SIMCO ION™
An ITW Company

APPLICATION NOTE

MiniPulse ESD Sensor

Application Embedded ESD Detector

Summary

Monitoring critical manufacturing processes for ESD has become increasingly important as more automation is brought to the line and vulnerable process points have become less accessible. To meet this new range of application requirements, a cost-effective, small footprint embeddable sensor has been developed to warn of product damage risks at the point of electrostatic discharge.

Part of the MiniPulse capability for detecting ESD and ignoring other noise sources is its ability to use numerous antenna configurations, including custom-designed solutions. The capability to limit ESD event capture by proximity is instrumental in determining where and when specific events occur and whether they pose a risk to product or process.

Hard to Monitor Applications

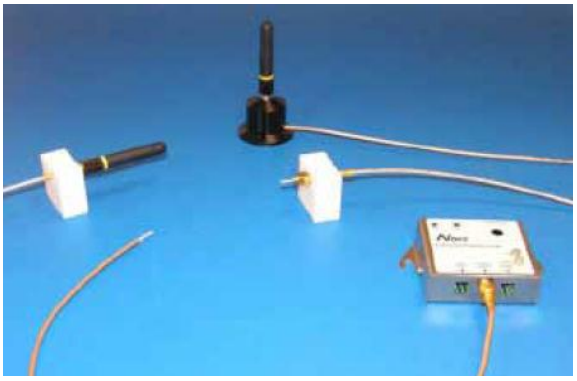
Many applications in semiconductor, disk-drive, FPD, automated IC handling and a host of other manufacturing processes handle sensitive product in locations which are difficult to monitor directly. In addition, many of these environments by their nature are saturated with noise sources ranging from HVDC supplies and actuators to broadband communication (RF). Detecting ESD events at specific points related to product handling can be challenging.

A New Approach

The four main features are:

Controlling ESD Detection by Pulse Length

This adjustable MiniPulse feature allows time domain discrimination between different ESD event types. Depending upon the specific ESD event type being detected (largely determined by the source), pulse detection length can be altered.



Threshold Control

Due to electromagnetic field attenuation over distance, many wider-area ESD events can be filtered out by adjusting the threshold to match local event amplitudes. The MiniPulse threshold control sensitivity allows fine tuning down to very small acquisition areas.

Antenna Configuration

A key factor in limiting ESD event detection to a specific process point is the form and placement of the antenna. Great success has

been had in using ultra small antennas deployed very close to the process monitor point (e.g., chip test socket, robot or probe contact point, etc.). Antennas can even be made integral with probe tips and other points of contact.

Noise Insensitivity

Differing antenna lengths and types can be calibrated to reject unwanted signal noise based upon antenna surface (the amount of antenna presented to the incident field), orientation and frequency wave length. One of the major challenges to embedded ESD detectors is accommodating robotic noise signatures and other tool/environmental noise without triggering false ESD alarms. The MiniPulse has been specifically designed for this type of application.

Alarm Reporting

The MiniPulse has several alarm features. A green LED indicates online and normal condition. The red LED blinks in tandem with an audible alarm feature for each ESD event detected. This makes the unit useful as a local monitor for many desktop applications as well. For remote embedded applications, an open collector output provides ESD event counts to a host system.

Power Requirements

Designed for tool integration, the MiniPulse can take power directly from the host tool. It can also use its own DC supply or be battery run for up to ten hours in standalone mode with a 9V battery attached.

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AN-Application-Embedded-ESD-Detector-V3 - 12/12