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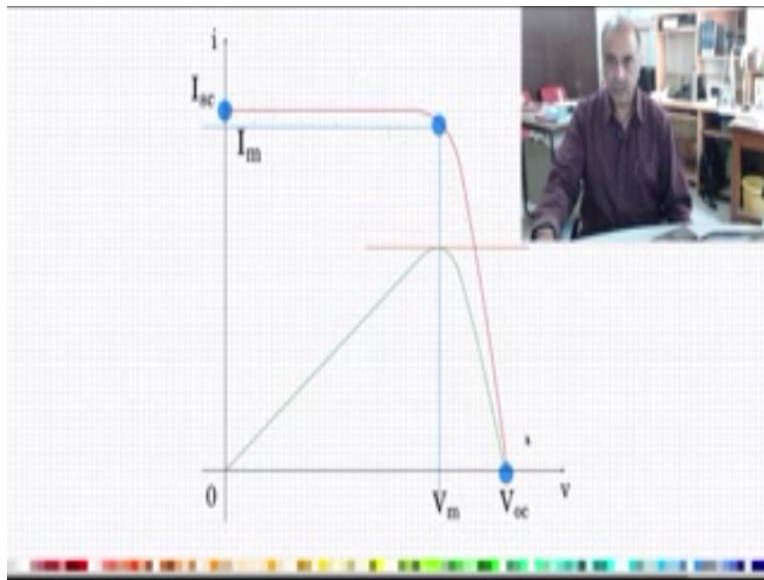
Design of Photovoltaic Systems

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NPTEL Online Certification Course

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Having looked at the IV characteristics and the significant points on the IV characteristic it is probably now a goodtime to look in the data sheets studying the datasheet and trying to map the datasheet parameters to the IV characteristic significant points will give great insight into the character of the IV characteristic and also to select the PV balance we shall have a look at the datasheet and try to consolidate our understanding of the IV characteristic of the PV panel.
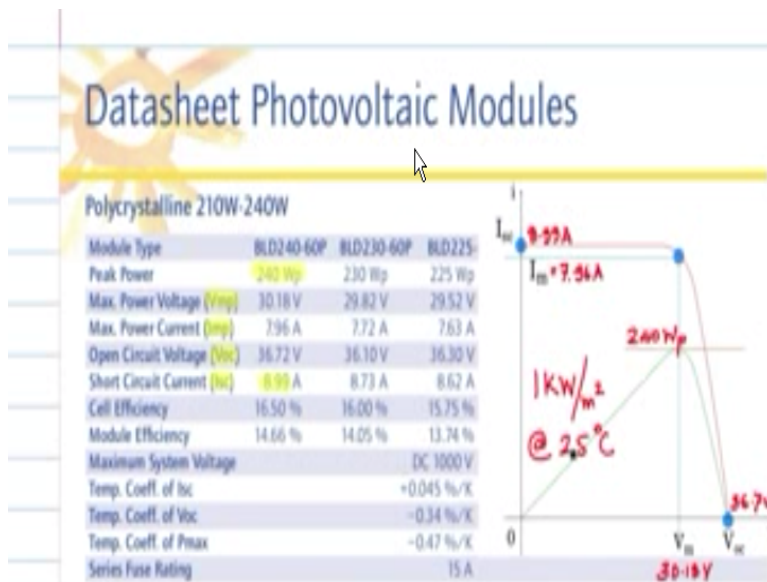
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Datasheet Photovoltaic Modules

Polycrystalline 210W-240W

Module Type	BLD240-60P	BLD230-60P	BLD225-60P	BLD220-60P	BLD215-60P	BLD210-60P
Peak Power	240 Wp	230 Wp	225 Wp	220 Wp	215 Wp	210 Wp
Max. Power Voltage (Vmp)	30.18 V	29.82 V	29.52 V	29.34 V	29.70 V	28.70 V
Max. Power Current (Imp)	7.96 A	7.72 A	7.63 A	7.50 A	7.48 A	7.32 A
Open Circuit Voltage (Voc)	36.72 V	36.10 V	36.30 V	36.56 V	36.50 V	36.48 V
Short Circuit Current (Isc)	8.99 A	8.73 A	8.62 A	8.48 A	8.46 A	8.28 A
Cell Efficiency	16.50 %	16.00 %	15.75 %	15.25 %	15.00 %	14.50 %
Module Efficiency	14.66 %	14.05 %	13.74 %	13.44 %	13.13 %	12.82 %
Maximum System Voltage	DC 1000 V					
Temp. Coeff. of Isc	+0.045 %/K					
Temp. Coeff. of Voc	-0.34 %/K					
Temp. Coeff. of Pmax	-0.47 %/K					
Series Fuse Rating	15 A					
Cells	6x10 pieces polycrystalline solar cells series (156 mm x 156 mm)					
Junction Box	with 3 bypass diodes					
Front Class	toughened safety glass 3.2 mm					

This page shows the datasheet of photovoltaic modules this is a poly crystalline 210 watts to 240watt module you see many columns here each column represents a particular package panel and these are the parameters of interest to us and then let us see how they map to the IV characteristics we will look at one typical panel of a particular watt age which is 240 watt peak and try to study each of the parameter.

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Maximum System Voltage			DC 1000 V
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Temp. Coeff. of Pmax			-0.47 %/K
Series Fuse Rating			15 A

And see how the map to the IV characteristics that we are studying for that let us place the IV characteristics of there here so that you will be able to understand it better along with the datasheet we do not have here the IV characteristic of the PV panel consider these parameters and let us take this column means we are taking a 240 watt PV.

Now let me consider is see this is 8.99 times and let us mark except 8.99 amps V_{oc} as given in the data sheet is 36.72 so we can write that down here 36.7 volts and we also have further parameters I_{mv} and V_{mv}, I_{mv} is the current at weak power point V_{MV} is the voltage at weak power point they correspond to this is V_{MV} which we have used the term VM and this is I_{MP} so if you look at these two and map it on to the PV panel this is equal to 7.96 amps.

And this is 30.18 volts now this is a 240 watt panel what it basically means is that we have 240watts as the paek power the panel is capable of supplying and this studies this point as indicated here you could also get it by multiplying 7.96*30.18 volts you will notice that the term e is used here e represents peak so generally in photovoltaic module datasheet terminology what is used is that peak implying that it is the peak power point.

So normally we would write this as P now one question arises we have 240 Watts peak and this would be the currents and the voltages as we see on the IV curve what at what incident solar power do all these values of life so normally there is a standard incident solar power and that is one kilowatt or meter square and at a temperature 25^0 centigrade now this is standard insulation we call it a standard insulation and 25^0 centigrade as the standard temperature so if it is not

specified all these values are given for this standard incident solar power per meter square and at a temperature of 25^0 centigrade ambient temperature.