#### Report on the RF Testing of:

KYOCERA Corporation Mobile Phone, Model: EB1065 FCC ID: JOYEB1065

#### In accordance with FCC Part 15 Subpart C

Prepared for: KYOCERA Corporation Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku Yokohama-shi, Kanagawa, Japan Phone: +81-45-943-6253 Fax: +81-45-943-6314

## COMMERCIAL-IN-CONFIDENCE

Document Number: JPD-TR-20229-0

SIGNATURE			
	Dio Sugula		
NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Hiroaki Suzuki	Deputy Manager of RF Group	Approved Signatory	2 2 JAN 2021

#### EXECUTIVE SUMMARY – Result: Complied

A sample of this product was tested and the result above was confirmed in accordance with FCC Part 15 Subpart C.



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The results in this report are applicable only to the equipment tested.

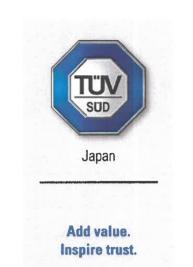
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#### ACCREDIATION

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#### 1 Summary of Test

#### 1.1 Modification history of the test report

Document Number	Modification History	Issue Date
JPD-TR-20229-0	First Issue	Refer to the cover page

#### 1.2 Standards

CFR47 FCC Part 15 Subpart C

#### 1.3 Test methods

ANSI C63.10-2013

#### 1.4 Deviation from standards

None

#### 1.5 List of applied test(s) of the EUT

Test item section	Test item	Condition	Result	Remark
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)		Conducted	PASS	-
15.205 15.209	Spurious Emissions	Radiated	PASS	-
15.247(d) 15.205 15.209	Restricted Bands of Operation	Radiated	PASS	-
15.207	AC Power Line Conducted Emissions	Conducted	PASS	-

#### 1.6 Test information

None

#### 1.7 Test set up

Table-top

#### 1.8 Test period

9- December -2020 - 22-December -2020



### 2 Equipment Under Test

All information in this chapter was provided by the applicant.

#### 2.1 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 (EUT)	Mobile Phone
Model number	EB1065
Serial number	359787710020644, 359787710020784
Trade name	Kyocera
Number of sample(s)	2
EUT condition	Pre-Production
Power rating	Battery: DC 3.85 V
Size	(W) 80.0 mm × (D) 20.0 mm × (H) 168.0 mm
Environment	Indoor and Outdoor use
Terminal limitation	-20 °C to 60 °C
Hardware version	DMT2
Software version	0.070VE
Firmware version	Not applicable
RF Specification	
Protocol	Bluetooth 5.2 + EDR
Frequency range	2402 MHz-2480 MHz
Number of RF Channels	79 Channels
Modulation method/Data rate	FHSS: GFSK (1 Mbps), π/4-DQPSK (2 Mbps), 8-DPSK (3 Mbps)
Channel separation	1 MHz
Conducted power	59.32 mW (DH5)
	42.82 mW (3-DH5)
Antenna type	Internal antenna
Antenna gain	-1.8 dBi



#### 2.2 Modification to the EUT

#### The table below details modifications made to the EUT during the test project.

Modification State	Description of Modification	Modification fitted by	Date of Modification		
Model: EB1065, Serial Number: 359787710020644, 359787710020784					
0	As supplied by the applicant	Not Applicable	Not Applicable		

#### 2.3 Variation of family model(s)

#### 2.3.1 List of family model(s)

Not applicable

#### 2.3.2 Reason for selection of EUT

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 X-axis, and the worst case recorded.

Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports.

#### 2.6 Operating flow

[Tx mode]

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

[Rx mode]

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



#### **3** Configuration of Equipment

Numbers assigned to equipment on the diagram in "3.3 System configuration" correspond to the list in "3.1 Equipment used" and "3.2 Cable(s) used".

This test configuration is based on the manufacture's instruction.

Cabling and setup(s) were taken into consideration and test data was taken under worse case condition.

#### 3.1 Equipment used

No.	Equipment	Company	Model No.	Serial No.	FCC ID/DoC	Comment
1	Mobile Phone	KYOCERA	EB1065	359787710020644	JOYEB1065	EUT
				359787710020784		
2	AC Adapter	KDDI	0301PQA	N/A	N/A	*

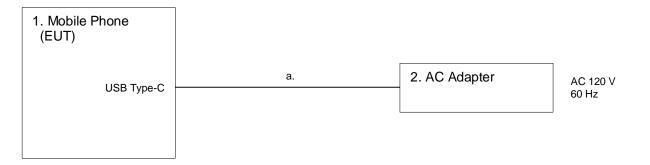
\*:AC power line Conducted Emission Test.

#### 3.2 Cable(s) used

No.	Equipment	Length[m]	Shield	Connector	Comment		
а	USB cable (for AC Adapter)	1.0	Yes	Metal	*		
*. ^ ^	* AC nower line Conducted Emission Test						

\*: AC power line Conducted Emission Test.

#### 3.3 System configuration





#### 4 Test Result

#### 4.1 20dB Bandwidth

#### 4.1.1 Measurement procedure

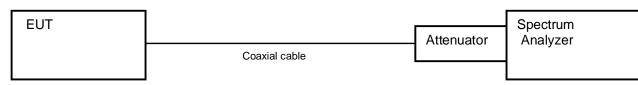
#### [FCC 15.247(a)(1)]

The bandwidth at 6 dB down from the highest inband spectral density is measured with 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  $\ge$  1% of the 20 dB bandwidth
- c) VBW ≥ RBW
- d) Sweep time = auto-couple
- e) Detector = peak
- f) Trace mode = max hold

#### - Test configuration



#### 4.1.2 Limit

None

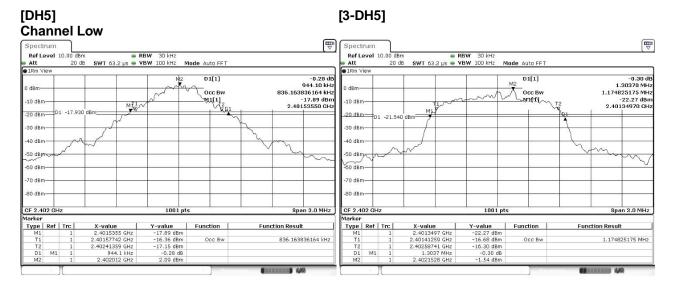
#### 4.1.3 Measurement result

Date Temperature	11-December-2020 22.6 [°C]			
Humidity Test place	30.0 [%] Shielded room No.4	Test engineer	:	Taiki Watanabe

Channel	Frequency	20dB bandwidth [MHz]			
Channel	(MHz)	DH5	3DH5		
Low	2402	0.944	1.304		
Middle	2441	0.962	1.295		
High	2480	0.950	1.301		

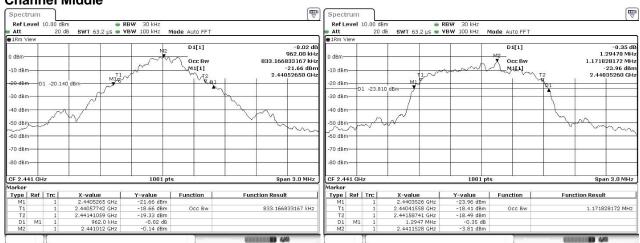


#### 4.1.4 Trace data



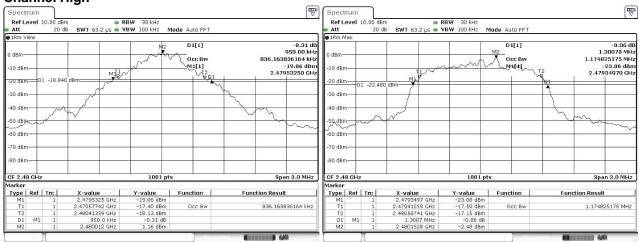
#### [DH5] Channel Middle

#### [3-DH5]



#### [DH5] Channel High

#### [3-DH5]





#### 4.2 Carrier Frequency Separation

#### 4.2.1 Measurement procedure

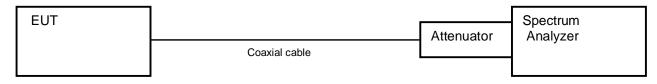
#### [FCC 15.247(a)(1)]

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;

- g) Span = wide enough to capture the peaks of two adjacent channels
- h) RBW  $\geq$  1% of the span
- i) VBW ≥ RBW
- j) Sweep time = auto-couple
- k) Detector = peak
- I) Trace mode = max hold

#### - Test configuration



#### 4.2.2 Limit

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

#### 4.2.3 Measurement result

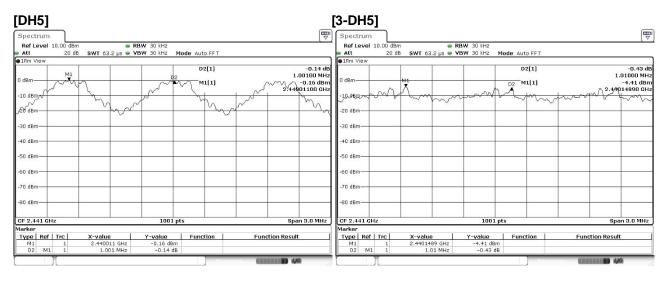
Date	:	11-Decdmber-2020				
Temperature	:	22.6 [°C]				
Humidity	:	30.0 [%]	Test eng	jineer	:	
Test place	:	Shielded room No.4				Taiki Watanabe

**Battery Full** 

Packet type	Channel separation (MHz)	Limit (MHz)	Result
DH5	1.001	>two-thirds of the 20dB Bandwidth = 641kHz	PASS
3-DH5	1.010	>two-thirds of the 20dB Bandwidth = 869kHz	PASS
DH5(AFH)	1.001	>two-thirds of the 20dB Bandwidth = 641kHz	PASS
3-DH5(AFH)	1.001	>two-thirds of the 20dB Bandwidth = 869kHz	PASS



#### 4.2.4 Trace data



[DH5(AFH)]				[3-DH5(AFH)]
Spectrum			E C	Spectrum T
Ref Level 10.00 dBm	RBW 30 kHz		(	Ref Level 10.00 dBm
Att 20 dB S	WT 63.2 µs 🖷 VBW 30 kHz	Mode Auto FFT		Att 20 dB SWT 63.2 µs  VBW 30 kHz Mode Auto FFT
●1Rm View				Rm View
0 dBm M1		D2[1]	-0.11 d 1.00100 MH	z 1.00100 MH
-10 dBm		M1[1]	-0.09 dBi 2:44001100 GF	z 10 dem provide and 2.44015180 CH
20 dBm	Martin	m	when when when when when when when when	
-30 dBm				-30 dBm-
-40 dBm				-40 dBm
-50 dBm				-50 dBm
-60 dBm				-60 dBm-
-70 dBm				-70 dBm
-80 dBm				-30 dBm-
CF 2.441 GHz	1001	pts	Span 3.0 MHz	CF 2.441 GHz 1001 pts Span 3.0 MHz
Marker				Marker
	X-value Y-value 2.440011 GHz -0.09 dB 1.001 MHz -0.11 (		Function Result	Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.4401518 GHz         -3.79 dBm         -
T T			(IIIIII) 44	



#### 4.3 Number of Hopping Frequencies

#### 4.3.1 Measurement procedure

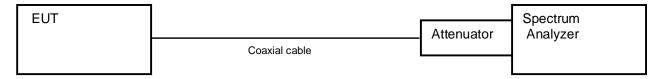
#### [FCC 15.247(a)(1)(iii)]

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



#### 4.3.2 Limit

Shall have more than 15 channels.

#### 4.3.3 Measurement result

Date	:	11-December-2020			
Temperature	:	22.6 [°C]			
Humidity	:	30.0 [%]	Test engineer	:	
Test place	:	Shielded room No.4			Taiki Watanabe

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					

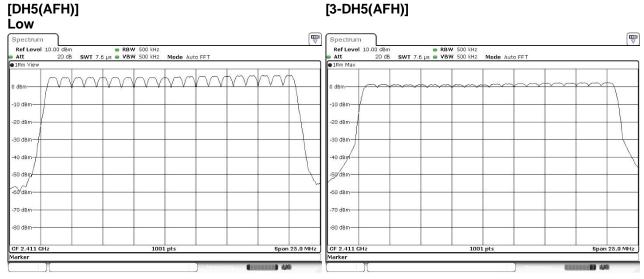


#### 4.3.4 Trace data



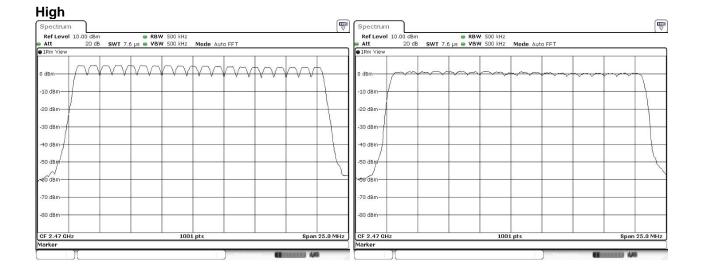


#### [3-DH5(AFH)]



#### Middle

Spectrum	Spect	rum				
RefLevel 10.00 dBm		evel 10.00 dBm 20 dB	e RBW 50 SWT 7.6 μs e VBW 50		to FFT	
●1Rm Yiew	e 1Rm M	ax			1 1	1 1
0 dBm	0 dBm10 dBm 20 dBm		<u>v~v~v~v</u>			
-30 d8m -	-30 dBr	ノー				
-50 dBm						
-60 dBm	-60 dBm					
-70 dBm	-70 dBm		<u> </u>			
-80 dBm	-80 dBm					
CF 2.441 GHz 1001 pts	Span 25.0 MHz CF 2.4	11 GHz		1001 pts		Span 25.0 MHz
Marker	Marker				Neosuring 🕕	111111 <b>)</b> 444





#### 4.4 Time of Occupancy (Dwell Time)

#### 4.4.1 Measurement procedure

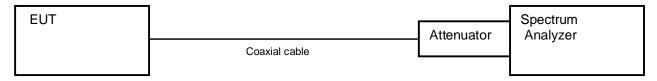
#### [FCC 15.247(a)(1)(iii)]

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 = 1 MHz
- c) VBW ≥ RBW
- d) Sweep time = auto-couple
- e) Detector = peak
- f) Trace mode = Single

#### - Test configuration



#### 4.4.2 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.



#### 4.4.3 Measurement result

Date	:	11-December-2020
Temperature	:	22.6 [°C]
Humidity	:	30.0 [%]
Test place	:	Shielded room No.4

Test engineer :

Taiki Watanabe

#### FHSS

Packet type	Channel	Frequency (MHz)	Dwell time (ms)	Occupancy time of 31.6 seconds (s)	Limit	Result
	Low	2402.0	2.860	0.305	<0.4s	PASS
DH5	Middle	2441.0	2.860	0.305	<0.4s	PASS
	High	2480.0	2.860	0.305	<0.4s	PASS
	Low	2402.0	2.860	0.305	<0.4s	PASS
3-DH5	Middle	2441.0	2.870	0.306	<0.4s	PASS
	High	2480.0	2.870	0.306	<0.4s	PASS

#### AFH

Packet type	Channel	Frequency (MHz)	Dwell time (ms)	Occupancy time of 8 seconds (s)	Limit	Result
	Low	2402.0	2.860	0.153	<0.4s	PASS
DH5(AFH)	Middle	2441.0	2.860	0.154	<0.4s	PASS
	High	2480.0	2.860	0.154	<0.4s	PASS
	Low	2402.0	2.870	0.153	<0.4s	PASS
3-DH5(AFH)	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 800 / 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



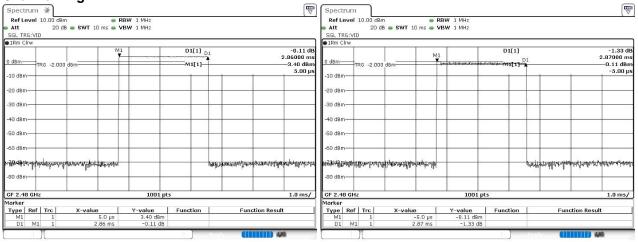
#### 4.4.4 Trace data

FHSS			
[DH5]		[3-DH5]	
Channel: Low			
Spectrum		Spectrum 🔆	
Ref Level 10.00 dBm		Ref Level 10.00 dBm 🛛 🖷 RBW 1 MHz	
Att 20 dB SWT 10 ms VBW 1 MHz SGL TRG:VID		Att 20 dB SWT 10 ms VBW 1 MHz     SGL TRG:VID	
IRm Cirw		IRm Cirw	
T ML	D1[1] D1 -0.17 dB 2.86000 ms	0 d8m TRG -2.000 d8m N1	D1[1] -1.27 dE D1 2.86000 ms
0 dBm TRG -2.000 dBm	M1[1] 4.61 dBm	0 dBm TRG -2.000 dBm	
-10 dBm	5.00 µs	-10 dBm	5.00 μ
-20 dBm		-20 dBm	
		120 00m	
-30 dBm		-30 dBm	
-40 dBm		-40 dBm	
-50 dBm		-50 dBm	
-60 dBm		-60 dBm	
huged all an	and a second and the second and the second	with the function of the second state of the s	freeder freeder water and the state of the s
-80 dBm-		-80 dBm	
GF 2.402 GHz 1001 pt:	s 1.0 ms/	GF 2.402 GHz 1001 pts	1.0 ms/
Marker Type Ref Trc X-value Y-value	Function Function Result	Marker Type Ref Trc X-value Y-value	Function Function Result
M1 1 5.0 µs 4.61 dBm D1 M1 1 2.86 ms -0.17 dB	Punction Punction Result	M1         1         5.0 µs         0.85 dBm           D1         M1         1         2.86 ms         -1.27 dB	runction runction Result
) M	Interior (IIIIII) 444		

#### **Channel: Middle**

CF 2.441 GHz Iarker		1001 pt	s		1.0 ms/	CF 2.441 C Marker	GHz		1001 p	ots		1.0 ms
50 dBm 60 dBm ភូមិរ៉ុងមិត្រទេសកុរារអ៊ីរ៉ូសភាសា 80 dBm	สระบบรายระสงครายให้สระจะ			and programs	Haaddanaa ahaa ahaa ahaa ahaa ahaa ahaa a	-50 dBm -60 dBm ւեժ անվելիներ -80 dBm	htysildertifyrsiteinydd	ultyrdyrfarfyrganou	J		Jourdityperstrainingtry	สระการกระเสรารราชการเราสัญญาณ
-20 dBm						-20 dBm						
0 dBm TRG -2.00	) dBm	1	D1[1] M1[1]		-0.06 dB 2.86000 ms —2.34 dBm 5.00 μs	0 dBm	TRG -2.000 dB	m	M1 Macroscoportogramme	D1[1]	21 •	-1.83 ( 2.87000 n -1.38 dB 5.00
Att 20 c SGL TRG:VID 1Rm Clrw	m 🛛 🖬 🖬	VBW 1 MHz			]	SGL TRG:V		<b>SWT</b> 10 ms	VBW 1 MHz			

#### Channel: High



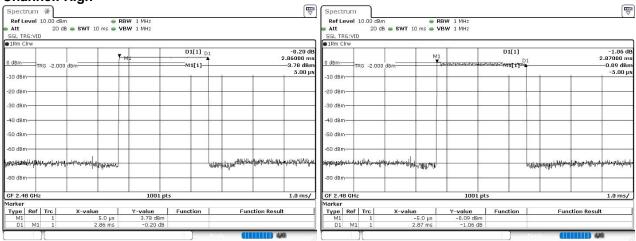


FHSS_AFH [DH5] Channel: Low		[3-DH5]	
Spectrum 🔆		Spectrum 💥	Ē
Ref Level         10.00 dBm         RBW         1 MHz           Att         20 dB         SWT         10 ms         VBW         1 MHz           SGL         TRG:VID            1 MHz	(*,	Ref Level         10.00 dBm         RBW         1 MHz           Att         20 dB         SWT         10 ms         VBW         1 MHz           SGL         TRG:VID         SWT         10 ms         VBW         1 MHz	( •
1Rm Clrw		●1Rm Clrw	
M1	D1[1] -1.27 dB D1 2.86000 ms	0 dBm TRG -2.000 dBm Trop	D1[1] -1.79 dB 2.87000 ms
0 dBm TRG -2.000 dBm 10 dBm	0.85 dBm 5.00 μs	-10 dBm	0.82 dBm 5.00 µs
-20 dBm		-20 dBm	
-30 dBm		-30 dBm	
-40 dBm-		-40 dBm	
-50 dBm		-50 dBm	
	สี่ระการการการการการการการการการการการการการก	-60 dBm	But a share a shar
-80 dBm		-80 dBm	1
CF 2.402 GHz 1001 pts	1.0 ms/	CF 2.402 GHz 1001 pts	i 1.0 ms/
Marker		Marker	1014 //m 10 10 10 10 10 10 10 10 10 10 10 10 10
M1 1 5.0 µs 0.85 dBm	ction Function Result	Type         Ref         Trc         X-value         Y-value           M1         1         5.0 µs         0.82 dBm	Function Function Result
D1 M1 1 2.86 ms -1.27 dB		D1 M1 1 2.87 ms -1.79 dB	

#### **Channel: Middle**

Spectrum 🔆						Spectru	im 💥							Ē
Ref Level 10.00 dBm Att 20 dB SGL TRG:VID	● F ● SWT 10 ms ● V	RBW 1 MHz VBW 1 MHz				Ref Lev Att SGL TRG		IBm dB 👄 SWT 10		3W 1 MHz 3W 1 MHz				
1Rm Clrw					]	1Rm Clrv	Y							
0 dBm TRG -2.000 c	dBm	1	D1[1] D. M1[1]		-0.05 dB 2.86000 ms -2.69 dBm 5.00 µs	0 dBm	TRG -2.0	00 dBm	M1		D1[1]	<u>D1</u>		-1.84 d 2.87000 m 1.16 dBr 5.00 μ
-20 dBm						-20 dBm-								
-30 dBm						-30 dBm—	-	-					-	-
-40 dBm						-40 dBm-								
-60 สมิทิจานเหนางเป็นเหลง -70 dBm	anti-ustra uni			wanderford	ionyilaaddullyndyillindaaay	-60 dBm-	Headlenniald	بالليمسمي	astication			- and and a state of the state	لىساللىكىمىتىلەللىلىدىە	logantalipaquinter
-80 dBm	fei					-80 dBm-	-					telle a flega		-
CF 2.441 GHz		1001 pt	s		1.0 ms/	CF 2.441	GHz			1001 p	ts			1.0 ms/
Marker						Marker								
Type         Ref         Trc           M1         1           D1         M1         1	X-value 5.0 µs 2.86 ms	Y-value 2.69 dBm -0.05 dB	Function	Function	Result	Type F M1 D1	1		5.0 µs .87 ms	Y-value -1.16 dBm -1.84 dB		F	unction Res	ult
D1 M1 1	2.86 ms	-0.05 dB		Roady (1111)	<b>1</b> ) 4/4	D1	M1 1	2	.87 ms	-1.84 dB		Ready		4)41

#### Channel: High





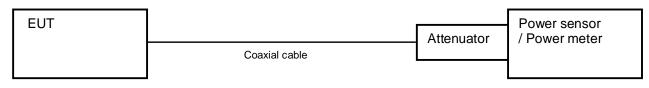
#### 4.5 Maximum Peak Output Power

#### 4.5.1 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



#### 4.5.2 Limit

 $0.125\,W$  or less

#### 4.5.3 Measurement result

Date	:	11-December-2020
Temperature	:	22.6 [°C]
Humidity	:	30.0 [%]
Test place	:	Shielded room No.4

Test engineer

:

Taiki Watanabe

#### **Battery Full**

Packet type	Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	10log(1/x) (dB)	Level (dBm)	Peak Output Power (mW)	Limit (mW)	Result
	Low	2402	5.95	10.63	1.15	17.73	59.320	≦125	PASS
DH5	Middle	2441	3.80	10.63	1.15	15.58	36.158	≦125	PASS
	High	2480	4.84	10.63	1.15	16.62	45.941	≦125	PASS
	Low	2402	4.54	10.63	1.15	16.32	42.819	≦125	PASS
3-DH5	Middle	2441	2.16	10.63	1.15	13.94	24.754	≦125	PASS
	High	2480	3.79	10.63	1.15	15.57	36.028	≦125	PASS

Calculation;

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



#### 4.6 Band Edge Compliance of RF Conducted Emissions

#### 4.6.1 Measurement procedure

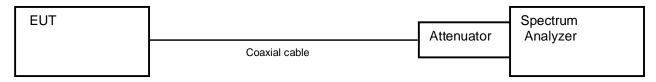
#### [FCC 15.247(d)]

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



#### 4.6.2 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.



#### 4.6.3 Measurement result

Date	:	11-December-2020
Temperature	:	22.6 [°C]
Humidity	:	30.6 [%]
Test place	:	Shielded room No.4

Test engineer

:

Taiki Watanabe

#### [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	2402.00	5.14	2399.20	-61.76	66.90	At least 20dB below from peak of RF	PASS
DHS	High	2480.00	3.97	2484.30	-67.55	71.52	At least 20dB below from peak of RF	PASS
0 DUIS	Low	2402.00	1.52	2399.40	-66.34	67.86	At least 20dB below from peak of RF	PASS
3-DH5	High	2480.00	0.80	2485.25	-69.41	70.21	At least 20dB below from peak of RF	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	2402.00	4.57	2399.95	-54.51	59.08	At least 20dB below from peak of RF	PASS
DHO	High	2480.00	3.49	2483.55	-65.85	69.34	At least 20dB below from peak of RF	PASS
	Low	2402.00	1.04	2399.95	-58.68	59.72	At least 20dB below from peak of RF	PASS
3-DH5	High	2480.00	-0.02	2483.70	-68.39	68.37	At least 20dB below from peak of RF	PASS



#### 4.6.4 Trace data

#### [Hopping] Channel Low DH5 3-DH5 Spectrum Ref Level 10.00 6m RBW 100 kHz Att 20 dB SWT 10 ms VBW 300 kHz IPm View IPm View IPm View IPm View IPm View IPm View Mode Auto Sweep Mode Auto Sweep M3[1] 2.000 and 1.000 and M3[1] 2.9994010 CH2 2.9994010 CH2 MACHUL Adam And McMarket 2.4913210 CH2 MACHUL Adam And McMarket 2.4913210 CH2 dBn dBr -10 dBm-10 dBm D1 -14.860 dBm D1 -18.480 dBn -20 dBm----20 dBm--30 dBm-30 dBm -40 dBm-40 dBm· -50 dBm--50 dBm--60 dBm--60 dBm-M A. P. -70 dBm--70 dBm--80 dBm--80 dBm-CF 2.4 GHz Marker Type Ref Trc M1 1 CF 2.4 GHz Marker 1001 pts Span 50.0 MHz 1001 pts Span 50.0 MHz X-value 2.419131 GHz 2.4 GHz 2.399201 GHz Y-value 5.14 dBm -66.12 dBm -61.76 dBm Type Ref Trc M1 1 M2 1 M3 1 X-value 2.419131 GHz 2.4 GHz 2.399401 GHz Y-value 1.52 dBm -63.02 dBm -66.34 dBm Function Function Function Result Function Result M1 M2 M3 ----

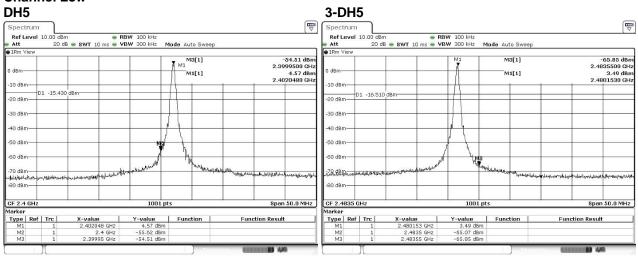
#### Channel High DH5

#### 3-DH5

							J-L		,								
Spectrum							Spect	trum									ſ
Ref Level	10.00 dBr	n 🖷 R	BW 100 kHz				RefL	evel	10.00 dBm		👄 RE	3W 100 kHz					
Att		B . SWT 10 ms . V		Mode Auto Sween			Att				ms e VI	BW 300 kHz	Mode Auto	Sween			
1Rm View	20 0		BIT CODICIE	Hous Auto Shoop			IRm V	liow						- anaop			
		1 1	T	M3[1]		67.55 dBm		10.0			-	T	M3	[1]			-69.41 dE
	MILA			mati		42990 GHz		M	1				113	[1]			852480 G
o #en A (	1714	AAAAAAAAA	ALA A	M1[1]		3.97 dBm	β dβm-	111	- 	1 4 1 4	1	tr t	M1	[1]		2.11	0.80 dt
UUNAAA	илии	44.0.0.0.000.000.000.000.000.000	AWSA – E	(int[1]		40690 GHz	PhiPhiPhi	MANN	Way My My My	Arran	M. M. M. M.	addyna 🛛				2.4	641690 G
わけもかり半	$\gamma \gamma \gamma \gamma \gamma$	₩₩₩₩₩₩₩₩			1 1 1		-10 dBr	n			0 4 17 9		1		-		1
	1 -16.030	1 dBm						~ I.		12		1 1 1					
20 dBm							-20 dBr	n D	1 -19.200	dBm=		+ + +			<u> </u>		
30 dBm							-30 dBr	n-+-			5						-
40 dBm					-		-40 dBr	n			8						
												1 1 1					
-50 dBm			+ + +		+ + +		-50 dBr	n			-						-
			1 5 1														
-60 dBm					+ + +		-60 dBr	n-+-			-	+ + +					
			5.142	V13								1 Mimz	M3		ور ماده اور ارز ا		
-70 dBm			weit	Allomatician	11	1	-70 dBr	n				Wing.	notonalia .				
				a mound halow the	ending the star and the sector of the start of	Antiperane								arotinities freitige	also acreated	Carl Mark and a for	weiteren
-80 dBm			-		เหมูสินให้สินเสียงเป็นเป็นเป็นเป็นเป็นเป็นเป็นเป็นเป็นเป็น		-80 dBr	n				-					-
			1 1														
CF 2.4835 G	Hz		1001	pts	Span	50.0 MHz	CF 2.4	835 G	Hz			1001 p	ots			Spar	n 50.0 MH
1arker							Marker										
Type   Ref	Trc	X-value	Y-value	Function	Function Result	1	Туре	Ref	Trc	X-value	1	Y-value	Functi	on	Fun	ction Resul	lt
M1	1	2.464069 GHz	3.97 dBm	n			M1	-	1	2.46416	9 GHz	0.80 dBm	1				
M2	1	2.4835 GHz	-69.37 dBm	ń			M2		1	2.483	IS GHZ	-70.50 dBm	ř .				
M3	1	2.484299 GHz	-67.55 dBm	n			M3		1	2.48524	8 GHz	-69.41 dBm	6				

# Japan

#### [No Hopping] Channel Low



# Channel High

DH5						3-DH	5					
Spectrum						Spectrum						
Ref Level 10.00	dBm (	RBW 100 kHz				Ref Level	10.00 dBm	i 👄	RBW 100 kHz			`
Att 2	) dB 👄 SWT 10 ms 🕯	VBW 300 kHz M	ode Auto Swee	1		👄 Att	20 dB	👄 SWT 10 ms 👄	VBW 300 kHz	Mode Auto Swee	p	
1Rm View						●1Rm View						
			M3[1]		-58.68 dBm					M3[1]		-68.39 dBr
dBm			T	2	.3999500 GHz	0 dBm			M1			2.4837000 GH
o ubili			M1[1]	~	1.04 dBm	o abiii			A	M1[1]		-0.02 dBr
10 dBm				2	.4021480 GHz	-10 dBm						2.4801530 GH
						1000000000000			111			
20 dBm D1 -18.	960 dBm					-20 dBm	01 -20.020	dBm				
-30 dBm						-30 dBm						
									- H F - I			
40 dBm		)			-	-40 dBm					-	
-50 dBm		- pl			_	-50 dBm					_	
		Ma				-60 dBm			1 1			
-60 dBm		1	ĥ.						7 Lw	8		<sub>สาร</sub> ราบรรมาศักรณ์ให้มีมระบบประเทศ
70 dBm	-iringagenet, ditartissanderstated	mound and the sector	Hundary	will we will be a second will be a second with the second s	dear Bill of the off of the bill	-70 d8p	i swa, a diskutku	rylower water and the ball of the second	ar 10	attal de antigente and alla her and		
anter and a state of the state	wiring approximition and the second	-41.000		in transmitter	and developments		Period Controlline.	No		a stantation	unrealistic the states	N-Lower and the second provide a se
-80 dBm						-80 dBm					_	
CF 2.4 GHz		1001 pt	s	Sr	an 50.0 MHz	CF 2.4835	GHz		1001	pts		Span 50.0 MHz
larker						Marker						
Type   Ref   Trc	X-value	Y-value	Function	Function Res	ult [	Type   Ref	Trc	X-value	Y-value	Function	Fund	tion Result
M1 1	2.402148 GH					M1	1	2.480153 GHz	-0.02 dB			
M2 1	2.4 GH					M2	1	2.4835 GHz	-68.23 dB			
M3 1	2.39995 GH	z -58.68 dBm				M3	1	2.4837 GHz	-68.39 dB	m		



#### 4.7 Spurious emissions - Conducted -

#### 4.7.1 Measurement procedure

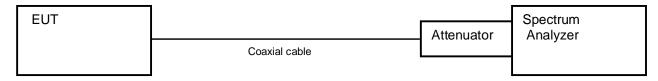
#### [FCC 15.247(d)]

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



#### 4.7.2 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.

#### 4.7.3 Measurement result

Date	: 12-December-2020			
Temperature	: 20.1 [°C]			
Humidity	: 27.0 [%]	Test engineer	:	
Test place	: Shielded room No.4		·	Taiki Watanabe

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



#### 4.7.4 Trace data

#### [DH5] Channel Low 30 MHz-1 GHz

Spectrum										Spectrur	n							
Ref Level	10.00 dBm	5	· RB	N 100 kHz					( )	Ref Leve	I 10.00 dBm	6	. RBW	/ 100 kHz				
Att	20 dB	SWT 9.	7 ms 🖷 🛛 🕬	<b>W</b> 300 kHz	Mode Au	to Sweep				👄 Att	20 dB	SWT 40 ms	. YBW	/ 300 kHz Mo	de Auto Sweep			
1Pk View										• 1Pk View								
			×		M	11[1]			-70.17 dBm				Т м1		M2[1]			-62.90 dBi
) dBm		-	-					/	48.540 MHz	0 dBm			IVIT		M1[1]			4.67 dBi
0.000-010										101010-000					mili'i		;	2.40060 GH
10 dBm						-				-10 dBm-							+	+
D	1 -15.330	dBm	-				-				D1 -15.330	dBm-					+	
20 dBm				-			-			-20 dBm						-		
										-30 dBm								
30 dBm										-30 UBIII-								
40 dBm			1							-40 dBm		-				_		+
TO GDIN																		
50 dBm										-50 dBm			- 23	· ·	-		-	
										-60 dBm								M2
60 dBm						-	-		-									T
							M1			-70 dBm-	Di Ci		all lulaise	when we want	the many shares	here services	dominante	an second herein
-70 dBm	and train	un ille turbase.	ا بر ایر ایر ایر ایر ایر ایر ایر ایر ایر ای	الباندهماير والمروا	التقامية أطبالهم	and the many prover	whether where	www.	ne martin fill the surgers	history and real of the	hundil phalmaning	r where the second second	~					
100000000000000000000000000000000000000				and a second second						-80 dBm						_		+
-80 dBm																		
										Start 1.0 0	Hz			1001 pt	s	_	St	op 5.0 GHz
Start 30.0 M	IHz		20	1001	pts	2		St	op 1.0 GHz	Marker								
larker										Type Re	f Trc	X-value	1	Y-value	Function	Fu	nction Resul	lt
Type Ref M1	Trc 1	X-valu	9 54 MHz	-70.17 dB	Fund	tion	Fun	ction Resul	t	M1 M2	1	2.4006 (		4.67 dBm -62.90 dBm				

#### 5 GHz-10 GHz

#### 10 GHz-15 GHz

Att	el 10.00 dBm 20 dB			/ 100 kHz / 300 kHz N	lode Auto	o Sweep				Att	el 10.00 dBm 20 dB
●1Pk View										●1Pk View	
0 d8m					M	1[1]			3 dBm 50 GHz	0 dBm-	
U dBm-										U dBm	
-10 dBm-										-10 dBm	
-20 dBm—	D1 -15.330	dBm								-20 dBm	D1 -15.330
-30 dBm—										-30 dBm	
-40 dBm—										-40 dBm	
-50 dBm—										-50 dBm	
-60 dBm			M							-60 dBm	M1
~~~dBht	- the of the state	defenseviblikger	antiplication alternation	A-rapic long so and	فلطيسيس	kasinthemanangeta	rs-angesellertetteterere	Ishering and the second	edunction	r-moldsmith	where the start and a start
-80 dBm							-		-	-80 dBm	
Start 5.0	GHz	2		1001 p	ts			Stop 10.		Start 10.0	GHz
Marker Type   R	(1-2-1	X-value		Y-value	Funct		-	ion Result		Marker Type Re	d mail
M1	1		55 GHz	-65.53 dBm	Punc	lion	Funct	ion Result		M1	1

# Spectrum TP Ref Level 10 00 dbm • RBW 100 HHz 1Pk View 20 dB SWT 50 ms • VBW 300 HHz 1Pk View 10.00090 GHz 0 dbm 11/1 10 dbm 10.00990 GHz 20 dbm 10.00990 GHz 30 dbm 10.00990 GHz 40 dbm 10.00990 GHz 40 dbm 10.00990 GHz 50 dbm 10.00990 GHz 50 dbm 10.0091 GHz 60 dbm 1001 pts 80 dbm 10.00 GHz 10.00 GHz 10.00 GHz 60 dbm 10.00 GHz

#### 15 GHz-20 GHz 20 GHz-25 GHz Ref Level 10.00 Spectrum Spectrum RBW 100 kHz SWT 50 ms YBW 300 kHz Ref Level 10.00 Att 2 1Pk View RBW 100 kHz VBW 300 kHz Mode Auto Swi SWT 50 ms Mode Auto Swi Att 1Pk Vie M1[1] -61.74 dBm 19.54800 GHz M1[1] -61.99 dBm 20.31220 GHz dBn dB -10 dBm--10 dBm-D1 -15.330 dBm-D1 -15.330 dBm--20 dBm--20 dBm--30 dBm--30 dBm--40 dBm--40 dBm--50 dBm--50 dBm--60 dB การแก่งไม่ไป -70 dBm -60 dBm hunture -70 dBm-Marked Market umututu - physical polis ULLAPPO phroniul AND IN . with -80 dBm-80 dBm Start 15.0 GHz Marker Type Ref Trc M1 1 Start 20.0 GHz Marker Type Ref Trc M1 1 100 Stop 20.0 GHz 1001 Stop 25.0 GHz X-value 19.548 GHz Y-value Function Function Result Function Result 10 100



Spectrum								Spectru	m							1
Ref Level 10.00 dBm	🖷 RB	W 100 kHz						Ref Leve	el 10.00 dBm	i.	👄 RB	W 100 kHz				
	WT 9.7 ms 🖷 VB	<b>W</b> 300 kHz	Mode Aut	o Sweep				Att	20 dB	SWT 40	ms 👄 VB	W 300 kHz Mc	de Auto Sweep			
1Pk View								●1Pk View								
			M	1[1]			69.26 dBm 1.370 MHz				M1		M2[1]			-65.24 dB 4.88210 G
) dBm					1	94	1.370 MHZ	0 dBm			l I	-	M1[1]		2	2.41 dB
															÷	2.44060 G
10 dBm					-			-10 dBm-							-	-
D1 -17.590 dBm		-						-20 dBm-	D1 -17.590	dBm						+
20 dBm 01 -17.590 dBm								-20 UBIII-								
								-30 dBm-								_
30 dBm								0.0250/2500								
40 dBm								-40 dBm-	-			-				
50 dBm								-50 dBm—					-		-	-
								-60 dBm-								
60 dBm																Ma
							M1	-70 dBm-	here a bit much		and the state		an open and a set of the second	الماليجند ومروا الملجد والمعا	- Benertidelinerest	an mineral play
-70 dBm	ماليه الوالعالية مراجع محمد المراجع	10 Unphand Hiller	numanan	Harry Mary	denous the other	wanter Psterene	And Proversity of Land	anga dila seconda serapata se	Constraint and the second	Cello Carola I a			597039			
1.421.0								-80 dBm-	-			-			+	+
-80 dBm-																
								Start 1.0	GHz			1001 pt	s		St	top 5.0 GHz
Start 30.0 MHz		1001	pts		2	Sto	p 1.0 GHz	Marker	33 33		1.126					
larker								Type R		X-value		Y-value	Function	Fur	nction Resu	lt
Type Ref Trc >	-value 941.37 MHz	-69.26 dB	Func	tion	Fund	tion Result		M1 M2	1		06 GHz 21 GHz	2.41 dBm -65.24 dBm				

#### 5 GHz-10 GHz

#### 10 GHz-15 GHz Ref Level 10.00 Att 20 1Pk View Spectrum Ref Level 10.00 Att 2 1Pk View ● RBW 100 kHz SWT 50 ms ● YBW 300 kHz ● RBW 100 kHz SWT 50 ms ● YBW 300 kHz Mode Auto Sweep Mode Auto Sweep 20 dB -65.07 dBm 6.97550 GHz -64.05 dBm 14.58290 GHz M1[1] M1[1] 0 dBn dB -10 dBm--10 dBm-D1 -17.590 dBm D1 -17.590 dBm--20 dBm--20 dBm---30 dBm--30 dBm -40 dBm--40 dBm--50 dBm--50 dBm--60 dBm--60 dBmphon the states 70 dBmphys 70 dBm--80 dBm-80 dBm· Start 5.0 GH: 1001 pts Stop 10.0 GHz Start 10.0 GHz 1001 pts Stop 15.0 GHz Marker Type Ref Trc M1 1 Marker Type Ref Trc M1 1 Y-value Function X-value 6.9755 GF Y-value Function Function Result X-value 14.5829 G Function Result -

#### 15 GHz-20 GHz

#### 20 GHz-25 GHz

M1[1]	-61.49 dBm 19.57790 GHz	0 dBm		M1[1]	-62.18 dBr 20.32720 GH
		-10 dBm			
		-20 dBm D1 -17.590	) dBm		
		-30 dBm			
	<u>,</u>	-40 dBm			
		-50 dBm			
alexan and the first contained on the other and the product of the	M1 heredownia and when a way on	-60 dBm տնակին -70 dBm	un manageration and the second	evilyerenter ware with service	multiperation of many provider and the
		-80 dBm			
1001 pts	Stop 20.0 GHz	Start 20.0 GHz		1001 pts	Stop 25.0 GHz
	1001 pts	inner hurdeliken den sinder sinder den der den 1001 pts Stop 20.0 GHz			

# SÜD Japan



#### **Channel High**

	Hz-1	GHZ						m	1 GH		HZ					Ē
Spectrun									Spectrur							( <del>"</del>
	10.00 dBm			3W 100 kHz						i 10.00 dBm		RBW 100 kHz				
Att	20 dB	3 SWT 9.	7 ms 🖷 ۷	3W 300 kHz	Mode Au	to Sweep			Att	20 dB	SWT 40 ms 👄	VBW 300 kHz M	lode Auto Swee	ep.		
1Pk View			1	-	-				• 1Pk View			41				-64.26 dBr
					M N	1[1]		-69.38 dBm 890.010 MHz				¥ l	M2[1]			-04.20 UBr 1.96200 GH
0 dBm				-		1		090.010 0012	0 dBm				M1[1]			3.77 dBr
															2	.48050 GH
-10 dBm				-					-10 dBm-						-	+
	01 -16.230	dBm								D1 -16.230	dBm	-			_	
-20 dBm	01 101200		-	_			-		-20 dBm-							
-30 dBm				-					-30 dBm						-	-
-40 dBm		-				-			-40 dBm-						-	
									-50 dBm							
-50 dBm									-50 dBm-							
									-60 dBm							
-60 dBm					· · · · · · · · · · · · · · · · · · ·	-										1
								M1	-70 d9m		الموردية بالعالمية العربية المرومية.			and an and the state of the		andfortur
-70 dBm -						alle tende out of a		eline and the second	Australiter	Monunitheren	And a superior of the of the second	Land Martin Martin Brand and an	Altho attention of the other	The hard a second second	affer a falle faite	
steranormalities	initial allowed the second	Pertingent for the	and the second	una anna ann an ann an ann ann an ann an	ra hour Antosta	deceste an antight	COMPANING OUN	nolledle motel office (but a to grow a	-80 dBm-							
-80 dBm		-														
Start 30.0			1	1001		L		Stop 1.0 GHz	Start 1.0	GHz		1001 p	ts		St	op 5.0 GHz
	MHZ			1001	. pts			stop 1.0 GHz	Marker						•	
larker Type Re	6   Tau	X-valu	- 1	Y-value	Func	tion 1	C	tion Result	Type Re M1		2.4805 GHz	Y-value 3.77 dBm	Function	Fu	unction Resul	t
M1 M1	1		9 O1 MHz	-69.38 dB		cion	Func		M1 M2	1	4.962 GHz	-64.26 dBm				
1114	1	690.	or mile	59.56 GE				44		-	4,902 GH2	54.20 GBII		1.	CONTRACTOR AN	

#### 5 GHz-10 GHz

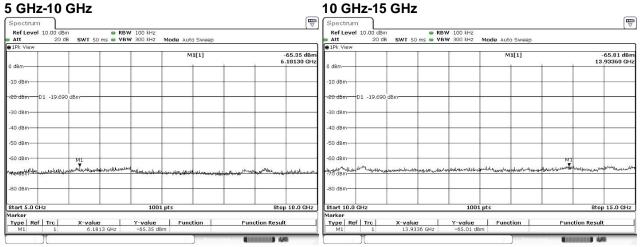
) dBm

#### 10 GHz-15 GHz Spectrum Ref Level 10.00 dBm RBW 100 kHz Att 20 dB SWT 50 ms VBW 300 kHz Mode Auto Sweep ● 1Pk View • 1Pk Viev -64.38 dBm 6.54100 GHz M1[1] -63.73 dBm 10.61190 GHz dBn 10 dBm 10 dBm D1 -16.230 dBm D1 -16.230 dBm -20 dBm -20 dBm--30 dBm--30 dBm 40 dBm 40 dBm -50 dBm-50 dBm--60 dBm M1 -60 dBm-Louistone mutation in the alary while 80 dBm-80 dBm Start 5.0 GHz Stop 10.0 GHz Start 10.0 GHz Stop 15.0 GHz 1001 pts 1001 pts Type Ref Trc Marker Type Ref Trc M1 1 Y-value Function X-value Y-value Function 10.6119 GHz -63.73 dBm -63.73 dBm X-value 6.541 GH Function Result Function Result

#### 15 GHz-20 GHz 20 GHz-25 GHz Spectrum Spectrum Ref Level 10.00 dB Ref Level 10.00 dBm Att 1Pk View Att IPk Viev -61.90 dBm 19.42310 GHz -63.07 dBm 20.30720 GHz M1[1] M1[1] 0 dBm dBr 10 dBm-10 dBm-D1 -16.230 dBm D1 -16.230 dBm -20 dBm -20 dBm--30 dBm--30 dBm--40 dBm--40 dBm--50 dBm--50 dBm-M1. -60 dBmwalken Udenson -70 dBmde. whether 80 dBm-30 dBm Start 15.0 GHz 1001 pts Stop 20.0 GHz Start 20.0 GHz 1001 pts Stop 25.0 GHz arkei arke Type Ref Trc Type Ref Trc X-value Y-value Function 19.4231 GHz -61.90 dBm X-value Y-value Function 20.3072 GHz -63.07 dBm -63.07 dBm Function Result Function Result 1 1.10

[3-DH5] Channel Low										
30 MHz-1 GHz			_	1 GHz	-5 GHz					_
RefLevel 10.00 dBm Att 20 dB SWT 9.7 r	<ul> <li>RBW 100 kHz</li> <li>Mode Aut</li> </ul>	o Sween		Ref Level	10.00 dBm		W 100 kHz W 300 kHz M(	de Auto Sweep		
1Pk View		F	1	• 1Pk View						
0 dBm	M	[1]	-69.97 dBm 962.690 MHz	0 d8m-		M1		M2[1]		-67.24 dBm 4.47850 GHz
-10 dBm				-10 dBm				M1[1]	ă ă	0.31 dBm 2.40060 GHz
-20 dBm D1 -19.690 dBm				-20 d8m(	01 -19.690 dBm				<u> </u>	
-30 dBm-				-30 dBm		-				
-40 dBm				-40 dBm						
-50 dBm				-50 dBm						_
-60 dBm			M1	-60 dBm					ويحدينا والمرجو بالمحمور وما	M2 Luterstander
-70 dBm visselformal-windstrandstrandstrandstrand	านที่เปรียกค่ะการถูกไม่เกาะถึงเป็นที่สามหัวเราะห์เสียงเป็นเป็นไปได้	received perceived as the production as	an water and a second straight of the	-80 dBm	ey gran had been and a second	nderdelisional Whyte	e Belgene Fischer und Kilden	www.uwwatthadiltantib		
-80 dBm-				Start 1.0 C			1001 pt			Stop 5.0 GHz
Start 30.0 MHz	1001 pts		Stop 1.0 GHz	Marker			1001 pt			
Marker <u>Type Ref Trc X-value</u> M1 1 962.69	Y-value Funct	ion Fu	nction Result	Type Ref M1 M2	1 2	alue	Y-value 0.31 dBm -67.24 dBm	Function	Function R	esult
<u> </u>		New Yorkson 🖉	1000 100 APA		X			Meste	Constants of	444





#### 15 GHz-20 GHz

#### 20 GHz-25 GHz

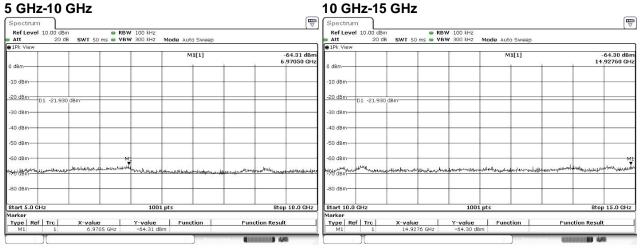
ectrum ef Level 10.00 dBm	
Att 20 dB SWT 50 ms SWT 300 kHz Mode Auto Sweep	Att 20 dB SWT 50 ms SWT 50 ms VBW 300 kHz Mode Auto Sweep
Pk View	Ptk View
M1[1] -61.36 19.55290	
Here in the second seco	-10 dBm
hd8m 01 -19.690 d8m	
) dBm	
) dBm	-40 dBm-
0.d8m	
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) d8m	
art 15.0 CHz 1001 pts Stop 20.0 c	4z Start 20.0 GHz 1001 pts Stop 25.0 G Marker
rker /pe Ref Trc X-value Y-value Function Function Result M1 1 19.5529 GHz -61.36 dBm	Marker         Type Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         20.3521 GHz         -62.54 dBm

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					<u></u>						E
Spectrum					Spectrum						
	<ul> <li>RBW 100 kHz</li> <li>VBW 300 kHz</li> <li>Mode</li> </ul>	Auto Dupon			Ref Level			BW 100 kHz BW 300 kHz Mo	de Auto Cueso		
1Pk View	SUD KHZ MOUE	Auto Sweep			IPk View	20 00 501	40 ms 🖷 🕇	BW 300 KHZ IVIL	de Auto Sweep		
) dBm		M1[1]		3.87 dBm .210 MHz	0 dBm-		MI		M2[1]		-68.08 dBi 4.25870 GH
10 dBm					-10 dBm				M1[1]		-1.93 dBr 2.44060 GH
					-20 dBm	01 -21.930 dBm					
20 dBm D1 -21.930 dBm					-30 dBm	1 -21.935 dBill		_			
40 dBm					-40 dBm						
50 dBm					-50 dBm					+ +	
60 dBm					-60 dBm						2
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80 dBm					-80 dBm						
Start 30.0 MHz	1001 pts		Stop	1.0 GHz	Start 1.0 G	łz		1001 pt	s		Stop 5.0 GH
larker					Type   Ref	Trc X-ve	due 1	Y-value	Function	E	on Result



[3-DH5]



#### 15 GHz-20 GHz

#### 20 GHz-25 GHz

Spectrum				Spectrum						1
Att 20 dB SWT	<ul> <li>RBW 100 kHz</li> <li>S0 ms</li> <li>VBW 300 kHz</li> </ul>	Mode Auto Sween		Ref Level 1 Att		SWT 50 ms - VB	W 100 kHz W 300 kHz /	Mode Auto Sween		
1Pk View	30 ms e 10 m 300 mz	Mode Auto Sweep	1	IPk View	20 00	3001 30 113 - 10	1 300 KHZ 1	Houe Auto Sweep		
0 dBm		M1[1]	-62.33 dBm 19.57290 GHz	0 dBm				M1[1]		2.20 dB 4220 Gł
				o dom						
-10 dBm		<u> </u>		-10 dBm						
20 dBm D1 -21.930 dBm				-20 dBm01	-21.930 d	Bm			++	
-30 dBm				-30 dBm					+	
40 dBm				-40 dBm						
50 dBm				-50 dBm						
-60 dBm			M1	-60 dBM1					+	
ndorwellensbragearticheranoweller -70 dBm	her and her so her s	internet and a subsection of the second s	strately apple of the second state of the seco	-70 dBm	razehnanatza	hallownerserverstand	aleraly warning	Landersen Microbilderandurisminik	while and a second second second	، ئى»ەللەرلۇ، يېلى
80 dBm				-80 dBm						
Start 15.0 GHz	1001	pts	Stop 20.0 GHz	Start 20.0 GF	lz	2	1001	pts	Stop 2	25.0 GH:
larker Type Ref Trc X-va		Function	Function Result	Marker Type Ref		X-value	Y-value	Function	Function Result	
M1 1 19.	5729 GHz -62.33 dB	m	CONTRACTOR AND	M1	1	20.3422 GHz	-62.20 dBm	<u>ו</u> ו	Constant 449	_



0 MHz-1 GH	Z					z-5 Gł	Ηz				G
pectrum RefLevel 10.00 dBm Att 20 dB SW	🖷 RBW 100 k				Spectrui Ref Leve	el 10.00 dBm		BW 100 kHz			[4
Att 20 dB SW 1Pk View	T 9.7 ms 🖷 VBW 300 k	Hz Mode Auto Sweep			Alt     IPk View	20 dB	SWT 40 ms 👄 V	BW 300 KH2 M	ode Auto Sweep		
dBm-		M1[1]	1 1	-68.52 dBm 715.590 MHz	0 dBm-		M	1	M2[1]	4.9	6.95 dB 3010 GH
LD dBm					-10 dBm				M1[1]		2.62 dB 8050 GF
0 dBm					-20 dBm	-D1 -22.620 d	Bm				
0 dBm 01 -22.620 dBm					-30 dBm						
0 dBm					-40 dBm						
0 dBm					-50 dBm						
0 dBm			M1		-60 dBm						M
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0 dBm											
art 30.0 MHz		.001 pts		Stop 1.0 GHz	Start 1.0 Marker	GHz		1001 pt	s	Stop	5.0 GH

#### 5 GHz-10 GHz

5 GHz-10 GHz		10 GHz-15 GHz
Spectrum		Spectrum
RefLevel 10.00 dBm 🛛 🖷 RBW 1	100 kHz	Ref Level 10.00 dBm
Att 20 dB SWT 50 ms • VBW 3	300 kHz Mode Auto Sweep	Att 20 dB SWT 50 ms VBW 300 kHz Mode Auto Sweep
IPk View		-65.32 dBm 6.51060 0Hz M1[1] -63.97 dBn 5.91060 0Hz 10.62190 GH
0 dBm		0 dBm
-10 dBm		10 dBm
-20 dBm		-20 dBm D1 -22.620 dBm
-30 dBm-		-30 d8m
-40 dBm-		-40 dBm
-50 dBm		-50 dBm
-60 dBm MI	Here we want a star store in the store it was been been a store it was a store it was a store it was a store it	60 dBm M1 secure all all the secure and all and a second and a second and a second all all all all all all all all all al
-80 dBm	an a	-70 dBm
Start 5.0 GHz	1001 pts Sto	Stop 10.0 GHz Start 10.0 GHz 1001 pts Stop 15.0 GHz
	-65.32 dBm Function	Marker         Type         Ref         Trc         X-value         Y-value         Function         Function Result           MI         1         10.6219 GHz         -63.97 dBm                                                                                                        <
	Measurfeet. (INNAND) 4	

#### 15 GHz-20 GHz

#### 20 GHz-25 GHz

Spectrum								Spectrur									(H
Att 20 dBm	SWT 50 ms 👄	RBW 100 kHz	Mode Auto	Swoon				Ref Leve	1 10.00 dBm		e RBW	100 kHz	Mode Aut	o Sween			
1Pk View	3001 30 113	1011 300 km2	Mode Add	2 Sweep				1Pk View	20 00	3441 30		300 112	Mode Aut	o sweep			
0 dBm			M	1[1]	3		61.28 dBm .56790 GHz	0 dBm					м	1[1]			-62.34 dB 0.10240 GF
								o usin-									
-10 dBm	· · · · · ·							-10 dBm									
-20 dBm D1 -22.620	dBm							-20 dBm	D1 -22.620	dam							
-30 dBm								-30 dBm								_	-
40 dBm								-40 dBm									-
-50 dBm								-50 dBm—								-	
-60 dBm							M1	14b dBm-									
-ou asm Mandhalannahannaharan -70 dBm	wheet our standard from the	ور المرابع المرابع مريندي من المجهد المرابع. المرابع المرابع مريندي من المجهد المرابع	hadden argen Hel	h-vyye <sup>ld[]+d</sup> habyy()	lerstoonerigth <sup>arry</sup> t	te Arren and a street	her hand bed the	-70 dBm-	ourservery grave	1974 Addrew marked after	water Maria Likan	العلى ويزيون المعالمة	haldwaysouth	konnekolumete	agerated at a grant	would mail for the second	an <mark>al</mark> filmentanyasih
-80 dBm		_						-80 dBm		-		-					
Start 15.0 GHz		100	1 pts			Stop	20.0 GHz	Start 20.0	GHz			1001	pts			Sto	op 25.0 GH:
Marker Type Ref Trc	X-value	Y-value	Func	tion	Fund	tion Result		Marker Type Re		X-value		Y-value	Func	tion	Fun	ction Resu	ılt
M1 1	19.5679 GHz	-61.28 di	sm					M1	1	20,102	24 GHz	-62.34 dB	sm	-		COLUMN A	

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#### 4.8 Spurious Emissions - Radiated -

#### 4.8.1 Measurement procedure

#### [FCC 15.247(d), 15.205, 15.209]

Test was applied by following conditions.

Test method Frequency range Test place EUT was placed on	:	ANSI C63.10 9kHz to 25GHz 3m Semi-anechoic chamber 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 - Detector - Bandwidth Spectrum analyzer setting - Peak - Average		Below 1GHz Average (9kHz-90kHz, 110kHz-490kHz), Quasi-peak 200Hz, 120kHz Above 1GHz RBW=1MHz, VBW=3MHz, Span=0Hz, Sweep=auto RBW=1MHz, VBW=1kHz, Span=0Hz, Sweep=auto Display mode=Linear

#### Average Measurement Setting [VBW]

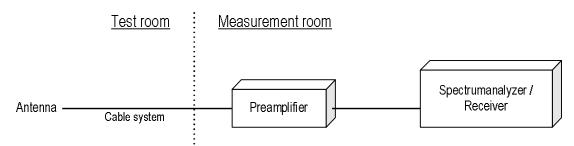
Mode	lode Duty Cycle T <sub>on</sub> T <sub>off</sub> 1/T <sub>on</sub> (%) (us) (us) (kHz)		Determined VBW Setting		
Bluetooth 5.1 EDR	76.80	2880	870	0.347	1kHz

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





#### 4.8.2 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

#### 4.8.3 Limit

Frequency	Field st	Field strength				
[MHz]	[uV/m]	[dBuV/m]	[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:

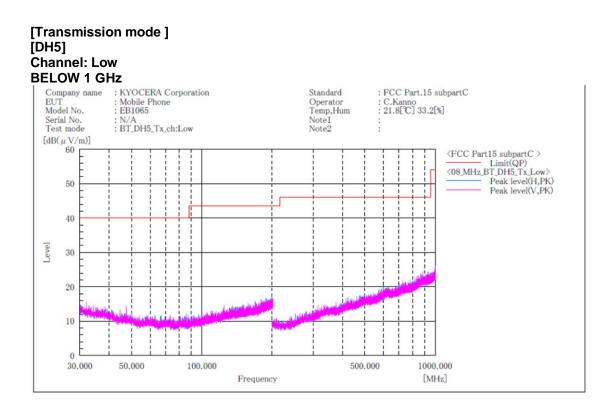
- 1. The lower limit shall apply at the transition frequencies.
- 2. Emission level [dBuV/m] = 20log Emission [uV/m]
- 3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the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



#### 4.8.4 Test data

Date Temperature Humidity Test place	<ul> <li>9-December-2020</li> <li>21.1 [°C]</li> <li>24.6 [%]</li> <li>3m Semi-anechoic chamber</li> </ul>	Test engineer :	Tadahiro Seino
Date Temperature Humidity Test place	: 10-December-2020 : 21.1 [°C] : 24.6 [%] : 3m Semi-anechoic chamber	Test engineer :	Tadahiro Seino
Date Temperature Humidity Test place	: 22-December-2020 : 21.8 [°C] : 33.2 [%] : 3m Semi-anechoic chamber	Test engineer :	Chiaki Kanno
Date Temperature Humidity Test place	<ul> <li>22-December-2020</li> <li>22.2 [°C]</li> <li>21.3 [%]</li> <li>3m Semi-anechoic chamber</li> </ul>	Test engineer :	Tadahiro Seino





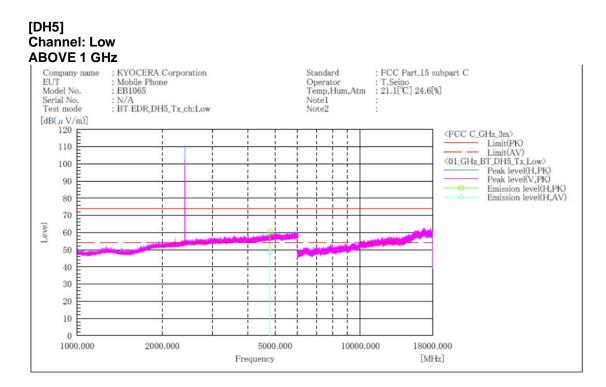
Final Result

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

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]

2. No emission were detected in frequency range 9kHz to 30MHz at the 3 meters distance.



Final Result

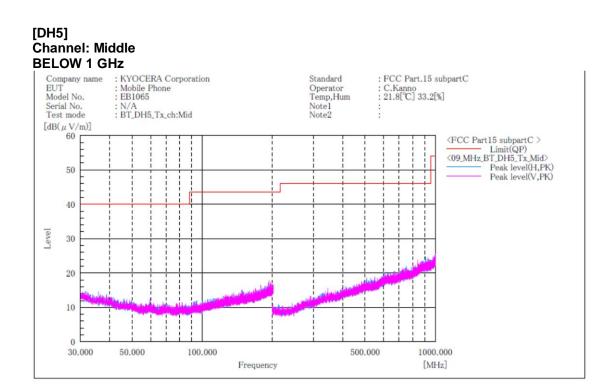
No.	Frequency	(P)	17h	Reading	c.f	Result	Result	Limit PK	Limit	Margin PK	AV		Angle
1	[MHz] 4804.000	H	[dB(µV)] 50.1		[dB(1/m)] 10.4		[dB(µV/m)] 48.3	$\begin{bmatrix} dB(\mu V/m) \end{bmatrix}$ 74.0	[dB(µV/m)] 54.0	[dB] 13.5	[dB] 5.7	[cm] 157.0	[°] 0.0

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.





Final Result

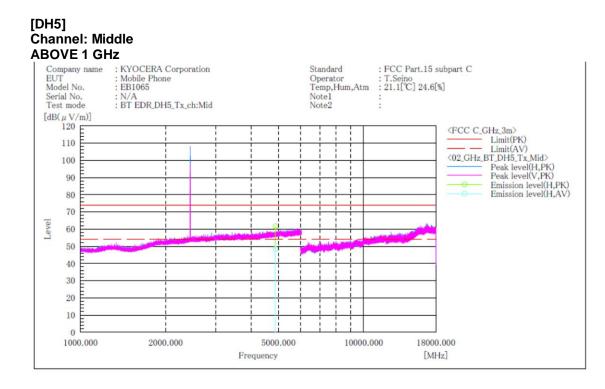
No.	Frequency	(P)	c.f	Height	Angle	Remark
	[MHz]		[dB(1/m)]	[cm]	[°]	

Note:

- 1. Emission Level (Margin) = Limit [Reading + Factor (Antenna + Cable Amp)]
- 2. No emission were detected in frequency range 9kHz to 30MHz at the 3 meters distance.





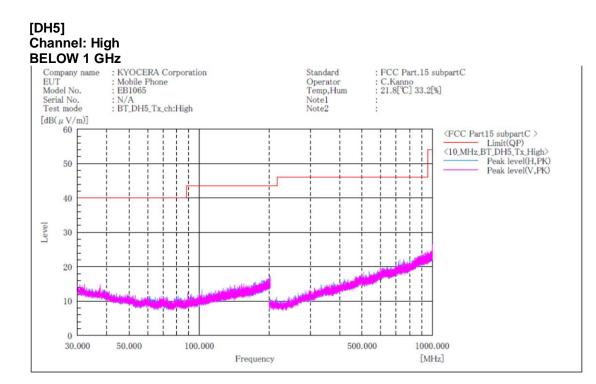


No.	Frequency	(P)	r n	Reading AV	c.f	Result PK	Result	Limit PK	Limit AV	Margin PK	AV		Angle
1	[MHz] 4882.000	H	[dB(μV)] 51.0			[dB(µV/m)] 61.6		$[dB(\mu V/m)]$ 74.0	$[dB(\mu V/m)]$ 54.0	PK [dB] 12.4	[dB] 5.6	[cm] 279.0	[°] 12.0

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.

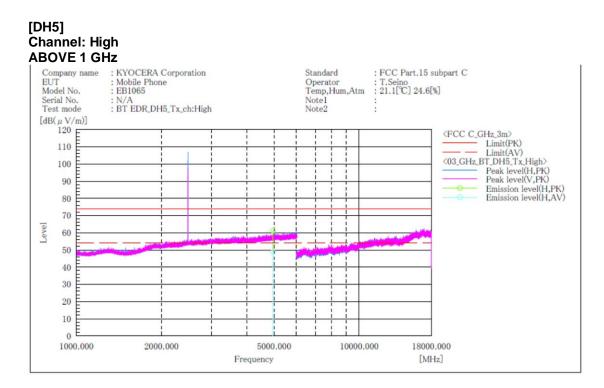


No.	Frequency	(P)	c.f	Height	Angle	Remark	
	[MHz]		[dB(1/m)]	[cm]	[°]		

#### Note:

- 1. Emission Level (Margin) = Limit [Reading + Factor (Antenna + Cable Amp)]
- 2. No emission were detected in frequency range 9kHz to 30MHz at the 3 meters distance.





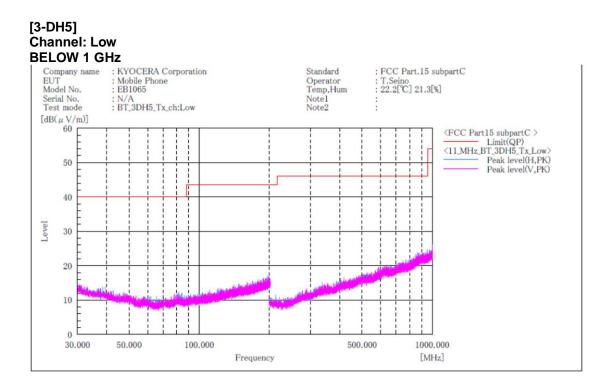
No.	Frequency	(P)	PK	Reading AV	c.f	Result	Result	Limit	Limit	Margin PK	Margin AV	Height	Angle
1	[MHz] 4960.000	Н	[dB(µV)] 50.5	[dB(µV)] 37.9				[dB(µV/m)] 74.0	[dB(µV/m)] 54.0	[dB] 12.7	[dB] 5.3	[cm] 270.0	[°] 117.0

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.



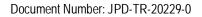


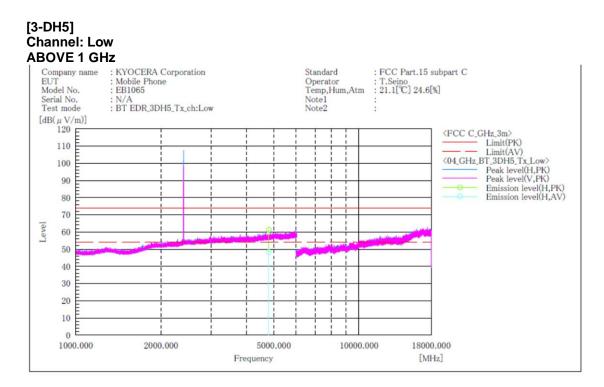
No.	Frequency	(P)	c.f	Height	Angle	
	[MHz]		[dB(1/m)]	[cm]	[°]	

Note:

- 1. Emission Level (Margin) = Limit [Reading + Factor (Antenna + Cable Amp)]
- 2. No emission were detected in frequency range 9kHz to 30MHz at the 3 meters distance.







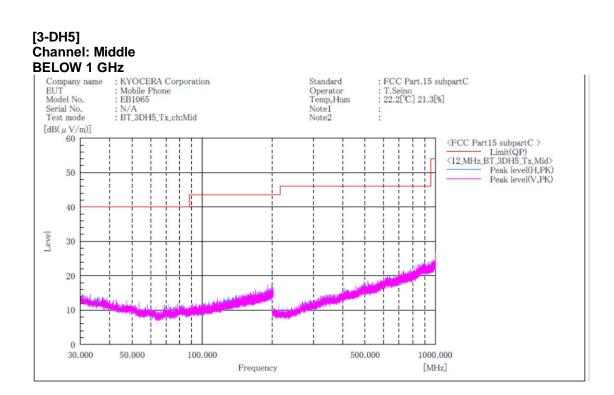
No.	Frequency	(P)	PR -	Reading	c.f	Result PK	Result	Limit	Limit	Margin PK	AV		Angle
1	[MHz] 4804.000	Н	[dB(µV)] 50.9			$[dB(\mu V/m)]$		$\begin{bmatrix} dB(\mu V/m) \end{bmatrix}$ 74.0	[dB(µV/m)] 54.0	[dB] 12.7	[dB] 5.7	[cm] 240.0	[°] 23.0

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.





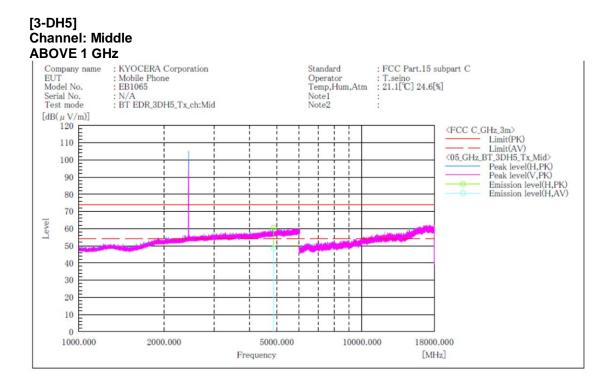
No.	Frequency	(P)	c.f	Height	Angle	
	[MHz]		[dB(1/m)]	[cm]	[°]	

#### Note:

- 1. Emission Level (Margin) = Limit [Reading + Factor (Antenna + Cable Amp)]
- 2. No emission were detected in frequency range 9kHz to 30MHz at the 3 meters distance.





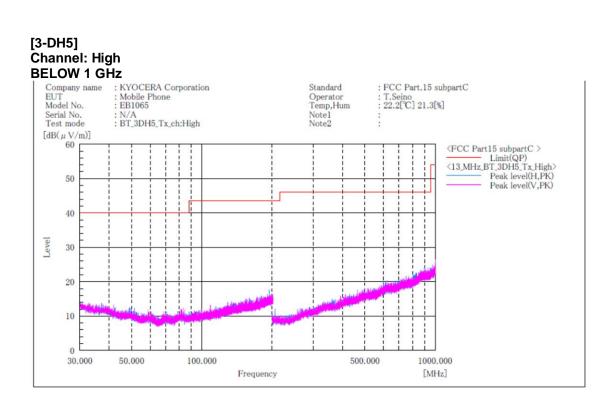


No.	Frequency	(P)	Reading	AV		Result	Result	Limit	Limit	Margin PK	Margin		Angle
1	[MHz] 4882.000	Н	[dB(µV)] 50.1	[dB(μV)] 37.8	[dB(1/m)] 10.6	$[dB(\mu V/m)]$	[dB(µV/m)] 48.4	$[dB(\mu V/m)]$	$[dB(\mu V/m)]$	[dB] 13.3	[dB] 5.6	[cm] 281.0	[°] 19.0

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.



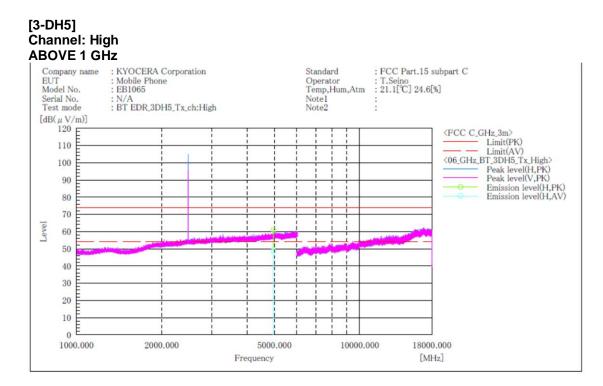
No.	Frequency	(P)	c.f	Height	Angle	
	[MHz]		[dB(1/m)]	[cm]	[°]	

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]

2. No emission were detected in frequency range 9kHz to 30MHz at the 3 meters distance.





No.		(P)	PK	Reading	c.f	Result	Result	Limit PK	Limit	PK	Margin AV		Angle
	[MHz]								$[dB(\mu V/m)]$	[dB]	[dB]	[cm]	[°]
1	4960.000	н	50.2	37.8	10.8	61.0	48.6	74.0	54.0	13.0	5.4	145.0	17.0

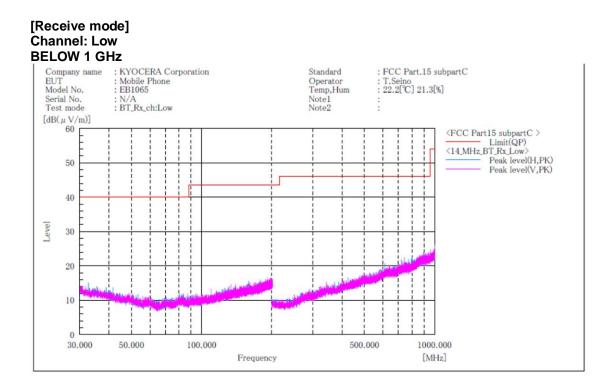
Note:

- 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.









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

#### Note:

- 1. Emission Level (Margin) = Limit [Reading + Factor (Antenna + Cable Amp)]
- 2. No emission were detected in frequency range 9kHz to 30MHz and 1GHz to 25GHz at the 3 meters distance.



#### **Channel: Middle BELOW 1 GHz** : KYOCERA Corporation : Mobile Phone : EB1065 Company name : FCC Part.15 subpartC Standard Operator Temp,Hum EUT Model No. T.Seino 22.2[°C] 21.3[%] Serial No. Test mode : N/A : BT\_Rx\_ch:Mid Note1 Note2 $[dB(\mu V/m)]$ 60 <FCC Part15 subpartC > Limit(QP) <15\_MHz\_BT\_Rx\_Mid> Peak level(H,PK) Peak level(V,PK) 50 40 Level 30 20 10 0 30.000 100.000 50.000 500.000 1000.000 Frequency [MHz]

Final Result

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

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]

2. No emission were detected in frequency range 9kHz to 30MHz and 1GHz to 25GHz at the 3 meters distance.



#### **Channel: High BELOW 1 GHz** Company name EUT Model No. Serial No. Test mode [dB(µ V/m)] 60 Standard Operator Temp,Hum Note1 Note2 : KYOCERA Corporation : Mobile Phone : EB1065 : FCC Part.15 subpartC T.seino 22.2[°C] 21.3[%] : N/A : BT\_Rx\_ch:High <FCC Part15 subpartC > Limit(QP) <16\_MHz\_BT\_Rx\_High> \_\_\_\_\_\_ Peak level(H,PK) \_\_\_\_\_\_ Peak level(V,PK) 50 40 Level 30 20 10 0 50.000 100.000 500.000 1000.000 30.000 Frequency [MHz]

#### Final Result

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

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable - Amp)]

2. No emission were detected in frequency range 9kHz to 30MHz and 1GHz to 25GHz at the 3 meters distance.

# TÜV SÜD Japan Ltd.



### 4.9 Restricted Band of Operation

### 4.9.1 Measurement procedure

#### [FCC 15.247(d), 15.205, 15.209]

Test was applied by following conditions.

Test method Test place EUT was placed on Antenna distance	:	ANSI C63.10 3m Semi-anechoic chamber 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) 3m
Spectrum analyzer setting - Peak - Average	:	RBW=1MHz, VBW=3MHz, Span=Arbitrary setting, Sweep=auto RBW=1MHz, VBW=1kHz, Span=Arbitrary setting, Sweep=auto Display mode=Linear

#### Average Measurement Setting [VBW]

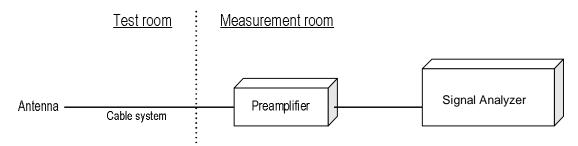
Mode	Duty Cycle (%)	T <sub>on</sub> (us)	T <sub>off</sub> (us)	1/T <sub>on</sub> (kHz)	Determined VBW Setting
Bluetooth 5.1 EDR	76.80	2880	870	0.347	1kHz

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





## 4.9.2 Limit

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

## 4.9.3 Measurement result

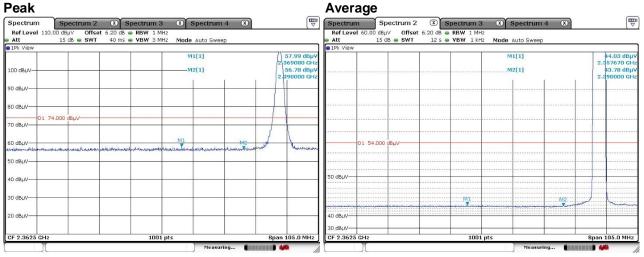
Channel	Frequency [MHz]	Results Chart	Result
Low	2402	See the Trace Data	Pass
High	2480	See the Trace Data	Pass

## 4.9.4 Test data

Date	:	18-December-2020			
Temperature	:	21.2 [°C]			
Humidity	:	24.0 [%]	Test engineer	:	
Test place	:	3m Semi-anechoic chamber			Tadahiro Seino

# TÜV SÜD Japan Ltd.

#### [DH5] Channel: Low Horizontal Peak

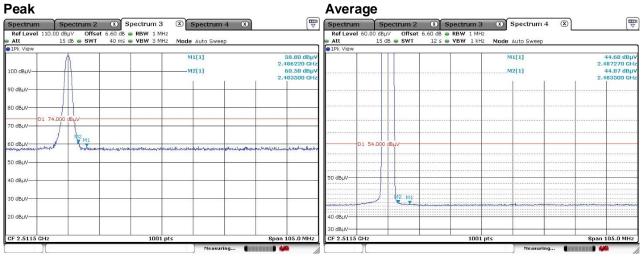


# Vertical

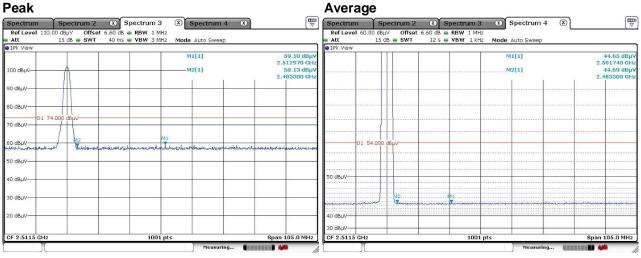
Peak						Avera	age								
Spectrum Spec	trum 2 🗶 Spe	ectrum 3 🛛 🗵	Spectrum 4	×		Spectrun		Spectrum 2	×s	pectrum 3	x s	Spectrum	4 X		E
Ref Level 110.00 dBuV	Offset 6.20 dB 👄	RBW 1 MHz			(.)	Ref Leve	60.00 d	BUV Offset	6.20 dB 👄	RBW 1 MH	2		1000		
Att 15 dB	<ul> <li>SWT 40 ms</li> </ul>	VBW 3 MHz M	de Auto Sweep			👄 Att	15	dB 👄 SWT	12 s 👄	VBW 1 kH	z Mode A	auto Sweep			
1Pk View						1Pk View									
100 dBµV			M1[1] M2[1]		58.47 dBµV Å.357220 GHz 56.09 dBµV							1[1] 2[1]		3	43.95 dBµ 2.388830 GH 43.83 dBµ
00 9800-			-M2[1]		2.390000 GHz							2[1]	с т		2.390000 GH
90 dBµV				-											
30 dBµV															
D1 74.000 dBp	N														
i0 dBuV		M1					D1 54.00	0.48.44							-
normalization while	www.www.www.www.urawy.	watch with service and	metalanteriation	-	Vernenseeren		01 54.00								
50 dBµV				-											
40 dBµV				_		50 dBµV									_
30 dBµV						and the second second							NN2	لسعب	. Comments
20 dBµV-				-		40 dBµV									
CF 2.3625 GHz		1001 pts		Pn	an 105.0 MHz	30 dBµV	CHA			1001	nte			Por	in 105.0 MHz
GF 2.3023 GHZ		root prs				CF 2.3023	UTI2			1001	pes				1 103.0 MH2
			Measuring		aga III							Measuri	ng 📲		ayta



#### [DH5] Channel: High Horizontal Peak

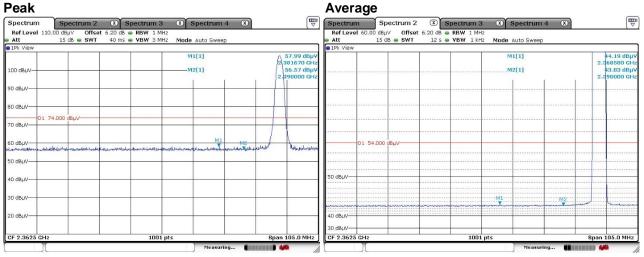


# Vertical





#### [3-DH5] Channel: Low Horizontal Peak



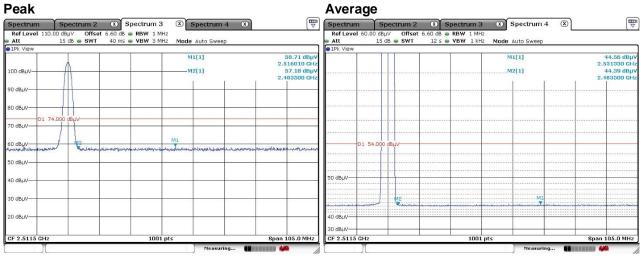
# Vertical

Ref Level         10.00         CB3y         Offset         6.20         CB3y         RBW         1 MHz           Att         15 dB         SWT         40 ms         VBW         3 MHz         Mode         Auto Sweep         Att         15 dB         SWT         12 s         VBW         14Hz         Mode         Auto Sweep         Att         15 dB         SWT         12 s         VBW         14Hz         Mode         Auto Sweep         Att         15 dB         SWT         12 s         VBW         14Hz         Mode         Auto Sweep         Att         15 dB         SWT         12 s         VBW         14Hz         Mode         Auto Sweep         Att         15 dB         SWT         12 s         VBW         14Hz         Mode         Auto Sweep         Att         13 dB         SWT         12 s         VBW         14Hz         Att         12 s         VBW         14Hz         12 s         VBW         14Hz         12 s         4D         12 s         <	Peak				Averag	e	_		
Att       15 db       SWT       40 ms       VBW 3 MH2       Mode Auto Sweep         1PL View       M1[1]       38.11 dby       M1[1]       38.11 dby       M1[1]       43.4         100 dby/       M2[1]       2900B0 dFz       M1[1]       2.1000       M2[1]       43.4         90 dby/       M2[1]       21900B0 dFz       M1[1]       43.4       2.1000         90 dby/       M2[1]       21900B0 dFz       M1[1]       43.4         100 dby/       M2[1]       21900B0 dFz       M2[1]       43.4         21900B0 dFz       M2[1]       21900B0 dFz       M2[1]       43.4         21900B0 dFz       M2[1]       43.4       4.4       4.4       4.4         90 dby/       M2[1]       M2[1]       4.2       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4       4.4	Spectrum 2	Spectrum 3 S	pectrum 4 🛛 🛞		Spectrum	Spectrum 2	Spectrum 3	Spectrum 4	*
100 dBµV									`````````````````````````````````
M1[1]         Sb.11 (Bpu/ 2.37060 0Hz/ 2.37060 0Hz/ 2.390000 CHz         M1[1]         B.1.3 (Bpu/ 2.37060 0Hz/ 2.37060 0Hz/ 2.39000 CHz           90 dBµ/         -M2[1]         2.37060 0Hz/ 2.39000 CHz		40 ms 🖷 VBW 3 MHz Mode	Auto Sweep			15 dB 👜 SWT	12 s 💩 VBW 1 kHz	Mode Auto Sweep	
90 dbu//     21990000 cit/2     2.190000 cit/2     2.190000 cit/2       80 dbu//     0     0     0     0       90 dbu//     0     0     0     0				2.370860 GHz	TLY AIGM				43.87 dE 2.379600 0
80 dBu// 01 74.000 dBu// 01 74.000 dBu// S0 dBu// 01 94.000 dBu// 01 54.000 dBu//	100 dBµV-	MZ	[1]					M2[1]	43.58 dE 2.390000 C
01 74.000 dBµV     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0     0	90 dBµV								
	30 dBµV								
10 dBuV 50 dBuV 40 dBuV				+ + - + + + + + + + + + + + + + + + +					
50 dBµV 40 dBµV					D1 5	4.000 dBµV			
		and was him for the second	ware the second and the second s	r Unacharterithe					
	40 dBuly				50 dBµV				
30 dBuV									
	10 dBhA-							M1. T	M2.
40 dBy//	20 dBµV-				40 dBµV				
CF 2.3625 CHz         1001 pts         Span 105.0 MHz         CF 2.3625 CHz         1001 pts         Span 105					1000000000000				Span 105.0 Mi

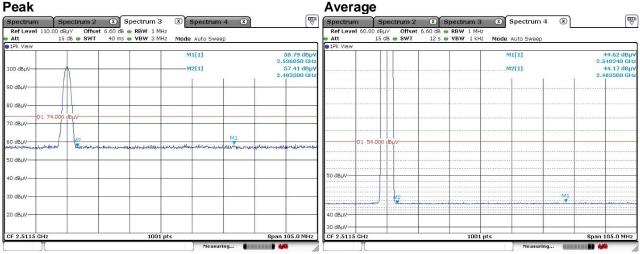




#### [3-DH5] Channel: High Horizontal Peak



#### Vertical Peak





## 4.10 AC Power Line Conducted Emissions

### 4.10.1 Measurement procedure

## [FCC 15.207]

Test was applied by following conditions.

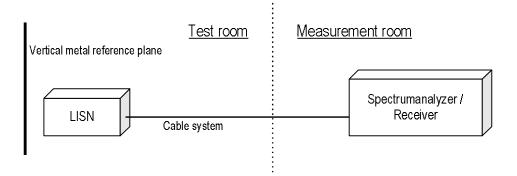
Test method Frequency range Test place EUT was placed on Vertical Metal Reference Plane Test receiver setting	:	ANSI C63.10 0.15 MHz to 30 MHz 3 m Semi-anechoic chamber FRP table / (W)2.0 m $\times$ (D)1.0 m $\times$ (H)0.8 m (W)2.0 m $\times$ (H)2.0 m 0.4 m away from EUT
- Detector - Bandwidth		Quasi-peak,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

EUT and peripherals are connected to  $50\Omega/50\mu$ H 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  $50\Omega$ .

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





## 4.10.2 Calculation method

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

Example:

Limit @ 6.770 MHz :  $60.0 \text{ dB}\mu\text{V}(\text{Quasi-peak})$ :  $50.0 \text{ dB}\mu\text{V}(\text{Average})$ (Quasi peak) Reading =  $41.2 \text{ dB}\mu\text{V}$  c.f = 10.3 dBEmission level =  $41.2 + 10.3 = 51.5 \text{ dB}\mu\text{V}$ Margin = 60.0 - 51.5 = 8.5 dB(Average) Reading =  $35.0 \text{ dB}\mu\text{V}$  c.f = 10.3 dBEmission level =  $35.0 + 10.3 = 45.3 \text{ dB}\mu\text{V}$ Margin = 50.0 - 45.3 = 4.7 dB

### 4.10.3 Limit

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

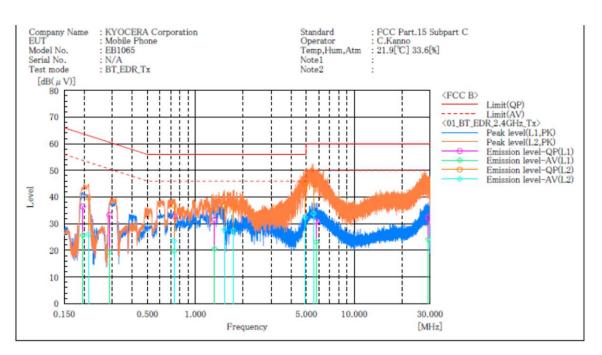
\*: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.



### 4.10.4 Test data

Test engineer :

Chiaki Kanno



#### Final Result

	L1 Phase	-								
No.	Frequency	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin
		QP	CAV		QP	CAV	QP	AV	QP	CAV
	[MHz]	$[dB(\mu V)]$	$[dB(\mu V)]$	[dB]	$[dB(\mu V)]$	$[dB(\mu V)]$	$[dB(\mu V)]$	$[dB(\mu V)]$	[dB]	[dB]
1	0.196	26.1	15.3	10.3	36.4	25.6	63.8	53.8	27.4	28.2
23	0.289	23.1	9.1	10.2	33.3	19.3	60.6	50.6	27.3	31.3
3	0.739	22.5	9.4	10.3	32.8	19.7	56.0	46.0	23.2	26.3
4 5 6	1.323	21.0	10.3	10.3	31.3	20.6	56.0	46.0	24.7	25.4
5	5.761	20.3	12.7	10.5	30.8	23.2	60.0	50.0	29.2	26.8
6	29.118	21.0	12.7	11.4	32.4	24.1	60.0	50.0	27.6	25.9
	L2 Phase	-								
No.	L2 Phase Frequency	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin
	Frequency	Reading QP	CAV		QP	CAV	QP	AV	QP	CAV
No.	Frequency [MHz]	Reading QP [dB(µV)]	CAV [dB(μV)]	[dB]	QP [dB( $\mu$ V)]	CAV [dB(μV)]	QP [dB( $\mu$ V)]	AV [dB( $\mu$ V)]	QP [dB]	CAV [dB]
No.	[MHz] 0.213	Reading QP [dB(μV)] 29.5	CAV [dB(μV)] 15.7	[dB] 10.3	QP [dB(μV)] 39.8	CAV [dB(μV)] 26.0	QP [dB(μV)] 63.1	ΑV [dB(μV)] 53.1	QP [dB] 23.3	CAV [dB] 27.1
No.	[MHz] 0.213 0.736	Reading QP [dB(μV)] 29.5 26.5	CAV [dB(µV)] 15.7 13.3	[dB] 10.3 10.3	QP [dB(μV)] 39.8 36.8	CAV [dB(µV)] 26.0 23.6	QP [dB(μV)] 63.1 56.0	AV [dB(µV)] 53.1 46.0	QP [dB] 23.3 19.2	CAV [dB] 27.1 22.4
No.	[MHz] 0.213 0.736 1.525	Reading QP [dB(μV)] 29.5 26.5 26.6	CAV [dB(µV)] 15.7 13.3 17.5	[dB] 10.3 10.3 10.3	QP [dB(μV)] 39.8 36.8 36.9	CAV [dB(µV)] 26.0 23.6 27.8	QP [dB(μV)] 63.1 56.0 56.0	AV [dB(µV)] 53.1 46.0 46.0	QP [dB] 23.3 19.2 19.1	CAV [dB] 27.1 22.4 18.2
No.	Frequency [MHz] 0.213 0.736 1.525 1.737	Reading QP [dB(µV)] 29.5 26.5 26.6 26.1	CAV [dB(µV)] 15.7 13.3 17.5 17.2	[dB] 10.3 10.3 10.3 10.3	QP [dB(μV)] 39.8 36.8 36.9 36.9 36.4	CAV [dB(µV)] 26.0 23.6 27.8 27.5	QP [dB(μV)] 63.1 56.0 56.0 56.0	AV [dB(µV)] 53.1 46.0 46.0 46.0	QP [dB] 23.3 19.2 19.1 19.6	CAV [dB] 27.1 22.4 18.2 18.5
No.	[MHz] 0.213 0.736 1.525	Reading QP [dB(μV)] 29.5 26.5 26.6	CAV [dB(µV)] 15.7 13.3 17.5	[dB] 10.3 10.3 10.3	QP [dB(μV)] 39.8 36.8 36.9	CAV [dB(µV)] 26.0 23.6 27.8	QP [dB(μV)] 63.1 56.0 56.0	AV [dB(µV)] 53.1 46.0 46.0	QP [dB] 23.3 19.2 19.1	CAV [dB] 27.1 22.4 18.2

# TÜV SÜD Japan Ltd.



# 5 Antenna requirement

According to FCC section 15.203, an intentional radiator shall be designed to ensure that no antenna other than 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.



# 6 Measurement Uncertainty

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 Parts 1 and 2 determining compliance or non-compliance with test result.

Test item	Measurement uncertainty
Conducted emission, AMN (9 kHz – 150 kHz)	±3.7 dB
Conducted emission, AMN (150 kHz – 30 MHz)	±3.3 dB
Radiated emission (9kHz – 30 MHz)	±3.7 dB
Radiated emission (30 MHz – 1000 MHz)	±5.3 dB
Radiated emission (1 GHz – 6 GHz)	±4.4 dB
Radiated emission (6 GHz – 18 GHz)	±4.7 dB
Radiated emission (18 GHz – 40 GHz)	±5.8 dB
Radio Frequency	±1.4 * 10 <sup>-8</sup>
RF power, conducted	±0.8 dB
Temperature	±0.6 °C
Humidity	±1.2 %
Voltage (DC)	±0.4 %
Voltage (AC, <10kHz)	±0.2 %

Judge	Measured value and standard limit value								
PASS	Case1	t value         Uncertainty       -Uncertainty         Even if it takes uncertainty into consideration,         Measured value       a standard limit value is fulfilled.         Although measured value is in a standard limit value,         a limit value won't be fulfilled if uncertainty is taken into consideration.							
FAIL	Case3	Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.							
		Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.							

# TÜV SÜD Japan Ltd.



# 7 Laboratory Information

Testing was performed and the report was issued at:

## 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

### Accreditation and Registration

A2LA Certificate #3686.03

VLAC Accreditation No.: VLAC-013

BSMI

Laboratory Code: SL2-IN-E-6018, SL2-A1-E-6018

Innovation, Science and Economic Development Canada ISED#: 4224A

#### VCCI Council

Registration number	Expiration date
A-0166	03-July-2021



# Appendix A. Test Equipment

### Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	31-Dec-2021	11-Dec-2020
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	31-Aug-2021	20-Aug-2020
Attenuator	Weinschel	56-10	J4180	31-Jul-2021	21-Jul-2020
Power meter	Keysight	N1911A	MY57390003	31-Dec-2021	01-Dec-2020
Power sensor	Keysight	N1921A	MY57370009	31-Dec-2021	01-Dec-2020

#### **Radiated emission**

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2021	28-Sep-2020
Spectrum analyzer	Agilent Technologies	E4447A	MY46180188	31-Mar-2021	27-Mar-2020
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	31-Dec-2021	11-Dec-2020
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	31-Aug-2021	20-Aug-2020
Spectrum analyzer	ROHDE&SCHWARZ	FSV40	101731	30-Jun-2021	22-Jun-2020
Preamplifier	SONOMA	310	372170	30-Sep-2021	29-Sep-2020
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	30-Apr-2021	15-Apr-2020
Attenuator	TAMAGAWA.ELEC	CFA-01NPJ-6	N/A(S275)	30-Jun-2021	04-Jun-2020
Biconical antenna	Schwarzbeck	VHBB9124/BBA9106	1333	31-Dec-2021	15-Dec-2020
Biconical antenna	Schwarzbeck	VHBB9124/BBA9106	1344	31-Dec-2020	04-Dec-2019
Log periodic antenna	Schwarzbeck	VUSLP9111B	344	30-Apr-2021	17-Apr-2020
Attenuator	TAMAGAWA.ELEC	CFA-01NPJ-6	N/A(S275)	30-Jun-2021	04-Jun-2020
Attenuator	TAMAGAWA.ELEC	CFA-10/3dB	N/A(S503)	31-Jul-2021	20-Jul-2020
Attenuator	AEROFLEX	26A-10	081217-08	31-Jan-2021	10-Jan-2020
Double ridged guide antenna	ETS LINDGREN	3117	00052315	30-Apr-2021	08-Apr-2020
Attenuator	HUBER+SUHNER	6803.17.B	N/A(2341)	31-Dec-2021	16-Dec-2020
				31-Dec-2020	18-Dec-2019
Double ridged guide antenna	A.H.Systems Inc.	SAS-574	469	30-Sep-2021	02-Sep-2020
Preamplifier	TSJ	MLA-1840-B03-35	1240332	30-Sep-2021	02-Sep-2020
Band rejection filter	Micro-Tronics	BRC50702	045	31-May-2021	15-May-2020
		SUCOFLEX104/9m	MY30037/4	31-Jan-2021	08-Jan-2020
Microwave cable		SUCOFLEX104/1m	my24610/4	31-Jan-2021	08-Jan-2020
	HUBER+SUHNER	SUCOFLEX104/8m	SN MY30031/4	31-Jan-2021	09-Jan-2020
	HUBER+SUHNER	SUCOFLEX104	MY32976/4	31-Jan-2021	08-Jan-2020
		SUCOFLEX104/1.5m	MY19309/4	31-Jan-2021	08-Jan-2020
		SUCOFLEX104/7m	41625/6	31-Jan-2021	08-Jan-2020
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)	31-May-2021	29-May-2020
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-SVSWR)	31-May-2021	28-May-2020

## Conducted emission at mains port

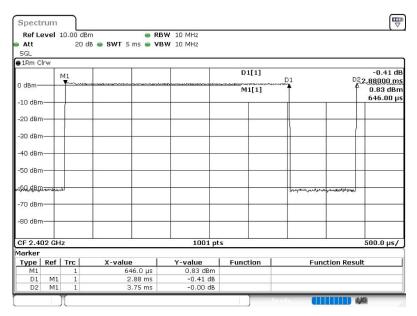
			Cal. Due	Cal. Date
ROHDE&SCHWARZ	ESCI	100765	30-Sep-2021	28-Sep-2020
HUBER+SUHNER	6810.01.A	N/A (S411)	31-Jan-2021	18-Jan-2020
Kyoritsu Electrical Works, Ltd.	KNW-407F2	12-17-110-2	30-Jun-2021	03-Jun-2020
FUJIKURA	5D-2W/4m	N/A (S350)	31-Jan-2021	18-Jan-2020
FUJIKURA	5D-2W/1m	N/A (S193)	31-Jan-2021	18-Jan-2020
HUBER+SUHNER	RG214/U/10m	N/A (S194)	31-Jan-2021	18-Jan-2020
DELL	DIMENSION	75465BX	N/A	N/A
TOYO Corporation	EP5/CE-AJ	0611193/V5.4.11	N/A	N/A
	HUBER+SUHNER Kyoritsu Electrical Works, Ltd. FUJIKURA FUJIKURA HUBER+SUHNER DELL TOYO Corporation	HUBER+SUHNER6810.01.AKyoritsu Electrical Works, Ltd.KNW-407F2FUJIKURA5D-2W/4mFUJIKURA5D-2W/1mHUBER+SUHNERRG214/U/10mDELLDIMENSIONTOYO CorporationEP5/CE-AJ	HUBER+SUHNER         6810.01.A         N/A (S411)           Kyoritsu Electrical Works, Ltd.         KNW-407F2         12-17-110-2           FUJIKURA         5D-2W/4m         N/A (S350)           FUJIKURA         5D-2W/1m         N/A (S193)           HUBER+SUHNER         RG214/U/10m         N/A (S194)           DELL         DIMENSION         75465BX           TOYO Corporation         EP5/CE-AJ         0611193/V5.4.11	HUBER+SUHNER         6810.01.A         N/A (S411)         31-Jan-2021           Kyoritsu Electrical Works, Ltd.         KNW-407F2         12-17-110-2         30-Jun-2021           FUJIKURA         5D-2W/4m         N/A (S350)         31-Jan-2021           FUJIKURA         5D-2W/1m         N/A (S193)         31-Jan-2021           HUBER+SUHNER         RG214/U/10m         N/A (S194)         31-Jan-2021           DELL         DIMENSION         75465BX         N/A

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

# TÜV SÜD Japan Ltd.

# Appendix B. Duty Cycle

## [Plot & Calculation]



Duty Cycle = Ton / (Ton + Toff) = 2880[µs] / (2880[µs] + 870[µs]) = 76.8[%]

