

EMI TEST REPORT

Test report No. : EMC- FCC- 0258
Type of equipment : MULTI CODEC JUKEBOX(MP3 Player)
Model No. : H10 Jr.
Variant Model No. : H10CT 512MB, H10CT 1GB
H10CT 2GB, H10CX 512MB
H10CX 1GB, H10CX 2GB
FCC ID. : QDMH10JR
Applicant : Reigncom Co.,Ltd
Test standards : FCC part 15 subpart B, Class B

Test Procedure and Items :

- AC Power Line Conducted Emissions Measurement: ANSI C63.4-1992
- Radiated Emissions Measurement : ANSI C63.4-1992

Test result : Complied

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of FCC Rules and Regulations.

The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Date of test: 2005. 04. 27~28 Issued date: 2005 .05. 02

Tested by :  Approved by: 

JUNG, SUNG-TAE

Chung, Min-Seok

EMC Compliance Ltd.

82-1, JEIL-RI, YANGJI-MYUN, YONGIN-CITY, KYUNGGI-DO, KOREA
TEL: 82 31 336 9919 FAX : 82 31 336 4767

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1. Client information

Applicant : Reigncom Co.,Ltd

Address : 8F, Posgen Venture Tower, 1586-7, Seocho-Dong
Seocho-gu, Seoul 137-876

Manufacturer #1 : Iriver Electronic Technology(china) Co.,Ltd.

Address : SSL Sci.& Tech. North Industry Park Dongguan,
Guangdong, China, 523-808

Manufacturer #2 : AV CHASEWAY MFG.FTY.

Address : Langang Village, Chonguang Town, Baoan
District, Shenzhen City, Guangdong, China

2. Laboratory information

Address

EMC compliance Ltd.

82-1, JEIL-RI, YANGJI-MYUN, YONGIN-CITY, KYUNGGI-DO, KOREA

Telephone Number : 82 31 336 9919

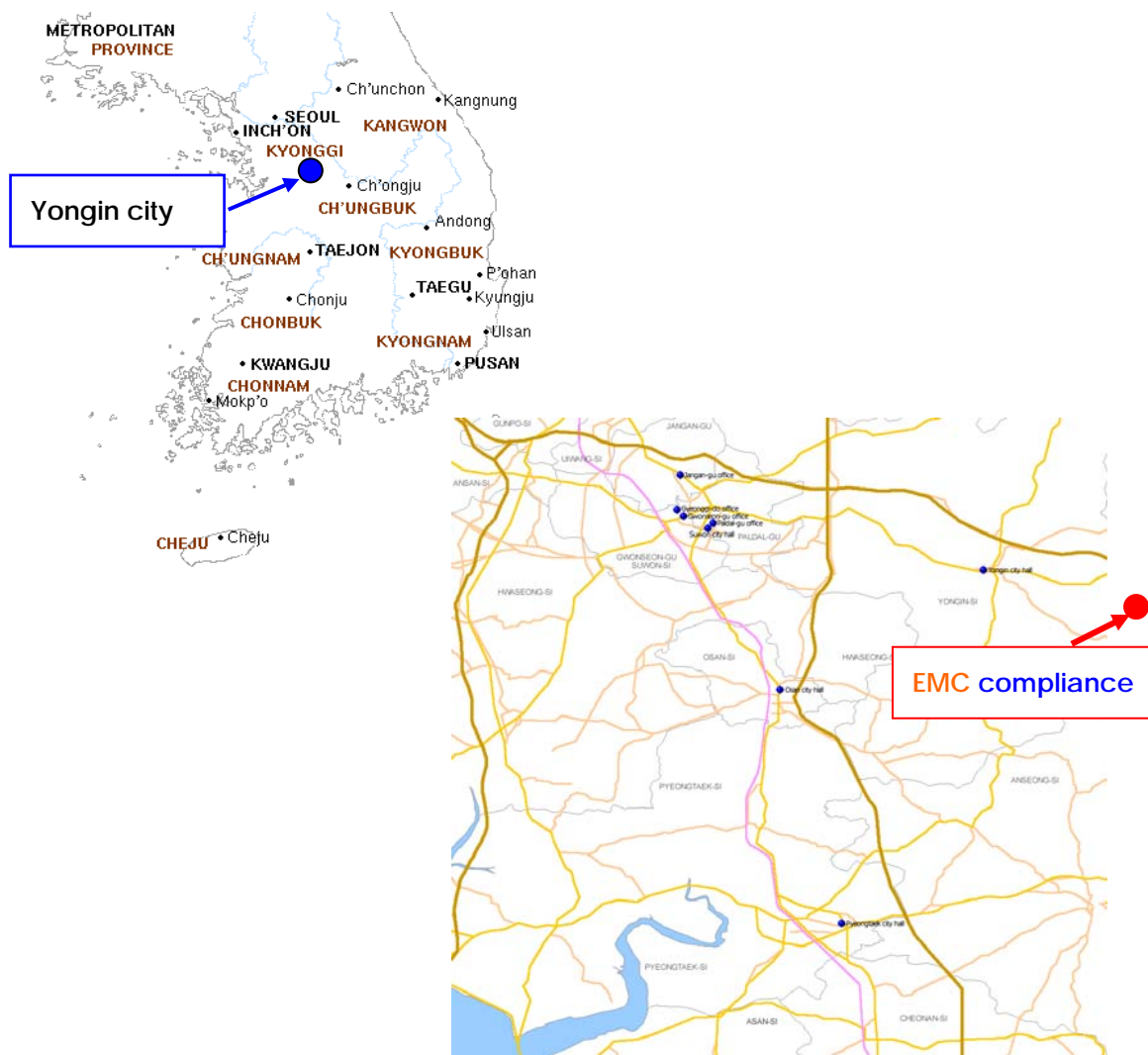
Facsimile Number : 82 31 336 4767

FCC Filing No. : 793334

VCCI Registration No. : C-1713, R-1606

KOLAS NO.: 231

SITE MAP



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3. Test system configuration

3.1 Operation Environment

	Temperature	Humidity	Pressure
OATS :	14 °C	38 %	1003 hPa
Shielded room :	24 °C	37 %	1002 hPa

Test site

These testing were performed following locations;

Shielded room : Conducted emission

OATS (10m) : Radiated emission

3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMI. The factors contributing to uncertainties are test receiver, Cable Loss, antenna factor calibration, Antenna directivity, antenna factor Variation with height, antenna phase center variation, antenna Frequency interpolation, measurement distance variation, Site imperfection, mismatching, and system repeatability.

Based on NIS 80, 81, the measurement uncertainty level with a 95% confidence level was applied.

3.3 Sample calculation

Conducted emission

The field strength is calculated by adding the LISN factor, cable loss to the measured reading.

The sample calculation is as follows :

$$FS = MR + LF + CL$$

MR = Meter Reading

LF = LISN Factor

CL = Cable Loss

If MR is 30dB, LISN Factor 1dB, CL 1dB

The result (MR) is

$$30 + 1 + 1 = 32\text{dBuV}$$

Radiated emission

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.

The sample calculation is as follows :

$$FS = MR + AF + CL + AT - AG$$

MR = Meter Reading

AF = Antenna Factor

CL = Cable Loss

AP = Antenna Pad

AG=Amplifier Gain

If MR is 30dB, AF 12dB, CL 5dB, AP 10dB, AG 35dB

The result (MR) is

$$30 + 12 + 5 + 10 - 35 = 22\text{dBuV/m}$$

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4. Description of E.U.T.

4.1 Product description

Applicant :	Reigncom Co.,Ltd
Address of Applicant:	8F, Posgen Venture Tower, 1586-7, Seocho-Dong Seocho-gu, Seoul 137-876
Manufacturer#1:	Iriver Electronic Technology(china) Co., Ltd.
Address of Manufacturer:	SSL Sci. & Tech. North Industry Park Dongguan, Guangdong, China, 523-808
Manufacturer#2:	AV CHASEWAY MFG.FTY.
Address of Manufacturer:	Langang Village, Chongguang Town, Baoan District, Shenzhen City, Guangdong, China
Type of equipment:	MULTI-CODEC JUKEBOX(MP3 Player)
Basic Model:	H10 Jr.
Variant Model:	H10CT 512MB, H10CT 1GB, H10CT 2GB H10CX 512MB, H10CX 1GB, H10CX 2GB
The difference basic model and variant model:	Memory
Rating:	*Adapter- Input : AC120V 60Hz 9W - Output : DC4.5V 600mA *3.7V Rechargeable Li-Polymer battery
Serial number:	N/A

4.2 Peripherals

Description	Model / Part #	Serial number	Manufacture
NOTE PC	Lite book P5010	46430711682	FUJITSU

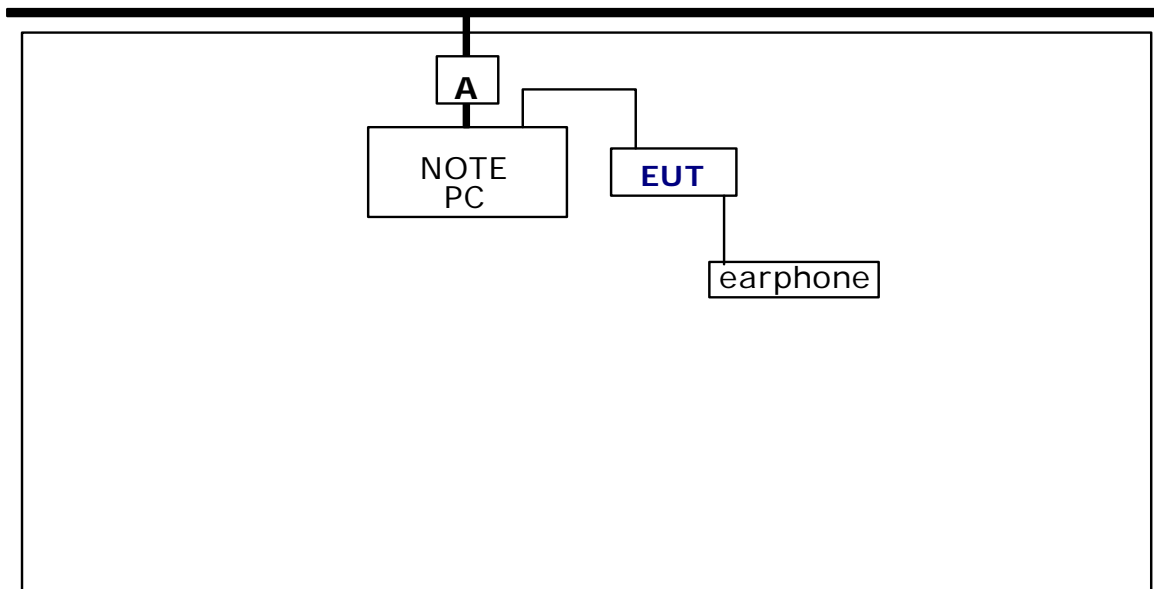
4.3 Operating conditions

Up & down load mode
Recording mode
Tuner mode
Player mode

4.4 Used cables

Start		END		Cable Spec.	
Name	I/O Port	Name	I/O Port	Length	Shield
EUT	USB	NOTE PC	USB	1.2	Shield
	Earphone	-	Open Cable	1.2	Unshield

4.5 EUT test configuration



5. Summary of test results

5.1 Modification to the E.U.T.

None

5.2 Standards & results

FCC Part 15 Subpart B (Class B)

ANSI C63.4 – 1992

Test items	Test methods	Result
Conducted emission	ANSI C63.4-1992	Pass
Radiated emission	ANSI C63.4-1992	Pass

6. Test results

6.1 Conducted Emission

6.1.1 Measurement procedure

Mains

The measurements were performed in a shielded room.

EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane.

The rear of table was located 0.4 m to the vertical conducted plane.

Each EUT power lead, except ground (safety) lead, was individually connected through a LISN to input power source.

Both lines of power cord, hot and neutral, were measured.

6.1.2 Used equipments

Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test receiver	ESHS10	1004.0401.10	R&S	05.05.13	<input checked="" type="checkbox"/>
L.I.S.N.	ESH3-Z5	100267	R&S	05.06.14	<input checked="" type="checkbox"/>
	L2-16A	0000J10705	PMM	05.11.20	<input checked="" type="checkbox"/>
Test site	Shield room	-	-	-	<input checked="" type="checkbox"/>

6.1.3 Measurement uncertainty

Conducted emission measurement : (k=2, 95%)

9kHz-150 kHz : ±3.48

150kHz-300 MHz : ±3.05

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6.1.4 Test data

[REC MODE]

Frequency [MHz]	Correction Factor		Line	Quasi-peak			Average		
	LISN	Cable		Limit	Reading	Result	Limit	Reading	Result
				[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]
0.159	0.03	0.2	N	65.52	42.76	42.99	55.52	12.18	12.41
0.213	0.03	0.2	N	63.09	40.08	40.31	53.09	9.87	10.10
0.294	0.09	0.2	N	60.41	36.05	36.34	50.41	6.35	6.64
0.342	0.09	0.2	N	59.15	37.07	37.36	49.15	7.26	7.55
0.366	0.09	0.2	N	58.59	35.57	35.86	48.59	5.98	6.27
0.378	0.10	0.2	N	58.32	34.64	34.94	48.32	5.22	5.52
0.675	0.11	0.3	N	56.00	28.16	28.57	46.00	0.51	0.92

[USB MODE]

Frequency [MHz]	Correction Factor		Line	Quasi-peak			Average		
	LISN	Cable		Limit	Reading	Result	Limit	Reading	Result
				[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]
0.159	0.03	0.2	H	65.52	43.06	43.29	55.52	12.53	12.76
0.162	0.03	0.2	N	65.36	43.49	43.72	55.36	12.84	13.07
0.165	0.03	0.2	H	65.21	42.88	43.11	55.21	12.28	12.51
0.207	0.03	0.2	H	63.32	40.99	41.22	53.32	10.72	10.95
0.213	0.03	0.2	N	63.09	40.81	41.04	53.09	10.47	10.70
0.276	0.08	0.2	H	60.94	37.67	37.95	50.94	7.77	8.05
0.627	0.10	0.2	N	56.00	29.76	30.06	46.00	1.29	1.59
0.648	0.10	0.2	N	56.00	29.52	29.82	46.00	1.09	1.39
1.206	0.13	0.5	N	56.00	27.00	27.63	46.00	0.13	0.76
22.040	0.89	0.5	N	60.00	29.16	30.55	50.00	26.56	27.95
22.580	0.96	0.7	N	60.00	33.10	34.76	50.00	31.03	32.69
23.130	0.99	0.7	H	60.00	34.78	36.47	50.00	31.27	32.96
24.220	1.03	0.6	N	60.00	29.64	31.27	50.00	25.36	26.99
25.030	1.03	0.8	N	60.00	31.68	33.51	50.00	30.37	32.20
25.580	1.04	0.7	H	60.00	30.72	32.46	50.00	26.46	28.20

[PLAY MODE]

Frequency [MHz]	Correction Factor		Line	Quasi-peak			Average		
	LISN	Cable		Limit	Reading	Result	Limit	Reading	Result
				[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]
0.159	0.03	0.2	N	65.52	43.24	43.47	55.52	12.66	12.89
0.162	0.03	0.2	H	65.36	43.02	43.25	55.36	12.43	12.66
0.165	0.03	0.2	N	65.21	42.88	43.11	55.21	12.42	12.65
0.195	0.03	0.2	H	63.82	41.39	41.62	53.82	10.96	11.19
0.204	0.03	0.2	N	63.45	40.81	41.04	53.45	10.72	10.95
0.216	0.03	0.2	H	62.97	40.71	40.94	52.97	10.37	10.60
0.663	0.10	0.2	N	56.00	27.68	27.98	46.00	0.20	0.50
25.850	1.04	0.7	H	60.00	22.09	23.83	50.00	18.74	20.48
28.290	1.01	0.8	H	60.00	26.67	28.48	50.00	22.94	24.75
28.300	0.99	0.8	N	60.00	26.33	28.12	50.00	23.07	24.86

- Note. QP = Quasi-Peak, AV= Average / LINE(N) : NEUTRAL, LINE(H) : HOT
- Loss = LISN Loss + Cable Loss
- Measurement time :

6.1.5 Result

Complied

6.2 Radiated Emission

6.2.1 Measurement procedure

A pretest was performed at 3 m distance in a mini chamber for searching correct frequency.

The final test was done at a 10 m open area test site with a quasi-peak detector.

EUT was placed on a non-metallic table height of 0.8 m above the reference ground plane.

They were folded back and forth forming a bundle 0.3 m to 0.4 m long and were hanged at a 0.4 m height to the ground plane.

Cables connected to EUT were fixed to cause maximum emission.

Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.

The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

6.2.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next cal. date	Used
Test receiver	ESVS10	827864/006	R&S	05.05.14	<input checked="" type="checkbox"/>
TRILOG Broadband Antenna	VULB 9160	9160-3149	SCHWARZBECK	05.09.29	<input checked="" type="checkbox"/>
Antenna Mast	A109	N/A	DEAIL	-	<input checked="" type="checkbox"/>
Turn Table	TS14	N/A	DEAIL	-	<input checked="" type="checkbox"/>
10m OATS	-	-	EMC Compliance	-	<input checked="" type="checkbox"/>

6.2.3 Measurement uncertainty

Radiated Emission measurement : (k=2, 95%)

30-300 MHz ; 3 m: ± 3.56 , 10 m: ± 3.50

300-1000 MHz ; 3 m: ± 4.47 , 10 m: ± 2.64

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6.2.4 Test data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	angle	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
					Antenna	Cable			
Recording mode									
700.04	4.0	V	1.0	60	20.61	6.00	37.0	30.61	6.39
766.79	1.3	H	2.1	67	21.90	6.53	37.0	29.73	7.27
Up/Down mode									
46.32	10.9	V	1.0	22	11.98	0.84	30.0	23.72	6.28
102.45	10.3	H	3.7	356	9.68	1.54	30.0	21.52	8.48
103.05	8.5	V	2.0	305	9.76	1.56	30.0	19.82	10.18
142.99	9.7	V	3.3	341	12.74	2.02	30.0	24.46	5.54
143.72	8.3	H	3.4	235	12.79	2.03	30.0	23.12	6.88
211.25	5.8	H	2.9	112	10.07	2.51	30.0	18.38	11.62
248.35	16.5	H	3.6	330	11.56	2.84	37.0	30.90	6.10
400.23	10.1	V	2.3	257	15.45	3.90	37.0	29.45	7.55
451.01	9.3	V	2.4	239	16.59	4.05	37.0	29.95	7.05
600.00	8.7	H	1.7	256	19.55	5.20	37.0	33.45	3.55
725.09	5.1	H	1.0	214	21.09	6.12	37.0	32.32	4.69
840.00	3.0	H	2.3	332	22.56	6.90	37.0	32.46	4.54
PLAY mode									
122.30	5.2	V	3.0	257	11.42	1.91	30.0	18.53	11.47
201.35	5.5	V	3.2	216	9.82	2.41	30.0	17.73	12.27
248.35	16.5	H	3.6	330	11.56	2.84	37.0	30.90	6.10
675.00	8.0	H	2.3	0	20.28	5.85	37.0	34.13	2.87
725.05	4.8	H	1.4	0	21.09	6.12	37.0	32.02	4.99

* Receiving Antenna Mode : *Horizontal, Vertical*

* 10 m OATS

* Note : Reading = Test Receiver meter,

P = Polarization → POL H = Horizontal, POL V = Vertical

* Result = Field Strength (Antenna factor + Cable factor + Reading)

[TEST MODE: FM TUNER]

Tuned Frequency [MHz]	Local Oscillator	Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	angle	Correction Factor		Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
							Antenna	Cable			
87.6	Harmonics	88.80	8.5	H	1.3	186	9.05	0.82	46.0	19.37	27.63
98	Harmonics	869.80	10.3	H	1.4	182	22.05	5.50	46.0	37.85	8.15
108	Harmonics	237.40	15.4	V	3.2	25	11.75	1.88	46.0	29.03	16.97
OTHER											

* Receiving Antenna Mode : *Horizontal, Vertical*

* 3 m OATS

* Note : Reading = Test Receiver meter,

P = Polarization → POL H = Horizontal, POL V = Vertical

* Result = Field Strength (Antenna factor + Cable factor + Reading)

6.2.5 Result

Complied

7. Test Graph

Conducted Emission test graph

[USB MODE]

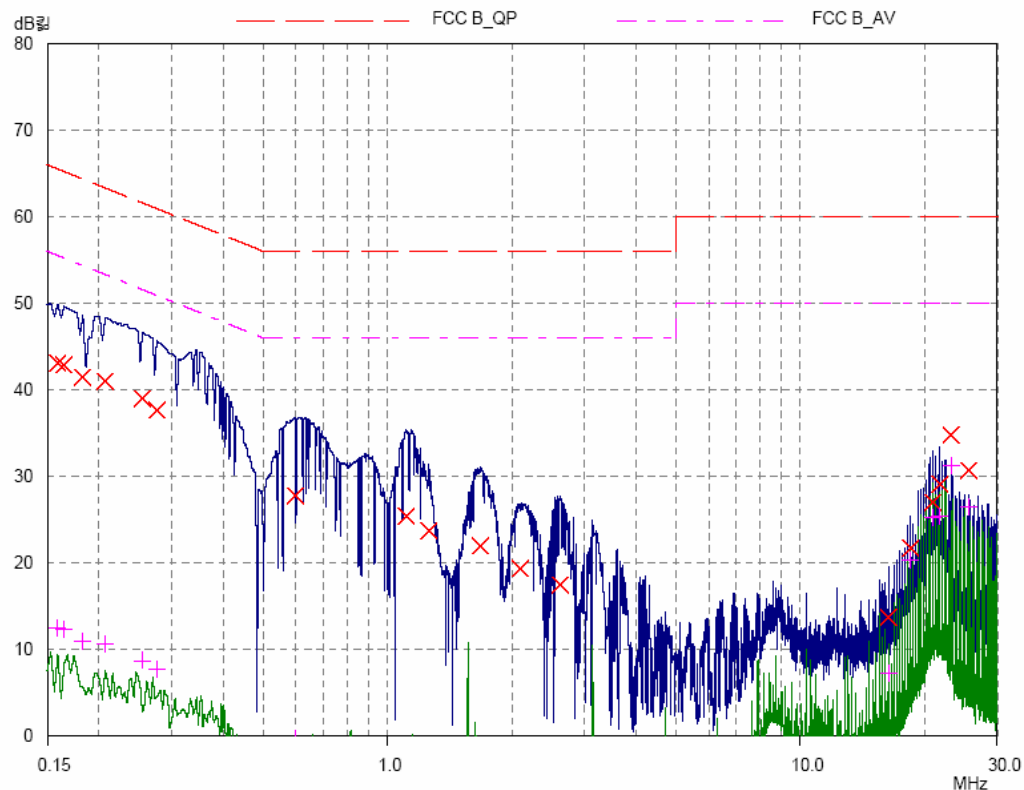
EUT: H10 Jr.
Manuf: iRiver
Op Cond: h
Operator: USB MODE
Test Spec: FCC Class B Conducted Emission
Comment: 220V, 60Hz

Result File: usbh~1.dat : IRIVER 1g_h

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



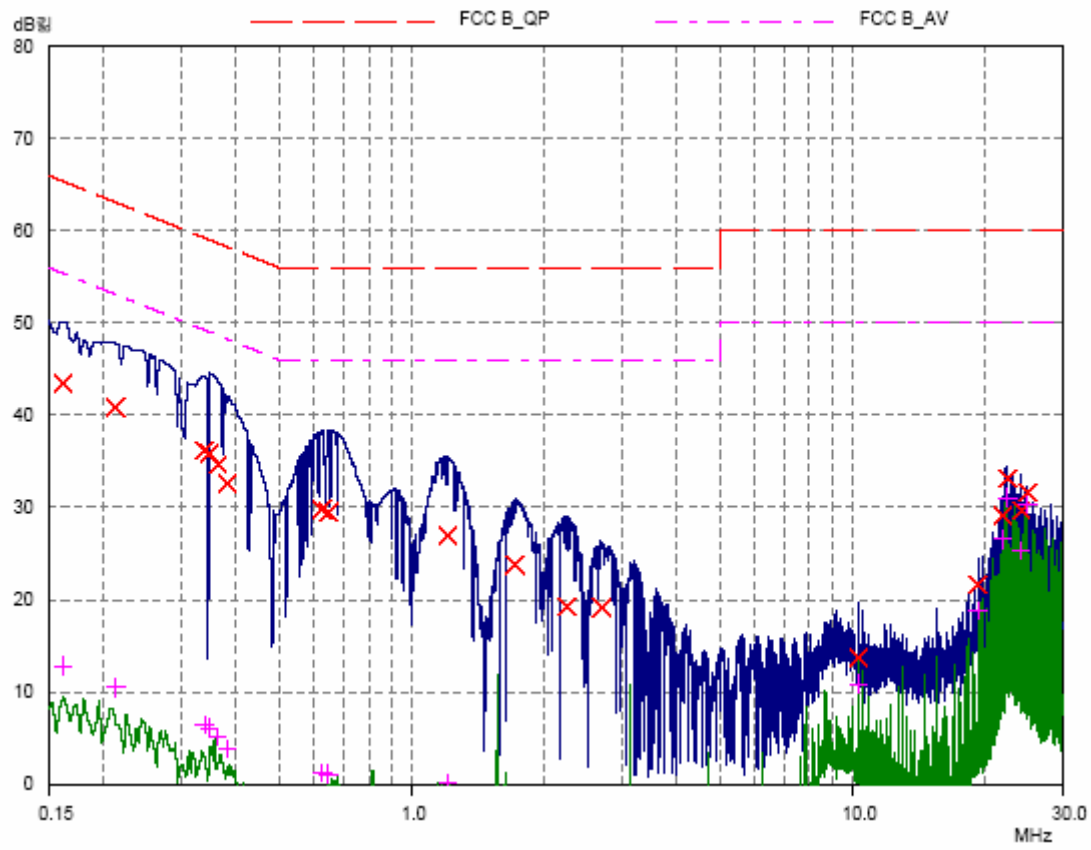
EUT: H10 Jr.
 Manuf: iRiver
 Op Cond: N
 Operator: USB MODE
 Test Spec: FCC Class B Conducted Emission
 Comment: 220V, 60Hz

Result File: usbn~1.dat : IRIVER 1g_N

Scan Settings (2 Ranges)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB	
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB	

Final Measurement: Detectors: X QP / + AV
 Meas Time: 1sec
 Peaks: 8
 Acc Margin: 25 dB



[REC MODE]

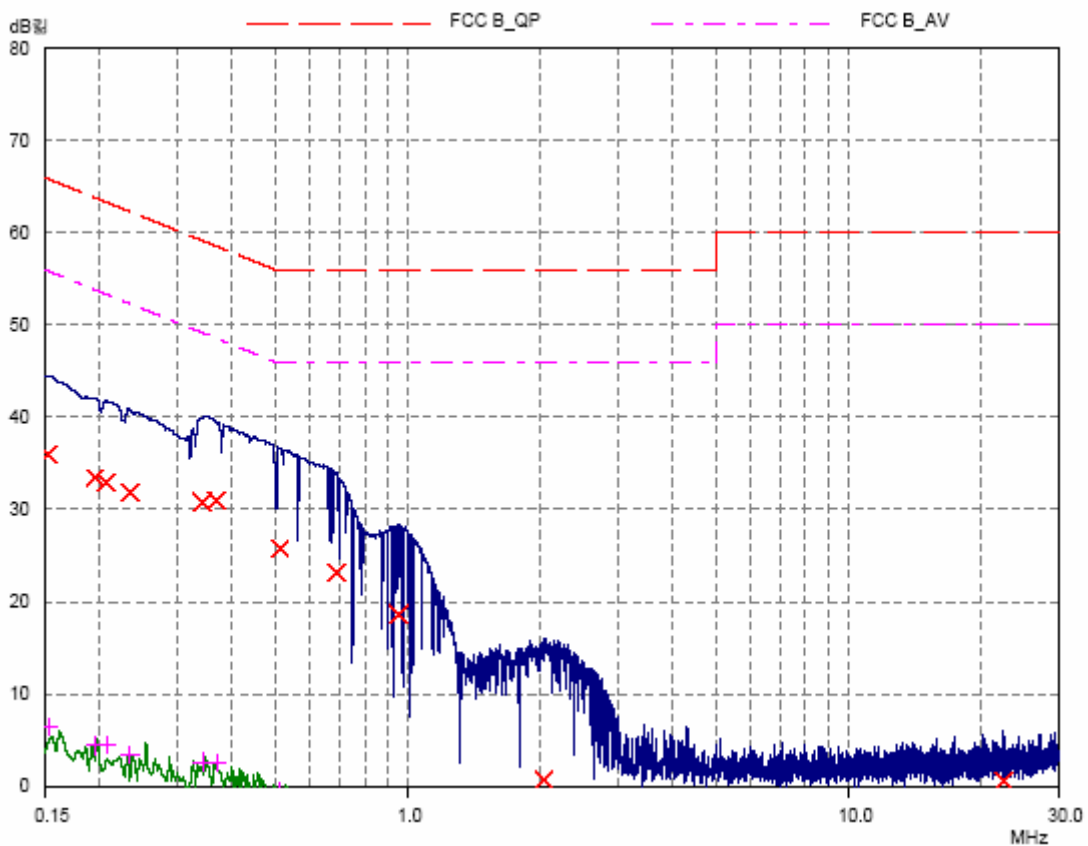
EUT: H10 Jr.
 Manuf: IRIVER
 Op Cond: h
 Operator:
 Test Spec: FCC Class B Conducted Emission
 Comment:

Result File: voiceh.dat : IRIVER_VOICE_H

Scan Settings (2 Ranges)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	80dB	
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	80dB	

Final Measurement: Detectors: X QP / + AV
 Meas Time: 1sec
 Peaks: 8
 Acc Margin: 25 dB

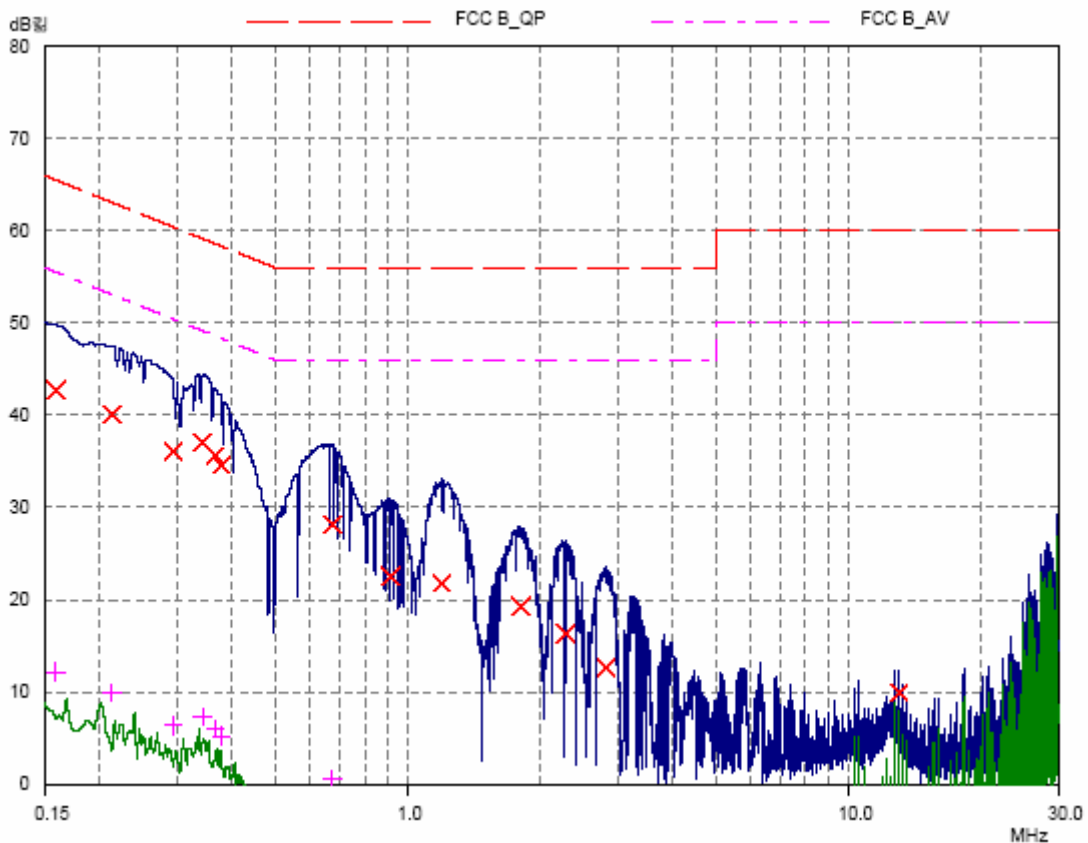


EUT: H10 Jr.
 Manuf: IRIVER
 Op Cond: N
 Operator:
 Test Spec: FCC Class B Conducted Emission
 Comment:

Result File: voicen.dat : IRIVER_VOICE_N

Scan Settings (2 Ranges)			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB	
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB	

Final Measurement: Detectors: X QP / + AV
 Meas Time: 1sec
 Peaks: 8
 Acc Margin: 25 dB



[PLAY MODE]

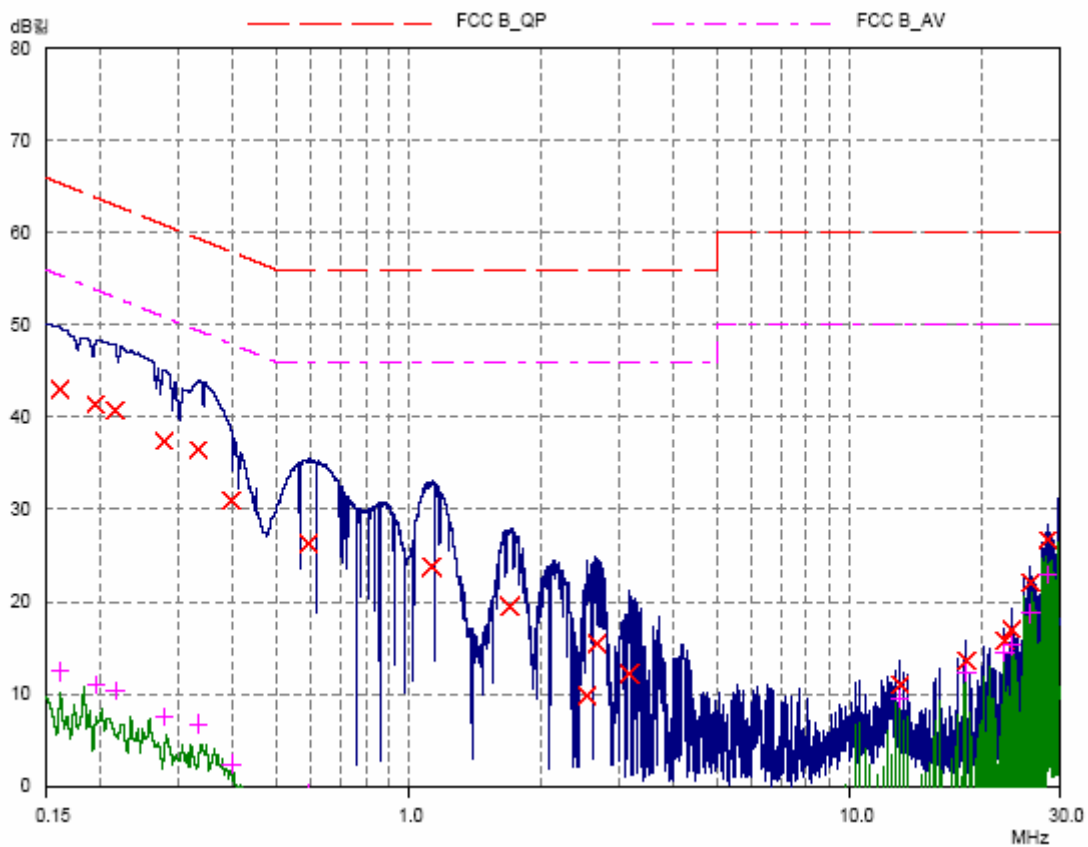
EUT: H10 Jr.
Manuf: IRIVER
Op Cond: H
Operator: PLAY
Test Spec: FCC Class B Conducted Emission
Comment:

Result File: iriv_p~1.dat : IRIVER_PLAY_CE

Scan Settings (2 Ranges)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB	
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB	

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



EUT: H10 Jr.
 Manuf: IRIVER
 Op Cond: N
 Operator:
 Test Spec: FCC Class B Conducted Emission
 Comment:

Result File: iriv_p~2.dat : IRIVER_PLAY_N

Scan Settings (2 Ranges)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150kHz	3MHz	3kHz	10kHz	PK+AV	10msec	Auto	OFF	60dB	
3MHz	30MHz	10kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB	

Final Measurement: Detectors: X QP / + AV
 Meas Time: 1sec
 Peaks: 8
 Acc Margin: 25 dB

