Features

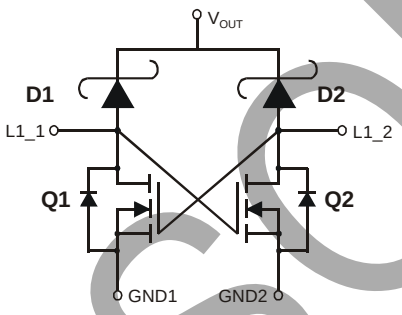
- Dual 30V N-Channel MOSFETs (Q1, Q2) with Dual 3.0A Super Barrier Rectifier Diodes (D1, D2) packaged in a 4.0 x 4.0 x 0.6mm DFN package
- Full-Bridge Rectifier Block
- Super Barrier Rectifiers (D1, D2)
  - Ultra low forward voltage drop
  - Patented Super Barrier Rectifier technology
  - +150°C operating temperature
  - ±8kV ESD protection (HBM, 3B)
  - ±25kV ESD protection (IEC61000-4-2 Level 4, Air Discharge)
- N-Channel MOSFET (Q1, Q2)
  - Low On-Resistance to minimize conduction loss
  - Low Gate Threshold Voltage
  - Low Input Capacitance
  - Fast Switching Speed
  - Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: U-DFN4040-8
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiPdAu over Copper Leadframe (Lead-Free Plating); Solderable per MIL-STD-202, Method 208 e4
- Terminal Connections: See Diagram
- Weight: 0.031 grams

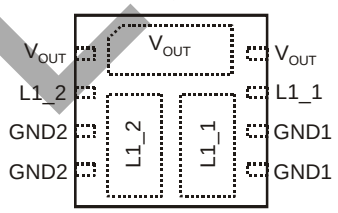
Applications

- Wireless Charging
- AC-DC Rectification
- Optimized for Power Management Applications for Portable Products



Device Schematic (Dual Channel)

U-DFN4040-8



Top View
Pin Configuration

Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
DFBR030U3LP-13	Standard	U-DFN4040-8	4,000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

U-DFN4040-8

FB302 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Digit of Year (ex: 15 for 2015)
WW = Week Code (01 to 53)

Maximum Ratings – D1, D2 (@T_A = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitance load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_{RM}	30	V
RMS Reverse Voltage	$V_{R(RMS)}$	21	V
Average Rectified Output Current (See Figure 1)	I_O	3.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	20	A

Maximum Ratings – Q1, Q2 (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Input Voltage Between Two MOSFET Drain	V_{LL}	30	V
Drain-Source Voltage	V_{DSS}	30	V
Gate-Source Voltage	V_{GSS}	±20	V
Drain Current (Note 5)	I_D	3.2	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	500	mW
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	250	°C/W
Power Dissipation (Note 6)	P_D	1000	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	125	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics – D1, D2 (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 7)	$V_{(BR)R}$	30	—	—	V	I_R = 400µA
Forward Voltage Drop	V_F	—	0.25	0.278	V	I_F = 0.1A, T_J = +25°C
		—	0.33	0.37		I_F = 1.0A, T_J = +25°C
		—	0.36	0.42		I_F = 2.0A, T_J = +25°C
		—	0.24	0.27		I_F = 0.1A, T_J = +125°C
		—	0.33	0.36		I_F = 1.0A, T_J = +125°C
		—	0.35	0.40		I_F = 2.0A, T_J = +125°C
Leakage Current (Note 7)	I_R	—	50	150	µA	V_R = 5V, T_J = +25°C
		—	100	400	µA	V_R = 30V, T_J = +25°C
		—	6	15	mA	V_R = 5V, T_J = +125°C
		—	10	20	mA	V_R = 30V, T_J = +125°C

Notes: 5. Part mounted on FR-4 board with recommended pad layout, which can be found on our website at http://www.diodes.com.
6. Part mounted on FR-4 board with 1-in sq pad layout, 2oz Cu.
7. Short duration pulse test used to minimize self-heating effect. Pulse width ≤ 300µs, duty cycle ≤ 2%.

Electrical Characteristics – Q1, Q2 (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	30	—	—	V	V_{GS} = 0V, I_D = 250μA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	220	μA	V_{DS} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±200	μA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	1	—	2.2	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	13	--	mΩ	V_{GS} = 10V, I_D = 2.0A
			17	26		V_{GS} = 10V, I_D = 3.2A
			22	--		V_{GS} = 4.5V, I_D = 2.0A
			23	32		V_{GS} = 4.5V, I_D = 3.2A
Forward Transconductance	g_{fs}	—	7	—	S	V_{DS} =15V, I_D = 2.0A
Diode Forward Voltage (Note 7)	V_{SD}	0.5	—	1.2	V	V_{GS} = 0V, I_S = 2.25A

Electrical Characteristics – DFBR030U3LP (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Rectifying Forward Voltage (Note 7)	Vfd2	—	0.45	0.56	V	Input voltage V_{LL} = ±5V; The output current of Rectifier I_{OUT} = 2A
Rectifier leakage current	Ileak	—	30	1000	μA	Input voltage V_{LL} = 16V; No Load on the Rectifier output
Rectifier Reverse leakage current	Irleak	—	20	1000	μA	Input voltage V_{LL} = 0V; The output voltage of the Rectifier V_{OUT} = 5V

Note: 7. Short duration pulse test used to minimize self-heating effect. Pulse width ≤ 300μs, duty cycle ≤ 2%.

Typical Performance Curves – D1, D2

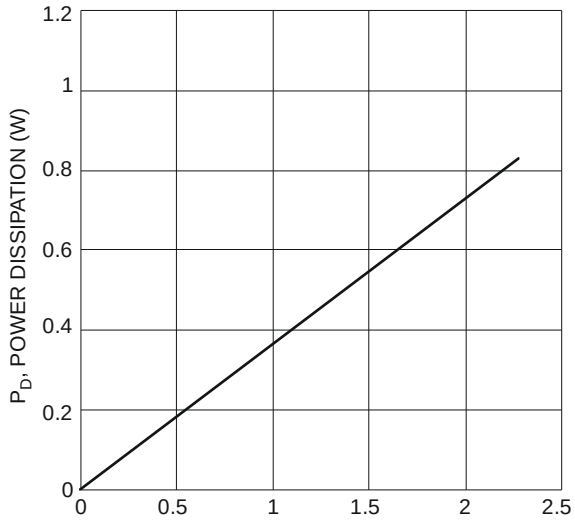


Figure 1 Forward Power Dissipation

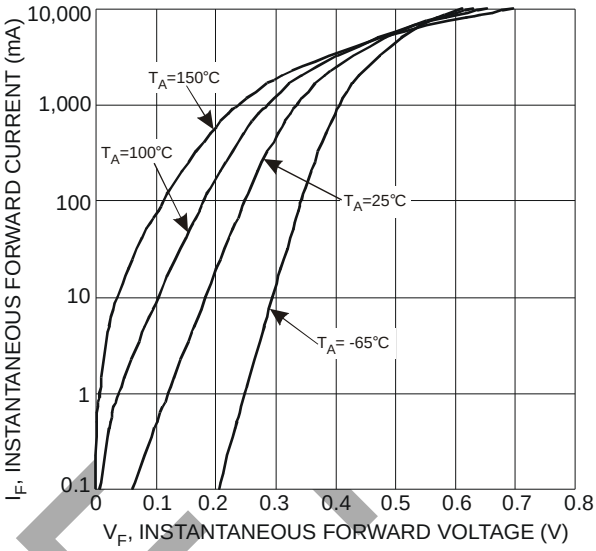


Figure 2 Typical Forward Characteristics

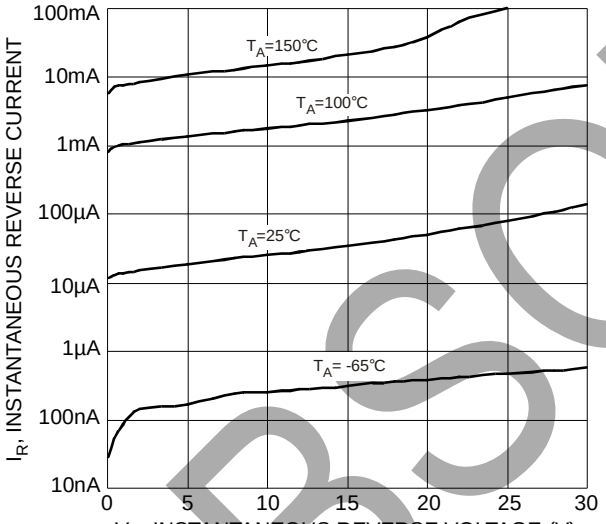


Figure 3 Typical Reverse Characteristics

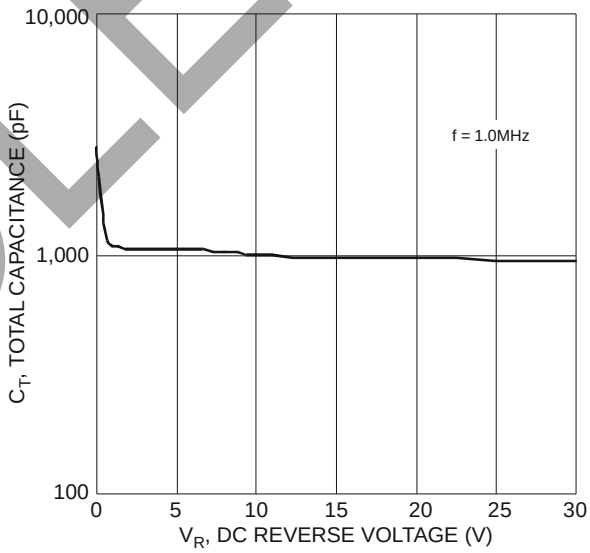


Figure 4 Total Capacitance vs. Reverse Voltage

OBSOLETE – PART DISCONTINUED

Typical Performance Curves – Q1, Q2

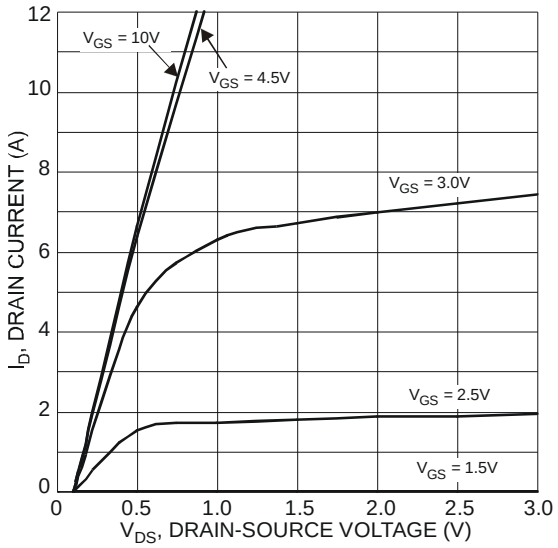


Figure 5 Typical Output Characteristics

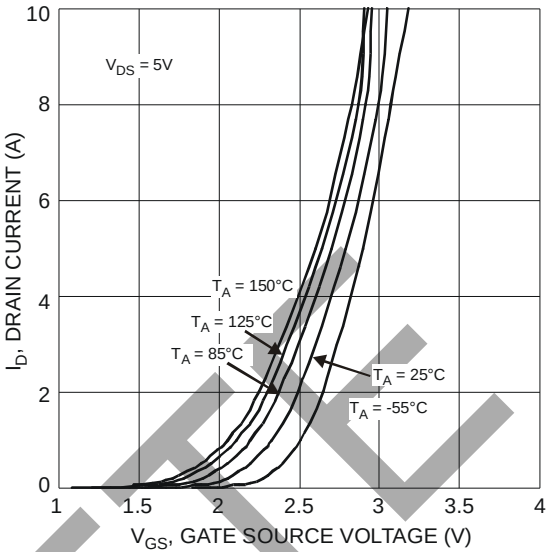


Figure 6 Typical Transfer Characteristics

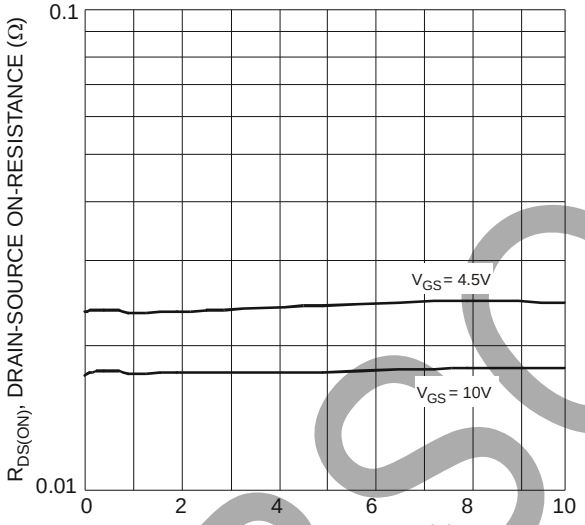


Figure 7 Typical On-Resistance vs. Drain Current and Gate Voltage

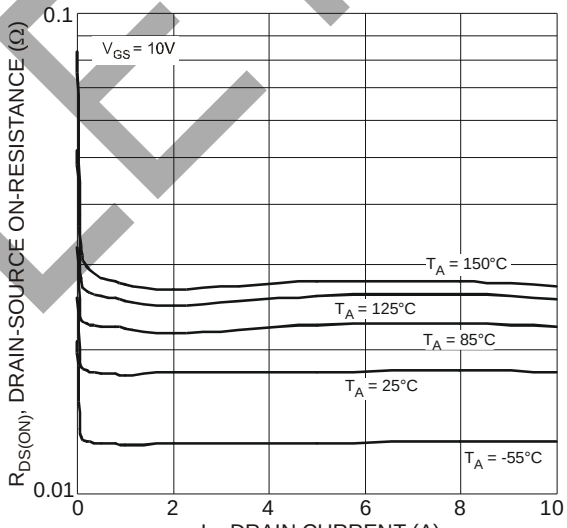


Figure 8 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

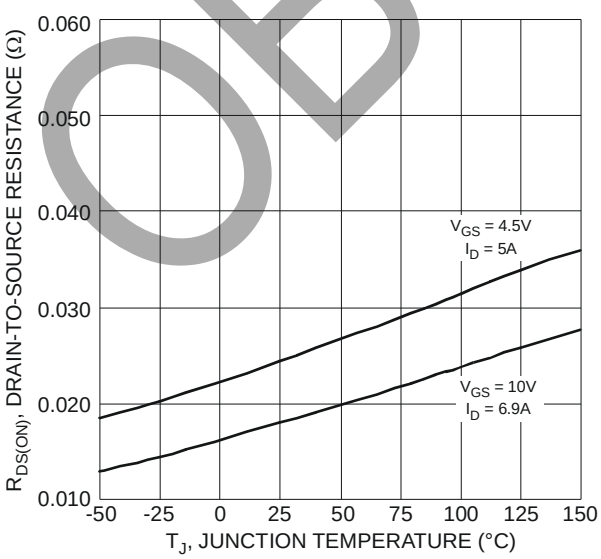


Figure 9 On-Resistance Variation with Temperature

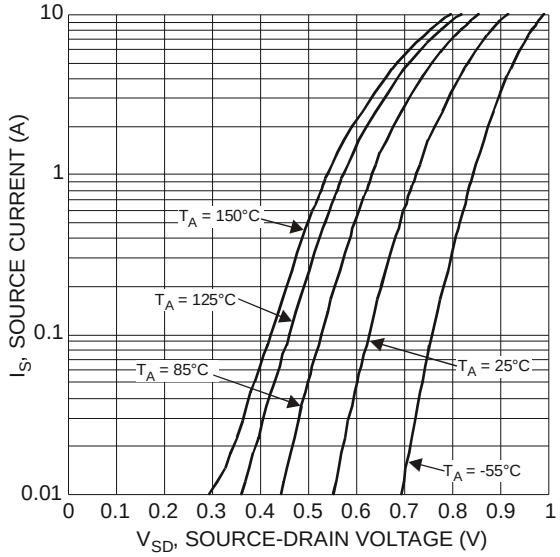


Figure 10 Diode Forward Voltage vs. Current

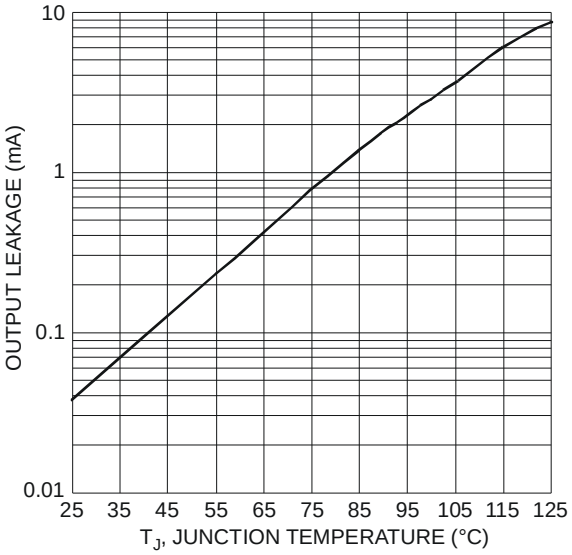


Figure 11 Output Leakage at 5V Bias vs. Junction Temperature

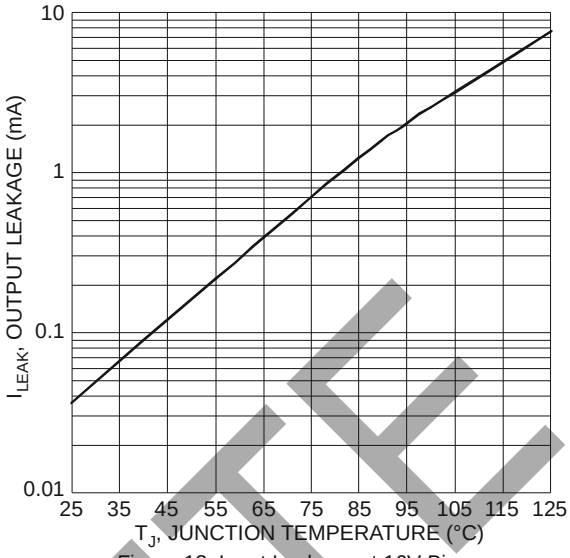


Figure 12 Input Leakage at 16V Bias vs. Junction Temperature

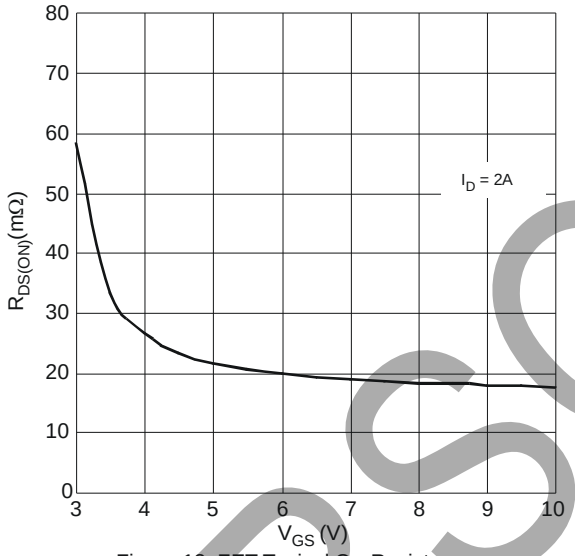


Figure 13 FET Typical On-Resistance vs. Gate-to-Source Voltage (from 3V to 10V)

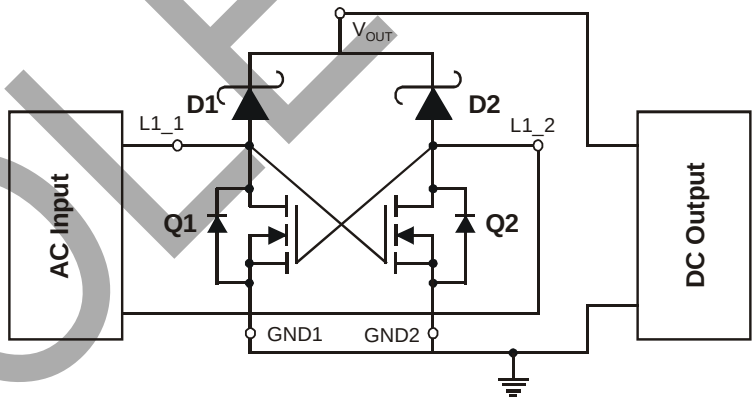
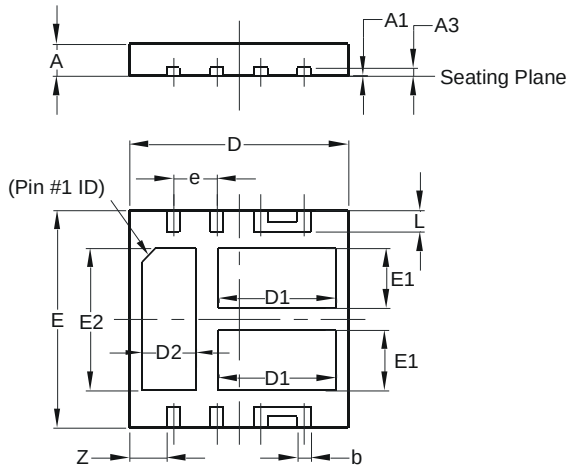


Figure 14 Typical Application Circuit
GND1 and GND2 are not internally connected.
The user should make the connection in the PCB design.

Package Outline Dimensions

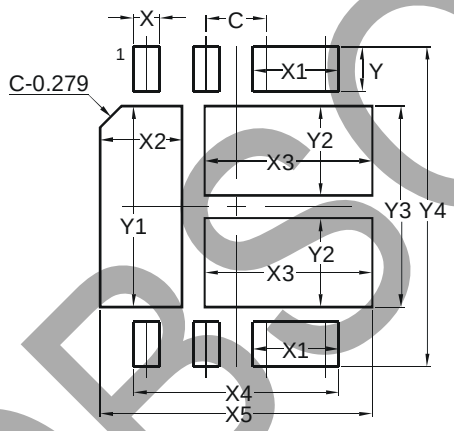
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



U-DFN4040-8			
Dim	**Min**	**Max**	**Typ**
A	0.57	0.63	0.60
A1	0	0.05	0.02
A3	-	-	0.15
b	0.20	0.30	0.25
D	3.95	4.05	4.00
D1	2.05	2.25	2.15
D2	0.90	1.10	1.00
E	3.95	4.05	4.00
E1	1.00	1.20	1.10
E2	2.50	2.70	2.60
e	-	-	0.80
L	0.35	0.45	0.40
Z	-	-	0.675
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
C	0.800
X	0.350
X1	1.150
X2	1.100
X3	2.250
X4	2.750
X5	3.650
Y	0.600
Y1	2.700
Y2	1.200
Y3	2.700
Y4	4.300

IMPORTANT NOTICE

1. DIODES INCORPORATED (Diodes) AND ITS SUBSIDIARIES MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes' products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes' products. Diodes' products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of Diodes' products for their intended applications, (c) ensuring their applications, which incorporate Diodes' products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.

3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.

4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.

5. Diodes' products are provided subject to Diodes' Standard Terms and Conditions of Sale (https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

6. Diodes' products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes' products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.

7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.

8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.

9. This Notice may be periodically updated with the most recent version available at https://www.diodes.com/about/company/terms-and-conditions/important-notice

www.diodes.com