What's the Next Cool Function for Portable CE's? How About Lightning Detection!

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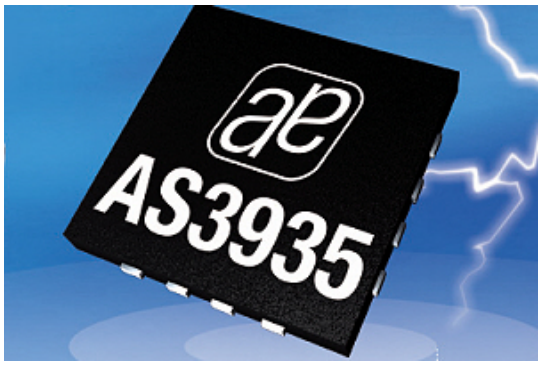

The National Oceanic and Atmospheric Association data says that lightning is the 2nd leading cause of storm deaths in the US with about 100 each year. This is only behind heat related deaths but is more than hurricanes and tornadoes combined. In addition, lightning causes about 1000 injuries and $5 billion of damage each year -- and that is just in the US.

The sheer power in a bolt of lightning is truly awesome. It can destroy anything it strikes. Golf courses, airports, and outdoor stadiums have complex and expensive lightning detection systems. These systems work quite well but are fixed in place and are ac line powered. However, such systems are no help for people pursuing numerous outdoor activities. Consider all the outdoor activities that most of us enjoy: soccer, football, baseball, lacrosse, and so on – and that includes both players and fans. There is also fishing, biking, climbing and much more. There are many groups of outdoor enthusiasts that would greatly appreciate knowing that a storm is bearing down on them -– and well before they can hear the thunder.

Human senses can detect thunder and lightning up to approximately 6 miles away, but that number is reduced by terrain and/or noise sources. When outdoors this can be critical, because a distance of 6 miles from the head of the storm doesn’t give you much time to take cover. Storms can be very fast moving and lightning can strike at angles, not just straight down. It’s therefore imperative that any type of early warning system allows you sufficient time to take cover.

There are some portable devices that claim lightning detection capabilities but they are inaccurate, prone to false alarms, have short battery life, are expensive and don’t detect cloud-to-cloud lightning, which usually precedes cloud-to-ground strikes. After a few false alarms people will simply turn off such detectors.

It was for the myriad outdoor activities that ams saw a need for a sensor that could

be at the heart of low-cost and portable early warning lightning detection systems. The AS3935 “Franklin” lightning sensor IC – named for the famous American inventor -- detects lightning up to 25 miles away. The AS3935 sensor from ams is a highly integrated IC that requires only a low-cost microcontroller and a few passive components for a full lightning detection system. The AS3935 utilizes a sensitive RF receiver that detects the electrical emissions from lightning activity. A proprietary algorithm in the sensor then converts the RF signal into an estimation of the distance to the head of the storm.

One of the sensor’s truly unique on-chip features is a sophisticated algorithm that minimizes the effects of false alarms. This is a huge improvement over current portable systems that can be triggered by fluorescent lights, microwave ovens, or a car starting. The algorithm also calculates the distance of an approaching storm. Another industry first is the IC’s on-chip integrated automatic antenna tuning that ensures the antenna is always “tuned” for optimal performance.

The AS3935 is the first of its kind and represents a new category of sensor that didn’t exist before. The performance and features of the AS3935’s make it suitable for use in all kinds of outdoor and sports enthusiast devices. It can be integrated into any kind of battery-powered device, including something as small as a keychain.

The sensor is also suitable for ac-powered products, such as Uninterruptible Power Supplies, power line conditioners, base stations, telecom equipment, and transportation products and even smart networks.

For more information about ams’ AS3935 lightning sensor IC, visit http://ams.com/eng/Products/RF-Products/Lightning-Sensor/AS3935 [1]

July 25, 2012

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