



Shenzhen Asia Test Technology Co., Ltd.

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FCC RADIO TEST REPORT

FCC ID: 2AE2VSDZ2100

Product : Zigbee Smoke Detector

Trade Name : 

Model Name : SDZ2100

Serial Model : N/A

Prepared for

Sensing Tek Co., Ltd

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Rules	Description Of Test	Result
§15.247(a)(2)	6dB bandwidth	PASS
§15.247(b)(3)	Max Peak output Power test	PASS
§15.247(e)	Power density	PASS
§15.247(d)	Band edge test	PASS
§15.207	AC Power Conducted Emission	N/A
§15.247(d), §15.209	Radiated Emission	PASS
§15.247(d)	Antenna Port Emission	PASS
§15.247(b)&§15.203	Antenna Application	PASS

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

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1.1 TEST FACILITY

Dongguan Yaxu (AiT) Technology Limited.
No. 22, JinQianLing Street 3, JiTiGang Village, Huang-Jiang Town, DongGuan, Guangdong,
523757 China
FCC Registration No.: 248337

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Zigbee Smoke Detector
Model Name	SDZ2100
Serial Model	N/A
Model Difference	N/A
Standards	IEEE802.15.4
Operation Frequency	Zigbee: 2405-2480MHz
Modulation	O-QPSK for Zigbee
Channel List	Please refer to the Note 2.
Channel spacing	5MHz
Antenna Gain	2dBi for Zigbee
Antenna Type	PCB Antenna
HW	BS-Smoke-ZB
SW	Bestom_SMOKE_JN5168_hp_Br1
Ratings	DC 3V by AA battery
Adapter	N/A
Battery	DC 2*1.5V AA battery
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

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2.

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	2405	17	2435	23	2465
12	2410	18	2440	24	2470
13	2415	19	2445	25	2475
14	2420	20	2450	26	2480
15	2425	21	2455		
16	2430	22	2460		

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test Frequency

Test Mode	RF Ch.	TX Channel NO.	TX Freq. [MHz]	RX Freq. [MHz]
Mode 1	L	CH11	2405	2405
Mode 2	M	CH18	2440	2440
Mode 3	H	CH26	2480	2480

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2)The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%. Use new batteries during test.
- (3) measurements are performed according to the KDB 558074 D01 DTS Meas Guidance v03r05

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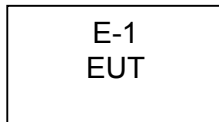


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2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test



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2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	Zigbee Smoke Detector		SDZ2100	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

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2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

No	Test Equipment	Manufacturer	Model No	Serial No	Cal. Date	Cal. Due Date
1	Spectrum Analyzer	ADVANTEST	R3182	150900201	2015.06.29	2016.06.28
2	EMI Measuring Receiver	R&S	ESR	101660	2015.12.12	2016.12.11
3	Low Noise Pre Amplifier	Tsj	MLA-10K01-B01-27	1205323	2015.06.29	2016.06.28
4	Low Noise Pre Amplifier	Tsj	MLA-0120-A02-34	2648A04738	2015.12.02	2016.12.01
5	TRILOG Super Broadband test Antenna	SCHWARZBECK	VULB9160	9160-3206	2015.12.03	2016.12.02
6	Broadband Horn Antenna	SCHWARZBECK	BBHA9120D	452	2015.12.03	2016.12.02
7	SHF-EHF Horn	SCHWARZBECK	BBHA9170	BBHA9170367	2015.12.03	2016.12.02
8	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.09.26	2016.09.25
9	Loop Antenna	ARA	PLA-1030/B	1029	2016.03.20	2017.03.19
10	Radiated Cable 1# (30MHz-1GHz)	FUJIKURA	5D-2W	01	2016.01.04	2017.01.03
11	Radiated Cable 2# (1GHz -25GHz)	FUJIKURA	10D2W	02	2015.12.25	2016.12.24
12	Conducted Cable 1#(9KHz-30MHz)	FUJIKURA	1D-2W	01	2016.01.04	2017.01.03
13	SMA Antenna connector	Dosin	Dosin-SMA	N/A	N/A	N/A
14	Power Meter	R&S	NRVS	100696	2015.07.06	2016.07.05
15	Power Sensor	R&S	URV5-Z4	0395.1619.05	2015.07.06	2016.07.05

Note: The SMA antenna connector is soldered on the PCB board in order to perform conducted tests and this SMA antenna connector is listed in the equipment list.

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3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

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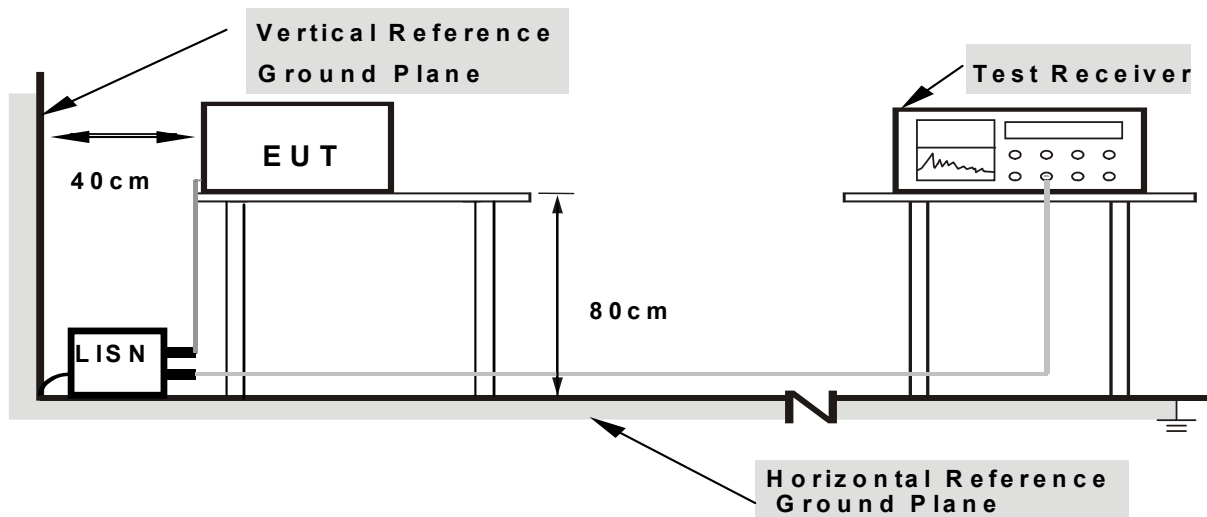
3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

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3.1.6 TEST RESULTS

N/A

Note : Due to this EUT is powered by batteries only, this test item is not applicable.

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3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

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- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

Both horizontal and vertical antenna polarities were tested

For the radiated emission test above 1GHz:

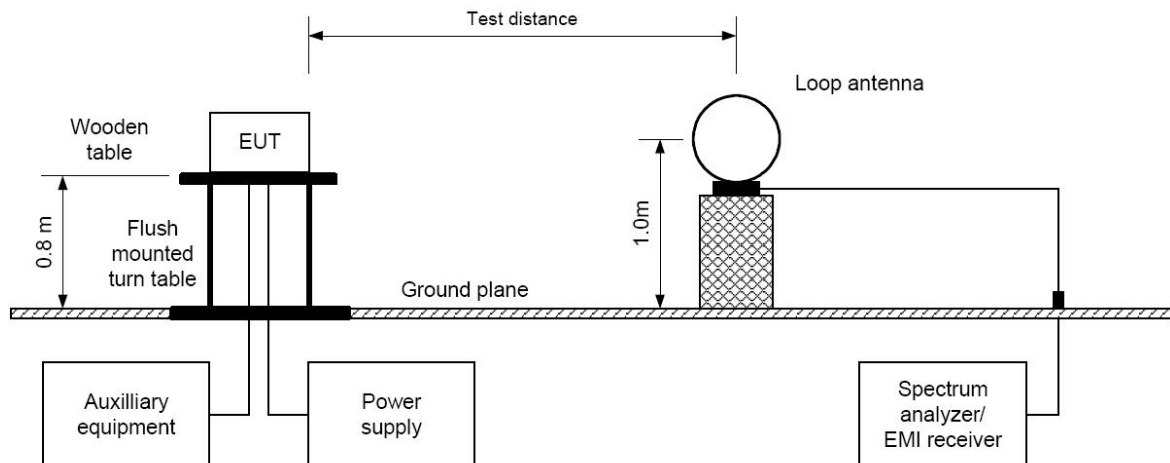
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

3.2.3 DEVIATION FROM TEST STANDARD

No deviation

3.2.4 TEST SETUP

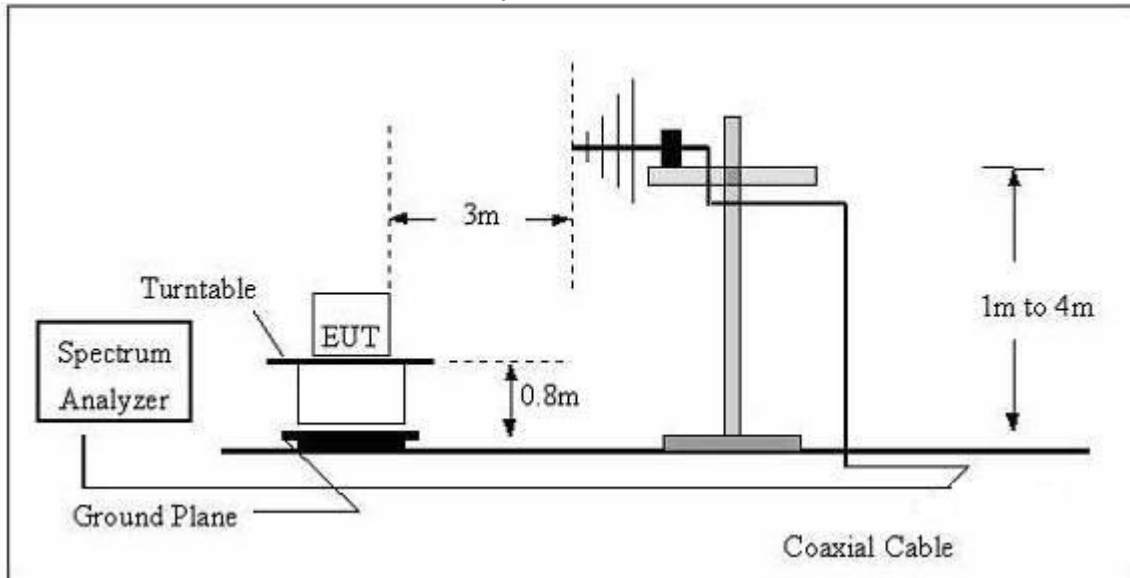
(A) Radiated Emission Test-Up Frequency Below 30MHz



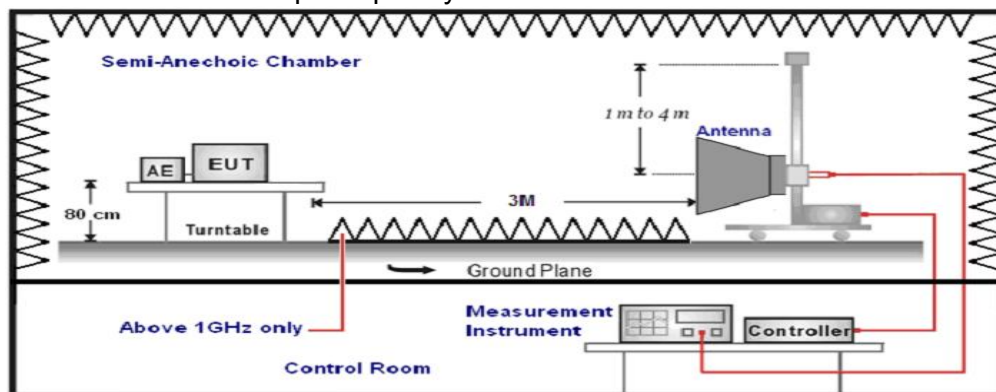
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(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

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3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

EUT:	Zigbee Smoke Detector	Model Name. :	SDZ2100
Temperature:	20 °C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX	Polarization :	--

Freq. (MHz)	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State P/F
--	--	--	--	P
--	--	--	--	P

NOTE:

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

Distance extrapolation factor = $40 \log(\text{specific distance}/\text{test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

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3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

EUT :	Zigbee Smoke Detector	Model Name :	SDZ2100
Temperature :	20 °C	Relative Humidity :	48%
Pressure:	1010 hPa	Test Voltage :	DC 3V
Test Mode :	TX2405(worst case)		

Polarization	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type	Comment
	(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		
Below 1G								
Horizontal	42.5	24.67	9.45	34.12	40	-5.88	QP	
Horizontal	115.6	22.72	11.25	33.97	43.5	-9.53	QP	
Horizontal	263.5	25.69	13.72	39.41	46	-6.59	QP	
Horizontal	442.7	23.42	14.35	37.77	46	-8.23	QP	
Horizontal	516.3	18.67	16.74	35.41	46	-10.59	QP	
Horizontal	776.54	25.26	18.18	43.44	46	-2.56	QP	
Vertical	68.72	24.35	11.66	36.01	40	-3.99	QP	
Vertical	106.6	25.16	10.15	35.31	43.5	-8.19	QP	
Vertical	277.3	23.54	13.75	37.29	46	-8.71	QP	
Vertical	415.1	25.14	14.13	39.27	46	-6.73	QP	
Vertical	505.8	26.387	15.98	42.367	46	-3.633	QP	
Vertical	668.6	23.24	16.77	40.01	46	-5.99	QP	

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3.2.8 TEST RESULTS (1GHZ-25GHZ)

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dB μ V)	(dB)	(dB μ V/m)	(dB μ V/m)	(dB)	Type	
Low Channel-Above 1G							
4810	45.12	9.97	55.09	74	-18.91	Pk	Vertical
4810	33.74	9.97	43.71	54	-10.29	Av	Vertical
7215	43.17	12.35	55.52	74	-18.48	Pk	Vertical
7215	32.68	12.35	45.03	54	-8.97	Av	Vertical
4810	46.68	10.57	57.25	74	-16.75	Pk	Horizontal
4810	35.49	10.57	46.06	54	-7.94	Av	Horizontal
7215	42	12.35	54.35	74	-19.65	Pk	Horizontal
7215	31.59	12.35	43.94	54	-10.06	Av	Horizontal
Mid Channel-Above 1G							
4880	47.42	10.4	57.82	74	-16.18	Pk	Vertical
4880	38.65	10.4	49.05	54	-4.95	Av	Vertical
7320	41.26	12.75	54.01	74	-19.99	Pk	Vertical
7320	30.76	12.75	43.51	54	-10.49	Av	Vertical
4880	45.87	10.4	56.27	74	-17.73	Pk	Horizontal
4880	35.62	10.4	46.02	54	-7.98	Av	Horizontal
7320	43.88	12.75	56.63	74	-17.37	Pk	Horizontal
7320	33.17	12.75	45.92	54	-8.08	Av	Horizontal
High Channel- Above 1G							
4960	47.18	10.39	57.57	74	-16.43	Pk	Vertical
4960	36.98	10.39	47.37	54	-6.63	Av	Vertical
7440	45.17	12.68	57.85	74	-16.15	Pk	Vertical
7440	34.35	12.68	47.03	54	-6.97	Av	Vertical
4960	44.52	10.39	54.91	74	-19.09	Pk	Horizontal
4960	35.76	10.39	46.15	54	-7.85	Av	Horizontal
7440	41.15	12.68	53.83	74	-20.17	Pk	Horizontal
7440	32.67	12.68	45.35	54	-8.65	Av	Horizontal

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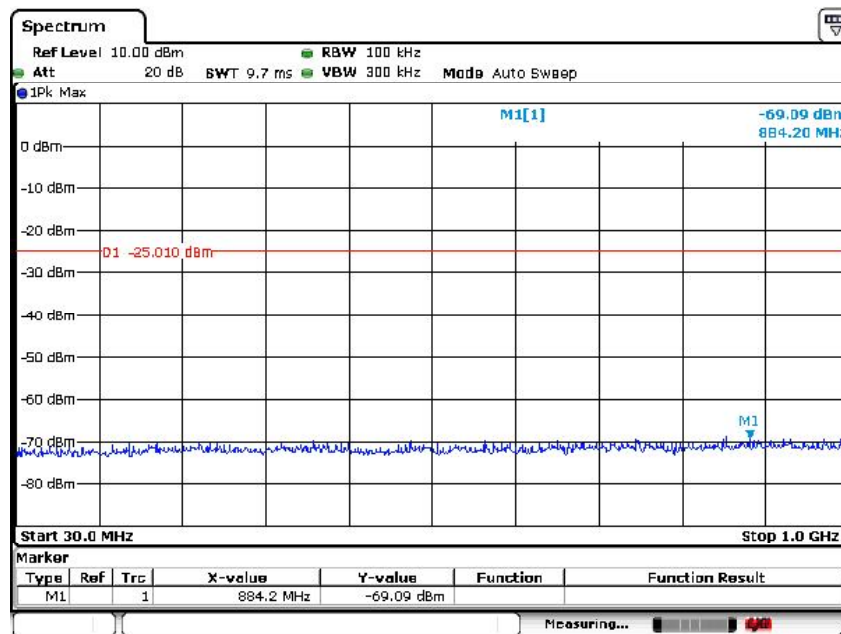
Report No. ATT-2016SZ0522855F

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Conducted Spurious Emissions at Antenna Port:

Channel	Frequency (MHz)	Frequency Range	Sweep Points	Refer to Plot	Limit (dBc)	Verdict
11	2405	30MHz-1GHz	9700	Plot 4.9.1 A1	-20	PASS
		1MHz-3GHz	20000	Plot 4.9.1 A2	-20	PASS
		3GHz-13GHz	100000	Plot 4.9.1 A3	-20	PASS
		13GHz-25GHz	120000	Plot 4.9.1 A4	-20	PASS
19	2445	30MHz-1GHz	9700	Plot 4.9.1 B1	-20	PASS
		1MHz-3GHz	20000	Plot 4.9.1 B2	-20	PASS
		3GHz-13GHz	100000	Plot 4.9.1 B3	-20	PASS
		13GHz-25GHz	120000	Plot 4.9.1 B4	-20	PASS
26	2480	30MHz-1GHz	9700	Plot 4.9.1 C1	-20	PASS
		1MHz-3GHz	20000	Plot 4.9.1 C2	-20	PASS
		3GHz-13GHz	100000	Plot 4.9.1 C3	-20	PASS
		13GHz-25GHz	120000	Plot 4.9.1 C4	-20	PASS

Low Channel



Date: 27 MAY 2016 18:14:42

Plot 4.9.1 A1

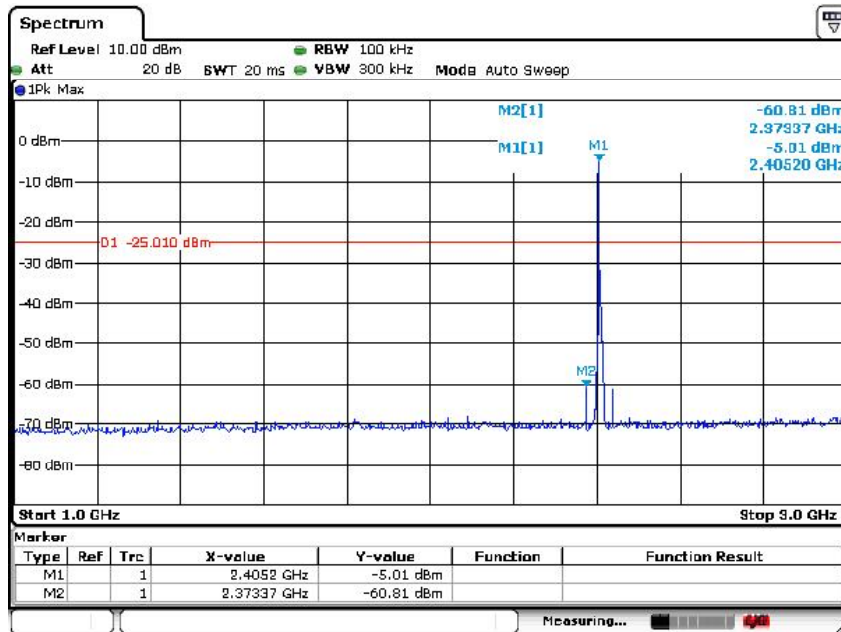
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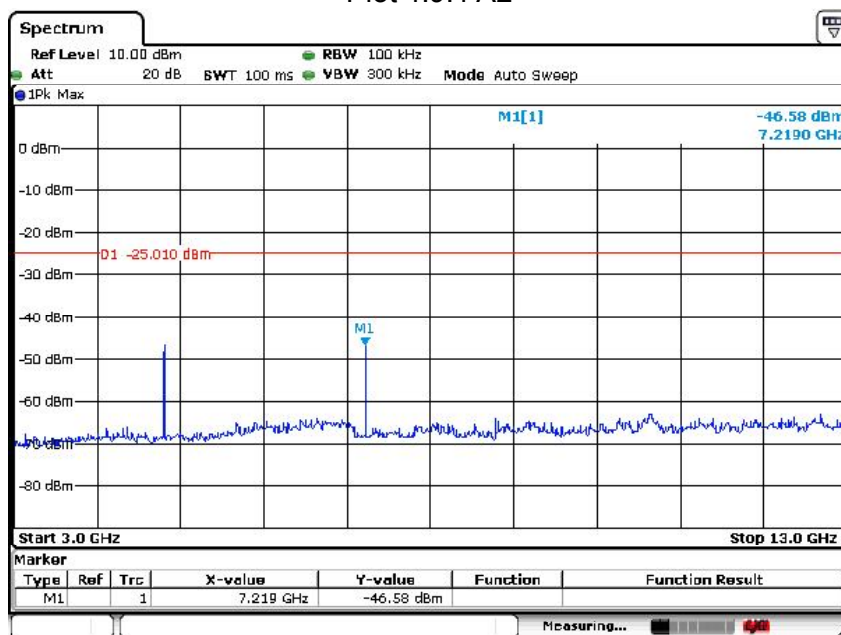
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Plot 4.9.1 A2



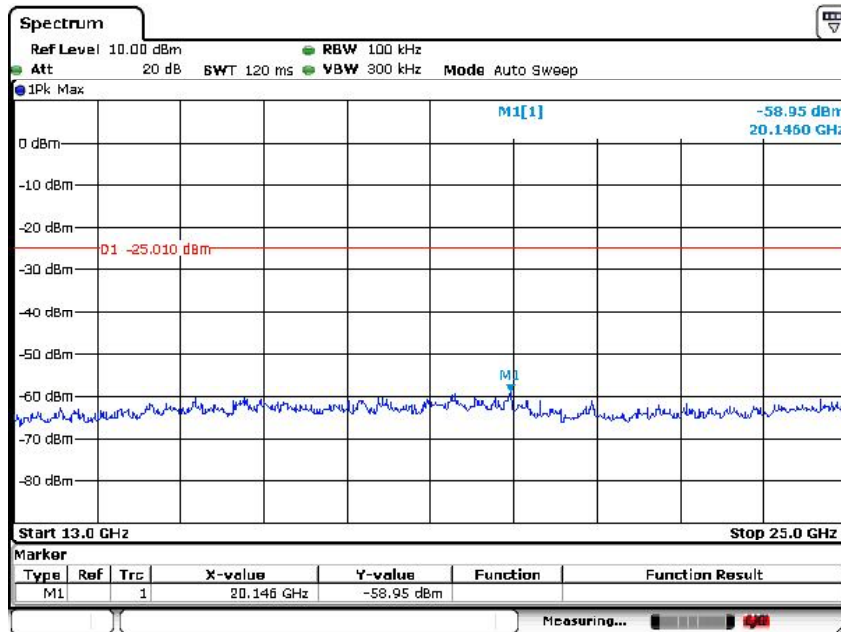
Plot 4.9.1 A3

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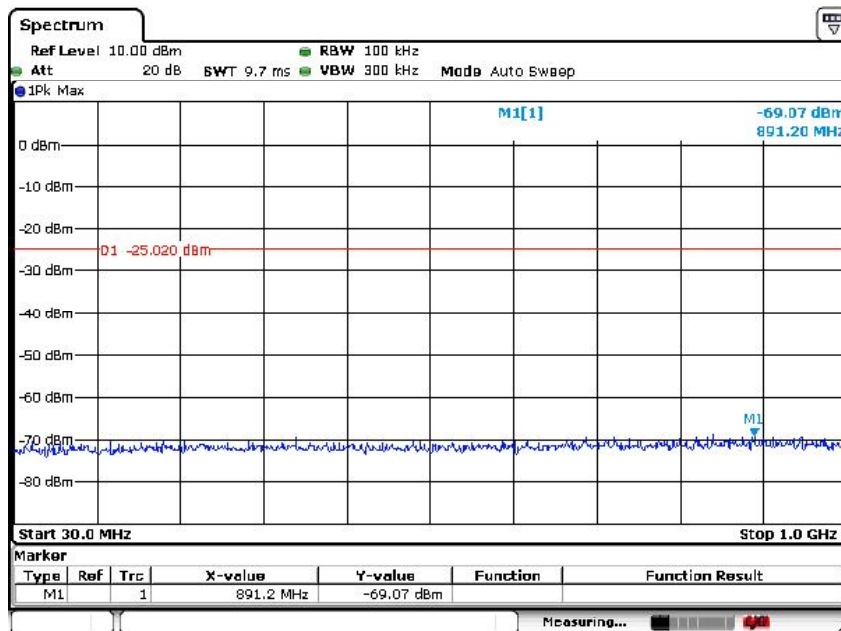
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Date: 27 Mar 2016 18:15:06

Plot 4.9.1 A4
 Middle Channel



Date: 27 Mar 2016 18:20:03

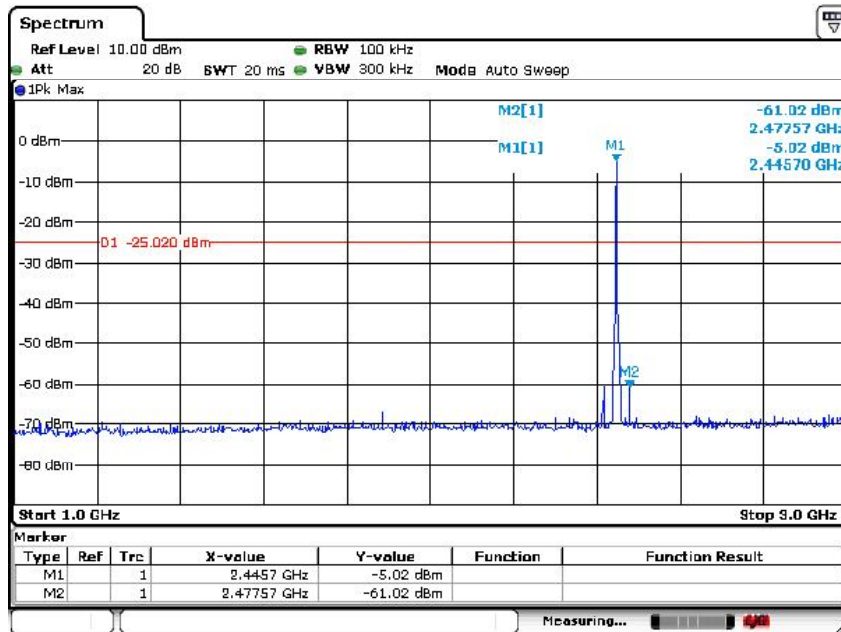
Plot 4.9.1 B1

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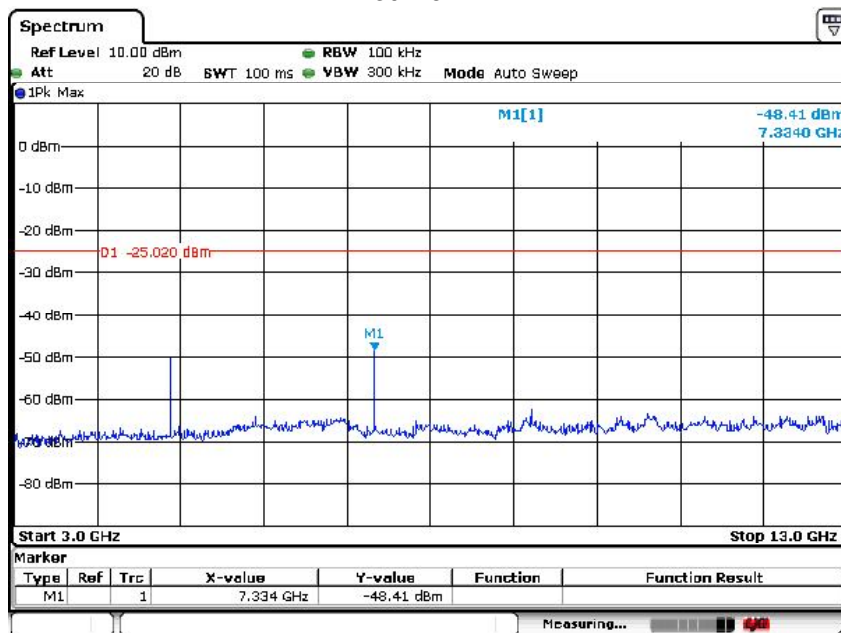


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Plot 4.9.1 B2



Plot 4.9.1 B3

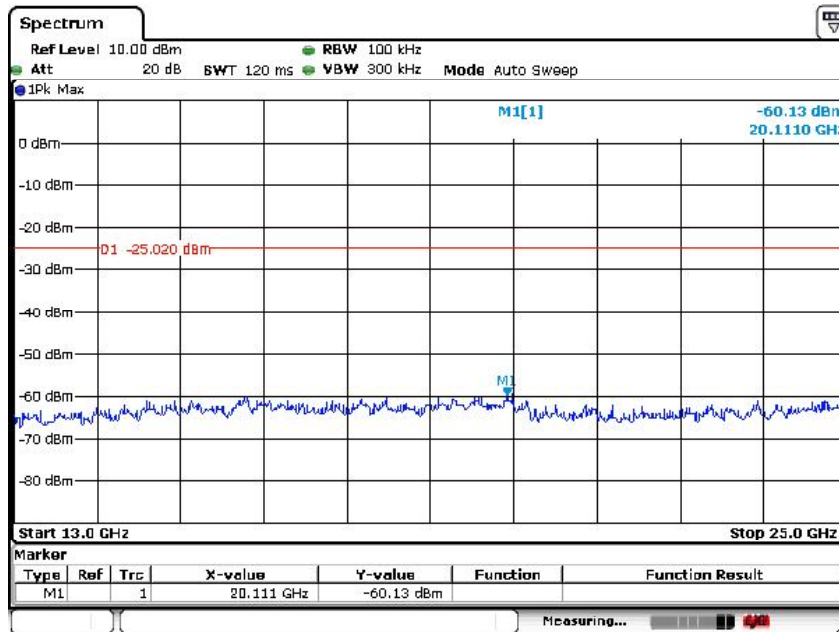
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Date: 27 Mar 2016 18:20:19

Plot 4.9.1 B4

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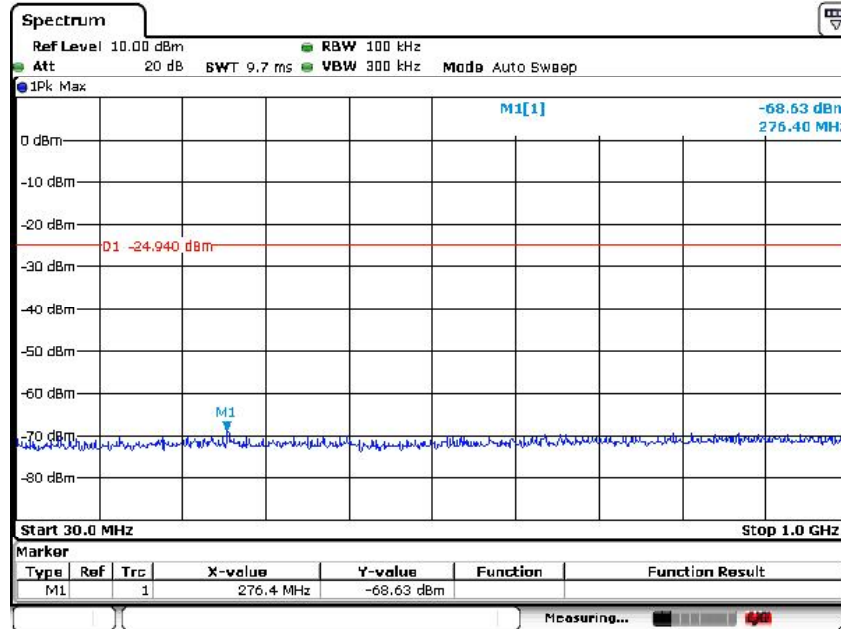


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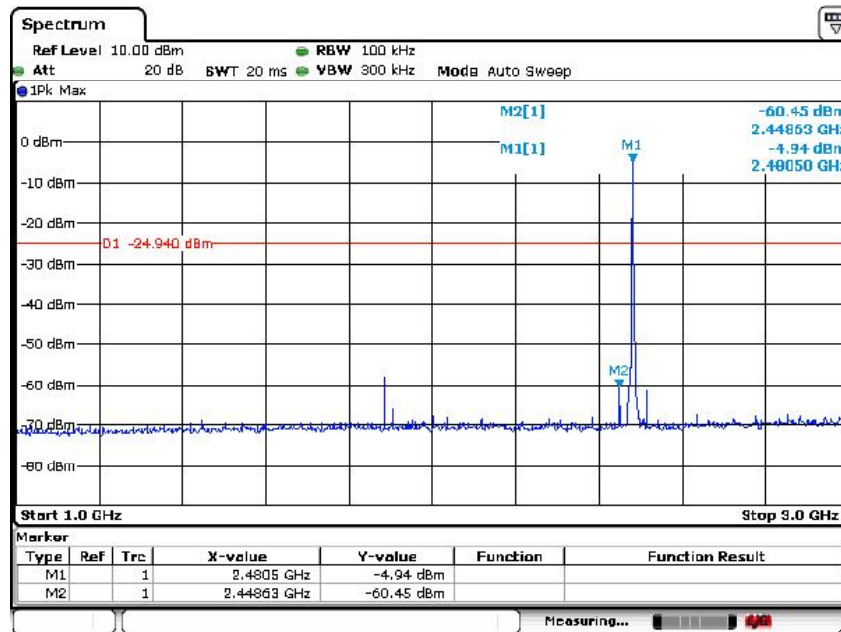
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High Channel



Date: 27 MAY 2016 18:41:03

Plot 4.9.1 C1



Date: 27 MAY 2016 18:40:52

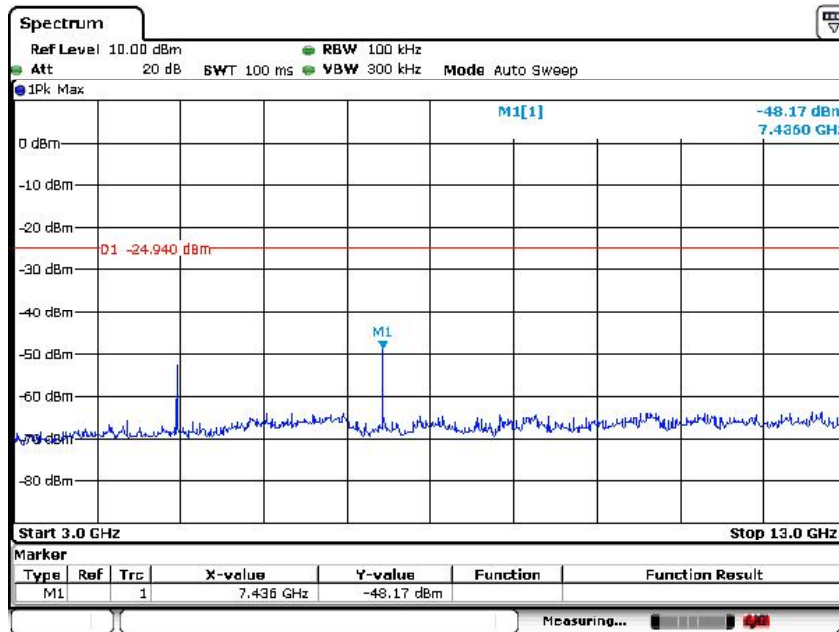
Plot 4.9.1 C2

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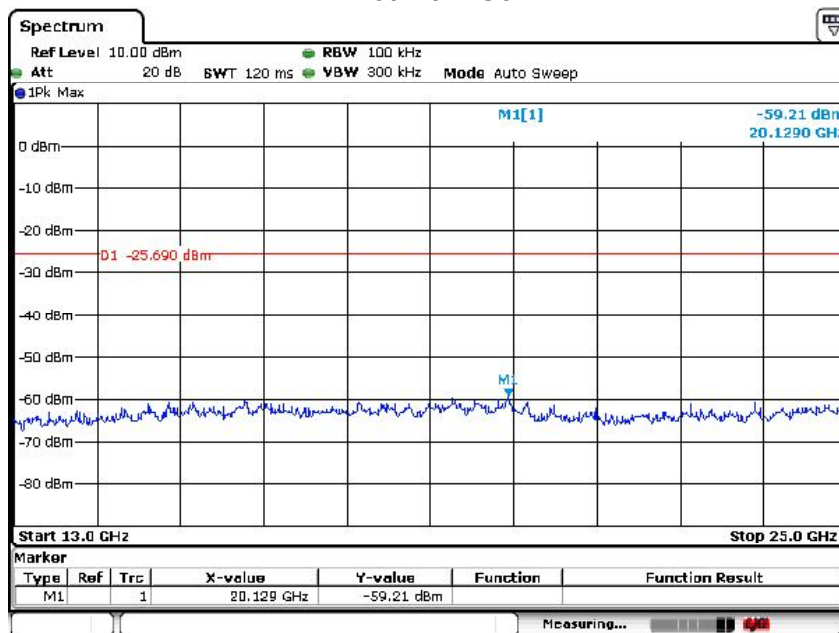


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Plot 4.9.1 C3



Plot 4.9.1 C4

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4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

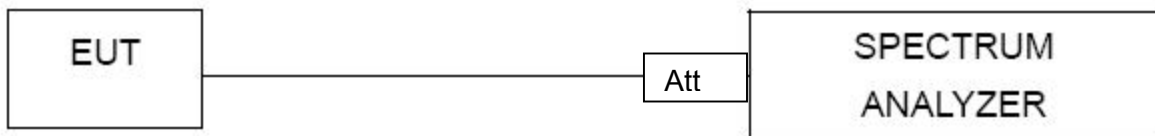
4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 DTS bandwidth.
3. Set the RBW \geq 3 kHz.
4. Set the VBW \geq 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

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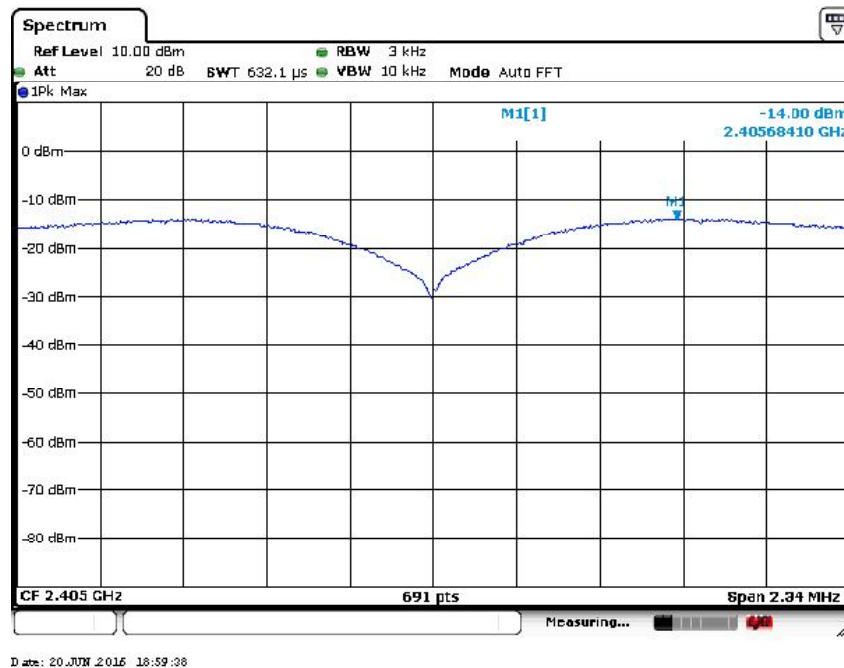
4.1.5 TEST RESULTS

EUT :	Zigbee Smoke Detector	Model Name :	SDZ2100
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1015 hPa	Test Voltage :	DC 3V
Test Mode :	TX		

Note: The relevant measured result has the offset with cable loss already.

Frequency	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2405 MHz	-14.00	8	PASS
2440 MHz	-13.23	8	PASS
2480 MHz	-13.20	8	PASS

TX CH11



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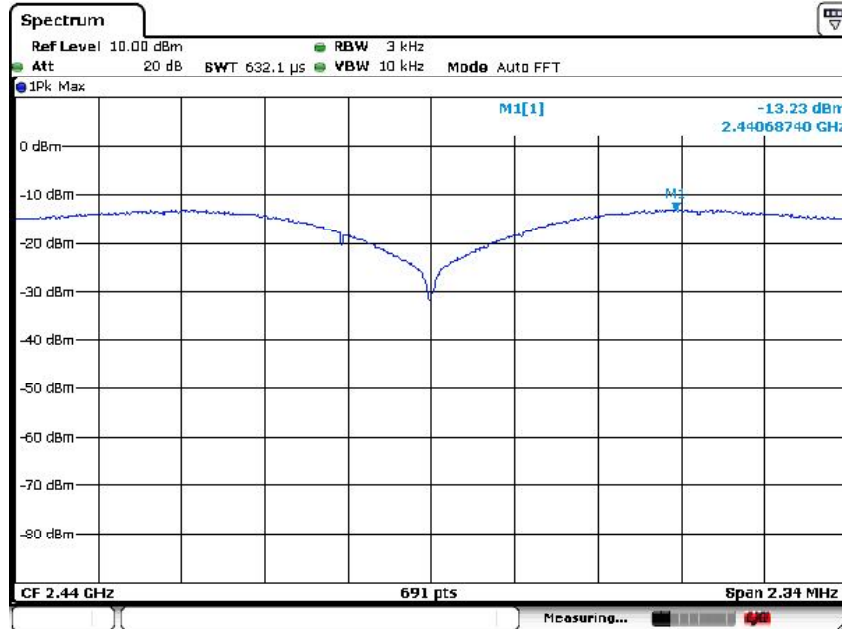


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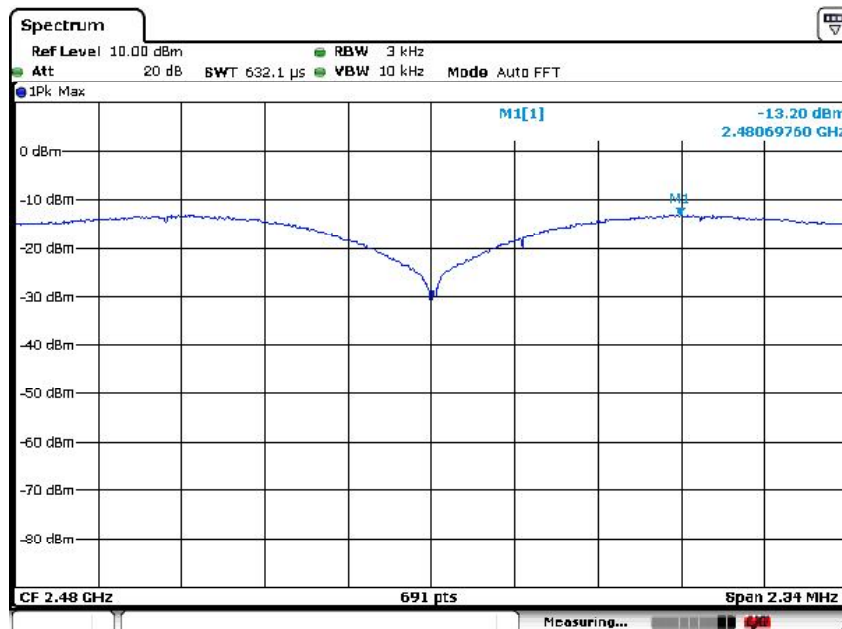
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TX CH18



TX CH26



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5. BANDWIDTH TEST

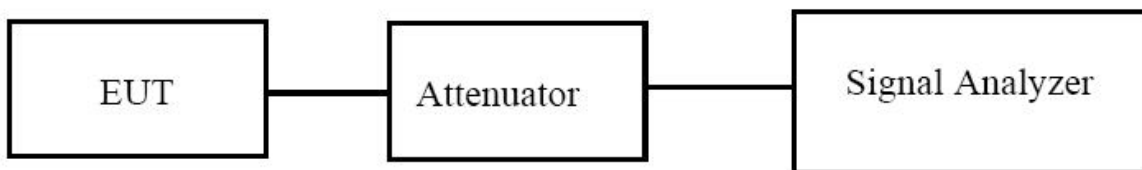
5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

5.1.1 TEST PROCEDURE

According to KDB 558074 D01 DTS Meas Guidance v03r05

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



5.1.2 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

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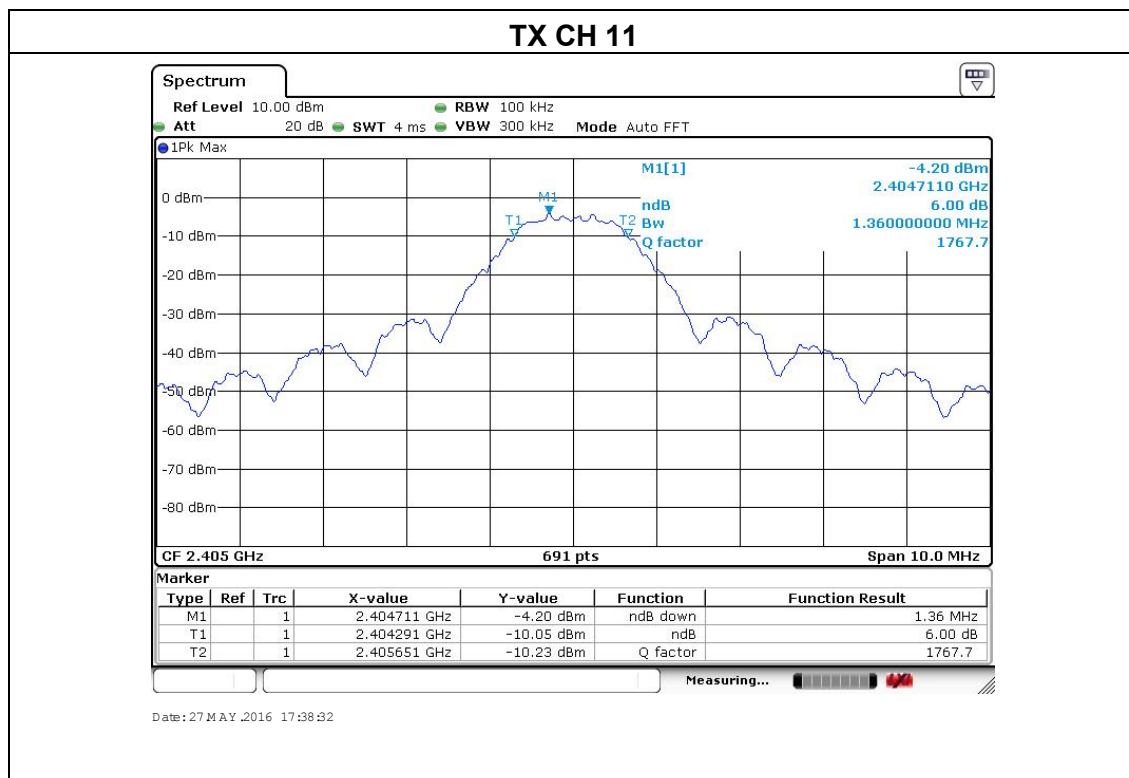
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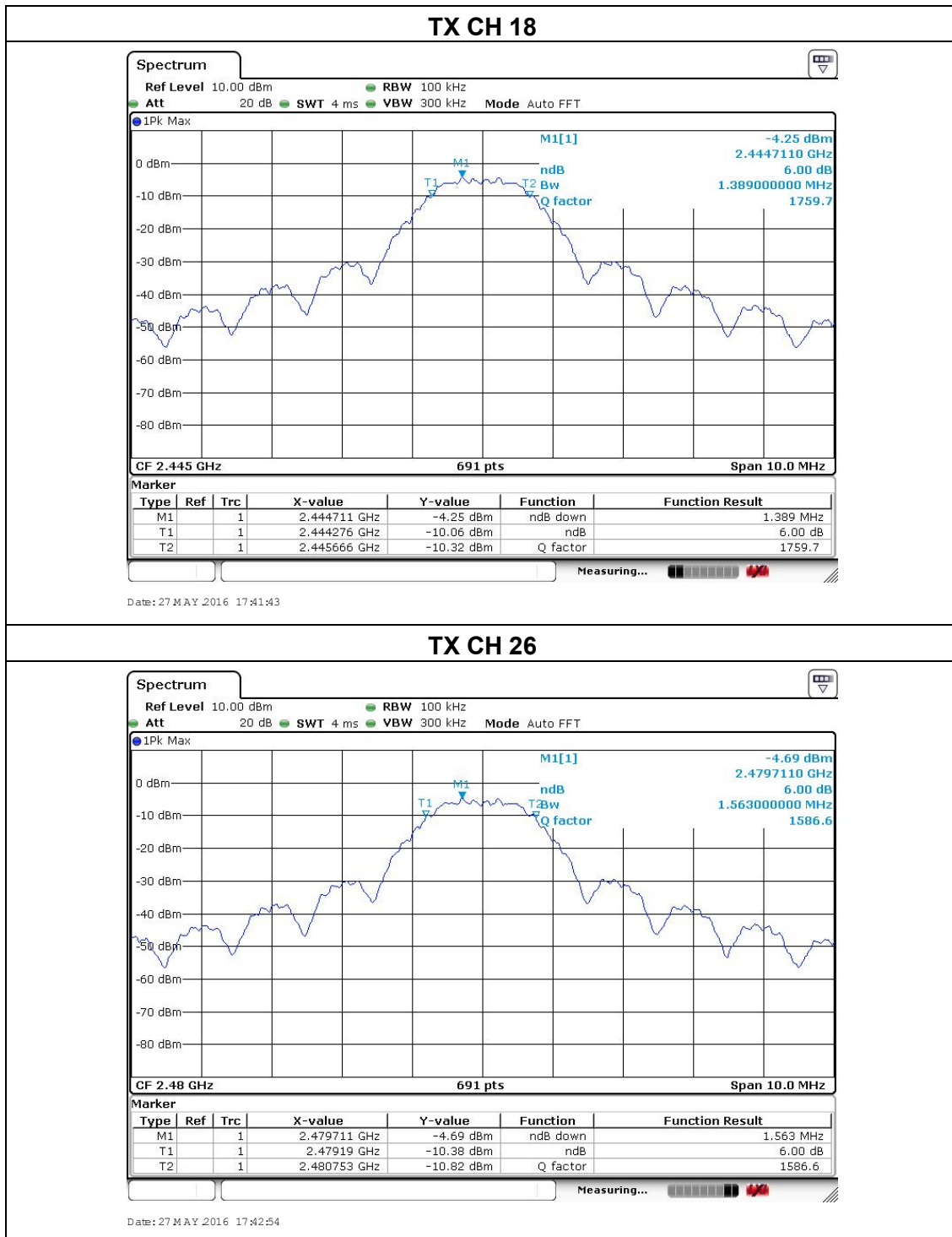
5.1.3 TEST RESULTS

EUT :	Zigbee Smoke Detector	Model Name :	SDZ2100
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3V
Test Mode :	TX		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2405	1.3600	500	Pass
Middle	2445	1.3890	500	Pass
High	2480	1.5630	500	Pass



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6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

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6.1.5 TEST RESULTS

EUT :	Zigbee Smoke Detector	Model Name :	SDZ2100
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3V
Test Mode :	TX		

Test Channe	Frequency	Maximum Conducted Output Power(PK)	LIMIT
	(MHz)	(dBm)	(dBm)
CH11	2405	17.75	30
CH18	2440	17.56	30
CH26	2480	17.75	30

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7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

APPLICABLE STANDARD

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

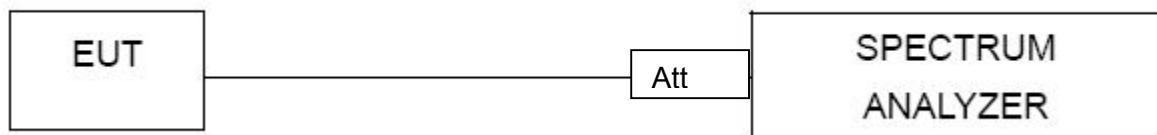
TEST PROCEDURE

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 1 MHz and VBW of spectrum analyzer to 3 MHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

7.1 DEVIATION FROM STANDARD

No deviation.

7.2 TEST SETUP



7.3 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



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7.4 TEST RESULTS

EUT :	Zigbee Smoke Detector	Model Name :	SDZ2100
Temperature :	25 °C	Relative Humidity :	56%
Pressure :	1012 hPa	Test Voltage :	DC 3V

Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
2390	49.17	20	Pass
2483.5	49.48	20	Pass

2390	44.75	9.86	54.61	74	-19.39	Pk	Vertical
2390	35.18	9.86	45.04	54	-8.96	Av	Vertical
2483.5	42.67	10.14	52.81	74	-21.19	Pk	Vertical
2483.5	31.95	10.14	42.09	54	-11.91	Av	Vertical
2390	43.57	9.86	53.43	74	-20.57	Pk	Horizontal
2390	33.25	9.86	43.11	54	-10.89	Av	Horizontal
2483.5	42.04	10.14	52.18	74	-21.82	Pk	Horizontal
2483.5	31.78	10.14	41.92	54	-12.08	Av	Horizontal

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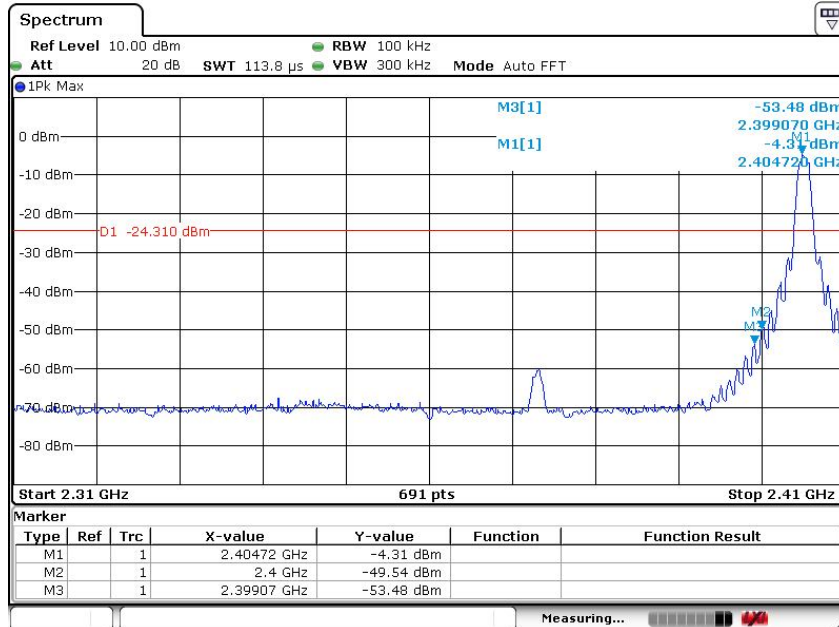


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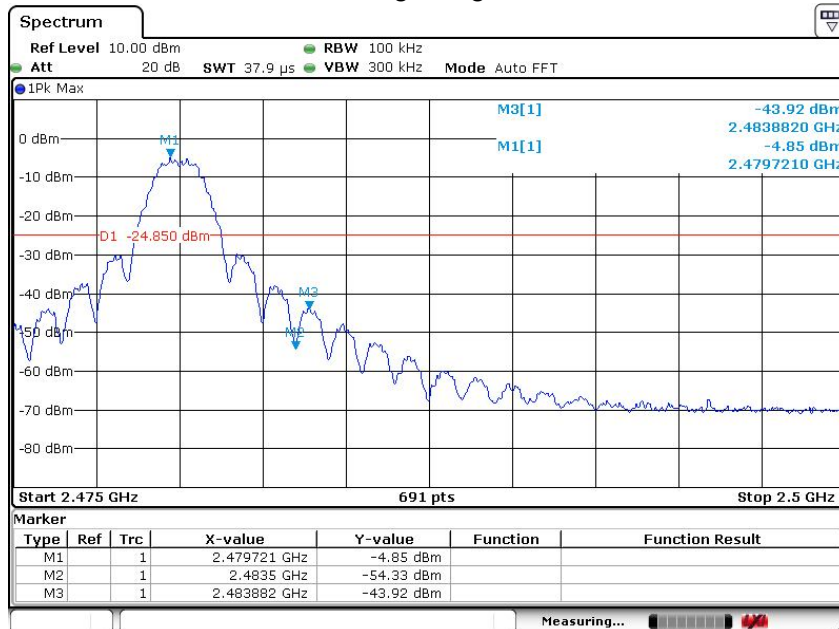
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Band Edge, Left Side



Band Edge, Right Side



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8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2 EUT ANTENNA

The EUT antenna is PCB Antenna. It comply with the standard requirement.

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