EMC
TEST REPORT

Report No. : **150500010TWN-001**
Model No. : **UMC-I210C**
Issued Date : **May 14, 2015**

Applicant: **Wistron Neweb Corporation**
20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan

Test Method/ Standard: **47 CFR FCC Part 15.247**
KDB 558074 D01 v03r02, ANSI C63.4: 2009
Registration No.: **93910**
Test By: **Intertek Testing Services Taiwan Ltd.**
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li, Shiang-Shan District, Hsinchu City, Taiwan

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1. Summary of Test Data

Test Requirement	Applicable Rule (Section 15.247)	Result
Minimum 6 dB Bandwidth	15.247(a)(2) KDB 558074 D01 v03r02	Pass
Maximum Peak Conducted Output Power	15.247(b)(3) KDB 558074 D01 v03r02	Pass
Power Spectral Density	15.247(e)	Pass
Emissions In Non-Restricted Frequency Bands	15.247(d)	Pass
Emissions In Restricted Frequency Bands (Radiated emission measurements)	15.247(d), 15.205, 15.209	Pass
Emission On The Band Edge	15.247(d), 15.205	Pass
AC Power Line Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass

2. General Information

2.1 Identification of the EUT

Product:	Integrate with certified module-End product
Model No:	UMC-I210C
FCC ID:	NKR-CB1GI210C
Manufacturer:	Wistron Neweb Corporation
Address:	20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan
Operating Frequency:	2405 MHz ~ 2475 MHz
Channel Number:	15 channels 2350 MHz +5k, k=11~25
Modulation:	O-QPSK
Rated Power:	DC 5 V from adapter
Power Cord:	N/A
Sample Received:	Apr. 30, 2015
Sample condition:	Workable
Test Date(s):	Apr. 30, 2015 ~ May 11, 2015
Note 1:	This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
Note 2:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.

2.2 Description of EUT

Modulation mode	Transmit path
	Chain 0 / Main
Zigbee	V

Product SW/HW version :	2.11.0-Beta2/ DGB
Radio SW/HW version :	N/A
Test SW Version :	socat 1.7.2.1

RF power setting in TEST SW:

Frequency	2405MHz	2440MHz	2475MHz
IEEE 802.15.4 Zigbee	-3	-3	-3

2.3 Antenna description

The EUT uses a permanently connected antenna.

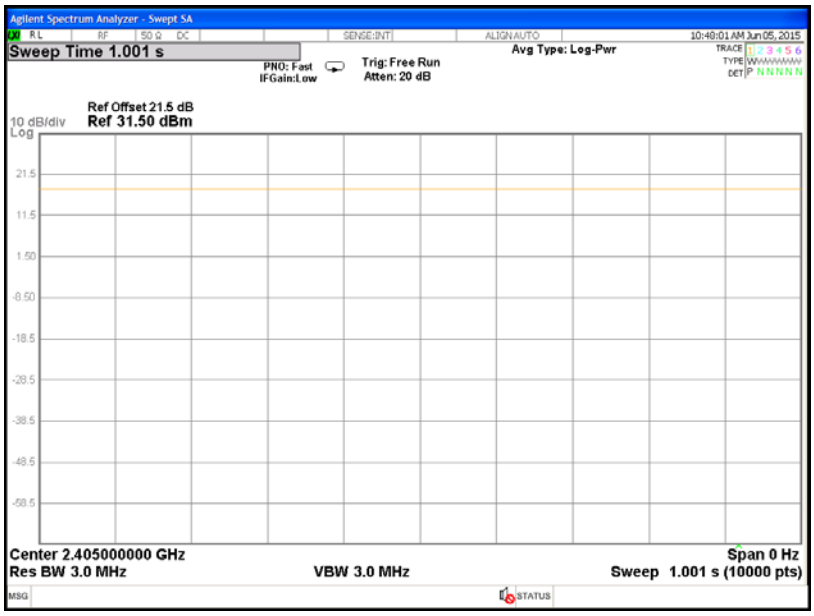
Antenna Gain : 4.0 dBi max
Antenna Type : PIFA antenna
Connector Type : Fixed

2.4 Operation mode

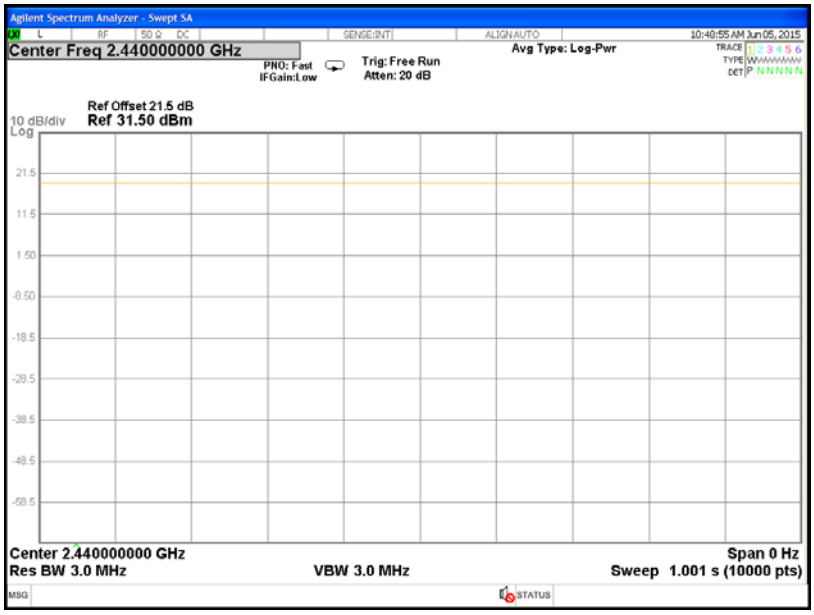
EUT can transmit continuously with specific software “socat command”.

Mode	Channel	Frequency (MHz)	Signal on time(s)	Total signal transmit time(s)	Duty cycle	Duty Cycle factor
Zigbee	Low	2405	1.001	1.001	1.000	0.000
	Middle	2440	1.001	1.001	1.000	0.000
	High	2475	1.001	1.001	1.000	0.000

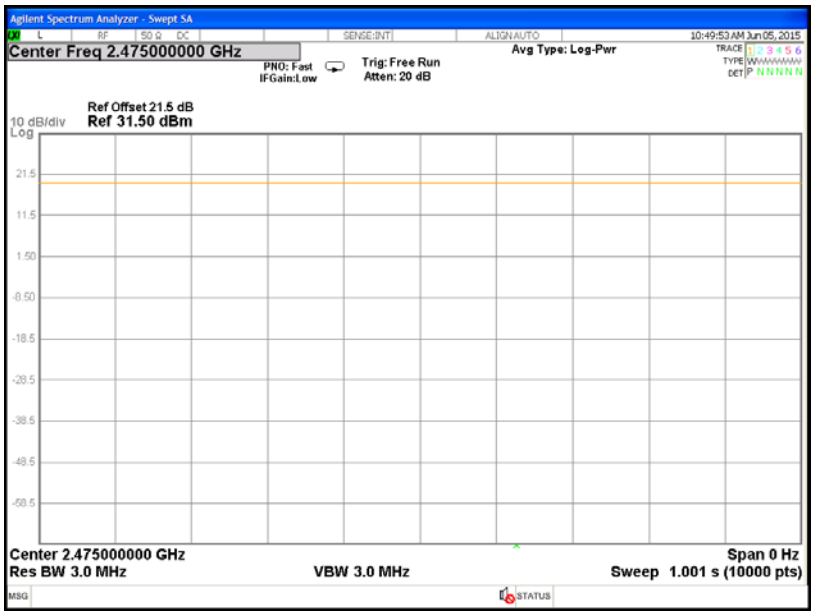
Duty Cycle @ Zigbee mode Ch Low



Duty Cycle @ Zigbee mode Ch Middle



Duty Cycle @ Zigbee mode Ch High



2.5 Adapter information

The EUT will be supplied with a power supply from below list:

No.	Brand	Model no.	Specification
Adapter	Ktec	KSAS0120500200HU	I/P: 100-240V~, 50-60Hz, 0.4A, O/P: 5.0Vdc, 2.0A

The above EUT information is declared by Wistron Neweb Corporation and for more detailed features description, please refers to the manufacturer's specifications or user's manual

2.6 Applied test modes and channels

Test items	Mode	Channel	Antenna
Minimum 6 dB Bandwidth	Zigbee TX	Low , Middle , High	Chain0
Maximum peak conducted output power	Zigbee TX	Low , Middle , High	Chain0
Power Spectral Density	Zigbee TX	Low , Middle , High	Chain0
RF Antenna Conducted Spurious	Zigbee TX	Low , Middle , High	Chain0
Radiated spurious Emission 30MHz~1GHz	Zigbee TX	Low , Middle , High	Chain0
Radiated Spurious Emission 1GHz~10th Harmonic	Zigbee TX	Low , Middle , High	Chain0
Emission on the Band Edge	Zigbee TX	Low , High	Chain0

3. Minimum 6 dB Bandwidth

3.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement & Test method	15.247(a)(2) KDB 558074 D01 v03r02	
Channel number	Low, Middle, High	

3.2 Limit for minimum 6dB bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

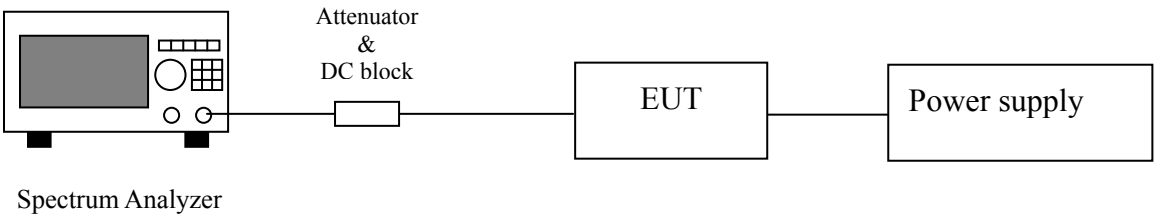
3.3 Measuring instrument setting

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	100kHz
VBW	≧3 x RBW
Sweep	Auto couple
Trace	Allow the trace to stabilize.
Span	Between two times and five times the occupied bandwidth
Attenuation	Auto

3.4 Test procedure

1. The transmitter output was connected to the spectrum analyzer.
2. Test was performed in accordance with clause 8.1 option1 of KDB 558074 D01
3. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

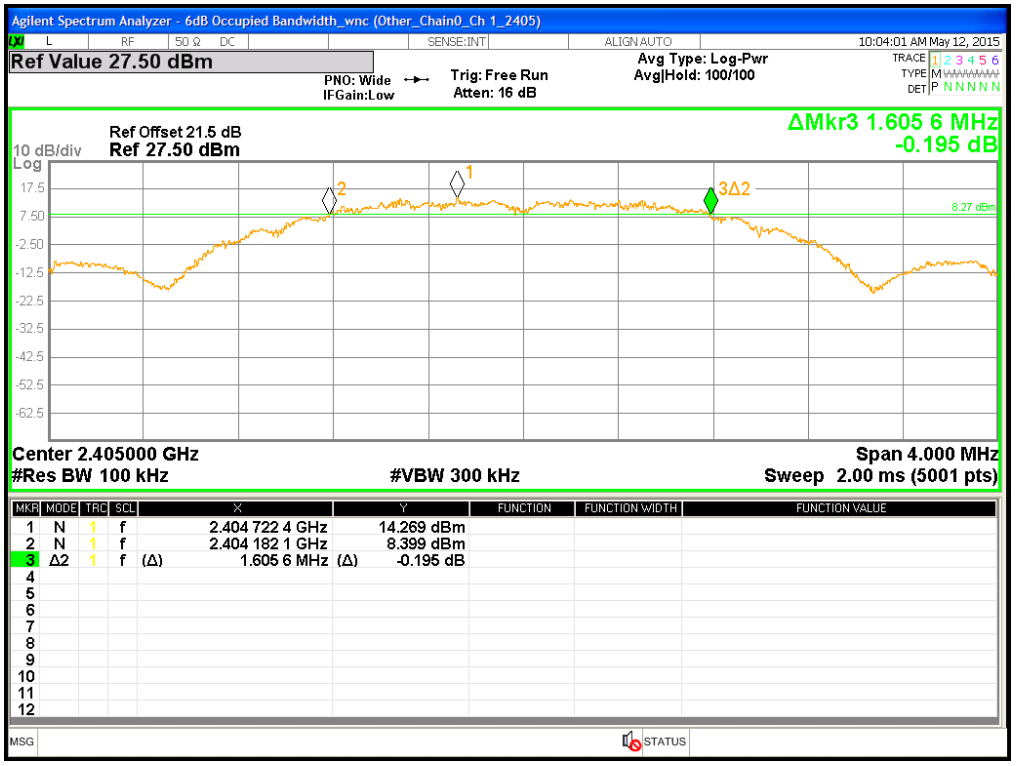
3.5 Test diagram



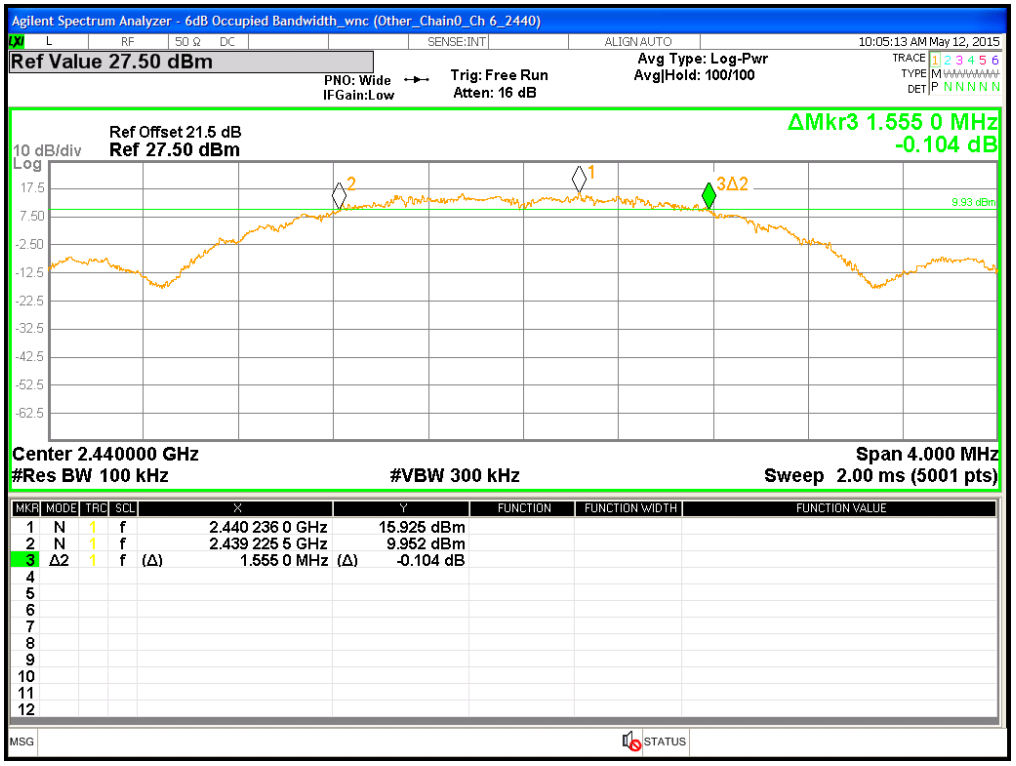
3.6 Test results

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
Zigbee TX	Low	2405	1.6056	0.5	Pass
	Middle	2440	1.555	0.5	Pass
	High	2475	1.5948	0.5	Pass

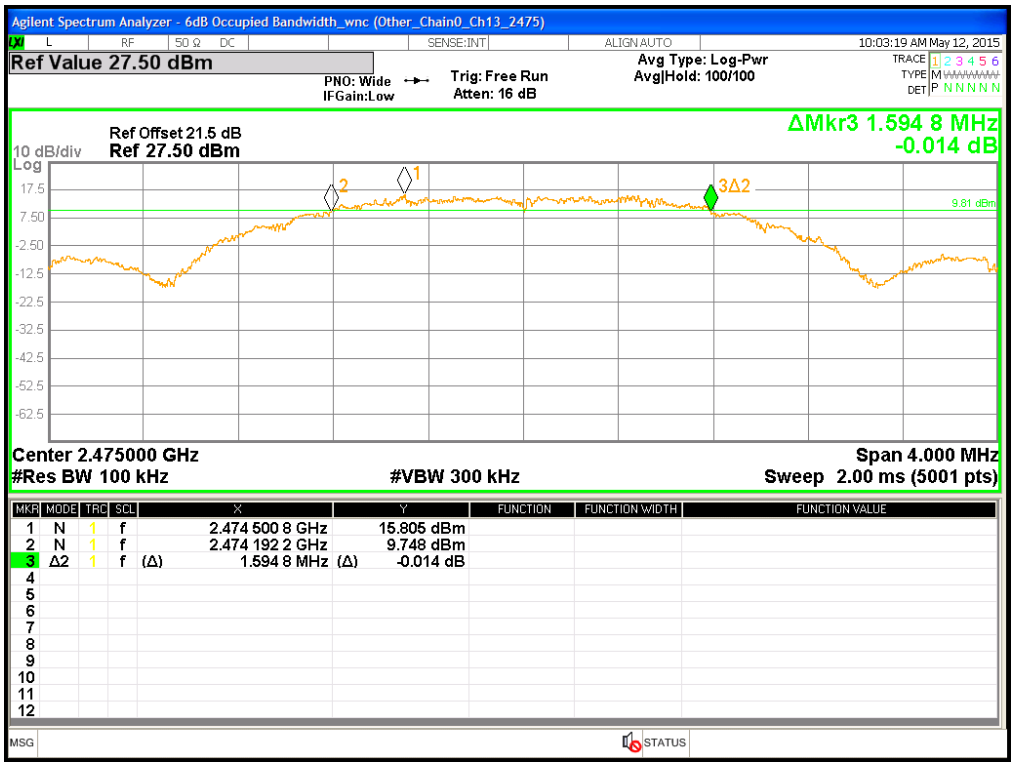
6dB Occupied Bandwidth Ch_Low 2405MHz



6dB Occupied Bandwidth Ch_Middle 2440MHz



6dB Occupied Bandwidth Ch_High 2475MHz



4. Maximum Peak Conducted Output Power

4.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement & Test method	15.247(b)(3) KDB 558074 D01 v03r02	
Channel number	Low, Middle, High	

4.2 Limit for maximum peak conducted output power

For systems using digital modulation in the 2400-2483.5 MHz: 1 Watt (30dBm)

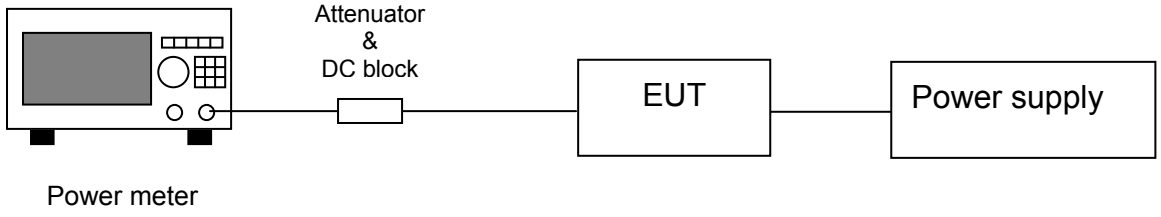
4.3 Measuring instrument setting

Power meter	
Power meter	**Setting**
Bandwidth	50MHz bandwidth is greater than the EUT emission bandwidth
Detector	Peak & Average

4.4 Test procedure

Test procedures refer to clause 9.1.3 peak power meter method and clause 9.2.3.2 measurement using a gated RF average power meter of KDB 558074 D01.

4.5 Test diagram



4.6 Test result

Mode	Channel	Frequency (MHz)	Output Power (AV) (dBm)	Total Power (AV) (mW)	Maximun power (PK) (dBm)	Maximun power (PK) (mW)	Limit (dBm)	Margin (dB)
Zigbee TX	Low	2405	17.95	62.37	18.01	63.24118	30	-11.99
	Middle	2440	19.33	85.70	19.37	86.49679	30	-10.63
	High	2475	19.42	87.50	19.45	88.10488	30	-10.55

5. Power Spectral Density

5.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement & Test method	15.247(e) KDB 558074 D01 v03r02	
Channel number	Low, Middle, High	

5.2 Limit for power spectrum density

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission

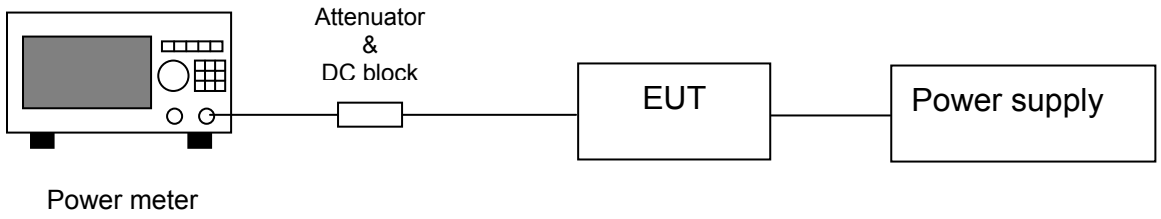
5.3 Measuring instrument setting

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	≧3 kHz
VBW	≧3 x RBW
Sweep	Auto couple
Trace	Max hold
Span	1.5 times x 6dB bandwidth
Attenuation	Auto

5.4 Test procedure

1. Test procedure refer to clause 10.2 method PKPSD (peak PSD) of KDB 558074 D01 and clause E) 2) b) measure and sum spectral maxima across the outputs of KDB 662911
2. Using the maximum conducted output power in the fundamental emission demonstrates compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Use the peak marker function to determine the maximum amplitude level within the RBW.

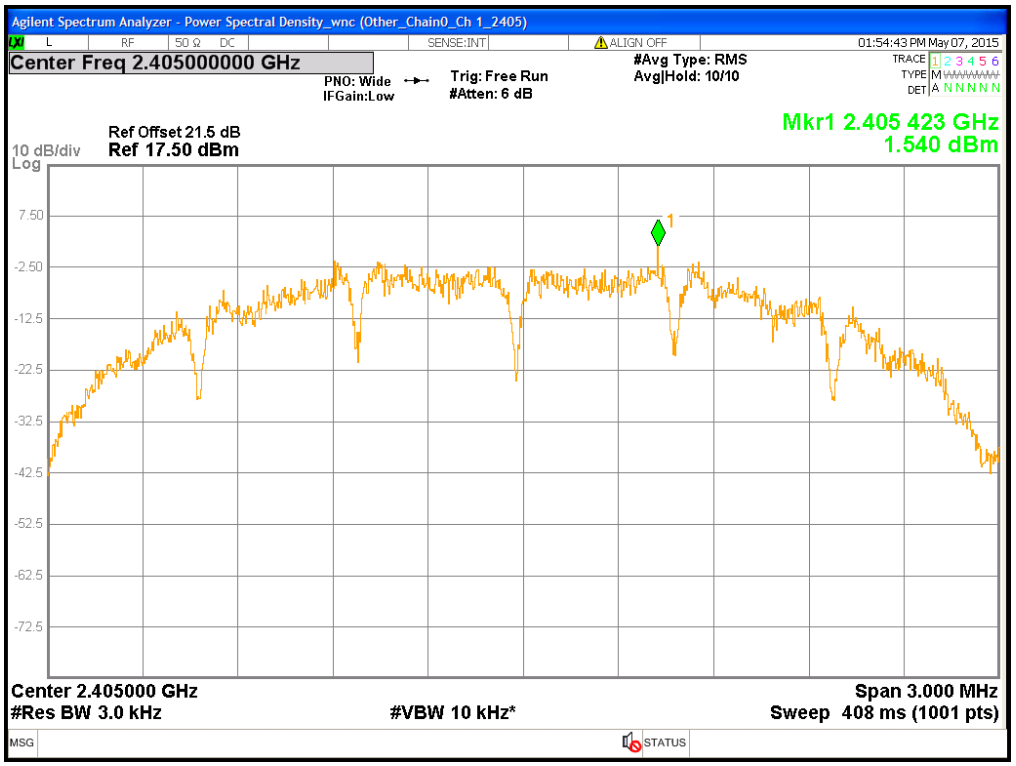
5.5 Test diagram



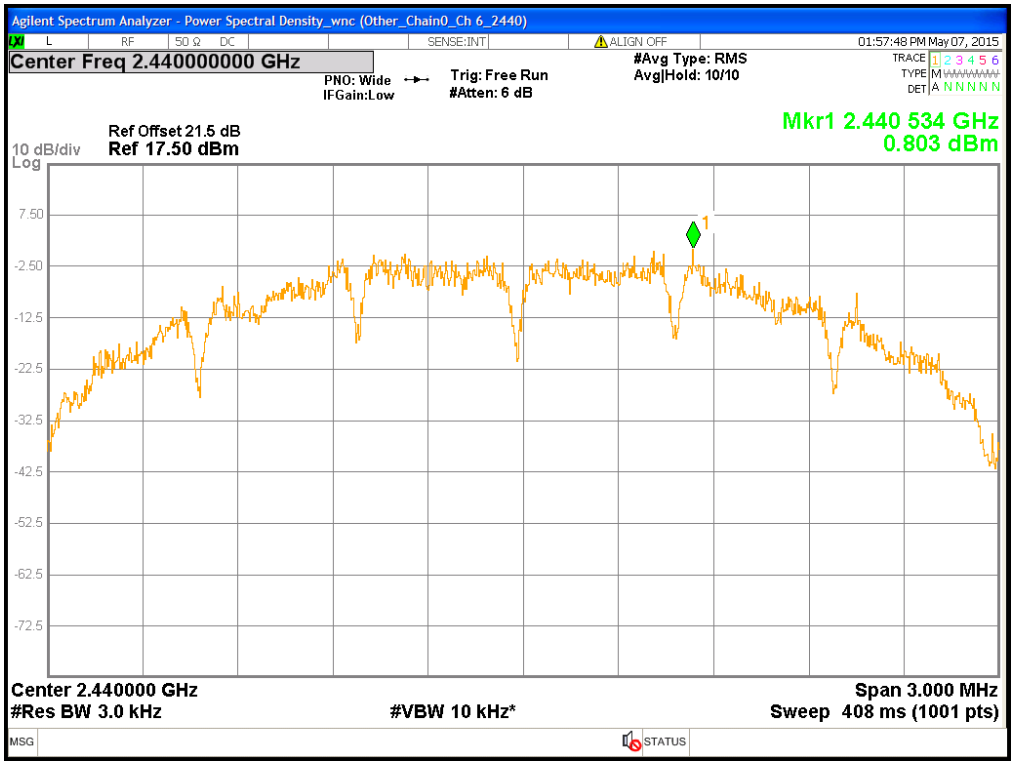
5.6 Test results

Mode	Channel	Frequency (MHz)	PSD		Limit (dBm/3kHz)	Margin (dB)
			(dBm/3kHz)	(mw/3kHz)		
Zigbee TX	Low	2405	1.54	1.43	8	-6.46
	Middle	2440	0.80	1.20	8	-7.20
	High	2475	0.14	1.03	8	-7.86

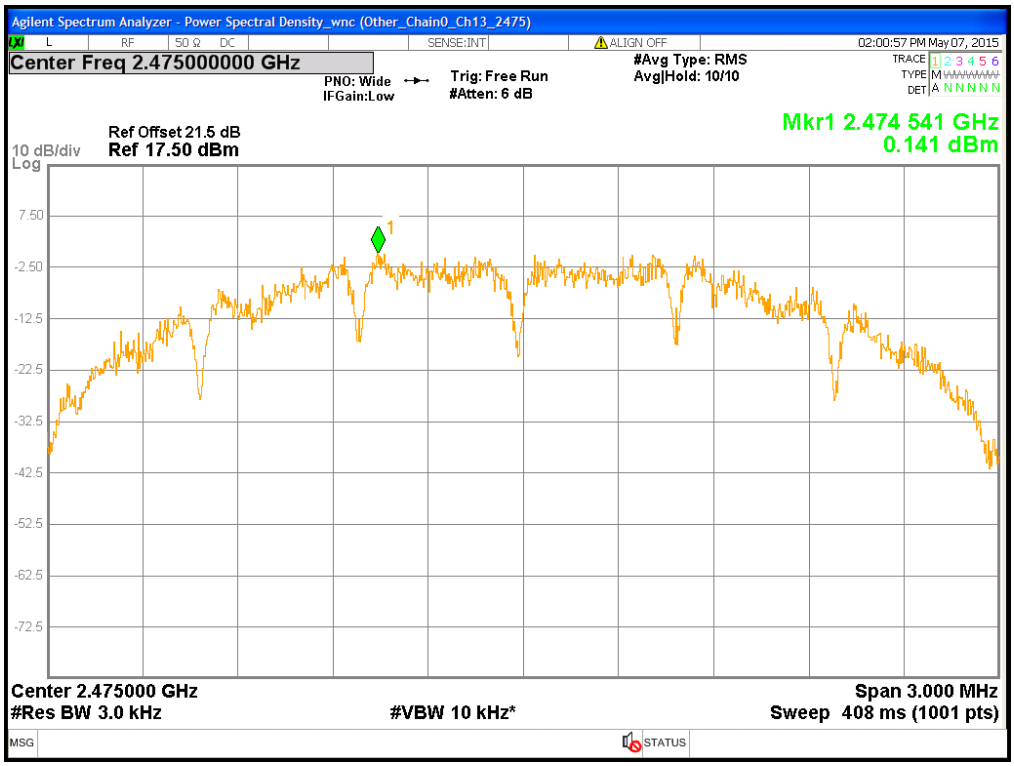
Power Density Ch_Low 2405MHz



Power Density Ch_Middle 2440MHz



Power Density Ch_High 2475MHz



6. Emissions In Non-Restricted Frequency Bands

6.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement	15.247(d)	
Channel number	Low, Middle, High	

6.2 Limit for emissions in non-restricted frequency bands

The peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz

6.3 Measuring instruments setting

Reference level measurement

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	≧100 kHz
VBW	≧3 x RBW
Sweep	Auto couple
Trace	Max hold
Span	≧1.5 time 6dB bandwidth
Attenuation	Auto

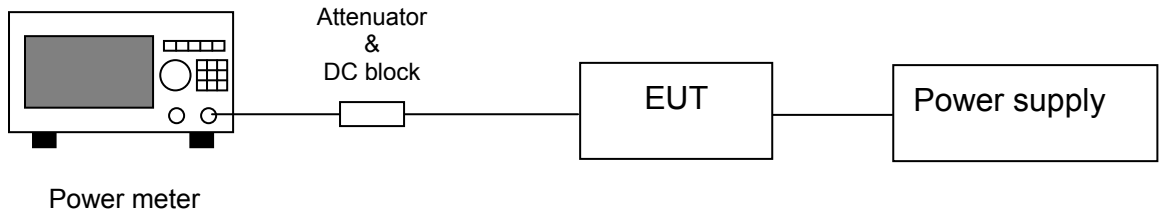
Emission level measurement

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	≧100 kHz
VBW	≧3 x RBW
Sweep	Auto couple
Trace	Max hold
Attenuation	Auto

6.4 Test procedure

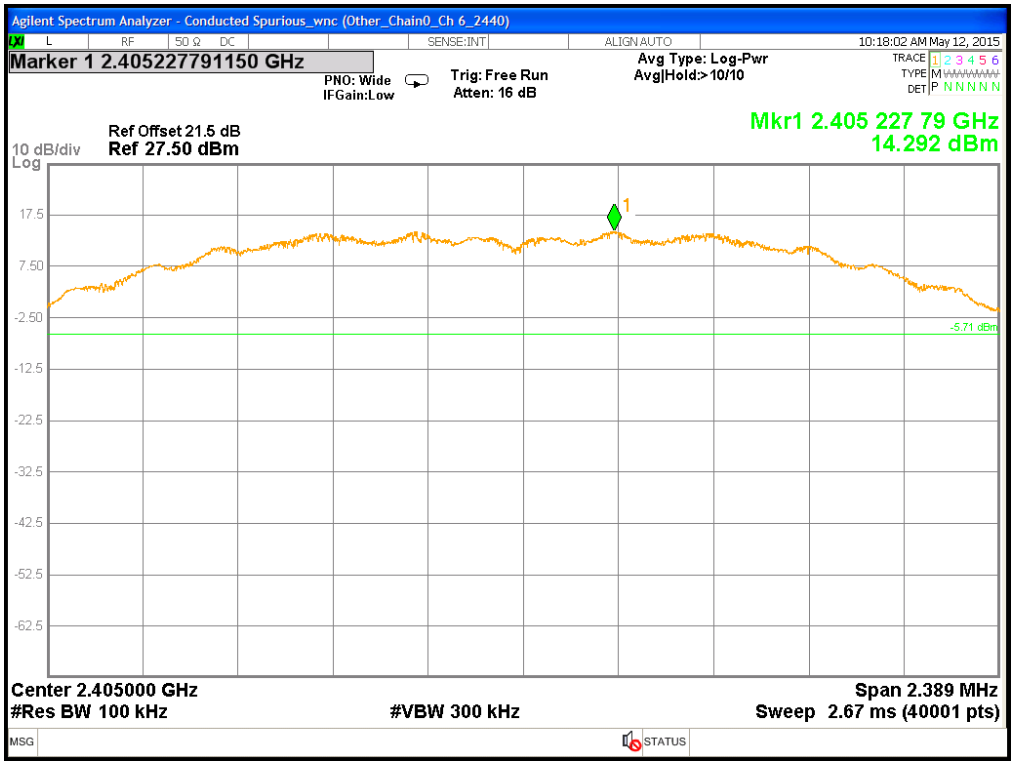
1. The procedure was used in antenna-port conducted and connected to the spectrum analyzer.
2. Set instrument center frequency to center frequency
3. Use the parameter configured in clause 6.3 to measure
4. Use the peak marker function to determine the maximum amplitude level.

6.5 Test diagram

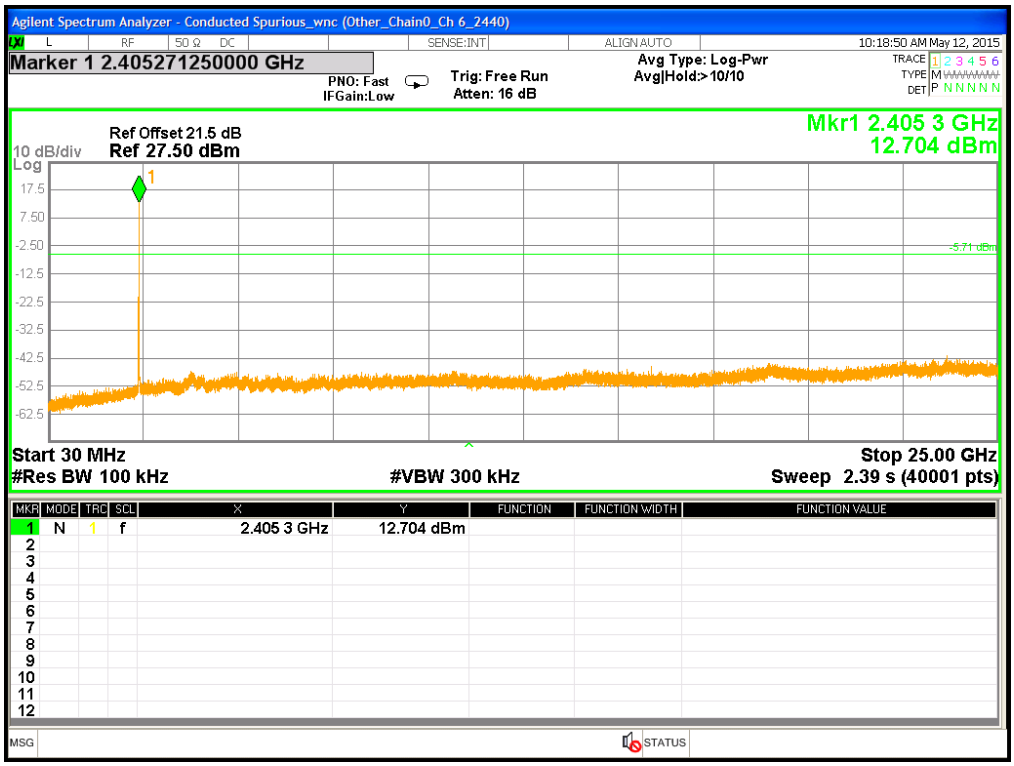


6.6 Test results

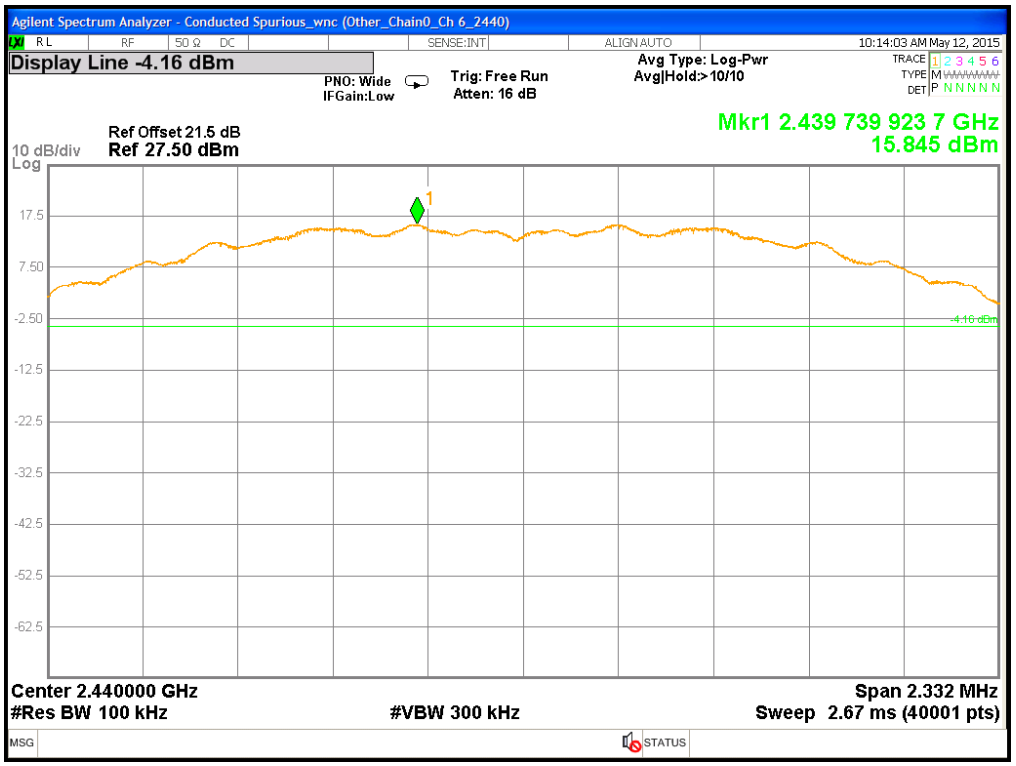
Conducted Spurious Ch_Low 2405MHz Reference Level



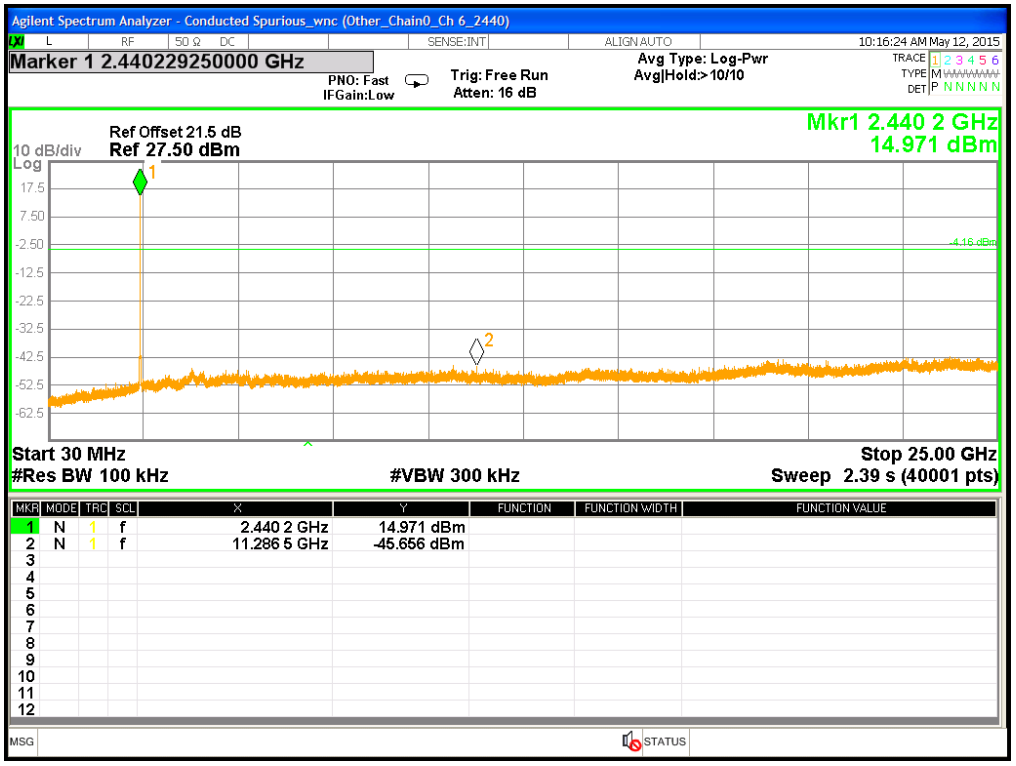
Conducted Spurious Ch_Low 2405MHz (30M-26G)



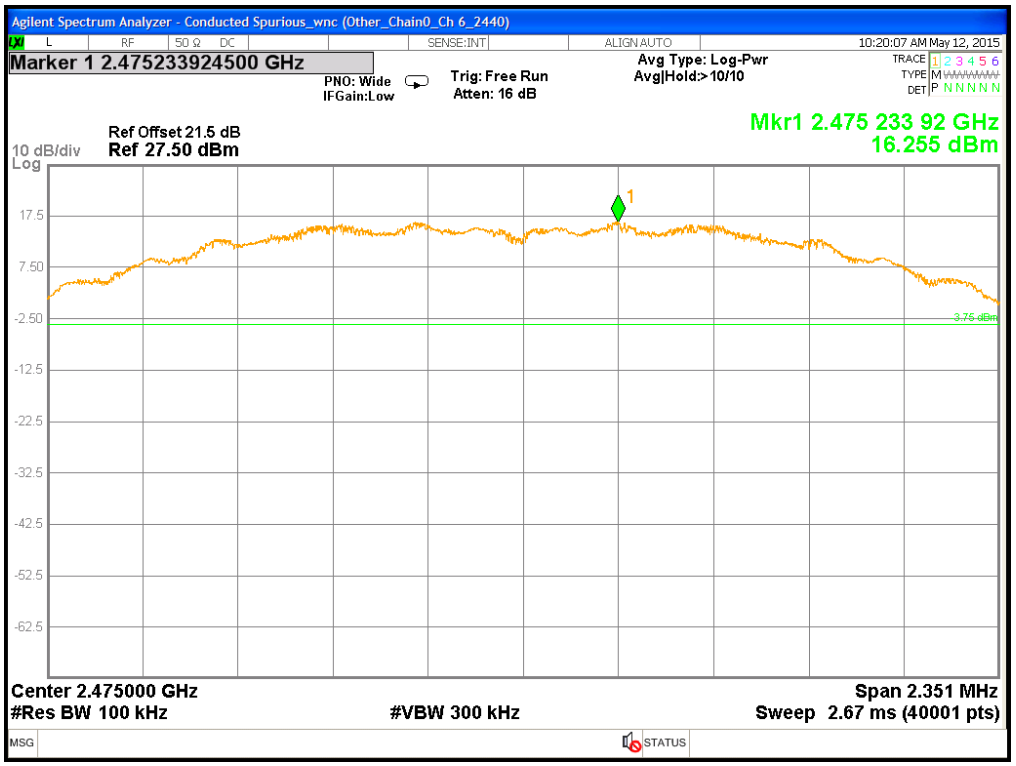
Conducted Spurious @ Ch_Middle 2440MHz Reference Level



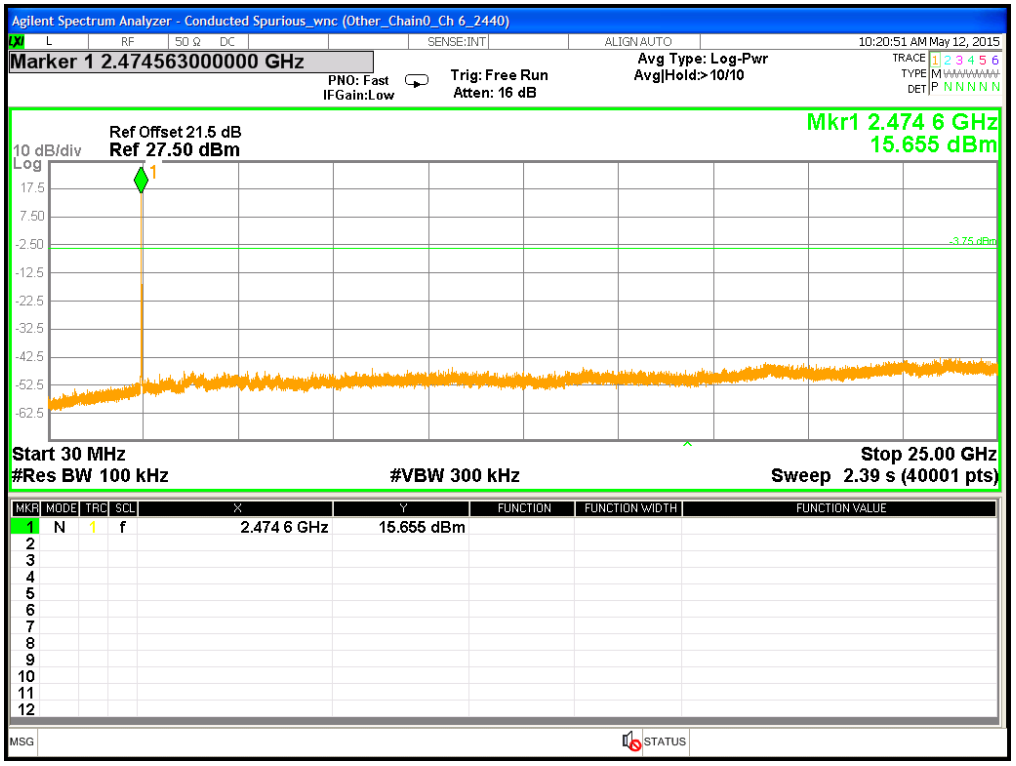
Conducted Spurious @ Ch_Middle 2440MHz (30M-26G)



Conducted Spurious @ Ch_High 2475MHz Reference level



Conducted Spurious @ Ch_High 2475MHz (30M-26G)



7. Emissions In Restricted Frequency Bands (Radiated emission measurements)

7.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement	15.247(d), 15.205, 15.209	
Channel number	Low, Middle, High	

7.2 Limit for emission in restricted frequency bands (Radiated emission measurement)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement distance (meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	2400/F(kHz)	30
1.705~30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

7.3 Measuring instrument setting

Below 1GHz measurement

Receiver settings	
Receiver function	**Setting**
Detector	QP
RBW	9-150 kHz ; 200-300 Hz 0.15-30 MHz; 9-10 kHz 30-1000 MHz; 100-120 kHz
VBW	≧3 x RBW
Sweep	Auto couple
Attenuation	Auto

Above 1GHz measurement

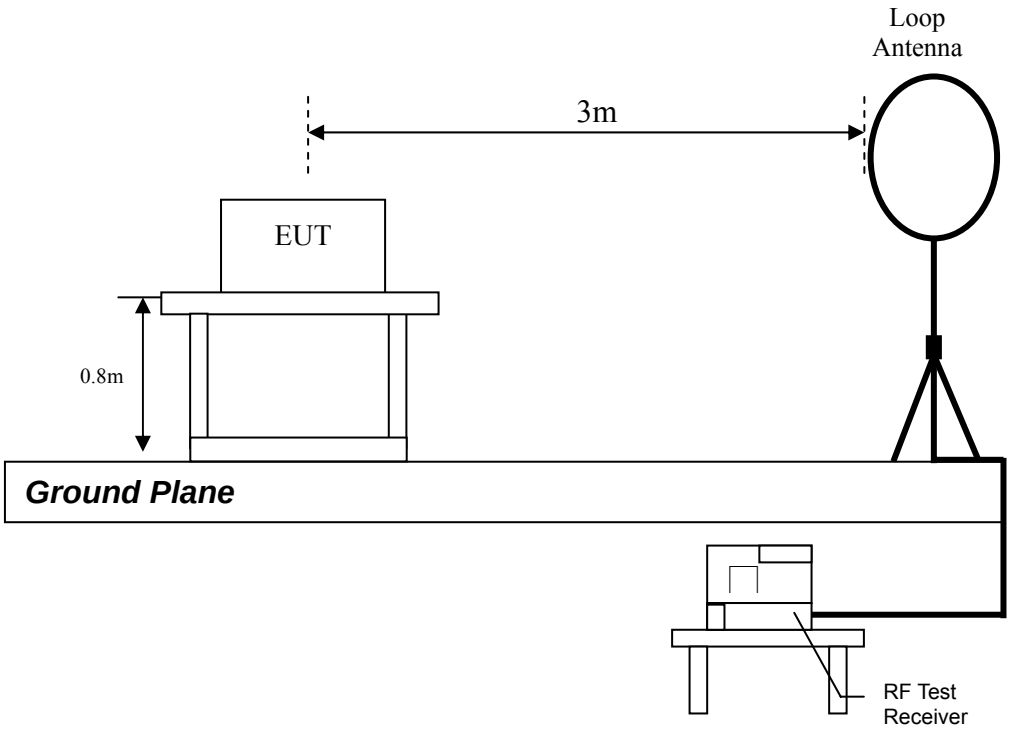
Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	1MHz
VBW	3MHz for Peak; 10Hz for Average
Sweep	Auto couple
Start Frequency	1GHz
Stop Frequency	Tenth harmonic
Attenuation	Auto

7.4 Test procedure

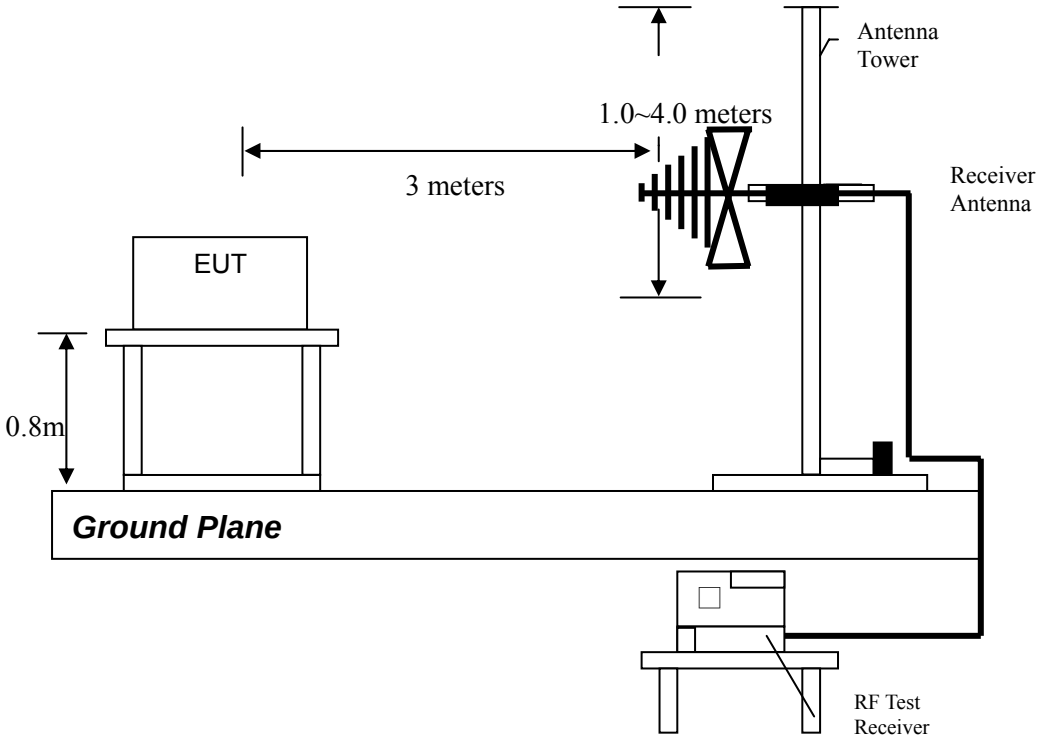
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the companion devices. The turntable was rotated by 360 degree to find the position of the maximum emission level.
3. The height of the receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of the both horizontal and vertical polarization
4. If find the frequencies above the limit or below within 3dB, the antenna tower was scan (from 1m to 4m) and then the turntable was rotated to find the maximum reading.
5. Set the test-receiver system to peak or CISPR quasi-peak detector with specified bandwidth under maximum hold mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3dB lower than the average limit specified then testing will be stopped and peak values of the EUT will be reported. Otherwise, the emissions which do not have 3dB margin will be measured using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, The emissions level of the EUT in peak mode was lower than average limit, then testing will be stopped and peak values of the EUT will be reported, otherwise, the emission will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be quasi-peak measured by receiver.

7.5 Test configuration

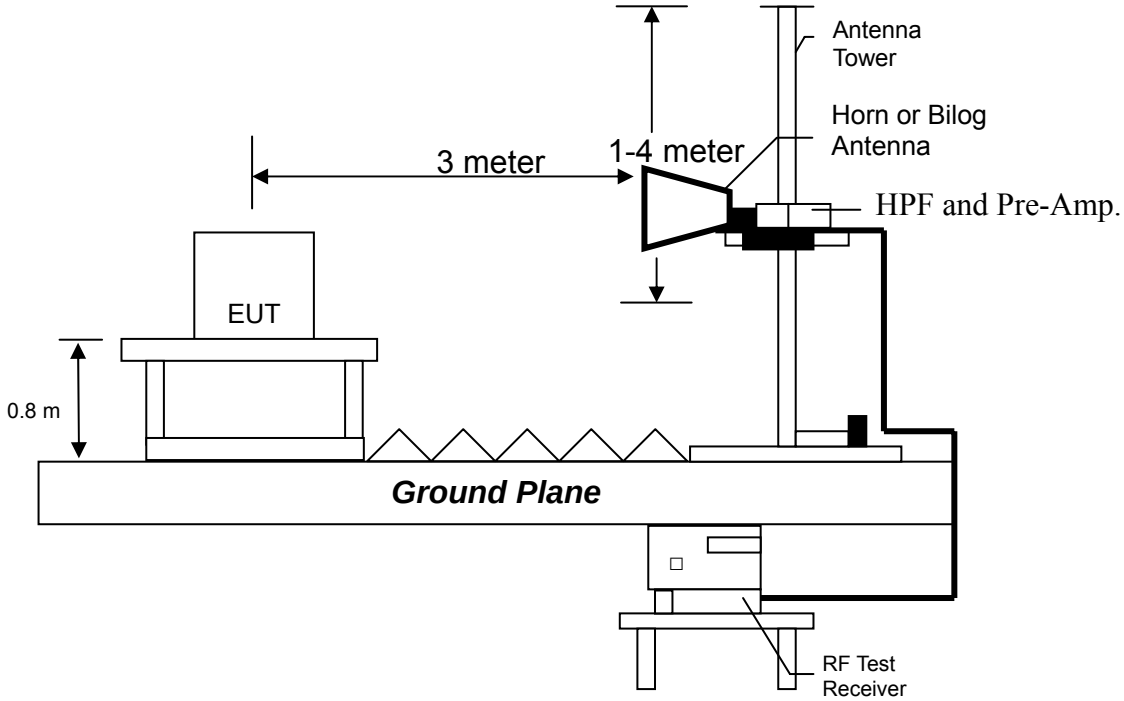
Radiated emission from 9kHz to 30MHz uses Loop Antenna:



Radiated emission from 30MHz to 1GHz uses Bilog Antenna:



Radiated emission above 1GHz using Horn Antenna



7.6 Test result

7.6.1 Measurement results: frequencies 9kHz to 30MHz

EUT : UMC-I210C
Test mode : TX mode

Polarity (circle)	Frequency (MHz)	Detection value	factor (dB/m)	Reading (dBμV)	value (dBμV/m)	Limit @ 3m (dBμV/m)	Tolerance (dB)
Plane	2.59	QP	16.15	24.52	40.67	69.54	-28.87
Plane	9.96	QP	8.14	28.73	36.87	69.54	-32.67
Plane	18.35	QP	6.85	31.26	38.11	69.54	-31.43
Coaxial	8.01	QP	9.23	21.33	30.56	69.54	-38.98
Coaxial	12.39	QP	7.76	24.82	32.58	69.54	-36.96
Coaxial	16.97	QP	7.06	27.12	34.18	69.54	-35.36
Remark: Corr. Factor = Antenna Factor + Cable Loss – PreAmplifier Gain							

7.6.2 Measurement results: frequencies below 1 GHz

The test was performed on EUT under O-QPSK continuously transmitting Low, Middle, High Channel. The worst case occurred at Middle channel.

EUT : UMC-I210C
Worst Case : Middle channel.

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBμV)	Corrected Level (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
V	191.02	QP	13.98	15.37	29.35	43.50	-14.15
V	216.24	QP	14.65	14.82	29.47	46.00	-16.53
V	255.04	QP	16.01	14.33	30.34	46.00	-15.66
V	322.94	QP	18.02	14.17	32.19	46.00	-13.81
V	503.36	QP	22.10	9.18	31.28	46.00	-14.72
V	577.08	QP	23.69	9.11	32.80	46.00	-13.20
H	216.24	QP	16.44	17.42	33.86	46.00	-12.14
H	288.02	QP	17.70	12.34	30.04	46.00	-15.96
H	322.94	QP	18.31	12.68	30.99	46.00	-15.01
H	359.80	QP	18.96	13.84	32.80	46.00	-13.20
H	542.16	QP	22.16	9.60	31.76	46.00	-14.24
H	586.78	QP	22.94	10.21	33.15	46.00	-12.85

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

Note: The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

7.6.3 Measurement results: frequency above 1GHz to 25GHz

EUT : UMC-I210C

Mode	Freq. (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Channel_Low	4980	PK	V	39.81	0.48	44.12	44.60	74.00	-29.40
	7215	PK	V	38.10	8.13	50.48	58.61	74.00	-15.39
	7215	AV	V	38.10	8.13	41.45	49.58	54.00	-4.42
	9620	PK	V	38.15	11.37	42.84	54.21	74.00	-19.79
	9620	AV	V	38.15	11.37	32.07	43.44	54.00	-10.56
	12025	PK	V	38.81	13.18	39.75	52.93	74.00	-21.07
	4980	PK	H	39.81	0.48	43.33	43.81	74.00	-30.19
	7215	PK	H	38.10	8.13	48.56	56.69	74.00	-17.31
	7215	AV	H	38.10	8.13	37.92	46.05	54.00	-7.95
	9620	PK	H	38.15	11.37	38.91	50.28	74.00	-23.72
	12025	PK	H	38.81	13.18	37.95	51.13	74.00	-22.87
Channel_Middle	4980	PK	V	39.81	0.48	44.34	44.82	74.00	-29.18
	7320	PK	V	38.01	8.45	49.00	57.45	74.00	-16.55
	7320	AV	V	38.01	8.45	40.59	49.04	54.00	-4.96
	9760	PK	V	38.34	11.23	43.26	54.49	74.00	-19.51
	9760	AV	V	38.34	11.23	32.34	43.57	54.00	-10.43
	12200	PK	V	38.66	13.18	44.65	57.83	74.00	-16.17
	12200	AV	V	38.66	13.18	33.72	46.90	54.00	-7.10
	4980	PK	H	39.81	0.48	42.74	43.22	74.00	-30.78
	7320	PK	H	38.01	8.45	47.03	55.48	74.00	-18.52
	7320	AV	H	38.01	8.45	38.06	46.51	54.00	-7.49
	9760	PK	H	38.34	11.23	37.38	48.61	74.00	-25.39
	12200	PK	H	38.66	13.18	38.44	51.62	74.00	-22.38

Mode	Freq. (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)
Channel_High	4980	PK	V	39.81	0.48	45.41	45.89	74.00	-28.11
	7425	PK	V	37.92	8.78	51.37	60.15	74.00	-13.85
	7425	AV	V	37.92	8.78	41.18	49.96	54.00	-4.04
	9900	PK	V	38.54	11.09	38.37	49.46	74.00	-24.54
	12375	PK	V	38.52	13.18	42.91	56.09	74.00	-17.91
	12375	AV	V	38.52	13.18	36.03	49.21	54.00	-4.79
	4980	PK	H	39.81	0.48	42.84	43.32	74.00	-30.68
	7425	PK	H	37.92	8.78	49.40	58.18	74.00	-15.82
	7425	AV	H	37.92	8.78	40.32	49.10	54.00	-4.90
	9900	PK	H	38.54	11.09	36.50	47.59	74.00	-26.41
	12375	PK	H	38.52	13.18	38.09	51.27	74.00	-22.73

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

8. Emission On Band Edge

8.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa
Requirement	15.247(d), 15.205,	
Channel	Low, Middle, High	

8.2 Measuring instrument setting

Spectrum analyzer settings	
Spectrum Analyzer function	**Setting**
Detector	Peak
RBW	1MHz
VBW	3MHz for Peak; 10Hz for Average
Sweep	Auto couple
Restrict bands	2310~2390MHz
	2483.5 ~2500MHz
Attenuation	Auto

8.3 Test procedure

The test procedure is the same as clause 7.4

8.4 Test results

Mode	Frequency (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Correction Factor (dB/m)	Reading (dBμV)	Corrected Reading (dBμV/m)	Limit @ 3 m (dBμV/m)	Margin (dB)	Restricted band (MHz)
Zigbee TX	2389.34	PK	V	33.85	20.52	54.37	74	-19.63	2310~2390
	2390.00	AV	V	33.85	8.71	42.56	54	-11.44	
	2483.50	PK	V	34.30	30.54	64.84	74	-9.16	2483.5~2500
	2483.50	AV	V	34.30	18.56	52.86	54	-1.14	
Remark: Correction Factor = Antenna Factor + Cable Loss									

9. AC Power Line Conducted Emission

9.1 Operating environment

Temperature:	24	℃
Relative Humidity:	53	%
Atmospheric Pressure	1008	hPa
Requirement	15.207	
Date of test	May 11, 2015	

9.2 Limit for AC power line conducted emission

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

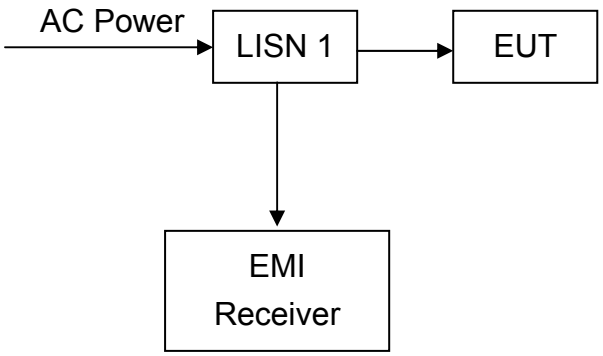
9.3 Measuring instrument setting

Receiver settings	
Receiver function	Setting
Detector	QP
Start frequency	0.15MHz
Stop frequency	30MHz
IF bandwidth	9 kHz
Attenuation	10dB

9.4 Test procedure

1. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 0.8 meter from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network.
3. All the companion devices are connected to the other LISN. The LISN should provide 50Uh/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30MHz was searched
5. Set the test-receiver system to peak detector and specified bandwidth with maximum hold mode.
6. The measurement has to be done between each power line and ground at the power terminal.

9.5 Test diagram

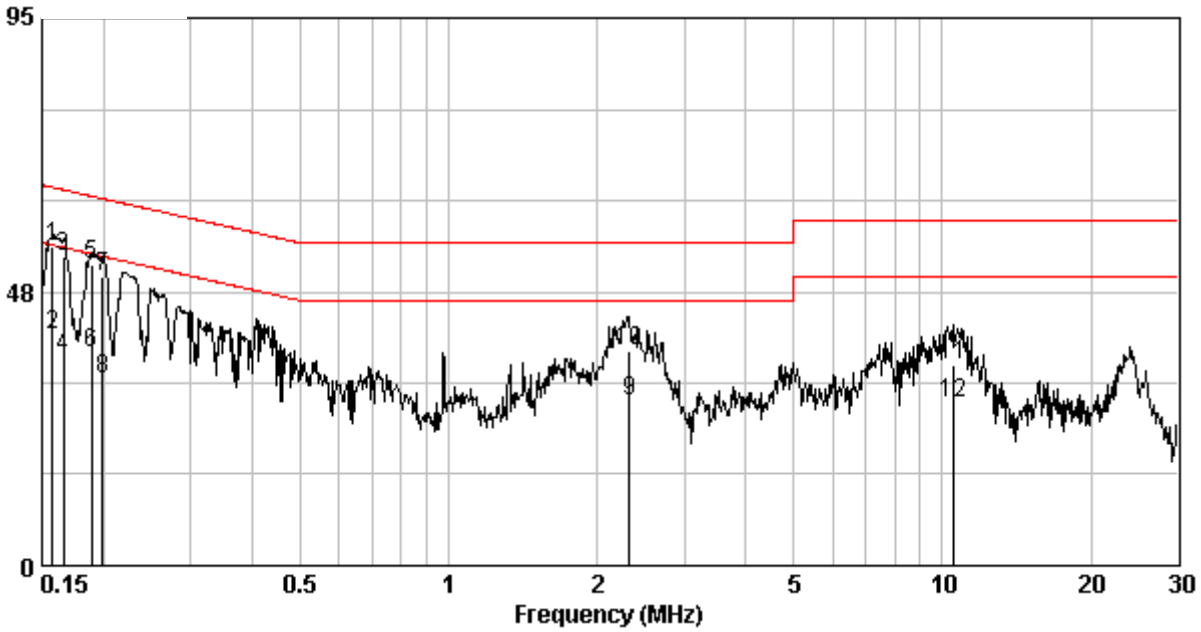


9.6 Test results

Phase : Line
EUT : UMC-I210C
Test Condition : TX mode (Channel High)
Test Voltage : 120Vac, 60Hz

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Over Limit (dB) Qp	Av
0.157	9.74	55.42	65.60	40.06	55.60	-10.19	-15.54
0.166	9.74	53.43	65.16	36.30	55.16	-11.73	-18.86
0.189	9.74	52.18	64.06	36.88	54.06	-11.89	-17.19
0.199	9.74	50.15	63.67	32.41	53.67	-13.52	-21.26
2.321	9.85	37.19	56.00	28.57	46.00	-18.81	-17.43
10.508	9.90	34.79	60.00	28.22	50.00	-25.21	-21.78

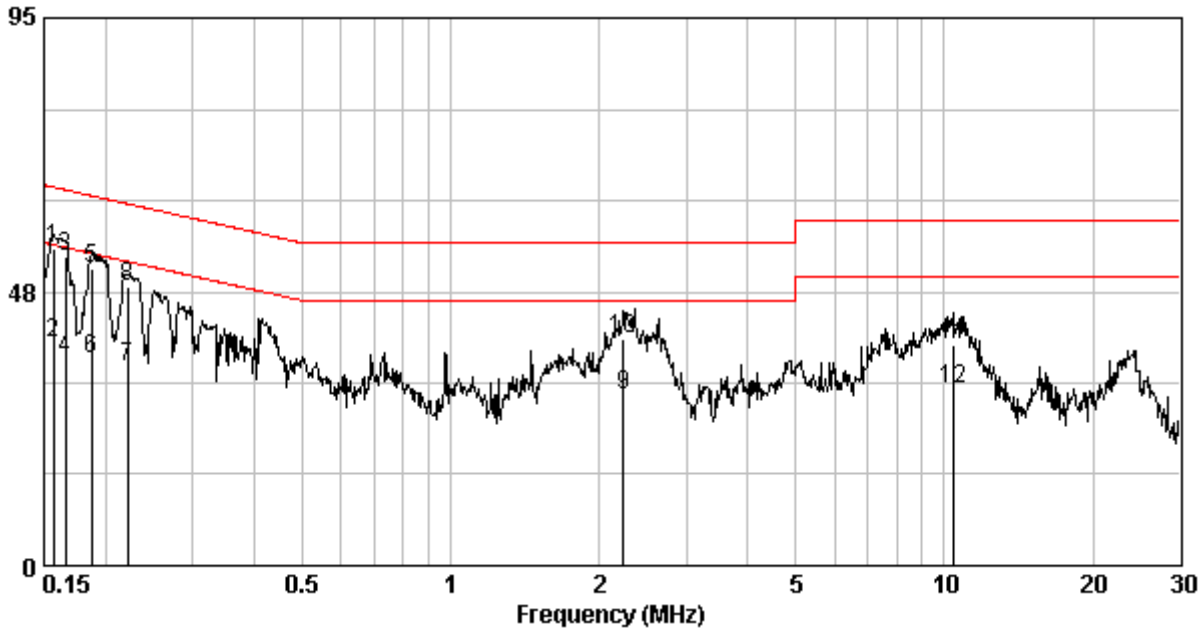
Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Over Limit (dB) = Level (dBuV) – Limit (dBuV)



Phase	: Neutral
EUT	: UMC-I210C
Test Condition	: TX mode (Channel High)
Test Voltage	: 120Vac, 60Hz

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Over Limit (dB) Qp	Av
0.156	9.75	55.10	65.65	38.71	55.65	-10.55	-16.94
0.166	9.75	53.48	65.16	35.86	55.16	-11.68	-19.30
0.187	9.74	51.59	64.15	36.01	54.15	-12.56	-18.14
0.222	9.74	48.39	62.74	34.35	52.74	-14.35	-18.39
2.237	9.85	39.30	56.00	29.68	46.00	-16.70	-16.32
10.397	9.93	38.20	60.00	30.61	50.00	-21.80	-19.39

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Over Limit (dB) = Level (dBuV) – Limit (dBuV)



Appendix A: Test equipment list

Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
ESCI EMI Test Receiver	Rohde & Schwarz	ESCI	100018	2014/12/02	2015/12/01
Spectrum Analyzer	Rohde & Schwarz	FSP30	100137	2014/06/16	2015/06/15
Spectrum Analyzer	Rohde & Schwarz	FSEK30	100186	2015/01/14	2016/01/13
Horn Antenna (1-18G)	SHWARZBECK	BBHA 9120 D	9120D-456	2014/08/29	2017/08/27
Horn Antenna (14-42G)	SHWARZBECK	BBHA 9170	BBHA9170159	2014/09/16	2017/09/14
Broadband Antenna	SHWARZBECK	VULB 9168	9168-172	2013/08/08	2015/08/07
Loop Antenna	RolfHeine	LA-285	02/10033	2014/3/18	2016/03/16
Pre-Amplifier	MITEQ	AFS44-00102650--42-10P-44	1495287	2013/10/27	2015/10/26
Power Meter	Anritsu	ML2495A	0844001	2014/11/12	2015/11/11
Power Senor	Anritsu	MA2411B	0738452	2014/11/12	2015/11/11
Signal Analyzer	Agilent	N9030A	MY51380492	2014/09/19	2015/09/18
RF Cable	Mini-Circuits	CBL-4FT-SMSM+	CB0003	2015/05/06	2016/05/05
966-2(A) Cable	SUHNER	SMA / EX 100	N/A	2015/05/06	2016/05/05
966-2(B) Cable	JUNFLON	SMA / J12J100880-00	AUG-26-08-002	2015/05/06	2016/05/05
Antenna connector(SMA Female)	Marvelous Microwave Inc	N/A	412293.081.15	N/A	N/A

Appendix B: Measurement Uncertainty

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

Item	Uncertainty
Vertically polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.15 dB
Horizontally polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m	5.23 dB
Vertically polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m	4.19 dB
Horizontally polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m	4.3 dB
Vertically polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m	4.19 dB
Horizontally polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m	4.3 dB
Conducted Output power	0.86 dB
Radiated electromagnetic disturbances in the frequency range from 9kHz to 30MHz	2.92 dB
Conducted disturbance measurements at a mains port from 9 kHz to 30 MHz using a 50 Ω/50 μH +5Ω artificial mains network (AMN)	2.5 dB