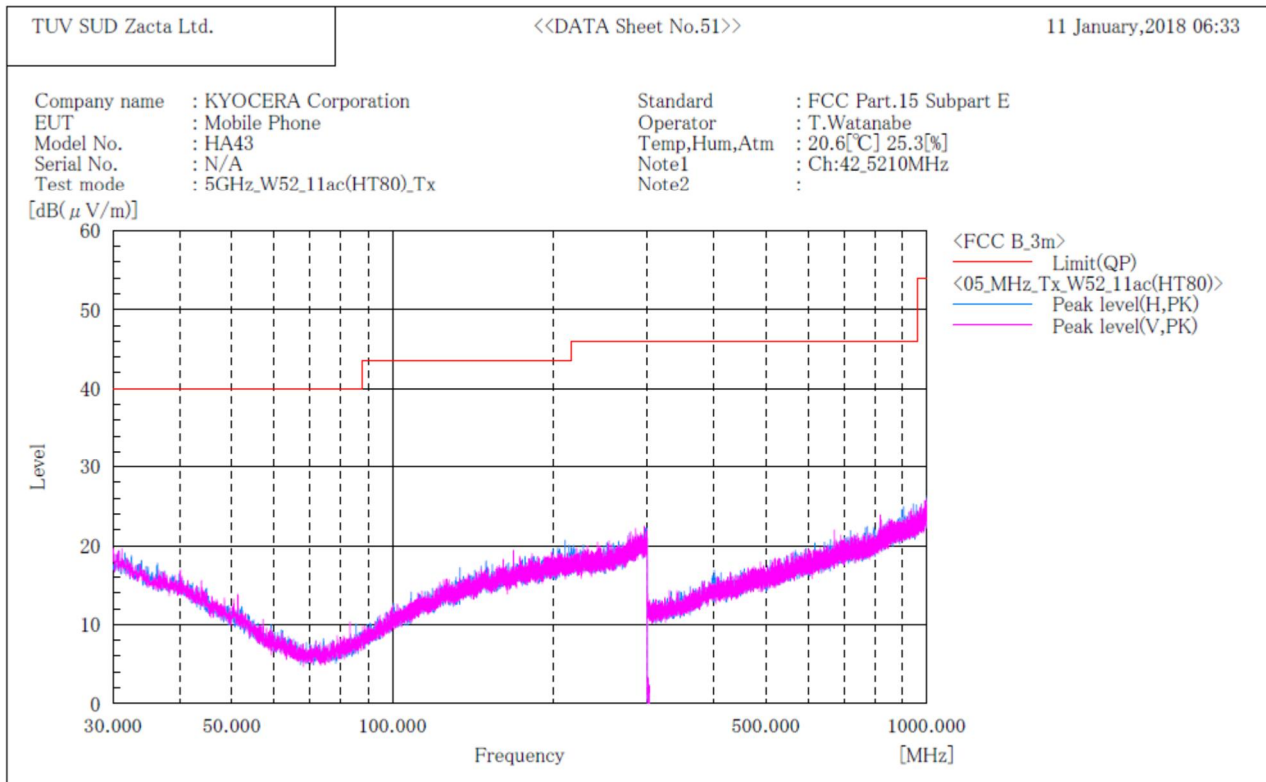




Zacta

[11n(HT80)]
W52
BELOW 1GHz

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



Final Result

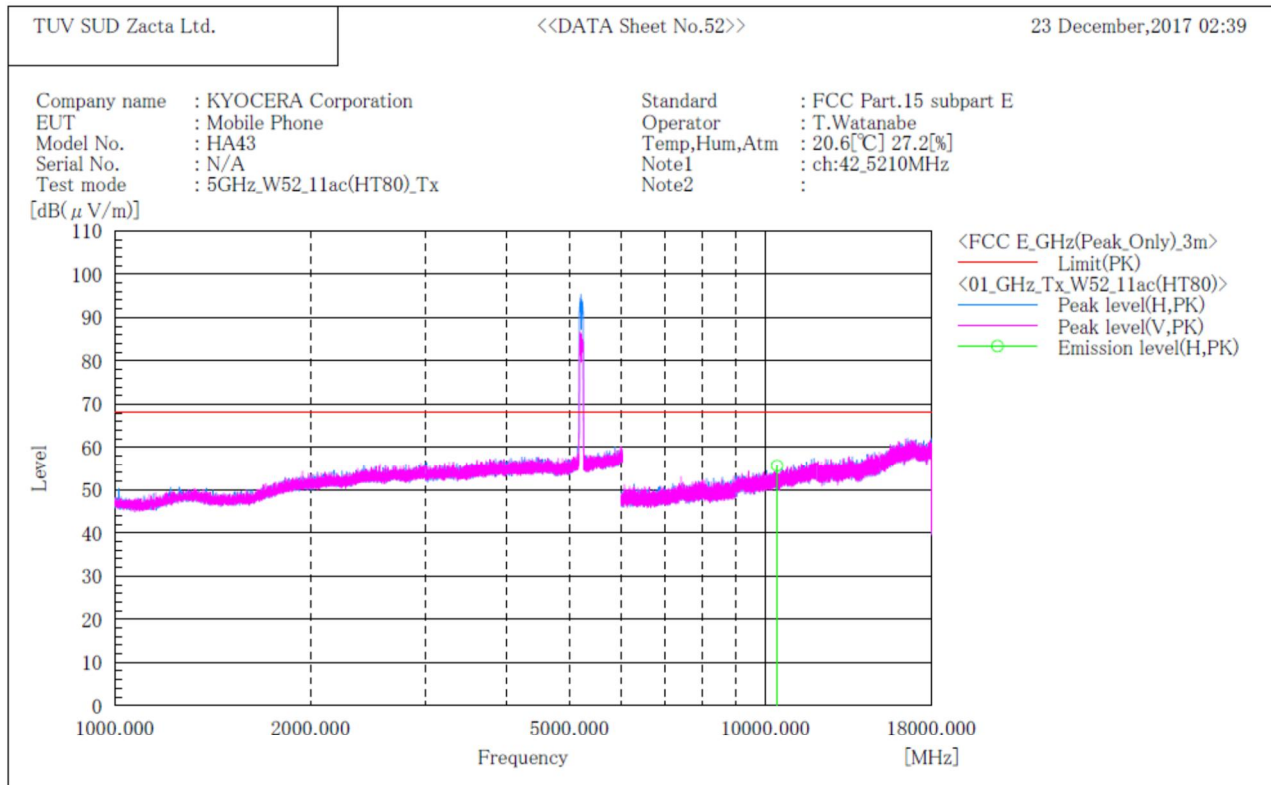
No.	Frequency (P)	c.f	Height	Angle
	[MHz]	[dB(1/m)]	[cm]	[°]

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.

[11n(HT80)]
W52
ABOVE 1GHz

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



Final Result

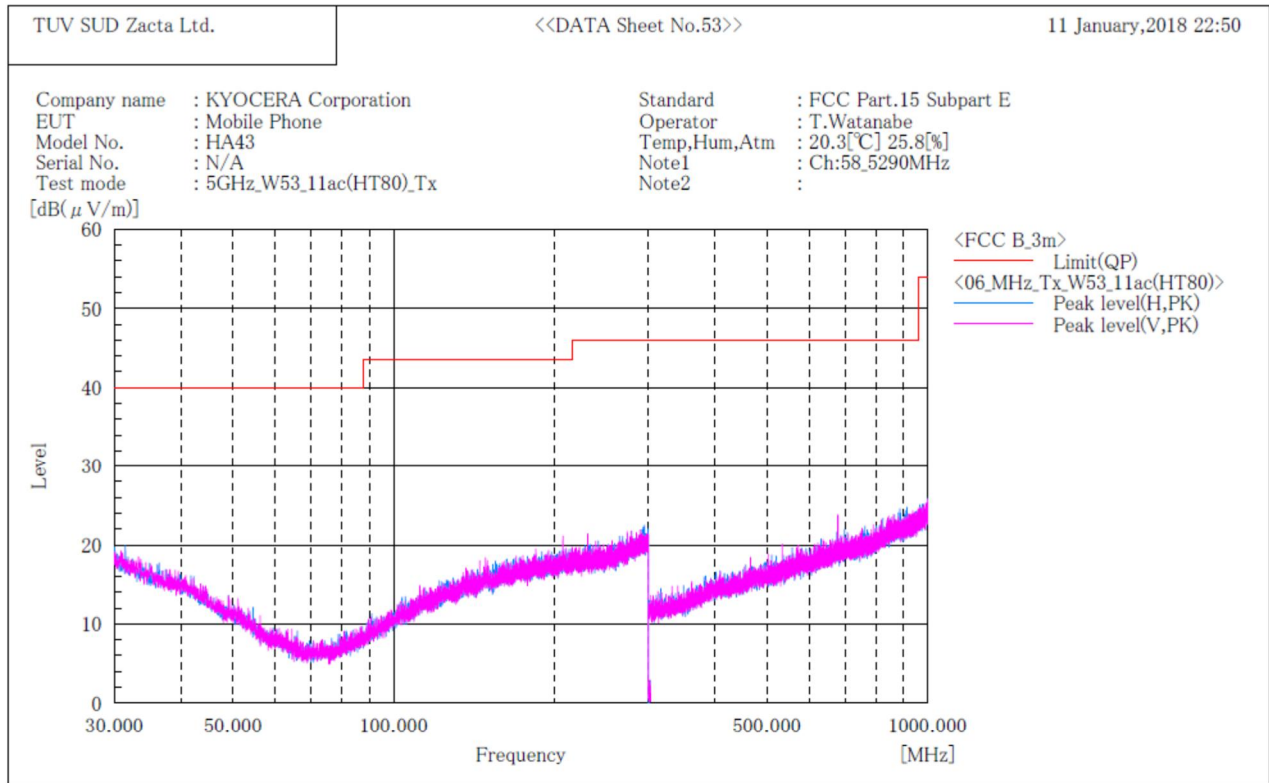
No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [°]	Remark
1	10420.000	H	45.8	9.9	55.7	68.2	12.5	144.0	117.0	

Note:

- Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
- No emission were detected in frequency range 18GHz to 40GHz at the 3 meters distance.

[11n(HT80)]
W53
BELOW 1GHz

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



Final Result

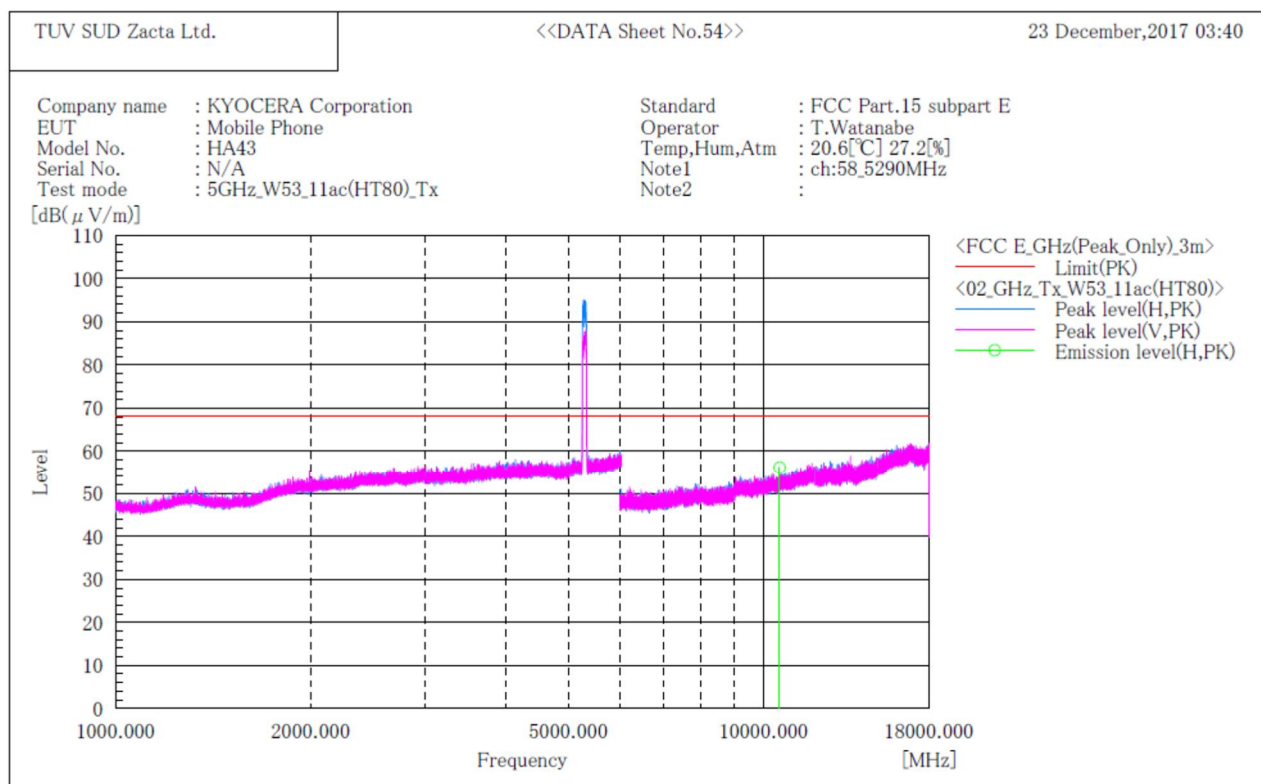
No.	Frequency (P)	c.f	Height	Angle
	[MHz]	[dB(1/m)]	[cm]	[°]

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.

[11n(HT80)]
W53
ABOVE 1GHz

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



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin PK [dB]	Height [cm]	Angle [°]	Remark
1	10580.000	H	46.1	10.1	56.2	68.2	12.0	148.0	197.0	

Note:

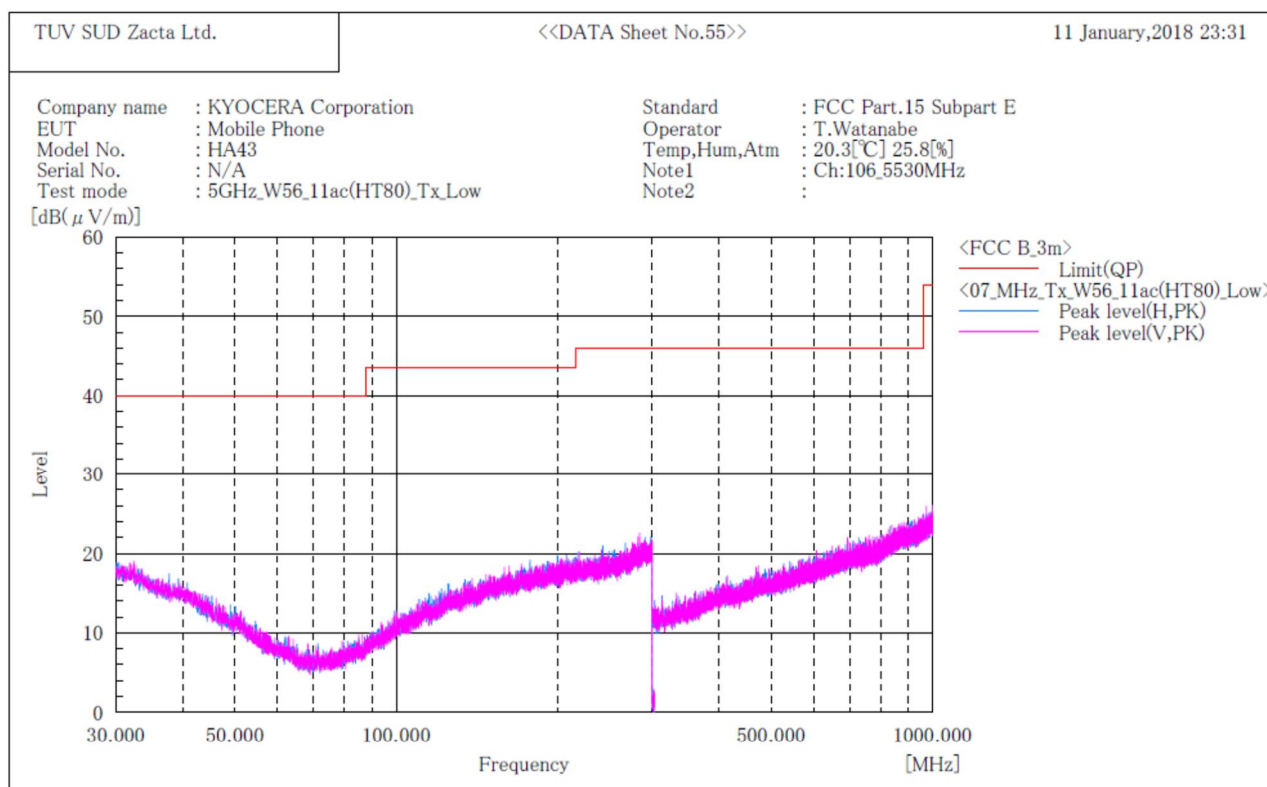
- Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
- No emission were detected in frequency range 18GHz to 40GHz at the 3 meters distance.



Zacta

[11n(HT80)]
W56 / Channel Low
BELOW 1GHz

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



Final Result

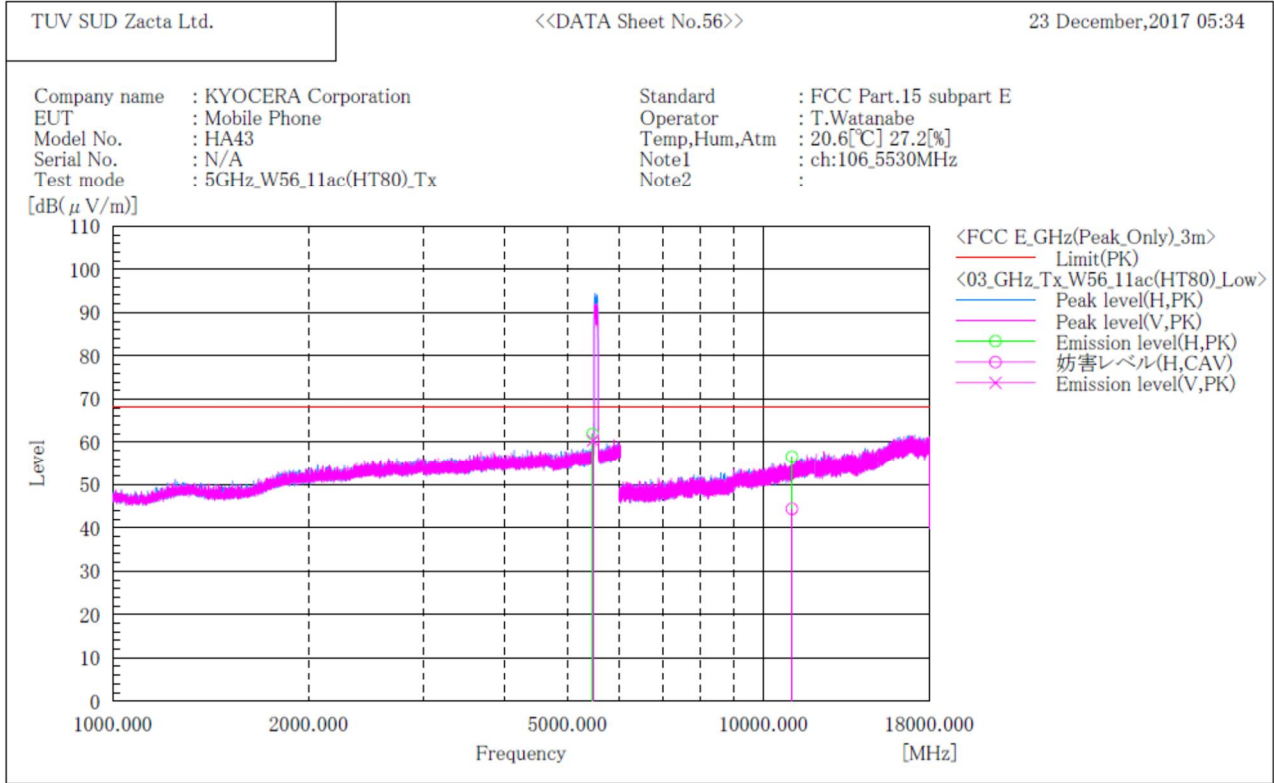
No.	Frequency (P)	c.f	Height	Angle
	[MHz]	[dB(1/m)]	[cm]	[°]

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.

[11n(HT80)]
W56 / Channel Low
ABOVE 1GHz

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



Final Result

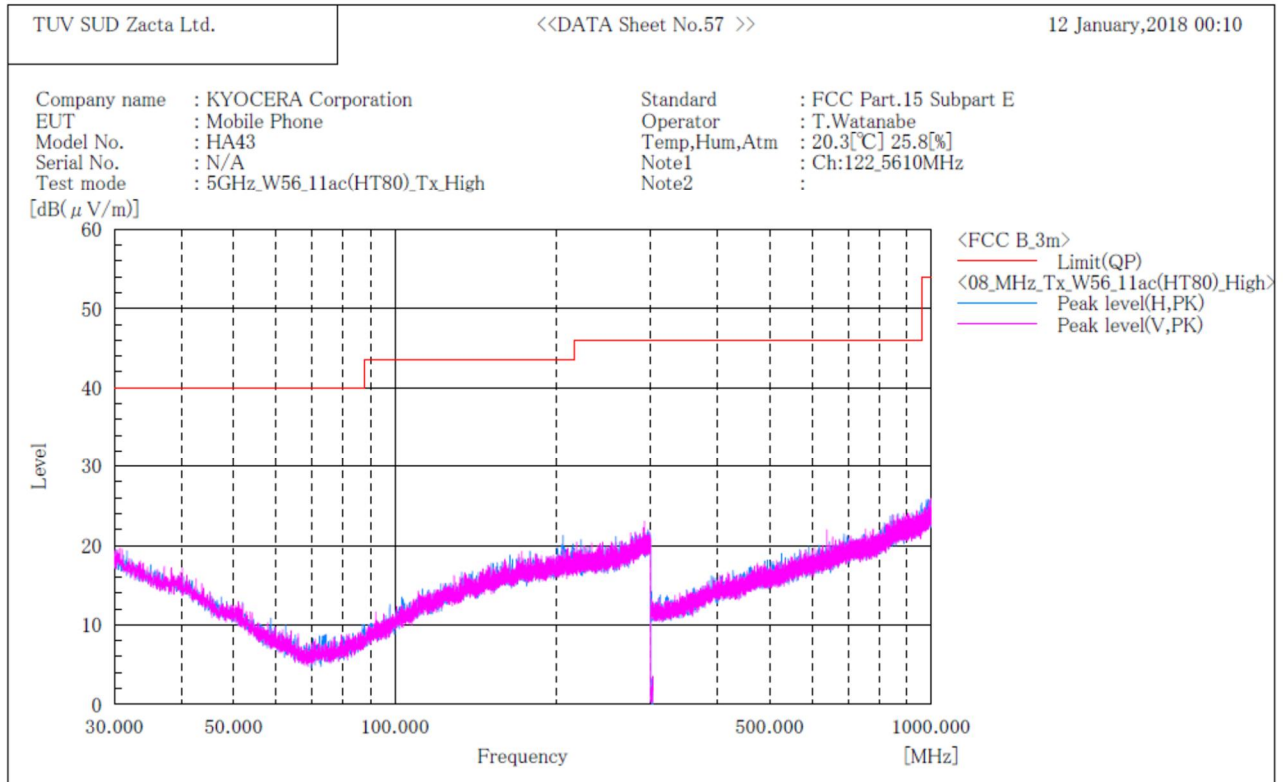
No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]	Remark
1	5461.200	H	51.7	-----	10.2	61.9	-----	68.2	6.3	-----	168.0	173.0	
2	5468.500	V	50.2	-----	10.2	60.4	-----	68.2	7.8	-----	178.0	142.0	
3	11060.000	H	45.9	33.7	10.7	56.6	44.4	74.0	17.4	9.6	150.0	136.0	

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 18GHz to 40GHz at the 3 meters distance.

[11n(HT80)]
W56 / Channel High
BELOW 1GHz

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



Final Result

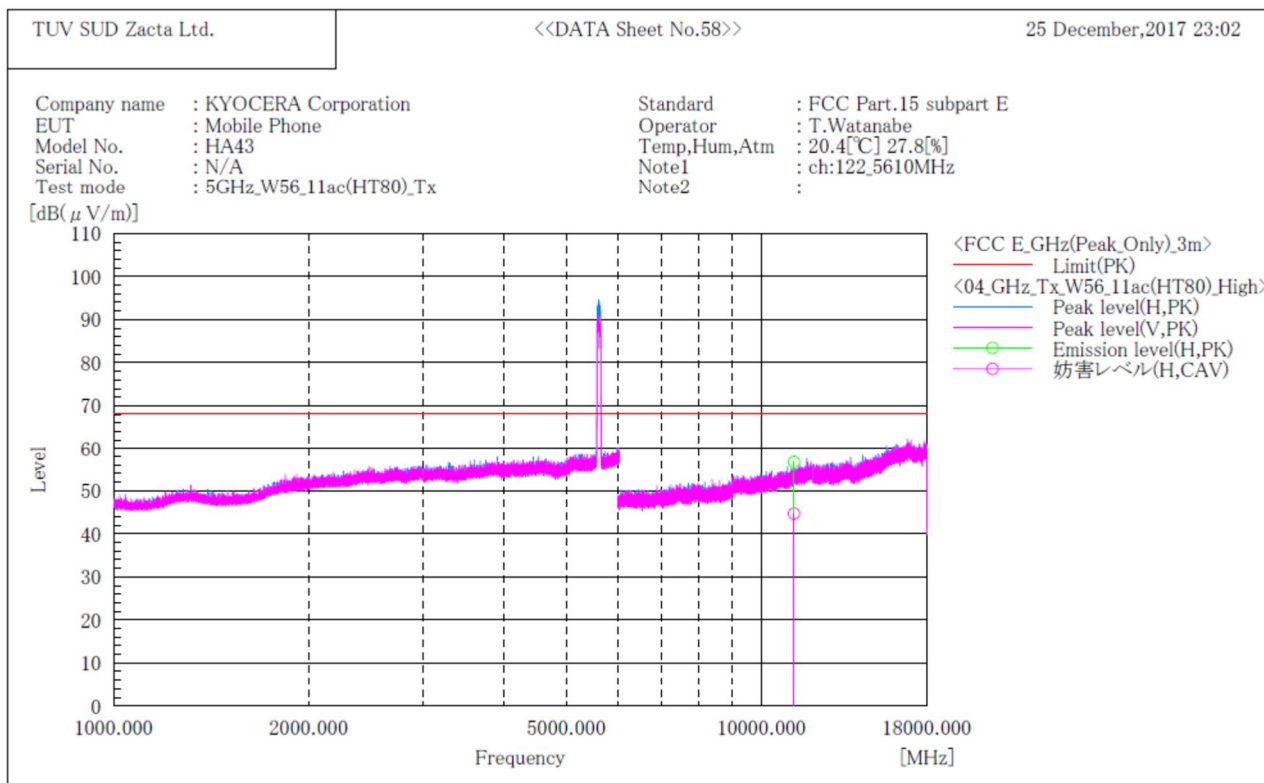
No.	Frequency (P)	c.f	Height	Angle
	[MHz]	[dB(1/m)]	[cm]	[°]

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz at the 3 meters distance.

[11n(HT80)]
W56 / Channel High
ABOVE 1GHz

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



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]	Remark
1	11220.000	H	45.7	33.7	11.0	56.7	44.7	74.0	17.3	9.3	152.0	143.0	

Note:

- Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
- No emission were detected in frequency range 18GHz to 40GHz at the 3 meters distance.

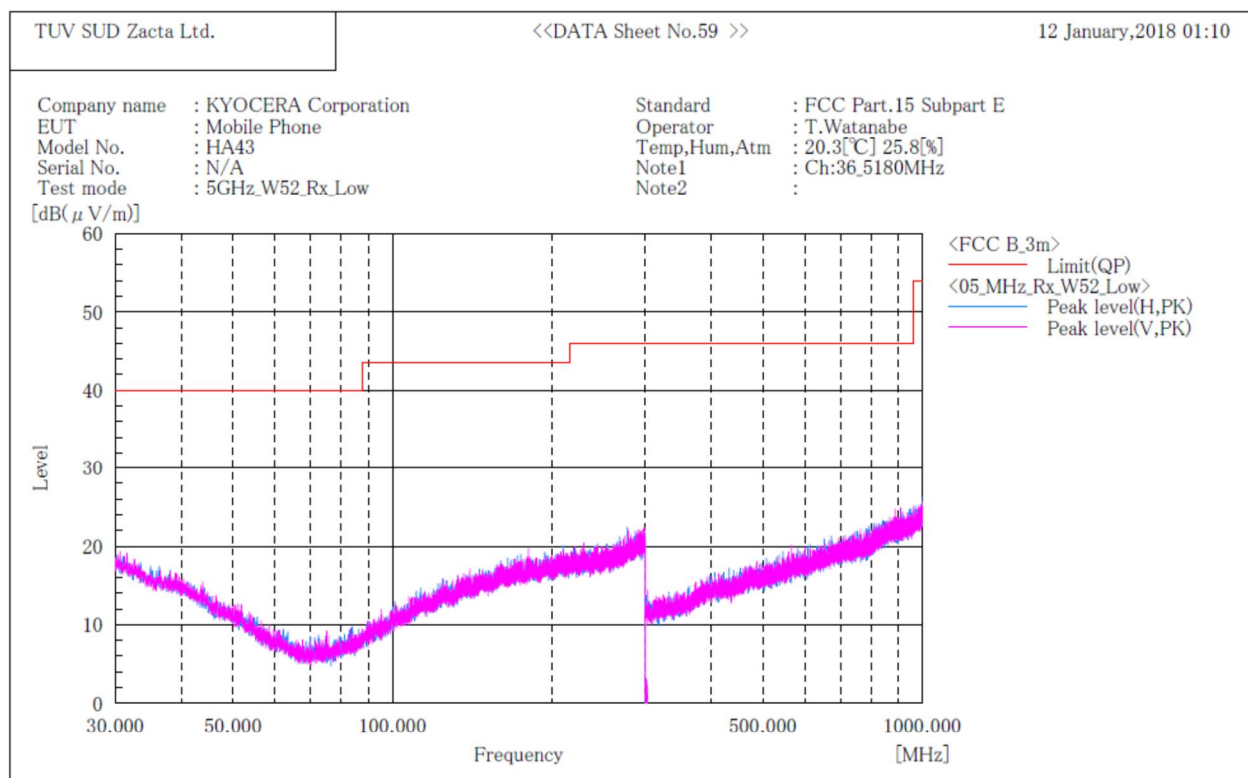


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7.4.4.2 Receive mode

W52 / Channel Low BELOW 1GHz

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



Final Result

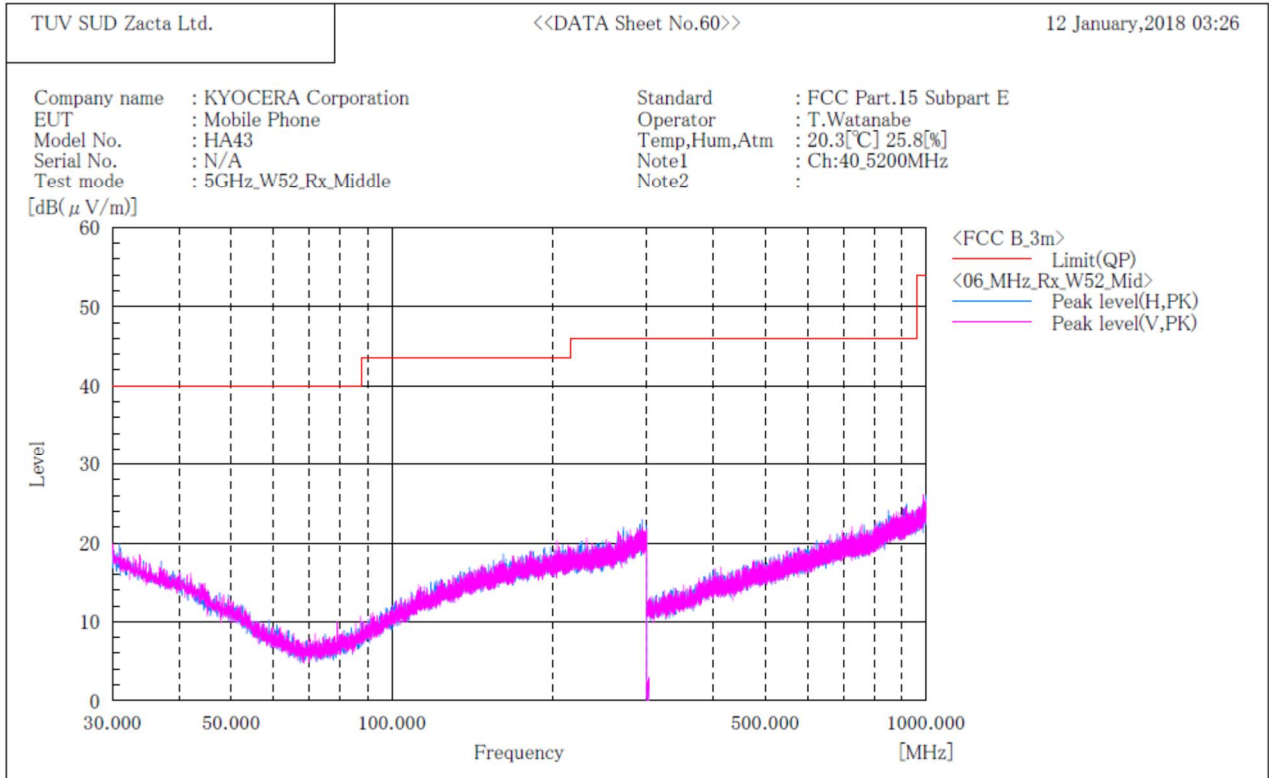
No.	Frequency (P)	c.f	Height	Angle
	[MHz]	[dB (1/m)]	[cm]	[°]

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 40GHz at the 3 meters distance.

W52 / Channel Middle BELOW 1GHz

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



Final Result

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

Note:

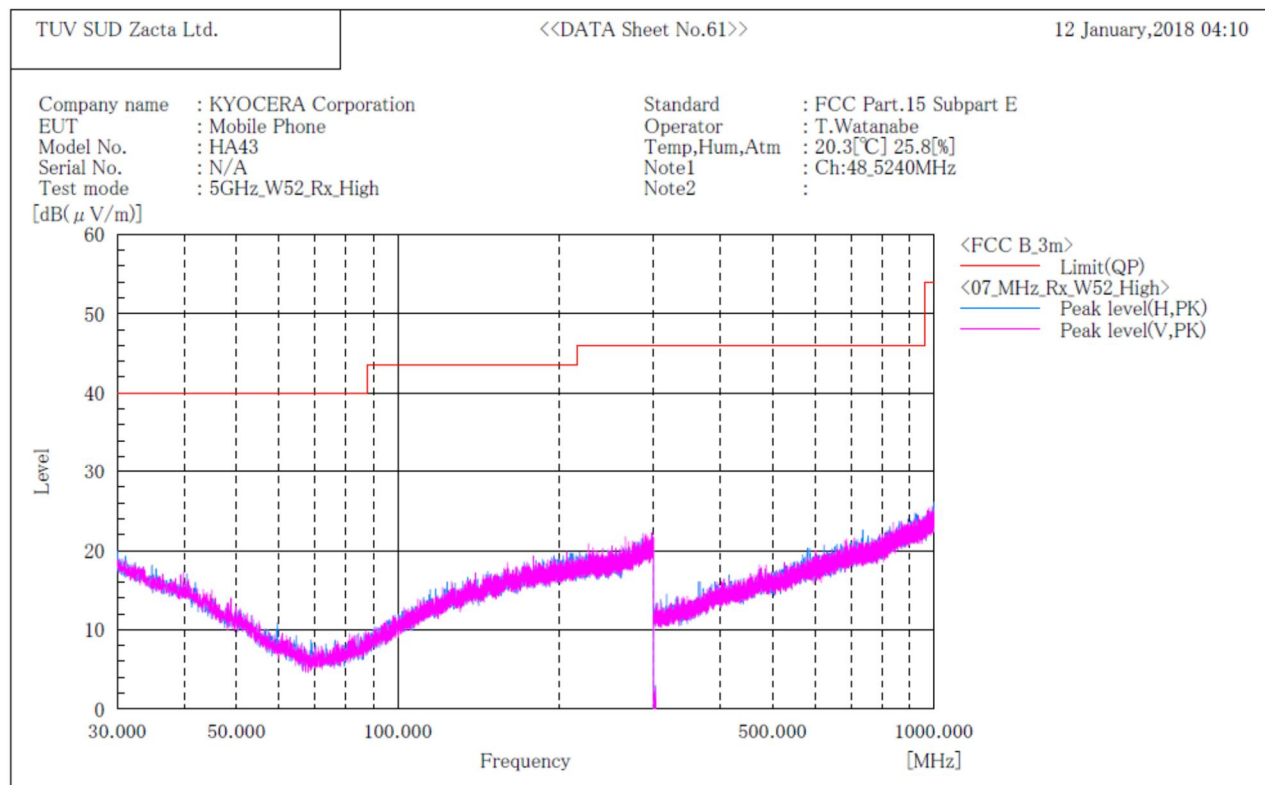
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 40GHz at the 3 meters distance.



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W52 / Channel High BELOW 1GHz

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



Final Result

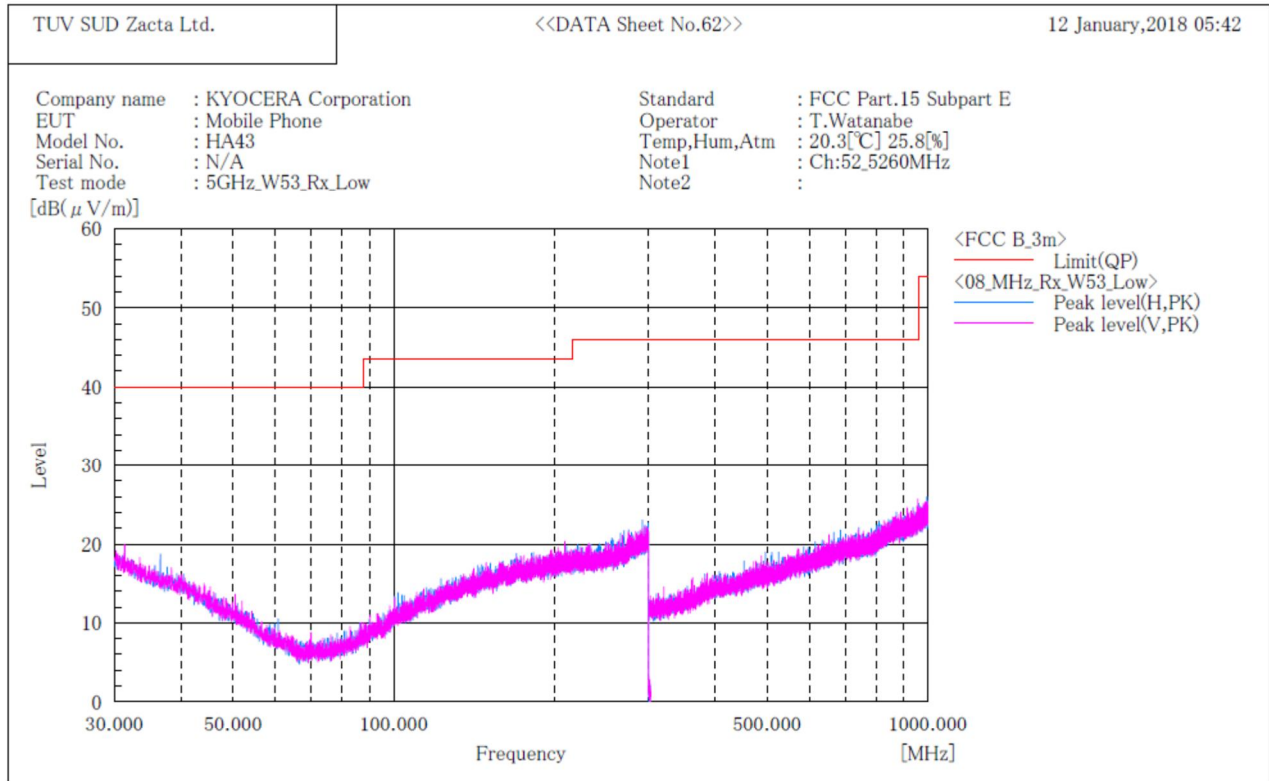
No.	Frequency (P)	c.f	Height	Angle
	[MHz]	[dB(1/m)]	[cm]	[°]

Note:

- Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
- No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 40GHz at the 3 meters distance.

W53 / Channel Low BELOW 1GHz

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



Final Result

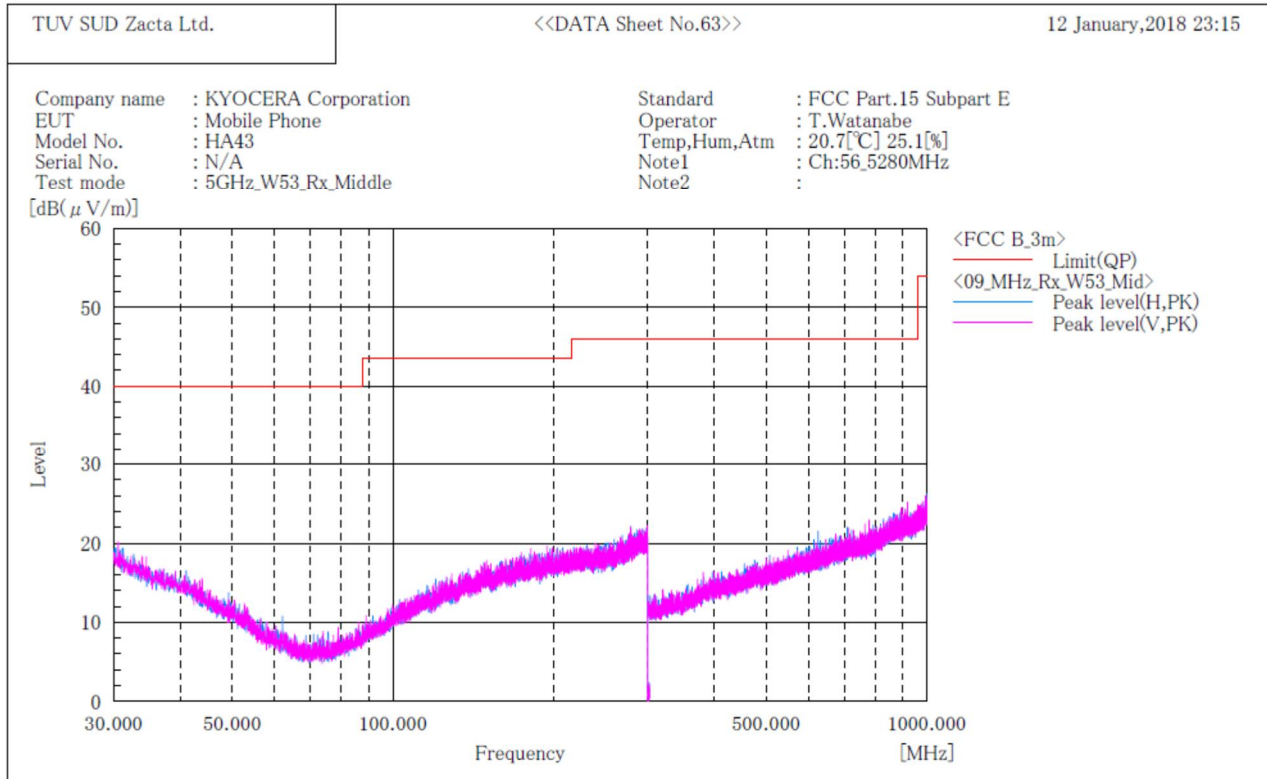
No.	Frequency (P)	c.f	Height	Angle
	[MHz]	[dB(1/m)]	[cm]	[°]

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 40GHz at the 3 meters distance.

W53 / Channel Middle BELOW 1GHz

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



Final Result

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

Note:

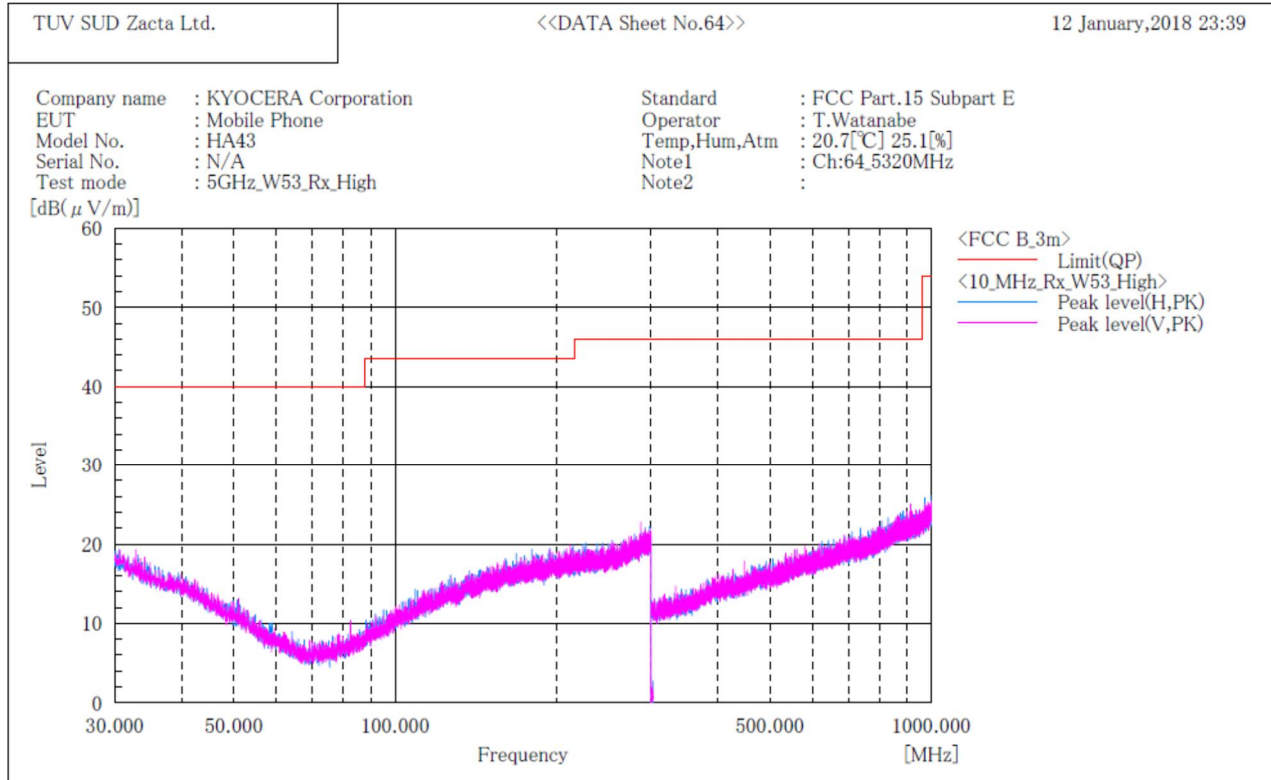
- Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
- No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 40GHz at the 3 meters distance.



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W53 / Channel High BELOW 1GHz

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



Final Result

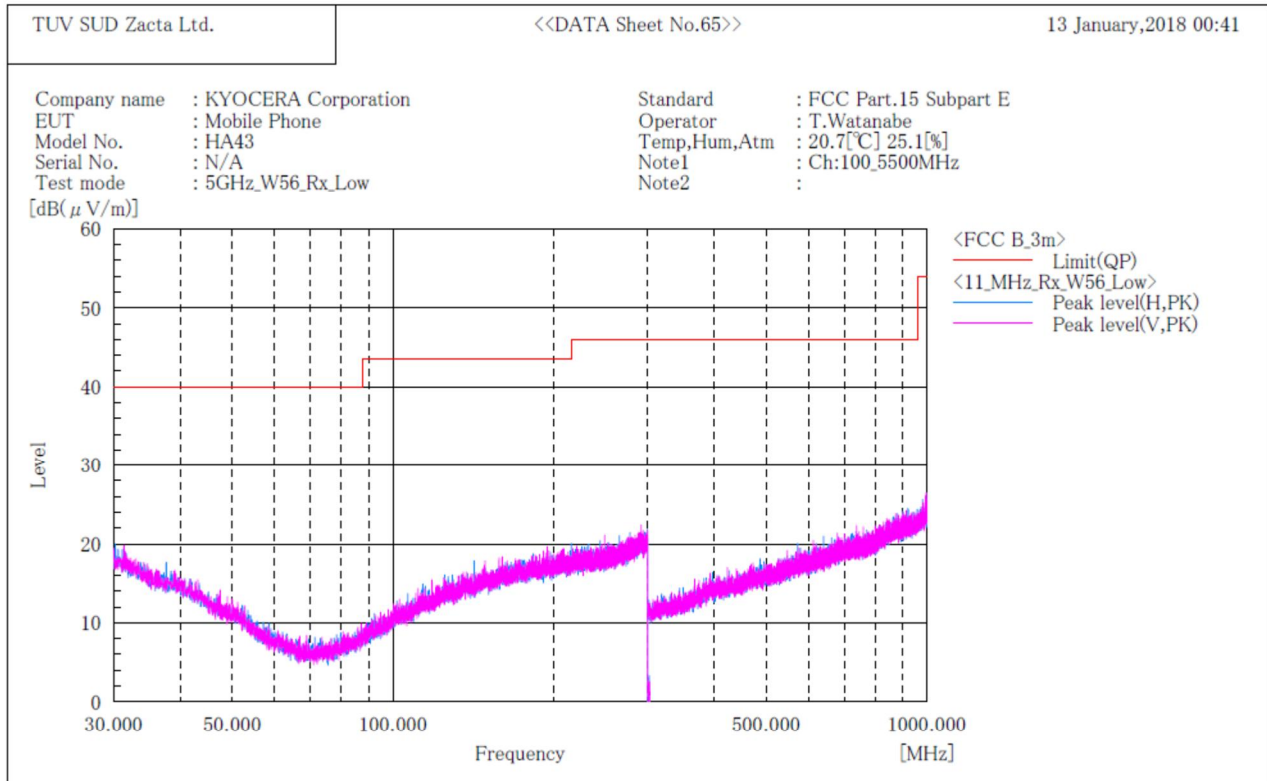
No.	Frequency (P)	c.f	Height	Angle
	[MHz]	[dB(1/m)]	[cm]	[°]

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 40GHz at the 3 meters distance.

W56 / Channel Low BELOW 1GHz

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



Final Result

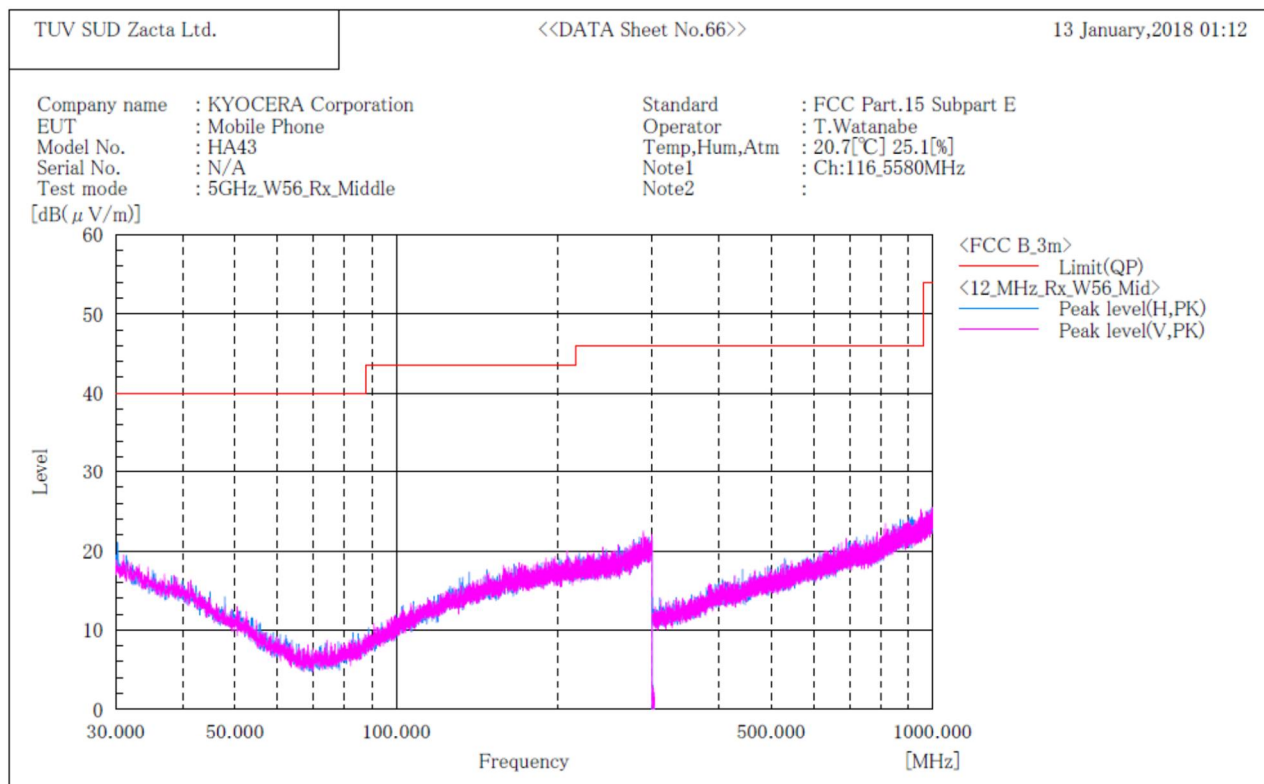
No.	Frequency (P)	c.f	Height	Angle
	[MHz]	[dB(1/m)]	[cm]	[°]

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 40GHz at the 3 meters distance.

W56 / Channel Middle BELOW 1GHz

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



Final Result

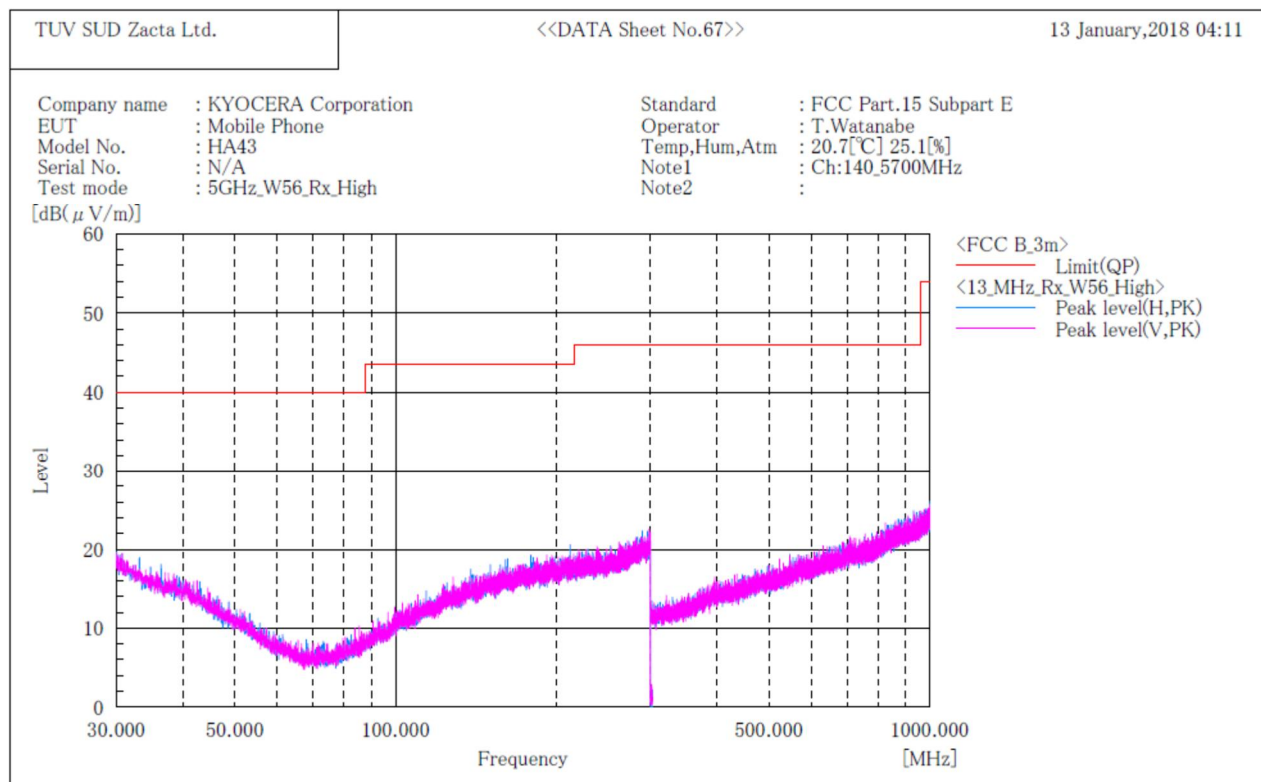
No.	Frequency (P)	c.f	Height	Angle
	[MHz]	[dB(1/m)]	[cm]	[°]

Note:

- Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
- No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 40GHz at the 3 meters distance.

W56 / Channel High BELOW 1GHz

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



Final Result

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

Note:

1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 9kHz to 1000MHz and 1GHz to 40GHz at the 3 meters distance.

8. Frequency Stability

8.1 Measurement procedure [FCC 15.407(g)]

The EUT was placed inside of a constant temperature chamber as the temperature in the chamber was varied between -30°C and $+60^{\circ}\text{C}$. The temperature was incremented by 10°C intervals and the unit was allowed to stabilize at each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

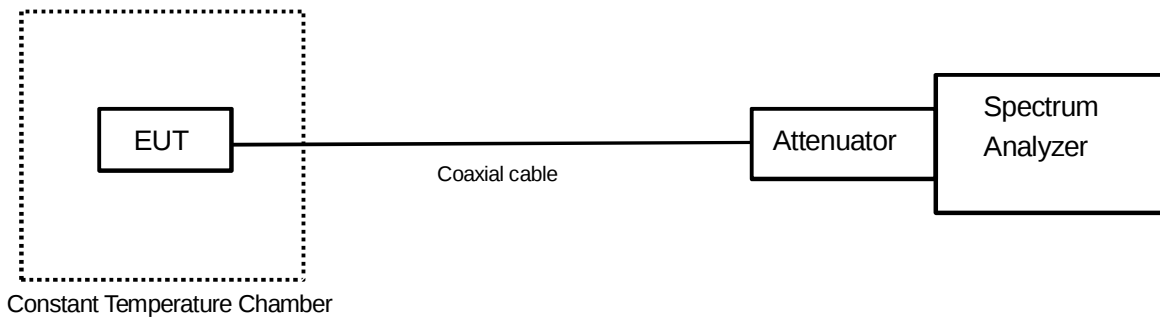
The EUT was set to operate with the following conditions.

- 5.2GHz Band, 5.3GHz Band, 5.6GHz Band

The test mode of EUT is as follows.

- Tx mode

- Test configuration



8.2 Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified.

8.3 Measurement result

Date : December 26, 2017
 Temperature : 21.9 [°C]
 Humidity : 34.3 [%]
 Test place : Shielded room No.4

Test engineer : Chiaki Kanno

[Channel: 36 (5180MHz)]

Power Supply	Temperature	Measurements Frequency (startup)	Frequency Tolerance (startup)	Measurements Frequency (2mins)	Frequency Tolerance (2mins)	Measurements Frequency (5mins)	Frequency Tolerance (5mins)	Measurements Frequency (10mins)	Frequency Tolerance (10mins)
[V]	[°C]	[Hz]	[ppm]	[Hz]	[ppm]	[Hz]	[ppm]	[Hz]	[ppm]
3.80	25(Ref.)	5179991506	0.00000000	5179983364	-1.57181725	5179994837	0.64305125	5179966736	-4.78186112
	60	5179976613	-2.87510124	5179966871	-4.75579930	5179964311	-5.25000861	5179967718	-4.59228552
	50	5179972605	-3.64884768	5179967480	-4.63823154	5179964307	-5.25078081	5179968884	-4.36718863
	40	5179965109	-5.09595430	5179956799	-6.70020404	5179972334	-3.70116437	5179969341	-4.27896455
	30	5180001433	1.91641241	5179963823	-5.34421726	5179976905	-2.81873049	5179967343	-4.66467946
	20	5179991533	0.00521236	5179990923	-0.11254845	5179976566	-2.88417461	5179996203	0.90675824
	10	5180005602	2.72123998	5180000750	1.78455891	5180008441	3.26931038	5180012314	4.01699500
	0	5180009516	3.47683968	5180011931	3.94305666	5180018527	5.21641782	5180030092	7.44904696
	-10	5180023683	6.21178625	5180022988	6.07761614	5179993115	0.31061827	5180028060	7.05676833
	-20	5180017667	5.05039438	5180038397	9.05233145	5180012865	4.12336583	5180002755	2.17162518
	-30	5179998029	1.25926847	5180008704	3.32008266	5180014694	4.47645522	5180001825	1.99208821
3.42	25	5179979012	-2.41197307	5179988683	-0.54498159	5179978674	-2.47722414	5179974712	-3.24209026
4.18	25	5179985373	-1.18397878	5179997600	1.17644981	5179979966	-2.22780288	5179970174	-4.11815347



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[Channel: 64 (5320MHz)]

Power Supply	Temperature	Measurements Frequency (startup)	Frequency Tolerance (startup)	Measurements Frequency (2mins)	Frequency Tolerance (2mins)	Measurements Frequency (5mins)	Frequency Tolerance (5mins)	Measurements Frequency (10mins)	Frequency Tolerance (10mins)
[V]	[°C]	[Hz]	[ppm]	[Hz]	[ppm]	[Hz]	[ppm]	[Hz]	[ppm]
3.80	25(Ref.)	5319984072	0.0000000	5319993391	1.75169697	5319992971	1.67274937	5319985177	0.20770739
	60	5319972501	-2.17500651	5319964425	-3.69305617	5319964386	-3.70038702	5319974533	-1.79305048
	50	5319968397	-2.94643739	5319966154	-3.36805520	5319966654	2.36504467	5319972421	-2.19004415
	40	5319981415	-0.49943759	5319998959	2.79831665	5319966795	-3.24756611	5319966452	-3.31203999
	30	5319984707	0.11936126	5319994234	1.91015609	5319991407	1.37876353	5319974277	-1.84117093
	20	5320001763	3.32538590	5320011441	5.14456427	5319983038	-0.19436148	5319974436	-1.81128362
	10	5319996045	2.25057065	5320010951	5.05245874	5319999834	2.96279083	5320023819	7.47126297
	0	5320036923	9.93442824	5320022786	7.27708946	5320023779	7.46374415	5320033432	9.27822327
	-10	5320036184	9.79551805	5320013976	5.62106946	5320038781	10.28367741	5320039126	10.34852722
	-20	5320017151	6.21787576	5320023854	7.47784194	5320026695	8.01186609	5320030989	8.81901137
	-30	5319999597	2.91824182	5320008404	4.57369790	5320008486	4.58911148	5320018341	6.44156064
3.42	25	5319991464	1.38947784	5319996998	2.42970652	5320007111	4.33065206	5320012313	5.30847454
4.18	25	5319991436	1.38421467	5319992169	1.52199704	5319987753	0.69191936	5319985311	0.23289543

[Channel: 140 (5700MHz)]

Power Supply	Temperature	Measurements Frequency (startup)	Frequency Tolerance (startup)	Measurements Frequency (2mins)	Frequency Tolerance (2mins)	Measurements Frequency (5mins)	Frequency Tolerance (5mins)	Measurements Frequency (10mins)	Frequency Tolerance (10mins)
[V]	[°C]	[Hz]	[ppm]	[Hz]	[ppm]	[Hz]	[ppm]	[Hz]	[ppm]
3.80	25(Ref.)	5699978758	0.0000000	5699960731	-3.16264337	5699978732	-0.00456142	5699973135	-0.98649490
	60	5699966848	-2.08948147	5699958048	-3.63334687	5699975308	-0.60526541	5699964020	-2.58562367
	50	5699965159	-2.38579836	5699960865	-3.13913451	5699966536	-2.14421852	5699959832	-3.32036325
	40	5699966074	-2.22527145	5699957536	-3.72317177	5699977781	-0.17140415	5699969489	-1.62614641
	30	5699974105	-0.81631883	5699982190	0.60210751	5699974504	-0.74631857	5699977291	-0.25736938
	20	5699998757	3.50860957	5699983935	0.90824900	5699988266	1.66807639	5699983654	0.85895057
	10	5699994152	2.70071182	5699997033	3.20615230	5699994534	2.76772961	5699997018	3.20352071
	0	5700000336	3.78562814	5700018530	6.97756986	5700009986	5.47861691	5700027906	8.62248827
	-10	5700022009	7.58792301	5700021380	7.47757173	5700017033	6.71493731	5700033265	9.56266722
	-20	5700022854	7.73616918	5700025319	8.16862693	5700030924	9.15196393	5700022272	7.63406354
	-30	5700012079	5.84581126	5699995352	2.91123892	5700012280	5.88107455	5700010032	5.48668711
3.42	25	5699982379	0.63526553	5699985437	1.17175875	5699969600	-1.60667265	5699974548	-0.73859924
4.18	25	5699985610	1.20210974	5699992514	2.41334233	5699986384	1.33789972	5699980624	0.32736964

9. AC Power Line Conducted Emissions

9.1 Measurement procedure [FCC 15.207]

Test was applied by following conditions.

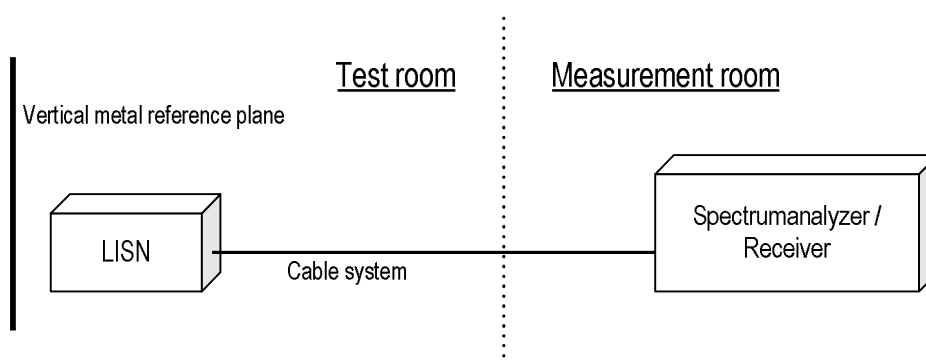
Test method	: ANSI C63.10
Frequency range	: 0.15MHz to 30MHz
Test place	: 3m Semi-anechoic chamber
EUT was placed on	: FRP table / (W)2.0m × (D)1.0m × (H)0.8m
Vertical Metal Reference Plane	: (W)2.0m × (H)2.0m 0.4m away from EUT
Test receiver setting	
- Detector	: Quasi-peak, Average
- Bandwidth	: 9kHz

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



9.2 Calculation method

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

Margin = Limit – Emission level

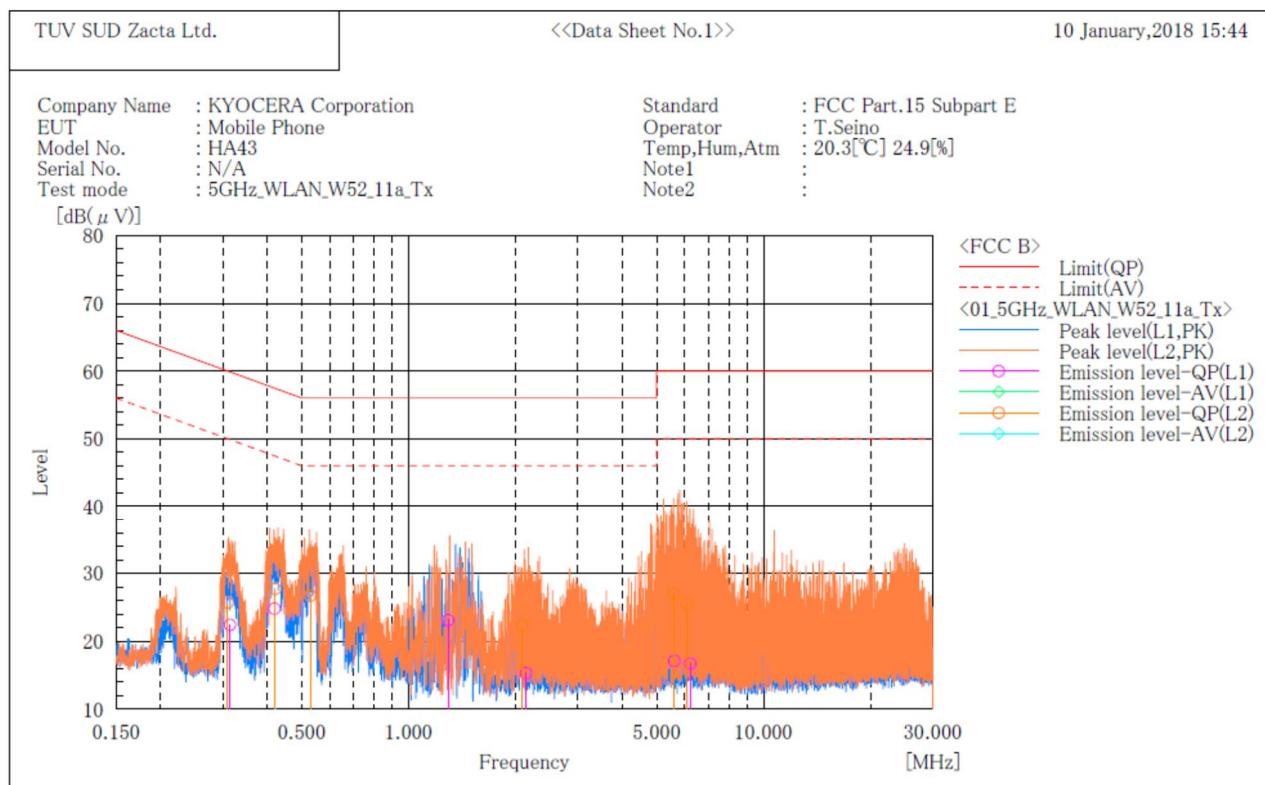
9.3 Limit

Frequency [MHz]	Limit	
	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.

9.4 Test data

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



Final Result

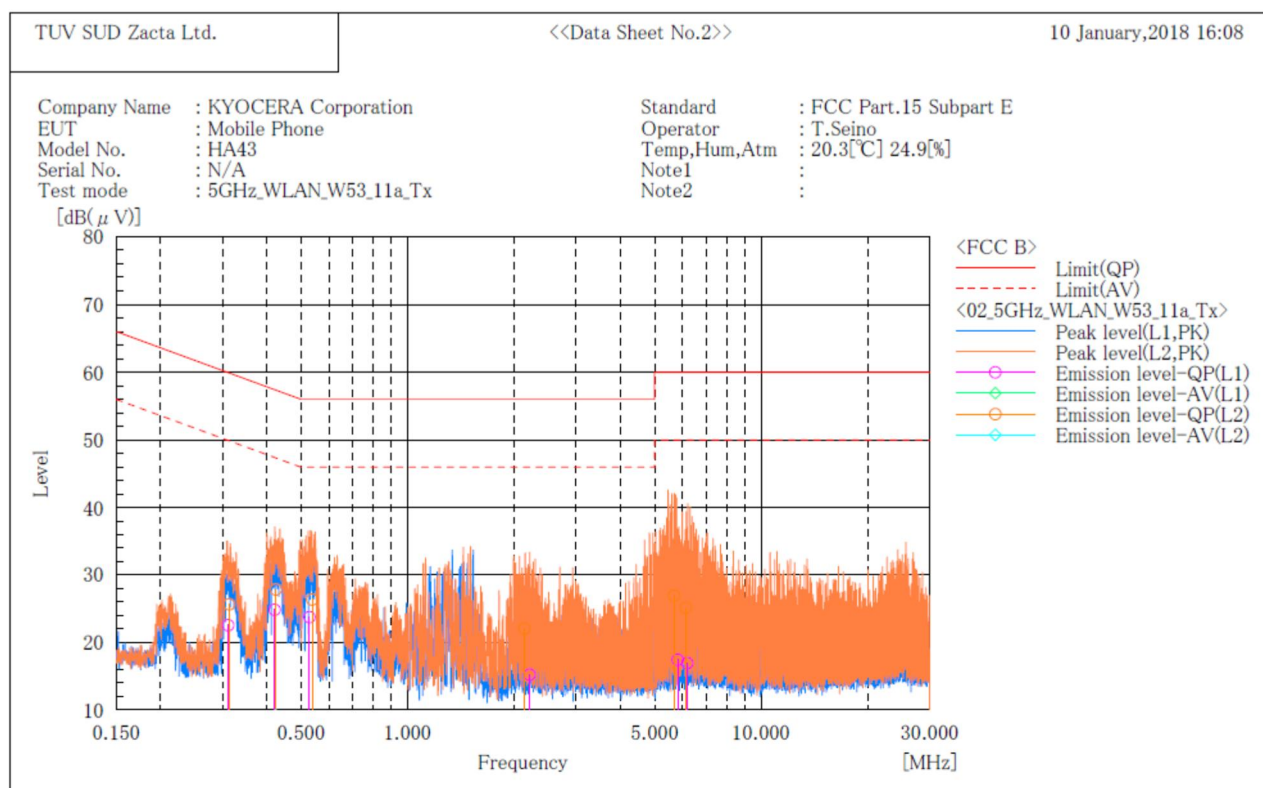
--- L1 Phase ---

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	0.314	12.0	-2.2	10.4	22.4	8.2	59.9	49.9	37.5	41.7
2	0.419	14.4	-2.2	10.4	24.8	8.2	57.5	47.5	32.7	39.3
3	1.291	12.7	-3.4	10.4	23.1	7.0	56.0	46.0	32.9	39.0
4	2.144	4.8	-4.6	10.5	15.3	5.9	56.0	46.0	40.7	40.1
5	5.610	6.4	-4.7	10.7	17.1	6.0	60.0	50.0	42.9	44.0
6	6.220	6.0	-4.6	10.7	16.7	6.1	60.0	50.0	43.3	43.9

--- 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	0.309	15.3	-1.8	10.4	25.7	8.6	60.0	50.0	34.3	41.4
2	0.421	17.3	-1.3	10.4	27.7	9.1	57.4	47.4	29.7	38.3
3	0.529	16.3	-1.9	10.4	26.7	8.5	56.0	46.0	29.3	37.5
4	2.089	11.8	-3.8	10.5	22.3	6.7	56.0	46.0	33.7	39.3
5	5.598	16.3	-3.4	10.7	27.0	7.3	60.0	50.0	33.0	42.7
6	6.101	14.6	-3.5	10.8	25.4	7.3	60.0	50.0	34.6	42.7

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



Final Result

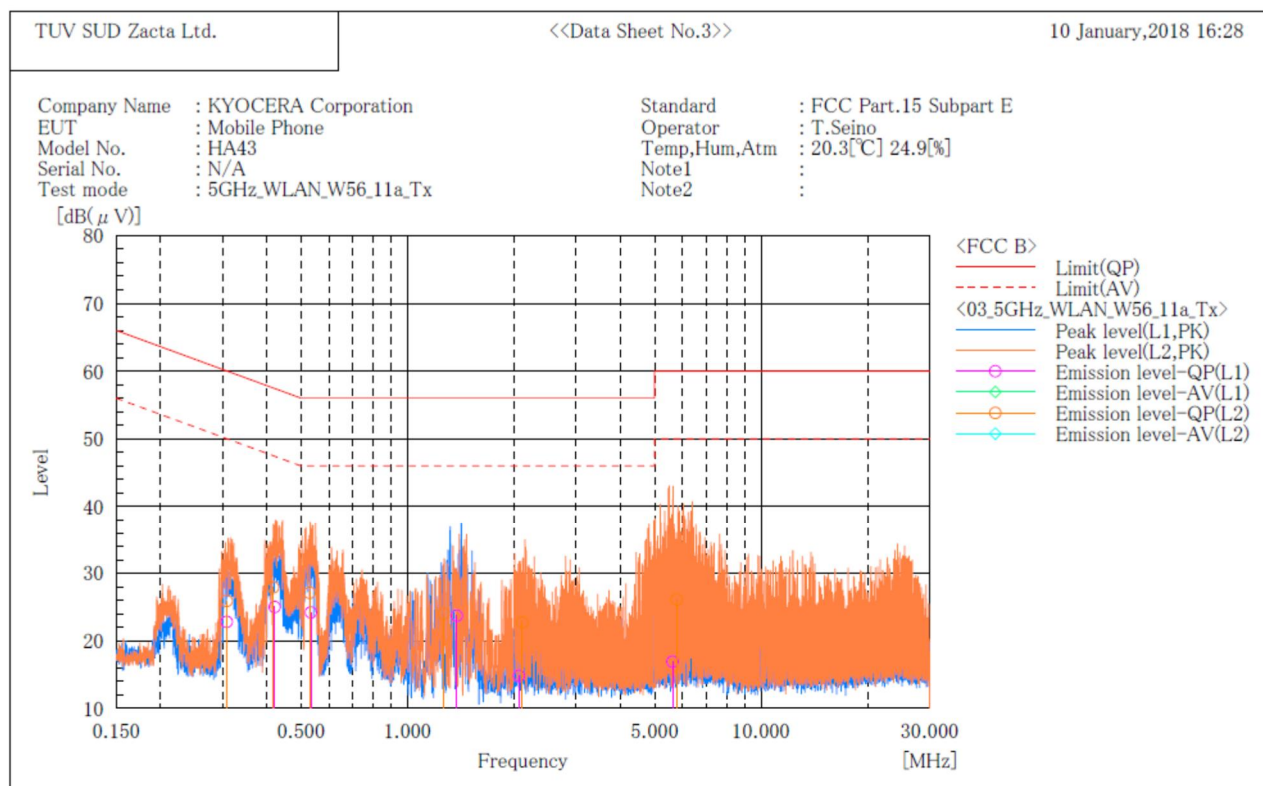
--- L1 Phase ---

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	0.311	12.1	-2.4	10.4	22.5	8.0	59.9	49.9	37.4	41.9
2	0.421	14.4	-2.2	10.4	24.8	8.2	57.4	47.4	32.6	39.2
3	0.528	13.3	-2.7	10.4	23.7	7.7	56.0	46.0	32.3	38.3
4	2.214	4.7	-4.6	10.5	15.2	5.9	56.0	46.0	40.8	40.1
5	5.810	6.7	-4.6	10.7	17.4	6.1	60.0	50.0	42.6	43.9
6	6.188	6.2	-4.6	10.7	16.9	6.1	60.0	50.0	43.1	43.9

--- 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	0.313	15.2	-1.6	10.4	25.6	8.8	59.9	49.9	34.3	41.1
2	0.424	17.4	-1.3	10.4	27.8	9.1	57.4	47.4	29.6	38.3
3	0.537	15.9	-2.0	10.4	26.3	8.4	56.0	46.0	29.7	37.6
4	2.141	11.5	-3.7	10.5	22.0	6.8	56.0	46.0	34.0	39.2
5	5.678	16.2	-3.4	10.7	26.9	7.3	60.0	50.0	33.1	42.7
6	6.122	14.3	-3.5	10.8	25.1	7.3	60.0	50.0	34.9	42.7

***** 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	0.308	12.4	-2.5	10.4	22.8	7.9	60.0	50.0	37.2	42.1
2	0.421	14.6	-2.1	10.4	25.0	8.3	57.4	47.4	32.4	39.1
3	0.533	13.8	-2.7	10.4	24.2	7.7	56.0	46.0	31.8	38.3
4	1.379	13.3	-3.3	10.4	23.7	7.1	56.0	46.0	32.3	38.9
5	2.065	4.3	-4.6	10.5	14.8	5.9	56.0	46.0	41.2	40.1
6	5.619	6.2	-4.6	10.7	16.9	6.1	60.0	50.0	43.1	43.9

--- 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	0.308	15.5	-1.9	10.4	25.9	8.5	60.0	50.0	34.1	41.5
2	0.417	17.5	-1.4	10.4	27.9	9.0	57.5	47.5	29.6	38.5
3	0.529	16.7	-1.9	10.4	27.1	8.5	56.0	46.0	28.9	37.5
4	1.266	13.6	-3.2	10.4	24.0	7.2	56.0	46.0	32.0	38.8
5	2.112	12.2	-3.6	10.5	22.7	6.9	56.0	46.0	33.3	39.1
6	5.770	15.3	-3.6	10.8	26.1	7.2	60.0	50.0	33.9	42.8

10. Duty Cycle

10.1 Measurement procedure

[KDB 789033 D02, Section B, Zero-Span Spectrum Analyzer Method]

The duty cycle 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;

- RBW=8MHz, VBW=8MHz, Span=0Hz, Sweep=Auto, Detector=Peak, Trace mode=Single

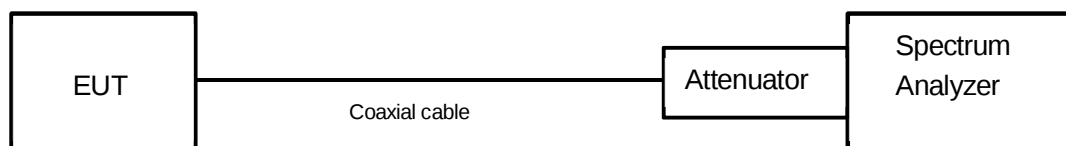
The EUT was set to operate with following conditions.

- 5.2GHz Band, 5.3GHz Band, 5.6GHz Band

The test mode of EUT is as follows.

- Tx mode

- Test configuration



10.2 Limit

None

10.3 Measurement result

Date : December 26, 2017
Temperature : 21.9 [°C]
Humidity : 34.3 [%]
Test place : Shielded room No.4

Test engineer : Chiaki Kanno

Mode	Channel	Frequency (MHz)	Duty Cycle				DCF (dB) 10log(1/x)	DCF (dB) 20log(1/x)
			On Time(ms)	On+Off Time(ms)	X	1/T		
802.11a	36	5180	1.364	1.372	0.994	733.1	0.025	0.051
	40	5200						
	48	5240						
	52	5260	1.364	1.372	0.994	733.1	0.025	0.051
	56	5280						
	64	5320						
	100	5500	1.364	1.372	0.994	733.1	0.025	0.051
	116	5580						
	140	5700						

Note: X = On time / (On + Off time)

Mode	Channel	Frequency (MHz)	Duty Cycle				DCF (dB) 10log(1/x)	DCF (dB) 20log(1/x)
			On Time(ms)	On+Off Time(ms)	X	1/T		
802.11n (20MHz)	36	5180	1.274	1.284	0.992	784.9	0.034	0.068
	40	5200						
	48	5240						
	52	5260	1.276	1.284	0.994	783.7	0.027	0.054
	56	5280						
	64	5320						
	100	5500	1.274	1.282	0.994	784.9	0.027	0.054
	116	5580						
	140	5700						

Note: X = On time / (On + Off time)

Mode	Channel	Frequency (MHz)	Duty Cycle				DCF (dB) 10log(1/x)	DCF (dB) 20log(1/x)
			On Time(ms)	On+Off Time(ms)	X	1/T		
802.11n (40MHz)	38	5190	0.635	0.645	0.984	1574.8	0.068	0.136
	46	5230						
	54	5270	0.635	0.645	0.984	1574.8	0.068	0.136
	62	5310						
	102	5510	0.635	0.645	0.984	1574.8	0.068	0.136
	110	5550						
	134	5670						

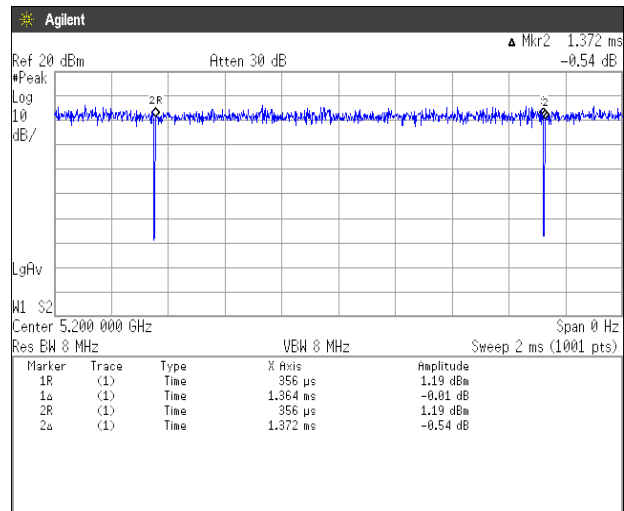
Note: X = On time / (On + Off time)

Mode	Channel	Frequency (MHz)	Duty Cycle				DCF (dB) 10log(1/x)	DCF (dB) 20log(1/x)
			On Time(ms)	On+Off Time(ms)	X	1/T		
802.11ac (80MHz)	42	5210	0.2475	0.2579	0.960	4040.4	0.179	0.358
	58	5290	0.2475	0.2579	0.960	4040.4	0.179	0.358
	106	5530	0.2480	0.2584	0.960	4032.3	0.178	0.357
	122	5610	0.2475	0.2584	0.958	4040.4	0.187	0.374

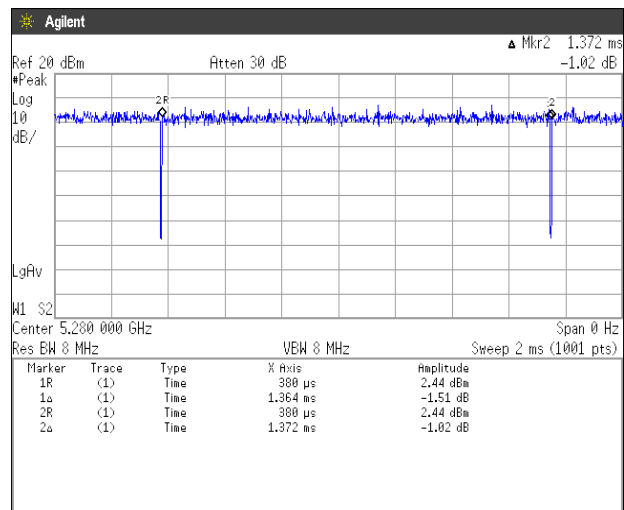
Note: X = On time / (On + Off time)

10.4 Trace data [IEEE802.11a]

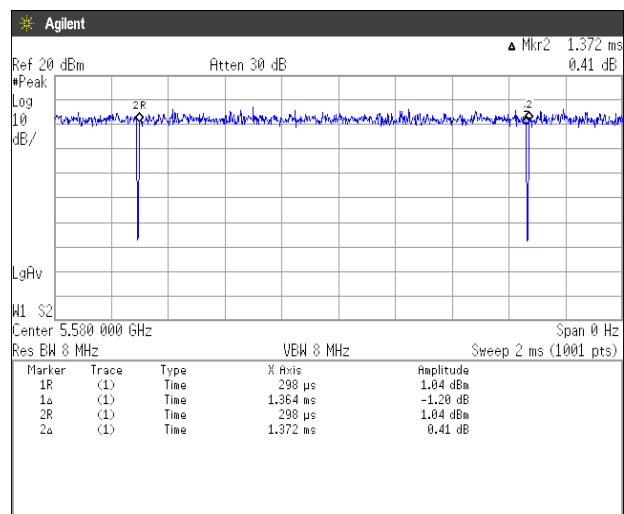
Channel: 40



Channel: 56

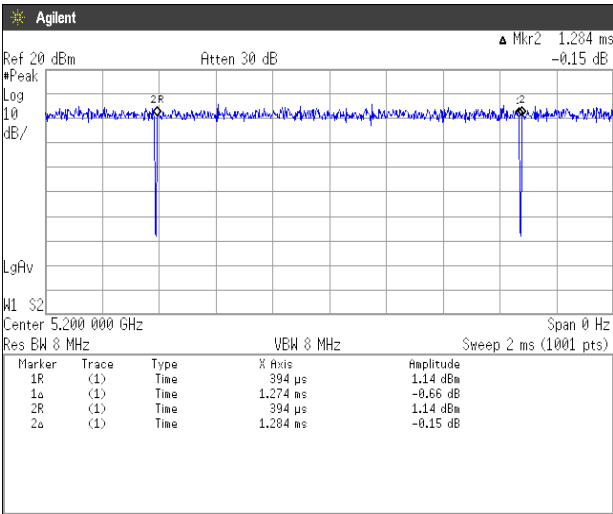


Channel: 116

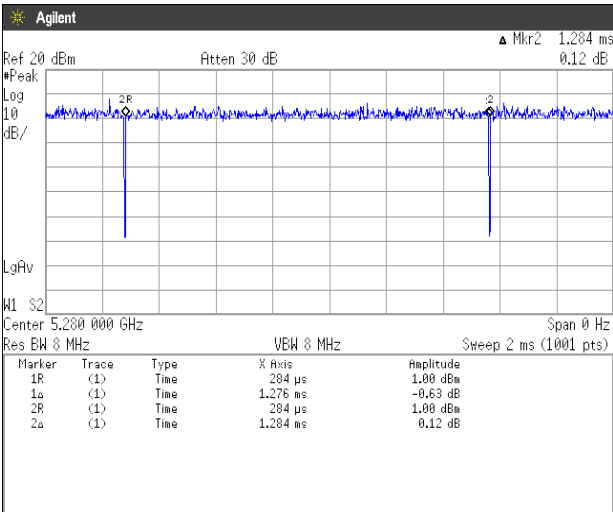


[IEEE802.11n (HT20)]

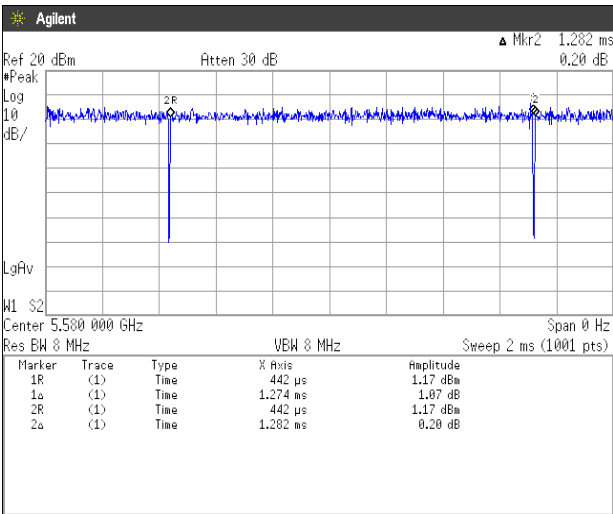
Channel: 40



Channel: 56

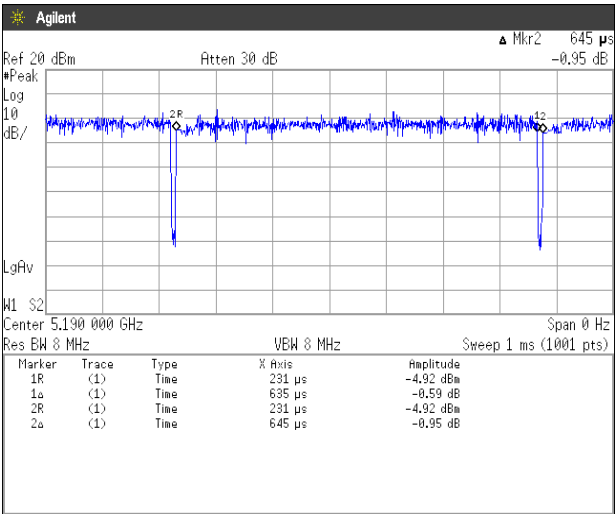


Channel: 116

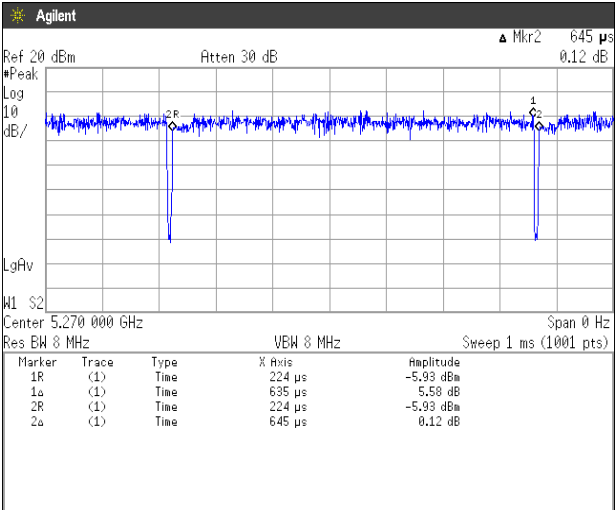


[IEEE802.11n (HT40)]

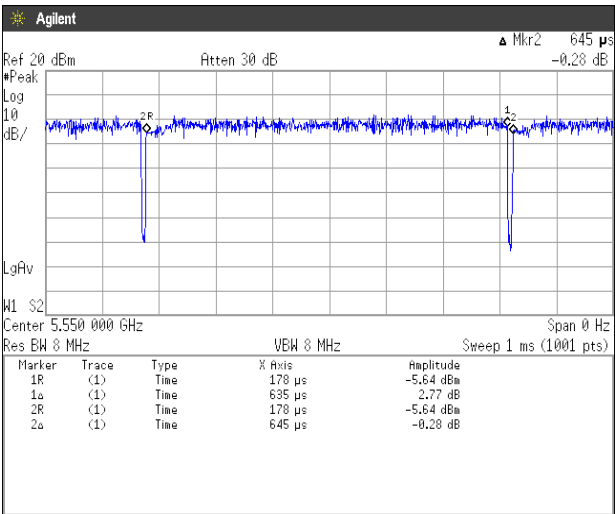
Channel: 38



Channel: 54

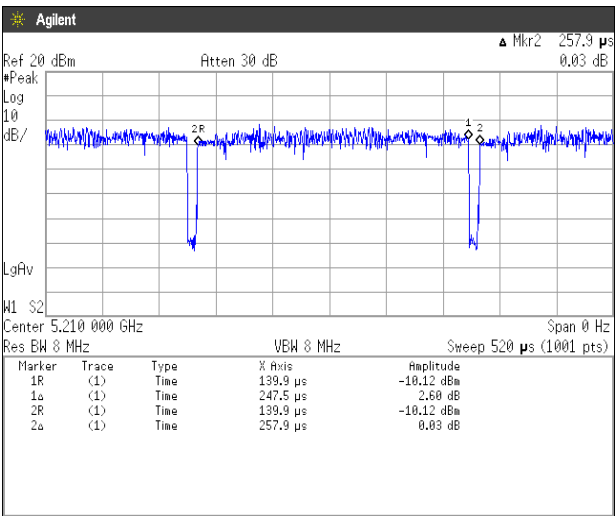


Channel: 110

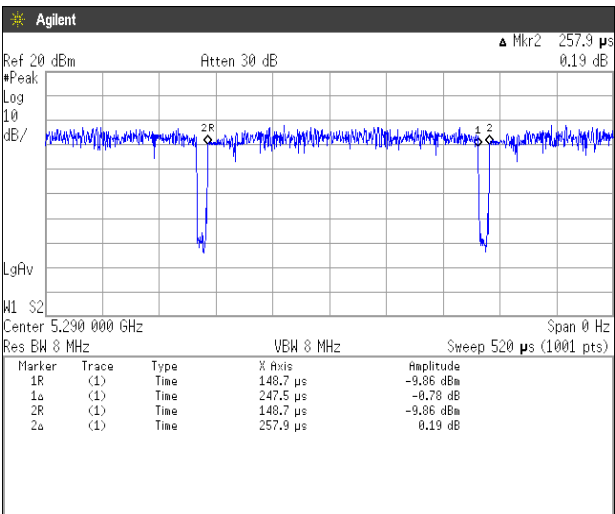


[IEEE802.11ac (HT80)]

Channel: 42

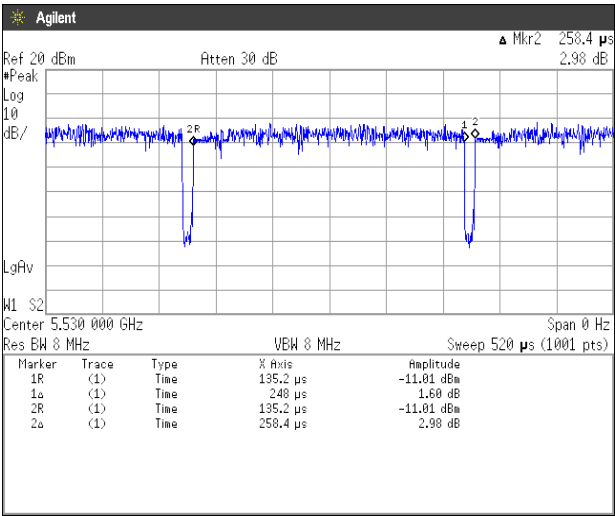


Channel: 58

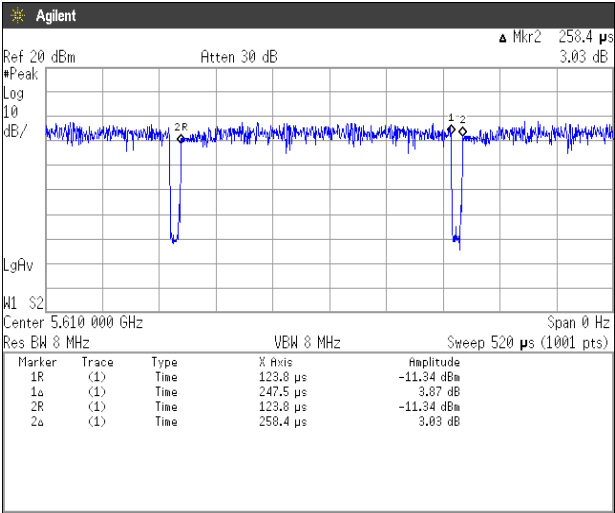


[IEEE802.11ac (HT80)]

Channel: 106



Channel: 122





Zacta

11. Antenna requirement

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

12. Uncertainty of measurement

Expanded uncertainties stated are calculated with a coverage Factor $k=2$.

Please note that these results are not taken into account when determining compliance or non-compliance with test result.

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



Zacta

13. Laboratory Information

1. Location

Name: Yonezawa Testing Center
 Address: 5-4149-7, Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan
 Phone: +81-238-28-2881
 Fax: +81-238-28-2888

2. Accreditation and Registration

- 1) VLAC
Accreditation No.: VLAC-013
- 2) NVLAP
LAB CODE: 200306-0
- 3) BSMI
Laboratory Code: SL2-IN-E-6018, SL2-A1-E-6018

4) Industry Canada

Site number	Facility	Expiration date
4224A-4	3m Semi-anechoic chamber	2020-11-27
4224A-5	10m Semi-anechoic chamber No.1	2020-11-27
4224A-6	10m Semi-anechoic chamber No.2	2019-12-14

5) VCCI Council

Registration number	Expiration date
A-0166	2019-07-03

Appendix A. Test equipment

Antenna port conducted test

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	Jun. 30, 2018	Jun. 28, 2017
Attenuator	HUBER+SUHNER	6810.19.A	N/A(S450)	Jan. 31, 2018	Jan. 20, 2017
Microwave cable	HUBER+SUHNER	SUCOFLEX 104	199119/4	Feb. 28, 2018	Feb. 2, 2017
Temperature and humidity chamber	ESPEC	PL1KP	14007261	Jan. 31, 2018	Jan. 20, 2017

Radiated emission

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	Sep. 30, 2018	Sep. 13, 2017
Spectrum analyzer	Agilent Technologies	E4447A	MY46180188	Mar. 31, 2018	Mar. 15, 2017
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	Oct. 31, 2018	Oct. 19, 2017
Preamplifier	ANRITSU	MH648A	M96057	Feb. 28, 2018	Feb. 1, 2017
Preamplifier	SONOMA	310	372170	Sep. 30, 2018	Sep. 12, 2017
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	Feb. 28, 2018	Feb. 17, 2017
Attenuator	TDC	TAT-43B-06	N/A(S209)	May 31, 2018	May 23, 2017
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	2155	Jul. 31, 2018	Jul. 18, 2017
Log periodic antenna	Schwarzbeck	UHALP9108A	0560	Jul. 31, 2018	Jul. 18, 2017
Attenuator	TME	CFA-01NPJ-6	N/A(S275)	Feb. 28, 2018	Feb. 3, 2017
Attenuator	TME	CFA-01NPJ-3	N/A(S272)	Feb. 28, 2018	Feb. 2, 2017
Preamplifier	TSJ	MLA-100M18-B02-40	1929118	Feb. 28, 2018	Feb. 3, 2017
Attenuator	AEROFLEX	26A-10	081217-08	May 31, 2018	May 24, 2017
Double ridged guide antenna	ETS LINDGREN	3117	00052315	Feb. 28, 2018	Feb. 23, 2017
Attenuator	Agilent Technologies	8491B	MY39268633	Feb. 28, 2018	Feb. 2, 2017
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170189	Jun. 30, 2018	Jun. 7, 2017
Double ridged guide antenna	A.H.Systems Inc.	SAS-574	469	Aug. 31, 2018	Aug. 8, 2017
Preamplifier	TSJ	MLA-1840-B03-35	1240332	Aug. 31, 2018	Aug. 8, 2017
Notch filter	Micro-Tronics	BRM50716	006	Jul. 31, 2018	Jul. 20, 2017
Microwave cable	HUBER+SUHNER	SUCOFLEX104/9m	MY30037/4	Feb. 28, 2018	Feb. 3, 2017
		SUCOFLEX104/1m	my24610/4	Feb. 28, 2018	Feb. 3, 2017
		SUCOFLEX104/8m	SN MY30031/4	Feb. 28, 2018	Feb. 2, 2017
		SUCOFLEX104/1.5m	MY32976/4	Feb. 28, 2018	Feb. 2, 2017
		SUCOFLEX104/1.5m	MY19309/4	Feb. 28, 2018	Feb. 3, 2017
		SUCOFLEX104/7m	41625/6	Feb. 28, 2018	Feb. 3, 2017
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)	May 31, 2018	May 30, 2017
3m Semi an-echoic Chamber	TOKIN	N/A	N/A(9002-SVSWR)	May 31, 2018	May 31, 2017

Conducted emission at mains port

Equipment	Company	Model No.	Serial No.	Cal. Due	Cal. Date
EMI Receiver	ROHDE&SCHWARZ	ESCI	100765	Sep. 30, 2018	Sep. 13, 2017
Attenuator	HUBER+SUHNER	6810.01.A	N/A (S411)	Feb. 28, 2018	Feb. 2, 2017
Line impedance stabilization network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-407F2	12-17-110-2	Apr. 30, 2018	Apr. 25, 2017
Coaxial cable	FUJIKURA	5D-2W/4m	N/A (S350)	Feb. 28, 2018	Feb. 2, 2017
Coaxial cable	FUJIKURA	5D-2W/1m	N/A (S193)	Feb. 28, 2018	Feb. 3, 2017
Coaxial cable	HUBER+SUHNER	RG214/U/10m	N/A (S194)	Feb. 28, 2018	Feb. 3, 2017
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.