1.0A SURFACE-MOUNT ULTRA-FAST RECTIFIER

Product Summary (@ T_A = +25°C)

V_{RRM} (V)	I_O (A)	$V_{F(MAX)}$ (V)	$I_{R(MAX)}$ (µA)
1200	1	1.7	5

Features and Benefits

- Low-Profile, Small Form Factor Package
- Low Leakage Current
- Glass Passivated Die Construction
- Ultra-Fast Recovery Time for High Efficiency
- Low Forward Voltage, Low Power Loss
- **Lead-Free Finish & RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The US1NDFQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

Description and Applications

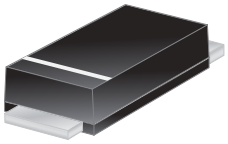
The US1NDFQ is a rectifier packaged in the low-profile D-FLAT package. Providing ultra-fast recovery time for high efficiency, this device is ideal for use in general rectification applications such as:

- Flat panel displays
- Switching power supplies/chargers
- LED lighting
- Freewheeling diodes

Mechanical Data

- Package: D-FLAT
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Polarity: Cathode Band
- Weight: 0.035 grams (Approximate)

D-FLAT



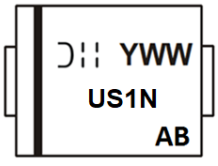
Top View

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
US1NDFQ-13	D-FLAT	10,000	Tape & Reel

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



US1N = Product Type Marking Code
= Manufacturer's Code Marking
YWW = Date Code Marking
Y = Last Digit of Year (ex: 4 for 2024)
WW = Week Code (01 to 53)
AB = Foundry and Assembly Code

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

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

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage (Note 5)	V_{RRM} V_{RWM} V_R	1200	V
RMS Reverse Voltage	$V_{R(RMS)}$	840	V
Average Rectified Output Current @T_T = +25°C	I_O	1.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine Wave Superimposed on Rated Load	I_{FSM}	30	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance, Junction to Terminal (Note 6)	$R_{\theta JT}$	44	°C/W
Typical Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	80	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage	$V_{(BR)R}$	1200	—	—	V	I_R = 10μA
Forward Voltage	V_F	— — —	1.3 1.4 1.5	1.7 1.9 2.0	V	I_F = 0.5A, T_J = +25°C I_F = 0.8A, T_J = +25°C I_F = 1A, T_J = +25°C
Reverse Leakage Current	I_R	— —	0.5 10	5 100	μA	V_R = 1200V, T_J = +25°C V_R = 1200V, T_J = +125°C
Reverse Recovery Time (Note 7)	t_{RR}	—	70	80	ns	I_F = 0.5A, I_R = 1.0A, I_{RR} = 0.25A
Total Capacitance (Note 8)	C_T	—	5	—	pF	V_R = 4V, f = 1MHz

Notes:
5. Short duration pulse test used to minimize self-heating effect.
6. Device mounted on FR-4 substrate, 1" x 1", 2oz, single-sided, PC boards with 0.1" x 0.15" copper pads.
7. Measured with I_F = 0.5A, I_R = 1.0A, I_{RR} = 0.25A. See Figure 7.
8. Measured at 1.0MHz and applied reverse voltage of 4.0V DC.
9. Device mounted on FR-4 substrate, 0.4" x 0.5", 2oz, single-sided, PC boards with 0.2" x 0.25" copper pads.

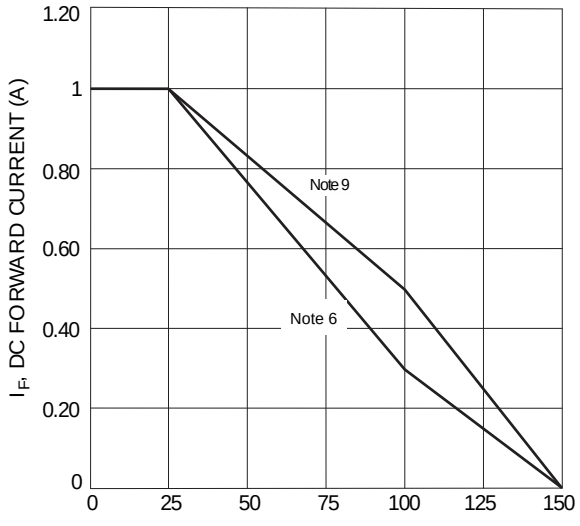


Figure 1 Forward Current Derating

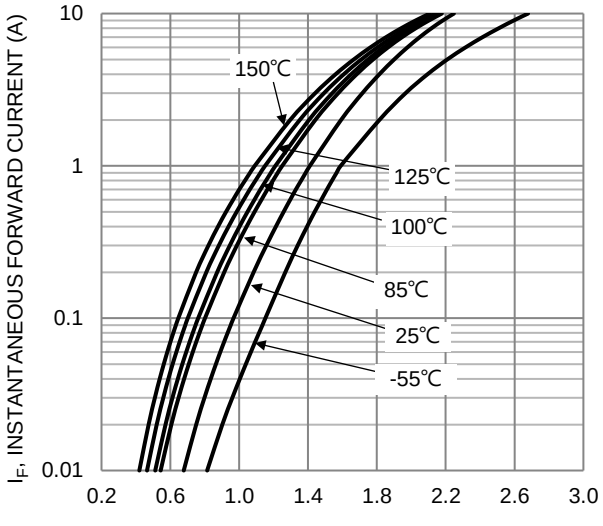


Figure 2. Typical Forward Characteristics

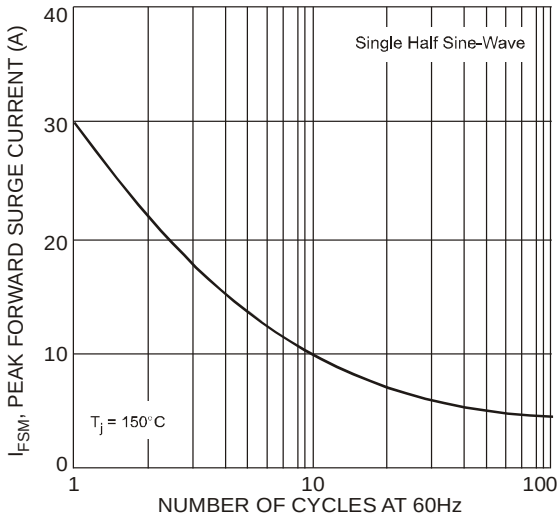


Figure 3. Forward Surge Current Derating Curve

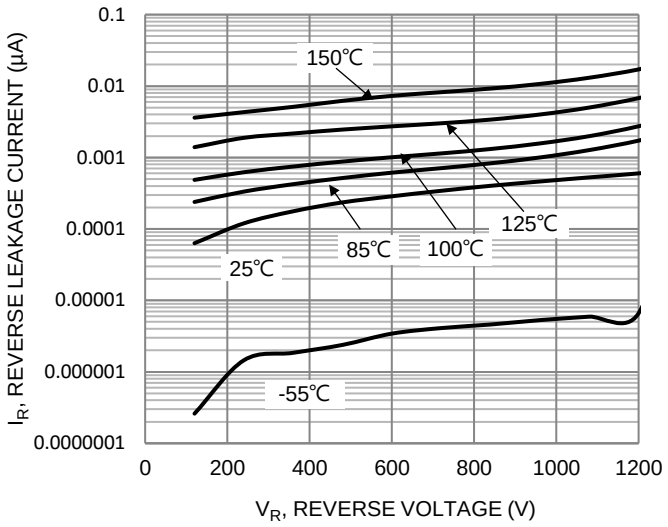


Figure 4. Typical Reverse Characteristics

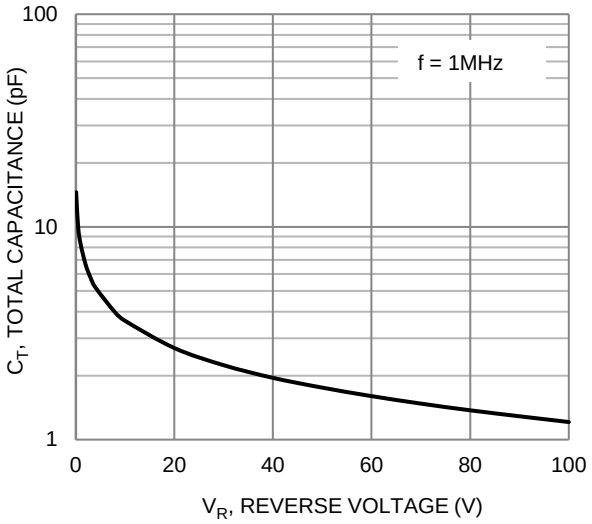


Figure 5. Typical Total Capacitance

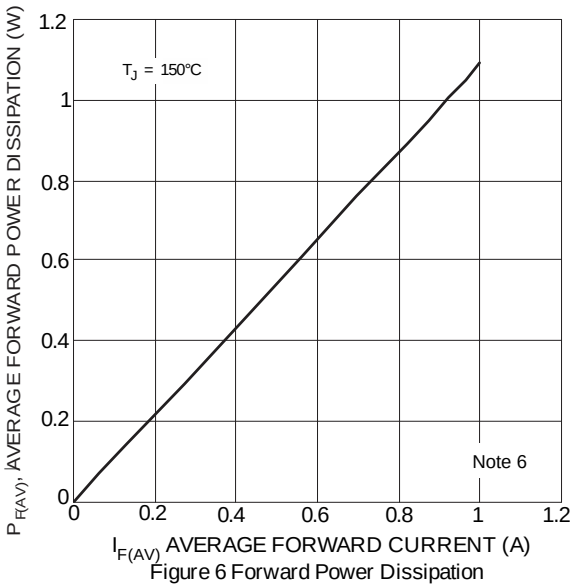
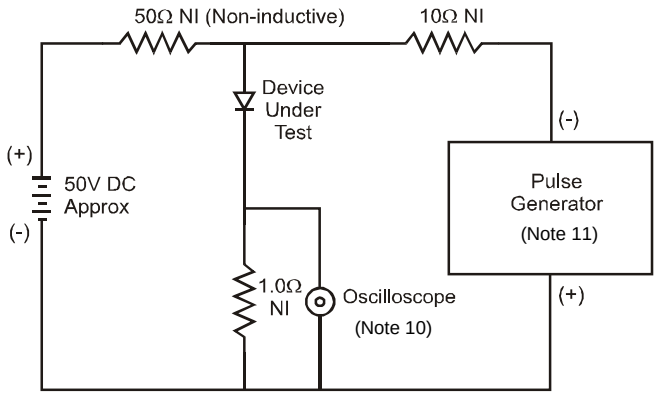


Figure 6 Forward Power Dissipation



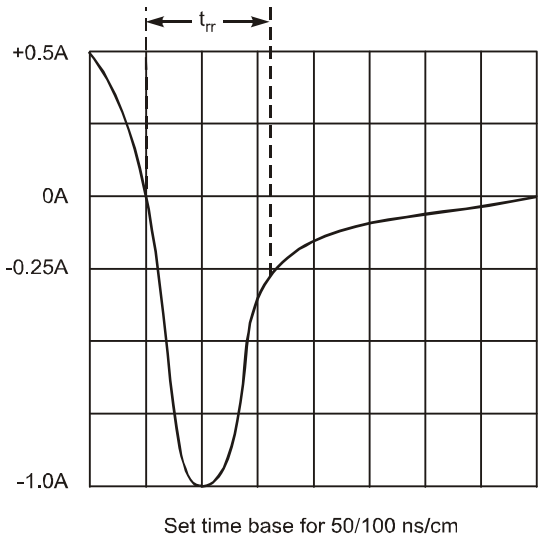


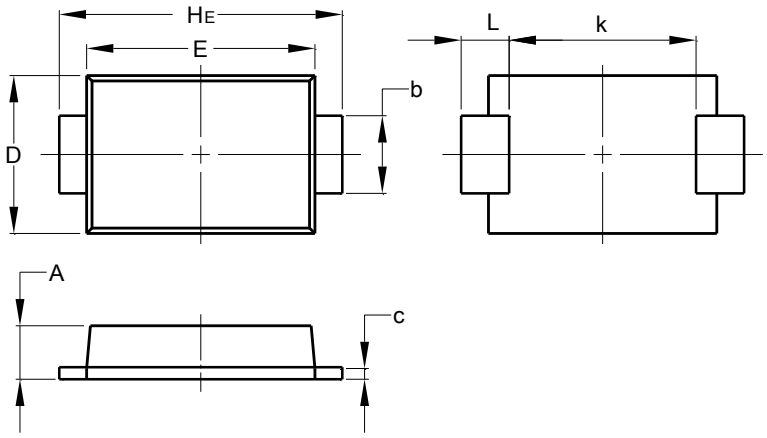
Figure 7. Reverse Recovery Time Characteristic and Test Circuit

Notes: 10. Rise time = 7.0ns max. Input impedance = 1.0MΩ, 22pF.
11. Rise time = 10ns max. Input impedance = 50Ω.

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

D-FLAT

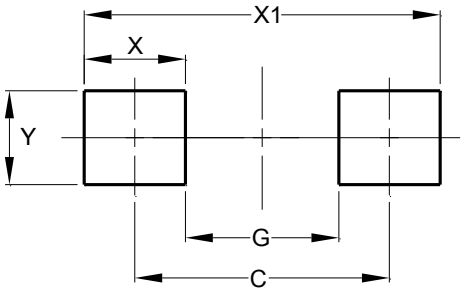


D-FLAT		
Dim	**Min**	**Max**
A	0.90	1.10
b	1.25	1.65
c	0.10	0.40
D	2.25	2.95
E	3.95	4.60
k	2.80	-
H_E	5.00	5.60
L	0.50	1.30
All Dimensions in mm		

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

D-FLAT



Dimensions	Value (in mm)
C	4.65
G	2.80
X	1.85
X1	6.50
Y	1.70

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