TEST REPORT

Your Ref:

Date: 07 Sep 2005

Our Ref: 56S050746/01

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FORMAL REPORT ON TESTING IN ACCORDANCE WITH
FCC Parts 15B & C : 2005
OF A
DVD/CD PLAYER WITH AV RECEIVER
[Model : E61TAUD]
[FCC ID : RFAAND5061TA]

TEST FACILITY	Telecoms & EMC, Testing Group, PSB Corporation Pte Ltd 1 Science Park Drive, Singapore 118221
FCC REG. NO.	90937 (3m & 10m OATS) 99142 (10m Anechoic Chamber) 871638 (5m Anechoic Chamber) 325572 (10m Anechoic Chamber)
IND. CANADA REG. NO.	IC 4257 (10m Anechoic Chamber)
PREPARED FOR	Eastech Electronics (Taiwan) Inc 13/F , No.99.Sec.1 ,Nankan Road, Luchu shiang, Taoyuan Hsien, Taiwan , R.O.C Tel : 886-3-3116686 Fax : 886-3-3116687
JOB NUMBER	56S050746
TEST PERIOD	24 Aug 2005 – 01 Sep 2005

PREPARED BY	**APPROVED BY**
Dylan Lin Choon Hwa Associate Engineer	Lim Cher Hwee Product manager

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LA-2001-0212-A
LA-2001-0213-F
LA-2001-0214-E
LA-2001-0215-B
LA-2001-0216-G
LA-2001-0217-G

The results reported herein have been performed in accordance with the laboratory's terms of accreditation under the Singapore Accreditation Council - Singapore Laboratory Accreditation Scheme. Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our laboratory.

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The product was tested in accordance with the customer's specifications.

Test Results Summary

Test Standard	Description	Pass / Fail
FCC Part 15: 2005		
15.107(a), 15.207	Conducted Emissions	Pass
15.109(a), 15.205, 15.209	Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)	Pass
15.247(a)(1)	Carrier Frequency Separation	Pass
	Spectrum Bandwidth (20dB Bandwidth Measurement)	Pass
15.247(a)(1)(iii)	Number of Hopping Frequencies	Pass
	Average Frequency Dwell Time	Pass
15.247(b)(1)	Maximum Peak Power	Pass
15.247(d)	RF Conducted Spurious Emissions	Pass
15.247(d)	Band Edge Compliance	Pass
15.247(e)	Peak Power Spectral Density	Pass
1.1310	Maximum Permissible Exposure	Pass
15.35(c)	Duty Cycle Factor Computation	Refer to pages 65 and 66 for details

Notes

1. Three channels as listed below, which respectively represent the lower, middle and upper channels of the equipment under test (EUT) were chosen and tested. For each channel, the EUT was configured to operate in the test mode.

Transmit Channel	Frequency (GHz)
Channel 1	2.403
Channel 39	2.441
Channel 78	2.480

2. All the measurements in section 15.247 were done based on conducted measurements.

3. The EUT is a Class B device when in non-transmitting state and meets the FCC Part15B Class B requirements.

4. For radiated emissions test, the EUT was tested with the RF antenna port terminated with a 75Ω terminator as the measured RF antenna power was less than 2nW.

Modifications

The EUT was brought to compliance to Conducted Emissions test removing a capacitor (C1007) from the AV receiver.

Description	:	The Equipment Under Test (EUT) is **a DVD / CD Player with AV Receiver**. The EUT consists of following units: - 1 x AV receiver - 1 x DVD / CD player - 2 x front speakers (left and right) - 1 x center speaker - 1 x subwoofer (wireless transceiver) - 1 x wireless rear speaker (wireless transceiver)
Manufacturer	:	Eastech Electronics (Taiwan) INC 13/F , No.99.Sec.1 ,Nankan Road, Luchu shiang, Taoyuan Hsien, Taiwan , R.O.C
Model Number	:	E61TAUD
FCC ID	:	RFAAND5061TA (for subwoofer and wireless speaker)
Serial Number	:	E33510025
Microprocessor	:	Refer to manufacturers' user manual / operating manual.
Operating / Transmitting Frequency	:	2.400GHz to 2.480GHz
Clock / Oscillator Frequency	:	Refer to manufacturers' user manual / operating manual.
Modulation	:	Gaussian Frequency Shift Keying (GFSK) with BT = 0.5
Port / Connectors	:	Refer to manufacturers' user manual / operating manual.
Rated Input Power	:	110VAC 60Hz (AV receiver) 110VAC 60Hz (DVD / CD player) 110VAC 60Hz (Subwoofer) 110VAC 60Hz (Wireless rear speaker)
Accessories	:	Nil

SUPPORTING EQUIPMENT DESCRIPTION

Equipment Description (Including Brand Name)	**Model, Serial & FCC ID Number**	**Cable Description** (List Length, Type & Purpose)
Toshiba 14” TV	M/N: 14NX1 S/N: 40C03286 FCC ID: Verification	1.80 m unshielded power cable 1.00 m RCA cable

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FCC Part 15
1. Conducted Emissions **2. Radiated Emissions (Spurious Emissions inclusive Restricted Bands Requirement)** **3. Spectrum Bandwidth (20dB Bandwidth Measurement)** **4. Maximum Peak Power** **5. RF Conducted Spurious Emissions** **6. Peak Power Spectral Density** **7. Maximum Permissible Exposure** **8. Duty Cycle Factor Computation**
The EUT was exercised by operating in maximum continuous transmission with frequency hopping off, i.e transmitting at lower, middle and upper channels respectively at one time.
FCC Part 15
1. Carrier Frequency Separation **2. Number of Hopping Frequencies** **3. Average Frequency Dwell Time** **4. Band Edge Compliance**
The EUT was exercised by operating in maximum continuous transmission with frequency hopping on.

FCC Parts 15.107(a) and 15.207 Conducted Emission Limits

Frequency Range	Limit Values (dBµV)	
(MHz)	Quasi-peak (QP)	Average (AV)
0.15 - 0.5	66 – 56 *	56 – 46 *
0.5 - 5.0	56	46
5.0 - 30.0	60	50
* Decreasing linearly with the logarithm of the frequency		

FCC Parts 15.107(a) and 15.207 Conducted Emission Test Instrumentation

Instrument	Model	S/No	Cal Due Date
Schaffner EMI Receiver – SCR1	SCR3501	238	28 Oct 2005
Agilent EMC Analyzer – SA6	E7403A	US41160166	25 May 2006
Schaffner Four-Line V-Network	NNB42	04-10057	20 May 2006

FCC Parts 15.107(a) and 15.207 Conducted Emission Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50Ω/50µH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipment were powered separately from another LISN.

FCC Parts 15.107(a) and 15.207 Conducted Emission Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A scan was made on the NEUTRAL line over the required frequency range using an EMI test receiver.
3. High peaks, relative to the limit line, were then selected.
4. The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10kHz. Both Quasi-peak and Average measurements were made.
5. Steps 2 to 4 were then repeated for the LIVE line.

Sample Calculation Example

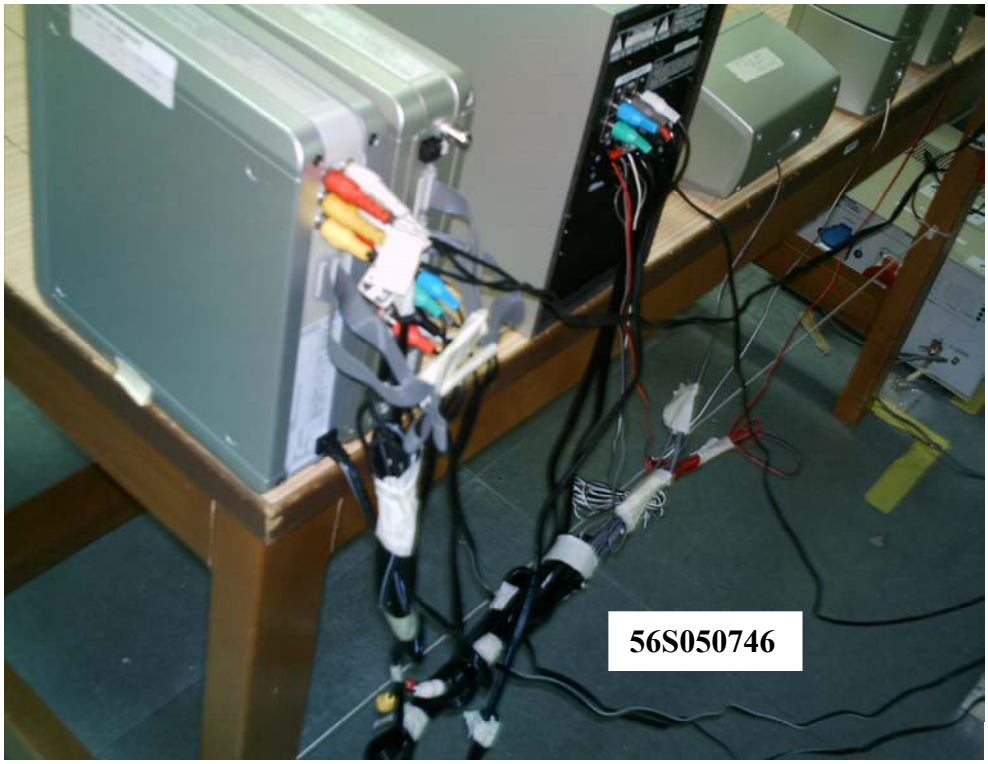
At 20 MHz Q-P limit (Class B) = 100 µV = 60.0 dBµV

Transducer factor of LISN, pulse limiter & cable loss at 20 MHz = 11.2 dB

Q-P reading obtained directly from EMI Receiver = 40.0 dBµV
(Calibrated for system losses)

Therefore, Q-P margin = 40.0 - 60.0 = -20.0 i.e. **20.0 dB below Q-P limit**

Conducted Emissions Test Setup (Front View)



Conducted Emissions Test Setup (Rear View)

FCC Parts 15.107(a) and 15.207 Conducted Emission Results

Test Input Power	110V 60Hz	Temperature	23°C
Line Under Test	AC Mains	Relative Humidity	55%
		Atmospheric Pressure	1030mbar
		Tested By	Thor Wen Lei / Lim Guan Leong

Subwoofer

Frequency (MHz)	Q-P Value (dBμV)	Q-P Margin (dB)	AV Value (dBμV)	AV Margin (dB)	Line	Channel
0.1565	58.8	-6.8	30.9	-24.7	Neutral	39
0.2087	57.8	-5.5	31.9	-21.4	Neutral	39
0.2435	56.8	-5.2	31.4	-20.6	Neutral	39
0.3162	55.2	-4.6	27.8	-22.0	Neutral	39
0.3846	53.1	-5.1	33.3	-14.9	Neutral	39
0.4048	49.6	-8.2	23.2	-24.6	Live	39

Wireless Rear Speaker

Frequency (MHz)	Q-P Value (dBμV)	Q-P Margin (dB)	AV Value (dBμV)	AV Margin (dB)	Line	Channel
0.1640	53.2	-12.2	26.2	-29.2	Live	39
0.1803	52.7	-11.9	25.8	-28.8	Live	39
0.2182	51.5	-11.5	32.2	-20.8	Live	39
0.2665	50.8	-10.5	24.2	-27.1	Live	39
0.3297	50.0	-9.6	23.7	-25.9	Live	39
0.4024	45.1	-12.8	20.3	-27.6	Neutral	39

AV Receiver

Frequency (MHz)	Q-P Value (dBμV)	Q-P Margin (dB)	AV Value (dBμV)	AV Margin (dB)	Line	Channel
0.6010	45.9	-10.1	35.5	-10.5	Neutral	39
0.9636	46.0	-10.0	33.7	-12.3	Neutral	39
1.4412	47.5	-8.5	31.5	-14.5	Neutral	39
1.3438	45.8	-10.2	32.5	-13.5	Neutral	39
1.8066	51.8	-4.2	34.5	-11.5	Neutral	39
7.8402	51.5	-8.5	49.0	-1.0	Live	39

DVD / CD Player

Frequency (MHz)	Q-P Value (dBμV)	Q-P Margin (dB)	AV Value (dBμV)	AV Margin (dB)	Line	Channel
0.1862	52.2	-12.1	28.3	-26.0	Live	39
0.4872	43.1	-13.2	33.1	-13.2	Neutral	39
0.5982	44.5	-11.5	33.2	-12.8	Neutral	39
0.9631	45.0	-11.0	34.0	-12.0	Neutral	39
1.4412	45.6	-10.4	31.3	-14.7	Neutral	39
1.8130	51.6	-4.4	34.2	-11.8	Neutral	39

Notes:

1. All possible modes of operation were investigated from 150kHz to 30MHz. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:
   9kHz - 30MHz
   RBW: 10kHz VBW: 30kHz
4. Conducted Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 9kHz – 30MHz (Average & Quasi-peak) is ±2.4dB.

FCC Part 15.205 Restricted Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	Above 38.6
13.36 - 13.41			

FCC Parts 15.109(a) and 15.209 Radiated Emission Limits

Frequency Range (MHz)	Quasi-Peak Limit Values (dBµV/m) @ 3m
30 - 88	40.0
88 - 216	43.5
216 - 960	46.0
Above 960	54.0*
* Above 1GHz, average detector was used. A peak limit of 20dB above the average limit does apply.	

FCC Parts 15.109(a) and 15.209 Radiated Emission Test Instrumentation

Instrument	Model	S/No	Cal Due Date
R&S Test Receiver (20Hz-26.5GHz) – ESMI2	ESMI	829214/006 829550/001	18 Apr 2006
HP Preamplifier (for ESMI2, 0.01-3GHz) – PA6	87405A	3950M00353	02 Aug 2006
MITEQ Preamplifier (0.1-26.5GHz) – PA3	NSP2650-N	592346	01 Apr 2006
Schaffner Bilog Antenna – BL9	CBL6143	5045	13 May 2006
EMCO Horn Antenna – H1	3115	9901-5671	19 May 2006
Bandstop Filter (2.4-2.5 GHz)	BRM50701	017	13 Nov 2005

FCC Parts 15.109(a) and 15.209 Radiated Emission Test Setup

1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m X 1.0m X 0.8m high, non-metallic table.
2. The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
3. The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.

FCC Parts 15.109(a) and 15.209 Radiated Emission Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. A prescan was carried out to pick the worst emission frequencies from the EUT. For EUT which is a portable device, the prescan was carried out by rotating the EUT through three orthogonal axes to determine which attitude and equipment arrangement produces such emissions.
3. The test was carried out at the selected frequency points obtained from the prescan in step 2. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
   a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
   b. The EUT was then rotated to the direction that gave the maximum emission.
   c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
4. A Quasi-peak measurement was made for that frequency point if it was less than or equal to 1GHz. For frequency point that above 1GHz, both Peak and Average measurements were carried out.
5. Steps 3 and 4 were repeated for the next frequency point, until all selected frequency points were measured.
6. The frequency range covered was from 30MHz to 10th harmonics of the EUT fundamental frequency, using the Bi-log antenna for frequencies from 30MHz up to 3GHz, and the Horn antenna above 3GHz.

Sample Calculation Example

At 300 MHz Q-P limit (Class B) = 200 μV/m = 46.0 dBμV/m

Log-periodic antenna factor & cable loss at 300 MHz = 18.5 dB

Q-P reading obtained directly from EMI Receiver = 40.0 dBμV/m
(Calibrated level including antenna factors & cable losses)

Therefore, Q-P margin = 40.0 - 46.0 = -6.0 i.e. **6 dB below Q-P limit**

Radiated Emissions Test Setup (Front View)

Radiated Emissions Test Setup (Rear View)

FCC Parts 15.109(a), 15.205 and 15.209 Radiated Emission Results

Test Input Power	110V 60Hz	Temperature	23°C
Test Distance	3m	Relative Humidity	55%
		Atmospheric Pressure	1030mbar
		Tested By	Thor Wen Lei / Johnsen Tia / Anthony Toh

Spurious Emissions ranging from 30MHz – 1GHz (all units except wireless rear speaker)

Frequency (MHz)	Q-P Value (dBμV/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)	Channel
31.9822	22.3	-17.7	112	100	V	39
107.9769	38.3	-4.7	180	100	V	39
171.9797	36.8	-6.7	311	112	V	39
184.3371	29.0	-14.5	321	107	V	39
196.6196	38.2	-5.3	180	144	H	39
245.6216	36.3	-9.7	207	100	H	39

Spurious Emissions above 1GHz (all units except wireless rear speaker)

Frequency (GHz)	Peak Value (dBμV/m)	Average Value (dBμV/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)	Channel
7.3231	47.5	45.4	-8.6	124	100	H	39

Spurious Emissions ranging from 30MHz – 1GHz (wireless rear speaker)

Frequency (MHz)	Q-P Value (dBμV/m)	Q-P Margin (dB)	Azimuth (Degrees)	Height (cm)	Polarisation (H/V)	Channel
257.9999	33.7	-12.3	189	101	H	39
552.9828	40.0	-6.0	96	118	H	39
589.9575	42.8	-3.2	160	98	H	39
671.9817	35.1	-10.9	76	158	H	39
703.9693	35.0	-11.0	76	147	H	39

Spurious Emissions above 1GHz (wireless rear speaker)

Frequency (GHz)	Peak Value (dBμV/m)	Average Value (dBμV/m)	Average Margin (dB)	Azimuth (Degrees)	Height (cm)	Pol (H/V)	Channel
1.5794	43.6	28.4	-25.6	150	100	V	39
1.6199	31.0	15.8	-38.2	17	101	V	39

Notes:

1. All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2. The average margin indicates the margin of the measured peak value below the average limit.
3. Quasi-peak measurement was used for frequency measurement up to 1GHz. Average and peak measurements were used for emissions above 1GHz. The average measurement was done by averaging over a complete cycle of the pulse train, including the blanking interval as the pulse train duration does not exceed 0.1 second.
4. A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
5. EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings:
   30MHz - 1GHz
   RBW: 120kHz VBW: 1MHz
   >1GHz
   RBW: 1MHz VBW: 1MHz
6. The upper frequency of radiated emission investigations was according to requirements stated in Section 15.33(a) for intentional radiators & Section 15.33(b) for unintentional radiators.
7. The channel in the table refers to the transmit channel of the EUT.
8. Radiated Emissions Measurement Uncertainty
   All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 30MHz – 25GHz (QP only @ 3m & 10m) is ±4.3dB (for EUTs < 0.5m X 0.5m X 0.5m).

FCC Part 15.247(a)(1) Carrier Frequency Separation Limits

The EUT shows compliance to the requirements of this section, which states the adjacent carrier frequencies must be separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Alternatively, the EUT may have hopping channel carrier frequencies that are separated by 25kHz or two-thirds of the 20dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125mW (21dBm).

FCC Part 15.247(a)(1) Carrier Frequency Separation Test Instrumentation

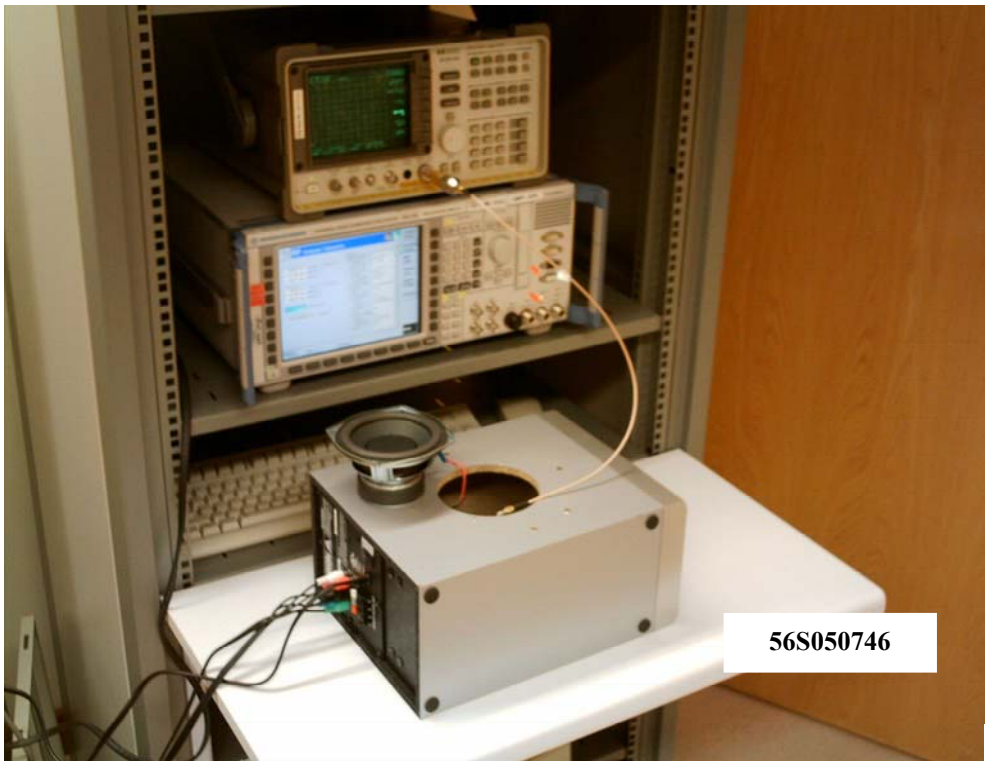
Instrument	Model	S/No	Cal Due Date
HP Spectrum Analyzer – SA10	8564E	3846A01433	27 Apr 2006

FCC Part 15.247(a)(1) Carrier Frequency Separation Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 100kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(a)(1) Carrier Frequency Separation Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The start and stop frequencies of the spectrum analyser were set to 2.401GHz and 2.404GHz.
3. The spectrum analyser was set to max hold to capture the two adjacent transmitting frequencies within the span. The signal capturing was continuous until no further signals were detected.
4. The carrier frequency separation of the two adjacent transmitting / operating frequency was measured by finding the carrier frequency difference between the two adjacent channels.
5. The steps 2 to 4 were repeated with the following start and stop frequencies settings:
   a. 2.439GHz to 2.442GHz
   b. 2.440GHz to 2.443GHz
   c. 2.478GHz to 2.481GHz



Carrier Frequency Separation Test Setup

FCC Part 15C (15.247(a)(1)) Carrier Frequency Separation Results

Test Input Power	110V 60Hz	Temperature	23°C
Attached Plots	1 - 3 (Subwoofer) 4 - 6 (Wireless Rear Speaker)	Relative Humidity	55%
		Atmospheric Pressure	1030mbar
		Tested By	Thor Wen Lei

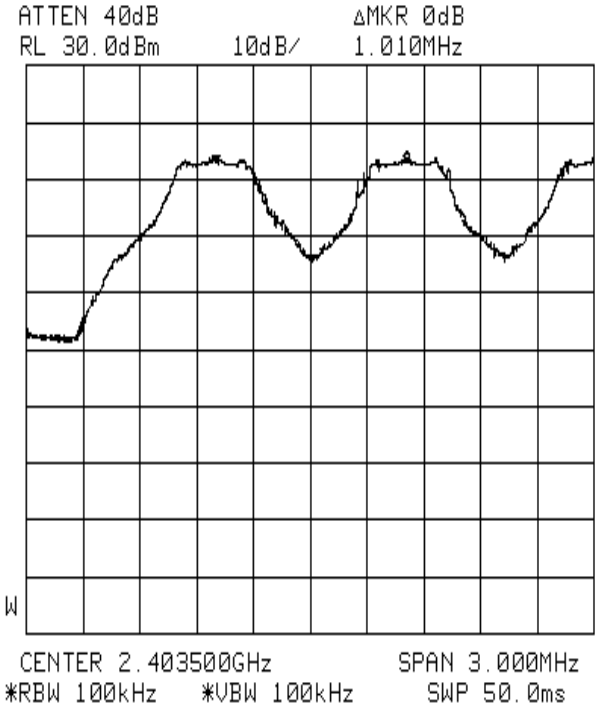
Subwoofer

Adjacent Channels	Channel Separation (MHz)
1 and 2 (2.403GHz and 2.404GHz)	1.010
38 and 39 (2.440GHz and 2.441GHz)	1.015
77 and 78 (2.479GHz and 2.480GHz)	1.020

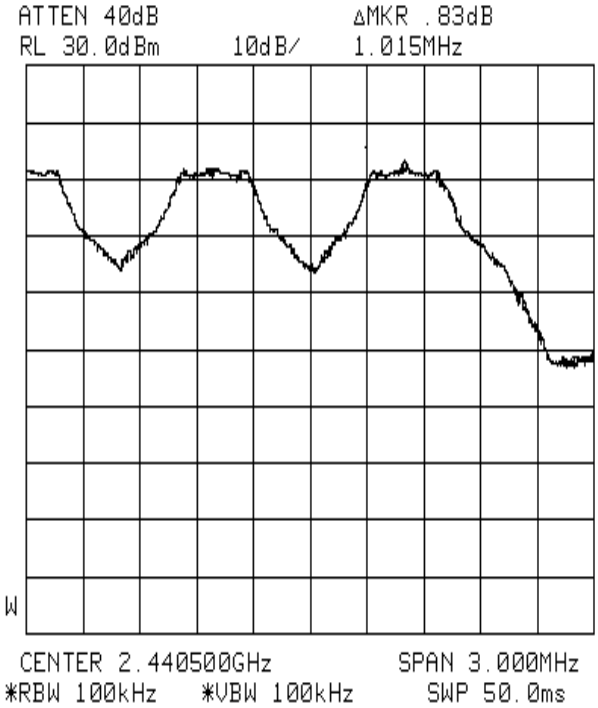
Wireless Rear Speaker

Adjacent Channels	Channel Separation (MHz)
1 and 2 (2.403GHz and 2.404GHz)	1.015
38 and 39 (2.440GHz and 2.441GHz)	1.015
77 and 78 (2.479GHz and 2.480GHz)	1.015

Carrier Frequency Separation Plots - Subwoofer

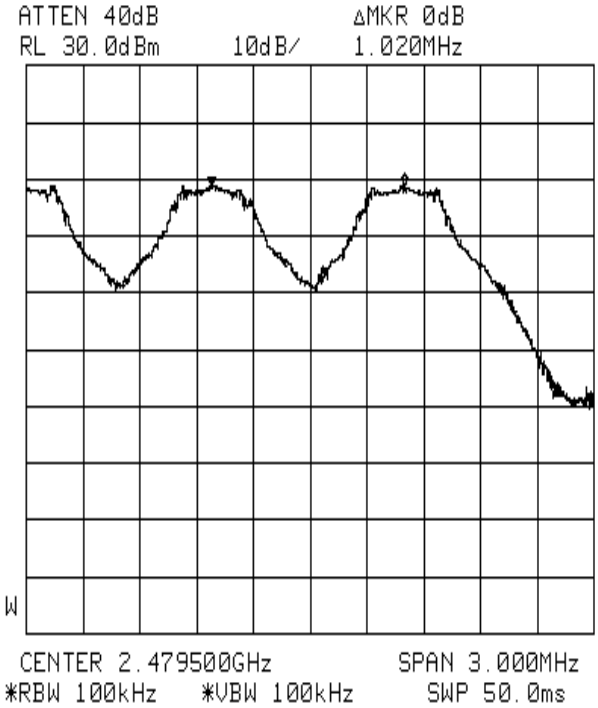


Plot 1 - Channels 1 and 2 Separation



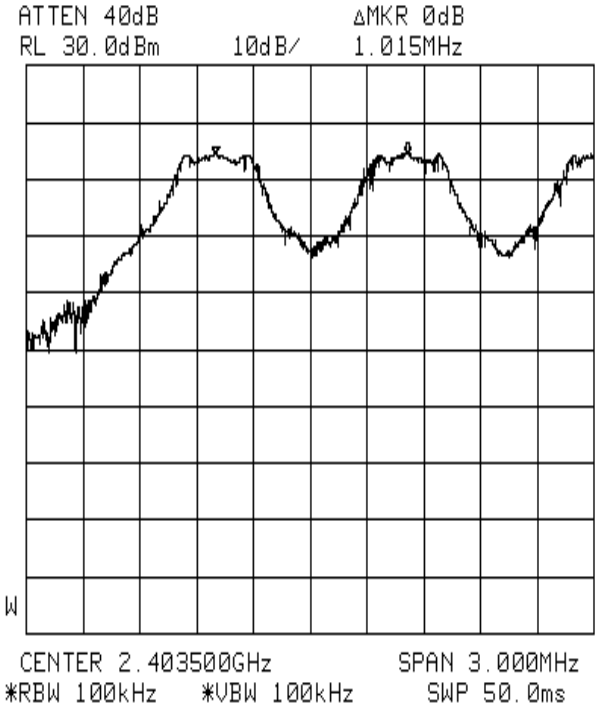
Plot 2 – Channels 38 and 39 Separation

Carrier Frequency Separation Plots - Subwoofer

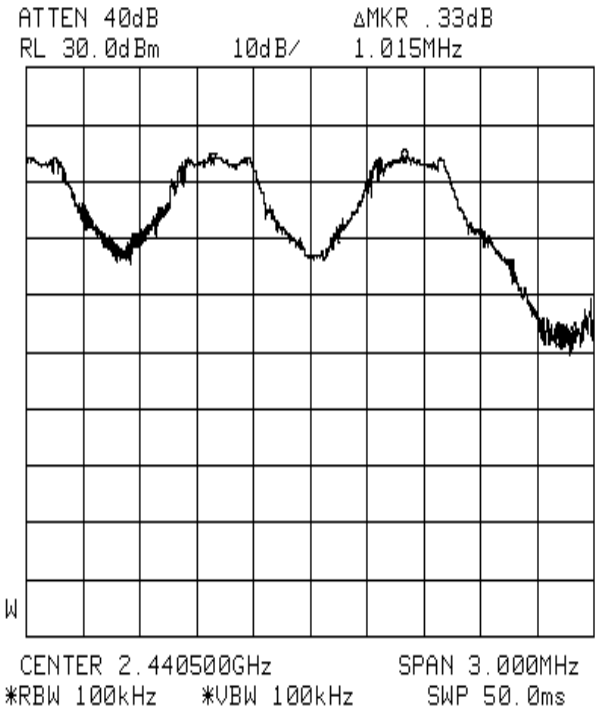


Plot 3 - Channels 77 and 78 Separation

Carrier Frequency Separation Plots - Wireless Rear Speaker

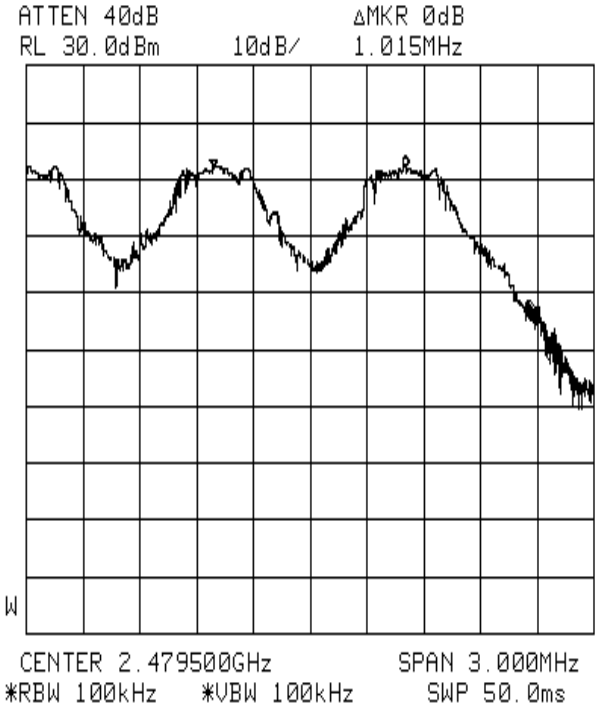


Plot 4 - Channels 1 and 2 Separation



Plot 5 – Channels 38 and 39 Separation

Carrier Frequency Separation Plots - Wireless Rear Speaker



Plot 6 - Channels 77 and 78 Separation

FCC Part 15.247(a)(1) Spectrum Bandwidth (20dB Bandwidth Measurement) Limits

The EUT shows compliance to the requirements of this section, which states that the 20dB bandwidth of the hopping channel shall be the channel frequency separation by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

FCC Part 15.247(a)(1) Spectrum Bandwidth (20dB Bandwidth Measurement) Test Instrumentation

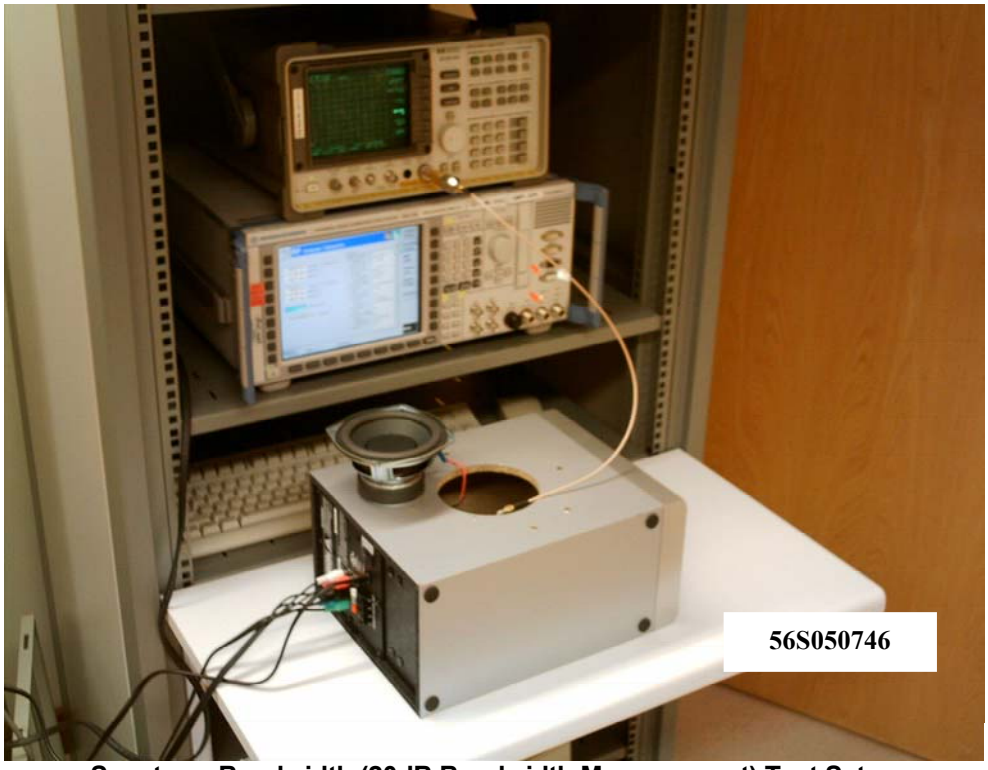
Instrument	Model	S/No	Cal Due Date
HP Spectrum Analyzer – SA10	8564E	3846A01433	27 Apr 2006

FCC Part 15.247(a)(1) Spectrum Bandwidth (20dB Bandwidth Measurement) Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 10kHz and 30kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(a)(1) Spectrum Bandwidth (20dB Bandwidth Measurement) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 1 (2.403GHz).
2. The center frequency of the spectrum analyser was set to the transmitting frequency with the frequency span wide enough to capture the 20dB bandwidth of the transmitting frequency.
3. The spectrum analyser was set to max hold to capture the transmitting frequency. The signal capturing was continuous until no further changes were observed.
4. The peak of the transmitting frequency was detected with the marker peak function of the spectrum analyser. The frequencies below the 20dB peak frequency at lower (f_L) and upper (f_H) sides of the transmitting frequency were marked and measured by using the marker-delta function of the spectrum analyser.
5. The 20dB bandwidth of the transmitting frequency is the frequency difference between the marked lower and upper frequencies, $| f_H – f_L |$.
6. The steps 2 to 5 were repeated with the transmitting frequency was set to Channel 39 (2.441GHz) and Channel 78 (2.480GHz) respectively.



Spectrum Bandwidth (20dB Bandwidth Measurement) Test Setup

FCC Part 15.247(a)(1) Spectrum Bandwidth (20dB Bandwidth Measurement) Results

Test Input Power	110V 60Hz	Temperature	23°C
Attached Plots	7 - 9 (Subwoofer) 10 - 12 (Wireless Rear Speaker)	Relative Humidity	55%
		Atmospheric Pressure	1030mbar
		Tested By	Thor Wen Lei

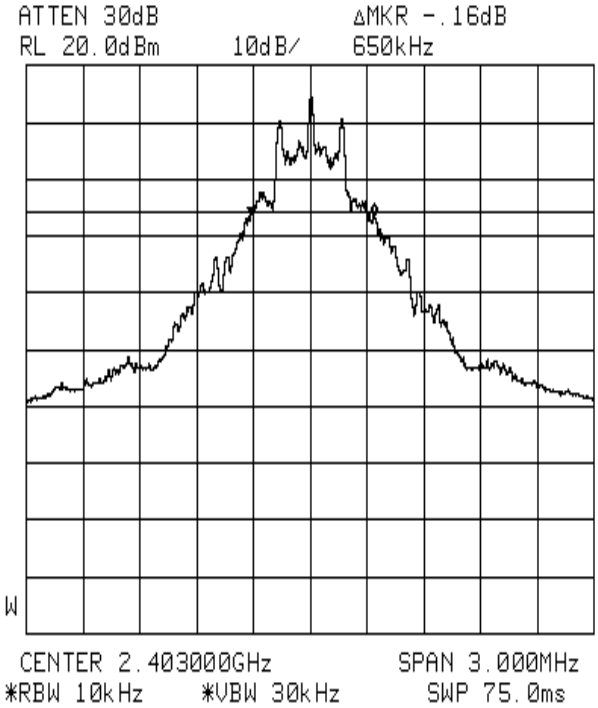
Subwoofer

Channel	Channel Frequency (GHz)	20dB Bandwidth (MHz)
1	2.403	0.650
39	2.441	0.665
78	2.480	0.635

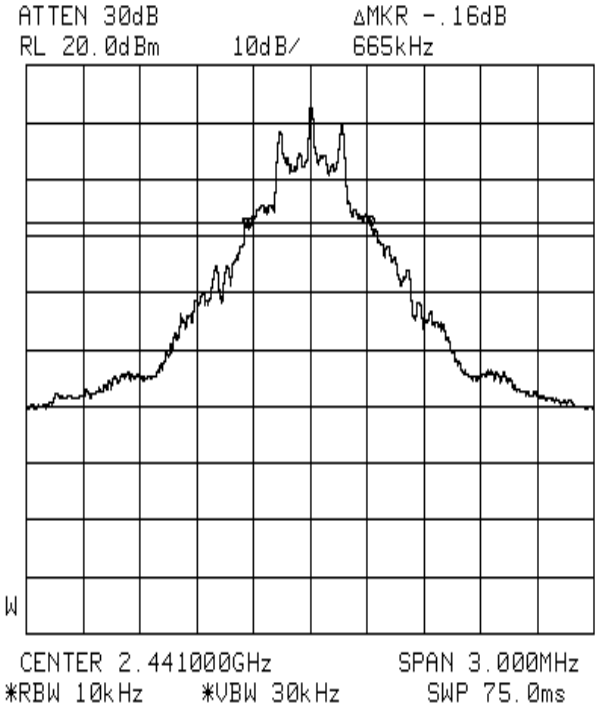
Wireless Rear Speaker

Channel	Channel Frequency (GHz)	20dB Bandwidth (MHz)
1	2.403	0.645
39	2.441	0.675
78	2.480	0.655

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots - Subwoofer

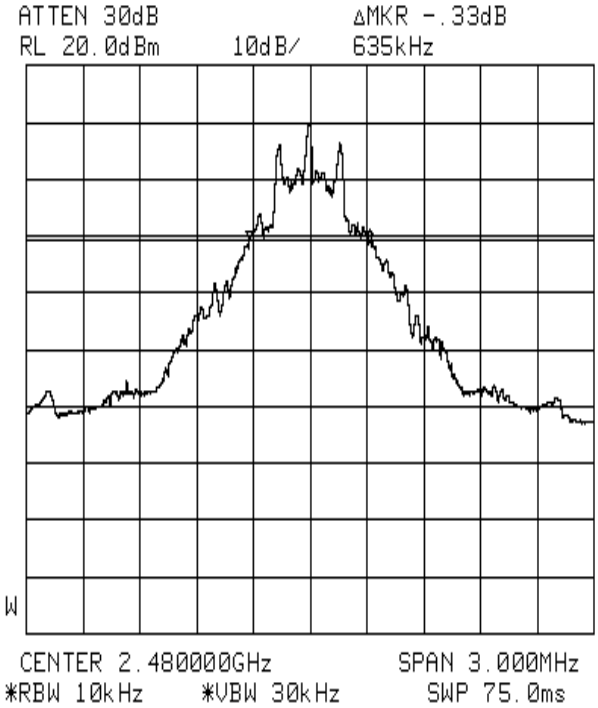


Plot 7 – Channel 1



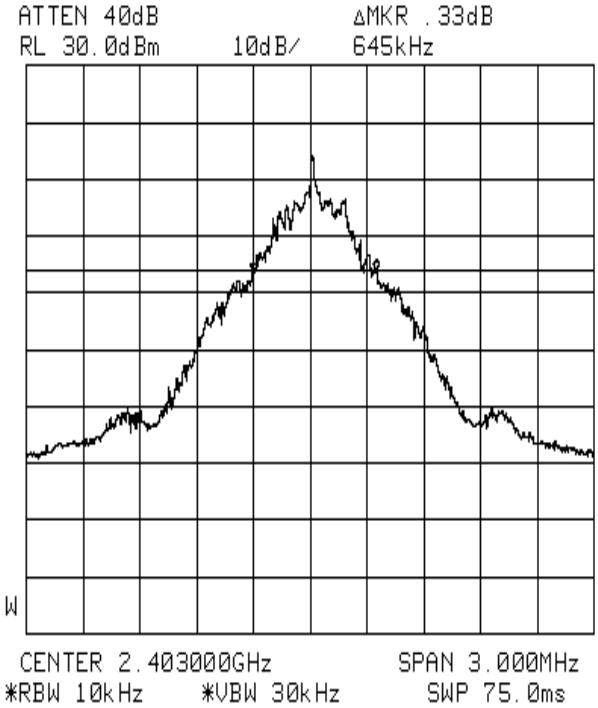
Plot 8 – Channel 39

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots - Subwoofer

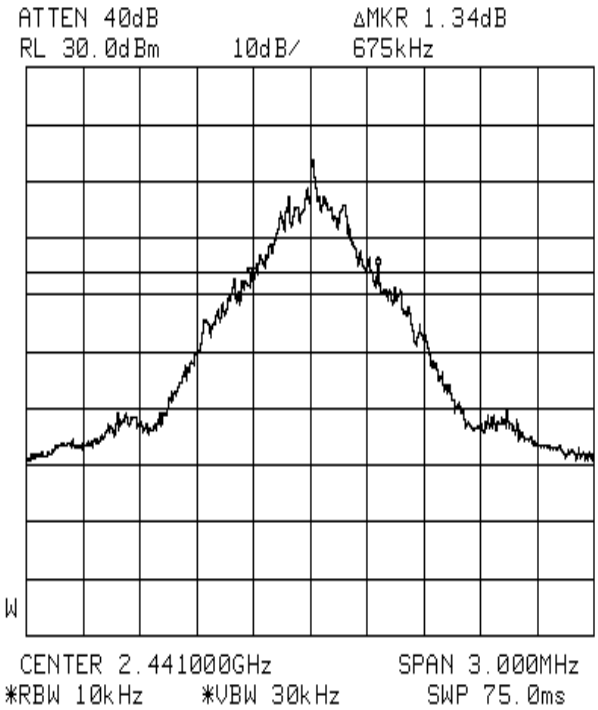


Plot 9 – Channel 78

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots - Wireless Rear Speaker

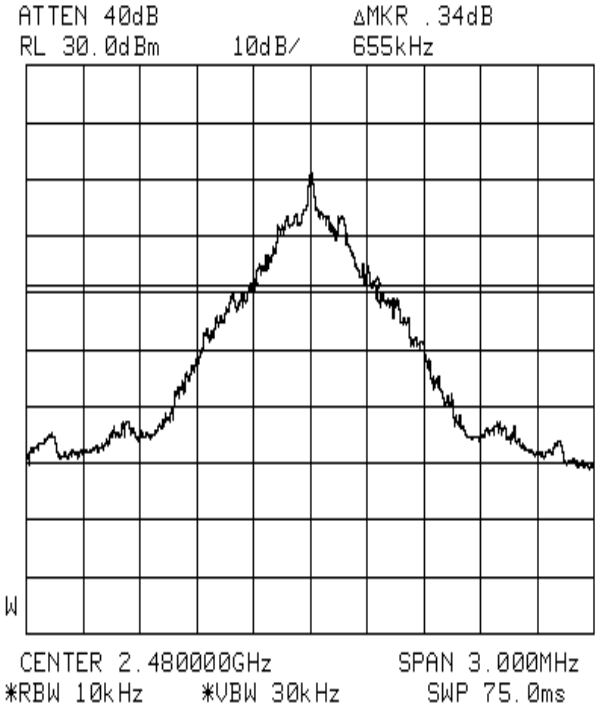


Plot 10 – Channel 1



Plot 11 – Channel 39

Spectrum Bandwidth (20dB Bandwidth Measurement) Plots - Wireless Speaker



Plot 12 – Channel 78

FCC Part 15.247(a)(1)(iii) Number of Hopping Frequencies Limits

The EUT shows compliance to the requirements of this section, which states the EUT shall use at least 15 channels.

FCC Part 15.247(a)(1)(iii) Number of Hopping Frequencies Test Instrumentation

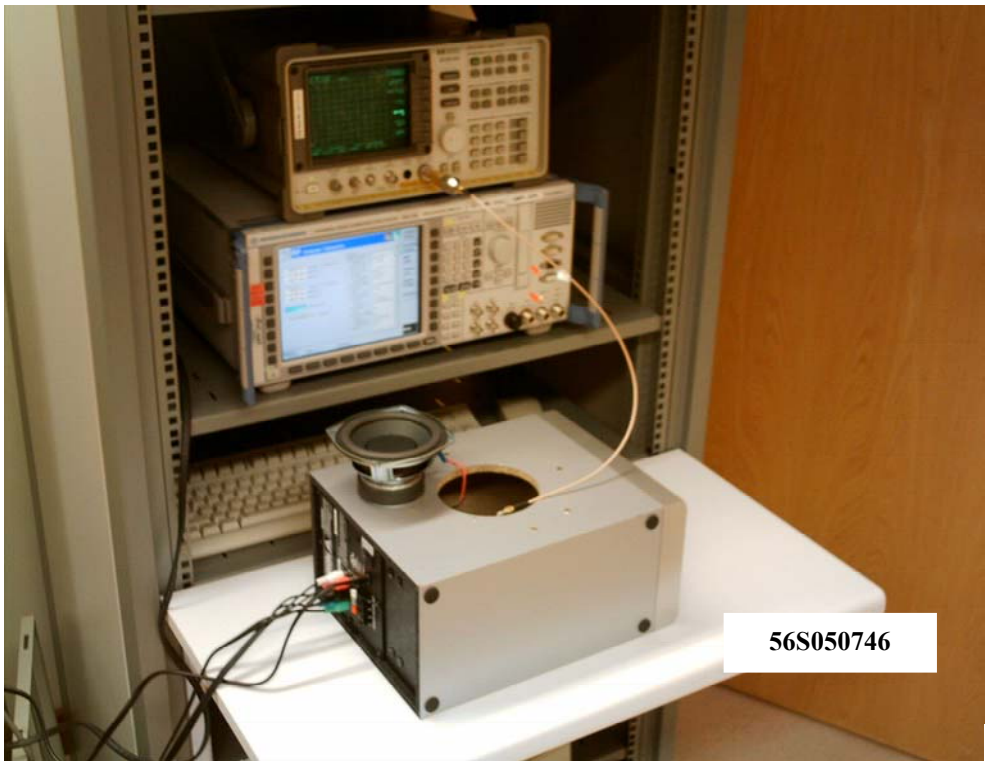
Instrument	Model	S/No	Cal Due Date
HP Spectrum Analyzer – SA10	8564E	3846A01433	27 Apr 2006

FCC Part 15.247(a)(1)(iii) Number of Hopping Frequencies Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 300kHz and 1000kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(a)(1)(iii) Number of Hopping Frequencies Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The start and stop frequencies of the spectrum analyser were set to 2.40GHz and 2.421GHz.
3. The spectrum analyser was set to max hold to capture all the transmitting frequencies within the span. The signal capturing was continuous until all the transmitting frequencies were captured and no further signals were detected.
4. The numbers of transmitting frequencies were counted and recorded.
5. The steps 2 to 4 were repeated with the following start and stop frequencies settings:
   a. 2.420GHz to 2.441GHz
   b. 2.440GHz to 2.461GHz
   c. 2.460GHz to 2.4835GHz
6. The total number of hopping frequencies is the sum of the number of the hopping frequencies found for each span.



Number of Hopping Frequencies Test Setup

FCC Part 15.247(a)(1)(iii) Number of Hopping Frequencies Results

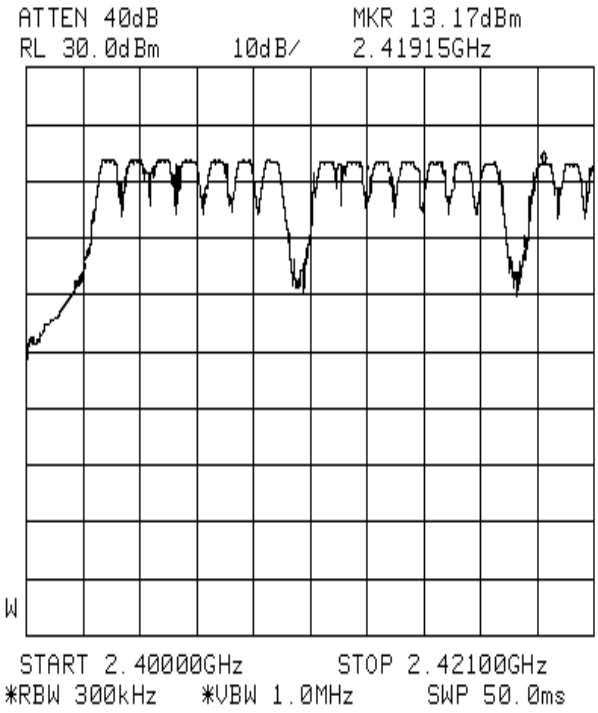
Test Input Power	110V 60Hz	Temperature	23°C
Attached Plots	13 - 16 (Subwoofer) 17 - 20 (Wireless Rear Speaker)	Relative Humidity	55%
		Atmospheric Pressure	1030mbar
		Tested By	Thor Wen Lei

The EUT was found to have 69 hopping frequencies for both subwoofer and wireless rear speaker. Please refer to the attached plots.

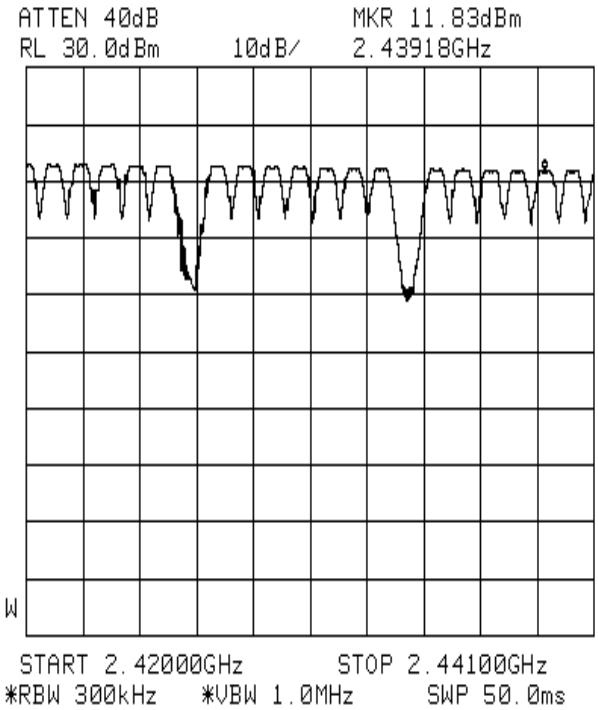
Note:

1. Channels 0, 8, 16, 24, 32, 40, 48, 56, 64, 72 are not in used.

Number Of Hopping Frequencies Plots - Subwoofer

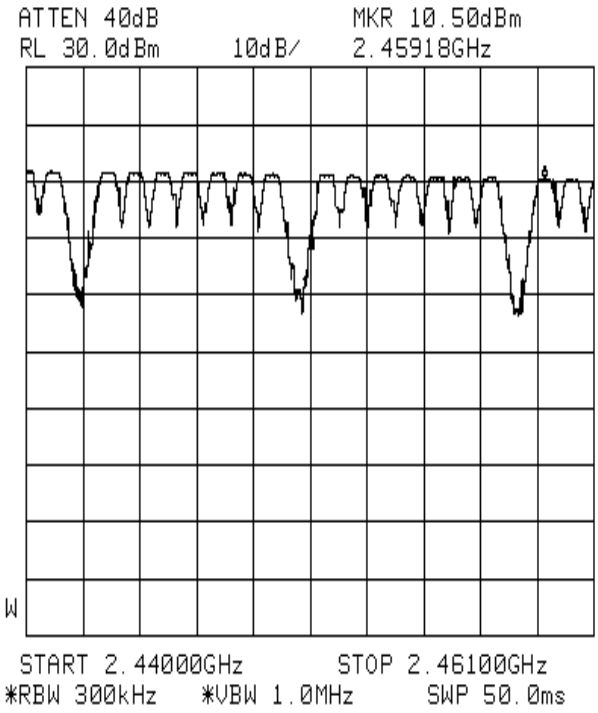


Plot 13 - Channels 1 to 18

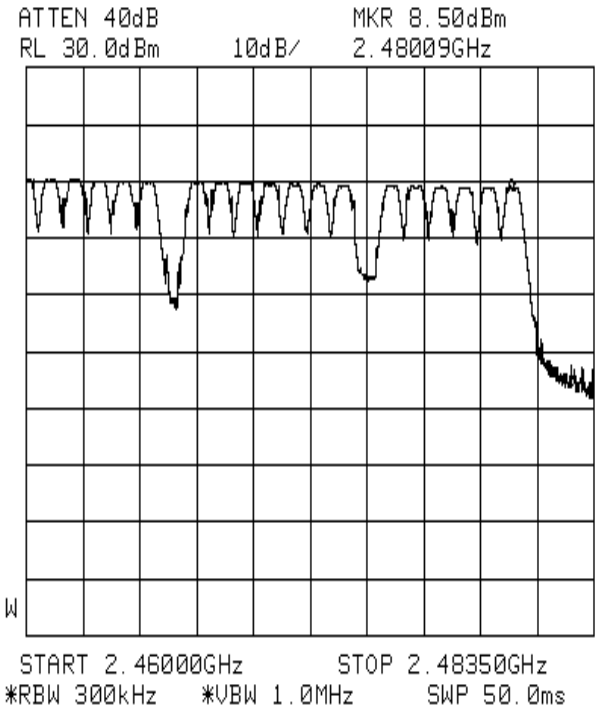


Plot 14 - Channels 19 to 38

Number Of Hopping Frequencies Plots - Subwoofer

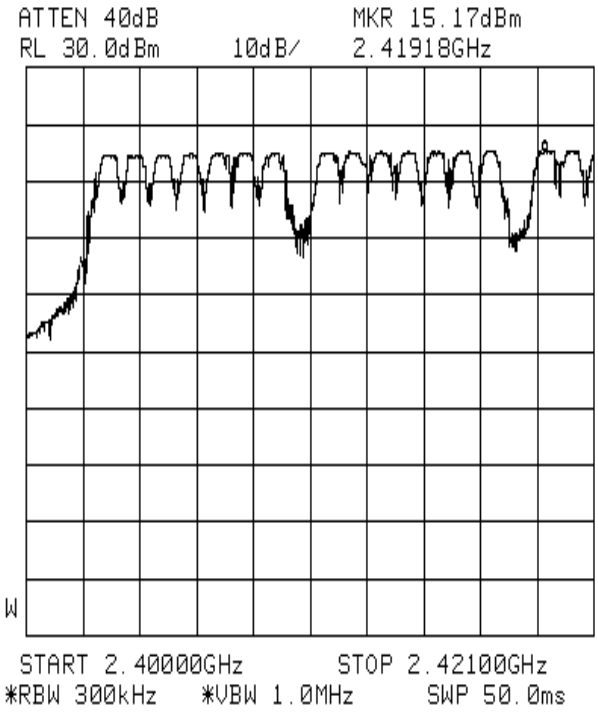


Plot 15 - Channels 39 to 58

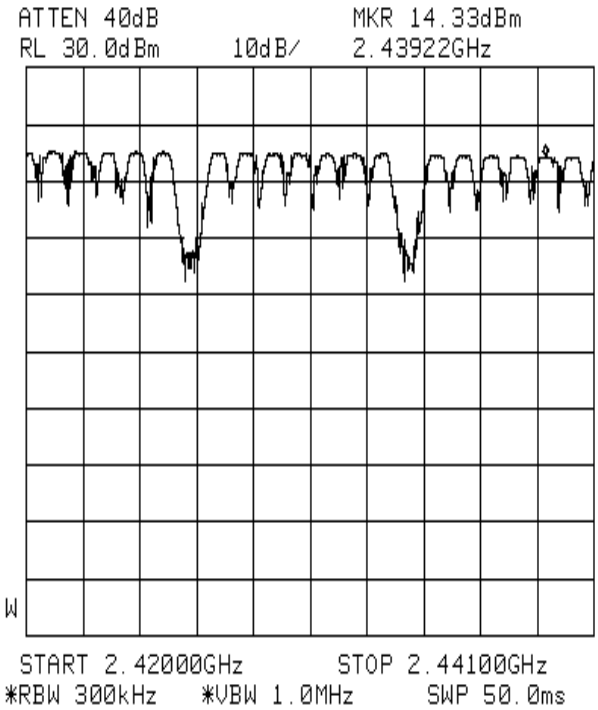


Plot 16 - Channels 59 to 78

Number Of Hopping Frequencies Plots - Wireless Rear Speaker

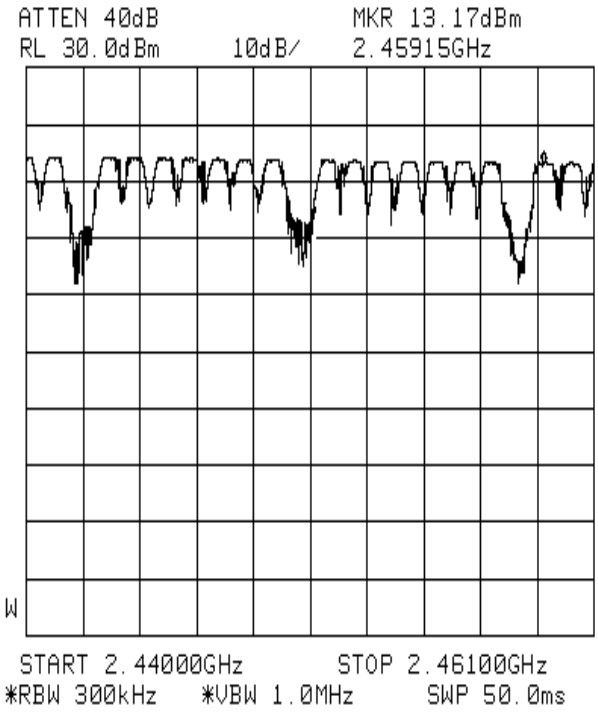


Plot 17 - Channels 1 to 18

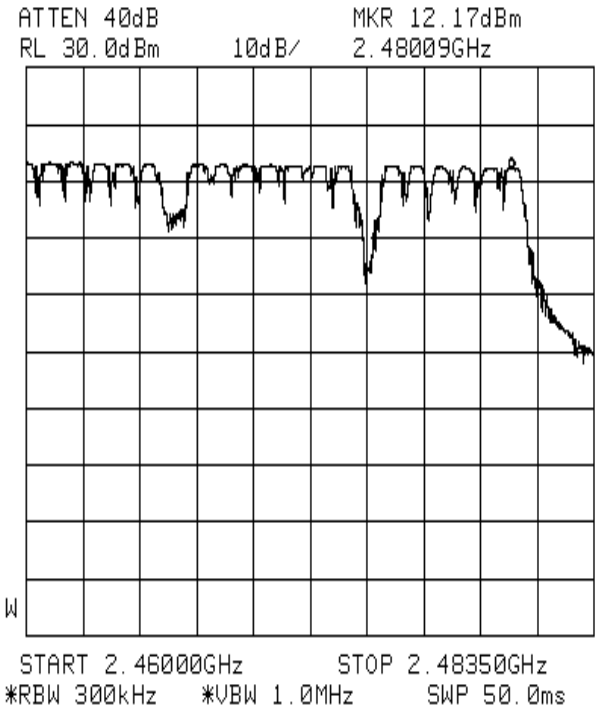


Plot 18 - Channels 19 to 38

Number Of Hopping Frequencies Plots - Wireless Rear Speaker



Plot 19 - Channels 39 to 58



Plot 20 - Channels 59 to 78

FCC Part 15.247(a)(1)(iii) Average Frequency Dwell Time Limits

The EUT shows compliance to the requirements of this section, which states the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

FCC Part 15.247(a)(1)(iii) Average Frequency Dwell Time Test Instrumentation

Instrument	Model	S/No	Cal Due Date
HP Spectrum Analyzer – SA10	8564E	3846A01433	27 Apr 2006

FCC Part 15.247(a)(1)(iii) Average Frequency Dwell Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 1MHz and 3MHz.
5. All other supporting equipment were powered separately from another filtered mains.

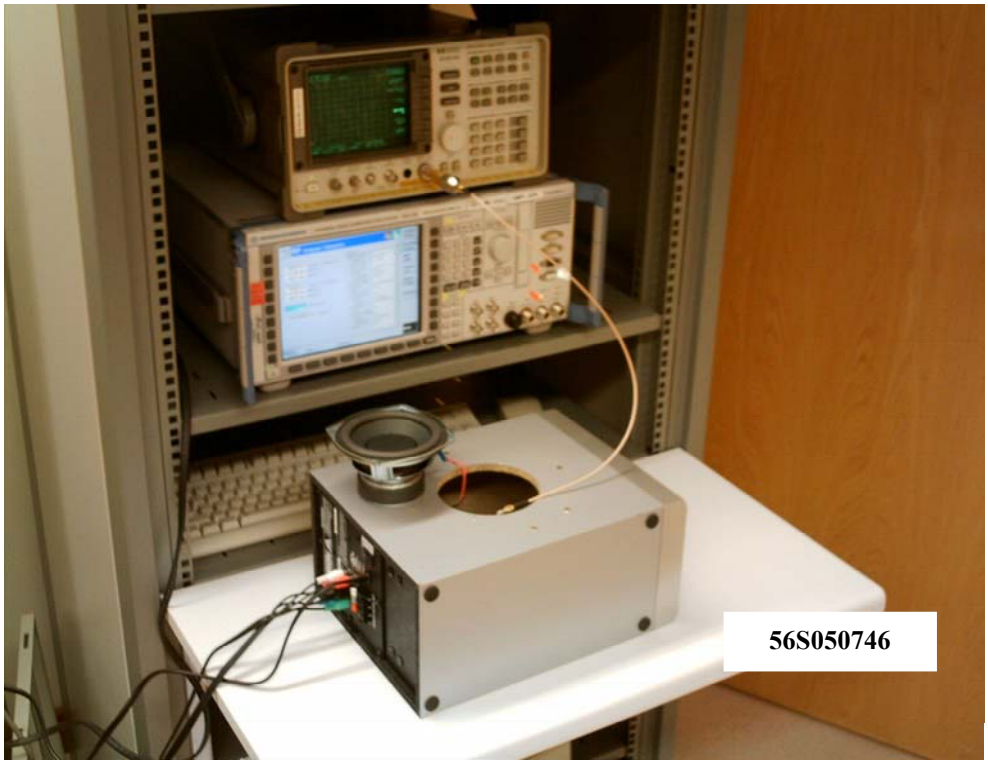
FCC Part 15.247(a)(1)(iii) Average Frequency Dwell Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The center frequency of the spectrum analyser was set to 2.403GHz with zero frequency span (spectrum analyser acts as an oscilloscope).
3. The sweep time of the spectrum analyser was adjusted until a stable signal can be seen on the spectrum analyser.
4. The duration (dwell time) of a packet was measured using the marker-delta function of the spectrum analyser. The average dwell time of the transmitting frequency was computed as below:

   Average Frequency Dwell Time = [measured time slot length x hopping rate / number of hopping channels] x [0.4 x number of hopping channels]

   where EUT hopping rate = 400 hops/s
   Number of EUT hopping channels = 78 channels

5. The steps 2 to 4 were repeated with the center frequency of the spectrum analyser were set to 2.441GHz and 2.480GHz respectively.



Average Frequency Dwell Time Test Setup

FCC Part 15.247(a)(1)(iii) Average Frequency Dwell Time Results

Test Input Power	110V 60Hz	Temperature	23°C
Attached Plots	21 - 23 (Subwoofer) 24 - 26 (Wireless Rear Speaker)	Relative Humidity	55%
Hopping Rate	400 hops / s	Atmospheric Pressure	1030mbar
Number of Hopping Channels	69 channels	Tested By	Thor Wen Lei

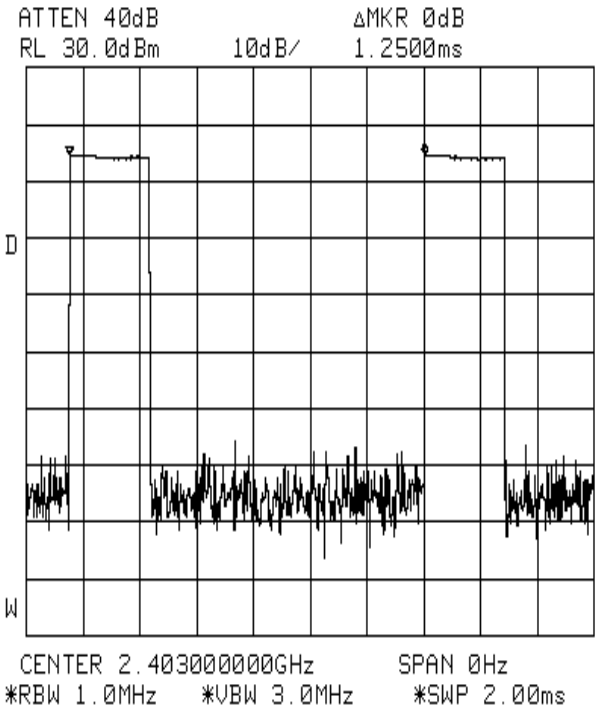
Subwoofer

Channel	Channel Frequency (GHz)	Measured Time Slot Length (ms)	Average Frequency Dwell Time (s)	Average Occupancy Limit (s)
1	2.403	1.25	0.2	0.4
39	2.441	1.25	0.2	0.4
78	2.480	1.25	0.2	0.4

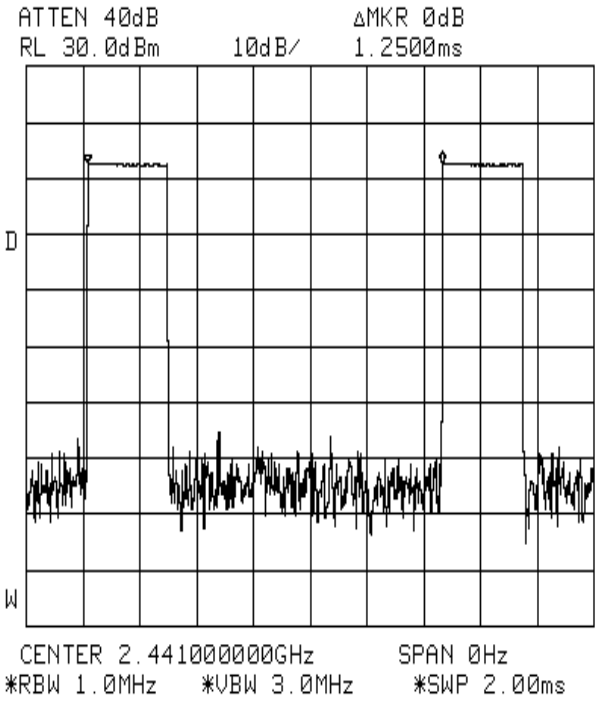
Wireless Rear Speaker

Channel	Channel Frequency (GHz)	Measured Time Slot Length (ms)	Average Frequency Dwell Time (s)	Average Occupancy Limit (s)
1	2.403	2.50	0.4	0.4
39	2.441	2.50	0.4	0.4
78	2.480	2.50	0.4	0.4

Average Frequency Dwell Time Plots - Subwoofer

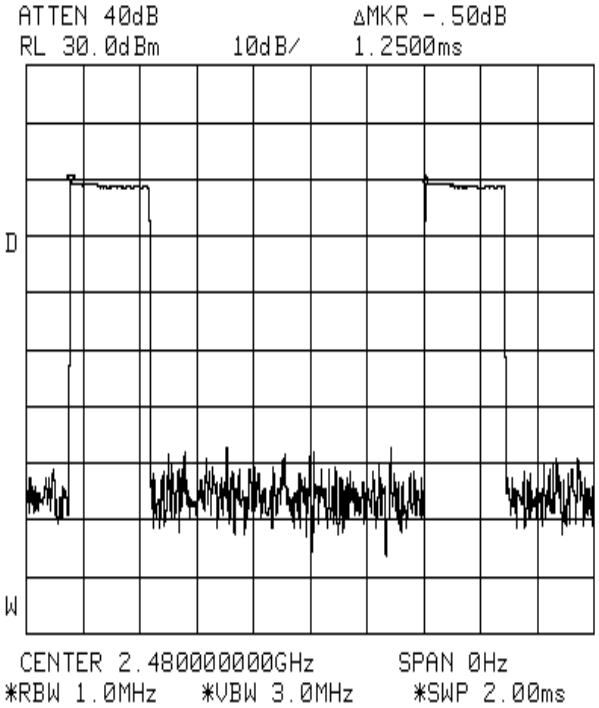


Plot 21 – Channel 1



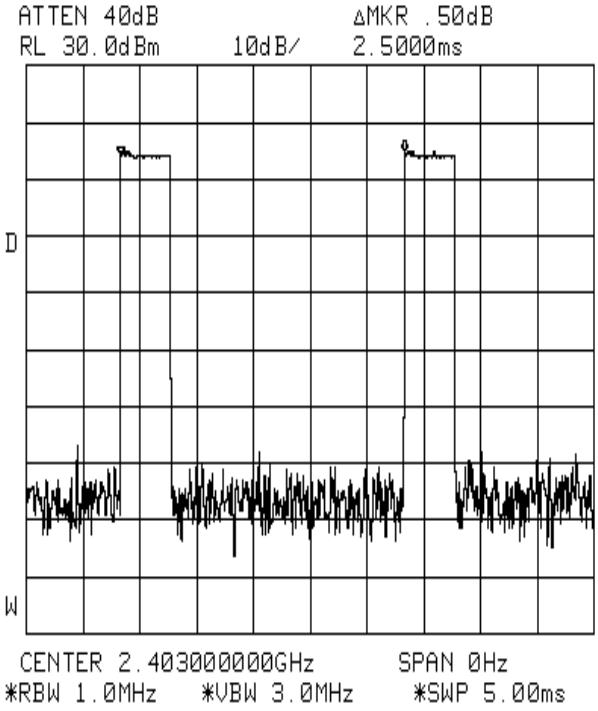
Plot 22 – Channel 39

Average Frequency Dwell Time Plots - Subwoofer

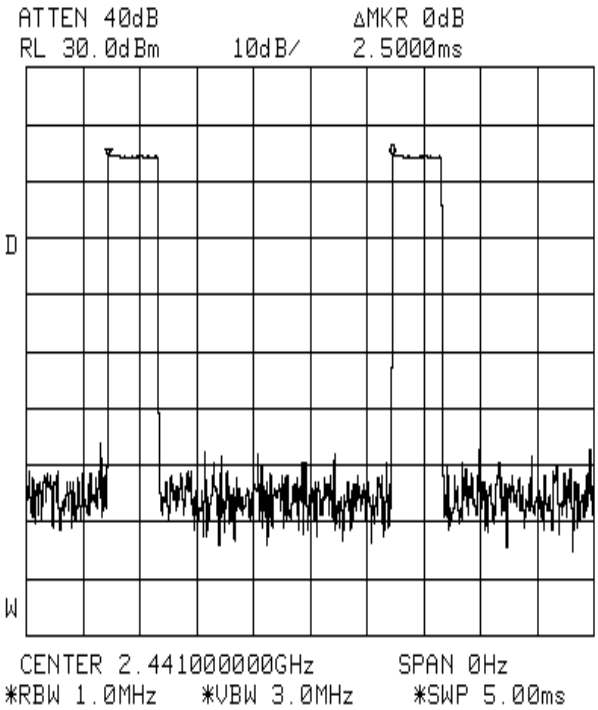


Plot 23 – Channel 78

Average Frequency Dwell Time Plots - Wireless Rear Speaker

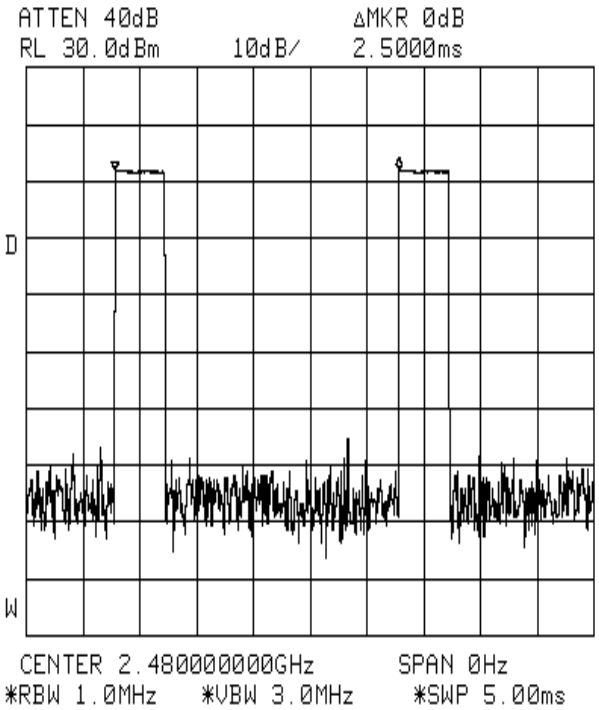


Plot 24 – Channel 1



Plot 25 – Channel 39

Average Frequency Dwell Time Plots - Wireless Rear Speaker



Plot 26 – Channel 78

FCC Part 15.247(b)(1) Maximum Peak Power Limits

The EUT shows compliance to the requirements of this section, which states the EUT employing at least 75 non-overlapping hopping channels shall not exceed 1W (30dBm). For the EUT employs other frequency hopping systems, the peak power shall not greater than 0.125W (21dBm).

FCC Part 15.247(b)(1) Maximum Peak Power Test Instrumentation

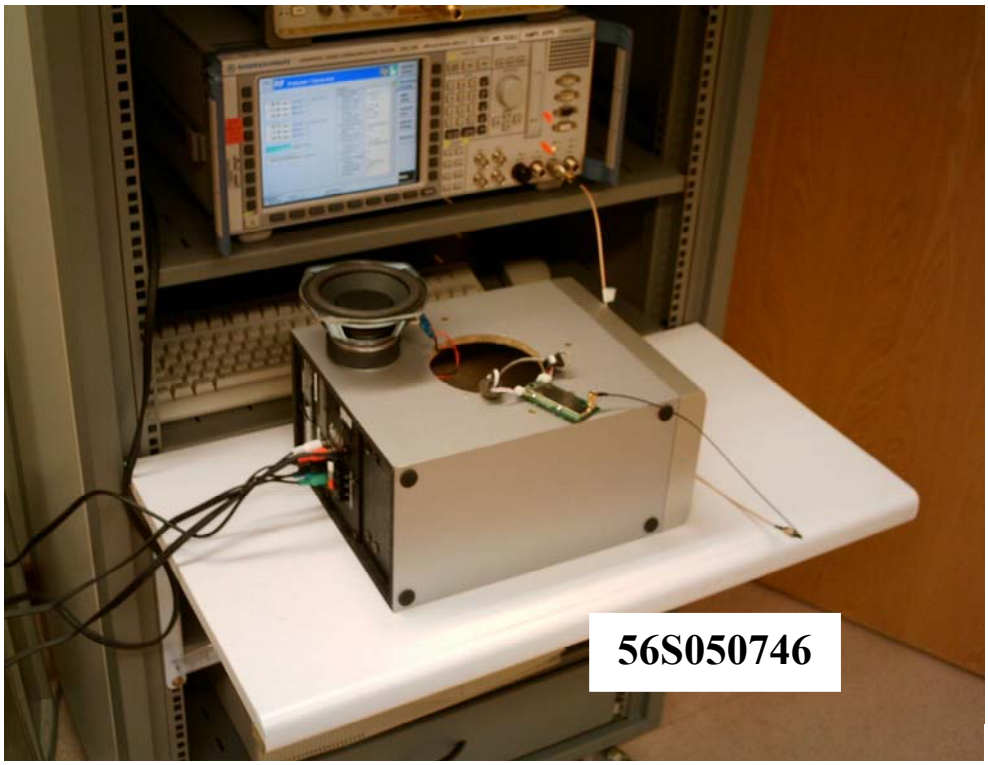
Instrument	Model	S/No	Cal Due Date
R&S Universal Radio Communication Tester	CMU 200	837587/068	23 Mar 2006

FCC Part 15.247(b)(1) Maximum Peak Power Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the Universal Radio Communication Tester, which set into power analyser mode via a low-loss coaxial cable.
4. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(b)(1) Maximum Peak Power Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 1 (2.403GHz).
2. The maximum peak power of the transmitting frequency was detected and recorded.
3. The step 2 was repeated with the transmitting frequency was set to Channel 39 (2.441GHz) and Channel 78 (2.480GHz) respectively.



Maximum Peak Power Test Setup

FCC Part 15.247(b)(1) Maximum Peak Power Results

Test Input Power	110V 60Hz	Temperature	23°C
		Relative Humidity	55%
		Atmospheric Pressure	1030mbar
		Tested By	Anthony Toh

Subwoofer

Channel	Channel Frequency (GHz)	Maximum Peak Power (W)	Limit (W)
1	2.403	0.0288	0.125
39	2.441	0.0239	0.125
78	2.480	0.0158	0.125

Wireless Rear Speaker

Channel	Channel Frequency (GHz)	Maximum Peak Power (W)	Limit (W)
1	2.403	0.0263	0.125
39	2.441	0.0229	0.125
78	2.480	0.0165	0.125

Notes:

1. Power analyser of Universal Radio Communication Tester was used for power measurement with peak detection as mode of measurement. The power analyser mode supports a wideband power measurement ranging from 100kHz to 2700MHz.

FCC Part 15.247(d) RF Conducted Spurious Emissions Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

FCC Part 15.247(d) RF Conducted Spurious Test Instrumentation

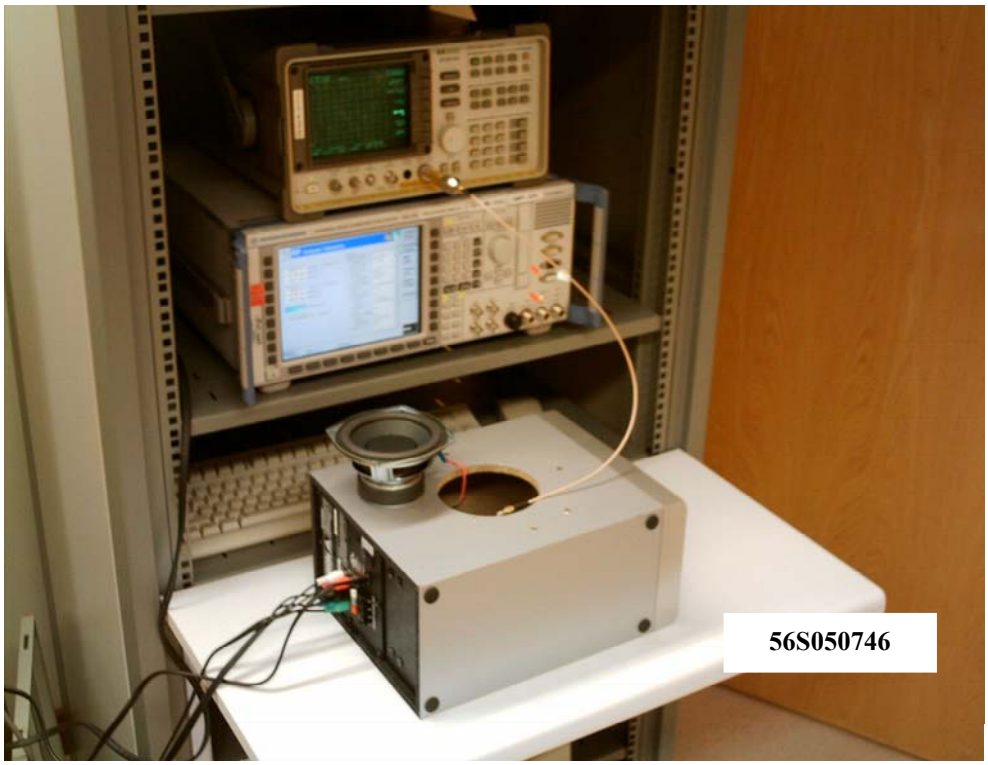
Instrument	Model	S/No	Cal Due Date
HP Spectrum Analyzer – SA10	8564E	3846A01433	27 Apr 2006

FCC Part 15.247(d) RF Conducted Spurious Emissions Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(d) RF Conducted Spurious Emissions Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 1 (2.403GHz).
2. The start and stop frequencies of the spectrum analyser were set to 30MHz and 10GHz.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. The steps 2 to 3 were repeated with frequency span was set from 10GHz to 25GHz.
5. The steps 2 to 4 were repeated with the transmitting frequency was set to Channel 39 (2.441GHz) and Channel 78 (2.480GHz) respectively.



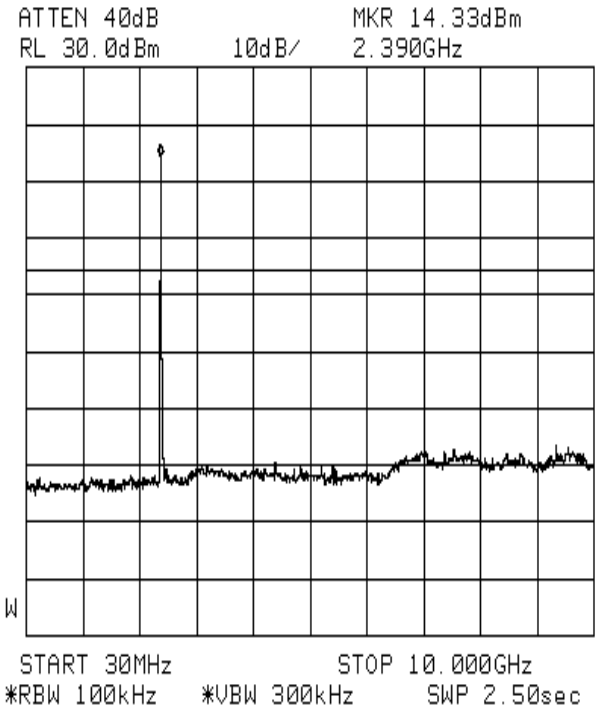
RF Conducted Spurious Emissions Test Setup

FCC Part 15.247(d) RF Conducted Spurious Emissions Results

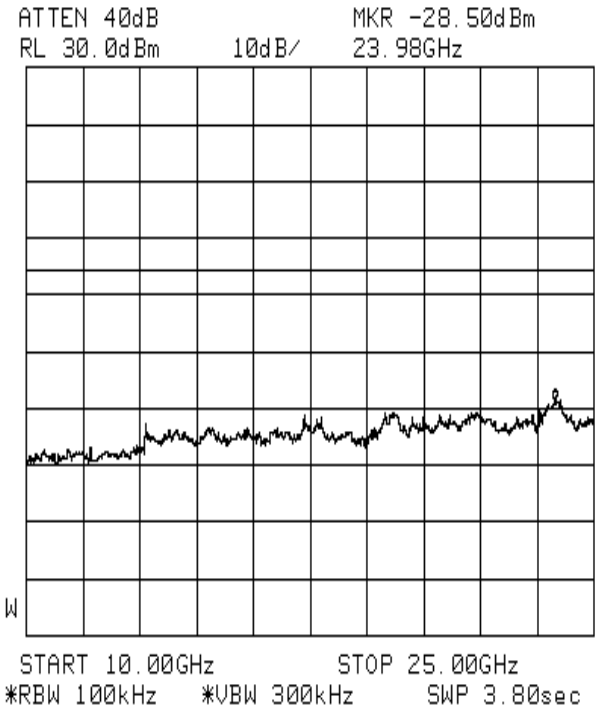
Test Input Power	110V 60Hz	Temperature	23°C
Attached Plots	27 - 32 (Subwoofer) 33 - 38 (Wireless Rear Speaker)	Relative Humidity	55%
		Atmospheric Pressure	1030mbar
		Tested By	Thor Wen Lei

All spurious signals found were below the specified limit. Please refer to the attached plots.

RF Conducted Spurious Emissions Plots - Subwoofer

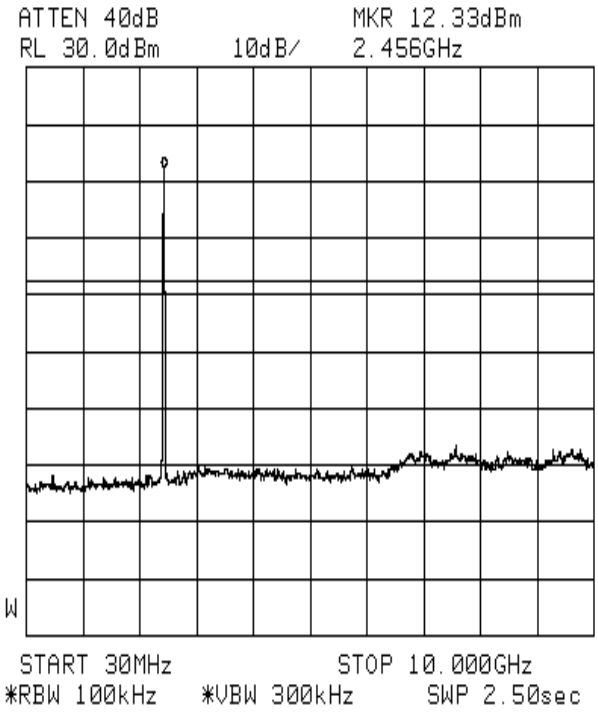


Plot 27 – Channel 1

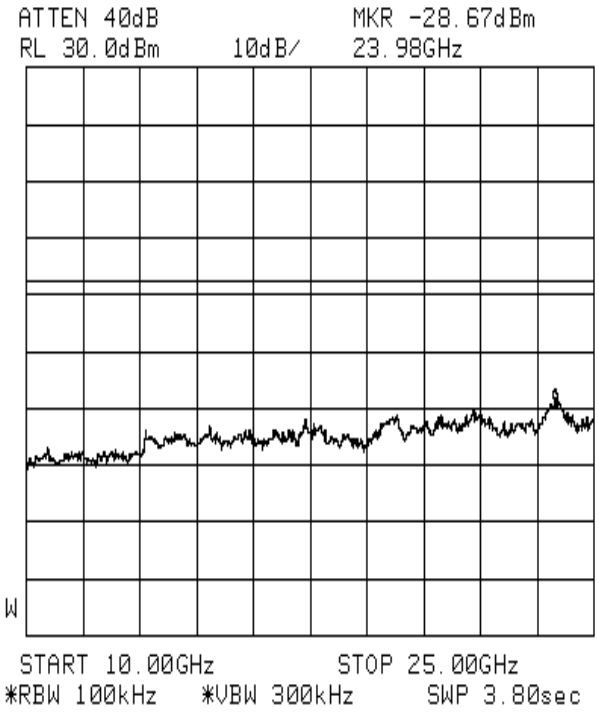


Plot 28 – Channel 1

RF Conducted Spurious Emissions Plots - Subwoofer

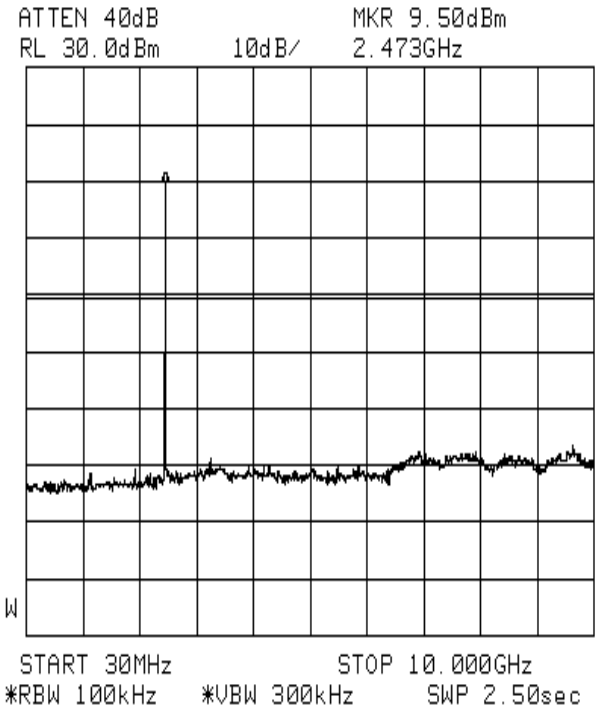


Plot 29 – Channel 39

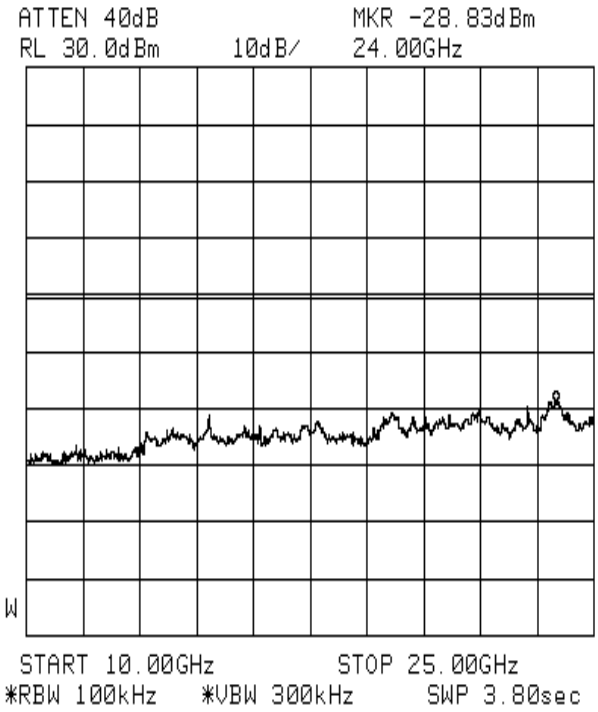


Plot 30 – Channel 39

RF Conducted Spurious Emissions Plots - Subwoofer

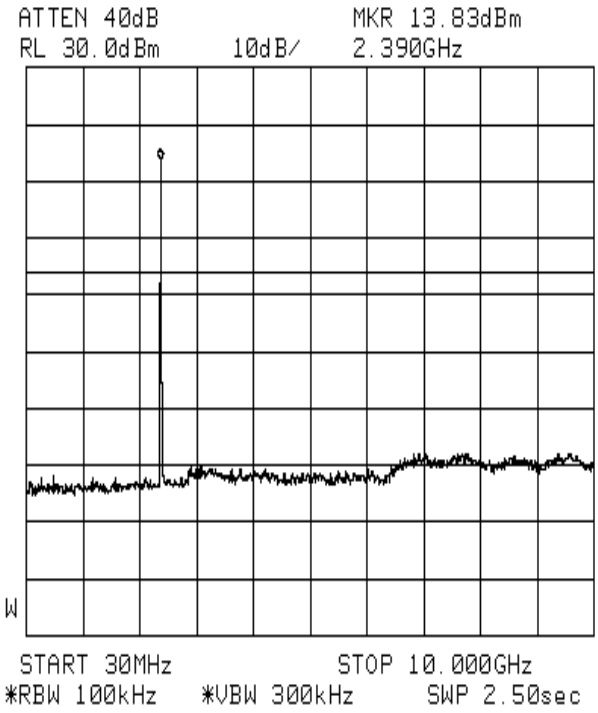


Plot 31 – Channel 78

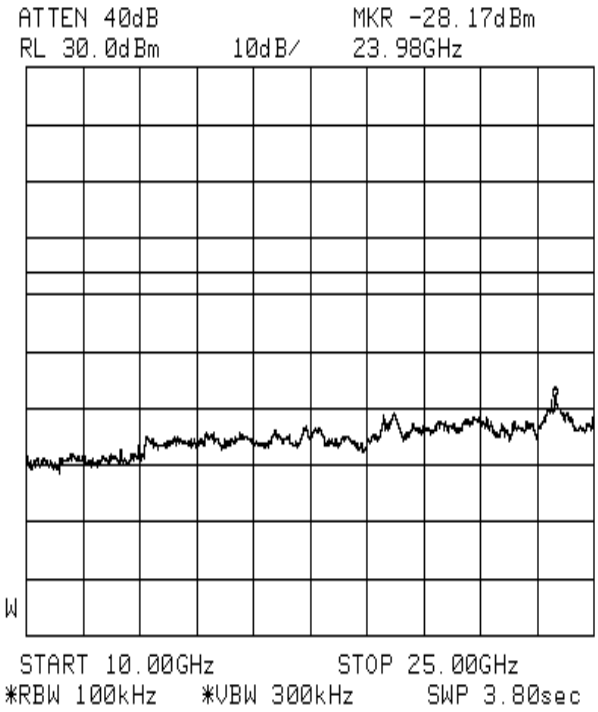


Plot 32 – Channel 78

RF Conducted Spurious Emissions Plots - Wireless Rear Speaker

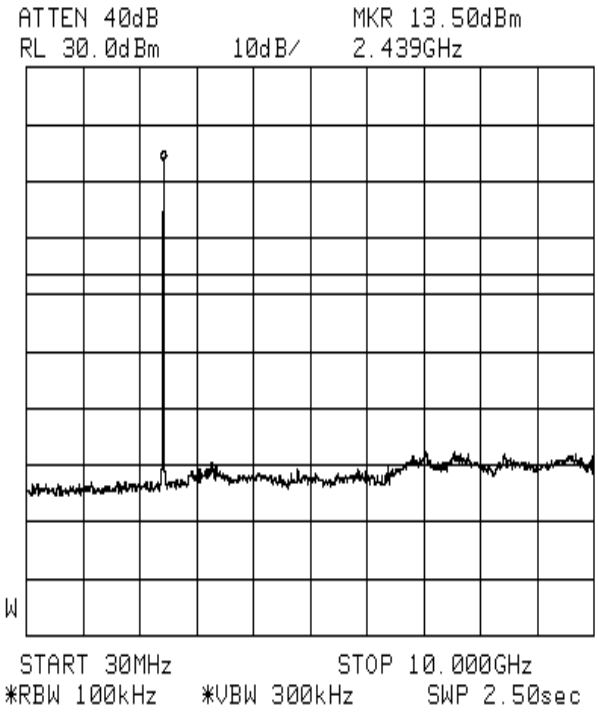


Plot 33 – Channel 1

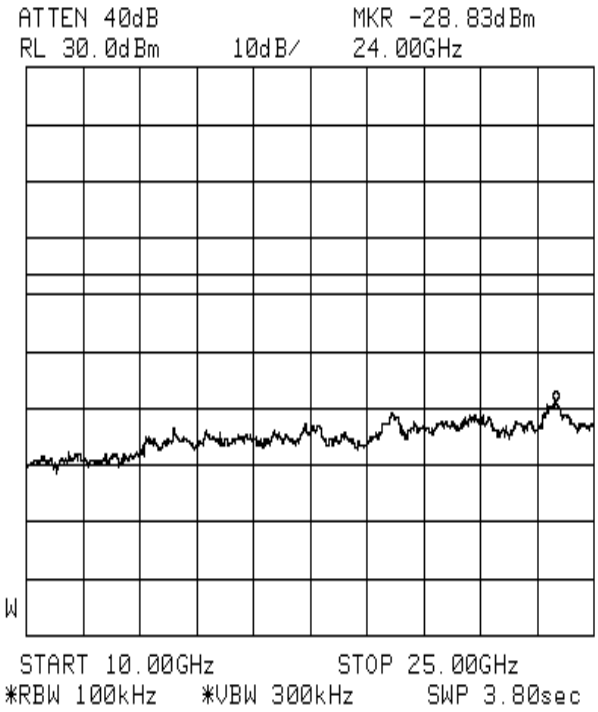


Plot 34 – Channel 1

RF Conducted Spurious Emissions Plots - Wireless Rear Speaker

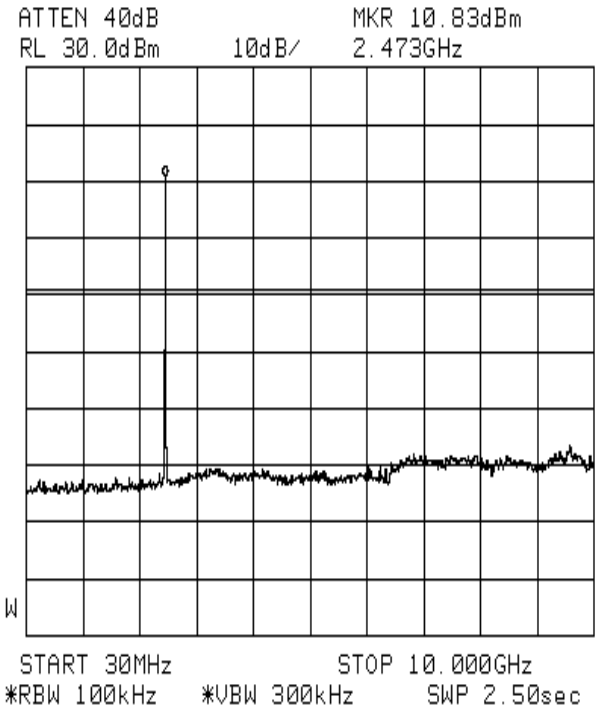


Plot 35 – Channel 39

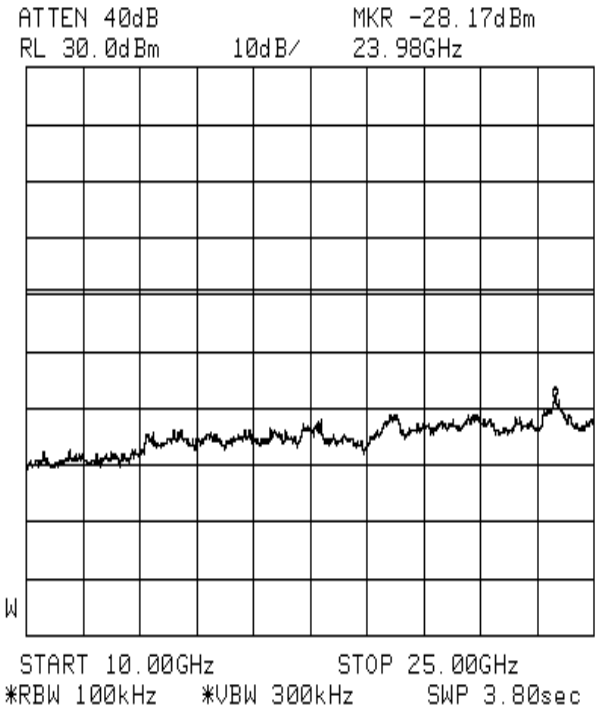


Plot 36 – Channel 39

RF Conducted Spurious Emissions Plots - Wireless Rear Speaker



Plot 37 – Channel 78



Plot 38 – Channel 78

FCC Part 15.247(d) Band Edge Compliance Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of desired power.

FCC Part 15.247(d) Band Edge Compliance Test Instrumentation

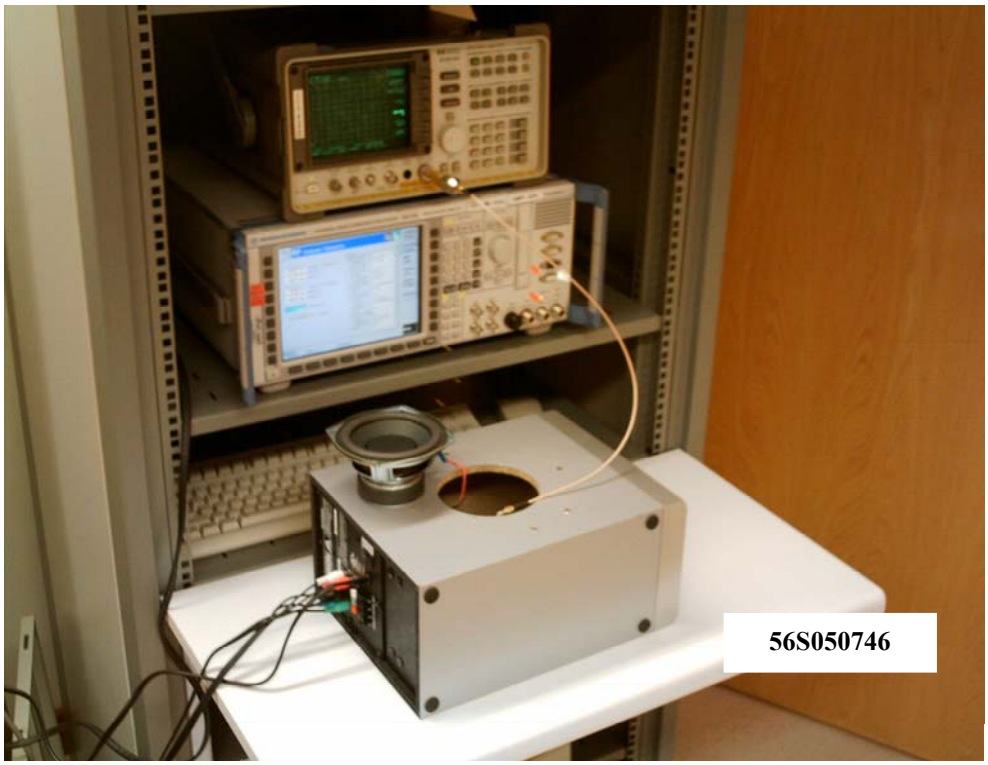
Instrument	Model	S/No	Cal Due Date
HP Spectrum Analyzer – SA10	8564E	3846A01433	27 Apr 2006

FCC Part 15.247(d) Band Edge Compliance Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum analyser via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(d) Band Edge Compliance Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode with frequency hopping sequence on.
2. The frequency span of the spectrum analyser was set to wide enough to capture the lower band edge of the transmission band, 2.400GHz and any spurious emissions at the band edge.
3. The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.
4. The steps 2 to 3 were repeated with the frequency span of the spectrum analyser was set to wide enough to capture the upper band edge frequency of the transmission band, 2.4835GHz and the any spurious emissions at the band-edge.



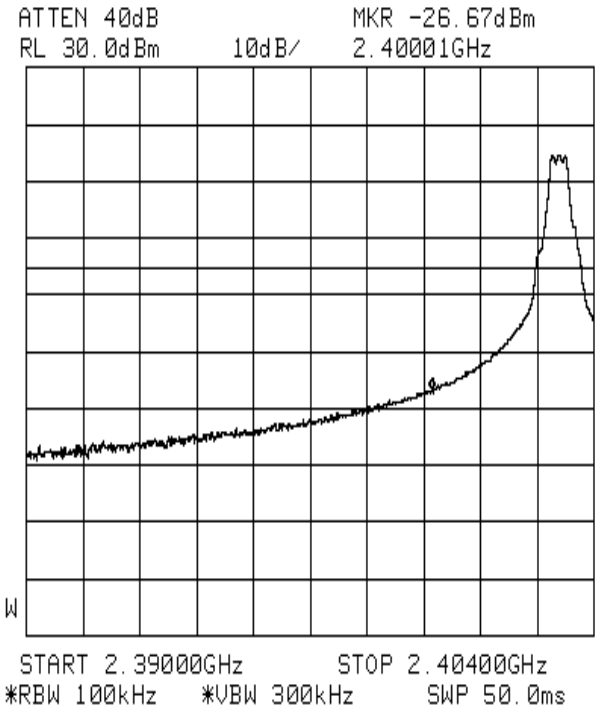
Band Edge Compliance Test Setup

FCC Part 15.247(d) Band Edge Compliance Results

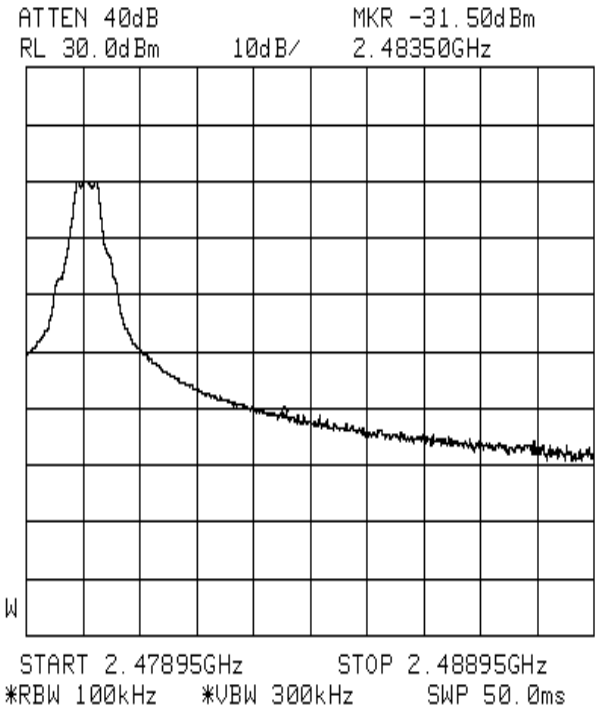
Test Input Power	110V 60Hz	Temperature	23°C
Attached Plots	39 - 40 (Subwoofer) 41 - 42 (Wireless Rear Speaker)	Relative Humidity	55%
		Atmospheric Pressure	1030mbar
		Tested By	Thor wen Lei

No significant signal was found and they were below the specified limit.

Band Edge Compliance Plots - Subwoofer

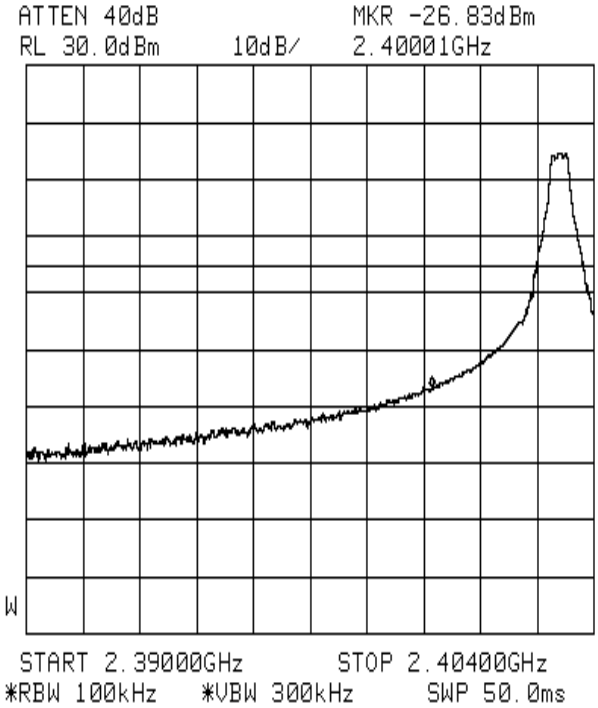


Plot 39 – Lower Band Edge at 2.4000GHz

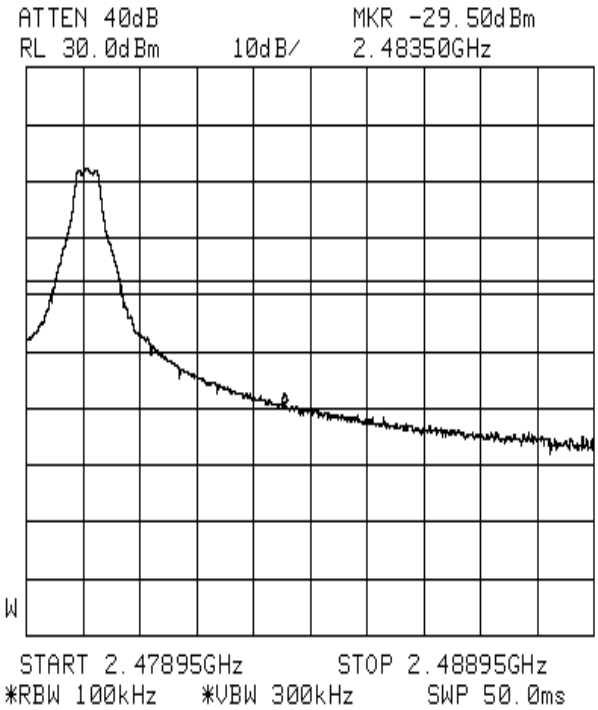


Plot 40 – Upper Band Edge at 2.4835GHz

Band Edge Compliance Plots - Wireless Rear Speaker



Plot 41 – Lower Band Edge at 2.4000GHz



Plot 42 – Upper Band Edge at 2.4835GHz

FCC Part 15.247(e) Peak Power Spectral Density Limits

The EUT shows compliance to the requirements of this section, which states the peak power spectral density conducted from the intentional radiator (EUT) to the antenna shall not be greater than 8dBm (6.3mW) in any 3kHz band during any time interval of continuous transmission.

FCC Part 15.247(e) Peak Power Spectral Density Test Instrumentation

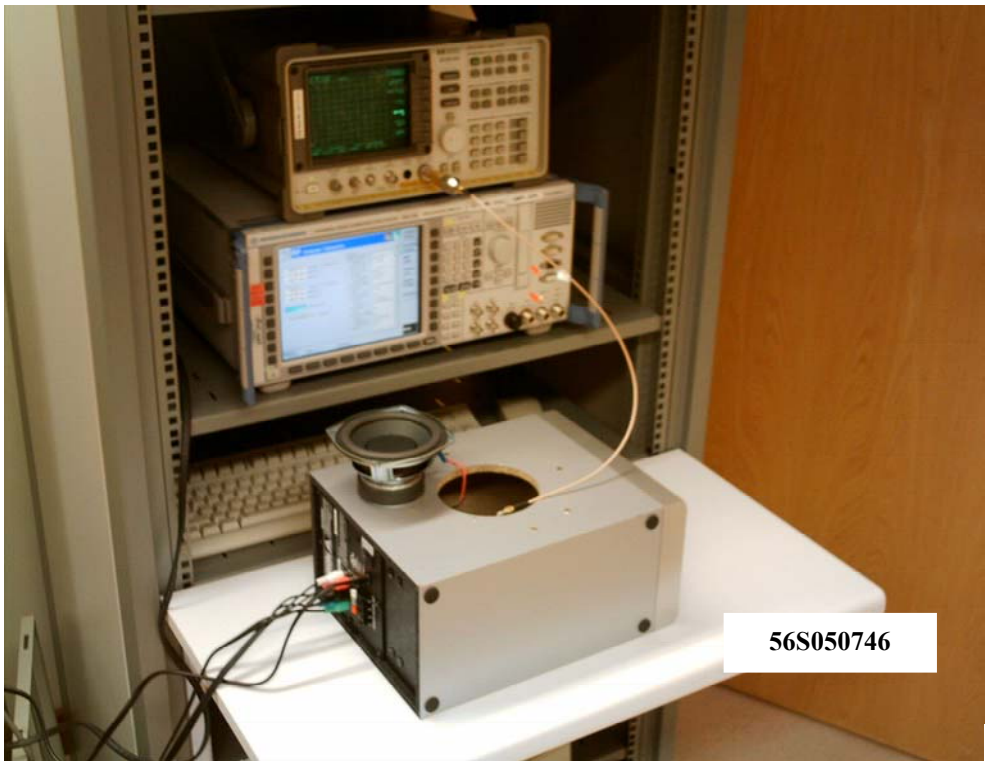
Instrument	Model	S/No	Cal Due Date
HP Spectrum Analyzer – SA10	8564E	3846A01433	27 Apr 2006

FCC Part 15.247(e) Peak Power Spectral Density Test Setup

1. The EUT and supporting equipment were set up as shown in the setup photo.
2. The power supply for the EUT was connected to a filtered mains.
3. The RF antenna connector was connected to the spectrum via a low-loss coaxial cable.
4. The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 3kHz and 10kHz.
5. All other supporting equipment were powered separately from another filtered mains.

FCC Part 15.247(e) Peak Power Spectral Density Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode, non-hopping with transmitting frequency at Channel 1 (2.403GHz).
2. The sweep time of the spectrum analyser was set to the value of the ratio of the frequency span divided by the RBW.
3. The peak power density of the transmitting frequency was detected and recorded.
4. The step 3 was repeated with the transmitting frequency was set to Channel 39 (2.411GHz) and Channel 78 (2.480GHz) respectively.



Peak Power Spectral Density Test Setup

FCC Part 15.247(e) Peak Power Spectral Density Results

Test Input Power	110V 60Hz	Temperature	23°C
Attached Plots	43 - 45 (Subwoofer) 46 - 48 (Wireless Rear Speaker)	Relative Humidity	55%
		Atmospheric Pressure	1030mbar
		Tested By	Anthony Toh

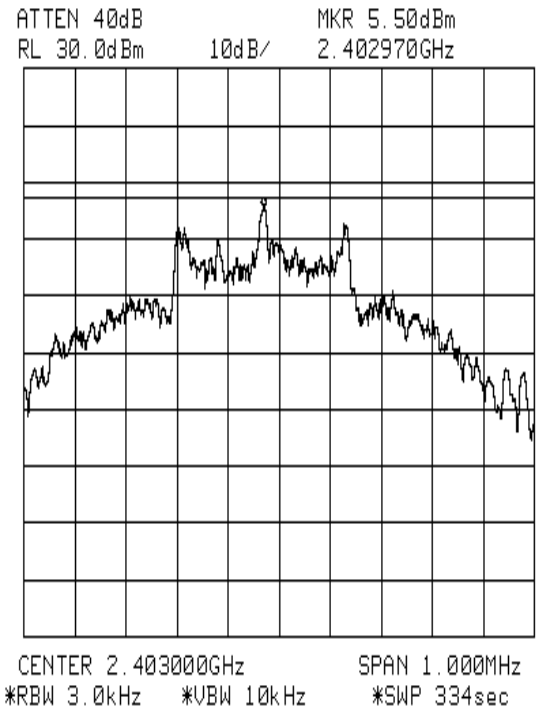
Subwoofer

Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)
1	2.403	3.5481	6.3
39	2.441	3.0408	6.3
78	2.480	1.9186	6.3

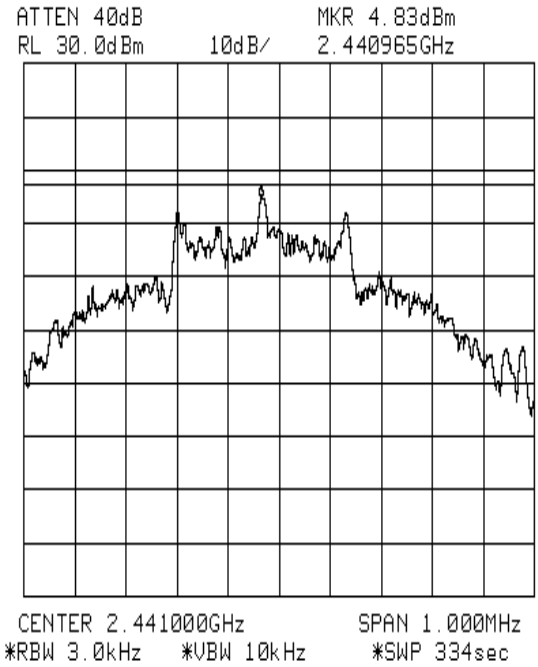
Wireless Rear Speaker

Channel	Channel Frequency (GHz)	Peak Power Spectral Density (mW)	Limit (mW)
1	2.403	4.1399	6.3
39	2.441	3.9810	6.3
78	2.480	2.0749	6.3

Peak Power Spectral Density Plots - Subwoofer

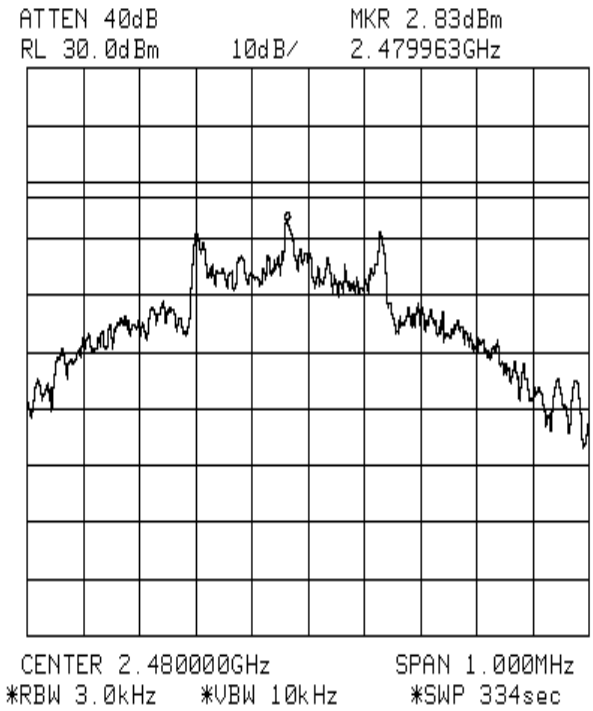


Plot 43 – Channel 1



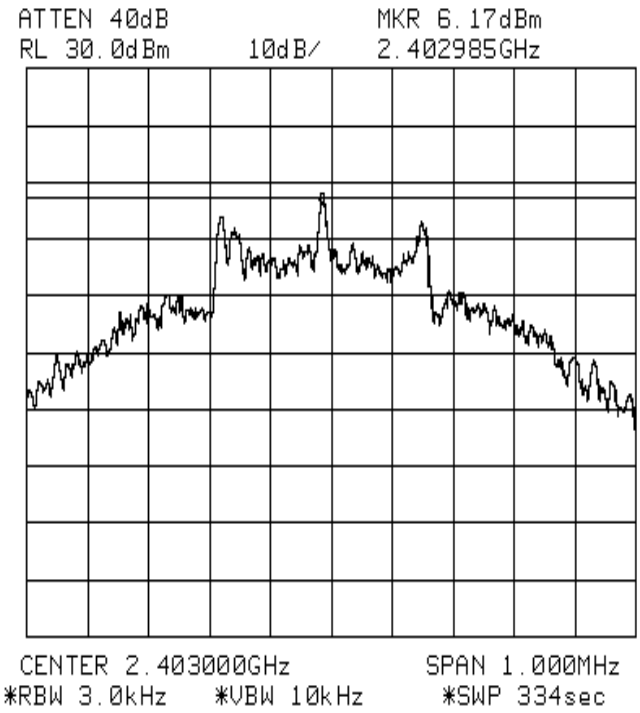
Plot 44 – Channel 39

Peak Power Spectral Density Plots - Subwoofer

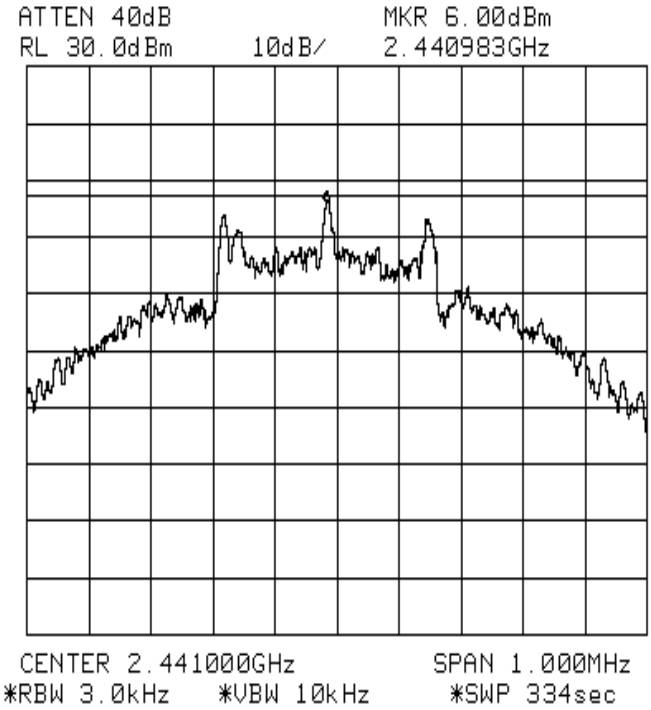


Plot 45 – Channel 78

Peak Power Spectral Density Plots - Wireless Rear Speaker

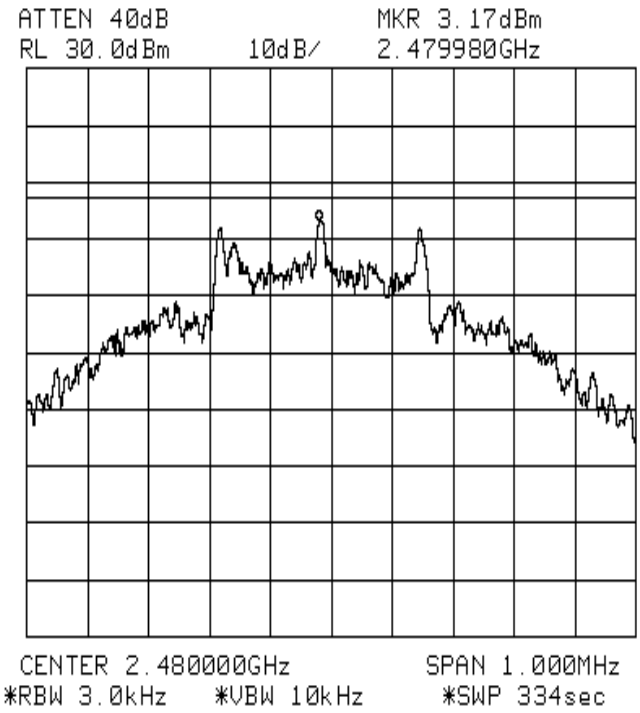


Plot 46 – Channel 1



Plot 47 – Channel 39

Peak Power Spectral Density Plots - Wireless Rear Speaker



Plot 48 – Channel 78

FCC Part 1.1310 Maximum Permissible Exposure (MPE) Limits

The EUT shows compliance to the requirements of this section, which states the MPE limits for general population / uncontrolled exposure are as shown below:

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (min)
0.3 - 1.34	614	1.63	100 Note 2	30
1.34 - 30	824 / f	2.19 / f	$180 / f^2$ Note 2	30
30 - 300	27.5	0.073	0.2	30
300 - 1500	-	-	f / 1500	30
1500 - 100000	-	-	1.0	30
Notes				
1. f = frequency in MHz				
2. Plane wave equivalent power density				

FCC Part 1.1310 Maximum Permissible Exposure (MPE) Test Instrumentation

Instrument	Model	S/No	Cal Due Date
PMM 8053 Portable Field Meter	8053	0220J10308	03 Feb 2006
PMM Electric and Magnetic Field Analyzer	EP-330	1010J10302	03 Feb 2006

FCC Part 1.1310 Maximum Permissible Exposure (MPE) Test Setup

1. The EUT and supporting equipment were set up as shown on the setup photo.
2. The relevant field probe was positioned at least 20cm away from the EUT and supporting equipment boundary.

FCC Part 1.1310 Maximum Permissible Exposure (MPE) Test Method

1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was first carried out at one of the positions / sides of the EUT.
3. Power density measurement (mW/cm^2) was made using the field meter set to the required averaging time.
4. Steps 2 and 3 were repeated for the next position and its associate EUT operating mode, until all possible positions and modes were measured.

Sample Calculation Example

At 2400 MHz, limit = 1.0 mW/cm^2

Power density reading obtained directly from field meter = 0.3 mW/cm^2 averaged over the required 30 minutes.

Therefore, margin = 0.3 – 1.0 = -0.7 mW/cm^2 i.e. **0.7 mW/cm^2 below limit**

Maximum Permissible Exposure (MPE) Test Setup

FCC Part 1.1310 Maximum Permissible Exposure (MPE) Results

Test Input Power	110V 50Hz	Temperature	23°C
Test Distance	20cm	Relative Humidity	55%
		Atmospheric Pressure	1030mbar
		Tested By	Thor Wen Lei

Subwoofer

Channel	Channel Frequency (GHz)	Power Density Value (mW/cm^2)	Margin (mW/cm^2)	Averaging Time (min)	Limit (mW/cm^2)
1	2.403	0.0008	-0.9992	30	1.0
39	2.441	0.0009	-0.9991	30	1.0
78	2.480	0.0002	-0.9998	30	1.0

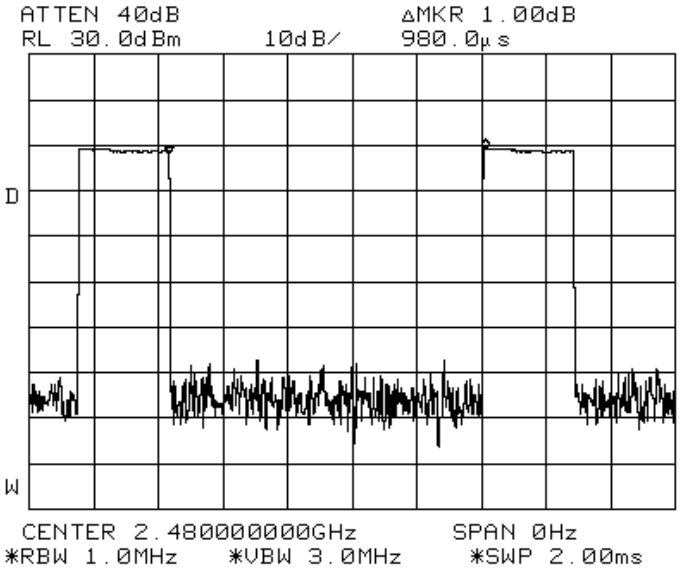
Wireless Rear Speaker

Channel	Channel Frequency (GHz)	Power Density Value (mW/cm^2)	Margin (mW/cm^2)	Averaging Time (min)	Limit (mW/cm^2)
1	2.403	0.0031	-0.9969	30	1.0
39	2.441	0.0047	-0.9953	30	1.0
78	2.480	0.0030	-0.9970	30	1.0

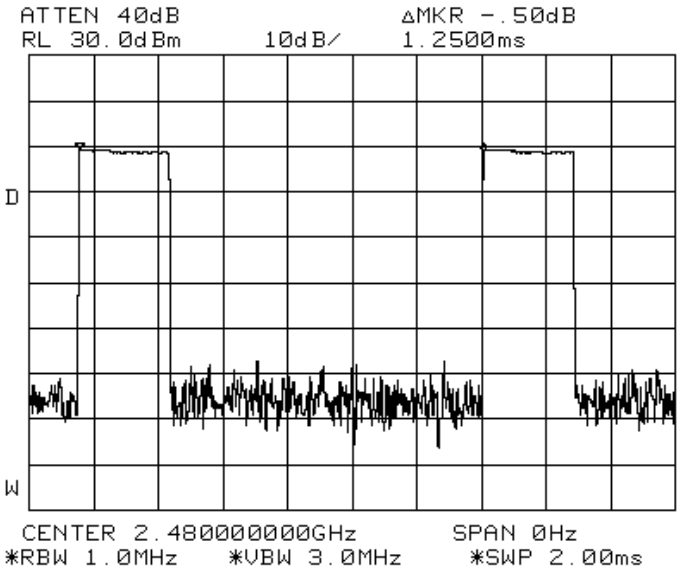
Notes:

1. All possible modes of operation were investigated. Only the worst case highest radiation levels were measured. Measurements were taken at the required averaging time. All other radiation levels were relatively insignificant.
2 A "-ve" margin indicates a PASS as it refers to the margin present below the limit line at the particular frequency.
3 Measurement Uncertainty
All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2, in the range 0.1MHz – 3GHz is ±15% .

FCC Part 15.35(c) Duty Cycle Correction Factor - Subwoofer



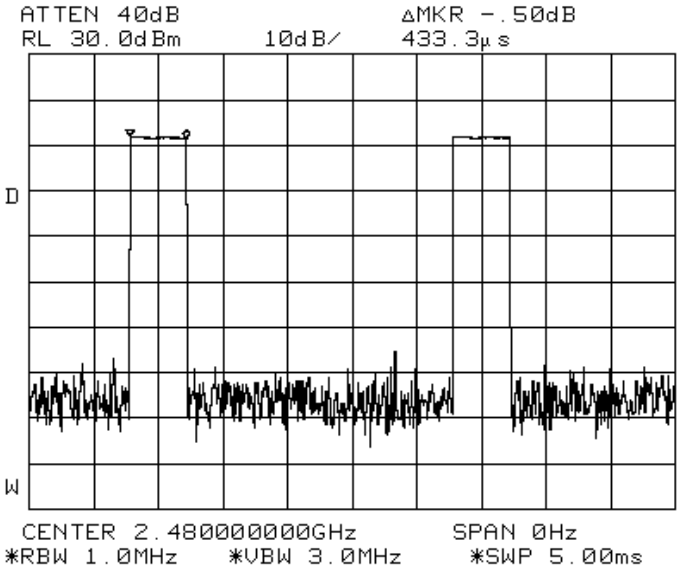
On Time



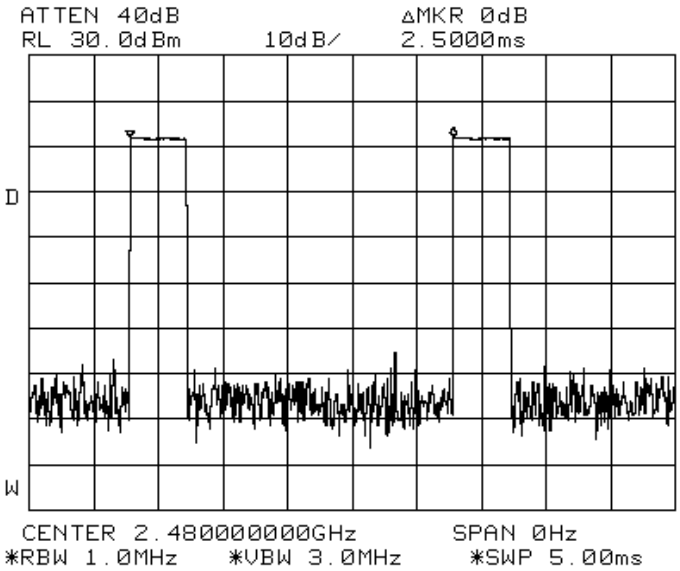
Period

Duty Cycle Factor (worst- case)	=	20 log [Total On time / Period]
	=	20 log [(0.980 / 1.250)]
	=	**-2.1dB**

FCC Part 15.35(c) Duty Cycle Correction Factor - Wireless Rear Speaker



On Time



Period

Duty Cycle Factor (worst- case)	=	20 log [Total On time / Period]
	=	20 log [(0.4333 / 2.500)]
	=	**-15.2dB**

This Report is issued under the following conditions:

1. Results of the testing/calibration in the form of a report will be issued immediately after the service has been completed or terminated.

2. Unless otherwise requested, a report shall contain only technical results. Analysis and interpretation of the results and professional opinion and recommendations expressed thereupon, if required, shall be clearly indicated and additional fee paid for, by the Client.

3. This report applies to the sample of the specific product/equipment given at the time of its testing/calibration. The results are not used to indicate or imply that they are applicable to other similar items. In addition, such results must not be used to indicate or imply that PSB Corporation approves, recommends or endorses the manufacturer, supplier or user of such product/equipment, or that PSB Corporation in any way "guarantees" the later performance of the product/equipment.

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10. Unless otherwise stated, the tests are carried out in PSB Corporation Pte Ltd, No.1 Science Park Drive Singapore 118221.

May 2005

ANNEX A

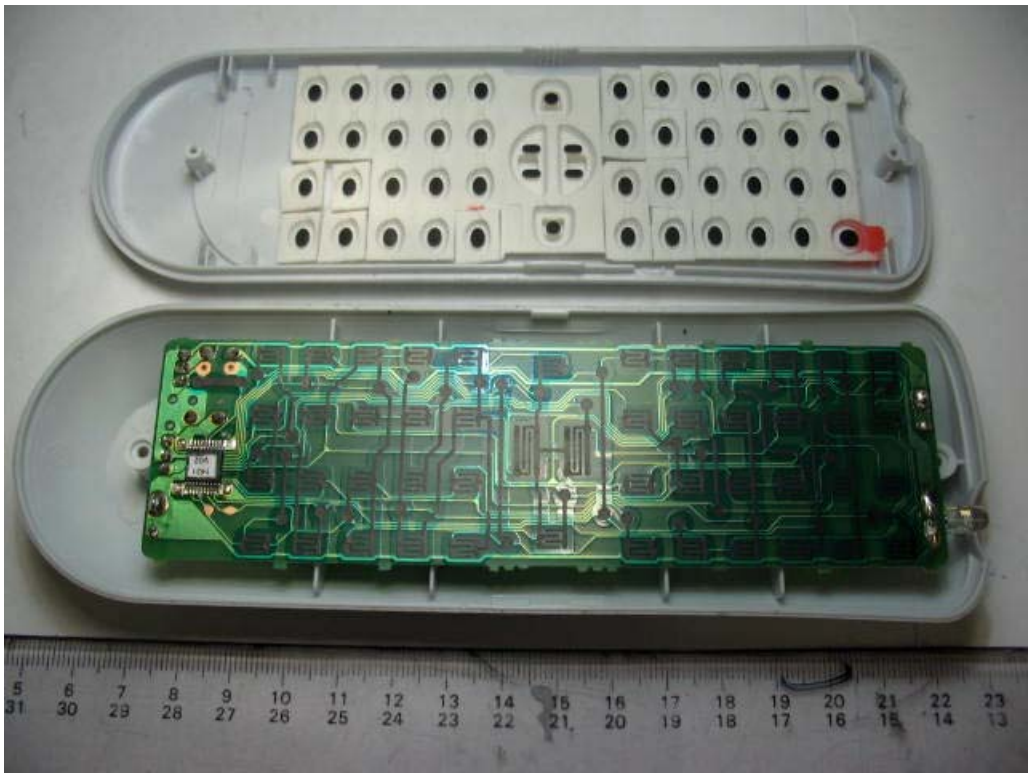
EUT PHOTOGRAPHS / DIAGRAMS

EUT PHOTOGRAPHS FOR REMOTE CONTROLLER

Front View

Rear View

INTERNAL PHOTOGRAPHS FOR REMOTE CONTROLLER

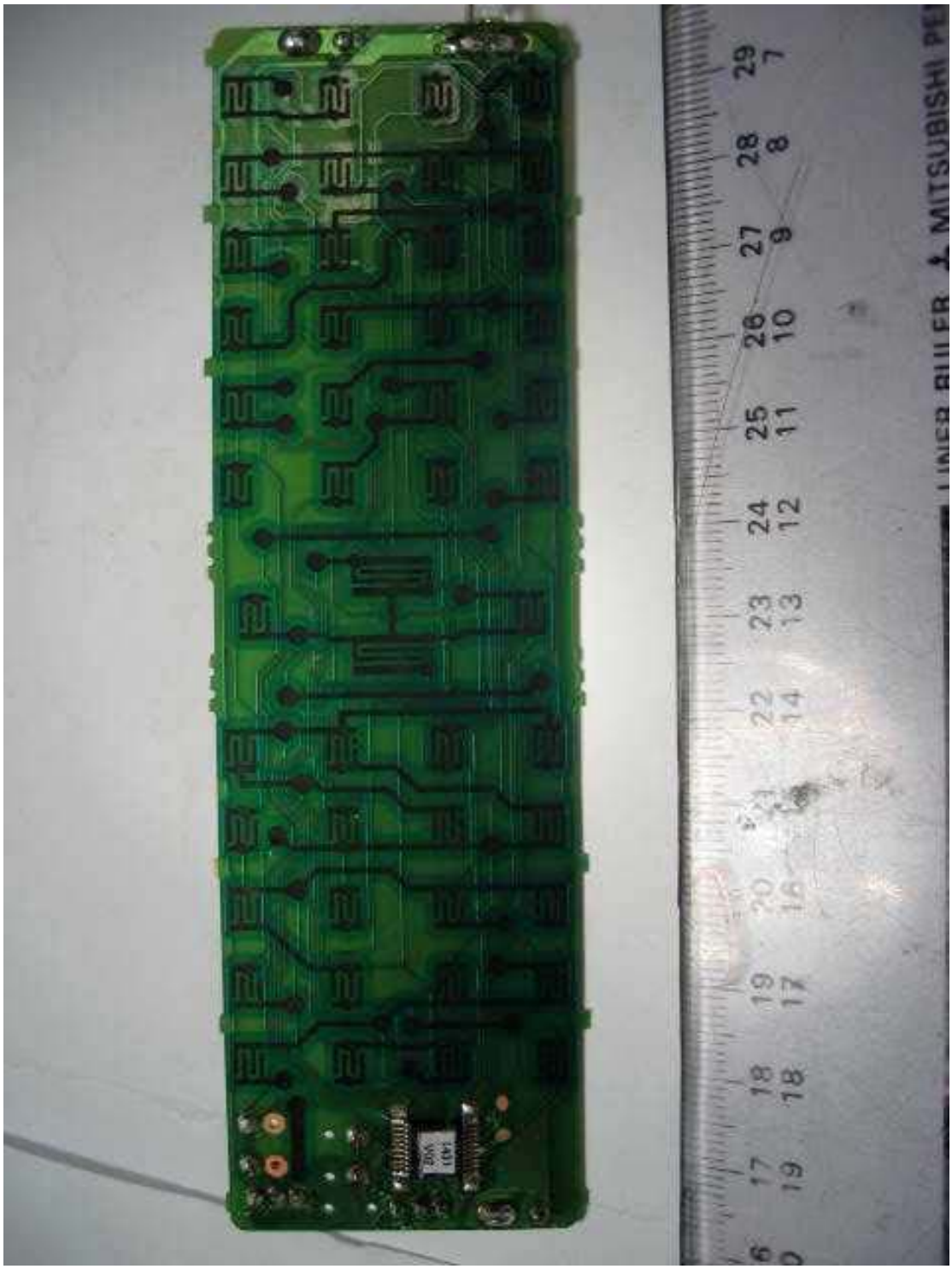


Internal View

PCB PHOTOGRAPHS FOR REMOTE CONTROLLER

Trace View

PCB PHOTOGRAPHS FOR REMOTE CONTROLLER



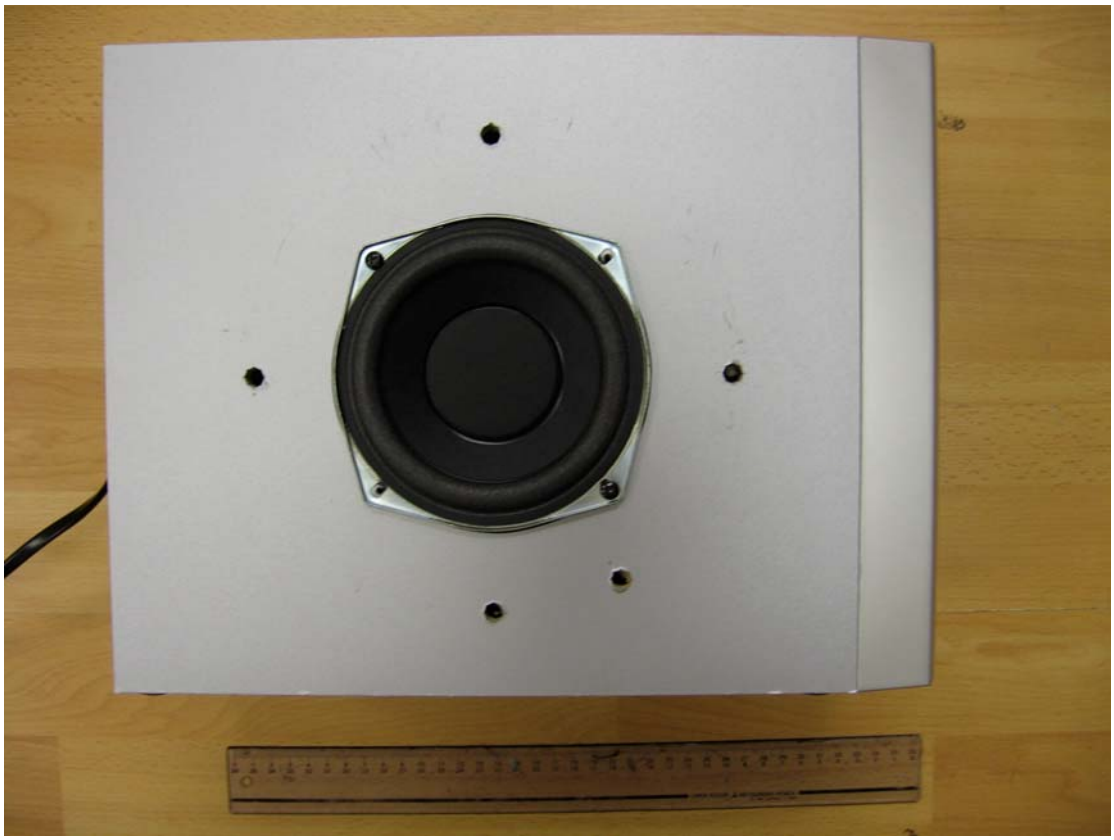
Component View

EUT PHOTOGRAPHS FOR SUBWOOFER

Front View

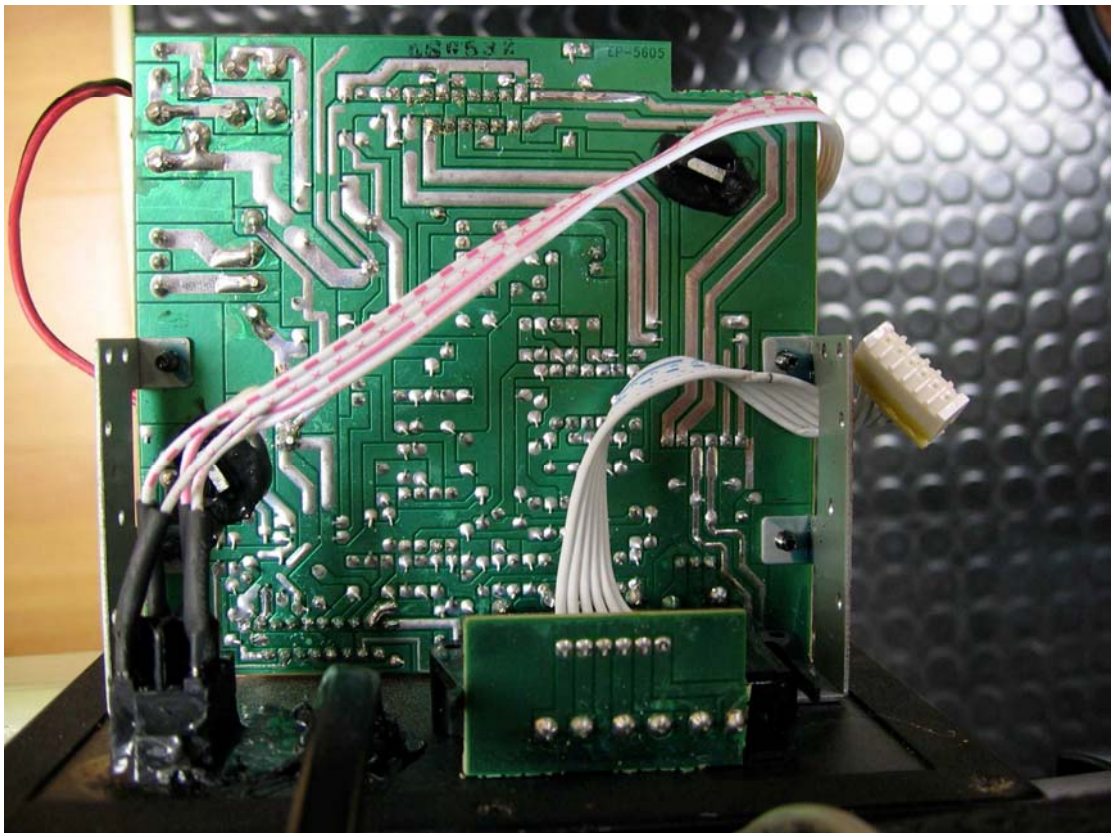
Rear View

EUT PHOTOGRAPHS FOR SUBWOOFER



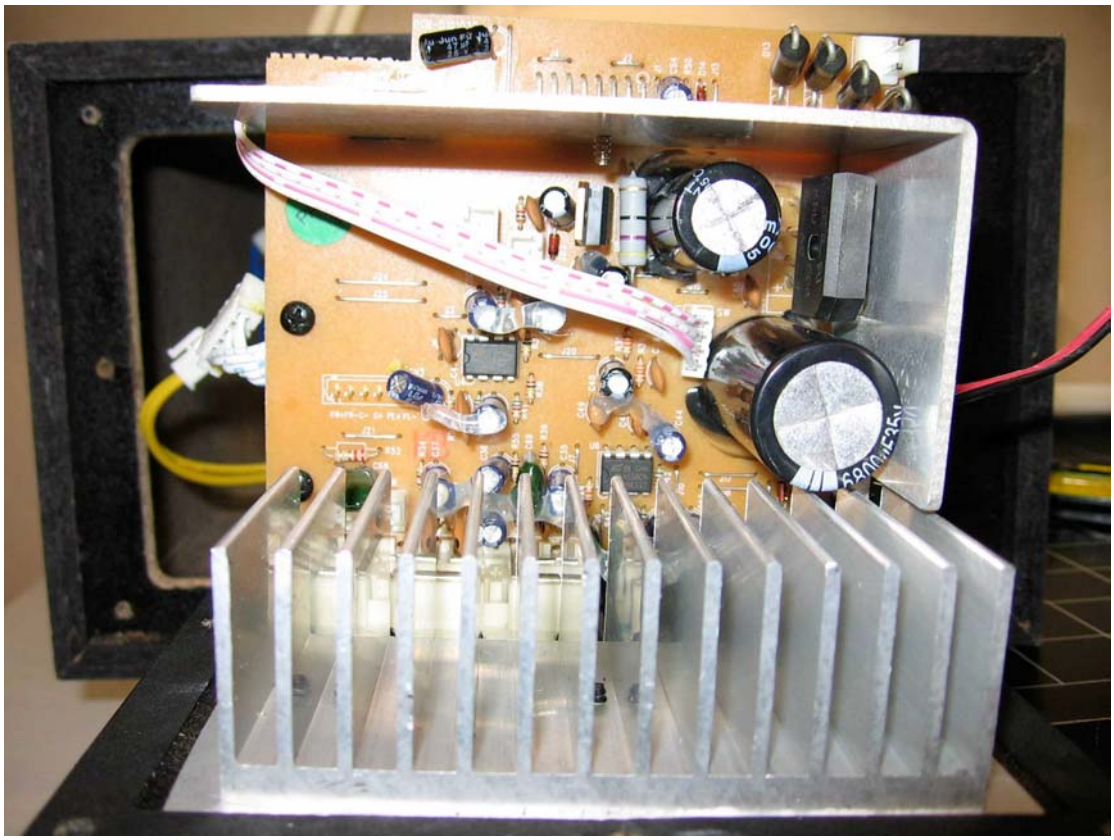
Side View

PCB PHOTOGRAPHS FOR SUBWOOFER



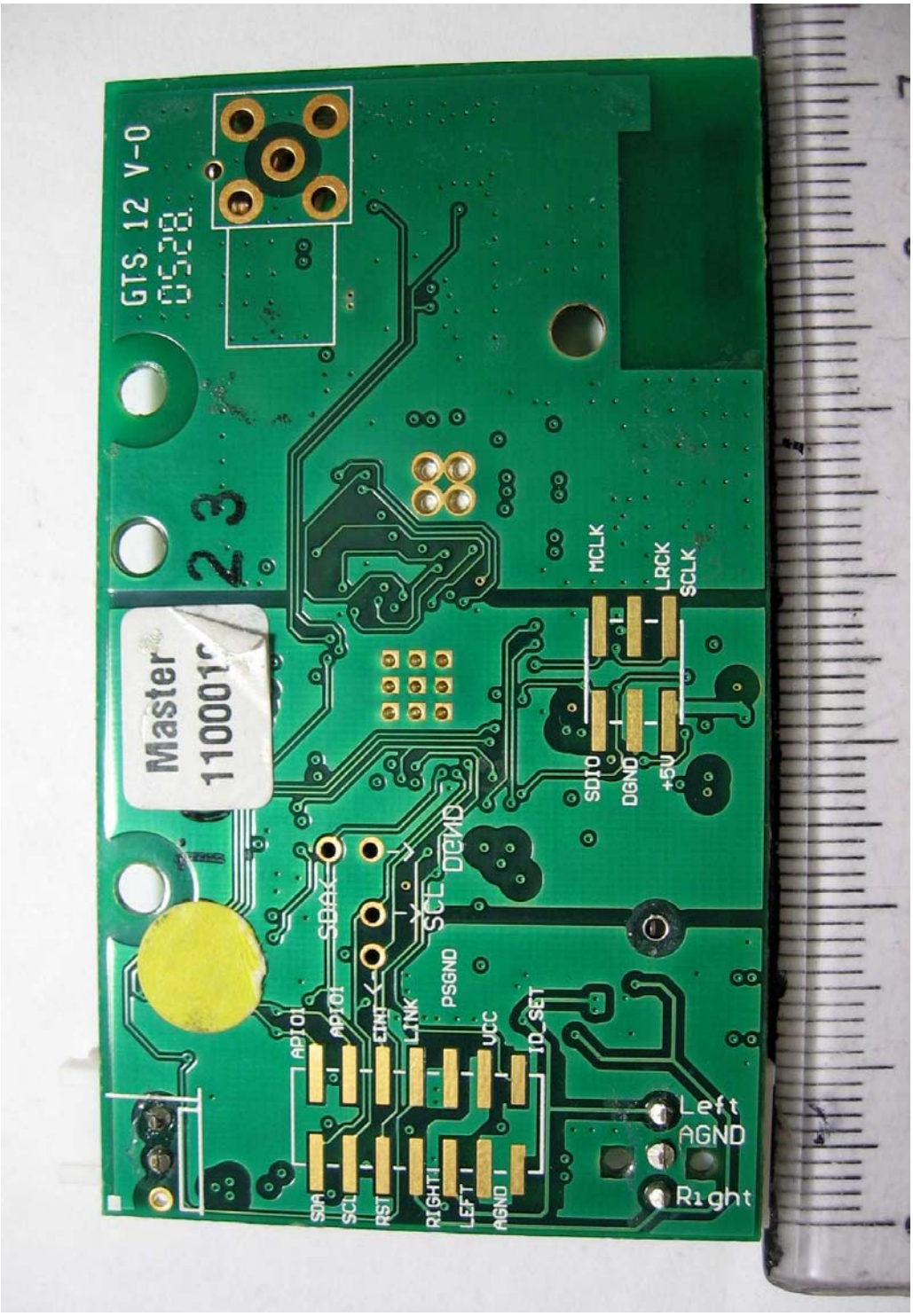
Trace View

PCB PHOTOGRAPHS FOR SUBWOOFER



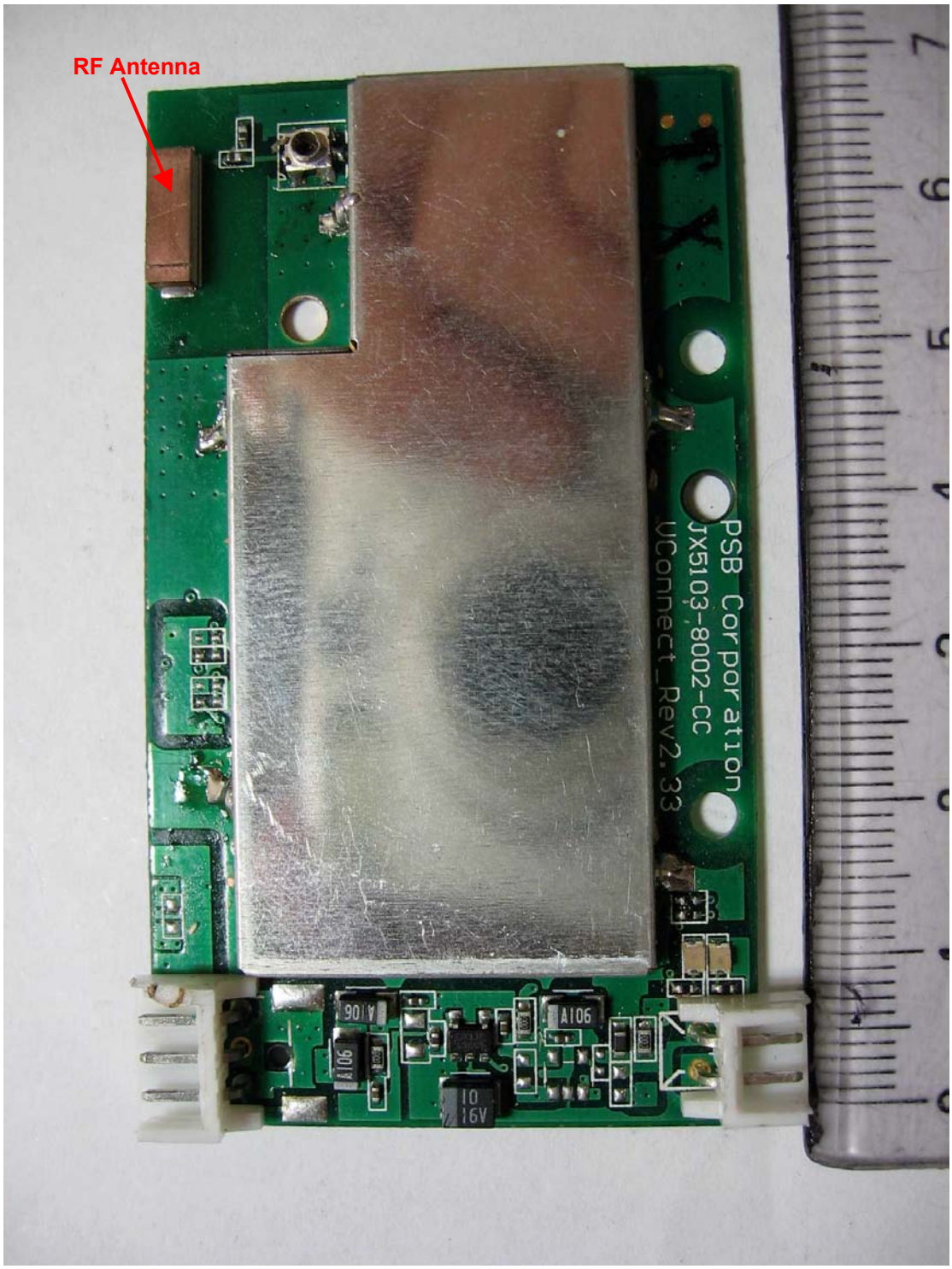
Component View

PCB PHOTOGRAPHS FOR SUBWOOFER RF MODULE



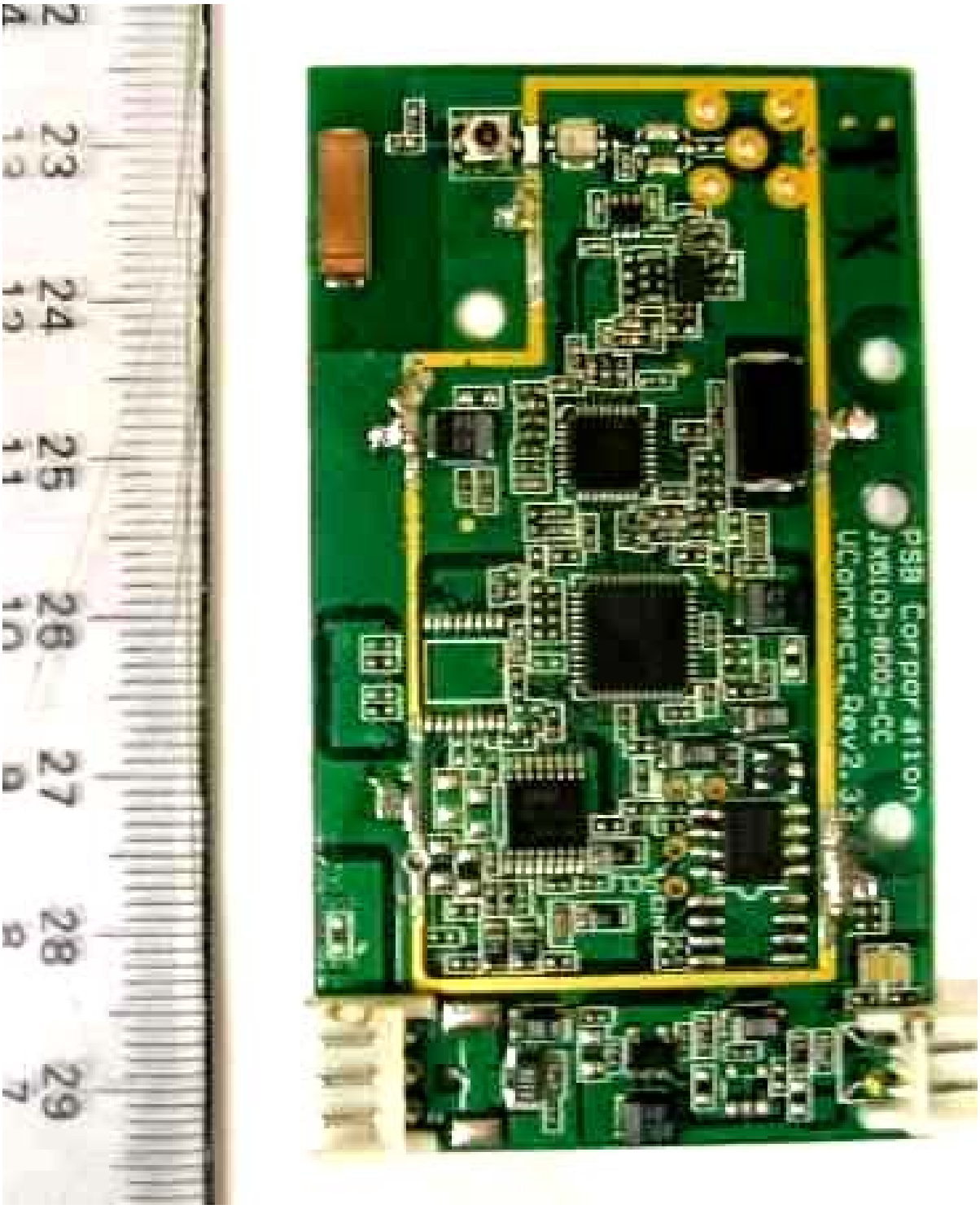
Trace View

PCB PHOTOGRAPHS FOR SUBWOOFER RF MODULE



Component View

PCB PHOTOGRAPHS FOR SUBWOOFER RF MODULE (RF SHIELD REMOVED)



Component View

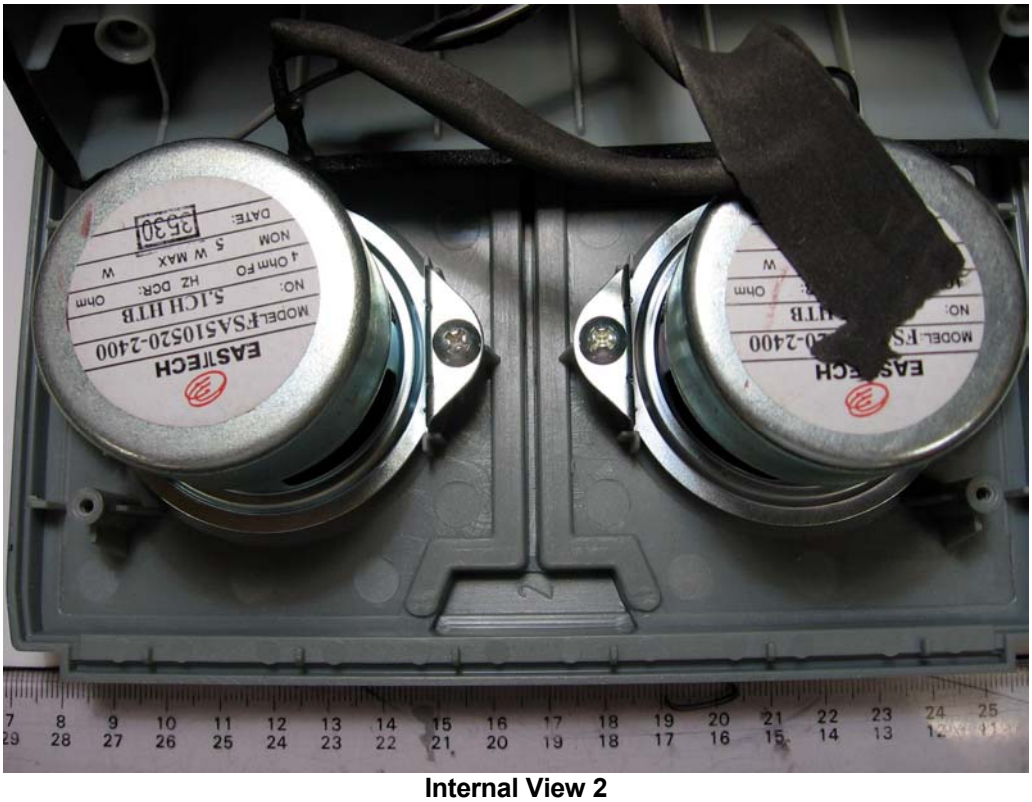
EUT PHOTOGRAPHS FOR CENTER SPEAKER

Front View

Rear View

INTERNAL PHOTOGRAPHS FOR CENTER SPEAKER

Internal View 1



Internal View 2

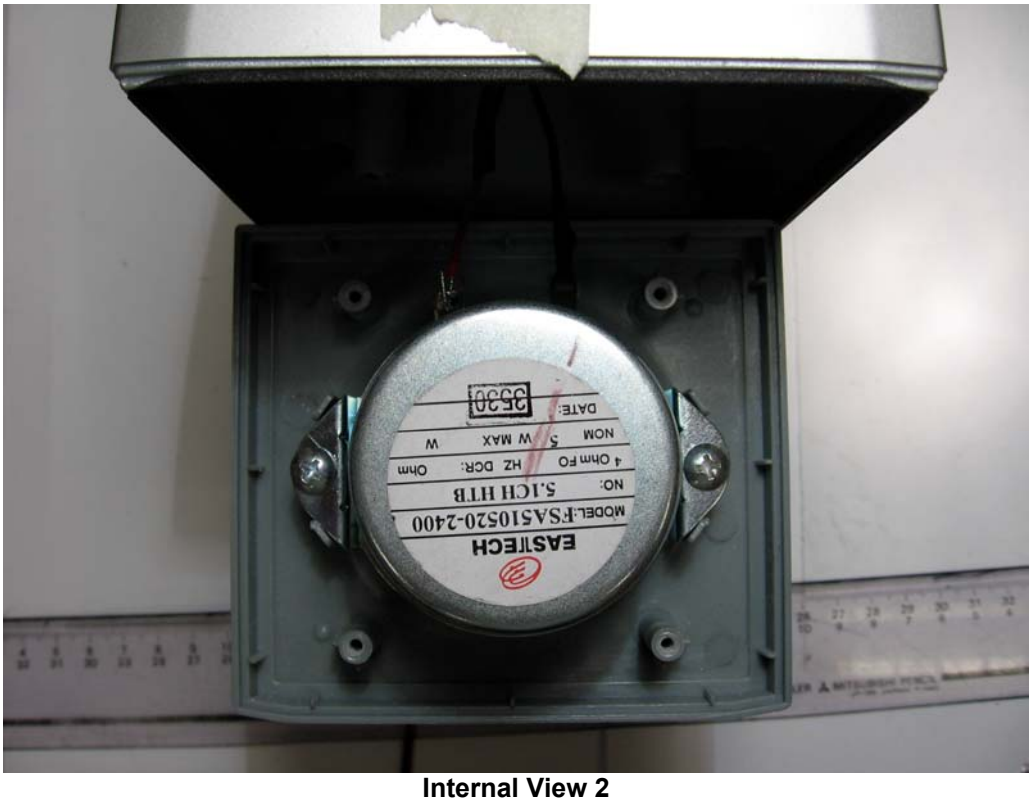
EUT PHOTOGRAPHS FOR FRONT SPEAKER

Front View

Rear View

INTERNAL PHOTOGRAPHS FOR FRONT SPEAKER

Internal View 1



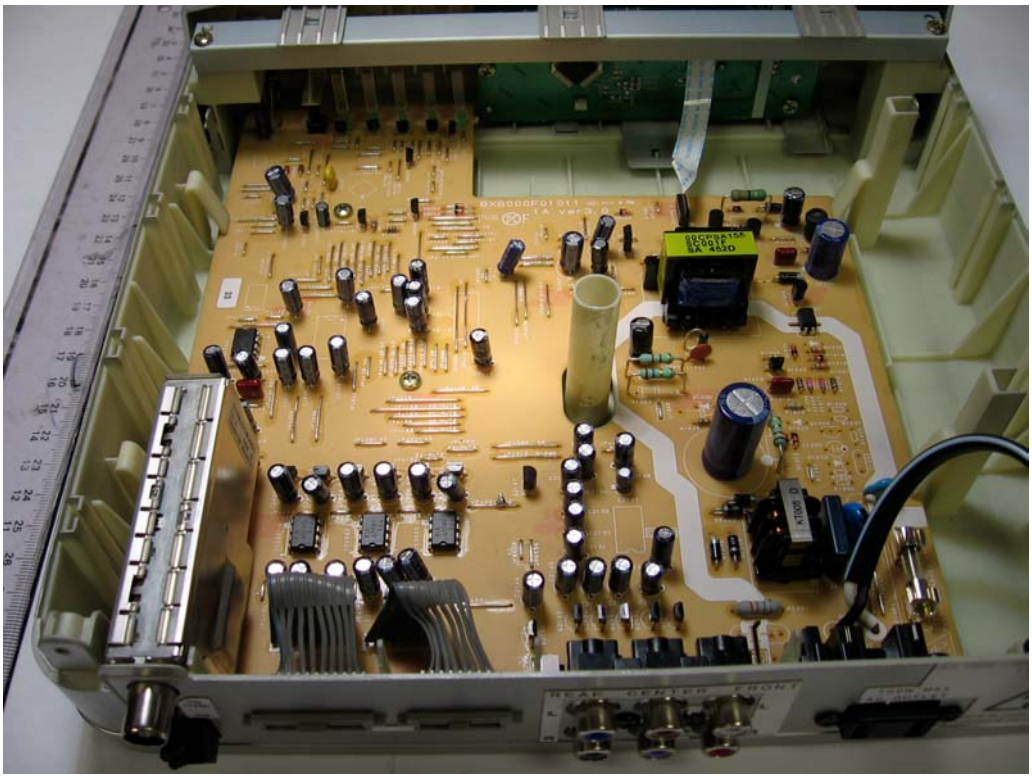
Internal View 2

EUT PHOTOGRAPHS FOR AV RECEIVER

Front View

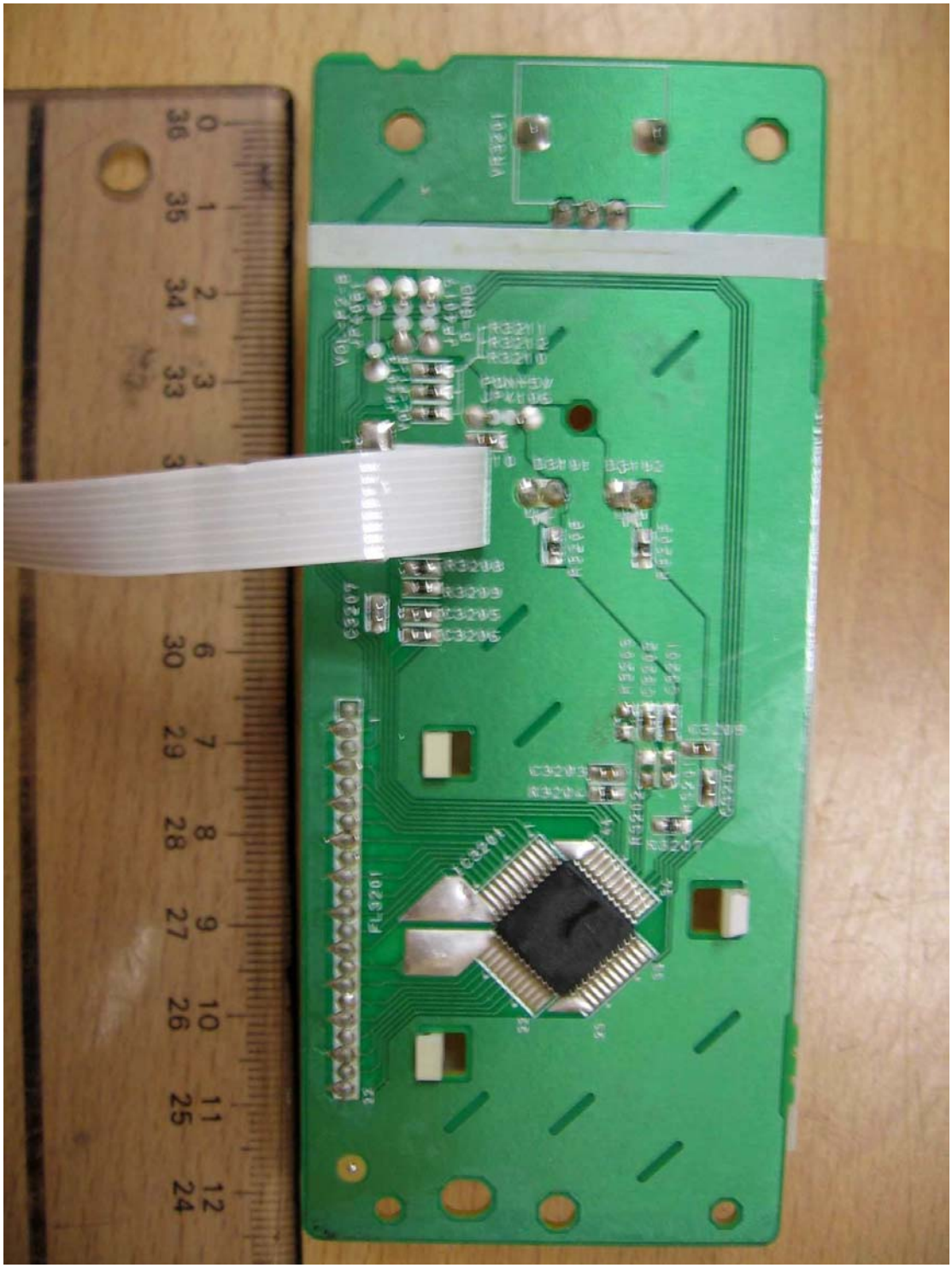
Rear View

EUT PHOTOGRAPHS FOR AV RECEIVER



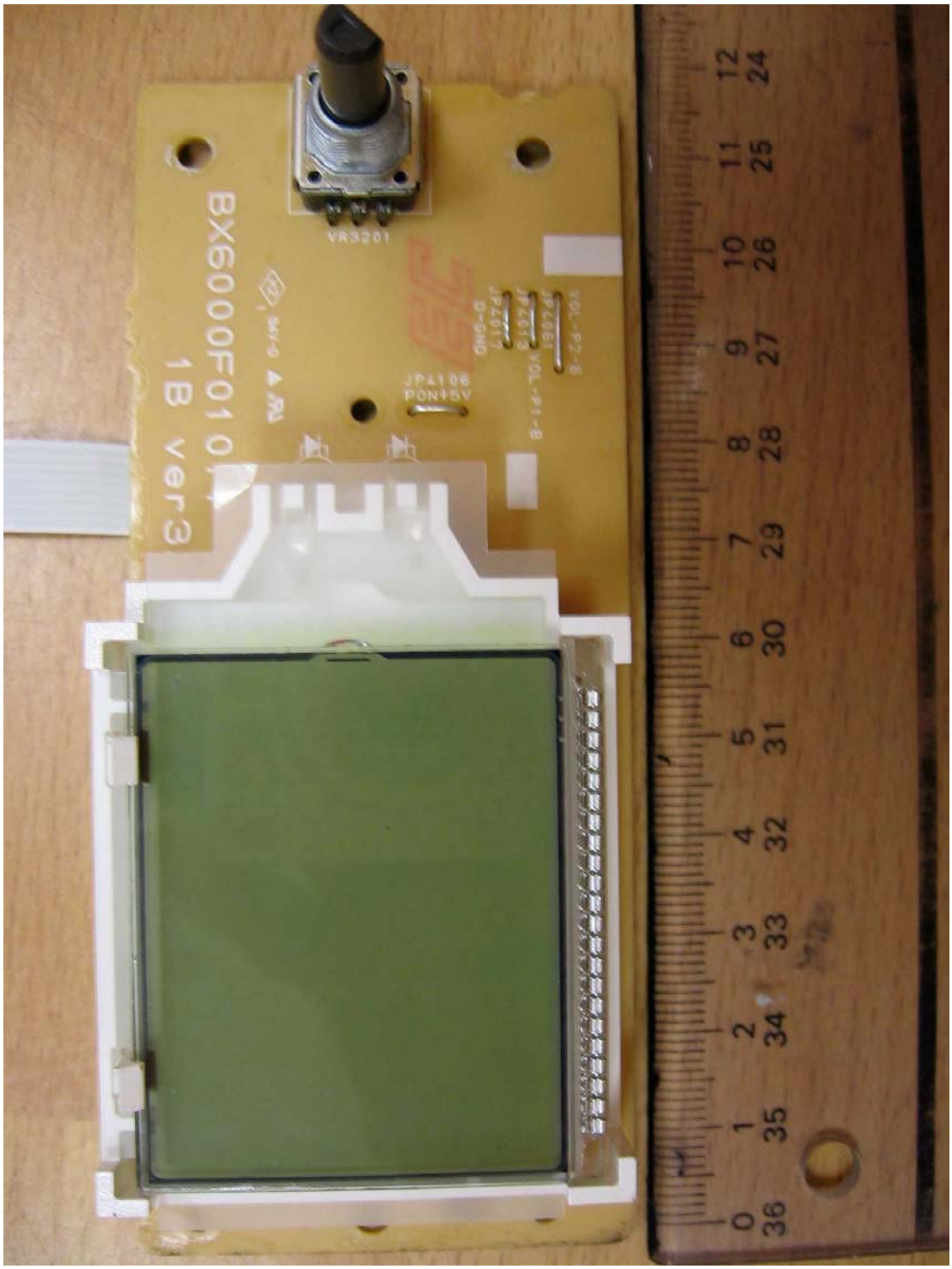
Internal View

PCB PHOTOGRAPHS FOR AV RECEIVER (LCD PORTION)



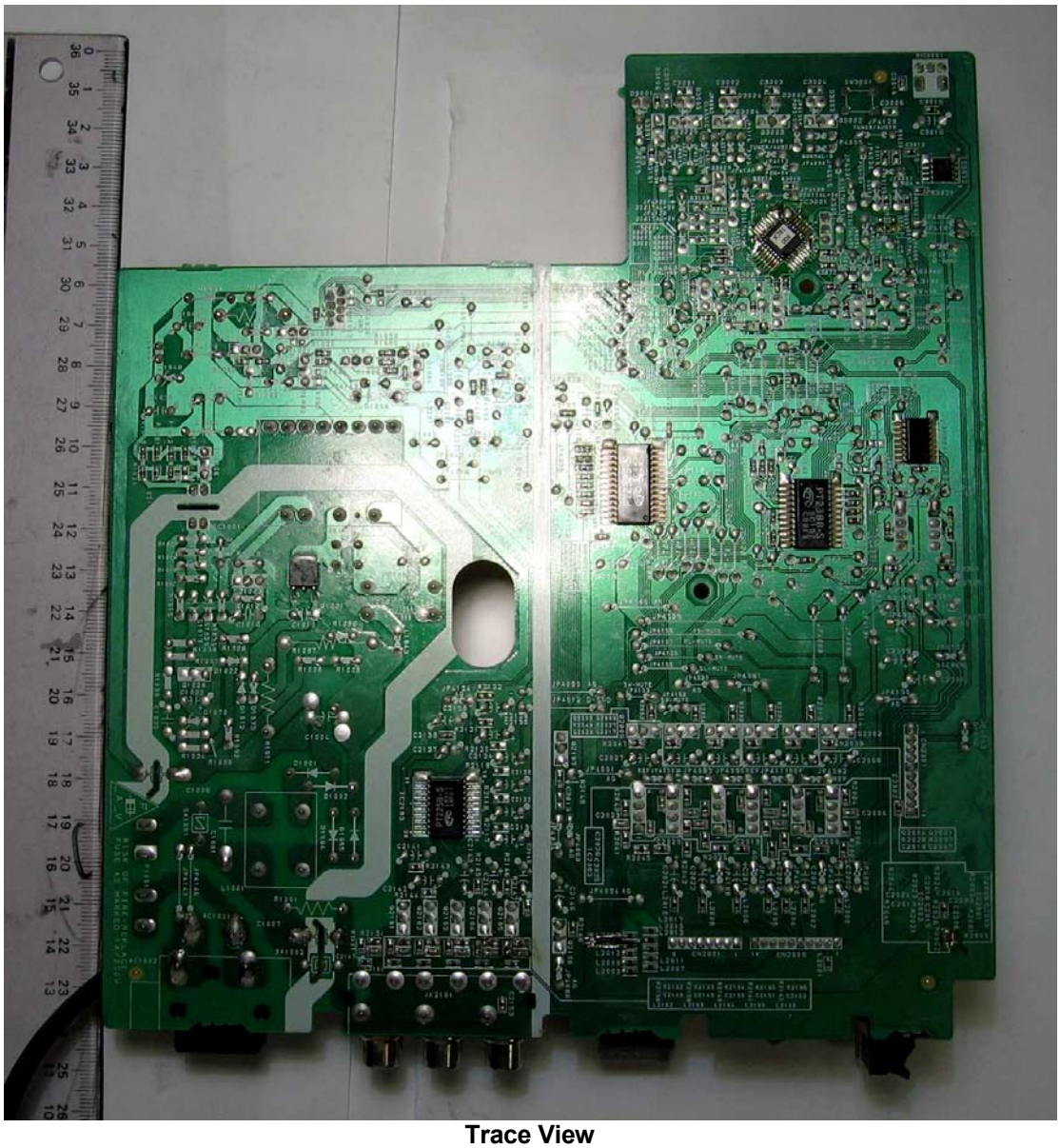
Trace View

PCB PHOTOGRAPHS FOR AV RECEIVER (LCD PORTION)



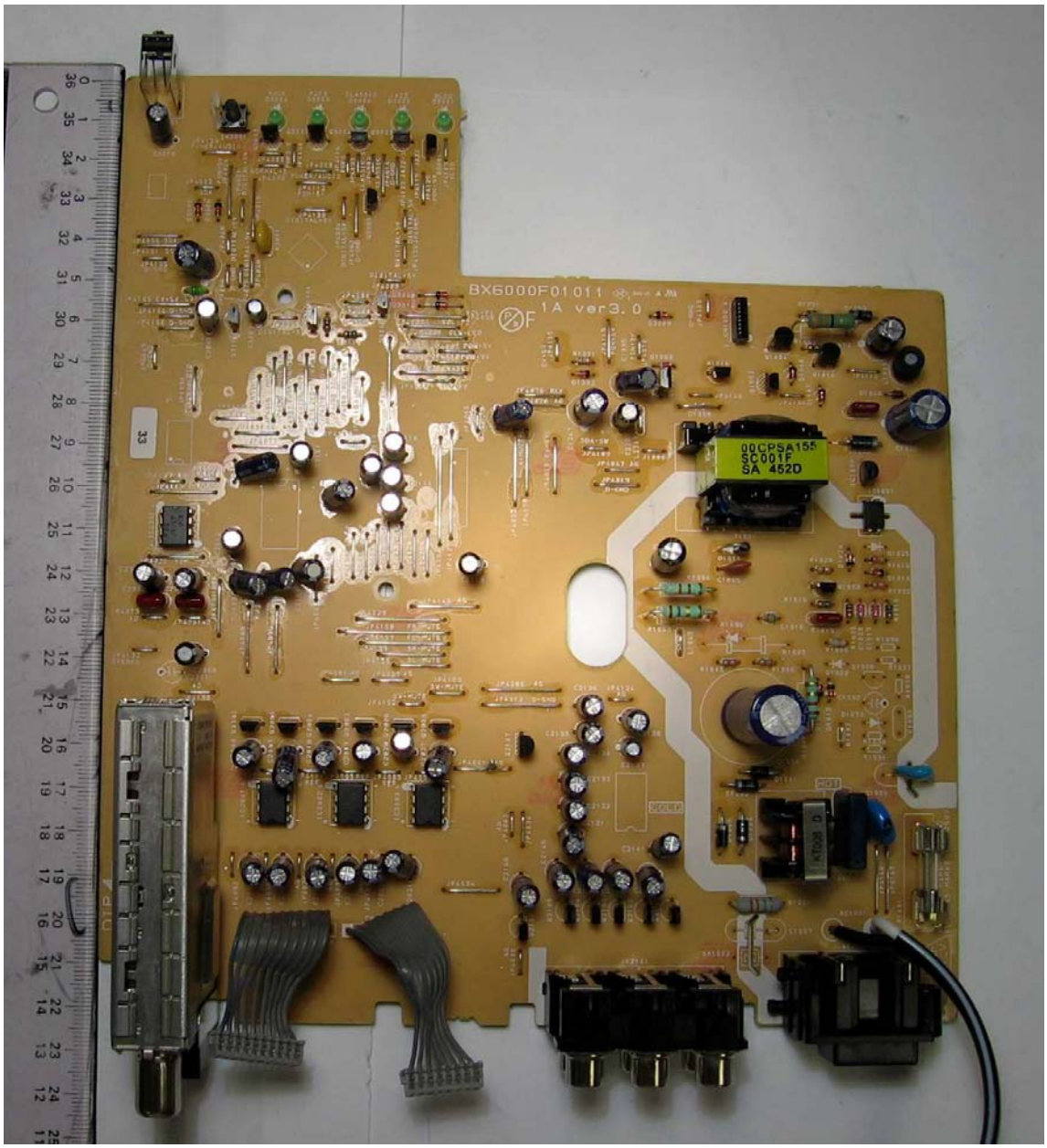
Component View

PCB PHOTOGRAPHS FOR AV RECEIVER (MAIN BOARD)



Trace View

PCB PHOTOGRAPHS FOR AV RECEIVER (MAIN BOARD)



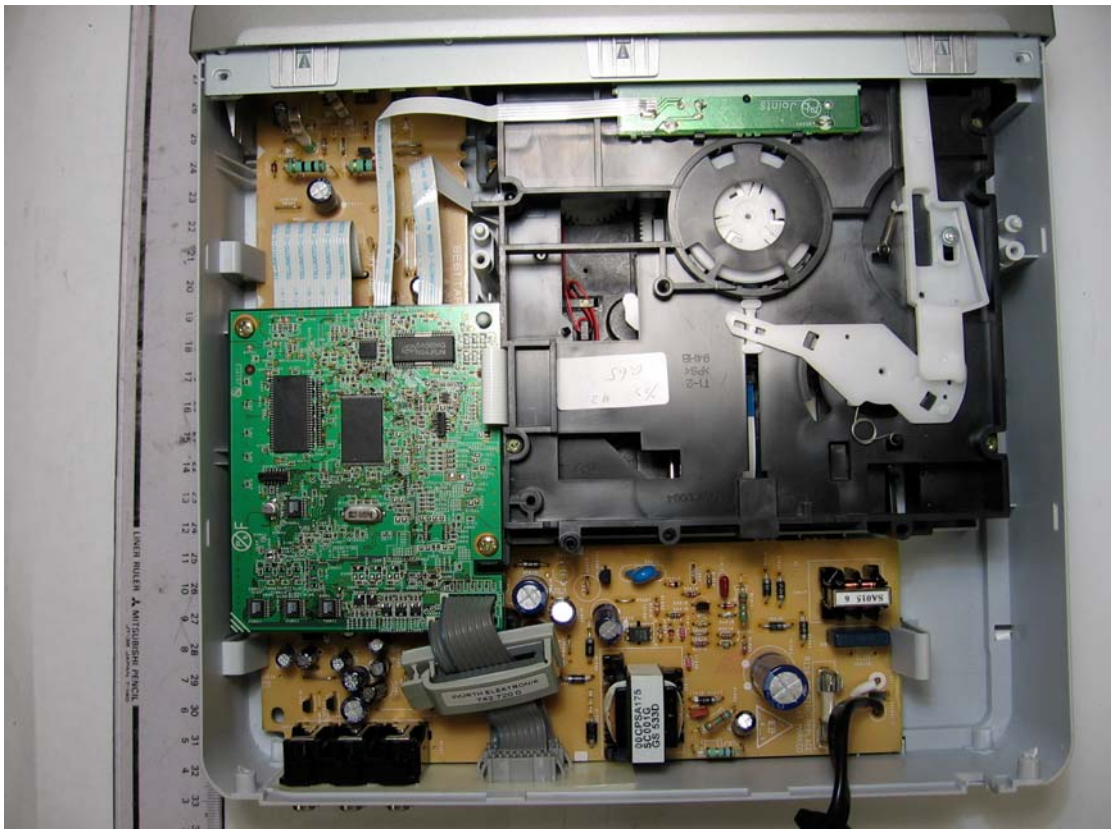
Component View

EUT PHOTOGRAPHS FOR DVD / CD PLAYER

Front View

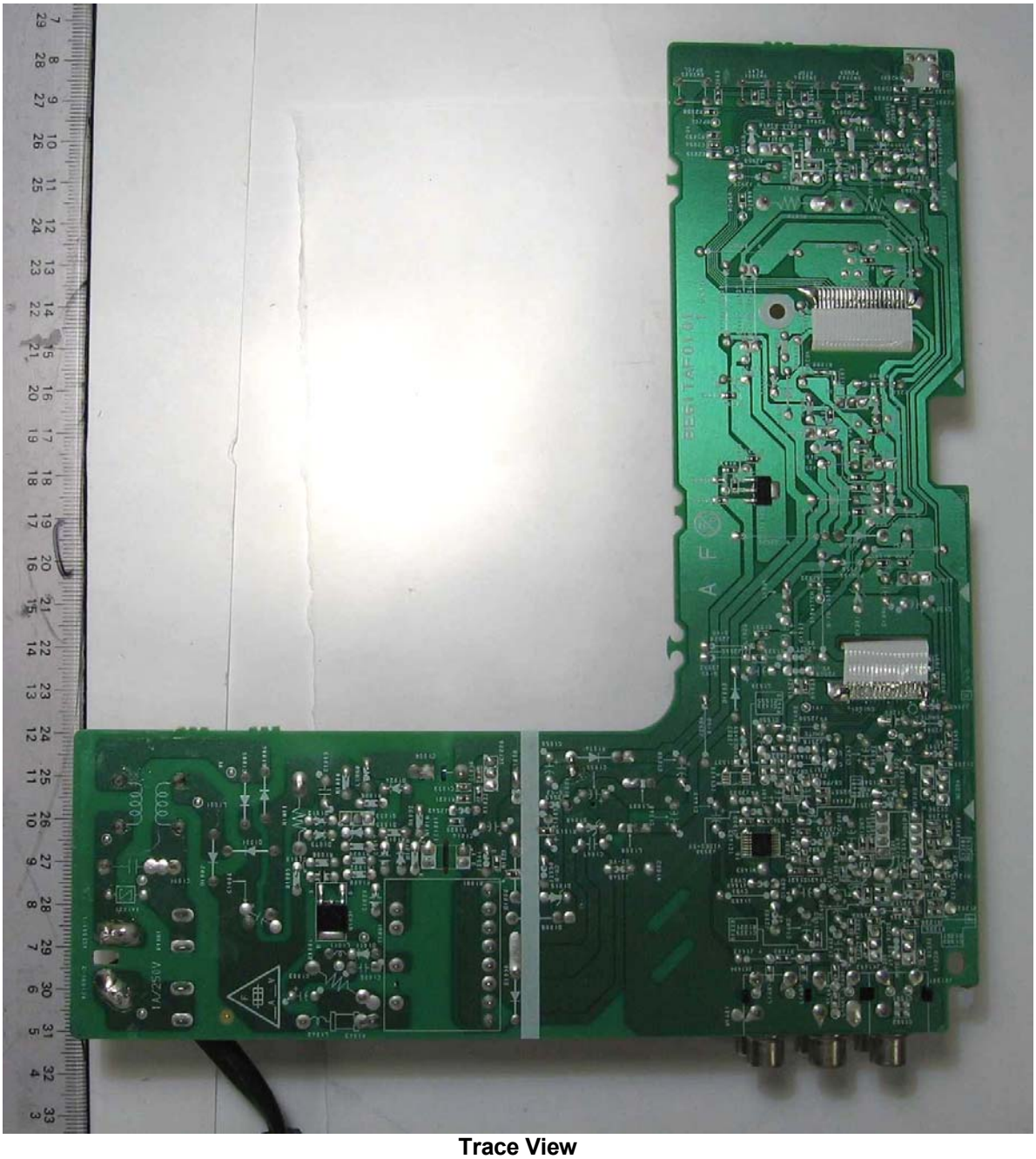
Rear View

INTERNAL PHOTOGRAPHS FOR DVD / CD PLAYER



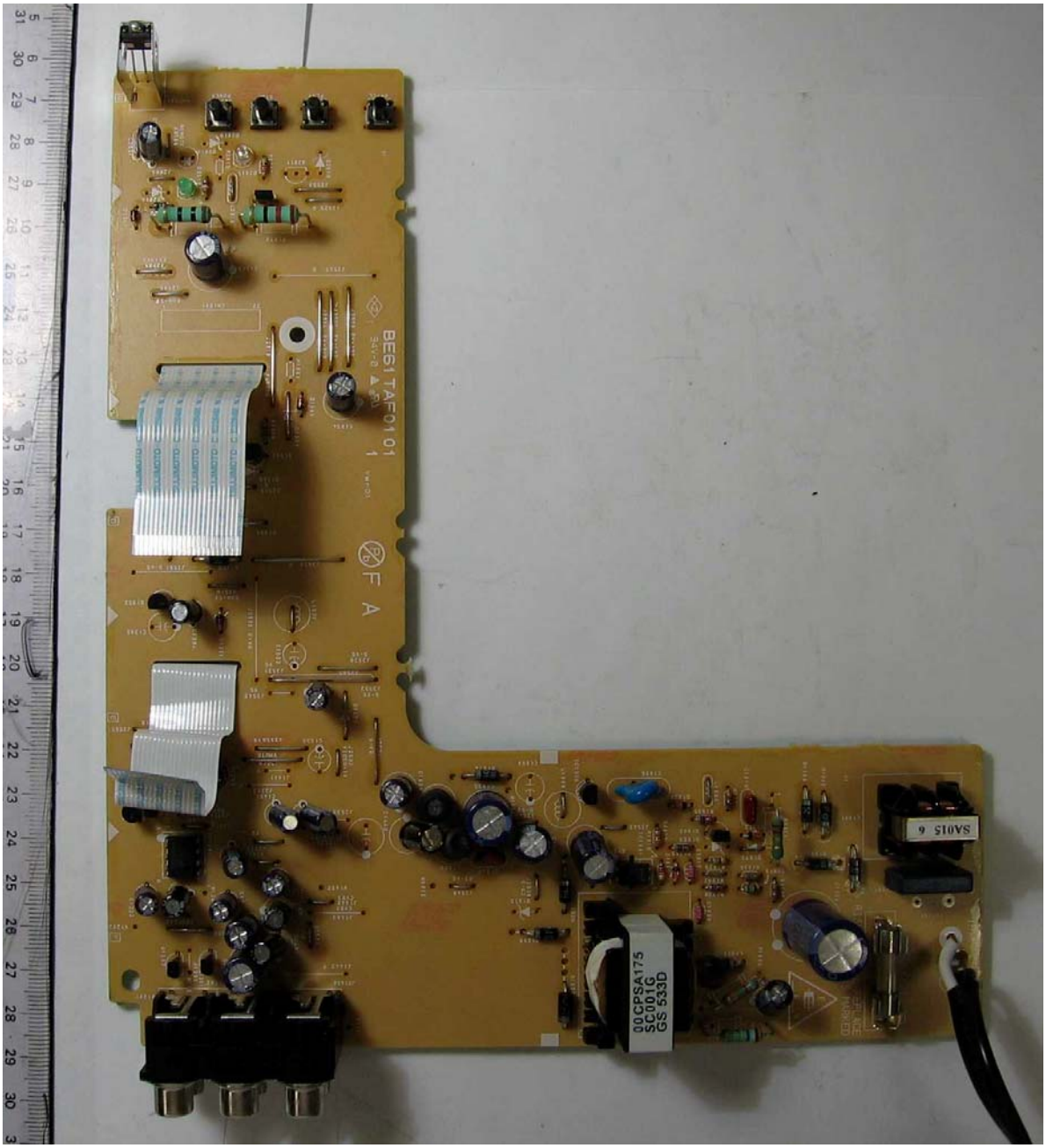
Internal View

PCB PHOTOGRAPHS FOR DVD / CD PLAYER



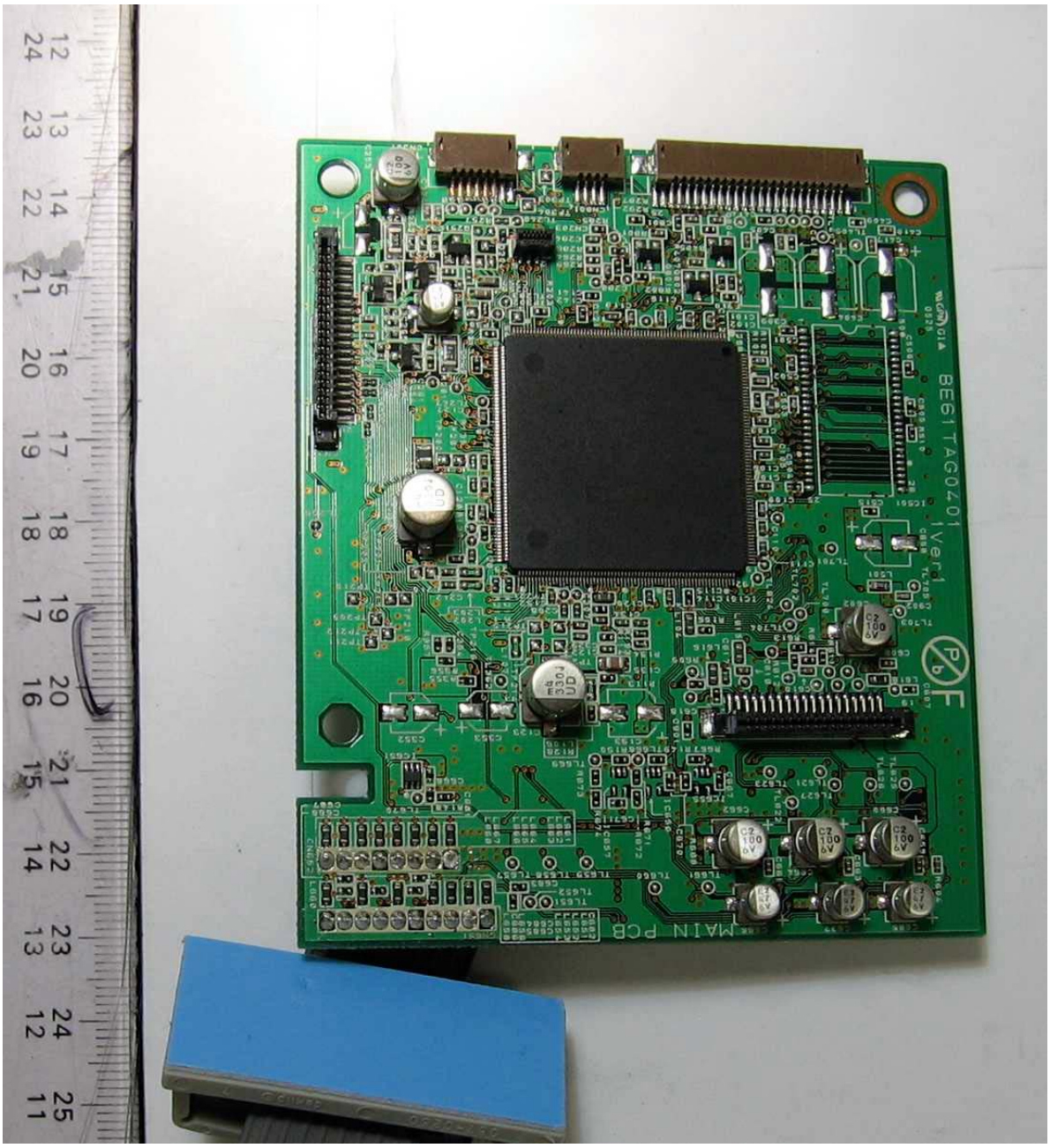
Trace View

PCB PHOTOGRAPHS FOR DVD / CD PLAYER



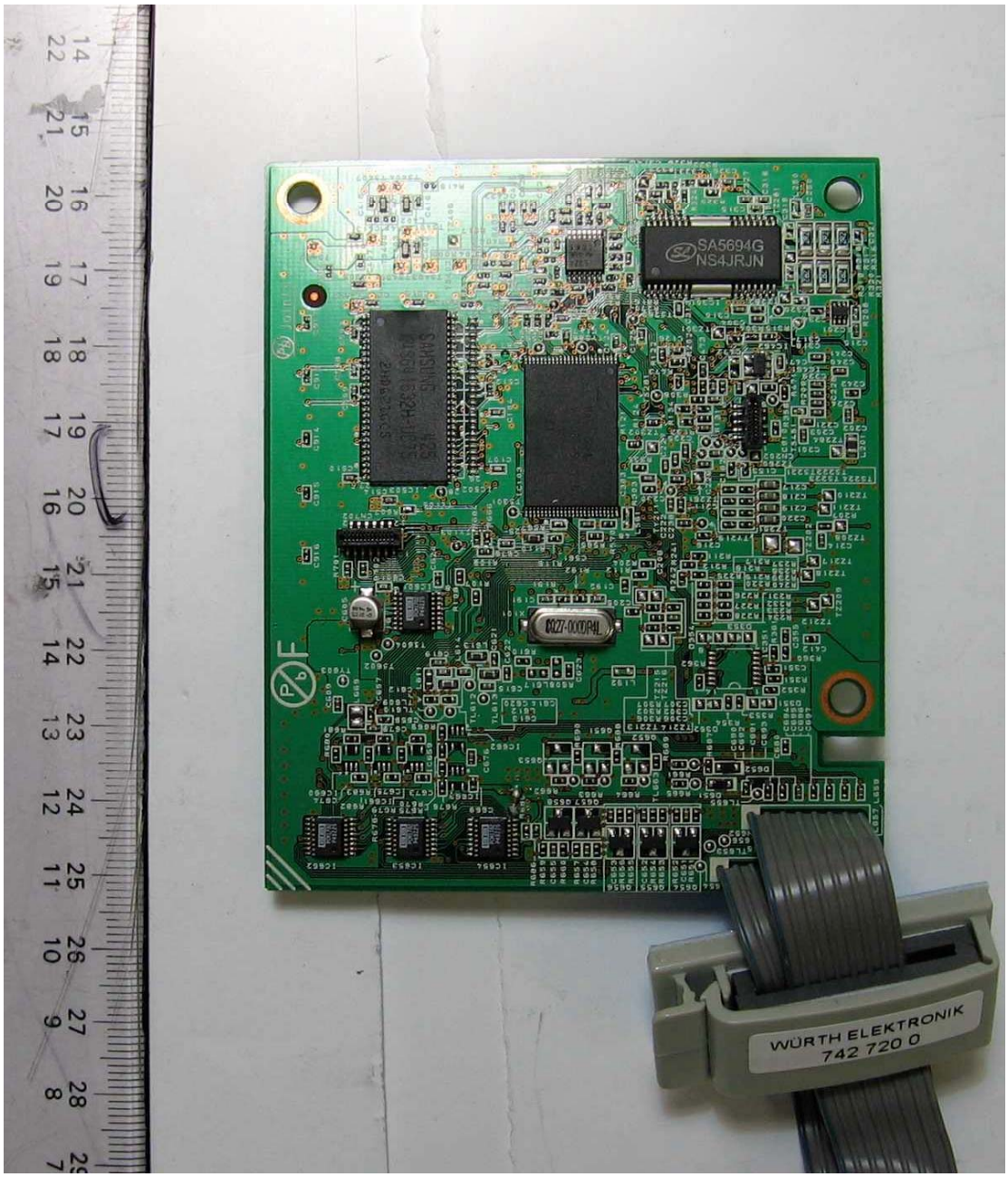
Component View

PCB PHOTOGRAPHS FOR DVD / CD PLAYER



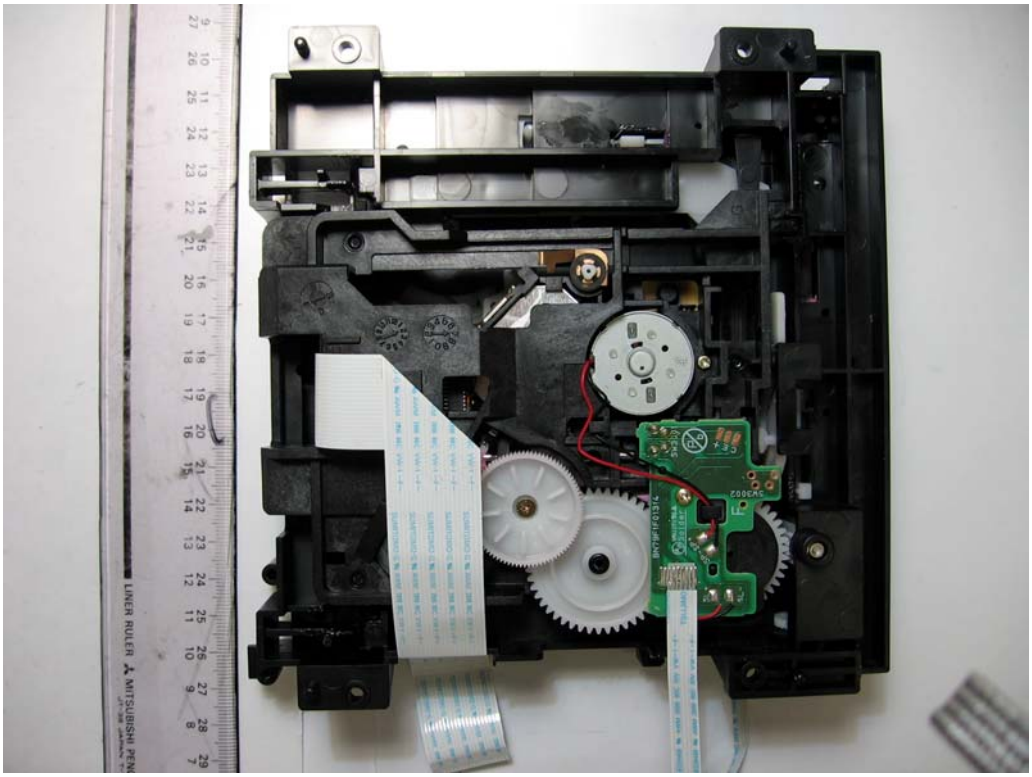
Top View

PCB PHOTOGRAPHS FOR DVD / CD PLAYER

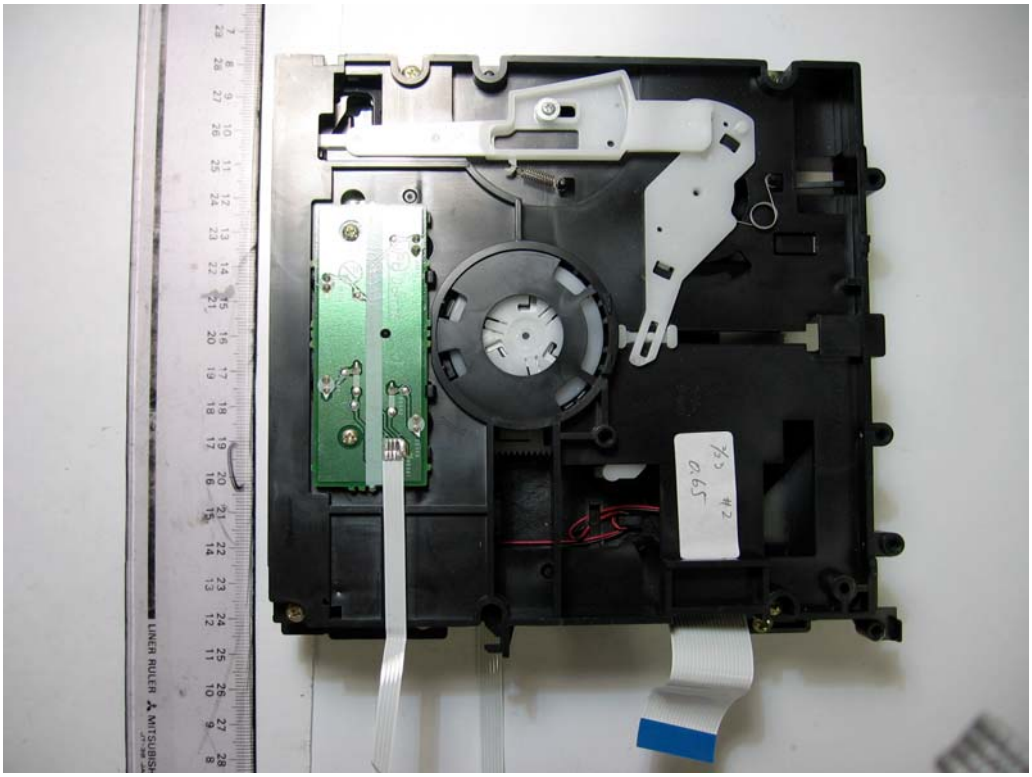


Rear View

PHOTOGRAPHS FOR DVD / CD PLAYER (DVD DRIVE)



Top View



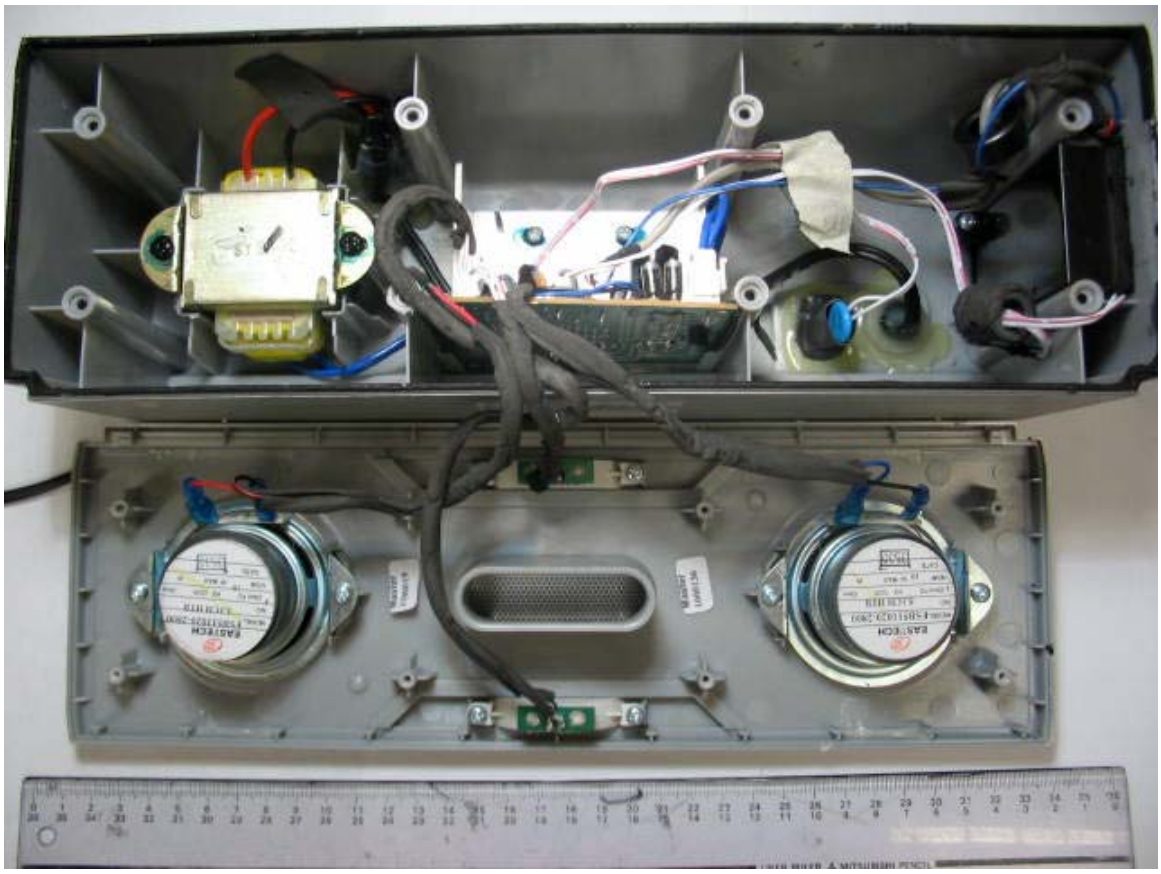
Rear View

EUT PHOTOGRAPHS FOR WIRELESS REAR SPEAKER

Front View

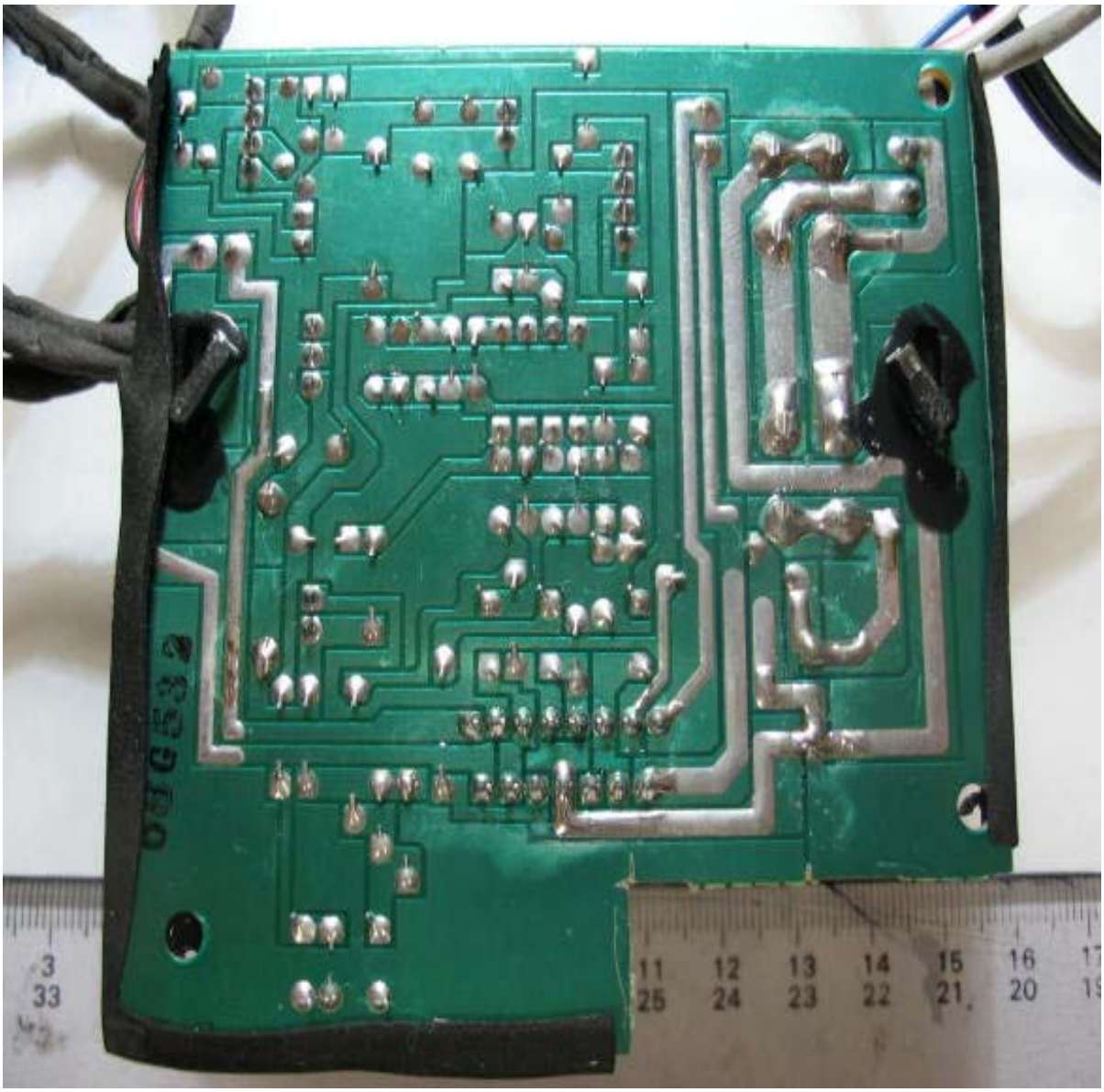
Rear View

INTERNAL PHOTOGRAPHS FOR WIRELESS REAR SPEAKER



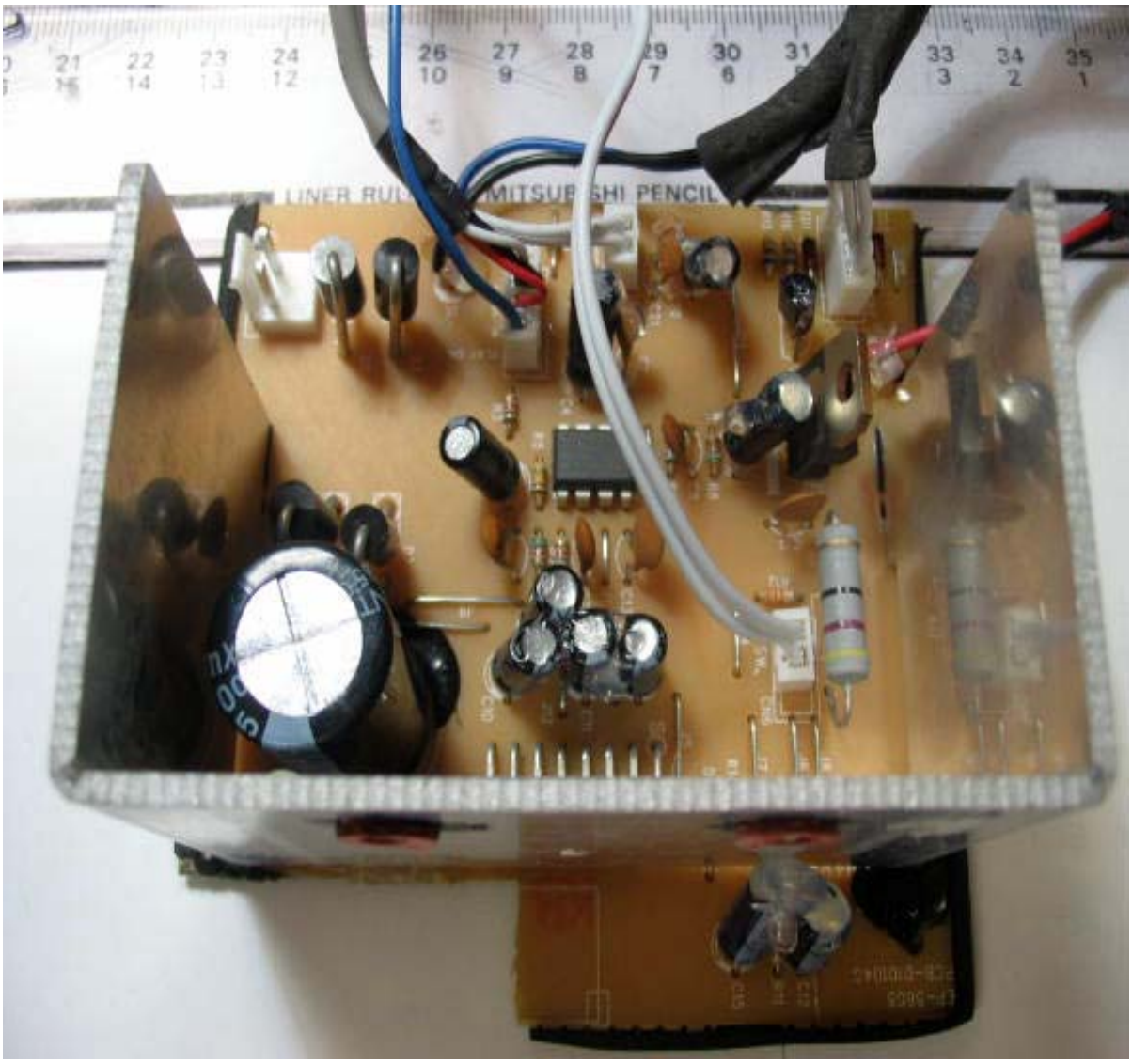
Internal View

PCB PHOTOGRAPHS FOR WIRELESS REAR SPEAKER



Trace View

PCB PHOTOGRAPHS FOR WIRELESS REAR SPEAKER

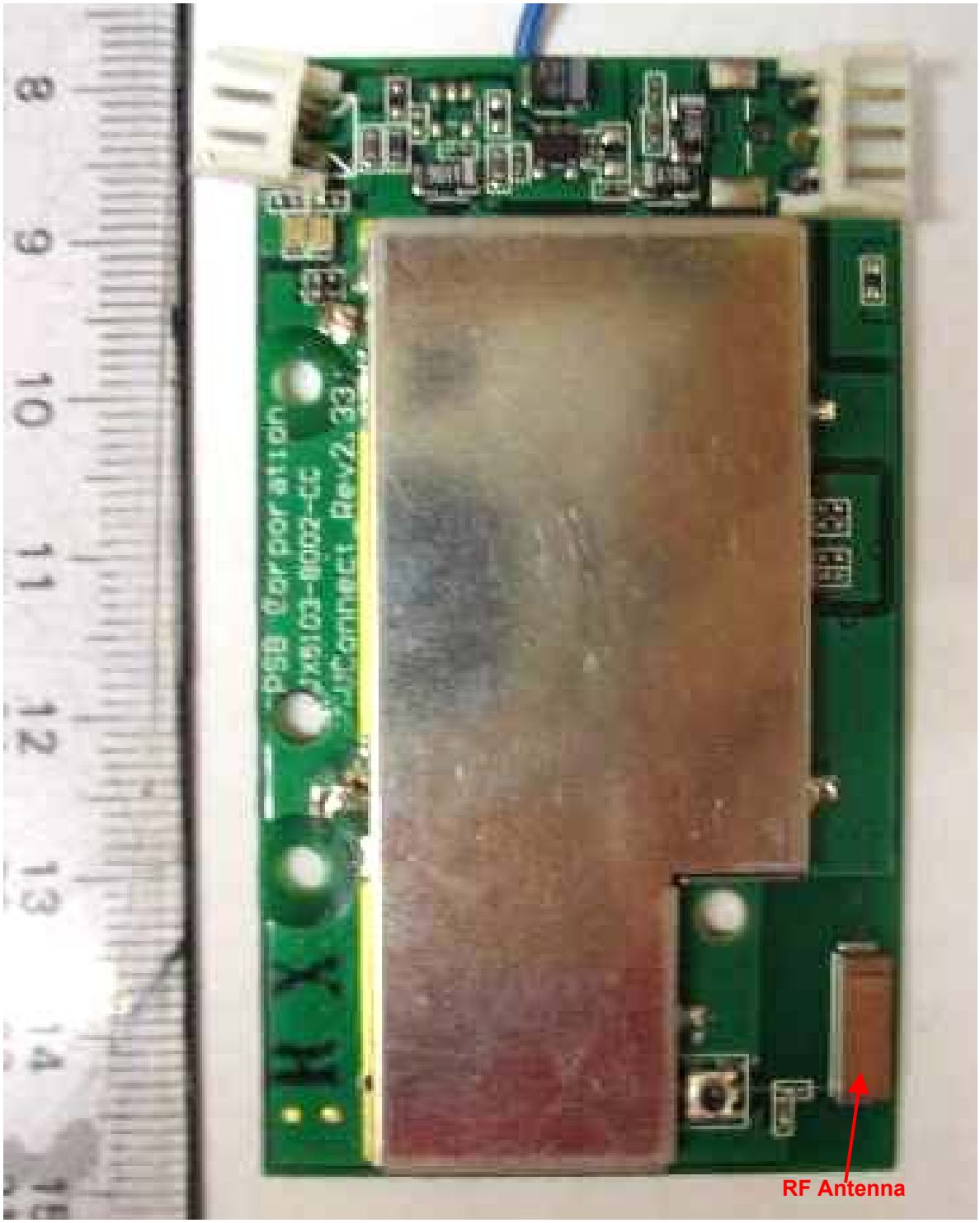


Component View

PCB PHOTOGRAPHS FOR WIRELESS REAR SPEAKER RF MODULE

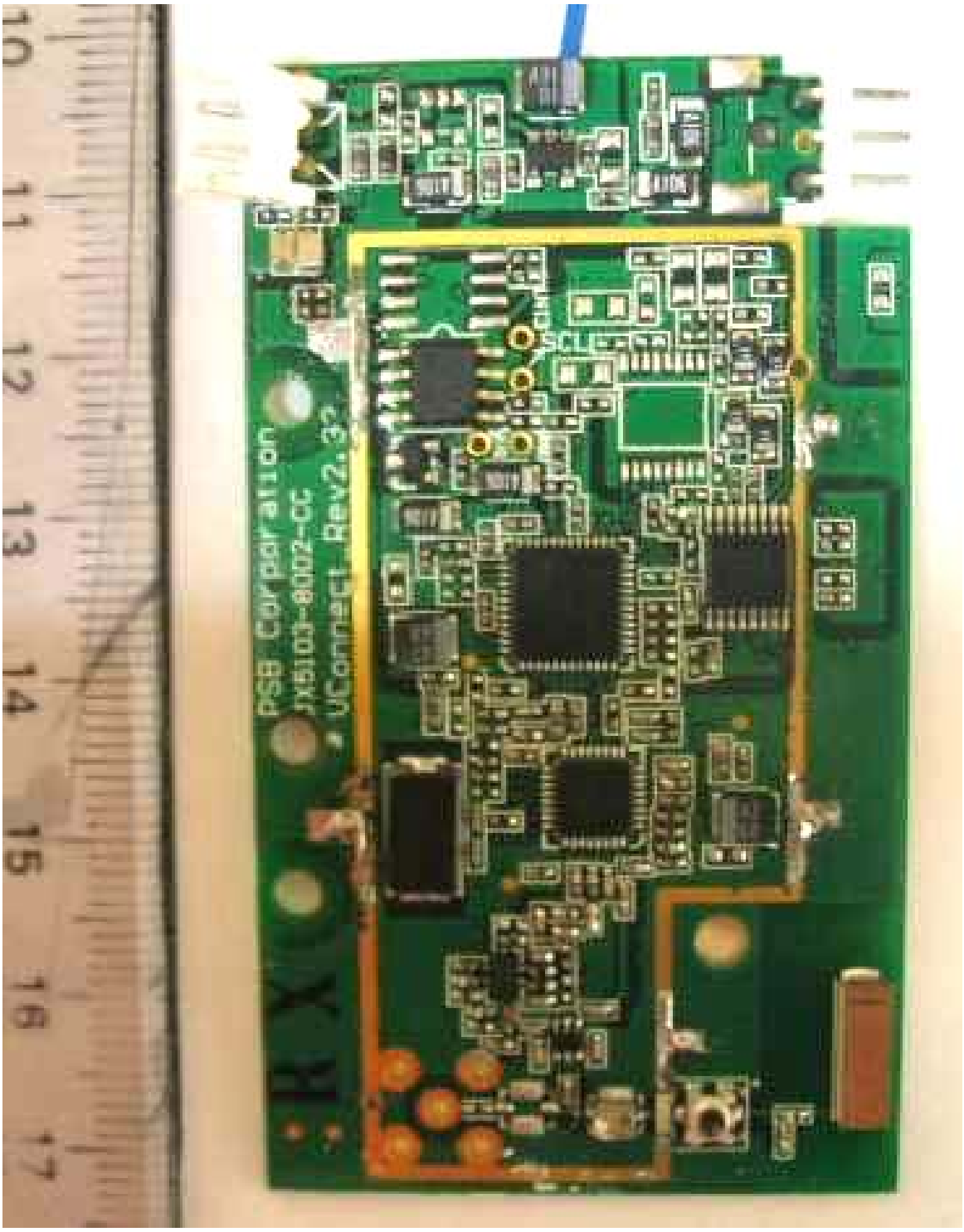
Trace View

PCB PHOTOGRAPHS FOR WIRELESS REAR SPEAKER RF MODULE



Component View

PCB PHOTOGRAPHS FOR WIRELESS REAR SPEAKER RF MODULE (RF SHIELD REMOVED)



Component View

ANNEX B

FCC LABEL & POSITION

FCC LABEL & POSITION ANNEX B

Labelling requirements per Section 2.925 & 15.19

The label shown will be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.

Sample Label

Physical Location of Label on EUT

ANNEX C

USER MANUAL
TECHNICAL DESCRIPTION
BLOCK & CIRCUIT DIAGRAMS

(Please refer to manufacturer for details)