**SOUTHWEST REGION EXPERIMENT STATION
(SWRES)
1990 REPORT**

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SUMMARY

The Southwest Region Experiment Station (SWRES), operated by the Southwest Technology Development Institute, located on the New Mexico State University campus in Las Cruces, New Mexico, performed the following tasks in 1990. Many of these projects were funded in whole or in part by the U.S. Department of Energy's National Photovoltaic Program.

- Collected a complete year of weather data.
- Collected data from and prepared a report describing performance of the PV systems at the Southwest Region Experiment Station.

1.0 INTRODUCTION

Photovoltaic (PV) systems and components have been tested at the SWRES since 1981. The U.S. Department of Energy provided the initial funding for the 12 support structures on the site. Approximately 40 kW of PV was installed on the roofs of these support structures to study the performance of residential applications. A review of the performance of these systems during the decade of the 1980's is included in Section 2 of this report.

2.0 PERFORMANCE OF THE GRID CONNECTED PV SYSTEMS AT THE SWRES

Eight grid-connected prototype photovoltaic systems were installed at the SWRES in 1981-82. These systems represented the state-of-the-art in residential PV systems when they were installed. They were designed by different companies and all of the component manufacturers of that time were represented. In 1984, a ninth prototype

support structure with a Mobil Solar Energy Corporation ribbon type module was added at the SWRES. The characteristics for the four systems are given in Table 1.

In 1987 amorphous silicon (a-Si) modules became available commercially and these new technology systems were installed at the SWRES. Three a-Si systems, all less than 1 kW, have been installed and operated at the SWRES in the last four years. These system characteristics are given in Table 2.

Table 1
Grid-Connected PV Systems at the SWRES

System	Area (m ²)	Installed Rating (kW)	1988/1989/1990 Rating (kW)	Tilt Angle (°)	1990 PCS
ARTU	55.2	4.9	2.5/2.5*/2.2	45	Gemini
Solarex	70.2	5.1	3.9/4.2/3.9	26	APCC
TriSolar	58.0	5.3	4.9/4.7/4.4	30	Gemini
MSEC	53.0	3.9	3.7/3.7/3.4	30	APCC

*Configuration changed from original.

Table 2
System Characteristics

System Name	Installed Rating (kW)	Dec. 1990 PCS	1990 46° Max Power Rating (kW)	Tilt	Dec. 1990 Area (m ²)
Chronar 2	0.72	Teslaco	0.617	25°	18.37125
Sovonics 1	1.15	ROSS	0.925	25°	23.0913281
OTP-101	0.943	ROSS	0.505	30°	14.8336

2.1 Solar Insolation at the SWRES

The total horizontal solar insolation received in 1990 is shown in Figure 1.

Comparing this actual data to meteorological year (TMY) for El Paso produces the results shown in Figure 2.

Figure 1. 1990 Horizontal Insolation Comparison

Figure 2. RES/ELP POA Insolation

2.1.1 TriSolar System

The 5.3 kW system installed by TriSolar, Inc., in March 1981 was the first SWRES system to become operational. This system used Applied Solar Energy Corporation (ASEC) modules in an integral roof mount with the tilt angle fixed at 30°.

A Gemini/Omnion PCS was used. This system has been the most consistent performer at the SWRES. The energy production is shown in Figure 3.

This system produced 8518.01 kWh of energy in 1990. The system rating determined from I-V curves taken in 1990 gives a value of 4.36 kW at standard test conditions (1,000 W/m², 25°C module temperature). This is 17.8 percent lower than the original rating given in 1981. (Note: Over the years, the test equipment used to measure array power has improved significantly. The techniques did not change, but the different equipment may cause some variation in comparing readings made in 1990 and 1982.)

Figure 3. TriSolar System AC Energy Production.

The reliability of the TriSolar system has been outstanding. There are only two recorded instances of unscheduled downtime. One instance was caused by a nearby lightning strike that burned the MOVISTOR on the output of the PCS, and the second instance was a fuse blown on the input of the PCS. Both problems were repaired in a few hours. There have been no hardware failures in the PCS or in the array. The modules are still producing at their original capability. The only visual change is a slight discoloration around the junction box.

2.1.2 ARTU System

The ARTU system started operation in July 1981. The ARTU system produced 4237 kWh of power in 1990. The energy production trends are shown in Figure 4. The system rating at standard test conditions is 2.2 kW based on I-V curves taken in December 1990. In 1985, one-third of this array was removed to support other testing. This caused the noticeable decrease in the annual production trend.

Figure 4. ARTU System AC Energy Production.

2.1.3 Solarex System

The Solarex system began operation in March 1981. This system used polycrystalline modules mounted in a low stand-off (1.75 inches) at a tilt angle of 26°. The energy production in 1990 was 7447 kWh, Figure 5. A 3.91 kW array rating was assigned in December 1990.

The system required maintenance several times in 1990 to correct loss of power in parts of the generating system. The most frequent failure was in the string connections. The connections corroded until the string was disconnected from the bus and not contributing any power. Corrections of these problems resulted in the higher 1989 rating. Also, the dc power relay in the inverter failed. This was a component related failure where the coil opened and would not close the contactor.

Figure 5. Solarex System AC Energy Production.

2.1.4 Arco Solar System

Arco Solar Corporation installed a 7.4 kW system at the SWRES and the initial production was in September 1989. The system used a Tedlar covered "batten and seam." module that was direct mounted to the 25° tilt roof. The direct mount caused this array to operate at temperatures equivalent to the GE array—about 15°C higher than other arrays on the site. This higher temperature penalized the energy production by 7 to 8 percent over an equivalent array that operates 15° cooler.

This system was dismantled in 1987 because of multiple shorts in the array. The Tedlar covering on the modules delaminated from the metal sheet used in the batten and seam construction. This allowed dust and moisture to invade, particularly in the corners of the modules, and electrical shorts occurred. Because of the lack of access to the direct mounted modules, it was almost impossible to

maintain or repair the array. The poor experience with this array and the GE array caused the direct mount technique to be abandoned.

2.1.5 Mobil Solar System

This system started production in October 1983. The array uses the 4 x 6 foot ribbon modules produced by Mobil for large arrays. The array is an integral mount at 30° tilt angle. The PCS is made by American Power Conversion Corporation (APCC).

This system has been reliable with only two instances of unscheduled downtime in the last seven years. Both were caused by PCS problems but these were repaired in a few hours. In 1990, the array produced 60 kWh of energy. The energy production is given in Figure 6. A fuse failed in the ac side of the inverter for an unknown reason (the second failure within a few months), and a module was replaced at Mobil's request. The latest I-V curves taken in 1990 show a system rating of 3.4 kW.

There has been a significant browning of the MSEC modules used on this array. This can be correlated with the 2% percent/year drop in power since 1988. Several of these modules were returned to MSEC so they could analyze the apparent discoloration of the EVA encapsulant.

Figure 6. MSEC System AC Energy Production.

2.2 PVFORM ANALYSIS

PVFORM is a software package used to design and size PV systems. PVFORM uses a typical meteorological year (TMY) data file and PV system specifications to forecast monthly energy production. In past years PVFORM was analyzed using SWRES crystalline system specifications and El Paso TMY data. Results were favorable for the crystalline systems and PVFORM found to be fairly accurate. El Paso data was used because local weather data was unavailable. This year SWRES weather data is used in the analysis and the amorphous systems are included as well. The result is that PVFORM accurately forecasts energy production for crystalline systems, but is not accurate for amorphous systems.

2.2.1 PVFORM Comparison of SWRES vs El Paso TMY Data

To clarify differences in SWRES and El Paso TMY data, PVFORM was run with each data set, using the same system specifications. A graph of the forecasted monthly energy production is shown in Figure 7. This shows there is no major discrepancies in the data sets, although real weather produces lower energy forecasts.

Figure 7. PVFORM Comparison of SWRES and El Paso TMY

2.2.2 PVFORM Comparison of Crystalline Systems

PVFORM was run with SWRES weather data using the specifications of the four crystalline systems on site. Graphs of the predicted versus actual energy production are shown below in Figures 8 through 11. The PVFORM energy production consistently follows the same trend as the actual energy production. The few differences, such as July for the MSEC system, are caused by system downtime for maintenance or repairs. This shows that PVFORM accurately (within +5%) forecasts energy production for crystalline systems.

Figure 8. SX System; PVFORM vs. Actual Energy Production.

Figure 9. TSC System; PVFORM vs. Actual Energy Production.

Figure 10. MSEC System; PVFORM vs. Actual Energy Production.

Figure 11. ARTU System; PVFORM vs. Actual Energy Production.

2.2.3 PVFORM Comparison of Amorphous Systems

PVFORM was run with SWRES weather data using the specifications of the three amorphous systems on site. The predicted energy production does not consistently follow the actual production trend (See figures 12 through 14). Notice how the data

lines cross each other, which did not occur for the crystalline systems. PVFORM both over and under predicts energy production for amorphous systems by plus or minus five percent.

Figure 12. CT System; PVFORM vs. Actual Energy Production.

Figure 13. SOVONICS System; PVFORM vs. Actual Energy Production.

Figure 14. CHRONAR System; PVFORM vs. Actual Energy Production.

2.2.4 Summary of PVFORM Analysis

SWRES weather data was used to analyze PVFORM for both crystalline and amorphous systems this year. PVFORM accurately (within +5%) predicts energy production for crystalline PV systems. Amorphous systems are not as accurately predicted. The error factor doubled to $\pm 5\%$. This indicates PVFORM needs modification to accurately forecast energy production for amorphous systems.

APPENDIX A

1990 Details on Downtime

1990 DETAILS ON DOWNTIME

SYSTEM	DATE	TIME	EXPLANATION
Sovonics	010490	1045-1120	New inverter breaker Switch.
	072890	1230	Rewired Ross Inverter.
	073190	1530	
GE	010490	1450	Removed 3 bad modules and rewired
	010990	0900	system for best power.
	053090 111290	1508-Indef. 1500-Indef.	Removed inverter, returned to SNL. Modules removed-moved to TEA (module failures and no interest by manufacturer)
Solarex	010990	0956-1123	Replaced a Solarex module ITT/LL 7821 with a Solarex module MIT 100-2967.
	082090 083090	1515 0730	Removed defective string switches. Rewired everything directly to array. Replaced all inadequate sized wires.
	090790 091090	1000 1600	Installed isolation transformer and ground fault interrupter for testing.
	101890	1435-1505	Modified ground fault interrupter prototype.
	103090	0830-0930	Installed ground fault interrupter for testing.
	120390	1505-1520	Photographed ground fault interrupter prototype.
	013190	1200-1600	Soldered leads on Pyranometer.
WST	020790 020890	0900 1630	Blown Fuse. Replaced both Fuses.
	021690 021990	? 1100	Array & Inverter breaker found off. Turned back on.
	042390	1500-1530	Re-routed Pyranometer cable.
	081490 031991	0100 1425	Removed inverter. Sent back to manu- facturer for repair. Reinstalled.
	022090 030590	? 0820	Array & Inverter breaker found off. Turned back on.
Mobile	121990 010291	? ?	System found off. Turned back on.

1990 DETAILS ON DOWNTIME

SYSTEM	DATE	TIME	EXPLANATION
TEA	042690	1415	Remount battery switch.
	042790		
	052190	0915-1030	Installed fuse protector.
	070990	0700	Installed Ni-H2 Batteries
	071690	1430	
	081590	1100-1345	Wired 2 additional batteries (Trojan L-16's) in parallel with existing system.
	100390	0825	Equalized batteries.
	100890	0730	
	112190	1105-1715	Installed 30 Solarex SA-20 modules.
	112690	0800-0900	Combined old Sovonics array with new Solarex array.
Trisolar	050890	0830	Condensation inside Pyro glass dome.
	053190	1500	System found off. Turned
	060190	1000	back on.
CT/OT	071790	0830-1015	Tester work (Steve Durand).
	062690	0800	Scheduled down time (Dug
	070390	1730	trenches for tracker).
	070890	1500	Testing ground fault
	071290	1123	interrupter.
	071790	1015-1040	Tester work (Steve Durand).
	072890	1230	Removed inverter. Sent
	092090	0920	back to manufacturer for
			repairs. Reinstalled.
	101290	0100	Blown inverter fuse.
	102290	0815	

APPENDIX B

ARTU 1990

Cell Temperature 44.000 deg C
 Irradiance962 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.1%)
 Short circuit current 15.5 amps
 Open circuit voltage 218.7 volts
 Max power current 13.2 amps
 Max power voltage 161.7 volts
 Max power 2136.3 watts

NORMALIZED CURVE DATA: (fill factor = 65.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 178.8 volts
 Max power 2440.1 watts

NORMALIZED CURVE DATA: (fill factor = 63.3%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.4 amps
 Max power voltage 164.4 volts
 Max power 2195.8 watts

Cell Temperature 44.000 deg C
 Irradiance961 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.945 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.1%)
 Short circuit current 15.5 amps
 Open circuit voltage 219.0 volts
 Max power current 13.0 amps
 Max power voltage 165.2 volts
 Max power 2143.0 watts

NORMALIZED CURVE DATA: (fill factor = 65.0%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 179.9 volts
 Max power 2448.0 watts

NORMALIZED CURVE DATA: (fill factor = 63.3%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 162.0 volts
 Max power 2205.7 watts

Cell Temperature 45.000 deg C
 Irradiance 1.030 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (f111 factor = 63.18)
 Short circuit current 16.3 amps
 Open circuit voltage 218.7 volts
 Max power current 13.6 amps
 Max power voltage 165.2 volts
 Max power 2248.8 watts

NORMALIZED CURVE DATA: (f111 factor = 64.48)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.2 amps
 Max power voltage 182.0 volts
 Max power 2410.7 watts

NORMALIZED CURVE DATA: (f111 factor = 62.78)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 13.1 amps
 Max power voltage 165.3 volts
 Max power 2172.2 watts

Cell Temperature 45.000 deg C
 Irradiance 1.033 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.0%)
 Short circuit current 16.4 amps
 Open circuit voltage 219.0 volts
 Max power current 13.7 amps
 Max power voltage 165.2 volts
 Max power 2258.7 watts

NORMALIZED CURVE DATA: (fill factor = 64.4%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.3 amps
 Max power voltage 180.9 volts
 Max power 2415.1 watts

NORMALIZED CURVE DATA: (fill factor = 62.7%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.2 amps
 Max power voltage 165.4 volts
 Max power 2175.5 watts

Cell Temperature 55.000 deg C
 Irradiance 1.041 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.1%)
 Short circuit current 17.5 amps
 Open circuit voltage 209.0 volts
 Max power current 14.9 amps
 Max power voltage 150.0 volts
 Max power 2242.5 watts

NORMALIZED CURVE DATA: (fill factor = 63.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 14.0 amps
 Max power voltage 181.3 volts
 Max power 2538.4 watts

NORMALIZED CURVE DATA: (fill factor = 61.8%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 14.2 amps
 Max power voltage 161.1 volts
 Max power 2283.4 watts

Cell Temperature 55.000 deg C
 Irradiance 1.045 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.2%)
 Short circuit current 17.5 amps
 Open circuit voltage 209.2 volts
 Max power current 14.8 amps
 Max power voltage 152.3 volts
 Max power 2250.1 watts

NORMALIZED CURVE DATA: (fill factor = 63.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 14.2 amps
 Max power voltage 179.1 volts
 Max power 2535.4 watts

NORMALIZED CURVE DATA: (fill factor = 61.8%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 13.9 amps
 Max power voltage 163.6 volts
 Max power 2276.4 watts

Cell Temperature 49.000 deg C
 Irradiance 1.060 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.945 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.1%)
 Short circuit current 16.9 amps
 Open circuit voltage 214.2 volts
 Max power current 14.3 amps
 Max power voltage 157.0 volts
 Max power 2242.4 watts

NORMALIZED CURVE DATA: (fill factor = 63.7%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.1 amps
 Max power voltage 182.2 volts
 Max power 2391.5 watts

NORMALIZED CURVE DATA: (fill factor = 62.0%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.3 amps
 Max power voltage 161.9 volts
 Max power 2153.8 watts

Cell Temperature 49.000 deg C
 Irradiance 1.062 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.2%)
 Short circuit current 16.9 amps
 Open circuit voltage 214.3 volts
 Max power current 14.1 amps
 Max power voltage 159.4 volts
 Max power 2247.3 watts

NORMALIZED CURVE DATA: (fill factor = 63.7%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.4 amps
 Max power voltage 178.7 volts
 Max power 2391.0 watts

NORMALIZED CURVE DATA: (fill factor = 61.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.1 amps
 Max power voltage 164.3 volts
 Max power 2151.4 watts

SWRES ARTU ARRAY 10-03-90 13:14:23

Module Temperature	60.0	°C
Insolation	1085.0	W/m ²
Series Resistance	2.100	ohms
Voltage Coefficient	-0.946	volts/°C
Current Coefficient	0.009	amps/°C

ACTUAL CURVE DATA: (fill factor = 62.7 %)

Short Circuit Current	17.3	amps
Open Circuit Voltage	209.5	volts
Max Power Current	15.0	amps
Max Power Voltage	151.2	volts
Max Power	2269.1	Watts

NORMALIZED CURVE DATA: (fill factor = 65.4 %)
(25°C and 1000 W/m²)

Max Power Current	13.7	amps
Max Power Voltage	183.0	volts
Max Power	2514.4	Watts

NORMALIZED CURVE DATA: (fill factor = 63.7 %)
(45°C and 1000 W/m²)

Max Power Current	13.5	amps
Max Power Voltage	168.5	volts
Max Power	2279.7	Watts

Cell Temperature 60.000 deg C
 Irradiance 1.040 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.945 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.4%)
 Short circuit current 17.0 amps
 Open circuit voltage 208.3 volts
 Max power current 14.3 amps
 Max power voltage 152.3 volts
 Max power 2170.8 watts

NORMALIZED CURVE DATA: (fill factor = 64.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.8 amps
 Max power voltage 181.6 volts
 Max power 2499.3 watts

NORMALIZED CURVE DATA: (fill factor = 62.3%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 13.5 amps
 Max power voltage 167.2 volts
 Max power 2253.9 watts

Cell Temperature 60.000 deg C
 Irradiance 1.042 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.3%)
 Short circuit current 17.0 amps
 Open circuit voltage 208.3 volts
 Max power current 14.3 amps
 Max power voltage 152.3 volts
 Max power 2175.4 watts

NORMALIZED CURVE DATA: (fill factor = 64.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.7 amps
 Max power voltage 182.8 volts
 Max power 2505.0 watts

NORMALIZED CURVE DATA: (fill factor = 62.4%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.7 amps
 Max power voltage 164.9 volts
 Max power 2259.0 watts

Cell Temperature 65.000 deg C
 Irradiance 1.011 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 60.8%)
 Short circuit current 15.5 amps
 Open circuit voltage 203.5 volts
 Max power current 13.9 amps
 Max power voltage 147.7 volts
 Max power 2045.1 watts

NORMALIZED CURVE DATA: (fill factor = 64.3%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 183.1 volts
 Max power 2496.5 watts

NORMALIZED CURVE DATA: (fill factor = 62.6%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.7 amps
 Max power voltage 164.0 volts
 Max power 2251.2 watts

Cell Temperature 65.000 deg C
 Irradiance 1.012 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 60.9%)
 Short circuit current 16.6 amps
 Open circuit voltage 203.2 volts
 Max power current 13.8 amps
 Max power voltage 148.8 volts
 Max power 2052.4 watts

NORMALIZED CURVE DATA: (fill factor = 64.3%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.7 amps
 Max power voltage 181.9 volts
 Max power 2499.8 watts

NORMALIZED CURVE DATA: (fill factor = 62.5%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.5 amps
 Max power voltage 166.4 volts
 Max power 2251.2 watts

Cell Temperature 59.000 deg C
 Irradiance926 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.1%)
 Short circuit current 15.1 amps
 Open circuit voltage 208.7 volts
 Max power current 12.5 amps
 Max power voltage 155.9 volts
 Max power 1954.5 watts

NORMALIZED CURVE DATA: (fill factor = 65.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.7 amps
 Max power voltage 182.6 volts
 Max power 2503.3 watts

NORMALIZED CURVE DATA: (fill factor = 63.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 165.9 volts
 Max power 2259.8 watts

Cell Temperature 59.000 deg C
 Irradiance928 KW/m^2
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (f111 factor = 62.18)
 Short circuit current ... 15.1 amps
 Open circuit voltage 208.9 volts
 Max power current 12.8 amps
 Max power voltage 153.5 volts
 Max power 1958.9 watts

NORMALIZED CURVE DATA: (f111 factor = 55.58)
 (for 25.0 deg C and 1.0 KW/m^2)
 Max power current 13.6 amps
 Max power voltage 183.9 volts
 Max power 2503.4 watts

NORMALIZED CURVE DATA: (f111 factor = 53.98)
 (for 46.0 deg C and 1.0 KW/m^2)
 Max power current 13.8 amps
 Max power voltage 163.6 volts
 Max power 2259.6 watts

Cell Temperature 54.000 deg C
 Irradiance815 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 64.0%)

Short circuit current 13.3 amps
 Open circuit voltage 221.3 volts
 Max power current 11.2 amps
 Max power voltage 168.8 volts
 Max power 1884.9 watts

NORMALIZED CURVE DATA: (fill factor = 68.0%)

(for 25.0 deg C and 1.0 kW/m²)

Max power current 13.6 amps
 Max power voltage 194.0 volts
 Max power 2646.6 watts

NORMALIZED CURVE DATA: (fill factor = 66.5%)

(for 46.0 deg C and 1.0 kW/m²)

Max power current 13.9 amps
 Max power voltage 173.7 volts
 Max power 2408.1 watts

Cell Temperature 56.000 deg C
 Irradiance890 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.9%)

Short circuit current 14.9 amps
 Open circuit voltage 217.1 volts
 Max power current 12.4 amps
 Max power voltage 164.1 volts
 Max power 2027.8 watts

NORMALIZED CURVE DATA: (fill factor = 66.3%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.9 amps
 Max power voltage 190.2 volts
 Max power 2641.9 watts

NORMALIZED CURVE DATA: (fill factor = 64.8%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 14.1 amps
 Max power voltage 169.9 volts
 Max power 2394.8 watts

Cell Temperature 56.000 deg C
 Irradiance891 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.9%)

Short circuit current 14.8 amps
 Open circuit voltage 216.9 volts
 Max power current 12.3 amps
 Max power voltage 164.1 volts
 Max power 2024.5 watts

NORMALIZED CURVE DATA: (fill factor = 66.3%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 13.9 amps
 Max power voltage 190.2 volts
 Max power 2634.7 watts

NORMALIZED CURVE DATA: (fill factor = 64.8%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 14.1 amps
 Max power voltage 169.9 volts
 Max power 2388.4 watts

Cell Temperature 55.000 deg C
 Irradiance879 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.4%)
 Short circuit current 14.2 amps
 Open circuit voltage 218.4 volts
 Max power current 11.9 amps
 Max power voltage 165.2 volts
 Max power 1969.5 watts

NORMALIZED CURVE DATA: (fill factor = 66.8%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 190.1 volts
 Max power 2582.2 watts

NORMALIZED CURVE DATA: (fill factor = 65.3%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 172.3 volts
 Max power 2345.1 watts

Cell Temperature 55.000 deg C
 Irradiance880 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 53.6%)
 Short circuit current 14.3 amps
 Open circuit voltage 219.0 volts
 Max power current 11.9 amps
 Max power voltage 166.4 volts
 Max power 1983.6 watts

NORMALIZED CURVE DATA: (fill factor = 66.9%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 191.3 volts
 Max power 2595.7 watts

NORMALIZED CURVE DATA: (fill factor = 65.4%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.7 amps
 Max power voltage 172.2 volts
 Max power 2356.4 watts

Cell Temperature 50.000 deg C
 Irradiance940 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.8%)

Short circuit current 15.2 amps
 Open circuit voltage 216.4 volts
 Max power current 12.7 amps
 Max power voltage 165.2 volts
 Max power 2098.4 watts

NORMALIZED CURVE DATA: (fill factor = 66.3%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 185.0 volts
 Max power 2519.3 watts

NORMALIZED CURVE DATA: (fill factor = 64.7%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 167.1 volts
 Max power 2277.5 watts

Cell Temperature 50.000 deg C
 Irradiance963 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.9%)
 Short circuit current 15.5 amps
 Open circuit voltage 218.0 volts
 Max power current 13.1 amps
 Max power voltage 165.2 volts
 Max power 2157.9 watts

NORMALIZED CURVE DATA: (fill factor = 56.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.4 amps
 Max power voltage 188.1 volts
 Max power 2526.2 watts

NORMALIZED CURVE DATA: (fill factor = 64.5%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 167.8 volts
 Max power 2285.9 watts

Cell Temperature 54.000 deg C
 Irradiance895 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.9%)

Short circuit current 14.5 amps
 Open circuit voltage 220.2 volts
 Max power current 12.2 amps
 Max power voltage 167.6 volts
 Max power 2042.8 watts

NORMALIZED CURVE DATA: (fill factor = 67.0%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 13.6 amps
 Max power voltage 192.0 volts
 Max power 2613.8 watts

NORMALIZED CURVE DATA: (fill factor = 65.5%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 13.7 amps
 Max power voltage 172.9 volts
 Max power 2373.2 watts

Cell Temperature 42.000 deg C
 Irradiance800 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 65.6%)

Short circuit current 11.3 amps
 Open circuit voltage 231.4 volts
 Max power current 9.4 amps
 Max power voltage 182.8 volts
 Max power 1720.2 watts

NORMALIZED CURVE DATA: (fill factor = 68.9%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 12.1 amps
 Max power voltage 193.3 volts
 Max power 2331.1 watts

NORMALIZED CURVE DATA: (fill factor = 67.6%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 12.1 amps
 Max power voltage 176.5 volts
 Max power 2129.7 watts

Cell Temperature 41.000 deg C
 Irradiance803 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 65.6%)

Short circuit current 11.4 amps
 Open circuit voltage 231.0 volts
 Max power current 9.5 amps
 Max power voltage 181.6 volts
 Max power 1720.1 watts

NORMALIZED CURVE DATA: (fill factor = 68.8%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 12.1 amps
 Max power voltage 191.3 volts
 Max power 2311.0 watts

NORMALIZED CURVE DATA: (fill factor = 67.5%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 12.1 amps
 Max power voltage 174.5 volts
 Max power 2109.1 watts

Cell Temperature 40.000 deg C
 Irradiance 1.032 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 64.8%)

Short circuit current 14.3 amps
 Open circuit voltage 231.3 volts
 Max power current 12.3 amps
 Max power voltage 174.6 volts
 Max power 2139.0 watts

NORMALIZED CURVE DATA: (fill factor = 65.6%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 11.7 amps
 Max power voltage 190.0 volts
 Max power 2219.3 watts

NORMALIZED CURVE DATA: (fill factor = 64.0%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 11.9 amps
 Max power voltage 169.8 volts
 Max power 2013.0 watts

Cell Temperature 40.000 deg C
 Irradiance 1.035 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 64.9%)
 Short circuit current 14.3 amps
 Open circuit voltage 231.6 volts
 Max power current 12.2 amps
 Max power voltage 175.8 volts
 Max power 2142.8 watts

NORMALIZED CURVE DATA: (fill factor = 65.7%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 11.6 amps
 Max power voltage 191.2 volts
 Max power 2215.0 watts

NORMALIZED CURVE DATA: (fill factor = 64.1%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 11.8 amps
 Max power voltage 171.0 volts
 Max power 2010.8 watts

Cell Temperature 35.000 deg C
 Irradiance754 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 85.9%)

Short circuit current .. 12.5 amps
 Open circuit voltage 229.0 volts
 Max power current 10.5 amps
 Max power voltage 179.3 volts
 Max power 1888.0 watts

NORMALIZED CURVE DATA: (fill factor = 69.3%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 14.1 amps
 Max power voltage 186.3 volts
 Max power 2626.0 watts

NORMALIZED CURVE DATA: (fill factor = 67.9%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 14.3 amps
 Max power voltage 165.9 volts
 Max power 2379.0 watts

Cell Temperature 35.000 deg C
 Irradiance753 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.945 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 66.0%)
 Short circuit current 12.5 amps
 Open circuit voltage 229.4 volts
 Max power current 10.5 amps
 Max power voltage 180.5 volts
 Max power 1854.9 watts

NORMALIZED CURVE DATA: (fill factor = 69.3%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 14.2 amps
 Max power voltage 185.1 volts
 Max power 2635.0 watts

NORMALIZED CURVE DATA: (fill factor = 67.8%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 14.5 amps
 Max power voltage 164.7 volts
 Max power 2384.8 watts

Cell Temperature 45.000 deg C
 Irradiance995 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.0%)
 Short circuit current 16.2 amps
 Open circuit voltage 218.1 volts
 Max power current 13.7 amps
 Max power voltage 162.9 volts
 Max power 2231.6 watts

NORMALIZED CURVE DATA: (fill factor = 64.7%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.8 amps
 Max power voltage 179.7 volts
 Max power 2479.8 watts

NORMALIZED CURVE DATA: (fill factor = 63.0%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 13.8 amps
 Max power voltage 161.8 volts
 Max power 2230.6 watts

Cell Temperature 44.000 deg C
 Irradiance995 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.1%)
 Short circuit current 16.2 amps
 Open circuit voltage 218.6 volts
 Max power current 13.8 amps
 Max power voltage 161.7 volts
 Max power 2235.0 watts

NORMALIZED CURVE DATA: (fill factor = 64.8%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.7 amps
 Max power voltage 179.9 volts
 Max power 2470.6 watts

NORMALIZED CURVE DATA: (fill factor = 63.0%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 13.9 amps
 Max power voltage 159.6 volts
 Max power 2221.7 watts

Cell Temperature 50.000 deg C
 Irradiance 1.029 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.0%)
 Short circuit current 15.8 amps
 Open circuit voltage 217.7 volts
 Max power current 14.3 amps
 Max power voltage 160.6 volts
 Max power 2302.3 watts

NORMALIZED CURVE DATA: (fill factor = 64.9%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.8 amps
 Max power voltage 183.3 volts
 Max power 2537.7 watts

NORMALIZED CURVE DATA: (fill factor = 63.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 13.8 amps
 Max power voltage 165.4 volts
 Max power 2288.0 watts

Cell Temperature 50.000 deg C
 Irradiance 1.018 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.1%)
 Short circuit current 16.7 amps
 Open circuit voltage 217.1 volts
 Max power current 14.1 amps
 Max power voltage 161.9 volts
 Max power 2282.4 watts

NORMALIZED CURVE DATA: (fill factor = 64.9%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 13.6 amps
 Max power voltage 186.6 volts
 Max power 2536.1 watts

NORMALIZED CURVE DATA: (fill factor = 63.3%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 13.8 amps
 Max power voltage 166.3 volts
 Max power 2290.8 watts

Cell Temperature 48.000 deg C
 Irradiance 1.151 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.2%)
 Short circuit current 15.6 amps
 Open circuit voltage 217.4 volts
 Max power current 13.4 amps
 Max power voltage 157.0 volts
 Max power 2104.2 watts

NORMALIZED CURVE DATA: (fill factor = 63.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 11.3 amps
 Max power voltage 181.1 volts
 Max power 2052.7 watts

NORMALIZED CURVE DATA: (fill factor = 61.3%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 11.3 amps
 Max power voltage 163.2 volts
 Max power 1851.7 watts

Cell Temperature 48.000 deg C
 Irradiance 1.153 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.5%)
 Short circuit current 15.6 amps
 Open circuit voltage 216.5 volts
 Max power current 13.2 amps
 Max power voltage 159.4 volts
 Max power 2105.4 watts

NORMALIZED CURVE DATA: (fill factor = 63.3%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 11.3 amps
 Max power voltage 181.1 volts
 Max power 2049.1 watts

NORMALIZED CURVE DATA: (fill factor = 61.5%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 11.5 amps
 Max power voltage 160.9 volts
 Max power 1846.1 watts

Cell Temperature 44.000 deg C
 Irradiance 1.162 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C
 ACTUAL CURVE DATA: (f111 factor = 63.78)
 Short circuit current 15.6 amps
 Open circuit voltage 220.2 volts
 Max power current 13.3 amps
 Max power voltage 164.1 volts
 Max power 2183.6 watts
 NORMALIZED CURVE DATA: (f111 factor = 63.98)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 11.1 amps
 Max power voltage 184.5 volts
 Max power 2057.4 watts
 NORMALIZED CURVE DATA: (f111 factor = 62.38)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 11.2 amps
 Max power voltage 166.7 volts
 Max power 1859.5 watts

Cell Temperature 44.000 deg C
 Irradiance 1.169 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.8%)
 Short circuit current 15.7 amps
 Open circuit voltage 221.3 volts
 Max power current 13.3 amps
 Max power voltage 166.4 volts
 Max power 2214.9 watts

NORMALIZED CURVE DATA: (fill factor = 63.9%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 11.2 amps
 Max power voltage 184.8 volts
 Max power 2074.9 watts

NORMALIZED CURVE DATA: (fill factor = 62.2%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 11.4 amps
 Max power voltage 164.6 volts
 Max power 1873.8 watts

Cell Temperature 41.000 deg C
 Irradiance 1.188 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.2%)

Short circuit current 16.2 amps
 Open circuit voltage 231.0 volts
 Max power current 13.7 amps
 Max power voltage 172.3 volts
 Max power 2365.3 watts

NORMALIZED CURVE DATA: (fill factor = 63.0%)

(for 25.0 deg C and 1.0 kW/m²)

Max power current 11.4 amps
 Max power voltage 188.3 volts
 Max power 2143.5 watts

NORMALIZED CURVE DATA: (fill factor = 61.3%)

(for 46.0 deg C and 1.0 kW/m²)

Max power current 11.5 amps
 Max power voltage 168.2 volts
 Max power 1939.6 watts

Cell Temperature 41.000 deg C
 Irradiance 1.182 kW/m²
 Series Resistance 2.100 ohms
 Voltage Coefficient -.946 volts/deg C
 Current Coefficient009 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.2%)

Short circuit current 16.1 amps
 Open circuit voltage 230.4 volts
 Max power current 13.7 amps
 Max power voltage 171.2 volts
 Max power 2342.6 watts

NORMALIZED CURVE DATA: (fill factor = 63.1%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 11.4 amps
 Max power voltage 187.0 volts
 Max power 2134.8 watts

NORMALIZED CURVE DATA: (fill factor = 61.3%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 11.6 amps
 Max power voltage 166.8 volts
 Max power 1930.0 watts

APPENDIX C

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Cell Temperature 53.000 deg C
 Irradiance818 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.5%)
 Short circuit current 18.9 amps
 Open circuit voltage 278.0 volts
 Max power current 15.4 amps
 Max power voltage 209.9 volts
 Max power 3234.7 watts

NORMALIZED CURVE DATA: (fill factor = 65.3%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.7 amps
 Max power voltage 235.4 volts
 Max power 4401.0 watts

NORMALIZED CURVE DATA: (fill factor = 64.1%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 19.1 amps
 Max power voltage 214.3 volts
 Max power 4096.8 watts

Cell Temperature 53.000 deg C
 Irradiance819 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.4%)
 Short circuit current 19.0 amps
 Open circuit voltage 278.5 volts
 Max power current 15.5 amps
 Max power voltage 208.6 volts
 Max power 3239.4 watts

NORMALIZED CURVE DATA: (fill factor = 65.2%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.4 amps
 Max power voltage 238.8 volts
 Max power 4402.4 watts

NORMALIZED CURVE DATA: (fill factor = 64.1%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 18.7 amps
 Max power voltage 219.0 volts
 Max power 4101.5 watts

Cell Temperature 55.000 deg C
 Irradiance944 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.0%)
 Short circuit current 21.7 amps
 Open circuit voltage 277.0 volts
 Max power current 17.8 amps
 Max power voltage 206.3 volts
 Max power 3663.0 watts

NORMALIZED CURVE DATA: (fill factor = 63.5%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.5 amps
 Max power voltage 235.3 volts
 Max power 4345.5 watts

NORMALIZED CURVE DATA: (fill factor = 62.3%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.5 amps
 Max power voltage 218.0 volts
 Max power 4030.6 watts

Cell Temperature 55.000 deg C
 Irradiance945 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.2%)

Short circuit current 21.7 amps
 Open circuit voltage 277.3 volts
 Max power current 17.9 amps
 Max power voltage 205.2 volts
 Max power 3675.5 watts

NORMALIZED CURVE DATA: (fill factor = 63.7%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 18.3 amps
 Max power voltage 237.8 volts
 Max power 4355.7 watts

NORMALIZED CURVE DATA: (fill factor = 62.4%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 18.9 amps
 Max power voltage 213.5 volts
 Max power 4038.2 watts

Cell Temperature 60.000 deg C
 Irradiance987 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 60.3%)
 Short circuit current 22.3 amps
 Open circuit voltage 270.4 volts
 Max power current 18.2 amps
 Max power voltage 200.4 volts
 Max power 3645.1 watts

NORMALIZED CURVE DATA: (fill factor = 62.8%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.1 amps
 Max power voltage 233.3 volts
 Max power 4225.0 watts

NORMALIZED CURVE DATA: (fill factor = 61.4%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 18.1 amps
 Max power voltage 216.1 volts
 Max power 3911.3 watts

Cell Temperature 60.000 deg C
 Irradiance988 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 60.3%)
 Short circuit current 22.4 amps
 Open circuit voltage 271.0 volts
 Max power current 18.4 amps
 Max power voltage 198.6 volts
 Max power 3554.8 watts

NORMALIZED CURVE DATA: (fill factor = 62.8%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.3 amps
 Max power voltage 231.8 volts
 Max power 4233.2 watts

NORMALIZED CURVE DATA: (fill factor = 61.4%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.3 amps
 Max power voltage 214.4 volts
 Max power 3920.4 watts

Cell Temperature 67.000 deg C
 Irradiance 1.049 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 59.0%)

Short circuit current 24.2 amps
 Open circuit voltage 264.5 volts
 Max power current 19.3 amps
 Max power voltage 195.7 volts
 Max power 3780.9 watts

NORMALIZED CURVE DATA: (fill factor = 61.4%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.2 amps
 Max power voltage 234.4 volts
 Max power 4260.0 watts

NORMALIZED CURVE DATA: (fill factor = 60.1%)

(for 45.0 deg C and 1.0 kW/m²)
 Max power current 18.4 amps
 Max power voltage 213.7 volts
 Max power 3939.3 watts

Cell Temperature 67.000 deg C
 Irradiance 1.047 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 58.7%)
 Short circuit current 24.3 amps
 Open circuit voltage 265.0 volts
 Max power current 19.3 amps
 Max power voltage 195.9 volts
 Max power 3777.9 watts

NORMALIZED CURVE DATA: (fill factor = 61.2%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.2 amps
 Max power voltage 234.3 volts
 Max power 4268.0 watts

NORMALIZED CURVE DATA: (fill factor = 59.7%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.8 amps
 Max power voltage 210.1 volts
 Max power 3940.4 watts

Cell Temperature 71.000 deg C
 Irradiance 1.009 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 58.1%)
 Short circuit current 23.3 amps
 Open circuit voltage 268.5 volts
 Max power current 18.7 amps
 Max power voltage 194.5 volts
 Max power 3629.9 watts

NORMALIZED CURVE DATA: (fill factor = 61.2%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.1 amps
 Max power voltage 237.5 volts
 Max power 4303.6 watts

NORMALIZED CURVE DATA: (fill factor = 59.8%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.5 amps
 Max power voltage 215.7 volts
 Max power 3989.2 watts

Cell Temperature 71.000 deg C
 Irradiance 1.009 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 58.0%)
 Short circuit current 23.4 amps
 Open circuit voltage 268.5 volts
 Max power current 18.6 amps
 Max power voltage 195.7 volts
 Max power 3638.1 watts

NORMALIZED CURVE DATA: (fill factor = 61.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.2 amps
 Max power voltage 236.5 volts
 Max power 4311.0 watts

NORMALIZED CURVE DATA: (fill factor = 59.8%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.4 amps
 Max power voltage 217.9 volts
 Max power 3999.3 watts

Cell Temperature 72.000 deg C
 Irradiance998 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 57.5%)

Short circuit current 23.1 amps
 Open circuit voltage 266.0 volts
 Max power current 18.4 amps
 Max power voltage 192.2 volts
 Max power 3540.1 watts

NORMALIZED CURVE DATA: (fill factor = 61.0%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 18.1 amps
 Max power voltage 235.9 volts
 Max power 4280.2 watts

NORMALIZED CURVE DATA: (fill factor = 59.5%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 18.5 amps
 Max power voltage 214.0 volts
 Max power 3961.0 watts

Cell Temperature 71.000 deg C
 Irradiance997 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 57.7%)
 Short circuit current 23.1 amps
 Open circuit voltage 265.9 volts
 Max power current 18.4 amps
 Max power voltage 193.4 volts
 Max power 3548.2 watts

NORMALIZED CURVE DATA: (fill factor = 61.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.1 amps
 Max power voltage 235.9 volts
 Max power 4274.9 watts

NORMALIZED CURVE DATA: (fill factor = 59.6%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 18.5 amps
 Max power voltage 213.9 volts
 Max power 3956.3 watts

Cell Temperature 68.000 deg C
 Irradiance 1.032 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 57.6%)

Short circuit current 24.0 amps
 Open circuit voltage 252.1 volts
 Max power current 19.3 amps
 Max power voltage 187.8 volts
 Max power 3628.1 watts

NORMALIZED CURVE DATA: (fill factor = 60.6%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.5 amps
 Max power voltage 227.4 volts
 Max power 4204.8 watts

NORMALIZED CURVE DATA: (fill factor = 58.9%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 19.0 amps
 Max power voltage 203.2 volts
 Max power 3868.2 watts

Cell Temperature 68.000 deg C
 Irradiance 1.095 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 56.5%)

Short circuit current 25.7 amps
 Open circuit voltage 263.1 volts
 Max power current 20.5 amps
 Max power voltage 186.3 volts
 Max power 3816.0 watts

NORMALIZED CURVE DATA: (fill factor = 58.8%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.1 amps
 Max power voltage 230.3 volts
 Max power 4161.6 watts

NORMALIZED CURVE DATA: (fill factor = 57.3%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.4 amps
 Max power voltage 208.9 volts
 Max power 3832.8 watts

Cell Temperature 70.000 deg C
 Irradiance 1.008 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 58.0%)
 Short circuit current 22.9 amps
 Open circuit voltage 262.9 volts
 Max power current 18.6 amps
 Max power voltage 187.5 volts
 Max power 3481.9 watts

NORMALIZED CURVE DATA: (fill factor = 61.0%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 17.8 amps
 Max power voltage 231.6 volts
 Max power 4128.0 watts

NORMALIZED CURVE DATA: (fill factor = 59.7%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 17.7 amps
 Max power voltage 215.5 volts
 Max power 3824.9 watts

Cell Temperature 70.000 deg C
 Irradiance 1.008 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 57.9%)

Short circuit current 22.9 amps
 Open circuit voltage 262.6 volts
 Max power current 18.2 amps
 Max power voltage 191.0 volts
 Max power 3480.4 watts

NORMALIZED CURVE DATA: (fill factor = 61.0%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 17.7 amps
 Max power voltage 232.8 volts
 Max power 4130.2 watts

NORMALIZED CURVE DATA: (fill factor = 59.7%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 17.8 amps
 Max power voltage 214.4 volts
 Max power 3823.5 watts

Cell Temperature 68.000 deg C
 Irradiance 1.000 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 58.7%)
 Short circuit current 22.5 amps
 Open circuit voltage 271.7 volts
 Max power current 18.1 amps
 Max power voltage 198.2 volts
 Max power 3585.3 watts

NORMALIZED CURVE DATA: (fill factor = 61.7%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 17.8 amps
 Max power voltage 237.4 volts
 Max power 4227.0 watts

NORMALIZED CURVE DATA: (fill factor = 60.3%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 17.8 amps
 Max power voltage 220.0 volts
 Max power 3921.0 watts

Cell Temperature 67.000 deg C
 Irradiance 1.000 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 58.6%)
 Short circuit current 22.5 amps
 Open circuit voltage 271.4 volts
 Max power current 18.4 amps
 Max power voltage 194.5 volts
 Max power 3575.5 watts

NORMALIZED CURVE DATA: (fill factor = 61.5%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 17.9 amps
 Max power voltage 235.0 volts
 Max power 4201.2 watts

NORMALIZED CURVE DATA: (fill factor = 60.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 17.8 amps
 Max power voltage 218.8 volts
 Max power 3897.6 watts

Cell Temperature 48.000 deg C
 Irradiance 1.120 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 60.4%)

Short circuit current 24.6 amps
 Open circuit voltage 291.1 volts
 Max power current 20.1 amps
 Max power voltage 215.6 volts
 Max power 4332.0 watts

NORMALIZED CURVE DATA: (fill factor = 60.9%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 17.9 amps
 Max power voltage 234.9 volts
 Max power 4203.4 watts

NORMALIZED CURVE DATA: (fill factor = 59.4%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 17.8 amps
 Max power voltage 217.7 volts
 Max power 3884.9 watts

Cell Temperature 48.000 deg C
 Irradiance 1.121 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 60.3%)

Short circuit current 24.7 amps
 Open circuit voltage 290.6 volts
 Max power current 20.0 amps
 Max power voltage 215.6 volts
 Max power 4323.4 watts

NORMALIZED CURVE DATA: (fill factor = 60.7%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 17.6 amps
 Max power voltage 237.2 volts
 Max power 4186.0 watts

NORMALIZED CURVE DATA: (fill factor = 59.3%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 17.8 amps
 Max power voltage 217.8 volts
 Max power 3871.9 watts

Cell Temperature 44.000 deg C
 Irradiance836 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.6%)

Short circuit current 18.4 amps
 Open circuit voltage 288.1 volts
 Max power current 15.3 amps
 Max power voltage 214.4 volts
 Max power 3272.5 watts

NORMALIZED CURVE DATA: (fill factor = 64.6%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.3 amps
 Max power voltage 230.4 volts
 Max power 4208.2 watts

NORMALIZED CURVE DATA: (fill factor = 63.2%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.4 amps
 Max power voltage 213.0 volts
 Max power 3910.8 watts

Cell Temperature 44.000 deg C
 Irradiance839 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.8%)
 Short circuit current 18.4 amps
 Open circuit voltage 288.9 volts
 Max power current 15.5 amps
 Max power voltage 212.1 volts
 Max power 3287.7 watts

NORMALIZED CURVE DATA: (fill factor = 64.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.4 amps
 Max power voltage 228.2 volts
 Max power 4205.1 watts

NORMALIZED CURVE DATA: (fill factor = 63.3%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.3 amps
 Max power voltage 214.3 volts
 Max power 3911.5 watts

Cell Temperature 58.000 deg C
 Irradiance 1.038 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 60.0%)

Short circuit current 23.6 amps
 Open circuit voltage 273.5 volts
 Max power current 19.2 amps
 Max power voltage 201.6 volts
 Max power 3853.9 watts

NORMALIZED CURVE DATA: (fill factor = 62.0%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.4 amps
 Max power voltage 230.6 volts
 Max power 4240.1 watts

NORMALIZED CURVE DATA: (fill factor = 60.4%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.4 amps
 Max power voltage 212.2 volts
 Max power 3907.7 watts

Cell Temperature 58.000 deg C
Irradiance 1.040 kW/m²
Series Resistance 1.700 ohms
Voltage Coefficient -1.110 volts/deg C
Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 60.0%)

Short circuit current 23.6 amps
Open circuit voltage 273.8 volts
Max power current 19.4 amps
Max power voltage 199.2 volts
Max power 3872.8 watts

NORMALIZED CURVE DATA: (fill factor = 62.0%)

(for 25.0 deg C and 1.0 kW/m²)
Max power current 18.1 amps
Max power voltage 234.2 volts
Max power 4239.7 watts

NORMALIZED CURVE DATA: (fill factor = 60.5%)

(for 46.0 deg C and 1.0 kW/m²)
Max power current 18.7 amps
Max power voltage 209.9 volts
Max power 3915.3 watts

Cell Temperature 61.000 deg C
 Irradiance998 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 59.8%)

Short circuit current 22.5 amps
 Open circuit voltage 272.0 volts
 Max power current 18.7 amps
 Max power voltage 196.9 volts
 Max power 3683.6 watts

NORMALIZED CURVE DATA: (fill factor = 62.3%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 17.8 amps
 Max power voltage 238.4 volts
 Max power 4239.4 watts

NORMALIZED CURVE DATA: (fill factor = 61.0%)

(for 45.0 deg C and 1.0 kW/m²)
 Max power current 18.3 amps
 Max power voltage 214.1 volts
 Max power 3929.4 watts

Cell Temperature 61.000 deg C
 Irradiance 1.035 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 60.2%)
 Short circuit current 22.2 amps
 Open circuit voltage 270.3 volts
 Max power current 18.2 amps
 Max power voltage 198.1 volts
 Max power 3602.5 watts

NORMALIZED CURVE DATA: (fill factor = 62.3%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 17.2 amps
 Max power voltage 232.7 volts
 Max power 3995.3 watts

NORMALIZED CURVE DATA: (fill factor = 60.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 17.6 amps
 Max power voltage 209.6 volts
 Max power 3695.3 watts

Cell Temperature 57.000 deg C
 Irradiance 1.123 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 59.7%)
 Short circuit current 24.9 amps
 Open circuit voltage 276.0 volts
 Max power current 20.5 amps
 Max power voltage 200.4 volts
 Max power 4110.0 watts

NORMALIZED CURVE DATA: (fill factor = 61.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.1 amps
 Max power voltage 230.1 volts
 Max power 4154.0 watts

NORMALIZED CURVE DATA: (fill factor = 59.5%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.0 amps
 Max power voltage 213.0 volts
 Max power 3828.7 watts

Cell Temperature 58.000 deg C
 Irradiance 1.123 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 59.8%)
 Short circuit current 24.9 amps
 Open circuit voltage 275.7 volts
 Max power current 20.3 amps
 Max power voltage 202.7 volts
 Max power 4107.3 watts

NORMALIZED CURVE DATA: (fill factor = 61.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 17.7 amps
 Max power voltage 234.8 volts
 Max power 4159.9 watts

NORMALIZED CURVE DATA: (fill factor = 59.6%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.2 amps
 Max power voltage 210.6 volts
 Max power 3838.1 watts

Cell Temperature 52.000 deg C
 Irradiance 1.100 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 60.3%)
 Short circuit current 24.1 amps
 Open circuit voltage 282.3 volts
 Max power current 19.9 amps
 Max power voltage 206.3 volts
 Max power 4104.4 watts

NORMALIZED CURVE DATA: (fill factor = 61.4%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 17.8 amps
 Max power voltage 232.9 volts
 Max power 4139.4 watts

NORMALIZED CURVE DATA: (fill factor = 59.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.3 amps
 Max power voltage 208.7 volts
 Max power 3817.1 watts

Cell Temperature 52.000 deg C
 Irradiance 1.128 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 60.4%)

Short circuit current 24.5 amps
 Open circuit voltage 284.2 volts
 Max power current 20.1 amps
 Max power voltage 209.8 volts
 Max power 4212.2 watts

NORMALIZED CURVE DATA: (fill factor = 61.3%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 17.7 amps
 Max power voltage 234.1 volts
 Max power 4141.8 watts

NORMALIZED CURVE DATA: (fill factor = 59.8%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 17.9 amps
 Max power voltage 213.2 volts
 Max power 3825.1 watts

Cell Temperature 41.000 deg C
 Irradiance 1.042 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.2%)

Short circuit current 23.1 amps
 Open circuit voltage 302.8 volts
 Max power current 19.3 amps
 Max power voltage 225.0 volts
 Max power 4347.0 watts

NORMALIZED CURVE DATA: (fill factor = 62.7%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 18.0 amps
 Max power voltage 245.0 volts
 Max power 4404.7 watts

NORMALIZED CURVE DATA: (fill factor = 61.4%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 18.5 amps
 Max power voltage 220.8 volts
 Max power 4089.2 watts

Cell Temperature 40.000 deg C
 Irradiance 1.045 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.4%)

Short circuit current 23.4 amps
 Open circuit voltage 302.9 volts
 Max power current 19.1 amps
 Max power voltage 227.3 volts
 Max power 4349.0 watts

NORMALIZED CURVE DATA: (fill factor = 61.9%)

(for 25.0 deg C and 1.0 kW/m²)

Max power current 18.3 amps
 Max power voltage 239.3 volts
 Max power 4381.1 watts

NORMALIZED CURVE DATA: (fill factor = 60.5%)

(for 46.0 deg C and 1.0 kW/m²)

Max power current 18.3 amps
 Max power voltage 222.1 volts
 Max power 4060.1 watts

Cell Temperature 43.000 deg C
 Irradiance 1.005 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.3%)

Short circuit current 20.2 amps
 Open circuit voltage 287.7 volts
 Max power current 16.5 amps
 Max power voltage 215.6 volts
 Max power 3560.1 watts

NORMALIZED CURVE DATA: (fill factor = 62.6%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 16.5 amps
 Max power voltage 229.6 volts
 Max power 3782.3 watts

NORMALIZED CURVE DATA: (fill factor = 61.1%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 16.4 amps
 Max power voltage 213.5 volts
 Max power 3501.5 watts

Cell Temperature 43.000 deg C
 Irradiance 1.014 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.3%)
 Short circuit current 20.4 amps
 Open circuit voltage 287.5 volts
 Max power current 16.9 amps
 Max power voltage 212.1 volts
 Max power 3593.1 watts

NORMALIZED CURVE DATA: (fill factor = 62.3%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 16.2 amps
 Max power voltage 233.4 volts
 Max power 3776.0 watts

NORMALIZED CURVE DATA: (fill factor = 60.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.7 amps
 Max power voltage 209.1 volts
 Max power 3500.4 watts

Cell Temperature 42.000 deg C
 Irradiance885 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.3%)

Short circuit current 19.5 amps
 Open circuit voltage 298.8 volts
 Max power current 16.3 amps
 Max power voltage 222.7 volts
 Max power 3629.4 watts

NORMALIZED CURVE DATA: (fill factor = 64.6%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 18.1 amps
 Max power voltage 240.4 volts
 Max power 4362.4 watts

NORMALIZED CURVE DATA: (fill factor = 63.3%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 18.4 amps
 Max power voltage 220.7 volts
 Max power 4062.3 watts

Cell Temperature 42.000 deg C
 Irradiance889 kW/m²
 Series Resistance 1.700 ohms
 Voltage Coefficient -1.110 volts/deg C
 Current Coefficient027 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.3%)

Short circuit current 19.4 amps
 Open circuit voltage 298.8 volts
 Max power current 16.3 amps
 Max power voltage 221.6 volts
 Max power 3608.1 watts

NORMALIZED CURVE DATA: (fill factor = 64.5%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 17.9 amps
 Max power voltage 240.8 volts
 Max power 4315.9 watts

NORMALIZED CURVE DATA: (fill factor = 63.2%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 18.2 amps
 Max power voltage 220.9 volts
 Max power 4021.4 watts

APPENDIX D

TriSolar 1990

Cell Temperature 41.000 deg C
 Irradiance802 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 73.5%)
 Short circuit current 22.2 amps
 Open circuit voltage 226.6 volts
 Max power current 20.5 amps
 Max power voltage 180.6 volts
 Max power 3699.1 watts

NORMALIZED CURVE DATA: (fill factor = 75.3%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 25.1 amps
 Max power voltage 192.6 volts
 Max power 4830.5 watts

NORMALIZED CURVE DATA: (fill factor = 74.0%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 25.5 amps
 Max power voltage 174.2 volts
 Max power 4438.6 watts

Cell Temperature 42.000 deg C
 Irradiance800 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 73.4%)
 Short circuit current 22.3 amps
 Open circuit voltage 226.9 volts
 Max power current 20.3 amps
 Max power voltage 182.8 volts
 Max power 3709.2 watts

NORMALIZED CURVE DATA: (fill factor = 75.4%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 25.4 amps
 Max power voltage 192.2 volts
 Max power 4878.9 watts

NORMALIZED CURVE DATA: (fill factor = 74.0%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 25.8 amps
 Max power voltage 173.8 volts
 Max power 4481.4 watts

Cell Temperature 51.000 deg C
Irradiance942 kW/m^2
Series Resistance 1.200 ohms
Voltage Coefficient -.856 volts/deg C
Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 72.1%)
Short circuit current 25.8 amps
Open circuit voltage 221.2 volts
Max power current 23.7 amps
Max power voltage 173.6 volts
Max power 4110.4 watts

NORMALIZED CURVE DATA: (fill factor = 74.0%)
(for 25.0 deg C and 1.0 kW/m^2)
Max power current 24.8 amps
Max power voltage 194.4 volts
Max power 4829.5 watts

NORMALIZED CURVE DATA: (fill factor = 72.6%)
(for 46.0 deg C and 1.0 kW/m^2)
Max power current 25.2 amps
Max power voltage 176.1 volts
Max power 4433.9 watts

Cell Temperature 51.000 deg C
Irradiance944 kW/m²
Series Resistance 1.200 ohms
Voltage Coefficient -.856 volts/deg C
Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 72.2%)

Short circuit current 25.8 amps
Open circuit voltage 221.5 volts
Max power current 23.6 amps
Max power voltage 174.6 volts
Max power 4129.5 watts

NORMALIZED CURVE DATA: (fill factor = 74.2%)
(for 25.0 deg C and 1.0 kW/m²)

Max power current 24.9 amps
Max power voltage 194.4 volts
Max power 4840.3 watts

NORMALIZED CURVE DATA: (fill factor = 72.8%)
(for 45.0 deg C and 1.0 kW/m²)

Max power current 25.1 amps
Max power voltage 177.2 volts
Max power 4445.3 watts

Cell Temperature 51.000 deg C
 Irradiance993 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.3%)
 Short circuit current 27.5 amps
 Open circuit voltage 219.7 volts
 Max power current 25.0 amps
 Max power voltage 172.3 volts
 Max power 4310.2 watts

NORMALIZED CURVE DATA: (fill factor = 73.0%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 25.0 amps
 Max power voltage 193.6 volts
 Max power 4833.4 watts

NORMALIZED CURVE DATA: (fill factor = 71.6%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 25.1 amps
 Max power voltage 176.4 volts
 Max power 4434.2 watts

Call Temperature 51.000 deg C
 Irradiance996 KW/m^2
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (f111 factor = 71.28)
 Short circuit current 27.5 amps
 Open circuit voltage 220.0 volts
 Max power current 25.0 amps
 Max power voltage 172.3 volts
 Max power 4315.4 watts

NORMALIZED CURVE DATA: (f111 factor = 73.18)
 (for 25.0 deg C and 1.0 KW/m^2)
 Max power current 25.2 amps
 Max power voltage 193.4 volts
 Max power 4870.9 watts

NORMALIZED CURVE DATA: (f111 factor = 71.78)
 (for 46.0 deg C and 1.0 KW/m^2)
 Max power current 25.4 amps
 Max power voltage 175.2 volts
 Max power 4468.1 watts

Cell Temperature 56.000 deg C
 Irradiance950 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.2%)
 Short circuit current 25.5 amps
 Open circuit voltage 215.2 volts
 Max power current 23.3 amps
 Max power voltage 167.7 volts
 Max power 3911.2 watts

NORMALIZED CURVE DATA: (fill factor = 73.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.2 amps
 Max power voltage 193.3 volts
 Max power 4667.8 watts

NORMALIZED CURVE DATA: (fill factor = 72.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 24.5 amps
 Max power voltage 174.9 volts
 Max power 4283.9 watts

Cell Temperature 56.000 deg C
 Irradiance949 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.3%)
 Short circuit current 25.5 amps
 Open circuit voltage 215.3 volts
 Max power current 23.6 amps
 Max power voltage 166.4 volts
 Max power 3920.6 watts

NORMALIZED CURVE DATA: (fill factor = 73.7%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.4 amps
 Max power voltage 191.9 volts
 Max power 4697.0 watts

NORMALIZED CURVE DATA: (fill factor = 72.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 24.8 amps
 Max power voltage 173.5 volts
 Max power 4297.8 watts

Cell Temperature 58.000 deg C
 Irradiance972 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 70.8%)

Short circuit current 26.4 amps
 Open circuit voltage 213.4 volts
 Max power current 24.1 amps
 Max power voltage 165.4 volts
 Max power 3987.3 watts

NORMALIZED CURVE DATA: (fill factor = 73.2%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 24.5 amps
 Max power voltage 192.0 volts
 Max power 4708.7 watts

NORMALIZED CURVE DATA: (fill factor = 71.8%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 24.7 amps
 Max power voltage 175.0 volts
 Max power 4317.9 watts

Cell Temperature 58.000 deg C
 Irradiance975 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 70.7%)

Short circuit current 26.5 amps
 Open circuit voltage 213.9 volts
 Max power current 24.2 amps
 Max power voltage 165.4 volts
 Max power 4007.2 watts

NORMALIZED CURVE DATA: (fill factor = 73.2%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 24.4 amps
 Max power voltage 193.4 volts
 Max power 4716.4 watts

NORMALIZED CURVE DATA: (fill factor = 71.7%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 24.7 amps
 Max power voltage 175.1 volts
 Max power 4327.2 watts

Cell Temperature 61.000 deg C
Irradiance 1.001 kW/m²
Series Resistance 1.200 ohms
Voltage Coefficient -.856 volts/deg C
Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 70.4%)
Short circuit current 26.9 amps
Open circuit voltage 212.6 volts
Max power current 24.5 amps
Max power voltage 164.1 volts
Max power 4026.0 watts

NORMALIZED CURVE DATA: (fill factor = 73.0%)
(for 25.0 deg C and 1.0 kW/m²)
Max power current 24.1 amps
Max power voltage 194.4 volts
Max power 4685.7 watts

NORMALIZED CURVE DATA: (fill factor = 71.6%)
(for 46.0 deg C and 1.0 kW/m²)
Max power current 24.3 amps
Max power voltage 177.2 volts
Max power 4302.6 watts

Cell Temperature 58.000 deg C
 Irradiance954 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.956 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.0%)
 Short circuit current 25.9 amps
 Open circuit voltage 213.6 volts
 Max power current 23.9 amps
 Max power voltage 165.4 volts
 Max power 3936.0 watts

NORMALIZED CURVE DATA: (fill factor = 73.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.5 amps
 Max power voltage 192.8 volts
 Max power 4725.1 watts

NORMALIZED CURVE DATA: (fill factor = 72.1%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 24.9 amps
 Max power voltage 174.4 volts
 Max power 4334.3 watts

Cell Temperature 58.000 deg C
 Irradiance954 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 70.9%)
 Short circuit current 26.0 amps
 Open circuit voltage 214.0 volts
 Max power current 23.7 amps
 Max power voltage 166.6 volts
 Max power 3943.9 watts

NORMALIZED CURVE DATA: (fill factor = 73.4%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.5 amps
 Max power voltage 192.8 volts
 Max power 4731.3 watts

NORMALIZED CURVE DATA: (fill factor = 72.0%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 24.7 amps
 Max power voltage 175.6 volts
 Max power 4342.7 watts

Cell Temperature 56.000 deg C
 Irradiance950 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.2%)
 Short circuit current 26.0 amps
 Open circuit voltage 223.4 volts
 Max power current 23.6 amps
 Max power voltage 174.6 volts
 Max power 4127.8 watts

NORMALIZED CURVE DATA: (fill factor = 73.4%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.5 amps
 Max power voltage 200.1 volts
 Max power 4902.3 watts

NORMALIZED CURVE DATA: (fill factor = 72.1%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 24.8 amps
 Max power voltage 181.7 volts
 Max power 4514.5 watts

Cell Temperature 56.000 deg C
 Irradiance951 kW/m²
 Series Resistance 1.200 ohm
 Voltage Coefficient -.956 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.4%)
 Short circuit current 26.0 amps
 Open circuit voltage 223.8 volts
 Max power current 23.4 amps
 Max power voltage 176.9 volts
 Max power 4147.7 watts

NORMALIZED CURVE DATA: (fill factor = 73.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.3 amps
 Max power voltage 202.5 volts
 Max power 4914.2 watts

NORMALIZED CURVE DATA: (fill factor = 72.3%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 24.6 amps
 Max power voltage 184.1 volts
 Max power 4531.4 watts

Cell Temperature 60.000 deg C
 Irradiance 1.092 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 70.1%)
 Short circuit current 29.4 amps
 Open circuit voltage 222.5 volts
 Max power current 26.8 amps
 Max power voltage 171.2 volts
 Max power 4584.1 watts

NORMALIZED CURVE DATA: (fill factor = 72.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.2 amps
 Max power voltage 201.3 volts
 Max power 4873.0 watts

NORMALIZED CURVE DATA: (fill factor = 70.7%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 24.1 amps
 Max power voltage 186.4 volts
 Max power 4491.9 watts

Cell Temperature 59.000 deg C
 Irradiance958 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.1%)

Short circuit current 26.0 amps
 Open circuit voltage 222.4 volts
 Max power current 23.5 amps
 Max power voltage 174.6 volts
 Max power 4101.6 watts

NORMALIZED CURVE DATA: (fill factor = 73.5%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 24.4 amps
 Max power voltage 200.8 volts
 Max power 4890.6 watts

NORMALIZED CURVE DATA: (fill factor = 72.2%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 24.4 amps
 Max power voltage 184.6 volts
 Max power 4507.9 watts

Cell Temperature 59.000 deg C
 Irradiance955 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.1%)
 Short circuit current 25.9 amps
 Open circuit voltage 222.1 volts
 Max power current 23.5 amps
 Max power voltage 173.6 volts
 Max power 4087.8 watts

NORMALIZED CURVE DATA: (fill factor = 73.5%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.2 amps
 Max power voltage 201.9 volts
 Max power 4888.5 watts

NORMALIZED CURVE DATA: (fill factor = 72.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 24.6 amps
 Max power voltage 183.5 volts
 Max power 4506.3 watts

Cell Temperature 55.000 deg C
 Irradiance 1.037 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 59.9%)
 Short circuit current 33.4 amps
 Open circuit voltage 215.2 volts
 Max power current 25.8 amps
 Max power voltage 166.4 volts
 Max power 4296.7 watts

NORMALIZED CURVE DATA: (fill factor = 61.0%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.6 amps
 Max power voltage 190.7 volts
 Max power 4698.3 watts

NORMALIZED CURVE DATA: (fill factor = 59.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 24.7 amps
 Max power voltage 174.5 volts
 Max power 4306.3 watts

Cell Temperature 55.000 deg C
 Irradiance 1.026 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 59.8%)
 Short circuit current 33.0 amps
 Open circuit voltage 215.2 volts
 Max power current 25.3 amps
 Max power voltage 167.7 volts
 Max power 4248.3 watts

NORMALIZED CURVE DATA: (fill factor = 61.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.4 amps
 Max power voltage 192.5 volts
 Max power 4697.4 watts

NORMALIZED CURVE DATA: (fill factor = 60.0%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 24.7 amps
 Max power voltage 174.1 volts
 Max power 4304.9 watts

Cell Temperature 52.000 deg C
 Irradiance 1.030 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.3%)
 Short circuit current 26.9 amps
 Open circuit voltage 217.7 volts
 Max power current 24.4 amps
 Max power voltage 171.1 volts
 Max power 4176.3 watts

NORMALIZED CURVE DATA: (fill factor = 73.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 23.5 amps
 Max power voltage 193.3 volts
 Max power 4547.7 watts

NORMALIZED CURVE DATA: (fill factor = 71.7%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 23.7 amps
 Max power voltage 176.1 volts
 Max power 4173.0 watts

Cell Temperature 52.000 deg C
 Irradiance 1.020 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.3%)
 Short circuit current 26.5 amps
 Open circuit voltage 217.4 volts
 Max power current 24.2 amps
 Max power voltage 169.9 volts
 Max power 4117.2 watts

NORMALIZED CURVE DATA: (fill factor = 73.2%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 23.6 amps
 Max power voltage 191.8 volts
 Max power 4528.0 watts

NORMALIZED CURVE DATA: (fill factor = 71.7%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 23.6 amps
 Max power voltage 175.8 volts
 Max power 4151.8 watts

Cell Temperature 61.000 deg C
 Irradiance 1.001 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 70.3%)

Short circuit current 25.4 amps
 Open circuit voltage 216.9 volts
 Max power current 23.7 amps
 Max power voltage 170.1 volts
 Max power 4027.3 watts

NORMALIZED CURVE DATA: (fill factor = 72.7%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 23.6 amps
 Max power voltage 198.1 volts
 Max power 4667.0 watts

NORMALIZED CURVE DATA: (fill factor = 71.3%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 23.8 amps
 Max power voltage 180.7 volts
 Max power 4294.1 watts

Cell Temperature 60.000 deg C
 Irradiance 1.002 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 70.2%)

Short circuit current 25.5 amps
 Open circuit voltage 216.9 volts
 Max power current 24.0 amps
 Max power voltage 167.7 volts
 Max power 4028.6 watts

NORMALIZED CURVE DATA: (fill factor = 72.6%)

(for 25.0 deg C and 1.0 kW/m²)

Max power current 23.6 amps
 Max power voltage 197.1 volts
 Max power 4649.7 watts

NORMALIZED CURVE DATA: (fill factor = 71.2%)

(for 46.0 deg C and 1.0 kW/m²)

Max power current 23.7 amps
 Max power voltage 180.0 volts
 Max power 4275.5 watts

Cell Temperature 49.000 deg C
 Irradiance900 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 72.4%)
 Short circuit current 23.3 amps
 Open circuit voltage 227.6 volts
 Max power current 21.0 amps
 Max power voltage 183.0 volts
 Max power 3845.8 watts

NORMALIZED CURVE DATA: (fill factor = 74.4%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 23.2 amps
 Max power voltage 200.9 volts
 Max power 4659.9 watts

NORMALIZED CURVE DATA: (fill factor = 73.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 23.6 amps
 Max power voltage 182.5 volts
 Max power 4299.3 watts

Cell Temperature 50.000 deg C
 Irradiance897 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 72.5%)

Short circuit current 23.3 amps
 Open circuit voltage 226.6 volts
 Max power current 21.2 amps
 Max power voltage 180.5 volts
 Max power 3824.2 watts

NORMALIZED CURVE DATA: (fill factor = 74.5%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 23.4 amps
 Max power voltage 199.2 volts
 Max power 4666.7 watts

NORMALIZED CURVE DATA: (fill factor = 73.2%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 23.6 amps
 Max power voltage 182.1 volts
 Max power 4301.8 watts

Cell Temperature 43.000 deg C
 Irradiance933 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 73.3%)

Short circuit current 23.9 amps
 Open circuit voltage 235.4 volts
 Max power current 21.7 amps
 Max power voltage 189.8 volts
 Max power 4119.5 watts

NORMALIZED CURVE DATA: (fill factor = 74.7%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 23.1 amps
 Max power voltage 203.6 volts
 Max power 4704.6 watts

NORMALIZED CURVE DATA: (fill factor = 73.5%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 23.5 amps
 Max power voltage 185.2 volts
 Max power 4344.4 watts

Cell Temperature 43.000 deg C
 Irradiance932 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 73.1%)

Short circuit current 24.0 amps
 Open circuit voltage 235.3 volts
 Max power current 21.9 amps
 Max power voltage 188.7 volts
 Max power 4128.1 watts

NORMALIZED CURVE DATA: (fill factor = 74.5%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 23.3 amps
 Max power voltage 202.3 volts
 Max power 4720.6 watts

NORMALIZED CURVE DATA: (fill factor = 73.2%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 23.4 amps
 Max power voltage 186.3 volts
 Max power 4357.7 watts

Cell Temperature 43.000 deg C
 Irradiance 1.098 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 72.2%)
 Short circuit current 28.5 amps
 Open circuit voltage 238.5 volts
 Max power current 25.8 amps
 Max power voltage 189.8 volts
 Max power 4901.7 watts

NORMALIZED CURVE DATA: (fill factor = 73.0%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 23.5 amps
 Max power voltage 205.1 volts
 Max power 4816.6 watts

NORMALIZED CURVE DATA: (fill factor = 71.6%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 23.8 amps
 Max power voltage 186.8 volts
 Max power 4441.7 watts

Cell Temperature 43.000 deg C
 Irradiance 1.099 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 72.3%)
 Short circuit current 28.5 amps
 Open circuit voltage 237.9 volts
 Max power current 26.0 amps
 Max power voltage 188.7 volts
 Max power 4896.0 watts

NORMALIZED CURVE DATA: (fill factor = 73.0%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 23.3 amps
 Max power voltage 206.4 volts
 Max power 4803.9 watts

NORMALIZED CURVE DATA: (fill factor = 71.7%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 23.6 amps
 Max power voltage 188.1 volts
 Max power 4433.3 watts

Cell Temperature 35.000 deg C
 Irradiance853 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 74.4%)

Short circuit current 21.6 amps
 Open circuit voltage 234.4 volts
 Max power current 19.9 amps
 Max power voltage 189.8 volts
 Max power 3772.1 watts

NORMALIZED CURVE DATA: (fill factor = 75.6%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 23.4 amps
 Max power voltage 194.1 volts
 Max power 4546.1 watts

NORMALIZED CURVE DATA: (fill factor = 74.3%)
 (for 45.0 deg C and 1.0 kW/m²)

Max power current 23.5 amps
 Max power voltage 178.2 volts
 Max power 4186.0 watts

Cell Temperature 35.000 deg C
 Irradiance860 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 74.4%)

Short circuit current 21.9 amps
 Open circuit voltage 234.4 volts
 Max power current 20.1 amps
 Max power voltage 189.8 volts
 Max power 3812.0 watts

NORMALIZED CURVE DATA: (fill factor = 75.6%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 23.5 amps
 Max power voltage 194.3 volts
 Max power 4558.6 watts

NORMALIZED CURVE DATA: (fill factor = 74.3%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 23.8 amps
 Max power voltage 175.9 volts
 Max power 4193.2 watts

Cell Temperature 50.000 deg C
 Irradiance 1.044 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.8%)

Short circuit current 27.3 amps
 Open circuit voltage 223.1 volts
 Max power current 24.9 amps
 Max power voltage 175.8 volts
 Max power 4371.6 watts

NORMALIZED CURVE DATA: (fill factor = 73.4%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 23.8 amps
 Max power voltage 195.5 volts
 Max power 4654.1 watts

NORMALIZED CURVE DATA: (fill factor = 71.9%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 23.7 amps
 Max power voltage 180.7 volts
 Max power 4274.4 watts

Cell Temperature 49.000 deg C
 Irradiance 1.042 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.8%)

Short circuit current 27.3 amps
 Open circuit voltage 223.2 volts
 Max power current 24.7 amps
 Max power voltage 176.9 volts
 Max power 4358.9 watts

NORMALIZED CURVE DATA: (fill factor = 73.3%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 23.6 amps
 Max power voltage 196.9 volts
 Max power 4639.5 watts

NORMALIZED CURVE DATA: (fill factor = 71.9%)
 (for 45.0 deg C and 1.0 kW/m²)

Max power current 23.9 amps
 Max power voltage 178.5 volts
 Max power 4253.2 watts

Cell Temperature 48.000 deg C
 Irradiance 1.030 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.956 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 72.1%)
 Short circuit current 26.4 amps
 Open circuit voltage 223.2 volts
 Max power current 24.2 amps
 Max power voltage 175.8 volts
 Max power 4248.6 watts

NORMALIZED CURVE DATA: (fill factor = 73.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 23.4 amps
 Max power voltage 194.5 volts
 Max power 4543.3 watts

NORMALIZED CURVE DATA: (fill factor = 72.1%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 23.4 amps
 Max power voltage 178.5 volts
 Max power 4170.5 watts

Cell Temperature 48.000 deg C
 Irradiance 1.121 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.6%)
 Short circuit current 29.2 amps
 Open circuit voltage 226.6 volts
 Max power current 26.8 amps
 Max power voltage 176.9 volts
 Max power 4745.8 watts

NORMALIZED CURVE DATA: (fill factor = 72.9%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 23.5 amps
 Max power voltage 199.6 volts
 Max power 4693.5 watts

NORMALIZED CURVE DATA: (fill factor = 71.5%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 23.8 amps
 Max power voltage 181.3 volts
 Max power 4315.7 watts

Cell Temperature 47.000 deg C
 Irradiance 1.117 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 71.8%)
 Short circuit current 29.2 amps
 Open circuit voltage 225.6 volts
 Max power current 25.8 amps
 Max power voltage 175.9 volts
 Max power 4745.8 watts

NORMALIZED CURVE DATA: (fill factor = 72.9%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 23.6 amps
 Max power voltage 198.6 volts
 Max power 4691.5 watts

NORMALIZED CURVE DATA: (fill factor = 71.5%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 23.9 amps
 Max power voltage 180.3 volts
 Max power 4311.5 watts

Cell Temperature 42.000 deg C
 Irradiance 1.082 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 72.5%)

Short circuit current 28.1 amps
 Open circuit voltage 230.1 volts
 Max power current 26.0 amps
 Max power voltage 180.5 volts
 Max power 4686.8 watts

NORMALIZED CURVE DATA: (fill factor = 73.4%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 23.7 amps
 Max power voltage 196.7 volts
 Max power 4671.0 watts

NORMALIZED CURVE DATA: (fill factor = 72.0%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 23.9 amps
 Max power voltage 179.5 volts
 Max power 4290.7 watts

Cell Temperature 42.000 deg C
 Irradiance 1.084 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 72.7%)

Short circuit current 28.2 amps
 Open circuit voltage 230.4 volts
 Max power current 25.0 amps
 Max power voltage 181.6 volts
 Max power 4722.6 watts

NORMALIZED CURVE DATA: (fill factor = 73.5%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 23.6 amps
 Max power voltage 199.1 volts
 Max power 4693.0 watts

NORMALIZED CURVE DATA: (fill factor = 72.1%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 23.9 amps
 Max power voltage 180.8 volts
 Max power 4315.4 watts

Cell Temperature 33.000 deg C
 Irradiance 1.051 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 72.9%)
 Short circuit current 28.0 amps
 Open circuit voltage 245.2 volts
 Max power current 25.8 amps
 Max power voltage 194.5 volts
 Max power 5015.0 watts

NORMALIZED CURVE DATA: (fill factor = 73.2%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.3 amps
 Max power voltage 203.2 volts
 Max power 4936.6 watts

NORMALIZED CURVE DATA: (fill factor = 71.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 24.2 amps
 Max power voltage 188.3 volts
 Max power 4548.4 watts

Cell Temperature 33.000 deg C
 Irradiance 1.048 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 73.0%)

Short circuit current 28.1 amps
 Open circuit voltage 246.1 volts
 Max power current 25.5 amps
 Max power voltage 198.1 volts
 Max power 5044.3 watts

NORMALIZED CURVE DATA: (fill factor = 73.2%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 24.2 amps
 Max power voltage 205.6 volts
 Max power 4973.3 watts

NORMALIZED CURVE DATA: (fill factor = 71.9%)

(for 45.0 deg C and 1.0 kW/m²)
 Max power current 24.4 amps
 Max power voltage 188.2 volts
 Max power 4588.6 watts

Cell Temperature 38.000 deg C
 Irradiance881 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 73.9%)

Short circuit current 23.1 amps
 Open circuit voltage 243.0 volts
 Max power current 21.1 amps
 Max power voltage 196.9 volts
 Max power 4152.2 watts

NORMALIZED CURVE DATA: (fill factor = 75.3%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 24.0 amps
 Max power voltage 204.5 volts
 Max power 4905.1 watts

NORMALIZED CURVE DATA: (fill factor = 74.1%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 23.9 amps
 Max power voltage 189.8 volts
 Max power 4536.3 watts

Cell Temperature 37.000 deg C
 Irradiance878 kW/m²
 Series Resistance 1.200 ohms
 Voltage Coefficient -.856 volts/deg C
 Current Coefficient016 amps/deg C

ACTUAL CURVE DATA: (fill factor = 73.9%)

Short circuit current 23.0 amps
 Open circuit voltage 242.7 volts
 Max power current 21.1 amps
 Max power voltage 195.7 volts
 Max power 4131.2 watts

NORMALIZED CURVE DATA: (fill factor = 75.2%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 24.0 amps
 Max power voltage 203.6 volts
 Max power 4878.6 watts

NORMALIZED CURVE DATA: (fill factor = 74.1%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 24.0 amps
 Max power voltage 187.8 volts
 Max power 4512.0 watts

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Cell Temperature 45.000 deg C
 Irradiance996 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.1%)
 Short circuit current 19.2 amps
 Open circuit voltage 274.4 volts
 Max power current 15.9 amps
 Max power voltage 206.3 volts
 Max power 3275.3 watts

NORMALIZED CURVE DATA: (fill factor = 63.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.7 amps
 Max power voltage 228.1 volts
 Max power 3584.2 watts

NORMALIZED CURVE DATA: (fill factor = 62.0%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 204.7 volts
 Max power 3273.1 watts

Cell Temperature 45.000 deg C
 Irradiance996 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.3%)

Short circuit current 19.2 amps
 Open circuit voltage 275.1 volts
 Max power current 16.1 amps
 Max power voltage 205.1 volts
 Max power 3297.7 watts

NORMALIZED CURVE DATA: (fill factor = 63.9%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.7 amps
 Max power voltage 230.3 volts
 Max power 3607.3 watts

NORMALIZED CURVE DATA: (fill factor = 62.3%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.2 amps
 Max power voltage 203.6 volts
 Max power 3295.1 watts

Cell Temperature 47.000 deg C
 Irradiance823 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.6%)
 Short circuit current 16.1 amps
 Open circuit voltage 266.0 volts
 Max power current 13.8 amps
 Max power voltage 198.1 volts
 Max power 2731.1 watts

NORMALIZED CURVE DATA: (fill factor = 67.0%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 226.6 volts
 Max power 3626.5 watts

NORMALIZED CURVE DATA: (fill factor = 65.4%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.7 amps
 Max power voltage 198.4 volts
 Max power 3322.4 watts

Cell Temperature 47.000 deg C
 Irradiance828 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.6%)

Short circuit current 16.2 amps
 Open circuit voltage 266.5 volts
 Max power current 13.8 amps
 Max power voltage 199.2 volts
 Max power 2753.2 watts

NORMALIZED CURVE DATA: (fill factor = 66.8%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 16.0 amps
 Max power voltage 226.8 volts
 Max power 3629.3 watts

NORMALIZED CURVE DATA: (fill factor = 65.3%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 16.6 amps
 Max power voltage 199.8 volts
 Max power 3326.3 watts

Cell Temperature 53.000 deg C
 Irradiance961 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 53.2%)
 Short circuit current 18.6 amps
 Open circuit voltage 265.4 volts
 Max power current 15.7 amps
 Max power voltage 199.2 volts
 Max power 3125.8 watts

NORMALIZED CURVE DATA: (fill factor = 65.7%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.6 amps
 Max power voltage 234.7 volts
 Max power 3661.6 watts

NORMALIZED CURVE DATA: (fill factor = 64.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.2 amps
 Max power voltage 206.8 volts
 Max power 3357.0 watts

Cell Temperature 51.000 deg C
 Irradiance961 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.1%)
 Short circuit current 18.7 amps
 Open circuit voltage 265.0 volts
 Max power current 15.9 amps
 Max power voltage 196.9 volts
 Max power 3124.5 watts

NORMALIZED CURVE DATA: (fill factor = 65.5%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.8 amps
 Max power voltage 229.7 volts
 Max power 3639.3 watts

NORMALIZED CURVE DATA: (fill factor = 63.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.5 amps
 Max power voltage 201.8 volts
 Max power 3324.7 watts

Cell Temperature 44.000 deg C
 Irradiance900 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.9%)

Short circuit current 17.2 amps
 Open circuit voltage 270.1 volts
 Max power current 14.4 amps
 Max power voltage 206.3 volts
 Max power 2970.0 watts

NORMALIZED CURVE DATA: (fill factor = 66.2%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 15.9 amps
 Max power voltage 223.7 volts
 Max power 3567.5 watts

NORMALIZED CURVE DATA: (fill factor = 64.7%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 16.3 amps
 Max power voltage 200.3 volts
 Max power 3262.8 watts

Cell Temperature 44.000 deg C
 Irradiance900 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 64.0%)

Short circuit current 17.2 amps
 Open circuit voltage 270.1 volts
 Max power current 14.5 amps
 Max power voltage 205.1 volts
 Max power 2979.8 watts

NORMALIZED CURVE DATA: (fill factor = 66.3%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.8 amps
 Max power voltage 226.0 volts
 Max power 3579.5 watts

NORMALIZED CURVE DATA: (fill factor = 64.7%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.1 amps
 Max power voltage 202.7 volts
 Max power 3271.2 watts

Cell Temperature 59.000 deg C
 Irradiance 1.002 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.250 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.8%)
 Short circuit current 19.4 amps
 Open circuit voltage 253.0 volts
 Max power current 16.0 amps
 Max power voltage 189.8 volts
 Max power 3035.5 watts

NORMALIZED CURVE DATA: (fill factor = 64.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.5 amps
 Max power voltage 229.2 volts
 Max power 3542.5 watts

NORMALIZED CURVE DATA: (fill factor = 63.0%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.1 amps
 Max power voltage 201.3 volts
 Max power 3234.2 watts

Cell Temperature 59.000 deg C
 Irradiance 1.005 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.6%)
 Short circuit current 19.5 amps
 Open circuit voltage 253.3 volts
 Max power current 16.3 amps
 Max power voltage 186.5 volts
 Max power 3039.5 watts

NORMALIZED CURVE DATA: (fill factor = 64.4%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.7 amps
 Max power voltage 225.8 volts
 Max power 3538.7 watts

NORMALIZED CURVE DATA: (fill factor = 62.8%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 15.8 amps
 Max power voltage 203.9 volts
 Max power 3228.0 watts

Cell Temperature 54.000 deg C
 Irradiance999 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.5%)
 Short circuit current 19.4 amps
 Open circuit voltage 258.0 volts
 Max power current 16.2 amps
 Max power voltage 192.2 volts
 Max power 3121.2 watts

NORMALIZED CURVE DATA: (fill factor = 64.8%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.7 amps
 Max power voltage 225.9 volts
 Max power 3558.0 watts

NORMALIZED CURVE DATA: (fill factor = 63.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 202.8 volts
 Max power 3249.7 watts

Cell Temperature 54.000 deg C
 Irradiance 1.002 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.5%)
 Short circuit current 19.4 amps
 Open circuit voltage 258.5 volts
 Max power current 16.2 amps
 Max power voltage 193.4 volts
 Max power 3140.2 watts

NORMALIZED CURVE DATA: (fill factor = 64.8%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 223.7 volts
 Max power 3573.4 watts

NORMALIZED CURVE DATA: (fill factor = 63.1%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 204.1 volts
 Max power 3258.8 watts

Cell Temperature 58.000 deg C
 Irradiance 1.055 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.3%)
 Short circuit current 20.9 amps
 Open circuit voltage 251.5 volts
 Max power current 17.4 amps
 Max power voltage 185.2 volts
 Max power 3221.8 watts

NORMALIZED CURVE DATA: (fill factor = 53.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.9 amps
 Max power voltage 225.5 volts
 Max power 3581.6 watts

NORMALIZED CURVE DATA: (fill factor = 61.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.5 amps
 Max power voltage 197.7 volts
 Max power 3254.2 watts

Cell Temperature 58.000 deg C
 Irradiance 1.056 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.3%)
 Short circuit current 20.9 amps
 Open circuit voltage 251.9 volts
 Max power current 17.5 amps
 Max power voltage 185.2 volts
 Max power 3232.9 watts

NORMALIZED CURVE DATA: (fill factor = 63.6%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.8 amps
 Max power voltage 226.7 volts
 Max power 3589.5 watts

NORMALIZED CURVE DATA: (fill factor = 61.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.4 amps
 Max power voltage 198.9 volts
 Max power 3264.2 watts

Cell Temperature 60.000 deg C
 Irradiance 1.059 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.4%)
 Short circuit current 20.9 amps
 Open circuit voltage 249.9 volts
 Max power current 17.4 amps
 Max power voltage 184.0 volts
 Max power 3201.3 watts

NORMALIZED CURVE DATA: (fill factor = 64.0%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.9 amps
 Max power voltage 224.8 volts
 Max power 3585.0 watts

NORMALIZED CURVE DATA: (fill factor = 62.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.1 amps
 Max power voltage 202.9 volts
 Max power 3258.6 watts

Cell Temperature 60.000 deg C
 Irradiance 1.058 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.250 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.4%)
 Short circuit current 20.9 amps
 Open circuit voltage 249.5 volts
 Max power current 17.3 amps
 Max power voltage 185.2 volts
 Max power 3197.7 watts

NORMALIZED CURVE DATA: (fill factor = 64.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 224.7 volts
 Max power 3588.3 watts

NORMALIZED CURVE DATA: (fill factor = 62.3%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 16.2 amps
 Max power voltage 201.6 volts
 Max power 3260.9 watts

Cell Temperature 60.000 deg C
 Irradiance 0.965 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient 0.029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.0%)
 Short circuit current 19.0 amps
 Open circuit voltage 248.0 volts
 Max power current 15.9 amps
 Max power voltage 184.0 volts
 Max power 2925.3 watts

NORMALIZED CURVE DATA: (fill factor = 65.2%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.8 amps
 Max power voltage 225.4 volts
 Max power 3563.2 watts

NORMALIZED CURVE DATA: (fill factor = 63.6%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 16.2 amps
 Max power voltage 201.0 volts
 Max power 3249.9 watts

Cell Temperature 60.000 deg C
 Irradiance970 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.1%)

Short circuit current 19.0 amps
 Open circuit voltage 248.9 volts
 Max power current 16.0 amps
 Max power voltage 184.0 volts
 Max power 2936.3 watts

NORMALIZED CURVE DATA: (fill factor = 65.3%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 15.8 amps
 Max power voltage 225.8 volts
 Max power 3563.1 watts

NORMALIZED CURVE DATA: (fill factor = 63.6%)
 (for 45.0 deg C and 1.0 kW/m²)

Max power current 16.4 amps
 Max power voltage 197.9 volts
 Max power 3246.9 watts

Cell Temperature 54.000 deg C
 Irradiance814 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.5%)
 Short circuit current 16.0 amps
 Open circuit voltage 262.1 volts
 Max power current 13.5 amps
 Max power voltage 196.9 volts
 Max power 2663.8 watts

NORMALIZED CURVE DATA: (fill factor = 67.4%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 229.7 volts
 Max power 3674.5 watts

NORMALIZED CURVE DATA: (fill factor = 66.0%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.5 amps
 Max power voltage 205.2 volts
 Max power 3387.2 watts

Cell Temperature 54.000 deg C
 Irradiance815 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.4%)

Short circuit current 16.1 amps
 Open circuit voltage 262.4 volts
 Max power current 13.5 amps
 Max power voltage 198.1 volts
 Max power 2671.7 watts

NORMALIZED CURVE DATA: (fill factor = 67.3%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.9 amps
 Max power voltage 230.9 volts
 Max power 3681.3 watts

NORMALIZED CURVE DATA: (fill factor = 66.0%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.5 amps
 Max power voltage 206.2 volts
 Max power 3392.6 watts

Cell Temperature 51.000 deg C
 Irradiance 1.002 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.2%)
 Short circuit current 19.9 amps
 Open circuit voltage 258.1 volts
 Max power current 16.5 amps
 Max power voltage 193.4 volts
 Max power 3196.2 watts

NORMALIZED CURVE DATA: (fill factor = 65.1%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 234.2 volts
 Max power 3746.6 watts

NORMALIZED CURVE DATA: (fill factor = 63.5%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.4 amps
 Max power voltage 209.8 volts
 Max power 3432.1 watts

Cell Temperature 61.000 deg C
 Irradiance 1.004 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.3%)
 Short circuit current 19.9 amps
 Open circuit voltage 258.5 volts
 Max power current 16.5 amps
 Max power voltage 194.5 volts
 Max power 3213.6 watts

NORMALIZED CURVE DATA: (fill factor = 65.2%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 235.6 volts
 Max power 3760.3 watts

NORMALIZED CURVE DATA: (fill factor = 63.6%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.6 amps
 Max power voltage 207.7 volts
 Max power 3441.6 watts

Cell Temperature 58.000 deg C
 Irradiance897 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.0%)
 Short circuit current 18.7 amps
 Open circuit voltage 260.6 volts
 Max power current 15.6 amps
 Max power voltage 196.9 volts
 Max power 3061.5 watts

NORMALIZED CURVE DATA: (fill factor = 66.4%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 16.8 amps
 Max power voltage 233.6 volts
 Max power 3926.3 watts

NORMALIZED CURVE DATA: (fill factor = 64.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 17.3 amps
 Max power voltage 207.9 volts
 Max power 3598.5 watts

Cell Temperature 58.000 deg C
 Irradiance953 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.250 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.8%)
 Short circuit current 18.8 amps
 Open circuit voltage 261.2 volts
 Max power current 15.6 amps
 Max power voltage 196.9 volts
 Max power 3079.2 watts

NORMALIZED CURVE DATA: (fill factor = 65.7%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.8 amps
 Max power voltage 235.3 volts
 Max power 3717.6 watts

NORMALIZED CURVE DATA: (fill factor = 64.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.2 amps
 Max power voltage 210.7 volts
 Max power 3413.5 watts

Cell Temperature 59.000 deg C
 Irradiance 1.028 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.5%)
 Short circuit current 20.1 amps
 Open circuit voltage 255.0 volts
 Max power current 17.0 amps
 Max power voltage 188.7 volts
 Max power 3201.7 watts

NORMALIZED CURVE DATA: (fill factor = 64.9%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.5 amps
 Max power voltage 235.0 volts
 Max power 3633.9 watts

NORMALIZED CURVE DATA: (fill factor = 63.4%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 15.1 amps
 Max power voltage 207.2 volts
 Max power 3326.2 watts

Cell Temperature 58.000 deg C
 Irradiance 1.037 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.5%)
 Short circuit current 20.3 amps
 Open circuit voltage 255.8 volts
 Max power current 17.0 amps
 Max power voltage 191.0 volts
 Max power 3247.3 watts

NORMALIZED CURVE DATA: (fill factor = 64.8%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 16.1 amps
 Max power voltage 227.0 volts
 Max power 3644.3 watts

NORMALIZED CURVE DATA: (fill factor = 63.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 15.9 amps
 Max power voltage 208.6 volts
 Max power 3324.8 watts

Cell Temperature 63.000 deg C
 Irradiance955 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.9%)

Short circuit current 19.0 amps
 Open circuit voltage 253.4 volts
 Max power current 15.9 amps
 Max power voltage 187.5 volts
 Max power 2977.5 watts

NORMALIZED CURVE DATA: (fill factor = 65.5%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 16.1 amps
 Max power voltage 229.0 volts
 Max power 3697.5 watts

NORMALIZED CURVE DATA: (fill factor = 63.9%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 16.5 amps
 Max power voltage 205.7 volts
 Max power 3385.5 watts

Cell Temperature 63.000 deg C
 Irradiance963 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 61.9%)

Short circuit current 19.1 amps
 Open circuit voltage 254.6 volts
 Max power current 16.0 amps
 Max power voltage 188.7 volts
 Max power 3018.7 watts

NORMALIZED CURVE DATA: (fill factor = 65.3%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 232.8 volts
 Max power 3715.9 watts

NORMALIZED CURVE DATA: (fill factor = 63.7%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.2 amps
 Max power voltage 209.6 volts
 Max power 3400.1 watts

Cell Temperature 58.000 deg C
 Irradiance 1.026 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.7%)

Short circuit current 20.0 amps
 Open circuit voltage 261.3 volts
 Max power current 16.7 amps
 Max power voltage 195.7 volts
 Max power 3276.0 watts

NORMALIZED CURVE DATA: (fill factor = 65.1%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 15.8 amps
 Max power voltage 234.7 volts
 Max power 3697.4 watts

NORMALIZED CURVE DATA: (fill factor = 63.6%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 16.1 amps
 Max power voltage 210.4 volts
 Max power 3386.8 watts

Cell Temperature 58.000 deg C
 Irradiance 1.025 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.250 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 62.6%)
 Short circuit current 20.0 amps
 Open circuit voltage 260.6 volts
 Max power current 16.7 amps
 Max power voltage 195.7 volts
 Max power 3260.4 watts

NORMALIZED CURVE DATA: (fill factor = 65.0%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.6 amps
 Max power voltage 235.9 volts
 Max power 3686.6 watts

NORMALIZED CURVE DATA: (fill factor = 63.5%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 16.2 amps
 Max power voltage 208.0 volts
 Max power 3375.2 watts

Cell Temperature 42.000 deg C
 Irradiance868 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 64.9%)

Short circuit current 17.0 amps
 Open circuit voltage 279.8 volts
 Max power current 14.4 amps
 Max power voltage 214.4 volts
 Max power 3079.5 watts

NORMALIZED CURVE DATA: (fill factor = 67.3%)

(for 25.0 deg C and 1.0 kW/m²)

Max power current 16.1 amps
 Max power voltage 234.7 volts
 Max power 3787.0 watts

NORMALIZED CURVE DATA: (fill factor = 65.8%)

(for 46.0 deg C and 1.0 kW/m²)

Max power current 16.6 amps
 Max power voltage 210.2 volts
 Max power 3479.2 watts

Cell Temperature 43.000 deg C
 Irradiance863 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 64.8%)

Short circuit current 17.0 amps
 Open circuit voltage 281.1 volts
 Max power current 14.3 amps
 Max power voltage 215.6 volts
 Max power 3087.8 watts

NORMALIZED CURVE DATA: (fill factor = 67.3%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 16.2 amps
 Max power voltage 237.0 volts
 Max power 3831.7 watts

NORMALIZED CURVE DATA: (fill factor = 66.0%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.7 amps
 Max power voltage 211.2 volts
 Max power 3530.6 watts

Cell Temperature 45.000 deg C
 Irradiance 1.106 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 64.3%)
 Short circuit current 21.1 amps
 Open circuit voltage 281.1 volts
 Max power current 17.7 amps
 Max power voltage 215.6 volts
 Max power 3825.3 watts

NORMALIZED CURVE DATA: (fill factor = 64.9%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.7 amps
 Max power voltage 239.8 volts
 Max power 3767.4 watts

NORMALIZED CURVE DATA: (fill factor = 63.4%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.1 amps
 Max power voltage 214.3 volts
 Max power 3452.2 watts

Cell Temperature 46.000 deg C
 Irradiance 1.106 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 64.5%)
 Short circuit current 21.1 amps
 Open circuit voltage 282.0 volts
 Max power current 17.8 amps
 Max power voltage 215.6 volts
 Max power 3842.5 watts

NORMALIZED CURVE DATA: (fill factor = 65.0%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.6 amps
 Max power voltage 243.3 volts
 Max power 3790.0 watts

NORMALIZED CURVE DATA: (fill factor = 63.6%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 218.0 volts
 Max power 3481.9 watts

Cell Temperature 38.000 deg.C
 Irradiance810 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.250 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 55.1%)

Short circuit current 15.7 amps
 Open circuit voltage 277.1 volts
 Max power current 13.3 amps
 Max power voltage 212.3 volts
 Max power 2831.5 watts

NORMALIZED CURVE DATA: (fill factor = 58.0%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.0 amps
 Max power voltage 229.3 volts
 Max power 3576.2 watts

NORMALIZED CURVE DATA: (fill factor = 55.6%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 15.7 amps
 Max power voltage 202.2 volts
 Max power 3376.7 watts

Cell Temperature 38.000 deg C
 Irradiance813 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.250 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 64.8%)
 Short circuit current 15.7 amps
 Open circuit voltage 278.0 volts
 Max power current 13.2 amps
 Max power voltage 214.4 volts
 Max power 2839.3 watts

NORMALIZED CURVE DATA: (fill factor = 67.7%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.1 amps
 Max power voltage 228.2 volts
 Max power 3574.2 watts

NORMALIZED CURVE DATA: (fill factor = 66.3%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.2 amps
 Max power voltage 208.2 volts
 Max power 3375.0 watts

Cell Temperature 55.000 deg C
 Irradiance 1.017 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.2%)

Short circuit current 20.1 amps
 Open circuit voltage 262.1 volts
 Max power current 15.9 amps
 Max power voltage 197.0 volts
 Max power 3331.6 watts

NORMALIZED CURVE DATA: (fill factor = 65.4%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 15.9 amps
 Max power voltage 235.1 volts
 Max power 3744.5 watts

NORMALIZED CURVE DATA: (fill factor = 63.9%)
 (for 45.0 deg C and 1.0 kW/m²)

Max power current 16.5 amps
 Max power voltage 207.2 volts
 Max power 3425.1 watts

Cell Temperature 55.000 deg C
Irradiance 1.014 kW/m²
Series Resistance 2.310 ohms
Voltage Coefficient -1.260 volts/deg C
Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.1%)
Short circuit current 20.1 amps
Open circuit voltage 262.6 volts
Max power current 17.0 amps
Max power voltage 195.7 volts
Max power 3332.8 watts

NORMALIZED CURVE DATA: (fill factor = 65.4%)
(for 25.0 deg C and 1.0 kW/m²)
Max power current 16.3 amps
Max power voltage 230.3 volts
Max power 3758.9 watts

NORMALIZED CURVE DATA: (fill factor = 63.8%)
(for 45.0 deg C and 1.0 kW/m²)
Max power current 16.5 amps
Max power voltage 208.3 volts
Max power 3435.5 watts

Cell Temperature 52.000 deg C
 Irradiance993 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.4%)
 Short circuit current 19.4 amps
 Open circuit voltage 262.4 volts
 Max power current 16.5 amps
 Max power voltage 195.9 volts
 Max power 3227.6 watts

NORMALIZED CURVE DATA: (fill factor = 65.5%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.8 amps
 Max power voltage 231.4 volts
 Max power 3662.3 watts

NORMALIZED CURVE DATA: (fill factor = 64.0%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 16.4 amps
 Max power voltage 203.5 volts
 Max power 3345.8 watts

Cell Temperature 52.000 deg C
 Irradiance992 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.250 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.4%)
 Short circuit current 19.4 amps
 Open circuit voltage 263.2 volts
 Max power current 15.2 amps
 Max power voltage 199.2 volts
 Max power 3235.3 watts

NORMALIZED CURVE DATA: (fill factor = 65.5%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.9 amps
 Max power voltage 231.2 volts
 Max power 3670.5 watts

NORMALIZED CURVE DATA: (fill factor = 64.0%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 15.2 amps
 Max power voltage 206.8 volts
 Max power 3354.9 watts

Cell Temperature 51.000 deg C
 Irradiance 1.158 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 53.6%)
 Short circuit current 21.9 amps
 Open circuit voltage 268.6 volts
 Max power current 18.8 amps
 Max power voltage 199.2 volts
 Max power 3751.3 watts

NORMALIZED CURVE DATA: (fill factor = 54.4%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.2 amps
 Max power voltage 240.4 volts
 Max power 3650.5 watts

NORMALIZED CURVE DATA: (fill factor = 52.9%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 15.7 amps
 Max power voltage 212.7 volts
 Max power 3342.2 watts

Cell Temperature 51.000 deg C
 Irradiance 1.157 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.4%)
 Short circuit current 22.0 amps
 Open circuit voltage 268.4 volts
 Max power current 18.3 amps
 Max power voltage 203.9 volts
 Max power 3739.7 watts

NORMALIZED CURVE DATA: (fill factor = 64.2%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.5 amps
 Max power voltage 234.5 volts
 Max power 3643.6 watts

NORMALIZED CURVE DATA: (fill factor = 62.7%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 15.8 amps
 Max power voltage 211.5 volts
 Max power 3332.3 watts

Cell Temperature 50.000 deg C
 Irradiance 1.165 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.7%)
 Short circuit current 21.9 amps
 Open circuit voltage 269.1 volts
 Max power current 19.5 amps
 Max power voltage 202.7 volts
 Max power 3742.4 watts

NORMALIZED CURVE DATA: (fill factor = 64.3%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.3 amps
 Max power voltage 235.8 volts
 Max power 3605.9 watts

NORMALIZED CURVE DATA: (fill factor = 62.7%)
 (for 45.0 deg C and 1.0 kW/m²)
 Max power current 15.8 amps
 Max power voltage 208.1 volts
 Max power 3291.6 watts

Cell Temperature 49.000 deg C
 Irradiance 1.151 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.7%)
 Short circuit current 21.6 amps
 Open circuit voltage 269.4 volts
 Max power current 18.2 amps
 Max power voltage 203.9 volts
 Max power 3709.1 watts

NORMALIZED CURVE DATA: (fill factor = 64.4%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.3 amps
 Max power voltage 235.1 volts
 Max power 3596.6 watts

NORMALIZED CURVE DATA: (fill factor = 62.8%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 15.5 amps
 Max power voltage 212.1 volts
 Max power 3284.7 watts

Cell Temperature 49.000 deg C
 Irradiance 1.138 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 63.9%)

Short circuit current 21.4 amps
 Open circuit voltage 269.8 volts
 Max power current 18.2 amps
 Max power voltage 202.7 volts
 Max power 3681.6 watts

NORMALIZED CURVE DATA: (fill factor = 64.8%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.4 amps
 Max power voltage 234.5 volts
 Max power 3615.8 watts

NORMALIZED CURVE DATA: (fill factor = 63.1%)

(for 45.0 deg C and 1.0 kW/m²)
 Max power current 16.0 amps
 Max power voltage 206.8 volts
 Max power 3299.5 watts

Cell Temperature 44.000 deg C
 Irradiance934 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 64.8%)
 Short circuit current 19.3 amps
 Open circuit voltage 272.3 volts
 Max power current 16.2 amps
 Max power voltage 209.8 volts
 Max power 3406.7 watts

NORMALIZED CURVE DATA: (fill factor = 66.7%)
 (for 25.0 deg C and 1.0 kW/m²)
 Max power current 17.0 amps
 Max power voltage 231.9 volts
 Max power 3946.2 watts

NORMALIZED CURVE DATA: (fill factor = 65.2%)
 (for 46.0 deg C and 1.0 kW/m²)
 Max power current 17.7 amps
 Max power voltage 204.0 volts
 Max power 3603.3 watts

Cell Temperature 44.000 deg C
 Irradiance937 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 64.6%)

Short circuit current 19.3 amps
 Open circuit voltage 272.9 volts
 Max power current 16.2 amps
 Max power voltage 209.8 volts
 Max power 3406.7 watts

NORMALIZED CURVE DATA: (fill factor = 66.6%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 17.3 amps
 Max power voltage 227.4 volts
 Max power 3936.1 watts

NORMALIZED CURVE DATA: (fill factor = 65.1%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 17.3 amps
 Max power voltage 207.6 volts
 Max power 3596.1 watts

Cell Temperature 40.000 deg C
 Irradiance 1.060 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 65.4%)

Short circuit current 20.1 amps
 Open circuit voltage 288.4 volts
 Max power current 17.1 amps
 Max power voltage 221.5 volts
 Max power 3791.7 watts

NORMALIZED CURVE DATA: (fill factor = 65.9%)

(for 25.0 deg C and 1.0 kW/m²)
 Max power current 15.8 amps
 Max power voltage 240.6 volts
 Max power 3799.5 watts

NORMALIZED CURVE DATA: (fill factor = 64.5%)

(for 46.0 deg C and 1.0 kW/m²)
 Max power current 16.1 amps
 Max power voltage 216.2 volts
 Max power 3490.4 watts

Cell Temperature 40.000 deg C
 Irradiance 1.060 kW/m²
 Series Resistance 2.310 ohms
 Voltage Coefficient -1.260 volts/deg C
 Current Coefficient029 amps/deg C

ACTUAL CURVE DATA: (fill factor = 65.4%)

Short circuit current 20.1 amps
 Open circuit voltage 288.7 volts
 Max power current 17.0 amps
 Max power voltage 223.8 volts
 Max power 3796.2 watts

NORMALIZED CURVE DATA: (fill factor = 65.9%)
 (for 25.0 deg C and 1.0 kW/m²)

Max power current 15.8 amps
 Max power voltage 240.6 volts
 Max power 3804.3 watts

NORMALIZED CURVE DATA: (fill factor = 64.4%)
 (for 46.0 deg C and 1.0 kW/m²)

Max power current 16.0 amps
 Max power voltage 218.5 volts
 Max power 3493.3 watts