



166 South Carter, Genoa City, WI 53128

Company: GE Healthcare  
Model Tested: 5390144-3 Rev. 2  
Report Number: 22025  
DLS Project: 8277

## Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

### Subpart F – Ultra-Wideband Operation Section 15.519 Technical Requirements for hand held UWB systems

#### Class II Permissive Change (Antenna Change)

#### THE FOLLOWING MEETS THE ABOVE TEST SPECIFICATION

Formal Name: Ultra-Wide-Band WUSB host dongle

Kind of Equipment: Transceiver

FCC ID Number: YYJ-5390144

Frequency Range: 3168 - 4752 MHz, 6336 – 7920 MHz

Test Configuration: Hand-held transceiver tested table-top in worst case configuration of three orthogonal planes.

Model Number(s): 5390144-3 Rev.1, Rev.2, Rev.3, Rev.4, Rev.5, Rev.6

Model(s) Tested: 5390144-3 Rev. 2

Serial Number(s): 11V07067

Date of Tests: July 19 – 20, 2016

Test Conducted For: GE Healthcare  
9900 W Innovation Drive  
Wauwatosa, WI 53226

**NOTICE:** “This test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government”. Please see the "Description of Test Sample" page listed inside of this report.

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Company:  
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DLS Project:

GE Healthcare  
5390144-3 Rev. 2  
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SIGNATURE PAGE

Tested By:

A handwritten signature in black ink that reads "Craig Brandt". The signature is written in a cursive style with a long horizontal stroke extending to the right.

Craig Brandt  
Senior Test Engineer

Reviewed By:

A handwritten signature in black ink that reads "William Stumpf". The signature is written in a cursive style with a long horizontal stroke extending to the right.

William Stumpf  
OATS Manager

Approved By:

A handwritten signature in black ink that reads "Brian J. Mattson". The signature is written in a cursive style with a long horizontal stroke extending to the right.

Brian Mattson  
General Manager



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United States Department of Commerce  
National Institute of Standards and Technology



**Certificate of Accreditation to ISO/IEC 17025:2005**

NVLAP LAB CODE: 100276-0

**D.L.S. Electronic Systems, Inc.**  
Wheeling, IL

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:*

**Electromagnetic Compatibility & Telecommunications**

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.  
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality  
management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).*

2015-09-25 through 2016-09-30  
*Effective Dates*



*[Signature]*  
For the National Voluntary Laboratory Accreditation Program

**ELECTROMAGNETIC  
COMPATIBILITY &  
TELECOMMUNICATIONS**

**NVLAP LAB CODE 100276-0**

**Emissions**

**Designation**

Off-site test location

**Description**

D.L.S. Electronics performs radiated emissions testing at an additional location, 166 South Carter Street, Genoa City, WI 53128.



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1.0 Summary of Test Report

It was determined that the GE Healthcare Ultra-Wide-Band WUSB host dongle, Model 5390144-3 Rev. 2, complies with the requirements of CFR 47 Part 15 Subpart F Section 15.519.

Subpart F Applicable Technical Requirements Tested:

Table with 5 columns: Section, Description, Procedure, Note, Compliant?. Rows include: 15.519 (b) Fundamental Emission Bandwidth - 10dB, 15.519 (c) / 15.209 Radiated Spurious Emissions below 960 MHz, 15.519 (c) Radiated / RF Conducted Spurious Emissions above 960 MHz, 15.519 (c) & (e) Radiated Fundamental Emissions in band 3100 to 10600 MHz, 15.519 (d) Radiated Spurious Emissions in GPS band.

Note 1: Radiated emission measurement tested in 3 orthogonal planes.

2.0 Introduction

On July 19 - 20, 2016 the Ultra-Wide-Band WUSB host dongle, Model 5390144-3 Rev. 2, as provided from GE Healthcare was tested to the requirements of CFR 47 Part 15 Subpart C Section 15.519. To meet these requirements, the procedures contained within this report were performed by personnel of D.L.S Electronic Systems, Inc.

3.0 Test Facilities

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at http://www.dlsemc.com/certificate. Our facilities are registered with the FCC, Industry Canada, and VCCI.

Wisconsin Test Facility:
D.L.S. Electronic Systems, Inc.
166 S. Carter Street
Genoa City, Wisconsin 53128

Wheeling Test Facility:
D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL 60090

FCC Registration #90531



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#### 4.0 Description of Test Sample

##### Description:

The sample under test is a wireless transceiver module working with Ultra-Wide-Band (UWB) technologies. It is used in X-ray systems for transferring images.

##### Type of Equipment / Frequency Range:

Handheld / MHz

Band Group	Band ID	Lower Frequency	Center Frequency	Upper Frequency
1	1	3168	3432	3696
	2	3696	3960	4224
	3	4224	4488	4752
3	7	6336	6600	6864
	8	6864	7128	7392
	9	7392	7656	7920

##### Physical Dimensions of Equipment Under Test:

Length: 5 in. x Width: 2 in. x Height: 1 in.

##### Power Source:

USB powered (5 VDC)

##### Internal Frequencies:

12 MHz

##### Type of Modulation(s) / Antenna Type:

Multiband OFDM with QPSK, Dual Carrier Modulation, Modified DCM / External UWB  
Antenna: Ethertronics Part No. 1003656, 3.1 to 10.6 GHz, Peak Gain: 3.1 dBi

##### Description of Circuit Board(s) / Part Number:

UWB WUSB host dongle	5390144-3, Rev.1
UWB WUSB host dongle	5390144-3, Rev.2
UWB WUSB host dongle	5390144-3, Rev.3
UWB WUSB host dongle	5390144-3, Rev.4
UWB WUSB host dongle	5390144-3, Rev.5
UWB WUSB host dongle	5390144-3, Rev.6



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### 5.0 Test Equipment

A list of the equipment used can be found in the table below. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.

#### D.L.S. Wisconsin –Site 2 / G1

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	6-23-16	6-23-17
Preamplifier	Rohde & Schwarz	TS-PR10	032001/003	9 kHz – 1 GHz	12-3-15	12-3-16
Antenna	EMCO	3104C	9810-4849	20 MHz – 200 MHz	5-31-16	5-31-18
Antenna	Electro-Metrics	LPA-25	1114	200 MHz – 1 GHz	8-21-15	8-21-17
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A
Preamp	Ciao	CA118-4010	101	1GHz-18GHz	1-20-16	1-20-17
Horn Antenna	EMCO	3115	9502-4451	1-18GHz	6-1-15	6-1-17
Signal Generator	Rhode & Schwarz	SMR40	100092	1-40 GHz	6-23-16	6-23-17
Horn Antenna	EMCO	3115	9903-5731	1-18GHz	9-24-15	9-24-17
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	6-23-16	6-23-17
Preamp	Miteq	AMF-7D-01001800-22-10P	17779900	1GHz-18GHz	1-22-16	1-22-17
Preamp	Miteq	AMF-8B-180265-40-	438727	18GHz-26GHz	6-6-16	6-6-17
Horn Antenna	EMCO	3116	2549	18 – 40GHz	9-2-14	9-2-16
Preamp	Rohde & Schwarz	TS-PR40	052002/025	26GHz-40GHz	5-11-16	5-11-17



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## 6.0 Test Arrangements

### Emissions Measurement Arrangement:

All emissions measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.10:2013, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for additional photos of the test set up.

Unless otherwise noted, the bandwidth of the measuring receiver / analyzer used during testing is shown below.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz

## 7.0 Test Conditions

### Test Conditions recorded during test:

#### Temperature and Humidity:

75 °F at 47% RH

## 8.0 Modifications Made To EUT For Compliance

None noted at time of test.





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### 9.0 Additional Descriptions

There are multiple revisions for the part 5390144-3 (EUT). The model tested was Rev 2. The table below lists the differences between the revisions. All the revisions use the exact same radio design.

Part	Rev	DATE	ECO NUMBER	BRIEF DESCRIPTION OF CHANGE	ENGINEERING JUSTIFICATION
5390144-3	6	20-Aug-15	2196330	1. Design change to update the part 5415263-3 quantity is 0.02 in 5390144-3's BOM. 2. Update the drawing notes 6, the glue type refer to Mark Number 16 in 5390144-3's BOM	Fixed typo in BOM, fixed typo in part drawing. No hardware and firmware change on this part, so there's no impact on the radio circuitry design can performance.
5390144-3	5	27-Jul-15	2194847	Design change to update dongle board 5390144-3's BOM, replace part 5411693 with 5398807.	The changed part is a memory chip. The purpose is to align the design to the URP radio (5436008-3) to share the same memory chip which needs LTB. Since this memory chip is not on the radio path, there's no impact on the radio circuitry design and performance.
5390144-3	4	13-Jul-15	2193172	Replace the old part 46-170684P3 with new part 5415263-3	This change is to replace the EoL screw glue (Loctite 271) with the new one (Loctite 263). There's no impact on the radio circuitry design and performance.
5390144-3	3	15-May-15	2191036	Correct typing errors in 5390144-3ADW and 5390144-3TST. subsystem is UWB dongle	Fixed typos in drawing and TST, no hardware or firmware change. There's no impact on the radio circuitry design and performance.
5390144-3	2	14-Jul-13	2143812	Change Essential Classification of 5390145-3 from "Safety" to "Minor". Update the ADW of 5390144-3 by adding PWA/PWB labels since the REV of 5390144-3/5390145-3 are updated.	Essential Classification and labeling update, no hardware or firmware change. There's no impact on the radio circuitry design and performance.



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9.0 Additional Descriptions (continued)

The client has been informed of the operational limits defined in FCC 47 CFR Section 15.519 (a).

AC Mains Line conducted was not performed because the UWB radio is powered by a PC USB port.

Using a PC with proprietary software, the UWB radio was connected through a USB cable and configured for continuous transmit. The software allowed the user to configure the radio settings to achieve compliant levels and determine worst case data rate settings.

TX Rate: 53
TX Payload: 4095
TX IFS: 10 us

Final Transmitter Power Settings:

Table with 4 columns: Band Group 1, TFC 5, TFC 6, TFC 7. Rows include TPC, C1, and C2 with numerical values.

Table with 4 columns: Band Group 3, TFC 5, TFC 6, TFC 7. Rows include TPC, D1, and D2 with numerical values.

10.0 Results

Measurements were performed in accordance with ANSI C63.10:2013. Graphical and tabular data can be found in Appendix B at the end of this report.

11.0 Conclusion

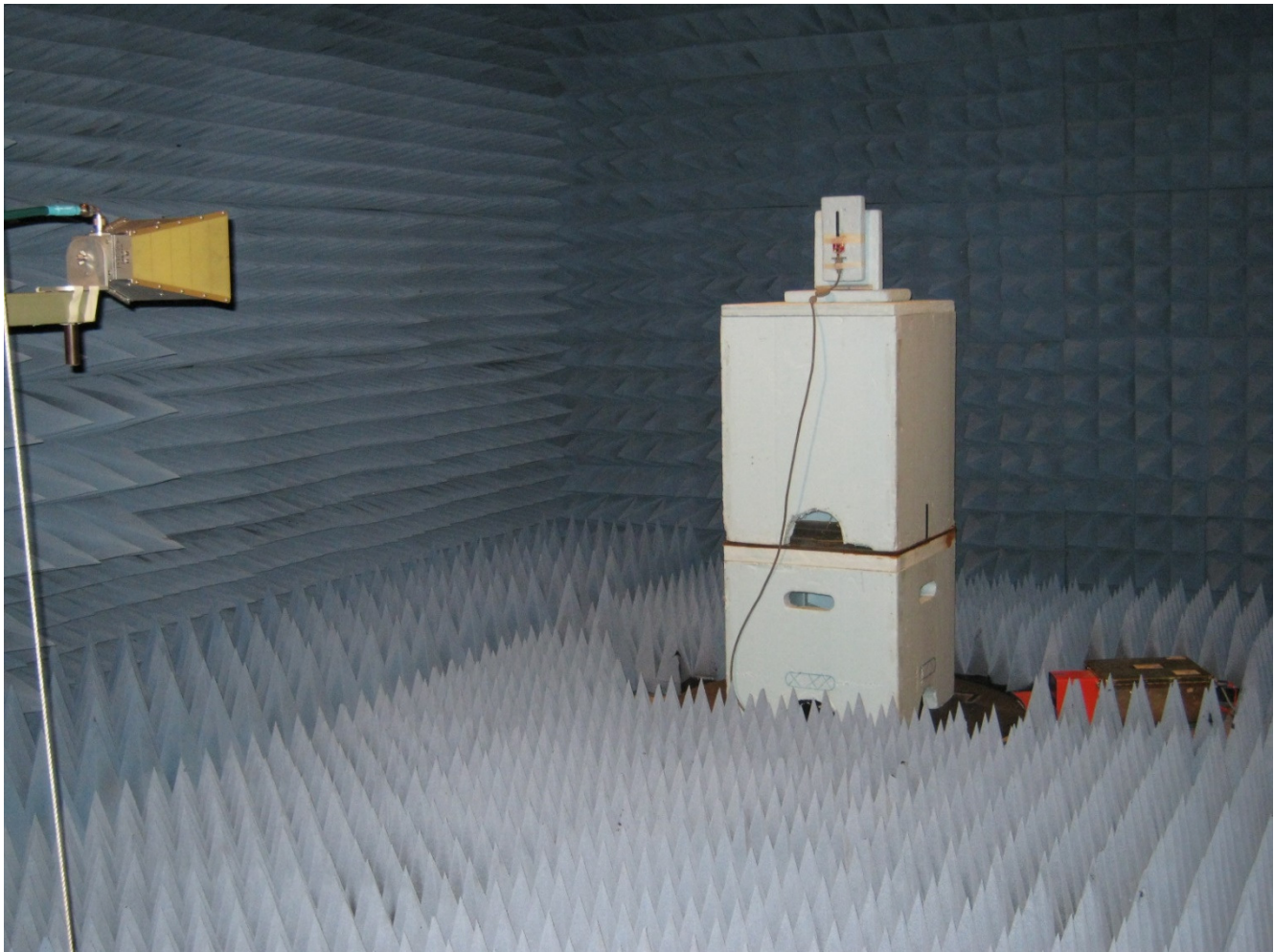
The Ultra-Wide-Band WUSB host dongle, Model 5390144-3 Rev. 2, as provided from GE Healthcare tested on July 19 - 20, 2016 meets the requirements of CFR 47 Part 15 Subpart F Section 15.519.

## Appendix A – Test Photos

### Photo Information and Test Setup:

Items: Ultra-Wide-Band WUSB host dongle 5390144-3 Rev. 2  
External UWB Antenna: Ethertronics Part No. 1003656  
3.1 to 10.6 GHz  
Peak Gain: 3.1 dBi  
20 meter USB cable with ferrite

### Radiated Emissions



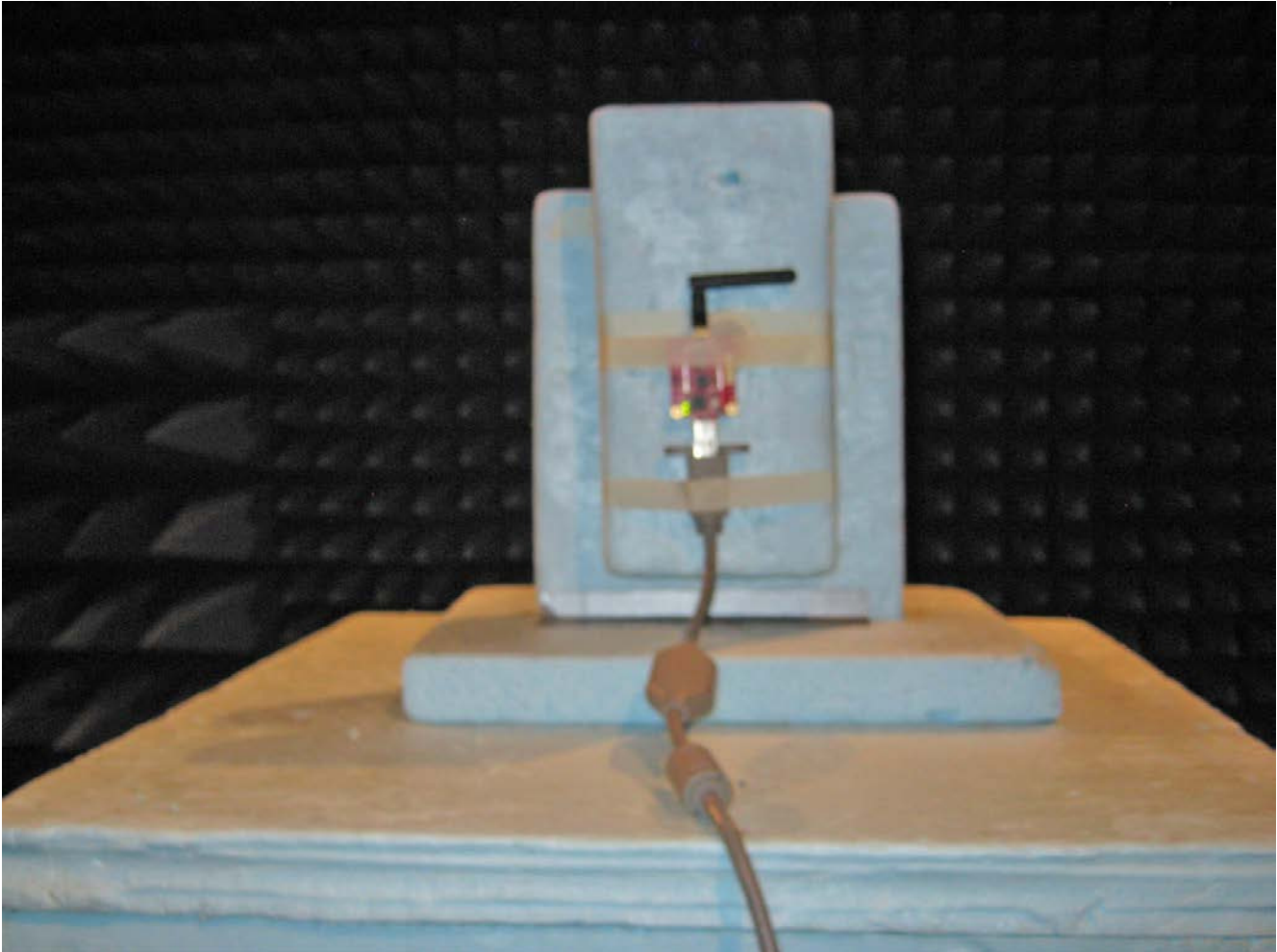
**Appendix A**

**Radiated Emissions – Position 1**



## Appendix A

### Radiated Emissions – Position 2





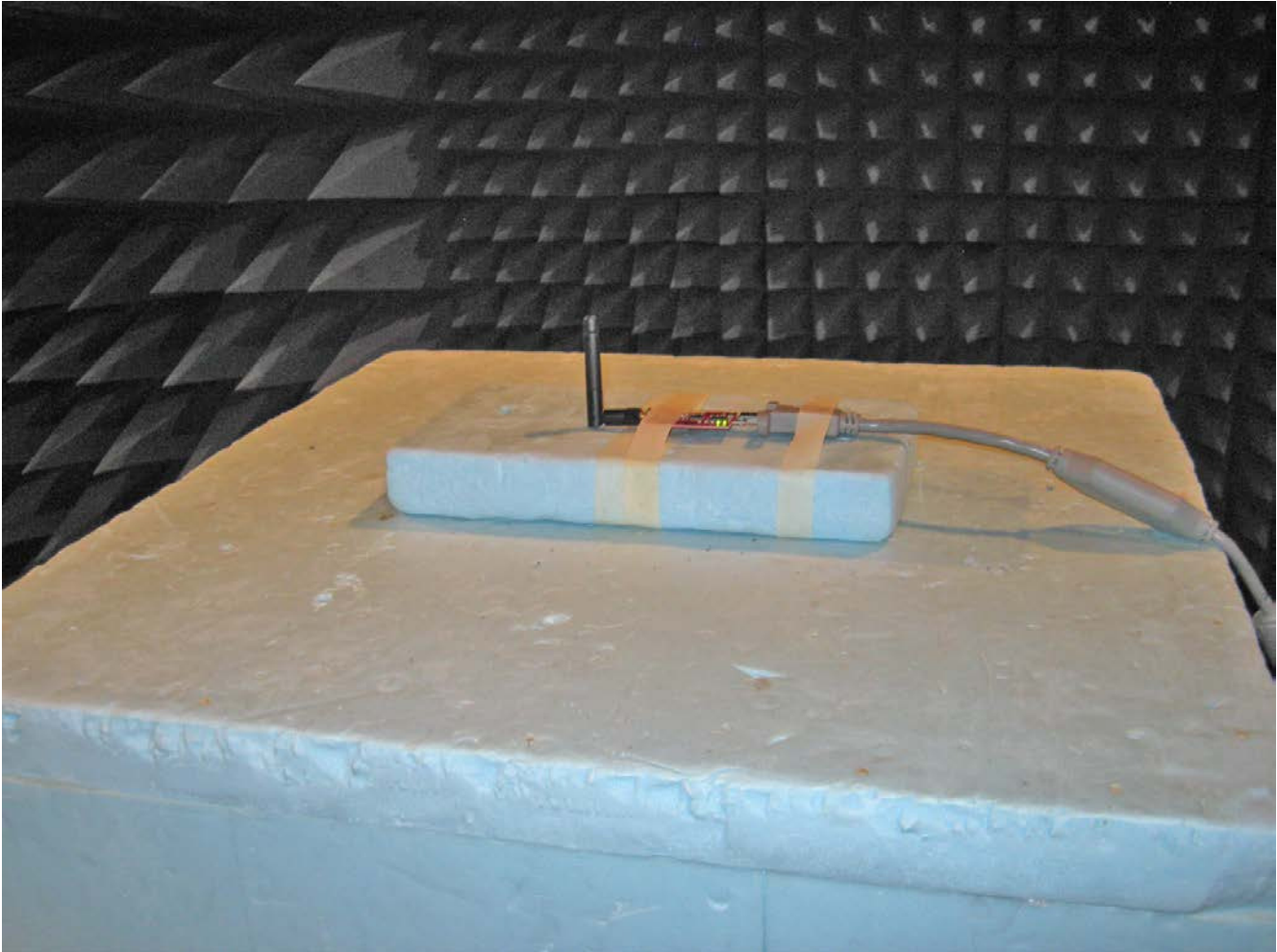
**Appendix A**

**Radiated Emissions – Position 3**



**Appendix A**

**Radiated Emissions – Position 4**



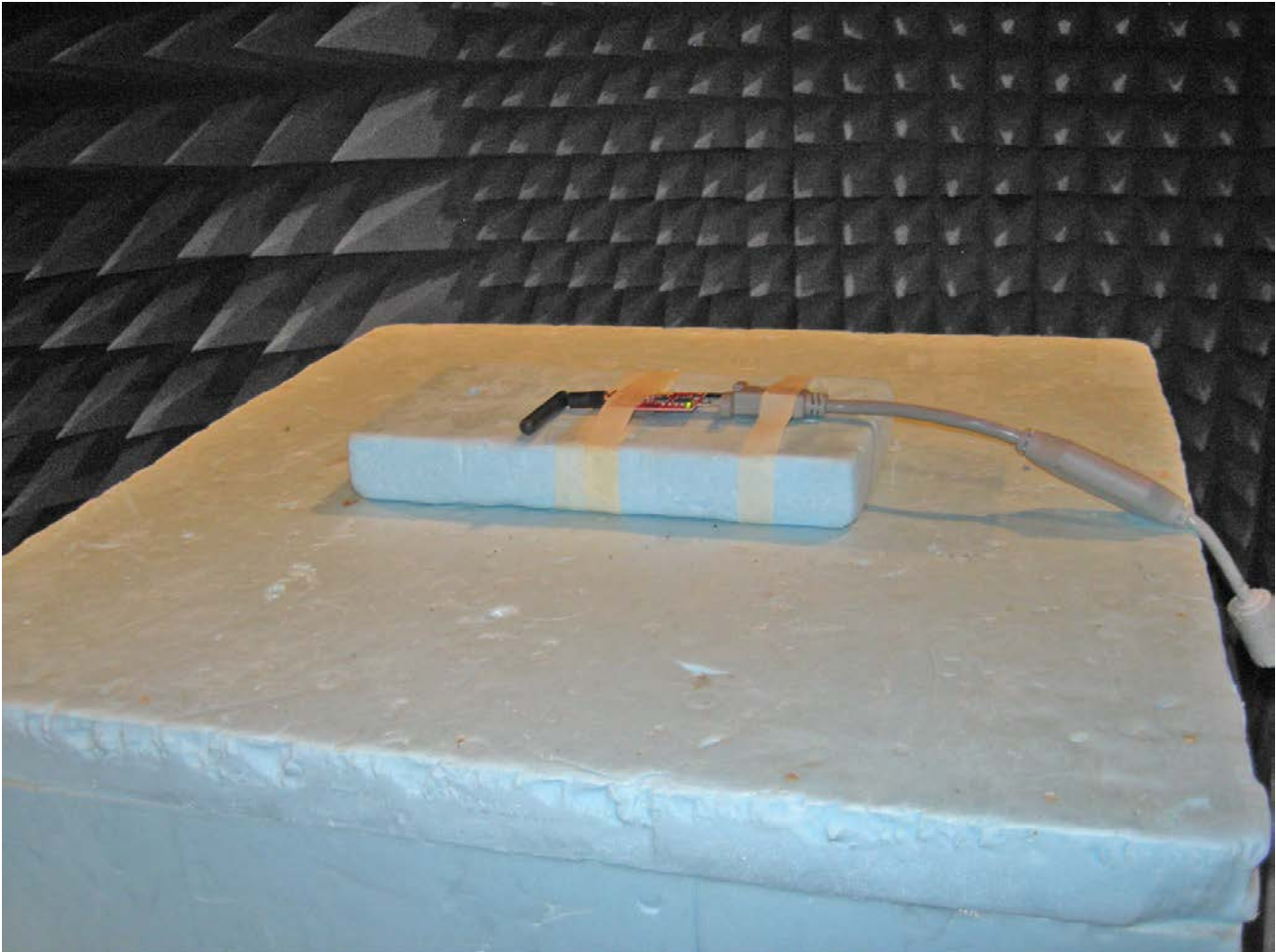


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## Appendix A

### Radiated Emissions – Position 5







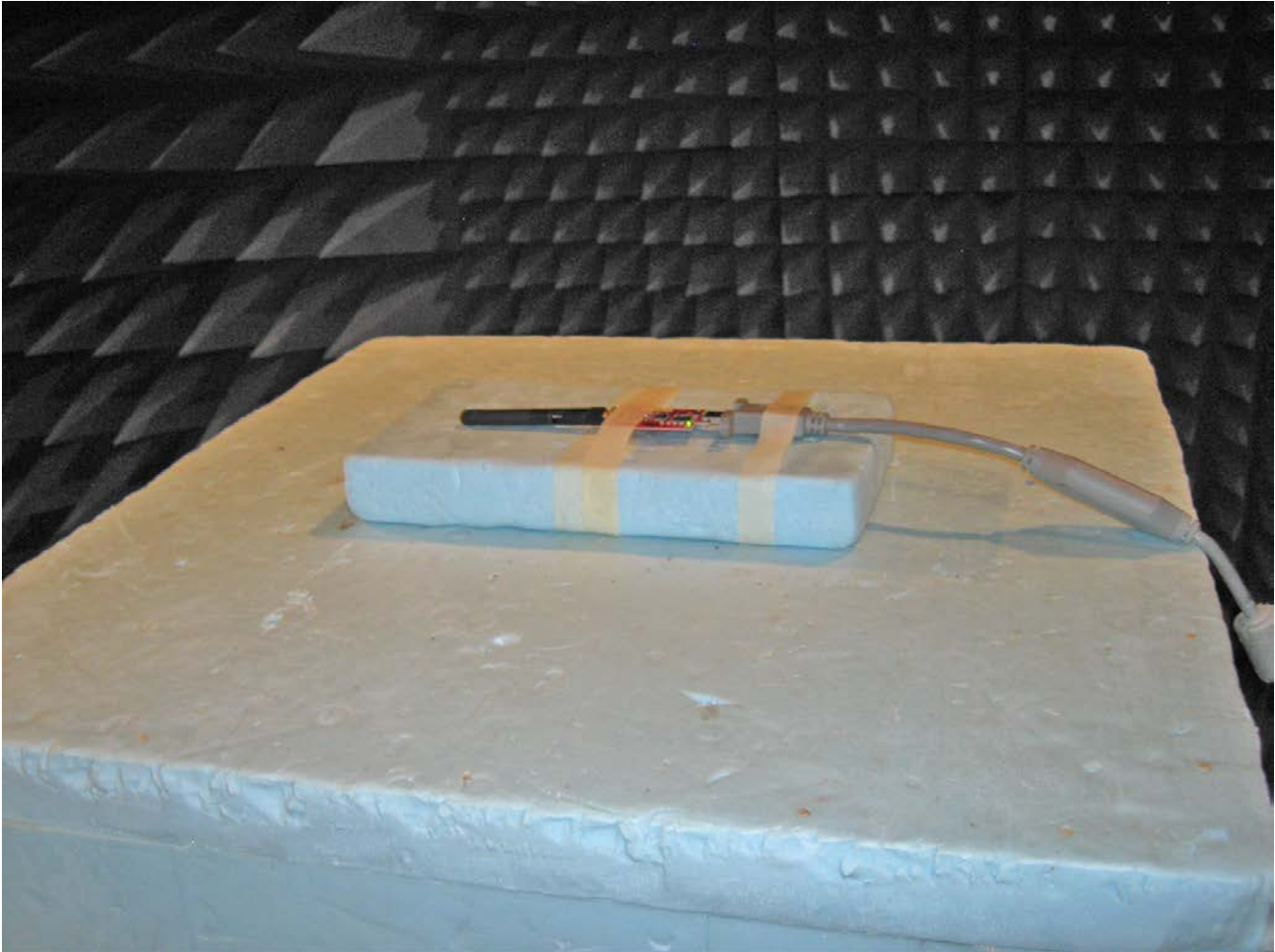
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Company:  
Model Tested:  
Report Number:  
DLS Project:

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## Appendix A

### Radiated Emissions – Position 6





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Company:  
Model Tested:  
Report Number:  
DLS Project:

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## Appendix B – Measurement Data

### 1.0 Fundamental Emission Bandwidth – 10 dB

#### Rule Part:

Section 15.519 (b)

#### Test Procedure:

ANSI C63.10:2013

#### Limit:

Contained between 3100 MHz and 10,600 MHz

#### Results:

Compliant:

Band ID	10 dB bandwidth
1	509.2 MHz
2	508.1 MHz
3	509.2 MHz
7	509.2 MHz
8	510.3 MHz
9	511.4 MHz

#### Sample Equation(s):

None

#### Notes:

This was a radiated emissions measurement. The maximum field strength of the emission was determined and the bandwidth was measured from the points at 10 dB down from the highest radiated emission, as based on the complete transmission system including the antenna.



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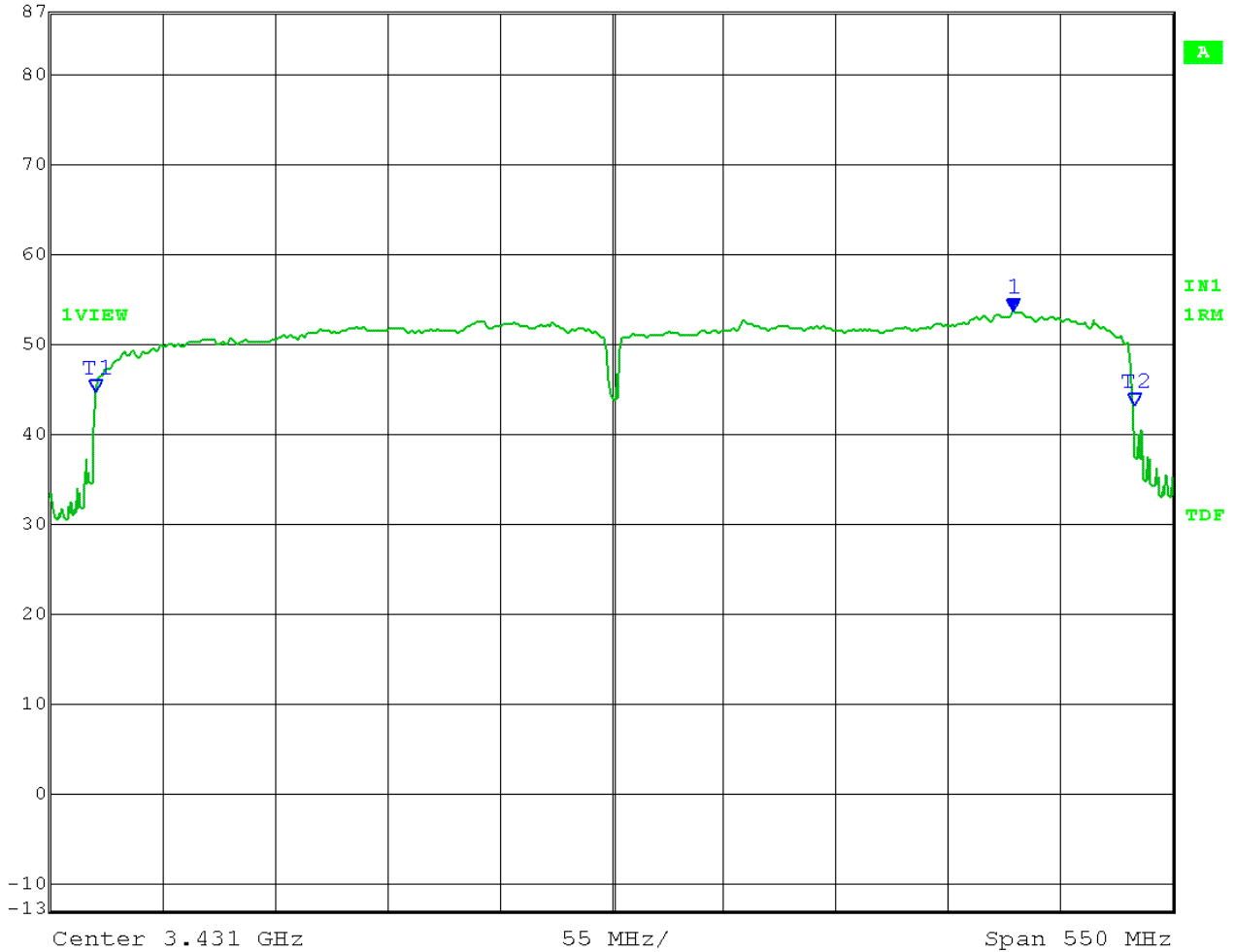
Company:  
 Model Tested:  
 Report Number:  
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**Band Group 1**  
**Band # 1**



Ref Lvl	Marker 1 [T1 ndB]	RBW	1 MHz	RF Att	10 dB
87 dB*	ndB 10.00 dB	VBW	3 MHz		
	BW 509.21843687 MHz	SWT	500 ms	Unit	dBμV/m



Date: 19.JUL.2016 14:14:38



166 South Carter, Genoa City, WI 53128

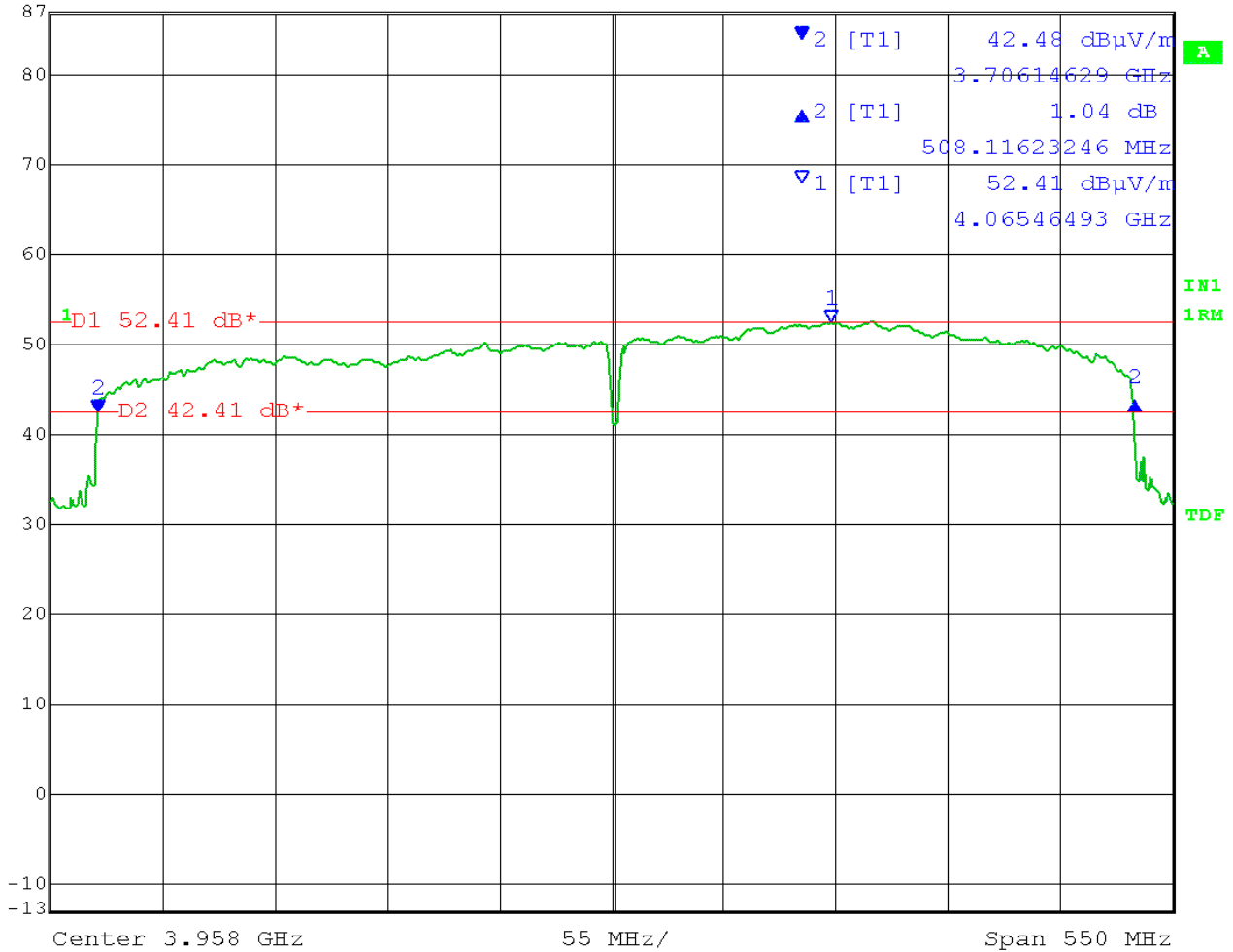
Company:  
Model Tested:  
Report Number:  
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**Band Group 1**  
**Band # 2**



Ref Lvl	Delta 2 [T1]	RBW	1 MHz	RF Att	10 dB
87 dB*	1.04 dB	VBW	3 MHz		
	508.11623246 MHz	SWT	500 ms	Unit	dBµV/m



Date: 19.JUL.2016 14:21:56



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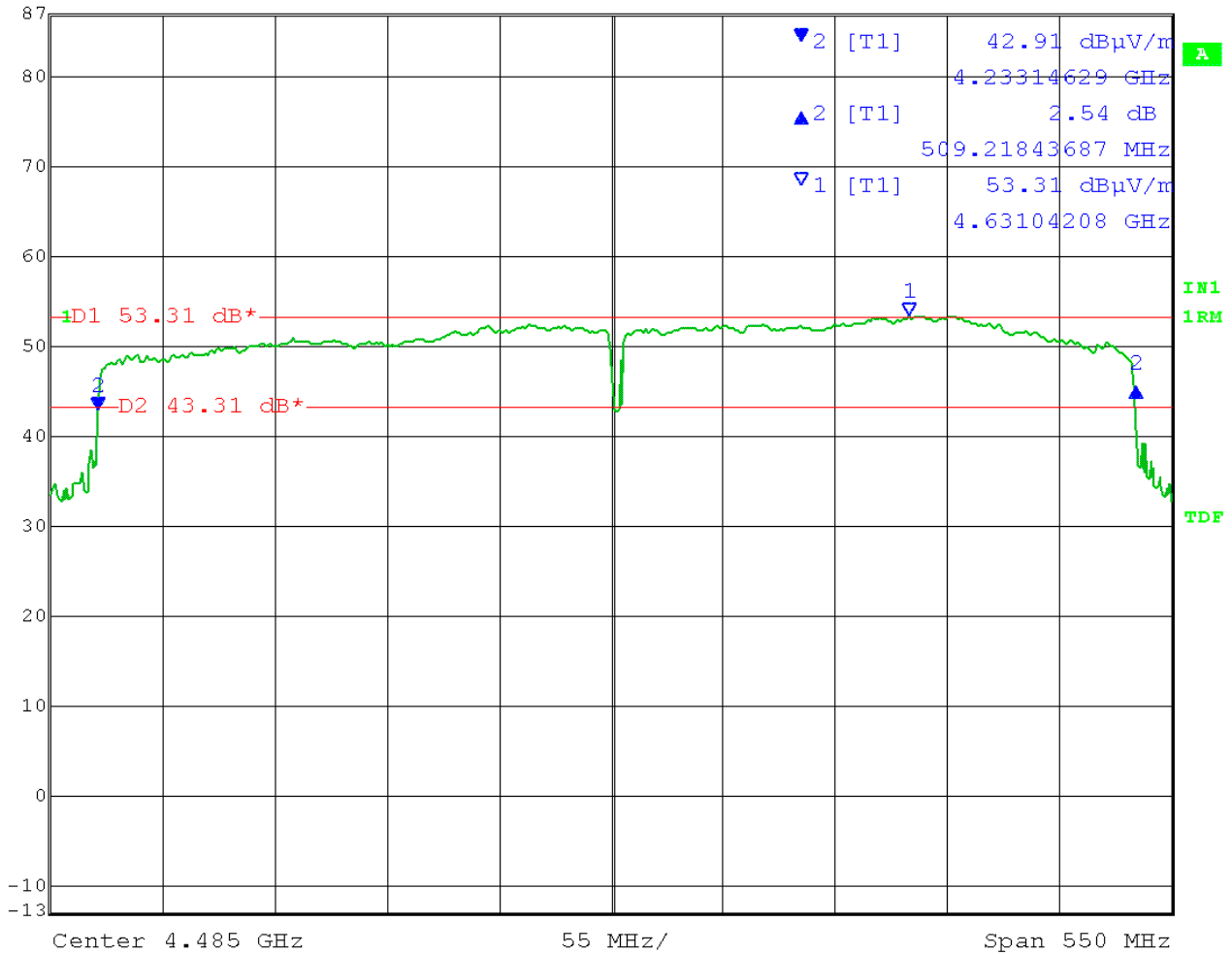
Company:  
Model Tested:  
Report Number:  
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**Band Group 1**  
**Band # 3**



Delta 2 [T1]	RBW	1 MHz	RF Att	10 dB
Ref Lvl	2.54 dB	VBW	3 MHz	
87 dB*	509.21843687 MHz	SWT	500 ms	Unit dB $\mu$ V/m



Date: 19.JUL.2016 14:31:55



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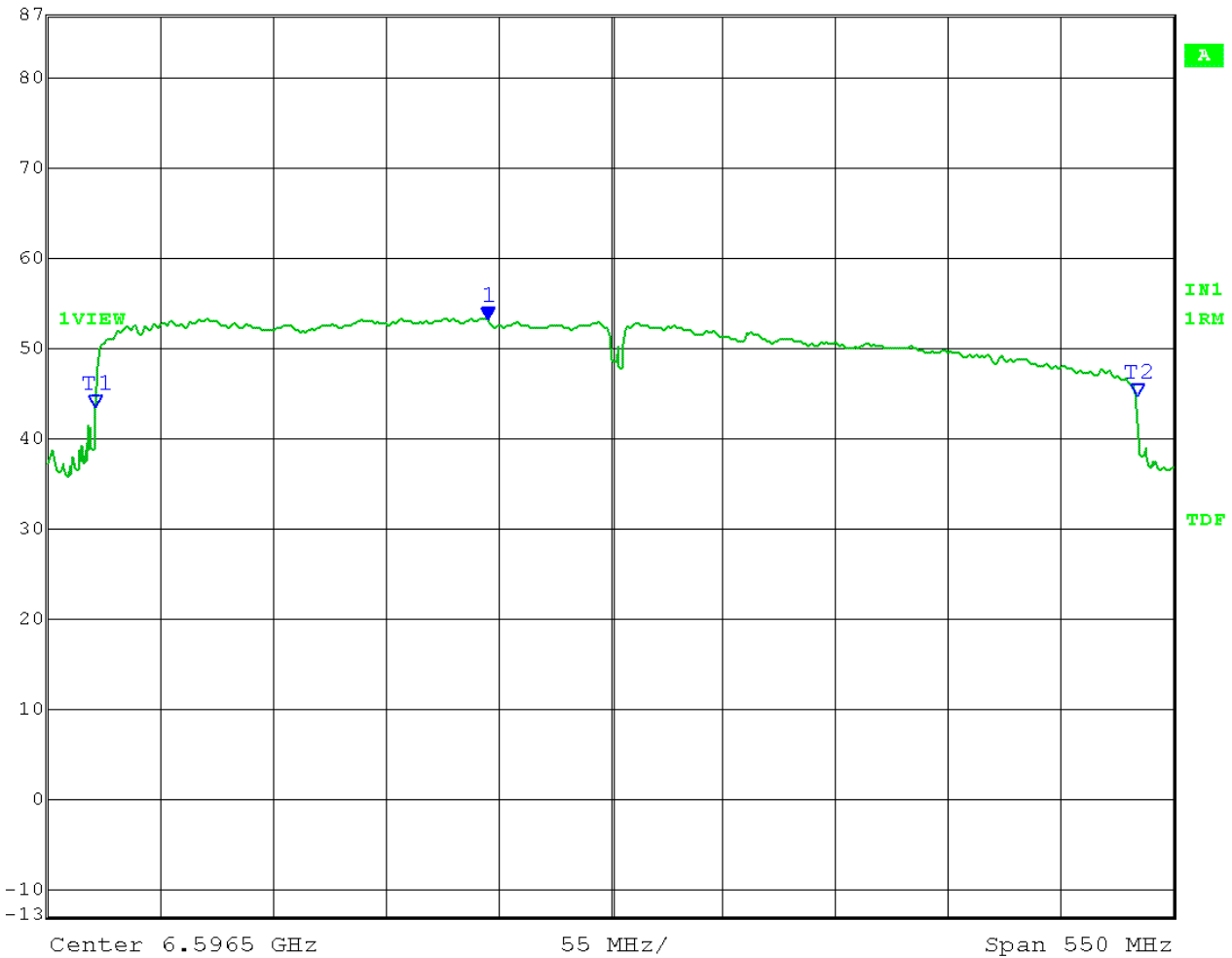
Company:  
Model Tested:  
Report Number:  
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### Band Group 3 Band # 7



Ref Lvl	87 dB*	Marker 1 [T1 ndB]	ndB	10.00 dB	RBW	1 MHz	RF Att	10 dB
		BW	509.21843687 MHz		VBW	3 MHz		
					SWT	500 ms	Unit	dBµV/m



Date: 19.JUL.2016 14:37:42



166 South Carter, Genoa City, WI 53128

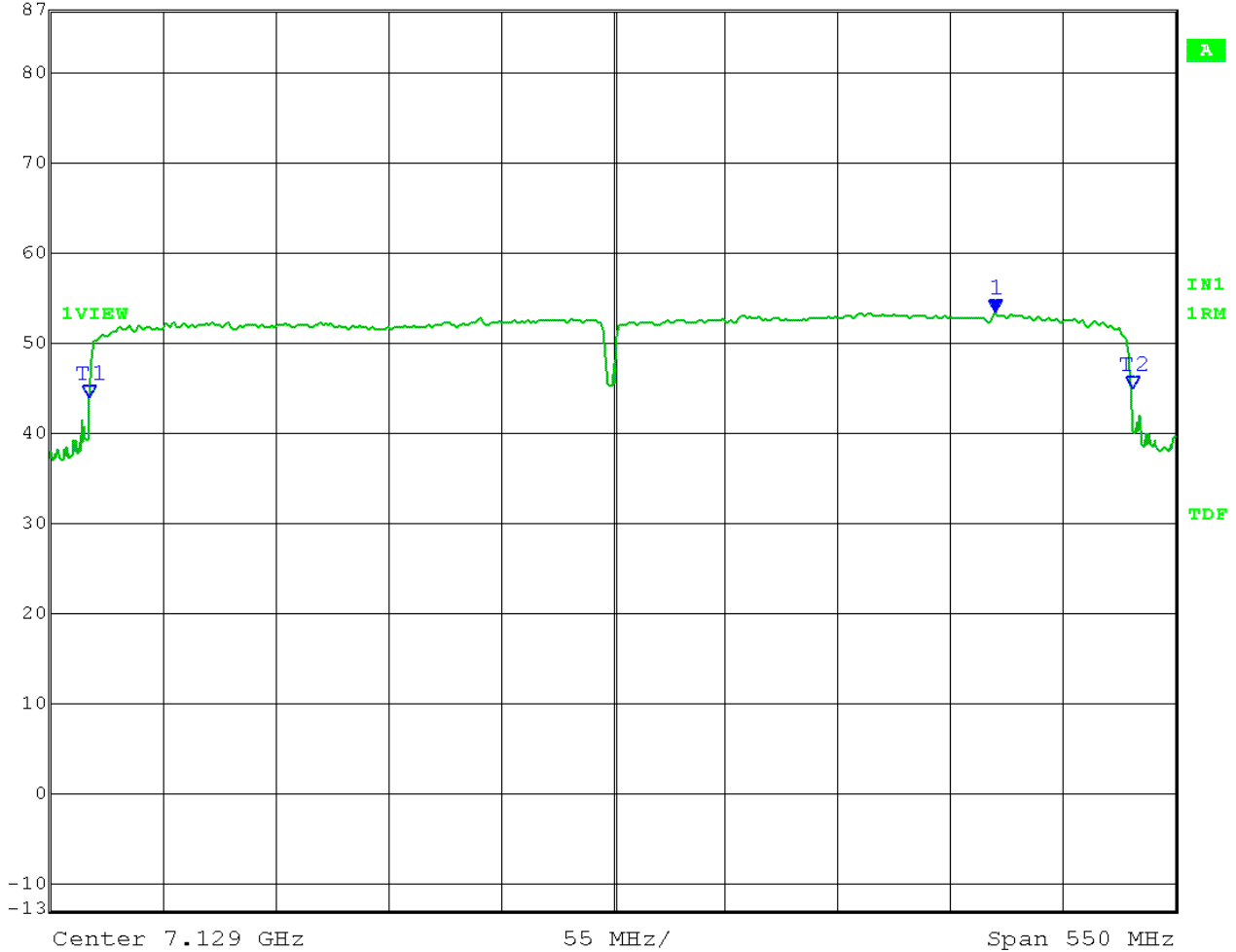
Company:  
Model Tested:  
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**Band Group 3**  
**Band # 8**



Ref Lvl	87 dB*	Marker 1 [T1 ndB]	ndB	10.00 dB	RBW	1 MHz	RF Att	10 dB
		BW	510.32064128 MHz	SWT	500 ms	Unit		dBµV/m



Date: 19.JUL.2016 14:42:57



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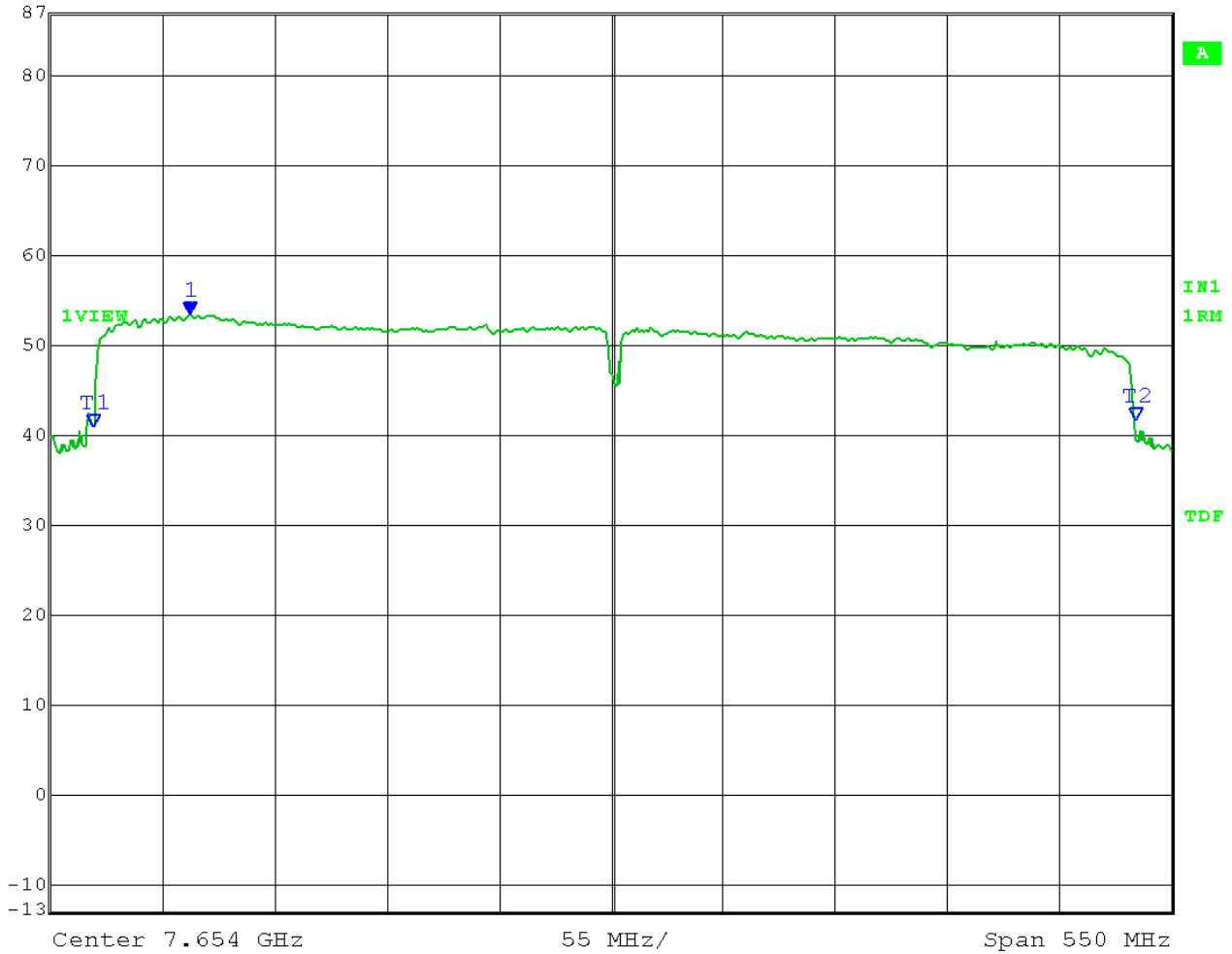
Company:  
Model Tested:  
Report Number:  
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### Band Group 3 Band # 9



Ref Lvl	Marker 1 [T1 ndB]	RBW	1 MHz	RF Att	10 dB
87 dB*	ndB 10.00 dB	VBW	3 MHz		
	BW 511.42284569 MHz	SWT	500 ms	Unit	dBμV/m



Date: 19.JUL.2016 14:47:45





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## Appendix B

### 2.0 Radiated Spurious Emissions below 960 MHz

**Rule Part:**

15.519 (c)

**Test Procedure:**

ANSI C63.10:2013

**Limit:**

15.209

**Results:**

Compliant

**Sample Equation(s):**

None

**Notes:**

Test distance 3 meter. No emissions detected within 20 dB of limit associated with UWB transmission.



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**Appendix B**

**3.0 Radiated Spurious Emissions above 960 MHz**

**Rule Part:**

15.519 (c)

**Test Procedure:**

ANSI C63.10:2013

**Limit:**

Average limit with resolution bandwidth of 1 MHz

Frequency (MHz)	EIRP in dBm	E in dBμV/m	D in meters
960 – 1610	-75.3	19.95	3
1610 – 1990	-63.3	31.95	3
1990 – 3100	-61.3	33.95	3
3100 – 10600	-41.3	53.95	3
Above 10600	-61.3	43.50	1
Above 10600	-61.3	49.52	0.5

**Results:**

Compliant

**Sample Equation(s):**

Field Strength limit calculated using equation:

$$E = \text{EIRP} - 20 \log(D) + 104.8$$

Where:

E = Field Strength in dBμV/m

EIRP = Effective Isotropic Radiated Power in dBm

D = test distance in meters

**Notes:**

Radiated emissions tested at 3 meter distance 1-10 GHz, 1 meter distance 10-18 GHz and 0.5 meter distance 18-40 GHz maximized in vertical and horizontal polarizations.



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### Radiated Spurious

960 MHz – 10.6 GHz @ 3 meter – Maximized in vertical and horizontal polarizations

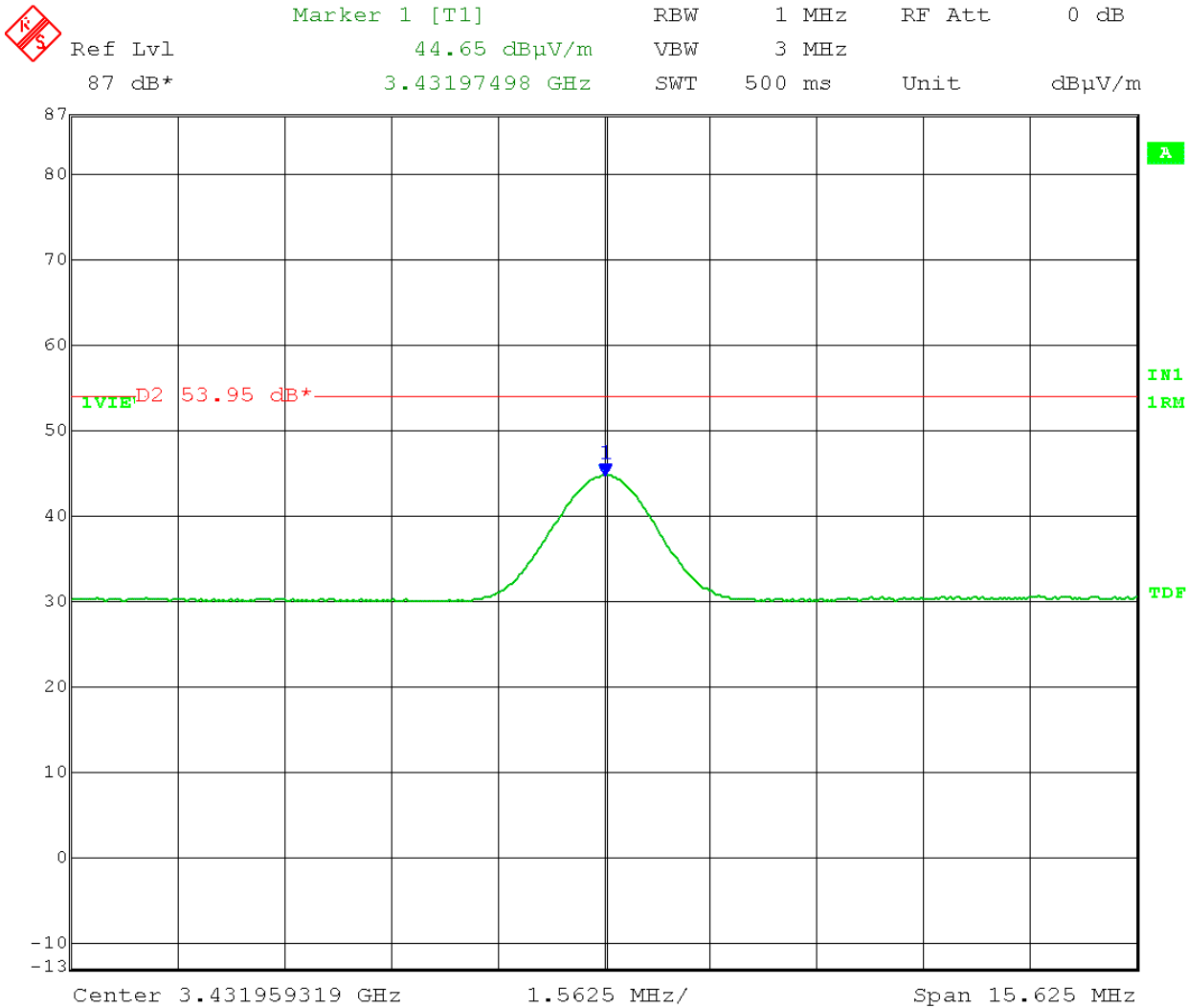
Bands 1,7,8, and 9: no emissions associated with UWB transmission found

Bands 2 and 3: emission is identical in frequency and amplitude

Horizontal:

Receive antenna height: 1.41 m

EUT table rotation: 345 degrees



Date: 19.JUL.2016 15:22:43



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### Radiated Spurious

960 MHz – 10.6 GHz @ 3 meter – Maximized in vertical and horizontal polarizations

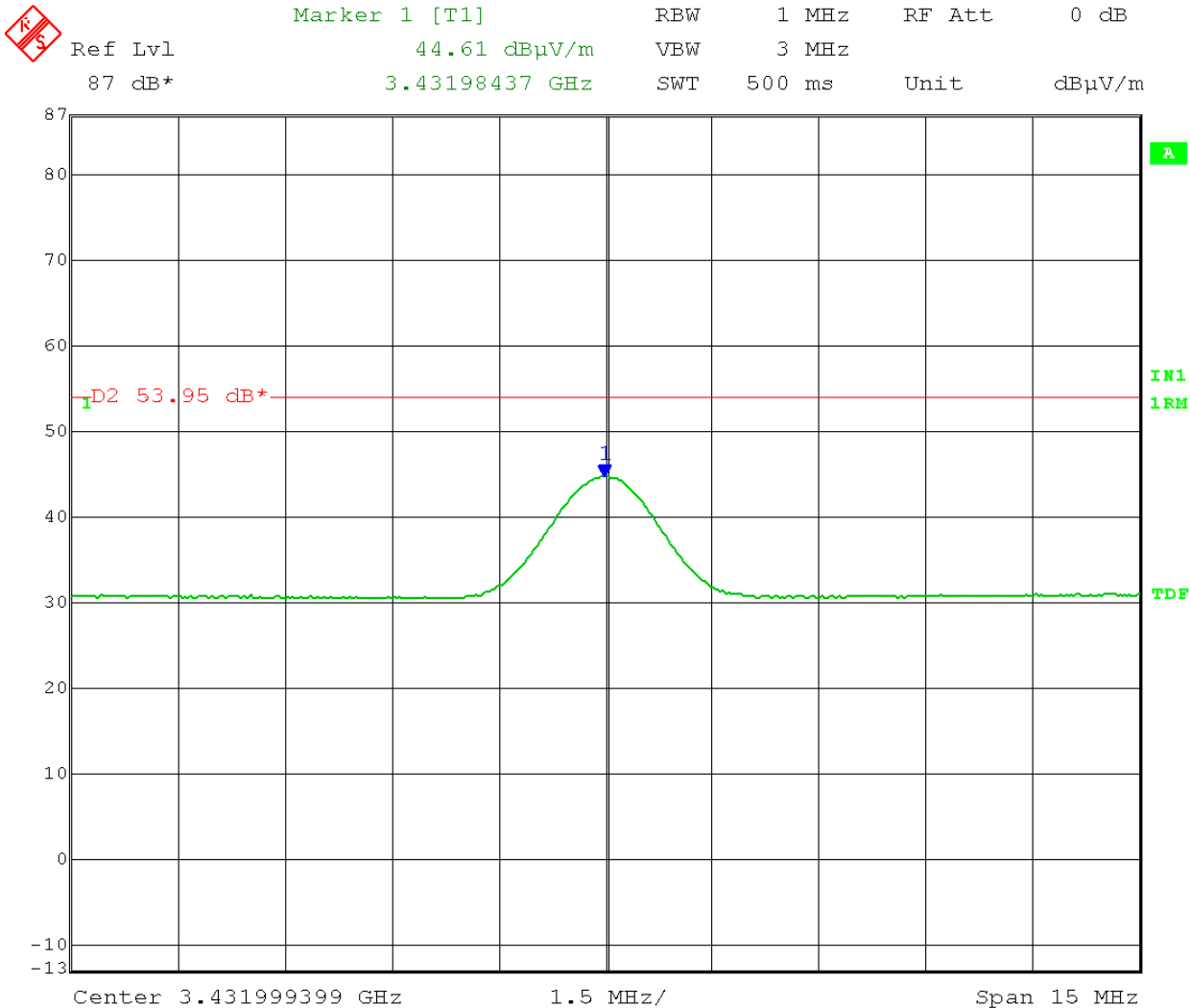
Bands 1,7,8, and 9: no emissions associated with UWB transmission found

Bands 2 and 3: emission is identical in frequency and amplitude

Vertical:

Receive antenna height: 1.73 m

EUT table rotation: 350 degrees



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### Radiated Spurious

960 MHz – 10.6 GHz @ 3 meter – Maximized in vertical and horizontal polarizations

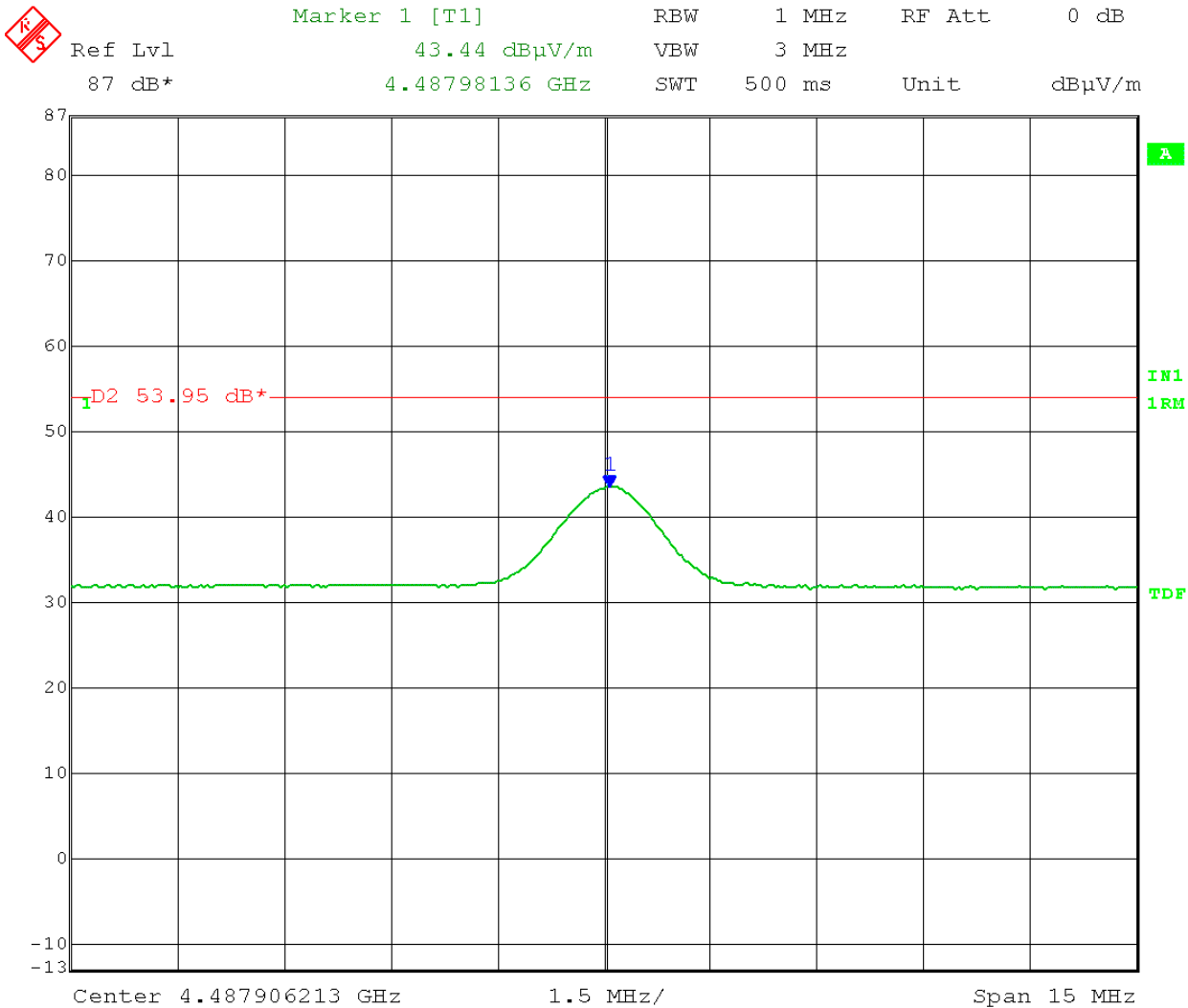
Bands 1,3,7,8, and 9: no emissions associated with UWB transmission found

Band 2:

Horizontal:

Receive antenna height: 1.61 m

EUT table rotation: 5 degrees



Date: 20.JUL.2016 08:23:27



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### Radiated Spurious

960 MHz – 10.6 GHz @ 3 meter – Maximized in vertical and horizontal polarizations

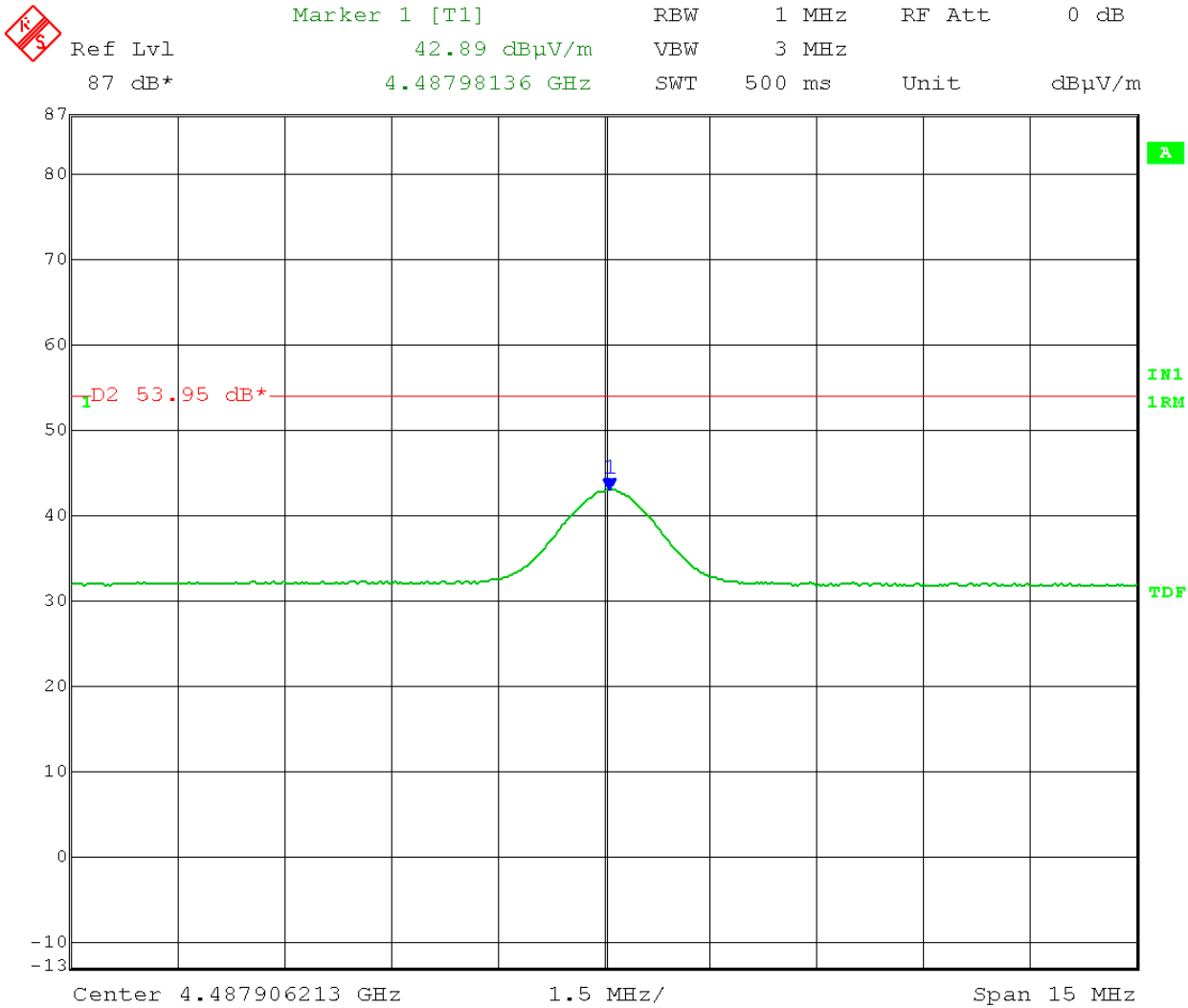
Bands 1,3,7,8, and 9: no emissions associated with UWB transmission found

Band 2:

Vertical:

Receive antenna height: 1 m

EUT table rotation: 355 degrees



Date: 20.JUL.2016 08:20:19



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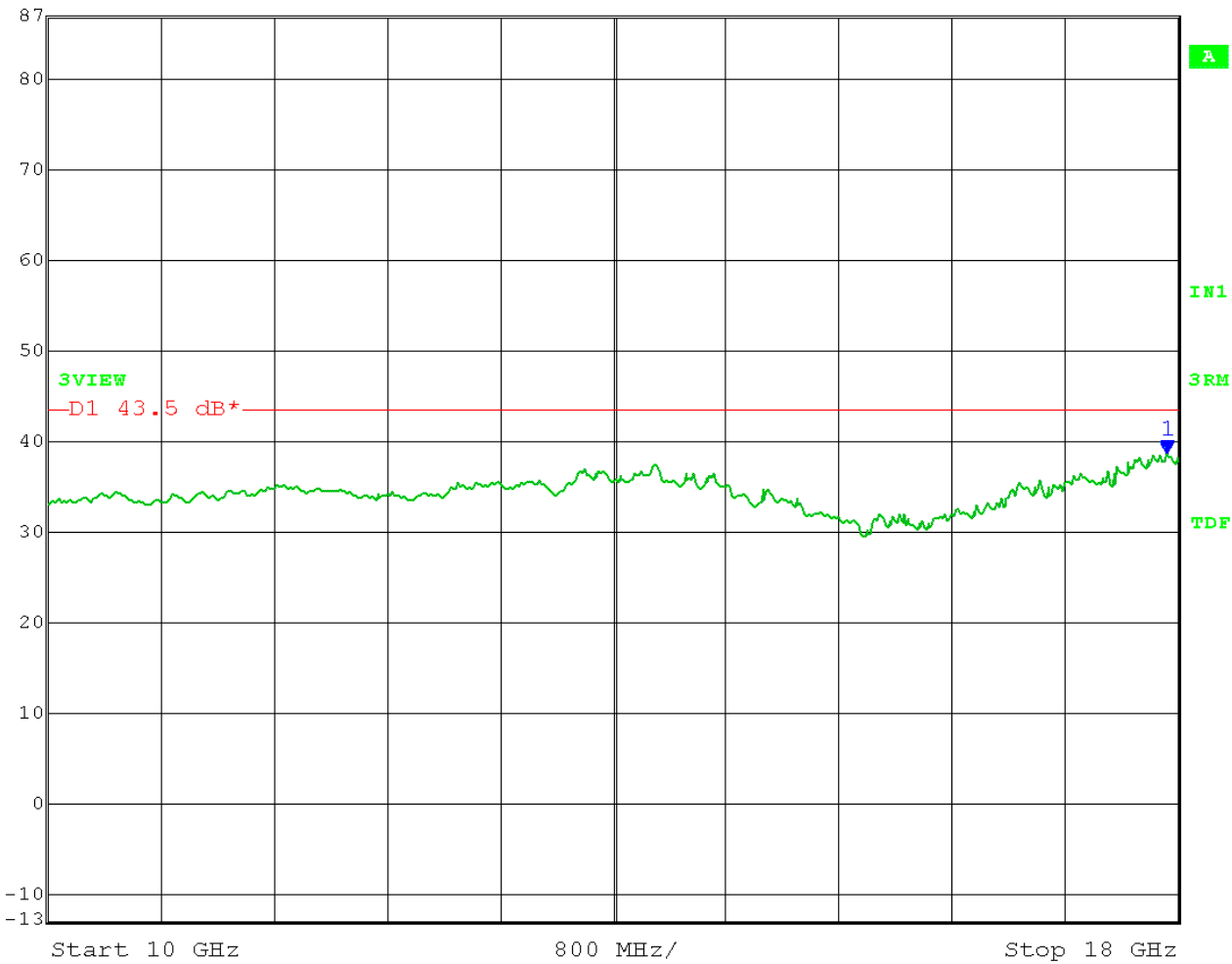
### Radiated Spurious

10 – 18 GHz @ 1 meter – Maximized in vertical and horizontal polarizations – no emissions found

Noise Floor:



	Marker 1 [T3]	RBW	300 kHz	RF Att	0 dB
Ref Lvl	38.54 dBµV/m	VBW	3 MHz		
87 dB*	17.91983968 GHz	SWT	560 ms	Unit	dBµV/m



Date: 20.JUL.2016 15:07:16



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Company:  
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### Radiated Spurious

18 – 26.5 GHz @ 0.5 meter – Maximized in vertical and horizontal polarizations – no emissions found

Noise Floor:



Marker 1 [T3]

RBW 300 kHz RF Att 0 dB

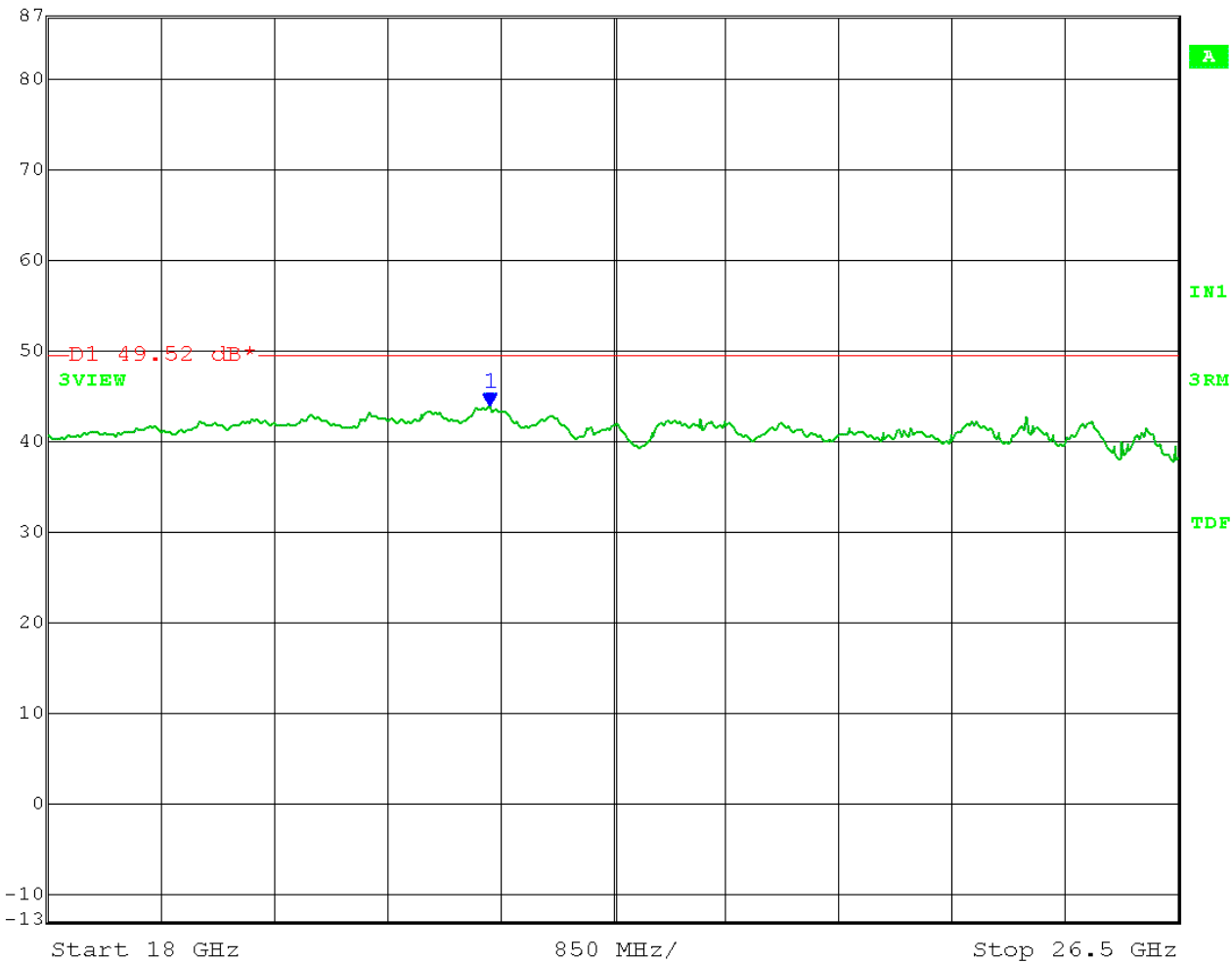
Ref Lvl 43.82 dB $\mu$ V/m

VBW 3 MHz

87 dB\* 21.32164329 GHz

SWT 560 ms

Unit dB $\mu$ V/m



Date: 20.JUL.2016 16:00:54





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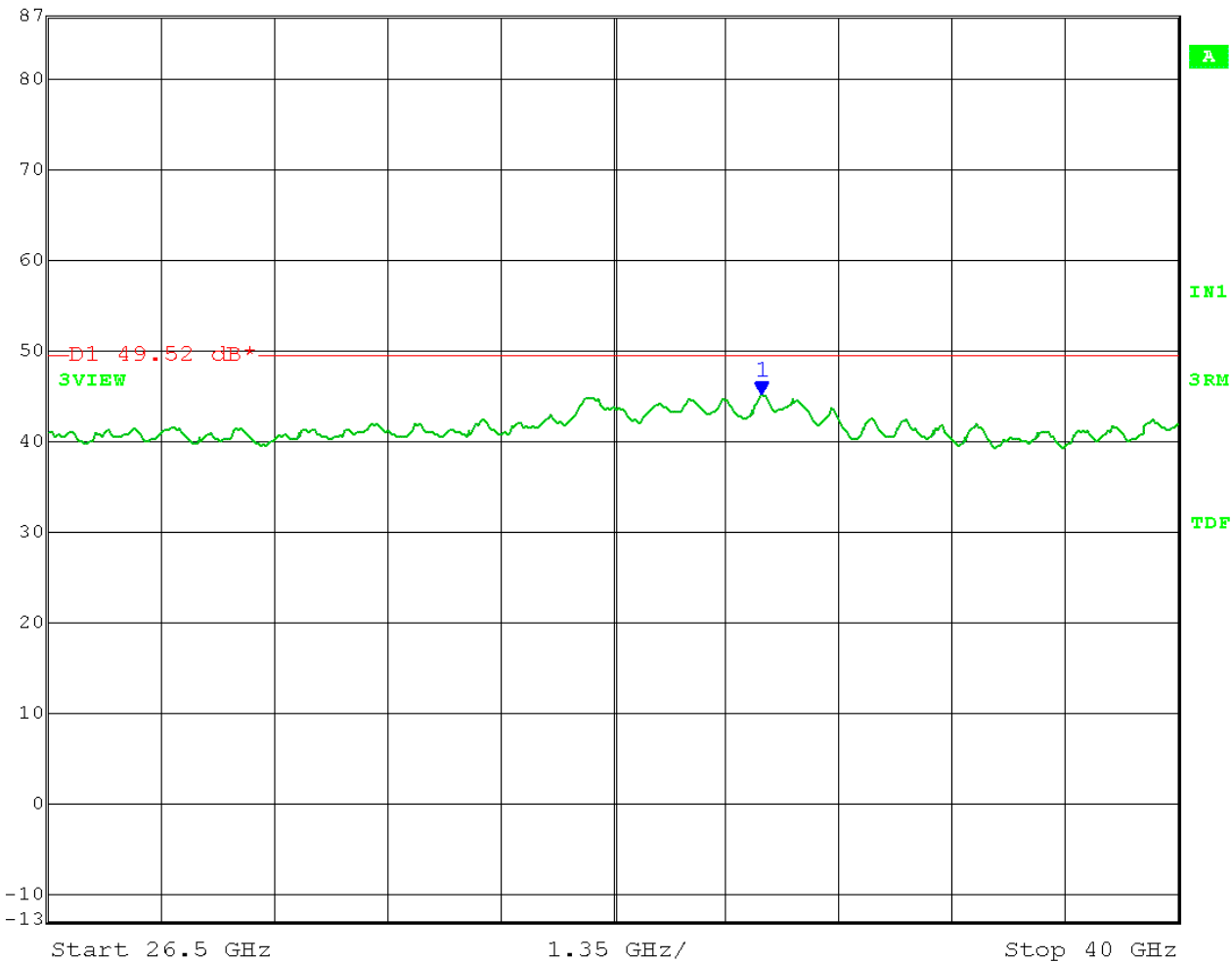
### Radiated Spurious

26.5 – 40 GHz @ 0.5 meter – Maximized in vertical and horizontal polarizations – no emissions found

Noise Floor:



	Marker 1 [T3]	RBW	200 kHz	RF Att	0 dB
Ref Lvl	45.03 dBµV/m	VBW	3 MHz		
87 dB*	35.02204409 GHz	SWT	860 ms	Unit	dBµV/m



Date: 20.JUL.2016 16:27:45



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## Appendix B

### 4.0 Radiated Fundamental Emissions in band 3100 to 10600 MHz

#### Rule Part:

15.519 (c) & (e)

#### Test Procedure:

ANSI C63.10:2013

#### Limit:

EIRP in dBm  
Average: -41.3  
Peak: -24.4\*

#### Results:

Compliant

#### Sample Equation(s):

See data

#### Notes:

\*As per 15.521(g), limit adjusted by  $20\log(\text{RBW}/50)$  dBm where RBW is the resolution bandwidth in MHz that is employed.

EUT investigated for worst case orientation and maximized in vertical and horizontal polarization. The maximum emission was then recorded. The EUT was replaced by an antenna connected to a signal generator. The level of the signal generator was set to match the maximum emission recorded from the EUT. Once corrected for antenna gain and cable loss the EIRP was compared to the limit.



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Company: GE Healthcare

Operator: Craig B

Date of test: 07-19-16

Temperature: 76 deg. F

Humidity: 49% R.H.

Company:  
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**Average Peak**  
Detector RMS Peak  
(linear)  
RBW 1 MHz 3 MHz  
VBW 3 MHz 3MHz  
Sweep 500 ms (1 ms per point)  
Span 550 MHz

Antenna to EUT Distance: 3 m  
Floor to EUT Height: 1.5 m  
Antenna Scan Height\*: 1 - 4 m  
\* EUT to remain in antenna 3dB  
beamwidth  
RF Absorber lined floor

EIRP = Signal generator output + cable loss + antenna gain

**Model: 5390144-3 Rev. 2 (Band Groups 1 and 3)**

Band #	Frequency (GHz)	Measurement Antenna Polarization	Limit Type	Field Strength of EUT (dBμV/m)	Antenna Height (m)	Table Azimuth (deg)	Level of Gen. when field strength equals that of EUT (dBm)	Cable loss between Gen. and Subst. Antenna (dB)	Gain of subst. Antenna (dBi)	Strength of emission [EIRP] (dBm)	Limit (dBm)	Margin (dB)
1	3.628	Vertical	Average	53.50	1.82	158	-48.72	-3.66	9.98	-42.40	-41.3	1.10
			Peak	65.71			-37.01			-30.69	-24.4	6.29
2	4.065	Vertical	Average	52.41	1.43	154	-48.86	-3.90	9.77	-42.99	-41.3	1.69
			Peak	64.67			-36.60			-30.73	-24.4	6.33
3	4.631	Horizontal	Average	53.31	1.79	10	-49.32	-4.20	11.10	-42.42	-41.3	1.12
			Peak	65.47			-37.27			-30.37	-24.4	5.97
7	6.536	Horizontal	Average	53.23	1.65	28	-48.93	-5.15	12.10	-41.98	-41.3	0.68
			Peak	66.76			-37.41			-30.46	-24.4	6.06
8	7.316	Horizontal	Average	53.28	1.51	31	-48.01	-5.52	11.20	-42.33	-41.3	1.03
			Peak	65.03			-36.26			-30.58	-24.4	6.18
9	7.447	Horizontal	Average	53.56	1.39	31	-48.22	-5.61	11.21	-42.62	-41.3	1.32
			Peak	66.47			-37.11			-31.51	-24.4	7.11



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## Appendix B

### 5.0 Radiated Spurious Emissions in GPS Band

#### Rule Part:

15.519 (d)

#### Test Procedure:

ANSI C63.4-2009 and ANSI C63.10-2009

#### Limit:

Average limit with resolution bandwidth of no less than 1 kHz

Frequency (MHz)	EIRP in dBm
1164 – 1240	-85.3
1559 – 1610	-85.3

#### Results:

Compliant

#### Sample Equation(s):

15.519 (e) limit @ 1 meter:  $-85.3 + 95.2 + 20\log(3/1) = 19.44 \text{ dB}\mu\text{V/m}$

15.209 limit @ 1 meter:  $63.54 \text{ dB}\mu\text{V/m}$

#### Notes:

EUT tested at 1 meter distance.

EUT was set in standby mode with no UWB transmission. The EUT was then placed in transmit mode to observe emissions related to the function of the UWB transmission.



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Company:  
Model Tested:  
Report Number:  
DLS Project:

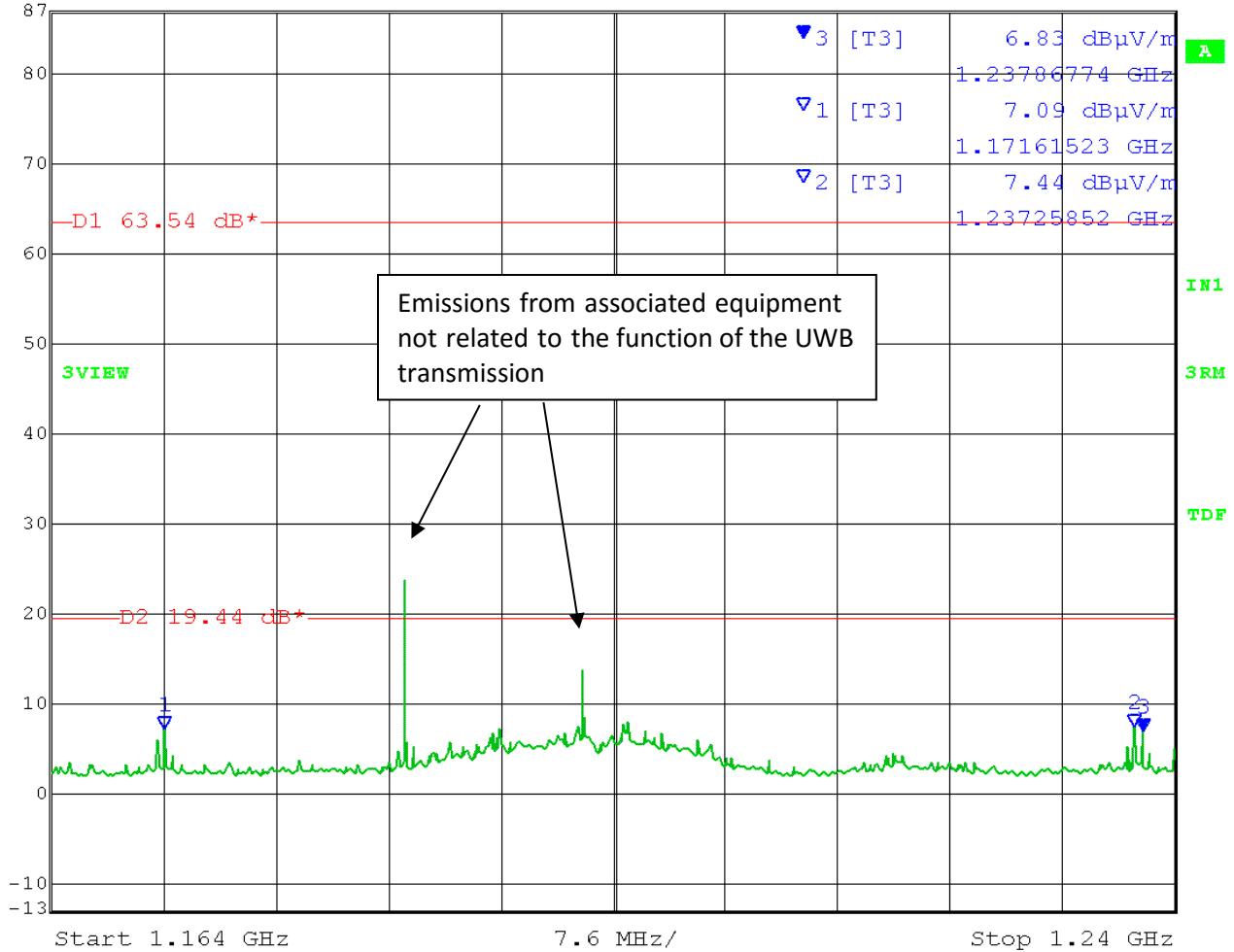
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**GPS BAND 1.164 – 1.240 GHz**

Worst-case of Vertical and Horizontal

Emissions same for Bands 1,2,3,7,8, and 9

	Marker 3 [T3]	RBW	10 kHz	RF Att	10 dB
	Ref Lvl	6.83 dBµV/m	VBW	30 kHz	
	87 dB*	1.23786774 GHz	SWT	1.9 s	Unit dBµV/m



Date: 20.JUL.2016 14:53:12



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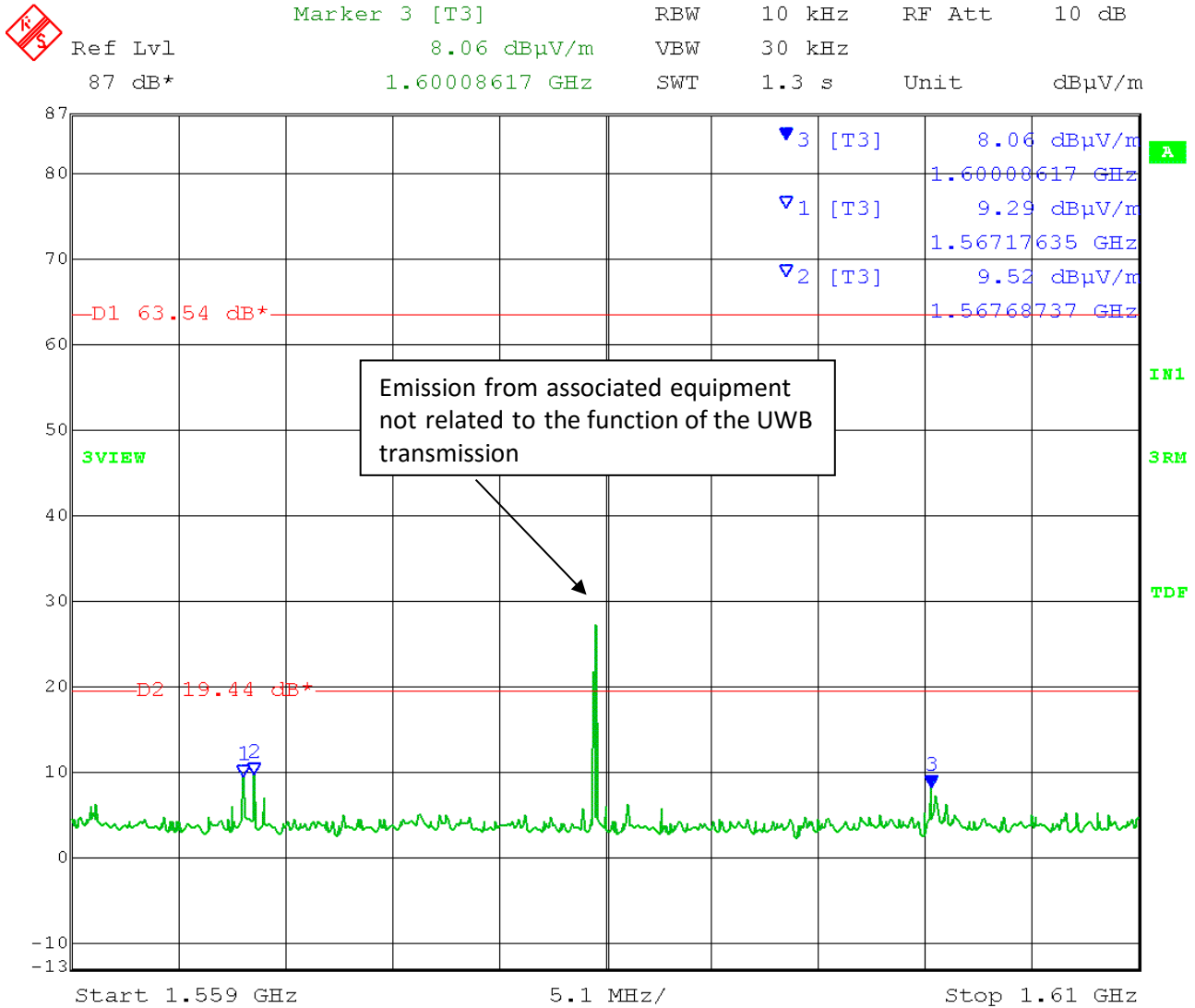
Company:  
Model Tested:  
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DLS Project:

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**GPS BAND 1.559 – 1.61 GHz**

Worst-case of Vertical and Horizontal

Emissions same for Bands 1,2,3,7,8, and 9



Date: 20.JUL.2016 14:49:37



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**Appendix C - Measurement Uncertainty**

Compliance with the limits in this standard are based on the results of the compliance measurement. Our calculated measurement uncertainty including the measurement instrumentation, associated connections between the various instruments in the measurement chain, and other contributions, are provided in this section of the test report.

<b>Radiated Emission Uncertainty below 30MHz</b>		<b>Uncertainty ( ± dB )</b>
Contribution	Probability Distribution	below 30 MHz
Combined Standard Uncertainty	Normal	1.60
Expanded Uncertainty	Normal (k=2)	3.19

<b>Radiated Emission Uncertainty above 30MHz</b>										
		(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)	(± dB)
Contribution	Probability Distribution	3M	3M	3M	3M	3M	3M	10M	10M	10M
		30-100 MHz	100-700 MHz	700-1000 MHz	1- 4.5 GHz	4.5 – 7 GHz	7 – 18 GHz	30-100 MHz	100-700 MHz	700-1000 MHz
Combined Standard Uncertainty	Normal	1.70	1.62	1.66	2.13	2.48	2.85	1.64	1.58	1.66
<b>Expanded Uncertainty</b>	<b>Normal (k=2)</b>	<b>3.40</b>	<b>3.23</b>	<b>3.33</b>	<b>4.26</b>	<b>4.95</b>	<b>5.69</b>	<b>3.29</b>	<b>3.16</b>	<b>3.31</b>

<b>Power Line Conducted</b>		<b>Uncertainty ( ± dB )</b>
Contribution	Probability Distribution	150 kHz - 30 MHz
Combined Standard Uncertainty	Normal	1.05
Expanded Uncertainty	Normal (k=2)	2.10



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## END OF REPORT

Revision #	Date	Comments	By
1.0	07-21-2016	Preliminary Release	CB
1.1	08-10-2016	Updated with information from Part A form	CB
1.2	08-16-2016	Added explanation for the different board revisions	CB