



FCC/IC Test Report

FOR:

Sentrilock, LLC

Model:

Remote Access Device 3G

Product Description:

Cellular-enabled Wireless Smartcard Reader

FCC ID: W9T-P10305

47 CFR Part 15.247 (DTS)

TEST REPORT #: EMC-SENTR-002-16001-DTS-Rev1

DATE: Oct 30, 2016



A2LA Accredited

FCC Recognized

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1 Assessment

The following device was evaluated against the applicable criteria specified in FCC rules Parts 15.247 of Title 47 of the Code of Federal Regulations.

No deviations were ascertained.

Company	Description	Model
Sentrilock, LLC	Cellular-enabled Wireless Smartcard Reader	Remote Access Device 3G

Responsible for Testing Laboratory:

Oct 30, 2016	Compliance	Kris Lazarov (Emc Engineer)	
Date	Section	Name	Signature

Responsible for the Report:

Oct 30, 2016	Compliance	James Donnellan (Sr. Emc Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3. CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

2 Administrative Data

2.1 Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Address:	411 Dixon Landing Road Milpitas, CA 95035 U.S.A.
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Test Engineer	James Donnellan
Project Manager	Laith Saman

2.2 Identification of the Client

Client:	Sentrilock, LLC
Street Address:	7701 Service Center Dr
City/Zip Code	West Chester, OH 45069
Country	USA
Contact Person:	Chris Hunt
Phone No.	513-644-1715
e-mail:	chunt@sentrilock.com

2.3 Identification of the Manufacturer

Manufacturer's Name:	Same as Client.
Manufacturers Address:	
City/Zip Code	
Country	

3 Equipment under Test (EUT)

3.1 Specification of the Equipment under Test

Model:	Remote Access Device 3G
HW Revision :	.0
SW Revision:	02.03.00
FCC-ID:	W9T-P10305
Product Description:	Cellular-enabled Wireless Smartcard Reader
Integrated Radios:	Atmel ATmega128RFA1 2.4 GHz ZigBee module
Frequency Range and mode of test:	ZigBee: 2405-2480MHz
No. of channels:	16
Type(s) of Modulation:	O-QPSK
Other Radios in the device:	Cinterion Wireless Modules GmbH- Quad-Band GSM/GPRS Module EHS5-US
Antenna Info:	Dual PCB trace dipole antennas Peak Gain: -1 dBi (As reported by the manufacturer)
Max. Output Powers:	Conducted: -5.81 dBm Radiated (Calculated): -6.81 dBm
Rated Operating Voltage Range (V DC):	3.33 (Low) / 3.7 (Nominal) / 4.2 (Max)
Rated Operating Temperature Range:	-40°C ~ +85°C
Test Sample Status:	Pre-Production

3.2 Identification of the Equipment under Test (EUT)

EUT #	Identification (IMEI #)	HW Version	SW Version	Notes/Comments
1	357330051688653	.0	02.03.00	Radiated Sample
2	357330051688315	.0	02.03.00	Conducted Sample

3.3 Identification of Accessory equipment

AE #	Type	Model	Manufacturer	Serial Number	Notes
1	5V USB Power Adapter	SKB0501000PU	-	-	Used to charge internal battery when needed

3.4 Test Sample Configuration

EUT Set-up #	Combination of AE used for test set up	Comments
1	EUT#1	The radio of the EUT was stimulated directly in a test mode via the thumbwheel. The EUT transmitted a modulated O-QPSK signal on a specified channel.
2	EUT#2	The radio of the EUT was stimulated directly in a test mode via the thumbwheel. The EUT transmitted a modulated O-QPSK signal on a specified channel. The EUT had a SMA cable attached input to the antenna port for measurement purposes.

4 Subject of Investigation

The objective of the measurements done by CETECOM Inc. was to assess the performance of the EUT per the relevant requirements specified in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations.

This test report is to support a request for new equipment authorization under the FCC ID: W9T-P10305

Testing procedures are based on “GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER §15.247; April 8, 2016” by the Federal Communications Commission, Office of Engineering and Technology, Laboratory Division and ANSI C63.10 (2013).

5 Summary of Measurement Results

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§15.247(e)	Power Spectral Density	Nominal	802.15.4 ZigBee	■	□	□	□	Complies
§15.247(a)(1)	Emission Bandwidth	Nominal	802.15.4 ZigBee	■	□	□	□	Complies
§15.247(b)(1)	Maximum Conducted Output Power and EIRP	Nominal	802.15.4 ZigBee	■	□	□	□	Complies
§15.247/15.209/15.205	Band edge compliance- Restricted Band Edges	Nominal	802.15.4 ZigBee	■	□	□	□	Complies
§15.247(d)	Band edge compliance- Unrestricted Band Edges	Nominal	802.15.4 ZigBee	■	□	□	□	Complies
§15.247(d) §15.209	TX Spurious emissions- Radiated	Nominal	802.15.4 ZigBee	■	□	□	□	Complies
§15.207(a)	AC Conducted Emissions	Nominal	802.15.4 ZigBee	■	□	□	□	Complies
§15.209(a)	TX Spurious Emissions Radiated<30MHz	Nominal	802.15.4 ZigBee	■	□	□	□	Complies
§15.207(a)	Conducted Emissions <30MHz	Nominal	802.15.4 ZigBee	□	□	■	□	Note 1

Note: NA= Not Applicable; NP= Not Performed.

1. EUT normally not connected to AC wall outlet.

6 Measurements

6.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus, with 95% confidence interval (in dB delta to result), based on a coverage factor k=1.

Radiated measurement:

	Uncertainty in dB Radiated <30MHz	Uncertainty in dB Radiated 30MHz - 1GHz	Uncertainty in dB Radiated > 1GHz
Standard Deviation k=1	2.48	1.94	2.16
95% Confidence Interval in dB	4.86	3.79	4.24
95% Confidence Interval in dB in Delta to Result	+/-2.5 dB	+/-2.0 dB	+/- 2.3dB

Conducted measurement:

150 kHz to 30 MHz ± 0.7 dB (LISN)

RF conducted measurement ± 0.5 dB

According to TR 102 273 a multiplicative propagation of error is assumed for RF measurement systems. For this reason the RMS method is applied to dB values and not to linear values as appropriate for additive propagation of error. Also used: <http://physics.nist.gov/cuu/Uncertainty/typeb.html>. The above calculated uncertainties apply to direct application of the Substitution method. The Substitution method is always used when the EUT comes closer than 3dB to the limit.

6.2 Environmental Conditions During Testing:

The following environmental conditions were maintained during the course of testing:

- Ambient Temperature: 20-25°C
- Relative humidity: 40-60%

Deviating test conditions are indicated at individual test description where applicable.

6.3 Dates of Testing:

June 19, 2016 – Aug, 7 2016

6.4 Additional Test Information

Testing is performed according to the guidelines provided in FCC publication (KDB) FCC KDB 558074 D01 V03R05, *GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER §15.247* and according to relevant parts of ANSI 63.10 (2013) as detailed below.

7 Measurement Procedures

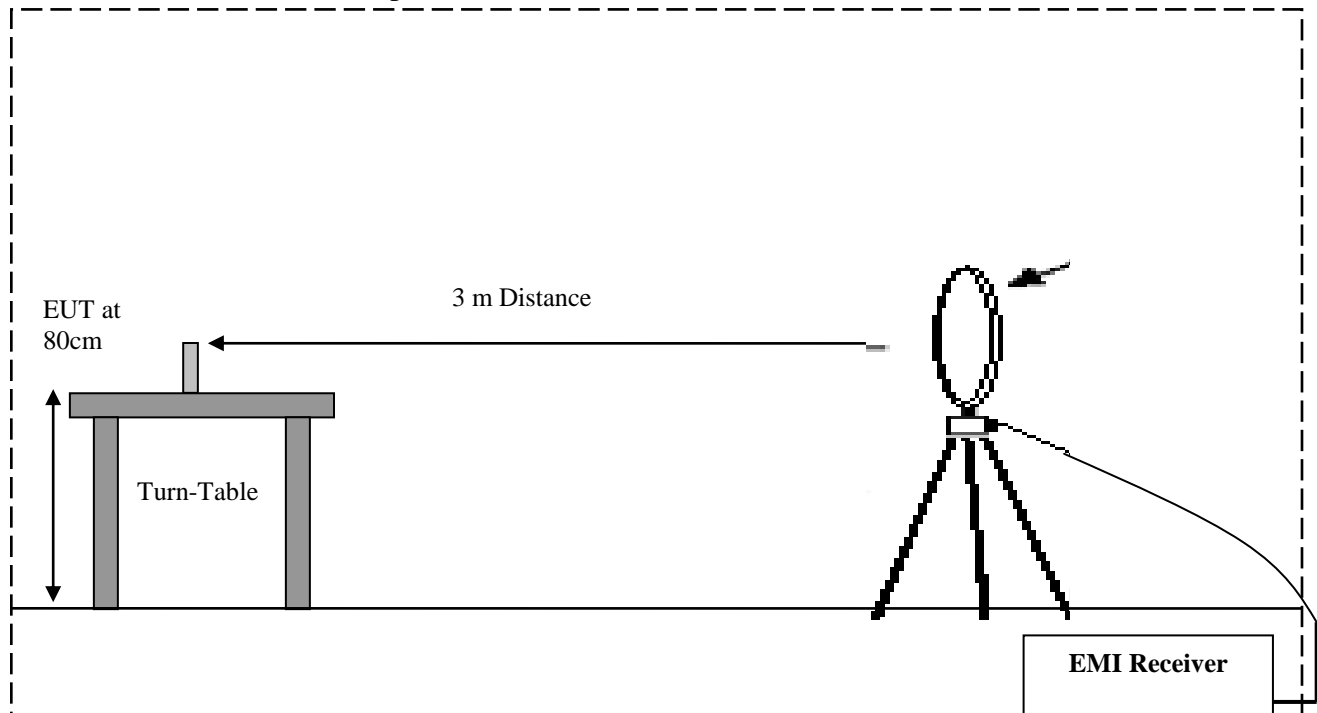
7.1 Radiated Measurement

The radiated measurement is performed according to:

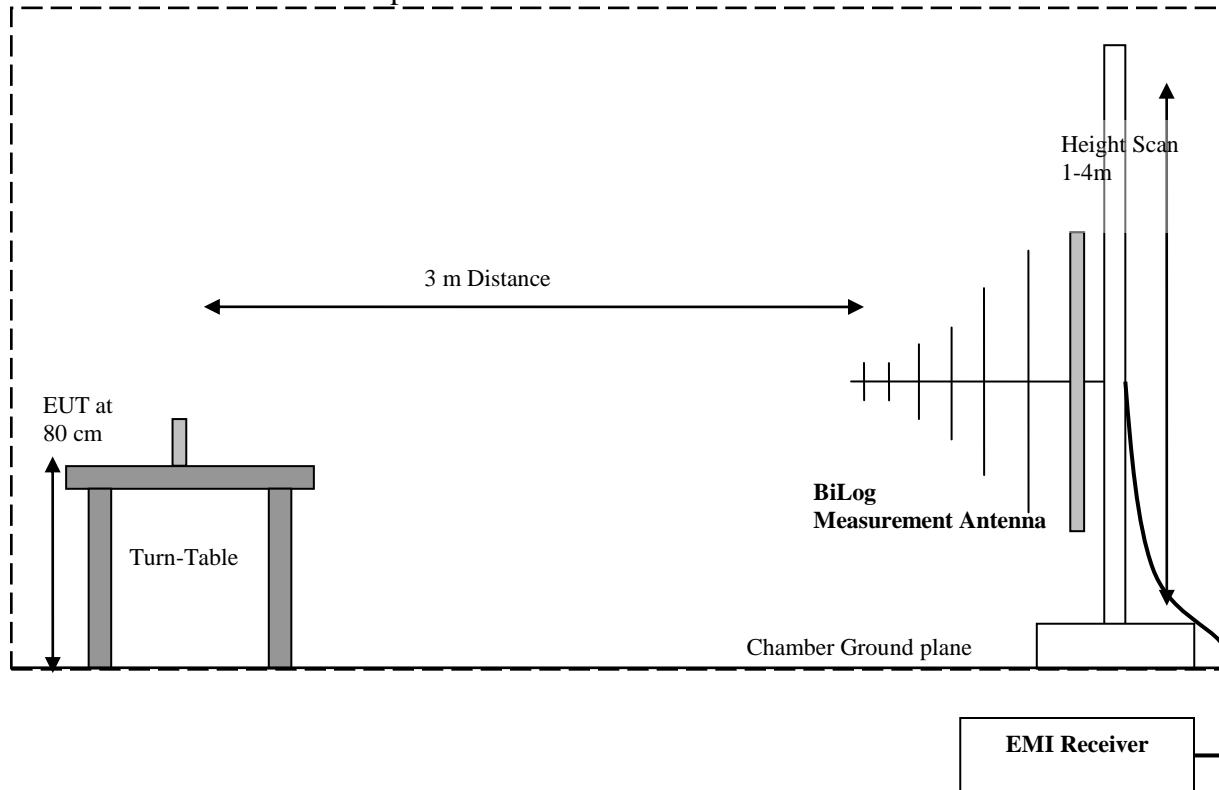
ANSI C63.10 (2013)

- The exploratory measurement is accomplished by running a matrix of 16 sweeps over the required frequency range with R&S Test-SW EMC32 for 4 positions of the turntable, two orthogonal positions of the EUT and both antenna polarizations. This procedure exceeds the requirement of the above standards to cover the 3 orthogonal axis of the EUT. A max peak detector is utilized during the exploratory measurement. The Test-SW creates an overall maximum trace for all 12 sweeps and saves the settings for each point of this trace. The maximum trace is part of the test report.
- The 10 highest emissions are selected with an automatic algorithm of EMC32 searching for peaks in the noise floor and ensuring that broadband signals are not selected multiple times.
- The maxima are then put through the final measurement and again maximized in a 90deg range of the turntable, fine search in frequency domain and height scan between 1m and 4m.
- The above procedure is repeated for all possible ways of power supply to EUT and for all supported modulations.
- In case there are no emissions above noise floor level only the maximum trace is reported as described above.
- The results are split up into up to 4 frequency ranges due to antenna bandwidth restrictions. A magnetic loop is used from 9 kHz to 30 MHz, a Biconilog antenna is used from 30 MHz to 1 GHz, and two different horn antennas are used to cover frequencies up to 40 GHz.

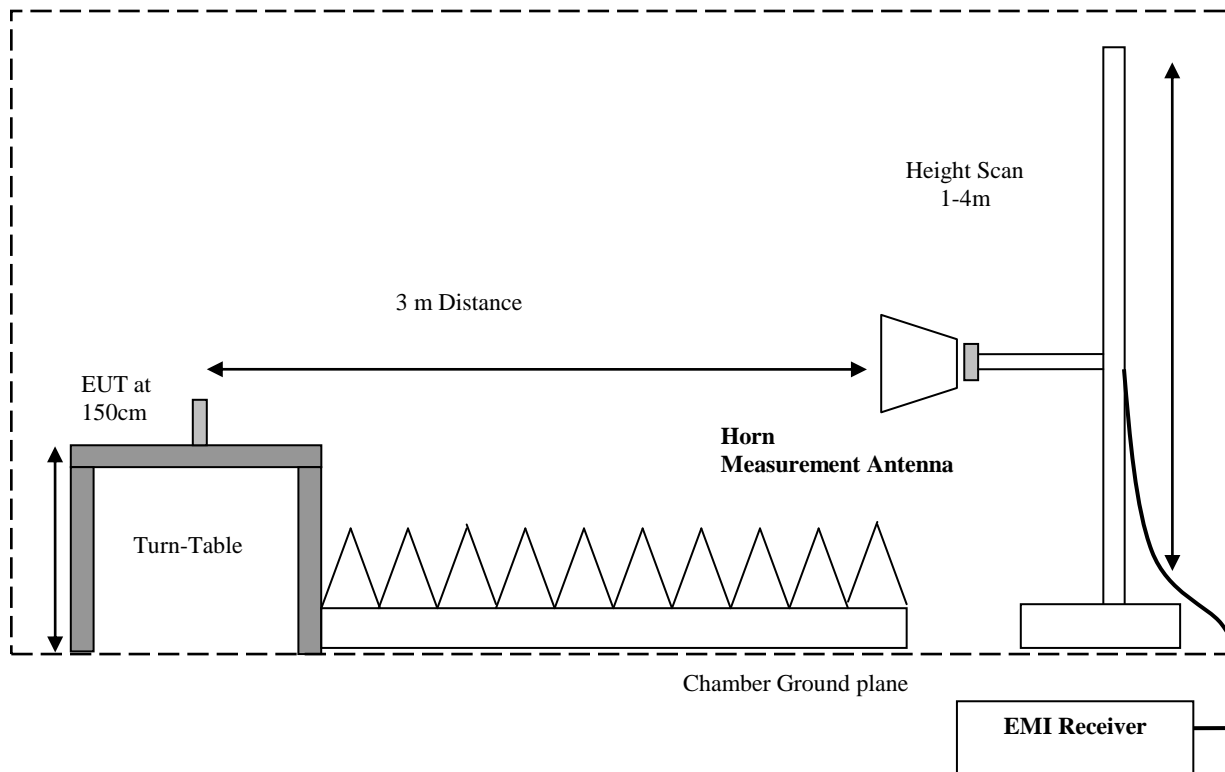
Radiated Emissions Test Setup below 30MHz Measurements



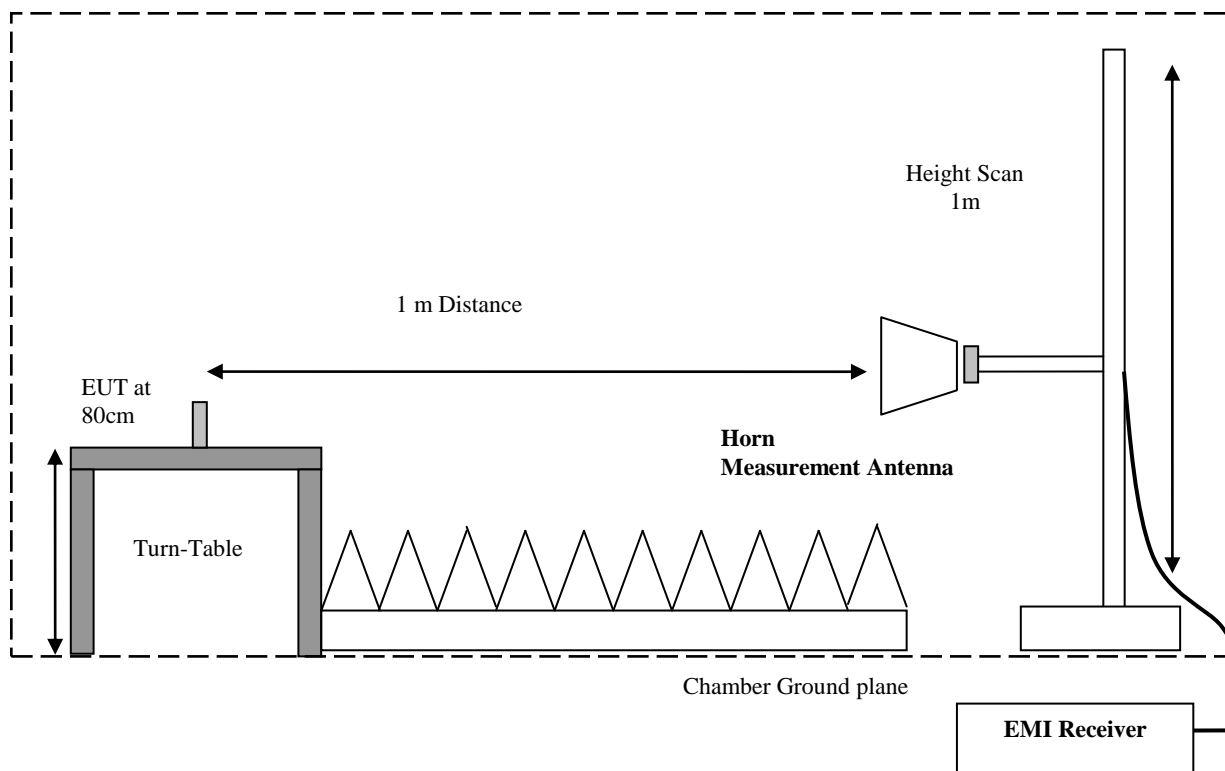
Radiated Emissions Test Setup 30MHz-1GHz Measurements



Radiated Emissions Test Setup 1-18GHz Measurements



Radiated Emissions Test Setup 18-26GHz Measurements



7.1.1 Sample Calculations for Field Strength Measurements

Field Strength is calculated from the Spectrum Analyzer/ Receiver readings, taking into account the following parameters:

1. Measured reading in dB μ V
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the following equation:

$$\text{FS (dB}\mu\text{V/m)} = \text{Measured Value on SA (dB}\mu\text{V)} - \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$$

Example:

Frequency (MHz)	Measured SA (dB μ V)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dB μ V/m)
1000	80.5	3.5	14	98.0

7.2 Power Line Conducted Measurement Procedure

AC Power Line conducted emissions measurements performed according to:

ANSI C63.10 (2013)

8 Test Result Data

8.1 Maximum Average Conducted Output Power

8.1.1 Measurement settings

Conducted measurements were taken according to ANSI C63.10 Section 11.9.1 Method Peak.

8.1.2 Limits:

Maximum Conducted Output Power:

FCC §15.247 (b) (3): 1W

8.1.3 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Antenna Gain
21.3° C	2	O-QPSK continuous fixed channel	-1

8.1.4 Measurement result:

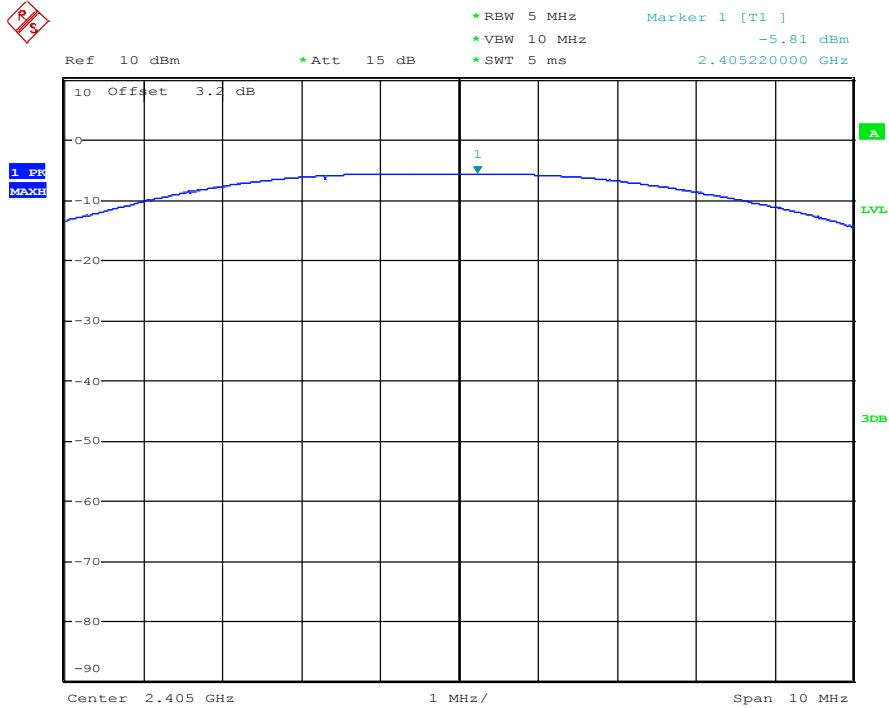
Measured Maximum Peak Conducted Output Power (dBm)			
Mode	Frequency (MHz)		
	2405 Channel 11	2440 Channel 18	2480 Channel 26
	Peak	Peak	Peak
802.15.4 ZigBee	-5.81	-6.20	-7.74

Calculated Maximum Radiated Output Power (dBm)			
Mode	Frequency (MHz)		
	2405 Channel 11	2440 Channel 18	2480 Channel 26
802.15.4 ZigBee	-6.81	-7.20	-8.74

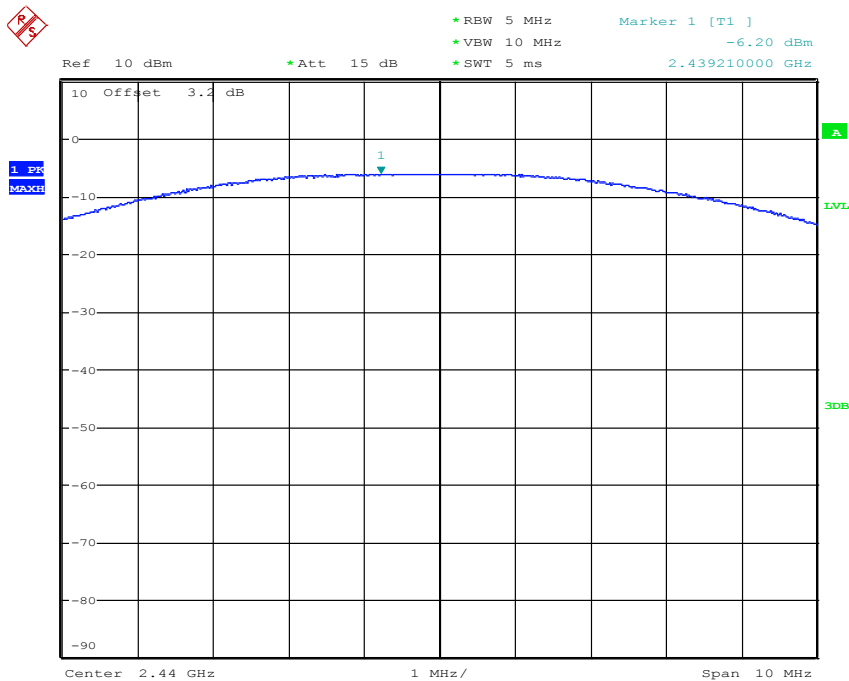
8.1.4.1 Measurement Verdict:

Pass.

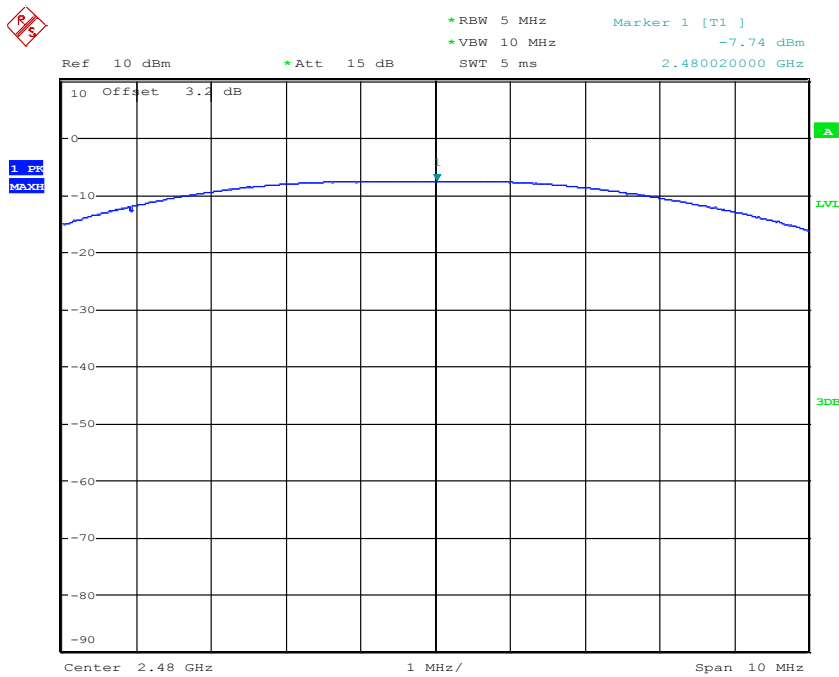
Low Channel 2405 MHz



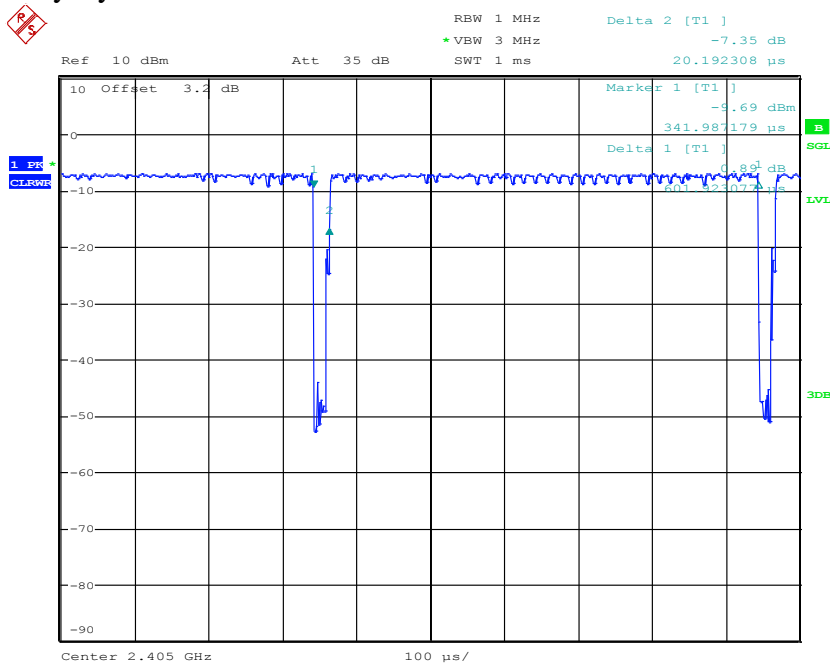
Mid Channel 2440 MHz



High Channel 2480 MHz



Duty Cycle



Duty Cycle % = (Time On / (Time On + Time Off)) * 100 = (601.92 - 20.19) / 601.92 * 100 = 96.6%

This gives a DCCF (Duty Cycle Correction Factor = 0.15 dB

8.2 DTS Bandwidth

8.2.1 Limits:

§15.247 (a) (2)

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

8.2.2 Test Conditions:

Ambient Temperature	EUT Set-Up #	EUT operating mode
22.3° C	2	Continuous fixed channel O-QPSK

8.2.3 Measurement procedure:

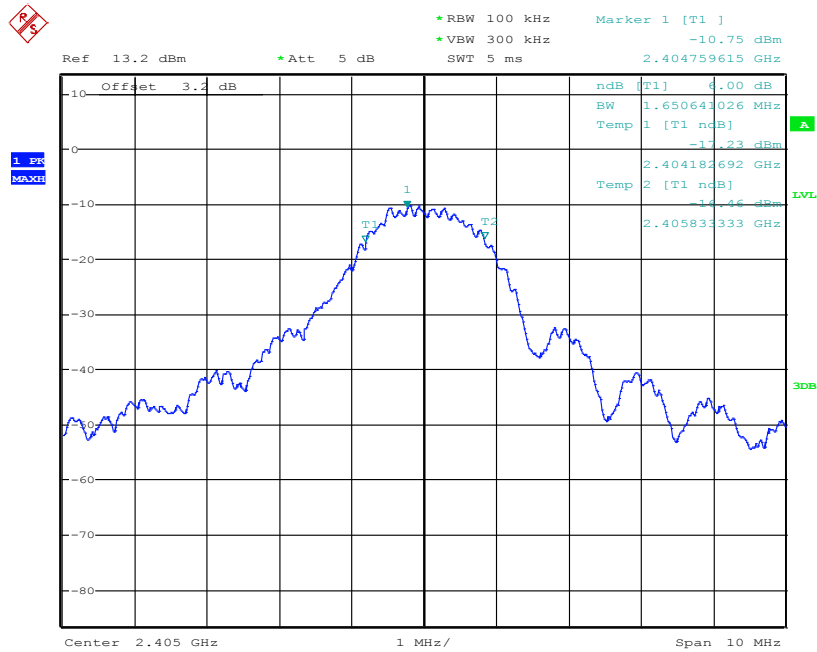
Conducted measurements were taken according to ANSI C63.10-2013 Section 11.8 for DTS Bandwidth.

Emission Bandwidth (MHz)						
Mode	Frequency (MHz)					
	2405 Channel 11		2440 Channel 18		2480 Channel 26	
	6dB	20dB/ 99%	6dB	20dB/ 99%	6dB	20dB/ 99%
802.15.4 ZigBee	1.65	2.70	1.61	2.80	1.61	2.80

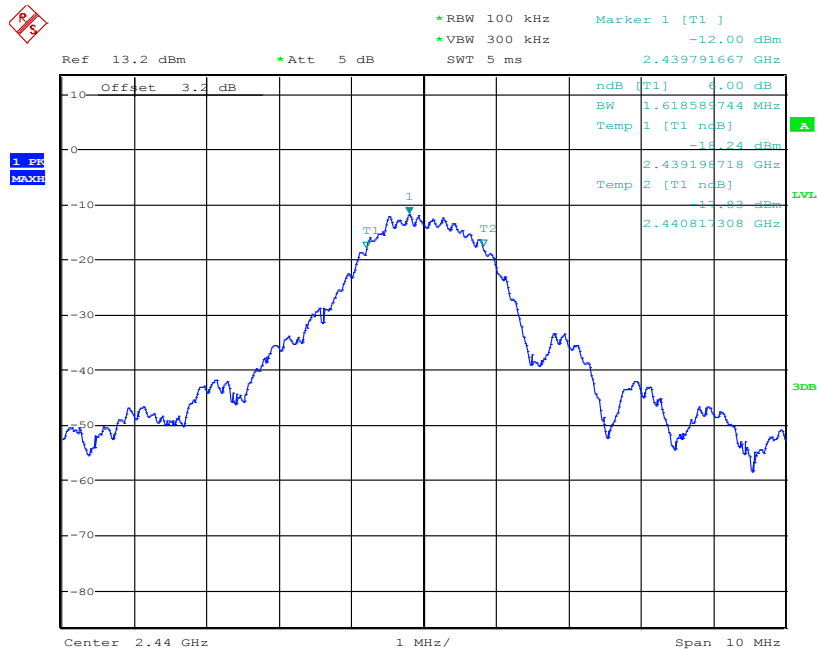
Measurement Verdict:

Pass.

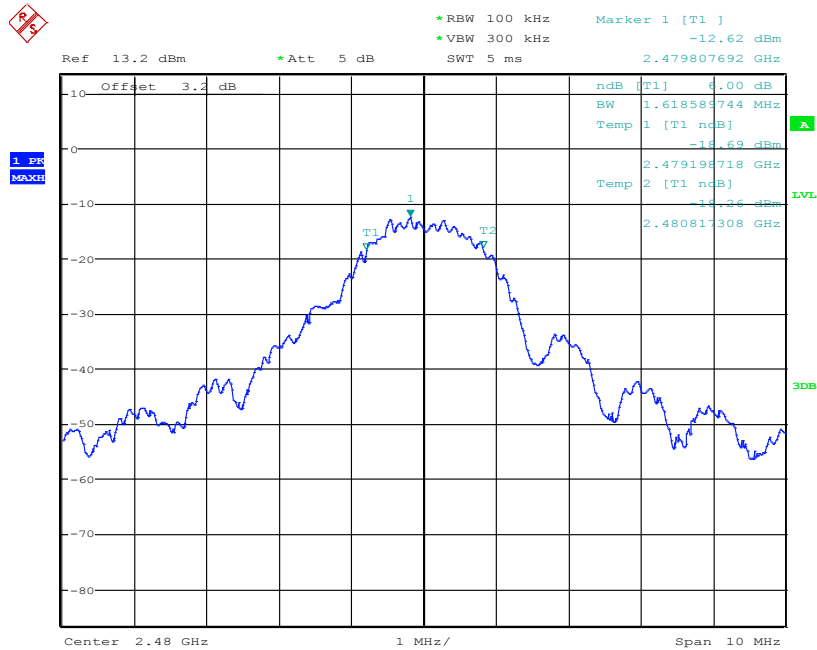
8.2.4 Test Data/plots: 6dB Bandwidth: 2405 MHz



6dB Bandwidth: 2440 MHz

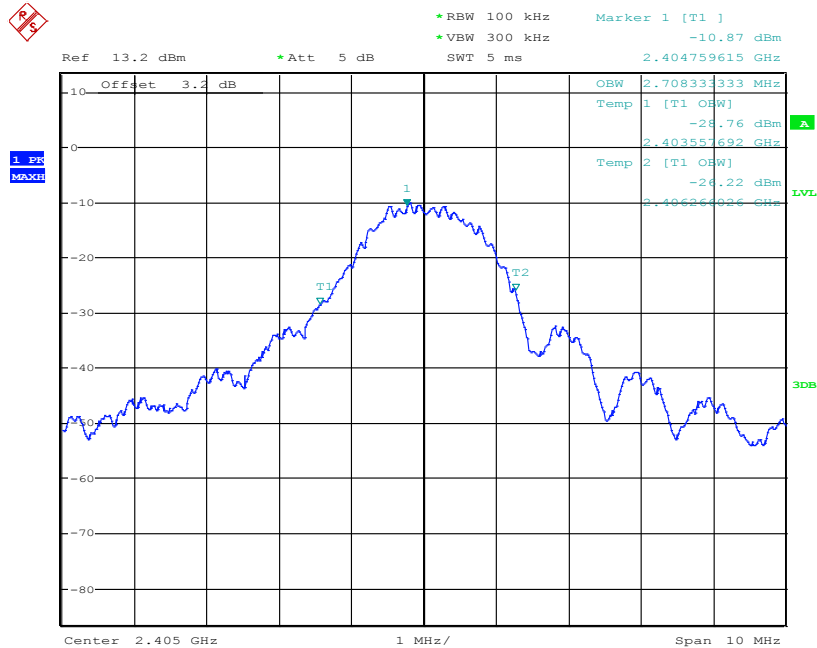


6dB Bandwidth: 2480 MHz

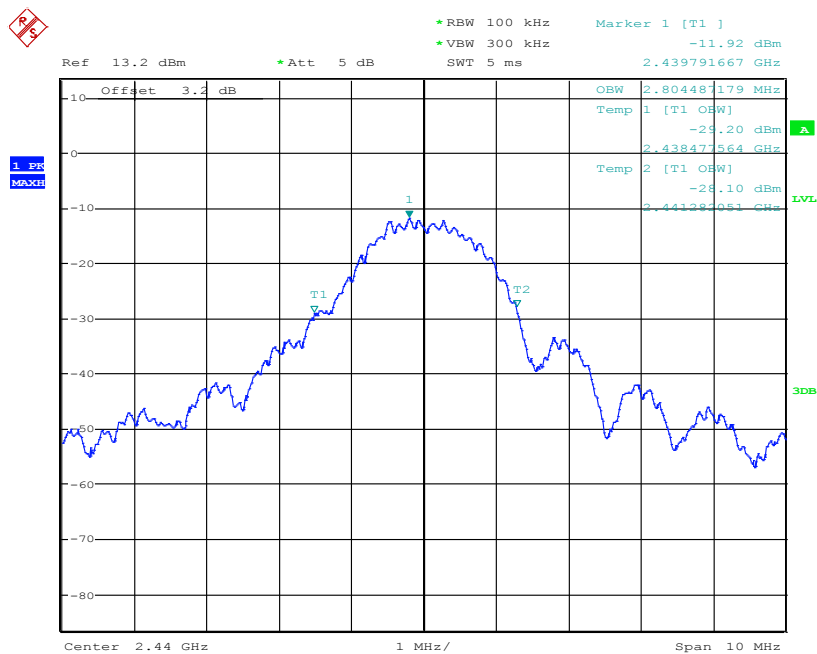


Date: 3.AUG.2016 17:17:13

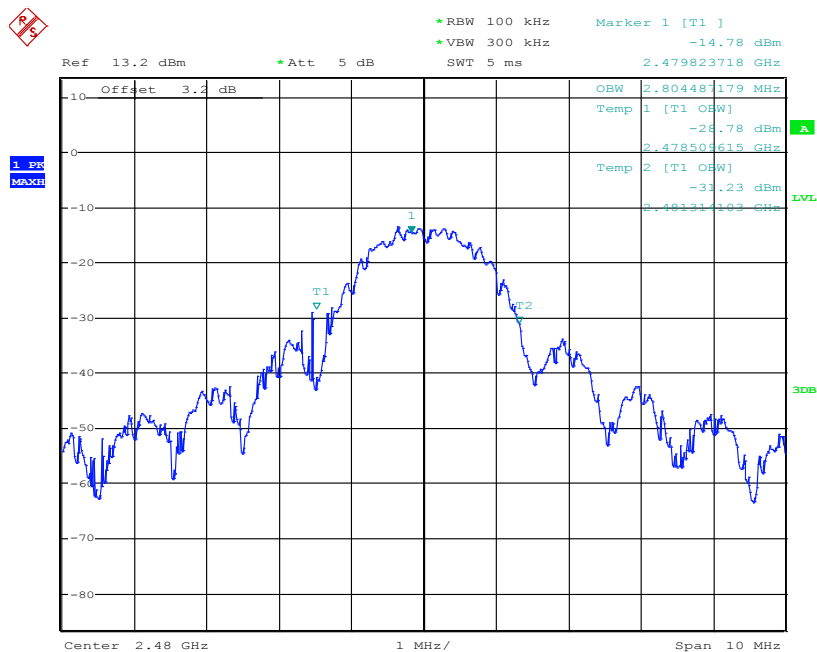
20dB Bandwidth: 2405 MHz



20dB Bandwidth: 2440 MHz



20dB Bandwidth: 2480 MHz



8.3 Power Spectral Density

8.3.1 Limits:

8.3.1.1 § 15.247 (e)

For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

8.3.2 Test Conditions:

T nom: 23°C; V nom: 4V

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
23.2° C	2	Tx	Nominal

8.3.3 Test procedure:

1. ANSI C63.10-2013 Method AVGPSD-2

8.3.4 Test results:

Measured Conducted Power Spectral Density (dBm)			
Mode	Frequency (MHz)		
	2405 Channel 11	2440 Channel 18	2480 Channel 26
802.15.4 ZigBee	-16.95	-19.23	-20.32
Measurement Uncertainty: ± 0.5 dB			

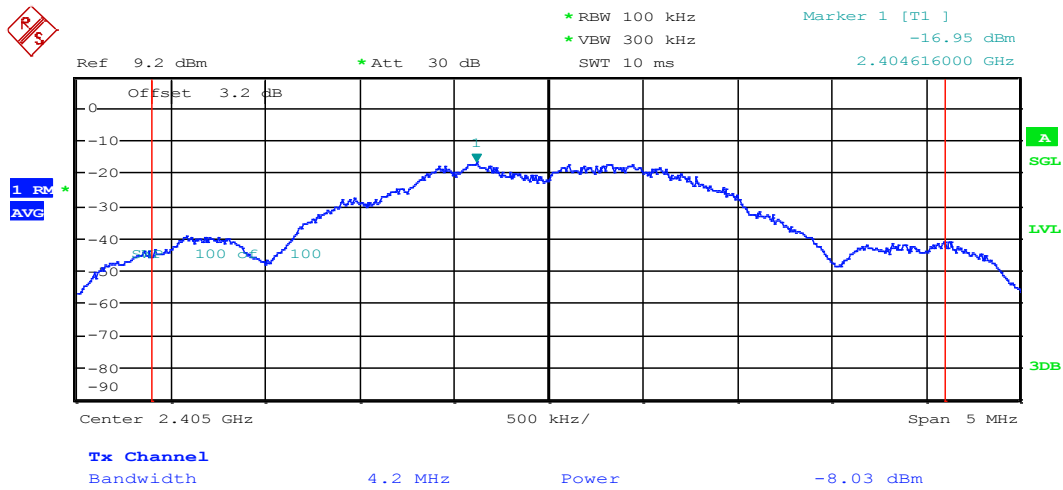
Corrected Power Spectral Density (dBm)			
Mode	Frequency (MHz)		
	2405 Channel 11	2440 Channel 18	2480 Channel 26
802.15.4 ZigBee	-16.80	-17.08	-20.17
Measurement Uncertainty: ± 0.5 dB			

8.3.4.1 Measurement Verdict

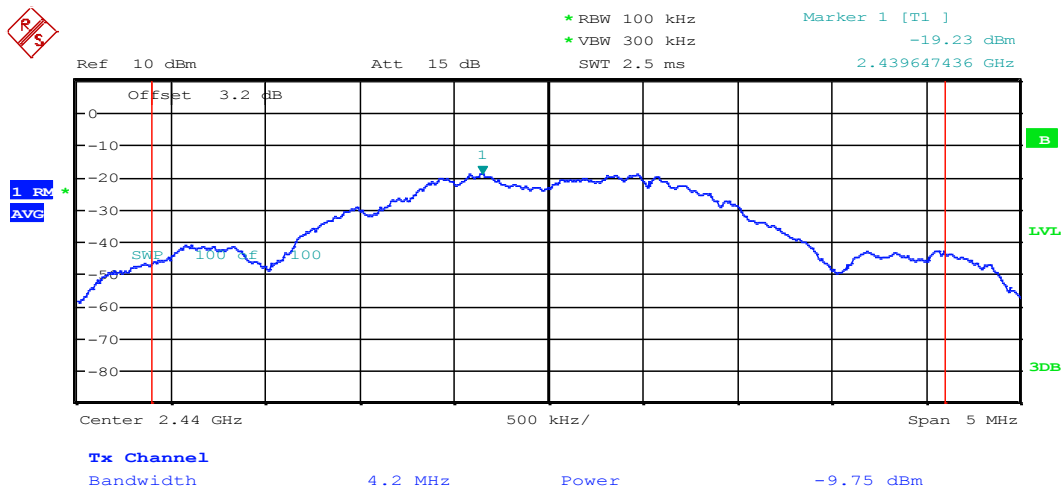
Pass.

8.3.5 Test Data/plots:

Power Spectral Density: 2405 MHz



Power Spectral Density: 2440 MHz

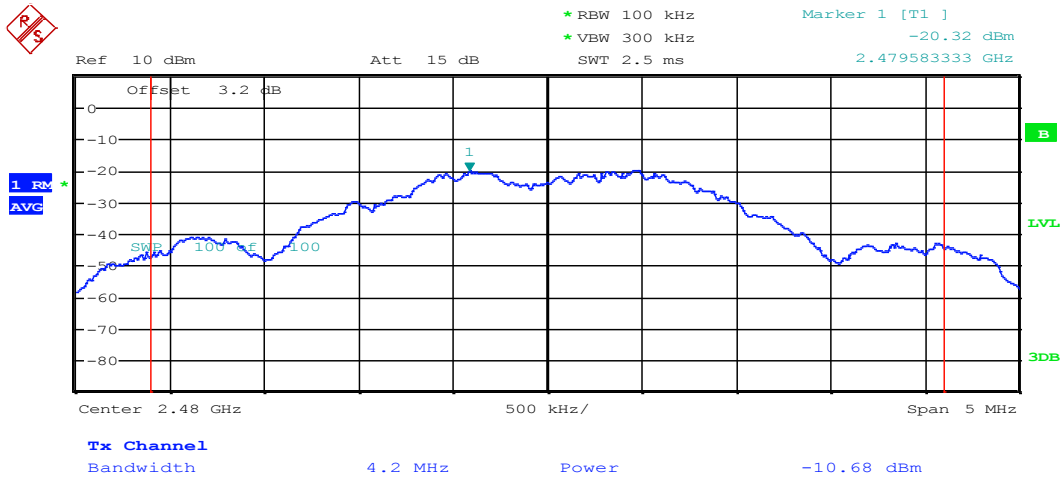


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Power Spectral Density: 2480 MHz



8.4 Compliance at Restricted and Non-Restricted Band edges

8.4.1 Limits:

§15.247/15.209/15.205

(a) Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

(b) Except as provided in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in § 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in § 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in § 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in § 15.35 apply to these measurements.

*PEAK LIMIT= 74dB μ V/m

*AVG. LIMIT= 54dB μ V/m

§15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

8.4.2 Measurement Procedure:

Conducted measurements were taken according to ANSI C63.10-2013 Section 11.11.1 for non restricted frequency bands and ANSI C63.10-2013 Section 11.12.2 for restricted frequency bands, using a spectrum analyzer

For the comparison with the dBm value of the restricted band limits for 3m distance

Peak = 74dBμV/m relates to -21.2 dBm;

Average = 54dBμV/m relates to -41.2 dBm.

8.4.3 Measurement Result

Pass.

8.4.4 Test Data:

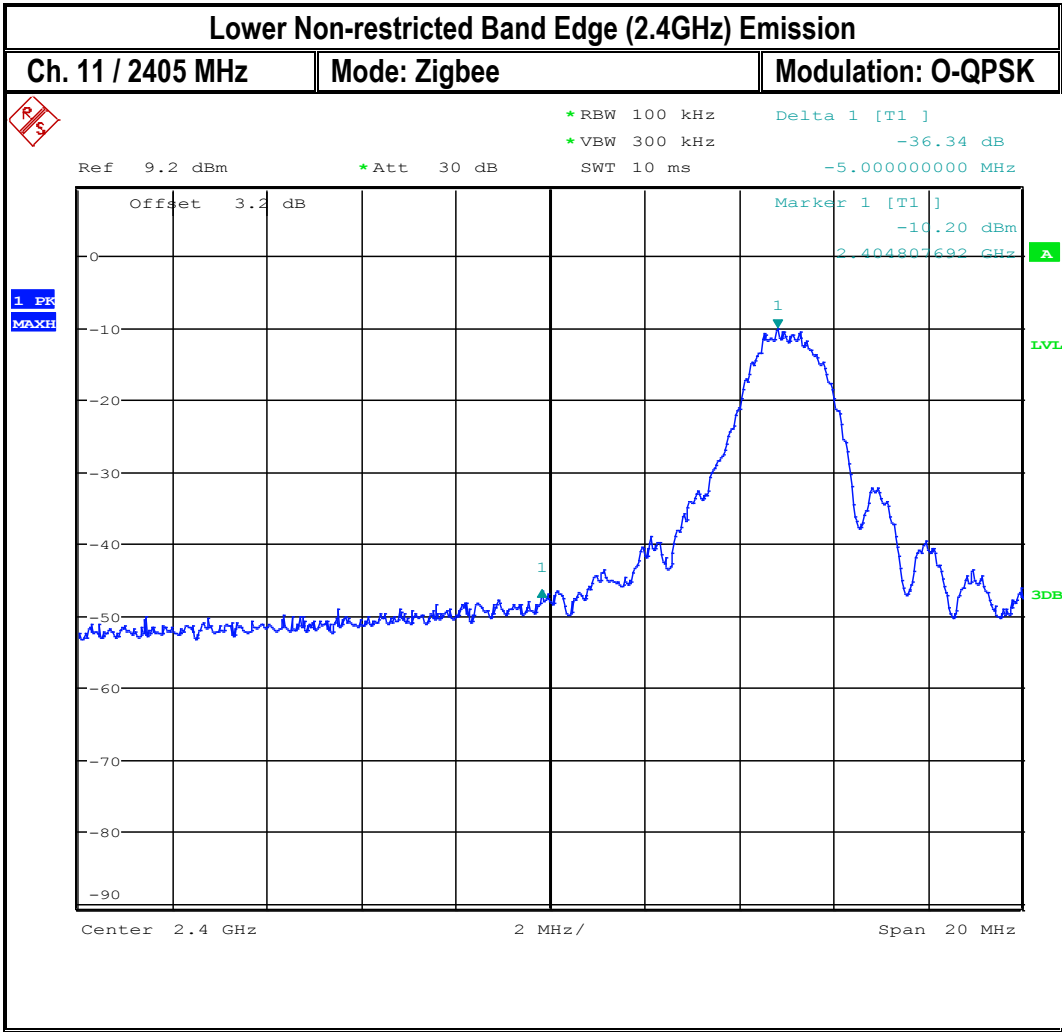
Lower non Restricted Band / Frequency Range: 2390MHz – 2400 MHz				
Measured Frequency Range (MHz)	Difference from Fundamental (dBc)	Limit (dBc)	Margin (dB)	Result
2300.0 - 2500 MHz	-36.34	-20	16.34	Pass

Note this measurement also gives 6.34 dB to the Average limit of 30dBc

Mode: Zigbee	Modulation: O-QPSK			Test Channel: High		
Upper Restricted Band / Frequency Range: 2483.5 MHz – 2500 MHz						
Measured Frequency Range (MHz)	Measured Emission Level (dBm)	Duty Cycle Correction	Default 2dBi correction for Antenna gain	Limit Peak/Average (dBm)	Margin (dB)	Result
2480 - 2500	-37 (Peak)	N/A	-35	-21.2 (Peak)	13.8	Pass
2480 - 2500	-47.45 (RMS)	-47.30	-45.30	-41.2 (RMS)	4.1	Pass



Lower Non-Restricted Band Edge



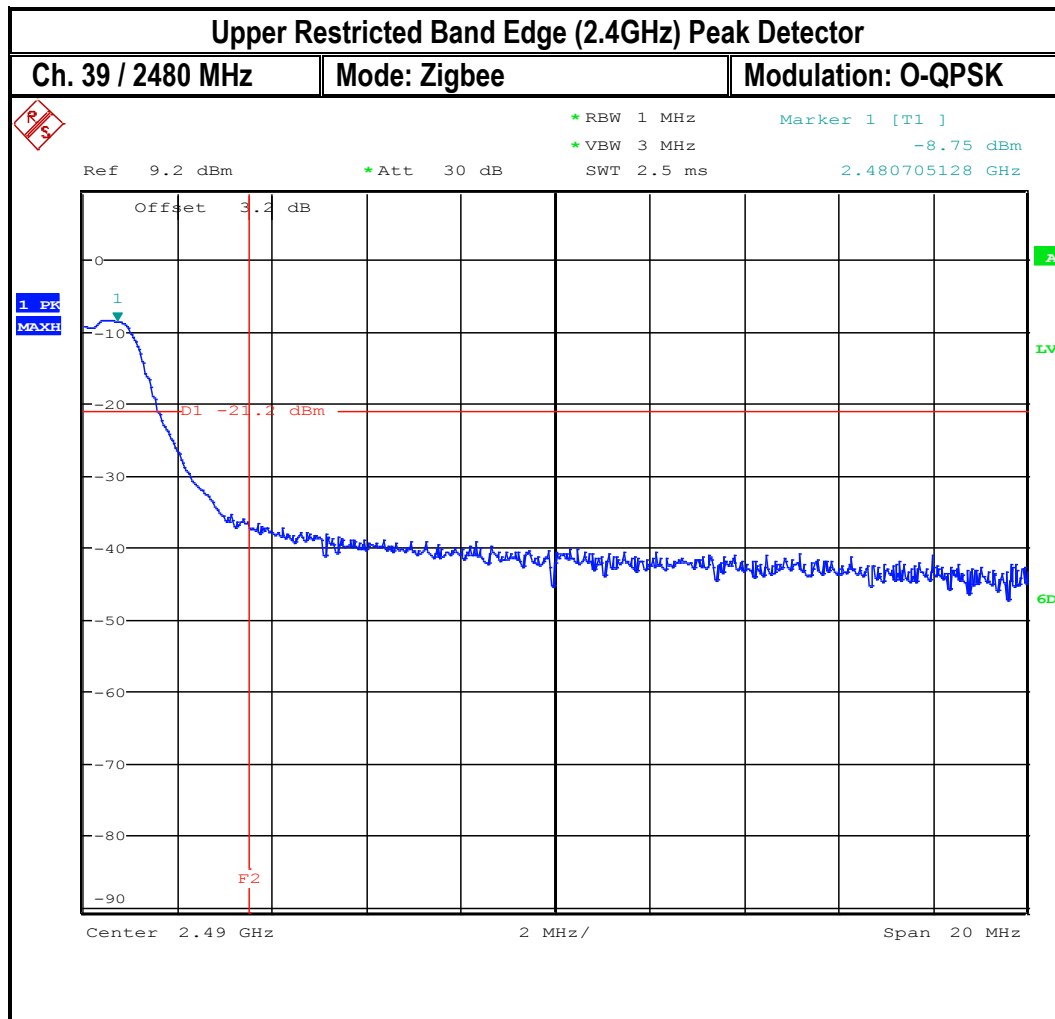
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Upper Restricted Band Edge

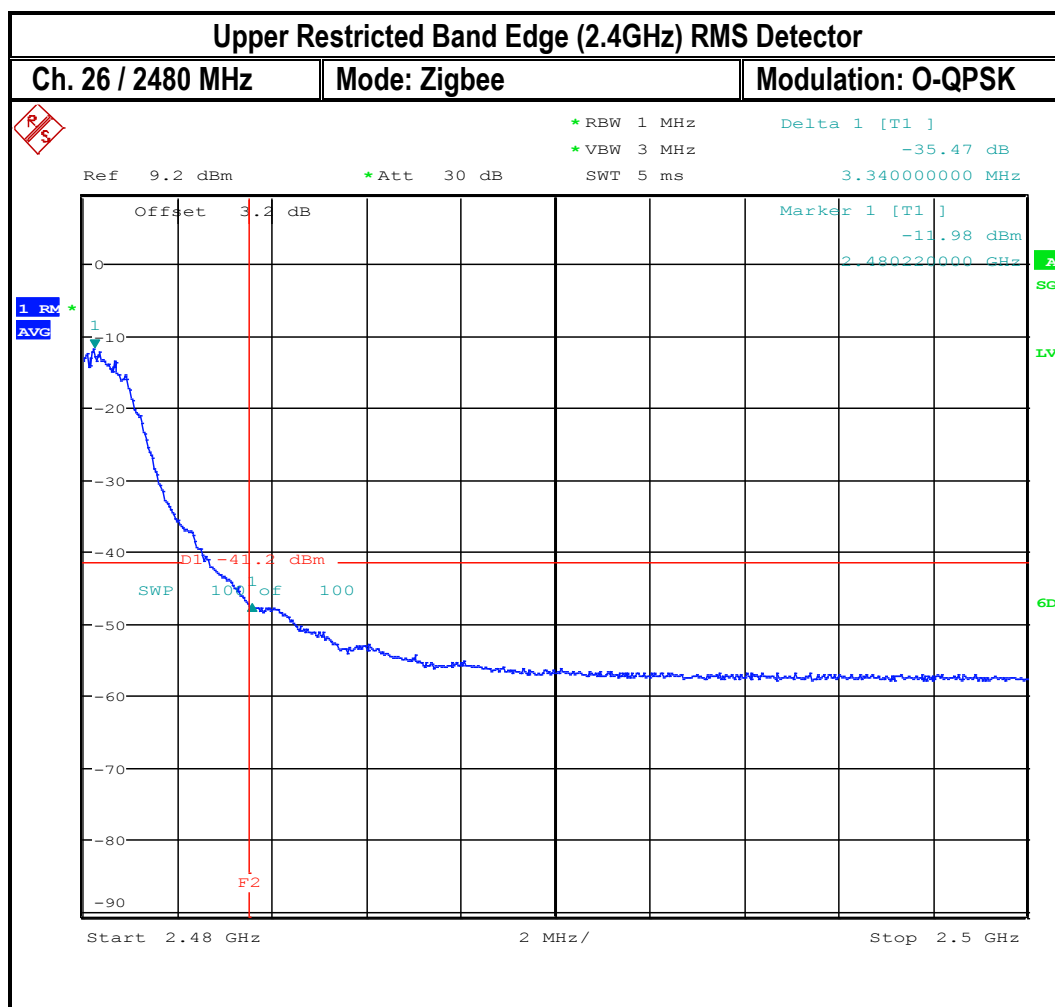


Note: F2=2483.5 MHz

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8.5 Transmitter Spurious Emissions- Radiated

8.5.1 Limits:

§15.247/15.205

Frequency of emission (MHz)	Field strength (μV/m)	Measurement Distance (m)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30

Frequency of emission (MHz)	Field strength (μV/m)
30–88	100 (40dBμV/m)
88–216	150 (43.5 dBμV/m)
216–960	200 (46 dBμV/m)
Above 960	500 (54 dBμV/m)

8.5.2 Test Result:

Test mode: 802.15.4 ZigBee Mode

Unless mentioned otherwise, the emissions outside the limit lines in the plots are from the transmit signal.

Plots reported here represent the worst case emissions for horizontal and vertical antenna polarizations and for three orientations of the EUT.

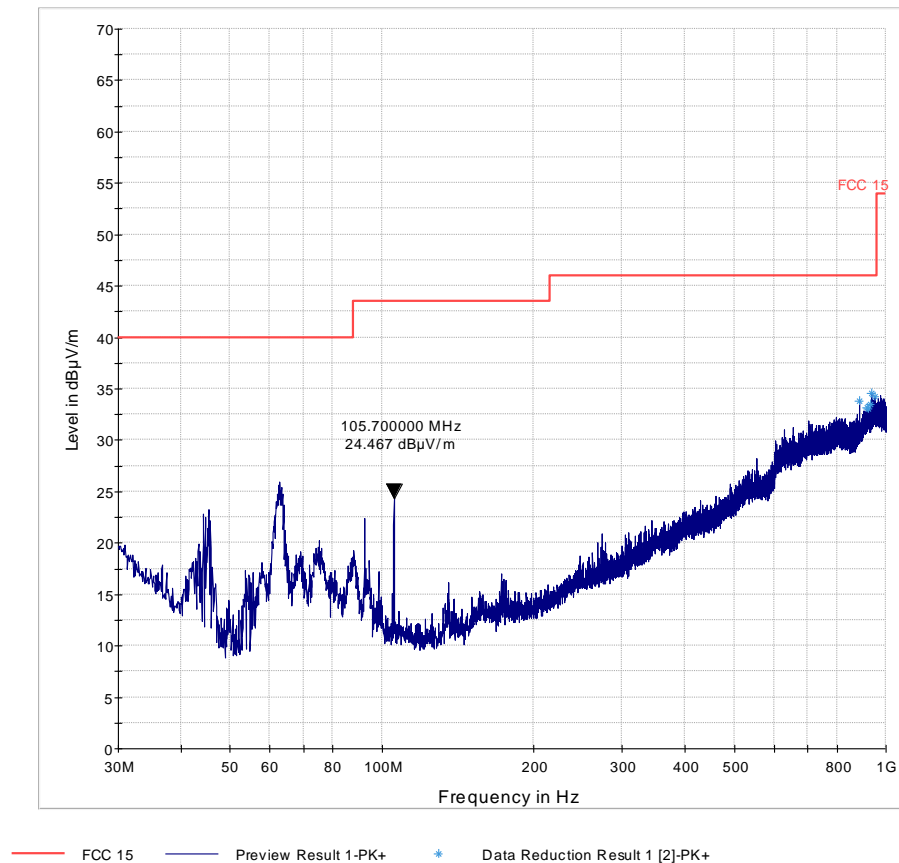
Measurement Uncertainty: ±3.0dB

8.5.2.1 Measurement Result

Pass.

8.5.3 Test data/ plots:**Transmitter Radiated Spurious Emission:<30MHz**

Note: Worst case representation for all modes of operation in this frequency range-
Limits adjusted for 3m measurement.

Transmitter Radiated Spurious Emission- Ch11 (2405 MHz): 30M-1GHz

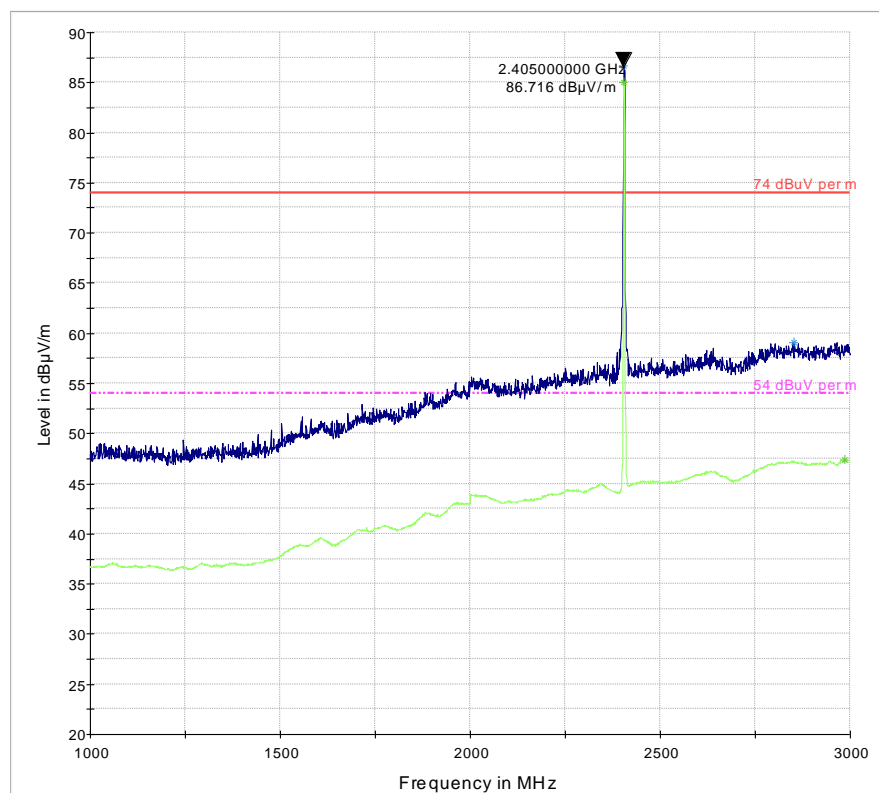
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Transmitter Radiated Spurious Emission- Ch11 (2405 MHz): 1GHz - 3GHz

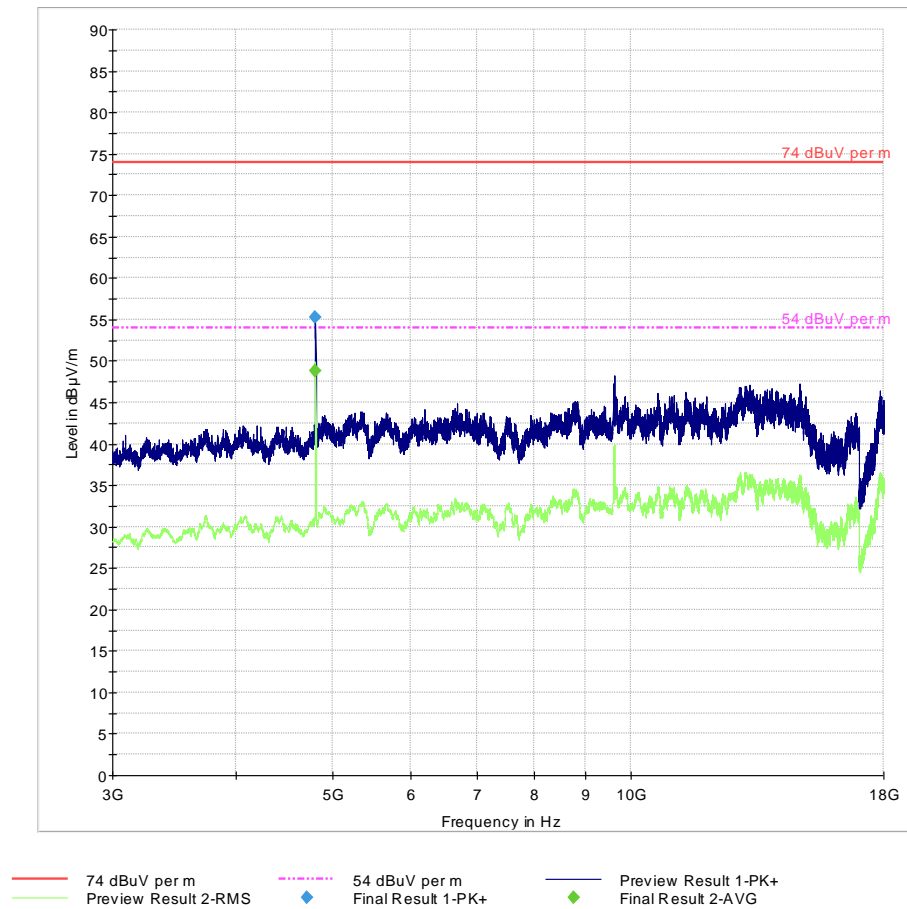


74 dBμV per m
Preview Result 2-RMS

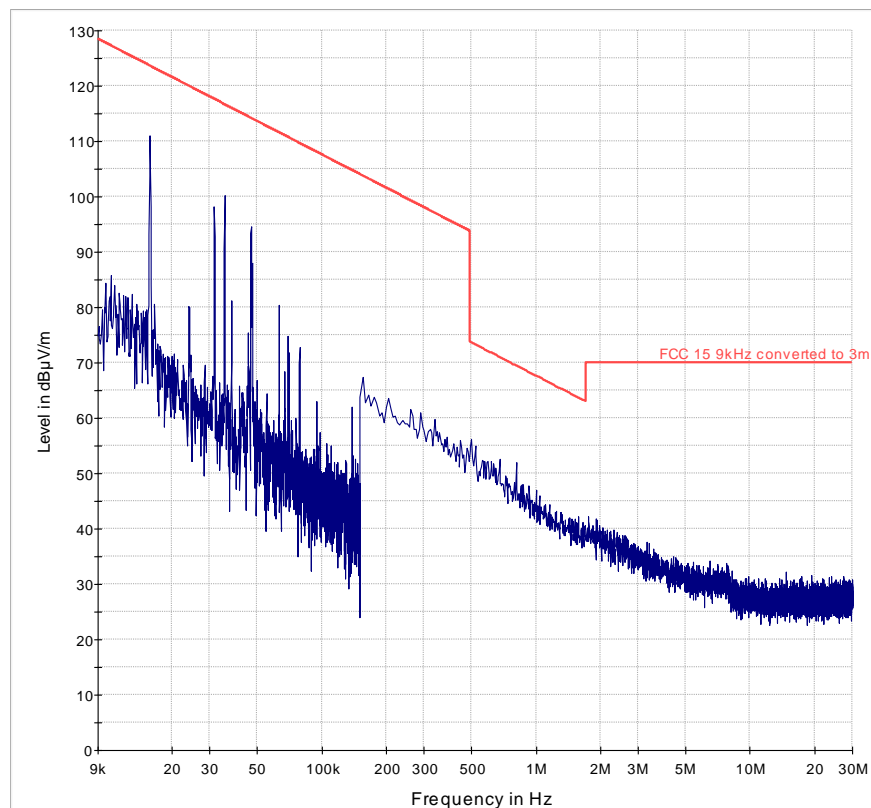
54 dBμV per m
Data Reduction Result 1 [4]-PK+

Preview Result 1-PK+
Data Reduction Result 2 [4]-RMS

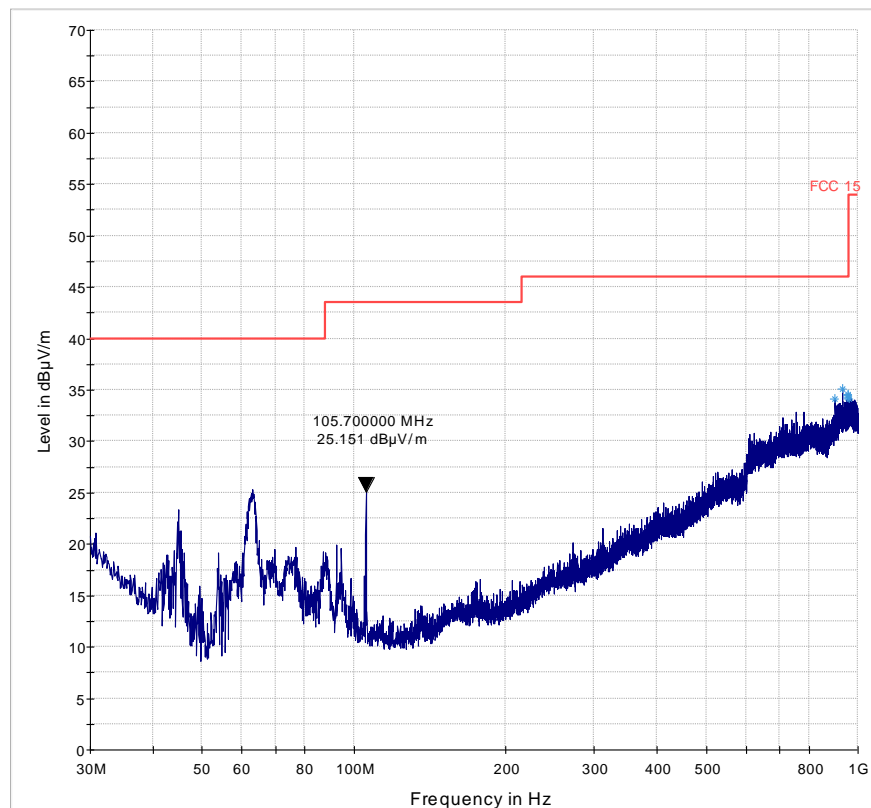
Transmitter Radiated Spurious Emission- Ch11 (2405 MHz): 3GHz - 18GHz



Transmitter Radiated Spurious Emission- Ch16 (2440 MHz): 9KHz - 30MHz

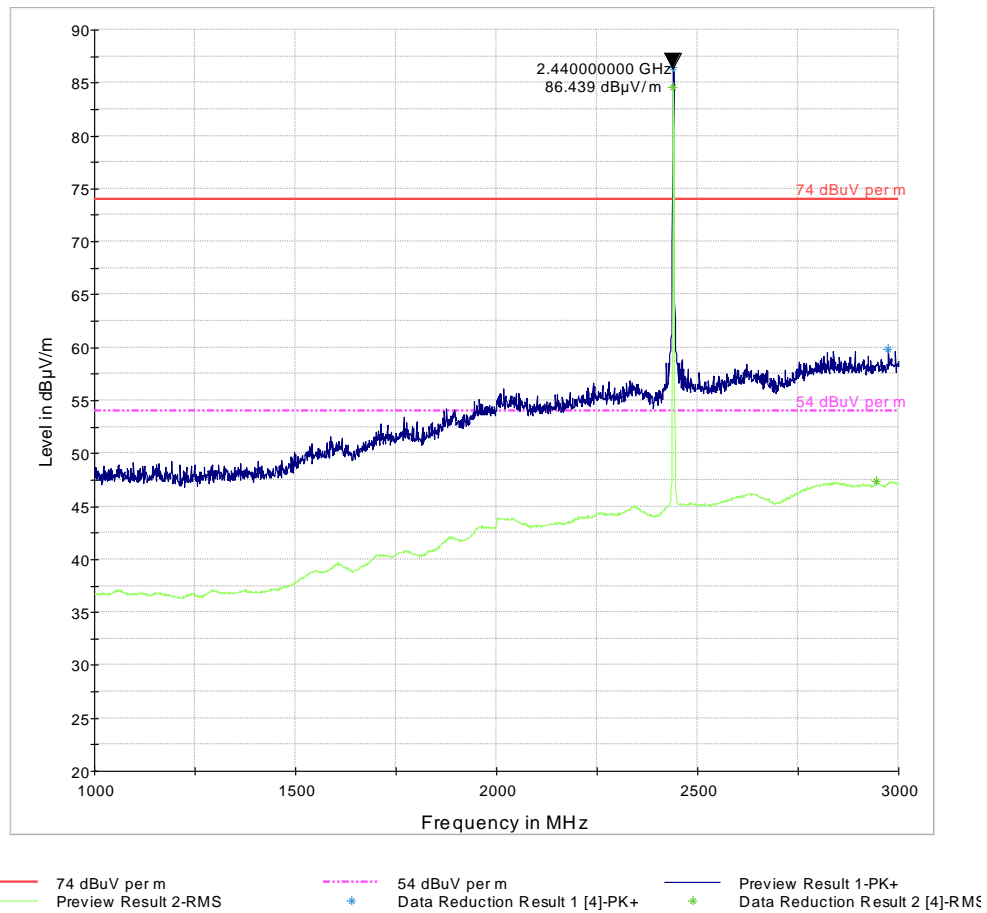


— FCC 15 9kHz converted to 3m — Preview Result 1-PK+

Transmitter Radiated Spurious Emission- Ch18 (2440 MHz): 30M-1GHz

— FCC 15 — Preview Result 1-PK+ * Data Reduction Result 1 [2]-PK+

Transmitter Radiated Spurious Emission- Ch18(2440 MHz): 1GHz - 3GHz



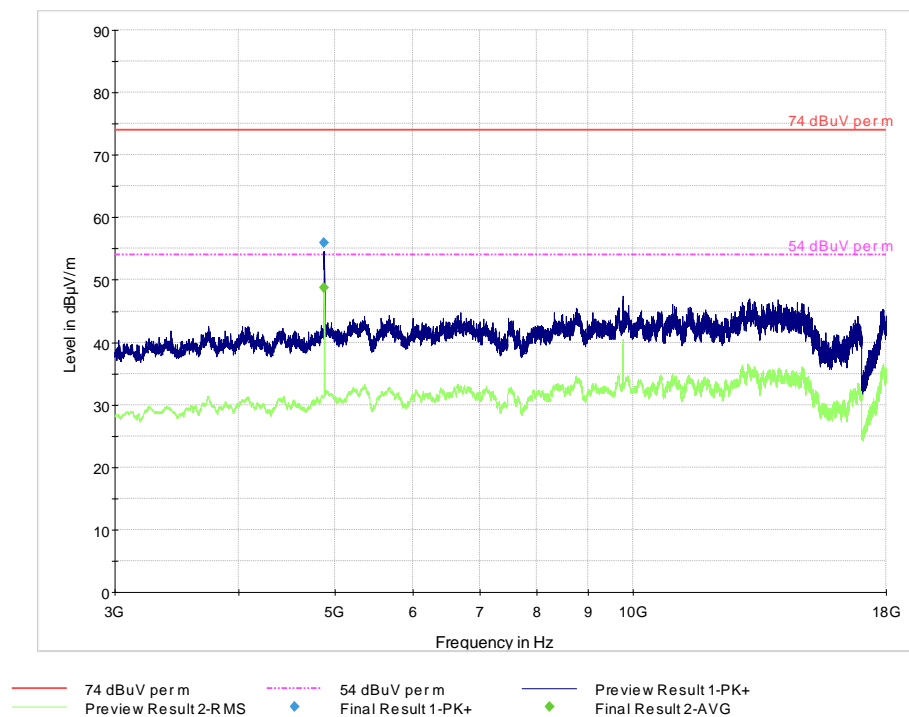
Test Report #: EMC-SENTR-002-16001-DTS

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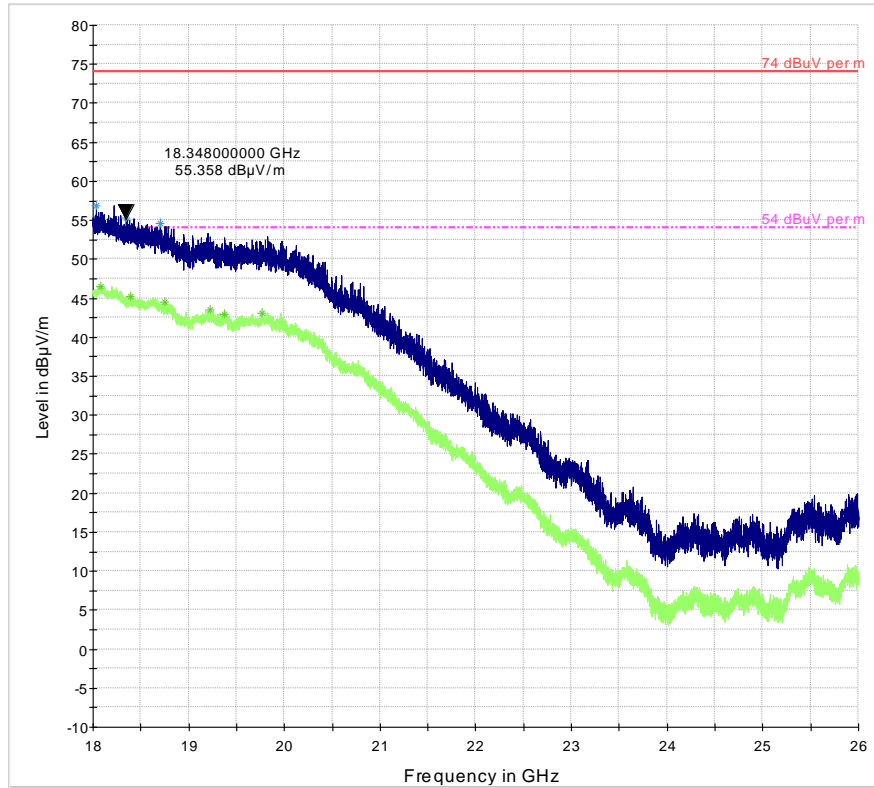
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Transmitter Radiated Spurious Emission- Ch18 (2440 MHz): 3GHz - 18GHz



Transmitter Radiated Spurious Emission- Ch18 (2440 MHz): 18G-26GHz



— 74 dBuV per m
— 54 dBuV per m
— Preview Result 1-PK+
— Preview Result 2-RMS
* Data Reduction Result 1 [6]-PK+
* Data Reduction Result 2 [6]-RMS

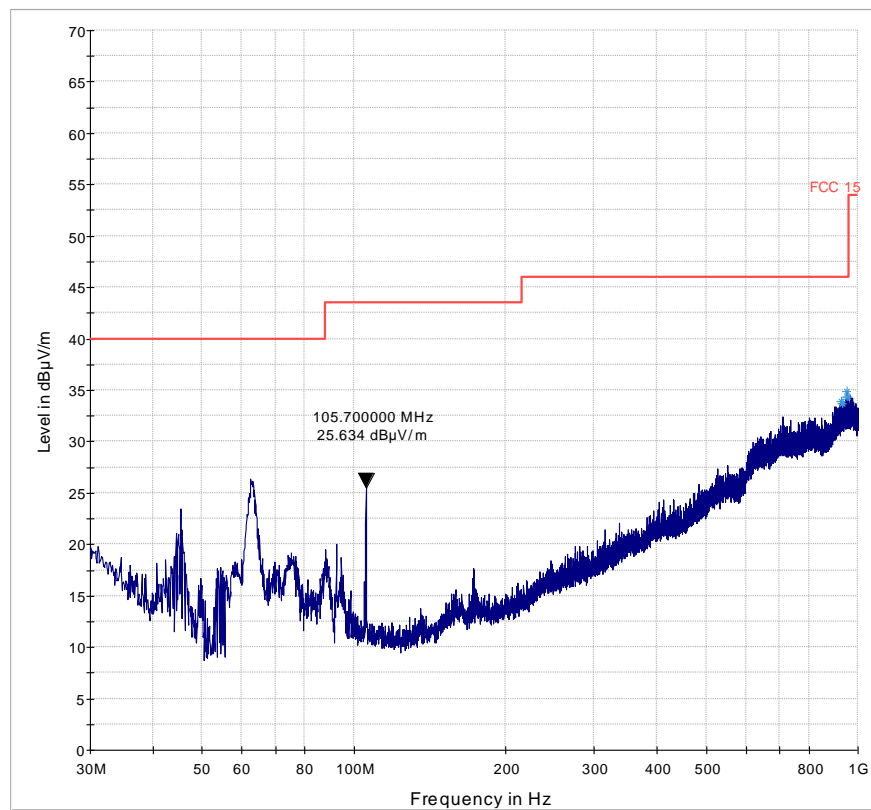
Test Report #: EMC-SENTR-002-16001-DTS

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Transmitter Radiated Spurious Emission- Ch26 (2480 MHz): 30M-1GHz



— FCC 15 — Preview Result 1-PK+ * Data Reduction Result 1 [2]-PK+

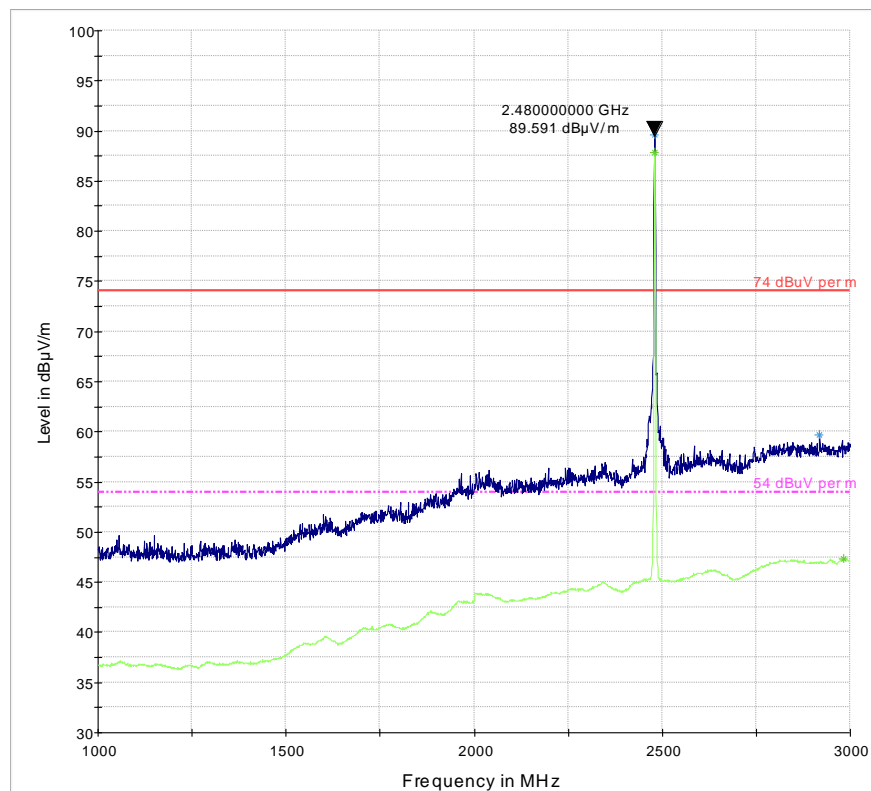
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Transmitter Radiated Spurious Emission- Ch26 (2480 MHz): 1GHz - 3GHz



74 dBμV per m
54 dBμV per m
Preview Result 1-PK+
Data Reduction Result 1 [4]-PK+
Preview Result 2-RMS
Data Reduction Result 2 [4]-RMS

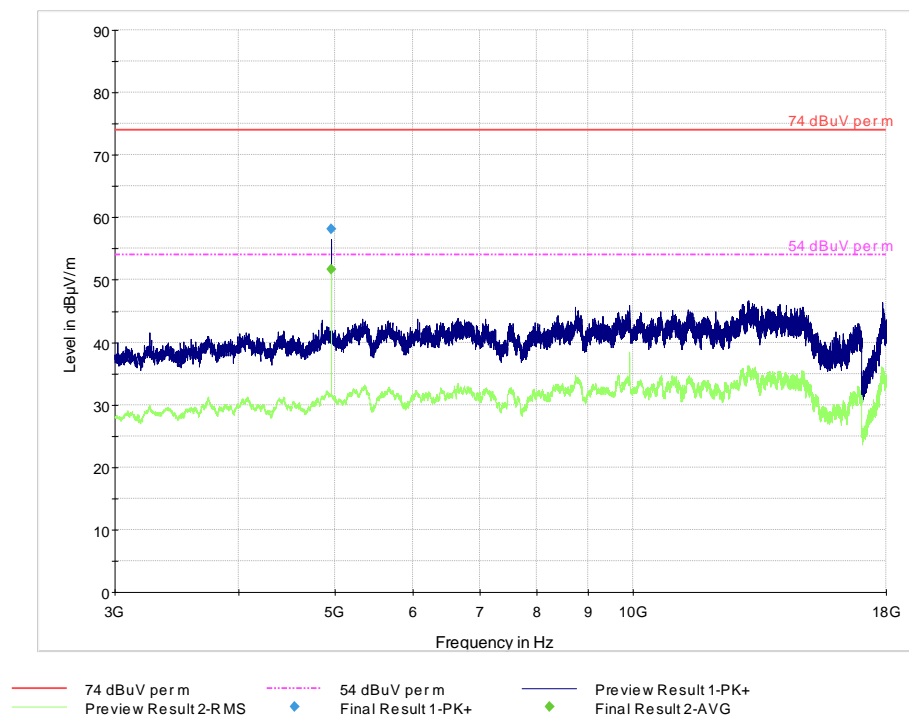
Test Report #: EMC-SENTR-002-16001-DTS

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Transmitter Radiated Spurious Emission- Ch26 (2480 MHz): 3GHz - 18GHz



9 EUT Setup Pictures

Please refer to EMC-SENTR-002-16001-FCC-TestSetupPhotos.pdf

10 Test Equipment and Ancillaries used for tests.

No.	Equipment Name	Manufacturer	Type/model	Serial No.	Cal Date	Cal Interval
3m Semi- Anechoic Chamber:						
	Digital Radio Comm. Tester	Rohde&Schwarz	CMU 200	101821	July 2015	2 Years
	EMC32 Measurement Software	Rohde&Schwarz	8.52.0	N/A	N/A	N/A
	Turn table	EMCO	2075	N/A	N/A	N/A
	MAPS Position Controller	ETS Lindgren	2092	0004-1510	N/A	N/A
	Antenna Mast	EMCO	2075	N/A	N/A	N/A
	Relay Switch Unit	Rohde&Schwarz	RSU	338964/001	N/A	N/A
	EMI Receiver/Analyzer	Rohde&Schwarz	ESU 40	100251	Sep 2015	2 Year
	1500MHz HP Filter	Filtek	HP12/1700	14c48	N/A	N/A
	2800 MHz HP Filter	Filtek	HP12/2800	14C47	N/A	N/A
	Pre-Amplifier	Miteq	JS40010260	340125	N/A	N/A
	Binconilog Antenna	EMCO	3141	0005-1186	Apr 2015	3 Years
	Horn Antenna	EMCO	3115	35114	Mar 2015	3 Years
	Horn Antenna	ETS Lindgren	3116	70497	Mar 2015	3 Years
	Spectrum Analyzer	Rohde&Schwarz	FSU	100189	Jun 2015	2 Years
	Loop Antenna 6512	ETS Lindgren	6512	49838	Mar 2014	3 Years
Ancillary equipment						
	Humidity Temperature Logger	Dickson	TM320	03280063	Apr 2015	2 Year

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11 Revision History

Date	Report Name	Changes to report	Prepared by
Oct 12, 2016	EMC-SENTR-002-16001-DTS	First Version	James Donnellan
Oct 30, 2016	EMC-SENTR-002-16001-DTS-Rev1	Updated conducted plots. Updated Band Edge to account for default 2dBi antenna gain.	James Donnellan