

# P-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

## ZVP4424A

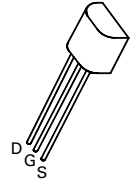
ISSUE 2 – SEPTEMBER 94

### FEATURES

- \* 240 Volt  $V_{DS}$
- \*  $R_{DS(on)}=9\Omega$
- \* Low threshold

### APPLICATIONS

- \* Electronic Hook Switch



E-Line  
TO92 Compatible

### ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Drain-Source Voltage	$V_{DS}$	-240	V
Continuous Drain Current at $T_{amb}=25^{\circ}C$	$I_D$	-200	mA
Pulsed Drain Current	$I_{DM}$	-1	A
Gate Source Voltage	$V_{GS}$	$\pm 40$	V
Power Dissipation at $T_{amb}=25^{\circ}C$	$P_{tot}$	750	mW
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^{\circ}C$

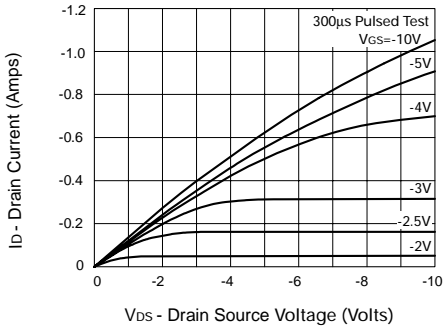
### ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}C$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP	MAX.	UNIT	CONDITIONS.
Drain-Source Breakdown Voltage	$BV_{DSS}$	-240			V	$I_D=-1mA, V_{GS}=0V$
Gate-Source Threshold Voltage	$V_{GS(th)}$	-0.7	-1.4	-2.0	V	$I_D=-1mA, V_{DS}=V_{GS}$
Gate-Body Leakage	$I_{GSS}$			100	nA	$V_{GS}=\pm 40V, V_{DS}=0V$
Zero Gate Voltage Drain Current	$I_{DSS}$			-10 -100	$\mu A$ $\mu A$	$V_{DS}=-240V, V_{GS}=0$ $V_{DS}=-190V, V_{GS}=0V, T=125^{\circ}C$
On-State Drain Current	$I_{D(on)}$	-0.75	-1.0		A	$V_{DS}=-10V, V_{GS}=-10V$
Static Drain-Source On-State Resistance	$R_{DS(on)}$		7.1 8.8	9 11	$\Omega$ $\Omega$	$V_{GS}=-10V, I_D=-200mA$ $V_{GS}=-3.5V, I_D=-100mA$
Forward Transconductance (1) (2)	$g_{fs}$	125			mS	$V_{DS}=-10V, I_D=-0.2A$
Input Capacitance (2)	$C_{iss}$		100	200	pF	$V_{DS}=-25V, V_{GS}=0V, f=1MHz$
Common Source Output Capacitance (2)	$C_{oss}$		18	25	pF	
Reverse Transfer Capacitance (2)	$C_{rss}$		5	15	pF	
Turn-On Delay Time (2)(3)	$t_{d(on)}$		8	15	ns	$V_{DD} \approx -50V, I_D = -0.25A,$ $V_{GEN} = -10V$
Rise Time (2)(3)	$t_r$		8	15	ns	
Turn-Off Delay Time (2)(3)	$t_{d(off)}$		26	40	ns	
Fall Time (2)(3)	$t_f$		20	30	ns	

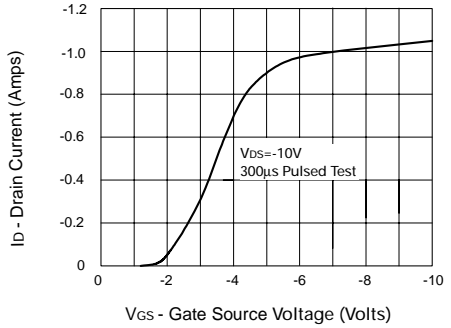
(1) Measured under pulsed conditions. Width=300 $\mu s$ . Duty cycle  $\leq 2\%$  (2) Sample test.

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

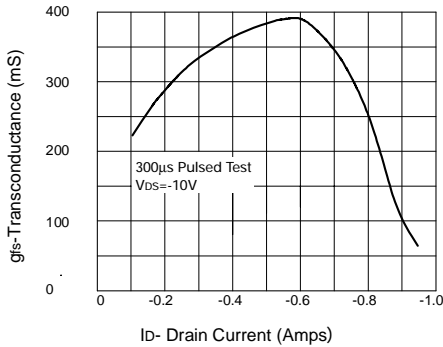
## TYPICAL CHARACTERISTICS



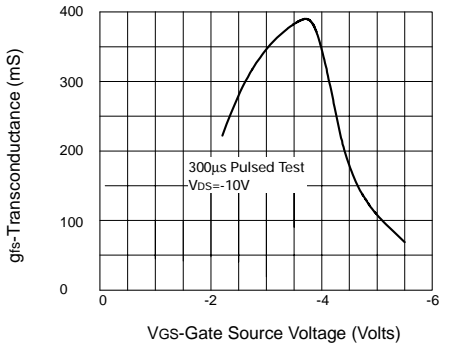
**Saturation Characteristics**



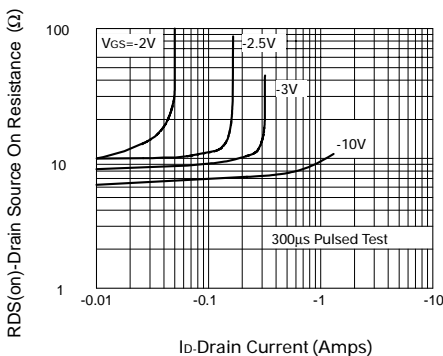
**Transfer Characteristics**



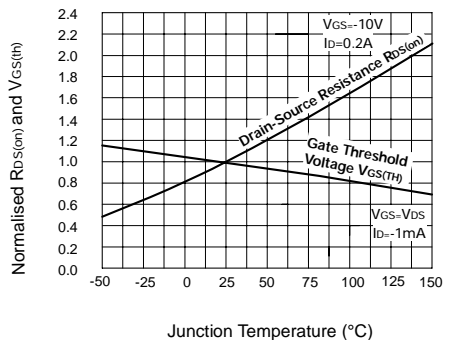
**Transconductance v drain current**



**Transconductance v gate-source voltage**



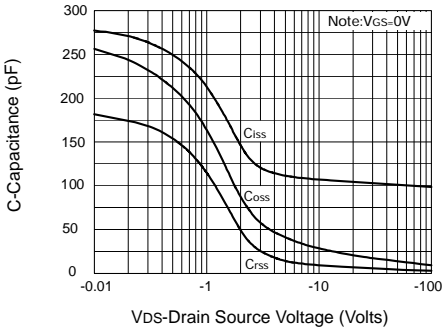
**On-resistance vs Drain Current**



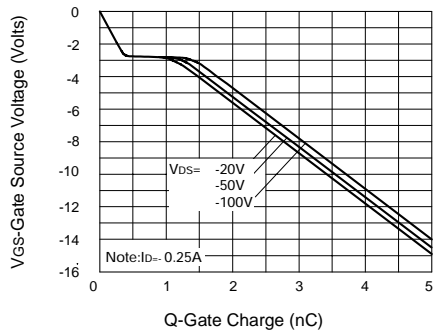
**Normalised  $R_{DS(on)}$  and  $V_{GS(th)}$  vs Temperature**

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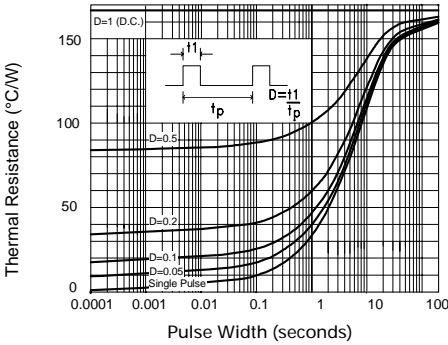
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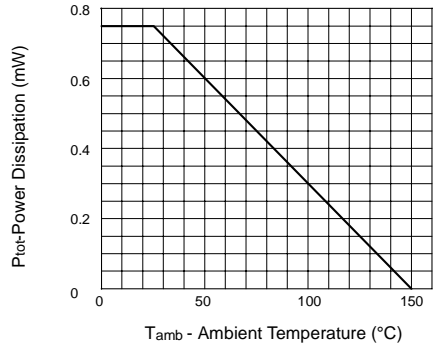
**Capacitance v drain-source voltage**



**Gate charge v gate-source voltage**



**Maximum transient thermal impedance**



**Derating Curve**

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