

# MOSFET – N-Channel, POWERTRENCH®

100 V, 300 A, 2.0 mΩ

## FDBL0200N100

### Features

- Typical  $R_{DS(on)}$  = 1.5 mΩ at  $V_{GS}$  = 10 V,  $I_D$  = 80 A
- Typical  $Q_{g(tot)}$  = 95 nC at  $V_{GS}$  = 10 V,  $I_D$  = 80 A
- UIS Capability
- This Device is Pb-Free and is RoHS Compliant

### Applications

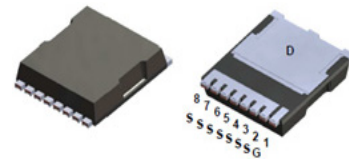
- Industrial Motor Drive
- Industrial Power Supply
- Industrial Automation
- Battery Operated Tools
- Battery Protection
- Solar Inverters
- UPS and Energy Inverters
- Energy Storage
- Load Switch



ON Semiconductor®

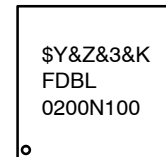
[www.onsemi.com](http://www.onsemi.com)

$V_{DSS}$	$R_{DS(on)}$ MAX	$I_D$ MAX
100 V	2.0 mΩ @ 10 V	300 A



H-PSOF8L 11.68x9.80  
CASE 100CU

### MARKING DIAGRAM



\$Y = ON Semiconductor Logo  
&Z = Assembly Plant Code  
&3 = 3-Digit Plant Code  
&K = 2-Digits Lot Run Traceability Code  
FDBL0200N100 = Specific Device Code

### ORDERING INFORMATION

See detailed ordering and shipping information on page 7 of this data sheet.

# FDBL0200N100

## MOSFET MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Rating	Value	Unit
$V_{DS}$	Drain-to-Source Voltage	100	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$I_D$	Drain Current – Continuous ( $V_{GS} = 10$ ) (Note 1)	$T_C = 25^\circ\text{C}$	300
	Pulsed Drain Current	$T_C = 25^\circ\text{C}$	See Figure 4
$E_{AS}$	Single Pulse Avalanche Energy (Note 2)	352	mJ
$P_D$	Power Dissipation	429	W
	Derate Above $25^\circ\text{C}$	2.9	W/ $^\circ\text{C}$
$T_J, T_{STG}$	Operating and Storage Temperature	$-55$ to $+175$	$^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case (Note 3)	0.35	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 3a)	43	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 3b)	62.5	$^\circ\text{C}/\text{W}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Current is limited by silicon.
2. Starting  $T_J = 25^\circ\text{C}$ ,  $L = 0.1$  mH,  $I_{AS} = 84$  A,  $V_{DD} = 100$  V during inductor charging and  $V_{DD} = 0$  V during time in avalanche.
3.  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins.  $R_{\theta JC}$  is guaranteed by design, while  $R_{\theta JA}$  is determined by the board design.
  - a.  $43^\circ\text{C}/\text{W}$  when mounted on a  $1$  in<sup>2</sup> pad of 2 oz copper
  - b.  $62.5^\circ\text{C}/\text{W}$  when mounted on a minimum pad of 2 oz copper

# FDBL0200N100

## ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

B <sub>V</sub> DSS	Drain-to-Source Breakdown Voltage	I <sub>D</sub> = 250 μA, V <sub>GS</sub> = 0 V	100	-	-	V	
I <sub>DSS</sub>	Drain-to-Source Leakage Current	V <sub>DS</sub> = 100 V, V <sub>GS</sub> = 0 V	T <sub>J</sub> = 25°C	-	-	5	μA
			T <sub>J</sub> = 175°C (Note 4)	-	-	2	mA
I <sub>GSS</sub>	Gate-to-Source Leakage Current	V <sub>GS</sub> = ±20V	-	-	±100	nA	

### ON CHARACTERISTICS

V <sub>GS(th)</sub>	Gate to Source Threshold Voltage	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250μA	2.0	3.1	4.5	V	
R <sub>DS(on)</sub>	Drain to Source On Resistance	I <sub>D</sub> = 80A, V <sub>GS</sub> = 10V	T <sub>J</sub> = 25°C	-	1.5	2.0	mΩ
			T <sub>J</sub> = 175°C (Note 4)	-	3.3	4.3	mΩ

### DYNAMIC CHARACTERISTICS

C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 0 V, f = 1 MHz	-	6970	9760	pF
C <sub>oss</sub>	Output Capacitance		-	3950	5530	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	29	41	pF
R <sub>g</sub>	Gate Resistance	f = 1 MHz	-	0.45	1	Ω
Q <sub>g(ToT)</sub>	Total Gate Charge at 10 V	V <sub>GS</sub> = 0 to 10 V, V <sub>DD</sub> = 80 V, I <sub>D</sub> = 80 A	-	95	133	nC
Q <sub>g(th)</sub>	Threshold Gate Charge	V <sub>GS</sub> = 0 to 2 V, V <sub>DD</sub> = 80 V, I <sub>D</sub> = 80 A	-	13	-	nC
Q <sub>gs</sub>	Gate-to-Source Gate Charge	V <sub>DD</sub> = 80 V, I <sub>D</sub> = 80 A	-	31	-	nC
Q <sub>gd</sub>	Gate-to-Drain "Miller" Charge		-	20	-	nC

### SWITCHING CHARACTERISTICS

t <sub>on</sub>	Turn-On Time	V <sub>DD</sub> = 50 V, I <sub>D</sub> = 80 A, V <sub>GS</sub> = 10 V, R <sub>GEN</sub> = 6 Ω	-	-	73	ns
t <sub>d(on)</sub>	Turn-On Delay		-	31	50	ns
t <sub>r</sub>	Rise Time		-	25	40	ns
t <sub>d(off)</sub>	Turn-Off Delay		-	36	58	ns
t <sub>f</sub>	Fall Time		-	9	18	ns
t <sub>off</sub>	Turn-Off Time		-	-	59	ns

### DRAIN-SOURCE DIODE CHARACTERISTICS

V <sub>SD</sub>	Source-to-Drain Diode Voltage	I <sub>SD</sub> = 80 A, V <sub>GS</sub> = 0 V	-	-	1.25	V
		I <sub>SD</sub> = 40 A, V <sub>GS</sub> = 0 V	-	-	1.2	V
t <sub>rr</sub>	Reverse-Recovery Time	I <sub>F</sub> = 80 A, dI <sub>SD</sub> /dt = 100 A/μs, V <sub>DD</sub> = 80 V	-	115	184	ns
Q <sub>rr</sub>	Reverse-Recovery Charge		-	172	273	nC

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

TYPICAL CHARACTERISTICS

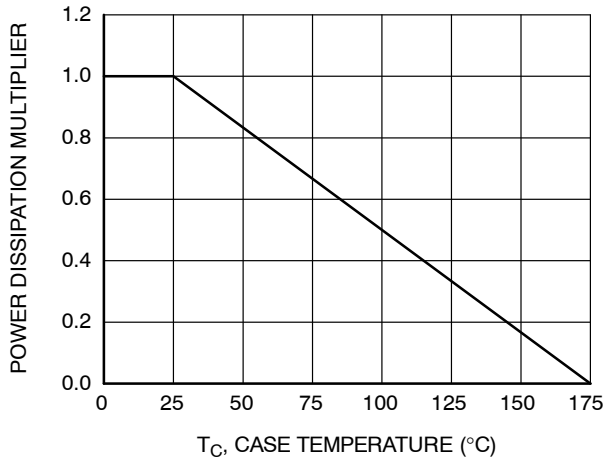


Figure 1. Normalized Power Dissipation vs. Case Temperature

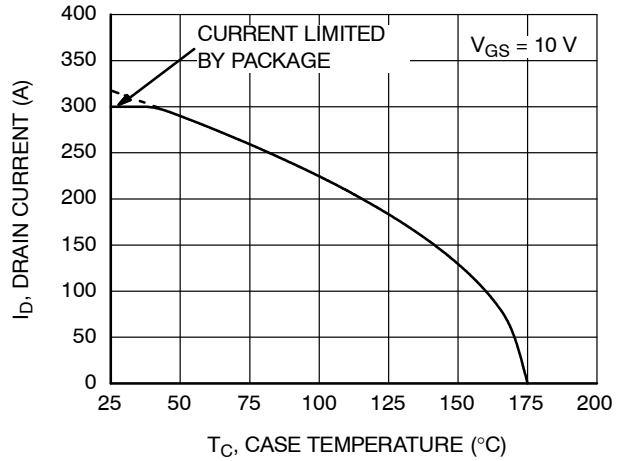


Figure 2. Maximum Drain Current vs. Case Temperature

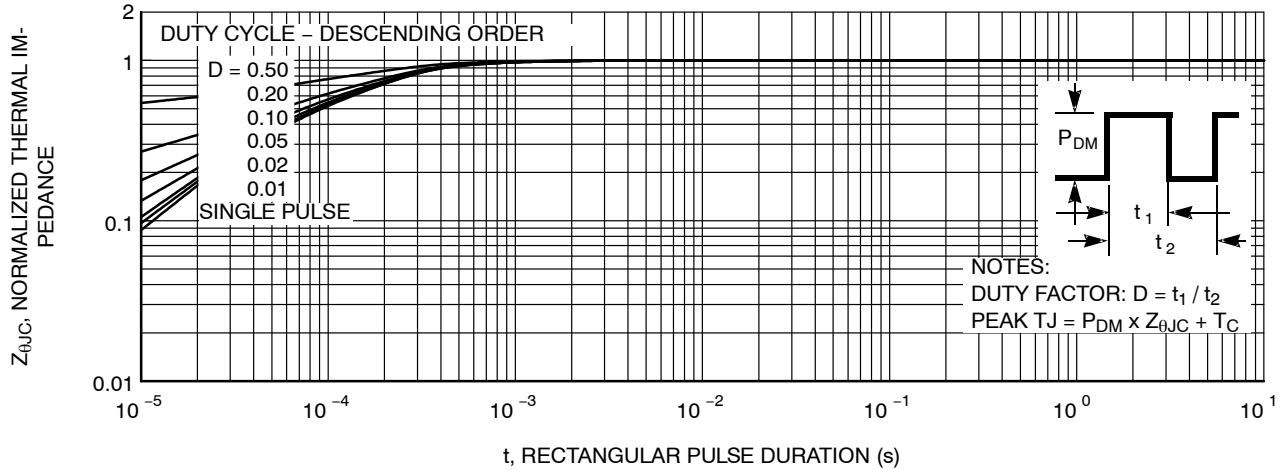


Figure 3. Normalized Maximum Transient Thermal Impedance

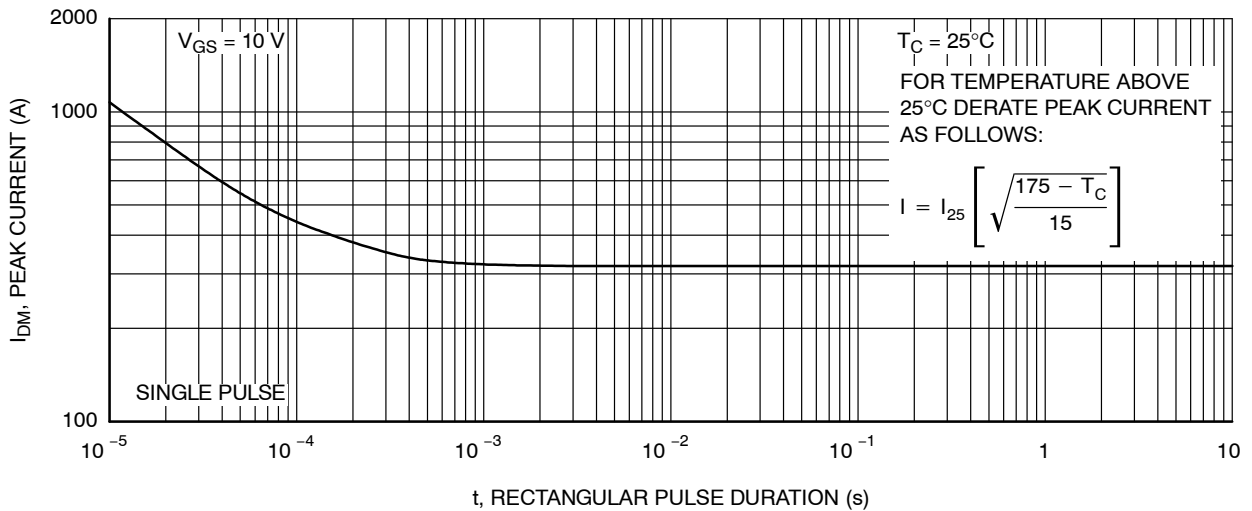


Figure 4. Peak Current Capability

TYPICAL CHARACTERISTICS (continued)

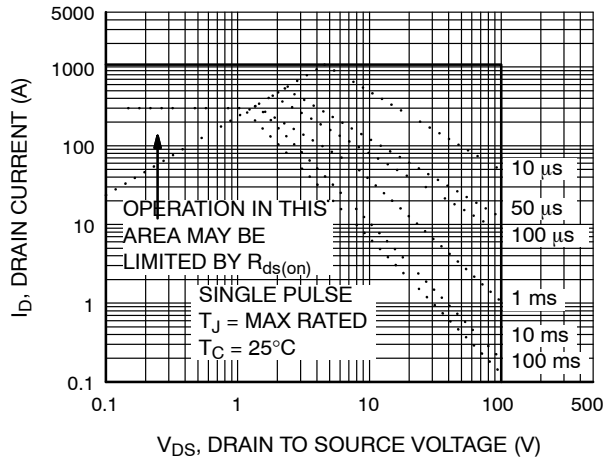
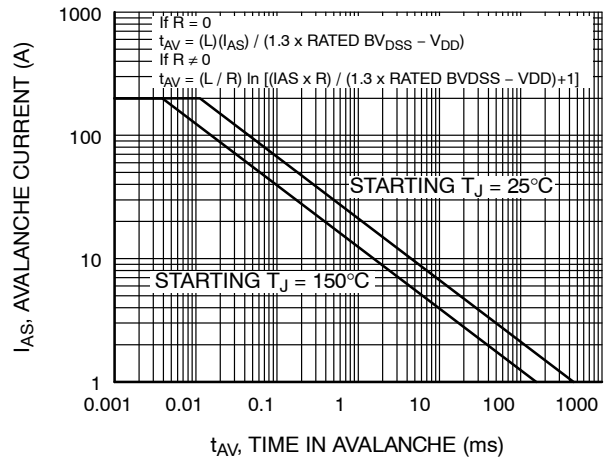


Figure 5. Forward Bias Safe Operating Area



NOTE: Refer to ON Semiconductor Application Notes [AN-7514](#) and [AN-7515](#)

Figure 6. Unclamped Inductive Switching Capability

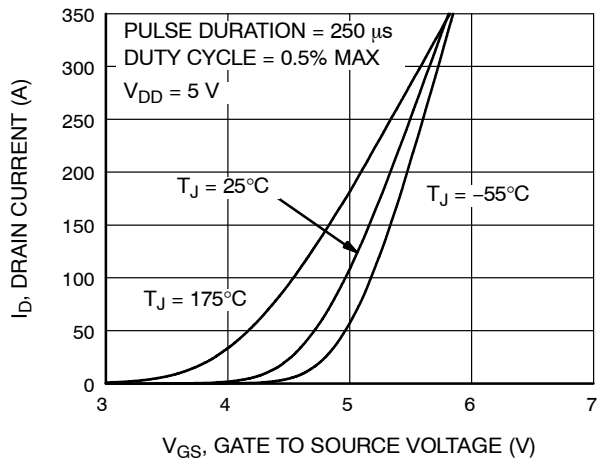


Figure 7. Transfer Characteristics

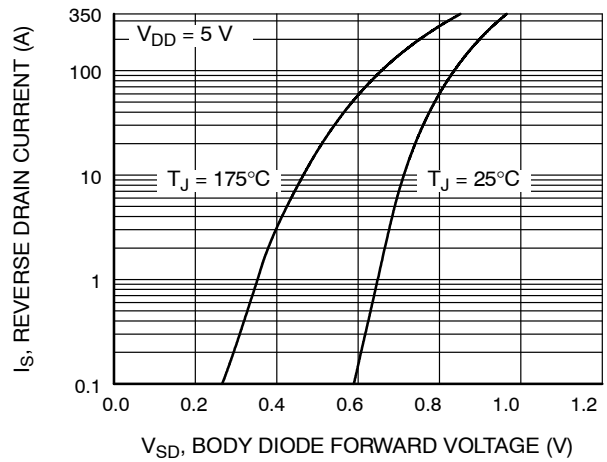


Figure 8. Forward Diode Characteristics

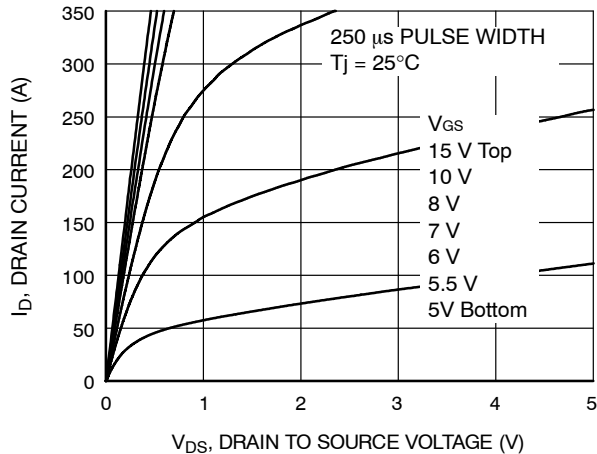


Figure 9. Saturation Characteristics

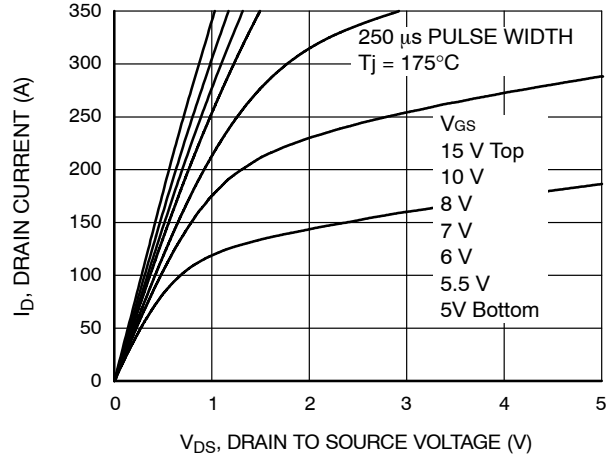


Figure 10. Saturation Characteristics

TYPICAL CHARACTERISTICS (continued)

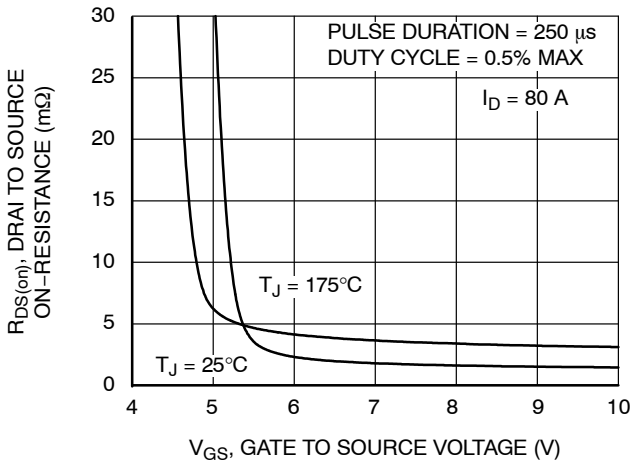


Figure 11.  $R_{DS(on)}$  vs. Gate Voltage

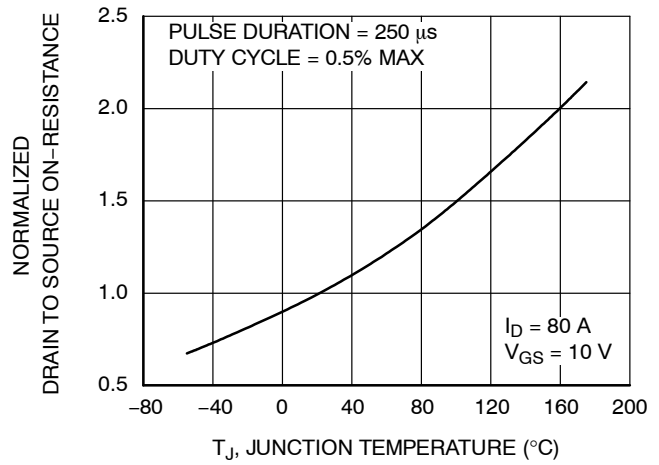


Figure 12. Normalized  $R_{DS(on)}$  vs. Junction Temperature

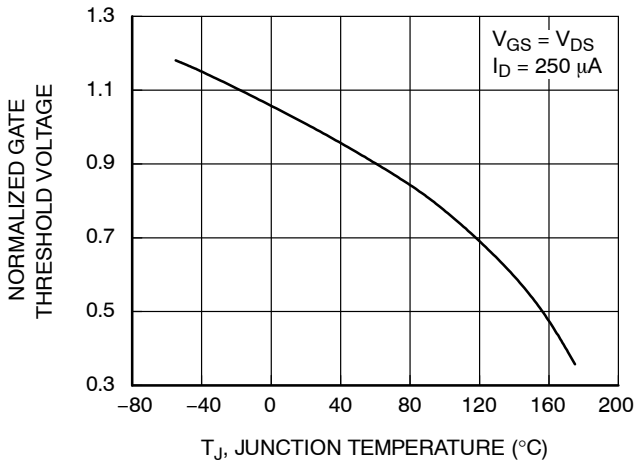


Figure 13. Normalized Gate Threshold Voltage vs. Temperature

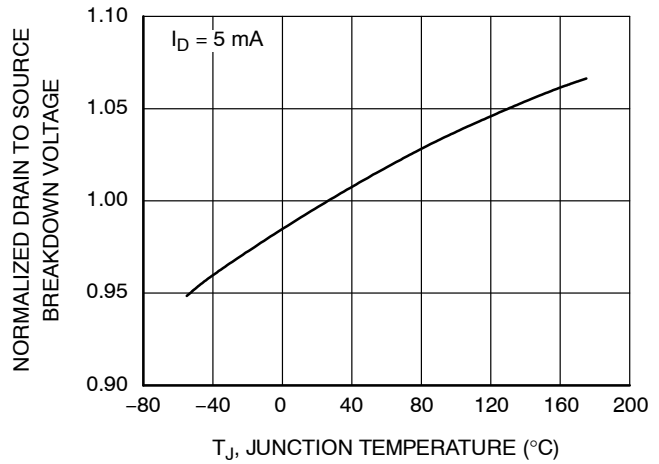


Figure 14. Normalized Drain to Source Breakdown Voltage vs. Junction Temperature

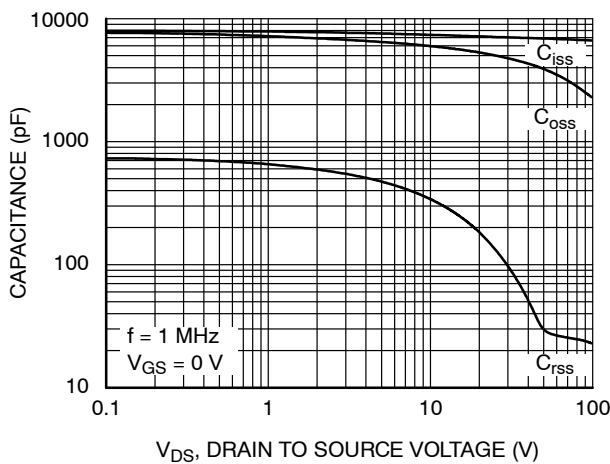


Figure 15. Capacitance vs. Drain to Source Voltage

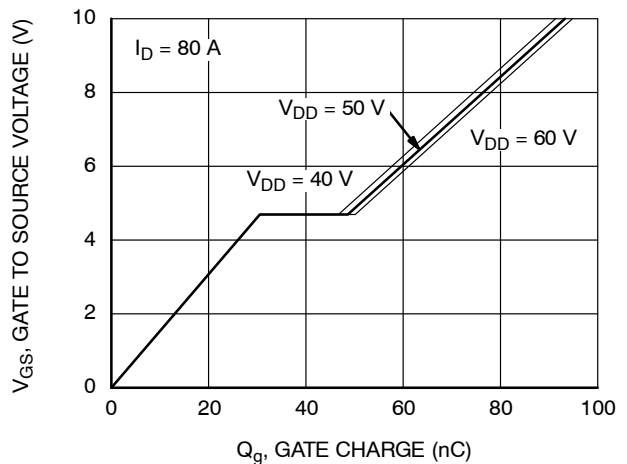


Figure 16. Gate Charge vs. Gate to Source Voltage

# FDBL0200N100

## ORDERING INFORMATION

Device	Device Marking	Package Type	Reel Size	Tape Width	Shipping <sup>†</sup>
FDBL0200N100	FDBL0200N100	H-PSOF8L 11.68x9.80 (Pb-Free)	13"	24 mm	2000 / Tape & Reel

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

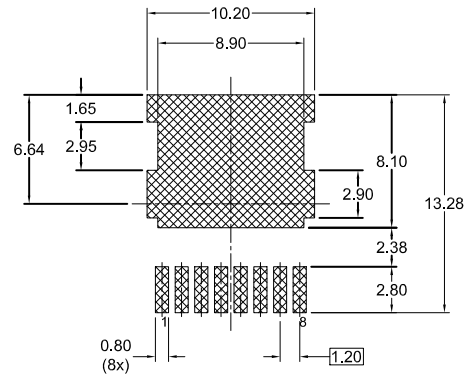
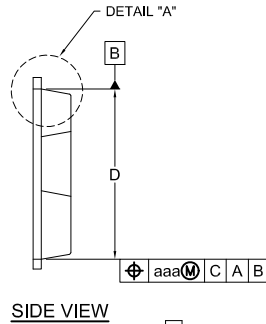
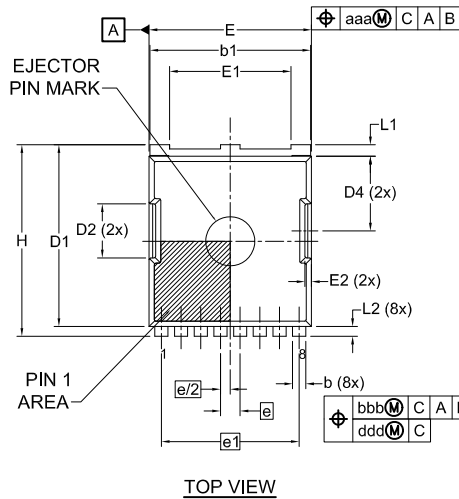
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# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



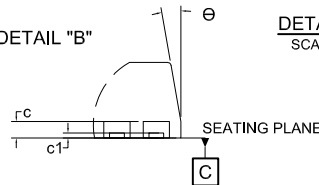
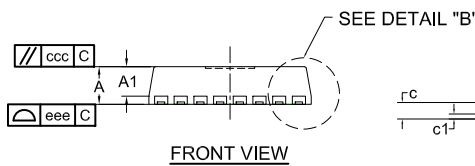
**H-PSOF8L 11.68x9.80**  
CASE 100CU  
ISSUE C

DATE 22 MAY 2023



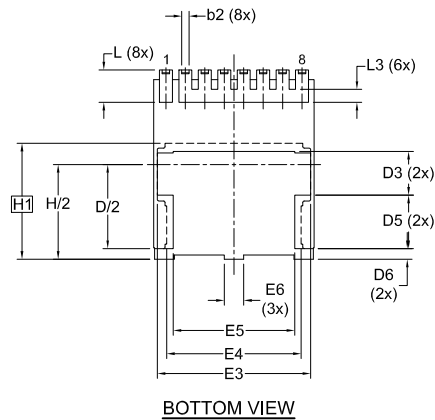
### LAND PATTERN RECOMMENDATION

\*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

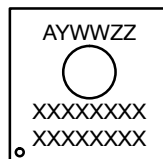


#### NOTES:

1. PACKAGE STANDARD REFERENCE: JEDEC MO-299, ISSUE A.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
3. CONTROLLING DIMENSION: MILLIMETERS.
4. COPLANARITY APPLIES TO THE EXPOSED WELL AS THE TERMINALS.
5. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
6. SEATING PLANE IS DEFINED BY THE TERMINALS. "A1" IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.



### GENERIC MARKING DIAGRAM\*



A = Assembly Location  
Y = Year  
WW = Work Week  
ZZ = Assembly Lot Code  
XXXX = Specific Device Code

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	2.20	2.30	2.40
A1	1.70	1.80	1.90
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
b2	0.35	0.45	0.55
c	0.40	0.50	0.60
c1	0.10	—	—
D	10.28	10.38	10.48
D/2	5.09	5.19	5.29
D1	10.98	11.08	11.18
D2	3.20	3.30	3.40
D3	2.60	2.70	2.80
D4	4.45	4.55	4.65
D5	3.20	3.30	3.40
D6	0.55	0.65	0.75
E	9.80	9.90	10.00
E1	7.30	7.40	7.50
E2	0.30	0.40	0.50
E3	9.36	9.46	9.56

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
E4	8.20	8.30	8.40
E5	7.40	7.50	7.60
E6	1.10	1.20	1.30
e	1.20 BSC		
e/2	0.60 BSC		
e1	8.40 BSC		
H	11.58	11.68	11.78
H/2	5.74	5.84	5.94
H1	7.15 BSC		
L	1.90	2.00	2.10
L1	0.60	0.70	0.80
L2	0.50	0.60	0.70
L3	0.70	0.80	0.90
theta	0°	—	12°
aaa	0.20		
bbb	0.25		
ccc	0.20		
ddd	0.20		
eee	0.10		

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "a", may or may not be present. Some products may not follow the Generic Marking.

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<b>DESCRIPTION:</b>	<b>H-PSOF8L 11.68x9.80</b>	<b>PAGE 1 OF 1</b>

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