N-Channel Depletion-Mode MOSFET

Ordering Information

BV_{DSX} / BV_{DGX}	$R_{DS(ON)}$ (max)	I_{DSS} (min)	Order Number / Package		
			TO-92	TO-243AA*	Die
500V	1.0KΩ	1.0mA	LND150N3	LND150N8	LND150ND

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

Product marking for TO-243AA:

LN1E❋

Where ❋ = 2-week alpha date code

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_{ISS}

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_{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

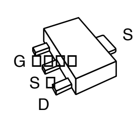
* Distance of 1.6 mm from case for 10 seconds.

Advanced DMOS Technology

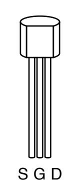
The LND1 is a high voltage N-channel depletion mode (normally-on) transistor utilizing Supertex's lateral DMOS technology. The gate is ESD protected.

The LND1 is ideal for high voltage applications in the areas of normally-on switches, precision constant current sources, voltage ramp generation and amplification.

Package Options



TO-243AA
(SOT-89)



TO-92

Note: See Package Outline section for dimensions.

12/13/01

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-92	30mA	30mA	0.74W	125	170	30mA	30mA
TO-243AA	30mA	30mA	1.6W†	31	105†	30mA	30mA

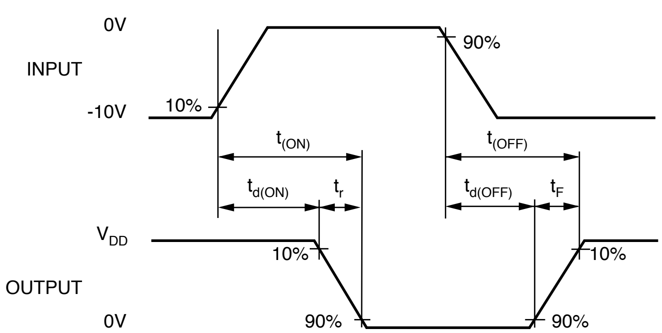
* I_D (continuous) is limited by max rated T_j.
† Mounted on FR5 Board, 25mm x 25mm x 1.57mm. Significant P_D increase possible on ceramic substrate.

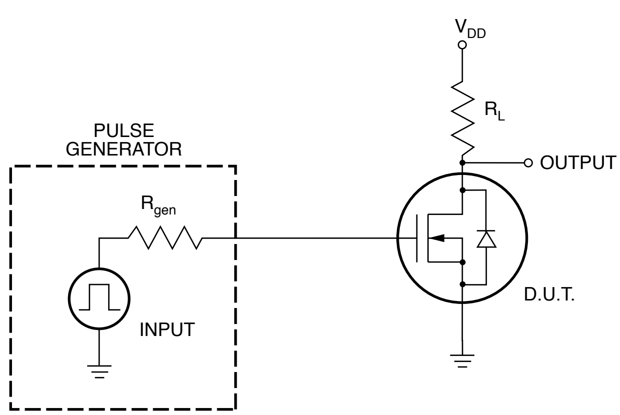
Electrical Characteristics (@ 25°C unless otherwise specified)

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	500			V	V_{GS} = -10V, I_D = 1.0mA
$V_{GS(OFF)}$	Gate-to-Source OFF Voltage	-1.0		-3.0	V	V_{DS} = 25V, I_D = 100nA
$\Delta V_{GS(OFF)}$	Change in $V_{GS(OFF)}$ with Temperature			5.0	mV/°C	V_{DS} = 25V, I_D = 100nA
I_{GSS}	Gate Body Leakage Current			100	nA	V_{GS} = ±20V, V_{DS} = 0V
$I_{D(OFF)}$	Drain-to-Source Leakage Current			100	nA	V_{GS} = -10V, V_{DS} = 450V
				100	µA	V_{GS} = -10V, V_{DS} = 0.8V max rating T_A =125°C
I_{DSS}	Saturated Drain-to-Source Current	1.0		3.0	mA	V_{GS} = 0V, V_{DS} = 25V
$R_{DS(ON)}$	Static Drain-to-Source ON-State Resistance		850	1000	Ω	V_{GS} = 0V, I_D = 0.5mA
$\Delta R_{DS(ON)}$	Change in RDS(ON) with Temperature			1.2	%/°C	V_{GS} = 0V, I_D = 0.5mA
G_{FS}	Forward Transconductance	1.0	2.0		m℧	V_{GS} = 0V, I_D = 1.0mA
C_{ISS}	Input Capacitance		7.5	10		
C_{OSS}	Output Capacitance		2.0	3.5	pF	V_{GS} = -10V, V_{DS} = 25V f = 1 MHz
C_{RSS}	Reverse Transfer Capacitance		0.5	1.0		
$t_{d(ON)}$	Turn-ON Delay Time		0.09			
tr	Rise Time		0.45		µs	V_{DD} = 25V, I_D = 1.0mA, R_{GEN} = 25Ω
$t_{d(OFF)}$	Turn-OFF Delay Time		0.1			
t_f	Fall Time		1.3			
V_{SD}	Diode Forward Voltage Drop			0.9	V	V_{GS} = -10V, I_{SD} = 1.0mA
t_{rr}	Reverse Recovery Time		200		ns	V_{GS} = -10V, I_{SD} = 1.0mA

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.

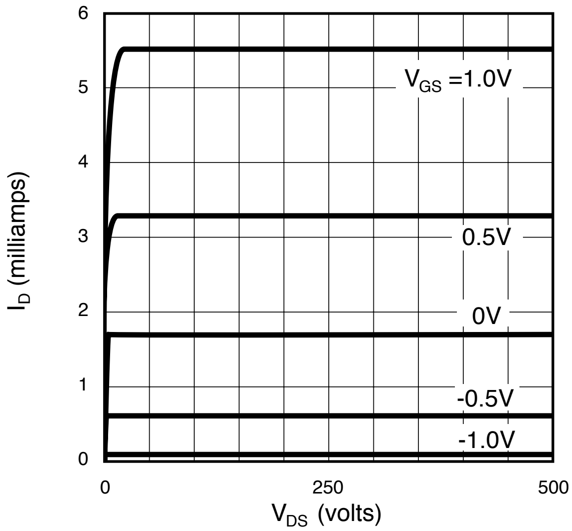
Switching Waveforms and Test Circuit



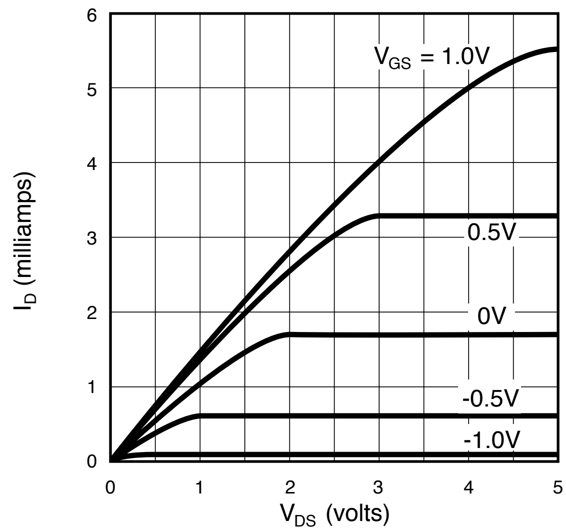


Typical Performance Curves

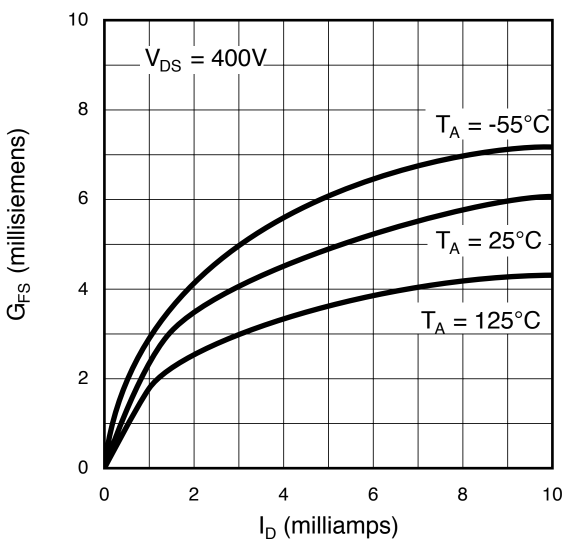
Output Characteristics



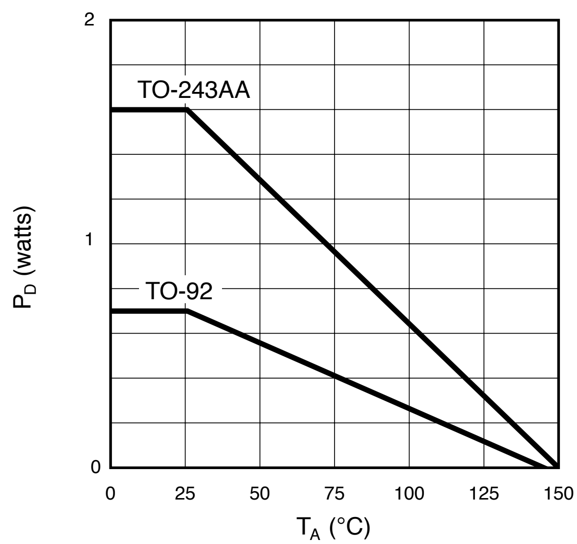
Saturation Characteristics



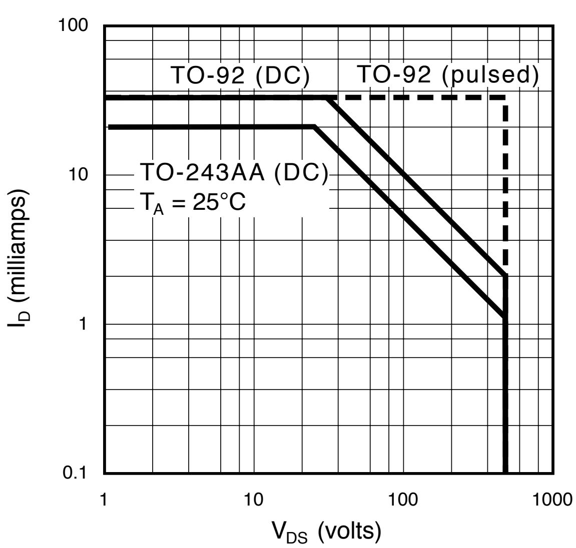
Transconductance vs. Drain Current



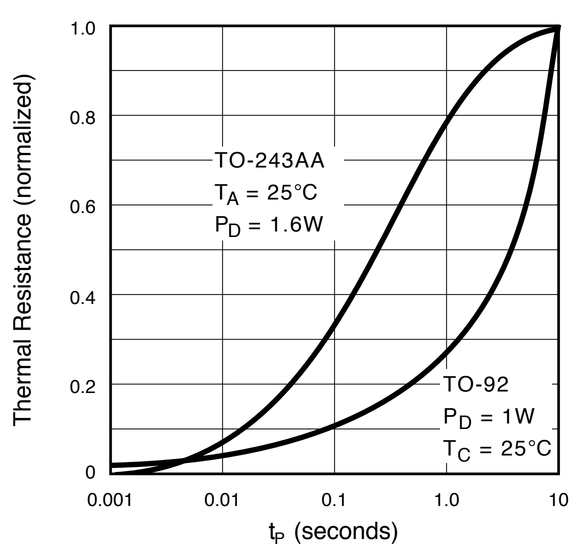
Power Dissipation vs. Ambient Temperature



Maximum Rated Safe Operating Area

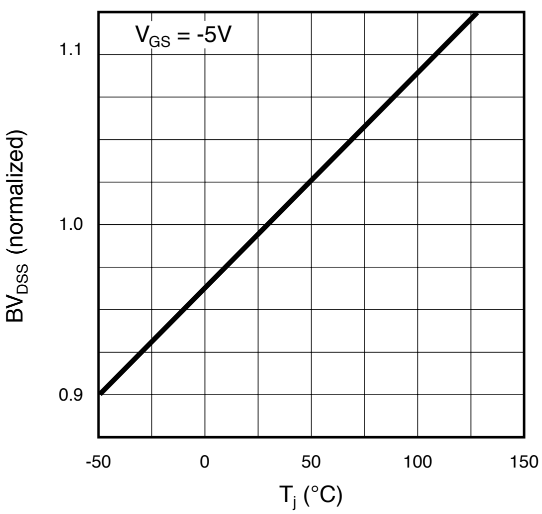


Thermal Response Characteristics

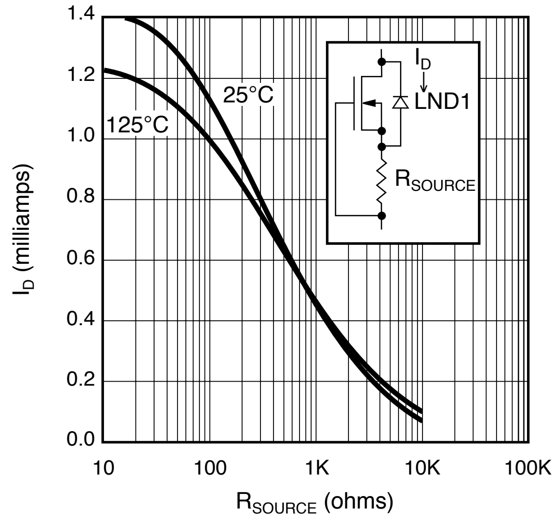


Typical Performance Curves

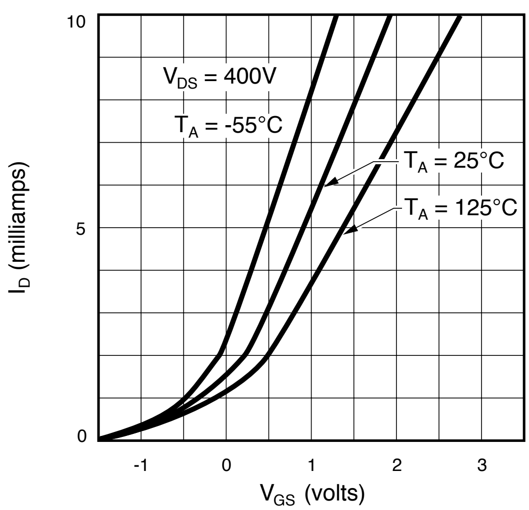
BV_{DSS} Variation with Temperature



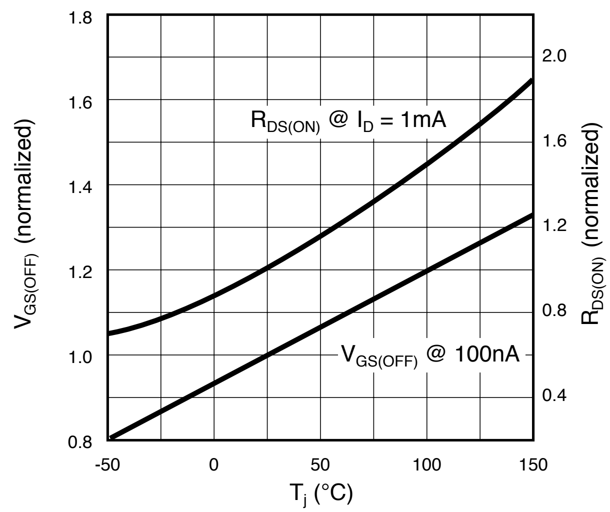
I_D vs. R_{SOURCE}



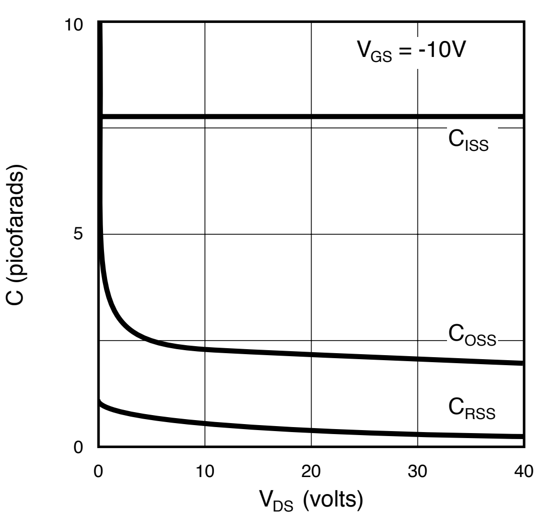
Transfer Characteristics



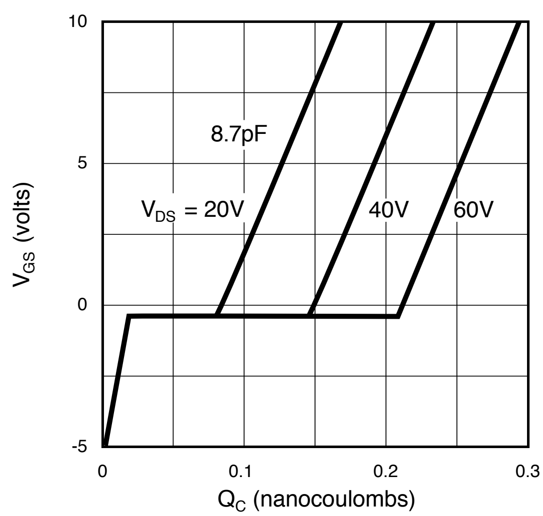
$V_{GS(OFF)}$ and R_{DS} Variation with Temperature



Capacitance vs. Drain-to-Source Voltage



Gate Drive Dynamic Characteristics



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