XinaBox Datasheet SL20 - IR 16x4 Temperature Array

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SL20 - IR 16x4 Temperature Array (MLX90621, AP2127)

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⊠CHIP	
Main Category	Sensor
Sub Category	Light
Introduced	1 January 2017
Current version	1.0.0
Current version date	1 January 2017
Dimensions	
Size	2x2U (32x32mm)
Weight	4.8 g
Height	14.1/0/0 mm
Main Chip Set	
Main Chip	MLX90621

Overview

This SL20 is based on the MLX90621 which is a 16X4 array and 64 infrared radiation (https://en.wikipedia.org/wiki/Infrared) pixels which measures temperature as a function of radiation.

The MLX90621 is a fully calibrated 16x4 pixels IR array. It contains 2 chips in one package: the MLX90670 (IR array with signal conditioning electronics) and the 24AA02 (256x8 EEPROM) chip. The MLX90621 contains 64 IR pixels with dedicated low noise chopper stabilized amplifier and fast ADC integrated. A PTAT (Proportional To Absolute Temperature) sensor is integrated to measure the ambient temperature of the chip. The outputs of both IR and PTAT sensors are stored in internal RAM and are accessible through I^2C.

The results of the infrared sensor measurements are stored in RAM 15...18-bit result of IR measurement for each individual sensor (64 words) and 15…18-bit result of PTAT sensor.

Depending on the application, the external microcontroller can read the different RAM data and, based on the calibration data stored in the EEPROM memory, compensate for difference between sensors to build up a thermal image, or calculate the temperature at each spot of the imaged scene. These constants are accessible by the user microcontroller through the I^2C bus and have to be used for external post processing of the thermal data.

This post processing includes Ta calculation, Pixel offset cancelling, Pixel to pixel sensitivity difference compensation, Object emissivity compensation and Object temperature calculation.

The result is an image with NETD better than 0.1K RMS at 1Hz refresh rate. The refresh rate of the array is programmable by means of register settings or directly via I^2C command. Changes of the refresh rate have a direct impact on the integration time and noise bandwidth (faster refresh rate means higher noise level). The frame rate is programmable in the range 0.5Hz…512Hz and can be changed to achieve the desired trade-off between speed and accuracy.

Product Highlights

- 16x4 IR array

Applications

- Identifying thermal leaks in homes
- Thermal scanners
- Security / safety gates
- Intrusion / Movement detection;
- Presence detection / Person localization

Specifications

- Based on MLX90621 From Melexis Technologies NV
- Factory calibrated infrared temperature measurement. Calibration parameters stored in EEPROM.
- Noise Equivalent Temperature Difference (NETD) 0.20 K RMS @ 4 Hz refresh rate
- I^2C compatible digital interface
- Programmable frame rate 0.5 H - 512 Hz
- 3 FOV - 40°x10°, 60°x16° and 120°x25°
- Ta -40°C to 85°C
- To -20°C to 300°C

External Links

Documents

- MLX90621 From Melexis Technologies NV (https://www.melexis.com/-/media/files/documents/datasheets/mlx90621-datasheet-melexis.pdf)
- AP2127 From Diodes Incorporated (https://www.diodes.com/assets/Datasheets/AP2127.pdf)
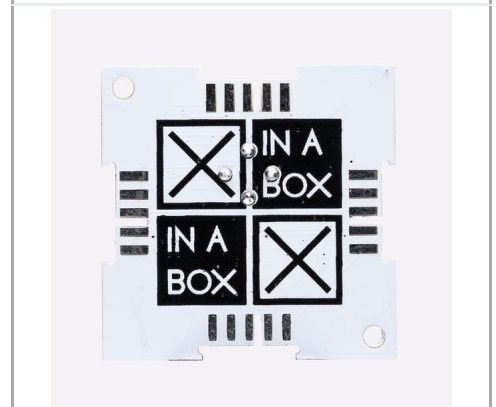
Shop

- Buy SL20 (https://xinabox.cc/products/SL20)

GitHub

- SL20 on GitHub (https://github.com/xinabox/xSL20)