

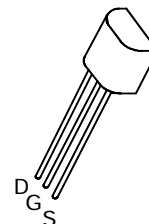
N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET

ZVN1409A

ISSUE 2 – MARCH 94

FEATURES

- * 90 Volt V_{DS}
- * Low input capacitance
- * Fast switching



E-Line
TO92 Compatible

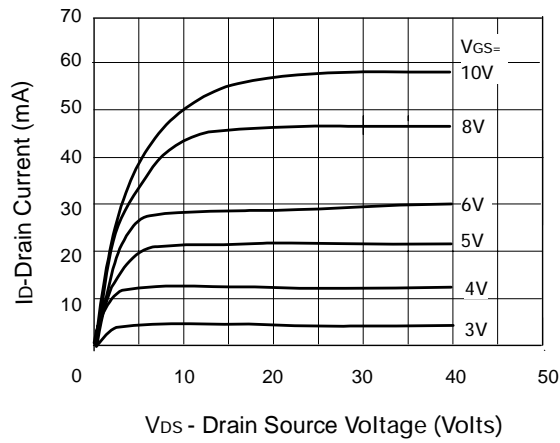
ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
Drain-Source Voltage	V_{DS}	90	V
Continuous Drain Current	I_D	10	mA
Pulsed Drain Current	I_{DM}	40	mA
Gate Source Voltage	V_{GS}	± 20	V
Power Dissipation at $T_{amb}=25^\circ\text{C}$	P_{tot}	625	mW
Operating and Storage Temperature Range	$T_j; T_{stg}$	-55 to +150	$^\circ\text{C}$

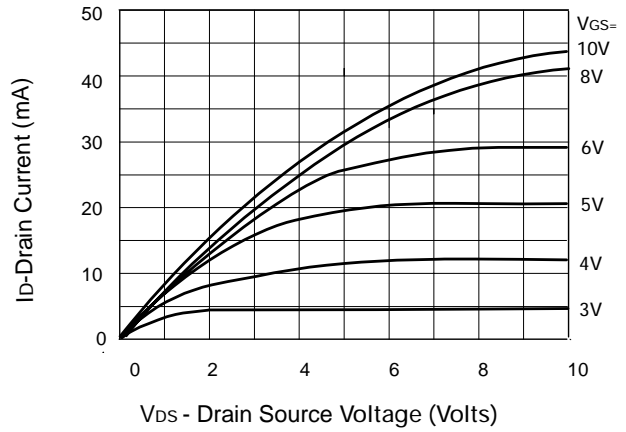
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^\circ\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	CONDITIONS.
Drain-Source Breakdown Voltage	BV_{DSS}	90		V	$I_D=0.1\text{mA}, V_{GS}=0\text{V}$
Gate-Source Breakdown Voltage	$V_{GS(th)}$	0.8	2.4	V	$I_D=0.1\text{mA}, V_{DS}=V_{GS}$
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}		1 100 (2)	μA	$V_{DS}=90\text{V}, V_{GS}=0\text{V}$ $V_{DS}=72\text{V}, V_{GS}=0\text{V},$ $T=125^\circ\text{C}$
On State Drain Current (1)	$I_{D(on)}$	10		mA	$V_{DS}=25\text{V}, V_{GS}=10\text{V}$
Static Drain Source On State Resistance (1)	$R_{DS(on)}$		250	Ω	$V_{GS}=10\text{V}, I_D=5\text{mA}$
Forward Transconductance (1)(2)	g_{fs}	2		mS	$V_{DS}=25\text{V}, I_D=10\text{mA}$
Input Capacitance (2)	C_{iss}		6.5	pF	$V_{DS}=25\text{V}, V_{GS}=0\text{V}$ $f=1\text{MHz}$
Common Source Output Capacitance (2)	C_{oss}		3	pF	
Reverse Transfer Capacitance (2)	C_{rss}		0.65	pF	
Turn-On Delay Time (2)(3)(4)	$t_{d(on)}$		0.3	ns	$V_{DD}\approx 25\text{V}, I_D=5\text{mA}$
Rise Time (2)(3)(4)	t_r		0.5	ns	
Turn-Off Delay Time (2)(3)(4)	$t_{d(off)}$		0.35	ns	
Fall Time (2)(3)(4)	t_f		0.5	ns	

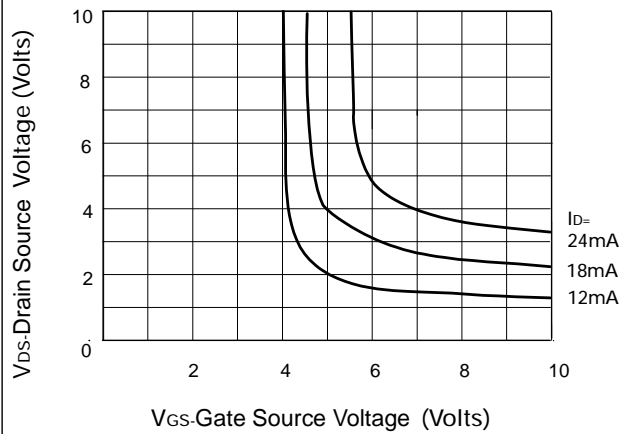
TYPICAL CHARACTERISTICS



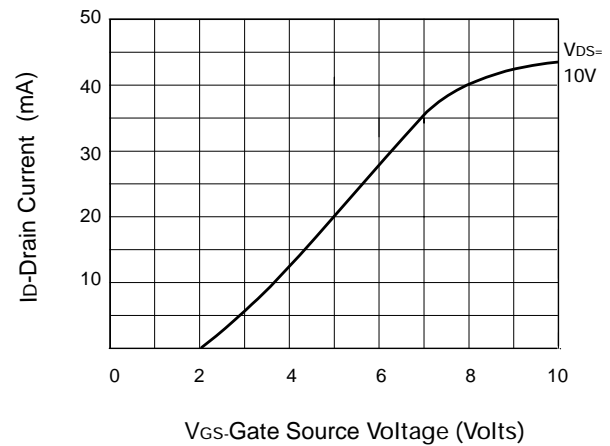
Output Characteristics



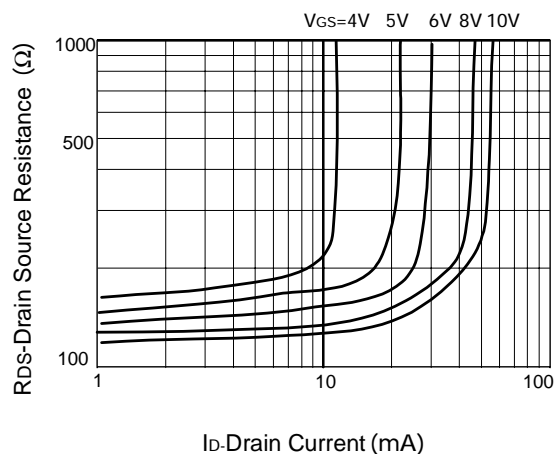
Saturation Characteristics



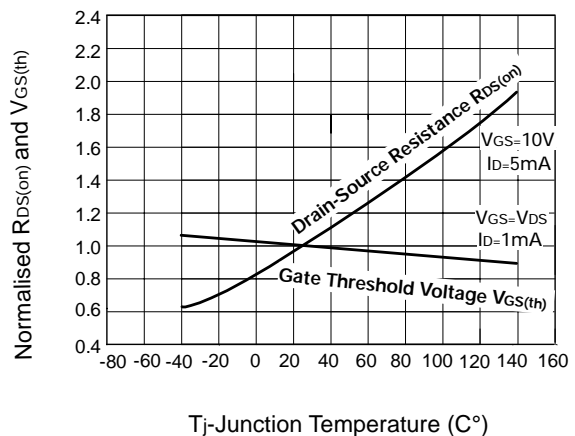
Voltage Saturation Characteristics



Transfer Characteristics



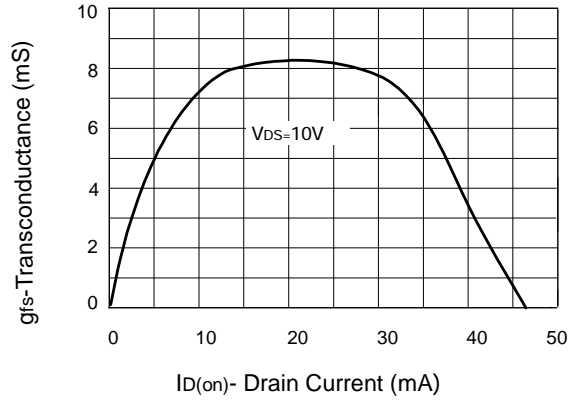
On-resistance v drain current



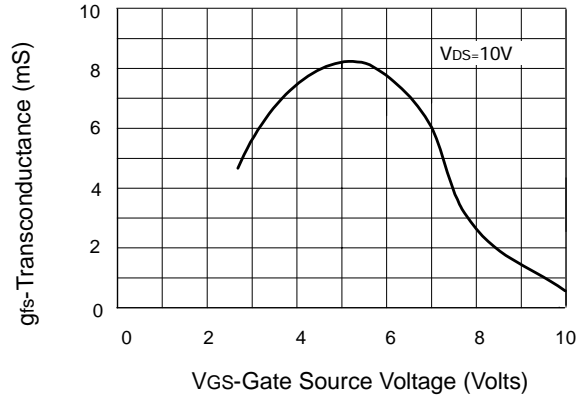
Normalised $R_{DS(on)}$ and $V_{GS(th)}$ vs Temperature

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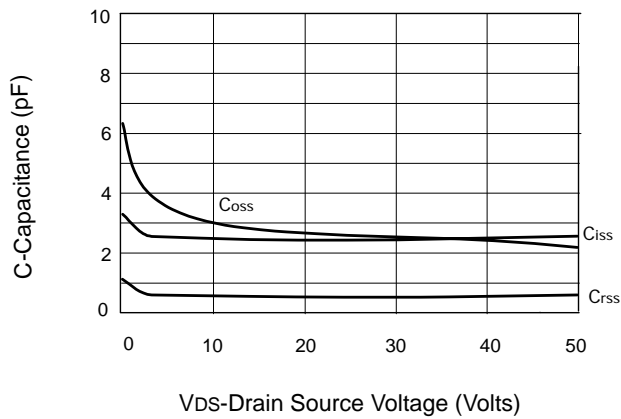
TYPICAL CHARACTERISTICS



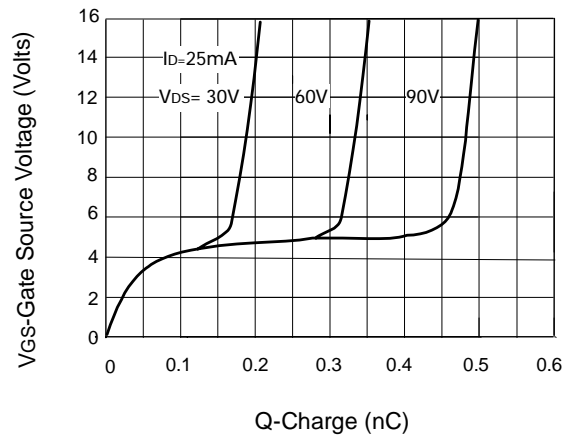
Transconductance v drain current



Transconductance v gate-source voltage



Capacitance v drain-source voltage



Gate charge v gate-source voltage