

## Features

- IEC 61000-4-2 (ESD): Air  $\pm 30\text{kV}$ , Contact  $\pm 25\text{kV}$
- 2 Channels of ESD Protection
- Low Channel Input Capacitance of 0.85pF Typical
- Typically Used at High Speed Ports such as USB 2.0, IEEE1394, Serial ATA, DVI™, HDMI™, PCI™
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The D1213A-02WLQ is suitable for automotive applications requiring specific change control; This part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

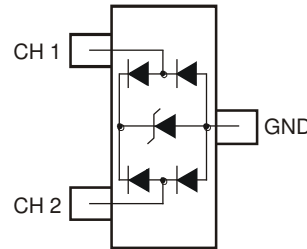
## Mechanical Data

- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.006 grams (Approximate)

### SOT323



Top View



Device Schematic

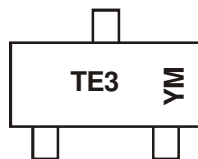
## Ordering Information (Note 4)

Part Number	Case	Packaging
D1213A-02WLQ-7	SOT323	3,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  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

### SOT323



TE3 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: H = 2020)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	H	I	J	K	L	M	N	O	P	R	S	T

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

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**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current (Note 7)	I <sub>PP</sub>	5	A	8/20μs, Per Figure 3
ESD Protection – Contact Discharge	V <sub>ESD_Contact</sub>	±25	kV	Standard IEC 61000-4-2
ESD Protection – Air Discharge	V <sub>ESD_Air</sub>	±30	kV	Standard IEC 61000-4-2

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 5)	P <sub>D</sub>	200	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	625	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic (Note 7)	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V <sub>RWM</sub>	—	3.3	5.5	V	—
Reverse Current (Note 6)	I <sub>R</sub>	—	0.1	1.0	μA	V <sub>R</sub> = V <sub>RWM</sub> = 5.5V
Reverse Breakdown Voltage	V <sub>BR</sub>	6.0	—	—	V	I <sub>R</sub> = 1mA
Forward Voltage	V <sub>F</sub>	0.6	0.8	0.95	V	I <sub>F</sub> = 8mA
Reverse Clamping Voltage, Positive Transients	V <sub>CL1</sub>	—	10.0	—	V	I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20μs
Reverse Clamping Voltage, Negative Transients	V <sub>CL2</sub>	—	-1.7	—	V	I <sub>PP</sub> = -1A, t <sub>p</sub> = 8/20μs
Dynamic Resistance	R <sub>DYN</sub>	—	0.9	—	Ω	I <sub>R</sub> = 1A, t <sub>p</sub> = 8/20μs
Capacitance	C <sub>T</sub>	—	0.85	1.2	pF	V <sub>R</sub> = 1.65V, f = 1MHz

- Notes:
- Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes Incorporated's suggested pad layout, which can be found on our website at <http://www.diodes.com>.
  - Short duration pulse test used to minimize self-heating effect.
  - Measured between any channel and GND.
  - For information on the impact of Diodes Incorporated's 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](http://www.diodes.com/destools/appnote_dnote.html).

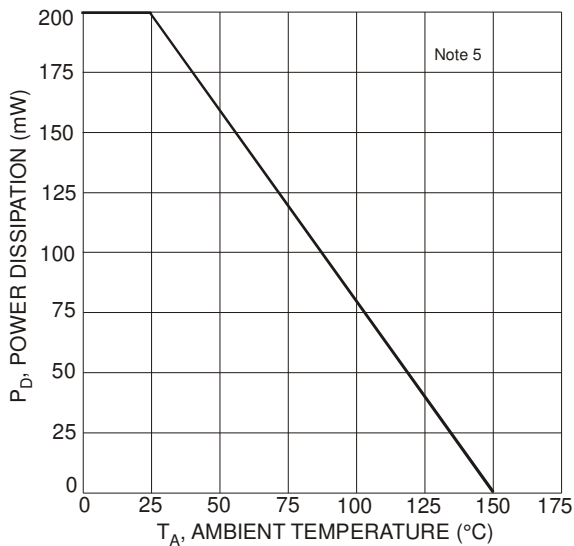


Figure 1 Power Derating Curve

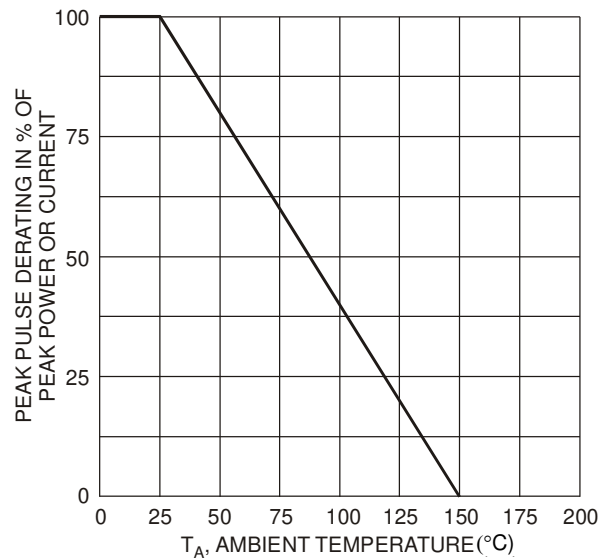
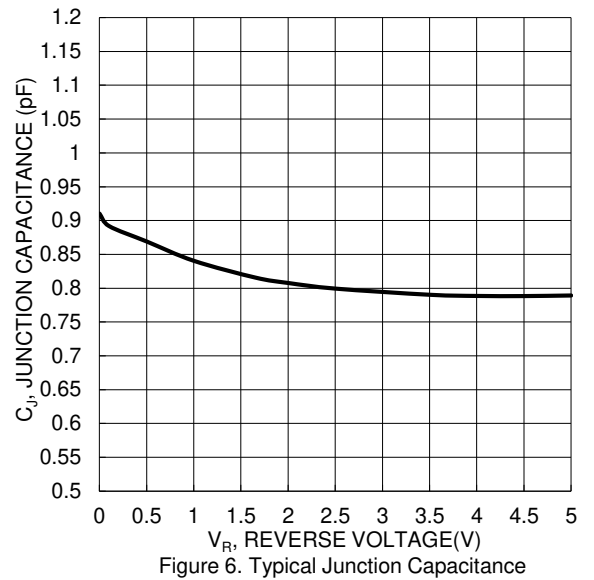
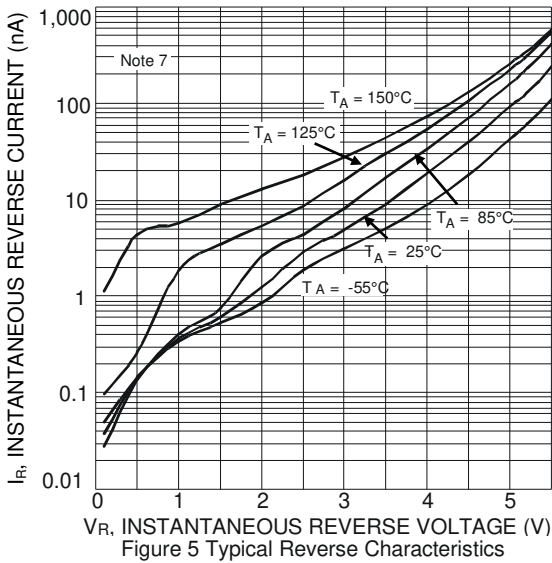
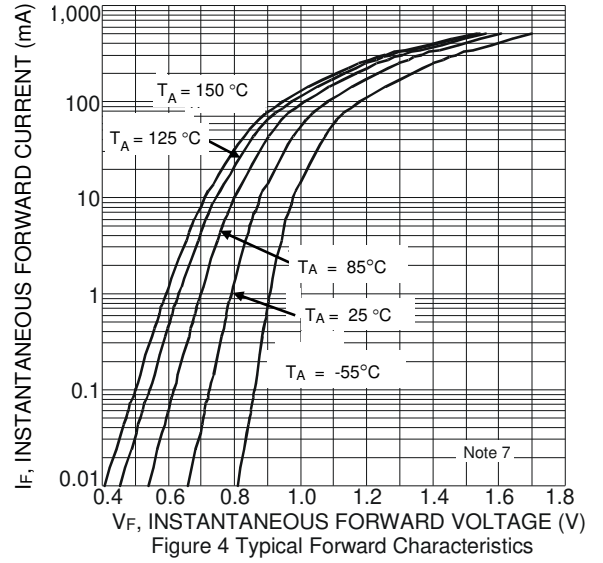
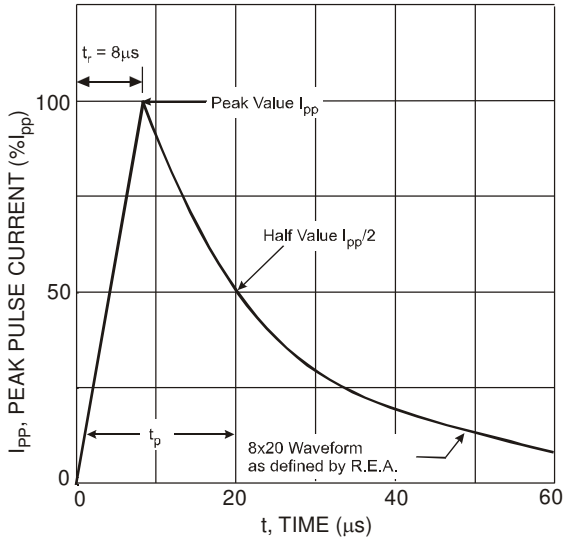


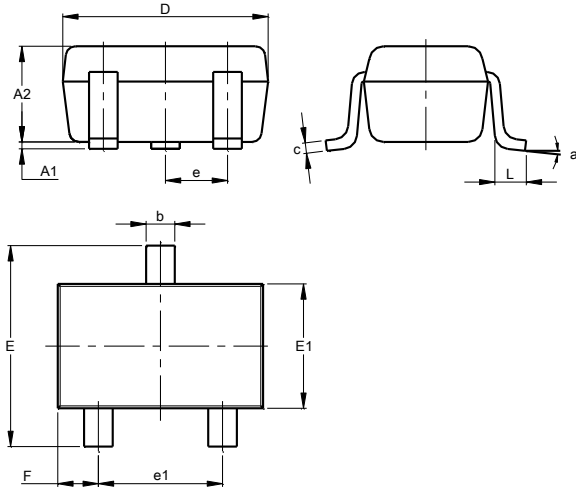
Figure 2 Pulse Derating Curve



**Package Outline Dimensions**

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

**SOT323**

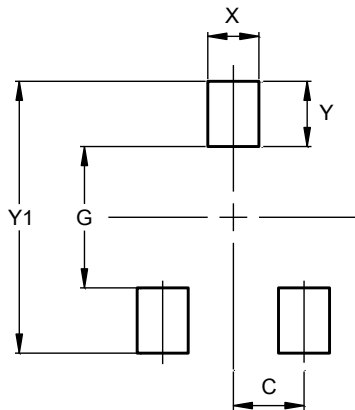


SOT323			
Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	0.95
b	0.25	0.40	0.30
c	0.10	0.18	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
e1	1.20	1.40	1.30
F	0.375	0.475	0.425
L	0.25	0.40	0.30
a	0°	8°	--
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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

**SOT323**



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.470
Y	0.600
Y1	2.500

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