FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8

CERTIFICATION TEST REPORT

FOR

Remote Controller

MODEL NUMBER: DR237973

FCC ID: POO-DR237973
IC: 4250A-DR237973

REPORT NUMBER: 32HE0052-SH-01-A

ISSUE DATE: March 22, 2012

Prepared for
MITSUMI ELECTRIC CO., LTD.
2-11-2, Tsurumaki, Tama-shi, Tokyo, 206-8567, JAPAN

Prepared by
UL Japan, Inc. Shonan EMC Lab.
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JAB Accreditation No. : RTL02610

JAB Testing
RTL2610

Revision History

Rev.	Issue Date	Revisions	Revised By
-	03/22/12	Initial Issue	A. Hayashi

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MITSUMI ELECTRIC CO., LTD.
2-11-2, Tsurumaki, Tama-shi, Tokyo, 206-8567, JAPAN

EUT DESCRIPTION: Remote Controller

MODEL: DR237973

SERIAL NUMBER: DE2151 (Radiated tests),
DE1078 (Conducted tests)

DATE TESTED: March 15 to 16, 2012

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-210 Issue 8 Annex 8	Pass
INDUSTRY CANADA RSS-GEN Issue 3	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. 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. No part of this report may be used to claim product certification, approval, or endorsement by any government agency.

Approved & Released For UL Japan, Inc. By: Tested By:

Go Ishiwata
Manager of WiSE Japan,
UL Verification Service

Akio Hayashi
Engineer of WiSE Japan,
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2009, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN.

UL Japan is accredited by JAB, Laboratory Code RTL02610. The full scope of accreditation can be viewed at
http://www.jab.or.jp/cgi-bin/jab_exam_proof_j.cgi?page=2&authorization_number=RTL02610

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER		UNCERTAINTY
Radiated Emission	30MHz-300MHz(3m)	+/- 5.0 dB
	300MHz-1000MHz(3m)	+/- 5.0 dB
	1000MHz-15GHz(3m)	+/- 4.9 dB
	15GHz-18GHz(1m)	+/- 5.6 dB
	18GHz-26.5GHz(1m)	+/- 4.4 dB

Uncertainty figures are valid to a confidence level of 95% using a coverage factor k=2.

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth Remote control unit, powered by battery.

The radio module is manufactured by CSR.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

* Refer to Section 7.1.5.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes λ \4 PIFA antenna, with a maximum gain of -0.91 dBi.

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
2402	Basic GFSK	0.48	1.12
2437	Basic GFSK	0.18	1.04
2480	Basic GFSK	-0.80	0.83

5.4. SOFTWARE AND FIRMWARE

The test utility software used during testing: fs_1012201147 + 20120222_No01

5.5. WORST-CASE CONFIGURATION AND MODE

The fundamental and spurious was measured in three different orientations X, Y and Z to find worst-case orientation, and final testing for radiated emissions was performed with EUT in following orientation.

	Horizontal	Vertical
Carrier	X	Z
Spurious (below 1GHz)	X	Z
Spurious (above 1GHz)	Z	Y
Spurious (Harmonics)	Y	Z

The worst-case channel is determined as the channel with the highest output power, radiated emissions below 1 GHz and power line conducted emissions were performed with the EUT set to the channel with highest output power.

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST			
Description	**Manufacturer**	**Model**	**Serial Number**
Jig	MITSUMI	-	-
Jig	MITSUMI	-	-

I/O CABLES

I/O CABLE LIST						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length**	**Remarks**
1	DC	1	DC	Un-Shielded	2.35m	N/A
1'	DC	1	DC	Un-Shielded	0.65m	N/A
2	USB	1	USB	Shielded	2.5m	N/A
2'	USB	1	USB	Shielded	0.5m	N/A

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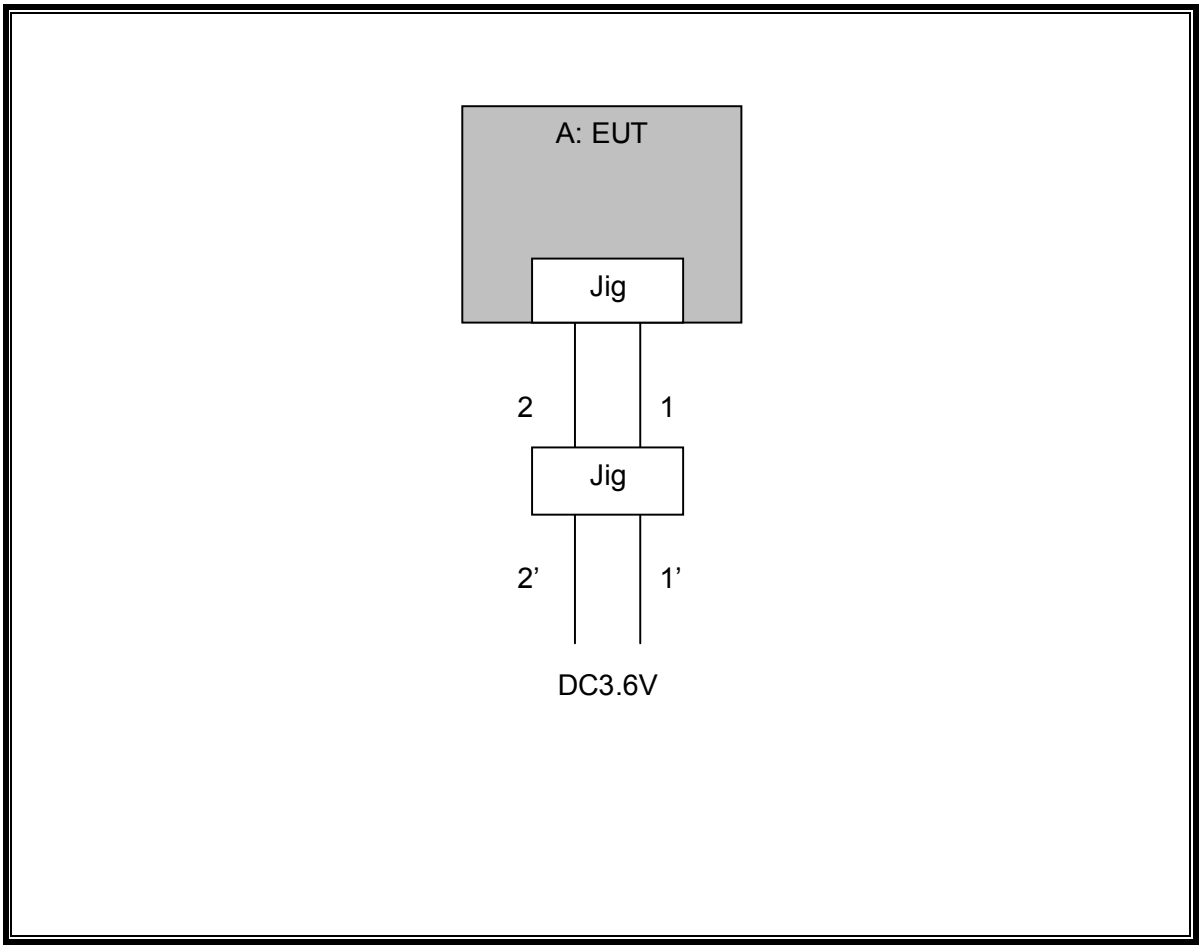
SETUP DIAGRAM FOR RADIATED TESTS



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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)
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	AT	03/02/2011 * 12
SPM-06	Power Meter	Anritsu	ML2495A	0850009	AT	04/12/2011 * 12
SPSS-03	Power sensor	Anritsu	MA2411B	0917063	AT	04/12/2011 * 12
KSA-08	Spectrum Analyzer	Agilent	E4446A	MY46180525	AT	02/16/2012 * 12
SAT10-09	Attenuator	Weinschel Corp.	54A-10	W5692	AT	11/09/2011 * 12
SCC-G12	Coaxial Cable	Suhner	SUCOFLEX 102	30790/2	AT	03/12/2012 * 12
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	07/19/2011 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	04/28/2011 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	05/27/2011 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	08/28/2011 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	02/06/2012 * 12
SSA-03	Spectrum Analyzer	Agilent	E4448A	MY48250152	RE	12/05/2011 * 12
SJM-10	Measure	PROMART	SEN1935	-	RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	RE	-
SAT20-01	Attenuator(above1GHz)	Agilent	8493C-020	74889	RE	12/27/2011 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	12/27/2011 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	03/15/2011 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	03/12/2012 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	03/12/2012 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	02/10/2012 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	02/10/2012 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	10/23/2011 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	04/28/2011 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A 0901	RE	10/23/2011 * 12
STR-03	Test Receiver	Rohde & Schwarz	ESI40	100054/040	RE	07/28/2011 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	09/23/2011 * 12

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test Item:

RE: Radiated emission

AT: Antenna terminal disturbance voltage

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7. ANTENNA PORT TEST RESULTS

7.1. BASIC DATA RATE GFSK MODULATION

7.1.1. 20 dB AND 99% BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to ≥ 1% of the 20 dB bandwidth. The VBW is set to ≥ RBW. The sweep time is coupled.

RESULTS

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	99% Bandwidth (kHz)
Low	2402	882.644	884.2099
Middle	2441	881.437	883.0967
High	2480	883.665	881.8579

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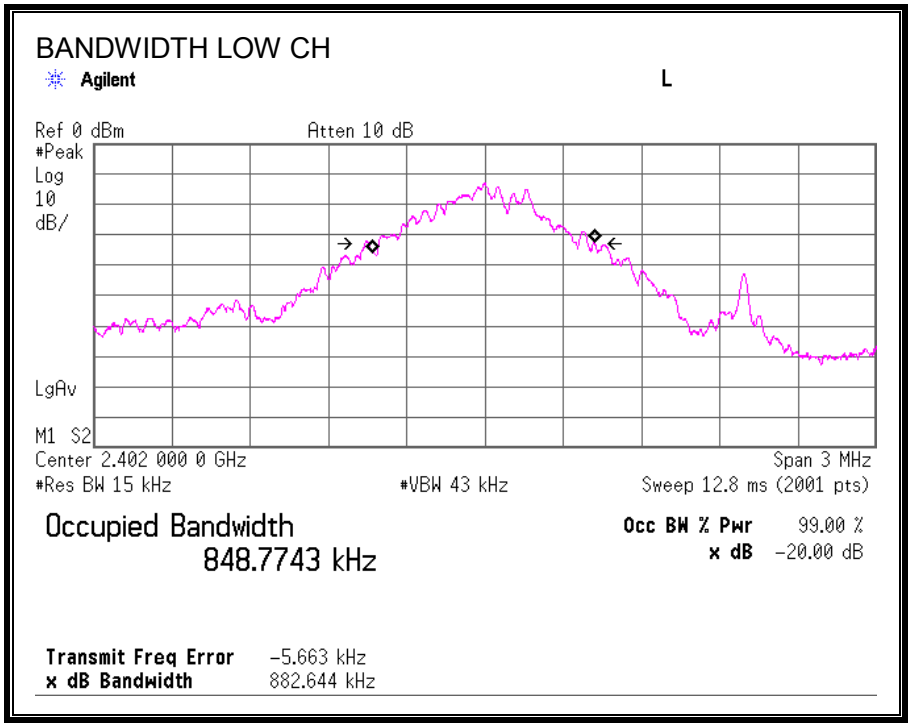
20 dB BANDWIDTH



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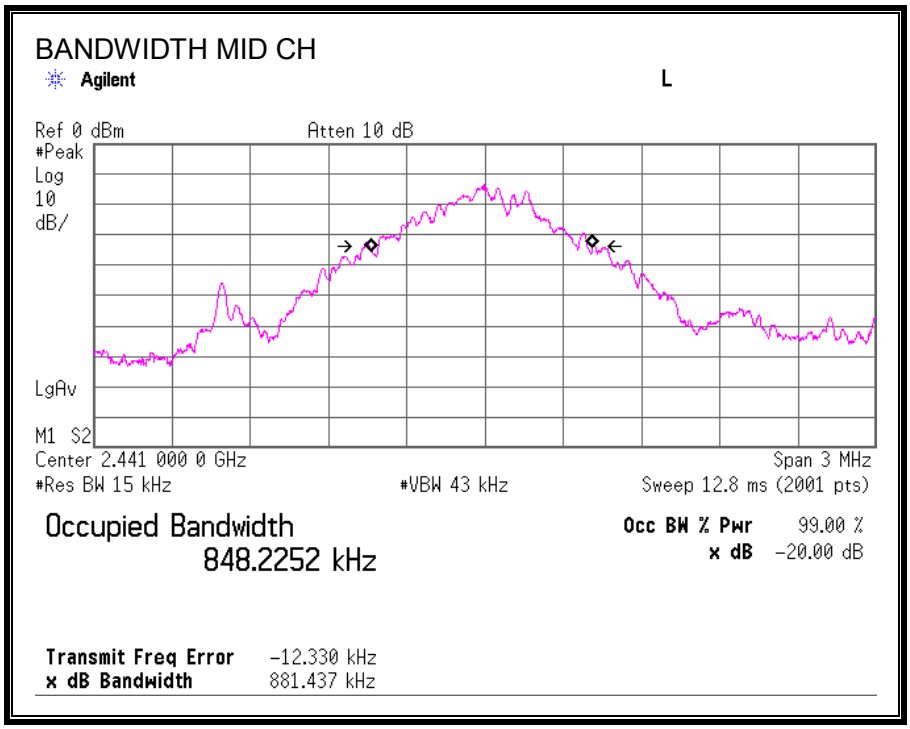

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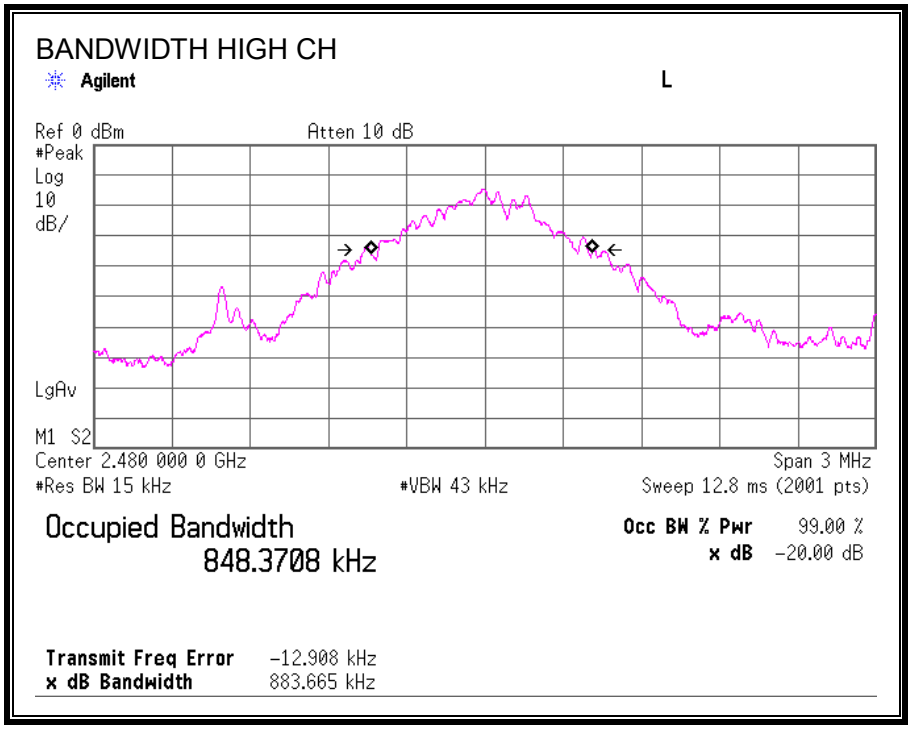

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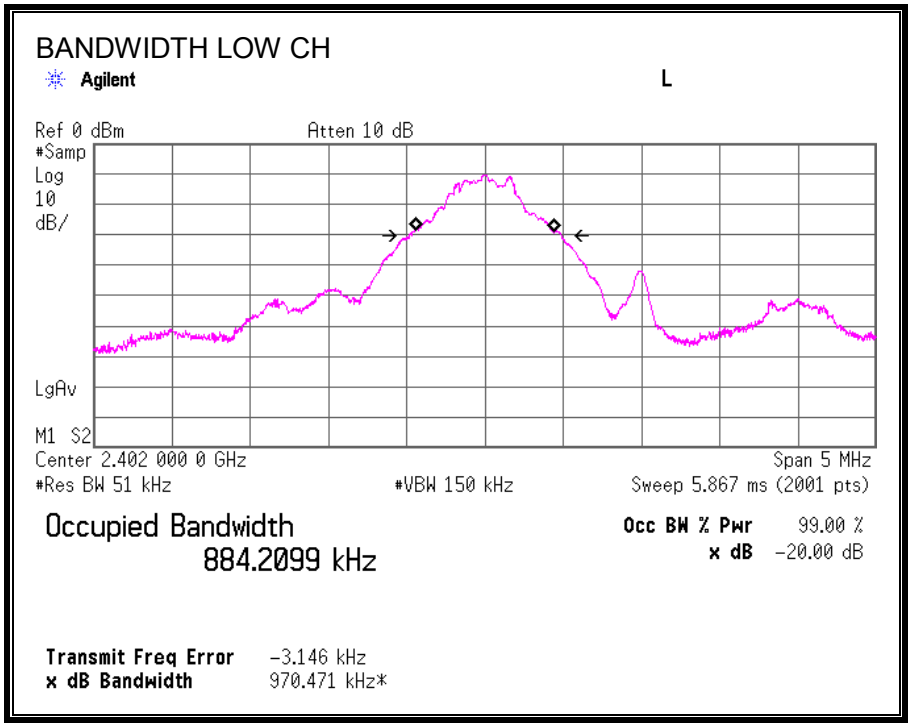
99% BANDWIDTH



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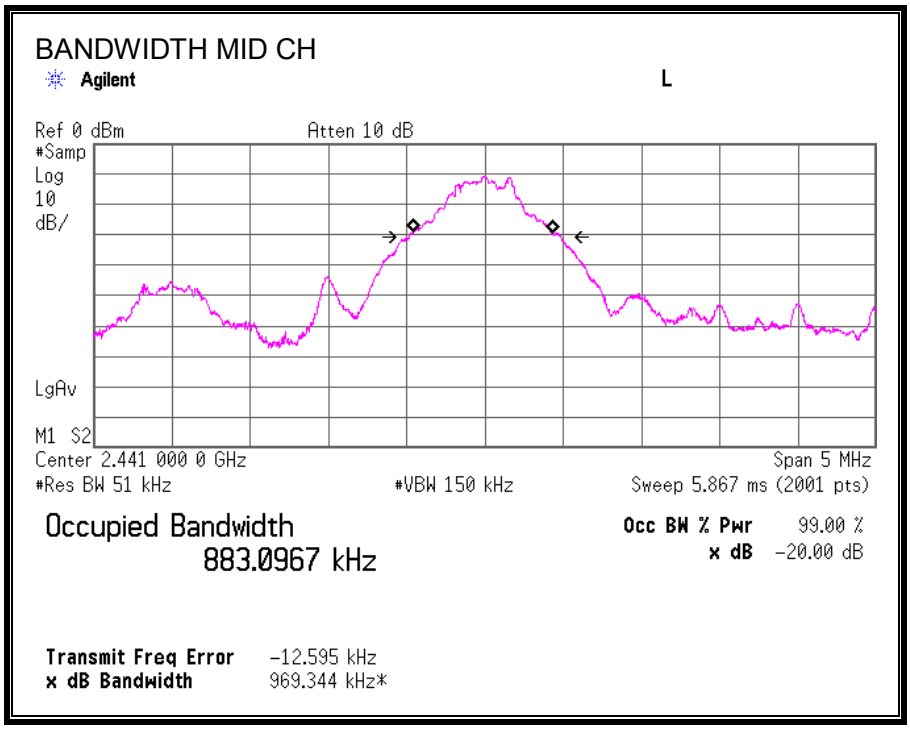

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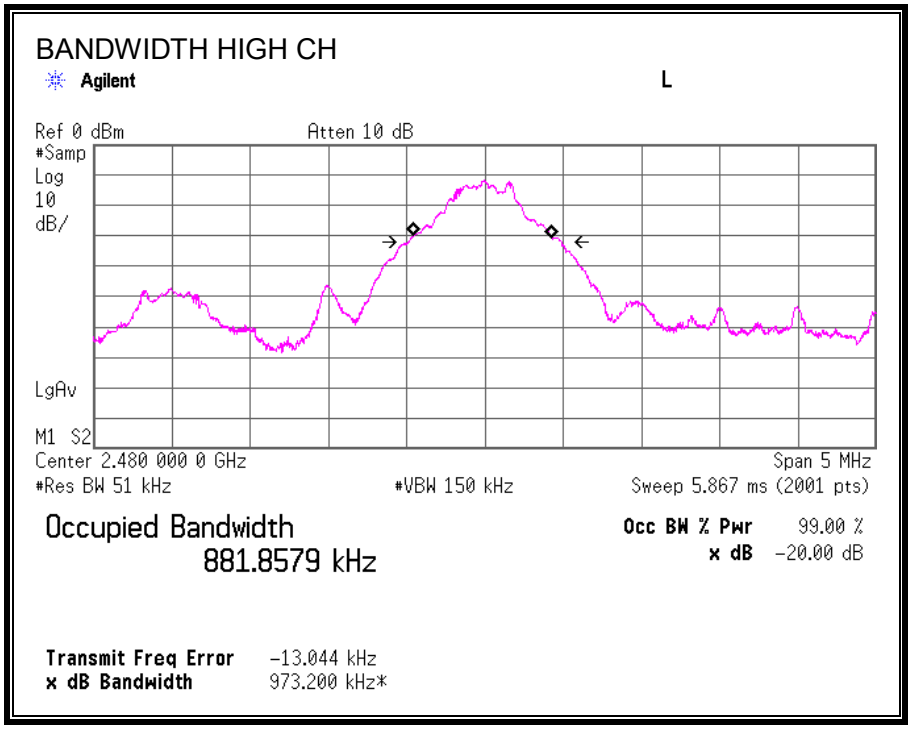

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7.1.2. HOPPING FREQUENCY SEPARATION

LIMIT

FCC §15.247 (a) (1)

IC RSS-210 A8.1 (b)

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hoping channel, whichever is greater.

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 300 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

The channel separation was 1MHz and the test result was greater than the requirement that was 2/3 of 20 dB channel bandwidth.

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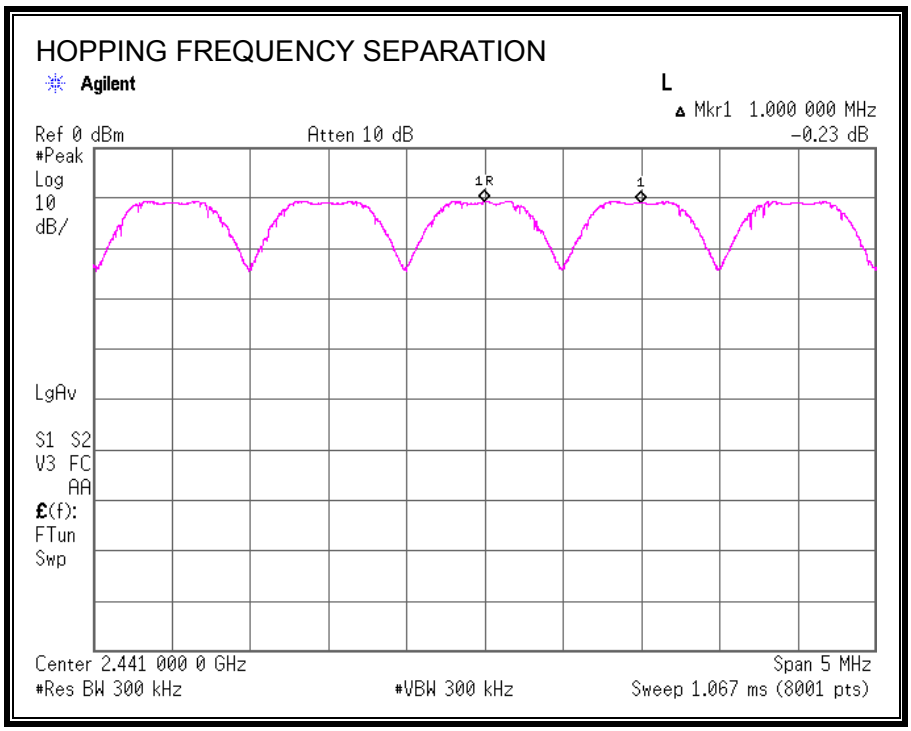
RESULTS

HOPPING FREQUENCY SEPARATION



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7.1.3. NUMBER OF HOPPING CHANNELS

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

RESULTS

79 Channels observed.

Test was not performed at AFH mode whose number of hopping channel is 20 channels because this Bluetooth radio is in compliance of Bluetooth Specification 2.0.

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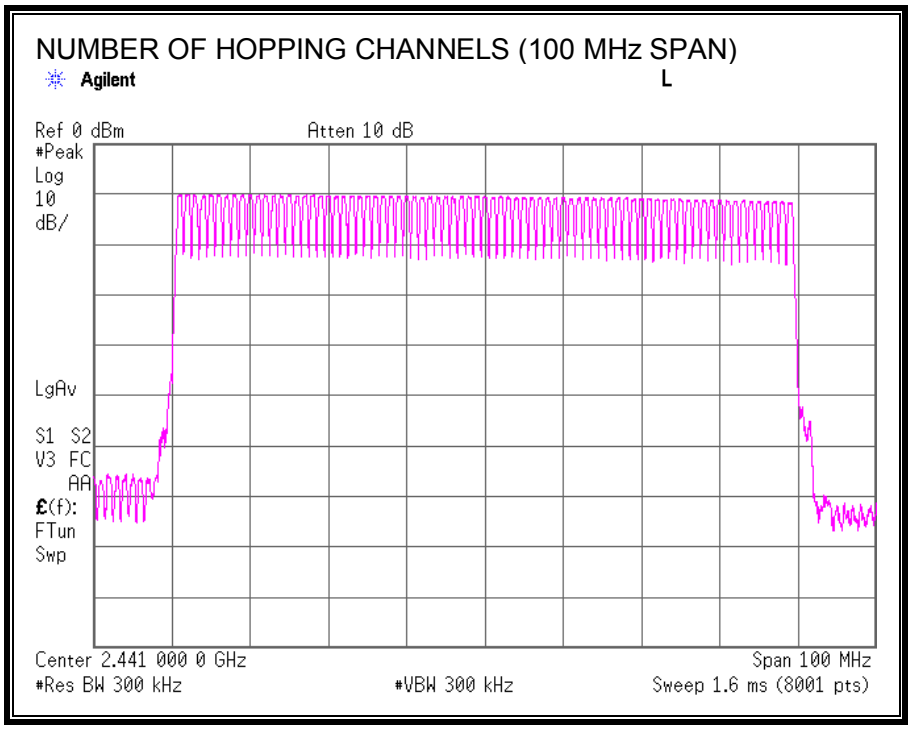
NUMBER OF HOPPING CHANNELS



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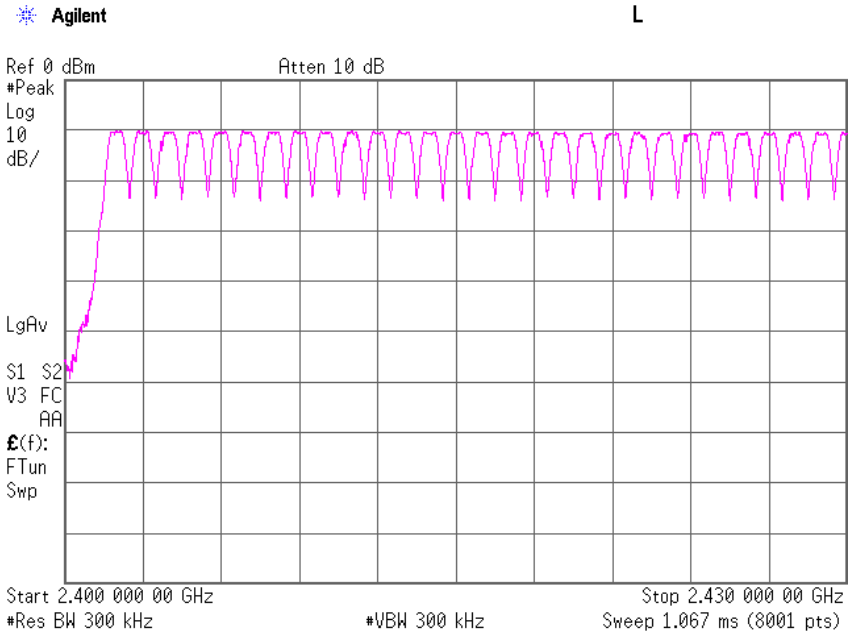
NUMBER OF HOPPING CHANNELS
(30 MHZ SPAN, FIRST SEGMENT)



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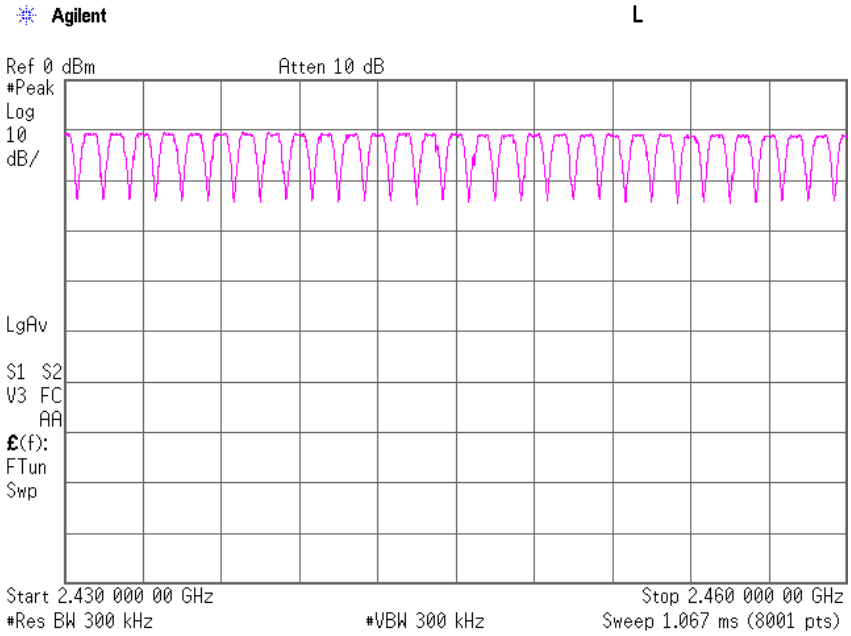
NUMBER OF HOPPING CHANNELS
(30 MHZ SPAN, SECOND SEGMENT)



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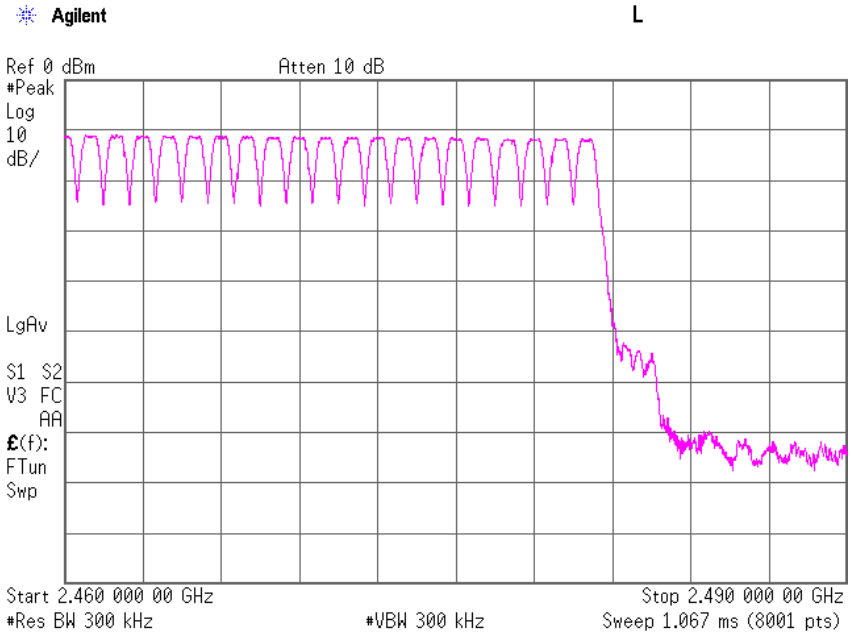
NUMBER OF HOPPING CHANNELS
(30 MHZ SPAN, THIRD SEGMENT)



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7.1.4. AVERAGE TIME OF OCCUPANCY

LIMIT

FCC §15.247 (a) (1) (iii)

IC RSS-210 A8.1 (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 31.6 second period (79 channels * 0.4 s) is equal to 10 * (# of pulses in 3.16 s) * pulse width.

RESULTS

Time Of Occupancy = 10 * xx pulses * yy msec = zz msec

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of (sec)	Limit (sec)	Margin (sec)
DH1	0.3950	33	0.1304	0.4	0.2697
DH3	1.6520	17	0.2808	0.4	0.1192
DH5	2.8990	11	0.3189	0.4	0.0811

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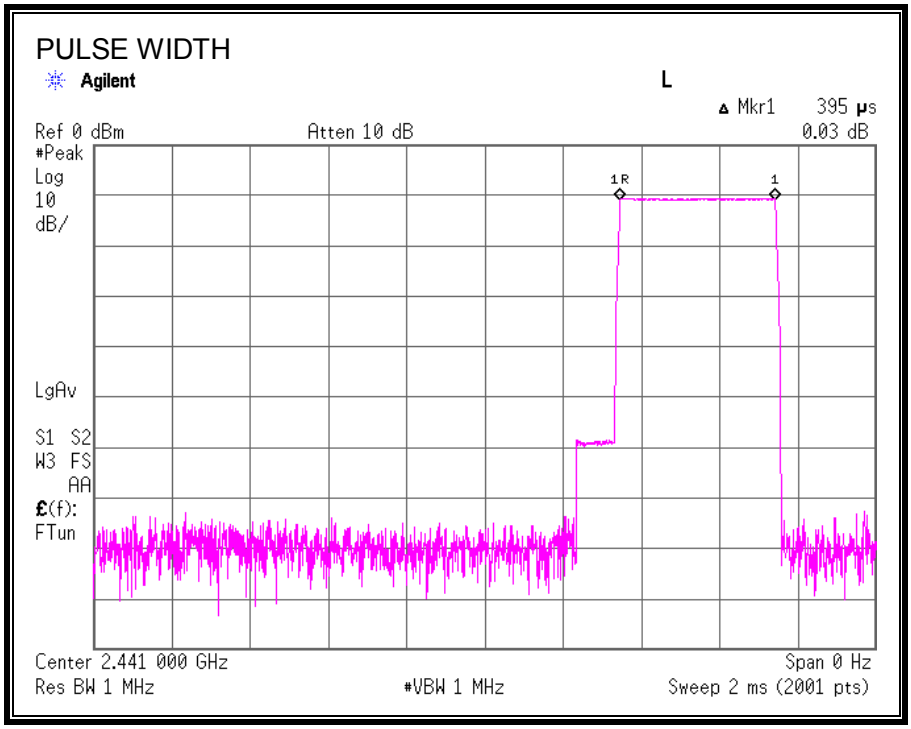
DH1 PULSE WIDTH



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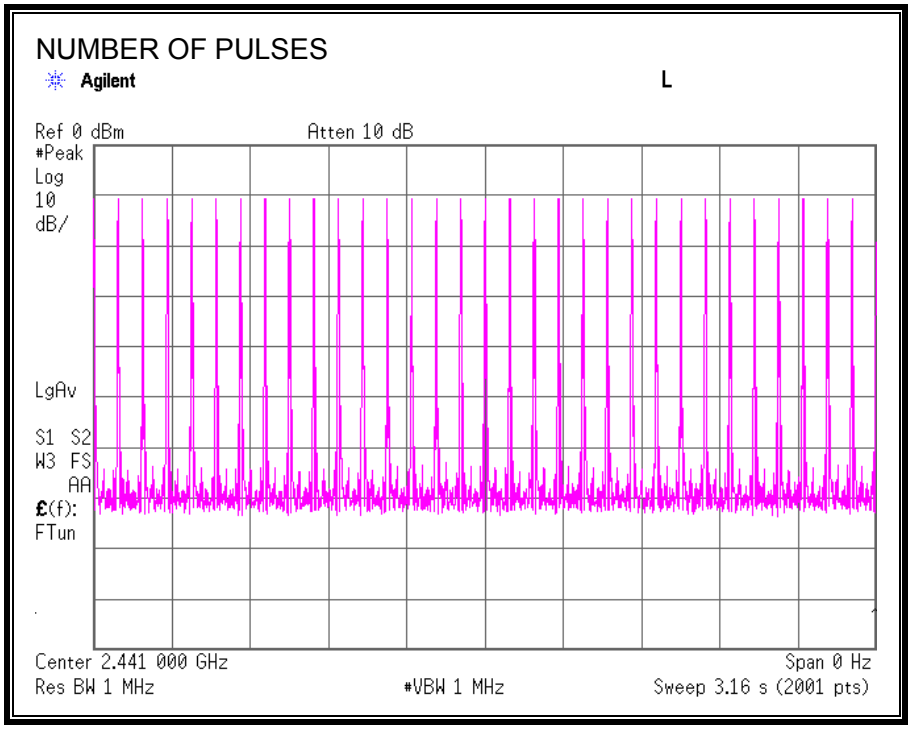
DH1 NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



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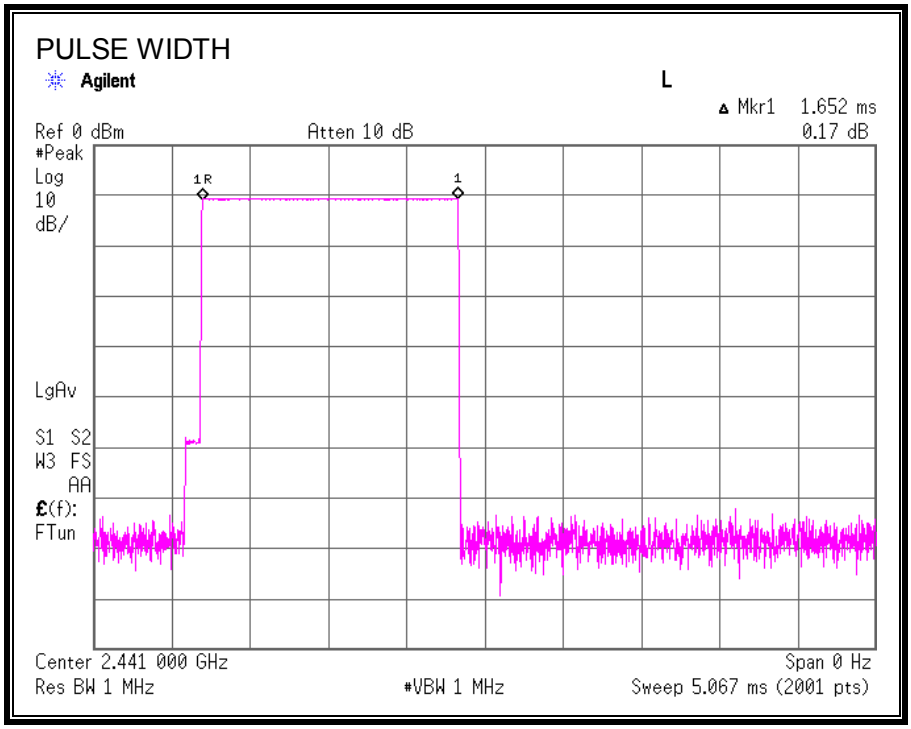
DH3 PULSE WIDTH



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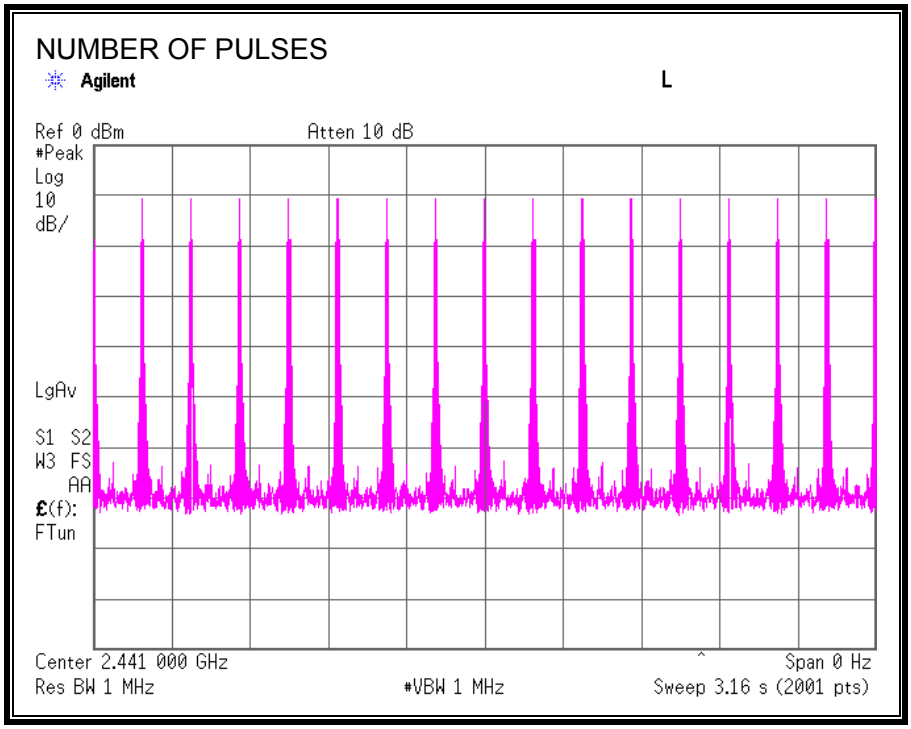

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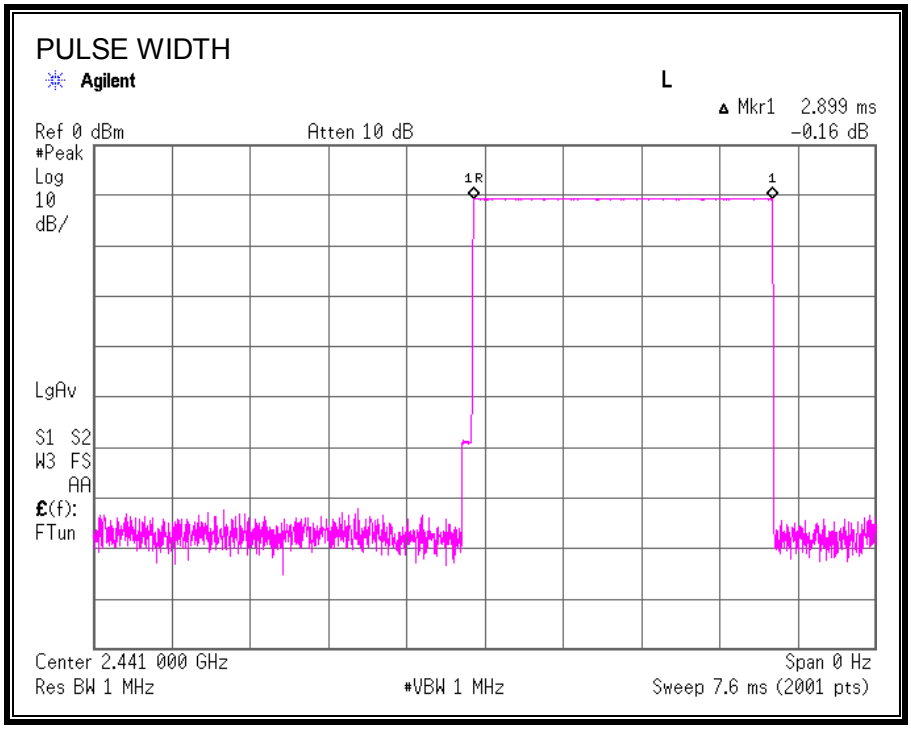
DH5 PULSE WIDTH



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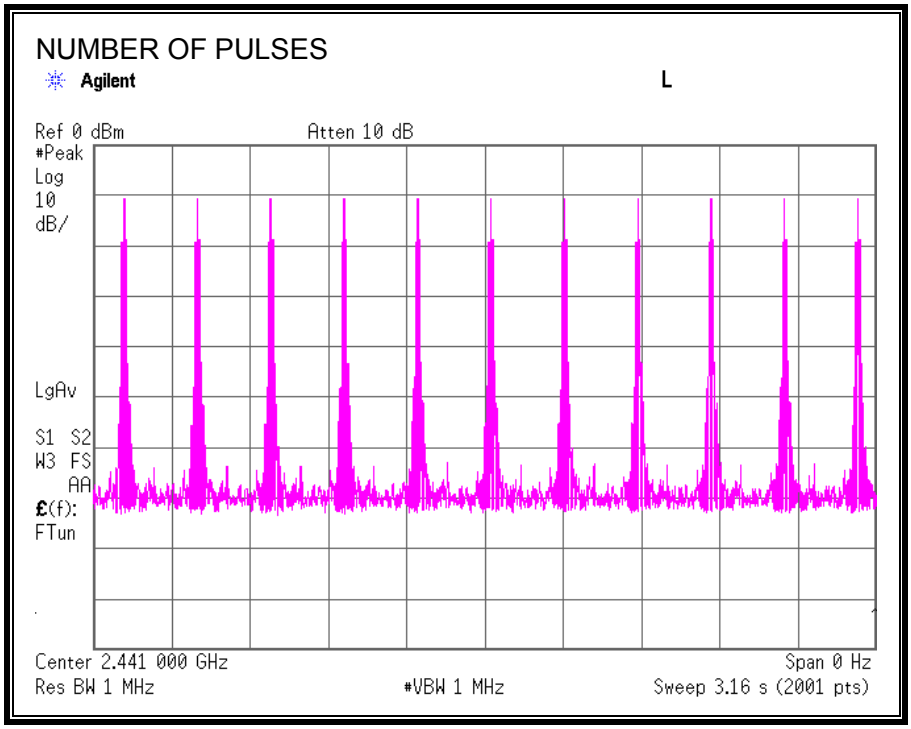
DH5 NUMBER OF PULSES IN 3.16 SECOND OBSERVATION PERIOD



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7.1.5. OUTPUT POWER

LIMIT

§15.247 (b) (1)

RSS-210 Issue 8 Clause A8.4

The maximum antenna gain is less than 6 dBi, therefore the limit is 20.96 dBm.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer the analyzer bandwidth is set to a value greater than the 20 dB bandwidth of the EUT.

RESULTS

(Spectrum analyzer measurement)

Channel	Frequency (MHz)	Output Power Reading (dBm)	factor (cable ,ATT) (dB)	Output Power Result (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-10.05	10.46	0.41	20.96	-20.55
Middle	2441	-10.47	10.47	0.00	20.96	-20.96
High	2480	-11.49	10.48	-1.01	20.96	-21.97

(Power meter measurement)

Channel	Frequency (MHz)	Output Power Reading (dBm)	factor (cable ,ATT) (dB)	Output Power Result (dBm)	Limit (dBm)	Margin (dB)
Low	2402	-9.98	10.46	0.48	20.96	-20.48
Middle	2441	-10.29	10.47	0.18	20.96	-20.78
High	2480	-11.28	10.48	-0.80	20.96	-21.76

Sample calculation: Output Power Reading [dBm] + factor [dB]
Test was not performed at AFH mode because this Bluetooth radio is in compliance of Bluetooth Specification 2.0 and the output power at non-AFH mode is less than 20.96dBm.

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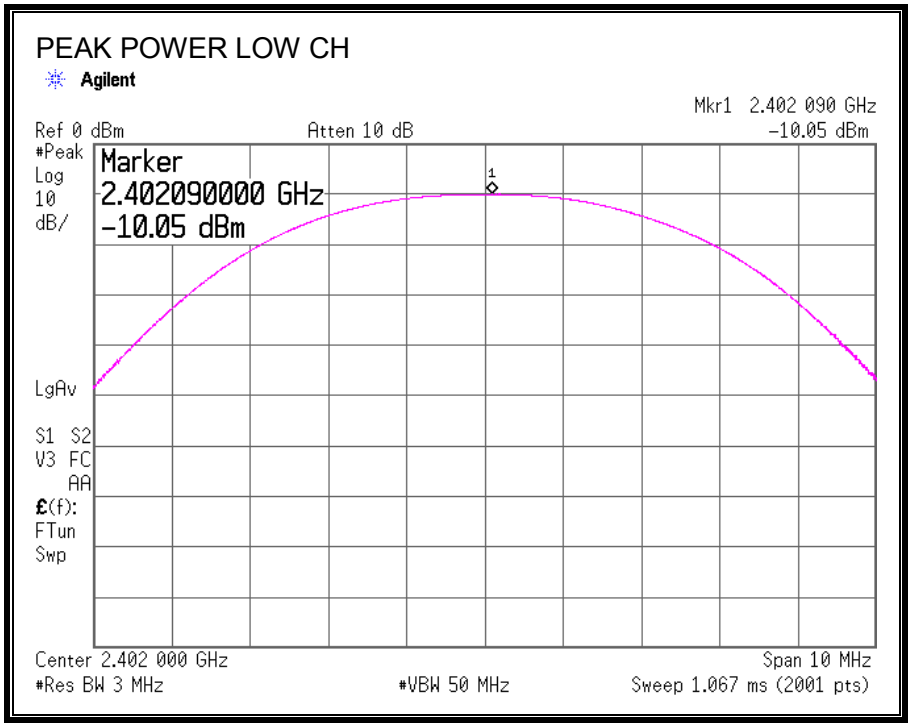
OUTPUT POWER



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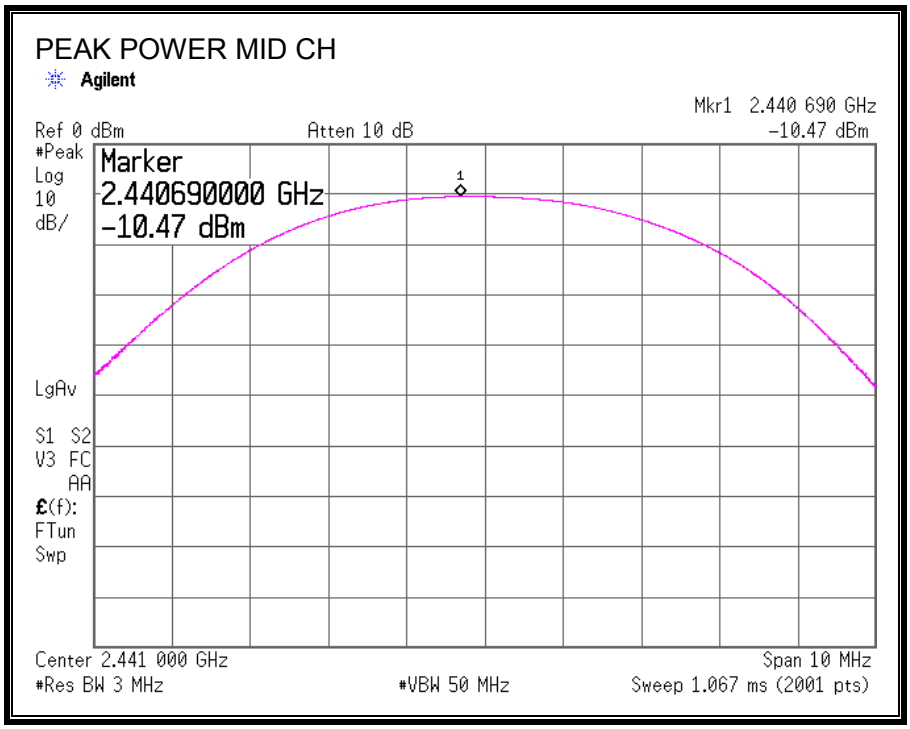

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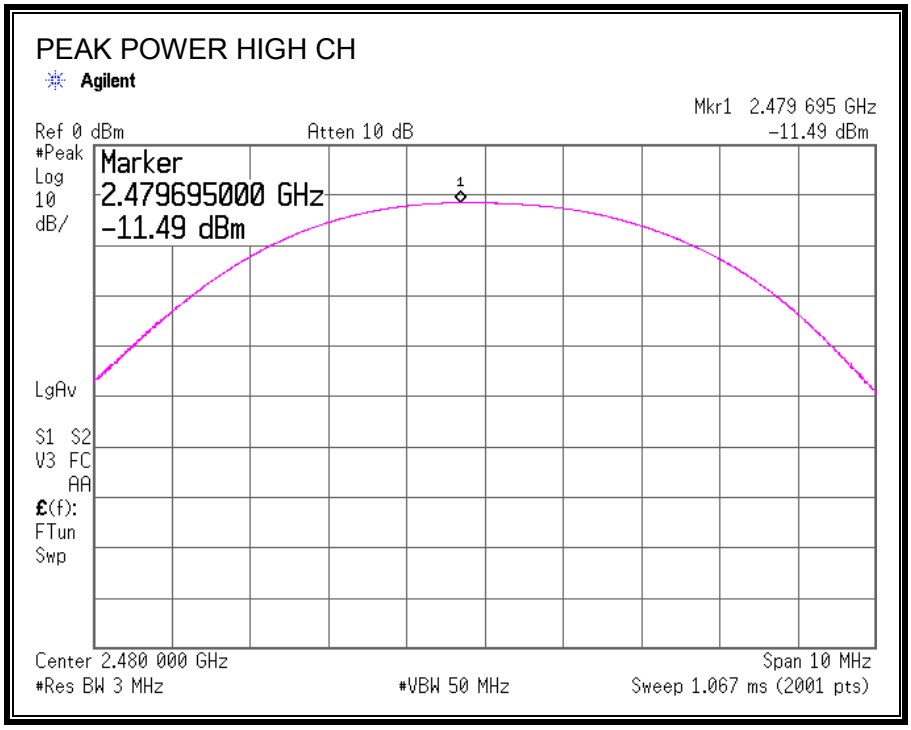

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7.1.6. AVERAGE POWER

LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.46 - 10.48 dB (including 9.68 dB pad and 0.78 - 0.80 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Average Power Reading (dBm)	Factor (cable ,ATT) (dB)	Average Power Result (dBm)
Low	2402	-11.39	10.46	-0.93
Middle	2441	-11.76	10.47	-1.29
High	2480	-12.81	10.48	-2.33

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7.1.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-210 A8.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.
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. (9kHz-150kHz:RBW=200Hz, 150kHz-30MHz:RBW=10kHz)

The spectrum from 9 kHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

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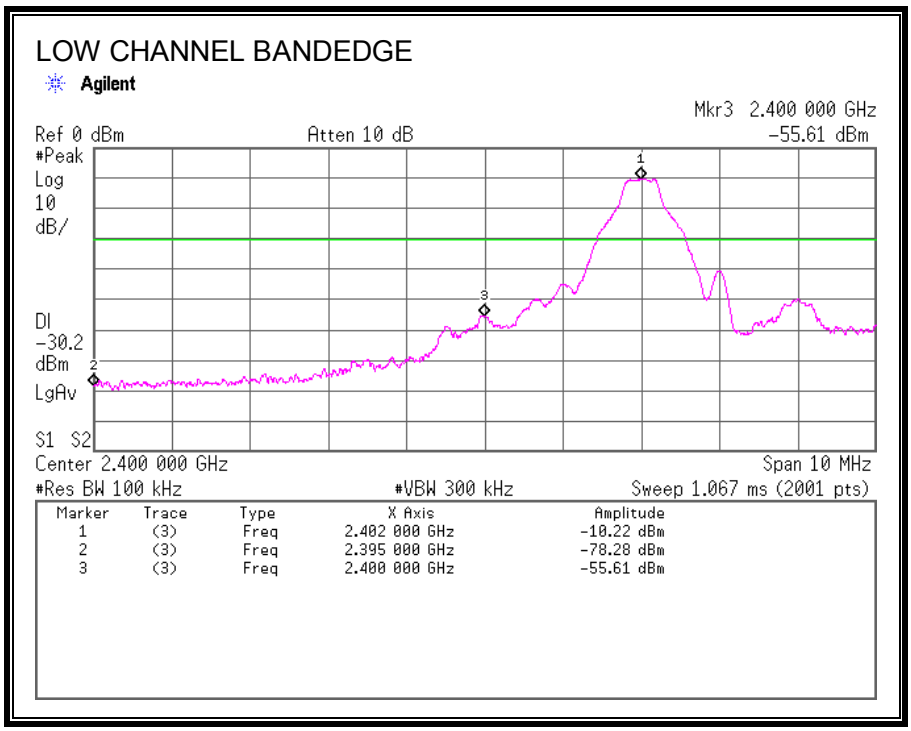
RESULTS

SPURIOUS EMISSIONS, LOW CHANNEL



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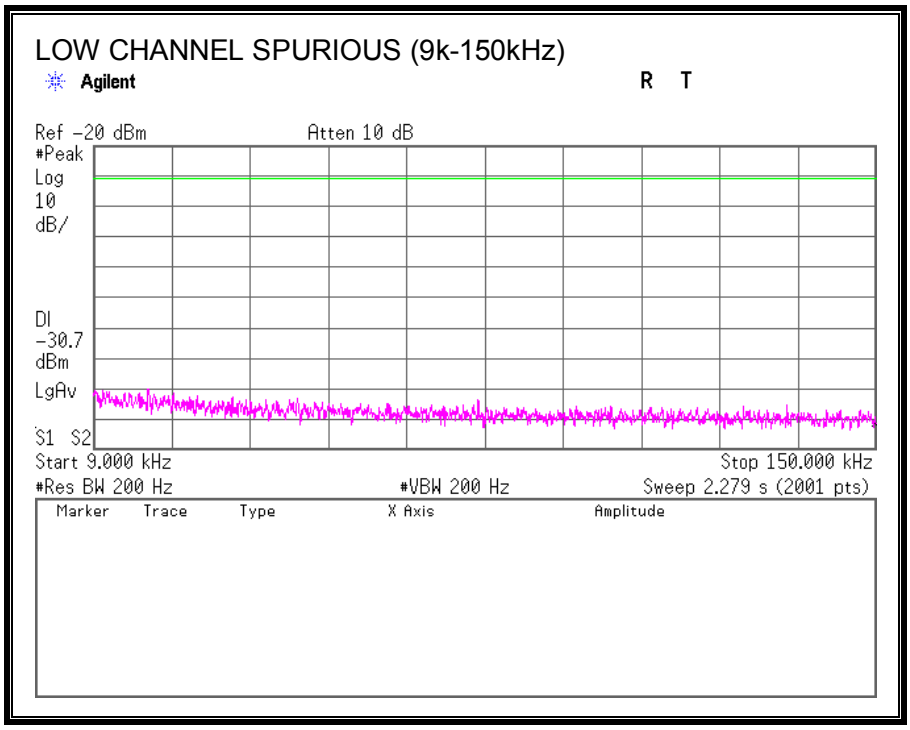

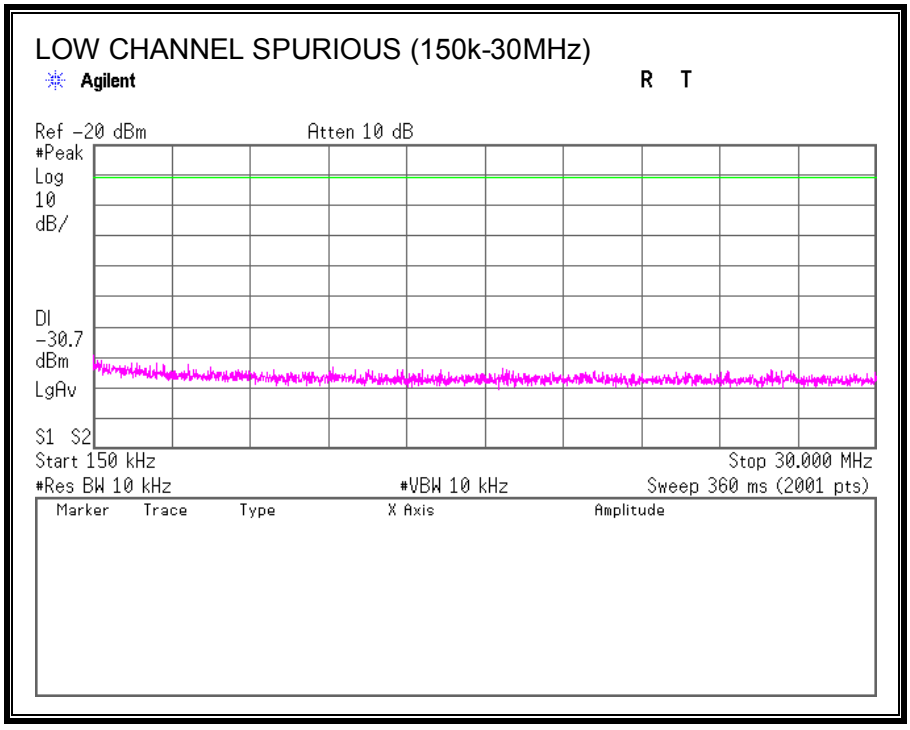

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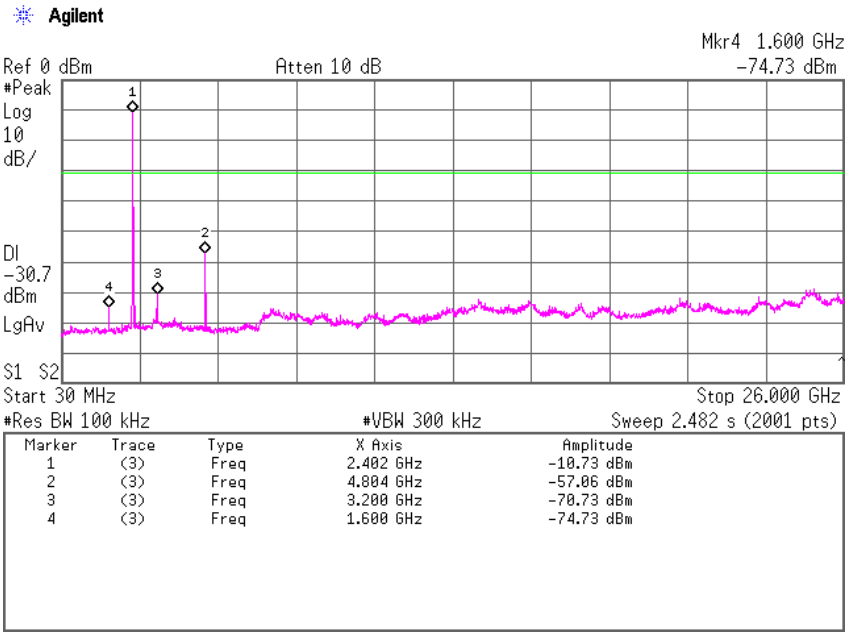
LOW CHANNEL SPURIOUS (30M-26GHz)



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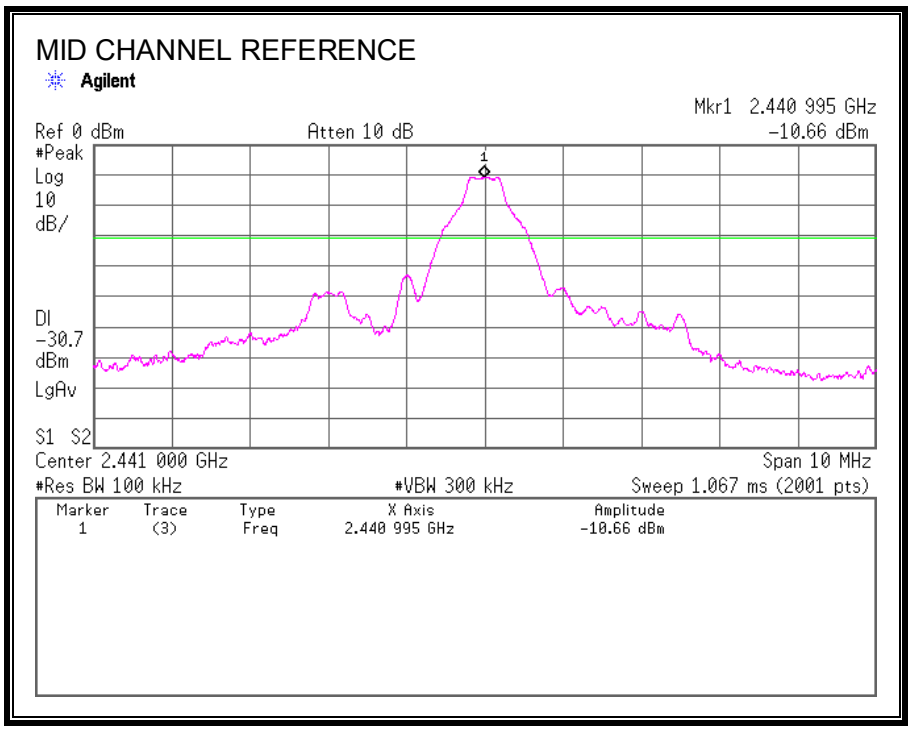
SPURIOUS EMISSIONS, MID CHANNEL



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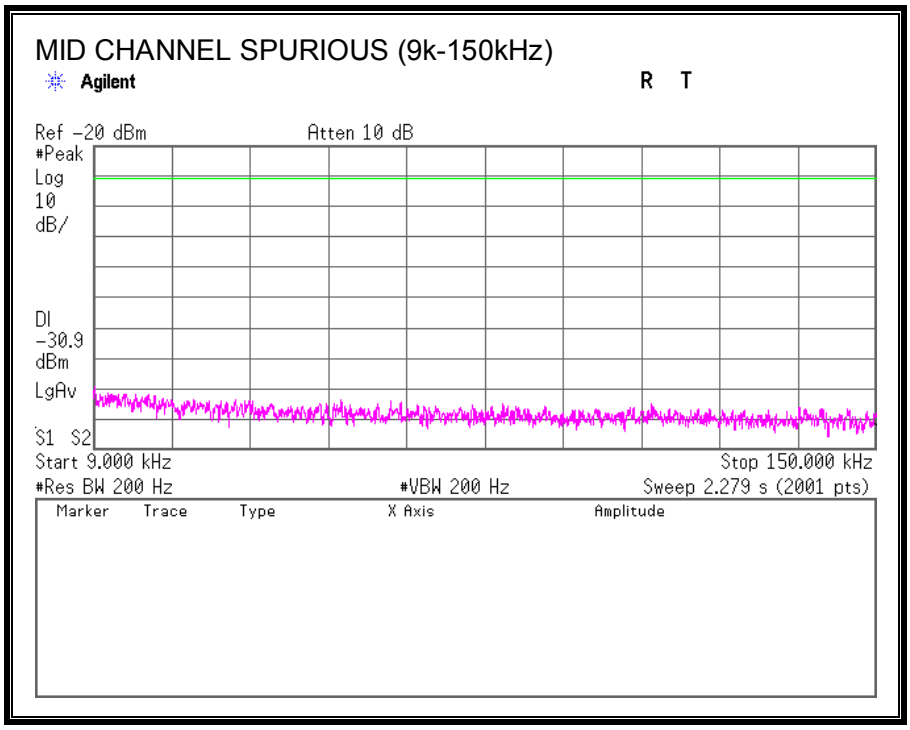

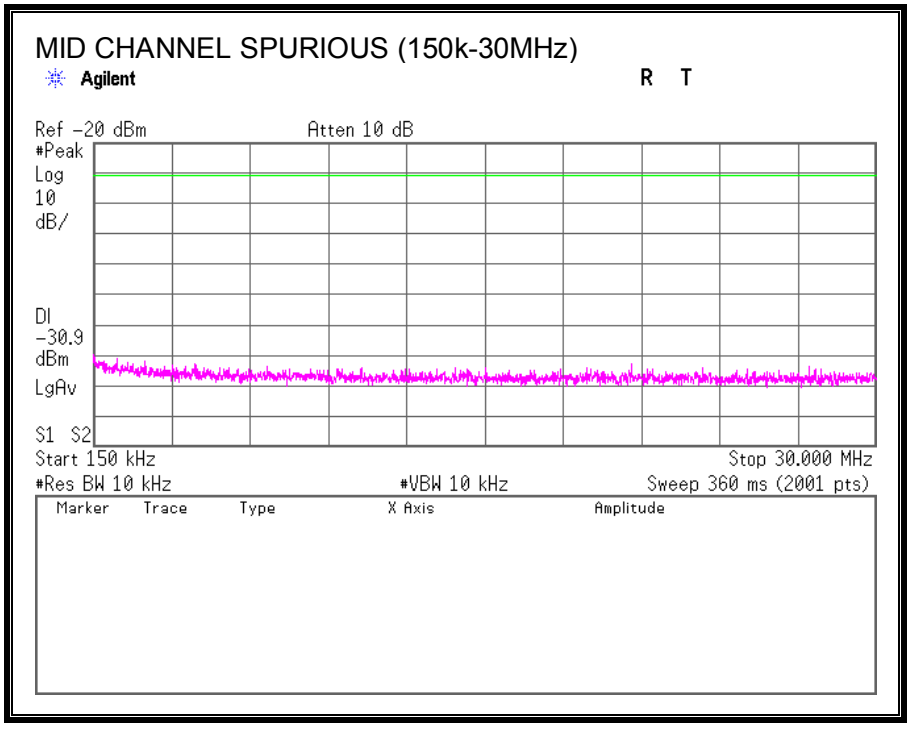

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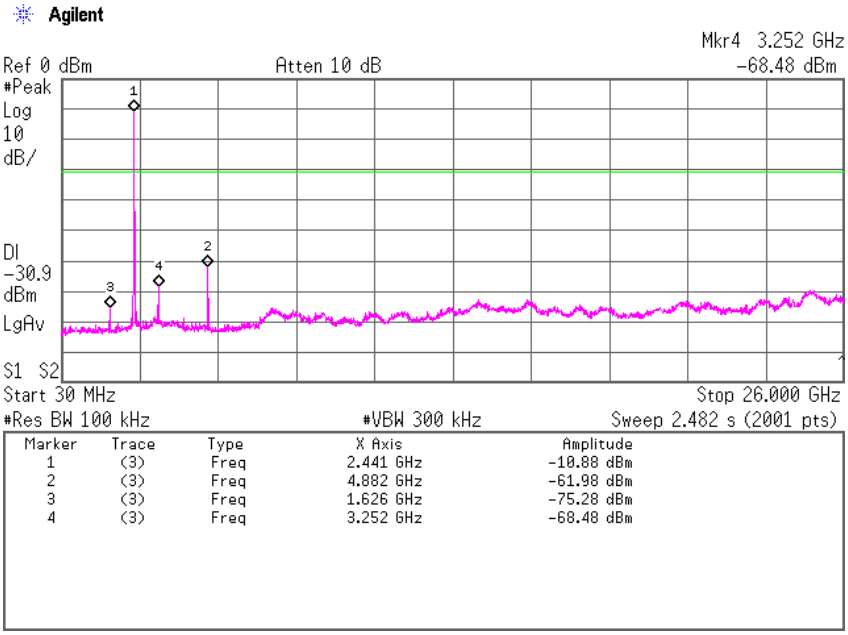
MID CHANNEL SPURIOUS (30M-26GHz)



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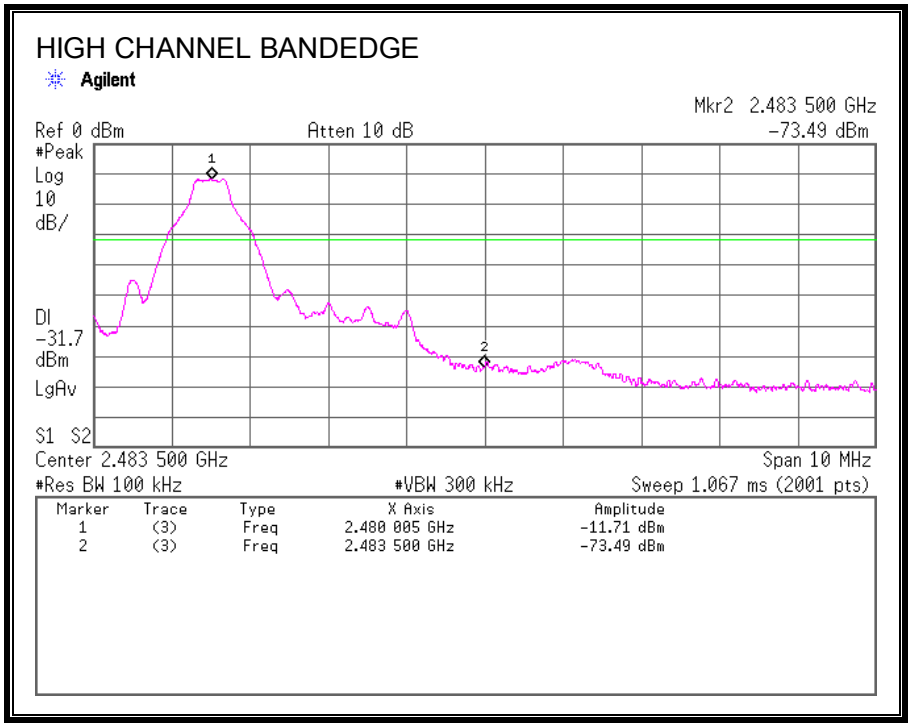
SPURIOUS EMISSIONS, HIGH CHANNEL



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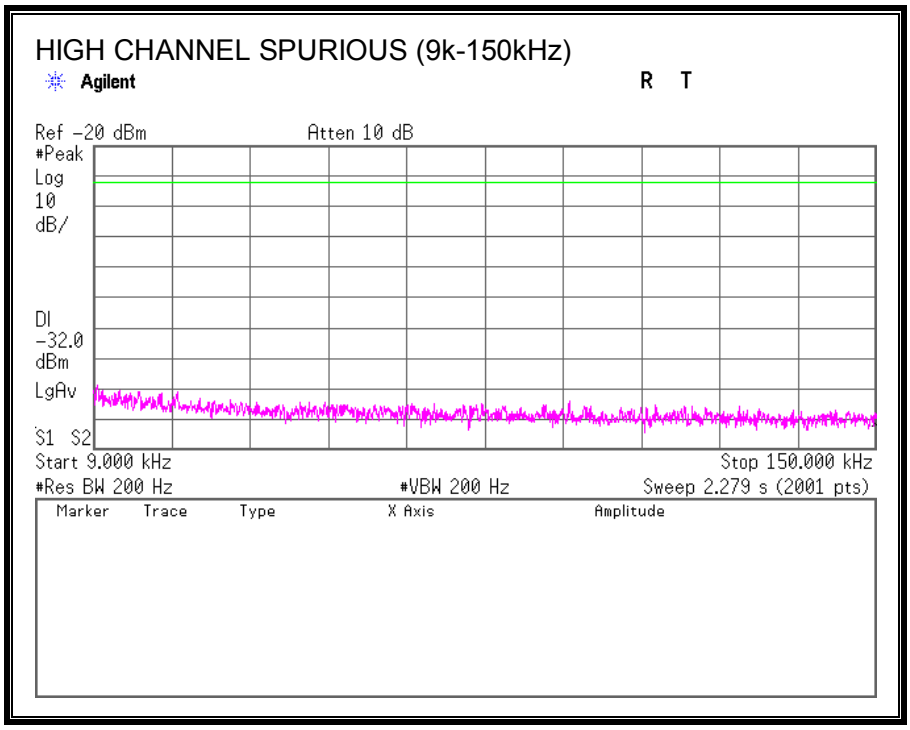

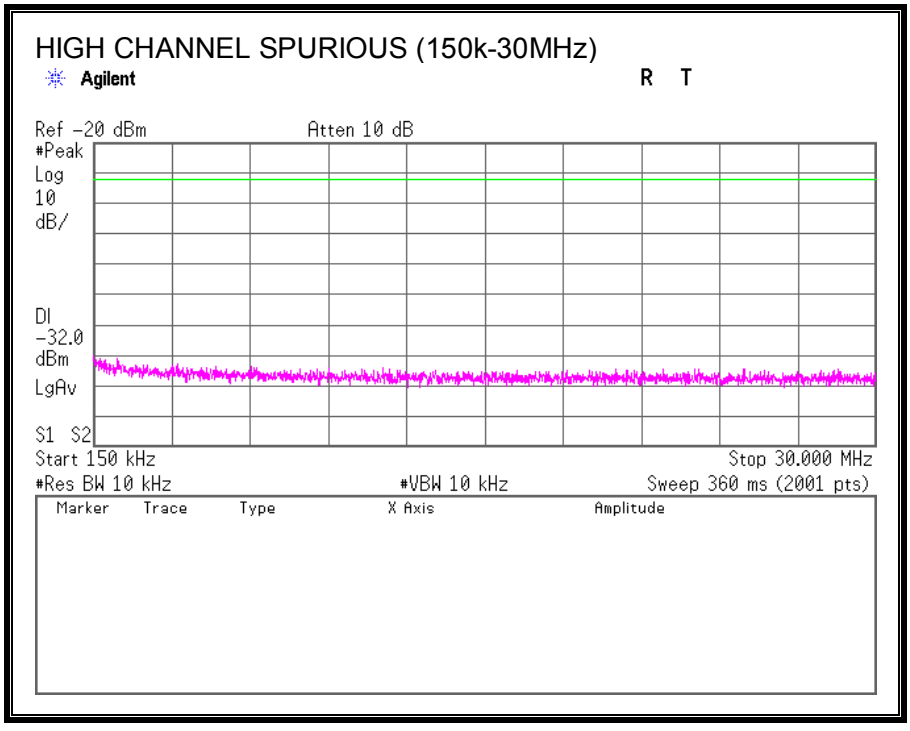

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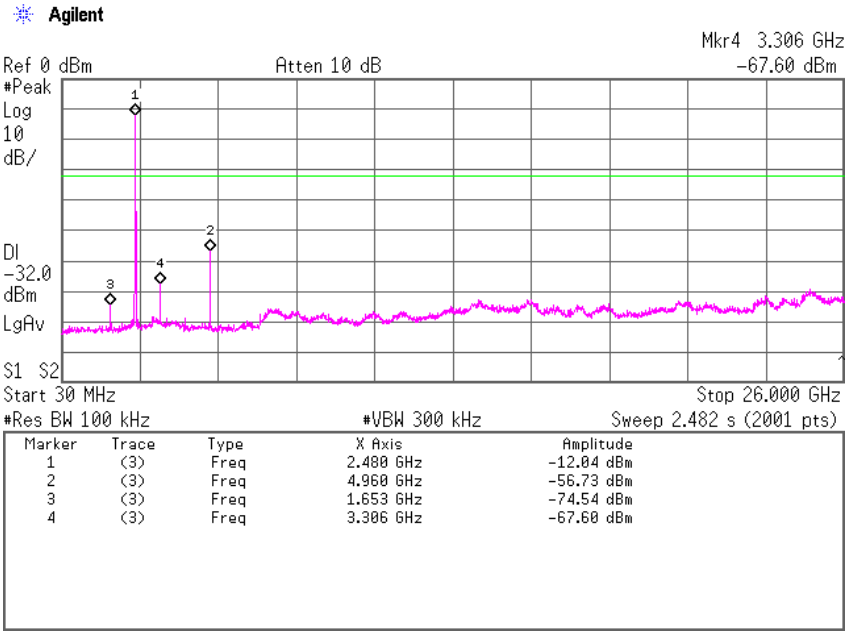
HIGH CHANNEL SPURIOUS



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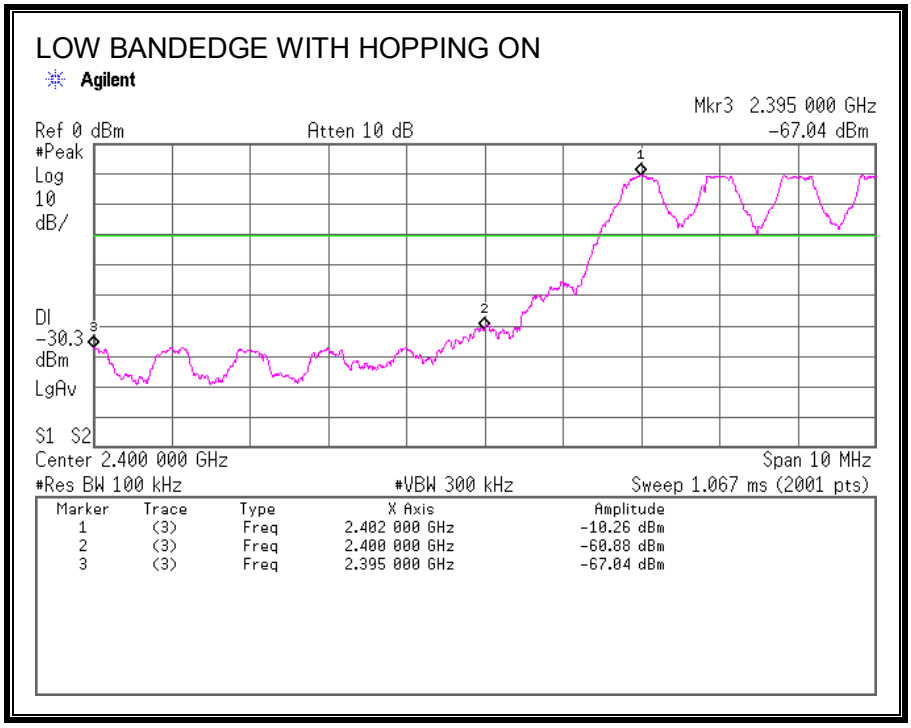
SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



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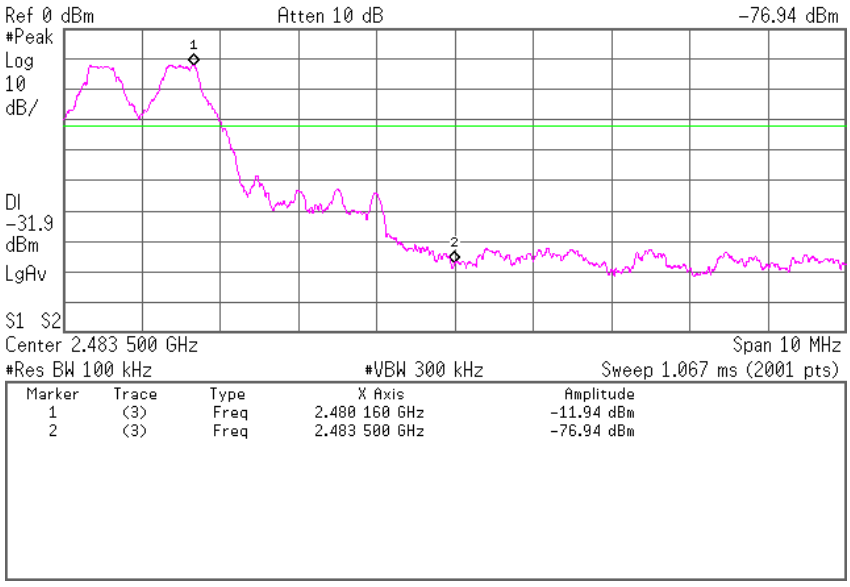
HIGH BANDEDGE WITH HOPPING ON



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8. RADIATED TEST RESULTS

8.1 LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN 7.2.5 (Transmitter)

IC RSS-GEN Clause 6 (Receiver)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

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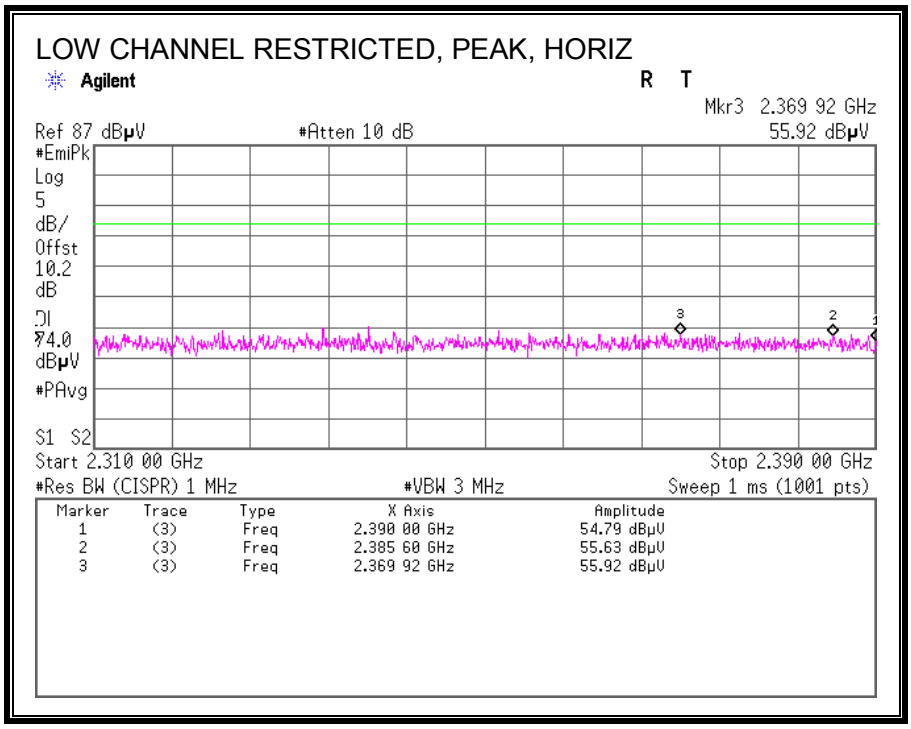
8.2 TRANSMITTER ABOVE 1 GHz

8.2.1 BASIC DATA RATE GFSK MODULATION

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



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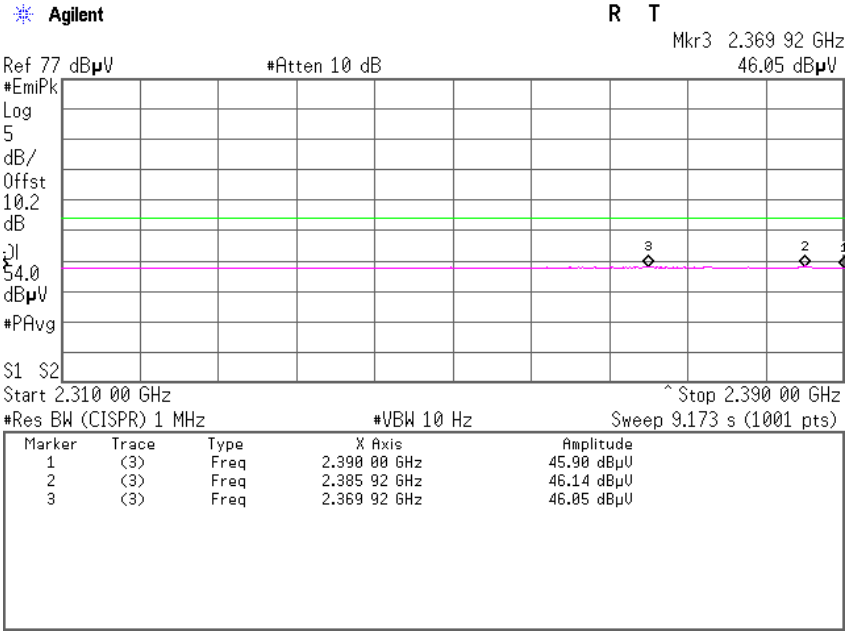
LOW CHANNEL RESTRICTED, AVG, HORIZ



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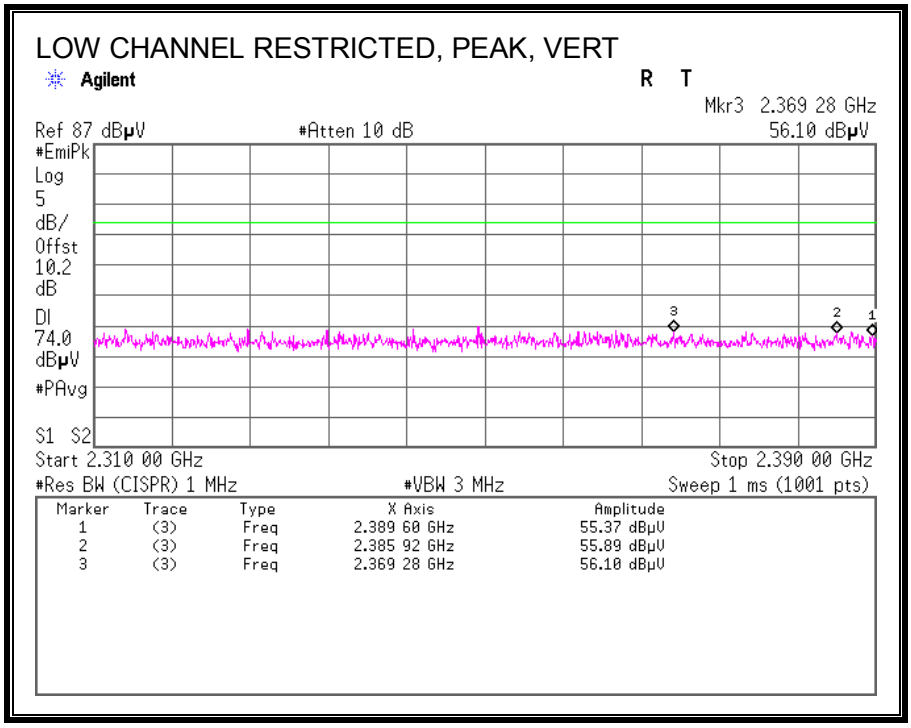
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



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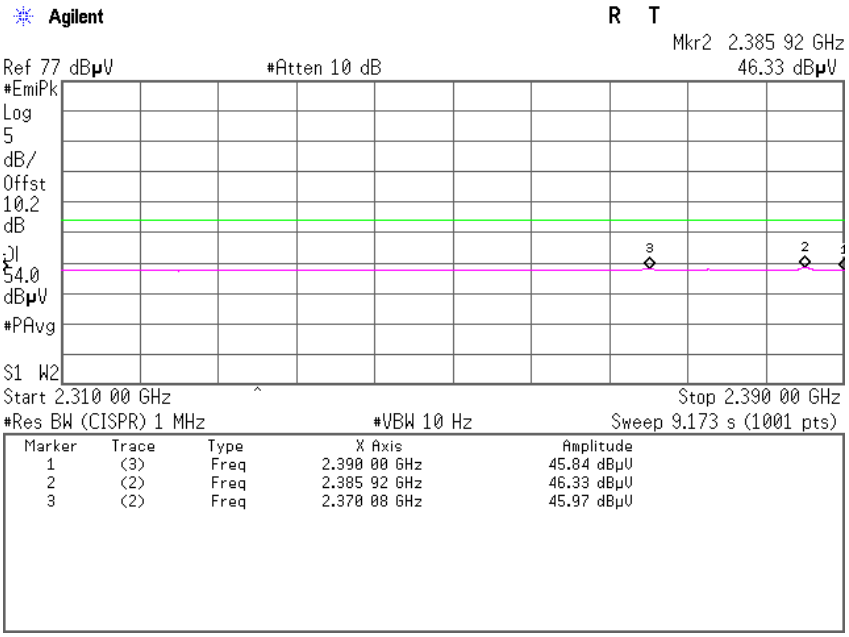
LOW CHANNEL RESTRICTED, AVG, VERT



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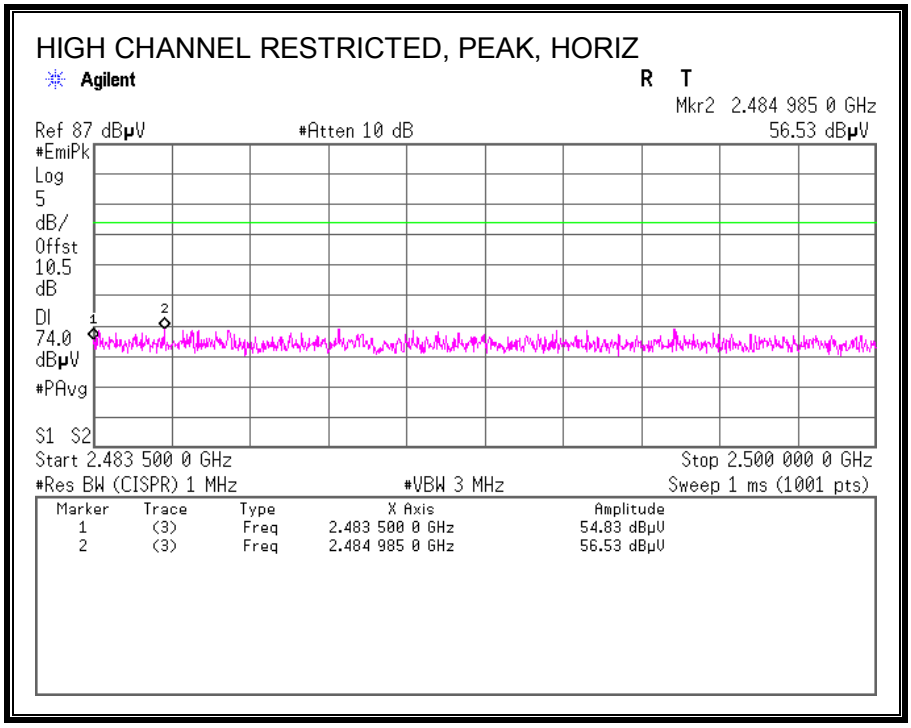
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



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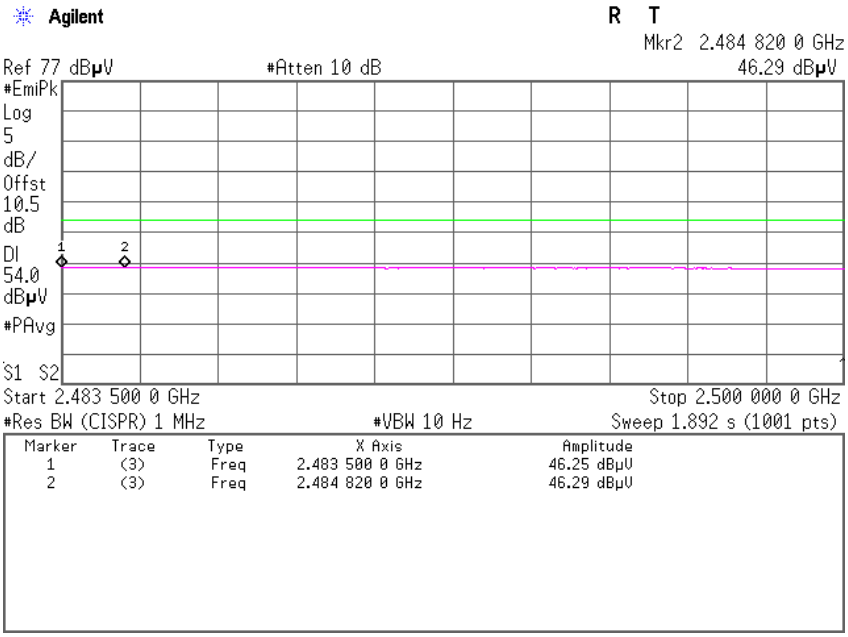
HIGH CHANNEL RESTRICTED, AVG, HORIZ



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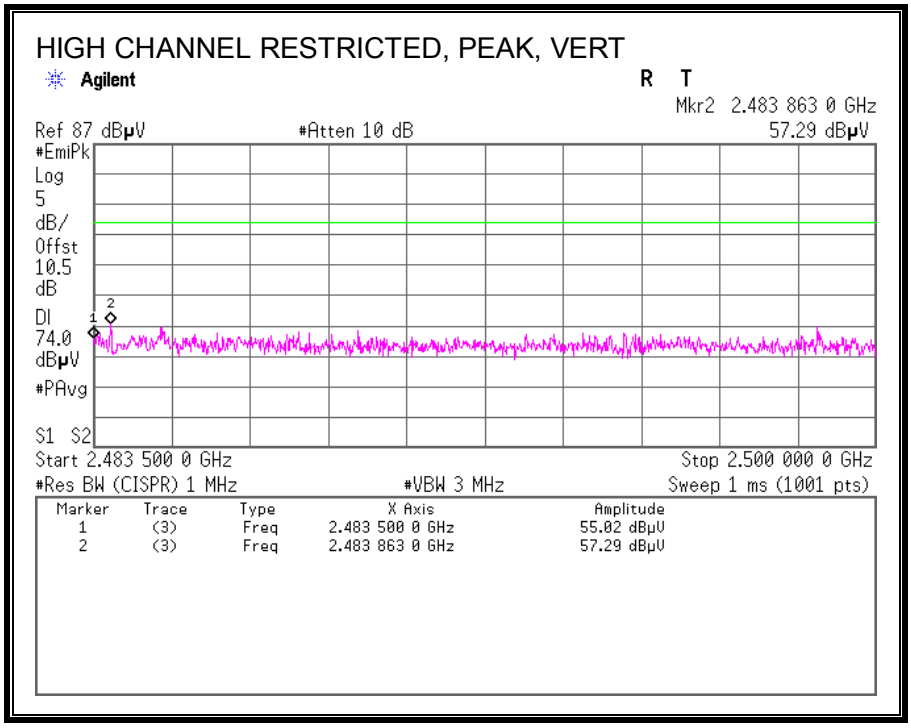
RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



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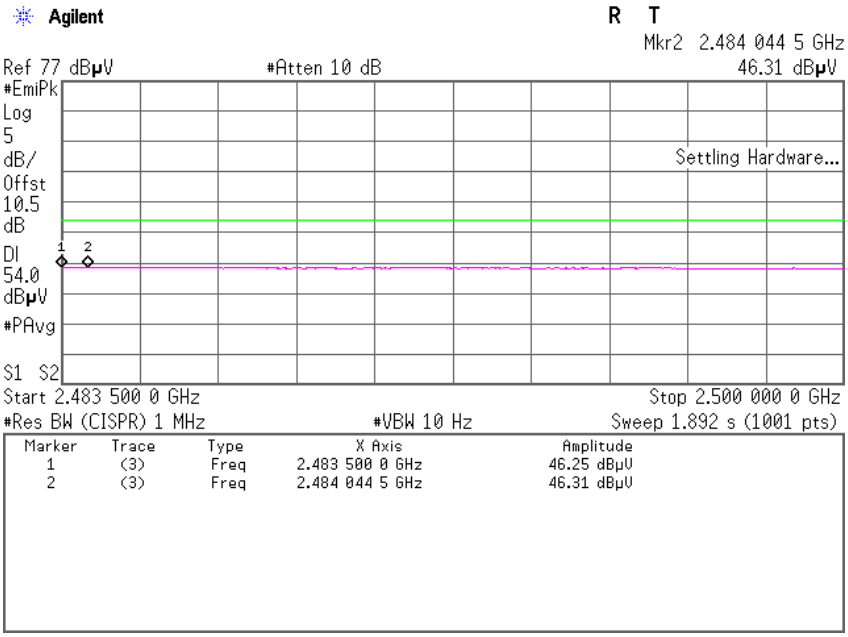
HIGH CHANNEL RESTRICTED, AVG, VERT



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HARMONICS AND SPURIOUS EMISSIONS

Radiated Emission

Test place: UL Japan, Inc. Shonan EMC Lab. No.3 Semi Anechoic Chamber
Date: 3/15/2012
Temperature / Humidity: 23deg.C. , 23%RH
Engineer: Akio Hayashi (above 1GHz)
Mode: Tx, Bluetooth, BDR, PRBS9

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
[Tx 2402MHz]												
Hori.	1601.970	PK	46.2	25.4	23.4	40.9	54.1	73.9	19.8	114	157	
Hori.	1601.970	AV	36.2	25.4	23.4	40.9	44.1	53.9	9.8	114	157	
Vert.	1601.970	PK	46.9	25.4	23.4	40.9	54.8	73.9	19.1	157	33	
Vert.	1601.970	AV	36.3	25.4	23.4	40.9	44.2	53.9	9.7	157	33	
Hori.	3203.940	PK	46.7	29.0	5.4	41.5	39.6	73.9	34.3	101	193	
Hori.	3203.940	AV	36.6	29.0	5.4	41.5	29.5	53.9	24.4	101	193	
Vert.	3203.940	PK	47.1	29.0	5.4	41.5	40.0	73.9	33.9	125	101	
Vert.	3203.940	AV	38.1	29.0	5.4	41.5	31.0	53.9	22.9	125	101	
Hori.	4804.000	PK	51.6	31.1	5.9	41.1	47.5	73.9	26.4	100	180	
Hori.	4804.000	AV	42.4	31.1	5.9	41.1	38.3	53.9	15.6	100	180	
Vert.	4804.000	PK	54.5	31.1	5.9	41.1	50.4	73.9	23.5	100	175	
Vert.	4804.000	AV	44.9	31.1	5.9	41.1	40.8	53.9	13.1	100	175	
[Tx 2441MHz]												
Hori.	1626.680	PK	46.3	25.4	23.4	40.9	54.2	73.9	19.7	110	127	
Hori.	1626.680	AV	36.1	25.4	23.4	40.9	44.0	53.9	9.9	110	127	
Vert.	1626.680	PK	46.0	25.4	23.4	40.9	53.9	73.9	20.0	113	41	
Vert.	1626.680	AV	36.4	25.4	23.4	40.9	44.3	53.9	9.6	113	41	
Hori.	3253.360	PK	46.7	29.0	5.4	41.6	39.5	73.9	34.4	100	192	
Hori.	3253.360	AV	37.0	29.0	5.4	41.6	29.8	53.9	24.1	100	192	
Vert.	3253.360	PK	48.0	29.0	5.4	41.6	40.8	73.9	33.1	117	84	
Vert.	3253.360	AV	38.9	29.0	5.4	41.6	31.7	53.9	22.2	117	84	
Hori.	4882.000	PK	51.7	31.2	5.9	40.9	47.9	73.9	26.0	103	174	
Hori.	4882.000	AV	42.5	31.2	5.9	40.9	38.7	53.9	15.2	103	174	
Vert.	4882.000	PK	52.3	31.2	5.9	40.9	48.5	73.9	25.4	100	335	
Vert.	4882.000	AV	43.1	31.2	5.9	40.9	39.3	53.9	14.6	100	335	
[Tx 2480MHz]												
Hori.	1652.654	PK	46.4	25.5	23.4	40.9	54.4	73.9	19.5	100	151	
Hori.	1652.654	AV	36.9	25.5	23.4	40.9	44.9	53.9	9.0	100	151	
Vert.	1652.654	PK	46.2	25.5	23.4	40.9	54.2	73.9	19.7	112	21	
Vert.	1652.654	AV	36.9	25.5	23.4	40.9	44.9	53.9	9.0	112	21	
Hori.	3305.308	PK	48.3	29.1	5.3	41.6	41.1	73.9	32.8	106	159	
Hori.	3305.308	AV	39.5	29.1	5.3	41.6	32.3	53.9	21.6	106	159	
Vert.	3305.308	PK	49.0	29.1	5.3	41.6	41.8	73.9	32.1	115	99	
Vert.	3305.308	AV	41.0	29.1	5.3	41.6	33.8	53.9	20.1	115	99	
Hori.	4960.000	PK	54.8	31.4	5.9	40.8	51.3	73.9	22.6	100	237	
Hori.	4960.000	AV	46.2	31.4	5.9	40.8	42.7	53.9	11.2	100	237	
Vert.	4960.000	PK	54.2	31.4	5.9	40.8	50.7	73.9	23.2	109	176	
Vert.	4960.000	AV	45.3	31.4	5.9	40.8	41.8	53.9	12.1	109	176	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amprifier)
*Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

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8.2.2 ENHANCED DATA RATE 8PSK MODULATION

N/A

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8.3 RECEIVER ABOVE 1 GHz

Radiated Emission

Test place	UL Japan, Inc. Shonan EMC Lab.	No.3 Semi Anechoic Chamber
Date	3/15/2012	
Temperature / Humidity	23deg.C. , 23%RH	
Engineer	Akio Hayashi (above 1GHz)	
Mode	Rx, 2441 MHz Rx, Bluetooth, BDR	

Polarity	Frequency [MHz]	Detector	Reading [dBuV]	Ant.Fac. [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [deg.]	Remark
Hori.	1628.362	PK	54.3	25.4	3.1	40.9	41.9	73.9	32.0	128	354	
Hori.	1628.362	AV	51.3	25.4	3.1	40.9	38.9	53.9	15.0	128	354	
Vert.	1628.362	PK	57.2	25.4	3.1	40.9	44.8	73.9	29.1	105	357	
Vert.	1628.362	AV	55.1	25.4	3.1	40.9	42.7	53.9	11.2	105	357	
Hori.	2442.495	PK	57.9	27.4	3.8	41.1	48.0	73.9	25.9	108	151	
Hori.	2442.495	AV	55.8	27.4	3.8	41.1	45.9	53.9	8.0	108	151	
Vert.	2442.495	PK	55.3	27.4	3.8	41.1	45.4	73.9	28.5	127	183	
Vert.	2442.495	AV	51.9	27.4	3.8	41.1	42.0	53.9	11.9	127	183	
Hori.	3256.724	PK	46.1	29.0	4.4	41.6	37.9	73.9	36.0	112	181	
Hori.	3256.724	AV	36.5	29.0	4.4	41.6	28.3	53.9	25.6	112	181	
Vert.	3256.724	PK	47.7	29.0	4.4	41.6	39.5	73.9	34.4	125	121	
Vert.	3256.724	AV	37.8	29.0	4.4	41.6	29.6	53.9	24.3	125	121	

Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amprifier)

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

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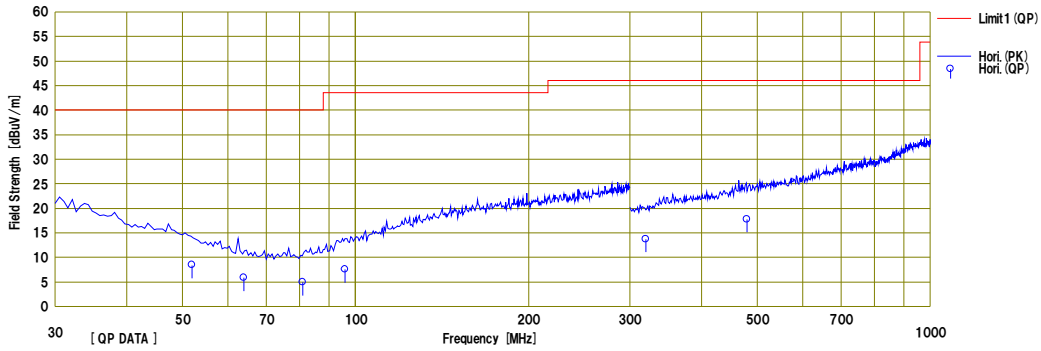
8.4 WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, HORIZONTAL)

HORIZONTAL PLOT



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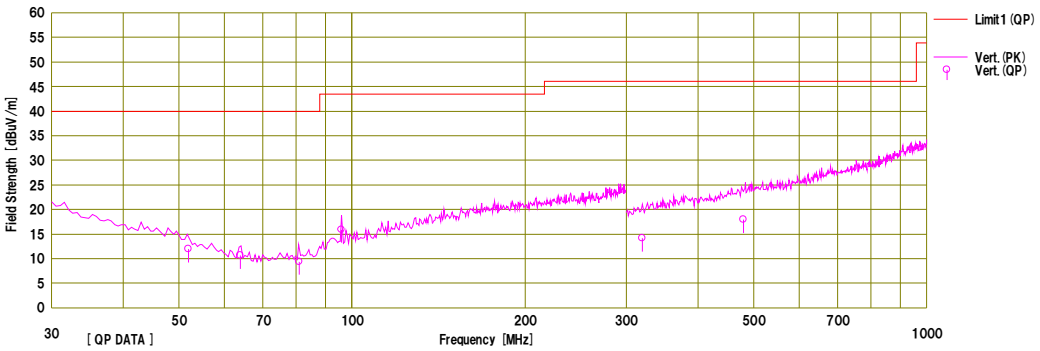
SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

VERTICAL PLOT



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HORIZONTAL AND VERTICAL DATA

DATA OF RADIATED EMISSION TEST

UL Japan,Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
Date : 2012/03/16

Company : MITSUMI ELECTRIC CO., LTD.
Kind of EUT : Remote Cotroller
Model No. : DR237973
Serial No. : DE2151

Mode : Tx DH5 2402MHz
Report No. : 32HE0052-SH-01-A
Power : DC3.6V
Temp./Humi. : 22deg.C. / 33%RH

Remarks : Hor:X, Ver:Z-axis

Limit1 : FCC15.209 3m, below 1GHz:QP, above 1GHz:AV

Engineer : Akio Hayashi

<< QP DATA >>

No.	Freq.	Reading <QP>	Ant.Fac	Loss	Gain	Result <QP>	Limit <QP>	Margin <QP>	Pola.	Height	Angle	Ant. Type	Comment
	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[H/V]	[cm]	[deg]		
1	51.999	23.3	10.5	6.7	32.1	8.4	40.0	31.6	Hori	100	0	BC	
2	64.006	23.9	7.6	6.4	32.1	5.8	40.0	34.2	Hori	100	0	BC	
3	81.009	23.3	6.3	7.4	32.1	4.9	40.0	35.1	Hori	100	359	BC	
4	95.997	23.3	8.9	7.4	32.1	7.5	43.5	36.0	Hori	100	0	BC	
5	320.000	22.4	14.4	8.8	31.9	13.7	46.0	32.3	Hori	100	359	LP	
6	480.000	22.6	17.5	9.5	31.9	17.7	46.0	28.3	Hori	100	0	LP	
7	51.999	26.8	10.5	6.7	32.1	11.9	40.0	28.1	Vert.	100	182	BC	
8	64.006	28.7	7.6	6.4	32.1	10.6	40.0	29.4	Vert.	100	240	BC	
9	81.009	27.8	6.3	7.4	32.1	9.4	40.0	30.6	Vert.	101	239	BC	
10	95.997	31.7	8.9	7.4	32.1	15.9	43.5	27.6	Vert.	100	140	BC	
11	320.000	22.8	14.4	8.8	31.9	14.1	46.0	31.9	Vert.	100	0	LP	
12	480.000	22.8	17.5	9.5	31.9	17.9	46.0	28.1	Vert.	100	0	LP	

Calculation:Result [dBuV/m] =Reading [dBuV] +Ant.Fac [dB/m] +Loss (Cable+ATT) [dB] -Gain (AMP) [dB]
Ant.Type=BC:Biconical Antenna LP:Logperiodic Antenna SHA03: Horn

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9 AC POWER LINE CONDUCTED EMISSIONS

EUT is only powered by batteries and it does not connect to the public power network; therefore, this test is not required.

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