

# Data Sheet

## CMR3100-D01 3-AXIS LOW POWER GYRO WITH DIGITAL SPI AND I<sup>2</sup>C INTERFACE

### Features

- Low 2.5 mA active current consumption
- Very small size 3.0x3.0x0.88 mm<sup>3</sup>
- Supply voltage range 2.5 V – 3.6 V
- Digital I/O voltage range 1.6 V – 3.6 V
- Flexible user selectable configurations:
  - Two active measurement modes
  - Stand By and Power Down modes
  - Measurement range  $\pm 250 \dots \pm 2000$  °/s
  - Configurable low pass and high pass filters with 8Hz...160Hz signal bandwidth
  - Integrated FIFO
- Advanced self diagnostics
- Programmable interrupt line
- Proven capacitive 3D-MEMS technology
- High shock durability
- RoHS compliant / lead free soldering
- Pin to pin and register compatible with CMR3000-D01

### Applications

CMR3100-D01 is targeted to battery operated devices. Typical but not limited applications are

- Gaming input devices
- Computer peripherals and remote controllers
- Mobile Phones

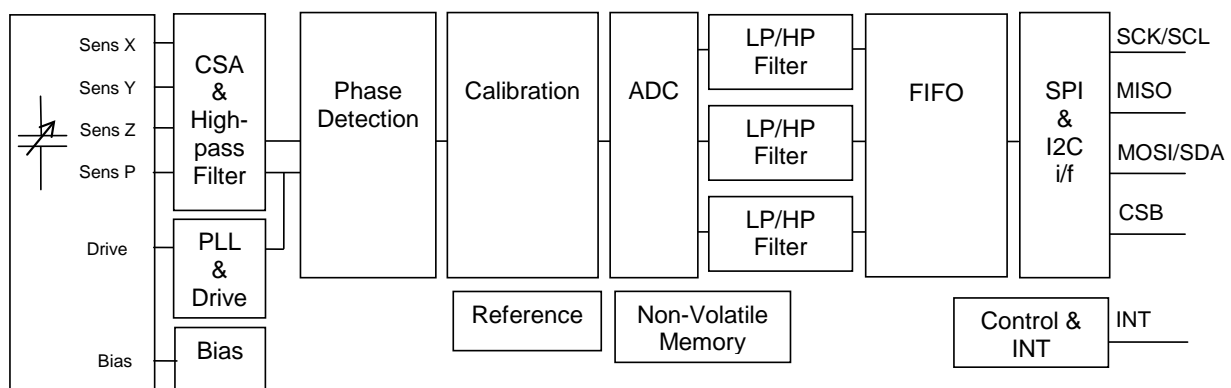


Figure 1. CMR3100-D01 block diagram.

## Target Performance Characteristics <sup>1)</sup>

Parameter	Condition	Typical supply range 2.5 – 3.0 V			Extended supply range 3.0 – 3.6 V			Units
		Min	Nom <sup>2)</sup>	Max	Min	Nom <sup>2)</sup>	Max	
Vdd		2.5	2.8	3.0		3.3		V
Digital I/O Vdd (DVIO)	Vdd ≥ Digital I/O Vdd	1.6	1.8 / 2.8	3.0		3.3		V
Operating temperature **		-40	-	85	-40	-	85	°C
Current consumption	Measurement mode * Low Power meas mode * Stand By * Power Down ** <sup>3)</sup>		5 2.5 TBD <0.1			5 2.5 TBD <0.1		mA mA mA µA
Measurement range **	FS=2000 dps FS=1000 dps FS=500 dps FS=250 dps	-2000 -1000 -500 -250	- - - -	2000 1000 500 250		±2000 ±1000 ±500 ±250		dps
Offset calibration error * <sup>4)</sup>		-100	-	100		±100		dps
Offset temperature error ** <sup>5)</sup>	-40 ... +85 °C		±0.5			±0.5		dps/°C
Sensitivity * <sup>6)</sup>	FS=2000 dps FS=1000 dps FS=500 dps FS=250 dps		10.7 21.3 42.7 85.3			10.7 21.3 42.7 85.3		Count/ dps
Sensitivity calibration error *		-5	-	+5		±5		%
Sensitivity temperature error ** <sup>7)</sup>	-40 ... +85 °C		±0.02			±0.02		%/°C
Non-Linearity ** <sup>8)</sup>	-1000<Q<1000 dps		±1			±1		% FS
Output Data Rate, ODR **			375 188 94			375 188 94		Hz
Bandwidth ** <sup>9)</sup>	User selectable		8...160			8...160		Hz
Integrated noise stdev**			TBD			TBD		dps
Turn on time PD to meas** <sup>10)</sup>			TBD			TBD		ms
Turn on time SB to meas** <sup>11)</sup>			TBD			TBD		ms
I <sup>2</sup> C clock rate **				400			400	kHz
SPI clock rate **				500			500	kHz

\* 100% tested in production.

\*\* Qualified during product validation.

1) The product is factory calibrated at 2.8 V in room temperature.

2) Typical values are not guaranteed.

3) Leakage current.

4) Offset when the device is not rotated.

5) Offset temperature error = {Count(0 °/s)-Offset} / Sensitivity [°/s]. Sensitivity = Calibrated sensitivity.  
Offset= Calibrated offset.

6) Sensitivity = {Count(+500°/s) - Count(-500°/s)}/2 [Count°/s].

7) Sensitivity temperature error = {[Count(+500°/s)-Count(-500°/s)]/2 - Sensitivity} / Sensitivity x 100% [%].  
Sensitivity = Calibrated sensitivity.

8) Best fit straight line -1000<Q<1000 °/s.

9) Frequency responses with 1<sup>st</sup> order roll off.

10) From Power Down to measurement mode. Settling error less than 1% of FS.

11) From Stand By to measurement mode. Settling error less than 1% of FS.

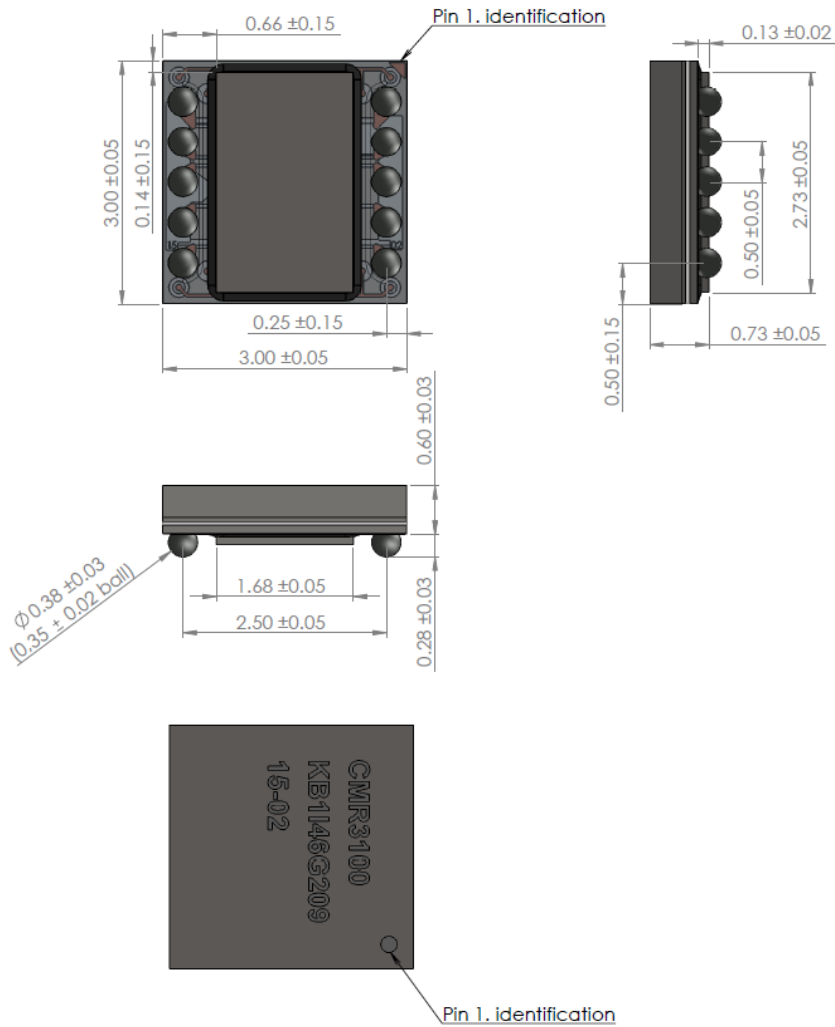


Figure 2. Package dimensions in mm.

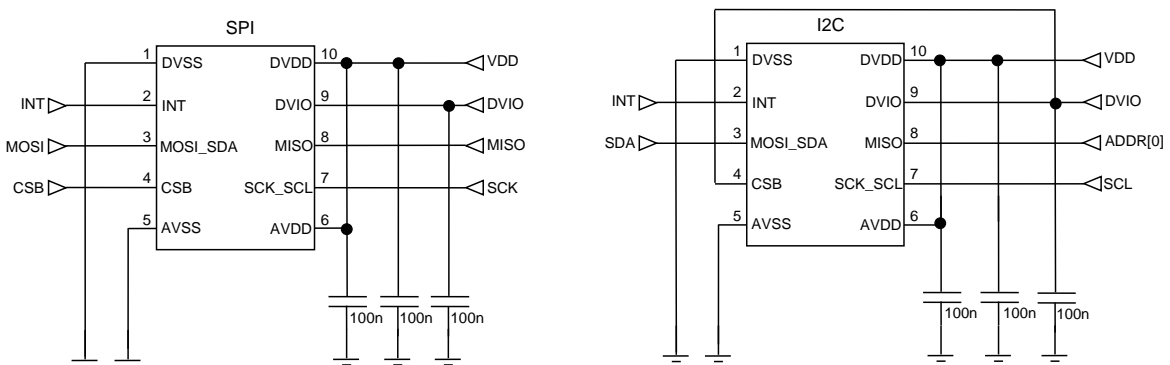
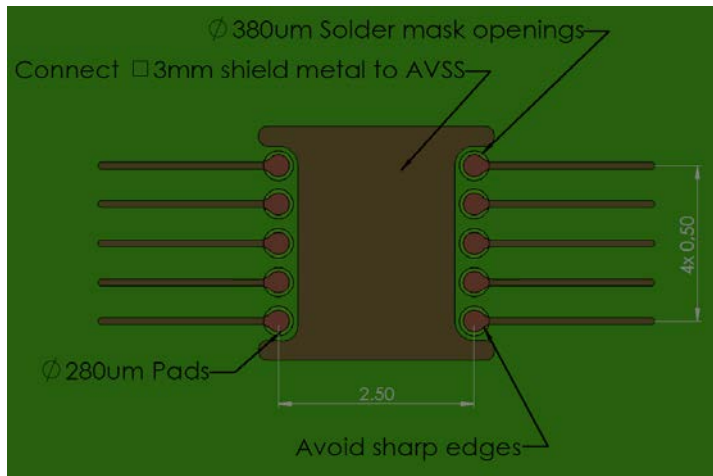


Figure 3. Application schematics for I<sup>2</sup>C and SPI bus.



Recommended solder pad and solder mask opening diameters should be followed in order to ensure optimum sensor performance.

Figure 4. Recommended layout pattern.

Table 1. Pin descriptions (top view)

Pin #	Name	Function
1	DVSS	Digital ground
2	INT	Interrupt
3	MOSI_SDA	SPI Serial Data Input (MOSI) / I <sup>2</sup> C Serial Data (SDA)
4	CSB	Chip select / I <sup>2</sup> C enable
5	AVSS	Analog ground
6	AVDD	Analog supply voltage
7	SCK_SCL	SPI Serial Clock (SCK) / I <sup>2</sup> C Serial Clock (SCL)
8	MISO	SPI Serial Data Output (MISO) / I <sup>2</sup> C slave address LSB ADDR[0]
9	DVIO	I/O Supply
10	DVDD	Digital supply voltage

## Document Change Control

Rev.	Date	Change Description
A.01	02-Jan-12	Release for product launch