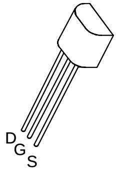
# N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

# ZVN4210A

**ISSUE 2 – MARCH 94**

FEATURES

- 100 Volt $V_{DS}$
- $R_{DS(on)} = 1.5\Omega$
- Spice model available



**E-Line**
**TO92 Compatible**

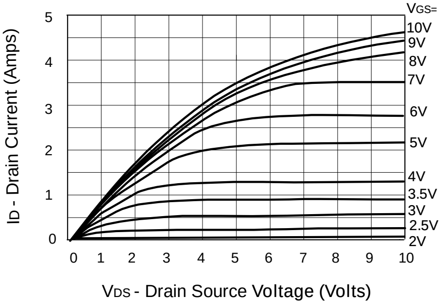
## ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | 100 | V |
| Continuous Drain Current at $T_{amb}$=25°C | $I_D$ | 450 | mA |
| Pulsed Drain Current | $I_{DM}$ | 6 | A |
| Gate-Source Voltage | $V_{GS}$ | ± 20 | V |
| Power Dissipation at $T_{amb}$=25°C | $P_{tot}$ | 700 | mW |
| Operating and Storage Temperature Range | $T_j$:$T_{stg}$ | -55 to +150 | °C |

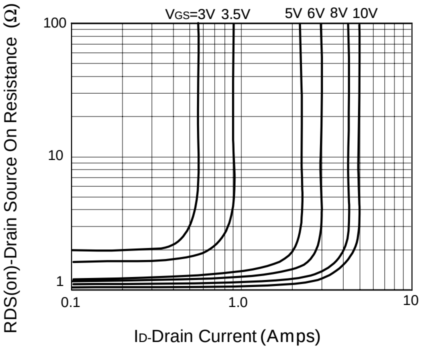
## ELECTRICAL CHARACTERISTICS (at $T_{amb}$ = 25°C unless otherwise stated).

| PARAMETER | SYMBOL | MIN. | MAX. | UNIT | CONDITIONS. |
|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | 100 | | V | $I_D$=1mA, $V_{GS}$=0V |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | 0.8 | 2.4 | V | ID=1mA, $V_{DS}$= $V_{GS}$ |
| Gate-Body Leakage | $I_{GSS}$ | | 100 | nA | $V_{GS}$=± 20V, $V_{DS}$=0V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | | 10<br>100 | μA<br>μA | $V_{DS}$=100V, $V_{GS}$=0<br>$V_{DS}$=80V, $V_{GS}$=0V, T=125°C(2) |
| On-State Drain Current(1) | $I_{D(on)}$ | 2.5 | | A | $V_{DS}$=25V, $V_{GS}$=10V |
| Static Drain-Source On-State Resistance (1) | $R_{DS(on)}$ | | 1.5<br>1.8 | Ω | $V_{GS}$=10V,$I_D$=1.5A<br>$V_{GS}$=5V,$I_D$=500mA |
| Forward Transconductance(1)(2) | $g_{fs}$ | 250 | | mS | $V_{DS}$=25V,$I_D$=1.5A |
| Input Capacitance (2) | $C_{iss}$ | | 100 | pF | $V_{DS}$=25V, $V_{GS}$=0V, f=1MHz |
| Common Source Output Capacitance (2) | $C_{oss}$ | | 40 | pF | |
| Reverse Transfer Capacitance (2) | $C_{rss}$ | | 12 | pF | |
| Turn-On Delay Time (2)(3) | $t_{d(on)}$ | | 4 | ns | $V_{DD}\approx$25V, $I_D$=1.5A |
| Rise Time (2)(3) | $t_r$ | | 8 | ns | |
| Turn-Off Delay Time (2)(3) | $t_{d(off)}$ | | 20 | ns | |
| Fall Time (2)(3) | $t_f$ | | 30 | ns | |

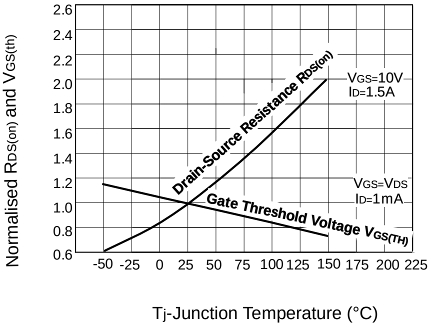
# TYPICAL CHARACTERISTICS



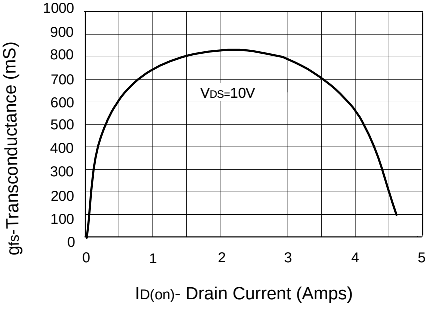
**Saturation Characteristics**



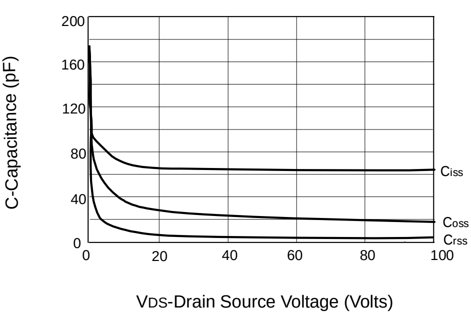
**On-resistance v drain current**



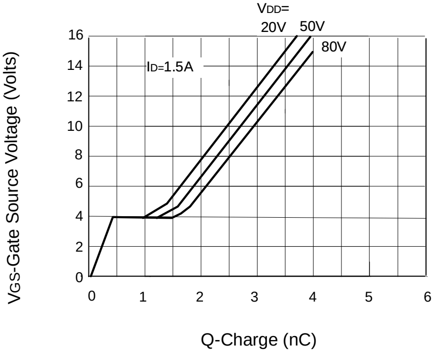
**Normalised RDS(on) and VGS(th) v Temperature**



**Transconductance v drain current**



**Capacitance v drain-source voltage**



**Gate charge v gate-source voltage**