EMC TEST REPORT for UNII device

No. 131001017SHA-002

Applicant	: Hansong (Nanjing) Technology Ltd. 8th Kangping Road, Jiangning Economy & Technology Development Zone, Nanjing, 211106, China
Manufacturer	: Hansong (Nanjing) Technology Ltd. 8th Kangping Road, Jiangning Economy & Technology Development Zone, Nanjing, 211106, China
Product Name	: Wireless module
Type/Model	: HSDWAM83

SUMMARY

The equipment complies with the requirements according to the following standard(s):

47CFR Part 15 (2012): Radio Frequency Devices

ANSI C63.4 (2009): American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

RSS-210 Issue 8 (December 2010): Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

RSS-Gen Issue 3 (December 2010): General Requirements and Information for the Certification of Radiocommunication Equipment

Date of issue: Dec. 27, 2013

Prepared by:	Reviewed by:
Daniel Zhao (*Project Engineer*)	Jonny Jing (*Reviewer*)

Description of Test Facility

Name: Intertek Testing Services Limited Shanghai
Address: Building No.86, 1198 Qinzhou Road(North), Shanghai 200233, P.R. China

FCC Registration Number: 236597
IC Assigned Code: 2042B-1

Name of contact: Steve Li
Tel: +86 21 64956565 ext. 214
Fax: +86 21 54262335 ext. 214

Content

1. General Information

1.1 Applicant Information

Applicant	:	Hansong (Nanjing) Technology Ltd. 8th Kangping Road, Jiangning Economy & Technology Development Zone, Nanjing, 211106, China
Name of contact	:	Wyn B. Wang
Tel	:	+86 25 66612888
Fax	:	+86 25 66612098
Manufacturer	:	Hansong (Nanjing) Technology Ltd. 8th Kangping Road, Jiangning Economy & Technology Development Zone, Nanjing, 211106, China
Sample received date	:	Nov. 22, 2013
Sample Identification No	:	20131122-21-001
Date of test	:	Nov. 23 – Dec. 20, 2013

1.2 Identification of the EUT

Product Name	:	Wireless module
Type/model	:	HSDWAM83
FCC ID	:	XCO-HSDWAM83
IC	:	7756A-HSDWAM83

1.3 Technical specification

Operation Frequency Band	:	2412 – 2464 MHz & 5736 – 5814 MHz (refer to report 131001017SHA-001) 5180 – 5240 MHz
Modulation	:	QPSK
Description of EUT	:	This is wireless module for data transmission.
Location for use	:	Indoor Only
Antenna description	:	model / Type / Gain (dBi / Frequency band(GHz) Integral / PIFA / 1.5 / 2.4-2.5 1.5 / 5.1-5.9 RC8WFI10042A / mono antenna / 3.6 / 2.4-2.5 3.8 / 5.1-5.9 RC1WFI0901A / PIFA / 4.2 / 2.4-2.5 4.5 / 5.1-5.9
Rating		DC 3.5 V
Signal terminal		No
Channel Description		9 channels, 2412MHz, 2438 MHz, 2464 MHz, 5736 MHz, 5762 MHz, 5814, MHz 5180 MHz, 5210 MHz, 5240 MHz

1.4 Mode of operation during the test / Test peripherals used

Within this test report, EUT was tested under 120V/60Hz (supplied by a control board with AC-DC adaptor). The EUT has transmitting as well as receiving modes, so both were assessed.
While testing transmitting mode of EUT, the internal modulation was used.
While testing receiving mode of EUT, the signal generator was employed to generate continuous answer signal.
Radiated emission testing was performed for three different antennas.

Model	Type	Gain (dBi	Frequency band(GHz)
Integral	PIFA	1.5	2.4-2.5
		1.5	5.1-5.9
RC8WFI10042A	mono antenna	3.6	2.4-2.5
		3.8	5.1-5.9
RC1WFI0901A	PIFA	4.2	2.4-2.5
		4.5	5.1-5.9

Test peripherals used:

Item No	Description	Band and Model	S/No
1	Mini-PCI control board	HanSang	/
2	Adaptor	GPE	/

2. Test Specification

2.1 Instrument list

Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
Test Receiver	ESCS 30	R&S	EC 2107	2013-10-21	2014-10-20
Test Receiver	ESIB 26	R&S	EC 3045	2013-10-21	2014-10-20
Test Receiver	ESCI 7	R&S	EC4501	2012-12-29	2013-12-28
A.M.N.	ESH2-Z5	R&S	EC 3119	2013-1-9	2014-1-8
Ultra-broadband antenna	HL 562	R&S	EC 3046-1	2013-5-16	2014-5-15
Bilog Antenna	CBL 6112D	TESEQ	EC 4206	2013-5-16	2014-5-15
Horn antenna	HF 906	R&S	EC 3049	2013-5-13	2014-5-12
Pre-amplifier	Pre-amp 18	R&S	EC 3222	2013-4-12	2014-4-11
Pre-amplifier	Tpa0118-40	R&S	EC 4792-2	2013-4-12	2014-4-11
Log-period antenna	AT 1080	AR	EC 3044-7	2013-5-22	2014-5-21
Biconical antenna	3109PX	ETS	EC3564	2013-8-25	2014-8-24
Semi-anechoic chamber	-	Albatross project	EC 3048	2013-5-21	2014-5-20
Shielded room	-	Zhongyu	EC 2838	2009-1-12	2014-1-11
Shielded room	-	Zhongyu	EC 2839	2009-1-12	2014-1-11
High Pass Filter	WHKX 1.0/15G-10SS	Wainwright	EC4297-1	2013-2-1	2014-1-31
High Pass Filter	WHKX 2.8/18G-12SS	Wainwright	EC4297-2	2013-2-1	2014-1-31
High Pass Filter	WHKX 7.0/1.8G-8SS	Wainwright	EC4297-3	2013-2-1	2014-1-31
Band Reject Filter	WRCGV 2400/2483-2390/2493-35/10SS	Wainwright	EC4297-4	2013-2-1	2014-1-31

2.2 Test Standard

47CFR Part 15:2012
ANSI C63.4: 2009
RSS-210 Issue 8: 2010
RSS-Gen Issue 3: 2010

2.3 Test Summary

This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	FCC REFERANCE	IC REFERANCE	RESULT
Maximum conducted output power	15.407(a)(1)	RSS-210 Issue 8 Annex 9.2(1)	Pass
Power spectral density	15.407(a)(1)	RSS-210 Issue 8 Annex 9.2(1)	Pass
Peak excursion radio	15.407(a)(6)	-	Pass
Radiated emission	15.407 (b)(1) 15.205, 15.209	RSS-210 Issue 8 Annex 9.2(1)	Pass
Power line conducted emission	15.207	RSS-Gen Issue 3 Clause 7.2.4	Pass
26 dB Bandwidth	15.407(a)(1)	-	Tested
Emission Bandwidth (99%)	-	RSS-Gen Issue 3 Clause 4.6.1	Tested
Spurious emission for receiver	-	RSS-Gen Issue 3 Clause 6.1	Pass

3. Maximum Conducted Output Power & eirp

Test result: Pass

3.1 Test limit

FCC:

For the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50mW or 4dBm + 10log B, where B is the 26-dB emission bandwidth in MHz.

If transmitting antennas of directional gain greater than 6dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

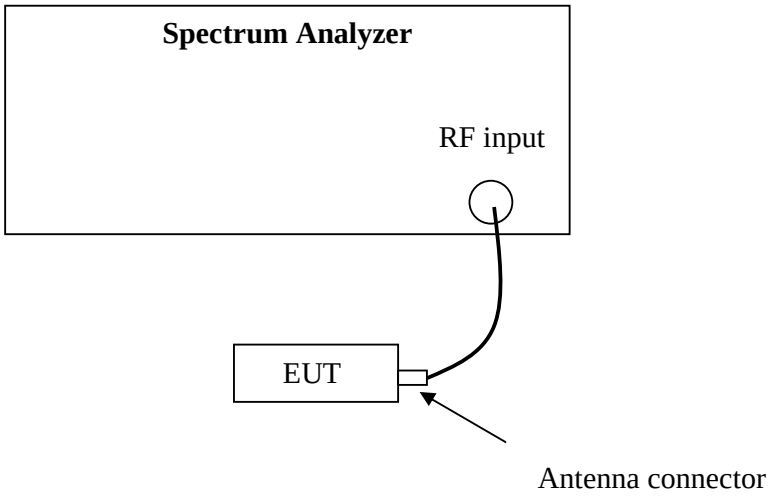
Frequency range (MHz)	Min. 26 dB Bandwidth (MHz)	4+ 10log B (dBm)	Limit (dBm)
5150 - 5250	16.50	16.17	16.17

RSS-210:

The maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Frequency range (MHz)	Min. 99% bandwidth (MHz)	10+ 10log B (dBm)	Limit (dBm)
5150 - 5250	15.20	21.82	21.82

3.2 Test Configuration



3.3 Test procedure and test setup

The power output per FCC §15.407(a) was measured on the EUT using a 50 ohm RF cable connected to spectrum analyzer and the measurement method refer to KDB 789033D01 v01r03: Method SA-1. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

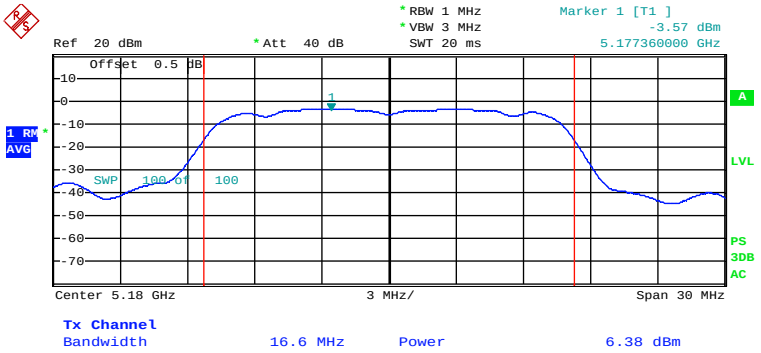
3.4 Test protocol

Temperature : 18 °C
Relative Humidity : 40 %

Test frequency (MHz)	Maximum Conducted Output Power (dBm)		Limits (dBm)
	Port A	Port B	
5180	6.38	6.80	16.17
5210	6.53	6.98	16.17
5240	6.63	7.44	16.17

The max. gain of Antenna = 4.5 dBi, the maximum e.i.r.p = 7.44dBm + 4.5dBi = 11.94 dBm (lower than the e.i.r.p limit of 21.82 dBm showed in RSS-210.).

CHAIN A, 5180 MHZ



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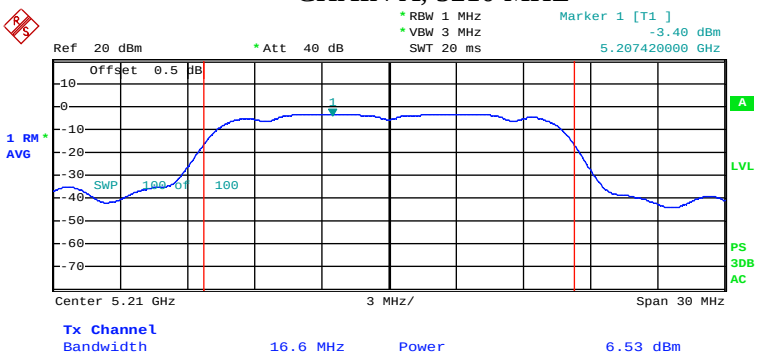
CHAIN A, 5210 MHZ



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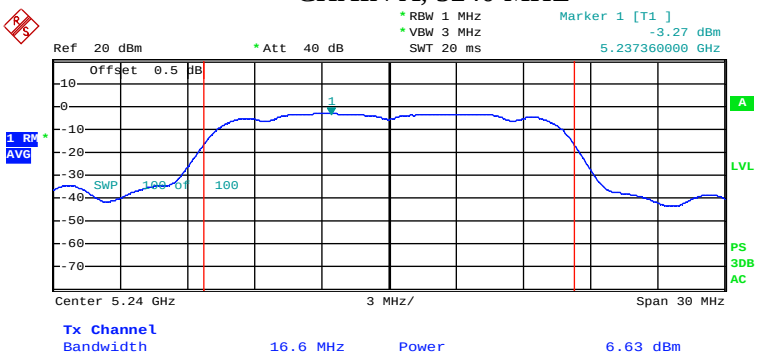
CHAIN A, 5240 MHZ



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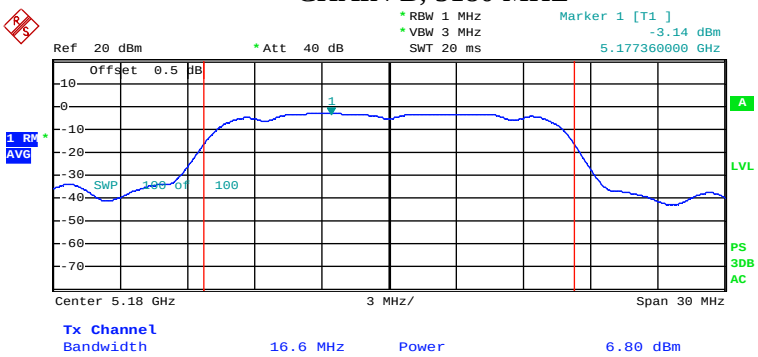
CHAIN B, 5180 MHZ



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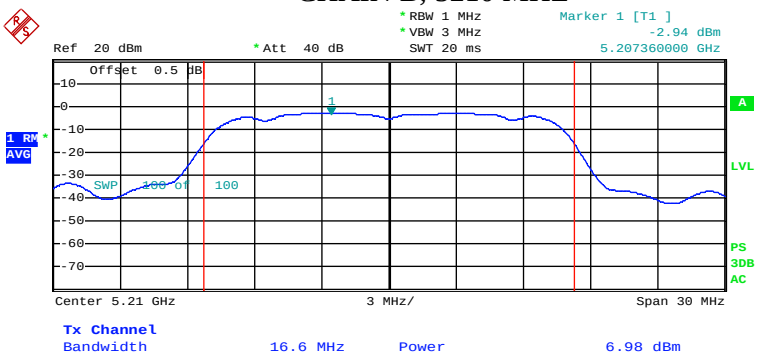
CHAIN B, 5210 MHZ



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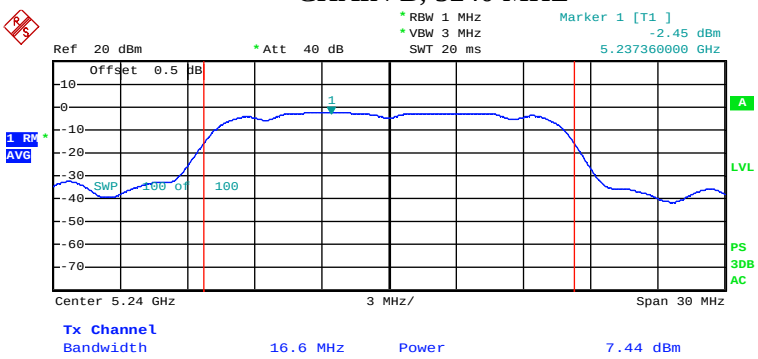
CHAIN B, 5240 MHZ



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4. Power spectral density

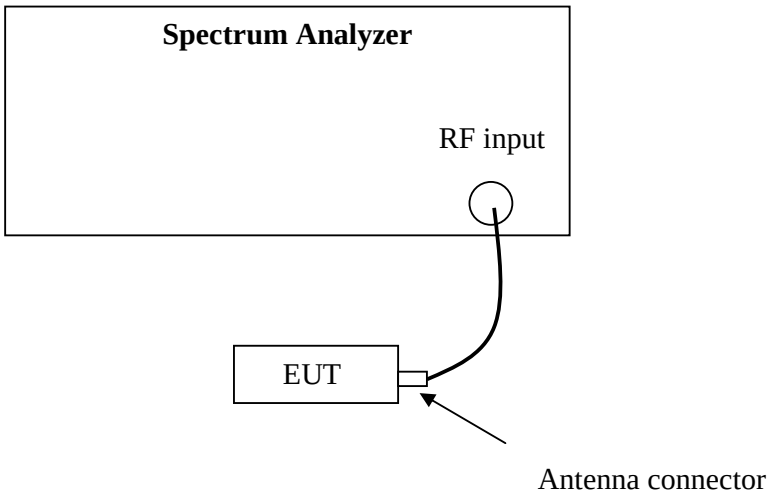
Test result: **Pass**

4.1 Test limit

FCC:
For the band 5.15-5.25 GHz, the peak power spectral density shall not exceed 4dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6dBi are used, the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

RSS-210:
The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

4.2 Test Configuration



4.3 Test procedure and test setup

The power spectral density per FCC §15.407(a) was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer with the resolution bandwidth set at 1MHz, the video bandwidth set at 3 MHz (measurement method refer to KDB 789033D01 v01r03: section F).
Power spectral density was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

4.4 Test Protocol

Temperature : 18 °C
Relative Humidity : 40 %

Test frequency	Power Spectral Density (dBm/MHz)		Limits
(MHz)	Port A	Port B	dBm/MHz
5180	-3.57	-3.14	4
5210	-3.40	-2.94	4
5240	-3.27	-2.45	4

The max. gain of Antenna = 4.50dBi, the maximum e.i.r.p. spectral density = -2.45dBm/MHz + 4.50 dBi =2.05 dBm/MHz (lower than limit of 10dBm/MHz showed in RSS-210).

Note: Please refer to clause 3.4 for test graph.

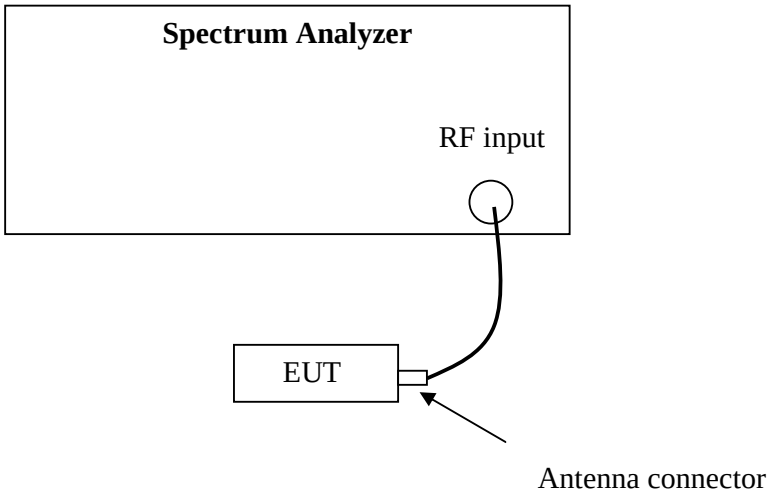
5. Peak Excursion

Test result: PASS

5.1 Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

5.2 Test Configuration



5.3 Test Procedure and test setup

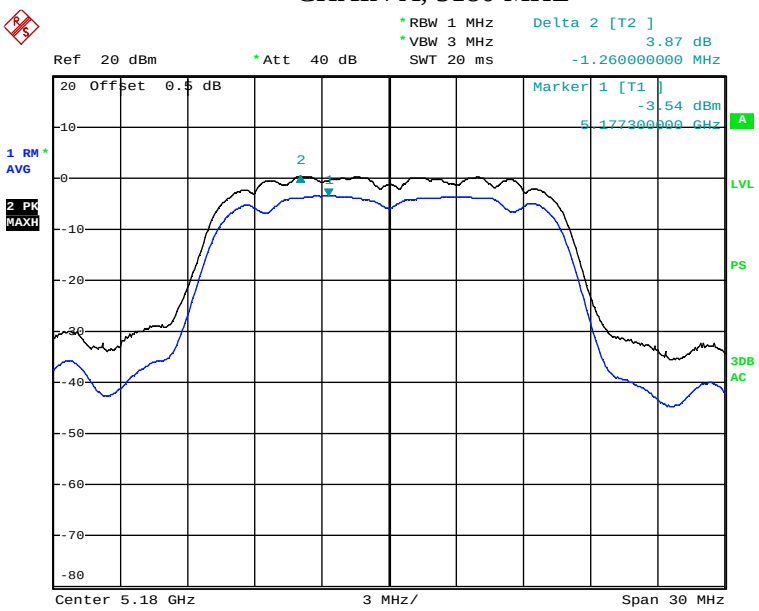
The power spectrum density per FCC §15.407(a)(6) was measured from the antenna port of the EUT. Using a 50ohm spectrum analyzer (measurement method refer to KDB 789033D01 v01r03: Section G) with the RBW=1MHz, VBW=3MHz, Detector=Peak for peak measurement and RBW=1MHz, VBW=3MHz, Detector=RMS for average measurement. And delta-mark peak & average ratio was read directly.

5.4 Test Protocol

Temperature : 22°C
Relative Humidity : 43%

Test frequency	Peak Excursion (dB)		Limits
(MHz)	Port A	Port B	(dB)
5180	3.87	3.76	13
5210	3.67	3.70	13
5240	3.63	3.72	13

CHAIN A, 5180 MHZ



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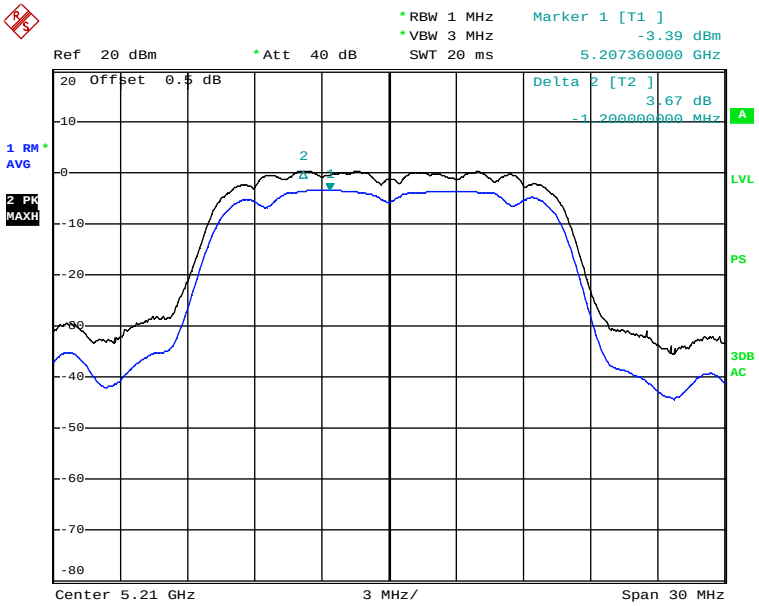
CHAIN A, 5210 MHZ



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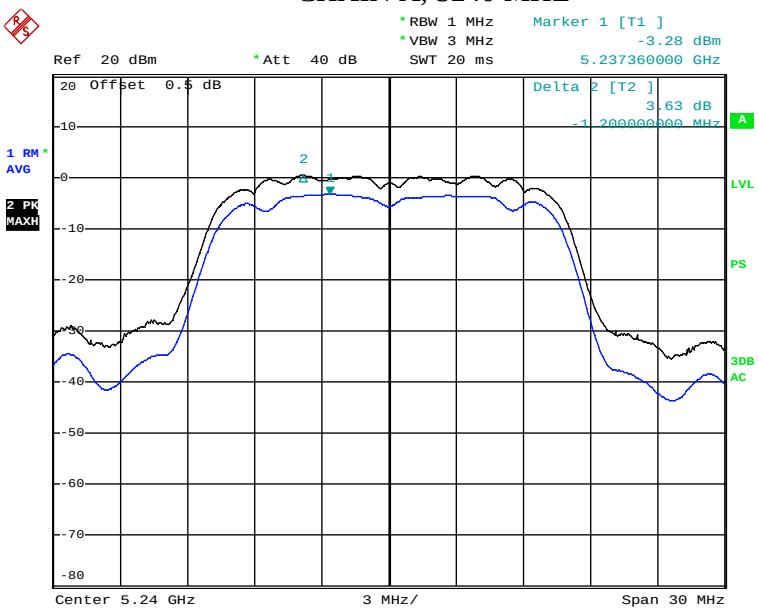
CHAIN A, 5240 MHZ



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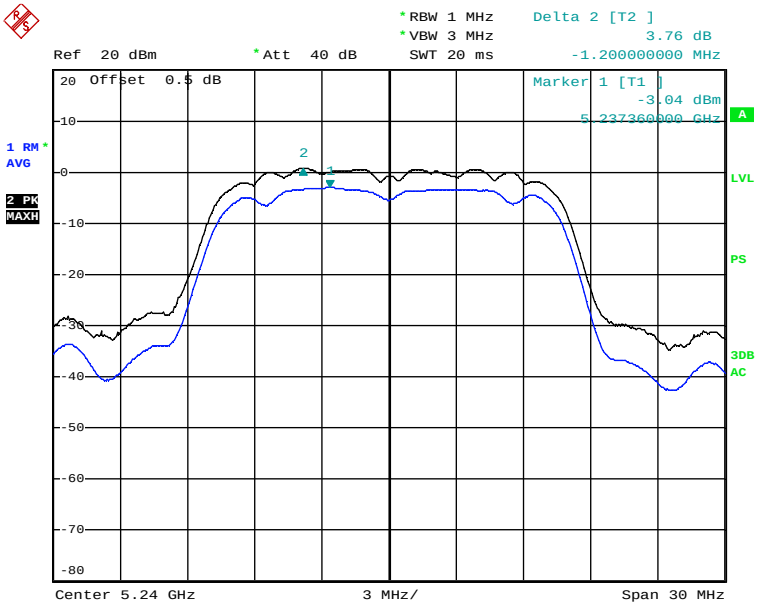
CHAIN B, 5180 MHZ



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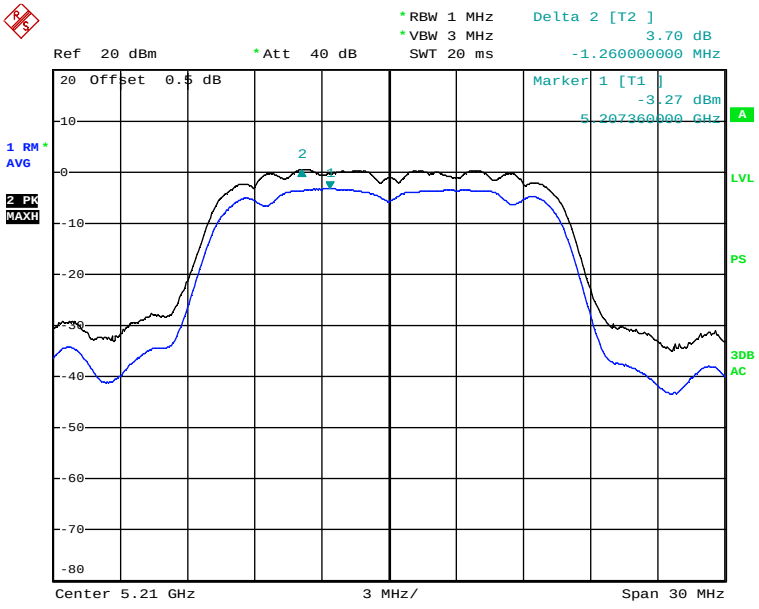
CHAIN B, 5210 MHZ



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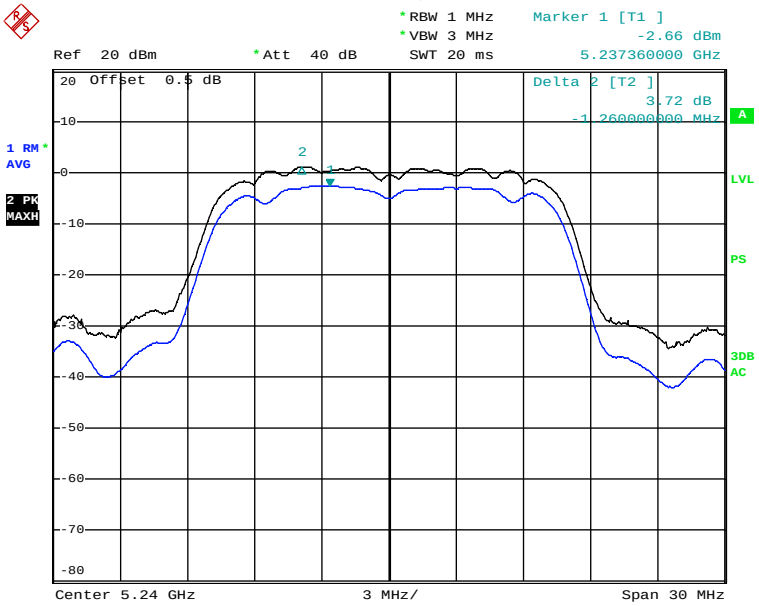
CHAIN B, 5240 MHZ



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6. Radiated emission

Test result: PASS

6.1 Test limit

6.1.1 The radiated emissions which are lower than 1GHz or fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

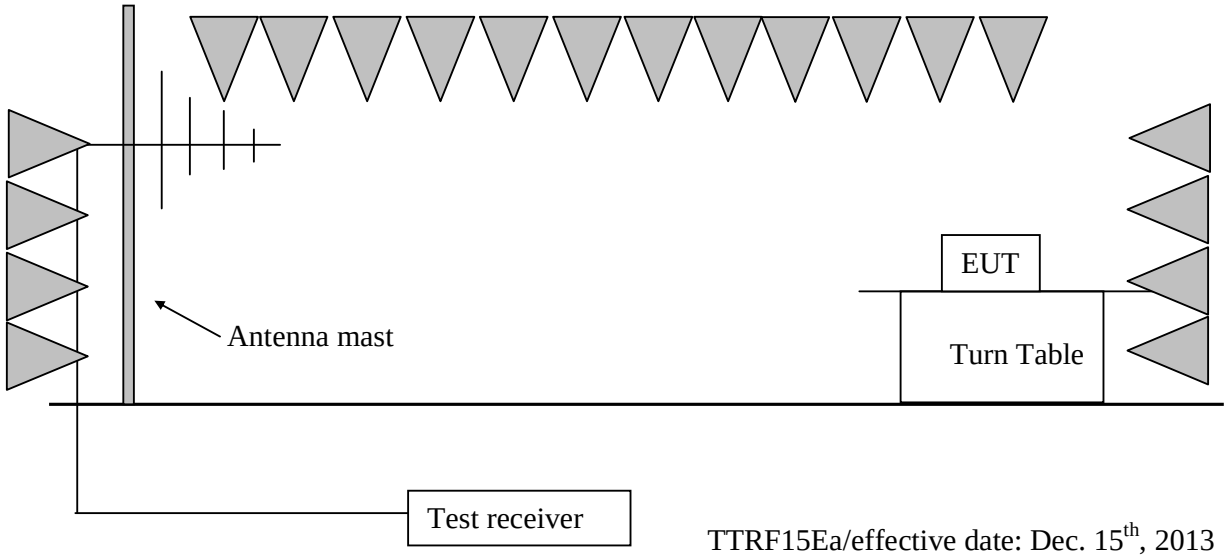
6.1.2 The emission which is outside the restrict bands, should comply with the EIRP limit as below:

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength (3m) (dBμV/m)
1000-5150	-27	68.23
5350-40000	-27	68.23

Note: The Equivalent Field Strength is converted from EIRP with the formula:

E = (1000000 $\sqrt{30P}$ / 3) μV/m, where P is the EIRP (Watts).

6.2 Test Configuration



6.3 Test procedure and test setup

Radiated emission measurements were performed from 30MHz to tenth harmonic or 40GHz. The EUT for testing is arranged on a turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

Testing settings (refer to KDB 789033 v01r03 section H)
Below 1GHz
1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
2, Span=encompass the entire emission
3, RBW=120KHz
4, Detector=Quasi-Peak
5, Trace was allowed to stabilize

Peak Measurements above 1GHz
1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
2, Span=encompass the entire emission
3, RBW=1MHz
4, VBW=3MHz
4, Detector= Peak (Max-hold)
5, Trace was allowed to stabilize

Average Measurements above 1GHz
1, Analyzer center frequency was set to the frequency of the radiated spurious emission.
2, Span=encompass the entire emission
3, RBW=1MHz
4, VBW=3MHz
4, Detector= RMS (Max-hold)
5, Trace was allowed to stabilize

6.4 Test protocol

With integral antenna:

Chan. Fre. (MHz)	Polarization	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
5180	V	5180.00	43.10	97.80	Fundamental	/	PK
	V	37.78	14.00	20.00	40.00	20.00	QP
	H	133.03	25.50	15.70	43.50	18.00	PK
	H	263.27	24.40	25.20	46.00	20.80	PK
	V	5150.00	32.10	59.30	74.00	14.70	PK
	V	5150.00	32.10	48.30	54.00	3.70	AV
	V	6283.17	-0.30	43.00	68.23	25.23	PK
	V	8541.60	4.20	46.00	68.23	22.23	PK
	V	10360.28	10.20	63.60	74.00	10.40	PK
	V	10360.28	10.20	41.70	54.00	12.30	AV
5210	V	5210.00	43.10	98.20	Fundamental	/	PK
	V	37.78	14.00	20.00	40.00	20.00	QP
	H	133.03	25.50	15.70	43.50	18.00	PK
	H	263.27	14.40	25.20	46.00	20.80	PK
	V	5350.00	32.70	56.60	74.00	17.40	PK
	V	5350.00	32.70	42.70	54.00	11.30	AV
	V	6283.17	-0.30	43.00	68.23	25.23	PK
	V	8541.60	4.20	46.00	68.23	22.23	PK
	V	10425.43	10.40	63.90	74.00	10.10	PK
	V	10425.43	10.40	42.50	54.00	11.50	AV
5240	V	5240.00	43.10	97.50	Fundamental	/	PK
	V	37.78	14.00	20.00	40.00	20.00	QP
	H	133.03	25.50	15.70	43.50	18.00	PK
	H	263.27	14.40	25.20	46.00	20.80	PK
	V	5350.00	32.70	56.60	74.00	17.40	PK

	V	5350.00	32.70	42.70	54.00	11.30	AV
	V	6283.17	-0.30	43.00	68.23	25.23	PK
	V	8541.60	4.20	46.00	68.23	22.23	PK
	V	10485.00	10.40	63.90	74.00	10.10	PK
	V	10485.00	10.40	42.50	54.00	11.50	AV

Remark: 1. For fundamental & restrict emission at 5000-5150MHz and 5350-5460MHz test, no amplifier is employed.
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
3. Corrected Reading = Original Receiver Reading + Correct Factor
4. Margin = limit – Corrected Reading
5. If the PK reading is lower than AV limit, the AV test can be elided.
6. Please refer to the "test data" for PK reading lower than 1GHz.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m
Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m, then Margin = 54 -10.20 = 43.80dBuV/m

With mono-antenna (RC8WFI10042A):

Chan. Fre. (MHz)	Polarization	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
5180	V	5180.00	32.10	99.60	Fundamental	/	PK
	V	37.78	14.00	20.00	40.00	20.00	QP
	H	133.03	25.50	15.70	43.50	18.00	PK
	H	263.27	14.40	25.20	46.00	20.80	PK
	V	5150.00	32.10	60.70	74.00	13.30	PK
	V	5150.00	32.10	50.40	54.00	3.60	AV
	V	6283.17	-0.30	43.00	68.23	25.23	PK
	V	8541.60	4.20	46.00	68.23	22.23	PK
	V	10360.28	10.20	63.60	74.00	10.40	PK
	V	10360.28	10.20	41.70	54.00	12.30	AV
5210	V	5210.00	32.10	98.80	Fundamental	/	PK
	V	37.78	14.00	20.00	40.00	20.00	QP
	H	133.03	25.50	15.70	43.50	18.00	PK
	H	263.27	14.40	25.20	46.00	20.80	PK
	V	5350.00	32.70	56.60	74.00	17.40	PK
	V	5350.00	32.70	42.70	54.00	11.30	AV
	V	6283.17	-0.30	43.00	68.23	25.23	PK
	V	8541.60	4.20	46.00	68.23	22.23	PK
	V	10425.43	10.40	63.90	74.00	10.10	PK
	V	10425.43	10.40	42.50	54.00	11.50	AV
5240	V	5240.00	32.10	100.40	Fundamental	/	PK
	V	37.78	14.00	20.00	40.00	20.00	QP
	H	133.03	25.50	15.70	43.50	18.00	PK
	H	263.27	14.40	25.20	46.00	20.80	PK
	V	5350.00	32.70	56.60	74.00	17.40	PK
	V	5350.00	32.70	42.70	54.00	11.30	AV
	V	6283.17	-0.30	43.00	68.23	25.23	PK

	V	8541.60	4.20	46.00	68.23	22.23	PK
	V	10485.00	10.40	63.90	74.00	10.10	PK
	V	10485.00	10.40	42.50	54.00	11.50	AV

Remark: 1. For fundamental & restrict emission at 5000-5150MHz and 5350-5460MHz test, no amplifier is employed.
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
3. Corrected Reading = Original Receiver Reading + Correct Factor
4. Margin = limit – Corrected Reading
5. If the PK reading is lower than AV limit, the AV test can be elided.
6. Please refer to the “test data” for PK reading lower than 1GHz.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m
Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m, then Margin = 54 -10.20 = 43.80dBuV/m

With PIFI antenna (RC1WFI0901A):

Chan. Fre. (MHz)	Polarization	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
5180	V	5180.00	32.10	101.90	Fundamental	/	PK
	V	37.78	14.00	20.00	40.00	20.00	QP
	H	133.03	25.50	15.70	43.50	18.00	PK
	H	263.27	14.40	25.20	46.00	20.80	PK
	V	5150.00	32.10	62.50	74.00	11.50	PK
	V	5150.00	32.10	51.30	54.00	2.70	AV
	V	6283.17	-0.30	43.00	68.23	25.23	PK
	V	8541.60	4.20	46.00	68.23	22.23	PK
	V	10360.28	10.20	63.60	74.00	10.40	PK
	V	10360.28	10.20	41.70	54.00	12.30	AV
5210	V	5210.00	32.10	101.60	Fundamental	/	PK
	V	37.78	14.00	20.00	40.00	20.00	QP
	H	133.03	25.50	15.70	43.50	18.00	PK
	H	263.27	14.40	25.20	46.00	20.80	PK
	V	5350.00	32.70	56.60	74.00	17.40	PK
	V	5350.00	32.70	42.70	54.00	11.30	AV
	V	6283.17	-0.30	43.00	68.23	25.23	PK
	V	8541.60	4.20	46.00	68.23	22.23	PK
	V	10425.43	10.40	63.90	74.00	10.10	PK
	V	10425.43	10.40	42.50	54.00	11.50	AV
5240	V	5240.00	32.10	103.20	Fundamental	/	PK
	V	37.78	14.00	20.00	40.00	20.00	QP
	H	133.03	25.50	15.70	43.50	18.00	PK
	H	263.27	14.40	25.20	46.00	20.80	PK
	V	5350.00	32.70	56.60	74.00	17.40	PK
	V	5350.00	32.70	42.70	54.00	11.30	AV
	V	6283.17	-0.30	43.00	68.23	25.23	PK

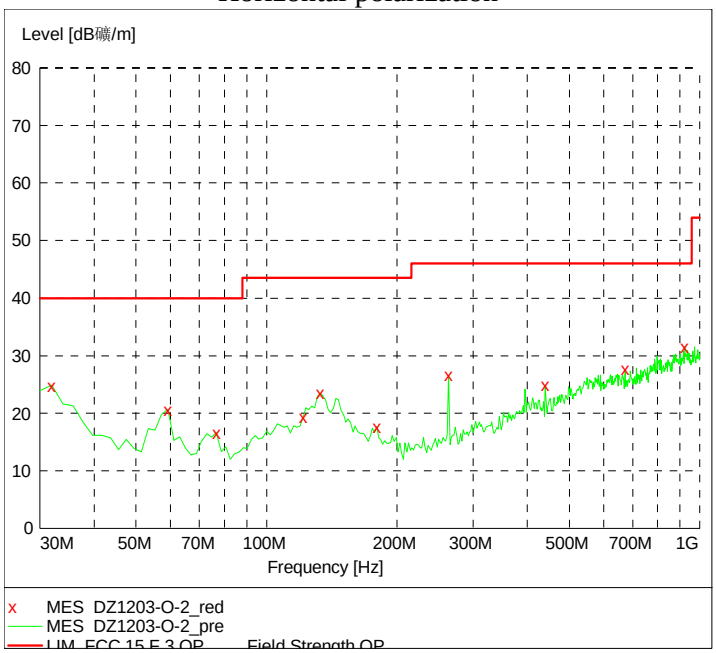
	V	8541.60	4.20	46.00	68.23	22.23	PK
	V	10485.00	10.40	63.90	74.00	10.10	PK
	V	10485.00	10.40	42.50	54.00	11.50	AV

Remark: 1. For fundamental & restrict emission at 5000-5150MHz and 5350-5460MHz test, no amplifier is employed.
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
3. Corrected Reading = Original Receiver Reading + Correct Factor
4. Margin = limit – Corrected Reading
5. If the PK reading is lower than AV limit, the AV test can be elided.
6. Please refer to the "test data" for PK reading lower than 1GHz.

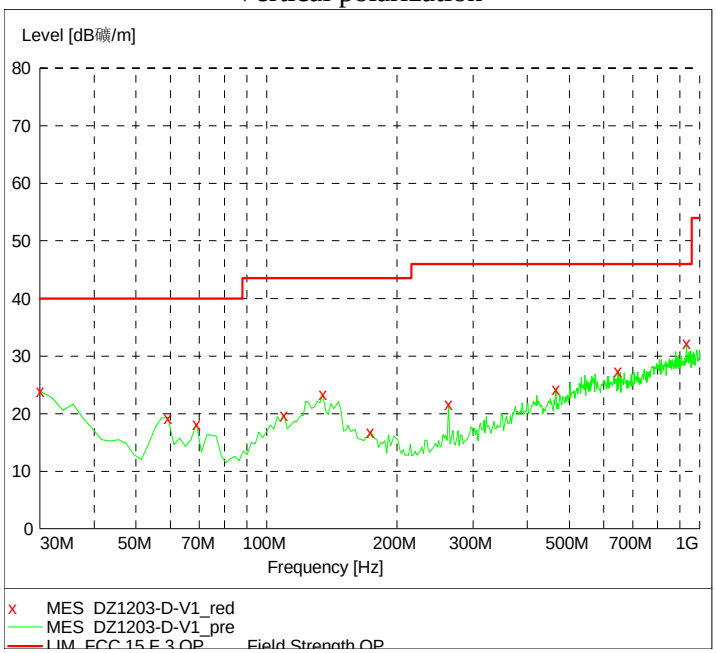
Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB, Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV. Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m
Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m, then Margin = 54 -10.20 = 43.80dBuV/m

Worst case (With PCBA (RC1WFI0901A)):

Horizontal polarization



Vertical polarization



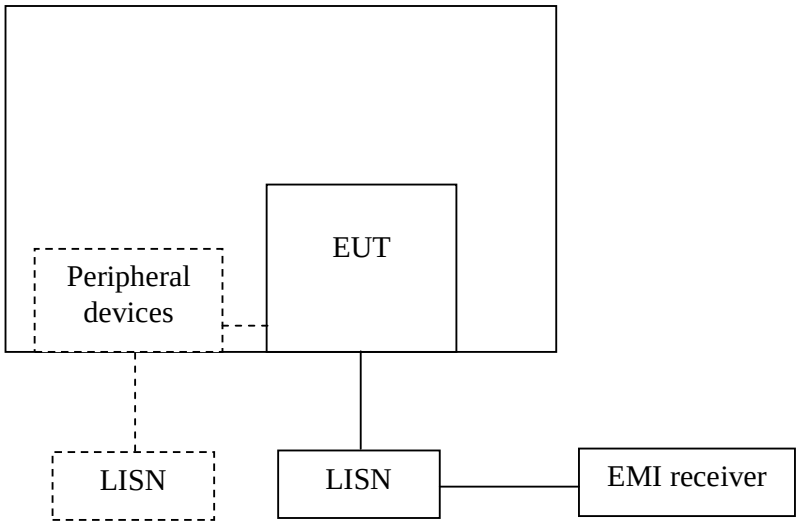
7. Power line conducted emission

Test result: **Pass**

7.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

7.2 Test configuration



☒ For table top equipment, wooden support is 0.8m height table

☐ For floor standing equipment, wooden support is 0.1m height rack.

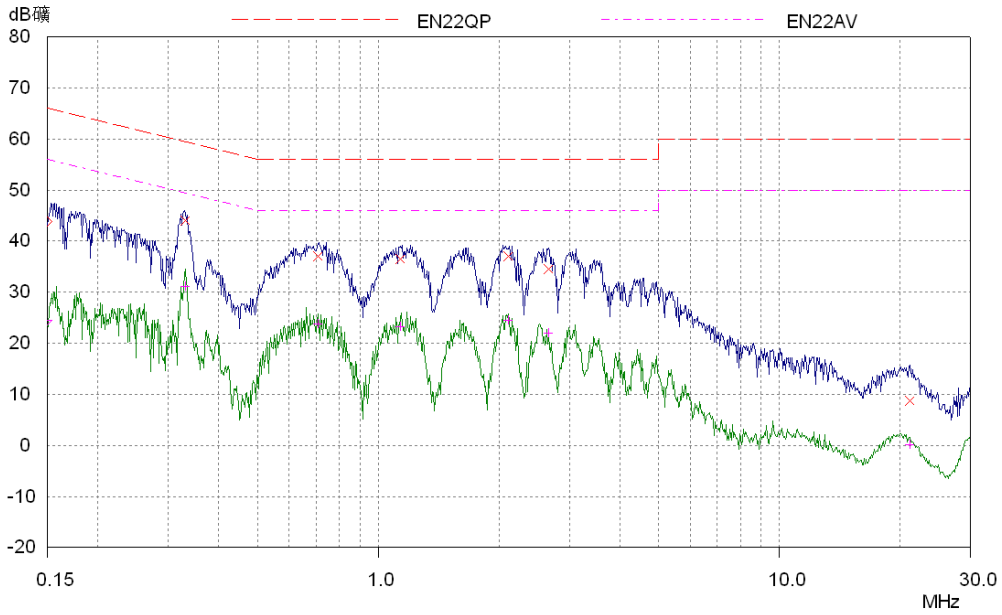
7.3 Test procedure and test set up

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50Ω/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50Ω/50uH coupling impedance with 50Ω termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement.
The bandwidth of the test receiver is set at 9 kHz.

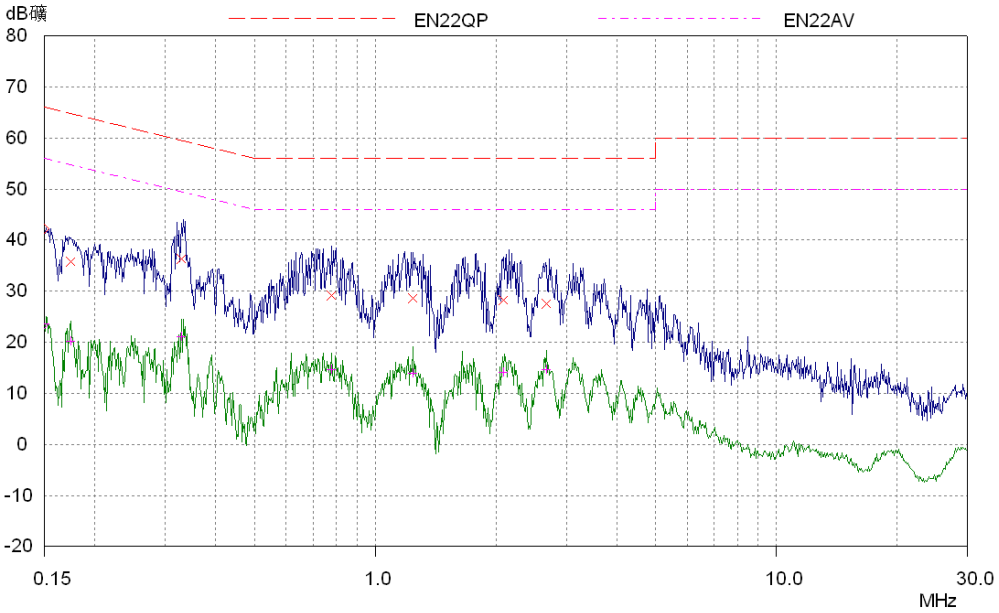
7.4 Test protocol

Frequency (MHz)	Correct Factor (dB)	Line	Corrected Reading (dBuV)		Limit (dBuV)		Margin (dB)	
			QP	AV	QP	AV	QP	AV
0.33	3.00	L	43.95	31.05	59.44	49.44	15.49	18.39
0.71	3.00	L	36.98	23.73	56.00	46.00	19.02	22.27
1.14	3.00	L	36.44	23.17	56.00	46.00	19.56	22.83
2.11	3.10	L	37.07	24.48	56.00	46.00	18.93	21.52
2.66	3.10	L	34.47	22.05	56.00	46.00	21.53	23.95
21.18	3.40	L	8.76	0.14	60.00	50.00	51.24	49.86
Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB). 2. Margin (dB) = Limit - Corrected Reading.								

L line:



N Line:


dB磺
EN22QP
EN22AV
80
70
60
50
40
30
20
10
0
-10
-20
0.15
1.0
10.0
30.0
MHz

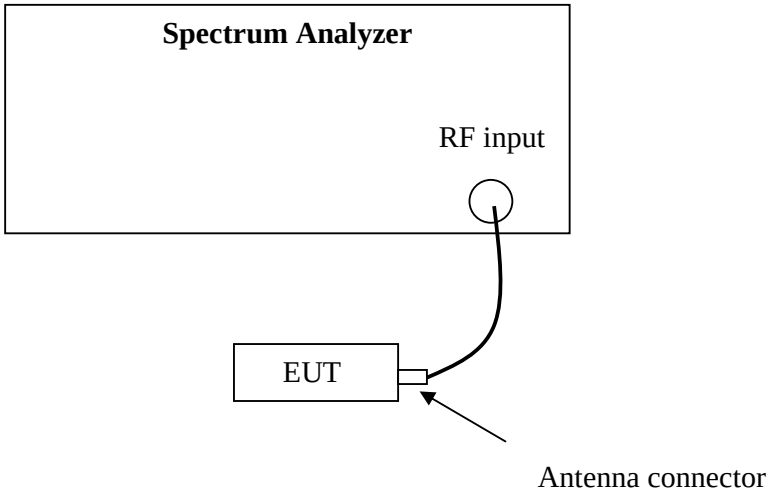
8. 26 dB Bandwidth & Emission Bandwidth (99%)

Test Status: Tested

8.1 Test limit

None

8.2 Test Configuration



8.3 Test procedure and test setup

For 26dB bandwidth test:
The measurement methods refer to KDB 789033D01 v01r03: section C.

Emission bandwidth:
The emission bandwidth per RSS-Gen Issue 3 Clause 4.6.1 was measured using the Spectrum Analyzer with the resolutions bandwidth set at 1MHz, the video bandwidth set at 3MHz.

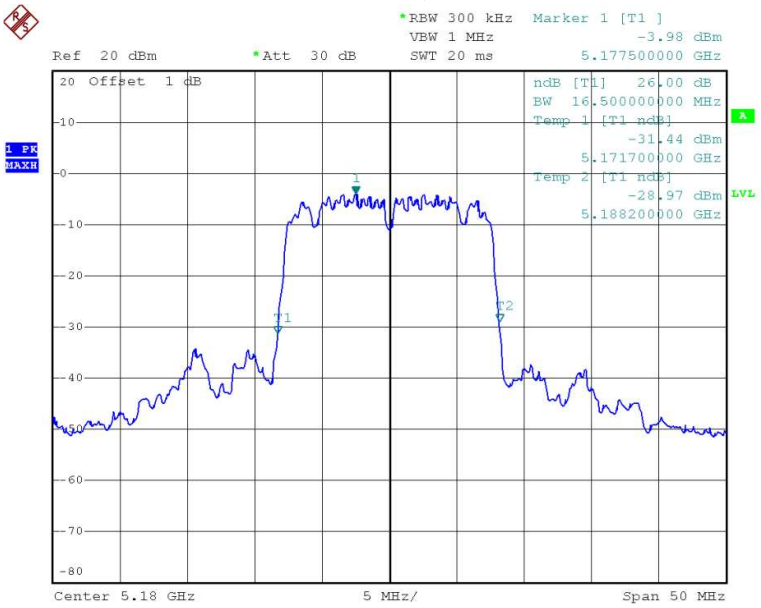
8.4 Test protocol

Temperature : 22 °C
Relative Humidity : 43 %

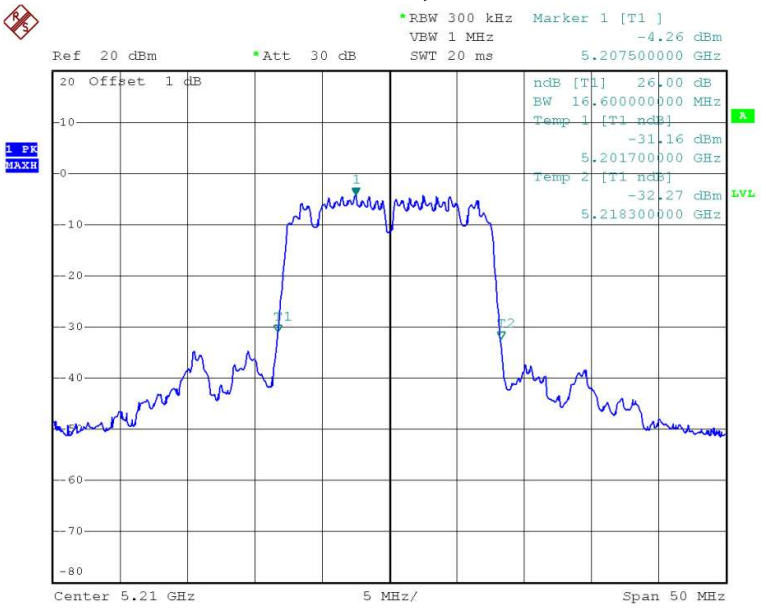
Test frequency	26 dB Bandwidth (MHz)		Occupied Bandwidth (99%) (MHz)	
(MHz)	Port A	Port B	Port A	Port B
5180	16.50	16.50	15.20	15.20
5210	16.60	16.60	15.20	15.20
5240	16.50	16.50	15.20	15.20

26 dB Bandwidth:

CHAIN A, 5180 MHz



CHAIN A, 5210 MHz



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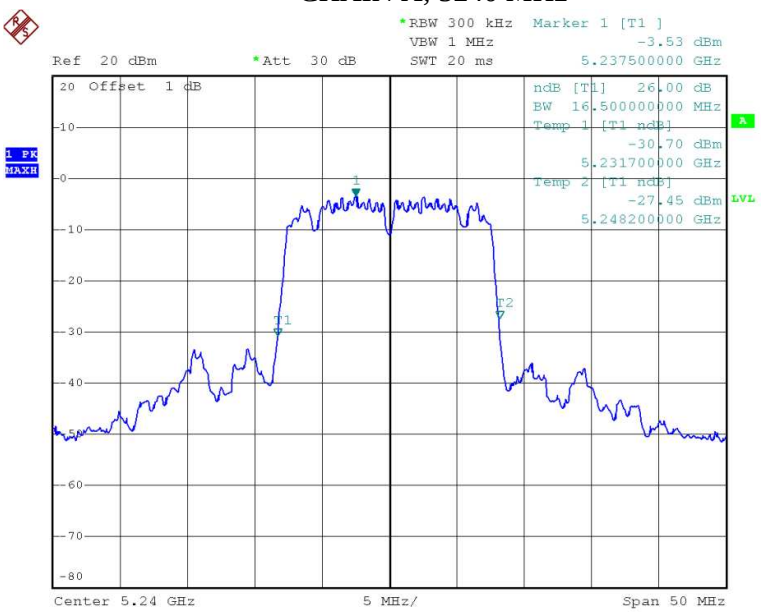
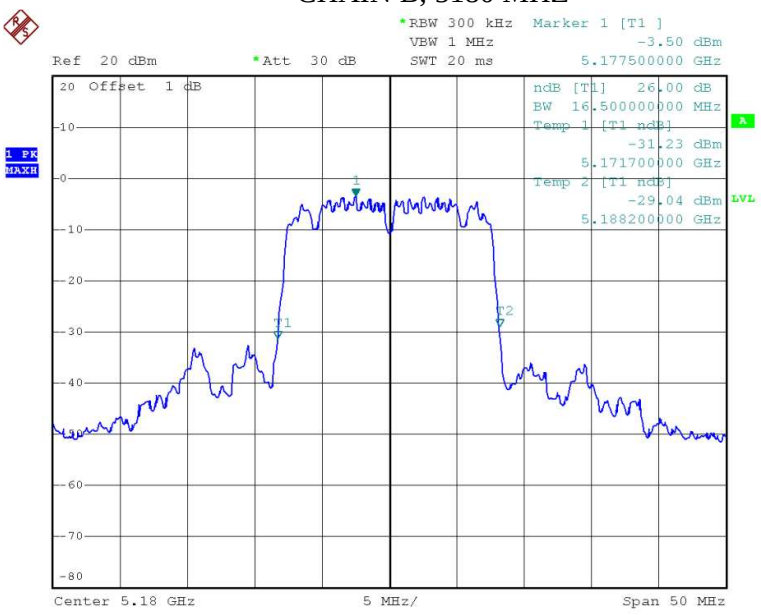
CHAIN A, 5240 MHz



Date: 4.DEC.2013 20:13:17

CHAIN B

CHAIN B, 5180 MHZ



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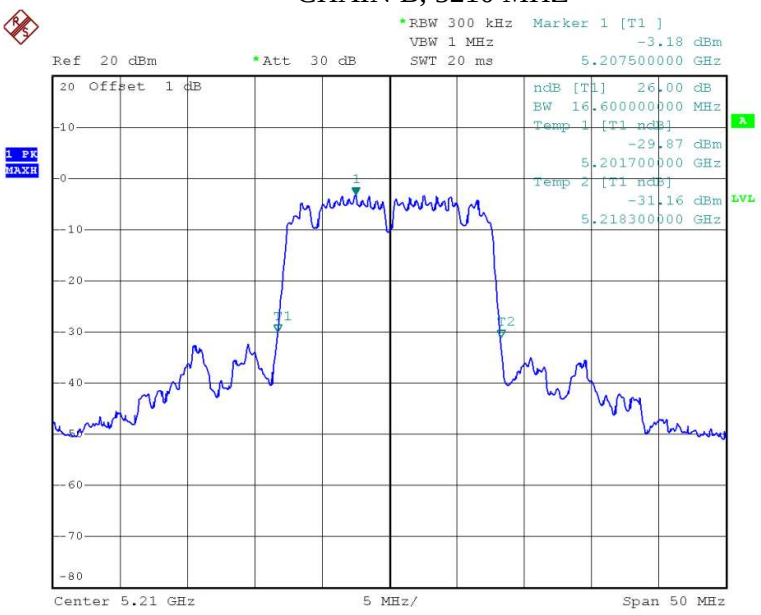
CHAIN B, 5210 MHZ



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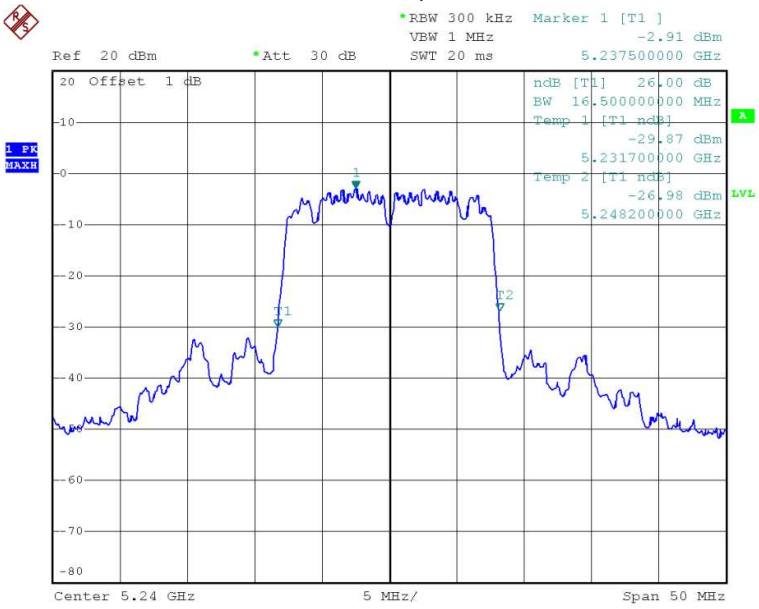
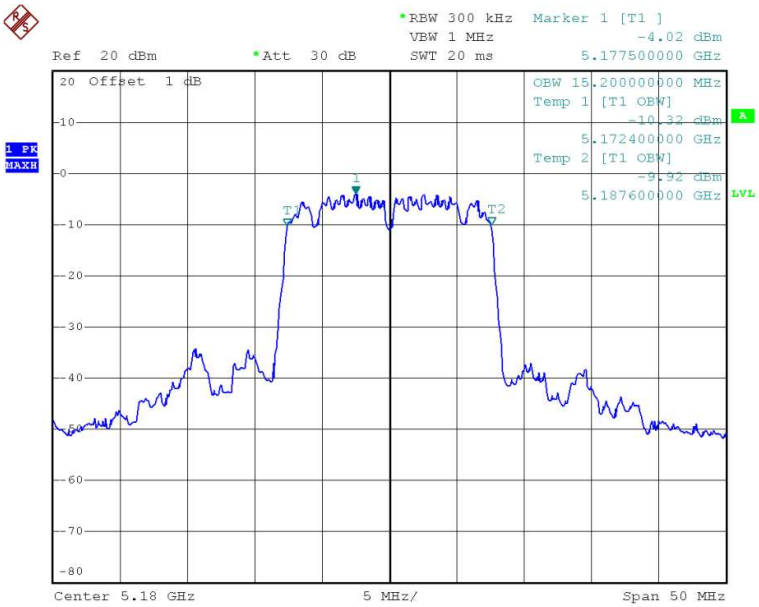
CHAIN B, 5240 MHZ



Date: 4.DEC.2013 20:20:14

99% OBW:

CHAIN A, 5180 MHZ



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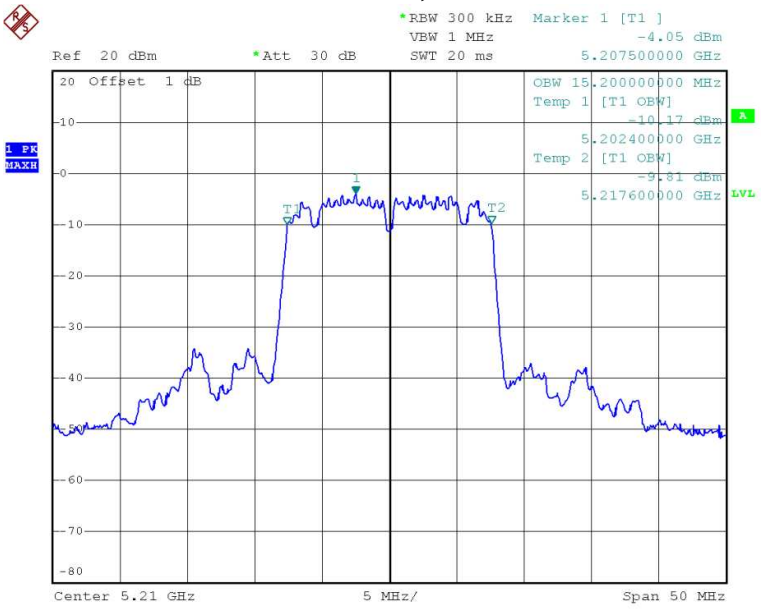
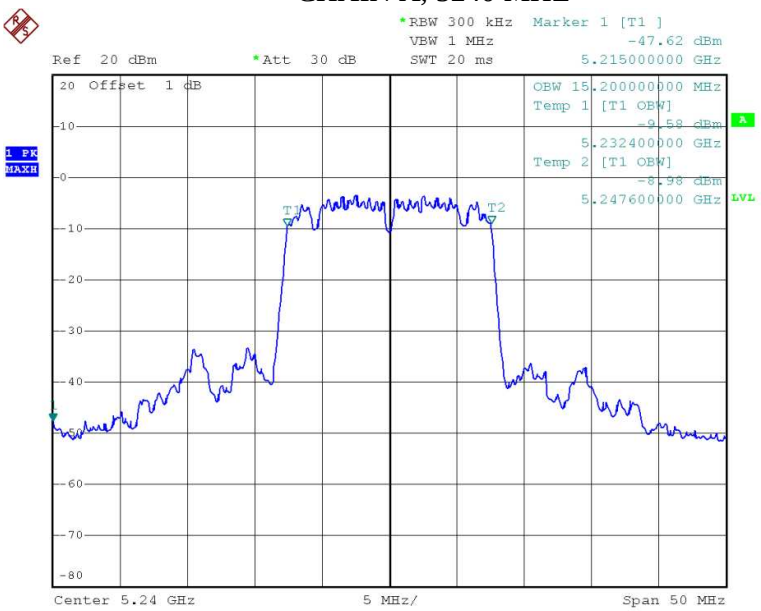
CHAIN A, 5210 MHZ



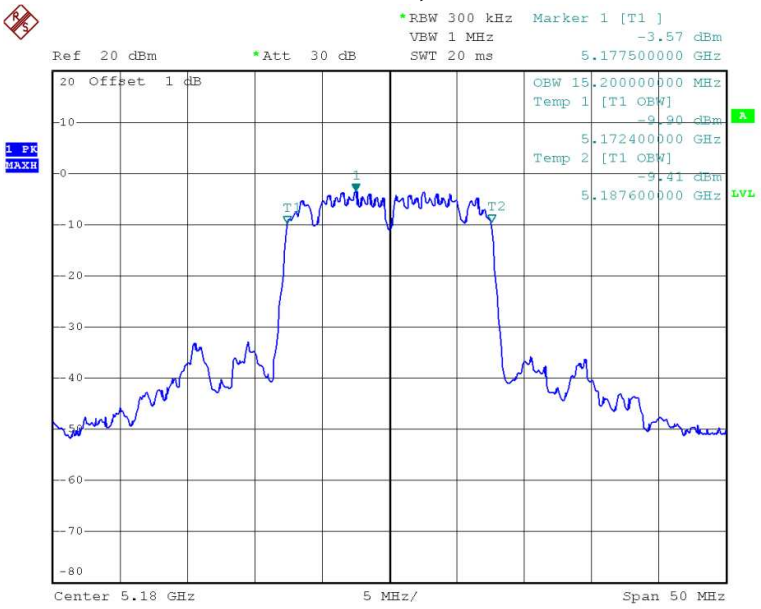
Date: 4.DEC.2013 20:12:07

CHAIN A, 5240 MHZ



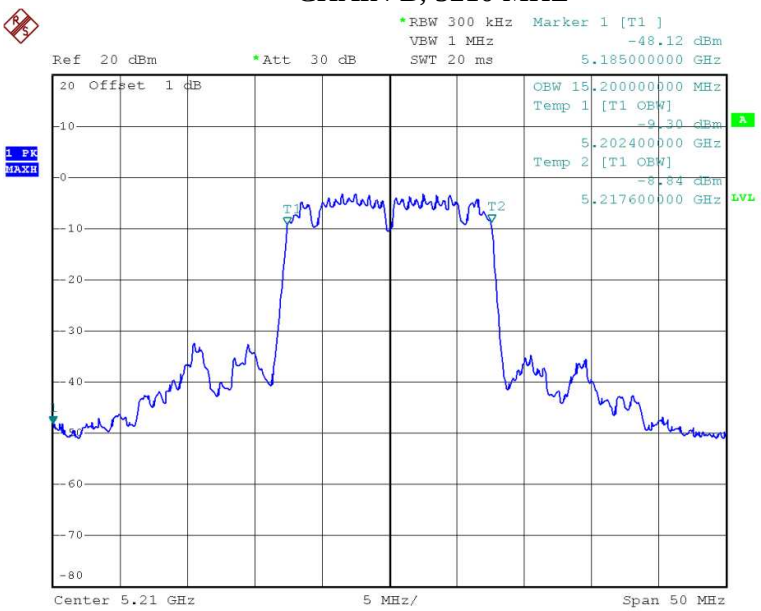
Date: 4.DEC.2013 20:12:40

CHAIN B, 5180 MHZ



Date: 4.DEC.2013 20:17:30

CHAIN B, 5210 MHZ



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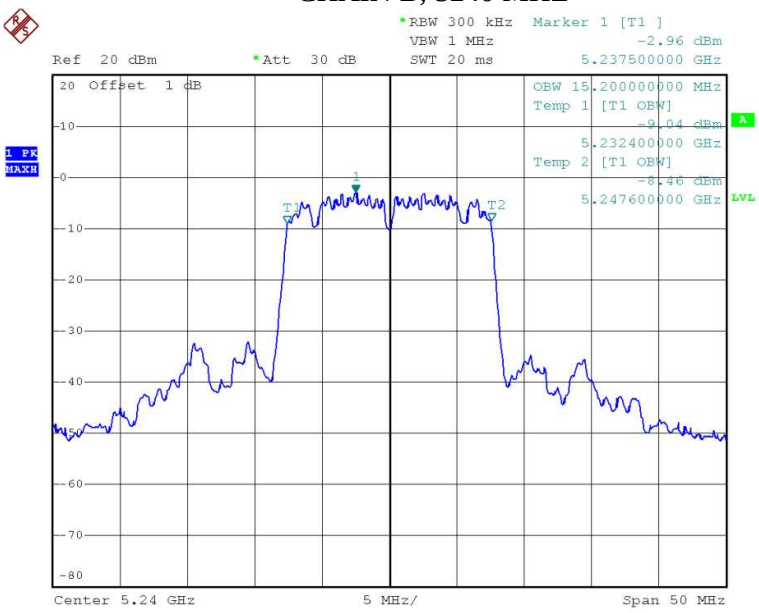
CHAIN B, 5240 MHZ



Date: 4.DEC.2013 20:20:40

9. Spurious emission for receiver

Test result: PASS

9.1 Test limit

The spurious emission shall test through 3 times tuneable or local oscillator frequency whichever is the higher, without exceeding 40 GHz.
1) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2nW per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5nW above 1 GHz.
2) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

9.2 Test Configuration

Please refer to clause 6.2

9.3 Test procedure and test setup

Please refer to clause 6.3.

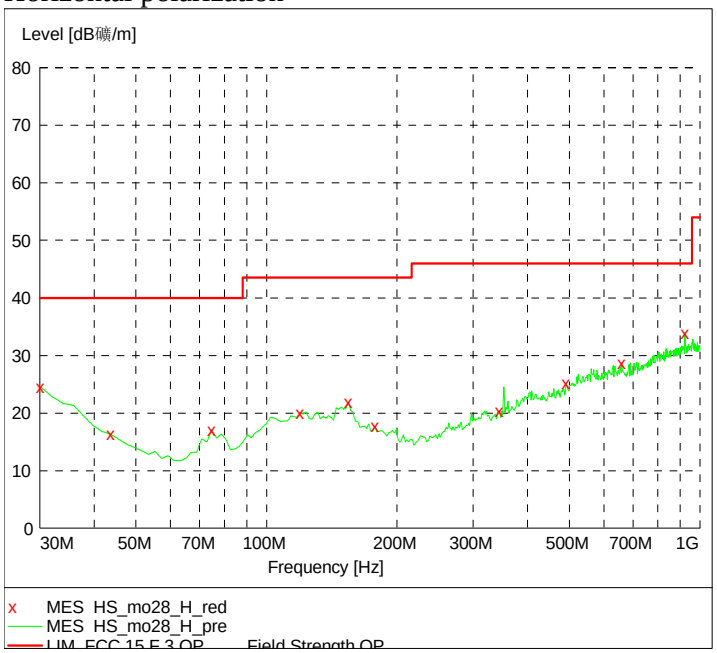
9.4 Test protocol

Polarization	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	30.00	22.00	24.60	40.00	15.40	PK
H	43.61	13.70	16.40	40.00	23.60	PK
V	76.65	10.00	19.60	40.00	20.40	PK
H	119.40	15.90	20.10	43.50	23.40	PK
V	344.91	16.60	20.50	46.00	25.50	PK
H	490.70	20.20	25.20	46.00	20.80	PK
V	2790.00	-11.7	41.10	54.00	12.90	PK
H	6723.45	0.90	46.90	54.00	7.10	PK

Remark: 1. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = limit – Corrected Reading
4. Please refer to the "test data" for PK reading lower than 1GHz.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Original Receiver Reading = 10dBuV.
Then Correct Factor = 30.20 + 2.00 = 32.20dB/m; Corrected Reading = 10dBuV + 32.20dB/m = 42.20dBuV/m
Assuming limit = 54dBuV/m, Corrected Reading = 42.20dBuV/m, then Margin = 54 -42.20 = 11.80dBuV/m

Horizontal polarization



Vertical polarization