

## ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

### INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

**Product Name:** 2.4GHz Dongle

**Brand Name:** ELECOM

**Model No.:** ELECOM3

**Model Difference:** N/A

**FCC ID:** YWOELECOM3



**Report No.:** ER/2012/20008-02

**Issue Date:** Mar. 09, 2012

**FCC Rule Part:** §15.249

**Prepared for:** ELECOM CO., LTD.  
1-1 FUSHIMI-MACHI 4-CHOME, CHUO-KU,  
OSAKA-SHI, OSAKA, JAPAN

**Prepared by:** SGS Taiwan Ltd.  
Electronics & Communication Laboratory  
No. 134, Wu Kung Rd., Wuku Industrial Zone,  
Taipei County, Taiwan.

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**VERIFICATION OF COMPLIANCE**

**Applicant:** ELECOM CO., LTD.  
 1-1 FUSHIMI-MACHI 4-CHOME, CHUO-KU, OSAKA-SHI,  
 OSAKA, JAPAN

**Product Description:** 2.4GHz Dongle

**Brand Name:** ELECOM

**Model No.:** ELECOM3

**FCC ID:** YWOELECOM3

**Model Difference:** N/A

**File Number:** ER/2012/20008-02

**Date of test:** Feb. 06, 2012~ Mar. 08, 2012

**Date of EUT Received:** Feb. 06, 2012

**We hereby certify that:**

The above equipment was tested by SGS Taiwan Ltd., Electronics & Communication Laboratory. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249.

The test results of this report relate only to the tested sample identified in this report.

**Test By:** *Jay Lin* **Date:** Mar. 09, 2012

*Jay Lin / Engineer*

**Prepared By:** *Tiffany Kao* **Date:** Mar. 09, 2012

*Tiffany Kao / Clerk*

**Approved By:** *Jim Chang* **Date:** Mar. 09, 2012

*Jim Chang / Supervisor*

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## Version

Version No.	Date	Description
00	Mar. 09, 2012	Initial creation of document

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## 1. GENERAL INFORMATION

### 1.1 Product Description

Product Name:	2.4GHz Dongle
Brand Name:	ELECOM
Model No.:	ELECOM3
Model Difference:	N/A
Hardware Version	Ver00
Software Version	Version 105
Operation Frequency:	2408~2474MHz, Step: 2MHz
Channel number:	34 channels
Modulation Type:	GFSK
Power Supply	DC 5V USB Port
Antenna Designation:	Printed Antenna

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## 1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **YWOLECOM3** filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

## 1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

## 1.4 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number is: 990257 and 236194, Canada Registration Number: 4620A-4.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

## 1.5 Special Accessories

Not available for this EUT intended for grant.

## 1.6 Equipment Modifications

Not available for this EUT intended for grant.

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## 2. System Test Configuration

### 2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2 EUT Exercise

The Transmitter was operated in the engineering operating mode. the Tx frequency was fixed which was for the purpose of the measurements.

### 2.3 Test Procedure

#### 2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

#### 2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003.

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## 2.4 Limitation

### (1) Conducted Emission

According to section 15.207(a) Conducted Emission Limits is as following.

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 - 56	56 - 46
0.5 – 5	56	46
5 - 30	60	50

### (2) Radiated Emission 15.249(a)

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following.

Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902 - 928	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
2400 – 2483.5	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
5725 – 5875	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
24.0 – 24.25 GHz	250 mV/m (107.95dBuV/m)	2500 uV/m (67.95dBuV/m)	3

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**(3) Radiated Emission 15.249 (d)**

Emission Radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in Section 15.209 as below, whichever is the lesser attenuation.

Frequency (MHz)	Field strength $\mu\text{V/m}$	Distance (m)	Field strength at 3m $\text{dB}\mu\text{V/m}$
1.705-30	30	30	69.54
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

**(4) Radiated Emission 15.249(e)**

For frequencies above 1000MHz, the above field strength limits are based on average limits. The peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20dB under any condition of modulation.

- Remark:
1. Emission level in  $\text{dB}\mu\text{V/m} = 20 \log (\mu\text{V/m})$
  2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
  3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of  $\xi$  15.205
  4. Emission spurious frequency which appearing within the Restricted Bands specified in provision of  $\xi$  15.205, then the general radiated emission limits in  $\xi$  15.209 apply.

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## 2.5 Configuration of Tested System

Fig. 2-1 Configuration

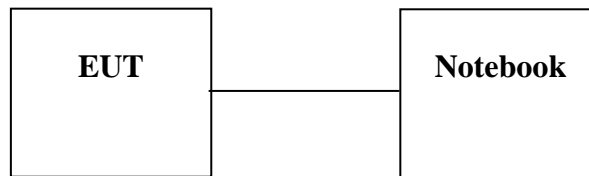


Table 2-2 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Notebook	DELL	E5400	3704625136	shielding	Un-shielding

**Note:** All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

**Grounding:** Grounding was in accordance with the manufacturer's requirements and conditions for the intended use.

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### 3. Summary of Test Results

FCC Rules	Description Of Test	Result
§15.207	Conducted Emission	N/A
§15.249(a)(e)	Radiated Emission	Compliant
§15.249(d)	20dB band width Measurement	Compliant

### 4. Description of test modes

The EUT has been tested under operating condition.  
The EUT is staying in continuous transmitting mode.

Channel low (2408MHz) 、mid (2440MHz) and high (2474MHz) with highest data rate are chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode). The worst-case of E2 position were reported.

### 5. Measurement Uncertainty for Field Strength of Spurious Radiation

Measurement uncertainty (Polarization : <b>Vertical</b> )	30MHz - 180MHz: 3.37dB
	180MHz -417MHz: 3.19dB
	0.417GHz-1GHz: 3.19dB
	1GHz - 18GHz: 4.04dB
	18GHz - 40GHz: 4.04dB

Measurement uncertainty (Polarization : <b>Horizontal</b> )	30MHz - 167MHz: 4.22dB
	167MHz -500MHz: 3.44dB
	0.5GHz-1GHz: 3.39dB
	1GHz - 18GHz: 4.08dB
	18GHz - 40GHz: 4.08dB

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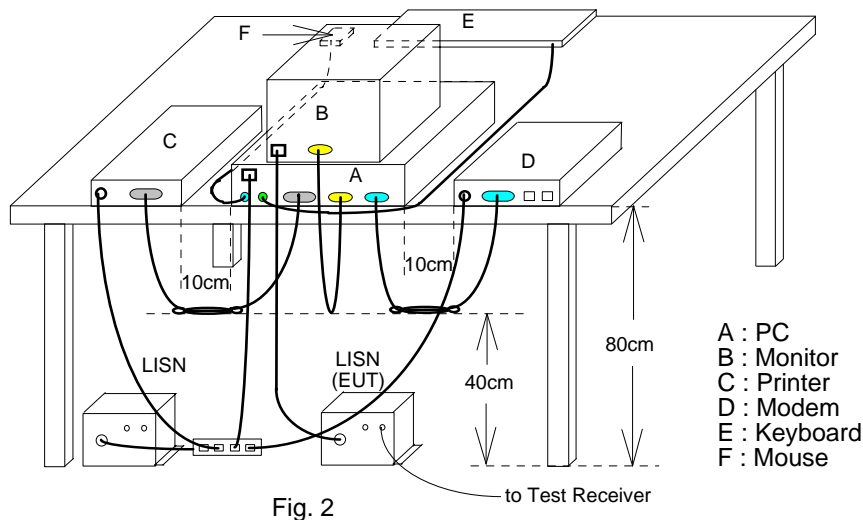
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## 6. Conducted Emissions Test

### 6.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

### 6.2 Test SET-UP (Block Diagram of Configuration)



### 6.3 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
EMI Test Receiver	R&S	ESC17	100759	05/20/2011	05/19/2013
LISN	Rolf-Heine	NNB-2/16Z	99012	03/31/2011	03/30/2012
LISN	FCC	FCC-LISN-50/250-25-2-01	04034	03/31/2011	03/30/2012
Coaxial Cables	N/A	WK CE Cable	N/A	01/04/2011	01/05/2013

### 6.4 Measurement Result:

Refer to next page for measurement data and plots.

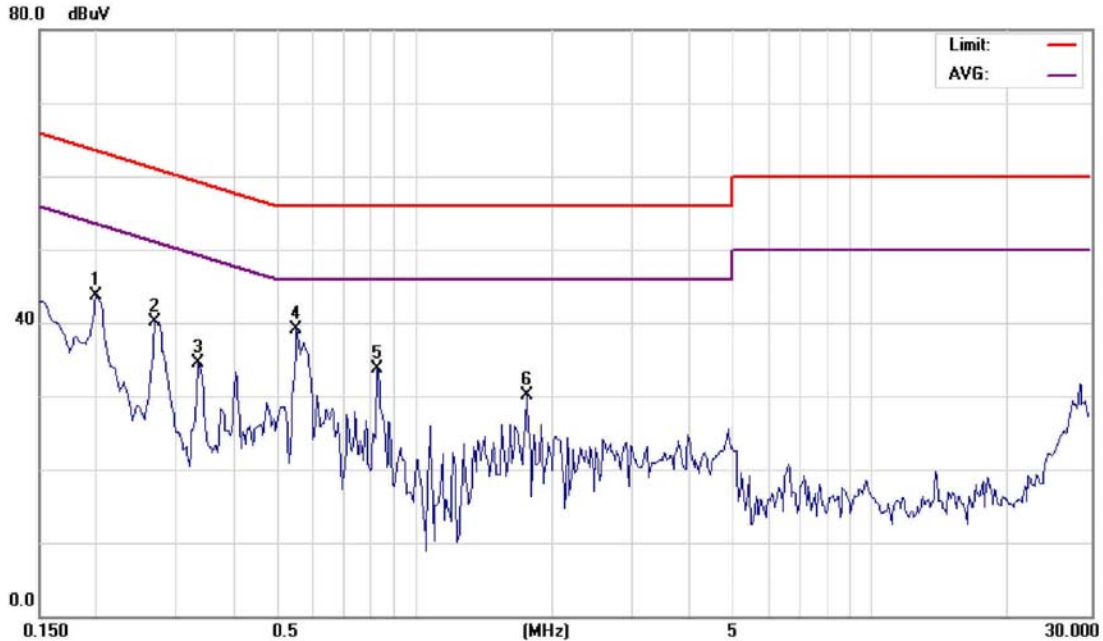
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### AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Charger Mode		Test Date:	Mar. 08, 2012	
Temperature:	23 °C	Humidity:	61 %	Test By:	Jay



Site	SGS CONDUCTED #1	Phase:	L1	Temperature:	24 °C
Limit:	FCC Class B Conduction(QP)	Power:	AC 120V/60Hz	Humidity:	60%
EUT:	2.4GHz Wireless Dongle	Distance:		Air Pressure:	hpa
M/N:	C55				
Note:	Operationmode				
	IMEI : 012686000001240				

No.	Mk.	Freq.	Reading Level	Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.2000	43.62	0.12	43.74	63.61	-19.87	peak	
2		0.2700	40.01	0.12	40.13	61.12	-20.99	peak	
3		0.3350	34.45	0.12	34.57	59.33	-24.76	peak	
4	*	0.5500	39.08	0.12	39.20	56.00	-16.80	peak	
5		0.8300	33.56	0.12	33.68	56.00	-22.32	peak	
6		1.7600	29.88	0.15	30.03	56.00	-25.97	peak	

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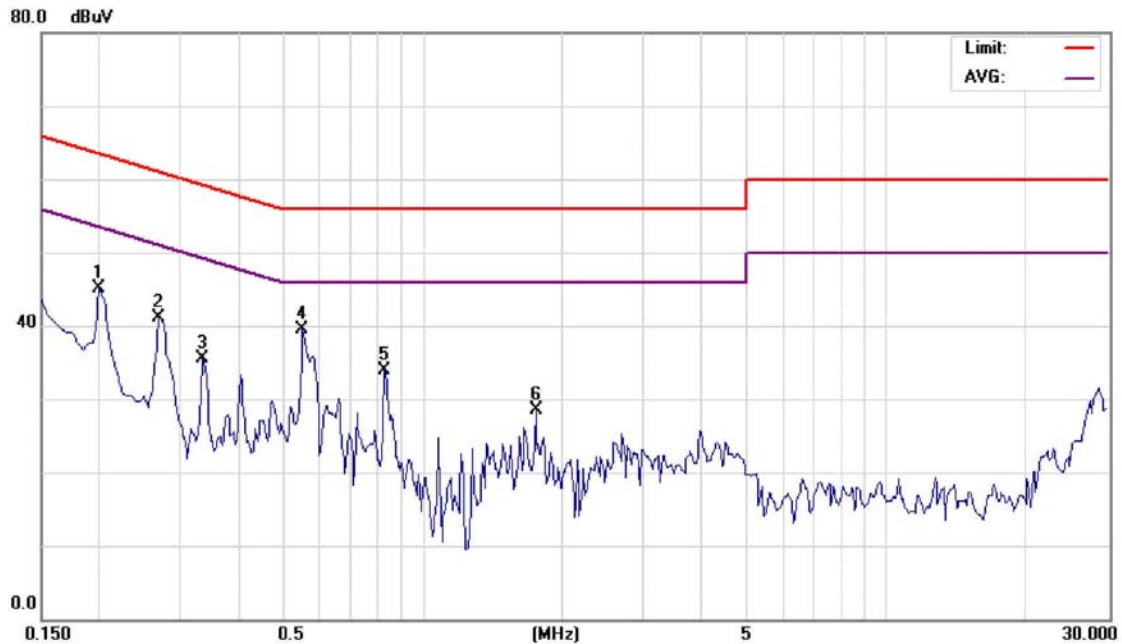
台灣檢驗科技股份有限公司

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Site	SGS CONDUCTED #1	Phase:	N	Temperature:	24 °C
Limit:	FCC Class B Conduction(QP)	Power:	AC 120V/60Hz	Humidity:	60%
EUT:	2.4GHz Wireless Dongle	Distance:		Air Pressure:	hpa
M/N:	C55				
Note:	Operationmode				
	IMEI : 01268600001240				

No.	Mk.	Freq.	Reading Level	Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.2000	44.91	0.13	45.04	63.61	-18.57	peak	
2		0.2700	40.93	0.13	41.06	61.12	-20.06	peak	
3		0.3350	35.40	0.12	35.52	59.33	-23.81	peak	
4	*	0.5500	39.32	0.12	39.44	56.00	-16.56	peak	
5		0.8300	33.72	0.13	33.85	56.00	-22.15	peak	
6		1.7600	28.30	0.15	28.45	56.00	-27.55	peak	

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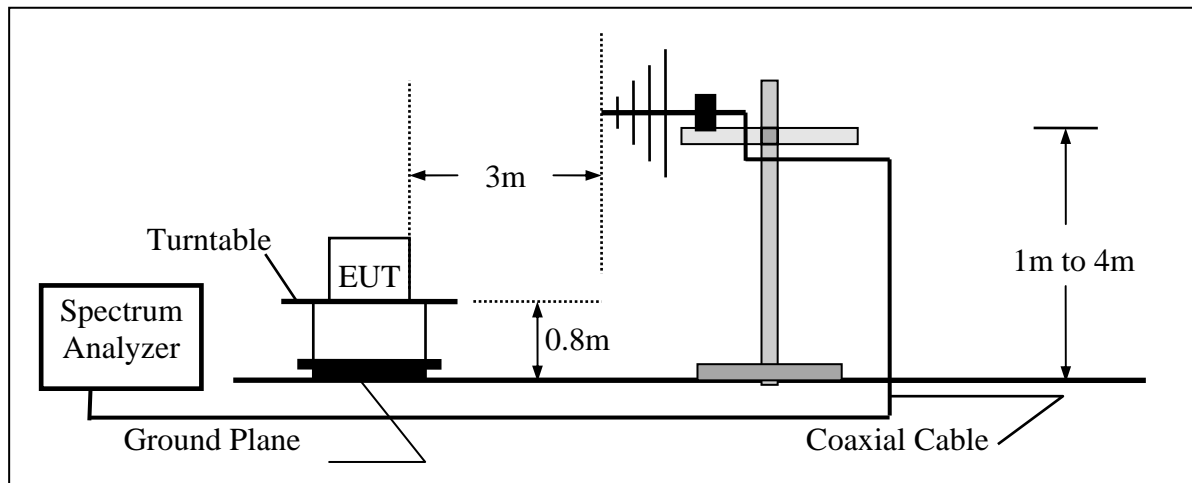
## 7. Radiated Emission Test

### 7.1 Measurement Procedure

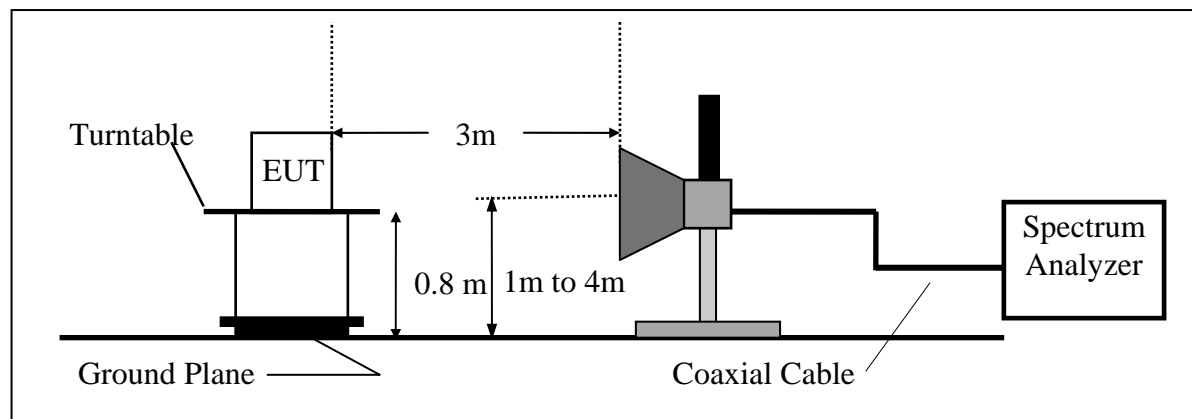
1. The EUT was placed on a turntable that is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

### 7.2 Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



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### 7.3 Measurement Equipment Used:

966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSV-30	101398	10/18/2011	10/17/2013
EMI Test Receiver	R&S	ESCI7	100759	05/20/2011	05/19/2013
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2011	04/14/2013
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	02/15/2011	02/14/2013
Bilog Antenna	SCHWAZBECK	VULB9168	378	01/10/2010	01/09/2012
Horn antenna	ETS.LINDGREN	3117	123995	03/19/2011	03/18/2013
Pre-Amplifier	Agilent	8447D	1937A02834	01/05/2012	01/04/2013
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2012	01/04/2013
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/05/2012	01/04/2013
Radio Communication Analyzer	R & S	CMU200	102189	08/12/2010	08/11/2012
DC Block	Agilent	BLK-18	155452	01/05/2012	01/04/2013
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2012	01/04/2013
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2012	01/04/2013
3m Site	SGS	966 chamber	N/A	07/15/2011	07/14/2012

### 7.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

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## 7.5 Measurement Result

### Radiated Spurious Emission Measurement Result

Operation Band	:2.4G	Test Date	:2012-03-06
Fundamental Frequency	:2408	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX LOW	Engineer	:Jay
EUT Pol.	:E2	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	Margin
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	dB
34.85	S	Peak	51.29	-14.71	36.58	40.00	-3.42
152.22	S	Peak	43.49	-13.28	30.21	43.50	-13.29
495.60	S	Peak	37.72	-8.10	29.62	46.00	-16.38
600.36	S	Peak	36.01	-4.97	31.04	46.00	-14.96
696.39	S	Peak	32.72	-3.74	28.98	46.00	-17.02
930.16	S	Peak	34.48	-0.43	34.05	46.00	-11.95
2408	F	Average	75.49	2.19	77.68	94.00	-16.32
2408	F	Peak	86.07	2.19	88.26	114.00	-25.74
4816.00	H	Peak	35.90	6.54	42.44	74.00	-31.56
7224.00	H	---					
9632.00	H	---					
12040.00	H	---					
14448.00	H	---					
16856.00	H	---					
19264.00	H	---					
21672.00	H	---					
24080.00	H	---					

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Operation Band	:2.4G	Test Date	:2012-03-06
Fundamental Frequency	:2408	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX LOW	Engineer	:Jay
EUT Pol.	:E2	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	Margin
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	dB
152.22	S	Peak	42.32	-13.28	29.04	43.50	-14.46
299.66	S	Peak	49.24	-12.40	36.84	46.00	-9.16
450.01	S	Peak	40.62	-8.11	32.51	46.00	-13.49
600.36	S	Peak	38.05	-4.97	33.08	46.00	-12.92
639.16	S	Peak	37.84	-4.80	33.04	46.00	-12.96
929.19	S	Peak	31.04	-0.49	30.55	46.00	-15.45
2408	F	Average	80.24	2.19	82.43	94.00	-11.57
2408	F	Peak	98.83	2.19	101.02	114.00	-12.98
4816.00	H	Peak	35.26	6.54	41.80	74.00	-32.20
7224.00	H	---					
9632.00	H	---					
12040.00	H	---					
14448.00	H	---					
16856.00	H	---					
19264.00	H	---					
21672.00	H	---					
24080.00	H	---					

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Operation Band	:2.4G	Test Date	:2012-03-06
Fundamental Frequency	:2440	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX MID	Engineer	:Jay
EUT Pol.	:E2	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	Margin
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	dB
30.00	S	Peak	52.32	-14.63	37.69	40.00	-2.31
141.55	S	Peak	42.92	-13.61	29.31	43.50	-14.19
295.78	S	Peak	37.00	-12.45	24.55	46.00	-21.45
600.36	S	Peak	32.18	-4.97	27.21	46.00	-18.79
694.45	S	Peak	34.40	-3.54	30.86	46.00	-15.14
843.83	S	Peak	29.71	-1.35	28.36	46.00	-17.64
2440	F	Average	76.39	2.26	78.65	94.00	-15.35
2440	F	Peak	86.61	2.26	88.87	114.00	-25.13
4880.00	H	Peak	36.54	6.60	43.14	74.00	-30.86
7320.00	H	---					
9760.00	H	---					
12200.00	H	---					
14640.00	H	---					
17080.00	H	---					
19520.00	H	---					
21960.00	H	---					
24400.00	H	---					

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Operation Band	:2.4G	Test Date	:2012-03-06
Fundamental Frequency	:2440	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX MID	Engineer	:Jay
EUT Pol.	: E2 PLAN	Measurement Antenna Pol.	: HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	Margin
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	dB
154.16	S	Peak	42.43	-13.32	29.11	43.50	-14.39
299.66	S	Peak	46.96	-12.40	34.56	46.00	-11.44
450.01	S	Peak	41.23	-8.11	33.12	46.00	-12.88
600.36	S	Peak	38.62	-4.97	33.65	46.00	-12.35
750.71	S	Peak	33.43	-3.11	30.32	46.00	-15.68
800.18	S	Peak	34.24	-2.74	31.50	46.00	-14.50
2440	F	Average	82.48	2.26	84.74	94.00	-9.26
2440	F	Peak	98.81	2.26	101.07	114.00	-12.93
4880.00	H	Peak	35.48	6.60	42.08	74.00	-31.92
7320.00	H	---					
9760.00	H	---					
12200.00	H	---					
14640.00	H	---					
17080.00	H	---					
19520.00	H	---					
21960.00	H	---					
24400.00	H	---					

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Operation Band	:2.4G	Test Date	:2012-03-06
Fundamental Frequency	:2474	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX HIGH	Engineer	:Jay
EUT Pol.	:E2	Measurement Antenna Pol.	:VERTICAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	Margin
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	dB
145.43	S	Peak	42.38	-13.45	28.93	43.50	-14.57
292.87	S	Peak	37.00	-12.50	24.50	46.00	-21.50
450.01	S	Peak	31.47	-8.11	23.36	46.00	-22.64
600.36	S	Peak	34.61	-4.97	29.64	46.00	-16.36
696.39	S	Peak	29.89	-3.74	26.15	46.00	-19.85
777.87	S	Peak	29.80	-2.29	27.51	46.00	-18.49
2474	F	Average	75.28	2.36	77.64	94.00	-16.36
2474	F	Peak	88.03	2.36	90.39	114.00	-23.61
4948.00	H	Peak	35.37	6.67	42.04	74.00	-31.96
7422.00	H	---					
9896.00	H	---					
12370.00	H	---					
14844.00	H	---					
17318.00	H	---					
19792.00	H	---					
22266.00	H	---					
24740.00	H	---					

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Operation Band	:2.4G	Test Date	:2012-03-06
Fundamental Frequency	:2474	Temp./Humi.	:27 deg_C / 66 RH
Operation Mode	:TX HIGH	Engineer	:Jay
EUT Pol.	:E2	Measurement Antenna Pol.	:HORIZONTAL

Actual FS(dBμV/m) = SPA. Reading level(dBμV) + Factor(dB)

Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre\_Amplifier Gain(dB)

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

“---” : denotes Noise Floor.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	Margin
		PK/QP/AV	dBμV		dBμV/m	dBμV/m	dB
71.71	S	Peak	40.73	-16.84	23.89	40.00	-16.11
144.46	S	Peak	40.41	-13.49	26.92	43.50	-16.58
291.90	S	Peak	43.08	-12.51	30.57	46.00	-15.43
450.01	S	Peak	39.59	-8.11	31.48	46.00	-14.52
600.36	S	Peak	35.37	-4.97	30.40	46.00	-15.60
769.14	S	Peak	30.94	-2.49	28.45	46.00	-17.55
2474	F	Average	84.54	2.36	86.90	94.00	-7.10
2474	F	Peak	98.54	2.36	100.90	114.00	-13.10
4948.00	H	Peak	35.28	6.67	41.95	74.00	-32.05
7422.00	H	---					
9896.00	H	---					
12370.00	H	---					
14844.00	H	---					
17318.00	H	---					
19792.00	H	---					
22266.00	H	---					
24740.00	H	---					

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## 8. 20 dB Band Width Measurement

### 8.1 Measurement Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set ETU normal operating mode.
3. Set SPA Center Frequency = fundamental frequency, RBW = 100kHz, VBW = 300kHz, Span = 3MHz.
4. Set SPA Max hold. Mark peak, -20dB.

### 8.2 Test SET-UP (Block Diagram of Configuration)

Same as 7.2 Radiated Emission Measurement.

### 8.3 Measurement Equipment Used:

Same as 7.3 Radiated Emission Measurement.

### 8.4 Measurement Results:

2408 Channel = 2.179MHz

2440 Channel = 2.195MHz

2474 Channel = 2.189MHz

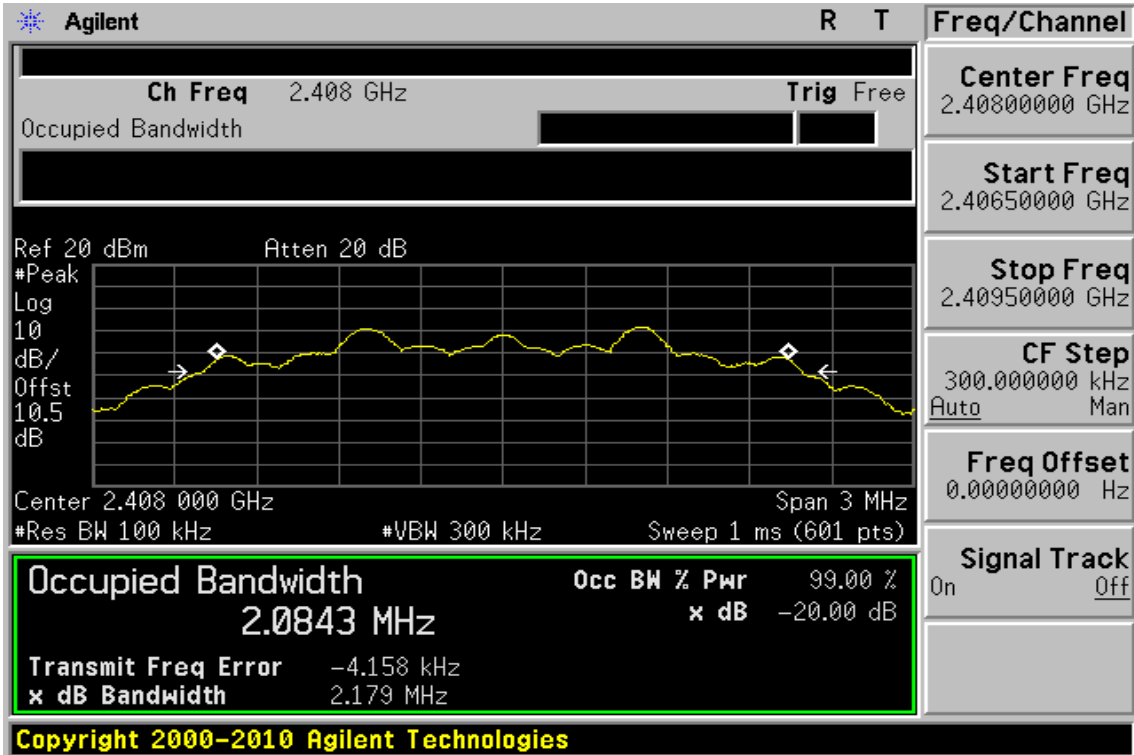
Refer to attached data chart.

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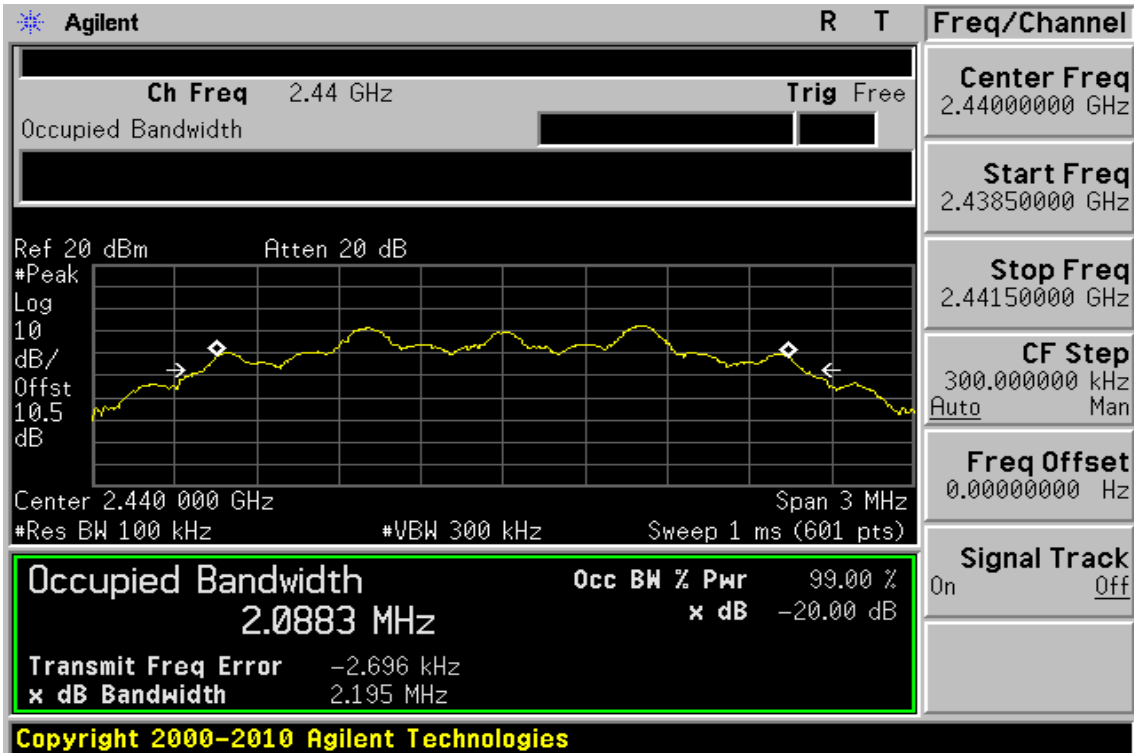
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**20dB Bandwidth Test Data CH-Low**



**20dB Bandwidth Test Data CH-Mid**



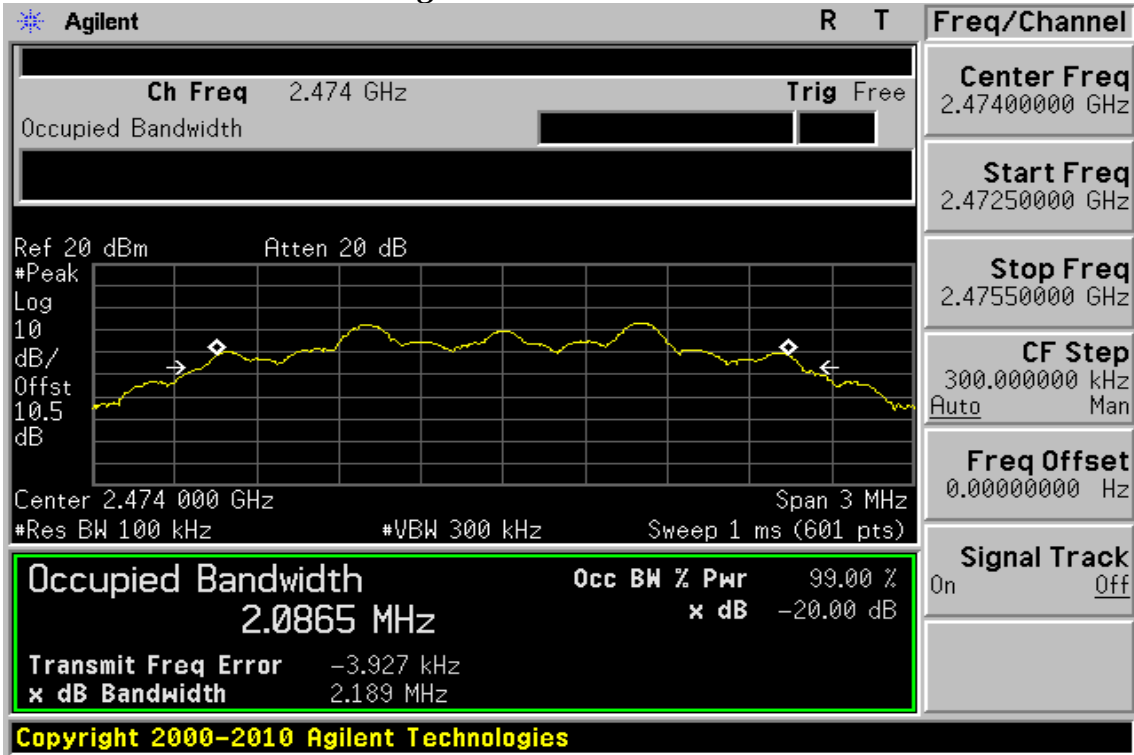
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**20dB Bandwidth Test Data CH-High**



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