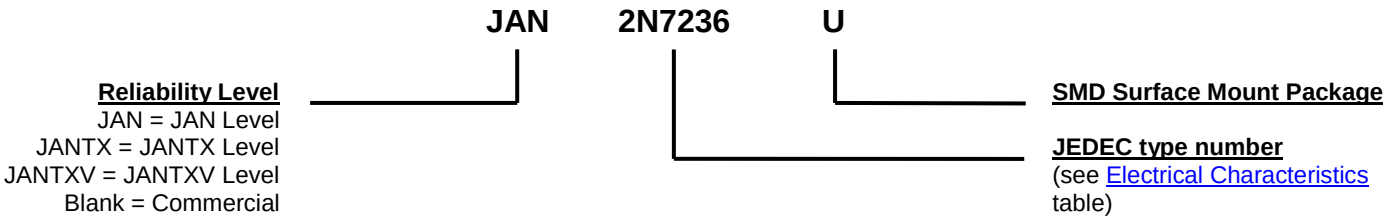
## MECHANICAL and PACKAGING

- CASE: Ceramic and gold over nickel plated steel.
- TERMINALS: Gold over nickel plated tungsten/copper.
- MARKING: Manufacturer's ID, part number, and date code.
- WEIGHT: 0.9 grams.
- See Package Dimensions on last page.

## PART NOMENCLATURE




## SYMBOLS & DEFINITIONS

| Symbol | Definition |
|---|---|
| di/dt | Rate of change of diode current while in reverse-recovery mode, recorded as maximum value. |
| $I_F$ | Forward current |
| $R_G$ | Gate drive impedance |
| $V_{DD}$ | Drain supply voltage |
| $V_{DS}$ | Drain source voltage, dc |
| $V_{GS}$ | Gate source voltage, dc |

## ELECTRICAL CHARACTERISTICS @ $T_A$ = +25 °C, unless otherwise noted

| Parameters / Test Conditions | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | |
| Drain-Source Breakdown Voltage<br>$V_{GS}$ = 0 V, $I_D$ = 1.0 mA | $V_{(BR)DSS}$ | -100 | | V |
| Gate-Source Voltage (Threshold)<br>$V_{DS} \geq V_{GS}$, $I_D$ = -0.25 mA<br>$V_{DS} \geq V_{GS}$, $I_D$ = -0.25 mA, $T_J$ = +125 °C<br>$V_{DS} \geq V_{GS}$, $I_D$ = -0.25 mA, $T_J$ = -55 °C | $V_{GS(th)1}$<br>$V_{GS(th)2}$<br>$V_{GS(th)3}$ | -2.0<br>-1.0 | -4.0<br><br>-5.0 | V |
| Gate Current<br>$V_{GS}$ = ± 20 V, $V_{DS}$ = 0 V<br>$V_{GS}$ = ± 20 V, $V_{DS}$ = 0 V, $T_J$ = +125 °C | $I_{GSS1}$<br>$I_{GSS2}$ | | ±100<br>±200 | nA |
| Drain Current<br>$V_{GS}$ = 0 V, $V_{DS}$ = -80 V | $I_{DSS1}$ | | -25 | µA |
| Drain Current<br>$V_{GS}$ = 0 V, $V_{DS}$ = -100 V, $T_J$ = +125 °C | $I_{DSS2}$ | | -1.0 | mA |
| Drain Current<br>$V_{GS}$ = 0 V, $V_{DS}$ = -80 V, $T_J$ = +125 °C | $I_{DSS3}$ | | -0.25 | mA |
| Static Drain-Source On-State Resistance<br>$V_{GS}$ = 10 V, $I_D$ = -11.0 A pulsed | $r_{DS(on)1}$ | | 0.20 | Ω |
| Static Drain-Source On-State Resistance<br>$V_{GS}$ = -10 V, $I_D$ = -18.0 A pulsed | $r_{DS(on)2}$ | | 0.22 | Ω |
| Static Drain-Source On-State Resistance<br>$T_J$ = +125°C<br>$V_{GS}$ = -10 V, $I_D$ = -11.0 A pulsed | $r_{DS(on)3}$ | | 0.34 | Ω |
| Diode Forward Voltage<br>$V_{GS}$ = 0 V, $I_D$ = -18.0 A pulsed | $V_{SD}$ | | -5.0 | V |

## DYNAMIC CHARACTERISTICS

| Parameters / Test Conditions | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| Gate Charge: | | | | |
| On-State Gate Charge<br>$V_{GS}$ = -10 V, $I_D$ = -18.0 A, $V_{DS}$ = -50 V | $Q_{g(on)}$ | | 60 | nC |
| Gate to Source Charge<br>$V_{GS}$ = -10 V, $I_D$ = -18.0 A, $V_{DS}$ = -50 V | $Q_{gs}$ | | 13 | nC |
| Gate to Drain Charge<br>$V_{GS}$ = -10 V, $I_D$ = -18.0 A, $V_{DS}$ = -50 V | $Q_{gd}$ | | 35.2 | nC |

**ELECTRICAL CHARACTERISTICS** @ $T_A$ = +25 °C, unless otherwise noted (continued)

## SWITCHING CHARACTERISTICS

| Parameters / Test Conditions | Symbol | Min. | Max. | Unit |
|---|---|---|---|---|
| Turn-on delay time<br>$I_D$ = -11.0 A, $V_{GS}$ = -10 V, $R_G$ = 9.1 Ω, $V_{DD}$ = -50 V | $t_{d(on)}$ | | 35 | ns |
| Rinse time<br>$I_D$ = -11.0 A, $V_{GS}$ = -10 V, $R_G$ = 9.1 Ω, $V_{DD}$ = -50 V | $t_r$ | | 85 | ns |
| Turn-off delay time<br>$I_D$ = -11.0 A, $V_{GS}$ = -10 V, $R_G$ = 9.1 Ω, $V_{DD}$ = -50 V | $t_{d(off)}$ | | 85 | ns |
| Fall time<br>$I_D$ = -11.0 A, $V_{GS}$ = -10 V, $R_G$ = 9.1 Ω, $V_{DD}$ = -50 V | $t_f$ | | 65 | ns |
| Diode Reverse Recovery Time<br>di/dt ≤ 100 A/µs, $V_{DD}$ ≤ 30 V, $I_F$ = -18.0 A | $t_{rr}$ | | 280 | ns |

## GRAPHS

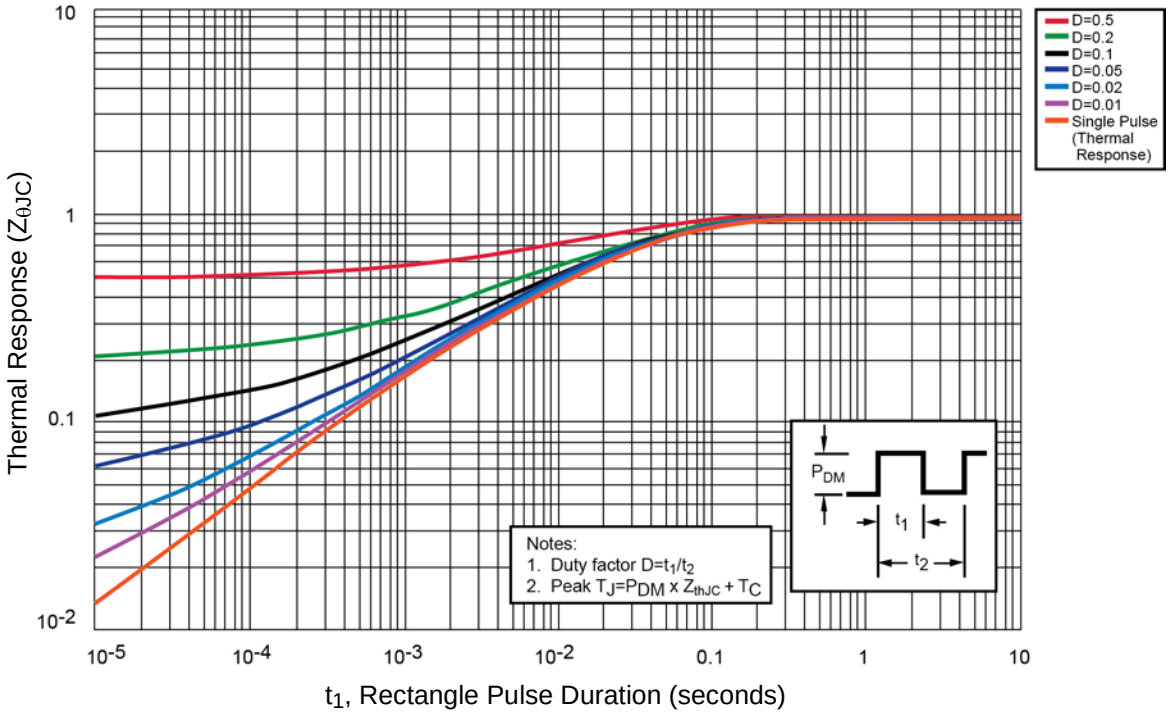



**FIGURE 1**
Thermal Impedance Curves

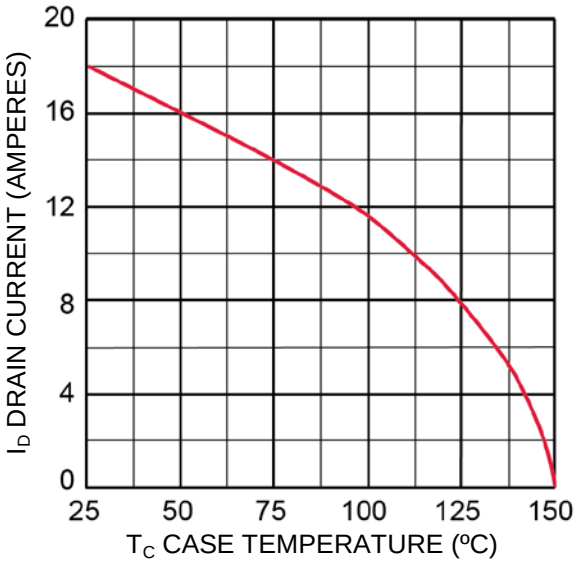



**FIGURE 2**
Maximum Drain Current vs Case Temperature Graphs

## GRAPHS (continued)

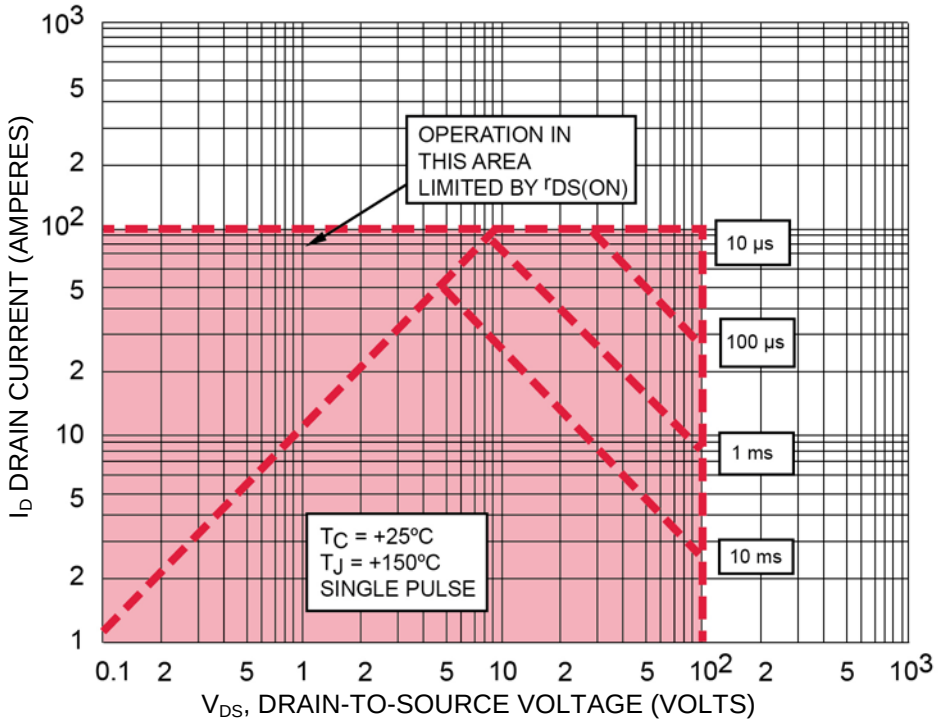
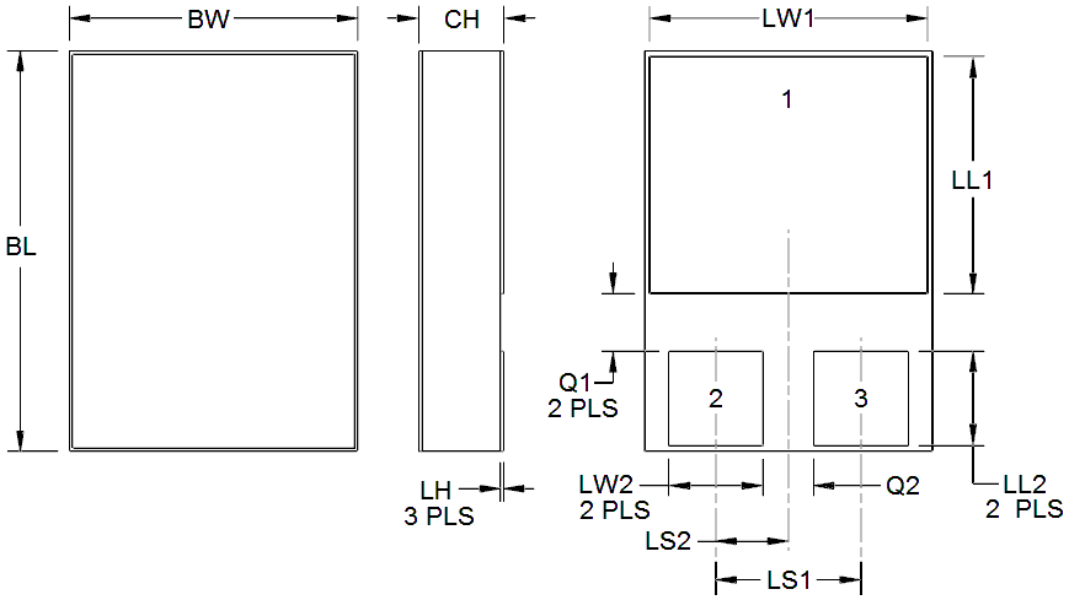



**FIGURE 3**
Maximum Safe Operating Area

## PACKAGE DIMENSIONS




NOTES:
1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. The lid shall be electrically isolated from the drain, gate and source.
4. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.

| Symbol | DIMENSIONS | | | |
|---|---|---|---|---|
| | INCH | | MILLIMETERS | |
| | Min | Max | Min | Max |
| BL | .620 | .630 | 15.75 | 16.00 |
| BW | .445 | .455 | 11.30 | 11.56 |
| CH | - | .142 | - | 3.60 |
| LH | .010 | .020 | .026 | .050 |
| LL1 | .410 | .420 | 10.41 | 10.67 |
| LL2 | .152 | .162 | 3.86 | 4.11 |
| LS1 | .210 BSC | | 5.33 BSC | |
| LS2 | .105 BSC | | 2.67 BSC | |
| LW1 | .370 | .380 | 9.40 | 9.65 |
| LW2 | .135 | .145 | 3.43 | 3.68 |
| Q1 | .030 | - | 0.76 | - |
| Q2 | .035 | - | 0.89 | - |
| Term 1 | Drain | | | |
| Term 2 | Gate | | | |
| Term 3 | Source | | | |