



RADIO TEST REPORT

Test Report No. : 10068338H-N-R1

Applicant : Sony Corporation
Type of Equipment : UHF Synthesized Transmitter
Model No. : UTX-B03
FCC ID : AK8UTXB03
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-N. 10068338H-N is replaced with this report.

Date of test: September 30, 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,
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UL Japan, Inc.

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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-B03
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-B03 (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: 30mW, Low: 5mW
Antenna type : 1/4 Lambda Monopole antenna (whip type)
Antenna gain : 2.14dBi
Power Supply (radio part input) : DC 3.3V, DC5.5V
AF Specification : 40Hz – 18000Hz, Maximum input: -24dBV (MIC level, ATT 0dB)

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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)	19.0dB 1215.75MHz, Vertical See IC report.	Complied	Radiated
	IC: RSS-Gen Section 4.9 RSS-123 Section 5.5	IC: RSS-123 Section 5.5			
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.

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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.

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3.5 Test Location

UL Japan, Inc. Head Office EMC Lab. *NVLAP Lab. code: 200572-0
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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.

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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. 30mW
*Transmitting duty was 100% on all tests.	
*Power of the EUT was set by the software as follows; Power settings: Low (5mW), High (30mW) 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	-24.5dBV, 2500Hz, Sine wave *1)	*4)
Spurious emissions at antenna terminals	470.125MHz (Low) 607.875MHz (Mid) 697.875MHz (High)	Low power High power	-24.5dBV, 2500Hz, Sine wave *1)	
Field strength of spurious radiation	470.125MHz (Low) 607.875MHz (Mid) 697.875MHz (High)	Low power High power	None, -24.5dBV, 2500Hz, Sine wave *2)	
Frequency stability	607.875MHz (Mid)	High power	None	*5)
<p>*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 model. 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 model. Therefore the test was performed on Mid channel as a representative.</p>				

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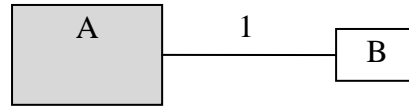
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4.2 Configuration and peripherals



* Cabling and 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-B03	UC14: 8052	Sony Corporation	EUT
		UTX-B03	UC30: 8062		
		UTX-B03	UC42: 8073		
B	Lavalier Microphone	-	-	Sony Corporation	-

List of cables used

No.	Name	Length (m)	Shield		Remarks
			Cable	Connector	
1	Microphone Cable	1.2	Shielded	Shielded	-

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SECTION 5: Field strength of spurious radiation

Test Procedure

- 1) EUT was placed on a platform of nominal size, 1.0m by 1.5m, 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

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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	$20\text{kHz} = \text{Maximum peak deviation} * 0.5 = 40\text{kHz} * 0.5$
Audio frequency	40Hz, 70Hz, 100Hz, 300Hz, 500Hz, 700Hz, 1kHz, 3kHz, 5kHz, 7kHz, 10kHz, 15kHz, 18kHz

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

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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**

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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. [MHz]	Reading		Cable Loss [dB]	Atten. Loss [dB]	Result				Limit [mW]	Margin [dB]
			Average [dBm]	Peak * [dBm]			Average		Peak *			
							[dBm]	[mW]	[dBm]	[mW]		
Low Power	Low	470.125	6.02	6.12	0.33	0.00	6.35	4.32	6.45	4.42	250	17.63
	Mid	607.875	6.54	6.64	0.38	0.00	6.92	4.92	7.02	5.04	250	17.06
	High	697.875	6.39	6.49	0.41	0.00	6.80	4.79	6.90	4.90	250	17.18
High Power	Low	470.125	14.24	14.28	0.33	0.00	14.57	28.64	14.61	28.91	250	9.41
	Mid	607.875	14.16	14.21	0.38	0.00	14.54	28.44	14.59	28.77	250	9.44
	High	697.875	13.79	13.84	0.41	0.00	14.20	26.30	14.25	26.61	250	9.78

Calculation formula:

$$\text{Result} = \text{Reading} + \text{Cable Loss} + \text{Atten. Loss}$$

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

* Reference data

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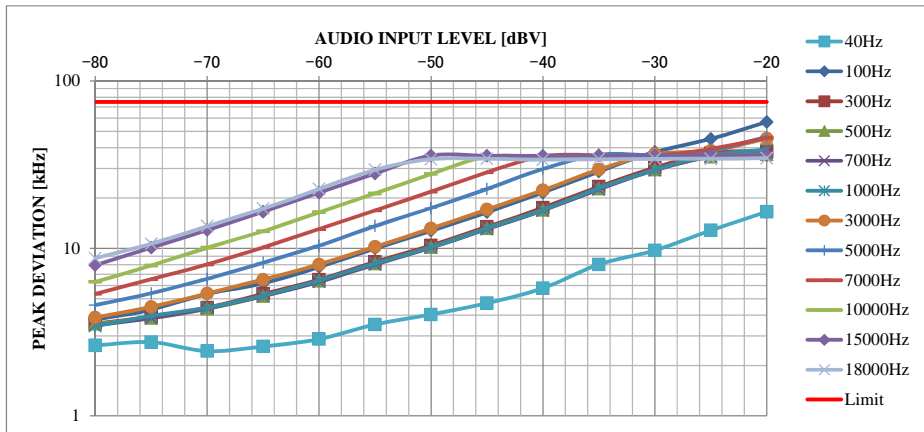
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Modulation Characteristics

Test place	Head Office EMC Lab. No.4 and 3 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	

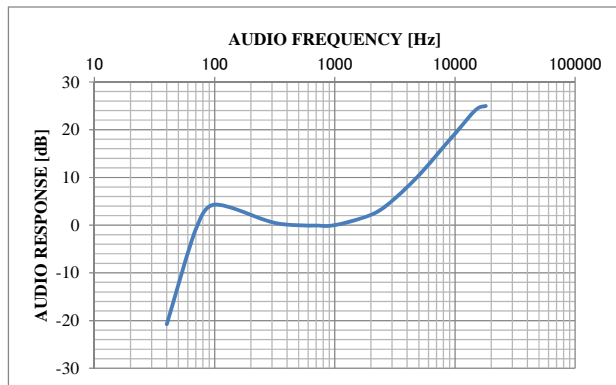
[Deviation versus Audio input level and Audio Frequency]

AF Level [dBV]	AF Frequency [Hz] / Peak Deviation [kHz]													Limit [kHz]
	40	100	300	500	700	1000	3000	5000	7000	10000	15000	18000		
-80	2.635	3.753	3.553	3.553	3.473	3.433	3.872	4.591	5.349	6.307	7.944	8.743	75	
-75	2.755	4.311	3.912	3.832	3.832	3.952	4.471	5.389	6.547	7.904	10.100	10.659	75	
-70	2.435	5.349	4.431	4.351	4.391	4.431	5.389	6.587	8.024	10.100	12.854	13.573	75	
-65	2.595	6.188	5.349	5.190	5.190	5.230	6.507	8.224	10.140	12.655	16.567	17.285	75	
-60	2.874	7.745	6.507	6.387	6.307	6.427	8.024	10.379	13.054	16.447	21.517	22.635	75	
-55	3.513	9.980	8.303	8.104	8.024	8.144	10.220	13.613	16.846	21.277	28.024	29.501	75	
-50	4.032	12.735	10.419	10.180	10.100	10.140	13.174	17.405	21.836	27.824	35.848	34.132	75	
-45	4.711	16.447	13.493	13.174	13.054	13.174	17.086	22.675	28.463	35.329	45.728	44.331	75	
-40	5.788	21.517	17.485	16.966	16.846	16.966	22.235	29.820	35.609	45.209	55.728	53.812	75	
-35	8.024	28.862	23.393	22.754	22.555	22.874	29.621	36.247	45.928	55.409	75.928	74.132	75	
-30	9.741	37.645	30.339	29.501	29.301	29.501	36.567	46.168	55.728	75.329	95.728	94.331	75	
-25	12.814	45.110	37.086	35.209	35.329	36.048	46.363	56.483	75.321	95.048	115.168	114.251	75	
-20	16.567	56.926	44.044	42.367	42.325	43.002	56.309	70.387	95.748	120.367	150.048	149.651	75	



[Audio Frequency Response]

AF Frequency [Hz]	AF Level [mV]	AF Response [dB]
40	155.00	-20.76
70	15.53	-0.78
100	8.66	4.30
300	13.23	0.61
500	14.24	-0.02
700	14.33	-0.08
1000	14.20	0.00
2000	11.07	2.16
3000	7.90	5.09
5000	4.27	10.44
7000	2.63	14.65
10000	1.56	19.18
15000	0.87	24.26
18000	0.80	24.98



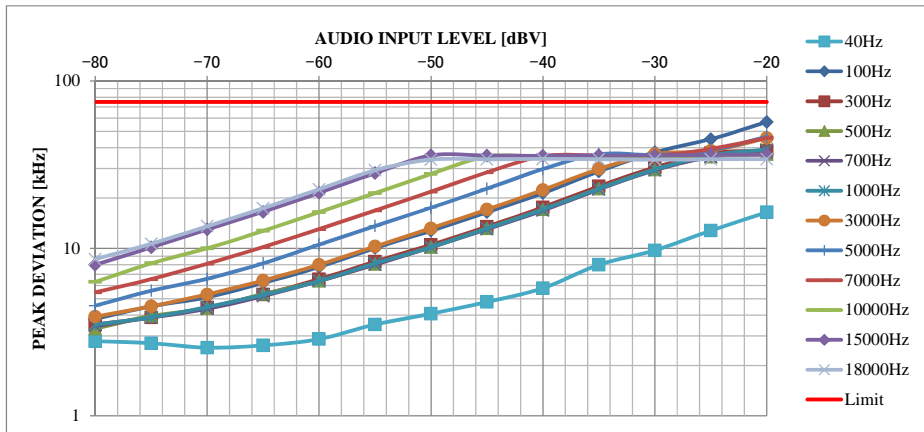
Calculation formula:
 $AF\ Response = 20 * \log(AF\ Level\ of\ 1kHz / AF\ level)$

Modulation Characteristics

Test place	Head Office EMC Lab. No.4 and 3 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	

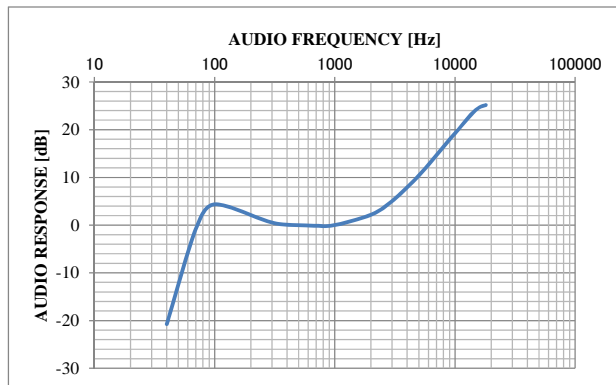
[Deviation versus Audio input level and Audio Frequency]

AF Level [dBV]	AF Frequency [Hz] / Peak Deviation [kHz]												Limit [kHz]
	40	100	300	500	700	1000	3000	5000	7000	10000	15000	18000	
-80	2.794	3.792	3.513	3.313	3.433	3.513	3.912	4.551	5.469	6.307	7.984	8.623	75
-75	2.715	4.511	3.872	3.952	3.872	3.872	4.511	5.589	6.547	8.144	10.140	10.659	75
-70	2.555	5.110	4.431	4.391	4.351	4.471	5.309	6.587	8.104	10.020	12.974	13.573	75
-65	2.635	6.228	5.309	5.349	5.190	5.269	6.427	8.144	10.180	12.735	16.527	17.365	75
-60	2.874	7.745	6.547	6.387	6.387	6.387	7.984	10.539	13.054	16.447	21.517	22.555	75
-55	3.513	10.060	8.343	8.064	8.024	8.144	10.299	13.613	16.846	21.397	28.144	29.301	75
-50	4.072	12.735	10.499	10.180	10.140	10.180	13.174	17.485	21.836	27.824	35.928	33.932	75
-45	4.790	16.447	13.493	13.174	13.054	13.174	17.086	22.754	28.463	35.409	45.848	44.052	75
-40	5.788	21.397	17.605	17.086	16.846	17.086	22.355	29.820	35.609	45.289	55.728	54.251	75
-35	7.984	28.862	23.513	22.754	22.555	22.754	29.820	36.567	45.848	55.529	70.928	70.132	75
-30	9.741	37.525	30.459	29.501	29.301	29.621	36.567	45.168	55.728	70.409	90.848	89.812	75
-25	12.774	44.990	37.086	35.209	35.209	35.928	38.363	45.563	59.321	76.048	106.168	105.132	75
-20	16.447	56.926	38.164	36.567	37.325	39.002	45.549	46.467	65.748	86.247	136.367	134.132	75



[Audio Frequency Response]

AF Frequency [Hz]	AF Level [mV]	AF Response [dB]
40	156.00	-20.74
70	15.54	-0.70
100	8.68	4.35
300	13.48	0.53
500	14.31	0.01
700	14.55	-0.13
1000	14.33	0.00
2000	11.14	2.19
3000	8.01	5.05
5000	4.33	10.40
7000	2.65	14.66
10000	1.56	19.26
15000	0.88	24.24
18000	0.79	25.17



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	82.8210	200	117.1790
	Mid	607.875	96.4184	200	103.5816
	Mid2	614.125	99.8776	200	100.1224
	High	697.875	97.3210	200	102.6790
High Power	Low	470.125	82.8165	200	117.1835
	Mid	607.875	96.2269	200	103.7731
	Mid2	614.125	99.2500	200	100.7500
	High	697.875	97.6969	200	102.3031

UL Japan, Inc.

Head Office EMC Lab.

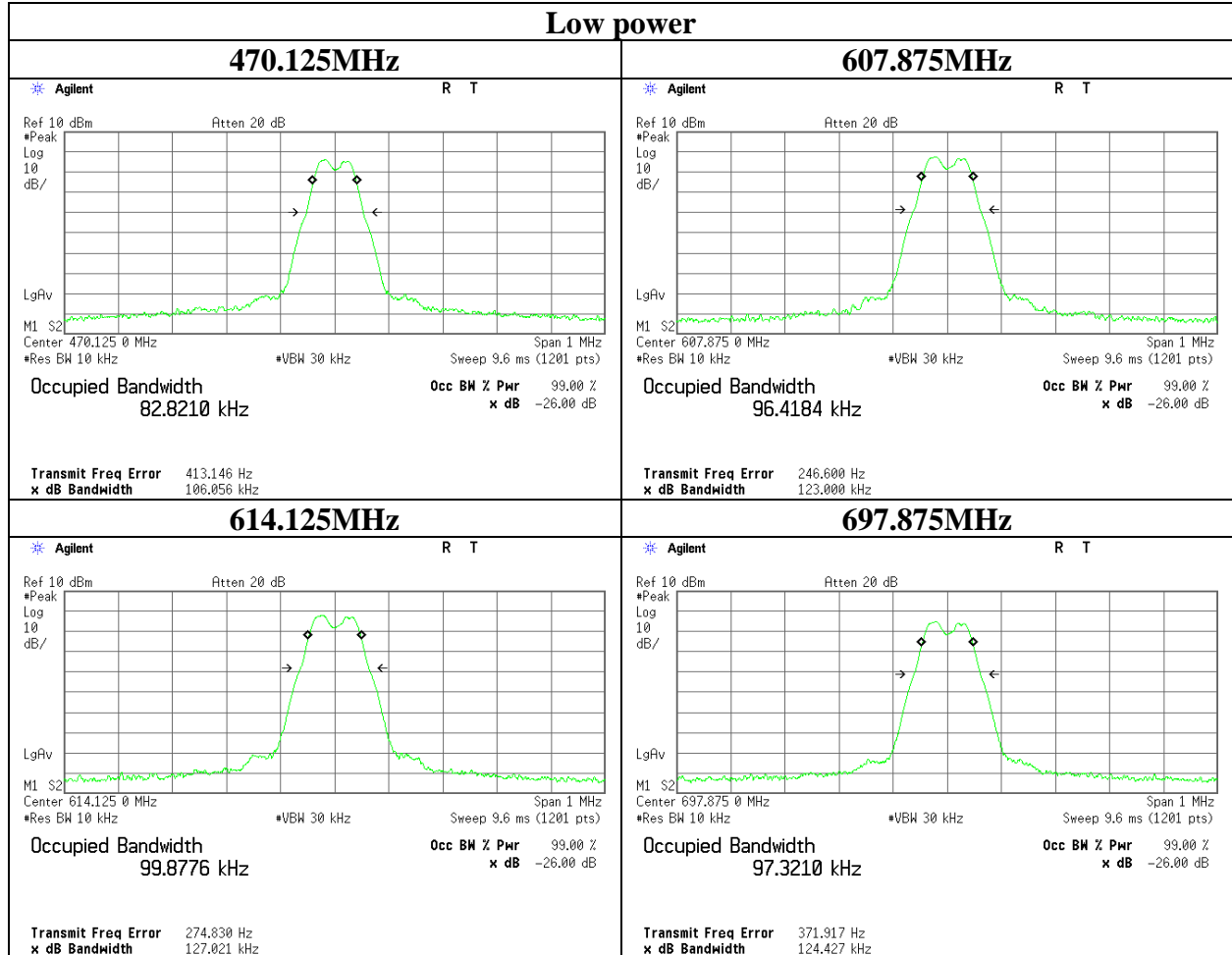
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8999

Facsimile : +81 596 24 8124

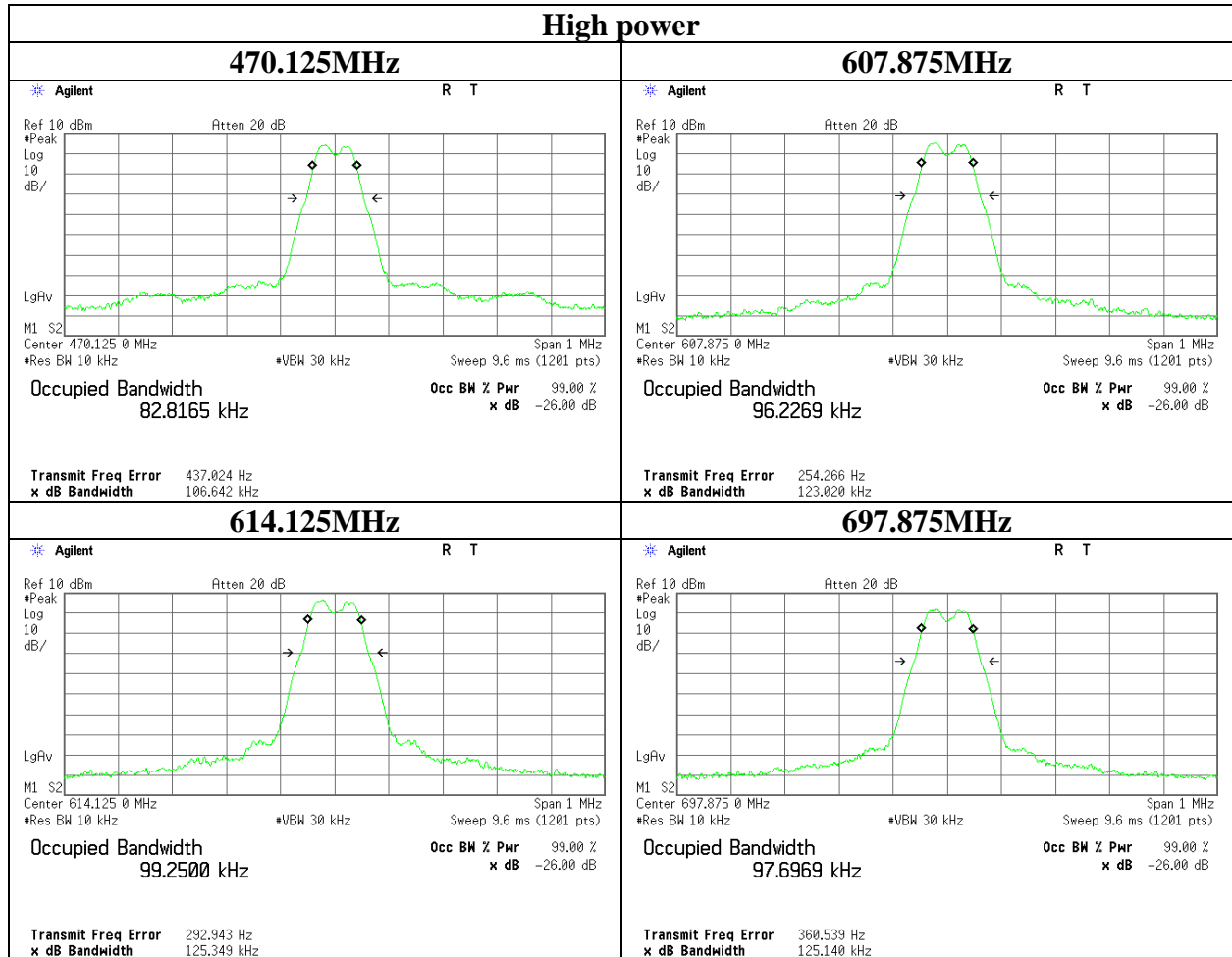
Emission Bandwidth

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



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



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		Cable Loss [dB]	Atten. Loss [dB]	Result [dBm]	Limit [dBm]	Margin [dB]	
			Freq. [MHz]	Level [dBm]						
Low Power	Low	470.125	0.01076	-87.50	0.03	9.87	-77.60	-13	64.60	
			0.15	-78.08	0.03	9.83	-68.22	-13	55.22	
			2820	-60.16	0.82	10.07	-49.27	-13	36.27	
	Mid	607.875	0.00959	-86.12	0.03	9.87	-76.22	-13	63.22	
			0.15	-79.12	0.03	9.83	-69.26	-13	56.26	
			3153	-60.82	0.88	10.08	-49.86	-13	36.86	
	High	697.875	7267	-59.43	3.56	10.18	-45.69	-13	32.69	
			0.01135	-87.03	0.03	9.87	-77.13	-13	64.13	
			0.225	-79.47	0.03	9.83	-69.61	-13	56.61	
	High Power	Low	470.125	3063	-60.86	0.87	10.07	-49.92	-13	36.92
				7046	-59.28	3.21	10.15	-45.92	-13	32.92
				0.01288	-87.52	0.03	9.86	-77.63	-13	64.63
0.15				-78.49	0.03	9.83	-68.63	-13	55.63	
Mid		607.875	940.2	-66.58	0.47	9.90	-56.21	-13	43.21	
			1880	-60.75	0.68	9.93	-50.14	-13	37.14	
			2350	-58.38	0.74	9.94	-47.70	-13	34.70	
			0.009	-86.09	0.03	9.87	-76.19	-13	63.19	
High		697.875	0.2	-78.99	0.03	9.83	-69.13	-13	56.13	
			3087	-61.22	0.87	10.08	-50.27	-13	37.27	
			6688	-58.30	2.65	10.14	-45.51	-13	32.51	
			0.01241	-87.05	0.03	9.87	-77.15	-13	64.15	
High	697.875	0.349	-79.19	0.03	9.83	-69.33	-13	56.33		
		3090	-60.99	0.87	10.08	-50.04	-13	37.04		
		6904	-58.65	2.99	10.14	-45.52	-13	32.52		

Calculation formula:

Result = Reading + Cable Loss + Attenuator Loss

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

UL Japan, Inc.

Head Office EMC Lab.

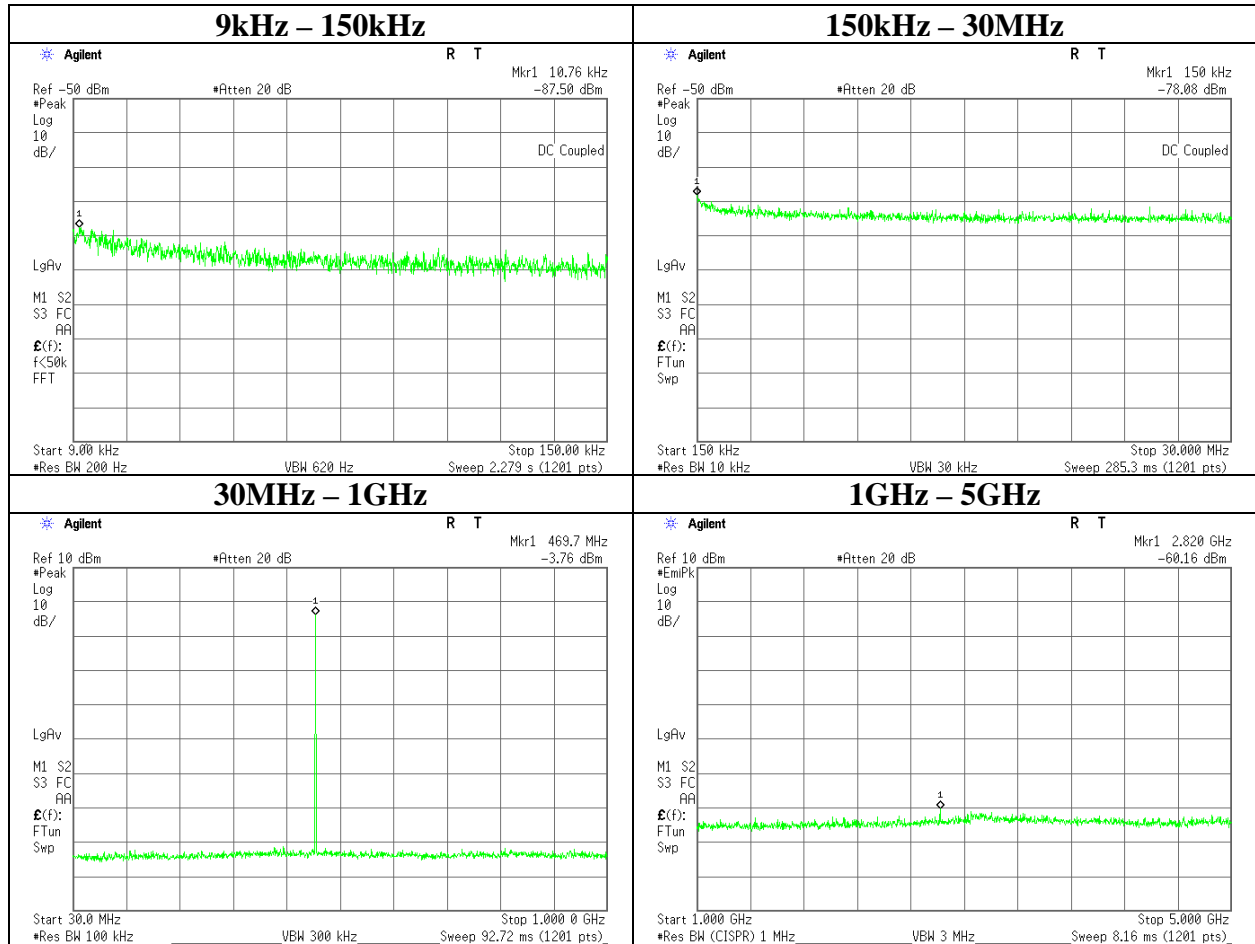
4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

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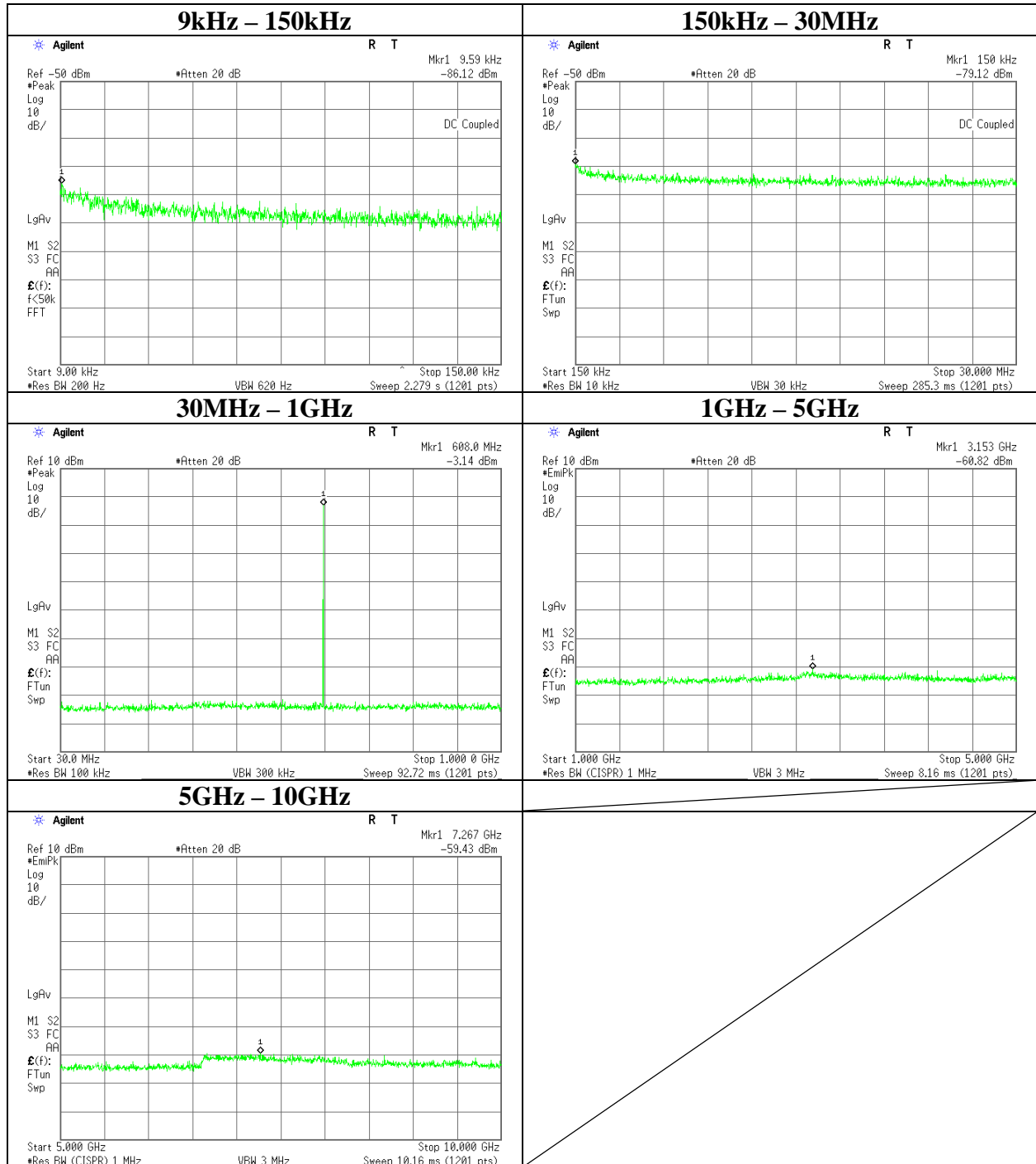
Spurious emissions at antenna terminals

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 470.125MHz, Low power



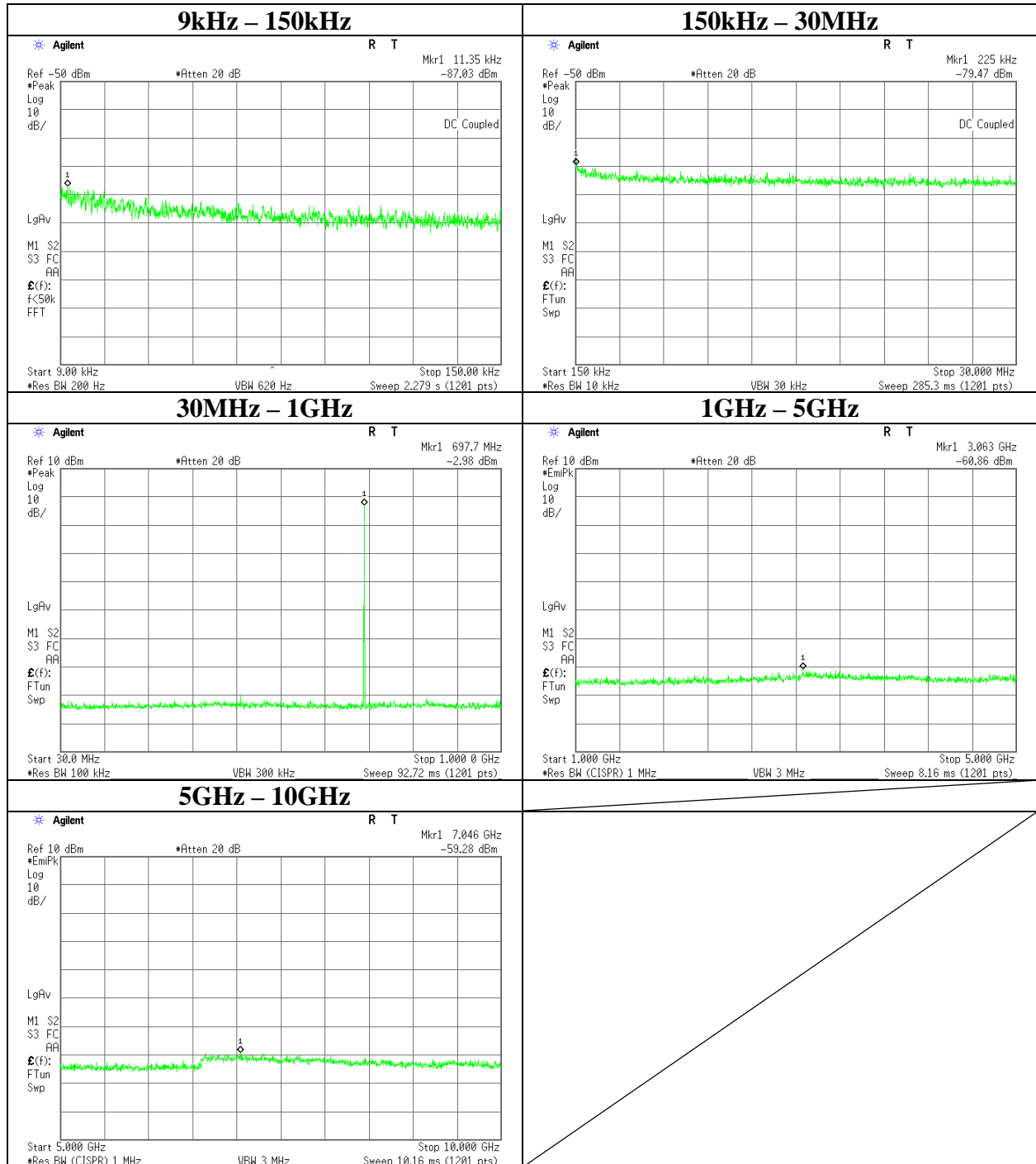
Spurious emissions at antenna terminals

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



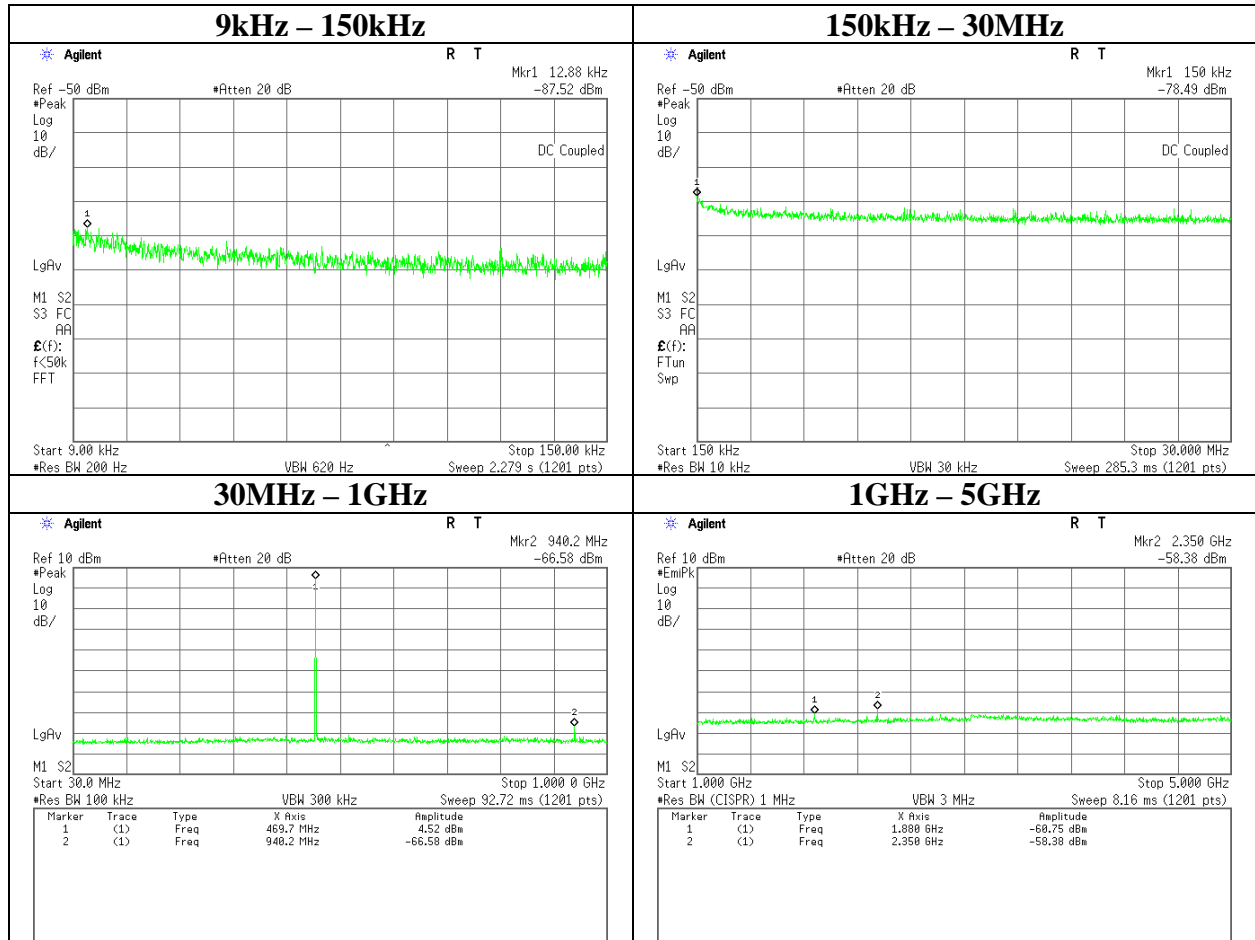
Spurious emissions at antenna terminals

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



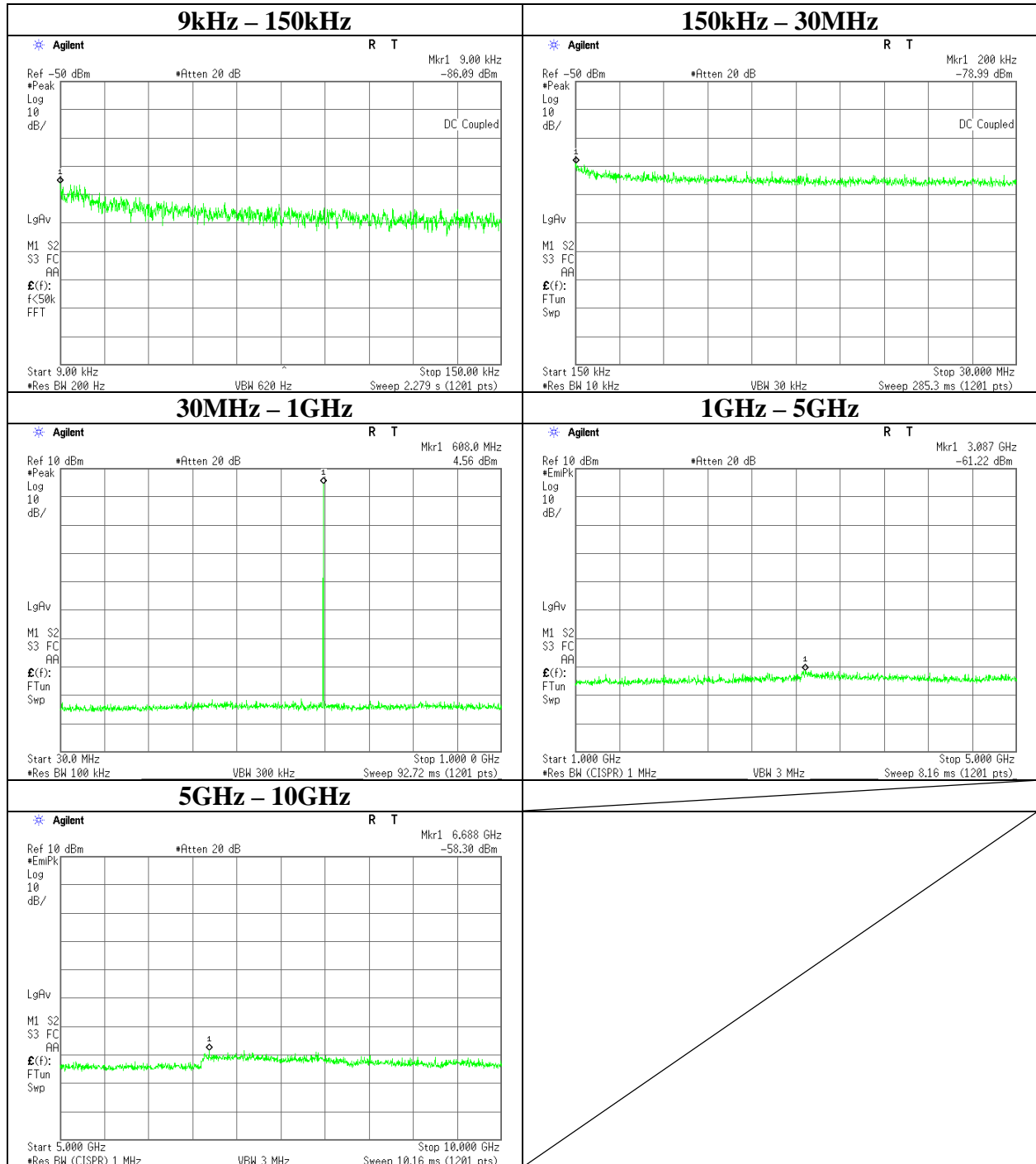
Spurious emissions at antenna terminals

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



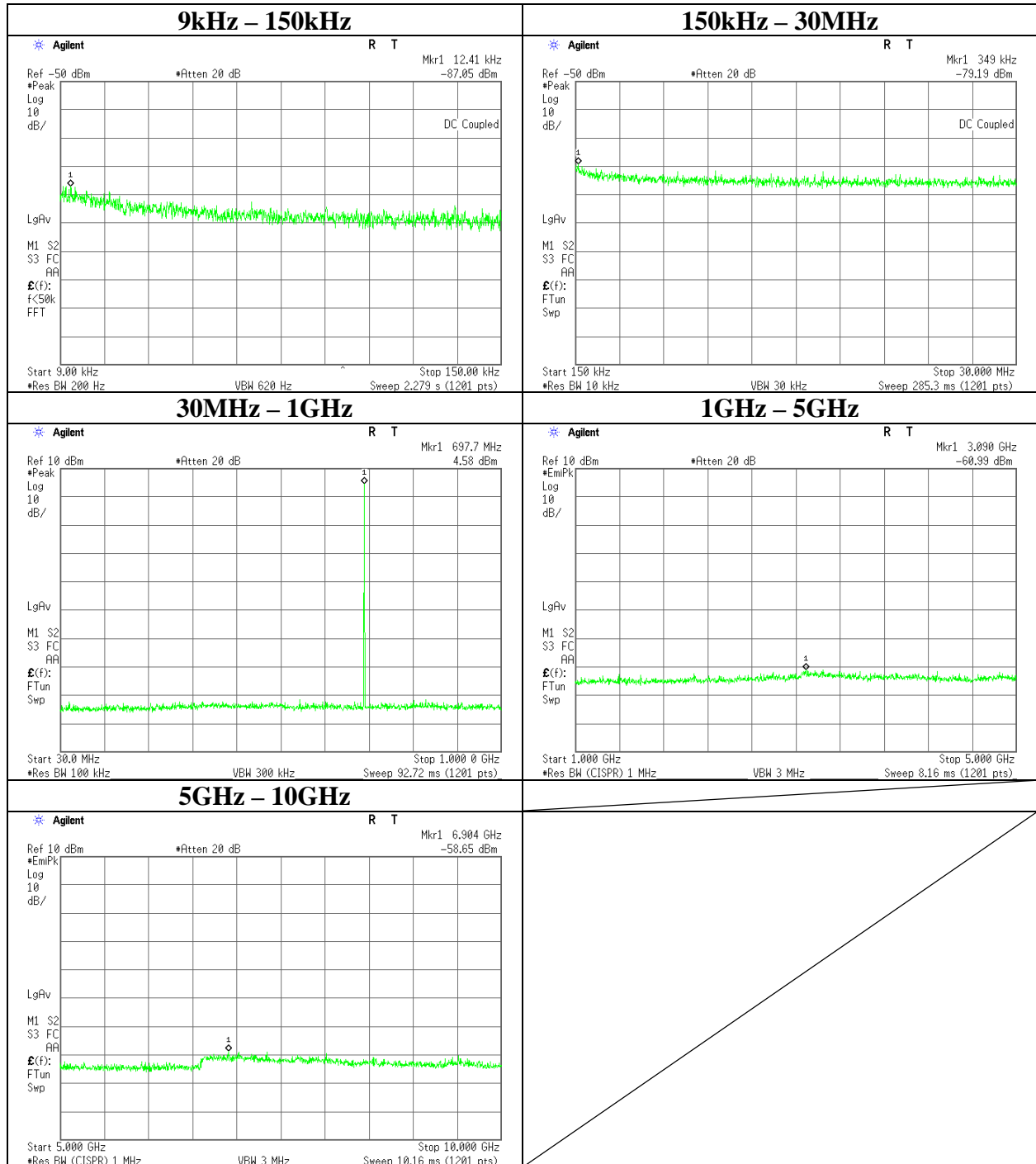
Spurious emissions at antenna terminals

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



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



Field strength of spurious radiation

Test place Head Office EMC Lab. No.4 Semi Anechoic Chamber
Report No. 10068338H
Date 09/30/2013 10/01/2013 10/02/2013
Temperature/ Humidity 24 deg. C / 57% RH 24 deg. C / 61% RH 24 deg. C / 73% RH
Engineer Takumi Shimada Takumi Shimada Hironobu Ohnishi
(Below 1GHz) (Above 1GHz, High power) (Above 1GHz, Low power)
Mode Tx 470.125MHz

[Low power]

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]
940.25	42.0	39.6	-38.1	-35.9	5.1	2.2	10.1	-53.3	-51.1	-13.0	40.3	38.1	155	313	136	345			
1410.38	39.6	39.9	-68.7	-67.8	2.9	6.9	0.0	-66.9	-66.0	-13.0	53.9	53.0	108	34	137	160			
1880.50	52.4	46.6	-54.3	-62.8	3.3	9.9	0.0	-49.9	-58.4	-13.0	36.9	45.4	114	34	100	17			
2350.63	52.5	50.6	-53.2	-58.4	3.7	10.9	0.0	-48.2	-53.4	-13.0	35.2	40.4	123	30	104	39			
2820.75	49.2	45.0	-54.6	-58.1	4.1	11.3	0.0	-49.6	-53.1	-13.0	36.6	40.1	100	21	100	48			
3290.88	42.4	38.3	-60.6	-66.3	4.5	12.5	0.0	-54.7	-60.4	-13.0	41.7	47.4	105	42	100	117			
3761.00	37.6	35.9	-65.8	-68.2	4.8	12.9	0.0	-59.9	-62.3	-13.0	46.9	49.3	100	358	100	80			
4231.13	40.1	40.2	-61.3	-59.3	5.1	12.4	0.0	-56.2	-54.2	-13.0	43.2	41.2	100	294	108	359			
4701.25	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	100	0	100	0			

[High power]

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]
940.25	47.8	49.7	-32.3	-25.8	5.1	2.2	10.1	-47.5	-41.0	-13.0	34.5	28.0	185	169	148	42			
1410.38	47.4	45.2	-60.9	-62.5	2.9	6.9	0.0	-59.1	-60.7	-13.0	46.1	47.7	100	37	191	138			
1880.50	48.2	47.4	-58.5	-62.0	3.3	9.9	0.0	-54.1	-57.6	-13.0	41.1	44.6	100	65	100	131			
2350.63	48.3	43.0	-57.4	-66.0	3.7	10.9	0.0	-52.4	-61.0	-13.0	39.4	48.0	100	40	100	140			
2820.75	41.6	39.7	-62.2	-63.4	4.1	11.3	0.0	-57.2	-58.4	-13.0	44.2	45.4	100	340	146	91			
3290.88	35.6	33.2	-67.4	-71.4	4.5	12.5	0.0	-61.5	-65.5	-13.0	48.5	52.5	111	342	100	0			
3761.00	37.5	36.2	-65.9	-67.9	4.8	12.9	0.0	-60.0	-62.0	-13.0	47.0	49.0	157	44	100	78			
4231.13	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	100	0	100	0			
4701.25	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	100	0	100	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 Semi Anechoic Chamber
Report No. 10068338H
Date 09/30/2013 10/01/2013 10/02/2013
Temperature/ Humidity 24 deg. C / 57% RH 24 deg. C / 61% RH 24 deg. C / 73% RH
Engineer Takumi Shimada Takumi Shimada Hironobu Ohnishi
(Below 1GHz) (Above 1GHz, High power) (Above 1GHz, Low power)
Mode Tx 607.875MHz

[Low power]

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]
1215.75	66.8	66.4	-38.9	-41.0	2.7	6.5	0.0	-37.2	-39.3	-13.0	24.2	26.3	126	40	100	178			
1823.63	43.3	40.2	-64.3	-69.3	3.3	9.5	0.0	-60.3	-65.3	-13.0	47.3	52.3	120	46	100	102			
2431.50	50.9	48.2	-55.0	-56.6	3.8	10.9	0.0	-50.0	-51.6	-13.0	37.0	38.6	117	36	100	23			
3039.38	41.4	42.3	-61.7	-61.5	4.3	11.6	0.0	-56.5	-56.3	-13.0	43.5	43.3	100	21	100	16			
3647.25	43.5	40.8	-59.8	-64.4	4.7	13.0	0.0	-53.6	-58.2	-13.0	40.6	45.2	100	16	105	79			
4255.13	46.2	45.3	-54.1	-54.1	5.1	12.4	0.0	-49.0	-49.0	-13.0	36.0	36.0	100	26	102	91			
4863.00	38.7	38.1	-57.4	-58.4	5.5	12.7	0.0	-52.4	-53.4	-13.0	39.4	40.4	100	22	121	196			
5470.88	35.0	36.4	-59.6	-59.6	5.8	13.5	0.0	-54.1	-54.1	-13.0	41.1	41.1	100	283	118	192			
6078.75	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	100	0	100	0			

[High power]

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]
1215.75	70.1	73.7	-35.6	-33.7	2.7	6.5	0.0	-33.9	-32.0	-13.0	20.9	19.0	137	166	100	132			
1823.63	46.8	42.3	-60.8	-67.2	3.3	9.5	0.0	-56.8	-63.2	-13.0	43.8	50.2	100	169	100	66			
2431.50	53.4	50.3	-52.5	-54.5	3.8	10.9	0.0	-47.5	-49.5	-13.0	34.5	36.5	121	39	105	154			
3039.38	47.0	47.5	-56.1	-56.3	4.3	11.6	0.0	-50.9	-51.1	-13.0	37.9	38.1	100	20	100	0			
3647.25	39.1	33.7	-64.2	-71.5	4.7	13.0	0.0	-58.0	-65.3	-13.0	45.0	52.3	100	299	100	353			
4255.13	45.6	48.5	-54.7	-50.9	5.1	12.4	0.0	-49.6	-45.8	-13.0	36.6	32.8	100	34	104	77			
4863.00	41.2	41.3	-54.9	-55.2	5.5	12.7	0.0	-49.9	-50.2	-13.0	36.9	37.2	118	145	105	80			
5470.88	41.4	42.5	-53.2	-53.5	5.8	13.5	0.0	-47.7	-48.0	-13.0	34.7	35.0	100	339	103	86			
6078.75	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	100	0	100	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 Semi Anechoic Chamber
Report No. 10068338H
Date 09/30/2013 10/01/2013 10/02/2013
Temperature/ Humidity 24 deg. C / 57% RH 24 deg. C / 61% RH 24 deg. C / 73% RH
Engineer Takumi Shimada Takumi Shimada Hironobu Ohnishi
(Below 1GHz) (Above 1GHz, High power) (Above 1GHz, Low power)
Mode Tx 697.875MHz

[Low power]

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]
1395.75	44.7	42.2	-63.0	-64.8	2.9	6.9	0.0	-61.2	-63.0	-13.0	48.2	50.0	109	331	147	20			
2093.63	39.7	35.4	-66.1	-70.1	3.5	10.7	0.0	-61.1	-65.1	-13.0	48.1	52.1	105	29	100	29			
2791.50	45.5	37.3	-58.9	-66.1	4.1	11.3	0.0	-53.9	-61.1	-13.0	40.9	48.1	100	44	100	48			
3489.38	42.1	39.5	-60.1	-62.8	4.6	13.2	0.0	-53.6	-56.3	-13.0	40.6	43.3	100	18	115	203			
4187.25	40.3	38.0	-60.5	-62.3	5.1	12.4	0.0	-55.3	-57.1	-13.0	42.3	44.1	100	8	100	105			
4885.13	35.4	34.0	-63.3	-63.6	5.5	12.7	0.0	-58.2	-58.5	-13.0	45.2	45.5	100	302	109	159			
5583.00	34.0	33.8	-62.0	-63.6	5.9	13.6	0.0	-56.4	-58.0	-13.0	43.4	45.0	100	345	157	6			
6280.88	36.1	33.0	-57.0	-61.5	6.3	13.1	0.0	-52.3	-56.8	-13.0	39.3	43.8	100	344	103	359			
6978.75	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	100	0	100	0			

[High power]

Frequency [MHz]	Rx SA/TR Reading [dBuV]		Tx SG Reading [dBm]		Tx Cable Loss [dB]	Tx Ant. Gain [dBi]	Tx Ant. Atten. Loss [dB]	Result (ERP) [dBm]		Limit (ERP) [dBm]	Margin [dB]		Horizontal		Vertical		Remarks		
	HOR	VER	HOR	VER				HOR	VER		HOR	VER	HOR	VER	Rx Ant. Height [cm]	Turn Table [deg.]		Rx Ant. Height [cm]	Turn Table [deg.]
1395.75	42.3	42.6	-65.4	-64.4	2.9	6.9	0.0	-63.6	-62.6	-13.0	50.6	49.6	112	18	115	246			
2093.63	44.6	44.4	-61.2	-61.1	3.5	10.7	0.0	-56.2	-56.1	-13.0	43.2	43.1	110	231	118	153			
2791.50	44.2	41.3	-60.2	-62.1	4.1	11.3	0.0	-55.2	-57.1	-13.0	42.2	44.1	105	69	100	150			
3489.38	40.9	39.3	-61.3	-63.0	4.6	13.2	0.0	-54.8	-56.5	-13.0	41.8	43.5	100	0	100	6			
4187.25	39.8	40.3	-61.0	-60.0	5.1	12.4	0.0	-55.8	-54.8	-13.0	42.8	41.8	158	60	100	125			
4885.13	34.0	35.1	-64.7	-62.5	5.5	12.7	0.0	-59.6	-57.4	-13.0	46.6	44.4	100	0	100	329			
5583.00	40.7	35.6	-55.3	-61.8	5.9	13.6	0.0	-49.7	-56.2	-13.0	36.7	43.2	100	0	177	341			
6280.88	47.3	40.2	-45.8	-54.3	6.3	13.1	0.0	-41.1	-49.6	-13.0	28.1	36.6	100	346	106	346			
6978.75	NS	NS	-	-	-	-	-	-	-	-13.0	-	-	100	0	100	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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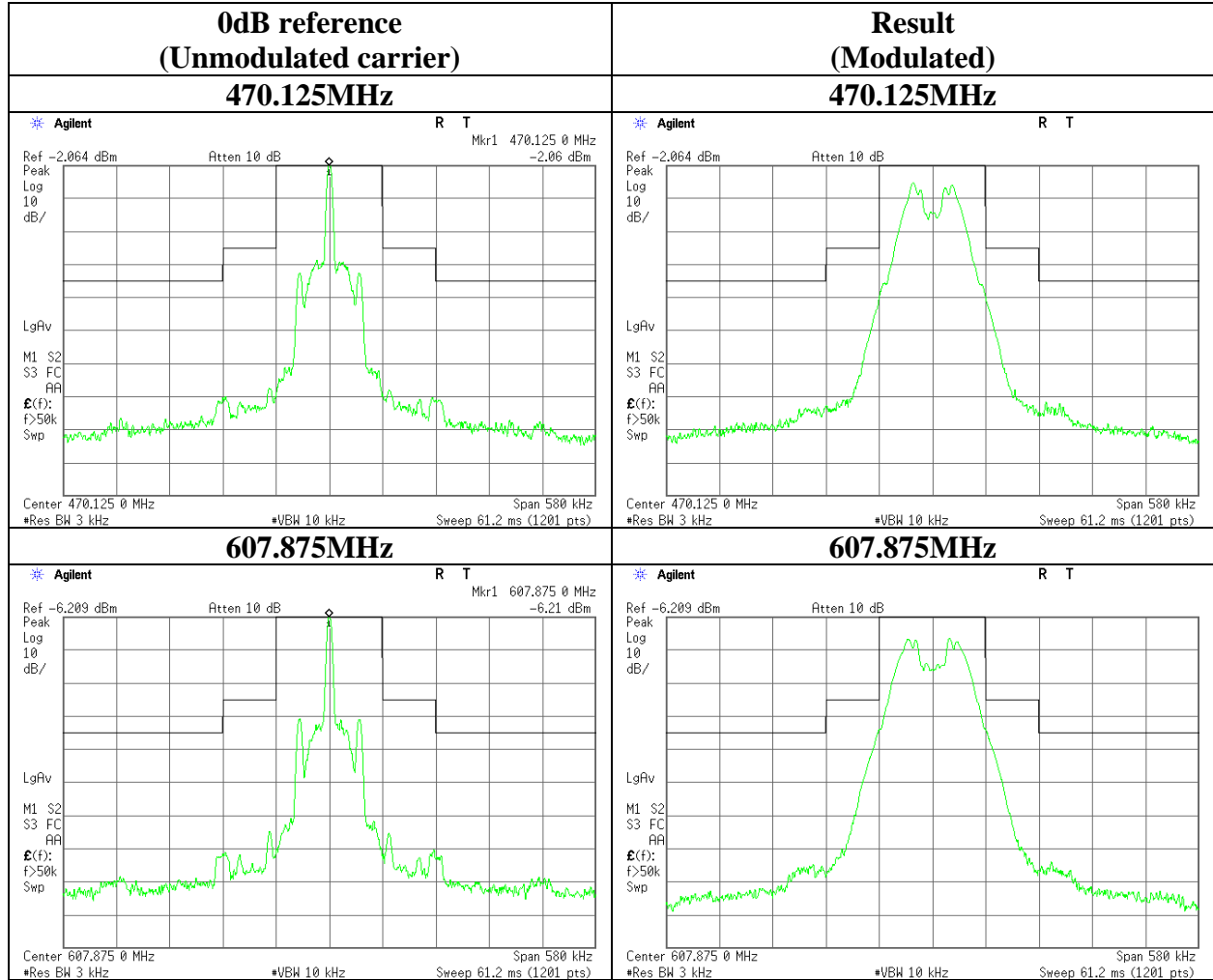
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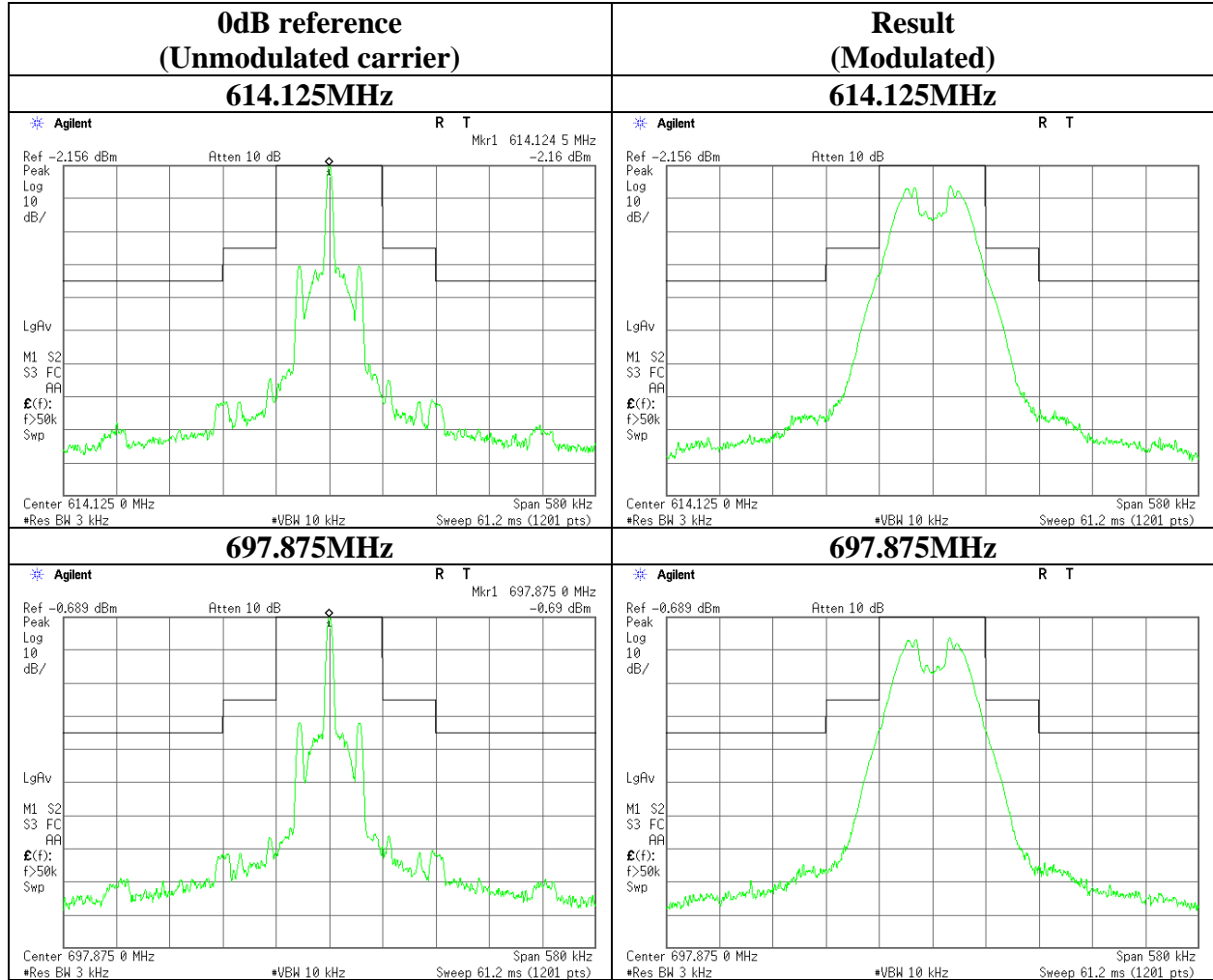
Field strength of spurious radiation

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



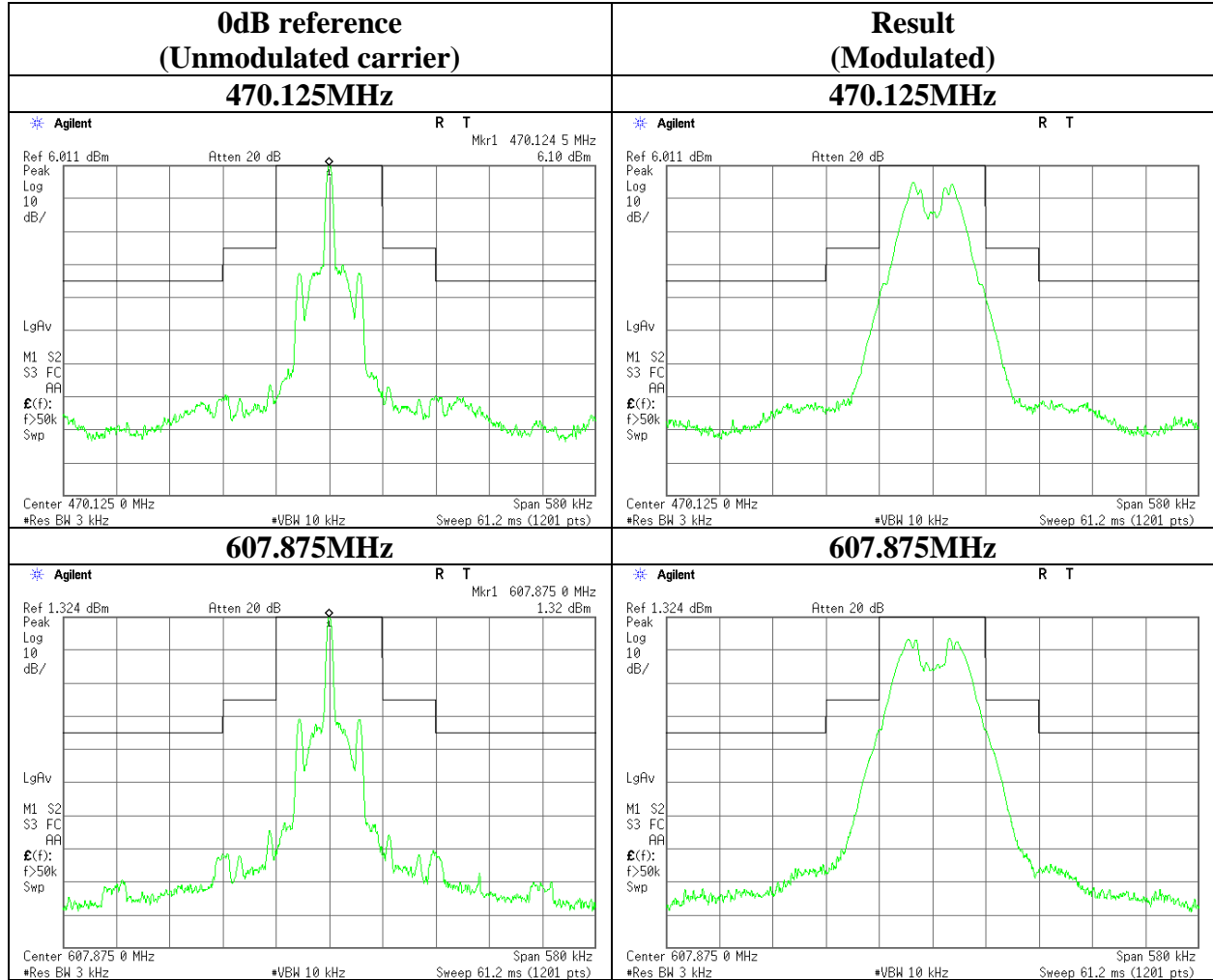
Field strength of spurious radiation

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



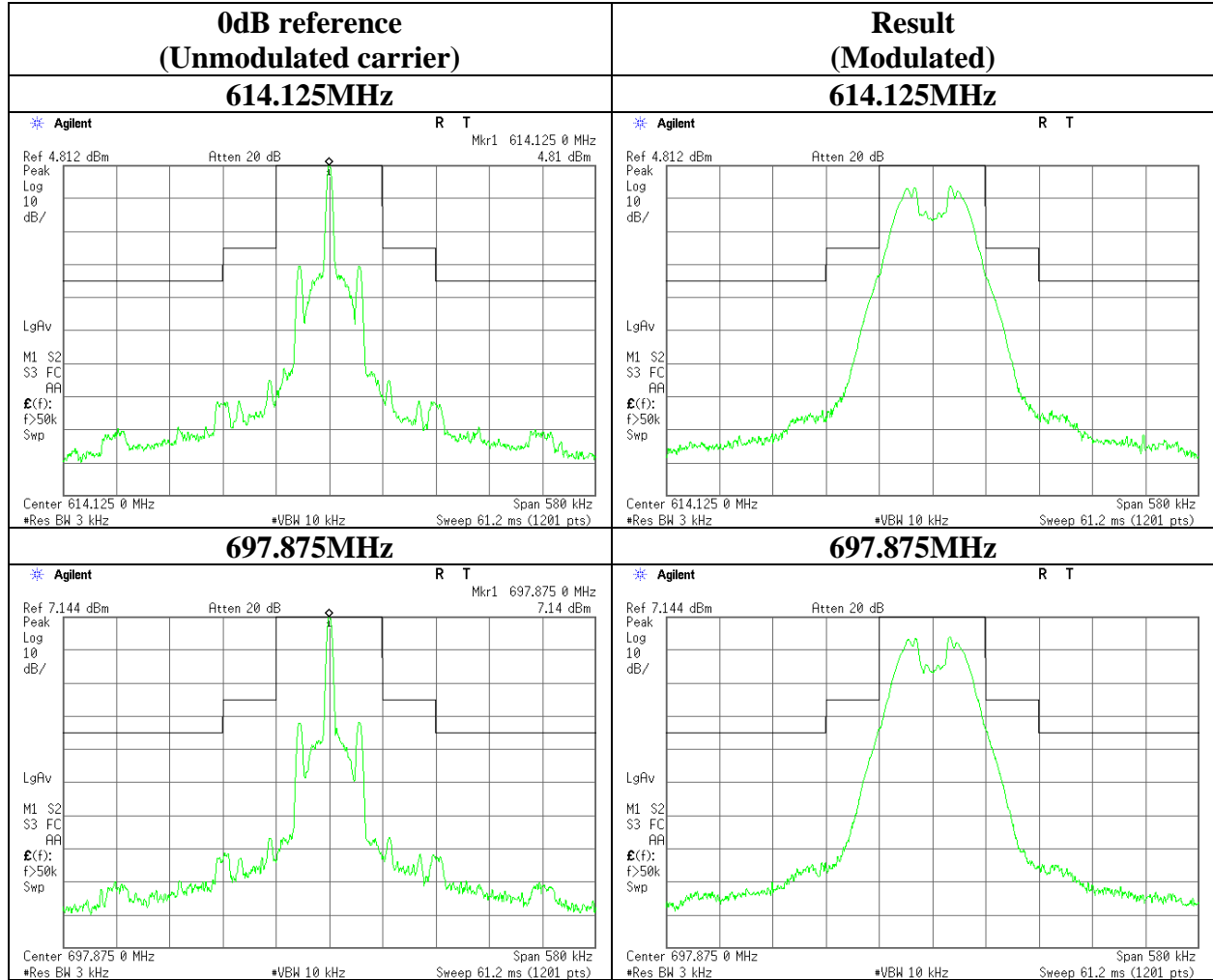
Field strength of spurious radiation

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



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



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 Hironobu Ohnishi
(Voltage) (Temperature)
Mode Tx 607.875MHz

607.875MHz(UTX-B03)

Test Condition	Measured freq [MHz]	Freq error [MHz]	Result [ppm]	Limit (+/- 0.005%) [+/- ppm]	Margin [ppm]
T max 50deg. C	607.874582	-0.000418	-0.69	50	49.31
40deg. C	607.874669	-0.000331	-0.54	50	49.46
30deg. C	607.874820	-0.000180	-0.30	50	49.70
T nom 20deg. C	607.874920	-0.000080	-0.13	50	49.87
10deg. C	607.874932	-0.000068	-0.11	50	49.89
0deg. C	607.874792	-0.000208	-0.34	50	49.66
-10deg. C	607.874746	-0.000254	-0.42	50	49.58
-20deg. C	607.874854	-0.000146	-0.24	50	49.76
T min -30deg. C	607.875238	0.000238	0.39	50	49.61

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

608.875MHz(UTX-B03)

Test Condition	Measured freq [MHz]	Freq error [MHz]	Result [ppm]	Limit (+/- 0.005%) [+/- ppm]	Margin [ppm]
T nom 20deg. C / Vnom 5.0V *1)	607.874908	-0.000092	-0.15	50	49.85
T nom 20deg. C / Vmin 4.25V *1)	607.874905	-0.000095	-0.16	50	49.84
T nom 20deg. C / Vmax 5.75V *1)	607.874900	-0.000100	-0.16	50	49.84
T nom 20deg. C / Vmax 3.0V *2)	607.874920	-0.000080	-0.13	50	49.87
T nom 20deg. C / Vmin 1.85V *2)	607.874861	-0.000139	-0.23	50	49.77

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)

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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	-
MRENT-95	Spectrum Analyzer	Agilent	E4440A	MY46185823	RE	2013/06/14 * 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
MBF-06	Band Pass Filter	M-City	BPF0950-01	UL0002	RE	2013/04/05 * 12
MCC-127	Coaxial Cable	UL Japan	-	-	RE	2013/07/23 * 12
YTSSG03	Signal Generator	Rohde & Schwarz	SMT02	51400043	RE	2013/08/31 * 12
MDA-04	Dipole Antenna	Schwarzbeck	UHAP	992	RE	2013/10/13 * 12
MSA-05	Spectrum Analyzer	Advantest	R3273	160400285	RE	2013/11/08 * 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
MHF-04	High Pass Filter 1.22-4.60GHz	Mini-Circuit	VHF-1200	10435	RE	2013/08/21 * 12
MHA-20	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	258	RE	2013/05/17 * 12
KSG-05	Signal Generator	Rohde & Schwarz	SMR40	100137	RE	2013/07/12 * 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
MFC-01	Microwave Counter	Advantest	R5373	120100309	RE	2013/08/07 * 12
MCH-06	Temperature and Humidity Chamber	Tabai Spec	PL-1KT	14007630	RE	2013/04/25 * 12
MRS-01	Radiocommunication 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

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