Pre-Release Information

N-Channel Depletion-Mode Vertical DMOS FETs

Ordering Information

BV_{DSX} / BV_{DGX}	$R_{DS(ON)}$ (max)	I_{DSS} (min)	Order Number / Package	
			TO-243AA*	Die**
250V	6.0Ω	300mA	DN3525N8	DN3525NW

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

** Die in wafer form.

Features

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

Applications

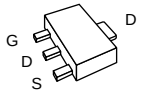
- ☐ Normally-on switches
- ☐ Solid state relays
- ☐ Converters
- ☐ Linear amplifiers
- ☐ Constant current sources
- ☐ Power supply circuits
- ☐ Telecom

Advanced DMOS Technology

These low threshold 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



TO-243AA
(SOT-89)

Note: See Package Outline section for dimensions.

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

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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-243AA	360mA	600mA	1.6W†	15	78†	360mA	600mA

* I_D (continuous) is limited by max rated T_j.

† Mounted on FR5 board, 25mm x 25mm x 1.57mm. Significant P_D increase possible on ceramic substrate.

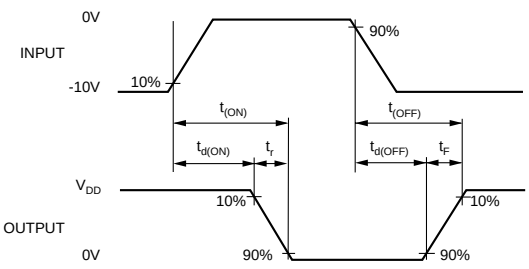
Electrical Characteristics (@ 25°C unless otherwise specified)

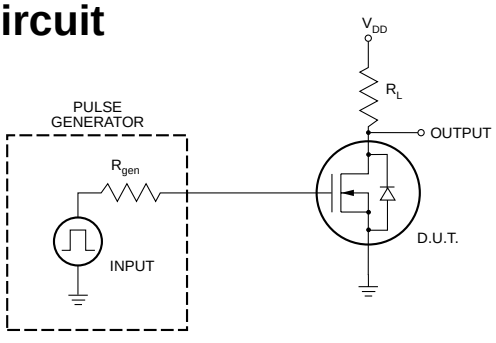
Symbol	Parameter	Min	Typ	Max	Unit	Conditions
BV_{DSX}	Drain-to-Souce Breakdown Voltage	250			V	V_{GS} = -5.0V, I_D = 100µA
$V_{GS(OFF)}$	Gate-to-Source OFF Voltage	-1.8		-3.5	V	V_{DS} = 15V, I_D = 1.0mA
$\Delta V_{GS(OFF)}$	Change in $V_{GS(OFF)}$ with Temperature			4.5	mV/°C	V_{DS} = 15V, I_D = 1.0mA
I_{GSS}	Gate Body Leakage Current			100	nA	V_{GS} = ±20V, V_{DS} = 0V
$I_{D(OFF)}$	Drain-to-Source Leakage Current			20	nA	V_{GS} = -5.0V, V_{DS} = 4.5V
				200		V_{GS} = -5.0V, V_{DS} = 100V
				1.0	µA	V_{GS} = -5.0V, V_{DS} = Max Rating
				1.0	mA	V_{GS} = -5.0V, V_{DS} = 0.8 Max Rating T_A = 125°C
I_{DSS}	Saturated Drain-to-Source Current	300			mA	V_{GS} = 0V, V_{DS} = 15V
$R_{DS(ON)}$	Static Drain-to-Source ON-State Resistance			6.0	Ω	V_{GS} = 0V, I_D = 200mA
				6.0		V_{GS} = -0.8V, I_D = 50mA
$\Delta R_{DS(ON)}$	Change in $R_{DS(ON)}$ with Temperature			1.1	%/°C	V_{GS} = 0V, I_D = 200mA
G_{FS}	Forward Transconductance	225			m℧	I_D = 150mA, V_{DS}=10V
C_{ISS}	Input Capacitance		270	350	pF	V_{GS} = -5.0V, V_{DS} = 25V, f =1.0Mhz
C_{OSS}	Common Source Output Capacitance		20	60		
C_{RSS}	Reverse Transfer Capacitance		5.0	20		
$t_{d(ON)}$	Turn-ON Delay Time			20	ns	V_{DD} = 25V,
t_r	Rise Time			25		I_D = 150mA,
$t_{d(OFF)}$	Turn-OFF Delay Time			25		R_{GEN} = 25Ω,
t_f	Fall Time			40		V_{GS} = 0V to -10V
V_{SD}	Diode Forward Voltage Drop			1.8	V	V_{GS} = -5.0V, I_{SD} = 150mA
t_{rr}	Reverse Recovery Time		800		ns	V_{GS} = -5.0V, I_{SD} = 150mA

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





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