Report on the RF Testing of:

KYOCERA Corporation Mobile Phone, Model: JA53 FCC ID: JOYJA53

In accordance with FCC Part 15 Subpart C



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Document Number: JPD-TR-19047-0

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NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
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Signatures in this approval bo	ox have checked this document in line with the red	quirements of TÜV SÜD Japan Ltd.	document control rules.

EXECUTIVE SUMMARY

A sample(s) of this product was tested and found to be compliant with FCC Part 15 Subpart C.



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1 Summary of Test

1.1 Modification history of the test report

Doc	Document Number Modification History		Issue Date	
JPD-1	TR-19047-0	First Issue	Refer to the cover page	

1.2 Standards

CFR47 FCC Part 15 Subpart C

1.3 Test methods

ANSI C63.10-2013, KDB 558074 D01 15.247 Meas Guidance v05

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)(2)	6dB Bandwidth	Conducted	PASS	-
15.247(b)(3)	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	05 Spurious Emissions		PASS	-
15.247(d) 15.205 15.209	Restricted Bands of Operation	Radiated	PASS	-
15.247(e)	Transmitter Power Spectral Density	Conducted	PASS	-
15.207	5.207 AC Power Line Conducted Emissions		PASS	-

1.6 Test information

None

1.7 Test set up

Table-top

1.8 Test period

24-January-2019 - 06-February-2019



Equipment Under Test 2

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	JA53
Serial number	N/A
Trade name	Kyocera
Number of sample(s)	1
EUT condition	Pre-Production
Power rating	Battery: DC 3.8 V
Size	(W) 51.3 × (D) 17.4 × (H) 112.3 mm
Environment	Indoor and Outdoor use
Terminal limitation	-20 °C to 60 °C
RF Specification	
Protocol	Bluetooth 4.1 + EDP

Protocol	Bluetooth 4.1 + EDR
Frequency range	2402 MHz-2480 MHz
Number of RF Channels	40 Channels
Modulation method/Data rate	GFSK (1 Mbps)
Channel separation	2 MHz
Conducted power	0.589 mW
Antenna type	Internal antenna
Antenna gain	1.98 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: JA53, Serial Number: N/A					
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)

JA53 has model with camera and without camera.

2.3.2 Reason for selection of EUT

Not applicable

2.4 Operating channels and frequencies

Channel	Frequency [MHz]	Channel	Frequency [MHz]
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

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	2440		
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 Type	Data Rate	
Low, Middle, High	GFSK	1 Mbps	

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, Open and the worst case recorded.



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: 2440 MHz, Channel High: 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: 2440 MHz, Channel High: 2480 MHz
- iii) Start test mode



3 Configuration of Equipment

Numbers assigned to equipment on the diagram in "3.2 System configuration" correspond to the list in "3.1 Equipment used".

3.1 Equipment used

No) .	Equipment	Company	Model No.	Serial No.	FCC ID/DoC	Comment
1	M	obile Phone	KYOCERA	JA53	N/A	JOYJA53	EUT
2	2 AC	C Adapter	au	N/A	N/A	N/A	*

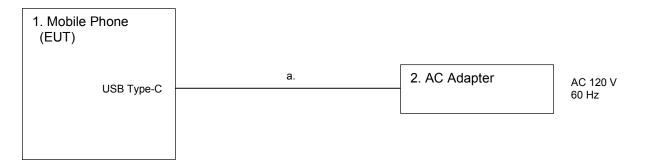
*:AC power line Conducted Emission Test.

3.2 Cable(s) used

No.	Equipment	Length[m]	Shield	Connector	Comment				
а	USB cable (for AC Adapter)	1.0	Yes	Metal	*				
*	* AC never line Conducted Emission Test								

*: AC power line Conducted Emission Test.

3.3 System configuration





4 Test Result

4.1 6dB Bandwidth

4.1.1 Measurement procedure

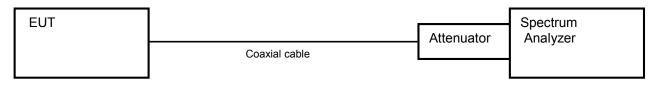
[FCC 15.247(a)(2), KDB558074 D01 v05]

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) RBW = 100 kHz
- b) VBW \ge 3 x RBW
- c) Sweep time = auto-couple
- d) Detector = peak
- e) Trace mode = max hold

- Test configuration



4.1.2 Limit

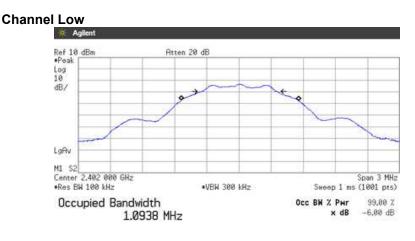
The minimum permissible 6dB bandwidth is 500kHz.

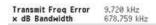
4.1.3 Measurement result

Date Temperature	:	29-January-2019 21.5 [°C]			
Humidity Test place	:	30.0 [%] Shielded room No.4	Test engineer	:	Taiki Watanabe

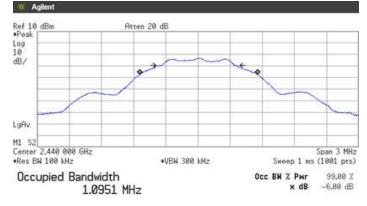
Channel	Frequency [MHz]	6 dB bandwidth [MHz]
Low	2402	0.679
Middle	2440	0.682
High	2480	0.677

4.1.4 Trace data



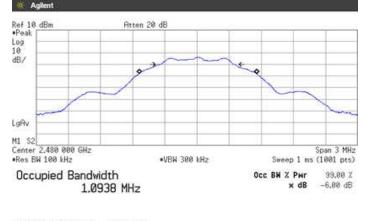


Channel Middle



Transmit Freq Error	8.644 kHz
x dB Bandwidth	682.279 kHz

Channel High



Transmit Freq Error 8,809 kHz x dB Bandwidth 677,344 kHz





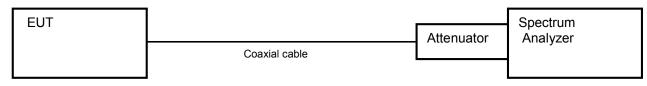
4.2 Maximum Peak Output Power

4.2.1 Measurement procedure

[FCC 15.247(b)(3), KDB558074 D01 v05]

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



4.2.2 Limit

1 W(1000 mW) or less

4.2.3 Measurement result

Date	:	24-January-2019			
Temperature	:	24.5 [°C]			
Humidity	:	35.6 [%]	Test engineer	:	
Test place	:	Shielded room No.4	-		Taiki Watanabe

Battery Full

Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Peak Output Power (mW)	Limit (mW)	Result
Low	2402	-12.83	10.48	-2.35	0.582	≦1000	PASS
Middle	2440	-12.83	10.48	-2.35	0.582	≦1000	PASS
High	2480	-12.78	10.48	-2.30	0.589	≦1000	PASS

Calculation;

Reading (dBm) + Factor (dB) = Level (dBm) 10logP = Level (dBm) P = 10^(Maximum Peak Output Power / 10) (mW)



4.3 Band Edge Compliance of RF Conducted Emissions

4.3.1 Measurement procedure

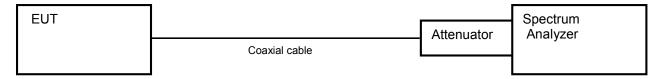
[FCC 15.247(d), KDB558074 D01 v05]

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 = 100 kHz
- c) VBW ≥ 3 x RBW
- d) Sweep time = auto-couple
- e) Detector = peak
- f) Trace mode = max hold

- Test configuration



4.3.2 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.

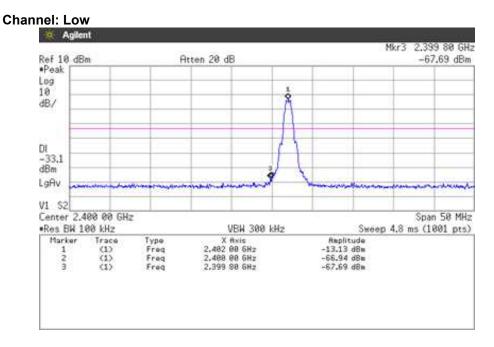
4.3.3 Measurement result

Date	: 29-January-2019			
Temperature	: 21.5 [°C]			
Humidity	: 30.0 [%]	Test engineer	:	
Test place	: Shielded room No.4	_		Taiki Watanabe
-				

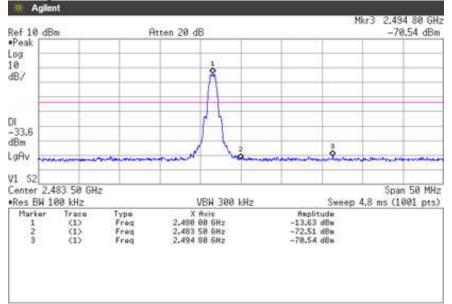
Channel	Frequency (MHz)	RF Power Level (dBm)	Band-edge Frequency (MHz)	Band-edge Level (dBm)	Difference Level (dBm)	Limit (dBm)	Result
Low	2402	-13.13	2399.80	-67.69	54.56	At least 20dB below from peak of RF	PASS
High	2480	-13.63	2494.80	-70.54	56.91	At least 20dB below from peak of RF	PASS



4.3.4 Trace data



Channel: High





4.4 Spurious emissions - Conducted -

4.4.1 Measurement procedure

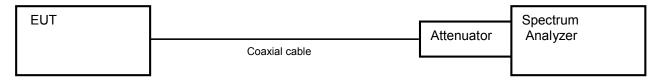
[FCC 15.247(d), KDB558074 D01 v05]

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



4.4.2 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.

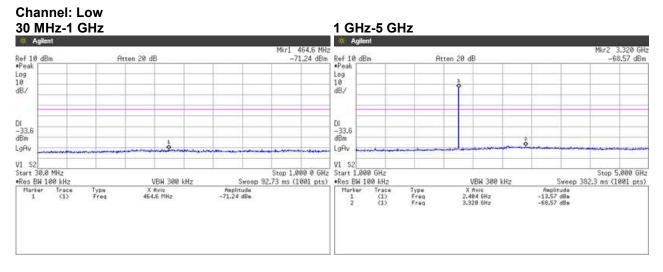
4.4.3 Measurement result

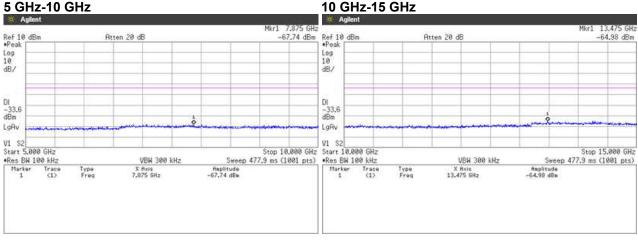
Date	:	29-January-2019			
Temperature	:	21.5 [°C]			
Humidity	:	30.0 [%]	Test engineer	:	
Test place	:	Shielded room No.4			Taiki Watanabe

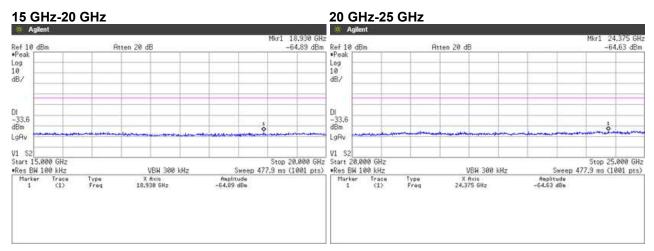
Channel	Frequency [MHz]	Limit [dB]	Results Chart	Result
Low	2402	At least 20dB below from peak of RF	See the trace Data	PASS
Middle	2440	At least 20dB below from peak of RF	See the trace Data	PASS
High	2480	At least 20dB below from peak of RF	See the trace Data	PASS



4.4.4 Trace data



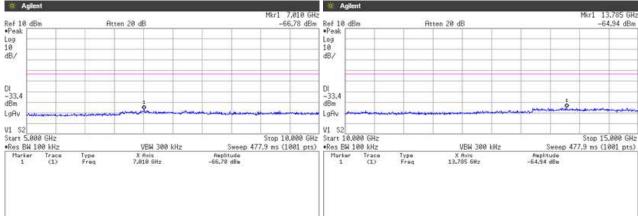


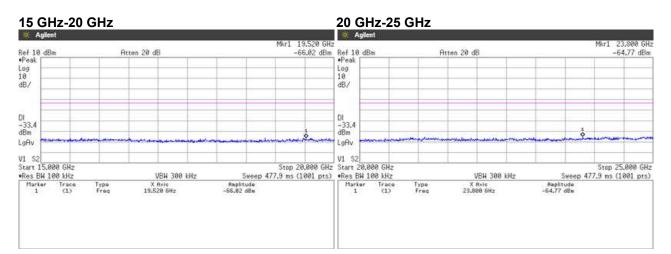


1 GHz-5 GHz 30 MHz-1 GHz Agilent * A Mkr1 541.2 MHz -70.91 dBm Ref 10 dBm *Peak Log 10 dB/ Atten 20 dB Ref 10 dBm *Peak Log 10 dB/ DI -33.4 dBm DI -33.4 dBm

LgAv LgAv VI S2 Stop 1.000 0 GHz Start 1.000 GHz Sweep 92.73 ms (1001 pts) •Res BW 100 kHz Itude 1.05m 1 GHz 1.000 GHz •Res BW 100 kHz Marker Trace 1.010 1 GHz 1.000 0 GHz •Res BW 100 kHz • V1 S2 Start 30.0 MHz Stop 5.008 GHz *Res BW 100 kHz Marker Trace 1 (1) Sweep 382.3 ms (1001 pts) VBW 300 kHz VBW 300 kHz Type Freq Raplitude -78.91 dBa X Axis 541.2 MHz Type Freq Freq Replitude -13.37 dBe -68.46 dBe X Rxis 2,448 6Hz 3,436 6Hz 5 GHz-10 GHz 10 GHz-15 GHz

Atten 20 dB



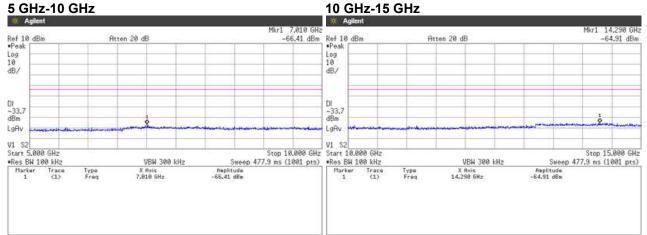


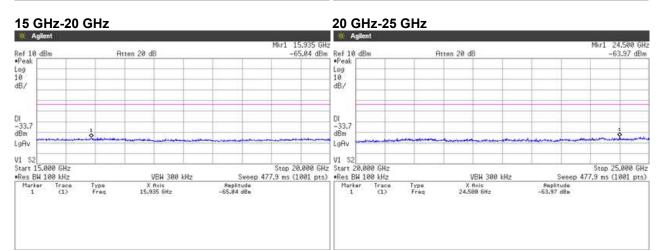
Channel: Middle

SÜD Japan

Mkr2 3.436 GHz -68.46 dBm

Channel: High 1 GHz-5 GHz 30 MHz-1 GHz 🗰 Agilent * A Mkr1 372.4 MHz -70.95 dBm 4kr2 3,160 GHz -68.07 dBm Ref 10 dBm *Peak Log 10 dB/ Atten 20 dB Ref 10 dBa *Peak Atten 20 dB Log 10 dB/ Å DI -33.7 dBm DI -33.7 dBm ò LgAv LgAv Stop 1.000 0 GHz V1 S2 Stop 1.000 0 GHz Start 1.000 GHz Sweep 92.73 ms (1001 pts) *Res BW 100 kHz naplitude -70.95 dBm Trace 1 (1) 2 (1) V1 S2 Start 30.0 MHz Stop 5.008 GHz Sweep 382.3 ms (1001 pts) Replitude -13.67 dBm -68.07 dBm *Res BW 100 kHz Marker Trace 1 (1) VBW 300 kHz VBW 300 kHz Type Freq X fixis 372.4 MHz Type Freq Freq X 8xis 2.488 6Hz 3.168 6Hz









4.5 Spurious Emissions - Radiated -

4.5.1 Measurement procedure

[FCC 15.247(d), 15.205, 15.209, KDB558074 D01 v05]

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=3kHz, Span=0Hz, Sweep=auto Display mode=Linear

Average Measurement Setting [VBW]

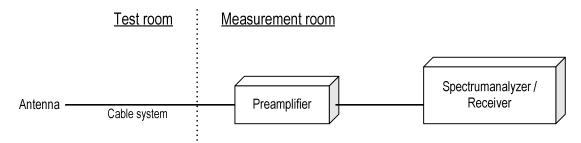
Mode	Duty Cycle (%)	T _{on} (us)	T _{off} (us)	1/T _{on} (kHz)	Determined VBW Setting
Bluetooth 4.1 LE	62.56	391	234	2.558	3kHz

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





4.5.2 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 = 39.9dBuV Cable system loss = 8.3dB Result = 39.9 + 8.3 = 48.2dBuV/m Margin = 74.0 - 48.2 = 25.8dB

4.5.3 Limit

Frequency	Field s	trength	Distance
[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.

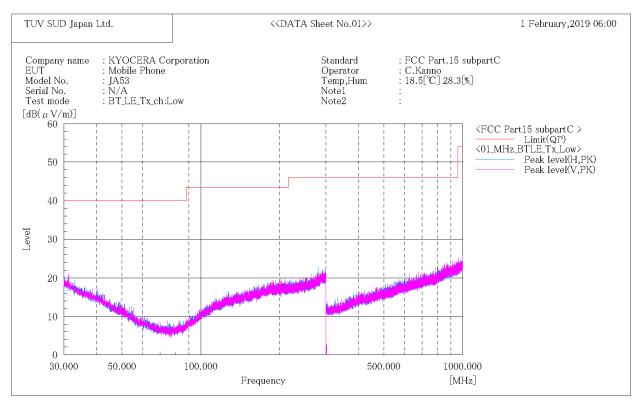


4.5.4 Test data

Date Temperature Humidity Test place	: 01-February-2019 : 18.5 [°C] : 28.3 [%] : 3m Semi-anechoic chamber	Test engineer	: Chiaki Kanno
Date Temperature Humidity Test place	: 02-February-2019 : 18.3 [°C] : 27.1 [%] : 3m Semi-anechoic chamber	Test engineer	: Chiaki Kanno



[Transmission mode - With camera] Channel: Low BELOW 1 GHz



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

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)]



Channel: Low ABOVE 1 GHz

TƯ	V SUD Japan	Ltd.		~	(CDATA	Sheet No	.02>>			1 February,2019 22:35
EU Mo Ser Tes	mpany name T del No. ial No. st mode (µV/m)]	: KYOCERA C : Mobile Phone : JA53 : N/A : BT_LE_Tx_ch	•			Standa Operat Temp,l Note1 Note2		: C.Ka	Part.15 subp nno ℃] 28.3[%]	art C
	110 100								-	FCC C_GHz_3m> Limit(PK) Limit(AV) 02_GHz_BT_LE_Tx_Low>
	80									Peak level(H,PK) Peak level(V,PK) Emission level(H,PK) Emission level(H,AV)
	70				 					
Level	60 50									
	40			 						
	30 20									
	10			 	1 1 1 1	 				
	0 1000.000	2000.	000	5 Frequei	000.000 ncy		10000	0.000	18000.00 [MHz]	0

****** 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
1	[MHz] 4804.000	Н	[dB(μV)] 49.0	[dB(μV)] 38.0	[dB(1/m)] 8.9	[dB(μV/m)] 57.9	[dB(µV/m)] 46.9	[dB(µV/m)] 74.0	[dB(μV/m)] 54.0	[dB] 16. 1	[dB] 7.1	[cm] 100. 0	[°] 253.0	

Note:

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



Channel: Middle BELOW 1 GHz

ΤU	/ SUI) Japan I	Ltd.		<<		1 February,2019 06:20					
EU Moo Seri Tes). de	: KYOCERA : Mobile Pho : JA53 : N/A : BT_LE_Tx_				Standard Operator Femp,Hur Note1 Note2		: C.K		subpartC [%]	
[ab(μ v, 60 50											art15 subpartC > - Limit(QP) z_BTLE_Tx_Mid> - Peak level(H,PK)
	40	- 1										– Peak level(V,PK)
Level	30										-	
	20	-			La cola di daila							
	10										-	
	0 30.	E	50.000	100.00				500.000)).000	
					Frequenc	y				[M	Hz]	

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

Final Result

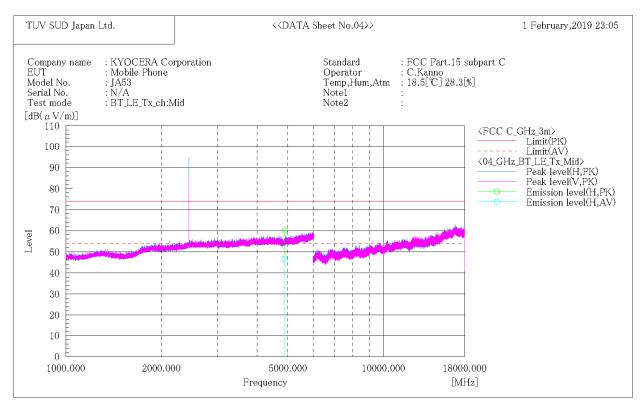
No.	Frequency	(P)	c.f	Height	Angle	Remark
	[MHz]		[dB(1/m)]	[cm]		

Note:

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



Channel: Middle ABOVE 1 GHz



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

Final Result

No.	Frequency	(P)	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin	Height	Angle	Remark
1	[MHz] 4880.000	Н	[dB(µV)] 50.9	[dB(μV)] 37.4	[dB(1/m)] 9.2				[dB(μV/m)] 54.0	[dB] 13. 9	[dB] 7.4	[cm] 100. 0	[°] 0.0	

Note:

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



Channel: High BELOW 1 GHz

TUN	V SUE) Japan I	Ltd.			<<	DATA She	eet No.0	5>>			1 February,2019 06:40
EU' Moo Seri Tes). le	: KYOCE : Mobile : JA53 : N/A : BT_LE_	Phone		n		Standard Operator Temp,Hu Note1 Note2		: FCC F : C.Kan : 18.5[°C :	no	subpartC [%]
	60 50											<pre> </pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <</pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>
I	40	-										
Level	30 20											-
	10						and a set of the set of the set of the set		inaine de la			-
	0 30.	000	50.000		100.0				500.000)).000
		000	50.000		100.0	000 Frequenc	y		500.000)] 0.000 Hz]

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

Final Result

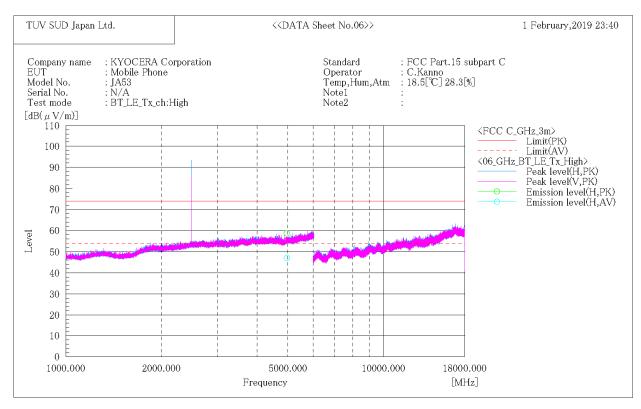
No.	Frequency	(P)	c.f	Height	Angle	Remark
	[MHz]		[dB(1/m)]	[cm]	[°]	

Note:

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



Channel: High ABOVE 1 GHz



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

Final Result

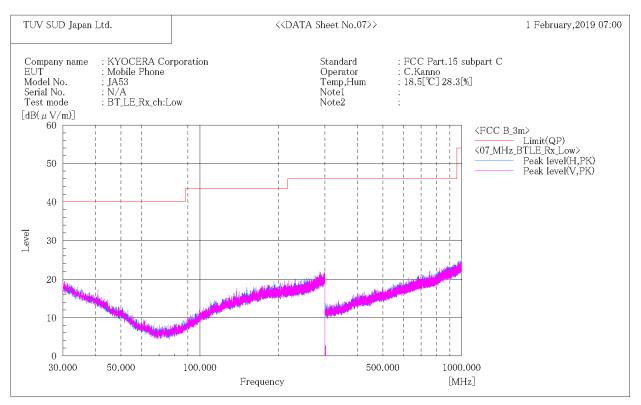
No.	Frequency	(P)	Reading PK	Reading AV	c.f	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Remark
1	[MHz] 4960.000	Н	[dB(µV)] 48.9	[dB(µV)] 37.3	[dB(1/m)] 9.8		[dB(µV/m)] 47.1		[dB(µV/m)] 54.0	[dB] 15. 3	[dB] 6. 9	[cm] 168.0	[°] 161.0	

Note:

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



[Receive mode - With camera] Channel: Low BELOW 1 GHz



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

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)]



Channel: Middle BELOW 1 GHz

TU	V SUD Japa	n Ltd.		< <data sheet<="" th=""><th>No.08>></th><th></th><th>1 February,2019 07:20</th></data>	No.08>>		1 February,2019 07:20
EU Mo Ser Tes	mpany name T del No. ial No. st mode (µV/m)]	e : KYOCERA C : Mobile Phone : JA53 : N/A : BT_LE_Rx_ch:		Stan Ope Tem Note Note	rator p,Hum e1	: FCC Part.15 subpar : C.Kanno : 18.5[°C] 28.3[%] : :	t C
							CC B_3m> Limit(QP) B_MHz_BTLE_Rx_Mid> Peak level(H,PK) Peak level(V,PK)
Level	30						
	20						
	30.000	50.000	100.000 Freq	uency	500.000	1000.000 [MHz]	

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

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)]



Channel: High BELOW 1 GHz

TU	V SUD Japan	Ltd.		< <data she<="" th=""><th>et No.09>></th><th></th><th>1 February,2019 07:40</th></data>	et No.09>>		1 February,2019 07:40
EU Mo Ser Tes	mpany name T del No. ial No. st mode (µV/m)]	: KYOCERA Co : Mobile Phone : JA53 : N/A : BT_LE_Rx_ch:H		Or Te No	andard oerator mp,Hum te1 te2	: FCC Part.15 su : C.Kanno : 18.5[℃] 28.3[% : :	ıbpart C]
							<pre> </pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pre> <pr< td=""></pr<></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre></pre>
Level	30	 					
	20						
	30.000	50.000	100.000 Freque	ency	500.00	0 1000.0 [MH:	

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

Final Result

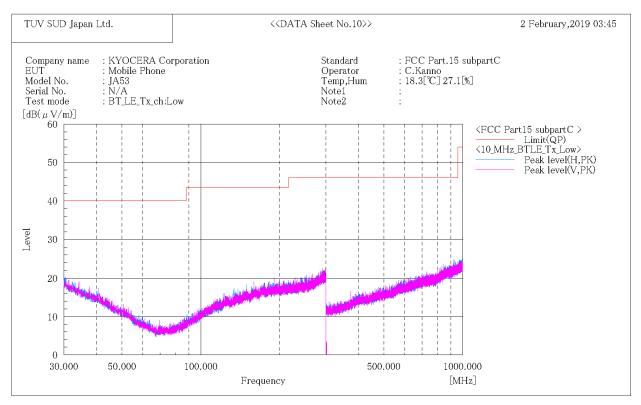
No.	Frequency	(P)	c.f	Height	Angle	Remark
	[MHz]		[dB(1/m)]	[cm]	[°]	

Note:

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



[Transmit mode - Without camera] Channel: Low BELOW 1 GHz



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

Final Result

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

Note:

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



Channel: Low ABOVE 1 GHz

TU	V SUD Japa	n Ltd.		< <d>ATA SI</d>	heet No.11>>		2 February,2019 01:00
EU Mo Ser Tes	mpany name T del No. ial No. st mode (µV/m)]	e : KYOCERA Co : Mobile Phone : JA53 : N/A : BT_LE_Tx_ch:			Standard Operator Temp,Hum,Atm Note1 Note2	: FCC Part.15 subpa : C.Kanno : 18.3[°C] 27.1[%] : :	urt C
Lab	110 F	1				<pre><f< pre=""></f<></pre>	CC C_GHz_3m>
	100	 					Limit(PK) Limit(AV)
	90	 				<1	1_GHz_BT_LE_Tx_Low> Peak level(H,PK)
	80	 					─────────────────────────────────────
	70	 					Emission level(H,AV)
	60	1					
Level			and the second data and the se			siles the show of the state	
	50 -			i ol 🖡			
	40	 					
	30						
	20						
	10	 					
	0 Ē						
	1000.000	2000.0		5000.000	10000.0		
			Fr	equency		[MHz]	

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

Final Result

No.	Frequency	(P)	Reading	Reading	c.f	Result	Result	Limit	Limit		Margin	Height	Angle	Remark
	[MHz]		PK PK	AV LUD (V)]	[JD (1 ()]	PK	AV	PK	ΑV [dB(μV/m)]	PK [dB]	AV [dB]	[cm]	го п	
1	4804.000	Н	48.7	37.4	[db(1/m)] 8.9	[αΒ(μν/m/] 57.6	46.3	[αΔ(μ v/m)] 74.0	54.0	16.4	[@b] 7.7	156.0	168.0	

Note:

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



Channel: Middle BELOW 1 GHz

TUV SUD Japan I	.td.			2 February,2019 04:00		
Company name EUT Model No. Serial No. Test mode [dB(μ V/m)]	: KYOCERA Co. : Mobile Phone : JA53 : N/A : BT_LE_Tx_ch:N		Standa Opera Temp, Note1 Note2	rd : : tor : Hum :	FCC Part.15 subpartC C.Kanno 18.3[℃] 27.1[%]	
60 50						Part15 subpartC > — Limit(QP) Hz_BTLE_Tx_Mid> — Peak level(H,PK) — Peak level(V,PK)
40						
10		and the state of the				
0 30.000	50.000	 100.000 Freque		500.000	1000.000 [MHz]	

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

Final Result

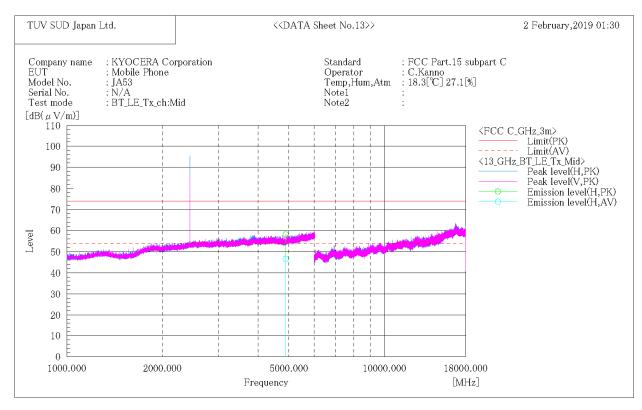
No.	Frequency	(P)	c.f	Height	Angle	Remark
	[MHz]		[dB(1/m)]	[cm]		

Note:

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



Channel: Middle ABOVE 1 GHz



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

Final Result

No.	Frequency	(P)	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin	Height	Angle	Remark
1	[MHz] 4880.000	Н	PK [dB(μV)] 49.0	ΑV [dB(μV)] 37.4	[dB(1/m)] 9.2	PK [dB(μV/m)] 58.2	AV [dB(μV/m)] 46.6	[dB(μV/m)] 74.0	ΑV [dB(μV/m)] 54.0	PK [dB] 15.8	AV [dB] 7.4	[cm] 154. 0	[°] 163.0	

Note:

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



Channel: High BELOW 1 GHz

TUV SUD Jap	an Ltd.		< <data n<="" sheet="" th=""><th>o.14>></th><th></th><th>2 February,2019 04:20</th></data>	o.14>>		2 February,2019 04:20
Company nam EUT Model No. Serial No. Test mode [dB(µ V/m)]	e : KYOCERA C : Mobile Phone : JA53 : N/A : BT_LE_Tx_ch		Stand Opera Temp Note1 Note2	tor : ,Hum :	FCC Part.15 subpa C.Kanno 18.3[℃] 27.1[%]	rtC
50 40						CC Part15 subpartC > Limit(QP) 4_MHz_BTLE_Tx_High> Peak level(H,PK) Peak level(V,PK)
Tevel 1						
20						
0 30.000	50.000	100.000 Frequ	encv	500.000	1000.000 [MHz]	

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

Final Result

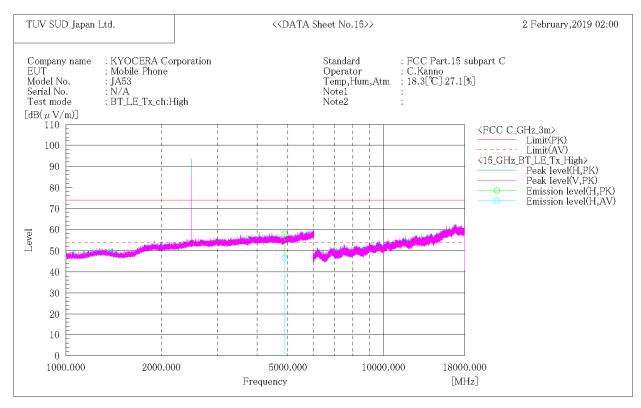
No.	Frequency	(P)	c.f	Height	Angle	Remark
	[MHz]		[dB(1/m)]	[cm]	[°]	

Note:

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



Channel: High ABOVE 1 GHz



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

Final Result

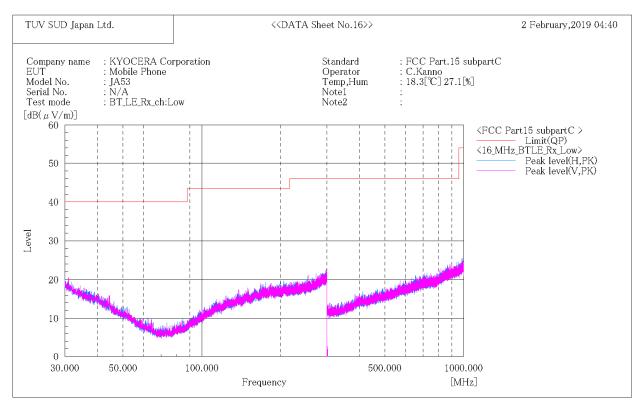
No.	Frequency	(P)	Reading PK	Reading AV	c.f	Result PK	Result AV	Limit PK	Limit AV	Margin PK	Margin AV	Height	Angle	Remark
1	[MHz] 4880.000	Н	[dB(µV)] 48.8	[dB(µV)] 37.4	[dB(1/m)] 9.2	[dB(µV/m)] 58.0	[dB(µV/m)] 46.6	[dB(µV/m)] 74.0	[dB(µV/m)] 54.0	[dB] 16. 0	[dB] 7.4	[cm] 192. 0	[°] 163.0	

Note:

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



[Receive mode - Without camera] Channel: Low BELOW 1 GHz



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

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)]



Channel: Middle BELOW 1 GHz

TUV SUD Japan Ltd.			Ltd.		< <d>ATA S</d>		2 February,2019 05:00		
EU1 Moc Seri Tes		le	: KYOCERA : Mobile Phor : JA53 : N/A : BT_LE_Rx_c	ne		Standard Operator Temp,Hum Note1 Note2	: H : C : 1 :	FCC Part.15 subpart(C.Kanno 88.3[°C] 27.1[%]	2
[UD($\mu \sqrt{60}$ 50 40								C Part15 subpartC > Limit(QP) MHz_BTLE_Rx_Mid> Peak level(H,PK) Peak level(V,PK)
Level	30	-							
	20					ulu uluuluulululu			
	10	-							
	0 30.	000	50.000	100.000	Frequency	5	00.000	1000.000 [MHz]	

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

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)]



Channel: High BELOW 1 GHz

TUV	/ SUD Japar	ı Ltd.		< <data she<="" th=""><th>eet No.18>></th><th></th><th></th><th>2 February,2019 05:20</th></data>	eet No.18>>			2 February,2019 05:20
EUT Mod Seria Test	npany name Γ lel No. al No. t mode μ V/m)]	: KYOCERA (: Mobile Phone : JA53 : N/A : BT_LE_Rx_ch	3		Standard Operator Temp,Hum Note1 Note2	: FCC : C.Kan : 18.3[% :	Part.15 subpar no C] 27.1[%]	τC
2	60 50 40							CC Part15 subpartC > Limit(QP) B_MHz_BTLE Rx_High> Peak level(H,PK) Peak level(V,PK)
Level	30							
	20							
	10	50,000	100.000		500	.000	1000.000	
	00.000	00.000		quency	000	••••	[MHz]	

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

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 and 1GHz to 25GHz at the 3 meters distance.



4.6 Restricted Band of Operation

4.6.1 Measurement procedure

[FCC 15.247(d), 15.205, 15.209, KDB558074 D01 v05]

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=3kHz, Span=Arbitrary setting, Sweep=auto Display mode=Linear

Average Measurement Setting [VBW]

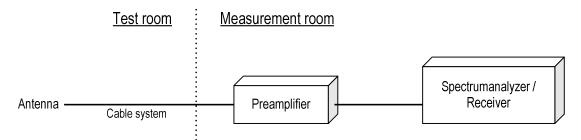
Mode	Duty Cycle (%)	T _{on} (us)	T _{off} (us)	1/T _{on} (kHz)	Determined VBW Setting
Bluetooth 4.1 LE	62.56	391	234	2.558	3kHz

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





4.6.2 Limit

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

4.6.3 Measurement result

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

4.6.4 Test data

Date	:	04-February-2019			
Temperature	:	19.3 [°C]			
Humidity	:	32.1 [%]	Test engineer	:	
Test place	:	3m Semi-anechoic chamber			Chiaki Kanno



[With camera] Channel: Low Horizontal Peak

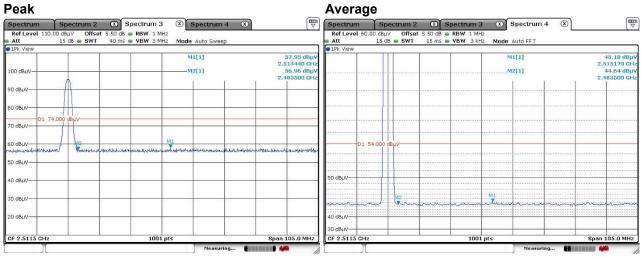
Peak				_	Averag	je				
Spectrum Spectrum 2	Spectrum 3	Spectrum 4	3		Spectrum	Spectrum 2	Spectrum 3	Spectrum 4	×	("
	t 5.10 dB 👄 RBW 1 MHz				Ref Level 60		5.10 dB 👄 RBW 1 MHz			
Att 15 dB 🖷 SWT	40 ms 🖷 VBW 3 MHz	Mode Auto Sweep			Att	15 dB 🐵 SWT	15 ms 🖷 VBW 3 kHz	Mode Auto FFT		
1Pk View					⊜1Pk View					
		M1[1]		57.77 dBµV 2.361940 GHz				M1[1]		44.47 dBµV 2.886000 GH:
100 dBuV		-M2[1]		55.13 dBµV				M2[1]		43.99 dBµ
		a constant	. 1	2.390000 GHz						2.390000 GH
90 dBuV										
				1				Declement of the book of the second of the	100000000 5 A 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5 4 5	
80 dBuV										
D1 74.000 dBuV										
70 dBuV										
60 dBµV	M			1	D1	54.000 dBµV				
and a strange of the second second and the later	port adara marile son line	ال/) المعمولة المياسي المعاولة المحاولة المعادية المعادية المعارفة المعارفة المعادة المعادية المعادية المعادية المعا	Enderlynd	machinestimes						
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oo										
40 dBµV-					50 dBµV					
10 0001										
30 dBuV-									41-m2	- f f
30.000					hann		and and a second	Manan manan	X man	w harm
20 dBuV					40 dBuV					
20 0000					40 00010					
					30 dBµV					
CF 2.3625 GHz	1001 pts		Spa	n 105.0 MHz	CF 2.3625 GH	Iz	1001 p	ts		Span 105.0 MHz

Vertical Book

Peak Average ₽ Spectrum Ref Level 110.00 Att 1Pk View Spectrum Spectrum 3 Spectrum 4 Spectrum 4 Ref Level 60.00 dbµ/ Offset 5.10 db = RBW 1 MHz Att 15 db = SWT 15 ms = VBW 3 kHz Mode Auto FFT Spectrum 2 Spectrum 3 Spectrum 4 Spectru Att 1Pk Viev 58.06 dBµ 2.324390 GH 56.35 dBµ 2.390000 GH M1[1] M1[1] 44.88 dBμV .339320 GHz 44.02 dBμV .390000 GHz 100 dBµV M2[1] M2[1] 90 dBµV 80 dBµV 1 74.000 70 dBµV MI 60 dBµV-1 54.000 Number unload south Hereb 50 dBµV-50 dBµV 40 dBuV MI 30 dBuV M2 40 dBµV-20 dBuV 30 dBµV-105.0 MHz 1001 pts Span 105.0 MHz CF 2.3625 1001 pt Span CF 2.3625 GHz Measuring... **CO**LCON. leasuring



Channel: High Horizontal

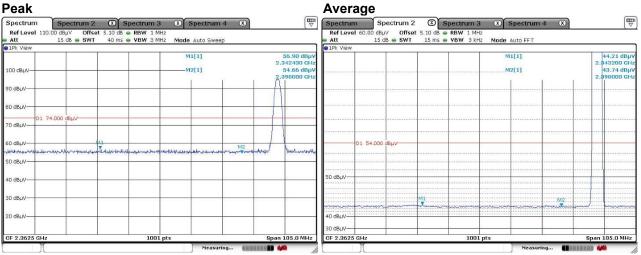


Vertical

	~					Avera						NO 1131 O 114 A 114 A 114			(m
Spectrum	Spectrum 2	Spectrum 3	7	x		Spectrun		pectrum		pectrum 3		Spectrum	4 ເ⊗		(U
Ref Level 110		5.50 dB 👄 RBW 1 MH				Ref Level			et 5.50 dB 👄						
Att	15 dB 🛑 SWT	40 ms 👜 VBW 3 MH	z Mode Auto Sweep			att	15	dB 💩 SWT	15 ms 🖷	VBW 3 kHz	Mode	Auto FFT			
1Pk View			M1[1]		57.74 dBµV	😁 1Pk View					M	1[1]			44.87 dBp
					2.507620 GHz										53350 GH
100 dBµV			-M2[1]		56.08 dBµV 2.483500 GHz	20000000000		• • • • • • • • • • • •			M	2[1]			44.20 dBp
				1	2.100000 0112								f	1	
90 dBµV				-											
io dBµV				÷	a a										
	4.000 dBµV														
70 dBµV															
io dBuV		MI													
house function by a low	the Westerheiter	ahikali salas anatu sula pata	مهاد والمعادية والمراجعة والمراجعة والمحادثة والمعادية والمعادية والمحادثة	and bulle then	and a strange to the second		D1 54.00						5.4		
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IO dBuV				_		50 dBµV									
U UBUV															
IO dBuV															1
o oppi						manne	mand	lim	munman	mann		min	m	min	man
O dBuV						40 dBuV									
0 000														1	
						30 dBµV									
CF 2.5115 GHz	1	1001	pts	S	pan 105.0 MHz	CF 2.5115	GHz	0.0	0.46	1001	pts			Span	105.0 MHz



[Without camera] Channel: Low Horizontal Peak

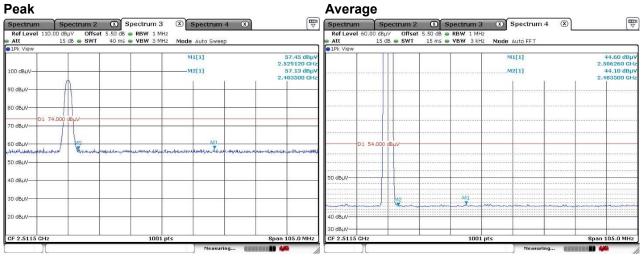


Vertical

Spectrum	10.0	Spectrum 3		4 ×		₩ ₩	Avera		Spectrum 2	× :		SD SD		4 x		The second secon
	Spectrum 2		Spectrum	4 🗴				12		1000	Spectrum 3		ectrum	4 🗴		7
Ref Level 110.	15 dB SWT	5.10 dB • RBW 1 MHz 40 ms • VBW 3 MHz		16			Ref Level		dBµV Offset .5 dB ● SWT		RBW 1 MH VBW 3 kH		1.1.1			
Att 1Pk View	15 08 🖷 SWI	40 ms 🖷 VBW 3 MHz	Mode Auto Swee	p			Att IPk View	1	5 08 🥌 SWI	15 ms e	VBW 3KH	z Mode Au	to FFT			
	1 1		M1[1]			56.68 dBµ¥					1	M1[11		- 1	44.15 dBu
			and all all all all all all all all all al		2	.387120 GHz						- ALL	~1		5	2.838060 GH
00 dBµV			-M2[1]			55.04 dBµV						M2[1]			43.52 dB
				C .	2	.390000 GHz						1		6	2	2.890000 GH
90 dBµV					-	-										
					1	1										
IO dBuV																
	1100 C 11															
0 dBuV-01 7	+.000 dBµV					1										
o dopr																
so dBuV				NZT				D1 54.0	an dates							
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							50 dBuV									
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io dBµV				0		-			M1					M2		
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20 dBuV-							40 dBµV									
							30 dBuV			-				2	-	-
CF 2.3625 GHz		1001 pt			0	n 105.0 MHz	CF 2.3625	014-			1001	ut -			0.00	n 105.0 MHz
JF 2.3025 GHZ		1001 pt	.5		spa		CF 2.3625	GHZ			1001	pre	Measuri		spa	A 105.0 MH2



Channel: High Horizontal



Vertical

		Averag		~~~~		
ctrum 🎽 Spectrum 2 🕱 Spectrum 3 🛞 Spectrum 4 🛞		Spectrum	Spectrum 2	Spectrum 3	🛪 Spectrum 4 🛛 🗷	
Level 110.00 dBµV Offset 5.50 dB 👄 RBW 1 MHz		Ref Level 60		5.50 dB 👄 RBW 1 MHz		
15 dB 🥌 SWT 40 ms 🖷 VBW 3 MHz Mode Auto Sweep		Att	15 dB 🥌 SWT	15 ms 🖷 VBW 3 kHz	Mode Auto FFT	
View		e 1Pk View	111			
	57.42 dBµV 488000 GHz				M1[1]	45.06 dBµ 2,552510 GH
	56.15 dBuV				M2[1]	44.05 dBL
	483500 GHz	0.0000000000000000000000000000000000000				2.483500 GH
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μν		40 dBµV				****
		30 dBuV				
.5115 GHz 1001 pts Span	105.0 MHz	CF 2.5115 GH	et	1001	nte	Span 105.0 MHz



4.7 Transmitter Power Spectral Density

4.7.1 Measurement procedure

[FCC 15.247(e), KDB558074 D01 v05]

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

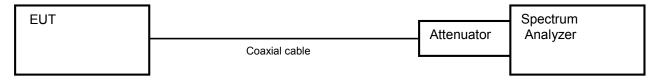
The spectrum analyzer is set to;

- a) Span = 1.5 times the 6 dB bandwidth.
- b) RBW = 3kHz 100kHz.
- c) VBW \geq 3 x RBW.

d) Sweep time = auto-couple.

- e) Detector = peak.
- f) Trace mode = max hold.

- Test configuration



4.7.2 Limit

The peak power spectral density shall not be greater than 8dBm in any 3kHz band.

4.7.3 Measurement result

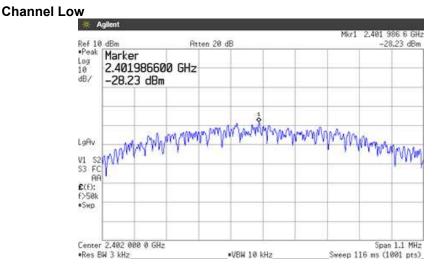
Date	:	29-January-2019			
Temperature	:	21.5 [°C]			
Humidity	:	30.0 [%]	Test engineer	:	
Test place	:	Shielded room No.4			Taiki Watanabe

Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dBm)	Result
Low	2402	-28.23	10.48	-17.75	8.00	25.75	PASS
Middle	2440	-28.19	10.48	-17.71	8.00	25.71	PASS
High	2480	-28.75	10.48	-18.27	8.00	26.27	PASS

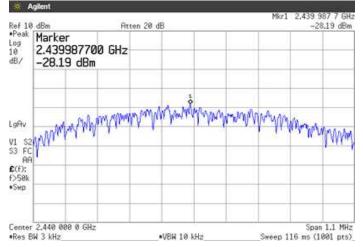
Calculation;

Transmitter Power Spectral Density Level (Margin) = Limit – (Reading + Factor)

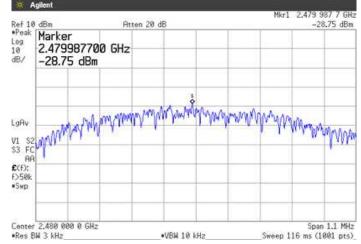
4.7.4 Trace data



Channel Middle



Channel High



Japan



4.8 AC Power Line Conducted Emissions

4.8.1 Measurement procedure

[FCC 15.207]

Test was applied by following conditions.

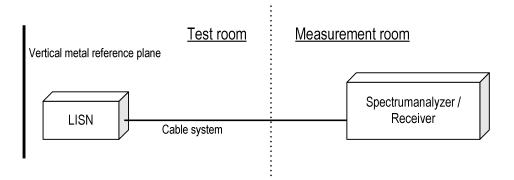
Test method Frequency range Test place EUT was placed on Vertical Metal Reference Plane Test receiver setting	:	ANSI C63.10 0.15 MHz to 30 MHz 3 m Semi-anechoic chamber FRP table / (W)2.0 m × (D)1.0 m × (H)0.8 m (W)2.0 m × (H)2.0 m 0.4 m away from EUT
- Detector	:	Quasi-peak, Average
- Bandwidth	:	9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





4.8.2 Calculation method

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

Example:

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

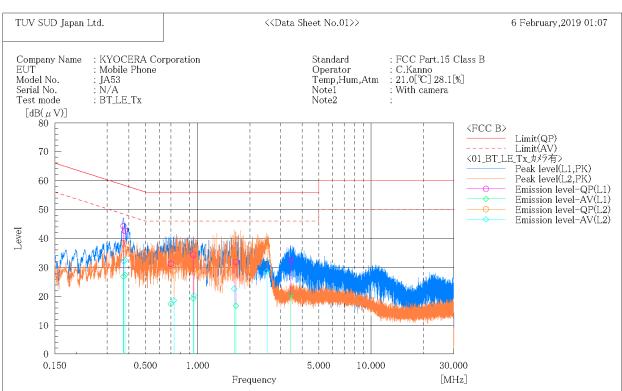
4.8.3 Limit

Frequency	Lir	nit
[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.

4.8.4 Test data

[With camera]



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

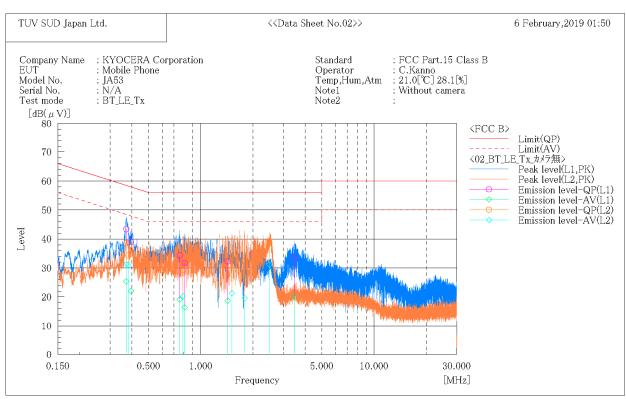
Final Result

	L1 Phase	_								
No.	Frequency	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin
		QP	AV		QP	AV	QP	AV	QP	AV
	[MHz]	$[dB(\mu V)]$	[dB(µV)]	[dB]	[dB(µV)]	[dB(μV)]	[dB(μV)]	[dB(µV)]	[dB]	[dB]
1	0.373	34.0	16.6	10.3	44.3	26.9	58.4	48.4	14.1	21.5
2	0.381	32.3	17.2	10.3	42.6	27.5	58.3	48.3	15.7	20.8
3	0.699	21.0	7.1	10.3	31.3	17.4	56.0	46.0	24.7	28.6
4 5	0.943	24.1	9.0	10.3	34.4	19.3	56.0	46.0	21.6	26.7
	1.661	21.5	6.4	10.4	31.9	16.8	56.0	46.0	24.1	29.2
6	3.443	22.1	10.0	10.5	32.6	20.5	56.0	46.0	23.4	25.5
	L2 Phase	_								
No.	Frequency	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin
		QP	AV		QP	AV	QP	AV	QĔ	AŬ
	[MHz]	$[dB(\mu V)]$	[dB(µV)]	[dB]	[dB(µV)]	$[dB(\mu V)]$	[dB(μV)]	[dB(µV)]	[dB]	[dB]
1	0.374	28.0	21.8	10.3	38.3	32.1	58.4	48.4	20.1	16.3
2	0.381	26.0	22.2	10.3	36.3	32.5	58.3	48.3	22.0	15.8
3	0.729	18.7	8.4	10.3	29.0	18.7	56.0	46.0	27.0	27.3
4	0.951	19.2	10.0	10.3	29.5	20.3	56.0	46.0	26.5	25.7
5	1.625	24.3	12.3	10.4	34.7	22.7	56.0	46.0	21.3	23.3
6	2.511	27.1	18.2	10.4	37.5	28.6	56.0	46.0	18.5	17.4





[Without camera]



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

Final Result

	L1 Phase	_								
No.	Frequency	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin
		QP	AV		QP	AV	QP	AV	QP	AV
	[MHz]	$[dB(\mu V)]$	[dB(µV)]	[dB]	[dB(µV)]	[dB(µV)]	[dB(µV)]	[dB(µV)]	[dB]	[dB]
1	0.372	33.1	15.1	10.3	43.4	25.4	58.5	48.5	15.1	23.1
2	0.396	28.6	11.7	10.3	38.9	22.0	57.9	47.9	19.0	25.9
3	0.757	24.0	8.8	10.3	34.3	19.1	56.0	46.0	21.7	26.9
4	0.809	21.5	6.1	10.3	31.8	16.4	56.0	46.0	24.2	29.6
5	1.429	22.0	8.4	10.3	32.3	18.7	56.0	46.0	23.7	27.3
6	3.463	23.0	9.7	10.5	33.5	20.2	56.0	46.0	22.5	25.8
	L2 Phase	_								
No.	Frequency	Reading	Reading	c.f	Result	Result	Limit	Limit	Margin	Margin
	,	QP	AV		QP	AV	QP	AV	QP	AV
	[MHz]	$[dB(\mu V)]$	[dB(µV)]	[dB]	[dB(µV)]	[dB(μV)]	[dB(μV)]	[dB(µV)]	[dB]	[dB]
1	0.373	28.3	21.0	10.3	38.6	31.3	58.4	48.4	19.8	17.1
2	0.382	24.0	20.8	10.3	34.3	31.1	58.2	48.2	23.9	17.1
3	0.791	19.0	10.0	10.3	29.3	20.3	56.0	46.0	26.7	25.7
4	1.513	23.0	11.0	10.3	33. 3	21.3	56.0	46.0	22.7	24.7
5	1.795	22.0	9.2	10.4	32.4	19.6	56.0	46.0	23.6	26.4
6	2.493	28.2	20.7	10.4	38.6	31.1	56.0	46.0	17.4	14.9



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 100 028-0011 determining compliance or non-compliance with test result.

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



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

NVLAP LAB CODE: 200306-0

VLAC Accreditation No.: VLAC-013

BSMI

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

Innovation, Science and Economic Development Canada

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

VCCI Council

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



Appendix A. Test Equipment

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	31-Jul-2019	02-Jul-2018
Attenuator	Weinschel	56-10	J4180	31-Jul-2019	12-Jul-2018
Power meter	ROHDE&SCHWARZ	NRP2	103269	31-Aug-2019	01-Aug-2018
Power sensor	ROHDE&SCHWARZ	NRP-Z81	102467	31-Aug-2019	01-Aug-2018

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2019	20-Sep-2018
Spectrum analyzer	ROHDE&SCHWARZ	FSV40	101731	31-Dec-2019	07-Dec-2018
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	31-Oct-2019	12-Oct-2018
Preamplifier	SONOMA	310	372170	30-Sep-2019	20-Sep-2018
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	28-Feb-2019	20-Feb-2018
Attenuator	TDC	TAT-43B-06	N/A(S209)	31-Jul-2019	11-Jul-2018
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	VHA91032155	31-Aug-2019	06-Aug-2018
Log periodic antenna	Schwarzbeck	UHALP9108A	0560	31-Aug-2019	06-Aug-2018
Attenuator	TAMAGAWA.ELEC	CFA-01/6dB	N/A(S465)	31-May-2019	16-May-2018
Attenuator	TAMAGAWA.ELEC	CFA-10/3dB	N/A(S503)	31-Jul-2019	11-Jul-2018
December	TO		4000440	31-Jan-2019	18-Jan-2018
Preamplifier	TSJ	MLA-100M18-B02-40	1929118	31-Jan-2020	17-Jan-2019
Allenuelen		004 40	001017.00	31-Jan-2019	18-Jan-2018
Attenuator	AEROFLEX	26A-10	081217-08	31-Jan-2020	17-Jan-2019
Double ridged guide antenna	ETS LINDGREN	3117	00052315	31-Mar-2019	14-Mar-2018
Attenuator	Agilent Technologies	8491B	MY39268633	31-Mar-2019	14-Mar-2018
Double ridged guide antenna	A.H.Systems Inc.	SAS-574	469	31-Aug-2019	24-Aug-2018
Preamplifier	TSJ	MLA-1840-B03-35	1240332	31-Aug-2019	24-Aug-2018
Notch filter	Micro-Tronics	BRM50702	045	31-May-2019	16-May-2018
		SUCOFLEX104/9m	MY30037/4	31-Jan-2019	18-Jan-2018
				31-Jan-2020	16-Jan-2019
		SUCOFLEX104/1m	my24610/4	31-Jan-2019	18-Jan-2018
				31-Jan-2020	16-Jan-2019
		SUCOFLEX104/8m	CNLM//20024/4	31-Jan-2019	18-Jan-2018
Missesses eachie			SN MY30031/4	31-Jan-2020	16-Jan-2019
Microwave cable	HUBER+SUHNER		NN/00070/4	31-Jan-2019	18-Jan-2018
		SUCOFLEX104	MY32976/4	31-Jan-2020	16-Jan-2019
			MV40200/4	31-Jan-2019	19-Jan-2018
		SUCOFLEX104/1.5m	MY19309/4	31-Jan-2020	16-Jan-2019
			4400510	31-Jan-2019	19-Jan-2018
		SUCOFLEX104/7m	41625/6	31-Jan-2020	16-Jan-2019
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-2019	21-May-2018
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-SVSWR)	31-May-2019	22-May-2018



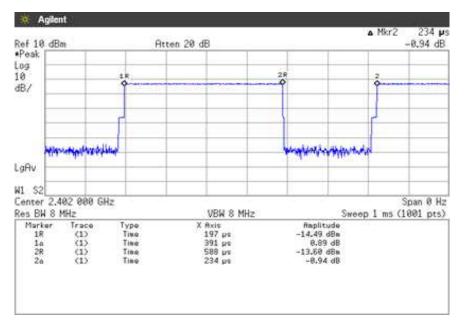
Conducted emission at mains port

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2019	20-Sep-2018
Attenuator	HUBER+SUHNER	6810.01.A	N/A (S411)	31-Jan-2020	17-Jan-2019
Line impedance stabilization network	Kyoritsu Electrical Works, Ltd.	KNW-407F	8-2003-1	28-Feb-2019	28-Feb-2018
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S350)	31-Jan-2020	16-Jan-2019
Coaxial cable	FUJIKURA	5D-2W/1m	N/A (S193)	31-Jan-2020	16-Jan-2019
Coaxial cable	HUBER+SUHNER	RG214/U/10m	N/A (S194)	31-Jan-2020	16-Jan-2019
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.

Appendix B. Duty Cycle

[Plot & Calculation]



Duty Cycle = Ton / (Ton + Toff) = 391[µs] / (391[µs] + 234[µs]) = 62.56[%]