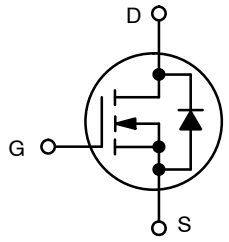
# MOSFET – N-Channel Shielded Gate POWERTRENCH®

## 150 V, 10.9 mΩ, 74.3 A

## NTP011N15MC

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ MAX | $I_D$ MAX |
|---|---|---|
| 150 V | 10.9 mΩ @ 10 V | 74.3 A |




N−CHANNEL MOSFET

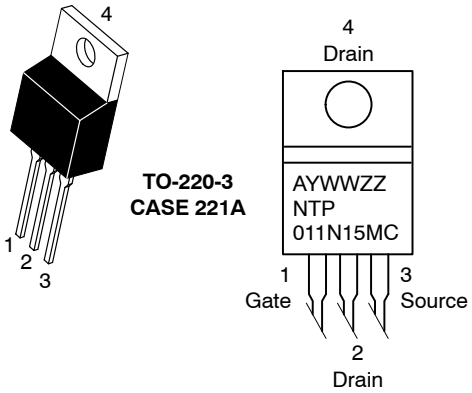
### Features

- Shielded Gate MOSFET Technology
- Max $R_{DS(on)}$ = 10.9 mΩ at $V_{GS}$ = 10 V, $I_D$ = 41 A
- 50% Lower Qrr than other MOSFET Suppliers
- Lowers Switching Noise/EMI
- 100% UIL Tested
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

### Typical Applications

- Synchronous Rectification for ATX / Server / Telecom PSU
- Motor Drives and Uninterruptible Power Supplies
- Micro Solar Inverter

### MARKING DIAGRAM




NTP011N15MC = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
ZZ = Lot Traceability

### MAXIMUM RATINGS ($T_J$ = 25 °C unless otherwise noted)

| Parameter | | | Symbol | Value | Unit |
|---|---|---|---|---|---|
| Drain-to-Source Voltage | | | $V_{DSS}$ | 150 | V |
| Gate-to-Source Voltage | | | $V_{GS}$ | ±20 | V |
| Continuous Drain Current $R_{\theta JC}$ (Note 2) | Steady State | $T_C$ = 25 °C | $I_D$ | 74.3 | A |
| Power Dissipation $R_{\theta JC}$ (Note 2) | Steady State | $T_C$ = 25 °C | $P_D$ | 136.4 | W |
| Continuous Drain Current $R_{\theta JA}$ (Notes 1, 2) | Steady State | $T_A$ = 25 °C | $I_D$ | 9.8 | A |
| Power Dissipation $R_{\theta JA}$ (Notes 1, 2) | Steady State | $T_A$ = 25 °C | $P_D$ | 2.4 | W |
| Pulsed Drain Current | $T_C$ = 25 °C, $t_p$ = 100 μs | | $I_{DM}$ | 374 | A |
| Operating Junction and Storage Temperature Range | | | $T_J$, $T_{stg}$ | −55 to +175 | °C |
| Single Pulse Drain-to-Source Avalanche Energy ($I_L$ = 14 $A_{pk}$, L = 3 mH) | | | $E_{AS}$ | 294 | mJ |
| Lead Temperature for Soldering Purposes (1/8″ from case for 10 s) | | | $T_L$ | 260 | °C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Surface-mounted on FR4 board using a 1 $in^2$, 2 oz. Cu pad.
2. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.

### ORDERING INFORMATION

| Device | Package | Shipping† |
|---|---|---|
| NTP011N15MC | TO-220-3 (Pb-Free) | 800 / Tube |

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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## THERMAL RESISTANCE MAXIMUM RATINGS

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Junction-to-Case – Steady State (Note 2) | $R_{\theta JC}$ | 1.1 | °C/W |
| Junction-to-Ambient – Steady State (Note 2) | $R_{\theta JA}$ | 62.5 | |

## ELECTRICAL CHARACTERISTICS ($T_J$ = 25 °C unless otherwise specified)

| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| Drain-to-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0 V, $I_D$ = 250 μA | 150 | | | V |
| Drain-to-Source Breakdown Voltage Temperature Coefficient | $V_{(BR)DSS}/T_J$ | $I_D$ = 250 μA, ref to 25 °C | | 83 | | mV/°C |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{GS}$ = 0 V, $V_{DS}$ = 120 V, $T_J$ = 25 °C | | | 1.0 | μA |
| Gate-to-Source Leakage Current | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = ±20 V | | | ±100 | nA |
| **ON CHARACTERISTICS** | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{GS}$ = $V_{DS}$, $I_D$ = 223 μA | 2.5 | | 4.5 | V |
| Negative Threshold Temperature Coefficient | $V_{GS(TH)}/T_J$ | $I_D$ = 223 μA, ref to 25 °C | | –8.5 | | mV/°C |
| Drain-to-Source On Resistance | $R_{DS(on)}$ | $V_{GS}$ = 10 V, $I_D$ = 41 A | | 8.7 | 10.9 | mΩ |
| | | $V_{GS}$ = 8 V, $I_D$ = 20 A | | 9.3 | 12.6 | |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$ = 10 V, $I_D$ = 41 A | | 85 | | S |
| **CHARGES, CAPACITANCES & GATE RESISTANCE** | | | | | | |
| Input Capacitance | $C_{ISS}$ | $V_{GS}$ = 0 V, f = 1 MHz, $V_{DS}$ = 75 V | | 2810 | | pF |
| Output Capacitance | $C_{OSS}$ | | | 840 | | |
| Reverse Transfer Capacitance | $C_{RSS}$ | | | 14 | | |
| Gate-Resistance | $R_G$ | | | 0.8 | 1.6 | Ω |
| Total Gate Charge | $Q_{G(TOT)}$ | $V_{GS}$ = 10 V, $V_{DS}$ = 75 V; $I_D$ = 41 A | | 37 | | nC |
| Threshold Gate Charge | $Q_{G(TH)}$ | | | 9.1 | | |
| Gate-to-Source Charge | $Q_{GS}$ | | | 15 | | |
| Gate-to-Drain Charge | $Q_{GD}$ | | | 6.5 | | |
| Plateau Voltage | $V_{GP}$ | | | 5.4 | | V |
| Output Charge | $Q_{OSS}$ | $V_{DD}$ = 75 V, $V_{GS}$ = 0 V | | 95 | | nC |
| **SWITCHING CHARACTERISTICS** (Note 3) | | | | | | |
| Turn-On Delay Time | $t_{d(ON)}$ | $V_{GS}$ = 10 V, $V_{DD}$ = 75 V, $I_D$ = 41 A, $R_G$ = 4.7 Ω | | 19 | | ns |
| Rise Time | $t_r$ | | | 14 | | |
| Turn-Off Delay Time | $t_{d(OFF)}$ | | | 28 | | |
| Fall Time | $t_f$ | | | 5.1 | | |
| **DRAIN-SOURCE DIODE CHARACTERISTICS** | | | | | | |
| Forward Diode Voltage | $V_{SD}$ | $V_{GS}$ = 0 V, $I_S$ = 41 A, $T_J$ = 25 °C | | 0.92 | 1.2 | V |
| Reverse Recovery Time | $t_{RR}$ | $V_{GS}$ = 0 V, $V_{DD}$ = 75 V, $dI_S/dt$ = 300 A/μs, $I_S$ = 41 A | | 49 | | ns |
| Reverse Recovery Charge | $Q_{RR}$ | | | 210 | | nC |
| Reverse Recovery Time | $t_{RR}$ | $V_{GS}$ = 0 V, $V_{DD}$ = 75 V, $dI_S/dt$ = 1000 A/μs, $I_S$ = 41 A | | 36 | | ns |
| Reverse Recovery Charge | $Q_{RR}$ | | | 421 | | nC |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Switching characteristics are independent of operating junction temperatures.



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## TYPICAL CHARACTERISTICS

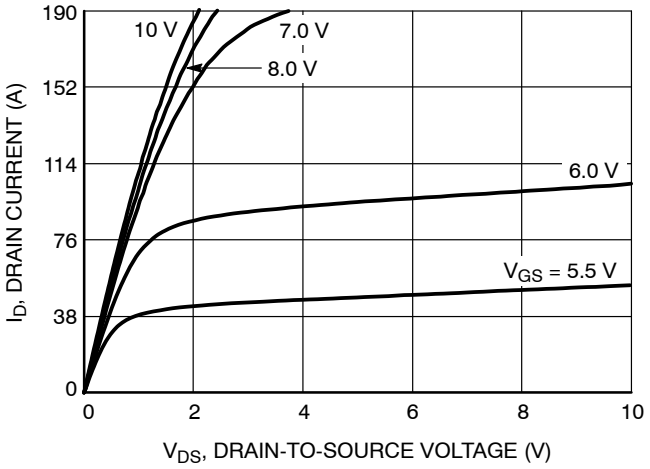



**Figure 1. On-Region Characteristics**

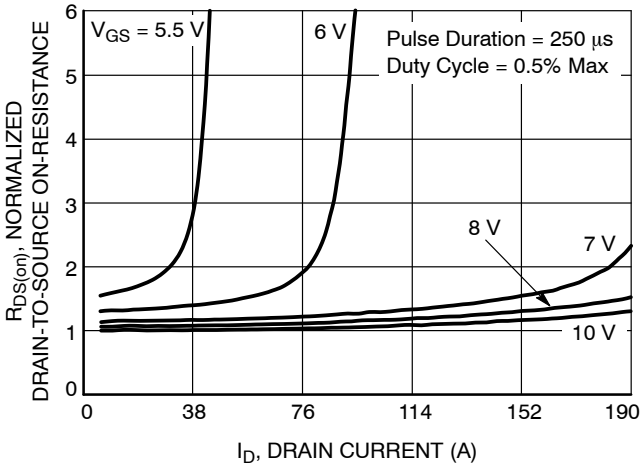



**Figure 2. Normalized On-Resistance vs. Drain Current and Gate Voltage**

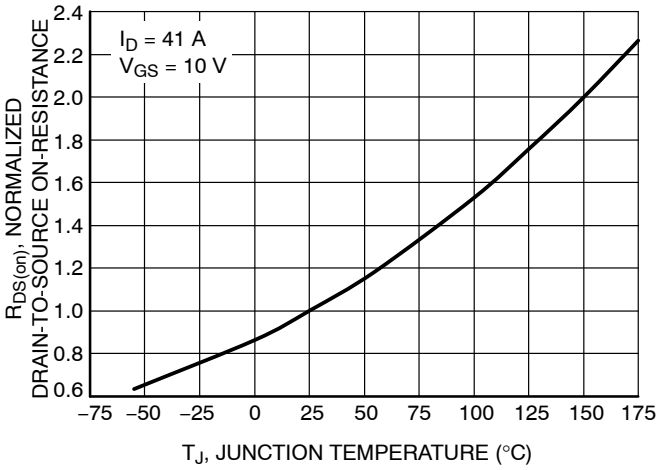



**Figure 3. Normalized On-Resistance vs. Junction Temperature**

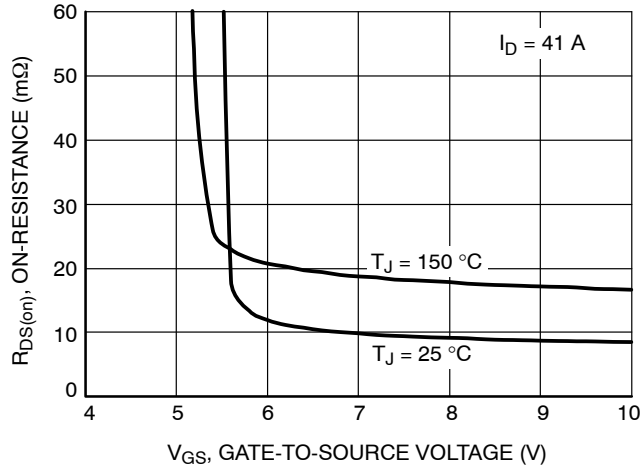



**Figure 4. On-Resistance vs. Gate-to-Source Voltage**

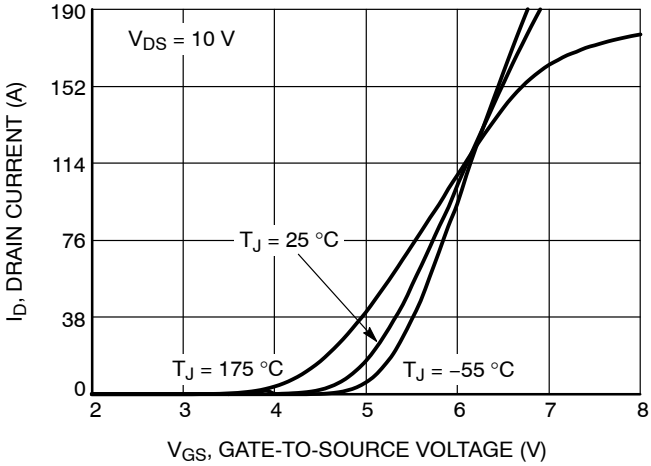



**Figure 5. Transfer Characteristics**

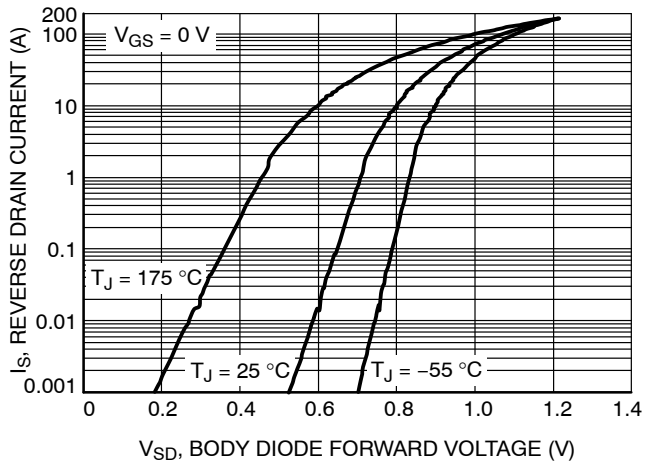



**Figure 6. Source-to-Drain Diode Forward Voltage vs. Source Current**



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## TYPICAL CHARACTERISTICS

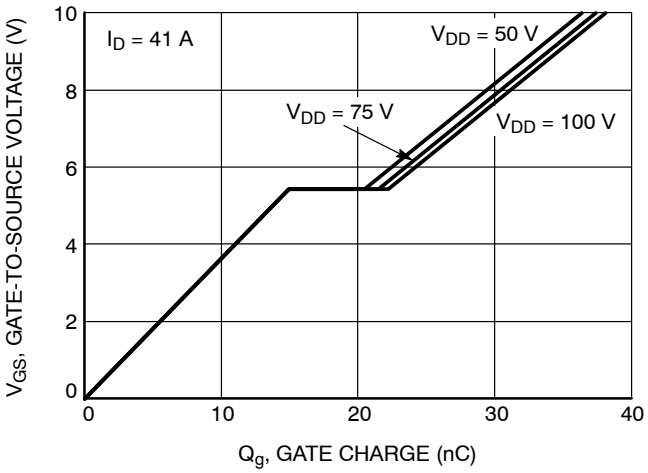



**Figure 7. Gate Charge Characteristics**

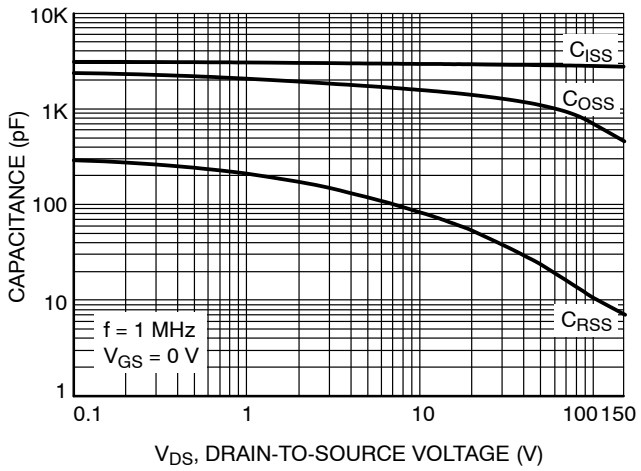



**Figure 8. Capacitance vs. Drain-to-Source Voltage**

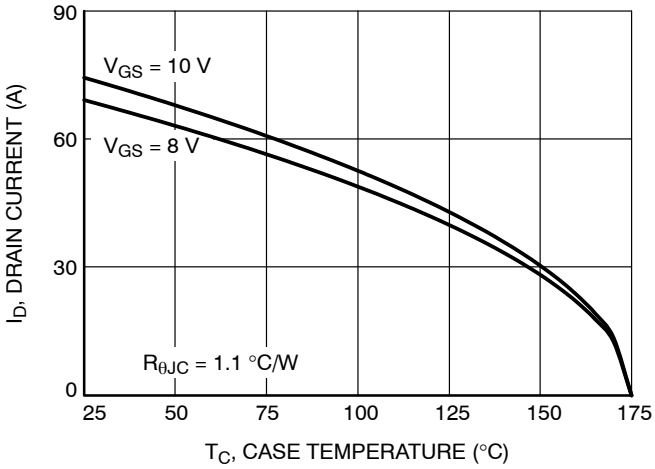



**Figure 9. Drain Current vs. Case Temperature**

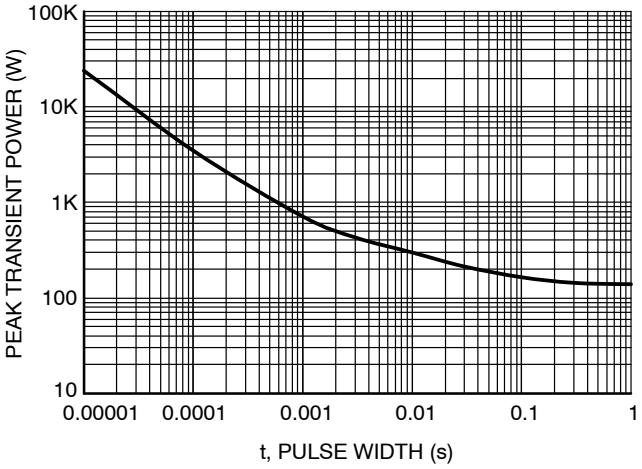



**Figure 10. Peak Power**

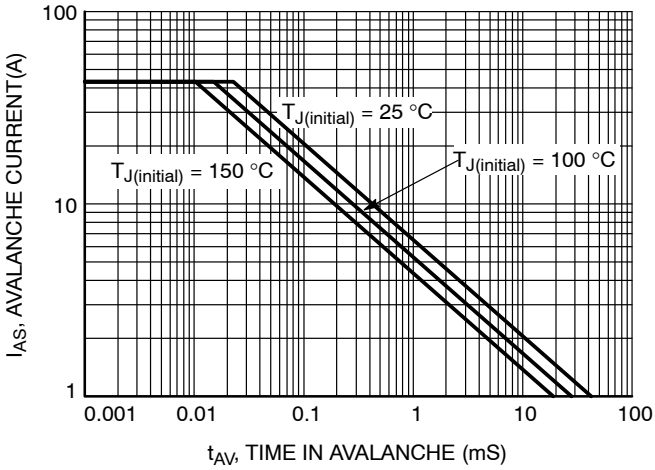



**Figure 11. Unclamped Inductive Switching Capability**

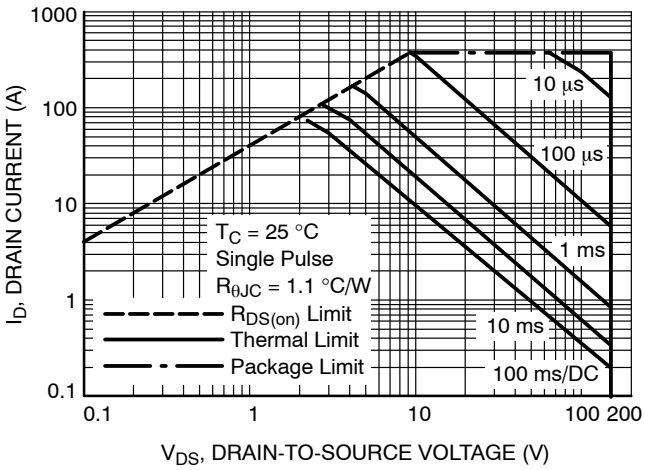



**Figure 12. Forward Bias Safe Operating Area**



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## TYPICAL CHARACTERISTICS

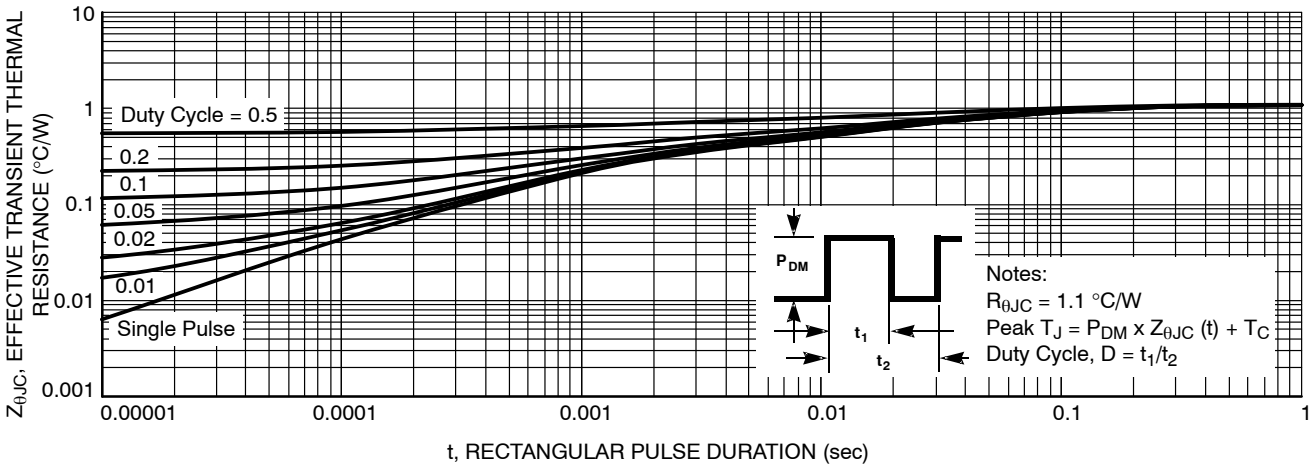



**Figure 13. Transient Thermal Impedance**

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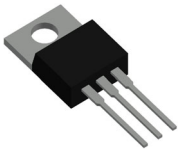
## REVISION HISTORY

| Revision | Description of Changes | Date |
|---|---|---|
| 2 | Document rebranded to **onsemi** format. | 11/4/2025 |

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

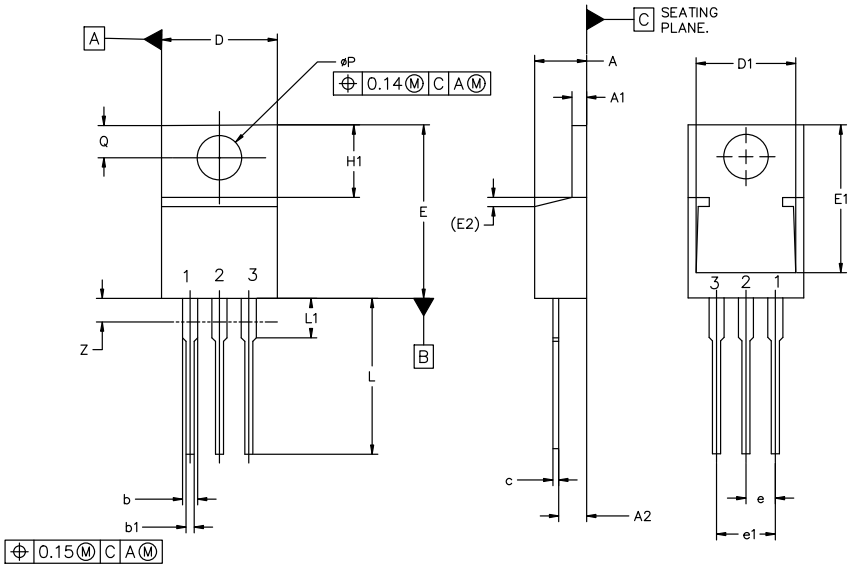


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**TO−220−3 10.10x15.12x4.45, 2.54P**
CASE 221A
ISSUE AL

DATE 05 FEB 2025




| MILLIMETERS | | | |
|---|---|---|---|
| DIM | MIN | NOM | MAX |
| A | 4.07 | 4.45 | 4.83 |
| A1 | 1.15 | 1.28 | 1.41 |
| A2 | 2.04 | 2.42 | 2.79 |
| b | 1.15 | 1.34 | 1.52 |
| b1 | 0.64 | 0.80 | 0.96 |
| c | 0.36 | 0.49 | 0.61 |
| D | 9.66 | 10.10 | 10.53 |
| D1 | 8.43 | 8.63 | 8.83 |
| E | 14.48 | 15.12 | 15.75 |
| E1 | 12.58 | 12.78 | 12.98 |
| E2 | 1.27 REF | | |

| MILLIMETERS | | | |
|---|---|---|---|
| DIM | MIN | NOM | MAX |
| e | 2.42 | 2.54 | 2.66 |
| e1 | 4.83 | 5.08 | 5.33 |
| H1 | 5.97 | 6.22 | 6.47 |
| L | 12.70 | 13.49 | 14.27 |
| L1 | 2.80 | 3.45 | 4.10 |
| Q | 2.54 | 2.79 | 3.04 |
| øP | 3.60 | 3.85 | 4.09 |
| Z | −.−− | −.−− | 3.48 |

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

STYLE 1:
PIN 1. BASE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 2:
PIN 1. BASE
2. EMITTER
3. COLLECTOR
4. EMITTER

STYLE 3:
PIN 1. CATHODE
2. ANODE
3. GATE
4. ANODE

STYLE 4:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. MAIN TERMINAL 2

STYLE 5:
PIN 1. GATE
2. DRAIN
3. SOURCE
4. DRAIN

STYLE 6:
PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

STYLE 7:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. ANODE

STYLE 8:
PIN 1. CATHODE
2. ANODE
3. EXTERNAL TRIP/DELAY
4. ANODE

STYLE 9:
PIN 1. GATE
2. COLLECTOR
3. EMITTER
4. COLLECTOR

STYLE 10:
PIN 1. GATE
2. SOURCE
3. DRAIN
4. SOURCE

STYLE 11:
PIN 1. DRAIN
2. SOURCE
3. GATE
4. SOURCE

STYLE 12:
PIN 1. MAIN TERMINAL 1
2. MAIN TERMINAL 2
3. GATE
4. NOT CONNECTED

| | | |
|---|---|---|
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| **DESCRIPTION:** | **TO−220−3 10.10x15.12x4.45, 2.54P** | **PAGE 1 OF 1** |

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**Üreticileri görün**

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