

The background of the slide is a collage of various technology-related images. These include a hand holding a smartphone displaying a city street, a robotic hand holding a human hand, a person wearing a VR headset, a person's hand wearing a smartwatch, and a drone flying over a body of water at sunset. These images are interconnected by a network of thin blue lines that form a geometric pattern across the slide.

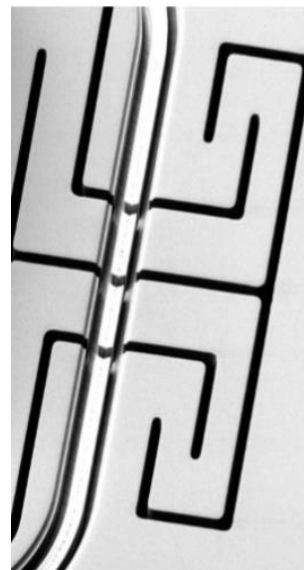
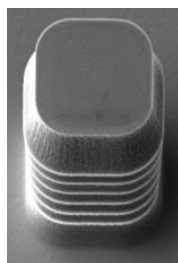
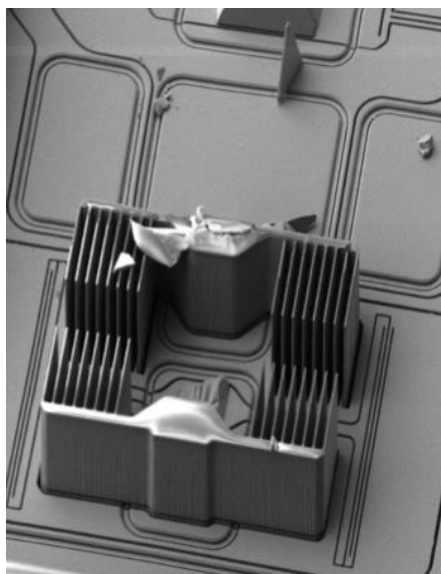
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QMC5883P和QMC5883L- Pin-To-Pin设计应用指南

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QST CORPORATION



前言



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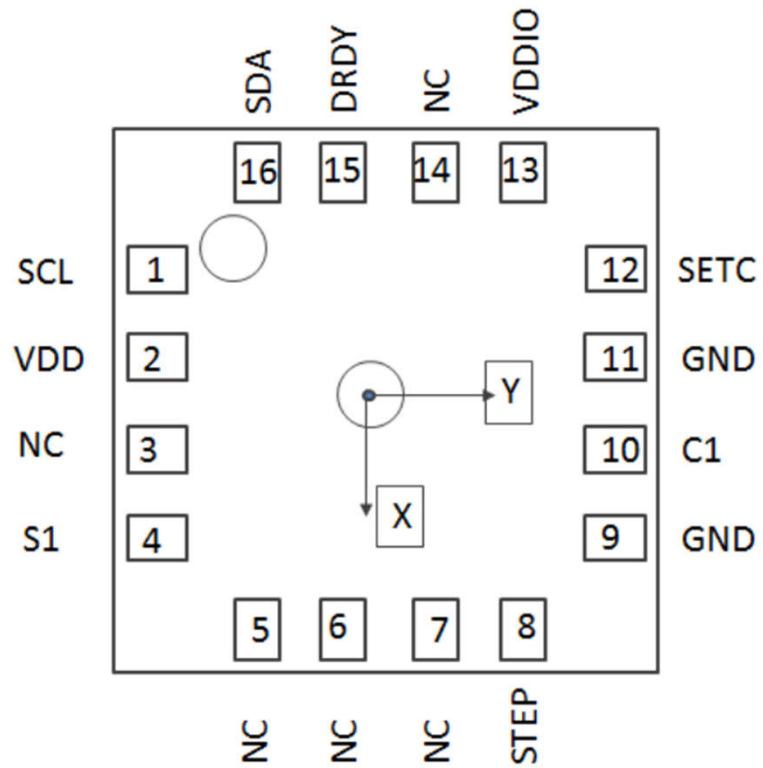
寄存器配置对照表

Parameter	QMC5883L	QMC5883P
I2C Address	If S1 pin tie to VDD: Write address: 0x1a Read address: 0x1b If S1 pin tie to GND: Write address: 0x18 Read address: 0x19	Fixed address: Write address: 0x2c Read address: 0x2d
Chip Id	0xFF	0x80
Ranges	0x09 bit5,bit4 00 : $\pm 2G$ 01 : $\pm 8G$	0x0B bit3,bit2 00 : $\pm 30G$ 01 : $\pm 12G$ 10 : $\pm 8G$ 11 : $\pm 2G$
Mode Register	0x09 bit1,bit0 00 : standby 01 : continuous	0x0A bit1,bit0 00 : suspend 01 : normal 10 : single 11 : continuous
Output Data Rate	0x09 bit3,bit2 00 : 10Hz 01 : 50Hz 10 : 100Hz 11 : 200Hz	0x0A bit3,bit2 00 : 10Hz 01 : 50Hz 10 : 100Hz 11 : 200Hz

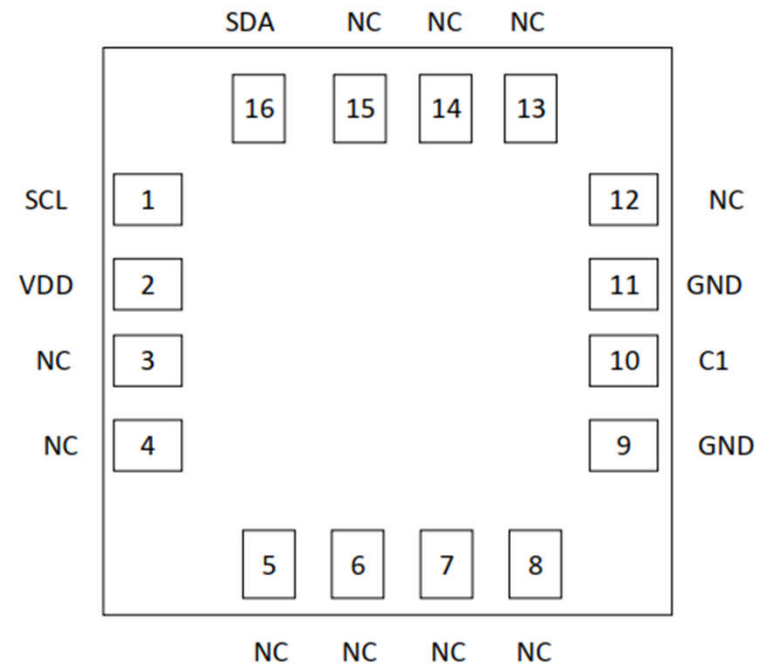
寄存器配置对照表

Parameter	QMC5883L	QMC5883P
Set/Reset Mode	No	0x0B bit1,bit0 00 : set and reset on 01 : set only on 10 :set and reset off 11 :set and reset off
Set/Reset Period	0x0B	No
Over Sample Ratio	0x09 bit7,bit6 00 : 512 01 : 256 10 : 128 11 : 64	0x0A bit5,bit4 00 : 8 01 : 4 10 : 2 11 : 1
Down Sampling Rate	No	0x0A bit7,bit6 00 : 1 01 : 2 10 : 4 11 : 8
Data Ready Bit	0x06 bit0	0x09 bit0
Read X/Y/Z Register	0x00 : Data Output X LSB[7:0] 0x01 : Data Output X MSB[15:8] 0x02 : Data Output Y LSB[7:0] 0x03 : Data Output Y MSB[15:8] 0x04 : Data Output Z LSB[7:0] 0x05 : Data Output Z LSB[15:8]	0x01 : Data Output X LSB[7:0] 0x02 : Data Output X MSB[15:8] 0x03 : Data Output Y LSB[7:0] 0x04 : Data Output Y MSB[15:8] 0x05 : Data Output Z LSB[7:0] 0x06 : Data Output Z LSB[15:8]
Temperature Output	0x07~0x08	No

QMC588L和QMC5883P管脚对比



QMC5883L Top view

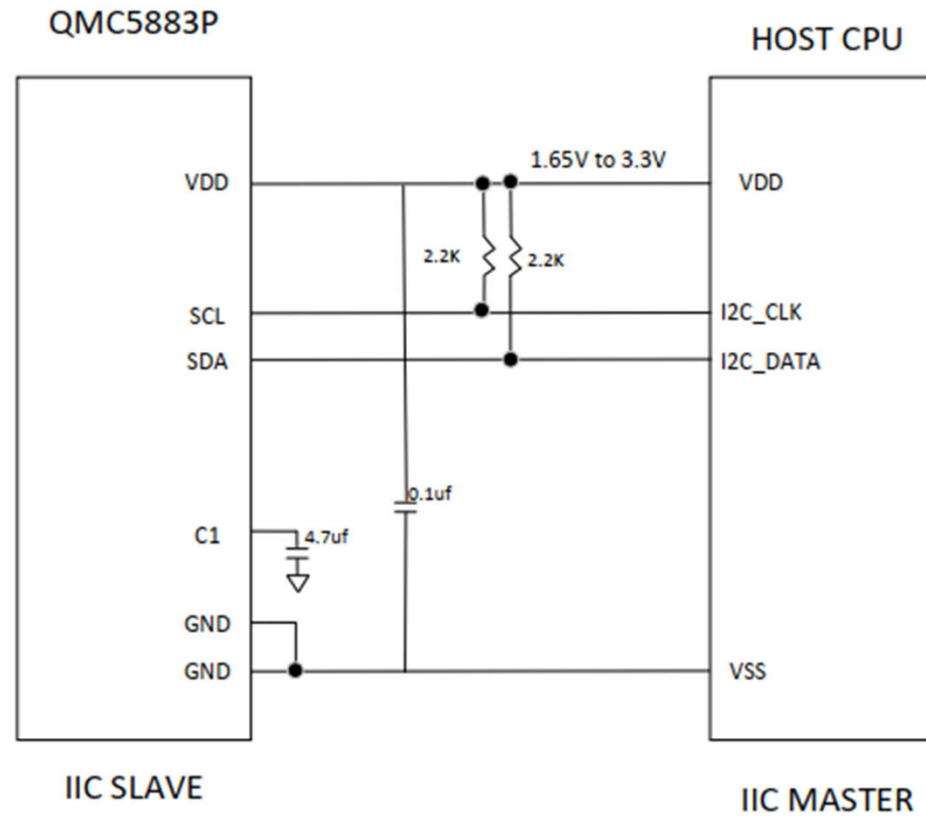


QMC5883P Top view

QMC588L和QMC5883P管脚功能对比

Pin No.	Pin Name	QMC5883L Function	QMC5883P Function
1	SCL	Serial Clock – I2C Master/Slave Clock	Serial Clock – I2C Master/Slave Clock
2	VDD	Power Supply (2.16V to 3.6V)	Power Supply (1.65V to 3.6V)
3	NC	Not to be Connected	Not to be Connected
4	S1	Tie to VDDIO	Not to be Connected
5	NC	Not to be Connected	Not to be Connected
6	NC	Not to be Connected	Not to be Connected
7	NC	Not to be Connected	Not to be Connected
8	SETP	Set/Reset Strap Positive – S/R Capacitor (C2) Connection	Not to be Connected
9	GND	Supply Ground	Supply Ground
10	C1	Reservoir Capacitor (C1) Connection	Reservoir Capacitor (C1) Connection
11	GND	Supply Ground	Supply Ground
12	SETC	S/R Capacitor (C2) Connection – Driver Side	Not to be Connected
13	VDDIO	IO Power Supply (1.71V to VDD)	Not to be Connected
14	NC	Not to be Connected	Not to be Connected
15	DRDY	Data Ready, Interrupt Pin. Default low. Data ready high until data register is read.	Not to be Connected
16	SDA	Serial Data – I2C Master/Slave Data	Serial Data – I2C Master/Slave Data

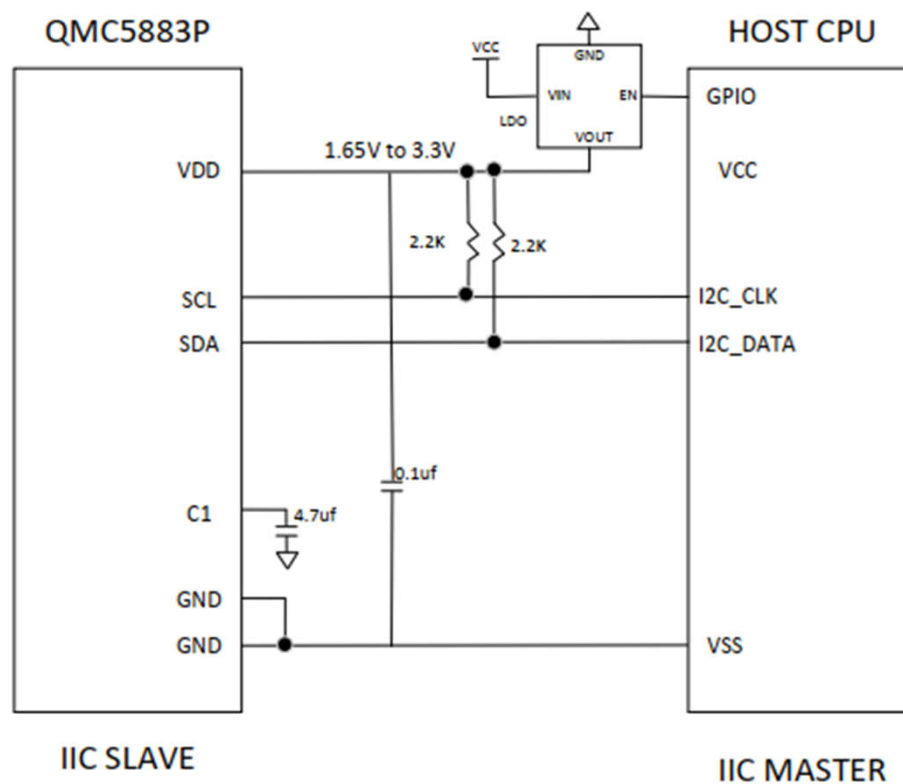
QMC588L和QMC5883P兼容参考设计1



QMC5883P兼容QMC5883L单双电源IIC通信设计[1]

Note[1]: QMC5883L/MMC5883L/MMC5983L电路可以直接Pin-To-PinQMC5883P。

QMC588L和QMC5883P兼容参考设计2-低功耗设计



QMC5883P低功耗IIC通信设计

- 1) 需要主机MCU通过可控LDO控制QMC5883P电源；
- 2) 主机MCU的IIC通信IO默认配置为开漏输出模式；
- 3) IIC通信上拉电阻电源需要接在可控LDO电压输出端；
- 4) 每次LDO开启后，需要重新初始化QMC5883P。

初始化流程

1) I2c_addr:

write 0x2c, read 0x2d

2) Init_Configure:

0x0D = 0x40;

0x29 = 0x06;

0x0A = 0xC3/0xC7/0xCB/0xCF; /*ODR = 10/50/100/200Hz, MODE = continuous*/

0x0B = 0x00/0x04/0x08/0x0C; /*RNG = $\pm 30G$ / $\pm 12G$ / $\pm 8G$ / $\pm 2G$ */

3) Data ready register:

0x09[bit0] DRDY:

"0": no new data; "1": have new data;

4) Read output data register:

0x01~0x06

5) Output register:

First byte is LSB, second byte is MSB.

6) Output data sensitivity, Follow to the Range param:

If Range = $\pm 2G$, 15000LSB/G

If Range = $\pm 8G$, 3750LSB/G

If Range = $\pm 12G$, 2500LSB/G

If Range = $\pm 30G$, 1000LSB/G

QMC588L和QMC5883P性能对比

Parameter			QMC5883L	QMC5883P	Unit
Ranges			±2 / ±8	± 2 / ±8 / ± 12 / ±30[1]	Gauss
Mode Register			Standby/Continuous	Suspend/Normal/Single/Continuous	
VDD			2.16 ~ 3.6	1.65 ~ 3.6	V
VDDIO			1.65 ~ 3.6	1.65 ~ 3.6	V
Standby Current			3	22	μA
Normal Mode Current	ODR=10Hz		75/100	35/78	μA
	ODR=50Hz		150/250	85/310	μA
	ODR=100Hz		250/450	150/600	μA
	ODR=200Hz		450/850	280/1180	μA
Linearity			0.1 (Field Range = ± 2G)	0.5 (Field Range = ± 30G)	%FS
Hysteresis			0.3	0.03	%FS
Cross Axis Sensitivity			0.1(Cross Field = 1G Happlied = ± 2G)	0.5(Field Range = ± 30G Happlied = ± 15G)	%/G
Sensitivity Tempco	Ta = -40°C~85°C		± 5	±0.05	%/°C
Offset			± 10	± 10	mGauss
Field Resolution	Standard deviation	X/Y axis	2	2	mGauss
		Z axis	3	3	
ESD	HBM		2000	4000	V
	CDM		750	1000	
Noise	Type(rms)		7	2.5	mGauss

Note[1]: 量程更大，抗干扰能力更强。

THANK YOU



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