

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 15 SUBPART C REQUIREMENT

OF

Product Name: In Wall Dual relay(2 way) switch module

Brand Name:



Model No.: PAN07-2

Model Difference: N/A

FCC ID: RHHPAN07

Report No.: ER/2014/90059

Issue Date: Oct. 06, 2014

FCC Rule Part: §15.249

Prepared for: Philio Technology Corporation

8F., NO.653-2,Zhongzheng Rd., Xinzhuang Dist., New
Taipei City, 24257, Taiwan(R.O.C)

Prepared by:

SGS Taiwan Ltd.

Electronics & Communication Laboratory

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VERIFICATION OF COMPLIANCE

Applicant: Philio Technology Corporation
8F., NO.653-2,Zhongzheng Rd., Xinzhuang Dist., New Taipei City,
24257, Taiwan(R.O.C)

Product Name: In Wall Dual relay(2 way) switch module

Brand Name: 

Model No.: PAN07-2

FCC ID: RHHPAN07

Model Difference: N/A

File Number: ER/2014/90059

Date of test: Sep. 19, 2014 ~ Oct. 06, 2014

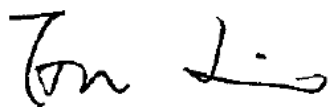
Date of EUT Received: Sep. 19, 2014

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 2009 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:

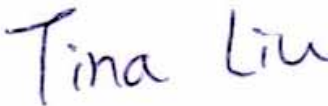


Date:

Oct. 06, 2014

Tin Lin / Engineer

Prepared By:

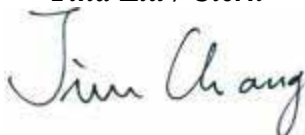


Date:

Oct. 06, 2014

Tina Liu / Clerk

Approved By:



Date:

Oct. 06, 2014

Jim Chang / Supervisor

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Version

Version No.	Date	Description
00	Oct. 06, 2014	Initial creation of document

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1. GENERAL INFORMATION

1.1 Product Description

Product Name:	In Wall Dual relay(2 way) switch module
Brand Name:	
Model No.:	PAN07-2
Model Difference:	N/A
Transmit Power:	97.32dBuV/m
Operation Frequency:	908.4MHz~916.0MHz
Channel number:	2 channels
Modulation Type:	FSK
Hardware Version:	N/A
Software Version:	N/A
Power Supply:	90~264 VAC by AC power
Antenna Designation:	Monopole Antenna

This report complies with FCC 15.249

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1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: **RHHPAN07** 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 2009. 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.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan 333 which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2009. FCC Registration Number: 628985. The address of SGS Taiwan Ltd. Electronics & Communication Laboratory 1F, No.134, Wukung Road New Taipei City TAIWAN 24803, Canada Registration Number: 4620A-5.

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. FCC Registration Number: 455997. The address of SGS Taiwan Ltd. Electronics & Communication Laboratory 1F, No.134, Wukung Road New Taipei City TA

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 C63.4-2009. 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 C63.4-2009.

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

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2.5 Configuration of Tested System

Fig. 2-1 Configuration (Radiated & Conducted)

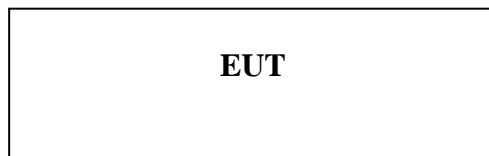


Table 2-2 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.
1.	N/A			

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	Compliant
§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.

908.4 MHz and 916.0 MHz are chosen for all testing.

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5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 2.586 dB
20 dB OCCUPIED BANDWIDTH	+/- 123.36 Hz
Temperature	+/- 0.8 °C
Humidity	+/- 4.7 %
DC / AC Power Source	DC= +/- 1%, AC=+/- 0.2%

Radiated Spurious Emission:

Measurement uncertainty	9kHz - 30MHz: +/- 2.3dB
-------------------------	-------------------------

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

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

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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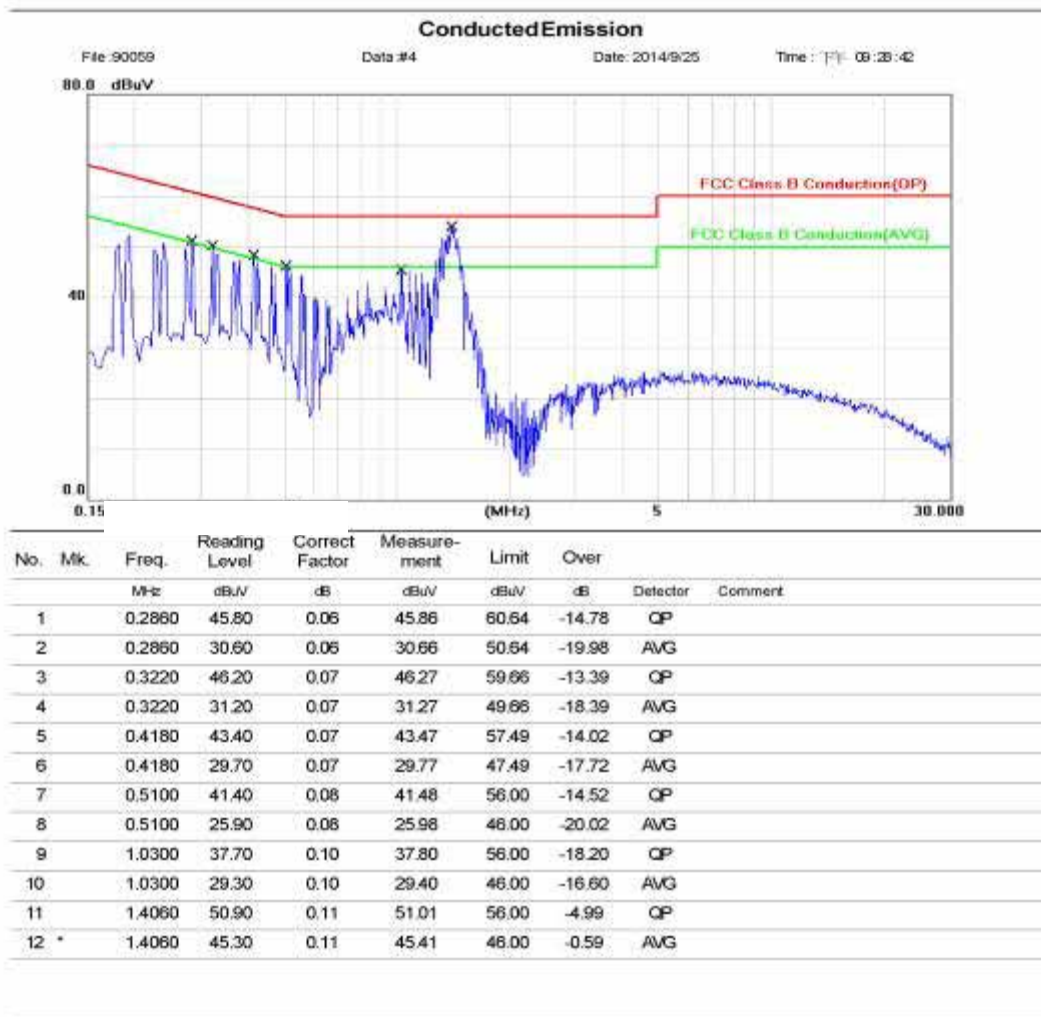
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AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation mode			Test Date:	Sep. 25, 2014
Temperature:	26	Humidity:	60 %	Test By:	Louis

Site: ConductionRoom	Phase: L1	Temperature: 26 °C
Limit: FCC Class B Conduction(QP)	Power: AC 120V/60Hz	Humidity: 60%
Mode: Operation		
Note:		



*: Maximum data x: Over limit !: over margin

File: 90059>Data: #4

Page: 1

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Site: ConductionRoom

Phase: N

Temperature: 25 °C

Limit: FCC Class B Conduction(QP)

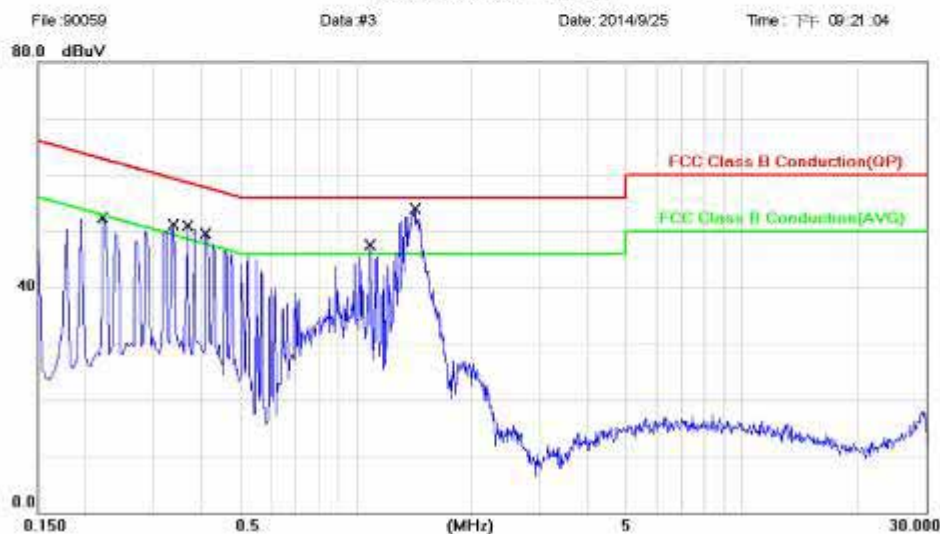
Power: AC 120V/60Hz

Humidity: 60%

Mode: Operation

Note:

Conducted Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1					46.76	62.74	-15.98	QP	
2		0.2220	29.10	0.06	29.16	52.74	-23.58	AVG	
3		0.3380	46.10	0.07	46.17	59.25	-13.08	QP	
4		0.3380	29.50	0.07	29.57	49.25	-19.68	AVG	
5		0.3660	45.60	0.07	45.67	58.59	-12.92	QP	
6		0.3660	30.00	0.07	30.07	48.59	-18.52	AVG	
7		0.4100	44.40	0.07	44.47	57.65	-13.18	QP	
8		0.4100	28.40	0.07	28.47	47.65	-19.18	AVG	
9		1.0900	39.20	0.10	39.30	56.00	-16.70	QP	
10		1.0900	26.80	0.10	26.90	46.00	-19.10	AVG	
11		1.4260	51.20	0.11	51.31	56.00	-4.69	QP	
12	*	1.4260	45.10	0.11	45.21	46.00	-0.79	AVG	

*: Maximum data x: Over limit !: over margin

File: 90059/Data: #3

Page: 1

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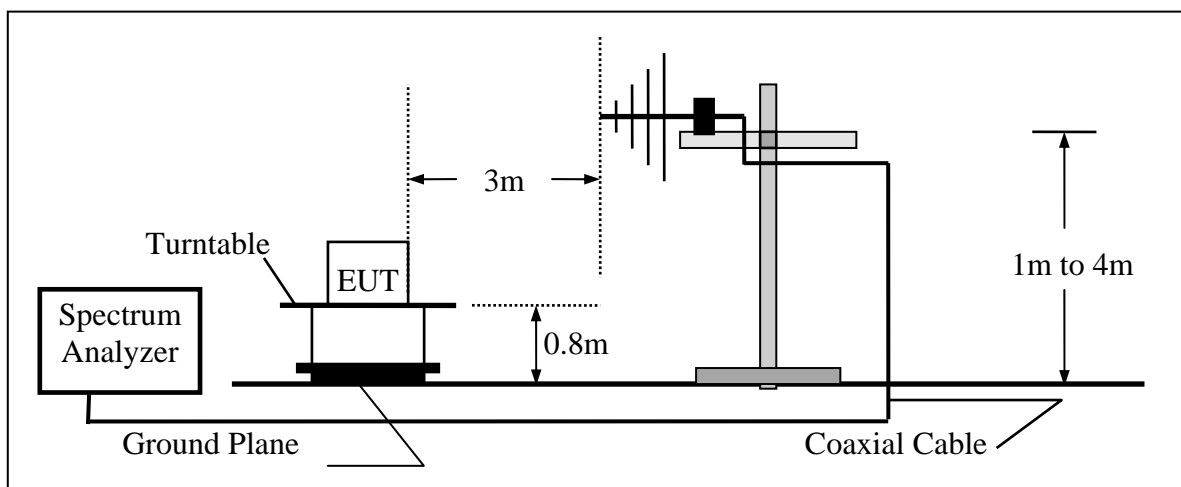
7. Radiated Emission Test

7.1 Measurement Procedure

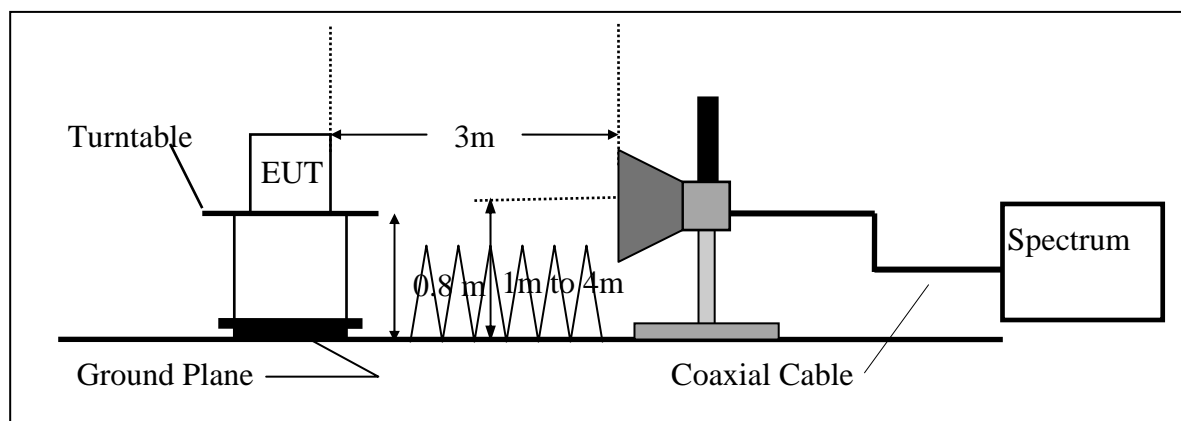
1. The EUT was placed on a turntable that is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above 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.
EMI Test Receiver	R&S	ESCI7	100760	05/26/2014	05/25/2015
Spectrum Analyzer	Agilent	E4446A	MY51100003	05/19/2014	05/18/2015
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	01/20/2014	01/19/2015
Spectrum Analyzer	R&S	FSV-30	101398	10/22/2013	10/21/2014
Loop Antenna	ETS.LINDGREN	6502	00148045	07/03/2014	07/02/2015
Bilog Antenna	SCHWAZBECK	VULB9168	378	01/02/2014	01/01/2015
Horn antenna	ETS.LINDGREN	3117	123995	05/19/2014	05/18/2015
Horn Antenna	Schwarzbeck	BBHA9170	184	01/23/2014	01/22/2015
Pre-Amplifier	Agilent	8447D	2944A07676	01/03/2014	01/02/2015
Pre-Amplifier	Agilent	8449B	3008A00578	01/03/2014	01/02/2015
Pre-Amplifier	EMC Instruments Corp.	EMC184045	980135	01/24/2014	01/23/2015
Filter 2400-2483.5 MHz	EWT	EWT-14-0166	M2	02/27/2014	02/26/2015
Attenuator	Mini-Circuit	BW-S10W2+	004	02/27/2014	02/26/2015
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	Huber Suhner	966_Rx	9	01/03/2014	01/02/2015
3m Site NSA	SGS	966 chamber	N/A	07/15/2014	07/14/2015

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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 (MAIN)

Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:908.4 MHz	Temp./Humi.	:21 deg_C / 54 RH
Operation Mode	:MAIN LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

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

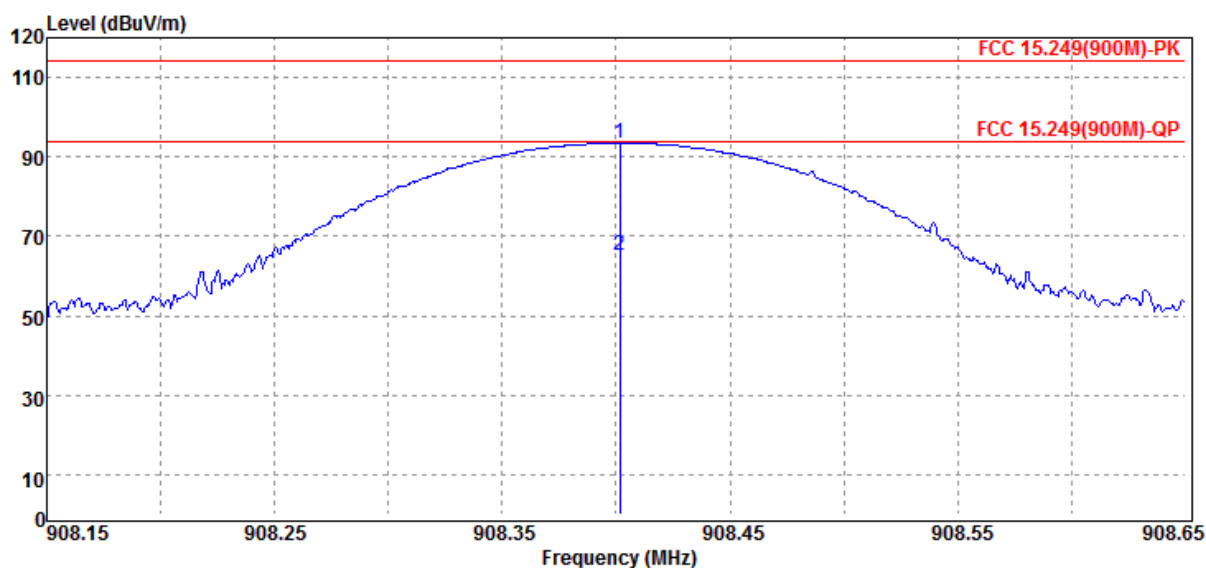
Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

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

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

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
MHz	F/H/E/S	Mode	Reading Level	dB	FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
908.40	F	Peak	94.00	-0.54	93.46	114.00	-20.54
908.40	F	QP	65.76	-0.54	65.22	94.00	-28.78

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Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:908.4 MHz	Temp./Humi.	:21 deg_C / 54 RH
Operation Mode	:MAIN LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

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

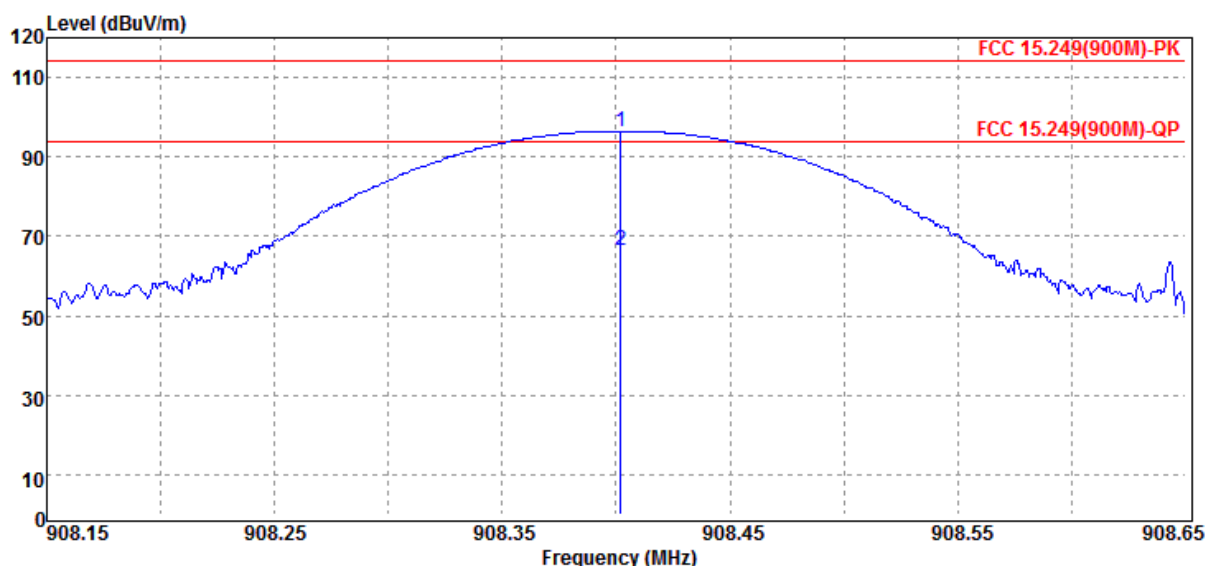
Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

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

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

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.



Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
MHz	F/H/E/S	Mode	Reading Level		FS	@3m	Margin
		PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
908.40	F	Peak	97.07	-0.54	96.53	114.00	-17.47
908.40	F	QP	67.17	-0.54	66.63	94.00	-27.37

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Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:916 MHz	Temp./Humi.	:21 deg_C / 54 RH
Operation Mode	:MAIN HIGH	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

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

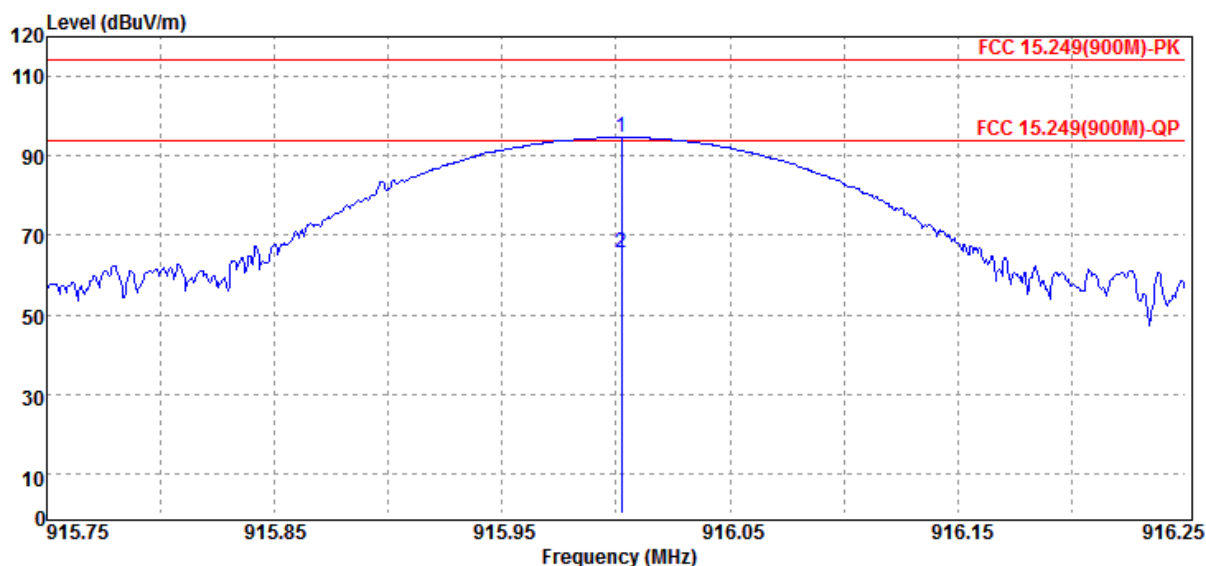
Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

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

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

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Safe Margin dB
916.00	F	Peak	94.93	-0.33	94.60	114.00	-19.40
916.00	F	QP	66.13	-0.33	65.80	94.00	-28.20

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Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:916 MHz	Temp./Humi.	:21 deg_C / 54 RH
Operation Mode	:MAIN HIGH	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:HORIZONTAL

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

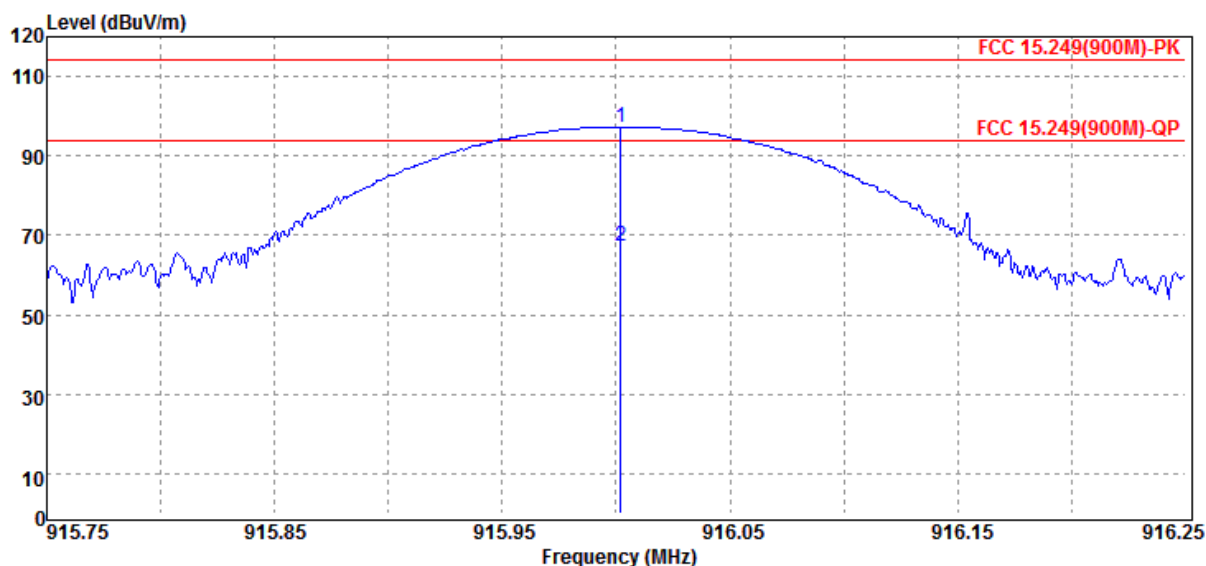
Factor(dB) = Antenna Factor(dBμV/m) + Cable Loss(dB) – Pre_Amplifier Gain(dB)

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

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

“---” : denotes Noise Floor.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.



Freq. MHz	Note F/H/E/S	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Safe Margin dB
916.00	F	Peak	97.65	-0.33	97.32	114.00	-16.68
916.00	F	QP	67.58	-0.33	67.25	94.00	-26.75

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Radiated Emission:

(Unwanted Emissions into Restricted Frequency Bands):

Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:908.4 MHz	Temp./Humi.	:21 deg_C / 60 RH
Operation Mode	:Band Edge LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
902.00	E	QP	11.05	-0.78	10.27	46.00	-35.73

Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:908.4 MHz	Temp./Humi.	:21 deg_C / 60 RH
Operation Mode	:Band Edge LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Margin
		Mode	Reading Level		FS	@3m	
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
902.00	E	QP	13.56	-0.78	12.78	46.00	-33.22

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Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:916 MHz	Temp./Humi.	:21 deg_C / 60 RH
Operation Mode	:Band Edge HIGH	Engineer	:Tin
EUT Pol.	:E2 Plane	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
928.00	E	QP	16.98	-0.10	16.88	46.00	-29.12

Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:916 MHz	Temp./Humi.	:21 deg_C / 60 RH
Operation Mode	:Band Edge HIGH	Engineer	:Tin
EUT Pol.	:E2 Plane	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we’ve employed is peak detector.

Freq.	Note	Detector Mode	Spectrum Reading Level	Factor	Actual FS	Limit @3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
928.00	E	QP	19.33	-0.10	19.23	46.00	-26.77

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Radiated Spurious Emission Measurement Result

Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:908.4 MHz	Temp./Humi.	:21 deg_C / 60 RH
Operation Mode	:TX LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

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

Factor(dB) = Antenna Factor(dB μ V/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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
MHz	F/H/E/S	Mode	Reading Level		FS	@3m	Margin
		PK/QP/AV	dB μ V	dB	dB μ V/m	dB μ V/m	dB
42.61	S	Peak	43.13	-13.35	29.78	40.00	-10.22
588.72	S	Peak	34.50	-5.00	29.50	46.00	-16.50
620.73	S	Peak	36.48	-5.94	30.54	46.00	-15.46
652.74	S	Peak	37.27	-4.62	32.65	46.00	-13.35
684.75	S	Peak	36.20	-3.63	32.57	46.00	-13.43
748.77	S	Peak	34.99	-2.54	32.45	46.00	-13.55
1816.80	H	Average	52.07	-0.33	51.74	54.00	-2.26
1816.80	H	Peak	53.26	-0.33	52.93	74.00	-21.07
2725.20	H	---					
3633.60	H	---					
4542.00	H	---					
5450.40	H	---					
6358.80	H	---					
7267.20	H	---					
8175.60	H	---					
9084.00	H	---					

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Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:908.4 MHz	Temp./Humi.	:21 deg_C / 60 RH
Operation Mode	:TX LOW	Engineer	:Tin
EUT Pol.	:E2 Plane	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
35.82	S	Peak	31.16	-13.81	17.35	40.00	-22.65
278.32	S	Peak	26.53	-11.70	14.83	46.00	-31.17
432.55	S	Peak	27.63	-8.79	18.84	46.00	-27.16
556.71	S	Peak	28.28	-6.73	21.55	46.00	-24.45
740.04	S	Peak	27.09	-2.95	24.14	46.00	-21.86
976.72	S	Peak	28.10	0.26	28.36	54.00	-25.64
1816.80	H	Average	47.63	-0.33	47.30	54.00	-6.70
1816.80	H	Peak	49.20	-0.33	48.87	74.00	-25.13
2725.20	H	---					
3633.60	H	---					
4542.00	H	---					
5450.40	H	---					
6358.80	H	---					
7267.20	H	---					
8175.60	H	---					
9084.00	H	---					

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Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:916.0 MHz	Temp./Humi.	:21 deg_C / 60 RH
Operation Mode	:TX HIGH	Engineer	:Tin
EUT Pol.	:E2 Plane	Measurement Antenna Pol.	:VERTICAL

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

Factor(dB) = Antenna Factor(dB μ V/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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dB μ V	dB	dB μ V/m	dB μ V/m	dB
42.61	S	Peak	43.02	-13.35	29.67	40.00	-10.33
588.72	S	Peak	34.50	-5.00	29.50	46.00	-16.50
620.73	S	Peak	34.79	-5.94	28.85	46.00	-17.15
652.74	S	Peak	36.17	-4.62	31.55	46.00	-14.45
684.75	S	Peak	35.27	-3.63	31.64	46.00	-14.36
748.77	S	Peak	34.35	-2.54	31.81	46.00	-14.19
1832.00	H	Average	52.01	-0.20	51.81	54.00	-2.19
1832.00	H	Peak	53.02	-0.20	52.82	74.00	-21.18
2748.00	H	---					
3664.00	H	---					
4580.00	H	---					
5496.00	H	---					
6412.00	H	---					
7328.00	H	---					
8244.00	H	---					
9160.00	H	---					

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Operation Band	:	Test Date	:2014-09-26
Fundamental Frequency	:916.0 MHz	Temp./Humi.	:21 deg_C / 60 RH
Operation Mode	:TX HIGH	Engineer	:Tin
EUT Pol.	:E2 Plane	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.

The trace on RE(radiation emission) plot is as colored blue, and the detection manner we've employed is peak detector.

Freq.	Note	Detector	Spectrum	Factor	Actual	Limit	Safe
		Mode	Reading Level		FS	@3m	Margin
MHz	F/H/E/S	PK/QP/AV	dBμV	dB	dBμV/m	dBμV/m	dB
36.79	S	Peak	32.30	-13.75	18.55	40.00	-21.45
286.08	S	Peak	29.51	-11.51	18.00	46.00	-28.00
444.19	S	Peak	27.01	-8.45	18.56	46.00	-27.44
524.70	S	Peak	29.74	-7.34	22.40	46.00	-23.60
758.47	S	Peak	27.46	-2.52	24.94	46.00	-21.06
979.63	S	Peak	27.02	0.22	27.24	54.00	-26.76
1832.00	H	Average	47.43	-0.20	47.23	54.00	-6.77
1832.00	H	Peak	49.36	-0.20	49.16	74.00	-24.84
2748.00	H	---					
3664.00	H	---					
4580.00	H	---					
5496.00	H	---					
6412.00	H	---					
7328.00	H	---					
8244.00	H	---					
9160.00	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 = 5MHz.
4. Set SPA Max hold. Mark peak, -20dB.

8.2 Test SET-UP (Block Diagram of Configuration)

Refer to 7.2 Radiated Emission Measurement.

8.3 Measurement Equipment Used:

Refer to 4.2 Radiated Emission Measurement.

8.4 Measurement Results:

908.4 MHz = 269.334 MHz

916.0 MHz = 274.413 MHz

Refer to attached data chart.

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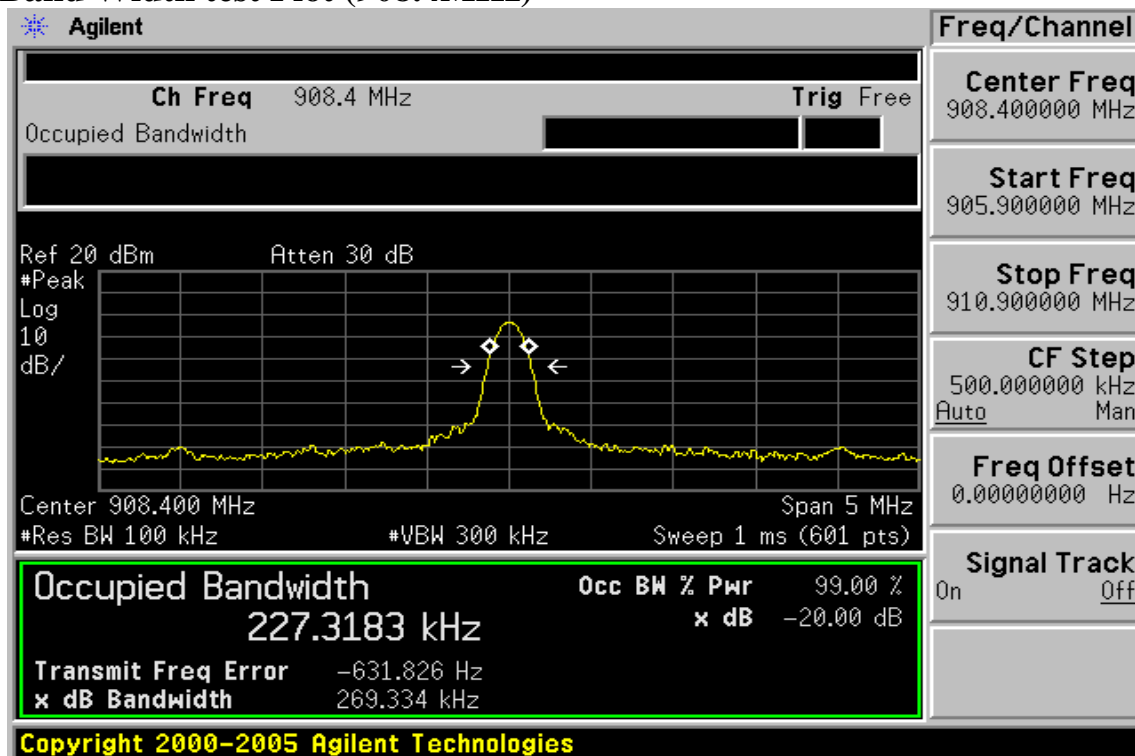
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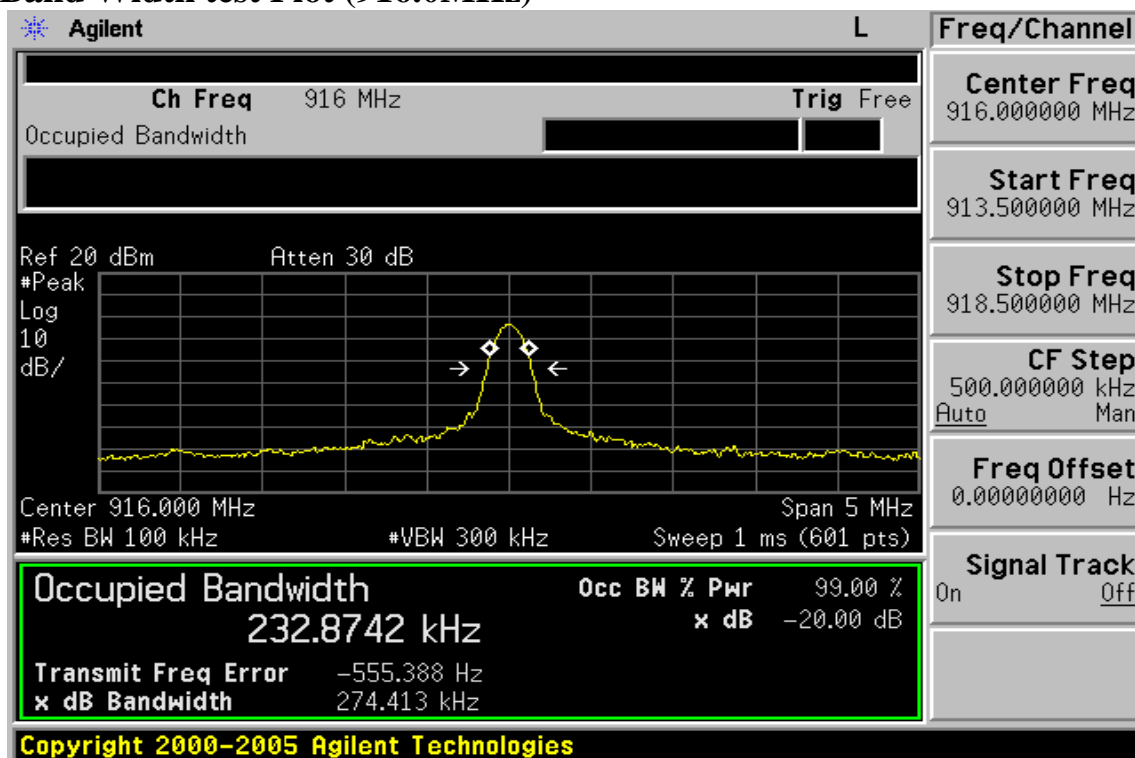
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20dB Band Width test Plot (908.4MHz)



20dB Band Width test Plot (916.0MHz)



~ End of Report ~

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