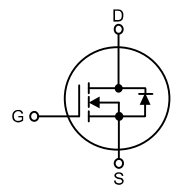
| V_{DS} (V) | $R_{DS(on)}$ (Ω) | I_D (A) |
|--------------|---------------------------|-----------|
| 600 | 1.2 @ $V_{GS}=10V$ | 8 |



Pin Definition:

1. Gate
2. Drain
3. Source

Block Diagram



ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ C$, unless otherwise specified)

| PARAMETER | | SYMBOL | RATINGS | UNIT |
|------------------------------------|----------------------------|-----------|------------|------------|
| Drain-Source Voltage | | V_{DSS} | 600 | V |
| Gate-Source Voltage | | V_{GSS} | ± 30 | V |
| Avalanche Current (Note 2) | | I_{AR} | 8 | A |
| Continuous Drain Current | | I_D | 8 | A |
| Pulsed Drain Current (Note 2) | | I_{DM} | 32 | A |
| Avalanche Energy | Single Pulsed (Note 3) | E_{AS} | 230 | mJ |
| Peak Diode Recovery dv/dt (Note 4) | | dv/dt | 4.5 | ns |
| Power Dissipation | TO-220AB/TO-262AB/TO-263AB | P_D | 142 | W |
| | ITO-220AB | | 48 | W |
| | TO-251AB/TO-252AB | | 62 | W |
| Junction Temperature | | T_J | +150 | $^\circ C$ |
| Operating Temperature | | T_{OPR} | -55 ~ +150 | $^\circ C$ |
| Storage Temperature | | T_{STG} | -55 ~ +150 | $^\circ C$ |

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating : Pulse width limited by T_J
3. $L = 7.1mH$, $I_{AS} = 8A$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting $T_J = 25^\circ C$
4. $I_{SD} \leq 7.5A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ C$

THERMAL DATA

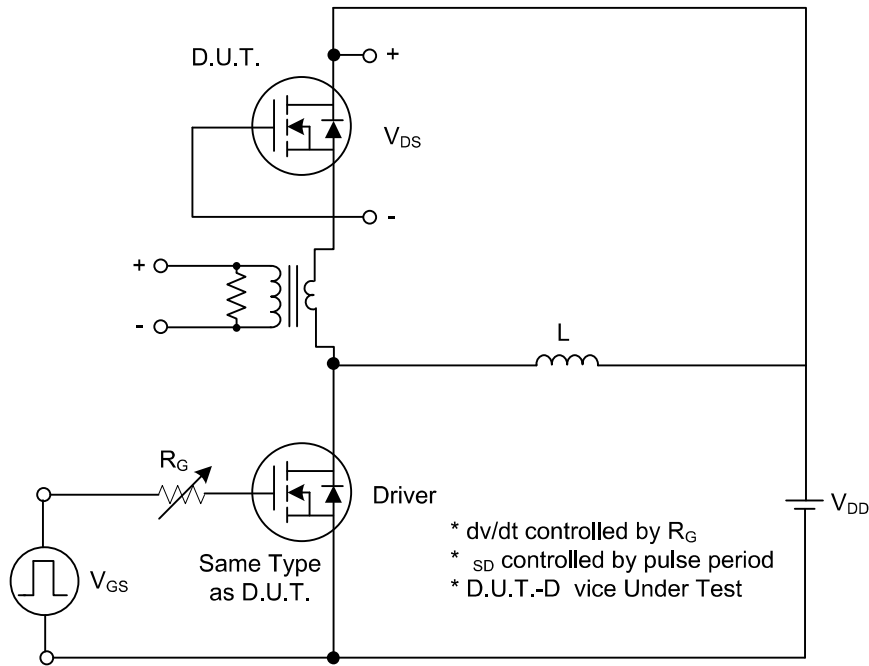
| PARAMETER | | SYMBOL | RATING | UNIT |
|---------------------|----------------------------|---------------|--------|------|
| Junction to Ambient | | θ_{JA} | 62.5 | °C/W |
| Junction to Case | TO-220AB/TO-262AB/TO-263AB | θ_{JC} | 0.85 | °C/W |
| | TO-220AB | | 2.6 | |
| | TO-251AB/TO-252AB | | 2.0 | |

ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

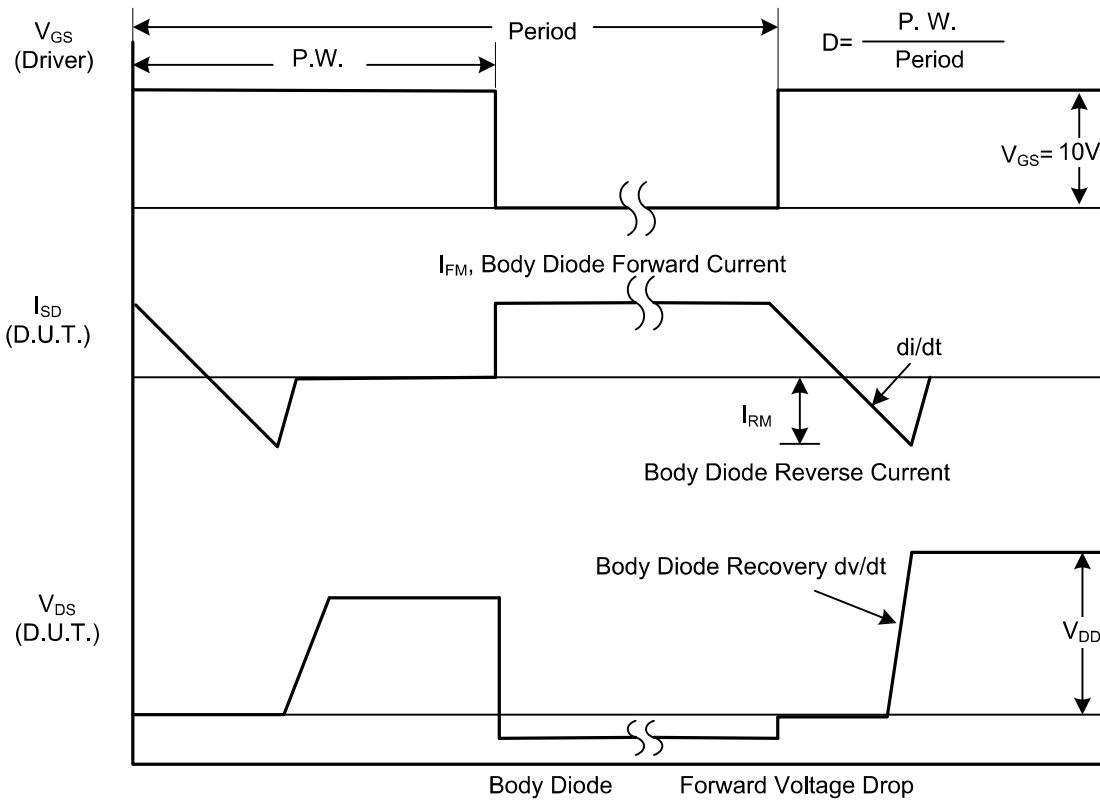
| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|---------|------------------------------|---|-----|------|------|----------|
| OFF CHARACTERISTICS | | | | | | | |
| Drain-Source Breakdown Voltage | | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 600 | | | V |
| Drain-Source Leakage Current | | I_{DSS} | $V_{DS}=600V, V_{GS}=0V$ | | | 10 | μA |
| Gate- Source Leakage Current | Forward | I_{GSS} | $V_G=30V, V_{DS}=0V$ | | | 100 | nA |
| | Reverse | | $V_{GS}=-30V, V_{DS}=0V$ | | | -100 | nA |
| Breakdown Voltage Temperature Coefficient | | $\Delta BV_{DSS}/\Delta T_J$ | $I_D=250\mu A$, Referenced to 25°C | | 0.7 | | V/°C |
| ON CHARACTERISTICS | | | | | | | |
| Gate Threshold Voltage | | $V_{GS(TH)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2.0 | | 4.0 | V |
| Static Drain-Source On-State Resistance | | $R_{DS(ON)}$ | $V_{GS} = 10V, I_D = 4A$ | | 1.0 | 1.2 | Ω |
| DYNAMIC CHARACTERISTICS | | | | | | | |
| Input Capacitance | | C_{ISS} | $V_{DS}=25V, V_{GS}=0V, f=1.0\text{ MHz}$ | | 965 | 1255 | pF |
| Output Capacitance | | C_{OSS} | | | 105 | 135 | pF |
| Reverse Transfer Capacitance | | C_{RSS} | | | 12 | 16 | pF |
| SWITCHING CHARACTERISTICS | | | | | | | |
| Turn-On Delay Time | | $t_{D(ON)}$ | $V_{DD} = 300V, I_D = 8A, R_G = 25\Omega$ (Note 1, 2) | | 16.5 | 45 | ns |
| Turn-On Rise Time | | t_R | | | 60.5 | 130 | ns |
| Turn-Off Delay Time | | $t_{D(OFF)}$ | | | 81 | 170 | ns |
| Turn-Off Fall Time | | t_F | | | 64.5 | 140 | ns |
| Total Gate Charge | | Q_G | $V_{DS}=480V, I_D=8A, V_{GS}=10V$ (Note 1, 2) | | 28 | 36 | nC |
| Gate-Source Charge | | Q_{GS} | | | 4.5 | | nC |
| Gate-Drain Charge | | Q_{GD} | | | 12 | | nC |
| DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS | | | | | | | |
| Drain-Source Diode Forward Voltage | | V_{SD} | $V_{GS} = 0V, I_S = 8A$ | | | 1.4 | V |
| Maximum Continuous Drain-Source Diode Forward Current | | I_S | | | | 8 | A |
| Maximum Pulsed Drain-Source Diode Forward Current | | I_{SM} | | | | 32 | A |
| Reverse Recovery Time | | t_{rr} | $V_{GS}=0V, I_S=8A,$ | | 365 | | ns |
| Reverse Recovery Charge | | Q_{RR} | $di_F/dt = 100\text{ A}/\mu s$ (Note 1) | | 3.4 | | μC |

Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.
 2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

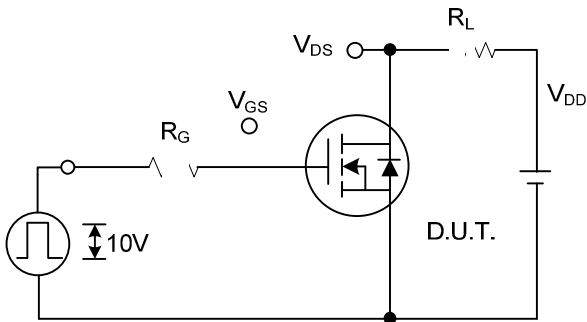


Peak Diode Recovery dv/dt Test Circuit

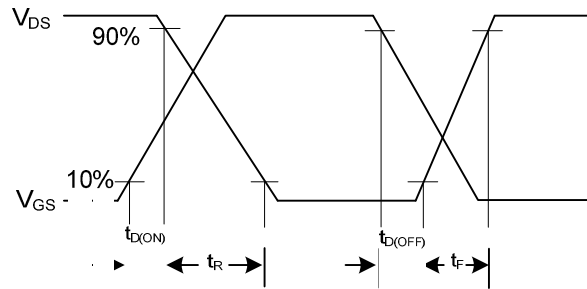


Peak Diode Recovery dv/dt Waveforms

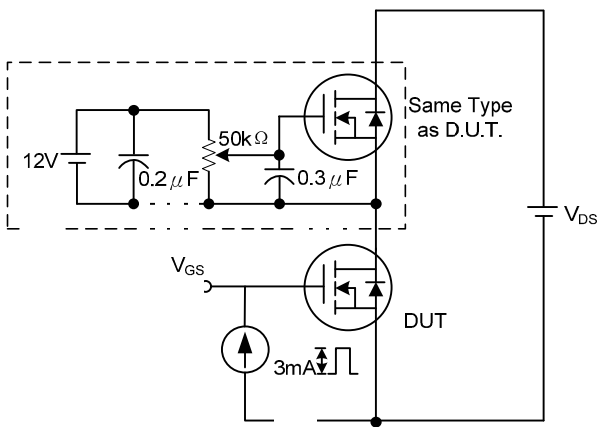
TEST CIRCUITS AND WAVEFORMS(Cont.)



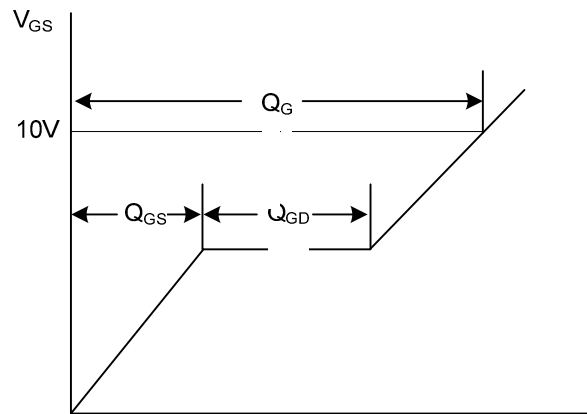
Switching Test Circuit



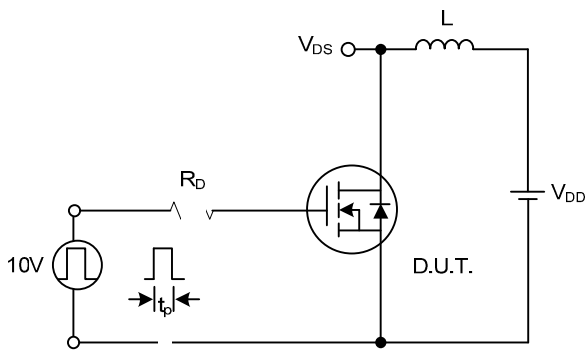
Switching Waveforms



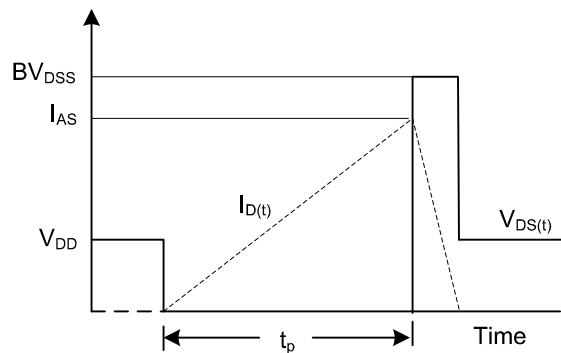
Gate Charge Test Circuit



Charge Gate Charge Waveform

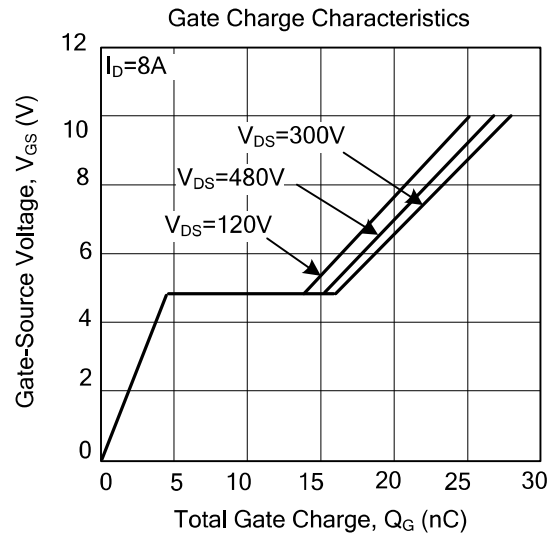
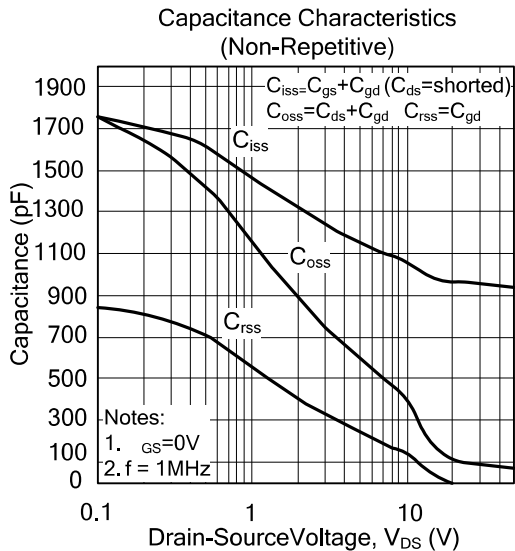
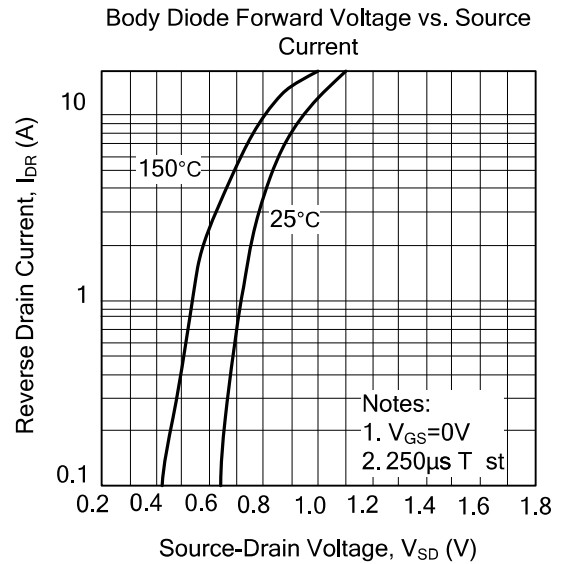
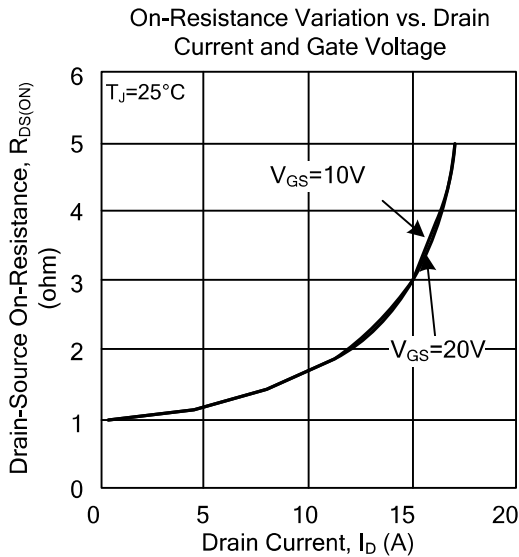
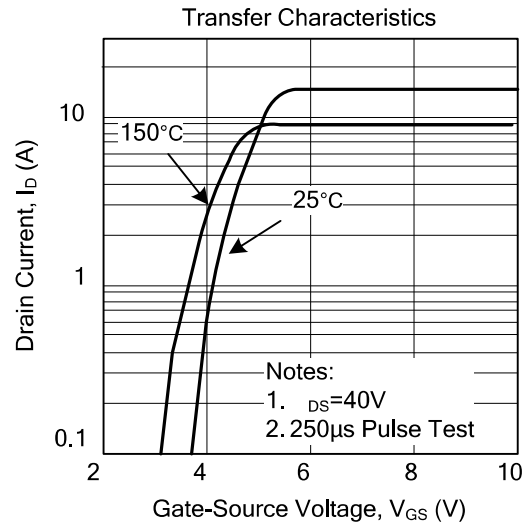
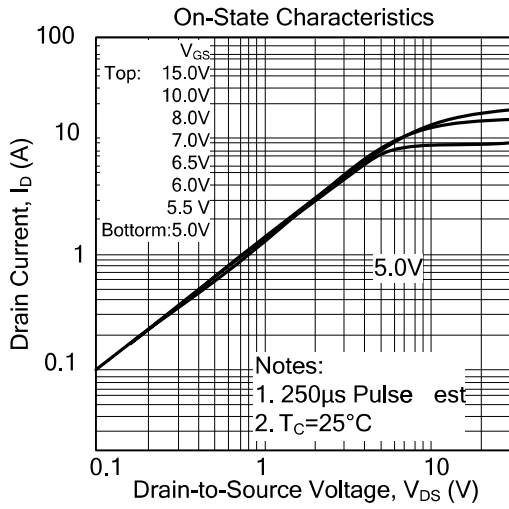


Unclamped Inductive Switching Test Circuit

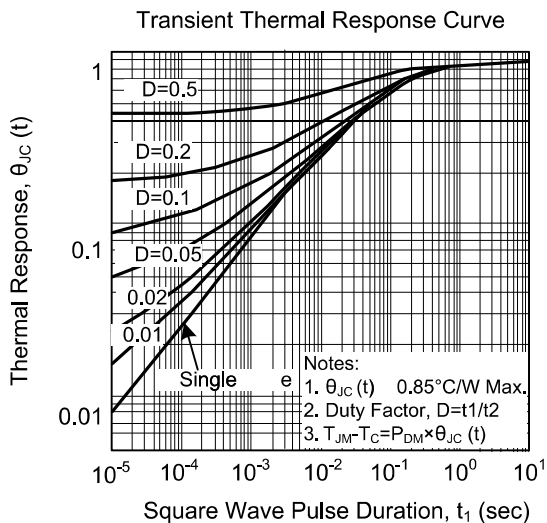
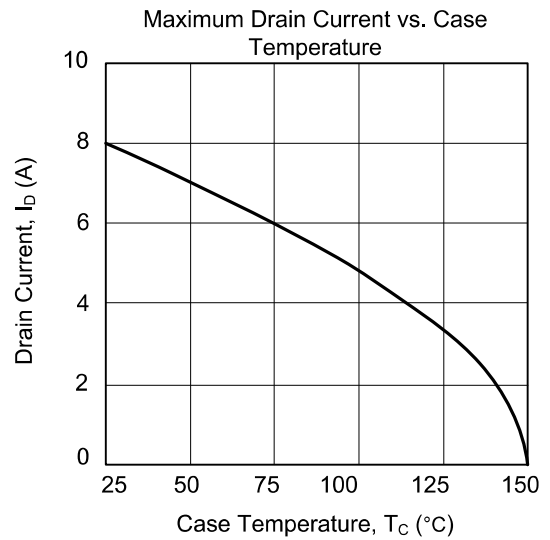
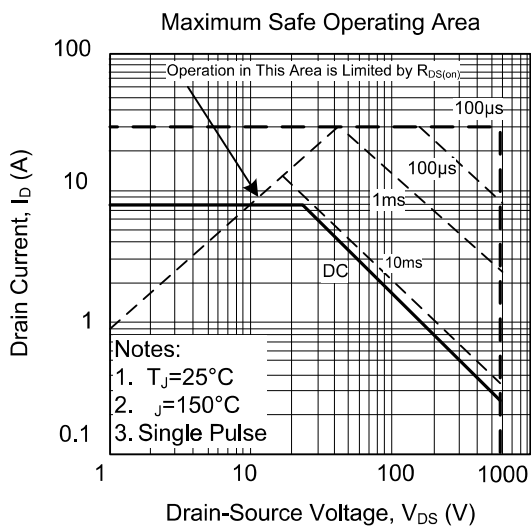
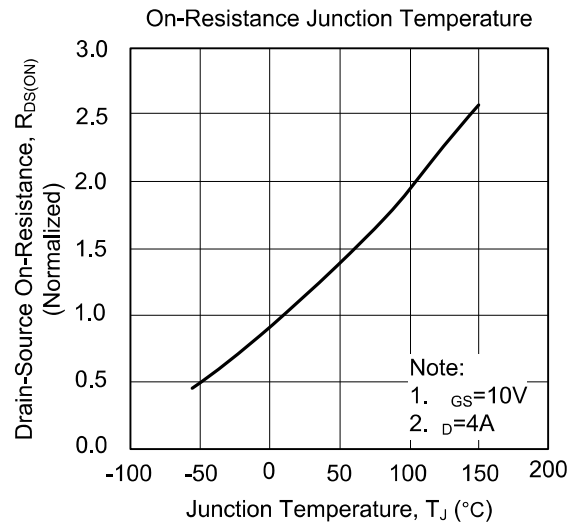
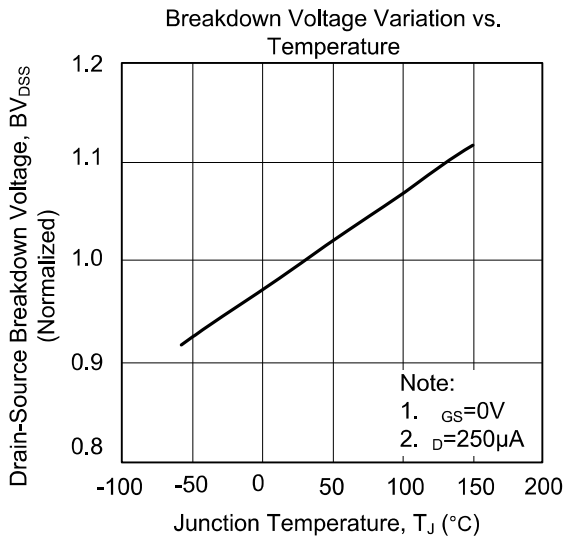


Unclamped Inductive Switching Waveforms

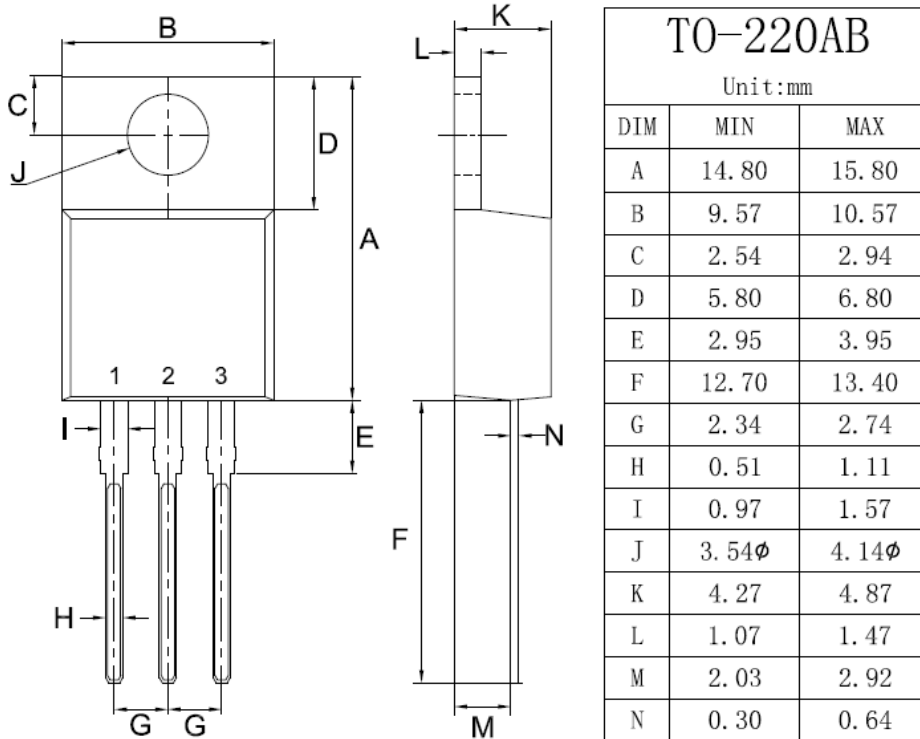
TYPICAL CHARACTERISTICS



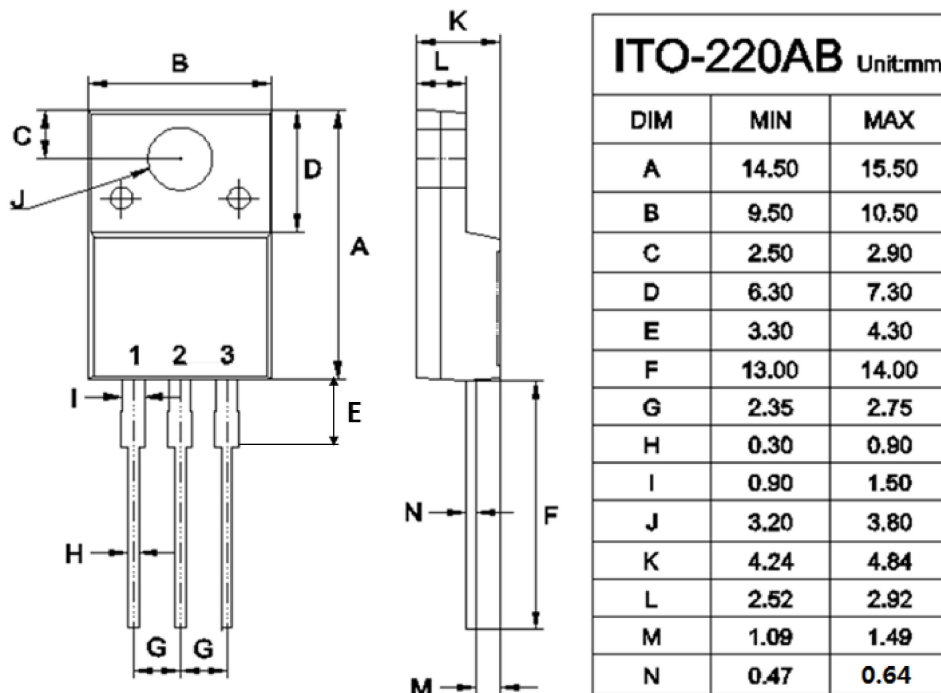
TYPICAL CHARACTERISTICS



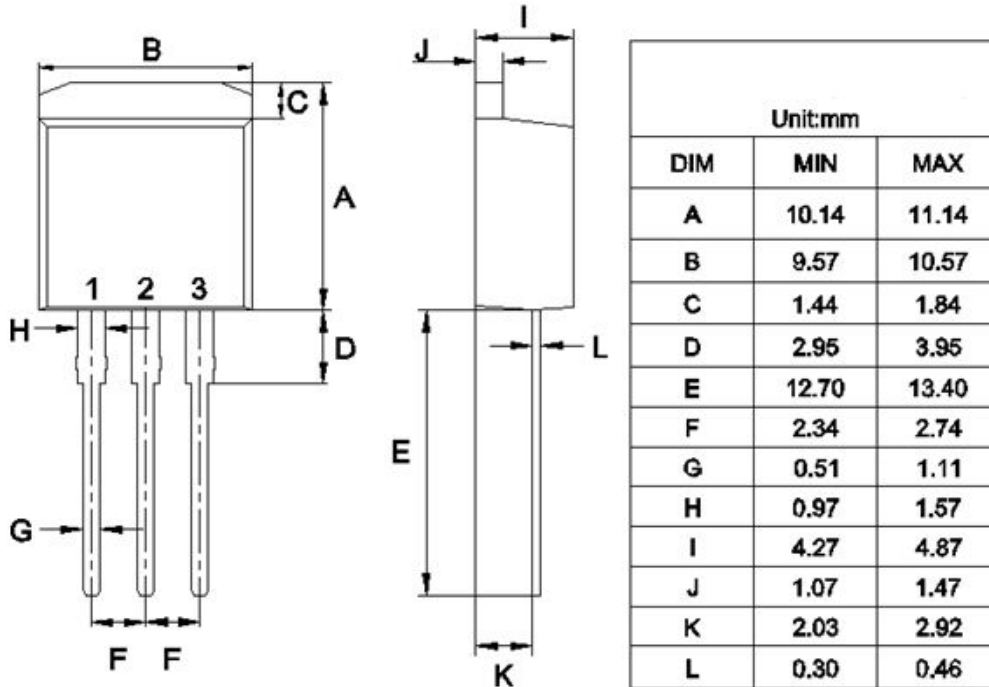
TO-220AB Mechanical Drawing



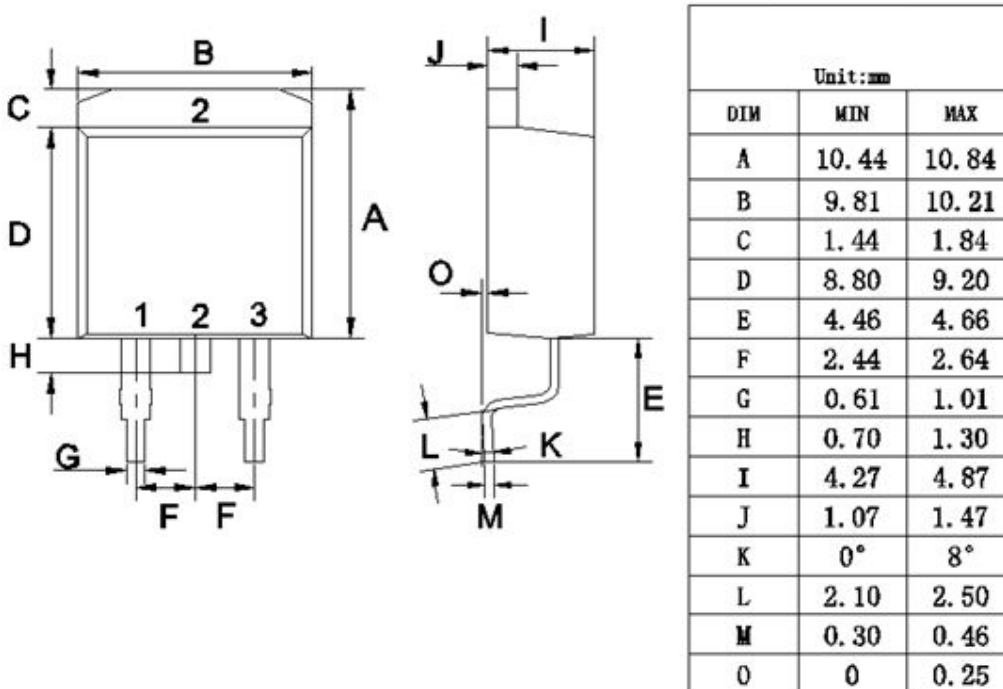
ITO-220AB Mechanical Drawing



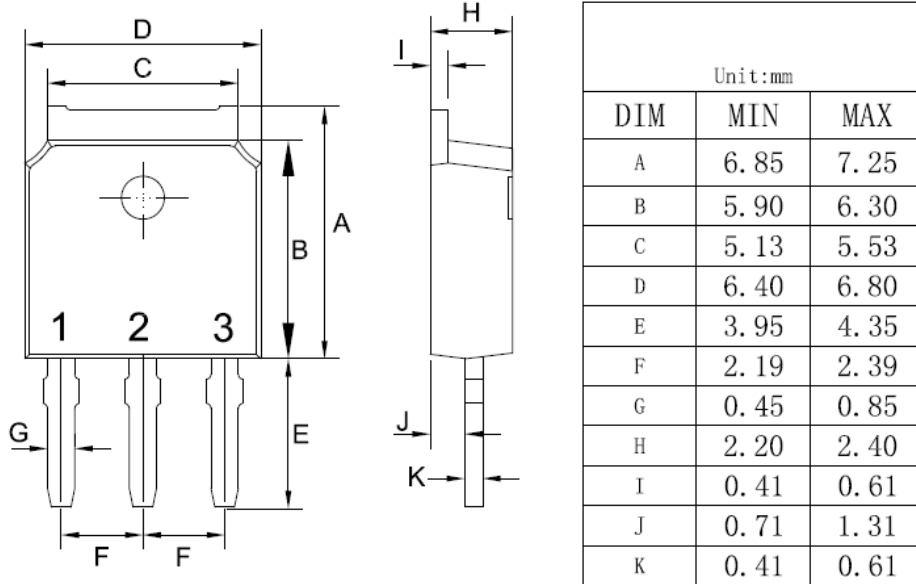
TO-262AB Mechanical Drawing



TO-263AB Mechanical Drawing



TO-251AB Mechanical Drawing



TO-252AB Mechanical Drawing

