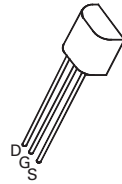# N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

ZVN4206A

ISSUE 2 – JUNE 94

FEATURES
* 60 Volt V_{DS}
* $R_{DS(on)} = 1\ \Omega$

**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°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°C	P_{tot}	0.7	W
Operating and Storage Temperature Range	T_j:T_{stg}	-55 to +150	°C

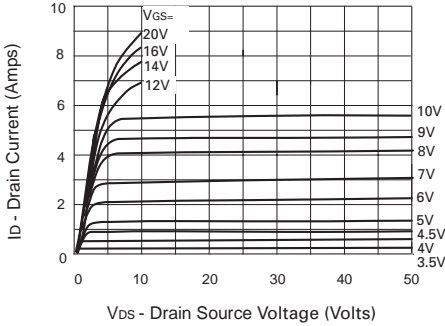## ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated).

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	ID=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	µA µA	V_{DS}=60V, V_{GS}=0 V_{DS}=48V, V_{GS}=0V, T=125°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	Ω Ω	V_{GS}=10V,I_D=1.5A V_{GS}=5V,I_D=500mA
Forward Transconductance(1)(2)	g_{fs}	300		mS	V_{DS}=25V,I_D=1.5A
Input Capacitance (2)	C_{iss}		100	pF	
Common Source Output Capacitance (2)	C_{oss}		60	pF	V_{DS}=25V, V_{GS}=0V, f=1MHz
Reverse Transfer Capacitance (2)	C_{rss}		20	pF	
Turn-On Delay Time (2)(3)	$t_{d(on)}$		8	ns	
Rise Time (2)(3)	t_r		12	ns	$V_{DD} \approx$25V, I_D=1.5A
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=300µs. Duty cycle ≤2% (2) Sample test.
(3) Switching times measured with 50Ω source impedance and <5ns rise time on a pulse generator
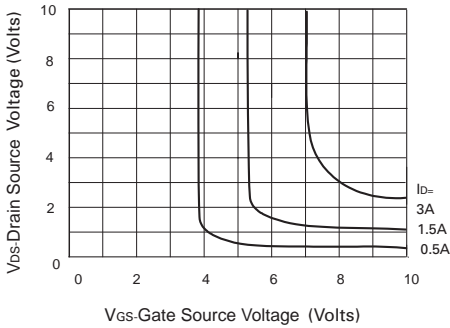
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TYPICAL CHARACTERISTICS

Output Characteristics

$V_{GS}=$ 20V, 16V, 14V, 12V, 10V, 9V, 8V, 7V, 6V, 5V, 4.5V, 4V, 3.5V

I_D - Drain Current (Amps)

V_{DS} - Drain Source Voltage (Volts)

Saturation Characteristics

$V_{GS}=$ 20V, 16V, 14V, 12V, 10V, 9V, 8V, 7V, 6V, 5V, 4.5V, 4V, 3.5V

I_D - Drain Current (Amps)
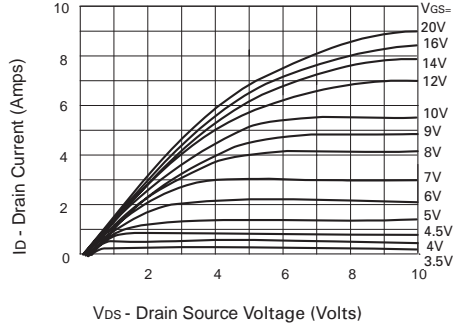
V_{DS} - Drain Source Voltage (Volts)

Voltage Saturation Characteristics

V_{DS}-Drain Source Voltage (Volts)

$I_D=$ 3A, 1.5A, 0.5A

V_{GS}-Gate Source Voltage (Volts)
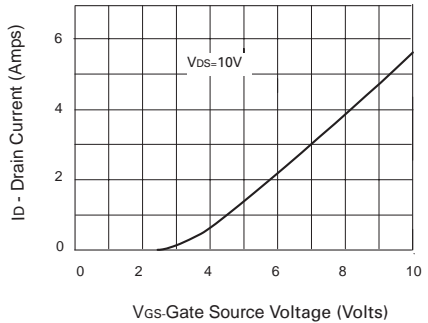
Transfer Characteristics

$V_{DS}=10V$

I_D - Drain Current (Amps)

V_{GS}-Gate Source Voltage (Volts)
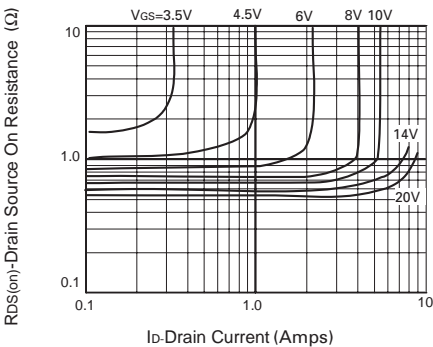
On-resistance v drain current

$R_{DS(on)}$-Drain Source On Resistance (Ω)

$V_{GS}=3.5V$, 4.5V, 6V, 8V, 10V, 14V, 20V

I_D-Drain Current (Amps)
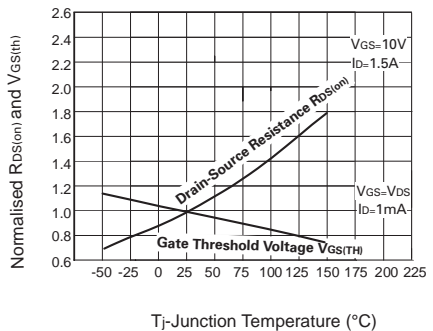
Normalised $R_{DS(on)}$ and $V_{GS(th)}$ v Temperature

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

$V_{GS}=10V$
$I_D=1.5A$

Drain-Source Resistance $R_{DS(on)}$

$V_{GS}=V_{DS}$
$I_D=1mA$

Gate Threshold Voltage $V_{GS(TH)}$
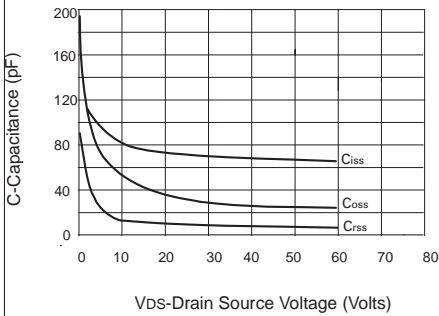
T_j-Junction Temperature (°C)

3-382

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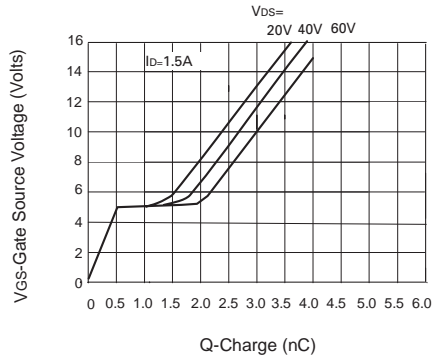
TYPICAL CHARACTERISTICS
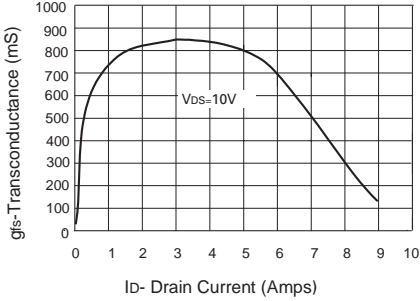
Transconductance v drain current
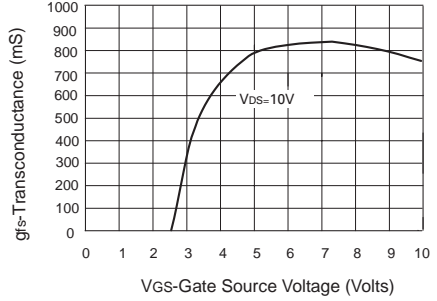
Transconductance v gate-source voltage

Capacitance v drain-source voltage

Gate charge v gate-source voltage