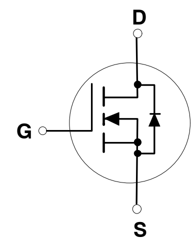
FDBL86062-F085

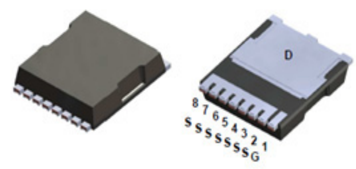
N-Channel POWERTRENCH® MOSFET

100 V, 300 A, 2.0 mΩ

ON Semiconductor®

www.onsemi.com





H−PSOF8L 11.68x9.80
CASE 100CU

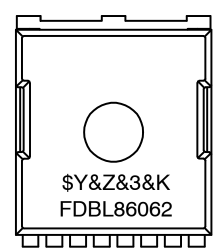
Features

- 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
- Qualified to AEC Q101
- This Device is Pb−Free and is RoHS Compliant

Applications

- Automotive Engine Control
- PowerTrain Management
- Solenoid and Motor Drivers
- Integrated Starter/Alternator
- Primary Switch for 12 V Systems

MARKING DIAGRAM



$Y	= ON Semiconductor Logo
&Z&3	= Data Code (Year & Week)
&K	= Lot
FDBL86062	= Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

March, 2019 − Rev. 3

Publication Order Number:
FDBL86062−F085/D

MOSFET MAXIMUM RATINGS T_J = 25°C unless otherwise noted

Symbol	Parameter		Rating	Units
V_{DSS}	Drain−to−Source Voltage		100	V
V_{GS}	Gate−to−Source Voltage		±20	V
I_D	Drain Current - Continuous (V_{GS} = 10) (Note 1)	T_C = 25°C	300	A
	Pulsed Drain Current	T_C = 25°C	See Figure 4	
E_{AS}	Single Pulse Avalanche Energy (Note 2)		352	mJ
P_D	Power Dissipation		429	W
	Derate Above 25°C		2.9	W/°C
T_J, T_{STG}	Operating and Storage Temperature		−55 to +175	°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case		0.35	°C/W
$R_{\theta JA}$	Maximum Thermal Resistance, Junction to Ambient (Note 3)		43	°C/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°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. The maximum rating presented here is based on mounting on a 1 in^2 pad of 2oz copper.

PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDBL86062	FDBL86062−F085	MO−299A	13”	24 mm	2000 Units

ELECTRICAL CHARACTERISTICS T_J = 25°C, unless otherwise noted

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Units
OFF CHARACTERISTICS							
B_{VDSS}	Drain−to−Source Breakdown Voltage	I_D = 250 μA, V_{GS} = 0 V		100	–	–	V
I_{DSS}	Drain−to−Source Leakage Current	V_{DS} = 100 V, V_{GS} = 0 V	T_J = 25°C	–	–	5	μA
			T_J = 175°C (Note 4)	–	–	2	mA
I_{GSS}	Gate−to−Source Leakage Current	V_{GS} = ±20 V		–	–	±100	nA
ON CHARACTERISTICS							
$V_{GS(th)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250 μA		2.0	3.1	4.5	V
$R_{DS(on)}$	Drain to Source On Resistance	I_D = 80 A, V_{GS} = 10 V	T_J = 25°C	–	1.5	2.0	mΩ
			T_J = 175°C (Note 4)	–	3.3	4.3	
DYNAMIC CHARACTERISTICS							
C_{iss}	Input Capacitance	V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz		–	6970	–	pF
C_{oss}	Output Capacitance			–	3950	–	
C_{rss}	Reverse Transfer Capacitance			–	29	–	
R_g	Gate Resistance	f = 1 MHz		–	0.4	–	Ω
$Q_{g(ToT)}$	Total Gate Charge at 10 V	V_{GS} = 0 to 10 V	V_{DD} = 80 V, I_D = 80 A	–	95	124	nC
$Q_{g(th)}$	Threshold Gate Charge	V_{GS} = 0 to 2 V		–	13	–	
Q_{gs}	Gate−to−Source Gate Charge			–	31	–	
Q_{gd}	Gate−to−Drain “Miller” Charge			–	20	–	

ELECTRICAL CHARACTERISTICS (continued) T_J = 25°C, unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
SWITCHING CHARACTERISTICS						
t_{on}	Turn−On Time	V_{DD} = 50 V, I_D = 80 A, V_{GS} = 10 V, R_{GEN} = 6 Ω	–	–	73	ns
$t_{d(on)}$	Turn−On Delay		–	31	–	
t_r	Rise Time		–	25	–	
$t_{d(off)}$	Turn−Off Delay		–	36	–	
t_f	Fall Time		–	9	–	
t_{off}	Turn−Off Time		–	–	59	
DRAIN−SOURCE DIODE CHARACTERISTICS						
V_{SD}	Source−to−Drain Diode Voltage	I_{SD} = 80 A, V_{GS} = 0 V	–	–	1.25	V
		I_{SD} = 40 A, V_{GS} = 0 V	–	–	1.2	
t_{rr}	Reverse−Recovery Time	I_F = 80 A, dI_{SD}/dt = 100 A/μs, V_{DD} = 80 V	–	115	150	ns
Q_{rr}	Reverse−Recovery Charge		–	172	224	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.

4. The maximum value is specified by design at T_J = 175°C. Product is not tested to this condition in production.

TYPICAL CHARACTERISTICS

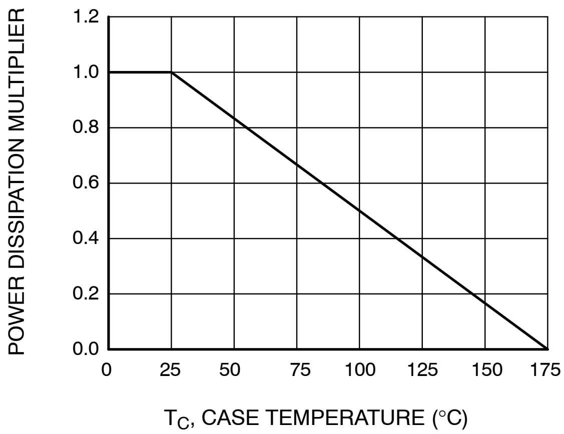


Figure 1. Normalized Power Dissipation vs. Case Temperature

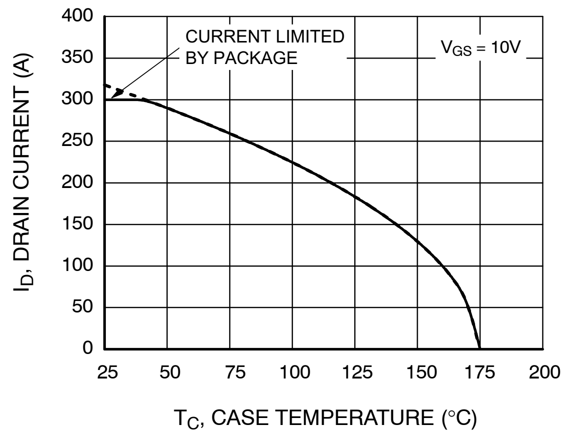


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

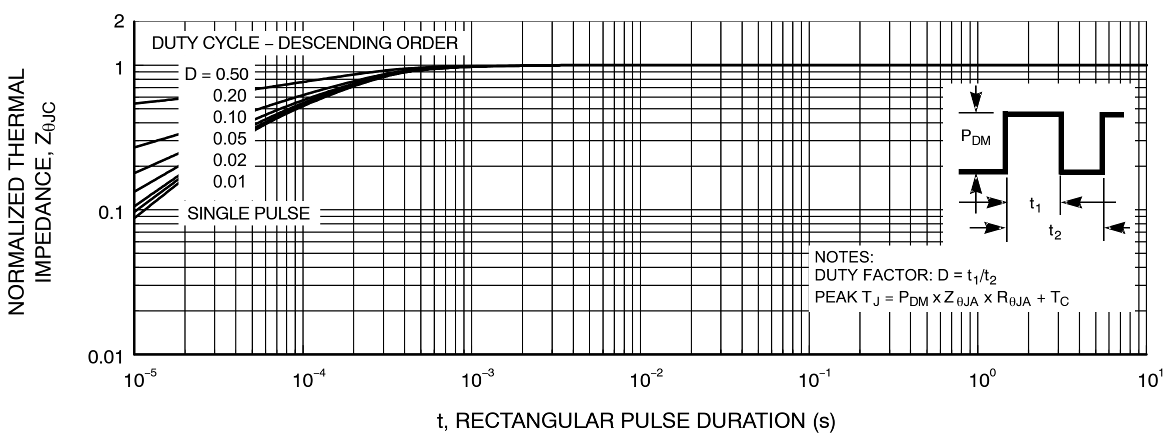


Figure 3. Normalized Maximum Transient Thermal Impedance

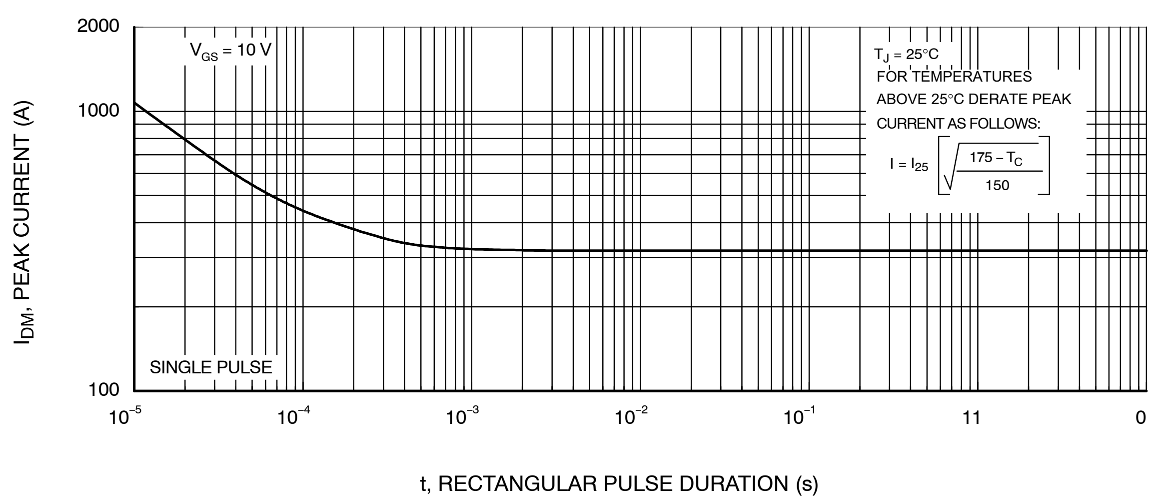


Figure 4. Peak Current Capability

TYPICAL CHARACTERISTICS (continued)

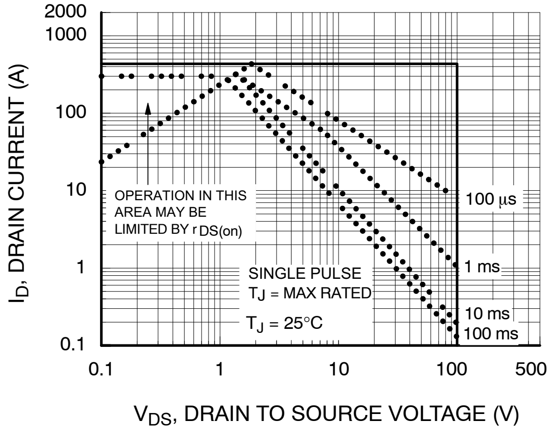
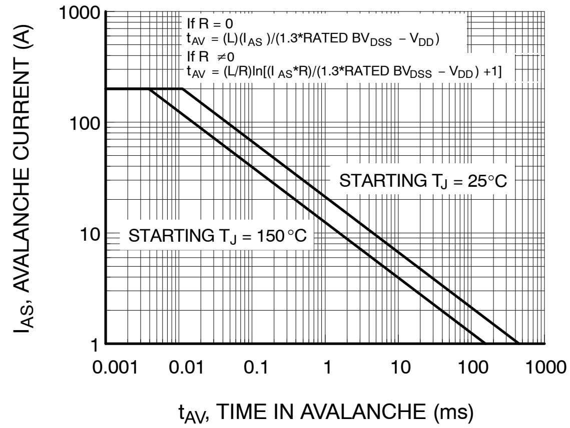


Figure 5. Forward Bias Safe Operating Area



NOTE: Refer to ON Semiconductor Application Notes AN7514 and AN7515

Figure 6. Unclamped Inductive Switching Capability

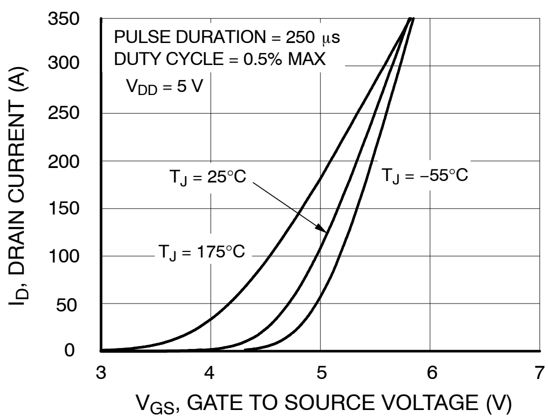


Figure 7. Transfer Characteristics

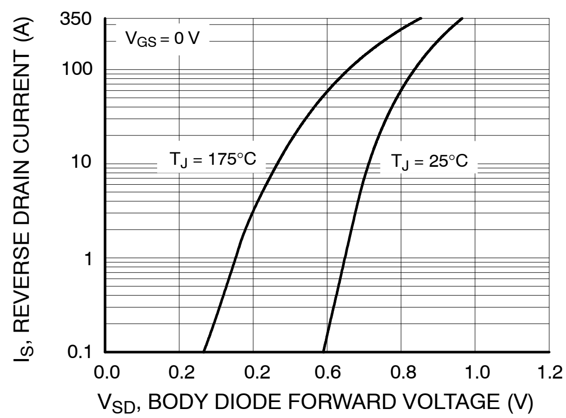


Figure 8. Forward Diode Characteristics

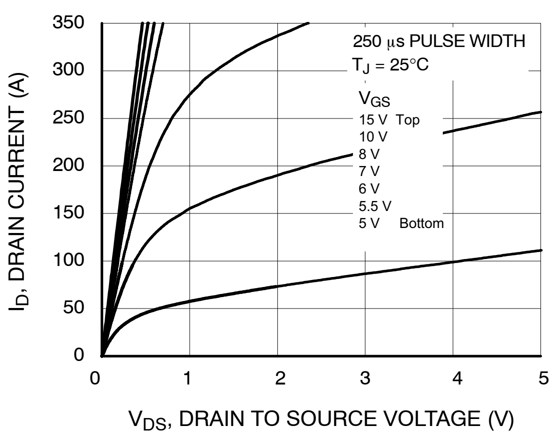


Figure 9. Saturation Characteristics

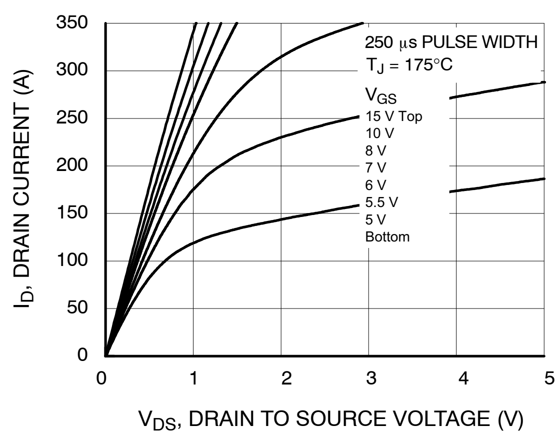


Figure 10. Saturation Characteristics

TYPICAL CHARACTERISTICS (continued)

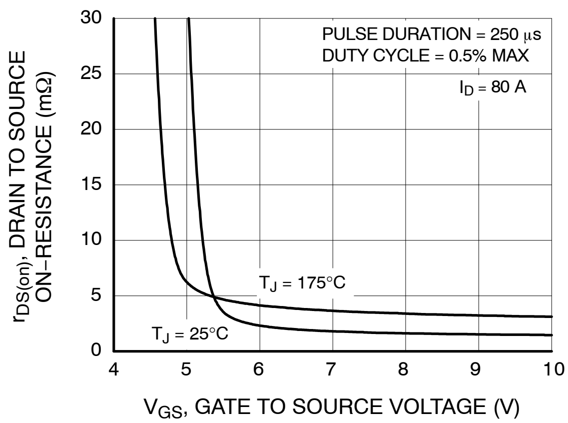


Figure 11. R_{DSON} vs. Gate Voltage

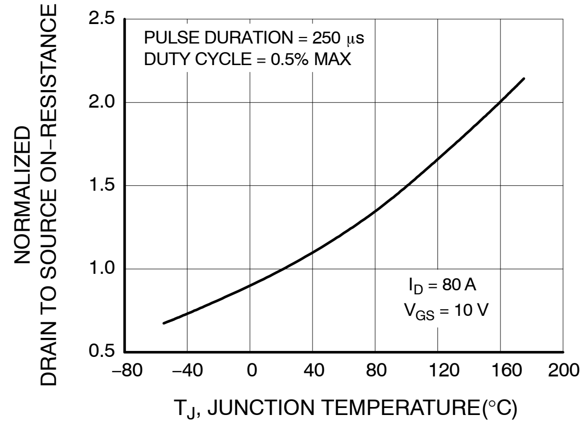


Figure 12. Normalized R_{DSON} vs. Junction Temperature

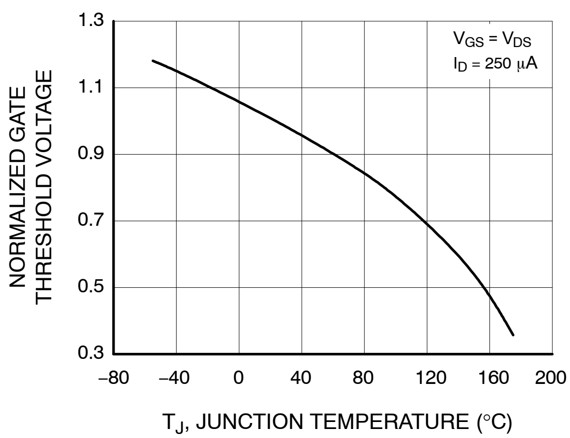


Figure 13. Normalized Gate Threshold Voltage vs. Temperature

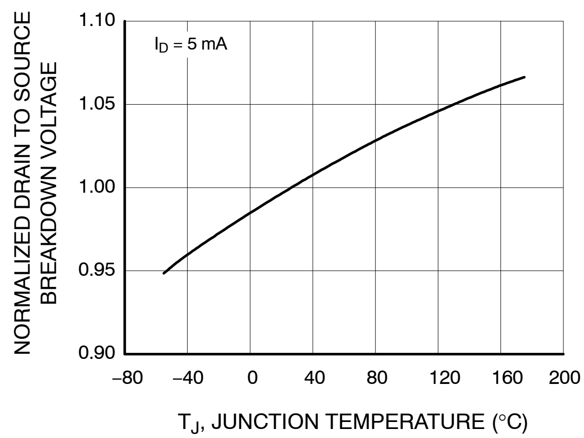


Figure 14. Normalized Drain to Source Breakdown Voltage vs. Junction Temperature

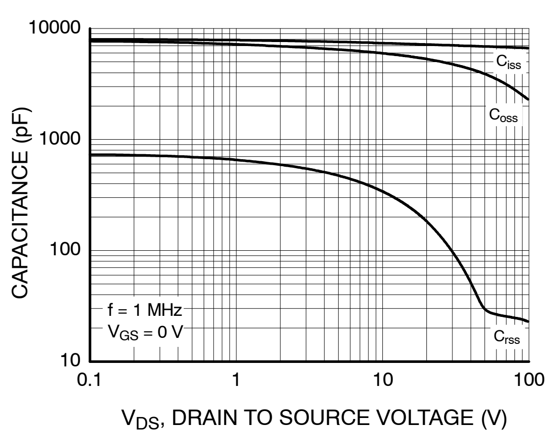


Figure 15. Capacitance vs. Drain to Source Voltage

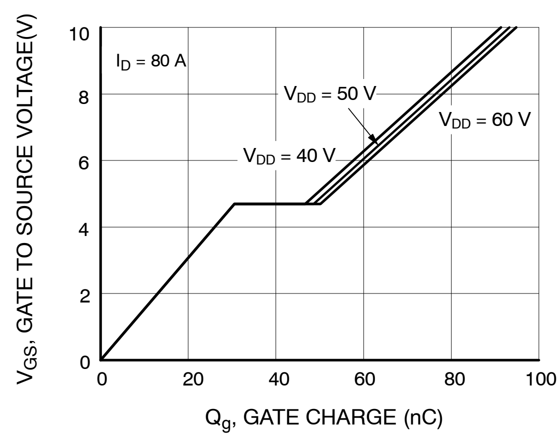
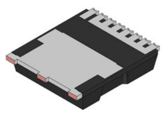
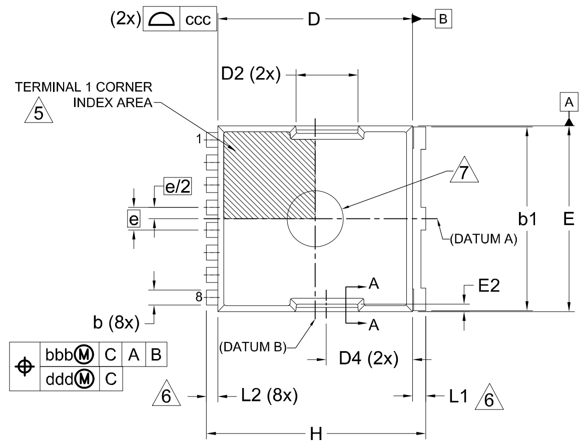


Figure 16. Gate Charge vs. Gate to Source Voltage

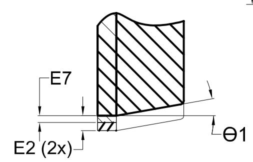


H−PSOF8L 11.68x9.80x2.30, 1.20P
CASE 100CU
ISSUE D

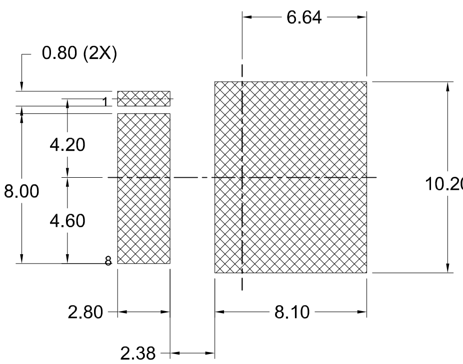
DATE 25 APRIL 2024



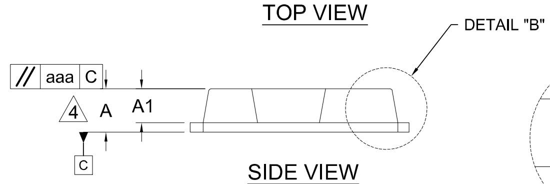
TOP VIEW



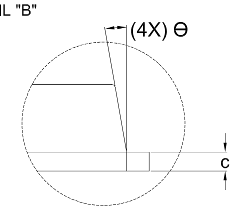
DETAIL "A"
SCALE: 2X



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.

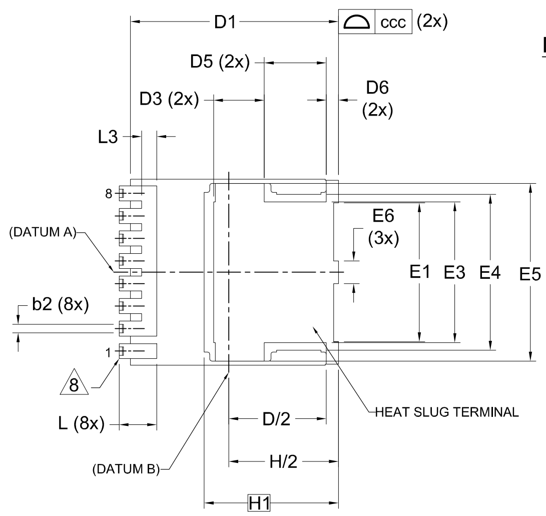


SIDE VIEW



DETAIL "B"
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.

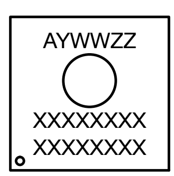


BOTTOM VIEW

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
Θ	10° REF		
Θ1	10° REF		
aaa	0.20		
bbb	0.25		
ccc	0.20		
ddd	0.20		
eee	0.10		

GENERIC MARKING DIAGRAM*



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

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

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DESCRIPTION:	**H−PSOF8L 11.68x9.80x2.30, 1.20P**	**PAGE 1 OF 1**

ADDITIONAL INFORMATION

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