World's First Lightning Sensor IC Targeting Low Power, Portable Applications

Posted Janine E. Mooney, Editor

austriamicrosystems introduced the world’s first lightning sensor IC, the AS3935 Franklin Lightning Sensor with an embedded intelligent algorithm.

Named after American innovator, Benjamin Franklin, the austriamicrosystems’ low power lightning sensor provides people with advanced warning of approaching electrical storms giving them additional time to take shelter.

The AS3935 Franklin Lightning Sensor utilizes a sensitive RF receiver that detects the electrical emissions from lightning activity. A proprietary algorithm in the AS3935 then converts the RF signal into an estimation of the distance to the head of the storm. The algorithm, which draws on extensive meteorological survey data, produces an estimated distance-to-storm calculation from 40 km down to 1 km, while rejecting disturbances from man-made signals such as motors and microwave ovens.

Portable lightning sensors can play a crucial role in keeping people from harm and protecting equipment from damage in locations that are prone to violent lightning storms. Unaided, humans can typically hear thunder at a distance of approximately 10km. This can often leave too little time to find shelter from a fast-moving, highly active electrical storm. In the case of being on a golf course or a baseball field, the extra time that a lightning sensor can provide could mean the difference between life and death.

The national weather service agencies today utilize sophisticated, large pole-mounted fixed sensors but portable lightning sensing equipment is not widely used by consumers or businesses today because it is cumbersome, inaccurate and prone to false alerts from man-made signals.

With the introduction of the revolutionary AS3935 Franklin Lightning Sensor it is now possible for the first time to incorporate this innovative sensor technology into a wide variety of portable devices. With multiple low-power modes, a listening mode current consumption of 60 µA and housed in a 4 mm x 4 mm 16-pin MLPQ package, the AS3935 can easily be integrated into a variety of portable or outdoor devices targeting biking, hiking, marine, golfing, sporting events (football, soccer, baseball, etc.), and also in-building equipment such as uninteruptible power supplies (UPS), power conditioners, telcom equipment, intelligent networks and smart grids needing early detection for use in surge protection.

A typical application for the AS3935 requires only a simple microcontroller with a SPI or I2C interface and seven other passive components allowing it to fit easily in a space about the size of an automobile keychain remote.

With extensive field trials conducted in Finland and the US (Florida), the AS3935 Franklin Lightning Sensor showed good correlation when compared to the larger, more complex systems. "Based upon field trials conducted by Florida Tech, preliminary results of studies conducted in Florida and in Finland show that the austriamicrosystems' lightning sensor has the potential to be used as a lightning early warning system that could augment other methods such as the 30-30 (1) rule for lightning safety" said Dr. Joseph Dwyer, Professor, Department of Physics and Space Sciences, Florida Institute of Technology, one of the world's leading research institutions in the field of lightning physics.

Bruce Ulrich, Wireless Product Line Director at austriamicrosystems said: "This innovative, highly-integrated sensor was designed with intelligence and low power capabilities that make it suitable for a variety of low-power portable & fixed products requiring very little board space. It is now possible to protect both humans and equipment from harm by providing early warning of impending danger. I have personally seen little league baseball teams in danger because the umpire did not have enough information to call-the-game because of lightning; now there is a way to provide that protection."

The AS3935 Franklin Lightning Sensor IC is available for sampling today. For more information on the AS3935, please visit www.austriamicrosystems.com/Lightning-Sensor/AS3935 [1].

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[1] http://www.austriamicrosystems.com/Lightning-Sensor/AS3935