



N-Channel Enhancement-Mode Vertical DMOS FET

Features

- ▶ Free from secondary breakdown
- ▶ Low power drive requirement
- ▶ Ease of paralleling
- ▶ Low C_{iss} and fast switching speeds
- ▶ High input impedance and high gain

Applications

- ▶ Motor controls
- ▶ Converters
- ▶ Amplifiers
- ▶ Switches
- ▶ Power supply circuits
- ▶ Drivers (relays, hammers, solenoids, lamps, memories, displays, bipolar transistors, etc.)

General Description

This low threshold, enhancement-mode (normally-off) transistor utilizes a vertical DMOS structure and Supertex's well-proven, silicon-gate manufacturing process. This combination produces a device with the power handling capabilities of bipolar transistors and the high input impedance and positive temperature coefficient inherent in MOS devices. Characteristic of all MOS structures, this device is free from thermal runaway and thermally-induced secondary breakdown.

Supertex's vertical DMOS FETs are ideally suited to a wide range of switching and amplifying applications where very low threshold voltage, high breakdown voltage, high input impedance, low input capacitance, and fast switching speeds are desired.

Ordering Information

Part Number	Package Option	Packing
VN2110K1-G	TO-236AB (SOT-23)	3000/Reel

-G denotes a lead (Pb)-free / RoHS compliant package.
Contact factory for Wafer / Die availability.
Devices in Wafer / Die form are lead (Pb)-free / RoHS compliant.

Product Summary

BV_{DSS}/BV_{DGS}	$R_{DS(ON)}$ (max)
100V	4.0Ω

Absolute Maximum Ratings

Parameter	Value
Drain-to-source voltage	BV_{DSS}
Drain-to-gate voltage	BV_{DGS}
Gate-to-source voltage	±20V
Operating and storage temperature	-55°C to +150°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may affect device reliability. All voltages are referenced to device ground.

Pin Configuration



Typical Thermal Resistance

Package	θ_{ja}
TO-236AB (SOT-23)	203°C/W

Product Marking



W = Code for Week Sealed
— = "Green" Packaging

Package may or may not include the following marks: Si or

TO-236AB (SOT-23)

Thermal Characteristics

Package	I_D (continuous) [†]	I_D (pulsed)	Power Dissipation @T _c = 25°C	I_{DR} [†]	I_{DRM}
TO-236AB (SOT-23)	200mA	800mA	0.36W	200mA	800mA

Notes:

[†] I_D (continuous) is limited by max rated T_j.

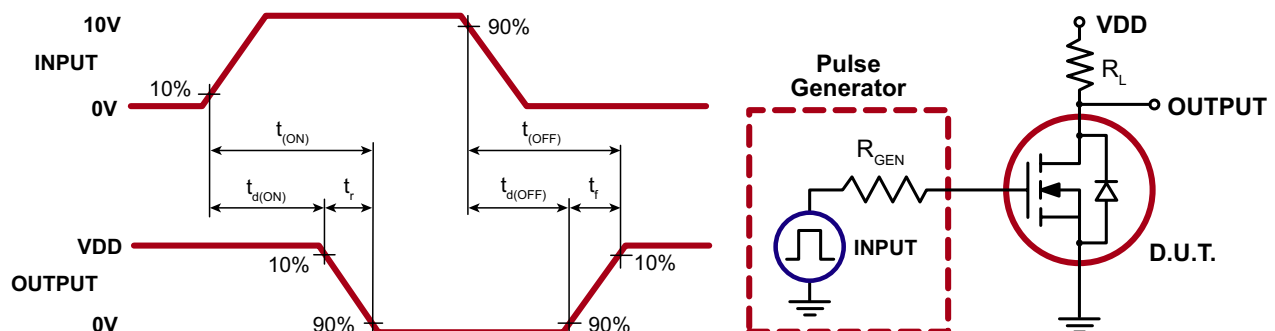
Electrical Characteristics (T_A = 25°C unless otherwise specified)

Sym	Parameter	Min	Typ	Max	Units	Conditions
BV _{DSS}	Drain-to-source breakdown voltage	100	-	-	V	V _{GS} = 0V, I _D = 1.0mA
V _{GS(th)}	Gate threshold voltage	0.8	-	2.4	V	V _{GS} = V _{DS} , I _D = 1.0mA
ΔV _{GS(th)}	Change in V _{GS(th)} with temperature	-	-3.8	-5.5	mV/°C	V _{GS} = V _{DS} , I _D = 1.0mA
I _{GSS}	Gate body leakage current	-	0.1	100	nA	V _{GS} = ±20V, V _{DS} = 0V
I _{DSS}	Zero gate voltage drain current	-	-	1.0	μA	V _{GS} = 0V, V _{DS} = Max Rating
		-	-	100		V _{DS} = 0.8 Max Rating, V _{GS} = 0V, T _A = 125°C
I _{D(ON)}	On-state drain current	0.6	-	-	A	V _{GS} = 10V, V _{DS} = 25V
R _{DS(ON)}	Static drain-to-source on-state resistance	-	4.5	6.0	Ω	V _{GS} = 5.0V, I _D = 75mA
		-	3.0	4.0		V _{GS} = 10V, I _D = 500mA
ΔR _{DS(ON)}	Change in R _{DS(ON)} with temperature	-	0.7	1.0	%/°C	V _{GS} = 10V, I _D = 500mA
G _{FS}	Forward transconductance	150	400	-	mmho	V _{DS} = 25V, I _D = 500mA
C _{ISS}	Input capacitance	-	35	50	pF	V _{GS} = 0V, V _{DS} = 25V, f = 1.0MHz
C _{OSS}	Common source output capacitance	-	13	25		
C _{RSS}	Reverse transfer capacitance	-	4.0	5.0		
t _{d(ON)}	Turn-on delay time	-	3.0	5.0	ns	V _{DD} = 25V, I _D = 600mA, R _{GEN} = 25Ω
t _r	Rise time	-	5.0	8.0		
t _{d(OFF)}	Turn-off delay time	-	6.0	9.0		
t _f	Fall time	-	5.0	8.0		
V _{SD}	Diode forward voltage drop	-	1.2	1.8	V	V _{GS} = 0V, I _{SD} = 600mA
t _{rr}	Reverse recovery time	-	400	-	ns	V _{GS} = 0V, I _{SD} = 600mA

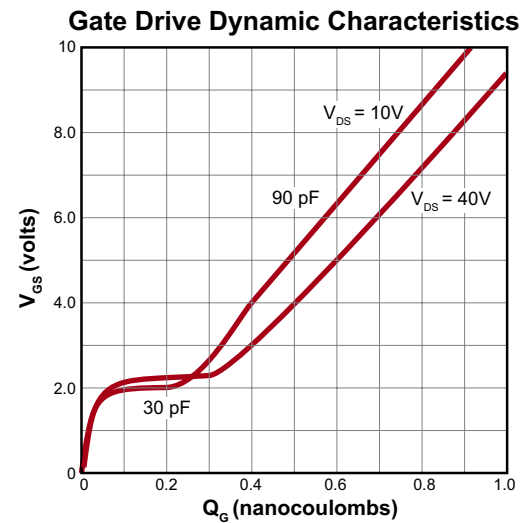
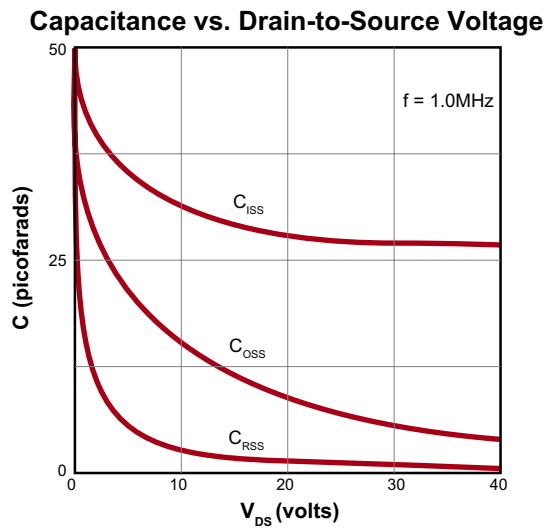
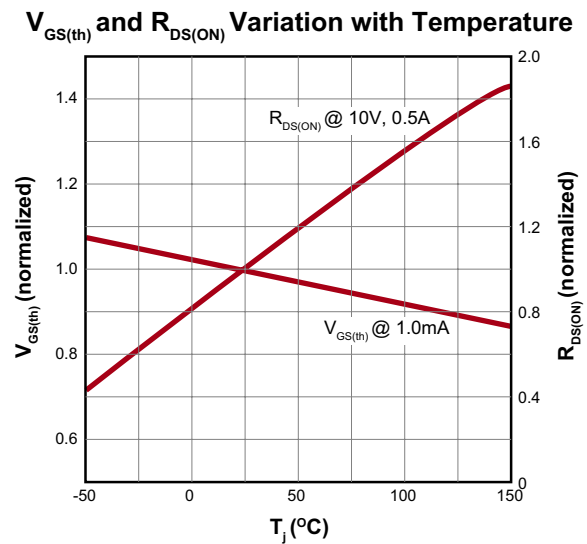
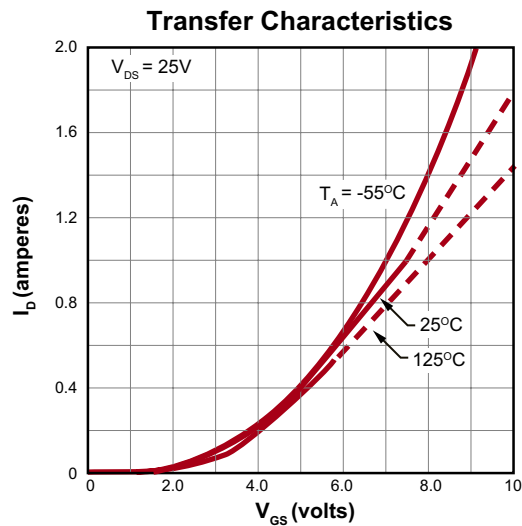
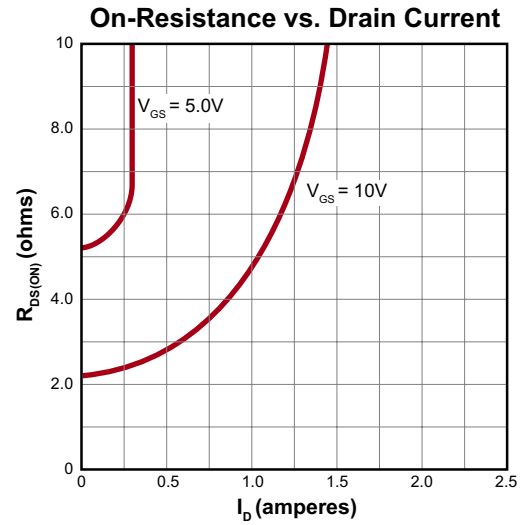
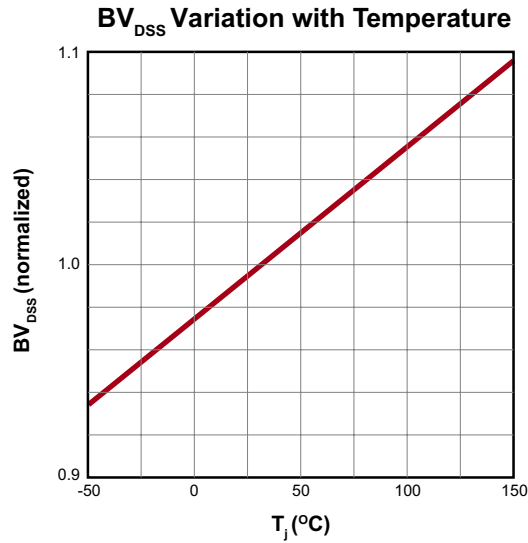
Notes:

1. All D.C. parameters 100% tested at 25°C unless otherwise stated. (Pulse test: 300μs pulse, 2% duty cycle.)
2. All A.C. parameters sample tested.

Switching Waveforms and Test Circuit

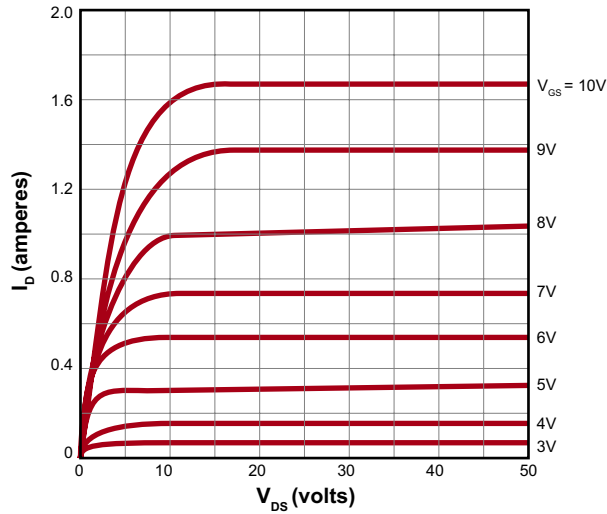


Typical Performance Curves

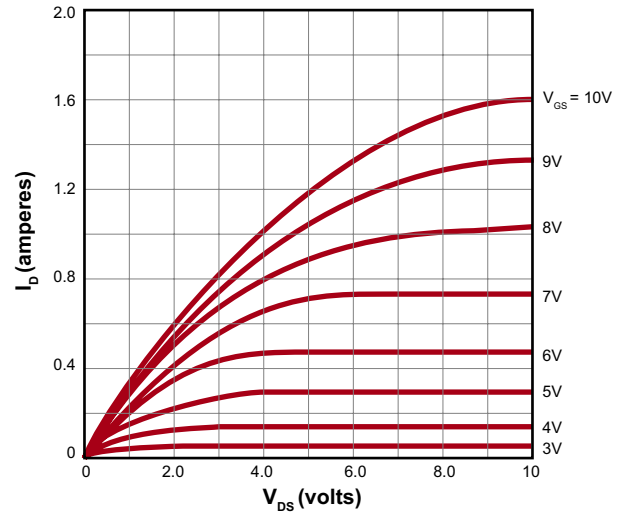


Typical Performance Curves (cont.)

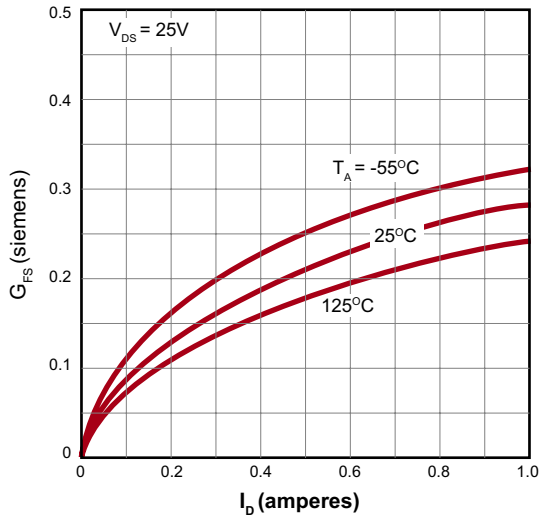
Output Characteristics



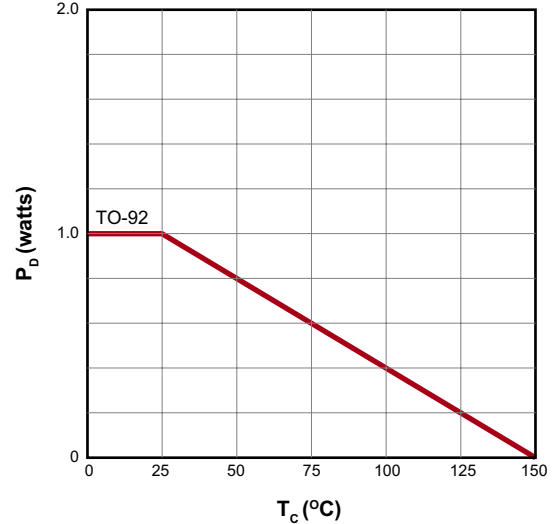
Saturation Characteristics



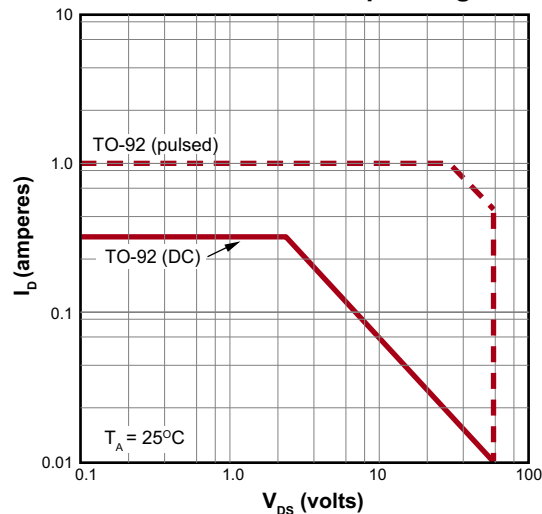
Transconductance vs. Drain Current



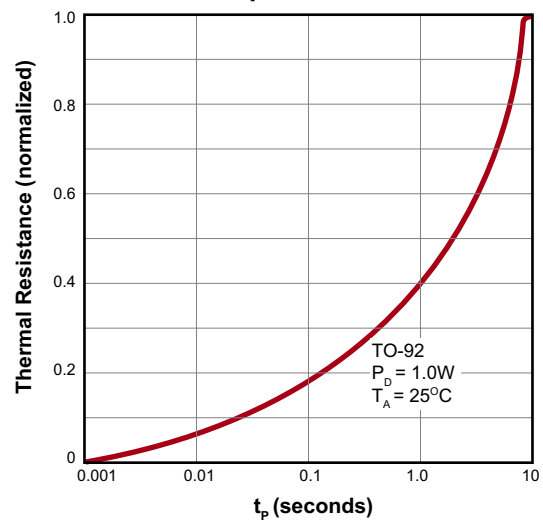
Power Dissipation vs. Case Temperature



Maximum Rated Safe Operating Area

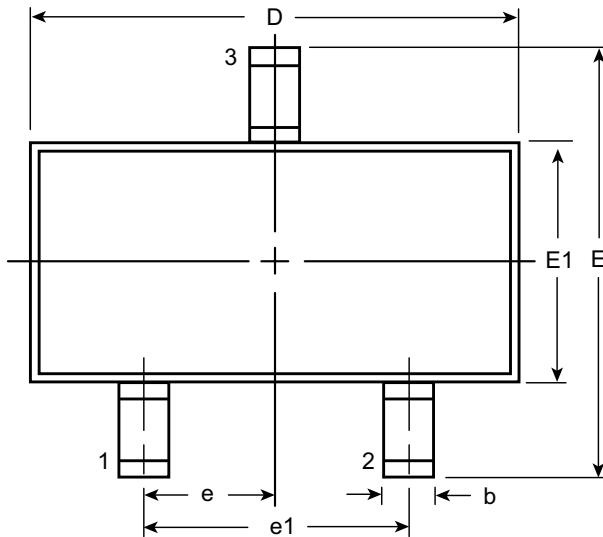


Thermal Response Characteristics

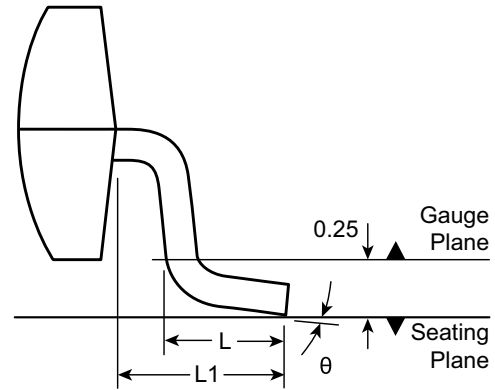


3-Lead TO-236AB (SOT-23) Package Outline (K1)

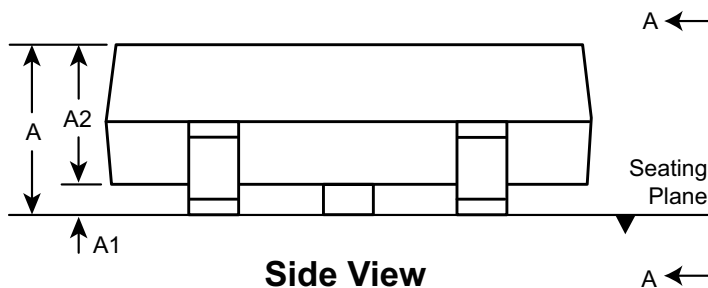
2.90x1.30mm body, 1.12mm height (max), 1.90mm pitch



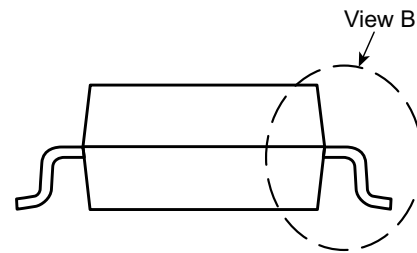
Top View



View B



Side View



View A - A

Symbol		A	A1	A2	b	D	E	E1	e	e1	L	L1	θ
Dimension (mm)	MIN	0.89	0.01	0.88	0.30	2.80	2.10	1.20	0.95 BSC	1.90 BSC	0.20 [†]	0.54 REF	0°
	NOM	-	-	0.95	-	2.90	-	1.30			0.50		-
	MAX	1.12	0.10	1.02	0.50	3.04	2.64	1.40			0.60		8°

JEDEC Registration TO-236, Variation AB, Issue H, Jan. 1999.

[†] This dimension differs from the JEDEC drawing.

Drawings not to scale.

Supertex Doc.#: DSPD-3TO236ABK1, Version C041309.

(The package drawing (s) in this data sheet may not reflect the most current specifications. For the latest package outline information go to <http://www.supertex.com/packaging.html>.)

Supertex inc. does not recommend the use of its products in life support applications, and will not knowingly sell them for use in such applications unless it receives an adequate "product liability indemnification insurance agreement." **Supertex inc.** does not assume responsibility for use of devices described, and limits its liability to the replacement of the devices determined defective due to workmanship. No responsibility is assumed for possible omissions and inaccuracies. Circuitry and specifications are subject to change without notice. For the latest product specifications refer to the **Supertex inc.** (website: <http://www.supertex.com>)

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9