



**Keystone Compliance, LLC  
131 Columbus Inner Belt  
New Castle, PA 16101**

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**MOS Equipment**

**2002-277ED-1**



# Shielding Effectiveness Test Report 2002-277ED-1 Rev. N/C

Test Standards: IEEE 299-2006

For

## MOS Equipment

201 W Montecito Street  
Santa Barbara, CA 93101

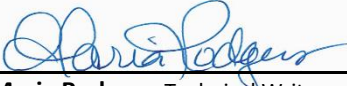

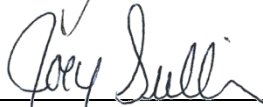
On

## FitanRF Faraday Tape

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, as received. This report shall not be reproduced, except in full, without the written authorization of Keystone Compliance, LLC.

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**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**

<b>Document History</b>				
<b>Revision</b>	<b>Issue Date</b>	<b>Description of Modifications</b>	<b>Revised By</b>	<b>Approved By</b>
N/C	10/7/2020	Initial release	N/A	T.M.

**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**

Client Information	
Purchase Order	2002-277EA
Quote Number	2002-277ED-1
EUT Arrival Date	8/13/2020 -- Received in good condition
Company Name	MOS Equipment
Address	201 W Montecito Street
City, State Zip	Santa Barbara, CA 93101
Contact Name	Amanda Benenati
Email	amanda@mosequipment.com

Test Facility Information	
Test Laboratory	Keystone Compliance, LLC.
Address	131 Columbus Inner Belt
City, State, Zip Code	New Castle, PA 16101
Phone	(724) 657-9940
Fax	724-657-9920
Web Site	<a href="http://www.keystonecompliance.com">www.keystonecompliance.com</a>
Contact Name	Tony Masone Jr.
Title	Lab Manager
E-Mail Address	<a href="mailto:Tonyjr@keystonecompliance.com">Tonyjr@keystonecompliance.com</a>

Test Program Information	
Test Personnel	Travis Gennaro – EMC Test Technician
Test Title & Test Dates	Shielding Effectiveness – September 11, 2020 to September 15, 2020

**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**
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**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**

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## Introduction

This report documents the results of the EMC tests performed on the FitanRF Faraday Tape, Model Number: N/A; Part Number: N/A; Serial Number: N/A, submitted by MOS Equipment

The EMC test programs described herein were performed in accordance with the applicable requirements of IEEE 299-2006.

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

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

**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**

**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
FitanRF Faraday Tape		MOS Equipment
Model Number	Part Number	Serial Number
N/A	N/A	N/A



**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**
**Summary of Tests Performed & Results**
**Table 1 Tests Performed & Results**

Report Paragraph	Test Description	Specification	Notes	Results
IEEE 299-2006				
3.1	Shielding Effectiveness	IEEE 299-2006	1.5-40GHz	Determined by Customer



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**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**

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**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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**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**

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## Section 2 – References

### 2.1 Applicable Specifications

Reference Specification Title	<b>IEEE 299-2006</b> <b>Method for Measuring the Effectiveness of Electromagnetic Shielding Enclosures</b>
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Calibration Information	<b>ANSI/NCSL Z540-3-2006</b> <b>Calibration Laboratories and Measuring Test Equipment— General Requirements</b>
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**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**

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### **Section 3 – Test Descriptions, Test Equipment, Test Data, & Test Setup Photographs**

#### **3.1 Shielding Effectiveness Test**

- a) The Shielding Effectiveness test requirements for the FitanRF Faraday Tape are specified in IEEE 299-2006.
- b) The Shielding Effectiveness test description for the FitanRF Faraday Tape is located in Paragraph 3.1.1 of this document.
- c) The Shielding Effectiveness test equipment used to test the FitanRF Faraday Tape is located in Paragraph 3.1.2 of this document.
- d) All recorded test data for the Shielding Effectiveness test on the FitanRF Faraday Tape is located in Paragraph 3.1.3 of this document.
- e) The Shielding Effectiveness test setup photographs for the FitanRF Faraday Tape are located in Paragraph 3.1.4 of this document.

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**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**


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## 3.1.1 Shielding Effectiveness Test Description

<b>Test Description</b>
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Using the configuration(s) noted within this report, multiple shielding effectiveness tests were performed. The frequency range investigated is also noted in this report.

<b>Sample Calculation</b>
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Shielding Effectiveness: "Open Bulkhead" measurement – Test Screen Measurement
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<b>Measurement Bandwidths</b>					
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Start Frequency:	1.5GHz	Stop Frequency:	40GHz	Step Size:	10/decade
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**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**

## 3.1.2 Shielding Effectiveness Test Equipment Log

Equipment Log	
Customer:	<b>MOS Equipment</b>
Date:	<b>9/11/20</b>
Test Engineer:	<b>T. Gennaro</b>

Test Equipment					
Asset No.	Description	Manufacturer	Model	Serial No.	Cal. Due
EF058	Signal Generator	Rohde & Schwarz	SMR20	100742	12/20/2020
EG007	RF Amplifier	Hewlett Packard	8349B	2644A01939	UWCE
EG066	RF Amplifier	Exodus Advanced Communications	AMP4037	10005	UWCE
EE039	DRG Antenna	Rohde & Schwarz	HF906	100066	UWCE
EE051	DRG Antenna	EMCO	3115	2434	10/16/2021
EE017	DRG Antenna	ETS Lindgren	3116	00026390	2/19/2022
EE071	Horn Antenna (18-26.5GHz)	Exodus Advanced Communications	EHA42-300-24	None	UWCE
EE072	Horn Antenna (26.5-31.5GHz)	Exodus Advanced Communications	EHA34-300-24	None	UWCE
EE073	Horn Antenna (31.5-40GHz)	Exodus Advanced Communications	EHA28-300-24	None	UWCE

**UWCE:** Used with Calibrated Equipment

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**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**


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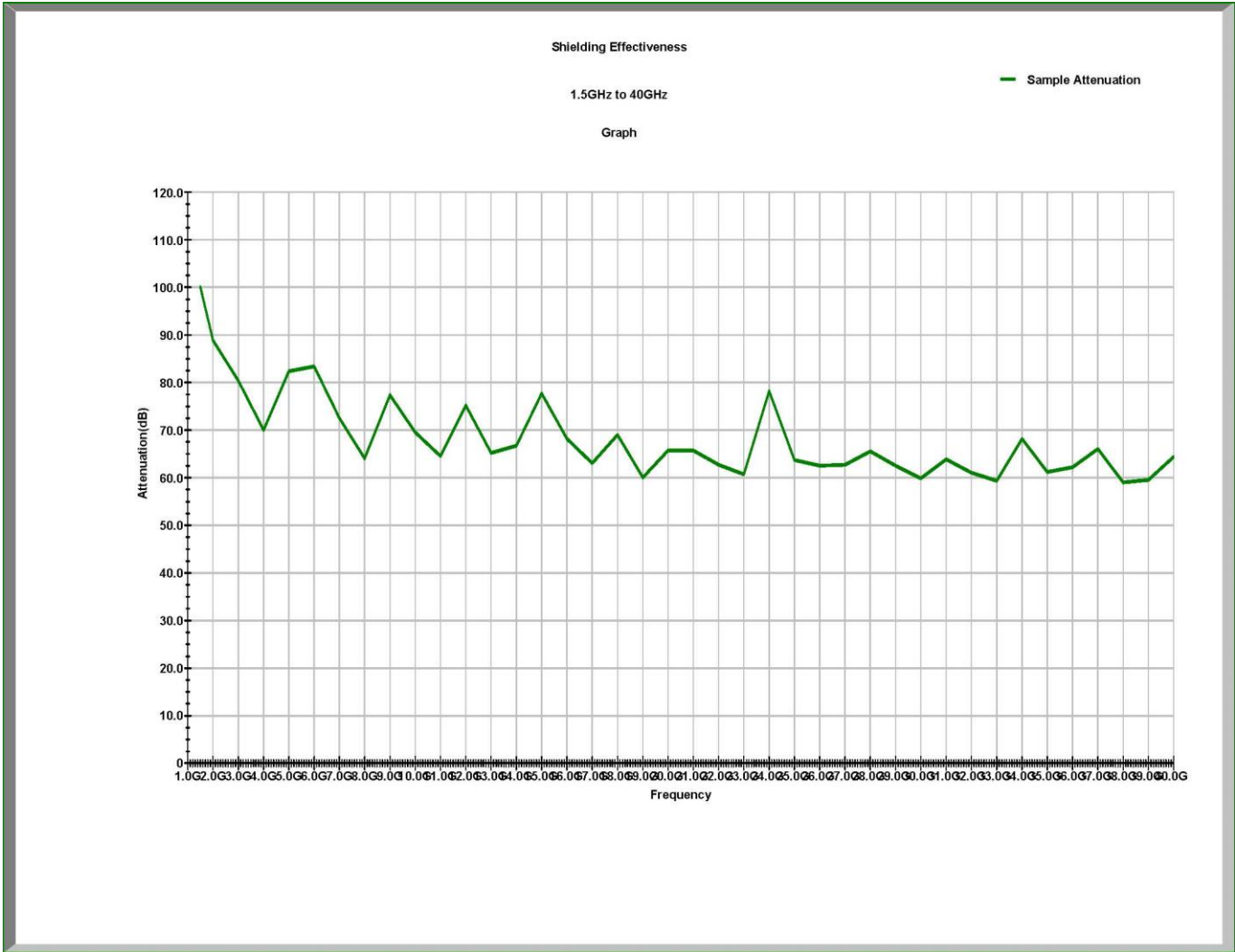


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## 3.1.3 Shielding Effectiveness Test Data

Shielding Effectiveness Data Sheet			
Customer:	MOS Equipment		
Date:	9/11/20	Test Engineer:	T. Gennaro
Config. #:	1	Power:	N/A
		Job Site:	Keystone Compliance
Test Specifications			
Test Spec.:	IEEE 299-2006		
Test Data			
Test Parameters			
Start Frequency:	1.5GHz	Stop Frequency:	40GHz
		Test Distance:	2 meters
EUT Operating Modes			
N/A			
Comments			
None			
Deviations From Test Standard			
None			
Results			
N/A			

**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**



**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**

Shielding Effectiveness – 10inch Tape	
Frequency	Attenuation (dB)
1.5GHz	100.00
2GHz	88.83
3GHz	80.33
4GHz	70.00
5GHz	82.33
6GHz	83.34
7GHz	72.50
8GHz	64.00
9GHz	77.33
10GHz	69.50
11GHz	64.50
12GHz	75.16
13GHz	65.17
14GHz	66.67
15GHz	77.67
16GHz	68.16
17GHz	63.00
18GHz	69.00
19GHz	60.00
20GHz	65.67
21GHz	65.67
22GHz	62.67
23GHz	60.67
24GHz	78.17
25GHz	63.67
26GHz	62.50
27GHz	62.67
28GHz	65.50
29GHz	62.50
30GHz	59.84
31GHz	63.84
32GHz	61.00
33GHz	59.33
34GHz	68.16
35GHz	61.16
36GHz	62.17
37GHz	66.00
38GHz	59.00
39GHz	59.50
40GHz	64.33



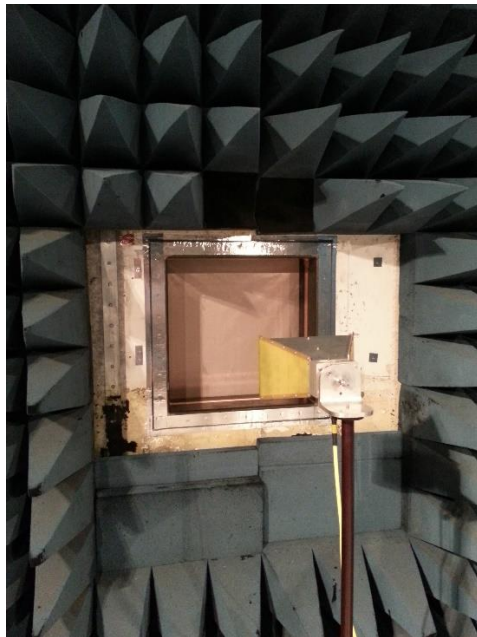
**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**

3.1.4 Shielding Effectiveness Test Setup Photographs



**Shielding Effectiveness**

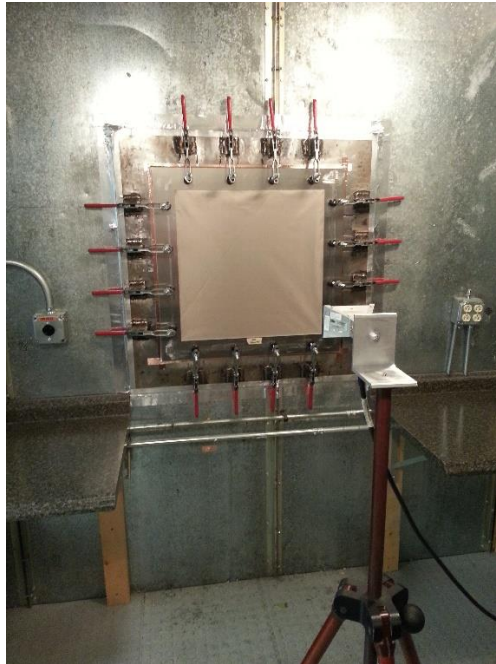
**1.5GHz to 17GHz  
 Receive**



**Shielding Effectiveness**

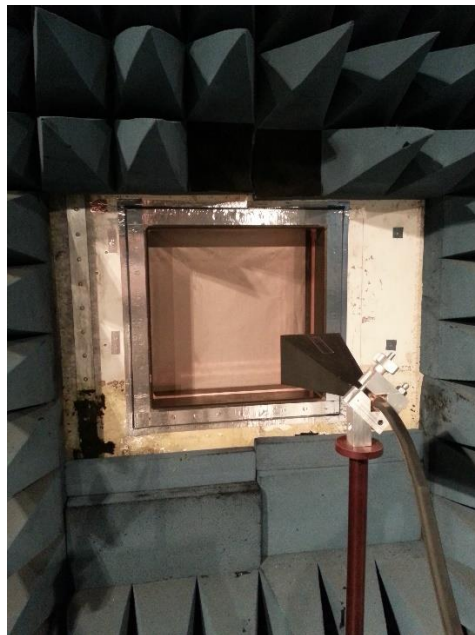
**1.5GHz to 17GHz  
 Transmit**

**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**



**Shielding Effectiveness**

**18GHz to 40GHz  
Receive**



**Shielding Effectiveness**

**18GHz to 40GHz  
Transmit**

**SHIELDING EFFECTIVENESS TEST REPORT FOR MOS EQUIPMENT**
**Section 4 – Conclusion**

- a) The FitanRF Faraday Tape, Model Number: N/A; Part Number: N/A; Serial Number: N/A, was subjected to the following EMC Tests in accordance with IEEE 299-2006 and the specifications as shown in Table 2:

**Table 2 Tests Performed & Results**

Test Description	Specification	Results
<b>IEEE 299-2006</b>		
<b>Shielding Effectiveness</b>	<b>IEEE 299-2006</b>	<b>Determined by Customer</b>

- b) The FitanRF Faraday Tape was returned to MOS Equipment after completion of the Shielding Effectiveness Test.