Report on the RF Testing of:

KYOCERA Corporation

Mobile Phone, Model: EB1035

FCC ID: JOYEB1035

In accordance with FCC Part 15 Subpart C

Prepared for: KYOCERA Corporation

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Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Japan Ltd. document control rules.

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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1 Summary of Test

1.1 Modification history of the test report

Document Number	Modification History	Issue Date
JPD-TR-20030-0	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	N/A	*1
15.247(a)(1)	Carrier Frequency Separation	Conducted	N/A	*1
15.247(a)(1)(iii)	Number of Hopping Frequencies	Conducted	N/A	*1
15.247(a)(1)(iii)	Time of Occupancy (Dwell Time)	Conducted	N/A	*1
15.247(b)(1)	Maximum Peak Output Power	Conducted	N/A	*1
15.247(d)	Band Edge Compliance of RF Conducted Emissions	Conducted	N/A	*1
15.247(d)		Conducted	N/A	*1
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} Since there is no change in Module from FCC ID: JOYCB70, only the Radiated test items were performed. Please refer to the test report "JPD-TR-19186-0" of "FCC ID: JOYCB70".

1.6 Test information

None

1.7 Test set up

Table-top

1.8 Test period

1- April -2020 - 22-April -2020



2 Equipment Under Test

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 EB1035 Serial number N/A

Trade name Kyocera

Number of sample(s)

EUT condition Pre-Production

Power rating Battery: DC 3.85 V

Size (W) $71.0 \times (D) 159.0 \times (H) 8.9 \text{ mm}$

Environment Indoor and Outdoor use

Terminal limitation -20 °C to 60 °C

Hardware version DMT1

Software version V0.060MI.0020.a Firmware version Not applicable

RF Specification

Protocol Bluetooth 5.0 + 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 10.351 mW (DH5)

8.954 mW (3-DH5)

Antenna type Internal antenna

Antenna gain 0.2 dBi



2.2 Modification to the EUT

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

Modification State	ate Description of Modification Modification fitted by		Date of Modification		
Model: EB1035, 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)

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 Software
- ii) Select a Test mode

Operating frequency: Channel Low: 2402 MHz, Channel Middle: 2441 MHz, Channel High: 2480 MHz

iii) Start test mode

[Rx mode]

- i) Test program setup to the Software
- 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".

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	EB1035	N/A	JOYEB1035	EUT
2	AC Adapter	KDDI	0301PQA	N/A	N/A	*

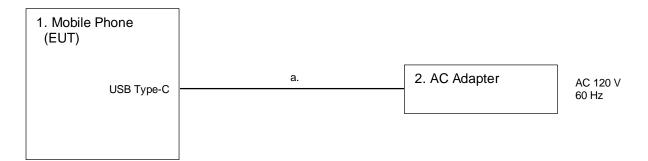
^{*:}AC power line Conducted Emission Test.

3.2 Cable(s) used

No.	Equipment	Length[m]	Shield	Connector	Comment
а	USB cable (for AC Adapter)	1.0	Yes	Metal	*

^{*:} AC power line Conducted Emission Test.

3.3 System configuration





4 Test Result

4.1 Spurious Emissions - Radiated -

4.1.1 Measurement procedure

[FCC 15.247(d), 15.205, 15.209]

Test was applied by following conditions.

Test method : ANSI C63.10 Frequency range : 9kHz to 25GHz

Test place : 3m Semi-anechoic chamber

EUT was placed on : Styrofoam table / (W)1.0m × (D)1.0m × (H)0.8m (below 1GHz)

Styrofoam table / (W)0.6m \times (D)0.6m \times (H)1.5m (above 1GHz)

Antenna distance : 3m

Test receiver setting Below 1GHz

- Detector : Average (9kHz-90kHz, 110kHz-490kHz), Quasi-peak

- Bandwidth : 200Hz, 120kHz Spectrum analyzer setting Above 1GHz

Peak
 Average
 RBW=1MHz, VBW=3MHz, Span=0Hz, Sweep=auto
 RBW=1MHz, VBW=1kHz, Span=0Hz, Sweep=auto

Display mode=Linear

Average Measurement Setting [VBW]

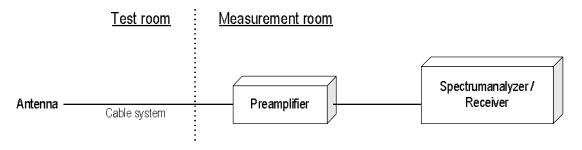
Mode	Duty Cycle (%)	T _{on} (us)	T _{off} (us)	1/T _{on} (kHz)	Determined VBW Setting
Bluetooth 5.0 EDR	76.93	2885	865	0.347	1kHz

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 0.8 m/1.5 m 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





4.1.2 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

4.1.3 Limit

Frequency	Field s	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

- 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.



4.1.4 Test data

Date 1-April-2020

Temperature 25.8 [°C] Humidity 38.5 [%]

Test engineer Test place 3m Semi-anechoic chamber Taiki Watanabe

Date 3-April-2020

Temperature 23.7 [°C]

35.6 [%] Test engineer Humidity

Test place 3m Semi-anechoic chamber Taiki Watanabe

22-April-2020 Date

24.4 [°C] 34.4 [%] Temperature

Test engineer Humidity

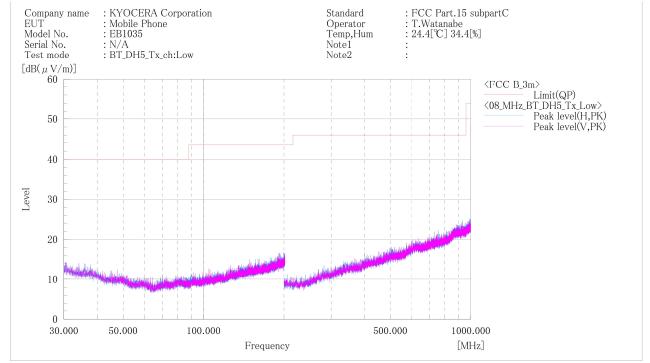
Test place 3m Semi-anechoic chamber Taiki Watanabe



[Transmission mode]

[DH5]

Channel: Low BELOW 1 GHz

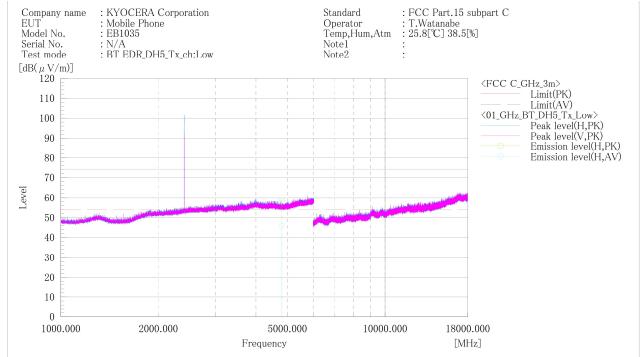


Final Result

- 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.



[DH5] Channel: Low ABOVE 1 GHz



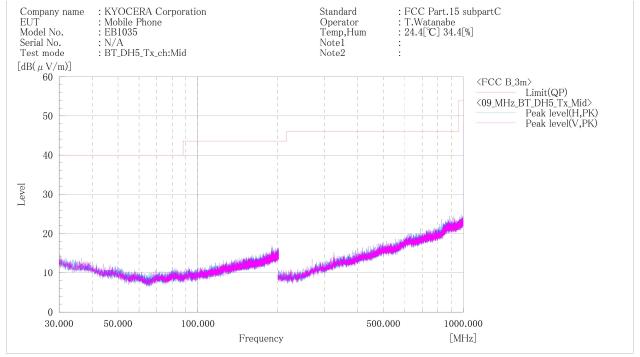


- 1. Emission Level (Margin) = Limit [Reading + Factor (Antenna + Cable Amp)]
- 2. No emission were detected in frequency range 18GHz to 25GHz at the 3 meters distance.



[DH5]

Channel: Middle BELOW 1 GHz



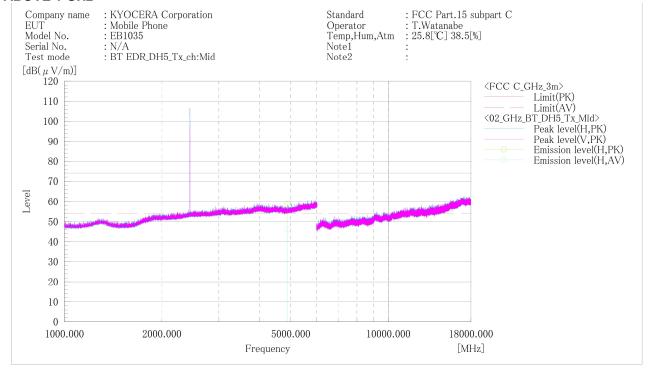
Final Result

- 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.



[DH5]

Channel: Middle ABOVE 1 GHz

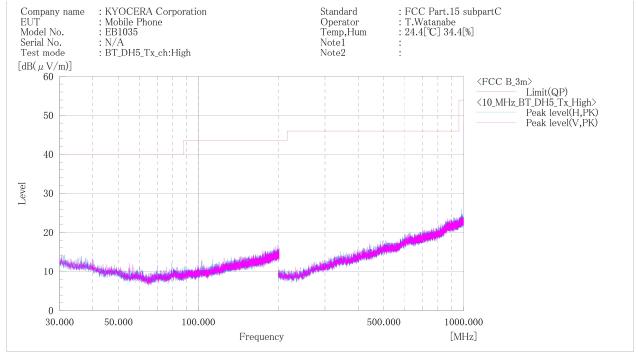




- 1. Emission Level (Margin) = Limit [Reading + Factor (Antenna + Cable Amp)]
- 2. No emission were detected in frequency range 18GHz to 25GHz at the 3 meters distance.



[DH5] Channel: High BELOW 1 GHz

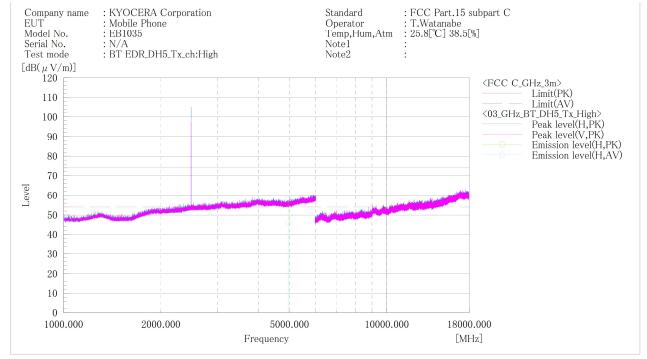


Final Result

- 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.



[DH5] Channel: High ABOVE 1 GHz

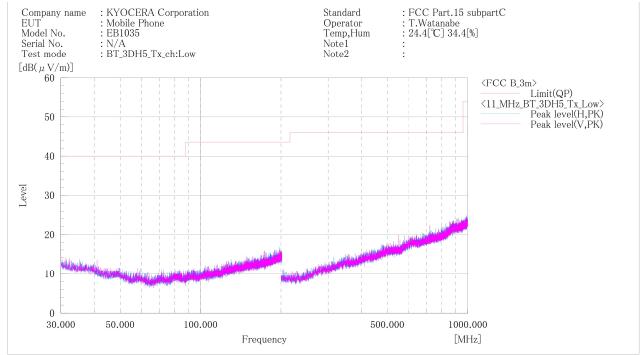




- 1. Emission Level (Margin) = Limit [Reading + Factor (Antenna + Cable Amp)]
- 2. No emission were detected in frequency range 18GHz to 25GHz at the 3 meters distance.



[3-DH5] Channel: Low BELOW 1 GHz

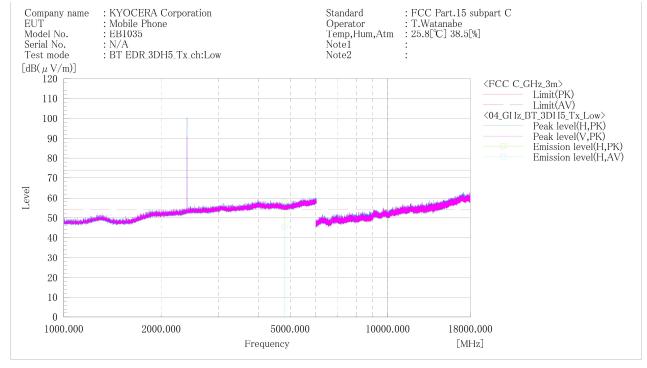


Final Result

- 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.



[3-DH5] Channel: Low ABOVE 1 GHz

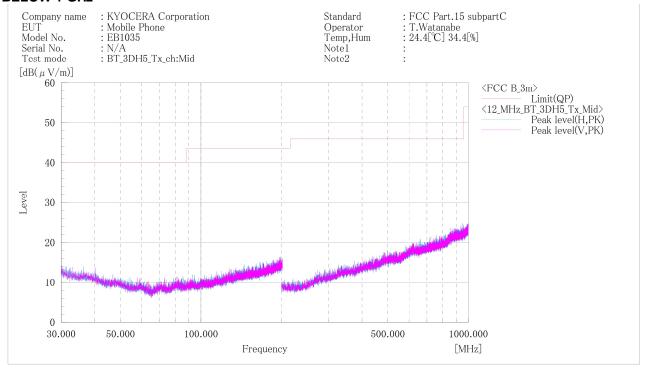




- 1. Emission Level (Margin) = Limit [Reading + Factor (Antenna + Cable Amp)]
- 2. No emission were detected in frequency range 18GHz to 25GHz at the 3 meters distance.



[3-DH5] Channel: Middle BELOW 1 GHz

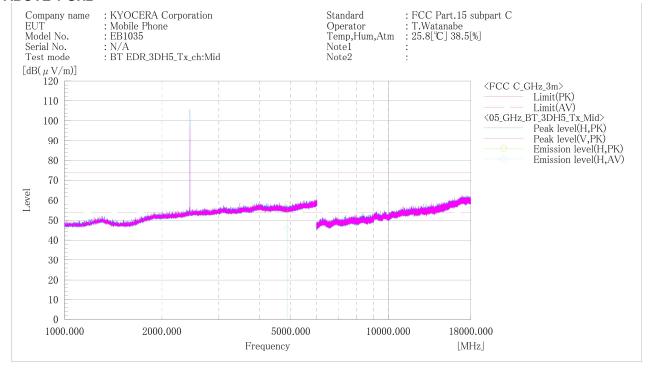


Final Result

- 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.



[3-DH5] Channel: Middle ABOVE 1 GHz

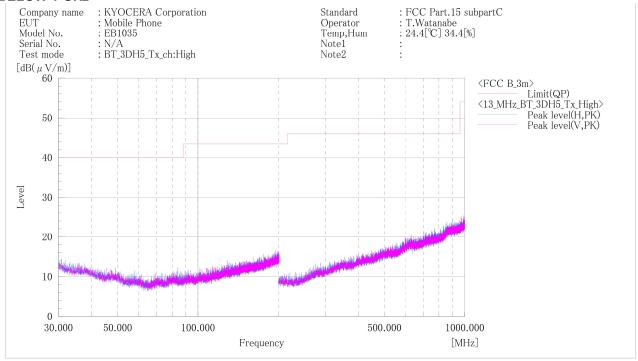




- 1. Emission Level (Margin) = Limit [Reading + Factor (Antenna + Cable Amp)]
- 2. No emission were detected in frequency range 18GHz to 25GHz at the 3 meters distance.



[3-DH5] Channel: High BELOW 1 GHz

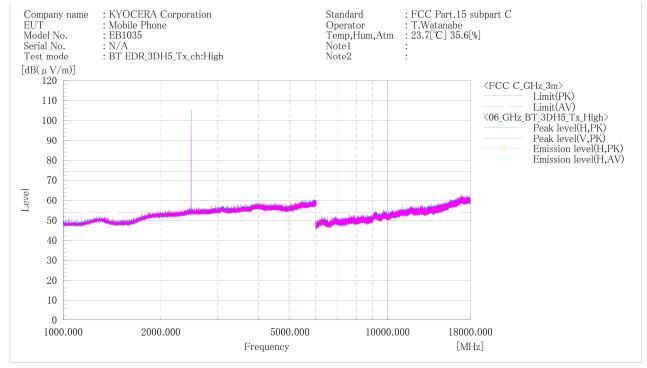


Final Result

- 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.



[3-DH5] Channel: High ABOVE 1 GHz





- 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.