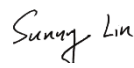





TEST REPORT	
SunSpec Common Smart Inverter Profile (CSIP) Conformance Test	
Report Reference No.	: SHES250400627401
Tested by (name + signature)	: Sunny Lin 
Approved by (name + signature)	: Roger Hu 
Date of issue	: 2025-04-23
Testing Laboratory Name	: SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
Address	: No.588 West JinDu Road, SongJiang District, ShangHai, CHINA
Testing location / procedure	: NRTL <input checked="" type="checkbox"/> WMT <input type="checkbox"/> TMP <input type="checkbox"/>
Testing location / address	: Same as above
Applicant's name	: MidNite Solar, Inc.
Address	: 19115 62nd Ave. NE, 98223, Arlington, Washington, United States of America
Test specification:	
Standard	: California Public Utilities Commission Resolution E-5000 & E-5036
Reference test procedure/standard ..	: Common Smart Inverter Profile V2.1 SunSpec Common Smart Inverter Profile (CSIP) Conformance Test Procedures V1.2
Non-standard test method	: N/A
Test item description	
ESS Inverter	: ESS Inverter
Trademark	: MidNite Solar, Inc.
Inverter Model/Type reference	: MN 15-12KW-AIO
Variant Models	: MN 7.5-5KW-AIO, MN 9-6KW-AIO, MN 12-7K6W-AIO, MN 12-8KW-AIO
Firmware version	: 051001
Rating(s)	: Refer to the page 5 to page 8 of this report
Gateway Model/Type reference	: Refer to page 4 of the report for details
Manufacturer	
As same as Applicant's name	: As same as Applicant's name
Address	: As same as Applicant's Address
Sample Series#	: 2324-20060081PH

Testing

Date of receipt of test item : 2024-07-08

Date(s) of performance of test : 2024-07-08 to 2024-07-10,
2024-12-17 to 2024-12-20**General remarks**

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

Remarks: This report is based on the original report SHES240701489102 issued on 2025-01-13, which changes the applicant, model.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Index

1. GENERAL INFORMATION	4
1.1 Testing Period and Climatic Conditions	4
1.2 Equipment Under Testing.....	4
1.3 Test Equipment List.....	8
1.4 Test Set up & Test Conditions	9
1.5 Test Results	10

1. GENERAL INFORMATION

1.1 Testing Period and Climatic Conditions

Necessary tests were conducted during two periods: one was between February 21st, 2023, and June 28th, 2023, and the other was from December 17th to December 20th, 2024.

All the tests and checks have been performed at climatic conditions:

Temperature	25 ± 10 °C
Relative Humidity	50 ± 20 %
Pressure	90 ± 10 kPa

1.2 Equipment Under Testing

- Part 1: Gateway Information

Product Type	CA Rule 21/CSIP DER Client
Product Name	Stick Logger(WiFi)
Product Model	LSW-5 Series
Product Object ID	1.3.6.1.4.1.58214.01
Software Operation Environment Type	Physical device
Software Name	LSW5BLE_MW17_CSIP5406_1.11
Software Version	1.11
Software Checksum	16b8d9d19a489cfd35277816eae40232
Operating System	FreeRTOS
Operating System Version	V10.2.0
SunSpec Certificate Number	CS-000046

- Optional: Gateway Information

Product Type	CA Rule 21/CSIP DER Client
Product Name	WiFi Module, LAN Module, Wi-Fi Dual Module, 4G Module
Product Model	EMS, SE WIFI U3, EMS Ethernet, SE LAN U3, SE WIFI U3D, SE 4G
Product Object ID	1.3.6.1.4.1.60675.026200.1(EMS) 1.3.6.1.4.1.60675.202200.1(SE WIFI U3) 1.3.6.1.4.1.60675.026200.2(EMS Ethernet) 1.3.6.1.4.1.60675.202210.1(SE LAN U3) 1.3.6.1.4.1.60675.202220.1(SE WIFI U3D) 1.3.6.1.4.1.60675.202230.1(SE 4G)
Software Operation Environment Type	Physical device
Software Name	ems.bin
Software Version	026200-05_010804
Software Checksum	1217201847
Operating System	FreeRTOS
Operating System Version	V10.5.1
SunSpec Certificate Number	CS-000089

- Part 2: Inverter Information

Equipment under testing:

- MN 15-12KW-AIO

Variant models:

- MN 7.5-5KW-AIO
- MN 9-6KW-AIO
- MN 12-7K6W-AIO
- MN 12-8KW-AIO

The parameter of each model as following:

Model:	MN 7.5-5KW-AIO		MN 9-6KW-AIO
INPUT RATINGS:			
Maximum input voltage	600V dc		
Range of input operating voltage	70 V dc to 540 V dc		
Range of input operating voltage with full power	200 V dc to 480 V dc		
Maximum input current (dc)	30/22 Adc		
Number of input	2		
OUTPUT RATINGS (Grid terminal, Bi-directional):			
Output power factor rating	default >0.99 (-0.8~+0.8 adjustable)		
Operating voltage range (ac) (L1-L2/L1-N)	0.88Un~1.1Un		
Number of phases	Single phase/Split phase		
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac		
Normal output frequency	60 Hz		
Maximum continuous output current (ac) per line	22.9Arms	27.5Arms	
Rated output current (ac) per line	20.9Arms	25Arms	
Maximum output apparent power (ac)	5.5 kVA	6.6 kVA	
Maximum continuous output power (ac)	5.0 kW	6.0 kW	
Maximum output fault current (ac) and duration	494 A _{peak} /18.6ms, 14.09 A _{rms} /cycle		
Trip limit and trip time accuracy - Voltage:	±1% Un		
Utility interconnection voltage and frequency trip limits and trip times	see Note 1 and 2		
Trip limit and trip time accuracy - Frequency:	±0.01 Hz		
Trip limit and trip time accuracy - Time	±1%setting, but not less than 50ms		
Normal operation temperature range	-25°C to 60°C (>45 °C derating)		
Enclosure Rating Type	Type 3R		
Weigh (kg)	46.2kg		
Dimension (mm)	420*950*240		
OUTPUT RATINGS (BACKUP output terminal):			
Number of phases	Single phase/Split phase		
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac		
Normal output frequency	60 Hz		
Maximum continuous output power (ac)	5.5 kVA	6.6 kVA	
Rated output power (ac)	5.0 kW	6.0 kW	
Battery terminal, Bi-directional:			
Battery Type	Lithium-ion/Lead-acid		
Range of DC operating voltage (Vdc)	40-64V dc		
Nominal voltage (Vdc)	48V dc		
Max. charging/ discharging current (Adc)	210/130 Arms	210/130 Arms	
Max. charging/ discharging power (W)	10000W/5000W	10000W/6000W	

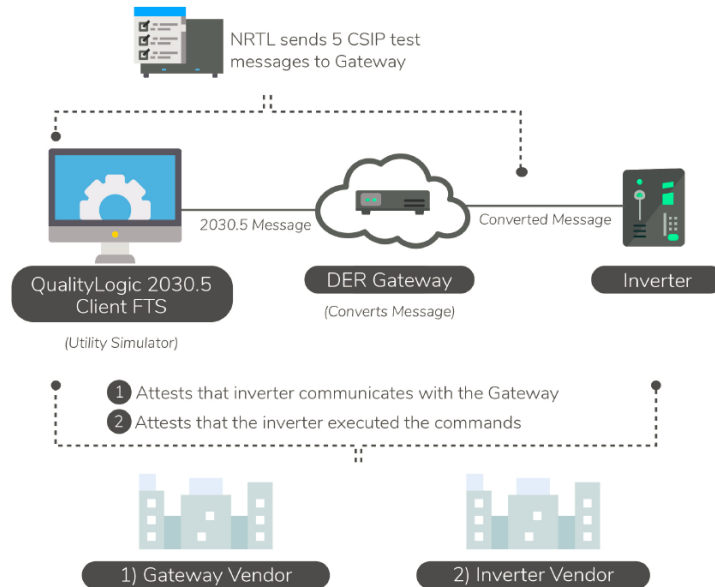
Model:	MN 12-7K6W-AIO		MN 12-8KW-AIO	
INPUT RATINGS:				
Maximum input voltage	600V dc			
Range of input operating voltage	70 V dc to 540 V dc			
Range of input operating voltage with full power	200 V dc to 480 V dc			
Maximum input current (dc)	30/22/22 Adc			
Number of input	3			
OUTPUT RATINGS (Grid terminal, Bi-directional):				
Output power factor rating	default >0.99 (-0.8~+0.8 adjustable)			
Operating voltage range (ac) (L1-L2/L1-N)	0.88Un~1.1Un			
Number of phases	Single phase/Split phase			
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac			
Normal output frequency	60 Hz			
Maximum continuous output current (ac) per line	34.8Arms	36.7Arms		
Rated output current (ac) per line	31.7Arms	33.4Arms		
Maximum output apparent power (ac)	8.36 kVA	8.8 kVA		
Maximum continuous output power (ac)	7.6 kW	8.0 kW		
Maximum output fault current (ac) and duration	494 A _{peak} /18.6ms, 14.09 A _{rms} /cycle			
Trip limit and trip time accuracy - Voltage:	±1% Un			
Utility interconnection voltage and frequency trip limits and trip times	see Note 1 and 2			
Trip limit and trip time accuracy - Frequency:	±0.01 Hz			
Trip limit and trip time accuracy - Time	±1%setting, but not less than 50ms			
Normal operation temperature range	-25°C to 60°C (>45 °C derating)			
Enclosure Rating Type	Type 3R			
Weigh (kg)	46.2kg			
Dimension (mm)	420*950*240			
OUTPUT RATINGS (BACKUP output terminal):				
Number of phases	Single phase/Split phase			
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac			
Normal output frequency	60 Hz			
Maximum continuous output power (ac)	8.36 kVA	8.8 kVA		
Rated output power (ac)	7.6 kW	8.0 kW		
Battery terminal, Bi-directional:				
Battery Type	Lithium-ion/Lead-acid			
Range of DC operating voltage (Vdc)	40-64V dc			
Nominal voltage (Vdc)	48V dc			
Max. charging/ discharging current (Adc)	210/180 Arms	210/180 Arms		
Max. charging/ discharging power (W)	10000W/7600W	10000W/8000W		

Model:	MN 15-12KW-AIO
INPUT RATINGS:	
Maximum input voltage	600V dc
Range of input operating voltage	70 V dc to 540 V dc
Range of input operating voltage with full power	200 V dc to 480 V dc
Maximum input current (dc)	30/22/22 Adc
Number of input	3
OUTPUT RATINGS (Grid terminal, Bi-directional):	
Output power factor rating	default >0.99 (-0.8~+0.8 adjustable)
Operating voltage range (ac) (L1-L2/L1-N)	0.88Un~1.1Un
Number of phases	Single phase/Split phase
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac
Normal output frequency	60 Hz
Maximum continuous output current (ac) per line	47.5Arms
Rated output current (ac) per line	41.7Arms
Maximum output apparent power (ac)	11.4 kVA
Maximum continuous output power (ac)	10 kW
Maximum output fault current (ac) and duration	494 A _{peak} /18.6ms, 14.09 A _{rms} /cycle
Trip limit and trip time accuracy - Voltage:	±1% Un
Utility interconnection voltage and frequency trip limits and trip times	see Note 1 and 2
Trip limit and trip time accuracy - Frequency:	±0.01 Hz
Trip limit and trip time accuracy - Time	±1%setting, but not less than 50ms
Normal operation temperature range	-25°C to 60°C (>45 °C derating)
Enclosure Rating Type	Type 3R
Weigh (kg)	46.2kg
Dimension (mm)	420*950*240
OUTPUT RATINGS (BACKUP output terminal):	
Number of phases	Single phase/Split phase
Nominal output voltage (ac)	Split phase:120/240Vac; 2/3 phase: 208Vac
Normal output frequency	60 Hz
Maximum continuous output power (ac)	11.4 kVA
Rated output power (ac)	10 kW
Battery terminal, Bi-directional:	
Battery Type	Lithium-ion/Lead-acid
Range of DC operating voltage (Vdc)	40-64V dc
Nominal voltage (Vdc)	48V dc
Max. charging/ discharging current (Adc)	210/210Arms
Max. charging/ discharging power (W)	10000W/10000W

1.3 Test Equipment List

SGS	IEEE 2030.5 (SEP 2.0) Test System	QualityLogic / FTS Function	Software Version: 4.6	--
-----	-----------------------------------	-----------------------------	--------------------------	----

1.4 Test Set up & Test Conditions



Note:

As the gateway used by customer is certified by SunSpec, the compatibility testing is as part of IEEE2030.5 conformance testing of the gateway. According to the Resolution E-5000 & E-5036, for inverters that do not directly implement IEEE 2030.5 client functionality, the following five test cases according to SunSpec CSIP test procedures on the gateway while it is connected to the inverter.

- 1) Inverter Status (BASIC-028)
- 2) Inverter Meter Reading (BASIC-029)
- 3) Basic Inverter Control – Volt/Var (BASIC-006)
- 4) Basic Inverter Control – Fixed Power Factor (BASIC-008)
- 5) Basic Inverter Control – Volt-Watt (BASIC-011)

The test was conducted using the QualityLogic IEEE 2030.5 Test Harness which implements the test cases that are described in the CSIP Test Procedures document.

The inverter under test was subjected to testing conditions as follows:

- ✓ The inverter was operating during test harness verification procedure.
- ✓ The gateway was given orders as IEEE 2030.5 commands (Inverter Status, Inverter Meter Reading, Volt/VAR, Fixed Power Factor, and Volt/Watt) sent from an IEEE 2030.5 Client FTS that were subsequently translated to signals understood by the inverter.
- ✓ The inverter parameters were verified:
 - a) to change during the test cases for Volt-VAR, Fixed Power Factor, and Volt-Watt and
 - b) report monitored data during the test cases for Inverter Status and Inverter Meter Reading.
 Based on this procedure, the requirements from Appendix C of the resolution were verified.

1.5 Test Results

Interpretation Keys

Test object does meet the requirement

Test object does not meet the requirement

Test case does not apply to the test object

To make a reference to a table or an annex.

To indicate that the test has not been realized

P Pass

F Fails

N/A Not applicable

See additional sheet

N/R Not realized

Test Name	Test Description	Result
BASIC-006	Basic Inverter Control (Volt/Var) [C, A, S]	Pass
BASIC-008	Basic Inverter Control (Fixed Power Factor) [C, A, S]	Pass
BASIC-011	Basic Inverter Control (Volt-Watt) [C, A, S]	Pass
BASIC-028	Inverter Status [C, A, S]	Pass
BASIC-029	Inverter Meter Reading [C, A, S]	Pass

-- END of REPORT --