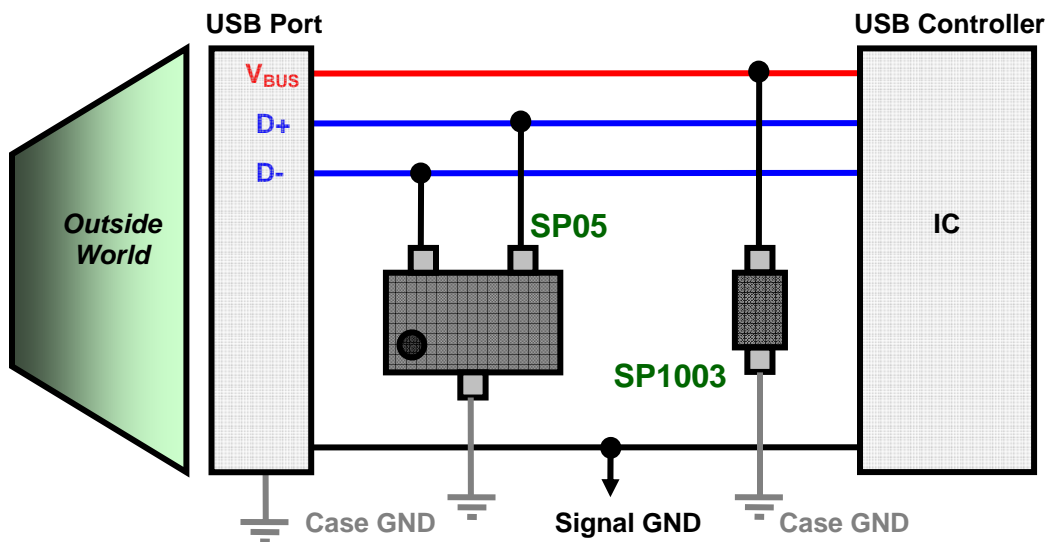# Application Guide
USB1.1

Considerations:
● Each port operates at either 1.5Mbps or 12Mbps (low and full speed respectively)
    → Slower speeds can tolerate higher capacitance devices

● Requires 2 channels of data line protection per port (i.e. D+/D-)
    → A 4 channel device can be useful if protecting a USB stack of 2 ports to make the
    ESD footprint as small as possible
    → V_{BUS} can be protected separately with a single channel device *(0402 shown)*

Application Schematic:

Recommended SPA Devices:

Ordering Number	ESD Level (Contact)	I/O Capacitance	# of Channels	V_{RWM}	Packaging
SP0502BAJTG	±20kV	30pF	2	5.5V	SC70-3
SP1001-02XTG	±8kV	12pF	2	5.5V	SOT553
SP1001-04XTG	±8kV	12pF	4	5.5V	SOT553
SP1003-01DTG	±25kV	30pF	1	5.0V	SOD723