



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

CERTIFICATION TEST REPORT

FOR

BLUETOOTH MODULE

MODEL NUMBER: GN-2020

**FCC ID: BJI-GN2020
IC: 1004C-GN2020**

REPORT NUMBER: 31LE0192-SH-A

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Prepared for
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6-78, MINAMI-CHO
MISHIMA-SHI
SHIZUOKA-PREF, 411-8520, JAPAN**

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JAB Accreditation No. : RTL02610



Revision History

Rev.	Issue Date	Revisions	Revised By
--	08/03/11	Initial Issue	A.Hayashi

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: TOSHIBA TEC CORPORATION
6-78, MINAMI-CHO,
MISHIMA-SHI,
SHIZUOKA-PREF, 411-8520, JAPAN

EUT DESCRIPTION: BLUETOOTH MODULE

MODEL: GN-2020

SERIAL NUMBER: 002258C52904

DATE TESTED: July 19 and 20, 2011

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,
UL Verification Service

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:

$$\text{Field Strength (dBuV/m)} = \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \text{Cable Loss (dB)} - \text{Preamp Gain (dB)}$$

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER		UNCERTAINTY
Power Line Conducted Emission	150kHz-30MHz	+/- 3.1 dB
	30MHz-300MHz	+/- 4.7 dB
Radiated Emission	300MHz-1000MHz	+/- 4.6 dB
	1000MHz-13GHz	+/- 4.0 dB
	13GHz-18GHz	+/- 4.8 dB
	18GHz-26.5GHz	+/- 4.2 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a Bluetooth Module (Power Class 2).
The radio module is manufactured by Taiyo Yuden.

5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The major change filed under this application is adding a ferrite core on the antenna to install into the specific host, Toshiba TEC Multifunctional Digital System; DP-2095, DP-2530, DP-3020, DP-3590, DP-4590, DP-5560, DP-6560, DP-7560, and DP-8560. The test was conducted by DP-3020, a representative model of Toshiba TEC Multifunctional Digital System.

5.3. MAXIMUM OUTPUT POWER

The test measurement passed within ± 0.5 dBm of the original output power.

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a PIFA antenna, a maximum gain, 0.5dBi including the cable loss.

5.5. SOFTWARE AND FIRMWARE

The EUT driver software installed in the Laptop during testing was Bluetest, rev. 3

5.6. WORST-CASE CONFIGURATION AND MODE

The EUT was tested in the direction normally used.

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

The power line conducted emissions was performed with the EUT set to the normal operation mode (Bluetooth Hopping ON).

5.7. DESCRIPTION OF TEST SETUP

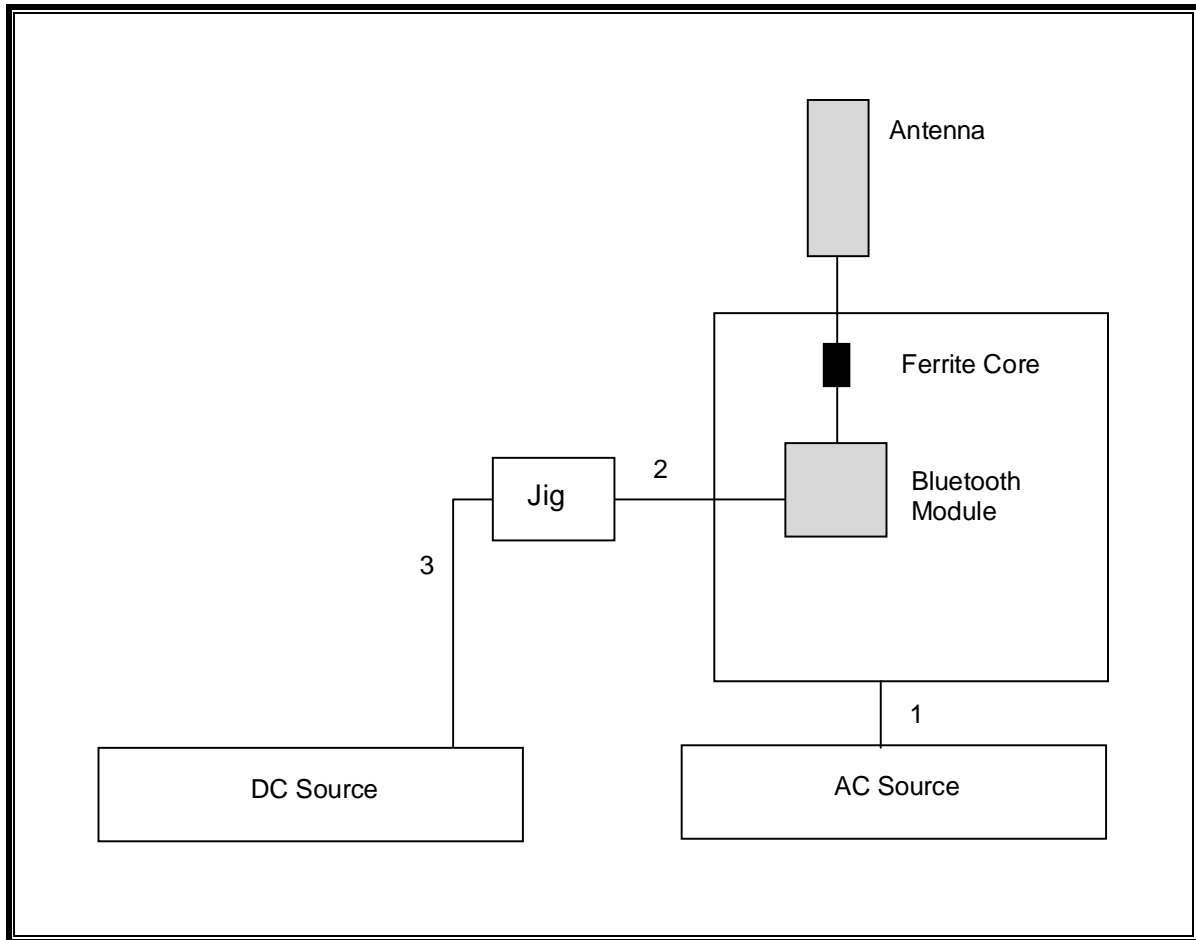
SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST			
Description	Manufacturer	Model	Serial Number
Multifunction Digital System	Toshiba	DP-3020	CLD135318
Test Jig	Taiyo Yuden	-	-

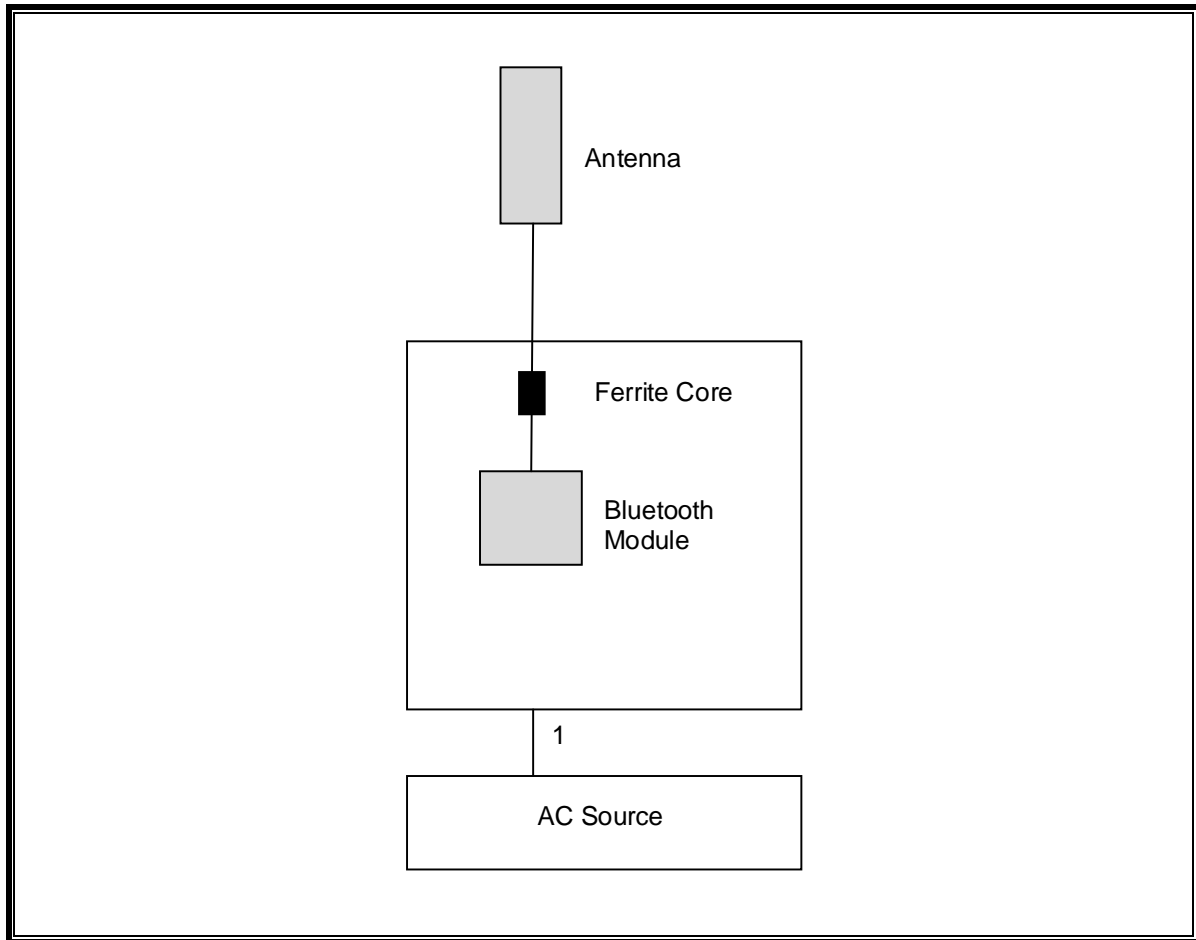
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC Input	1	AC	Un-Shielded	1.9m	N/A
2	DC and Signal	1	USB	Un-Shielded	0.1m	N/A
3	DC Input	1	DC	Un-Shielded	2.3m	N/A

SETUP DIAGRAM FOR RADIATED TESTS



SETUP DIAGRAM FOR CONDUCTED TESTS



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)
SCC-C6/C7/C8/C10/SRSE-03	Coaxial Cable&RF Selector	Suhner/Fujikura/Suhner/Suhner/TOYO	141PE/12DSFA/141PE/141PE/NS4906	-/0901-271(RF Selector)	CE	2011/04/28 * 12
SLS-05	LISN	Rohde & Schwarz	ENV216	100516	CE	2011/02/23 * 12
SOS-06	Humidity Indicator	A&D	AD-5681	4062118	CE	2011/03/02 * 12
STR-03	Test Receiver	Rohde & Schwarz	ESI40	100054/040	CE/RE	2010/07/21 * 12
SJM-10	Measure	PROMART	SEN1935	-	CE/RE	-
COTS-SEMI-1	EMI Software	TSJ	TEPTO-DV(RE,CE,RFI,MF)	-	CE/RE	-
SAF-06	Pre Amplifier	TOYO Corporation	TPA0118-36	1440491	RE	2011/07/19 * 12
SCC-G03	Coaxial Cable	Suhner	SUCOFLEX 104A	46499/4A	RE	2011/04/28 * 12
SCC-G23	Coaxial Cable	Suhner	SUCOFLEX 104	297342/4	RE	2011/05/27 * 12
SHA-03	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-739	RE	2010/08/17 * 12
SOS-05	Humidity Indicator	A&D	AD-5681	4062518	RE	2011/02/23 * 12
SAT10-04	Attenuator(above1GHz)	Agilent	8493C-010	74863	RE	2010/12/15 * 12
SFL-02	Highpass Filter	MICRO-TRONICS	HPM50111	051	RE	2010/12/15 * 12
SHA-04	Horn Antenna	ETS LINDGREN	3160-09	LM3640	RE	2011/03/15 * 12
SAF-08	Pre Amplifier	TOYO Corporation	HAP18-26W	00000019	RE	2011/03/16 * 12
SCC-G17	Coaxial Cable	Suhner	SUCOFLEX 104A	46291/4A	RE	2011/03/16 * 12
SAF-03	Pre Amplifier	SONOMA	310N	290213	RE	2011/02/17 * 12
SAT6-03	Attenuator	JFW	50HF-006N	-	RE	2011/02/17 * 12
SBA-03	Biconical Antenna	Schwarzbeck	BBA9106	91032666	RE	2010/10/15 * 12
SCC-C1/C2/C3/C4/C5/C10/SRSE-03	Coaxial Cable&RF Selector	Fujikura/Fujikura/Suhner/Suhner/Suhner/TOYO	8D2W/12DSFA/141PE/141PE/141PE/NS4906	-/0901-271(RF Selector)	RE	2011/04/28 * 12
SLA-03	Logperiodic Antenna	Schwarzbeck	UHALP9108A	UHALP 9108-A0901	RE	2010/10/15 * 12
SAEC-03(NSA)	Semi-Anechoic Chamber	TDK	SAEC-03(NSA)	3	RE	2010/09/13 * 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 traceable calibrations. Each calibration is traceable to the national or international standards.

Test Item:

- CE: Conducted emission,
- RE: Radiated emission

7. ANTENNA PORT TEST RESULTS *

* Refer to the original report 05U3286-1 REV B issued by COMPLIANCE CERTIFICATION SERVICES.

8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-210 Clause 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 was installed in a host device (Multifunction Digital System) that was placed on a reference 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.

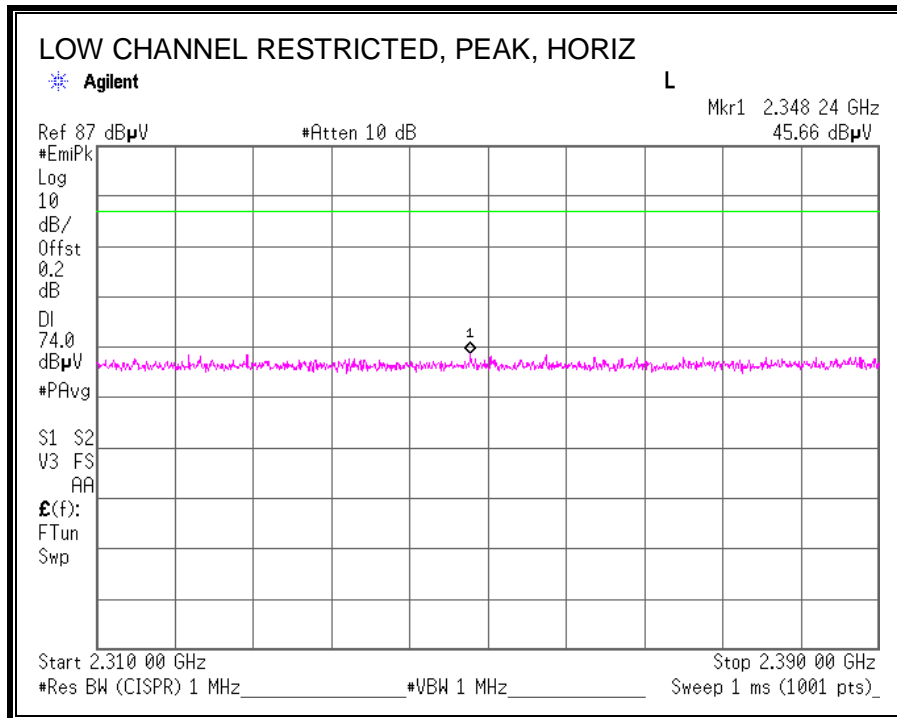
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

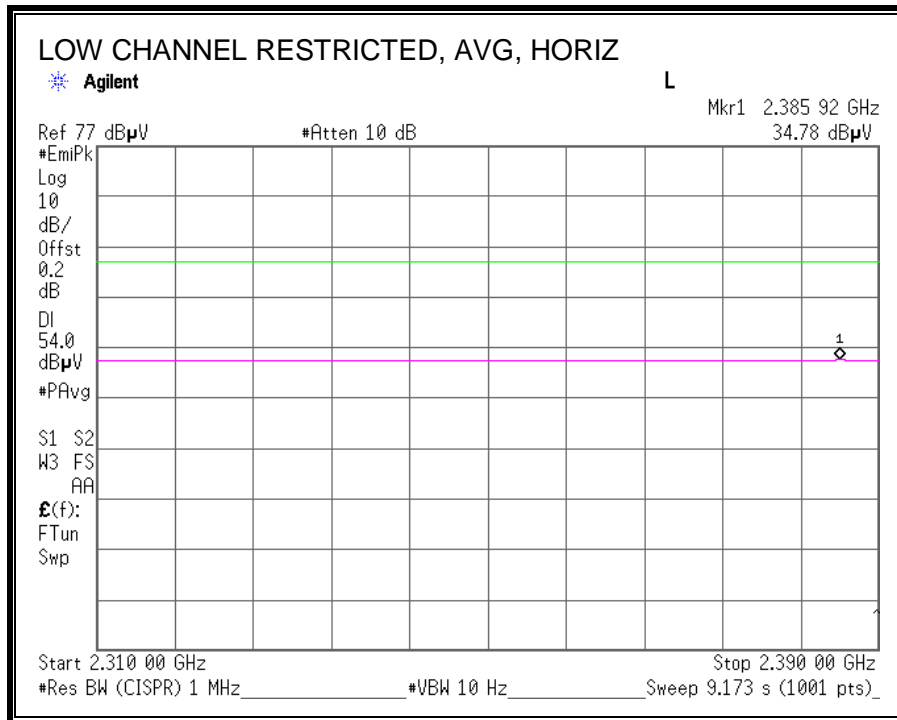
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized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

8.2. TRANSMITTER ABOVE 1 GHz

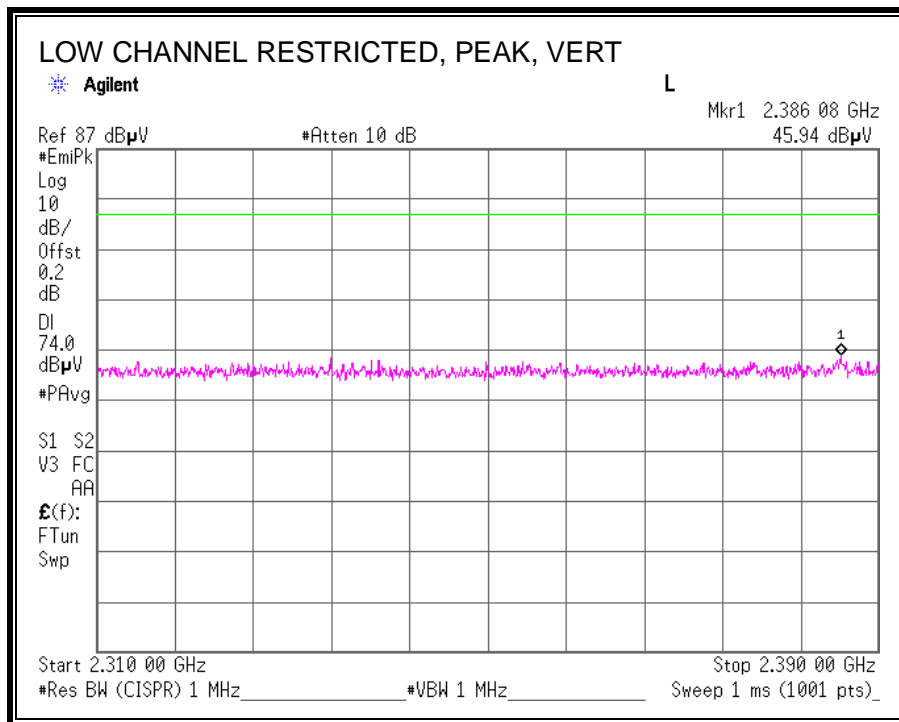
8.2.1. BASIC DATA RATE GFSK MODULATION

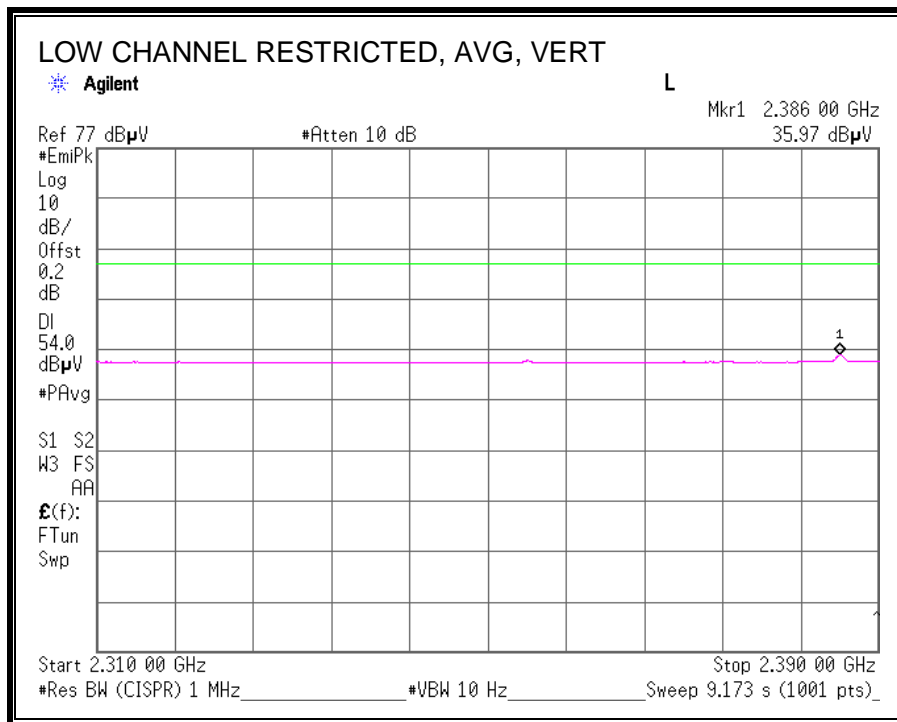
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



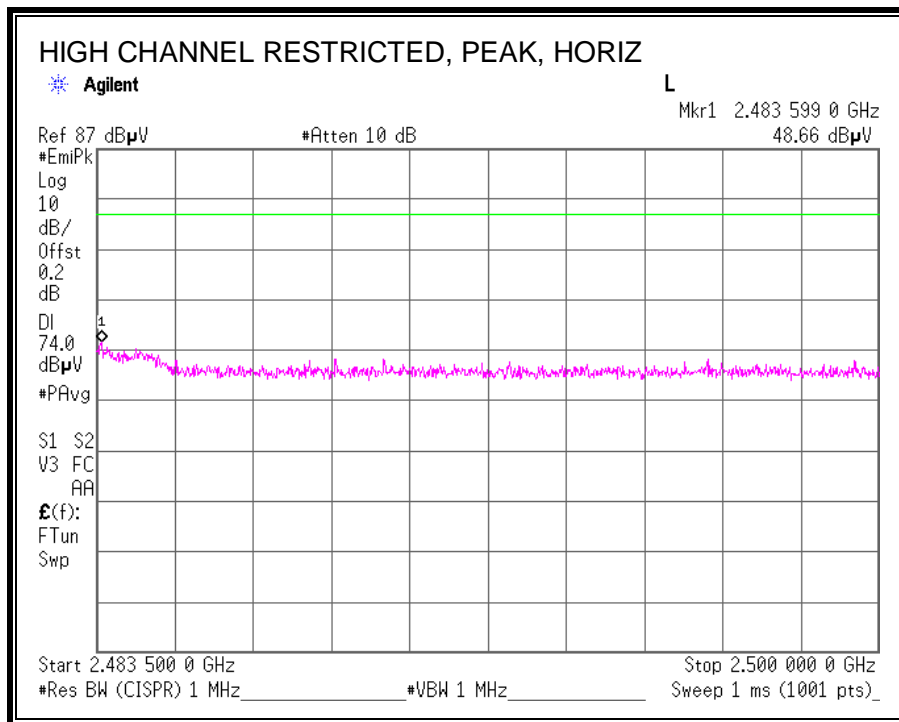


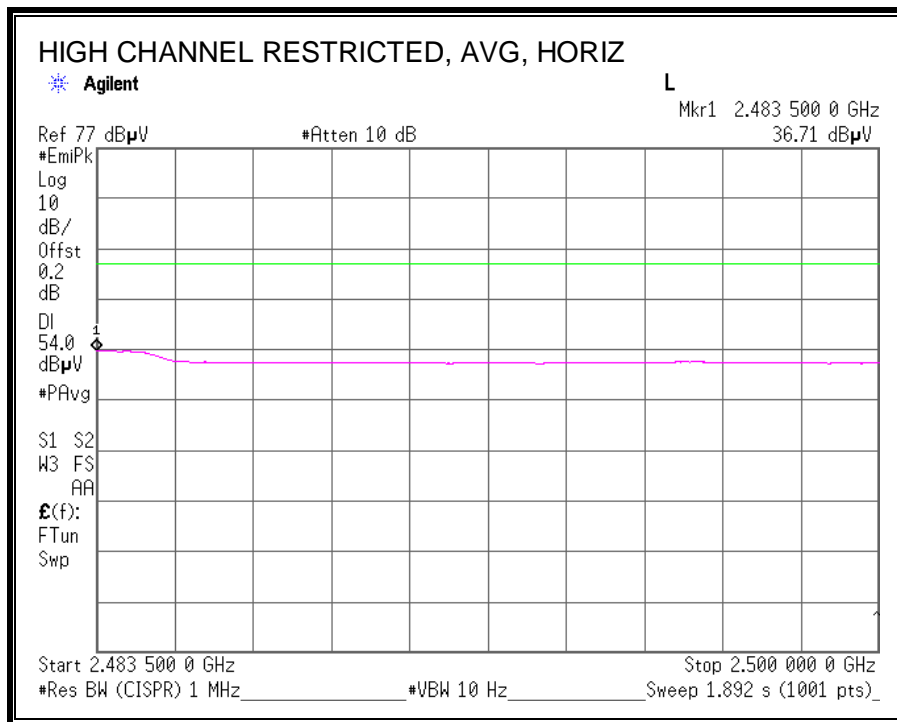
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



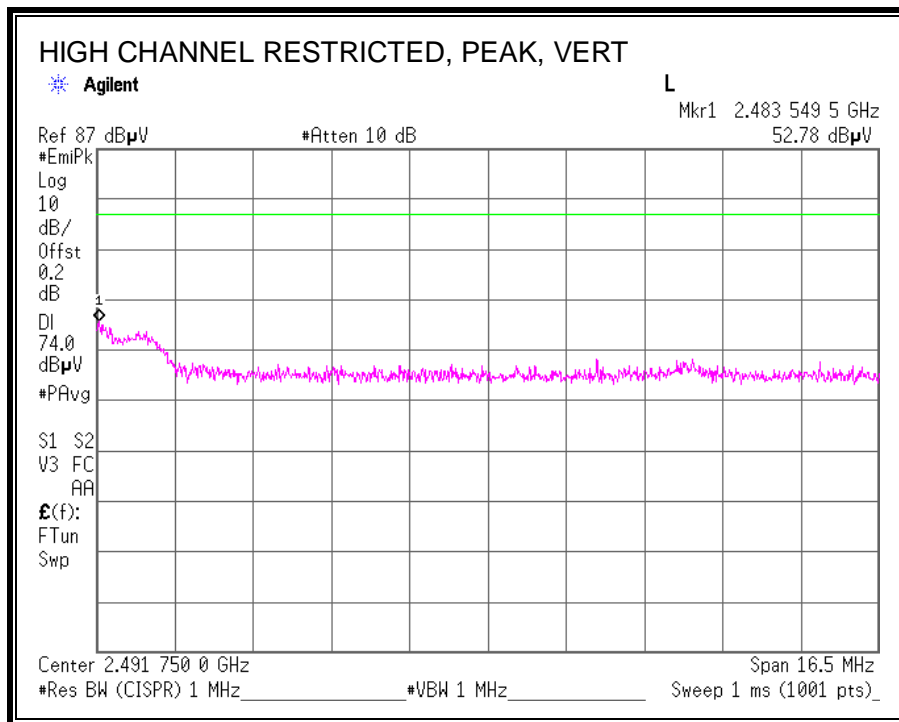


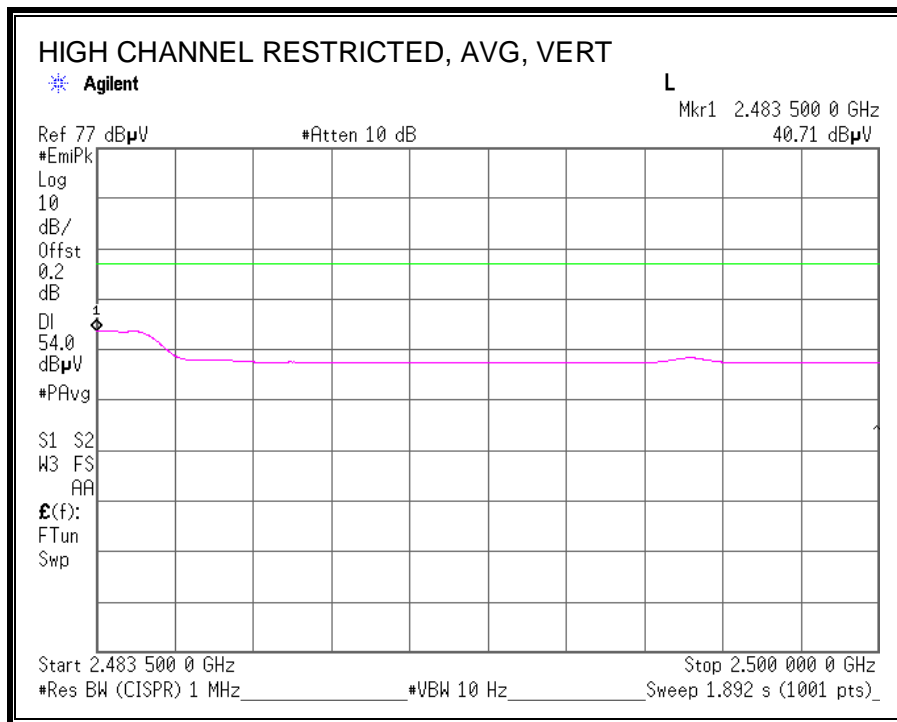
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)





RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)





HARMONICS AND SPURIOUS EMISSIONS

Radiated Emission												
Test place		UL Japan, Inc. Shonan EMC Lab.				No.3 Semi Anechoic Chamber						
Date		2011/7/20										
Temperature / Humidity		26deg.C . 53%RH										
Engineer		Akio Hayashi										
Mode		Tx, Bluetooth, BDR, PRB59										
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.	3204.000	PK	47.4	29.2	5.5	41.5	40.6	73.9	33.3	164	204	
Hori.	3204.000	AV	38	29.2	5.5	41.5	31.2	53.9	22.7	164	204	
Hori.	4804.000	PK	54.6	31.5	6	41.1	51	73.9	22.9	121	135	
Hori.	4804.000	AV	44.8	31.5	6	41.1	41.2	53.9	12.7	121	135	
Hori.	7206.000	PK	48.2	36.4	7.4	41.3	50.7	73.9	23.2	100	0	
Hori.	7206.000	AV	36.8	36.4	7.4	41.3	39.3	53.9	14.6	100	0	
Vert.	3204.000	PK	51.9	29.2	5.5	41.5	45.1	73.9	28.8	113	197	
Vert.	3204.000	AV	43.6	29.2	5.5	41.5	36.8	53.9	17.1	113	197	
Vert.	4804.000	PK	55.9	31.5	6	41.1	52.3	73.9	21.6	100	135	
Vert.	4804.000	AV	46.1	31.5	6	41.1	42.5	53.9	11.4	100	135	
Vert.	7206.000	PK	49.3	36.4	7.4	41.3	51.8	73.9	22.1	100	0	
Vert.	7206.000	AV	37	36.4	7.4	41.3	39.5	53.9	14.4	100	0	
[Tx 2441MHz]												
Hori.	3256.776	PK	48.2	29.3	5.4	41.6	41.3	73.9	32.6	100	204	
Hori.	3256.776	AV	37.1	29.3	5.4	41.6	30.2	53.9	23.7	100	204	
Hori.	4882.000	PK	55.1	31.7	6	40.9	51.9	73.9	22.0	100	183	
Hori.	4882.000	AV	45.6	31.7	6	40.9	42.4	53.9	11.5	100	183	
Hori.	7323.000	PK	44.9	36.7	7.4	41.4	47.6	73.9	26.3	100	0	
Hori.	7323.000	AV	34.5	36.7	7.4	41.4	37.2	53.9	16.7	100	0	
Vert.	3254.180	PK	50.8	29.3	5.4	41.6	43.9	73.9	30.0	100	208	
Vert.	3254.180	AV	41.2	29.3	5.4	41.6	34.3	53.9	19.6	100	208	
Vert.	4882.000	PK	55.4	31.7	6	40.9	52.2	73.9	21.7	100	133	
Vert.	4882.000	AV	46.1	31.7	6	40.9	42.9	53.9	11.0	100	133	
Vert.	7323.000	PK	45.6	36.7	7.4	41.4	48.3	73.9	25.6	100	0	
Vert.	7323.000	AV	34.7	36.7	7.4	41.4	37.4	53.9	16.5	100	0	
[Tx 2480MHz]												
Hori.	3308.000	PK	47.9	29.3	5.4	41.6	41.0	73.9	32.9	130	248	
Hori.	4960.000	PK	52.3	31.9	6.0	40.8	49.4	73.9	24.5	126	162	
Hori.	7440.000	PK	47.0	36.9	7.3	41.5	49.7	73.9	24.2	100	0	
Hori.	3308.000	AV	36.7	29.3	5.4	41.6	29.8	53.9	24.1	130	248	
Hori.	4960.000	AV	41.6	31.9	6	40.8	38.7	53.9	15.2	126	162	
Hori.	7440.000	AV	35.8	36.9	7.3	41.5	38.5	53.9	15.4	100	0	
Vert.	3308.000	PK	51.4	29.3	5.4	41.6	44.5	73.9	29.4	133	143	
Vert.	4960.000	PK	52.6	31.9	6	40.8	49.7	73.9	24.2	130	166	
Vert.	7440.000	PK	47.3	36.9	7.3	41.5	50	73.9	23.9	100	0	
Vert.	3308.000	AV	41.4	29.3	5.4	41.6	34.5	53.9	19.4	133	143	
Vert.	4960.000	AV	42	31.9	6	40.8	39.1	53.9	14.8	130	166	
Vert.	7440.000	AV	36	36.9	7.3	41.5	38.7	53.9	15.2	100	0	

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

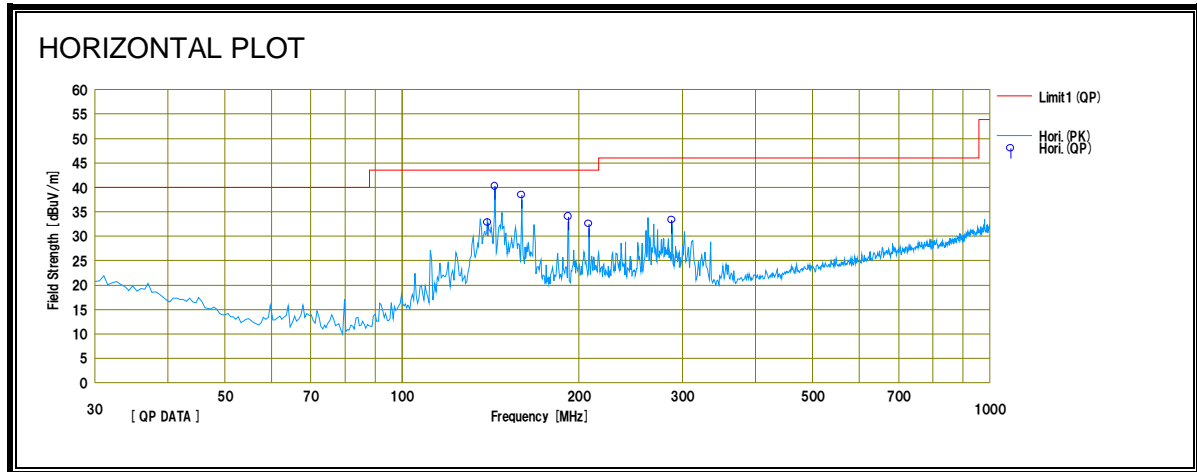
8.3. RECEIVER ABOVE 1 GHz

<u>Radiated Emission</u>												
Test place	UL Japan, Inc. Shonan EMC Lab.		No.3 Semi Anechoic Chamber									
Date	2011/7/20											
Temperature / Humidity	26deg.C , 53%RH											
Engineer	Akio Hayashi (above 1GHz)											
Mode	Rx, Bluetooth, 2441MHz											
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.	1170.000	PK	49.5	24.1	2.7	40.7	35.6	73.9	38.3	122	164	
Hori.	1170.000	AV	44.4	24.1	2.7	40.7	30.5	53.9	23.4	122	164	
Hori.	1200.000	PK	53.1	24.2	2.7	40.7	39.3	73.9	34.6	100	165	
Hori.	1200.000	AV	46.9	24.2	2.7	40.7	33.1	53.9	20.8	100	165	
Hori.	1626.332	PK	50.5	25.6	3.1	40.9	38.3	73.9	35.6	100	132	
Hori.	1626.332	AV	45.5	25.6	3.1	40.9	33.3	53.9	20.6	100	132	
Hori.	2439.497	PK	49.6	27.6	3.8	41.1	39.9	73.9	34.0	100	121	
Hori.	2439.497	AV	43.1	27.6	3.8	41.1	33.4	53.9	20.5	100	121	
Vert.	1170.000	PK	50.1	24.1	2.7	40.7	36.2	73.9	37.7	131	167	
Vert.	1170.000	AV	45.7	24.1	2.7	40.7	31.8	53.9	22.1	131	167	
Vert.	1200.000	PK	52	24.2	2.7	40.7	38.2	73.9	35.7	113	167	
Vert.	1200.000	AV	45.8	24.2	2.7	40.7	32	53.9	21.9	113	167	
Vert.	1230.032	PK	52.8	24.3	2.7	40.7	39.1	73.9	34.8	120	167	
Vert.	1230.032	AV	50	24.3	2.7	40.7	36.3	53.9	17.6	120	167	
Vert.	1239.800	PK	48.1	24.3	2.7	40.7	34.4	73.9	39.5	146	168	
Vert.	1239.800	AV	41.1	24.3	2.7	40.7	27.4	53.9	26.5	146	168	

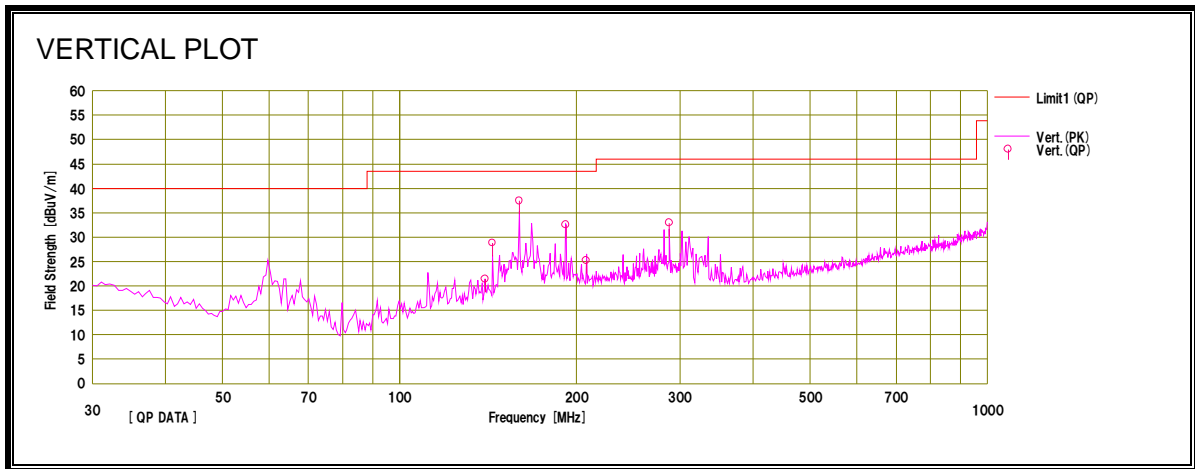
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter-Distance factor(above 13GHz)) - Gain(Amplifier)
 *Other frequency noises omitted in this report were not seen or have enough margin (more than 20dB).

8.4. WORST-CASE BELOW 1 GHz

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



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



RESULTS

HORIZONTAL AND VERTICAL DATA

DATA OF RADIATED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
 Date : 2011/07/21

Company : TOSHIBA TEC CORPORATION
 Kind of EUT : Bluetooth Module
 Model No. : GN-2020
 Serial No. : 002258C52904

Mode : Tx 2441MHz
 Report No. : 31LE0192-SH-A
 Power : DC5.0V
 Temp./Humi. : 26deg.C. / 53%RH

Remarks : -

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

Engineer : Makoto Hosaka

<< QP DATA >>

No.	Freq [MHz]	Reading	Ant.Fac	Loss	Gain	Result	Limit	Margin	Pola.	Height [cm]	Angle [deg]	Ant. Type	Comment
		<QP>	[dB/m]	[dB]	[dB]	[dB]	<QP>	<QP>					
1	139.961	43.8	13.6	7.5	32.1	32.8	43.5	10.7	Hori	124	246	BC	
2	143.993	50.8	13.9	7.6	32.1	40.2	43.5	3.3	Hori	122	246	BC	
3	159.877	47.6	15.2	7.7	32.1	38.4	43.5	5.1	Hori	114	265	BC	
4	191.996	42.0	16.1	7.9	32.0	34.0	43.5	9.5	Hori	158	50	BC	
5	207.988	40.1	16.4	8.0	32.0	32.5	43.5	11.0	Hori	157	49	BC	
6	287.983	38.0	18.7	8.6	32.0	33.3	46.0	12.7	Hori	320	15	BC	
7	139.961	32.4	13.6	7.5	32.1	21.4	43.5	22.1	Vert.	288	224	BC	
8	143.993	39.4	13.9	7.6	32.1	28.8	43.5	14.7	Vert.	215	253	BC	
9	159.990	46.6	15.2	7.7	32.1	37.4	43.5	6.1	Vert.	195	138	BC	
10	191.996	40.5	16.1	7.9	32.0	32.5	43.5	11.0	Vert.	100	345	BC	
11	207.988	32.8	16.4	8.0	32.0	25.2	43.5	18.3	Vert.	100	223	BC	
12	287.983	37.6	18.7	8.6	32.0	32.9	46.0	13.1	Vert.	176	336	BC	

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, SHA-03:Horn Antenna

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9. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

ANSI C63.4

RESULTS

DATA OF CONDUCTED EMISSION TEST

UL Japan, Inc. Shonan EMC Lab. No.3 Semi-Anechoic Chamber
 Date : 2011/07/19

Company : TOSHIBA TEC CORPORATION
 Kind of EUT : Bluetooth Module
 Model No. : GN-2020
 Serial No. : 002258C528B4
 Mode : Normal Operation (Bluetooth ON)
 Report No. : 31LE0192-SH-A
 Power : AC 120V / 60Hz
 Temp./Humi. : 27deg.C. / 50%RH
 Remarks : -

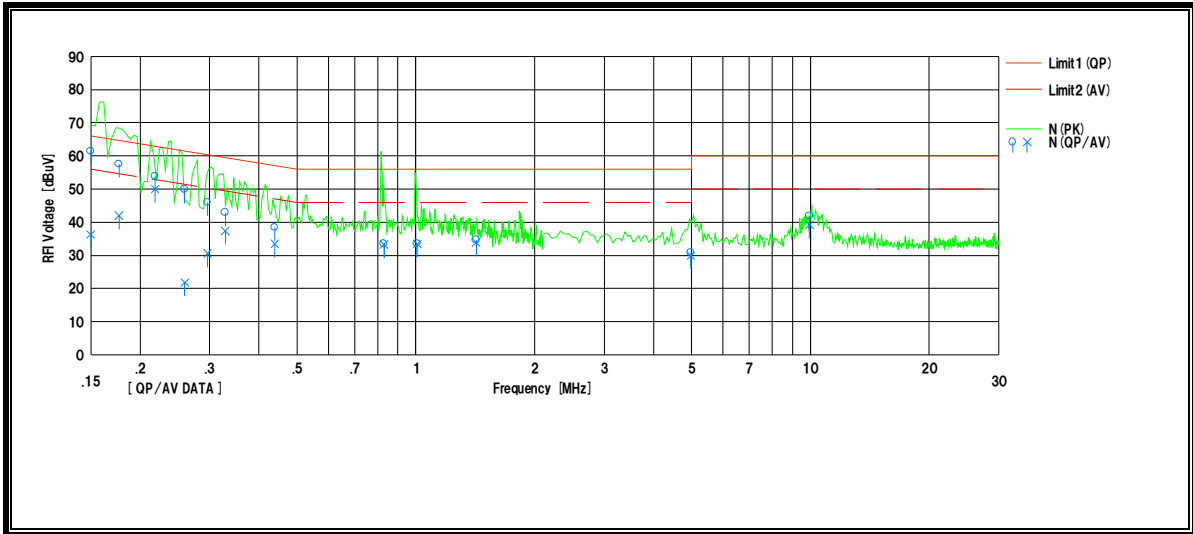
Limit1 : FCC 15C (15.207) QP
 Limit2 : FCC 15C (15.207) AV
 Engineer : Akio Hayashi

<< QP/AV DATA >>

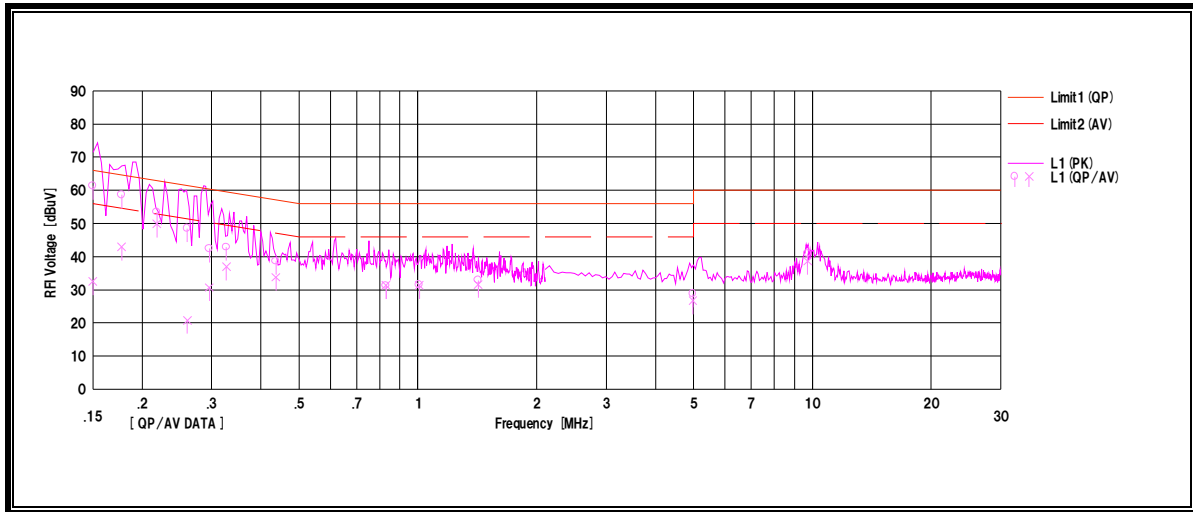
No.	Freq. [MHz]	Reading		C.Fac [dB]	Results		Limit		Margin		Phase	Comment
		<QP> [dBuV]	<AV> [dBuV]		<QP> [dBuV]	<AV> [dBuV]	<QP> [dBuV]	<AV> [dBuV]	<QP> [dB]	<AV> [dB]		
1	0.15000	48.8	23.7	12.6	61.4	36.3	66.0	56.0	4.6	19.7	N	
2	0.21818	41.3	37.5	12.5	53.8	50.0	62.8	52.8	9.0	2.8	N	
3	0.25940	37.4	9.3	12.5	49.9	21.8	61.4	51.4	11.5	29.6	N	
4	0.29630	33.4	18.0	12.6	46.0	30.6	60.3	50.3	14.3	19.7	N	
5	0.32860	30.3	24.8	12.6	42.9	37.4	59.4	49.4	16.5	12.0	N	
6	0.17740	46.0	30.3	12.6	58.6	42.9	64.6	54.6	6.0	11.7	L1	

Calculation: Result [dBuV] = Reading [dBuV] + C.Fac (LISN+Cable+ATT) [dB]
 LISN: SLS-05

LINE 1 RESULTS



LINE 2 RESULTS



10. MAXIMUM PERMISSIBLE EXPOSURE

FCC RULES

§1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)—Continued

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
30–300	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

IC RULES

IC Safety Code 6, Section 2.2.1 (a) A person other than an RF and microwave exposed worker shall not be exposed to electromagnetic radiation in a frequency band listed in Column 1 of Table 5, if the field strength exceeds the value given in Column 2 or 3 of Table 5, when averaged spatially and over time, or if the power density exceeds the value given in Column 4 of Table 5, when averaged spatially and over time.

**Table 5
 Exposure Limits for Persons Not Classed As RF and Microwave Exposed Workers (Including the General Public)**

1 Frequency (MHz)	2 Electric Field Strength; rms (V/m)	3 Magnetic Field Strength; rms (A/m)	4 Power Density (W/m ²)	5 Averaging Time (min)
0.003–1	280	2.19		6
1–10	280/ <i>f</i>	2.19/ <i>f</i>		6
10–30	28	2.19/ <i>f</i>		6
30–300	28	0.073	2*	6
300–1 500	1.585 <i>f</i> ^{0.5}	0.0042 <i>f</i> ^{0.5}	<i>f</i> /150	6
1 500–15 000	61.4	0.163	10	6
15 000–150 000	61.4	0.163	10	616 000 / <i>f</i> ^{1.2}
150 000–300 000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616 000 / <i>f</i> ^{1.2}

* Power density limit is applicable at frequencies greater than 100 MHz.

- Notes:**
1. Frequency, *f*, is in MHz.
 2. A power density of 10 W/m² is equivalent to 1 mW/cm².
 3. A magnetic field strength of 1 A/m corresponds to 1.257 microtesla (μT) or 12.57 milligauss (mG).

EQUATIONS

Power density is given by:

$$S = \text{EIRP} / (4 * \text{Pi} * D^2)$$

where

- S = Power density in W/m²
- EIRP = Equivalent Isotropic Radiated Power in W
- D = Separation distance in m

Power density in units of W/m² is converted to units of mWc/m² by dividing by 10.

Distance is given by:

$$D = \text{SQRT} (\text{EIRP} / (4 * \text{Pi} * S))$$

where

- D = Separation distance in m
- EIRP = Equivalent Isotropic Radiated Power in W
- S = Power density in W/m²

In the table(s) below, Power and Gain are entered in units of dBm and dBi respectively and conversions to linear forms are used for the calculations.

LIMITS

From FCC §1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm²

From IC Safety Code 6, Section 2.2 Table 5 Column 4, S = 10 W/m²

RESULTS

The below power is from the original report 05U3286-1 REV B issued by COMPLIANCE CERTIFICATION SERVICES.

Band	Mode	Separation Distance (m)	Output Power (dBm)	Antenna Gain (dBi)	IC Power Density (W/m ²)	FCC Power Density (mW/cm ²)
2.4 GHz	Bluetooth	0.20	1.46	0.50	0.0031	0.0003

11. MAXIMUM PERMISSIBLE EXPOSURE (CO-LOCATED)

Host Device of EUT (DP-2095, DP-2530, DP-3020, DP-3590, DP-4590, DP-5560, DP-6560, DP-7560 and DP-8560) has Wireless LAN module GN-1060, FCC ID; BJI-GN1060 *.

* FCC ID: BJI-GN1060 was changed in Identification from FCC ID: PPD-AR5B95. The below power is from the original report 81029055 issued by Compliance Certification Services Inc.

RESULTS (Wireless LAN module)

Band	Mode	Separation Distance (m)	Output Power (dBm)	Antenna Gain (dBi)	IC Power Density (W/m ²)	FCC Power Density (mW/cm ²)
2.4 GHz	WLAN	0.20	25.28	0.50	0.7533	0.0753

RESULTS (CO-LOCATED)

IC Power Density = $0.0031 + 0.7533 = 0.7564$ (W/m²)

FCC Power Density = $0.0003 + 0.0753 = 0.0756$ (mW/cm²)

As shown in the calculations above, when GN-2020 & GN-1060 are operational, the worst case combination is within the limit at a distance of 20cm from the device.

SETUP PHOTOS

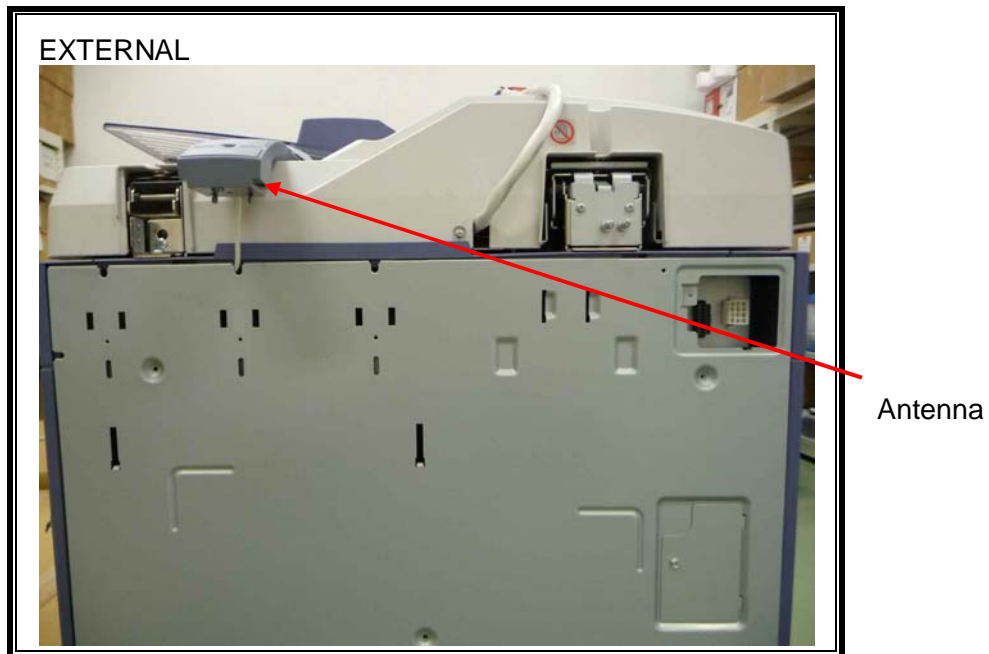
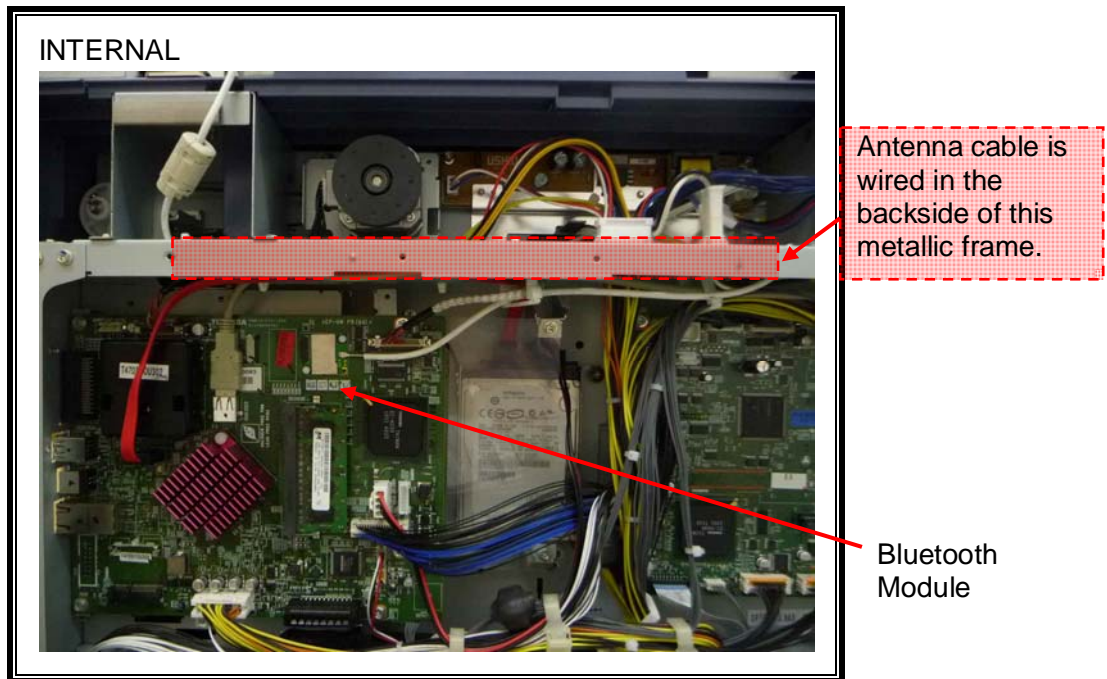
RADIATED RF MEASUREMENT SETUP



AC POWER LINE CONDUCTED EMISSIONS SETUP



BLUETOOTH MODULE and ANTENNA CONNECTION



END OF REPORT