Zacta

TEST REPORT

Report number : JPD-TR-16223-0
Issue date : February 1, 2017

The device, as described herewith, was tested pursuant to applicable test procedure and complies with the requirements of;

FCC Part15 Subpart C

The test results are traceable to the international or national standards.

Applicant	:	KYOCERA Corporation
Equipment under test (EUT)	:	Mobile Phone
Model number	:	DA03
FCC ID	:	JOYDA03

Date of test	:	October 28, 31, 2016, December 12, 14, 15, 16, 20, 2016 January 27, 30, 2017, February 1, 2017
Test place	:	TÜV SÜD Zacta Ltd. Yonezawa Testing Center 5-4149-7, Hachimanpara, Yonezawa-shi, Yamagata, 992-1128 Japan Phone: +81-238-28-2881 Fax: +81-238-28-2888
Test results	:	Complied

The results in this report are applicable only to the equipment tested.
This report shall not be re-produced except in full without the written approval of TÜV SÜD Zacta Ltd.
This test report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

Tested by : Kazunori Saito
Kazunori Saito

Approved by : Hiroaki Suzuki
Hiroaki Suzuki
Lab Manager of RF Lab

NVLAP TESTING
NVLAP LAB CODE 200306-0

ilac-MRA

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1. Summary of Test

1.1 Purpose of test

It is the original test in order to verify conformance to FCC Part 15 Subpart C.

1.2 Standards

CFR47 FCC Part 15 Subpart C

1.2.1 Test Methods

ANSI C63.10-2013, KDB 558074 D01 DTS Meas Guidance v03r05

1.2.2 Deviation from standards

None

1.3 List of applied test to the EUT

Test items Section	Test items	Condition	Result
15.247(a)(2)	6dB Bandwidth	Conducted	PASS
15.247(b)(3)	Maximum Conducted Output Power	Conducted	PASS
15.247(d)	Band Edge Compliance of RF Conducted Emissions	Conducted	PASS
15.247(d) 15.205 15.209	Spurious Emissions	Conducted Radiated	PASS
15.247(d) 15.205 15.209	Restricted Bands of Operation	Radiated	PASS
15.247(e)	Transmitter Power Spectral Density	Conducted	PASS
15.207	AC Power Line Conducted Emissions	Conducted	PASS

1.3.1 Test set up

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1.4 Modification to the EUT by laboratory

None

2. Equipment Under Test

2.1 General Description of equipment

EUT is the Mobile Phone.

2.2 EUT information

Applicant	:	KYOCERA Corporation Yokohama Office 2-1-1 Kagahara, Tsuzuki-ku Yokohama-shi, Kanagawa, Japan Phone: +81-45-943-6253 Fax: +81-45-943-6314
Equipment under test	:	Mobile Phone
Trade name	:	Kyocera
Model number	:	DA03
Serial number	:	N/A
EUT condition	:	Pre-Production
Power ratings	:	Battery: DC 3.8V
Size	:	(W) 71.0 × (D) 10.4 × (H) 142.0 mm
Environment	:	Indoor and Outdoor use
Terminal limitation	:	-20˚C to 60˚C
RF Specification		
Protocol	:	IEEE802.11b, IEEE802.11g, IEEE802.11n (HT20)
Frequency range	:	IEEE802.11b /11g/11n (HT20): 2412MHz-2462MHz
Number of RF Channels	:	11 Channels
Modulation type	:	IEEE802.11b: DSSS (DBPSK, DQPSK, CCK) IEEE802.11g / n (HT20) : OFDM (BPSK, QPSK, 16QAM, 64QAM)
Data rate	:	IEEE802.11b: 1, 2, 5.5, 11Mbps IEEE802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps IEEE802.11n (HT20 LGI): 6.5, 13, 19.5, 26, 39, 52, 58.5, 65Mbps IEEE802.11n (HT20 SGI): 7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65, 72.2Mbps
Channel separation	:	5MHz
Output power	:	88.716mW (IEEE802.11b) 110.662mW (IEEE802.11g) 105.439mW (IEEE802.11n: HT20)
Antenna type	:	Internal antenna
Antenna gain	:	-1.9dBi

2.3 Variation of the family model(s)

Not applicable

2.4 Operating channels and frequencies

Channel	Frequency [MHz]
1	2412
2	2417
3	2422
4	2427
5	2432
6	2437
7	2442
8	2447
9	2452
10	2457
11	2462

2.5 Operating mode

The EUT had been tested under operating condition.
There are three channels have been tested as following:

Tested Channel	Frequency [MHz]
Low	2412
Middle	2437
High	2462

The pre-test has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

Tested Channel	Modulation Type	Data Rate
Low, Middle, High	IEEE802.11b: DSSS	1Mbps
Low, Middle, High	IEEE802.11g: OFDM	6Mbps
Low, Middle, High	IEEE802.11n (HT20 LGI): OFDM	MCS0 (6.5Mbps)

The field strength of spurious emissions was measured at each position of all three axis X, Y and Z to compare the level, and the maximum noise.
The worst emission was found in X axis and the worst case recorded.

2.6 Operating flow

[Tx mode]
i) Test program setup to the DM tool
ii) Select a Test mode
[IEEE802.11b、IEEE802.11g、IEEE802.11n (HT20)]
Operating frequency: Channel Low: 2412MHz, Channel Middle: 2437MHz, Channel High: 2462MHz

iii) Start test mode

[Rx mode]
i) Test program setup to the DM tool
ii) Select a Test mode
[IEEE802.11b、IEEE802.11g、IEEE802.11n (HT20)]
Operating frequency: Channel Low: 2412MHz, Channel Middle: 2437MHz, Channel High: 2462MHz

iii) Start test mode

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3. Configuration of equipment

3.1 Equipment(s) used

No.	Equipment	Company	Model No.	Serial No.	FCC ID / DoC	Comment
1	Mobile Phone	KYOCERA	DA03	N/A	JOYDA03	EUT
2	AC Adapter	au	N/A	N/A	N/A	*

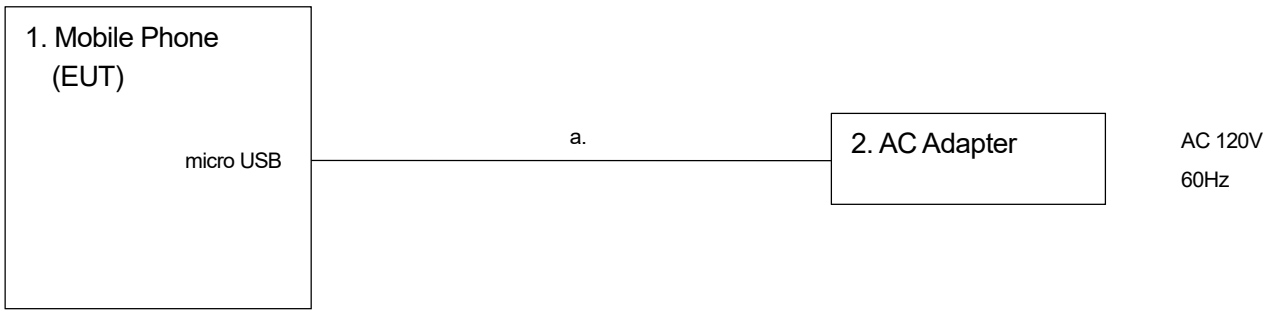
*: AC power line Conducted Emission Test.

3.2 Cable(s) used

No.	Cable	Length[m]	Shield	Connector	Comment
a	Micro USB cable (for AC Adapter)	1.0	Yes	Metal	*

*: AC power line Conducted Emission Test.

3.3 System configuration



Note1: Numbers assigned to equipment or cables on this diagram correspond to the list in “3.1 Equipment(s) used” and “3.2 Cable(s) used”.

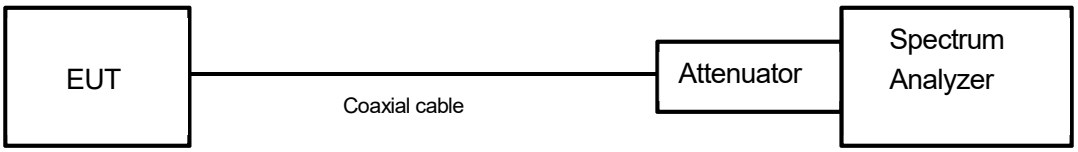
4. 6dB Bandwidth

4.1 Measurement procedure
[FCC 15.247(a)(2), KDB 558074 D01 v03r05, Section 8.2]

The bandwidth at 6dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
a) RBW = 100kHz.
b) VBW ≥ 3 x RBW.
c) Sweep time = auto-couple.
d) Detector = peak.
e) Trace mode = max hold.

- Test configuration



4.2 Limit

The minimum permissible 6dB bandwidth is 500kHz.

4.3 Measurement result

Date : October 28, 2016
Temperature : 22.5 [˚C]
Humidity : 47.4 [%]
Test place : Shielded room No.4

Test engineer : Kazunori Saito

[IEEE802.11b、IEEE802.11g、IEEE802.11n (HT20)]

Channel	Frequency [MHz]	6dB bandwidth [MHz]		
		IEEE802.11b	IEEE802.11g	IEEE802.11n (HT20)
Low	2412	8.101	16.404	17.628
Middle	2437	8.074	16.424	17.625
High	2462	8.089	16.424	17.655

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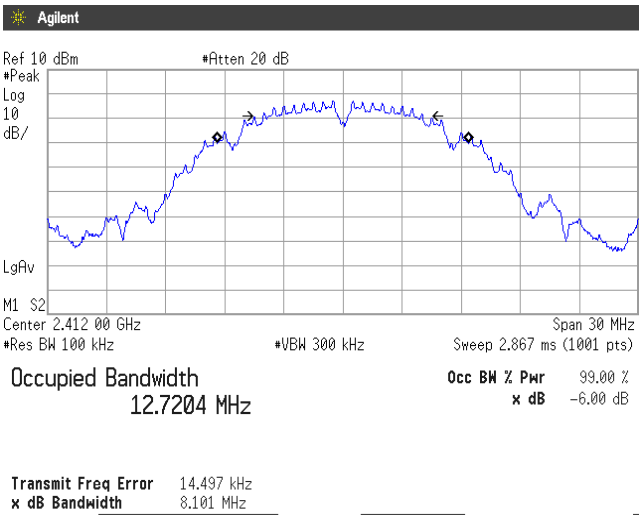
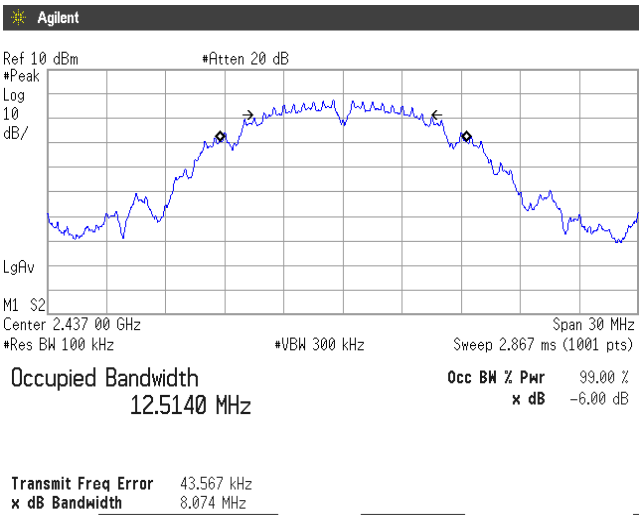
4.4 Trace data [IEEE802.11b]

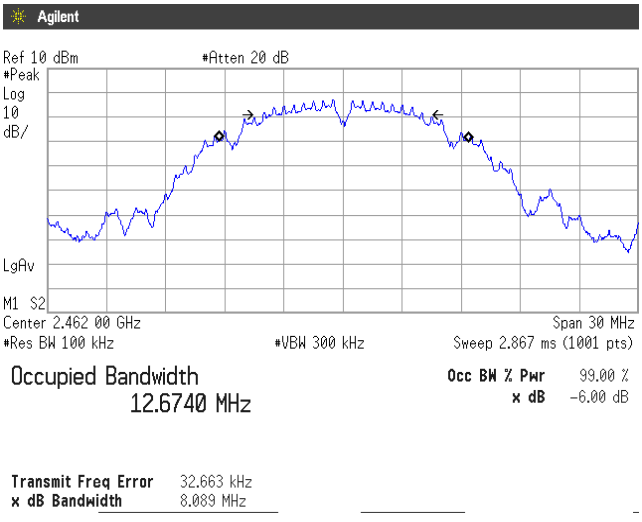
Channel Low



Channel Middle

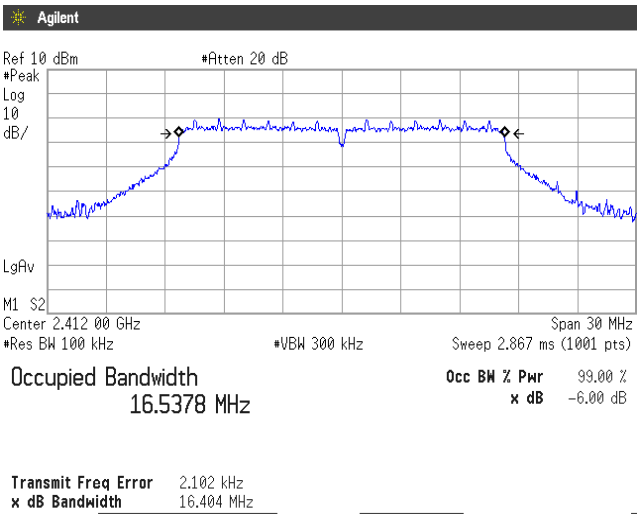


Channel High

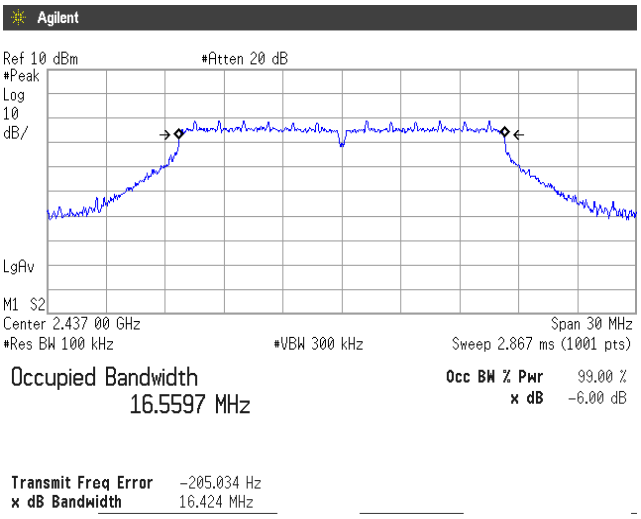


[IEEE802.11g]

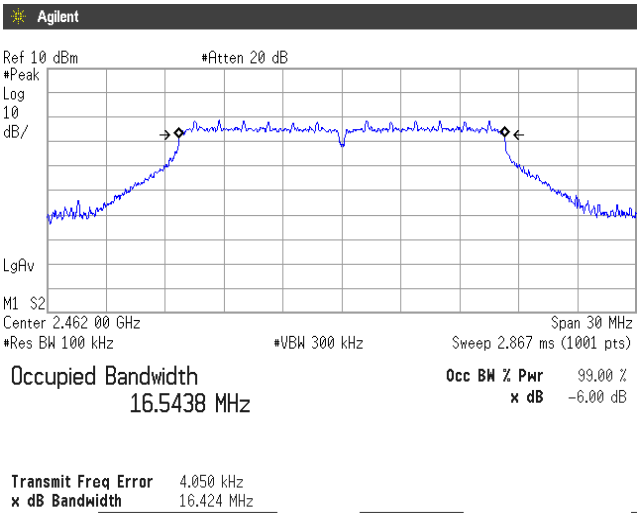
Channel Low



Channel Middle

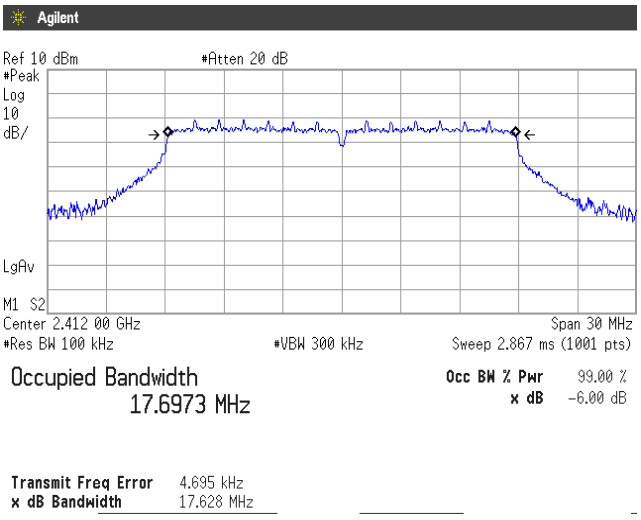


Channel High

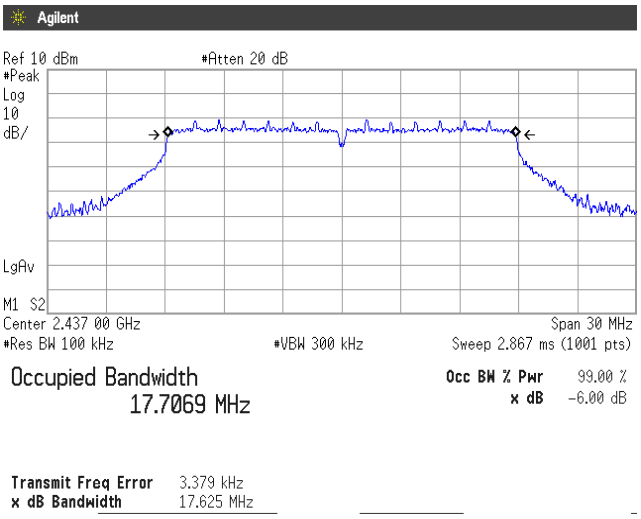


[IEEE802.11n (HT20)]

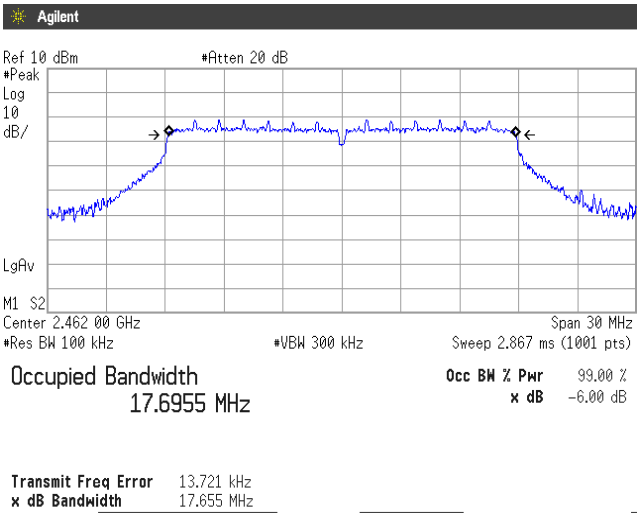
Channel Low



Channel Middle



Channel High

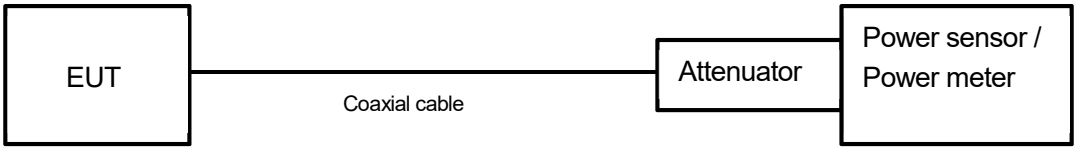


5. Maximum Conducted Output Power

5.1 Measurement procedure
[FCC 15.247(b)(3), KDB558074 D01 v03r05, Section 9.1.2]

The peak power is measured with a power sensor connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

- Test configuration



5.2 Limit

1W (1000mW) or less

5.3 Measurement result

Date	:	January 27, 2017		
Temperature	:	23.1 [˚C]		
Humidity	:	28.1 [%]	Test engineer	:
Test place	:	Shielded room No.4		Kazunori Saito

[IEEE802.11b]

Battery Full

Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Output Power (mW)	Limit (mW)	Result
Low	2412	7.67	10.52	18.19	65.917	≦1000	PASS
Middle	2437	8.96	10.52	19.48	88.716	≦1000	PASS
High	2462	8.33	10.52	18.85	76.736	≦1000	PASS

[IEEE802.11g]

Battery Full

Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Output Power (mW)	Limit (mW)	Result
Low	2412	8.99	10.52	19.51	89.331	≦1000	PASS
Middle	2437	9.92	10.52	20.44	110.662	≦1000	PASS
High	2462	9.16	10.52	19.68	92.897	≦1000	PASS

[IEEE802.11n (HT20)]

Battery Full

Channel	Center Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Output Power (mW)	Limit (mW)	Result
Low	2412	9.06	10.52	19.58	90.782	≦1000	PASS
Middle	2437	9.71	10.52	20.23	105.439	≦1000	PASS
High	2462	9.18	10.52	19.70	93.325	≦1000	PASS

Calculation;

Reading (dBm) + Factor (dB) = Level (dBm)

10logP = Level (dBm)

$P = 10^{(\text{Maximum Peak Output Power} / 10)}$ (mW)

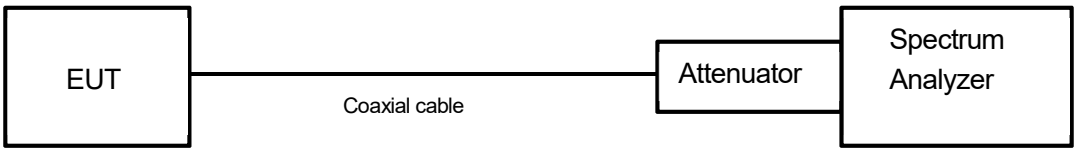
6. Band Edge Compliance of RF Conducted Emissions

6.1 Measurement procedure
[FCC 15.247(d), KDB 558074 D01 v03r05, Section 11.0]

The Band Edge is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
a) Span = Arbitrary setting. (Setting suitable for measurement.)
b) RBW = 100kHz.
c) VBW ≥ 3 x RBW
d) Sweep time = auto-couple.
e) Detector = peak.
f) Trace mode = max hold.

- Test configuration



6.2 Limit

In any 100kHz bandwidth outside the frequency band the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

6.3 Measurement result

Date : February 1, 2017
Temperature : 23.3 [˚C]
Humidity : 29.4 [%] Test engineer :
Test place : Shielded room No.4 Kazunori Saito

[IEEE802.11b]

Channel	Frequency (MHz)	RF Power Level (dBm)	Band-edge Frequency (MHz)	Band-edge Level (dBm)	Difference Level (dBm)	Limit (dBm)	Result
Low	2412	-3.15	2398.56	-48.61	45.46	At least 20dB below from peak of RF	PASS
High	2462	-2.60	2483.50	-59.01	56.41	At least 20dB below from peak of RF	PASS

[IEEE802.11g]

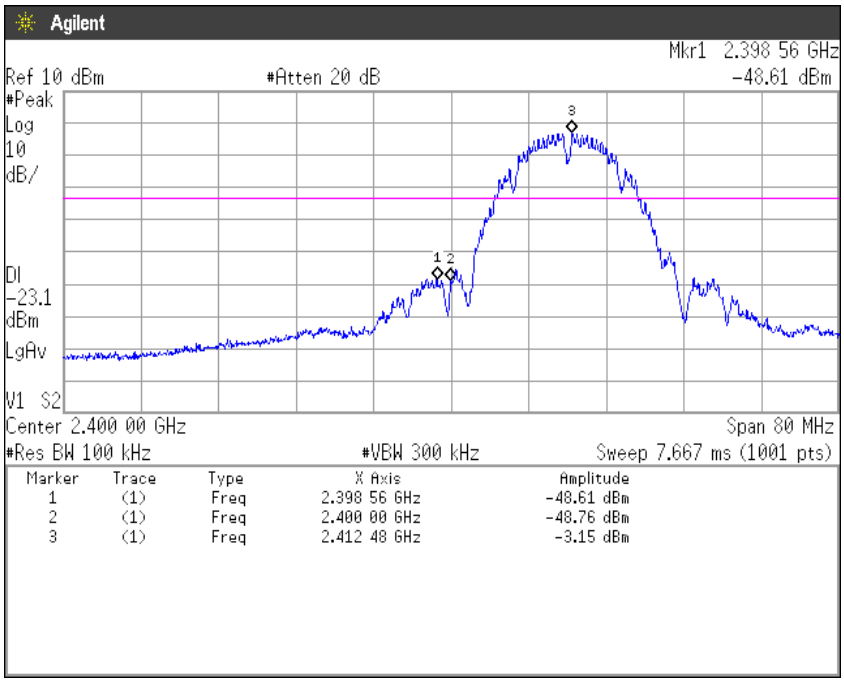
Channel	Frequency (MHz)	RF Power Level (dBm)	Band-edge Frequency (MHz)	Band-edge Level (dBm)	Difference Level (dBm)	Limit (dBm)	Result
Low	2412	-10.12	2399.52	-44.62	34.50	At least 20dB below from peak of RF	PASS
High	2462	-10.27	2483.58	-57.61	47.34	At least 20dB below from peak of RF	PASS

[IEEE802.11n (HT20)]

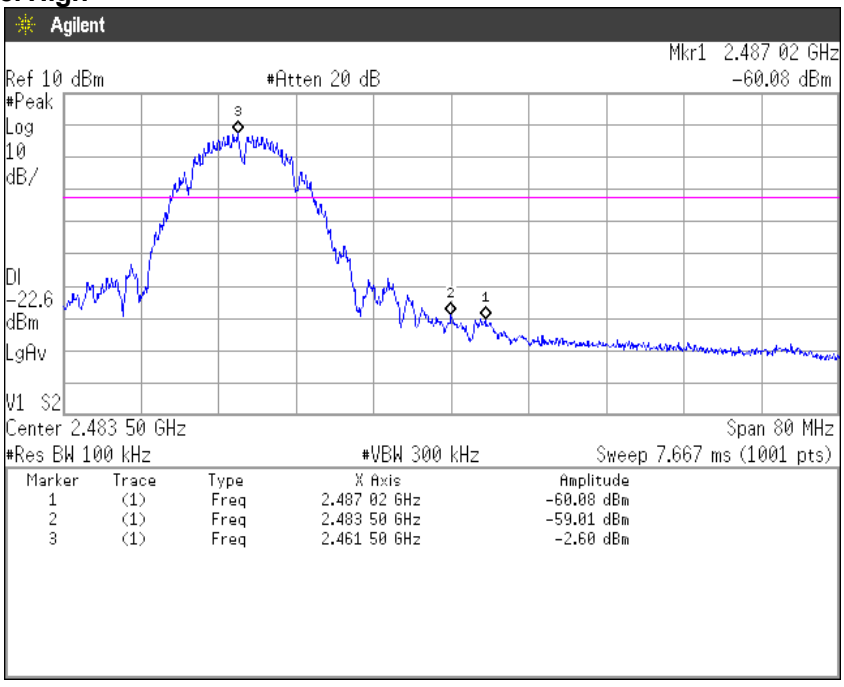
Channel	Frequency (MHz)	RF Power Level (dBm)	Band-edge Frequency (MHz)	Band-edge Level (dBm)	Difference Level (dBm)	Limit (dBm)	Result
Low	2412	-10.04	2399.76	-43.44	33.40	At least 20dB below from peak of RF	PASS
High	2462	-10.25	2483.74	-55.55	45.30	At least 20dB below from peak of RF	PASS

6.4 Trace data
[IEEE802.11b]

Channel Low

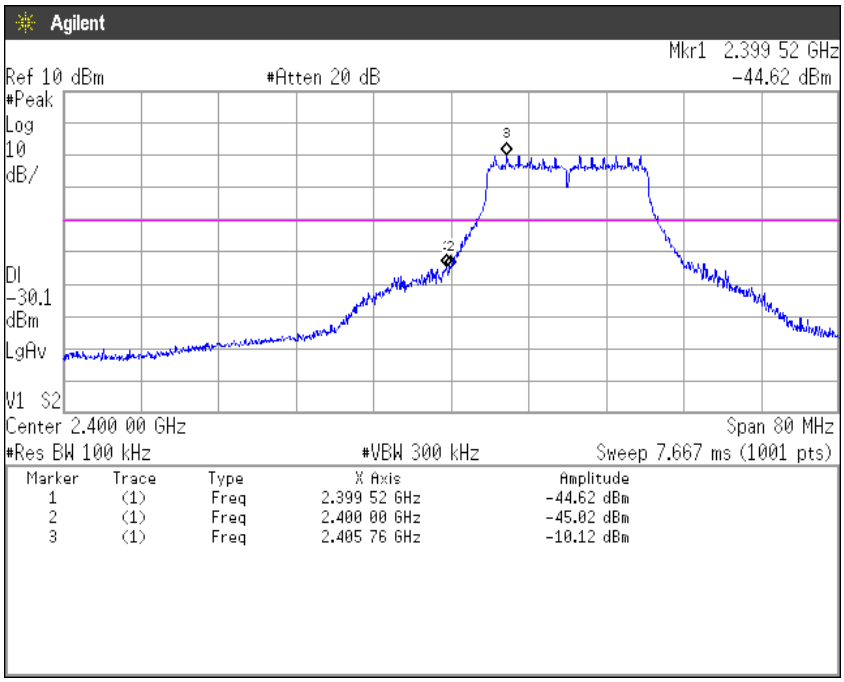


Channel High

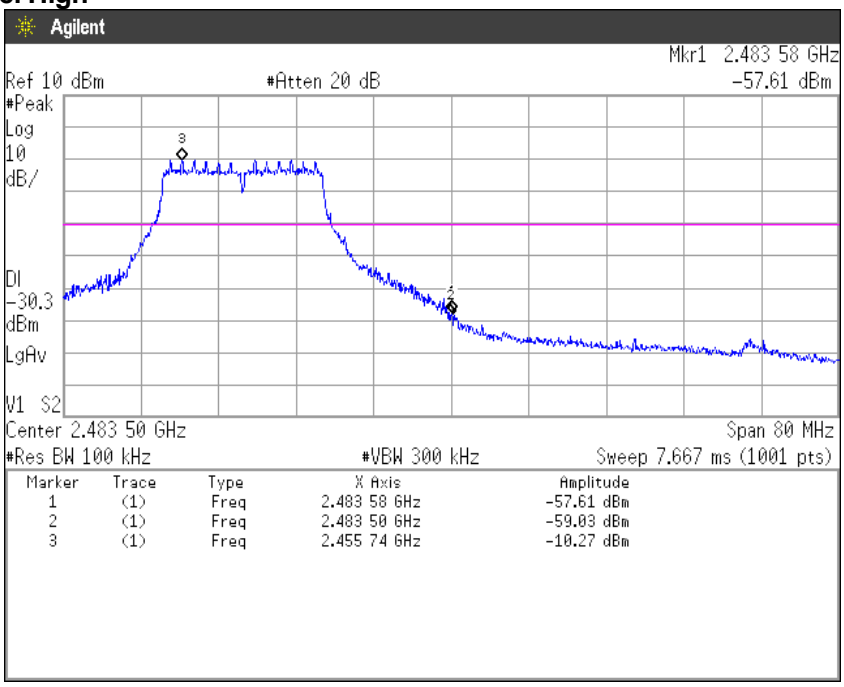


[IEEE802.11g]

Channel Low

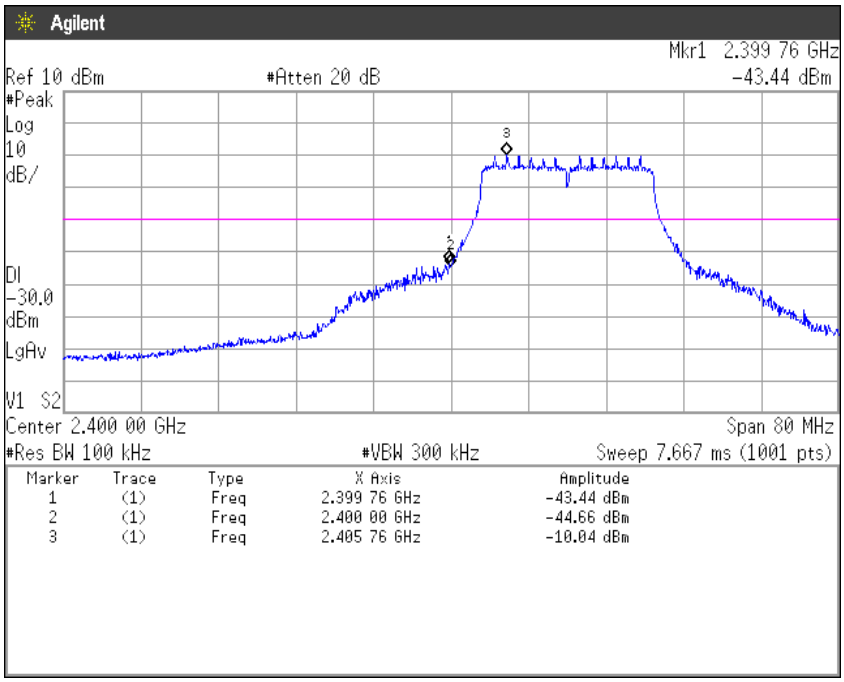


Channel High

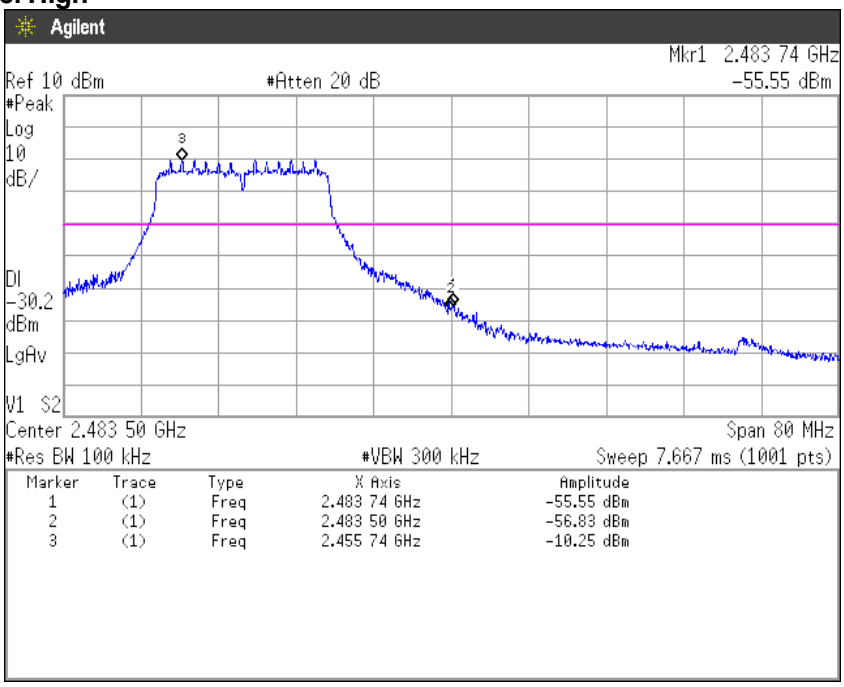


[IEEE802.11n (HT20)]

Channel Low



Channel High



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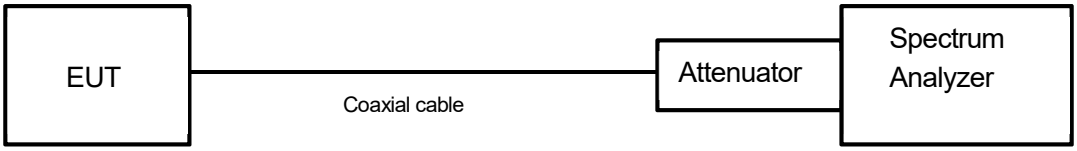
7. Spurious emissions - Conducted -

7.1 Measurement procedure
[FCC 15.247(d), KDB 558074 D01 v03r05, Section 11.0]

The spurious emissions (Conducted) are measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

The spectrum analyzer is set to;
a) Span = wide enough to fully capture the emission being measured.
b) RBW = 100 kHz.
c) VBW ≥ RBW.
d) Sweep time = auto-couple.
e) Detector = peak.
f) Trace mode = max hold.

- Test configuration



7.2 Limit

In any 100kHz bandwidth outside the frequency band the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

7.3 Measurement result

Date	:	January 30, 2017		
Temperature	:	22.0 [˚C]		
Humidity	:	27.9 [%]	Test engineer	:
Test place	:	Shielded room No.4		Kazunori Saito

[IEEE802.11b、IEEE802.11g、IEEE802.11n (HT20)]

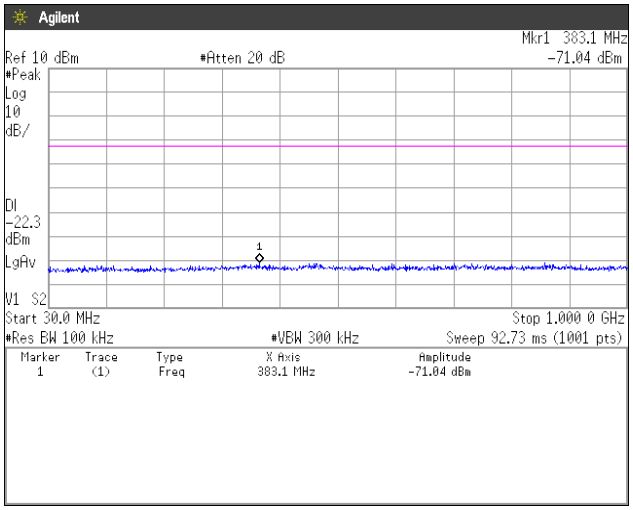
Channel	Frequency [MHz]	Limit [dB]	Results Chart	Result
Low	2412	At least 20dB below from peak of RF	See the trace Data	PASS
Middle	2437	At least 20dB below from peak of RF	See the trace Data	PASS
High	2462	At least 20dB below from peak of RF	See the trace Data	PASS

7.4 Trace data

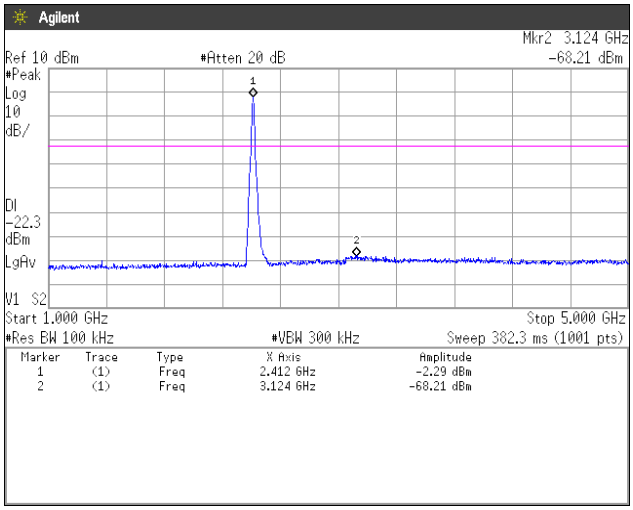
[IEEE802.11b]

Channel Low

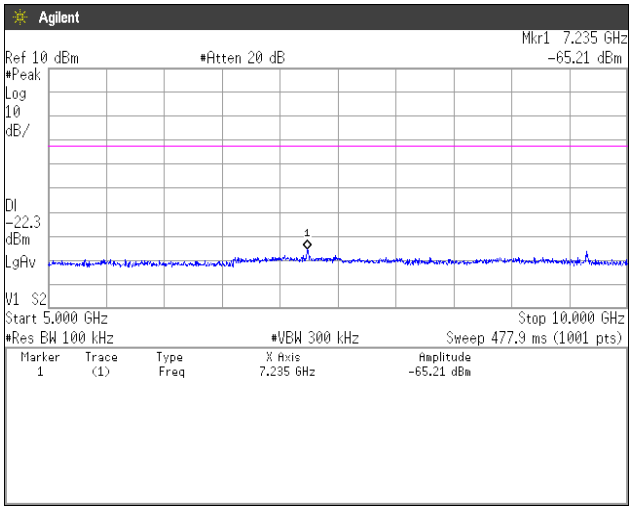
30MHz-1GHz



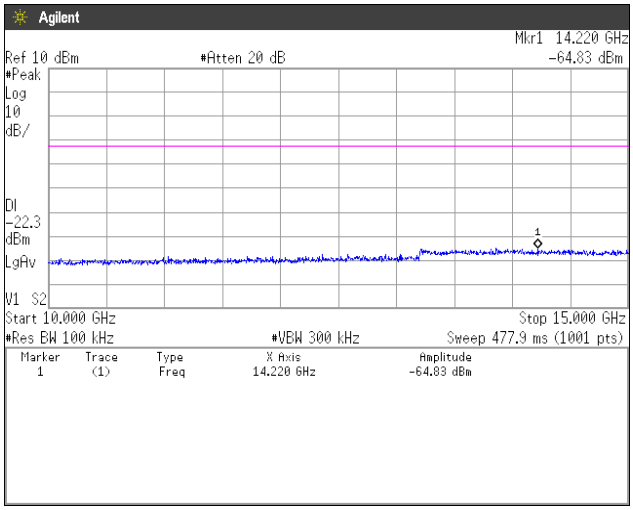
1GHz-5GHz



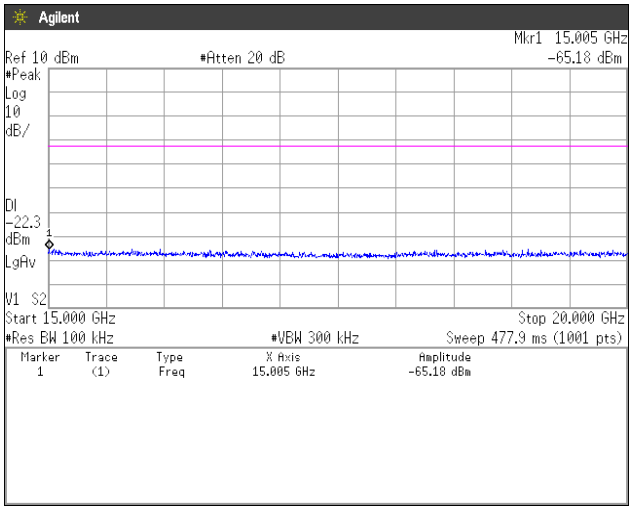
5GHz-10GHz



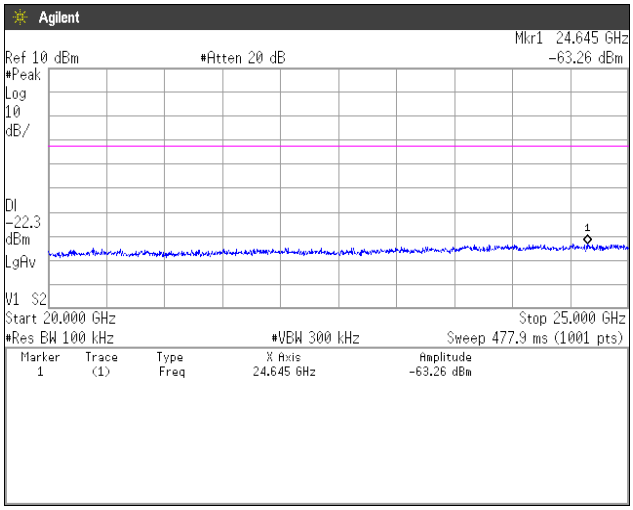
10GHz-15GHz



15GHz-20GHz

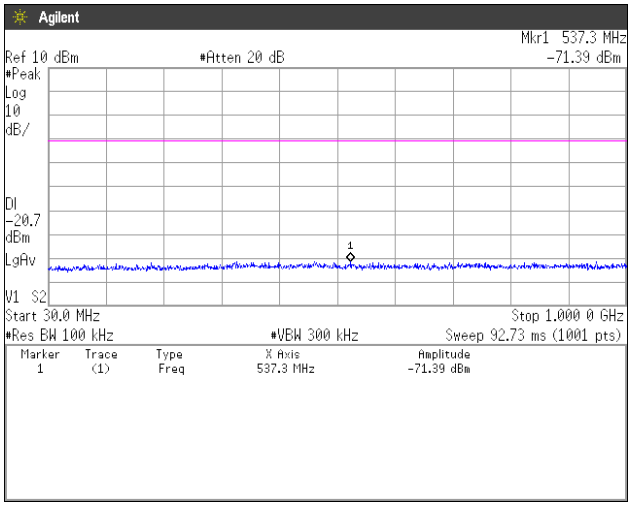


20GHz-25GHz

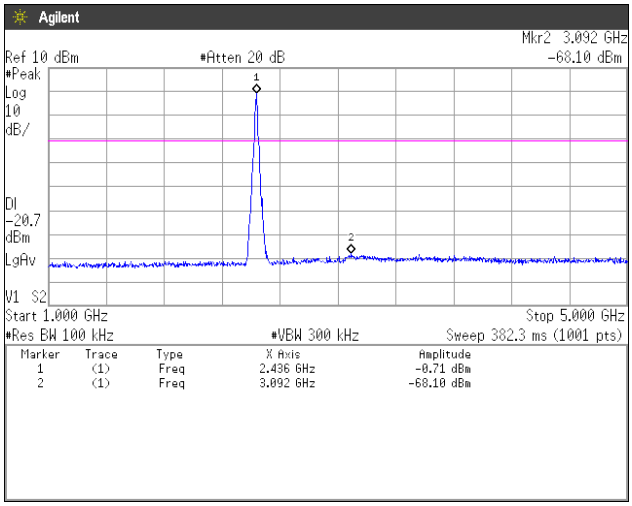


Channel Middle

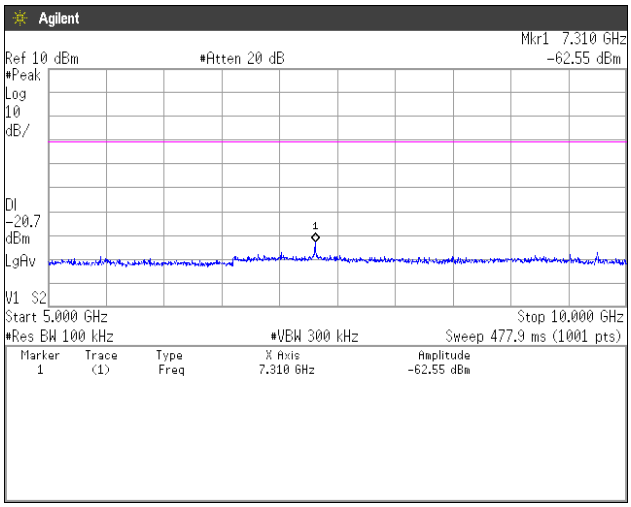
30MHz-1GHz



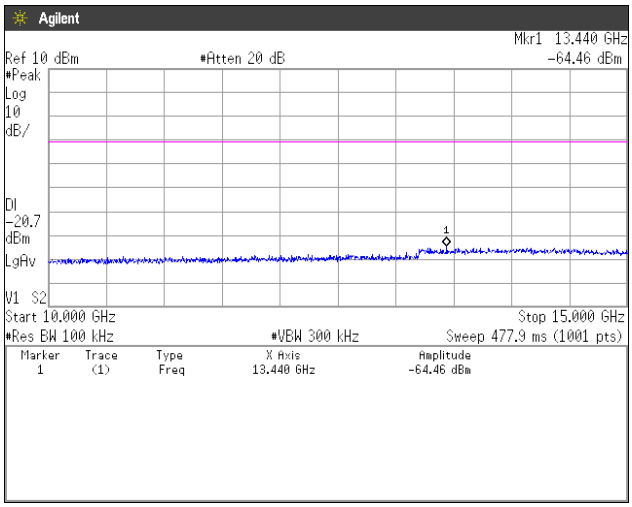
1GHz-5GHz



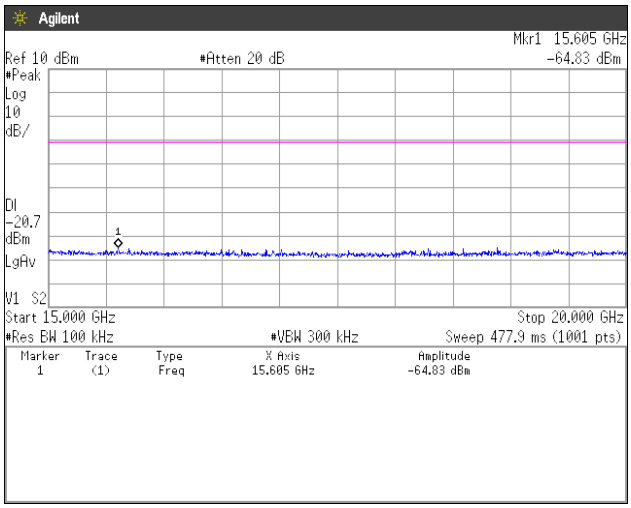
5GHz-10GHz



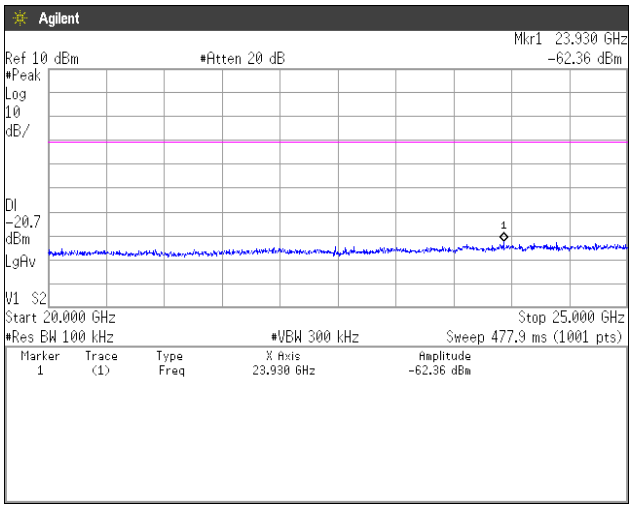
10GHz-15GHz



15GHz-20GHz

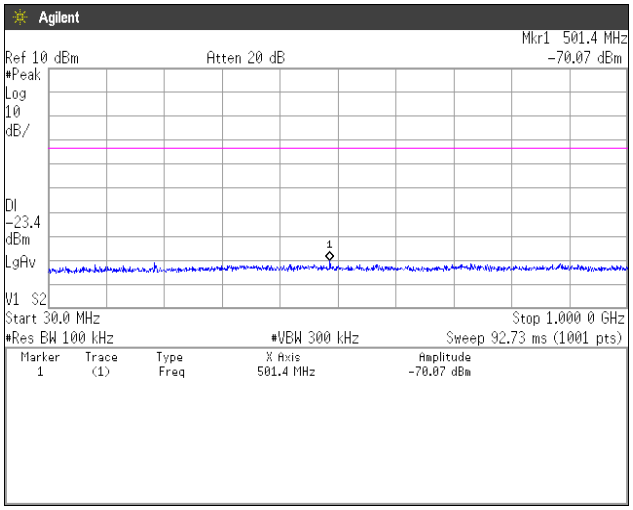


20GHz-25GHz

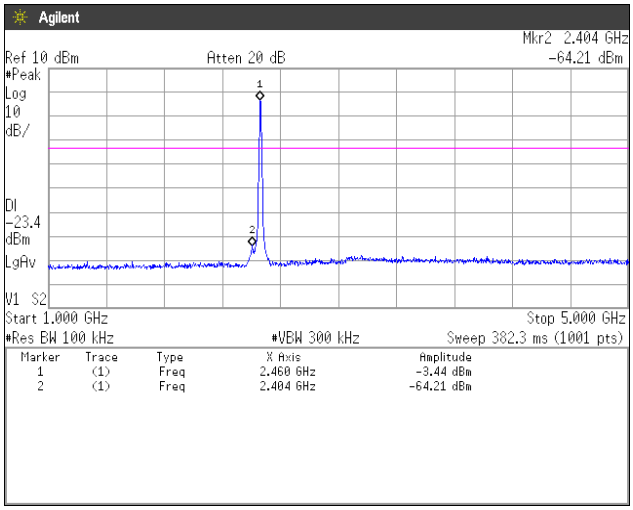


Channel High

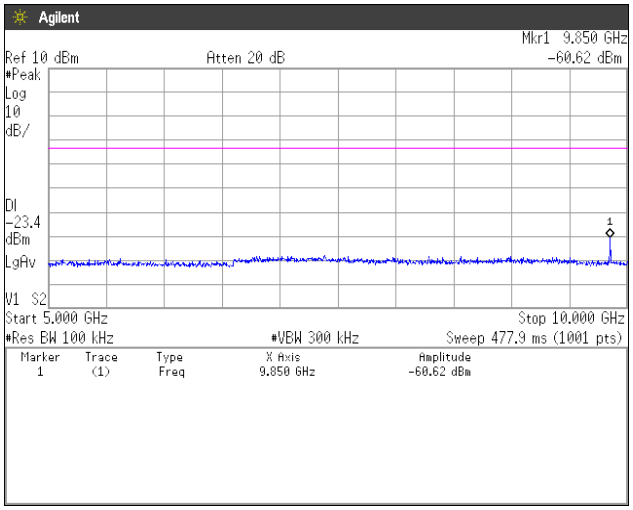
30MHz-1GHz



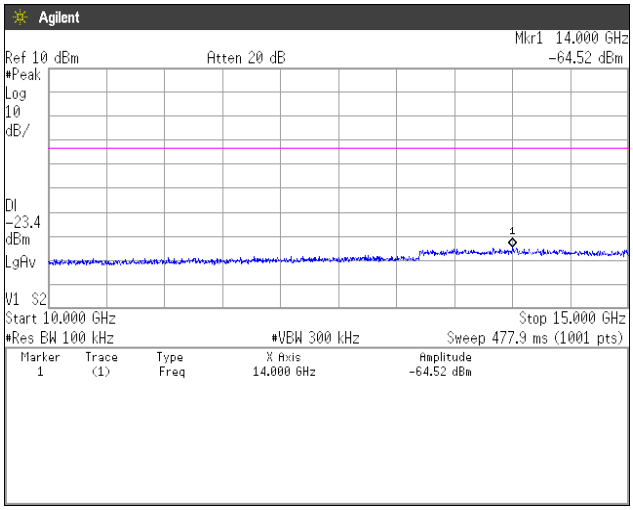
1GHz-5GHz



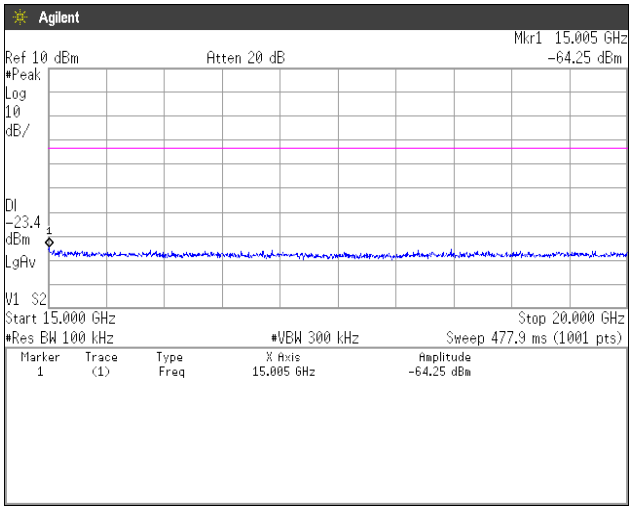
5GHz-10GHz



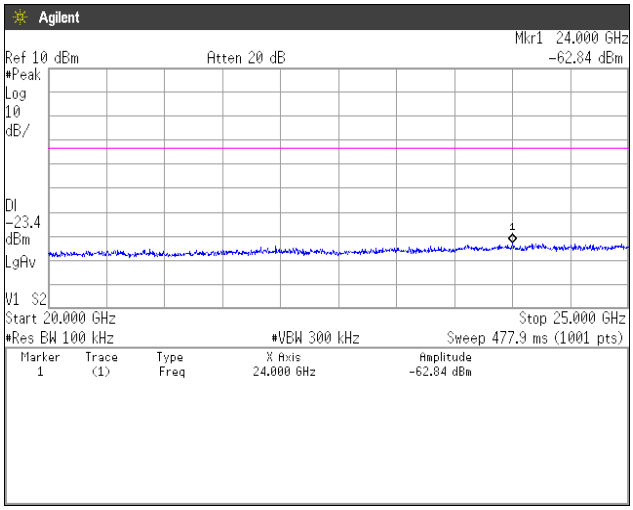
10GHz-15GHz



15GHz-20GHz

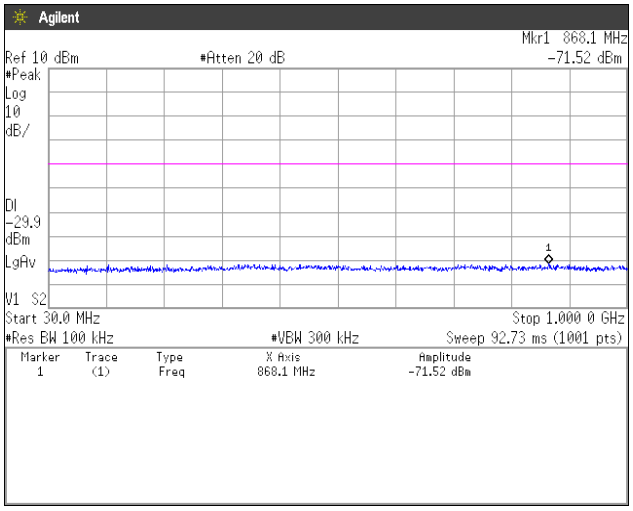


20GHz-25GHz

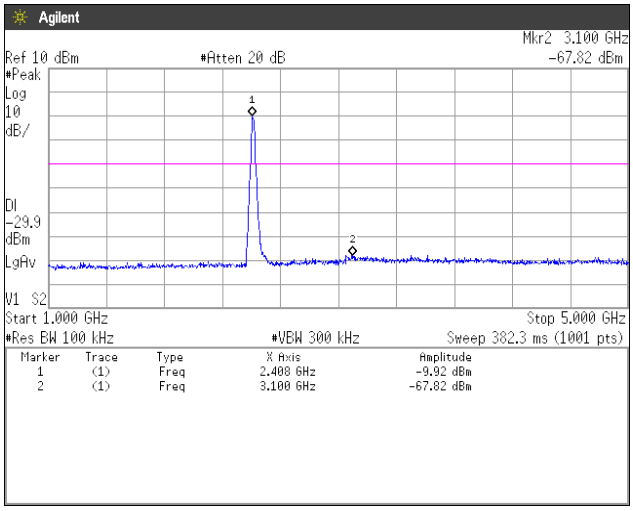


Zacta

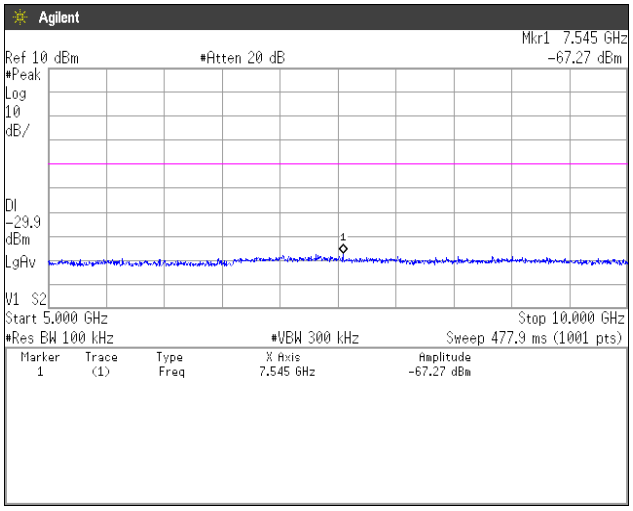
[IEEE802.11g]
Channel Low
30MHz-1GHz



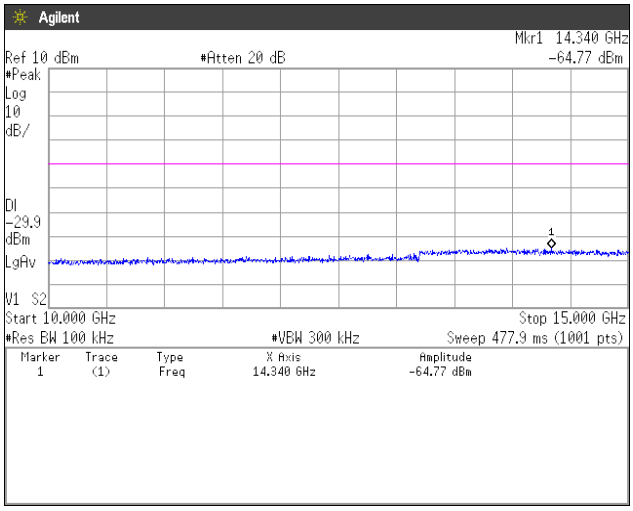
1GHz-5GHz



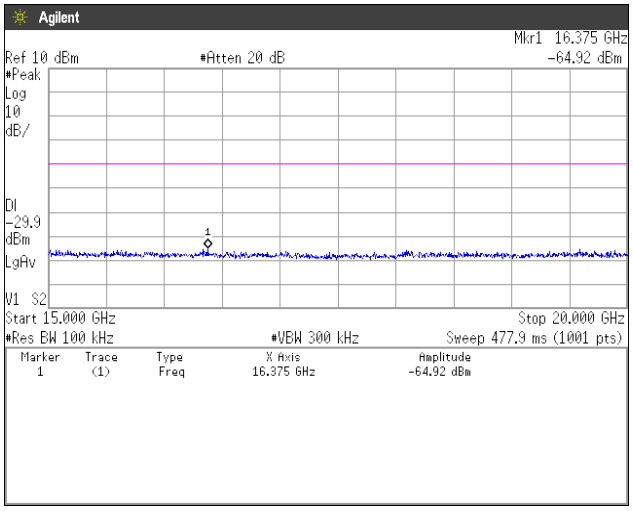
5GHz-10GHz



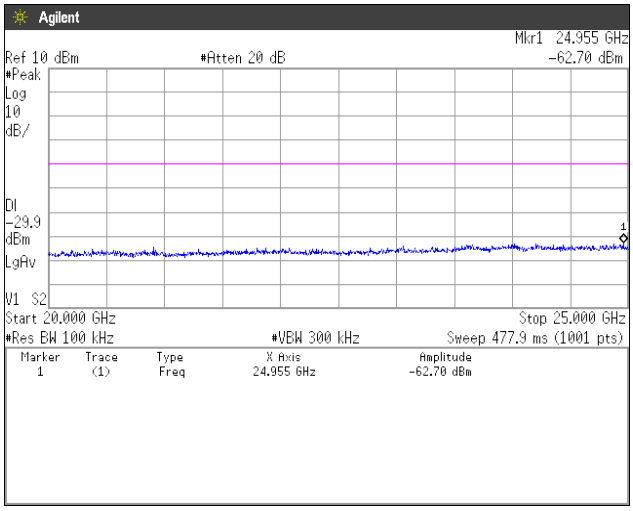
10GHz-15GHz



15GHz-20GHz

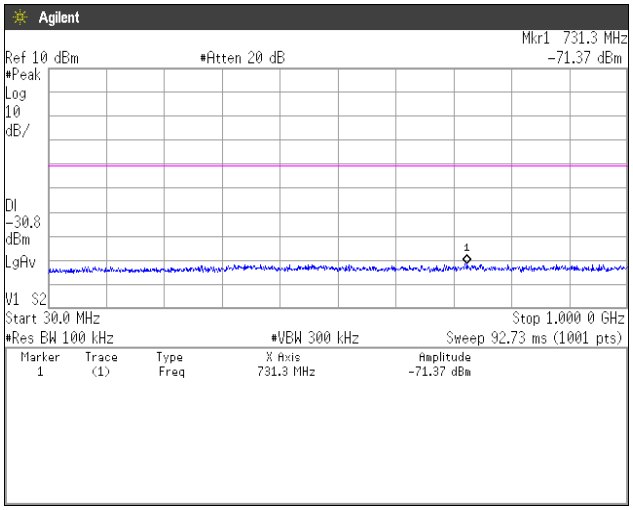


20GHz-25GHz

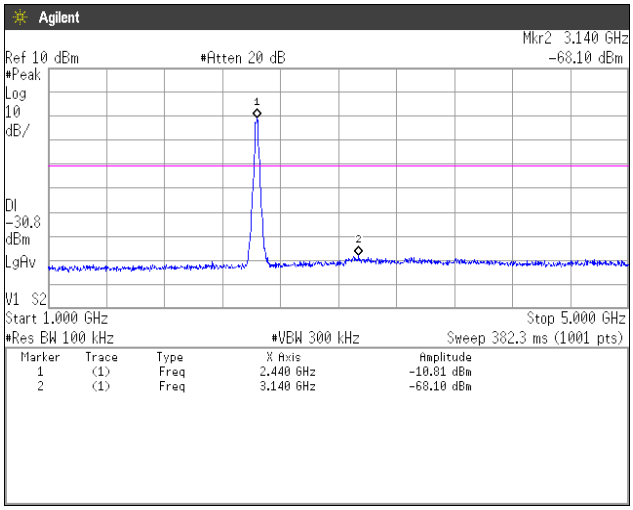


Channel Middle

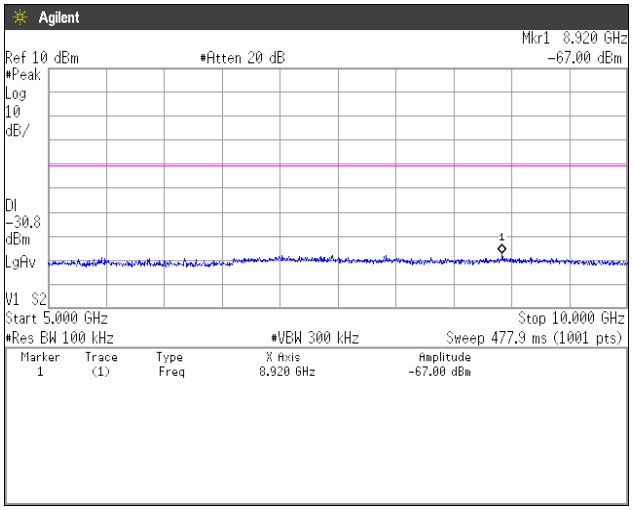
30MHz-1GHz



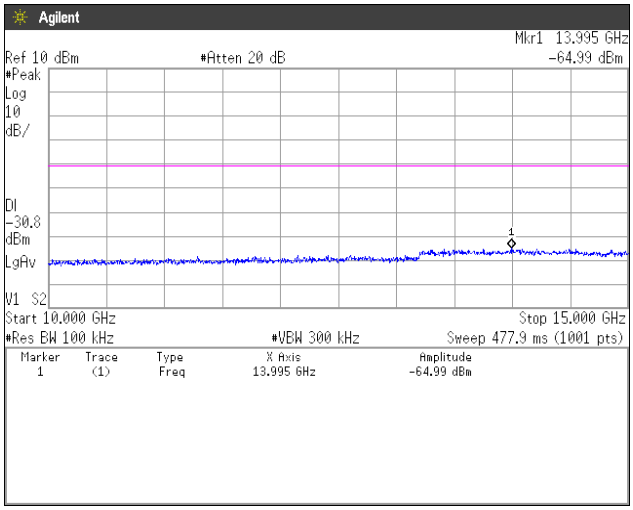
1GHz-5GHz



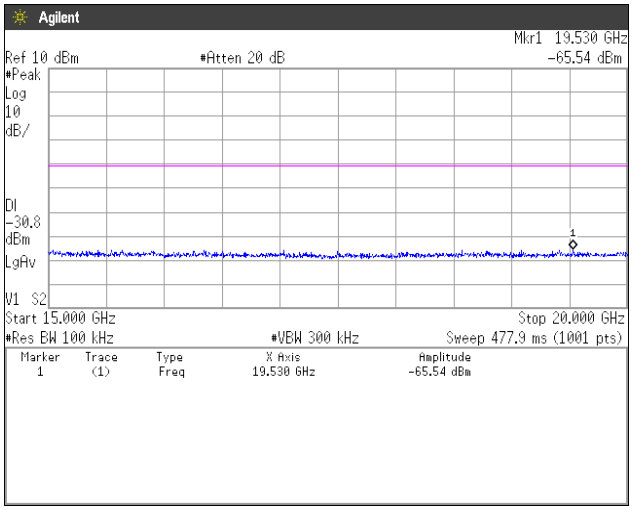
5GHz-10GHz



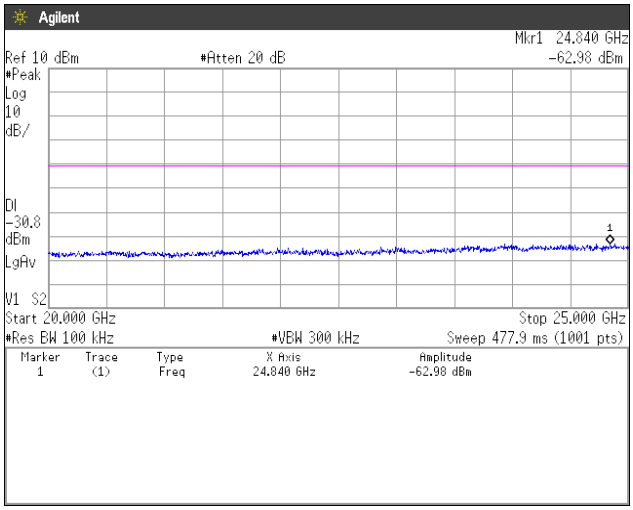
10GHz-15GHz



15GHz-20GHz



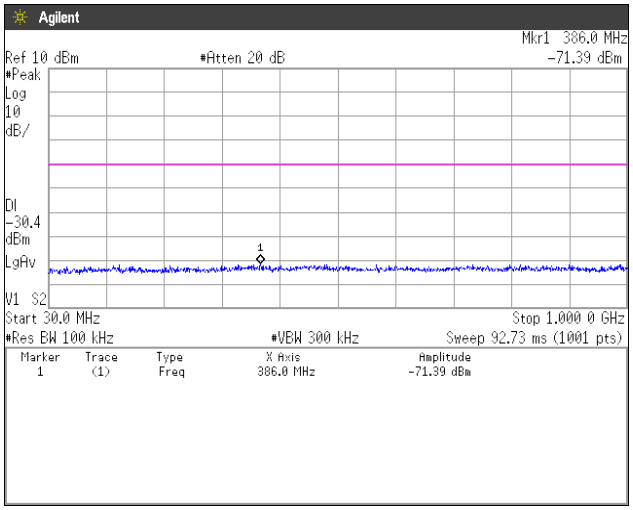
20GHz-25GHz



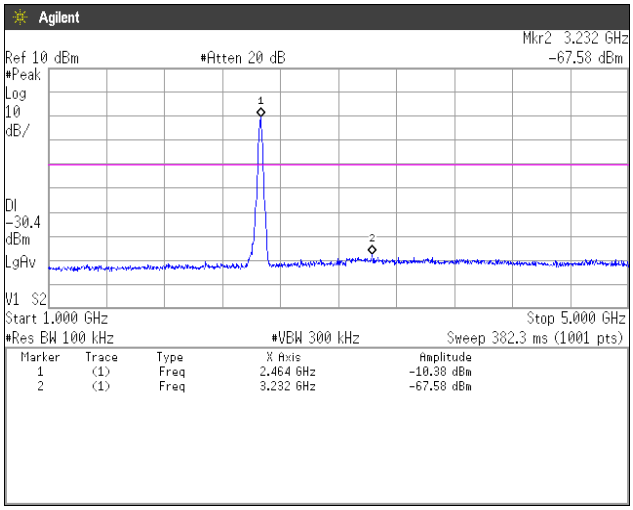
Zacta

Channel High

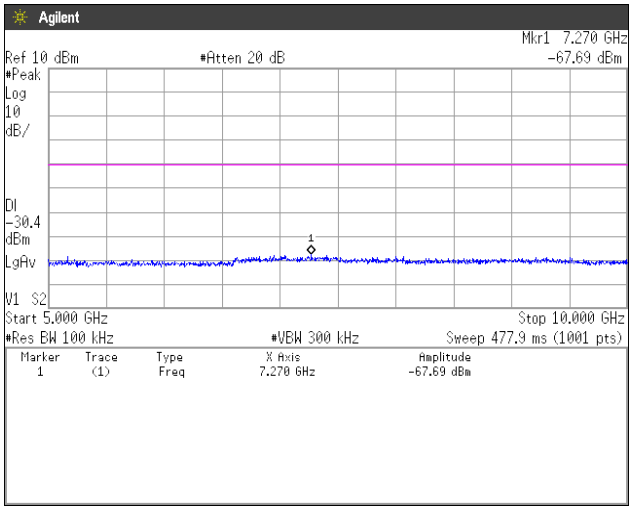
30MHz-1GHz



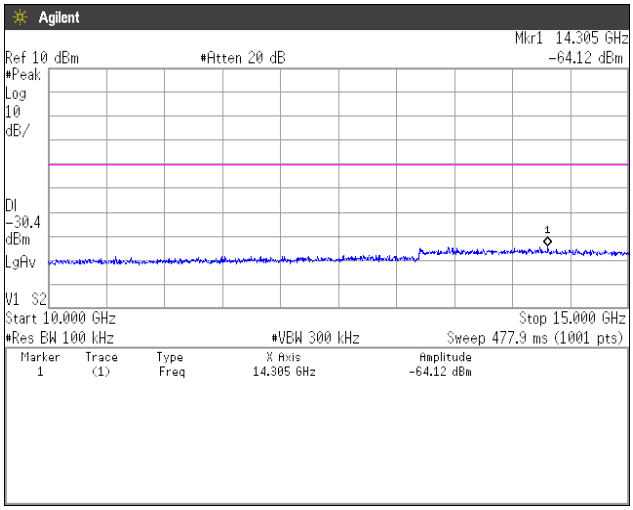
1GHz-5GHz



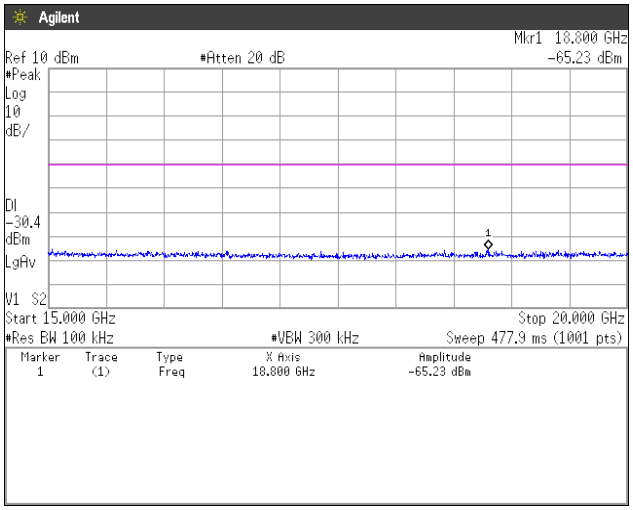
5GHz-10GHz



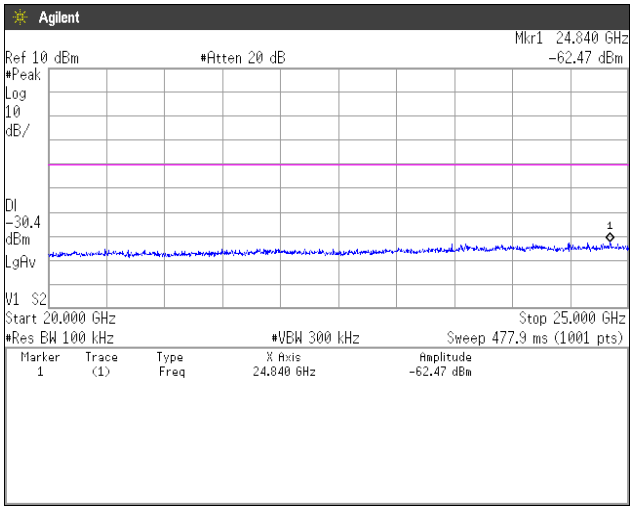
10GHz-15GHz



15GHz-20GHz



20GHz-25GHz

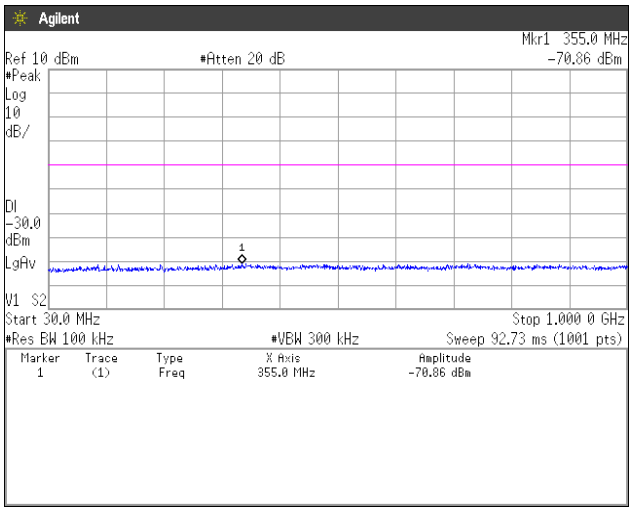


Zacta

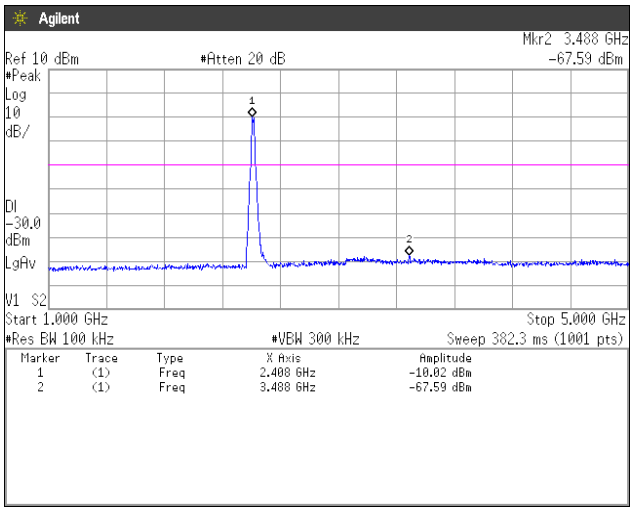
[IEEE802.11n (HT20)]

Channel Low

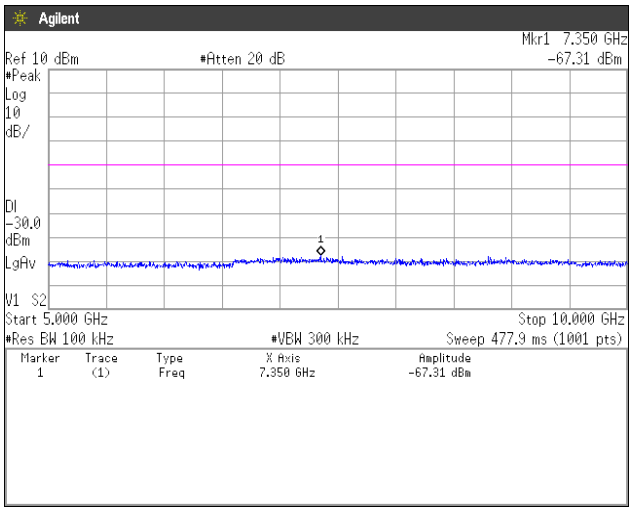
30MHz-1GHz



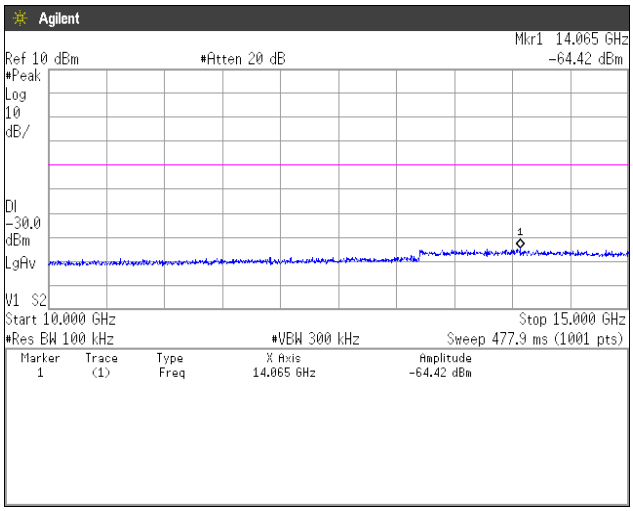
1GHz-5GHz



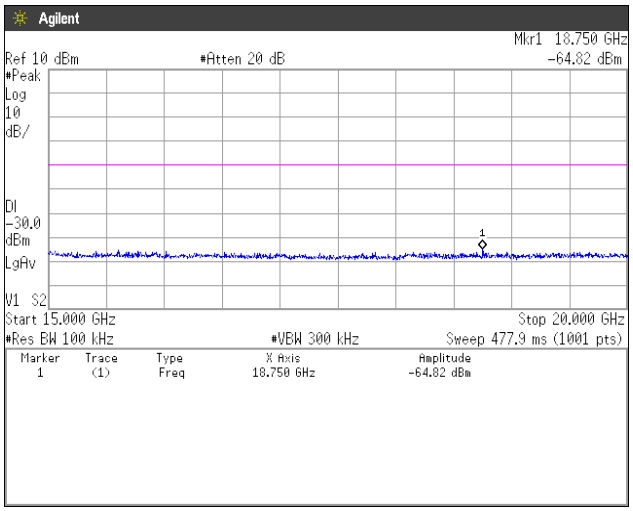
5GHz-10GHz



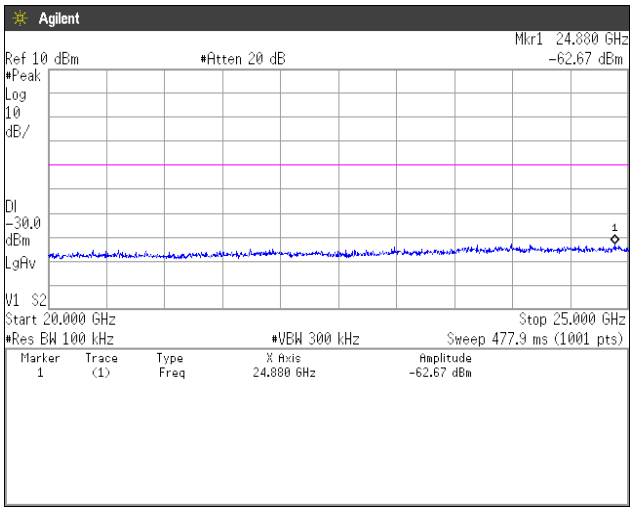
10GHz-15GHz



15GHz-20GHz



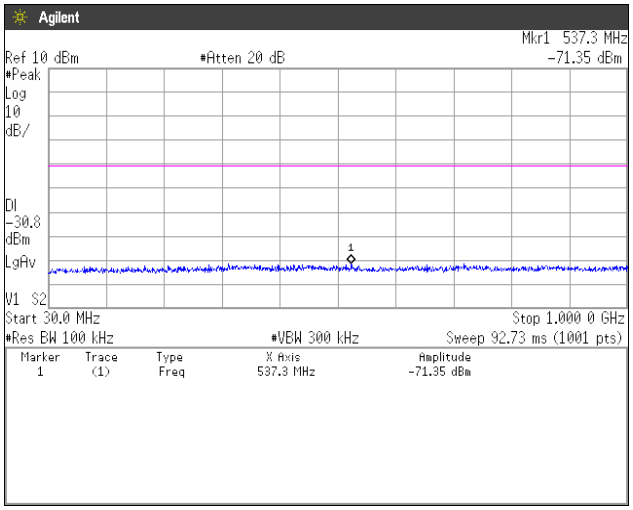
20GHz-25GHz



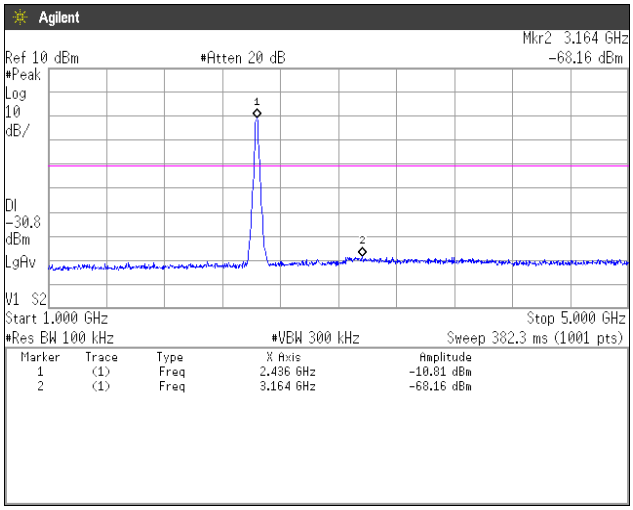
Zacta

Channel Middle

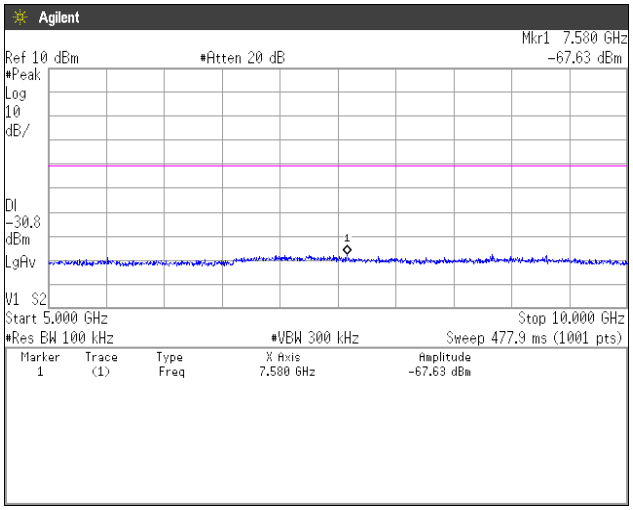
30MHz-1GHz



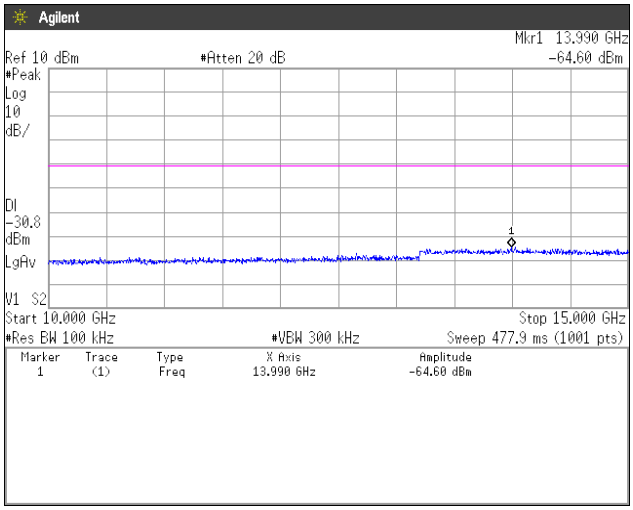
1GHz-5GHz



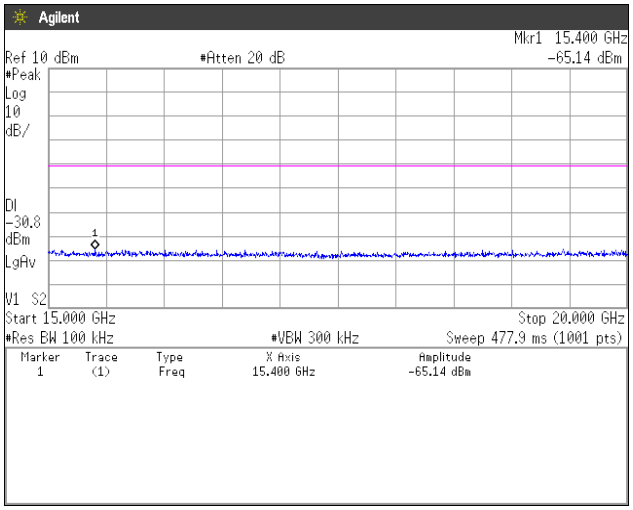
5GHz-10GHz



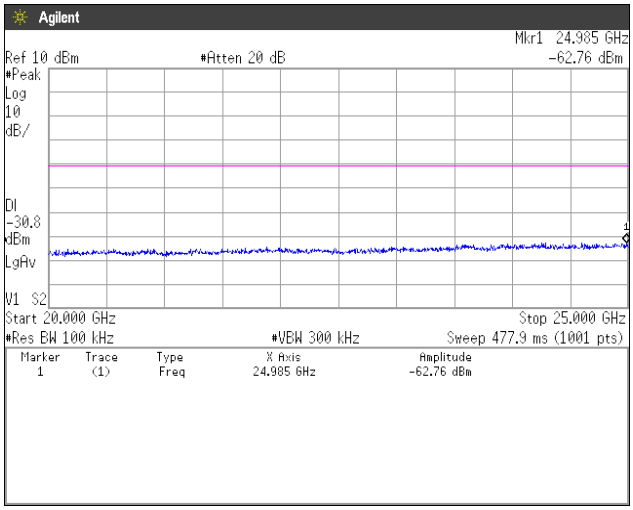
10GHz-15GHz



15GHz-20GHz

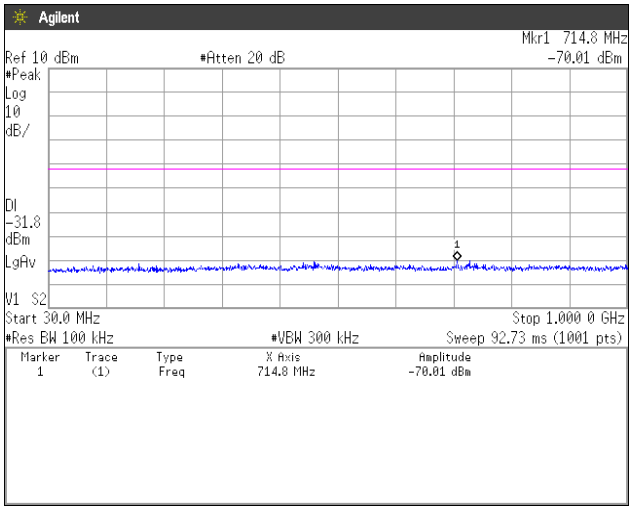


20GHz-25GHz

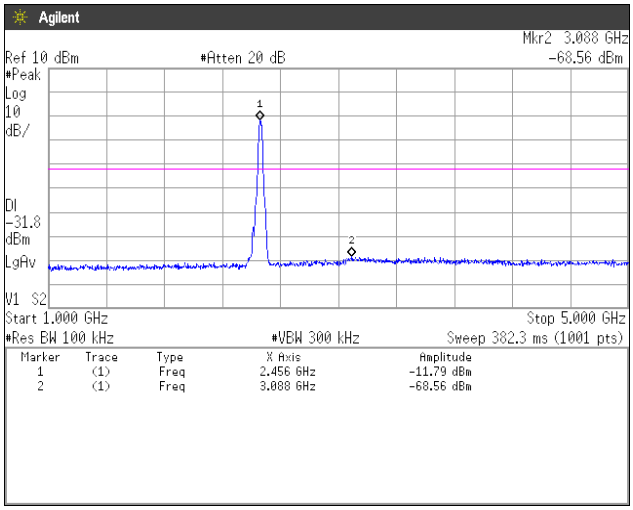


Channel High

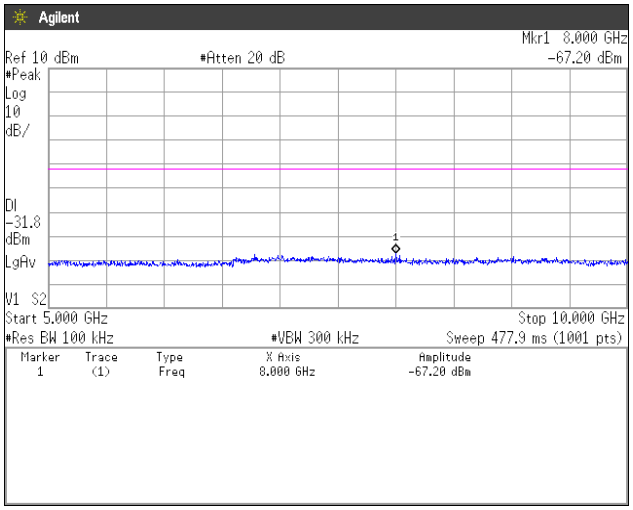
30MHz-1GHz



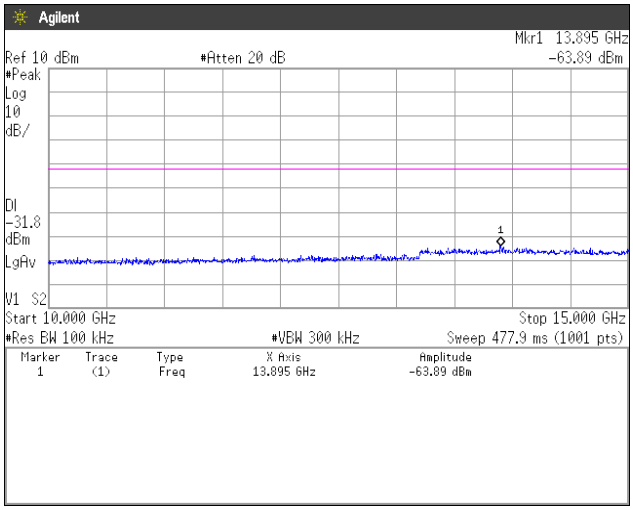
1GHz-5GHz



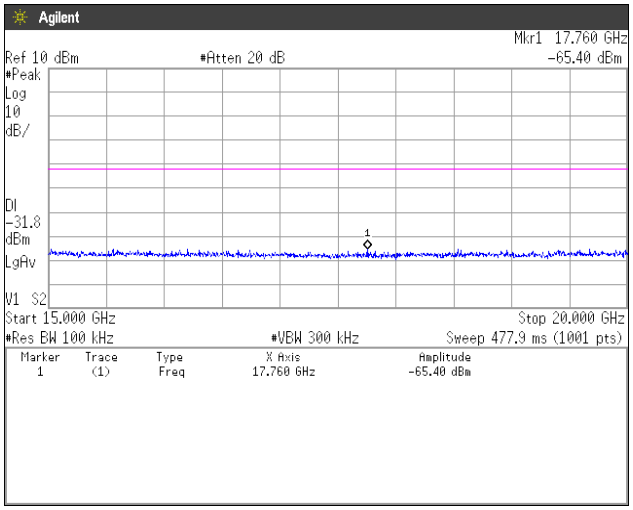
5GHz-10GHz



10GHz-15GHz



15GHz-20GHz



20GHz-25GHz