



# Digital Temperature, Water Depth and Azimuth Sensor WF5808FCP

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## Main Features

- 24-bit high-precision digital air pressure conversion
- LGA8 package length 6.8 × width 6.2 × 3.3mm
- Absolute pressure accuracy:  $\pm 0.5\text{kPa}$
- Pressure resolution: 1Pa (water depth resolution less than 1cm)
- Absolute temperature accuracy:  $\pm 2^\circ\text{C}$  (0-- $50^\circ\text{C}$ )
- Azimuth angle resolution: 1 degree
- Communication method: UART
- Low power consumption:  $3.5\mu\text{A}@1\text{Hz}$  sampling      Operating temperature:  $-40\sim+125^\circ\text{C}$
- Environmentally friendly and halogen-free

## Typical Applications

- Anti-corrosion pressure gauge
- Sports watches
- Underwater equipment

## Product Introduction

The WF5808FCP is a digital temperature, water depth, and position sensor. It combines a pressure sensor and a dedicated DSP chip in a waterproof package.

It features low operating voltage, ultra-low power consumption, and exceptionally high waterproof and corrosion resistance, making it ideal for smartwatches and other waterproof devices.

It utilizes an LGA8 package, measuring only 6.2mm (L) x 6.8mm (W) x 3.3mm (H), effectively reducing the size of end products.

## Product Advantages

- Maintain high accuracy within 0~ $+50^\circ\text{C}$  temperature range
- Small package, only 3.3mm height
- Super cost-effective
- Excellent waterproofness



## Electrical characteristics

Test conditions: VDD=3.3V, T=25°C, unless otherwise specified

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Operating temperature range	T <sub>A</sub>	Work	-40	25	+125	°C
		High precision	0		50	
Supply voltage	V <sub>DD</sub>		2.8		3.6	V
IO supply voltage	V <sub>DDIO</sub>		2.8		3.6	V
Average operating current	I <sub>DD, LP</sub>	1Hz		3.4		μA
Peak operating current	I <sub>DDT</sub>			1	2	mA
Standby current	I <sub>DDSL</sub>	25°C		0.1	0.3	μA
Resolution	Res			0.01		°C
Absolute temperature error	A <sub>T</sub>	@25°C		±1		°C
		0...+65°C		±2		°C

### Absolute Maximum Ratings

Parameter	Symbol	Test conditions	Min	Max	Unit
Supply voltage	V <sub>DD</sub>		-0.3	+3.6	V
IO operating voltage	V <sub>DDIO</sub>	allpins	-0.3	V <sub>DD</sub> +0.3	V
Storage temperature	T <sub>STOR</sub>		-45	+85	C
ESD protection	ESD	HBM		±2	kV



## UART Communication Protocol

### Serial Port Settings:

串口设置:

Baud rate 波特率	Start bit 开始位	Data bit 数据位	Stop bit 停止位	Parity bit 校验位
9600	1	8	1	No

### Data Format:

Starting Sign (1 Byte)	Temp integer (1 Byte)	Pressure/Water Depth Integer (1 Byte)	Temp and pressure/water depth decimal points (1 Byte)	Direction and Calibration (1 Byte)
0xAA	Bit 7 Symbol slot Bit 6-0 value 0-127	Bit 7 Pressure/Water Depth Bit 6-0 value 0-127	Bit 7-4 Temperature decimal 0-9 Bit 3-0 Pressure/Water depth decimal 0-9	Bit 7 Direction valid bit 0/1 Bit 6-4 Lens Direction 0-7 Bit 3-0 CRC4 Verification

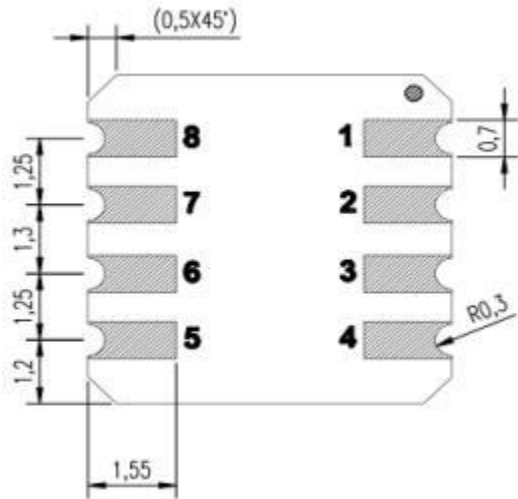
### CRC-4 Format:

```
uint8_t crc4_itu(uint8_t *data, uint_len length)
{
    uint8_t i;
    uint8_t crc = 0;           // Initial value
    while(length--)
    {
        crc ^= *data++;       // crc ^= *data; data++;
        for (i = 0; i < 8; ++i)
        {
            if (crc & 1)
                crc = (crc >> 1) ^ 0x0C; // 0x0C = (reverse 0x03)>>(8-4)
            else
                crc = (crc >> 1);
        }
    }
    return crc;
}
```

After the WF5808F CP is powered on, no configuration is required and data is automatically sent via TX every 500ms.

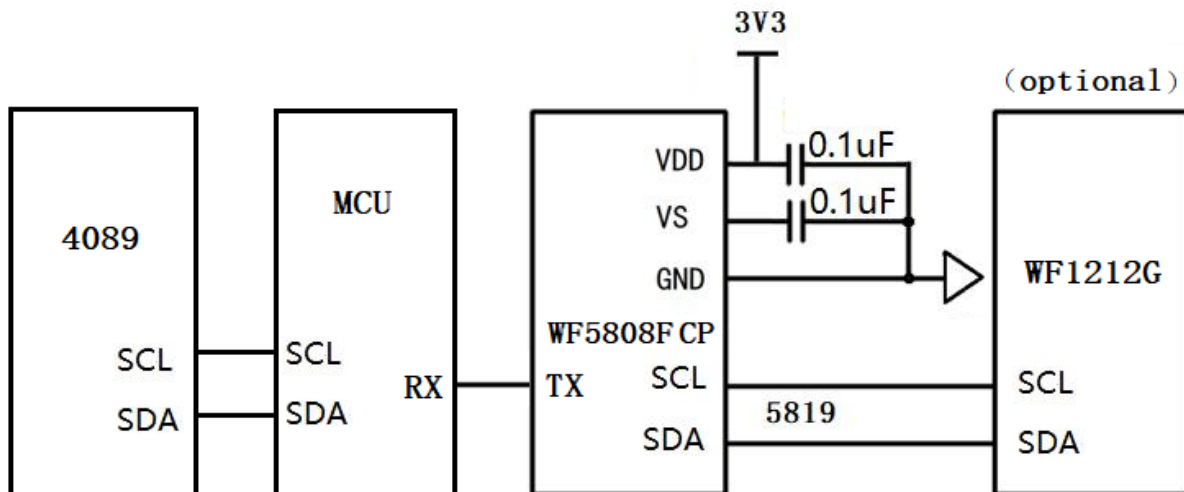


### Foot Position Definition



Pin	Name	Function
1	CLK	Compass Chip Clock
2	GND	ground
3	RX	Serial Port Data Reception
4	NC	Dangling
5	VDD	Power Supply Positive Terminal
6	VS	External 0.1uF to ground
7	SDA	Compass Chip Data
8	TX	Serial Port Data Transmission

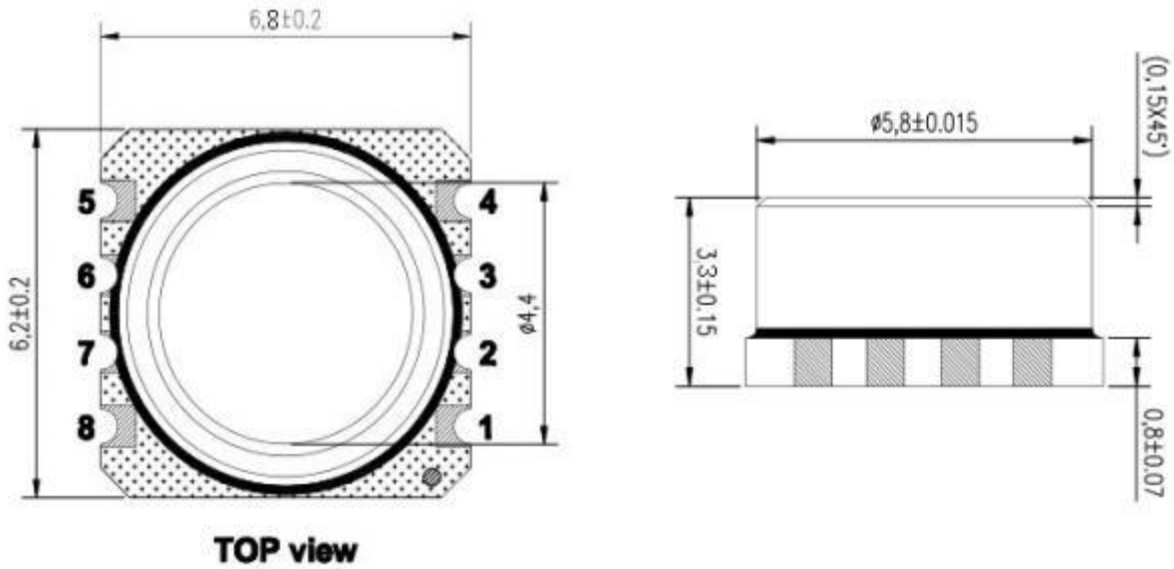
### Typical Application Circuits





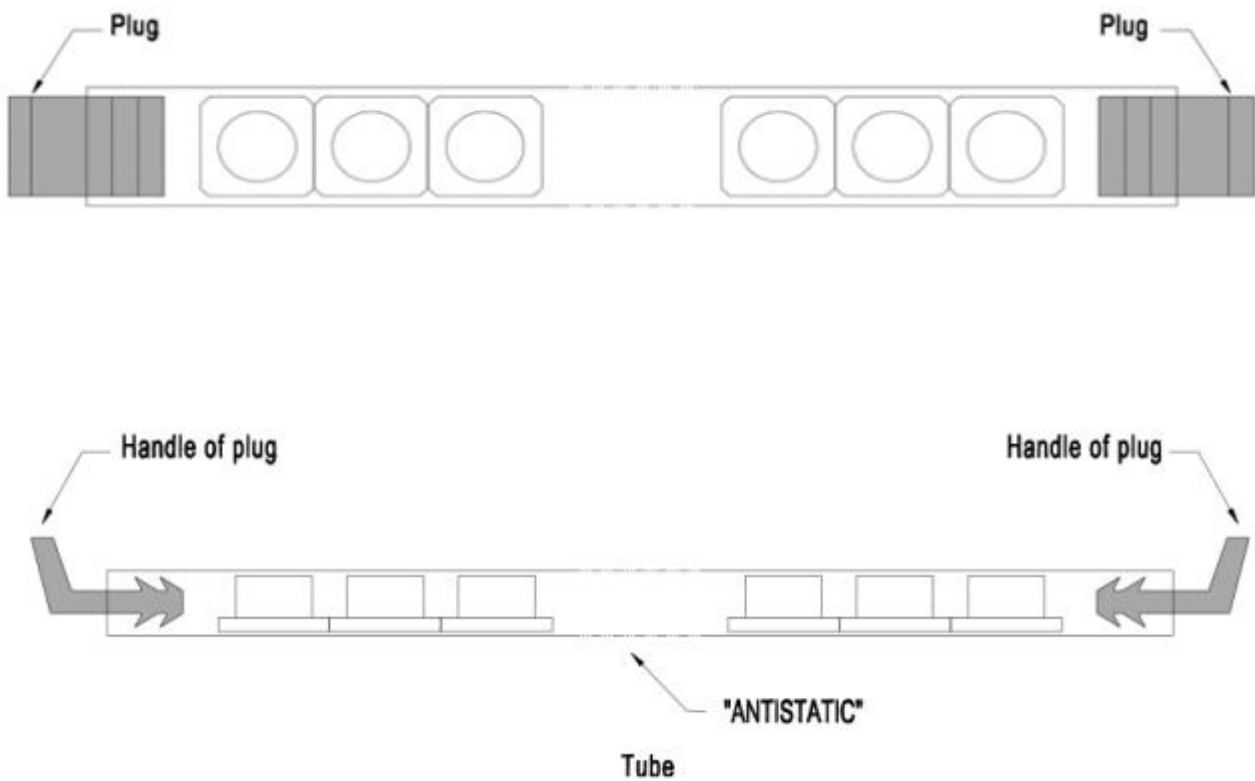
### Package Information

Product Size mm



### Tube Packaging

50个/Tube



## Soldering recommendation

The recommended welding curve is shown in Figure 12, and the subsequent curve characteristics are described in Table 10.

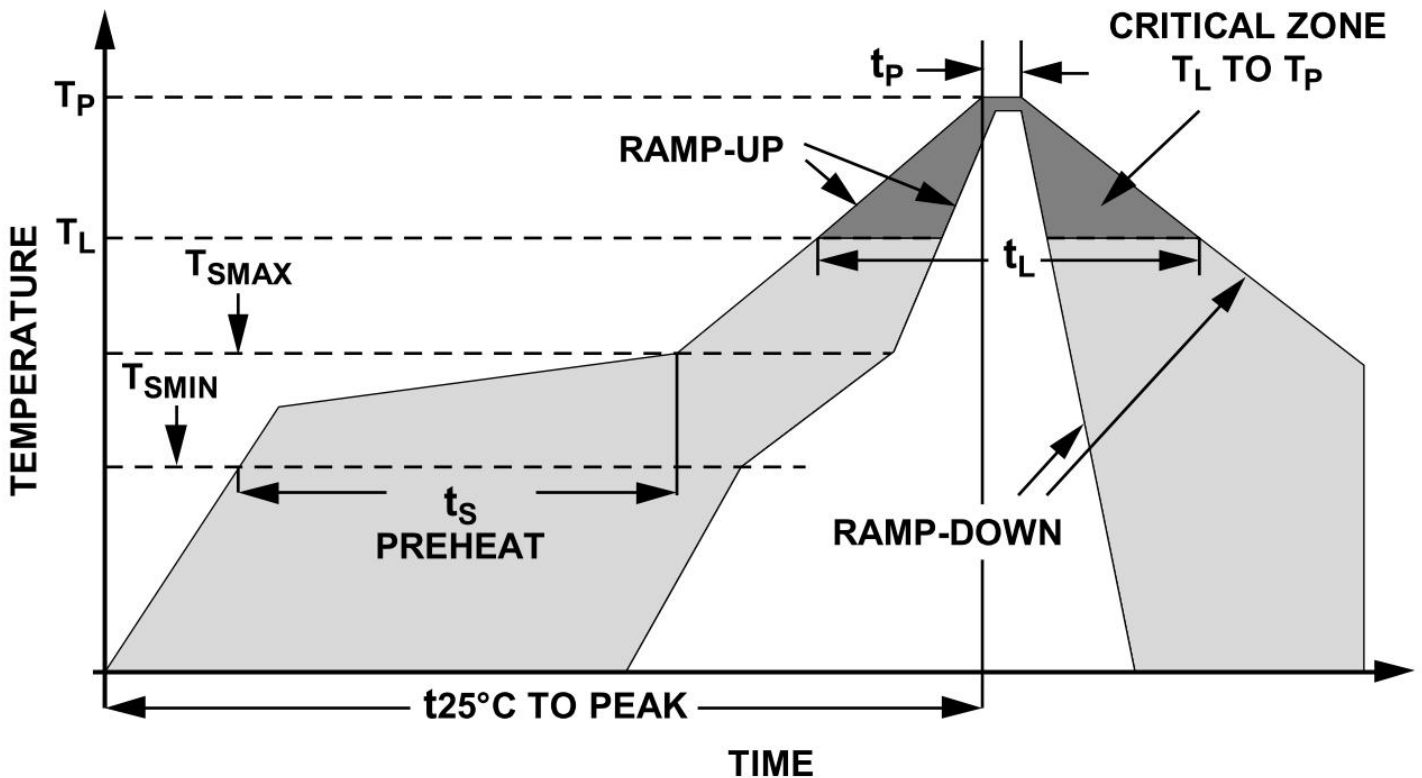


Figure 12 Recommended Soldering Temperature Profile

Table 10 Recommended Soldering Temperature Profile

Profile Feature	Pb-Free
Average ramp-up rate(TsMax to TP)	3°C/sec max.
Preheat:	
-Temperature Min.(TsMin)	150°C
-Temperature Max.(TsMax)	200°C
-Time.(TsMin to TsMax)(Ts)	60 sec to 180 sec
Time maintained above:	
-Temperature(TL)	217°C
-Time(tL)	60 sec to 150 sec
Peak temperature(TP)	250°C
Time within 5°C of actual peak temperature(TP)2	20 sec to 40 sec
Ramp-down rate	4°C/sec max.
Time 25°C to peak temperature	8 minutes max.