

# N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

## ZVN4206AV

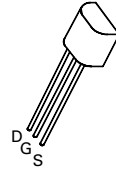
ISSUE 3 - APRIL 1998

### FEATURES

- \* 60 Volt  $V_{DS}$
- \*  $R_{DS(on)} = 1\Omega$
- \* Repetitive avalanche rating
- \* No transient protection required
- \* Characterised for 5V logic drive

### APPLICATIONS

- \* Automotive relay drivers
- \* Stepper motor driver



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 $T_{amb}=25^{\circ}C$	$P_{tot}$	700	mW
Continuous Body Diode Current at $T_{amb}=25^{\circ}C$	$I_{SD}$	600	mA
Avalanche Current – Repetitive	$I_{AR}$	600	mA
Avalanche Energy – Repetitive	$E_{AR}$	15	mJ
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^{\circ}C$

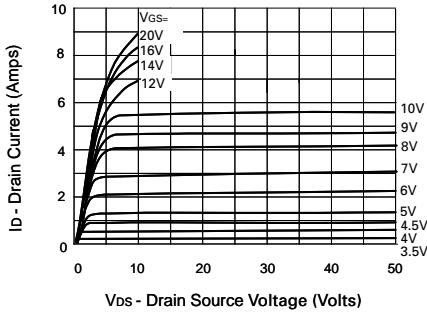
### ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}C$ unless otherwise stated).

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	$I_{DSS}$		10 100	$\mu A$ $\mu A$	$V_{DS}=60V, V_{GS}=0$ $V_{DS}=48V, V_{GS}=0V, T=125^{\circ}C(2)$
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 1.5	$\Omega$ $\Omega$	$V_{GS}=10V, I_D=1.5A$ $V_{GS}=5V, I_D=.0.5A$
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	$V_{DD}\approx 25V, I_D=1.5A, V_{GEN}=10V$
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	

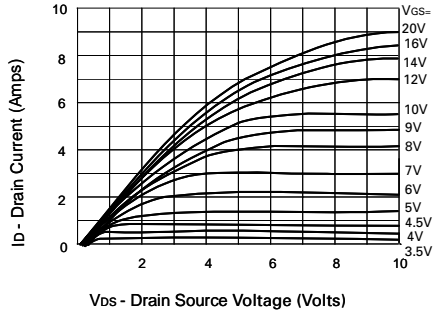
(1) Measured under pulsed conditions. Width=300 $\mu s$ . Duty cycle  $\leq 2\%$  (2) Sample test.

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

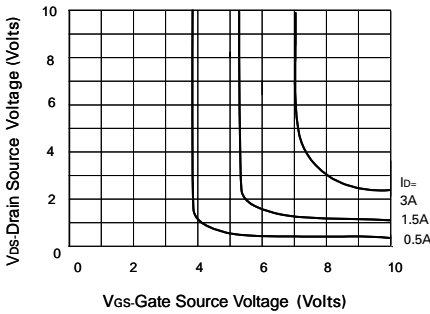
## TYPICAL CHARACTERISTICS



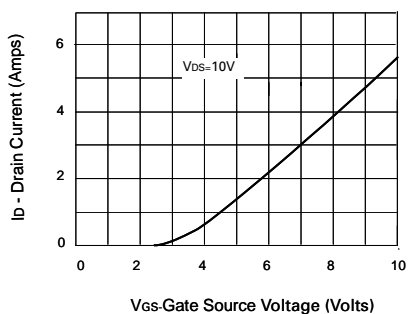
**Output Characteristics**



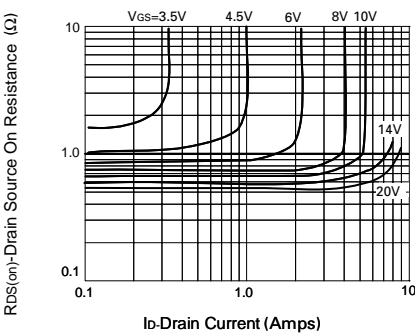
**Saturation Characteristics**



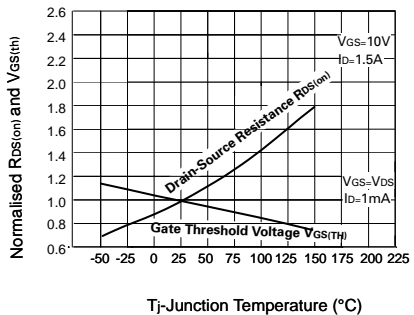
**Voltage Saturation Characteristics**



**Transfer Characteristics**



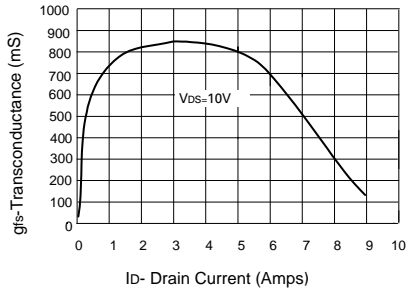
**On-resistance v drain current**



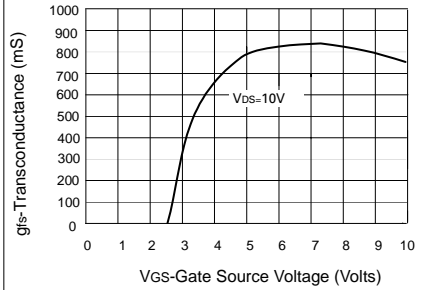
**Normalised  $R_{DS(on)}$  and  $V_{GS(th)}$  v Temperature**

# ZVN4206AV

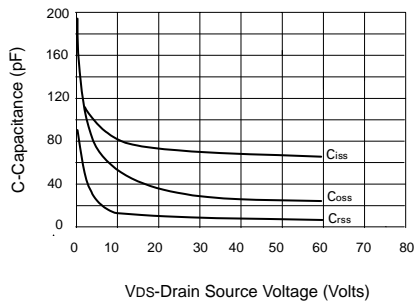
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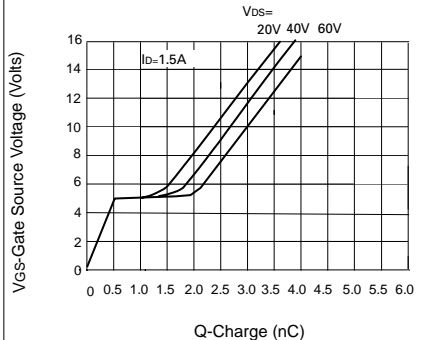
**Transconductance v drain current**



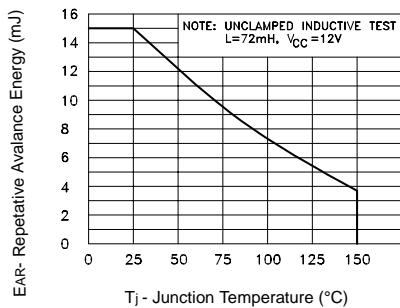
**Transconductance v gate-source voltage**



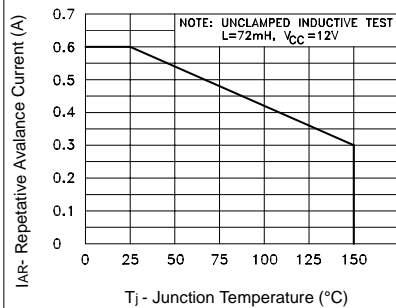
**Capacitance v drain-source voltage**



**Gate charge v gate-source voltage**



**Maximum repetitive avalanche energy v Junction Temperature**



**Maximum repetitive avalanche current v Junction Temperature**

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