

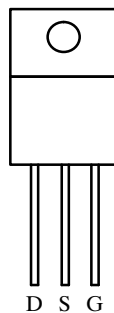
### N-Channel Enhancement-Mode Transistors

#### Product Summary

| $V_{DS}$ (V) | $r_{DS(on)}$ ( $\Omega$ ) | $I_D$ (A) |
|--------------|---------------------------|-----------|
| 500          | 0.515                     | 12        |

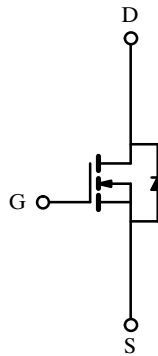
Parametric limits in accordance with MIL-S-19500/592 where applicable.

TO-254AA  
Hermetic Package



Top View

Case Isolated



N-Channel MOSFET

#### Absolute Maximum Ratings ( $T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

| Parameter  | Symbol         | Limit                     | Unit             |
|--|----------------|---------------------------|------------------|
| Drain-Source Voltage                                   | $V_{DS}$       | 500                       | V                |
| Gate-Source Voltage                                    | $V_{GS}$       | $\pm 20$                  |                  |
| Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) | $I_D$          | $T_C = 25^\circ\text{C}$  | A                |
|  |                | $T_C = 100^\circ\text{C}$ |                  |
| Pulsed Drain Current                                   | $I_{DM}$       | 48                        | A                |
| Avalanche Current                                      | $I_{AR}$       | 12                        |                  |
| Maximum Power Dissipation                              | $P_D$          | 150                       | W                |
| Operating Junction and Storage Temperature Range       | $T_J, T_{stg}$ | -55 to 150                | $^\circ\text{C}$ |

#### Thermal Resistance Ratings

| Parameter                | Symbol     | Limit | Unit                      |
|--------------------------|------------|-------|---------------------------|
| Maximum Junction-to-Case | $R_{thJC}$ | 0.83  | $^\circ\text{C}/\text{W}$ |

## 2N7228JANTX/JANTXV

### Specifications ( $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

| Parameter   | Symbol        | Test Condition  | Limit |                  |           | Unit          |
|---|---------------|---|-------|------------------|-----------|---------------|
|   |               |   | Min   | Typ <sup>a</sup> | Max       |               |
| <b>Static</b>   |               |   |       |                  |           |               |
| Drain-Source Breakdown Voltage                        | $V_{(BR)DSS}$ | $V_{GS} = 0\text{ V}, I_D = 1000\ \mu\text{A}$  | 500   |                  |           | V             |
| Gate Threshold Voltage                                | $V_{GS(th)}$  | $V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}, T_J = -55^\circ\text{C}$  |       |                  | 5.0       |               |
|   |               | $V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}, T_J = 25^\circ\text{C}$   | 2.0   |                  | 4.0       |               |
| Gate-Body Leakage                                     | $I_{GSS}$     | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$   |       |                  | $\pm 100$ | nA            |
|   |               | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}, T_J = 125^\circ\text{C}$  |       |                  | $\pm 200$ |               |
| Zero Gate Voltage Drain Current                       | $I_{DSS}$     | $V_{DS} = 400\text{ V}, V_{GS} = 0\text{ V}$  |       |                  | 25        | $\mu\text{A}$ |
|   |               | $V_{DS} = 400\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$   |       |                  | 250       |               |
|   |               | $V_{DS} = 500\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$   |       |                  | 1000      |               |
| Drain-Source On-State Resistance <sup>b</sup>         | $r_{DS(on)}$  | $V_{GS} = 10\text{ V}, I_D = 12\text{ A}$   |       |                  | 0.515     | $\Omega$      |
|   |               | $V_{GS} = 10\text{ V}, I_D = 8\text{ A}, T_J = 125^\circ\text{C}$   |       |                  | 0.9       |               |
| <b>Dynamic</b>  |               |   |       |                  |           |               |
| Total Gate Charge <sup>c</sup>                        | $Q_g$         | $V_{DS} = 250\text{ V}, V_{GS} = 10\text{ V}, I_D = 12\text{ A}$  | 55    |                  | 120       | nC            |
| Gate-Source Charge <sup>c</sup>                       | $Q_{gs}$      |   | 5     |                  | 19        |               |
| Gate-Drain Charge <sup>c</sup>                        | $Q_{gd}$      |   | 27    |                  | 70        |               |
| Turn-On Delay Time <sup>c</sup>                       | $t_{d(on)}$   | $V_{DD} = 250\text{ V}, R_L = 20.8\ \Omega$<br>$I_D \cong 12\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.35\ \Omega$ |       |                  | 35        | ns            |
| Rise Time <sup>c</sup>                                | $t_r$         |   |       |                  | 190       |               |
| Turn-Off Delay Time <sup>c</sup>                      | $t_{d(off)}$  |   |       |                  | 170       |               |
| Fall Time <sup>c</sup>                                | $t_f$         |   |       |                  | 130       |               |
| <b>Source-Drain Diode Ratings and Characteristics</b> |               |   |       |                  |           |               |
| Continuous Current                                    | $I_S$         |   |       |                  | 12        | A             |
| Pulsed Current  | $I_{SM}$      |   |       |                  | 48        |               |
| Diode Forward Voltage <sup>b</sup>                    | $V_{SD}$      | $I_F = 12\text{ A}, V_{GS} = 0\text{ V}$  |       |                  | 1.7       | V             |
| Reverse Recovery Time                                 | $t_{rr}$      | $I_F = 12\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$   |       |                  | 1600      | ns            |

Notes:

- For design aid only; not subject to production testing.
- Pulse test; pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .
- Independent of operating temperature.