

**NEWS RELEASE**

PR0110E

**Development and Mass Production of the HSPPA Series Piezoresistive Type Waterproof MEMS Pressure Sensor (to Detect Absolute Pressure)***World's Smallest Class\*<sup>1</sup> Waterproof-Type Pressure Sensor*

Duesseldorf, Germany, January 11, 2010 – ALPS ELECTRIC EUROPE GmbH has completed development of the HSPPA series, the world's smallest-class piezoresistive type waterproof MEMS pressure sensor (to detect absolute pressure) that uses barometric and water-pressure detection functions. Mass production commenced in December 2009.

Applications for pressure sensors are continuing to expand into a wide array of fields, including medical and industrial devices; pressure sensors are used in the automotive field in particular to detect oil pressure in brakes and power steering as well as combustion control in engines. The growing use of pressure sensors has extended to such consumer devices as washing machines in recent years, while mounting them onto such familiar compact digital devices as digital cameras and wrist watches is no longer unusual.

Applications for pressure sensors designed for compact digital devices include wrist watches for outdoor use and divers wrist watches, which measure barometric and water pressure, respectively. They also include digital cameras and digital camcorders that can perform such functions as color-correction and water depth detection during underwater photography.

Through the use of propriety thin-film process, microfabrication and package technologies cultivated over many years, ALPS has developed the world's smallest piezoresistive/waterproof-type

pressure sensor, realizing a design that is compact and short (Diameter: 3.95mm x Height: 1.85mm).

The sensor detects pressure by reading the electrical signals that result from changes in electrical resistance generated when external pressure causes the diaphragm to flex, which then distorts the piezoresistive element formed above the diaphragm. Utilizing direct detection of the electrical resistance of the piezoresistive element through the diaphragm's flexible volume enables a simple element structure, making this type of sensor suitable for compact-sized components.

Owing to the optimal use of structures and materials designed to realize waterproof capability, the HSPPA series maintains a high degree of water resistance, while achieving a highly sensitive level of performance as a pressure detector.

In addition, this product features minimal fluctuation characteristics due to the stable cavity<sup>\*2</sup> configuration resulting from etching optimization and Si-Si sealed joints<sup>\*3</sup> that control the impact of external component stress.

In addition to waterproof-type pressure sensors, ALPS also features regular-type MEMS pressure sensors (single element- and built-in amplifier-type sensors) in its lineup of products.

## Features

World's smallest class piezoresistive type waterproof MEMS pressure sensor developed; mass production commenced

1. Realizes a compact and thin design by using piezoresistive elements
2. Achieves reduced fluctuations due to packaging optimization
3. Capable of use at a depth of 50 meters owing to the sealing fabrication process

\*1 Based on studies conducted by Alps Electric (December 15, 2009).

\*2. Refers to the internal cavity structure of elements. A vacuum is maintained internally.

\*3. Technology that bonds smooth silicon materials. Vacuum sealing capability based on strong joining characteristics.

## Principal Applications

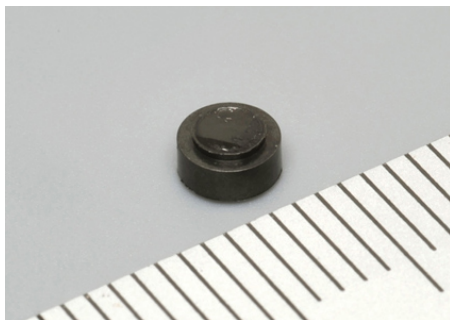
Mobile phones, wrist watches, digital cameras, digital camcorders, etc.

## Specifications

Product name	HSPPA series		
Dimensions (D × H)	Φ3.95mm × 1.85mm		
Measurable pressure range	50 to 110kPa	50 to 200kPa	100 to 500kPa
Operating temperature range	-20°C to 60°C		
Operating voltage	Constant current drive 0.15mA		
Span voltage	16.5mV	19.5mV	20.8mV
Output voltage	12.0mV (at 110kPa) 9.6mV (at 101.3kPa)	39.0mV (at 200kPa) 19.75mV (at 101.3kPa)	4.0mV (at 100kPa) 24.8mV (at 500kPa)
Offset temperature range	-2 to +3%FS		
Sensitivity temperature range	-2 to +3%FS		
Bridge resistance	4 to 7 kΩ		

For more information on the new the product please visit

[http://www.alps.com/products/e/npv\\_product/091217\\_HSPPA/HSPPA\\_E.PDF](http://www.alps.com/products/e/npv_product/091217_HSPPA/HSPPA_E.PDF)



**ALPS Electric Co., Ltd.**

Since its establishment in 1948 ALPS has grown as a comprehensive manufacturer of electronic components. At present ALPS is creating innovative high-value-added products in its main business segments – Components, Magnetic Devices, Communications, Peripheral Products, and Automotive Electronics – which are contributing to the advance of a digital society. ALPS is a global company that carries out its operations with 23 production bases in 9 countries as well as 57 sales bases in 14 countries. Consolidated net sales in the year ended March 31, 2009 amounted to YEN 539 billion.

**ALPS ELECTRIC EUROPE GmbH**, a subsidiary of ALPS Electric Co., Ltd., was established in 1979. Since 1989 the European Head Office has been located in Düsseldorf, where a team of specialists works in Sales, Marketing, and Product Engineering. The activities of our branch offices in Munich, Paris, Milton Keynes, Stockholm, Gothenburg, and our sales office in Milan are coordinated from Düsseldorf.

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