FCC CFR47 PART 95H REQUIREMENT

TEST REPORT

FOR

TRANSMITTER

MODEL: ZM-541PA

FCC ID: B6BZM-541PAA

REPORT NUMBER: 10989131H-C

ISSUE DATE: October 30, 2015

Prepared for
NIHON KOHDEN CORPORATION
1-31-4, NISHIOCHIAI SHINJUKU-KU
TOKYO 161-8560, JAPAN

Prepared by
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NVLAP LAB CODE: 200572-0

This laboratory is accredited by the NVLAP LAB CODE 200572-0, U.S.A. The tests reported herein have been performed in accordance with its terms of accreditation.
*As for the range of Accreditation in NVLAP, you may refer to the WEB address, http://japan.ul.com/resources/emc_accredited/

Revision History

Rev.	Issue Date	Revisions	Revised By
--	10/30/15	Initial Issue	T. Hatakeda

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: NIHON KOHDEN CORPORATION
1-31-4, NISHIOCHIAI SHINJUKU-KU
TOKYO 161-8560, JAPAN

EUT DESCRIPTION: TRANSMITTER

MODEL: ZM-541PA

SERIAL NUMBER: A00001 (for Spurious emission test)
A00003 (for Antenna terminal conducted tests)

DATE TESTED: OCTOBER 7 TO 19, 2015

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 95 SUBPART H	Pass

UL Japan, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Japan, Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Japan, Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Japan, Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI/TIA-603-D-2010, FCC CFR 47 Part 2 and FCC CFR 47 Part 95.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN.

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The full scope of accreditation can be viewed at
http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

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4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

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

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Test site (semi anechoic chamber)	Conducted emission Uncertainty (+/-)			
	No. 1	No. 2	No. 3	No. 4
150 kHz - 30 MHz	3.5 dB	3.5 dB	3.4 dB	3.5 dB

Test site (semi anechoic chamber)	Radiated emission Uncertainty (+/-)						
	Measurement distance: 3 m				1 m		0.5 m
	9 kHz - 30 MHz	30 MHz - 300 MHz	300 MHz - 1 GHz	1 GHz - 10 GHz	10 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz
No. 1	4.3 dB	5.1 dB	6.2 dB	5.5 dB	5.8 dB	5.8 dB	4.3 dB
No. 2	4.2 dB	5.1 dB	6.2 dB	5.4 dB	5.7 dB	5.9 dB	5.6 dB
No. 3	4.4 dB	5.1 dB	6.3 dB	5.2 dB	5.5 dB	5.8 dB	5.5 dB
No. 4	4.7 dB	5.3 dB	6.3 dB	5.3 dB	5.7 dB	5.9 dB	5.5 dB

Antenna terminal test Uncertainty (+/-)							
Power meter		Conducted emission and Power density			Conducted emission		Channel power
Below 1 GHz	Above 1 GHz	Below 1 GHz	1 GHz - 3 GHz	3 GHz - 18 GHz	18 GHz - 26.5 GHz	26.5 GHz - 40 GHz	
0.7 dB	1.5 dB	1.5 dB	1.7 dB	2.8 dB	2.8 dB	2.9 dB	2.6 dB

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

a).	Type of EUT:	TRANSMITTER
b).	Brand Name:	NIHON KOHDEN
c).	Model No:	ZM-541PA
d).	FCC ID:	B6BZM-541PAA
e).	Battery Type:	Three AA (R6)
f).	Channel Number:	1395.0250 MHz (channel number E002) to 1399.9750 MHz (channel number E398), and 1427.0250 MHz (channel number E502) to 1431.9750 MHz (channel number E898)
g).	Frequency Range:	1395.025-1399.975 MHz and 1427.025-1431.975 MHz bands
h).	RF Conducted Output Power:	5mW (factory default setting) or 1mW
i).	Channel Spacing:	50 KHz or 37.5 kHz (12.5 KHz when interleave)
j).	Modulation	Frequency Shift Keying
k).	Type of Modulation:	F1D
l).	Occupied Bandwidth	<20 kHz
m).	Antenna Type:	Internal

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a Helical Monopole antenna, with a maximum gain of 0 dBi.

5.3. SOFTWARE AND FIRMWARE

The test utility software used during testing was Channel Writer, rev. 01-24.

5.4. WORST-CASE CONFIGURATION AND MODE

The worst-case channel is determined as the channel with the highest output power.

During emission tests the antenna orientations as X, Y, and Z were investigated to determine the worst-case. The outcome showed that X-orientation for Horizontal and Z-orientation for Vertical as the worst-case.

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5.5. DESCRIPTION OF TEST SETUP

DESCRIPTION OF EUT AND SUPPORT EQUIPMENT

DESCRIPTION OF EUT AND SUPPORT EQUIPMENT					
No.	**Description**	**Manufacturer**	**Model**	**Serial Number**	**FCC ID**
A	TRANSMITTER	NIHON KOHDEN CORPORATION	ZM-541PA	A00001(RE) / A00003(AT)	DoC
B	Arm Cuff	Nihon Koden	YP-503P	-	-
C	Probe	Nihon Kohden	TL-201T	227918	-

*RE: Spuriouse emission test, AT: Antenna terminal conducted tests

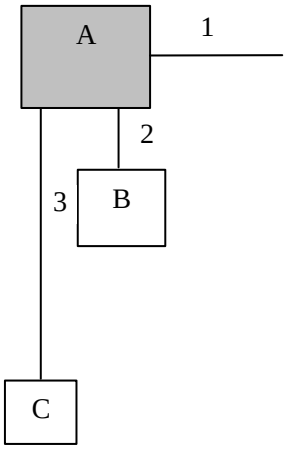
I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identica Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	ECG Cable	1	ECG	Shielded	0.8m	N/A
2	NIBP Cable	1	NIBP socket	Rubber	0.3m	Connect Arm Cuff
3	Sp02	1	Sp02	Shielded	1.6 m	Probe

TEST SETUP

Test setup is shown below setup diagram.

SETUP DIAGRAM FOR TESTS



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6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAEC-02	Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-06902	RE	2015/07/01 * 12
MOS-22	Thermo-Hygrometer	Custom	CTH-201	0003	RE	2015/01/13 * 12
MJM-14	Measure	KOMELON	KMC-36	-	RE	-
COTS-MEMI	EMI measurement program	TSJ	TEPTO-DV	-	RE	-
MSA-13	Spectrum Analyzer	Agilent	E4440A	MY46185823	RE	2015/06/02 * 12
MHA-06	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	254	RE	2015/02/05 * 12
MCC-168	Microwave Cable	Junkosha	MWX221	1408S016(1m) / 1409S492(5m)	RE	2015/09/24 * 12
MPA-10	Pre Amplifier	Agilent	8449B	3008A02142	RE	2015/01/28 * 12
MBF-09	Band Pass Filter	M-City	BPF4250-01	UL0004	RE	2015/06/01 * 12
MHF-06	High Pass Filter 3.5-24GHz	TOKIMEC	TF323DCA	601	RE	2015/05/15 * 12
MTR-03	Test Receiver	Rohde & Schwarz	ESCI	100300	RE	2015/06/08 * 12
MBA-02	Biconical Antenna	Schwarzbeck	BBA9106	VHA91032008	RE	2014/10/18 * 12
MLA-02	Logperiodic Antenna	Schwarzbeck	USLP9143	201	RE	2014/10/18 * 12
MCC-12	Coaxial Cable	Fujikura/Agilent	-	-	RE	2015/02/06 * 12
MAT-07	Attenuator(6dB)	Weinschel Corp	2	BK7970	RE	2014/11/11 * 12
MPA-09	Pre Amplifier	Agilent	8447D	2944A10845	RE	2015/09/04 * 12
MHA-05	Horn Antenna 1-18GHz	Schwarzbeck	BBHA9120D	253	RE	2015/05/18 * 12
MOS-19	Thermo-Hygrometer	Custom	CTH-201	0001	AT	2014/12/22 * 12
MRENT-124	Spectrum Analyzer	KEYSIGHT	E4440A	MY46187750	AT	2015/06/24 * 12
MCH-06	Temperature and Humidity Chamber	Tabai Espec	PL-1KT	14007630	AT	2015/04/29 * 12
MCC-137	Microwave cable	HUBER+SUHNER	SUCOFLEX 102	37954/2	AT	2015/10/08 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	AT	2015/10/08 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	AT	2015/10/08 * 12
MAT-57	Attenuator(10dB)	Suhner	6810.19.A	-	AT	2015/01/08 * 12
MCC-35	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	AT	2015/09/16 * 12

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.

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7. ANTENNA PORT TEST RESULTS

7.1. 26 dB AND 99% BW

LIMITS

§2.1049, for reporting purposes only, also the 26dB bandwidth shall be less than 20 KHz (F1D).

TEST PROCEDURE

ANSI C63.4

The transmitter output is connected to the spectrum analyzer.

26dB Bandwidth: The RBW is set to 1% to 5% of the 26dB bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 26dB bandwidth function is utilized.

99% Bandwidth: The RBW is set to 1% to 5% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

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RESULTS

26dB Bandwidth

Channel	Frequency (MHz)	26dB Bandwidth (kHz)
E002	1395.025	19.307
E398	1399.975	19.330
E502	1427.025	19.331
E898	1431.975	19.209

99% Bandwidth

Channel	Frequency (MHz)	99% Bandwidth (kHz)
E002	1395.025	15.522
E398	1399.975	15.311
E502	1427.025	15.338
E898	1431.975	15.352

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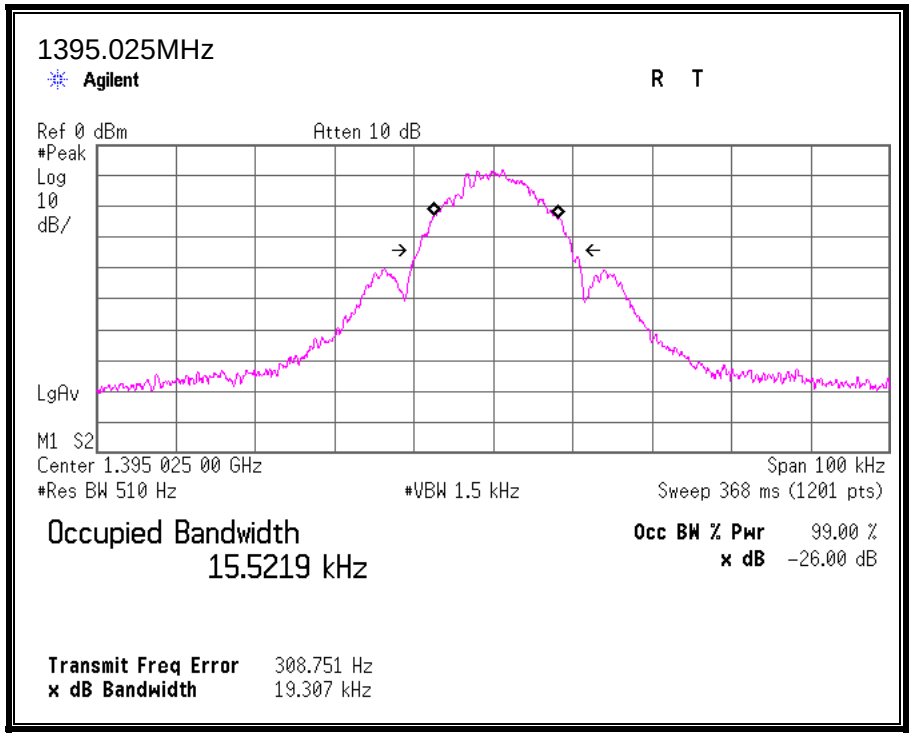
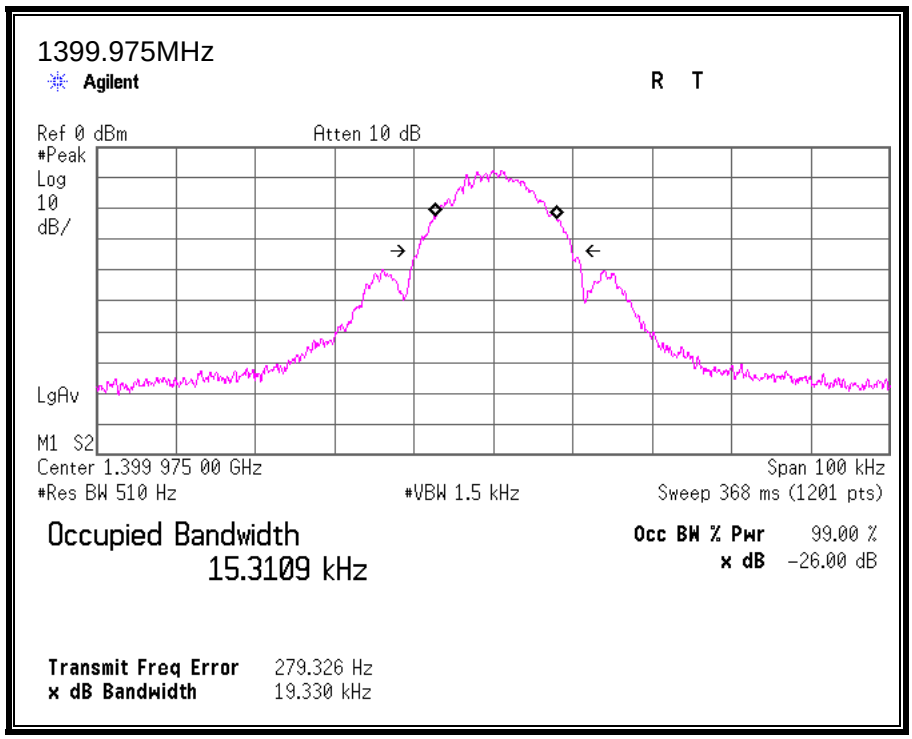
20dB and 99% BANDWIDTH





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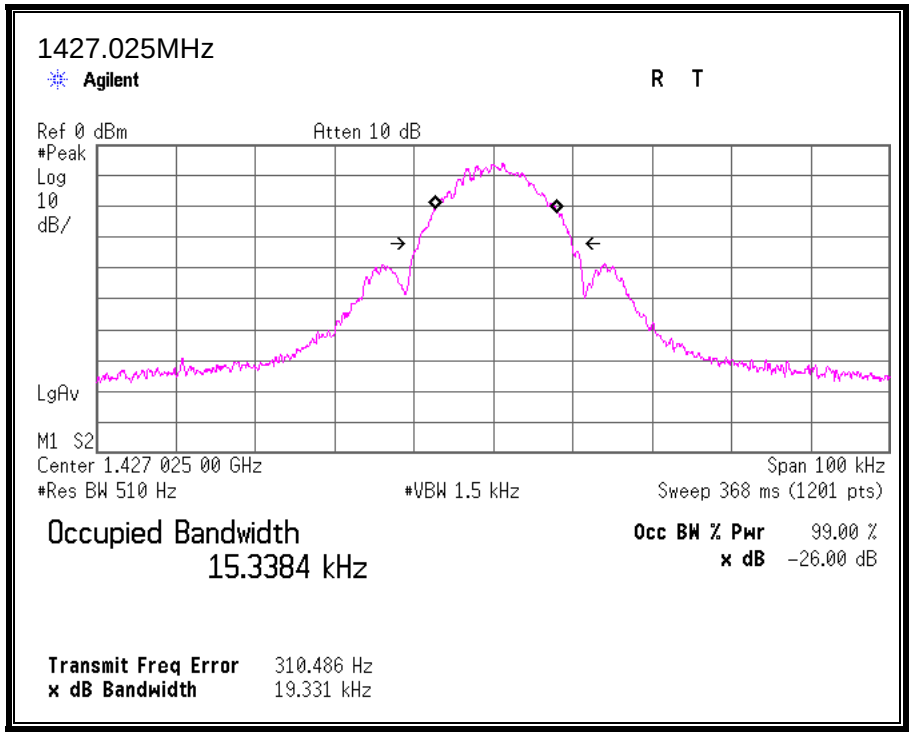

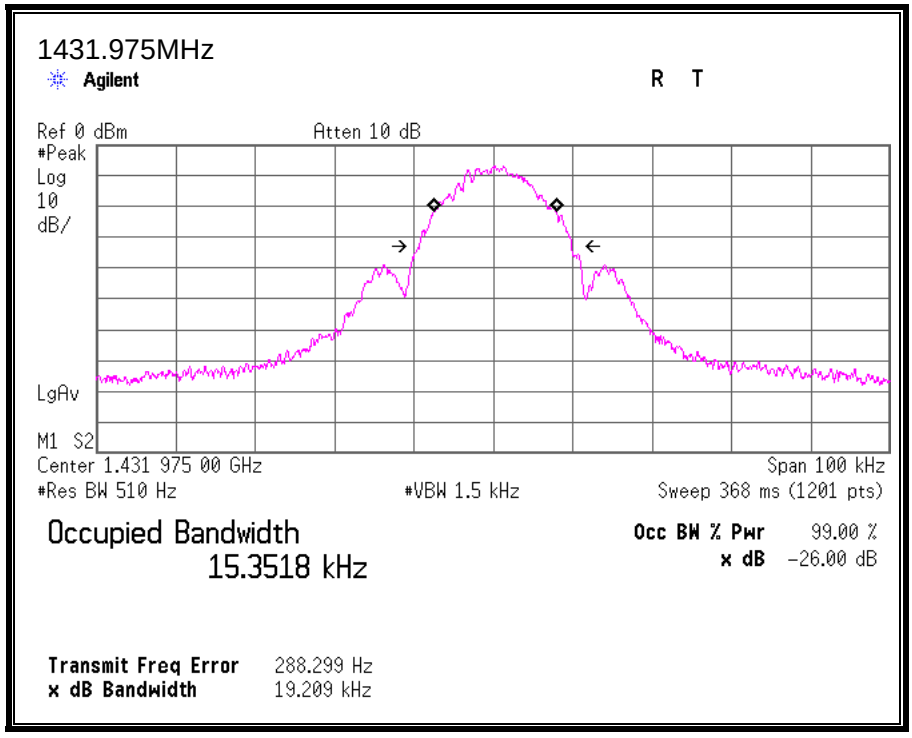

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7.2. PEAK OUTPUT POWER

LIMITS

§2.1046, for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

PK

Freq.	Reading	Cable Loss	Atten.	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
1395.025	-5.05	0.62	10.00	5.57	3.61
1399.975	-4.37	0.62	10.00	6.25	4.22
1427.025	-2.91	0.63	10.01	7.73	5.93
1431.975	-3.42	0.63	10.01	7.22	5.27

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

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7.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

AV

Freq.	Reading	Cable Loss	Atten.	Result	
[MHz]	[dBm]	[dB]	[dB]	[dBm]	[mW]
1395.025	-5.16	0.66	10.00	5.50	3.55
1399.975	-4.48	0.66	10.00	6.18	4.15
1427.025	-2.99	0.67	10.01	7.69	5.87
1431.975	-3.50	0.67	10.01	7.18	5.22

Sample Calculation:
Result = Reading + Cable Loss + Attenuator

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7.4. SPURIOUS EMISSIONS AT ANTENNA TERMINAL

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW=1MHz VBW=3MHz.

The spectrum from 30 MHz to 10th harmonic is investigated with the transmitter set to the lowest and highest channels.

TEST RESULTS

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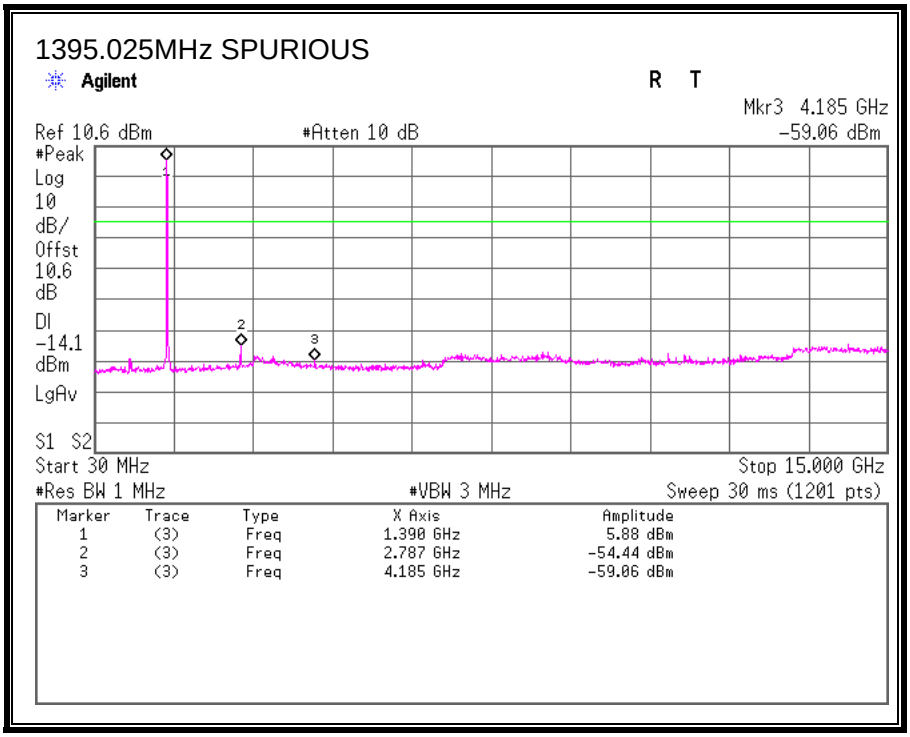

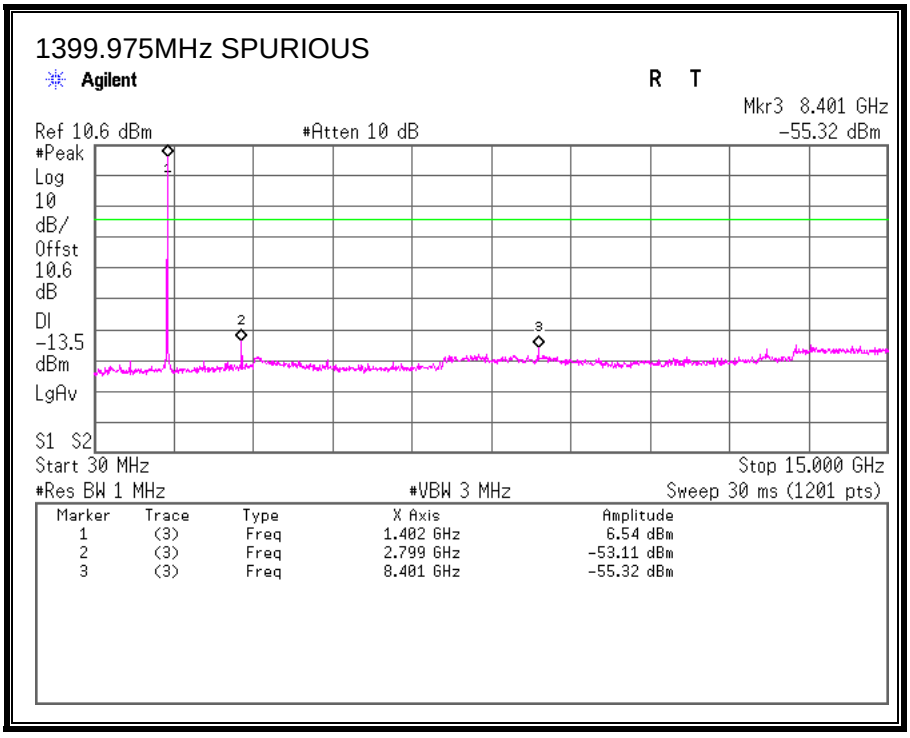

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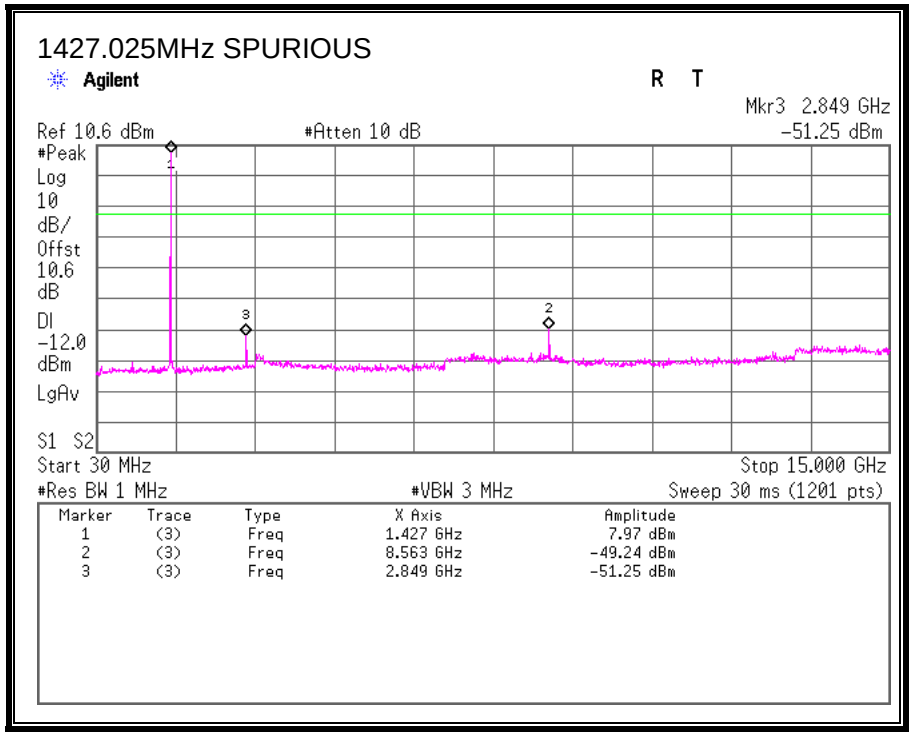

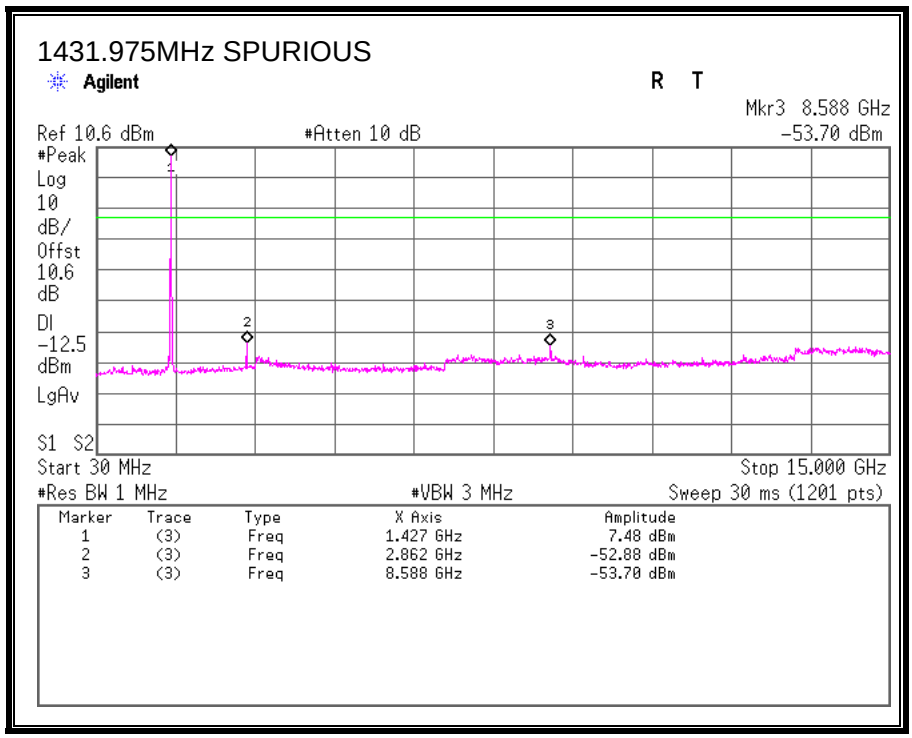

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7.5. FREQUENCY STABILITY MEASUREMENT

LIMIT

§95.1115 (e) Frequency stability.
Manufacturers of wireless medical telemetry devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all of the manufacturer's specified conditions.

TEST PROCEDURE

Frequency stability versus environmental temperature

1) Set the temperature of chamber to 50°C @ low/high channel. Allow sufficient time (approximately 60 min) for the temperature of the chamber to stabilize. While maintaining a set temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.

2) Set spectrum analyzer Resolution Bandwidth to 300 Hz and Video Resolution Bandwidth to 300 Hz and Frequency Span to 50 KHz. Record this frequency as reference frequency.

3) Repeat step 2 with a 10°C decreased per stage until the lowest temperature -30°C is measured, record all measured frequencies on each temperature step. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize.

Frequency stability versus input voltage

1). Setup the configuration as shown below for frequencies measured at temperature if it is 20°C.

2). Set spectrum analyzer center frequency to the EUT radiated frequency. Set SA Resolution Bandwidth to 300 Hz and Video Resolution Bandwidth to 300 Hz and Frequency Span to 50 KHz. Record this frequency as reference frequency.

3). For battery operated only device, supply the EUT primary voltage at the operating end point which is specified by manufacturer and record the frequency.

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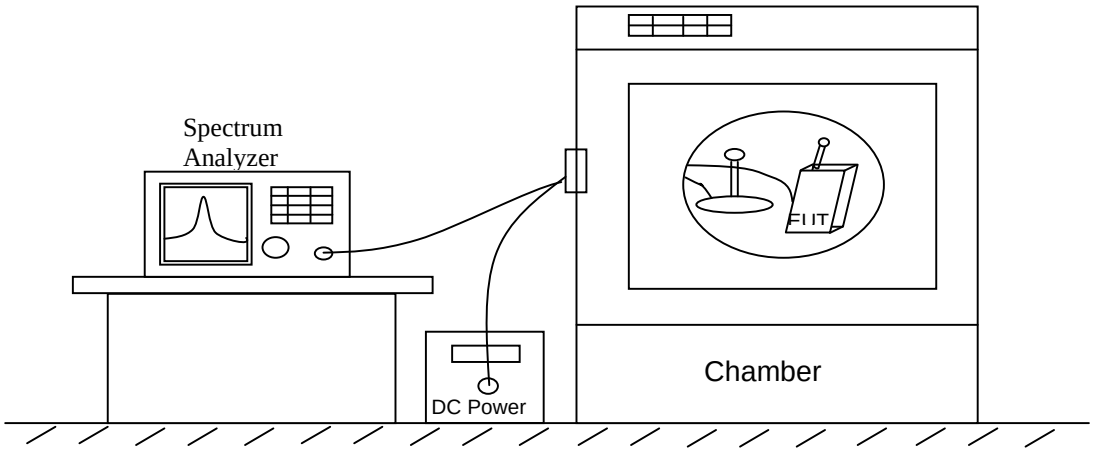

Frequency stability measurement configuration

TEST RESULTS

LOW CHANNEL

20°C Reference Frequency:			1395.025000		MHz
Limit: +/-	10	ppm =	0.013950		MHz
Power Supply		Environment	Frequency	Delta (MHz)	Limit +/- (MHz)
VDC		Temperature (°C)	(MHz)		
4.50	Normal (100%)	50	1395.025123	0.000123	0.013950
		40	1395.024904	-0.000096	0.013950
		30	1395.024909	-0.000091	0.013950
		20	1395.025021	0.000021	0.013950
		10	1395.024949	-0.000051	0.013950
		0	1395.025138	0.000138	0.013950
		-10	1395.025245	0.000245	0.013950
		-20	1395.025534	0.000534	0.013950
		-30	1395.025170	0.000170	0.013950
4.50	Normal		1395.025021	0.000021	0.013950
3.20	Low		1395.025632	0.000632	0.013950
3.10	End Point				

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HIGH CHANNEL

20°C Reference Frequency:			1431.975000		MHz
Limit: +/- 10 ppm =			0.014320		MHz
Power Supply		Environment	Frequency	Delta (MHz)	Limit +/- (MHz)
VDC		Temperature (°C)	(MHz)		
4.50	Normal (100%)	50	1431.974944	-0.000056	0.014320
		40	1431.974912	-0.000088	0.014320
		30	1431.974849	-0.000151	0.014320
		20	1431.975034	0.000034	0.014320
		10	1431.974953	-0.000047	0.014320
		0	1431.975289	0.000289	0.014320
		-10	1431.975361	0.000361	0.014320
		-20	1431.975023	0.000023	0.014320
		-30	1431.975322	0.000322	0.014320
4.50	Normal		1431.975034	0.000034	0.014320
3.20	Low		1431.975727	0.000727	0.014320
3.10	End Point				

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8. RADIATED EMISSION TEST RESULTS

LIMITS

§95.1115
(a) Field strength limits
(2) In the 1395–1400 MHz and 1427–1432 MHz bands, the maximum allowable field strength is 740 mV/m as measured at a distance of 3 meters, using measuring equipment with an averaging detector and a 1 MHz measurement bandwidth.

(b) Undesired emissions.
(1) Out-of-band emissions below 960 MHz are limited to 200 microvolts/meter, as measured at a distance of 3 meters, using measuring instrumentation with a CISPR quasi-peak detector.
(2) Out-of-band emissions above 960 MHz are limited to 500 microvolts/meter as measured at a distance of 3 meters, using measuring equipment with an averaging detector and a 1 MHz measurement bandwidth.

TEST PROCEDURE

ANSI/TIA-603-D-2010

RESULTS

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8.1. FUNDAMENTAL OUTPUT POWER

Report No.	: 10989131H	
Test Place	: Ise EMC Lab.	: Ise EMC Lab.
Semi Anechoic Chamber:	: No. 2	: No. 2
Date	: 2015/10/07	: 2015/10/13
Temperature/Humidity	: 26 deg.C / 48 % RH	: 25 deg.C / 52 % RH
Engineer:	: Tomoki Matsui	: Yutaka Yoshida

Tx 1395.025MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	1395.025	AV	72.3	26.2	2.0	0.0	100.5	117.4	16.9	
Vert	1395.025	AV	70.2	26.2	2.0	0.0	98.4	117.4	19.0	

Tx 1399.975MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	1399.975	AV	68.1	26.2	2.0	0.0	96.3	117.4	21.1	
Vert	1399.975	AV	67.2	26.2	2.0	0.0	95.4	117.4	22.0	

Tx 1427.025MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	1427.025	AV	69.0	26.2	2.0	0.0	97.2	117.4	20.2	
Vert	1427.025	AV	68.2	26.2	2.0	0.0	96.4	117.4	21.0	

Tx 1431.975MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	1431.975	AV	67.4	26.2	2.0	0.0	95.6	117.4	21.8	
Vert	1431.975	AV	67.6	26.2	2.0	0.0	95.8	117.4	21.6	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

Gain 0.0 dB shows that the pre amplifier was not used to avoid the influence of carrier power.

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8.2. RADIATED EMISSIONS BELOW 960 MHz

SPURIOUS EMISSIONS 30 TO 960 MHz (HORIZONTAL)

1395.025MHz

Report No. : 10989131H
Test Place : Ise EMC Lab.
Semi Anechoic Chamber: : No. 2
Date : 2015/10/15
Temperature/Humidity : 23 deg.C / 40 % RH
Engineer: : Keisuke Kawamura
Mode: : Tx 1395.025MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	61.437	QP	31.6	7.2	7.1	28.4	17.5	46.0	28.5	
Hori	76.799	QP	43.5	6.6	7.3	28.3	29.1	46.0	16.9	
Hori	92.157	QP	39.6	8.9	7.4	28.2	27.7	46.0	18.3	
Hori	107.516	QP	33.8	11.1	7.5	28.1	24.3	46.0	21.7	
Hori	122.877	QP	30.1	12.9	7.6	28.1	22.5	46.0	23.5	
Hori	491.496	QP	38.2	18.6	9.7	28.5	38.0	46.0	8.0	
Vert	61.437	QP	22.2	7.2	7.1	28.4	8.1	46.0	37.9	
Vert	76.079	QP	32.8	6.6	7.3	28.3	18.4	46.0	27.6	
Vert	92.157	QP	31.2	8.9	7.4	28.2	19.3	46.0	26.7	
Vert	107.516	QP	26.5	11.1	7.5	28.1	17.0	46.0	29.0	
Vert	122.877	QP	23.3	12.9	7.6	28.1	15.7	46.0	30.3	
Vert	491.496	QP	32.9	18.6	9.7	28.5	32.7	46.0	13.3	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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FAX: +81 596 24 8124

SPURIOUS EMISSIONS 30 TO 960 MHz

1399.975MHz

Report No. : 10989131H
Test Place : Ise EMC Lab.
Semi Anechoic Chamber: : No. 2
Date : 2015/10/15
Temperature/Humidity : 23 deg.C / 40 % RH
Engineer: : Keisuke Kawamura
Mode: : Tx 1399.975MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	76.799	QP	40.8	6.6	7.3	28.3	26.4	46.0	19.6	
Hori	432.006	QP	32.3	17.9	9.5	28.3	31.4	46.0	14.6	
Hori	448.004	QP	32.7	18.1	9.5	28.4	31.9	46.0	14.1	
Hori	464.001	QP	33.9	18.3	9.6	28.4	33.4	46.0	12.6	
Hori	480.005	QP	35.0	18.5	9.7	28.5	34.7	46.0	11.3	
Hori	491.496	QP	39.2	18.6	9.7	28.5	39.0	46.0	7.0	
Vert	61.437	QP	22.2	7.2	7.1	28.4	8.1	46.0	37.9	
Vert	76.079	QP	30.6	6.6	7.3	28.3	16.2	46.0	29.8	
Vert	92.157	QP	29.5	8.9	7.4	28.2	17.6	46.0	28.4	
Vert	107.516	QP	26.4	11.1	7.5	28.1	16.9	46.0	29.1	
Vert	122.877	QP	23.3	12.9	7.6	28.1	15.7	46.0	30.3	
Vert	491.496	QP	33.3	18.6	9.7	28.5	33.1	46.0	12.9	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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SPURIOUS EMISSIONS 30 TO 960 MHz (HORIZONTAL)

1427.025MHz

Report No. : 10989131H
Test Place : Ise EMC Lab.
Semi Anechoic Chamber: : No. 2
Date : 2015/10/15
Temperature/Humidity : 23 deg.C / 40 % RH
Engineer: : Keisuke Kawamura
Mode: : Tx 1427.025MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	92.157	QP	37.3	8.9	7.4	28.2	25.4	46.0	20.6	
Hori	432.006	QP	32.5	17.9	9.5	28.3	31.6	46.0	14.4	
Hori	448.004	QP	32.5	18.1	9.5	28.4	31.7	46.0	14.3	
Hori	464.001	QP	34.0	18.3	9.6	28.4	33.5	46.0	12.5	
Hori	480.005	QP	35.1	18.5	9.7	28.5	34.8	46.0	11.2	
Hori	491.496	QP	39.6	18.6	9.7	28.5	39.4	46.0	6.6	
Vert	76.079	QP	30.4	6.6	7.3	28.3	16.0	46.0	30.0	
Vert	92.157	QP	29.4	8.9	7.4	28.2	17.5	46.0	28.5	
Vert	107.516	QP	26.4	11.1	7.5	28.1	16.9	46.0	29.1	
Vert	448.004	QP	28.6	18.1	9.5	28.4	27.8	46.0	18.2	
Vert	480.005	QP	31.0	18.5	9.7	28.5	30.7	46.0	15.3	
Vert	491.496	QP	33.5	18.6	9.7	28.5	33.3	46.0	12.7	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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SPURIOUS EMISSIONS 30 TO 960 MHz

1431.975MHz

Report No. : 10989131H
Test Place : Ise EMC Lab.
Semi Anechoic Chamber: : No. 2
Date : 2015/10/15
Temperature/Humidity : 23 deg.C / 40 % RH
Engineer: : Keisuke Kawamura
Mode: : Tx 1431.975MHz

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	76.799	QP	32.3	6.6	7.3	28.3	17.9	46.0	28.1	
Hori	92.157	QP	35.8	8.9	7.4	28.2	23.9	46.0	22.1	
Hori	105.771	QP	23.7	10.9	7.5	28.1	14.0	46.0	32.0	
Hori	107.516	QP	36.9	11.1	7.5	28.1	27.4	46.0	18.6	
Hori	122.877	QP	31.7	12.9	7.6	28.1	24.1	46.0	21.9	
Hori	491.496	QP	35.2	18.6	9.7	28.5	35.0	46.0	11.0	
Vert	76.079	QP	31.2	6.6	7.3	28.3	16.8	46.0	29.2	
Vert	92.157	QP	23.0	8.9	7.4	28.2	11.1	46.0	34.9	
Vert	105.771	QP	22.2	10.9	7.5	28.1	12.5	46.0	33.5	
Vert	107.516	QP	29.7	11.1	7.5	28.1	20.2	46.0	25.8	
Vert	122.877	QP	23.3	12.9	7.6	28.1	15.7	46.0	30.3	
Vert	491.496	QP	32.4	18.6	9.7	28.5	32.2	46.0	13.8	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter) - Gain(Amprifier)

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8.3. RADIATED EMISSIONS ABOVE 960 MHz

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 960 MHz

1395.025MHz

Report No.	: 10989131H	
Test Place	: Ise EMC Lab.	
Semi Anechoic Chamber:	: No. 2	
Date	: 2015/10/07	: 2015/10/15
Temperature/Humidity	: 26 deg.C / 48 % RH	: 23 deg.C / 40 % RH
Engineer:	: Tomoki Matsui	: Keisuke Kawamura
	1GHz-10GHz	Above 10GHz
Mode:	: Tx 1395.025MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2790.050	AV	41.2	29.5	3.5	34.8	39.4	54.0	14.6	
Hori	4185.075	AV	38.8	31.4	4.0	34.0	40.2	54.0	13.8	
Hori	5580.100	AV	43.8	33.0	4.7	33.9	47.6	54.0	6.4	
Hori	6975.125	AV	34.7	36.7	5.2	34.0	42.6	54.0	11.4	NS
Hori	8370.150	AV	40.0	36.4	5.6	34.5	47.5	54.0	6.5	
Hori	9765.175	AV	35.8	39.0	5.9	34.7	46.0	54.0	8.0	NS
Hori	11160.200	AV	34.9	39.9	-3.0	33.9	37.9	54.0	16.1	NS
Hori	12555.230	AV	34.7	40.5	-2.5	33.4	39.3	54.0	14.7	NS
Hori	13950.250	AV	34.8	41.0	-2.5	32.4	40.9	54.0	13.1	NS
Vert	2790.050	AV	39.5	29.5	3.5	34.8	37.7	54.0	16.3	
Vert	4185.075	AV	40.3	31.4	4.0	34.0	41.7	54.0	12.3	
Vert	5580.100	AV	45.8	33.0	4.7	33.9	49.6	54.0	4.4	
Vert	6975.125	AV	34.5	36.7	5.2	34.0	42.4	54.0	11.6	NS
Vert	8370.150	AV	43.8	36.4	5.6	34.5	51.3	54.0	2.7	
Vert	9765.175	AV	35.5	39.0	5.9	34.7	45.7	54.0	8.3	NS
Vert	11160.200	AV	34.8	39.9	-3.0	33.9	37.8	54.0	16.2	NS
Vert	12555.230	AV	34.6	40.5	-2.5	33.4	39.2	54.0	14.8	NS
Vert	13950.250	AV	34.8	41.0	-2.5	32.4	40.9	54.0	13.1	NS

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

NS : NosignalDetected

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 960 MHz

1399.975MHz

Report No.	: 10989131H	
Test Place	: Ise EMC Lab.	
Semi Anechoic Chamber:	: No. 2	
Date	: 2015/10/13	: 2015/10/15
Temperature/Humidity	: 25 deg.C / 52 % RH	: 23 deg.C / 40 % RH
Engineer:	: Yutaka Yoshida	: Keisuke Kawamura
	1GHz-10GHz	Above 10GHz
Mode:	: Tx 1399.975MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2799.950	AV	47.2	29.6	3.5	34.8	45.5	54.0	8.5	
Hori	4199.925	AV	39.5	31.4	4.3	34.0	41.2	54.0	12.8	
Hori	5599.900	AV	49.6	33.0	4.7	33.9	53.4	54.0	0.6	
Hori	6999.875	AV	34.3	36.7	5.2	34.0	42.2	54.0	11.8	
Hori	8399.850	AV	42.3	36.4	5.6	34.5	49.8	54.0	4.2	
Hori	9799.825	AV	34.8	39.0	5.8	34.7	44.9	54.0	9.1	NS
Hori	11199.800	AV	34.9	40.0	-3.0	33.8	38.1	54.0	15.9	NS
Hori	12599.780	AV	34.7	40.5	-2.5	33.4	39.3	54.0	14.7	NS
Hori	13999.750	AV	34.8	41.0	-2.5	32.4	40.9	54.0	13.1	NS
Vert	2799.950	AV	43.3	29.6	3.5	34.8	41.6	54.0	12.4	
Vert	4199.925	AV	40.5	31.4	4.3	34.0	42.2	54.0	11.8	
Vert	5599.900	AV	46.7	33.0	4.7	33.9	50.5	54.0	3.5	
Vert	6999.875	AV	35.0	36.7	5.2	34.0	42.9	54.0	11.1	
Vert	8399.850	AV	44.9	36.4	5.6	34.5	52.4	54.0	1.6	
Vert	9799.825	AV	34.6	39.0	5.8	34.7	44.7	54.0	9.3	NS
Vert	11199.800	AV	34.8	40.0	-3.0	33.8	38.0	54.0	16.0	NS
Vert	12599.780	AV	34.6	40.5	-2.5	33.4	39.2	54.0	14.8	NS
Vert	13999.750	AV	34.8	41.0	-2.5	32.4	40.9	54.0	13.1	NS

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

NS : NosignalDetected

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 960 MHz

1427.025MHz

Report No.	: 10989131H	
Test Place	: Ise EMC Lab.	
Semi Anechoic Chamber:	: No. 2	
Date	: 2015/10/13	: 2015/10/15
Temperature/Humidity	: 25 deg.C / 52 % RH	: 23 deg.C / 40 % RH
Engineer:	: Yutaka Yoshida	: Keisuke Kawamura
	1GHz-10GHz	Above 10GHz
Mode:	: Tx 1427.025MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2854.050	AV	48.9	29.6	3.5	34.8	47.2	54.0	6.8	
Hori	4281.075	AV	37.2	31.6	4.3	34.0	39.1	54.0	14.9	
Hori	5708.100	AV	46.2	33.2	4.9	33.9	50.4	54.0	3.6	
Hori	7135.125	AV	34.4	36.8	5.2	34.0	42.4	54.0	11.6	
Hori	8562.150	AV	39.6	36.5	5.7	34.5	47.3	54.0	6.7	
Hori	9989.175	AV	34.5	39.0	5.8	34.7	44.6	54.0	9.4	NS
Hori	11416.200	AV	34.9	40.3	-2.9	33.7	38.6	54.0	15.4	NS
Hori	12843.230	AV	34.7	40.4	-2.5	33.4	39.2	54.0	14.8	NS
Hori	14270.250	AV	34.8	40.9	-2.3	32.6	40.8	54.0	13.2	NS
Vert	2854.050	AV	45.0	29.6	3.5	34.8	43.3	54.0	10.7	
Vert	4281.075	AV	37.9	31.6	4.3	34.0	39.8	54.0	14.2	
Vert	5708.100	AV	41.4	33.2	4.9	33.9	45.6	54.0	8.4	
Vert	7135.125	AV	35.1	36.8	5.2	34.0	43.1	54.0	10.9	
Vert	8562.150	AV	41.2	36.5	5.7	34.5	48.9	54.0	5.1	
Vert	9989.175	AV	34.3	39.0	5.8	34.7	44.4	54.0	9.6	NS
Vert	11416.200	AV	34.8	40.3	-2.9	33.7	38.5	54.0	15.5	NS
Vert	12843.230	AV	34.6	40.4	-2.5	33.4	39.1	54.0	14.9	NS
Vert	14270.250	AV	34.8	40.9	-2.3	32.6	40.8	54.0	13.2	NS

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

NS : NosignalDetected

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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FAX: +81 596 24 8124

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 960 MHz

1431.975MHz

Report No.	: 10989131H	
Test Place	: Ise EMC Lab.	
Semi Anechoic Chamber:	: No. 2	
Date	: 2015/10/13	: 2015/10/15
Temperature/Humidity	: 25 deg.C / 52 % RH	: 23 deg.C / 40 % RH
Engineer:	: Yutaka Yoshida	: Keisuke Kawamura
	1GHz-10GHz	Above 10GHz
Mode:	: Tx 1431.975MHz	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori	2863.950	AV	47.2	29.6	3.5	34.8	45.5	54.0	8.5	
Hori	4295.925	AV	36.6	31.6	4.3	34.0	38.5	54.0	15.5	
Hori	5727.900	AV	42.9	33.2	4.9	33.9	47.1	54.0	6.9	
Hori	7159.875	AV	33.6	36.8	5.2	34.1	41.5	54.0	12.5	
Hori	8591.850	AV	35.9	36.5	5.7	34.5	43.6	54.0	10.4	
Hori	11455.800	AV	34.9	40.4	-2.9	33.7	38.7	54.0	15.3	NS
Hori	12887.780	AV	34.7	40.4	-2.5	33.4	39.2	54.0	14.8	NS
Hori	14319.750	AV	34.8	40.8	-2.2	32.7	40.7	54.0	13.3	NS
Vert	2863.950	AV	44.3	29.6	3.5	34.8	42.6	54.0	11.4	
Vert	4295.925	AV	37.4	31.6	4.3	34.0	39.3	54.0	14.7	
Vert	5727.900	AV	37.6	33.2	4.9	33.9	41.8	54.0	12.2	
Vert	7159.875	AV	33.9	36.8	5.2	34.1	41.8	54.0	12.2	
Vert	8591.850	AV	36.1	36.5	5.7	34.5	43.8	54.0	10.2	
Vert	11455.800	AV	34.8	40.4	-2.9	33.7	38.6	54.0	15.4	NS
Vert	12887.780	AV	34.6	40.4	-2.5	33.4	39.1	54.0	14.9	NS
Vert	14319.750	AV	34.8	40.8	-2.2	32.7	40.7	54.0	13.3	NS

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 10GHz)) - Gain(Amplifier)

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20dB).

NS : NosignalDetected

Distance factor: 10GHz-26.5GHz 20log(3.0m/1.0m)= 9.5dB

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