RADIO TEST REPORT

Test Report No. : 10068338H-P-R1

Applicant	:	**Sony Corporation**
Type of Equipment	:	**UHF Synthesized Transmitter**
Model No.	:	**UTX-P03**
FCC ID	:	**AK8UTXP03**
Test regulation	:	**FCC Part 74: 2013**
Test Result	:	**Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This report is a revised version of 10068338H-P. 10068338H-P is replaced with this report.

Date of test: October 17, 2013 to January 15, 2014

Representative test engineer:

Hironobu Ohnishi
Engineer of WiSE Japan,
UL Verification Service

Approved by:

Masanori Nishiyama
Manager of WiSE Japan,
UL Verification Service

REVISION HISTORY

Original Test Report No.: 10068338H-P

Revision	Test report No.	Date	Page revised	Contents
- (Original)	10068338H-P	January 22, 2014	-	-
1	10068338H-P-R1	January 27, 2014	P. 4	Correction of Product Description
1	10068338H-P-R1	January 27, 2014	P. 8	Correction of Operating mode chart
1	10068338H-P-R1	January 27, 2014	P. 10	Correction of Test Procedure
1	10068338H-P-R1	January 27, 2014	P. 11	Correction of Test Procedure
1	10068338H-P-R1	January 27, 2014	P. 29 - 32	Correction of table entry

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SECTION 1: Customer information

Company Name	:	Sony Corporation
Address	:	1-7-1 Konan, Minato-ku, Tokyo 108-0075, Japan
Telephone Number	:	+81-53-577-1012
Facsimile Number	:	+81-53-577-3489
Contact Person	:	Youhei Hisano

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment	:	UHF Synthesized Transmitter
Model No.	:	UTX-P03
Serial No.	:	Refer to 4.2 in this report.
Rating	:	DC3V (Battery), DC5V (USB)
Receipt Date of Sample	:	September 11, 2013
Country of Mass-production	:	Korea
Condition of EUT	:	Engineering prototype
Modification of EUT	:	(Not for Sale: This sample is equivalent to mass-produced items.)

2.2 Product Description

Model: UTX-P03 (referred to as the EUT in this report) is a UHF Synthesized Transmitter.

General Specification

Clock frequency(ies) in the system	:	DSP: 26MHz (TCXO)

Radio Specification

Radio type	:	Transmitter
Modulation type	:	Frequency modulation
Emission designator	:	116KF3E
Necessary bandwidth	:	116kHz = 2M + 2D where M: Maximum modulation frequency = 18kHz D: Peak deviation = 40kHz As for the peak deviation, refer to the Maximum deviation which described in exhibit "Theory of operation".
Channel spacing	:	125kHz
Frequency of operation	:	470.125-607.875MHz, 614.125-697.875MHz UC14: 470.125-541.875MHz UC30: 566.125-607.875MHz, 614.125-637.875MHz UC42: 638.125-697.875MHz
Clock frequency(ies)	:	PLL: 19.2MHz (TCXO)
RF power	:	High: 40mW, Low: 5mW
Antenna type	:	1/4 Lambda Monopole antenna (integral type)
Antenna gain	:	4.8dBi
Power Supply (radio part input)	:	DC 3.3V, DC5.5V
AF Specification	:	40Hz – 18000Hz, Maximum input: -24dBV (MIC level, ATT 0dB)

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part 74: 2013, final revised on November 5, 2013 and effective December 5, 2013.
* The revision on November 5, 2013 does not affect the test specification applied to the EUT.

Title : FCC 47CFR Part74
EXPERIMENTAL RADIO, AUXILIARY, SPECIAL BROADCAST AND OTHER PROGRAM DISTRIBUTIONAL SERVICES

* The EUT complies with FCC Part 15 Subpart B: 2013, final revised on September 30, 2013 and effective October 30, 2013. The revision on September 30, 2013 does not affect the test specification applied to the EUT.
USB port was confirmed to be complied with FCC Part 15 Subpart: B (Verification), since it can be used as DC power input only.

3.2 Procedures and results

Item	Test Procedure	Specification	Worst margin	Results	Remarks
RF power output	FCC: Section 2.1046	FCC: Section 74.861 (e) (1)	See data.	Complied	Conducted
	IC: RSS-Gen Section 4.8 RSS-123 Section 4.2	IC: RSS-123 Section 5.1			
Modulation Characteristics	FCC: Section 2.1047	FCC: Section 74.861 (e) (3)	See data.	Complied	Radiated
	IC: RSS-123 Section 4.1	IC: RSS-123 Section 5.2			
Emission Bandwidth	FCC: Section 2.1049	FCC: Section 74.861 (e) (5), (6)	See data.	Complied	Radiated
	IC: RSS-Gen Section 4.6	IC: RSS-123 Section 5.3			
Spurious emissions at antenna terminals	FCC: Section 2.1051	FCC: Section 74.861 (e) (6)	See data.	Complied	Conducted
	IC: RSS-123 Section 5.5	IC: RSS-123 Section 5.5			
Field strength of spurious radiation	FCC: Section 2.1053	FCC: Section 74.861 (e) (6)	21.9dB 2093.63MHz, Horizontal	Complied	Radiated
	IC: RSS-Gen Section 4.9 RSS-123 Section 5.5	IC: RSS-123 Section 5.5	See IC report.		
Frequency stability	FCC: Section 2.1055	FCC: Section 74.861 (e) (4)	See data.	Complied	Radiated
	IC: RSS-Gen Section 4.7	IC: RSS-123 Section 5.4			
Note: UL Japan, Inc.'s EMI Work Procedure No. 13-EM-W0420. This EUT does not have receiving part. Therefore Receiver Spurious Emission test was not performed.					

* In case any questions arise about test procedure, TIA/EIA 603-C (2004) is also referred.

Supplied Voltage Information
This EUT provides stable voltage (DC3.3V, DC5.5V) constantly to RF Part regardless of input voltage.

Antenna Information
The antenna is not removable from the EUT.

3.3 Addition to standard

No addition, exclusion nor deviation has been made from the standard.

3.4 Uncertainty

EMI

The following uncertainties have been calculated to provide a confidence level of 95% using a coverage factor k=2.

Spurious Emission (EUT height: 0.8m) (±dB)	
Measurement Distance 3m	
30MHz-300MHz	5.5dB
300MHz-1000MHz	4.2dB
1GHz-12.75GHz	4.6dB

Power meter (±dB)
Below 1GHz
0.7dB

Antenna terminal conducted emission (±dB)		
Below 1GHz	1GHz-3GHz	3GHz-18GHz
1.5dB	1.7dB	2.8dB

Radiated emission test (3m)

The data listed in this test report has enough margin, more than the site margin.

3.5 Test Location

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	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	313583	2973C-1	19.2 x 11.2 x 7.7m	7.0 x 6.0m	No.1 Power source room
No.2 semi-anechoic chamber	655103	2973C-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 semi-anechoic chamber	148738	2973C-3	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.3 Preparation room
No.3 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.4 semi-anechoic chamber	134570	2973C-4	12.0 x 8.5 x 5.9m	6.8 x 5.75m	No.4 Preparation room
No.4 shielded room	-	-	4.0 x 6.0 x 2.7m	N/A	-
No.5 semi-anechoic chamber	-	-	6.0 x 6.0 x 3.9m	6.0 x 6.0m	-
No.6 shielded room	-	-	4.0 x 4.5 x 2.7m	4.0 x 4.5 m	-
No.6 measurement room	-	-	4.75 x 5.4 x 3.0m	4.75 x 4.15 m	-
No.7 shielded room	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.8 measurement room	-	-	3.1 x 5.0 x 2.7m	N/A	-
No.9 measurement room	-	-	8.0 x 4.6 x 2.8m	2.4 x 2.4m	-
No.11 measurement room	-	-	6.2 x 4.7 x 3.0m	2.4 x 3.4m	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1, No.2, No.3, and No.4 semi-anechoic chambers and No.3 and No.4 shielded rooms.

3.6 Data of EMI, Test instruments, and Test set up

Refer to APPENDIX.

SECTION 4: Operation of E.U.T. during testing

4.1 Operating Mode(s)

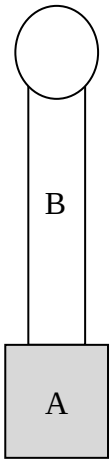
Mode	Remarks
Transmitting (Tx), Low power	Typ. 5mW
Transmitting (Tx), High power	Typ. 40mW
*Transmitting duty was 100% on all tests.	
*Power of the EUT was set by the software as follows; Power settings: Low (5mW), High (40mW) Software: 130906b *This setting of software is the worst case. Any conditions under the normal use do not exceed the condition of setting. In addition, end users cannot change the settings of the output power of the product without High or Low settings.	

*The details of Operating mode(s)

Test Item	Tested frequency	Power setting	AF input signal	Remarks
RF power output	470.125MHz (Low) 607.875MHz (Mid) 697.875MHz (High)	Low power High power	None	
Modulation Characteristics	607.875MHz (Mid)	Low power High power	See data.	*3)
Emission Bandwidth	470.125MHz (Low) 607.875MHz (Mid) 614.125MHz (Mid2) 697.875MHz (High)	Low power High power	-22.9dBV, 2500Hz, Sine wave *1)	*4)
Spurious emissions at antenna terminals	470.125MHz (Low) 607.875MHz (Mid) 697.875MHz (High)	Low power High power	-22.9dBV, 2500Hz, Sine wave *1)	
Field strength of spurious radiation	470.125MHz (Low) 607.875MHz (Mid) 697.875MHz (High)	Low power High power	None, -22.9dBV, 2500Hz, Sine wave *2)	
Frequency stability	607.875MHz (Mid)	High power	None	*5)

*1) When modulated by a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation. (50% deviation: 20kHz = Maximum peak deviation * 0.5 = 40 kHz * 0.5)
*2) As for side band spectrum measurements, EUT was modulated same as note *1).
*3) There is no difference in audio part on each channel. Therefore the test was performed on Mid channel as a representative.
*4) The tests were performed at both edges of allocated bands.
*5) There is no difference in frequency generating method on each channel. Therefore the test was performed on Mid channel as a representative.

4.2 Configuration and peripherals



* Setup(s) were taken into consideration and test data was taken under worse case conditions.

Description of EUT

No.	Item	Model number	Serial number	Manufacturer	Remarks
A	UHF Synthesized Transmitter	UTX-P03	UC14: 8051	Sony Corporation	EUT
		UTX-P03	UC30: 8059		
		UTX-P03	UC42: 8078		
B	Microphone	F-112	-	Sony Corporation	-

SECTION 5: Field strength of spurious radiation

Test Procedure

1) EUT was placed on a platform of nominal size, 0.5m by 1.0m, raised 0.8m above the conducting ground plane. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization. The Radiated Electric Field Strength has been measured in semi anechoic chamber at a distance of 3m. The measuring antenna height was varied between 1 to 4m and the turn table was rotated a full revolution in order to obtain the maximum value of the electric field strength. The measurements were performed for both vertical and horizontal antenna polarization. Spurious emissions were observed with enough time according to the test standard.

2) Exchanged the EUT to the Substitution Antenna, the measurement was set for the same height 0.8m as the EUT. The frequency below 1GHz of the Substitution Antenna was used the Half wave dipole Antenna, which was tuned the measured frequency in 1). The frequency above 1GHz of the Substitution Antenna was used Horn Antenna. The Substitution Antenna was connected to the Signal Generator, and the polarized electromagnetic radiation of the Substitution Antenna was matched with the one of the measuring Antenna, which was set with the Signal Generator to the measured frequency in 1). Then, we set with the Output power (CW) of the Signal Generator where the measuring electromagnetic field strength is equal to the measured value in 1) by means of varying the measuring antenna height between 1 to 4m to obtain maximum receiving level. Its Output power of Signal Generator was recorded.

3) Effective radiated power was calculated by subtracting the cable loss and the attenuator loss connected between the Signal Generator and the Substitution Antenna from the Output power of the Signal Generator recorded in 2). For the usage of the Antenna (Horn Antenna) except for the Half wave dipole Antenna (2.15dBi) for the Substitution Antenna, the Effective radiated power was calculated by compensating the finite difference in the Antenna gain of the Half wave dipole Antenna, and Substitution Antenna.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver	Spectrum Analyzer
IF Bandwidth	RMS Average: 120kHz BW	RMS Average: RBW: 1MHz/VBW: 3MHz

- The carrier level and noise levels were confirmed at each position of X, Y and Z axes of EUT to see the position of maximum noise, and the test was made at the position that has the maximum noise.

The test results and limit are rounded off to one decimal place, so some differences might be observed.

[Side band spectrum measurement]

1) Center frequency of the spectrum analyzer was set to the assigned transmitter frequency. Span was set to 500% of necessary bandwidth. Transmit the EUT, and the level of the unmodulated carrier was set to a full scale reference level. This is the 0dB reference for the measurement.
2) The EUT was modulated with 2500Hz sine wave at an input level 16dB greater than that necessary to produce 50% of rated system deviation.
3) The resulting spectrum analyzer plot of the emission level was recorded.

Measurement range : 30M-7GHz
Test data : APPENDIX
Test result : Pass

SECTION 6: Modulation Characteristics

Deviation versus Audio input level and Audio Frequency

Test Procedure

The frequency deviations were measured when input level and frequency were varied. It was measured with Radio-communication Service Monitor.

Audio input level	-80dBV to -20dBV, 5dB step
Audio frequency	40Hz, 100Hz, 300Hz, 500Hz, 700Hz, 1kHz, 3kHz, 5kHz, 7kHz, 10kHz, 15kHz, 18kHz

Audio Frequency Response

Test Procedure

The audio input level was measured when frequency deviation indicates 50% modulation which measured with Radio communication Service Monitor.

50% deviation	20kHz = Maximum peak deviation * 0.5 = 40 kHz * 0.5
Audio frequency	40Hz, 70Hz, 100Hz, 300Hz, 500Hz, 700Hz, 1kHz, 3kHz, 5kHz, 7kHz, 10kHz, 15kHz, 18kHz

Test data : APPENDIX
Test result : Pass

SECTION 7: Antenna terminal tests, Emission Bandwidth and Frequency stability

Test Procedure

The tests were made with below setting connected to the antenna port.

Test	Span	RBW	VBW	Sweep time	Detector	Trace	Instrument used
RF power output	-	-	-	Auto	Average Peak *1)	-	Power Meter (Sensor: 50MHz BW)
Emission Bandwidth	Enough width to display emission skirts	1 to 3% of Span	Three times of RBW	Auto	Peak *2)	Max Hold *2)	Spectrum Analyzer
Conducted Spurious Emission	9kHz -150kHz	200Hz	620Hz	Auto	Peak	Max Hold	Spectrum Analyzer *3)
	150kHz - 30MHz	10kHz	30kHz				
	30MHz – 1GHz	100kHz	300kHz				
	Above 1GHz	1MHz	3MHz				
Frequency stability	-	-	-	-	-	-	Frequency Counter

*1) Reference data
*2) The measurement was performed with Peak and Max Hold since the modulation method was FM.
*3) In the frequency range below 30MHz, RBW was narrowed to separate the noise contents. Then, wide-band noise near the limit was checked separately, however the noise was not detected as shown in the chart.

The test results and limit are rounded off to two decimals place, so some differences might be observed.

Test data : **APPENDIX**
Test result : **Pass**

APPENDIX 1: Data of EMI test

RF power output
(Conducted)

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10068338H
Date	11/12/2013
Temperature/ Humidity	22 deg. C / 43% RH
Engineer	Hironobu Ohnishi
Mode	Tx

Power Setting	Channel	Freq.	Reading		Cable Loss	Atten. Loss	Result				Limit	Margin
			Average	Peak *			Average		Peak *			
		[MHz]	[dBm]	[dBm]	[dB]	[dB]	[dBm]	[mW]	[dBm]	[mW]	[mW]	[dB]
Low Power	Low	470.125	7.74	7.77	0.33	0.00	8.07	6.41	8.10	6.46	250	15.91
	Mid	607.875	6.85	6.95	0.38	0.00	7.23	5.28	7.33	5.41	250	16.75
	High	697.875	7.19	7.28	0.41	0.00	7.60	5.75	7.69	5.87	250	16.38
High Power	Low	470.125	14.73	14.77	0.33	0.00	15.06	32.06	15.10	32.36	250	8.92
	Mid	607.875	14.50	14.55	0.38	0.00	14.88	30.76	14.93	31.12	250	9.10
	High	697.875	14.79	14.84	0.41	0.00	15.20	33.11	15.25	33.50	250	8.78

Calculation formula:
Result = Reading + Cable Loss + Atten. Loss

Cable or Atten was not used for factor 0.00dB of the above table.

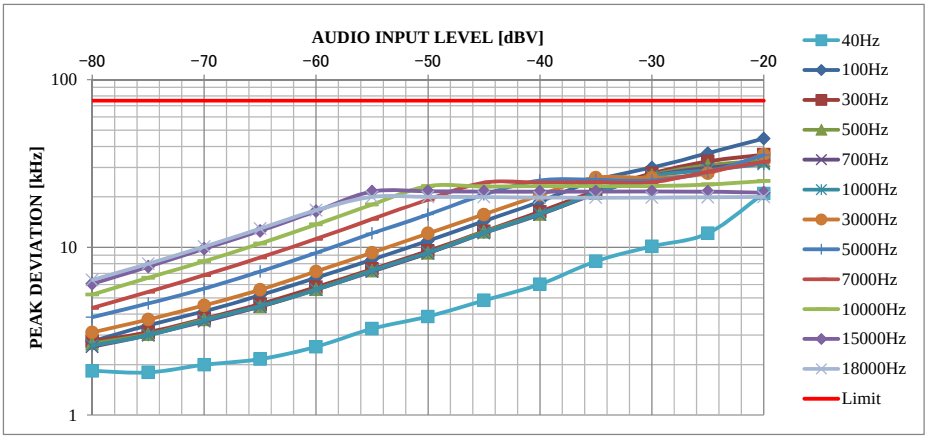
* Reference data

Modulation Characteristics

Test place	Head Office EMC Lab. No.4 Measurement Room	
Report No.	10068338H	
Date	10/31/2013	01/15/2014
Temperature/ Humidity	22 deg. C / 52% RH	25 deg. C / 32% RH
Engineer	Hironobu Ohnishi	Hironobu Ohnishi
Mode	Tx 607.875MHz, Low power	

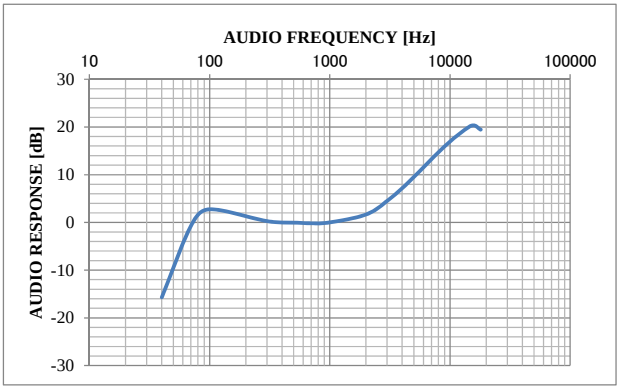
[Deviation versus Audio input level and Audio Frequency]

AF Level	AF Frequency [Hz] / Peak Deviation [kHz]												Limit
[dBV]	40	100	300	500	700	1000	3000	5000	7000	10000	15000	18000	[kHz]
-80	1.836	2.755	2.755	2.675	2.555	2.595	3.114	3.832	4.351	5.230	6.068	6.387	75
-75	1.796	3.433	3.114	3.034	2.994	2.994	3.713	4.631	5.429	6.587	7.665	7.984	75
-70	1.996	4.152	3.753	3.713	3.633	3.673	4.511	5.669	6.826	8.263	9.820	10.100	75
-65	2.156	5.190	4.591	4.431	4.431	4.471	5.589	7.186	8.703	10.539	12.535	12.934	75
-60	2.555	6.587	5.788	5.629	5.589	5.589	7.186	9.261	11.218	13.693	16.447	16.647	75
-55	3.273	8.463	7.425	7.265	7.186	7.265	9.301	12.136	14.770	18.004	21.517	20.000	75
-50	3.872	10.938	9.501	9.261	9.222	9.301	12.136	15.689	19.281	23.194	21.597	20.000	75
-45	4.830	14.331	12.455	12.375	12.176	12.216	15.689	20.679	24.351	23.074	21.517	20.000	75
-40	6.028	18.762	16.327	15.808	15.689	15.808	20.559	25.070	24.351	23.194	21.517	19.800	75
-35	8.263	25.190	21.717	21.078	20.958	21.078	26.028	25.309	24.471	23.194	21.517	19.800	75
-30	10.140	29.940	27.625	26.986	26.667	26.547	25.948	25.070	24.471	23.194	21.517	19.800	75
-25	12.136	36.487	32.575	30.898	29.820	28.862	27.705	28.144	28.263	23.713	21.517	19.920	75
-20	20.958	44.591	35.728	32.894	31.936	31.497	35.728	35.529	32.375	24.870	21.198	20.000	75



[Audio Frequency Response]

AF Frequency [Hz]	AF Level [mV]	AF Response [dB]
40	96.53	-15.69
70	17.19	-0.70
100	11.56	2.75
300	15.38	0.27
500	15.93	-0.04
700	16.19	-0.18
1000	15.86	0.00
2000	13.11	1.65
3000	9.43	4.52
5000	5.32	9.49
7000	3.45	13.25
10000	2.25	16.96
15000	1.54	20.26
18000	1.69	19.45



Calculation formula:

AF Response = 20 * log(AF Level of 1kHz / AF level)

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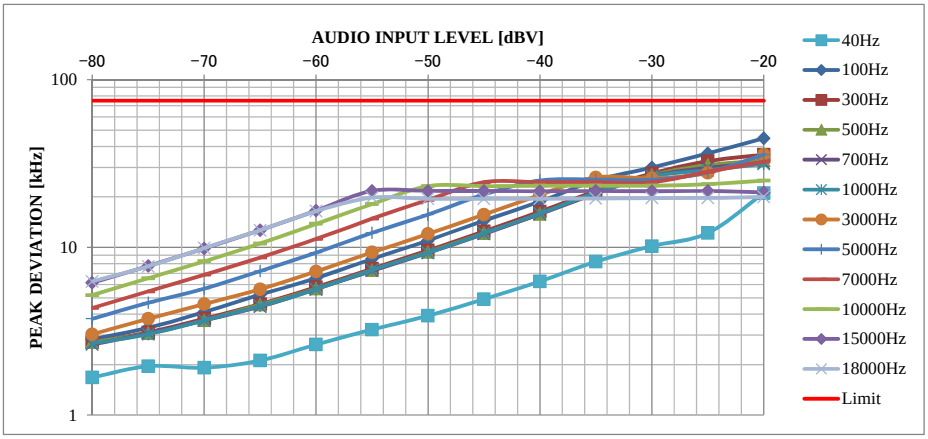
Modulation Characteristics

Test place	Head Office EMC Lab. No.4 Measurement Room	
Report No.	10068338H	
Date	10/31/2013	01/15/2014
Temperature/ Humidity	22 deg. C / 52% RH	25 deg. C / 32% RH
Engineer	Hironobu Ohnishi	Hironobu Ohnishi
Mode	Tx 607.875MHz, High power	

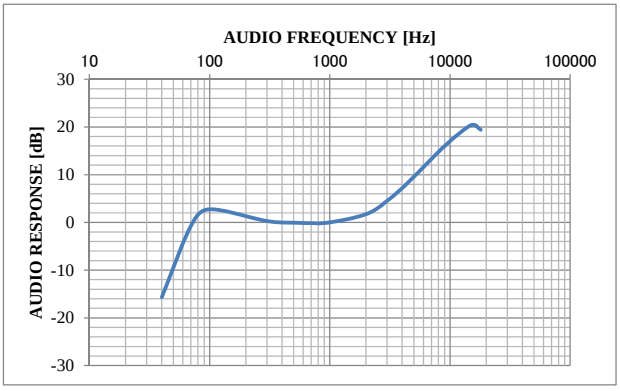
[Deviation versus Audio input level and Audio Frequency]

AF Level [dBV]	AF Frequency [Hz] / Peak Deviation [kHz]												Limit [kHz]
	40	100	300	500	700	1000	3000	5000	7000	10000	15000	18000	
-80	1.677	2.834	2.715	2.715	2.635	2.675	3.034	3.753	4.351	5.190	6.148	6.267	75
-75	1.956	3.313	3.114	3.074	3.074	3.034	3.753	4.671	5.469	6.547	7.745	7.705	75
-70	1.916	4.112	3.753	3.673	3.673	3.673	4.591	5.669	6.866	8.263	9.860	9.900	75
-65	2.116	5.230	4.591	4.551	4.431	4.471	5.629	7.226	8.703	10.539	12.655	12.655	75
-60	2.635	6.547	5.788	5.669	5.629	5.629	7.186	9.301	11.218	13.812	16.567	16.447	75
-55	3.234	8.543	7.465	7.305	7.265	7.345	9.341	12.216	14.850	18.124	21.717	19.800	75
-50	3.912	10.978	9.581	9.381	9.261	9.301	12.016	15.689	19.202	23.194	21.717	19.481	75
-45	4.910	14.451	12.455	12.136	12.016	12.136	15.689	20.679	24.471	23.194	21.717	19.481	75
-40	6.267	18.762	16.327	15.808	15.808	15.928	20.559	25.070	24.471	23.313	21.597	19.481	75
-35	8.224	25.070	21.717	21.078	20.958	21.198	26.148	25.389	24.471	23.313	21.717	19.601	75
-30	10.180	29.940	27.625	26.986	26.667	26.547	25.828	25.309	24.471	23.313	21.597	19.681	75
-25	12.176	36.367	32.695	30.978	29.820	28.862	27.824	28.024	28.263	23.832	21.717	19.681	75
-20	21.078	44.710	35.728	32.974	31.936	31.497	35.728	35.728	32.455	24.990	21.277	20.000	75



[Audio Frequency Response]

AF Frequency [Hz]	AF Level [mV]	AF Response [dB]
40	96.31	-15.64
70	17.21	-0.68
100	11.59	2.75
300	15.40	0.28
500	16.01	-0.05
700	16.19	-0.15
1000	15.91	0.00
2000	13.05	1.72
3000	9.44	4.53
5000	5.32	9.52
7000	3.43	13.33
10000	2.24	17.03
15000	1.52	20.40
18000	1.70	19.42



Calculation formula:

AF Response = 20 * log(AF Level of 1kHz / AF level)

Emission Bandwidth

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	10068338H
Date	11/05/2013
Temperature/ Humidity	23 deg. C / 41% RH
Engineer	Hironobu Ohnishi
Mode	Tx

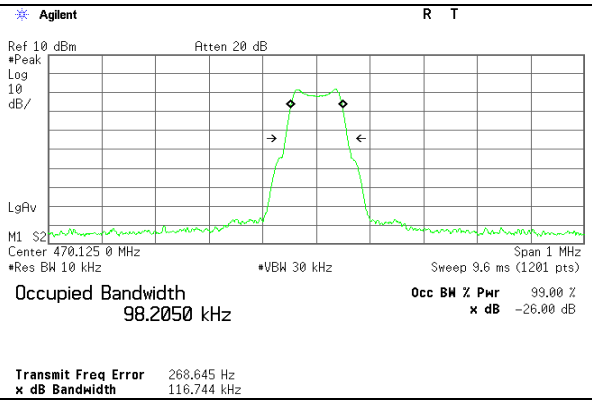
Power Setting	Channel	Freq. [MHz]	99% Occupied Bandwidth [kHz]	Limit [kHz]	Margin [kHz]
Low Power	Low	470.125	98.2050	200	101.7950
	Mid	607.875	75.5154	200	124.4846
	Mid2	614.125	77.8978	200	122.1022
	High	697.875	75.5973	200	124.4027
High Power	Low	470.125	98.0217	200	101.9783
	Mid	607.875	75.5119	200	124.4881
	Mid2	614.125	77.7606	200	122.2394
	High	697.875	75.8192	200	124.1808

Emission Bandwidth

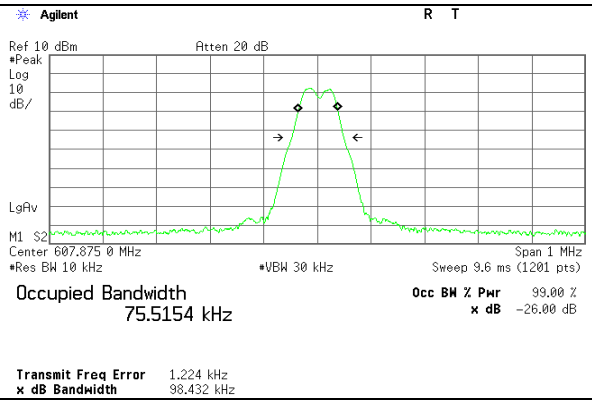
Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	10068338H
Date	11/05/2013
Temperature/ Humidity	23 deg. C / 41% RH
Engineer	Hironobu Ohnishi
Mode	Tx Low power

Low power

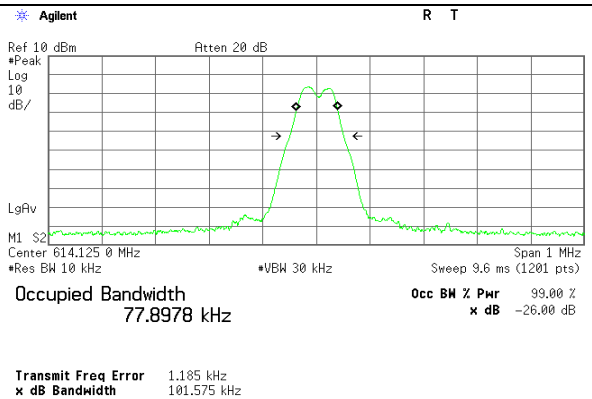
470.125MHz



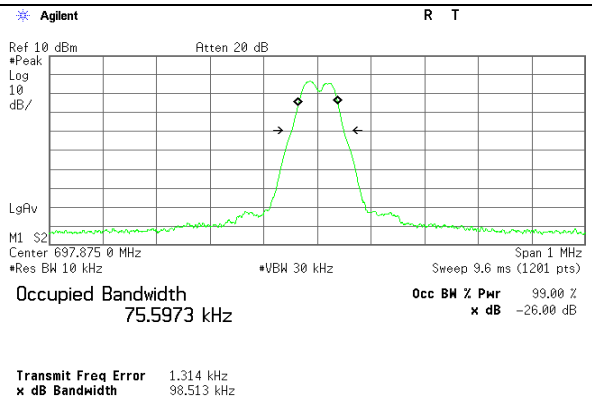
607.875MHz



614.125MHz



697.875MHz



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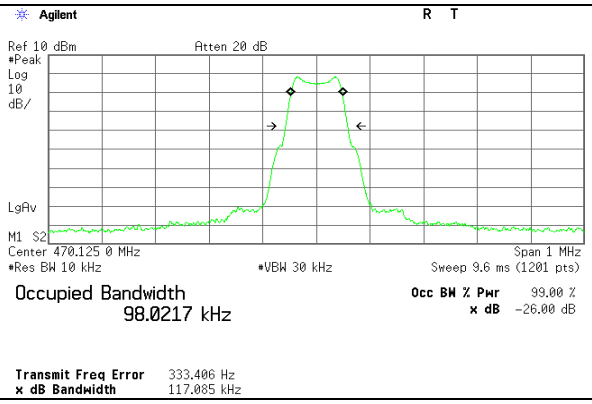
Emission Bandwidth

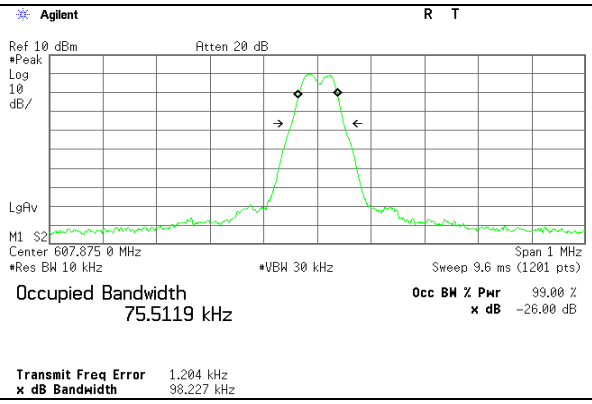
Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	10068338H
Date	11/05/2013
Temperature/ Humidity	23 deg. C / 41% RH
Engineer	Hironobu Ohnishi
Mode	Tx High power

High power

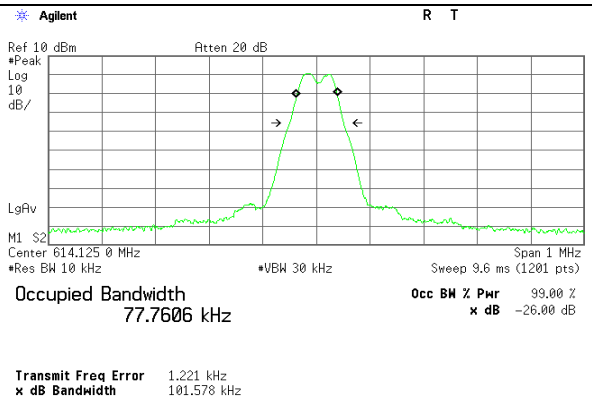
470.125MHz



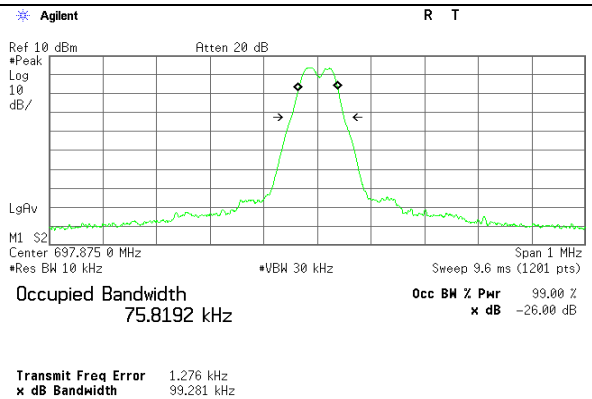
607.875MHz



614.125MHz



697.875MHz



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Spurious emissions at antenna terminals

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10068338H
Date	11/12/2013
Temperature/ Humidity	22 deg. C / 43% RH
Engineer	Hironobu Ohnishi
Mode	Tx

Power Setting	Channel	Tested Freq. [MHz]	Reading Freq. [MHz]	Reading Level [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]
Low Power	Low	470.125	0.01053	-87.37	0.03	9.87	-77.47	-13	64.47
			0.2	-77.21	0.03	9.83	-67.35	-13	54.35
			940.2	-69.10	0.47	9.90	-58.73	-13	45.73
			3957	-60.07	0.97	10.13	-48.97	-13	35.97
	Mid	607.875	0.01158	-85.36	0.03	9.87	-75.46	-13	62.46
			0.15	-79.02	0.03	9.83	-69.16	-13	56.16
			3397	-61.05	0.90	10.10	-50.05	-13	37.05
			7171	-58.55	3.41	10.17	-44.97	-13	31.97
	High	697.875	0.009	-86.05	0.03	9.87	-76.15	-13	63.15
			0.15	-78.04	0.03	9.83	-68.18	-13	55.18
			3067	-60.77	0.87	10.07	-49.83	-13	36.83
			6904	-58.59	2.99	10.14	-45.46	-13	32.46
High Power	Low	470.125	0.01041	-85.55	0.03	9.87	-75.65	-13	62.65
			0.25	-78.98	0.03	9.83	-69.12	-13	56.12
			940.2	-67.43	0.47	9.90	-57.06	-13	44.06
			3097	-61.01	0.87	10.08	-50.06	-13	37.06
	Mid	607.875	0.01217	-85.73	0.03	9.87	-75.83	-13	62.83
			0.15	-79.08	0.03	9.83	-69.22	-13	56.22
			1217	-61.16	0.53	10.07	-50.56	-13	37.56
			3143	-59.73	0.88	10.08	-48.77	-13	35.77
			7083	-58.45	3.27	10.15	-45.03	-13	32.03
	High	697.875	0.01241	-86.52	0.03	9.87	-76.62	-13	63.62
			0.15	-77.74	0.03	9.83	-67.88	-13	54.88
			3163	-60.60	0.88	10.08	-49.64	-13	36.64
			7700	-59.03	4.24	10.24	-44.55	-13	31.55

Calculation formula:

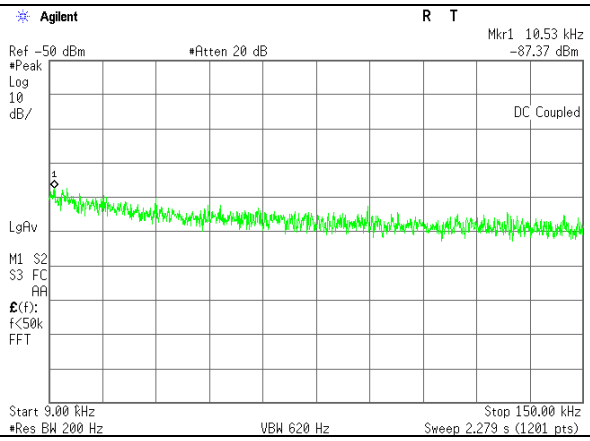
Result = Reading + Cable Loss + Attenuator Loss

Limit = mean output power in dBm - (43+10log10 (mean output power in watts)) dB = -13dBm

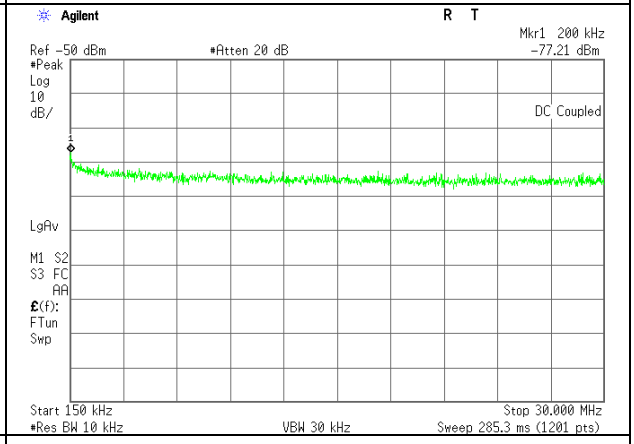
Spurious emissions at antenna terminals

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10068338H
Date	11/12/2013
Temperature/ Humidity	22 deg. C / 43% RH
Engineer	Hironobu Ohnishi
Mode	Tx 470.125MHz, Low power

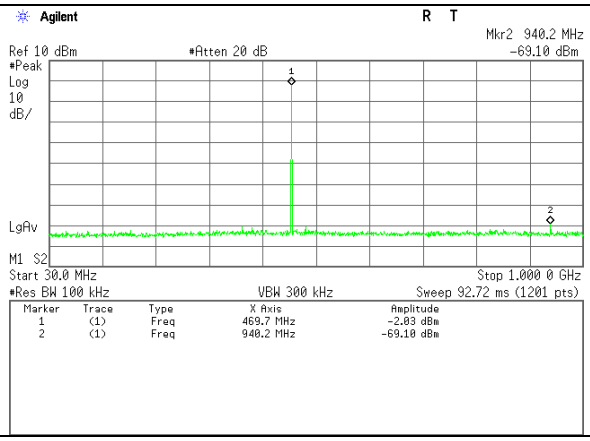
9kHz – 150kHz



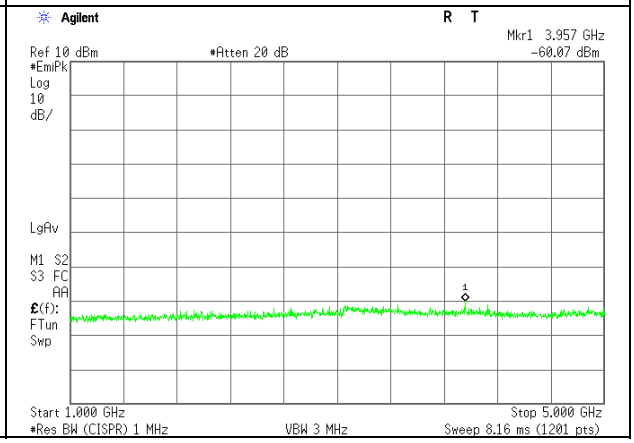
150kHz – 30MHz



30MHz – 1GHz



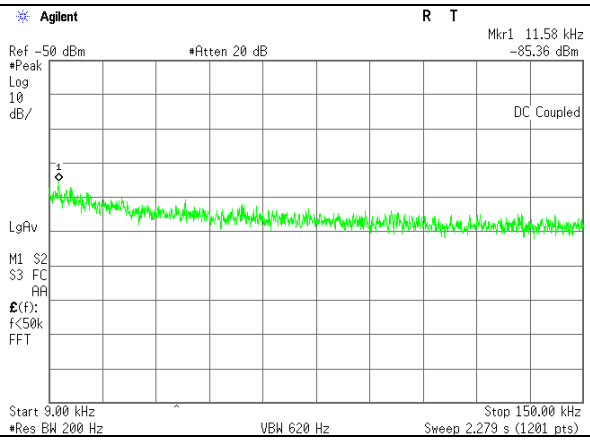
1GHz – 5GHz



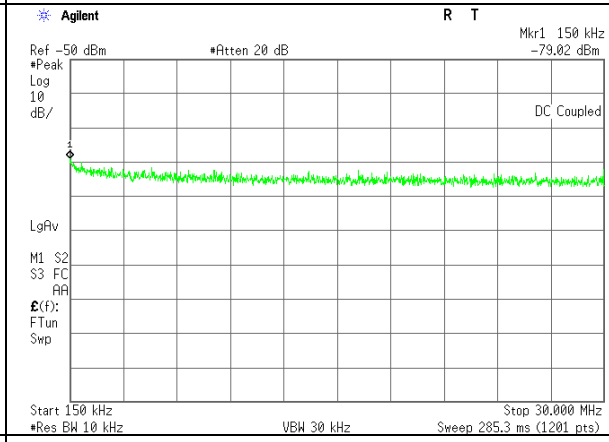
Spurious emissions at antenna terminals

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10068338H
Date	11/12/2013
Temperature/ Humidity	22 deg. C / 43% RH
Engineer	Hironobu Ohnishi
Mode	Tx 607.875MHz, Low power

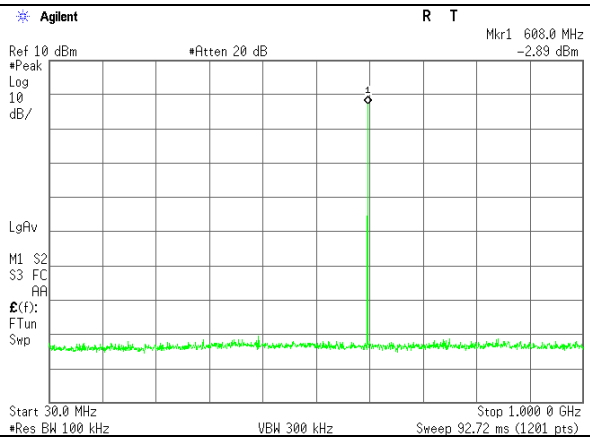
9kHz – 150kHz



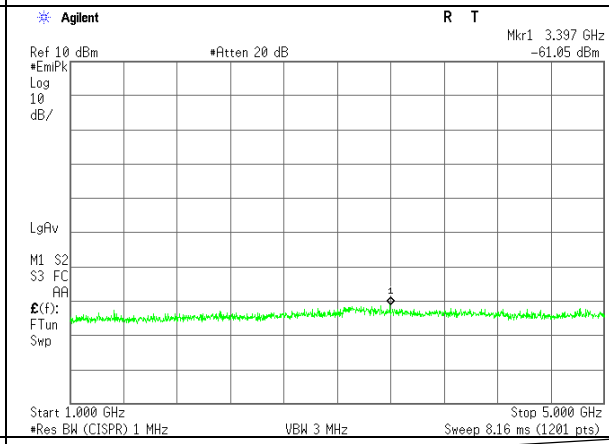
150kHz – 30MHz



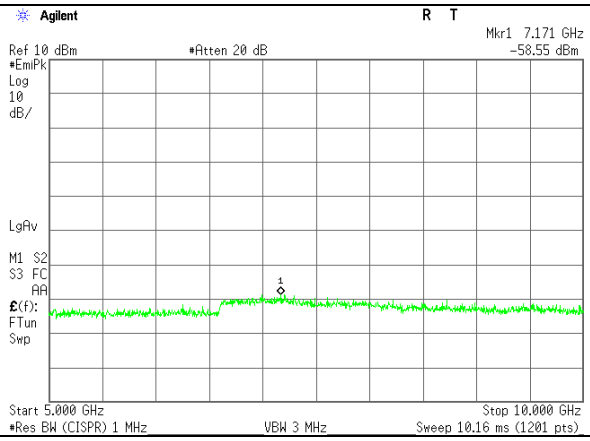
30MHz – 1GHz



1GHz – 5GHz



5GHz – 10GHz



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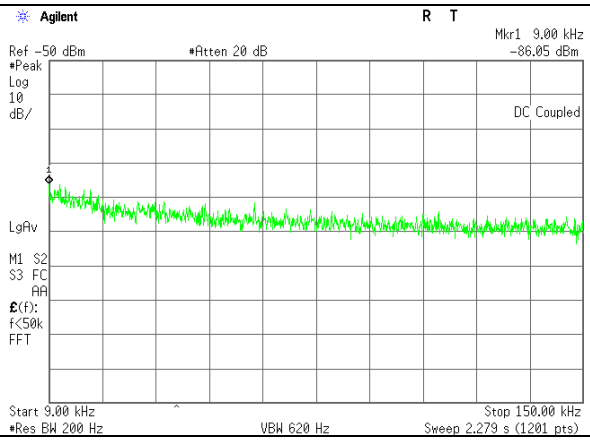
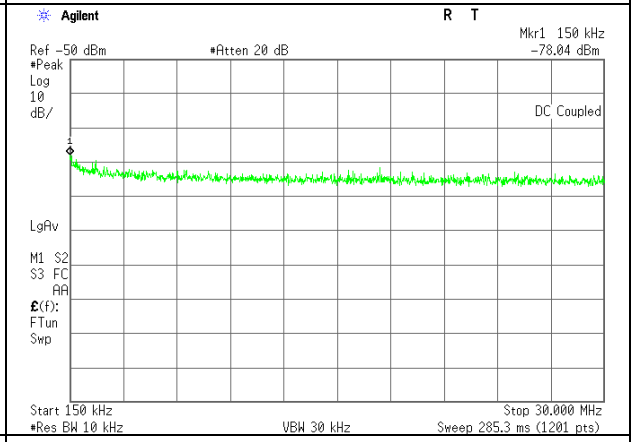
Spurious emissions at antenna terminals

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10068338H
Date	11/12/2013
Temperature/ Humidity	22 deg. C / 43% RH
Engineer	Hironobu Ohnishi
Mode	Tx 697.875MHz, Low power

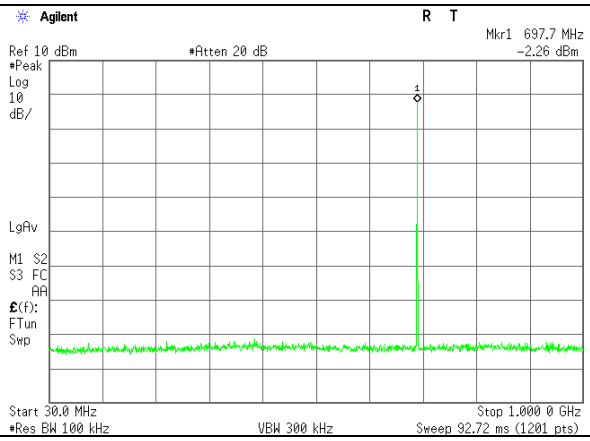
9kHz – 150kHz



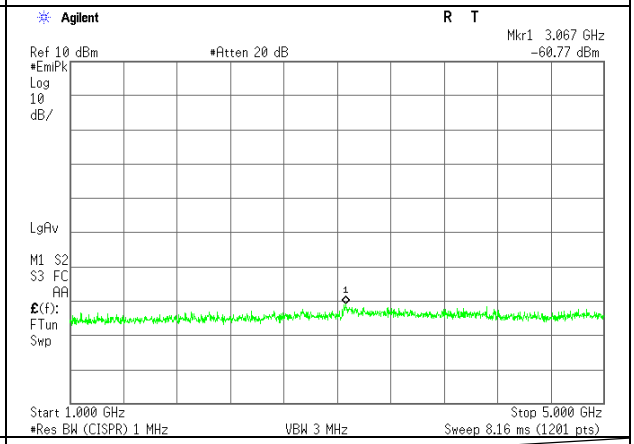
150kHz – 30MHz



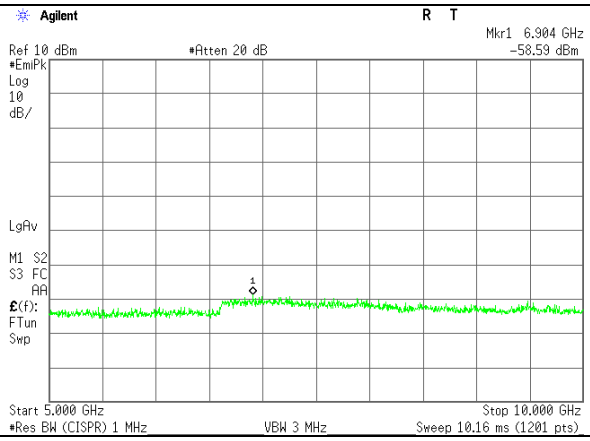
30MHz – 1GHz



1GHz – 5GHz



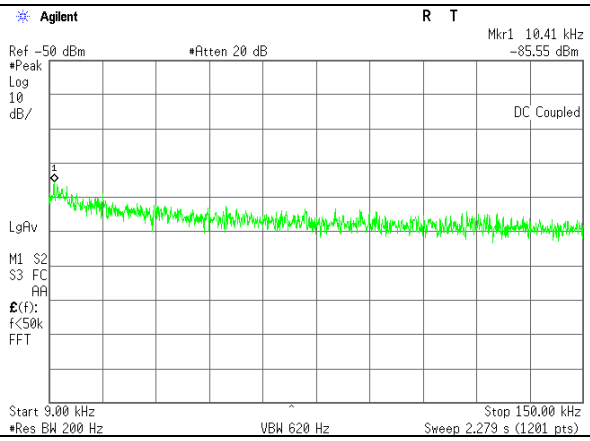
5GHz – 10GHz



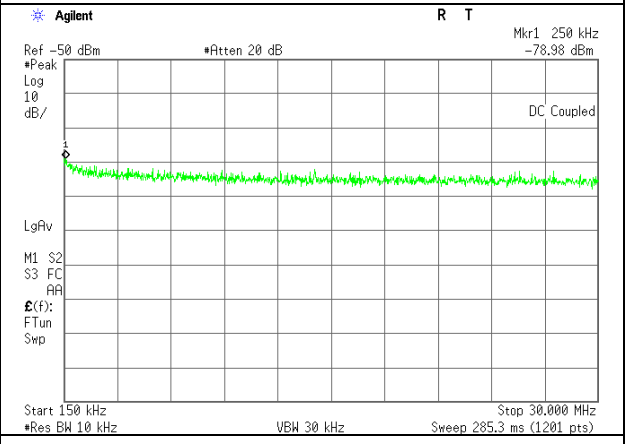
Spurious emissions at antenna terminals

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10068338H
Date	11/12/2013
Temperature/ Humidity	22 deg. C / 43% RH
Engineer	Hironobu Ohnishi
Mode	Tx 470.125MHz, High power

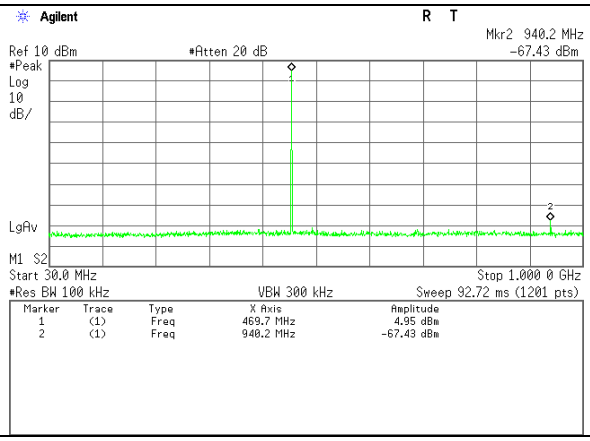
9kHz – 150kHz



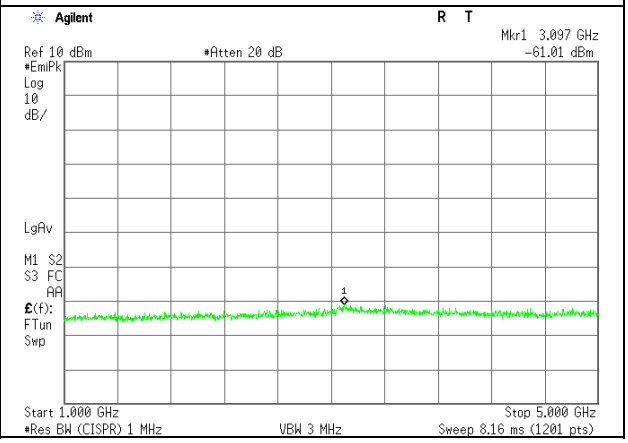
150kHz – 30MHz



30MHz – 1GHz



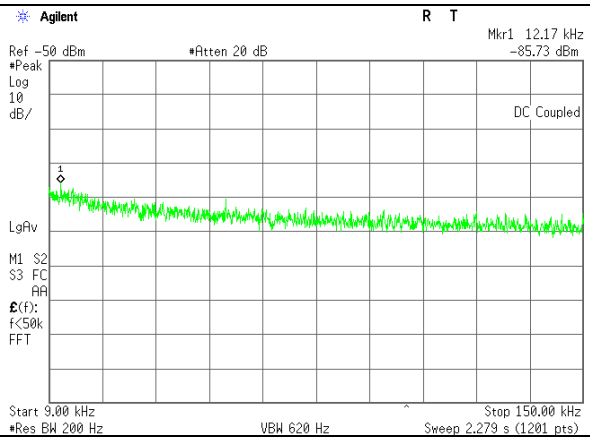
1GHz – 5GHz



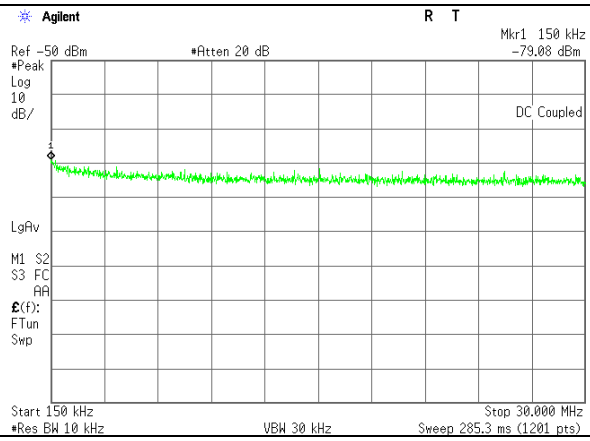
Spurious emissions at antenna terminals

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10068338H
Date	11/12/2013
Temperature/ Humidity	22 deg. C / 43% RH
Engineer	Hironobu Ohnishi
Mode	Tx 607.875MHz, High power

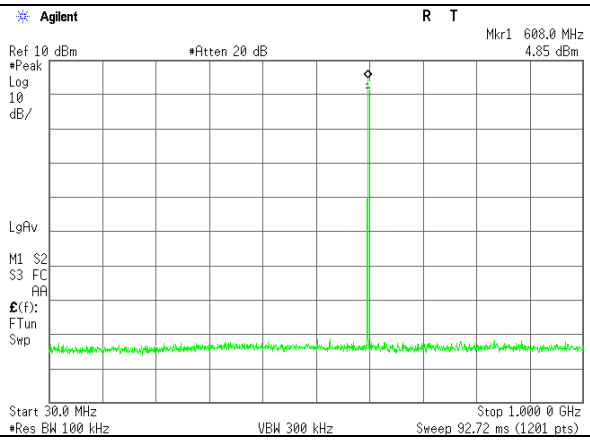
9kHz – 150kHz



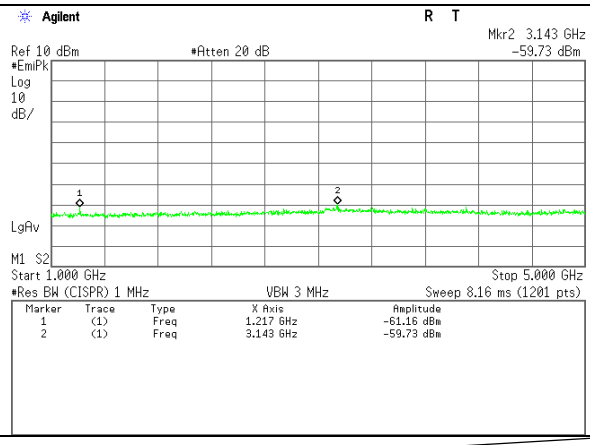
150kHz – 30MHz



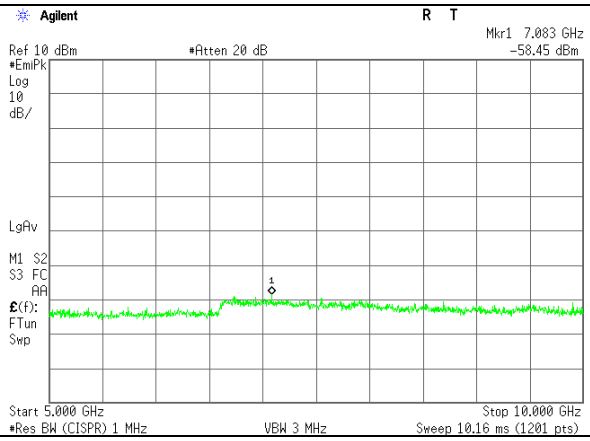
30MHz – 1GHz



1GHz – 5GHz



5GHz – 10GHz



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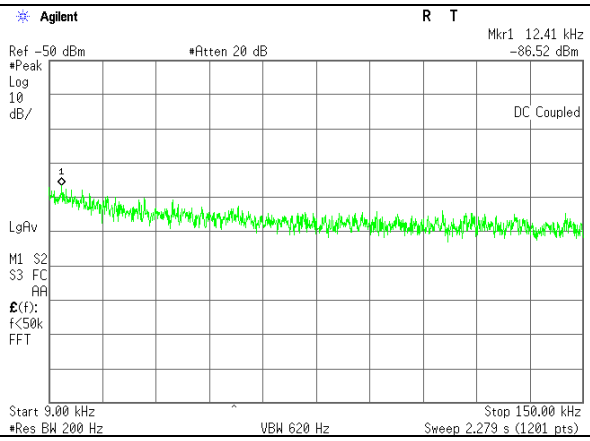
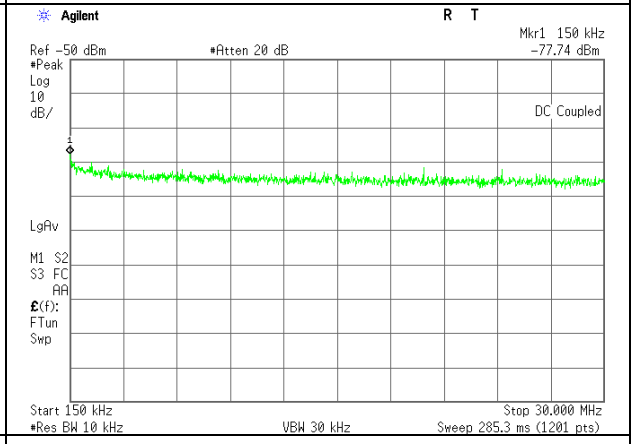
Spurious emissions at antenna terminals

Test place	Head Office EMC Lab. No.3 Measurement Room
Report No.	10068338H
Date	11/12/2013
Temperature/ Humidity	22 deg. C / 43% RH
Engineer	Hironobu Ohnishi
Mode	Tx 697.875MHz, High power

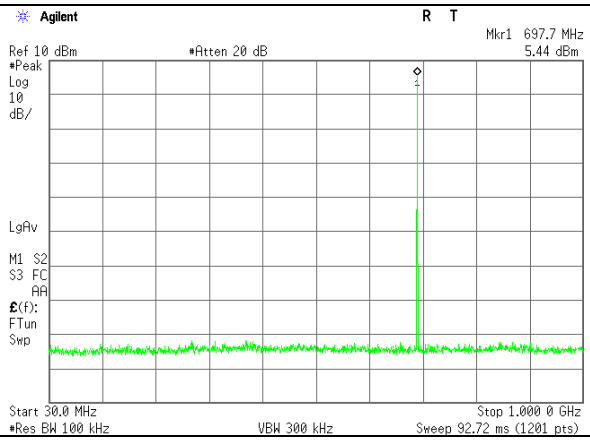
9kHz – 150kHz



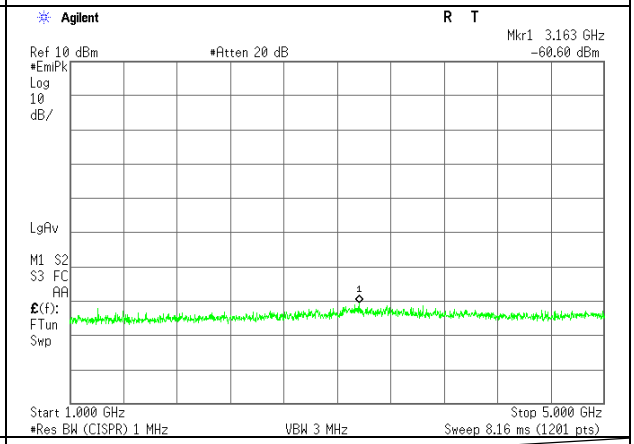
150kHz – 30MHz



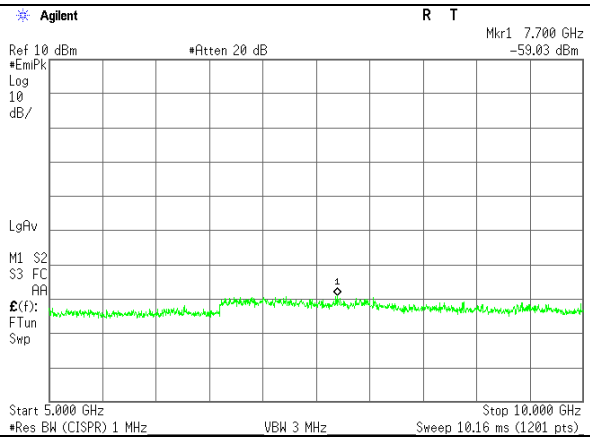
30MHz – 1GHz



1GHz – 5GHz



5GHz – 10GHz



Field strength of spurious radiation

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber	
Report No.	10068338H	
Date	11/06/2013	11/07/2013
Temperature/ Humidity	23 deg. C / 46% RH	23 deg. C / 51% RH
Engineer	Keisuke Kawamura (Below 1GHz)	Keisuke Kawamura (Above 1GHz)
Mode	Tx 470.125MHz	

[Low power]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Height	Horizontal Turn Table	Vertical Rx Ant. Height	Vertical Turn Table	Remarks
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
940.25	51.5	47.4	-27.7	-29.0	5.1	2.2	10.1	-42.9	-44.2	-13.0	29.9	31.2	100	294	211	359	
1410.38	38.0	39.4	-70.2	-68.6	2.9	8.0	0.0	-67.3	-65.7	-13.0	54.3	52.7	100	155	111	94	
1880.50	39.8	38.5	-68.4	-72.0	3.3	10.3	0.0	-63.6	-67.2	-13.0	50.6	54.2	141	97	128	258	
2350.63	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
2820.75	36.7	NS	-70.6	-	4.1	10.9	0.0	-66.0	-	-13.0	53.0	-	116	188	-	-	
3290.88	42.0	38.2	-62.6	-67.1	4.5	12.1	0.0	-57.2	-61.7	-13.0	44.2	48.7	100	341	188	19	
3761.00	37.2	NS	-67.0	-	4.8	12.4	0.0	-61.6	-	-13.0	48.6	-	104	176	-	-	
4231.13	40.0	37.2	-62.6	-65.8	5.1	12.0	0.0	-57.8	-61.0	-13.0	44.8	48.0	100	55	100	12	
4701.25	33.1	NS	-68.1	-	5.4	12.0	0.0	-63.6	-	-13.0	50.6	-	100	330	-	-	

[High power]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Height	Horizontal Turn Table	Vertical Rx Ant. Height	Vertical Turn Table	Remarks
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
940.25	56.6	51.4	-22.6	-25.0	5.1	2.2	10.1	-37.8	-40.2	-13.0	24.8	27.2	100	291	214	177	
1410.38	49.5	45.6	-58.7	-62.4	2.9	8.0	0.0	-55.8	-59.5	-13.0	42.8	46.5	217	328	108	134	
1880.50	42.3	41.7	-65.9	-68.8	3.3	10.3	0.0	-61.1	-64.0	-13.0	48.1	51.0	144	98	100	359	
2350.63	NS	35.4	-	-73.3	3.7	10.2	0.0	-	-69.0	-13.0	-	56.0	-	-	100	160	
2820.75	35.3	35.4	-72.0	-72.6	4.1	10.9	0.0	-67.4	-68.0	-13.0	54.4	55.0	144	333	100	232	
3290.88	45.5	41.6	-59.1	-63.7	4.5	12.1	0.0	-53.7	-58.3	-13.0	40.7	45.3	100	336	192	348	
3761.00	37.5	34.6	-66.7	-72.5	4.8	12.4	0.0	-61.3	-67.1	-13.0	48.3	54.1	100	52	135	116	
4231.13	39.1	36.3	-63.5	-66.7	5.1	12.0	0.0	-58.7	-61.9	-13.0	45.7	48.9	100	55	100	359	
4701.25	37.7	36.4	-63.5	-65.4	5.4	12.0	0.0	-59.0	-60.9	-13.0	46.0	47.9	107	346	100	16	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : Below 1GHz: Test receiver RMS (BW: 120kHz)
Above 1GHz: Spectrum analyzer RMS Average (RBW: 1MHz, VBW: 3MHz)
Limit = mean output power in dBm - (43+10log10 (mean output power in watts)) dB = -13dBm

Field strength of spurious radiation

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber	
Report No.	10068338H	
Date	11/06/2013	11/07/2013
Temperature/ Humidity	23 deg. C / 46% RH	23 deg. C / 51% RH
Engineer	Keisuke Kawamura (Below 1GHz)	Keisuke Kawamura (Above 1GHz)
Mode	Tx 607.875MHz	

[Low power]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Height	Horizontal Turn Table	Vertical Rx Ant. Height	Vertical Turn Table	Remarks
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1215.75	48.9	50.6	-59.2	-59.1	2.7	7.2	0.0	-56.9	-56.8	-13.0	43.9	43.8	262	253	292	25	
1823.63	39.5	39.6	-68.8	-71.7	3.3	10.1	0.0	-64.2	-67.1	-13.0	51.2	54.1	149	260	156	5	
2431.50	41.3	37.6	-65.3	-68.4	3.8	10.1	0.0	-61.2	-64.3	-13.0	48.2	51.3	137	33	116	0	
3039.38	40.2	38.8	-64.7	-69.2	4.3	11.5	0.0	-59.7	-64.2	-13.0	46.7	51.2	125	89	118	352	
3647.25	46.2	41.1	-57.9	-62.8	4.7	12.4	0.0	-52.3	-57.2	-13.0	39.3	44.2	128	66	100	188	
4255.13	42.5	41.1	-59.7	-60.5	5.1	12.0	0.0	-54.9	-55.7	-13.0	41.9	42.7	106	19	100	0	
4863.00	37.1	34.8	-63.7	-71.9	5.5	12.2	0.0	-59.2	-67.4	-13.0	46.2	54.4	100	17	101	73	
5470.88	35.6	35.3	-64.4	-65.7	5.8	13.1	0.0	-59.2	-60.5	-13.0	46.2	47.5	100	25	103	66	
6078.75	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

[High power]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal Rx Ant. Height	Horizontal Turn Table	Vertical Rx Ant. Height	Vertical Turn Table	Remarks
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1215.75	50.7	54.4	-57.4	-55.3	2.7	7.2	0.0	-55.1	-53.0	-13.0	42.1	40.0	100	251	141	152	
1823.63	44.1	40.3	-64.2	-71.0	3.3	10.1	0.0	-59.6	-66.4	-13.0	46.6	53.4	146	329	100	17	
2431.50	46.9	44.5	-59.7	-61.5	3.8	10.1	0.0	-55.6	-57.4	-13.0	42.6	44.4	132	106	122	1	
3039.38	37.6	35.2	-67.3	-72.8	4.3	11.5	0.0	-62.3	-67.8	-13.0	49.3	54.8	130	336	118	0	
3647.25	41.0	39.5	-63.1	-64.4	4.7	12.4	0.0	-57.5	-58.8	-13.0	44.5	45.8	107	27	100	0	
4255.13	42.2	41.1	-60.0	-60.5	5.1	12.0	0.0	-55.2	-55.7	-13.0	42.2	42.7	105	17	104	4	
4863.00	37.4	32.8	-63.4	-73.9	5.5	12.2	0.0	-58.9	-69.4	-13.0	45.9	56.4	100	42	100	0	
5470.88	36.6	37.1	-63.4	-63.9	5.8	13.1	0.0	-58.2	-58.7	-13.0	45.2	45.7	100	42	103	273	
6078.75	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : Below 1GHz: Test receiver RMS (BW: 120kHz)
Above 1GHz: Spectrum analyzer RMS Average (RBW: 1MHz, VBW: 3MHz)
Limit = mean output power in dBm - (43+10log10 (mean output power in watts)) dB = -13dBm

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Head Office EMC Lab.
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN
Telephone : +81 596 24 8999
Facsimile : +81 596 24 8124

Field strength of spurious radiation

Test place	Head Office EMC Lab. No.4 Semi Anechoic Chamber	
Report No.	10068338H	
Date	11/06/2013	11/07/2013
Temperature/ Humidity	23 deg. C / 46% RH	23 deg. C / 51% RH
Engineer	Keisuke Kawamura (Below 1GHz)	Keisuke Kawamura (Above 1GHz)
Mode	Tx 697.875MHz	

[Low power]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1395.75	53.8	51.6	-54.0	-56.4	2.9	7.9	0.0	-51.1	-53.5	-13.0	38.1	40.5	125	58	223	22	
2093.63	37.3	37.8	-68.8	-67.7	3.5	10.7	0.0	-63.8	-62.7	-13.0	50.8	49.7	100	149	110	178	
2791.50	43.9	41.3	-61.0	-65.6	4.1	10.8	0.0	-56.5	-61.1	-13.0	43.5	48.1	119	351	128	359	
3489.38	43.6	38.9	-63.8	-66.0	4.6	12.5	0.0	-58.0	-60.2	-13.0	45.0	47.2	115	64	129	45	
4187.25	33.9	34.3	-70.8	-69.2	5.1	12.1	0.0	-65.9	-64.3	-13.0	52.9	51.3	100	53	100	359	
4885.13	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
5583.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6280.88	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6978.75	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

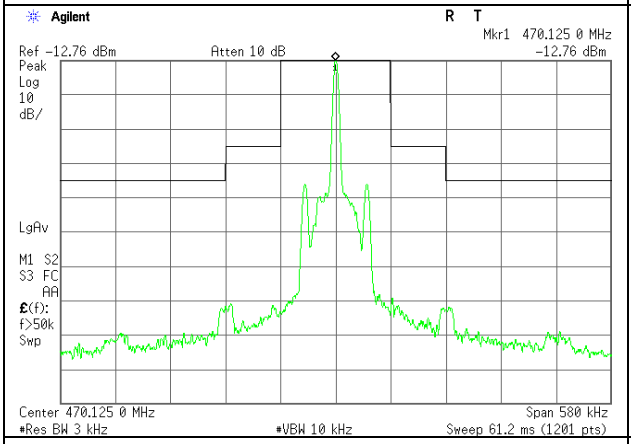
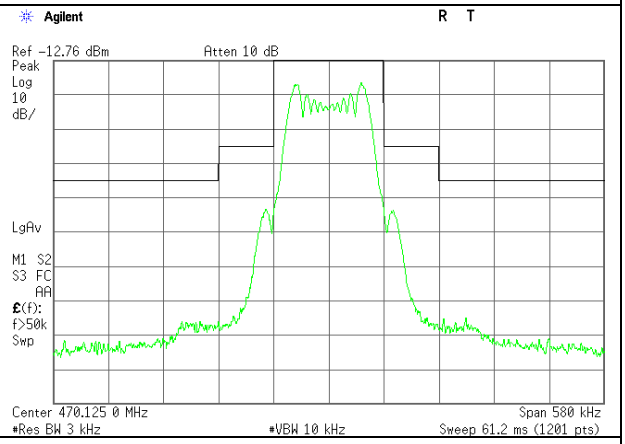
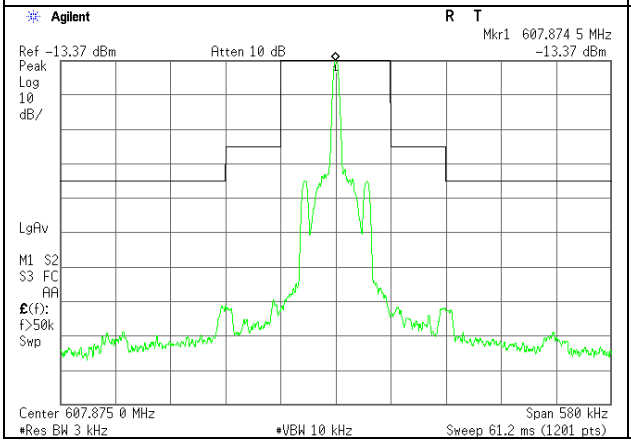
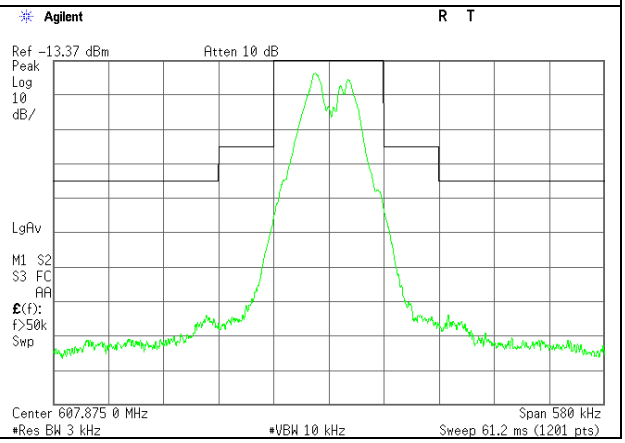
[High power]

Frequency	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss	Tx Ant. Gain	Tx Ant. Atten. Loss	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks
													Rx Ant. Height	Turn Table	Rx Ant. Height	Turn Table	
[MHz]	HOR	VER	HOR	VER	[dB]	[dBi]	[dB]	HOR	VER		HOR	VER	[cm]	[deg.]	[cm]	[deg.]	
1395.75	68.9	62.9	-38.9	-45.1	2.9	7.9	0.0	-36.0	-42.2	-13.0	23.0	29.2	132	306	224	88	
2093.63	66.2	58.4	-39.9	-47.1	3.5	10.7	0.0	-34.9	-42.1	-13.0	21.9	29.1	133	58	258	358	
2791.50	43.3	35.1	-61.6	-71.8	4.1	10.8	0.0	-57.1	-67.3	-13.0	44.1	54.3	123	59	104	174	
3489.38	36.5	NS	-70.9	-	4.6	12.5	0.0	-65.1	-	-13.0	52.1	-	108	64	-	-	
4187.25	36.2	36.2	-68.5	-67.3	5.1	12.1	0.0	-63.6	-62.4	-13.0	50.6	49.4	100	34	100	354	
4885.13	33.2	33.2	-70.9	-71.7	5.5	12.2	0.0	-66.4	-67.2	-13.0	53.4	54.2	100	20	100	167	
5583.00	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6280.88	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	
6978.75	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	-	-	-	-	

Calculation Result = SG Reading - Tx Cable Loss + Tx Antenna Gain - Tx Antenna Attenuator Loss -2.15
Rx-ANTENNA : Biconical Antenna(30M-300MHz), Logperiodic Antenna(300M-1000MHz), Horn Antenna(1G-12.75GHz)
Tx-ANTENNA : 120MHz tuned Dipole Antenna(30M-120MHz), Dipole Antenna(120M-1000MHz), Horn Antenna(1G-12.75GHz)
Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).
NS : No signal detect.
Detector : Below 1GHz: Test receiver RMS (BW: 120kHz)
Above 1GHz: Spectrum analyzer RMS Average (RBW: 1MHz, VBW: 3MHz)
Limit = mean output power in dBm - (43+10log10 (mean output power in watts)) dB = -13dBm

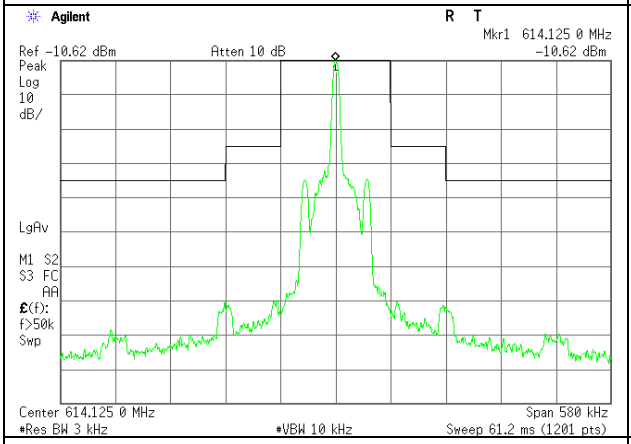
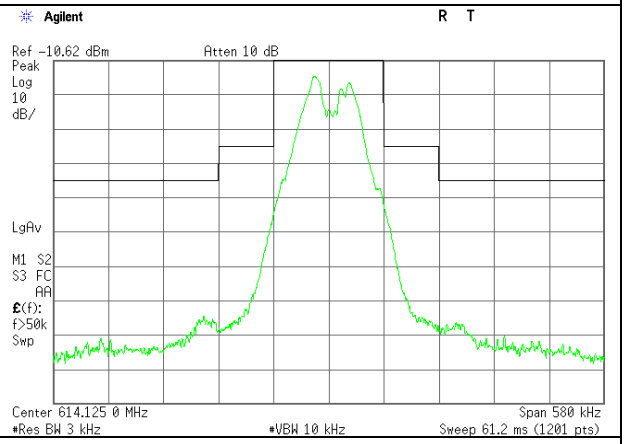
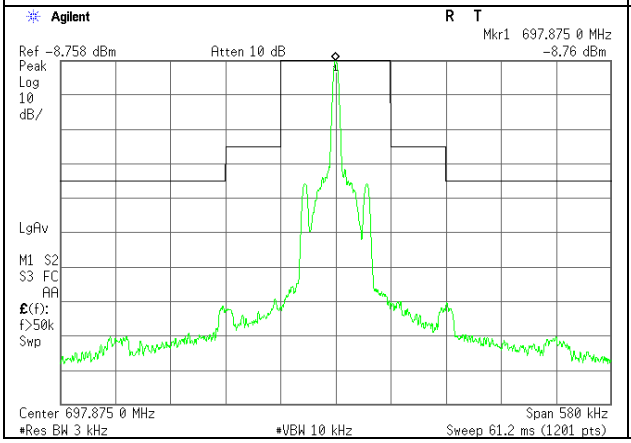
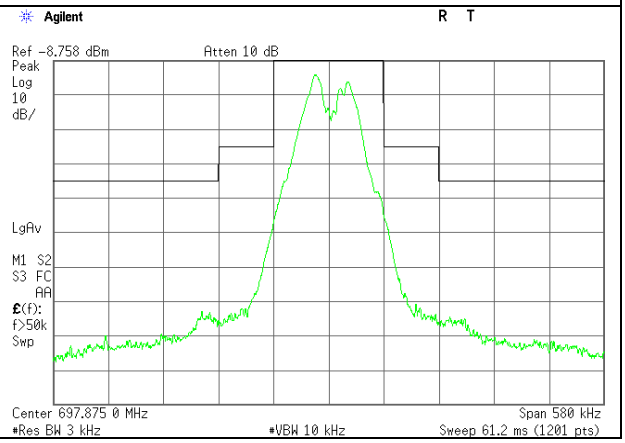
Field strength of spurious radiation

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	10068338H
Date	11/05/2013
Temperature/ Humidity	23 deg. C / 41% RH
Engineer	Hironobu Ohnishi
Mode	Tx Low power

0dB reference (Unmodulated carrier)	Result (Modulated)
470.125MHz	**470.125MHz**
	
607.875MHz	**607.875MHz**
	

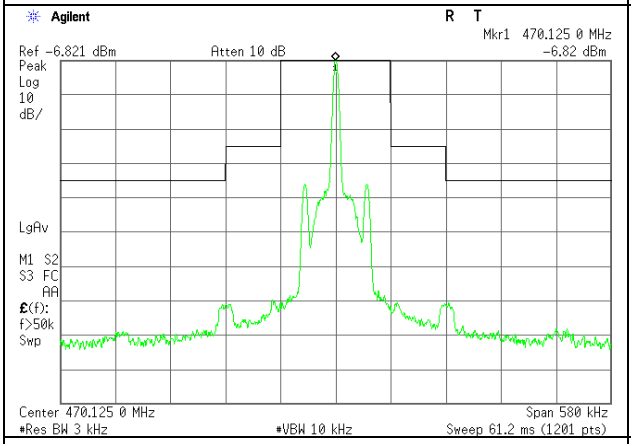
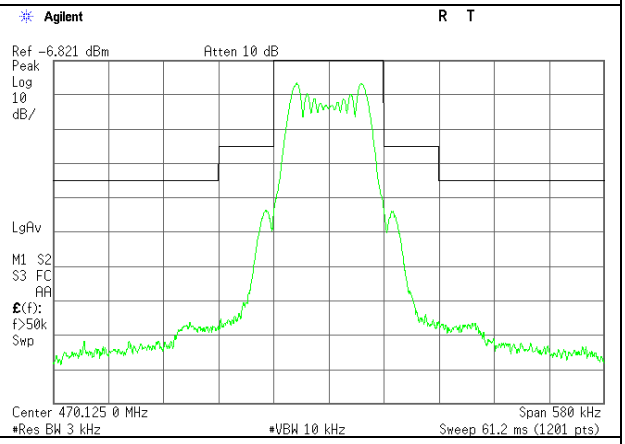
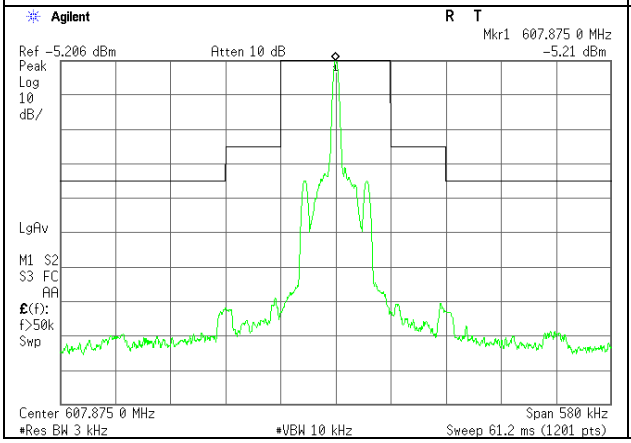
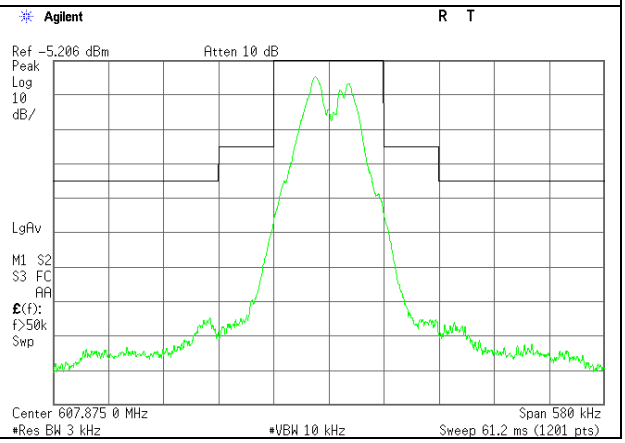
Field strength of spurious radiation

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	10068338H
Date	11/05/2013
Temperature/ Humidity	23 deg. C / 41% RH
Engineer	Hironobu Ohnishi
Mode	Tx Low power

0dB reference (Unmodulated carrier)	Result (Modulated)
614.125MHz	**614.125MHz**
	
697.875MHz	**697.875MHz**
	

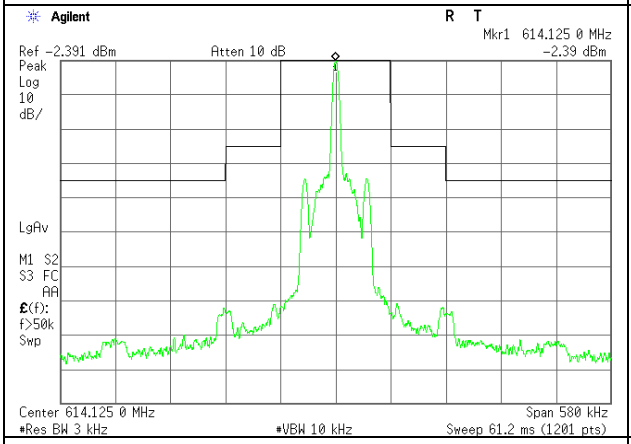
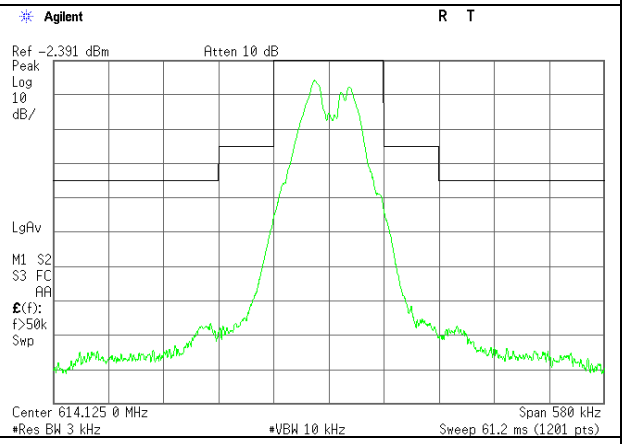
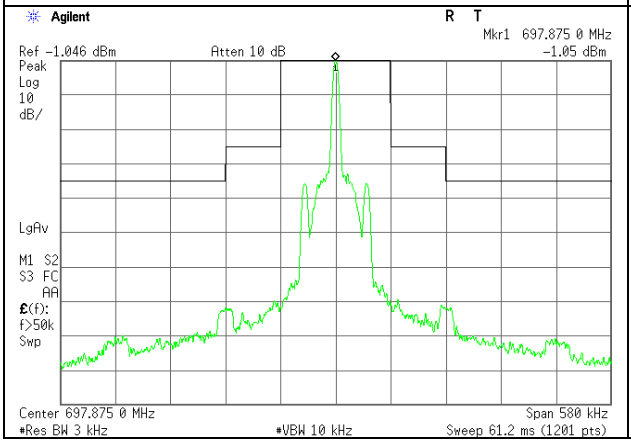
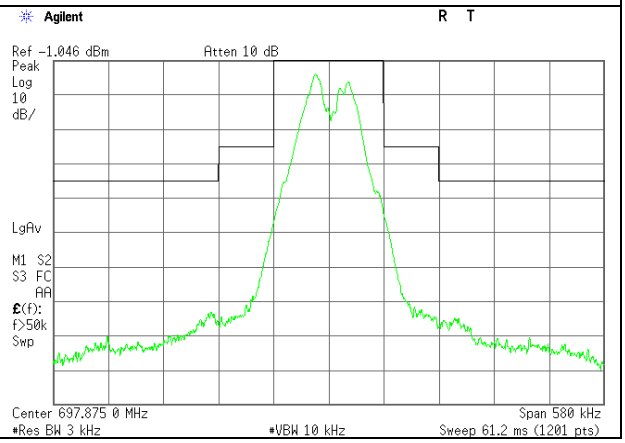
Field strength of spurious radiation

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	10068338H
Date	11/05/2013
Temperature/ Humidity	23 deg. C / 41% RH
Engineer	Hironobu Ohnishi
Mode	Tx High power

0dB reference (Unmodulated carrier)	Result (Modulated)
470.125MHz	**470.125MHz**
	
607.875MHz	**607.875MHz**
	

Field strength of spurious radiation

Test place	Head Office EMC Lab. No.4 Measurement Room
Report No.	10068338H
Date	11/05/2013
Temperature/ Humidity	23 deg. C / 41% RH
Engineer	Hironobu Ohnishi
Mode	Tx High power

0dB reference (Unmodulated carrier)	Result (Modulated)
614.125MHz	**614.125MHz**
	
697.875MHz	**697.875MHz**
	

Frequency stability

Test place	Head Office EMC Lab. No.11 Measurement Room	
Report No.	10068338H	
Date	10/17/2013	10/18/2013
Temperature/ Humidity	23 deg. C / 38% RH	24 deg. C / 34% RH
Engineer	Hironobu Ohnishi (Voltage)	Hironobu Ohnishi (Temperature)
Mode	Tx 607.875MHz	

607.875MHz(UTX-P03)

Test Condition	Measured freq [MHz]	Freq error [MHz]	Result [ppm]	Limit (+/- 0.005%) [+/- ppm]	Margin [ppm]
T max 50deg. C	607.874665	-0.000335	-0.55	50	49.45
40deg. C	607.874747	-0.000253	-0.42	50	49.58
30deg. C	607.874876	-0.000124	-0.20	50	49.80
T nom 20deg. C	607.874940	-0.000060	-0.10	50	49.90
10deg. C	607.874925	-0.000075	-0.12	50	49.88
0deg. C	607.874783	-0.000217	-0.36	50	49.64
-10deg. C	607.874720	-0.000280	-0.46	50	49.54
-20deg. C	607.874866	-0.000134	-0.22	50	49.78
T min -30deg. C	607.875184	0.000184	0.30	50	49.70

607.875 MHz +/-0.005 % (+/- 50ppm) = +/- 0.030394 MHz

607.875MHz(UTX-P03)

Test Condition	Measured freq [MHz]	Freq error [MHz]	Result [ppm]	Limit (+/- 0.005%) [+/- ppm]	Margin [ppm]
T nom 20deg. C / Vnom 5.0V *1)	607.874945	-0.000055	-0.09	50	49.91
T nom 20deg. C / Vmin 4.25V *1)	607.874943	-0.000057	-0.09	50	49.91
T nom 20deg. C / Vmax 5.75V *1)	607.874942	-0.000058	-0.10	50	49.90
T nom 20deg. C / V nom 3.0V *2)	607.874940	-0.000060	-0.10	50	49.90
T nom 20deg. C / Vmin 1.85V *2)	607.874938	-0.000062	-0.10	50	49.90

607.875 MHz +/-0.005 % (+/- 50ppm) = +/- 0.030394 MHz

*1) USB power operation (85% / 115% of nominal voltage)
*2) Battery power operation (Nominal and lower end voltage)

APPENDIX 2: Test instruments

EMI test equipment

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-04	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	RE	2013/02/28 * 12
MOS-15	Thermo-Hygrometer	Custom	CTH-180	-	RE	2013/02/26 * 12
MJM-09	Measure	KDS	E19-55	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-04	Spectrum Analyzer	Agilent	E4448A	US44300523	RE	2013/04/03 * 12
MTR-07	Test Receiver	Rohde & Schwarz	ESCI	100635	RE	2013/04/10 * 12
MBA-05	Biconical Antenna	Schwarzbeck	BBA9106	1302	RE	2012/11/18 * 12
MLA-08	Logperiodic Antenna	Schwarzbeck	UKLP9140-A	N/A	RE	2012/11/18 * 12
MCC-50	Coaxial Cable	UL Japan	-	-	RE	2013/06/18 * 12
MAT-68	Attenuator	Anritsu	MP721B	6200961025	RE	2012/11/21 * 12
MPA-14	Pre Amplifier	SONOMA INSTRUMENT	310	260833	RE	2013/03/12 * 12
MCC-64	Coaxial Cable	UL Japan	-	-	RE	2013/03/22 * 12
MBF-06	Band Pass Filter	M-City	BPF0950-01	UL0002	RE	2013/04/05 * 12
YTSSG03	Signal Generator	Rohde & Schwarz	SMT02	51400043	RE	2013/08/31 * 12
MCC-127	Coaxial Cable	UL Japan	-	-	RE	2013/07/23 * 12
MDA-04	Dipole Antenna	Schwarzbeck	UHAP	992	RE	2013/10/13 * 12
MRENT-112	Spectrum Analyzer	Agilent	E4440A	MY48250080	RE	2013/10/04 * 12
MHA-21	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	9120D-557	RE	2013/08/12 * 12
MCC-141	Microwave Cable	Junkosha	MWX221	1305S002R(1m) / 1204S062(5m)	RE	2013/05/28 * 12
MPA-12	MicroWave System Amplifier	Agilent	83017A	MY39500780	RE	2013/03/19 * 12
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2013/07/12 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2013/02/15 * 12
MCC-130	Microwave Cable(1-33GHz)	HUBER+SUHNER	SF103/11PC3.5-31/11PC3.5-31/8.0m	54308/3	RE	2013/01/29 * 12
MCC-36	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2013/09/27 * 12
MAT-10	Attenuator(10dB)	Weinschel Corp	2	BL1173	AT	2012/11/06 * 12
MAT-20	Attenuator(10dB)(above 1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	AT	2013/01/09 * 12
MPM-13	Power Meter	Anritsu	ML2495A	0824014	AT	2013/11/15 * 12
MPSE-18	Power sensor	Anritsu	MA2411B	0738174	AT	2013/11/15 * 12
MOS-13	Thermo-Hygrometer	Custom	CTH-180	-	AT/MOD	2013/02/26 * 12
MCH-06	Temperature and Humidity Chamber	Tabai Espec	PL-1KT	14007630	RE	2013/04/25 * 12
MFC-01	Microwave Counter	Advantest	R5373	120100309	RE	2013/08/07 * 12
MRS-01	Radiocomunication Service Monitor	Rohde & Schwarz	CMS54	840.0009.54	RE/AT/MOD	Pre Check

The expiration date of the calibration is the end of the expired month.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

Test Item: RE: Radiated Emission, AT: Antenna Terminal Conducted test, MOD: Modulation Characteristics