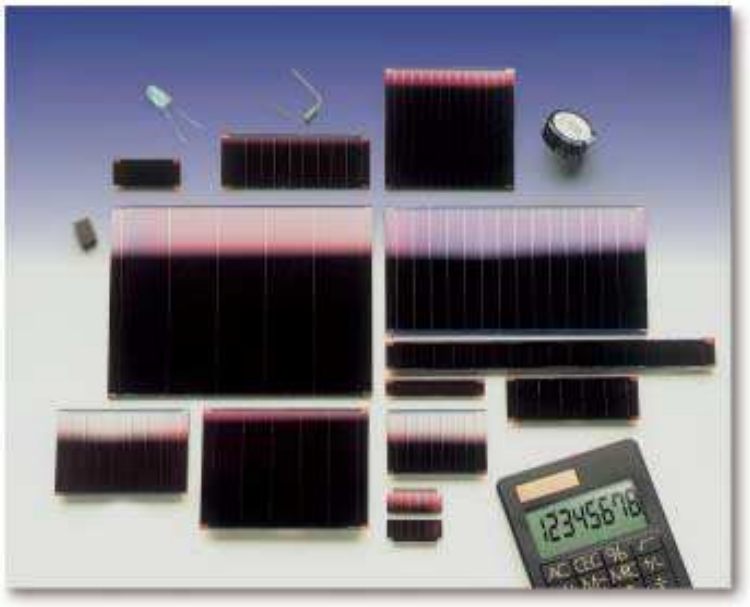
SOLEMS
L'énergie lumière

Solar cells

Thin-film solar cells for low and high illumination

- Amorphous silicon material
- Adapted to any artificial and natural day light
- Simple protection for indoor or in-housing use
- Standard or custom designed size and voltage



- Very sensitive to low light down to 20 lux, and in cloudy weather
- Protection adapted indoor use, or in a **weatherproof housing** for outodoor use
- On **glass substrates**, square or rectangular, thickness 2, 1.1 ou 0.55 mm
- **Voltage range** : 1.5V, 2.5V, 5.5VDC or else …
- **RoHS** conform

- Full product range next page -

Examples of use : low consumption electronic

Swiming pool water purification ionizer

LCD shading windows for welding helmets

Smart surge arrester monitor

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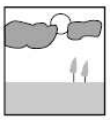
Solar cells 2/3


200 Lux


1000 Lux


200 W/m²


1000 W/m²

CURRENT / VOLTAGE at maximum power point

Product ref.	LOW ILLUMINATION 200 lux	LOW ILLUMINATION 1000 lux	HIGH ILLUMINATION 200 W/m²	HIGH ILLUMINATION 1000 W/m²	Dimensions (mm) Length	Height	Thick.*	Weight (g)
					* except on contact areas			
Range 3	**at 1.2 V :**	**at 1.3 V :**	**at 1.5 V :**					
03/017/013	4 µA / 1.2V	20 µA / 1.3V	0.5 mA / 1.5V	2 mA / 1.8V	17	13	1	0.6
03/048/016	17 µA / 1.2V	95 µA / 1.3V	2 mA / 1.5V	8 mA / 1.5V	48	16	1	2
03/048/032	40 µA / 1.2V	200 µA / 1.3V	5 mA / 1.5V	18 mA / 1.5V	48	32	1	4
Range 5	**at 2 V :**	**at 2.2 V :**	**at 2.5 V :**	**at 2.7 V :**				
05/040/009	6 µA	30 µA	0.8 mA	3.5 mA	40	9	0.55	0.5
05/048/016	11 µA	55 µA	1.6 mA	7 mA	48	16	2	4
05/048/032	24 µA	120 µA	3.4 mA	15 mA	48	32	2	8
05/072/032	42 µA	210 µA	6 mA	18 mA	72	32	2	11
05/072/048	65 µA	325 µA	9 mA	27 mA	72	48	2	17
05/072/072	98 µA	490 µA	14 mA	42 mA	72	72	2	25
Range 7	**at 2.8 V :**	**at 3 V :**	**at 3.5 V :**	**at 3.7 V :**				
07/040/009	4 µA	19 µA	0.8 mA	3.5 mA	40	9	0.55	0.5
07/036/024	8 µA	40 µA	1 mA	6 mA	36	24	2	4
07/048/016	8 µA	40 µA	1 mA	6 mA	48	16	2	4
07/048/032	17 µA	85 µA	2.3 mA	12 mA	48	32	2	8
07/055/020	12 µA	62 µA	1.8 mA	9.6 mA	55	20	1	3
07/072/032	30 µA	150 µA	4 mA	17 mA	72	32	2	11
07/072/048	45 µA	220 µA	6 mA	26 mA	72	48	2	17
07/072/072	68 µA	340 µA	9.5 mA	40 mA	72	72	2	25
07/096/048	65 µA	325 µA	9 mA	28 mA	96	48	2	22
07/096/072	100 µA	500 µA	13 mA	43 mA	96	72	2	33
07/096/096	133 µA	660 µA	17 mA	65 mA	96	96	2	44
Range 9 to 13								
09/055/020	9 µA / 3.6V	45 µA / 4V	1.3 mA / 4.5V	7 mA / 5V	55	20	1	3
10/048/024	8 µA / 4V	40 µA / 4.5V	1.2 mA / 5V	5.5 mA / 5.5V	48	24	2	6
10/072/048	28 µA / 4V	140 µA / 4.5V	4 mA / 5V	20 mA / 5.5V	72	48	2	17
12/048/045	12 µA / 4.8V	60 µA / 5.4V	1.8 mA / 6V	8 mA / 6.8V	48	45	2	10
12/072/024	8 µA / 4.8V	40 µA / 5.4V	1.6 mA / 6V	7 mA / 6.8V	72	24	2	8
12/072/032	15 µA / 4.8V	75 µA / 5.4V	2 mA / 6V	10 mA / 6.8V	72	32	2	11
12/096/072	50 µA / 4.8V	250µA / 5.4V	7 mA / 6V	33 mA / 6.8V	96	72	2	33
13/096/013	7 µA / 5.2V	35 µA / 5.6V	1 mA / 6.5V	4.8 mA / 7V	96	13	1	4
Range 14	**at 5.6 V :**	**at 6.3 V :**	**at 7 V :**	**at 7.3 V :**				
14/046/046	9 µA	47 µA	1.4 mA	7 mA	46	46	3	17
14/096/048	28 µA	140 µA	4 mA	20 mA	96	48	2	22
14/096/096	59 µA	290 µA	8 mA	42 mA	96	96	2	44
14/144/072	70 µA	350 µA	10 mA	42 mA	144	72	2	50
14/144/144	138 µA	690 µA	20 mA	85 mA	144	144	2	100
Range > 14								
15/096/018	9 µA / 6V	47 µA / 6.7V	1.4 mA / 7.5V	7 mA / 8 V	96	18	1	5
18/072/048	18 µA / 7.2V	88 µA / 8V	2.5 mA / 9V	10 mA / 9.5V	72	48	2	17
22/090/040	13 µA / 8.8V	64 µA / 9.9V	2 mA / 11V	9 mA / 13V	90	40	1	10
28/124/124	46 µA / 11V	230µA / 12.6V	7 mA / 14V	32 mA / 16V	124	124	2	72

LOW ILLUMINATION : Values tolerance ±10% under a fluorescent source
HIGH ILLUMINATION : Values tolerance ±10% under AM1.5 solar spectrum 25°C

You need a different solar cell ?
Send your drawing and electrical specs.

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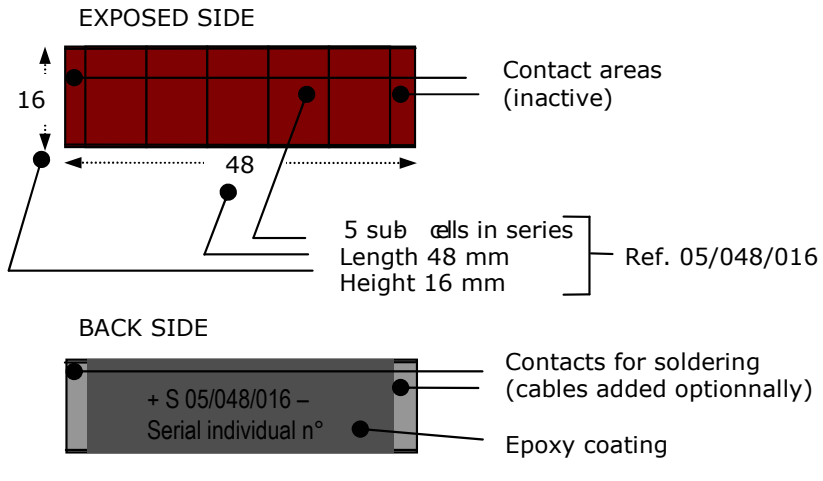
Product ref. and technical description

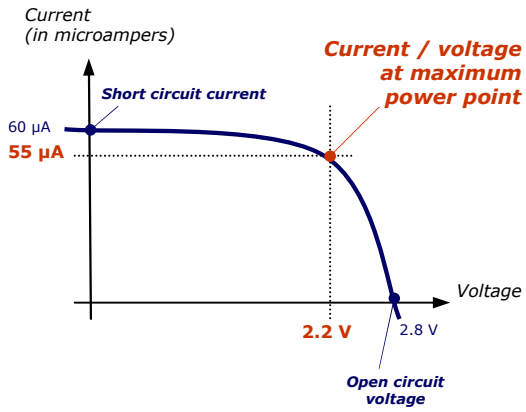
• *The active material, **thin film amorphous silicon**, about 0.3µm thick, is produced under vacuum on a transparent electrode on glass. Afterwards, the active surface is covered with a metallic electrode and an epoxy coating.*
• *Each solar cell is divided in individual photovoltaic segments, or "sub-cells" that are **electrically connected in series** by laser etching and lift-off masking technology.*

• ***The DC voltage** delivered under illumination increases with the number of sub-cells in series, and with the illumination level (but less).*
• *The current depends on the surface of the sub-cell and the illumination level.*

Example : Solar cell *ref.* 05/048/016



Front and back side of the cell
Dimensions in mms. General tolerance : - 0 /+0.5 mm



Current-voltage curve under light
1000 lux – fluorescent source

Conditions of use

• Electrical connections
The 2 contact areas on the back of the cell are tinned (RoHS). It is recommended to solder thin flexible cables with a welding iron (or by dipping) below 320°C and RoHS solder material. Do not use a wave solder machine. Do not heat the whole component above 120°C. For direct assembly on a PC board, apply to us. No damage when short circuited.

• Assembly
Can be assembled with flexible non acidic glue, or clamped with a flexible. Take into account the temperatures the component will meet during use. The supporting material is glass.

• Climatic category
- 40°C / +70°C and 75% R.H.
The epoxy coating supplied is sufficient for all indoor types of use.
For an outdoor use, place the cell inside a weatherproof housing, behind a transparent UV stable window, or turn to a TD type SOLAR MODULE, ready to use outdoor, under any climate.

• Warranty / lifetime
For an indoor use, the solar cells are warranted 5 years, and have a lifetime around 10 years in normal conditions (neutral atmosphere, not salty, nor corrosive). Same warranties for indoor use if adequate protection is added.

• Electrical use
These solar cells can supply power to low consumption electronic devices, for the following currents :
- in microamps full time or in milliamps part time under low illumination (indoor light)
- in milliamps full time under high illumination (outside under natural light).

They can be connected in directly or through a storage device : super capacitor, NiCad, NiMH or Li rechargeable battery with an adequate charge limitation system (especially in case of Li).

The short circuit current of these cells being proportional to light intensity (and not their current at maximum power point) they can be used as light sensors. See our LIGHT SENSORS leaflet.

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