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Electromagnetic Compatibility Criteria Test Report

for the

**Spartan SAS
WaveTech**

To be evaluated under the Requirements of
IEEE-299

MET Report: EMC94298-IEEE

June 6, 2017

Prepared For:

**Spartan SAS
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75005, Paris, France**

Prepared By:
MET Laboratories, Inc.
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Baltimore, MD 21230



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WaveTech**

To be evaluated under the requirements of

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Testing Performed By:

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Electromagnetic Compatibility Lab

Prepared By:

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Test Report Status Sheet

Revision	Test Report Date	Reason for Revision
Ø	June 6, 2017	Initial Issue.



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I. Overview



A. Overview

Model(s) Tested:	WaveTech
Model(s) Covered:	WaveTech
EUT Specifications:	Primary Power Tested: NA
Analysis:	The results obtained relate only to the item(s) tested.
Prepared by:	Jesse Trawinski

B. References

IEEE-299: 2006	Measuring the Effectiveness of Electromagnetic Shielded Enclosures
ISO/IEC 17025: 2005	General Requirements for the Competence of Testing and Calibration Laboratories

Table 1. List of Reference Documents



II. Equipment Configuration



A. Overview

MET Laboratories, Inc. was contracted by Spartan SAS to perform testing on the WaveTech.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Spartan SAS, WaveTech.

In accordance with §2.955(a) (3), the following data is presented in support of the verification of the Spartan SAS, WaveTech. Spartan SAS should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the WaveTech has been **permanently** discontinued, as per §2.955(b).

The results obtained relate only to the item(s) tested.

B. Test Site

All testing was performed at MET Laboratories, Inc., 914 West Patapsco Ave. Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

C. Description of Test Sample

The WaveTech, is the Equipment Under Test (EUT).

D. Equipment Configuration

All equipment incorporated as part of the EUT is included in the following list.

Ref. ID	Name / Description	Model Number	Part Number	Serial Number	Revision
-	WaveTech	-	-	-	-

Table 2. Equipment Configuration

E. Support Equipment

No support equipment was necessary for the operation and testing of the EUT

F. Modifications

i. Modifications to the EUT

No modifications were made to the EUT.

ii. Modifications to the Test Standard

No modifications were made to the test standard.

G. Disposition of EUT

The test sample including all support equipment (if any), submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Spartan SAS upon completion of testing.



III. IEEE-299



A. Shielding Effectiveness Measurement Data

Test Results: Testing was completed by Cheng Zheng on 05/05/17.

Environmental Conditions:

Temperature:
20°C
Rel. Humidity:
42%

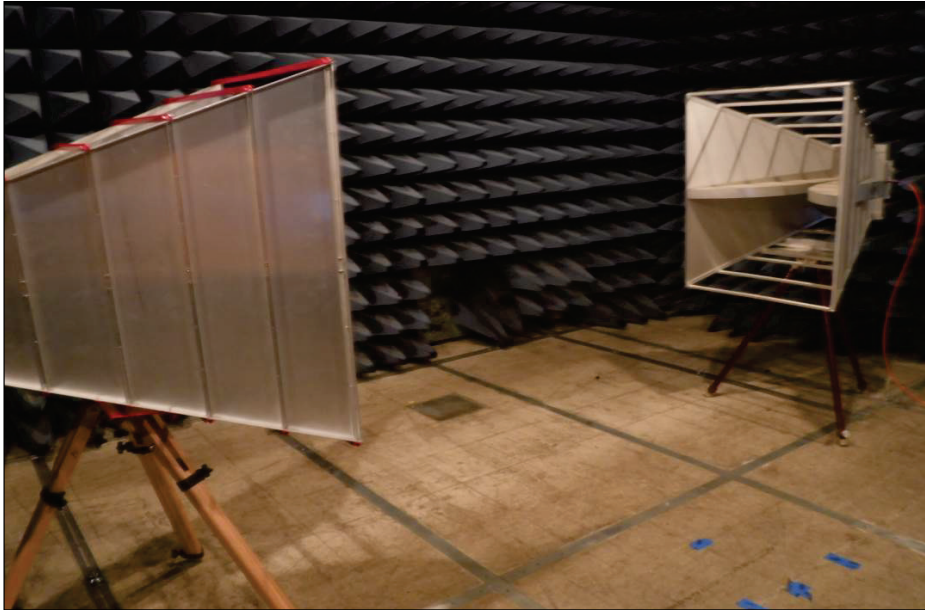
Frequency (MHz)	Noise Floor Measurement (dBm)		Direct Measurement (dBm)		Dynamic Range (dB)		Steel Panel Isolation (dBm)		Shielding Effectiveness of Steel Panel (dB)	
	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical
700.00	-115.45	-116.05	3.52	4.83	118.97	120.88	-110.4	-110.3	113.92	115.13
800.00	-116.05	-115.29	4.06	3.3	120.11	118.59	-110.68	-108.65	114.74	111.95
900.00	-116.36	-115.05	1.96	1.24	118.32	116.29	-113.56	-111.6	115.52	112.84
1000.00	-117.22	-115.23	-8.72	-5.41	108.5	109.82	-113.09	-115.15	104.37	109.74
2000.00	-117.56	-115.05	-17.34	-18.77	100.22	96.28	-113.25	-113.68	95.91	94.91
3000.00	-113.02	-113.17	-18.59	-20.34	94.43	92.83	-110.96	-112.31	92.37	91.97
4000.00	-113.61	-113.71	-16.73	-16.82	96.88	96.89	-113.49	-113.37	96.76	96.55
5000.00	-116.44	-114.88	-20.12	-19.49	96.32	95.39	-113.47	-113.79	93.35	94.3

Table 3. Shielding Effectiveness, Test Results, 1

Frequency (MHz)	WaveStopper Fabric Measurement		Shielding Effectiveness of WaveStopper Fabric(dB)		Shielding Effectiveness WaveStopper (%)
	Horizontal	Vertical	Horizontal	Vertical	
700.00	-37.89	-39.04	41.41	43.87	99,99%
800.00	-40.32	-41.49	44.38	44.79	99,99%
900.00	-38.06	-38.63	40.02	39.87	99,99%
1000.00	-41.31	-41.65	32.59	36.24	99,95%
2000.00	-47.12	-45.34	29.78	26.57	99,90%
3000.00	-45.97	-41.63	27.38	21.29	99,82%
4000.00	-43.6	-38.19	26.87	21.37	99,79%
5000.00	-47.94	-43.08	27.82	23.59	99,84%

Table 4. Shielding Effectiveness, Test Results, 2

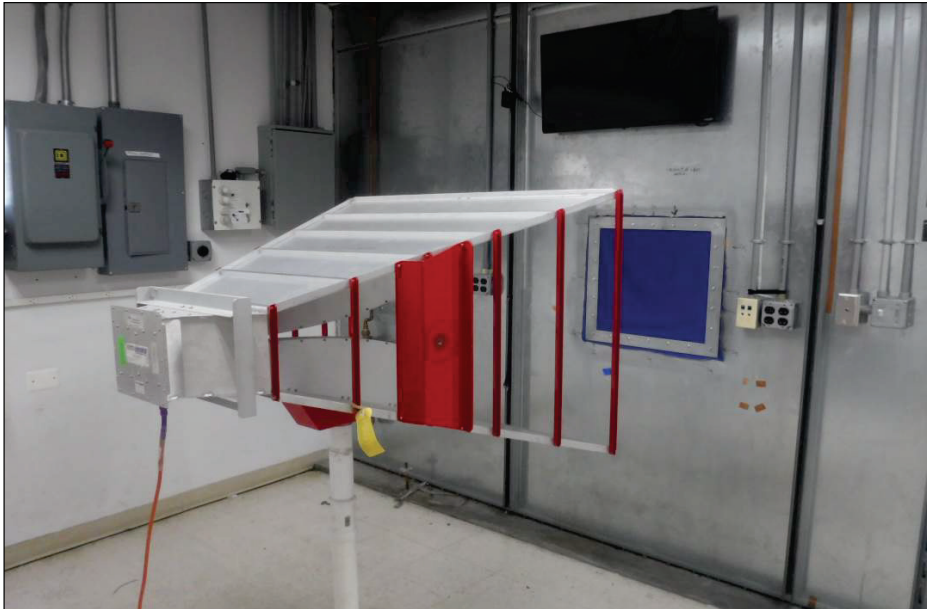
B. Electric Field Shielding Effectiveness (Test Setup)



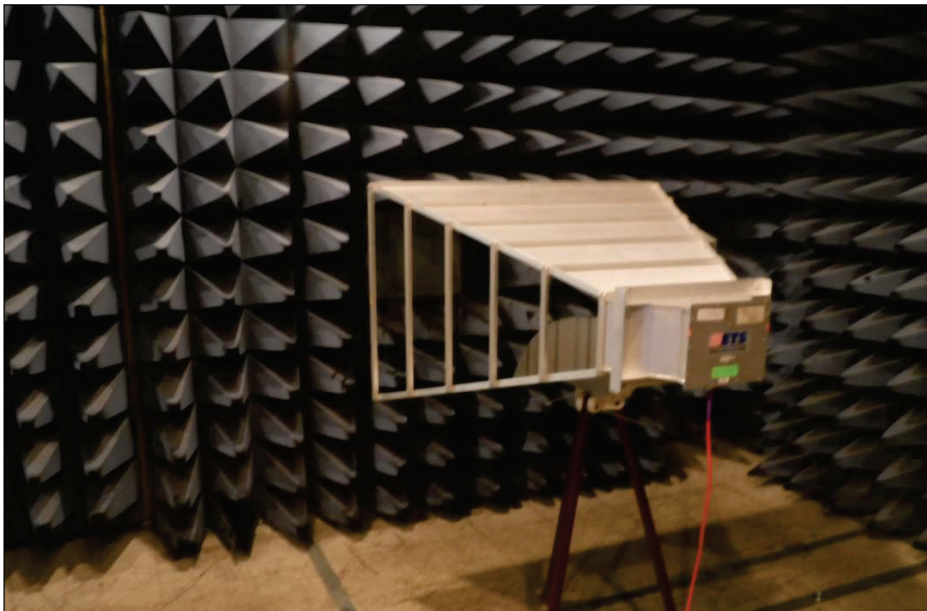
Photograph 1. Shielding Effectiveness, Big Horn Ambient and Direct Measurement, Test Setup



Photograph 2. Shielding Effectiveness, Big Horn EUT Measurement Receiver, Test Setup



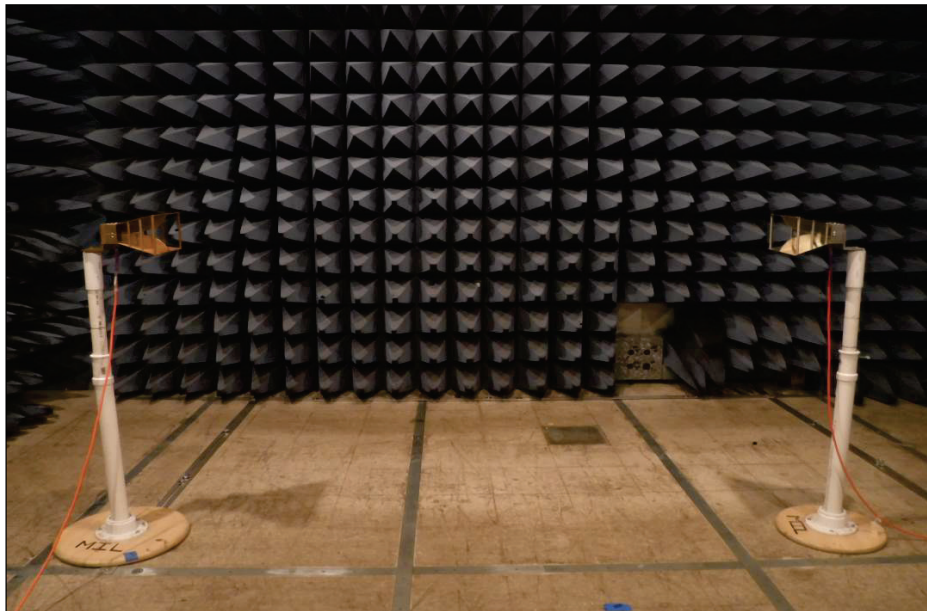
Photograph 3. Shielding Effectiveness, Big Horn EUT Measurement Transmitter, Test Setup



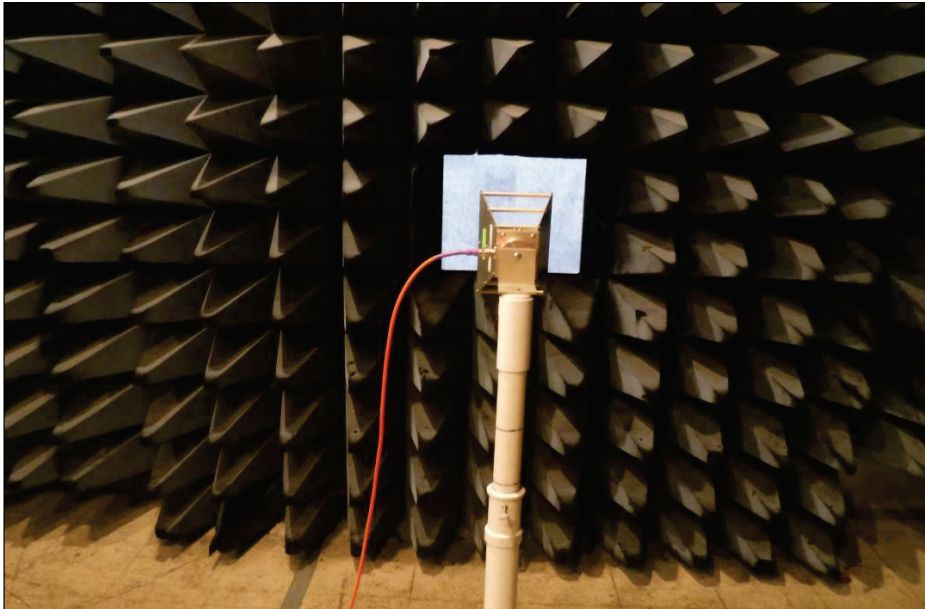
Photograph 4. Shielding Effectiveness, Big Horn Isolation Measurement Receiver, Test Setup



Photograph 5. Shielding Effectiveness, Big Horn Isolation Measurement Transmitter, Test Setup



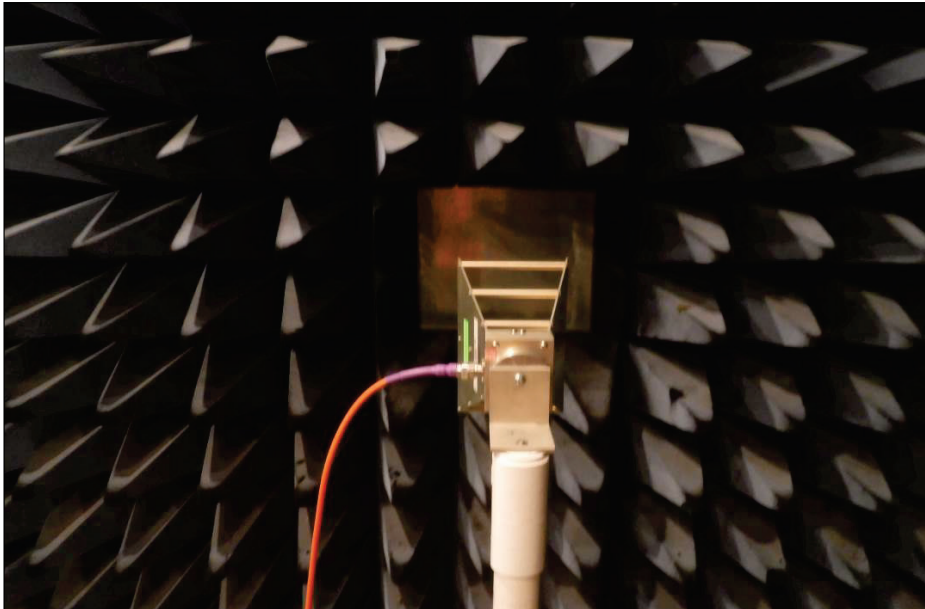
Photograph 6. Shielding Effectiveness, Small Horn Ambient and Direct Measurement, Test Setup



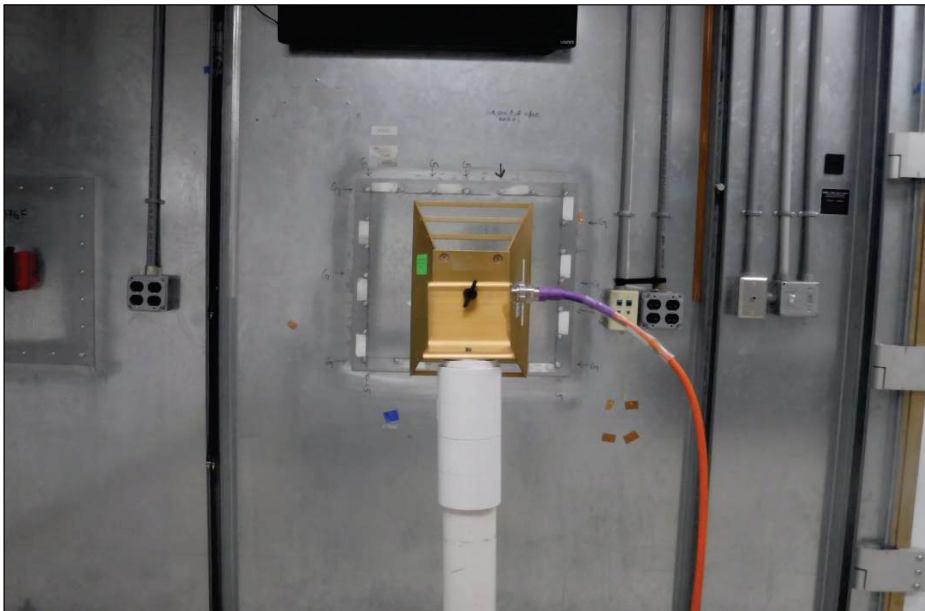
Photograph 7. Shielding Effectiveness, Small Horn EUT Measurement Receiver, Test Setup



Photograph 8. Shielding Effectiveness, Small Horn EUT Measurement Transmitter, Test Setup



Photograph 9. Shielding Effectiveness, Small Horn Isolation Measurement Receiver, Test Setup



Photograph 10. Shielding Effectiveness, Small Horn Isolation Measurement Transmitter, Test Setup



C. Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2005.

MET #	EQUIPMENT	MANUFACTURER	MODEL#	CAL DATE	CAL DUE
1T4480	MILITARY CHAMBER 20 X 20 X 12	ETS-LINDGREN	SERIES 80	NOT REQUIRED	
1T4710	SIGNAL GENERATOR	HP	8648D	08/31/2016	03/03/2018
1T4765	ANTENNA; DRG HORN	ETS-LINDGREN	3106B	01/17/2017	07/17/2018
1T4375	DOUBLE RIDGED WAVEGUIDE HORN	ETS-LINDGREN	3106	03/03/2016	09/03/2017
1T4681	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4448A	11/07/2016	11/07/2017
1T2278	SWEPT SIGNAL GENERATOR	HEWLETT PACKARD	83650B	05/10/2016	11/10/2017
1T8371	DOUBLE RIDGE GUIDE HORN ANTENNA	A.H. SYSTEMS, INC.	SAS-571	02/14/2017	02/14/2018
1T4905	HORN ANTENNA	COM-POWER	AH-118	02/05/2016	08/05/2017
1T4909	DIGITAL BAROMETER, HYGROMETER, THERMOMETER	CONTROL COMPANY	06-662-4	01/11/2016	01/11/2018

Table 5. Test Equipment



End of Test Report