

TEST REPORT

Job No. : GPEM2404000300EC
Test Report No. : F690501-RF-EMC002395_3
Applicant : Master Lock Company
Product Name : Digital Door Lock
Model Name : YRD450 FP
Standards : FCC Part 15 Subpart B
ICES-003 Issue 7:2020
FCC ID : 2ABFG-YRD450-F
Date of Receipt : April 18, 2023(For initial test), April 15, 2024(For additional test)
Date of Test : April 20, 2023 ~ April 27, 2023(For initial test)
May 2, 2024(For additional test)
August 22, 2024(For additional RE test)
Date of Issue : August 23, 2024
Test Result : Complied

- 1) This test report does not assure KOLAS accreditation.
2) The results of this test report are effective only to the items tested.
3) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.

Affirmation Tested by (Name, signature) Approved by (Name, signature)
Luther Choi  Julia Choi 

SGS Korea Co., Ltd. Gunpo Laboratory

4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, 15807, KOREA

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Revision History

Revision	Report Number	Description
0	F690501-RF-EMC001354	Initial
1	F690501-RF-EMC002395	- Applicant, manufacturer and FCC ID changed. - Existed model name was revised. - The YRD430-P and YRD410-P models were added as Alt. Models and additional tests were conducted.
2	F690501-RF-EMC002395_1	- Basic model name and FCC ID changed. - Alt. Model added.
3	F690501-RF-EMC002395_2	Alt. Model and Model Differences revised.
4	F690501-RF-EMC002395_3	- It added radiated emission(Above 1 GHz) test results for YRD450 FP, YRD420 FP models (missing). - It tested radiated emission(Above 1 GHz) additionally. (Tested Model : YRD430-F, YRD410-F)

1. Test Laboratory

1.1 General information

Name	SGS Korea Co., Ltd.		
- Branch Site	4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Republic of Korea		
	Tel. 82 31 428 5700		Fax. 82 31 427 5370
- Branch Site-3	35, Giheungdanji-ro 121beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Republic of Korea		
	Tel. 82 31 548 0710		Fax. 82 31 548 0719
- Branch Site-4	12, Dongtansandan 10-gil, Hwaseong-si, Gyeonggi-do, 18487, Republic of Korea		
	Tel. 82 31 8007 5302		Fax. 82 31 427 2370
Website	http://www.sgsgroup.kr/ee		

SGS Korea Co., Ltd. has been accredited by the agencies listed in the following table;

Accreditation	Accreditation bodies	Accreditation No.
KC	MSIT- RRA	KR0150
FCC	FCC (MRA)	
IC	IC (MRA)	
Vietnam-MIC	Vietnam-MIC	
Japan EMI	VCCI	C-14102, T-11156, R-13662, G-20037
KOLAS	KATS - KOLAS	Testing No.123
CBTL	IECEE	TL 146
SDPPI	SDPPI	-

2. General Information of E.U.T.

2.1 Applicant Information

Applicant	Master Lock Company
Applicant Address	6744 S. Howell Avenue Oak Creek, WI 53154, USA
Manufacturer	Master Lock Company
Manufacturer Address	Lot A10 Ba Thien II Industrial Park Thien Ke Ward Vinh Phuc Province, Vietnam

2.2 General Information of E.U.T.

Classification	Description	
Product Name	Digital Door Lock	
Model Name	YRD450 FP	
Alt. Model Name	YRD420 FP, YRD430-F, YRD410-F	
Model Differences	Model Names	Description
	YRD450 FP (Basic Model)	Representative production model.
	YRD420 FP	- Same as basic model except below. - Variant model differs in the authentication method that opens the door.
	YRD430-F	- Same as basic model except below. - Variant model is push type and has a different unlocking method. - Has a 9 V charging terminal.
	YRD410-F	- Same as YRD430-F model except below. - Variant model differs in the authentication method that opens the door. - No 9V charging terminal.
Serial No.	-	
EMI Classification	Class B	
Internal Clock Frequency	64 MHz (Bluetooth Frequency : 2.4 GHz)	
Rated Power	6 Vd.c.	
Tested Power	6 Vd.c.	
H/W Version	-	
S/W Version	-	
Port	-	
Components	-	
Function	Door locking devices.	

2.3 Configurations of E.U.T

Description	Model	Serial No.	Manufacturer	Note
1.Model Name: YRD450 FP				
Main Board	YRD450 FP MAIN PV01	PC4M-D300S-E1	-	-
Front Board	YRD450 FP TS KEYLESS FRONT PV01	PC4F-D300S-E1	-	-
Speaker	-	-	-	-
Motor	-	-	-	-
Fingerprint Module	-	-	-	-
Bluetooth Antenna	-	-	-	-
2. Model Name: YRD420 FP				
Main Board	YRD450 FP MAIN PV01	PC4M-D300S-E1	-	-
Front Board	YRD420 FP TS KEYED FRONT PV01	PC4F-D320S-E1	-	-
Speaker	-	-	-	-
Motor	-	-	-	-
Fingerprint Module	-	-	-	-
Bluetooth Antenna	-	-	-	-
3. Model Name : YRD430-F				
Main board	PC4M-D300S-E1	-	-	-
Keypad Front board	PC4F-D330S-E100	-	-	-
Fingerprint board	IREVO R03	-	-	-
Motor	-	-	-	-
Speaker	-	-	-	-
Bluetooth Antenna	-	-	-	-
4. Model Name : YRD410-F				
Main board	PC4M-D300S-E1	-	-	-
Keyless Front board	PC4F-D310S-E100	-	-	-
Fingerprint board	IREVO R03	-	-	-
Motor	-	-	-	-
Speaker	-	-	-	-
Bluetooth Antenna	-	-	-	-

3. E.U.T. Operation and Test Configuration

3.1 Peripheral Equipments

Description	Model	Serial No.	Manufacturer	Note.
-	-	-	-	-

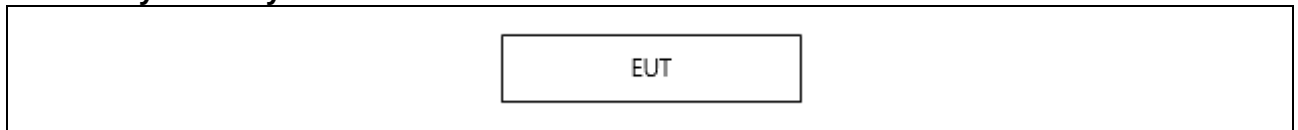
3.2 Cable List

Start		END		Cable Spec.		Used core
Name	I/O Port	Name	I/O Port	Length (m)	Shield	
EUT	-	-	-	-	-	-

3.3 Operating Modes and Conditions

Operating mode		Operating condition
01	PW(Password)	A state that the EUT is operated by password.
02	FP(Fingerprint)	A state that the EUT is operated by touching fingerprint.

3.4 Test System Layout



3.5 Modifications to the test items during testing

- ☒ No modifications done during testing
- ☐ Modification done during testing (see details below)

No.	Description of modification (if any)
1	
2	

4. Test Results

4.1 Summary

Test Items	Standards	Test Results
Conducted Emission	FCC Part 15 Subpart B Section 15.107 ICES-003 Issue 7:2020 ANSI C63.4a:2017	N/A
Radiated Emission	FCC Part 15 Subpart B Section 15.109 ICES-003 Issue 7:2020 ANSI C63.4a:2017	Complied

4.2 Note

- 1
Test Methods of all test items are performed according to the basic standard in subclause 4.1.
- 2

Emission Test

5.1 Test Method and Limits

Test Items	Measuring Frequency Range	RBW	Measuring Distance
Conducted Emission	0.15 MHz - 30 MHz	9 kHz	-
Radiated Emission	30 MHz - 1 GHz	120 kHz	10 m or 3 m
	Above 1 GHz	1 MHz	3 m

5.2 Test Limits

Frequency Range	Limits(dBμV)		Class
	Quasi-peak	CISPR-Average	
0.15 MHz - 0.5 MHz	79	66	Class A
0.5 MHz - 30 MHz	73	60	
0.15 MHz - 0.5 MHz	66 to 56 ^{Note1}	56 to 46 ^{Note1}	Class B
0.5 MHz - 5 MHz	56	46	
5 MHz - 30 MHz	60	50	

[Table 2.1 Conducted Emission Limits]

Frequency Range	Limits(dBμV/m)	Class
	Quasi-peak	
30 MHz - 88 MHz	39.0	Class A (10 m method)
88 MHz - 216 MHz	43.5	
216 MHz - 960 MHz	46.4	
960 MHz - 1 GHz	49.5	
30 MHz - 88 MHz	40.0	Class B (3 m method)
88 MHz - 216 MHz	43.5	
216 MHz - 960 MHz	46.0	
960 MHz - 1 GHz	54.0	

[Table 2.2 Radiated Emission Limits below 1 GHz_For FCC Part 15 Subpart B]

Frequency Range	Limits(dBμV/m)	Class
	Quasi-peak	
30 MHz - 88 MHz	40.0	Class A (10 m method)
88 MHz - 216 MHz	43.5	
216 MHz - 230 MHz	46.4	
230 MHz - 960 MHz	47.0	
960 MHz - 1 GHz	49.5	

30 MHz - 88 MHz	50.0	Class A (3 m method)
88 MHz - 216 MHz	54.0	
216 MHz - 230 MHz	56.9	
230 MHz - 960 MHz	57.0	
960 MHz - 1 GHz	60.0	
30 MHz - 88 MHz	30.0	Class B (10 m method)
88 MHz - 216 MHz	33.1	
216 MHz - 230 MHz	35.6	
230 MHz - 960 MHz	37.0	
960 MHz - 1 GHz	43.5	
30 MHz - 88 MHz	40.0	Class B (3 m method)
88 MHz - 216 MHz	43.5	
216 MHz - 230 MHz	46.0	
230 MHz - 960 MHz	47.0	
960 MHz - 1 GHz	54.0	

[Table 2.3 Radiated Emission Limits below 1 GHz_For ICES-003 Issue 7 : 2020]

Frequency Range	Limits(dBμV)		Class
	Quasi-peak	CISPR-Average	
Above 1 GHz	79.5	59.5	Class A
	74.0	54.0	Class B

[Table 2.4 Radiated Emission Limits Above 1 GHz_For FCC Part 15 Subpart B ^{Note2}]

Frequency Range	Limits(dBμV)		Class
	Quasi-peak	CISPR-Average	
Above 1 GHz	80.0	60.0	Class A
	74.0	54.0	Class B

[Table 2.5 Radiated Emission Limits Above 1 GHz_For ICES-003 Issue 7 : 2020]

Note 1. The lower limit shall apply at the transition frequencies. The limit decreases linearly with the logarithm of that frequency.

Note 2. The limits of class A equipment is extrapolated using an extrapolation factor of 20 dB/decade because it was measured at 3 m distance not 10 m distance.

5.3 Radiated Emission

5.3.1 Test Equipments

Equipment	Model	Manufacturer	Serial No	Cal Due. Date
Tested Model : YRD450 FP, YRD420 FP				
Horn Antenna	HF906	R & S	100326	2024-02-18
Signal Conditioning Unit	SCU 18	R & S	10117	2023-06-13
Test Receiver	ESU26	R & S	100109	2024-01-18
Hybrid Antenna	VULB9163	SCHWARZBECK	01126	2024-02-09
Amplifier	8447F	HP	2944A03909	2023-08-04
RF Cable(CA-04)	-	-	-	2023-10-04
RF Cable(CA-05)	-	-	-	2023-10-04
RF Cable(CA-06)	MWX221-NMSNMS (4m)	RF ONE	J023142	2023-10-04
RF Cable(CA-07)	PL520-NMNM-10M (10m)	RF ONE	0200324001	2023-10-04
Tested Model : YRD430-F, YRD410-F(Below 1 GHz)				
EMI TEST RECEIVER	ESU40	R&S	100075	2025-01-17
TRILOG BROADBAND ANTENNA	VULB 9163	SCHWARZBECK	01126	2025-02-26
PREAMPLIFIER	AM-1431	MITEQ	1336160	2024-05-23
RF Cable	EMH-1Lab-RE-01	-	-	-
RF Cable	EMH-1Lab-RE-04	-	-	-
RF Cable	EMH-1Lab-RE-06	-	-	-
Tested Model : YRD430-F, YRD410-F(Above 1 GHz)				
EMI TEST RECEIVER	ESU40	R&S	100075	2025-01-17
Double Ridged Horn Antenna	HF907	R&S	100208	2025-03-04
AMPLIFIER	SCU 18F	R&S	101072	2025-05-20
RF Cable	EMH-1Lab-RE-06	-	-	-
RF Cable	EMH-1Lab-RE-05	-	-	-

Note. Measuring software is below

- Branch Site : EP5RE(V5.3.70) from TOYO
- Branch Site-3 : EMC32(V10.40.10) from R&S
- Branch Site-4 : EMC32(V10.40.10) from R&S

5.3.2 Environment Conditions

Tested Model : YRD450 FP, YRD420 FP

Test Site	3 m SEMI-ANECHOIC CHAMBER in Branch site
Temperature	(Minimum 20.0, Maximum 21.2) °C
Humidity	(Minimum 30.0, Maximum 43.0) % R.H.
Atmospheric Pressure	(Minimum 100.1, Maximum 101.3) kPa
Test Date	2023-04-20, 2023-04-27 (for Below 1 GHz) 2023-04-24, 2023-04-27 (for Above 1 GHz)

Tested Model : YRD430-F, YRD410-F(Below 1 GHz)

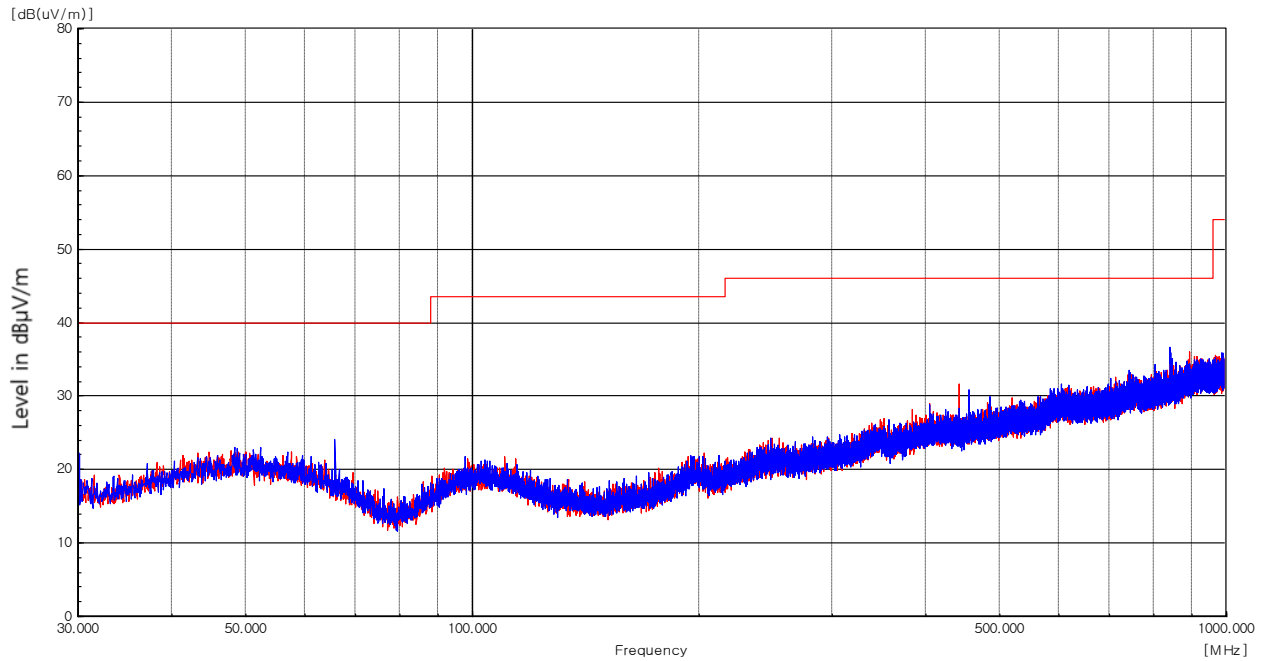
Test Site	10 m SEMI-ANECHOIC CHAMBER in Branch site-3
Temperature	(Minimum 21.2, Maximum 21.6) °C
Humidity	(Minimum 31.0, Maximum 33.0) % R.H.
Atmospheric Pressure	(Minimum 101.0, Maximum 101.0) kPa
Test Date	2024-05-02

Tested Model : YRD430-F, YRD410-F(Above 1 GHz)

Test Site	10 m SEMI-ANECHOIC CHAMBER in Branch site-3
Temperature	(Minimum 21.2, Maximum 21.4) °C
Humidity	(Minimum 31.0, Maximum 33.0) % R.H.
Atmospheric Pressure	(Minimum 101.0, Maximum 101.0) kPa
Test Date	2024-08-22

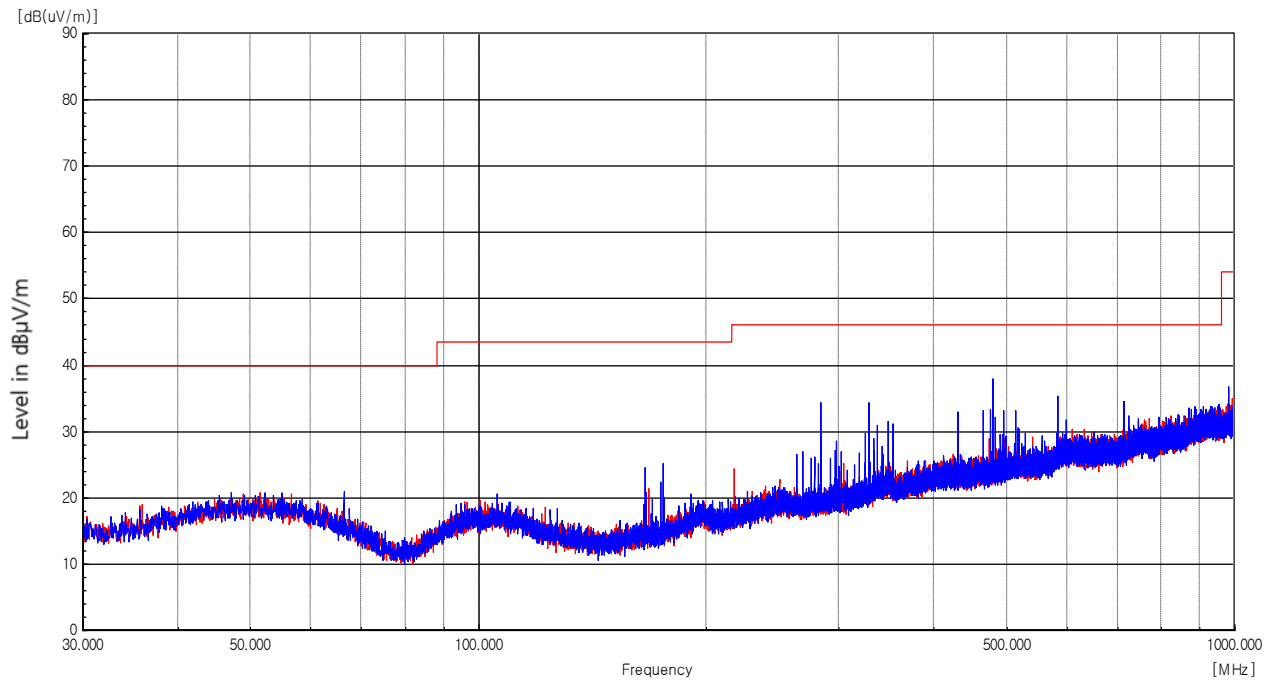
5.3.3 Test Result

01 Mode_Model: YRD450 FP [FCC]



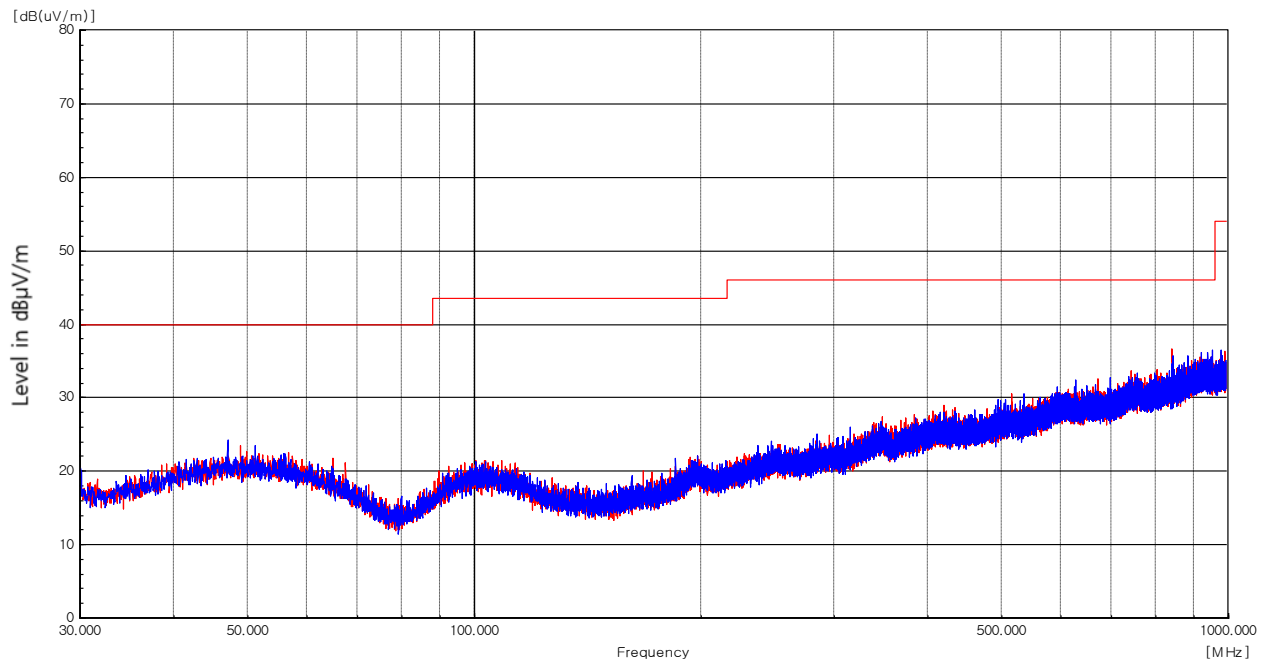
Freq. (MHz)	Reading (dBμV/m)	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
30.04	22.10	V	20	205	16.29	0.66	28.20	10.85	40.00	29.15
65.73	23.50	V	350	100	16.65	1.09	28.20	13.04	40.00	26.96
110.47	22.00	H	145	112	17.15	1.41	28.18	12.38	43.50	31.12
441.64	23.50	H	160	102	21.92	2.55	28.13	19.84	46.00	26.16
455.39	23.70	V	145	100	21.97	2.95	28.23	20.39	46.00	25.61
842.54	24.00	V	10	195	27.00	3.66	28.73	25.93	46.00	20.07

02 Mode_Model: YRD450 FP [FCC]



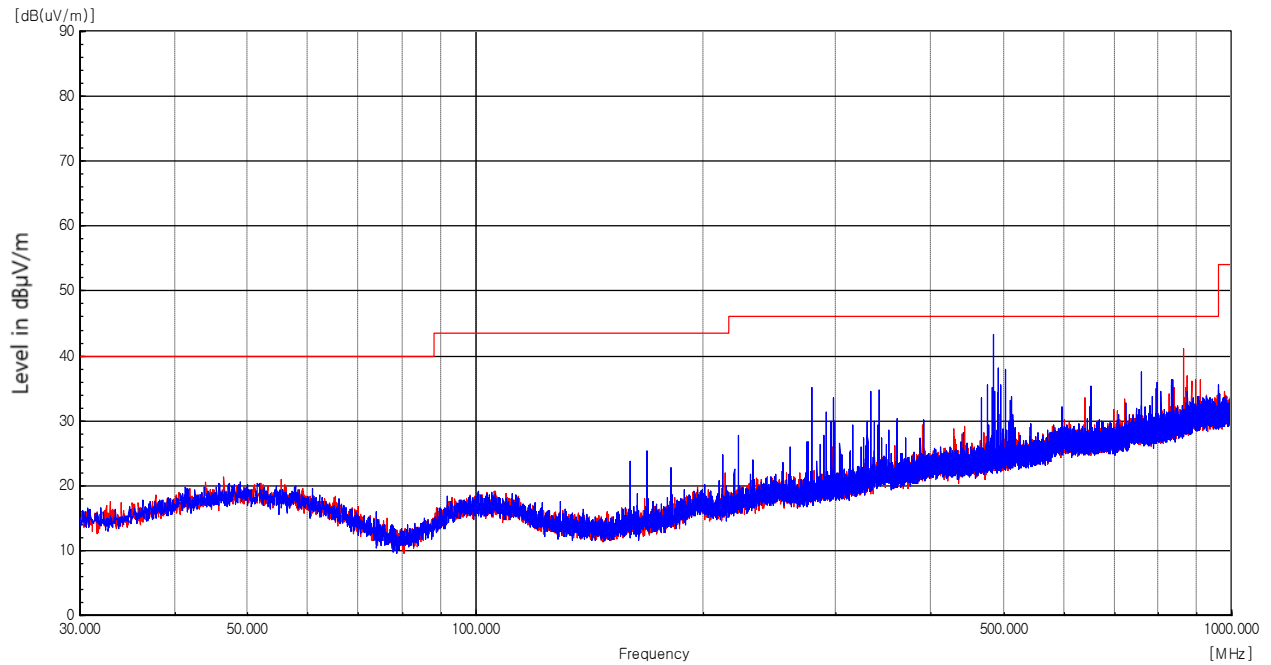
Freq. (MHz)	Reading (dBμV/m)	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
175.50	23.40	V	90	105	14.80	1.73	28.00	11.93	43.50	31.57
217.61	24.50	H	25	195	16.88	1.95	27.85	15.48	46.00	30.52
283.78	24.70	V	350	107	18.79	2.14	27.65	17.98	46.00	28.02
478.34	25.00	V	320	100	22.52	2.75	28.37	21.90	46.00	24.10
584.15	24.50	V	300	109	24.32	3.40	28.67	23.55	46.00	22.45
981.33	24.10	V	285	110	28.10	4.48	28.54	28.14	54.00	25.86

01 Mode_Model: YRD420 FP [FCC]



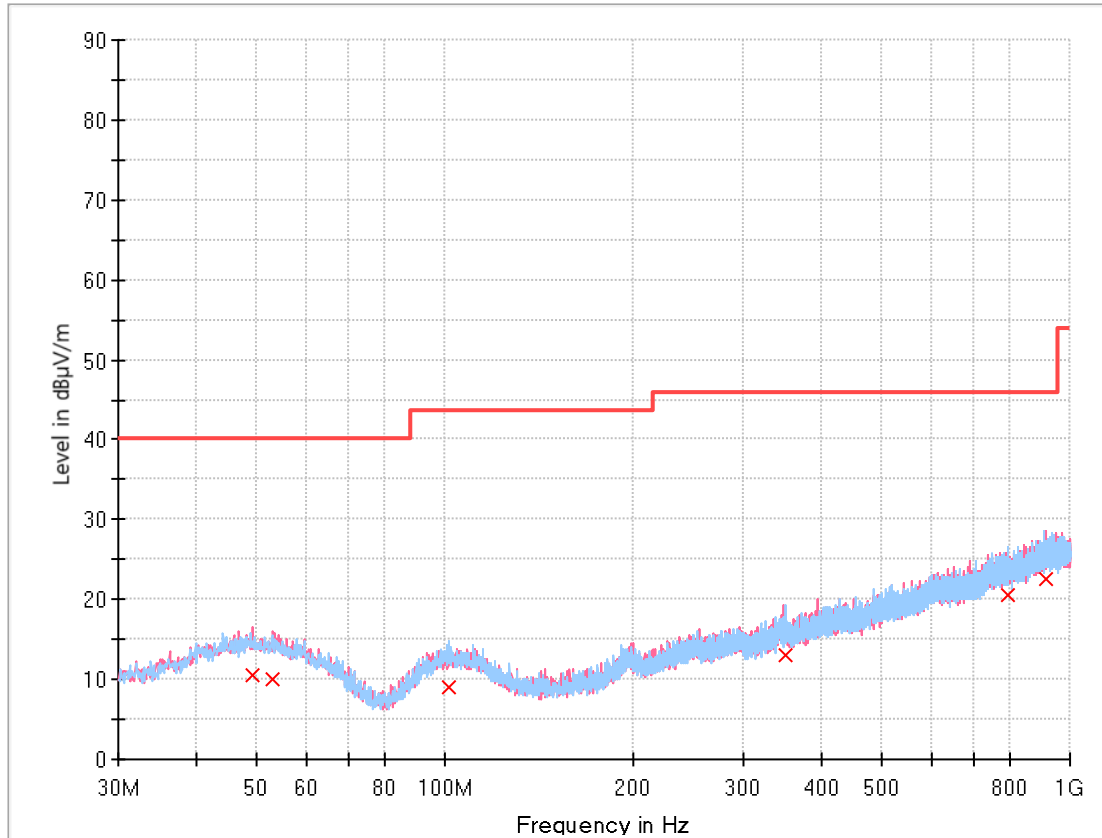
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47.06	22.20	V	345	100	19.61	0.83	28.20	14.44	40.00	25.56
48.96	22.30	H	90	204	19.70	0.86	28.20	14.66	40.00	25.34
515.93	23.40	H	20	198	23.20	3.06	28.53	21.13	46.00	24.87
626.35	23.80	V	255	200	25.08	3.08	28.78	23.18	46.00	22.82
842.54	24.00	H	355	210	27.00	3.66	28.73	25.93	46.00	20.07
843.99	23.80	V	350	100	27.00	3.67	28.72	25.75	46.00	20.25

02 Mode_Model: YRD420 FP [FCC]



Freq. (MHz)	Reading (dBμV/m)	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
222.46	24.20	V	40	105	17.15	1.96	27.83	15.48	46.00	30.52
278.16	23.20	V	30	100	18.60	2.14	27.67	16.27	46.00	29.73
342.02	23.50	V	35	109	20.50	2.38	27.52	18.86	46.00	27.14
484.81	22.90	V	260	201	22.70	2.71	28.41	19.90	46.00	26.10
760.57	23.00	V	240	100	26.60	3.78	28.94	24.44	46.00	21.56
862.71	22.50	H	280	100	27.24	3.70	28.70	24.74	46.00	21.26

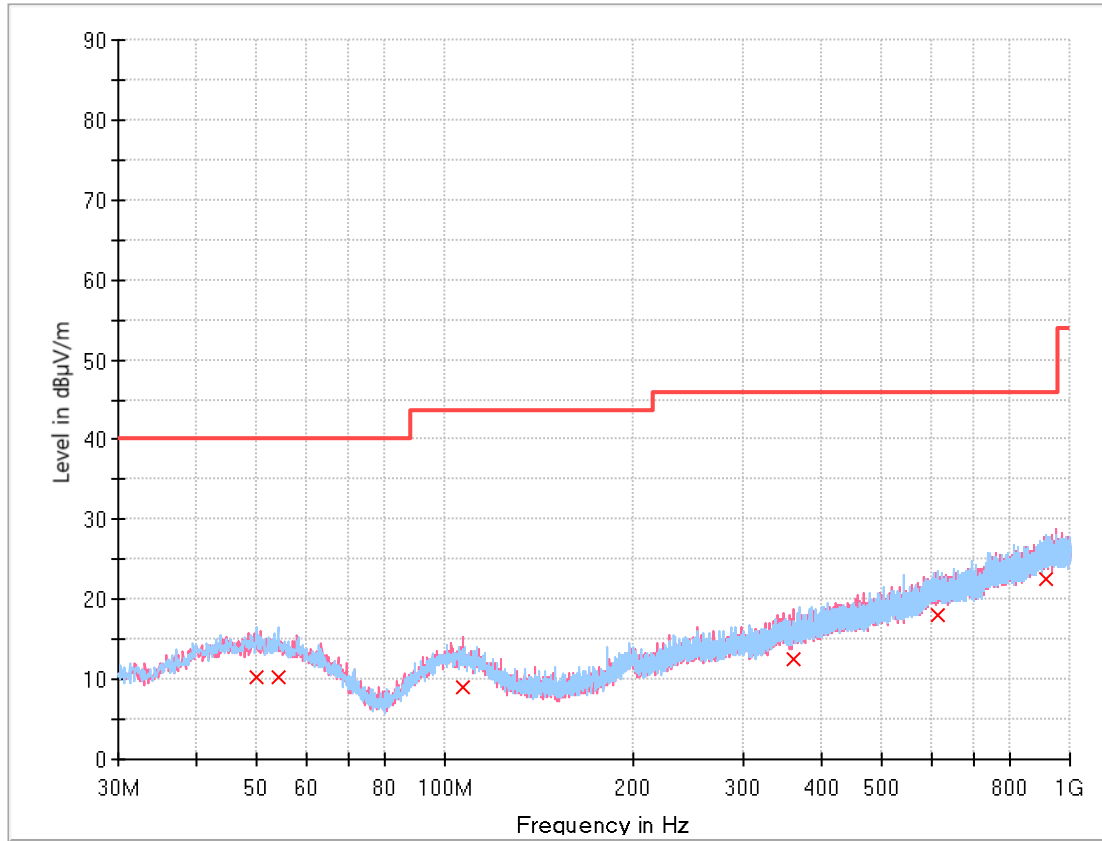
01 Mode_Model: YRD430-F [FCC]



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
49.206	10.47	40.00	29.53	15 000.0	120.000	112.0	V	354.0	-17.8
53.086	10.01	40.00	29.99	15 000.0	120.000	386.0	V	349.0	-18.0
101.586	9.06	43.50	34.44	15 000.0	120.000	364.0	H	0.0	-19.2
349.712	13.07	46.00	32.93	15 000.0	120.000	374.0	H	0.0	-15.4
794.942	20.56	46.00	25.44	15 000.0	120.000	145.0	H	198.0	-8.1
918.326	22.53	46.00	23.47	15 000.0	120.000	287.0	V	102.0	-6.4

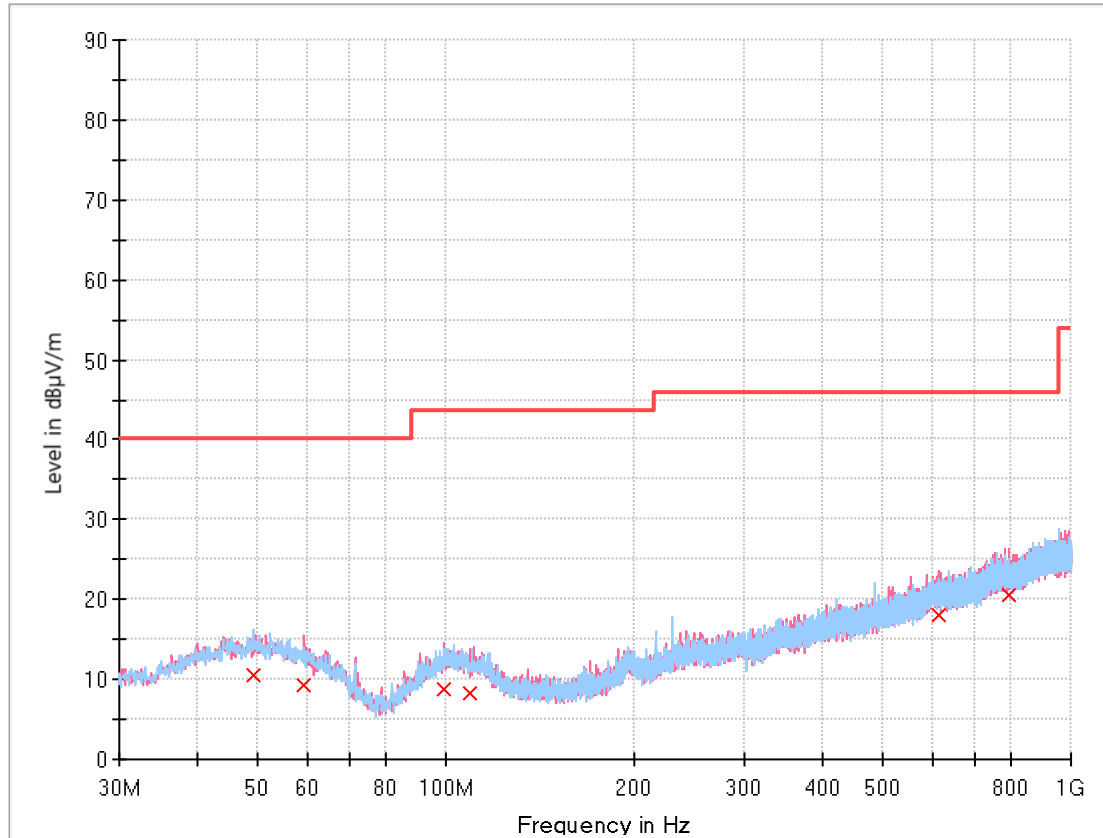
02 Mode_Model: YRD430-F [FCC]



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
49.982	10.40	40.00	29.60	15 000.0	120.000	245.0	H	127.0	-17.8
53.959	10.28	40.00	29.72	15 000.0	120.000	122.0	H	0.0	-18.1
107.018	8.92	43.50	34.58	15 000.0	120.000	314.0	V	1.0	-19.5
359.994	12.49	46.00	33.51	15 000.0	120.000	136.0	V	186.0	-16.1
612.291	18.12	46.00	27.88	15 000.0	120.000	344.0	H	59.0	-10.1
914.446	22.59	46.00	23.41	15 000.0	120.000	375.0	H	146.0	-6.4

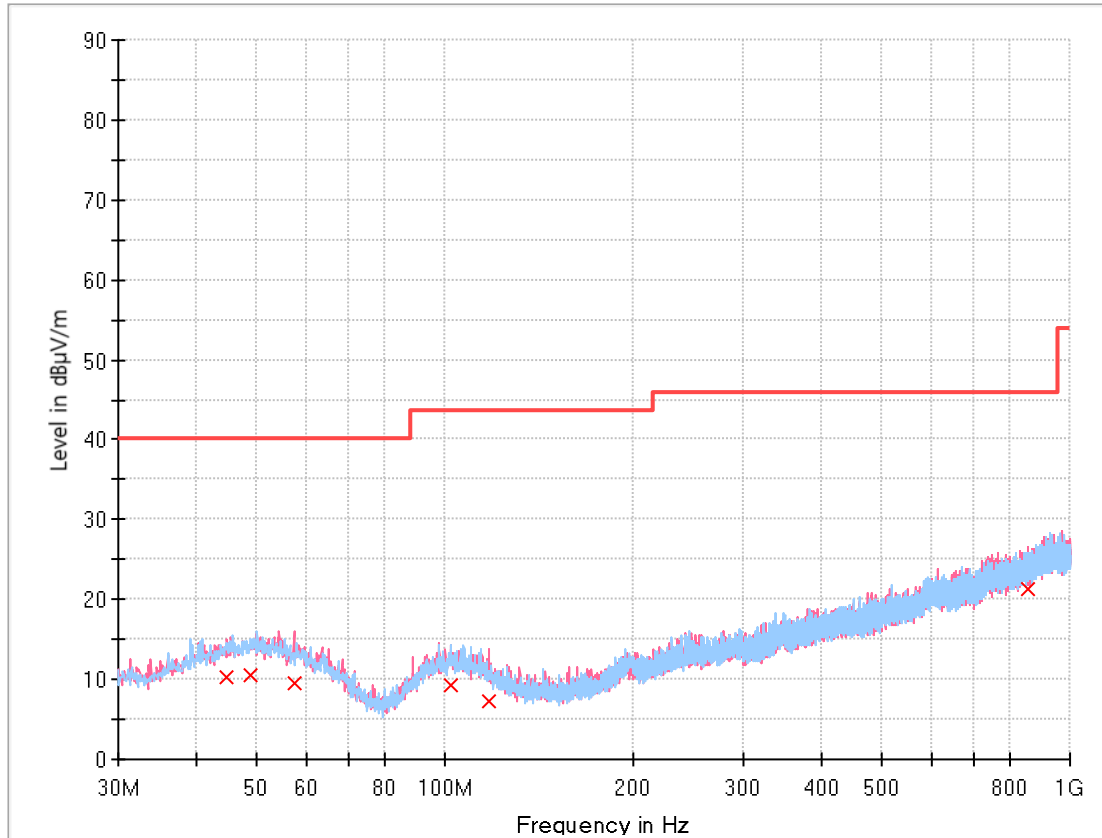
01 Mode_Model: YRD410-F [FCC]



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
49.109	10.49	40.00	29.51	15 000.0	120.000	374.0	H	344.0	-17.8
59.294	9.19	40.00	30.81	15 000.0	120.000	134.0	V	252.0	-19.0
99.064	8.70	43.50	34.80	15 000.0	120.000	144.0	V	336.0	-19.4
109.443	8.33	43.50	35.17	15 000.0	120.000	187.0	V	277.0	-19.8
612.291	18.12	46.00	27.88	15 000.0	120.000	348.0	V	32.0	-10.1
792.905	20.51	46.00	25.49	15 000.0	120.000	244.0	V	160.0	-8.1

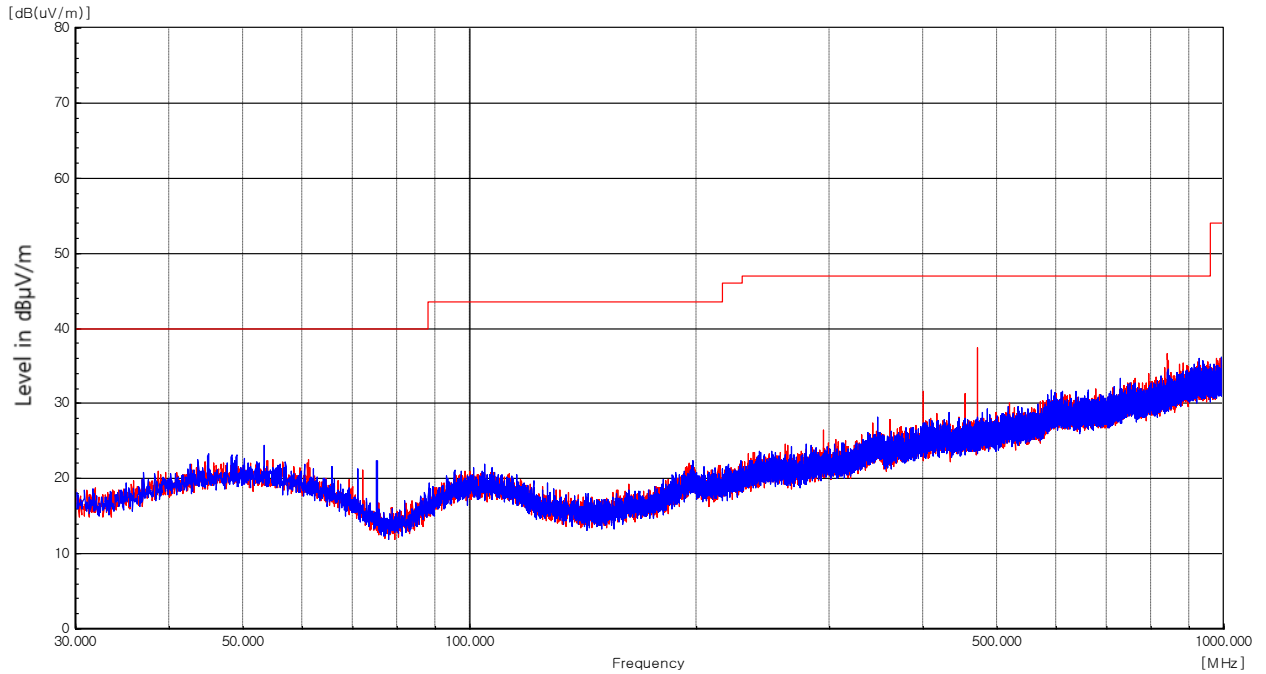
02 Mode_Model: YRD410-F [FCC]



Final Result

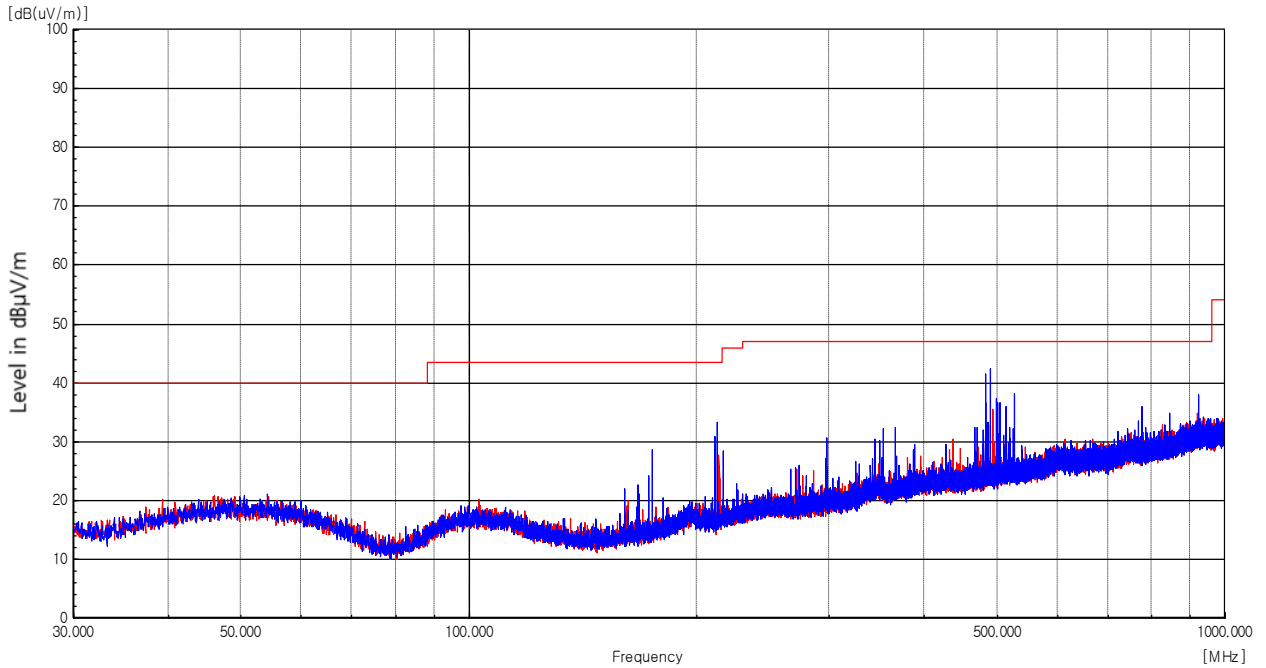
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
44.744	10.25	40.00	29.75	15 000.0	120.000	124.0	V	318.0	-18.0
48.915	10.48	40.00	29.52	15 000.0	120.000	148.0	H	192.0	-17.8
57.257	9.43	40.00	30.57	15 000.0	120.000	377.0	V	0.0	-18.6
101.974	9.21	43.50	34.29	15 000.0	120.000	355.0	V	236.0	-19.2
117.397	7.32	43.50	36.18	15 000.0	120.000	255.0	V	258.0	-20.9
854.015	21.22	46.00	24.78	15 000.0	120.000	314.0	V	119.0	-7.4

01 Mode_Model: YRD450 FP [ICES-003]



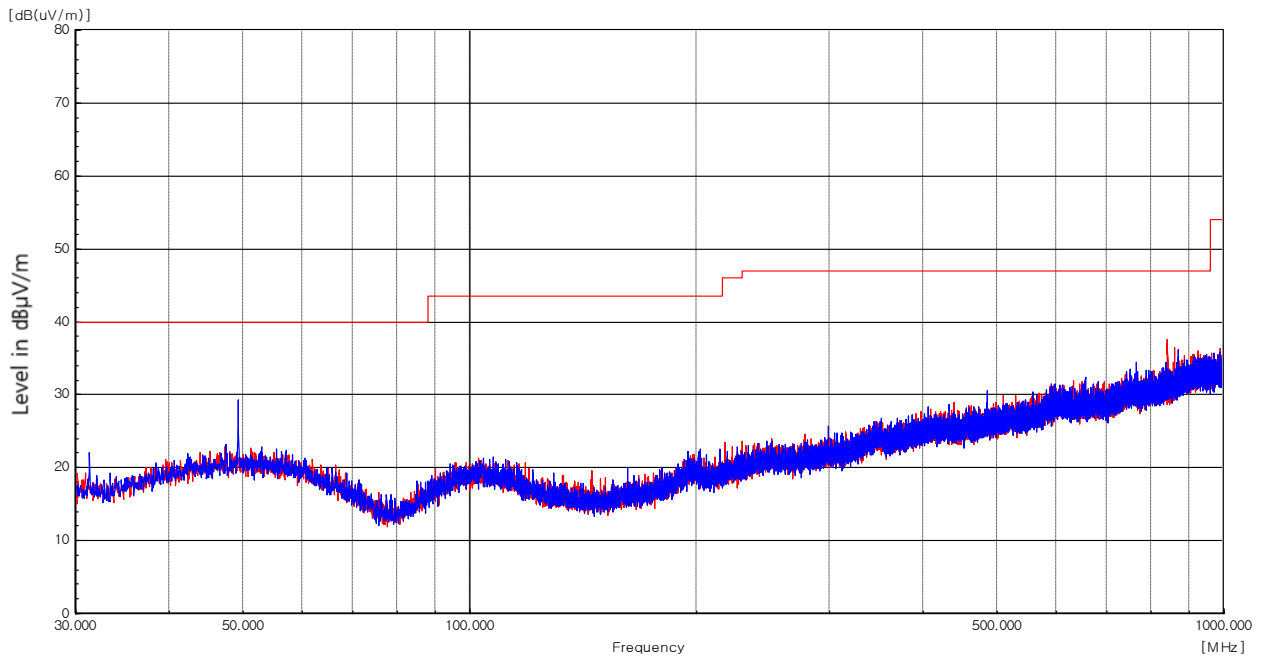
Freq. (MHz)	Reading (dBμV/m)	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
53.36	22.30	V	350	102	19.40	0.93	28.20	14.43	40.00	25.57
75.31	23.40	V	320	185	13.14	1.16	28.20	9.50	40.00	30.50
347.35	23.20	V	0	204	20.70	2.42	27.51	18.81	46.00	27.19
398.88	24.20	H	255	210	21.34	2.72	27.79	20.47	46.00	25.53
471.47	26.20	H	240	195	22.17	2.85	28.33	22.89	46.00	23.11
842.62	24.20	H	120	200	27.00	3.66	28.73	26.13	46.00	19.87

02 Mode_Model: YRD450 FP [ICES-003]



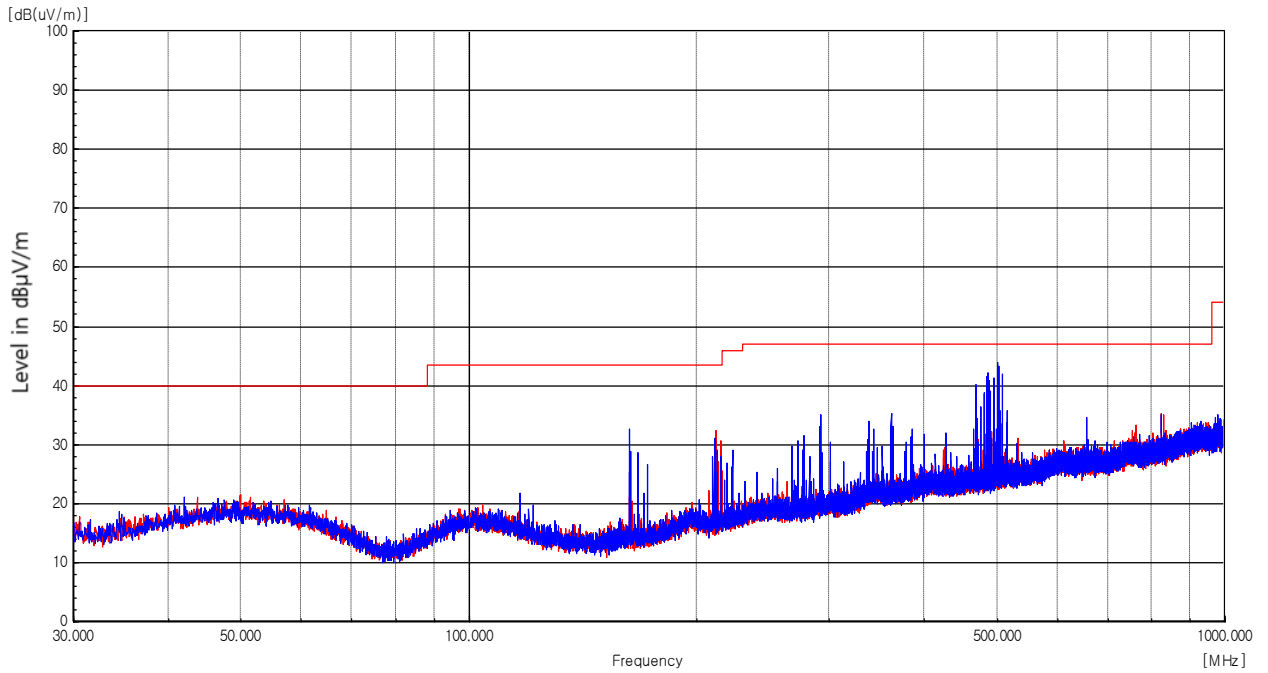
Freq. (MHz)	Reading (dBμV/m)	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
174.77	23.20	V	35	105	14.78	1.71	28.00	11.69	43.50	31.81
213.21	24.50	V	20	215	16.66	1.89	27.86	15.19	43.50	28.31
366.43	24.20	V	30	102	20.50	2.43	27.60	19.53	46.00	26.47
436.19	25.10	H	20	200	22.00	2.56	28.09	21.57	46.00	24.43
489.13	25.20	V	300	103	22.80	2.70	28.43	22.27	46.00	23.73
923.86	24.30	V	330	110	28.20	4.09	28.65	27.94	46.00	18.06

01 Mode_Model: YRD420 FP [ICES-003]



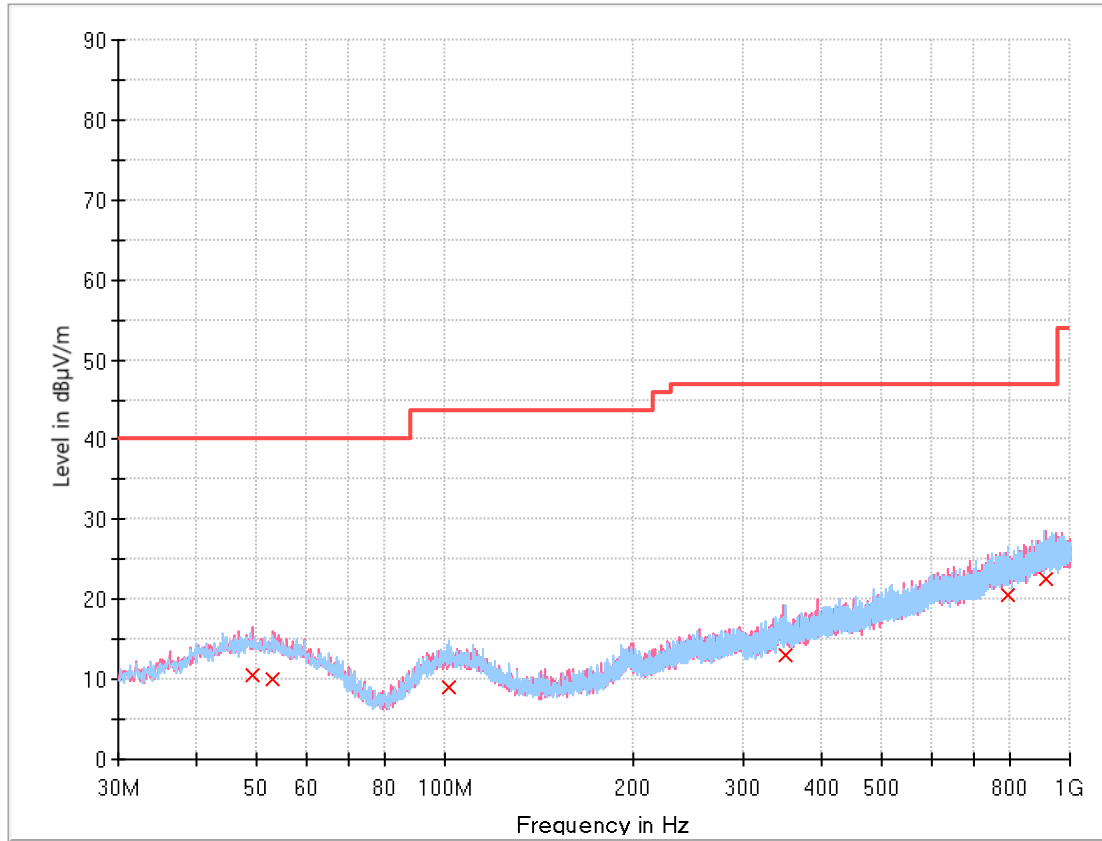
Freq. (MHz)	Reading (dBμV/m)	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
31.29	22.50	V	48	200	16.07	0.67	28.20	11.04	40.00	28.96
49.32	23.00	V	37	200	19.67	0.86	28.20	15.33	40.00	24.67
217.82	22.50	H	156	100	16.89	1.96	27.85	13.50	46.00	32.50
437.89	23.30	H	358	200	22.00	2.53	28.10	19.73	46.00	26.27
485.86	23.40	V	212	200	22.70	2.71	28.42	20.39	46.00	25.61
842.54	23.20	H	359	200	27.00	3.66	28.73	25.13	46.00	20.87

02 Mode_Model: YRD420 FP [ICES-003]



Freq. (MHz)	Reading (dBμV/m)	Pol. (H/V)	A (°)	H (cm)	AF (dB/m)	CL (dB)	Amp. (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
162.97	23.70	V	45	109	14.50	1.59	28.05	11.74	43.50	31.76
212.12	24.20	H	0	110	16.61	1.88	27.86	14.83	43.50	28.67
291.82	23.40	V	40	105	18.90	2.13	27.62	16.81	46.00	29.19
361.78	23.40	V	95	100	20.28	2.32	27.57	18.43	46.00	27.57
499.52	23.00	V	60	200	22.90	2.78	28.50	20.18	46.00	25.82
823.58	22.30	H	210	102	26.70	3.83	28.81	24.02	46.00	21.98

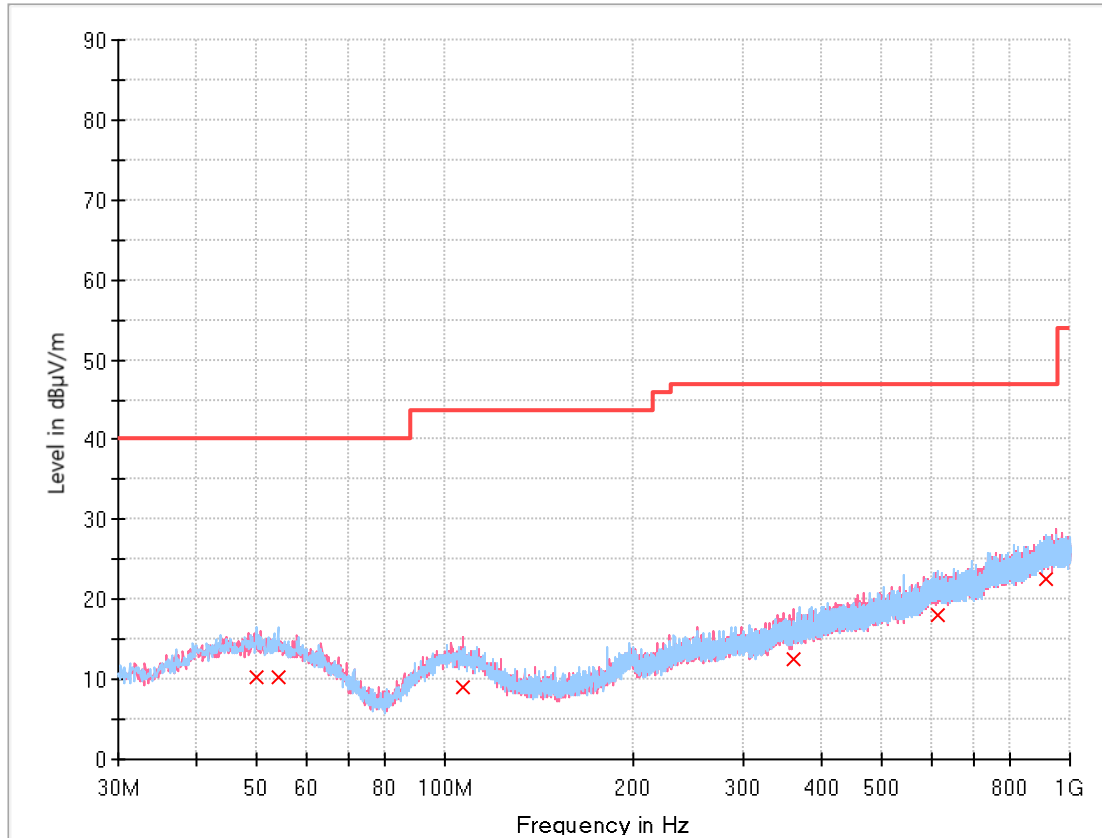
01 Mode_Model: YRD430-F [ICES-003]



Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
49.206	10.47	40.00	29.53	15 000.0	120.000	112.0	V	354.0	-17.8
53.086	10.01	40.00	29.99	15 000.0	120.000	386.0	V	349.0	-18.0
101.586	9.06	43.50	34.44	15 000.0	120.000	364.0	H	0.0	-19.2
349.712	13.07	47.00	33.93	15 000.0	120.000	374.0	H	0.0	-15.4
794.942	20.56	47.00	26.44	15 000.0	120.000	145.0	H	198.0	-8.1
918.326	22.53	47.00	24.47	15 000.0	120.000	287.0	V	102.0	-6.4

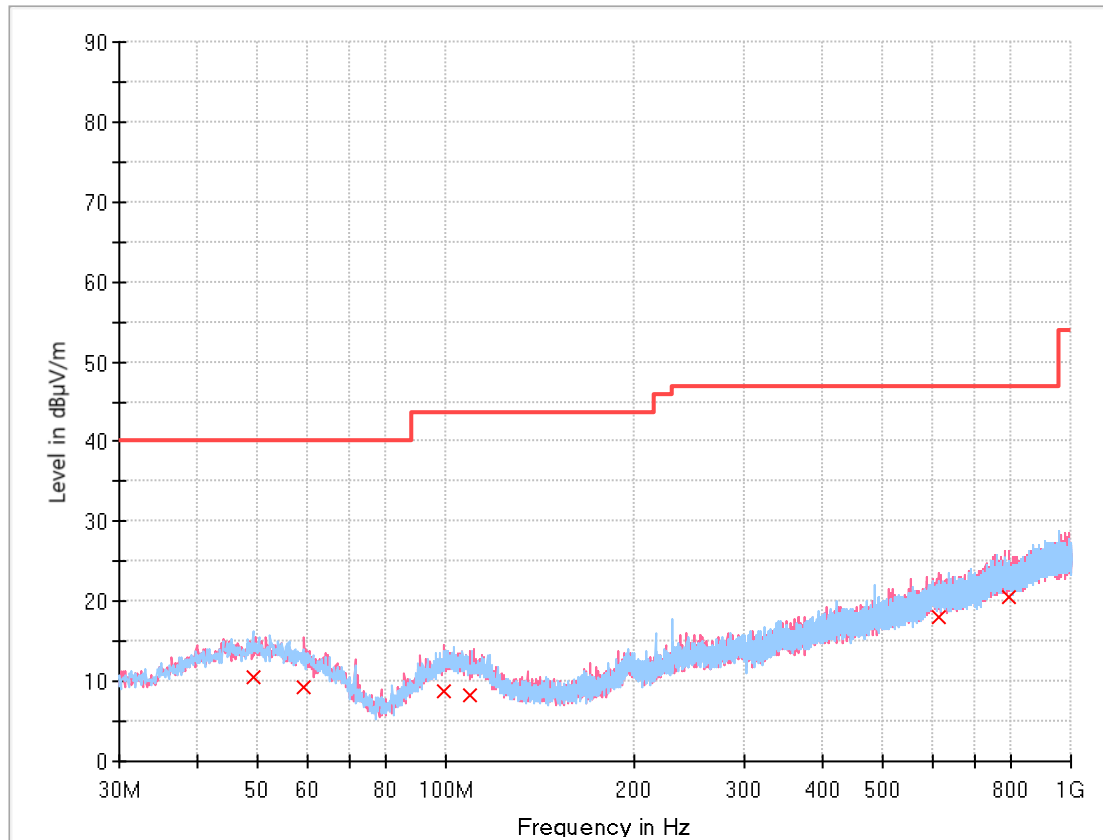
02 Mode_Model: YRD430-F [ICES-003]



Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
49.982	10.40	40.00	29.60	15 000.0	120.000	245.0	H	127.0	-17.8
53.959	10.28	40.00	29.72	15 000.0	120.000	122.0	H	0.0	-18.1
107.018	8.92	43.50	34.58	15 000.0	120.000	314.0	V	1.0	-19.5
359.994	12.49	47.00	34.51	15 000.0	120.000	136.0	V	186.0	-16.1
612.291	18.12	47.00	28.88	15 000.0	120.000	344.0	H	59.0	-10.1
914.446	22.59	47.00	24.41	15 000.0	120.000	375.0	H	146.0	-6.4

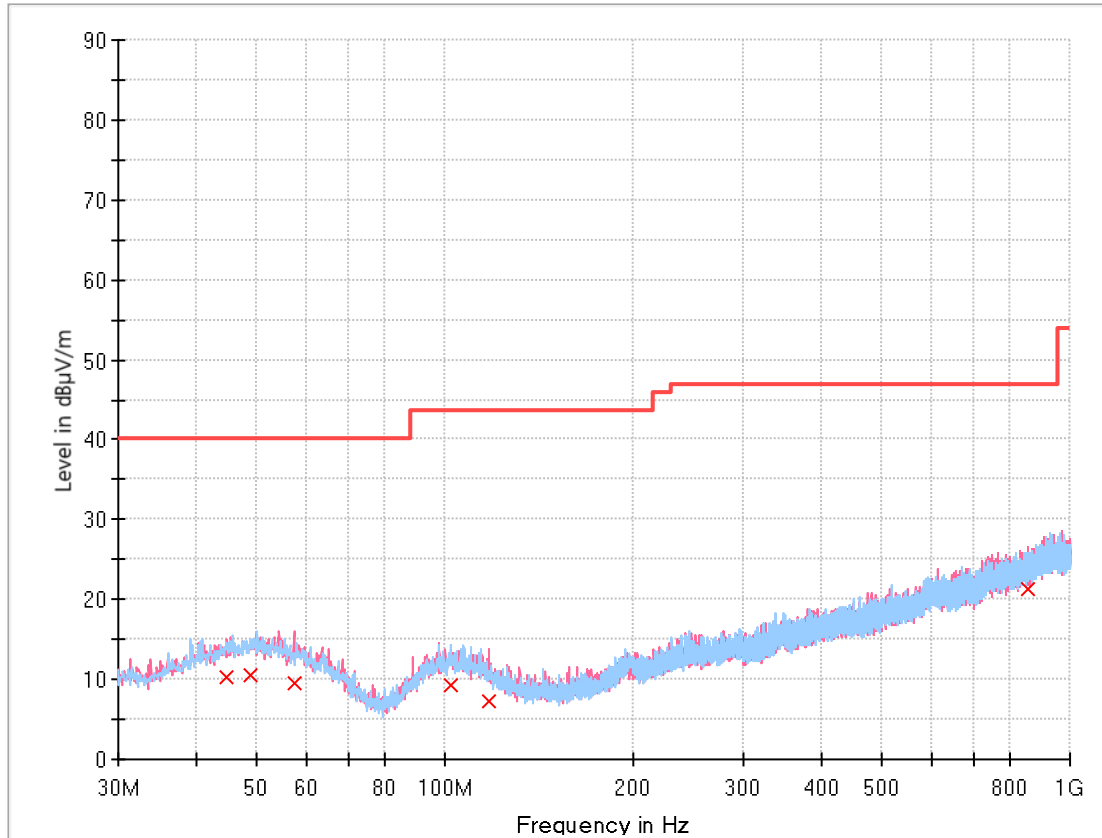
01 Mode_Model: YRD410-F [ICES-003]



Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
49.109	10.49	40.00	29.51	15 000.0	120.000	374.0	H	344.0	-17.8
59.294	9.19	40.00	30.81	15 000.0	120.000	134.0	V	252.0	-19.0
99.064	8.70	43.50	34.80	15 000.0	120.000	144.0	V	336.0	-19.4
109.443	8.33	43.50	35.17	15 000.0	120.000	187.0	V	277.0	-19.8
612.291	18.12	47.00	28.88	15 000.0	120.000	348.0	V	32.0	-10.1
792.905	20.51	47.00	26.49	15 000.0	120.000	244.0	V	160.0	-8.1

02 Mode_Model: YRD410-F [ICES-003]



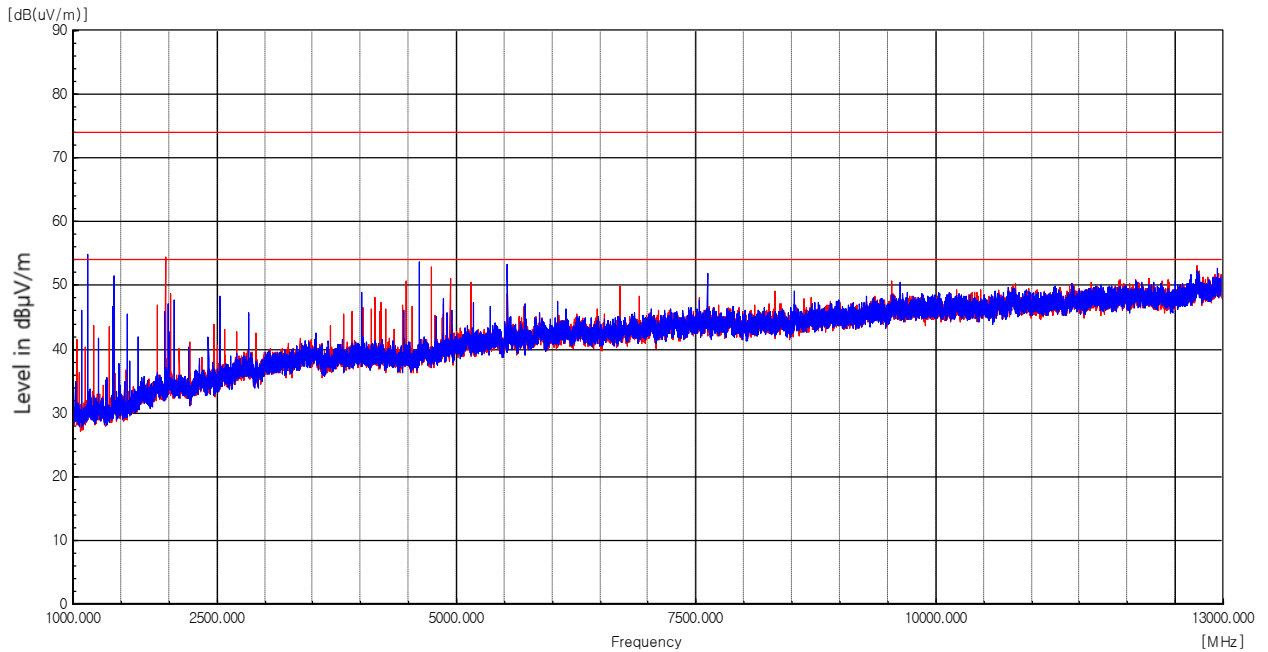
Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
44.744	10.25	40.00	29.75	15 000.0	120.000	124.0	V	318.0	-18.0
48.915	10.48	40.00	29.52	15 000.0	120.000	148.0	H	192.0	-17.8
57.257	9.43	40.00	30.57	15 000.0	120.000	377.0	V	0.0	-18.6
101.974	9.21	43.50	34.29	15 000.0	120.000	355.0	V	236.0	-19.2
117.397	7.32	43.50	36.18	15 000.0	120.000	255.0	V	258.0	-20.9
854.015	21.22	47.00	25.78	15 000.0	120.000	314.0	V	119.0	-7.4

Note. Measurement Uncertainty: See Appendix A

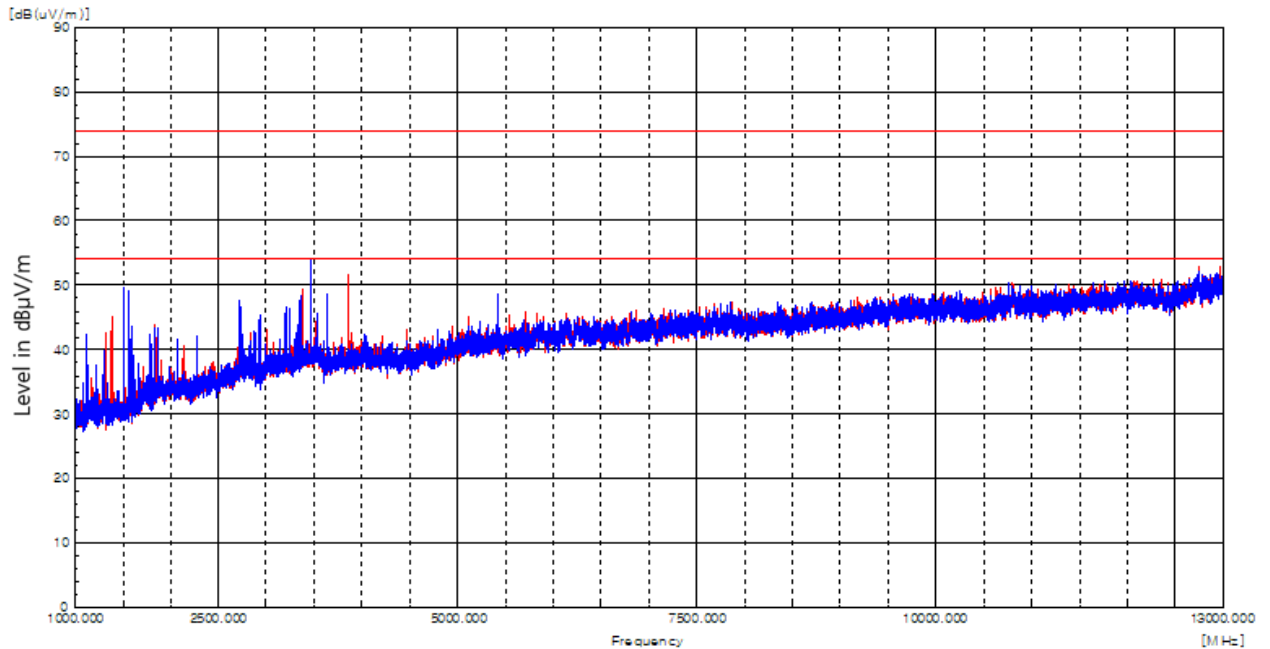
- AF = Antenna Factor
- CL = Cable Loss
- F/R = Final Result
- Pol.(H) = Horizontal
- Pol.(V) = Vertical
- Amp. = Amplifier Gain
- Margin = Limit – F/R or Quasi Peak
- F/R = Reading + AF + CL – Amp.
- A: Angle
- H: Height
- Corr. = Antenna Factor + Cable loss – Amplifier Gain

01 Mode_Model: YRD450 FP



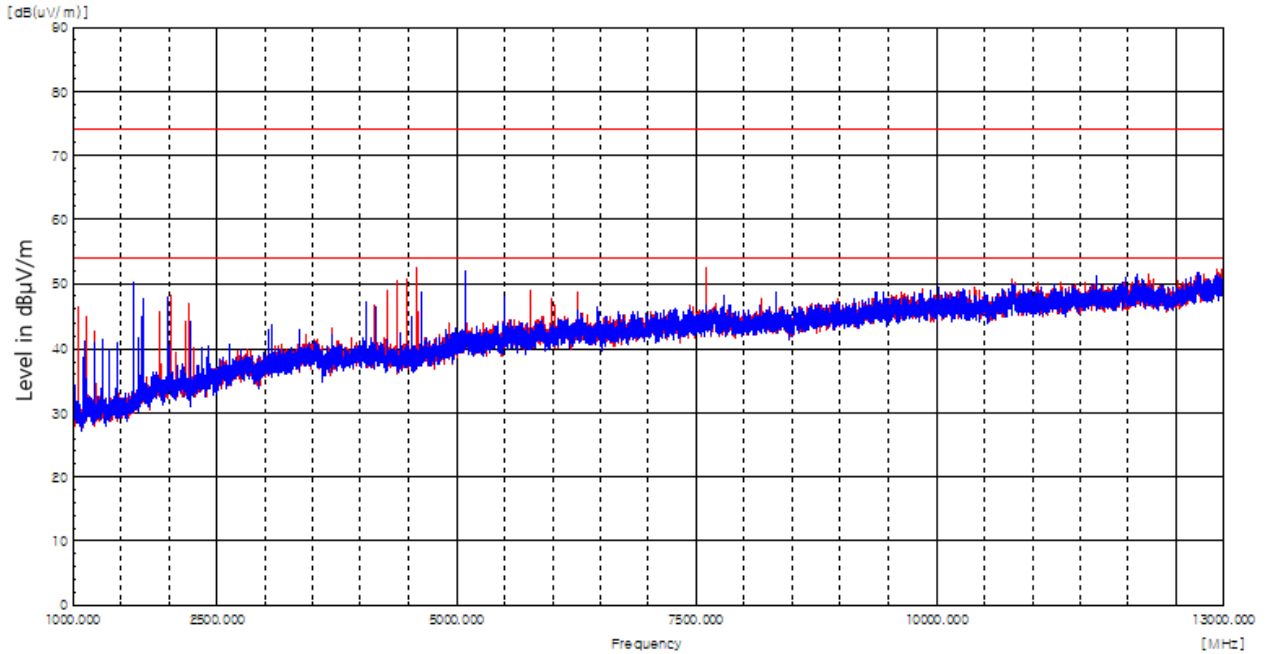
Freq. (MHz)	Level(dBμV/m)		Pol. (H/V)	A (°)	H (cm)	AF (dB)	CL (dB)	Amp. (dB)	CF (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Peak	C-AV										
1 148.50	46.50	-	V	45	100	24.51	4.45	45.53	0.00	29.93	74.00	44.07
1 148.50	-	32.30	V	45	100	24.51	4.45	45.53	0.00	15.73	54.00	38.27
1 959.50	64.00	-	H	241	100	27.66	6.06	45.30	0.00	52.42	74.00	21.58
1 959.50	-	33.90	H	241	100	27.66	6.06	45.30	0.00	22.32	54.00	31.68
4 607.50	45.20	-	V	34	100	32.13	9.16	45.70	0.00	40.79	74.00	33.21
4 607.50	-	32.20	V	34	100	32.13	9.16	45.70	0.00	27.79	54.00	26.21
5 532.00	43.20	-	H	1	100	34.16	10.34	45.39	0.00	42.31	74.00	31.69
5 532.00	-	31.50	H	1	100	34.16	10.34	45.39	0.00	30.61	54.00	23.39
7 529.50	42.60	-	H	1	100	36.20	12.91	45.78	0.00	45.93	74.00	28.07
7 529.50	-	29.20	H	1	100	36.20	12.91	45.78	0.00	32.53	54.00	21.47
9 630.50	43.30	-	V	240	100	37.60	13.78	45.55	0.00	49.13	74.00	24.87
9 630.50	-	29.90	V	240	100	37.60	13.78	45.55	0.00	35.73	54.00	18.27

02 Mode_Model: YRD450 FP



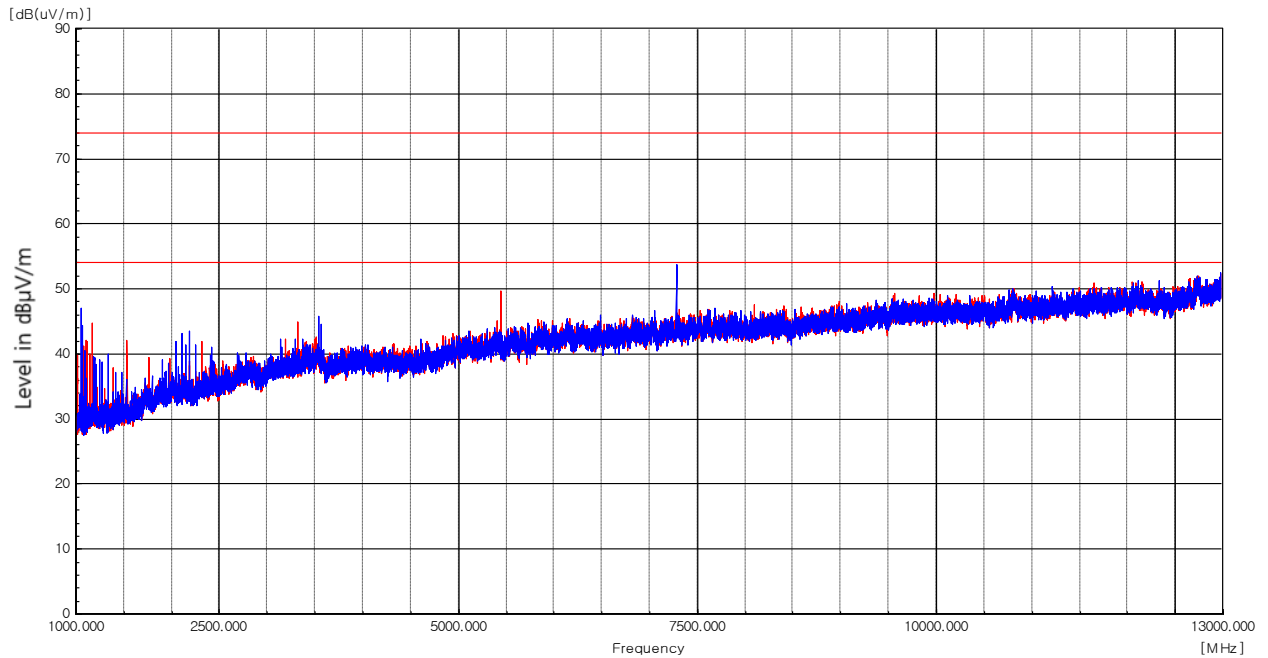
Freq. (MHz)	Level(dBμV/m)		Pol. (H/V)	A (°)	H (cm)	AF (dB)	CL (dB)	Amp. (dB)	CF (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Peak	C-AV										
1 391.50	46.30	-	H	105	105	25.02	5.40	45.40	0.00	31.32	74.00	42.68
1 391.50	-	32.40	H	105	105	25.02	5.40	45.40	0.00	17.42	54.00	36.58
1 519.00	64.00	-	V	200	111	25.12	5.71	45.40	0.00	49.43	74.00	24.57
1 519.00	-	33.90	V	200	111	25.12	5.71	45.40	0.00	19.33	54.00	34.67
3 455.00	45.40	-	V	5	101	31.20	7.89	45.43	0.00	39.06	74.00	34.94
3 455.00	-	31.60	V	5	101	31.20	7.89	45.43	0.00	25.26	54.00	28.74
3 857.50	45.60	-	H	240	120	32.33	8.34	45.40	0.00	40.87	74.00	33.13
3 857.50	-	32.00	H	240	120	32.33	8.34	45.40	0.00	27.27	54.00	26.73
5 423.00	42.60	-	V	10	125	34.15	10.08	45.40	0.00	41.43	74.00	32.57
5 423.00	-	29.20	V	10	125	34.15	10.08	45.40	0.00	28.03	54.00	25.97
12 283.50	43.30	-	H	350	110	38.67	15.25	45.07	0.00	52.15	74.00	21.85
12 283.50	-	29.90	H	350	110	38.67	15.25	45.07	0.00	38.75	54.00	15.25

01 Mode_Model: YRD420 FP



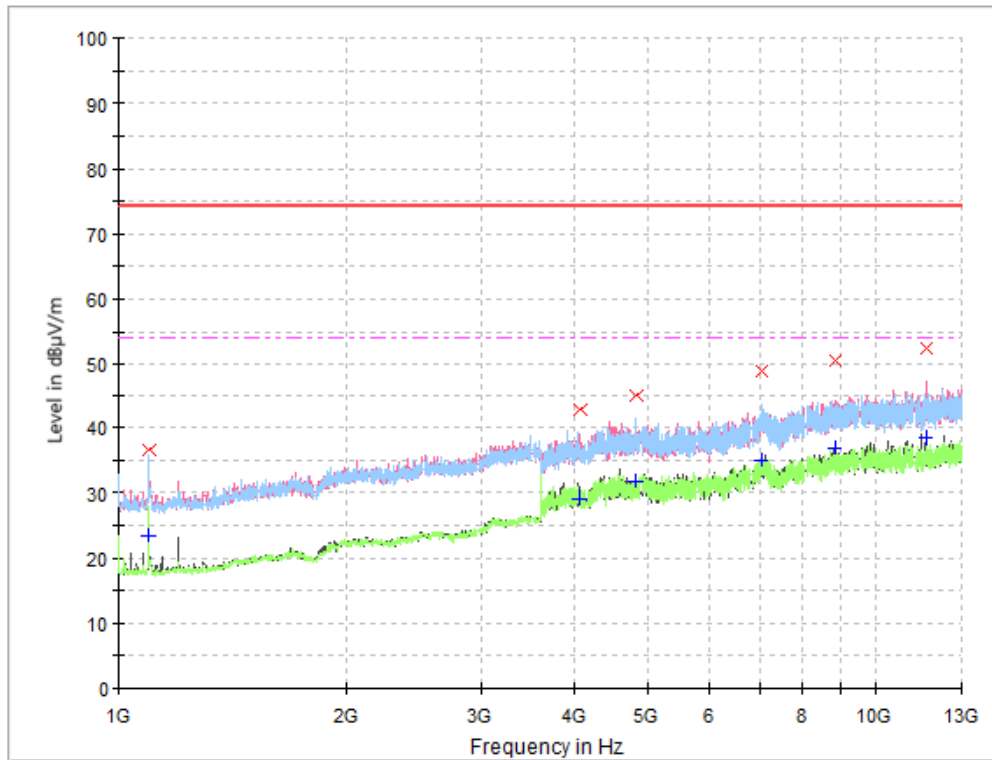
Freq. (MHz)	Level(dBμV/m)		Pol. (H/V)	A (°)	H (cm)	AF (dB)	CL (dB)	Amp. (dB)	CF (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Peak	C-AV										
1 644.50	49.50	-	V	125	100	26.11	5.74	45.38	0.00	35.97	74.00	38.03
1 644.50	-	34.50	V	125	100	26.11	5.74	45.38	0.00	20.97	54.00	33.03
2 020.00	64.00	-	H	85	100	28.14	5.96	45.30	0.00	52.80	74.00	21.20
2 020.00	-	33.90	H	85	100	28.14	5.96	45.30	0.00	22.70	54.00	31.30
4 063.50	45.40	-	V	42	100	32.20	8.58	45.37	0.00	40.81	74.00	33.19
4 063.50	-	32.20	V	42	100	32.20	8.58	45.37	0.00	27.61	54.00	26.39
4 584.50	45.60	-	H	327	100	31.83	9.16	45.68	0.00	40.91	74.00	33.09
4 584.50	-	31.40	H	327	100	31.83	9.16	45.68	0.00	26.71	54.00	27.29
5 084.00	42.60	-	V	261	100	33.54	10.12	45.40	0.00	40.86	74.00	33.14
5 084.00	-	29.20	V	261	100	33.54	10.12	45.40	0.00	27.46	54.00	26.54
7 607.00	43.30	-	H	257	100	36.00	13.45	45.74	0.00	47.01	74.00	26.99
7 607.00	-	29.90	H	257	100	36.00	13.45	45.74	0.00	33.61	54.00	20.39

02 Mode_Model: YRD420 FP



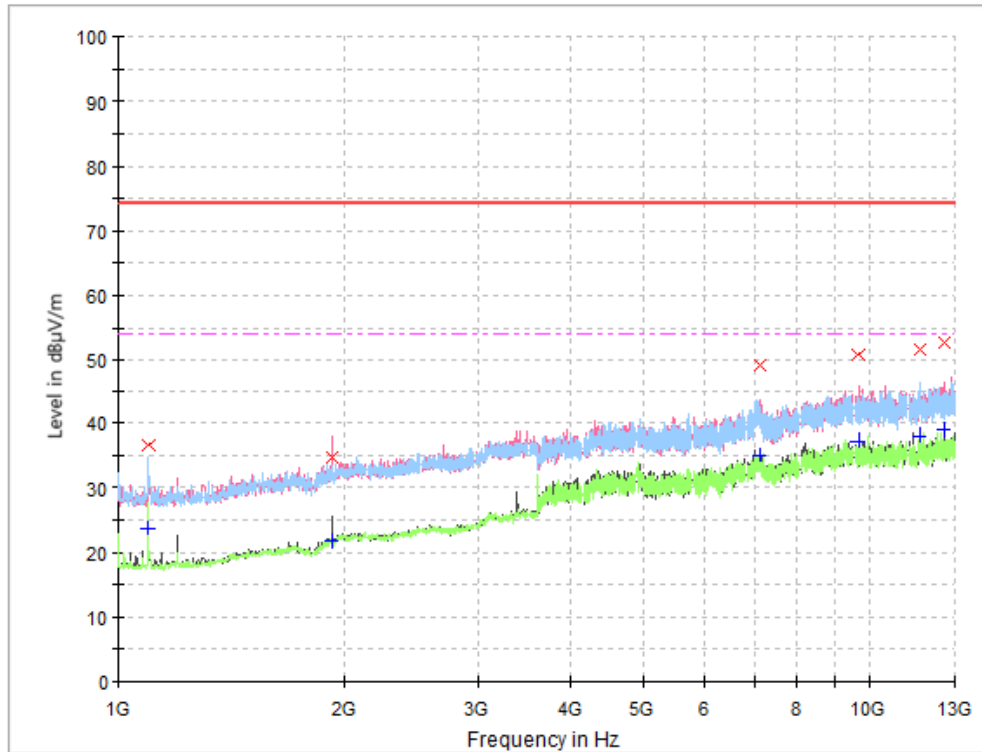
Freq. (MHz)	Level(dBμV/m)		Pol. (H/V)	A (°)	H (cm)	AF (dB)	CL (dB)	Amp. (dB)	CF (dB)	F/R (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Peak	C-AV										
1 057.00	48.30	-	V	145	102	24.43	4.26	45.57	0.00	31.42	74.00	42.58
1 057.00	-	34.50	V	145	102	24.43	4.26	45.57	0.00	17.62	54.00	36.38
1 167.00	64.00	-	H	120	100	25.24	4.53	45.52	0.00	48.25	74.00	25.75
1 167.00	-	33.90	H	120	100	25.24	4.53	45.52	0.00	18.15	54.00	35.85
2 184.00	46.50	-	V	230	110	27.53	6.15	45.30	0.00	34.88	74.00	39.12
2 184.00	-	33.10	V	230	110	27.53	6.15	45.30	0.00	21.48	54.00	32.52
3 323.00	44.40	-	H	260	100	30.70	8.27	45.32	0.00	38.05	74.00	35.95
3 323.00	-	31.00	H	260	100	30.70	8.27	45.32	0.00	24.65	54.00	29.35
3 566.00	42.60	-	V	355	108	31.36	7.88	45.48	0.00	36.36	74.00	37.64
3 566.00	-	29.20	V	355	108	31.36	7.88	45.48	0.00	22.96	54.00	31.04
5 438.50	43.30	-	H	125	105	34.12	10.25	45.40	0.00	42.27	74.00	31.73
5 438.50	-	29.90	H	125	105	34.12	10.25	45.40	0.00	28.87	54.00	25.13
12 335.50	42.80	-	V	300	100	38.60	15.65	45.03	0.00	52.02	74.00	21.98
12 335.50	-	29.10	V	300	100	38.60	15.65	45.03	0.00	38.32	54.00	15.68

01 Mode_Model: YRD430-F

**Final Result**

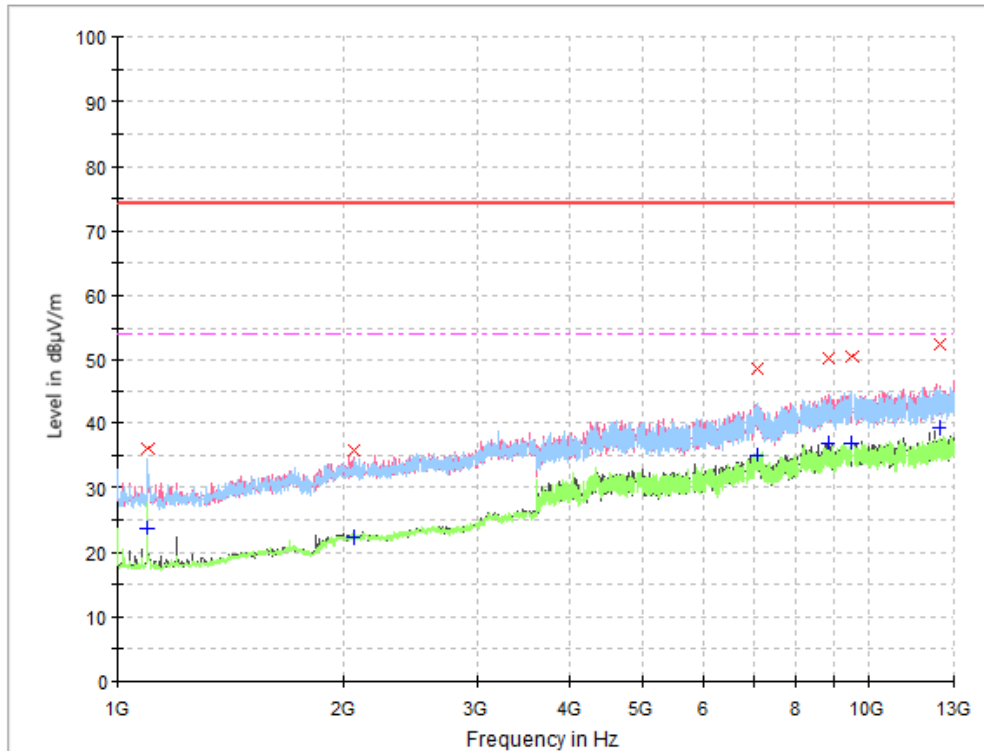
Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1 099.600	---	23.51	54.00	30.49	15 000.0	1 000.000	100.0	H	0.0	-14.6
1 099.600	36.65	---	74.00	37.35	15 000.0	1 000.000	100.0	H	0.0	-14.6
4 078.000	---	29.32	54.00	24.68	15 000.0	1 000.000	100.0	V	304.0	-0.6
4 078.000	42.87	---	74.00	31.13	15 000.0	1 000.000	100.0	V	304.0	-0.6
4 835.200	45.10	---	74.00	28.90	15 000.0	1 000.000	100.0	H	80.0	2.0
4 835.200	---	31.70	54.00	22.30	15 000.0	1 000.000	100.0	H	80.0	2.0
7 045.600	48.79	---	74.00	25.21	15 000.0	1 000.000	100.0	H	136.0	5.4
7 045.600	---	35.13	54.00	18.87	15 000.0	1 000.000	100.0	H	136.0	5.4
8 860.000	---	36.93	54.00	17.07	15 000.0	1 000.000	100.0	V	346.0	7.8
8 860.000	50.45	---	74.00	23.55	15 000.0	1 000.000	100.0	V	346.0	7.8
11 614.000	---	38.58	54.00	15.42	15 000.0	1 000.000	100.0	V	346.0	9.2
11 614.000	52.37	---	74.00	21.63	15 000.0	1 000.000	100.0	V	346.0	9.2

02 Mode_Model: YRD430-F

**Final Result**

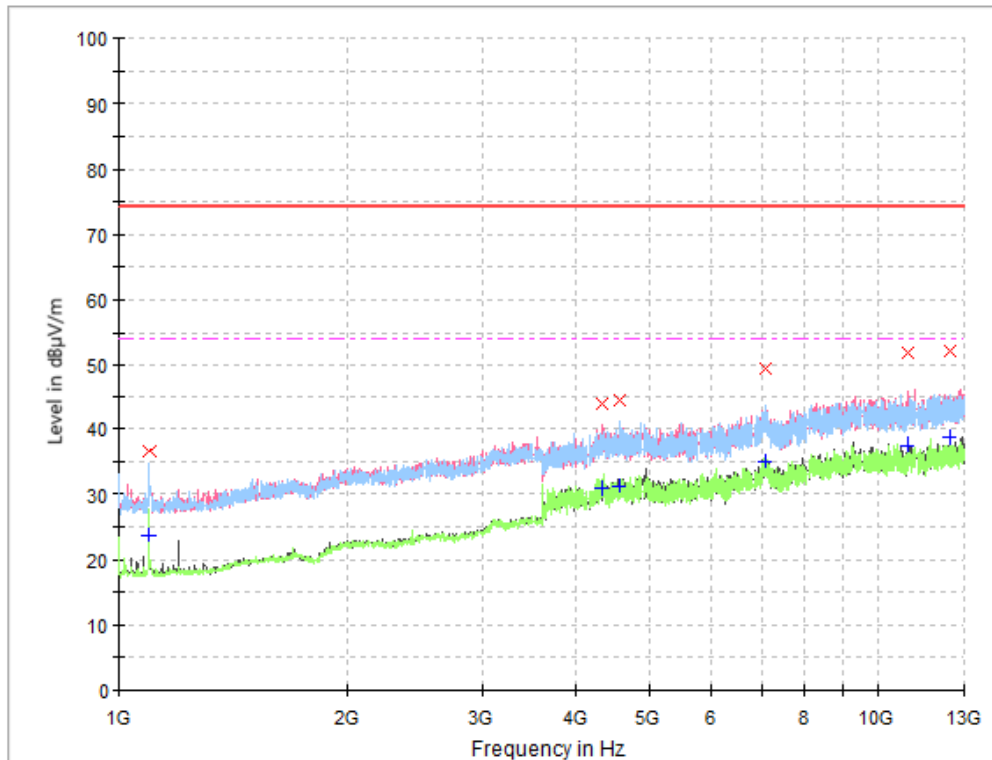
Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1 099.600	---	23.70	54.00	30.30	15 000.0	1 000.000	100.0	H	0.0	-14.6
1 099.600	36.82	---	74.00	37.18	15 000.0	1 000.000	100.0	H	0.0	-14.6
1 928.800	34.95	---	74.00	39.05	15 000.0	1 000.000	100.0	V	183.0	-9.1
1 928.800	---	21.67	54.00	32.33	15 000.0	1 000.000	100.0	V	183.0	-9.1
7 120.000	---	35.21	54.00	18.79	15 000.0	1 000.000	100.0	V	147.0	5.5
7 120.000	49.02	---	74.00	24.98	15 000.0	1 000.000	100.0	V	147.0	5.5
9 678.400	---	37.33	54.00	16.67	15 000.0	1 000.000	100.0	V	168.0	8.0
9 678.400	50.83	---	74.00	23.17	15 000.0	1 000.000	100.0	V	168.0	8.0
11 627.200	51.53	---	74.00	22.47	15 000.0	1 000.000	100.0	H	134.0	9.2
11 627.200	---	38.30	54.00	15.70	15 000.0	1 000.000	100.0	H	134.0	9.2
12 596.800	---	39.13	54.00	14.87	15 000.0	1 000.000	100.0	V	210.0	10.3
12 596.800	52.72	---	74.00	21.28	15 000.0	1 000.000	100.0	V	210.0	10.3

01 Mode_Model: YRD410-F

**Final Result**

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1 099.600	36.21	---	74.00	37.79	15 000.0	1 000.000	100.0	V	219.0	-14.6
1 099.600	---	23.59	54.00	30.41	15 000.0	1 000.000	100.0	V	219.0	-14.6
2 063.200	36.07	---	74.00	37.93	15 000.0	1 000.000	100.0	V	190.0	-8.0
2 063.200	---	22.24	54.00	31.76	15 000.0	1 000.000	100.0	V	190.0	-8.0
7 105.600	48.52	---	74.00	25.48	15 000.0	1 000.000	100.0	H	97.0	5.5
7 105.600	---	35.21	54.00	18.79	15 000.0	1 000.000	100.0	H	97.0	5.5
8 863.600	50.21	---	74.00	23.79	15 000.0	1 000.000	100.0	V	234.0	7.8
8 863.600	---	36.92	54.00	17.08	15 000.0	1 000.000	100.0	V	234.0	7.8
9 511.600	---	37.12	54.00	16.88	15 000.0	1 000.000	100.0	H	0.0	8.0
9 511.600	50.40	---	74.00	23.60	15 000.0	1 000.000	100.0	H	0.0	8.0
12 427.600	---	39.18	54.00	14.82	15 000.0	1 000.000	100.0	V	346.0	10.0
12 427.600	52.44	---	74.00	21.56	15 000.0	1 000.000	100.0	V	346.0	10.0

02 Mode_Model: YRD410-F

**Final Result**

Frequency (MHz)	MaxPeak (dBμV/m)	CAverage (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1 099.600	36.80	---	74.00	37.20	15 000.0	1 000.000	100.0	H	22.0	-14.6
1 099.600	---	23.64	54.00	30.36	15 000.0	1 000.000	100.0	H	22.0	-14.6
4 333.600	---	30.91	54.00	23.09	15 000.0	1 000.000	100.0	V	254.0	0.6
4 333.600	44.08	---	74.00	29.92	15 000.0	1 000.000	100.0	V	254.0	0.6
4 580.800	---	31.15	54.00	22.85	15 000.0	1 000.000	100.0	H	164.0	0.8
4 580.800	44.48	---	74.00	29.52	15 000.0	1 000.000	100.0	H	164.0	0.8
7 094.800	---	35.19	54.00	18.81	15 000.0	1 000.000	100.0	H	178.0	5.5
7 094.800	49.42	---	74.00	24.58	15 000.0	1 000.000	100.0	H	178.0	5.5
10 963.600	---	37.73	54.00	16.27	15 000.0	1 000.000	100.0	V	14.0	8.3
10 963.600	51.75	---	74.00	22.25	15 000.0	1 000.000	100.0	V	14.0	8.3
12 450.400	52.04	---	74.00	21.96	15 000.0	1 000.000	100.0	H	0.0	10.0
12 450.400	---	38.82	54.00	15.18	15 000.0	1 000.000	100.0	H	0.0	10.0

Note. Measurement Uncertainty: See Appendix A

- AF = Antenna Factor
- CL = Cable Loss
- F/R = Final Result
- Pol.(H) = Horizontal
- Pol.(V) = Vertical
- Amp. = Amplifier Gain
- A: Angle
- H: Height
- F/R = Level + AF + CL – Amp
- Margin = Limit – F/R or MaxPeak or CAverage
- Corr. = AF + CL – AMP ** The value of 'Level' includes 'Corr.'.

Ex) In case

Freq ; 100 MHz, level ; 30 dB(μV/m), AF ; 10 dB/m, CL ; 4 dB, Amp ; 25 dB

Result = Level + AF + CL – Amp

= 30 + 10 + 4 - 25

= 19

Margin = Limit – Result

= 43.5 – 19

= 24.5

Appendix A: Measurement Uncertainty

Test Method		Measurement Uncertainty
Conducted Emission	ENV216	4.0 dB (The confidential level is 95 %, $k=2$)
	ESH2-Z5	3.6 dB (The confidential level is 95 %, $k=2$)
	ESH3-Z6	3.8 dB (The confidential level is 95 %, $k=2$)
Conducted Emission - Signal	ISN T800	5.8 dB (The confidential level is 95 %, $k=2$)
	ISNT8-Cat6	5.8 dB (The confidential level is 95 %, $k=2$)
	ISN S751	7.5 dB (The confidential level is 95 %, $k=2$)
Disturbance Voltage at Antenna Terminal		2.9 dB (The confidential level is 95 %, $k=2$)
Radiated Emission	9 kHz - 30 MHz	Horizontal 3.4 dB (The confidential level is 95 %, $k=2$)
		Vertical 3.4 dB (The confidential level is 95 %, $k=2$)
	30 MHz - 1 000 MHz	Horizontal 4.5 dB (The confidential level is 95 %, $k=2$)
		Vertical 5.1 dB (The confidential level is 95 %, $k=2$)
	1 GHz - 18 GHz	Horizontal 3.7 dB (The confidential level is 95 %, $k=2$)
		Vertical 3.9 dB (The confidential level is 95 %, $k=2$)

Table A.1 Measurement Uncertainty of Branch Site

Test Method		Measurement Uncertainty	
Conducted Emission	ENV216	3.2 dB	(The confidential level is 95 %, $k=2$)
	ESH3-Z6	3.2 dB	(The confidential level is 95 %, $k=2$)
	ESH2-Z5	3.0 dB	(The confidential level is 95 %, $k=2$)
	NNLK8129	3.0 dB	(The confidential level is 95 %, $k=2$)
Conducted Emission - Signal		ISN T800	5.5 dB (The confidential level is 95 %, $k=2$)
		ISN ST08	6.6 dB (The confidential level is 95 %, $k=2$)
Radiated Emission	9 kHz - 30 MHz	Horizontal	3.3 dB (The confidential level is 95 %, $k=2$)
		Vertical	3.3 dB (The confidential level is 95 %, $k=2$)
	30 MHz - 1 000 MHz	Horizontal	4.3 dB (The confidential level is 95 %, $k=2$)
		Vertical	4.6 dB (The confidential level is 95 %, $k=2$)
	1 GHz - 18 GHz	Horizontal	3.9 dB (The confidential level is 95 %, $k=2$)
		Vertical	4.0 dB (The confidential level is 95 %, $k=2$)

Table A.2 Measurement Uncertainty of Branch Site-3

Test Method		Measurement Uncertainty	
Conducted Emission	ENV216	3.5 dB	(The confidential level is 95 %, $k=2$)
	ESH2-Z5	3.3 dB	(The confidential level is 95 %, $k=2$)
	ESH3-Z6	3.3 dB	(The confidential level is 95 %, $k=2$)
	NNLK8129	3.4 dB	(The confidential level is 95 %, $k=2$)
Conducted Emission - Signal	ISN T800	5.7 dB	(The confidential level is 95 %, $k=2$)
	ISN ST08	5.5 dB	(The confidential level is 95 %, $k=2$)
Radiated Emission	9 kHz - 30 MHz (Triple Loop Ant.)	3.4 dB	(The confidential level is 95 %, $k=2$)
	9 kHz - 30 MHz (Loop Ant.)	Horizontal	3.8 dB (The confidential level is 95 %, $k=2$)
		Vertical	3.8 dB (The confidential level is 95 %, $k=2$)
	30 MHz - 1 000 MHz	Horizontal	4.8 dB (The confidential level is 95 %, $k=2$)
		Vertical	5.4 dB (The confidential level is 95 %, $k=2$)
	1 GHz - 18 GHz	Horizontal	4.1 dB (The confidential level is 95 %, $k=2$)
		Vertical	4.2 dB (The confidential level is 95 %, $k=2$)

Table A.3 Measurement Uncertainty of Branch Site-4

- End of Test Report -