

Report on the RF Testing of:

KYOCERA Corporation
Tablet, Model: KC-T302DT
FCC ID: JOYKB18

In accordance with FCC Part15 Subpart C

Prepared for: KYOCERA Corporation
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Japan

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Document Number: JPD-TR-19089-0

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Hiroaki Suzuki	Deputy Manager of RF Group	Approved Signatory	14 JUN 2019

Signatures in this approval box have checked this document in line with the requirements 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 Part15 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-19089-0	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
15.209	Radiated Emissions	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

22-May-2019

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)	Tablet
Model number	KC-T302DT
Serial number	N/A
Trade name	Kyocera
Number of sample(s)	1
EUT condition	Pre-production
Power rating	Battery: DC3.8V
Size	Tablet (W) 180.0 × (D) 10.7 × (H) 270.0 mm
Environment	Indoor and Outdoor use
Terminal limitation	-20°C to 60°C
Hardware Version	DMT1
Software Version	V0.040JS
Firmware Version	Not applicable
RF Specification	
Frequency range	562.5kHz (Pen side) 593.75kHz (Eraser side)
Number of RF Channels	2 Channels
Modulation type/Data rate	AM/PM

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: KC-T302DT, S/N: 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]
Pen side	562.5
Eraser side	593.75

2.5 Description of test mode

Not applicable

2.6 Operating flow

- i) Pen on the tablet's display

3 Configuration of Equipment

Numbers assigned to equipment on the diagram in “3.3 System configuration” correspond to the lists 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.

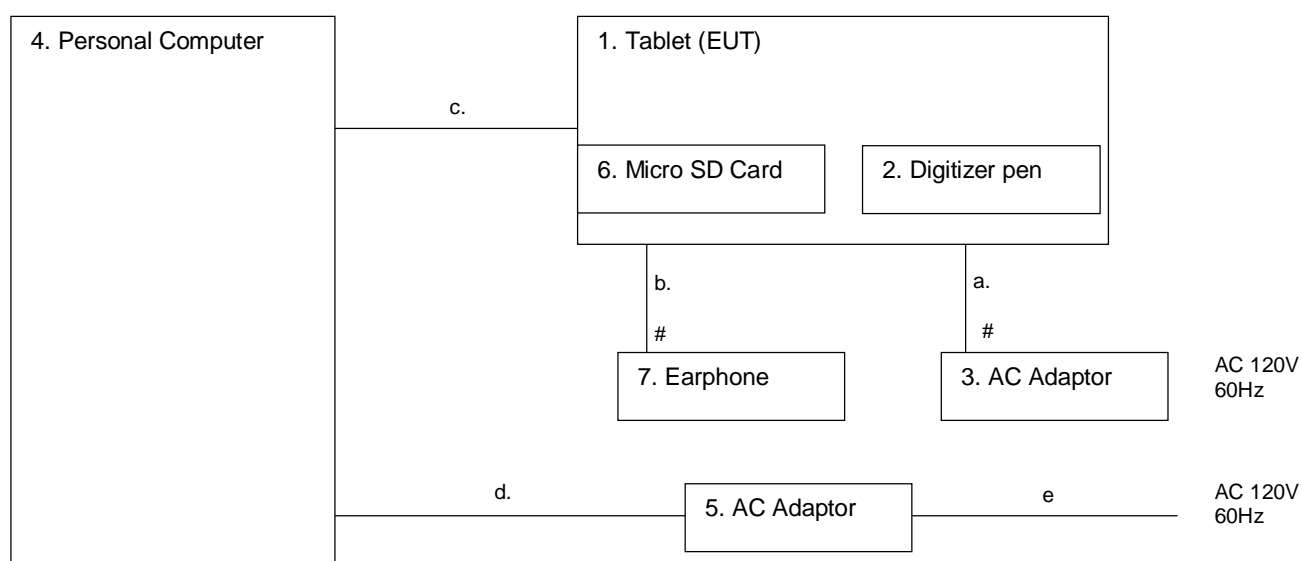
3.1 Equipment used

No.	Equipment	Company	Model No.	Serial No.	FCC ID / DoC	Comment
1	Tablet	KYOCERA	KC-T302DT	N/A	JOYKB18	EUT
2	Digitizer pen	Wacom	CP-903E-21B-2	N/A	-	Accessory
3	AC adapter	SALOM ELECTRIC(XIAMEN) CO.,LTD.	ADT301	N/A	-	Accessory
4	Personal Computer	HP	Compaq6720S	CNU8321Q6M	DoC	-
5	AC adapter	HP	PA-1650-02H	W92C401BMW6TY9	-	-
6	Micro SD Card	TOSHIBA	N/A	1729CJ72686	-	-
7	Earphone	Hosiden	HDH0281	N/A	-	-

3.2 Cable(s) used

No.	Cable	Length[m]	Shield	Connector	Comment
a	DC cable	1.2	Yes	Metal	-
b	Earphone cable	1.2	No	Metal	-
c	Micro USB cable	1.0	Yes	Metal	-
d	DC cable	1.8	No	Metal	-
e	AC cable	1.8	No	Plastic	-

3.3 System configuration



: Un-detachable cable

4 Test Result

4.1 Radiated Emissions

4.1.1 Measurement procedure

[FCC 15.209]

Test was applied by following conditions.

Test method	:	ANSI C63.10
Frequency range	:	9kHz to 30MHz
Test place	:	3m Semi-anechoic chamber
EUT was placed on	:	Styrofoam table / (W)0.6m × (D)0.6m ×(H)0.8m
Antenna distance	:	3m

Test receiver setting

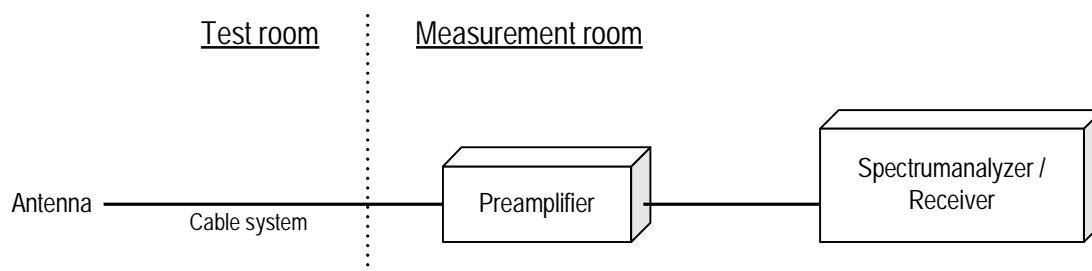
- Detector	:	Average (9kHz-90kHz, 110kHz-490kHz), Quasi-peak
- Bandwidth	:	200Hz, 120kHz

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area 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 414788.

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements up to 30MHz were performed with test receiver in above setting. The turntable and the Loop antenna are rotated by 360 degrees and stopped at azimuth of producing the maximum emission. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition.

- Test configuration



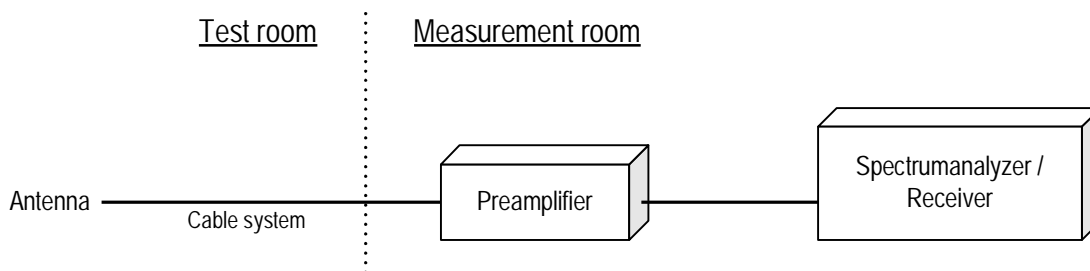
Test was applied by following conditions.

Test method : ANSI C63.10
 Frequency range : 30MHz to 1000MHz
 Test place : 3m Semi-anechoic chamber
 EUT was placed on : Styrofoam table / (W)0.6m × (D)0.6m ×(H)0.8m
 Antenna distance : 3m

Test receiver setting
 - Detector : Quasi-peak
 - Bandwidth : 120kHz

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Then, emission measurements up to 1000MHz were performed with test receiver in above setting. In order to find the maximum emissions, antenna is adjusted between 1m and 4m in height and varied its polarization (horizontal and vertical), and EUT azimuth was also varied by rotating turntable 0 to 360 degrees. Sufficient time for EUT, peripherals and test equipment is provided 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 1000MHz]

Emission level = Reading + (Ant. factor + Cable system loss – Amp. Gain)

Margin = Limit – Emission level

Example:

Limit @ 350.0MHz : 37.0dBμV/m

Reading = 41.1dBμV c.f = -11.8dB/m

Emission level = 41.1 - 11.8 = 29.3dBμV/m

Margin = 37.0 - 29.3 = 7.7dB

4.1.3 Limit

Frequency [MHz]	Field strength		Distance [m]
	[uV/m]	[dBuV/m]	
0.009-0.490	$2400 / F$ [kHz]	$20\log E$ [uV/m]	300
0.490-1.705	$24000 / F$ [kHz]	$20\log E$ [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] = $20\log$ Emission [uV/m]
3. Measurements were corrected to 300m using $40\log (3/300) = -80.0\text{dB}$
4. Measurements were corrected to 30m using $40\log (3/30) = -40.0\text{dB}$

4.1.4 Measurement result

Date : 21-May-2019

Temperature : 20.2 [°C]

Humidity : 52.7 [%]

Test place : 3m Semi-anechoic chamber

Test engineer :

Tadahiro Seino

[9kHz to 30MHz]

562.5kHz (Pen side) Output

Frequency [MHz]	Reading [dBuV] At 3m	c.f [dB(1/m)]	Result [dBuV/m] At 3m	Result [dBuV/m] At 30m	Limit [dBuV/m] At 30m	Margin [dB]	Result
0.562	46.0	-8.0	38.0	-2.0	32.6	34.6	PASS
1.125	32.5	-7.9	24.6	-15.4	26.6	42.0	PASS

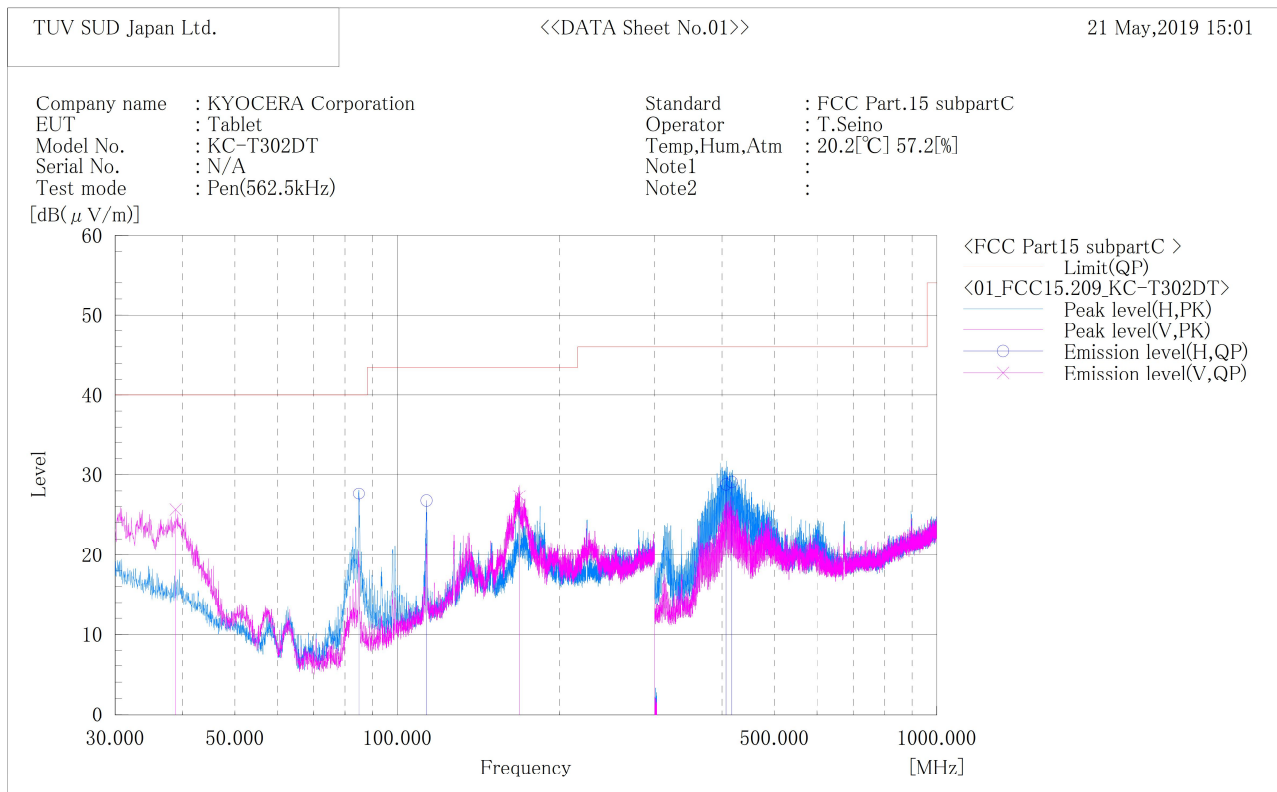
[9kHz to 30MHz]

593.75kHz (Eraser side) Output

Frequency [MHz]	Reading [dBuV] At 3m	c.f [dB(1/m)]	Result [dBuV/m] At 3m	Result [dBuV/m] At 30m	Limit [dBuV/m] At 30m	Margin [dB]	Result
0.594	46.6	-8.0	38.6	-1.6	32.1	33.7	PASS
1.188	32.4	-7.9	24.5	-15.5	26.1	41.6	PASS

[30MHz to 1000MHz]
562.5kHz (Pen side) Output

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

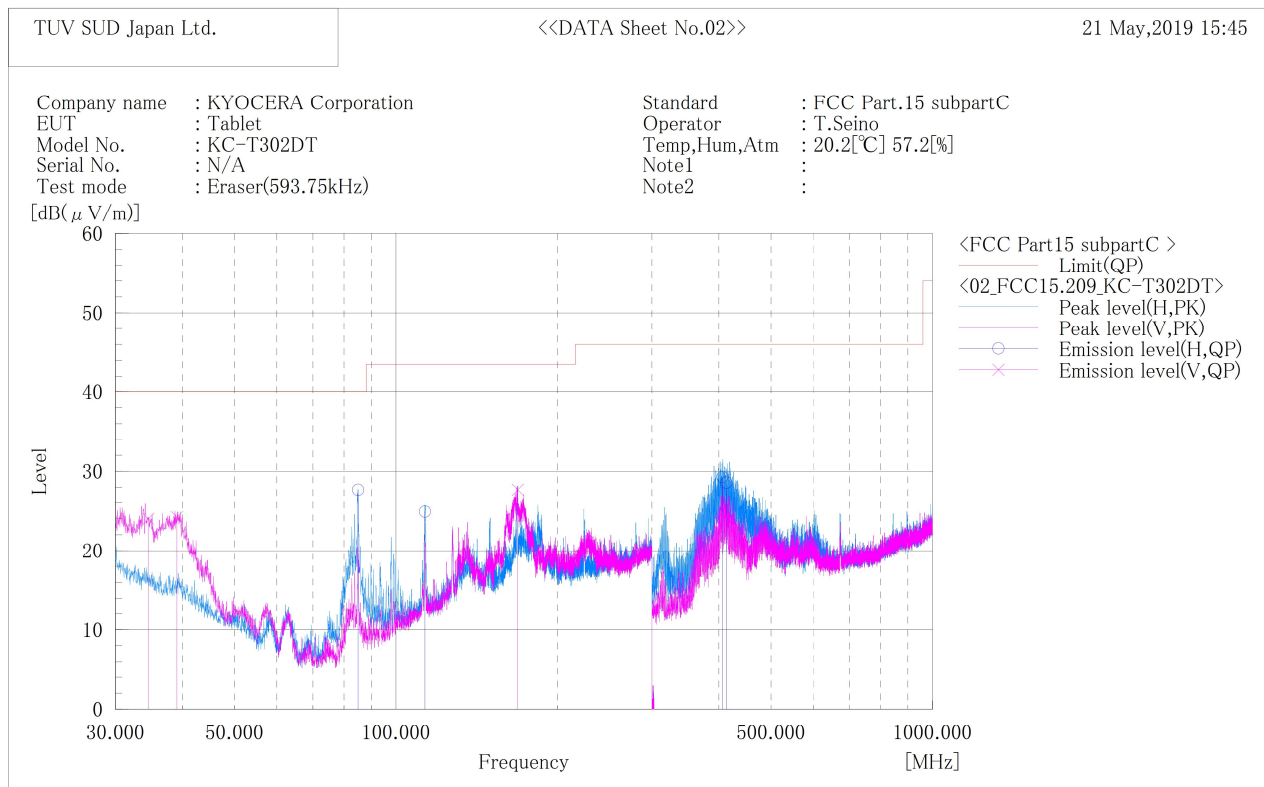


Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	38.830	V	36.4	-10.8	25.6	40.0	14.4	100.0	91.0
2	84.900	H	45.8	-18.2	27.6	40.0	12.4	375.0	255.0
3	113.320	H	39.7	-13.0	26.7	43.5	16.8	260.0	270.0
4	168.400	V	36.5	-9.2	27.3	43.5	16.2	100.0	323.0
5	406.680	H	39.7	-10.9	28.8	46.0	17.2	289.0	318.0
6	416.920	H	40.0	-10.9	29.1	46.0	16.9	322.0	318.0

[30MHz to 1000MHz]
593.75kHz (Eraser side) Output

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



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [°]
1	34.530	V	33.1	-9.1	24.0	40.0	16.0	100.0	189.0
2	39.060	V	35.1	-10.9	24.2	40.0	15.8	100.0	100.0
3	84.980	H	45.9	-18.2	27.7	40.0	12.3	400.0	247.0
4	113.230	H	37.9	-13.0	24.9	43.5	18.6	400.0	268.0
5	168.620	V	36.9	-9.2	27.7	43.5	15.8	100.0	312.0
6	405.840	H	40.2	-10.9	29.3	46.0	16.7	318.0	315.0
7	412.850	H	39.5	-10.9	28.6	46.0	17.4	272.0	313.0

4.2 AC Power Line Conducted Emissions

4.2.1 Measurement procedure

[FCC 15.207]

Test was applied by following conditions.

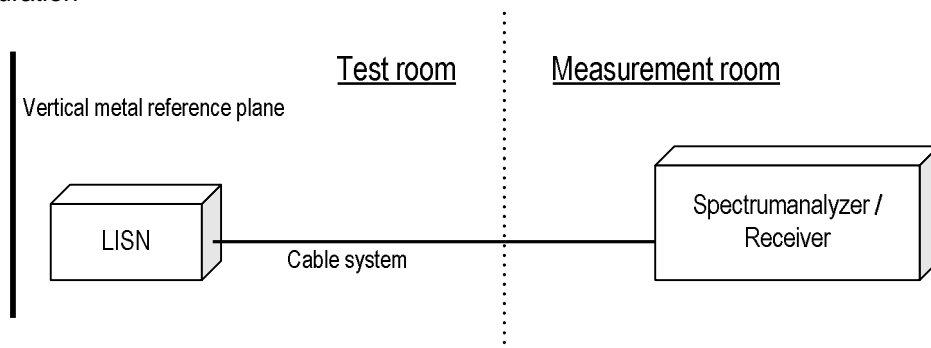
Test method	:	ANSI C63.10
Frequency range	:	0.15MHz to 30MHz
Test place	:	10m Semi-anechoic chamber No.1
EUT was placed on	:	FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Vertical Metal Reference Plane	:	(W)2.0m × (H)2.0m 0.4m away from EUT
Test receiver setting		
- Detector	:	Quasi-peak, Average
- Bandwidth	:	9kHz

EUT and peripherals are connected to 50Ω/50μH Line Impedance Stabilization Network (LISN) which are connected to reference ground plane, and are placed 80cm away from EUT. Excess of AC power cable is bundled in center.

LISN for peripheral is terminated in 50Ω.

EUT operating mode is selected to emit the maximum noise. Overall frequency range is investigated with spectrum analyzer using peak detector. Maximum emission configuration is determined by manipulating the EUT, peripherals, interconnecting cables. Then, emission measurements are performed with test receiver in above setting to each current-carrying conductor of the mains port. Sufficient time for EUT, peripherals and test equipment is provided in order for them to warm up to their normal operating condition. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits.

- Test configuration



4.2.2 Calculation method

Emission level = Reading + (LISN. factor + Cable system loss)

Margin = Limit – Emission level

Example:

Limit @ 6.770MHz : 60.0dBμV(Quasi-peak)
: 50.0dBμV(Average)

(Quasi peak) Reading = 41.2dBμV c.f = 10.3dB

Emission level = 41.2 + 10.3 = 51.5dBμV

Margin = 60.0 – 51.5 = 8.5dB

(Average) Reading = 35.0dBμV c.f = 10.3dB

Emission level = 35.0 + 10.3 = 45.3dBμV

Margin = 50.0 – 45.3 = 4.7dB

4.2.3 Limit

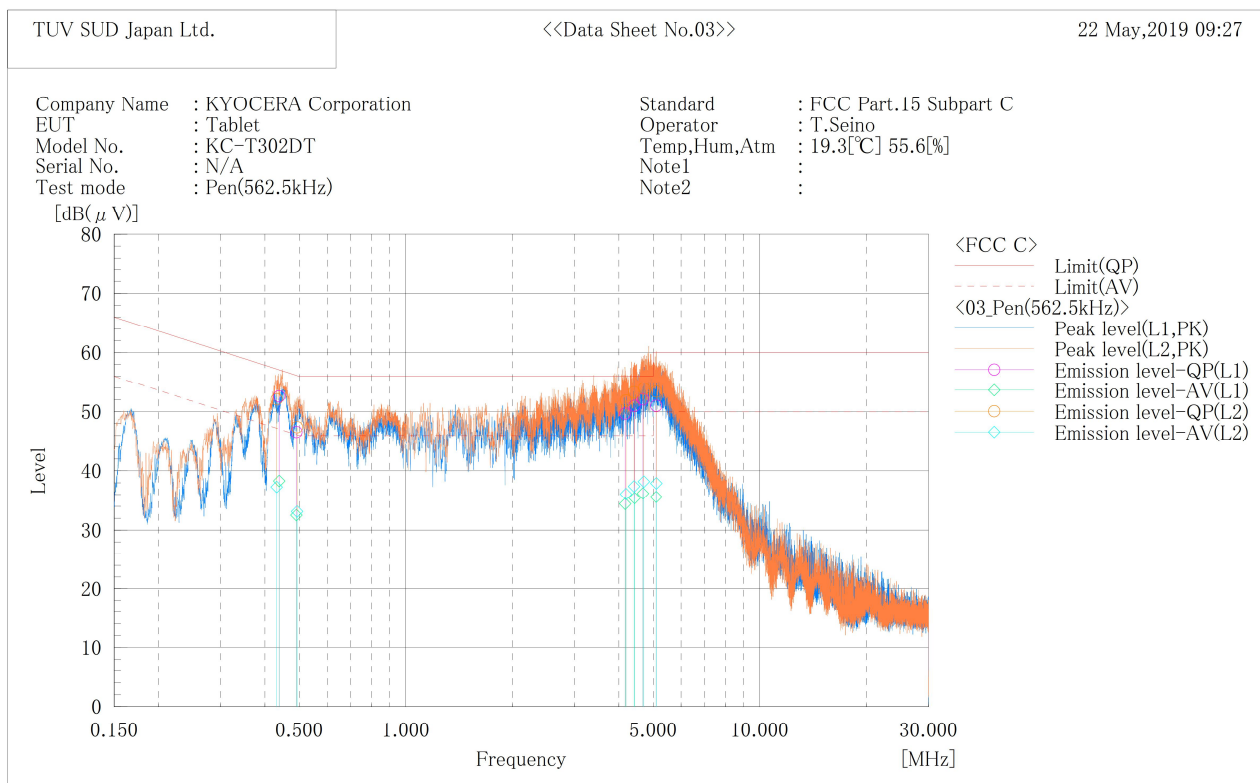
Frequency [MHz]	Field strength	
	[μ V/m]	[dB μ V/m]
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

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

4.2.4 Test data

562.5kHz (Pen side) Output

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



Final Result

--- L1 Phase ---

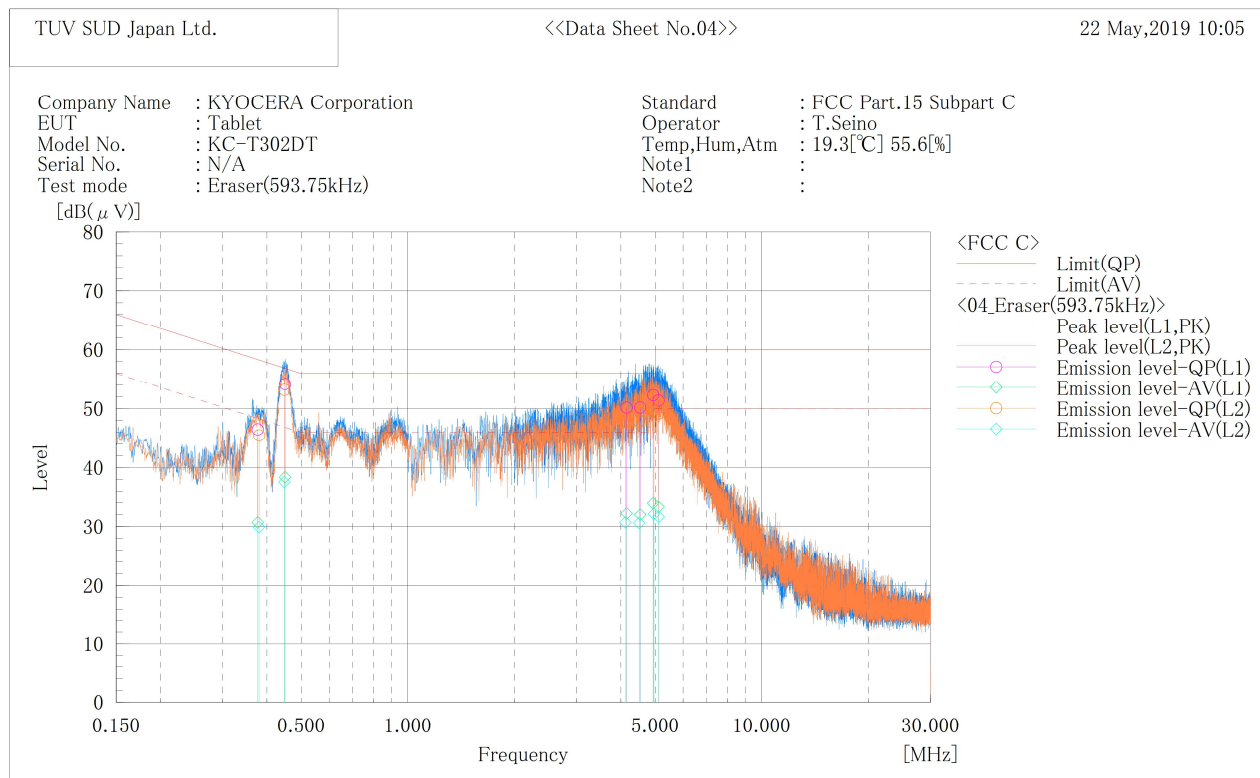
No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.439	42.2	27.9	10.4	52.6	38.3	57.1	47.1	4.5	8.8
2	0.491	36.2	22.1	10.4	46.6	32.5	56.2	46.2	9.6	13.7
3	4.170	39.1	23.8	10.6	49.7	34.4	56.0	46.0	6.3	11.6
4	4.433	40.4	24.8	10.6	51.0	35.4	56.0	46.0	5.0	10.6
5	4.678	41.4	25.5	10.7	52.1	36.2	56.0	46.0	3.9	9.8
6	5.100	40.3	24.9	10.7	51.0	35.6	60.0	50.0	9.0	14.4

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.432	41.7	26.9	10.4	52.1	37.3	57.2	47.2	5.1	9.9
2	0.493	37.0	22.7	10.4	47.4	33.1	56.1	46.1	8.7	13.0
3	4.191	41.3	25.5	10.6	51.9	36.1	56.0	46.0	4.1	9.9
4	4.416	42.7	26.8	10.6	53.3	37.4	56.0	46.0	2.7	8.6
5	4.706	43.2	27.5	10.7	53.9	38.2	56.0	46.0	2.1	7.8
6	5.104	42.7	27.2	10.7	53.4	37.9	60.0	50.0	6.6	12.1

593.75kHz (Eraser side) Output

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



Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.377	36.1	20.3	10.4	46.5	30.7	58.3	48.3	11.8	17.6
2	0.450	43.8	28.0	10.4	54.2	38.4	56.9	46.9	2.7	8.5
3	4.156	39.6	21.6	10.6	50.2	32.2	56.0	46.0	5.8	13.8
4	4.538	39.6	21.4	10.6	50.2	32.0	56.0	46.0	5.8	14.0
5	4.937	41.6	23.2	10.7	52.3	33.9	56.0	46.0	3.7	12.1
6	5.115	40.7	22.6	10.7	51.4	33.3	60.0	50.0	8.6	16.7

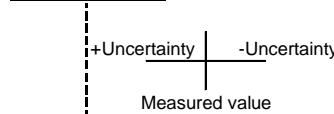

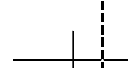

--- L2 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c. f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]
1	0.380	35.1	19.5	10.4	45.5	29.9	58.3	48.3	12.8	18.4
2	0.448	42.8	27.2	10.4	53.2	37.6	56.9	46.9	3.7	9.3
3	4.124	37.3	20.1	10.6	47.9	30.7	56.0	46.0	8.1	15.3
4	4.511	37.3	20.0	10.6	47.9	30.6	56.0	46.0	8.1	15.4
5	4.962	39.0	21.4	10.7	49.7	32.1	56.0	46.0	6.3	13.9
6	5.119	38.5	20.9	10.7	49.2	31.6	60.0	50.0	10.8	18.4

5 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)	± 3.3 dB
Radiated emission (9 kHz – 30 MHz)	± 3.1 dB
Radiated emission (30 MHz – 1000 MHz)	± 4.9 dB
Radiated emission (1 GHz – 6 GHz)	± 4.8 dB
Radiated emission (6 GHz – 18 GHz)	± 5.1 dB
Radiated emission (18 GHz – 40 GHz)	± 5.8 dB
Radio Frequency	$\pm 1.4 \cdot 10^{-8}$
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  <p>Even if it takes uncertainty into consideration, a standard limit value is fulfilled.</p>	
	Case2  <p>Although measured value is in a standard limit value, a limit value won't be fulfilled if uncertainty is taken into consideration.</p>	
FAIL	Case3  <p>Although measured value exceeds a standard limit value, a limit value will be fulfilled if uncertainty is taken into consideration.</p>	
	Case4  <p>Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.</p>	



Japan

6 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

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	Sep 30, 2019	Sep 20, 2018
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	Oct. 31, 2019	Oct. 12, 2018
Preamplifier	SONOMA	310	372170	Sep. 30, 2019	Sep. 20, 2018
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	Mar. 31, 2019	Mar. 7, 2019
Attenuator	TDC	TAT-43B-06	N/A(S209)	Jul. 31, 2019	Jul. 11, 2018
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	2155	Aug. 31, 2019	Aug. 6, 2018
Log periodic antenna	Schwarzbeck	UHALP9108A	0560	Aug. 31, 2019	Aug. 6, 2018
Attenuator	TME	CFA-01NPJ-6	N/A(S275)	Mar. 31, 2019	Mar. 7, 2019
Attenuator	TME	CFA-01NPJ-3	N/A(S272)	Mar. 31, 2019	Mar. 7, 2019
Microwave cable	HUBER+SUHNER	SUCOFLEX104/9m	MY30037/4	Jan. 31, 2020	Jan. 16, 2019
		SUCOFLEX104/1m	my24610/4	Jan. 31, 2020	Jan. 16, 2019
		SUCOFLEX104/8m	SN MY30031/4	Jan. 31, 2020	Jan. 16, 2019
		SUCOFLEX104/1.5m	MY32976/4	Jan. 31, 2020	Jan. 16, 2019
		SUCOFLEX104/1.5m	MY19309/4	Jan. 31, 2020	Jan. 16, 2019
		SUCOFLEX104/7m	41625/6	Jan. 31, 2020	Jan. 16, 2019
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/RE-AJ	0611193/V5.6.0	N/A	N/A
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-NSA)	May 31, 2019	May 14, 2019

Conducted emission at mains port

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	Sep 30, 2019	Sep 20, 2018
Attenuator	HUBER+SUHNER	6810.01.A	N/A(S411)	Jan. 31, 2020	Jan. 17, 2019
Line impedance stabilization network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-407F2	12-17-110-2	May 31, 2020	May 16, 2019
Line impedance stabilization network	Kyoritsu Electrical Works, Ltd.	KNW-242F	8-2003-1	Sep. 30, 2019	Sep. 20, 2018
Coaxial cable	FUJIKURA	5D-2W/4m	N/A(S350)	Jan. 31, 2020	Jan. 17, 2019
Coaxial cable	FUJIKURA	5D-2W/1m	N/A(S193)	Jan. 31, 2020	Jan. 17, 2019
Coaxial cable	HUBER+SUHNER	RG214/U/10m	N/A(S194)	Jan. 31, 2020	Jan. 17, 2019
50Ω terminator	RS	090-0510	N/A(S026)	Mar. 31, 2020	Mar. 7, 2019
PC	DELL	DIMENSION E521	75465BX	N/A	N/A
Software	TOYO Corporation	EP5/CE-AJ	0611193/V5.4.11	N/A	N/A
3m Semi-anechoic Chamber	TOKIN	N/A	N/A(9002-NSA)	May 31, 2019	May 14, 2019

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