CM200 Color Meter Module

Features

Measure tristimulus values, chromaticity, color difference, correlated color temperature, and luminance of light sources.

Application

QC inspection for color of incoming material.

Color inspection of light in for lamp manufacturers, building illumination and interior design.

Backlight adjustment of projectors/display walls.

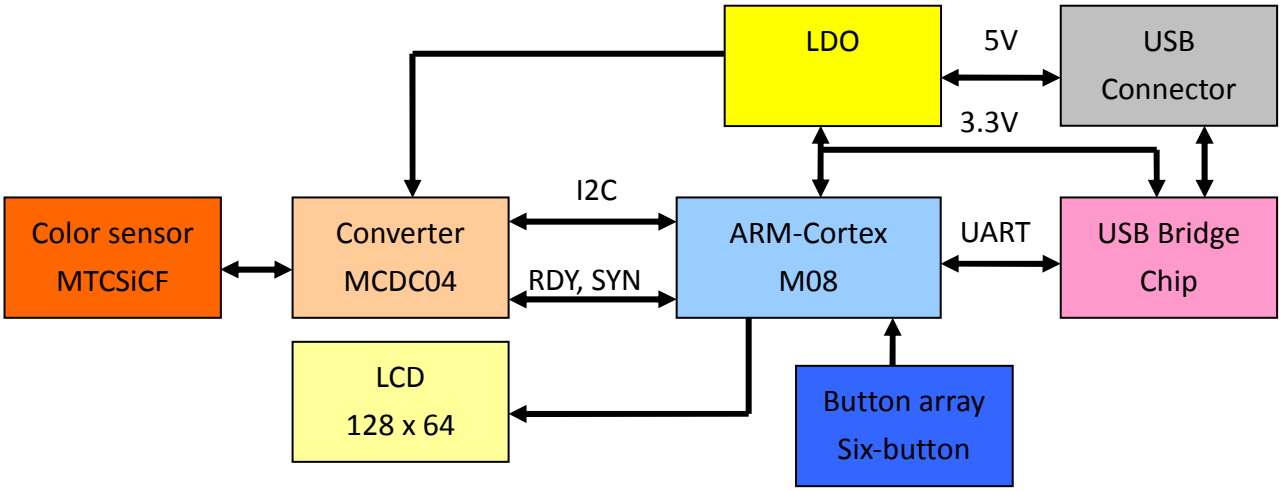
Adjust color of NB/PC monitors or TV sets.

Design Specification

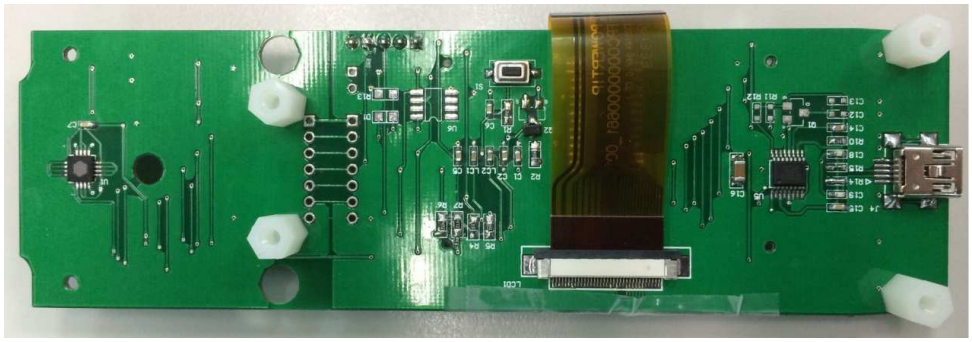
Display	128*64 pixel LCD with Backlight (16*4 char.)
Illuminating / Viewing geometry	illumination at 45°, measurement at 0°
Color Measuring	(L*, a*, b*) (Y, u, v) (Y, x, y) (X, Y, Z) or (Rs, Gs, Bs)
Color Difference	Δ(L*,a*,b*) Δ(Y, u, v) Δ(Y, x, y) Δ(X, Y, Z) or Δ(Rs, Gs, Bs)
Host Interface	USB
Calibration	On Device or Download from Host
Accuracy (after calibration)(*)	Ev (Linearity): ±3% xy: ±0.02 (800 lx, Standard Illuminant A measured)
Repeatability(*)	Ev: ±0.5% xy: ±0.003 (800 lx, Standard Illuminant A measured)
Temperature Drift(*)	Ev: ±5%rdg ± 2dgts, xy: ±0.008
Power Source	USB Power
Dimension	44 x 146 x 2 (mm)
Weight	34 (g)

(*) After calibration, with proper light source and optic design

Block diagram

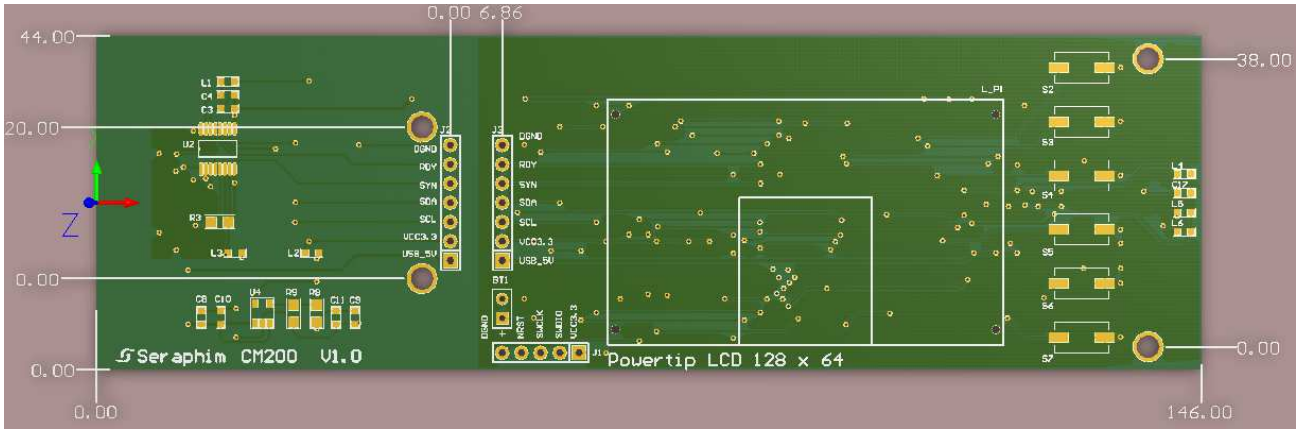


PCB:



It is possible to separate the sensor part and display part then connect the two parts with a 7-pin flat cable.

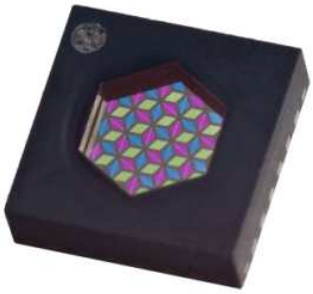
Outside dimension:



Color sensor MTCSiCF

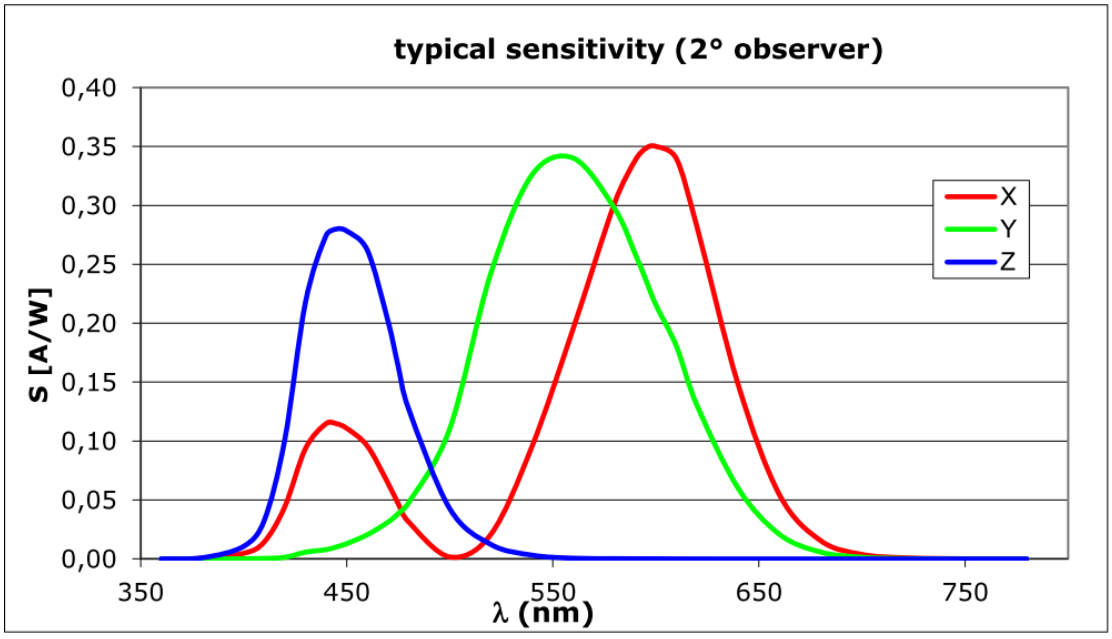
One of the central components of MTCS-INT-AB4 is the MTCSiCF JENCOLOR sensor. This interference based True Color sensor consists of 19x3 photo diodes (special PIN silicon technology with advanced sensitivity) integrated on chip. The diodes are aligned as segments of a multiple-element hexagonal matrix structure with a diameter of 2mm.

Figure: True color sensor MTCSiCF from JENCOLOR



The design as Si-PIN photo diode allows signal frequencies from Hz up to the MHz range. In order to achieve minimal cross talk between the photodiodes the individual sectors are separated from each other by additional structures. Each of these photodiodes is sensitized with new True Color dielectric spectral filters for its color range, preferably for the color standard CIE 1931 (Commission Internationale de l'Eclairage or International Commission on Illumination) color space and/or DIN 5033 – Color Measurement. The typical sensitivity characteristics of the MTCSiCF Sensor scanned by monochromatic light with FWHM 27 nm are shown in the following figure.

Figure: Typical (relative) sensitivity (XYZ) of the color sensor (MTCSiCF) scanned by width broadband light and limited angle of incidence (<10°)



The used interference filter technology guarantees high transmission in the band pass range, a very low rest transmission, resistant to aging effects and long-term stable against mechanical and tem-perature influences during processes.

For more information please check details in the data sheet of MTCSiCF True Color sensor [2].

Calibration

The digitized sensor values are converted into color coordinates or spectral data depending on the application. Various transformations and algorithms can be used for this purpose. The corresponding parameters are specifically adapted to the application by appropriate sensor calibrations and determined once for each sensor. The basis is formed by application target sets with known colorimetric or spectral data. For further enquiries please contact our sales partners or offices. Various application scripts3 and simulation environments are available for further support. Our support team will examine application restrictions and possible optimization potential base on your application.
Therefore MAZeT offers simulation software in which the optimal calibration method and targets for an application can be determined and the system result can be calculated.

Calibration of emitting measuring objects
A requirement for the measurement of emitting objects (self-luminous) is the calibration of the color sensor using a light source setting where the chromatic values are first determined by an appropriate spectrometer.

Calibration of reflective measuring objects
A requirement for the measurement of reflective targets (e.g. illuminated surfaces) is the calibration of the color sensor by a reflection target setting where the color values are first determined by an appropriate spectrometer. This target set should be of the same type and nature as the objects intended for measurement.

NOTES

It is essential to keep the sensor surface clean. Dust or scratches will adversely affect the sensor parameters. Sensors should be handled with care, like all optical devices. It is important to perform normal ESD handling and precautions for ESD sensitive devices.

REFERENCE DOCUMENTS

[1] MCDC04EQ Converter data sheet
http://www.mazet.de/en/english-documents/english/data-sheets/mcdc04eq/download
[2] MTCSiCF Sensor data sheet
http://www.mazet.de/en/english-documents/english/data-sheets/mtcsicf/download
[3] EEPROM AT30TSE752 8751D–DTS–8/2012 Atmel data sheet
http://www.atmel.com/Images/doc8751.pdf

Headquarter and Sales Offices

Headquarter

Seraphim Engineering Co.,Ltd

Address: 14F-7, No.81 Sintai 5th Rd., Sec.1, Sijhih Dist., New Taipei City 22101, Taiwan, ROC

Tel: +886-2-26984660

Fax: +886-2-26984536

Contact window: Mrs LIN ext.235

Email：sales@seraphim.com.tw

China Contact Window:

ShenZhen

Address: Rm.707, 212 Building,TaiRanJiu Road, Chegongmiao, Futian Dist., Shenzhen, ChinaC

Postal code: 518048

Tel: +86-755-8325-2850

Fax: +86-755-8255-2329

Contact: Mr. Angus Cheng ext. 807

Email：anguscheng@advancechina.com.hk