SDA004

DATA BUS TRANSIENT SUPPRESSOR

Features

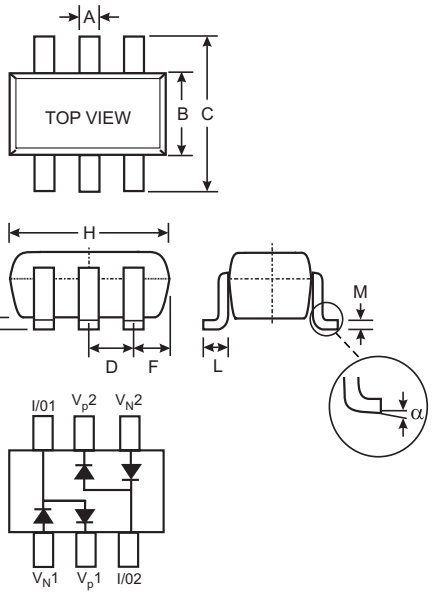
- ESD Protection >30kV (Human Body Model) (Note 1)
- Ultra-Small Surface Mount Package
- Protects 2 Data Lines
- Low Leakage <25nA
- Low Capacitance 3pF Typ.
- Protects USB 2.0 and USB 1.1
- **Lead Free by Design/RoHS Compliant (Note 4)**

IEC Compatibility (Note 1)

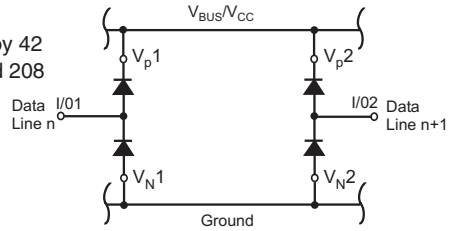
- 61000-4-2 (ESD) Air-30kV Contact-30kV
- 61000-4-4 (EFT) 40A, 5/50 ns
- 61000-4-5 (Surge) 8x20μs, 20 Amperes

Mechanical Data

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



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



APPLICATION

Maximum Ratings @ T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Non-Repetitive Peak Reverse Voltage	V_{RM}	100	V
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	80	V
Forward Continuous Current (Note 2)	I_{FM}	500	mA
Repetitive Peak Forward Current @ T_p = 5μs, f = 50kHz (Note 2)	I_{FRM}	1000	mA
Non-Repetitive Peak Forward Surge Current @ t = 1.0μs @ t = 1.0s	I_{FSM}	20 2.0	A
Clamping Voltage (Note 3) @ I_{pp} = 20A 8x20μs Waveform	V_C	16	V
Power Dissipation (Note 2)	P_d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 2)	$R_{\theta JA}$	625	°C/W
Operating and Storage Temperature Range	T_j , T_{STG}	-65 to +150	°C

Notes:
1. Tested with V_P connected to V_N to simulate appropriate V_{BUS}/V_{CC} decoupling to ground.
2. 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/datasheets/ap02001.pdf.
3. Referenced to V_p or V_N.
4. No purposefully added lead.

Electrical Characteristics @ $T_A = 25°C$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 5)	$V_{(BR)R}$	80	—	—	V	$I_R = 100\mu A$
Forward Voltage	V_F	0.62 — — —	—	0.72 0.93 1.0 1.25	V	$I_F = 5.0mA$ $I_F = 20mA$ $I_F = 100mA$ $I_F = 150mA$
Reverse Current (Note 5)	I_R	—	—	100 50 30 25	nA μA μA nA	$V_R = 70V$ $V_R = 75V$, $T_j = 150°C$ $V_R = 25V$, $T_j = 150°C$ $V_R = 20V$
Capacitance, Between I/O Lines (I/O1 & I/O2)	C_{LL}	—	2.5	4.0	pF	$V_R = 0V$, f = 1.0MHz
Capacitance Between I/O Line and Ground	C_{LG}	—	3.3	5.3	pF	$V_R = 0V$, f = 1.0MHz
Reverse Recovery Time	t_{rr}	—	—	4.0	ns	$V_R = 6V$, $I_F = 5mA$

Notes: 5. Short duration test pulse used to minimize self-heating effect.

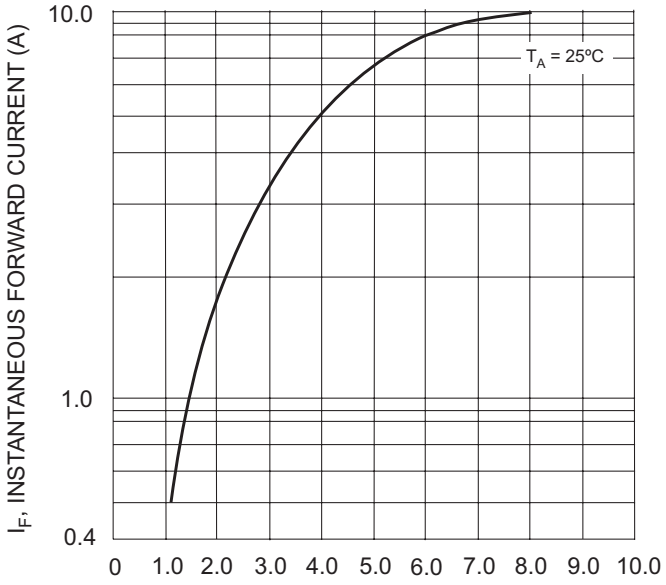


Fig. 1 Typical Forward Characteristics, High Current

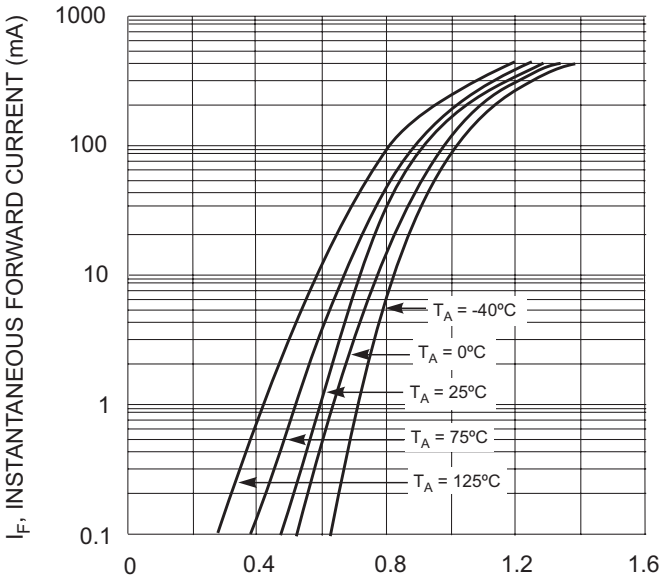


Fig. 2 Typical Forward Characteristics, Low Current

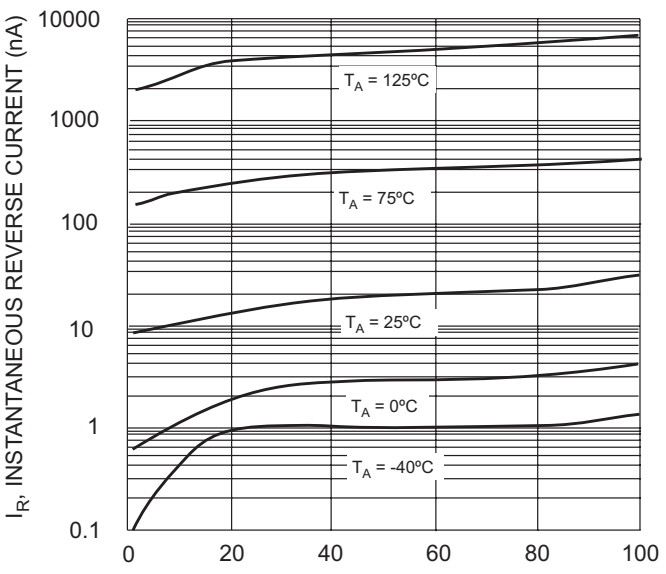


Fig. 3 Typical Reverse Characteristics

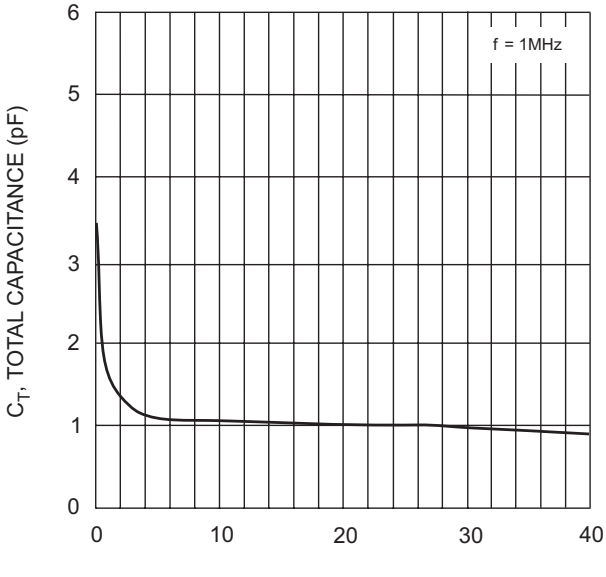


Fig. 4 Typical Capacitance vs. Reverse Voltage
One Diode Element

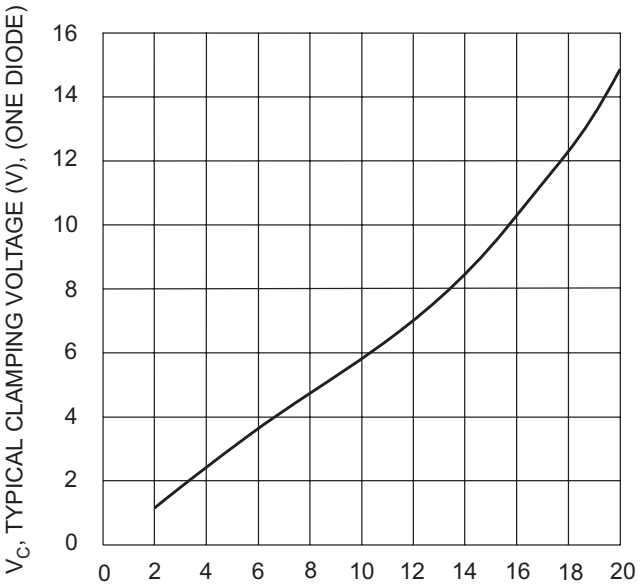


Fig. 5 61000-4-5 8x20μs Lightning Surge Response

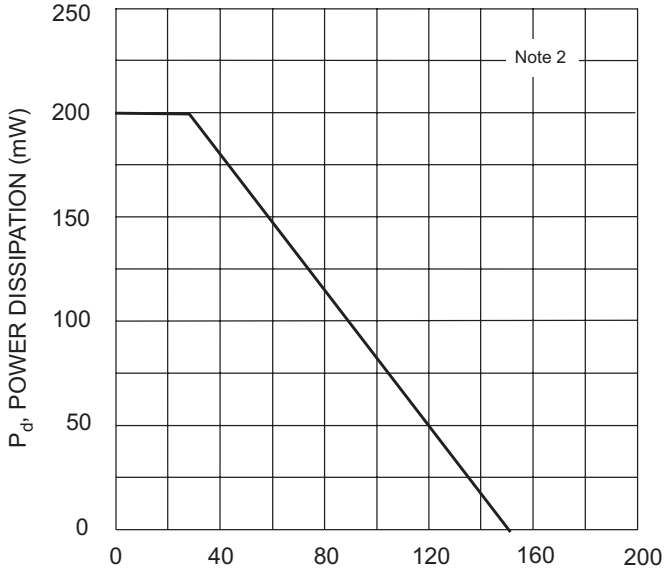
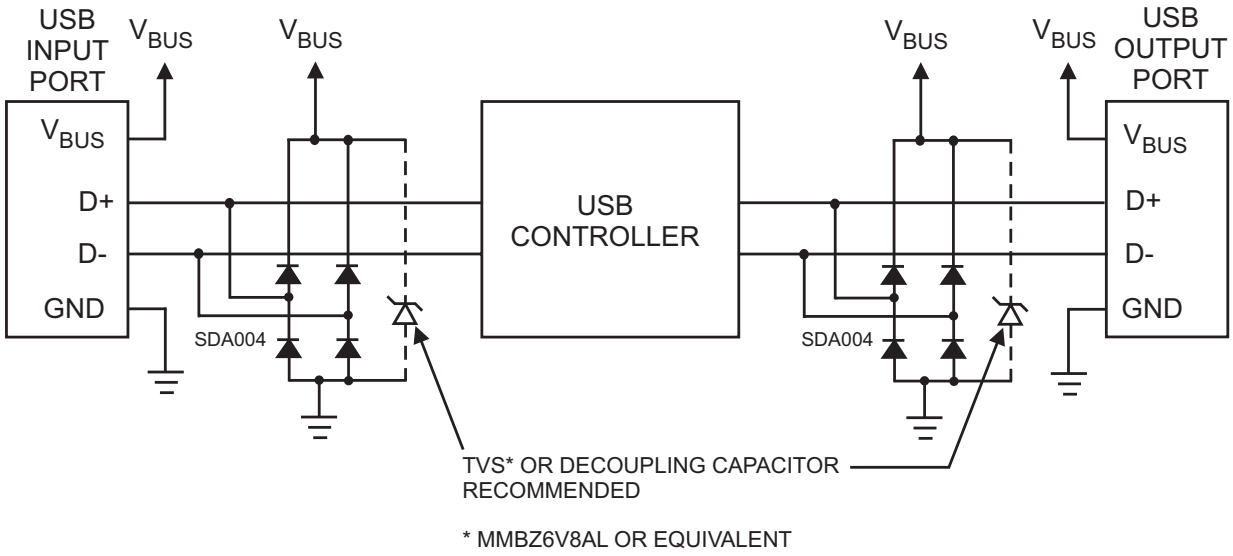


Fig. 6 Power Derating Curve, Total Package



* MMBZ6V8AL OR EQUIVALENT

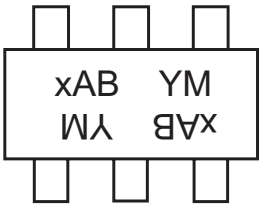
ESD PROTECTION - USB APPLICATION

Ordering Information (Note 6)

Device	Packaging	Shipping
SDA004-7	SOT-363	3000/Tape & Reel

Notes: 6. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



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

SOT-363

Date Code Key

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	R	S	T	U	V	W	X	Y	Z

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