



Appendix for Test report

Appendix A: DTS (6 dB) Bandwidth

In this document, the "DTS6dBBW" refers to the measured "DTS (6 dB) Bandwidth" value. In this Appendix, the "fc(DTS6dBBW)" refers to the centre of the measured "DTS6dBBW". The introduction of the "fc(DTS6dBBW)" is due to that other measurements use it as the spectrum analyzer setting.

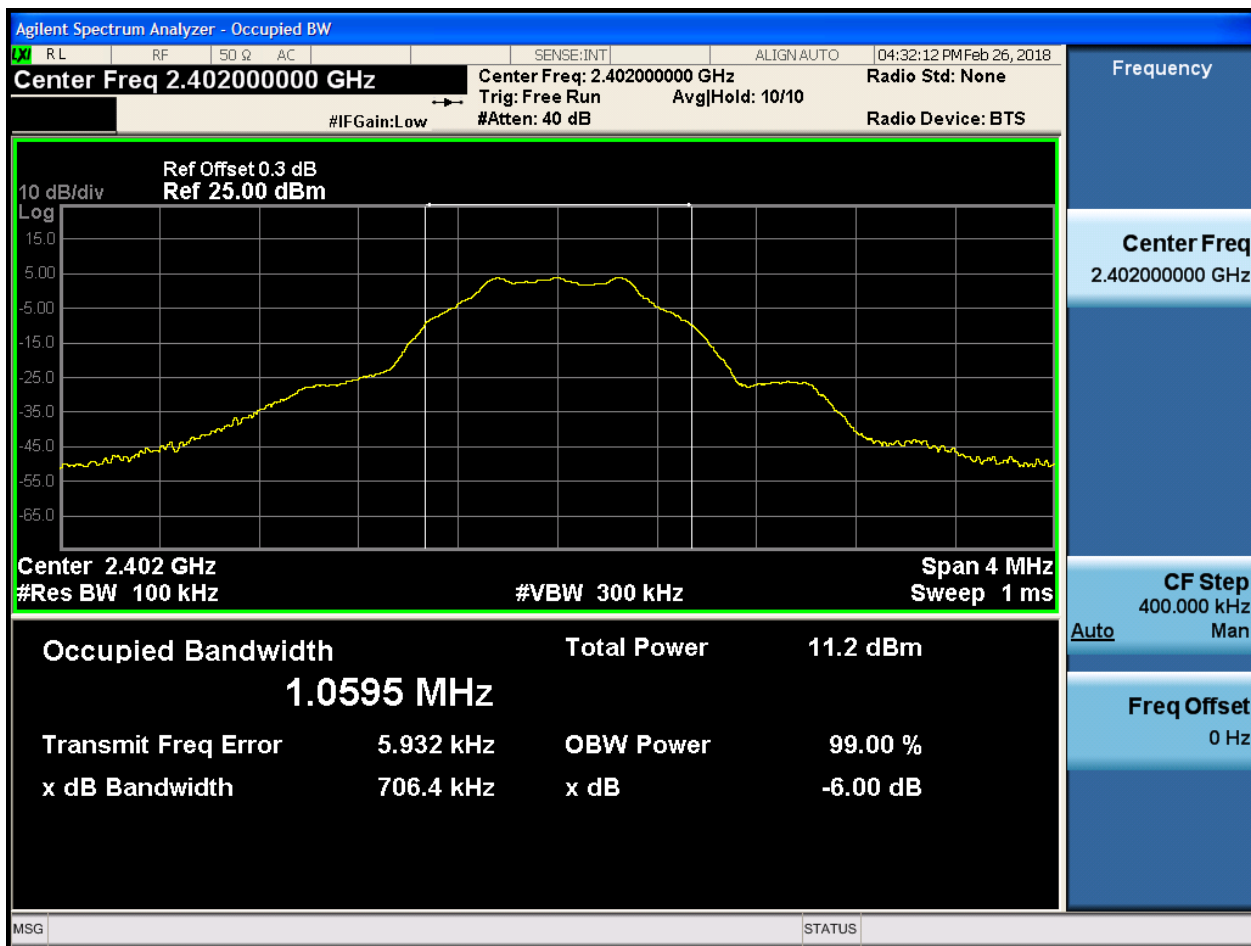
For measurements on smart antenna systems (devices with multiple transmit chains), the test is performed at each chain, and used as respective results for each chain.

Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	DTS6dBBW[MHz]	Verdict
TM1 _Ch0	L	2402	0.71	pass
TM1 _Ch19	M	2440	0.71	pass
TM1 _Ch39	H	2480	0.71	pass

Part II - Test Plots

2.1 TM1_Ch0_L



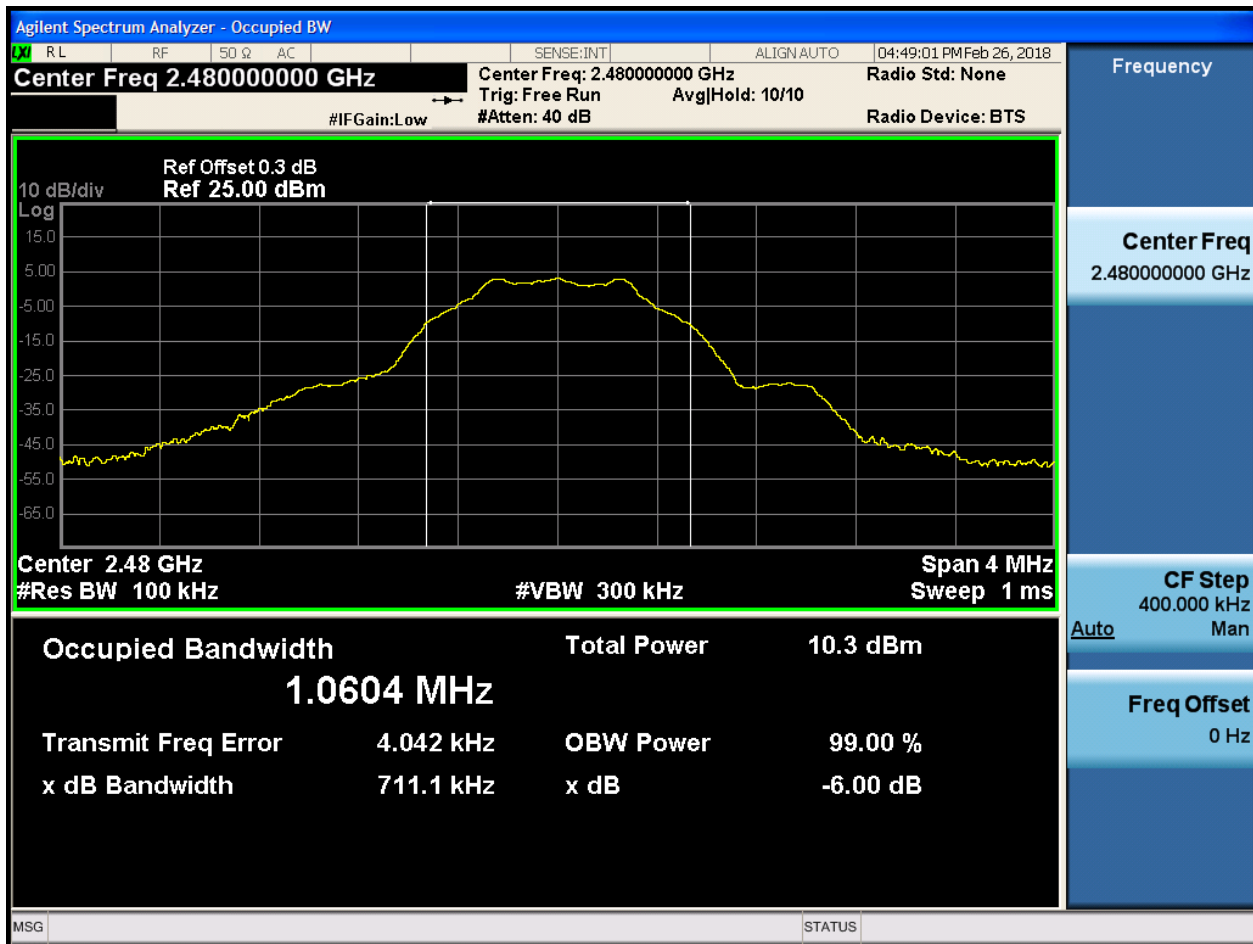


2.2 TM1_Ch19_M





2.3 TM1_Ch39_H



Appendix B: Occupied Bandwidth

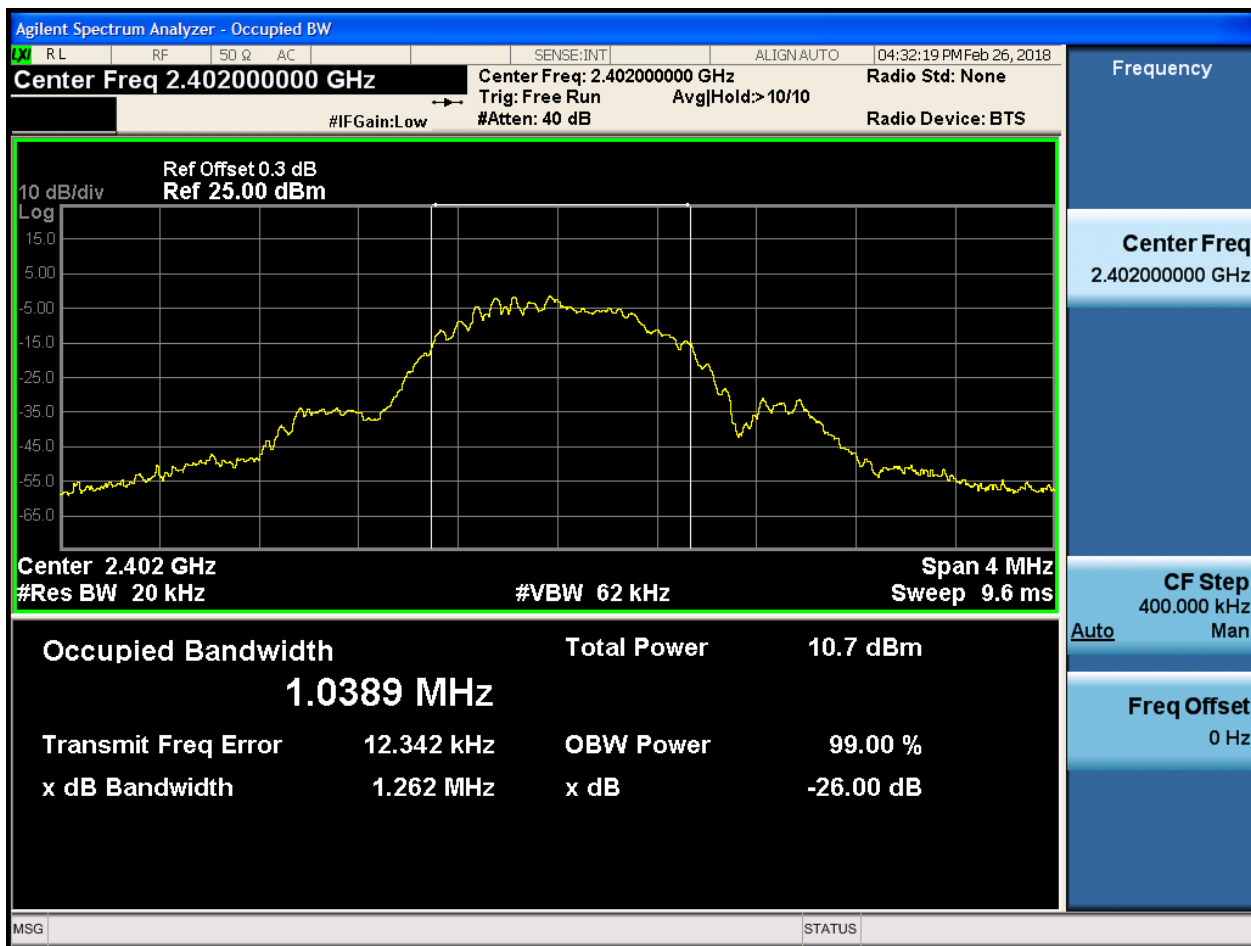
For measurements on smart antenna systems (devices with multiple transmit chains), the test is performed at each chain, and used as respective results for each chain.

Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Occupied Bandwidth [MHz]	Verdict
TM1 _Ch0	L	2402	1.04	pass
TM1 _Ch19	M	2440	1.04	pass
TM1 _Ch39	H	2480	1.04	pass

Part II - Test Plots

2.1 TM1_Ch0_L





2.2 TM1_Ch19_M





2.3 TM1_Ch39_H





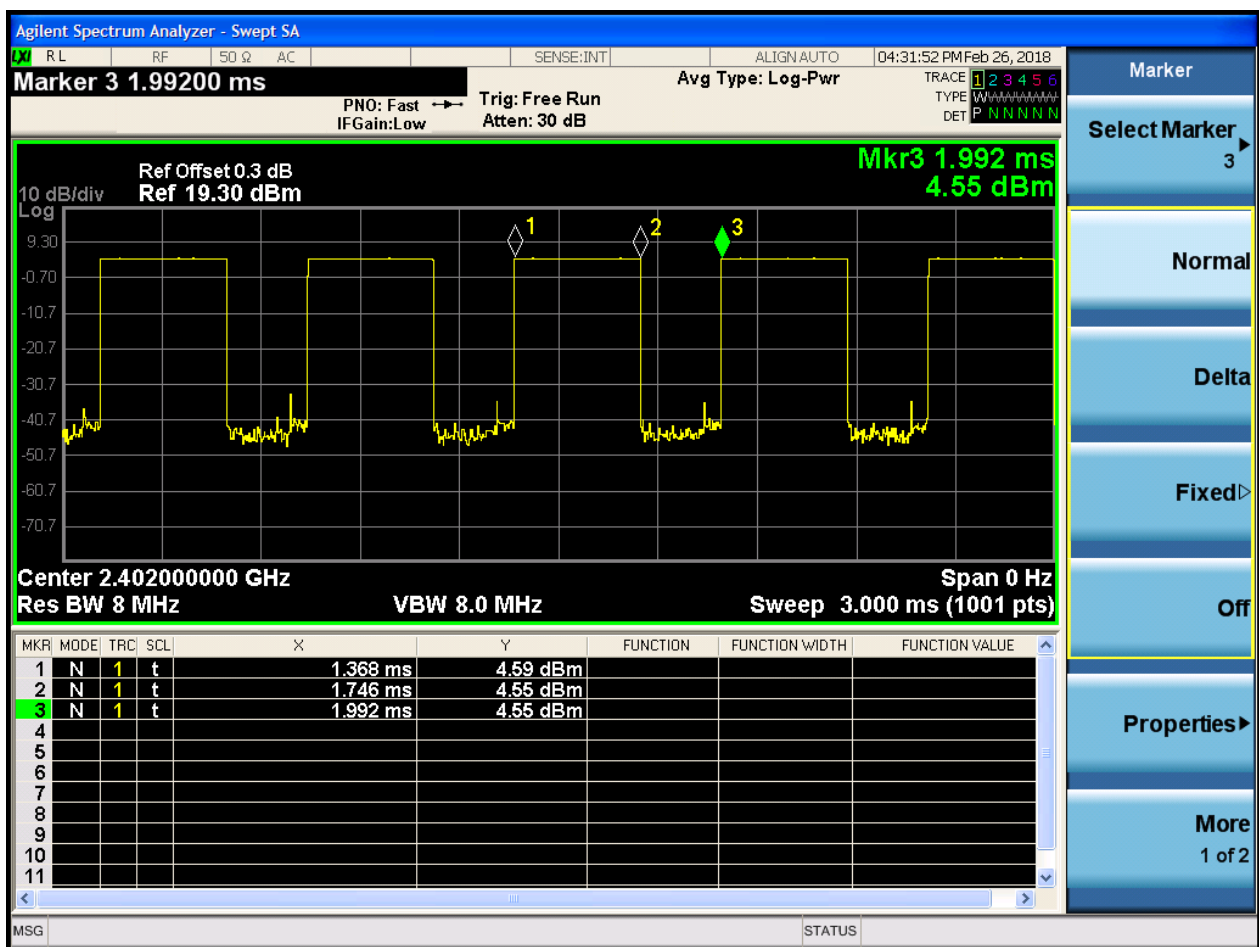
Appendix C: Duty Cycle

Part I - Test Results

Test Mode	TX Freq. [MHz]	Duty cycle [%]
TM1	CH0,CH19,CH39	60.6

Part II - Test Plots

2.1 TM1





Appendix D: Maximum Conducted Average Output Power

Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Duty Cycle [%]	Power[dBm]	Verdict
TM1_Ch0	L	2402	60.6	4.75	pass
TM1_Ch19	M	2440	60.6	4.64	pass
TM1_Ch39	H	2480	60.6	3.79	pass



Part II - Test Plots

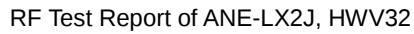
2.1 TM1_Ch0_L





2.2 TM1_Ch19_M





Agilent Spectrum Analyzer - The duty cycle factor 2.18 dB added.

Center Freq 2.48000000 GHz

PNO: Wide → Trig: Free Run
IFGain:Low Atten: 38 dB

#Avg Type: RMS
AvgHold: 500/500

05:05:18 PM Feb 26, 2018

TRACE 1 2 3 4 5 6
TYPE A A A A A A
DET A A A A A A

Ref Offset 2.48 dB
Ref 30.00 dBm

Mkr1 2.480 000 GHz
Band Power 4.008 dBm

Start 2.478000 GHz
#Res BW 20 kHz

Stop 2.482000 GHz
Sweep 12.32 ms (601 pts)

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 000 GHz	-9.432 dBm	Band Power	1.053 MHz	4.008 dB
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								

MSG STATUS

Frequency

Auto Tune

Center Freq
2.48000000 GHz

Start Freq
2.478000000 GHz

Stop Freq
2.482000000 GHz

CF Step
400.000 kHz
Man

Freq Offset
0 Hz

Appendix E: Maximum Power Spectral Density Level

Part I - Test Results

Test Mode	Test Channel	Frequency[MHz]	Duty Cycle [%]	PD[MHz]	Verdict
TM1_Ch0	L	2402	60.6	-7.79	pass
TM1_Ch19	M	2440	60.6	-8.23	pass
TM1_Ch39	H	2480	60.6	-8.67	pass

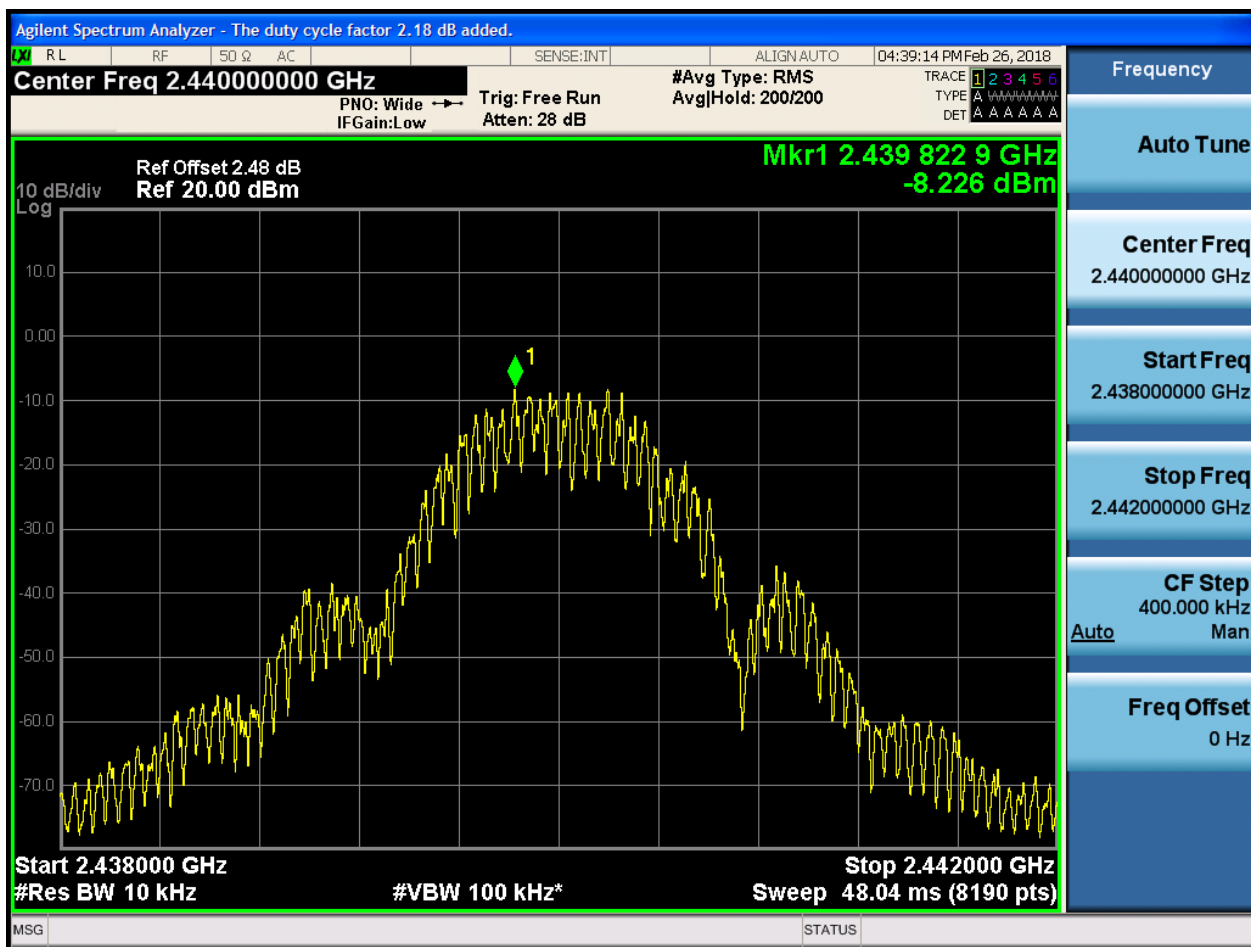
Part II - Test Plots

2.1 TM1_Ch0_L





2.2 TM1_Ch19_M





2.3 TM1_Ch39_H



Appendix F: Band Edges Compliance

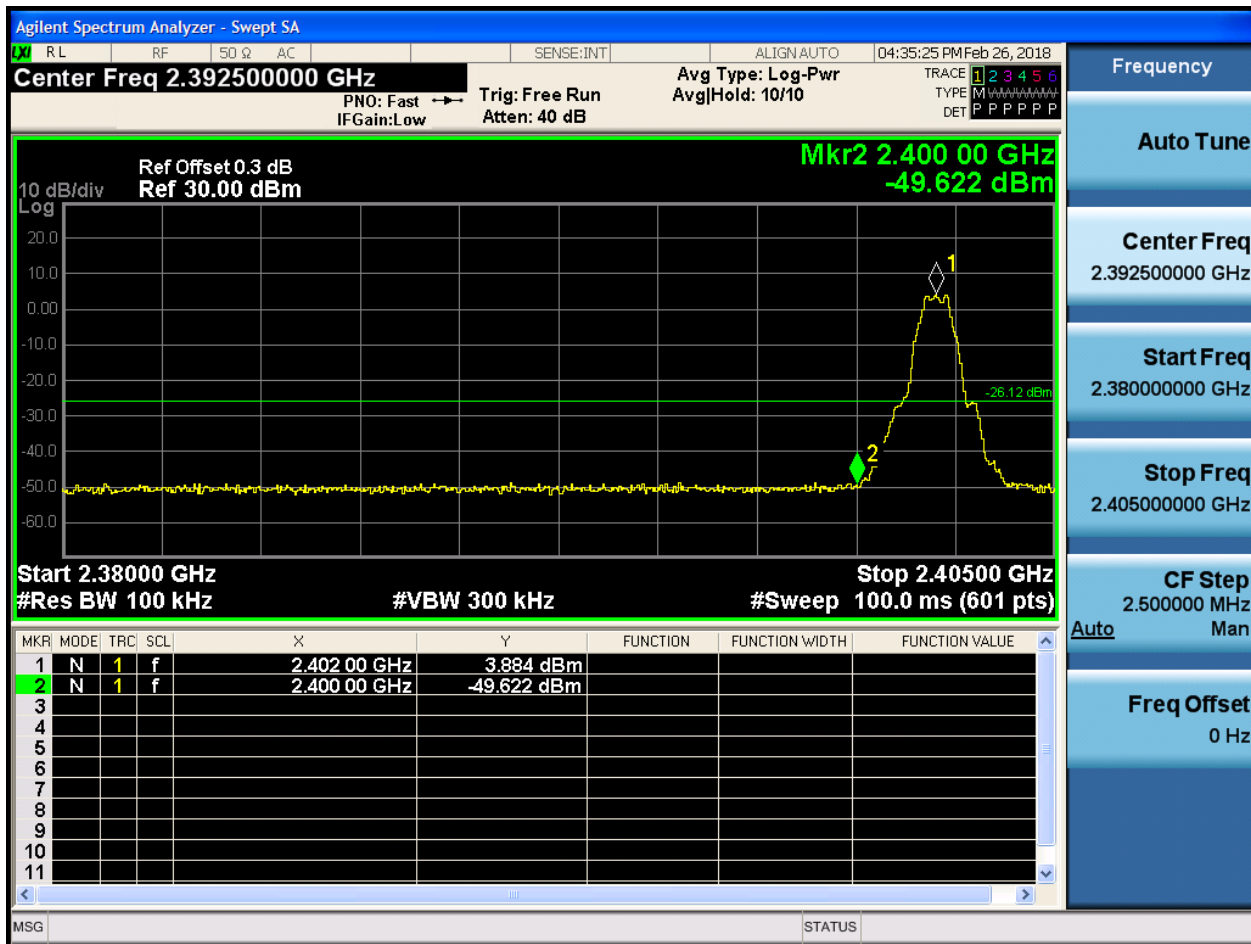
Part I - Test Results

Test Mode	Test Channel	Frequency[M Hz]	Carrier Power[dBm]	Max.Spurious Level[dBm]	Verdict
TM1 _Ch0	L	2402	3.88	-49.62	pass
TM1 _Ch39	H	2480	3.10	-50.17	pass



Part II - Test Plots

2.1 TM1_Ch0_L





Agilent Spectrum Analyzer - Swept SA

Center Freq 2.483500000 GHz

PNO: Fast → Trig: Free Run
IFGain: Low Atten: 40 dB

Avg Type: Log-Pwr AvgHold: 100/100

TRACE 1 2 3 4 5 6
TYPE M W W W W W W W
DET P P P P P P

Ref Offset 0.3 dB
Ref 30.00 dBm

Mkr2 2.483 50 GHz
-50.168 dBm

MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.480 00 GHz	3.109 dBm			
2	N	1	f	2.483 50 GHz	-50.168 dBm			
3								
4								
5								
6								
7								
8								
9								
10								
11								

Start 2.47350 GHz #Res BW 100 kHz #VBW 300 kHz Stop 2.49350 GHz #Sweep 100.0 ms (601 pts)

Frequency Auto Tune Center Freq 2.483500000 GHz Start Freq 2.473500000 GHz Stop Freq 2.493500000 GHz CF Step 2.000000 MHz Man Freq Offset 0 Hz

Appendix G: Unwanted Emissions into Non-Restricted Frequency

Bands

In this Appendix, the "Pref", which is used as the reference level, refers to the peak power level in any 100 kHz bandwidth within the fundamental emission, the "Puw" refers to the maximum emission power in 100 kHz band segments outside of the authorized frequency band.

Considering that the higher ratio of RBW to the span for the frequency ranges below 30 MHz makes the results determination be complicated, a narrower RBW other than 100 kHz is used for these ranges. The measured value should add a RBW correction factor (RBWCF) where $RBWCF [dB] = 10 \times \lg(100 [kHz]/\text{narrower RBW} [kHz])$. As to this Appendix, the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

For measurements on smart antenna systems (devices with multiple transmit chains), the test is performed at each chain and used as respective results for each chain, due to the relative-limit requirement.

In the result table, the "< Limit" denotes that "The Puw [dBm] is less than Pref[dBm]-30[dBm], see test plots for detailed".

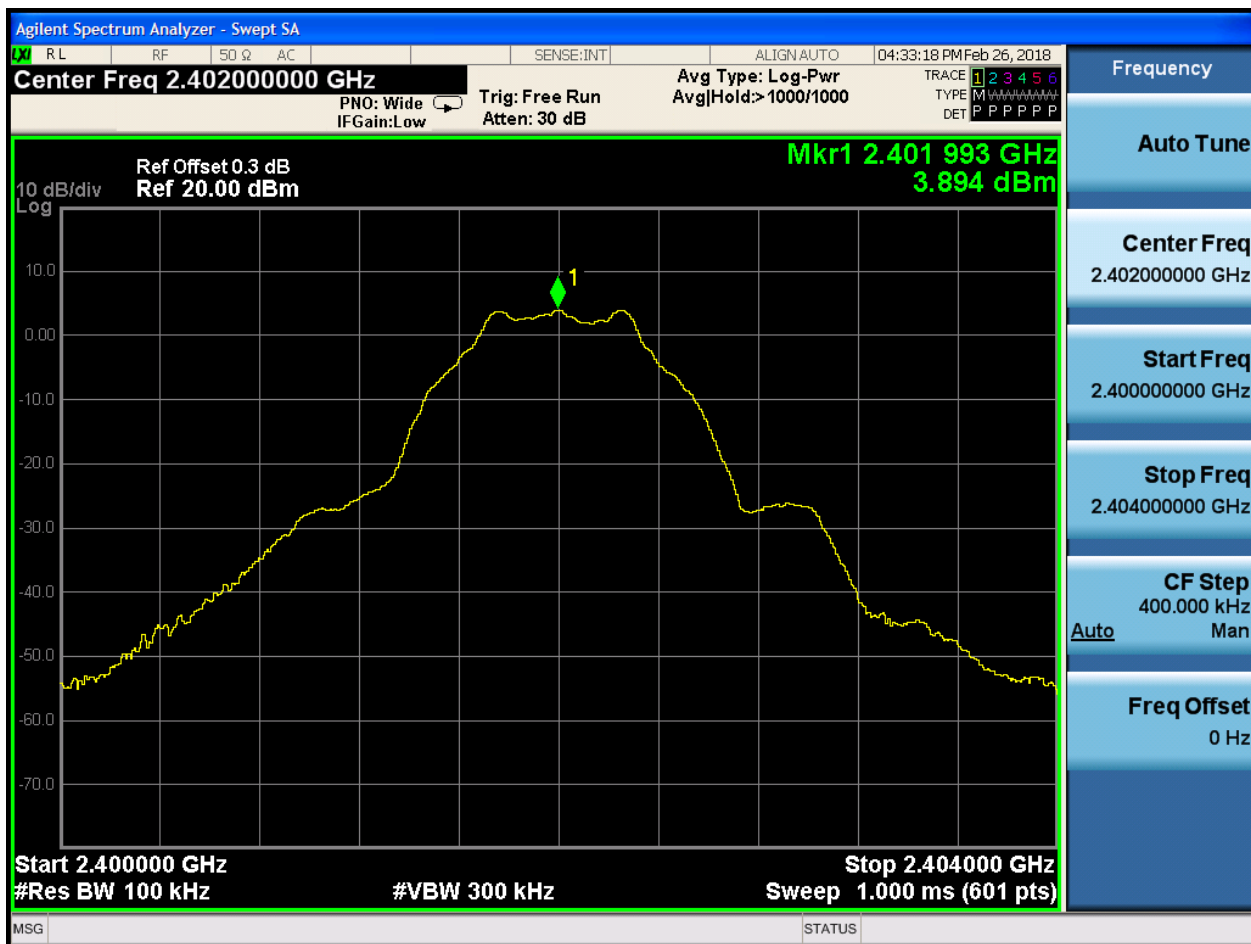
Part I - Test Results

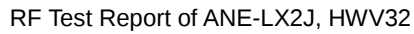
Test Mode	Test Channel	Frequency[MHz]	Pref[dBm]	Puw[dBm]	Verdict
TM1_Ch0	L	2402	3.89	<limit	pass
TM1_Ch19	M	2440	4.07	<limit	pass
TM1_Ch39	H	2480	3.14	<limit	pass

Part II - Test Plots

2.1 TM1_Ch0_L

Pref:





Agilent Spectrum Analyzer - Swept SA

Center Freq 79.500 kHz

PNO: Wide IFGain:Low Trig: Free Run #Atten: 26 dB

Avg Type: Log-Pwr AvgHold>50/50

TRACE 1 2 3 4 5 6
TYPE M W W W W W W W
DET P P P P P P

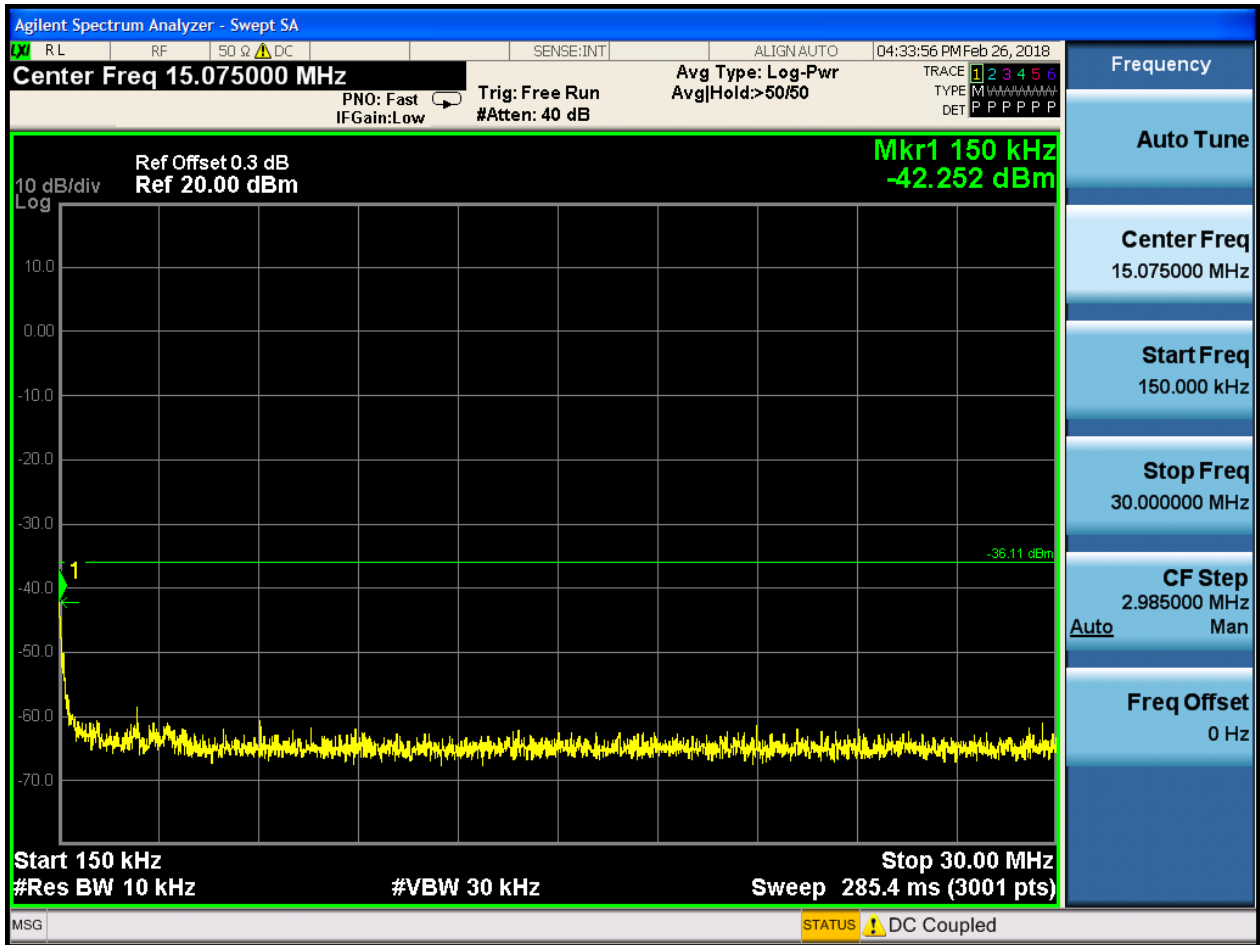
Ref Offset 0.3 dB Ref 0.00 dBm

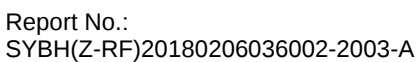
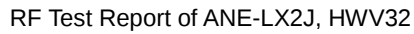
Mkr1 9.705 kHz -54.681 dBm

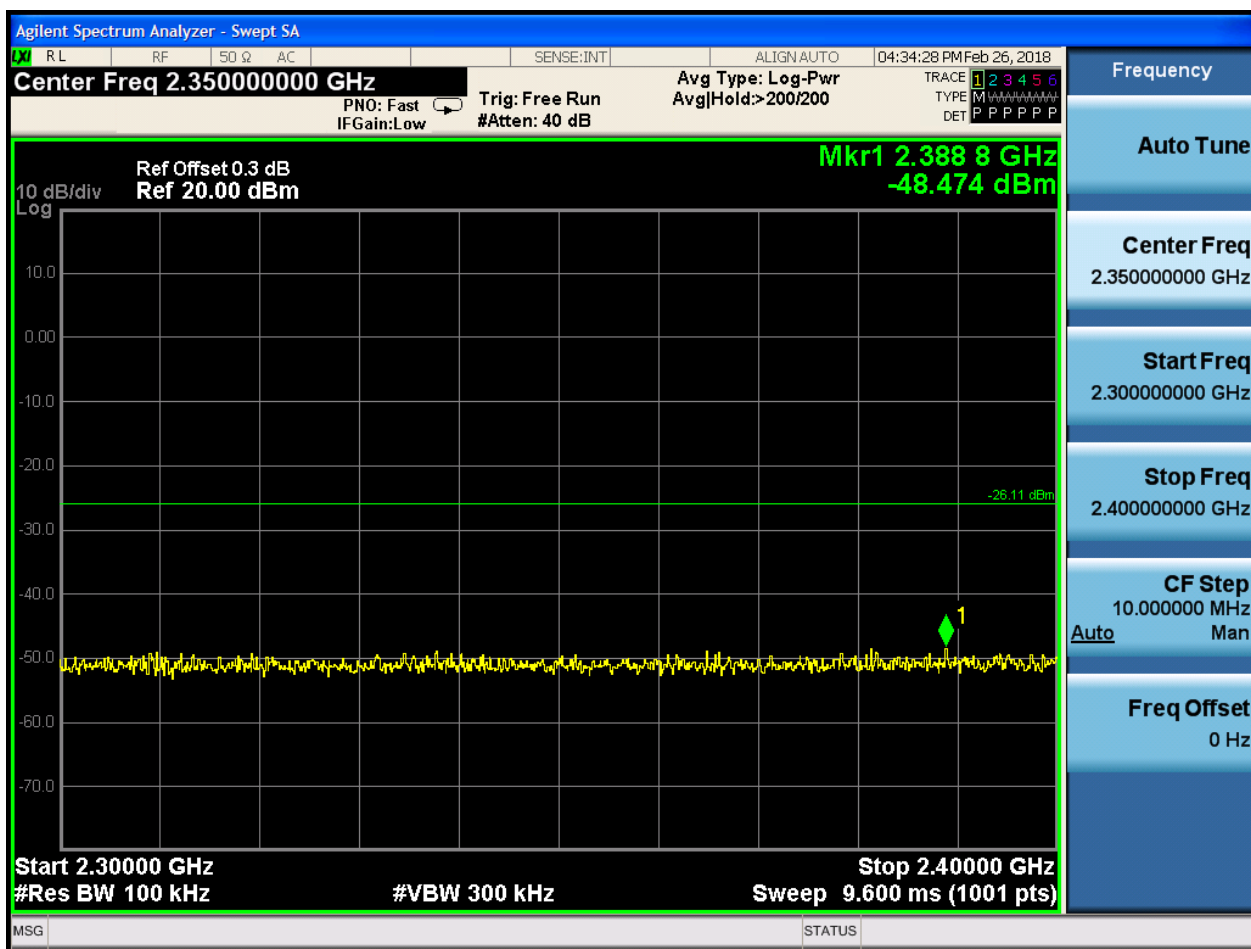
Start 9.00 kHz Stop 150.00 kHz
#Res BW 1.0 kHz #VBW 3.0 kHz Sweep 134.8 ms (601 pts)

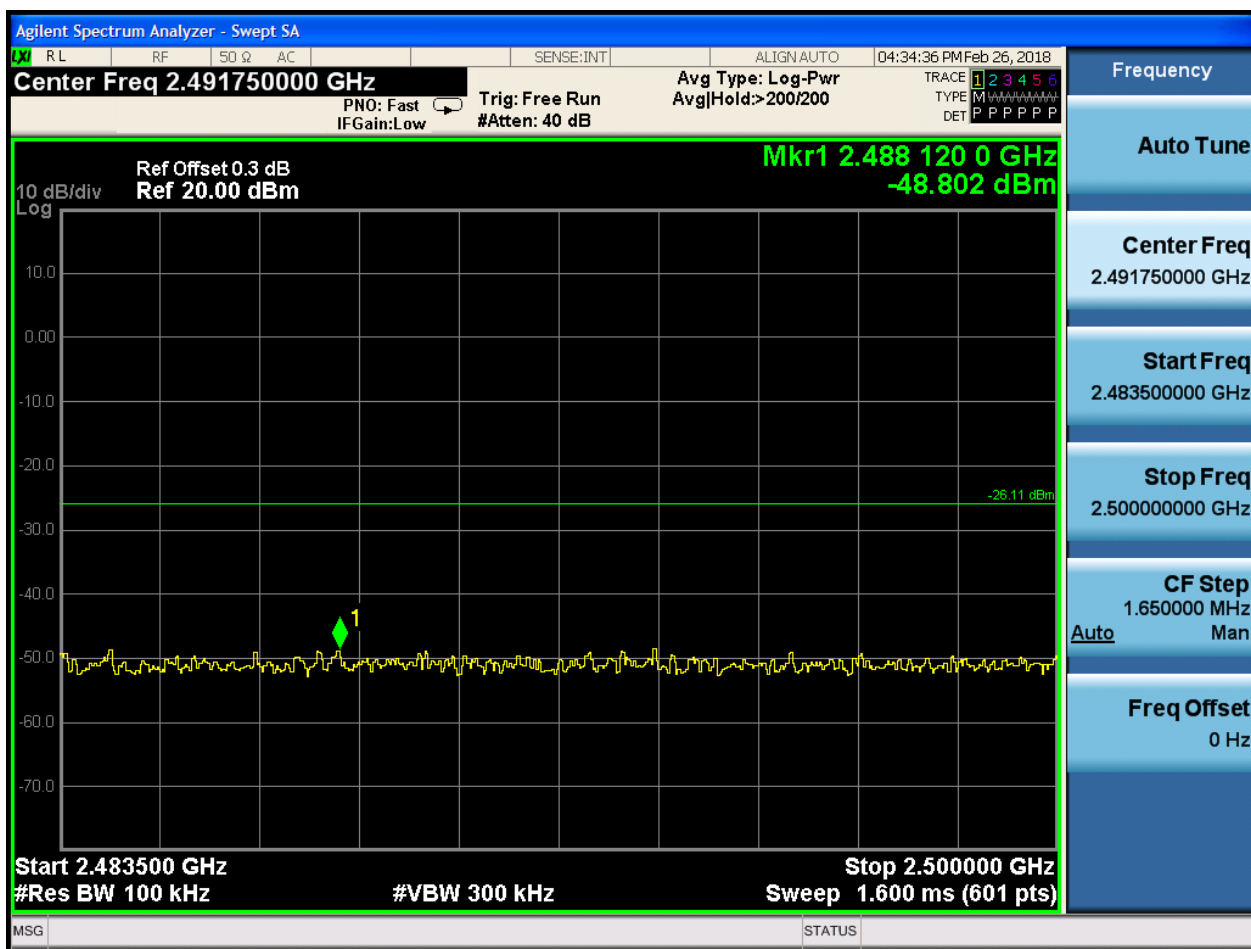
Frequency
Auto Tune
Center Freq 79.500 kHz
Start Freq 9.000 kHz
Stop Freq 150.000 kHz
CF Step 14.100 kHz Man
Freq Offset 0 Hz

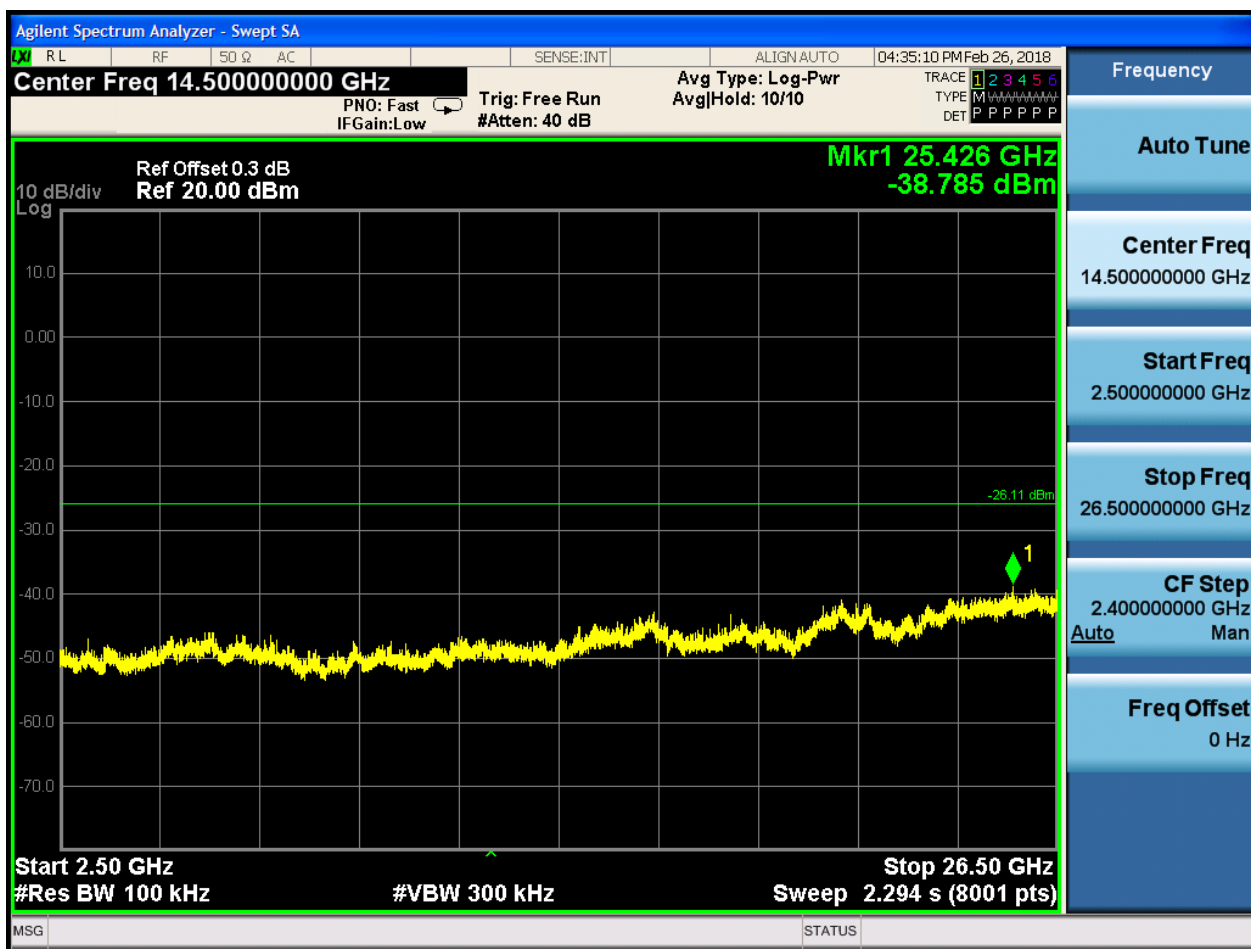
STATUS DC Coupled









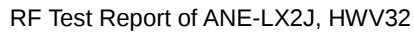




2.2 TM1_Ch19_M

Pref:





Agilent Spectrum Analyzer - Swept SA

RL RF 50 Ω DC SENSE:INT ALIGN: AUTO 04:39:42 PM Feb 26, 2018

Center Freq 79.500 kHz Avg Type: Log-Pwr Avg/Hold: >50/50

PNO: Wide Trig: Free Run IF Gain: Low #Atten: 26 dB

TRACE 1 2 3 4 5 6
TYPE M W W W W W W W W W
DET P P P P P P

Ref Offset 0.3 dB
Ref 0.00 dBm

Mkr1 9.705 kHz
-54.708 dBm

10 dB/div
Log

-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
-70.0
-80.0
-90.0

-45.93 dBm

Start 9.00 kHz Stop 150.00 kHz
#Res BW 1.0 kHz #VBW 3.0 kHz Sweep 134.8 ms (601 pts)

Frequency

Auto Tune

Center Freq
79.500 kHz

Start Freq
9.000 kHz

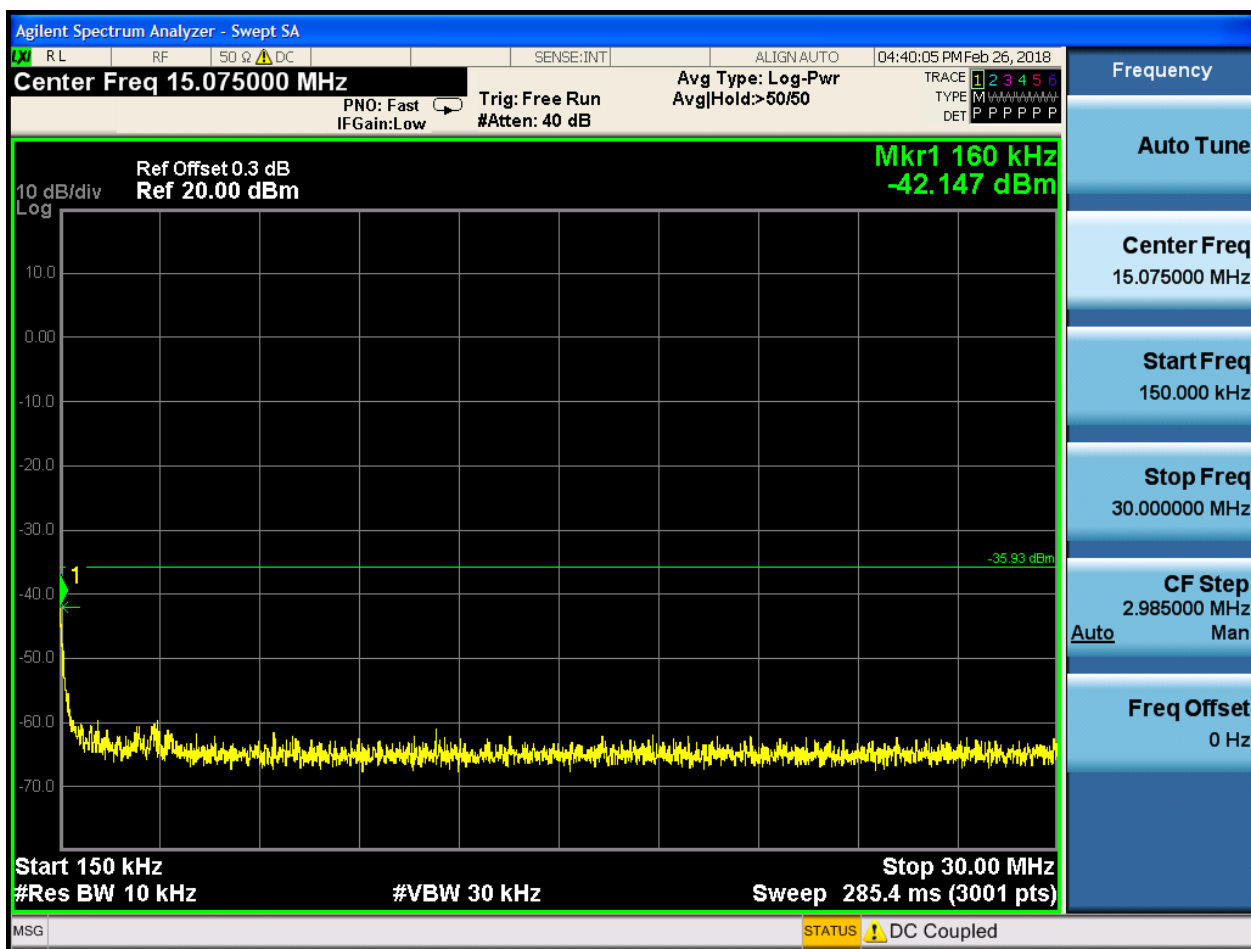
Stop Freq
150.000 kHz

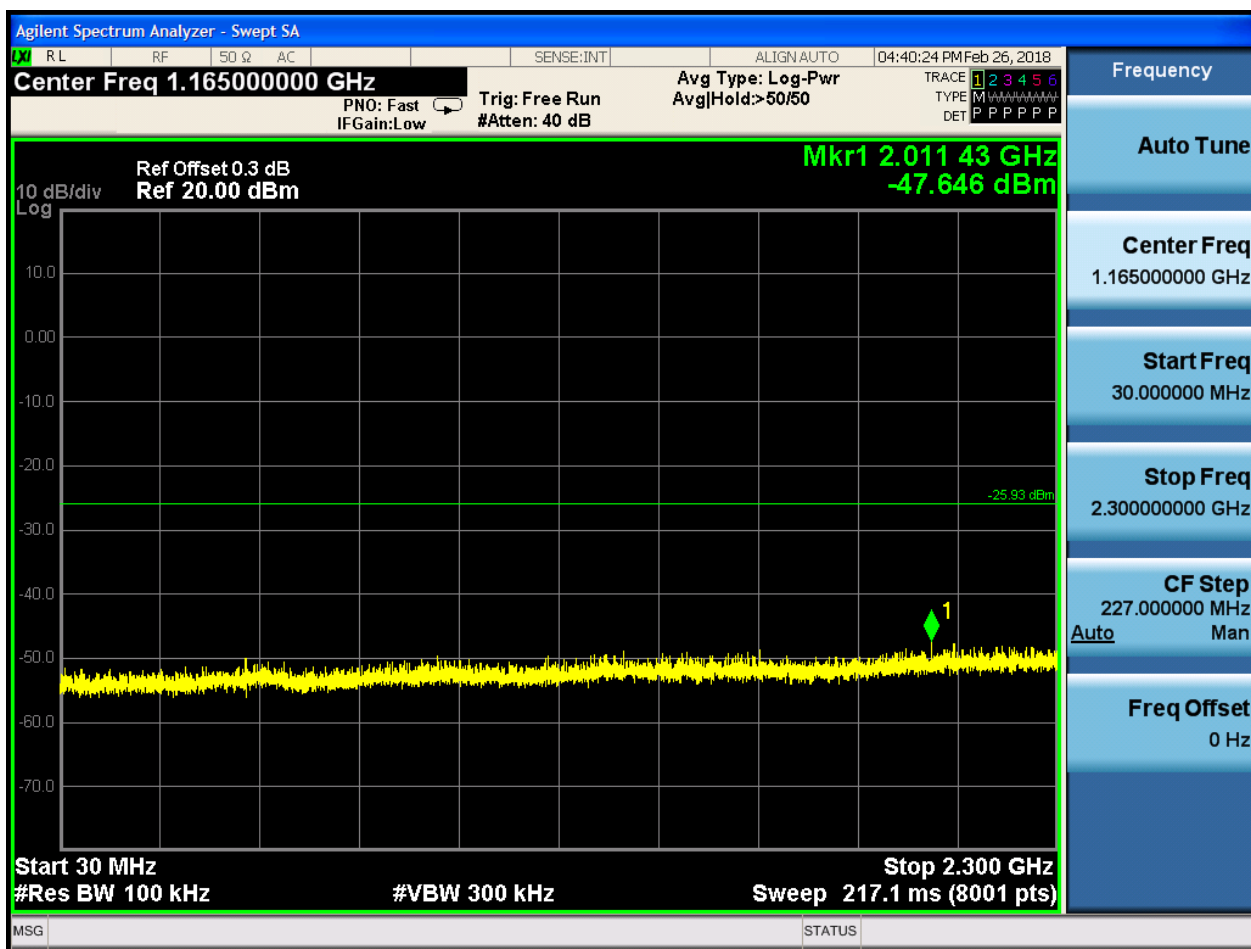
CF Step
14.100 kHz
Man

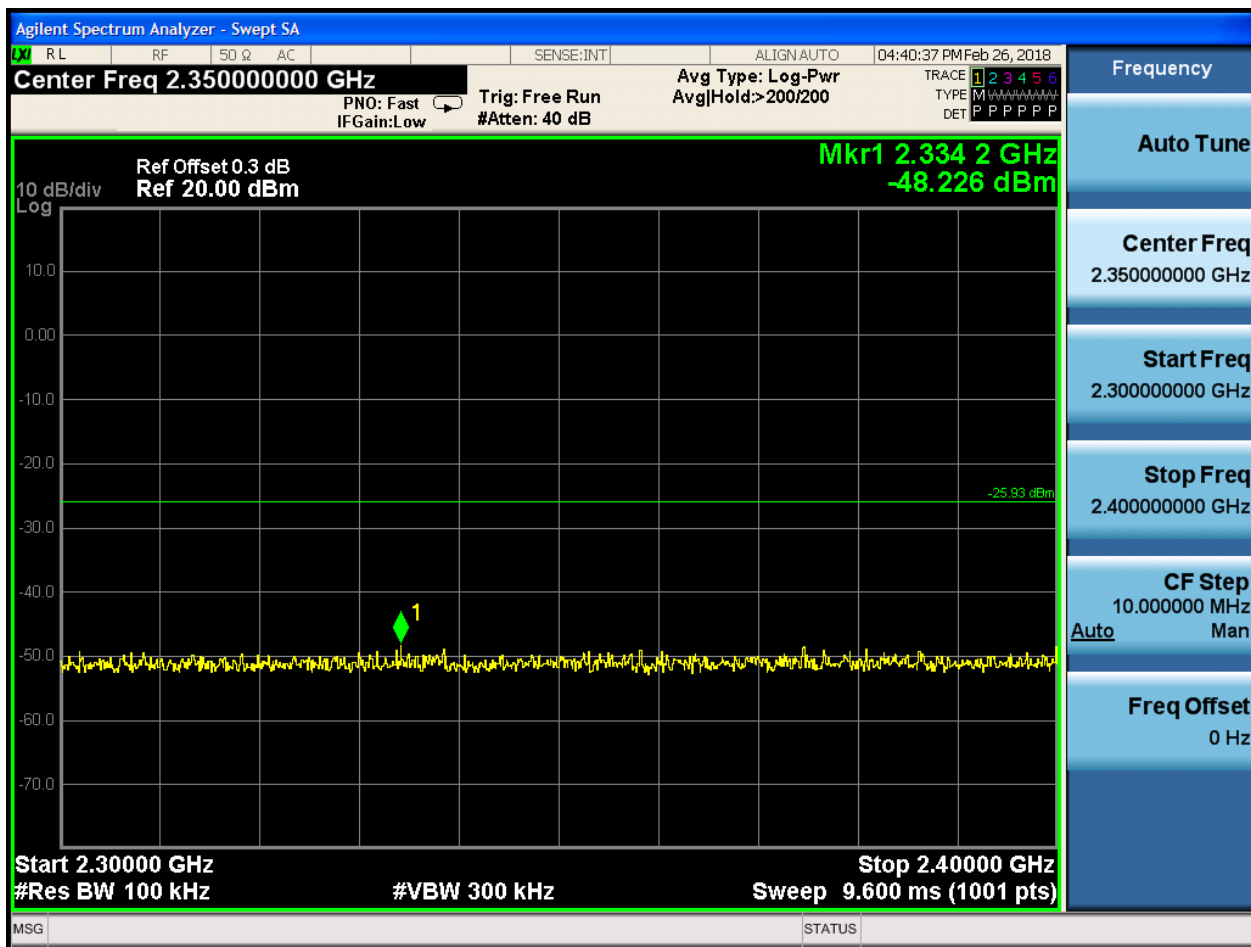
Auto

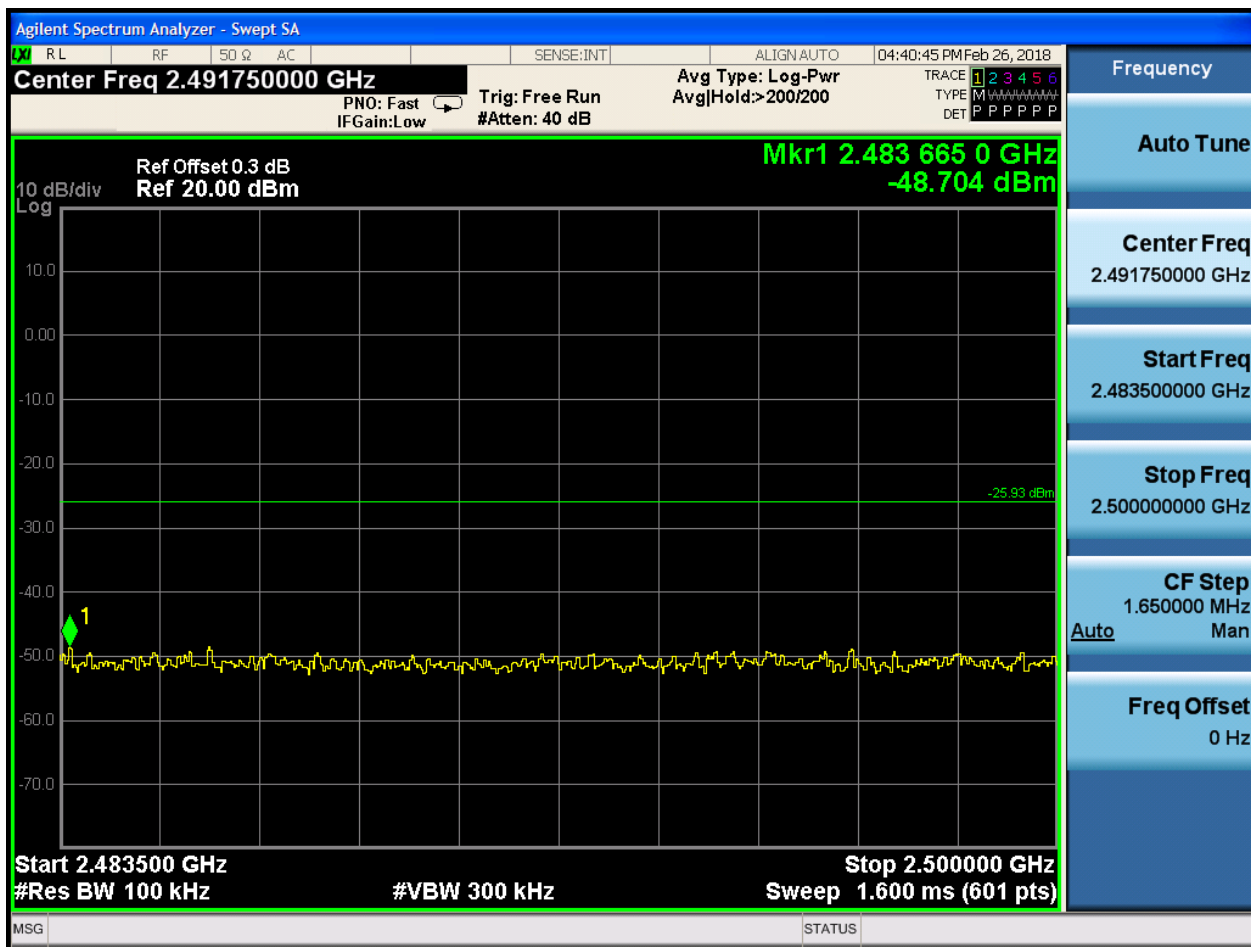
Freq Offset
0 Hz

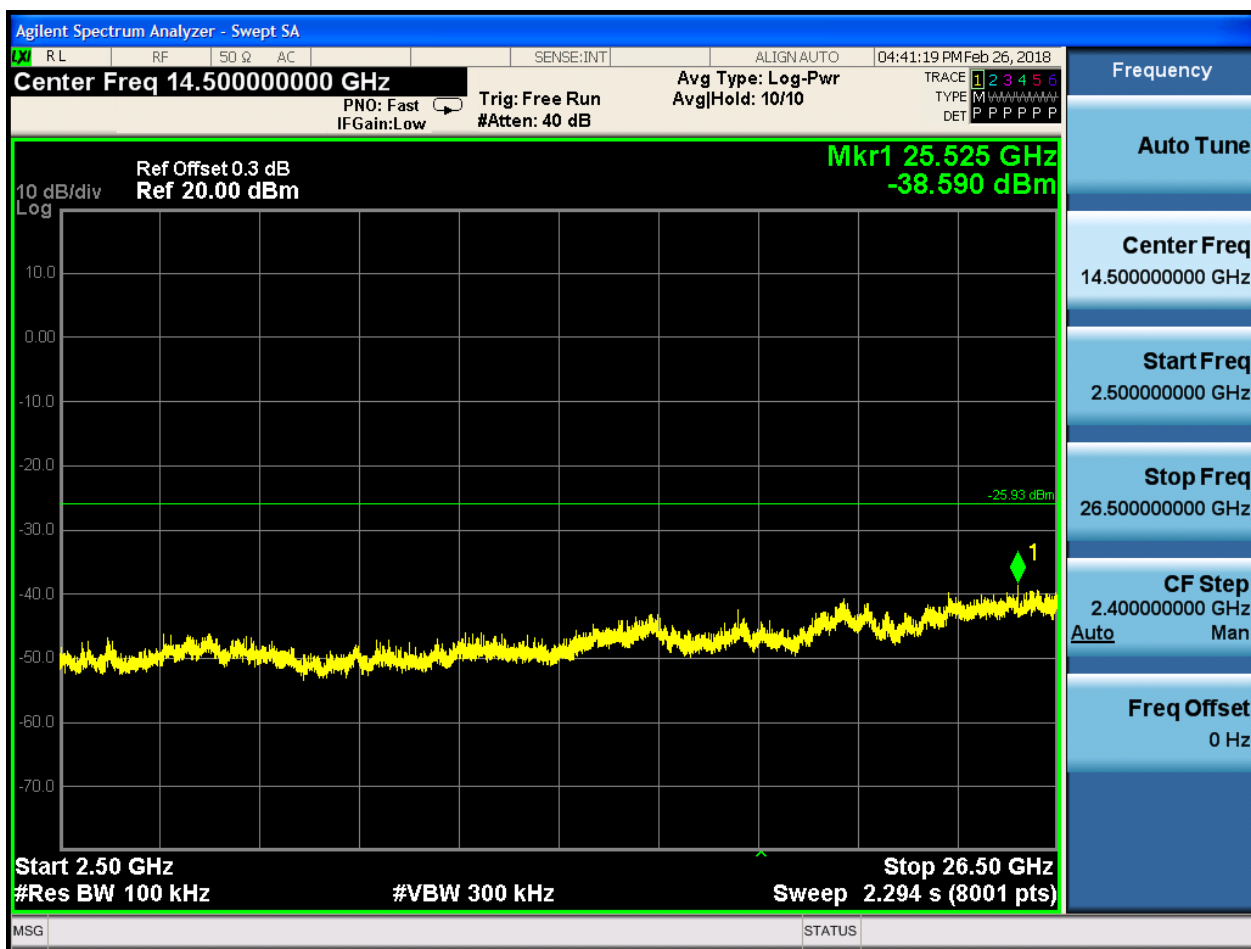
MSG STATUS $\uparrow$ DC Coupled







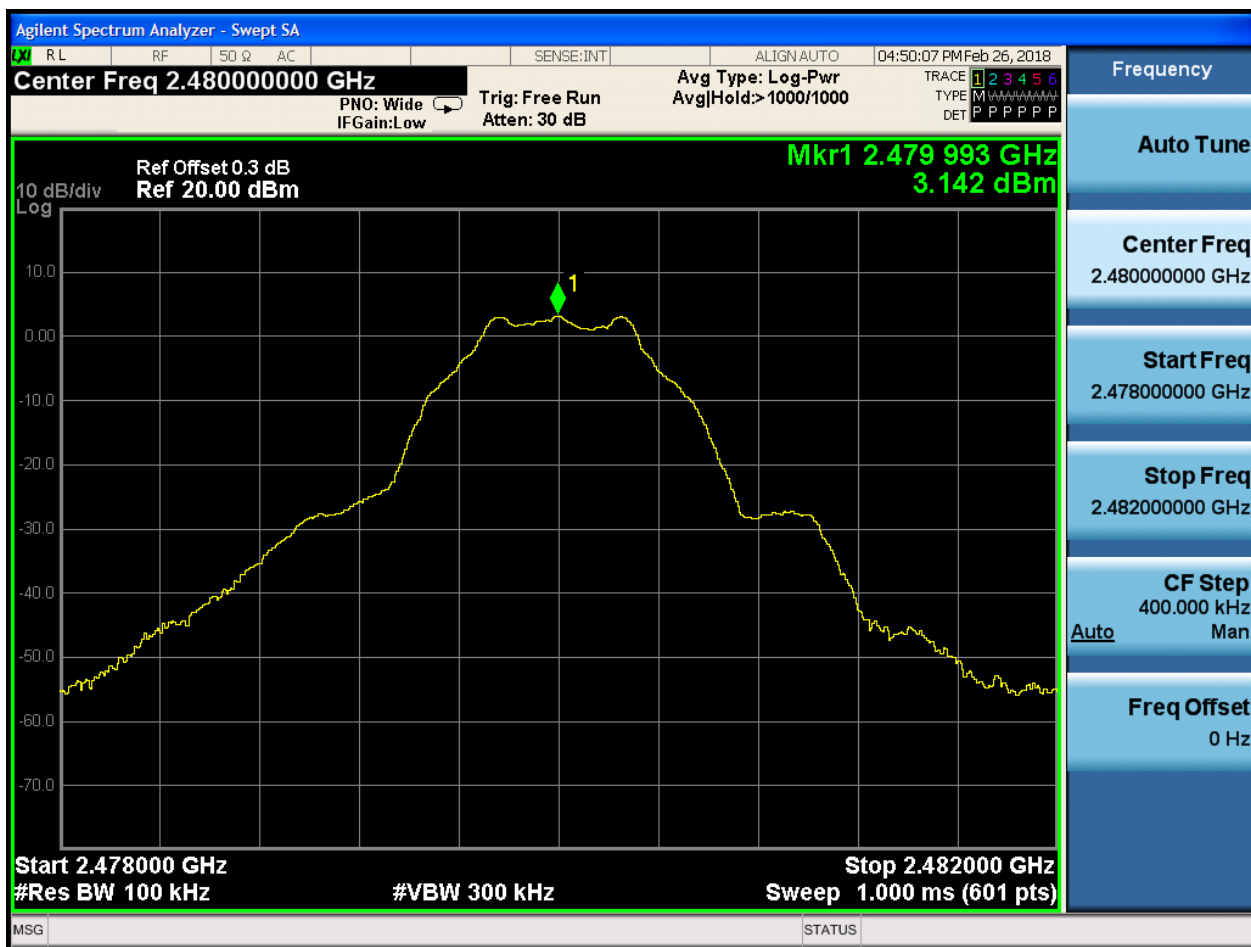






2.3 TM1_Ch39_H

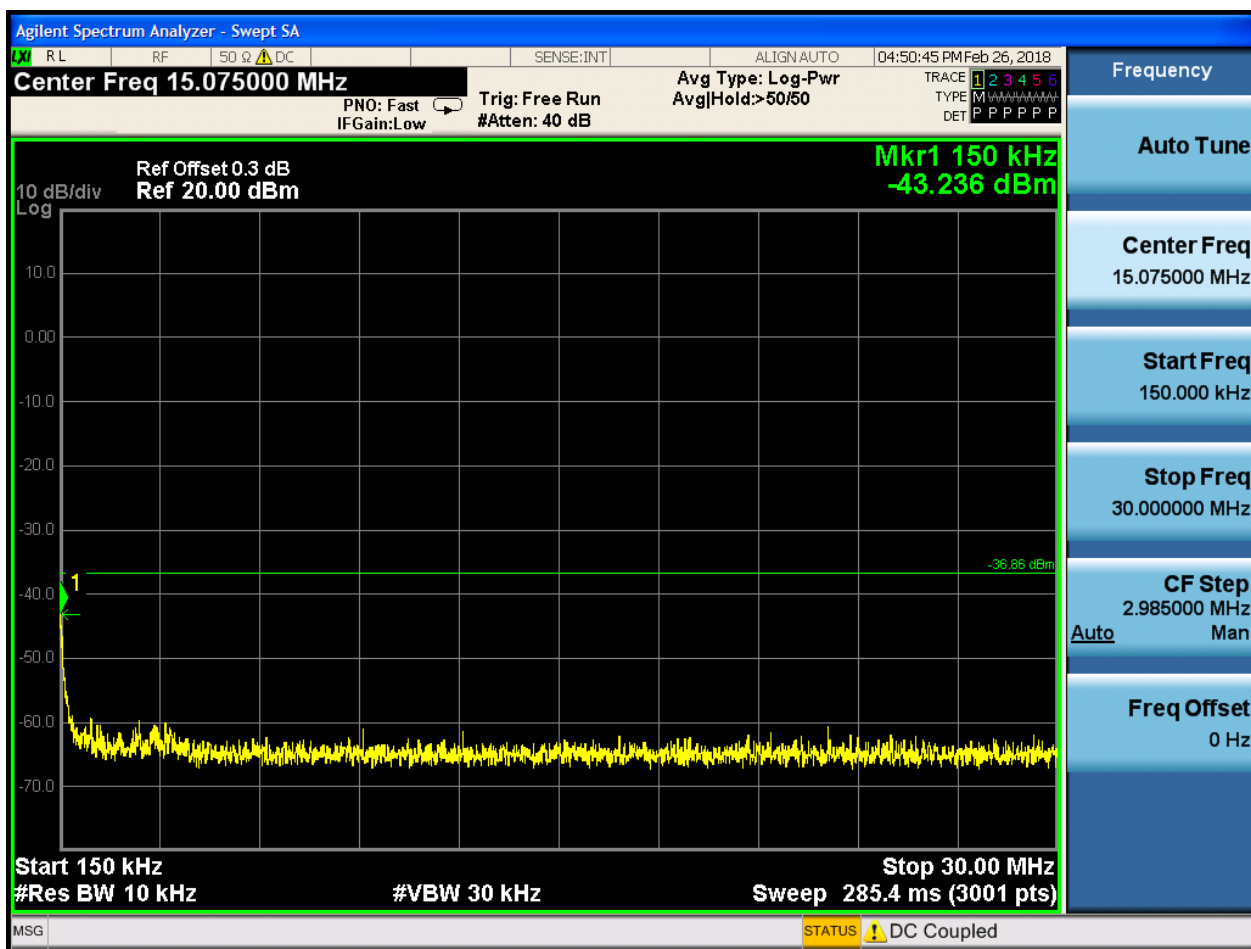
Pref:

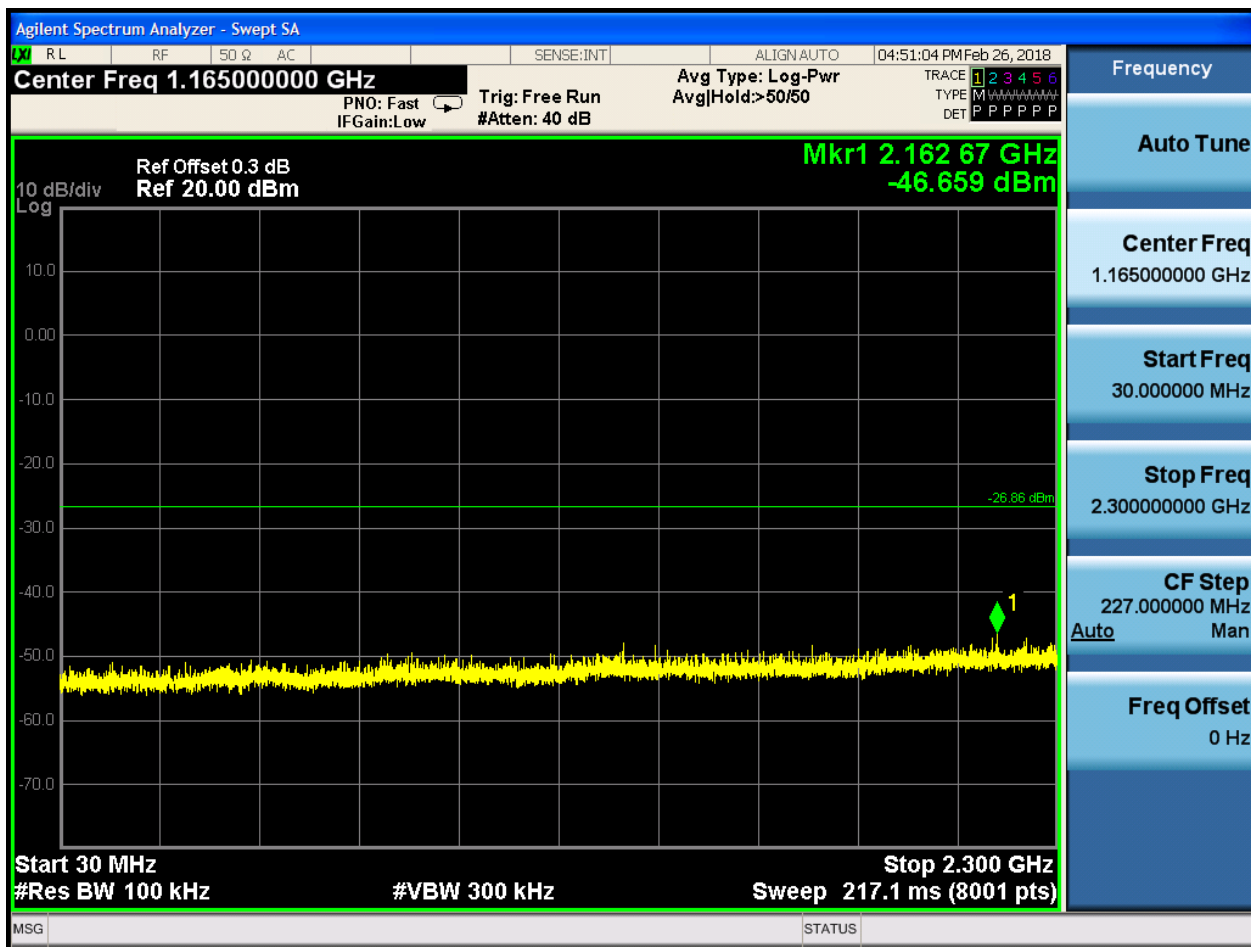


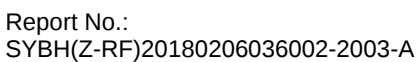
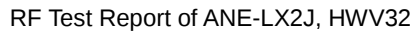


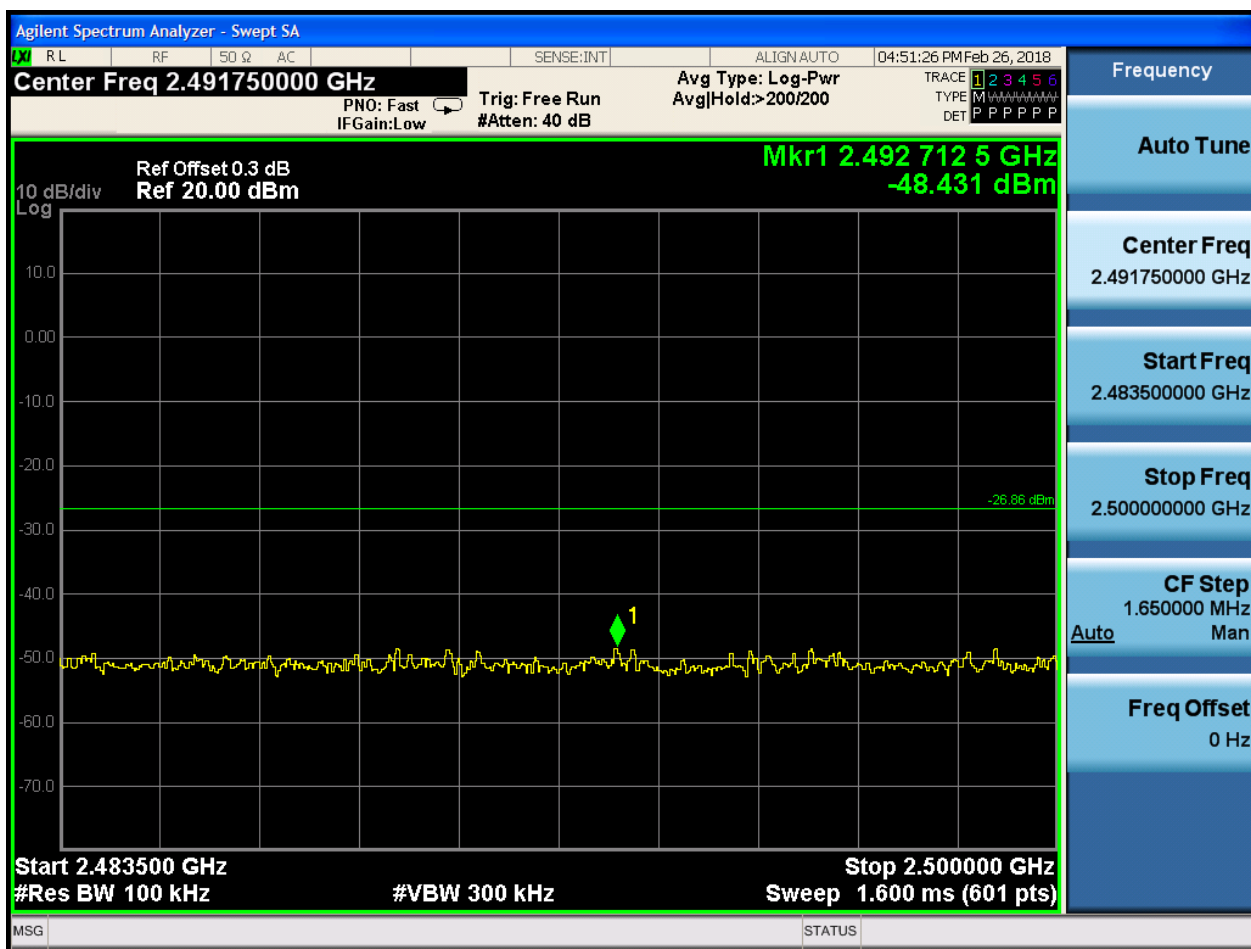
Puw:

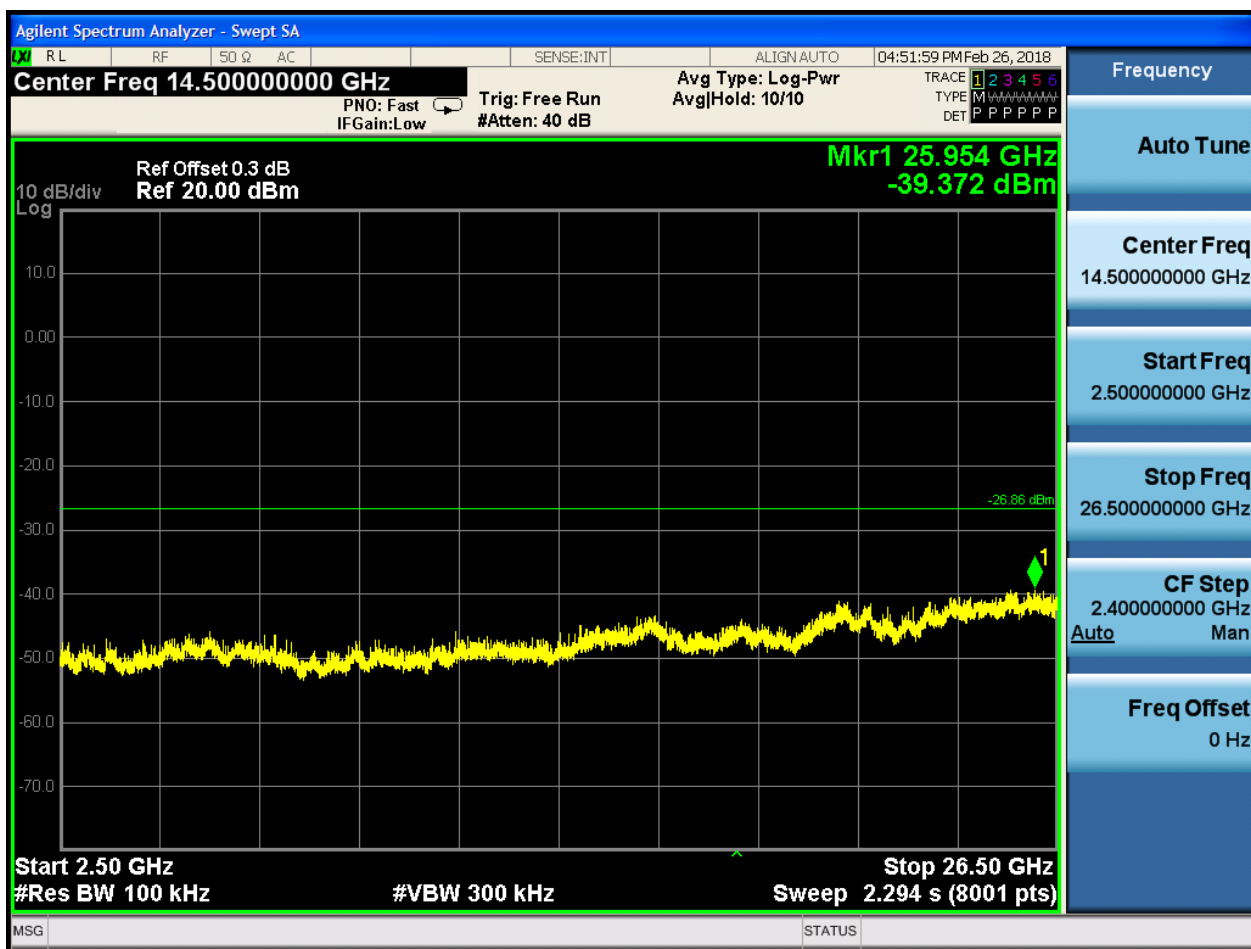












Appendix H: Radiated Spurious Emission & Spurious in Restricted Band

Note: We tested all modes, but the data presented below is the worst case.

Below 1GHz, RBW = 100 kHz, VBW = 300 kHz.

Above 1GHz, RBW = 1 MHz, VBW = 3 MHz.

The simultaneous transmission has been considered

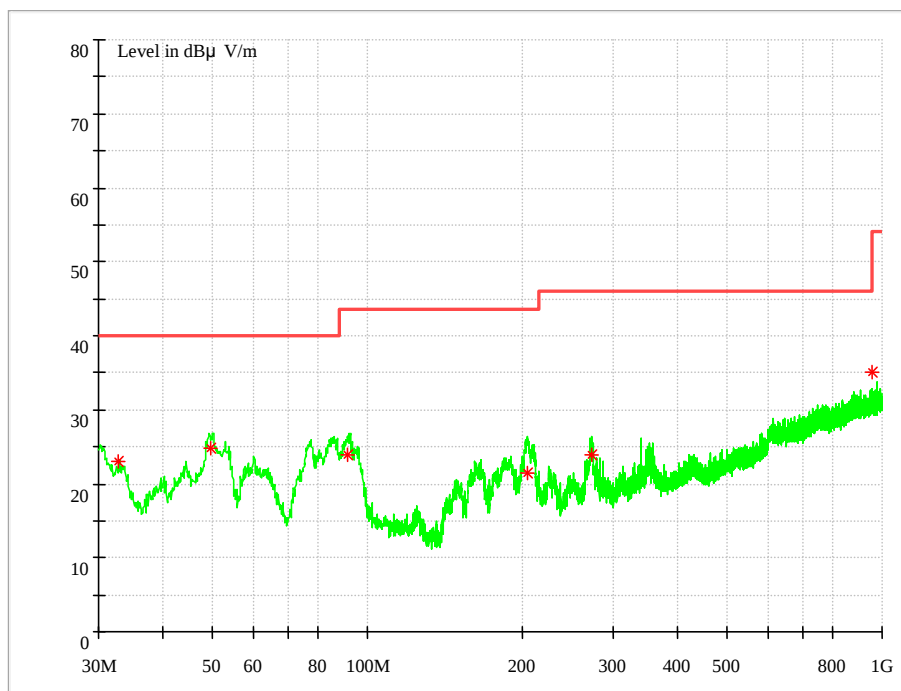
1.1 Part 1: Testing Range of “9 kHz to 30MHz”

NOTE1: No peak found in the Test Range of “9 kHz to 30MHz”

1.2 Part 2: Testing Range of “30 MHz to 1 GHz”

Note 1: The test results and plot for testing range of “30 MHz to 1 GHz” showed as below is the WORST case for all Test Modes and Channels. This range will not be presented for each Test Mode and each Channel.

Note 2: The emissions in this range are mainly from the Platform Device (Notepad PC and its ancillary components).



MEASUREMENT RESULT: QP Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Transd. (dB)
32.696850	22.93	40.00	17.07	106.0	V	210.0	14.3
49.467300	24.85	40.00	15.15	100.0	V	35.0	15.5
91.778850	24.00	43.50	19.50	130.0	V	353.0	12.4
203.949000	21.37	43.50	22.13	130.0	V	175.0	13.0
272.903400	23.90	46.00	22.10	117.0	H	274.0	15.1
955.828650	35.05	46.00	10.95	137.0	H	267.0	26.6

Note:

1, Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

2, Margin=Limit - Level

1.3 Part 3: Testing Range of “1GHz to 3GHz”

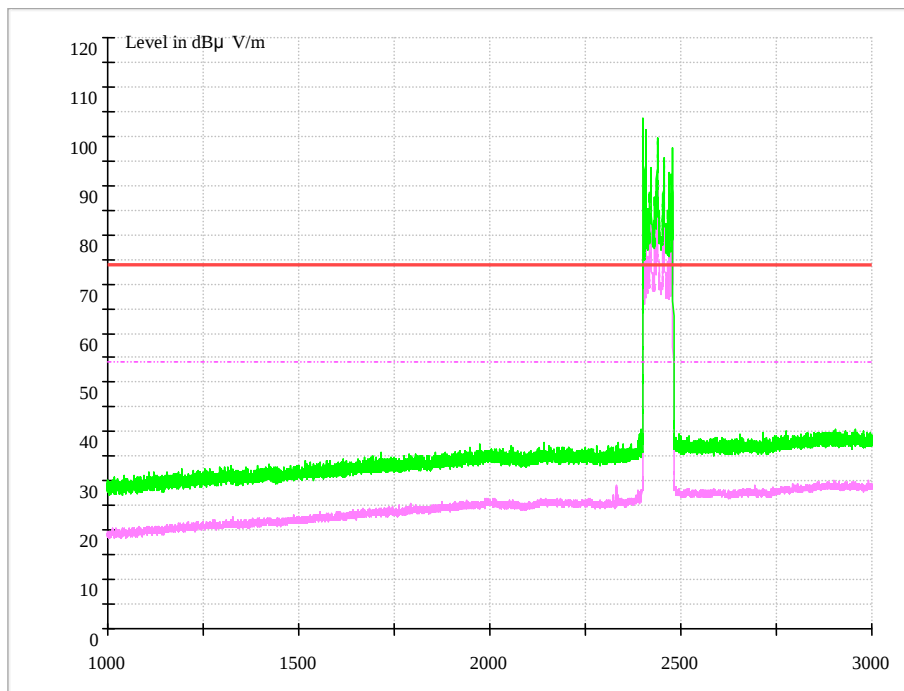
Note 1: The testing range of “1GHz to 3 GHz” is for checking radiated emissions located in restricted bands near the EUT operating bands.

Note 2: Two limits are required in the testing range above 1 GHz, that is Peak limit (74 dB μ V/m) and Average Limit (54 dB μ V/m).

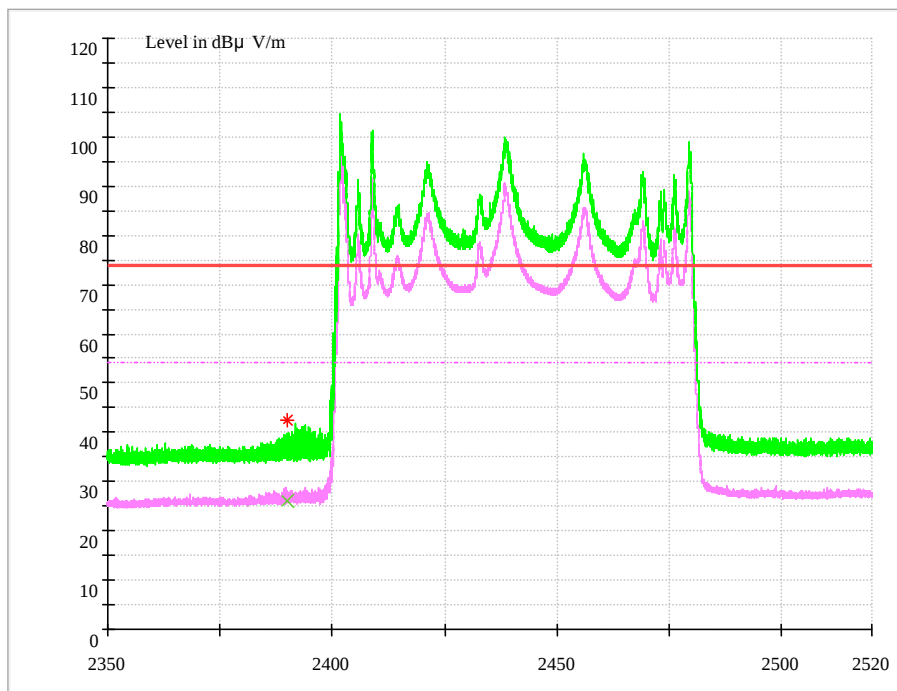
Note 3: The peak spike exceeds the limit line is EUT’s operating frequency.

Test Mode:

1.4.1 Test Mode: TM1



1.4.1.1 Channel 0



MEASUREMENT RESULT: AV Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h	Transd. (dB)
2390.0	26.08	54.00	27.92	150.0	H	245.0	-10.2

MEASUREMENT RESULT: PK Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h	Transd. (dB)
2390.0	42.31	74.00	31.69	150.0	H	254.0	-10.2

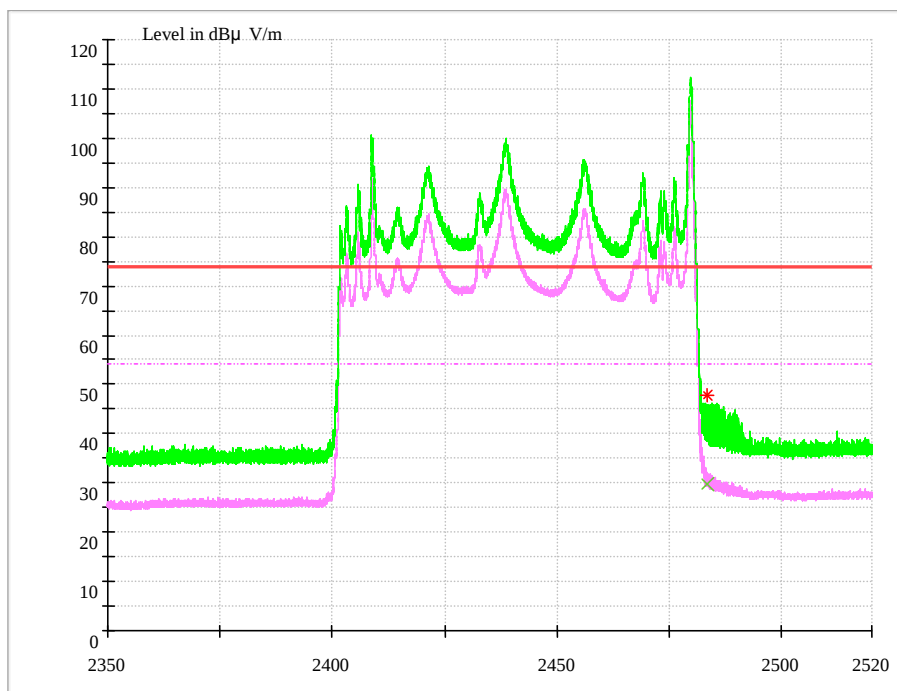
Note:

1, Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

2, Margin=Limit - Level

1.4.1.2 Channel 39



MEASUREMENT RESULT: AV Detector

Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h	Transd. (dB)
2483.5	29.76	54.00	24.24	150.0	H	237.0	-6.8

MEASUREMENT RESULT: PK Detector

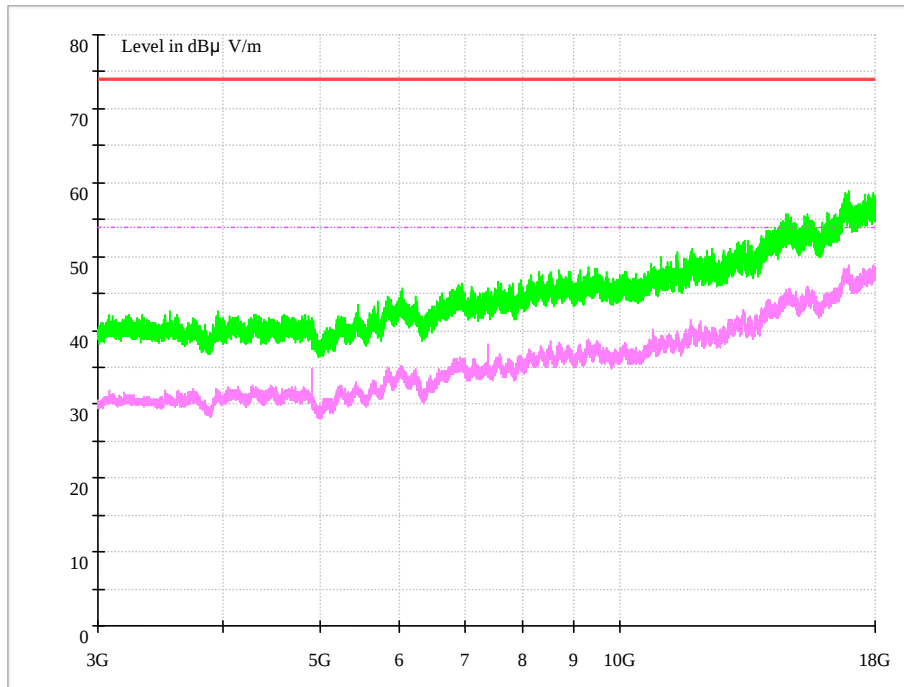
Frequency (MHz)	Level (dBμ V/m)	Limit (dBμ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth h (deg)	Transd. (dB)
2483.5	47.85	74.00	26.15	150.0	H	254.0	-6.8

Note:

- 1, Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.
- 2, Margin = Limit - Level

1.4 Part 4: Testing Range of “3 GHz to 18 GHz”

- Note 1: The test results and plot for testing range of “3 GHz to 18 GHz” showed as below is the WORST case for all Test Modes and Channels. This range will not be presented for each Test Mode and each Channel.
- Note 2: The testing range of “3 GHz to 18 GHz” is for checking radiated emissions located in restricted bands faraway from the EUT operating bands.
- Note 3: Two limits are required in the testing range above 1 GHz, that is Peak limit (74 dB μ V/m) and Average Limit (54 dB μ V/m).





1.5 Part 5: Testing Range of “18 GHz to 26.5 GHz”

NOTE: No peak found in the Test Range of “18 GHz to 26.5GHz”

Appendix I: Conducted Emission at Power Port

Note: RBW =9 kHz, VBW = 30 kHz

Channel 39



MEASUREMENT RESULT: PK Detector

Frequency (MHz)	Level (dBμ V)	Limit (dBμ V)	Transd. (dB)	Margin (dB)	Line	PE
0.165974	43.03	65.16	9.7	22.13	N	FLO
0.239657	39.4	62.11	9.7	22.71	N	FLO
0.395228	41.55	57.96	9.7	16.41	N	FLO
0.458714	42.92	56.72	9.8	13.8	L1	FLO
1.573831	33.65	56	9.9	22.35	N	FLO
9.77321	34.64	60	10	25.36	L1	FLO

MEASUREMENT RESULT: AV Detector

Frequency (MHz)	Level (dBμ V)	Limit (dBμ V)	Transd. (dB)	Margin (dB)	Line	PE
0.164267	27.72	55.25	9.7	27.53	N	FLO
0.23774	24.12	52.18	9.7	28.06	N	FLO
0.466472	30.63	46.58	9.7	15.95	L1	FLO
0.786709	22.9	46	9.7	23.1	N	FLO
2.618178	21.02	46	9.7	24.98	N	FLO
17.914586	19.08	50	10.1	30.92	N	FLO

Note:

1, Level =Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)

The reading level is calculated by software which is not shown in the sheet.

2, Margin=Limit - Level

END