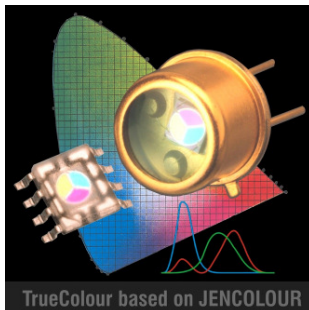


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	<b>REV.</b>	<b>DESCRIPTION</b>	<b>APPROVED</b>
	1	V 1.2	2005-03-07

## Data Sheet



# MTCSiCS

## Integral True Colour Sensor – LCC8

### Table of contents

1 FUNCTION .....	2
2 APPLICATION .....	2
3 FEATURES .....	2
4 ELECTRICAL CONNECTIONS .....	3
5 MAXIMUM RATINGS / CHARACTERISTICS .....	3
6 CHARACTERISTIC CURVE.....	4
7 PACKAGE OVERVIEW .....	4
8 PIN-CONFIGURATION.....	5
9 APPLICATION CIRCUIT .....	5
10 ORDERING INFORMATION.....	6

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DATA SHEET MTCSiCS True Colour Sensor - LCC

## REVISIONS

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## 1 FUNCTION

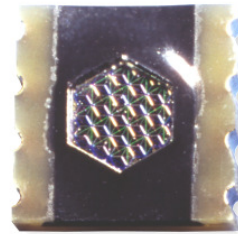
The True Colour Sensors are made of 19 x 3 photo diodes (special PIN silicon technology with extended sensibility) integrated on chip. The diodes are carried out as segments of a multiple-element hexagonal matrix structure with the diameter of 2,0 mm.

The design as Si-PIN photo diodes allows signal frequencies up to MHz-range. In order to achieve a small cross talk between the photodiodes the individual sectors were separated from each other by additional structures.

Each of these photodiodes is sensitised with new dielectric spectral filter (named True Colour Filter<sup>1</sup>) for its colour range, preferably for the primary colour standard CIE (Commission Internationale de l'Eclairage or International Commission on Illumination) colour space.

## 2 APPLICATION

- Quality control
- Monitoring the production
- Control of manufacturing
- Detection of colour marks
- Colour measurement



## 3 FEATURES

Dielectric filters guaranties the good optical properties of the colour sensors, such as:

- high transmission
- slight ageing of the filter
- high temperature stability
- high signal frequency
- reduced cross talk
- small size (diameter of the optical sensitive surface ca. 2 mm)
- like tri-stimulus interference filter for colour measurement to DIN 5033 (&CIE XYZ & La\*b\*)
- LCC package
- **RoHS-conform**



<sup>1</sup> The new generation of JENCOLOUR sensors is committed to implementing (see relative sensitivity) the standard distribution functions as defined under DIN 5033 Part 2 – Color Measurement; CIE 1931 Standard Colorimetric Systems. This implementation method allows colors to be determined according to the three-range procedure that is defined in part 6 of DIN 5033.

DATA SHEET MTCSiCS True Colour Sensor - LCC

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1	V 1.2	2005-03-07

**4 ELECTRICAL CONNECTIONS**

- three anodes
- one common cathode

**5 MAXIMUM RATINGS / CHARACTERISTICS**(T<sub>A</sub> = 25°C; per single diode)

Description	Symbol	Condition	typ. Value	Unit
Diameter of the light sensitivity area	D		2,0	mm
Light sensitivity area per element	A		0,76	mm <sup>2</sup>
Typical photo sensitivity of colour ranges	S <sub>max</sub>	λ <sub>z</sub> = 445 nm	0,23	A/W
		λ <sub>y</sub> = 555 nm	0,33	
		λ <sub>xk</sub> = 445 nm	0,12	
		λ <sub>xl</sub> = 600 nm	0,35	
Spectral tolerance of filter curve	Δλ(λ)		<1%*λ	nm
Reverse voltage	V <sub>R</sub>	0...5V	2,5	V
Dark current	I <sub>R</sub>	V <sub>R</sub> = 2,5V	10	pA
Terminal capacitance	C	V <sub>R</sub> = 2V	70	pF
Rise and fall time of the photo-current	t <sub>r</sub> , t <sub>f</sub>		<2	μs
Noise equivalent power	NEP	f <sub>R</sub> = 100 Hz	<10 <sup>-13</sup>	W/√Hz
Cross-talk			<1	%
Angle of incidence	φ	Δλ <sub>(Filter)</sub> < 1%*λ	8	Grad
Operating temperature range	T <sub>op</sub>		-15 ... +70	°C
Storage temperature range	T <sub>st</sub>		-20 ... +80	°C
Soldering temperature	T	2...3 sec	240	°C

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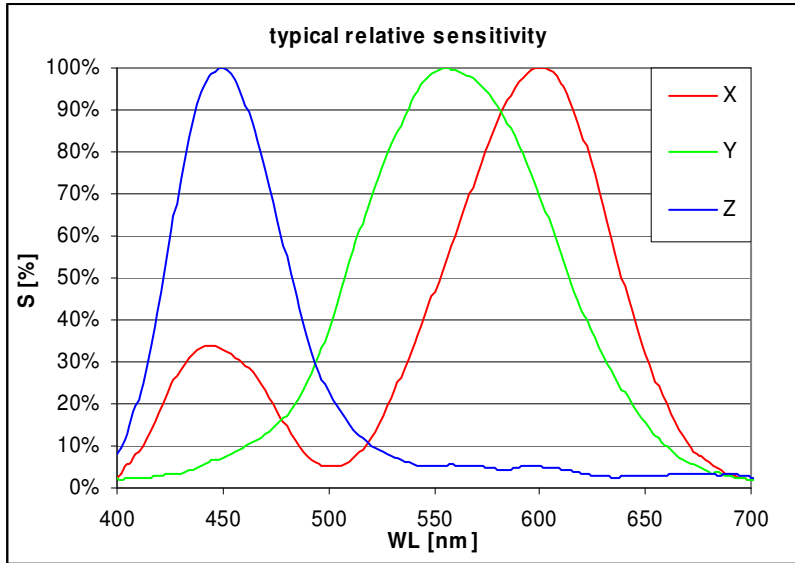
Page 3 of 6

DATA SHEET MTCSiCS True Colour Sensor - LCC

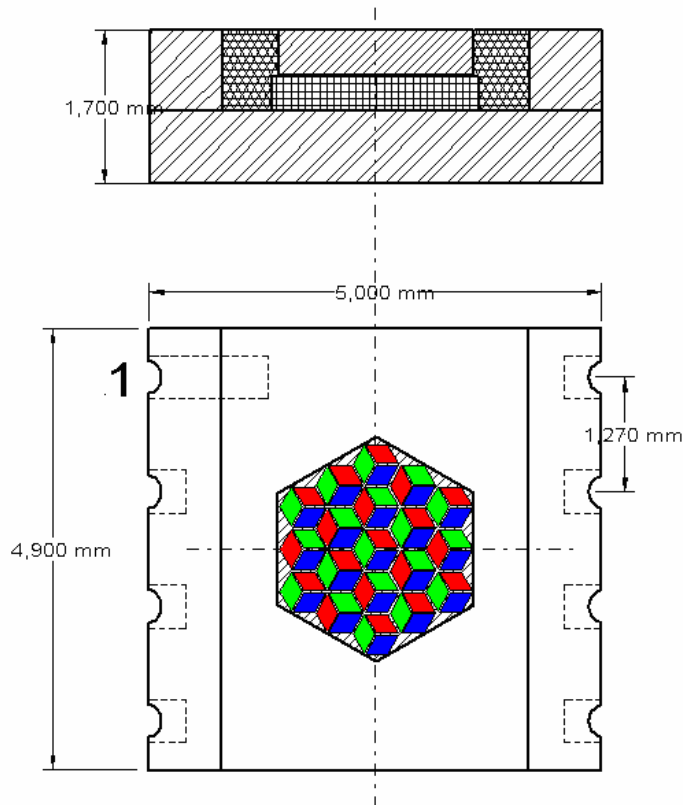
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## 6 CHARACTERISTIC CURVE

Typical (relative) sensitivity (XYZ) of the colour sensor (MTCSiCS)



## 7 PACKAGE OVERVIEW



MTCSiCS in 8 Pin LCC package

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Page 4 of 6

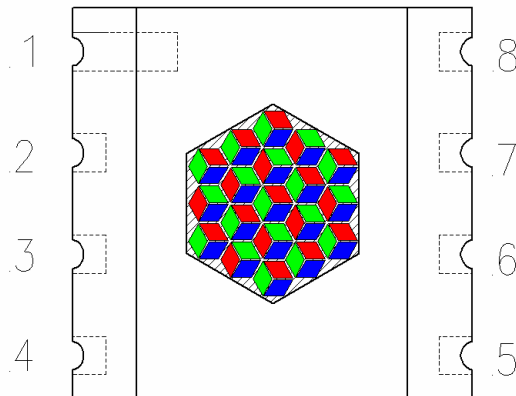
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1	V 1.2	2005-03-07

## 8 PIN-CONFIGURATION

(Top view)

PIN	description
1	Y (green)
2	nc
3	nc
4	Z (blue)
5	X (red)
6	nc
7	TrD
8	K common cathode

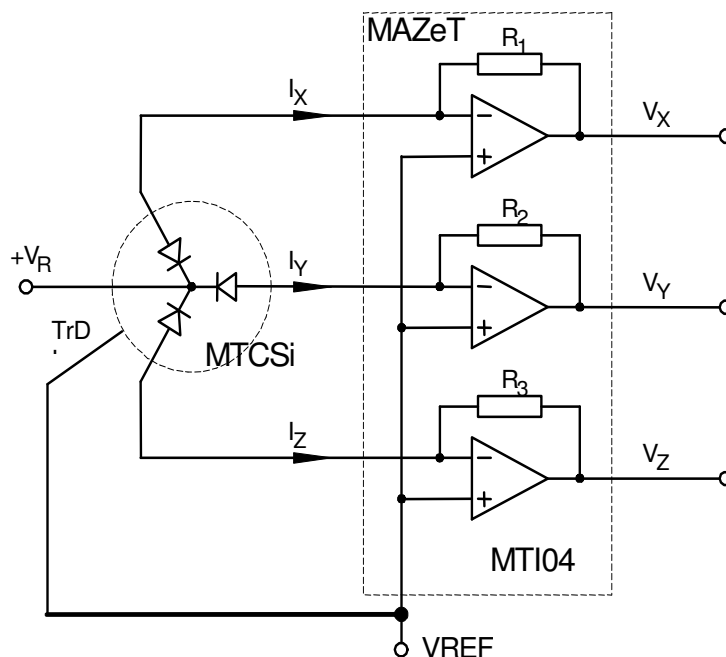


LCC 8 package

## 9 APPLICATION CIRCUIT

Opposite figure shows a circuit for the conversion of photo current to an equivalent voltage. These voltage can be processed e.g. with an ADC. By the selection of suitable resistors the output voltage range can be adjusted to the photo current value. (for example the pin-programmable transimpedance amplifier MTI04).

$$R_x \approx \frac{V_{Out}}{I_{Photo}}$$



DATA SHEET MTCSiCS True Colour Sensor - LCC

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## 10 ORDERING INFORMATION

True Colour sensor with LCC8-package  
Modular application board modEVA

MTCSiCS  
MTCS-ME1

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