



P-Channel Enhancement-Mode Lateral MOSFET

Ordering Information

BV _{DSS} / BV _{DGS}	R _{DS(ON)} (max)	I _{D(ON)} (min)	V _{GS(th)} (max)	Order Number / Package		
				TO-92	SO-8	Die
-16.5V	1.5Ω	-1.25A	-1.0V	LP0701N3	LP0701LG	LP0701ND

Features

- Ultra low threshold
- High input impedance
- Low input capacitance
- Fast switching speeds
- Low on resistance
- Freedom from secondary breakdown
- Low input and output leakage
- Complementary N- and P-channel devices

Advanced MOS Technology

These enhancement-mode (normally-off) transistors utilize a lateral MOS 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 negative temperature coefficient inherent in MOS devices. Characteristic of all MOS structures, these devices are free from thermal runaway and thermally-induced secondary breakdown. The low threshold voltage and low on-resistance characteristics are ideally suited for hand held battery operated applications.

Applications

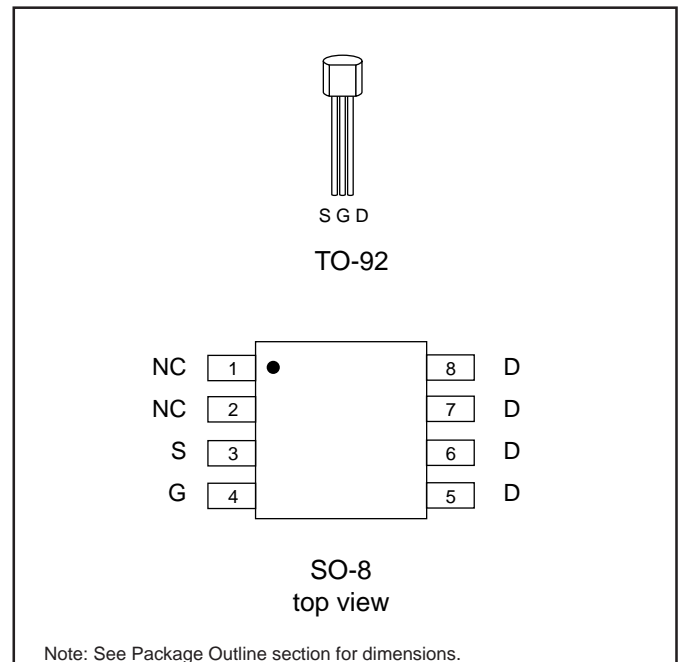
- Logic level interfaces
- Solid state relays
- Battery operated systems
- Photo voltaic drives
- Analog switches
- General purpose line drivers

Absolute Maximum Ratings

Drain-to-Source Voltage	BV _{DSS}
Drain-to-Gate Voltage	BV _{DGS}
Gate-to-Source Voltage	± 10V
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



Thermal Characteristics

Package	I_D (continuous)*	I_D (pulsed)*	Power Dissipation @ $T_c = 25^\circ\text{C}$	θ_{jc} $^\circ\text{C/W}$	θ_{ja} $^\circ\text{C/W}$	I_{DR}	I_{DRM}^*
TO-92	-0.5A	-1.25A	1W	125	170	-0.5A	-1.25A
SO-8	-0.7A	-1.25A	1.5W [†]	83	104 [†]	-0.7A	-1.25A

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

† Mounted on FR4 board, 25mm x 25mm x 1.57mm.

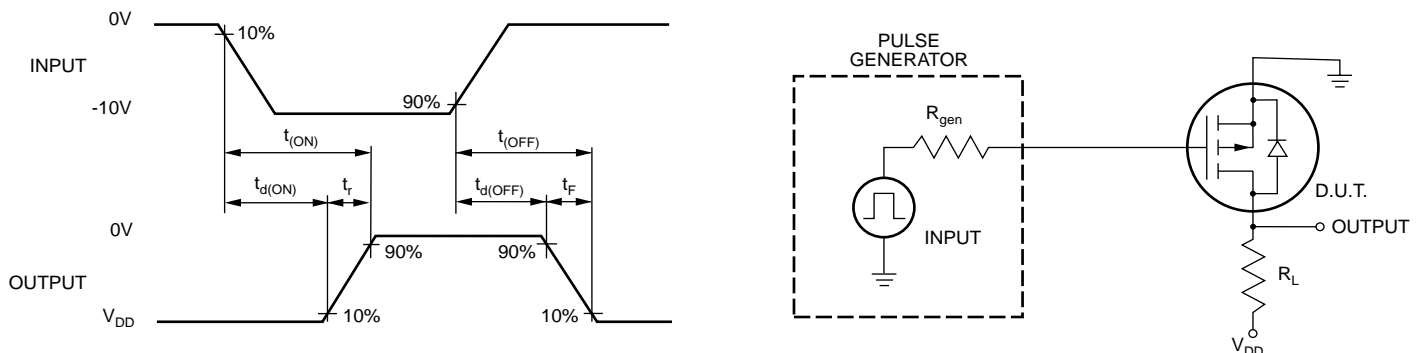
Electrical Characteristics (@ 25°C unless otherwise specified)

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	-16.5			V	$V_{GS} = 0V, I_D = -1mA$
$V_{GS(th)}$	Gate Threshold Voltage	-0.5	-0.7	-1.0	V	$V_{GS} = V_{DS}, I_D = -1mA$
$\Delta V_{GS(th)}$	Change in $V_{GS(th)}$ with Temperature			-4.0	mV/ $^\circ\text{C}$	$V_{GS} = V_{DS}, I_D = -1mA$
I_{GSS}	Gate Body Leakage			-100	nA	$V_{GS} = \pm 10V, V_{DS} = 0V$
I_{DSS}	Zero Gate Voltage Drain Current			-100	nA	$V_{DS} = -15V, V_{GS} = 0V$
				-1.0	mA	$V_{DS} = 0.8$ Max Rating, $V_{GS} = 0V, T_A = 125^\circ\text{C}$
$I_{D(ON)}$	ON-State Drain Current		-0.4		A	$V_{GS} = V_{DS} = -2V$
		-0.6	-1.0		A	$V_{GS} = V_{DS} = -3V$
		-1.25	-2.3		A	$V_{GS} = V_{DS} = -5V$
$R_{DS(ON)}$	Static Drain-to-Source ON-State Resistance		2.0	4.0	Ω	$V_{GS} = -2V, I_D = -50mA$
			1.7	2.0	Ω	$V_{GS} = -3V, I_D = -150mA$
			1.3	1.5	Ω	$V_{GS} = -5V, I_D = -300mA$
$\Delta R_{DS(ON)}$	Change in $R_{DS(ON)}$ with temperature			0.75	%/ $^\circ\text{C}$	$V_{GS} = -5V, I_D = -300mA$
G_{FS}	Forward Transconductance	500	700		m Ω	$V_{DS} = -15V, I_D = -1A$
C_{ISS}	Input Capacitance		120	250	pF	$V_{GS} = 0V, V_{DS} = -15V, f = 1MHz$
C_{OSS}	Common Source Output Capacitance		100	125		
C_{RSS}	Reverse Transfer Capacitance		40	60		
$t_{d(ON)}$	Turn-ON Delay Time			20	ns	$V_{DD} = -15V, I_D = -1.25A,$ $R_{GEN} = 25\Omega$
t_r	Rise Time			20		
$t_{d(OFF)}$	Turn-OFF Delay Time			30		
t_f	Fall Time			30		
V_{SD}	Diode Forward Voltage Drop		-1.2	-1.5	V	$V_{GS} = 0V, I_{SD} = -500mA$

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

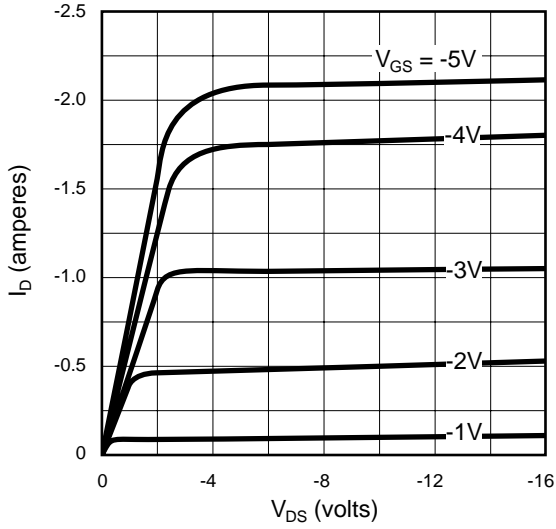
Note 2: All A.C. parameters sample tested.

Switching Waveforms and Test Circuit

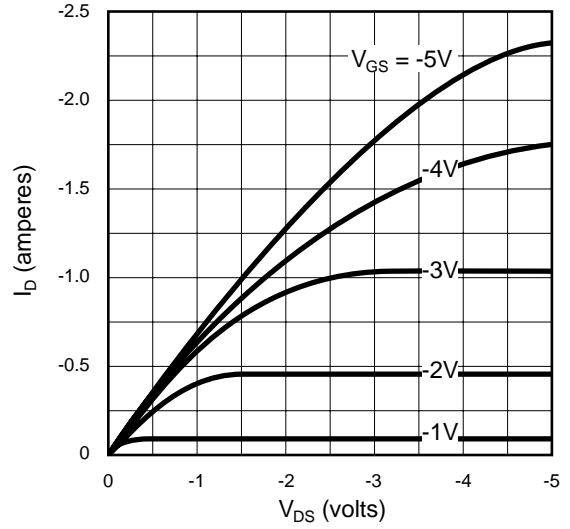


Typical Performance Curves

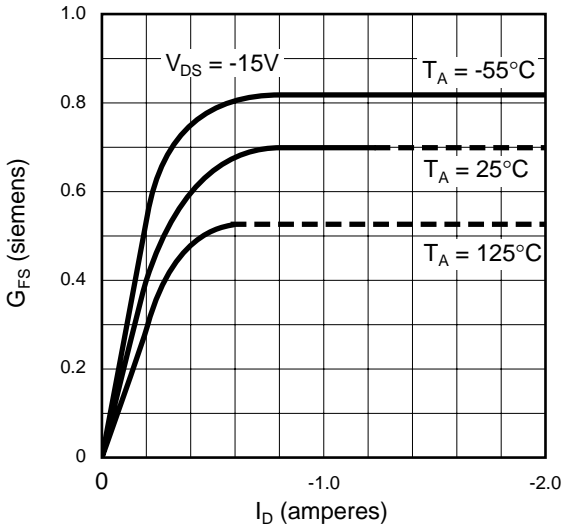
Output Characteristics



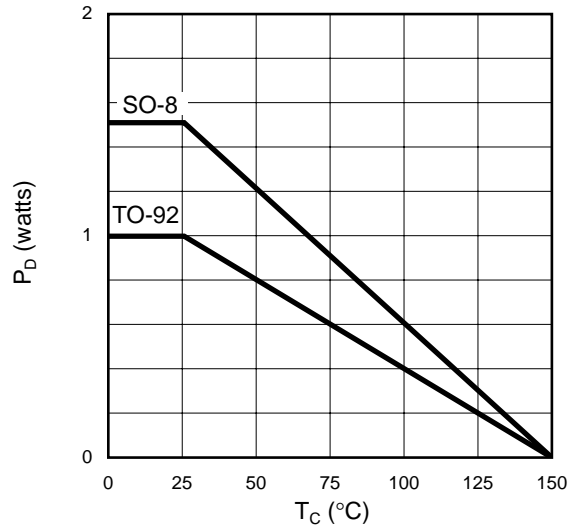
Saturation Characteristics



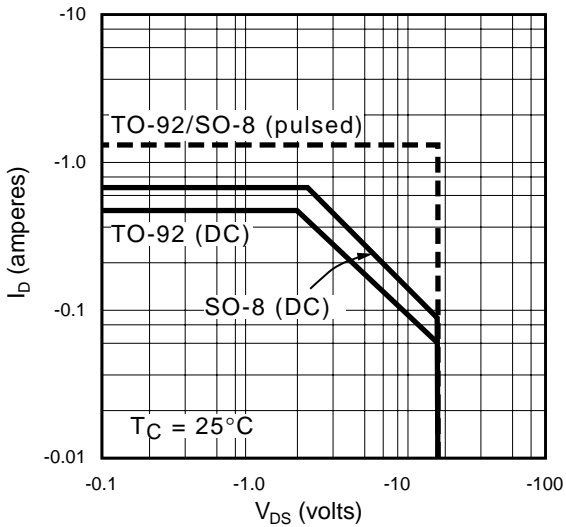
Transconductance vs. Drain Current



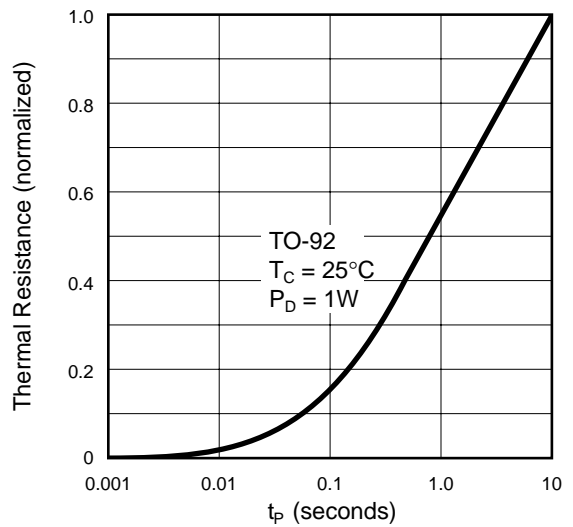
Power Dissipation vs. Case Temperature



Maximum Rated Safe Operating Area

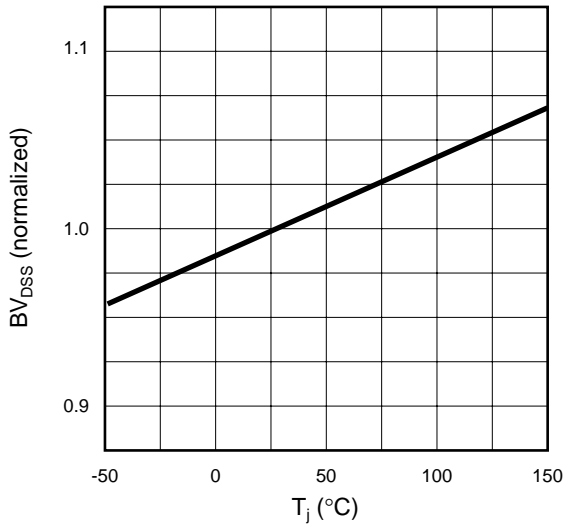


Thermal Response Characteristics

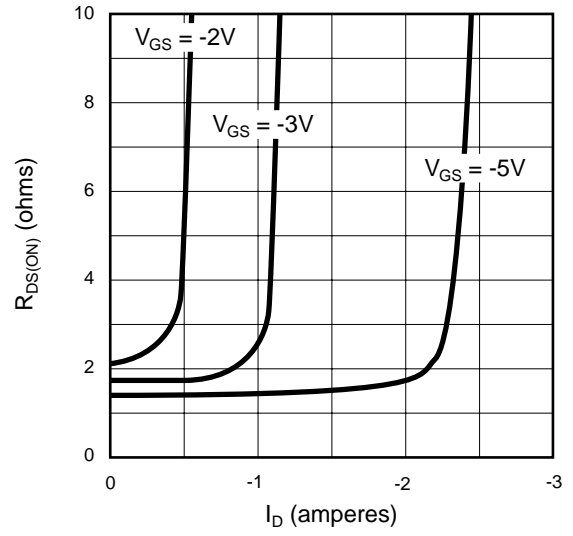


Typical Performance Curves

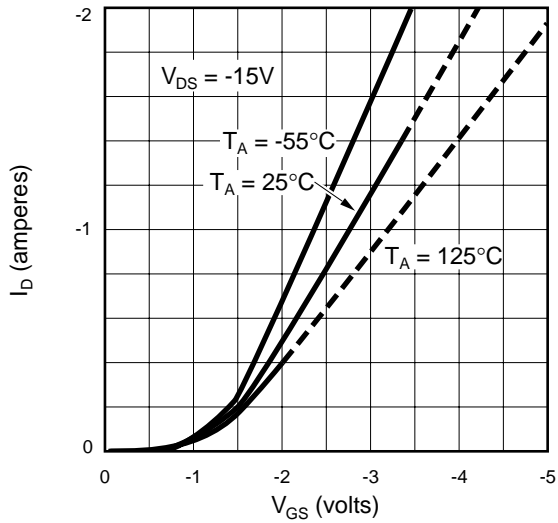
BV_{DSS} Variation with Temperature



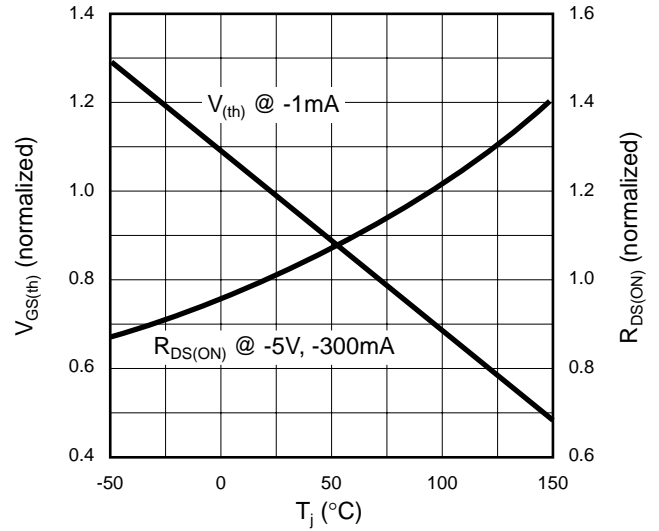
On-Resistance vs. Drain Current



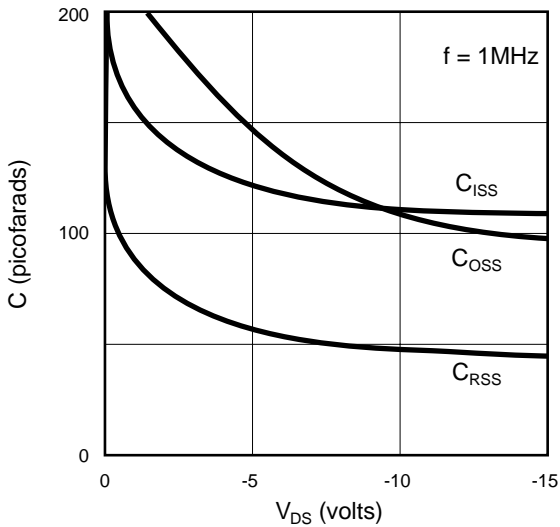
Transfer Characteristics



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



Capacitance vs. Drain-to-Source Voltage



Gate Drive Dynamic Characteristics

