BP-M-FLEX Solar Module

BP-M-F Series solar module using CIGS material, specifically designed for roofs. Flexible modules for almost all roof shapes ; light weight, no variety of installation accessories . We improved roof surface coverage, improve conversion efficiency, low good low-light performance increase power generation capacity each roof.

Application:

•Designed specially for rooftops

Integrates with roofing surface

· No mounting hardware

· No roof penetrations

· No wind load

Flexible module

· Fits many roof types

· Durable, non-breakable

Light weight

· 3.5 kg/m2 (0.5 lb/ft2) with adhesive

· No structural reinforcement required

•More energy per roof

High efficiency CIGS

· 10.4% to 12.7% aperture efficiency

· 50% more efficient than flexible a-Si

High performance

· Performs in all light conditions

· Shade tolerant

Covers entire roof area

· Lays flat. No tilt required

· Minimum module spacing required

•Lower installed system costs

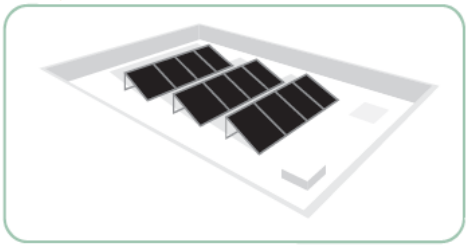
· Large format module

· 82-100 Watts

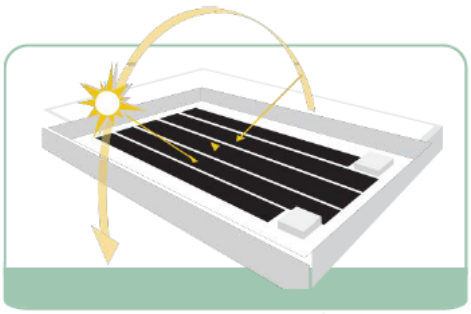
· 2.0m x 0.49m dimensions

· 30% to 40% savings in BOS & installation costs

This is your roof with tilted solar panels



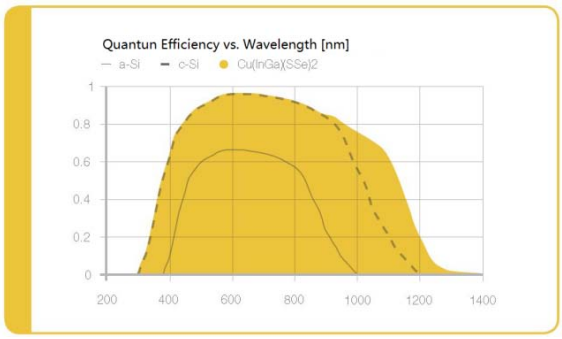
This is your roof with PowerFlex™ BIPV



BP-M-FLEX Solar Module

· Stable Energy Generation

Crystalline silicon PV exhibits light diffusion and photo deterioration when exposed to the sun for long periods of time, thus causing their power generation capability to gradually decline. CIGS PV does not suffer from these phenomena. Thus, from the long-term perspective, CIGS PV offers more stable energy generation and requires less maintenance costs.



·High Transfer Efficiency, High Overall Electrical Output

According to the National Renewable Energy Labs (NREL), CIGS PV can currently attain up to a 19.9% efficiency rate. However, the highest rate recorded in the industry has been up to 16%, with an average rate of 12%. It is worth noting that when crystalline silicon (efficiency of 16%) and CIGS are tested together outdoors, the latter generates 1.2 times more energy than the former. Even though the current in use CIGS PV's efficiency be lower than that of silicon-based, CIGS PV absorbs more sunlight per day and so produces more energy in total.

·Low Production Costs

The main cost of CIGS PV lies in its raw materials — copper, indium, gallium and selenium. However, it requires only ordinary soda glass as opposed to special ultra-white or thin-film conductive glass. While the aforementioned metals are precious metals, CIGS PV requires no more than a 3 um (1 um = 1/1000mm) coat, giving it a competitive per unit cost.

·Short Energy Payback

Time Renewable energy offers many benefits. However, manufacturing the technology to produce such energy is itself resource-intensive. Thus, in assessing whether a particular type of renewable energy is genuinely sustainable, one needs to look at not only its efficiency but also how long it takes for the renewable energy produced to offset the resources needed to produce that facility. This is known as "EPBT " (energy payback time). According to the U.S. Department of Energy, assuming a 30-year lifespan for solar installments, the EPBT of crystalline silicon PV has been estimated to be about 2-4 years . By contrast , CIGS PV is estimated only 1-2 years. In other words, any of the PV systems abovementioned would have a roughly 26-29 year lifespan of truly pollution-free use. In a nutshell, CIGS comes out on top.

BP-M-FLEX Solar Module

Features:

1.unique printing processes to apply suspensions of metal oxide particles.

Particle deposition leaves behind a porous film

2.The high surface area of the initial powder layer allows the reduction reaction to proceed very quickly, much faster than either a bulk or a thin-film reaction.

3.Controlling the quantities of precursor powders gives us uniform initial compositions and nearly unlimited access to the full CIGS alloy system. Our non-vacuum deposition method serves three objectives: improved materials utilization, improved uniformity, and reduced process costs.

Electrical Specifications:

Capacity rating	P max	90W	100W	250W	275W
Tolerance of Pmax	%	±7%	±7%	±7%	±7%
Module aperture area efficiency	%	11.4%	12.7%	10.5%	11.5%
Rated voltage	Vmpp	16.5V	17.8V	48.6V	51.5V
Rated current	Impp	5.4A	5.6A	5.1A	5.3A
Open circuit voltage	Voc	22.0V	23.3V	65.4V	67.6V
Short circuit current	Isc	6.3A	6.4A	6.2A	6.3A

Temperature Cofficients:

Maximum power	P max	-0.43%/°C
Voltage an Maximum Power	Vmax	-0.38%/°C
Open circuit voltage	Voc	-0.33%/°C
Short circuit current	Isc	-0.03%/°C

BP-M-FLEX Solar Module

Mechanical Specifications:

Capacity rating	90W 100W	250W 275W
Dimensions	2015X492X3.5mm	5745X492X3mm
Weight	3.0kg without adhesive (3.0kg/m²) 3.5kg with adhesive (3.6kg/m²)	7.2kg(nominal without adhesive) or 2.6kg /m² 9.3kg(nominal with adhesive) or 3.3kg/m²
Junction Box	TE Connectivity SOLARLOK™ Micro Junction Box	
Cables	4 mm² dual rated with SOLARLOK™ connectors	
Front Sheet	ETFE	Non-stick ETFE
Solar Cells	36 CIGS cells (210X100mm)	108 CIGS cells (210x100mm)
Adhesive	ADCO HelioBond™ PVA 600BT butyl mastic	
Hot Spot Protection	2 bypass diodes at each cell; 1 at junction box	
Materials	Lead free and exempt from RoHS requirements	
Maximum Series Fuse Rating	10Amp	10Amp
Color Options	Black(B) or White(W) backsheet behind cells	

Operating Conditions:

Temperature Range	-40°C to +85°C
Maximum System Voltage	1000VDC IEC, 600VDC UL

Materials and workmanship - 5 years

Power output - 25 years (90% @ 10 yrs; 80% @ 25 yrs)