

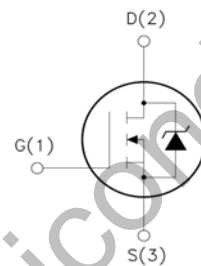
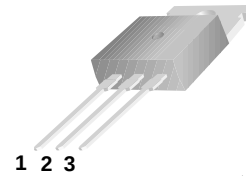


## WGP100N08

## Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Q<sub>G</sub>=76nC (Typ.).
- ☐ BVDSS=80V, I<sub>D</sub>=100A
- ☐ R<sub>DS(on)</sub> : 7.5mΩ (Max) @V<sub>G</sub>=10V
- ☐ 100% Avalanche Tested

TO-220



- 1.Gate (G)
- 2.Drain (D)
- 3.Source (S)

Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

| Symbol                            | Parameter                            | Maximum               | Unit |
|-----------------------------------|--------------------------------------|-----------------------|------|
| V <sub>DSS</sub>                  | Drain-to-Source Voltage              | 80                    | V    |
| V <sub>GSS</sub>                  | Gate-to-Source Voltage               | ±25                   | V    |
| I <sub>D</sub> <sup>3</sup>       | Continuous Drain Current             | T <sub>C</sub> =25°C  | 100  |
|                                   |                                      | T <sub>C</sub> =100°C | 70   |
| I <sub>DP</sub> <sup>4</sup>      | Pulsed Drain Current                 | T <sub>C</sub> =25°C  | 340  |
| I <sub>AS</sub> <sup>5</sup>      | Avalanche Current                    | 20                    | A    |
| EAS <sup>5</sup>                  | Avalanche energy                     | 410                   | mJ   |
| PD                                | Maximum Power Dissipation            | T <sub>C</sub> =25°C  | 240  |
|                                   |                                      | T <sub>C</sub> =100°C | 100  |
| T <sub>J</sub> , T <sub>STG</sub> | Junction & Storage Temperature Range | -55~175               | °C   |

## Thermal Characteristics

| Symbol           | Parameter                              | Typical | Unit |
|------------------|----------------------------------------|---------|------|
| Rθ <sub>JC</sub> | Thermal Resistance-Junction to Case    | 0.52    | °C/W |
| Rθ <sub>JA</sub> | Thermal Resistance-Junction to Ambient | 55      |      |

**Electrical Characteristics** (TA=25°C unless otherwise noted)

| Symbol                                   | Parameter                        | Test Conditions                                                  | Min.                                                                                    | Typ  | Max. | Unit |    |
|------------------------------------------|----------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------|------|------|----|
| Static Characteristics                   |                                  |                                                                  |                                                                                         |      |      |      |    |
| BV <sub>DSS</sub>                        | Drain-Source Breakdown Voltage   | V <sub>GS</sub> =0V, I <sub>D</sub> =250uA                       | 80                                                                                      | —    | —    | V    |    |
| I <sub>DSS</sub>                         | Zero Gate Voltage Drain Current  | V <sub>DS</sub> =64V, V <sub>GS</sub> =0V                        | —                                                                                       | —    | 1    | uA   |    |
|                                          |                                  | T <sub>J</sub> =125°C                                            | —                                                                                       | —    | 100  |      |    |
| V <sub>GS(th)</sub>                      | Gate Threshold Voltage           | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA         | 2                                                                                       | 3    | 4    | V    |    |
| I <sub>GSS</sub>                         | Gate Leakage Current             | V <sub>GS</sub> =±25V, V <sub>DS</sub> =0V                       | —                                                                                       | —    | ±100 | nA   |    |
| R <sub>DS(on)</sub> <sup>1</sup>         | Drain-Source On-Resistance       | V <sub>GS</sub> =10V, I <sub>D</sub> =40A                        | —                                                                                       | 6.4  | 7.5  | mΩ   |    |
|                                          |                                  |                                                                  | —                                                                                       | —    | —    |      |    |
| Diode Characteristics                    |                                  |                                                                  |                                                                                         |      |      |      |    |
| V <sub>SD</sub> <sup>1</sup>             | Diode Forward Voltage            | I <sub>SD</sub> =40A, V <sub>GS</sub> =0V                        | —                                                                                       | —    | 1.3  | V    |    |
| I <sub>S</sub> <sup>3</sup>              | Diode Continuous Forward Current |                                                                  |                                                                                         | —    | 100  | A    |    |
| t <sub>rr</sub>                          | Reverse Recovery Time            | I <sub>F</sub> =40A,                                             | —                                                                                       | 25   | —    | nS   |    |
| Q <sub>rr</sub>                          | Reverse Recovery Charge          | dI/dt=100A/us                                                    | —                                                                                       | 18.5 | —    | nC   |    |
| Dynamic Characteristics <sup>2</sup>     |                                  |                                                                  |                                                                                         |      |      |      |    |
| R <sub>G</sub>                           | Gate Resistance                  | V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, Frequency=1MHz         | —                                                                                       | 1.3  | —    | Ω    |    |
| C <sub>iSS</sub>                         | Input Capacitance                | V <sub>GS</sub> =0V, V <sub>DS</sub> =25V Frequency=1MHz         | —                                                                                       | 3850 | —    | pF   |    |
| C <sub>oSS</sub>                         | Output Capacitance               |                                                                  | —                                                                                       | 480  | —    |      |    |
| C <sub>rSS</sub>                         | Reverse Transfer Capacitance     |                                                                  | —                                                                                       | 278  | —    |      |    |
| t <sub>d(on)</sub>                       | Turn-On Delay Time               |                                                                  | V <sub>DD</sub> =37.5V, I <sub>D</sub> =40A, V <sub>GS</sub> =10V, R <sub>G</sub> =6.8Ω | —    | 20.4 | —    | nS |
| t <sub>r</sub>                           | Rise Time                        |                                                                  |                                                                                         | —    | 63   | —    |    |
| t <sub>d(off)</sub>                      | Turn-Off Delay Time              | —                                                                |                                                                                         | 67   | —    |      |    |
| t <sub>f</sub>                           | Fall Time                        | —                                                                |                                                                                         | 43   | —    |      |    |
| Gate Charge Characteristics <sup>2</sup> |                                  |                                                                  |                                                                                         |      |      |      |    |
| Q <sub>g</sub>                           | Total Gate Charge                | V <sub>DS</sub> =37.5V, V <sub>GS</sub> =10V I <sub>D</sub> =40A | —                                                                                       | 76   | —    | nC   |    |
| Q <sub>gs</sub>                          | Gate-to-Source Charge            |                                                                  | —                                                                                       | 9.5  | —    |      |    |
| Q <sub>gd</sub>                          | Gate-to-Drain Charge             |                                                                  | —                                                                                       | 40   | —    |      |    |

Note: 1: Pulse test; pulse width ≤ 300us, duty cycle ≤ 2%.

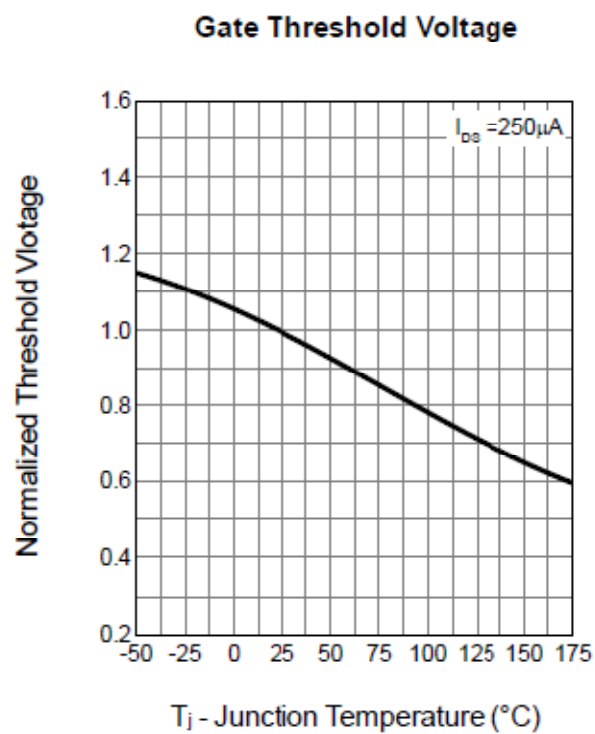
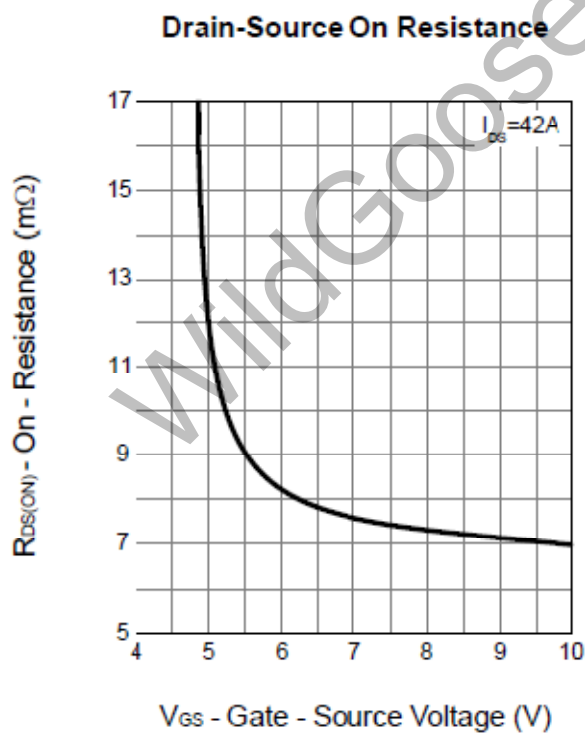
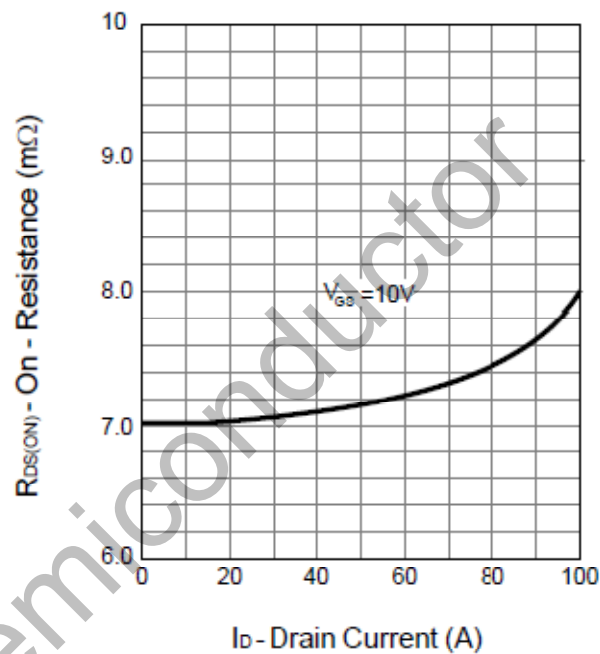
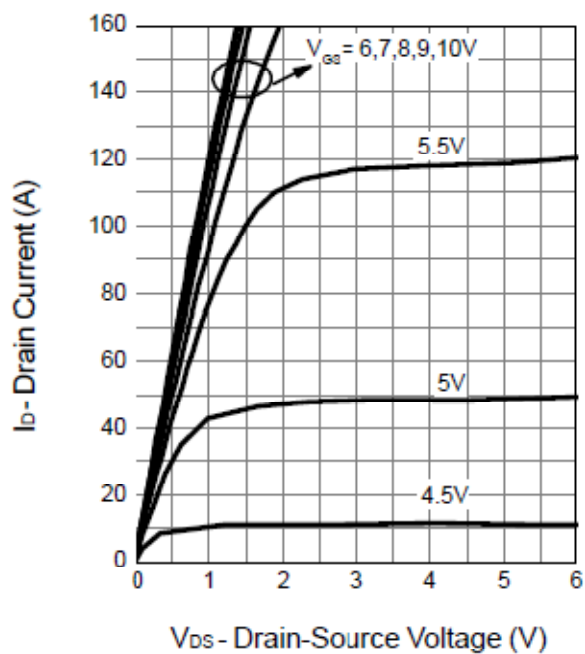
2: Guaranteed by design, not subject to production testing.

3: Package limitation current is 50A. Calculated continuous current based on maximum allowable junction temperature.

4: Repetitive rating, pulse width limited by max junction temperature.

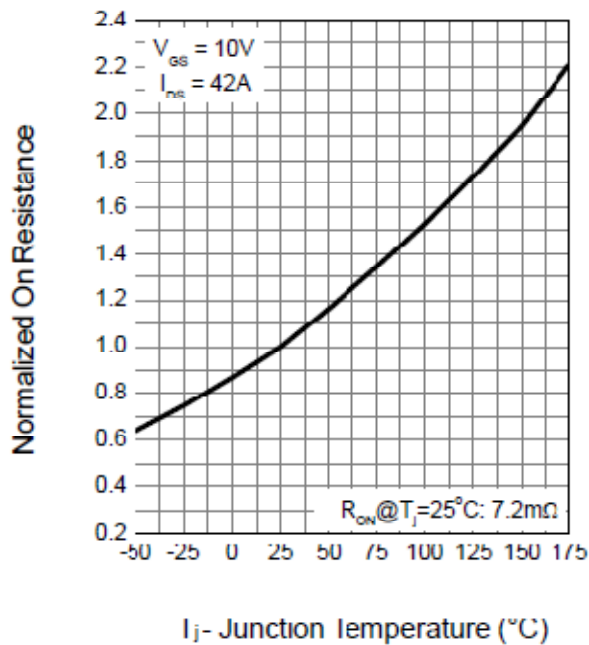
5: Starting T<sub>J</sub> = 25°C, L = 1mH, I<sub>AS</sub> = 40A.

## Typical Characteristics

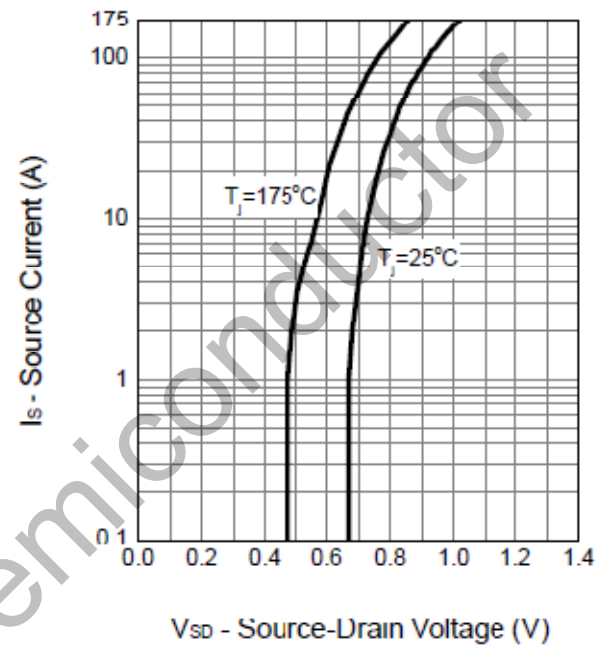


## Typical Characteristics (Continued)

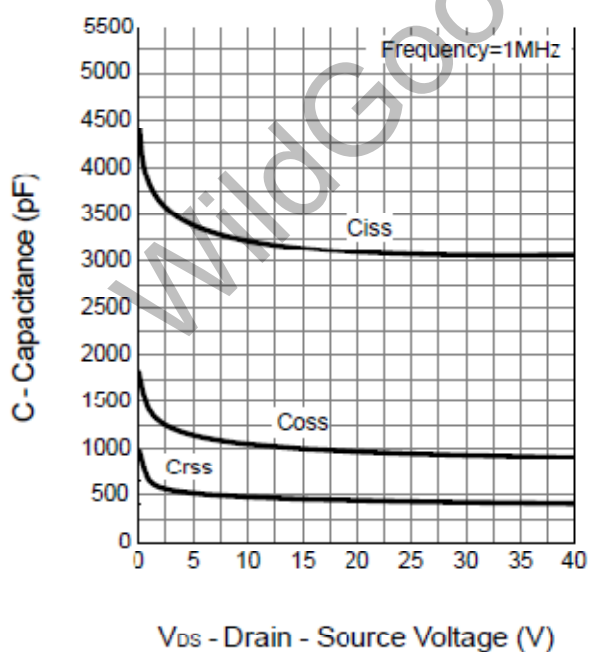
Drain-Source On Resistance



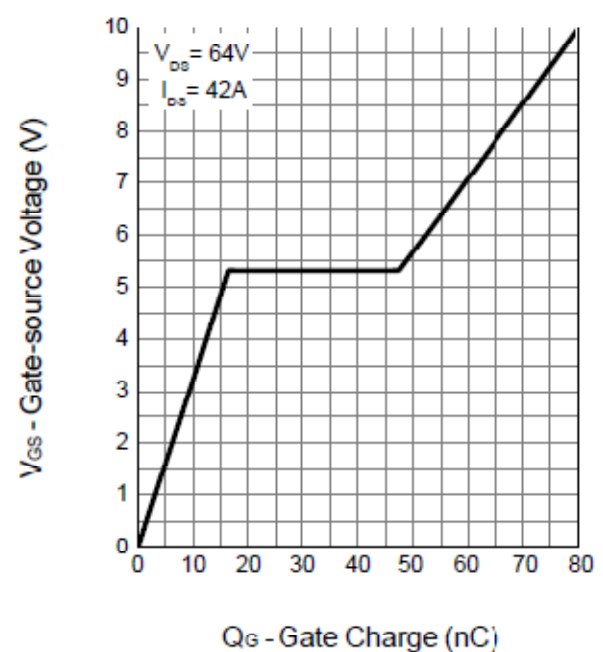
Source-Drain Diode Forward



Capacitance

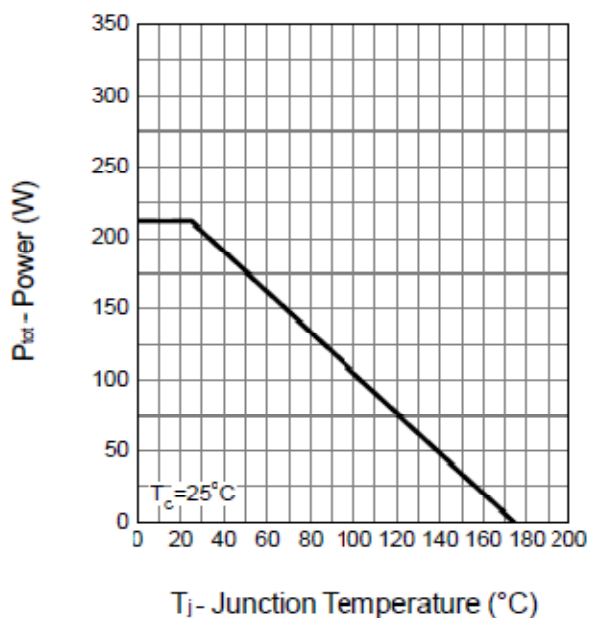


Gate Charge

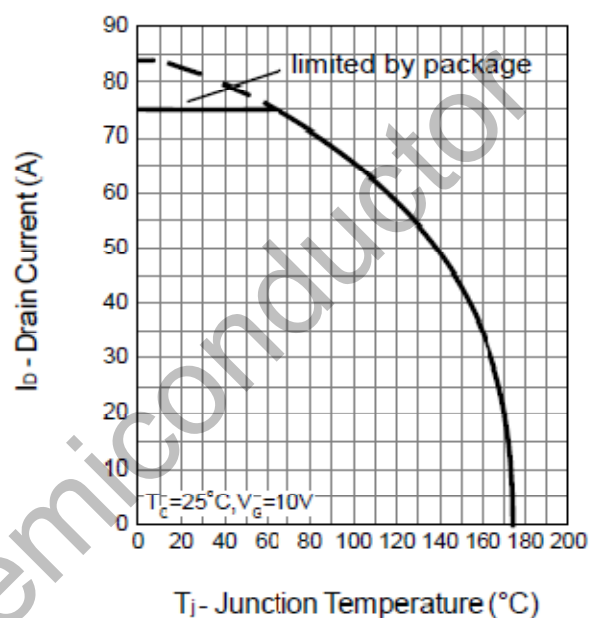


## Typical Characteristics (Continued)

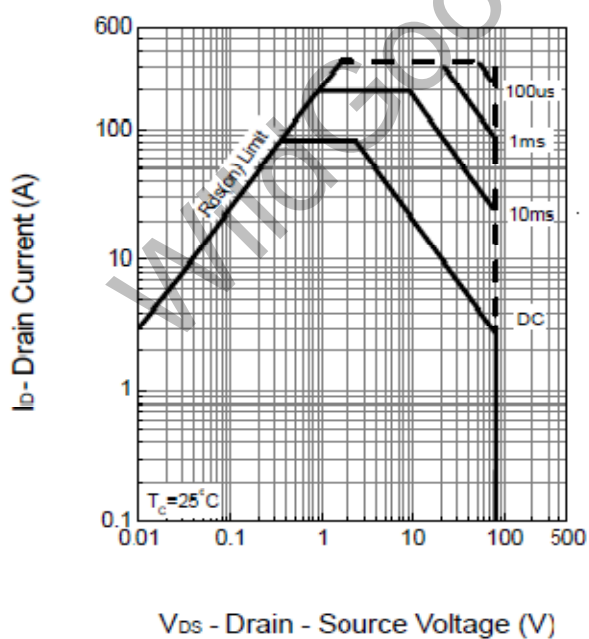
Power Dissipation



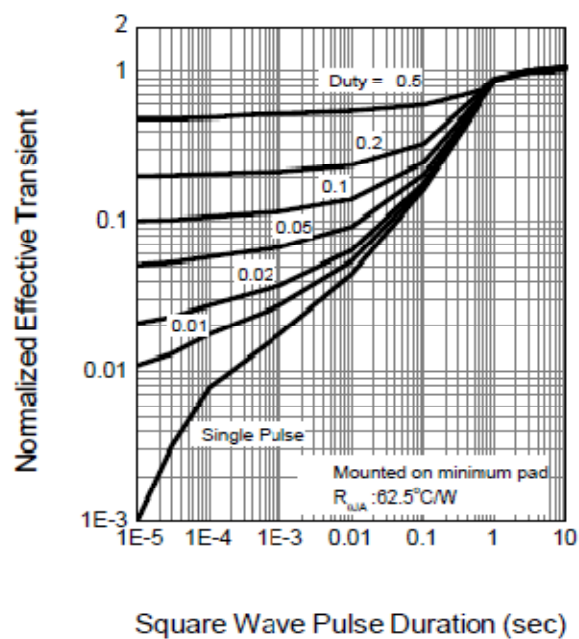
Drain Current



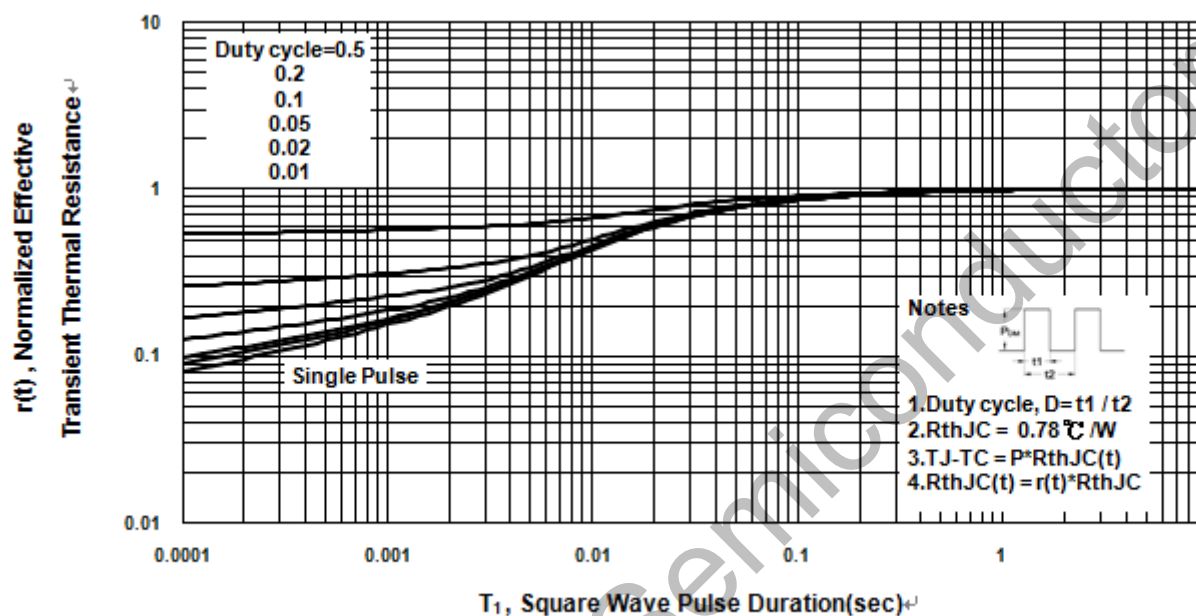
Safe Operation Area



Thermal Transient Impedance



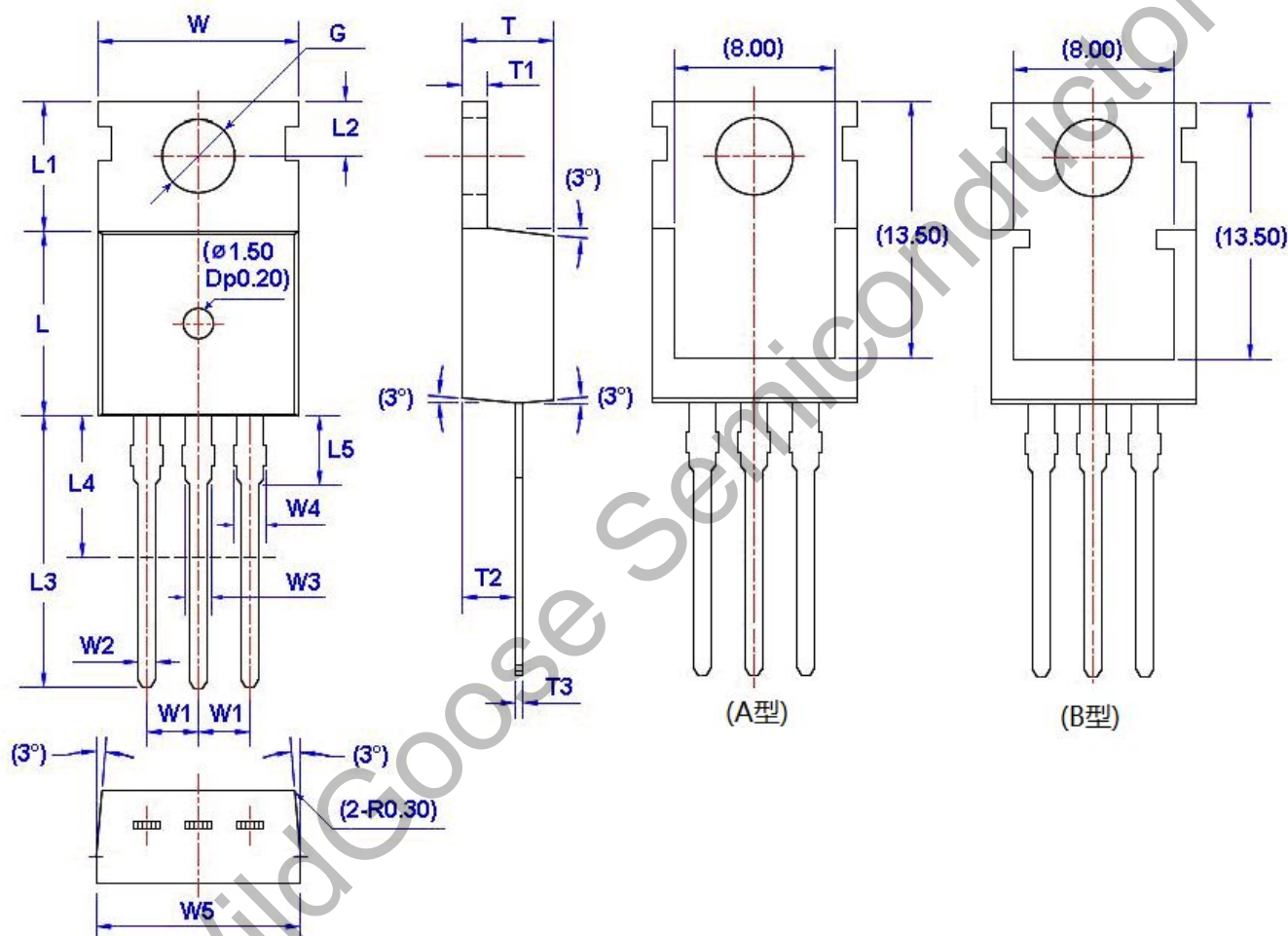
## Typical Characteristics (Continued)



Transient Thermal Response Curve

**Package Dimension****TO-220**

Unit: mm



| Symbol | Size       |       | Symbol | Size  |       | Symbol | Size |      | Symbol      | Size |      |
|--------|------------|-------|--------|-------|-------|--------|------|------|-------------|------|------|
|        | Min        | Max   |        | Min   | Max   |        | Min  | Max  |             | Min  | Max  |
| W      | 9.66       | 10.28 | W5     | 9.80  | 10.20 | L4**   | 6.20 | 6.60 | T3          | 0.45 | 0.60 |
| W1     | 2.54 (TYP) |       | L      | 9.00  | 9.40  | L5     | 2.79 | 3.30 | G( $\Phi$ ) | 3.50 | 3.70 |
| W2     | 0.70       | 0.95  | L1     | 6.40  | 6.80  | T      | 4.30 | 4.70 |             |      |      |
| W3     | 1.17       | 1.37  | L2     | 2.70  | 2.90  | T1     | 1.15 | 1.40 |             |      |      |
| W4*    | 1.32       | 1.72  | L3     | 12.70 | 14.27 | T2     | 2.20 | 2.60 |             |      |      |