The BioSensor-F58GM measures and transfers various types of bio-data including ECG, EEG,RESP, GSR, HR, PPG, HCM and BIA etc, integrated Bio-Processor with Analog Front-End to make an all-in-one health monitoring solution.

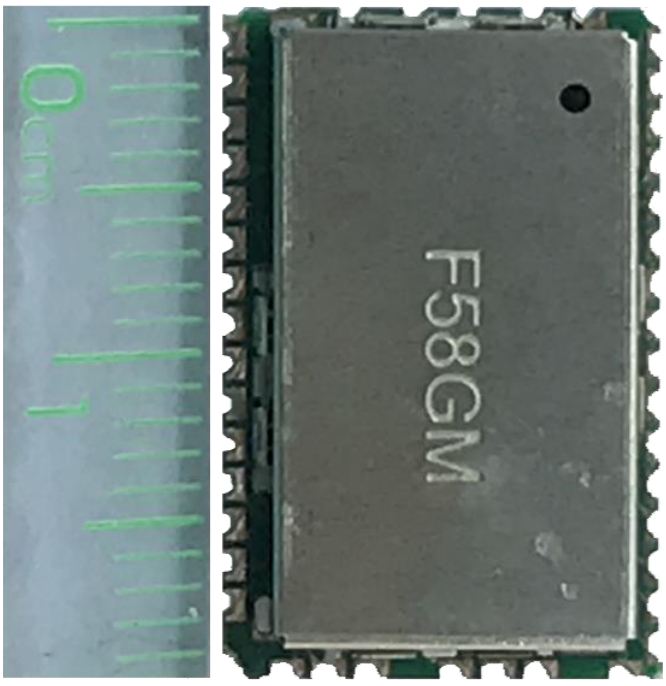
BioSensor supports 8 electrodes to achieve applications with human electrical activities and impedance activities;

Specially, for some common healthcare applications, BioSensor supports direct adaptation of these sensors, such as body temperature, weight, piezoelectric and so on.

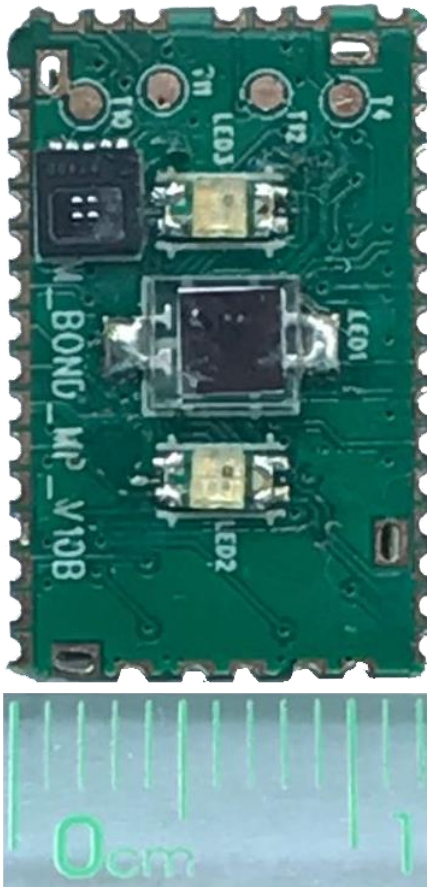
Optional,BioSensor integrates red (660 nm), green (520 nm) and infrared (940 nm) three-color LED and photodiode(PD) sensor to realize PPG-related applications.

Optional, BioSensor integrates Infrared thermopile for contactless medical temperature measurement, and the accuracy reaches ± 0.2 ℃ near 37 ℃.

BioSensor integrates MCU/DSP with biological analog front end and 24 bit ADC , hardware interface supports SPI/I2C/UART optional.



Top



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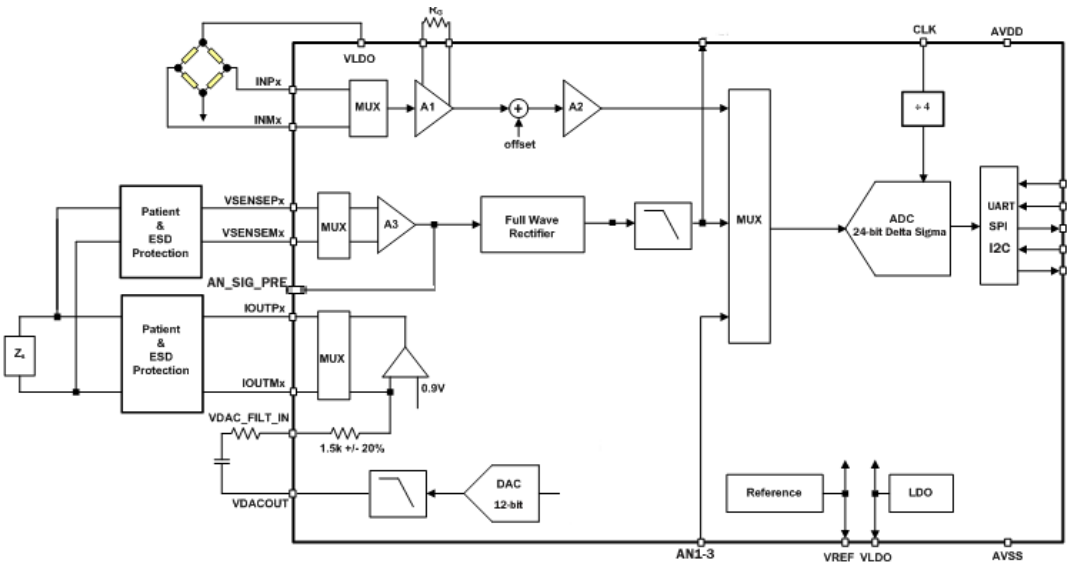
APPLICATIONS

1. Fitness,wristband devices;
2. Healthcare devices;
3. Mobile devices and robots etc;

Block diagram



FEATURES

● Biological Analog Front End:
– Multifunctional analog amplifier, compatible with various vital sign sensor;
– 2-stage PGA, maximum gain 5x128;
– 3-channel 24 bit delta sigma A/D converter;

● Built-in single lead ECG:
– 3 electrodes with right leg driver;
– Lead-off detect;
– Support extend to multi-lead ECG

● Single channel EMG or EEG:
– Support reference driver;
– Lead-off detect;

● Bio-impedance with 8 electrodes:
– Built-in DAC and multi-frequency waveform generator;
– Support RESP,BIA and GSR … ;

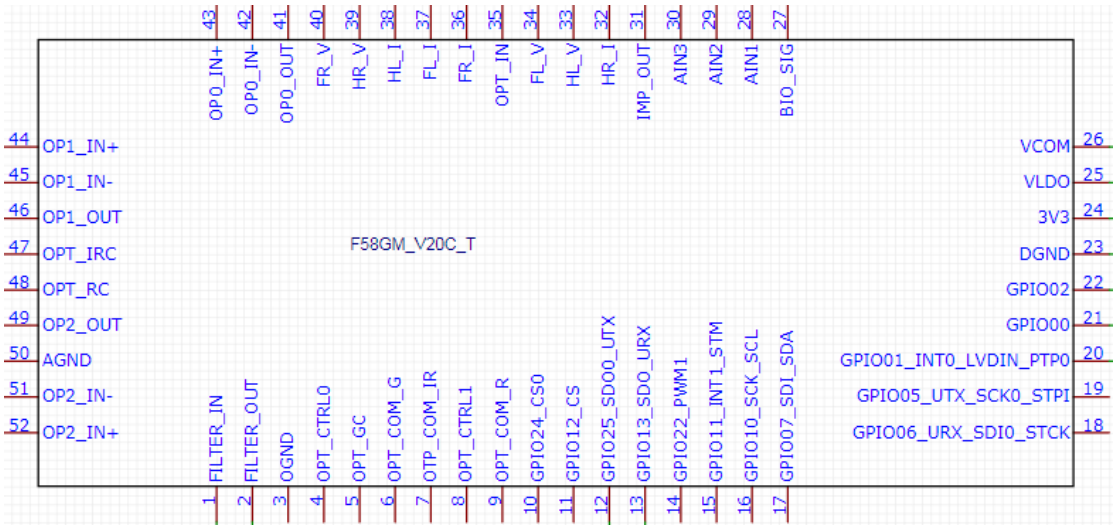
● PPG :
– Built-in red (660 nm), green (520 nm) and infrared (940 nm) LED and PD;
– Support HR,SPO2 and Bio-assay … ;

● Temperature:
– Built-in contactless Infrared thermopile：
support forehead or ear temperature with accuracy of ± .2 ℃ near 37 ℃;
– Support extend to contact-type electric thermometer such as NTC;

● Interface：
– SPI/UART/I2C,optional；
_ Stamp-hole PCBA Module;

● Small size, suitable for wristband devices:
– Area 20 ×12.5mm;
– Support customized for special;

F58GM PIN Map：



F58GM Pins definition:

Table 1:

PIN Name	PIN No.	Type	Function
FILTER_IN	1	AI	Analog Filter input
FILTER_OUT	2	AO	Analog Filter Output
OGND	3	PI	Ground for leds part
OPT_CTRL0	4	SI	LED control input
OPT_GC	5	SO	Source Input about Green Led
OPT_COM_G	6	SO	Source Common End about Green Led
OPT_COM_IR	7	SO	Source Common End about IR Led
OPT_CTRL1	8	SI	LED control input
OPT_COM_R	9	SO	Source Common End about Red Led
GPIO24_CS0	10	I/O	GPIO2_4; CS of spi0
PIO12_CS	11	I/O	GPIO1_2; CS of spi
GPIO25_SDO0_UTX	12	I/O	GPIO2_5; SDO of spi0; TX of Uart
GPIO13_SDO_URX	13	I/O	GPIO1_3; SDO of spi; RX of Uart
PIO22_PWM1	14	I/O	GPIO2_2;PWM1 Output
GPIO11_INT1_STM	15	I/O	GPIO1_1; INT1; TIMER Output
GPIO10_SCK_SCL	16	I/O	GPIO1_0; SCK of spi; SCL of IIC
GPIO07_SDI_SDA	17	I/O	GPIO0_7; SDI of spi; SDA of IIC
GPIO06_URX_SDI0_STCK	18	I/O	GPIO0_6; SDI of spi0; RX of Uart;TIMER Capture Input
GPIO05_UTX_SCK0_STPI	19	I/O	GPIO0_5; SCK of spi0; TX of Uart;TIMER Input
GPIO01_INT0_TM0	20	I/O	GPIO0_1; INT0; TIMER0 Output
PIO00	21	I/O	GPIO0_0
PIO02	22	I/O	GPIO0_2
DGND	23	PI	Digital Ground
V33	24	PI	Power supply
VLDO	25	PO	LDO Output
VCM	26	PO	Common mode voltage output
BIO_SIG	27	AO	Analog output about ECG or others
AD_AIN1	28	AI	ADC Input
AD_AIN2	29	AI	ADC Input
AD_AIN3	30	AI	ADC Input
IMP_OUT	31	AO	Bio-impedance Output
HR_I	32	SO	Drive electrode about Bio-impedance
HL_V	33	AI	Analog Input
FL_V	34	AI	Analog Input
OPT_IN	35	AO	Output for PD sensor
FR_I	36	SO	Drive electrode about Bio-impedance

FL_I	37	SO	Drive electrode about Bio-impedance
HL_I	38	SO	Drive electrode about Bio-impedance
HR_V	39	AI	Analog Input
FR_V	40	AI	Analog Input
OPO_OUT	41	AO	OPA Output
OPO_IN-	42	AI	OPA Input-
OPO_IN+	43	AI	OPA Input+
OP1_IN+	44	AI	OPA Input+
OP1_IN-	45	AI	OPA Input-
OP1_OUT	46	AO	OPA Output
OPT_IRC	47	SO	Source Input about IR Led
OPT_RC	48	SO	Source Input about Red Led
OP2_OUT	49	AO	OPA Output
AGND	50	AI	Analog Ground
OP2_IN-	51	AI	OPA Input-
OP2_IN+	52	AI	OPA Input+

Note: AO--Analog Output,AI--Analog Input;
PI--Power Input,PO--Power Output
SO--Source Output,SI--Source Input

Order information:

Part number	Description	Recommended application
F58GM	No integrated PPG and infrared temperature sensor	All except wristband
F58GM-F	Integrated PPG sensor	wristband
F58GM-FT	Integrated PPG and infrared temperature sensor	wristband

BioSensor Applications

● Non-contact vital sign sensor：

– Support HR,RESP,Sleep,In/out bed,HRV and OSAHS；
– Run as strip sensor under mattress or pillow；
– Non-contact, even without any assistance；
– Wide range of applications - under pillows, seats and mattresses；

● Multifunctional vital signs smart wristband：
Coming soon…

● Portable multi-parameter patient monitor：
Coming soon…