



# ±16 Gauss, Ultra Small, Low Noise 3-axis Magnetic Sensor

## MMC3416xPJ

### FEATURES

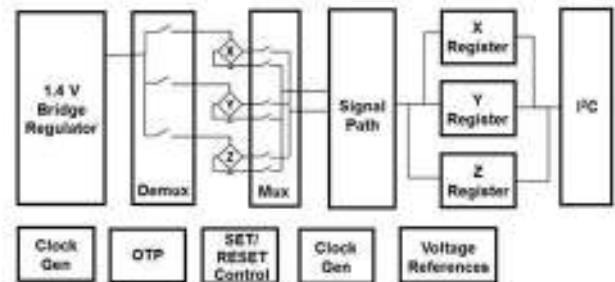
- Fully integrated 3-axis magnetic sensor and electronic circuits requiring fewer external components
- Superior Dynamic Range and Accuracy:
  - ✓ ±16 G FSR with 16/14 bits operation
  - ✓ 0.5 mG/2 mG per LSB resolution in 16/14 bits operation mode
  - ✓ 1.5 mG total RMS noise
  - ✓ Enables heading accuracy of ±1°
- Max output data rate of 800 Hz (12 bits mode)
- Ultra Small Low profile package  
1.6x1.6x0.6 mm
- SET/RESET function
  - ✓ Allows for elimination of temperature variation induced offset error (Null field output)
  - ✓ Clears the sensors of residual magnetization resulting from strong external fields
- On-chip sensitivity compensation
- Low power consumption (140 µA @ 7 Hz)
- 1 µA (max) power down function
- I<sup>2</sup>C Slave, FAST (≤400 KHz) mode
- 1.62 V~3.6 V wide power supply operation supported, 1.8 V I/O compatibility.
- RoHS compliant

### APPLICATIONS

Electronic Compass & GPS Navigation  
Position Sensing

### DESCRIPTION

The MMC3416xPJ is a complete 3-axis magnetic sensor with on-chip signal processing and integrated I<sup>2</sup>C bus. The device can be connected directly to a microprocessor, eliminating the need for A/D converters or timing resources. It can measure magnetic fields within the full scale range of ±16 Gauss (G), with 0.5 mG/2 mG per LSB resolution for 16/14 bits operation mode and 1.5 mG total RMS



FUNCTIONAL BLOCK DIAGRAM

noise level, enabling heading accuracy of 1° in electronic compass applications. Contact Memsic for access to advanced calibration and tilt-compensation algorithms.

An integrated SET/RESET function provides for the elimination of error due to Null Field output change with temperature. In addition it clears the sensors of any residual magnetic polarization resulting from exposure to strong external magnets. The SET/RESET function can be performed for each measurement or periodically as the specific application requires.

The MMC3416xPJ is packaged in an ultra small low profile BGA package (1.6 x 1.6 x 0.65 mm,) and with an operating temperature range from -40 °C to +85 °C.

The MMC3416xPJ provides an I<sup>2</sup>C digital output with 400 KHz, fast mode operation.

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# ±30 Gauss, Monolithic, High Performance, Low Cost 3-axis Magnetic Sensor

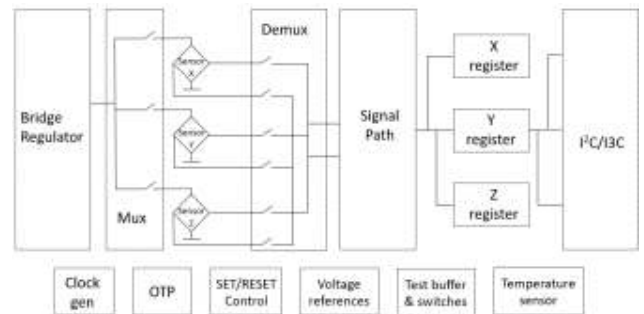
## MMC5633NJL

### FEATURES

- Monolithic integrated 3-axis AMR magnetic sensor and electronic circuits requiring fewer external components
- Superior Dynamic Range and Accuracy:
  - ✓ ±30 G FSR
  - ✓ 20bits operation mode
  - ✓ 0.0625mG per LSB resolution
  - ✓ 2 mG total RMS noise
  - ✓ Enables heading accuracy of ±1°
- Sensor true frequency response up to 1KHz
- Ultra-Small Wafer Level Package 0.85x0.85x0.4 mm
- On-chip automatic degaussing with built-in SET/RESET function
  - ✓ Eliminates thermal variation induced offset error (Null field output)
  - ✓ Clears the residual magnetization resulting from strong external fields
- On-chip sensitivity compensation
- On-chip temperature sensor
- Selftest signal available
- Data\_ready Interrupt (I3C only)
- Low power consumption
- 1 µA power down current
- I<sup>2</sup>C slave, FAST (≤400 KHz) mode
- I3C interface, Compatible with MIPI I3C specification version 1.0
- 1.62V to 3.6V wide range single power supply
- 1.2V compatible I<sup>2</sup>C interface
- 1.8V compatible I3C interface
- RoHS compliant

### APPLICATIONS

- Electronic Compass & GPS Navigation
- Position Sensing



FUNCTIONAL BLOCK DIAGRAM

### DESCRIPTION

The MMC5633NJL is a monolithic complete 3-axis AMR magnetic sensor with on-chip signal processing and integrated digital bus (I<sup>2</sup>C fast mode and I3C interface), the device can be connected directly to a microprocessor, eliminating the need for A/D converters or timing resources.

It can measure magnetic fields within the full scale range of ±30 Gauss (G), with up to 0.0625mG per LSB resolution at 20bits operation mode and 2mG total RMS noise level, enabling heading accuracy of ±1° in electronic compass applications. Contact MEMSIC for access to advanced calibration and tilt-compensation algorithms.

An integrated SET/RESET function provides for the elimination of error due to Null Field output change with temperature. In addition, it clears the sensors of any residual magnetic polarization resulting from exposure to strong external magnets. The SET/RESET function can be performed for each measurement or periodically as the specific application requires.

The MMC5633NJL is in wafer level package with an ultra-small size of 0.85 x 0.85 x 0.4 mm and with an operating temperature range from -40 °C to +85 °C.

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MEMSIC MMC5633NJL Rev A



14 Odem ST. P.O.B. 7042 Petach Tikva 4917001, ISRAEL | Office: +972-3-924-3352  
Fax: +972-3-9243385 | sales@hypertech.co.il | www.hypertech.co.il



# ±30 Gauss, Monolithic, High Performance, Low Cost 3-axis Magnetic Sensor

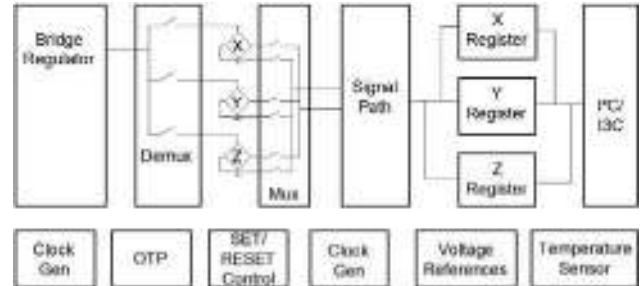
## MMC5603NJ

### FEATURES

- Monolithic integrated 3-axis AMR magnetic sensor and electronic circuits requiring fewer external components
- Superior Dynamic Range and Accuracy:
  - ✓ ±30 G FSR
  - ✓ 20bits operation mode
  - ✓ 0.0625mG per LSB resolution
  - ✓ 2 mG total RMS noise
  - ✓ Enables heading accuracy of ±1°
- Sensor true frequency response up to 1KHz
- Ultra-Small Wafer Level Package 0.8x0.8x0.4 mm
- On-chip automatic degaussing with built-in SET/RESET function
  - ✓ Eliminates thermal variation induced offset error (Null field output)
  - ✓ Clears the residual magnetization resulting from strong external fields
- On-chip sensitivity compensation
- On-chip temperature sensor
- Selftest signal available
- Data\_ready Interrupt (I3C only)
- Low power consumption
- 1 μA power down current
- I<sup>2</sup>C slave, FAST (≤400 KHz) mode
- I3C interface available
- 1.62V to 3.6V wide range single power supply
- 1.2V logic IO
- RoHS compliant

### APPLICATIONS

- Electronic Compass & GPS Navigation
- Position Sensing



FUNCTIONAL BLOCK DIAGRAM

### DESCRIPTION

The MMC5603NJ is a monolithic complete 3-axis AMR magnetic sensor with on-chip signal processing and integrated digital bus (I<sup>2</sup>C fast mode and I3C interface), the device can be connected directly to a microprocessor, eliminating the need for A/D converters or timing resources.

It can measure magnetic fields within the full scale range of ±30 Gauss (G), with up to 0.0625mG per LSB resolution at 20bits operation mode and 2mG total RMS noise level, enabling heading accuracy of ±1° in electronic compass applications. Contact MEMSIC for access to advanced calibration and tilt-compensation algorithms.

An integrated SET/RESET function provides for the elimination of error due to Null Field output change with temperature. In addition it clears the sensors of any residual magnetic polarization resulting from exposure to strong external magnets. The SET/RESET function can be performed for each measurement or periodically as the specific application requires.

The MMC5603NJ is in wafer level package with an ultra-small size of 0.8x 0.8 x 0.4 mm and with an operating temperature range from -40 °C to +85 °C.

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MEMSIC MMC5603NJ Rev.B



14 Odem ST. P.O.B. 7042 Petach Tikva 4917001, ISRAEL | Office: +972-3-924-3352  
Fax: +972-3-9243385 | sales@hypertech.co.il | www.hypertech.co.il



# ±30 Gauss, High Performance, Low Cost 3-axis Magnetic Sensor

## MMC3630KJ

### FEATURES

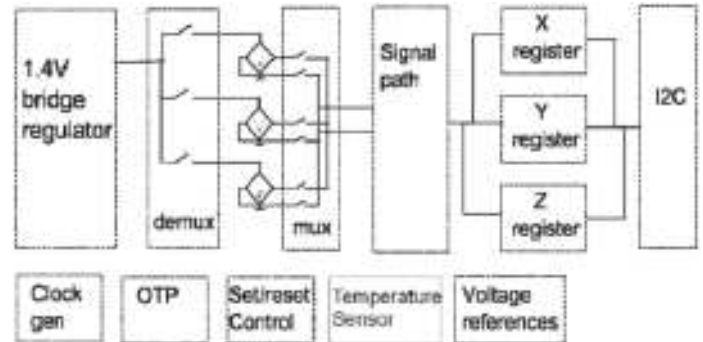
- Fully integrated 3-axis magnetic sensor and electronic circuits requiring fewer external components
- Superior Dynamic Range and Accuracy:
  - ✓ ±30 G FSR with 16 bits operation
  - ✓ 1 mG per LSB resolution
  - ✓ 2 mG total RMS noise
  - ✓ Enables heading accuracy of ±1°
- Output data rate up to 600 Hz
- Ultra Small Low profile package  
1.2x1.2x0.5 mm
- Degaussing with built-in SET/RESET function
  - ✓ Eliminates thermal variation induced offset error (Null field output)
  - ✓ Clears the residual magnetization resulting from strong external fields
- On-chip sensitivity compensation
- On-chip temperature sensor
- Motion\_Detection and Data\_Ready Interrupt
- Low power consumption
- 1 μA power down current
- I<sup>2</sup>C Slave, FAST (≤400 KHz) mode
- 1.8V single low power supply compatible
- Low to 1.2V I<sup>2</sup>C interface
- RoHS compliant
- P2P compatible with AK09911

### APPLICATIONS

- Electronic Compass & GPS Navigation
- Position Sensing

### DESCRIPTION

The MMC3630KJ is a complete 3-axis magnetic sensor with on-chip signal processing and integrated I<sup>2</sup>C bus. The device can be connected directly to a microprocessor, eliminating the need for A/D converters or timing resources. It can measure



FUNCTIONAL BLOCK DIAGRAM

magnetic fields within the full scale range of ±30 Gauss (G), with 1 mG per LSB resolution at 16 bits operation mode and 2 mG total RMS noise level, enabling heading accuracy of ±1° in electronic compass applications. Contact MEMSIC for access to advanced calibration and tilt-compensation algorithms.

An integrated SET/RESET function provides for the elimination of error due to Null Field output change with temperature. In addition it clears the sensors of any residual magnetic polarization resulting from exposure to strong external magnets. The SET/RESET function can be performed for each measurement or periodically as the specific application requires.

The MMC3630KJ is packaged in an ultra-small low profile BGA package (1.2x 1.2 x 0.5 mm) and with an operating temperature range from -40 °C to +85 °C. The MMC3630KJ provides an I<sup>2</sup>C digital output with 400 KHz, fast mode operation.

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# ±8 Gauss, High Performance 3-axis Magnetic Sensor

## MMC5983MA

### FEATURES

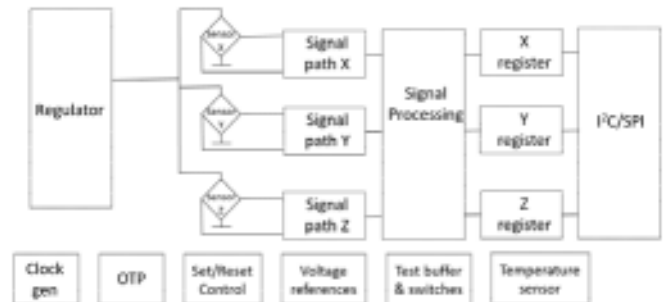
- Fully integrated 3-axis magnetic sensor and electronic circuits requiring fewer external components
- Superior dynamic range and accuracy:
  - ✓ ±8G FSR
  - ✓ 18bits operation
  - ✓ 0.4mG total RMS noise
  - ✓ Enables heading accuracy of ±0.5°
- Max output data rate of 1000Hz
- Industrial standard low profile package 3.0mm x 3.0mm x 1.0mm
- Degaussing with built-in SET/RESET function
  - ✓ Eliminates thermal variation induced offset error (Null field output)
  - ✓ Clears the residual magnetization resulting from strong external fields
- On-chip sensitivity compensation
- On-chip temperature sensor
- Data\_Ready Interrupt
- Low power consumption
- 1µA power down current
- I<sup>2</sup>C Slave, FAST(≤400KHz) mode
- 3.0V single low power supply
- SPI interface available
- RoHS compliant

### APPLICATIONS

- Electronic Compass & Navigation
- Position Sensing
- General Purpose Magnetic Field Measurements

### DESCRIPTION

The MMC5983MA is an AEC-Q100 qualified complete 3-axis magnetic sensor with on-chip signal processing and integrated I<sup>2</sup>C/SPI bus suitable for use in automotive applications. The device can be connected directly to a microprocessor, eliminating the need for A/D converters or timing resources.



FUNCTIONAL BLOCK DIAGRAM

It can measure magnetic fields within the full scale range of ±8 Gauss (G), with 0.25mG/0.0625mG per LSB resolution at 16bits/18bits operation mode and 0.4 mG total RMS noise level, enabling heading accuracy of ±0.5° in electronic compass applications.

An integrated SET/RESET function provides for the elimination of error due to Null Field output change with temperature. Temperature information from the integrated temperature sensor is available over the I<sup>2</sup>C Interface. The SET/RESET function can be performed for each measurement, periodically, or when the temperature changes by a predetermined amount as the specific application requires.

In addition, the SET/RESET function clears the sensors of any residual magnetic polarization resulting from exposure to strong external magnets.

The MMC5983MA is packaged in a low profile LGA package and an operating temperature range from -40°C to +105°C.

The MMC5983MA provides an I<sup>2</sup>C digital output with 400 KHz, fast mode operation, and a 10MHz SPI digital output.

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