



**Keystone Compliance, LLC
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Sol-Ark

2304-176E



EMI Test Report 2304-176E Rev. A

Test Standards: MIL-STD-461G

For

Sol-Ark

1100 Professional Drive
Plan, TX 75074

On

15K-2P-N Inverter

Model Number: N/A; Part Number: N/A; Serial Number: N/A

Performed By: Keystone Compliance, LLC.
131 Columbus Inner Belt
New Castle, PA 16101

Keystone Compliance, LLC. does hereby certify that all inspections and tests have been performed in accordance with the documents referenced herein with exceptions as noted in this report. The results in this report pertain to the specified equipment tested. This report shall not be reproduced, except in full, without the written authorization of Keystone Compliance, LLC.

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Date: 8/18/2023

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Date: 8/18/2023

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Date: 8/18/2023



EMI TEST REPORT FOR SOL-ARK

Document History				
Revision	Issue Date	Description of Modifications	Revised By	Approved By
N/C	5/22/2023	Initial release	N/A	T.M.
A	8/18/2023	Added photograph to page 8. Power to page 14	TB	TM



EMI TEST REPORT FOR SOL-ARK

Client Information	
Purchase Order	1698
Quote Number	2304-176E
EUT Arrival Date	5/15/2023 -- Received in good condition
Company Name	Sol-Ark
Address	1100 Professional Drive
City, State Zip	Plan, TX 75074
Contact Name	Dylan Hillman
Phone	972-575-8875 Ext. 101
Email	dylan@sol-ark.com

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Test Laboratory	Keystone Compliance, LLC.
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Title	EMC Lab Manager
E-Mail Address	TonyJr@keystonecompliance.com

Test Program Information	
Test Personnel	Mike Gennaro -- EMC Test Technician
Test Title & Test Dates	RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP) – May 16, 2023



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EMI TEST REPORT FOR SOL-ARK

Introduction

This report documents the results of the EMC tests performed on the 15K-2P-N Inverter, Model Number: N/A; Part Number: N/A; Serial Number: N/A, submitted by Sol-Ark

The EMC test programs described herein were performed in accordance with the applicable requirements of MIL-STD-461G.

Statements of compliance are made in this report without taking measurement uncertainty into account, except for when specifically requested by the customer. Where statements of compliance are made in this report, the following decision rules are applied:

Complied/Met the criteria of the specification - Results are within the limits
Non-Compliant/Did not meet the criteria of the specification - Results exceed the limits

All test data is included in Section 3 of this document.

All tests performed at Keystone Compliance New Castle, PA EMC test facility. All tests were performed using the test set-ups of the relevant standard for tests performed in laboratory conditions.

Acronyms and Abbreviations

EMC – Electromagnetic Compatibility	EMI – Electromagnetic Interference
EUT – Equipment Under Test	M/N – Model Number
P/N – Part Number	S/N – Serial Number
Vac – Voltage Alternating Current	DC – Direct Current
AM – Amplitude Modulation	dB – Decibel
deg – Degree	H/V – Horizontal or Vertical Polarity
m – Meters	cm – Centimeter
V/m – Volts per meter	dBuV/m – Decibel microvolts per meter
kV – Kilovolt	Hz – Hertz
kHz – Kilohertz	MHz – Megahertz
GHz – Gigahertz	pF – Picofarad
Ω – Ohm	QP – Quasi-Peak
N/A – Not Applicable	

EMI TEST REPORT FOR SOL-ARK
Configuration

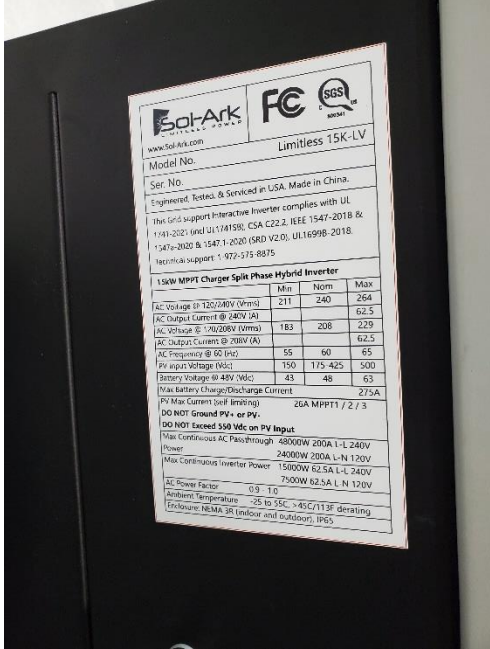
Testing performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations, and settings used to complete the evaluation. The actual test parameters specified in the test data; this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation, indicated in the test data.

EUT		
Description		Manufacturer
15K-2P-N Inverter		Sol-Ark
Model Number	Part Number	Serial Number
N/A	N/A	N/A

EUT

15K-2P-N Inverter

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EUT	
	
<p>Model Information</p>	

EUT	
	
<p>Battery Connected to Inverter</p>	

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Summary of Tests Performed & Results
Table 1 Tests Performed & Results

Report Paragraph	Test Description	Specification	Notes	Results
MIL-STD-461G				
3.1	RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP)	MIL-STD-461G	Test Level: 50kV/m; Waveform: See FIGURE RS105-1	Complied

EMI TEST REPORT FOR SOL-ARK

Section 1 – Test Conditions and Equipment**1.1 Instrumentation and Equipment**

Measuring and test equipment, utilized in the performance of these tests, was calibrated in accordance with ANSI/NCSL Z540-3-2006, by Keystone Compliance, LLC or a commercial facility, utilizing reference standards (or interim standards) whose calibrations have been certified as being traceable to the National Institute of Standards & Technology (NIST). All reference standards utilized in the above calibration system are supported by certificates, reports, or data sheets attesting to the date, accuracy, and conditions under which the results furnished were obtained. All subordinate standards, measuring and test equipment are supported by like data when such information is essential to achieve the accuracy control required by the procedure.

Keystone Compliance, LLC attests that the commercial sources providing calibration services on the above-referenced equipment, other than the NIST Standards are in fact capable of performing the required services to the satisfaction of Keystone Compliance, LLC Quality Assurance. Certifications of all calibrations performed are retained on file in the Keystone Compliance, LLC Quality Assurance Department, and are available for inspection upon request by customer representatives.

The test equipment utilized during this test program is listed on individual Test Equipment Logs located in Section 3 of this document.

1.2 Tolerances

All test conditions were maintained within all applicable specified tolerances.

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Section 2 – References

2.1 Applicable Specifications

Reference
Specification Title

MIL-STD-461G
Requirements For The Control Of Electromagnetic Interference Characteristics Of Subsystems And Equipment

Calibration
Information

ANSI/NCSL Z540-3-2006
Calibration Laboratories and Measuring Test Equipment - General Requirements

EMI TEST REPORT FOR SOL-ARK

Section 3 –Test Equipment, Test Data, & Test Photographs

3.1 RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP) Test

- a) The RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP) test requirements for the 15K-2P-N Inverter are specified in MIL-STD-461G.
- b) The RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP) test equipment used to test the 15K-2P-N Inverter is located in Paragraph 3.1.1 of this document.
- c) All recorded test data for the RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP) test on the 15K-2P-N Inverter is located in Paragraph 3.1.2 of this document.
- d) The RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP) test photographs for the 15K-2P-N Inverter are located in Paragraph 3.1.3 of this document.

EMI TEST REPORT FOR SOL-ARK

3.1.1 RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP) Test Equipment Log

Equipment Log		
Customer:	Sol-Ark	
Date:	5/16/23	
Test Engineer:	M. Gennaro	
Test:	RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP)	
Test Specifications		
Test Spec:	MIL-STD-461G	

Test Equipment					
Asset No.	Description	Manufacturer	Model	Serial No.	Cal. Due
ED013	Digital Oscilloscope	Tektronix	TDS754A	B011163	12/14/2023
EU000	WaveStar (Version 2.9)	Tektronix	None	None	UWCE
EF103	RS105 Generator	Keystone	None	None	CBU
EE055	D-Dot Sensor	Prodyn	AD-30(A)	75	11/15/2023
EE056	Passive Integrator	Prodyn	None	None	11/15/2023
EE057	RS105 Antenna	Keystone	None	None	UWCE
ED013	Digital Oscilloscope	Tektronix	TDS754A	B011163	12/14/2023
EU000	WaveStar (Version 2.9)	Tektronix	None	None	UWCE

UWCE: Used with Calibrated Equipment

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3.1.2 RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP) Test Data

RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP) Data Sheet			
Customer:	Sol-Ark		
Date:	5/16/23	Test Engineer:	M. Gennaro
Config. #:	1	Power:	EndureEnergy Systems ESP-5100 Battery (~51VDC)
		Job Site:	Keystone Compliance
Test Specifications			
Test Spec.:	MIL-STD-461G		

Test Data

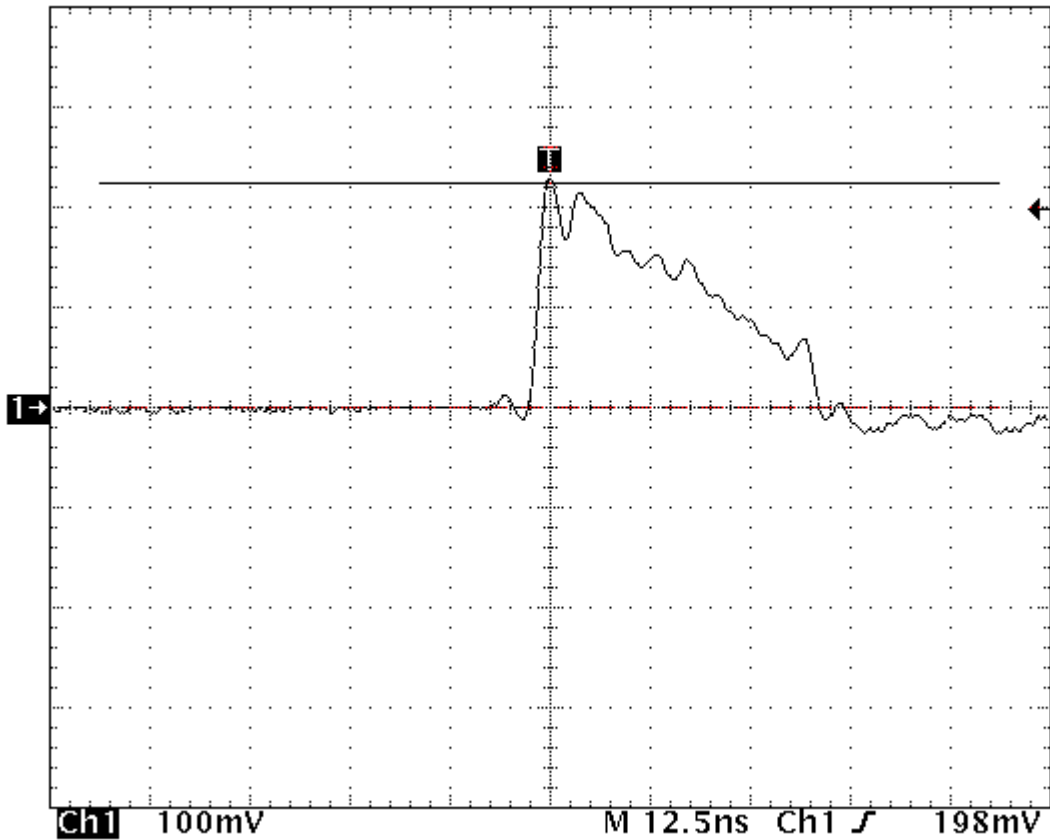
Test Specifications			
Probe Factor:	.004427 V per kV/m	Category/Limits:	50kV/m
Test Level:	50 kV/m	Method:	MIL-STD-461G; RS105
# Pulses	5 per Axis	Axes Tested:	X, Y, Z
Repetition Rate:	<1 Pulse Per Minute		

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Calibration – Amplitude

Tek Stop: 2.00GS/s

17 Acqs



Δ: 224mV
@: 224mV

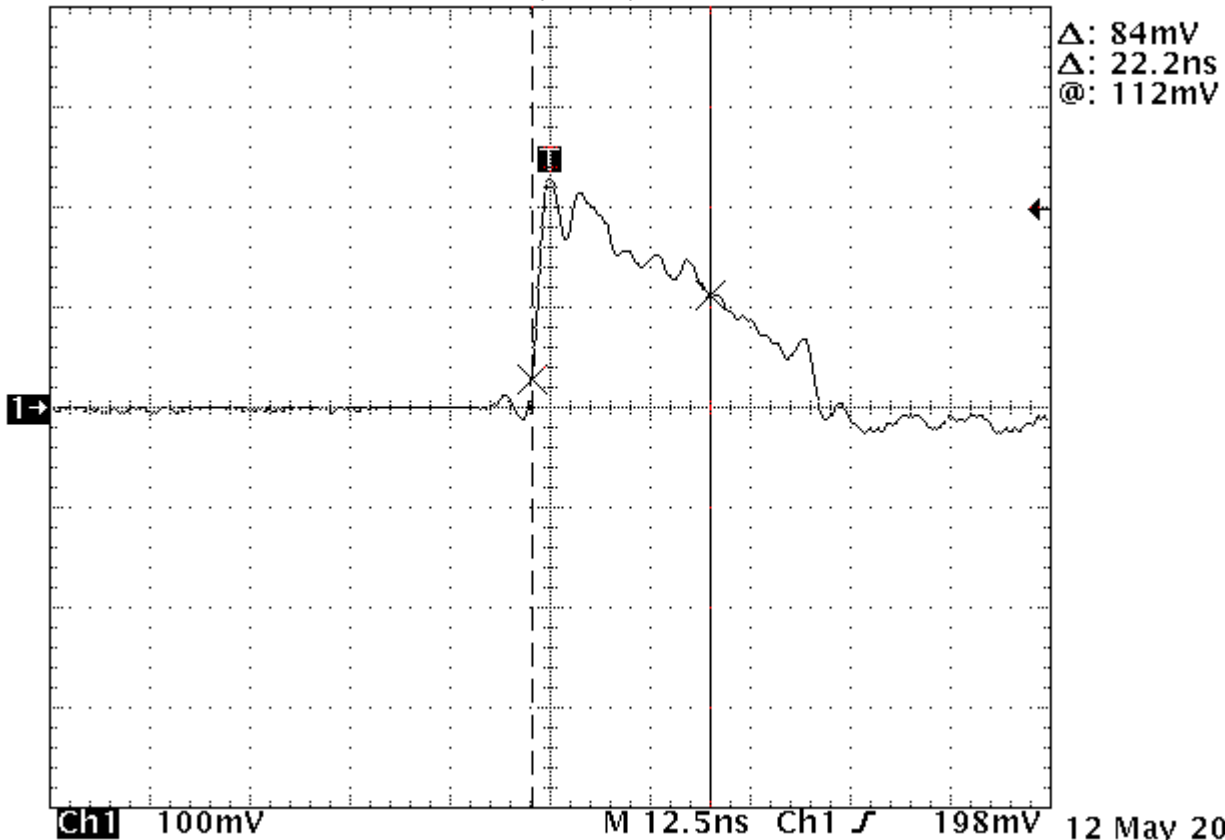
12 May 2023
10:59:31

EMI TEST REPORT FOR SOL-ARK

Calibration – FWHM

Tek Stop: 2.00GS/s

17 Acqs



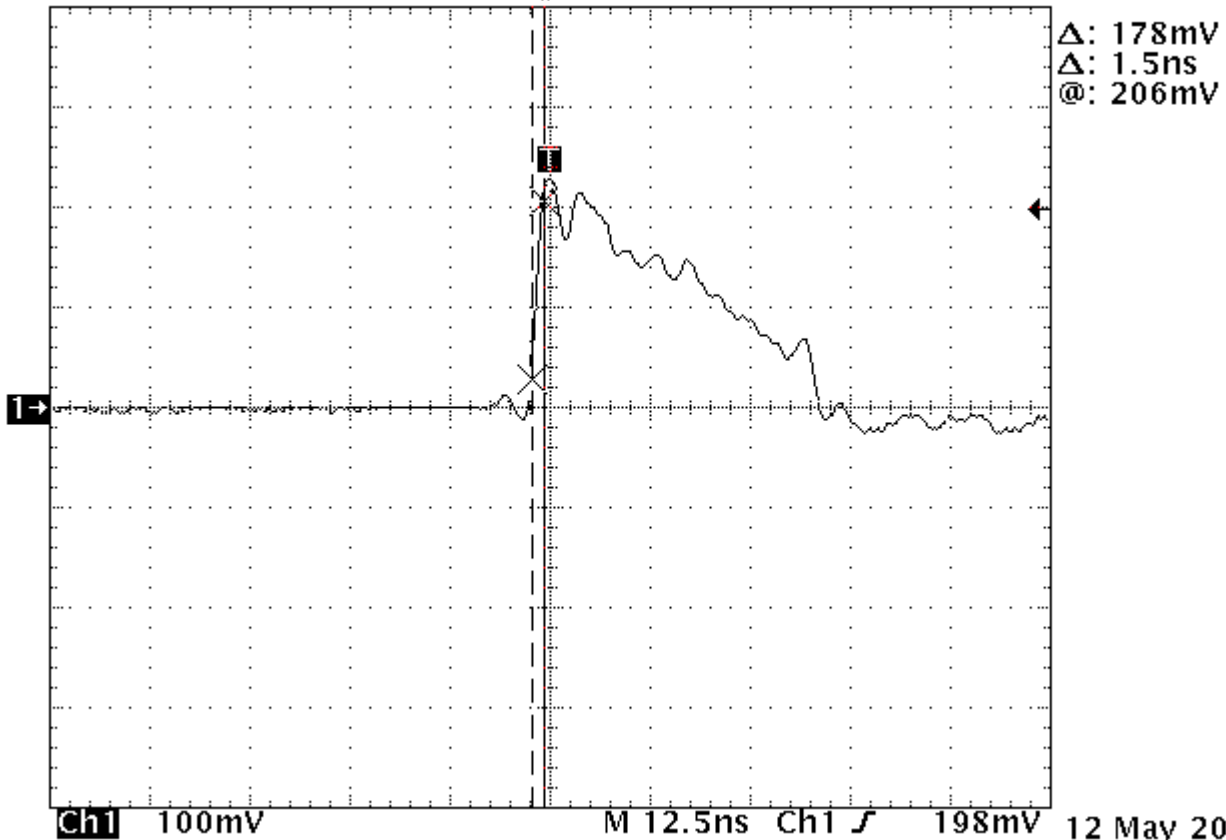
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11:13:39

EMI TEST REPORT FOR SOL-ARK

Calibration – Risetime

Tek Stop: 2.00GS/s

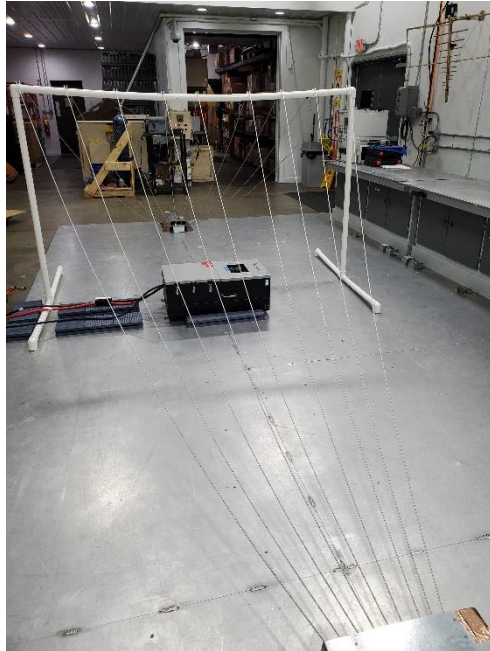
17 Acqs



12 May 2023
11:02:30

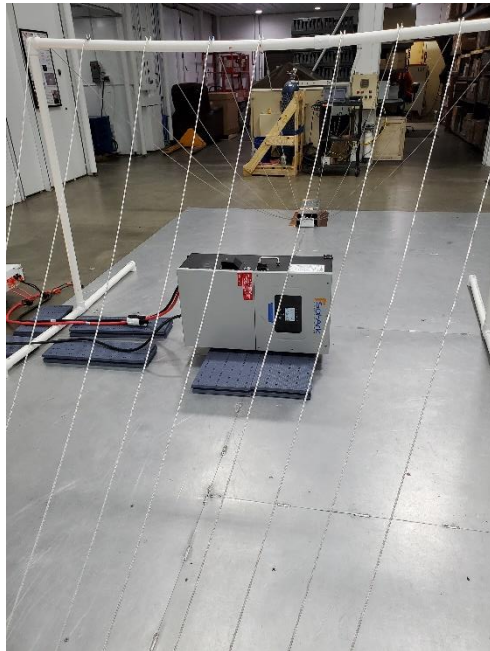
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3.1.3 RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP) Test Photographs



**RS105 - Radiated Susceptibility
- Transient Electromagnetic
Field (EMP)**

Test Setup - X Axis



**RS105 - Radiated Susceptibility
- Transient Electromagnetic
Field (EMP)**

Test Setup - Y Axis

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**RS105 - Radiated Susceptibility
- Transient Electromagnetic
Field (EMP)**

Test Setup - Z Axis

EMI TEST REPORT FOR SOL-ARK
Section 4 – Conclusion

- a) The 15K-2P-N Inverter, Model Number: N/A; Part Number: N/A; Serial Number: N/A, was subjected to the following EMC Tests in accordance with MIL-STD-461G and the specifications as shown in Table 2:

Table 2 Tests Performed & Results

Test Description	Specification	Results
MIL-STD-461G		
RS105 - Radiated Susceptibility - Transient Electromagnetic Field (EMP)	MIL-STD-461G	Complied

- b) The 15K-2P-N Inverter was returned to Sol-Ark after completion of the EMI Test.