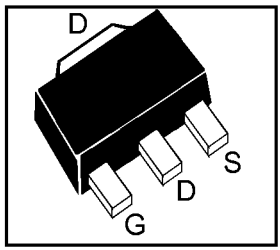
# SOT89 N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

# ZVN4424Z

**ISSUE 1 - NOVEMBER 1998**

FEATURES
* 240 Volt $BV_{DS}$
* Extremely low $R_{DS(on)}$=4.3Ω
* Low threshold and Fast switching

APPLICATIONS
* Earth recall and dialling switches
* Electronic hook switches
* Battery powered equipment
* Telecoms and high voltage dc-dc convertors




PARTMARKING DETAILS - N24
COMPLEMENTARY TYPE - ZVP4424Z

## ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 240 | V |
| Continuous Drain Current at $T_{amb}$=25°C | $I_D$ | 300 | mA |
| Pulsed Drain Current | $I_{DM}$ | 1.0 | A |
| Gate Source Voltage | $V_{GS}$ | ± 40 | V |
| Power Dissipation at $T_{amb}$=25°C | $P_{tot}$ | 1 † | W |
| Operating and Storage Temperature Range | $T_j$:$T_{stg}$ | -55 to +150 | °C |

† recommended $P_{tot}$ calculated using FR4 measuring 15x15x0.6mm
Refer to the handling instructions for soldering surface mount components.

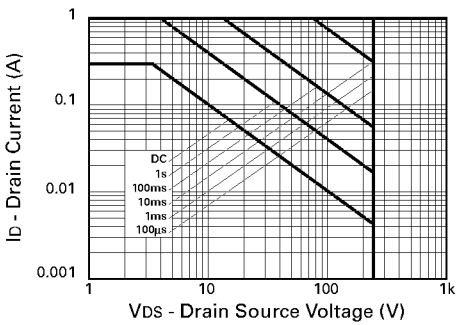
# ZVN4424Z

**ELECTRICAL CHARACTERISTICS (at $T_{amb}$ = 25°C unless otherwise stated).**

| PARAMETER | SYMBOL | MIN. | TYP | MAX. | UNIT | CONDITIONS. |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | 240 | | | V | $I_D$=1mA, $V_{GS}$=0V |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | 0.8 | 1.3 | 1.8 | V | $I_D$=1mA, $V_{DS}$= $V_{GS}$ |
| Gate-Body Leakage | $I_{GSS}$ | | | 100 | nA | $V_{GS}$=± 40V, $V_{DS}$=0V |
| On State Drain-Current | $I_{D(on)}$ | 0.8 | 1.4 | | A | $V_{DS}$=10V, $V_{GS}$=10V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | | | 10<br>100 | µA<br>µA | $V_{DS}$=240 V, $V_{GS}$=0V<br>$V_{DS}$=190 V, $V_{GS}$=0V, T=125°C |
| Static Drain-Source On-State Resistance | $R_{DS(on)}$ | | 4<br>4.3 | 5.5<br>6 | Ω<br>Ω | $V_{GS}$=10V,$I_D$=500mA*<br>$V_{GS}$=2.5V,$I_D$=100mA* |
| Forward Transconductance (1) (2) | $g_{fs}$ | 0.4 | 0.75 | | S | $V_{DS}$=10V,$I_D$=0.5A |
| Input Capacitance (2) | $C_{iss}$ | | 110 | 200 | pF | $V_{DS}$=25V, $V_{GS}$=0V, f=1MHz |
| Common Source Output Capacitance (2) | $C_{oss}$ | | 15 | 25 | pF | |
| Reverse Transfer Capacitance (2) | $C_{rss}$ | | 3.5 | 15 | pF | |
| Turn-On Delay Time (2)(3) | $t_{d(on)}$ | | 2.5 | 5 | ns | $V_{DD}$≈50V, $I_D$ =0.25A, $V_{GEN}$=10V |
| Rise Time (2)(3) | $t_r$ | | 5 | 8 | ns | |
| Turn-Off Delay Time (2)(3) | $t_{d(off)}$ | | 40 | 60 | ns | |
| Fall Time (2)(3) | $t_f$ | | 16 | 25 | ns | |

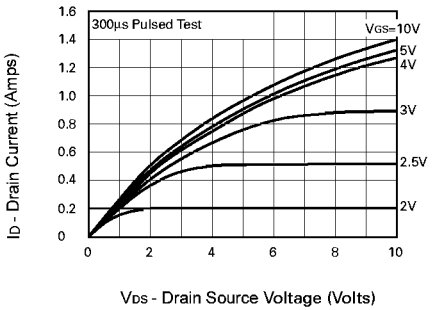
(1) Measured under pulsed conditions. Width=300µs. Duty cycle ≤2%
(2) Sample test.
(3) Switching times measured with 50Ω source impedance and <5ns rise time on a pulse generator
Spice parameter data is available upon request for this device

## TYPICAL CHARACTERISTICS

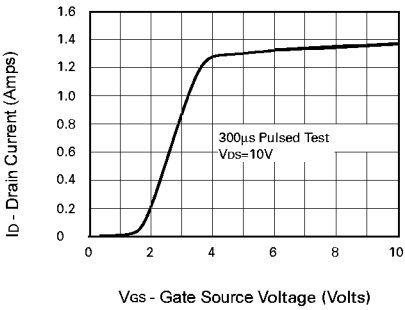



**Safe Operating Area**

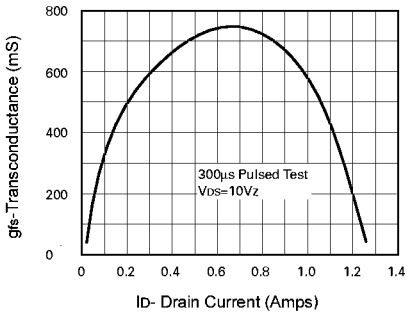
# TYPICAL CHARACTERISTICS



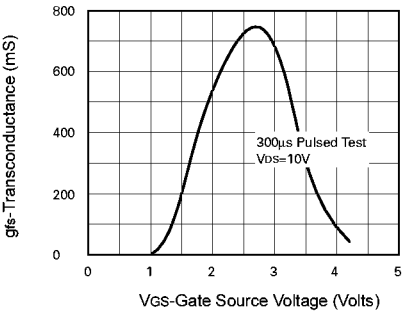

**Saturation Characteristics**



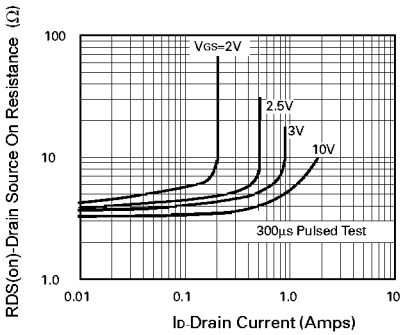

**Transfer Characteristics**



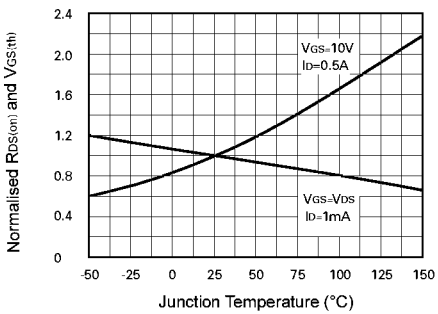

**Transconductance v drain current**




**Transconductance v gate-source voltage**




**On-resistance vs Drain Current**




**Normalised $R_{DS(on)}$ and $V_{GS(th)}$ vs Temperature**

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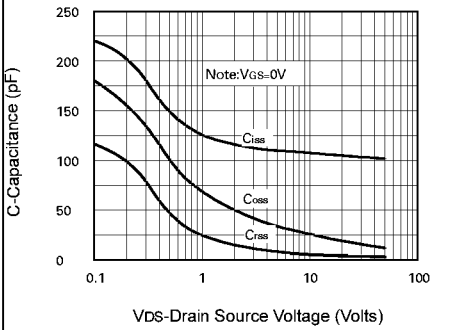
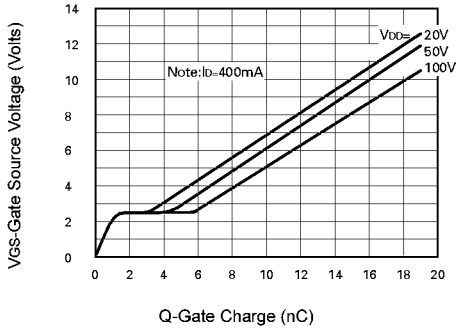
## TYPICAL CHARACTERISTICS




**Capacitance v drain-source voltage**




**Gate charge v gate-source voltage**