Hong Kong

FCC - TEST REPORT

Report Number	: **60/790.13.023.01 (Revision 2.0)**	Date of Issue:	September 26, 2013
Model	: **Y-400Pc**		
Product Type	: **Wireless Gaming Headset-controller**		
Applicant	: Guillemot Corporation S.A.		
Address	: Place du Granier, B.P 97143, Chantepie, 35171, France		
Test Result	: ■ **Positive** ☐ **Negative**		
Total pages including Appendices	: 32		

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Hong Kong

1. Table of Contents

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2. Details about the Test Laboratory

Details about the Test Laboratory

Test site 1:
Company name: TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2,
10 Science Park West Avenue,
Science Park, Shatin
HK.

Telephone: 852 2776 1323
Fax: 852 2776 1372

Test site 2:
Company name: Global United Technology Service Co., Ltd.
2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, China

3. Description of the Equipment Under Test

Description of the Equipment Under Test

Product:	Wireless Gaming Headset-controller
Model no.:	Y-400Pc
Serial number:	NIL
Options and accessories:	NIL
Rated Voltage:	3.0VDC – 1 x CR2032 size battery
Rated Current:	NIL
Rated Power:	NIL
Frequency:	NIL
Modulation type:	O-QPSK
Antenna gain:	2.93 dBi
RF Transmission Frequency:	2425MHz-2475MHz

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
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4. Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C, Intentional Radiators, 10-1-12 Edition	PART 15 – RADIO FREQUENCY DEVICES Subpart C – Intentional Radiators

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5. Summary of Test Results

Technical Requirements					
FCC Part 15 Subpart C					
Test Condition	Pages	Test site	Test Result		
			Pass	Fail	N/A
15.207 Conducted Emission AC Power Port	N/A	N/A	☐	☐	☒
15.247 (b) (1) Conducted peak output power	8	Site 2	☒	☐	☐
15.247(d) Band edge compliance of RF emissions	10	Site 2	☒	☐	☐
15.247(d) Spurious RF conducted emissions	15	Site 2	☒	☐	☐
15.247(d) & 15.209 Spurious radiated emissions for transmitter	19	Site 2	☒	☐	☐
15.247(a)(2) 6dB bandwidth	23	Site 2	☒	☐	☐
15.247(e) Power spectral density	28	Site 2	☒	☐	☐

6. General Remarks

Remarks
This submittal(s) (test report) is intended for FCC ID: NAM4160586C complies with Section, 15.209, 15.247 of the FCC Part 15.

All the configurations of the product were tested and only the worst test results listed in the report.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date: 21st May 2013

Testing Start Date: 21st May 2013

Testing End Date: 30th May 2013

- TÜV SÜD HONG KONG LTD. -

Prepared by: CHAN Kwong Ngai

Reviewed by: Edmond FUNG

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7. Technical Requirement

7.1 Conducted peak output power

Test Method
The transmitter output connected to the Spectrum analyzer and set to the peak power detection.

Limits for conducted peak output power measurements

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤1.0	≤30.0

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Conducted peak output power

Date of test : 21st May 2013

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed

Type	Channel		
	2425 MHz	2450 MHz	2475 MHz
O-QPSK	-0.96 dBm	-1.28 dBm	-0.025 dBm

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7.2 Band edge Measurement

Test Method

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW and VBW to 1MHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.
The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW and VBW to 100kHz, to measure the conducted peak band edge.

Limits

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in 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. 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 Section 15.205(c)).

Frequency MHz	Limit Average dBuV/m	Limit Peak dBuV/m
Below 2390 Above 2483.5	54	74

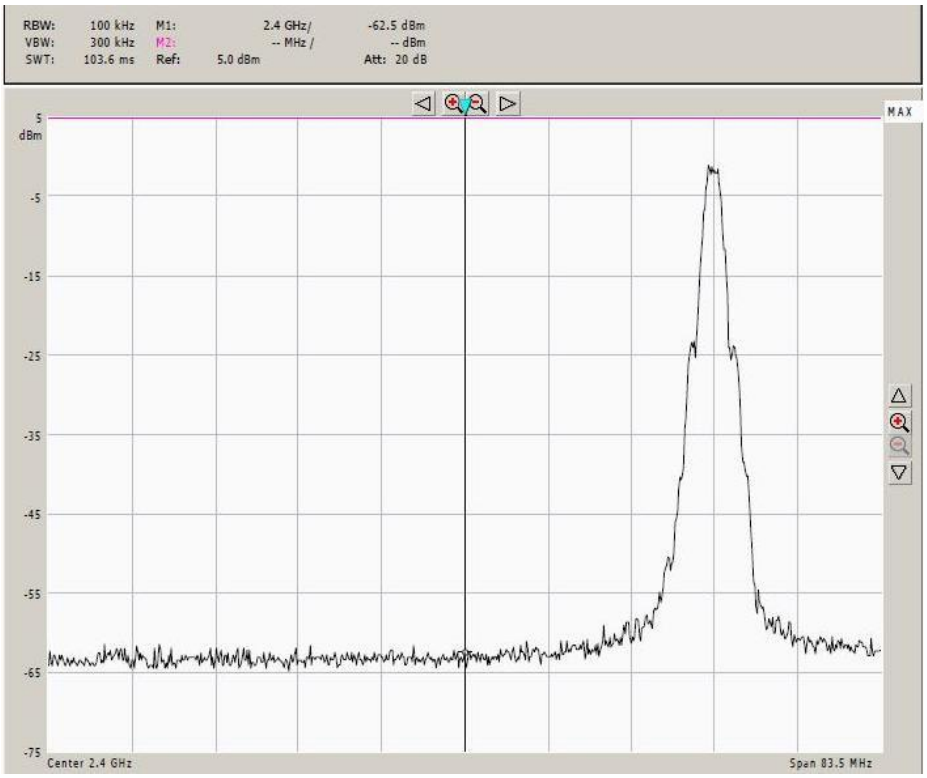
Band edge Measurement

Date of test : 21st May 2013

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed

Conducted measurement



Frequency (MHz)	Reading (dBm)	Limit (-20dBc)	Margin (dB)
2400.000	-62.5	-21.77	-40.73
2425.050	-1.77	-	-

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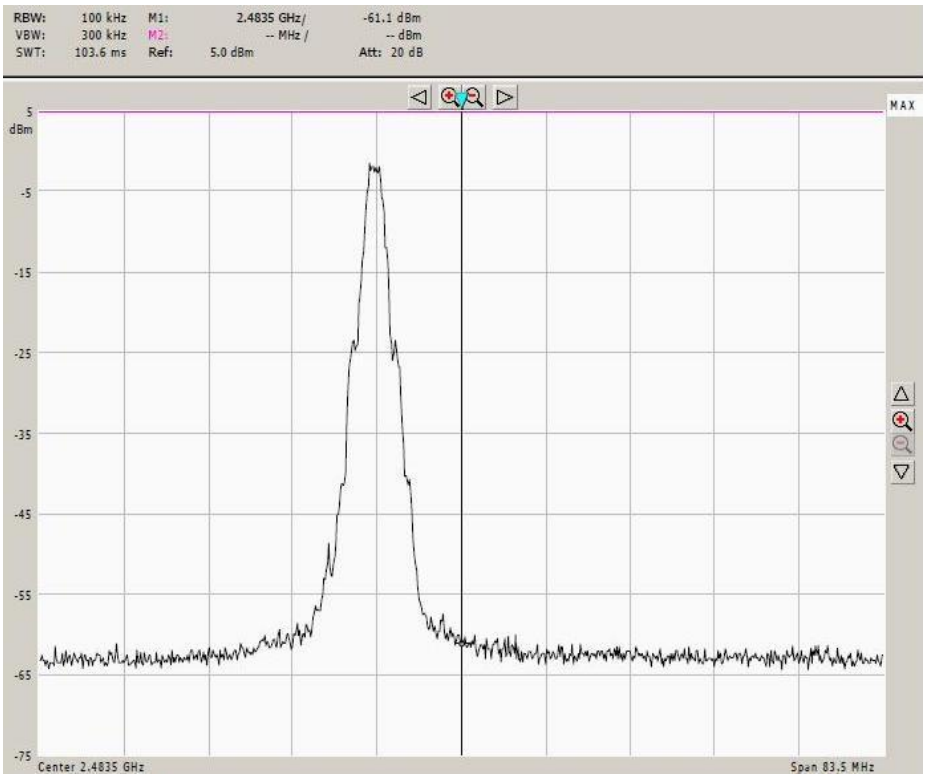
Band edge Measurement

Date of test : 21st May 2013

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed

Conducted measurement



Frequency (MHz)	Reading (dBm)	Limit (-20dBc)	Margin (dB)
2474.672	-1.92	-	-
2483.500	-61.1	-21.92	-39.18

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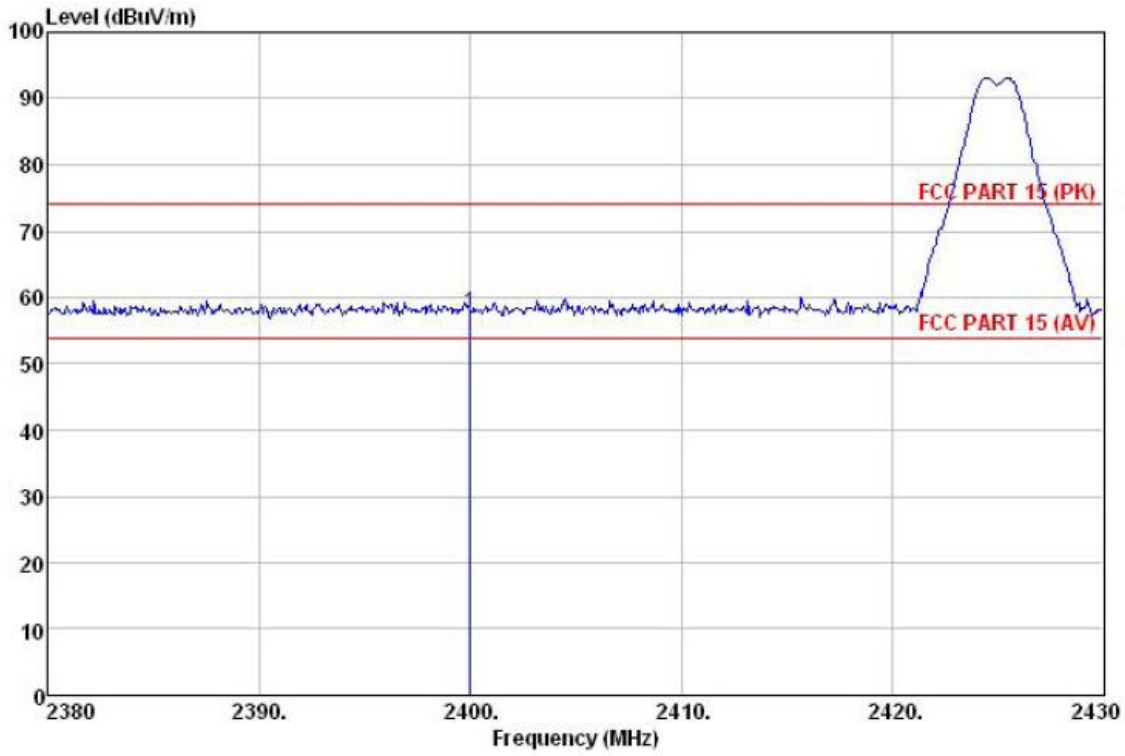
Band edge Measurement

Date of test : 21st May 2013

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed

Radiated measurement



Frequency (MHz)	Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
2400.000	57.7	74.0	-16.3	PK
2400.000	45.7	54.0	-8.3	AV

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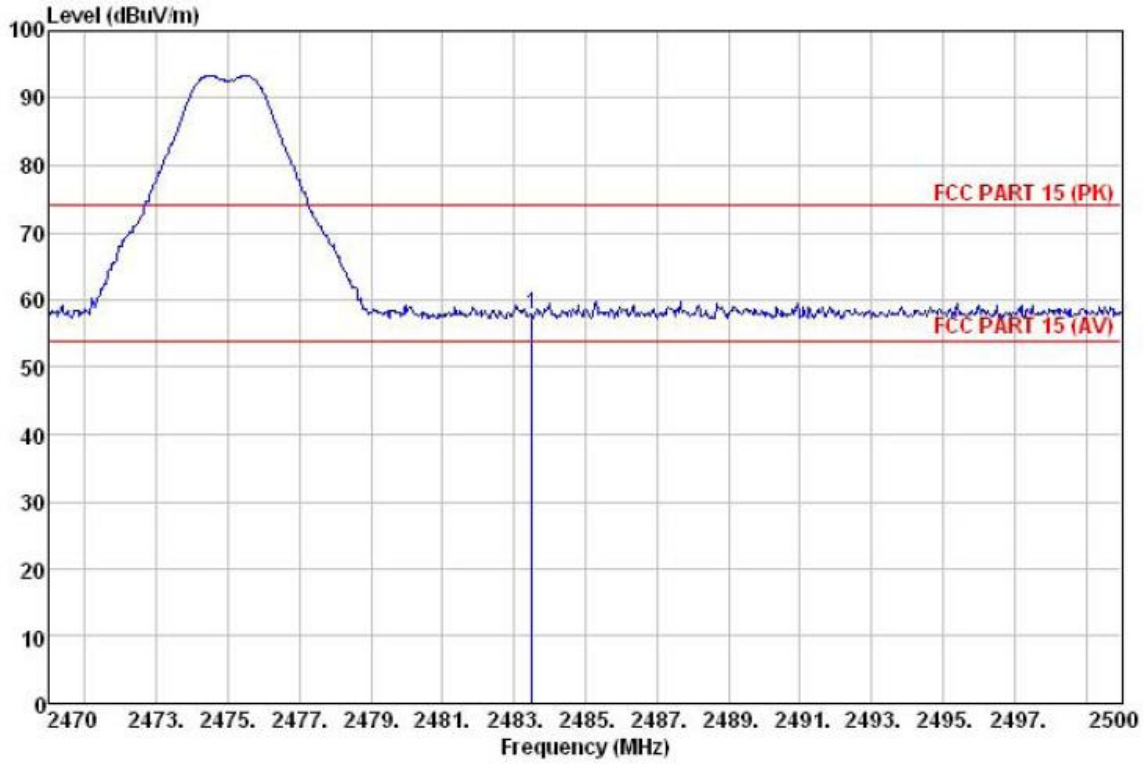
Band edge Measurement

Date of test : 21st May 2013

Remarks : NIL

Test Result
☒ Passed
☐ Not Passed

Radiated measurement



Frequency (MHz)	Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
2483.500	58.1	74.0	-15.9	PK
2483.500	46.4	54.0	-7.6	AV

7.3 Spurious RF conducted emissions

Test Method

The transmitter output is connected to the Spectrum analyzer. The Spectrum analyzer is set to the peak power detection.
Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The resolution bandwidth(RBW) and the video bandwidth (VBW) of the spectrum analyzer were respectively set to 100kHz and 100kHz.

Limit

Frequency Range MHz	Limit (dBc)
1000-25000	-20

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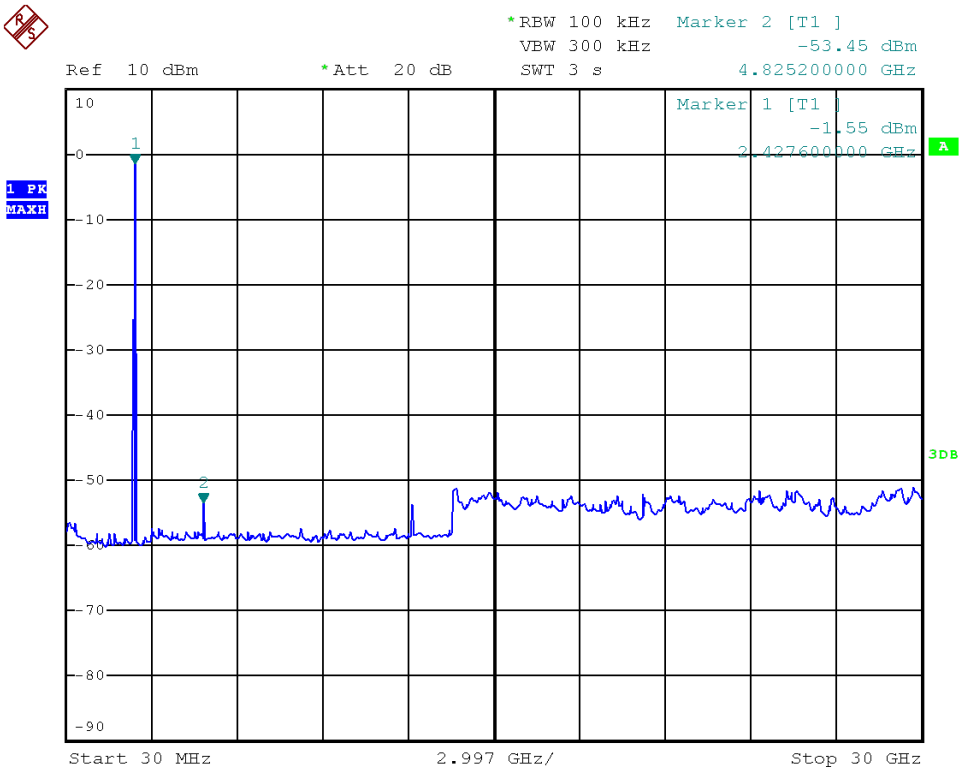
Spurious RF conducted emissions

Date of test : 23rd May 2013

Channel : 2425 MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed



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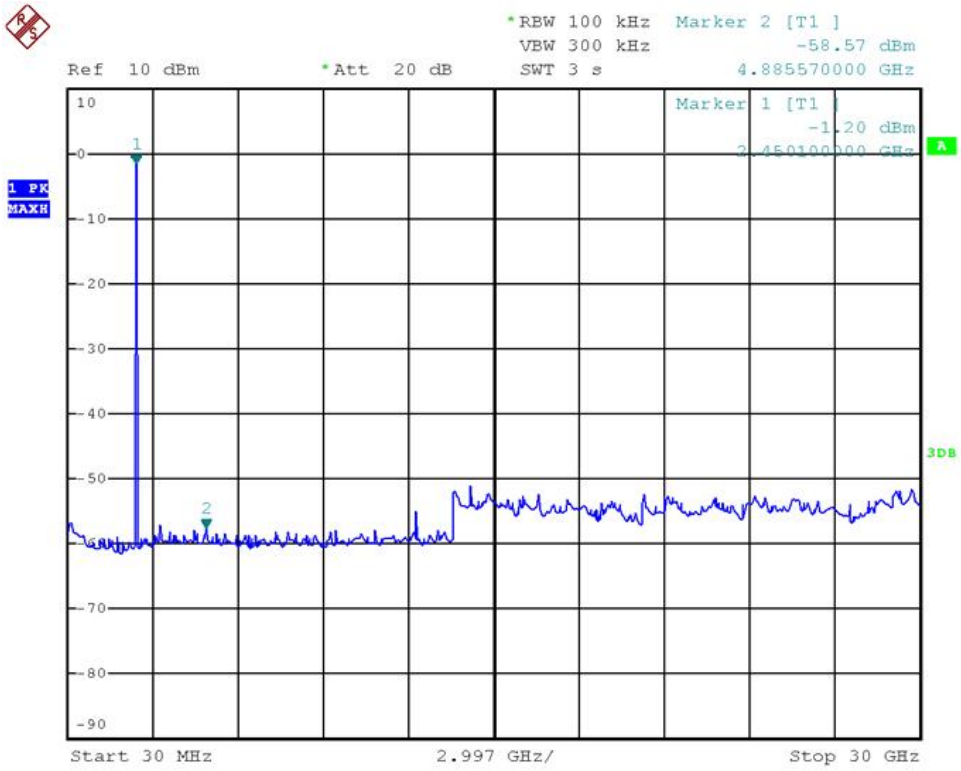
Spurious RF conducted emissions

Date of test : 23rd May 2013

Channel : 2450MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed



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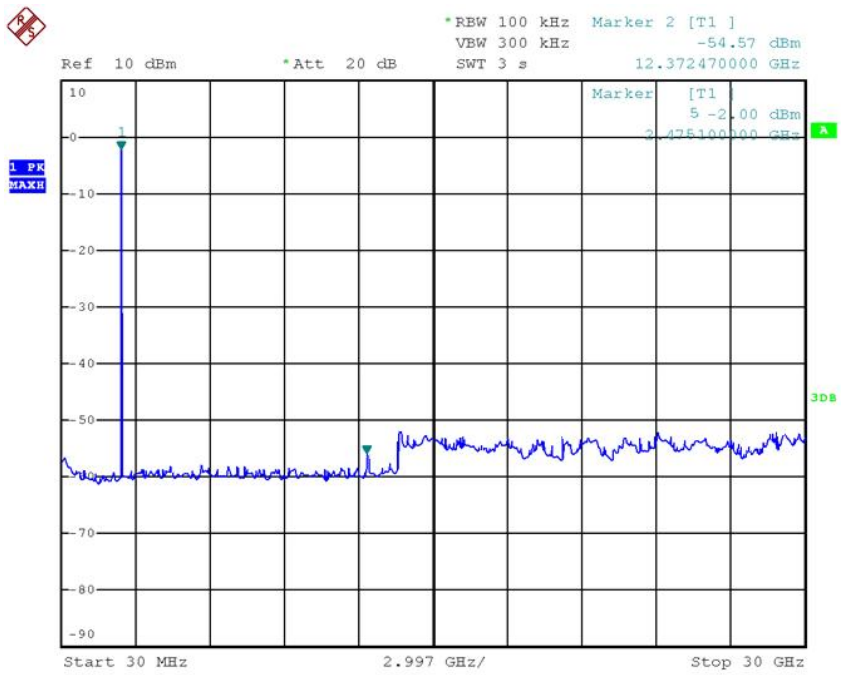
Spurious RF conducted emissions

Date of test : 23rd May 2013

Channel : 2475MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed



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7.4 Spurious radiated emissions

Test Method

1 The EUT is placed on a turntable, which is 0.8m above ground plane.
2 The turntable shall be rotated for 360 degrees to determine the position of maximum emission level
3 EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4 Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5 Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Limit

Frequency MHz	Field Strength uV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

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Spurious radiated emissions

Date of test : 21st May 2013

Operating mode : Transmitter mode

Frequency : 2425MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
48.332	V	36.27	-13.52	22.75	40.00	-17.25	QP
*133.151	V	38.45	-18.49	19.96	43.50	-23.54	QP
434.065	V	37.69	-11.64	26.05	46.00	-19.95	QP
2425.000	V	98.74	-0.53	98.21	/	/	PK
2425.000	V	90.15	-0.53	89.62	/	/	Ave.
*4850.000	V	58.88	0.35	59.23	74.00	-14.77	PK
*4850.000	V	50.63	0.35	50.98	54.00	-3.02	Ave.

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
48.332	H	33.43	-13.52	19.91	40.00	-20.09	QP
79.800	H	35.66	-19.94	15.72	40.00	-24.28	QP
434.065	H	43.00	-11.64	31.36	46.00	-14.64	QP
2425.000	H	96.51	-0.53	95.98	/	/	PK
2425.000	H	88.43	-0.53	87.9	/	/	Ave.
*4850.000	H	55.30	0.35	55.65	74.00	-18.35	PK
*4850.000	H	49.68	0.35	50.03	54.00	-3.97	Ave.

"*" means the emission(s) appear within the restricted bands shall follow the requirement of section 15.205.

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Spurious radiated emissions

Date of test : 21st May 2013

Operating mode : Transmitter mode

Frequency : 2450MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
33.680	V	38.13	-13.37	24.76	40.00	-15.24	QP
48.332	V	36.09	-13.52	22.57	40.00	-17.43	QP
72.592	V	38.25	-20.36	17.89	40.00	-22.11	QP
*133.151	V	38.42	-18.49	19.93	43.50	-23.57	QP
2450.000	V	99.30	-2.89	96.41	/	/	PK
2450.000	V	91.55	-2.89	88.66	/	/	Ave.
*4900.000	V	59.81	0.46	60.27	74.00	-13.73	PK
*4900.000	V	50.53	0.46	50.99	54.00	-3.01	Ave.

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
48.332	H	32.25	-13.52	18.73	40.00	-21.27	QP
*110.957	H	31.87	-15.76	16.11	43.50	-27.39	QP
2450.000	H	94.85	-2.89	91.96	/	/	PK
2450.000	H	85.34	-2.89	82.45	/	/	Ave.
*4900.000	H	53.71	0.46	54.17	74.00	-19.83	PK
*4900.000	H	48.26	0.46	48.72	54.00	-5.28	Ave.

"*" means the emission(s) appear within the restricted bands shall follow the requirement of section 15.205.

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Spurious radiated emissions

Date of test : 21st May 2013

Operating mode : Transmitter mode

Frequency : 2475MHz

Remark : NIL

Test Result
☒ Passed
☐ Not Passed

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
48.332	V	36.08	-13.52	22.56	40.00	-17.44	QP
106.385	V	34.86	-15.36	19.50	43.50	-24.00	QP
*133.151	V	38.11	-18.49	19.62	43.50	-23.88	QP
176.888	V	33.79	-15.07	18.72	43.50	-24.78	QP
2475.000	V	97.97	-2.89	95.08	/	/	PK
2475.000	V	91.55	-2.89	88.66	/	/	Ave.
*4950.000	V	57.98	0.65	58.63	74.00	-15.37	PK
*4950.000	V	50.15	0.65	50.80	54.00	-3.2	Ave.

Frequency (MHz)	Polarity (H/V)	Read Level (dBµV)	Corr. (dB)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
48.332	H	32.15	-13.52	18.63	40.00	-21.37	QP
*110.182	H	32.43	-15.58	16.85	43.50	-26.65	QP
351.708	H	36.35	-12.29	24.06	46.00	-21.94	QP
2475.000	H	98.50	-2.89	95.61	/	/	PK
2475.000	H	90.44	-2.89	87.55	/	/	Ave.
*4950.000	H	58.63	0.65	59.28	74.00	-14.72	PK
*4950.000	H	50.11	0.65	50.76	54.00	-3.24	Ave.

"*" means the emission(s) appear within the restricted bands shall follow the requirement of section 15.205.

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7.5 6dB bandwidth

Test Method

1 Place the EUT on the table and set it in the transmitting mode.
2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3 Mark the peak frequency and 6dB (upper and lower) frequency.

Limit

Limit [kHz]
≥500

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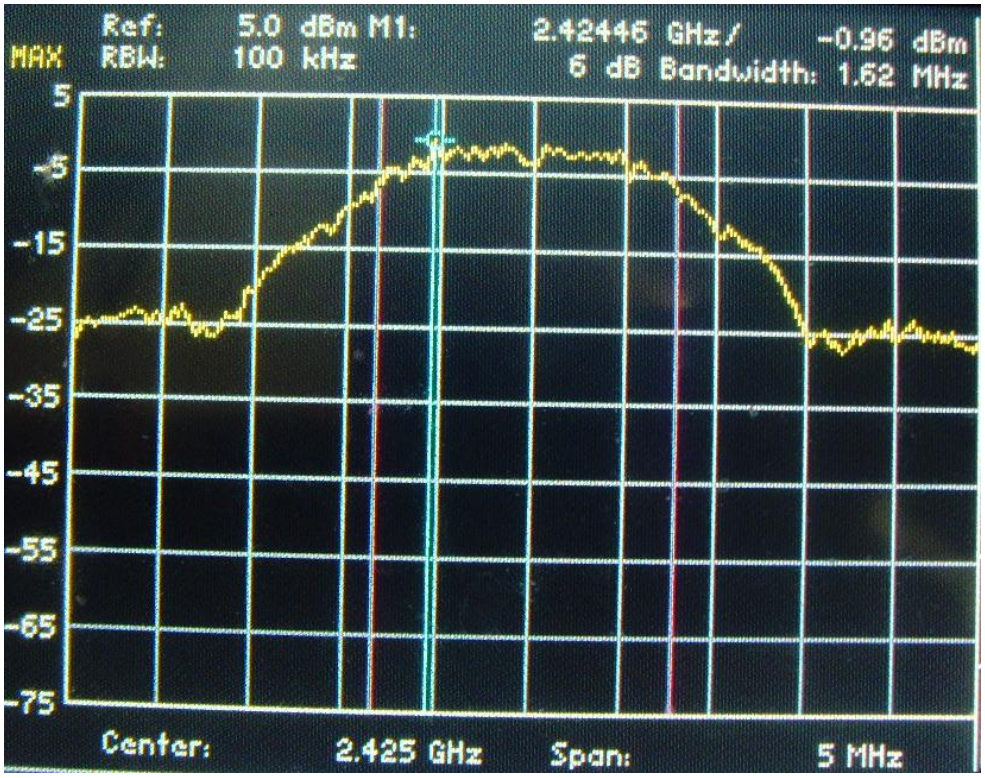
6dB bandwidth

6dB bandwidth test result

Bandwidth MHz	Result
1.62	Pass

Remark : NIL



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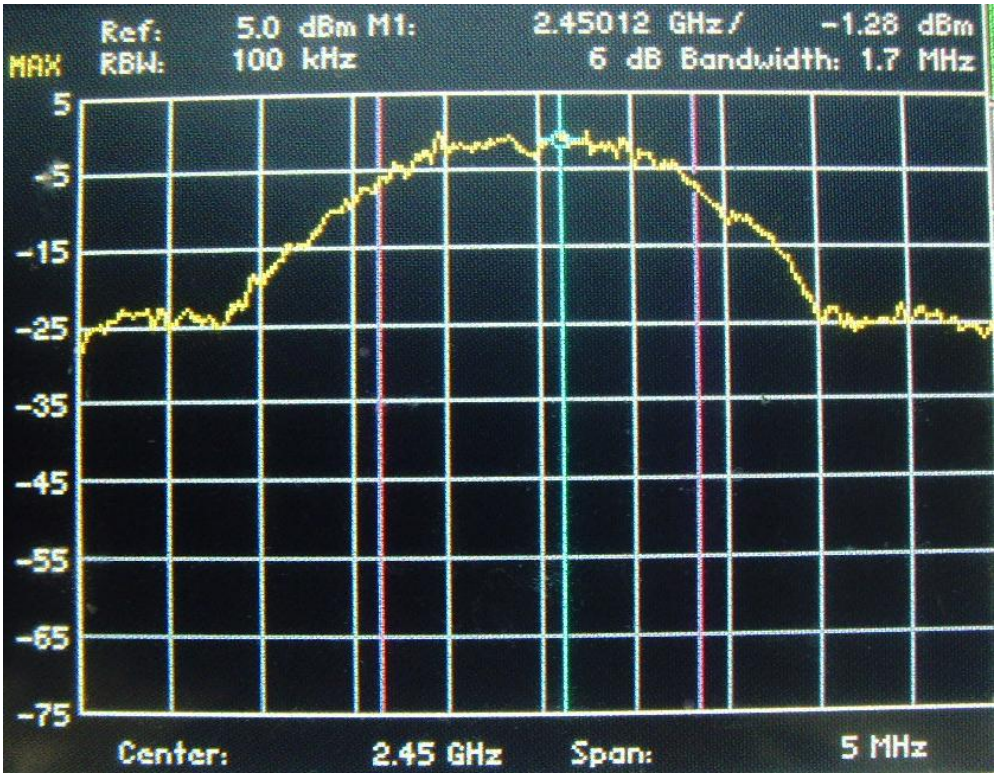
6dB bandwidth

6dB bandwidth test result

Bandwidth MHz	Result
1.70	Pass

Remark : NIL



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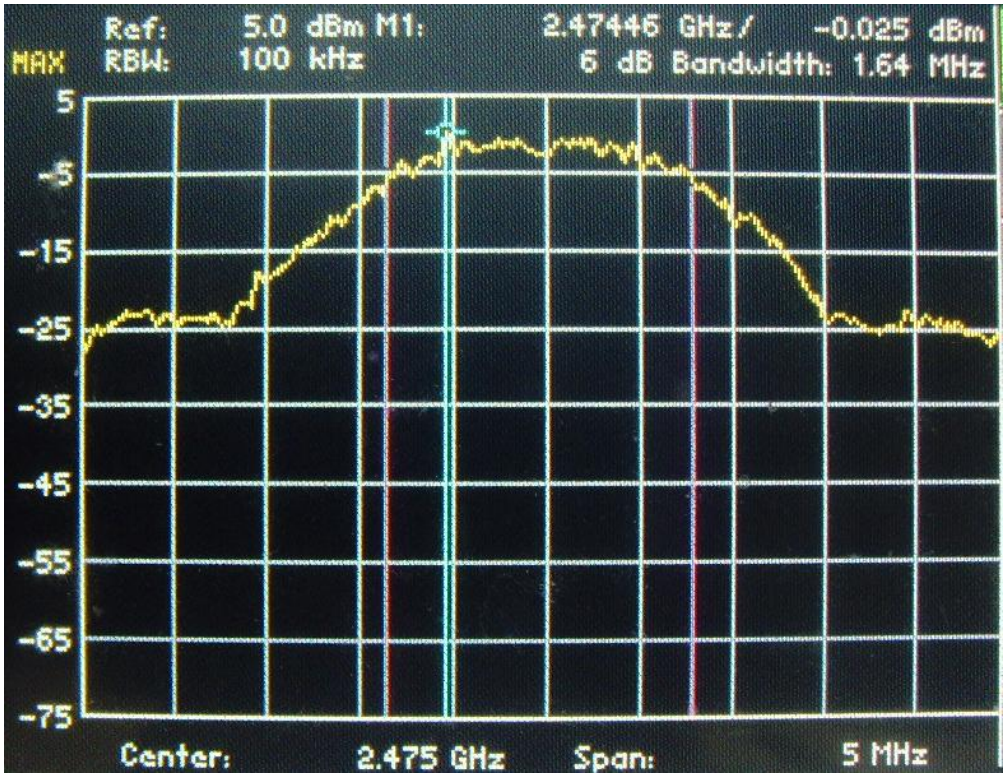
6dB bandwidth

6dB bandwidth test result

Bandwidth MHz	Result
1.64	Pass

Remark : NIL



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6dB bandwidth

Test Equipment

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Due date (mm-dd-yy)
BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	May 24 2014
Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	May 24 2014
EMI Test Software	AUDIX	E3	N/A	N/A
Coaxial Cable	CCIS	N/A	CCIS0016	May 31 2013
Coaxial Cable	CCIS	N/A	CCIS0017	May 31 2013
Coaxial cable	CCIS	N/A	CCIS0018	May 31 2013
Coaxial Cable	CCIS	N/A	CCIS0019	May 31 2013
Coaxial Cable	CCIS	N/A	CCIS0087	May 31 2013
Amplifier(10kHz-1.3GHz)	HP	8447D	CCIS0003	May 31 2013
Amplifier(1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	Jun 08 2014
Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	May 31 2013
Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 29 2014
Positioning Controller	UC	UC3000	CCIS0015	N/A
Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP	CCIS0023	May. 28 2014
Loop antenna	Laplace instrument	RF300	EMC0701	Aug. 11 2014
EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	May 24 2014
Spectrum Analyzer	Agilent	E4440A	US	Jan.10 2014

7.6 Power spectral density

Test Method

1 Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2 Set the spectrum analyzer as RBW = 3 kHz, VBW = 10 kHz, Span = 300 kHz, Sweep = 500s
3 Record the max reading.

Limit

Limit dBm / 3kHz
8

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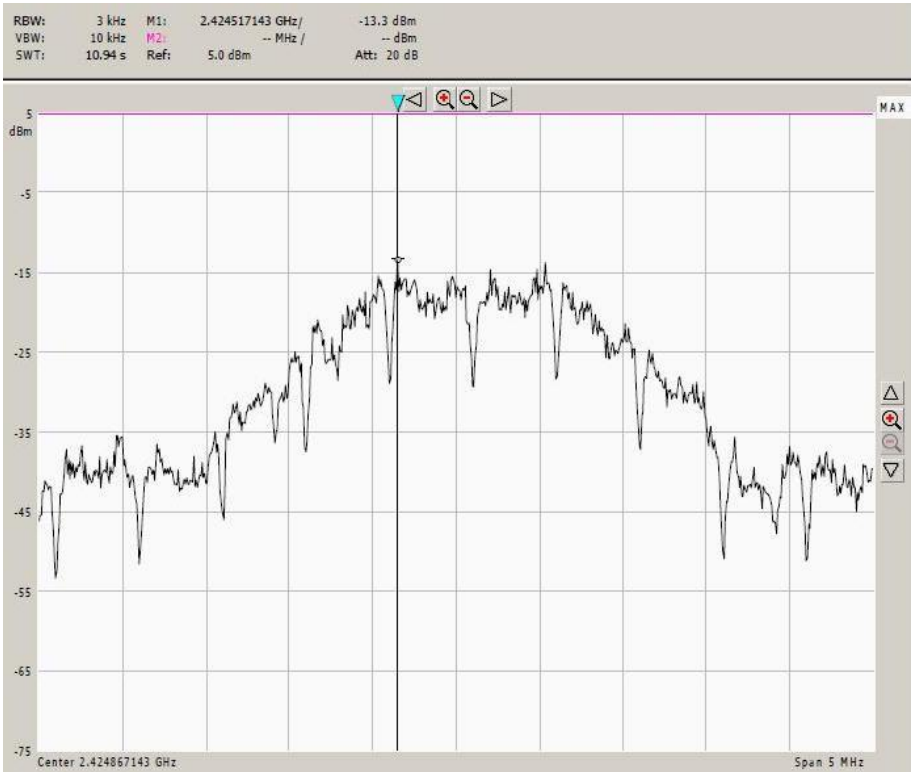
Power spectral density

Test result

Frequency (MHz)	Power spectral density (dBm)	Result
2425	-13.3	Pass
2450	-13.5	Pass
2475	-13.7	Pass



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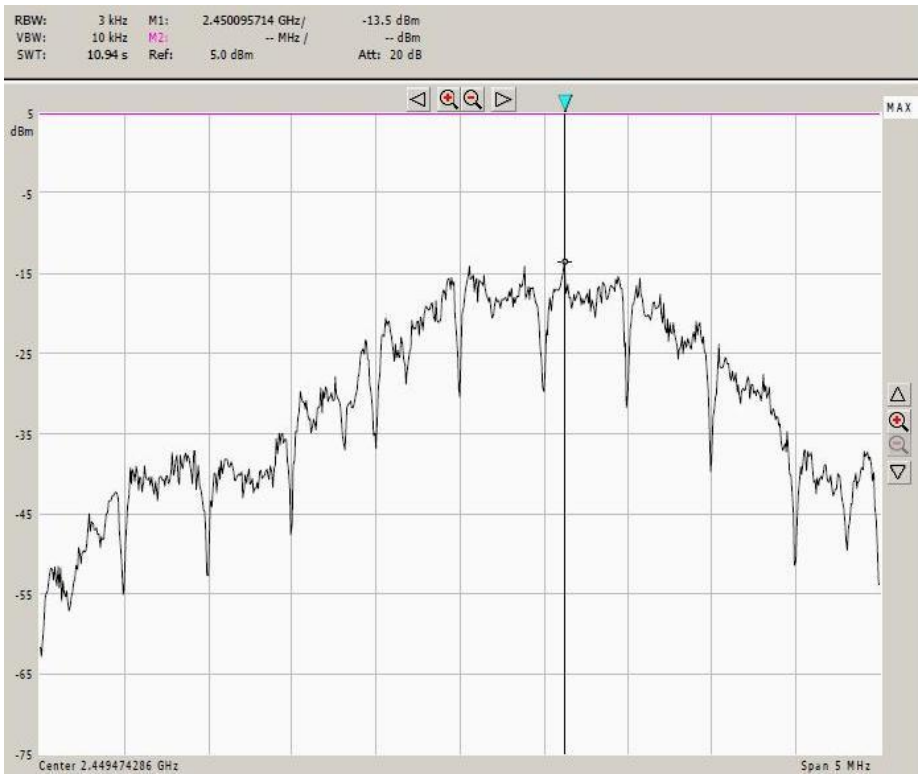
Power spectral density



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8. System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items		Extended Uncertainty
RE	Field strength (dBµV/m)	U=5.12dB (30MHz-1GHz) U=4.63dB (1GHz-6GHz)
CE	Disturbance Voltage (dBµV)	U=3.1dB

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9. Test Equipment List

Test Equipment

Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Due date (mm-dd-yy)
BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	May 24 2014
Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	May 24 2014
EMI Test Software	AUDIX	E3	N/A	N/A
Coaxial Cable	CCIS	N/A	CCIS0016	May 31 2013
Coaxial Cable	CCIS	N/A	CCIS0017	May 31 2013
Coaxial cable	CCIS	N/A	CCIS0018	May 31 2013
Coaxial Cable	CCIS	N/A	CCIS0019	May 31 2013
Coaxial Cable	CCIS	N/A	CCIS0087	May 31 2013
Amplifier(10kHz-1.3GHz)	HP	8447D	CCIS0003	May 31 2013
Amplifier(1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	Jun 08 2014
Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	May 31 2013
Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 29 2014
Positioning Controller	UC	UC3000	CCIS0015	N/A
Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP	CCIS0023	May. 28 2014
Loop antenna	Laplace instrument	RF300	EMC0701	Aug. 11 2014
EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	May 24 2014
Spectrum Analyzer	Agilent	E4440A	US	Jan.10 2014

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