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TEST REPORT

KCTL Inc.
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

KCTL

1. Client

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
- Date of Receipt : 2019-10-25

2. Use of Report : -

3. Name of Product and Model : Mobile Phone / SM-A515F/DS

4. Manufacturer and Country of Origin : SAMSUNG ELECTRONICS VIETNAM CO.,LTD./ Vietnam

5. FCC ID : A3LSMA515F

6. Date of Test : 2019-11-11 to 2019-11-27

7. Test Standards : FCC Part 2 , Part 15.247 subpart C,
FCC Part 15.249 subpart C, Part 15.407 subpart E
FCC Part 22 subpart H, Part 24 subpart E
FCC Part 27 subpart C, Part 90 subpart S

8. Test Results : Refer to the test result in the test report

Affirmation	Tested by Name : Euijung Kim (Signature)	Technical Manager Name : Jaehyong Lee (Signature)

2019-11-28

KCTL Inc.

As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by KCTL Inc.

Report revision history

Date	Revision	Page No
2019-11-28	Initial report	-

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1. General information

Client	:	Samsung Electronics Co., Ltd.
Address	:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Manufacturer	:	SAMSUNG ELECTRONICS VIETNAM CO.,LTD.
Address	:	Kcn Yen Binh1, huyen pho Yen Tinh Thai Nguyen Vietnam
Laboratory	:	KCTL Inc.
Address	:	65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Accreditations	:	FCC Site Designation No: KR0040, FCC Site Registration No: 687132
		VCCI Registration No. : R-20080, G-20078, C-20059, T-20056
		Industry Canada Registration No. : 8035A
		KOLAS No.: KT231

2. Spot-check information

This report referenced from the FCC ID : A3LSMA515FN.
The difference between the FCC ID: A3LSMA515F and FCC ID: A3LSMA515N is NFC functionality, all the functions are same except circuit diagram and software.

As for all bands, they have been verified and the parent model test results under FCC ID : A3LSMA515FN shall remain representative of FCC ID : A3LSMA515F.

Reference FCC ID	Equipment class	Spot check bands	Report title
A3LSMA515FN	PCE	GSM 850	2G3G(Part22,24,27) report
		GSM 1900	
		WCDMA 850	
		WCDMA 1700	
		WCDMA 1900	
		LTE Band 2	LTE(Part22,24,27) report
		LTE Band 4	
		LTE Band 5	
		LTE Band 12	
		LTE Band 13	
		LTE Band 17	
		LTE Band 41	
		LTE Band 66	
		LTE Band 26	LTE(Part22,90) report
	DTS	WIFI	WIFI(Part 15.247) report
		BLE	BLE(Part 15.247) report
	DSS	Bluetooth	BT(Part 15.247) report
	DXX	ANT+	ANT+(Part 15.249) report
	NII	WIFI	WIFI(Part 15.407) report

Notes:

1. For FCC ID: ASLSMA515F has been verified the performance as for LTE Band2/4/5/12/13/17 /26/41/66, GSM850/1900, WCDMA 850/1700/1900, WIFI, BT, BLE and ANT+ identical with the FCC ID: A3LSMA515FN.
2. Comparison of two models, upper deviation is within 3 dB range and all test results are under FCC technical limits.
3. The test procedure(s) in this report were performed in accordance as following.
   - KDB 484596 D01 v01

3. Spot-check verification data

3.1. Radiated power (ERP/EIRP) & spurious emissions

Test results

3.1.1. Radiated power (ERP/EIRP) for licensed bands

Test band	Test item	Worst mode	Channel	Measured frequency (㎒)	SM-A515F/DSN (dBm)	SM-A515F/DS (dBm)	Deviation (dB)
GSM 850	ERP	GSM	251	848.80	26.36	26.30	0.06
GSM 1900	EIRP	GSM	810	1 909.80	28.10	27.02	1.08
WCDMA V	ERP	RMC	4132	826.40	19.44	18.57	0.87
WCDMA IV	EIRP	RMC	1513	1 752.60	18.96	18.59	0.37
WCDMA II	EIRP	RMC	9538	1 907.60	20.85	19.80	1.05
LTE 2	EIRP	QPSK 1.4 MHz	19193	1 909.30	20.52	19.54	0.98
LTE 4	EIRP	QPSK 20 MHz	20050	1 720.00	21.22	20.83	0.39
LTE 5	ERP	QPSK 10 MHz	20450	829.00	19.37	18.64	0.73
LTE 12	ERP	QPSK 3 MHz	23165	714.50	19.06	18.86	0.20
LTE 13	ERP	QPSK 5 MHz	23205	779.50	18.83	18.37	0.46
LTE 17	ERP	QPSK 5 MHz	23825	713.50	18.96	18.09	0.87
LTE 26(P22H)	ERP	QPSK 3 MHz	26805	825.50	18.90	18.20	0.70
LTE 26(P22H)	ERP	QPSK 3 MHz	26790	824.00	19.35	18.26	1.09
LTE 26(P90S)	ERP	QPSK 1.4 MHz	26783	823.30	18.69	18.42	0.27
LTE 41	EIRP	QPSK 20 MHz	40620	2 593.00	23.87	23.38	0.49
LTE 66	EIRP	QPSK 3 MHz	132657	1 778.50	22.66	21.77	0.89

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3.1.2. Spurious emissions for licensed bands

Test band	Test item	Worst mode	Channel	Measured frequency (MHz)	SM-A515F/DSN (dBm)	SM-A515F/DS (dBm)	Deviation (dB)
GSM 850	RSE	GSM	251	4 241.70	-55.80	-59.10	3.30
GSM 1900	RSE	GSM	810	9 550.50	-53.80	-54.50	0.70
WCDMA V	RSE	RMC	4132	3 302.64	-55.80	-56.10	0.30
WCDMA IV	RSE	RMC	1513	7 011.00	-55.40	-54.00	-1.40
WCDMA II	RSE	RMC	9538	7 642.00	-54.20	-55.40	1.20
LTE 2	RSE	QPSK 1.4 MHz	19193	9 546.44	-52.80	-54.00	1.20
LTE 4/66	RSE	QPSK 3 MHz	132657	3 557.00	-52.30	-55.10	2.80
LTE 5	RSE	QPSK 10 MHz	20450	3 316.15	-46.10	-51.70	5.60
LTE 12	RSE	QPSK 3 MHz	23165	3 573.16	-51.90	-54.60	2.70
LTE 13	RSE	QPSK 5 MHz	23205	3 886.68	-54.10	-53.80	-0.30
LTE 17	RSE	QPSK 5 MHz	23825	3 578.32	-52.50	-51.80	-0.70
LTE 26(P22H)	RSE	QPSK 3 MHz	26805	3 296.29	-47.40	-52.30	4.90
LTE 26(P22H)	RSE	QPSK 3 MHz	26790	3 291.29	-51.50	-50.90	-0.60
LTE 26(P90S)	RSE	QPSK 1.4 MHz	26783	3 291.14	-53.40	-55.10	1.70
LTE 41	RSE	QPSK 20 MHz	40620	7 779.32	-41.10	-41.00	-0.10

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3.2. Radiated spurious emissions & band edge

Test results

3.2.1. Unlicensed bands

Test band	Test item	Test mode	Channel	Measured frequency (MHz)	SM-A515F/DSN (dBμV)		SM-A515F/DS (dBμV)		Deviation (dB)	
					Avg.	Peak	Avg.	Peak	Avg.	Peak
2.4G WIFI	Band edge	802.11b	13	2 483.5 ~ 2 500	-	50.33	-	52.12	-	-1.79
	RSE		6	7 311	50.59	54.56	50.98	55.58	-0.39	-1.02
	Band edge	802.11g	13	2 483.5 ~ 2 500	50.69	63.92	50.55	65.24	0.14	-1.32
	RSE		1	7 236	43.01	56.22	45.98	55.09	-2.97	1.13
	Band edge	802.11n HT20	13	2 483.5 ~ 2 500	50.95	63.19	50.89	64.91	0.06	-1.72
	RSE		6	7 311	45.66	54.48	47.42	56.33	-1.76	-1.85
BT	Band edge	DH5	0	2 310 ~ 2 390	36.33	63.56	29.52	54.79	6.81	8.77
	RSE		78	7 440	49.87	54.64	47.41	51.14	2.46	3.50
	Band edge	3DH5	78	2 483.5 ~ 2 500	36.49	63.33	29.27	52.35	7.22	10.98
	RSE		78	7 440	-	53.45	-	50.05	-	3.40
BLE	Band edge	1Mbps Packet 37	39	2 483.5 ~ 2 500	43.62	57.96	37.48	53.17	6.14	4.79
	RSE		39	7 440	-	48.08	-	47.81	-	0.27
	Band edge	1Mbps Packet 255	39	2 483.5 ~ 2 500	-	47.86	-	50.28	-	-2.42
	RSE		39	7 440	-	46.37	-	47.76	-	-1.39
	Band edge	2Mbps Packet 37	39	2 483.5 ~ 2 500	44.55	57.78	42.18	51.98	2.37	5.80
	RSE		39	7 440	-	47.79	-	48.42	-	-0.63
	Band edge	2Mbps Packet 255	39	2 483.5 ~ 2 500	-	49.61	-	50.07	-	-0.46
	RSE		39	7 440	-	45.50	-	45.60	-	-0.10

Test band	Test item	Test mode	Channel	Measured frequency (MHz)	SM-A515F/DSN (dBμV)		SM-A515F/DS (dBμV)		Deviation (dB)	
					Avg.	Peak	Avg.	Peak	Avg.	Peak
ANT+	Band edge	GFSK	78	2 483.5 ~ 2 500	-	46.01	-	42.17	-	3.84
	RSE	GFSK	39	7 323	-	43.43	-	45.51	-	-2.08
5G WIFI	Band edge	802.11a	64	5 350 ~ 5 460	50.68	62.50	49.26	59.09	1.42	3.41
	RSE		120	16 800	-	51.75	-	47.76	-	3.99
	Band edge	802.11n HT20	64	5 350 ~ 5 460	50.60	60.28	49.53	61.21	1.07	-0.93
	RSE		120	16 800	-	50.60	-	46.89	-	3.71
	Band edge	802.11n HT40	62	5 350 ~ 5 460	50.89	59.70	49.66	61.13	1.23	-1.43
	RSE		118	16 770	-	50.65	-	47.79	-	2.86
	Band edge	802.11ac VHT20	36	4 500 ~ 5 150	50.55	59.99	50.95	60.92	-0.40	-0.93
	RSE		120	16 800	-	51.02	-	49.14	-	1.88
	Band edge	802.11ac VHT40	38	4 500 ~ 5 150	50.84	58.63	47.15	55.78	3.69	2.85
	RSE		118	16 770	-	51.03	-	47.37	-	3.66
	Band edge	802.11ac VHT80	58	5 350 ~ 5 460	50.88	57.79	48.76	56.81	2.12	0.98
	RSE		42	10 420	-	50.31	-	44.35	-	5.96

3.2.2 Field strength of fundamental for ANT+

Test band	Test item	Test mode	Pol. (V/H)	Channel	Measured frequency (MHz)	SM-A105F/DS (dBμV)		SM-A105M/DS (dBμV)		Deviation (dB)	
						Avg.	Peak	Avg.	Peak	Avg.	Peak
ANT+	Fundamental	GFSK	H	0	2 402	48.14	80.88	39.65	72.81	8.49	8.07
			V			43.70	76.44	35.88	69.05	7.82	7.39
			H	39	2 441	48.67	81.41	40.56	73.72	8.11	7.69
			V			42.06	74.80	34.81	67.98	7.25	6.82
			H	78	2 480	48.43	81.18	37.36	70.52	11.07	10.66
			V			44.68	77.43	30.61	63.78	14.07	13.65

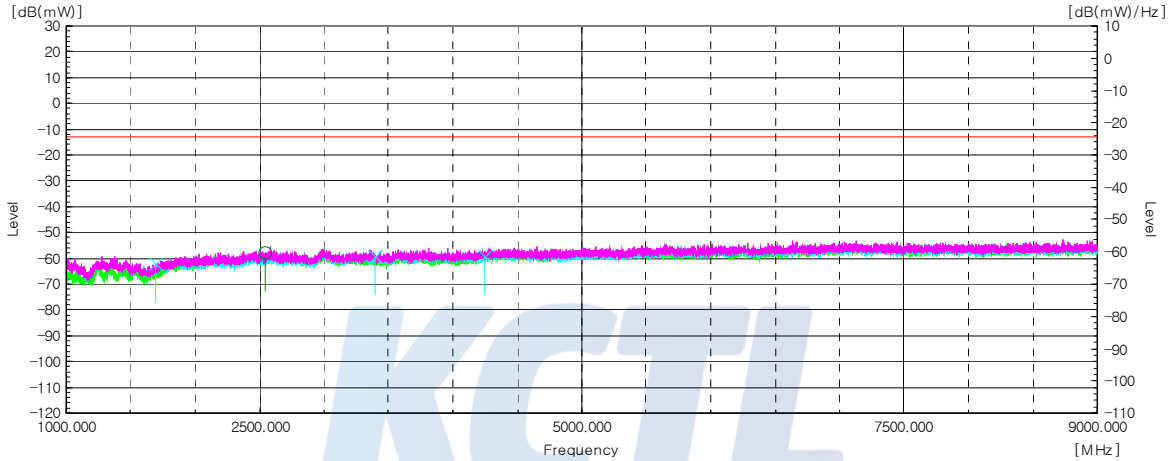
3.3. Test results

3.3.1 Licensed bands

Test results (Above 1 000 ㎒)

Test mode : GSM 850
Frequency (㎒) : 848.8
Channel : 251

Horizontal/Vertical

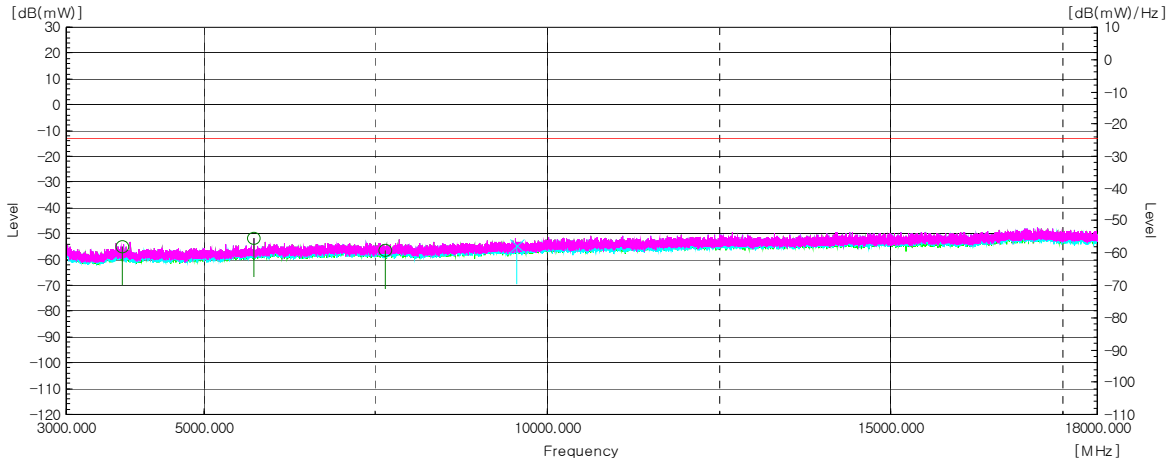


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	4 242.20	V	8.84	8.70	-59.24	-59.10	-13.00	46.10

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : GSM 1900
Frequency (㎒) : 1 909.8
Channel : 810

Horizontal/Vertical

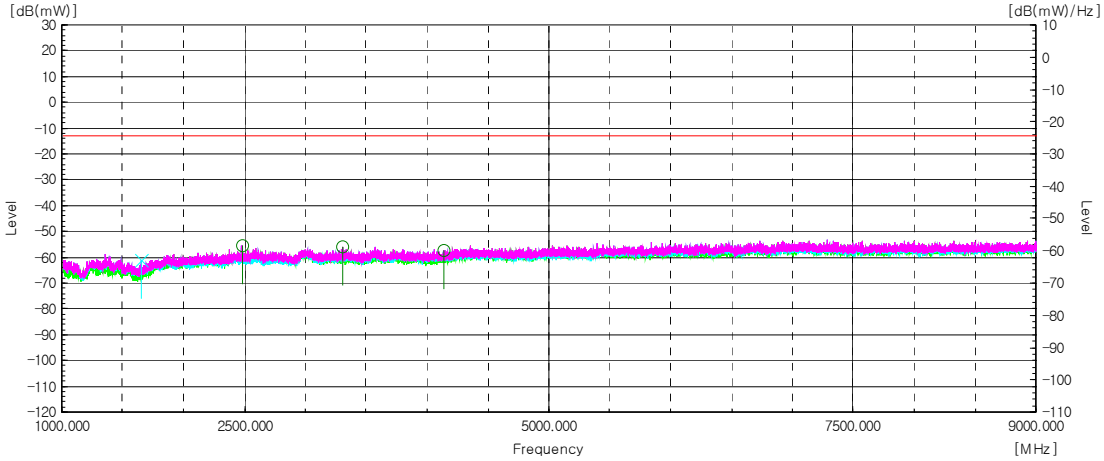


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	9 549.50	V	13.06	13.32	-54.24	-54.50	-13.00	41.50

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : WCDMA 850
Frequency (㎒) : 826.4
Channel : 4132

Horizontal/Vertical

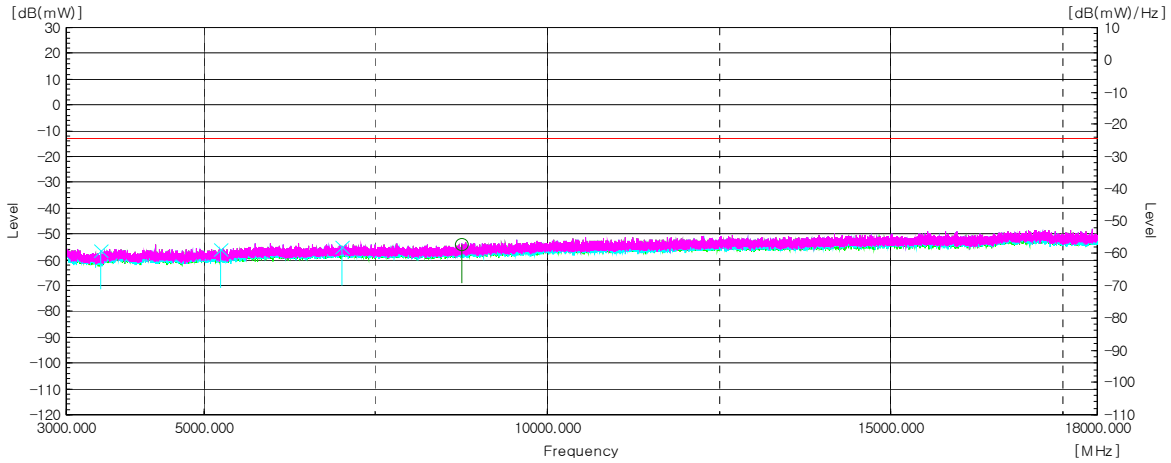


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 303.14	H	7.38	7.68	-55.80	-56.10	-13.00	43.10

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : WCDMA 1700
Frequency (㎒) : 1 752.6
Channel : 1513

Horizontal/Vertical

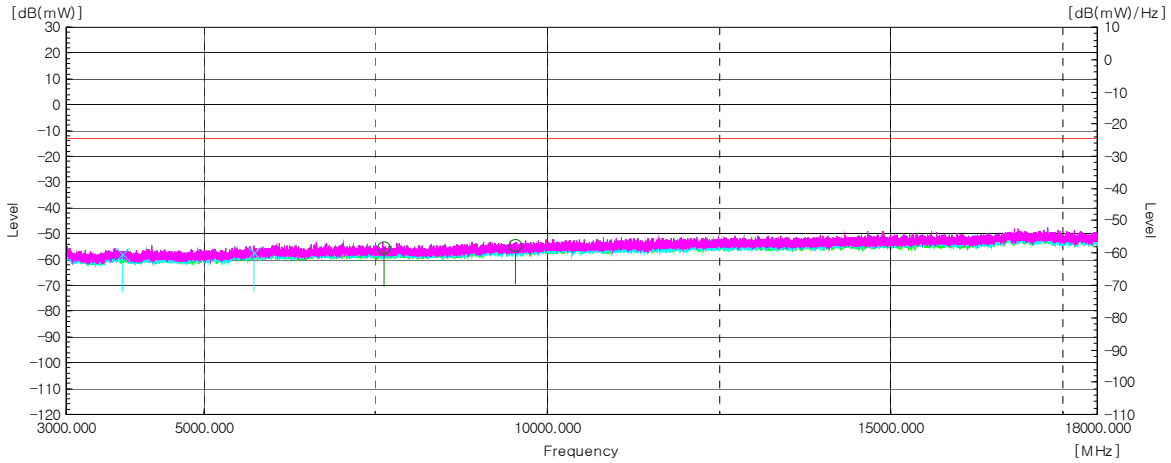


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	7 010.50	V	11.12	11.33	-53.79	-54.00	-13.00	41.00

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : WCDMA 1900
Frequency (㎒) : 1 907.6
Channel : 9538

Horizontal/Vertical

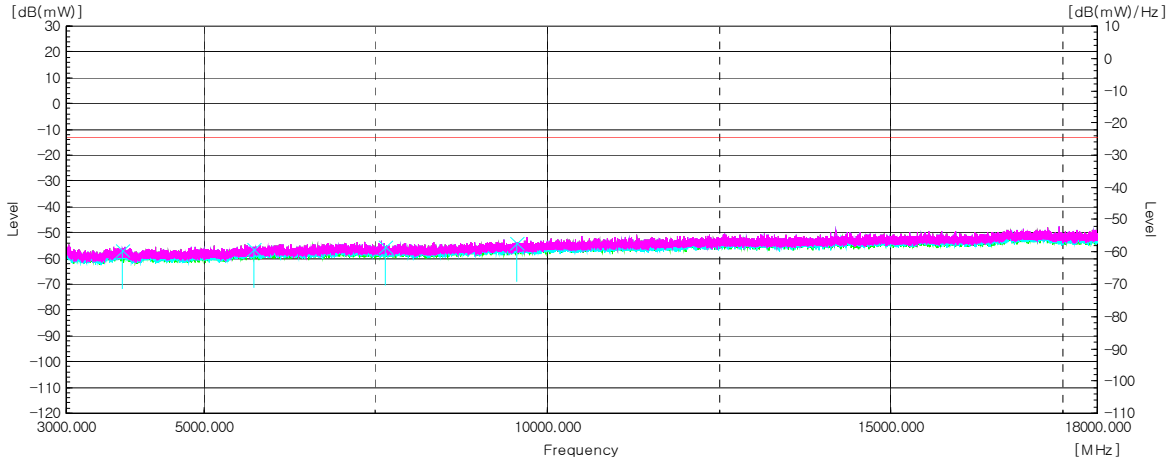


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	7 642.00	H	12.13	11.92	-55.61	-55.40	-13.00	42.40

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : LTE Band 2
Frequency (㎒) : 1 909.3
Channel : 19193
Bandwidth (㎒) : 1.4

Horizontal/Vertical

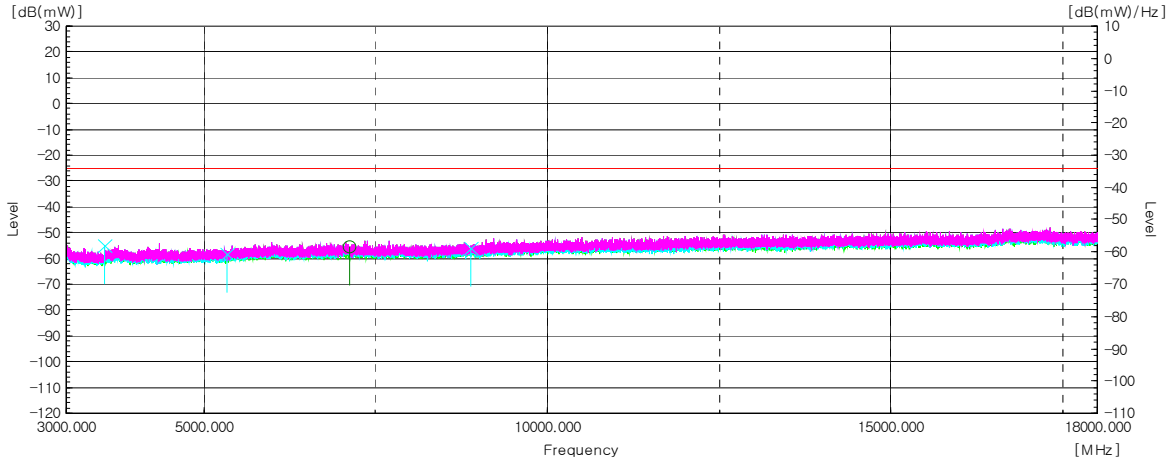


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	9 546.98	V	13.06	13.32	-53.74	-54.00	-13.00	41.00

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : LTE Band 4/66
Frequency (㎒) : 1 778.5
Channel : 132657
Bandwidth (㎒) : 3

Horizontal/Vertical

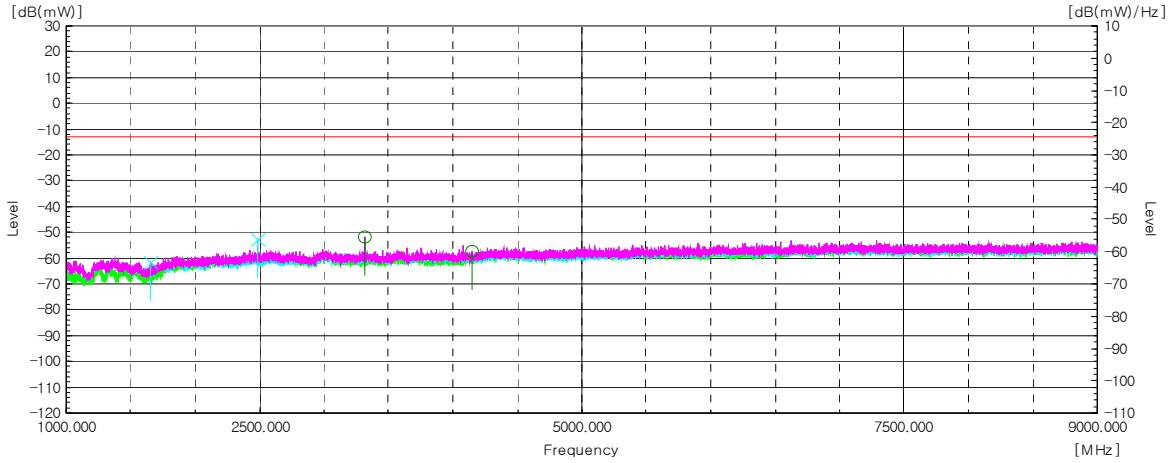


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 557.50	V	7.89	7.94	-55.05	-55.10	-25.00	30.10

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : LTE Band 5
Frequency (㎒) : 829.0
Channel : 20450
Bandwidth (㎒) : 10

Horizontal/Vertical

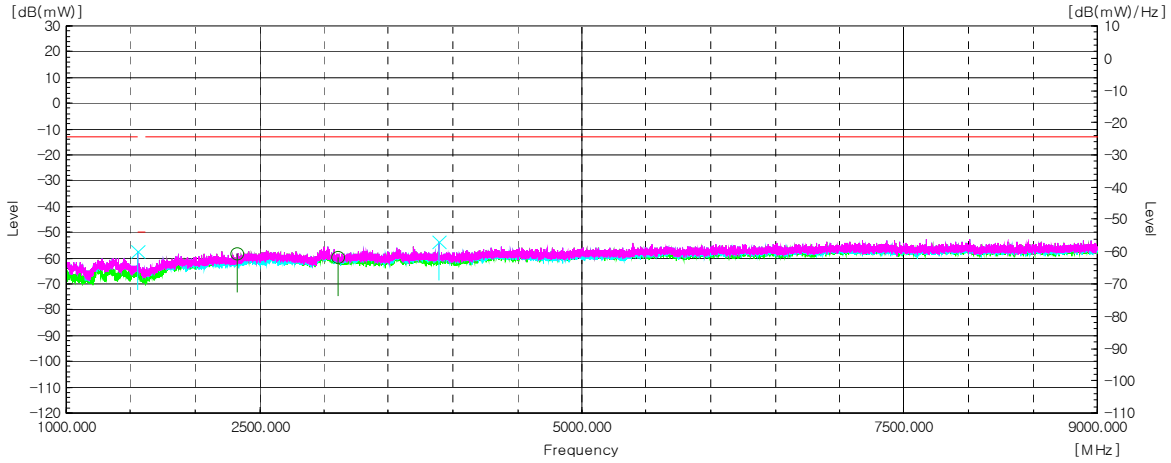


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 316.65	H	7.40	7.68	-51.42	-51.70	-13.00	38.70

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : LTE Band 13
Frequency (㎒) : 779.5
Channel : 23205
Bandwidth (㎒) : 5

Horizontal/Vertical

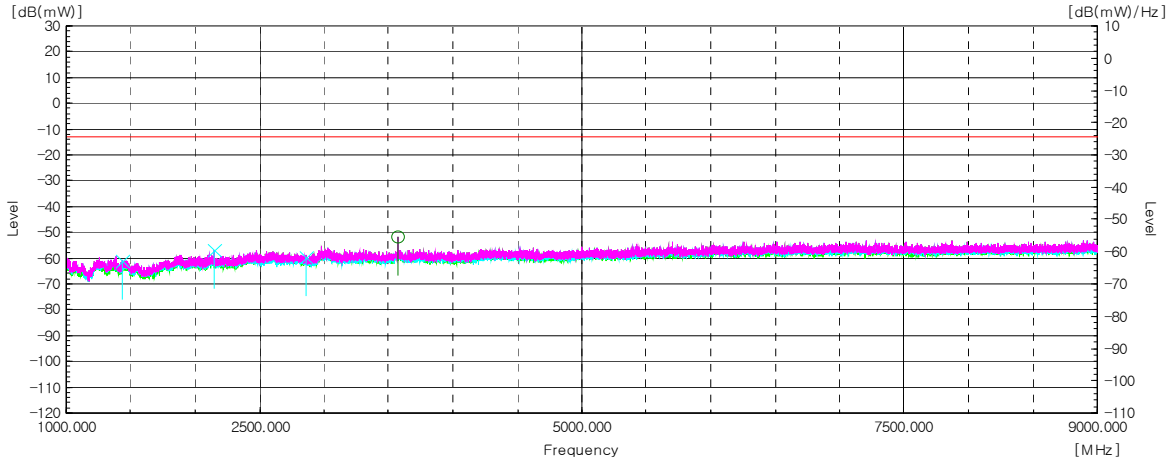


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 886.68	V	8.42	8.35	-53.87	-53.80	-13.00	40.80

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : LTE Band 17
Frequency (㎒) : 713.5
Channel : 23825
Bandwidth (㎒) : 5

Horizontal/Vertical

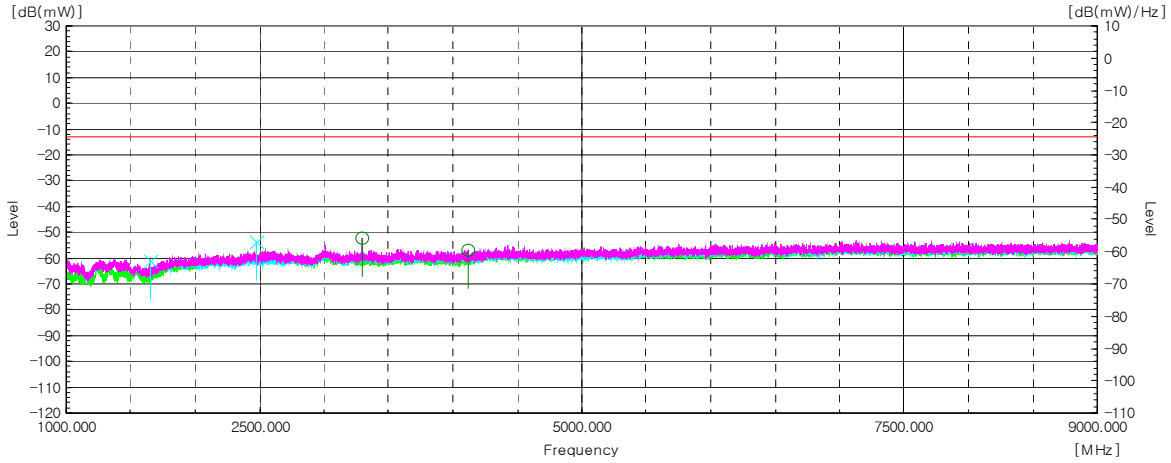


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 578.16	H	7.93	7.96	-51.77	-51.80	-13.00	3 578.16

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : LTE Band 26 (Part 22H)
Frequency (㎒) : 825.5
Channel : 26805
Bandwidth (㎒) : 3

Horizontal/Vertical

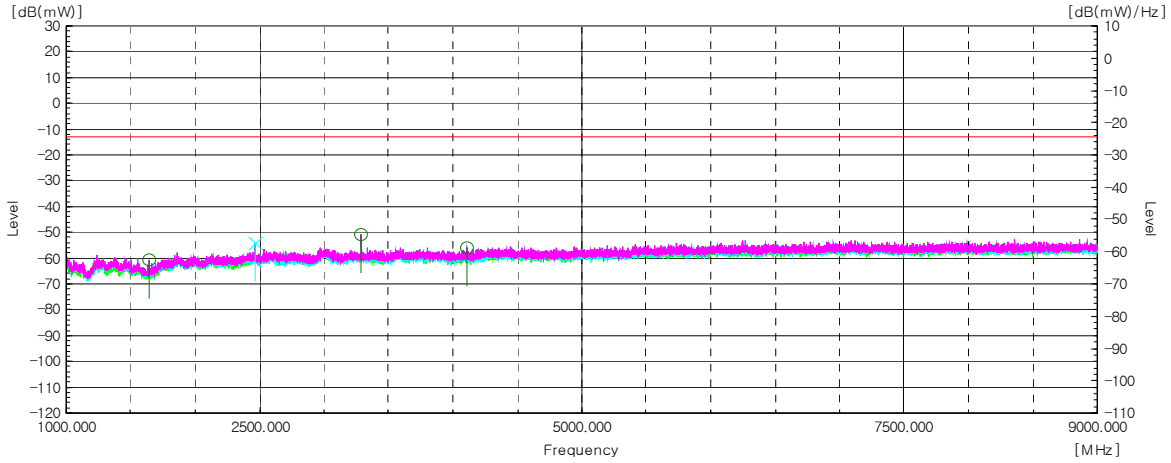


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 296.64	H	7.35	7.66	-51.99	-52.30	-13.00	39.30

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : LTE Band 26 (Part 22H)
Frequency (㎒) : 824.0
Channel : 26790
Bandwidth (㎒) : 3

Horizontal/Vertical

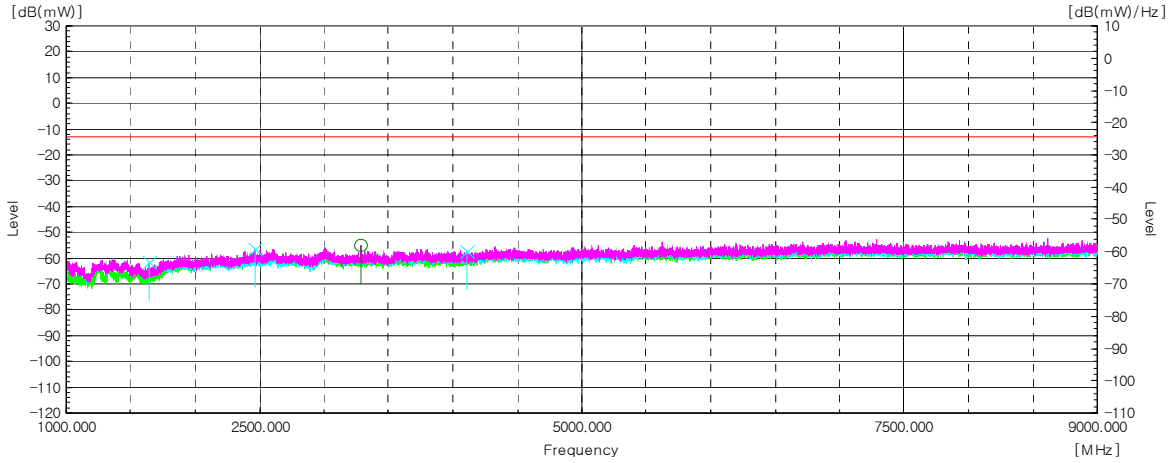


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 290.64	H	7.34	7.65	-50.59	-50.90	-13.00	37.90

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : LTE Band 26 (Part 90S)
Frequency (㎒) : 823.3
Channel : 26783
Bandwidth (㎒) : 1.4

Horizontal/Vertical

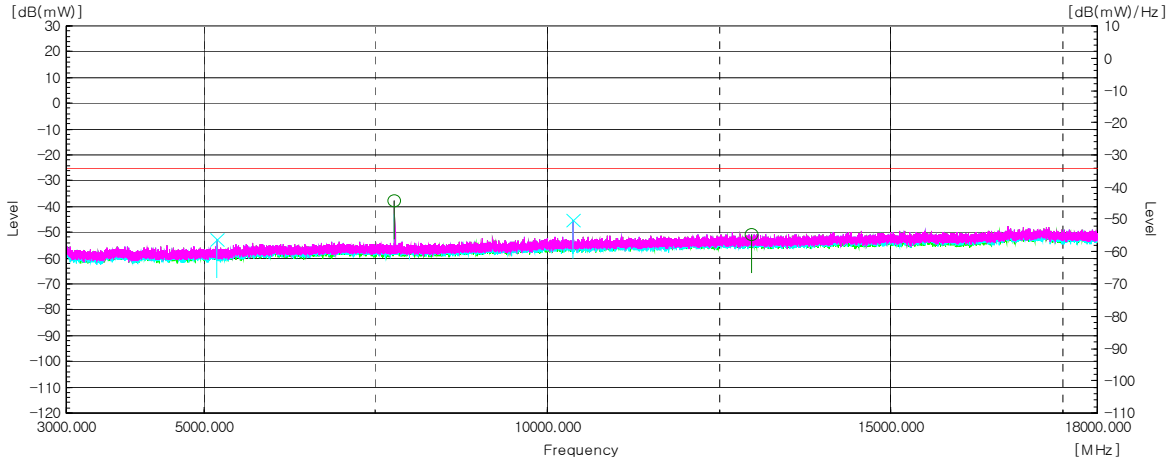


Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	3 291.14	H	7.34	7.65	-54.79	-55.10	-13.00	42.10

Note.
1. Limit Calculation(dBm)= 43 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

Test mode : LTE Band 41
Frequency (㎒) : 2 593.0
Channel : 40620
Bandwidth (㎒) : 20

Horizontal/Vertical



Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	7 779.00	H	12.28	11.98	-41.30	-41.00	-25.00	16.00

Note.
1. Limit Calculation(dBm)= 55 + 10log($P_{[Watts]}$)
2. Result level(dBm) = Substitute Level(dBm) + Antenna gain(dBi) – Cable loss (dB)

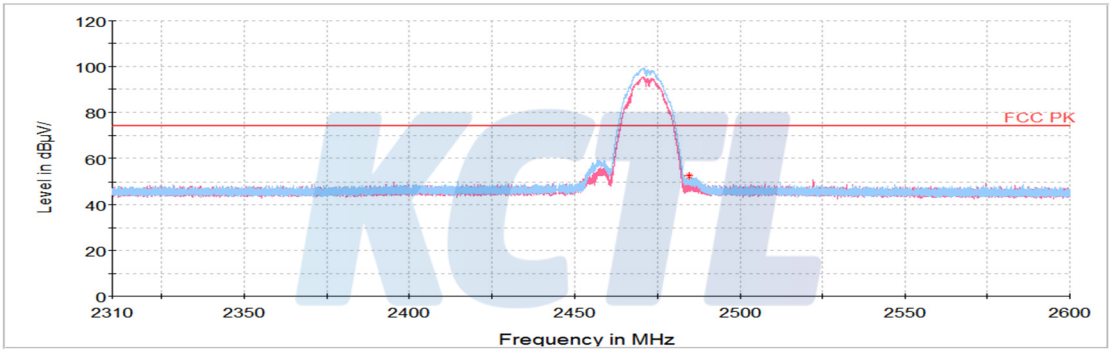
3.3.2 Unlicensed bands

Test results (2.4G WIFI)
802.11b / Band-edge

13 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 484.65[1)]	H	49.27	32.07	-29.22	-	52.12	74.00	21.88
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

Horizontal/Vertical for Band-edge

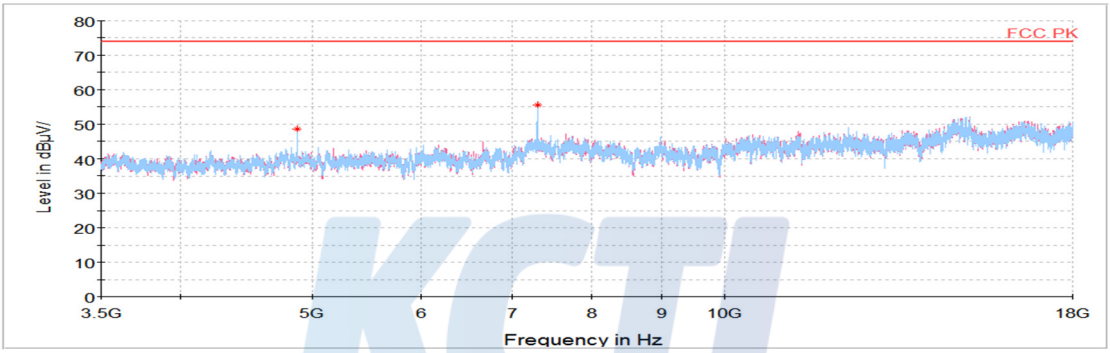


802.11b / Harmonic

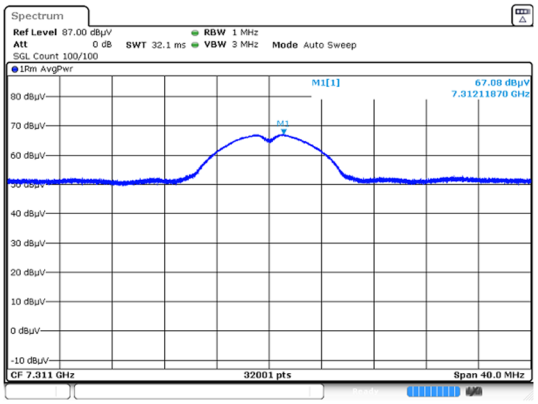
6 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
7 312.12[1)]	H	71.68	35.40	-51.50	-	55.58	74.00	18.42
Average Data								
7 312.12[1)]	H	67.08	35.40	-51.50	-	50.98	54.00	3.02

Horizontal/Vertical for 3.5 GHz ~ 18 GHz



Average data



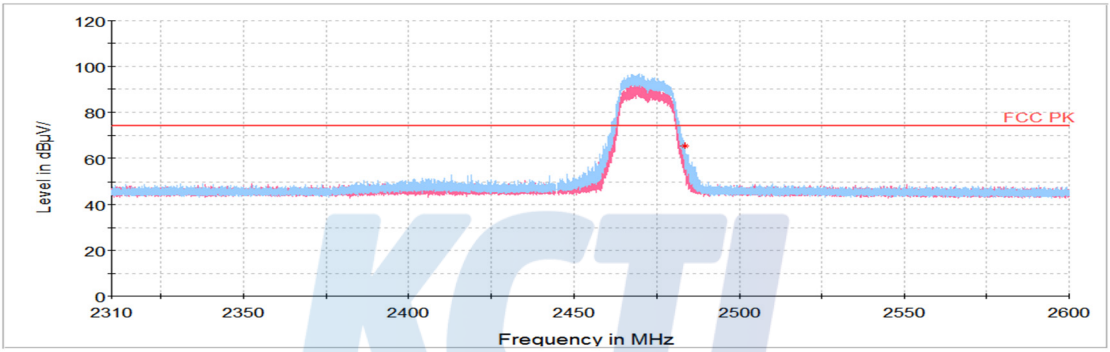
Blank

802.11g / Band-edge

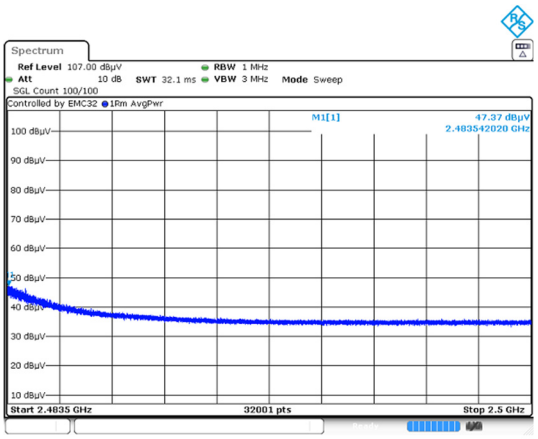
13 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 483.54[1)]	H	62.38	32.07	-29.21	-	65.24	74.00	8.76
Average Data								
2 483.54[1)]	H	47.37	32.07	-29.21	0.32	50.55	54.00	3.45

Horizontal/Vertical for Band-edge



Average data



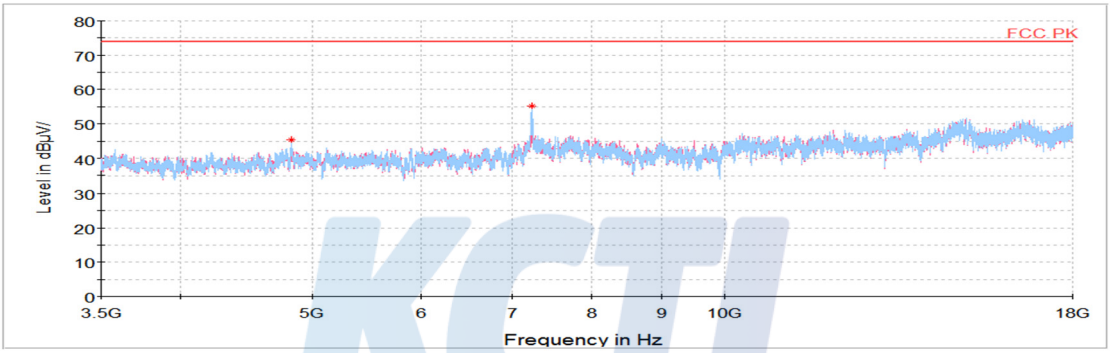
Blank

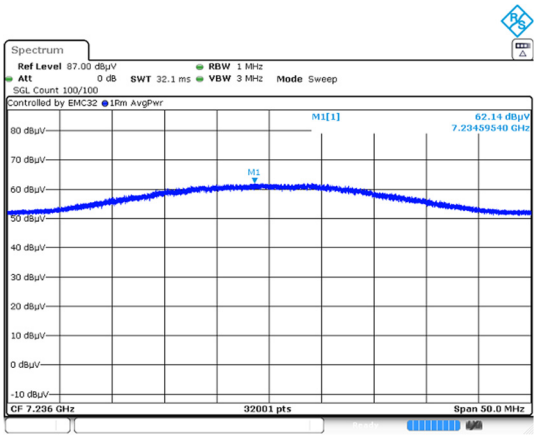
802.11g / Harmonic

1 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
7 234.60[1)]	H	71.57	35.40	-51.88	-	55.09	74.00	18.91
Average Data								
7 234.60[1)]	H	62.14	35.40	-51.88	0.32	45.98	54.00	8.02

Horizontal/Vertical for 3.5 GHz ~ 18 GHz



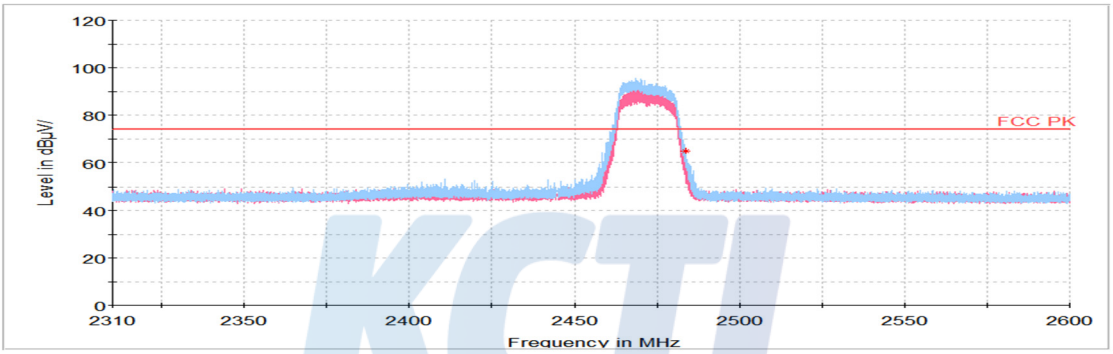
Average data	
	Blank

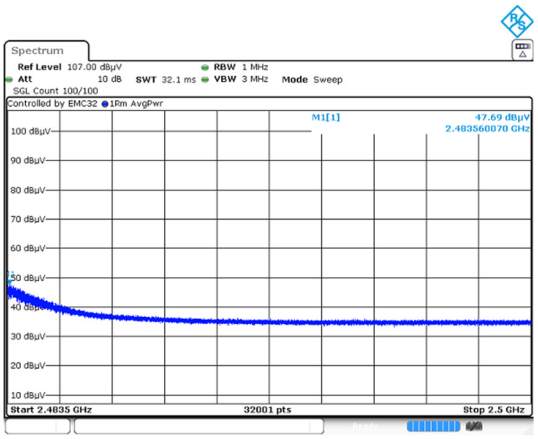
802.11n HT20 / Band-edge

13 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 483.56[1)]	H	62.05	32.07	-29.21	-	64.91	74.00	9.09
Average Data								
2 483.56[1)]	H	47.69	32.07	-29.21	0.34	50.89	54.00	3.11

Horizontal/Vertical for Band-edge



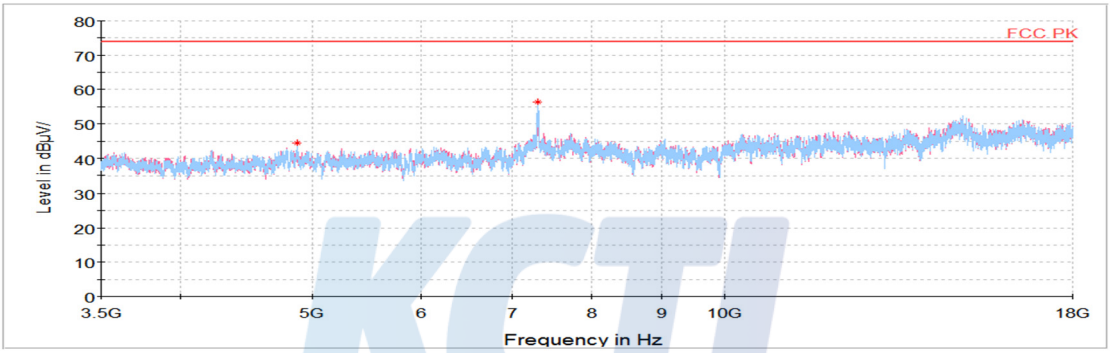
Average data	
	Blank

802.11n HT20 / Harmonic

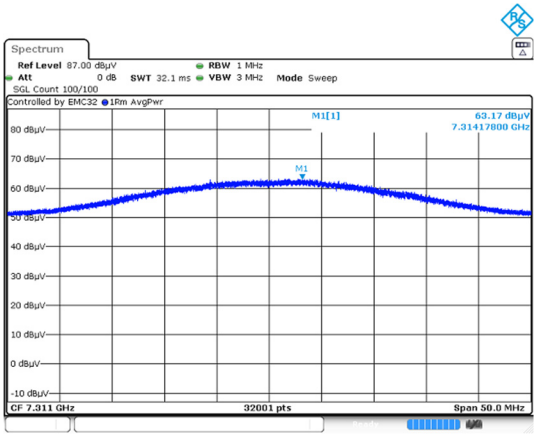
6 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
7 314.18[1)]	H	72.42	35.40	-51.49	-	56.33	74.00	17.67
Average Data								
7 314.18[1)]	H	63.17	35.40	-51.49	0.34	47.42	54.00	6.58

Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



Average data



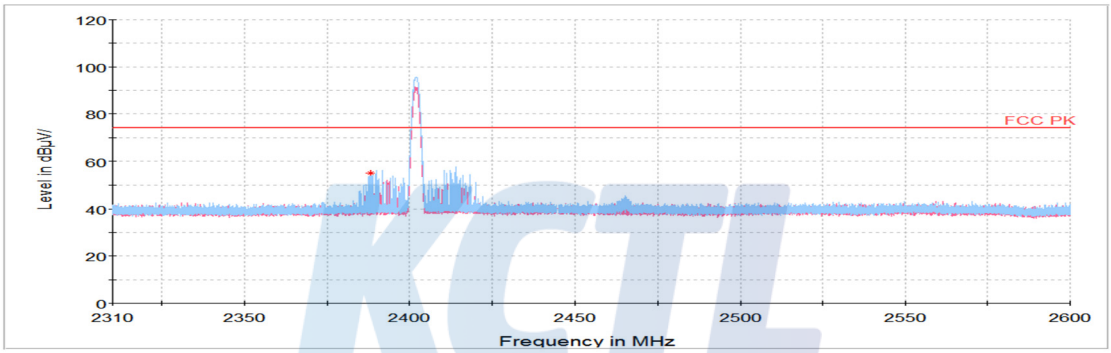
Blank

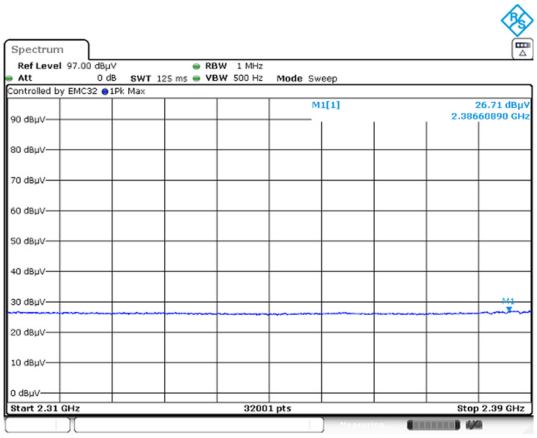
Test results (Bluetooth)
GFSK / Band-edge

0 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 386.61[1)]	H	51.98	31.87	-29.06	-	54.79	74.00	19.21
Average Data								
2 386.61[1)]	H	26.71	31.87	-29.06	-	29.52	54.00	24.48

Horizontal/Vertical for Band-edge



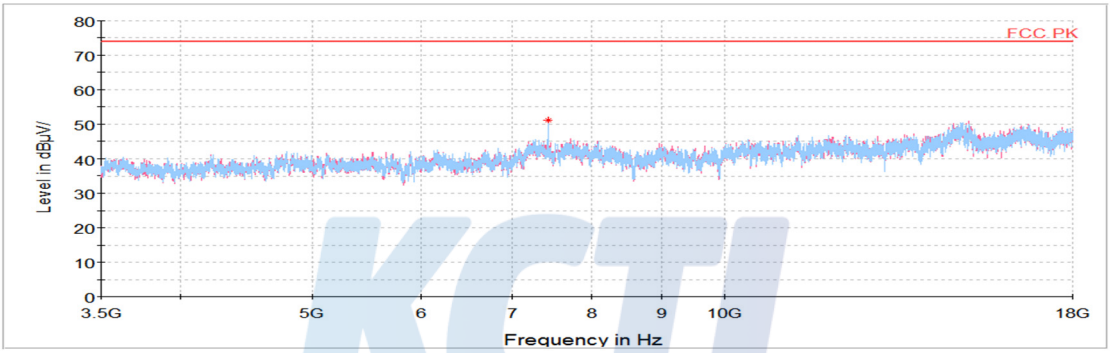
Average data	
	Blank

GFSK / Harmonic

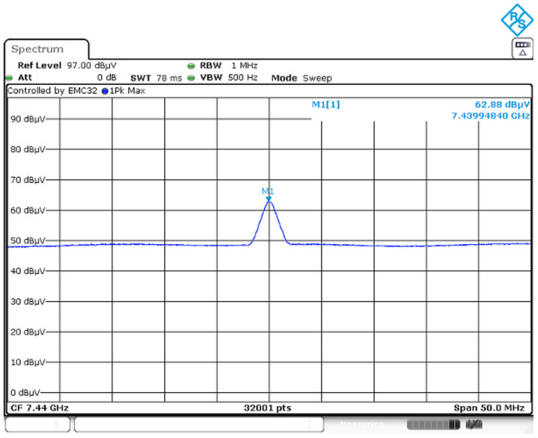
78 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
7 439.95[1)]	H	66.61	35.40	-50.87	-	51.14	74.00	22.86
Average Data								
7 439.95[1)]	H	62.88	35.40	-50.87	-	47.41	54.00	6.59

Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



Average data



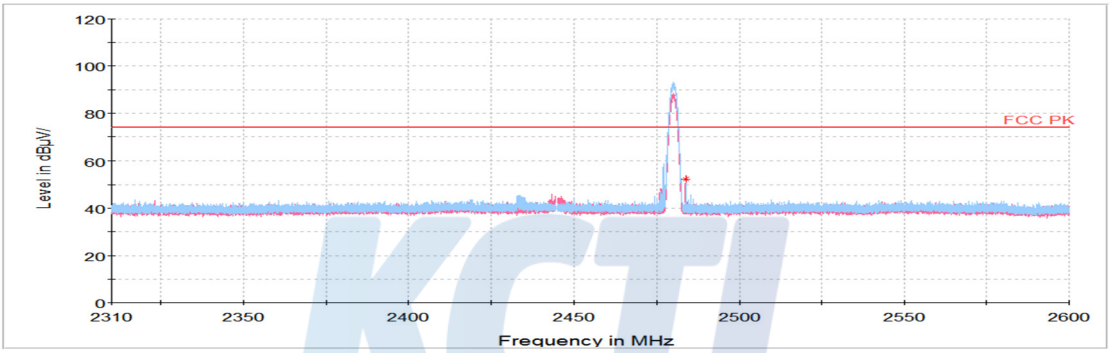
Blank

8DPSK / Band-edge

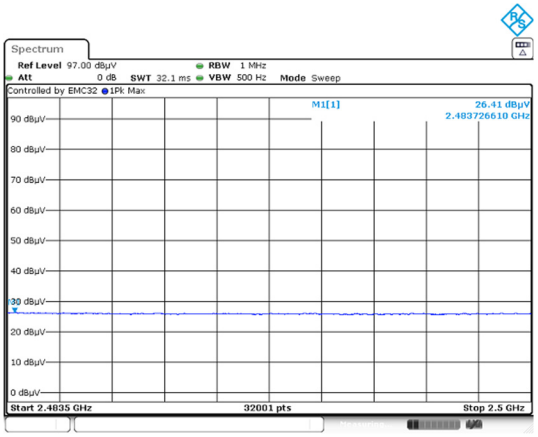
78 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 483.73[1)]	V	49.49	32.07	-29.21	-	52.35	74.00	21.65
Average Data								
2 483.73[1)]	V	26.41	32.07	-29.21	-	29.27	54.00	24.73

Horizontal/Vertical for Band-edge



Average data



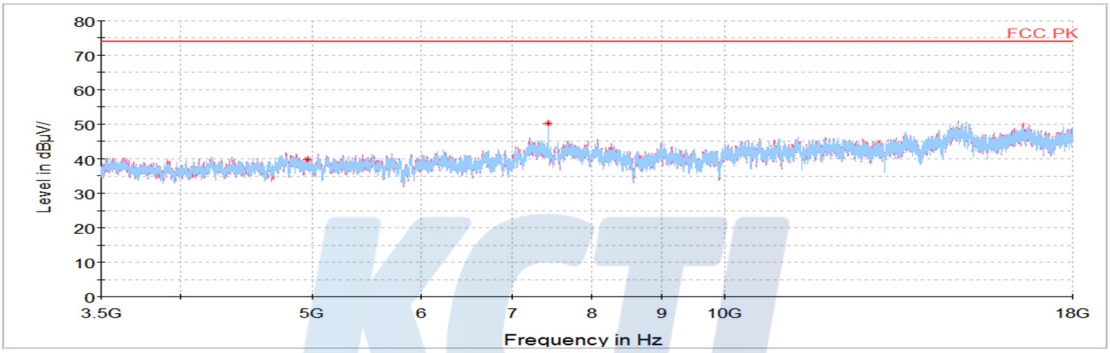
Blank

8DPSK / Harmonic

78 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
7 440.38[1)]	V	65.51	35.40	-50.86	-	50.05	74.00	23.95
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓

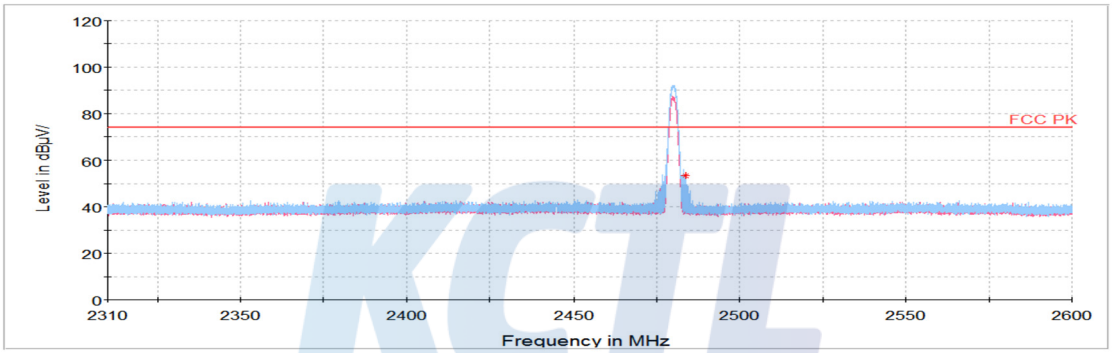


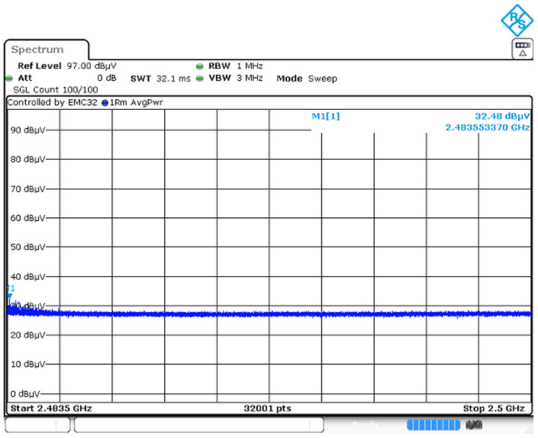
Test results (Bluetooth Low Energy)
BLE_1 MBit/s(37 Bytes) / Band-edge

39 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 483.55[1)]	H	50.31	32.07	-29.21	-	53.17	74.00	20.83
Average Data								
2 483.55[1)]	H	32.48	32.07	-29.21	2.14	37.48	54.00	16.52

Horizontal/Vertical for Band-edge



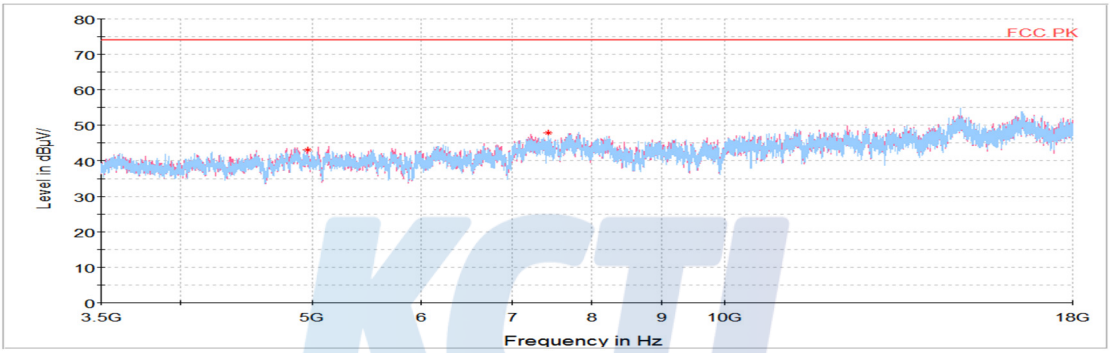
Average data	
	Blank

BLE 1 MBit/s(37 Bytes) / Harmonic

39 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
7 439.92[1)]	H	63.28	35.40	-50.87	-	47.81	74.00	26.19
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓

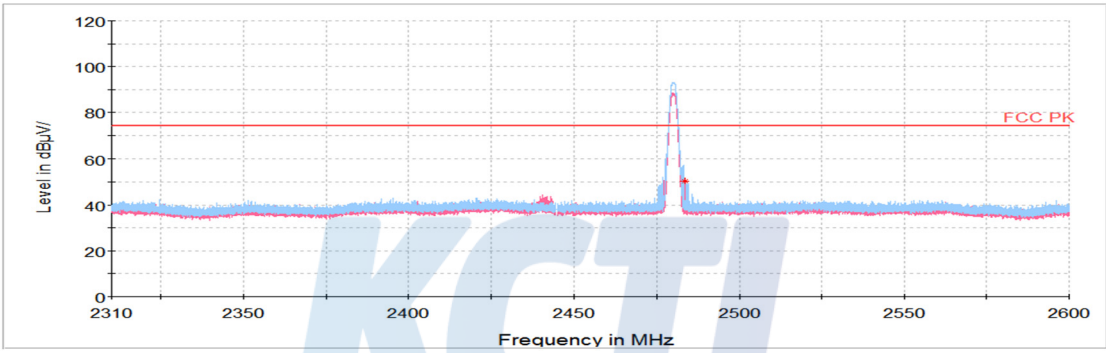


BLE 1 MBit/s(255 Bytes) / Band-edge

39 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 483.60[1)]	H	47.42	32.07	-29.21	-	50.28	74.00	23.72
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

Horizontal/Vertical for Band-edge

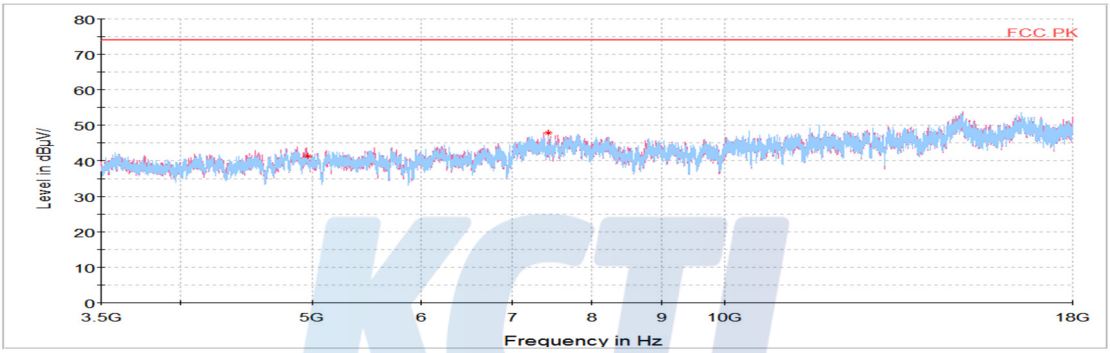


BLE 1 MBit/s(255 Bytes) / Harmonic

39 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
7 439.92[1)]	H	63.26	35.40	-50.87	-	47.76	74.00	26.24
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓

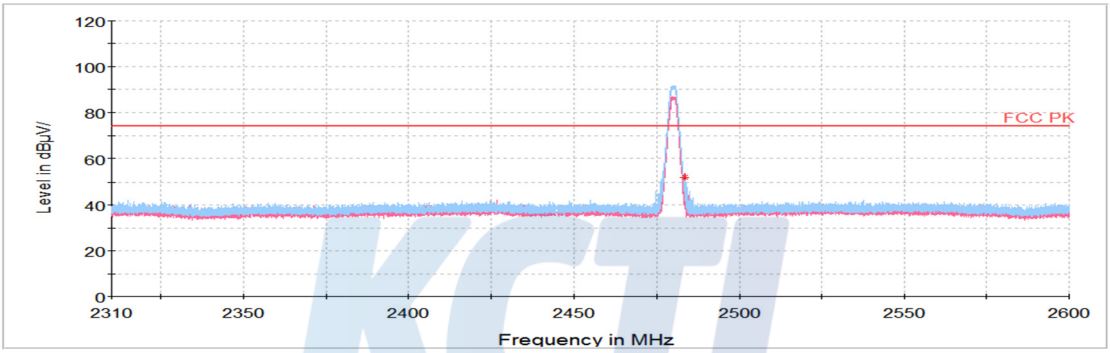


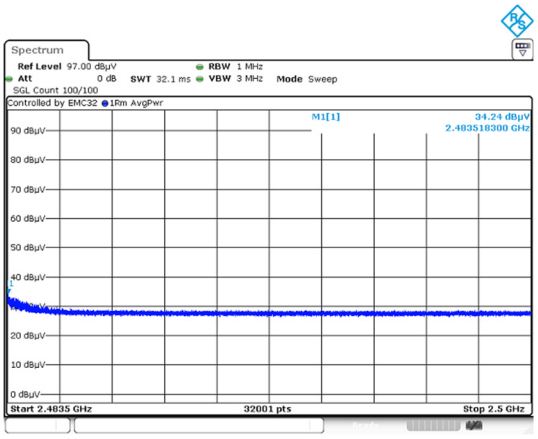
BLE 2 MBit/s(37 Bytes) / Band-edge

39 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 483.52[1)]	H	49.12	32.07	-29.21	-	51.98	74.00	22.02
Average Data								
2 483.52[1)]	H	34.24	32.07	-29.21	5.08	42.18	54.00	11.82

Horizontal/Vertical for Band-edge



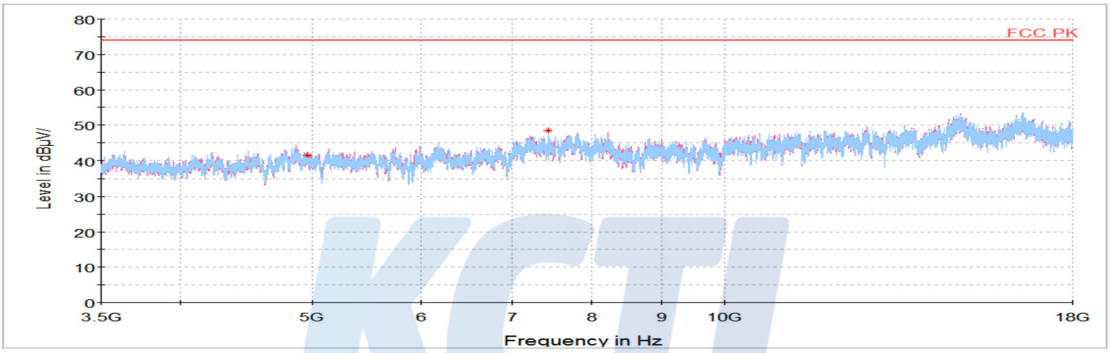
Average data	
	Blank

BLE 2 MBit/s(37 Bytes) / Harmonic

39 Channel

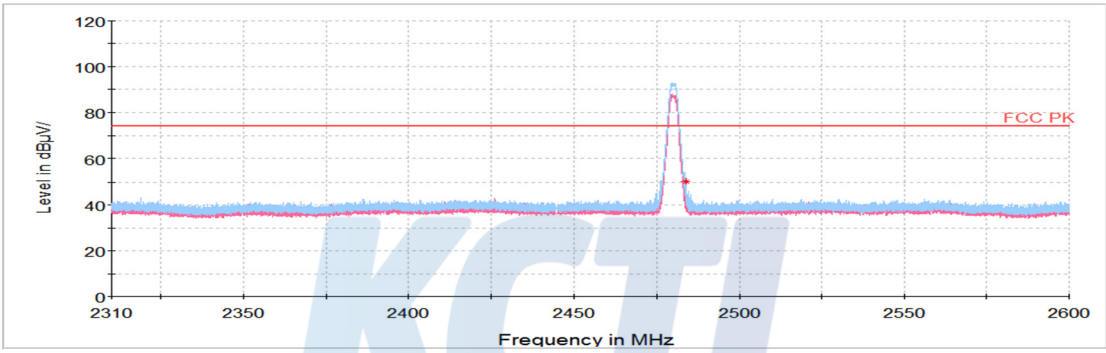
Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Peak data								
7 441.73[1)]	H	63.88	35.40	-50.86	-	48.42	74.00	25.58
Average Data								
No spurious emissions were detected within 20 ㏈ of the limit.								

Horizontal/Vertical for 3.5 ㎓ ~ 18 ㎓



BLE 2 MBit/s(255 Bytes) / Band-edge

39 Channel

Frequency	Pol.	Reading	Ant. Factor	Amp. + Cable	DCCF	Result	Limit	Margin
(MHz)	(V/H)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Peak data								
2 484.03[1)]	V	47.22	32.07	-29.22	-	50.07	74.00	23.93
Average Data								
No spurious emissions were detected within 20 dB of the limit.								

Horizontal/Vertical for Band-edge