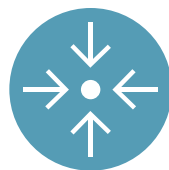




Sensors

PRODUCT SELECTOR GUIDE



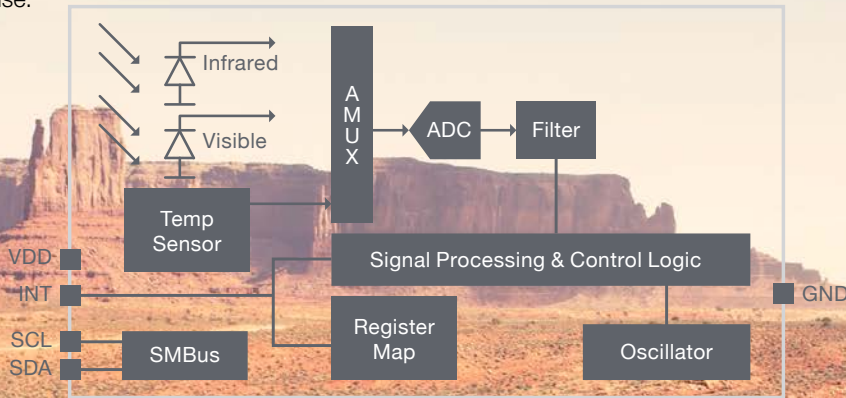
Sensors

Fully-calibrated, low-power intelligent sensing solutions

High precision optical sensor family senses UV Index, ambient light, long range proximity, heart rate/pulse oximetry and motion with 2D or 3D gestures.

Si1132 Ultraviolet (UV) Index and Ambient Light Sensor

The monolithic Si1132 sensor integrates multiple photodiodes, an analog-to-digital converter, a signal processor and a digital I²C control interface. This UV Index and ambient light sensor enables fitness wrist/arm bands, smart watches, and smartphones to measure UV sun exposure. Customers benefit by receiving a warning of when their current UV exposure is at an unhealthy level or to determine their cumulative UV exposure during exercise.



IDEAL FOR WEARABLE APPLICATIONS

Digital UV Index sensor enables real-time UV sun exposure and cumulative UV sun exposure

Ambient light sensor with 0.1 to 128 kLux dynamic range operates in direct sunlight

Long battery life with as little as 1.2 μ A average current UV Index measurements, < 500 nA standby, and 1.7 V to 3.6 V operation

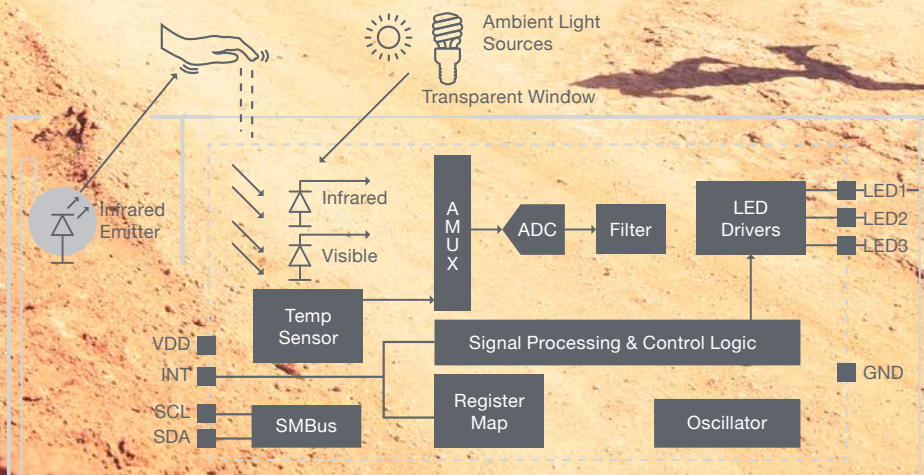
I²C interface for ease of communication with host MCU

Tiny 2 mm x 2 mm clear QFN package

Operating temperature – 40 to 85 °C

Si114x Multi-LED Heart Rate, SpO₂, Proximity and Ambient Light

The monolithic Si114x sensors integrate high sensitivity photodiodes, a low-noise analog-to-digital converter, analog filtering, up to 3-LED drivers and a digital I²C control interface into one package. Broad spectral sensitivity supports green through 940nm LEDs for wrist, ear, and finger-tip heart rate/SpO₂ signals. This low-power sensing family enables long battery life with standby less than 500 nA and a short 25.6 μ s LED on time.



BIOMETRIC, PROXIMITY, AND AMBIENT LIGHT SENSING

Accurately sense weak blood flow signals

Advanced signal processing to extract heart rate information

Broad spectral sensitivity supports green through 940nm LEDs

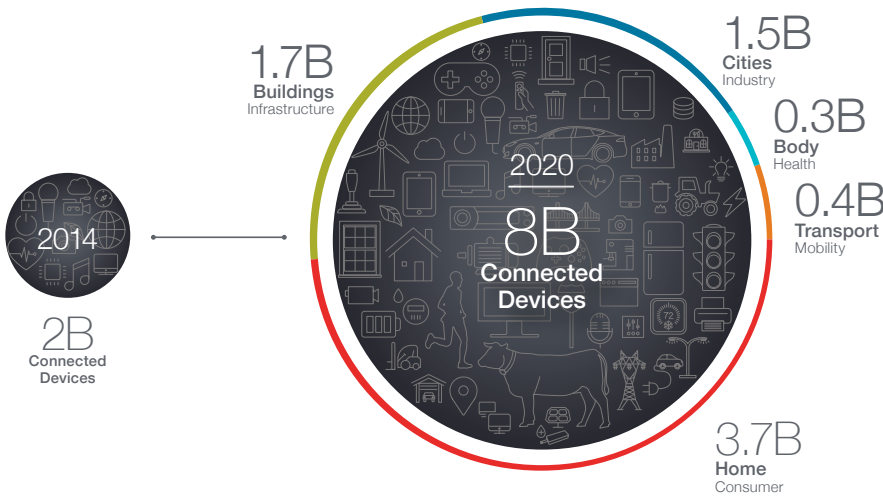
Dynamically drive 1, 2, or 3 LEDs

Long battery life

I²C interface for ease of communication with host MCU

Tiny 2 mm x 2 mm clear QFN package

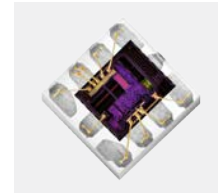
Powering an ever-increasing ecosystem of connected devices



Harbor Research, Inc. 03/2014



Highly Integrated
High-precision sensor elements
Analog front-end
High resolution ADC



Accurate
Fully factory-calibrated
Highest sensitivity
Fast response times



Low Power
Ultra-low sleep current
Fast measurement times
Automatic wakeup



Automotive/Industrial
Up to -40 to 125 °C operation
AEC-Q100 qualified
PPAP/IMDS support

It's not only about connecting devices. It's about improving our way of life. The way we do business, and the impact we have on our environment. It's called the Internet of Things, and it's going to change everything.

Full system-level solutions

In addition to highly integrated sensor products, Silicon Labs offers software and source code for a variety of applications, along with full hardware and software reference designs.

Easy design-in and production ramp

All of Silicon Labs' sensor products are compatible with SMT pick-and-place and reflow assembly processes. The full factory calibration and minimal amount of external bill of materials keeps costs low.

High performance and flexibility

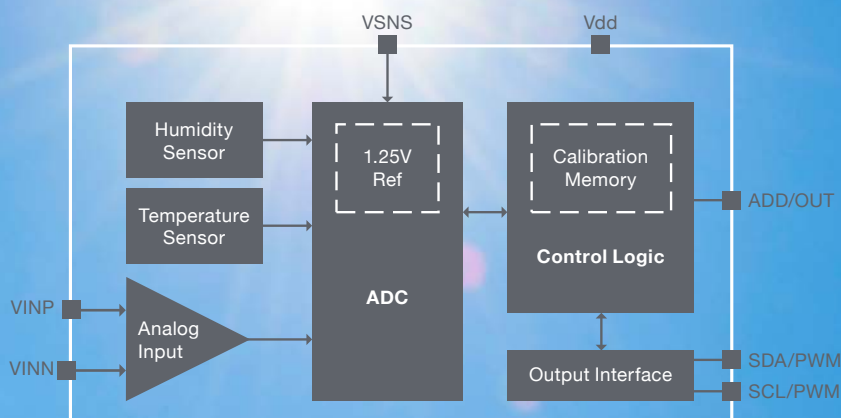
High performance sensor elements, combined with patented analog front end circuit design enables high sensitivity and wide accuracy ranges. Multiple package options provide flexibility depending on the application requirements.



Energy-friendly relative humidity sensor family offers flexibility to meet the needs of almost any application.

Si700x/1x/2x Relative Humidity and Temperature Sensors

Silicon Labs' state of the art relative humidity and temperature sensors utilize proven techniques for measuring humidity using polymer dielectric film along with CMOS mixed signal integrated circuits. These monolithic ICs combine fully calibrated humidity and temperature sensing elements along with on-chip signal conditioning into a compact, rugged and reliable package.



FEATURES

Three RH accuracy levels up to $\pm 3\%$ RH (maximum) @ 0 to 80% RH

Two temperature accuracy levels up to $\pm 0.4\text{ }^\circ\text{C}$ (maximum) @ -10 to $+85\text{ }^\circ\text{C}$

I^2C or PWM outputs

As low as $2.2\text{ }\mu\text{W}$ average power at 3.3 V and 1 sample per second

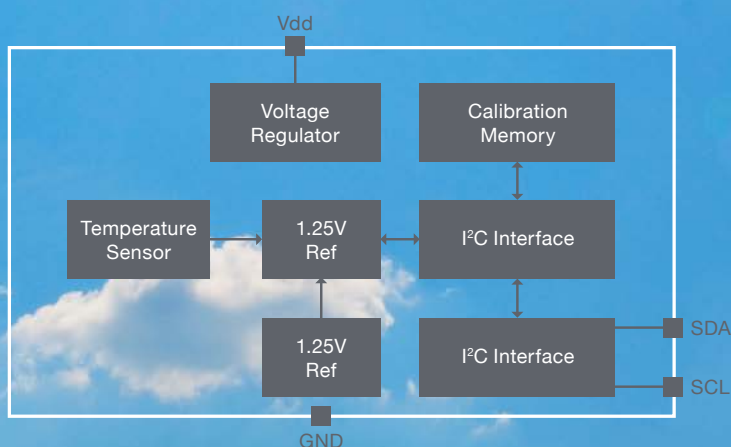
Optional factory-installed filter/cover offers lifetime protection of the sensor

Optional auxiliary 2nd zone sensor input

Industry standard package footprint

Si705x Temperature Sensors

Silicon Labs' digital temperature sensors feature innovative signal processing and mixed-signal designs that deliver high accuracy and industry-leading low power consumption. All of these devices are factory calibrated and maintain their accuracy across the entire operating voltage and temperature ranges. The integrated analog to digital converters support up to 14-bit resolution for applications demanding high-precision.



FEATURES

Four temperature accuracy levels from $\pm 0.3\text{ }^\circ\text{C}$ to $\pm 1.0\text{ }^\circ\text{C}$ (maximum)

Accuracy maintained over the entire operating temperature and voltage range

-40 to $+125\text{ }^\circ\text{C}$ and 1.9 to 3.6 V operating ranges

As low as 195 nA average current @ 1 Hz sample rate

14-bit resolution

I^2C interface

Part Number	Package	Description	LED Drivers	Heart Rate Monitor	Gesture/Motion Sensing	ALS	Interface	Evaluation Kit
OPTICAL SENSORS WITH UV INDEX								
Si 1132-A10-GMR	2x2 mm QFN-10	AEC-Q100 Proximity/ALS	-		-	✓	I ² C	UVIrSlider2EK
Si 1147-A10 -GMR	2x2 mm QFN-10	AEC-Q100 Proximity/ALS	3	✓	3D gesture detection	✓	I ² C	UVIrSlider2EK
Si 1146-A10-GMR	2x2 mm QFN-10	AEC-Q100 Proximity/ALS	2	✓	2D gesture detection	✓	I ² C	UVIrSlider2EK
Si1145-A10-GMR	2x2 mm QFN-10	Proximity/ALS	1	✓	Motion sensing	✓	I ² C	UVIrSlider2EK
OPTICAL SENSORS WITHOUT UV INDEX								
Si 1143-A11-YM0R	2x2 mm QFN-10	AEC-Q100 UV/Proximity/ALS	3	✓	3D gesture detection	✓	I ² C	Si1140DK, IRMF8-EK
Si 1142-A11-YM0R	2x2 mm QFN-10	AEC-Q100 UV/Proximity/ALS	2	✓	2D gesture detection	✓	I ² C	Si1140DK, IRMF8-EK
Si 1141-A11-YM0R	2x2 mm QFN-10	AEC-Q100 UV/Proximity/ALS	1	✓	Motion sensing	✓	I ² C	Si1140DK, IRMF8-EK
Si 1143-A11-GMR	2x2 mm QFN-10	UV/Proximity/ALS	3	✓	3D gesture detection	✓	I ² C	Si1140DK, IRMF8-EK
Si 1142-A11-GMR	2x2 mm QFN-10	Proximity/ALS	2	✓	2D gesture detection	✓	I ² C	Si1140DK, IRMF8-EK
Si 1141-A11-GMR	2x2 mm QFN-10	Proximity/ALS	1	✓	Motion sensing	✓	I ² C	Si1140DK, IRMF8-EK
Si 1102-A-GMR	2x2 mm QFN-10	Optical proximity detector	1	✓	-	-	Digital (On/Off)	Si1102EK
Part Number	Package	Accuracy (Max)	Output	Protective Cover Option	AEC-Q100 Qualified w/ PPAP Support	Standard Footprint / Drop-in Replacement	Evaluation Kit	
RELATIVE HUMIDITY AND TEMPERATURE SENSORS								
Si7023-A20	3x3mm, DFN-6	±3%RH / 0.4°C	PWM	✓	✓	✓	Si7022-23-EVB	
Si7021-A20	3x3mm, DFN-6	±3%RH / 0.4°C	I ² C	✓	✓	✓	Si7013USB-DONGLE	
Si7013-A20*	3x3mm, DFN-10	±3%RH / 0.4°C	I ² C	✓	✓	-	Si7013USB-DONGLE	
Si7022-A20	3x3mm, DFN-6	±4%RH / 0.4°C	PWM	✓	✓	✓	Si7022-23-EVB	
Si7020-A20	3x3mm, DFN-6	±4%RH / 0.4°C	I ² C	✓	✓	✓	Si7013USB-DONGLE	
Si7007-A20	3x3mm, DFN-6	±5%RH / 1.0°C	PWM	✓	-	✓	Si7006-07-EVB	
Si7006-A20	3x3mm, DFN-6	±5%RH / 1.0°C	I ² C	✓	-	✓	Si7006-07-EVB	
TEMPERATURE SENSORS								
Si7053-A20	3x3mm, DFN-6	±0.3°C	I ² C	-	✓	-	Si7053-EVB	
Si7054-A20	3x3mm, DFN-6	±0.4°C	I ² C	-	✓	-	Si7054-EVB	
Si7055-A20	3x3mm, DFN-6	±0.5°C	I ² C	-	✓	-	Si7055-EVB	
Si7050-A20	3x3mm, DFN-6	±1.0°C	I ² C	-	✓	-	Si7050-EVB	

*Note: Includes 2-zone temperature sensor

Silicon Labs' Sensor Development Tools



SLSTK3201A

This kit contains both the EFM32™ Zero Gecko STK and sensor expansion board, which contains Silicon Labs' Si7013 Relative Humidity and Temperature Sensor, Si1147 Si1147 HRM/SpO2/Proximity/UV/Ambient Light Sensor.



SENSOR-PUCK

The SENSOR-PUCK provides a convenient environmental and biometric sensor evaluation tool using Silicon Labs' Si114x Optical Sensors and Si701x/2x Relative Humidity and Temperature Sensors.



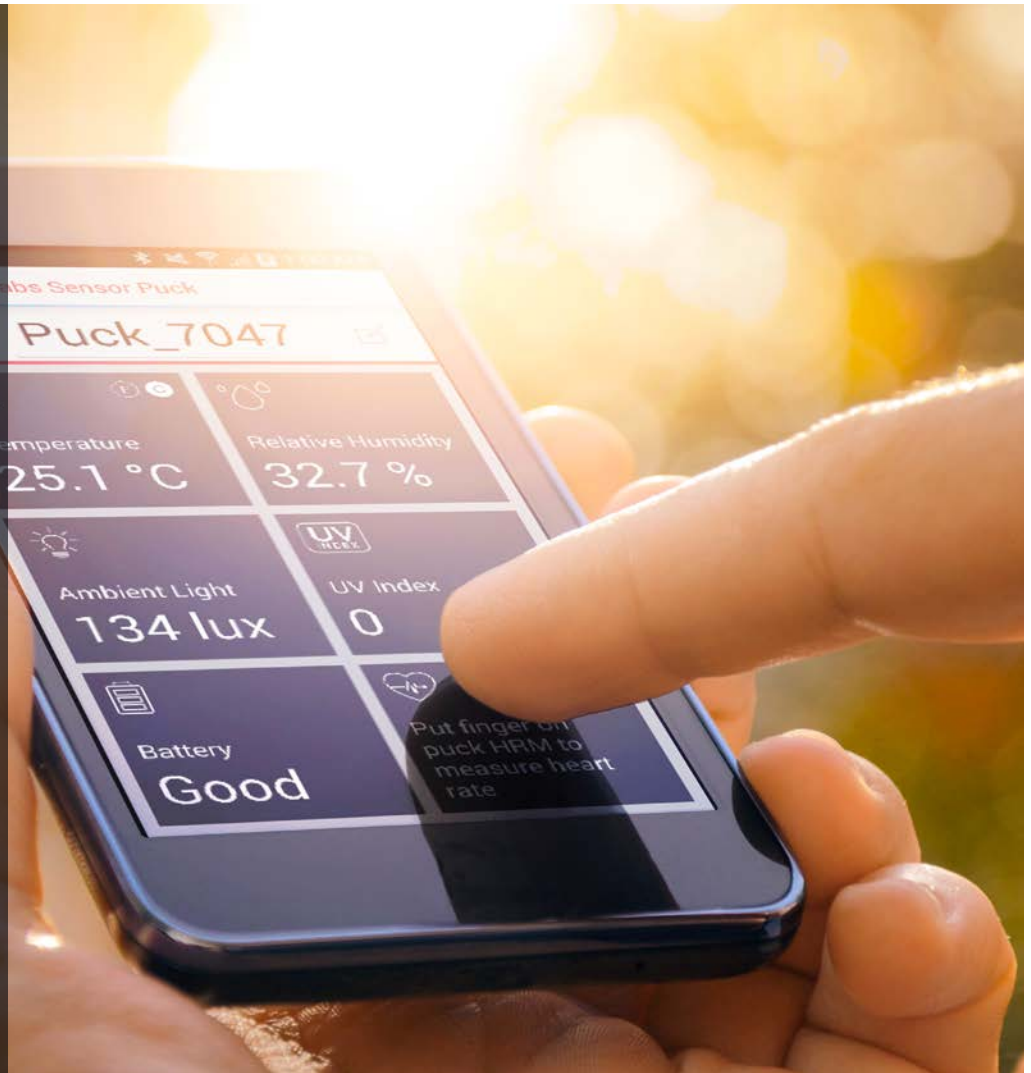
BIOMETRIC-EXP

The BIOMETRIC-EXP-EVB card provides a convenient development and demo platform for Silicon Labs' Si114x heart rate/SpO2/UV sensor and Si701x/2x Relative Humidity and Temperature Sensors.

Silicon Labs' design resources allow for quick and easy development and demos.

The SENSOR-PUCK is an easy to demonstrate, small, low-power, sensor IoT system that uses Bluetooth low energy to broadcast environmental and biometric sensor measurements to smartphones using Silicon Labs iPhone or Android apps.

www.silabs.com/sensor-puck



HRM Development Kit

This \$49.99 kit is an excellent starting point for developing wearables with Silicon Labs



Online Utilities

Use IR Range Estimator, Sensor Current Estimator, plus Cross-Reference search tools to streamline development



Need Help

Ask questions and contact our experts directly in the support portal.

www.silabs.com/support



Silicon Labs Community

Find the support and answers you need on Silicon Labs community forum.

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Find your nearest distributor, or buy or sample online, see details at www.silabs.com/sensors