

# 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

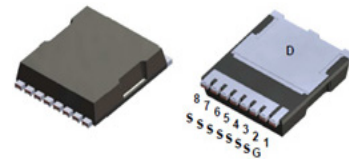
- Industrial Motor Drive
- Industrial Power Supply
- Industrial Automation
- Battery Operated Tools
- Battery Protection
- Solar Inverters
- UPS and Energy Inverters
- Energy Storage
- Load Switch



ON Semiconductor®

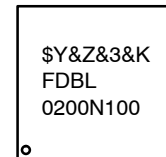
[www.onsemi.com](http://www.onsemi.com)

$V_{DSS}$	$R_{DS(on)}$ 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.

- Current is limited by silicon.
- 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.
- $R_{\theta JA}$  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.
  - $43^\circ\text{C}/\text{W}$  when mounted on a  $1$  in<sup>2</sup> pad of 2 oz copper
  - $62.5^\circ\text{C}/\text{W}$  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

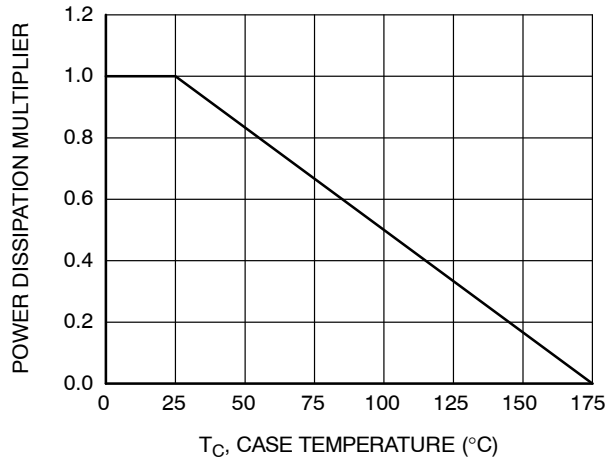


Figure 1. Normalized Power Dissipation vs. Case Temperature

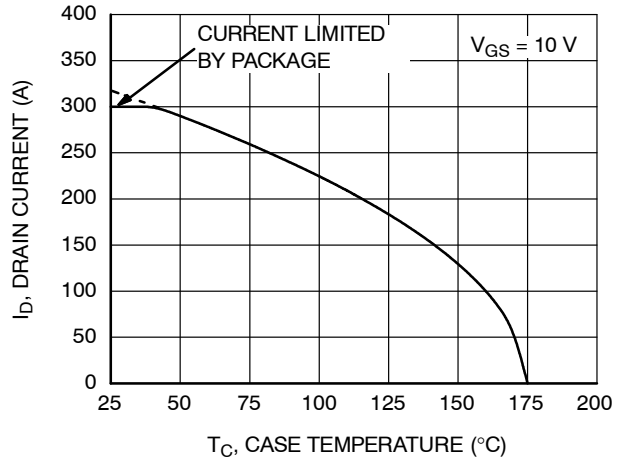


Figure 2. Maximum Drain Current vs. Case Temperature

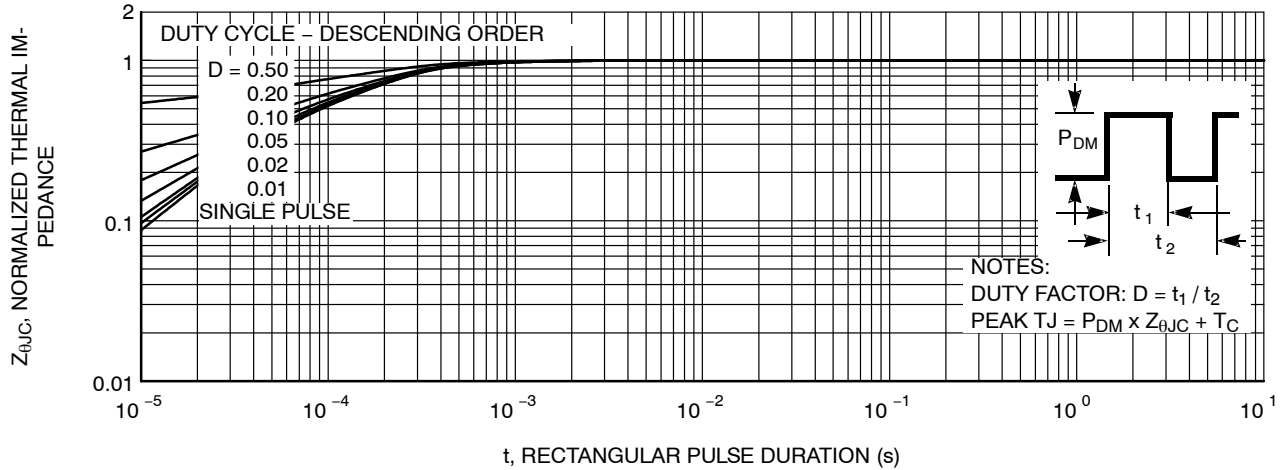


Figure 3. Normalized Maximum Transient Thermal Impedance

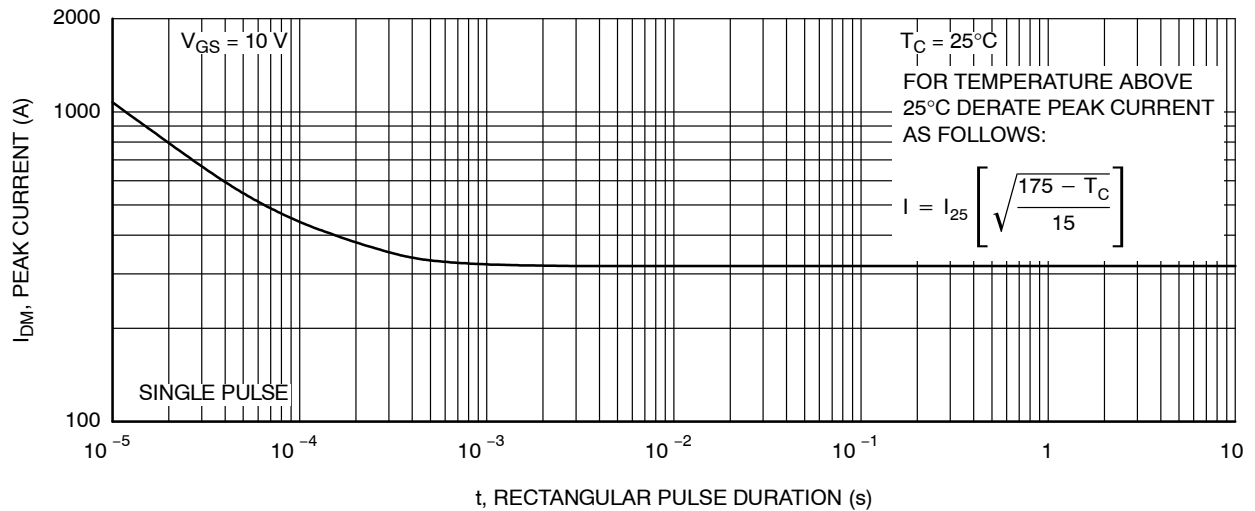


Figure 4. Peak Current Capability

TYPICAL CHARACTERISTICS (continued)

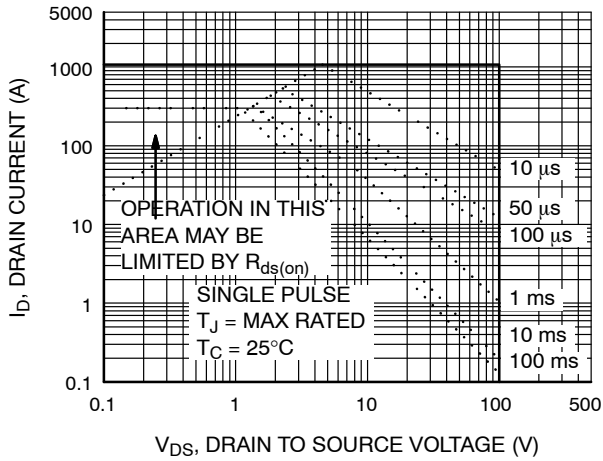
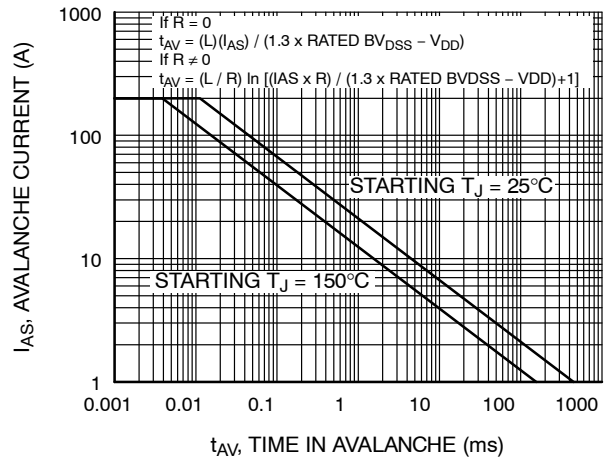


Figure 5. Forward Bias Safe Operating Area



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

Figure 6. Unclamped Inductive Switching Capability

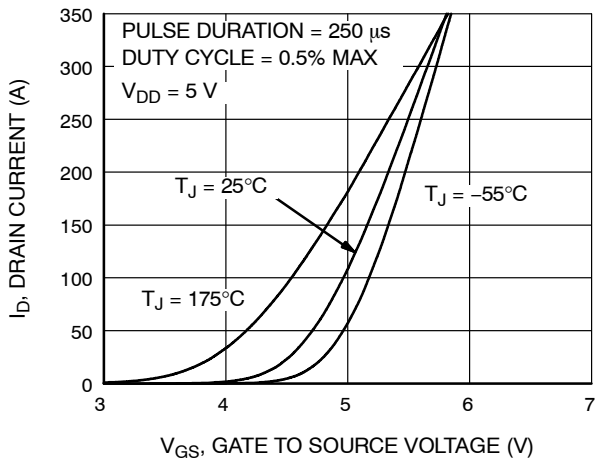


Figure 7. Transfer Characteristics

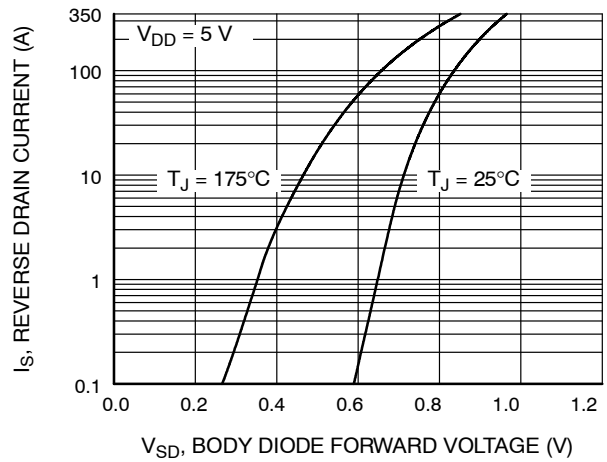


Figure 8. Forward Diode Characteristics

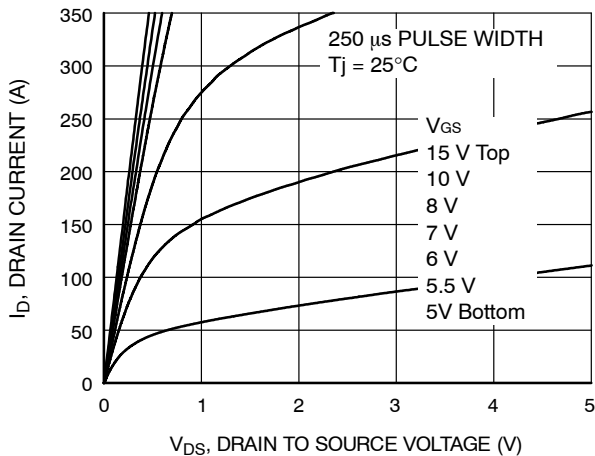


Figure 9. Saturation Characteristics

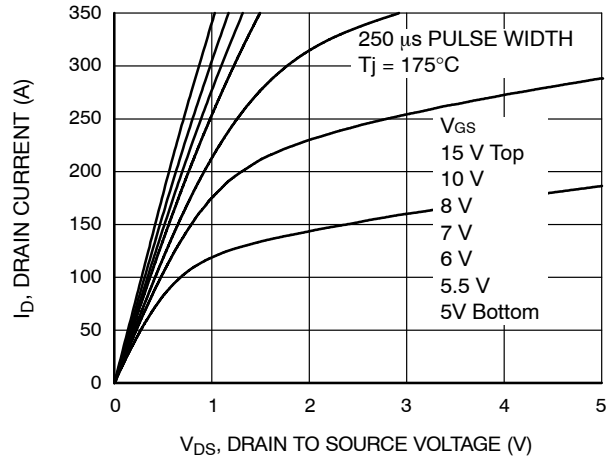


Figure 10. Saturation Characteristics

TYPICAL CHARACTERISTICS (continued)

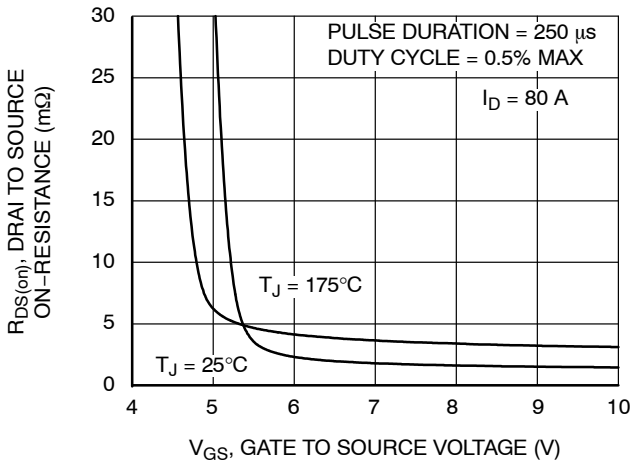


Figure 11.  $R_{DS(on)}$  vs. Gate Voltage

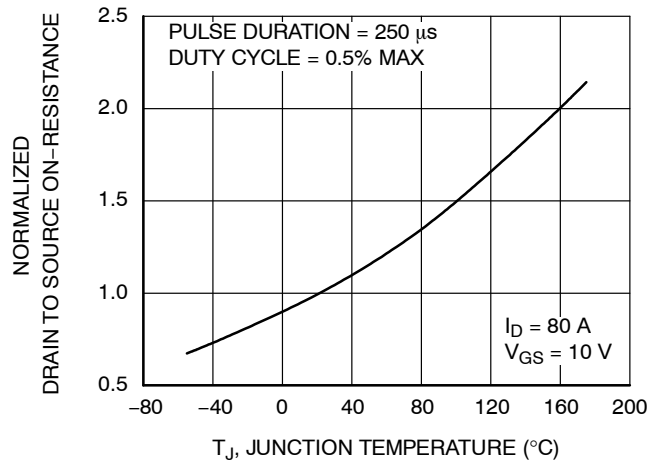


Figure 12. Normalized  $R_{DS(on)}$  vs. Junction Temperature

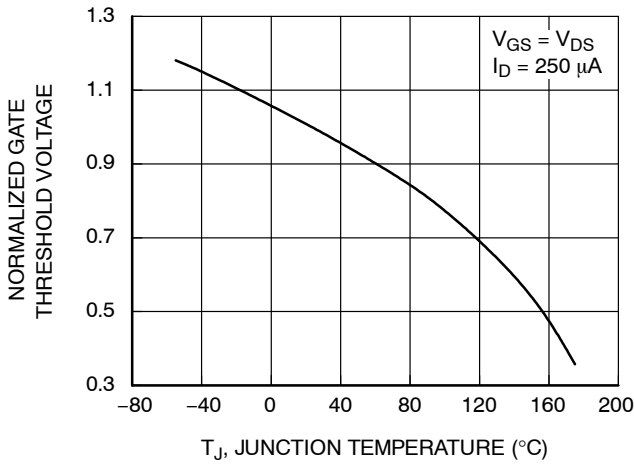


Figure 13. Normalized Gate Threshold Voltage vs. Temperature

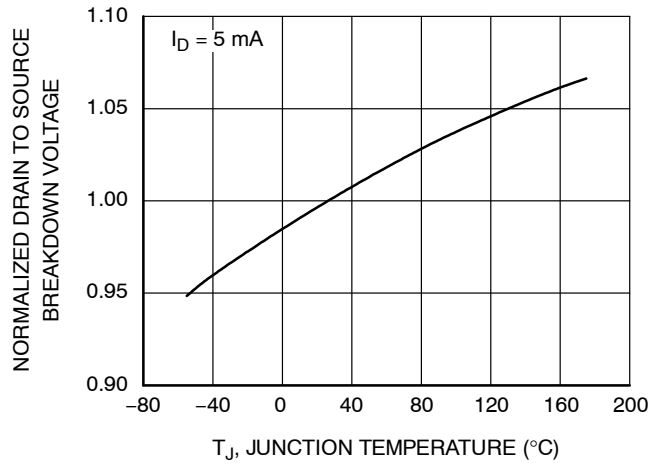


Figure 14. Normalized Drain to Source Breakdown Voltage vs. Junction Temperature

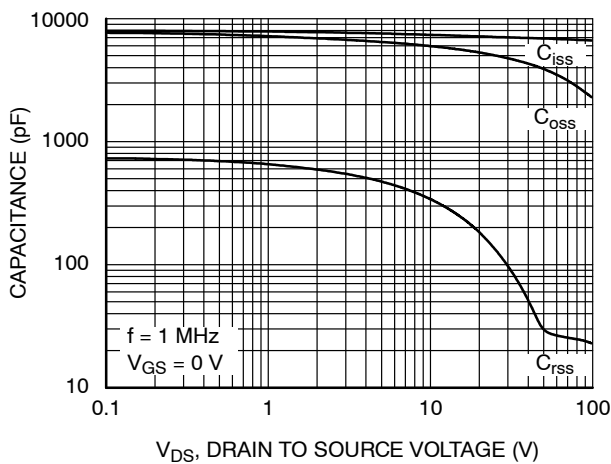


Figure 15. Capacitance vs. Drain to Source Voltage

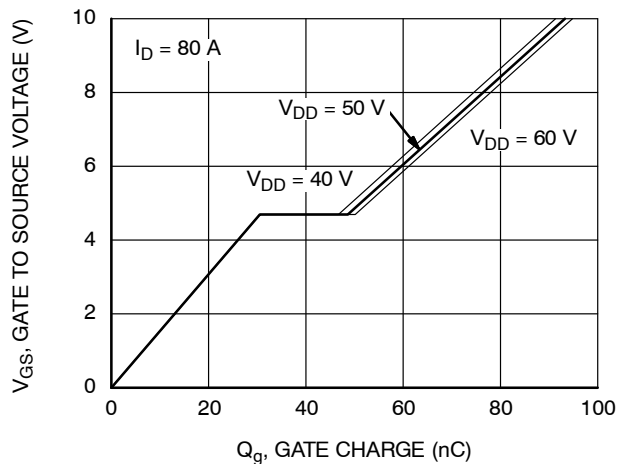


Figure 16. Gate Charge vs. Gate to Source Voltage

# FDBL0200N100

## ORDERING INFORMATION

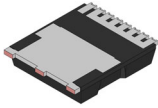
Device	Device Marking	Package Type	Reel Size	Tape Width	Shipping <sup>†</sup>
FDBL0200N100	FDBL0200N100	H-PSOF8L 11.68x9.80 (Pb-Free)	13"	24 mm	2000 / Tape & Reel

<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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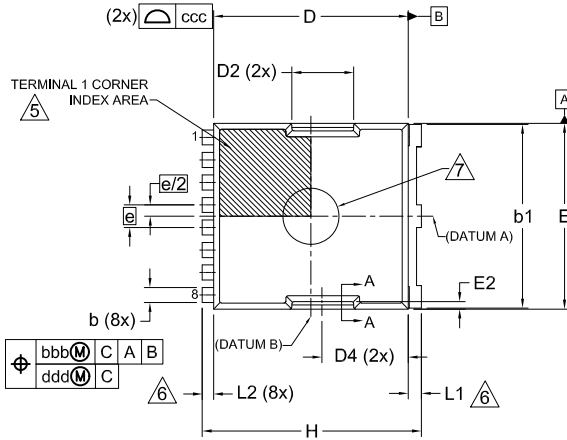
# MECHANICAL CASE OUTLINE

## PACKAGE DIMENSIONS

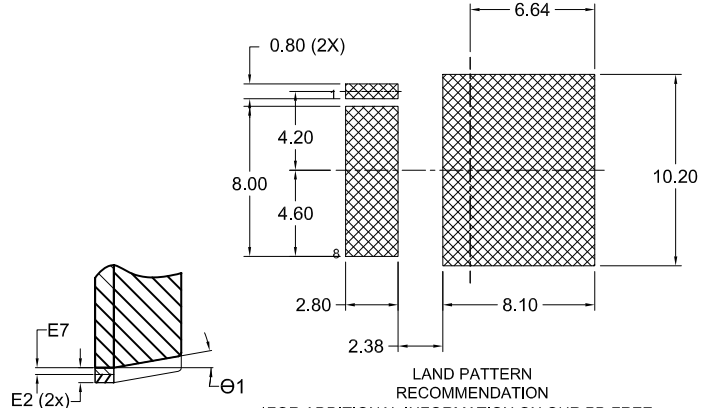


**H-PSOF8L 11.68x9.80x2.30, 1.20P**  
**CASE 100CU**  
**ISSUE D**

DATE 25 APRIL 2024

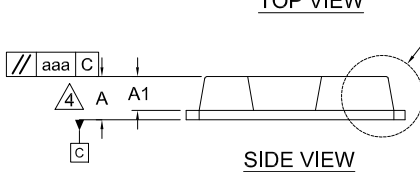


TOP VIEW

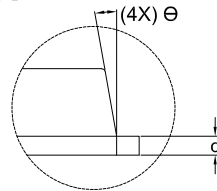


LAND PATTERN RECOMMENDATION

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



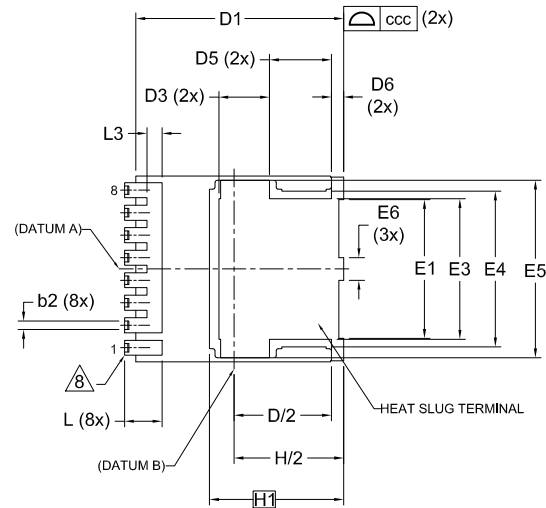
SIDE VIEW



DETAIL "A"  
SCALE: 2X

NOTES:

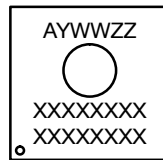
1. PACKAGE STANDARD REFERENCE: JEDEC MO-299, ISSUE B.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
3. "e" REPRESENTS THE TERMINAL PITCH.
4. THIS DIMENSION INCLUDES ENCAPSULATION THICKNESS "A1", AND PACKAGE BODY THICKNESS, BUT DOES NOT INCLUDE ATTACHED FEATURES, e.g., EXTERNAL OR CHIP CAPACITORS. AN INTEGRAL HEATSLUG IS NOT CONSIDERED AS ATTACHED FEATURE.
5. A VISUAL INDEX FEATURE MUST BE LOCATED WITHIN THE HATCHED AREA.
6. DIMENSIONS b1, L1, L2 APPLY TO PLATED TERMINALS.
7. THE LOCATION AND SIZE OF EJECTOR MARKS ARE OPTIONAL.
8. THE LOCATION AND NUMBER OF FUSED LEADS ARE OPTIONAL.



BOTTOM VIEW

DETAIL "B"  
SCALE: 2X

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
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	7.40	7.50	7.60
E4	8.20	8.30	8.40

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
E5	9.36	9.46	9.47
E6	1.10	1.20	1.30
E7	0.15	0.18	0.21
e	1.20 BSC		
e/2	0.60 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	10° REF		
theta 1	10° REF		
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 "μ", may or may not be present. Some products may not follow the Generic Marking.

<b>DOCUMENT NUMBER:</b>	<b>98AON13813G</b>	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
<b>DESCRIPTION:</b>	<b>H-PSOF8L 11.68x9.80x2.30, 1.20P</b>	<b>PAGE 1 OF 1</b>

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