DATA SHEET
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MOSFET – Single, N-Channel, POWERTRENCH®

30 V, 11 A, 13 mΩ

FDMA7630

Description

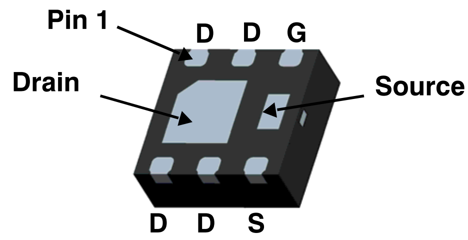
This Device has been Designed To Provide Maximum Efficiency and Thermal Performance for synchronous buck converters. The low $R_{DS(on)}$ and gate charge provide excellent switching performance.

Features

- Max $R_{DS(on)}$ = 13 mΩ at V_{GS} = 10 V, I_D = 11 A
- Max $R_{DS(on)}$ = 20 mΩ at V_{GS} = 4.5 V, I_D = 9 A
- Low Profile − 0.8 mm Maximum − in the New Package MicroFET™ 2x2 mm
- Free from halogenated compounds and antimony oxides
- These Devices is Pb−Free, Halide Free and is RoHS Compliant

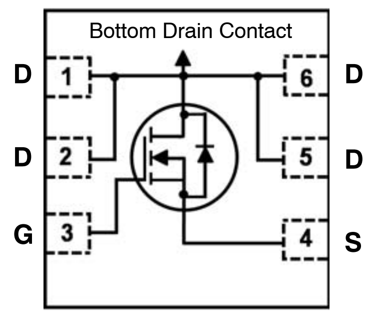
Typical Applications

- DC–DC Buck Converters



MicroFET 2X2 (Bottom View)

WDFN6 2X2, 0.65P
CASE 511CZ



ABSOLUTE MAXIMUM RATINGS T_A = 25°C unless otherwise noted

Symbol	Parameter	Value	Unit
V_{DSS}	Drain to Source Voltage	30	V
V_{GSS}	Gate to Source Voltage	±20	V
I_D	Drain Current − Continuous T_A = 25°C (Note 1a) − Pulsed	 11 24	A
P_D	Power Dissipation T_A = 25°C (Note 1)	24	W
	Power Dissipation T_A = 25°C (Note 1)	0.9	
T_J, T_{stg}	Operating and Storage Junction Temperature Range	−55 to +150	°C

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.

MARKING DIAGRAM

&Z&2&K
630

&Z = Assembly Plant Code
&2 = Date Code (Year & Week)
&K = Lot Traceability Code
630 = Specific Device Code

ORDERING INFORMATION

Device	Package	Shipping†
FDMA7630	WDFN−6 (Pb−Free)	3000 / 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.

THERMAL CHARACTERISTICS

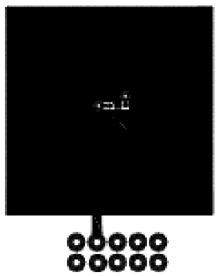
Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1a)	52	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1b)	145	°C/W

ELECTRICAL CHARACTERISTICS T_J = 25°C unless otherwise noted

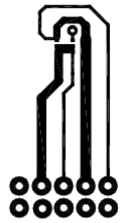
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain to Source Breakdown Voltage	I_D = 250 μA, V_{GS} = 0 V	30	–	–	V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, Referenced to 25°C	–	15	–	mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 24 V, V_{GS} = 0 V	–	–	1	μA
I_{GSS}	Gate to Source Leakage Current	V_{GS} =+/−20 V, V_{DS} = 0 V	–	–	100	nA
On Characteristics						
$V_{GS(th)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250 μA	1.0	2.0	3.0	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	I_D = 250 μA, Referenced to 25°C	–	−6	–	mV/°C
$R_{DS(on)}$	Static Drain−Source On−Resistance	V_{GS} = 10 V, I_D = 11 A V_{GS} = 4.5 V, I_D = 9 A, V_{GS} = 10 V, I_D = 11 A, T_J = 125°C	– – –	10 14 14	13 20 18	mΩ
g_{FS}	Forward Transconductance	V_{DS} = 5 V, I_D = 11 A		36	–	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 15 V, V_{GS} = 0 V, f = 1.0 MHz	–	1020	1360	pF
C_{oss}	Output Capacitance		–	315	415	pF
C_{rss}	Reverse Transfer Capacitance		–	35	55	pF
R_g	Gate Resistance		–	1.7	–	Ω
Switching Characteristics (Note 2)						
$t_{d(on)}$	Turn−On Delay Time	V_{DD} = 15 V, I_D = 11 A, V_{GS} = 10 V, R_{GEN} = 6 Ω	–	8	15	ns
t_r	Rise Time		–	3	10	ns
$t_{d(off)}$	Turn−Off Delay Time		–	19	34	ns
t_f	Fall Time		–	3	10	ns
Q_g	Total Gate Charge	V_{GS} = 0 V to 10 V V_{DD} = 15 V, I_D = 11 A	–	16	22	nC
		V_{GS} = 0 V to 4.5 V, V_{DD} = 15 V, I_D = 11 A	–	8	10	nC
Q_{gs}	Gate to Source Gate Charge	V_{DD} = 15 V, I_D = 11 A	–	3.0	–	nC
Q_{gd}	Gate to Drain “Miller” Charge		–	2.2	–	nC
Drain−Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain–Source Diode Forward Current		–	–	2	A
V_{SD}	Source to Drain Diode Forward Voltage	V_{GS} = 0 V, I_S = 2 A (Note 2)	–	0.8	1.2	V
t_{rr}	Reverse Recovery Time	I_F = 11 A, di/dt = 100 A/μs	–	21	33	ns
Q_{rr}	Reverse Recovery Charge		–	6	12	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.

NOTES:
1. $R_{\theta JA}$ is determined with the device mounted on a 1 in^2 pad 2 oz copper pad on a 1.5 x 1.5 in. board of FR−4 material. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.



a. 52 °C/W when mounted on a 1 in^2 pad of 2 oz copper.



b. 145 °C/W when mounted on a minimum pad of 2 oz copper.

2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

TYPICAL CHARACTERISTICS

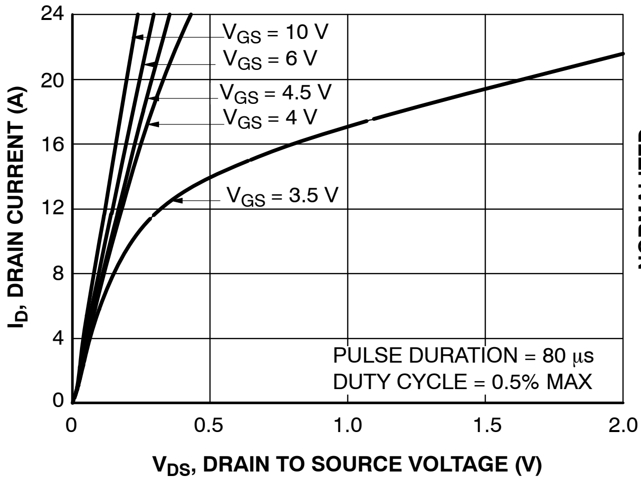


Figure 1. On−Region Characteristics

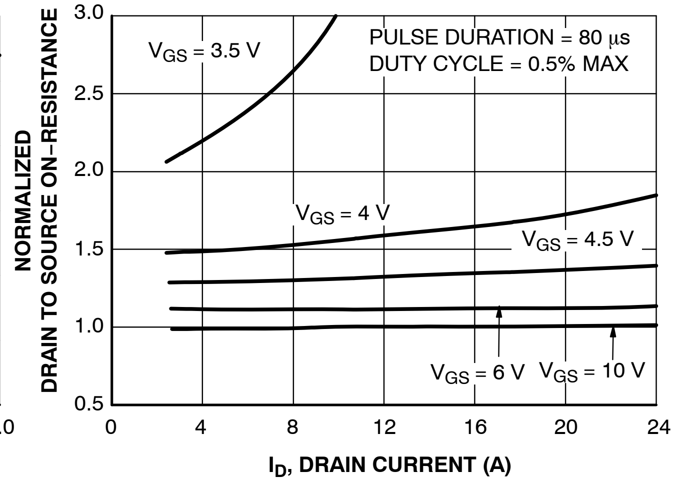


Figure 2. Normalized On−Resistance vs. Drain Current and Gate Voltage

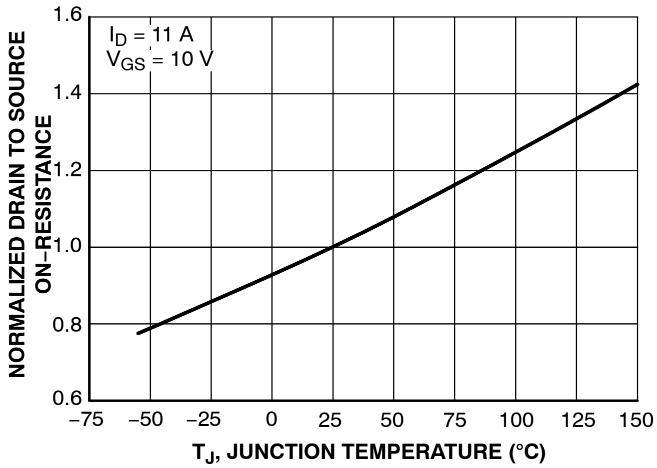


Figure 3. Normalized On−Resistance vs Junction Temperature

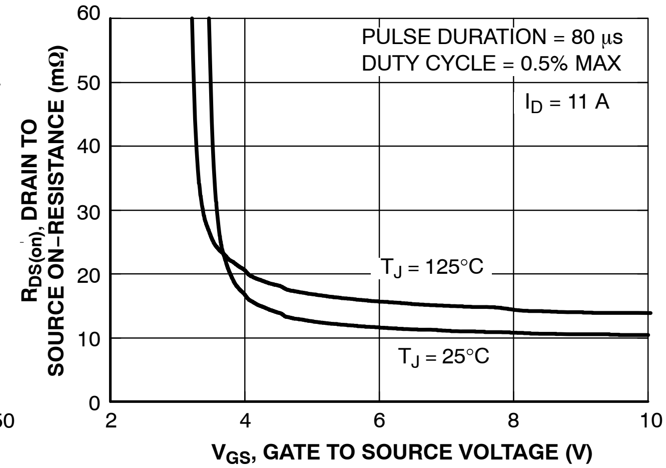


Figure 4. On−Resistance vs Gate to Source Voltage

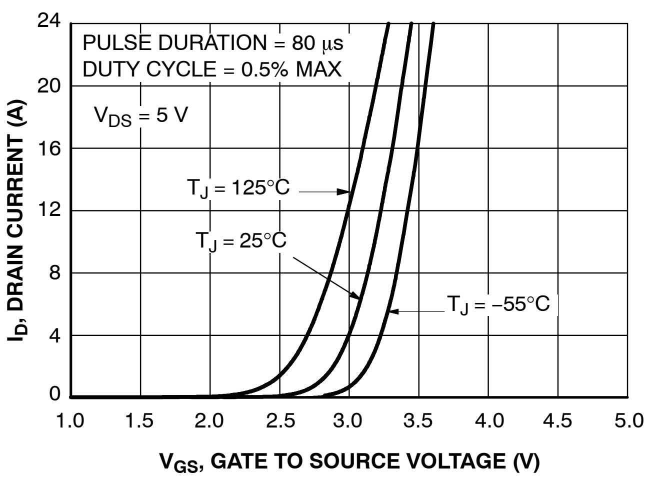


Figure 5. Transfer Characteristics

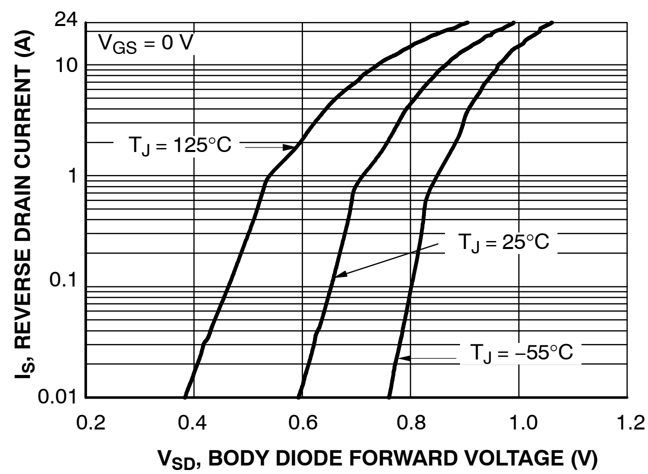


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

TYPICAL CHARACTERISTICS (CONTINUED)

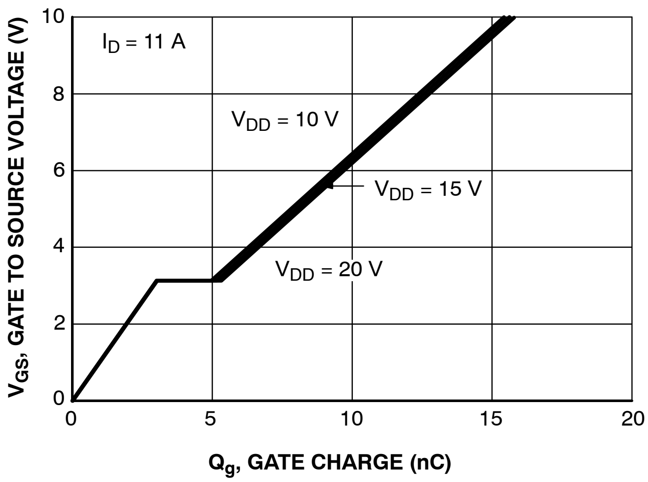


Figure 7. Gate Charge Characteristics

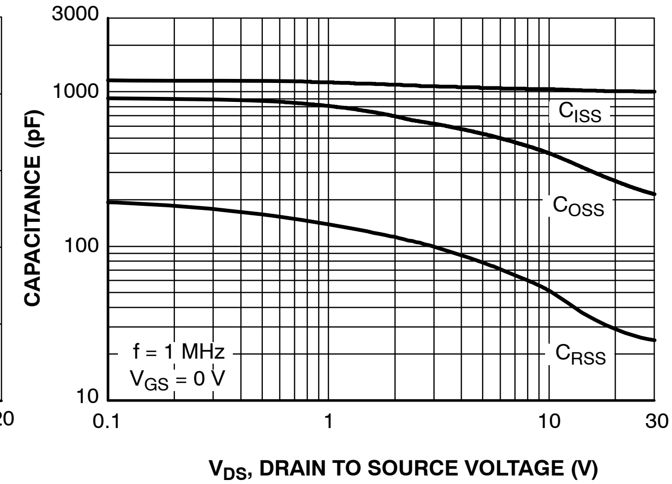


Figure 8. Capacitance vs Drain to Source Voltage

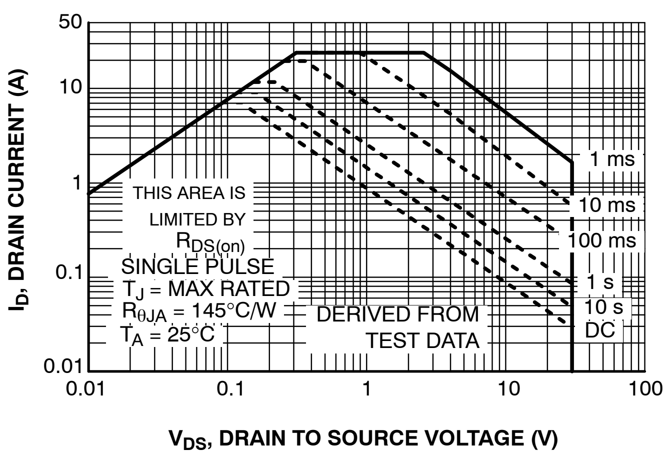


Figure 9. Forward Bias Safe Operating Area

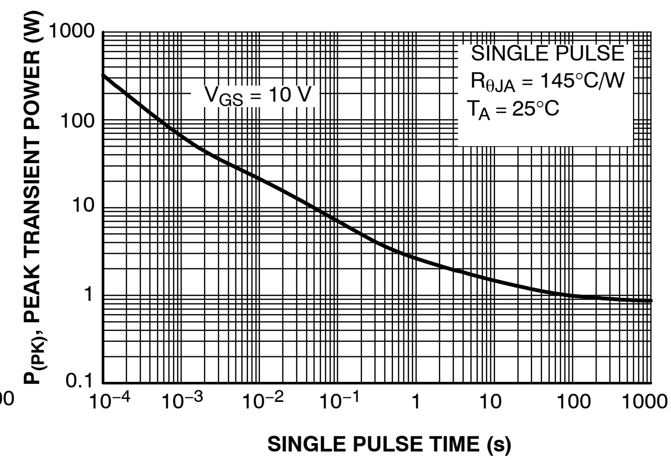


Figure 10. Single Pulse Maximum Power Dissipation

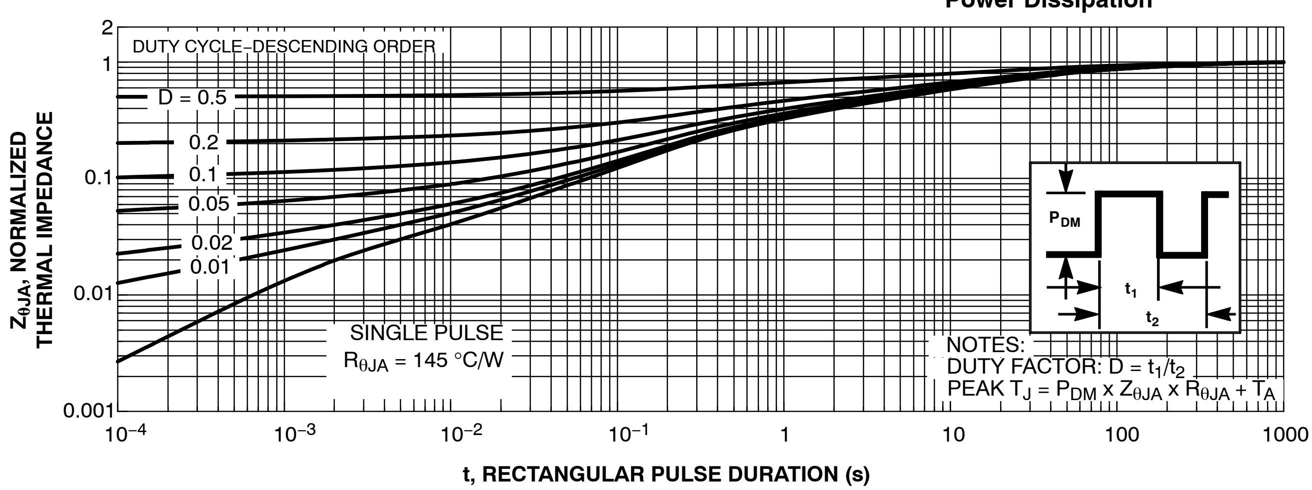
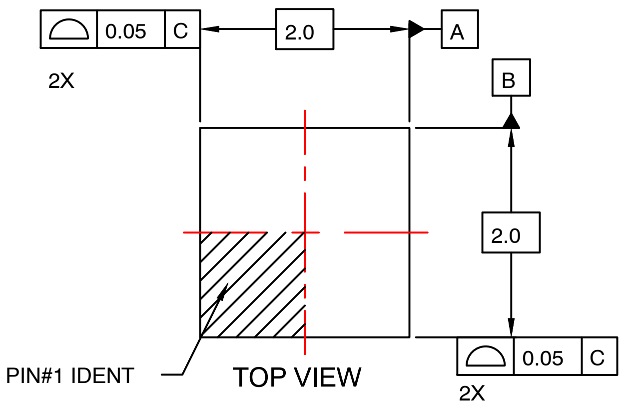


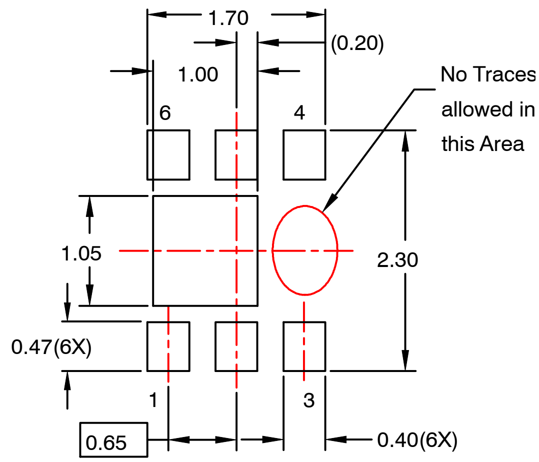
Figure 11. Transient Thermal Response Curve

WDFN6 2x2, 0.65P
CASE 511CZ
ISSUE O

DATE 31 JUL 2016



TOP VIEW



RECOMMENDED
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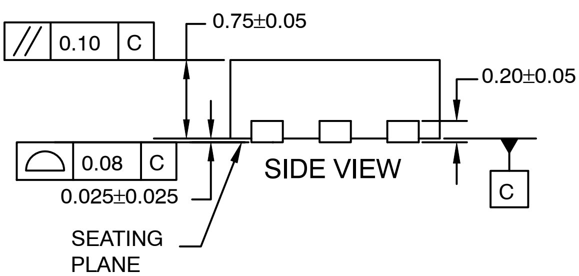
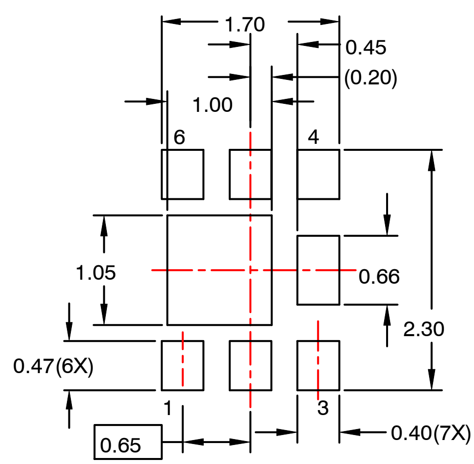


SIDE VIEW



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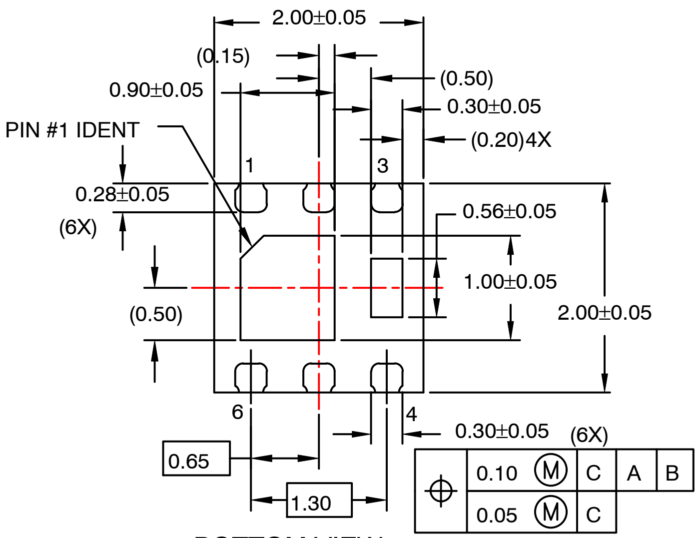

BOTTOM VIEW

NOTES:

A. PACKAGE DOES NOT FULLY CONFORM TO JEDEC MO−229 REGISTRATION

B. DIMENSIONS ARE IN MILLIMETERS.

C. DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 2009.

D. LAND PATTERN RECOMMENDATION IS EXISTING INDUSTRY LAND PATTERN.

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