

TEST REPORT

For

Radio control transmitter (DSSS)

In conformity with

FCC CFR 47 Part15 Subpart C

Model : EX-6

FCC ID : WIZSYNCROEX6

Report No. : ERY1505P25R1

Issue Date : 25 May. 2015

Prepared for

Kyosho Corporation of America.
20322 Valencia Circle, Lake Forest, CA, USA 92630

Prepared by

SGS RF Technologies Inc.
3-5-23, Kitayamata, Tsuzuki-ku, Yokohama, 224-0021, Japan
Telephone: +81+(0)45- 550-3520
FAX: +81+(0)45- 592-7506

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SGS RF Technologies Inc. is managed to ISO17025 and has the necessary knowledge and test facilities for testing according to the referenced standards. The test results in this report apply only to the sample(s) tested.

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History

Report No.	Date	Revisions	Issued By
ERY1505P25R1	25 May. 2015	Initial Issue	T.Kato

1 General information

1.1 Product description

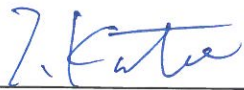
Test item	: Radio control transmitter
Manufacturer 1	: Miyuki seiki
Address 1	: 1737-1, Shiono, Shioityou, Yonezawa, Yamagata 992-0042, Japan
Manufacturer 2	: Creare
Address 2	: 3580-8, Kamikawahara, Muramatsu, Matsuyama, Kitakata, Fukushima 966-0902, Japan
Model	: EX-6
FCC ID	: WIZSYNCROEX6
Serial number	: 0721414 (for RF conducted test) 0721413 (for RF radiated test)
Hardware version	: v1.00
Software version	: v1.00
Operating frequency	: 2404 - 2480 MHz
Modulation	: digital modulation system
Antenna gain	: +0.5 dBi
Receipt date of EUT	: 01 May. 2015
Nominal power source voltages	: 6.0 V DC

1.2 Test(s) performed/ Summary of test result

Test specification(s)	: FCC CFR 47 Part 15 Subpart C (01 Oct. 2014)
Test method(s)	: ANSI C63.10: 2009
Test(s) started	: 14 May. 2015
Test(s) completed	: 19 May. 2015
Purpose of test(s)	: Certification

Summary of test result : Complied

Note: The above judgment is only based on the measurement data and it does not include the measurement uncertainty. Accordingly, the statement below is applied to the test result.
The EUT complies with the limit required in the standard in case that the margin is not less than the measurement uncertainty in the Laboratory.
Compliance of the EUT is more probable than non-compliance is case that the margin is less than the measurement uncertainty in the Laboratory.

Test engineer : 
T. Kato
EMC testing Department

Reviewer : 
K. Onishi
Manager
EMC testing Department

1.3 Test facility

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at SGS RF Technologies Inc., located in 472, Nippa-cho, Kohoku-ku, Yokohama, 223-0057, Japan, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948, per October 1, 2014.

The description of the test facilities has been filed under registration number 319924 at the Office of the Federal Communications Commission. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at <http://www.fcc.gov>.

Registered by Industry Canada (IC): The registered facility number is as follows;

Test site No. 1 (Semi-Anechoic chamber 3m): 6974A-1

Accredited by **National Voluntary Laboratory Accreditation Program (NVLAP)** for the emission tests stated in the scope of the certificate under Certificate Number 200780-0

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



NVLAP LAB CODE 200780-0

1.4 Measurement uncertainty

The treatment of uncertainty is based on the general matters on the definition of uncertainty in “Guide to the expression of uncertainty in measurement (GUM)” published by ISO. The Lab’s uncertainty is determined by referring UKAS Publication LAB34: 2002 “The Expression of Uncertainty in EMC Testing” and CISPR16-4-2: 2011 “Uncertainty in EMC Measurements”.

The uncertainty of the measurement result in the level of confidence of approximately 95% ($k=2$) is as follows;

Conducted emission: ± 3.4 dB (10 kHz - 30 MHz)
Radiated emission (9 kHz - 30 MHz): ± 3.3 dB
Radiated emission (30 MHz - 200 MHz): ± 5.0 dB
Radiated emission (200 MHz - 1000 MHz): ± 6.2 dB
Radiated emission (1 GHz - 6 GHz): ± 4.7 dB
Radiated emission (6 GHz - 18 GHz): ± 4.8 dB
Radiated emission (18 GHz - 26 GHz): ± 5.0 dB

1.5 Summary of test results

Requirement	Section in specification	Result	Section in this report
Occupied Bandwidth (99 %)	2.1049	Complied	2.1
6 dB Bandwidth	15.247 (a) (2)	Complied	2.2
Conducted Output Power	15.247 (b) (3)	Complied	2.3
Conducted Spurious Emission	15.247 (d)	Complied	2.4
Power Spectral Density	15.247 (e)	Complied	2.5
Radiated Emissions	15.247(d), 15.205 (a)	Complied	2.6
AC power line conducted emissions	15.207	N/A (*)	2.7

(*) The EUT is powered by battery.

1.6 Setup of equipment under test (EUT)

1.6.1 Test configuration of EUT

Equipment(s) under test

No.	Item	Manufacture	Model No.	Serial No.
A1	Radio control transmitter (RF Conducted)	Kyosho Corporation	EX-6	0721414
A2	Radio control transmitter (RF Radiated)	Kyosho Corporation	EX-6	0721413

Support Equipment(s)

No.	Item	Manufacture	Model No.	Serial No.
B	AAA size battery	-	-	-
-	-	-	-	-

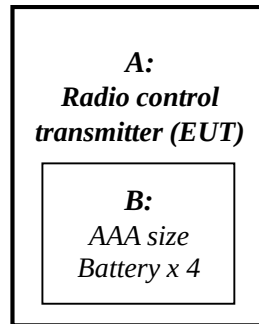
Connected cable(s)

No.	Item	Identification (Manu.etc.)	Cable Shielded	Ferrite Core	Length [m]
-	-	-	-	-	-
-	-	-	-	-	-

1.6.2 Operating condition:

- Tx (2404MHz): The EUT is in DSSSnormal transmission mode in 2404 MHz.
- Tx (2442MHz): The EUT is in DSSS normal transmission mode in 2442 MHz.
- Tx (2480MHz): The EUT is in DSSS normal transmission mode in 2480 MHz.

1.6.3 Setup diagram of tested system



1.7 Equipment modifications

No modifications have been made to the equipment in order to achieve compliance with the applicable standards described in clause 1.2.

1.8 Deviation from the standard

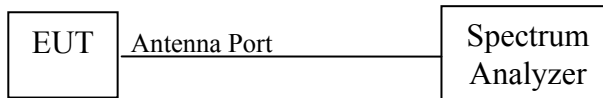
No deviations from the standards described in clause 1.2.

2 Test procedure and test data

2.1 Occupied Bandwidth (99%)

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10

- RBW: 1 to 5 % of OBW
- VBW: 3 times RBW
- Detector : Peak
- Span: 1.5 to 5.0 times OBW

Limitation

There are no limitations.

The measurement value is used for the emission designator.

Test equipment used (refer to List of utilized test equipment)

TR06	CL31				
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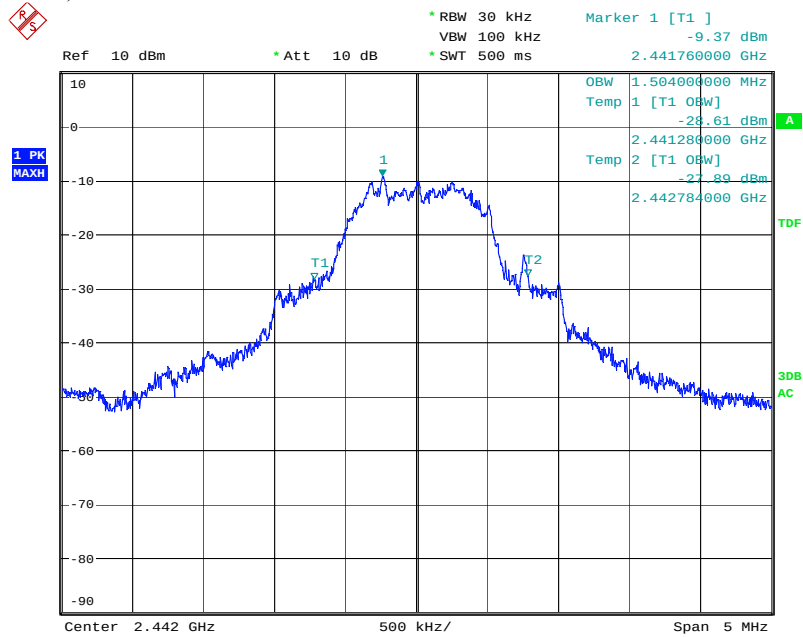
Test results

Tested sample: A1

Transmission Frequency [MHz]	Occupied Bandwidth [MHz]
2404	1.744
2442	1.504
2480	1.456

[Chart]

Tx (2442 MHz)



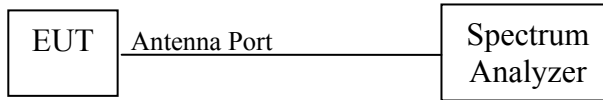
Tested Date: 19 May. 2015
Humidity: 64 %

Temperature: 23 degC
Atmos. Press: 1005 hPa

2.2 6dB Bandwidth (DTS bandwidth)

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10.

- RBW = 100 kHz
- VBW > 3 times RBW
- Detector : Peak

Applicable rule and limitation

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.

Test equipment used (refer to List of utilized test equipment)

TR06	CL31				
------	------	--	--	--	--

Test results - Complied with requirement

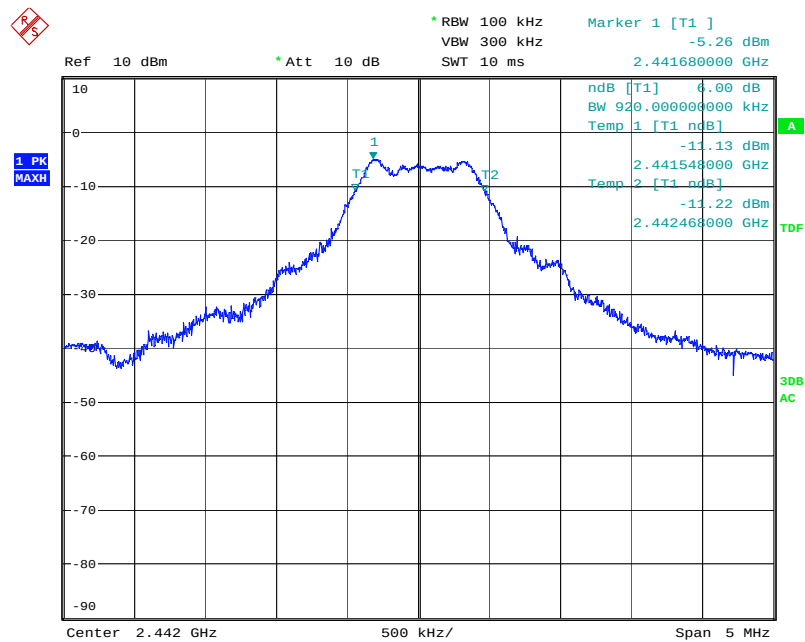
Test Data

Tested sample: A1

Transmission Frequency [MHz]	6 dB Bandwidth [kHz]
2404	956
2442	920
2480	924

[Chart]

Tx 2442 MHz



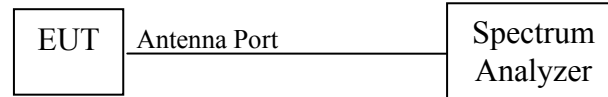
Tested Date: 19 May. 2015
Humidity: 64 %

Temperature: 23 degC
Atmos. Press: 1005 hPa

2.3 Peak Output Power

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10.

- RBW > DTS BW
- VBW > 3 times RBW
- Detector : > Peak
- Span > 3 times RBW

Applicable rule and limitation

15.247(b) (3) For systems using digital modulation in the 902–928 MHz, 2400–2483.5MHz, and 5725–5850 MHz bands: 1 Watt (30 dBm).

Test equipment used (refer to List of utilized test equipment)

TR06	CL31				
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Test results - Complied with requirement

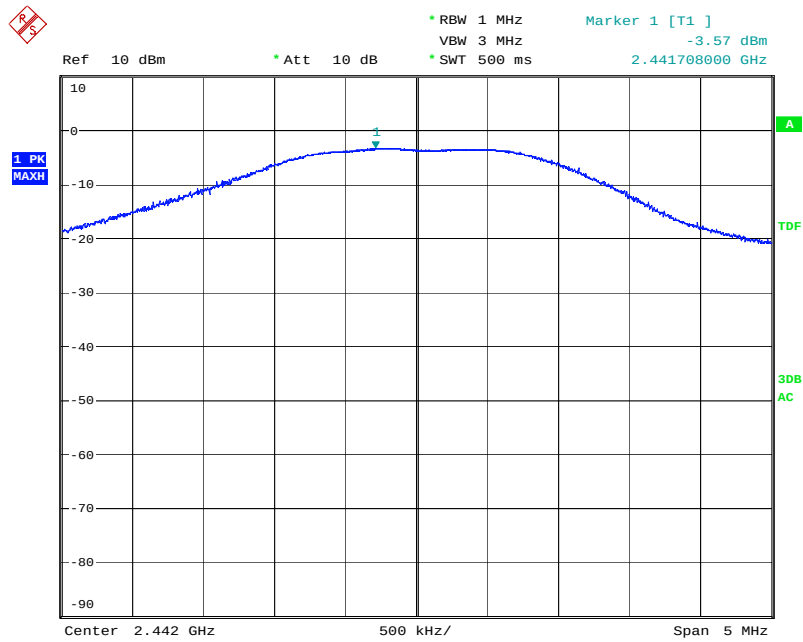
Test Data

Tested sample: A1

Transmission Frequency [MHz]	Output Power [dBm]
2404	-3.15
2442	-3.57
2480	-4.71

[Chart]

Tx 2442 MHz



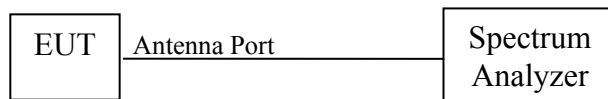
Tested Date: 19 May. 2015
Humidity: 64 %

Temperature: 23 degC
Atmos. Press: 1005 hPa

2.4 Conducted Spurious Emissions (for non-restricted frequency band)

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10.

- RBW : 100 kHz
- VBW > 3 times RBW
- Detector : Peak
- Span > 1.5 times DTS

Limitation

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.

Test equipment used (refer to List of utilized test equipment)

TR06	CL31				
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Test results - Complied with requirement

Test Data

Tested sample: A1

Operating mode: Tx (2404 MHz)

Frequency [MHz]	Spurious level [dBm]	Carrier level [dBm]	20dB below [dBm]
3205.300	-62.98	-4.67	-24.67

Operating mode: Tx (2442 MHz)

Frequency [MHz]	Spurious level [dBm]	Carrier level [dBm]	20dB below [dBm]
-	-	-	-

Note: All emission have more than 20dB margin.

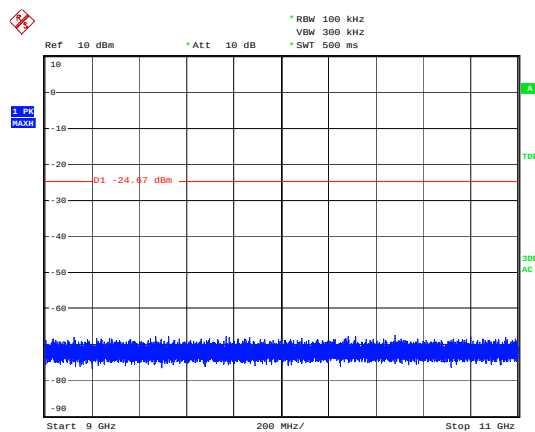
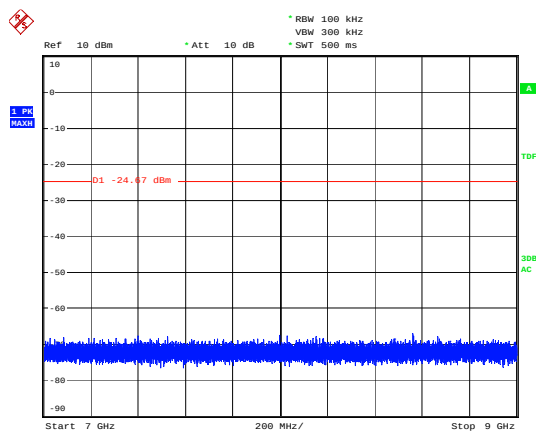
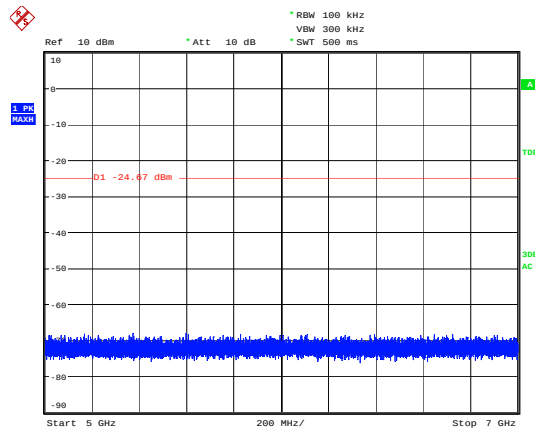
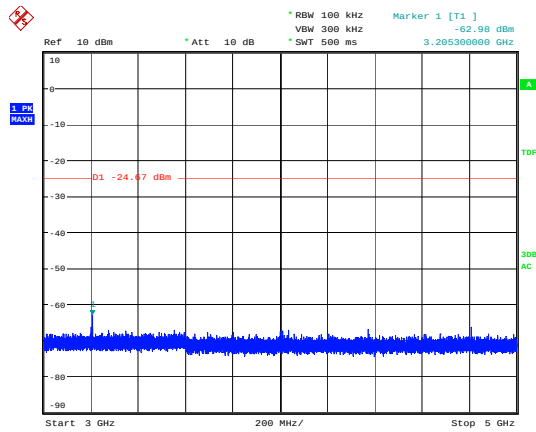
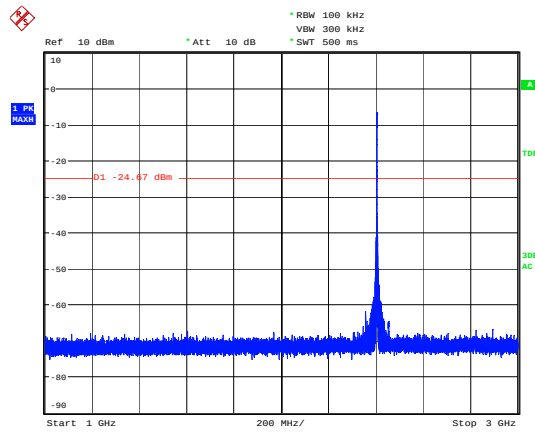
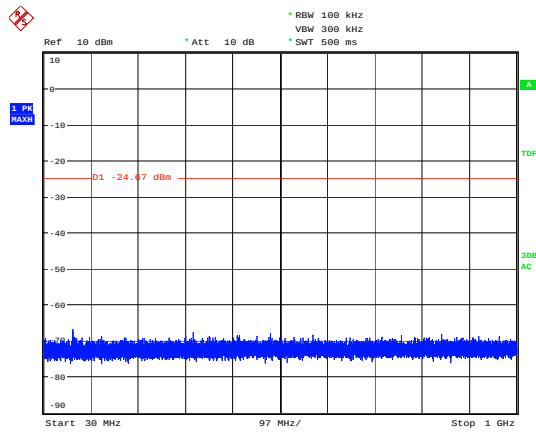
Operating mode: Tx (2480 MHz)

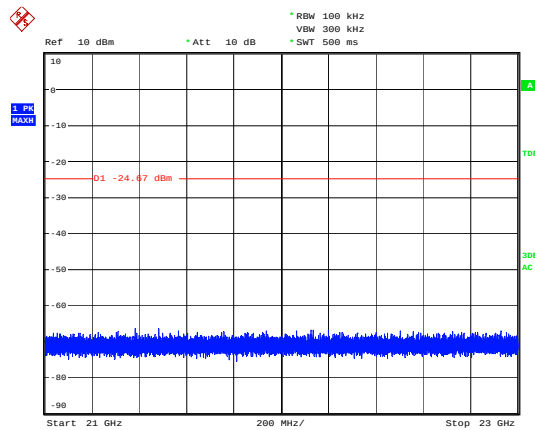
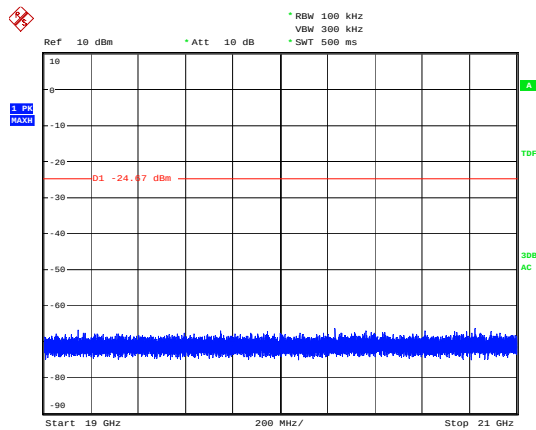
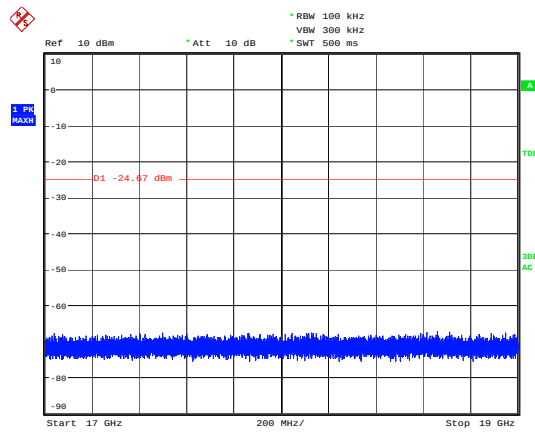
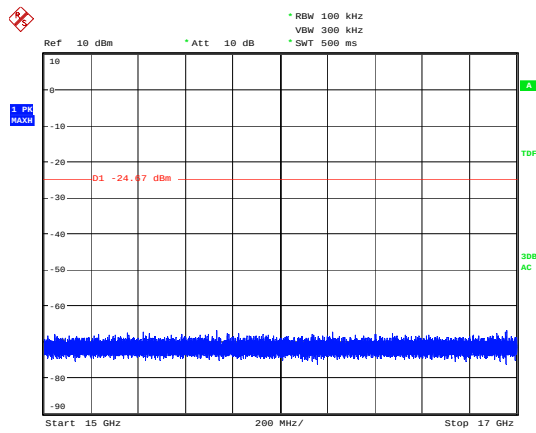
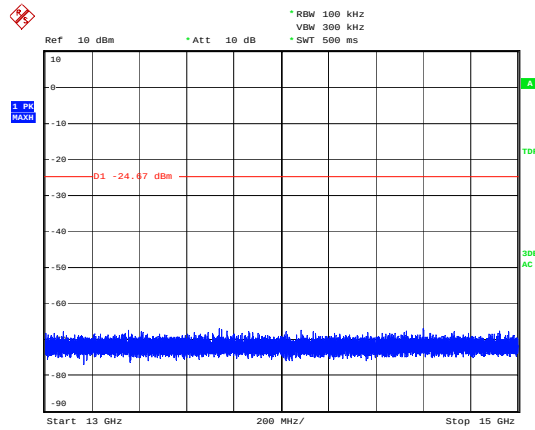
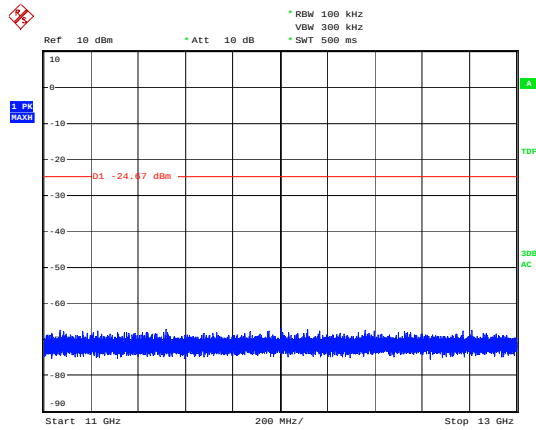
Frequency [MHz]	Spurious level [dBm]	Carrier level [dBm]	20dB below [dBm]
-	-	-	-

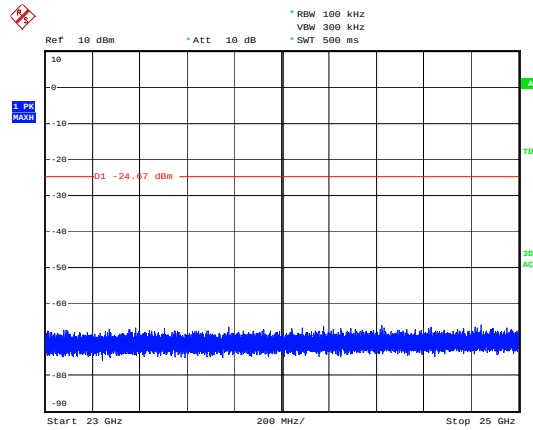
Note: All emission have more than 20dB margin.

[Chart]

Tx 2404 MHz



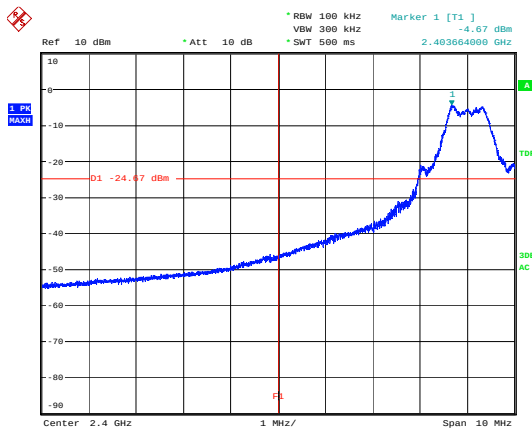




Tested Date: 19 May, 2015
Humidity: 64 %

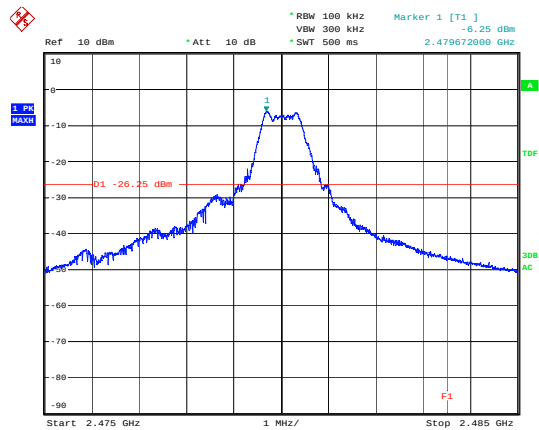
Temperature: 23 degC
Atmos. Press: 1005 hPa

[Band edge]



Tested Date: 19 May, 2015
Humidity: 64 %

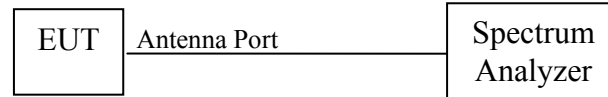
Temperature: 23 degC
Atmos. Press: 1005 hPa



2.5 Power Spectral density

Test setup

Test setup is the following drawing. The antenna port of EUT was connected to the spectrum analyzer.



Test procedure

Spectrum analyzer is set as below according to ANSI C63.10.

- RBW : 3 kHz
- VBW = 3 times RBW
- Detector : Peak
- Span > 1.5 times DTS BW

Limitation

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

Test equipment used (refer to List of utilized test equipment)

TR06	CL31				
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Test results - Complied with requirement

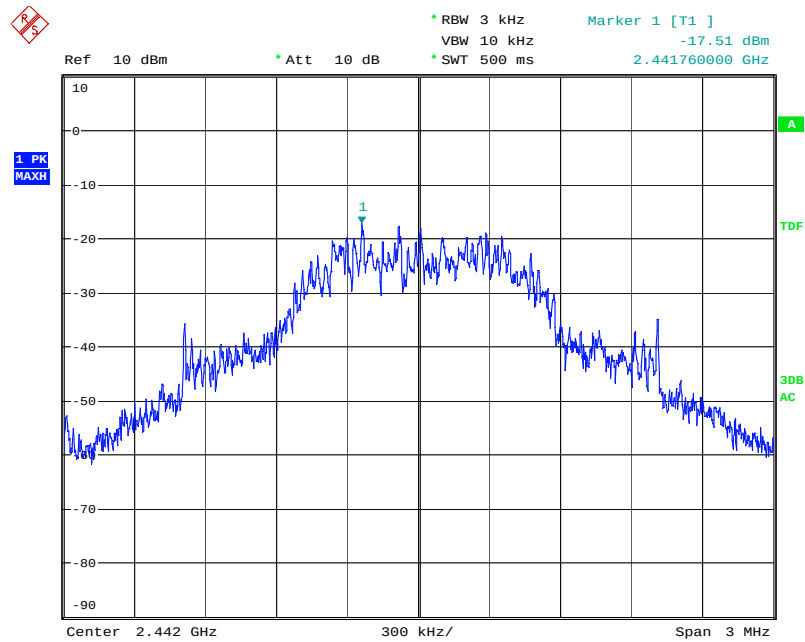
Test Data

Tested sample: A1

Transmission Frequency [MHz]	Spectral Density [dBm]
2404	-17.09
2442	-17.51
2480	-19.14

[Chart]

Tx 2442 MHz



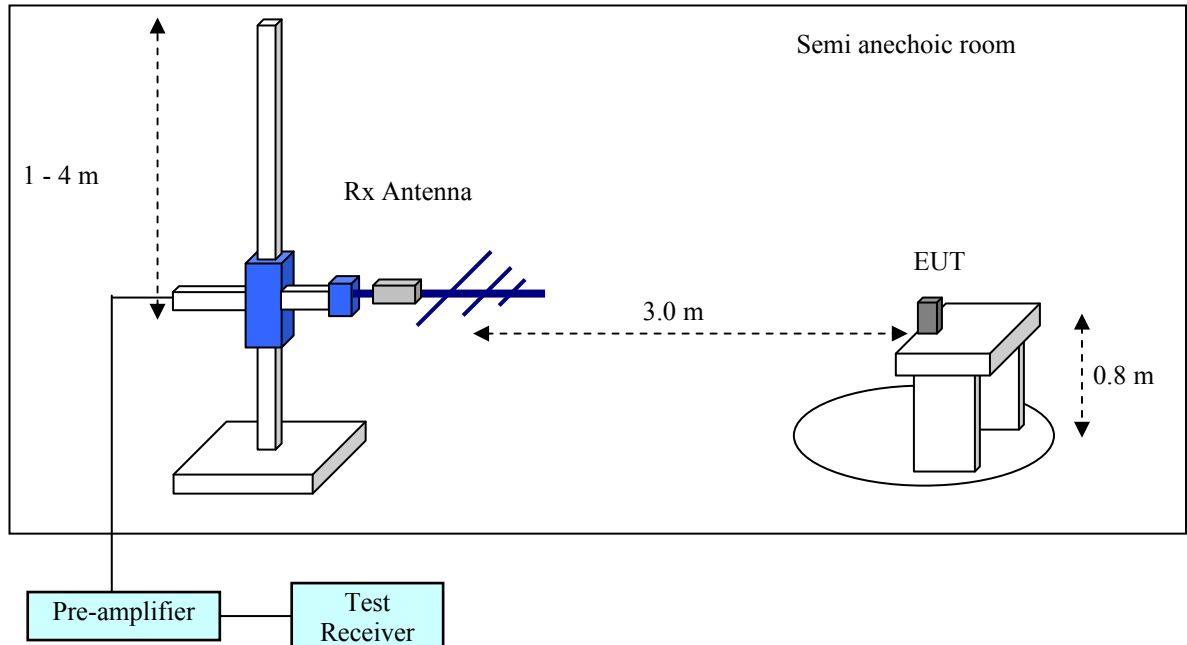
Tested Date: 19 May. 2015
Humidity: 64 %

Temperature: 23 degC
Atmos. Press: 1005 hPa

2.6 Radiated emissions (for restricted frequency band)

Test setup

Test setup was implemented according to the method of ANSI C63.10. measurements setup”.



Test procedure

Measurement procedures were implemented according to the method of ANSI C63.10. The test receiver is set as below

[below 1000 MHz]
RBW: 120 kHz, Detector: QP

[above 1000 MHz]
RBW: 1 MHz, Detector: Ave/PK

Applicable rule and limitation

FCC 15.205 restricted bands of operation

Except as shown in paragraph 15.205 (d) of this section, 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
0.490 - 0.510	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	38.6 -

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in FCC 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in FCC 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions.

FCC 15.209 Field strength limits

Frequency [MHz]	Field Strength [μ V/m]	Measurement Distance [m]	Field Strength [dB μ V/m]
30 – 88	100	3	40.0
88 – 216	150	3	43.5
216 – 960	200	3	46.0
Above 960	500	3	53.9

In the emission table above, the tighter limit applies at the band edges.

The emission limits shown in the above table are based on measurements employing a quasi-peak detector.

Test results - Complied with requirement

Test equipment used (refer to List of utilized test equipment)

AC01	CL11	TR06	PR15	BA10	CL29	CL30
PR12	DH01	CH01	SH01			

Test software used

EMI Ver. 5.6

Calculation method

The Correction Factor and Result are calculated as followings.

Correction Factor [dB/m] = Ant. Factor [dB/m] + Loss [dB] – Gain [dB]

Result [dB μ V/m] = Reading [dB μ V] + Correction Factor [dB/m]

Test Data

Tested sample: A2

Operating mode: Tx (2404 MHz)

[Emission level] X-plane

Range: 30 - 1000 MHz

No.	Frequency [MHz]	Reading [dB μ V]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Ant.
1	212.042	37.1	10.0	8.9	29.9	26.1	43.5	17.4	Hori.
2	214.109	36.4	10.1	8.9	29.9	25.5	43.5	18.0	Hori.
3	216.177	35.2	10.3	8.9	29.9	24.5	46.0	21.5	Hori.
4	222.474	39.2	10.7	9.0	29.9	29.0	46.0	17.0	Hori.
5	402.636	42.4	16.1	10.0	29.8	38.7	46.0	7.3	Hori.
6	401.132	37.2	16.0	10.0	29.8	33.4	46.0	12.6	Vert.

Range: 1 - 25 GHz

No.	Frequency [MHz]	Reading PK [dB μ V]	Reading Ave [dB μ V]	C.Factor [dB]	Result PK [dB μ V/m]	Result Ave [dB μ V/m]	Limit PK [dB μ V/m]	Limit Ave [dB μ V/m]	Ant.
1	1602.470	67.1	43.9	-8.6	58.5	35.3	73.9	53.9	Hori.
2	2806.160	64.3	42.6	-3.3	61.0	39.3	73.9	53.9	Hori.
3	4006.850	54.3	34.3	0.6	54.9	34.9	73.9	53.9	Hori.
4	4807.810	62.2	40.8	2.5	64.7	43.3	73.9	53.9	Hori.
5	1602.470	60.2	38.7	-8.6	51.6	30.1	73.9	53.9	Vert.
6	2806.160	63.5	41.8	-3.3	60.2	38.5	73.9	53.9	Vert.
7	4006.350	56.1	35.5	0.6	56.7	36.1	73.9	53.9	Vert.
8	4807.810	60.9	40.0	2.5	63.4	42.5	73.9	53.9	Vert.

[Emission level] Y-plane
Range: 30 - 1000 MHz

No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	212.042	37.0	10.0	8.9	29.9	26.0	43.5	17.5	Hori.
2	214.109	36.2	10.1	8.9	29.9	25.3	43.5	18.2	Hori.
3	216.271	37.5	10.3	8.9	29.9	26.8	46.0	19.2	Hori.
4	218.338	38.5	10.4	8.9	29.9	27.9	46.0	18.1	Hori.
5	401.132	41.8	16.0	10.0	29.8	38.0	46.0	8.0	Hori.
6	401.132	37.7	16.0	10.0	29.8	33.9	46.0	12.1	Vert.

Range: 1 - 25 GHz

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	1602.470	67.2	43.9	-8.6	58.6	35.3	73.9	53.9	Hori.
2	2805.410	66.5	43.3	-3.3	63.2	40.0	73.9	53.9	Hori.
3	4006.850	55.6	35.2	0.6	56.2	35.8	73.9	53.9	Hori.
4	4807.810	63.9	42.5	2.5	66.4	45.0	73.9	53.9	Hori.
5	1602.720	65.5	43.3	-8.6	56.9	34.7	73.9	53.9	Vert.
6	2805.160	63.6	40.9	-3.3	60.3	37.6	73.9	53.9	Vert.
7	4006.600	54.3	34.7	0.6	54.9	35.3	73.9	53.9	Vert.
8	4808.810	63.0	40.2	2.5	65.5	42.7	73.9	53.9	Vert.

[Emission level] Z-plane
Range: 30 - 1000 MHz

No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	400.944	37.9	16.0	10.0	29.8	34.1	46.0	11.9	Hori.
2	155.935	28.2	11.0	8.4	30.0	17.6	43.5	25.9	Vert.
3	207.906	32.7	9.7	8.9	29.9	21.4	43.5	22.1	Vert.
4	218.338	32.6	10.4	8.9	29.9	22.0	46.0	24.0	Vert.
5	220.406	32.7	10.6	8.9	29.9	22.3	46.0	23.7	Vert.
6	401.132	38.0	16.0	10.0	29.8	34.2	46.0	11.8	Vert.

Range: 1 - 25 GHz

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	1598.970	56.3	35.4	-8.6	47.7	26.8	73.9	53.9	Hori.
2	2805.660	67.3	44.7	-3.3	64.0	41.4	73.9	53.9	Hori.
3	4006.850	55.4	34.9	0.6	56.0	35.5	73.9	53.9	Hori.
4	4807.560	63.6	41.5	2.5	66.1	44.0	73.9	53.9	Hori.
5	1602.720	66.2	43.8	-8.6	57.6	35.2	73.9	53.9	Vert.
6	2805.910	64.8	43.1	-3.3	61.5	39.8	73.9	53.9	Vert.
7	4006.850	57.0	36.0	0.6	57.6	36.6	73.9	53.9	Vert.
8	4807.810	62.2	40.8	2.5	64.7	43.3	73.9	53.9	Vert.

Tested sample: A2
Operating mode: Tx (2442 MHz)

[Emission level] X-plane
Range: 30 - 1000 MHz

No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	209.974	37.6	9.8	8.9	29.9	26.4	43.5	17.1	Hori.
2	212.136	34.8	10.0	8.9	29.9	23.8	43.5	19.7	Hori.
3	214.109	36.5	10.1	8.9	29.9	25.6	43.5	17.9	Hori.
4	216.340	34.8	10.3	8.9	29.9	24.1	43.5	21.9	Hori.
5	220.312	31.5	10.6	8.9	29.9	21.1	43.5	24.9	Hori.
6	224.729	32.5	10.9	9.0	29.9	22.5	43.5	23.5	Hori.

Range: 1 - 25 GHz

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	1626.469	49.9	32.5	-8.6	41.3	23.9	73.9	53.9	Hori.
2	4884.056	59.5	38.3	2.6	62.1	40.9	73.9	53.9	Hori.
3	7325.034	47.7	30.4	8.5	56.2	38.9	73.9	53.9	Hori.
4	4070.846	48.2	31.7	0.7	48.9	32.4	73.9	53.9	Vert.
5	4883.806	61.4	40.3	2.6	64.0	42.9	73.9	53.9	Vert.
6	7325.333	47.7	30.5	8.5	56.2	39.0	73.9	53.9	Vert.

[Emission level] Y-plane
Range: 30 - 1000 MHz

No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	209.974	37.6	9.8	8.9	29.9	26.4	43.5	17.1	Hori.
2	212.136	34.6	10.0	8.9	29.9	23.6	43.5	19.9	Hori.
3	214.109	36.2	10.1	8.9	29.9	25.3	43.5	18.2	Hori.
4	216.177	35.1	10.3	8.9	29.9	24.4	43.5	21.6	Hori.
5	218.338	38.5	10.4	8.9	29.9	27.9	43.5	18.1	Hori.
6	220.312	31.3	10.6	8.9	29.9	20.9	43.5	25.1	Hori.

Range: 1 - 25 GHz

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	4069.596	49.2	31.8	0.7	49.9	32.5	73.9	53.9	Hori.
2	4884.056	60.8	39.9	2.6	63.4	42.5	73.9	53.9	Hori.
3	7326.234	46.7	30.0	8.5	55.2	38.5	73.9	53.9	Hori.
4	4069.846	49.5	31.9	0.7	50.2	32.6	73.9	53.9	Vert.
5	4884.056	58.1	37.8	2.6	60.7	40.4	73.9	53.9	Vert.
6	7326.833	47.1	30.3	8.5	55.6	38.8	73.9	53.9	Vert.

[Emission level] Z-plane
Range: 30 - 1000 MHz

No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	192.306	25.5	9.1	8.7	30.0	13.3	43.5	30.2	Vert.
2	195.407	30.4	9.1	8.8	29.9	18.4	43.5	25.1	Vert.
3	199.542	28.5	9.1	8.8	29.9	16.5	43.5	27.0	Vert.
4	213.169	26.8	10.1	8.9	29.9	15.9	43.5	27.6	Vert.
5	216.177	29.5	10.3	8.9	29.9	18.8	46.0	27.2	Vert.
6	217.305	26.4	10.4	8.9	29.9	15.8	46.0	30.2	Vert.

Range: 1 - 25 GHz

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	4069.596	48.1	31.3	0.7	48.8	32.0	73.9	53.9	Hori.
2	4883.806	61.7	40.3	2.6	64.3	42.9	73.9	53.9	Hori.
3	7326.534	47.1	30.2	8.5	55.6	38.7	73.9	53.9	Hori.
4	1626.469	49.4	32.1	-8.6	40.8	23.5	73.9	53.9	Vert.
5	4069.346	48.6	31.9	0.7	49.3	32.6	73.9	53.9	Vert.
6	4884.056	59.0	38.6	2.6	61.6	41.2	73.9	53.9	Vert.
7	7326.534	48.4	30.9	8.5	56.9	39.4	73.9	53.9	Vert.

Tested sample: A2
Operating mode: Tx (2480 MHz)

[Emission level] X-plane
Range: 30 - 1000 MHz

No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	209.880	38.3	9.8	8.9	29.9	27.1	43.5	16.4	Hori.
2	212.136	34.8	10.0	8.9	29.9	23.8	43.5	19.7	Hori.
3	214.109	39.1	10.1	8.9	29.9	28.2	43.5	15.3	Hori.
4	216.177	39.6	10.3	8.9	29.9	28.9	46.0	17.1	Hori.
5	220.312	39.3	10.6	8.9	29.9	28.9	46.0	17.1	Hori.
6	222.568	38.3	10.7	9.0	29.9	28.1	46.0	17.9	Hori.

Range: 1 - 25 GHz

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	4133.343	48.9	31.5	0.4	49.3	31.9	73.9	53.9	Hori.
2	4960.052	57.5	37.2	3.0	60.5	40.2	73.9	53.9	Hori.
3	7440.228	46.1	29.9	8.2	54.3	38.1	73.9	53.9	Hori.
4	4133.343	50.6	32.3	0.4	51.0	32.7	73.9	53.9	Vert.
5	4959.552	60.7	39.3	3.0	63.7	42.3	73.9	53.9	Vert.
6	7439.028	47.6	30.4	8.2	55.8	38.6	73.9	53.9	Vert.

[Emission level] Y-plane

Range: 30 - 1000 MHz

No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	209.880	38.1	9.8	8.9	29.9	26.9	43.5	16.6	Hori.
2	214.203	38.7	10.1	8.9	29.9	27.8	43.5	15.7	Hori.
3	216.459	38.8	10.3	8.9	29.9	28.1	46.0	17.9	Hori.
4	220.500	37.7	10.6	8.9	29.9	27.3	46.0	18.7	Hori.
5	222.474	38.7	10.7	9.0	29.9	28.5	46.0	17.5	Hori.
6	226.609	36.6	11.0	9.0	29.9	26.7	46.0	19.3	Hori.

Range: 1 - 25 GHz

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	4960.802	61.5	39.0	3.0	64.5	42.0	73.9	53.9	Hori.
2	7439.628	47.3	30.5	8.2	55.5	38.7	73.9	53.9	Hori.
3	9093.146	43.9	29.6	8.5	52.4	38.1	73.9	53.9	Hori.
4	4133.093	47.4	30.7	0.4	47.8	31.1	73.9	53.9	Vert.
5	4960.302	57.8	37.4	3.0	60.8	40.4	73.9	53.9	Vert.
6	7440.828	47.3	30.5	8.2	55.5	38.7	73.9	53.9	Vert.
7	9093.445	43.5	29.4	8.5	52.0	37.9	73.9	53.9	Vert.

[Emission level] Z-plane

Range: 30 - 1000 MHz

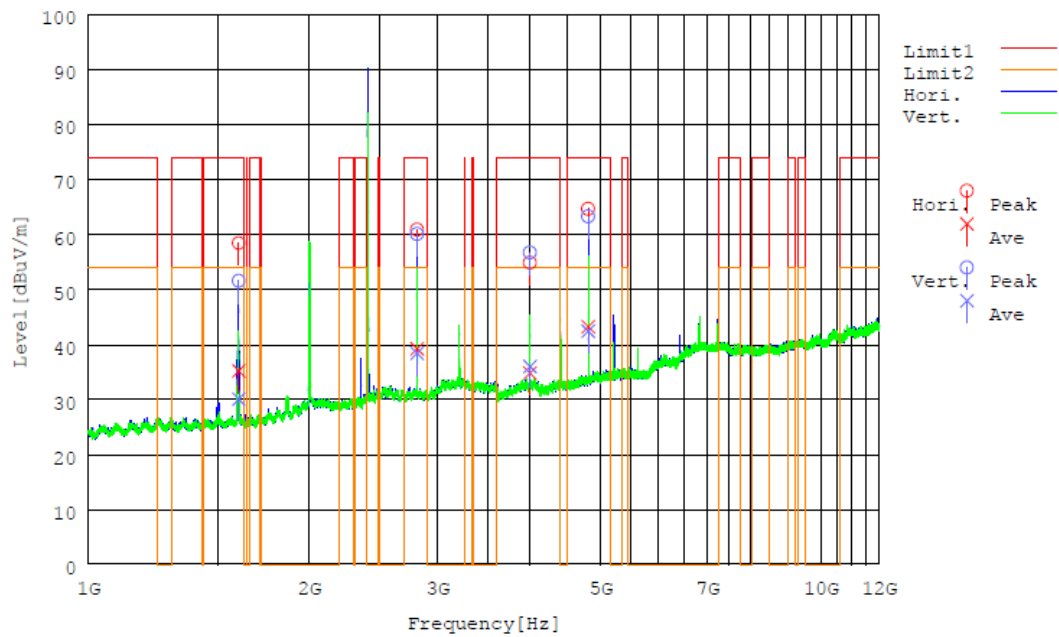
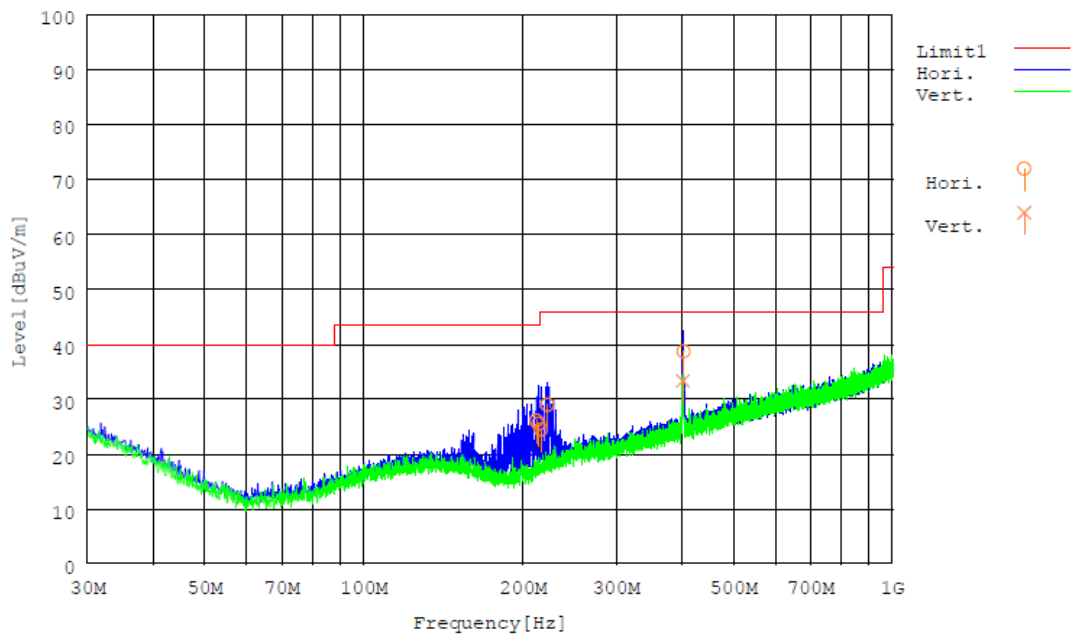
No.	Frequency [MHz]	Reading [dBμV]	Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Ant.
1	203.771	32.8	9.4	8.8	29.9	21.1	43.5	22.4	Vert.
2	205.933	32.7	9.5	8.8	29.9	21.1	43.5	22.4	Vert.
3	207.906	32.4	9.7	8.9	29.9	21.1	43.5	22.4	Vert.
4	212.042	33.1	10.0	8.9	29.9	22.1	43.5	21.4	Vert.
5	216.365	33.0	10.3	8.9	29.9	22.3	46.0	23.7	Vert.
6	220.500	32.9	10.6	8.9	29.9	22.5	46.0	23.5	Vert.

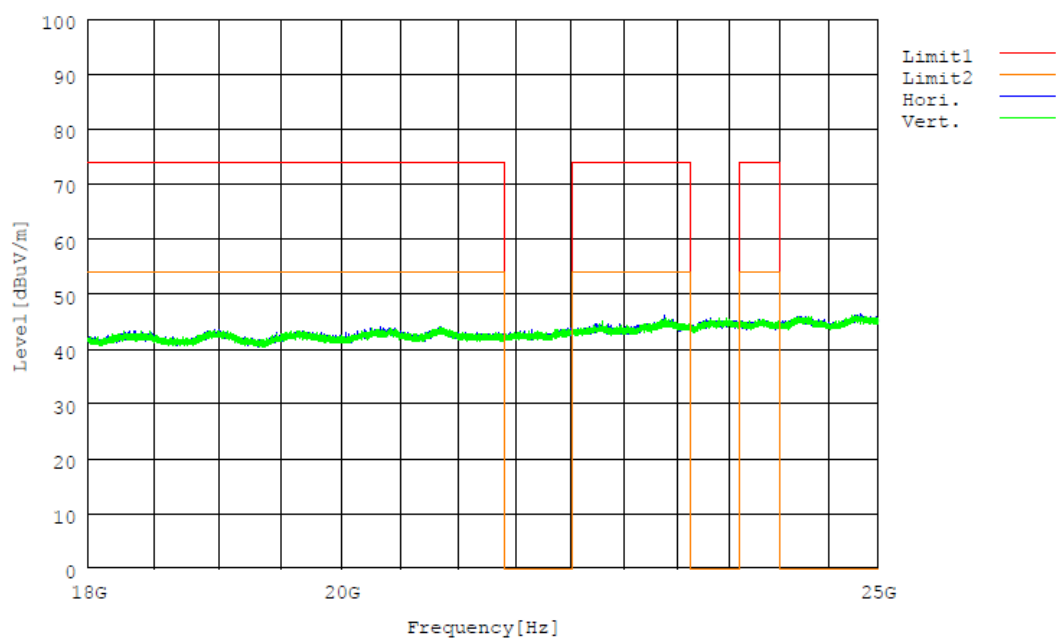
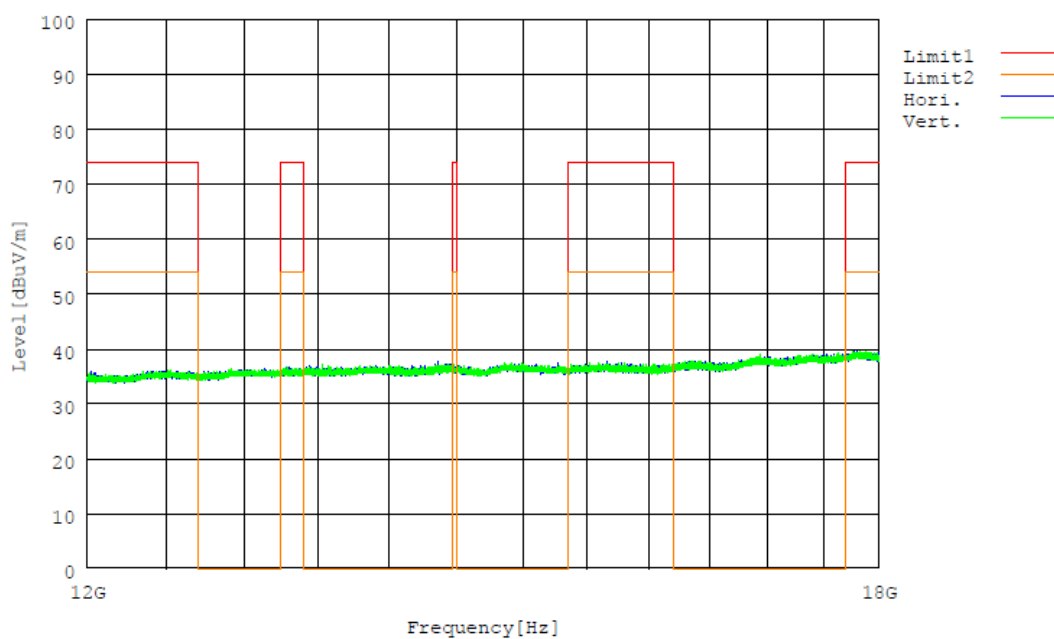
Range: 1 - 25 GHz

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	4960.302	58.7	37.9	3.0	61.7	40.9	73.9	53.9	Hori.
2	7439.328	48.6	31.1	8.2	56.8	39.3	73.9	53.9	Hori.
3	4133.093	50.0	31.9	0.4	50.4	32.3	73.9	53.9	Vert.
4	4960.552	58.9	37.9	3.0	61.9	40.9	73.9	53.9	Vert.
5	7440.828	47.8	30.8	8.2	56.0	39.0	73.9	53.9	Vert.

[Chart]

Tx 2404 MHz (X-plane)





[Band-edge]

Tested sample: A2

Operating mode: Tx (2404 MHz)

[Emission level] X-plane

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	2354.790	52.5	32.8	-4.8	47.7	28.0	73.9	53.9	Hori.
2	2390.000	58.3	31.2	-4.6	53.7	26.6	73.9	53.9	Hori.

[Emission level] Y-plane

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	2354.800	51.5	32.8	-4.8	46.7	28.0	73.9	53.9	Hori.
2	2390.000	58.7	31.2	-4.6	54.1	26.6	73.9	53.9	Hori.

[Emission level] Z-plane

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	2354.885	51.8	32.7	-4.8	47.0	27.9	73.9	53.9	Vert.
2	2390.000	60.0	31.3	-4.6	55.4	26.7	73.9	53.9	Vert.

Tested sample: A2

Operating mode: Tx (2480 MHz)

[Emission level] X-plane

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	2483.500	71.7	33.8	-3.7	68.0	30.1	73.9	53.9	Hori.
-	-	-	-	-	-	-	-	-	-

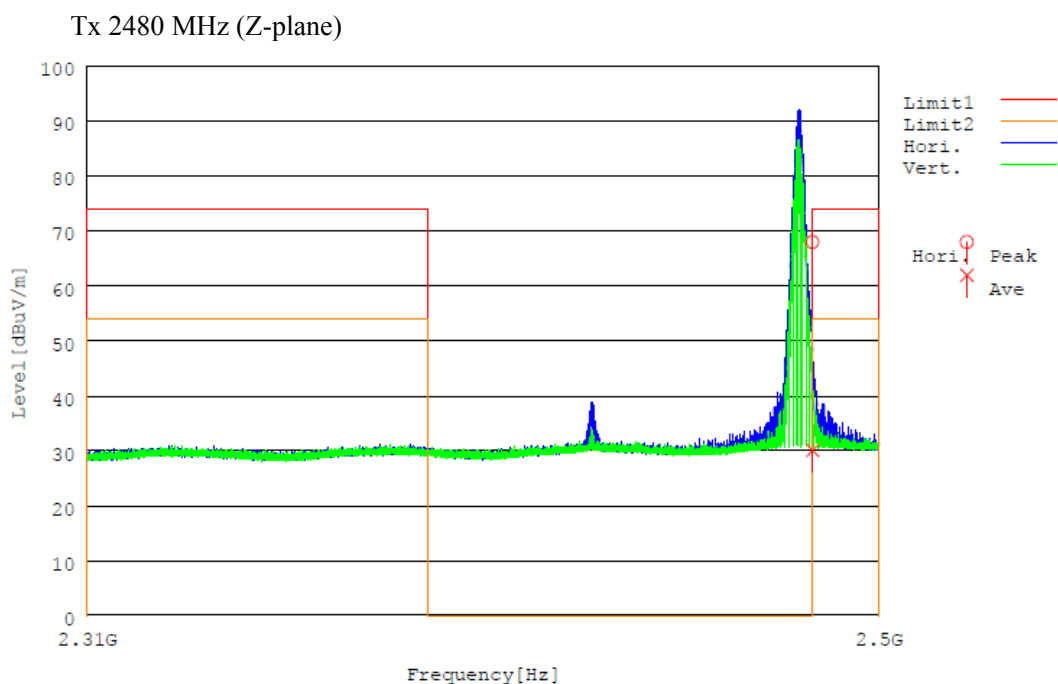
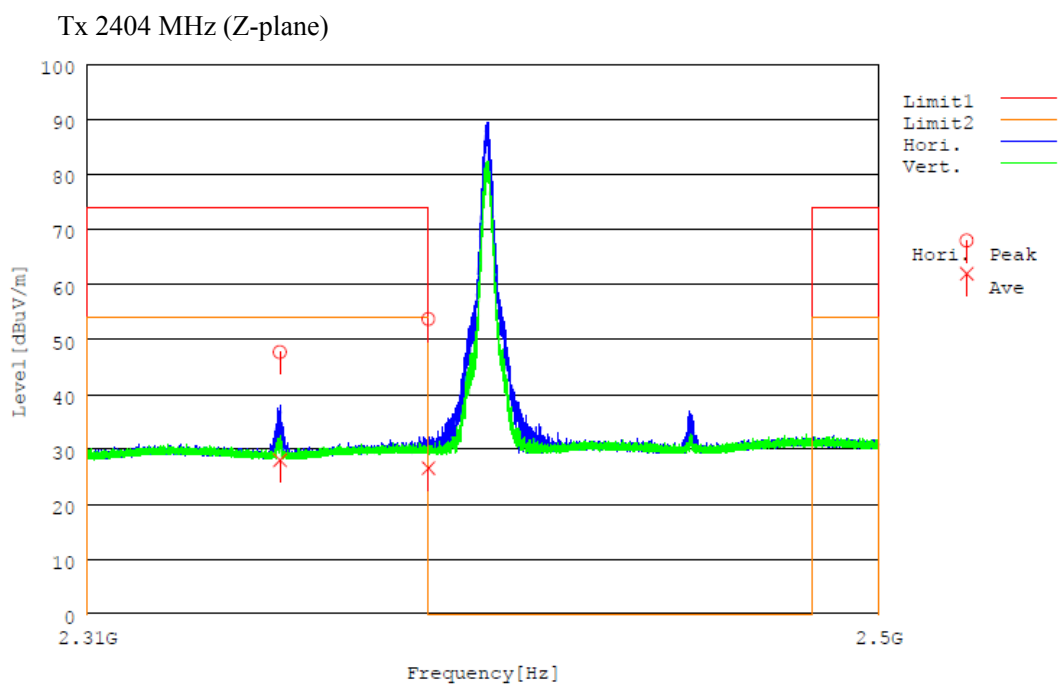
[Emission level] Y-plane

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	2483.500	70.2	33.2	-3.7	66.5	29.5	73.9	53.9	Hori.
2	2483.500	70.9	33.4	-3.7	67.2	29.7	73.9	53.9	Vert.

[Emission level] Z-plane

No.	Frequency [MHz]	Reading PK [dBμV]	Reading Ave [dBμV]	C.Factor [dB]	Result PK [dBμV/m]	Result Ave [dBμV/m]	Limit PK [dBμV/m]	Limit Ave [dBμV/m]	Ant.
1	2483.500	72.6	34.0	-3.7	68.9	30.3	73.9	53.9	Vert.
-	-	-	-	-	-	-	-	-	-

[Chart : band-edge]



Tested Date1: 14 May. 2015
Humidity: 52 %

Temperature: 23 degC
Atmos. Press: 1012 hPa

Tested Date2: 18 May. 2015
Humidity: 60 %

Temperature: 23 degC
Atmos. Press: 1014 hPa

2.7 AC power line conducted emissions

Test setup

Test setup was implemented according to the method of ANSI C63.4: 2003 clause 6 “General requirements for EUT equipment arrangements and operation” and Annex H.1 “AC power line conducted emission measurements setup”.

Test procedure

Measurement procedures were implemented according to the method of ANSI C63.4: 2003 clauses 7, clause 13.1.3 and Annex H.2 “AC power line conducted emission measurements”.

Applicable rule and limitation

FCC 15.207 AC power line conducted emissions limits

Frequency of Emission [MHz]	Conducted emissions Limit [dB μ V]	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46 *
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency. The lower limit applies at the band edges.

Test equipment used (refer to List of utilized test equipment)

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Test software used

EMI Ver. 5.6

Calculation method

The Correction Factor and Result are calculated as followings.

$$\begin{aligned}\text{Correction Factor [dB]} &= \text{ISN Factor [dB]} + \text{Loss [dB]} \\ \text{Result [dB}\mu\text{V]} &= \text{Reading [dB}\mu\text{V]} + \text{Correction Factor [dB]}\end{aligned}$$

Test results - ***This item was not tested.***

Test Data

Operating mode: -

[Emission level]

No.	Frequency [MHz]	Reading		C.F. [dB]	Result		Limit		Phase	Pass/Fail
		QP [dB μ V]	AV [dB μ V]		QP [dB μ V]	AV [dB μ V]	QP [dB μ V]	AV [dB μ V]		
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

[Chart]

Operating mode: -

Tested Date: -
Humidity: - %

Temperature: - degC
Atmos. Press: - hPa

4 List of utilized test equipment / calibration

RFT ID No.	Kind of Equipment and Precision	Manufacturer	Model No.	Serial Number	Calibration Date	Calibrated until
AC01(EM)	Anechoic Chamber (1st test room)	JSE	203397C	-	2015/4/18	2016/4/30
AC01(EG)	Anechoic Chamber (1st test room)	JSE	203397C	-	2014/11/24	2015/11/30
BA10	Biological Antenna	TESEQ	CBL6111D	32342	2014/6/9	2015/6/30
CH01	Conical Horn Antenna (12-18GHz)	ETS-Lindgren	3163-05	00126641	2014/7/3	2016/7/31
CL11	RF Cable for RE	RFT	-	-	2015/3/13	2016/3/31
CL29	RF Cable 2 m	SUHNER	SUCOFLEX104PE	94709	2015/1/26	2016/1/31
CL30	RF Cable 5 m	SUHNER	SUCOFLEX104PE	MY3599	2014/8/28	2015/8/31
CL31	RF Cable 1 m	Junkosha	MWX221	1303S118	2014/10/6	2015/10/31
DH01	DRG Horn Antenna	A.H. Systems	SAS-571	785	2014/1/21	2016/1/31
LPF1	Low Pass Filter (1000MHz)	M-City	LPF1000-04	RF0012-01	2015/2/23	2016/2/29
PR12	Pre. Amplifier (1-26G)	Agilent Technologies	8449B	3008A02513	2015/1/26	2016/1/31
PR15	Pre. Amplifier	Anritsu	MH648A	6201156141	2014/6/10	2015/6/30
SH01	Standard Horn Antenna (18-26G)	A.H. Systems	SAS-572	208	2014/7/3	2016/7/31
TR06	Test Receiver (E/W : 3.93 SP2)	Rohde & Schwarz	ESU26	100002	2014/9/5	2015/9/30

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.