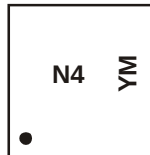


## Marking Information

Site 1



N4 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: H = 2020)  
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2011 | ... | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Code | Y    | ... | H    | I    | J    | K    | L    | M    | N    | O    | P    | R    |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

Site 2



N4 = Product Type Marking Code  
 YWX = Date Code Marking  
 Y = Year (ex: 0 = 2020)  
 W = Week (ex: a = Week 27; z Represents Week 52 and 53)  
 X = Internal Code (ex: U = Monday)

Date Code Key

| Year | 2011 | ... | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Code | 1    | ... | 0    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    |

| Week | 1-26 | 27-52 | 53 |
|------|------|-------|----|
| Code | A-Z  | a-z   | z  |

| Internal Code | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---------------|-----|-----|-----|-----|-----|-----|-----|
| Code          | T   | U   | V   | W   | X   | Y   | Z   |

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                           |              |                                                  | Symbol           | Value        | Unit |
|----------------------------------------------------------|--------------|--------------------------------------------------|------------------|--------------|------|
| Drain-Source Voltage                                     |              |                                                  | V <sub>DSS</sub> | 20           | V    |
| Gate-Source Voltage                                      |              |                                                  | V <sub>GSS</sub> | ±12          | V    |
| Continuous Drain Current (Note 6) V <sub>GS</sub> = 4.5V | Steady State | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | 10.5<br>8.5  | A    |
|                                                          | t < 10s      | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | 12.5<br>10.0 | A    |
| Continuous Drain Current (Note 6) V <sub>GS</sub> = 2.5V | Steady State | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | 9.4<br>7.5   | A    |
|                                                          | t < 10s      | T <sub>A</sub> = +25°C<br>T <sub>A</sub> = +70°C | I <sub>D</sub>   | 11.2<br>8.8  | A    |
| Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)       |              |                                                  | I <sub>DM</sub>  | 80           | A    |
| Maximum Body Diode Continuous Current                    |              |                                                  | I <sub>S</sub>   | 2.5          | A    |

**Thermal Characteristics**

| Characteristic                                   |                        | Symbol                            | Value       | Unit |
|--------------------------------------------------|------------------------|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5)                 | T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 0.66        | W    |
|                                                  | T <sub>A</sub> = +70°C |                                   | 0.42        |      |
| Thermal Resistance, Junction to Ambient (Note 5) | Steady State           | R <sub>θJA</sub>                  | 189         | °C/W |
|                                                  | t < 10s                |                                   | 132         |      |
| Total Power Dissipation (Note 6)                 | T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 2.03        | W    |
|                                                  | T <sub>A</sub> = +70°C |                                   | 1.31        |      |
| Thermal Resistance, Junction to Ambient (Note 6) | Steady State           | R <sub>θJA</sub>                  | 61          | °C/W |
|                                                  | t < 10s                |                                   | 43          |      |
| Thermal Resistance, Junction to Case (Note 6)    |                        | R <sub>θJC</sub>                  | 9.3         |      |
| Operating and Storage Temperature Range          |                        | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                         | Symbol              | Min | Typ  | Max  | Unit | Test Condition                                                                                |
|--------------------------------------------------------|---------------------|-----|------|------|------|-----------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 7)</b>                    |                     |     |      |      |      |                                                                                               |
| Drain-Source Breakdown Voltage                         | BV <sub>DSS</sub>   | 20  | —    | —    | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA                                                  |
| Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C | I <sub>DSS</sub>    | —   | —    | 1    | μA   | V <sub>DS</sub> = 16V, V <sub>GS</sub> = 0V                                                   |
| Gate-Source Leakage                                    | I <sub>GSS</sub>    | —   | —    | ±100 | nA   | V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V                                                  |
| <b>ON CHARACTERISTICS (Note 7)</b>                     |                     |     |      |      |      |                                                                                               |
| Gate Threshold Voltage                                 | V <sub>GS(TH)</sub> | 0.5 | —    | 1.1  | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA                                    |
| Static Drain-Source On-Resistance                      | R <sub>DS(ON)</sub> | —   | 9.3  | 11.6 | mΩ   | V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 8.5A                                                 |
|                                                        |                     |     | 11.4 | 15   |      | V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 8.5A                                                 |
|                                                        |                     |     | 17   | 30   |      | V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 5A                                                   |
|                                                        |                     |     | 24   | 50   |      | V <sub>GS</sub> = 1.5V, I <sub>D</sub> = 3A                                                   |
| Forward Transfer Admittance                            | Y <sub>fs</sub>     | —   | 11.3 | —    | s    | V <sub>DS</sub> = 10V, I <sub>D</sub> = 8.5A                                                  |
| Diode Forward Voltage                                  | V <sub>SD</sub>     | —   | —    | 1.2  | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = 8.5A                                                   |
| <b>DYNAMIC CHARACTERISTICS (Note 8)</b>                |                     |     |      |      |      |                                                                                               |
| Input Capacitance                                      | C <sub>iss</sub>    | —   | 1779 | —    | pF   | V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V,<br>f = 1.0MHz                                    |
| Output Capacitance                                     | C <sub>oss</sub>    | —   | 175  | —    | pF   |                                                                                               |
| Reverse Transfer Capacitance                           | C <sub>rss</sub>    | —   | 154  | —    | pF   |                                                                                               |
| Gate Resistance                                        | R <sub>g</sub>      | —   | 0.94 | —    | Ω    | V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz                                          |
| Total Gate Charge (V <sub>GS</sub> = 4.5V)             | Q <sub>g</sub>      | —   | 19.7 | —    | nC   | V <sub>DS</sub> = 10V, I <sub>D</sub> = 8.5A                                                  |
| Total Gate Charge (V <sub>GS</sub> = 10V)              | Q <sub>g</sub>      | —   | 45.6 | —    | nC   |                                                                                               |
| Gate-Source Charge                                     | Q <sub>gs</sub>     | —   | 2.9  | —    | nC   |                                                                                               |
| Gate-Drain Charge                                      | Q <sub>gd</sub>     | —   | 3.8  | —    | nC   |                                                                                               |
| Turn-On Delay Time                                     | t <sub>D(on)</sub>  | —   | 7.4  | —    | ns   | V <sub>DS</sub> = 10V, I <sub>D</sub> = 8.5A<br>V <sub>GS</sub> = 4.5V, R <sub>G</sub> = 1.8Ω |
| Turn-On Rise Time                                      | t <sub>r</sub>      | —   | 16.8 | —    | ns   |                                                                                               |
| Turn-Off Delay Time                                    | t <sub>D(off)</sub> | —   | 43.6 | —    | ns   |                                                                                               |
| Turn-Off Fall Time                                     | t <sub>f</sub>      | —   | 10.9 | —    | ns   |                                                                                               |
| Reverse Recovery Time                                  | T <sub>rr</sub>     | —   | 8.6  | —    | ns   | I <sub>F</sub> = 8.5A, di/dt = 210A/μs                                                        |
| Reverse Recovery Charge                                | Q <sub>rr</sub>     | —   | 3.7  | —    | nC   |                                                                                               |

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
  - Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

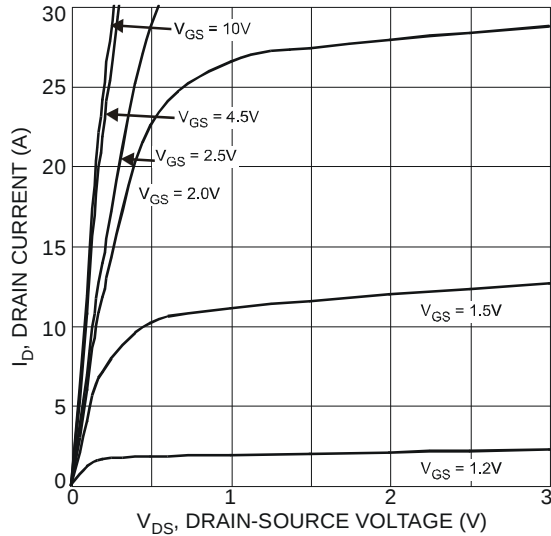


Fig. 1 Typical Output Characteristic

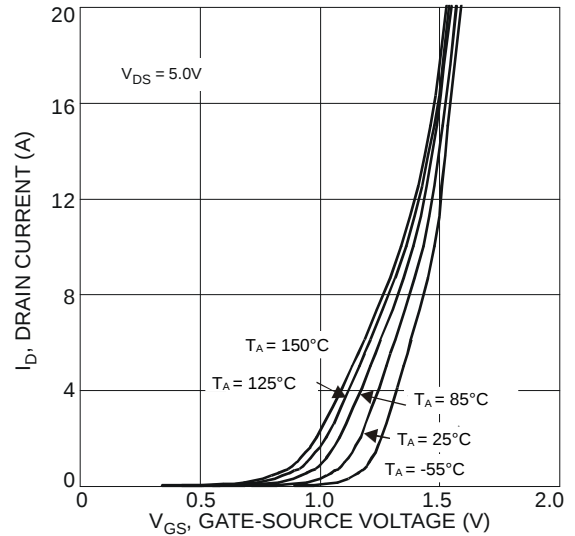


Fig. 2 Typical Transfer Characteristics

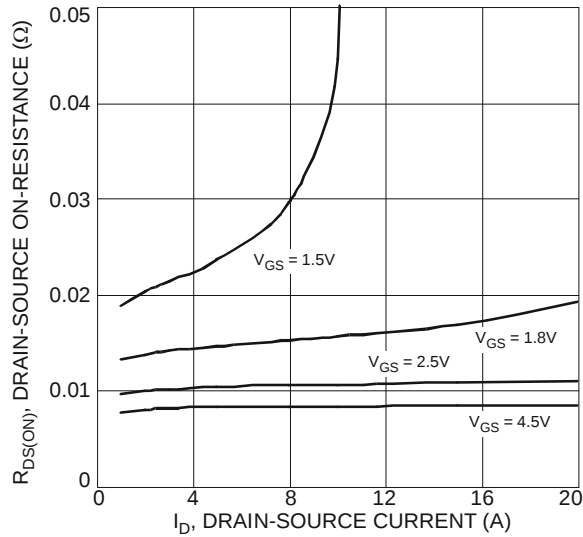


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

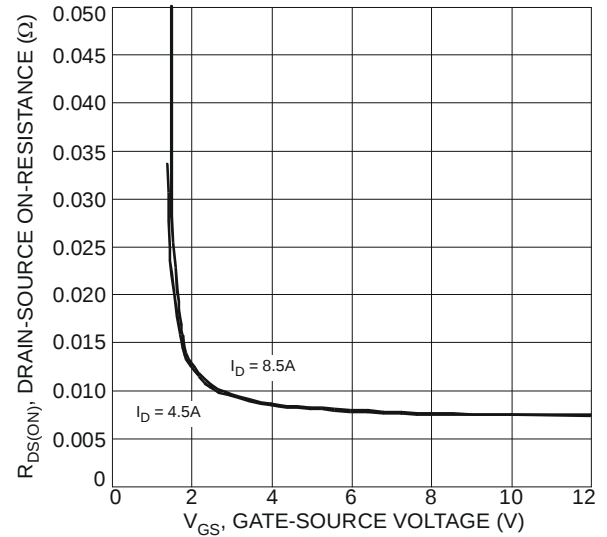


Fig. 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

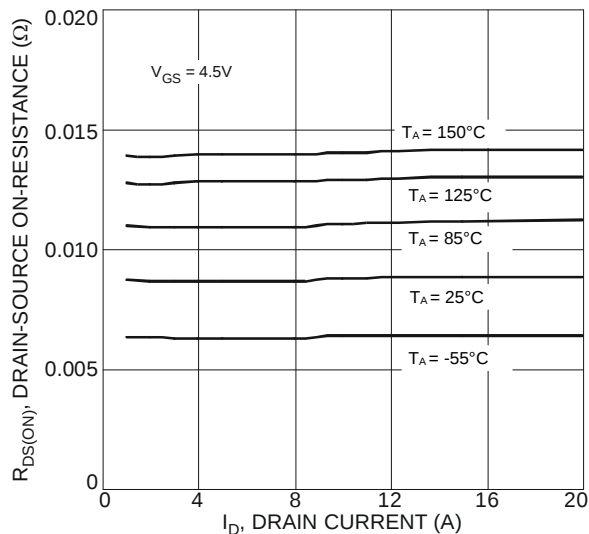


Fig. 5 Typical On-Resistance vs. Drain Current and Temperature

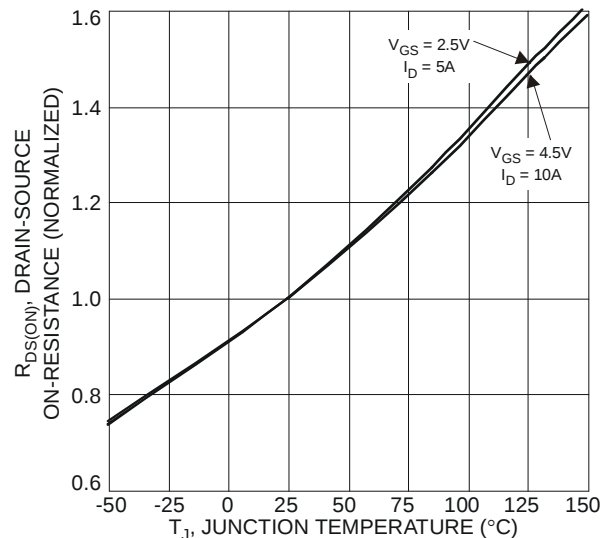


Fig. 6 On-Resistance Variation with Temperature

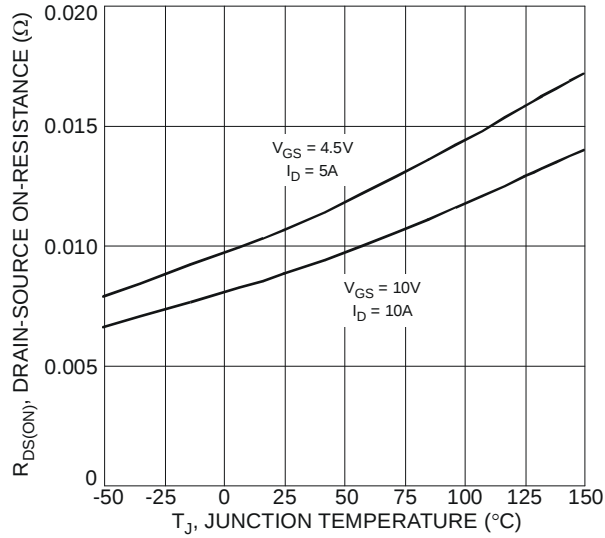


Fig. 7 On-Resistance Variation with Temperature

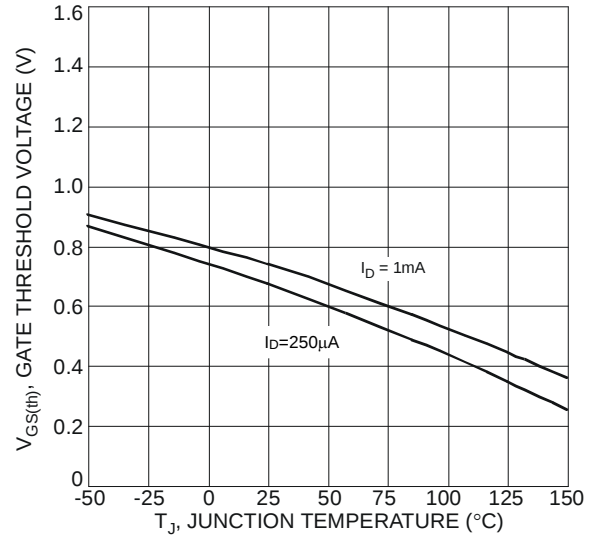


Fig. 8 Gate Threshold Variation vs. Junction Temperature

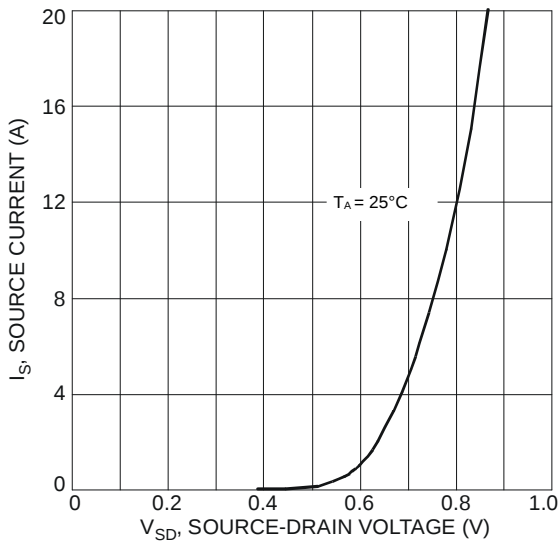


Fig. 9 Diode Forward Voltage vs. Current

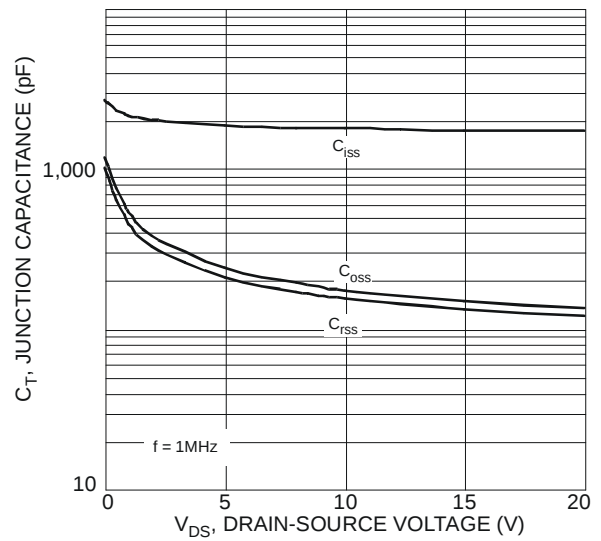


Fig. 10 Typical Junction Capacitance

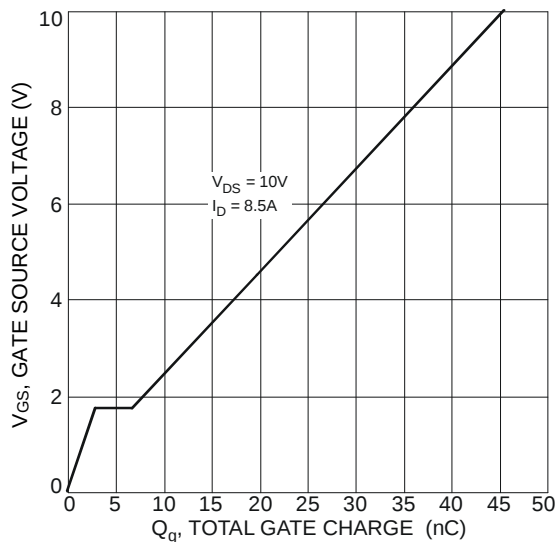


Fig. 11 Gate Charge

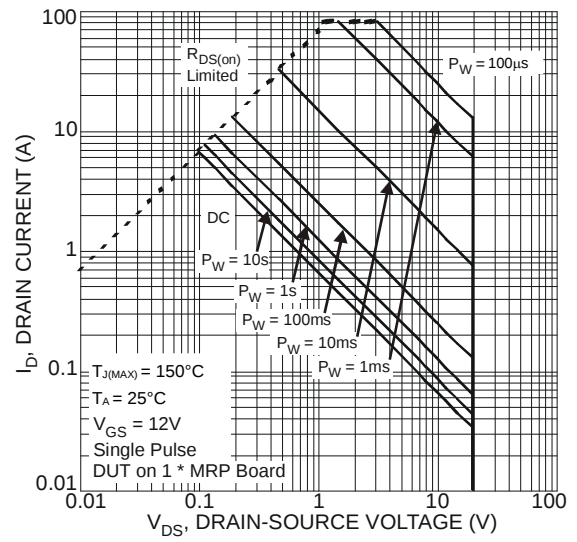
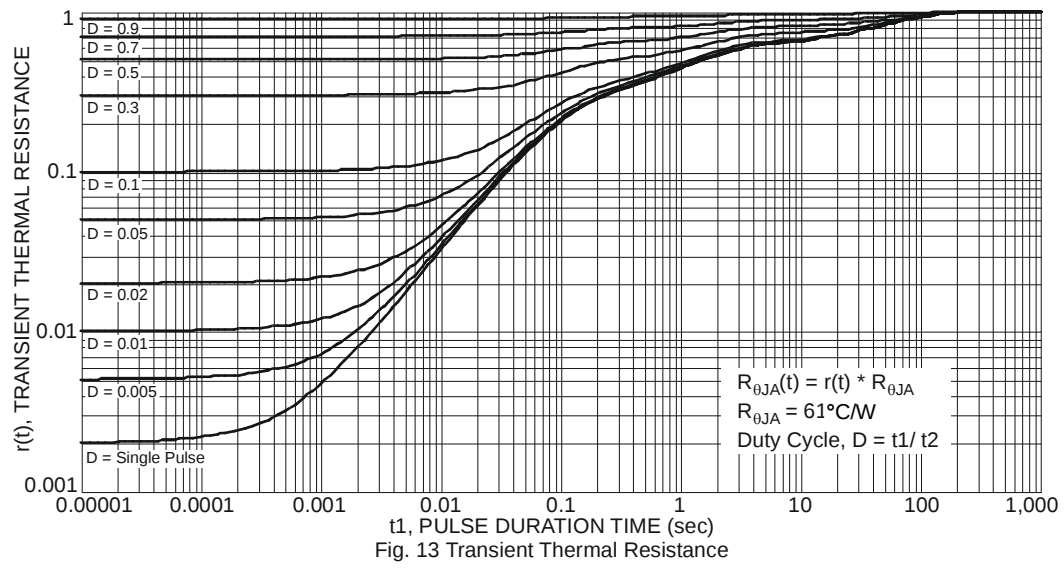


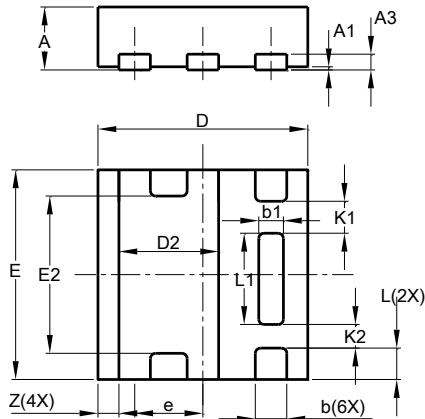
Fig. 12 SOA, Safe Operation Area



## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### U-DFN2020-6 (Type E)

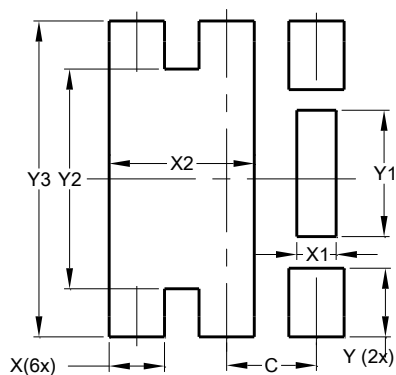


| U-DFN2020-6<br>Type E |       |       |       |
|-----------------------|-------|-------|-------|
| Dim                   | Min   | Max   | Typ   |
| A                     | 0.57  | 0.63  | 0.60  |
| A1                    | 0     | 0.05  | 0.03  |
| A3                    | —     | —     | 0.15  |
| b                     | 0.25  | 0.35  | 0.30  |
| b1                    | 0.185 | 0.285 | 0.235 |
| D                     | 1.95  | 2.05  | 2.00  |
| D2                    | 0.85  | 1.05  | 0.95  |
| E                     | 1.95  | 2.05  | 2.00  |
| E2                    | 1.40  | 1.60  | 1.50  |
| e                     | —     | —     | 0.65  |
| L                     | 0.25  | 0.35  | 0.30  |
| L1                    | 0.82  | 0.92  | 0.87  |
| K1                    | —     | —     | 0.305 |
| K2                    | —     | —     | 0.225 |
| Z                     | —     | —     | 0.20  |
| All Dimensions in mm  |       |       |       |

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### U-DFN2020-6 (Type E)



| Dimensions | Value<br>(in mm) |
|------------|------------------|
| C          | 0.650            |
| X          | 0.400            |
| X1         | 0.285            |
| X2         | 1.050            |
| Y          | 0.500            |
| Y1         | 0.920            |
| Y2         | 1.600            |
| Y3         | 2.300            |

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