Product Summary

$V_{BR\ (min)}$	$I_{PP\ (max)}$	$I_{R\ (max)}$
28V & 6V	9.5A & 3.5A	50nA

Description

This new generation TVS is designed to protect sensitive electronics from the damage due to ESD. The combination of small size and high ESD surge capability makes it ideal for use in portable applications such as cellular phones, digital cameras, and MP3 players.

Applications

- Cellular Handsets
- Portable Electronics
- Computers and Peripheral

Features

- Low Profile Package (0.605mm max) and Ultra-small PCB Footprint Area (2.05 * 2.05mm max) Suitable for Compact Portable Electronics
- 3 Bi-directional Channels and 1 VBUS of ESD protection
- Typically Used at High Speed Ports such as USB 2.0 OTG
- Low Channel Input Capacitance of 0.4pF Typical for I/Os
- High Surge Ipp up to 9.5A(10x1000 µs) for VBUS
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

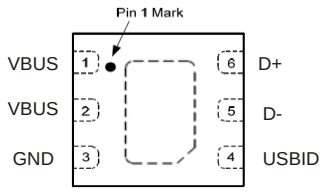
Mechanical Data

- Case: U-DFN2020-6
- 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; Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.0065 grams (Approximate)

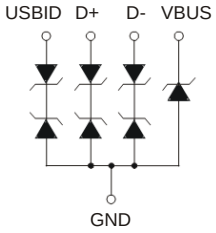
DFN2020-6

Pin #	Description
1, 2	VBUS
4, 5, 6	I/Os
3	Ground
Center Tab	Ground

Pin Description



Top View



Schematic

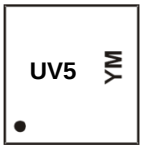
Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
D5V0F3B6LP20-7	Standard	UV5	7	12	3,000/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

DFN2020-6



UV5 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: B = 2014)
M = Month (ex: 9 = September)

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

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current, VBUS Pin	I_{PP1}	9.5	A	10/1000µs
ESD Protection – Contact Discharge, VBUS Pin	$V_{ESD\_Contact}$	±30	kV	Standard IEC 61000-4-2
ESD Protection – Air Discharge, VBUS Pin	V_{ESD_Air}	±30	kV	Standard IEC 61000-4-2

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

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current, I/O Pins	I_{PP}	3.5	A	8/20µs
ESD Protection – Contact Discharge, I/O Pins	$V_{ESD\_Contact}$	±8	kV	Standard IEC 61000-4-2
ESD Protection – Air Discharge, I/O Pins	V_{ESD_Air}	±15	kV	Standard IEC 61000-4-2

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	500	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	250	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Standoff Voltage	V_{RWM}	—	—	26	V	—
Channel Leakage Current (Note 6)	I_{RM}	—	—	50	nA	V_{RWM} = 26V
Forward Voltage	V_F	0.6	0.8	1.2	V	I_R = 10mA
Clamping Voltage	V_{CL}	—	—	40	V	I_{PP} = 9.5A, t_p = 10/1000µS
Breakdown Voltage	V_{BR}	28	—	31.9	V	I_R = 1mA
Channel Input Capacitance	C_T	—	630	—	pF	V_R = 0V, f = 1MHz

Electrical Characteristics – I/Os (@T_A = +25°C unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V_{RWM}	—	—	5.5	V	—
Reverse Current (Note 6)	I_R	—	—	50	nA	V_R = 5.5V
Reverse Breakdown Voltage	V_{BR}	6.0	—	9.95	V	I_R = 1mA
Reverse Clamping Voltage, Positive Transients (Note 7)	V_{CL}	—	12	14	V	I_{PP} = 1A, t_p = 8/20µs
Dynamic Resistance	R_{DYN}	—	1.0	—	Ω	I_R = 1A, t_p = 8/20µs
Capacitance (Note 8)	C_T	—	0.4	0.5	pF	V_R = 0V, f = 1MHz, VBUS = 26V

Notes:
5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes, Inc. suggested pad layout AP02001, which can be found on our website at http://www.diodes.com.
6. Short duration pulse test used to minimize self-heating effect.
7. Clamping voltage value is based on an 8x20µs peak pulse current (I_{pp}) waveform.
8. Measured from any I/O to GND.
9. For information on the impact of Diodes' USB 2.0 compatible ESD protectors on signal integrity including eye diagram plots, please refer to AN77 at the following URL: http://www.diodes.com/destools/appnote_dnote.html.

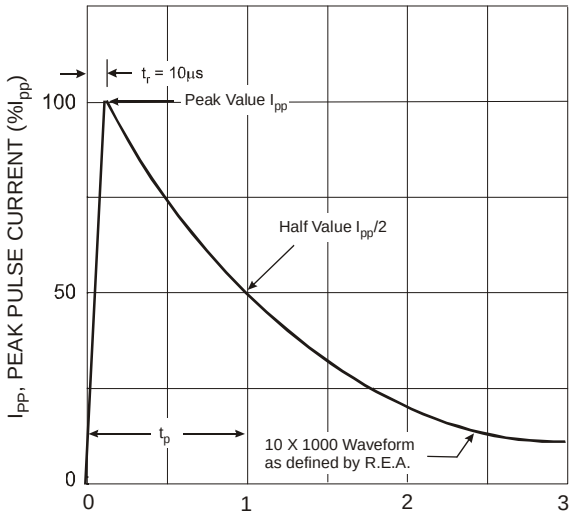


Figure 1 Pulse Waveform

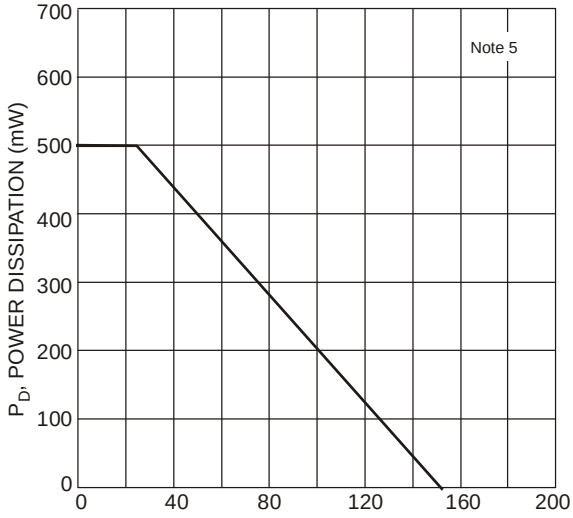


Figure 2 Power Derating Curve

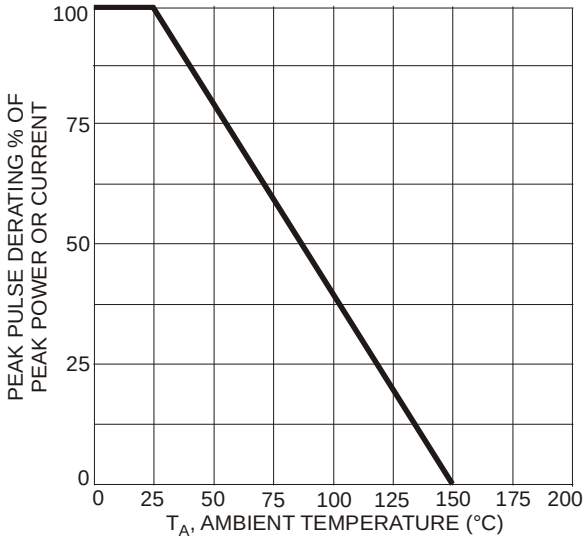


Figure 3 Power Dissipation vs. Ambient Temperature

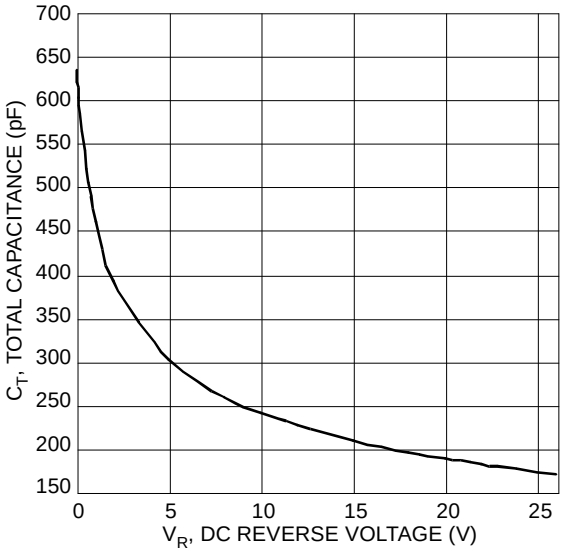


Figure 4 Typical Total Capacitance, VBUS

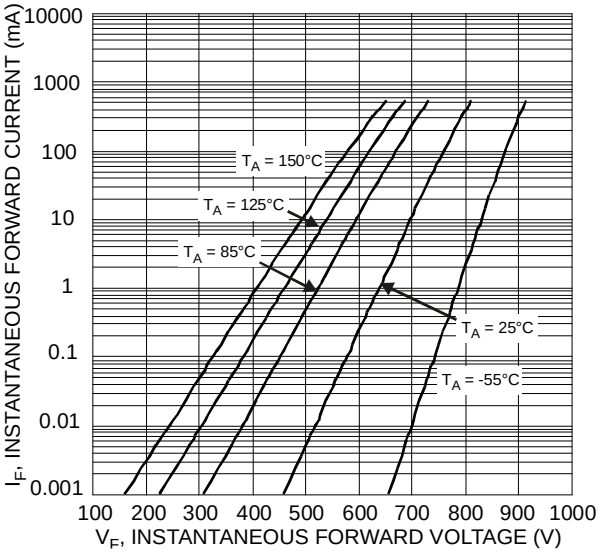


Figure 5 Typical Forward Characteristics, VBUS

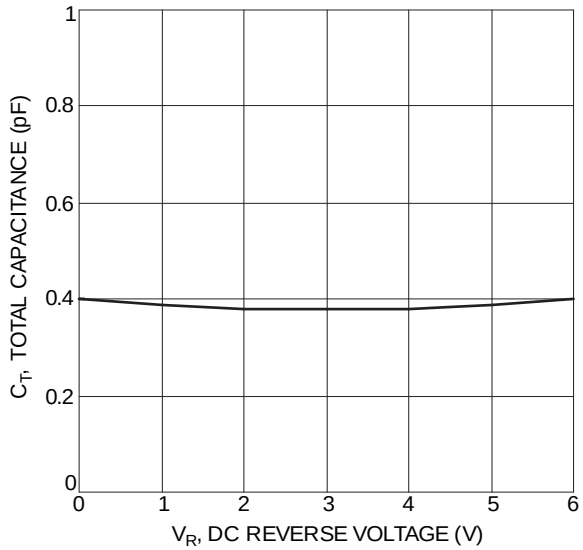
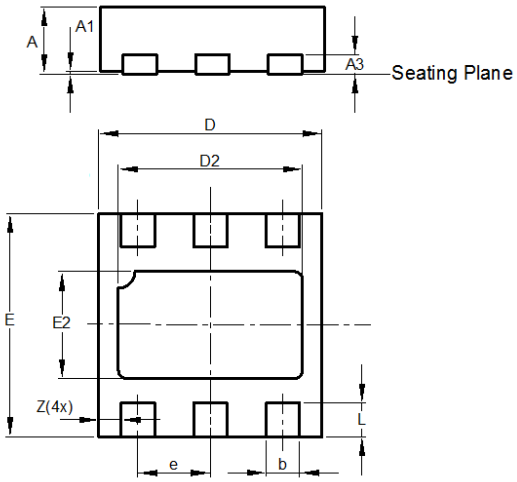


Figure 6 Typical Total Capacitance, I/Os

Package Outline Dimensions

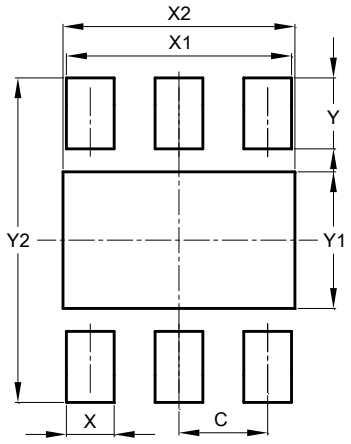
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



U-DFN2020-6 (TYPE C)			
Dim	**Min**	**Max**	**Typ**
A	0.57	0.63	0.60
A1	0.00	0.05	0.02
A3	—	—	0.15
b	0.25	0.35	0.30
D	1.95	2.075	2.00
D2	1.55	1.75	1.65
E	1.95	2.075	2.00
E2	0.86	1.06	0.96
e	—	—	0.65
L	0.25	0.35	0.30
Z	—	—	0.20
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	0.650
X	0.350
X1	1.650
X2	1.700
Y	0.525
Y1	1.010
Y2	2.400

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