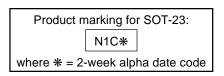
Supertex inc.

N-Channel Enhancement-Mode

Ordering Information

BV _{DSS} /	R _{DS(ON)} (max)	V _{GS(th)} (max)	Order Number / Package			
BV _{DGS}			TO-243AA**	TO-236AB*		
240V	15Ω	2.0V	TN2124N8	TN2124K1		



* Same as SOT-23. All units shipped on 3,000 piece carrier tape reels.

** Prodcut supplied on 2000 piece carrier tape reels.

Features

- Free from secondary breakdown
- Low power drive requirement
- Ease of paralleling
- Low C_{ISS} and fast switching speeds
- Excellent thermal stability
- Integral Source-Drain diode
- □ High input impedance and high gain
- Complementary N- and P-channel devices

Applications

- □ Logic level interfaces ideal for TTL and CMOS
- Solid state relays
- Battery operated systems
- Photo voltaic drives
- Analog switches
- General purpose line drivers
- Telecom switches

08/30/99

Absolute Maximum Ratings

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
Soldering Temperature*	300°C

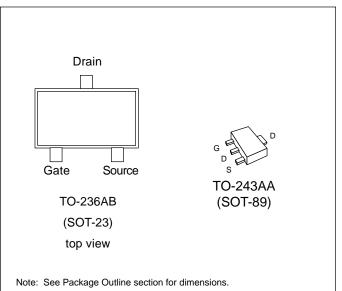
* Distance of 1.6 mm from case for 10 seconds.

Advanced DMOS Technology

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

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

Package Options



Supertex Inc. does not recommend the use of its products in life support applications and will not knowingly sell its products for use in such applications unless it receives an adequate "products liability indemnification insurance agreement." Supertex does not assume responsibility for use of devices described and limits its liability to the replacement of devices determined to be defective due to workmanship. No responsibility is assumed for possible omissions or inaccuracies. Circuitry and specifications are subject to change without notice. For complete liability information covering this and other Supertex products, refer to the Supertex 1998 Databook.

Thermal Characteristics

Package	I _D (continuous)*	I _D (pulsed)	Power Dissipation @ T _A = 25°C	θ _{jc} °C/W	θ _{ja} °C/W	I _{DR} *	I _{DRM}
TO-236AB	134mA	250mA	0.36W	200	350	134mA	250mA
TO-243AA	230mA	1.1A	1.6W [†]	15	7 8†	230mA	1.1A

* I_{D} (continuous) is limited by max rated $T_{j}.$

 † Mounted on FR5 board. 25mmx25mmx1.57mm. Significant P_D increase possible on ceramic substrate.

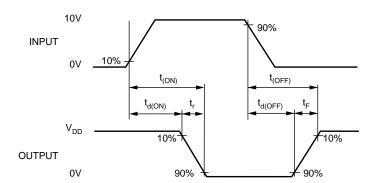
Electrical Characteristics (@ 25°C unless otherwise specified)

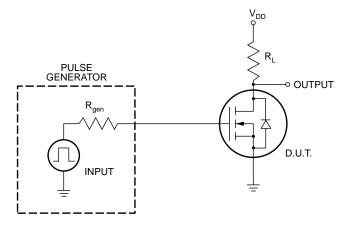
Symbol	Parameter	Min	Тур	Max	Unit	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	240			V	$I_D = 1mA$, $V_{GS} = 0V$
V _{GS(th)}	Gate Threshold Voltage	0.8		2.0	V	$V_{GS} = V_{DS}, I_{D} = 1mA$
$\Delta V_{GS(th)}$	Change in $V_{GS(th)}$ with Temperature			-5.5	mV/°C	$I_D = 1mA, V_{GS} = V_{DS}$
I _{GSS}	Gate Body Leakage		0.1	100	nA	$V_{GS} = \pm 20 V, V_{DS} = 0 V$
I _{DSS}	Zero Gate Voltage Drain Current			1	μΑ	$V_{GS} = 0V, V_{DS} = Max Rating$
				100	μΑ	$V_{GS} = 0V, V_{DS} = 0.8$ Max Rating $T_A = 125^{\circ}C$
I _{D(ON)}	ON-State Drain Current	140			mA	$V_{GS} = 4.5V, V_{DS} = 25V$
R _{DS(ON)}	Static Drain-to-Source			30	Ω	$V_{GS} = 3V, I_{D} = 25mA$
	ON-State Resistance			15	Ω	$V_{GS} = 4.5 V, I_{D} = 120 mA$
$\Delta R_{DS(ON)}$	Change in R _{DS(ON)} with Temperature		0.7	1.0	%/°C	I _D = 120mA, V _{GS} = 4.5V
G _{FS}	Forward Transconductance	100	170		mΩ	$V_{DS} = 25V, I_{D} = 120mA$
C _{ISS}	Input Capacitance		38	50		
C _{OSS}	Common Source Output Capacitance		9	15	pF	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$
C _{RSS}	Reverse Transfer Capacitance		3	5		
t _{d(ON)}	Turn-ON Delay Time		4	7		
t _r	Rise Time		2	5		$V_{DD} = 25V$ $I_{D} = 140mA$
t _{d(OFF)}	Turn-OFF Delay Time		7	10	- ns -	$R_{GEN} = 25\Omega$
t _f	Fall Time		9	12		GEN
V _{SD}	Diode Forward Voltage Drop			1.8	V	I _{SD} = 120mA, V _{GS} = 0V
t _{rr}	Reverse Recovery Time		400		ns	I _{SD} = 120mA, V _{GS} = 0V

Notes:

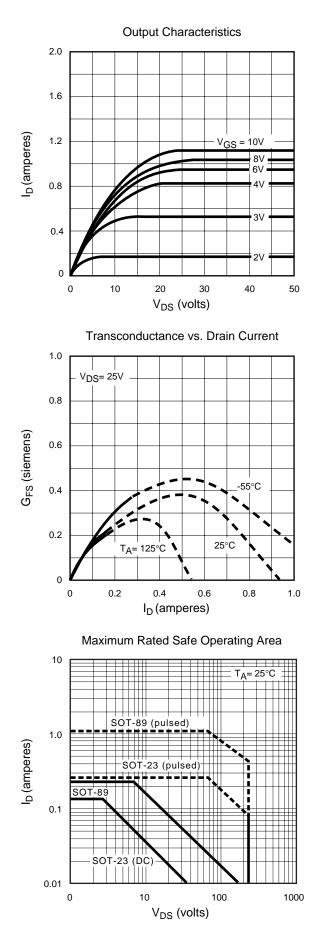
1.All D.C. parameters 100% tested at 25°C unless otherwise stated. (Pulse test: 300µs pulse, 2% duty cycle.) 2.All A.C. parameters sample tested.

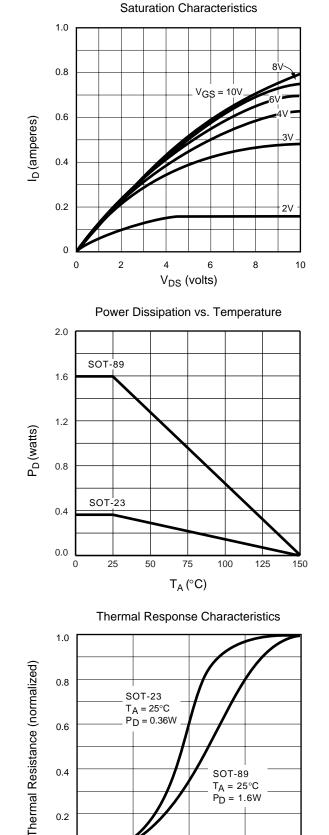
Switching Waveforms and Test Circuit





Typical Performance Curves





SOT-89 $T_A = 25^{\circ}C$

 $P_{D} = 1.6W$

1

10

0.4

0.2

0

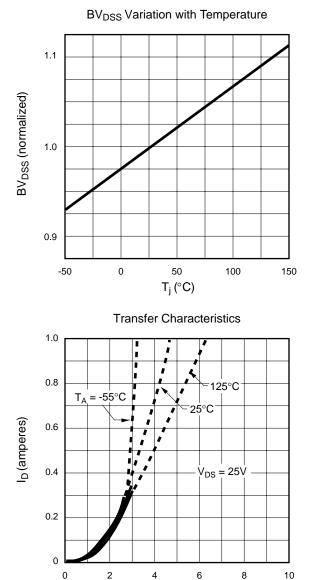
0.001

0.01

0.1

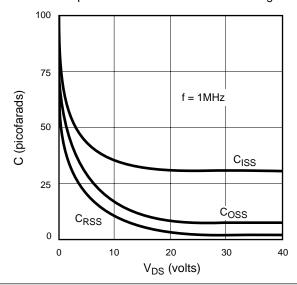
tp (seconds)

Typical Performance Curves

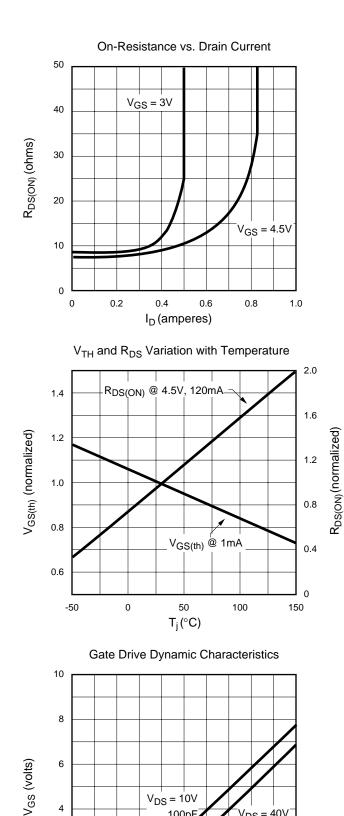


Capacitance vs. Drain-to-Source Voltage

V_{GS} (volts)







1235 Bordeaux Drive, Sunnyvale, CA 94089 TEL: (408) 744-0100 • FAX: (408) 222-4895 www.supertex.com

0.4

32 pF

0.2

100pF

Q_G (nanocoulombs)

0.6

 $V_{DS} = 40V$

0.8

1.0

08/30/99

4

2

0

0