

## L530NS-VB Datasheet N-Channel 100-V (D-S) MOSFET

PRODUCT SUMMARY							
V <sub>(BR)DSS</sub> (V)	R <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)					
100	0.100 at V <sub>GS</sub> = 10 V	20					

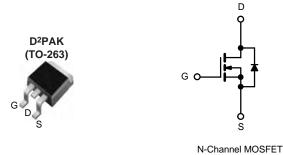
#### FEATURES

- Trench Power MOSFET
- 175 °C Junction Temperature
- Low Thermal Resistance Package
- 100 % R<sub>g</sub> Tested

#### **APPLICATIONS**

• Isolated DC/DC Converters





<b>ABSOLUTE MAXIMUM RATINGS</b>	T <sub>C</sub> = 25 °C, unless oth	erwise noted			
Parameter	Symbol	Limit	Unit		
Drain-Source Voltage	V <sub>DS</sub>	100	V		
Gate-Source Voltage	V <sub>GS</sub>	± 20	v		
Continuous Drain Current ( $T_1 = 175 \text{ °C}$ )	T <sub>C</sub> = 25 °C	1-	20		
Continuous Drain Current (1) = 175 C)	T <sub>C</sub> = 125 °C	- I <sub>D</sub> -	16	A	
Pulsed Drain Current		I <sub>DM</sub>	70		
Avalanche Current	L = 0.1 mH	I <sub>AS</sub>	20		
Single Pulse Avalanche Energy <sup>b</sup>	L = 0.1 mm	E <sub>AS</sub>	200	mJ	
Mariana Diasia di sh	T <sub>C</sub> = 25 °C	P	105		
Maximum Power Dissipation <sup>b</sup>	T <sub>A</sub> = 25 °C <sup>d</sup>	– P <sub>D</sub> –	3.75		
Operating Junction and Storage Temperature Ra	T <sub>J</sub> , T <sub>stg</sub>	- 55 to 175	°C		

THERMAL RESISTANCE RATINGS								
Parameter		Symbol	Limit	nit Unit				
Junction-to-Ambient	PCB Mount (TO-263) <sup>d</sup>	R <sub>thJA</sub>	40	°C/W				
Junction-to-Case (Drain)	R <sub>thJC</sub>	0.4	C/VV					

Notes:

- a. Package limited.
- b. Duty cycle  $\leq$  1 %.
- c. See SOA curve for voltage derating.

d. When Mounted on 1" square PCB (FR-4 material).

<b>SPECIFICATIONS</b> $T_J = 25^{\circ}$	1			1 _			
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static	1		-	1		-	
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	$V_{DS} = 0 V, I_{D} = 250 \mu A$	100			V	
Gate-Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	1		3	-	
Gate-Body Leakage	I <sub>GSS</sub>	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
		$V_{DS} = 100 \text{ V}, V_{GS} = 0 \text{ V}$			1		
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	$V_{DS}$ = 100 V, $V_{GS}$ = 0 V, $T_{J}$ = 125 °C			50	μA	
		$V_{DS}$ = 100 V, $V_{GS}$ = 0 V, $T_{J}$ = 175 °C		250			
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	$V_{DS} \ge 5$ V, $V_{GS}$ = 10 V	120			А	
		$V_{GS} = 10 \text{ V}, \text{ I}_{D} = 20 \text{ A}$		0.100		nA μA A Ω S PF nC Ω ns A V v	
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	$V_{GS}$ = 10 V, $I_{D}$ = 20 A, $T_{J}$ = 125 °C		0.110			
		$V_{GS}$ = 10 V, $I_{D}$ = 20 A, $T_{J}$ = 175 °C		0.120			
Forward Transconductance <sup>a</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 20 A	25			S	
Dynamic <sup>b</sup>							
Input Capacitance	C <sub>iss</sub>			950			
Output Capacitance	C <sub>oss</sub>	$V_{GS} = 0 V$ , $V_{DS} = 25 V$ , f = 1 MHz		280		pF	
Reverse Transfer Capacitance	C <sub>rss</sub>			110			
Total Gate Charge <sup>c</sup>	Qg						
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>	$V_{DS} = 100 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 65 \text{ A}$			4.8	nC	
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>				15		
Gate Resistance	Rg		0.5	1.7	3.3	Ω	
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>			8			
Rise Time <sup>c</sup>	t <sub>r</sub>	$V_{DD}$ = 100 V, R <sub>L</sub> = 1.5 $\Omega$		120			
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>	$\text{I}_\text{D} \cong$ 65 A, $\text{V}_\text{GEN}$ = 10 V, $\text{R}_\text{g}$ = 2.5 $\Omega$		25		ns	
Fall Time <sup>c</sup>	t <sub>f</sub>			50			
Source-Drain Diode Ratings and Cha	aracteristics 7	<sub>C</sub> = 25 °C <sup>b</sup>					
Continuous Current	ا <sub>S</sub>				65		
Pulsed Current	I <sub>SM</sub>				140	A	
Forward Voltage <sup>a</sup>	V <sub>SD</sub>	$I_{F} = 65 \text{ A}, \text{ V}_{GS} = 0 \text{ V}$		1.0	1.5	V	
Reverse Recovery Time	t <sub>rr</sub>			130	200	ns	
Peak Reverse Recovery Current	I <sub>RM(REC)</sub>	I <sub>F</sub> = 50 A, di/dt = 100 A/μs		8	12	А	
Reverse Recovery Charge	Q <sub>rr</sub>	0.52 1.2		1.2	uС		

Notes:

a. Pulse test; pulse width  $\leq$  300 µs, duty cycle  $\leq$  2 %.

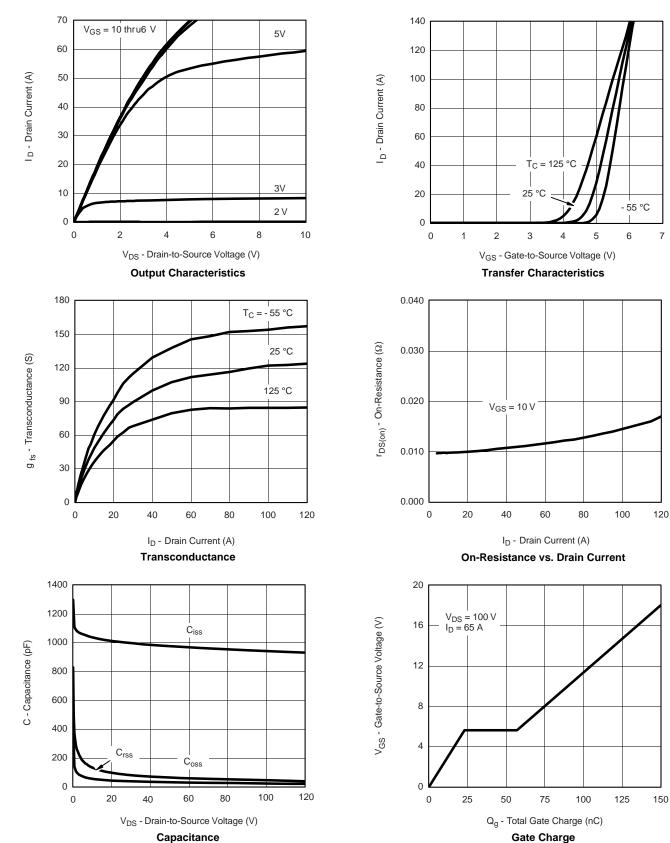
b. Guaranteed by design, not subject to production testing.

c. Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

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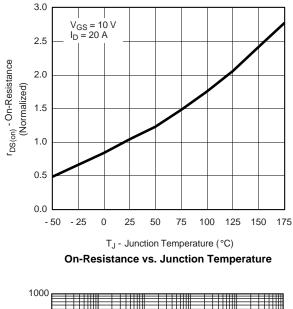


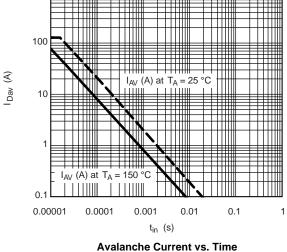


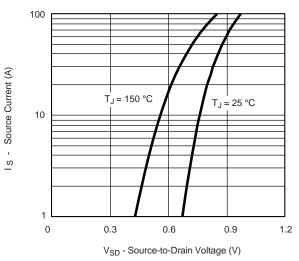
#### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



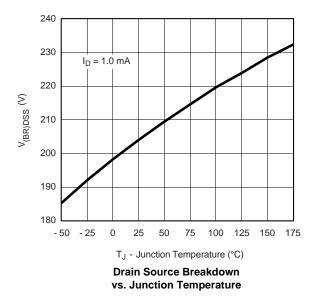
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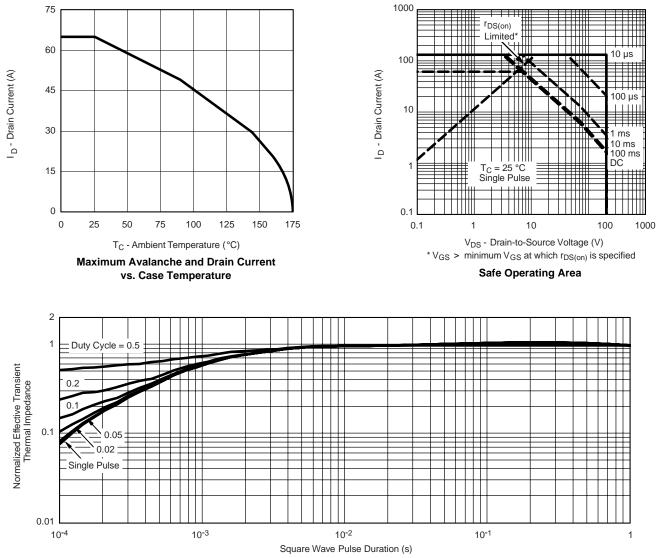


Source-Drain Diode Forward Voltage





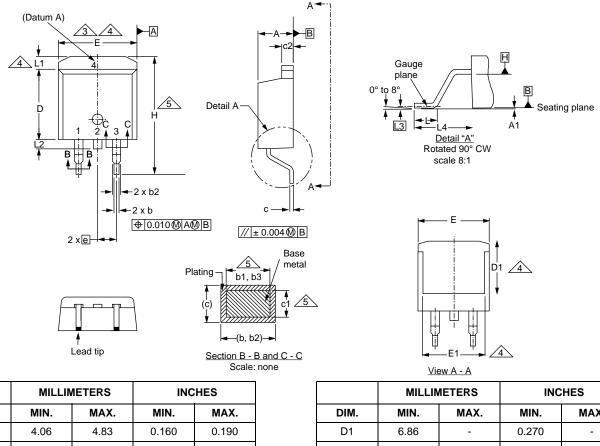
#### THERMAL RATINGS



Normalized Thermal Transient Impedance, Junction-to-Case



#### **TO-263AB (HIGH VOLTAGE)**



DIM.	MIN.	MAX.	MIN.	MAX.	DIM.	MIN.	MAX.	MIN.		
А	4.06	4.83	0.160	0.190	D1	D1	6.86	-	0.270	l
A1	0.00	0.25	0.000	0.010	E	E	9.65	10.67	0.380	
b	0.51	0.99	0.020	0.039	E1	E1	6.22	-	0.245	
b1	0.51	0.89	0.020	0.020 0.035		е	2.54 BSC		0.100	) E
b2	1.14	1.78	0.045	0.070	Н	Н	14.61	15.88	0.575	
b3	1.14	1.73	0.045	0.068	L	L	1.78	2.79	0.070	
с	0.38	0.74	0.015	0.029	L1	L1	-	1.65	-	
c1	0.38	0.58	0.015	0.023	L2	L2	-	1.78	-	
c2	1.14	1.65	0.045	0.065	L3	L3	0.25 BSC		0.010	) E
D	8.38	9.65	0.330	0.380	L4	L4	4.78	5.28	0.188	
ECN: S-82 DWG: 597	2110-Rev. A, 70	15-Sep-08		·						
otes										

1. Dimensioning and tolerancing per ASME Y14.5M-1994.

2. Dimensions are shown in millimeters (inches).

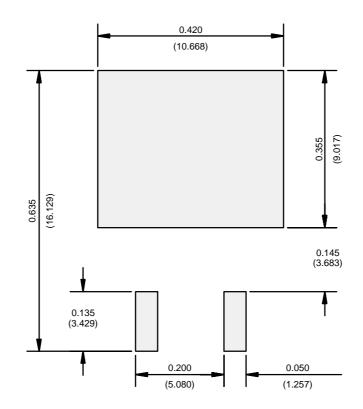
3. Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body at datum A.

4. Thermal PAD contour optional within dimension E, L1, D1 and E1.

- 5. Dimension b1 and c1 apply to base metal only.
- 6. Datum A and B to be determined at datum plane H.

7. Outline conforms to JEDEC outline to TO-263AB.





### **RECOMMENDED MINIMUM PADS FOR D<sup>2</sup>PAK: 3-Lead**

Recommended Minimum Pads Dimensions in Inches/(mm)



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