



July 13, 2009

# New Product Introduction: FSS-SMT Series Force Sensor

**Honeywell**

## FSS-SMT Series Force Sensor



**FSS-SMT, enlarged**

# FSS-SMT Series Force Sensor

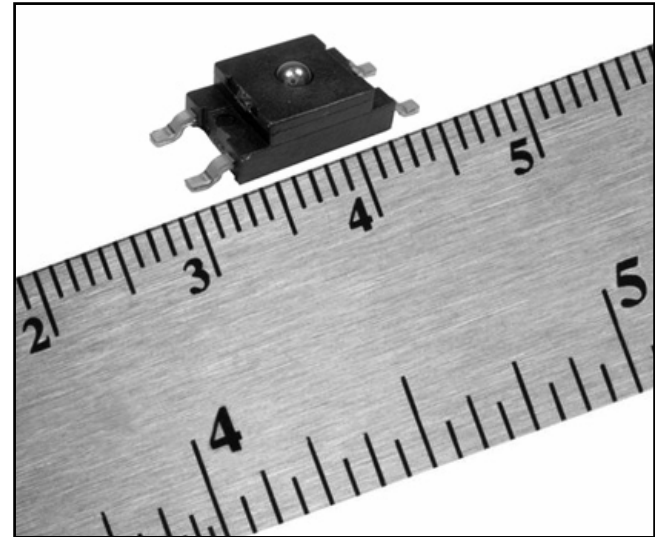
- Introduction

- Honeywell is expanding its Force Sensor product line
- New low profile surface mount technology (SMT) device
- SMT form factor eliminates the customer from having to manually bend the leads via hand soldering, helping to reduce assembly costs
- The FSS-SMT Series is part of the FSS Series portfolio that is designed to provide precise and reliable force sensing performance in a compact commercial-grade package
- Incorporates proven sensing technology that uses a specialized piezoresistive micromachined silicon sensing element
- Low power, unamplified, uncompensated Wheatstone bridge circuit design provides inherently stable millivolt output over the force range



# FSS-SMT Series Force Sensor

- How the FSS-SMT fits into Honeywell's Force Sensor Portfolio
  - FSS Series is offered as through hole and surface mount devices
  - FSG Series is similar to the FSS Series except that the FSG Series has a metal pin mechanical interface in place of the ball that is on the FSS Series
  - 1865 Series is a compensated force sensor with a silicone diaphragm mechanical interface
  - FS01 and FS03 Series are amplified compensated force sensors with a plastic button mechanical interface
- Smallest force sensor in the portfolio



**FSS-SMT, actual size**

# FSS-SMT Series Force Sensor

- Potential Applications
  - Includes occlusion detection, load and compression sensing, and variable tension control in:
    - Ambulatory pumps
    - Clinical diagnostic equipment
    - Enteral pumps
    - Infusion pumps
    - Kidney dialysis machines
    - Wire bonding equipment



# FSS-SMT Series Force Sensor

- Features and Benefits

- Surface Mount Technology allows for automated assembly and may eliminate hand soldering
- Maximum peak reflow temperature 260 ° C [500 ° F] allows for the use of reflow profiles for lead-free RoHS-compliant solders
- Low deflection (30 microns typical at full scale) and fast response help reduce measurement errors
- Provides enhanced sensitivity without compromising signal integrity, resulting in low system noise and reducing measurement errors
- Direct mechanical coupling of the actuation ball to the sense element reduces coupling errors and keeps mechanical hysteresis to a minimum
- Reliable product with 20 million Mean Cycle To Failure (MCTF) at 25° C [77 ° F] rating allows for consistent output over time and reduces repairs or replacements
- Small size minimizes space on the PCB



# FSS-SMT Series Force Sensor

- Features and Benefits (continued)
  - Precision force sensing enhances accuracy
  - Electrically ratiometric output accommodates supply voltage variations, leading to low ratiometricity error
  - Ratiometric output and low voltage supply allows for use in battery powered applications
  - High resistance to electrostatic discharge (ESD) (8 kV) meets ESD Sensitivity Classification Level 3, eliminating special handling during assembly
  - Sensor output is virtually insensitive to mounting stresses
  - Available in tube packaging; tape and reel packaging is in development
  - RoHS-compliant materials meet Directive 2002/95/EC



## How the FSS-SMT Provides Value to our Customers

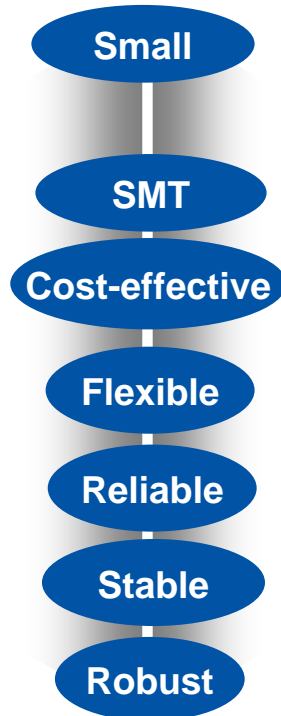
**For (customer)**      **SEGMENTS:** Medical and commercial  
**POTENTIAL APPLICATIONS:** Potential medical and commercial applications include occlusion detection, load and compression sensing, and variable tension control in ambulatory pumps, clinical diagnostic equipment, enteral pumps, infusion pumps, kidney dialysis machines, wire bonding equipment

... that need      precise and reliable force sensing in a surface mount technology (SMT) package

... Honeywell's      **Force Sensor** FSS-SMT Series

### CUSTOMER BENEFITS

- Takes up less space on the printed circuit board
- Customers previously had to manually bend the leads to use a Honeywell force sensor as an SMT device; the FSS-SMT allows the customer to eliminate this step, saving time and money
- Gives cost-conscious customers the flexibility to customize and integrate the sensor into other system electronics
- Allows for consistent output over time
- Provides excellent mechanical stability
- Makes the sensor more robust because it can better handle unexpected increases in load



### HONEYWELL DELIVERS...

- Honeywell's smallest force sensor
- Honeywell has designed a low profile, SMT device that allows customers to use the sensor as a true SMT for automated assembly
- Provides all four points of the Wheatstone bridge sensing element
- 20 million Mean Cycle To Failure (MCTF) at 25 °C [77 °F] rating
- Stainless steel ball
- Innovative elastomeric technology and engineered molded plastics provide load excitation capacities of 44 N over-force

## FSS-SMT Series Force Sensor

- Training
  - Available from:
    - **Product manager:**
      - Petrina Zaraszczak, +1.763.954.6929, [petrina.zaraszczak@honeywell.com](mailto:petrina.zaraszczak@honeywell.com)
    - **Application engineering team:**
      - Richard Wade, +1.614.850.7946, [richard.wade@honeywell.com](mailto:richard.wade@honeywell.com)
      - Adan Ramirez, +1.763.954.6812, [adan.ramirez@honeywell.com](mailto:adan.ramirez@honeywell.com)



# FSS-SMT Series Force Sensor

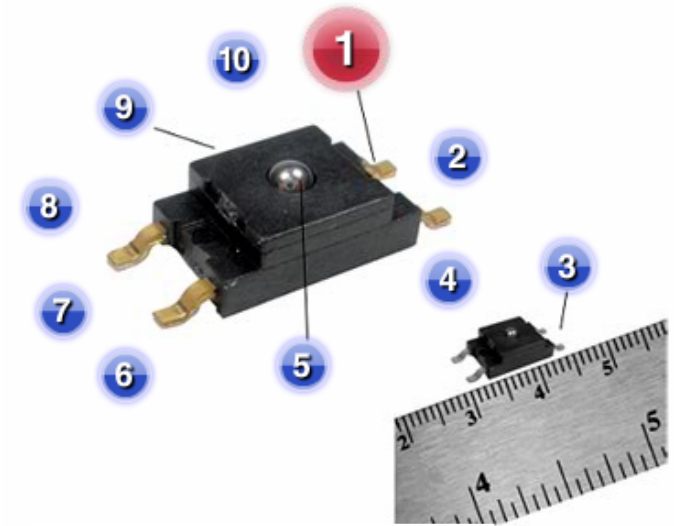
- Samples
  - Samples are available now
    - Catalog listing: FSS1500NGB
    - Description: 2 pieces
  - Contact your Authorized Distributor or Sales Rep to obtain a sample
    - Visit the [Honeywell Sensing and Control](#) website to find an Authorized Distributor or Rep in your area
- How to Order
  - Catalog listing: FSS1500NGT
  - Description: Tube packaging
  - Tape and reel packaging is in development
- Product Availability
  - July 13, 2009



# FSS-SMT Series

- For more information:
  - [Product Sheet](#)
  - [Installation Instructions](#)
  - [Force Sensor Line Guide](#)
  - [FSS-SMT Series New Product Webpage](#) with hotspot rollovers
  - [Press release](#)
  - [S&C Website](#)

FSS-SMT Series Force Sensor



**New Product Webpage** to view features



**Warnings, Remedies, Warranties**

**Honeywell**

## Warnings

### WARNING

#### PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

#### WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

### WARNING

#### MISUSE OF DOCUMENTATION

- The information presented in this document is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**