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Data Sheet

CMR3000-D01 3-AXIS LOW POWER GYRO WITH DIGITAL SPI AND I²C INTERFACE

Features

- 2.5 V – 3.6 V supply voltage,
  1.6 V – 3.6 V digital I/O voltage
- Low 5 mA current consumption
- ±2000 °/s measurement range
- 20 Hz and 80 Hz user selectable bandwidths
- SPI and I²C digital interface
- Interrupt signal triggered by data ready
- Size 3.1x4.1x0.83 mm³
- Proven capacitive 3D-MEMS technology
- High shock durability
- RoHS compliant / lead free soldering

Applications

CMR3000-D01 is targeted to battery operated devices. Typical but not limited applications are

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

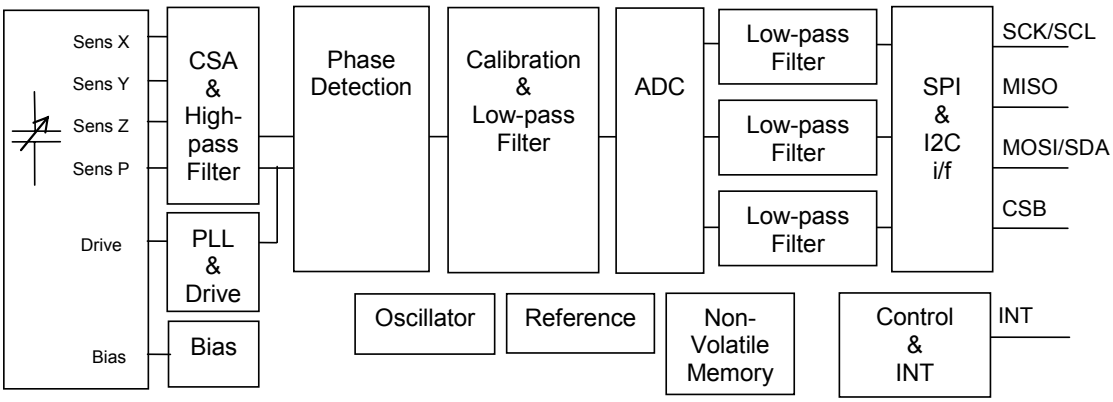

Figure 1 CMR3000-D01 Block Diagram

Target Performance Characteristics [1)]

Parameter	Condition	Typical supply range 2.5 – 3.0 V			Extended supply range 3.0 – 3.6 V			Units
		Min	Nom [2)]	Max	Min	Nom [2)]	Max	
Vdd		2.5	2.8	3.0	-	3.3	-	V
Digital I/O Vdd	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 Stand-By Power down	- - -	5 1.3 <10		- - -	5 1.3 <10	- - -	mA mA nA
Measurement range **	FS=2000 °/s	-2000	-	2000	-	±2000	-	°/s
Offset calibration error * [3)]		-200	-	200		±200		°/s
Offset temperature error ** [4)]	-40 ... +85 °C		±1			±1		°/s/°C
Sensitivity * [5)]		-	1.33	-	-	1.33	-	Count/°/s
Sensitivity calibration error *		-7	-	+7	-	±7	-	%
Sensitivity temperature error ** [6)]	-40 ... +85 °C	-	0.02			0.02	-	%/°C
Non-Linearity ** [7)]	-1000<Ω<1000 °/s	-	1		-	1	-	% FS
Output Data Rate, ODR **			2000		-	2000	-	Hz
Bandwidth ** [8)]			20 80			20 80	-	Hz
Integrated noise stdev**	20 Hz BW	-	0.9		-	0.9	-	°/s
Turn on time PD to meas** [9)]	20 Hz BW	-	250		-	250	-	ms
Turn on time SB to meas** [10)]	80 Hz BW	-	12		-	12	-	ms
I^2C 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) Offset when the device is not rotated
4) Offset temperature error = {Count(0 °/s)-Offset} / Sensitivity [°/s]. Sensitivity = Calibrated sensitivity. Offset= Calibrated offset.
5) Sensitivity = {Count(+500°/s) - Count(-500°/s)}/2 [Count/°/s].
6) Sensitivity temperature error = {[Count(+500°/s)-Count(-500°/s)]/2 - Sensitivity} / Sensitivity x 100% [%]. Sensitivity = Calibrated sensitivity.
7) Best fit straight line -1000<Ω<1000 °/s.
8) Frequency responses with 1st order roll off
9) From Power-Down to measurement mode. Settling error less than 1% of FS.
10) From Stand-By to measurement mode. Settling error less than 1% of FS.

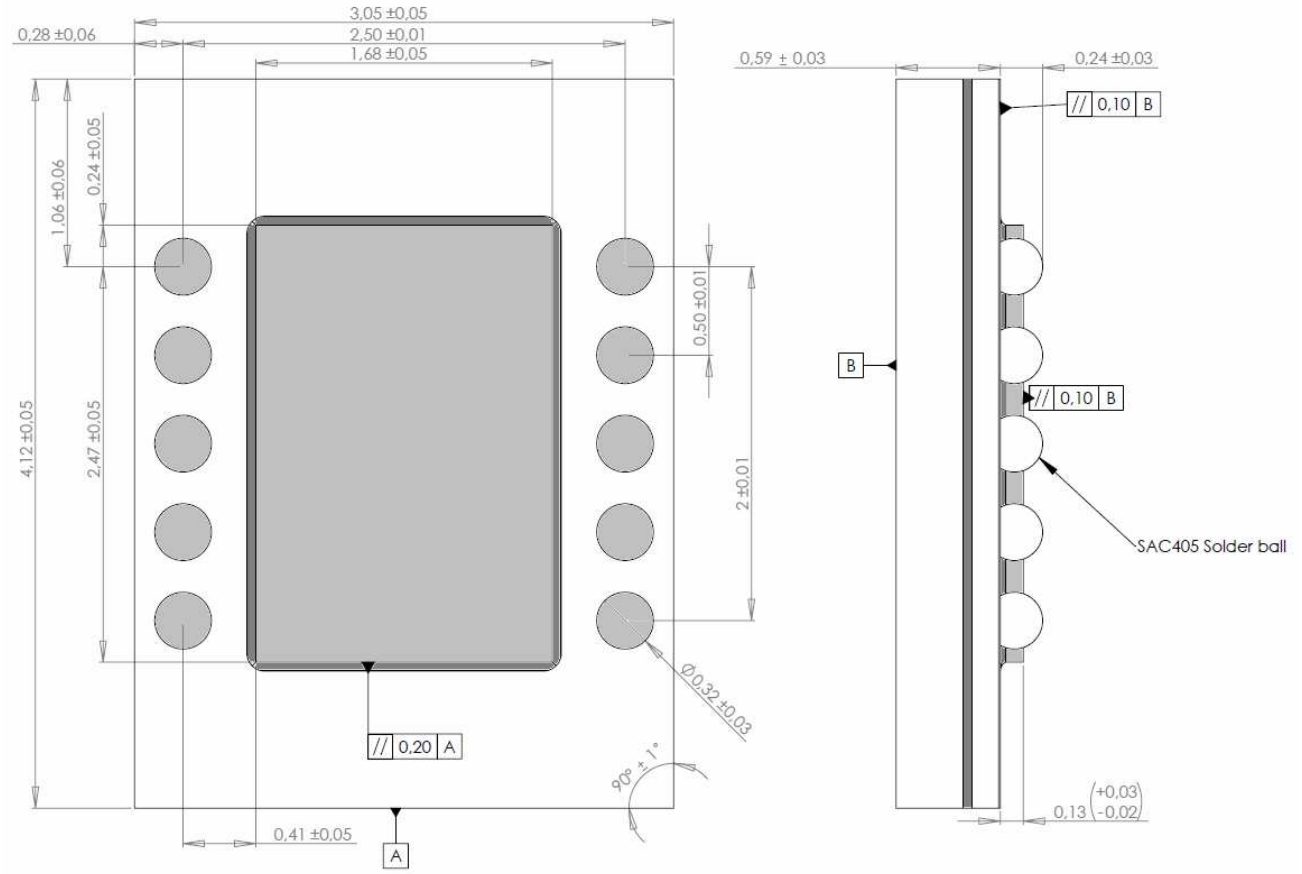

Figure 2 Package dimensions in mm

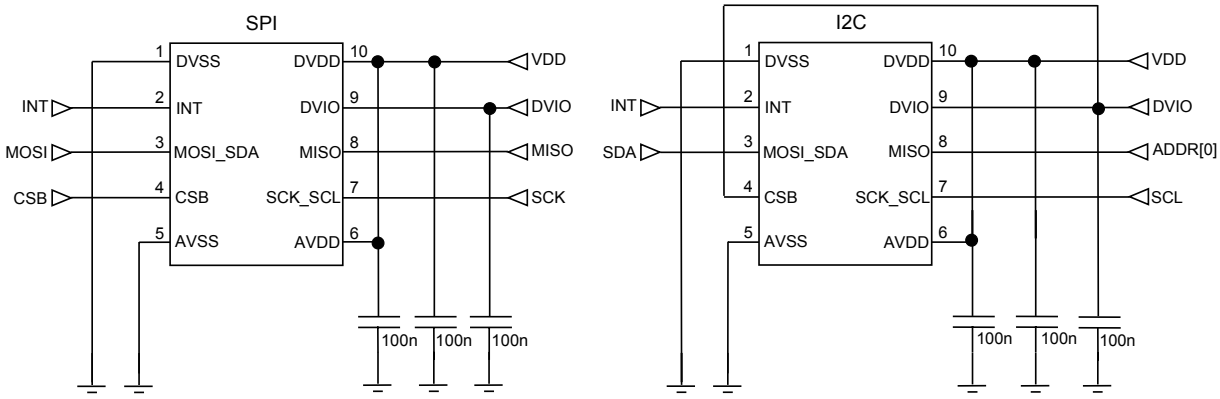

Figure 3 Application schematics for I^2C and SPI bus

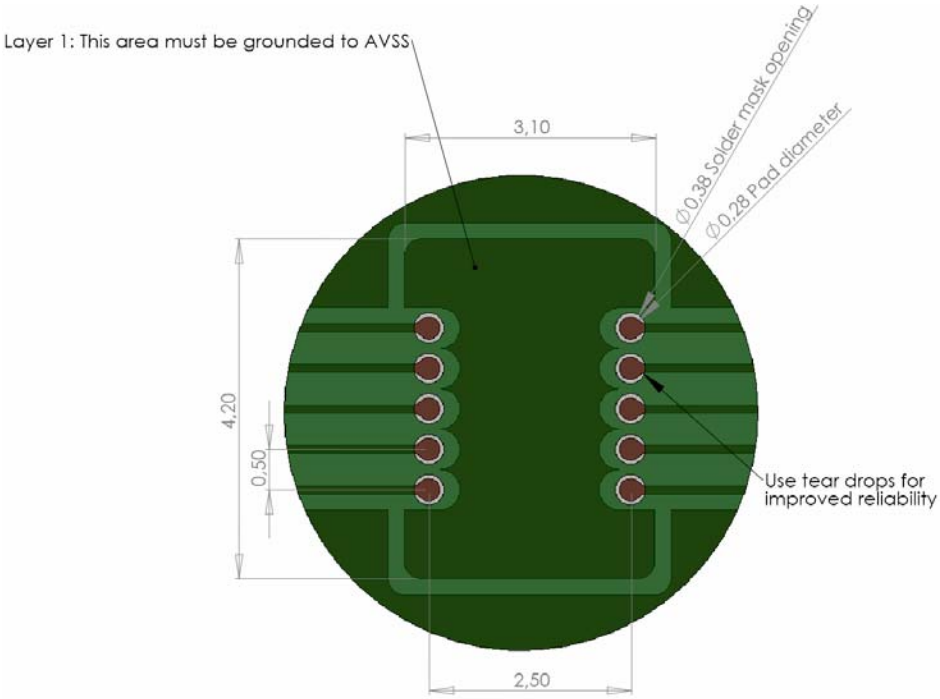

Figure 4 Recommended layout pattern (not actual size, for reference only)

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^2C Serial Data (SDA)
4	CSB	Chip select / I^2C enable
5	AVSS	Analog ground
6	AVDD	Analog supply voltage
7	SCK_SCL	SPI Serial Clock (SCK) / I^2C Serial Clock (SCL)
8	MISO	SPI Serial Data Output (MISO) / I2C slave address LSB ADDR[0]
9	DVIO	I/O Supply
10	DVDD	Digital supply voltage

Document Change Control

Rev.	Date	Change Description
0.1	04-May-09	1st version
0.2	04-Sep-09	Block diagram, package dimensions & layout pattern added
0.3	01-Oct-10	Package dimensions updated
0.4	09-Apr-10	Target Performance Characteristics updated
0.5	20-May-10	Target Performance Characteristics, Table 1, Figure 3 updated
0.6	01-Oct-10	Target Performance Characteristics updated
A.01	03-Nov-10	Fig.2 updated, Target Performance Characteristics updated
A.02	25-Mar-11	Target Performance Characteristics updated