

FDBL0630N150

MOSFET – N-Channel, POWERTRENCH®

150 V, 169 A, 6.3 mΩ

Features

- Typ $r_{DS(on)} = 5 \text{ m}\Omega$ at $V_{GS} = 10 \text{ V}$, $I_D = 80 \text{ A}$
- Typ $Q_{g(tot)} = 70 \text{ nC}$ at $V_{GS} = 10 \text{ V}$, $I_D = 80 \text{ A}$
- 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

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$, unless otherwise specified)

Symbol	Parameter	Ratings	Unit
V_{DSS}	Drain to Source Voltage	150	V
V_{GS}	Gate to Source Voltage	± 20	V
I_D	Drain Current – Continuous ($V_{GS} = 10 \text{ V}$) (Note 1) $T_C = 25^\circ\text{C}$	169	A
	Pulsed Drain Current $T_C = 25^\circ\text{C}$	See Figure 4	
EAS	Single Pulse Avalanche Energy (Note 2)	502	mJ
P_D	Power Dissipation	500	W
	Derate above 25°C	3.3	$\text{W}/^\circ\text{C}$
T_J, T_{STG}	Operating and Storage Temperature	-55 to $+175$	$^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance Junction to Case	0.3	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Maximum Thermal Resistance Junction to Ambient (Note 3)	43	$^\circ\text{C}/\text{W}$

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.

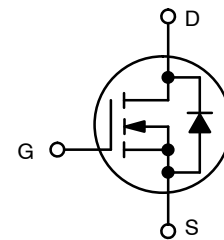
1. Current is limited by junction temperature.
2. Starting $T_J = 25^\circ\text{C}$, $L = 0.24 \text{ mH}$, $I_{AS} = 64 \text{ A}$, $V_{DD} = 100 \text{ V}$ during inductor charging and $V_{DD} = 0 \text{ V}$ during time in avalanche.
3. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient 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 user's board design. The maximum rating presented here is based on mounting on a 1 in² pad of 2 oz copper.



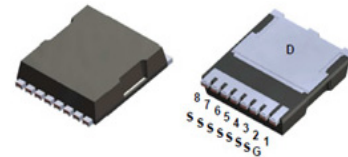
ON Semiconductor®

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V_{DSS}	$r_{DS(ON)} \text{ MAX}$	$I_D \text{ MAX}$
150 V	6.3 mΩ @ 10 V	169 A



MOSFET — N-Channel



H-PSOF8L 11.68x9.80
CASE 100CU

MARKING DIAGRAM



$\$Y$ = ON Semiconductor Logo
 $\&Z$ = Assembly Plant Code
 $\&3$ = Date Code
 $\&K$ = Lot Run Traceability Code
 FDBL0630N150 = Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 6 of this data sheet.

FDBL0630N150

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

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

B _{VDS}	Drain to Source Breakdown Voltage	I _D = 250 μA, V _{GS} = 0 V	150	–	–	V	
I _{DSS}	Drain to Source Leakage Current	V _{DS} = 150 V, V _{GS} = 0 V	T _J = 25°C	–	–	1	μA
			T _J = 175°C (Note 4)	–	–	1	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	2.8	4.0	V	
r _{DS(on)}	Drain to Source On Resistance	I _D = 80 A, V _{GS} = 10 V	T _J = 25°C	–	5	6.3	mΩ
			T _J = 175°C (Note 4)	–	14	17.5	mΩ

DYNAMIC CHARACTERISTICS

C _{iss}	Input Capacitance	V _{DS} = 75 V, V _{GS} = 0 V, f = 1 MHz	–	5805	–	pF
C _{oss}	Output Capacitance		–	536	–	pF
C _{rss}	Reverse Transfer Capacitance		–	16	–	pF
R _g	Gate Resistance	f = 1 MHz	–	2.2	–	Ω
Q _{g(ToT)}	Total Gate Charge at 10 V	V _{GS} = 0 to 10 V, V _{DD} = 75 V, I _D = 80 A	–	70	90	nC
Q _{g(th)}	Threshold Gate Charge	V _{GS} = 0 to 2 V, V _{DD} = 75 V, I _D = 80 A	–	10.5	13	nC
Q _{gs}	Gate to Source Gate Charge	V _{DD} = 75 V, I _D = 80 A	–	32.5	–	nC
Q _{gd}	Gate to Drain “Miller” Charge	V _{DD} = 75 V, I _D = 80 A	–	10	–	nC

SWITCHING CHARACTERISTICS

t _{on}	Turn-On Time	V _{DD} = 75 V, I _D = 80 A, V _{GS} = 10 V, R _{GEN} = 6 Ω	–	–	80	ns
t _{d(on)}	Turn-On Delay Time		–	39	–	ns
t _r	Rise Time		–	30	–	ns
t _{d(off)}	Turn-Off Delay Time		–	70	–	ns
t _f	Fall Time		–	23	–	ns
t _{off}	Turn-Off Time		–	–	130	ns

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	V
T _{rr}	Reverse Recovery Time	I _F = 80 A, dI _{SD} /dt = 100 A/μs, V _{DD} = 120 V	–	108	125	ns
Q _{rr}	Reverse Recovery Charge		–	323	467	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

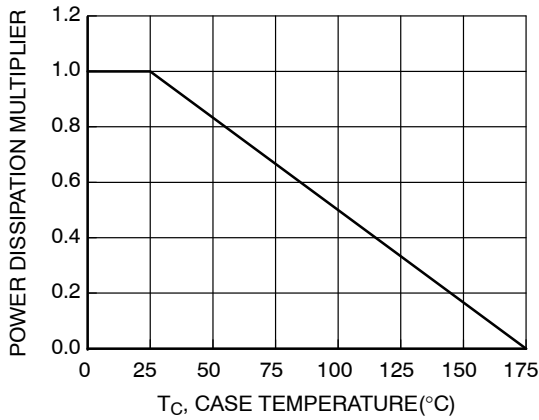


Figure 1. Normalized Power Dissipation vs. Case Temperature

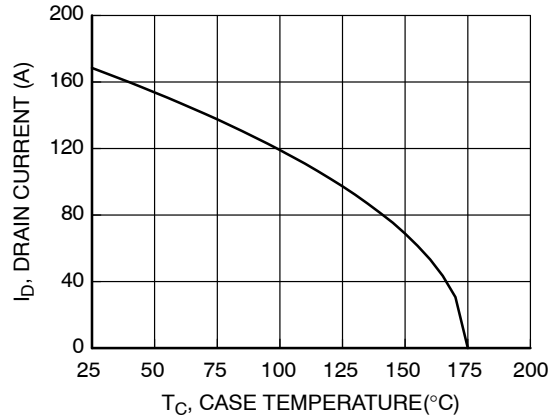


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

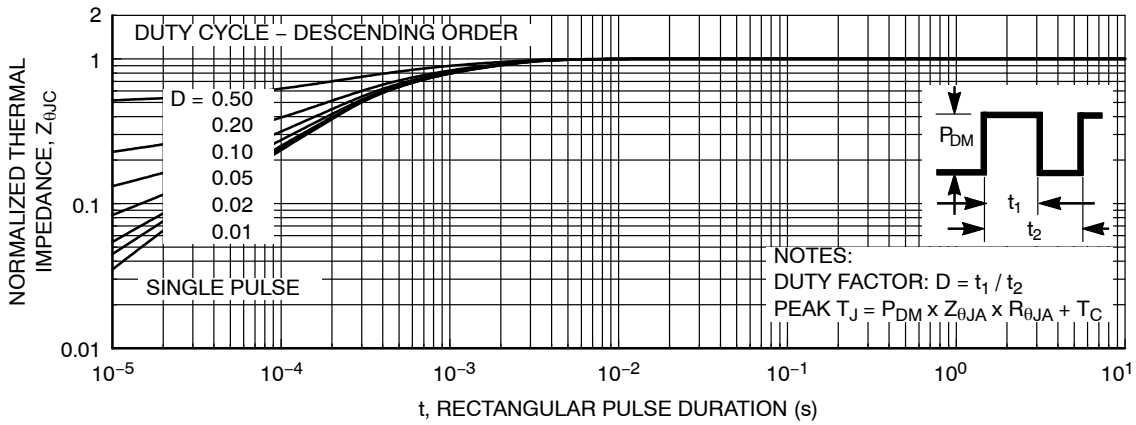


Figure 3. Normalized Maximum Transient Thermal Impedance

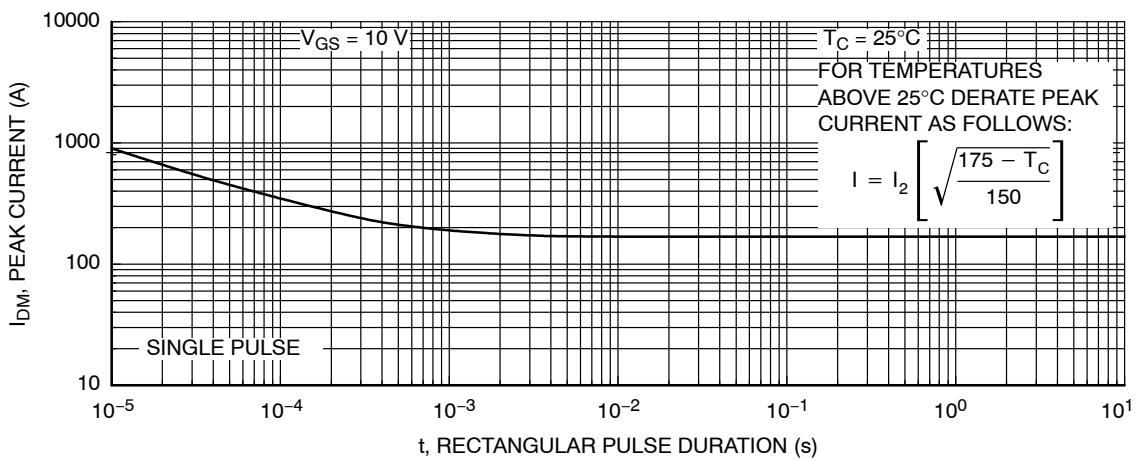


Figure 4. Peak Current Capability

TYPICAL CHARACTERISTICS (continued)

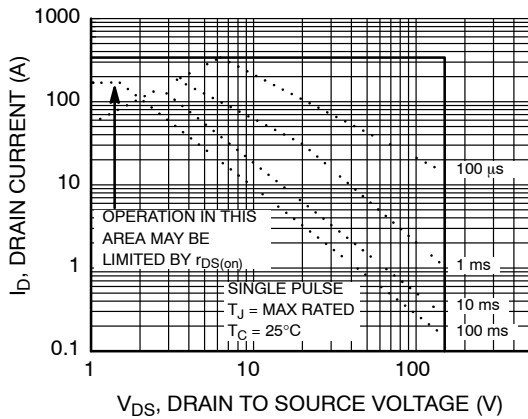


Figure 5. Forward Bias Safe Operating Area

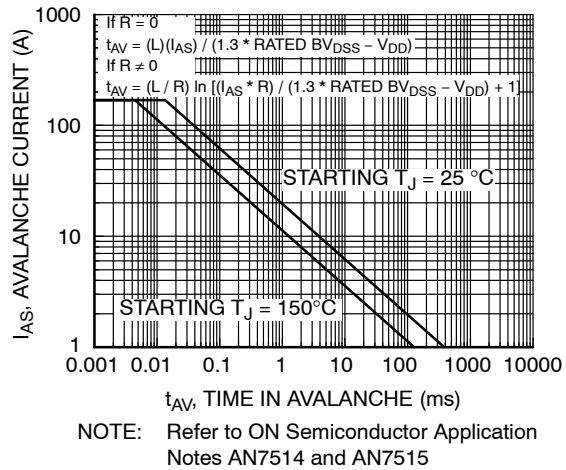


Figure 6. Unclamped Inductive Switching Capability

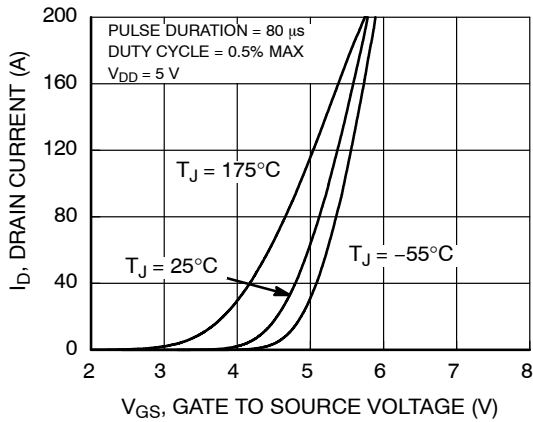


Figure 7. Transfer Characteristics

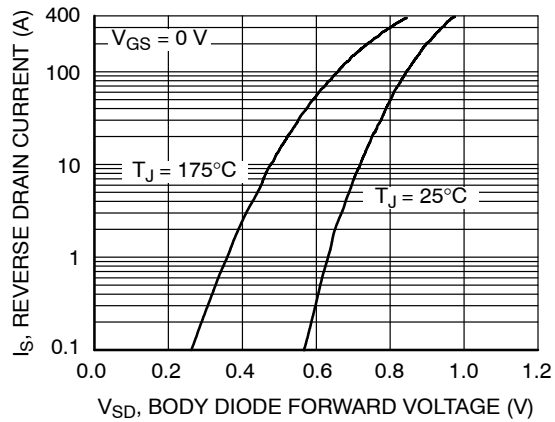


Figure 8. Forward Diode Characteristics

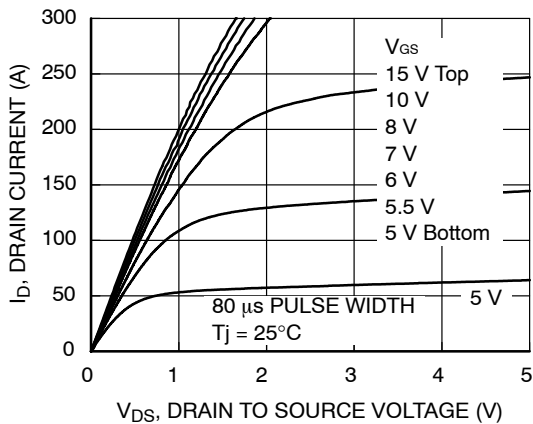


Figure 9. Saturation Characteristics

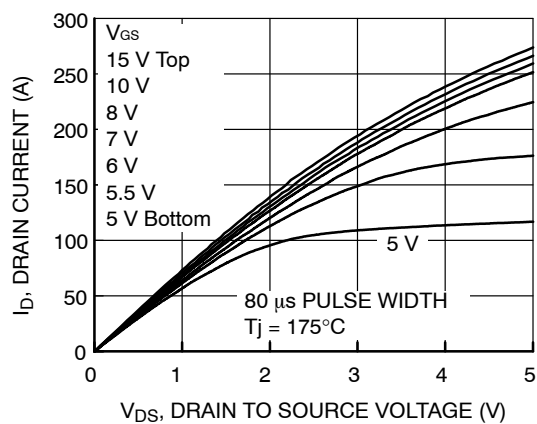


Figure 10. Saturation Characteristics

TYPICAL CHARACTERISTICS (continued)

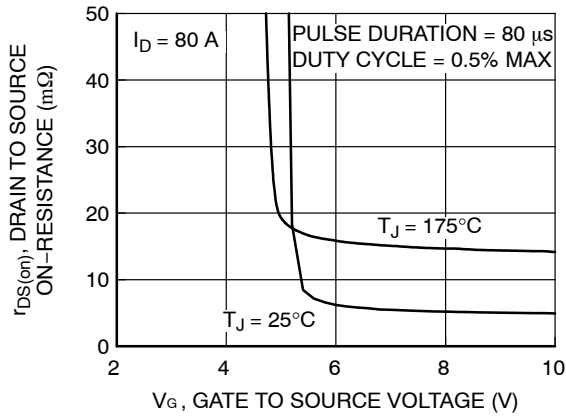


Figure 11. Rdson vs. Gate Voltage

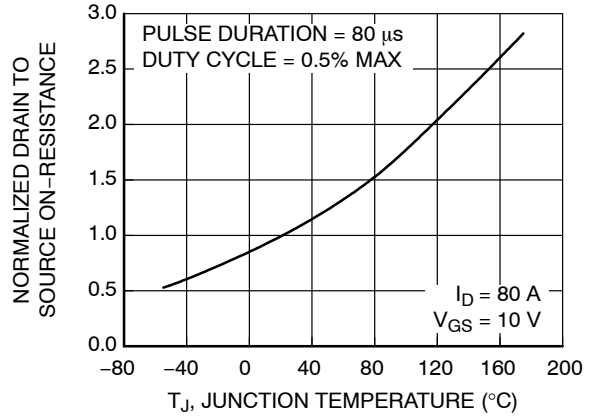


Figure 12. Normalized Rdson vs. Junction Temperature

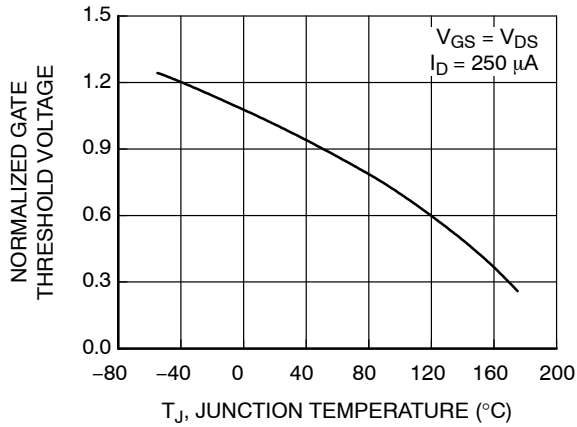


Figure 13. Normalized Gate Threshold Voltage vs. Temperature

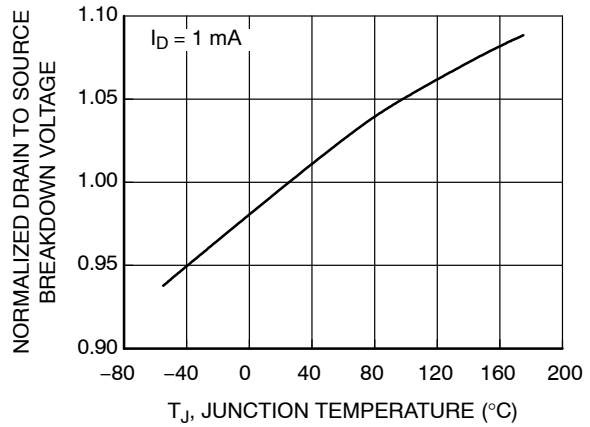


Figure 14. Normalized Drain to Source Breakdown Voltage vs. Junction Temperature

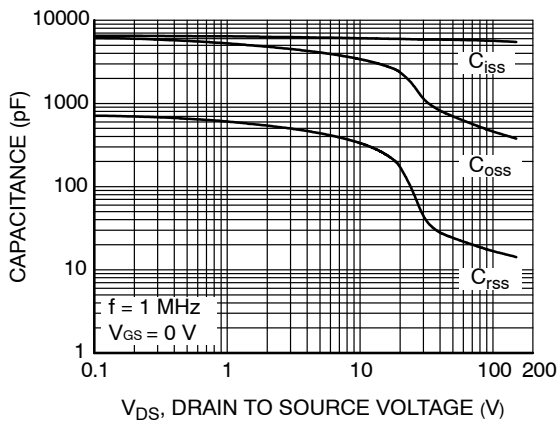


Figure 15. Capacitance vs Drain to Source Voltage

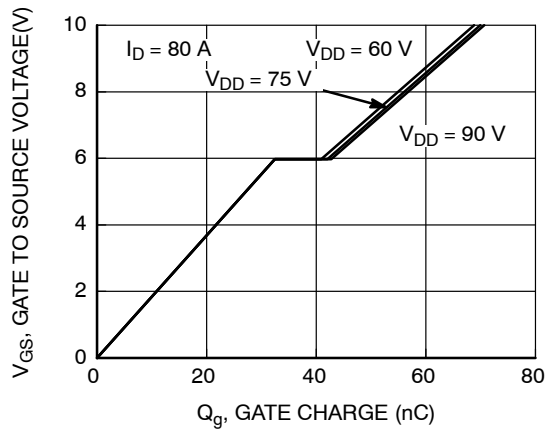


Figure 16. Gate Charge vs Gate to Source Voltage

FDBL0630N150

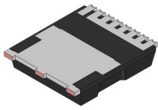
ORDERING INFORMATION

Device	Device Marking	Package	Shipping [†]
FDBL0630N150	FDBL0630N150	H-PSOF8L 11.68x9.80 (Pb-Free)	2000 / Tape & Reel

[†]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.

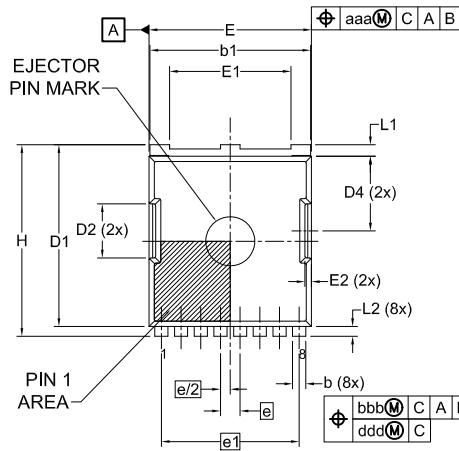
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MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS

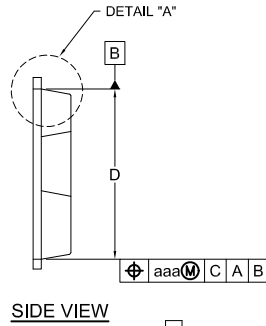


H-PSOF8L 11.68x9.80
CASE 100CU
ISSUE C

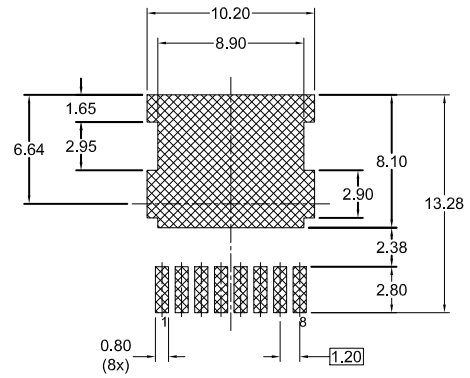
DATE 22 MAY 2023



TOP VIEW

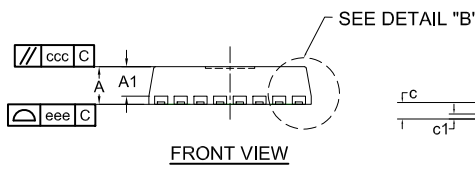


SIDE VIEW

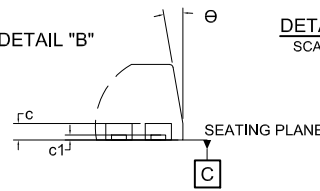


LAND PATTERN
RECOMMENDATION

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



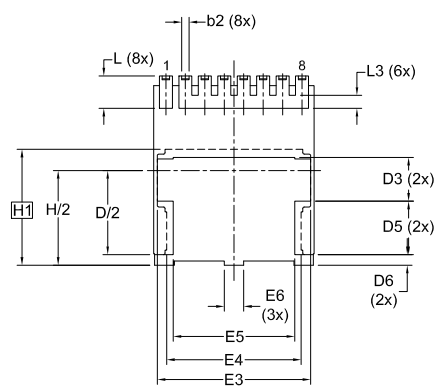
FRONT VIEW



DETAIL "A"
SCALE: 2X

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.

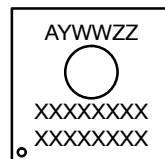


BOTTOM VIEW



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
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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DESCRIPTION:	H-PSOF8L 11.68x9.80	PAGE 1 OF 1

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