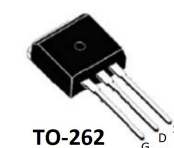
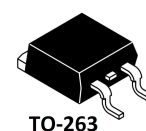
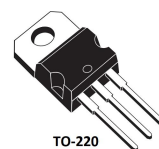
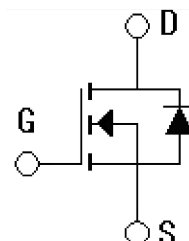


Features

- Low gate charge
- Low C_{rss} (typ 9pF)
- Fast switchin
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product

Applications

- High frequency switching mode power supply
- Electronic ballast
- UPS



Absolute Ratings (Tc=25°C)

| Parameter | Symbol | Value | Unit |
|--|---------------------------------------|----------|------|
| Drain-Source Voltage | V_{DSS} | 1000 | V |
| Drain Current-continuous | I_D T=25°C T=100°C | 8 | A |
| | | 5 | A |
| Drain Current-pulse (note 1) | I_{DM} | 32* | A |
| Gate-Source Voltage | V_{GS} | ±30 | V |
| Single pulse avalanche energy(note 2) | E_{AS} | 650 | mJ |
| Avalanche Current (note 1) | I_{AR} | 8 | A |
| Repetitive Avalanche Energy(note 1) | E_{AR} | 16.7 | mJ |
| Power Dissipation (TO-263\TO-262\TO-220) | PD TC=25°C Derate above 25°C | 167 | W |
| | | 1.43 | W/°C |
| Power Dissipation (TO-220F) | PD TC=25°C Derate above 25°C | 31.7 | W |
| | | 0.25 | W/°C |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55~+150 | °C |
| Peak Diode Recovery dv/dt (note 3) | dv/dt | 4.5 | V/ns |
| Maximum Lead Temperature for Soldering Purposes | T_L | 300 | °C |

*Drain current limited by maximum junction temperature

Electrical Characteristics($T_{CASE}=25^{\circ}C$ unless otherwise specified)

| Parameter | Symbol | Tests conditions | Min | Type | Max | Units |
|---|------------------------------|--|------|------|-----------|----------------|
| Drain-Source Voltage | BV_{DSS} | $I_D=250\mu A, V_{GS}=0V$ | 1000 | - | - | V |
| Breakdown Voltage Temperature Coefficient | $\Delta BV_{DSS}/\Delta T_J$ | $I_D=250\mu A$, referenced to $25^{\circ}C$ | - | 1.05 | - | V/ $^{\circ}C$ |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS}=1000V, V_{GS}=0V, T_C=25^{\circ}C$ | - | - | 1 | μA |
| | | $V_{DS}=800V, T_C=125^{\circ}C$ | - | - | 10 | μA |
| Gate body leakage current | I_{GSS} | $V_{DS}=0V, V_{GS}=\pm 30V$ | - | - | ± 100 | nA |
| On-Characteristics | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}=V_{GS}, I_D=250\mu A$ | 3.0 | - | 5.0 | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}=10V, I_D=4A$ | - | 1.8 | 2 | Ω |
| Forward Transconductance | g_{FS} | $V_{DS}=40V, I_D=4A$ (note 4) | - | 5.6 | - | S |
| Dynamic Characteristics | | | | | | |
| Input capacitance | C_{iss} | $V_{DS}=25V, V_{GS}=0V, f=1.0MHZ$ | - | 1320 | 1716 | pF |
| Output capacitance | C_{oss} | | - | 105 | 136 | pF |
| Reverse transfer capacitance | C_{rss} | | - | 9 | 12 | pF |

Electrical Characteristics($T_{CASE}=25^{\circ}C$ unless otherwise specified)

| Parameter | Symbol | Tests conditions | Min | Type | Max | Units |
|----------------------------------|--------------|--|-----|------|-----|-------|
| Switching-Characteristics | | | | | | |
| Turn-On delay time | $t_{d(on)}$ | $V_{DD}=500V, I_D=8A, R_{GEN}=25\Omega$ (note 4,5) | - | 34 | 75 | ns |
| Turn-On rise time | t_r | | - | 85 | 155 | ns |
| Turn-Off delay time | $t_{d(off)}$ | | - | 56 | 113 | ns |
| Turn-Off rise time | t_f | | - | 59 | 118 | ns |
| Total Gate Charge | Q_g | $V_{DS}=800V, I_D=8A, V_{GS}=10V$ (note 4,5) | - | 14 | 19 | nC |
| Gate-Source charge | Q_{gs} | | - | 2.0 | - | nC |
| Gate-Drain charge | Q_{gd} | | - | 7.0 | - | nC |

| Drain-Source Diode Characteristics and Maximum Ratings | | | | | | |
|---|----------|---|---|------|-----|---------|
| Diode Forward Voltage (note 3) | V_{SD} | $V_{GS}=0V, I_S=8A$ | - | - | 1.4 | V |
| Maximum Pulsed Drain-Source Diode Forward Current | I_{SM} | - | - | - | 24 | A |
| Maximum Continuous Drain Source Diode Forward Current | I_S | - | - | - | 8 | A |
| Reverse recovery time | t_{rr} | $V_{GS}=0V,$ | - | 625 | - | ns |
| Reverse recovery charge | Q_{rr} | $I_S=8A \text{ di}/dt=100A/\mu s$ (note 4) | - | 6.71 | - | μC |

Thermal Characteristic

| Parameter | Symbol | Value | | Unit |
|--|---------------|---------------|---------|---------------|
| | | TO-262/TO-263 | TO-220F | |
| Thermal Resistance, junction to Case | $R_{th(j-C)}$ | 0.78 | 3.94 | $^{\circ}C/W$ |
| Thermal Resistance, Junction to Ambient | $R_{th(j-A)}$ | 62.5 | 80 | $^{\circ}C/W$ |

Order Message

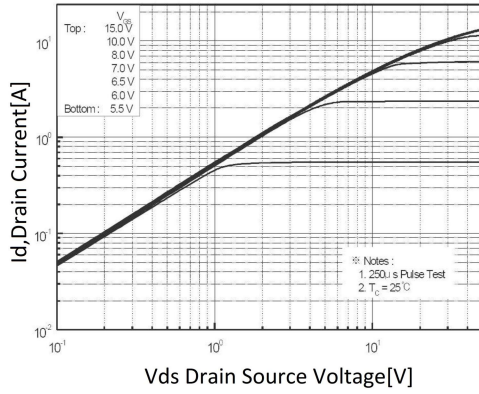
| Marking | Package |
|-----------|---------|
| MS8N100FE | TO-263 |
| MS8N100FK | TO-262 |
| MS8N100FS | TO-220F |
| MS8N100FT | TO-220 |

Notes:

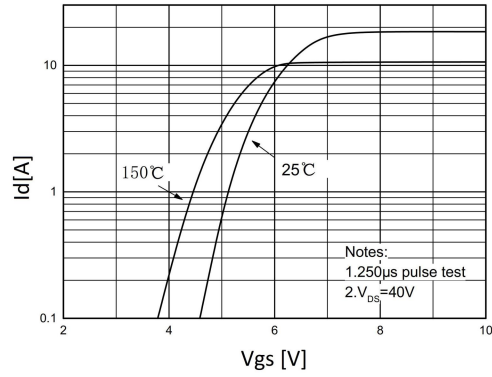
1. Pulse width limited by maximum junction temperature
2. $L=33.0mH, I_{AS}=8A, V_{DD}=50V, R_G=25 \Omega, \text{Starting } T_J=25^{\circ}C$
3. $I_{SD} \leq 8A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}, \text{Starting } T_J=25^{\circ}C$
4. Pulse Test: Pulse Width $\leq 300\mu s, \text{Duty Cycle} \leq 2\%$
5. Essentially independent of operating temperature

ELECTRICAL CHARACTERISTICS (curves)

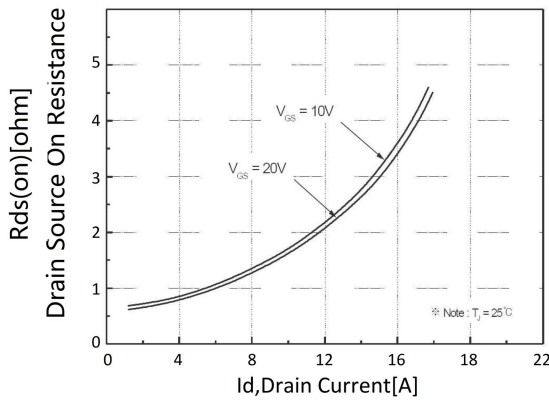
On-Region Characteristics



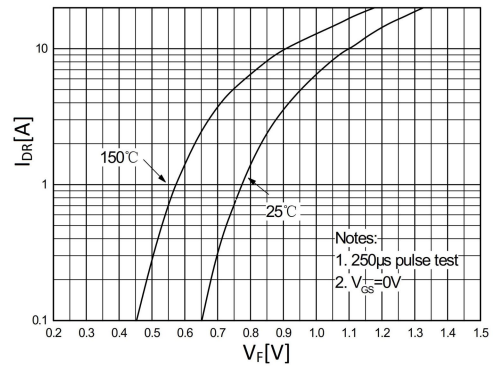
Transfer Characteristics



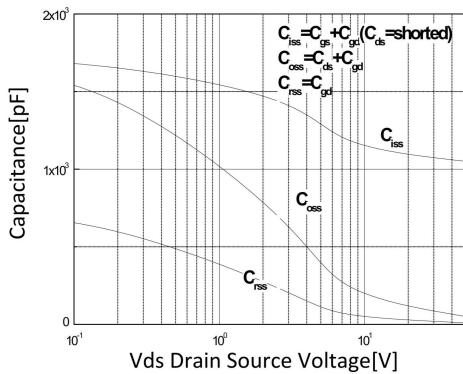
On-Resistance Variation vs. Drain Current and Gate Voltage



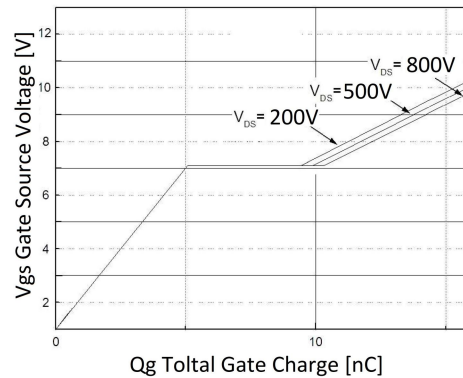
Body Diode Forward Voltage Variation vs. Source Current and Temperature



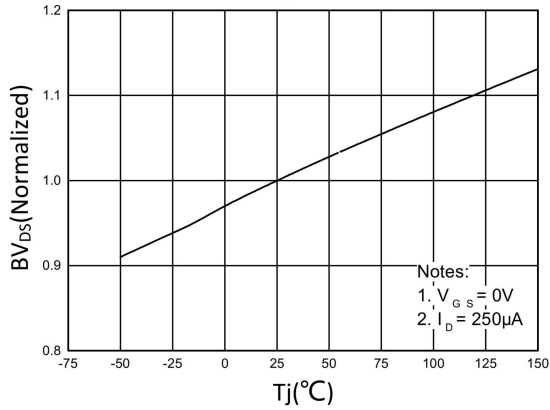
Capacitance Characteristics



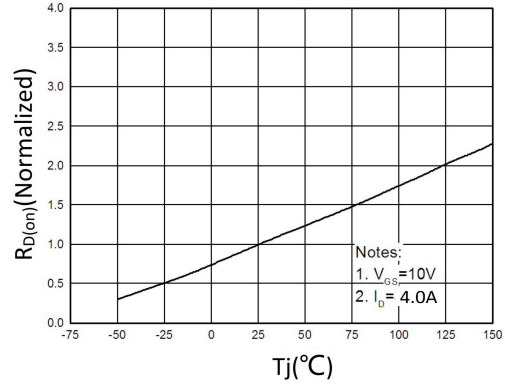
Gate Charge Characteristics



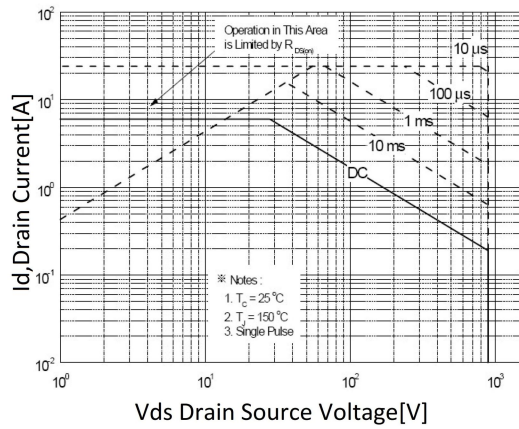
Breakdown Voltage Variation vs. Temperature



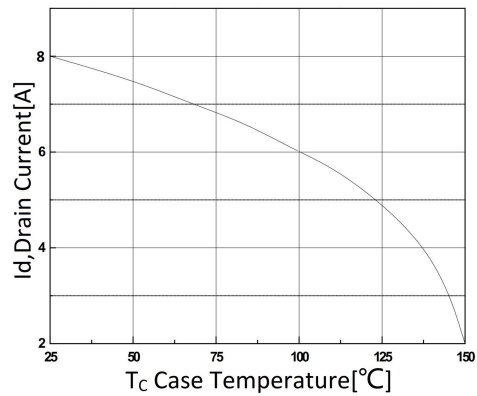
On-Resistance Variation vs. Temperature



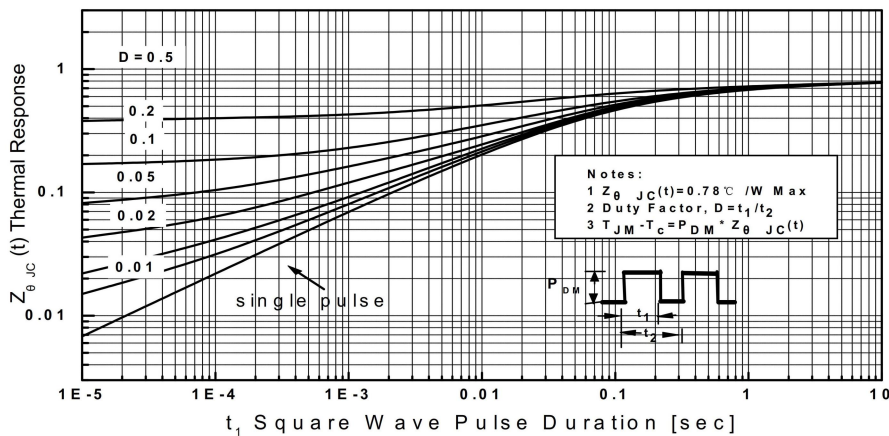
Maximum Safe Operating Area



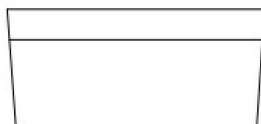
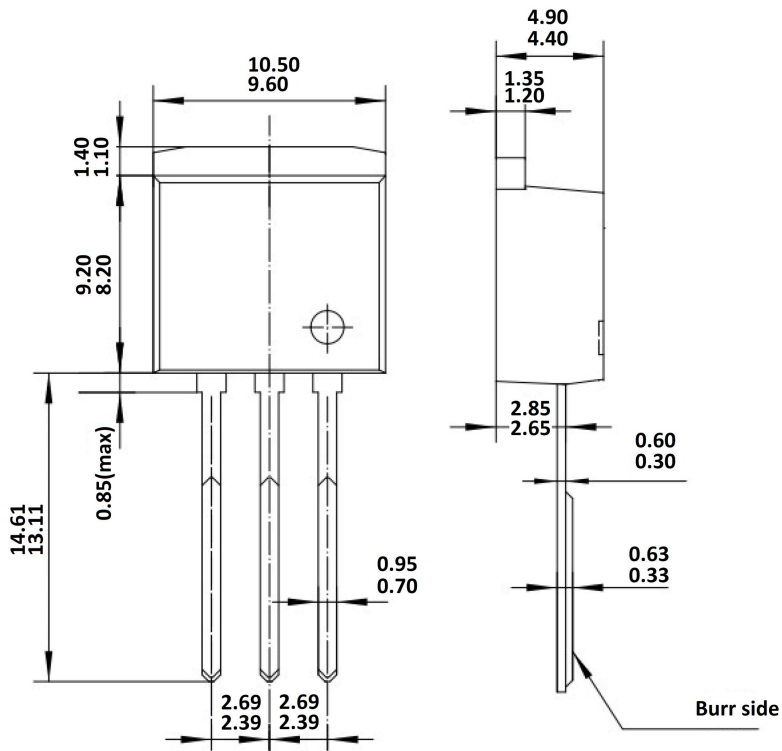
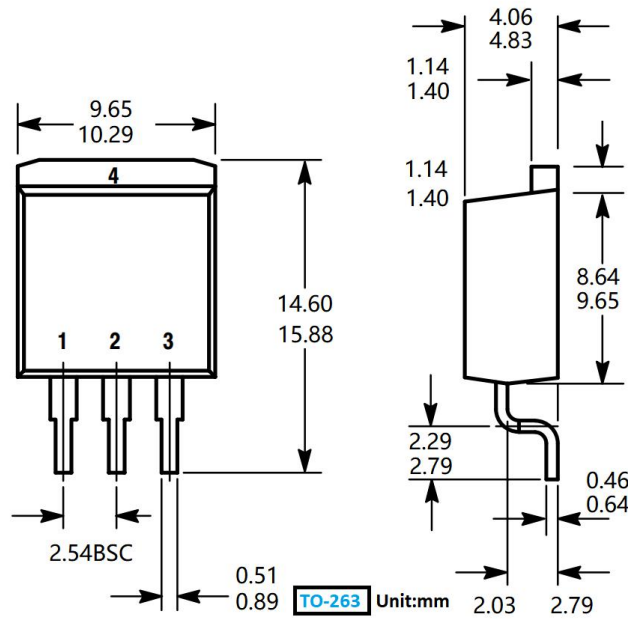
Maximum Drain Current vs. Case Temperature

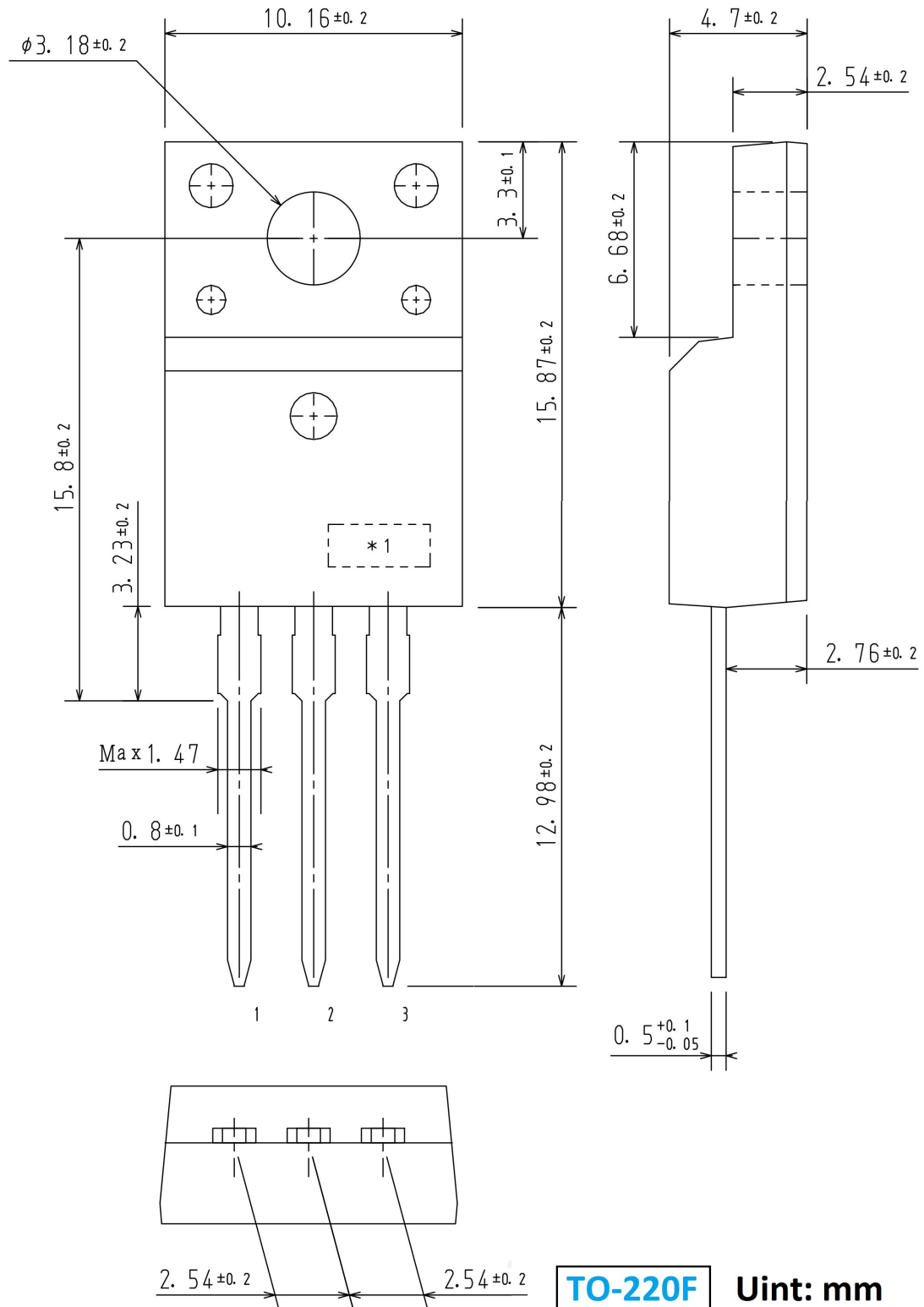


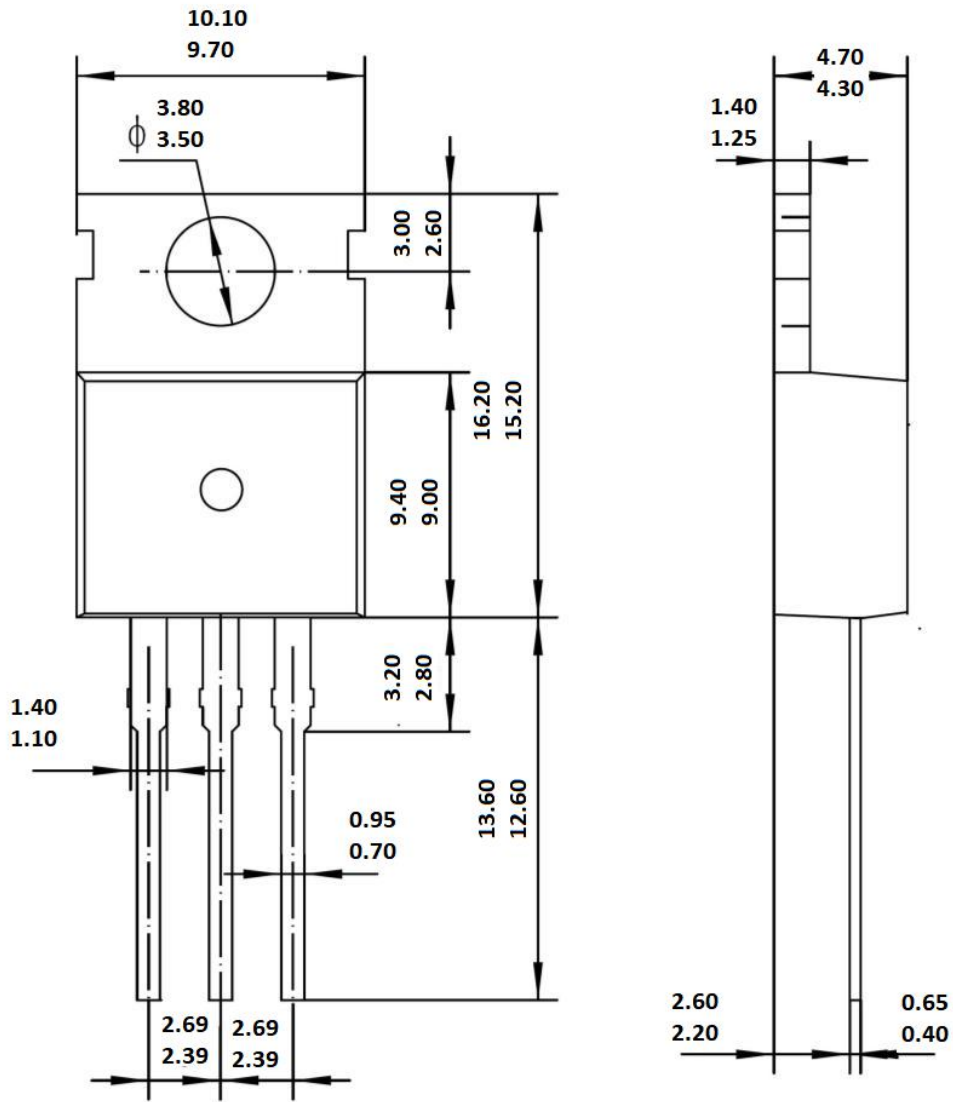
Transient Thermal Response Curve



PACKAGE MECHANICAL DATA







TO-220

Unit: mm

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