

[Receive mode] Channel: Low **BELOW 1 GHz** : KYOCERA Corporation : Mobile Phone : EB1035 : FCC Part.15 subpartC : T.Watanabe : 24.4[℃] 34.4[%] Company name Standard Operator Temp,Hum EUT Model No. : N/A : BT_Rx_ch:Low Serial No. Test mode Note1 Note2 $[\mathrm{dB}(\,\mu\,\mathrm{V/m})]$ <FCC B_3m> Limit(QP) <14_MHz_BT_Rx_Low> Peak level(H,PK) Peak level(V,PK) 60 50 40 Level 30 2010 What was 0 30.000 50.000 100.000 500.000 1000.000 [MHz] Frequency

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.





Channel: Middle BELOW 1 GHz



Final Result

No.	Frequency (P) c.:		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.





Channel: High BELOW 1 GHz



Final Result

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

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.



4.2 Restricted Band of Operation

4.2.1 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 _{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 0.8m/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





4.2.2 Limit

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

4.2.3 Measurement result

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

4.2.4 Test data

Date	:	16-April-2020			
Temperature	:	25.3 [°C]			
Humidity	:	36.2 [%]	Test engineer	:	
Test place	:	3m Semi-anechoic chamber	-	_	Taiki Watanabe

[DH5] Channel: Low Horizontal Peak



Vertical Peak



Dato: 16.AF3.2020 14:23:53

Nato: 16.AF7.2020 14:23:04



[DH5] Channel: High Horizontal Peak Spectrum Spectrum 2 Spectrum 3 Spectrum 4 Spectrum 4 Ref Level 110.00 dbjv Offset 5.0 db 8 R8W 1 MHz Att 15 db 8 WT 40 ms VBW 3 MHz Node Auto Sweep M1[1] 100 dBµV



Vertical

Peak					Ave	erage			
Spectrum	Spectrum 2	Spectrum 3	Spectrum 4		Spectrum	Spectrum 2	Spectrum 3	3 🗴 Spectrum	4 🛞 🕎
Ref Level 11	0.00 dBµV Offset 6.	50 dB 🖷 RBW 1 MHz			Ref Level 60.	odapy Offset	6.50 dB 🥃 RBW 1 MF	-12	
Att	15 dB 📾 SWT 🕓	40 ms 🖷 VBW 3 MHz	Mode Auto Sweep		Att	15 dB 😑 SWT	12 s 🖝 VBW 1 kH	iz Mode Auto Sweep	
IPk View					1Pk View				
			M1[1]	59.48 dBµV 2.495820 GHz				M1[1]	44.34 dBµV 2.483600 GHz
100 dBµV	Λ		M2[1]	57.47 dBµV 2.483500 GHz				M2[1]	44.34 dBµV 2.483500 GHz
90 dBµN									
80 dBLN									
D1	74.000 dBµV								
yo abbe		11							
60 dBLN	wort Menushapant	Le same water	and when the second second second	englined in porture and an end of	D1 S	4.000 dBµV			
50 dBµN									
40 dBµV					50 dBµN				
20 db.47									
30 UBDV						m) Commun	and the state of the	and the second day and a second second	
20 dBµN					40 dBµN	*******			
Start 2.46 GHz		1001 pt	is in the second	Stop 2.565 GHz	30 dBuV		100	upts .	Stop 2.565 GHz
Ĩ	-	1001 P	Measuring	·····				Measuri	ng 🚺 🗰 🥠
Start 2.46 GHz	020 14:37:31	1001 pt	S Neasuring	Stop 2.565 GHz	Start 2.46 GHz	20 :4:35:39	100	l pts Measuri	Stop 2.565 GHz ng



[3-DH5] Channel: Low Horizontal



Vertical Peak



Jato: 16.AF3.2020 5:03:52

Date: 16.AP7.2020 14:47:45



[3-DH5] Channel: High Horizontal Peak Spectrum 2 Spectrum 3 Spectrum 4 Ref Lovel 110 00 db/Y Offset 6.55 db @ RBW 1 MH2 Att 15 db @ SWT 40 ms @ VBW 3 MH2 Node Auto Sweep IfK View MBW 3 MH2 Node Auto Sweep



Average

Vertical Peak



Dato: 16.AF3.2020 14:58:51

Nato: 16.AF3.2020 14:59:46





4.3 AC Power Line Conducted Emissions

4.3.1 Measurement procedure

[FCC 15.207]

Test was applied by following conditions.

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





4.3.2 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 $\mu\text{V}(\text{Average})$ (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

4.3.3 Limit

Frequency	Limit						
[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.



4.3.4 Test data

Date ·	20-April-2020
Temperature :	20.7 [°C]
Humidity :	25.2 [%]
Test place :	3m Semi-anechoic chamber

Test engineer

:

Kazunori Saito



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(μV)]	[dB(µV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(µV)]	[dB]	[dB]
1	0.219	30.7	17.6	10.4	41.1	28.0	62.9	52.9	21.8	24.9
2	0.318	27.1	16.3	10.4	37.5	26.7	59.8	49.8	22.3	23.1
3	0.760	25.9	12.7	10.4	36.3	23.1	56.0	46.0	19.7	22.9
4	0.870	22.8	10.8	10.4	33.2	21.2	56.0	46.0	22.8	24.8
5	1.314	27.4	14.7	10.4	37.8	25.1	56.0	46.0	18.2	20.9
6	6.150	17.7	10.4	10.8	28.5	21.2	60.0	50.0	31.5	28.8
	L2 Phase	-	D 11	2	D 1.	D 1.				
No.	Frequency	Reading	Reading	c.f	Result	Result	Limit	Limit	Marg1n	Marg1n
		QP	AV		QP	AV	QP	AV	_QP_	_AV_
	[MHz]	[dB(μV)]	[dB(µV)]	[dB]	[dB(µV)]	[dB(µV)]	[dB(µV)]	[dB(µV)]	[dB]	[dB]
1	0.217	33.8	22.7	10.4	44.2	33.1	62.9	52.9	18.7	19.8
2	0.324	31.0	19.6	10.4	41.4	30.0	59.6	49.6	18.2	19.6
3	0.655	30.7	16.2	10.4	41.1	26.6	56.0	46.0	14.9	19.4
4	0.765	31.2	16.8	10.4	41.6	27.2	56.0	46.0	14.4	18.8
5	1.210	30.5	16.8	10.4	40.9	27.2	56.0	46.0	15.1	18.8
6	5.589	30.5	18.8	10.7	41.2	29.5	60.0	50.0	18.8	20.5



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)	±3.8 dB
Conducted emission, AMN (150 kHz – 30 MHz)	±3.4 dB
Radiated emission (9kHz – 30 MHz)	±3.9 dB
Radiated emission (30 MHz – 1000 MHz)	±4.9 dB
Radiated emission (1 GHz – 6 GHz)	±4.6 dB
Radiated emission (6 GHz – 18 GHz)	±4.9 dB
Radiated emission (18 GHz – 40 GHz)	±5.8 dB
Radio Frequency	±1.4 * 10 ⁻⁸
RF power, conducted	±0.6 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 +U Case2	t value Incertainty -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.			



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

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2020	25-Sep-2019
Spectrum analyzer	Agilent Technologies	E4447A	MY46180188	31-Mar-2021	27-Mar-2020
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	30-Sep-2020	26-Sep-2019
Preamplifier	SONOMA	310	372170	30-Sep-2020	26-Sep-2019
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	892246/010	31-May-2020	21-May-2019
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	30-Apr-2021	15-Apr-2020
Biconical antenna	Schwarzbeck	VHBB9124/BBA9106	1344	31-Dec-2020	04-Dec-2019
Log periodic antenna	Schwarzbeck	VUSLP9111B	345	31-Aug-2020	27-Aug-2019
Attenuator	TAMAGAWA.ELEC	CFA-01/6dB	N/A(S465)	31-May-2020	17-May-2019
Attenuator	TAMAGAWA.ELEC	CFA-10/3dB	N/A(S503)	31-Jul-2020	17-Jul-2019
Preamplifier	TSJ	MLA-100M18-B02-40	1929118	31-Jan-2021	08-Jan-2020
Attenuator	AEROFLEX	26A-10	081217-08	31-Jan-2021	10-Jan-2020
Double ridged guide antenna	ETS LINDGREN	3117	00209352	31-Dec-2020	16-Dec-2019
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-2020	18-Dec-2019
Double ridged guide antenna	A.H.Systems Inc.	SAS-574	469	31-Aug-2020	28-Aug-2019
Preamplifier	TSJ	MLA-1840-B03-35	1240332	31-Aug-2020	28-Aug-2019
High Pass Filter	Wainwright	WHKX2.8/18G-6SS	1	31-Jul-2020	18-Jul-2019
Band rejection filter	Micro-Tronics	BRC50720	014	31-Dec-2020	18-Dec-2019
Signal generator	ROHDE&SCHWARZ	SMB100A	177525	31-Jul-2020	18-Jul-2019
RF power amplifier	R&K	CGA020M602-2633R	B40240	31-May-2020	16-May-2019
Microwave cable	HUBER+SUHNER	SUCOFELX102/2m	31648	31-Mar-2021	26-Mar-2020
Dipole antenna	Schwarzbeck	VHAP	1021	31-Aug-2020	15-Aug-2019
Dipole antenna	Schwarzbeck	UHAP	993	31-Aug-2020	15-Aug-2019
Double ridged guide antenna	ETS LINDGREN	3117	00218815	31-Dec-2020	16-Dec-2019
Wideband Radio Frequency Tester	ROHDE&SCHWARZ	CMW500	126079	30-Nov-2020	14-Nov-2019
Wideband Radio Frequency Tester	ROHDE&SCHWARZ	CMW500	116338	31-Aug-2020	27-Aug-2019
	HUBER+SUHNER	SUCOFLEX104/9m	MY30037/4	31-Jan-2021	08-Jan-2020
		SUCOFLEX104/1m	my24610/4	31-Jan-2021	08-Jan-2020
Microwaya cabla		SUCOFLEX104/8m	SN MY30031/4	31-Jan-2021	09-Jan-2020
Microwave cable		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-2020	14-May-2019
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-SVSWR)	31-May-2020	13-May-2019

Conducted emission at mains port

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	30-Sep-2020	25-Sep-2019
Attenuator	HUBER+SUHNER	6810.01.A	N/A (S411)	31-Jan-2021	08-Jan-2020
Line impedance stabilization network	Kyoritsu Electrical Works, Ltd.	TNW-407F2	12-17-110-2	31-May-2020	16-May-2019
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S350)	31-Jan-2021	08-Jan-2020
Coaxial cable	FUJIKURA	5D-2W/1m	N/A (S193)	31-Jan-2021	08-Jan-2020
Coaxial cable	HUBER+SUHNER	RG214/U/10m	N/A (S194)	31-Jan-2021	08-Jan-2020
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) = $2885[\mu s] / (2885[\mu s] + 865[\mu s]) = 76.93[\%]$