

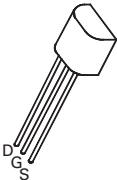
# N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

ISSUE 2 – JUNE 94

## FEATURES

- \* 60 Volt  $V_{DS}$
- \*  $R_{DS(on)} = 1 \Omega$

**ZVN4206A**



**E-LINE  
TO92 COMPATIBLE**

## ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                                         | SYMBOL        | VALUE       | UNIT        |
|---------------------------------------------------|---------------|-------------|-------------|
| Drain-Source Voltage                              | $V_{DS}$      | 60          | V           |
| Continuous Drain Current at $T_{amb}=25^{\circ}C$ | $I_D$         | 600         | mA          |
| Pulsed Drain Current                              | $I_{DM}$      | 8           | A           |
| Gate-Source Voltage                               | $V_{GS}$      | $\pm 20$    | V           |
| Power Dissipation at $T_{amb}=25^{\circ}C$        | $P_{tot}$     | 0.7         | W           |
| Operating and Storage Temperature Range           | $T_j:T_{stg}$ | -55 to +150 | $^{\circ}C$ |

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

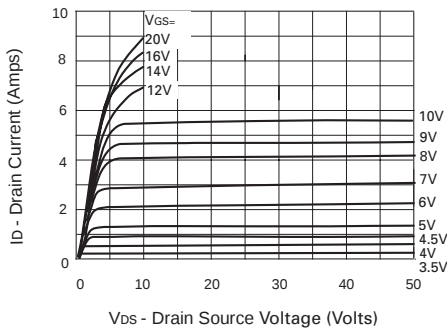
| PARAMETER                                   | SYMBOL       | MIN. | MAX.      | UNIT                 | CONDITIONS.                                                          |
|---------------------------------------------|--------------|------|-----------|----------------------|----------------------------------------------------------------------|
| Drain-Source Breakdown Voltage              | $BV_{DSS}$   | 60   |           | V                    | $I_D=1mA, V_{GS}=0V$                                                 |
| Gate-Source Threshold Voltage               | $V_{GS(th)}$ | 1.3  | 3         | V                    | $I_D=1mA, V_{DS}=V_{GS}$                                             |
| Gate-Body Leakage                           | $I_{GSS}$    |      | 100       | nA                   | $V_{GS}=\pm 20V, V_{DS}=0V$                                          |
| Zero Gate Voltage Drain Current             | $I_{DSS}$    |      | 10<br>100 | $\mu A$<br>$\mu A$   | $V_{DS}=60V, V_{GS}=0$<br>$V_{DS}=48V, V_{GS}=0V, T=125^{\circ}C(2)$ |
| On-State Drain Current(1)                   | $I_{D(on)}$  | 3    |           | A                    | $V_{DS}=25V, V_{GS}=10V$                                             |
| Static Drain-Source On-State Resistance (1) | $R_{DS(on)}$ |      | 1<br>1.5  | $\Omega$<br>$\Omega$ | $V_{GS}=10V, I_D=1.5A$<br>$V_{GS}=5V, I_D=500mA$                     |
| Forward Transconductance(1)(2)              | $g_{fs}$     | 300  |           | 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)        | $C_{oss}$    |      | 60        | pF                   |                                                                      |
| Reverse Transfer Capacitance (2)            | $C_{rss}$    |      | 20        | pF                   |                                                                      |
| Turn-On Delay Time (2)(3)                   | $t_{d(on)}$  |      | 8         | ns                   | $V_{DD} \approx 25V, I_D=1.5A$                                       |
| Rise Time (2)(3)                            | $t_r$        |      | 12        | ns                   |                                                                      |
| Turn-Off Delay Time (2)(3)                  | $t_{d(off)}$ |      | 12        | ns                   |                                                                      |
| Fall Time (2)(3)                            | $t_f$        |      | 15        | ns                   |                                                                      |

(1) Measured under pulsed conditions. Width=300 $\mu s$ . Duty cycle  $\leq 2\%$  (2) Sample test.

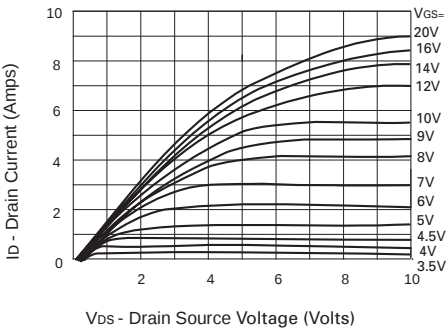
(3) Switching times measured with 50 $\Omega$  source impedance and <5ns rise time on a pulse generator

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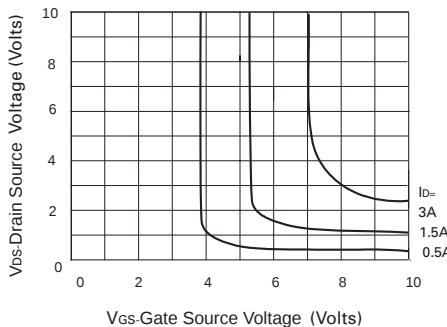
## TYPICAL CHARACTERISTICS



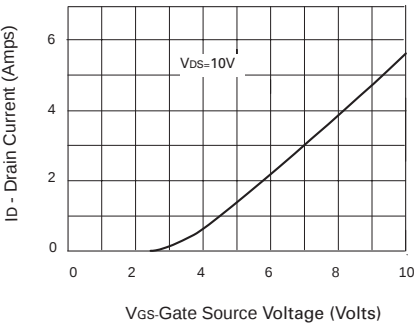
Output Characteristics



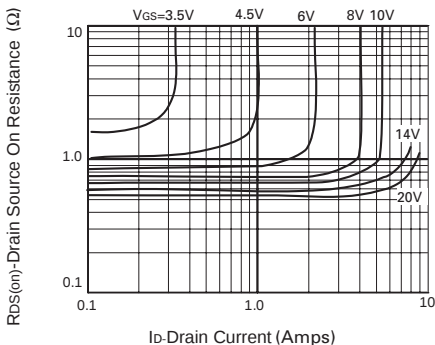
Saturation Characteristics



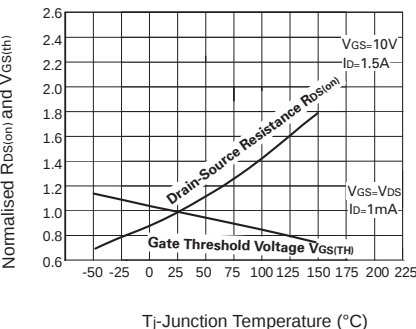
Voltage Saturation Characteristics



Transfer Characteristics



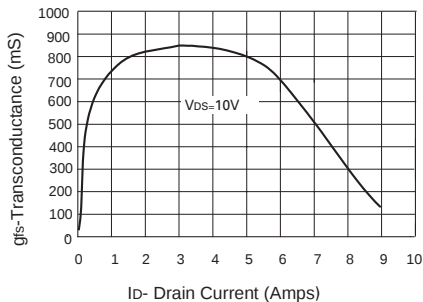
On-resistance v drain current



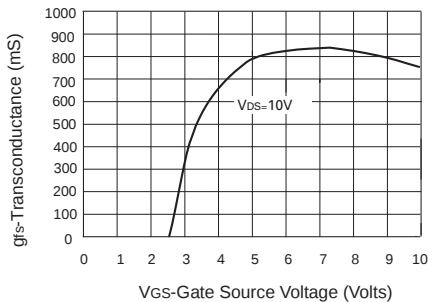
Normalised  $R_{DS(on)}$  and  $V_{GS(th)}$  v Temperature

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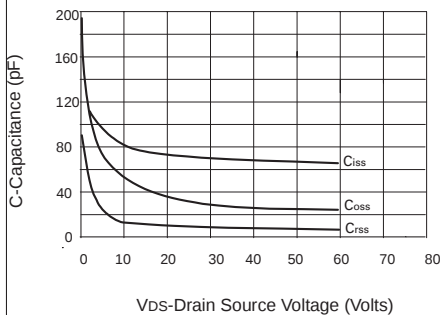
TYPICAL CHARACTERISTICS



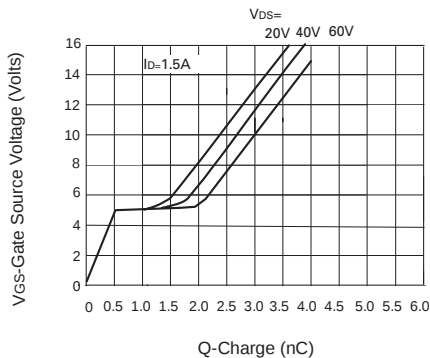
Transconductance v drain current



Transconductance v gate-source voltage



Capacitance v drain-source voltage



Gate charge v gate-source voltage