

NDP610B-VB Datasheet N-Channel 100-V (D-S) MOSFET

PRODUCT SUMMARY				
V _{(BR)DSS} (V)	R _{DS(on)} (Ω)	I _D (A)		
100	0.127at V _{GS} = 10 V	18		

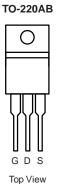
FEATURES

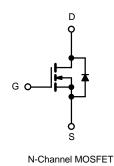
- Trench Power MOSFET
- 175 °C Junction Temperature
- Low Thermal Resistance Package
- 100 % R_g Tested

APPLICATIONS

• Isolated DC/DC Converters







Parameter		Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	100	V	
Gate-Source Voltage		V _{GS}	± 20	- V
Continuous Drain Current (T _J = 175 °C)	T _C = 25 °C	1-	18	
	T _C = 125 °C	I _D	15	А
Pulsed Drain Current		I _{DM}	68	A
Avalanche Current	L = 0.1 mH	I _{AS}	18	
Single Pulse Avalanche Energy ^b	L = 0.1 1111	E _{AS}	200	mJ
	T _C = 25 °C	Р	105	14/
Maximum Power Dissipation ^b	T _A = 25 °C ^d	– P _D –	3.75	W
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Limit	Unit	
Junction-to-Ambient	PCB Mount (TO-263) ^d	R _{thJA}	40	°C/W	
Junction-to-Case (Drain)		R _{thJC}	0.4	0/11	

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).

SPECIFICATIONS $T_J = 25^{\circ}$			Min	T	Mess	11	
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static			400			[
Drain-Source Breakdown Voltage	V _{(BR)DSS}	$V_{DS} = 0 V, I_D = 250 \mu A$	100			V	
Gate-Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	2		4		
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
Zero Gate Voltage Drain Current		$V_{DS} = 100 \text{ V}, V_{GS} = 0 \text{ V}$			1	μA	
	I _{DSS}	V_{DS} = 100 V, V_{GS} = 0 V, T_{J} = 125 °C			50		
		V_{DS} = 100 V, V_{GS} = 0 V, T_{J} = 175 °C			250		
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5$ V, V_{GS} = 10 V	120			А	
		$V_{GS} = 10 \text{ V}, \text{ I}_{D} = 20 \text{ A}$		0.127			
Drain-Source On-State Resistance ^a	r _{DS(on)}	$V_{GS} = 10 \text{ V}, \text{ I}_{D} = 20 \text{ A}, \text{ T}_{J} = 125 \text{ °C}$		0.130		Ω	
		V_{GS} = 10 V, I_{D} = 20 A, T_{J} = 175 °C		0.170			
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 20 A	25			S	
Dynamic ^b	•						
Input Capacitance	C _{iss}			1300		pF	
Output Capacitance	C _{oss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		260			
Reverse Transfer Capacitance	C _{rss}			110			
Total Gate Charge ^c	Qg				28	nC	
Gate-Source Charge ^c	Q _{gs}	$V_{DS} = 100 \text{ V}, V_{GS} = 10 \text{ V}, I_{D} = 65 \text{ A}$			4.8		
Gate-Drain Charge ^c	Q _{gd}				15		
Gate Resistance	R _q		0.5	1.7	3.3	Ω	
Turn-On Delay Time ^c	t _{d(on)}			8			
Rise Time ^c	t _r	V_{DD} = 100 V, R _L = 1.5 Ω I _D ≅ 65 A, V _{GEN} = 10 V, R _g = 2.5 Ω		120		ns	
Turn-Off Delay Time ^c	t _{d(off)}			25			
Fall Time ^c	t _f			50			
Source-Drain Diode Ratings and Cha	aracteristics 7	Γ _C = 25 °C ^b		<u>.</u>			
Continuous Current	I _S			18		Ι.	
Pulsed Current	I _{SM}			68		— A	
Forward Voltage ^a	V _{SD}	I _F = 65 A, V _{GS} = 0 V		1.0	1.5	V	
Reverse Recovery Time	t _{rr}			130	200	ns	
Peak Reverse Recovery Current	I _{RM(REC)}	I _F = 50 A, di/dt = 100 A/μs		8	12	А	
Reverse Recovery Charge	Q _{rr}			0.52	1.2	uС	

Notes:

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

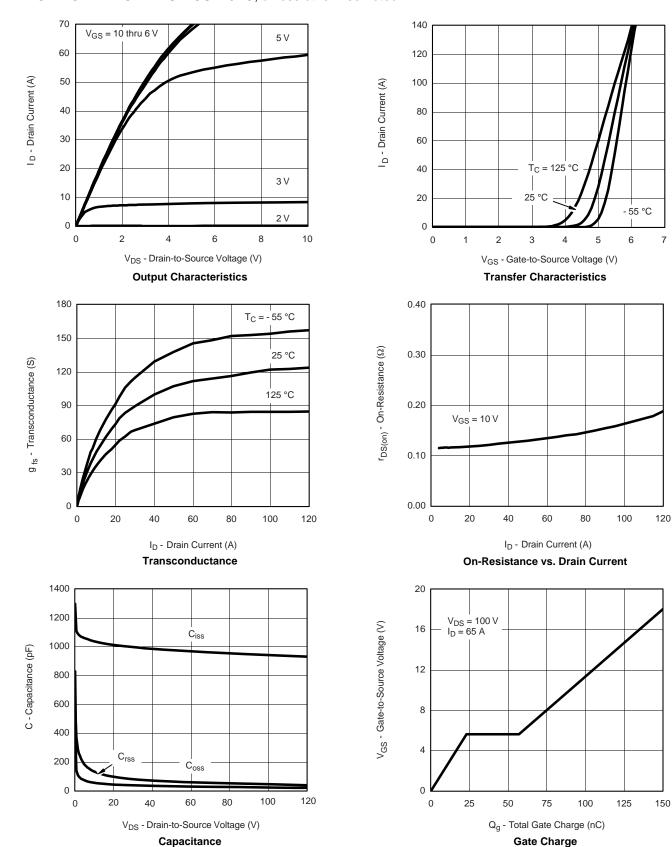
b. Guaranteed by design, not subject to production testing.

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.

Bsemi





TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

10

1

0.1

0.00001

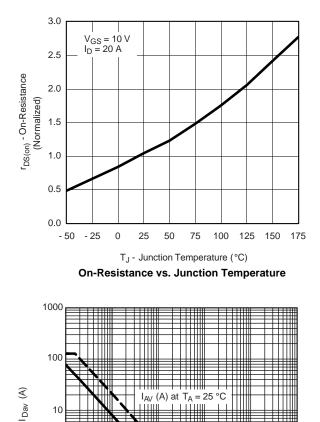
 I_{AV} (A) at $T_A = 150$ °C

0.0001

0.001



TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

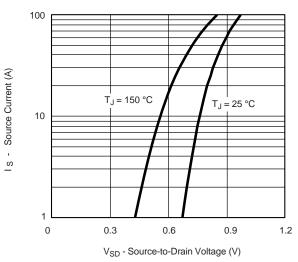




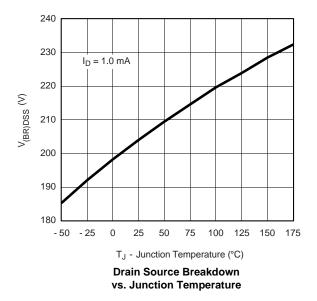
0.01

0.1

1



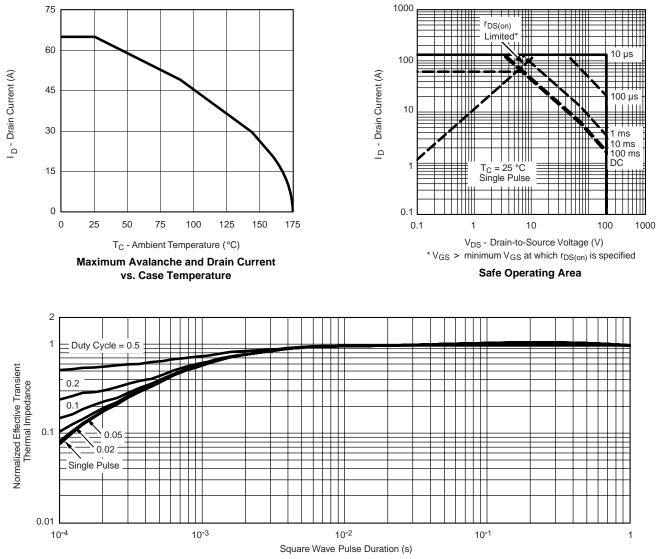
Source-Drain Diode Forward Voltage



NDP610B-VB



THERMAL RATINGS



Normalized Thermal Transient Impedance, Junction-to-Case



TO-220AB



MIN. 4.25 0.69 1.20 0.36 14.85	MAX. 4.65 1.01 1.73 0.61	MIN. 0.167 0.027 0.047	MAX. 0.183 0.040 0.068
0.69 1.20 0.36	1.01 1.73	0.027 0.047	0.040
1.20 0.36	1.73	0.047	
0.36			0.068
	0.61		
14 85		0.014	0.024
17.00	15.49	0.585	0.610
10.04	10.51	0.395	0.414
2.41	2.67	0.095	0.105
4.88	5.28	0.192	0.208
1.14	1.40	0.045	0.055
6.09	6.48	0.240	0.255
2.41	2.92	0.095	0.115
13.35	14.02	0.526	0.552
3.32	3.82	0.131	0.150
3.54	3.94	0.139	0.155
2.60	3.00	0.102	0.118
	4.88 1.14 6.09 2.41 13.35 3.32 3.54 2.60	4.88 5.28 1.14 1.40 6.09 6.48 2.41 2.92 13.35 14.02 3.32 3.82 3.54 3.94	2.41 2.67 0.095 4.88 5.28 0.192 1.14 1.40 0.045 6.09 6.48 0.240 2.41 2.92 0.095 13.35 14.02 0.526 3.32 3.82 0.131 3.54 3.94 0.139 2.60 3.00 0.102

Notes

* M = 1.32 mm to 1.62 mm (dimension including protrusion) Heatsink hole for HVM



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