Product Service

FCC/IC- TEST REPORT

Report Number	:	**64.790.15.03581.01**	Date of Issue:	September 16, 2015

Model	:	OSK102, SK102, OSK103
Product Type	:	Smart Kit
Applicant	:	GD Midea Air-Conditioning Equipment Co., Ltd.
Address	:	Midea Industrial City, Beijiao, 528311 Shunde, Foshan, Guangdong, PEOPLE'S REPUBLIC OF CHINA
Production Facility	:	GD Midea Air-Conditioning Equipment Co., Ltd.
Address	:	Midea Industrial City, Beijiao, 528311 Shunde, Foshan, Guangdong, PEOPLE'S REPUBLIC OF CHINA

Test Result	:	■ **Positive**	☐ **Negative**
Total pages including Appendices	:	44	

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch is a subcontractor to TÜV SÜD Product Service GmbH according to the principles outlined in ISO 17025.

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch reports apply only to the specific samples tested under stated test conditions. Construction of the actual test samples has been documented. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. The manufacturer/importer is responsible to the Competent Authorities in Europe for any modifications made to the production units which result in non-compliance to the relevant regulations. TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch issued reports.

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

1 Table of Contents

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

2 Details about the Test Laboratory

Details about the Test Laboratory
Test Site 1

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
Building 12&13, Zhiheng Wisdomland Business Park,
Nantou Checkpoint Road 2, Nanshan District,
Shenzhen City, 518052,
P. R. China

Telephone: 86 755 8828 6998
Fax: 86 755 8828 5299

3 Description of the Equipment under Test

Description of the Equipment Under Test

Product:	Smart Kit
Model No.:	OSK102, SK102, OSK103
Remark:	The three models are identical in circuit design, PCB layout and components used but only different in appearance and the connection interface. Tests were only performed on SK102.
FCC ID:	2ADQOMDNA15
IC:	12575A-MDNA15
Options and accessories:	N/A
Rating:	DC 5V input
RF Transmission Frequency:	2412MHz-2462MHz
No. of Operated Channel:	11 channels (11B, 11G, 11N_20M_SISO) 7 channels (11N_40M_SISO)
Modulation:	DSSS,OFDM
Duty Cycle:	100% during test
Antenna Type:	PCB layout
Antenna Gain:	2.0dBi
Description of the EUT:	EUT is a smart kit with WIFI function. It can be plugged into air-conditioner for internet controlling by WIFI.

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C 10-1-2014 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators
RSS-Gen Issue 4 November 2014	General Requirements for the Certification of Radio Apparatus
RSS-247 Issue 1 May 2015	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices

All the test methods were according to KDB558074 D01 DTS Meas Guidance v03r02 and ANSI C63.10 (2013).

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

5 Summary of Test Results

Technical Requirements				
FCC Part 15 Subpart C				
Test Condition			Pages	Test Result
§15.207	RSS-GEN A7.2.4	Conducted emission AC power port	**10**	Pass
§15.247(b)(1)	RSS-247 Clause 5.4(2)	Conducted peak output power	**13**	Pass
§15.247(a)(2)	RSS-247 Clause 5.2(1)	6dB bandwidth	**14**	Pass
§15.247(e)	RSS-247 Clause 5.2(2)	Power spectral density*	**21**	Pass
§15.247(a)(1)	RSS-247 Clause 5.1(1)	20dB bandwidth and 99% Occupied Bandwidth	--	N/A
§15.247(a)(1)	RSS-247 Clause 5.1(2)	Carrier frequency separation	--	N/A
§15.247(a)(1)(iii)	RSS-247 Clause 5.1(4)	Number of hopping frequencies	--	N/A
§15.247(a)(1)(iii)	RSS-247 Clause 5.1(4)	Dwell Time	--	N/A
§15.247(d)	RSS-247 Clause 5.5	Spurious RF conducted emissions	**22**	Pass
§15.247(d)	RSS-247 Clause 5.5	Band edge	**35**	Pass
§15.247(d) & §15.209 &	& RSSGEN 7.2.5	Spurious radiated emissions for transmitter and receiver	**40**	Pass
§15.203	RSSGEN 7.1.2	Antenna requirement	See note 1	Pass

Remark 1: N/A – Not Applicable.
Note 1: The EUT uses a PCB layout antenna, which gain is 2dBi. In accordance to §15.203 and RSS-Gen 8.3 , It is considered sufficiently to comply with the provisions of this section.

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: 2ADQOMDNA15, IC: 12575A-MDNA15 complies with Section 15.207, 15.209, 15.247 of the FCC Part 15 Subpart C Rules, RSS 247 and RSS-Gen rules.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date: July 24, 2015

Testing Start Date: July 27, 2015

Testing End Date: September 2, 2015

- TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch -

Reviewed by:

Tony Liu
EMC Project Manager

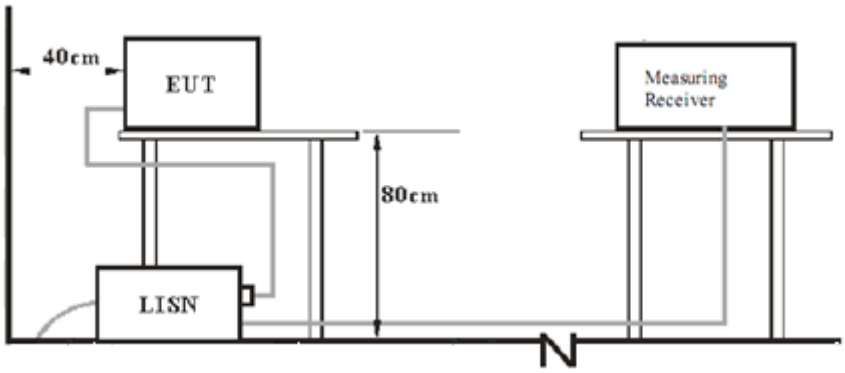
Prepared by:

Peter Jia
EMC Project Engineer

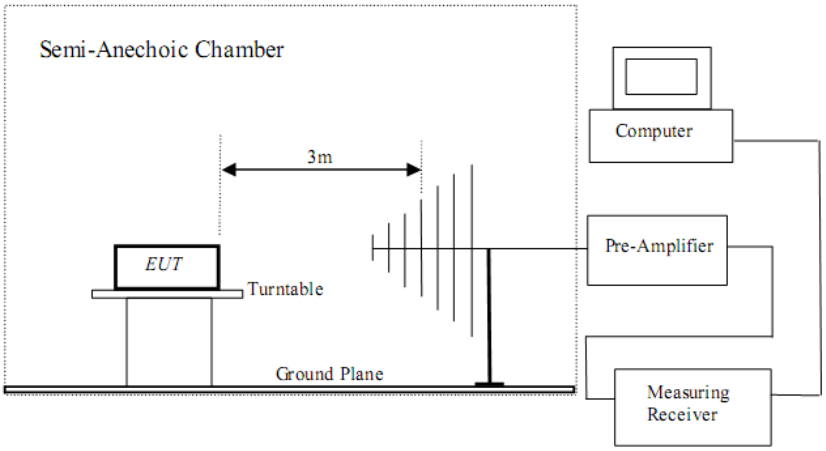
TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

7 Test Setups

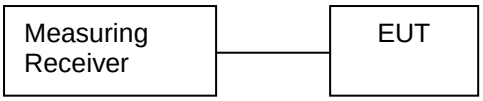
7.1 AC Power Line Conducted Emission test setups



7.2 Radiated test setups



7.3 Conducted RF test setups



TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

8 Systems test configuration

Auxiliary Equipment Used during Test:

Description	Manufacturer	Model no.	S/N
Computer	Lenovo	X240	SL10F31638GS
Air-conditioner	Midea	KFR-26G/WEAB2	D11000113751541584F010

Test software: ART2_Kingfisher.1.1.2_beta 150601; AirConditionOEM_7_17.apk

The system was configured to channel 1(2412MHz), 6(2437MHz), and 11(2462MHz) for the tests of 802.11b/g/n(20).
The system was configured to channel 1(2422MHz), 6(2437MHz), and 11(2452MHz) for the tests of 802.11n(40).

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

9 Technical Requirement

9.1 Conducted Emission

Test Method

1. The EUT was placed on a table, which is 0.8m above ground plane
2. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
3. Maximum procedure was performed to ensure EUT compliance
4. A EMI test receiver is used to test the emissions from both sides of AC line

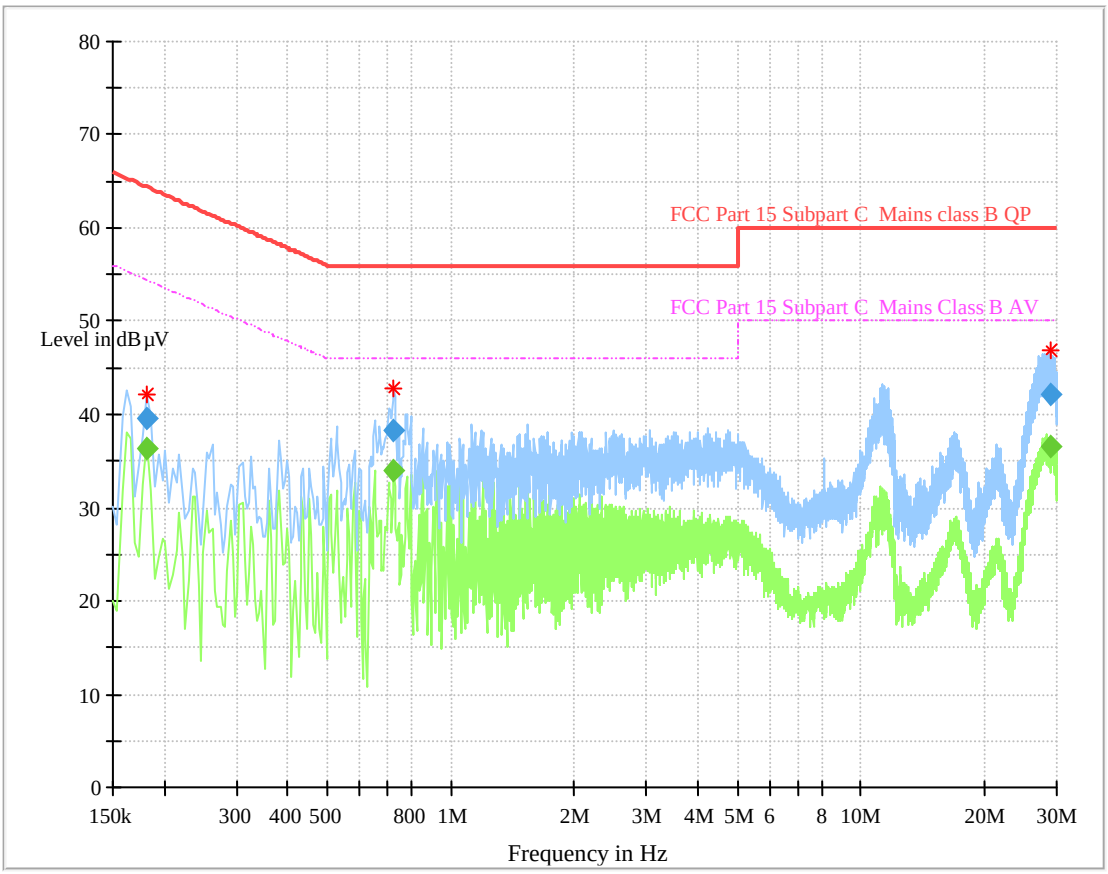
Limit

Frequency MHz	QP Limit dBµV	AV Limit dBµV
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

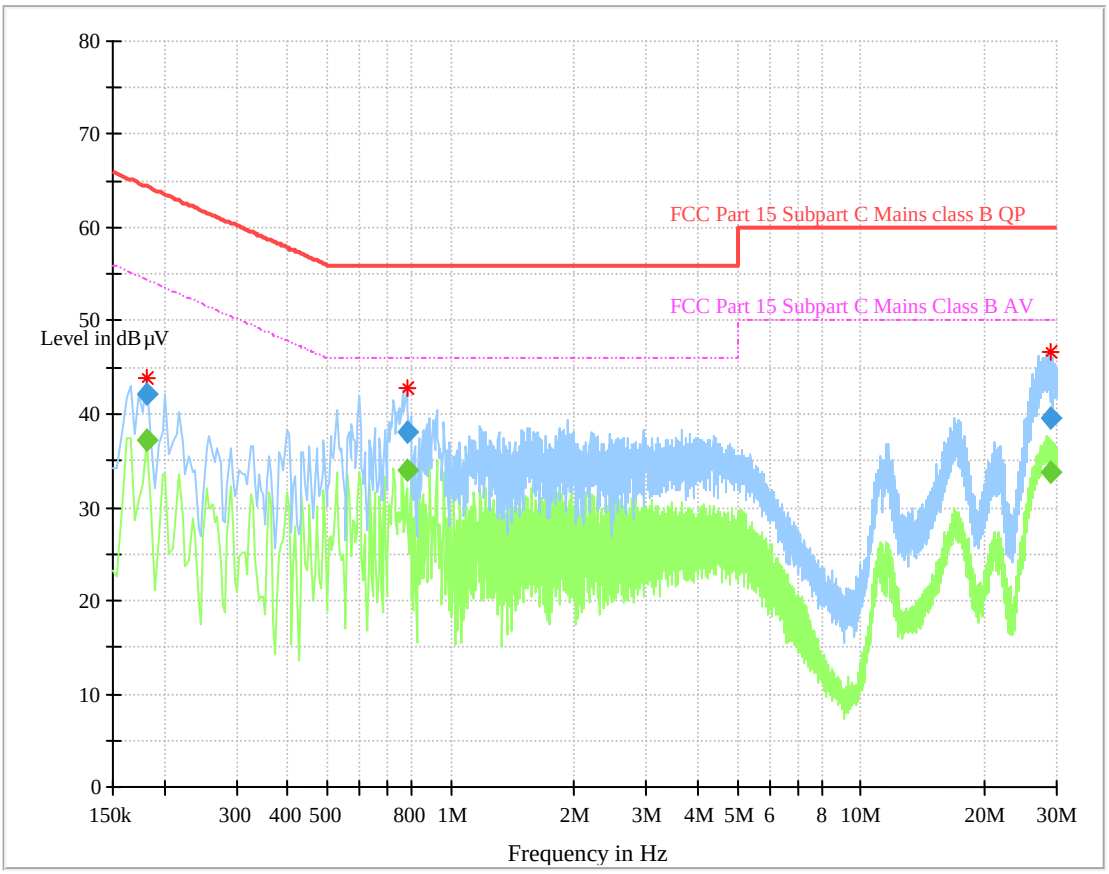
Product Type	:	Smart Kit
M/N	:	SK102
Operating Condition	:	WIFI communication mode.
Test Specification	:	L



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.181500	---	36.32	54.42	18.10	L1	9.7
0.181500	39.61	---	64.42	24.81	L1	9.7
0.725500	---	34.06	46.00	11.94	L1	10.0
0.725500	38.21	---	56.00	17.79	L1	10.0
28.922500	---	36.61	50.00	13.39	L1	10.3
28.922500	42.17	---	60.00	17.83	L1	10.3

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

Product Type : Smart Kit
M/N : SK102
Operating Condition : WIFI communication mode.
Test Specification : N



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.181500	---	37.22	54.42	17.20	N	9.7
0.181500	42.24	---	64.42	22.18	N	9.7
0.781500	---	34.04	46.00	11.96	N	9.9
0.781500	38.10	---	56.00	17.90	N	9.9
28.845500	---	33.85	50.00	16.15	N	10.3
28.845500	39.61	---	60.00	20.39	N	10.3

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

9.2 Conducted peak output power

Test Method

1. Use the following spectrum analyzer settings:
   RBW > the 6 dB bandwidth of the emission being measured, VBW≥3RBW, Span≥3RBW
   Sweep = auto, Detector function = peak, Trace = max hold.
2. Add a correction factor to the display.
3. Use a power meter to measure the conducted peak output power.

Limits

Frequency Range MHz	Limit W	Limit dBm
2400-2483.5	≤1	≤30

Test result as below table

802.11B

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2412MHz	18.11	Pass
Middle channel 2437MHz	18.65	Pass
High channel 2462MHz	19.35	Pass

802.11G

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2412MHz	25.61	Pass
Middle channel 2437MHz	26.02	Pass
High channel 2462MHz	26.50	Pass

802.11N20

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2412MHz	25.67	Pass
Middle channel 2437MHz	26.11	Pass
High channel 2462MHz	26.42	Pass

802.11N40

Frequency MHz	Conducted Peak Output Power dBm	Result
Low channel 2422MHz	25.45	Pass
Middle channel 2437MHz	26.47	Pass
High channel 2452MHz	26.34	Pass

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

9.3 6dB Bandwidth

Test Method

1. Use the following spectrum analyzer settings:
   RBW=100K, VBW≥3RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Use the automatic bandwidth measurement capability of an instrument, may be employed using the X dB bandwidth mode with X set to 6 dB, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥ 6 dB.
3. Allow the trace to stabilize, record the X dB Bandwidth value.

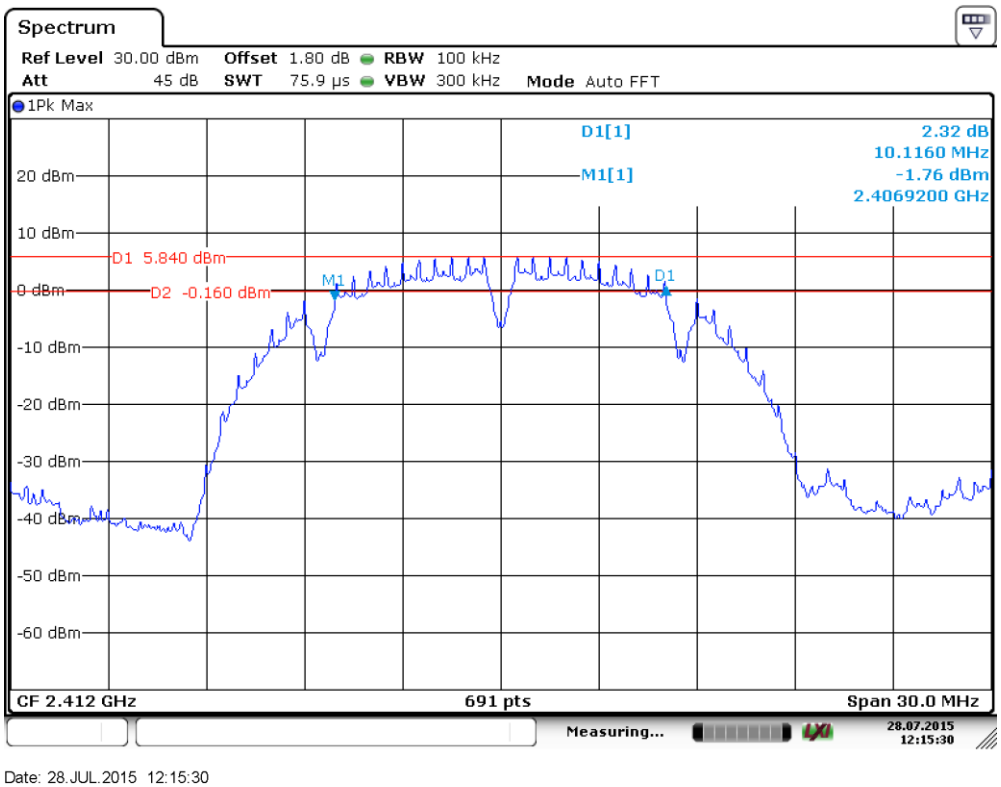
Limit

Limit [kHz]
≥500

Test result
802.11B

Frequency MHz	6dB bandwidth MHz	Result
Low channel 2412MHz	10.116	Pass
Middle channel 2437MHz	10.159	Pass
High channel 2462MHz	10.116	Pass

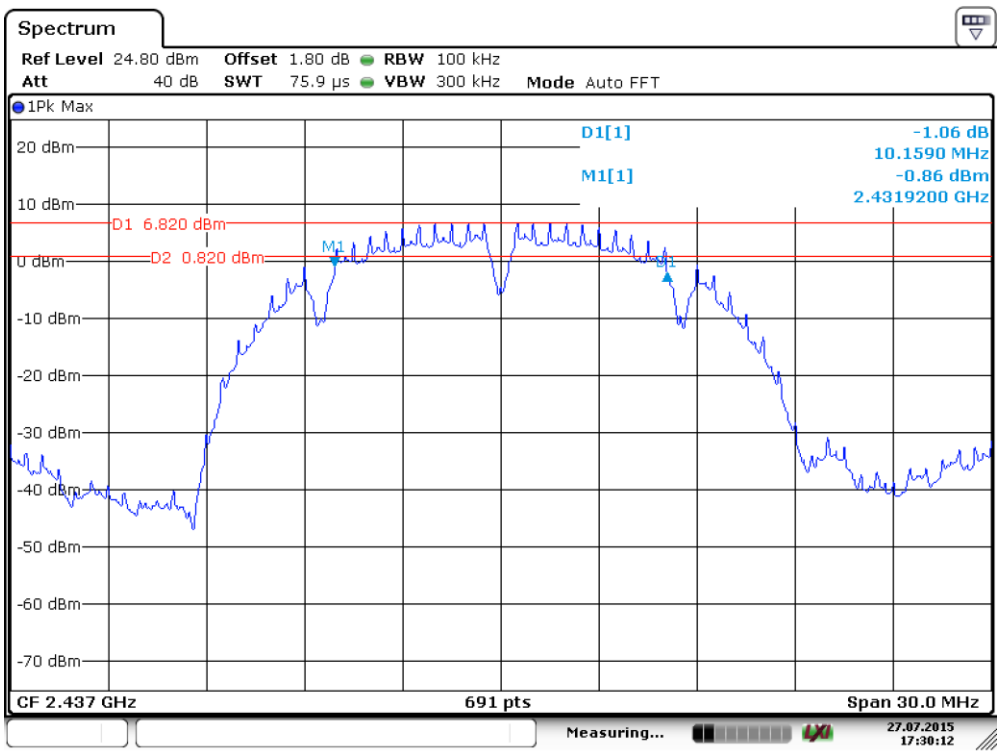
2412MHz



Date: 28.JUL.2015 12:15:30

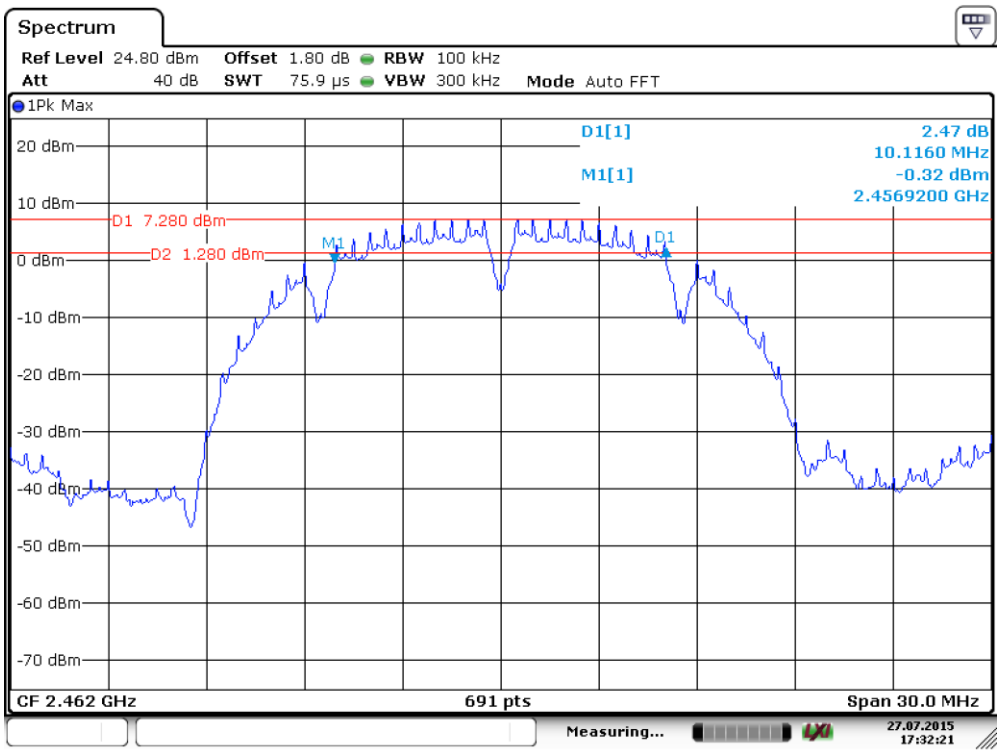
TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

2437MHz



Date: 27.JUL.2015 17:30:12

2462MHz



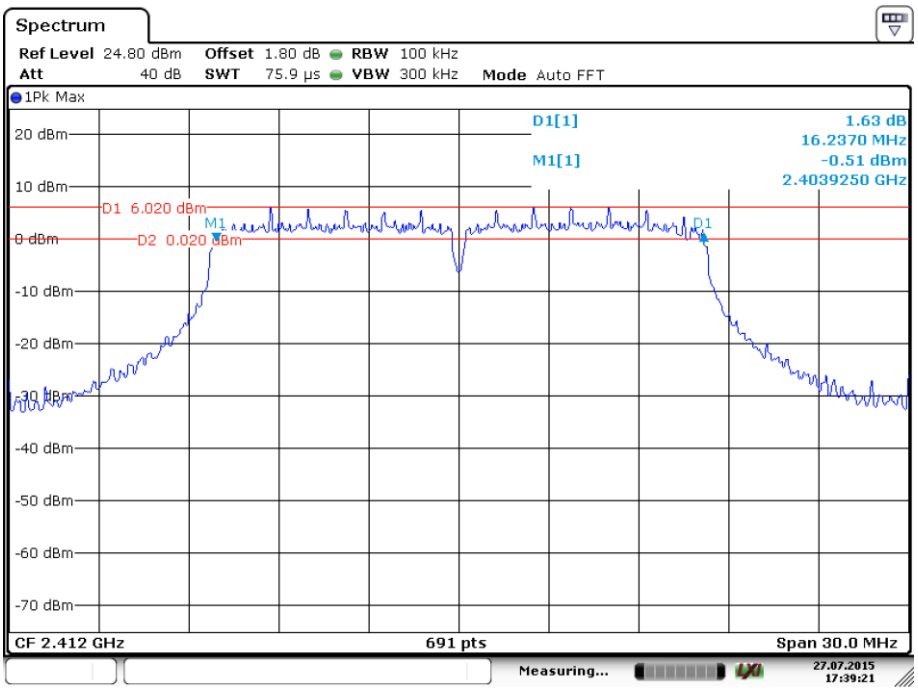
Date: 27.JUL.2015 17:32:21

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

802.11G

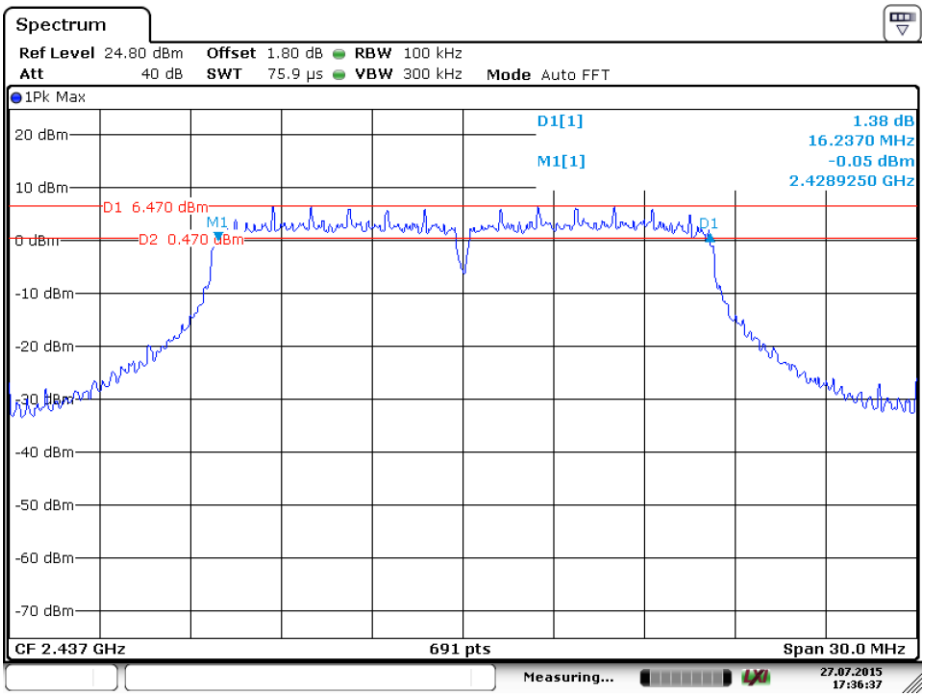
Frequency MHz	6dB bandwidth MHz	Result
Low channel 2412MHz	16.237	Pass
Middle channel 2437MHz	16.237	Pass
High channel 2462MHz	16.281	Pass

2412MHz



Date: 27.JUL.2015 17:39:20

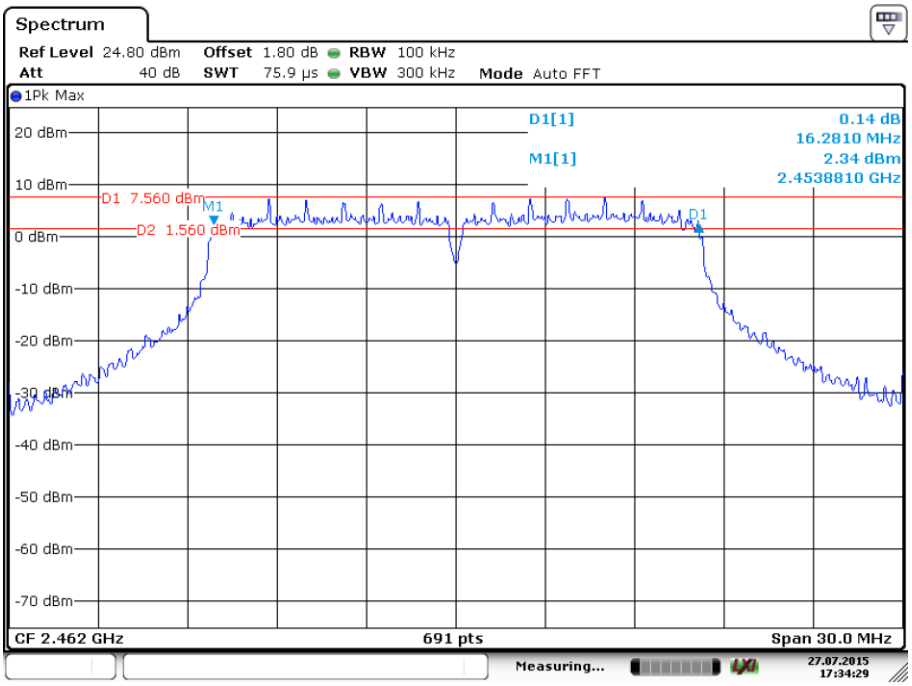
2437MHz



Date: 27.JUL.2015 17:36:37

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

2462MHz

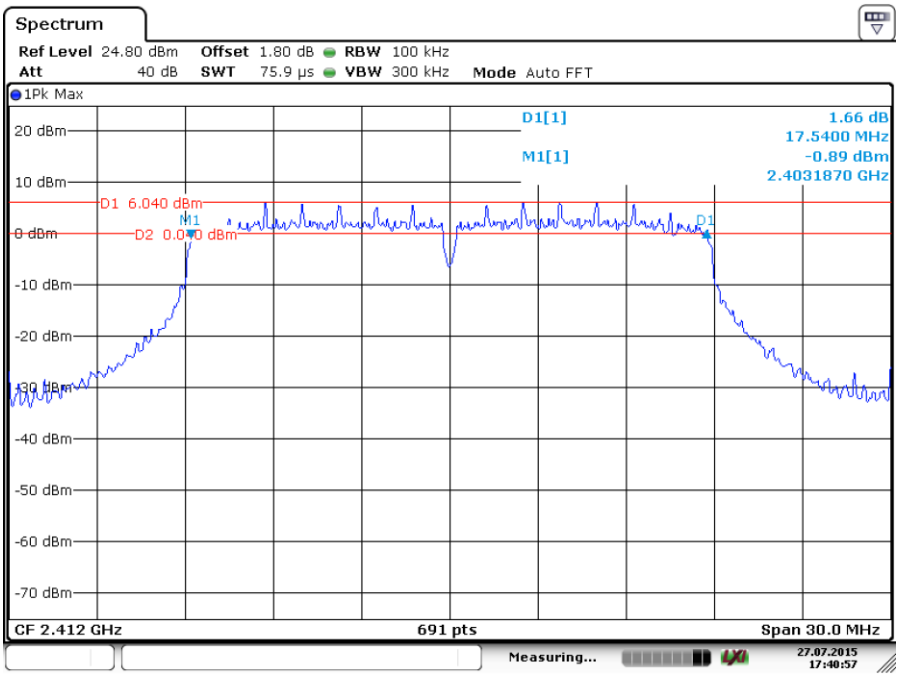


Date: 27.JUL.2015 17:34:28

802.11N20

Frequency MHz	6dB bandwidth MHz	Result
Low channel 2412MHz	17.540	Pass
Middle channel 2437MHz	17.540	Pass
High channel 2462MHz	17.583	Pass

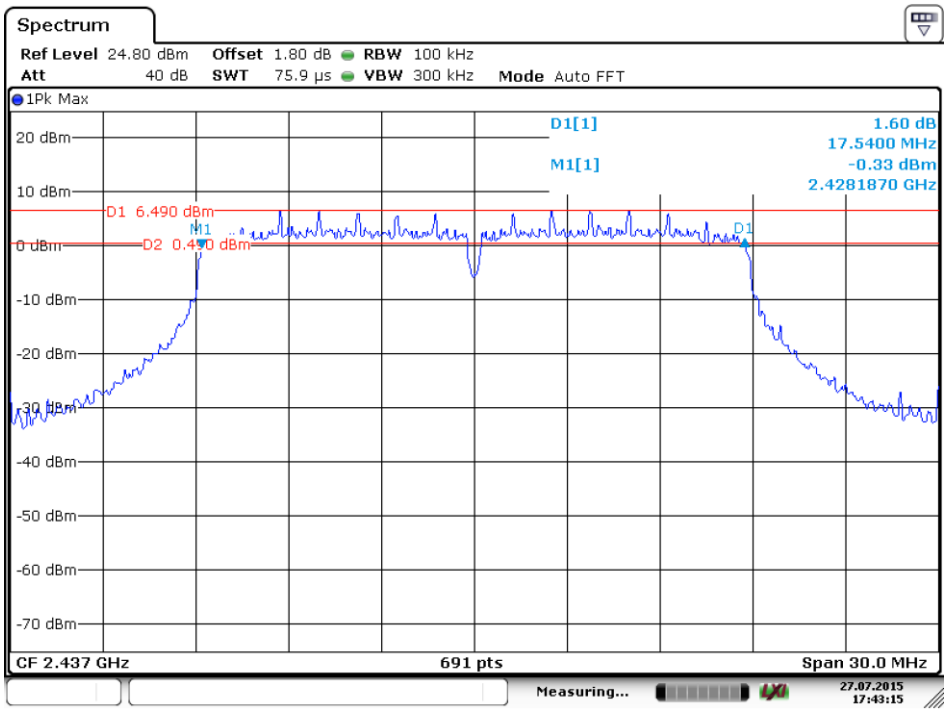
2412MHz



Date: 27.JUL.2015 17:40:57

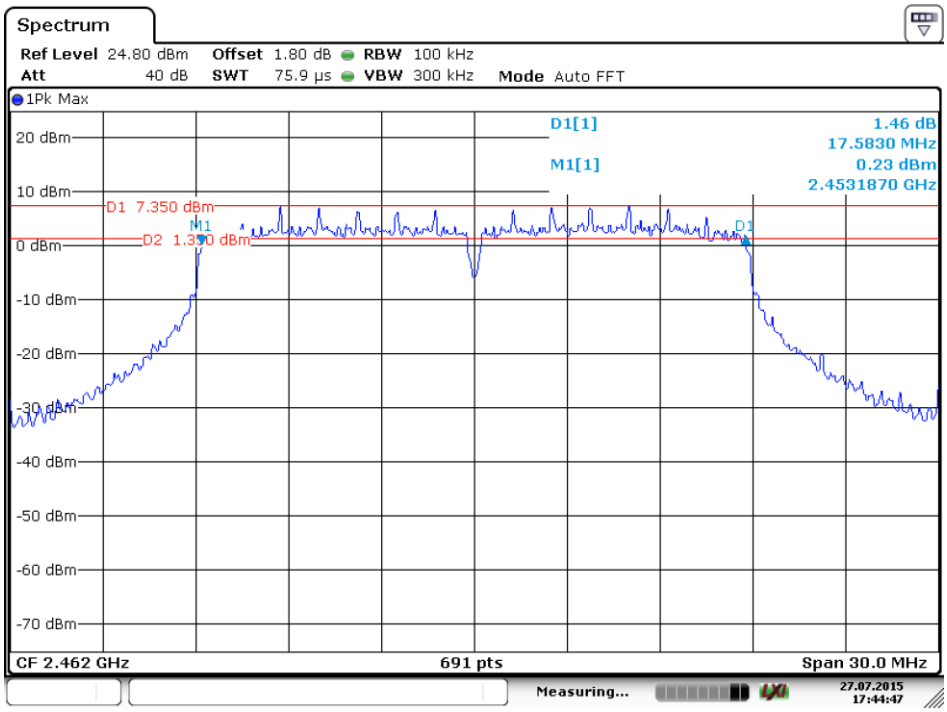
TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

2437MHz



Date: 27.JUL.2015 17:43:16

2462MHz



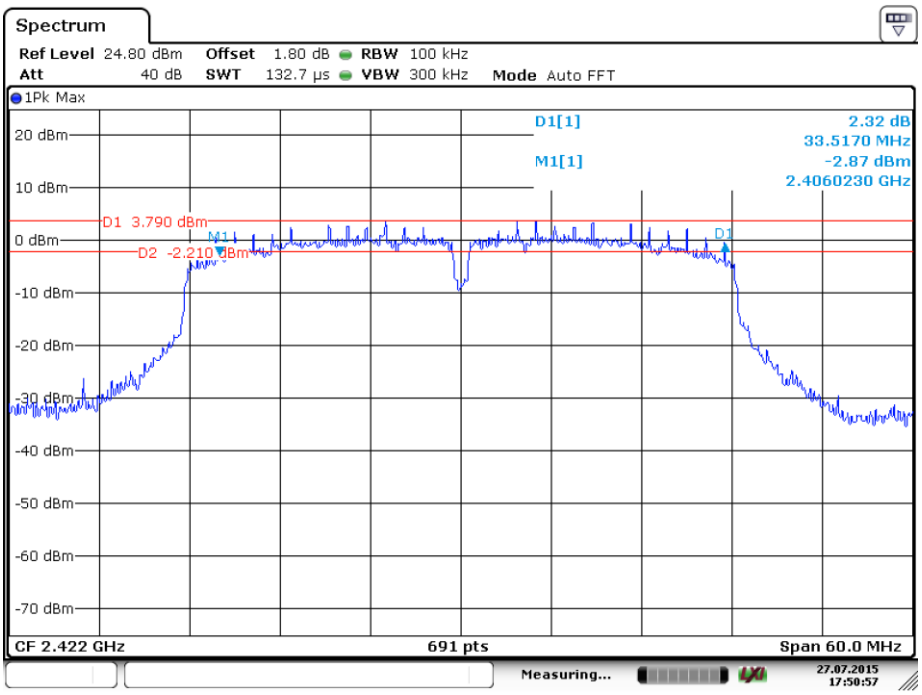
Date: 27.JUL.2015 17:44:47

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

802.11N40

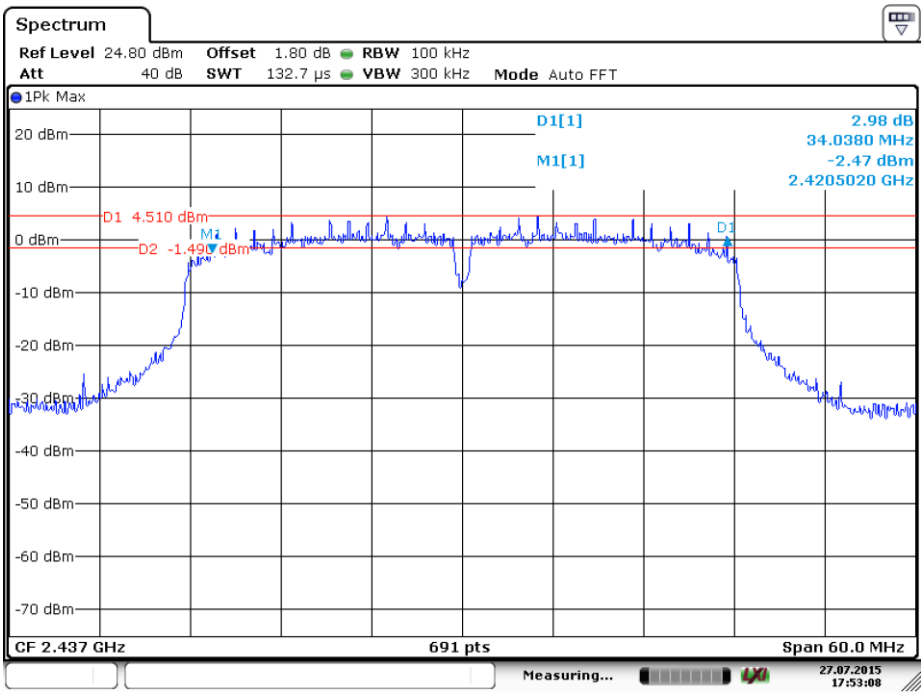
Frequency MHz	6dB bandwidth MHz	Result
Low channel 2422MHz	33.517	Pass
Middle channel 2437MHz	34.038	Pass
High channel 2452MHz	33.690	Pass

2422MHz



Date: 27.JUL.2015 17:50:57

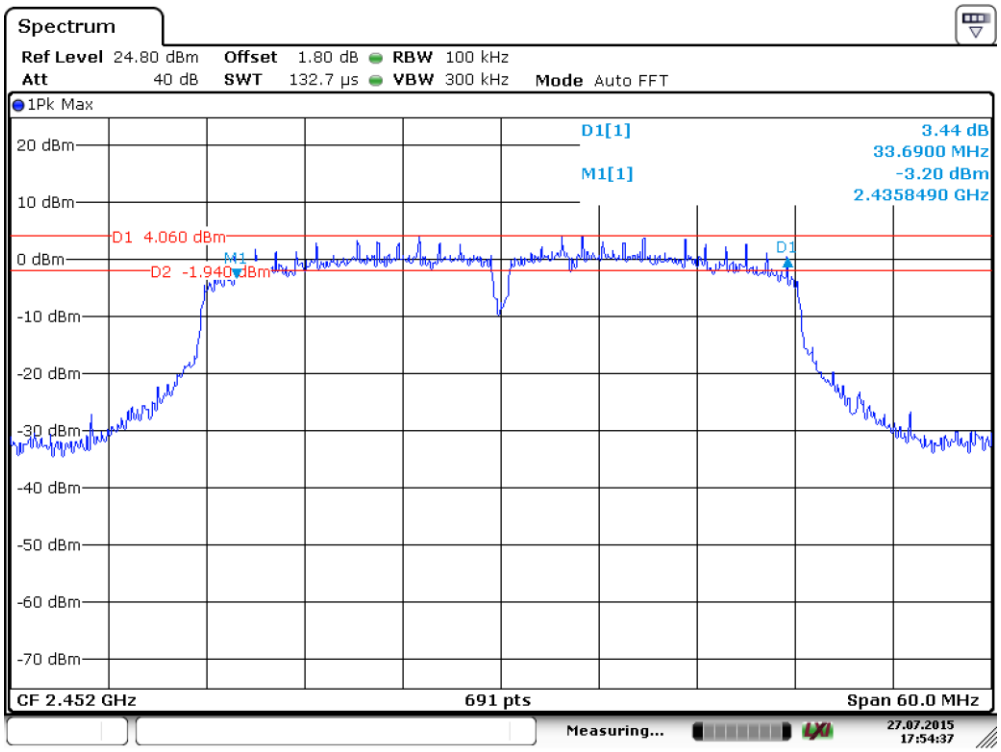
2437MHz



Date: 27.JUL.2015 17:53:09

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

2452MHz



Date: 27.JUL.2015 17:54:38

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

9.4 Power spectral density

Test Method

This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance:

1. Set analyzer center frequency to DTS channel center frequency. RBW=3kHz,VBW≥3RBW,Span=1.5 times DTS bandwidth, Detector=Peak, Sweep=auto, Trace= max hold.
2. Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level within the RBW.
3. Repeat above procedures until other frequencies measured were completed.

Limit

Limit [dBm]
≤8

Test result

802.11 B

Frequency	Power spectral density	Result
MHz	**dBm**	
Low channel 2412MHz	-6.77	Pass
Middle channel 2437MHz	-6.47	Pass
High channel 2462MHz	-5.60	Pass

802.11 G

Frequency	Power spectral density	Result
MHz	**dBm**	
Low channel 2412MHz	-6.27	Pass
Middle channel 2437MHz	-5.59	Pass
High channel 2462MHz	-4.91	Pass

802.11 N20

Frequency	Power spectral density	Result
MHz	**dBm**	
Low channel 2412MHz	-6.16	Pass
Middle channel 2437MHz	-5.85	Pass
High channel 2462MHz	-5.25	Pass

802.11 N40

Frequency	Power spectral density	Result
MHz	**dBm**	
Low channel 2422MHz	-9.71	Pass
Middle channel 2437MHz	-8.82	Pass
High channel 2452MHz	-9.22	Pass

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

9.5 Spurious RF conducted emissions

Test Method

1. Establish a reference level by using the following procedure:
   a. Set RBW=100 kHz. VBW≥3RBW. Detector =peak, Sweep time = auto couple, Trace mode = max hold.
   b. Allow trace to fully stabilize, use the peak marker function to determine the maximum PSD level.
2. Use the maximum PSD level to establish the reference level.
   a. Set the center frequency and span to encompass frequency range to be measured.
   b. Use the peak marker function to determine the maximum amplitude level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements, report the three highest emissions relative to the limit.
3. Repeat above procedures until other frequencies measured were completed.

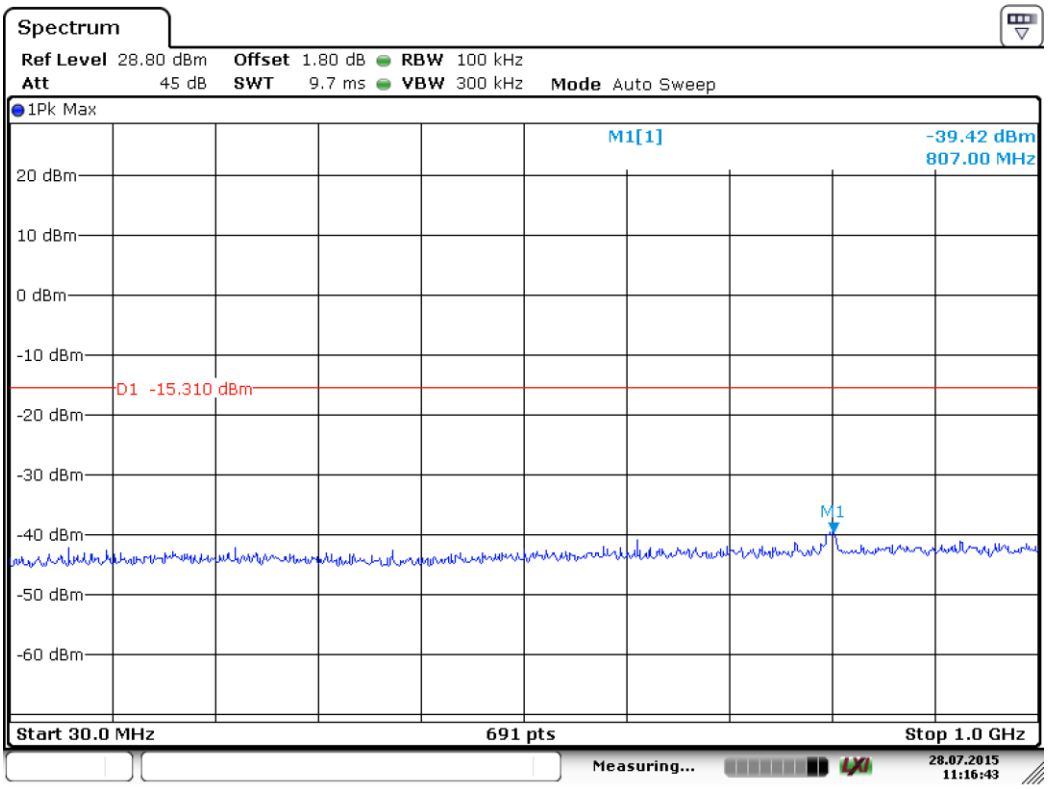
Limit

Frequency Range MHz	Limit (dBc)
30-25000	-20

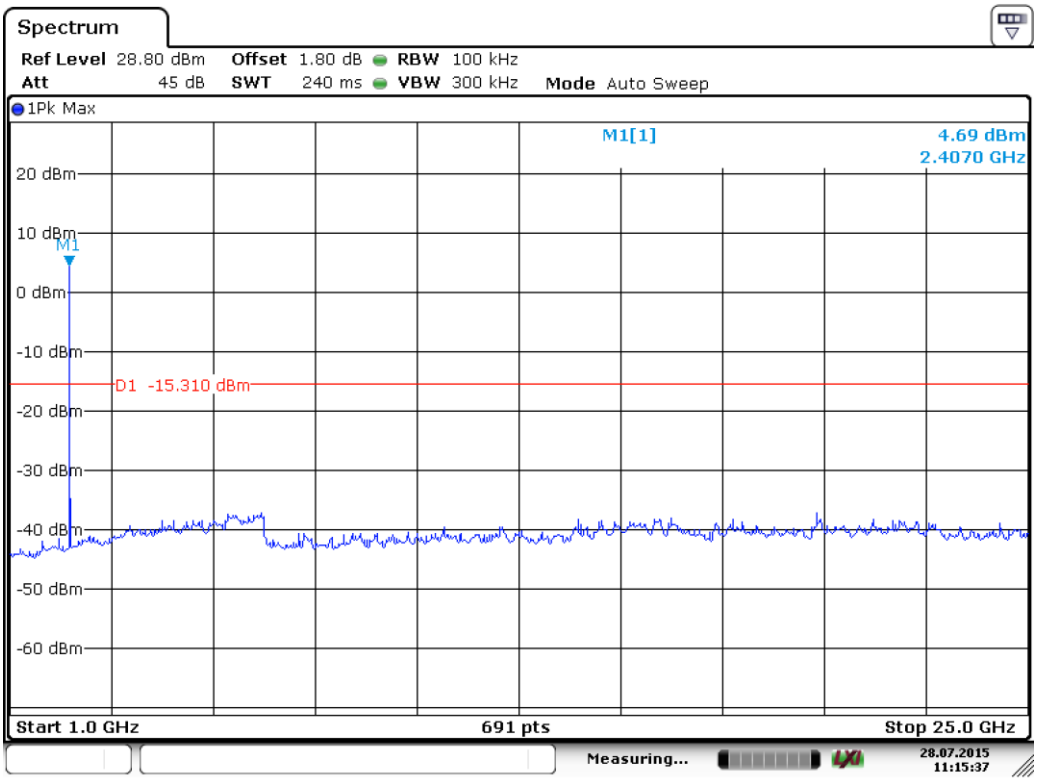
Spurious RF conducted emissions

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

802.11 b
Low channel



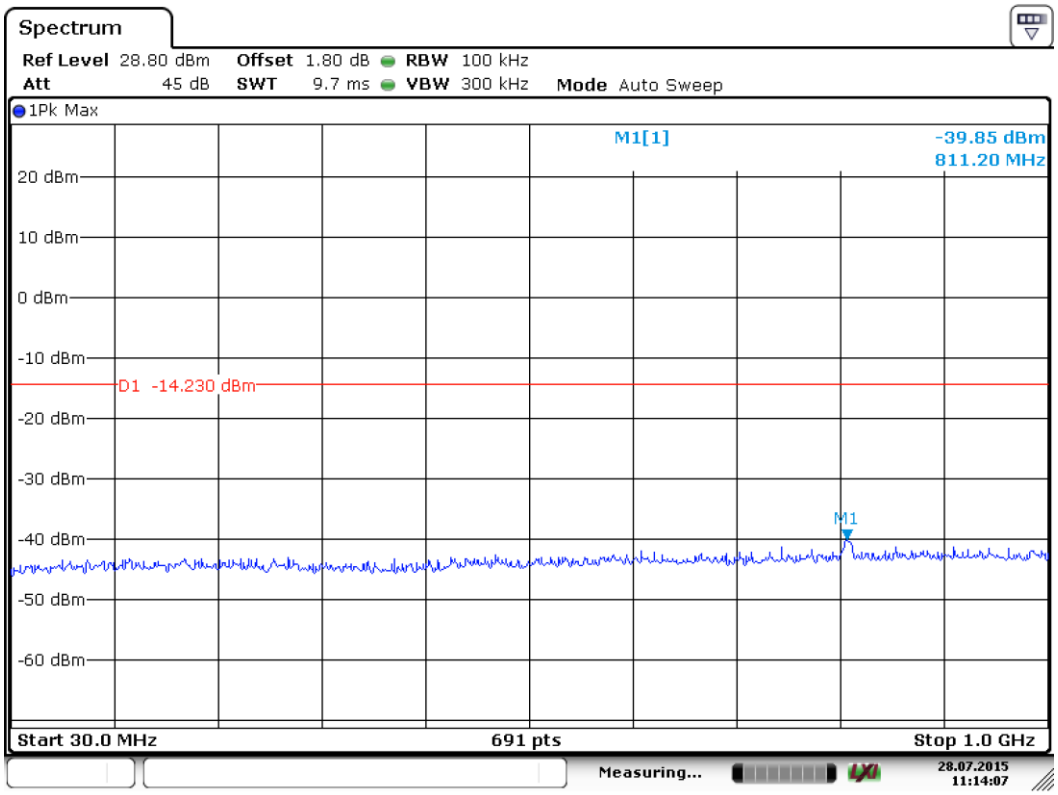
Date: 28.JUL.2015 11:16:44



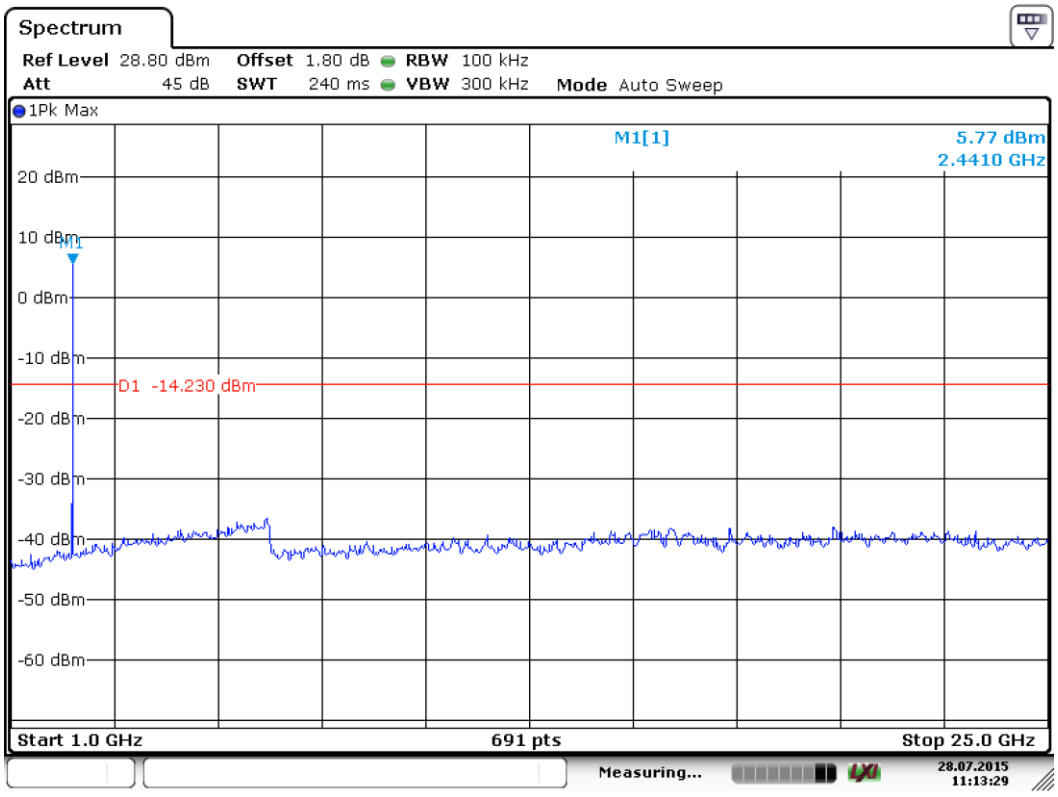
Date: 28.JUL.2015 11:15:37

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

Middle channel



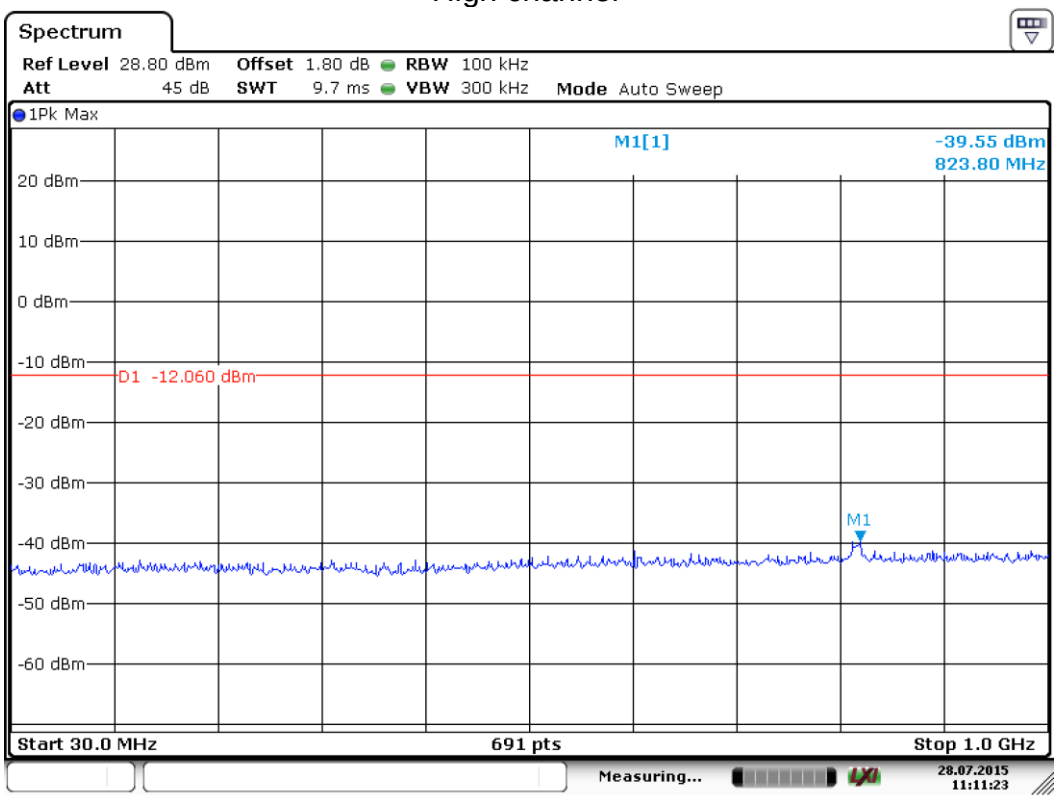
Date: 28.JUL.2015 11:14:07



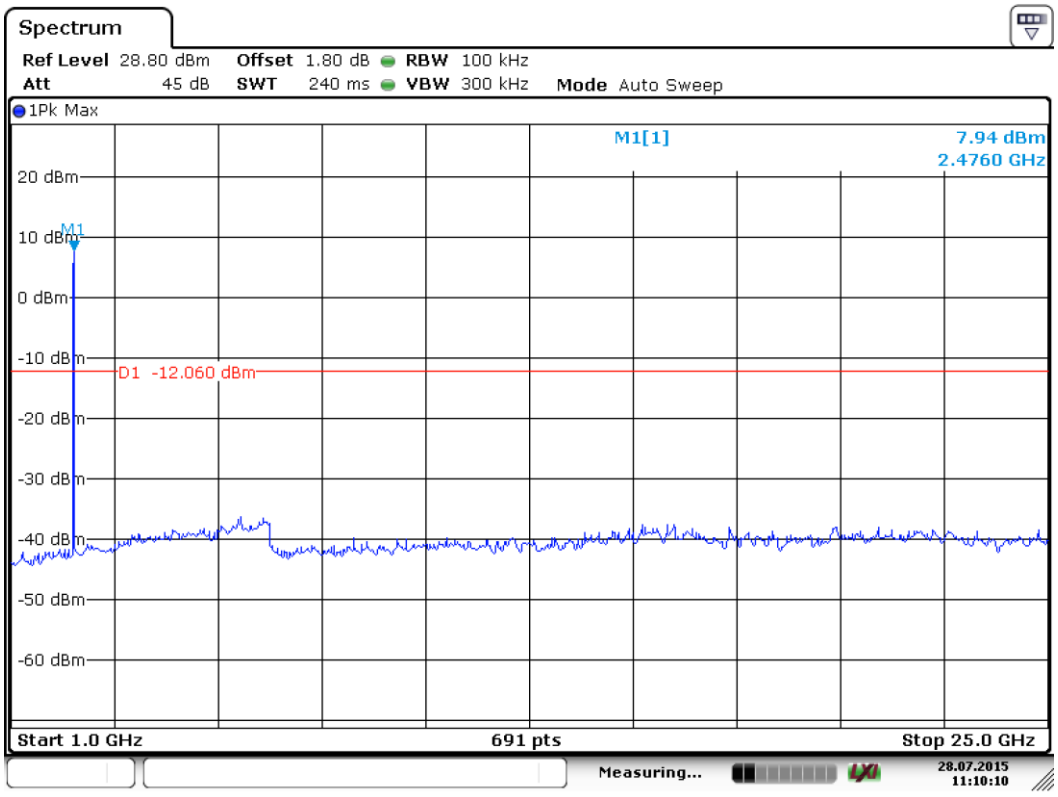
Date: 28.JUL.2015 11:13:29

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

High channel



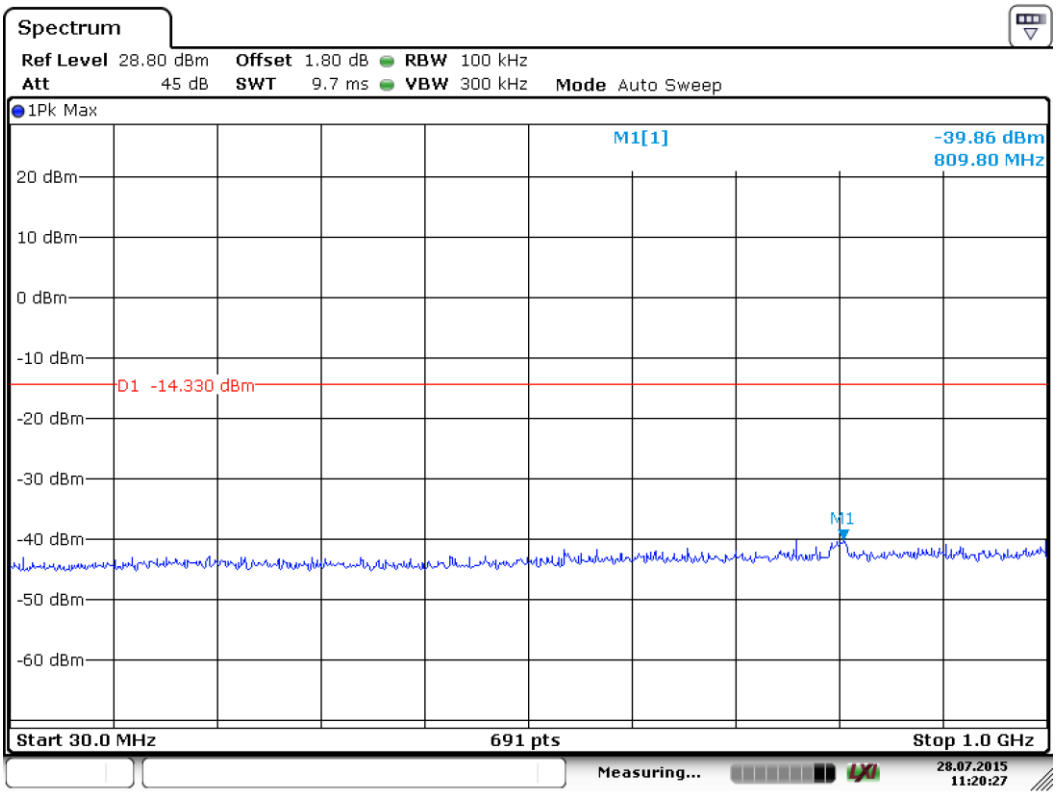
Date: 28.JUL.2015 11:11:22



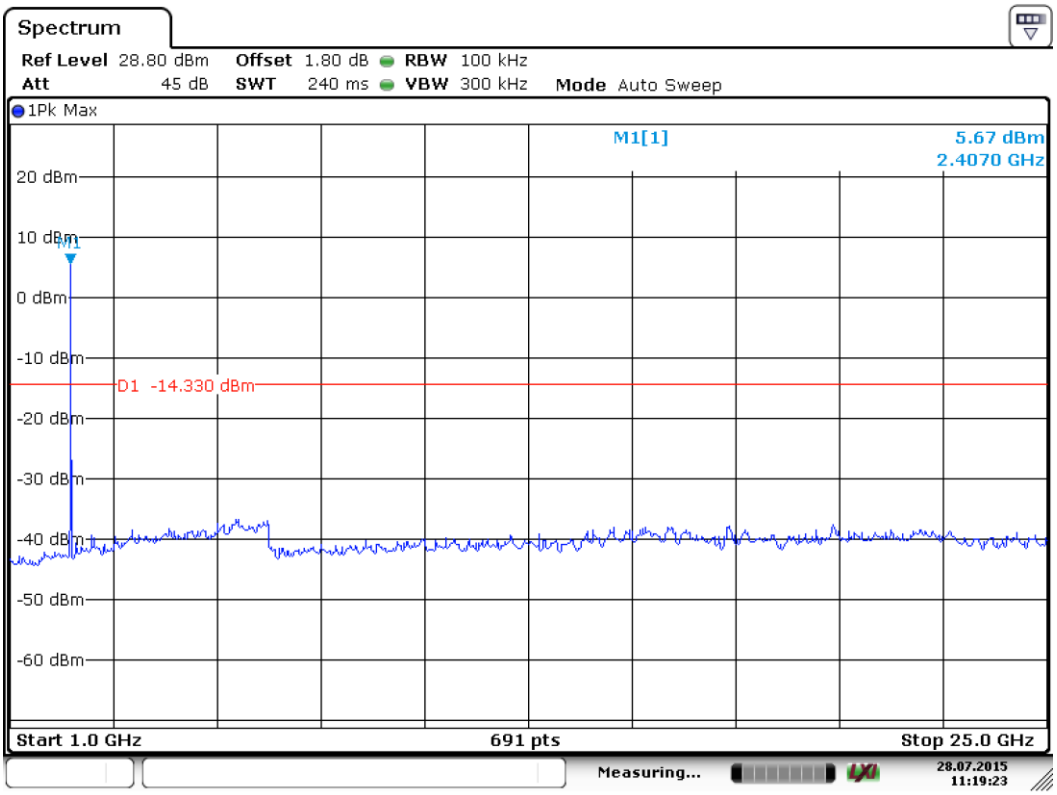
Date: 28.JUL.2015 11:10:10

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

802.11 g
Low channel



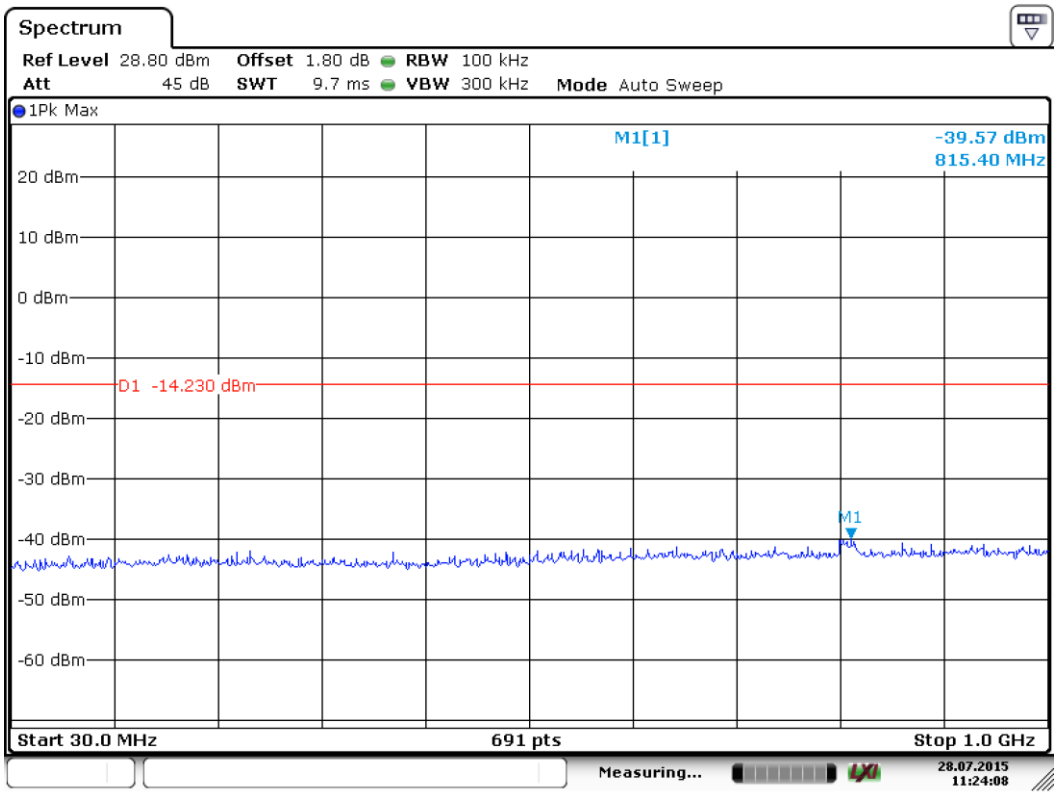
Date: 28.JUL.2015 11:20:27



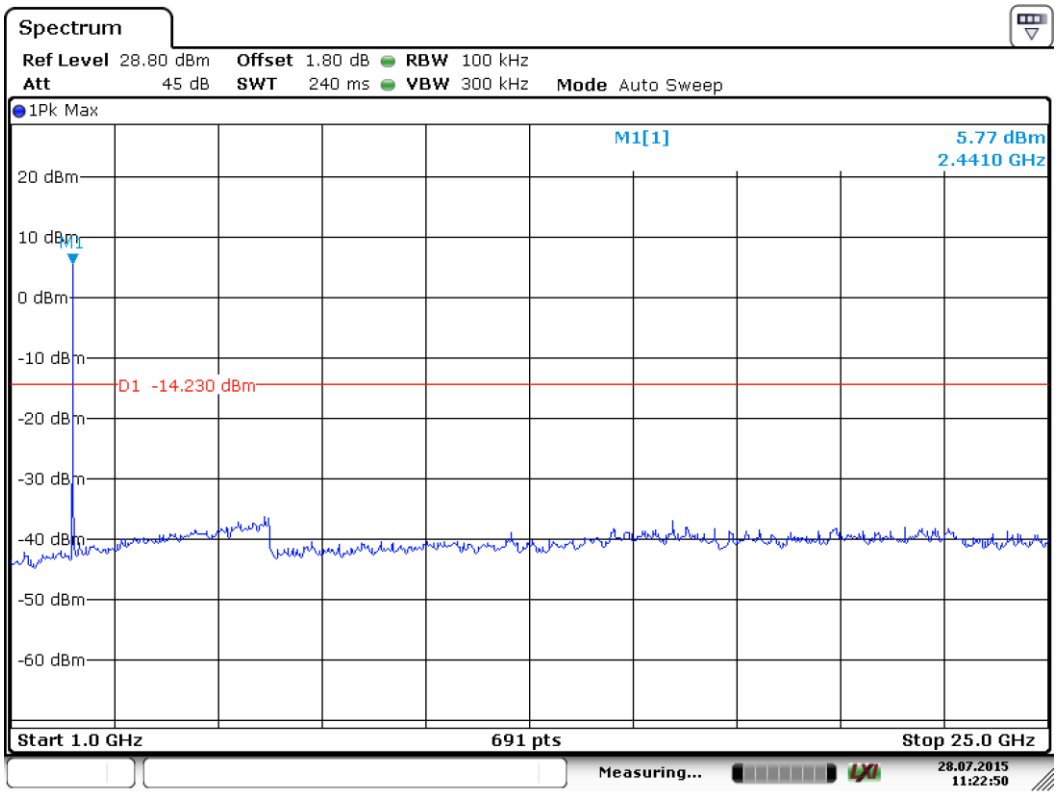
Date: 28.JUL.2015 11:19:23

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

Middle channel



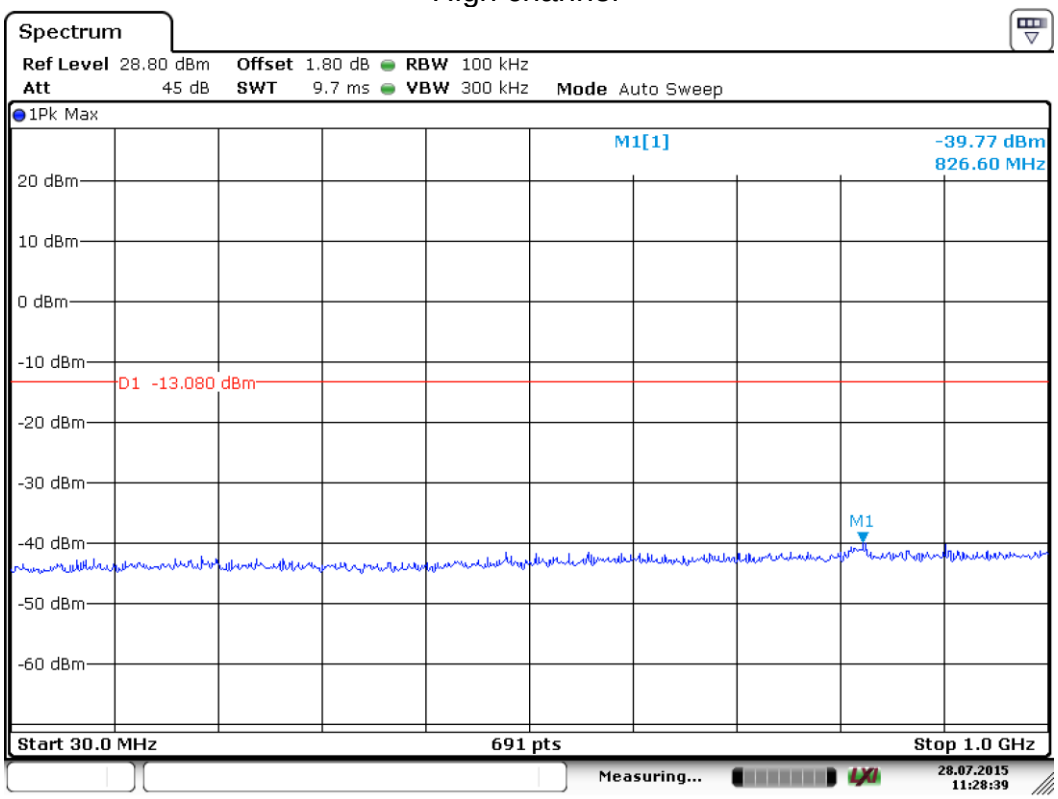
Date: 28.JUL.2015 11:24:09



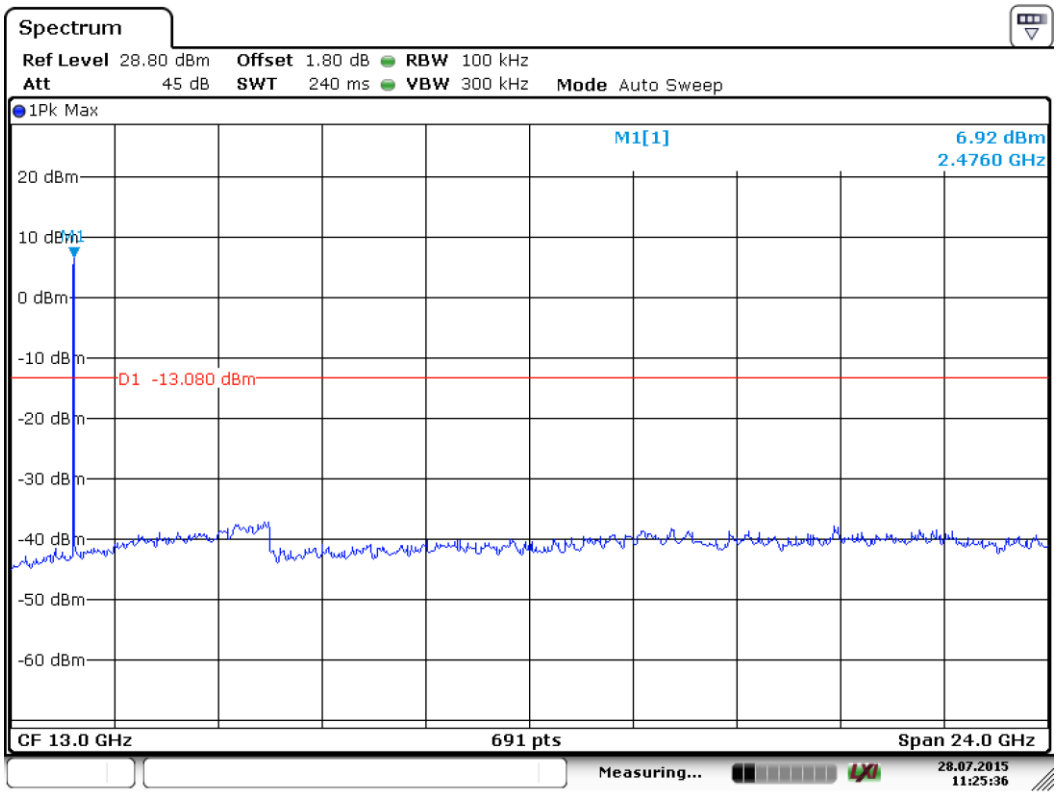
Date: 28.JUL.2015 11:22:50

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

High channel



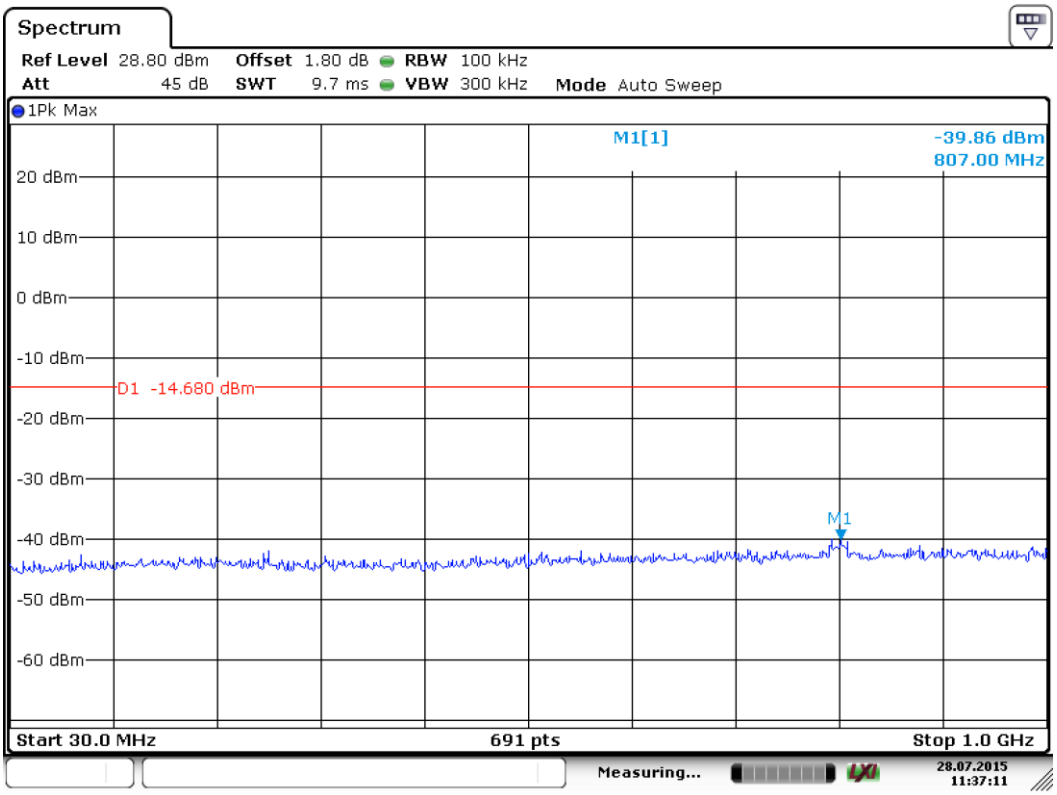
Date: 28.JUL.2015 11:28:39



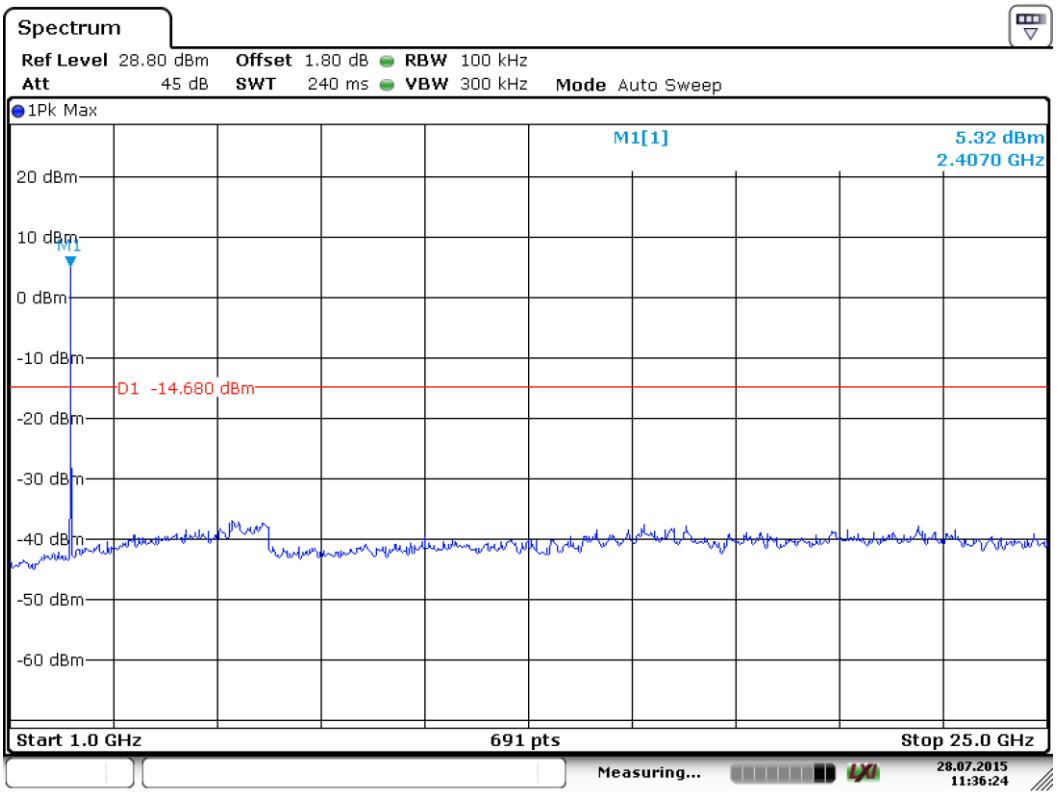
Date: 28.JUL.2015 11:25:37

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

802.11 n20
Low channel



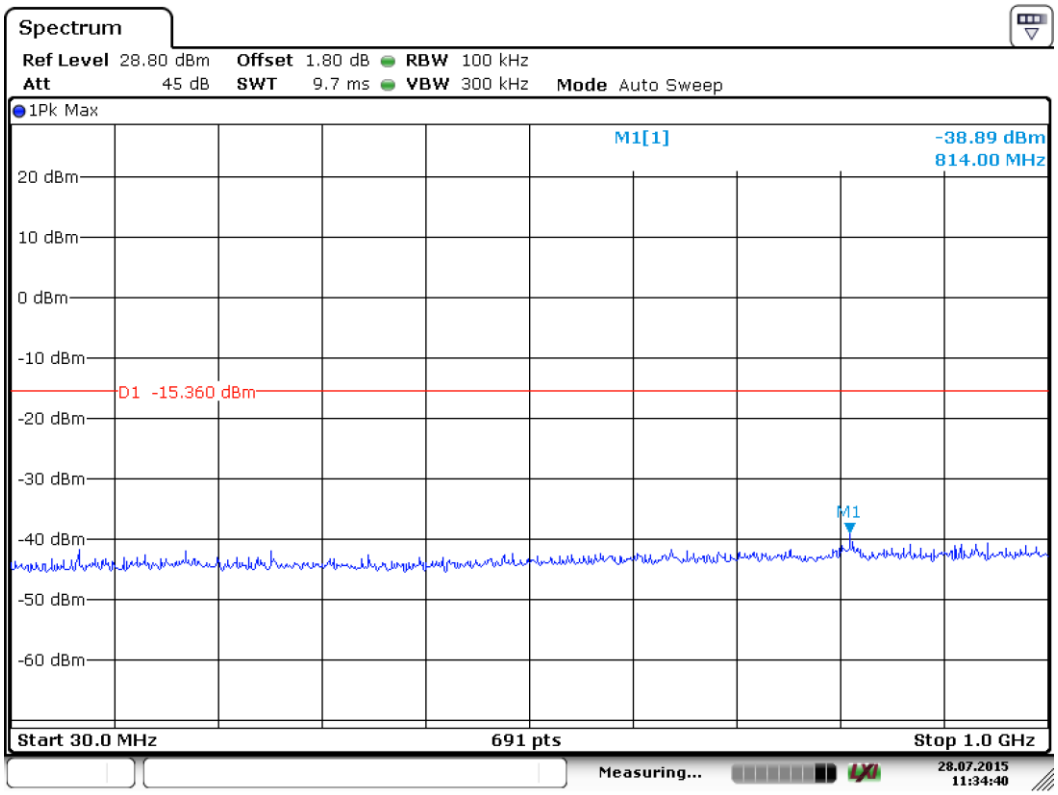
Date: 28.JUL.2015 11:37:11



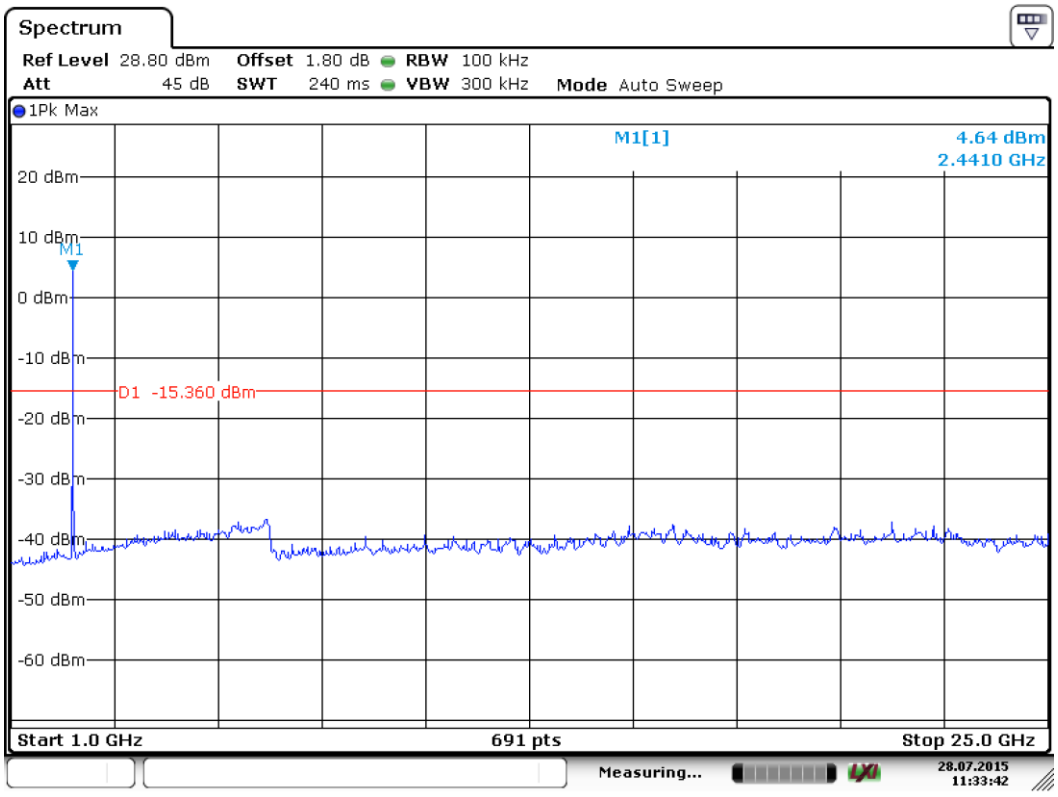
Date: 28.JUL.2015 11:36:24

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

Middle channel



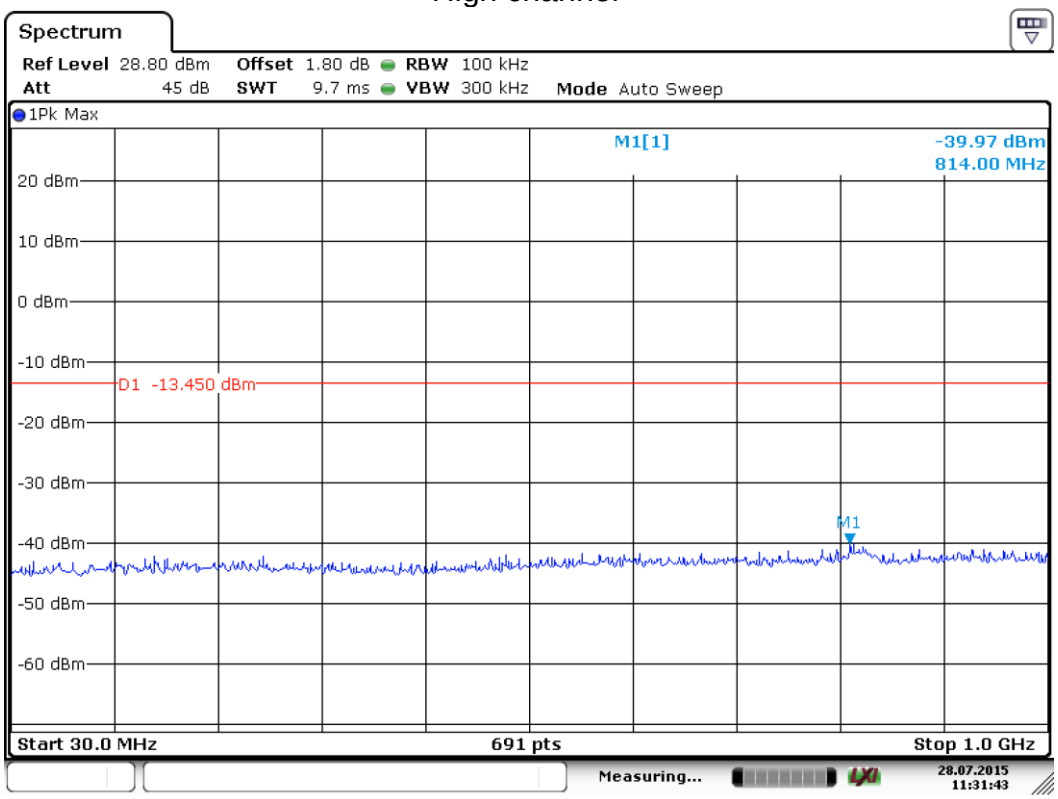
Date: 28.JUL.2015 11:34:40



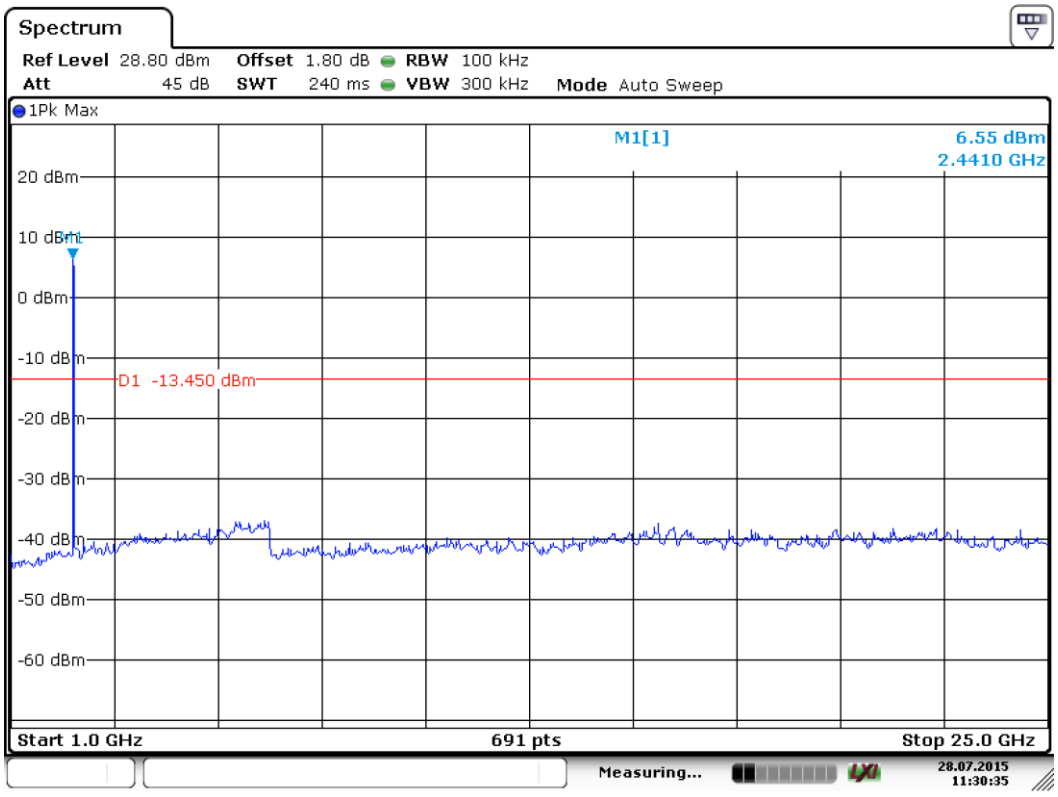
Date: 28.JUL.2015 11:33:43

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

High channel



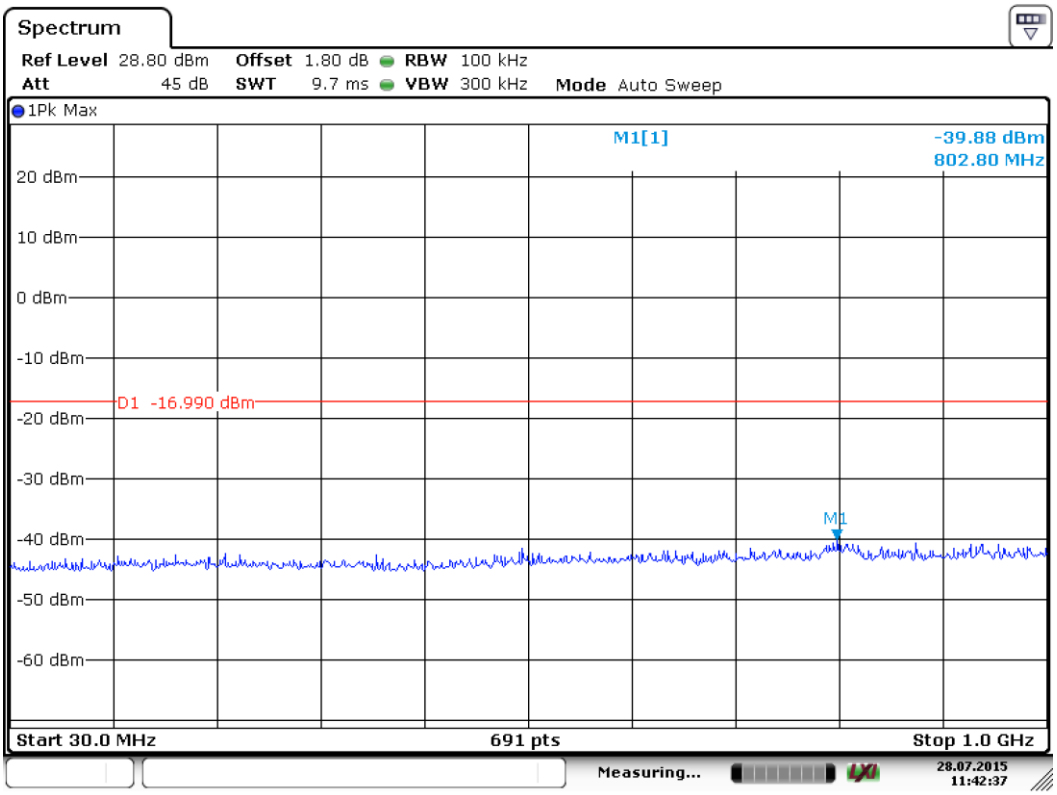
Date: 28.JUL.2015 11:31:43



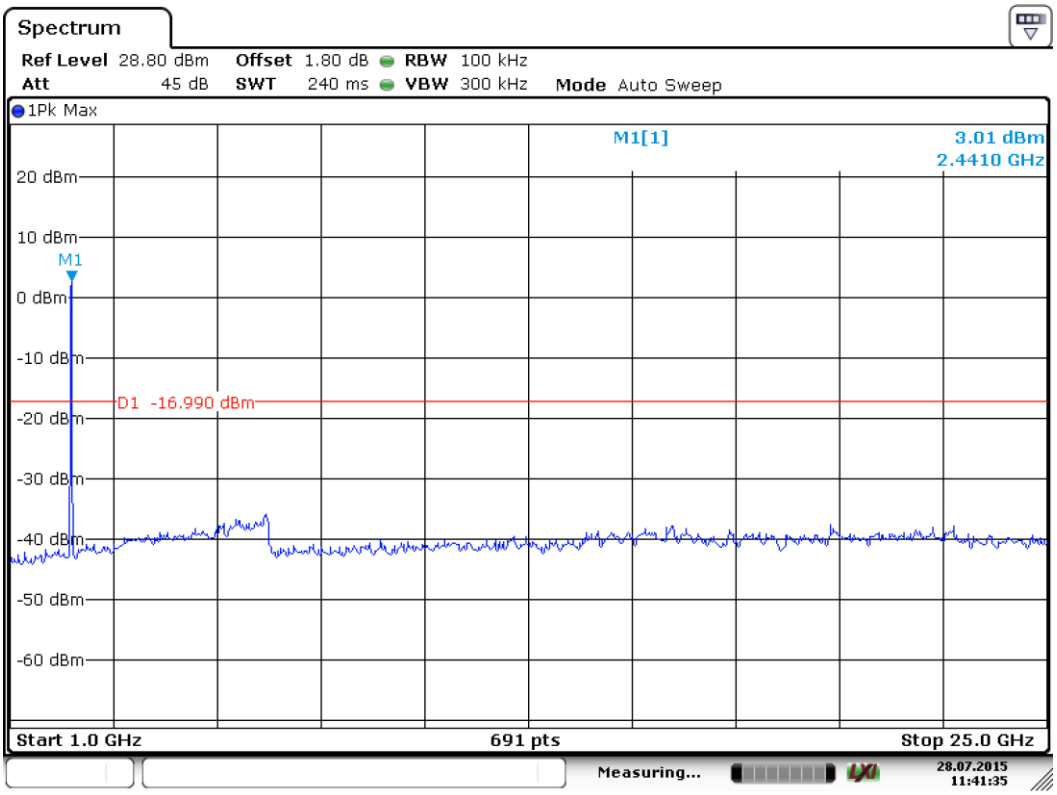
Date: 28.JUL.2015 11:30:35

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

802.11 n40
Low channel



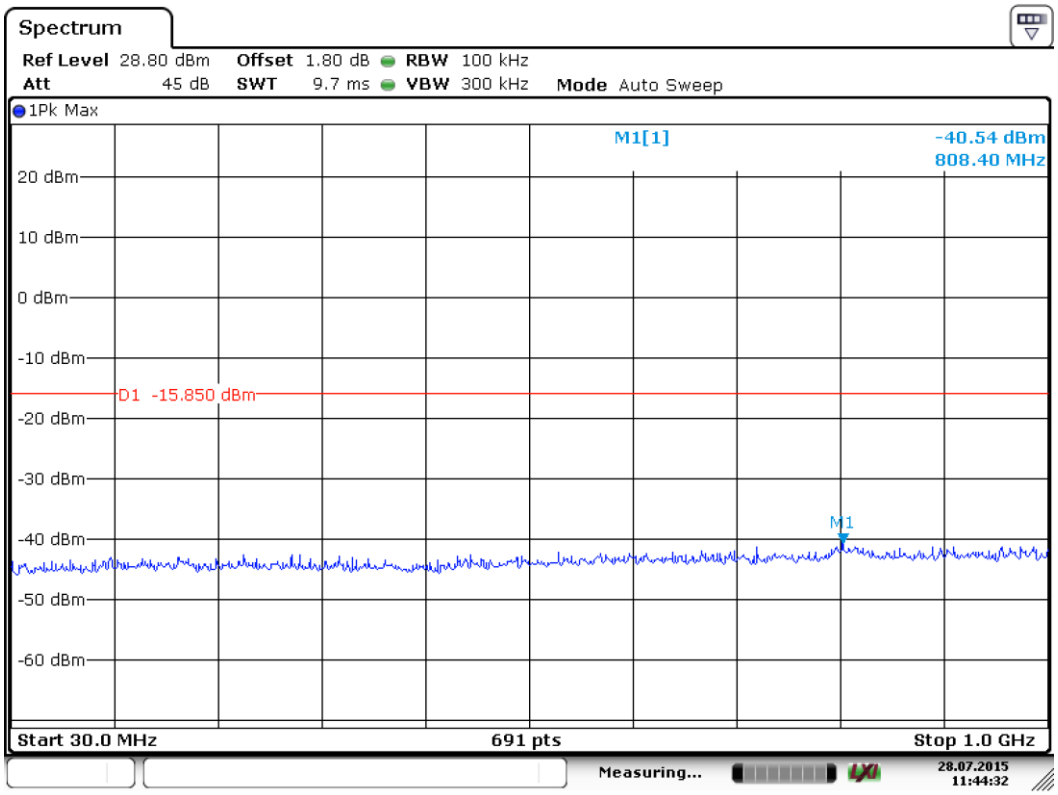
Date: 28.JUL.2015 11:42:36



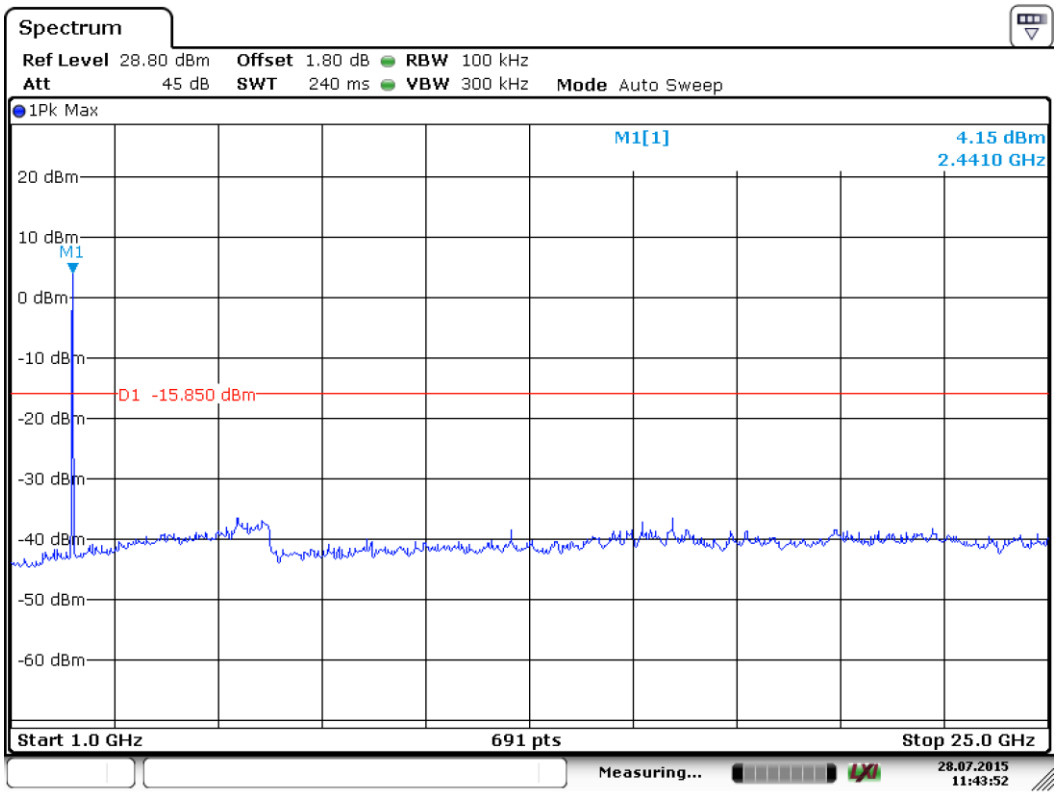
Date: 28.JUL.2015 11:41:35

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

Middle channel



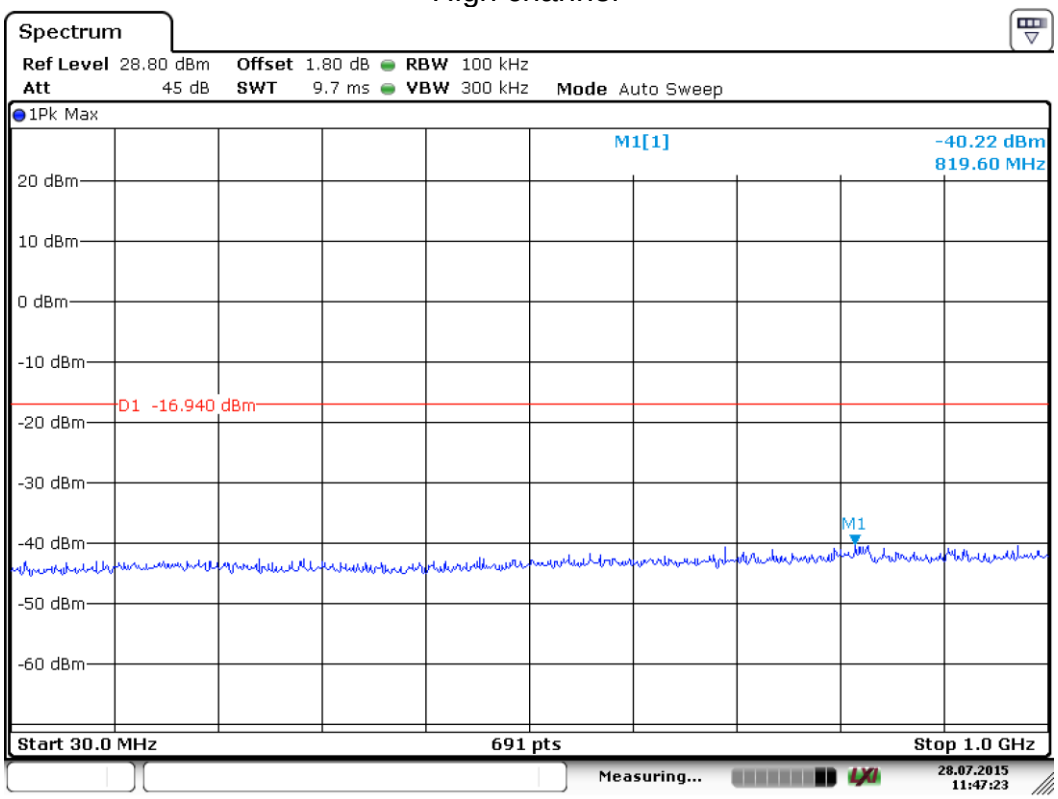
Date: 28.JUL.2015 11:44:32



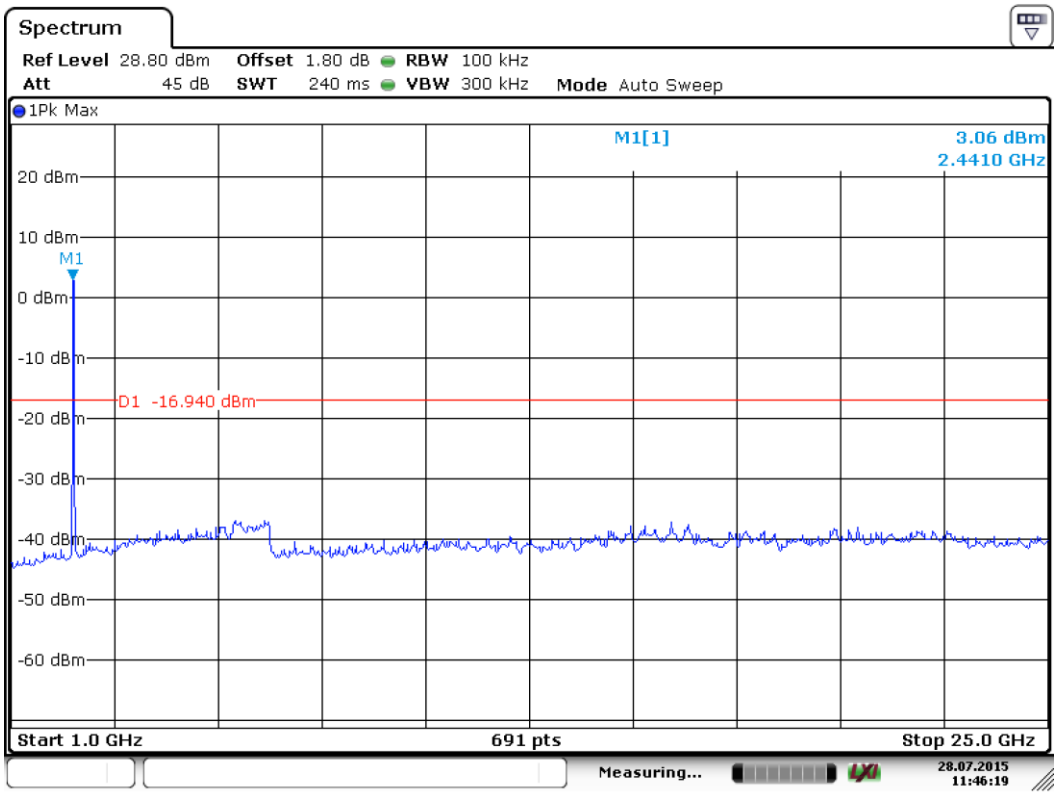
Date: 28.JUL.2015 11:43:52

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

High channel



Date: 28.JUL.2015 11:47:23



Date: 28.JUL.2015 11:46:19

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

9.6 Band edge

Test Method

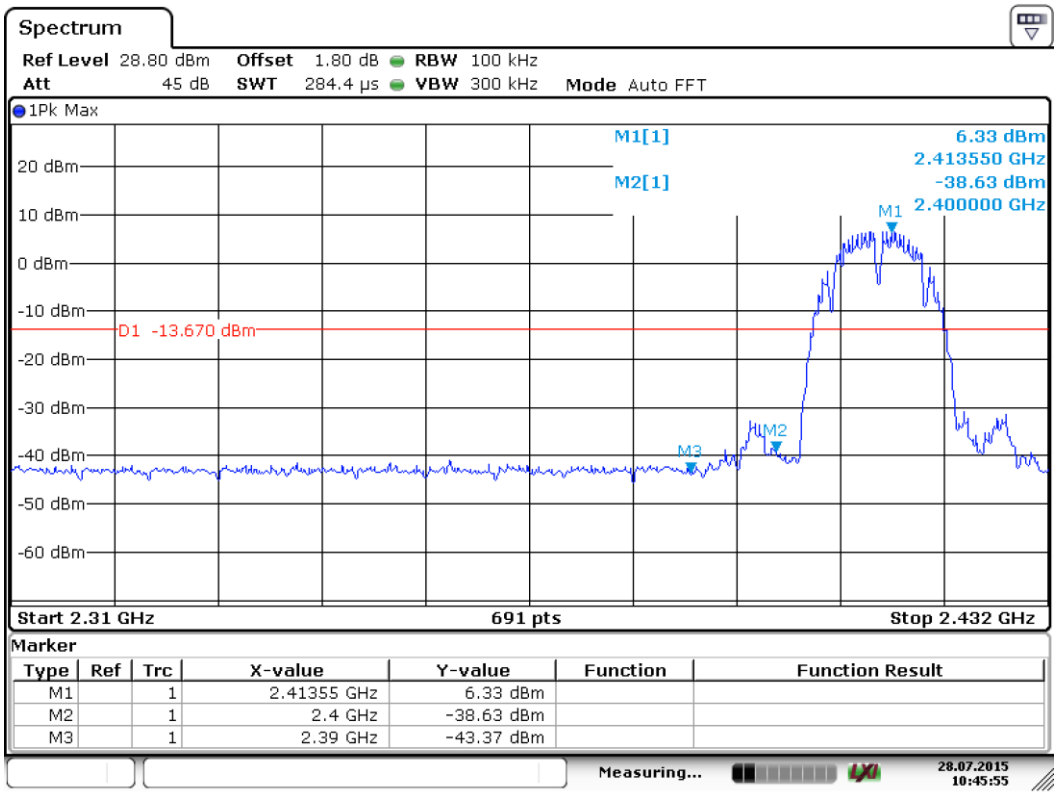
1 Use the following spectrum analyzer settings:
Span = wide enough to capture the peak level of the in-band emission and all spurious
RBW = 100 kHz, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold.
2 Allow the trace to stabilize, use the peak and delta measurement to record the result.
3 The level displayed must comply with the limit specified in this Section.

Limit

In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a) and RSS-Gen8.10, must also comply with the radiated emission limits specified in 15.209(a) (see Section 15.205(c)) and RSS-Gen.

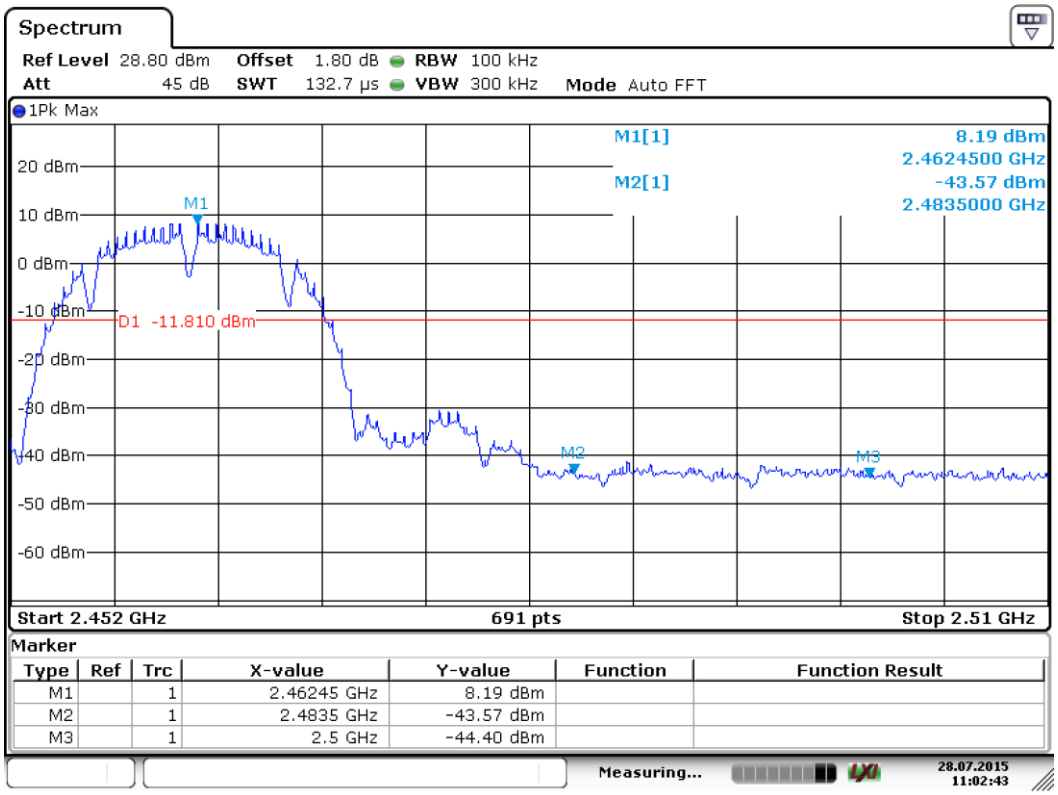
Test result

802.11 b



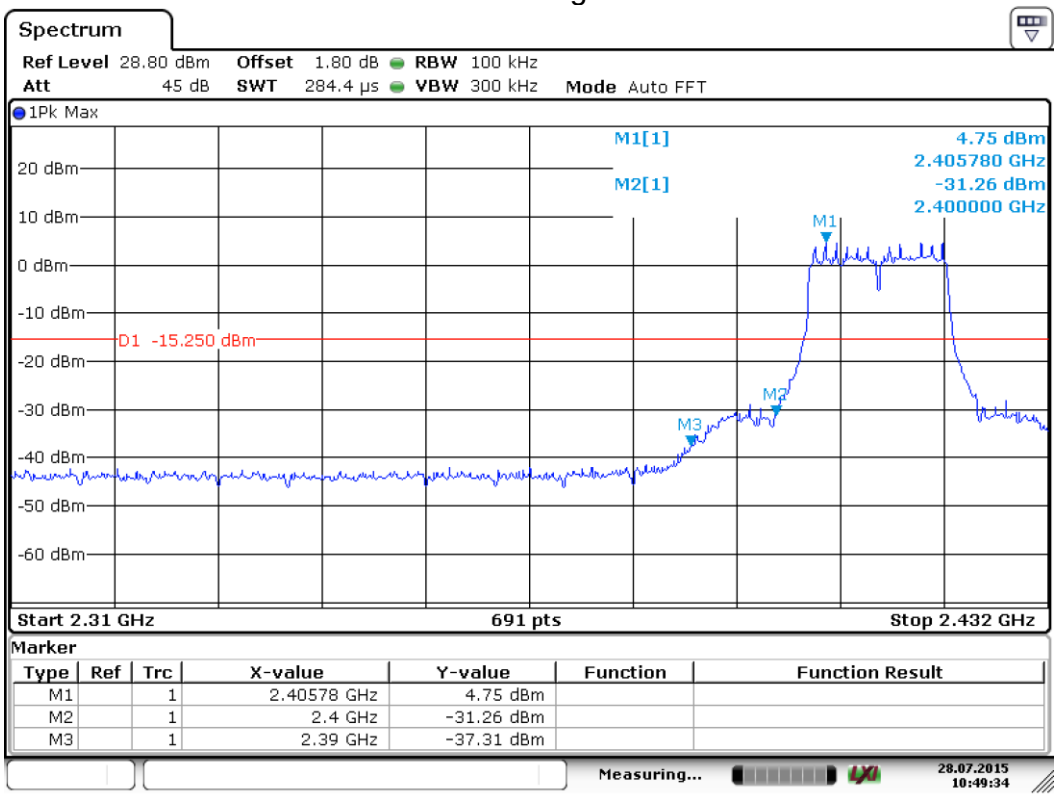
Date: 28.JUL.2015 10:45:54

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478



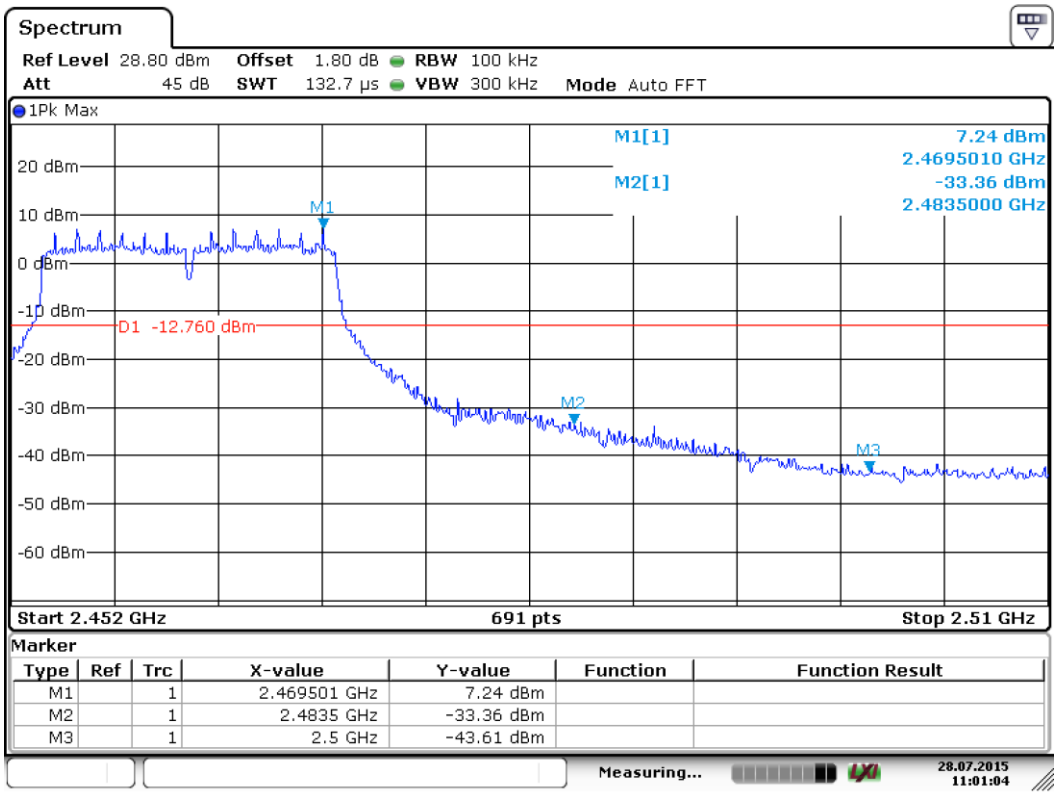
Date: 28.JUL.2015 11:02:42

802.11 g



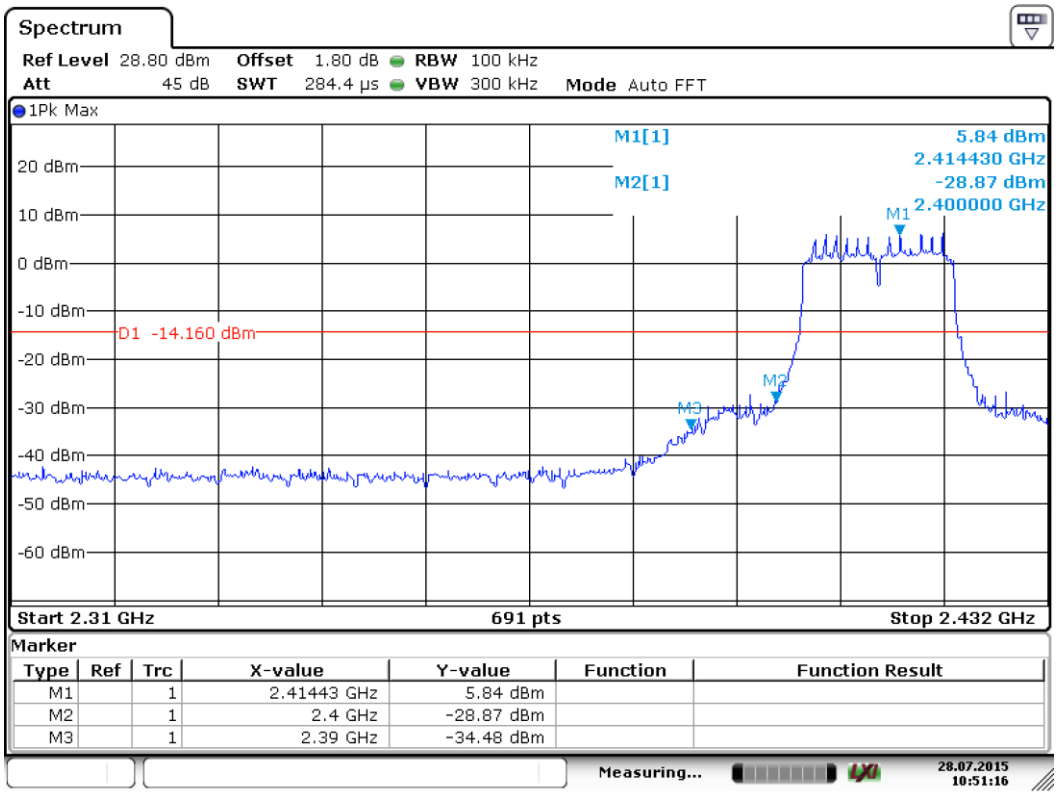
Date: 28.JUL.2015 10:49:34

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478



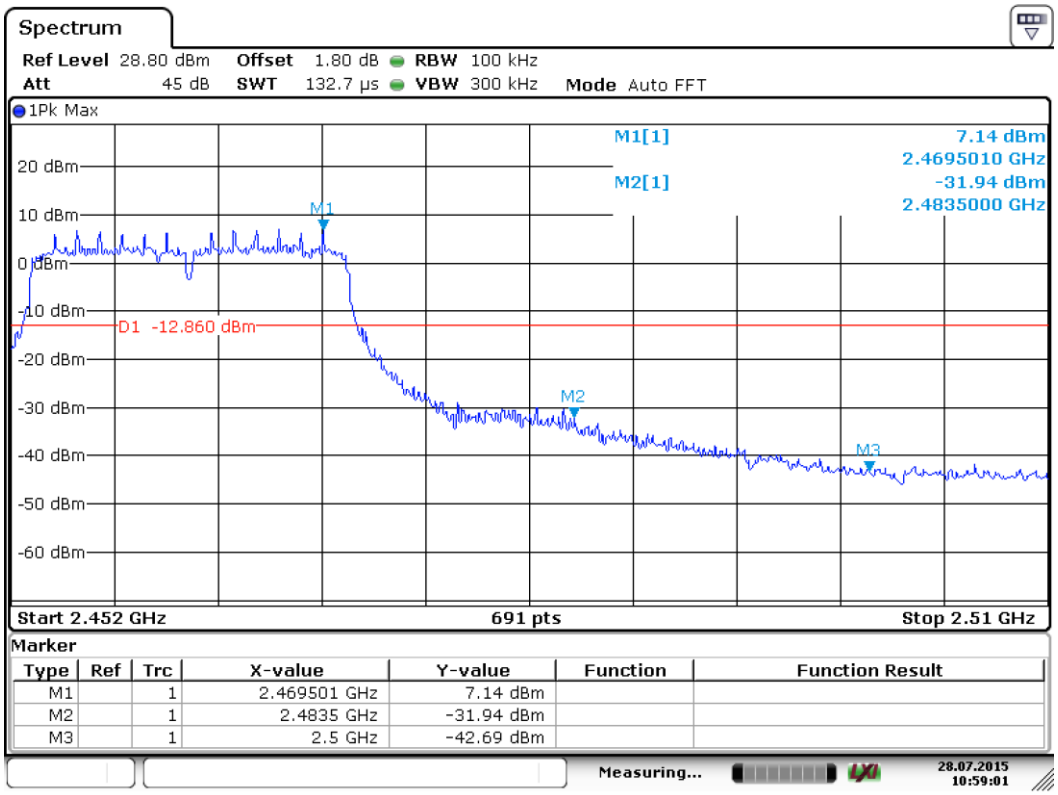
Date: 28.JUL.2015 11:01:04

802.11 n20



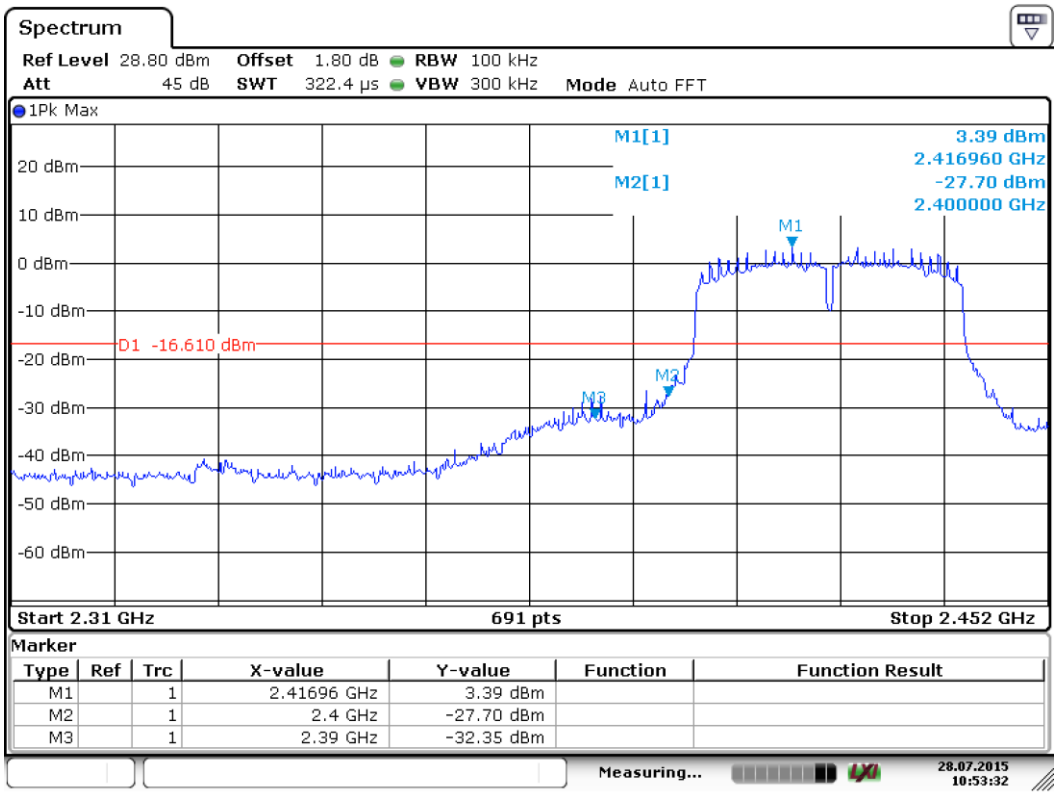
Date: 28.JUL.2015 10:51:16

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478



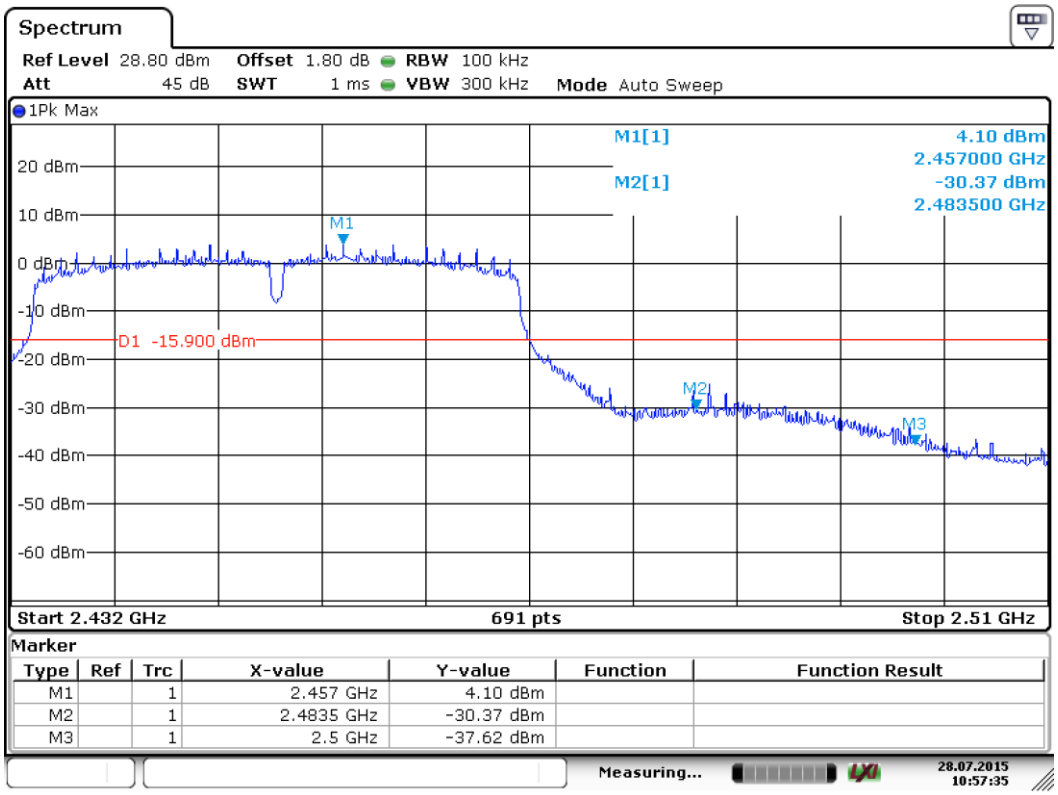
Date: 28.JUL.2015 10:59:01

802.11 n40



Date: 28.JUL.2015 10:53:32

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478



Date: 28.JUL.2015 10:57:35

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

9.7 Spurious radiated emissions for transmitter

Test Method

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
3. Use the following spectrum analyzer settings:
   Span = wide enough to fully capture the emission being measured, RBW = 1 MHz for f ≥ 1GHz, 100 kHz for f < 1 GHz, VBW ≥ RBW, Sweep = auto, Detector function = peak, Trace = max hold
4. Follow the guidelines in ANSI C63.4-1992 with respect to maximizing the emission by rotating the EUT, adjusting the measurement antenna height and polarization, etc.
   The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, submit this data. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the duty cycle per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a “duty cycle correction factor”, derived from 20log(duty cycle/100 ms), in an effort to demonstrate compliance with the 15.209 limit. Submit this data.

Limit

The radio emission outside the operating frequency band shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. Radiated emissions which fall in the restricted bands, as defined in section15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

Spurious radiated emissions for transmitter

According to C63.10, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement, so AV emission value did not show in below table if the peak value complies with average limit.
The only worse case (which is subject to the maximum EIRP, B mode) test result is listed in the report.

Transmitting spurious emission test result as below:

Emission below 1GHz

Frequency (MHz)	QP (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol
81.470625	28.63	40.00	11.37	H
152.523125	27.82	43.50	15.68	H
196.900625	29.49	43.50	14.01	H
250.008125	31.59	46.00	14.41	H
42.913125	32.64	40.00	7.36	V
64.603125	35.97	40.00	4.03	V
146.824375	30.09	43.50	13.41	V

Emission above 1GHz

2412MHz

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
1297.000000	39.94	74.00	34.06	H	-13.9
1598.000000	38.82	74.00	35.18	H	-12.6
2390.000000	43.69	74.00	30.31	H	-8.6
4818.750000	56.09	74.00	17.91	H	-0.4
9855.625000	41.98	74.00	32.02	H	5.7
17786.875000	49.90	74.00	24.10	H	18.3
1113.000000	38.73	74.00	35.27	V	-14.6
2806.000000	40.32	74.00	33.68	V	-7.0
4824.375000	58.49	74.00	15.51	V	-0.3
9646.875000	44.22	74.00	29.78	V	5.5
17736.875000	50.16	74.00	23.84	V	18.2

2437MHz

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
1599.000000	37.31	74.00	36.69	H	-12.6
2205.500000	42.21	74.00	31.79	H	-9.0
17988.750000	50.37	74.00	23.63	H	19.1
4864.375000	53.35	74.00	20.65	H	-0.2
1399.500000	40.42	74.00	33.58	V	-13.5
2791.500000	38.59	74.00	35.41	V	-7.2
4872.500000	54.85	74.00	19.15	V	-0.2
9788.125000	43.36	74.00	30.64	V	5.5
17935.625000	50.62	74.00	23.38	V	18.8

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

2462MHz

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol	Corr. (dB)
2231.000000	40.39	74.00	33.61	H	-8.9
2812.000000	39.29	74.00	34.71	H	-6.9
4918.125000	51.94	74.00	22.06	H	-0.2
9846.250000	43.36	74.00	30.64	H	5.7
17704.375000	50.19	74.00	23.81	H	17.9
1596.000000	36.40	74.00	37.60	V	-12.6
2824.000000	39.48	74.00	34.52	V	-6.9
4927.500000	53.79	74.00	20.21	V	-0.1
9851.250000	46.77	74.00	27.23	V	5.7
17970.625000	50.46	74.00	23.54	V	19.0

Remark:

(1) AV Emission Level= PK Emission Level+20log (dutycycle)

(2) Data of measurement within 30-1000MHz frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20db below the permissible limits or the field strength is too small to be measured.

(3) "*" means the emission(s) appear within the restrict bands shall follow the requirement of section 15.205.

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch

5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

10 Test Equipment List

List of Test Instruments

	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
CE	EMI Test Receiver	Rohde & Schwarz	ESR 3	101782	2016-7-24
	LISN	Rohde & Schwarz	ENV4200	100249	2016-7-24
	LISN	Rohde & Schwarz	ENV216	100326	2016-7-24
	ISN	Rohde & Schwarz	ENY81	100177	2016-7-24
	ISN	Rohde & Schwarz	ENY81-CAT6	101664	2016-7-24
	High Voltage Proble	Rohde & Schwarz	TK9420(VT9420)	9420-58	2016-7-24
	RF Current probe	Rohde & Schwarz	EZ-17	100816	2016-7-24
C	Signal Generator	Rohde & Schwarz	SMB100A	108272	2016-7-24
	Signal Analyzer	Rohde & Schwarz	FSV40	101030	2016-7-24
	Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	2016-7-24
	RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2016-7-24
RE	EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2016-7-24
	Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2016-8-14
	Horn Antenna	Rohde & Schwarz	HF907	102294	2016-7-24
	Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2016-7-24
	3m Semi-anechoic chamber	TDK	9X6X6	----	2019-5-29

C - Conducted RF tests

- Conducted peak output power
- 6dB bandwidth and 99% Occupied Bandwidth
- Power spectral density*
- Spurious RF conducted emissions
- Band edge

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478

11 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Radiation emission	U=4.32dB (30MHz-25GHz)
Output power test	0.94 dB
Power density test	2.10 dB
Bandwidth	$1x10^{-9}$

TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch
5F, Communication Building,163 Pingyun Rd, Huangpu Ave. West Guangzhou, P.R.China TEL: +86 20 3832 0668 FAX: +86 20 3832 0478