# 2N6661JAN/JANTX/JANTXV

## N-Channel Enhancement-Mode MOS Transistors

### Product Summary

| $V_{(BR)DSS}$ Min (V) | $r_{DS(on)}$ Max (Ω) | $V_{GS(th)}$ (V) | $I_D$ (A) |
|---|---|---|---|
| 90 | 4 @ $V_{GS}$ = 10 V | 0.8 to 2 | 0.86 |

### Features

- Military Qualified
- Low On-Resistance: 3.6 Ω
- Low Threshold: 1.6 V
- Low Input Capacitance: 35 pF
- Fast Switching Speed: 6 ns
- Low Input and Output Leakage

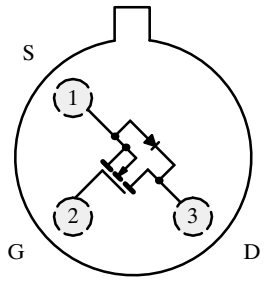
### Benefits

- Guaranteed Reliability
- Low Offset Voltage
- Low-Voltage Operation
- Easily Driven Without Buffer
- High-Speed Circuits
- Low Error Voltage

### Applications

- Military Applications
- Direct Logic-Level Interface: TTL/CMOS
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Solid-State Relays

TO-205AD
(TO-39)




Top View

### Absolute Maximum Ratings ($T_C$ = 25°C Unless Otherwise Noted)

| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 90 | V |
| Gate-Source Voltage | | $V_{GS}$ | ± 20 | |
| Continuous Drain Current ($T_J$ = 150°C) | $T_C$= 25°C | $I_D$ | 0.86 | A |
| | $T_C$= 100°C | | 0.54 | |
| Pulsed Drain Current[a] | | $I_{DM}$ | 3 | |
| Power Dissipation | $T_C$= 25°C | $P_D$ | 6.25 | W |
| | $T_A$= 25°C | | 0.725 | |
| Maximum Junction-to-Ambient[b] | | $R_{thJA}$ | 170 | °C/W |
| Maximum Junction-to-Case | | $R_{thJC}$ | 20 | |
| Operating Junction and Storage Temperature Range | | $T_J$, $T_{stg}$ | –55 to 150 | °C |

Notes
a. Pulse width limited by maximum junction temperature.
b. Not required by Military Spec.

## Specifications[a]

| Parameter | Symbol | Test Conditions | Limits Min | Limits Typ[b] | Limits Max | Unit |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0 V, $I_D$ = 10 µA | 90 | 125 | | V |
| Gate-Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$ = $V_{GS}$, $I_D$ = 1 mA | 0.8 | 1.6 | 2 | V |
| | | $T_C$ = –55°C | | 1.8 | 2.5 | |
| | | $T_C$ = 125°C | 0.3 | 1.3 | | |
| Gate-Body Leakage | $I_{GSS}$ | $V_{DS}$ = 0 V, $V_{GS}$ = ±20 V | | | ±100 | nA |
| | | $T_C$ = 125°C | | | ±500 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 72 V, $V_{GS}$ = 0 V | | | 1 | µA |
| | | $T_C$ = 125°C | | | 100 | |
| On-State Drain Current[c] | $I_{D(on)}$ | $V_{DS}$ = 10 V, $V_{GS}$ = 10 V | | 1.8 | | mA |
| Drain-Source On-Resistance[c] | $r_{DS(on)}$ | $V_{GS}$ = 5 V, $I_D$ = 0.3 A | | 3.8 | 5.3 | Ω |
| | | $V_{GS}$ = 10 V, $I_D$ = 1 A | | 3.6 | 4 | |
| | | $T_C$ = 125°C | | 6.7 | 7.5 | |
| Forward Transconductance[c] | $g_{fs}$ | $V_{DS}$ = 7.5 V, $I_D$ = 0.475 A | 170 | 340 | | mS |
| Diode Forward Voltage | $V_{SD}$ | $I_S$ = 0.86 A, $V_{GS}$ = 0 V | 0.7 | 0.9 | 1.4 | V |
| **Dynamic** | | | | | | |
| Input Capacitance | $C_{iss}$ | $V_{DS}$ = 25 V, $V_{GS}$ = 0 V<br>f = 1 MHz | | 35 | 50 | pF |
| Output Capacitance | $C_{oss}$ | | | 15 | 40 | |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 2 | 10 | |
| Drain-Source Capacitance | $C_{ds}$ | | | 30 | | |
| **Switching[d]** | | | | | | |
| Turn-On Time | $t_{ON}$ | $V_{DD}$ = 25 V, $R_L$ = 23 Ω<br>$I_D$ ≅ 1 A, $V_{GEN}$ = 10 V<br>$R_G$ = 25 Ω | | 6 | 1 0 | ns |
| Turn-Off Time | $t_{OFF}$ | | | 8 | 10 | |

Notes
a. $T_A$ = 25°C unless otherwise noted. VNDQ09
b. For DESIGN AID ONLY, not subject to production testing.
c. Pulse test: PW ≤ 300 µs duty cycle ≤ 2%.
d. Switching time is essentially independent of operating temperature.
e. For typical characteristics curves see the 2N6661/VN88AFD data sheet.