

## Features

- ESD Protection >30kV (Human Body Model) (Note 1)
- Ultra-Small Surface Mount Package
- Protects 2 Data Lines
- Low Leakage <25nA
- Low Capacitance 3pF Typ.
- Protects USB 2.0 and USB 1.1
- **Lead, Halogen and Antimony Free, RoHS Compliant "Green" Device (Notes 2, 3 and 4)**

## EC Compatibility (Note 1)

- 61000-4-2 (ESD) Air-30kV Contact-30kV
- 61000-4-4 (EFT) 40A, 5/50 ns
- 61000-4-5 (Surge) 8x20µs, 20 Amperes

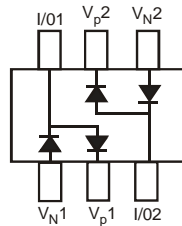
## Mechanical Data

- Case: SOT-363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Orientation: See Diagram Below
- Weight: 0.006 grams (approximate)

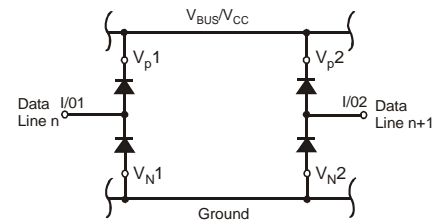
SOT-363



Top View



Internal Schematic



APPLICATION

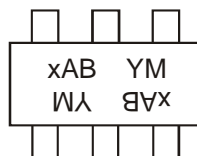
Top View

## Ordering Information (Note 5)

Part Number	Case	Packaging
SDA004-7	SOT-363	3000/Tape & Reel

- Notes:
1. Tested with  $V_P$  connected to  $V_N$  to simulate appropriate  $V_{BUS}/V_{CC}$  decoupling to ground.
  2. No purposefully added lead. Halogen and Antimony Free.
  3. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
  4. Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or  $Sb_2O_3$  Fire Retardants.
  5. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



KAB or JAB = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year ex: R = 2004  
 M = Month ex: 9 = September

### Date Code Key

Year	2004	2005	2006	2007	2008	2009	2010	2111	2012	2013	2014	2015
Code	R	S	T	U	V	W	X	Y	Z	A	B	C
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

### Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Non-Repetitive Peak Reverse Voltage	V <sub>RM</sub>	100	V
Peak Repetitive Reverse Voltage	V <sub>RPM</sub>	80	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>R</sub>		
Forward Continuous Current (Note 6)	I <sub>FM</sub>	500	mA
Repetitive Peak Forward Current @ T <sub>p</sub> = 5μs, f = 50kHz (Note 6)	I <sub>FRM</sub>	1000	mA
Non-Repetitive Peak Forward Surge Current	I <sub>FSM</sub>	20	A
@ t = 1.0μs		1.0	
Clamping Voltage @ I <sub>pp</sub> = 20A (Note 7) 8x20μs Waveform	V <sub>C</sub>	16	V

### Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P <sub>D</sub>	200	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	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	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 8)	V <sub>(BR)R</sub>	80	—	—	V	I <sub>R</sub> = 100μA
Forward Voltage	V <sub>F</sub>	0.62	—	0.72	V	I <sub>F</sub> = 5.0mA
		—		0.93		I <sub>F</sub> = 20mA
		—		1.0		I <sub>F</sub> = 100mA
		—		1.25		I <sub>F</sub> = 150mA
Reverse Current (Note 8)	I <sub>R</sub>	—	—	100	nA	V <sub>R</sub> = 70V
				50	μA	V <sub>R</sub> = 75V, T <sub>J</sub> = 150°C
				30	μA	V <sub>R</sub> = 25V, T <sub>J</sub> = 150°C
				25	nA	V <sub>R</sub> = 20V
Capacitance, Between I/O Lines (I/O1 & I/O2)	C <sub>LL</sub>	—	2.5	4.0	pF	V <sub>R</sub> = 0V, f = 1.0MHz
Capacitance Between I/O Line and Ground	C <sub>LG</sub>	—	3.3	5.3	pF	V <sub>R</sub> = 0V, f = 1.0MHz
Reverse Recovery Time	t <sub>rr</sub>	—	—	4.0	ns	V <sub>R</sub> = 6V, I <sub>F</sub> = 5mA

- Notes:
6. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com>.
  7. Referenced to V<sub>P</sub> or V<sub>N</sub>.
  8. Short duration pulse test used to minimize self-heating effect.

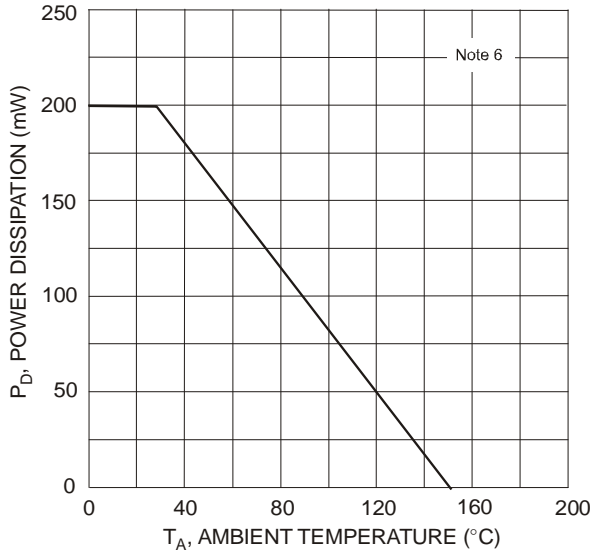


Fig. 1 Power Derating Curve, Total Package

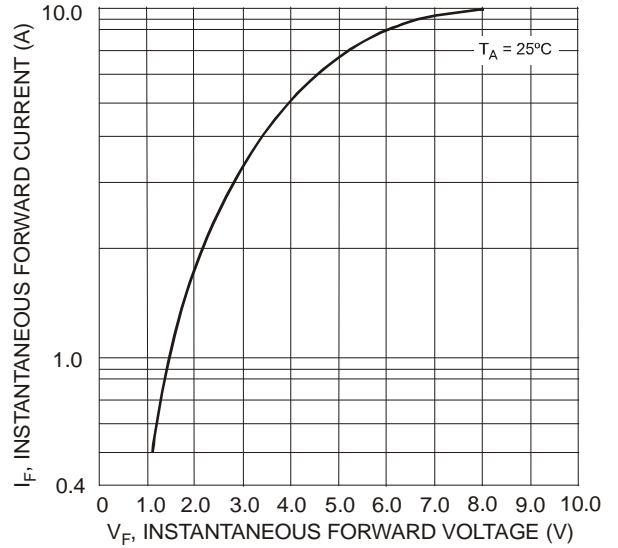


Fig. 2 Typical Forward Characteristics, High Current, Per Element

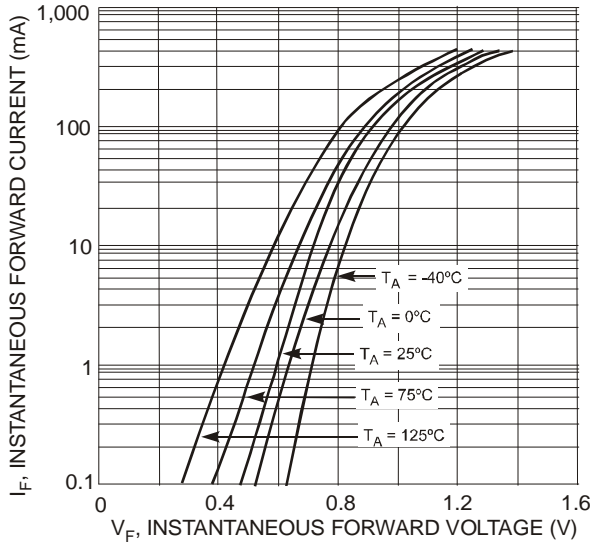


Fig. 3 Typical Forward Characteristics, Low Current, Per Element

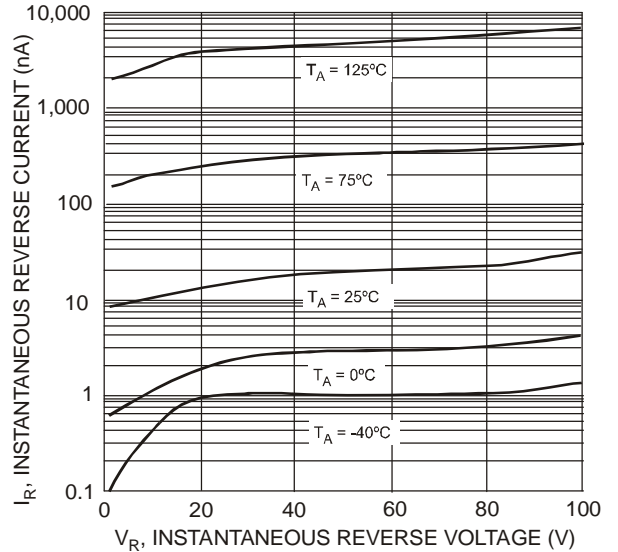


Fig. 4 Typical Reverse Characteristics, Per Element

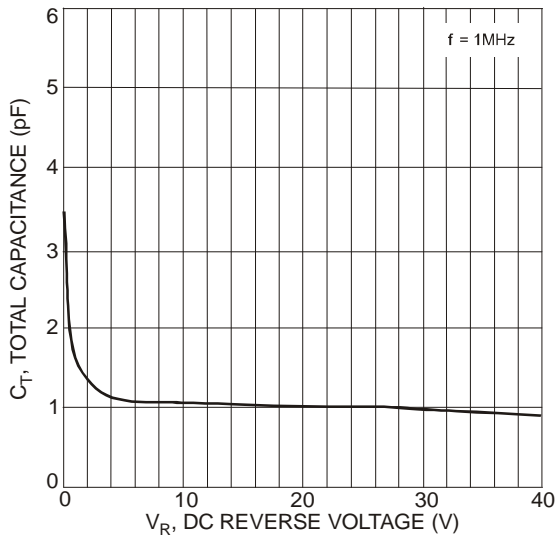


Fig. 5 Total Capacitance vs. Reverse Voltage Per Element

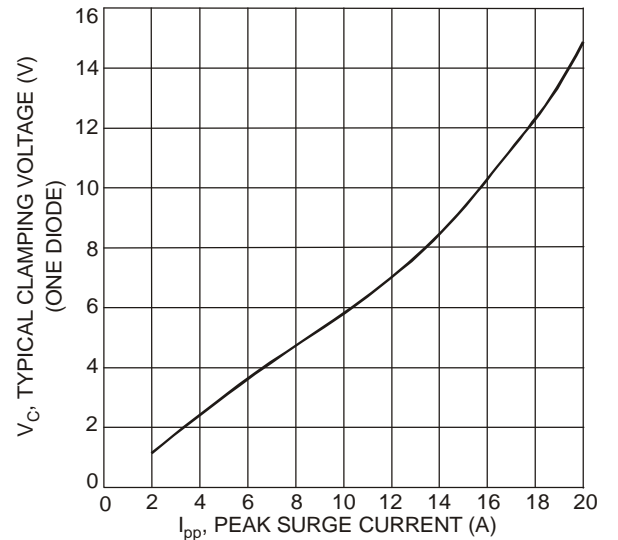
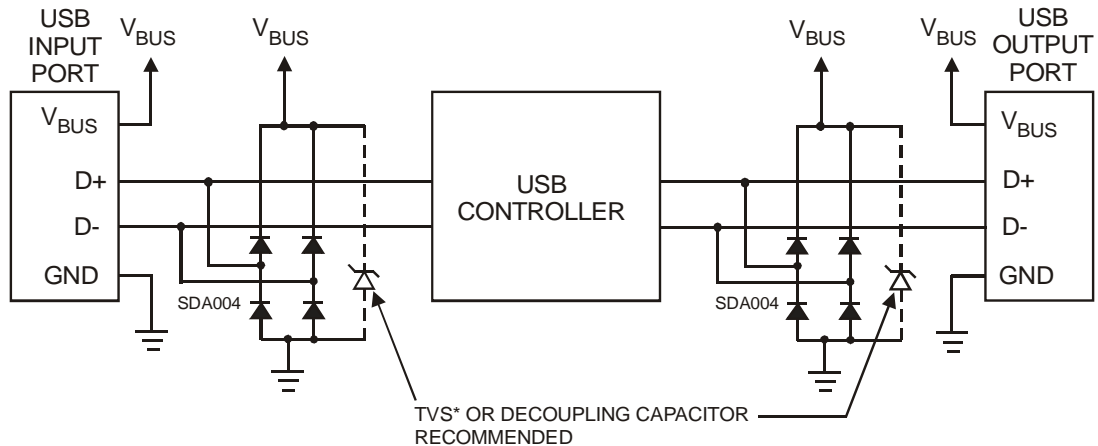


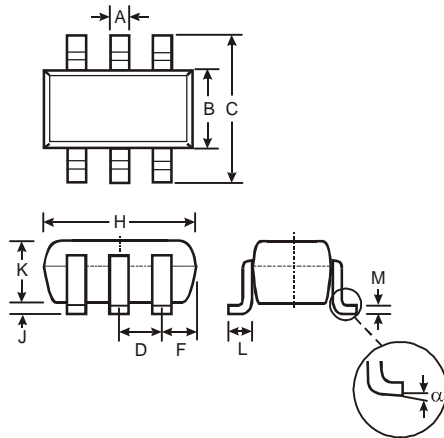
Fig. 6 6100-4-5 8x20µs Surge Response, Per Element



\* MMBZ6V8AL OR EQUIVALENT

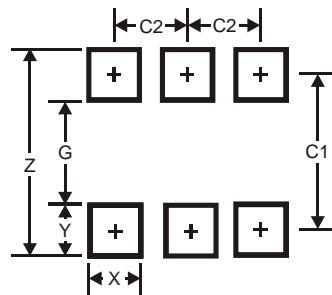
**ESD PROTECTION - USB APPLICATION**

**Package Outline Dimensions**



SOT-363		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Typ	
F	0.40	0.45
H	1.80	2.20
J	0	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.22
α	0°	8°
All Dimensions in mm		

**Suggested Pad Layout**



Dimensions	Value (in mm)
Z	2.5
G	1.3
X	0.42
Y	0.6
C1	1.9
C2	0.65

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