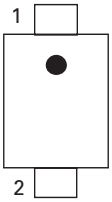
RoHS Pb GREEN SP1003 Lead-Free/Green Series

Description

Zener diodes fabricated in a proprietary silicon avalanche technology protect each I/O pin to provide a high level of protection for electronic equipment that may experience destructive electrostatic discharges (ESD). These robust diodes can safely absorb repetitive ESD strikes at ±25kV (contact discharge, IEC 61000-4-2) without performance degradation. Additionally, each diode can safely dissipate 7A of 8/20µs surge current (IEC61000-4-5) with very low clamping voltages.

Pinout



Features

- ESD, IEC61000-4-2, ±25kV contact, ±30kV air
- EFT, IEC61000-4-4, 40A (5/50ns)
- Lightning, IEC61000-4-5, 7A (8/20µs)
- Low leakage current of 1µA (MAX) at 5V
- Tiny SOD723 package saves board space
- Fits solder footprint of industry standard 0402 (1005) devices

Functional Block Diagram

Applications

- Mobile phones
- Smart phones
- PDAs
- Portable navigation devices
- Digital cameras
- Portable medical devices

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current (t_p=8/20μs)	7.0	A
T_{OP}	Operating Temperature	-40 to 85	°C
T_{STOR}	Storage Temperature	-60 to 150	°C

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

Thermal Information

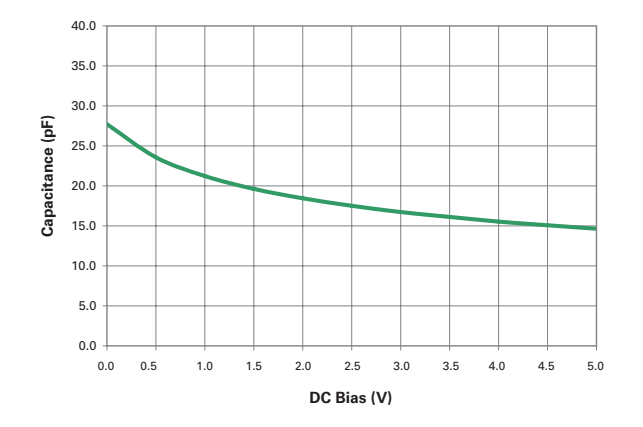
Parameter	Rating	Units
Storage Temperature Range	-65 to 150	°C
Maximum Junction Temperature	150	°C
Maximum Lead Temperature (Soldering 10s)	260	°C

Electrical Characteristics (T_{OP}=25°C)

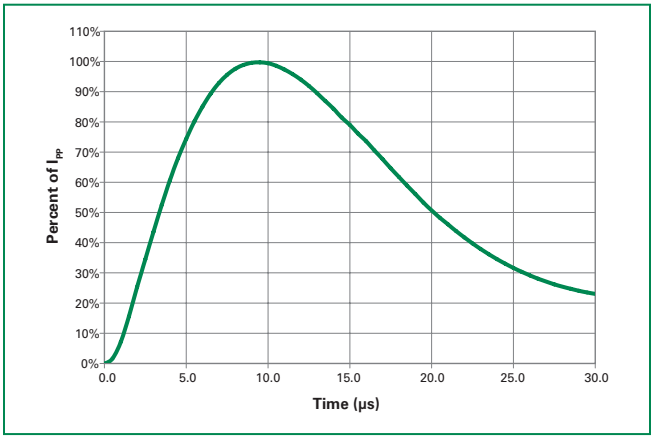
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Forward Voltage Drop	V_F	I_F = 10mA		0.8	1.2	V
Reverse Voltage Drop	V_R	I_R=1mA	6.0	7.0	8.0	V
Reverse Standoff Voltage	V_{RWM}	I_R≤1μA			5.0	V
Reverse Leakage Current	I_{LEAK}	V_R=5V			1	μA
Clamp Voltage @ MAX I_{PP}[1]	V_C	t_p=8/20μs (IEC61000-4-5)		12.5		V
ESD Withstand Voltage[1]	V_{ESD}	IEC61000-4-2 (Contact Discharge)	±25			kV
		IEC61000-4-2 (Air Discharge)	±30			kV
Diode Capacitance[1]	C_D	Reverse Bias=0V		30		pF

Note: [1] Parameter is guaranteed by design and/or device characterization.

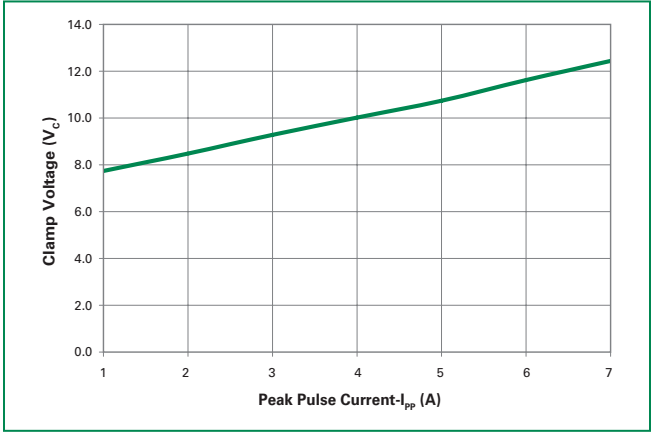
Capacitance vs. Reverse Bias



Pulse Waveform

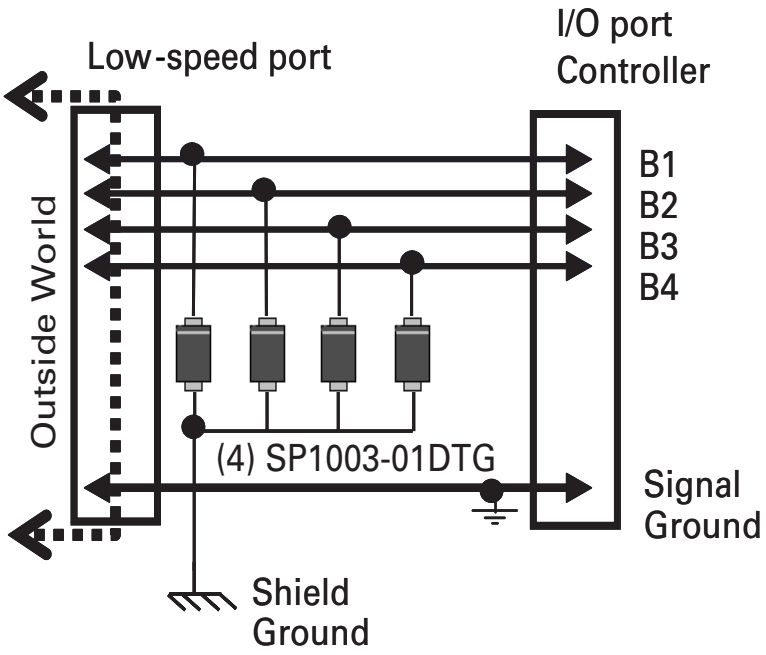


Clamping Voltage vs. I_{PP}



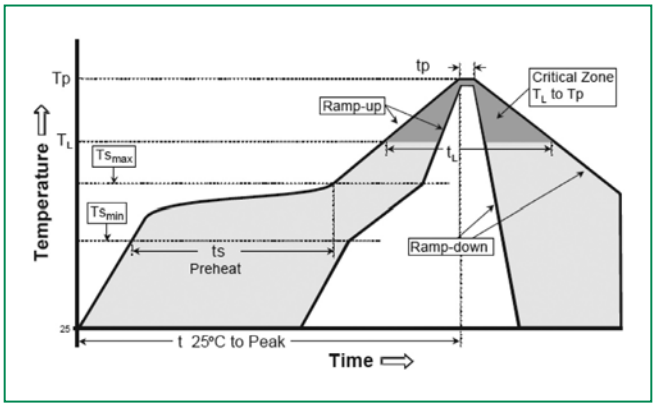
Application Example

Dx: SP1003-01DTG Discrete Diodes

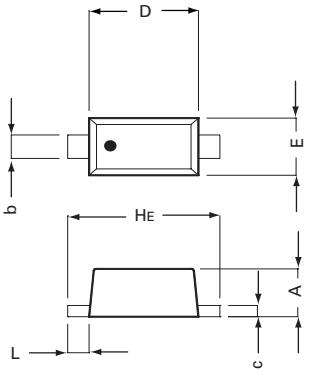


Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	-Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus) Temp (T_L) to peak		3°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		$250^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		260°C

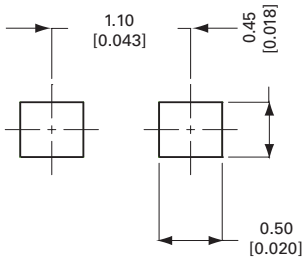


Package Dimensions - SOD723

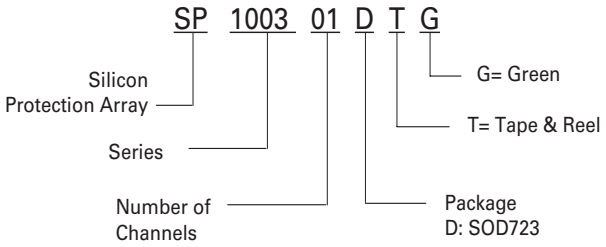


Symbol	SOD723			
	Millimeters		Inches	
	Min	Max	Min	Max
A	0.46	0.51	0.018	0.020
b	0.23	0.28	0.009	0.011
c	0.08	0.13	0.003	0.005
D	0.99	1.04	0.039	0.041
E	0.58	0.64	0.023	0.025
HE	1.37	1.47	0.054	0.058
L	0.15	0.25	0.006	0.010

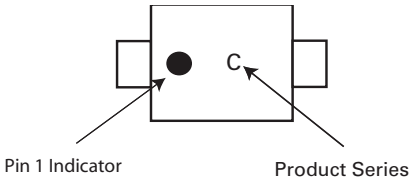
Recommended Solder Pad Layout
Millimeters (Inches)



Part Numbering System



Part Marking System



Product Characteristics

Lead Plating	Pre-Plated Frame
Lead Material	Copper Alloy
Lead Coplanarity	0.0004 inches (0.102mm)
Subsitute Material	Silicon
Body Material	Molded Epoxy
Flammability	UL94-V-0

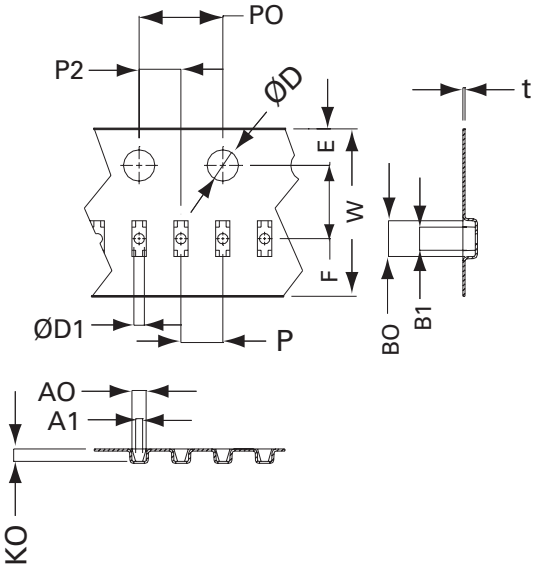
Notes :

1. All dimensions are in millimeters
2. Dimensions include solder plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. All specifications comply to JEDEC SPEC MO-223 Issue A
5. Blo is facing up for mold and facing down for trim/form, i.e. reverse trim/form.
6. Package surface matte finish VDI 11-13.

Ordering Information

Part Number	Package	Marking	Min. Order Qty.
SP1003-01DTG	SOD723	C	8000

Embossed Carrier Tape & Reel Specification – SOD723



Symbol	Millimetres		Inches	
	Min	Max	Min	Max
E	1.65	1.85	0.064	0.072
F	3.45	3.55	0.135	0.139
D1	0.45	0.55	0.017	0.021
D	150	- -	0.06	- -
PO	3.90	4.10	0.153	0.161
10PO	40.0+/- 0.20		1.57+/-0.01	
W	7.90	8.20	0.311	0.322
PO	1.90	2.10	0.074	0.082
AO	0.63	0.73	0.024	0.028
A1	0.33 REF		0.01 REF	
BO	1.66	1.76	0.07	0.07
B1	1.10 REF		0.04 REF	
KO	0.54	0.64	0.021	0.025
t	- -	0.21	- -	0.008