Japan

TEST REPORT

Report number : JPD-TR-18161-0
Issue date : October 1, 2018

The device, as described herewith, was tested pursuant to applicable test procedure and complies with the requirements of;

FCC Part15 Subpart C

The test results are traceable to the international or national standards.

Applicant	:	KYOCERA Corporation
Equipment under test (EUT)	:	Mobile Phone
Model number	:	JA28
FCC ID	:	JOYJA28

Date of test : August 3, 6, 7, 9, 10, 17, 20, 2018
Test place : TÜV SÜD Zacta Ltd. Yonezawa Testing Center
5-4149-7, Hachimanpara, Yonezawa-shi,
Yamagata, 992-1128 Japan
Phone: +81-238-28-2881 Fax: +81-238-28-2888
Test results : Complied

Due to merger of TÜV SÜD Japan Ltd. and TÜV SÜD Zacta Ltd. on October 1st, 2018, this test report was issued by TÜV SÜD Japan Ltd.
The results in this report are applicable only to the equipment tested.
This report shall not be re-produced except in full without the written approval of TÜV SÜD Japan Ltd.
This test report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, ILAC-MRA, or any agency of the federal government.

Tested by : Tadahiro Seino Taiki Watanabe
Tadahiro Seino Taiki Watanabe

Approved by : Hiro Suzuki
Hiroaki Suzuki
Deputy Manager of RF Group

NVLAP TESTING
NVLAP LAB CODE 200306-0

Japan

Table of contents

Japan

1. Summary of Test

1.1 Purpose of test

It is the original test in order to verify conformance to FCC Part 15 Subpart C.

1.2 Standards

CFR47 FCC Part 15 Subpart C

1.2.1 Test Methods

ANSI C63.10-2013

1.2.2 Deviation from standards

None

1.3 List of applied test to the EUT

Test items Section	Test items	Condition	Result
15.247(a)(1)	20dB Bandwidth	Conducted	PASS
15.247(a)(1)	Carrier Frequency Separation	Conducted	PASS
15.247(a)(1)(iii)	Number of Hopping Frequencies	Conducted	PASS
15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Conducted	PASS
15.247(b)(1)	Maximum Peak Output Power	Conducted	PASS
15.247(d)	Band Edge Compliance of RF Conducted Emissions	Conducted	PASS
15.247(d) 15.205 15.209	Spurious Emissions	Conducted Radiated	PASS
15.247(d) 15.205 15.209	Restricted Bands of Operation	Radiated	PASS
15.207	AC Power Line Conducted Emissions	Conducted	PASS

1.3.1 Test set up

Table-Top

1.4 Modification to the EUT by laboratory

None

Japan

2. Equipment Under Test

2.1 General Description of equipment

EUT is the Mobile Phone.

2.2 EUT information

Applicant	:	KYOCERA Corporation Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku Yokohama-shi, Kanagawa, Japan Phone: +81-45-943-6253 Fax: +81-45-943-6314
Equipment under test	:	Mobile Phone
Trade name	:	Kyocera
Model number	:	JA28
Serial number	:	N/A
EUT condition	:	Pre-Production
Power ratings	:	Battery: DC 3.8V
Size	:	(W) 48.0mm × (D) 14.0mm × (H) 138.0mm
Environment	:	Indoor and Outdoor use
Operating environment	:	Temperature: 5˚C to 35˚C Humidity: 35% to 85%
RF Specification		
Protocol	:	Bluetooth 4.2 + EDR
Frequency range	:	2402MHz-2480MHz
Number of RF Channels	:	79 Channels
Modulation type/ Data rate	:	FHSS: GFSK (1Mbps), π/4-DQPSK (2Mbps), 8-DPSK (3Mbps)
Channel separation	:	1MHz
Conducted power	:	8.387mW (DH5) 11.225mW (3-DH5)
Antenna type	:	Internal antenna
Antenna gain	:	-0.5dBi

Japan

2.3 Variation of the family model(s)

Not applicable

2.4 Operating channels and frequencies

Channel	Frequency [MHz]	Channel	Frequency [MHz]	Channel	Frequency [MHz]
0	2402	27	2429	54	2456
1	2403	28	2430	55	2457
2	2404	29	2431	56	2458
3	2405	30	2432	57	2459
4	2406	31	2433	58	2460
5	2407	32	2434	59	2461
6	2408	33	2435	60	2462
7	2409	34	2436	61	2463
8	2410	35	2437	62	2464
9	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

2.5 Operating mode

The EUT had been tested under operating condition.
There are three channels have been tested as following:

Tested Channel	Frequency [MHz]
Low	2402
Middle	2441
High	2480

The pre-test has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

Tested Channel	Modulation Technology	Modulation Type	Packet Type
Low, Middle, High	FHSS	GFSK	DH5
Low, Middle, High	FHSS	8-DPSK	3-DH5

The field strength of spurious emissions was measured at each position of all three axis X, Y and Z to compare the level, and the maximum noise.
The worst emission was found in Y axis and the worst case recorded.

2.6 Operating flow

[Tx mode]
i) Bluetooth test program setup to the DM tool
ii) Select a test mode
Operating frequency:
No hopping (Channel Low: 2402MHz, Channel Middle: 2441MHz, Channel High: 2480MHz)
Hopping
Packet type: DH5, 3-DH5
iii) Start test mode

[Rx mode]
i) Bluetooth test program setup to the DM tool
ii) Select a test mode
Operating frequency: Channel Low: 2402MHz, Channel Middle: 2441MHz, Channel High: 2480MHz
iii) Start test mode

Japan

3. Configuration of equipment

3.1 Equipment(s) used

No.	Equipment	Company	Model No.	Serial No.	FCC ID / DoC	Comment
1	Mobile Phone	KYOCERA	JA28	N/A	JOYJA28	EUT
2	AC Adapter	au	N/A	N/A	N/A	*

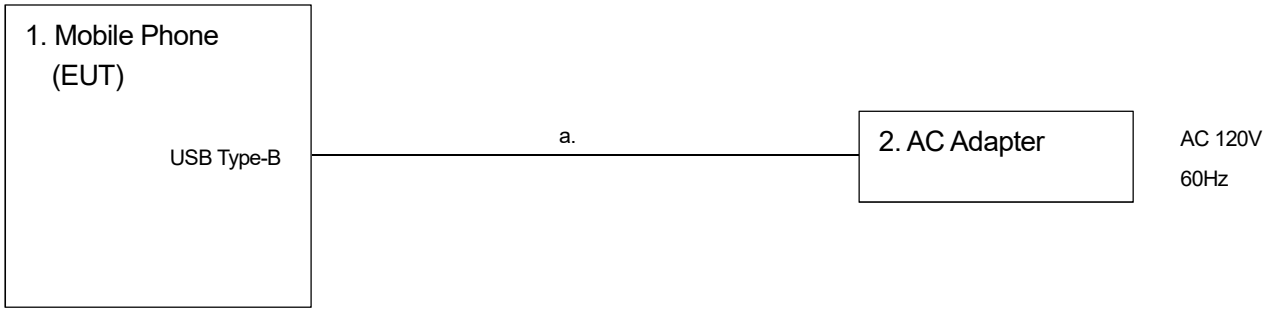
*: AC power line Conducted Emission Test.

3.2 Cable(s) used

No.	Cable	Length[m]	Shield	Connector	Comment
a	USB cable (for AC Adapter)	0.8	Yes	Metal	*

*: AC power line Conducted Emission Test.

3.3 System configuration



Note1: Numbers assigned to equipment or cables on this diagram correspond to the list in “3.1 Equipment(s) used” and “3.2 Cable(s) used”.

Japan

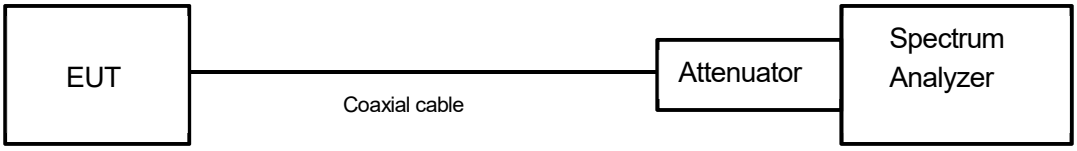
4. 20dB Bandwidth

4.1 Measurement procedure [FCC 15.247(a)(1)]

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
a) Span = 2-3 times the 20 dB bandwidth.
b) RBW ≥ 1% of the 20 dB bandwidth.
c) VBW ≥ RBW.
d) Sweep time = auto-couple.
e) Detector = peak.
f) Trace mode = max hold.

- Test configuration



4.2 Limit

None

4.3 Measurement result

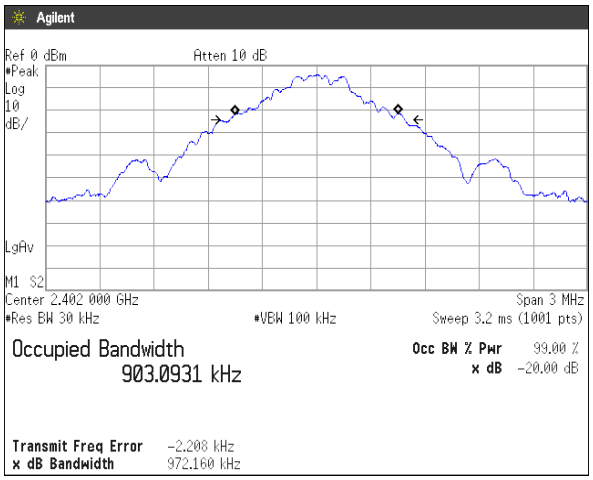
Date : August 6, 2018
Temperature : 24.5 [˚C]
Humidity : 65.1 [%]
Test place : Shielded room No.4
Test engineer : Tadahiro Seino

Channel	Frequency [MHz]	20dB bandwidth [MHz]	
		DH5	3-DH5
Low	2402	0.972	1.308
Middle	2441	1.022	1.308
High	2480	0.972	1.308

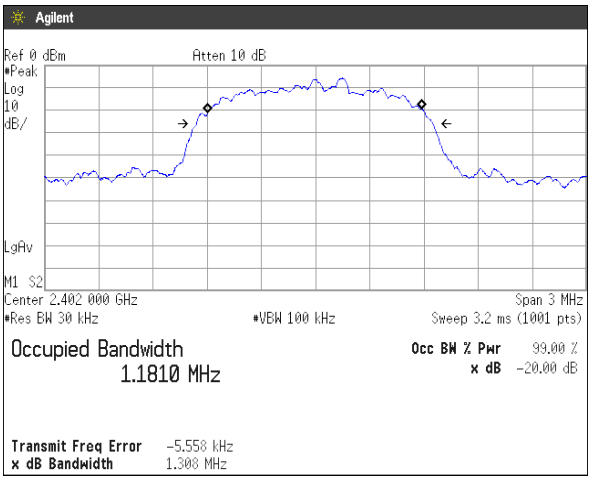
Japan

4.4 Trace data

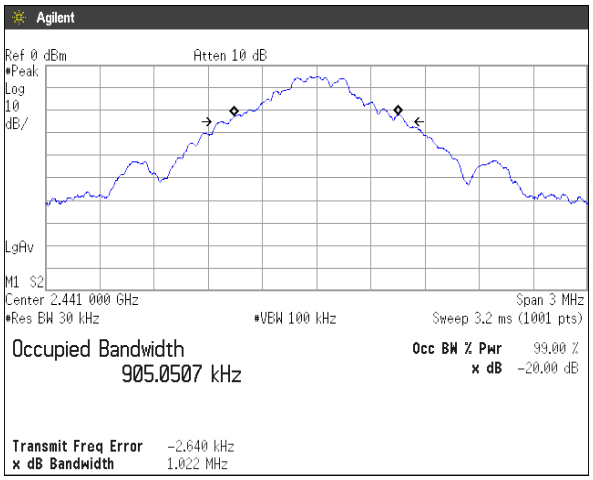
[DH5]
Channel Low



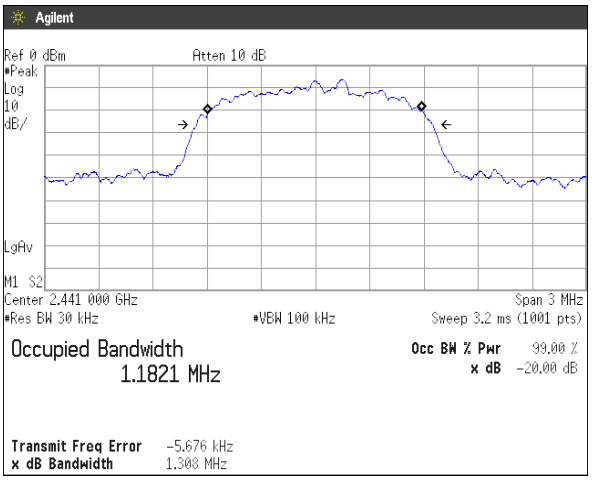
[3-DH5]



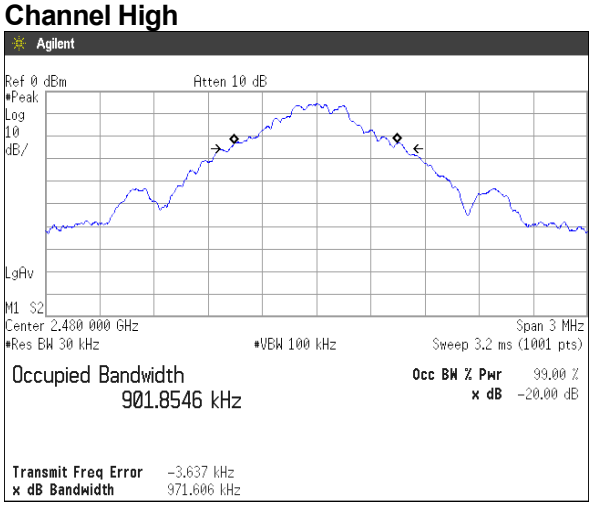
[DH5]
Channel Middle



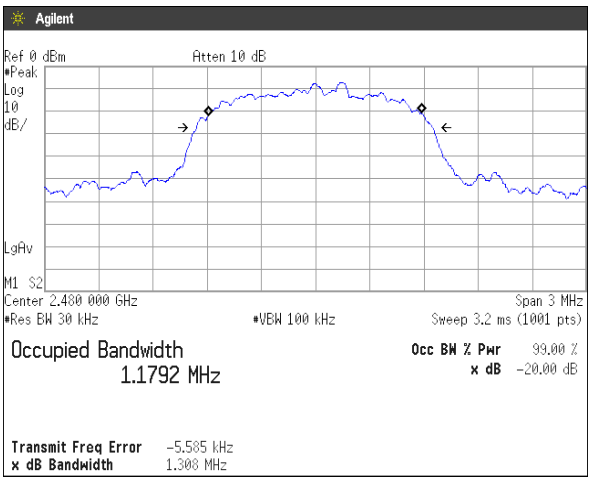
[3-DH5]



[DH5]
Channel High



[3-DH5]



Japan

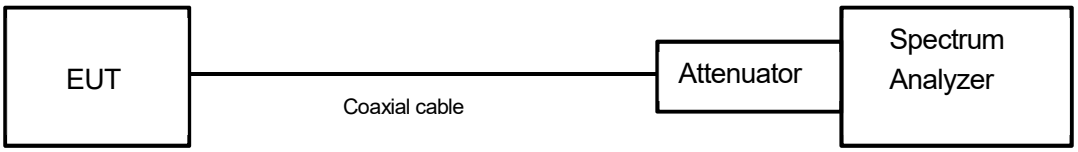
5. Carrier Frequency Separation

5.1 Measurement procedure [FCC 15.247(a)(1)]

The adjacent channel interval is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
a) Span = wide enough to capture the peaks of two adjacent channels.
b) RBW ≥ 1% of the span.
c) VBW ≥ RBW.
d) Sweep time = auto-couple.
e) Detector = peak.
f) Trace mode = max hold.

- Test configuration



5.2 Limit

System shall have hopping channel carrier frequencies separated by a minimum of, 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater.

5.3 Measurement result

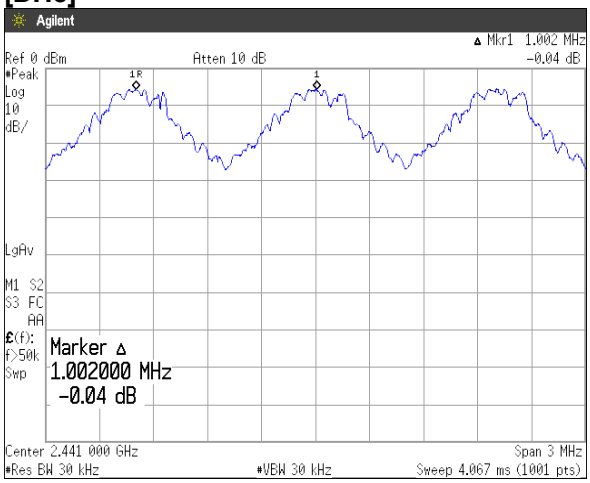
Date : August 6, 2018
Temperature : 24.5 [˚C]
Humidity : 65.1 [%]
Test place : Shielded room No.4
Test engineer : Tadahiro Seino

Packet type	Channel separation (MHz)	Limit (MHz)	Result
DH5	1.002	>two-thirds of the 20dB Bandwidth = 681kHz	PASS
3-DH5	1.002	>two-thirds of the 20dB Bandwidth = 872kHz	PASS
DH5(AFH)	1.002	>two-thirds of the 20dB Bandwidth = 681kHz	PASS
3-DH5(AFH)	1.002	>two-thirds of the 20dB Bandwidth = 872kHz	PASS

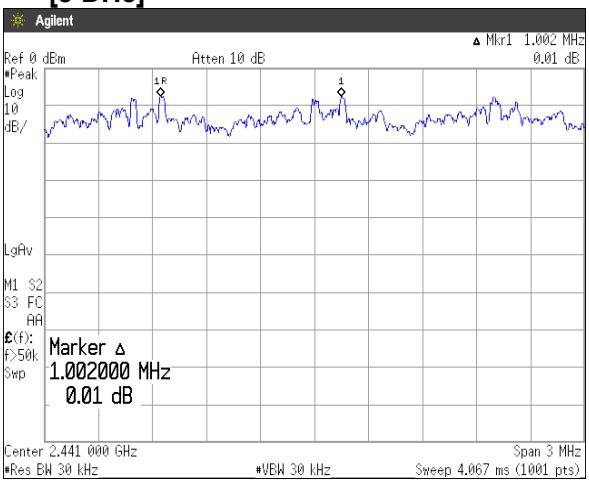
Japan

5.4 Trace data

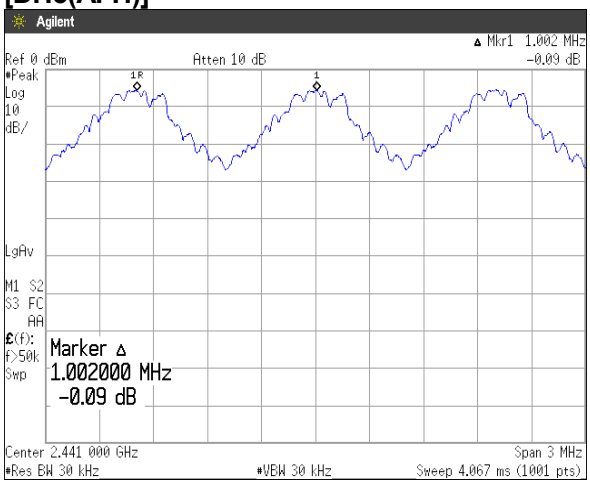
[DH5]



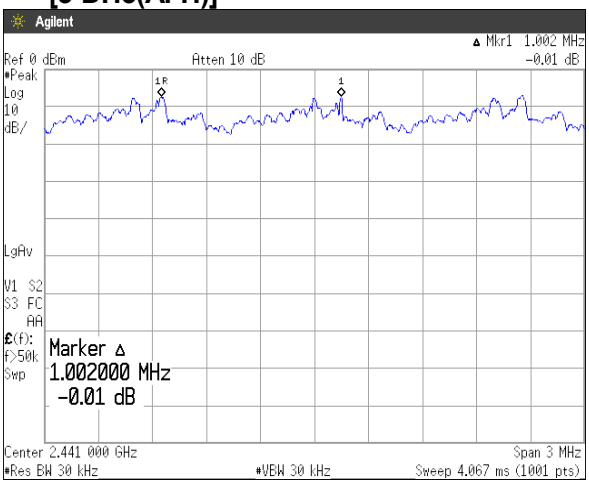
[3-DH5]



[DH5(AFH)]



[3-DH5(AFH)]



Japan

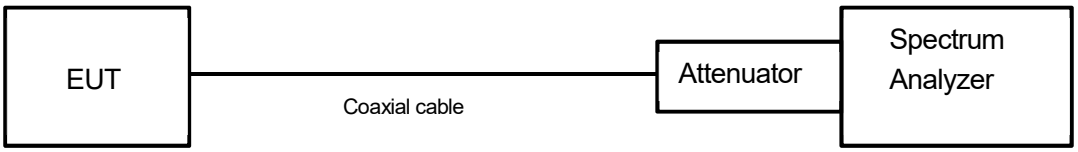
6. Number of Hopping Frequencies

6.1 Measurement procedure [FCC 15.247(a)(1)(iii)]

The number of hopping channels is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
a) Span = the frequency band of operation.
b) RBW ≥ 1% of the Span.
c) VBW ≥ RBW.
d) Sweep time = auto-couple.
e) Detector = peak.
f) Trace mode = max hold.

- Test configuration



6.2 Limit

Shall have more than 15 channels.

6.3 Measurement result

Date : August 6, 2018
Temperature : 24.5 [˚C]
Humidity : 65.1 [%]
Test place : Shielded room No.4

Test engineer : Tadahiro Seino

FHSS

Number of channels	Limit	Result
79	≥15 channel	PASS

AFH

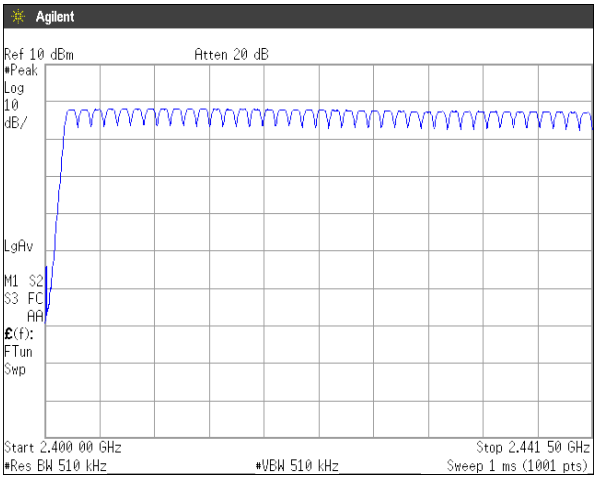
Channel	Number of channels	Limit	Result
Low	20	≥15 channel	PASS
Middle	20	≥15 channel	PASS
High	20	≥15 channel	PASS

Japan

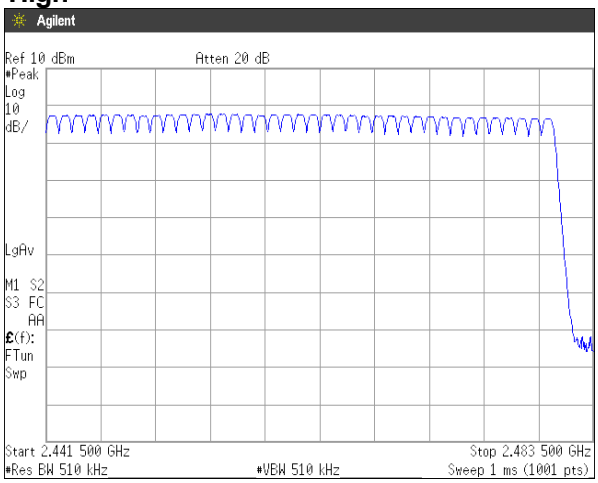
6.4 Trace data

[DH5]

Low

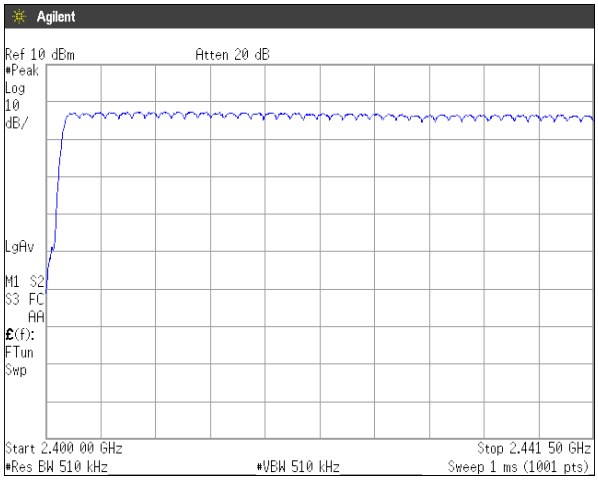


High

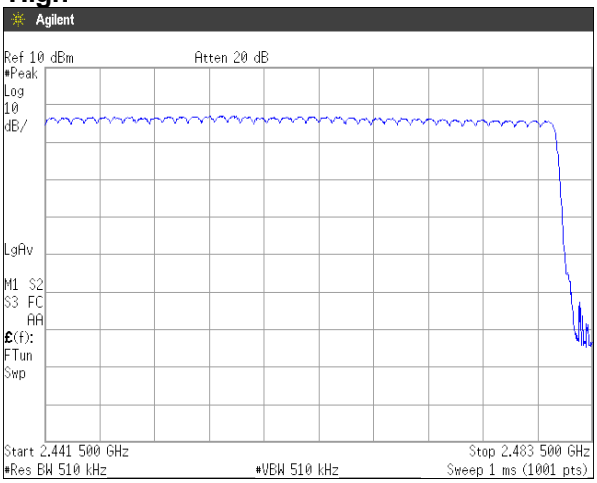


[3-DH5]

Low



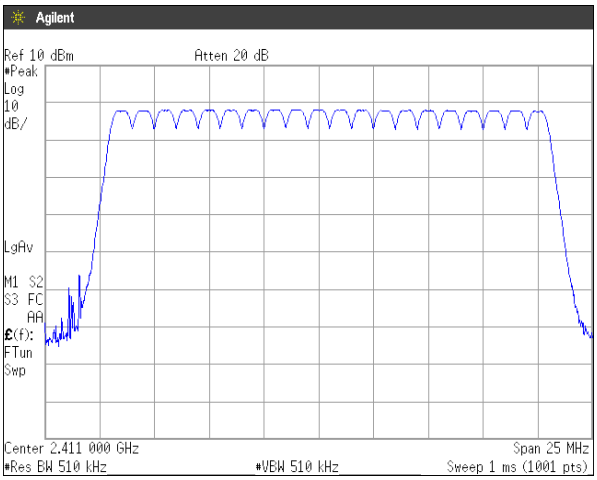
High



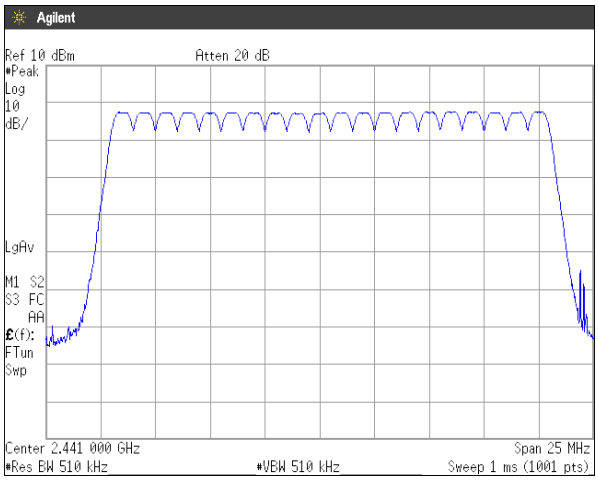
Japan

[DH5(AFH)]

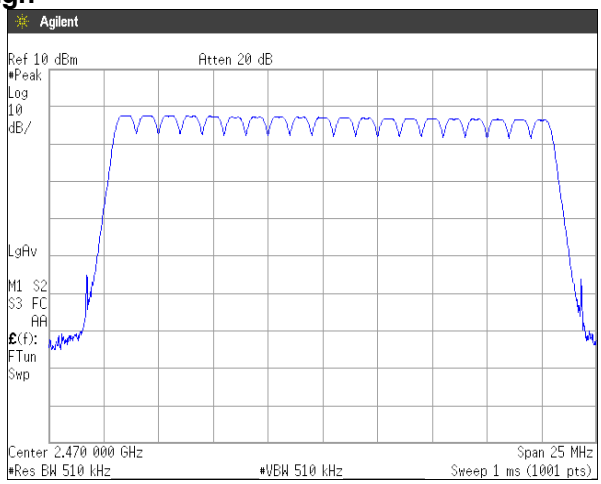
Low



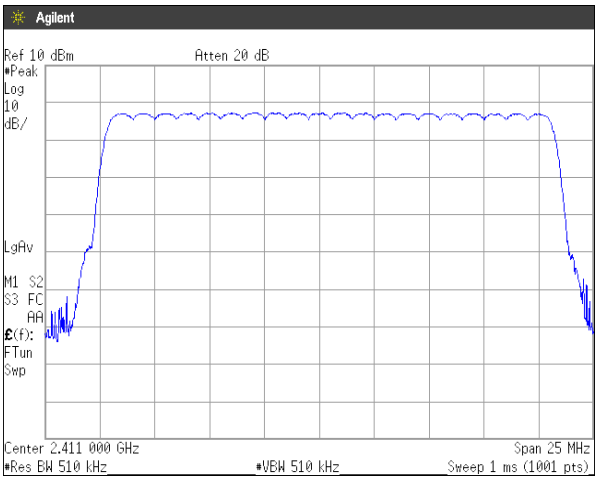
Middle

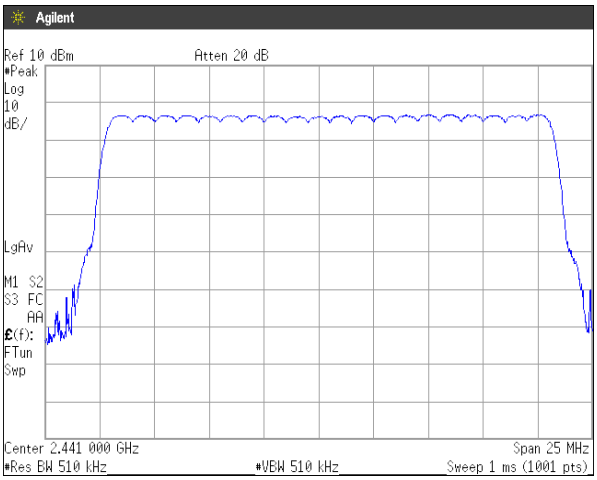


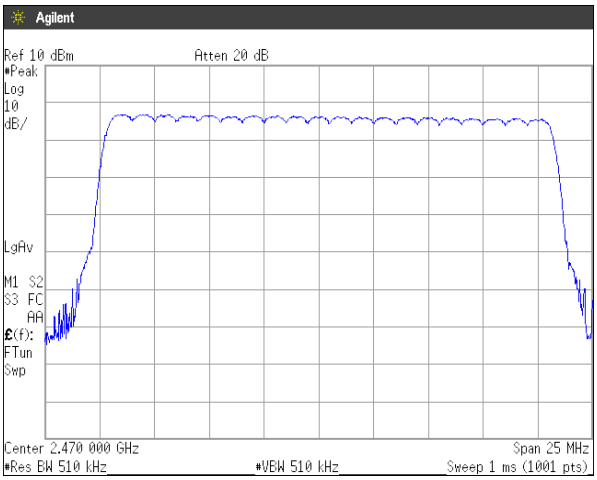
High



[3-DH5(AFH)]







Japan

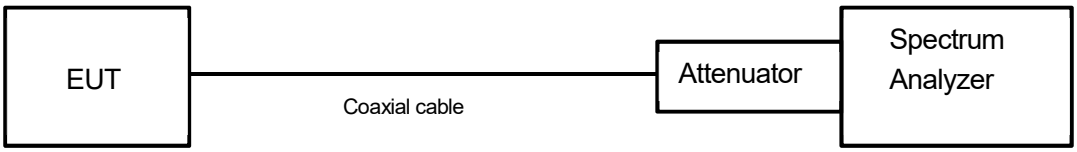
7. Time of Occupancy (Dwell Time)

7.1 Measurement procedure [FCC 15.247(a)(1)(iii)]

The time occupancy of hopping channel is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
a) Span = Zero span, centered on a hopping channel.
b) RBW ≥ 1MHz.
c) VBW ≥ RBW.
d) Sweep time = auto-couple.
e) Detector = peak.
f) Trace mode=Single.

- Test configuration



7.2 Limit

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.

Japan

7.3 Measurement result

Date : August 6, 2018
Temperature : 24.5 [˚C]
Humidity : 65.1 [%] Test engineer :
Test place : Shielded room No.4 Tadahiro Seino

FHSS

Packet type	Channel	Frequency (MHz)	Dwell time (ms)	Occupancy time of 31.6 seconds (s)	Limit	Result
DH5	Low	2402.0	2.890	0.308	<0.4s	PASS
	Middle	2441.0	2.880	0.307	<0.4s	PASS
	High	2480.0	2.880	0.307	<0.4s	PASS
3-DH5	Low	2402.0	2.870	0.306	<0.4s	PASS
	Middle	2441.0	2.890	0.308	<0.4s	PASS
	High	2480.0	2.890	0.308	<0.4s	PASS

AFH

Packet type	Channel	Frequency (MHz)	Dwell time (ms)	Occupancy time of 8 seconds (s)	Limit	Result
DH5(AFH)	Low	2402.0	2.880	0.154	<0.4s	PASS
	Middle	2441.0	2.880	0.154	<0.4s	PASS
	High	2480.0	2.880	0.154	<0.4s	PASS
3-DH5(AFH)	Low	2402.0	2.870	0.153	<0.4s	PASS
	Middle	2441.0	2.870	0.153	<0.4s	PASS
	High	2480.0	2.870	0.153	<0.4s	PASS

FHSS
DH5/3-DH5 = Dwell time (ms) x 1600 / 6 / 79 x 31.6

AFH
DH5/3-DH5 = Dwell time (ms) x 1600 / 6 / 20 x 8

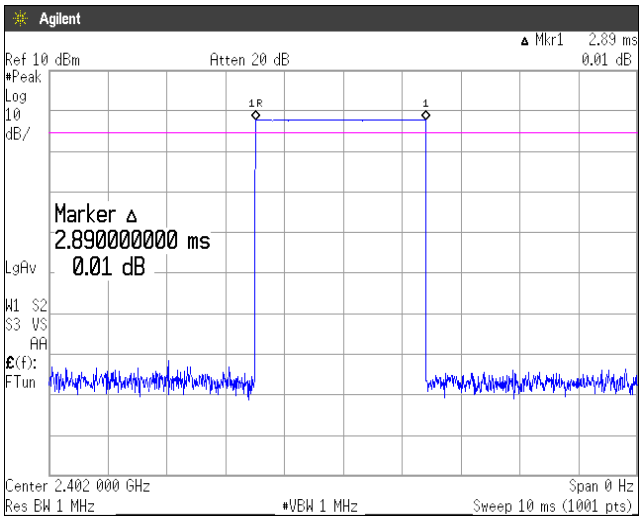
The hopping rates of Bluetooth devices change with different types of payload. The longer the payload is, the slower the hopping rate. The hopping rate scenario is defined in Bluetooth core specification.
Calculation:
Occupancy time of 31.6 seconds* = time domain slot length x hop rate / number of hopper channel / 79 /x 31.6
Ex.) for FHSS mode Channel Low,3- DH5 = 2.880ms x 1600 / 6/ 79 x 31.6 = 307ms

Japan

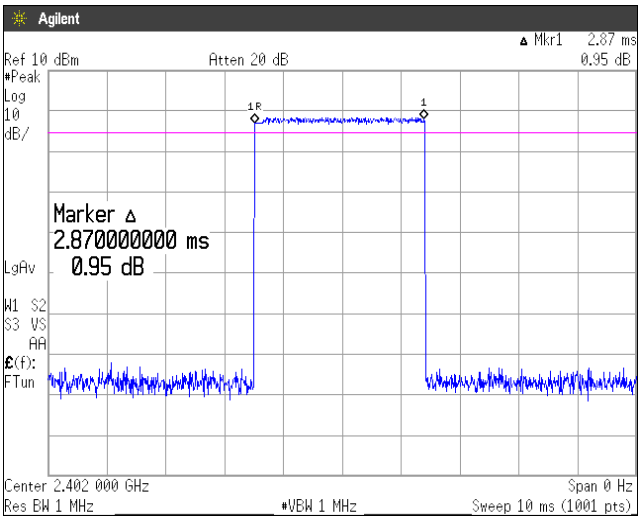
7.4 Trace data

FHSS
[DH5]

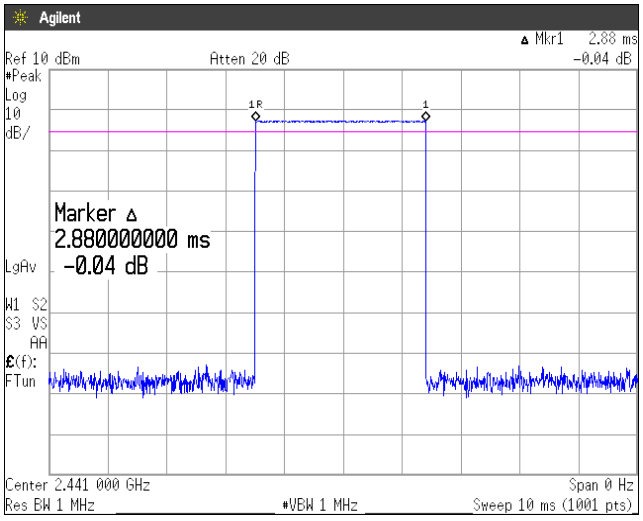
Channel Low

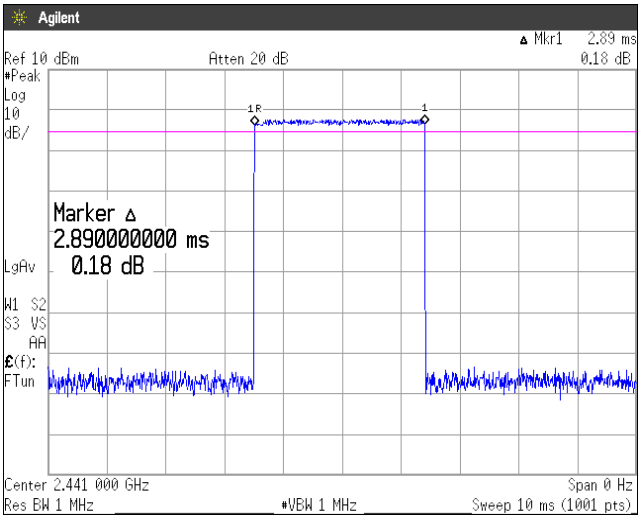


[3-DH5]

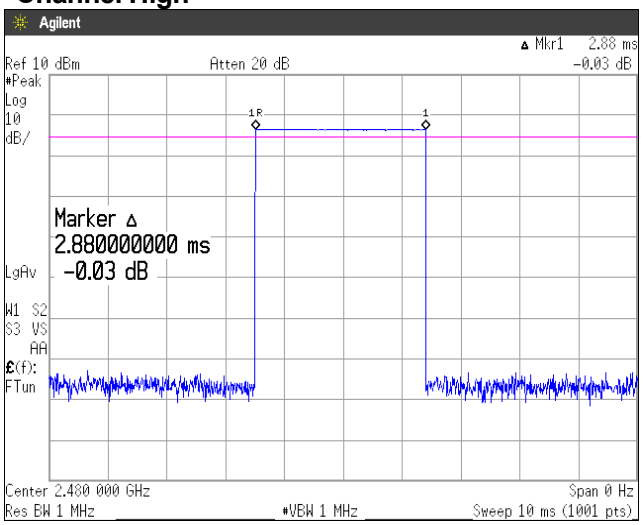


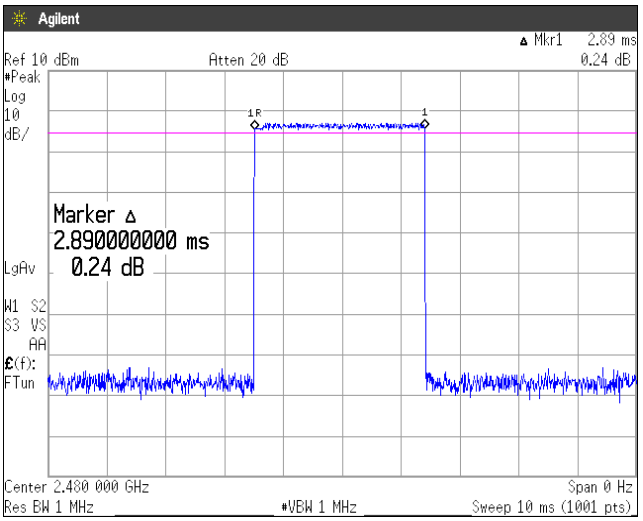
Channel Middle





Channel High



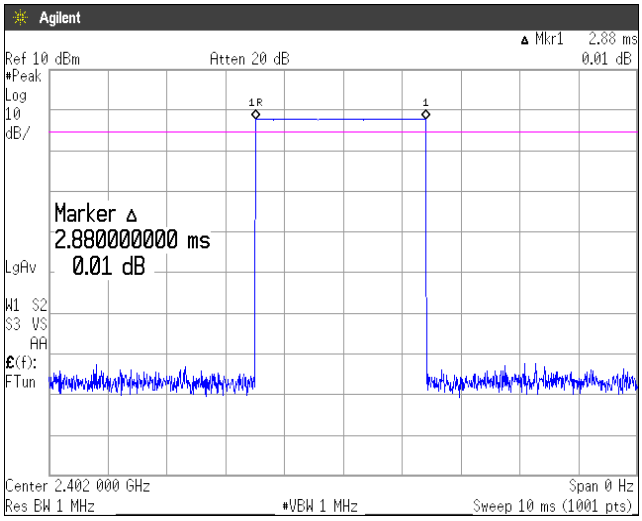


Japan

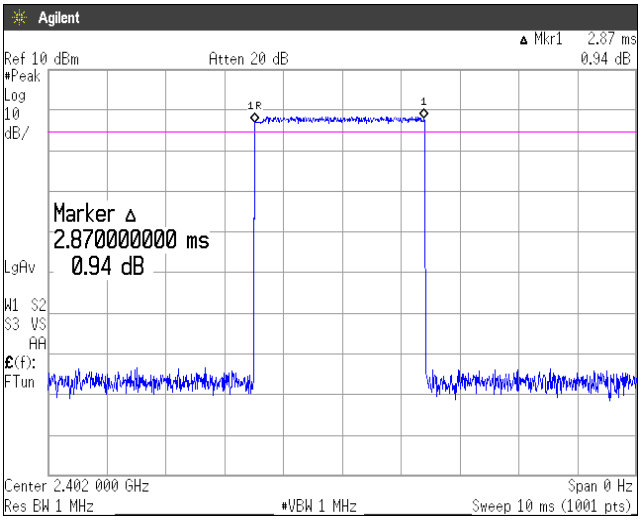
AFH

[DH5]

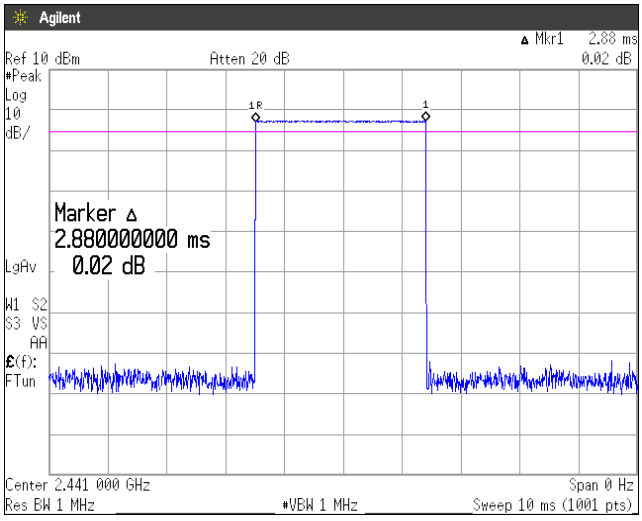
Channel Low

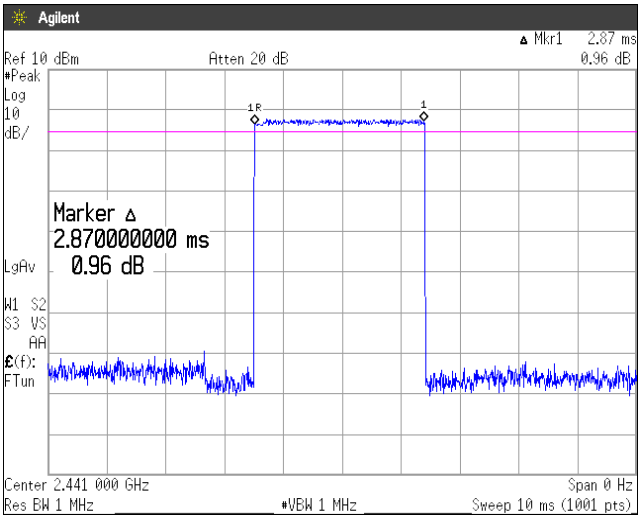


3-DH5]

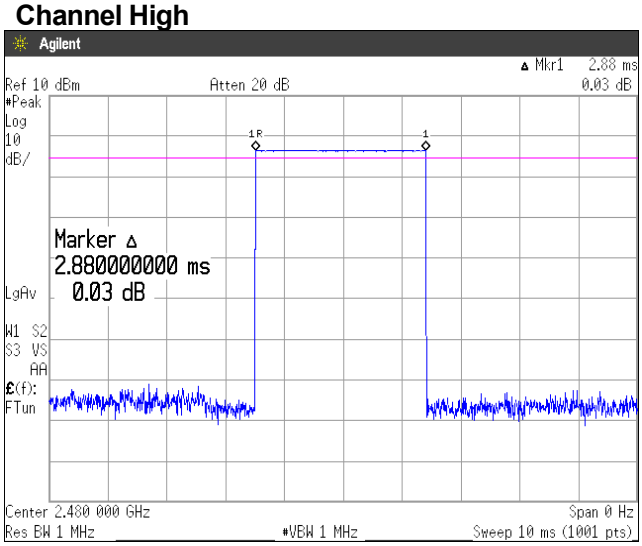


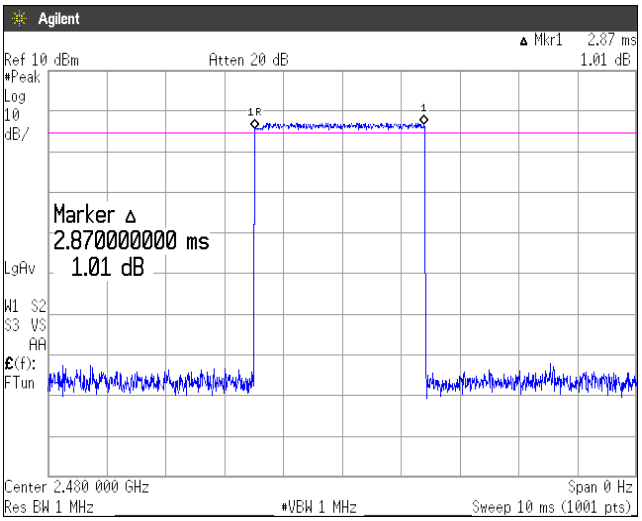
Channel Middle





Channel High





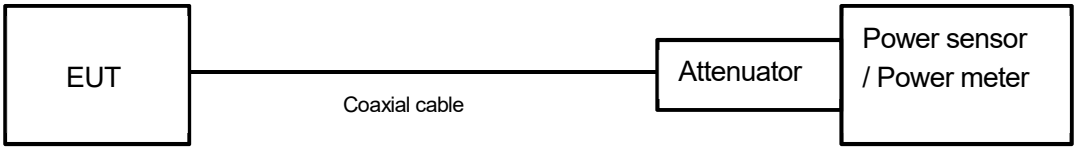
Japan

8. Maximum Peak Output Power

8.1 Measurement procedure [FCC 15.247(b)(1)]

The peak power is measured with a power sensor connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

- Test configuration



8.2 Limit

0.125W or less

8.3 Measurement result

Date : August 20, 2018
Temperature : 24.4 [˚C]
Humidity : 59.2 [%]
Test place : Shielded room No.4

Test engineer : Tadahiro Seino

Battery Full

Packet type	Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Peak Output Power (mW)	Limit (mW)	Result
DH5	Low	2402	-1.68	10.92	9.24	8.387	≦125	PASS
	Middle	2441	-2.32	10.92	8.60	7.251	≦125	PASS
	High	2480	-2.91	10.92	8.01	6.323	≦125	PASS
3-DH5	Low	2402	-0.42	10.92	10.50	11.225	≦125	PASS
	Middle	2441	-1.12	10.92	9.80	9.557	≦125	PASS
	High	2480	-1.56	10.92	9.36	8.630	≦125	PASS

Calculation;
Reading (dBm) + Factor (dB) = Level (dBm)
10logP = Level (dBm)
$P = 10^{(\text{Maximum Peak Output Power} / 10)}$ (mW)

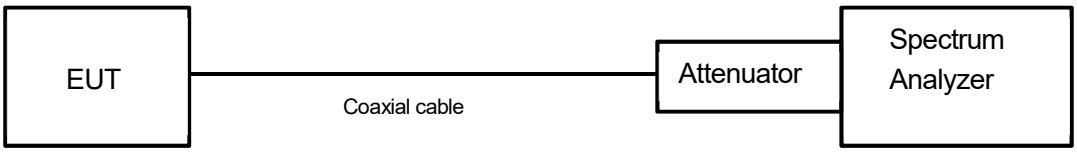
9. Band Edge Compliance of RF Conducted Emissions

9.1 Measurement procedure [FCC 15.247(d)]

The Band Edge is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
a) Span = Arbitrary setting.(Setting suitable for measurement.)
b) RBW ≥ 1% of the span
c) VBW ≥ RBW
d) Sweep time = auto-couple.
e) Detector = peak.
f) Trace mode = max hold.

- Test configuration



9.2 Limit

In any 100kHz bandwidth outside the frequency band the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

Japan

9.3 Measurement result

Date : May 7, 2018
Temperature : 24.8 [˚C]
Humidity : 55.5 [%]
Test place : Shielded room No.4
Test engineer : Tadahiro Seino

[Hopping]

Packet Type	Channel	Frequency (MHz)	RF Power Level (dBm)	Band-edge Frequency (MHz)	Band-edge Level (dBm)	Difference Level (dBm)	Limit (dBm)	Result
DH5	Low	2402	-1.72	2400.00	-59.19	57.47	At least 20dB below from peak of RF	PASS
	High	2480	-2.27	2485.05	-69.46	67.19		PASS
3-DH5	Low	2402	-2.54	2399.75	-60.35	57.81		PASS
	High	2480	-3.30	2483.90	-69.11	65.81		PASS

[No hopping]

Packet Type	Channel	Frequency (MHz)	RF Power Level (dBm)	Band-edge Frequency (MHz)	Band-edge Level (dBm)	Difference Level (dBm)	Limit (dBm)	Result
DH5	Low	2402	-1.99	2400.00	-58.15	56.16	At least 20dB below from peak of RF	PASS
	High	2480	-3.61	2483.50	-67.63	64.02		PASS
3-DH5	Low	2402	-2.75	2400.00	-57.33	54.58		PASS
	High	2480	-4.12	2483.60	-68.24	64.12		PASS

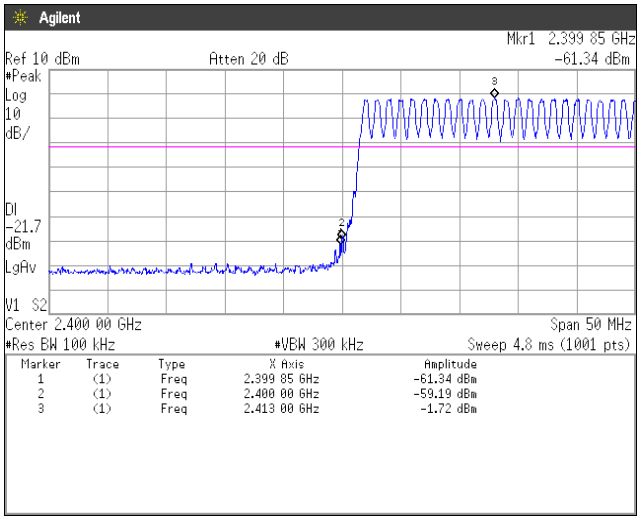
Japan

9.4 Trace data

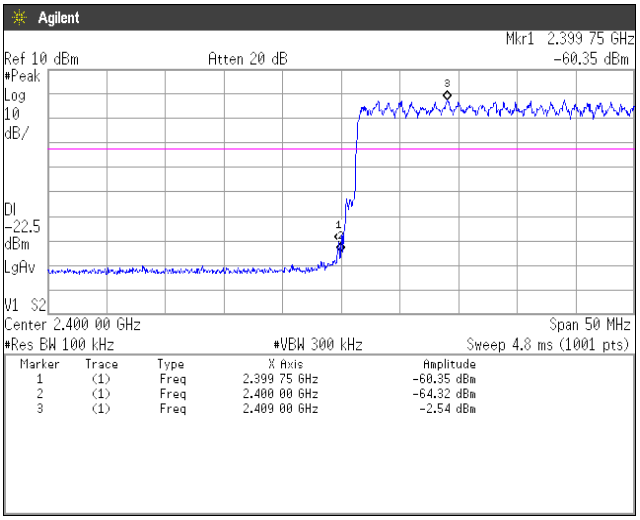
[Hopping]

Channel Low

DH5

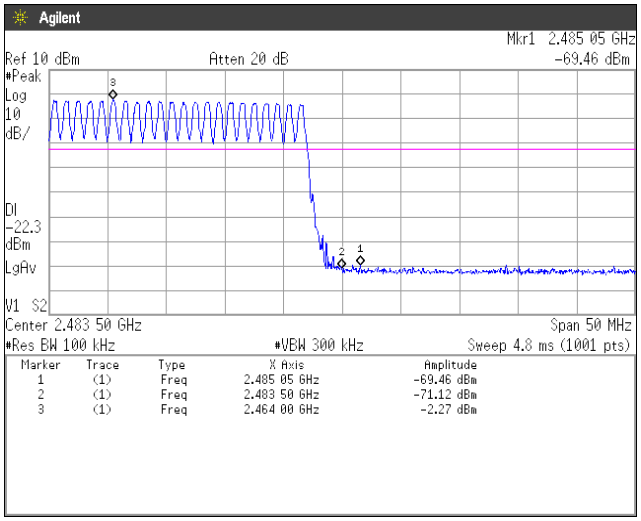


3-DH5

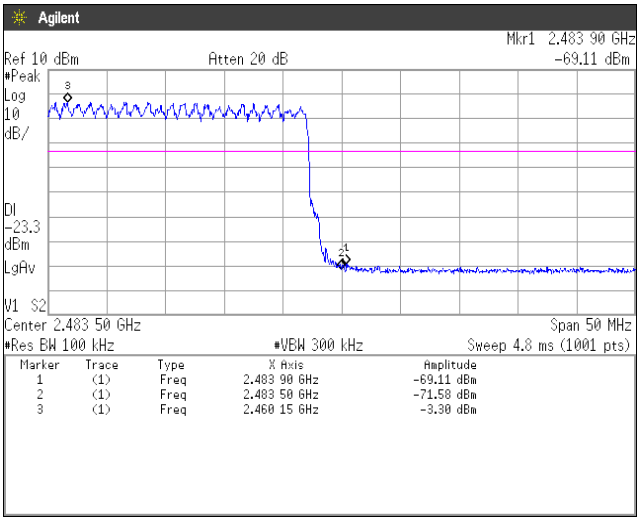


Channel High

DH5



3-DH5

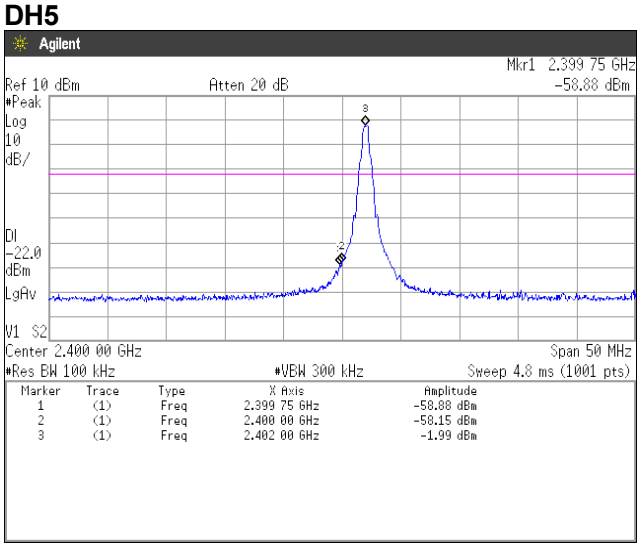


Japan

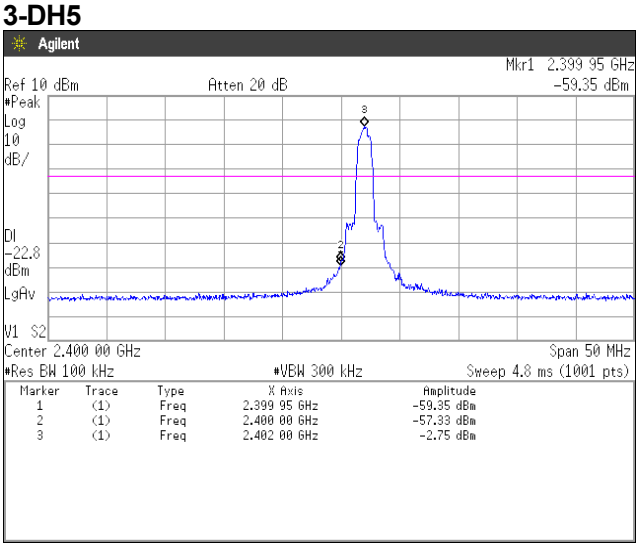
[No hopping]

Channel Low

DH5

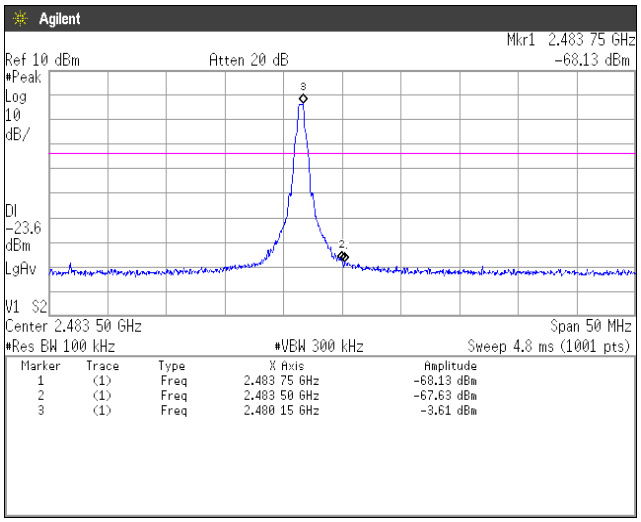


3-DH5

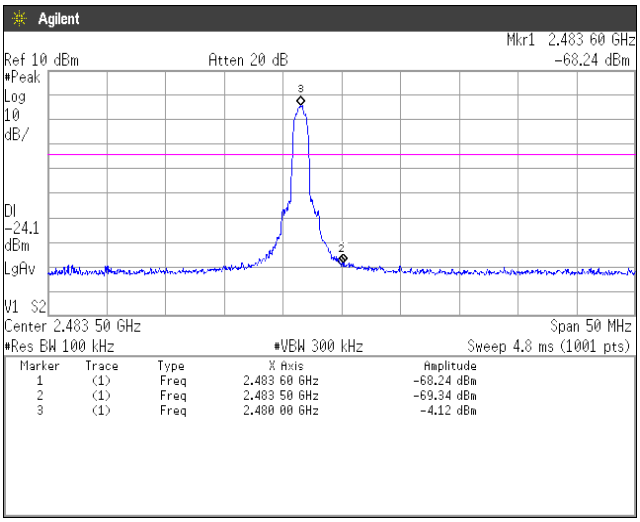


Channel High

DH5



3-DH5



Japan

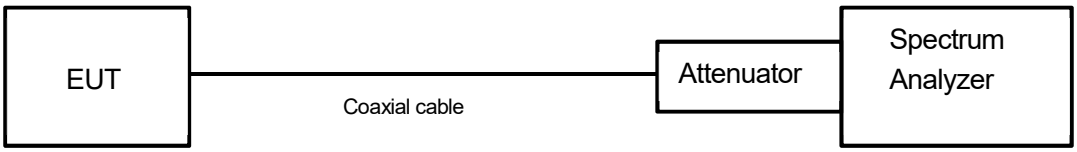
10. Spurious emissions - Conducted -

10.1 Measurement procedure [FCC 15.247(d)]

The spurious emissions (Conducted) are measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
a) Span = wide enough to fully capture the emission being measured.
b) RBW = 100 kHz.
c) VBW ≥ RBW.
d) Sweep time = auto-couple.
e) Detector = peak.
f) Trace mode = max hold.

- Test configuration



10.2 Limit

In any 100kHz bandwidth outside the frequency band the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

10.3 Measurement result

Date : August 7, 2018
Temperature : 24.8 [˚C]
Humidity : 55.5 [%]
Test place : Shielded room No.4

Test engineer : Tadahiro Seino

Channel	Frequency [MHz]	Limit [dB]	Results Chart	Result
Low	2402	At least 20dB below from peak of RF	See the trace Data	PASS
Middle	2441	At least 20dB below from peak of RF	See the trace Data	PASS
High	2480	At least 20dB below from peak of RF	See the trace Data	PASS

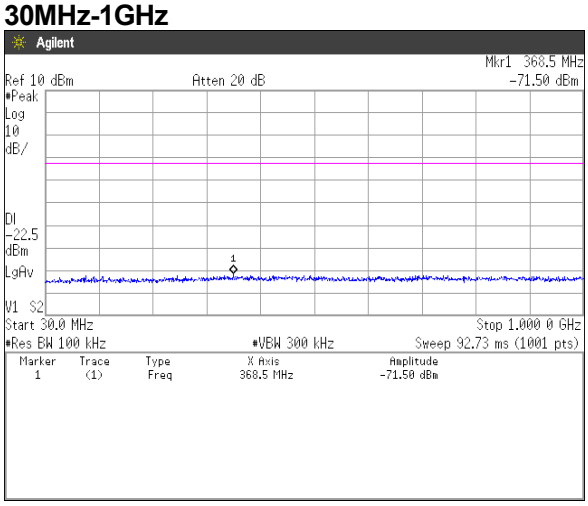
Japan

10.4 Trace data

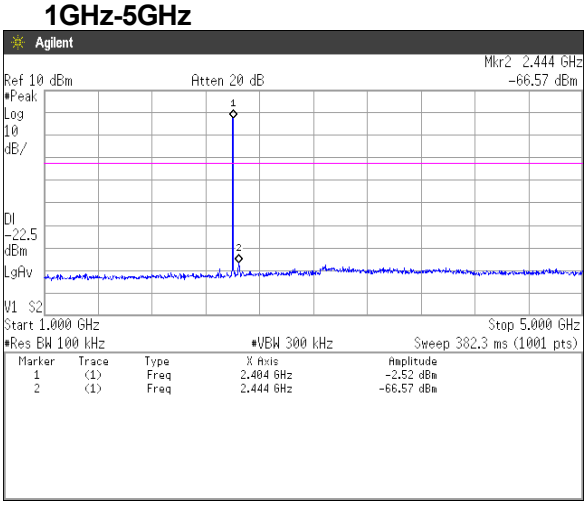
[DH5]

Channel Low

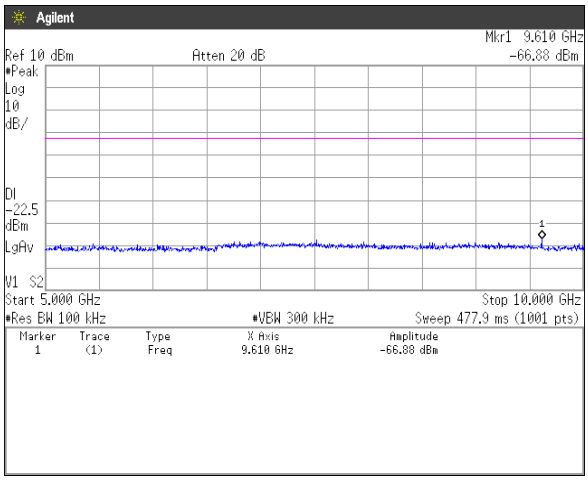
30MHz-1GHz



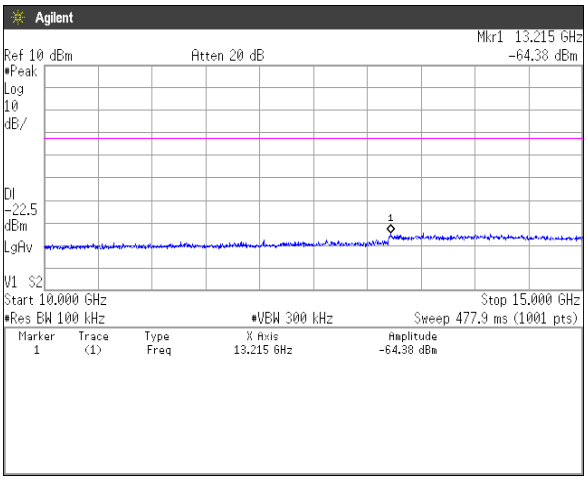
1GHz-5GHz



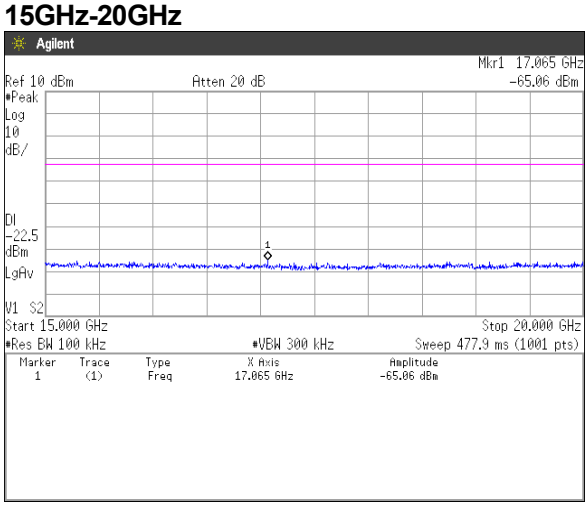
5GHz-10GHz



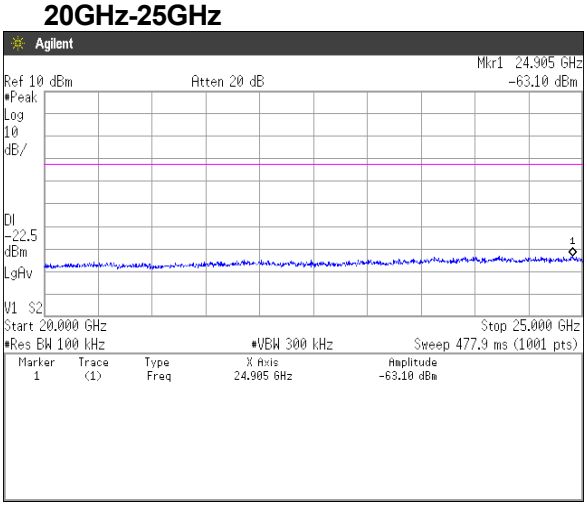
10GHz-15GHz



15GHz-20GHz



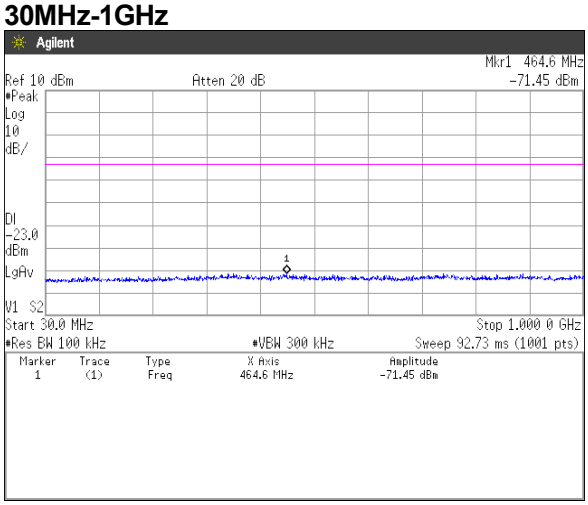
20GHz-25GHz



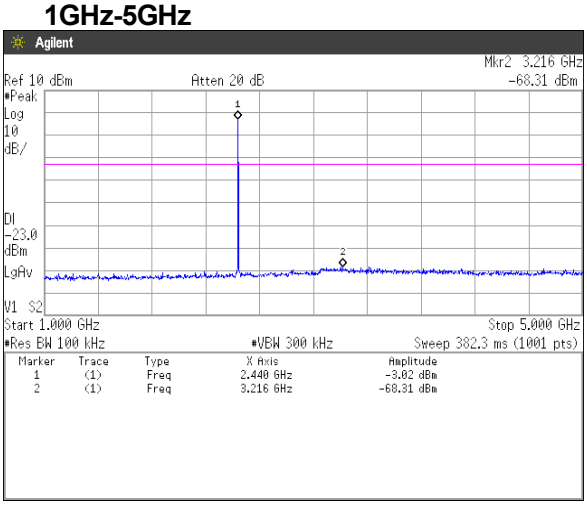
Japan

Channel Middle

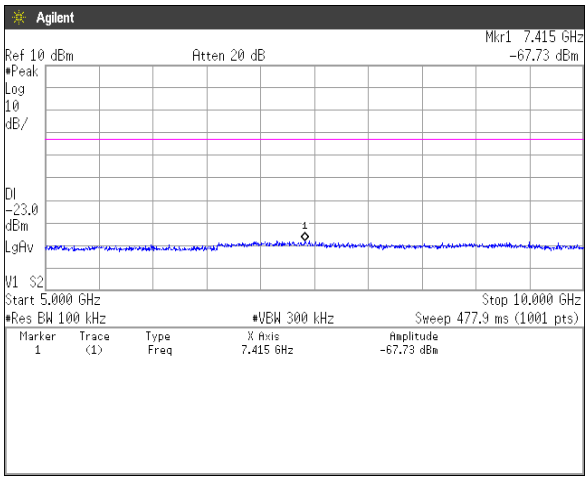
30MHz-1GHz



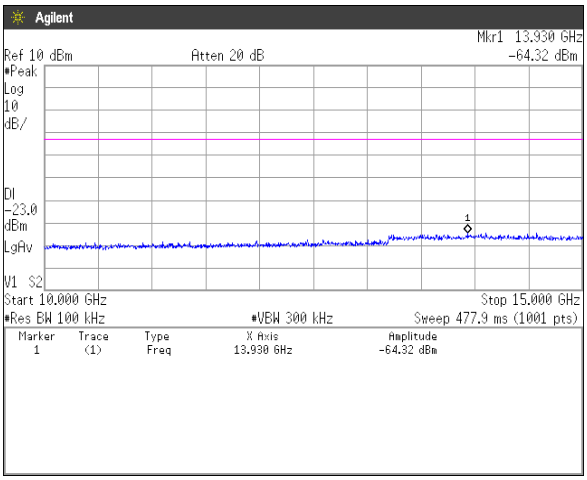
1GHz-5GHz



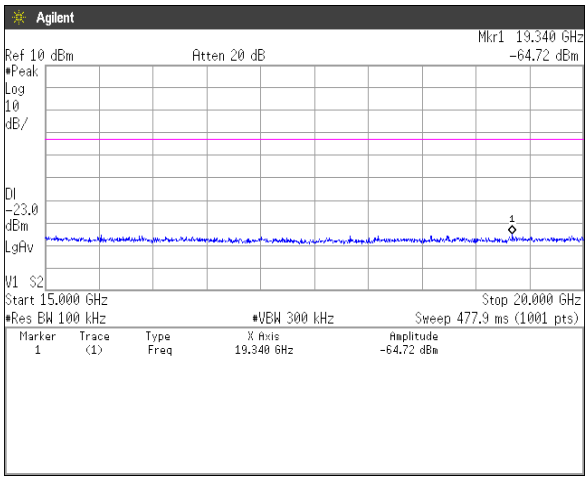
5GHz-10GHz



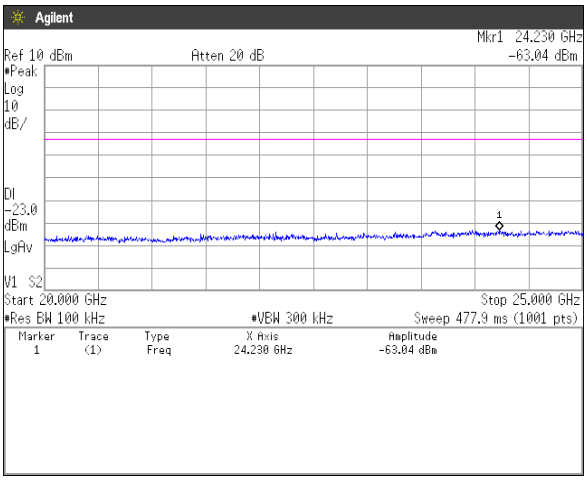
10GHz-15GHz



15GHz-20GHz



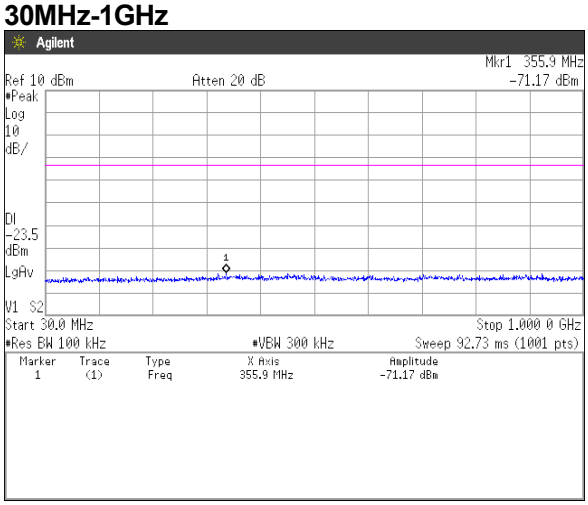
20GHz-25GHz



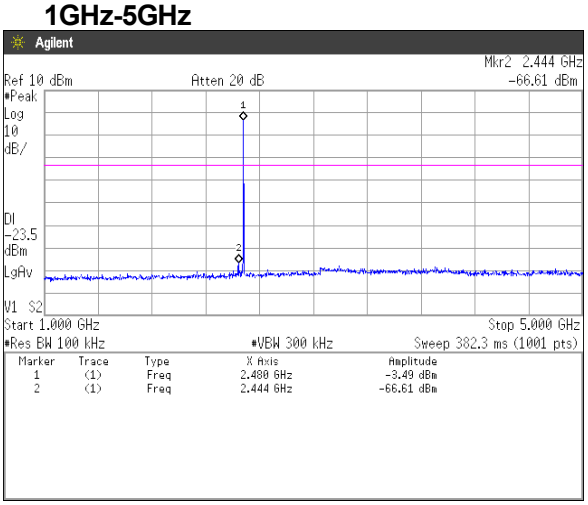
Japan

Channel High

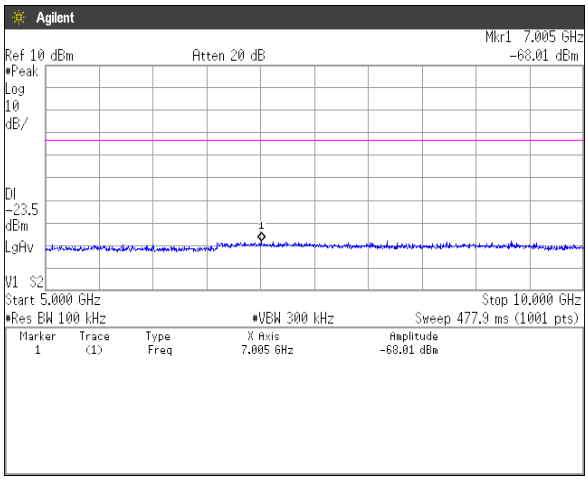
30MHz-1GHz



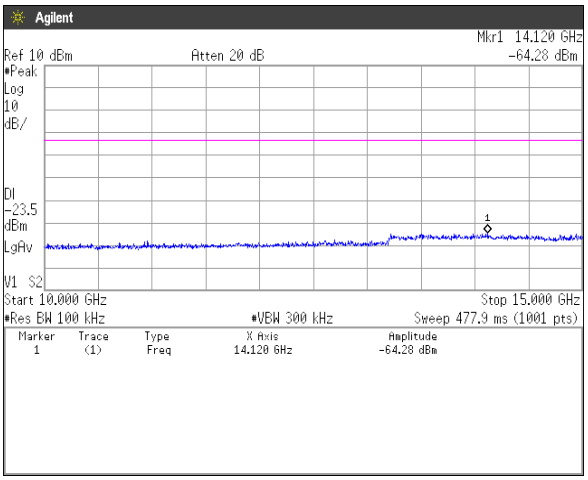
1GHz-5GHz



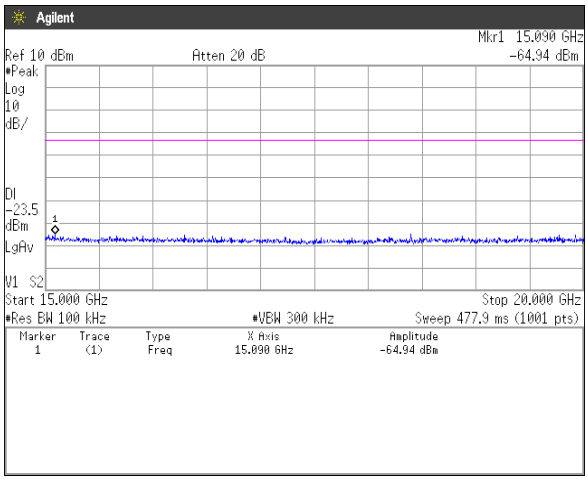
5GHz-10GHz



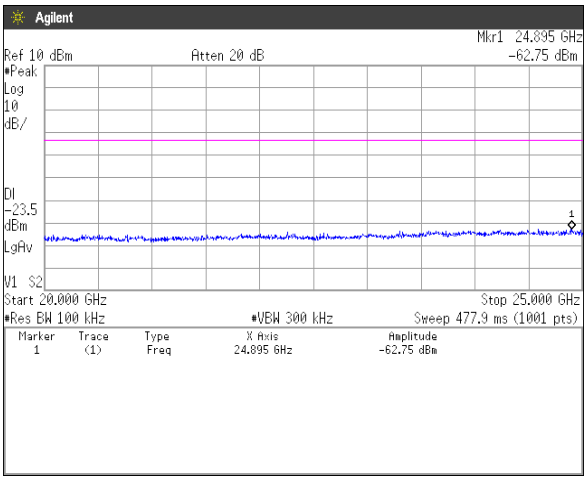
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz

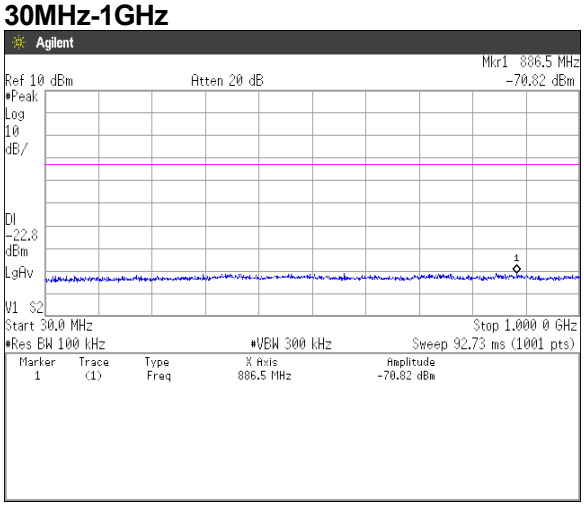


Japan

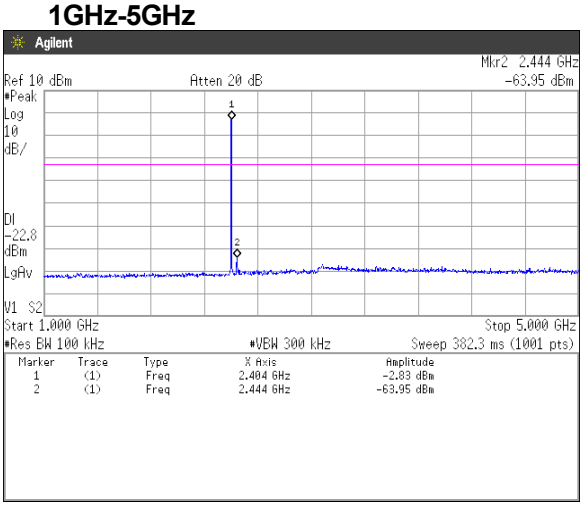
[3-DH5]

Channel Low

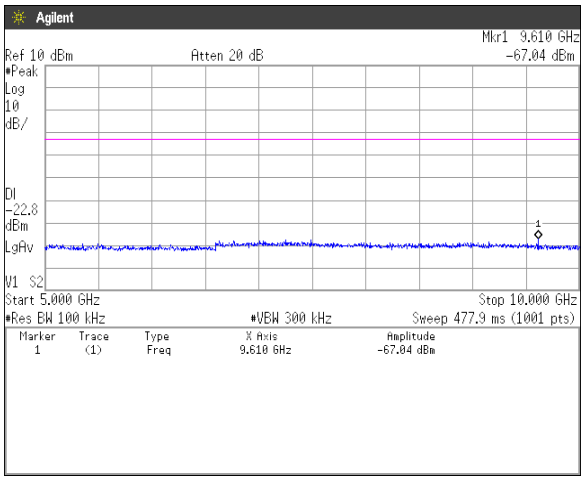
30MHz-1GHz



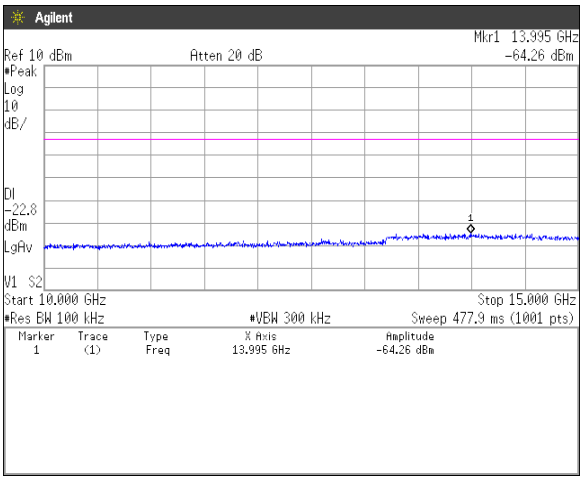
1GHz-5GHz



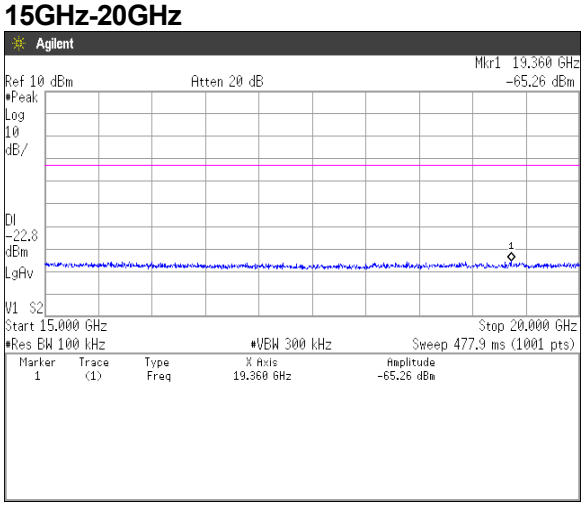
5GHz-10GHz



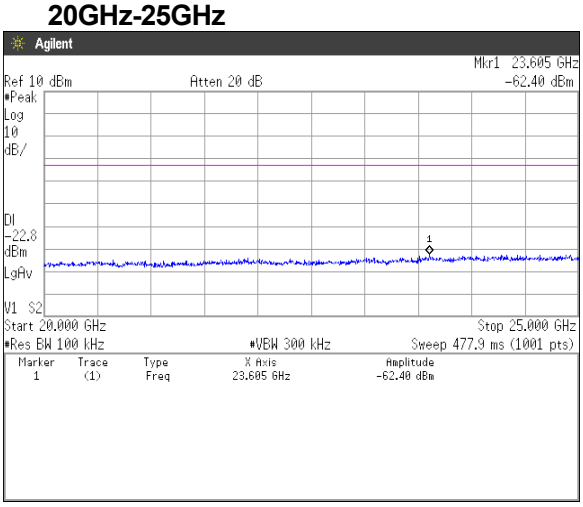
10GHz-15GHz



15GHz-20GHz



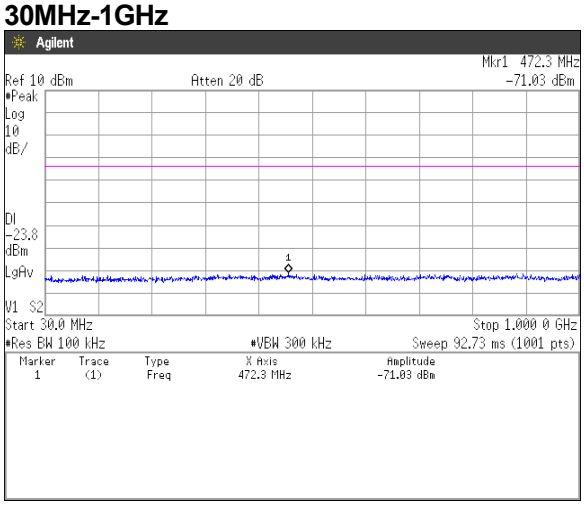
20GHz-25GHz



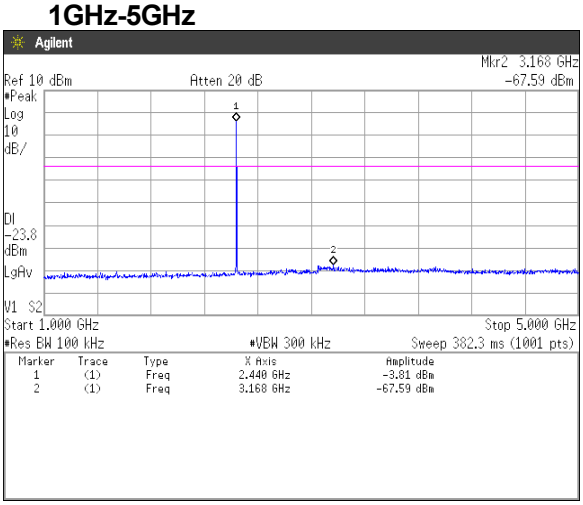
Japan

Channel Middle

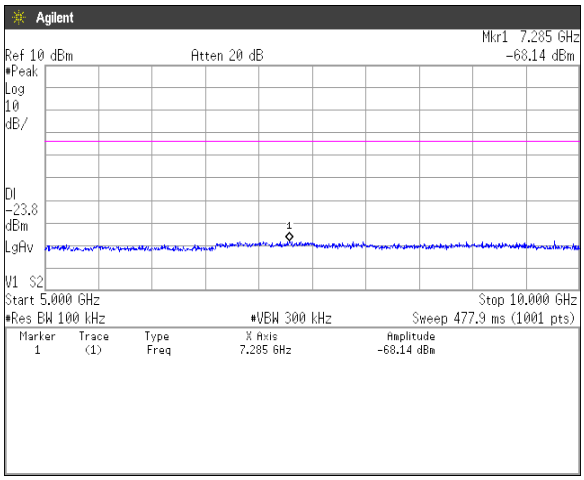
30MHz-1GHz



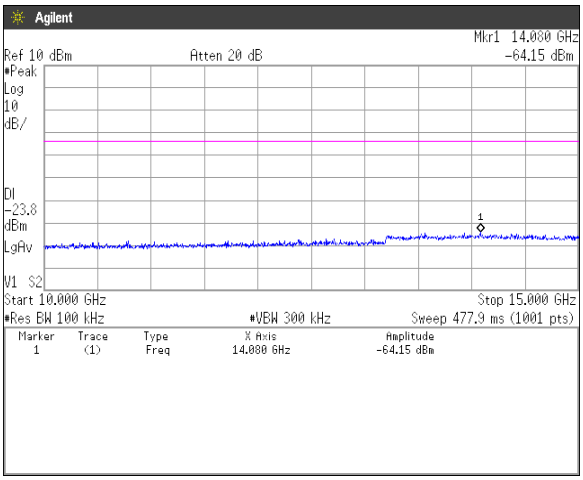
1GHz-5GHz



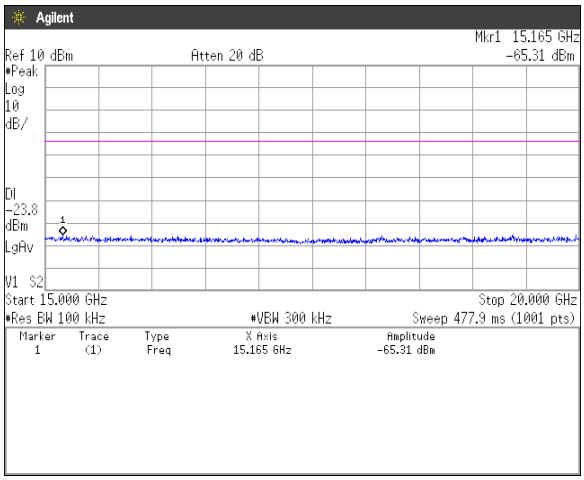
5GHz-10GHz



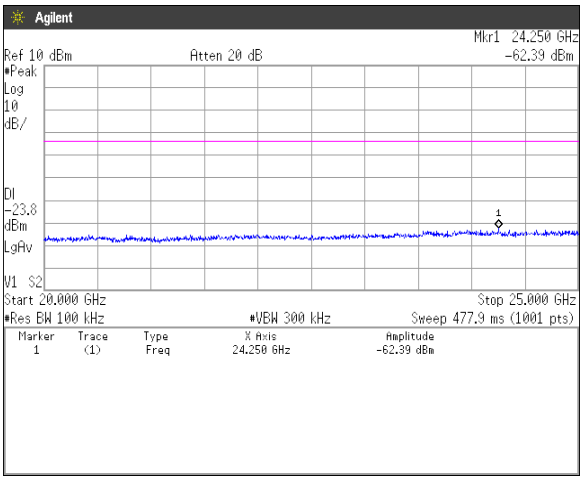
10GHz-15GHz



15GHz-20GHz



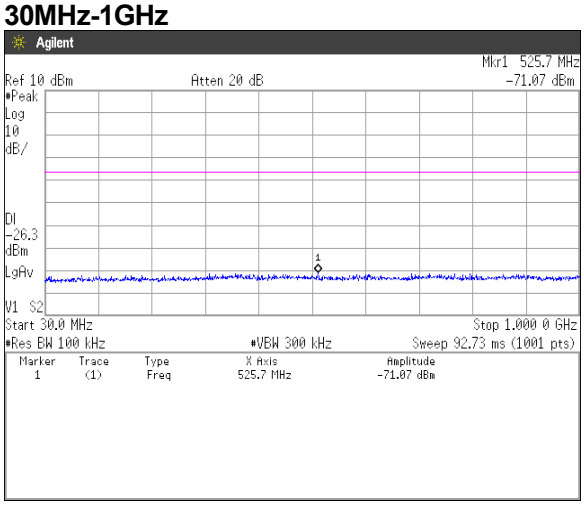
20GHz-25GHz



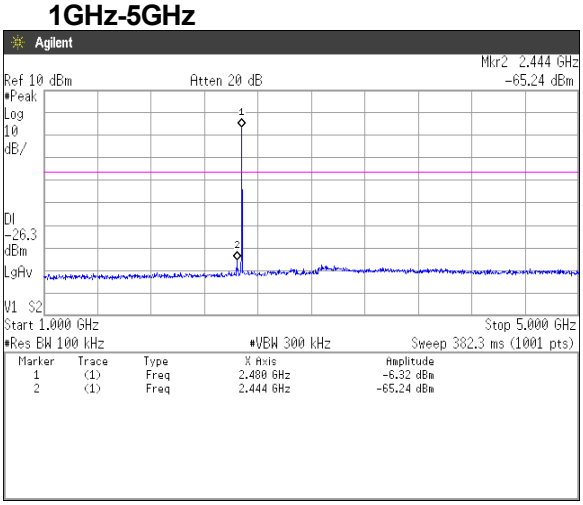
Japan

Channel High

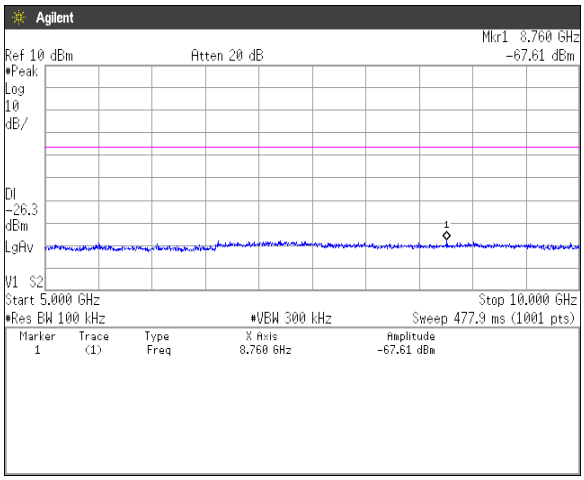
30MHz-1GHz



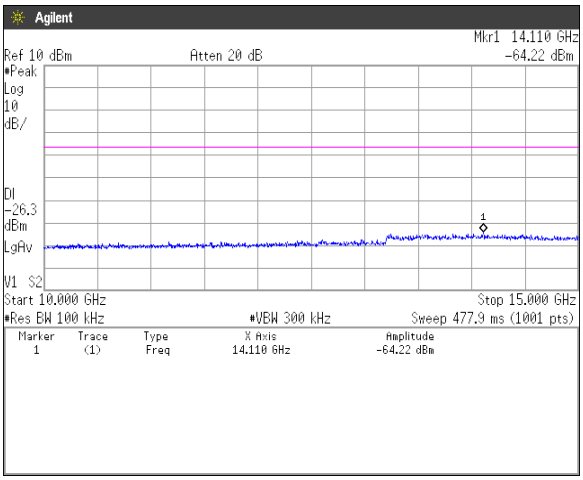
1GHz-5GHz



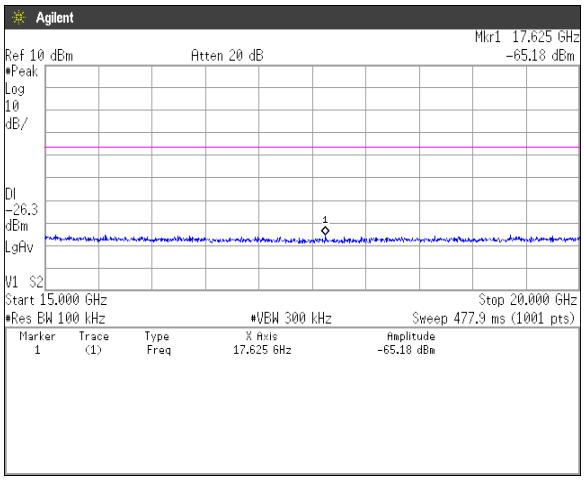
5GHz-10GHz



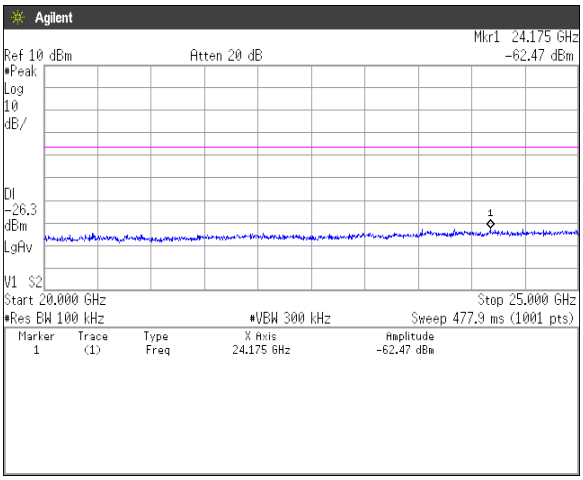
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz



Japan

11. Spurious Emissions - Radiated -

11.1 Measurement procedure
[FCC 15.247(d), 15.205, 15.209]

Test was applied by following conditions.

Test method	:	ANSI C63.10
Frequency range	:	9kHz to 25GHz
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	Styrofoam table / (W)1.0m × (D)1.0m × (H)0.8m (below 1GHz) Styrofoam table / (W)0.6m × (D)0.6m ×(H)1.5m (above 1GHz)
Antenna distance	:	3m
Test receiver setting		Below 1GHz
- Detector	:	Average (9kHz-90kHz, 110kHz-490kHz), Quasi-peak
- Bandwidth	:	200Hz, 120kHz
Spectrum analyzer setting		Above 1GHz
- Peak	:	RBW=1MHz, VBW=3MHz, Span=0Hz, Sweep time = auto-couple
- Average	:	RBW=1MHz, VBW=1kHz, Span=0Hz, Sweep time = auto-couple Display mode=Linear

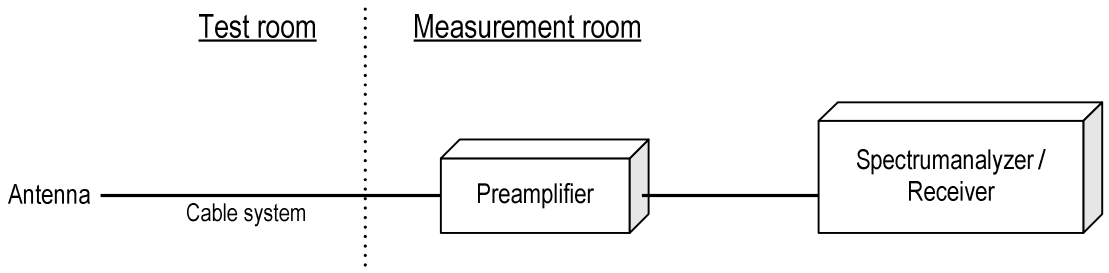
Average Measurement Setting [VBW]

Mode	Duty Cycle (%)	T_{on} (us)	T_{off} (us)	$1/T_{on}$ (kHz)	Determined VBW Setting
Bluetooth 4.2 EDR	76.73	2885	875	0.347	1kHz

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

Radiated emission measurements are performed at 3m distance with the broadband antenna (Loop antenna, Biconical antenna, Log periodic antenna, Double ridged guide antenna and Broad-band horn Antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1m to 4m and stopped at height producing the maximum emission. As for the Loop antenna, it is positioned with its plane vertical, and the center of the Loop antenna is 1m above the ground plane.
The EUT is Placed on a turntable, which is 0.8m/1.5m above ground plane. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. The test results represent the worst case emission for each emission with manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation. Sufficient time for the EUT, support equipment, and test equipment are allowed in order for them to warm up to their normal operating condition.

- Test configuration



Japan

11.2 Calculation method

[9kHz to 150kHz]
Emission level = Reading + (Ant factor + Cable system loss)
Margin = Limit – Emission level

[150kHz to 25GHz]
Emission level = Reading + (Ant factor + Cable system loss - Amp. Gain)
Margin = Limit – Emission level

Example:
Limit @ 4804.0MHz : 74.0dBuV/m (Peak Limit)
S.A Reading = 49.0dBuV Cable system loss = 8.3dB
Result = 49.0 + 8.3 = 57.3dBuV/m
Margin = 74.0 - 57.3 = 16.7dB

11.3 Limit

Frequency [MHz]	Field strength		Distance [m]
	[uV/m]	[dBuV/m]	
0.009-0.490	2400 / F [kHz]	20logE [uV/m]	300
0.490-1.705	24000 / F [kHz]	20logE [uV/m]	30
1.705-30	30	29.5	30
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Note:
1. The lower limit shall apply at the transition frequencies.
2. Emission level [dBuV/m] = 20log Emission [uV/m]
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition modulation.

Japan

11.4 Test data

Date	:	August 3, 2018			
Temperature	:	19.3 [˚C]			
Humidity	:	55.1 [%]	Test engineer	:	
Test place	:	3m Semi-anechoic chamber			Taiki Watanabe

Date	:	August 7, 2018			
Temperature	:	24.0 [˚C]			
Humidity	:	56.6 [%]	Test engineer	:	
Test place	:	3m Semi-anechoic chamber			Taiki Watanabe

Date	:	August 9~10, 2018			
Temperature	:	23.4 [˚C]			
Humidity	:	65.9 [%]	Test engineer	:	
Test place	:	3m Semi-anechoic chamber			Taiki Watanabe

Japan

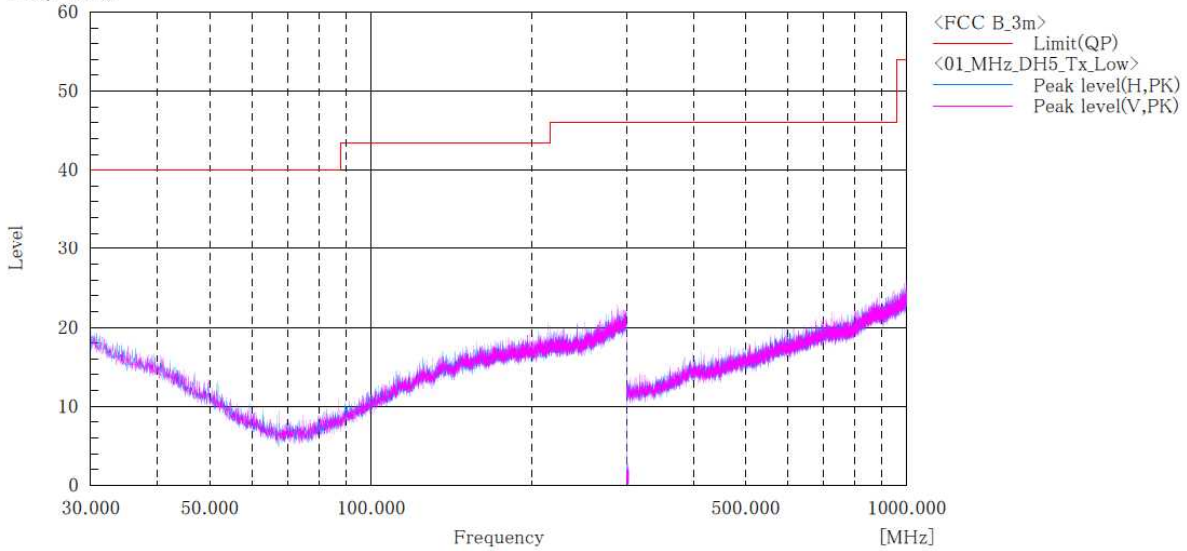
11.4.1 Transmission mode

[DH5]
Channel Low
BELOW 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<DATA Sheet No.01>> 9 August,2018 23:20

Company name	: KYOCERA Corporation	Standard	: FCC Part.15 subpartC
EUT	: Mobile Phone	Operator	: T.Watanabe
Model No.	: JA28	Temp,Hum	: 23.4[℃] 65.9[%]
Serial No.	: N/A	Note1	:
Test mode	: BT_DH5_Tx_ch:Low	Note2	:



Final Result

No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.

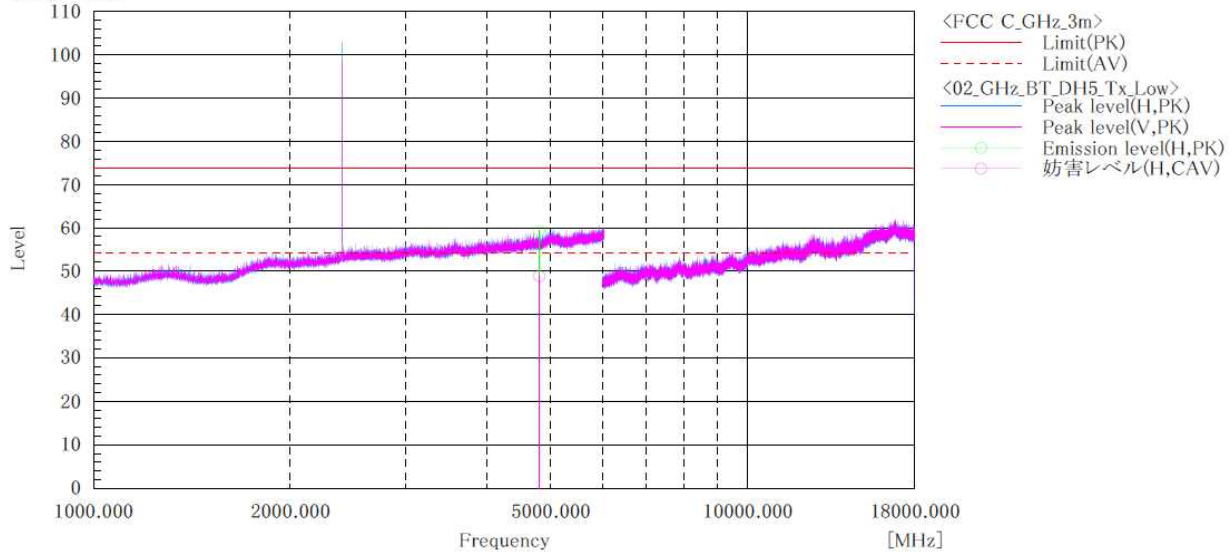
Japan

[DH5]
Channel Low
ABOVE 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<DATA Sheet No.02>> 3 August,2018 15:20

Company name	: KYOCERA Corporation	Standard	: FCC Part.15 subpart C
EUT	: Mobile Phone	Operator	: T.Watanabe
Model No.	: JA28	Temp,Hum,Atm	: 19.3[℃] 55.1[%]
Serial No.	: N/A	Note1	:
Test mode	: BT_DH5_Tx_ch:Low	Note2	:



Final Result

No.	Frequency	(P)	Reading PK	Reading CAV	c.f	Result PK	Result CAV	Limit PK	Limit AV	Margin PK	Margin CAV	Height	Angle	Remark
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]	
1	4804.000	H	50.4	39.9	8.9	59.3	48.8	74.0	54.0	14.7	5.2	174.0	47.0	

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 18GHz to 25GHz at the 3 meters distance.

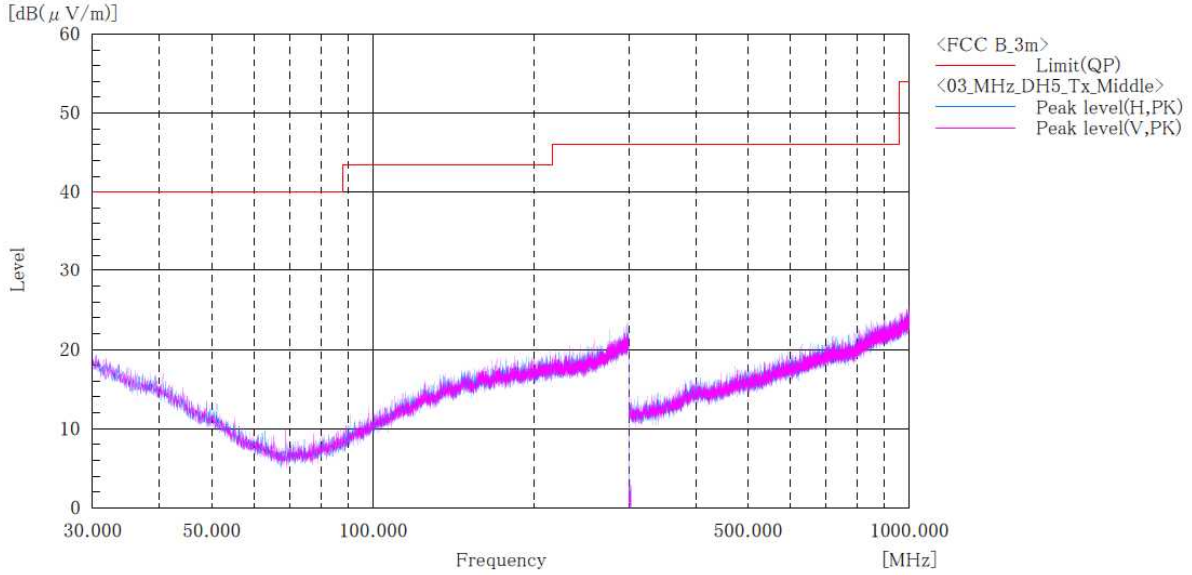
Japan

[DH5]
Channel Middle
BELOW 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<DATA Sheet No.03>> 9 August,2018 23:52

Company name	: KYOCERA Corporation	Standard	: FCC Part.15 subpartC
EUT	: Mobile Phone	Operator	: T.Watanabe
Model No.	: JA28	Temp,Hum	: 23.4[℃] 65.9[%]
Serial No.	: N/A	Note1	:
Test mode	: BT_DH5_Tx_ch:Middle	Note2	:



Final Result

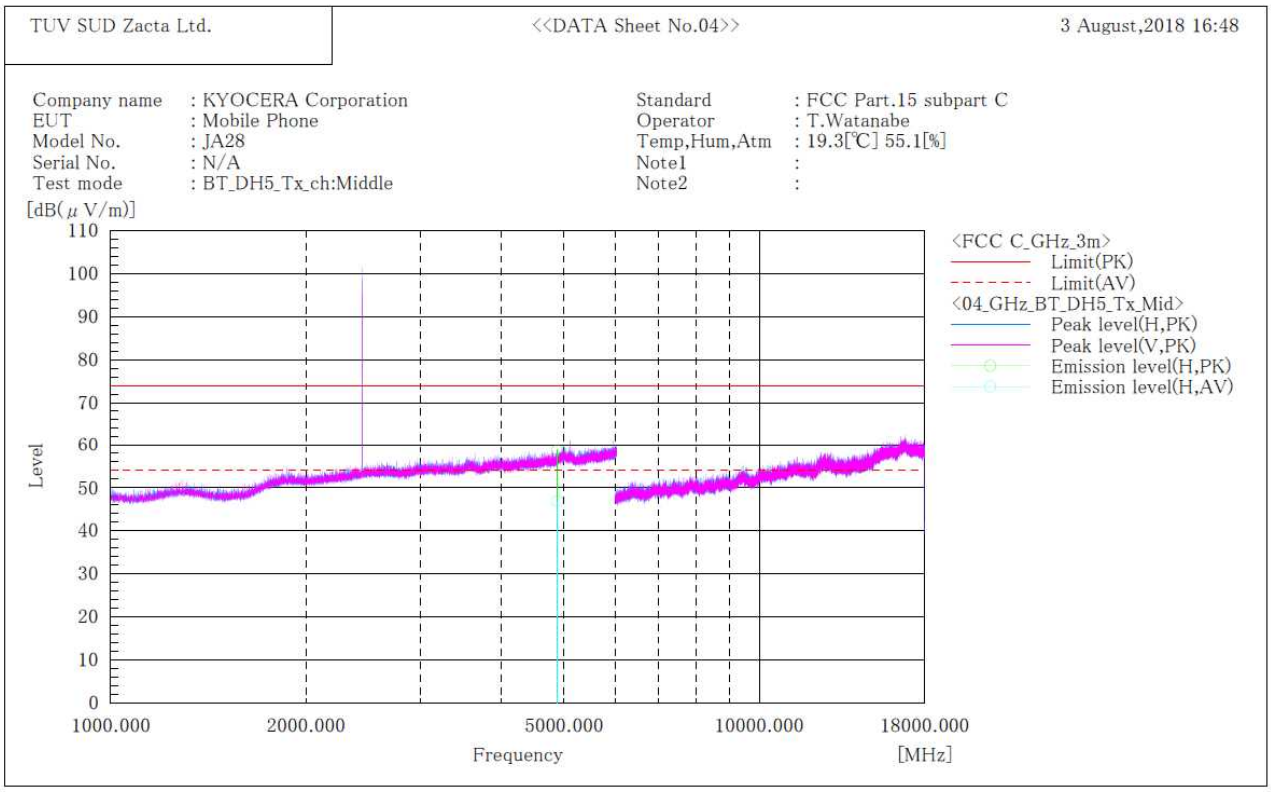
No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.

Japan

[DH5]
Channel Middle
ABOVE 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]



Final Result

No.	Frequency	(P)	Reading PK	Reading AV	c.f	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Remark
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]	
1	4882.000	H	49.7	37.7	9.2	58.9	46.9	74.0	54.0	15.1	7.1	161.0	294.0	

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 18GHz to 25GHz at the 3 meters distance.

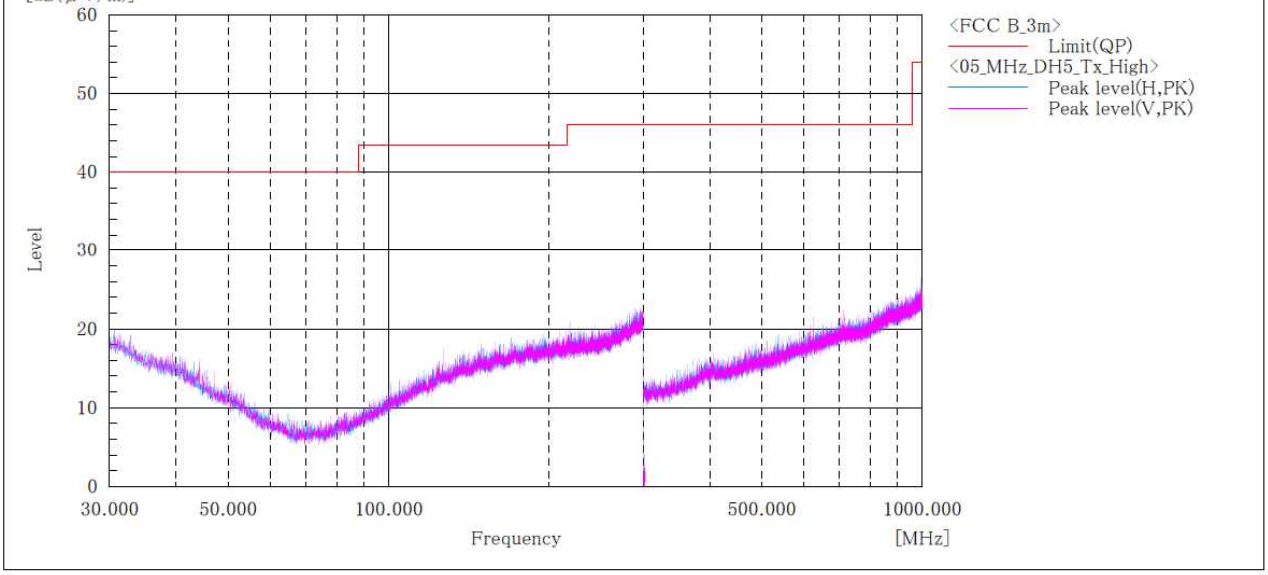
Japan

[DH5]
Channel High
BELOW 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<DATA Sheet No.05>> 10 August,2018 00:32

Company name	: KYOCERA Corporation	Standard	: FCC Part.15 subpartC
EUT	: Mobile Phone	Operator	: T.Watanabe
Model No.	: JA28	Temp,Hum	: 23.4[℃] 65.9[%]
Serial No.	: N/A	Note1	:
Test mode	: BT_DH5_Tx_ch:High	Note2	:



Final Result

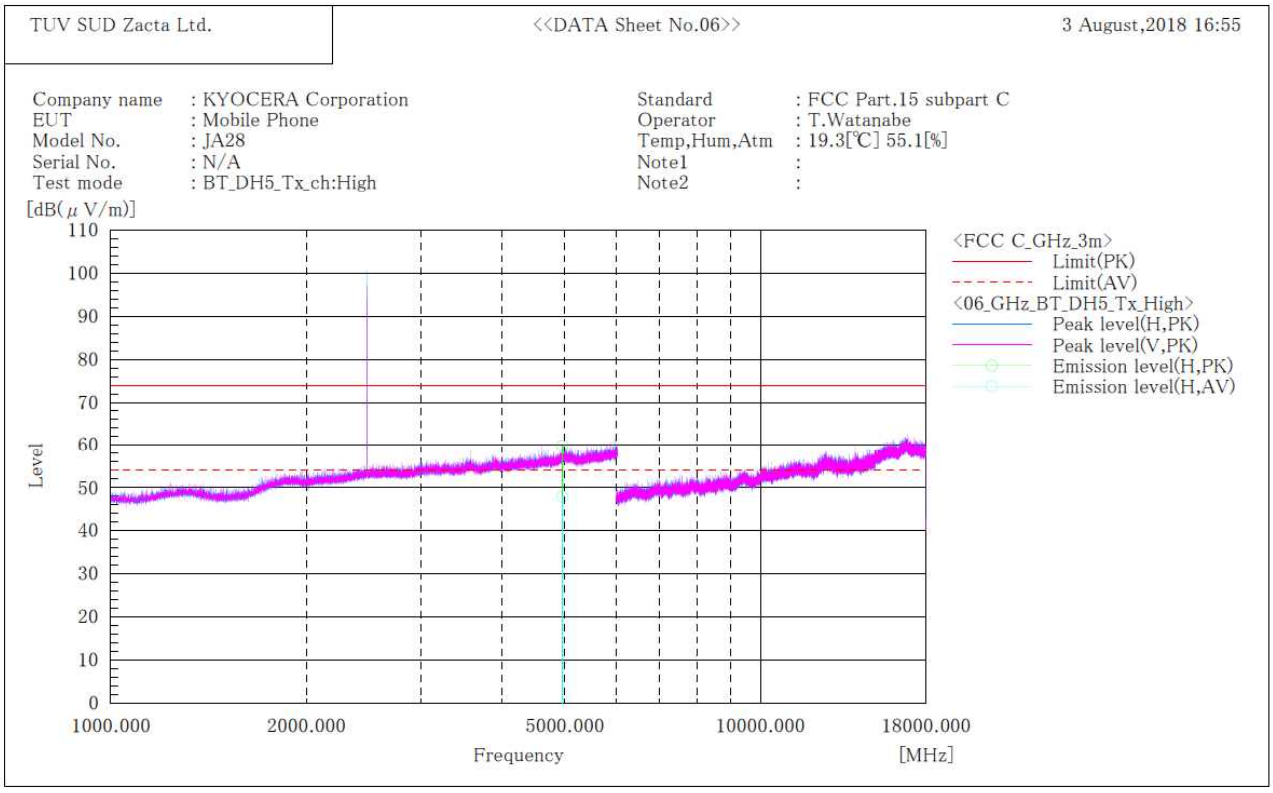
No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.

Japan

[DH5]
Channel High
ABOVE 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]



Final Result

No.	Frequency	(P)	Reading PK	Reading AV	c.f	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Remark
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]	
1	4960.000	H	50.1	38.1	9.8	59.9	47.9	74.0	54.0	14.1	6.1	157.0	271.0	

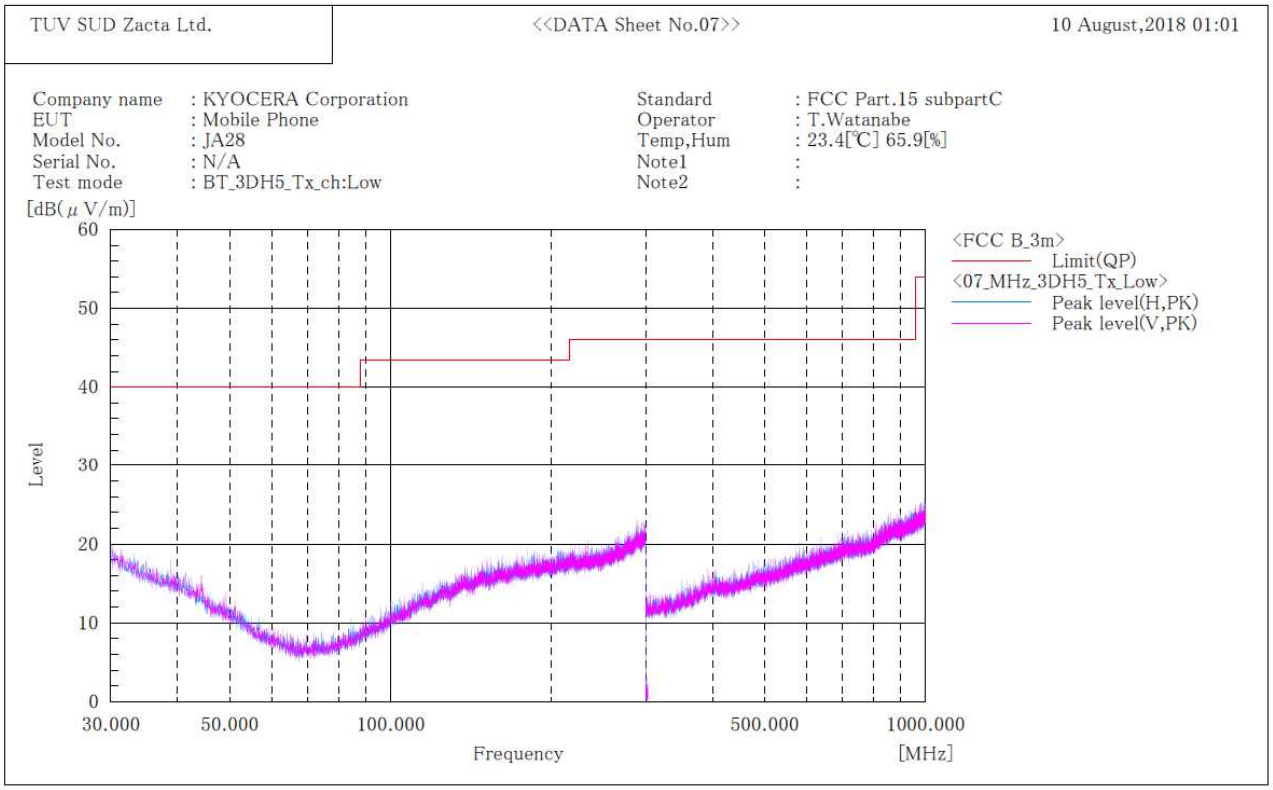
Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 18GHz to 25GHz at the 3 meters distance.

Japan

[3-DH5]
Channel Low
BELOW 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]



Final Result

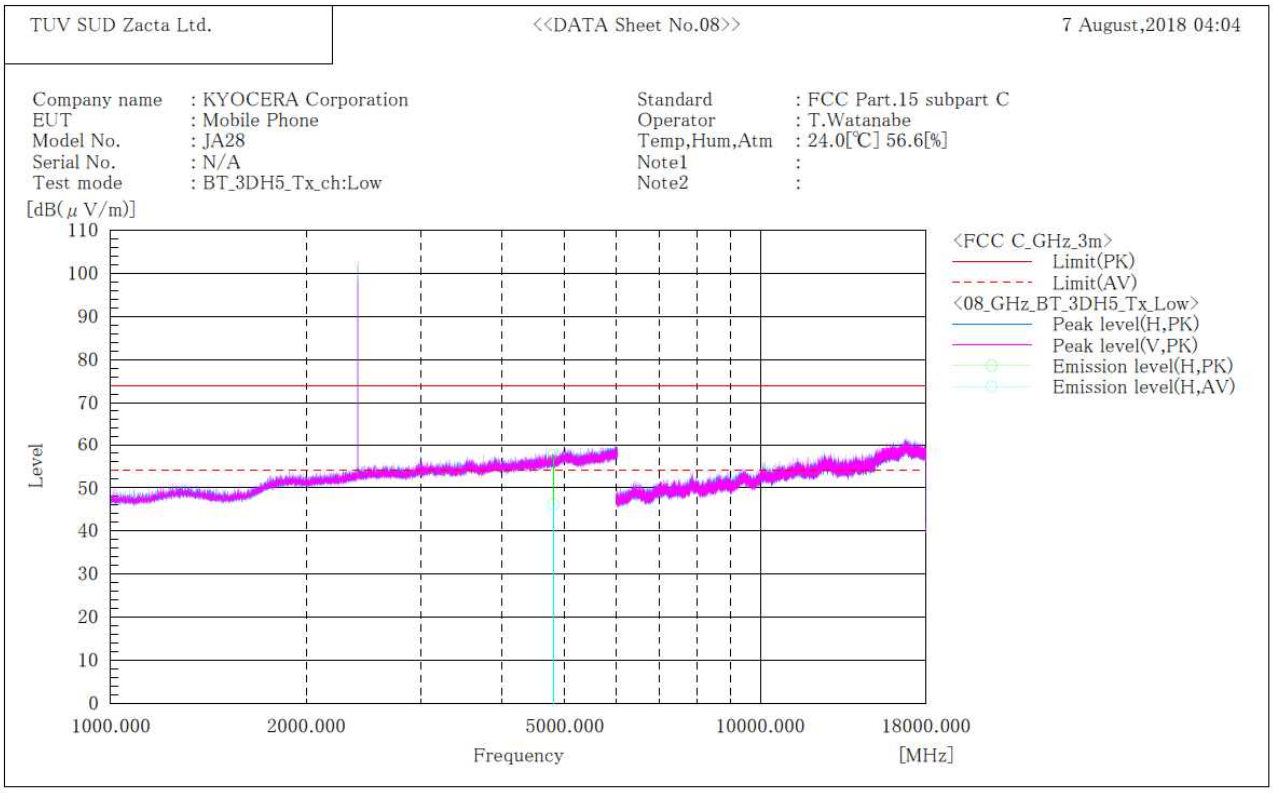
No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.

Japan

[3-DH5]
Channel Low
ABOVE 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]



Final Result

No.	Frequency	(P)	Reading PK	Reading AV	c.f	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Remark
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]	
1	4804.000	H	48.7	37.2	8.9	57.6	46.1	74.0	54.0	16.4	7.9	152.0	109.0	

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 18GHz to 25GHz at the 3 meters distance.

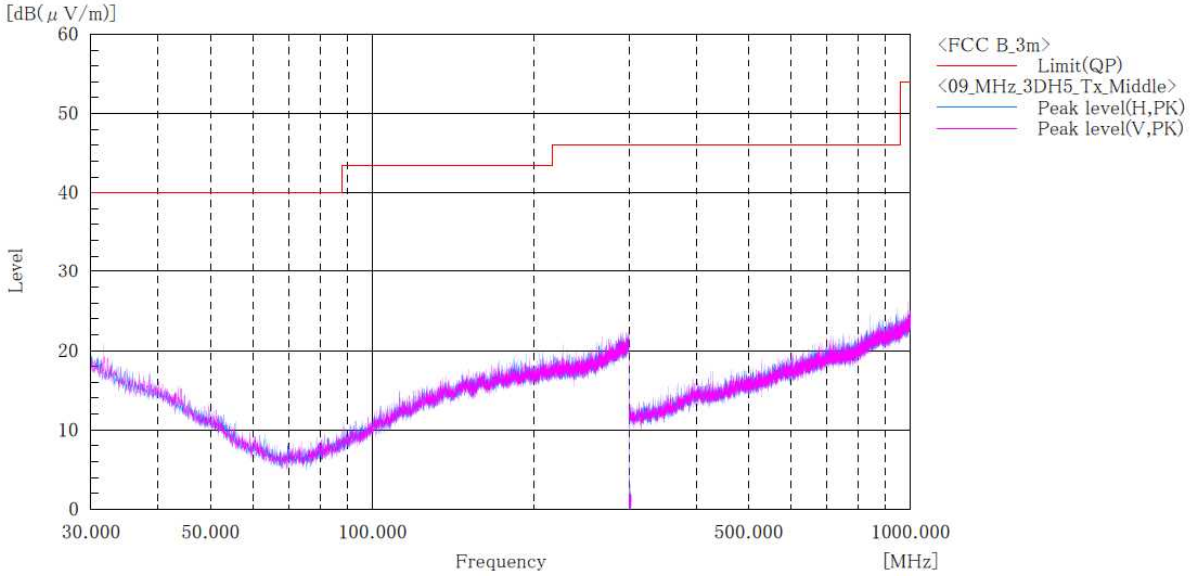
Japan

[3-DH5]
Channel Middle
BELOW 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<DATA Sheet No.09>> 10 August,2018 01:36

Company name	: KYOCERA Corporation	Standard	: FCC Part.15 subpartC
EUT	: Mobile Phone	Operator	: T.Watanabe
Model No.	: JA28	Temp,Hum	: 23.4[℃] 65.9[%]
Serial No.	: N/A	Note1	:
Test mode	: BT_3DH5_Tx_ch:Middle	Note2	:



Final Result

No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.

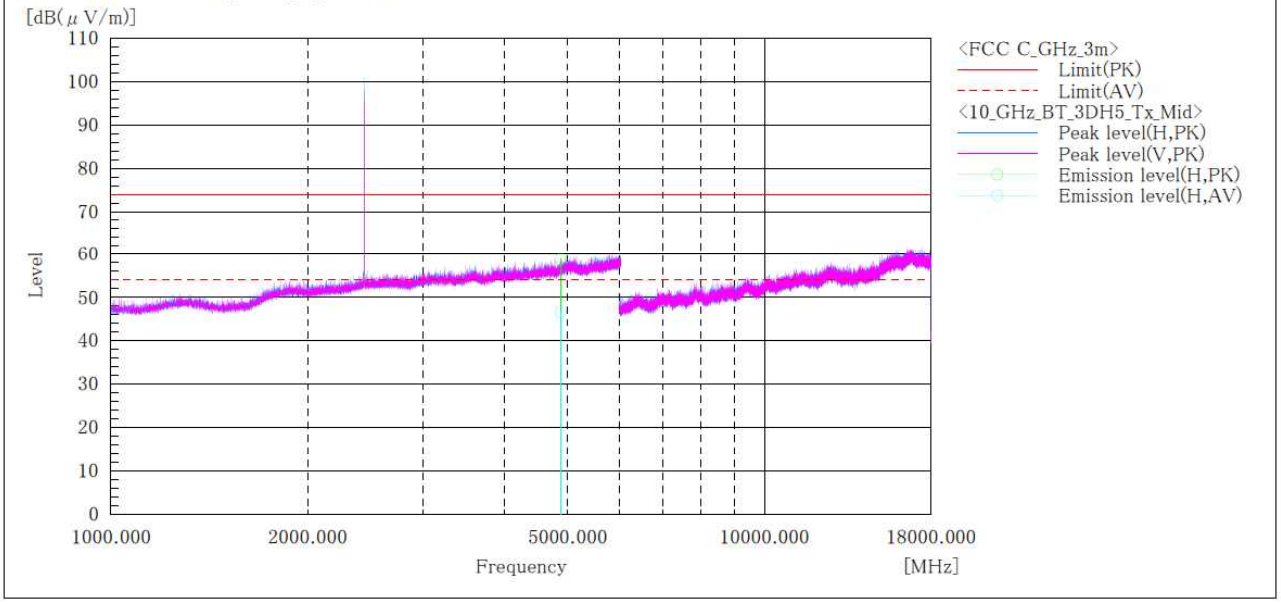
Japan

[3-DH5]
Channel Middle
ABOVE 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<DATA Sheet No.10>> 7 August,2018 04:40

Company name	: KYOCERA Corporation	Standard	: FCC Part.15 subpart C
EUT	: Mobile Phone	Operator	: T.Watanabe
Model No.	: JA28	Temp,Hum,Atm	: 24.0[℃] 56.6[%]
Serial No.	: N/A	Note1	:
Test mode	: BT_3DH5_Tx_ch:Middle	Note2	:



Final Result

No.	Frequency	(P)	Reading PK	Reading AV	c.f	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Remark
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]	
1	4882.000	H	49.7	37.4	9.2	58.9	46.6	74.0	54.0	15.1	7.4	159.0	182.0	

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 18GHz to 25GHz at the 3 meters distance.

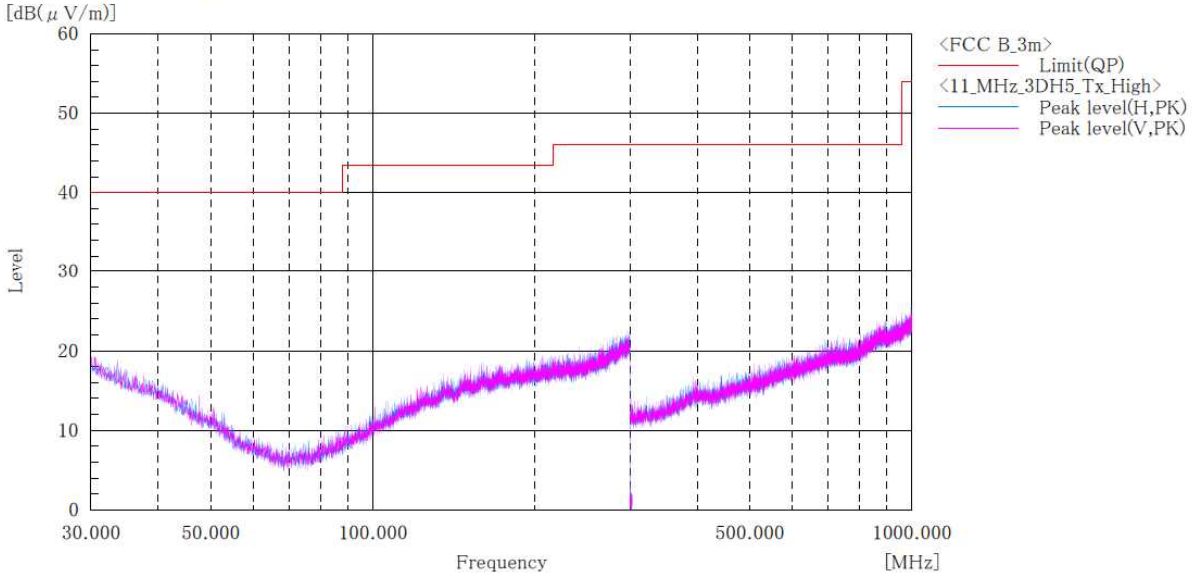
Japan

[3-DH5]
Channel High
BELOW 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<DATA Sheet No.11>> 10 August,2018 02:12

Company name	: KYOCERA Corporation	Standard	: FCC Part.15 subpartC
EUT	: Mobile Phone	Operator	: T.Watanabe
Model No.	: JA28	Temp,Hum	: 23.4[℃] 65.9[%]
Serial No.	: N/A	Note1	:
Test mode	: BT_3DH5_Tx_ch:High	Note2	:



Final Result

No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.

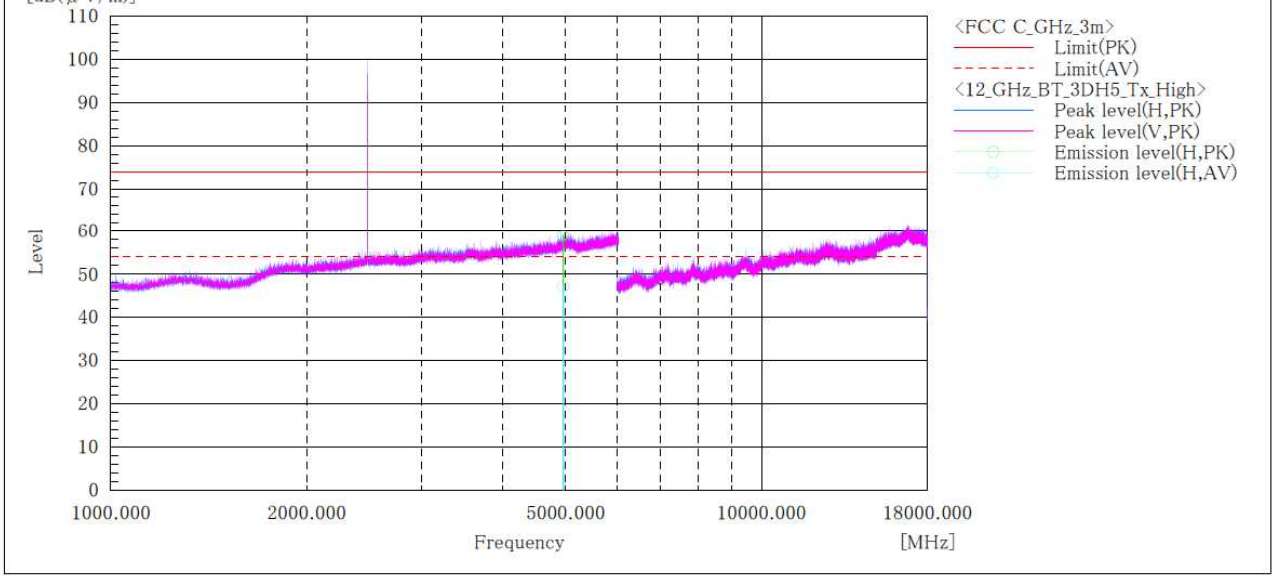
Japan

[3-DH5]
Channel High
ABOVE 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<DATA Sheet No.12>> 7 August,2018 05:22

Company name	: KYOCERA Corporation	Standard	: FCC Part.15 subpart C
EUT	: Mobile Phone	Operator	: T.Watanabe
Model No.	: JA28	Temp,Hum,Atm	: 24.0[℃] 56.6[%]
Serial No.	: N/A	Note1	:
Test mode	: BT_3DH5_Tx_ch:High	Note2	:



Final Result

No.	Frequency	(P)	Reading PK	Reading AV	c.f	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Remark
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]	
1	4960.000	H	49.0	37.4	9.8	58.8	47.2	74.0	54.0	15.2	6.8	142.0	203.0	

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 18GHz to 25GHz at the 3 meters distance.

Japan

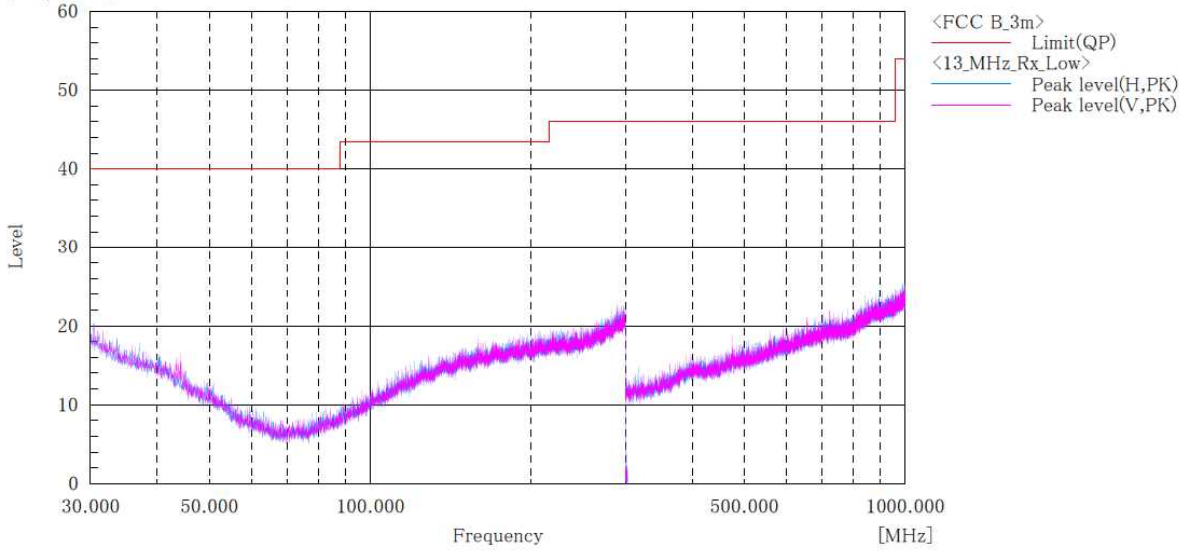
11.4.2 Receive mode

Channel Low
BELOW 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<DATA Sheet No.13>> 10 August,2018 02:37

Company name	: KYOCERA Corporation	Standard	: FCC Part.15 subpartC
EUT	: Mobile Phone	Operator	: T.Watanabe
Model No.	: JA28	Temp,Hum,Atm	: 23.4[℃] 65.9[%]
Serial No.	: N/A	Note1	:
Test mode	: BT_Rx_ch:Low	Note2	:



Final Result

No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 25GHz at the 3 meters distance.

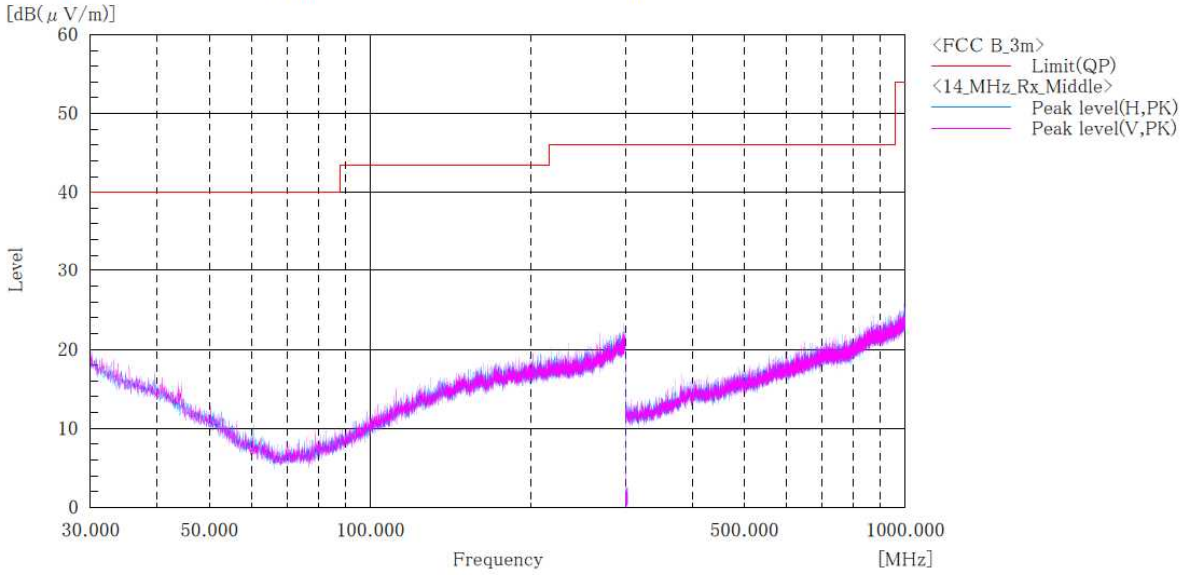
Japan

Channel Middle
BELOW 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<DATA Sheet No.14>> 10 August,2018 03:07

Company name	: KYOCERA Corporation	Standard	: FCC Part.15 subpartC
EUT	: Mobile Phone	Operator	: T.Watanabe
Model No.	: JA28	Temp,Hum,Atm	: 23.4[℃] 65.9[%]
Serial No.	: N/A	Note1	:
Test mode	: BT_Rx_ch:Middle	Note2	:



Final Result

No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 25GHz at the 3 meters distance.

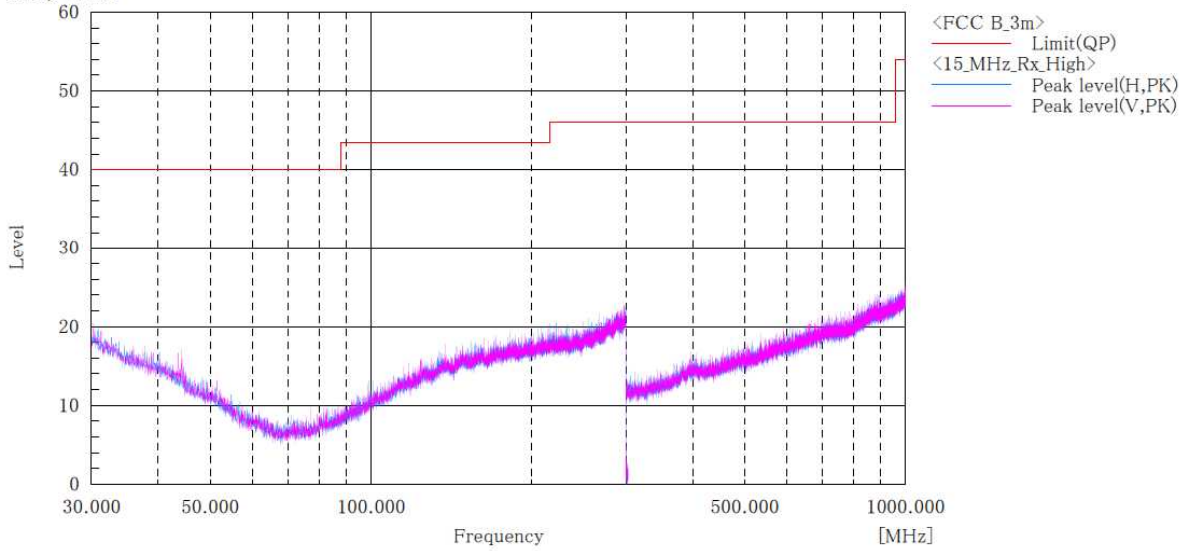
Japan

Channel High
BELOW 1GHz

******* RADIATED EMISSION *******
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<DATA Sheet No.15>> 10 August,2018 04:41

Company name	: KYOCERA Corporation	Standard	: FCC Part.15 subpartC
EUT	: Mobile Phone	Operator	: T.Watanabe
Model No.	: JA28	Temp,Hum,Atm	: 23.4[℃] 65.9[%]
Serial No.	: N/A	Note1	:
Test mode	: BT_Rx_ch:High	Note2	:



Final Result

No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 25GHz at the 3 meters distance.

Japan

12. Restricted Band of Operation

12.1 Measurement procedure [FCC 15.247(d), 15.205, 15.209]

Test was applied by following conditions.

Test method	:	ANSI C63.10
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	Styrofoam table / (W)1.0m × (D)1.0m × (H)0.8m (below 1GHz) Styrofoam table / (W)0.6m × (D)0.6m × (H)1.5m (above 1GHz)
Antenna distance	:	3m
Spectrum analyzer setting		
- Peak	:	RBW=1MHz, VBW=3MHz, Span=Arbitrary setting, Sweep time = auto-couple
- Average	:	RBW=1MHz, VBW=1kHz, Span=Arbitrary setting, Sweep time = auto-couple, Display mode=Linear

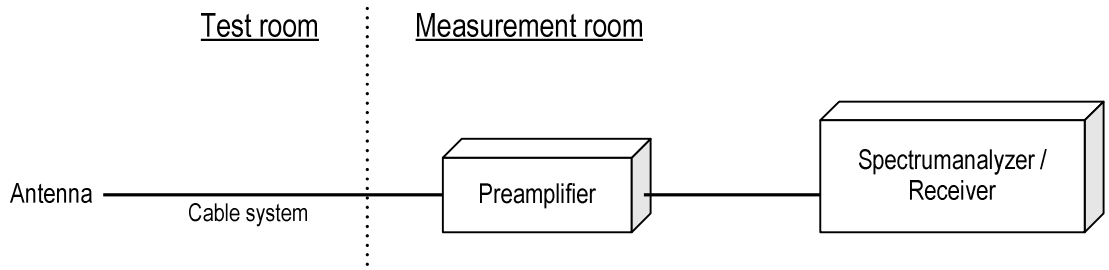
Average Measurement Setting [VBW]

Mode	Duty Cycle (%)	T_{on} (us)	T_{off} (us)	$1/T_{on}$ (kHz)	Determined VBW Setting
Bluetooth 4.2 EDR	76.73	2885	875	0.347	1kHz

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site.
Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

Radiated emission measurements are performed at 3m distance with the broadband antenna (Double ridged guide antenna). The antenna is positioned both the horizontal and vertical planes of polarization and height is varied 1m to 4m and stopped at height producing the maximum emission.
The EUT is Placed on a turntable, which is 0.8m/1.5m above ground plane. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. The test results represent the worst case emission for each emission with manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation. Sufficient time for the EUT, support equipment, and test equipment are allowed in order for them to warm up to their normal operating condition.

- Test configuration



12.2 Limit

Emission at the boundary of the restricted band provided by 15.205 shall be lower than 15.209 limit.

Japan

12.3 Measurement Result

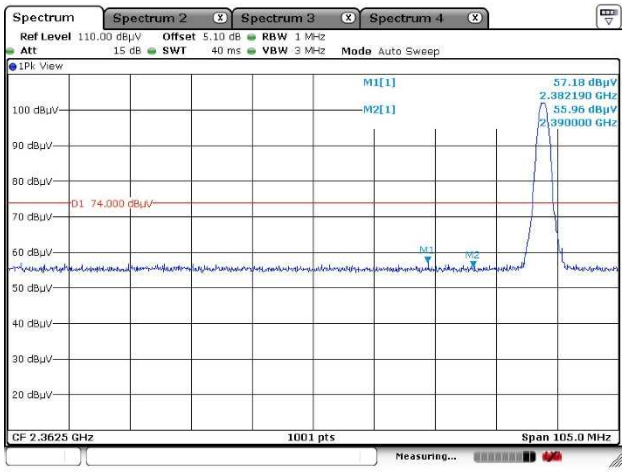
Channel	Frequency [MHz]	Results Chart	Result
Low	2402	See the Trace Data	Pass
High	2480	See the Trace Data	Pass

12.4 Test data

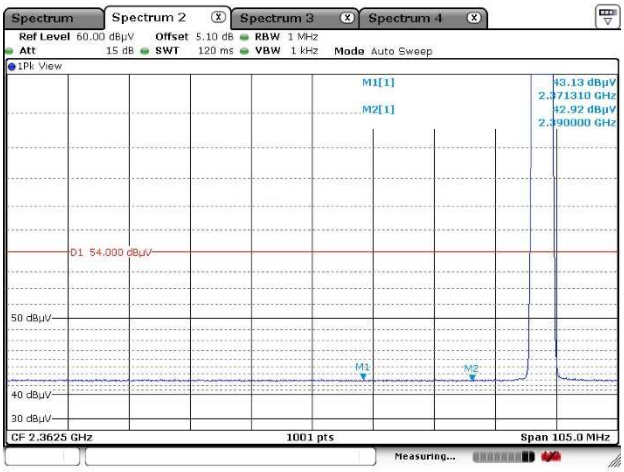
Date : August 17, 2018
Temperature : 22.5 [˚C]
Humidity : 45.5 [%] Test engineer :
Test place : 3m Semi-anechoic chamber Tadahiro Seino

Japan

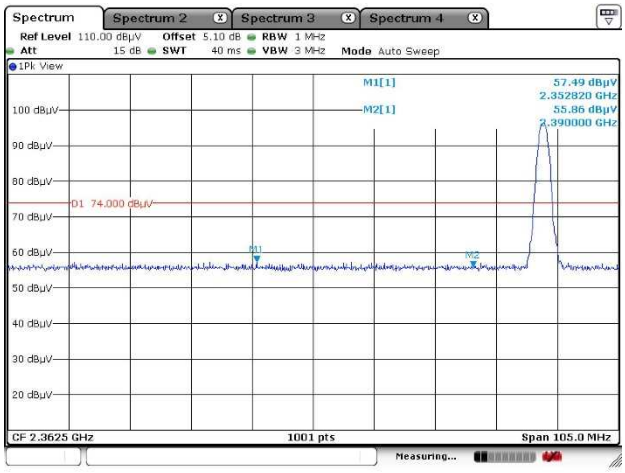
[DH5]
Channel Low
Horizontal
Peak



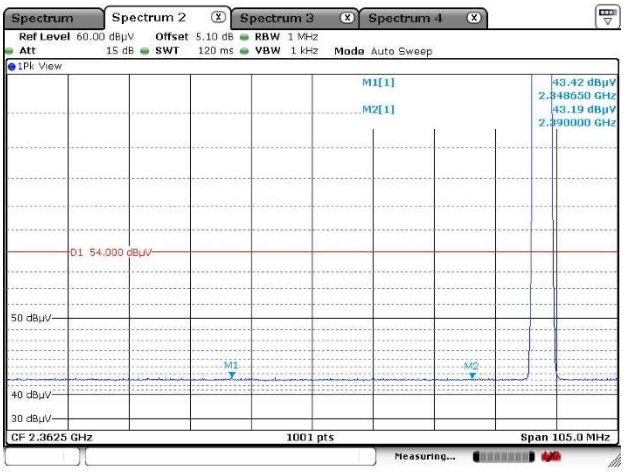
Average



Vertical
Peak

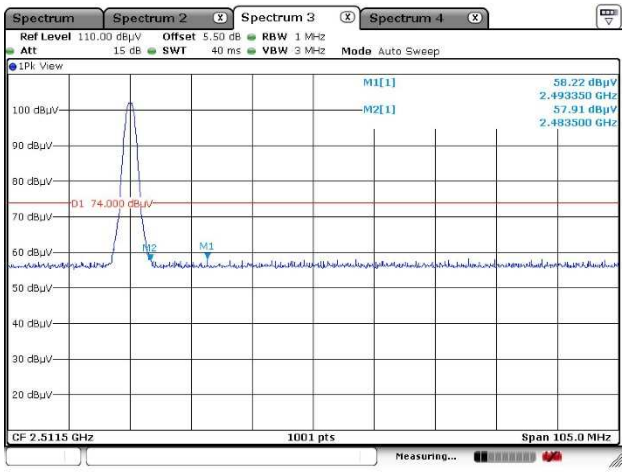


Average

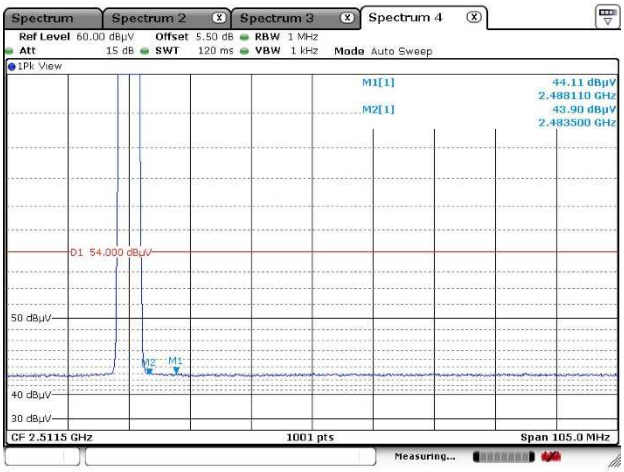


Japan

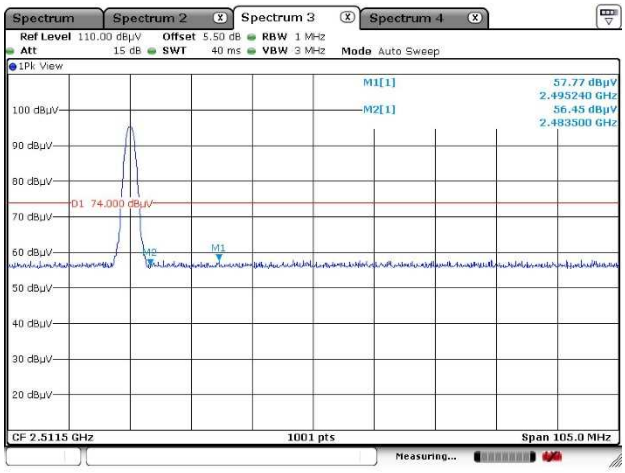
[DH5]
Channel High
Horizontal
Peak



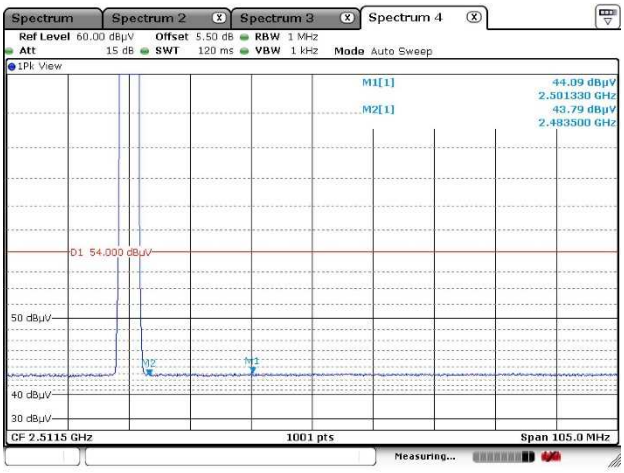
Average



Vertical
Peak

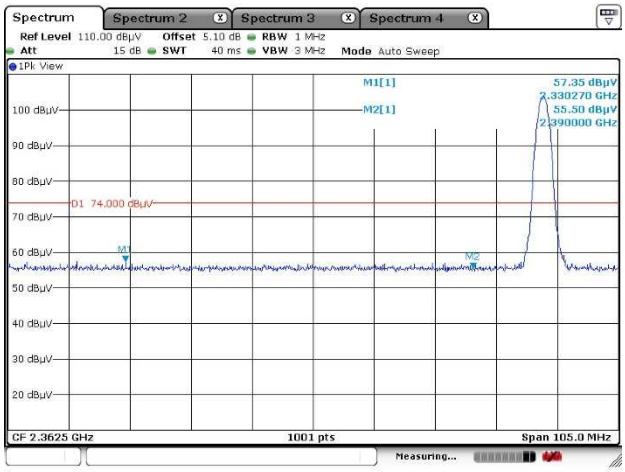


Average

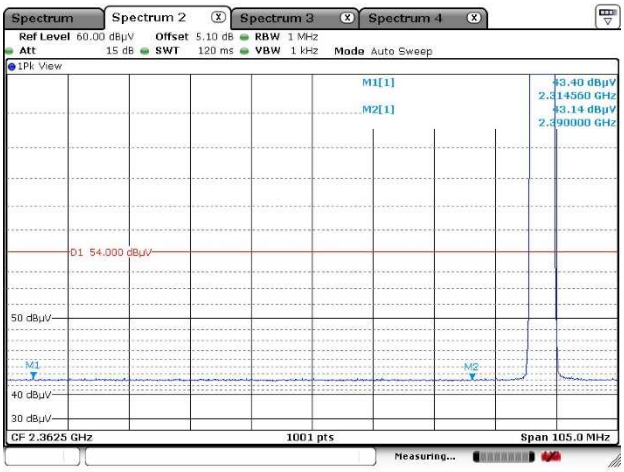


Japan

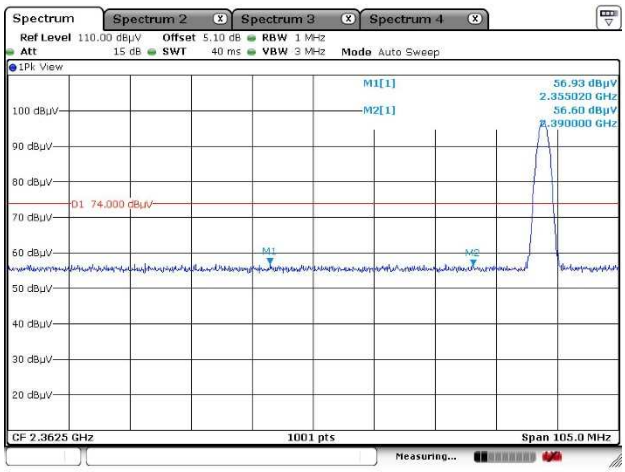
[3-DH5]
Channel Low
Horizontal
Peak



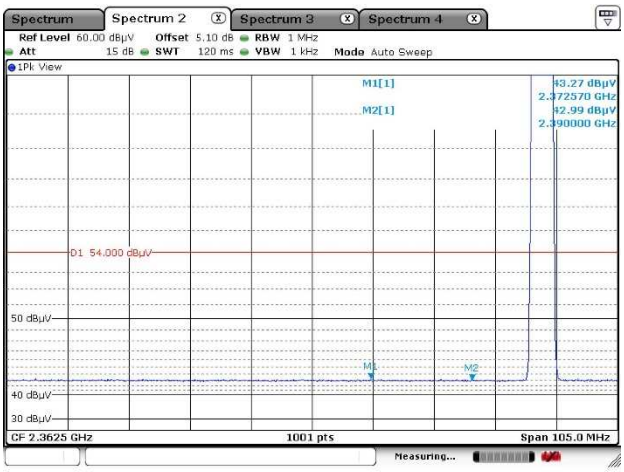
Average



Vertical
Peak

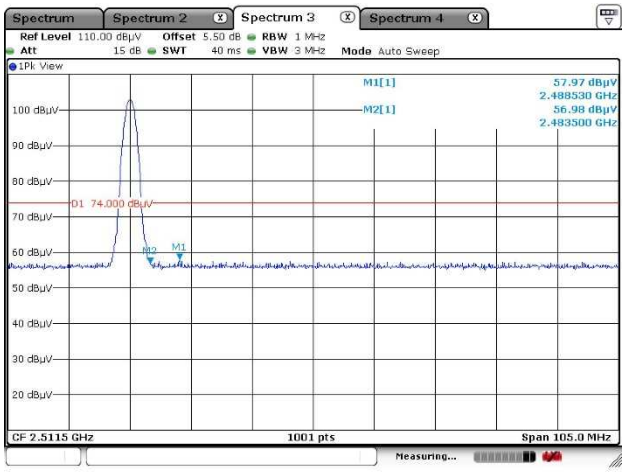


Average

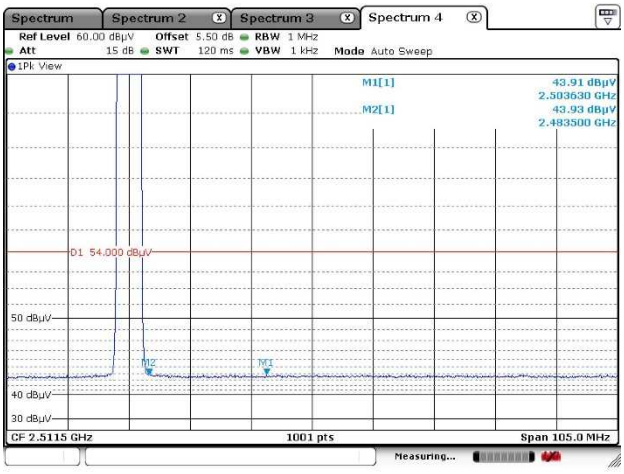


Japan

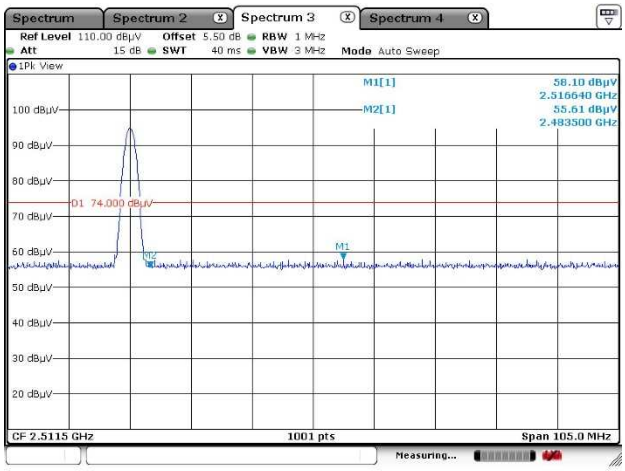
[3-DH5]
Channel High
Horizontal
Peak



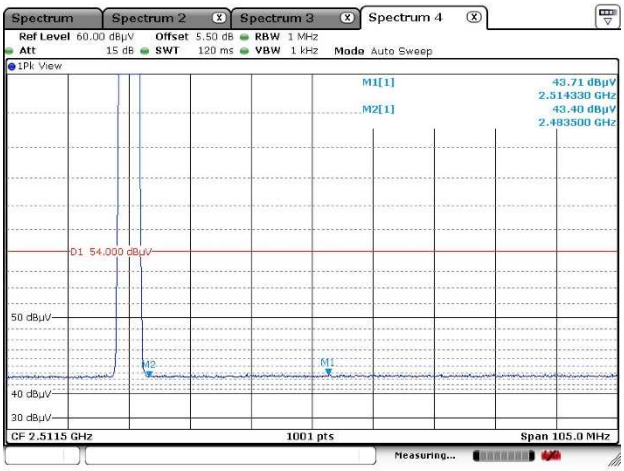
Average



Vertical
Peak



Average



Japan

13. AC Power Line Conducted Emissions

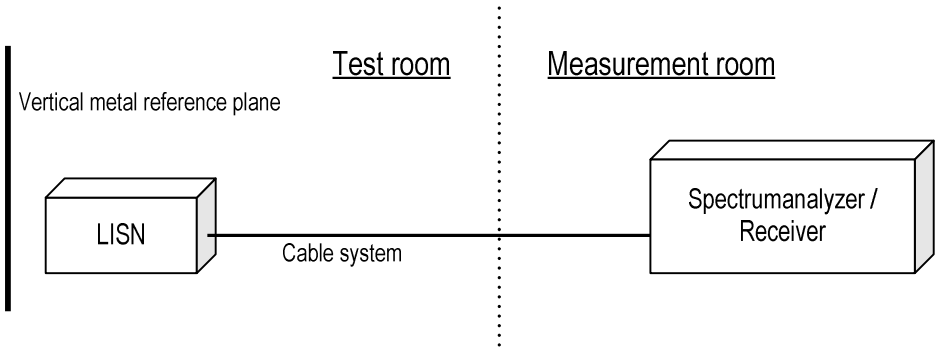
13.1 Measurement procedure [FCC 15.207]

Test was applied by following conditions.

Test method	:	ANSI C63.10
Frequency range	:	0.15MHz to 30MHz
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Vertical Metal Reference Plane	:	(W)2.0m × (H)2.0m 0.4m away from EUT
Test receiver setting		
- Detector	:	Quasi-peak, Average
- Bandwidth	:	9kHz

EUT and peripherals are connected to 50Ω/50μH Line Impedance Stabilization Network (LISN) which are connected to reference ground plane, and are placed 80cm away from EUT. Excess of AC power cable is bundled in center.
LISN for peripheral is terminated in 50Ω.
EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, peripherals, interconnecting cables. Then, emission measurements are performed with test receiver in above setting to each current-carrying conductor of the mains port. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits.

- Test configuration



13.2 Calculation method

Emission level = Reading + (LISN. Factor + Cable system loss)
Margin = Limit – Emission level

Example:
Limit @ 0.400MHz : 57.9dBμV(Quasi-peak)
: 47.9dBμV(Average)
(Quasi peak) Reading = 22.7dBμV c.f = 10.4dB
Emission level = 22.7 + 10.4 = 33.1dBμV
Margin = 57.9 – 33.1 = 8.5dB
(Average) Reading = 6.3dBμV c.f = 10.4dB
Emission level = 6.3 + 10.4 = 16.7dBμV
Margin = 47.9 – 16.7 = 4.7dB

Japan

13.3 Limit

Frequency [MHz]	Limit	
	QP [dBuV]	AV [dBuV]
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

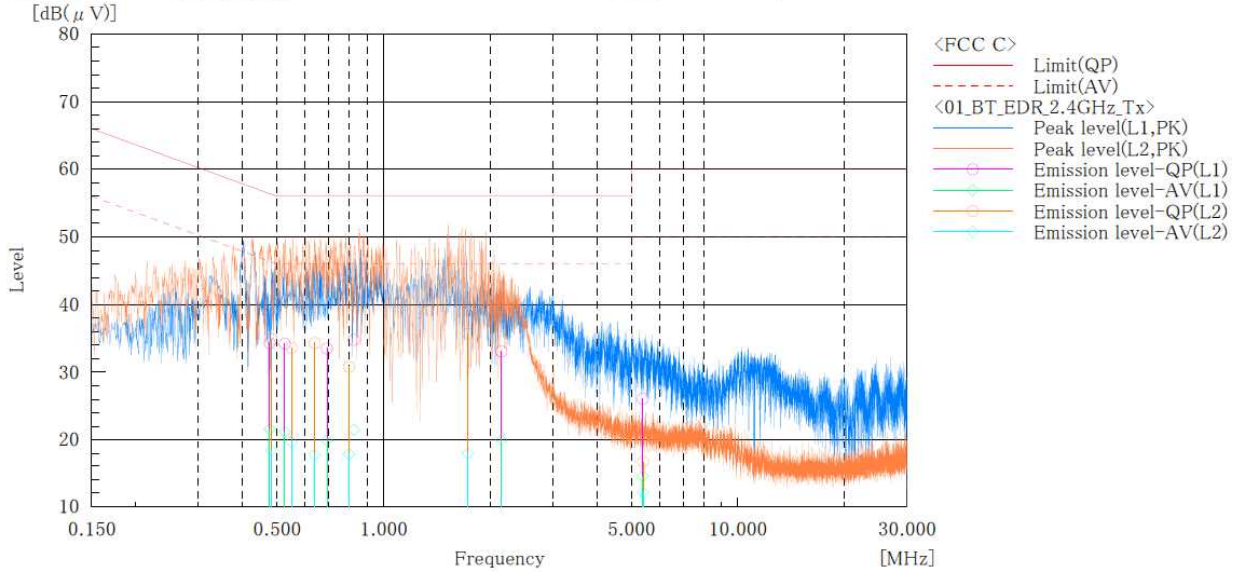
13.4 Test data

***** CONDUCTED EMISSION at MAINS PORT *****
[3m Semi-anechoic chamber]

TUV SUD Zacta Ltd. <<Data Sheet No.01>> 17 August,2018 15:55

Company Name : KYOCERA Corporation
EUT : Mobile Phone
Model No. : JA28
Serial No. : N/A
Test mode : BT_EDR_Tx

Standard : FCC Part.15 Class C
Operator : T.Seino
Temp,Hum,Atm : 22.5[℃] 45.5[%]
Note1 :
Note2 :



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.477	23.9	11.2	10.4	34.3	21.6	56.4	46.4	22.1	24.8
2	0.526	23.8	10.8	10.4	34.2	21.2	56.0	46.0	21.8	24.8
3	0.692	23.1	9.5	10.4	33.5	19.9	56.0	46.0	22.5	26.1
4	0.824	24.4	11.1	10.4	34.8	21.5	56.0	46.0	21.2	24.5
5	2.150	22.6	9.5	10.5	33.1	20.0	56.0	46.0	22.9	26.0
6	5.391	15.4	3.8	10.7	26.1	14.5	60.0	50.0	33.9	35.5

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.482	24.5	8.0	10.4	34.9	18.4	56.3	46.3	21.4	27.9
2	0.549	23.2	9.3	10.4	33.6	19.7	56.0	46.0	22.4	26.3
3	0.639	23.9	7.4	10.4	34.3	17.8	56.0	46.0	21.7	28.2
4	0.799	20.4	7.5	10.4	30.8	17.9	56.0	46.0	25.2	28.1
5	1.729	25.3	7.6	10.4	35.7	18.0	56.0	46.0	20.3	28.0
6	5.401	6.0	1.4	10.7	16.7	12.1	60.0	50.0	43.3	37.9

14. Antenna requirement

According to FCC section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
The antenna is a special antenna mounted inside of the EUT. Therefore, the EUT complies with the antenna requirement of FCC section 15.203.

Japan

15. Uncertainty of measurement

Expanded uncertainties stated are calculated with a coverage Factor k=2.
Please note that these results are not taken into account when measurement uncertainty considerations contained in ETSI TR 100 028-0011 determining compliance or non-compliance with test result

Test item	Measurement uncertainty
Conducted emission, AMN (9kHz – 150kHz)	±3.8dB
Conducted emission, AMN (150kHz – 30MHz)	±3.3dB
Radiated emission (9kHz – 30MHz)	±3.0dB
Radiated emission (30MHz – 1000MHz)	±4.7dB
Radiated emission (1GHz – 6GHz)	±4.9dB
Radiated emission (6GHz – 18GHz)	±5.2dB
Radiated emission (18GHz – 40GHz)	±5.8dB

16. Laboratory Information

1. Location

Testing done by September 30th, 2018 was performed at:
Name: TÜV SÜD Zacta Ltd. Yonezawa Testing Center
Address: 5-4149-7, Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan
Phone: +81-238-28-2881
Fax: +81-238-28-2888

Testing done after October 1st, 2018 was performed and the test report was issued at:
Name: TÜV SÜD Japan Ltd. Yonezawa Testing Center
Address: 5-4149-7, Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan
Phone: +81-238-28-2881
Fax: +81-238-28-2888

2. Accreditation and Registration

1) VLAC
Accreditation No.: VLAC-013

2) NVLAP
LAB CODE: 200306-0

3) BSMI
Laboratory Code: SL2-IN-E-6018, SL2-A1-E-6018

4) Industry Canada

Site number	Facility	Expiration date
4224A-4	3m Semi-anechoic chamber	2020-11-27
4224A-5	10m Semi-anechoic chamber No.1	2020-11-27
4224A-6	10m Semi-anechoic chamber No.2	2019-12-14

5) VCCI Council

Registration number	Expiration date
A-0166	2019-07-03

Japan

Appendix A. Test equipment

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	Oct. 31, 2018	Oct. 19, 2017
Attenuator	HUBER+SUHNER	6810.19.A	N/A(S450)	Jan. 31, 2019	Jan. 18, 2018
Power meter	ROHDE&SCHWARZ	NRP2	103269	Aug. 31, 2019	Aug. 1, 2018
Power sensor	ROHDE&SCHWARZ	NRP-Z81	102467	Aug. 31, 2019	Aug. 1, 2018

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	Sep. 30, 2018	Sep. 13, 2017
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	Oct. 31, 2018	Oct. 19, 2017
Spectrum analyzer	ROHDE&SCHWARZ	FSV40	101731	Dec. 31, 2018	Dec. 20, 2017
Preamplifier	SONOMA	310	372170	Sep. 30, 2018	Sep. 12, 2017
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	Feb. 28, 2019	Feb. 20, 2018
Attenuator	TDC	TAT-43B-06	N/A(S209)	Jul. 31, 2019	Jul. 11, 2018
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	2155	Aug. 31, 2019	Aug. 6, 2018
Log periodic antenna	Schwarzbeck	UHALP9108A	0560	Aug. 31, 2019	Aug. 6, 2018
Attenuator	TME	CFA-01NPJ-6	N/A(S275)	Jan. 31, 2019	Jan. 18, 2018
Attenuator	TME	CFA-01NPJ-3	N/A(S272)	Jan. 31, 2019	Jan. 18, 2018
Preamplifier	TSJ	MLA-100M18-B02-40	1929118	Jan. 31, 2019	Jan. 18, 2018
Attenuator	AEROFLEX	26A-10	081217-08	Jan. 31, 2019	Jan. 18, 2018
Double ridged guide antenna	ETS LINDGREN	3117	00052315	Mar. 31, 2019	Mar. 14, 2018
DRGH antenna	A.H.Systems Inc.	SAS-574	469	Aug. 31, 2019	Aug. 24, 2018
Preamplifier	TSJ	MLA-1840-B03-35	1240332	Aug. 31, 2019	Aug. 24, 2018
Notch filter	Micro-Tronics	BRM50702	045	May 30, 2019	May 16, 2018
Microwave cable	HUBER+SUHNER	SUCOFLEX104/9m	MY30037/4	Jan. 31, 2019	Jan. 18, 2018
		SUCOFLEX104/1m	my24610/4	Jan. 31, 2019	Jan. 18, 2018
		SUCOFLEX104/8m	SN MY30031/4	Jan. 31, 2019	Jan. 18, 2018
		SUCOFLEX104	MY32976/4	Jan. 31, 2019	Jan. 18, 2018
		SUCOFLEX104/1.5m	MY19309/4	Jan. 31, 2019	Jan. 19, 2018
		SUCOFLEX104/7m	41625/6	Jan. 31, 2019	Jan. 19, 2018
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V5.6.0	N/A	N/A
Absorber	RIKEN	PFP30	N/A	N/A	N/A
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-NSA)	May 31, 2019	May 21, 2018
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-SVSWR)	May 31, 2019	May 22, 2018

Conducted emission at mains port

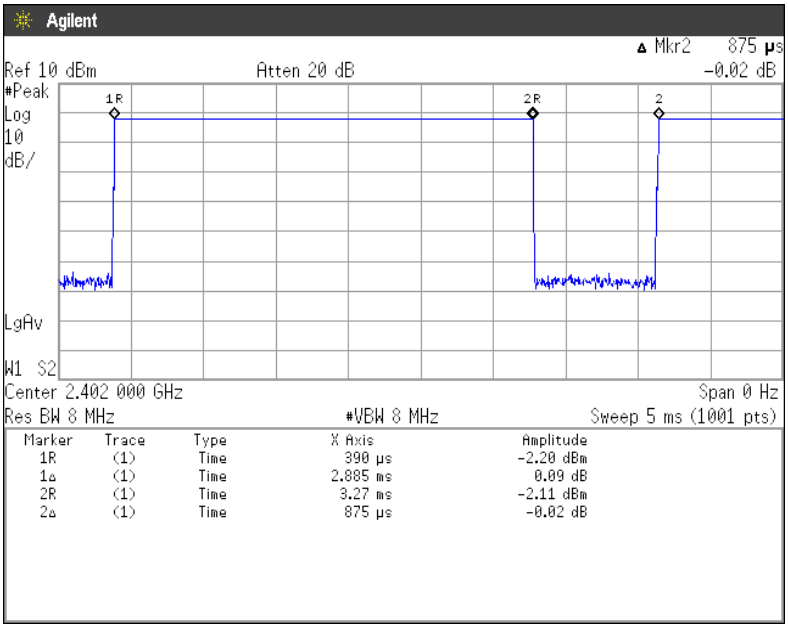
Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	Sep. 30, 2018	Sep. 13, 2017
Attenuator	HUBER+SUHNER	6810.01.A	N/A (S411)	Jan. 31, 2019	Jan. 18, 2018
Line impedance stabilization network	Kyoritsu Electrical Works, Ltd.	KNW-407F	8-2003-1	Feb. 28, 2019	Feb. 28, 2018
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S350)	Jan. 31, 2019	Jan. 18, 2018
Coaxial cable	FUJIKURA	5D-2W/1m	N/A (S193)	Jan. 31, 2019	Jan. 18, 2018
Coaxial cable	HUBER+SUHNER	RG214/U/10m	N/A (S194)	Jan. 31, 2019	Jan. 18, 2018
PC	DELL	DIMENSION	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/CE-AJ	0611193/V5.4.11	N/A	N/A

*: The calibrations of the above equipment are traceable to NIST or equivalent standards of the reference organizations.

Japan

Appendix B. Duty Cycle

[Plot & Calculation]



Duty Cycle = Ton / (Ton + Toff) = 2885[µs] / (2885[µs] + 875[µs]) = 76.73[%]