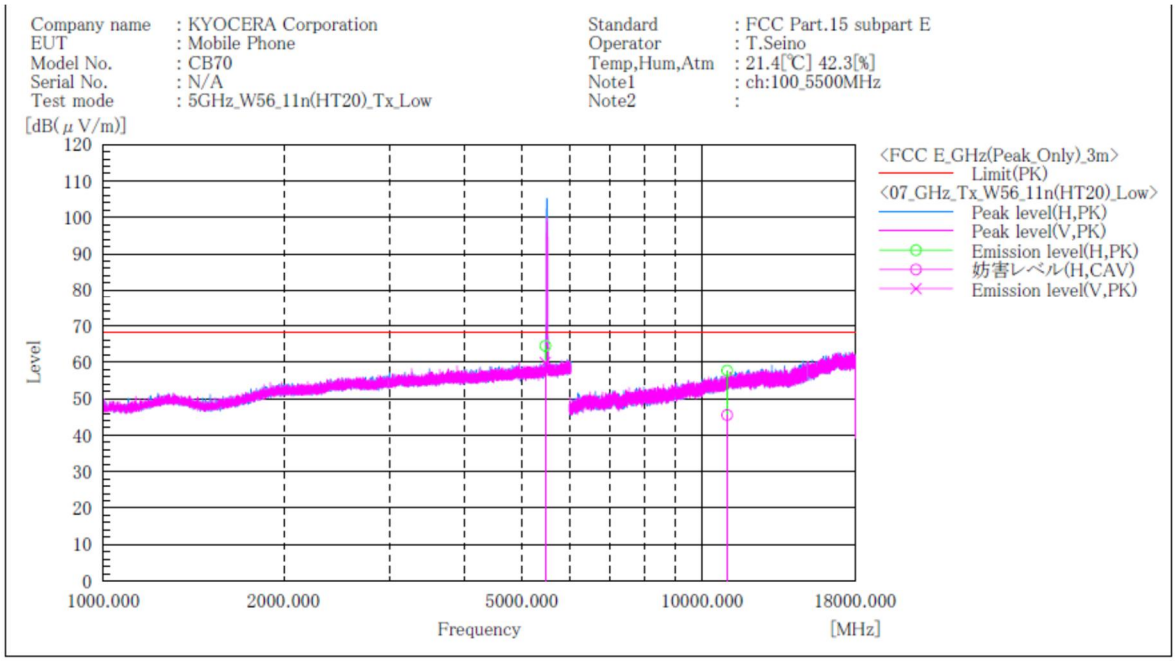
[11n(HT20)]
W56 / Channel Low
ABOVE 1GHz



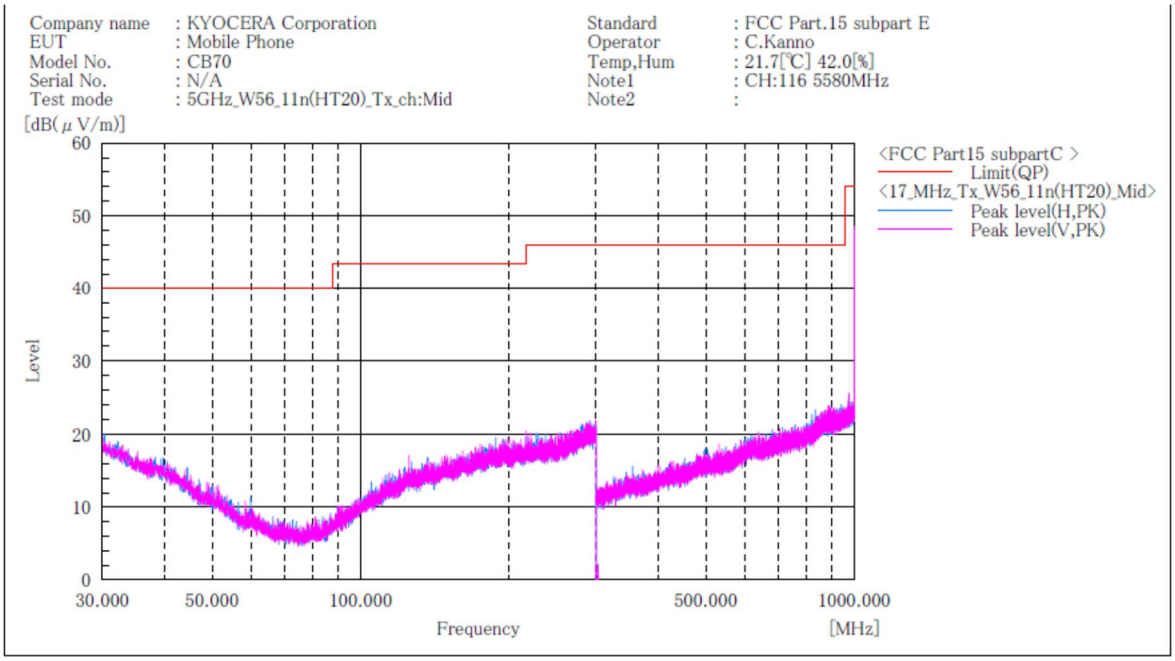
Final Result

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 [°]
1	5468.900	H	53.5	--------	11.0	64.5	--------	68.2	3.7	--------	100.0	78.0
2	5464.700	V	48.9	--------	11.0	59.9	--------	68.2	8.3	--------	129.0	23.0
3	11000.000	H	45.8	33.6	11.9	57.7	45.5	74.0	16.3	8.5	100.0	79.0

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.

Japan

[11n(HT20)]
W56 / Channel Middle
BELOW 1GHz



Final Result

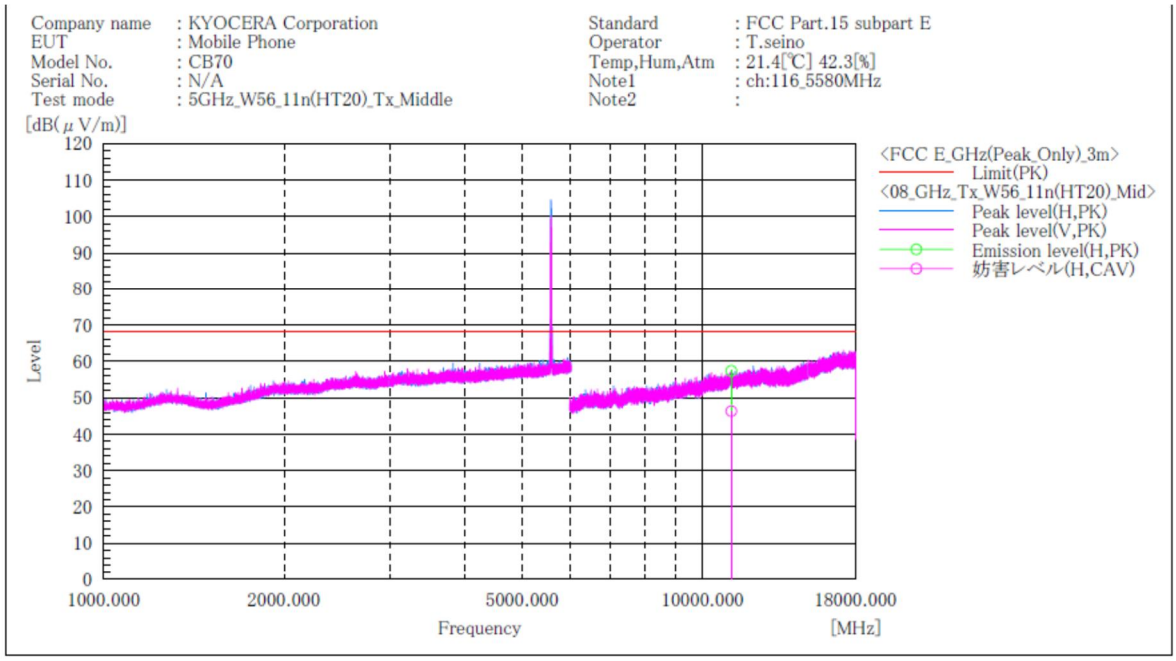
No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

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.

Japan

[11n(HT20)]
W56 / Channel Middle
ABOVE 1GHz



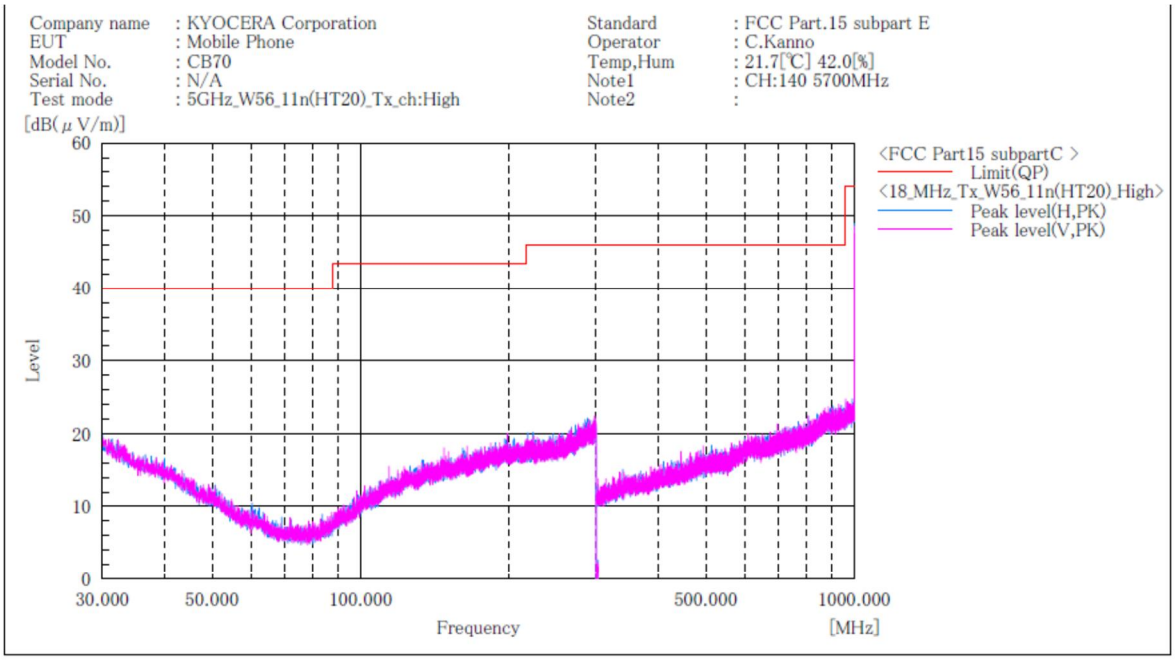
Final Result

No.	Frequency	(P)	Reading PK	Reading CAV	c.f	Result PK	Result CAV	Limit PK	Margin PK	Margin CAV	Height	Angle
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]
1	11160.000	H	45.4	34.3	12.0	57.4	46.3	74.0	16.6	7.7	100.0	95.0

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(HT20)]
W56 / Channel High
BELOW 1GHz



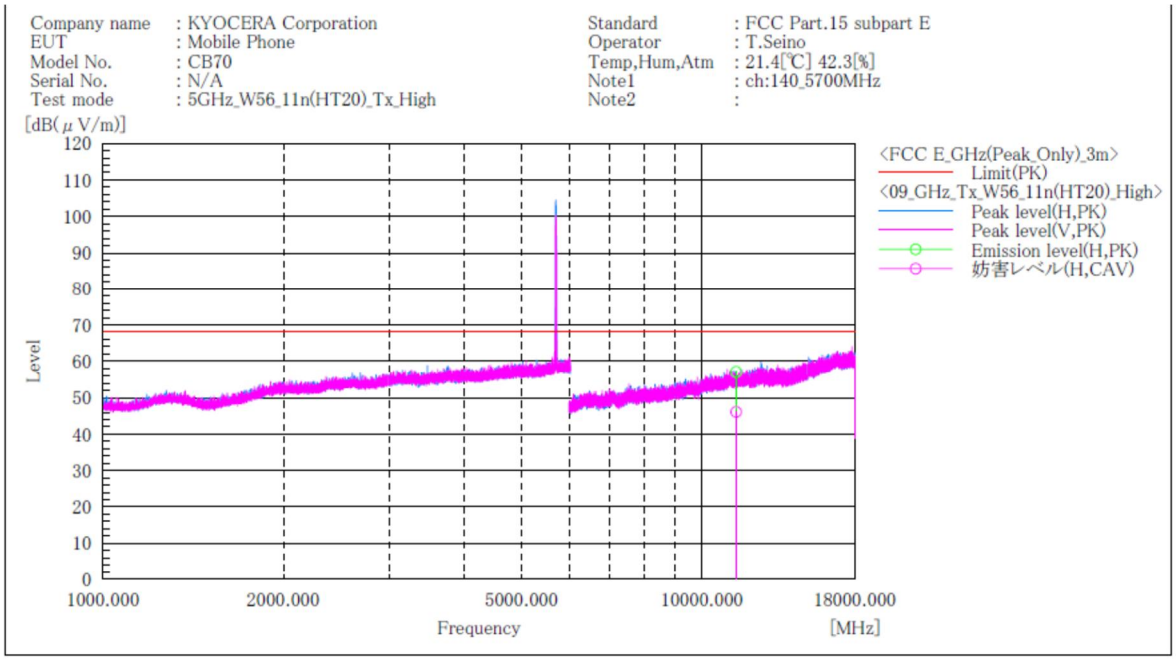
Final Result

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

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.

Japan

[11n(HT20)]
W56 / Channel High
ABOVE 1GHz



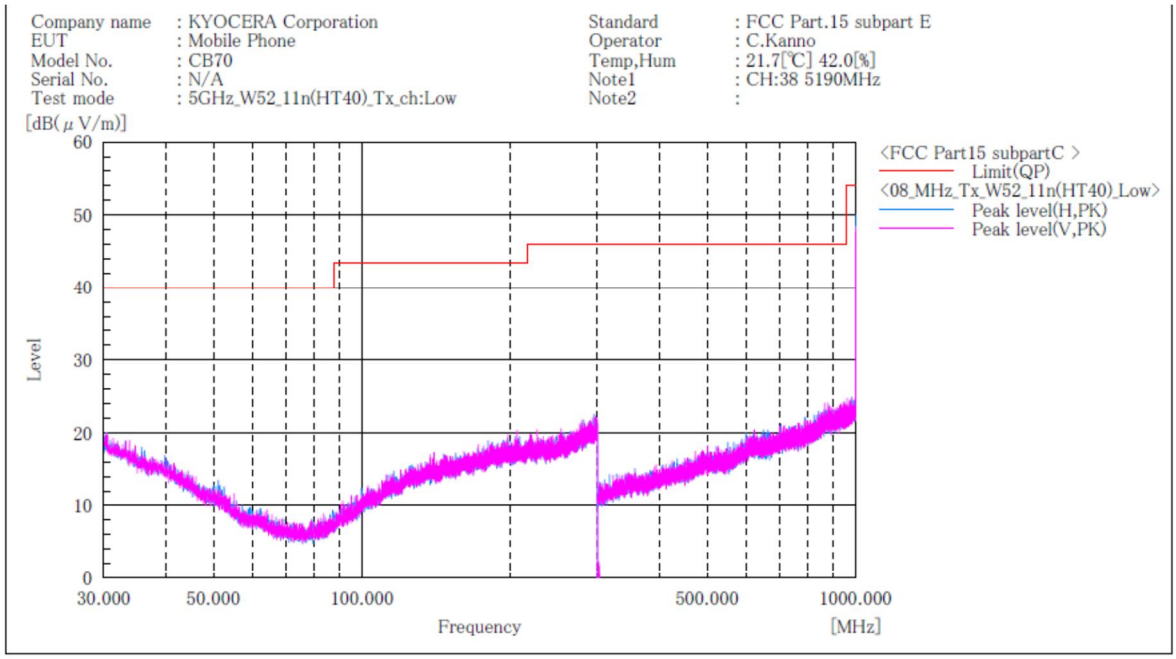
Final Result

No.	Frequency	(P)	Reading PK	Reading CAV	c.f	Result PK	Result CAV	Limit PK	Margin PK	Margin CAV	Height	Angle
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]
1	11400.000	H	44.9	33.9	12.2	57.1	46.1	74.0	16.9	7.9	100.0	93.0

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(HT40)]
W52 / Channel Low
BELOW 1GHz



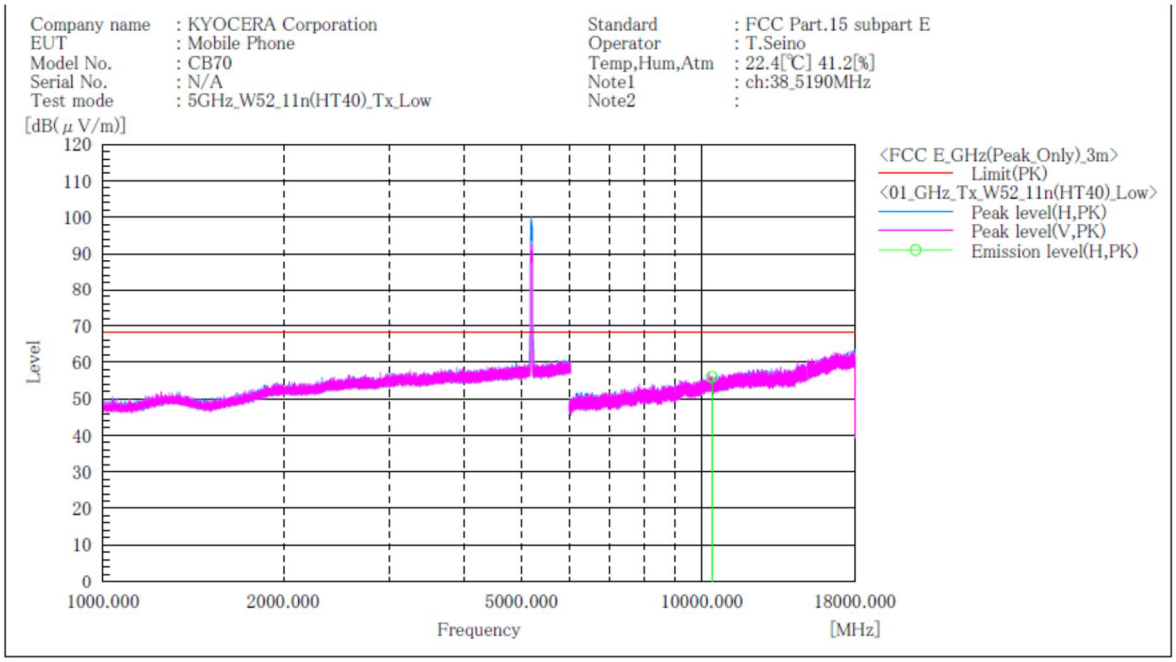
Final Result

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

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(HT40)]
W52 / Channel Low
ABOVE 1GHz

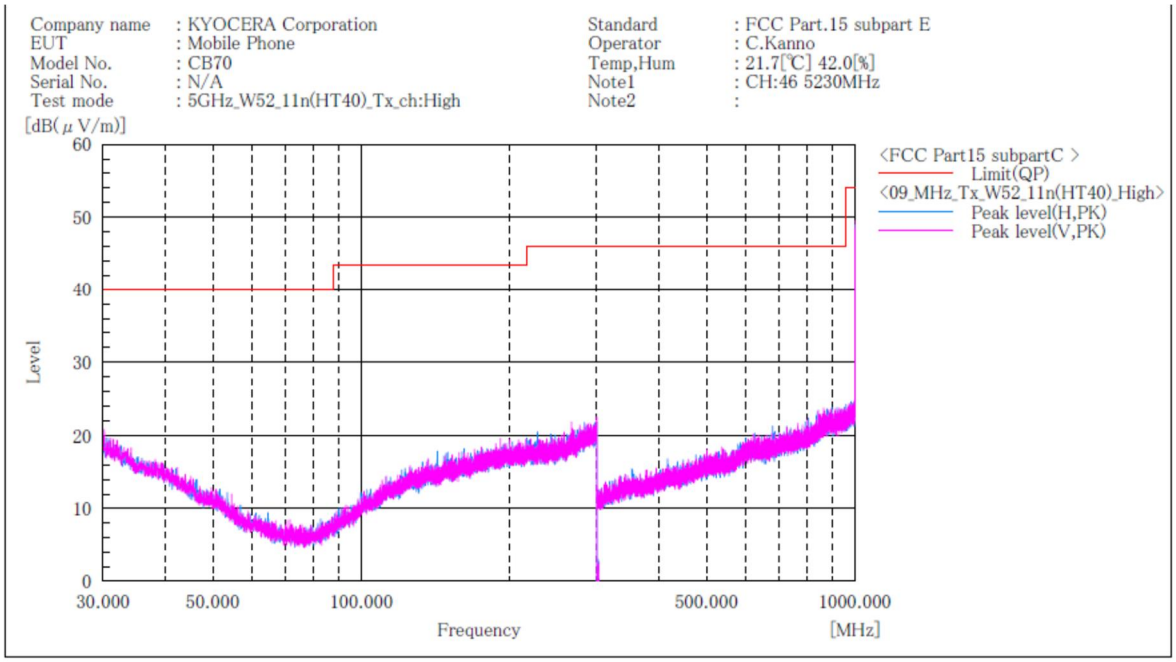


Final Result

No.	Frequency	(P)	Reading PK	c.f	Result PK	Limit PK	Margin PK	Height	Angle
	[MHz]		[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[cm]	[°]
1	10380.000	H	45.2	10.8	56.0	68.2	12.2	100.0	89.0

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(HT40)]
W52 / Channel High
BELOW 1GHz



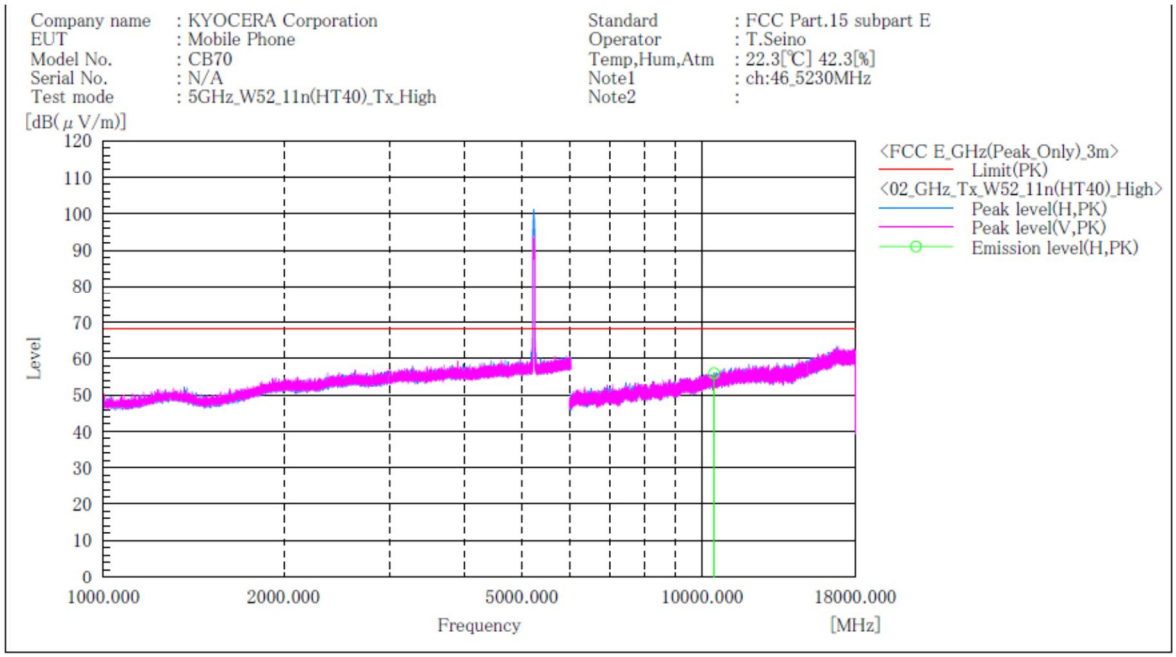
Final Result

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

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.

Japan

[11n(HT40)]
W52 / Channel High
ABOVE 1GHz



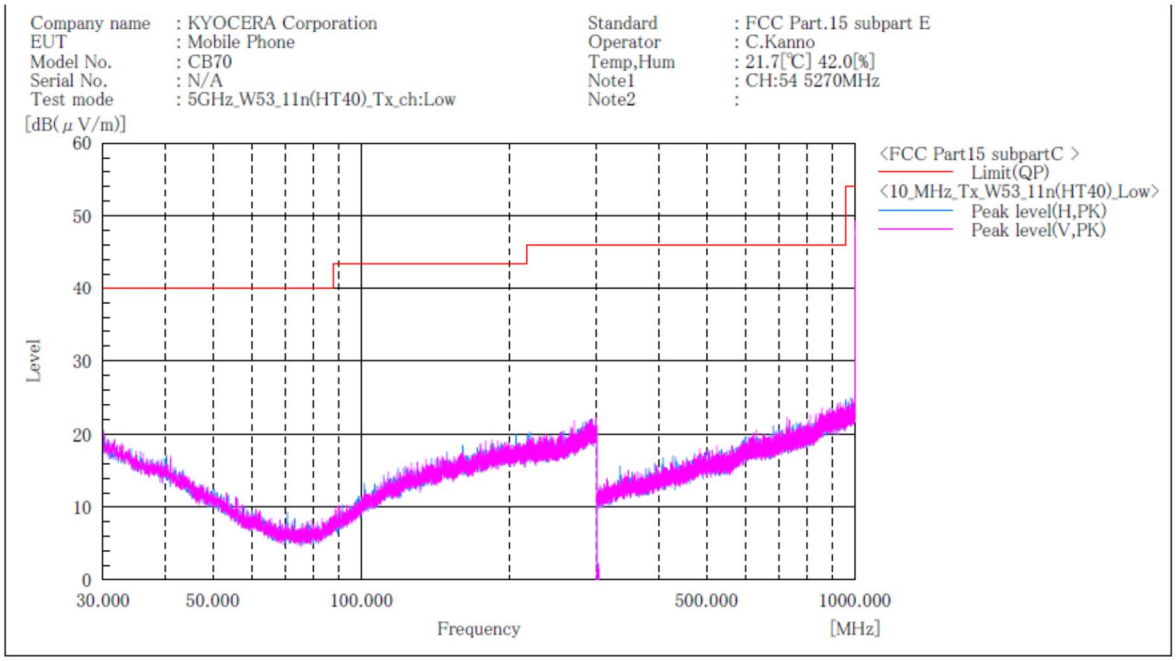
Final Result

No.	Frequency	(P)	Reading PK	c.f	Result PK	Limit PK	Margin PK	Height	Angle
	[MHz]		[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[cm]	[°]
1	10460.000	H	45.0	11.0	56.0	68.2	12.2	100.0	90.0

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.

Japan

[11n(HT40)]
W53 / Channel Low
BELOW 1GHz



Final Result

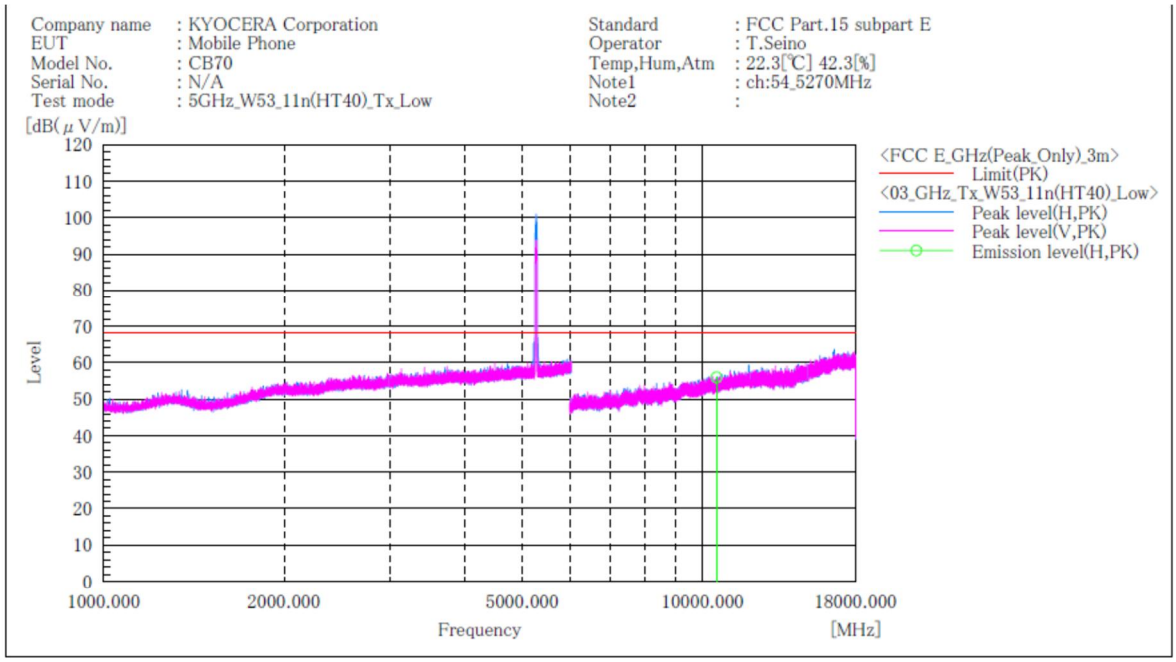
No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

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.

Japan

[11n(HT40)]
W53 / Channel Low
ABOVE 1GHz



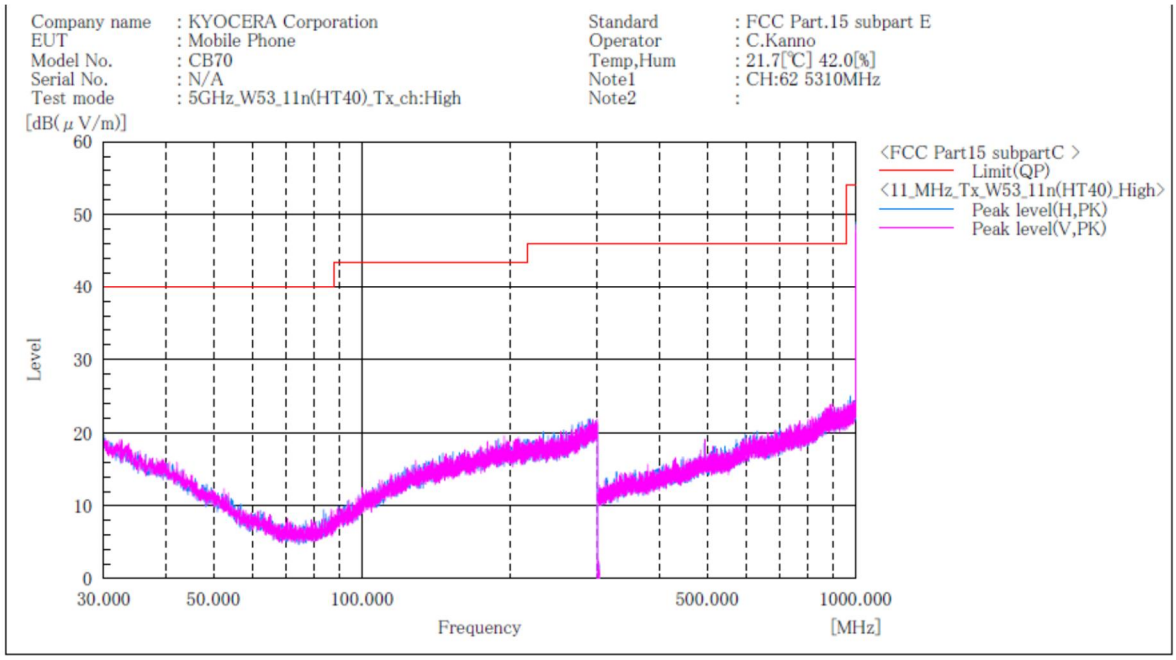
Final Result

No.	Frequency	(P)	Reading PK	c.f	Result PK	Limit PK	Margin PK	Height	Angle
	[MHz]		[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[cm]	[°]
1	10540.000	H	44.9	11.1	56.0	68.2	12.2	100.0	88.0

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(HT40)]
W53 / Channel High
BELOW 1GHz



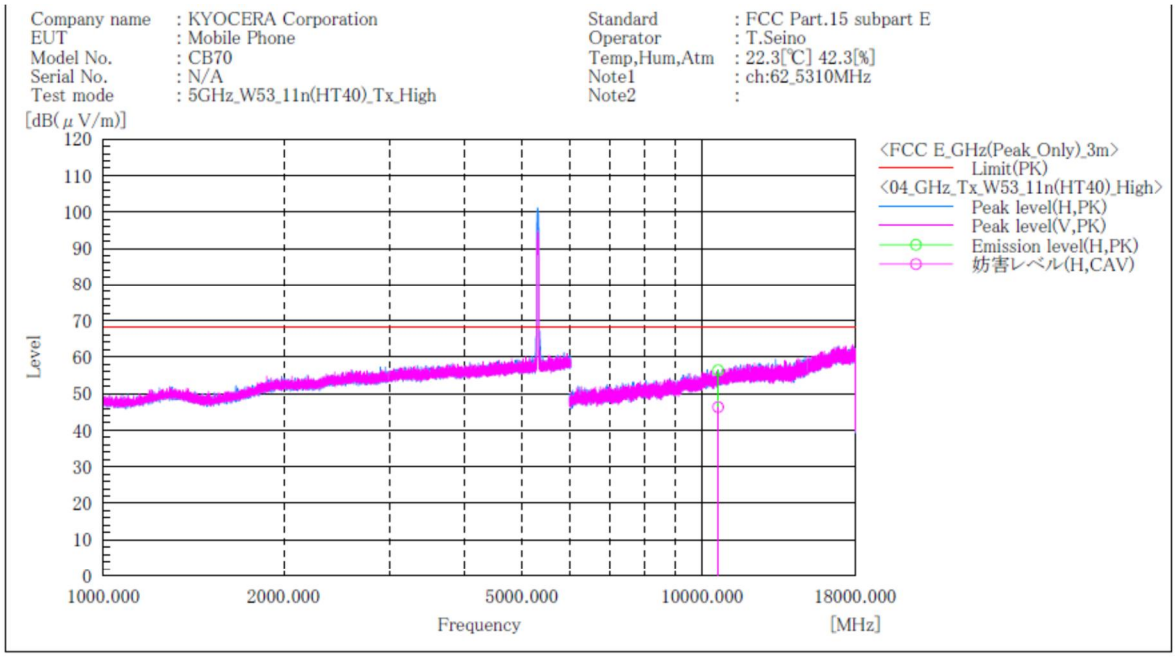
Final Result

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

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.

Japan

[11n(HT40)]
W53 / Channel High
ABOVE 1GHz



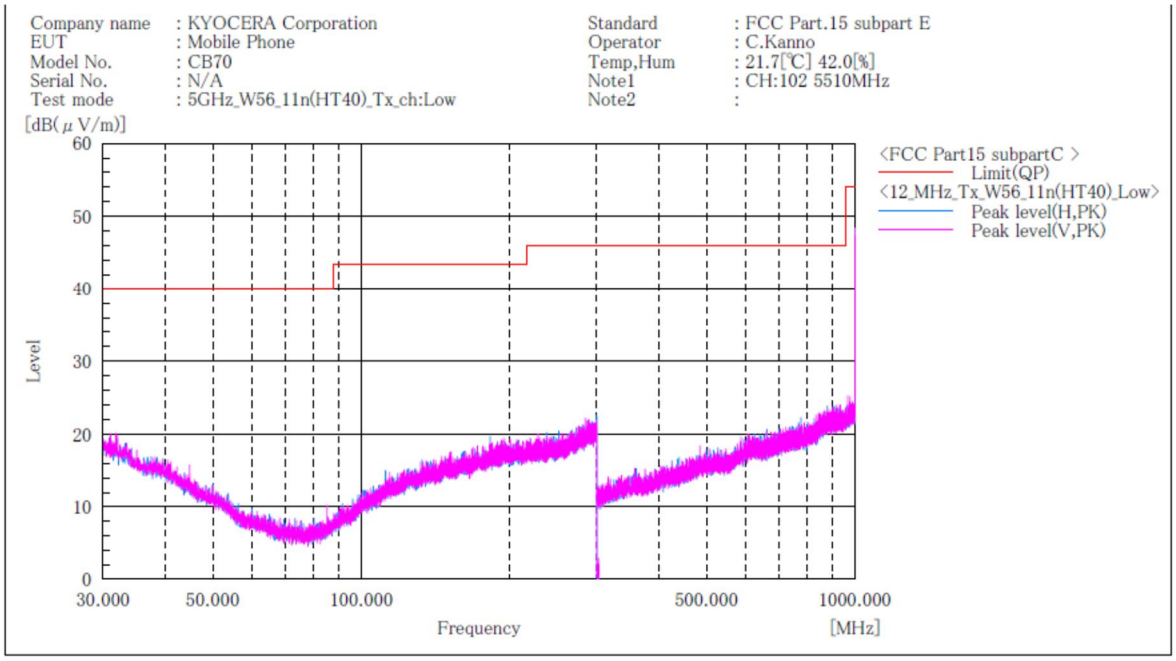
Final Result

No.	Frequency	(P)	Reading PK	Reading CAV	c.f	Result PK	Result CAV	Limit PK	Margin PK	Margin CAV	Height	Angle
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]
1	10620.000	H	45.1	35.0	11.3	56.4	46.3	74.0	17.6	7.7	100.0	79.0

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(HT40)]
W56 / Channel Low
BELOW 1GHz



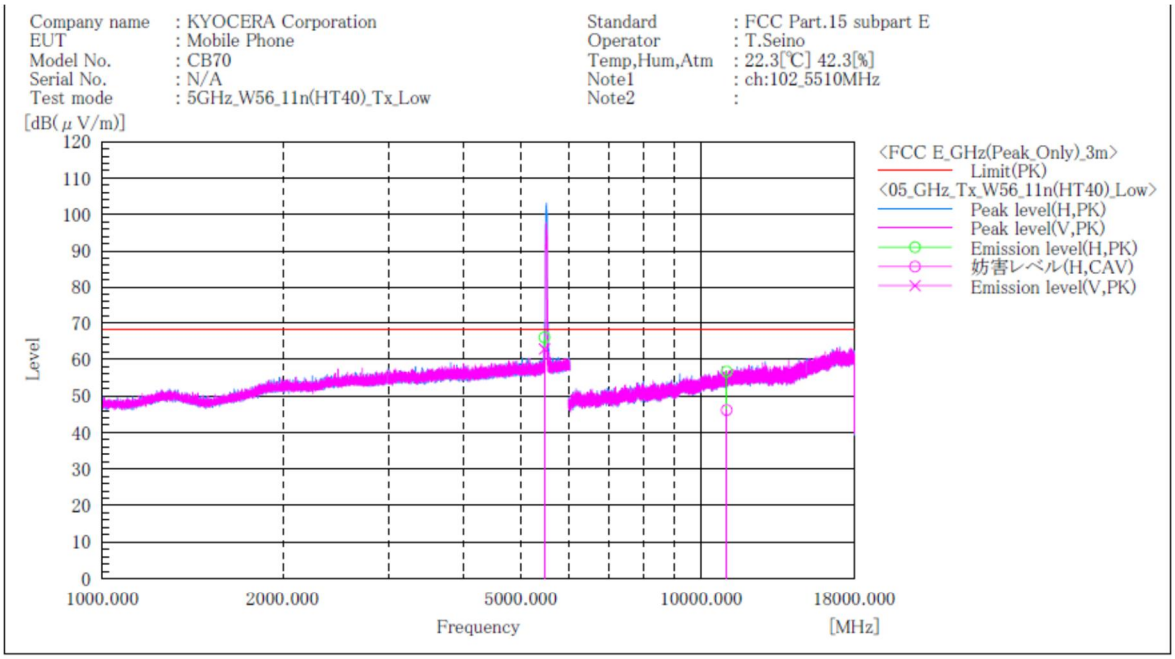
Final Result

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

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(HT40)]
W56 / Channel Low
ABOVE 1GHz



Final Result

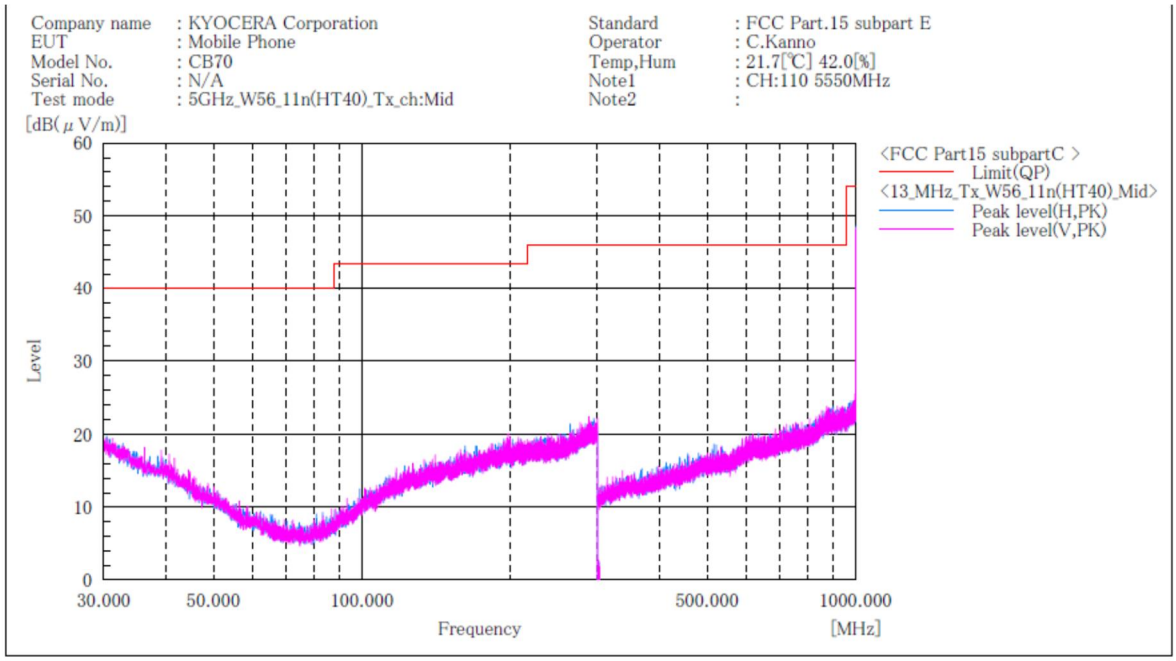
No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [°]
1	5467.700	H	55.0	---------	11.0	66.0	---------	68.2	2.2	---------	100.0	101.0
2	5469.800	V	51.8	---------	11.0	62.8	---------	68.2	5.4	---------	100.0	140.0
3	11020.000	H	44.8	34.2	11.9	56.7	46.1	74.0	17.3	7.9	100.0	77.0

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.

Japan

[11n(HT40)]
W56 / Channel Middle
BELOW 1GHz



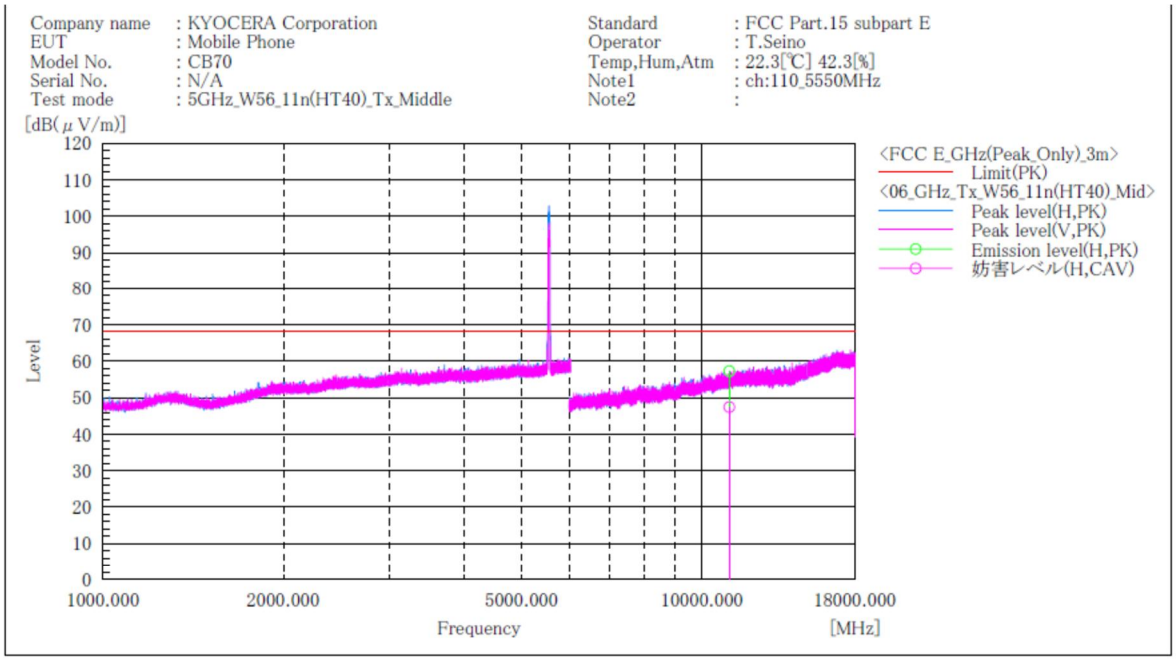
Final Result

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

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(HT40)]
W56 / Channel Middle
ABOVE 1GHz

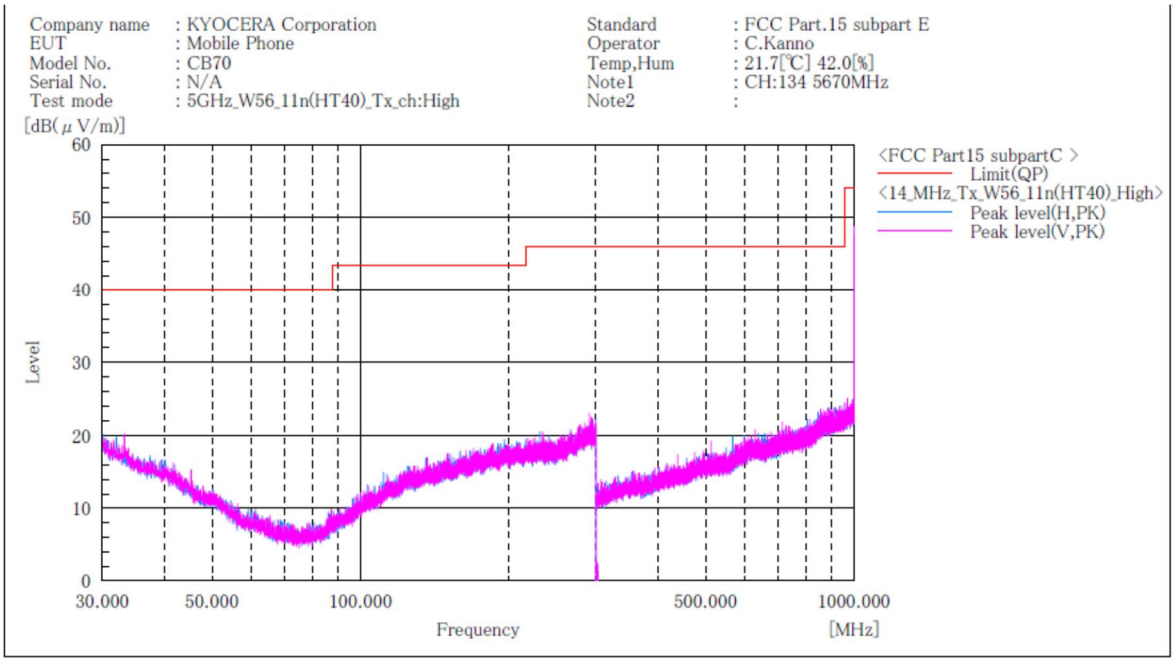


Final Result

No.	Frequency	(P)	Reading PK	Reading CAV	c.f	Result PK	Result CAV	Limit PK	Margin PK	Margin CAV	Height	Angle
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]
1	11100.000	H	45.3	35.4	12.0	57.3	47.4	74.0	16.7	6.6	100.0	99.0

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(HT40)]
W56 / Channel High
BELOW 1GHz



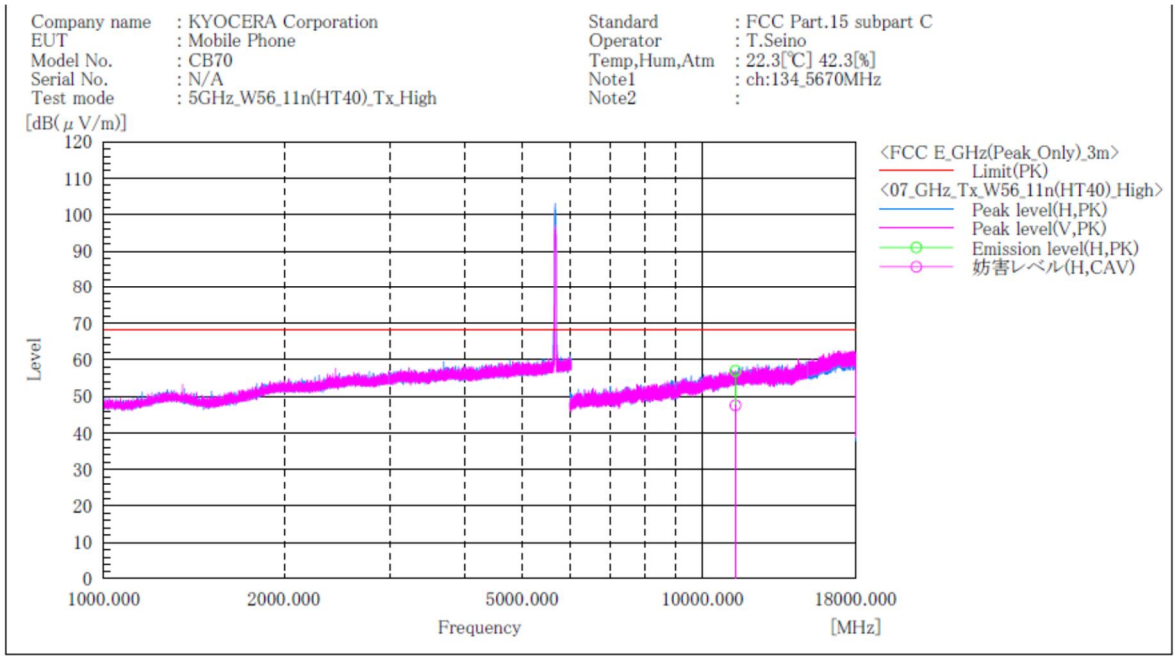
Final Result

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

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(HT40)]
W56 / Channel High
ABOVE 1GHz



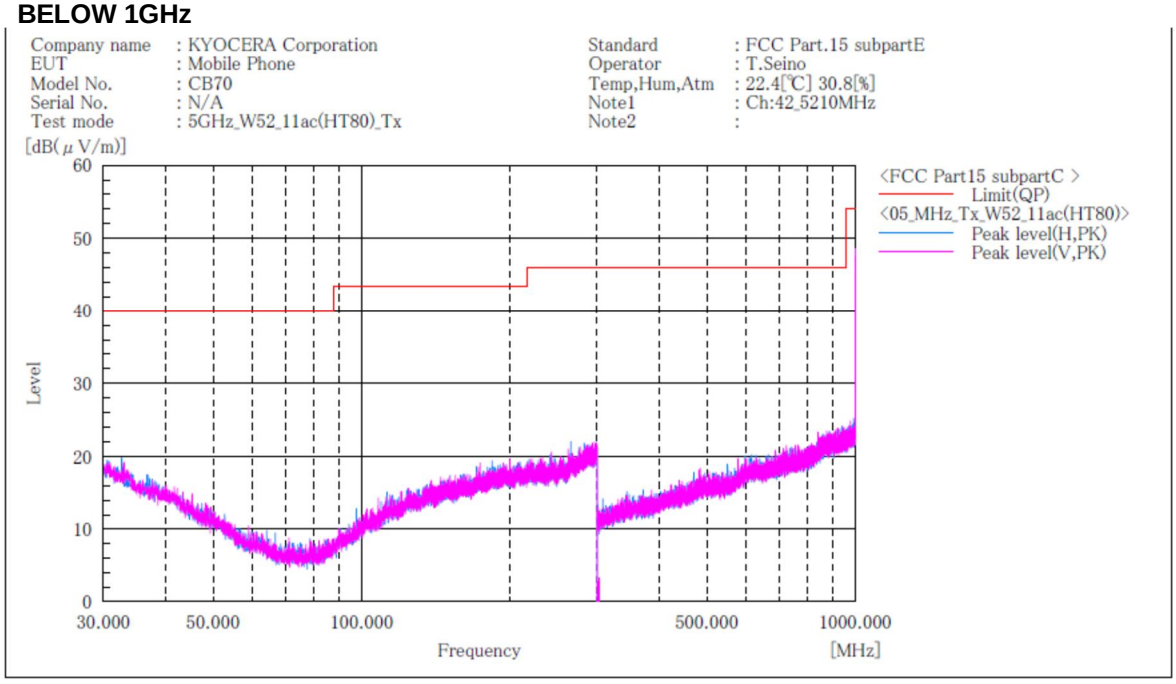
Final Result

No.	Frequency	(P)	Reading PK	Reading CAV	c.f	Result PK	Result CAV	Limit PK	Margin PK	Margin CAV	Height	Angle
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]
1	11340.000	H	44.8	35.3	12.2	57.0	47.5	74.0	17.0	6.5	100.0	93.0

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.

Japan

[11n(HT80)]
W52
BELOW 1GHz



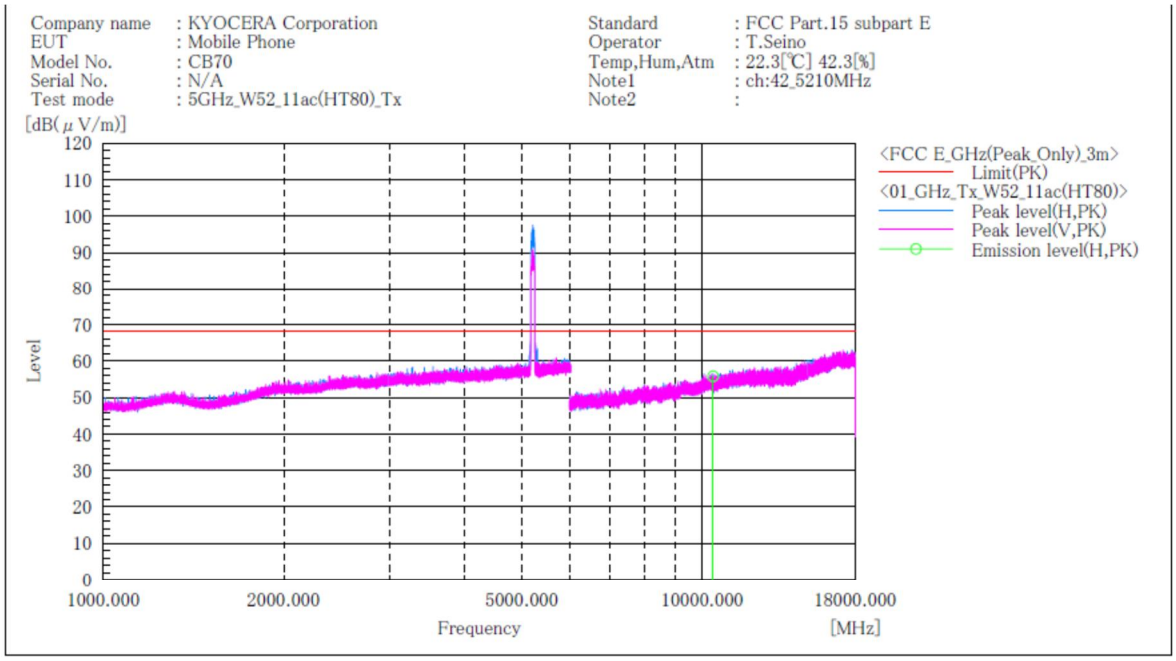
Final Result

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

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.

Japan

[11n(HT80)]
W52
ABOVE 1GHz



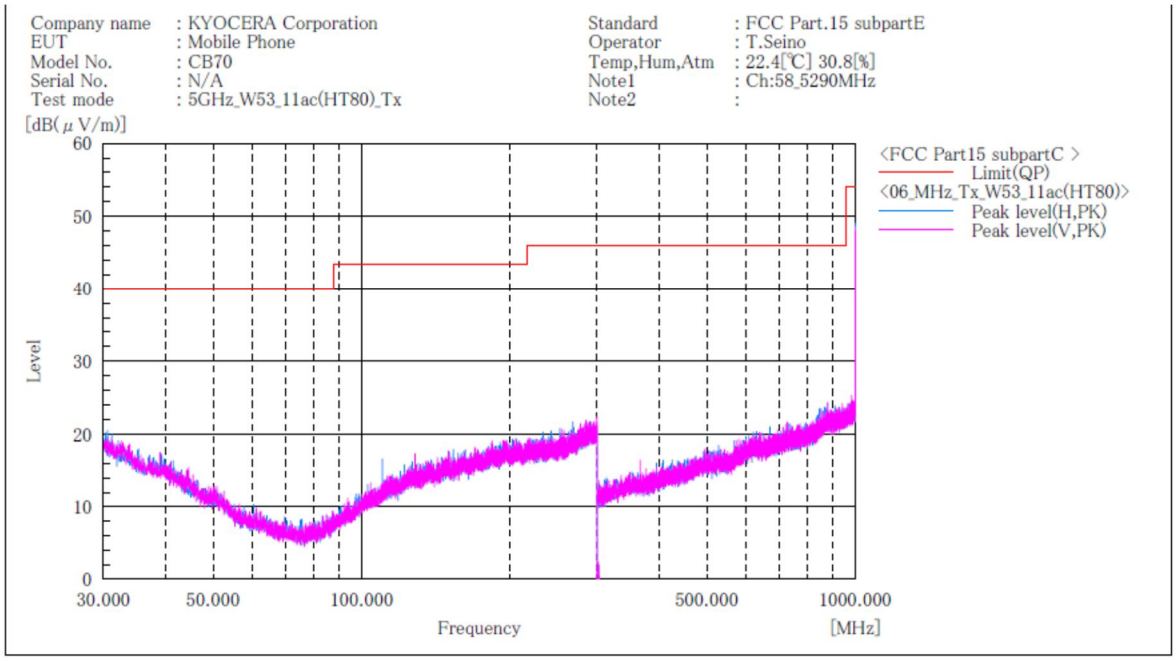
Final Result

No.	Frequency	(P)	Reading PK	c.f	Result PK	Limit PK	Margin PK	Height	Angle
	[MHz]		[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[cm]	[°]
1	10420.000	H	44.9	10.9	55.8	68.2	12.4	100.0	88.0

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.

Japan

[11n(HT80)]
W53
BELOW 1GHz



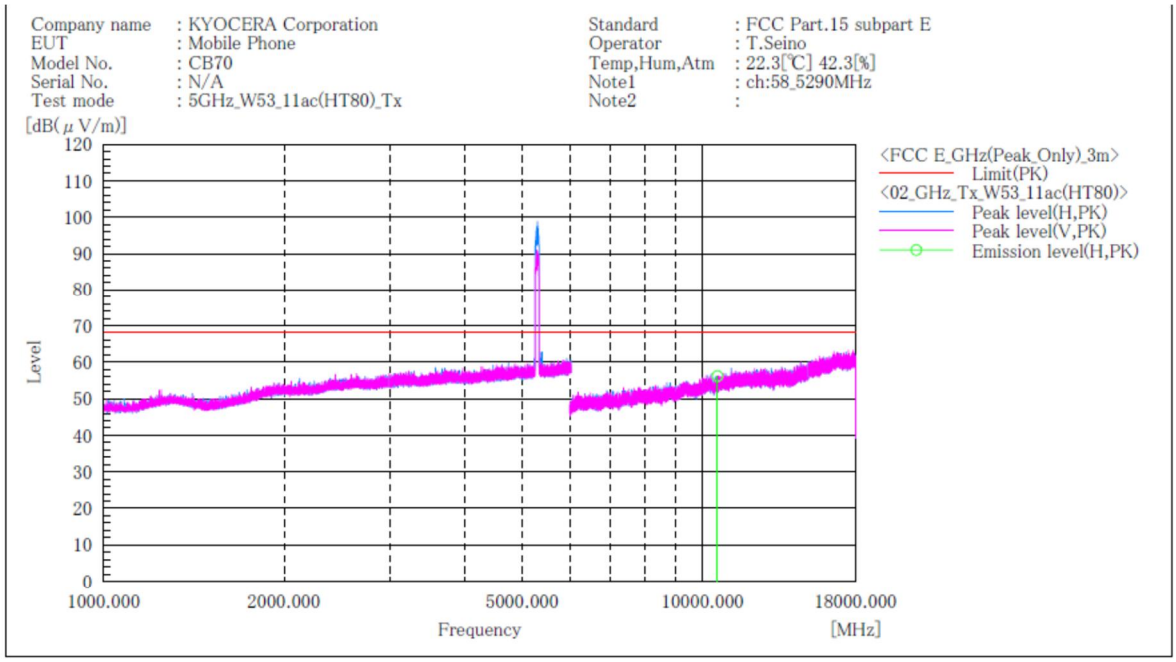
Final Result

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

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.

Japan

[11n(HT80)]
W53
ABOVE 1GHz



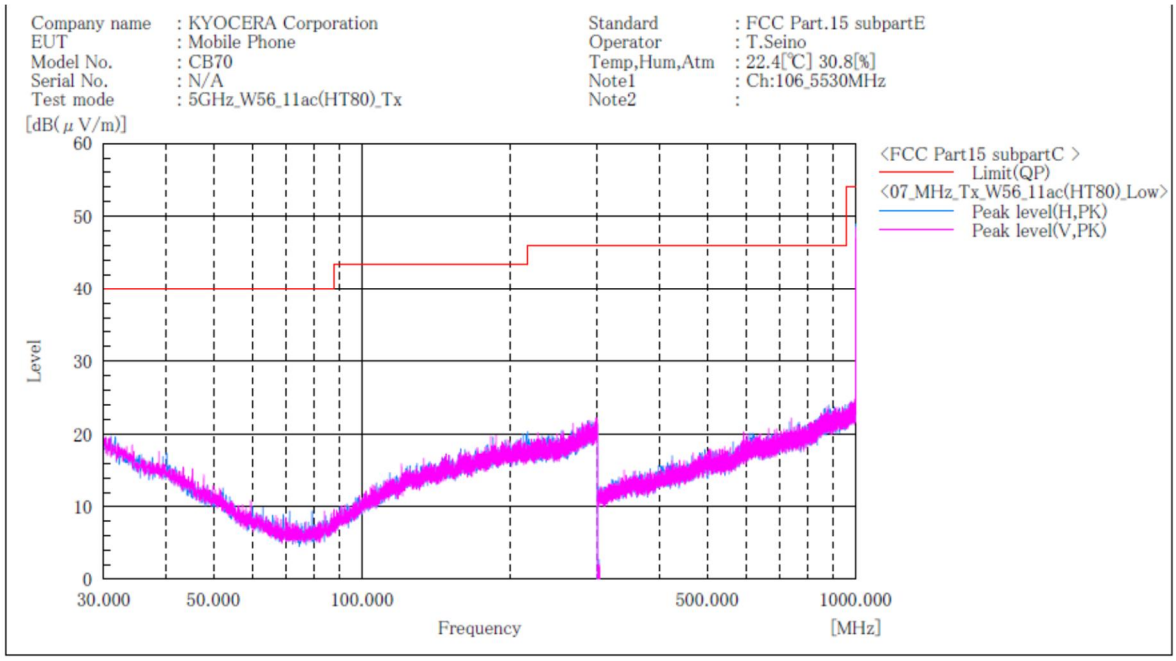
Final Result

No.	Frequency	(P)	Reading PK	c.f	Result PK	Limit PK	Margin PK	Height	Angle
	[MHz]		[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[cm]	[°]
1	10580.000	H	45.0	11.2	56.2	68.2	12.0	128.0	23.0

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.

Japan

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

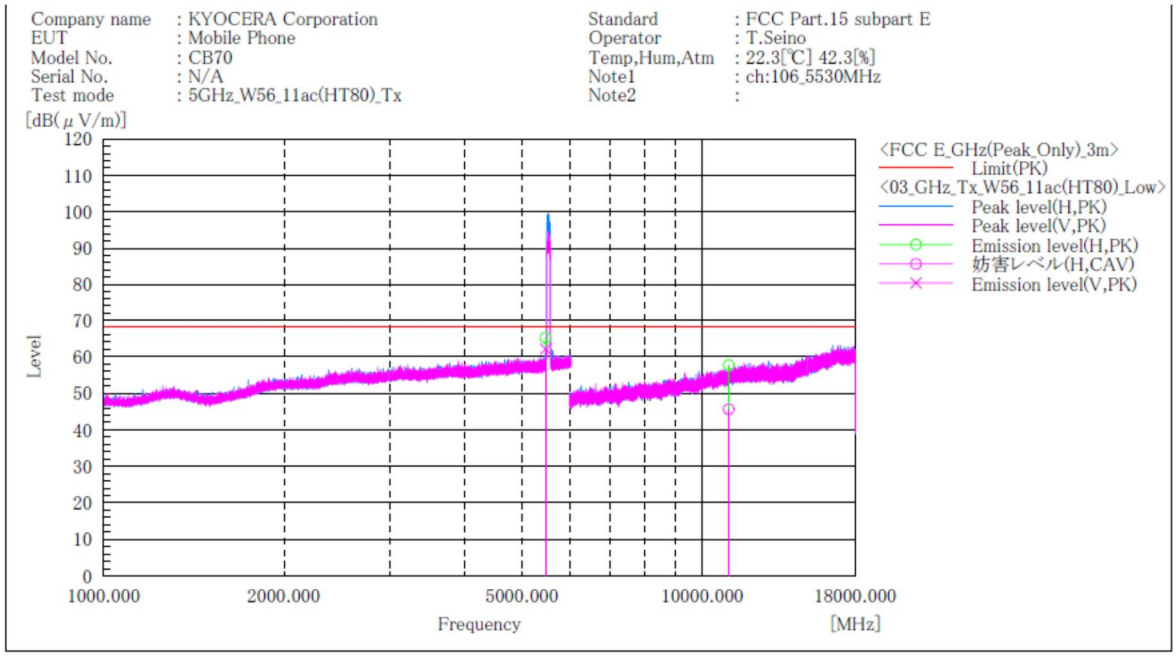


Final Result

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

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

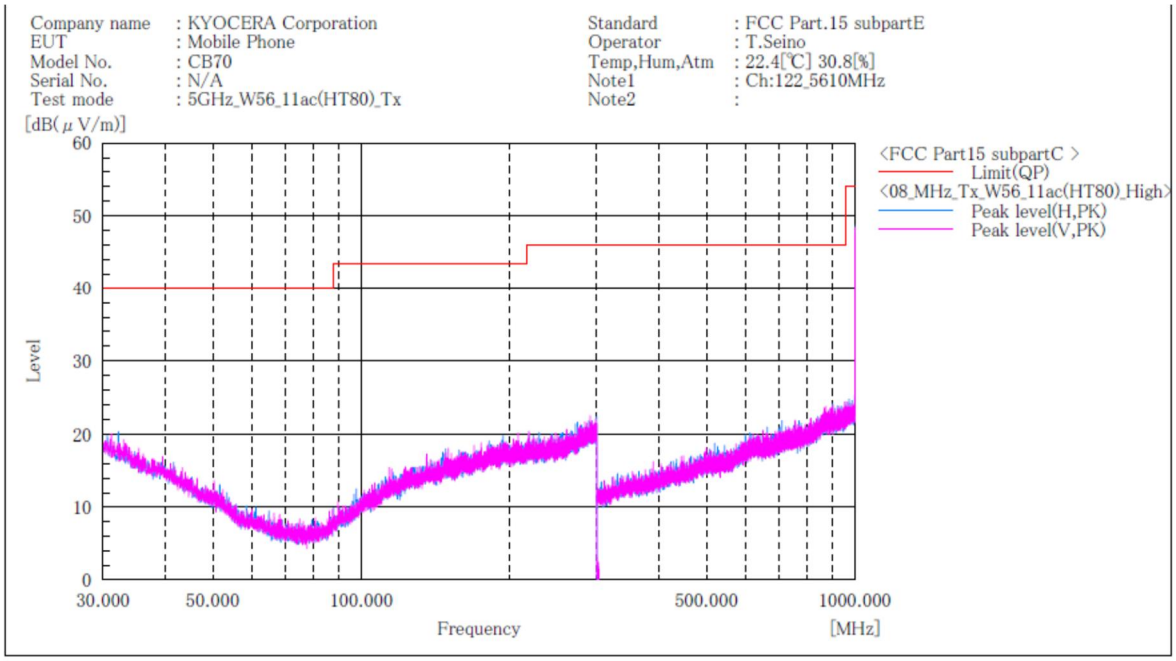


Final Result

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 [°]
1	5466.600	H	54.2	----------	11.0	65.2	----------	68.2	3.0	----------	100.0	94.0
2	5468.900	V	51.1	----------	11.0	62.1	----------	68.2	6.1	----------	100.0	355.0
3	11060.000	H	45.8	33.7	11.9	57.7	45.6	74.0	16.3	8.4	100.0	73.0

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



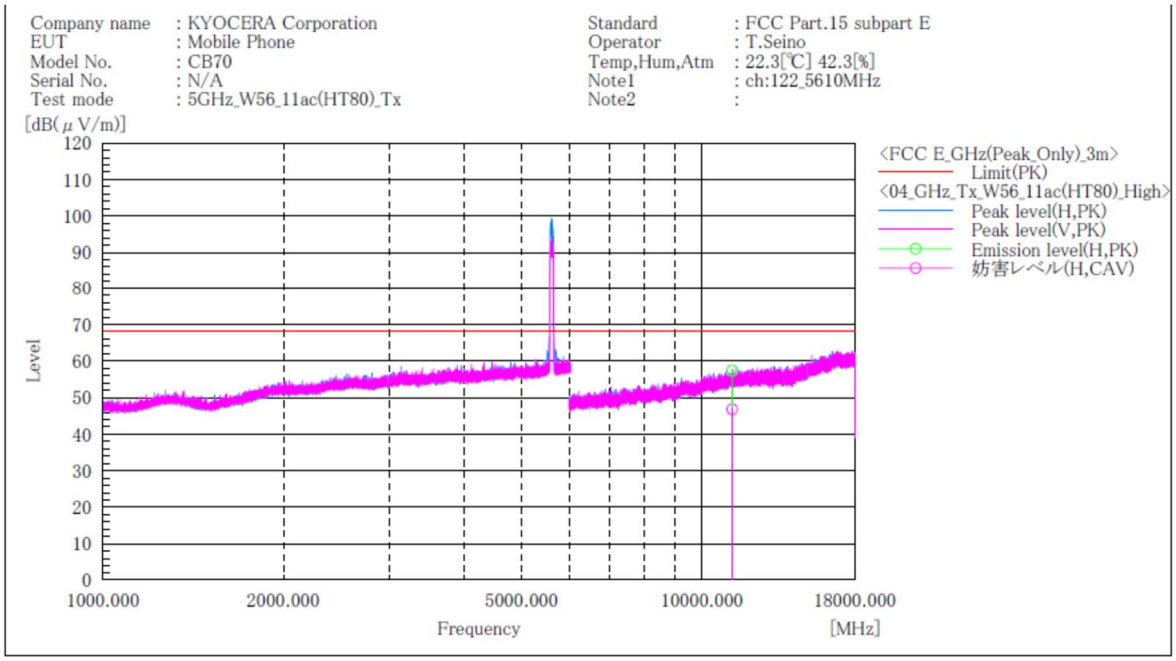
Final Result

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

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.

Japan

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



Final Result

No.	Frequency	(P)	Reading PK	Reading CAV	c.f	Result PK	Result CAV	Limit PK	Margin PK	Margin CAV	Height	Angle
	[MHz]		[dB(μV)]	[dB(μV)]	[dB(1/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB(μV/m)]	[dB]	[dB]	[cm]	[°]
1	11220.000	H	45.3	34.7	12.1	57.4	46.8	74.0	16.6	7.2	100.0	89.0

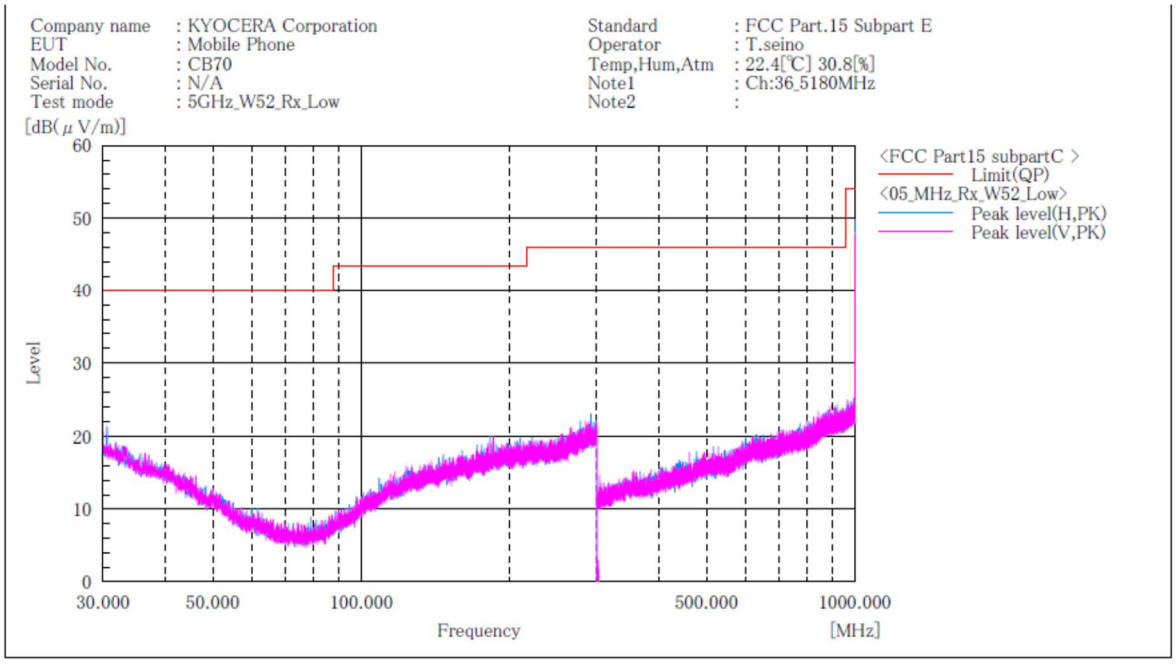
Note:
1. Emission Level (Margin) = Limit - [Reading + Factor (Antenna + Cable – Amp)]
2. No emission were detected in frequency range 18GHz to 40GHz at the 3 meters distance.

Japan

Receive mode

W52 / Channel Low

BELOW 1GHz



Final Result

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

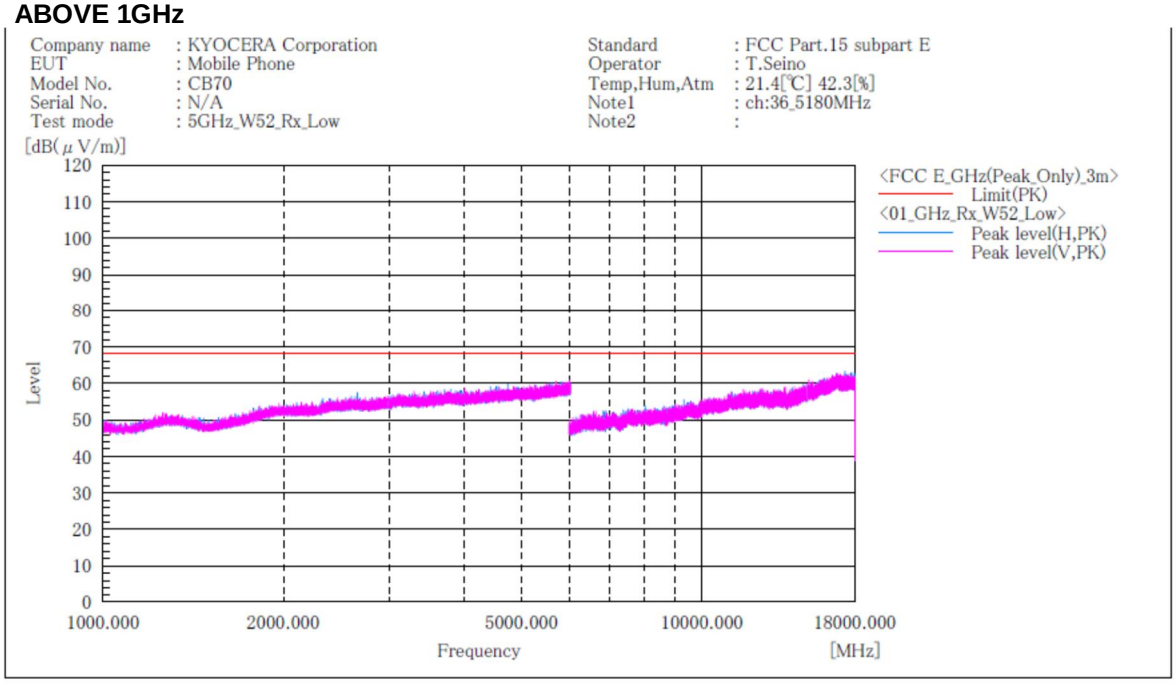
Note:

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.

Japan

W52 / Channel Low

ABOVE 1GHz



Final Result

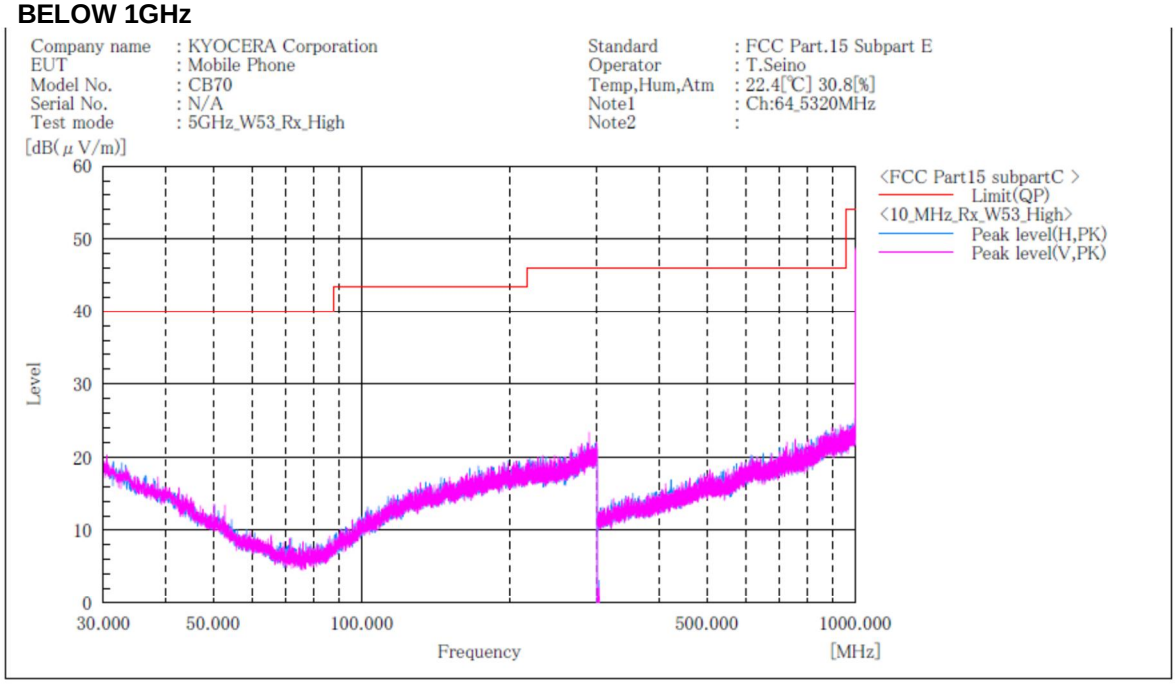
No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

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.

W53 / Channel High

BELOW 1GHz



Final Result

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

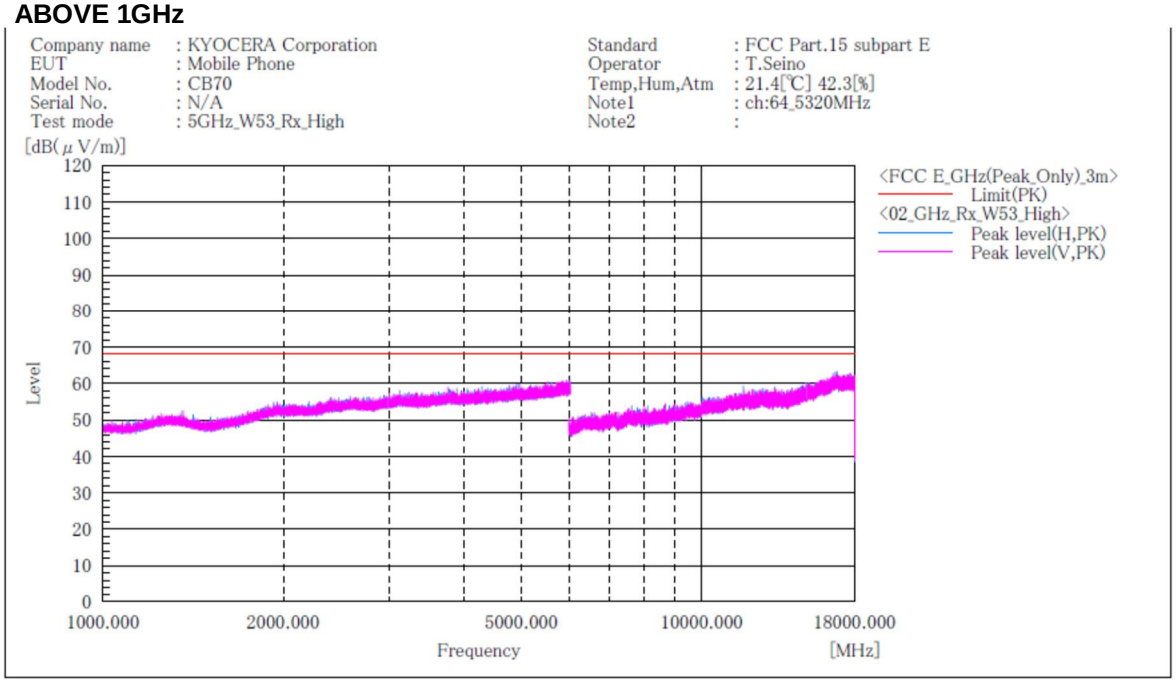
Note:

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.

Japan

W53 / Channel High

ABOVE 1GHz



Final Result

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

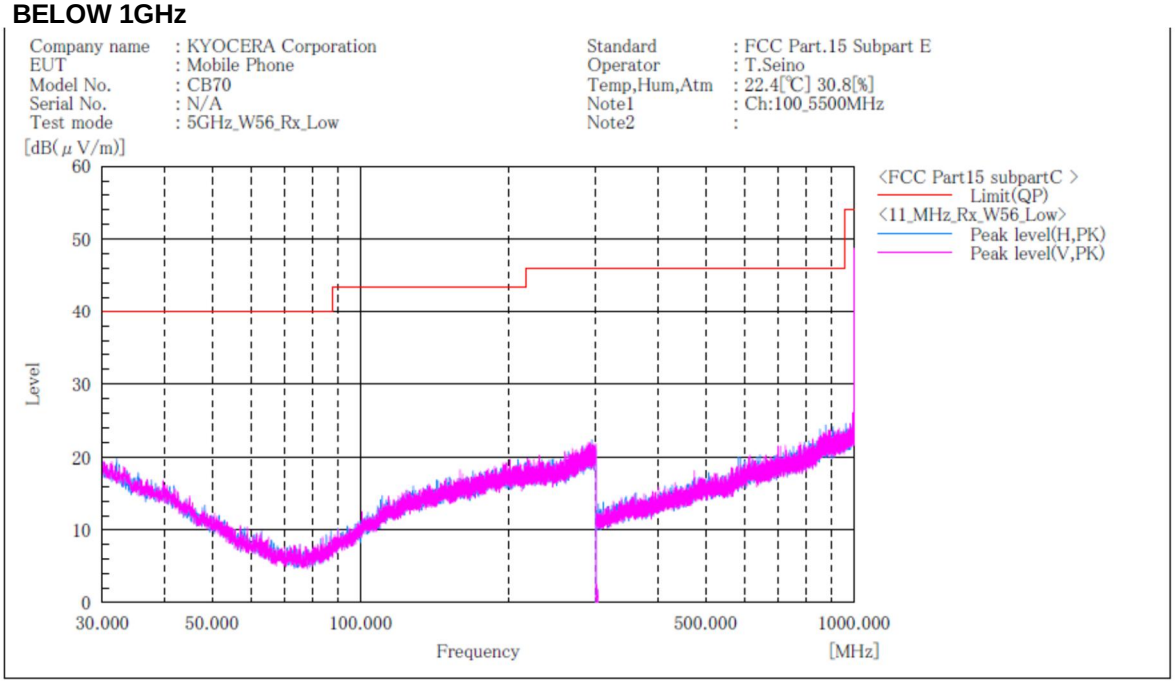
Note:

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.

Japan

W56 / Channel Low

BELOW 1GHz



Final Result

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

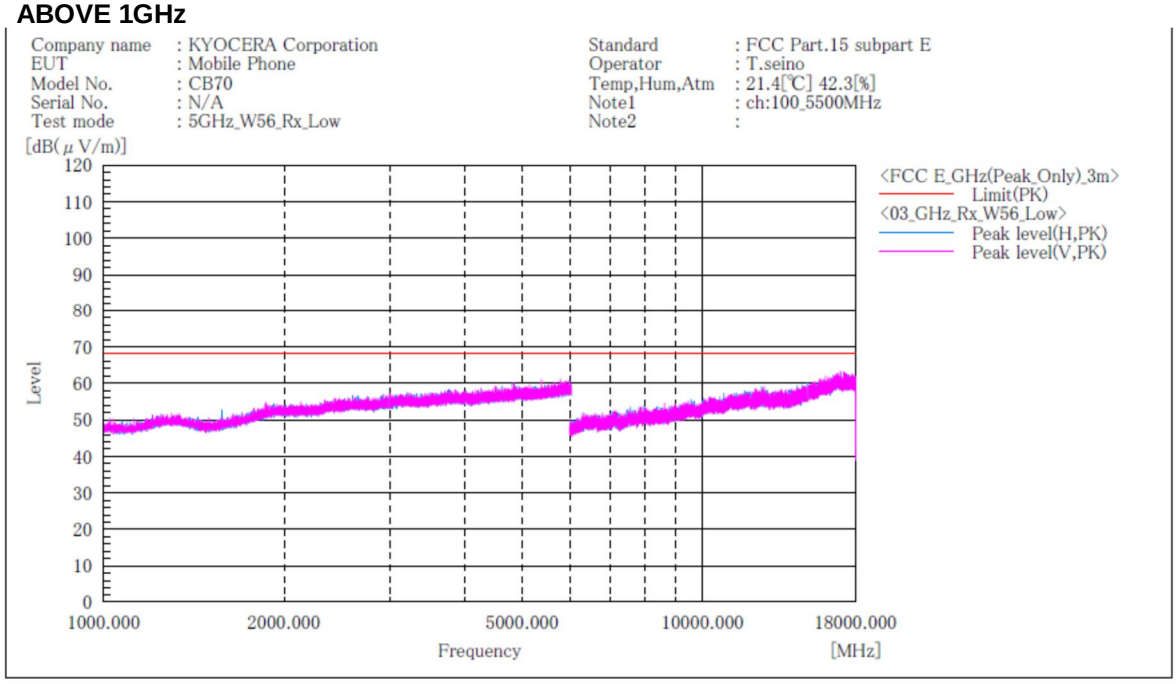
Note:

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.

Japan

W56 / Channel Low

ABOVE 1GHz



Final Result

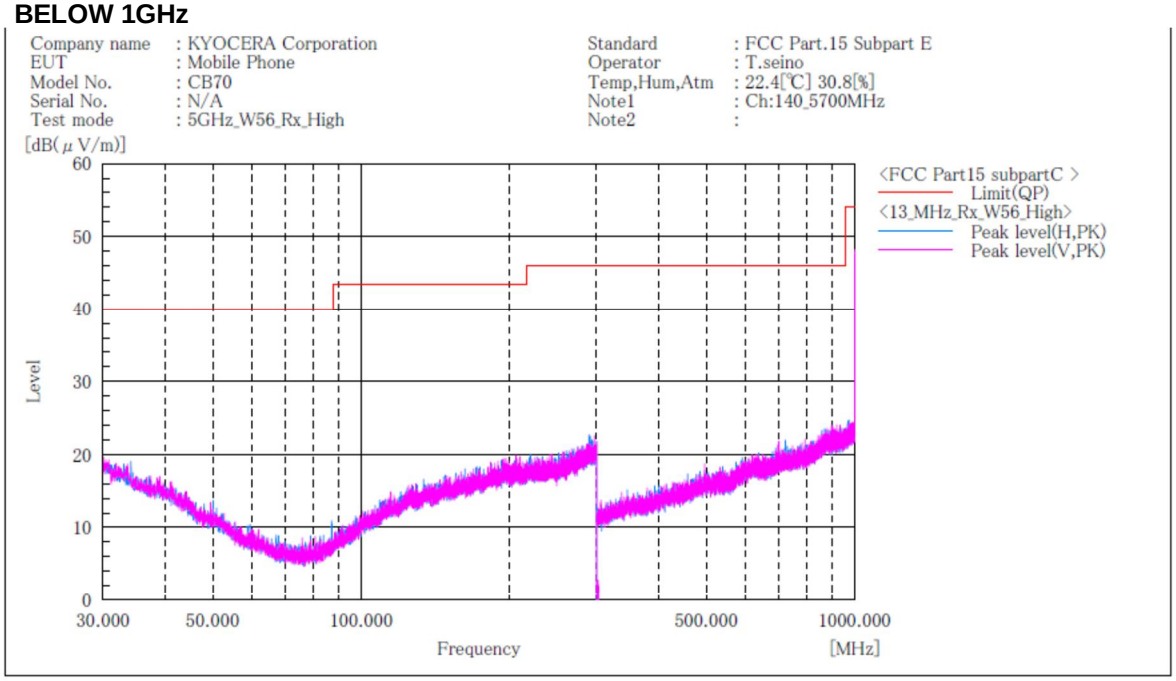
No.	Frequency [MHz]	(P)	c.f [dB(1/m)]	Height [cm]	Angle [°]

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.

W56 / Channel High

BELOW 1GHz



Final Result

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

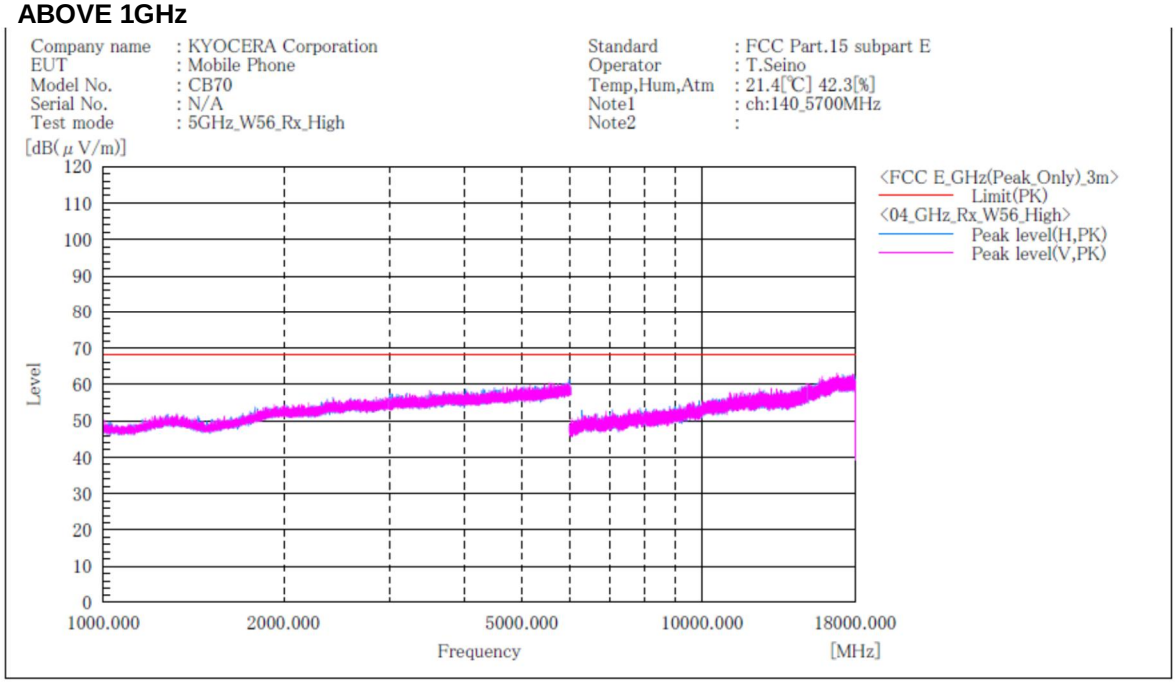
Note:

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.

Japan

W56 / Channel High

ABOVE 1GHz



Final Result

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

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.

Japan

4.5 Frequency Stability

4.5.1 Measurement procedure

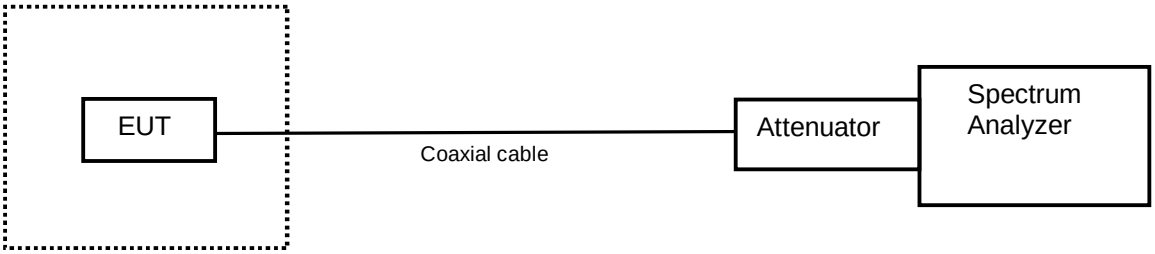
[FCC 15.407(g)]

The EUT was placed of an inside of an constant temperature chamber as the temperature in the chamber was varied between -30˚C and +60˚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 channels center frequency was recorded.

The EUT was set to operate with following conditions.
- 5.2 GHz Band, 5.3 GHz Band, 5.6 GHz Band

The test mode of EUT is as follows.
- Tx mode

- Test configuration



Constant Temperature Chamber

4.5.2 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.

Japan

4.5.3 Measurement result

Date : 23-October-2019
Temperature : 20.6 [˚C]
Humidity : 60.8 [%]
Test place : Shielded room No.4

Test engineer : Taiki Watanabe

[Channel: 36 (5180 MHz)]

Power Supply [V]	Temperature [ºC]	Measurements Frequency (startup) [Hz]	Frequency Tolerance (startup) [ppm]	Measurements Frequency (2mins) [Hz]	Frequency Tolerance (2mins) [ppm]	Measurements Frequency (5mins) [Hz]	Frequency Tolerance (5mins) [ppm]	Measurements Frequency (10mins) [Hz]	Frequency Tolerance (10mins) [ppm]
3.85	25(Ref.)	5180032894	0.00000000	5180042090	1.77527830	5180003666	-5.64243521	5179958248	-14.41033320
	60	5179977544	-10.68526033	5179969823	-12.17579141	5179975377	-11.10359744	5180017918	-2.89110133
	50	5179968426	-12.44548081	5179964140	-13.27288869	5179978181	-10.56228814	5179972614	-11.63699174
	40	5179973785	-11.41093140	5180014610	-3.52970732	5179994246	-7.46095648	5179991090	-8.07021902
	30	5180012440	-3.94862357	5179994047	-7.49937323	5179962059	-13.67462359	5180019960	-2.49689534
	20	5180042162	1.78917783	5179988082	-8.65091032	5179982503	-9.72793050	5179997731	-6.78818083
	10	5179969988	-12.14393833	5180062726	5.75903679	5180044282	2.19844164	5179999634	-6.42080865
	0	5180022642	-1.97913801	5180037366	0.86331498	5179991851	-7.92330876	5180022121	-2.07971652
	-10	5180037117	0.81524579	5180039782	1.32972129	5180007595	-4.88394582	5180023643	-1.78589600
	-20	5180050182	3.33743054	5180028457	-0.85655827	5179989471	-8.38276530	5180014238	-3.60152153
	-30	5180064607	6.12216190	5180017932	-2.88839865	5179998601	-6.62022823	5180009601	-4.49668959
3.47	25	5180020661	-2.36156802	5180004654	-5.45170283	5179978070	-10.58371658	5179983836	-9.47059623
4.24	25	5179978479	-10.50475955	5180023369	-1.83879141	5179994416	-7.42813816	5179989680	-8.34241807

Frequency Tolerance (ppm) = Measurements Frequency (Hz) – Reference Frequency (Hz) / Reference Frequency (Hz) x 1000000

Japan

[Channel: 64 (5320 MHz)]

Power Supply [V]	Temperature [ºC]	Measurements Frequency (startup) [Hz]	Frequency Tolerance (startup) [ppm]	Measurements Frequency (2mins) [Hz]	Frequency Tolerance (2mins) [ppm]	Measurements Frequency (5mins) [Hz]	Frequency Tolerance (5mins) [ppm]	Measurements Frequency (10mins) [Hz]	Frequency Tolerance (10mins) [ppm]
3.85	25(Ref.)	5319972450	0.00000000	5319980423	1.49869197	5319979530	1.33083396	5320014863	7.97240971
	60	5319971699	-0.14116614	5319960112	-2.31918494	5319946997	-4.78442327	5319982784	1.94249126
	50	5319997131	4.63930974	5319992052	3.68460555	5319948239	-4.55096342	5319948587	-4.48554954
	40	5319987081	2.75020221	5319991825	3.64193615	5319985282	2.41204257	5319956607	-2.97802294
	30	5319946736	-4.83348368	5320009500	6.96432178	5320008569	6.78932087	5319952156	-3.81468141
	20	5319995599	4.35133832	5320002384	5.62672087	5319979758	1.37369132	5319972913	0.08703053
	10	5319988138	2.94888745	5319992693	3.80509489	5320044151	13.47770137	5320011320	7.30642881
	0	5320016794	8.33538151	5320045507	13.73258991	5320032390	11.26697564	5319981864	1.76955804
	-10	5319962736	-1.82594931	5319981101	1.62613624	5320001576	5.47484038	5320014145	7.83744660
	-20	5320033666	11.50682651	5320011495	7.33932372	5320030059	10.82881548	5320016106	8.20605753
	-30	5319982288	1.84925770	5320071247	18.57096083	5320020816	9.09140046	5320002290	5.60905160
3.47	25	5319997830	4.77070140	5319959302	-2.47144137	5320035840	11.91547524	5320039404	12.58540352
4.24	25	5319992867	3.83780183	5319997381	4.68630246	5319986238	2.59174274	5320004670	6.05642234

Frequency Tolerance (ppm) = Measurements Frequency (Hz) – Reference Frequency (Hz) / Reference Frequency (Hz) x 1000000

[Channel: 140 (5700 MHz)]

Power Supply [V]	Temperature [ºC]	Measurements Frequency (startup) [Hz]	Frequency Tolerance (startup) [ppm]	Measurements Frequency (2mins) [Hz]	Frequency Tolerance (2mins) [ppm]	Measurements Frequency (5mins) [Hz]	Frequency Tolerance (5mins) [ppm]	Measurements Frequency (10mins) [Hz]	Frequency Tolerance (10mins) [ppm]
3.85	25(Ref.)	5700013703	0.00000000	5700001424	-2.15420535	5699989096	-4.31700717	5700014340	0.11175412
	60	5699964260	-8.67418967	5699999379	-2.51297641	5699990570	-4.05841130	5700018148	0.77982269
	50	5699943078	-12.39032109	5699962288	-9.02015375	5699948387	-11.45891982	5699905206	-19.03451564
	40	5699961396	-9.17664461	5699980087	-5.89752968	5699980374	-5.84717893	5699990479	-4.07437617
	30	5699967093	-8.17717332	5699973917	-6.97998322	5700012176	-0.26789409	5699990184	-4.12613043
	20	5699949791	-11.21260462	5699982989	-5.38840810	5700035826	3.88121874	5700026393	2.22631044
	10	5700042465	5.04595278	5699998143	-2.72981800	5700041077	4.80244460	5699973701	-7.01787787
	0	5699959062	-9.58611731	5699994678	-3.33771127	5700014010	0.05385952	5700038378	4.32893696
	-10	5700025091	1.99788993	5699995777	-3.14490472	5700047573	5.94209098	5700054113	7.08945664
	-20	5699997080	-2.91630878	5699989967	-4.16420052	5700000124	-2.38227497	5700067491	9.43646854
	-30	5699988910	-4.34963867	5700032225	3.24946587	5699985243	-4.99297045	5699998011	-2.75297584
3.47	25	5700018023	0.75789291	5700020710	1.22929529	5700009496	-0.73806840	5700006363	-1.28771620
4.24	25	5700018415	0.82666468	5699976517	-6.52384397	5700014825	0.19684163	5699973039	-7.13401794

Frequency Tolerance (ppm) = Measurements Frequency (Hz) – Reference Frequency (Hz) / Reference Frequency (Hz) x 1000000

Japan

4.6 AC Power Line Conducted Emissions

4.6.1 Measurement procedure

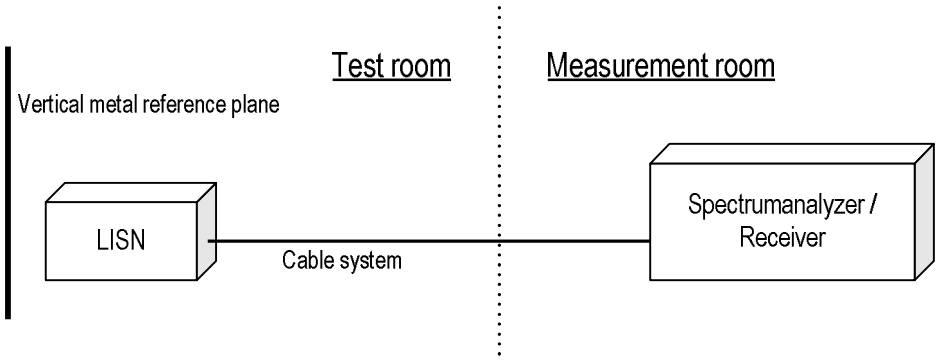
[FCC 15.207]

Test was applied by following conditions.

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



4.6.2 Calculation method

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

Japan

4.6.3 Limit

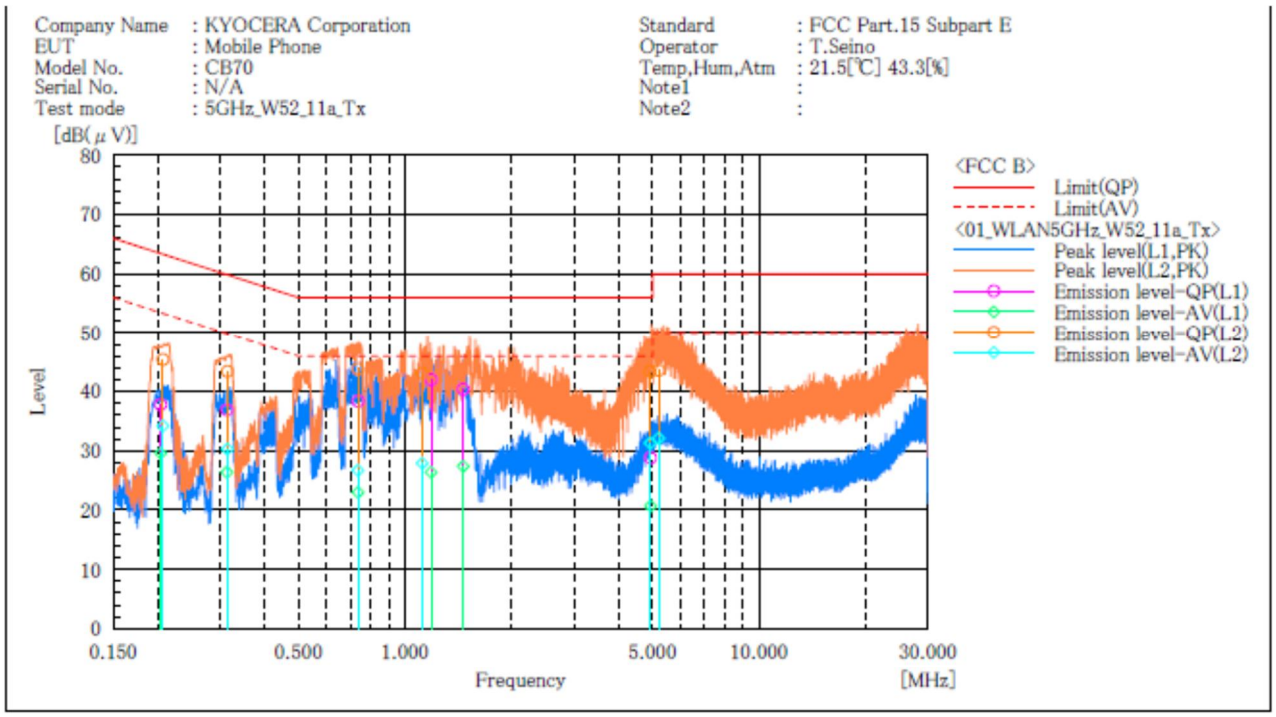
Frequency [MHz]	Limit	
	QP [dBuV]	AV [dBuV]
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

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

Japan

4.6.4 Test data

Date : 31-October-2019
Temperature : 21.5 [˚C]
Humidity : 43.3 [%] Test engineer :
Test place : 3m Semi-anechoic chamber Tadahiro Seino



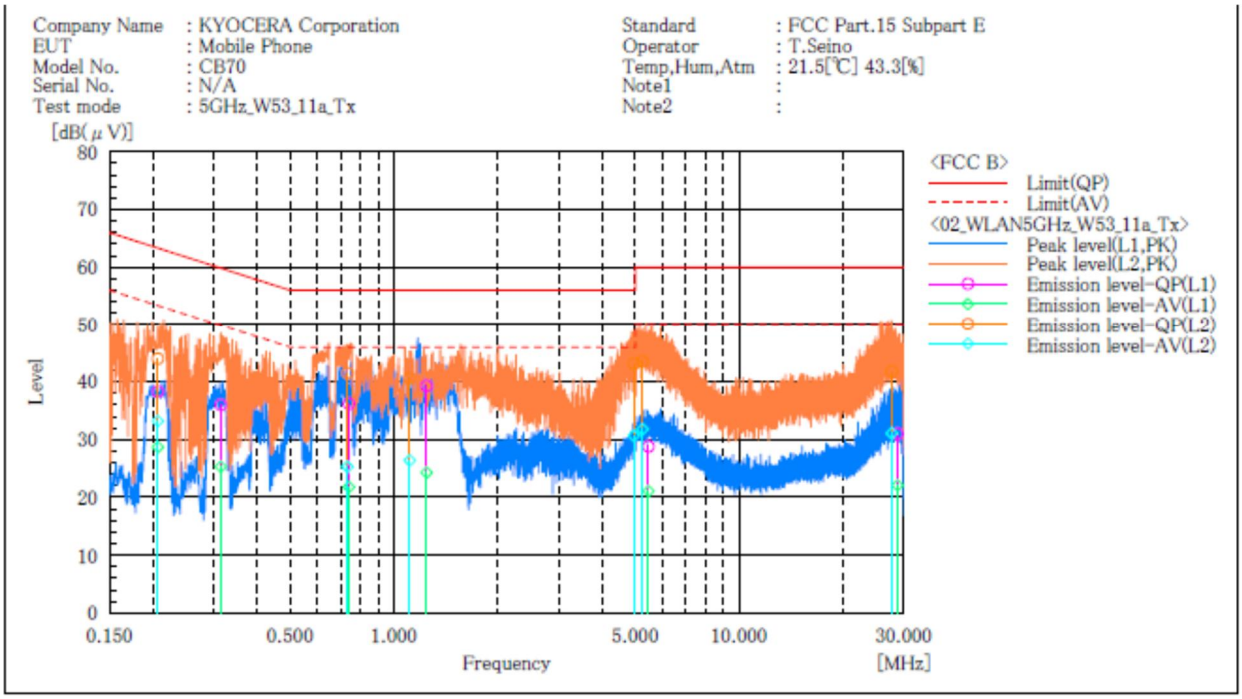
Final Result

--- 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	0.204	27.4	19.2	10.4	37.8	29.6	63.4	53.4	25.6	23.8
2	0.314	26.6	16.1	10.3	36.9	26.4	59.9	49.9	23.0	23.5
3	0.737	28.1	12.7	10.3	38.4	23.0	56.0	46.0	17.6	23.0
4	1.185	31.6	16.0	10.4	42.0	26.4	56.0	46.0	14.0	19.6
5	1.460	30.0	17.0	10.4	40.4	27.4	56.0	46.0	15.6	18.6
6	4.936	18.3	10.2	10.5	28.8	20.7	56.0	46.0	27.2	25.3

--- 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	0.207	35.0	23.8	10.4	45.4	34.2	63.3	53.3	17.9	19.1
2	0.315	33.1	20.0	10.3	43.4	30.3	59.8	49.8	16.4	19.5
3	0.736	33.5	16.4	10.3	43.8	26.7	56.0	46.0	12.2	19.3
4	1.118	32.7	17.5	10.4	43.1	27.9	56.0	46.0	12.9	18.1
5	4.923	32.9	20.8	10.5	43.4	31.3	56.0	46.0	12.6	14.7
6	5.201	33.1	21.6	10.5	43.6	32.1	60.0	50.0	16.4	17.9



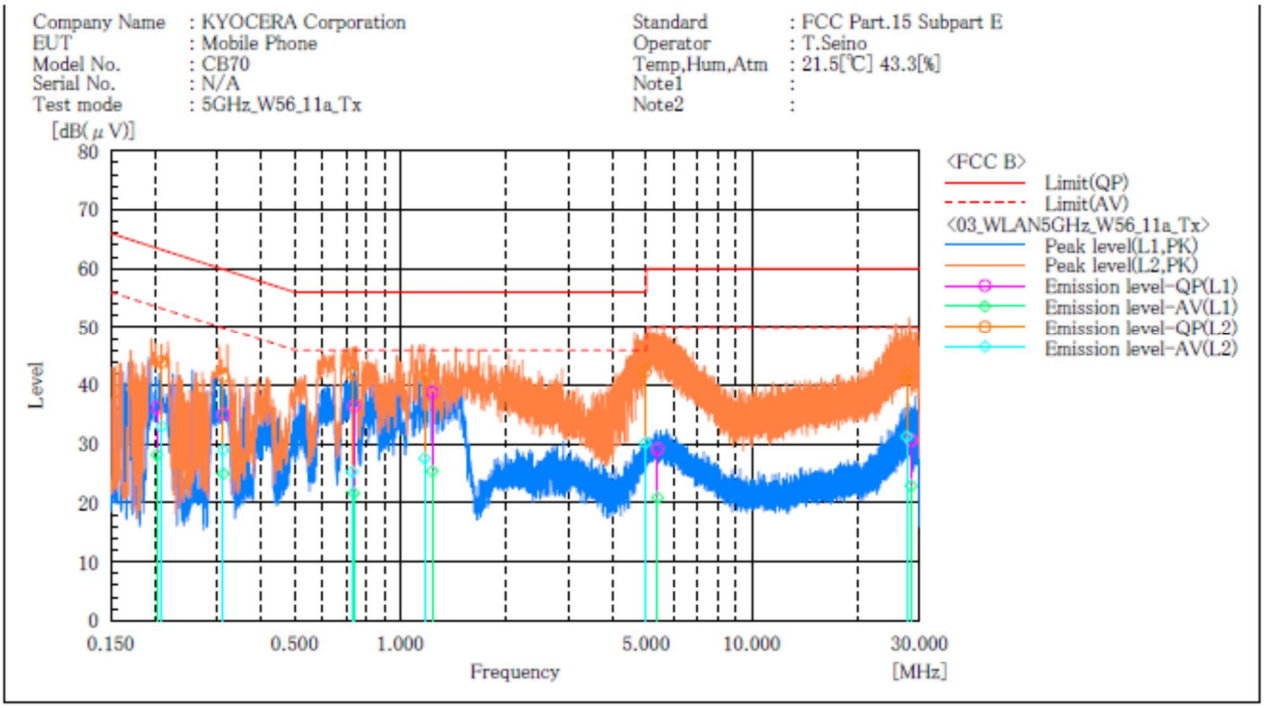
Final Result

--- 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	0.207	27.9	18.3	10.4	38.3	28.7	63.3	53.3	25.0	24.6
2	0.315	25.7	15.0	10.3	36.0	25.3	59.8	49.8	23.8	24.5
3	0.740	25.9	11.5	10.3	36.2	21.8	56.0	46.0	19.8	24.2
4	1.243	28.9	13.9	10.4	39.3	24.3	56.0	46.0	16.7	21.7
5	5.461	18.3	10.6	10.5	28.8	21.1	60.0	50.0	31.2	28.9
6	28.770	19.7	10.8	11.3	31.0	22.1	60.0	50.0	29.0	27.9

--- 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	0.207	33.6	22.8	10.4	44.0	33.2	63.3	53.3	19.3	20.1
2	0.733	31.2	15.0	10.3	41.5	25.3	56.0	46.0	14.5	20.7
3	1.111	30.2	16.0	10.4	40.6	26.4	56.0	46.0	15.4	19.6
4	4.954	32.6	20.2	10.5	43.1	30.7	56.0	46.0	12.9	15.3
5	5.247	33.0	21.3	10.5	43.5	31.8	60.0	50.0	16.5	18.2
6	27.700	30.5	19.8	11.3	41.8	31.1	60.0	50.0	18.2	18.9



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	0.203	25.8	17.8	10.4	36.2	28.2	63.5	53.5	27.3	25.3
2	0.313	24.8	14.7	10.3	35.1	25.0	59.9	49.9	24.8	24.9
3	0.737	26.2	11.4	10.3	36.5	21.7	56.0	46.0	19.5	24.3
4	1.232	28.4	15.0	10.4	38.8	25.4	56.0	46.0	17.2	20.6
5	5.387	18.7	10.4	10.5	29.2	20.9	60.0	50.0	30.8	29.1
6	28.370	19.4	11.6	11.3	30.7	22.9	60.0	50.0	29.3	27.1

--- 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	0.209	33.6	22.6	10.4	44.0	33.0	63.2	53.2	19.2	20.2
2	0.313	31.2	18.7	10.3	41.5	29.0	59.9	49.9	18.4	20.9
3	0.730	31.7	15.0	10.3	42.0	25.3	56.0	46.0	14.0	20.7
4	1.172	31.4	17.2	10.4	41.8	27.6	56.0	46.0	14.2	18.4
5	4.976	31.9	19.7	10.5	42.4	30.2	56.0	46.0	13.6	15.8
6	27.580	30.4	20.0	11.3	41.7	31.3	60.0	50.0	18.3	18.7

Japan

4.7 Duty Cycle

4.7.1 Measurement procedure

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

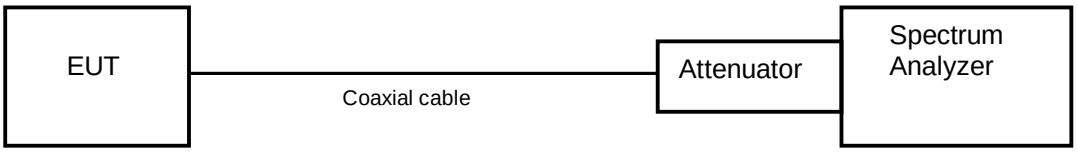
The duty cycle is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
- RBW=8 MHz, VBW=8 MHz, Span=0 Hz, Sweep=Auto, Detector=Peak, Trace mode=Single

The EUT was set to operate with following conditions.
- 5.2 GHz Band, 5.3 GHz Band, 5.6 GHz Band

The test mode of EUT is as follows.
- Tx mode

- Test configuration



4.7.2 Limit

None

4.7.3 Measurement result

Date	:	23-October-2019		
Temperature	:	20.6 [˚C]		
Humidity	:	60.8 [%]	Test engineer	:
Test place	:	Shielded room No.4		Taiki Watanabe

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	1.392	1.436	0.969	718.4	0.135	0.270
	40	5200						
	48	5240						
	52	5260	1.392	1.436	0.969	718.4	0.135	0.270
	56	5280						
	64	5320						
	100	5500	1.392	1.436	0.969	718.4	0.135	0.270
	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	1.288	1.332	0.967	776.4	0.146	0.292
	40	5200						
	48	5240						
	52	5260	1.288	1.332	0.967	776.4	0.146	0.292
	56	5280						
	64	5320						
	100	5500	1.286	1.328	0.968	777.6	0.140	0.279
	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	0.636	0.680	0.935	1572.3	0.291	0.581
	46	5230						
	54	5270	0.635	0.680	0.934	1574.8	0.297	0.595
	62	5310						
	102	5510	0.635	0.680	0.934	1574.8	0.297	0.595
	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	0.324	0.369	0.878	3086.4	0.565	1.130
	58	5290	0.323	0.368	0.878	3096.0	0.566	1.133
	106	5530	0.324	0.369	0.879	3086.4	0.561	1.123
	122	5610	0.323	0.369	0.875	3096.0	0.578	1.156

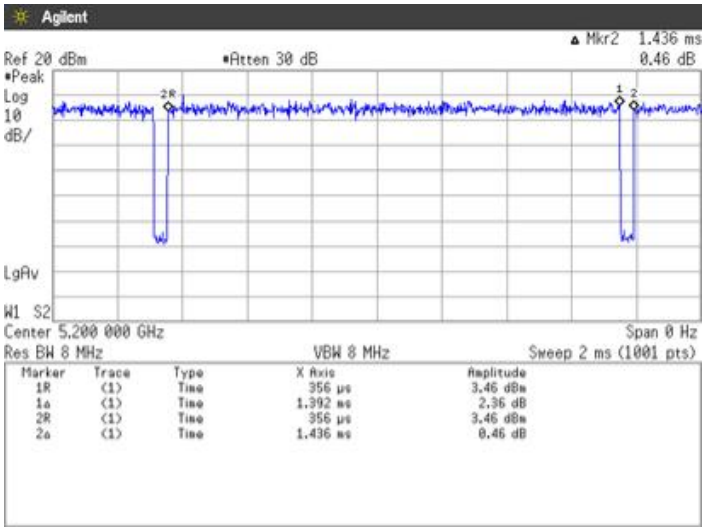
Note: X = On time / (On + Off time)

Japan

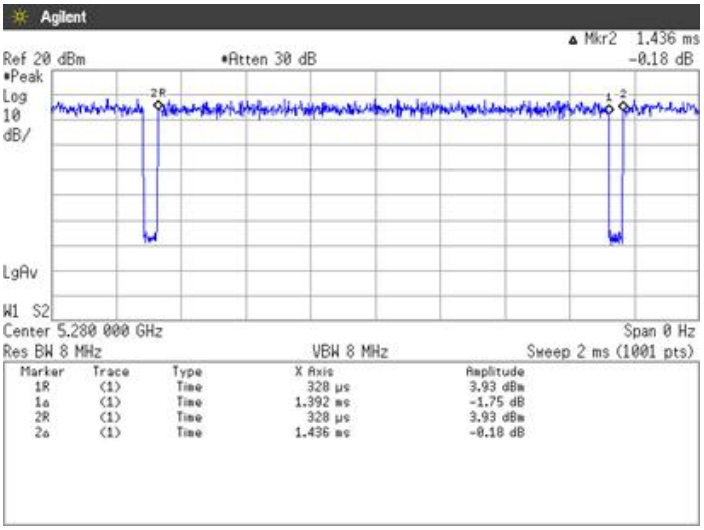
4.7.4 Trace data

[IEEE802.11a]

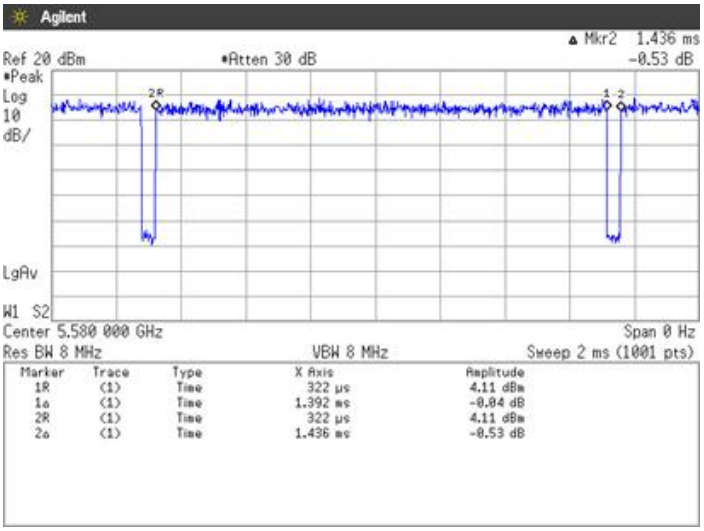
Channel: 40



Channel: 56



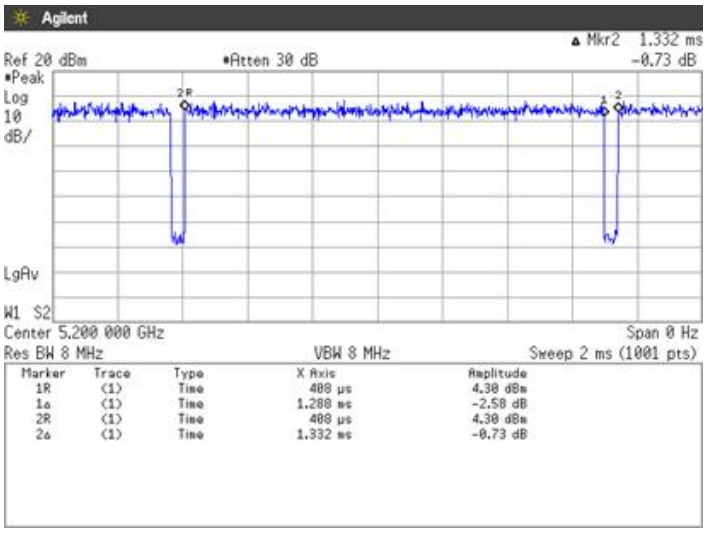
Channel: 116



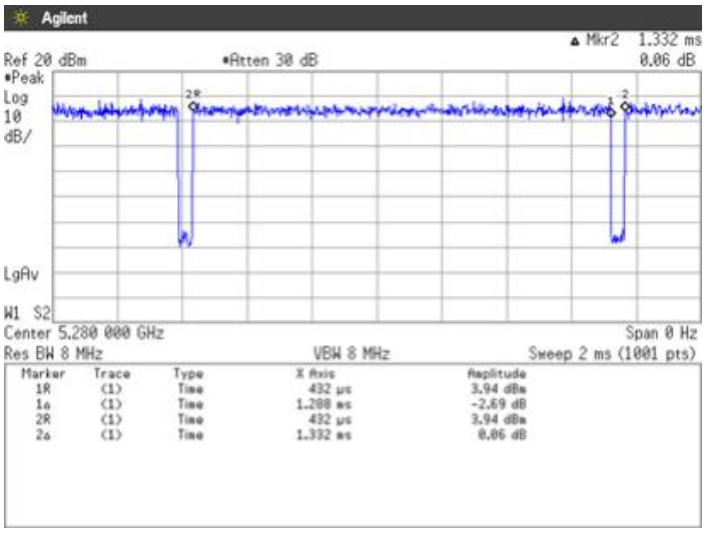
Japan

[IEEE802.11n (HT20)]

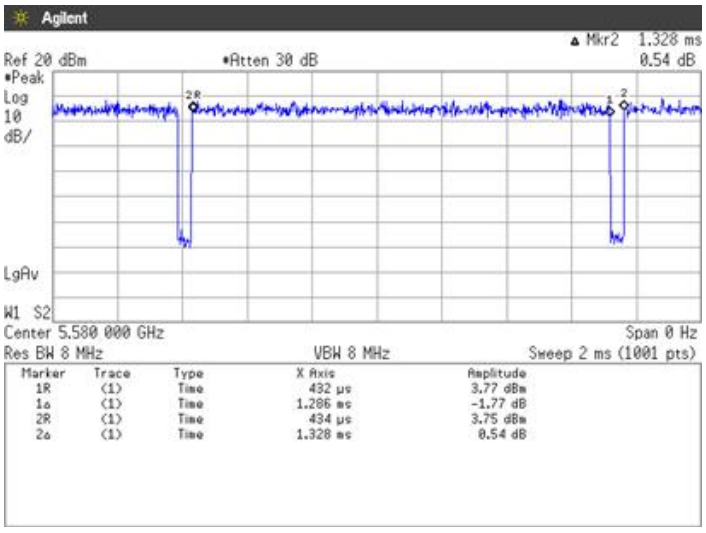
Channel: 40



Channel: 56



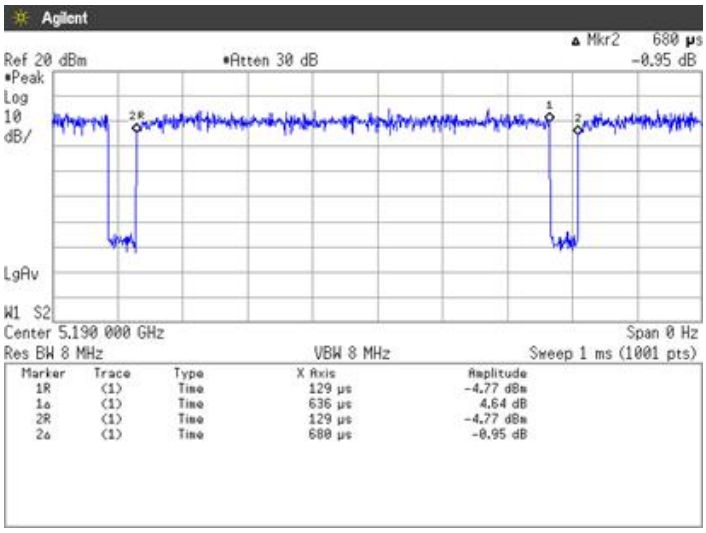
Channel: 116



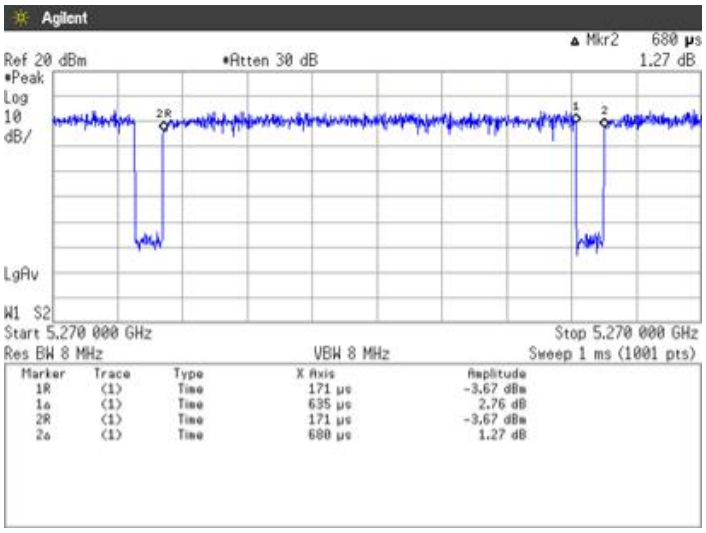
Japan

[IEEE802.11n (HT40)]

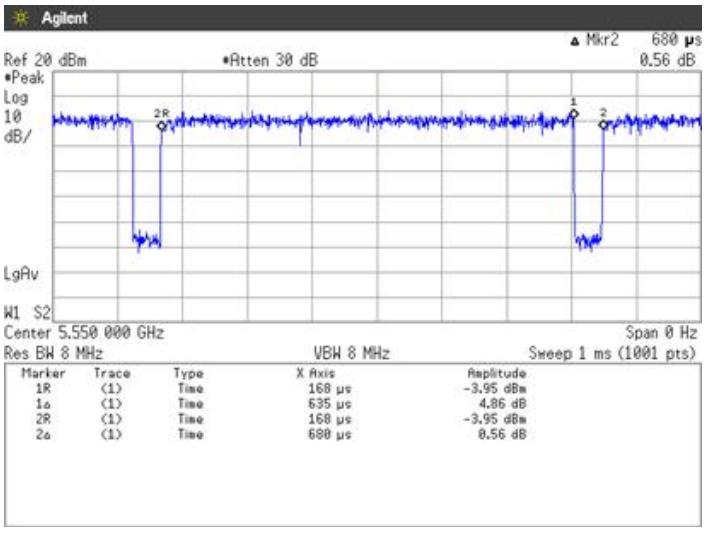
Channel: 38



Channel: 54



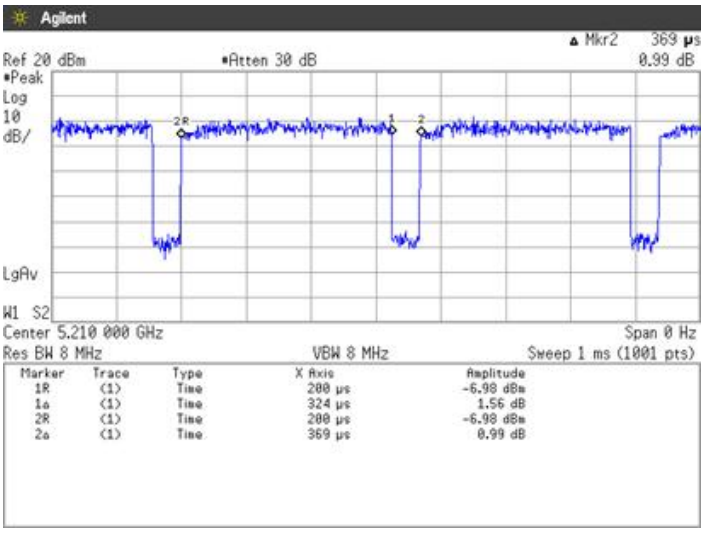
Channel: 110



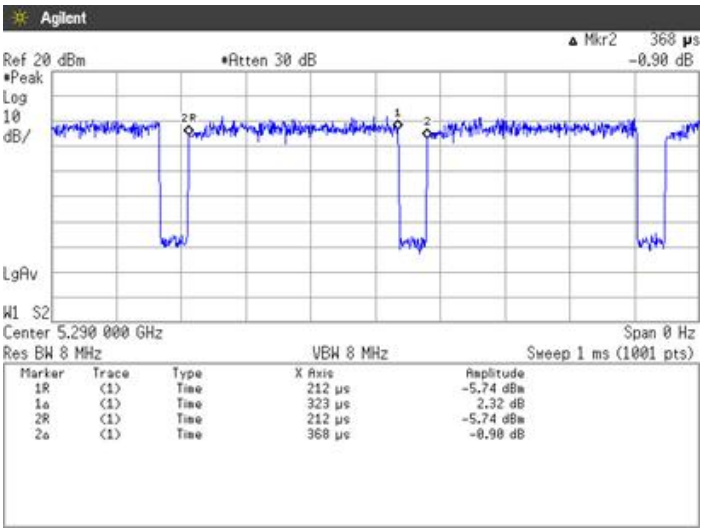
Japan

[IEEE802.11ac (HT80)]

Channel: 42



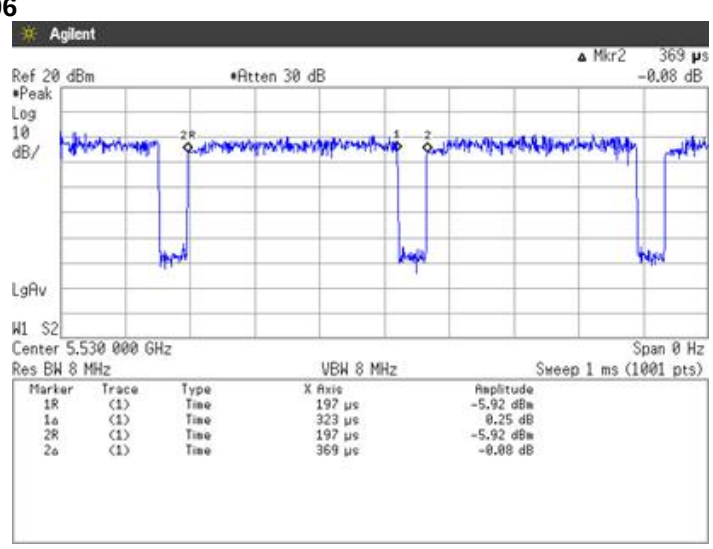
Channel: 58



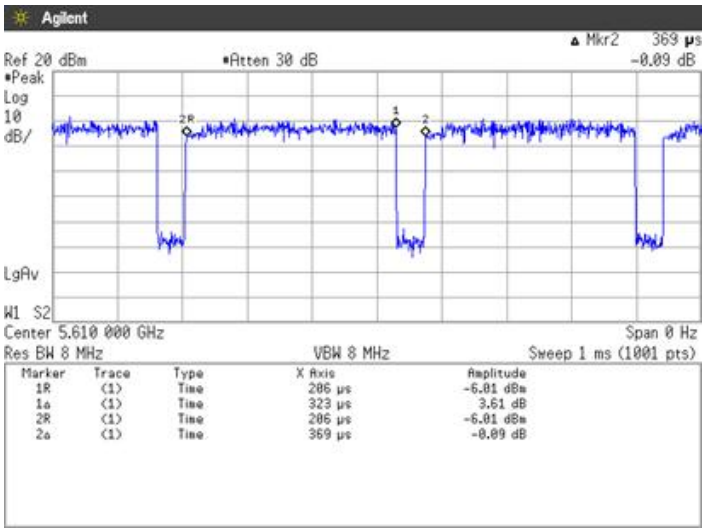
Japan

[IEEE802.11ac (HT80)]

Channel: 106



Channel: 122



Japan

5 Antenna requirement

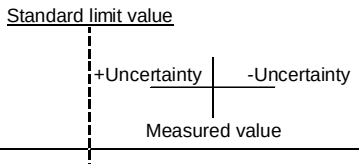
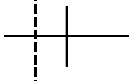
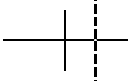
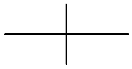
According to FCC section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
The antenna is a special antenna mounted inside of the EUT. Therefore, the EUT complies with the antenna requirement of FCC section 15.203.

Japan

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)	±3.3 dB
Radiated emission (9kHz – 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	$\pm 1.4 * 10^{-8}$
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	 Even if it takes uncertainty into consideration, a standard limit value is fulfilled.
	Case2	 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.
	Case4	 Even if it takes uncertainty into consideration, a standard limit value isn't fulfilled.

Japan

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-2021

Japan

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-Aug-2020	05-Aug-2019
Attenuator	Weinschel	56-10	J4180	31-Jul-2020	18-Jul-2019
Power meter	ROHDE&SCHWARZ	NRP2	103269	31-Jul-2020	18-Jul-2019
Power sensor	ROHDE&SCHWARZ	NRP-Z81	102467	31-Jul-2020	18-Jul-2019
Temperature and humidity chamber	ESPEC	PL1KP	14007261	30-Sep-2020	03-Sep-2019

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	30-Apr-2020	16-Apr-2019
Spectrum analyzer	Agilent Technologies	E4440A	US40420937	31-Oct-2019	12-Oct-2018
				30-Sep-2020	26-Sep-2019
Spectrum analyzer	Agilent Technologies	E4440A	US44302655	31-Aug-2020	05-Aug-2019
Preamplifier	SONOMA	310	372170	30-Sep-2020	26-Sep-2019
Loop antenna	ROHDE&SCHWARZ	HFH2-Z2	100515	28-Mar-2020	07-Mar-2019
Attenuator	TOYO Connector	NA-PJ-6	N/A(S507)	31-Dec-2019	17-Dec-2018
Biconical antenna	Schwarzbeck	VHA9103/BBA9106	VHA91031308	31-May-2020	16-May-2019
Log periodic antenna	Schwarzbeck	UHALP9108A	0728	31-May-2020	16-May-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-2020	17-Jan-2019
Attenuator	AEROFLEX	26A-10	081217-08	31-Jan-2020	17-Jan-2019
Double ridged guide antenna	ETS LINDGREN	3117	00224193	31-Jan-2020	23-Jan-2019
Attenuator	Agilent Technologies	8491B	MY39268633	31-Mar-2020	08-Mar-2019
DRGH 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
Notch filter	Micro-Tronics	BRM50716	006	31-May-2020	16-May-2019
Microwave cable	HUBER+SUHNER	SUCOFLEX104/9m	MY30037/4	31-Jan-2020	16-Jan-2019
		SUCOFLEX104/1m	my24610/4	31-Jan-2020	16-Jan-2019
		SUCOFLEX104/8m	SN MY30031/4	31-Jan-2020	16-Jan-2019
		SUCOFLEX104/1.5m	MY32976/4	31-Jan-2020	16-Jan-2019
		SUCOFLEX104/1.5m	MY19309/4	31-Jan-2020	16-Jan-2019
		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-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-2020	17-Jan-2019
Line impedance stabilization network for EUT	Kyoritsu Electrical Works, Ltd.	KNW-407F2	12-17-110-2	31-May-2020	16-May-2019
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.