Supertex inc.



Ordering Information

BV _{DSX} /	R _{DS(ON)}	I _{DSS}	Order Numb	oer / Package	
BV _{DGX}	(max)	(min)	TO-92	TO-243AA*	
300V	12Ω	200mA	DN2530N3	DN2530N8	

* Same as SOT-89. Product shipped on 2000 piece carrier tape reels.

Features

- High input impedance
- Low input capacitance
- □ Fast switching speeds
- Low on resistance
- □ Free from secondary breakdown
- Low input and output leakage

Applications

- Normally-on switches
- Solid state relays
- Converters
- Linear amplifiers
- Constant current sources
- Power supply circuits
- Telecom

Absolute Maximum Ratings

Drain-to-Source Voltage	BV _{DSX}
Drain-to-Gate Voltage	BV _{DGX}
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.

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Advanced DMOS Technology

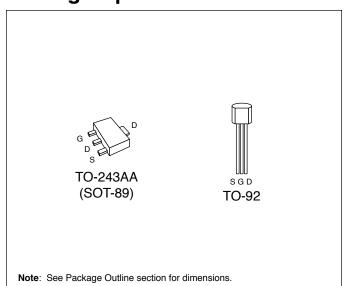
Product marking for TO-243AA: DN5T* Where * = 2-week alpha date code

Not recommended for new designs. Please use DN3535 or DN3545 instead.

These depletion-mode (normally-on) transistors utilize an advanced 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's 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 the latest product specifications, refer to the Supertex website: http://www.supertex.com. For complete liability information on all Supertex products, refer to the most current databook or to the Legal/Disclaimer page on the Supertex website.

Thermal Characteristics

Package	I _D (continuous)*	l _D (pulsed)	Power Dissipation @ T _A = 25°C	θ _{jc} °C/W	θ _{ja} °C/W	I _{DR} *	I _{DRM}
TO-92	175mA	500mA	0.74W	125	170	175mA	500mA
TO-243AA	200mA	500mA	1.6 [†]	15	78 [†]	200mA	500mA

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

⁺ Mounted on FR4 board, 25mm x 25mm x 1.57mm. Significant P_p increase possible on ceramic substrate.

Electrical Characteristics (@ 25°C unless otherwise specified)

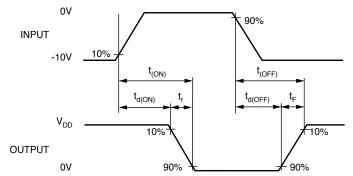
Symbol	Parameter	Min	Тур	Max	Unit	Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	300			V	$V_{GS} = -5V$, $I_D = 100\mu A$
V _{GS(OFF)}	Gate-to-Source OFF Voltage	-1.0		-3.5	V	$V_{DS} = 25V, I_{D} = 10\mu A$
$\Delta V_{GS(OFF)}$	Change in $V_{GS(OFF)}$ with Temperature			4.5	mV/°C	$V_{DS} = 25V, I_{D} = 10\mu A$
I _{GSS}	Gate Body Leakage Current			100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
I _{D(OFF)}	Drain-to-Source Leakage Current			10	μΑ	V_{GS} = -10V, V_{DS} = Max Rating
				1	mA	V_{GS} = -10V, V_{DS} = 0.8 Max Rating T_A = 125°C
I _{DSS}	Saturated Drain-to-Source Current	200			mA	$V_{GS} = 0V, V_{DS} = 25V$
R _{DS(ON)}	Static Drain-to-Source ON-State Resistance			12	Ω	V _{GS} = 0V, I _D = 150mA
$\Delta R_{DS(ON)}$	Change in R _{DS(ON)} with Temperature			1.1	%/°C	$V_{GS} = 0V, I_{D} = 150mA$
G _{FS}	Forward Transconductance	300			mΩ	I _D = 150mA, V _{DS} = 10V
C _{ISS}	Input Capacitance			300		V _{GS} = -10V, V _{DS} = 25V
C _{OSS}	Common Source Output Capacitance			30	pF	f = 1 MHz
C _{RSS}	Reverse Transfer Capacitance			5		
t _{d(ON)}	Turn-ON Delay Time			10		V _{DD} = 25V,
t _r	Rise Time			15	ns	I _D = 150mA,
t _{d(OFF)}	Turn-OFF Delay Time			15	1	$R_{GEN} = 25\Omega$
t _f	Fall Time			20	1	
V _{SD}	Diode Forward Voltage Drop			1.8	V	V _{GS} = -10V, I _{SD} = 150mA
t _{rr}	Reverse Recovery Time		600	1	ns	V _{GS} = -10V, I _{SD} = 1A

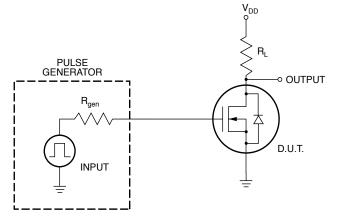
Notes:

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

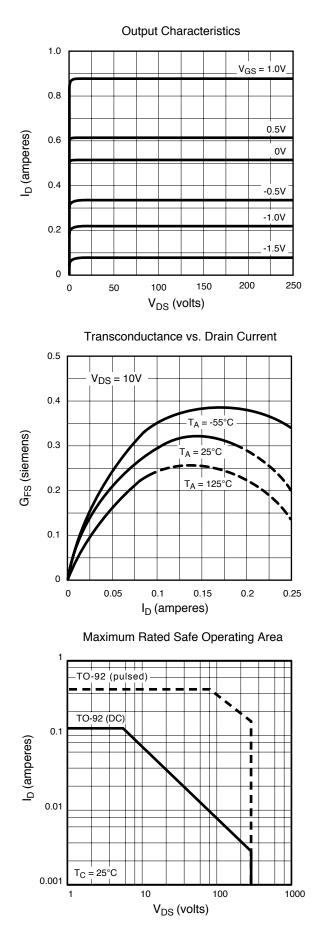
2. All A.C. parameters sample tested.

Switching Waveforms and Test Circuit



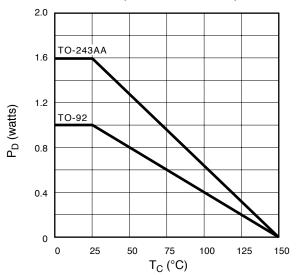


Typical Performance Curves

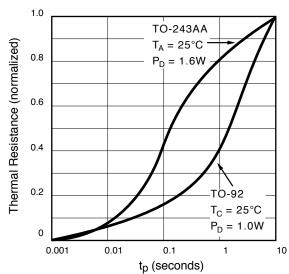


0.25 -0.5V V_{GS} = 1.0V -1.0V οv 0.5V 0.2 I_D (amperes) 0.15 0.1 -1.5V 0.05 0 0 1 2 3 4 5 V_{DS} (volts)

Power Dissipation vs. Case Temperature



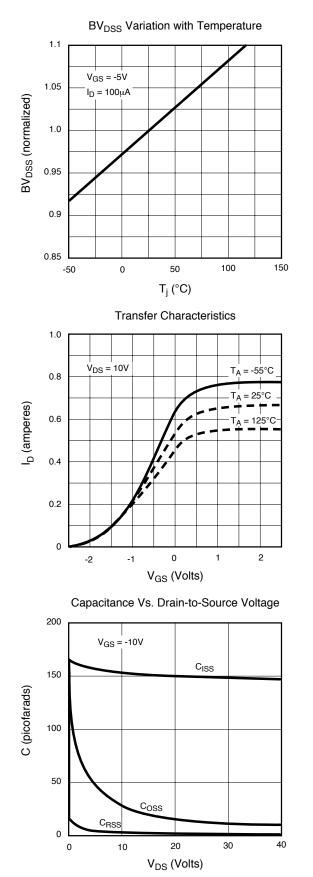
Thermal Response Characteristics

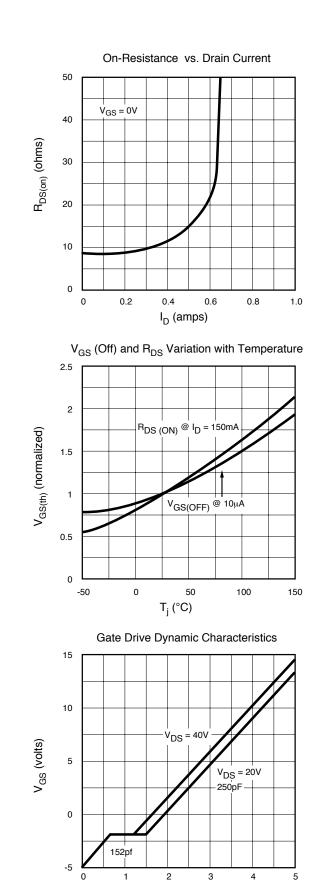


Saturation Characteristics

DN2530

Typical Performance Curves





Q_C (Nanocoulombs)

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