SOON ELETRONIC CO., LTD.

SON1303

Integrated Heart Rate Sensor

Product Specification

VERSION 1.0

SON1303

Integrated
Heart Rate Sensor

Description

SON1303 is the highly integrated pulse meter module using PPG reflective method to measure human heart beat. The module integrate the receiver and transmitter chip and with built-in the double green LED. The receiver parts built-in photo diode inside and low noise pre-amplifier With built-in optical filter It is used in smartphone, tablet PCs and wearable device.

Features

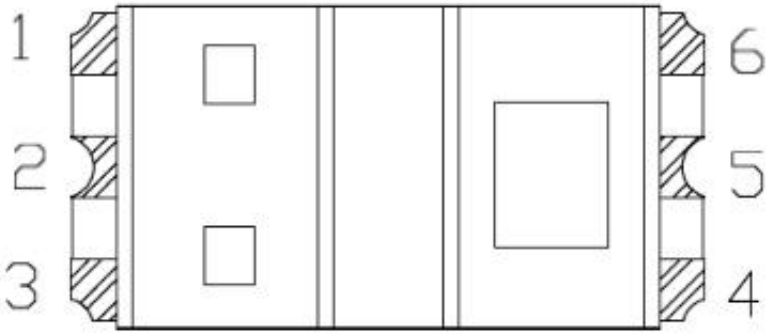
- Heart rate sensor with on chip Photo Detector and green LED in a single module
- Small form factor (4.1x2x1.05 mm)
- Single Power
- High sensitivity
- Double green LED Peak wavelength:570nm
- Receiver parts Peak sensitivity wavelength : 570 nm
- Receiver parts With built-in optical filter
- Crystal-less
- Core V_{DD} : 2.3 to 6 V
- Average current at 3.0V, based on power-saving mode.

Applications

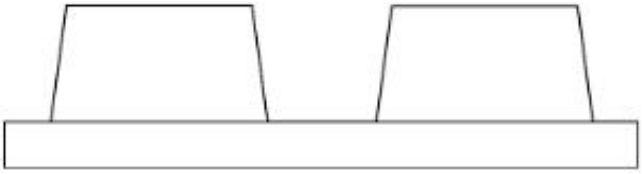
- Wearable device
- Smartphone
- Tablet PCs

Physical Appearance

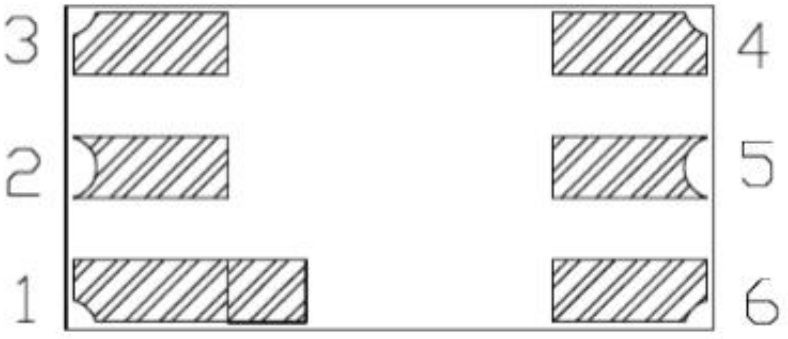
TOP VIEW



SIDE VIEW

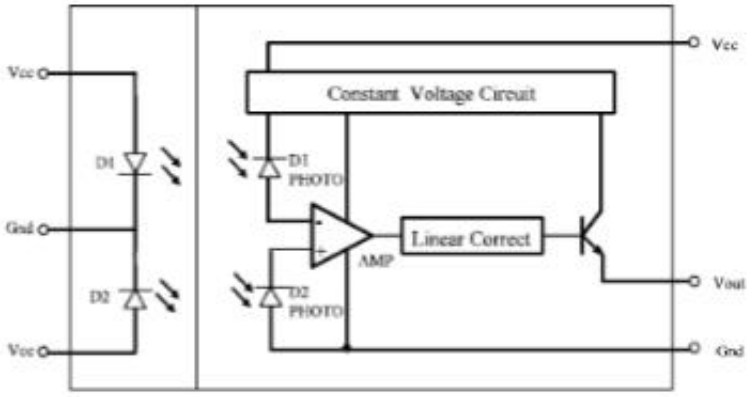


BOTTOM VIEW



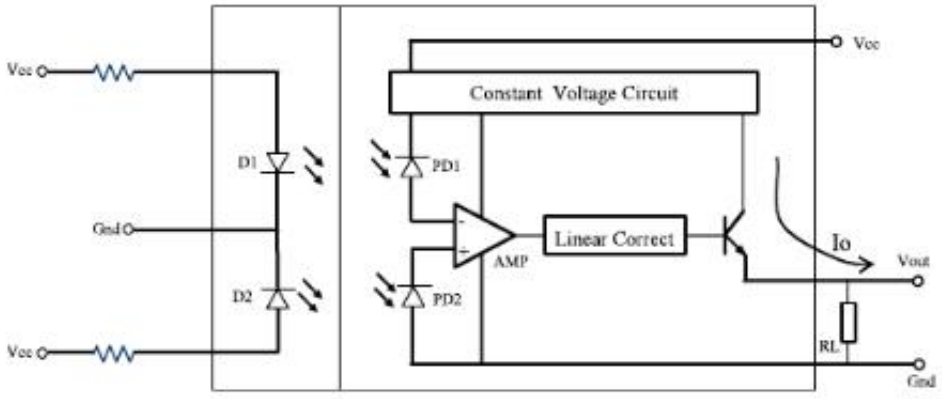
Hardware Specification s

Block Diagram



SON1303 Functional Block Diagram

Converting Photocurrent to Voltage



- The output voltage (V_{OUT}) is the product of photocurrent (I_O) and loading resistor (R_L)
- The value of the loading resistor should be chose properly to obtain the maximum output voltage under the maximum ambient light

$$V_{OUT(max)} = I_{O(max)} \times R_L < V_{O(sat)}$$

SON1303 Pin Description

Pin No.	Names
1	LED+
2	LED-
3	LED+
4	VCC+
5	GND
6	VOUT

Absolute Maximum Ratings (Ta=25 °C)

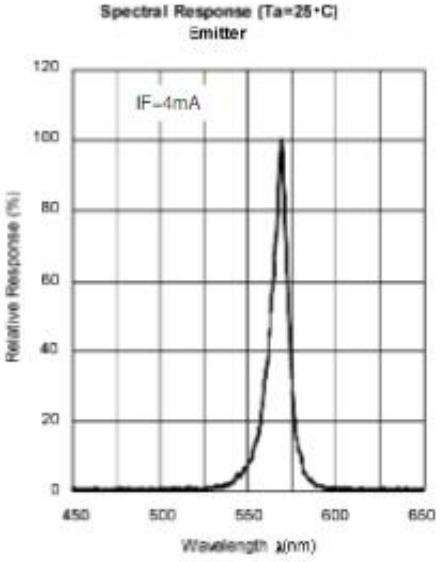
Parameter	Symbol	Rating	Unit
Emitter			
LED2Forward Current (Continuous)	IF	20	mA
LED1Forward Current (Continuous)	IF	20	mA
Reverse Voltage (Continuous)	VR	4	V
Detector			
Supply voltage	V_{CC}	-0.7 to 7	V
Output voltage	V_{OUT}	$\leq V_{CC}$	V
Output current	I_O	5	mA
Storage temperature	T_S	-40 to +100	°C
Operating temperature	T_A	-30 to +85	°C
Soldering temperature(10 s)	Tsol	260	°C
Electrostatic discharge, HBM	ESD	>8	KV

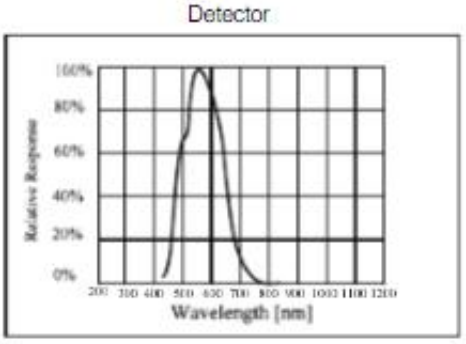
Electro-optical Characteristics

(Vcc=3V, T_A=25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Emitter						
Forward Voltage	VF	IF=4mA	—	—	2.3	V
Reverse Current	IR	VR=4V	—	—	100	μA
Peak Wavelength	λ_P		—	570	—	nm
Detector						
Peak Spectral Response	λ_{PR}		-	570	-	nm
Current Consumption	I_{CC}			$I_O \times 1.02$		
Photocurrent(1)	I_{O1}	Ev=10Lux	3.5	5	6.5	uA
Photocurrent(2)	I_{O2}	Ev=100Lux	35	50	65	uA
Dark current	I_{DARK}	Ev=0 Lux	-	-	90	nA
Saturation Output Voltage	$V_{O(sat)}$	Ev=100Lux, R_{LOAD}=75KΩ	2.2	2.35	-	V
Temperature Coefficient	T_C	T=20 °C~80 °C, Ev=100Lux	-	0.2	-	%/°C
Power Supply Rejection Ratio	$\frac{\Delta I_O}{\Delta V_{CC} \times I_O}$	V_{CC}=1.8~6.5V, Ev=100Lux	-	8	-	%/V

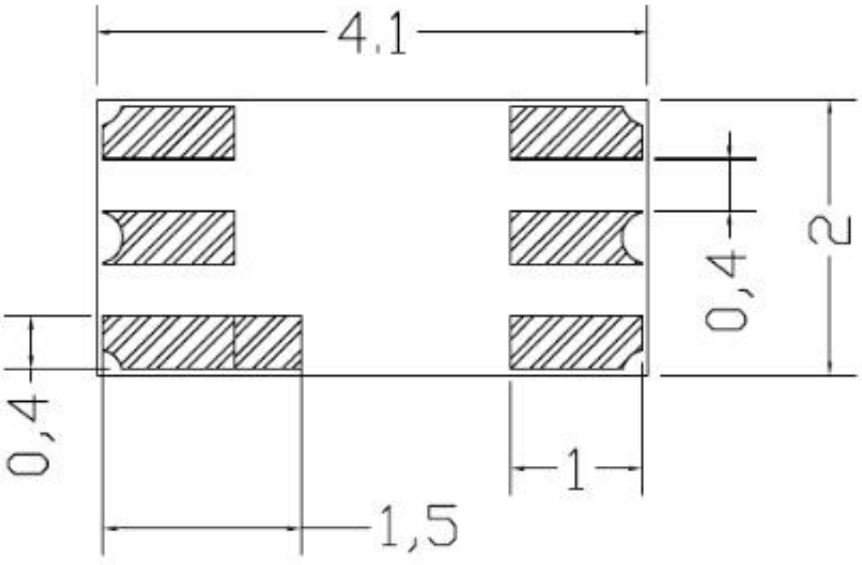
Electrical and optical characteristic curves





Spectral Response with IR-filter Coating

Package Outline



Package of Dimension (Unit: mm)