CFV Labs

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CFV Solar Test Laboratory
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CEC Test Report:
Mitrex M345-RF041F Modules

Report Number: 22062-PR-E-002
Report Date: 2022-10-13
Test Period: 2022-09-26 to 2022-10-12
Project ID: 22062 (CFV), 001239 (Customer PO)
Customer: Hadi Khatibzadezad / Mitrex
41 Racine Rd, Etobicoke, Ontario M9W 2Z4, Canada

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Project Summary

CFV Labs conducted CEC testing on **M345-RF041F** modules produced by **Mitrex**. An incoming inspection report, sample images and EL images were provided separately to the customer.

Results

Estimated performance uncertainties (k=2) on silicon modules are: Isc ±1.4%, Voc ±0.7%, Imp ±1.8%, Vmp ±1.2%, Pmp ±1.9%
Estimated temperature coefficient uncertainties (k=2): α Isc ±10%, β Voc ±5%, γ Pmp ±5%
Estimated NOCT measurement uncertainty (k=2): ±2.7° C

Test	Parameter	Symbol	Units	Value
NOCT	Nominal Operating Cell Temperature	NOCT	°C	48.2
Performance at STC	Maximum power	P_{max}	Watts	341.84
	Voltage at maximum power	V_{pmax}	Volts	40.10
	Current at maximum power	I_{pmax}	Amps	8.526
	Open circuit voltage	V_{oc}	Volts	48.62
	Short circuit current	I_{sc}	Amps	8.985
Performance at Low Irradiance	Voltage at maximum power	$V_{pmax, low}$	Volts	38.93
	Current at maximum power	$I_{pmax, low}$	Amps	1.705
Performance at NOCT	Voltage at maximum power	$V_{pmax, NOCT}$	Volts	36.93
	Current at maximum power	$I_{pmax, NOCT}$	Amps	6.800
Temperature Coefficients	Coefficient **β** at Voc	β_{Voc}	%/°C	-0.2716
	Coefficient **α** at Isc	α_{Isc}	%/°C	+0.0342
	Coefficient **γ** at Pmax	γ_{Pmax}	%/°C	-0.3624

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Sample Information

Sample Labeling & Test Flow Assignment:

Module ID	Module Type	Serial Number	Test Flow Assignment
22062-001	M345-RF041F	MIT22A23448	Outdoor - NOCT
22062-005	M345-RF041F	MIT22A23823	Indoor – Performance

Construction Details:

Module Type	Length [m]	Width [m]	Thickness [mm]
M345-RF041F	2.036	0.996	40

Nameplate Values:

Module Type	Isc [A]	Voc [V]	Imp [A]	Vmp [V]	Pmp [W]	Max Sys Volt [V]	Fuse Rating [A]
M345-RF041F	8.94	48.9	8.41	41.0	345	1000	20

Result Applicability

The following table summarizes the module types/models that this test report and LTM data can be applied to:

LTM	Rated Power of LTM [W]	Group 1 / Sub-Group 1		
		Module Series	Min. Rated Power [W]	Max. Rated Power [W]
M345-RF041F	345	MXXX-RF041F	315	360

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Procedures

The procedures for the testing in this report are summarized in the following table:

Test Name	Standard / Procedure	CFV Accreditation
Incoming Inspection	CFV	NA
Visual Inspection	IEC 61215:2005 §10.1	ISO 17025
Electroluminescence Imaging	IEC TS 60904-13:2018	ISO 17025
Preconditioning	IEC 61215:2005, Clause 5	ISO 17025
Performance at STC	IEC 61215:2005 §10.6.3.1	ISO 17025
Performance at Low Irradiance	IEC 61215:2005 §10.7	ISO 17025
Performance at NOCT	IEC 61215:2005 §10.6.3.2	ISO 17025
Temperature Coefficients	IEC 61215:2005 §10.4	ISO 17025
NOCT	IEC 61215:2005 §10.5	ISO 17025

Procedure Notes

For all I-V measurements (including temperature coefficients) the following details apply:

Spectral Mismatch Factor 1.000

Measurement Mode Forward and reverse sweeps

Measurement Duration 25 ms forward, 25 ms reverse

Flash Profile Type Plateau

Averaging Three I-V measurements are obtained and averaged.

Equipment and Calibration

Equipment and calibration information is available upon request.

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