EMC
TEST REPORT

Report No. : TW14050335
Model No. : System 1021
Issued Date : Jun. 27, 2014

Applicant: **Acoustic Analog Corporation**
4th Floor, No. 53, Pok Oi Road, Taipei

Test Method/ Standard: **47 CFR FCC Part 15.249 & ANSI C63.4 2003**

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Summary of Tests

Test	Reference	Results
Radiated Emission test	15.249(c), 15.209	Pass
Emission on the Band Edge	15.249(d)	Pass
Conducted Emission of AC Power	15.207	Pass
20dB Bandwidth	15.215(c)	Pass

1. General information

1.1 Identification of the EUT

Product:	Full Analog Sound System
Model No.:	System 1021
FCC ID:	2ACNDSYSTEM1021
Frequency Range:	2402MHz ~ 2480MHz
Channel Number:	79 Channels
Frequency of Each Channel:	2402MHz, 2441MHz, 2480MHz
Type of Modulation:	GFSK, π /4-QDPSK and 8-DPSK
Rated Power:	DC 6 V come from Subwoofer
Power Cord:	N/A
Sample Received:	May 19, 2014
Test Date(s):	May 22, 2014 ~ Jun. 12, 2014
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.

1.2 Additional information about the EUT

The EUT is Full Analog Sound System, and was defined as information technology equipment. (Fixed installation)

For more detail features, please refer to User's manual as file name “User's Manual.pdf”

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain	: 0 dBi
Antenna Type	: Dipole antenna
Connector Type	: I-PEX

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Paragraph 15.249 for non-spread spectrum devices.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

The EUT is supplied with DC 6 V come from Subwoofer (Test voltage: 120Vac, 60Hz).

TX/RX mode: EUT transmits continuously as power on and press button to change different channel.

2.3 Test equipment

Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100018	2013/12/03	2014/12/02
Spectrum Analyzer	Rohde & Schwarz	FSP30	100137	2013/06/21	2014/06/20
Spectrum Analyzer	Rohde & Schwarz	FSEK30	100186	2014/01/20	2015/01/19
Horn Antenna (1-18G)	Schwarzbeck	BBHA 9120 D	9120D-456	2012/09/03	2014/09/03
Horn Antenna (14-42G)	SHWARZBECK	BBHA 9170	BBHA9170159	2012/9/05	2014/09/05
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-172	2013/08/08	2015/08/07
Pre-Amplifier	MITEQ	AFS44-00102650--42-10P-44	1495287	2013/10/27	2015/10/26
Pre-Amplifier	MITEQ	JS4-26004000--27-8A	828825	2012/09/18	2014/09/17
Power Meter	Anritsu	ML2495A	0844001	2013/10/10	2014/10/09
Power Senor	Anritsu	MA2411B	0738452	2013/10/10	2014/10/09
Temperature&Humidity Test Chamber	TERCHY	MHU-225LRU (SA)	950838	2014/06/12	2015/06/11
Two-Line V-Network	Rohde & Schwarz	ESH3-Z5	838979/014	2013/10/12	2014/10/11
Singal Analyzer	Agilent	N9030A	MY51380492	2013/09/19	2014/09/18
Loop Antenna	RolfHeine	LA-285	02/10033	2014/3/18	2016/3/16

Note: The above equipments are within the valid calibration period.

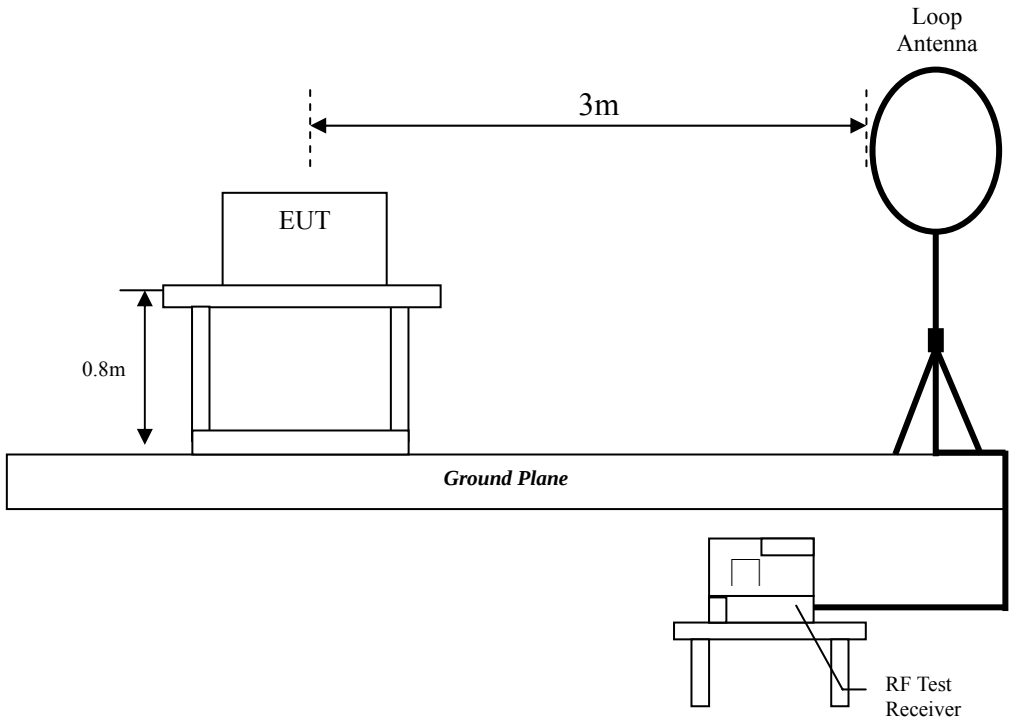
3. Radiated emission test FCC 15.249 (C)

3.1 Operating environment

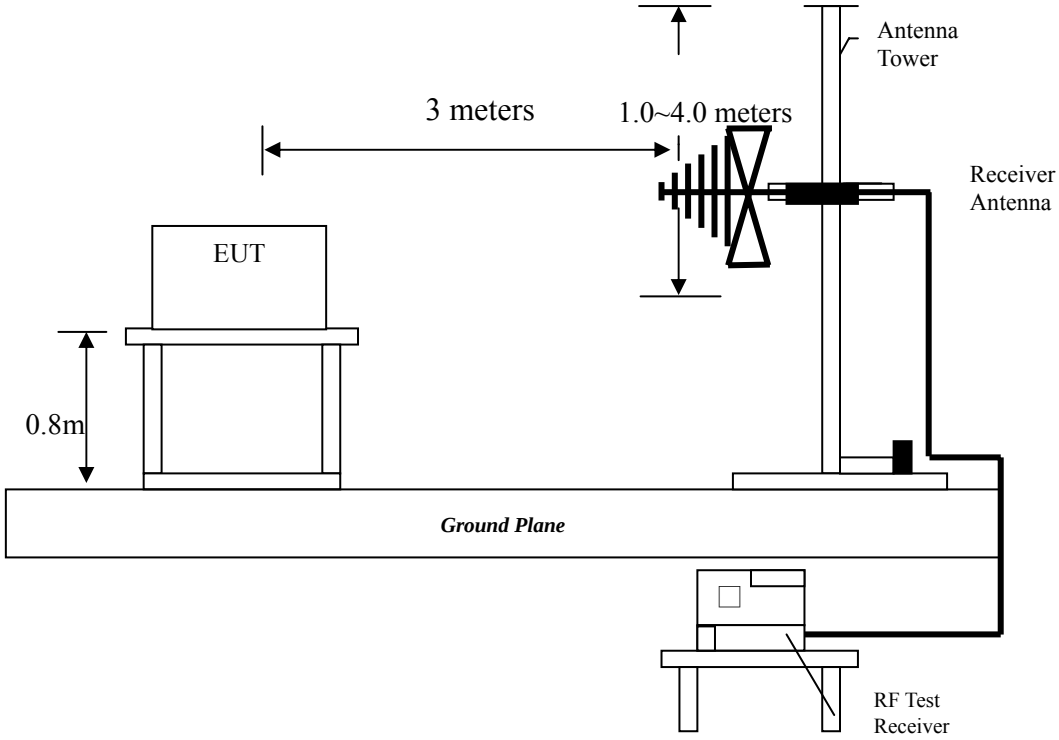
Temperature:	25	℃
Relative Humidity:	55	%
Atmospheric Pressure	1008	hPa

3.2 Test setup & procedure

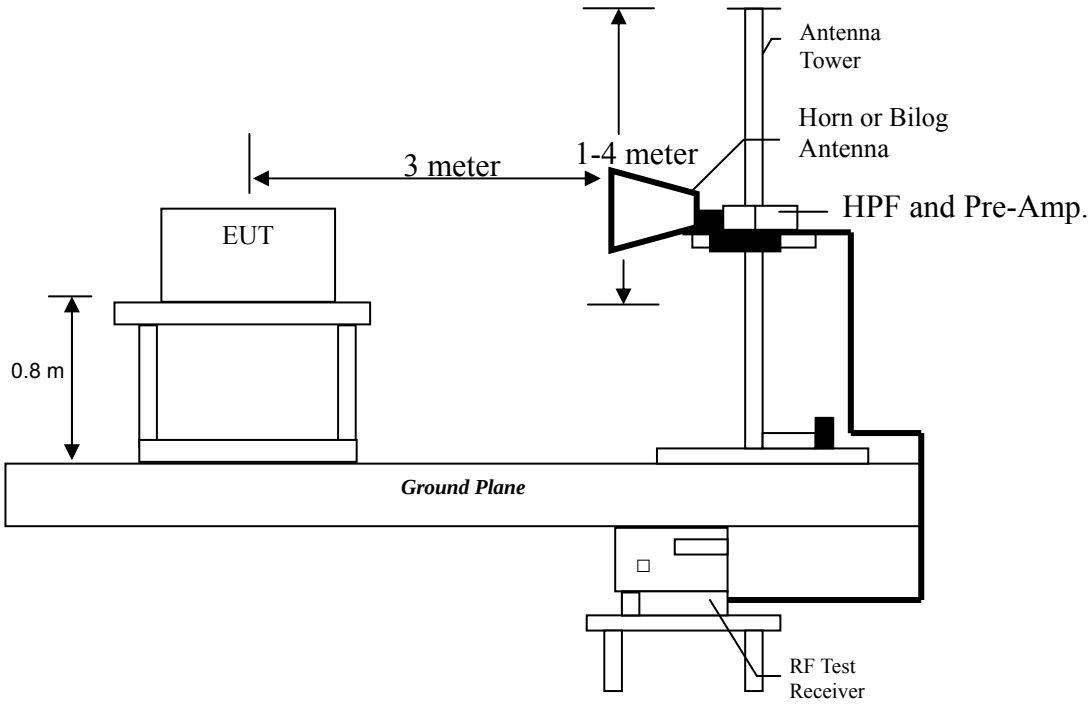
Radiated emission from 9 kHz to 30 MHz uses Loop Antenna:



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



Radiated emission above 1 GHz uses Horn Antenna:



Radiated emissions were invested cover the frequency range from 9kHz to 150kHz using a receiver RBW of 200Hz and 9kHz to 150kHz using a receiver RBW of 9kHz, 9 kHz to 90 kHz and 110 kHz to 490 kHz for PK/AVG detector, 90 kHz to 110 kHz and 490 kHz to 30 MHz for QP detector, 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1 MHz RBW/ 3 MHz VBW) recorded also on the report.
The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance.

The EUT configuration please refer to the “Radiated emission test set-up photo.pdf”.

3.3 Emission limit

3.3.1 Fundamental and harmonics emission limits

Frequency (MHz)	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m@3m)	(dBuV/m@3m)	(uV/m@3m)	(dBuV/m@3m)
2400-2483.5	50	94	500	54

3.3.2 General radiated emission limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

Frequency MHz	15.209 Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

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

Measurement uncertainty was calculated in accordance with TR 100 028-1.

Parameter	Uncertainty
Radiated Emission	Vertical: 4.13 dB Horizontal:3.85 dB
Conducted Emission	2.08 dB.

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

3.4 Radiated spurious emission test data

3.4.1 Measurement results: frequency range from 9kHz to 30MHz

Frequency (MHz)	Detector	Corrected Factor (dB/m)	Reading (dBuV)	Emission (dBuV)	Limit (dBuV)	Margin (dB)
0.35	PK	63.45	19.87	83.32	96.72	-13.4
0.71	QP	57.95	3.69	61.64	79.88	-18.24
26	QP	36.62	22.15	58.77	69.54	-10.77

3.4.2 Measurement results: frequencies equal to or less than 1 GHz

The test was performed on EUT under GFSK continuously transmitting mode. Low, Middle, High Channel were verified. The worst case occurred at GFSK TX Low Channel

EUT : System 1021
Test Condition : Tx at Low Channel

Antenna Polariz. (V/H)	Freq. (MHz)	Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
Vertical	84.32	QP	11.56	26.35	37.91	40.00	-2.09
Vertical	125.06	QP	14.37	23.00	35.30	43.50	-8.20
Vertical	293.84	QP	17.22	23.00	33.41	46.00	-12.59
Vertical	491.72	QP	21.89	23.00	38.74	46.00	-7.26
Vertical	515.00	QP	22.33	23.00	33.40	46.00	-12.60
Vertical	800.18	QP	27.31	23.00	36.34	46.00	-9.66
Horizontal	86.26	QP	14.16	23.00	35.56	40.00	-4.44
Horizontal	154.16	QP	15.35	23.00	37.80	43.50	-5.70
Horizontal	289.96	QP	17.73	23.00	40.09	46.00	-5.91
Horizontal	390.84	QP	19.50	23.00	32.10	46.00	-13.90
Horizontal	450.98	QP	20.56	23.00	27.71	46.00	-18.29
Horizontal	798.24	QP	26.65	21.00	35.22	46.00	-10.78

Remark:

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

3.4.3 Measurement results: frequency above 1GHz

EUT : System 1021
Test Condition : Tx at Low channel
Mode : GFSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
3120	PK	V	-3.71	51.20	47.49	54.00	-6.51
3180	PK	V	-3.75	49.09	45.34	54.00	-8.66
3990	PK	V	-1.57	42.91	41.34	54.00	-12.66
4804	PK	V	-0.10	45.18	45.08	54.00	-8.92
7206	PK	V	8.10	39.82	47.92	54.00	-6.08
3120	PK	H	-3.71	48.86	45.15	54.00	-8.85
3990	PK	H	-1.57	40.03	38.46	54.00	-15.54
4804	PK	H	-0.10	39.07	38.97	54.00	-15.03
7206	PK	H	8.10	36.73	44.83	54.00	-9.17

Remark:

1. Correction Factor = Antenna Factor + Cable Loss - Power Amplifier
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : System 1021
Test Condition : Tx at Middle channel
Mode : GFSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
3120	PK	V	-3.71	52.72	49.01	54.00	-4.99
3240	PK	V	-3.80	50.21	46.41	54.00	-7.59
3390	PK	V	-3.92	46.24	42.32	54.00	-11.68
4882	PK	V	0.16	41.12	41.28	54.00	-12.72
7323	PK	V	8.46	41.89	50.35	54.00	-3.65
3120	PK	H	-3.71	49.50	45.79	54.00	-8.21
3240	PK	H	-3.80	42.91	39.11	54.00	-14.89
4882	PK	H	0.16	39.55	39.71	54.00	-14.29
7323	PK	H	8.46	41.24	49.70	54.00	-4.30

Remark:

1. Correction Factor = Antenna Factor + Cable Loss - Power Amplifier
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : System 1021
Test Condition : Tx at High channel
Mode : GFSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
3120	PK	V	-3.71	52.41	48.70	54.00	-5.30
3300	PK	V	-3.85	53.42	49.57	54.00	-4.43
3960	PK	V	-1.72	45.26	43.54	54.00	-10.46
4960	PK	V	0.41	42.04	42.45	54.00	-11.55
7440	PK	V	8.82	41.79	50.61	54.00	-3.39
3120	PK	H	-3.71	47.66	43.95	54.00	-10.05
3300	PK	H	-3.85	44.79	40.94	54.00	-13.06
3990	PK	H	-1.57	41.42	39.85	54.00	-14.15
4960	PK	H	0.41	37.53	37.94	54.00	-16.06
7440	PK	H	8.82	40.34	49.16	54.00	-4.84

Remark:

11. Correction Factor = Antenna Factor + Cable Loss - Power Amplifier
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor..

EUT : System 1021
Test Condition : Tx at Low channel
Mode : 8-DPSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
3120	PK	V	-3.71	49.22	45.51	54.00	-8.49
3180	PK	V	-3.75	50.88	47.13	54.00	-6.87
3990	PK	V	-1.57	44.87	43.30	54.00	-10.70
4804	PK	V	-0.10	36.96	36.86	54.00	-17.14
7206	PK	V	8.10	38.29	46.39	54.00	-7.61
3120	PK	H	-3.71	49.00	45.29	54.00	-8.71
4050	PK	H	-1.48	40.98	39.50	54.00	-14.50
4804	PK	H	-0.10	37.15	37.05	54.00	-16.95

Remark:

1. Correction Factor = Antenna Factor + Cable Loss - Power Amplifier
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : System 1021
Test Condition : Tx at Middle channel
Mode : 8-DPSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
3120	PK	V	-3.71	52.49	48.78	54.00	-5.22
3240	PK	V	-3.80	50.88	47.08	54.00	-6.92
3990	PK	V	-1.57	45.14	43.57	54.00	-10.43
4882	PK	V	0.16	37.12	37.28	54.00	-16.72
7323	PK	V	8.46	37.16	45.62	54.00	-8.38
3120	PK	V	-3.71	48.64	44.93	54.00	-9.07
3240	PK	H	-3.80	44.75	40.95	54.00	-13.05
3960	PK	H	-1.72	41.30	39.58	54.00	-14.42
4882	PK	H	0.16	38.07	38.23	54.00	-15.77
7323	PK	H	8.46	37.47	45.93	54.00	-8.07

Remark:

1. Correction Factor = Antenna Factor + Cable Loss - Power Amplifier
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : System 1021
Test Condition : Tx at High channel
Mode : 8-DPSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
3120	PK	V	-3.71	51.77	48.06	54.00	-5.94
3300	PK	V	-3.85	54.45	50.60	54.00	-3.40
3990	PK	V	-1.57	43.83	42.26	54.00	-11.74
4960	PK	V	0.41	39.15	39.56	54.00	-14.44
3120	PK	H	-3.71	48.23	44.52	54.00	-9.48
3300	PK	H	-3.85	46.44	42.59	54.00	-11.41
3990	PK	H	-1.57	40.63	39.06	54.00	-14.94
4960	PK	H	0.41	37.49	37.90	54.00	-16.10

Remark:

11. Correction Factor = Antenna Factor + Cable Loss - Power Amplifier
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor..

3.4.4 Measurement results: Fundamental and harmonics emission

EUT : System 1021
Test Condition : Tx at Low channel
Mode : GFSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2402	PK	V	33.91	74.97	108.88	114.00	-5.12
2402	AV	V	33.91	35.21	69.12	94.00	-24.88
2402	PK	H	33.91	64.28	98.19	114.00	-15.81
2402	AV	H	33.91	27.26	61.17	94.00	-32.83

Remark:
1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : System 1021
Test Condition : Tx at Middle channel
Mode : GFSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2441	PK	V	34.10	71.88	105.98	114.00	-8.02
2441	AV	V	34.10	34.65	68.75	94.00	-25.25
2441	PK	H	34.10	64.53	98.63	114.00	-15.37
2441	AV	H	34.10	27.22	61.32	94.00	-32.68

Remark:
1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : System 1021
Test Condition : Tx at High channel
Mode : GFSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2480	PK	V	34.28	71.44	105.72	114.00	-8.28
2480	AV	V	34.28	34.45	68.73	94.00	-25.27
2480	PK	H	34.28	63.62	97.90	114.00	-16.10
2480	AV	H	34.28	26.47	60.75	94.00	-33.25

Remark:
1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : System 1021
Test Condition : Tx at Low channel
Mode : 8-DPSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2402	PK	V	33.91	74.28	108.19	114.00	-5.81
2402	AV	V	33.91	34.79	68.70	94.00	-25.30
2402	PK	H	33.91	63.10	97.01	114.00	-16.99
2402	AV	H	33.91	26.52	60.43	94.00	-33.57

Remark:
1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : System 1021
Test Condition : Tx at Middle channel
Mode : 8-DPSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2441	PK	V	34.10	70.39	104.49	114.00	-9.51
2441	AV	V	34.10	33.37	67.47	94.00	-26.53
2441	PK	H	34.10	63.06	97.16	114.00	-16.84
2441	AV	H	34.10	26.27	60.37	94.00	-33.63

Remark:
1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : System 1021
Test Condition : Tx at High channel
Mode : 8-DPSK

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
2480	PK	V	34.28	70.44	104.72	114.00	-9.28
2480	AV	V	34.28	34.13	68.41	94.00	-25.59
2480	PK	H	34.28	62.59	96.87	114.00	-17.13
2480	AV	H	34.28	25.51	59.79	94.00	-34.21

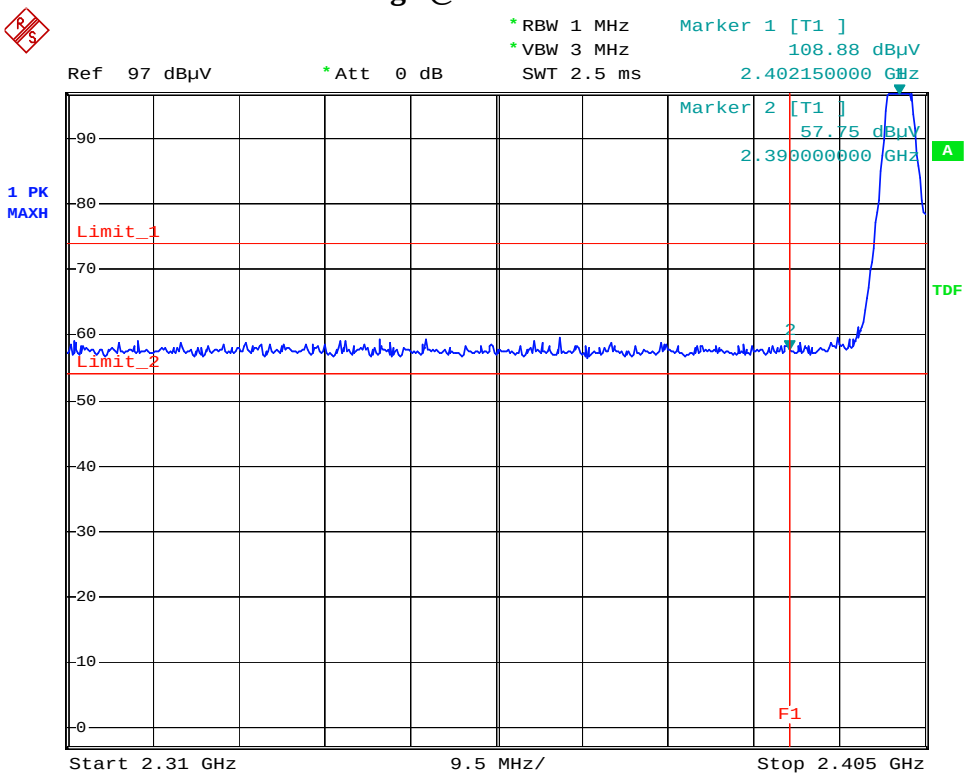
Remark:
1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

4. Radiated emission on the band edge FCC 15.249(d)

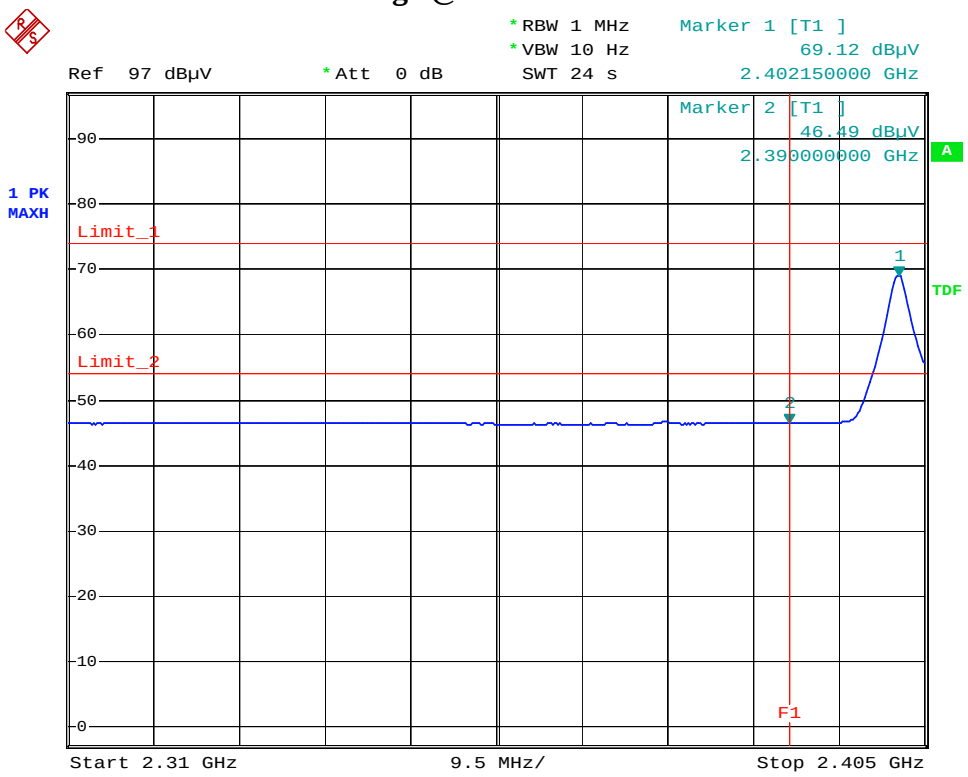
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental (2414~2470MHz) or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

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)
GFSK	2390.00	PK	V	32.51	25.24	57.75	74	-16.25	2310~2390
	2390.00	AV	V	32.51	13.98	46.49	54	-7.51	
	2402.00	PK	V	32.55	76.33	108.88	-	108.88	-
	2402.00	AV	V	32.55	36.57	69.12	-	69.12	
	2480.00	PK	V	32.83	72.89	105.72	-	105.72	-
	2480.00	AV	V	32.83	35.90	68.73	-	68.73	
	2483.50	PK	V	32.84	35.13	67.97	74	-6.03	2483.5~2500
	2483.50	AV	V	32.84	19.78	52.62	54	-1.38	
8-DPSK	2390.00	PK	V	32.51	26.03	58.54	74	-15.46	2310~2390
	2390.00	AV	V	32.51	13.97	46.48	54	-7.52	
	2402.00	PK	V	32.55	75.64	108.19	-	108.19	-
	2402.00	AV	V	32.55	36.15	68.70	-	68.70	
	2480.00	PK	V	32.83	71.89	104.72	-	104.72	-
	2480.00	AV	V	32.83	35.58	68.41	-	68.41	
	2483.50	PK	V	32.84	35.74	68.58	74	-5.42	2483.5~2500
	2483.50	AV	V	32.84	19.32	52.16	54	-1.84	

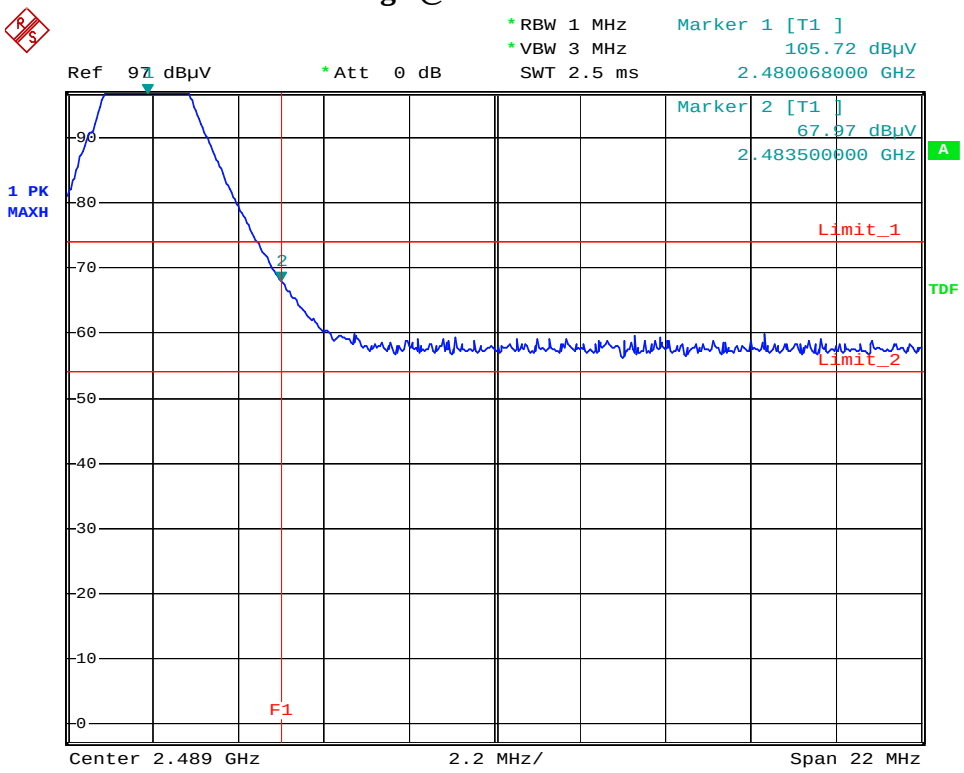
Band edge @ GFSK mode channel 0 PK



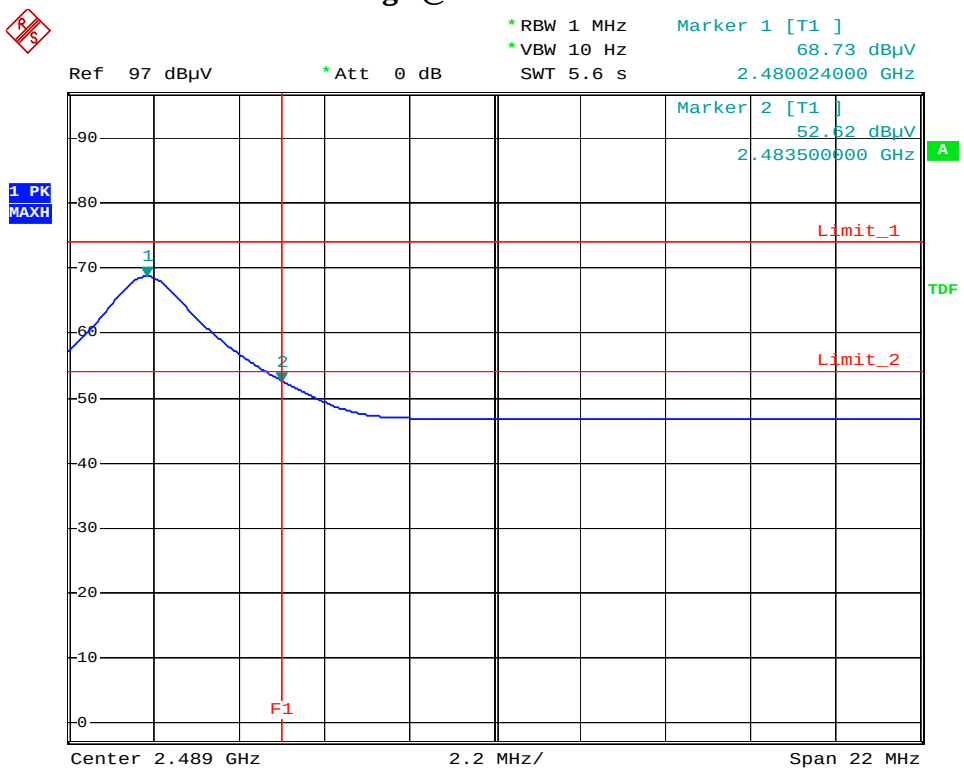
Band edge @ GFSK mode channel 0 AV



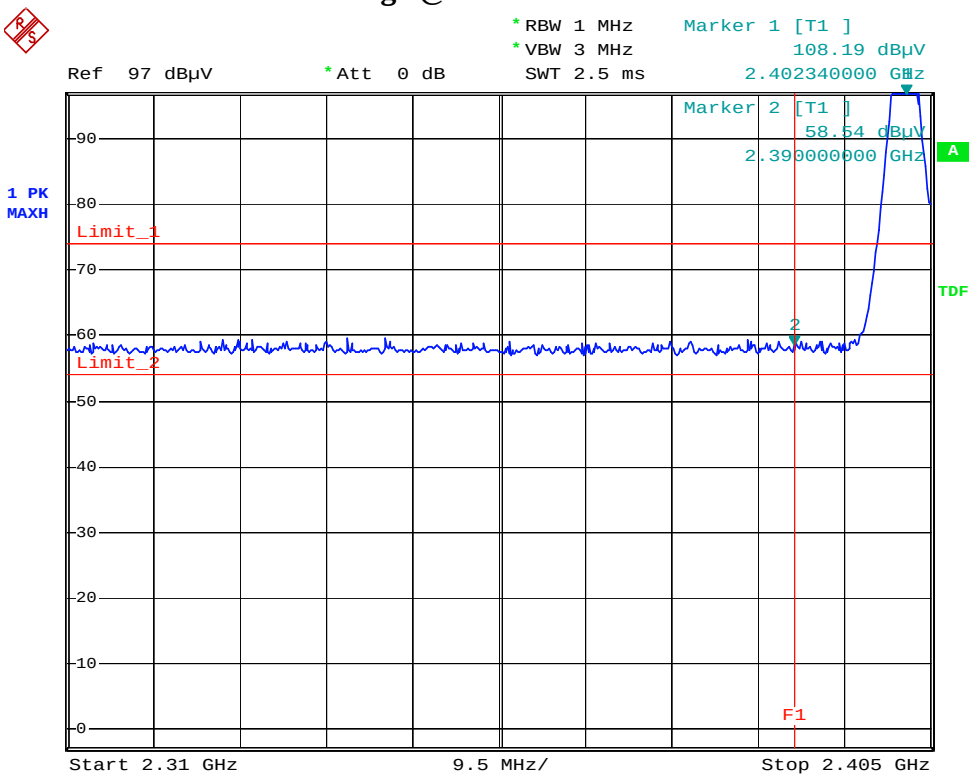
Band edge @ GFSK mode channel 78 PK



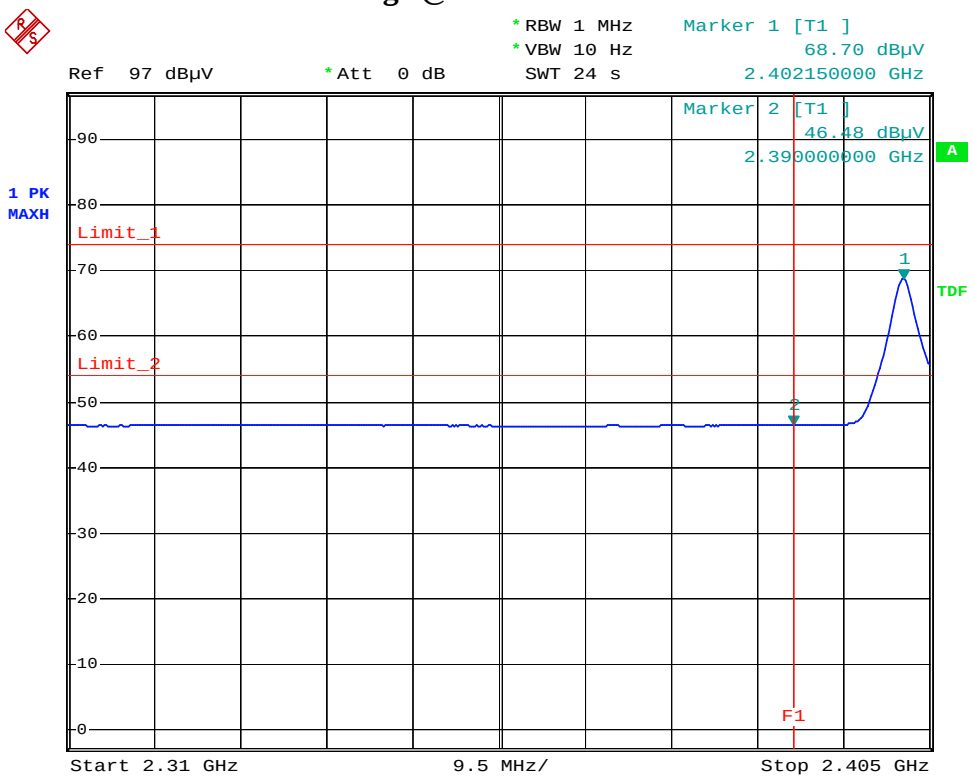
Band edge @ GFSK mode channel 78 AV



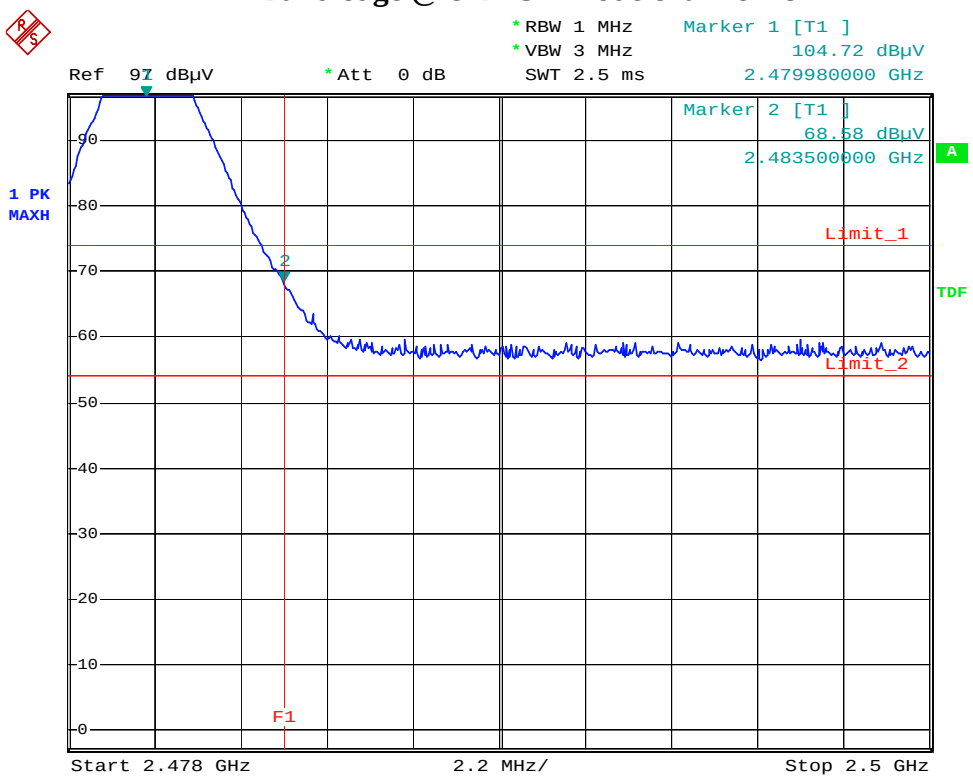
Band edge @ 8-DPSK mode channel 0 PK



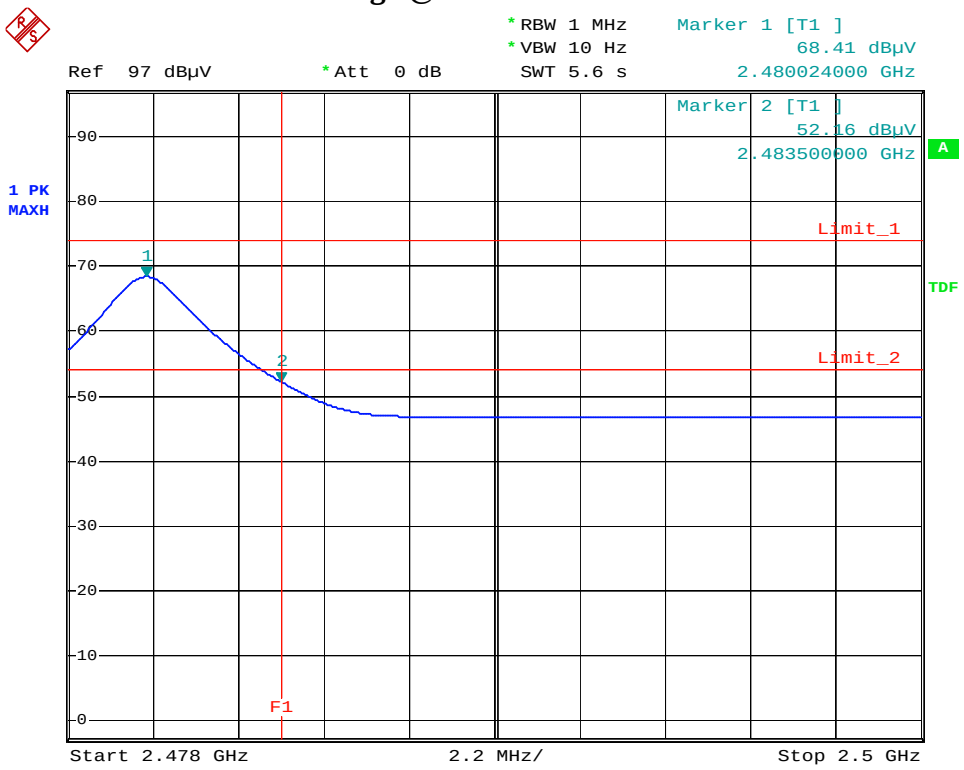
Band edge @ 8-DPSK mode channel 0 AV



Band edge @ 8-DPSK mode channel 78 PK



Band edge @ 8-DPSK mode channel 78 AV

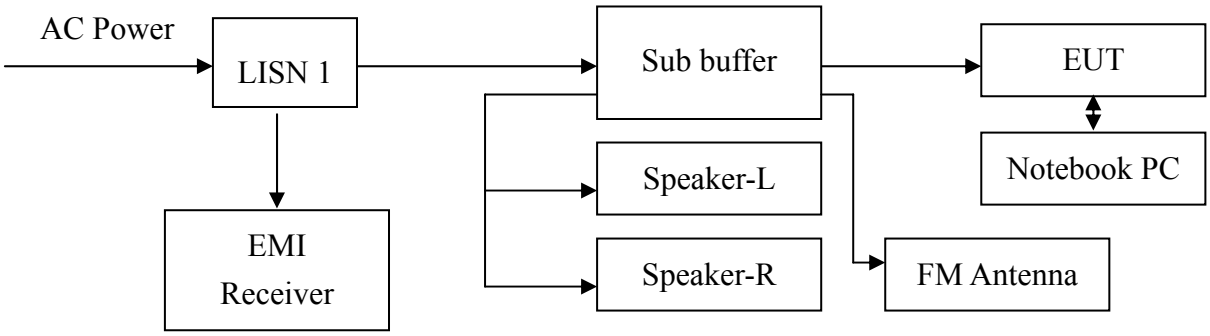


5. Conducted emission test FCC 15.207

5.1 Operating environment

Temperature:	25	℃
Relative Humidity:	50	%
Atmospheric Pressure	1008	hPa

5.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/2003 on conducted measurement.
The bandwidth of the field strength meter (R & S Test Receiver ESCI 30) is set at 9kHz.

The EUT configuration please refer to the “Conducted set-up photo.pdf”.

5.3 Emission limit

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

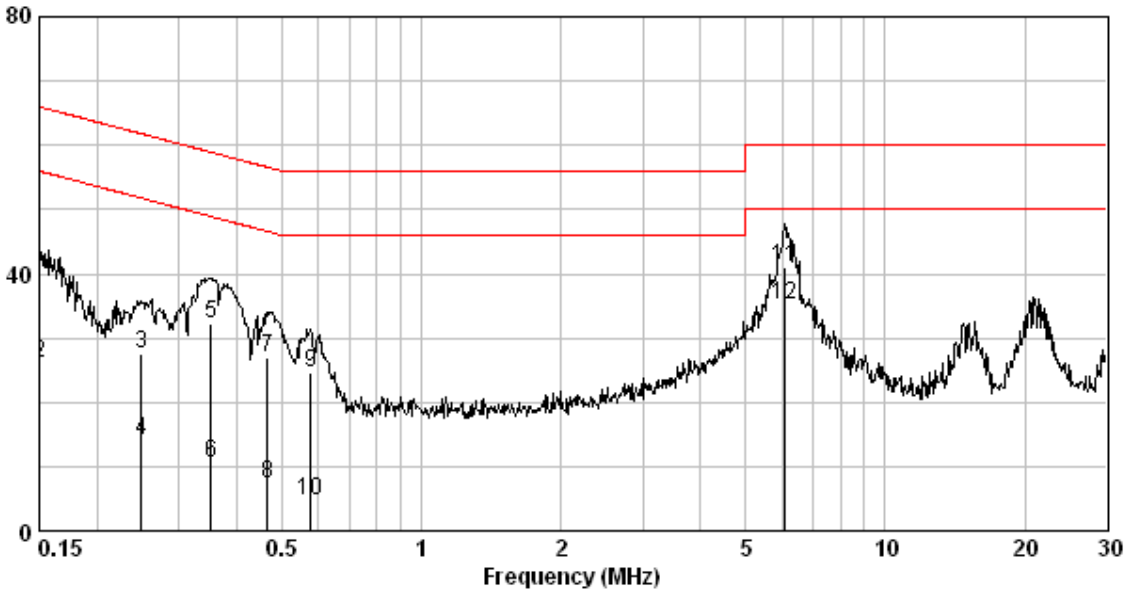
*Decreases with the logarithm of the frequency.

5.4 Conducted emission data FCC 15.207

Phase: Live Line
Model No.: System 1021
Test Condition: Normal mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Over Limit (dB) Qp	Over Limit (dB) Av
0.150	0.33	35.93	66.00	26.10	56.00	-30.07	-29.90
0.249	0.33	27.63	61.78	14.21	51.78	-34.15	-37.57
0.352	0.30	32.09	58.91	10.53	48.91	-26.82	-38.38
0.466	0.29	27.05	56.58	7.35	46.58	-29.53	-39.23
0.576	0.31	24.74	56.00	4.67	46.00	-31.26	-41.33
6.056	0.91	41.03	60.00	35.09	50.00	-18.97	-14.91

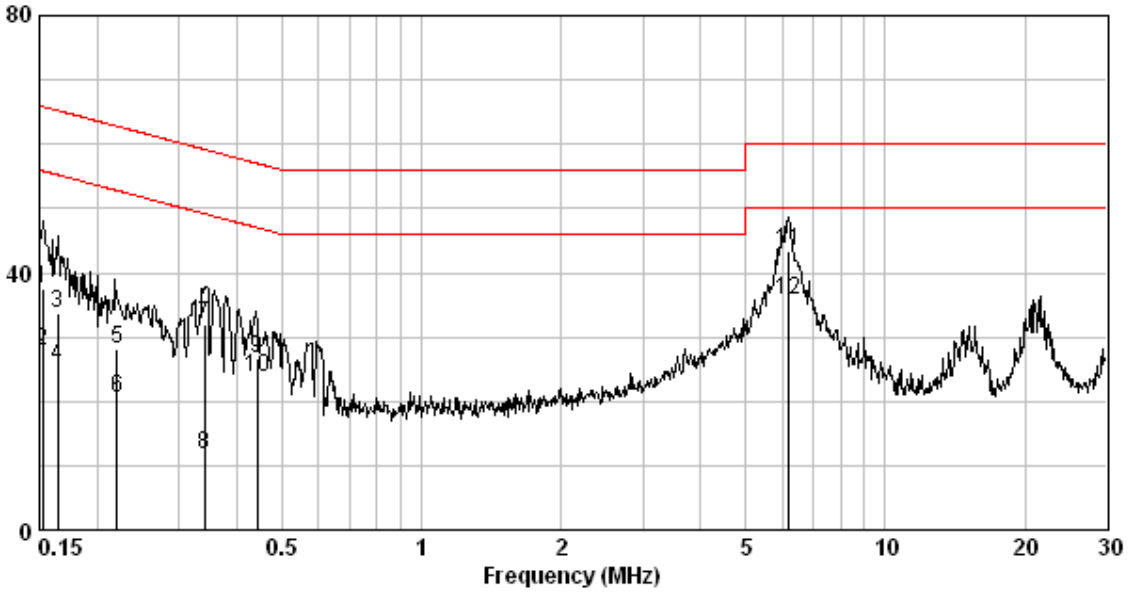
Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Over Limit (dB) = Level (dBuV) – Limit (dBuV)



Phase: Neutral Line
Model No.: System 1021
Test Condition: Normal mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Over Limit (dB) Qp	Over Limit (dB) Av
0.152	0.32	37.60	65.87	27.84	55.87	-28.27	-28.03
0.164	0.32	33.62	65.25	25.54	55.25	-31.63	-29.71
0.221	0.32	28.00	62.79	20.39	52.79	-34.78	-32.39
0.341	0.29	32.05	59.18	11.76	49.18	-27.12	-37.41
0.442	0.28	26.77	57.02	23.83	47.02	-30.25	-23.19
6.162	0.87	43.30	60.00	35.90	50.00	-16.70	-14.10

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



6. 20dB Bandwidth test

6.1 Operating environment

Temperature: 25 ℃
Relative Humidity: 50 %
Atmospheric Pressure: 1008 hPa

6.2 Test setup & procedure

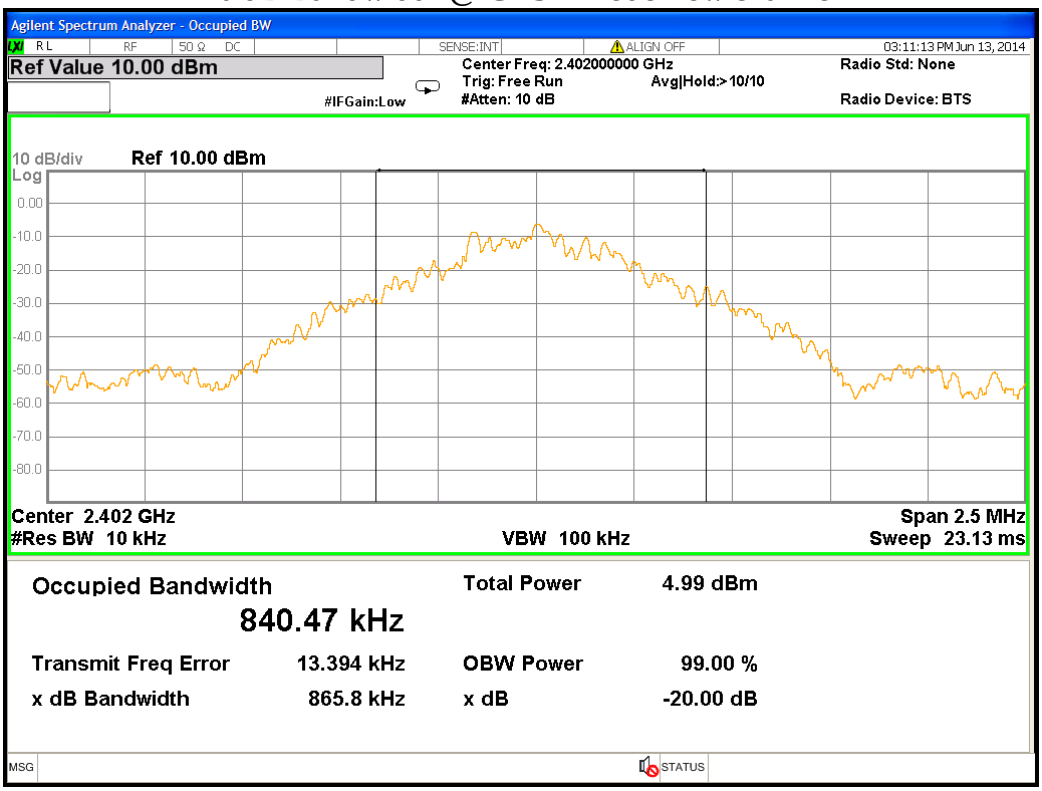
Step 1: The 20dB bandwidth was measured using a 50 ohm spectrum analyzer
Step 2: The span range for the SA display shall be between two times and five times the OBW.
Step 3: The nominal IF filter bandwidth (3 dB RBW) should be approximately 1 % to 5 % of the OBW, unless otherwise specified, depending on the applicable requirement.
Step 4: The test was performed at 3 channels (lowest, middle and highest channel). The maximum 20dB modulation bandwidth is in the following Table.

6.3 Measured data of modulated bandwidth test results

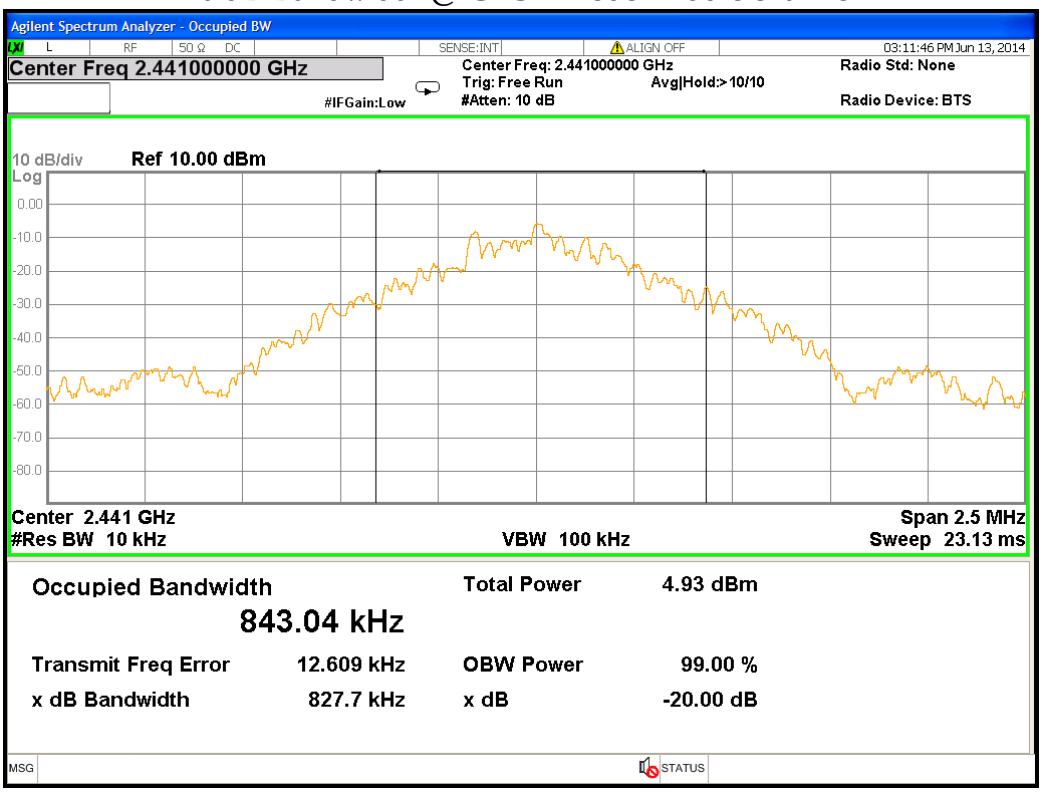
Modulation	Channel	Frequency (MHz)	Data Rate Mbps	20dB Bandwidth(MHz)
GFSK	0	2402	1	0.866
	39	2441		0.828
	78	2480		0.829
8-DPSK	0	2402	3	1.120
	39	2441		1.155
	78	2480		1.158

Please see the plot below.

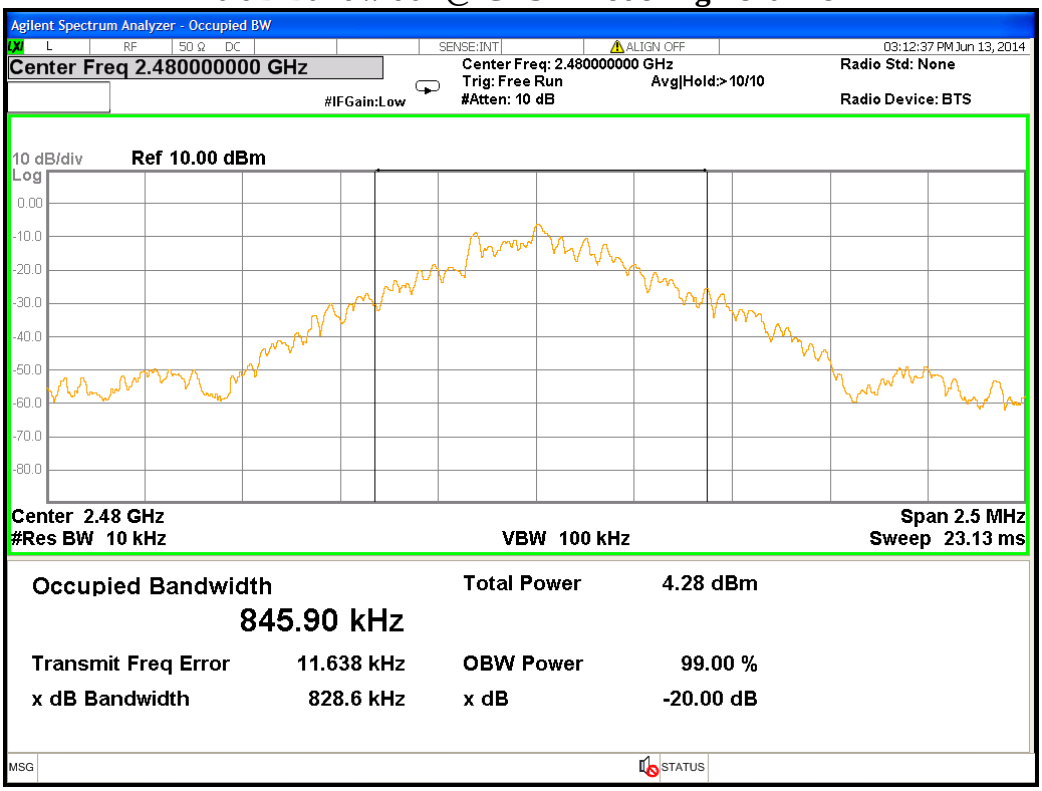
20 dB Bandwidth @ GFSK mode Low channel



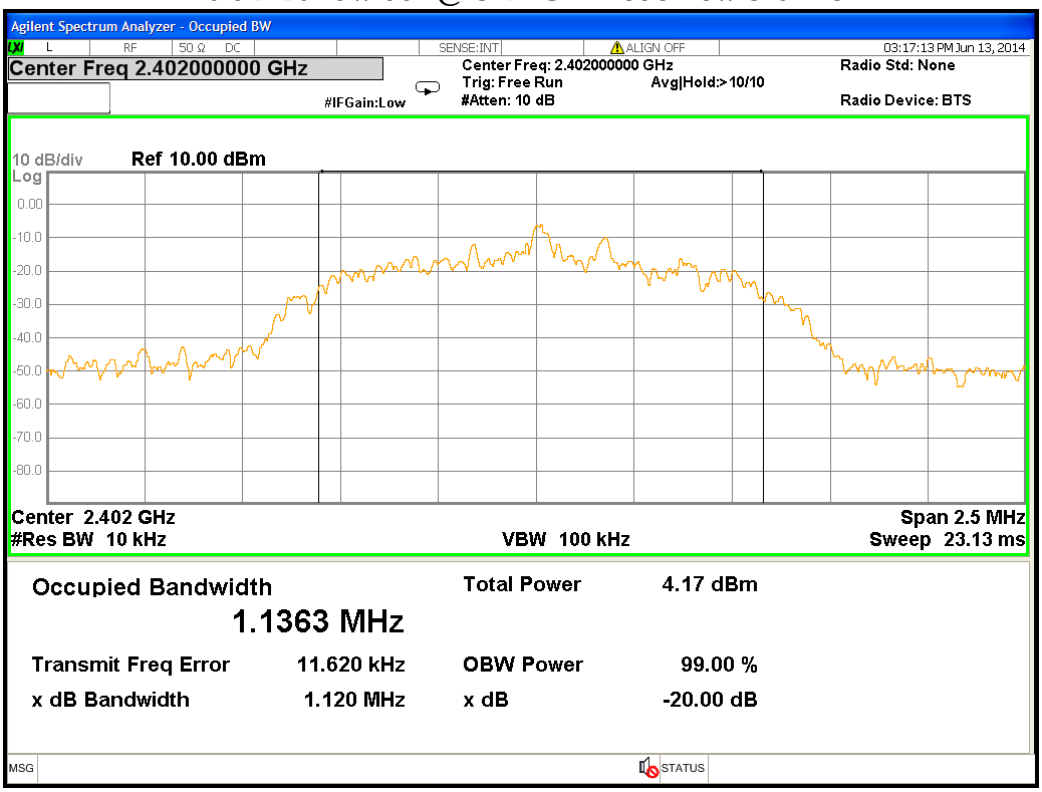
20 dB Bandwidth @ GFSK mode Middle channel



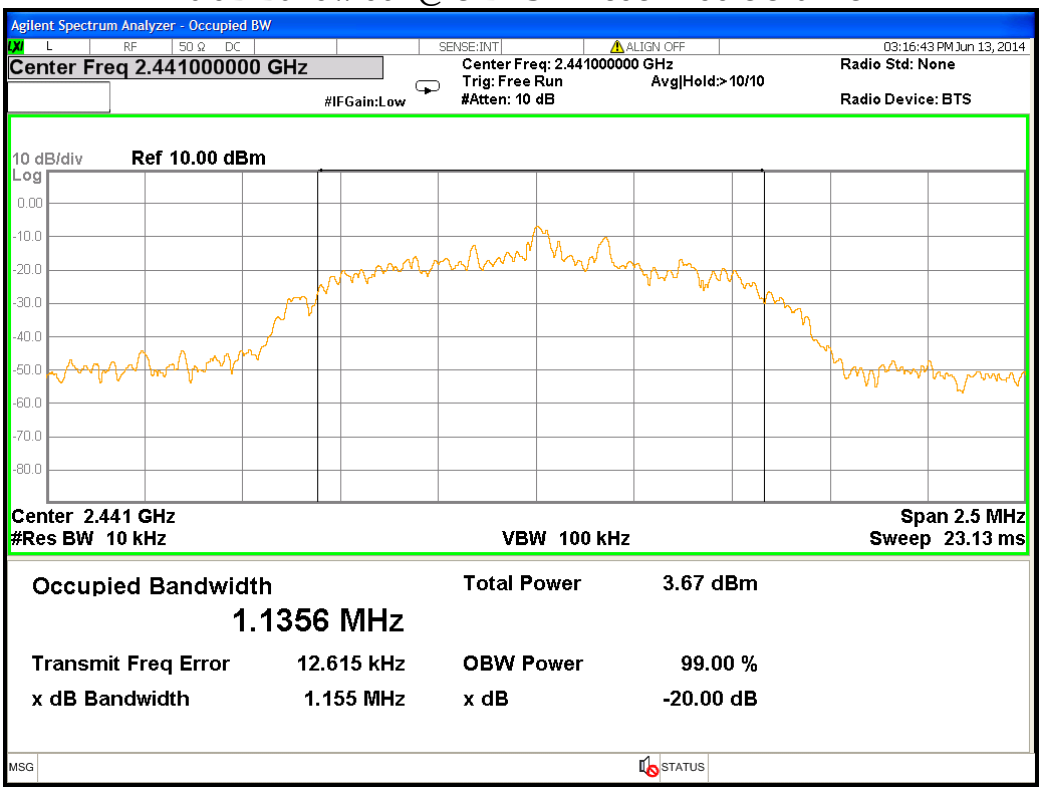
20 dB Bandwidth @ GFSK mode High channel



20 dB Bandwidth @ 8-DPSK mode Low channel



20 dB Bandwidth @ 8-DPSK mode Middle channel



20 dB Bandwidth @ 8-DPSK mode High channel