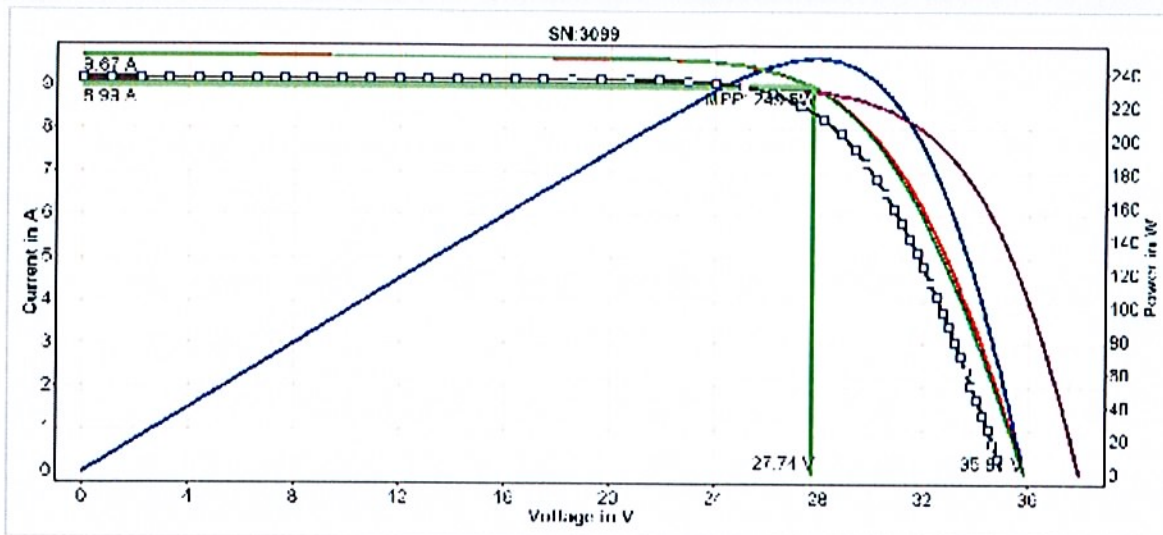


Result of PVPM Power Measurement



Measurement Results

Module type: AFP-60-250 SERIES / 235W-250W - AFP-240 (Altius Fotovoltaic SRL)

In series: 1 - Parallel: 1

		Measurm.:	Nominal:	Deviation:
Values at STC:	Peak power P pk:	259.2 Wp	240.0 W	8.0 %
	Ppk max:	272.2 W	252.0 W	
	Ppk min:	246.3 W	240.0 W	
	I pmax0:	8.44 A	8.05 A	4.8 %
	V pmax0:	30.7 V	29.8 V	3.1 %
	I sc0:	9.07 A	8.60 A	5.5 %
	V oc0:	37.9 V	36.9 V	2.8 %
Maximum values (actual):	P max:	249.5 W		
	I pmax:	8.99 A		
	V pmax:	27.7 V		
	I sc:	9.67 A		
	V oc:	35.8 V		
Calculated values:	Rs:	0.4 Ohm	0.4 Ohm	8.8 %
	Losses by add. Rs:	-2 W		
	Rp:	220 Ohm	253 Ohm	-12.8 %
	FF:	0.72	0.76	-4.8 %
	NOCT:	34 °C		
Conditions during measurement:	Cell temperature T mod:	45.0 °C		
	Irradiance E eff:	1066 W/m2		
	Temperature reference cell T ref:	55.6 °C		

Additional Informations

File: C:\...\Raport PVPM 04092013\Raport SN3099\Raport PVPM 04092013 SN3099.4.SUI

PVPM Serial No.: PVPM2540C03707

Sensor: ISET-00670

Customer: Altius Fotovoltaic SRL

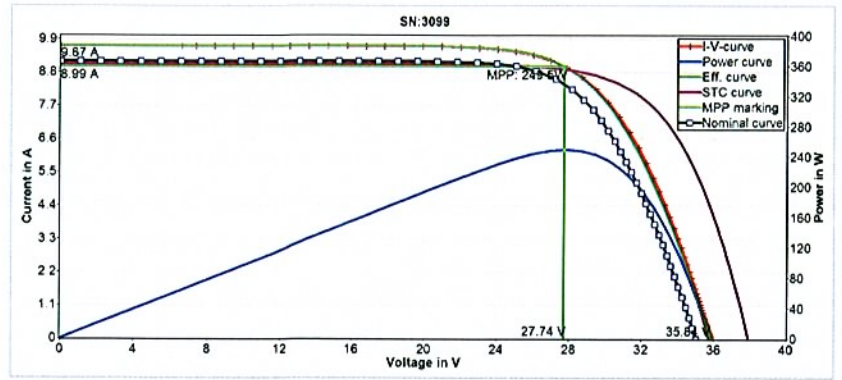
PV plant: -

Plant part: -

Date of measurement: 04.09.2013 12:32:09

Description: SN:3099

Analysis of an I-V-curve measurement



Measurement file: C:\Users\cristea\Desktop\Raport PVPM 04092013 SN3097\Raport PVPM 04092013 SN3099.4.SUI
 Device serial no.:PVPM2540C03707
 Reference sensor:ISET-00670
 Date of measurement:04.09.2013 12:32:09
 Remark: SN:3099

Comparison module: AFP-60-250 SERIES / 235W-250W - AFP-240
 Configuration: 1 module(s) in series, 1 module(s) parallel

Conditions during measurement:

	Target values:	Description:
Eeff	1066W/m2	Irradiance during measurement
Tamb	27.0°C	Ambient temperature during measurement
Tmod	45.0°C	Module temperature during measurement
Tmod exp.	60°C	Expected module temperature
T Sensor	55.6°C	Temperature irradiance reference during measurement
NOCT	34°C	Normal Operating Cell Temperature

	Target values:	Actual values:	Divergence:%	Description:
Ppk:	240.0Wp	259.2Wp	8.0%	Peak power (STC)
Voc:	36.9V	37.9V	2.8%	Open circuit voltage (STC)
Isc:	8.60A	9.07A	5.5%	Short circuit current (STC)
Vpmax:	29.8V	30.7V	3.1%	Voltage at MPP (STC)
Ipmax:	8.05A	8.44A	4.8%	Current at MPP (STC)
Rs:	0.4Ohm	0.4Ohm	8.8%	Internal series resistance
FF:	0.76	0.72	-4.8%	Fill factor
PRs	--	-2W	--	Power loss due to Rs

Quality of curve match:
 Well(Variance: 0.02 standard deviation: 0.12)

Evaluation:

Measured peak power higher than expected
 The measured peak power is between 246.3WP and 272.2Wp.
Possible reasons:
 > power of the modules higher than expected
 > measurement fault (irradiance/temperature wrong)

> wrong module type for comparison

Irradiance 1066W/m² equates IEC60904, sufficient for an estimation!

Expected module temperature 60°C differs significantly from measured (45.0°C) !

Possible reasons:

> warmup time of sensor too short

> varying irradiance