

**N-Channel Depletion-Mode** MOSFET

#### **Ordering Information**

BV <sub>DSX</sub> /	R <sub>DS(ON)</sub> (max)	I <sub>DSS</sub>	Order Number / Package	Product marking for SOT-23:		
BV <sub>DGX</sub>		(min)	TO-236AB*	NDE*		
500V	1.0KΩ	1.0mA	LND250K1	where $* = 2$ -week alpha date code		

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

#### Features

- ESD gate protection
- Free from secondary breakdown
- Low power drive requirement
- Ease of paralleling
- Excellent thermal stability
- Integral source-drain diode
- High input impedance and low C<sub>ISS</sub>

# Advanced DMOS Technology

The LND2 is a high voltage N-channel depletion mode (normallyon) transistor utilizing Supertex's lateral DMOS technology. The gate is ESD protected.

The LND2 is ideal for high voltage applications in the areas of normally-on switches, precision constant current sources, voltage ramp generation and amplification.

# **Applications**

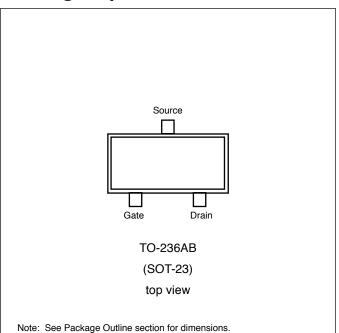
- Solid state relays
- Normally-on switches
- Converters
- Power supply circuits
- Constant current sources
- Input protection circuits

# **Absolute Maximum Ratings**

Drain-to-Source Voltage	BV <sub>DSX</sub>
Drain-to-Gate Voltage	BV <sub>DGX</sub>
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.

### **Package Options**



#### 12/13/01

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# **Thermal Characteristics**

Package	I <sub>D</sub> (continuous)*	Ι <sub>p</sub> (pulsed)	Power Dissipation $@T_A = 25^{\circ}C$	θ <sub>jc</sub> °C/W	θ <sub>ja</sub> °C/W	I <sub>DR</sub>	I_*	
TO-236AB	13mA	30mA	0.36W	200	350	13mA	30mA	

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

#### Electrical Characteristics (@ 25°C unless otherwise specified)

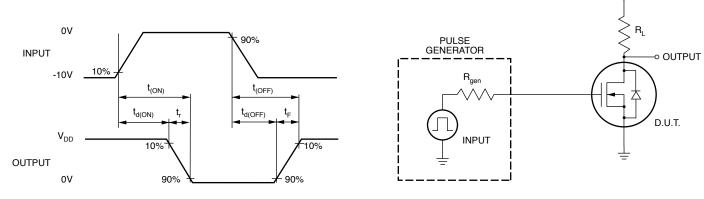
Symbol	Parameter	Min	Тур	Max	Unit	Conditions	
BV <sub>DSX</sub>	Drain-to-Source Breakdown Voltage	500			V	V <sub>GS</sub> = -10V, I <sub>D</sub> = 1.0mA	
V <sub>GS(OFF)</sub>	Gate-to-Source OFF Voltage	-1.0		-3.0	V	$V_{\rm DS} = 25V, I_{\rm D} = 100nA$	
$\Delta V_{GS(OFF)}$	Change in $V_{GS(OFF)}$ with Temperature			5.0	mV/°C	$V_{\rm DS} = 25V, I_{\rm D} = 100nA$	
I <sub>GSS</sub>	Gate Body Leakage Current			100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$	
I <sub>D(OFF)</sub>	Drain-to-Source Leakage Current			100	nA	V <sub>GS</sub> = -10V, V <sub>DS</sub> = 450V	
				100	μΑ	$V_{GS} = -10V$ , $V_{DS} = 0.8V$ max rating $T_A = 125^{\circ}C$	
I <sub>DSS</sub>	Saturated Drain-to-Source Current	1.0		3.0	mA	$V_{GS} = 0V, V_{DS} = 25V$	
R <sub>DS(ON)</sub>	Static Drain-to-Source ON-State Resistance		850	1K	Ω	$V_{GS} = 0V, I_{D} = 0.5mA$	
$\Delta R_{DS(ON)}$	Change in R <sub>DS(ON)</sub> with Temperature			1.2	%/°C	$V_{GS} = 0V, I_{D} = 0.5mA$	
G <sub>FS</sub>	Forward Transconductance	1.0	2.0		m 22	$V_{GS} = 0V, I_{D} = 1.0mA$	
C <sub>ISS</sub>	Input Capacitance Output Capacitance		7.5	10	pF	V <sub>GS</sub> = -10V, V <sub>DS</sub> = 25V f = 1MHz	
C <sub>OSS</sub>			2.0	3.5			
C <sub>RSS</sub>	Reverse Transfer Capacitance		0.5	1.0	1		
t <sub>d(ON)</sub>	Turn-ON Delay Time		0.09			$V_{DD} = 25V, I_{D} = 1.0mA,$	
tr	Rise Time		0.45		1	$R_{GEN} = 25\Omega$	
t <sub>d(OFF)</sub>	Turn-OFF Delay Time		0.1		μs		
t <sub>f</sub>	Fall Time		1.3		]		
$V_{SD}$	Diode Forward Voltage Drop			0.9	V	V <sub>GS</sub> = -10V, I <sub>SD</sub> = 1.0mA	
t <sub>rr</sub>	Reverse Recovery Time		200		ns	V <sub>GS</sub> = -10V, I <sub>SD</sub> = 1.0mA	

Notes:

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

2. All A.C. parameters sample tested.

# **Switching Waveforms and Test Circuit**



12/13/010

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 $V_{DD}$