

Features

- $R_{DS(ON)} < 0.9\Omega @ V_{GS}=10V$
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.
- Green molding compound

PRODUCT SUMMARY

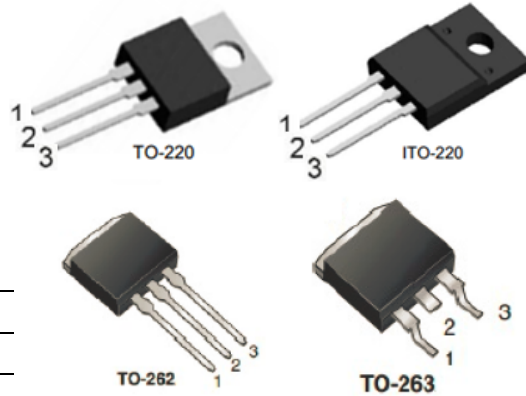
| V_{DS} (V) | $R_{DS(on)}$ (Ω) | I_D (A) |
|--------------|---------------------------|-----------|
| 600 | 0.9 @ $V_{GS}=10V$ | 10 |

Pin Definition:

1. Gate
2. Drain
3. Source

Mechanical Data

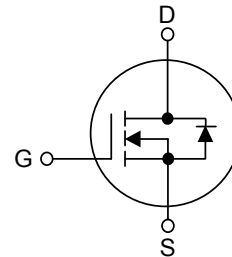
- Case: TO-220, ITO-220, TO-262, TO-263 Package



Ordering Information

| Part No. | Package | Packing |
|-------------|---------|-------------------|
| DMT10N60-TU | TO-220 | 50pcs / Tube |
| DMF10N60-TU | ITO-220 | 50pcs / Tube |
| DMK10N60-TU | TO-262 | 50pcs / Tube |
| DMG10N60-TU | TO-263 | 50pcs / Tube |
| DMG10N60-TR | TO-263 | 800pcs / 13" Reel |

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 | |
| Continuous Drain Current | I_D | 10 | A | |
| Pulsed Drain Current (Note 2) | I_{DM} | 38 | A | |
| Avalanche Energy | Single Pulsed (Note 3) | E_{AS} | 700 | mJ |
| Power Dissipation | TO-220/TO-262/TO-263 | P_D | 156 | W |
| | ITO-220 | | 50 | 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. $L = 30mH$, $I_{AS} = 6.4A$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting $T_J = 25^\circ C$

THERMAL DATA

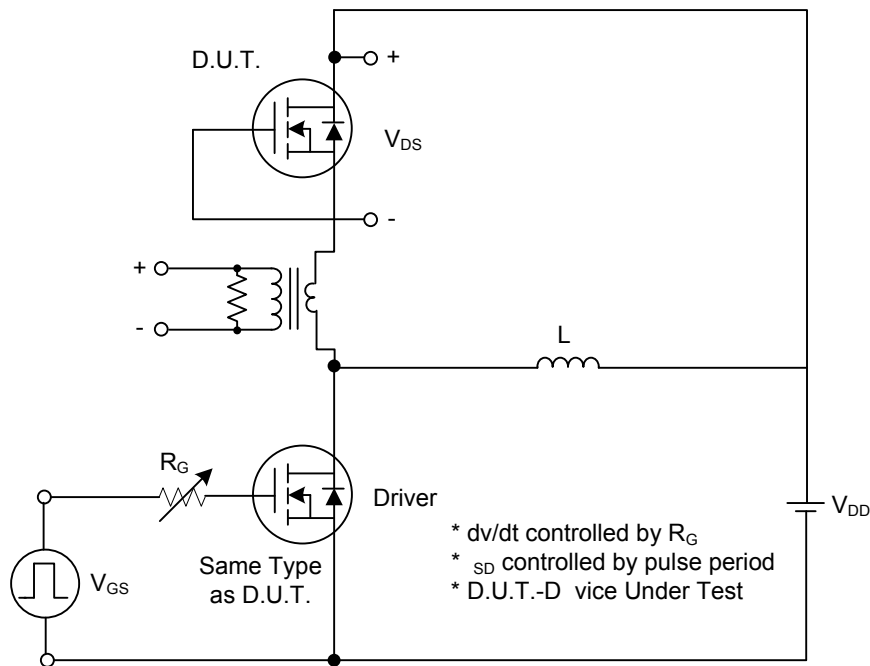
| PARAMETER | | SYMBOL | RATING | UNIT |
|---------------------|---------------------------------|---------------|--------|------|
| Junction to Ambient | TO-220/ITO-220 TO-262/TO-263 | θ_{JA} | 62.5 | °C/W |
| Junction to Case | TO-220 | θ_{JC} | 0.85 | °C/W |
| | ITO-220 | | 2.6 | |

ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

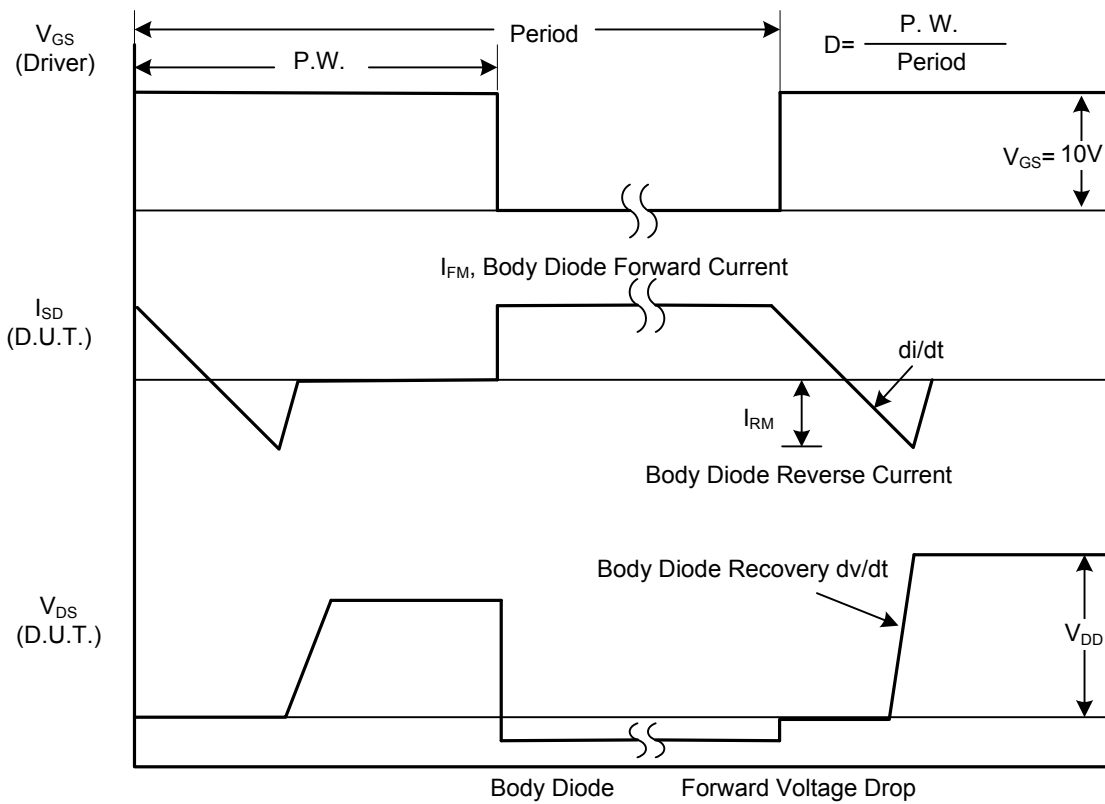
| PARAMETER | | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT | |
|---|---------|--------------|--|-----|------|------|---------------|----|
| OFF CHARACTERISTICS | | | | | | | | |
| Drain-Source Breakdown Voltage | | BV_{DSS} | $V_{GS}=0V, I_D=250\mu A$ | 600 | | | V | |
| Drain-Source Leakage Current | | I_{DSS} | $V_{DS}=600V, V_{GS}=0V$ | | | 1 | μA | |
| Gate- Source Leakage Current | Forward | I_{GSS} | $V_{GS}=30V, V_{DS}=0V$ | | | 100 | nA | |
| | Reverse | | $V_{GS}=-30V, V_{DS}=0V$ | | | -100 | nA | |
| 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 | | $R_{DS(ON)}$ | $X_{\theta S}=10V, I_D=5A$ | | 0.76 | 0.9 | Ω | |
| DYNAMIC CHARACTERISTICS | | | | | | | | |
| Input Capacitance | | C_{ISS} | $V_{DS}=25V, V_{GS}=0V, f=1.0\text{ MHz}$ | | 1570 | | pF | |
| Output Capacitance | | C_{OSS} | | | | 166 | | pF |
| Reverse Transfer Capacitance | | C_{RSS} | | | | 18 | | pF |
| SWITCHING CHARACTERISTICS | | | | | | | | |
| Turn-On Delay Time | | $t_{D(ON)}$ | $V_{DD}=300V, I_D=10A, R_G=25\Omega$ (Note 1, 2) | | 23 | | ns | |
| Turn-On Rise Time | | t_R | | | | 69 | | ns |
| Turn-Off Delay Time | | $t_{D(OFF)}$ | | | | 144 | | ns |
| Turn-Off Fall Time | | t_F | | | | 77 | | ns |
| Total Gate Charge | | Q_G | $V_{DS}=480V, I_D=10A, V_{GS}=10V$ (Note 1, 2) | | 44 | | nC | |
| Gate-Source Charge | | Q_{GS} | | | | 6.7 | | nC |
| Gate-Drain Charge | | Q_{GD} | | | | 18.5 | | nC |
| DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS | | | | | | | | |
| Drain-Source Diode Forward Voltage | | V_{SD} | $V_{GS}=0V, I_S=10A$ | | | 1.4 | V | |
| Maximum Continuous Drain-Source Diode Forward Current | | I_S | | | | 10 | A | |
| Maximum Pulsed Drain-Source Diode Forward Current | | I_{SM} | | | | 40 | A | |
| Reverse Recovery Time | | t_{rr} | $V_{GS}=0V, I_S=10A,$ | | 450 | | ns | |
| Reverse Recovery Charge | | Q_{RR} | $di_f/dt=100\text{ A}/\mu\text{s}$ (Note 1) | | 4.2 | | μC | |

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

TEST CIRCUITS AND WAVEFORMS

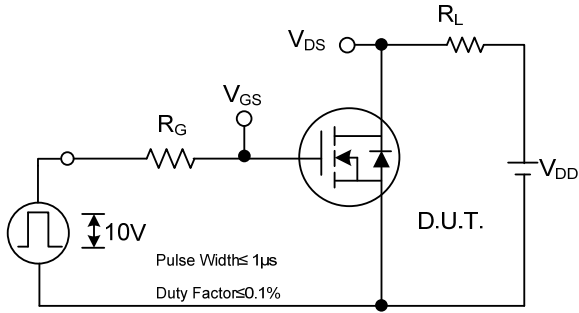


Peak Diode Recovery dv/dt Test Circuit

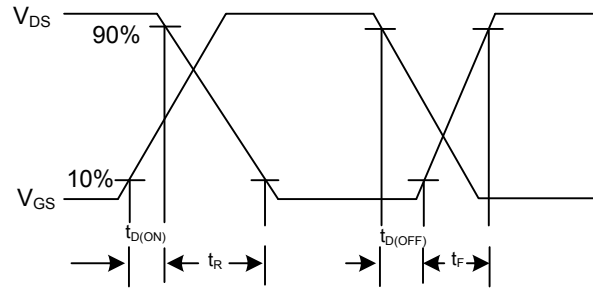


Peak Diode Recovery dv/dt Waveforms

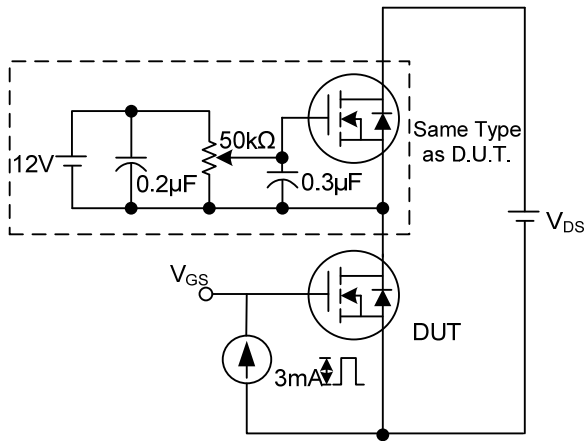
TEST CIRCUITS AND WAVEFORMS(Cont.)



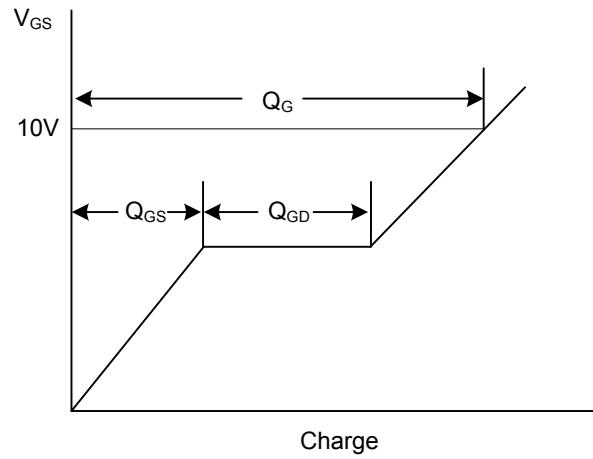
Switching Test Circuit



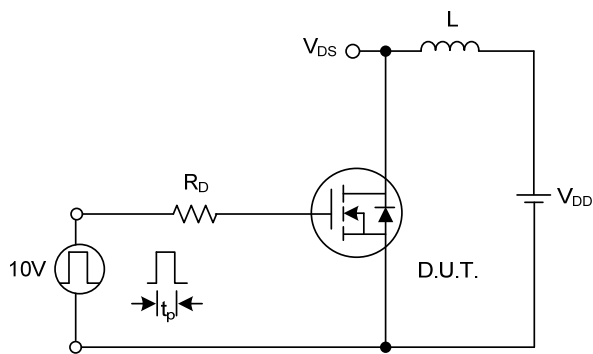
Switching Waveforms



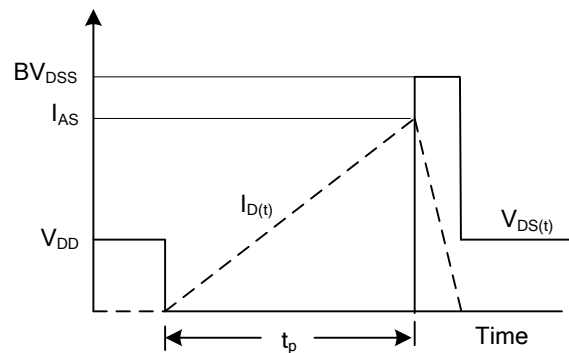
Gate Charge Test Circuit



Gate Charge Waveform



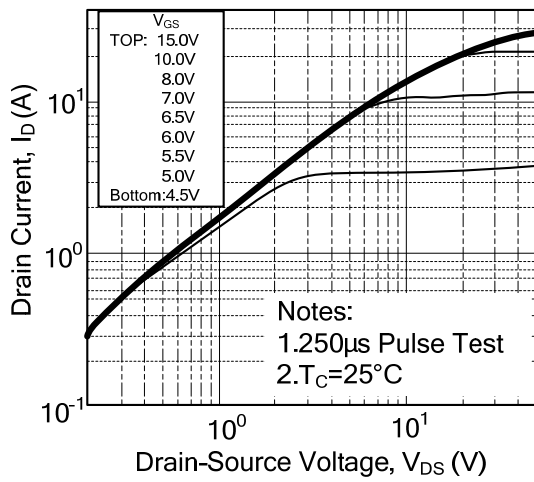
Unclamped Inductive Switching Test Circuit



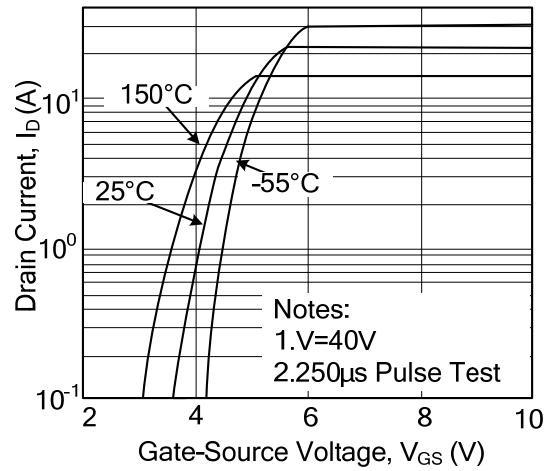
Unclamped Inductive Switching Waveforms

TYPICAL CHARACTERISTICS

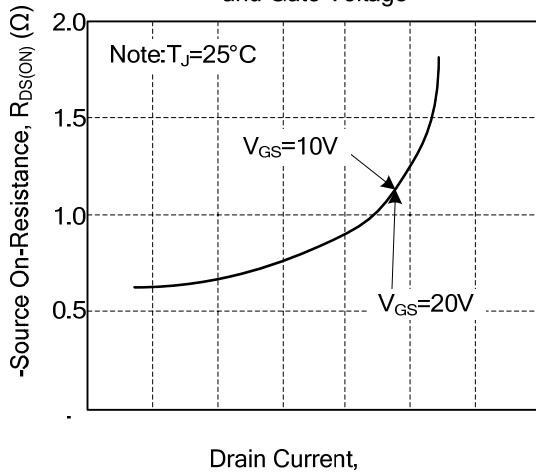
On-Region Characteristics



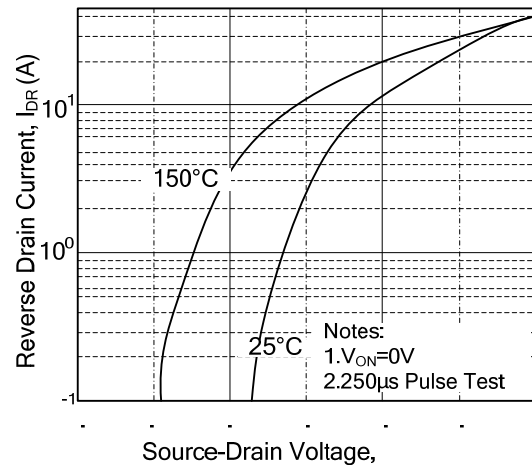
Transfer Characteristics



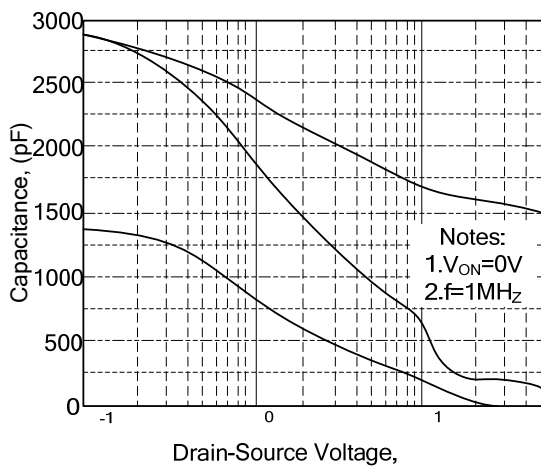
On-Resistance Variation vs. Drain Current and Gate Voltage



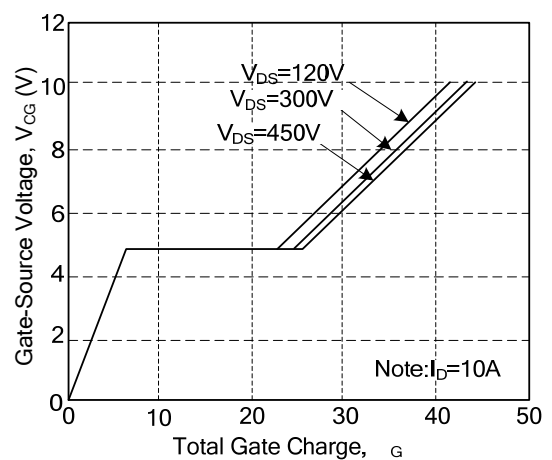
Body Diode Forward Voltage Variation with Source Current and Temperature



Capacitance Characteristics

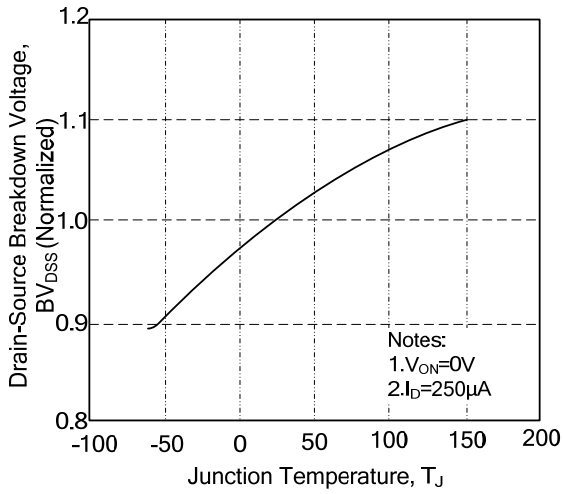


Gate Charge Characteristics

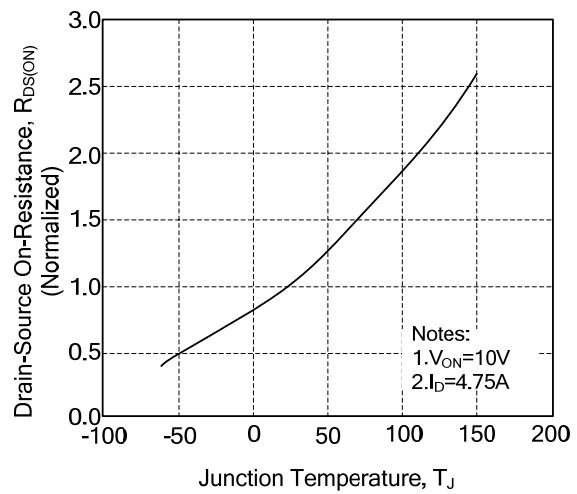


TYPICAL CHARACTERISTICS

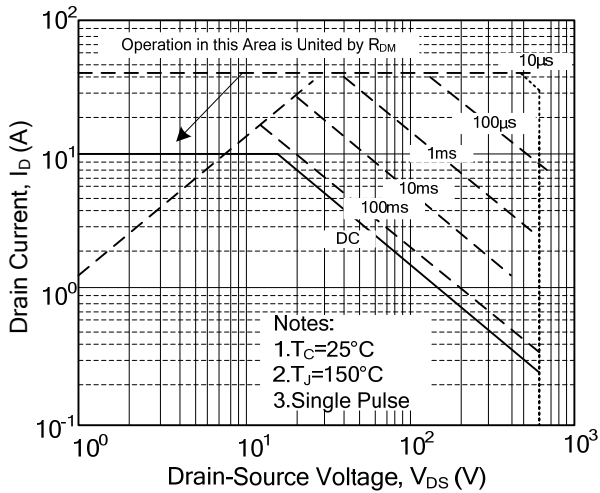
Breakdown Voltage Variation vs. Temperature



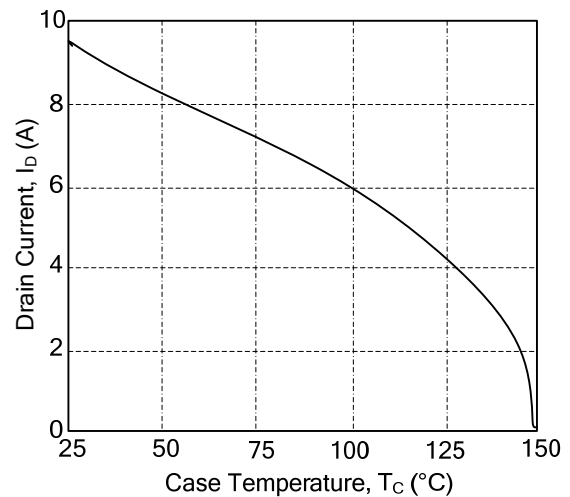
On-Resistance Variation vs. Temperature



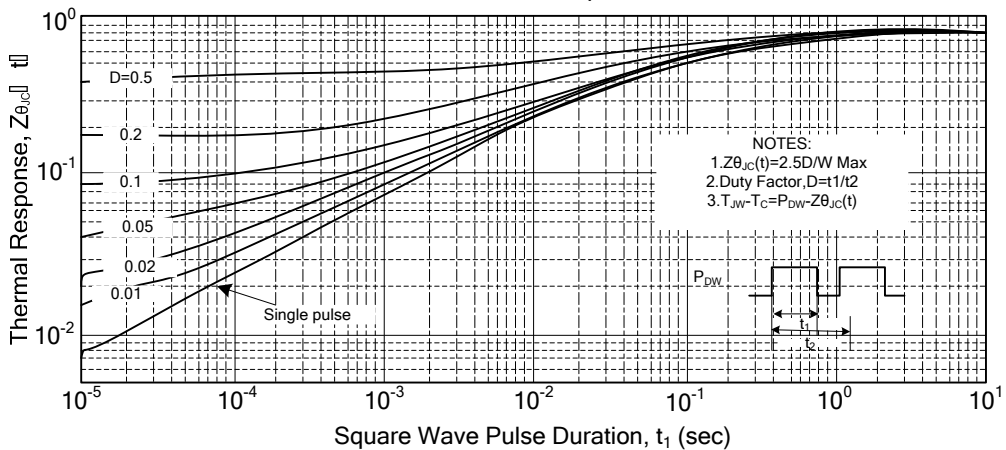
Maximum Safe Operating Area



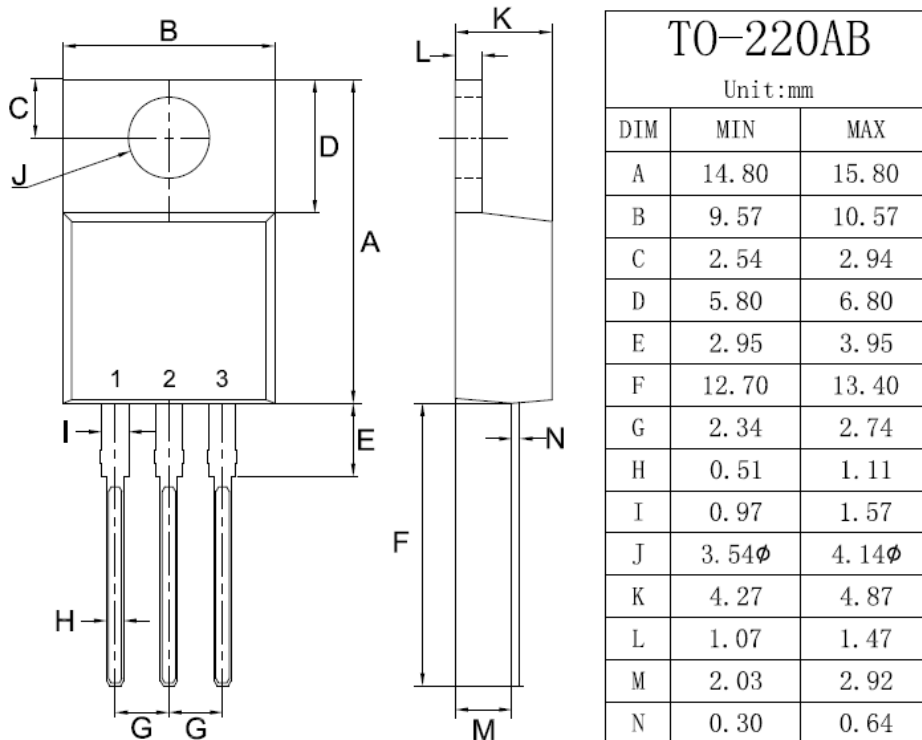
Maximum Drain Current vs. Case Temperature



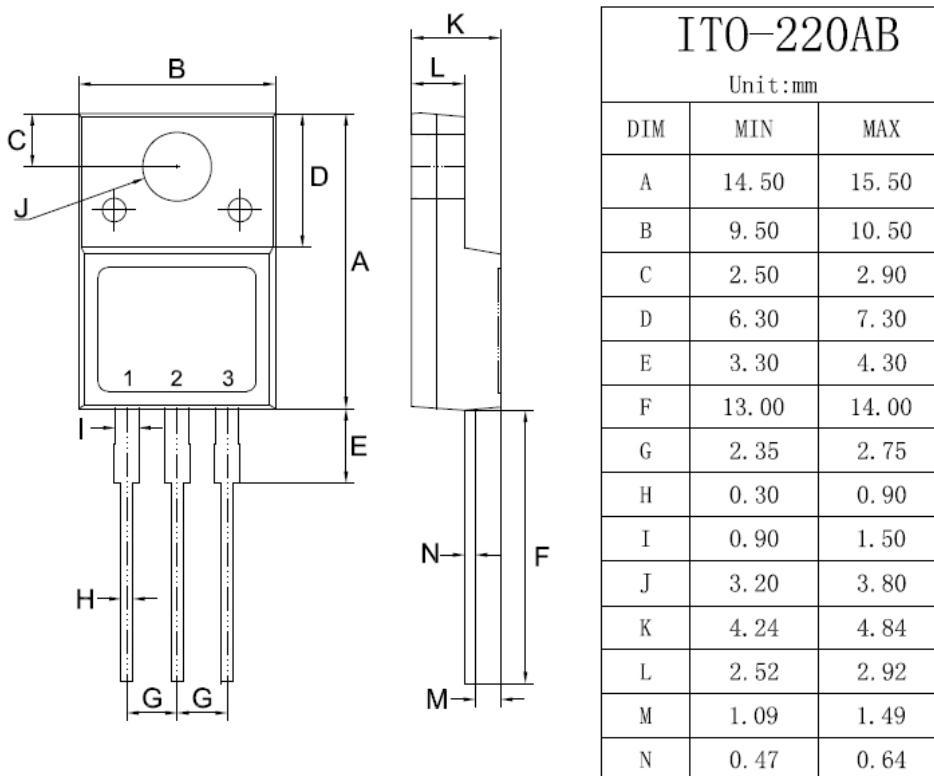
Transient Thermal Response Curve



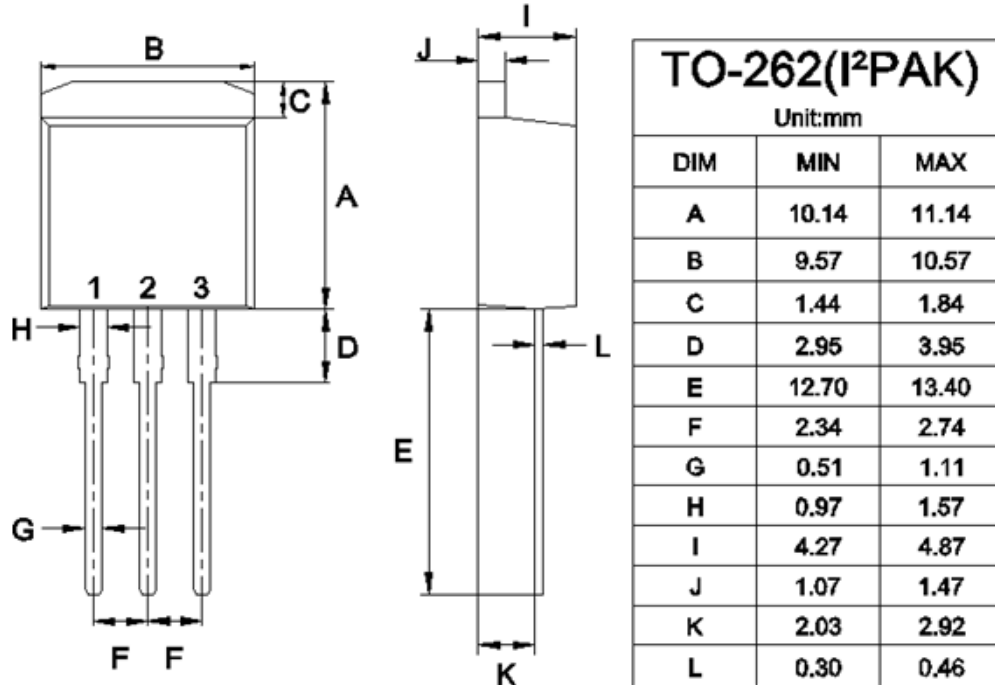
TO-220 Mechanical Drawing



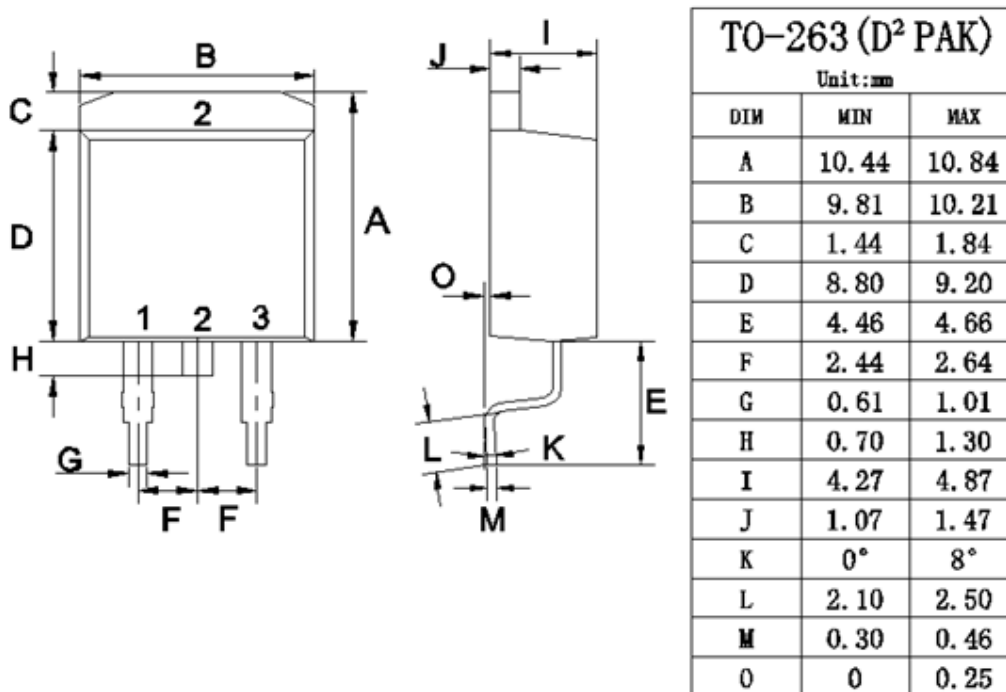
ITO-220 Mechanical Drawing



TO-262 Mechanical Drawing



TO-263 Mechanical Drawing



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