

N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

ZVN4424A/C

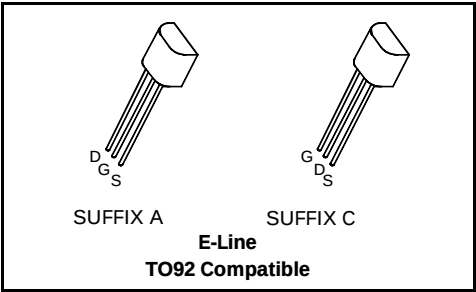
ISSUE 3 – August 1994

FEATURES

- * Compact E-LINE (TO92 style) package
- * 240 Volt BV_{DS}
- * $R_{DS(on)}=4.3\Omega$ Typical at $V_{GS}=2.5V$
- * Low threshold
- * Fast switching

APPLICATIONS

- * Earth recall and dialling switches
- * Electronic hook switches
- * Battery powered equipment
- * Telecoms and high voltage dc-dc converters



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	260	mA
Pulsed Drain Current	I_{DM}	1.5	A
Gate Source Voltage	V_{GS}	± 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	$^{\circ}C$

TYPICAL CHARACTERISTICS

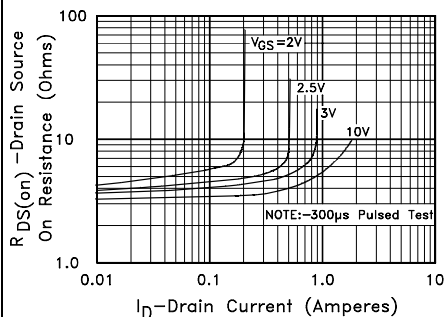


FIG. 3 Typical On Resistance vs. Drain Current

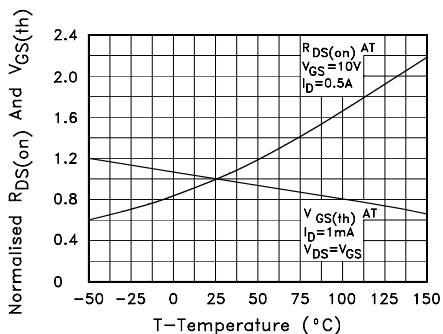


FIG. 4 Normalised $R_{DS(on)}$ And $V_{GS(th)}$ vs. Temperature

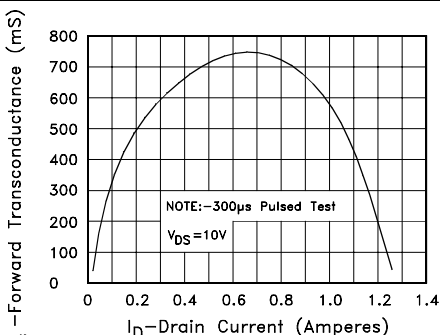


FIG. 5 Typical Transconductance vs. Drain Current

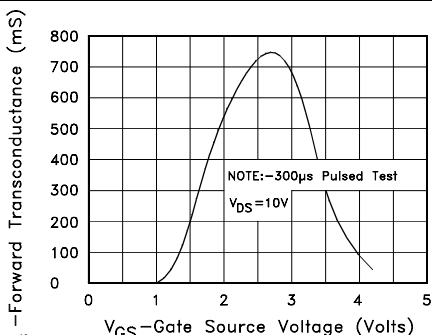


FIG. 6 Typical Transconductance vs. Gate-Source Voltage

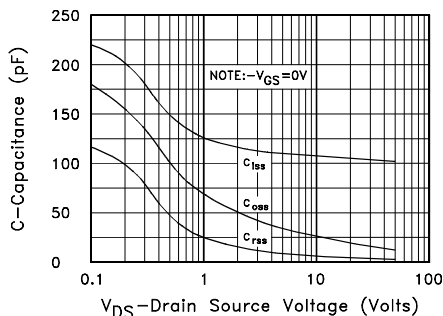


FIG. 7 Typical Capacitance vs. Drain-Source Voltage

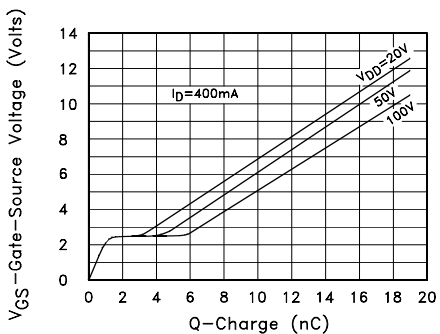


FIG. 8 Typical Gate Charge vs. Gate-Source Voltage

ZVN4424A/C

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

PARAMETER	SYMBOL	MIN.	TYP	MAX.	UNIT	CONDITIONS.
Drain-Source Breakdown Voltage	BV_{DSS}	240			V	$I_D=1\text{mA}$, $V_{GS}=0\text{V}$
Gate-Source Threshold Voltage	$V_{GS(th)}$	0.8	1.3	1.8	V	$I_D=1\text{mA}$, $V_{DS}=V_{GS}$
Gate-Body Leakage	I_{GSS}			100	nA	$V_{GS}=\pm 40\text{V}$, $V_{DS}=0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}			10 100	μA μA	$V_{DS}=240\text{V}$, $V_{GS}=0$ $V_{DS}=190\text{V}$, $V_{GS}=0\text{V}$, $T=125^{\circ}\text{C}$
On-State Drain Current	$I_{D(on)}$	0.8	1.4		A	$V_{DS}=10\text{V}$, $V_{GS}=10\text{V}$
Static Drain-Source On-State Resistance	$R_{DS(on)}$		4 4.3	5.5 6	Ω Ω	$V_{GS}=10\text{V}$, $I_D=500\text{mA}$ $V_{GS}=2.5\text{V}$, $I_D=100\text{mA}$
Forward Transconductance (1) (2)	g_{fs}	0.4	0.75		S	$V_{DS}=10\text{V}$, $I_D=0.5\text{A}$
Input Capacitance (2)	C_{iss}		110	200	pF	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$
Common Source Output Capacitance (2)	C_{oss}		15	25	pF	
Reverse Transfer Capacitance (2)	C_{rss}		3.5	15	pF	
Turn-On Delay Time (2)(3)	$t_{d(on)}$		2.5	5	ns	$V_{DD}\approx 50\text{V}$, $I_D=0.25\text{A}$, $V_{GEN}=10\text{V}$
Rise Time (2)(3)	t_r		5	8	ns	
Turn-Off Delay Time (2)(3)	$t_{d(off)}$		40	60	ns	
Fall Time (2)(3)	t_f		16	25	ns	

- (1)* Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$ (2) Sample Test
(3) Switching times measured with 50 Ω source impedance and >5ns rise time on pulse generator

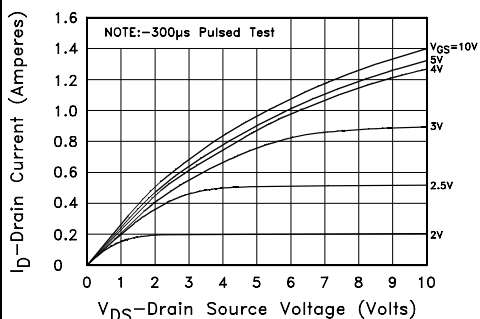


FIG. 1 Typical Saturation Characteristics

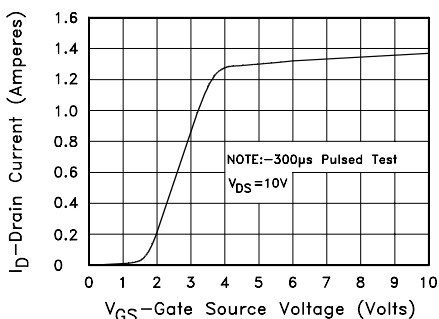


FIG. 2 Typical Transfer Characteristics

ZVN4424A/C

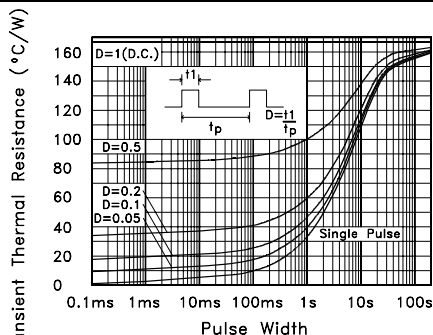


FIG. 9 Transient Thermal Resistance

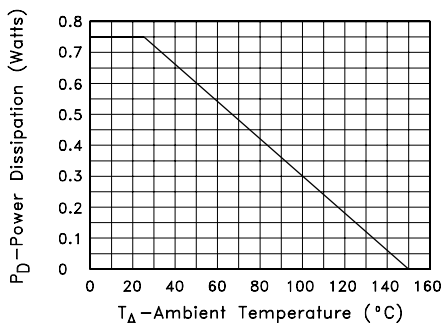


FIG. 10 Power vs. Temperature Derating Curve (Ambient)

SPICE PARAMETERS

*ZVN4424 MODEL LAST REVISION 1/94

*

.SUBCKT ZVN4424 30 40 50

* NODES: DRAIN GATE SOURCE

M1 30 20 50 50 MOD1 L=1 W=1

RG 40 20 200

RL 30 50 240E6

D1 50 30 DIODE1

.MODEL MOD1 NMOS VT0=1.25 RS=2.34 RD=1.634 IS=1E-15 KP=5.319

+CGS0=101P CGD0=4P CBD=66.2P PB=1

.MODEL DIODE1 D IS=5.516E-13 RS=0.2084 N=1.0078

.ENDS ZVN4424

For clarification of the above or for technical enquires generally please contact the Applications Dept. at Zetex plc.

©1992 ZETEX plc

The copyright in this model and the design embodied belonging to Zetex plc ("Zetex"). It is supplied free of charge by Zetex for the purpose of research and design and may be used or copied intact (including this notice) for that purpose only. All other rights are reserved. The model is believed accurate but no condition or warranty as to its merchantability or fitness for the purpose is given and no liability in respect of any use is accepted by Zetex plc, its distributors or agents.



Zetex plc.

Fields New Road, Chadderton, Oldham, OL9-8NP, United Kingdom.

Telephone: (44)161-627 5105 (Sales), (44)161-627 4963 (General Enquiries)

Fax: (44)161-627 5467

Zetex GmbH
Streitfeldstraße 19
D-81673 München
Germany
Telefon: (49) 89 45 49 49 0
Fax: (49) 89 45 49 49 49

Zetex Inc.
47 Mall Drive, Unit 4
Commack NY 11725
USA
Telephone: (516) 543-7100
Fax: (516) 864-7630

Zetex (Asia) Ltd.
3510 Metroplaza, Tower 2
Hing Fong Road,
Kwai Fong, Hong Kong
Telephone: (852) 26100 611
Fax: (852) 24250 494

These are supported by
agents and distributors in
major countries world-wide
©Zetex plc 1997
Internet:
<http://www.zetex.com>

This publication is issued to provide outline information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or be regarded as a representation relating to the products or services concerned. The Company reserves the right to alter without notice the specification, design, price or conditions of supply of any product or service.