

N-Channel Enhancement-Mode Vertical DMOS FETs

Ordering Information

BV _{DSS} /	R _{DS(ON)} (max)	V _{GS(th)} (max)	Order Number / Package			
BV _{DGS}			TO-236AB*	Die		
300V	25Ω	2.4V	TN2130K1	TN2130ND		

Product marking for SOT-23:

N1T*

where * = 2-week alpha date code

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

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

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

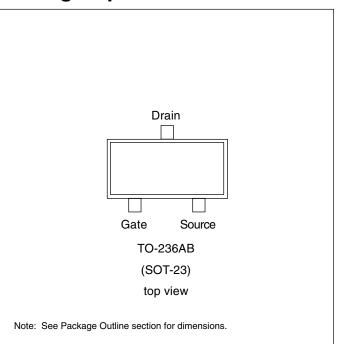
^{*} Distance of 1.6 mm from case for 10 seconds.

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'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 Option



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

Thermal Characteristics

Package	I _D (continuous)*	I _D (pulsed)	Power Dissipation @ T _A = 25°C	$ heta_{ m jc}$ $^{\circ}$ C/W	$ heta_{ja}$ °C/W	I _{DR} *	I _{DRM}
TO-236AB	85mA	200mA	0.36W	200	350	85mA	200mA

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

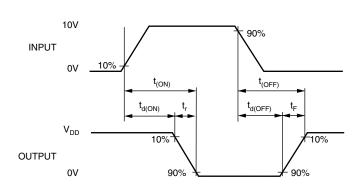
Electrical Characteristics (@ 25°C unless otherwise specified)

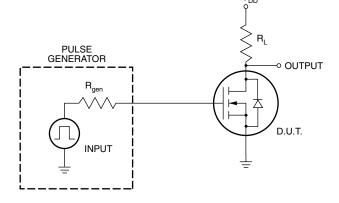
Symbol	Parameter	Min	Тур	Max	Unit	Conditions		
BV _{DSS}	Drain-to-Source Breakdown Voltage	300			V	$I_D = 1 \text{mA}, V_{GS} = 0 \text{V}$		
V _{GS(th)}	Gate Threshold Voltage	0.8		2.4	V	$V_{GS} = V_{DS}$, $I_D = 1mA$		
$\Delta V_{GS(th)}$	Change in V _{GS(th)} with Temperature			-5.5	mV/°C	$I_D = 1 \text{mA}, V_{GS} = V_{DS}$		
I _{GSS}	Gate Body Leakage			100	nA	$V_{GS} = \pm 20V$, $V_{DS} = 0V$		
I _{DSS}	Zero Gate Voltage Drain Current			10	μΑ	V _{GS} = 0V, V _{DS} = Max Rating		
				100	μА	$V_{GS} = 0V$, $V_{DS} = 0.8$ Max Rating $T_A = 125$ °C		
I _{D(ON)}	ON-State Drain Current	250			mA	$V_{GS} = 10V, V_{DS} = 25V$		
R _{DS(ON)}	Static Drain-to-Source ON-State Resistance			25	Ω	$V_{GS} = 4.5V, I_D = 120mA$		
$\Delta R_{DS(ON)}$	Change in R _{DS(ON)} with Temperature			1.1	%/°C	V _{GS} = 4.5V, I _D = 120mA		
G _{FS}	Forward Transconductance		250		m	$V_{DS} = 25V, I_{D} = 100mA$		
C _{ISS}	Input Capacitance			50				
C _{OSS}	Common Source Output Capacitance			15	pF	$V_{GS} = 0V, V_{DS} = 25V, f = 1MHz$		
C _{RSS}	Reverse Transfer Capacitance			5				
$t_{d(ON)}$	Turn-ON Delay Time			10		.,,		
t _r	Rise Time			7	ns	$V_{DD} = 25V,$		
t _{d(OFF)}				12		$I_D = 120 \text{mA}$ $R_{GEN} = 25\Omega$		
t _f	Fall Time			15]	OLIV.		
V _{SD}	Diode Forward Voltage Drop			1.8	V	I _{SD} = 120mA, V _{GS} = 0V		
t _{rr}	Reverse Recovery Time		400		ns	$I_{SD} = 120 \text{mA}, V_{GS} = 0 \text{V}$		

Notes:

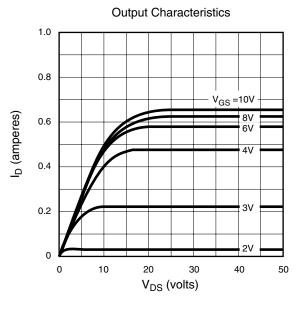
- 1. All D.C. parameters 100% tested at 25°C unless otherwise stated. (Pulse test: $300\mu s$ pulse, 2% duty cycle.)
- 2. All A.C. parameters sample tested.

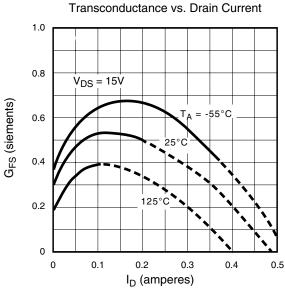
Switching Waveforms and Test Circuit

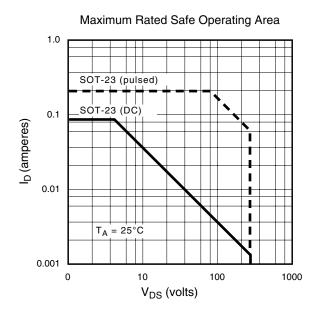


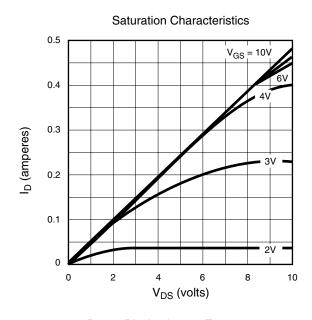


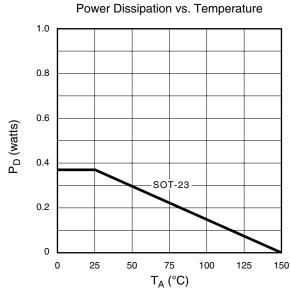
Typical Performance Curves

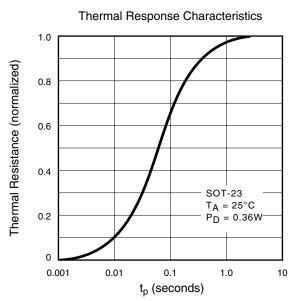












Typical Performance Curves

