

SOT223 N-CHANNEL ENHANCEMENT
MODE VERTICAL DMOS FET

ISSUE 3 - APRIL 1998

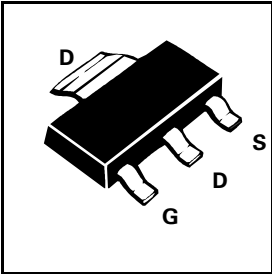
ZVN4206GV

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



PARTMARKING DETAIL - ZVN4206V

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	1	A
Pulsed Drain Current	I_{DM}	8	A
Gate-Source Voltage	V_{GS}	± 20	V
Power Dissipation at $T_{amb} = 25^{\circ}C$	P_{tot}	2	W
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	$^{\circ}C$

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

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	CONDITIONS.
Drain-Source Breakdown Voltage	BV_{DSS}	60		V	$I_D = 1\text{mA}$, $V_{GS} = 0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	1.3	3	V	$I_D = 1\text{mA}$, $V_{DS} = V_{GS}$
Gate-Body Leakage	I_{GSS}		100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}		10 100	μA μA	$V_{DS} = 60\text{V}$, $V_{GS} = 0\text{V}$ $V_{DS} = 48\text{V}$, $V_{GS} = 0\text{V}$, $T = 125^{\circ}\text{C}$ (2)
On-State Drain Current (1)	$I_{D(on)}$	3		A	$V_{DS} = 25\text{V}$, $V_{GS} = 10\text{V}$
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$		1 1.5	Ω Ω	$V_{GS} = 10\text{V}$, $I_D = 1.5\text{A}$ $V_{GS} = 5\text{V}$, $I_D = 0.5\text{A}$
Forward Transconductance (1)(2)	g_{fs}	300		mS	$V_{DS} = 25\text{V}$, $I_D = 1.5\text{A}$
Input Capacitance (2)	C_{iss}		100	pF	$V_{DS} = 25\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$
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	$V_{DD} \approx 25\text{V}$, $I_D = 1.5\text{A}$, $V_{GEN} = 10\text{V}$
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	

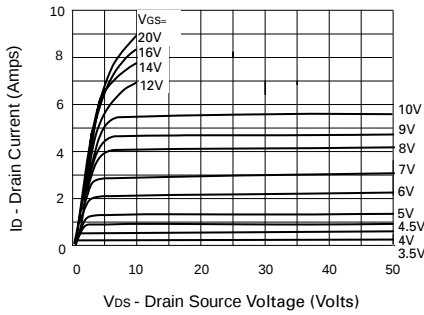
(1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$

(2) Sample test.

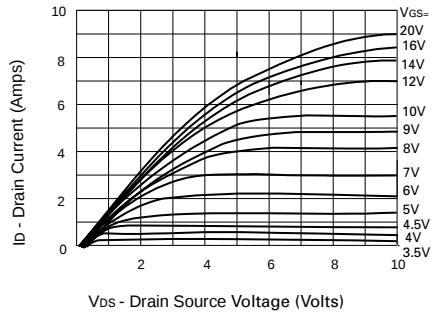
(3) Switching times measured with 50 Ω source impedance and <5ns rise time on a pulse generator

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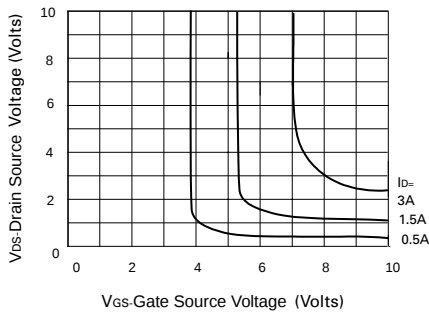
TYPICAL CHARACTERISTICS



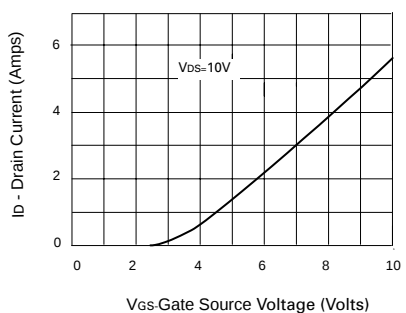
Output Characteristics



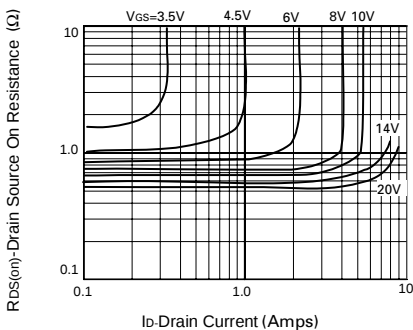
Saturation Characteristics



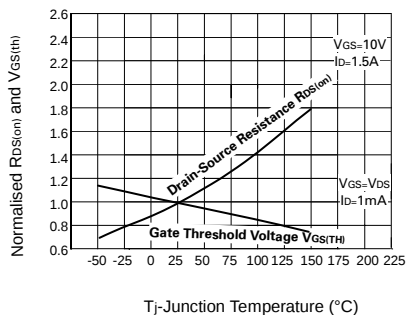
Voltage Saturation Characteristics



Transfer Characteristics



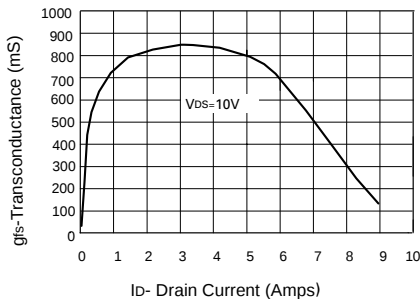
On-resistance v drain current



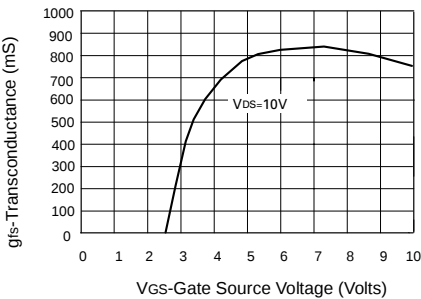
Normalised $R_{DS(on)}$ and $V_{GS(th)}$ v Temperature

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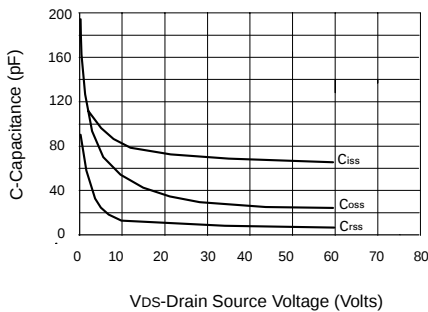
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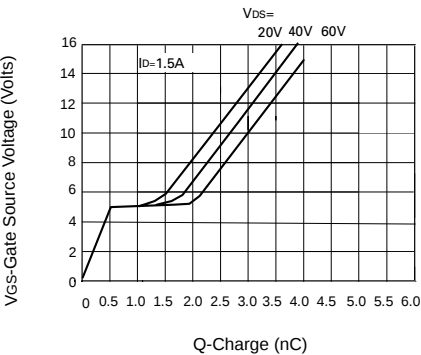
Transconductance v drain current



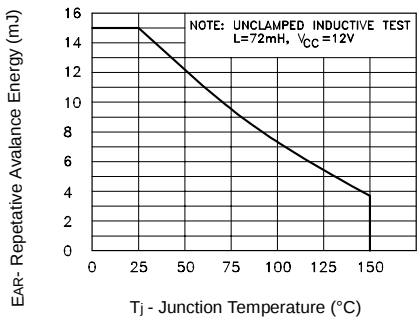
Transconductance v gate-source voltage



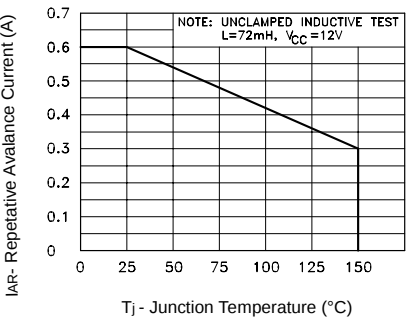
Capacitance v drain-source voltage



Gate charge v gate-source voltage



Maximum repetitive avalanche energy v Junction Temperature



Maximum repetitive avalanche current v Junction Temperature