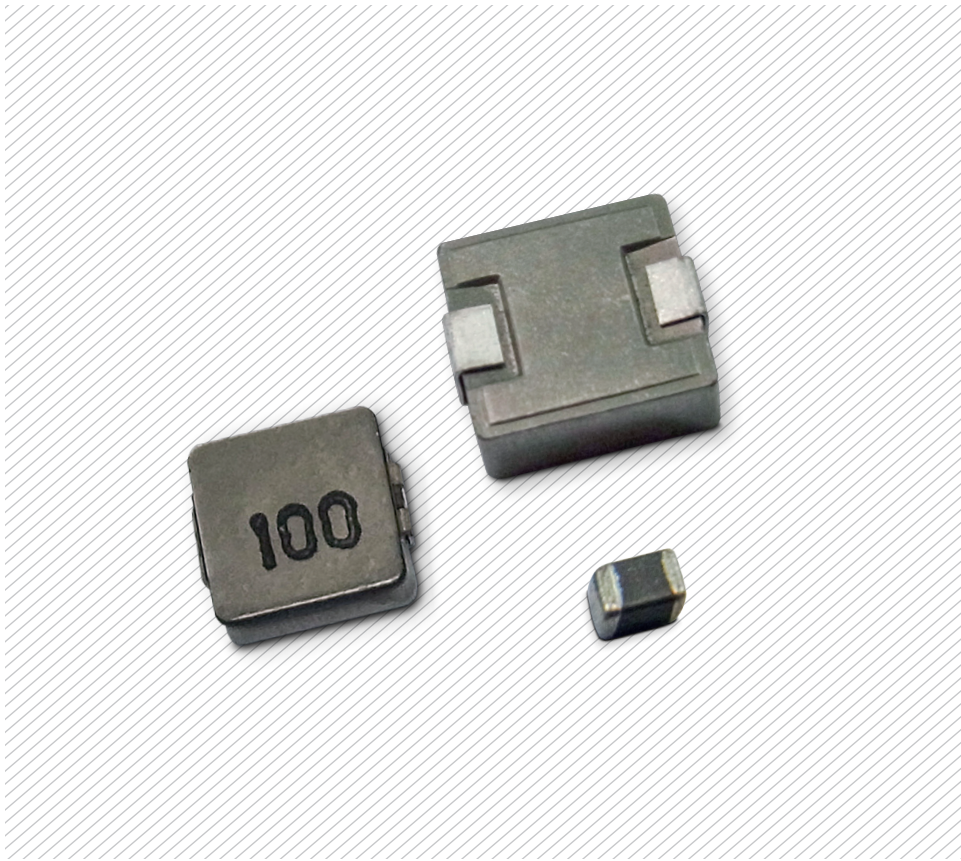


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OUR PRODUCT OF THE MONTH: ENLARGED PORTFOLIO OF HIGH CURRENT MOLDING POWER CHOKE



FEATURES

- Very high saturation current
- Good frequency characteristics
- Low core losses
- Excellent EMI shielding

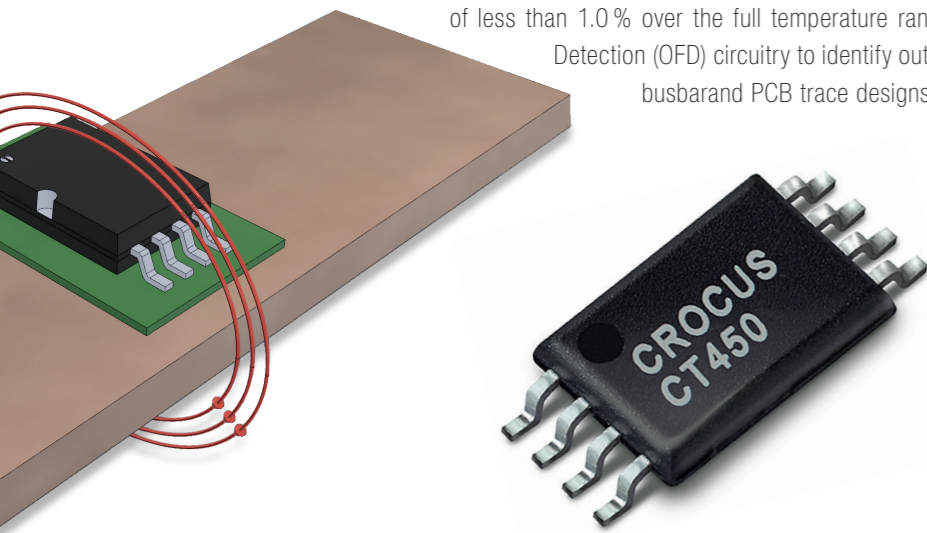


CT45X – MARKET LEADING HIGH PRECISION / HIGH CURRENT TMR CONTACTLESS CURRENT SENSOR

HAVE A LOOK

Crocus Technology's CT45x Isolated Contactless Current Sensor simplifies <200 A ~ 4000 A High Precision Current Applications by eliminating Costly Concentrators or Complex Mechanical Mountings

A contactless TMR current sensor enables high precision AC and DC current sensing without the need of a concentrator core or shield. It can sense the magnetic field from 8 mT to 20 mT of current flowing through a PCB trace or larger bus bar. This high sensitivity and wide dynamic range supports designs targeted for <200 A to 4000 A. The high-speed operation and accurate output allow customers to optimize system design for smaller size and higher efficiency. These coreless devices utilize Crocus' state-of-the-art XtremeSense® TMR technology to detect extremely small variations in AC or DC currents while achieving an unprecedented total output error of less than 1.0% over the full temperature range. In addition, CT45x is equipped with Over Field Detection (OFD) circuitry to identify out of range field. An online tool is available to calculate busbar and PCB trace designs. http://tools.crocus-technology.com:5010/MF_CAL



FEATURES

- Total error output $\leq \pm 1\%$ FS
- Low noise performance
- Fast response time (<math>< 300</math> ns)
- Over Field Detection (OFD)
- AEC-Q100

PARAMETER	CT450	CT451
CURRENT RANGE	+8 mT / ± 8 mT +12 mT / ± 12 mT +20 mT / ± 20 mT	
SUPPLY VOLTAGE	4.75 V to 5.5 V	3.0 V to 3.6 V
PERFORMANCE	High	High
BANDWIDTH	1 MHz	1 MHz
TOTAL OUTPUT ERROR	0.65 % FS	0.65 % FS
RATED ISOLATION VOLTAGE	> 5 kV _{RMS}	> 5 kV _{RMS}
OVER CURRENT DETECTION OUTPUT PIN	Yes	Yes
PACKAGE TYPE	TSSOP-8	TSSOP-8

CT45X – MARKET LEADING HIGH PRECISION / HIGH CURRENT TMR CONTACTLESS CURRENT SENSOR

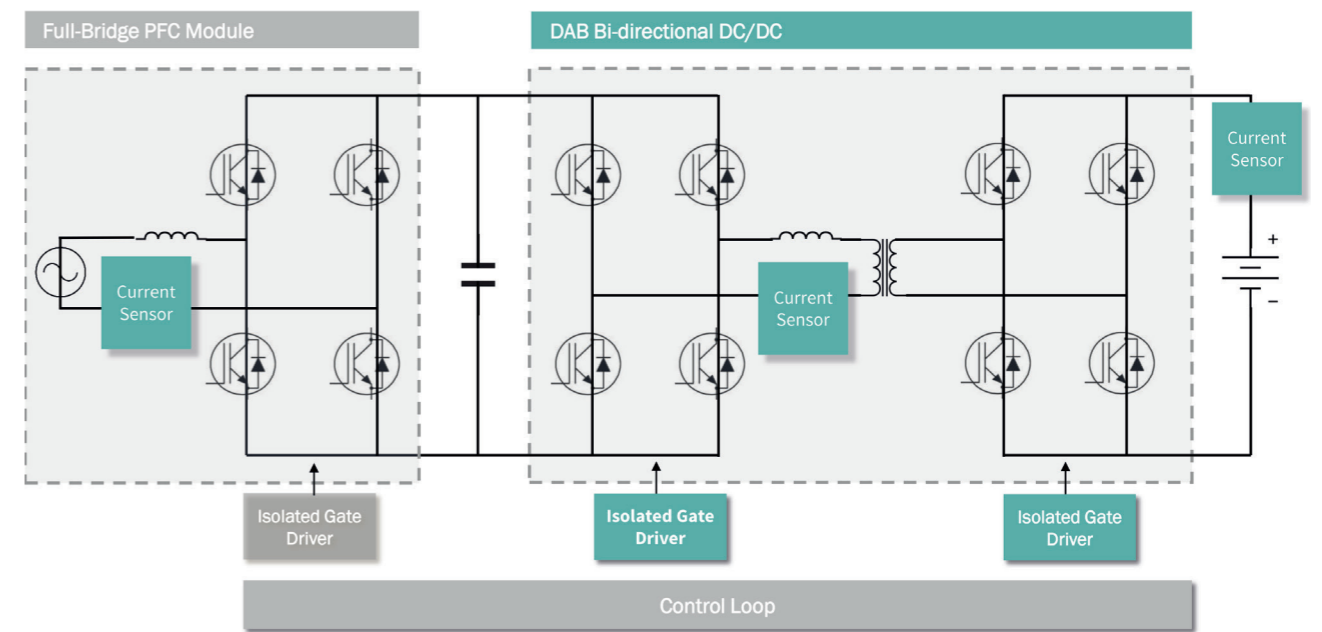
Superior Performance vs. Other Contactless Hall Effect Current

PARAMETER	CT450	COMP B	COMP C
FIELD RANGE	+8 mT / ± 8 mT, +12 mT / ± 12 mT, +20 mT / ± 20 mT	± 13.0 mT, ± 20.0 mT, +26.5 mT, ± 40.0 mT	± 10 mT, ± 25 mT, ± 60 mT
TOTAL OUTPUT ERROR (TYP.)	± 0.50 % FS	± 2.20 % FS to ± 2.30 % FS	± 0.80 % FS
LINEARITY ERROR (TYP.)	± 0.15 % FS	± 0.45 % FS	± 0.70 % FS
RESPONSE TIME	0.30 μ s	1.60 μ s	3.00 μ s
NOISE (TYP.)	As low as 0.6 mV _{RMS} @ 100 kHz	4.5 to 13.0 mV _{RMS} @ 120 kHz 6.5 to 19.0 mV _{RMS} @ 240 kHz	6.0 mV _{RMS} @ 150 kHz 10.0 mV _{RMS} @ 250 kHz
POWER CONSUMPTION (TYP.)	6.0 mA	12.0 mA	12.0 mA
V _{REF} OUTPUT	Yes	No	No
OVER FIELD DETECTION	Yes	No	No

The CT450 offers market leading noise performance, as low as 0.55 mV_{RMS}, to enable applications to sense small current levels and tiny changes or variation in current through a busbar. This achieves a SNR (signal-to-noise ratio) as high as 77 dB for the CT45x output analog signal which allows the system to process higher resolution data and deliver higher accuracy current measurements. Competing Hall-effect contactless current sensors for the same field have a noise of 9.00 mV_{RMS} which reduces the accuracy of the current measurement.

APPLICATIONS

- Solar / Power Inverters
- Traction Inverters
- Battery Management
- DC/DC Converter
- Power Distribution Unit (PDU)
- Smart E-Meters
- EV Charging

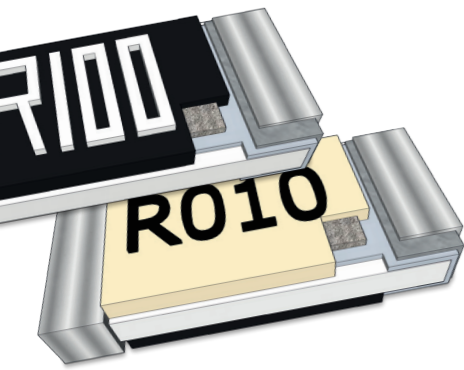


Example: Bi-directional EV Charging Block Diagram

FBF SERIES – INNOVATIVE METAL PASTE SHUNT RESISTOR

HAVE A LOOK

Prosperity Dielectrics Corp. Ltd. (PDC), is a well known manufacturer of sophisticated specialty chip resistors, inductors and ceramic capacitors.



Several solutions of current sensing resistors exist in the market, such as thick film, metal foil or solid metal versions. Each version has its advantages and disadvantages. The innovative metal paste shunt resistor from PDC try to close the price/performance gap between thick film and metal foil shunt. FBF series is ideally suitable for industrial and consumer applications where TCR or space is important, but not the top priority and offer an excellent price/performance ratio at the same time. Additionally, FBF offers better power rating than conventional thick film shunts. There is also a „power type“ with even better heat dissipation which leads to enormous potential as to downsizing or increasing the reliability. The shunts are pin compatible with many popular well-known manufacturers on the market, yet offer a better TCR, tolerance and power rating than many thick film shunts.

FEATURES

- Low resistance 10 mOhm – 910 mOhm
- High precision (1 %, 2 %, 5 % available)
- Good TCR (100 ppm/200 ppm available)
- Wide portfolio from 0603 ~ 2512
- Excellent reliability and price/performance ratio

APPLICATIONS

- Industrial applications such as DC/DC converter, motor controller, etc ...
- Consumer electronics, White Goods
- IoT and Smart Things
- Charging circuits e.g. in battery packs or portable devices

TYPE	SIZE	POWER RATING (NORMAL TYPE) @ 70°C	POWER RATING (POWER TYPE) @ 70°C	TCR	RESISTANCE RANGE, (E24 VALUES)
FBF03	0603	1/8 W	1/4 W	± 200 ppm/K	40 – 91 mOhm
				± 100 ppm/K	100 – 910 mOhm
FBF05	0805	1/4 W	1/2 W	± 200 ppm/K	10 – 46 mOhm
				± 100 ppm/K	47 – 910 mOhm
FBF06	1206	1/3 W	3/4 W	± 200 ppm/K	10 – 46 mOhm
				± 100 ppm/K	47 – 910 mOhm
FBF12	1210	2/3 W	3/4 W	± 200 ppm/K	10 – 46 mOhm
				± 100 ppm/K	47 – 910 mOhm
FBF20	2010	3/4 W	1.0 W	± 200 ppm/K	10 – 46 mOhm
				± 100 ppm/K	47 – 910 mOhm
FBF25	2512	1.0 W	2.0 W	± 200 ppm/K	10 – 46 mOhm
				± 100 ppm/K	47 – 910 mOhm

ENLARGED PORTFOLIO OF HIGH CURRENT MOLDING POWER CHOKE

HAVE A LOOK

PDC has announced to increase their production capacity for their molded power chokes of 20 Mio. pcs per month to 40 Mio pcs per month in 2022. This results in highly competitive prices and good availability.

Molded power chokes consist of a spring coil made by enamelled copper wire that is connected to a lead frame. Iron powder or metall alloy powder is ground to very small particle size and is mixed with a binder. This powder is molded around the spring coil with lead frame and pressed at high pressure to form the magnetic core and body. Due to the characteristics of the used materials, very high saturation current can be guaranteed. For chip types, the available sizes go from 2.0 x 1.6 mm to

2.5 x 2.0 mm. PDC has also added larger variants, coming in from 10 x 10 mm to 17 x 17 mm. The manufacturer has also made additions to the existing series with different profiles – 1.2/1.5/1.8/2.0/2.4 mm for height are now available. A samples stock has been built up for quick design support.

FEATURES	APPLICATIONS
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- | | |
|----------------------------------|------------------------|
| ▪ Very high saturation current | ▪ DC/DC converter |
| ▪ Good frequency characteristics | ▪ POL converter |
| ▪ Low core losses | ▪ Drives and actuators |
| ▪ Excellent EMI shielding | ▪ Power supplies |

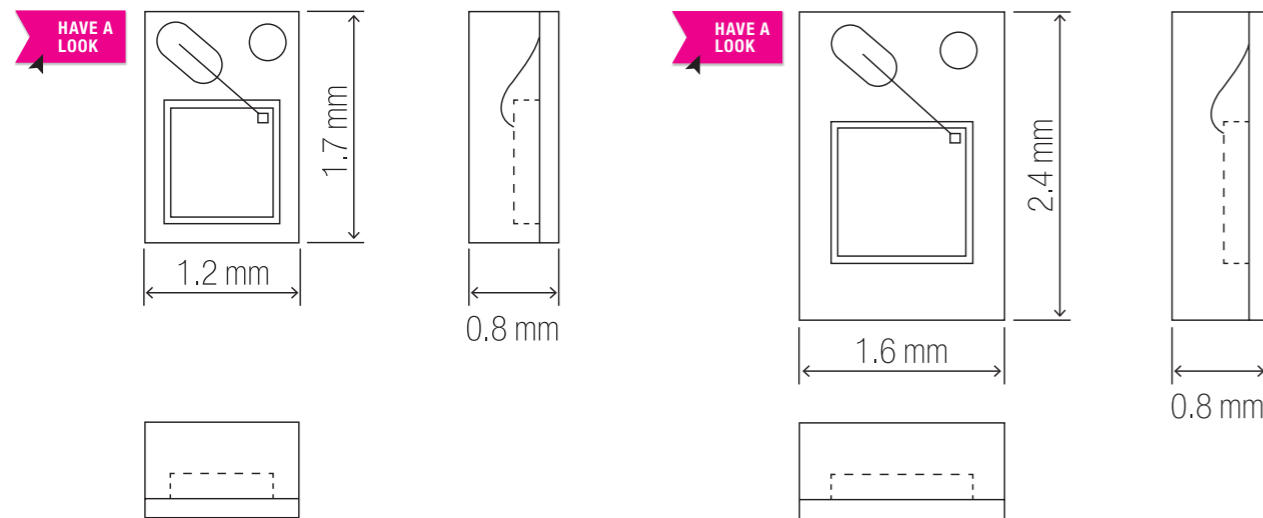
CLASS	TYPE	SIZE	INDUCTANCE RANGE	RATED CURRENT
Chip	MCS20FC	2.0 x 1.6 x 1.0 mm	0.33 uH – 2.2 uH	4.7 A – 2.2 A
	MCS25GC	2.5 x 2.0 x 1.0 mm	0.22 uH – 4.7 uH	5.6 A – 1.6 A
	MCS25GD	2.5 x 2.0 x 1.2 mm	0.47 uH – 4.7 uH	4.6 A – 2.2 A
SMD	MCS0312	~ 3.0 x 3.0 x 1.2 mm	0.47 uH – 10.0 uH	5.0 A – 1.0 A
	MCS0320	~ 3.0 x 3.0 x 2.0 mm	0.10 uH – 10.0 uH	10.5 A – 1.4 A
	MCS0412	~ 4.0 x 4.0 x 1.2 mm	0.10 uH – 22.0 uH	7.5 A – 1.8 A
	MCS0418	~ 4.0 x 4.0 x 1.8 mm	0.56 uH – 10.0 uH	5.0 A – 1.4 A
	MCS0420	~ 4.0 x 4.0 x 2.0 mm	0.10 uH – 10.0 uH	12.0 A – 1.0 A
	MCS0512	~ 5.0 x 5.0 x 1.2 mm	0.10 uH – 15.0 uH	13.0 A – 1.2 A
	MCS0515	~ 5.0 x 5.0 x 1.5 mm	0.15 uH – 22.0 uH	14.0 A – 1.0 A
	MCS0518	~ 5.0 x 5.0 x 1.8 mm	0.22 uH – 10.0 uH	11.0 A – 1.9 A
	MCS0520	~ 5.0 x 5.0 x 2.0 mm	0.10 uH – 22.0 uH	16.0 A – 1.2 A
	MCS0530	~ 5.0 x 5.0 x 3.0 mm	0.20 uH – 10.0 uH	25.0 A – 1.5 A
	MCS0612	~ 6.0 x 6.0 x 1.2 mm	0.15 uH – 22.0 uH	13.0 A – 1.0 A
	MCS0615	~ 6.0 x 6.0 x 1.5 mm	0.10 uH – 22.0 uH	15.0 A – 1.2 A
	MCS0618	~ 6.0 x 6.0 x 1.8 mm	0.10 uH – 22.0 uH	25.0 A – 1.8 A
	MCS0620	~ 6.0 x 6.0 x 2.0 mm	0.10 uH – 22.0 uH	18.0 A – 1.2 A
	MCS0624	~ 6.0 x 6.0 x 2.4 mm	0.10 uH – 22.0 uH	26.0 A – 1.4 A
	MCS0630	~ 6.0 x 6.0 x 3.0 mm	0.10 uH – 33.0 uH	32.0 A – 2.0 A
MCS0640	~ 6.0 x 6.0 x 4.0 mm	0.12 uH – 33.0 uH	30.0 A – 1.8 A	
MCS0650	~ 6.0 x 6.0 x 5.0 mm	0.33 uH – 68.0 uH	22.0 A – 1.1 A	
Large	MCS1040	~ 10.0 x 10.0 x 4.0 mm	0.15 uH – 82.0 uH	40.0 A – 1.2 A
	MCS1070	~ 10.0 x 10.0 x 7.0 mm	0.30 uH – 0.33 uH	36.0 A
	MCS1250	~ 12.0 x 12.0 x 5.0 mm	0.20 uH – 100.0 uH	40.0 A – 1.7 A
	MCS1265	~ 12.0 x 12.0 x 6.5 mm	0.15 uH – 100.0 uH	55.0 A – 4.2 A
	MCS1770	~ 17.0 x 17.0 x 7.0 mm	0.45 uH – 100.0 uH	62.0 A – 5.3 A

Highlighted lines = high runner

BLUE TO INFRARED WAVELENGTH PHOTO DIODE NJL6401R-3 / 6402R-2



The NJL6401R-3/6402R-2 are the high speed Si PIN photo diode sensor up to 350 MHz that is capable of detecting at a wide wavelength range from blue-violet light up to infrared light.



SPECIFICATIONS OF NJL6401R-3*

Corresponding to three wavelength	$\lambda = 405 \text{ nm} / 650 \text{ nm} / 780 \text{ nm}$
Short rise-time, fall-time	2ns typ. ($\lambda = 405 \text{ nm} / 650 \text{ nm} / 780 \text{ nm}$, VR = 2.5V, 10–90 %)
High speed	250 MHz ($\lambda = 780 \text{ nm}$), 300 MHz ($\lambda = 650 \text{ nm}$) 350 MHz ($\lambda = 405 \text{ nm}$)
Package	1.2 x 1.7 x 0.8 mm
Active area	0.7 x 0.7 mm

SPECIFICATIONS OF NJL6402R-2*

Corresponding to three wavelength	$\lambda = 405 \text{ nm} / 650 \text{ nm} / 780 \text{ nm}$
Short rise-time, fall-time	2ns typ. ($\lambda = 405 \text{ nm} / 650 \text{ nm} / 780 \text{ nm}$, VR = 2.5V, 10–90 %)
High speed	200 MHz ($\lambda = 780 \text{ nm}$), 220 MHz ($\lambda = 650 \text{ nm}$) 250 MHz ($\lambda = 405 \text{ nm}$)
Package	1.6 x 2.4 x 0.8 mm
Active area	1.0 x 1.0 mm

* Pb free solder reflowing permitted ■ Pb free, halogen free, conformity to RoHs directive ■ Low wavelength dependence and fast fall-time

BLUE TO INFRARED WAVELENGTH PHOTO DIODE NJL6401R-3 / 6402R-2

Example: smoke detector

Optical smoke detectors are changing from std. single wavelength (near IR) to dual wavelength (Blue & near IR) type.

Key requirements for PDs used for dual wavelength smoke detectors are:

- High sensitivity characteristic at 470 nm (blue wavelength)
- No deterioration of the resin at high temperature and blue light

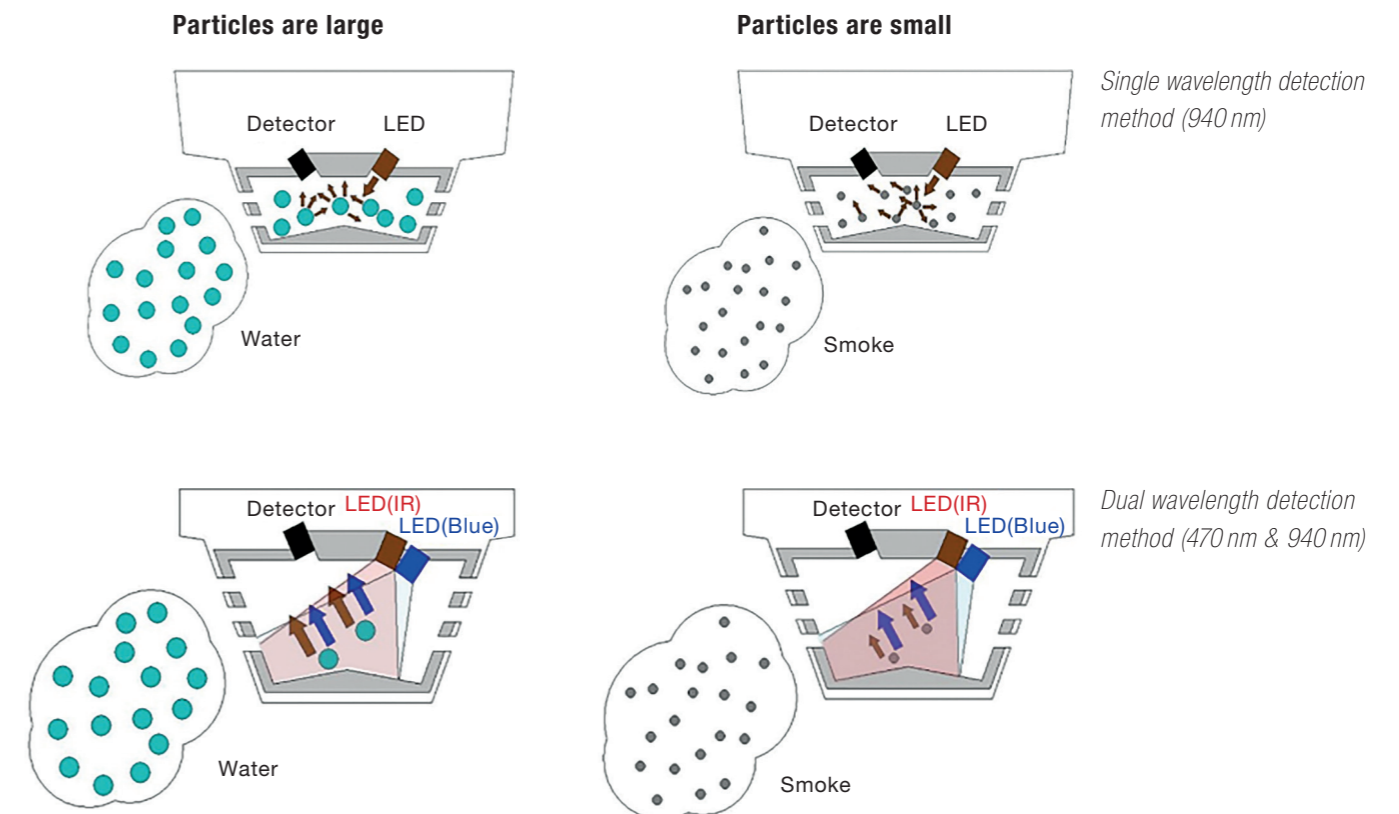
Challenge: How to distinguish between real smoke and steam to avoid false alarms?

Solution: Usage of two LEDs with IR and Blue wavelengths

- In case of large size particles
 - Difference in optical scattering intensity of two wavelength is very small. ($I_{BL} / I_{IR} = 1$)
- In case of small size particles
 - Difference in optical scattering intensity of two wavelength is large, blue scattering is bigger than IR. ($I_{BL} / I_{IR} > 1.4$)

MORE APPLICATIONS

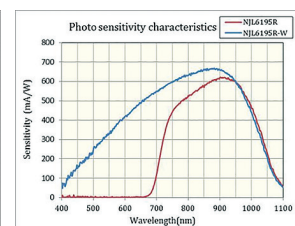
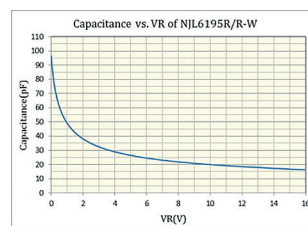
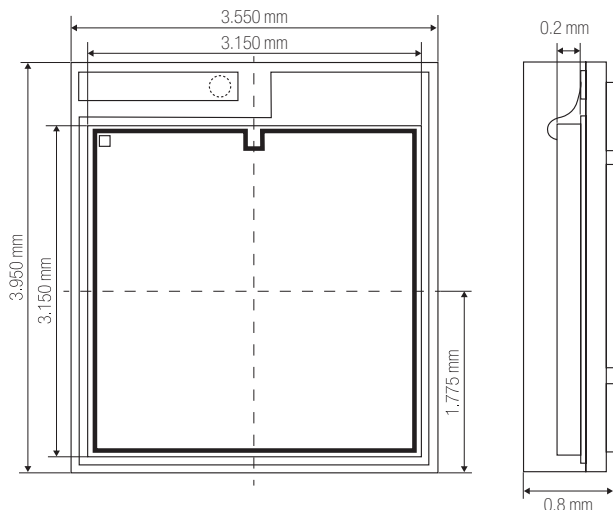
- Monitor for RGB wavelength projector
- TOF sensor
- Optical smoke detector
- Photoelectric switch, space light transmitting,
- Optical data transmission etc.



SMD IR LIGHT SENSOR NJL6195R

HAVE A LOOK

NJL6195R is a SMD Si photo diode that is covering a wide wavelength range. Due to its large active area and speed it is suitable for a variety of applications such as optical switches, IR remote controls and various kinds of safety systems like light barriers and light curtains.



APPLICATIONS

- Optical switches
- IR remote controls
- Light curtains
- Light barriers
- ToF sensors
- And many more

FEATURES

- Leadless surface mount type: 3.55 x 3.95 x 0.8 mm
Active area: 2.98 x 2.98 mm
- Wavelength of peak sensitivity: 890 nm
- Mold resin with visible light filtering function
(Optional clear mold type [NJL6195R-W] is also available)
- Pb free solder re-flowing permitted
- Pb free, halogen free conformity to RoHS directive

HAVE A LOOK

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