

# SOT23 P-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

## ZVP3310F

ISSUE 3 – OCTOBER 1995

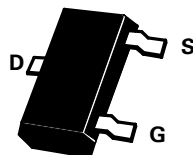


### FEATURES

- \* 100 Volt  $V_{DS}$
- \*  $R_{DS(on)}=20\Omega$

COMPLEMENTARY TYPE - ZVN3310F

PARTMARKING DETAIL - MR



### ABSOLUTE MAXIMUM RATINGS.

| PARAMETER                                                | SYMBOL         | VALUE       | UNIT               |
|----------------------------------------------------------|----------------|-------------|--------------------|
| Drain-Source Voltage                                     | $V_{DS}$       | -100        | V                  |
| Continuous Drain Current at $T_{amb}=25^{\circ}\text{C}$ | $I_D$          | 75          | mA                 |
| Pulsed Drain Current                                     | $I_{DM}$       | -1.2        | A                  |
| Gate Source Voltage                                      | $V_{GS}$       | $\pm 20$    | V                  |
| Power Dissipation at $T_{amb}=25^{\circ}\text{C}$        | $P_{tot}$      | 330         | mW                 |
| Operating and Storage Temperature Range                  | $T_j; T_{stg}$ | -55 to +150 | $^{\circ}\text{C}$ |

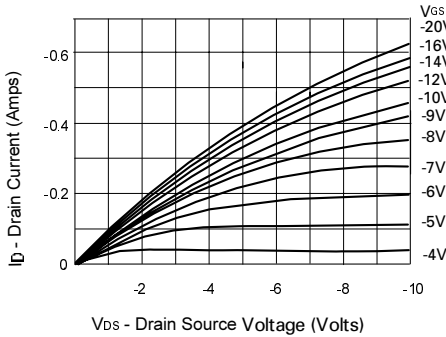
### ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

| PARAMETER                                   | SYMBOL       | MIN. | MAX.      | UNIT                           | CONDITIONS.                                                                                                  |
|---------------------------------------------|--------------|------|-----------|--------------------------------|--------------------------------------------------------------------------------------------------------------|
| Drain-Source Breakdown Voltage              | $BV_{DSS}$   | -100 |           | V                              | $I_D=-1\text{mA}$ , $V_{GS}=0\text{V}$                                                                       |
| Gate-Source Threshold Voltage               | $V_{GS(th)}$ | -1.5 | -3.5      | V                              | $I_D=-1\text{mA}$ , $V_{DS}=V_{GS}$                                                                          |
| Gate-Body Leakage                           | $I_{GSS}$    |      | -20       | nA                             | $V_{GS}=\pm 20\text{V}$ , $V_{DS}=0\text{V}$                                                                 |
| Zero Gate Voltage Drain Current             | $I_{DSS}$    |      | -1<br>-50 | $\mu\text{A}$<br>$\mu\text{A}$ | $V_{DS}=-100\text{V}$ , $V_{GS}=0$<br>$V_{DS}=-80\text{V}$ , $V_{GS}=0\text{V}$ , $T=125^{\circ}\text{C}(2)$ |
| On-State Drain Current(1)                   | $I_{D(on)}$  | -300 |           | mA                             | $V_{DS}=-25\text{V}$ , $V_{GS}=-10\text{V}$                                                                  |
| Static Drain-Source On-State Resistance (1) | $R_{DS(on)}$ |      | 20        | $\Omega$                       | $V_{GS}=-10\text{V}$ , $I_D=-150\text{mA}$                                                                   |
| Forward Transconductance (1)(2)             | $g_{fs}$     | 50   |           | mS                             | $V_{DS}=-25\text{V}$ , $I_D=-150\text{mA}$                                                                   |
| Input Capacitance (2)                       | $C_{iss}$    |      | 50        | pF                             | $V_{DS}=-25\text{V}$ , $V_{GS}=0\text{V}$ , $f=1\text{MHz}$                                                  |
| Common Source Output Capacitance (2)        | $C_{oss}$    |      | 15        | pF                             |                                                                                                              |
| Reverse Transfer Capacitance (2)            | $C_{rss}$    |      | 5         | pF                             |                                                                                                              |
| Turn-On Delay Time (2)(3)                   | $t_{d(on)}$  |      | 8         | ns                             | $V_{DD}\approx -25\text{V}$ , $I_D=-150\text{mA}$                                                            |
| Rise Time (2)(3)                            | $t_r$        |      | 8         | ns                             |                                                                                                              |
| Turn-Off Delay Time (2)(3)                  | $t_{d(off)}$ |      | 8         | ns                             |                                                                                                              |
| Fall Time (2)(3)                            | $t_f$        |      | 8         | ns                             |                                                                                                              |

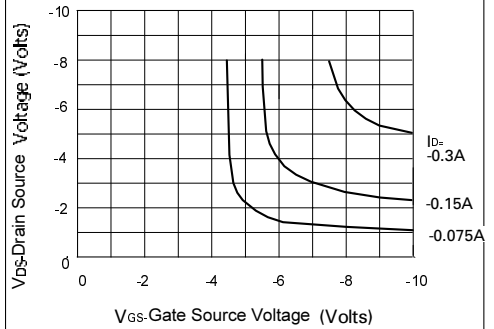
(1) Measured under pulsed conditions. Width=300 $\mu\text{s}$ . Duty cycle  $\leq 2\%$  (2) Sample test.

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

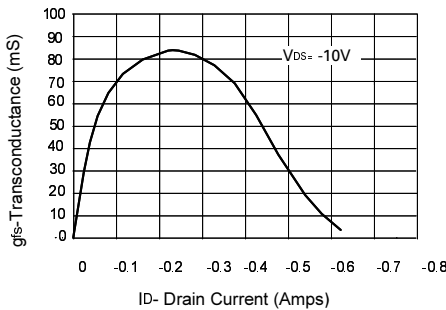
## TYPICAL CHARACTERISTICS



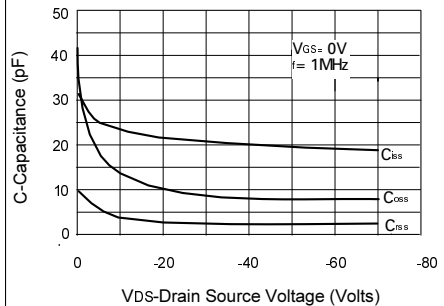
**Saturation Characteristics**



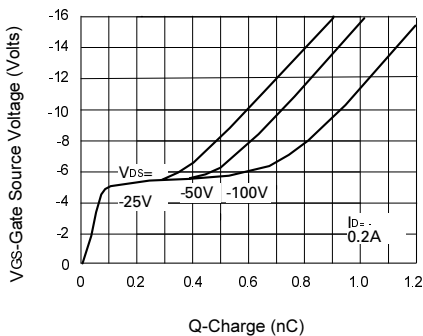
**Voltage Saturation Characteristics**



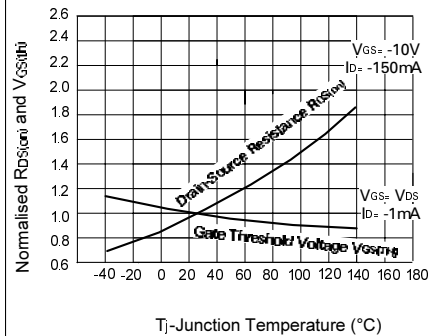
**Transconductance v drain current**



**Capacitance v drain-source voltage**



**Gate charge v gate-source voltage**



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