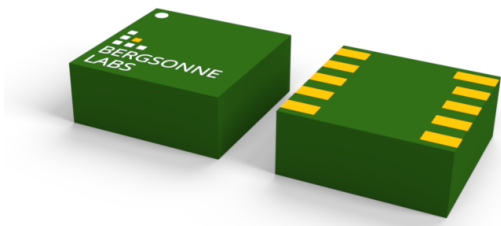




Sense.HR

heart rate, pulse oximetry, and hydration

The fully-integrated Sense.HR optical heart-rate and SpO₂ sensor combines the advanced Analog Devices MAX86174A photoplethysmography (PPG) front end with dual Vishay VEMD1060X01 silicon PIN photodiodes and four LEDs (two green, one red, one IR) for multi-wavelength reflective optical sensing. The 20-bit ADC with a 256-word FIFO provides data at configurable rates from 1 to 2048 frames per second for external processing.



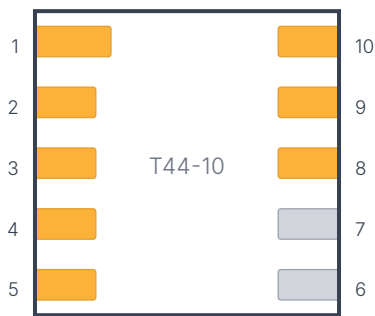
Overview

Revision	a
Package	T44-10
Packaging	12 mm tape and reel, 500 per 7 in reel
Power	1.7–2V (system) (MAX86174A core supply, 1.7–2.0 V (2.2 V absolute maximum): a 1.8 V rail, not 3.3 V. About 0.1–0.5 mA while sampling, 1 µA in shutdown.), 2.7–5.5V (system) (LED supply (anodes of all four LEDs), 2.7–5.5 V; 5 V recommended so green LEDs keep driver headroom. Draws short LED pulses (up to 100 mA, the LEDs' pulse rating); average is well under 1 mA at typical frame rates. VLED must not come up before V+ (datasheet: "Power up VDD before VLED").)
Component	MAX86174A
Component	VEMD1060X01
Component	IN-S42CTQHIR
Component	IN-S42ATR
Component	IN-S42ATG
Interfaces	I2C, SPI

Configuration

I2C address	0x6B (default) (default) · 0x6A (alternate)
Interface mode	I ² C (default) · SPI (4-wire)

Pad Assignments



(top view)

PAD	TYPE	FUNCTION	NOTE
1	power	GND	
2	digital	I2C.AD0	A pull-up to 1.8 V on the tile (R1/R2) selects address 0x6B; tie to GND for 0x6A. Never drive above 2.1 V (VDD + 0.3 V absolute maximum).
	digital	SPI.MISO	
3	digital	I2C.EN	A pull-up to 1.8 V on the tile (R1/R2) selects I2C; tie to GND for SPI. Tolerates up to 6 V.
	digital	SPI.CS	
4	digital	I2C.CLK	6V tolerant
	digital	SPI.CLK	6V tolerant
5	digital	I2C.DAT	6V tolerant
	digital	SPI.MOSI	6V tolerant
8	digital	INTB	interrupt output, open-drain, active low; needs a pull-up on the host side (tolerates up to 6 V)
9	power	VLED	2.7-5.5V LED supply
10	power	V+	1.8V (1.7-2.0V)



Interfaces

I2C

I2C

Mode

slave

Max Clock

400kHz

Addresses

0x6B (default), 0x6A

Format

7-bit addr

FUNCTION	REQ	PAD(S)
I2C.CLK	Yes	4
I2C.DAT	Yes	5

SPI

SPI

Mode

slave

Max Clock

20MHz

FUNCTION	REQ	PAD(S)
SPI.MISO	No	2
SPI.CS	No	3
SPI.CLK	No	4
SPI.MOSI	No	5

Packaging

Method	Tape and reel, EIA-481
Carrier tape	12 mm embossed, cold seal cover tape
Pocket	4.3 × 4.3 × 1.8 mm (A0 × B0 × K0)
Pocket pitch	8 mm (P1)
Reel	7 in (178 mm)
Quantity	500 per reel
Pin 1	Quadrant 1 per EIA-481: keyed land toward the sprocket holes, tile face up Tape and reel drawing (PDF)

