

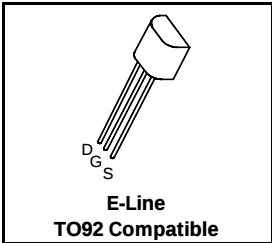
**P-CHANNEL ENHANCEMENT  
MODE VERTICAL DMOS FET**

**ZVP2110A**

**ISSUE 2 – MARCH 94**

**FEATURES**

- \* 100 Volt  $V_{DS}$
- \*  $R_{DS(on)}=8\Omega$



**ABSOLUTE MAXIMUM RATINGS.**

| PARAMETER                                         | SYMBOL        | VALUE       | UNIT        |
|---------------------------------------------------|---------------|-------------|-------------|
| Drain-Source Voltage                              | $V_{DS}$      | -100        | V           |
| Continuous Drain Current at $T_{amb}=25^{\circ}C$ | $I_D$         | -230        | mA          |
| Pulsed Drain Current                              | $I_{DM}$      | -3          | A           |
| Gate Source Voltage                               | $V_{GS}$      | $\pm 20$    | V           |
| Power Dissipation at $T_{amb}=25^{\circ}C$        | $P_{tot}$     | 700         | mW          |
| 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).**

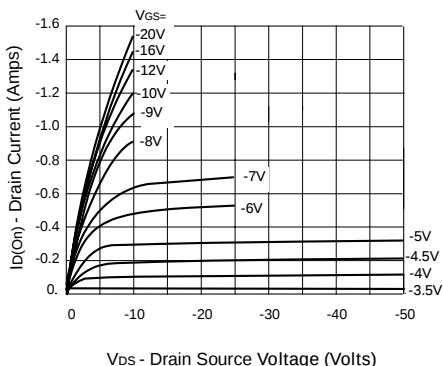
| PARAMETER                                   | SYMBOL       | MIN. | MAX.       | UNIT               | CONDITIONS.                                                             |
|---------------------------------------------|--------------|------|------------|--------------------|-------------------------------------------------------------------------|
| Drain-Source Breakdown Voltage              | $BV_{DSS}$   | -100 |            | V                  | $I_D=-1mA, V_{GS}=0V$                                                   |
| Gate-Source Threshold Voltage               | $V_{GS(th)}$ | -1.5 | -3.5       | V                  | $I_D=-1mA, V_{DS}=V_{GS}$                                               |
| Gate-Body Leakage                           | $I_{GSS}$    |      | 20         | nA                 | $V_{GS}=\pm 20V, V_{DS}=0V$                                             |
| Zero Gate Voltage Drain Current             | $I_{DSS}$    |      | -1<br>-100 | $\mu A$<br>$\mu A$ | $V_{DS}=-100V, V_{GS}=0$<br>$V_{DS}=-80V, V_{GS}=0V, T=125^{\circ}C(2)$ |
| On-State Drain Current(1)                   | $I_{D(on)}$  | -750 |            | mA                 | $V_{DS}=-25V, V_{GS}=-10V$                                              |
| Static Drain-Source On-State Resistance (1) | $R_{DS(on)}$ |      | 8          | $\Omega$           | $V_{GS}=-10V, I_D=-375mA$                                               |
| Forward Transconductance (1)(2)             | $g_{fs}$     | 125  |            | mS                 | $V_{DS}=-25V, I_D=-375mA$                                               |
| Input Capacitance (2)                       | $C_{iss}$    |      | 100        | pF                 | $V_{DS}=-25V, V_{GS}=0V, f=1MHz$                                        |
| Common Source Output Capacitance (2)        | $C_{oss}$    |      | 35         | pF                 |                                                                         |
| Reverse Transfer Capacitance (2)            | $C_{rss}$    |      | 10         | pF                 |                                                                         |
| Turn-On Delay Time (2)(3)                   | $t_{d(on)}$  |      | 7          | ns                 | $V_{DD}\approx -25V, I_D=-375mA$                                        |
| Rise Time (2)(3)                            | $t_r$        |      | 15         | 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  $\leq 2\%$

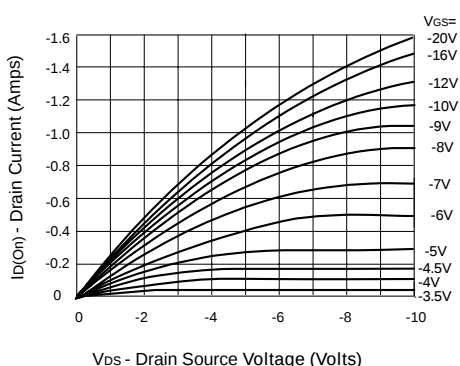
(2) Sample test.

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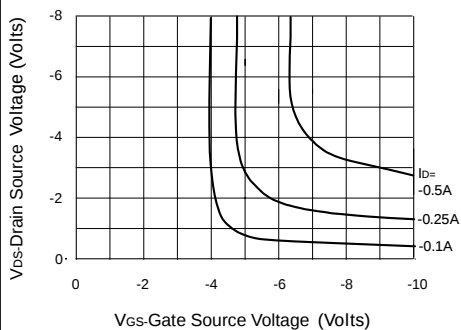
## TYPICAL CHARACTERISTICS



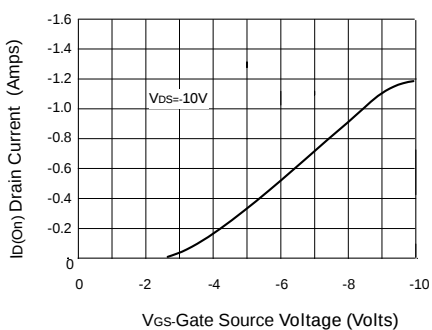
**Output Characteristics**



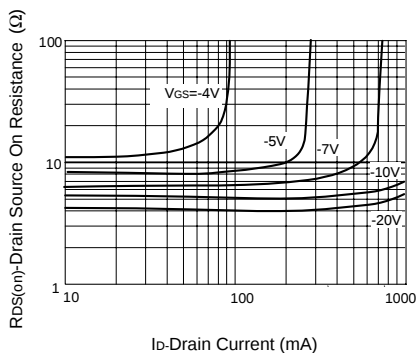
**Saturation Characteristics**



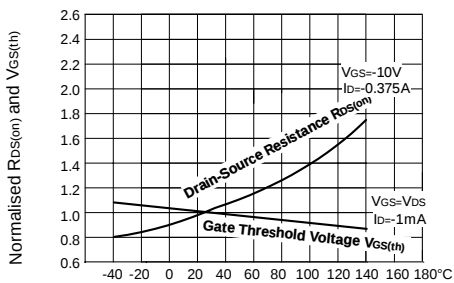
**Voltage Saturation Characteristics**



**Transfer Characteristics**



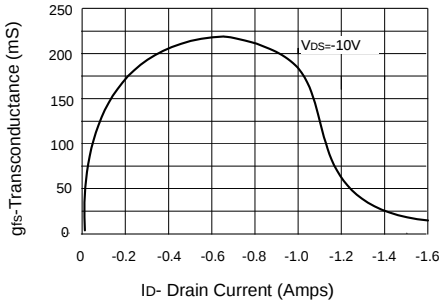
**On-resistance v drain current**



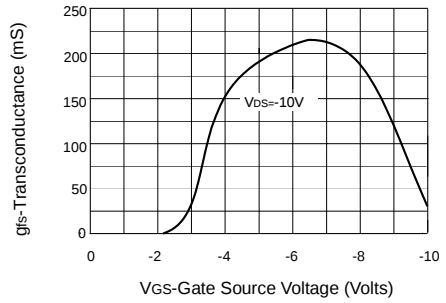
**Normalised  $R_{DS(on)}$  and  $V_{GS(th)}$  vs Temperature**

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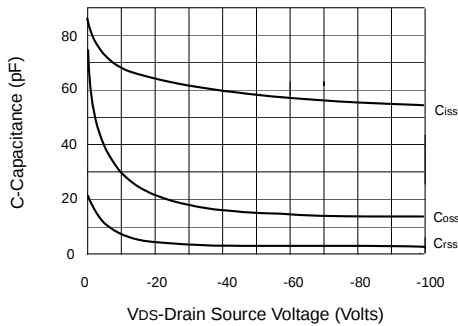
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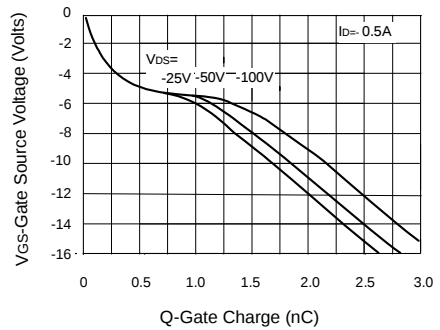
**Transconductance v drain current**



**Transconductance v gate-source voltage**



**Capacitance v drain-source voltage**



**Gate charge v gate-source voltage**