

# Dye-sensitized Solar Cell for energy harvesting



## Dye-sensitized solar cell (DSC)

DSCs are expected to be next-generation solar cells because of their environmentally friendly features compared to conventional solar cells.

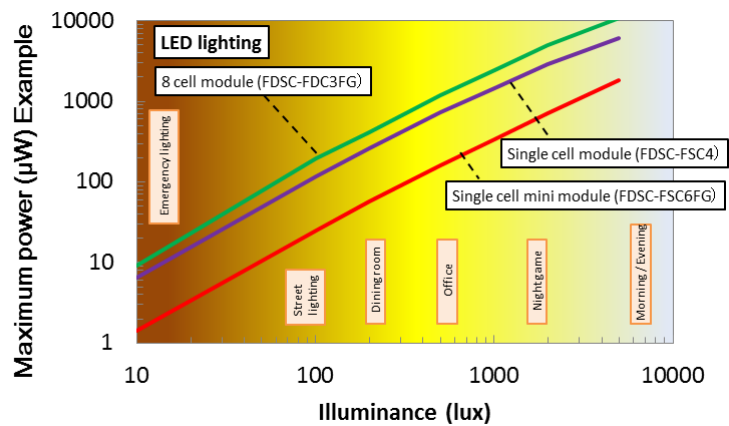
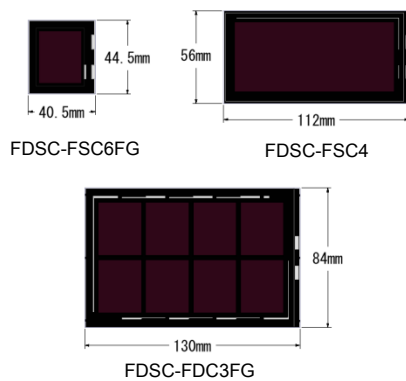
### Features of DSC

- High conversion efficiency at light intensity from 200 to 10,000 lux
- Operable at illuminance from 10 to 100,000 lux
- Usable even in oblique light



## DSC product lineup

### DSC module panel



### Initial electric performance (White LED, 200 lux)

| Item                           | Unit    | Single cell mini module (FDSC-FSC6FG)<br>Aperture area 9 cm <sup>2</sup> | Single cell module (FDSC-FSC4)<br>Aperture area 32 cm <sup>2</sup> | 8 cell module (FDSC-FDC3FG)<br>Aperture area 74 cm <sup>2</sup> |
|--------------------------------|---------|--------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|
| Maximum Power ( $P_m$ )        | $\mu$ W | 49                                                                       | 255                                                                | 428                                                             |
| Operating Current ( $I_{op}$ ) | $\mu$ A | 122 - 0.38 V                                                             | 637 - 0.38 V                                                       | 136 - 3.0 V                                                     |

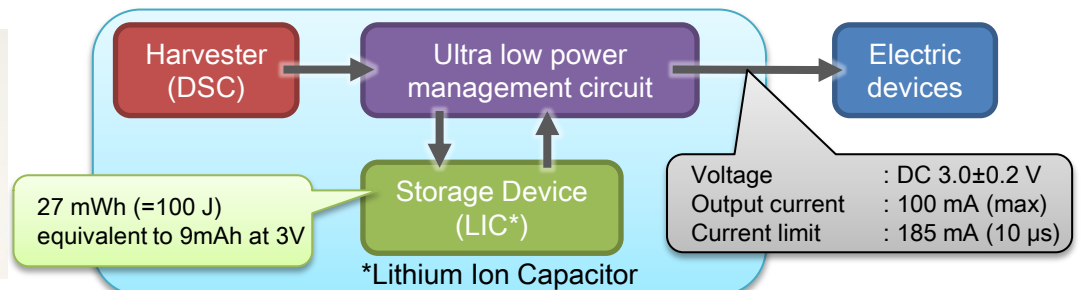
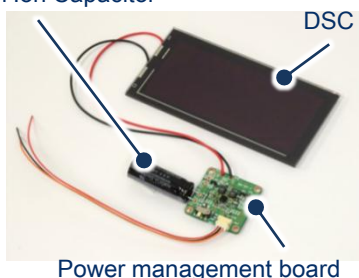
Operating condition : Surface temperature -30 ~ 50°C, Illuminance 10 ~ 100,000 lux  
Electric performance will linearly increase according to intensity of illuminance (e.g.  $P_m$  and  $I_{op}$  under 1,000 lux are five times bigger than the ones under 200 lux).

### DSC power module

The DSC power module can:

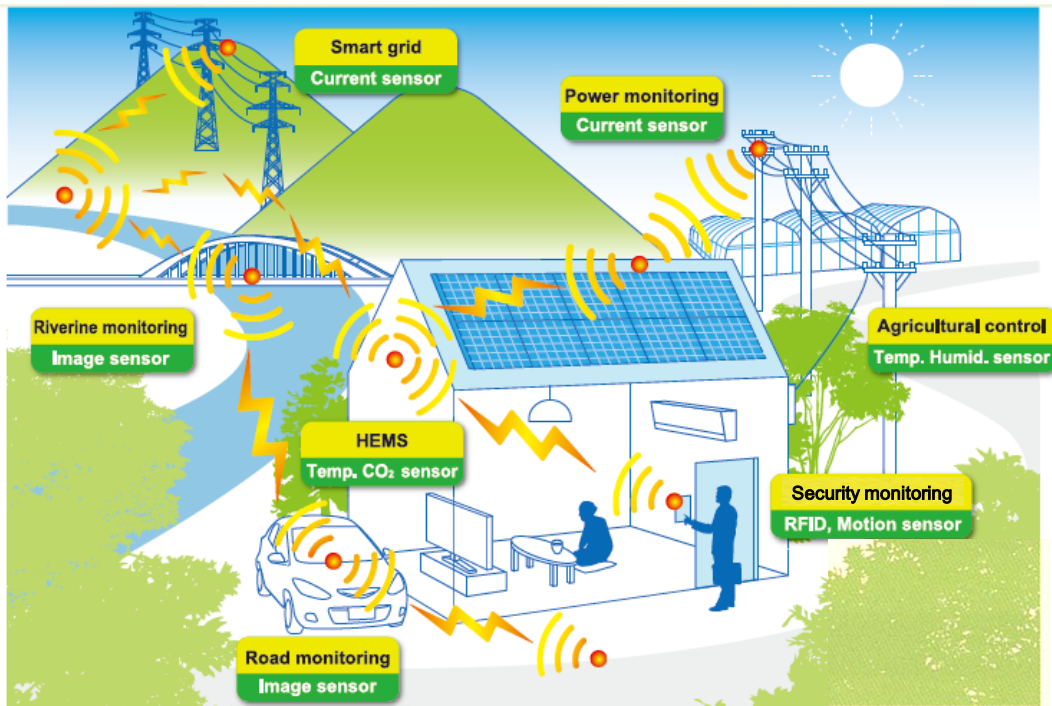
- realize battery-less or extend battery life of various electric devices (e.g. IoT devices).
- reduce user's burden of designing ultra low power management circuit required for energy harvesting.

Lithium Ion Capacitor





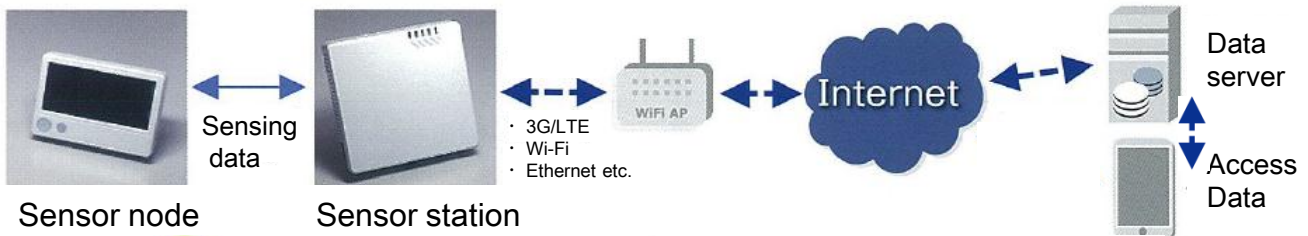
## Applicable areas of DSC



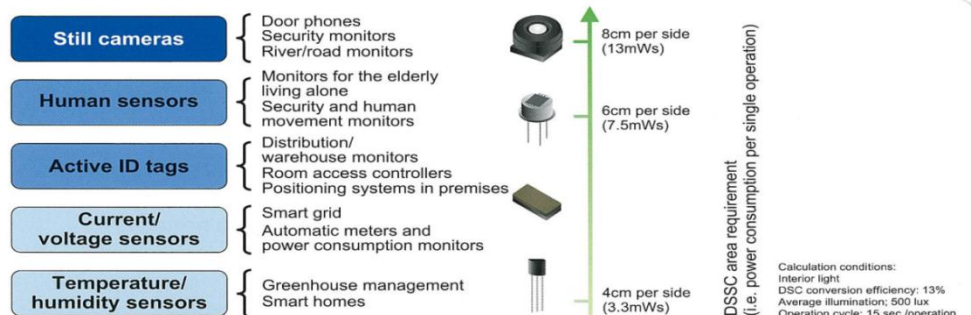
## DSC powered Wireless Sensor Network System (Applicable only in Japan)

### Features

- Batteryless
  - Powered by Dye-sensitized Solar Cell (DSC) and Lithium Ion Capacitor (LIC)
- Location free
  - Long-distance Wireless communication with 920MHz band radio
- Operable at low light illuminance by DSC



### Power consumption of various sensing devices



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