Advanced Information
Preliminary Product Brief

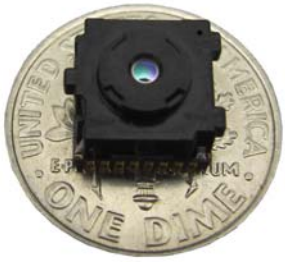
LEPTON Longwave Infrared (LWIR) Camera Module

General Description

Lepton is a complete longwave Infrared (LWIR) camera module designed to interface easily into native mobile device interfaces and other consumer electronics. It captures light input in its nominal response wavelength band (from 8 to 14 microns) and outputs a uniform thermal image via a MIPI or VoSPI interface.

Features

- 8.5 × 8.5 × <5.9 mm fixed focus camera module
- 80 (h) × 60 (v) active pixels
- LWIR sensor, wavelength 8 to 14 µm
- Thermal sensitivity, <50 mK
- 17µm pixel size
- 50-degree HFOV, 60-deg diagonal, dual-element lens (f/1.1)
- Integrated digital thermal image processing functions, including automatic thermal environment compensation, noise filters, non-uniformity correction, and gain control
- Temperature stable output to support radiometric processing
- Export compliant frame rate (< 9 Hz)
- Two-wire I2C-like serial control interface
- MIPI compatible serial video interface, D-PHY, single data lane
- Uses standard cell phone compatible power supplies: 2.8V to sensor, 1.2V to digital core, and flexible IO from 2.5V to 3.1V
- Fast time to image since no configuration needed at power up

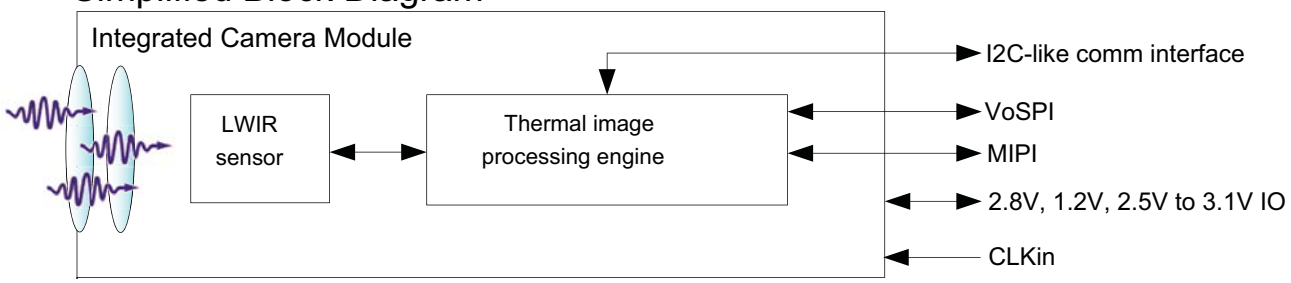


- On-chip PLL, 6.0 to 27-MHz clock input
- Low operating power of nominally 150 mW (< 200 mW over temperature range)
- Low power standby mode (when 2.8V to sensor is turned off)
- RoHS compliant
- 32-pin socket interface to standard Molex or similar side-contact connector

Applications

- Mobile phones
- Gesture recognition
- Building automation
- Thermal imaging
- Night vision

Simplified Block Diagram

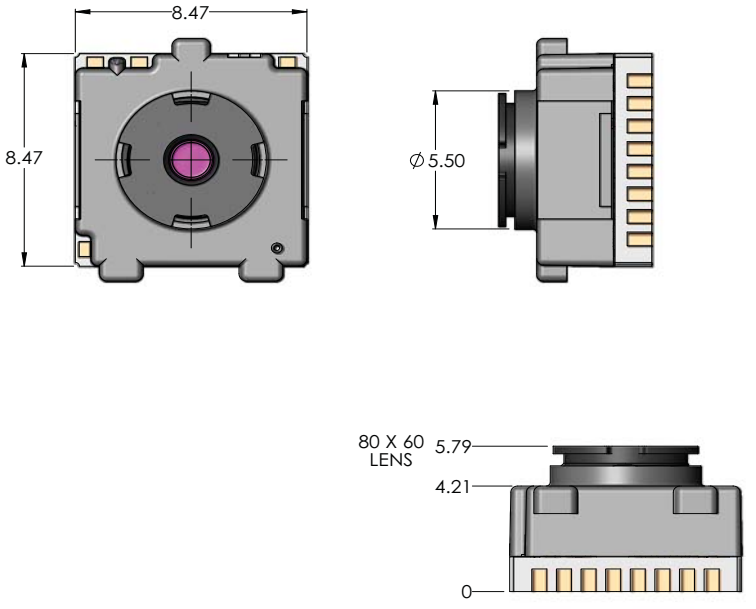


Version 2.0 January 2014

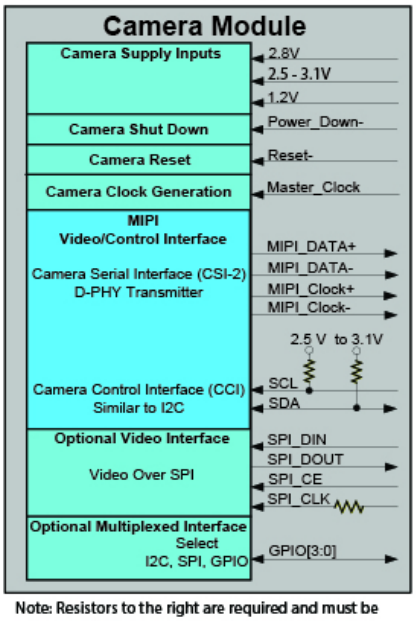
Key Specifications

Overview	
Function	Passive thermal imaging module for mobile equipment
Sensor technology	Uncooled VOx microbolometer
Spectral range	Longwave infrared, 8 µm to 14 µm
Array format	80 × 60, progressive scan
Pixel size	17 µm
Exportable frame rate	9 Hz
Thermal sensitivity	<50 mK
Temperature compensation	Automatic, output image independent of camera temperature
Non-uniformity corrections	Shutterless, automatic; also compatible with external shutter
Image optimization	Factory set
FOV - horizontal	50°
FOV - diagonal	60°
Output format	14-bit, 18-bi t AGC applied; 24-bit RGB
Solar protection	Integral solar blocking filter
Electrical	
Input clock	6 MHz to 27 MHz, (integrated PLL), CMOS IO voltage level
Video data interface	MIPI single data lane, D-PHY, or SPI
Control port	I2C, CMOS IO Voltage Levels
Input supply voltage (nominal)	2.8 V, 1.2 V, 2.5 V to 3.1 V IO
Power dissipation	Nominally 150 mW (operating), < 150 uW (standby)
Physical Attributes	
Package dimensions – socket version	8.5 × 8.5 × <5.9 mm (w × l × h)
Weight	0.55 grams (typ)
Environmental	
Operating temperature range	-10°C to +65°C
Non-operating temperature range	-40°C to +80°C
Shock	1500 G @ 0.4 ms
Vibration	5 – 10 Hz: +10 dB/octave; 10 – 50 Hz: 5.58 m^2/S3 (0.055 g^2/Hz); 50 – 300 Hz: -10 dB/octave

Mechanical Interface



Application Circuit Example



Note: Resistors to the right are required and must be installed outside the camera module at the host controller