Radio Test Report (BT LE)

Report No.:	RJBAYG-WTW-P22030448-1
Test Model:	911L
Received Date:	2022/3/14
Test Date:	2022/3/18 ~ 2022/3/21
Issued Date:	2022/6/1
Applicant:	Bose Corporation
Address:	100 The Mountain Road Framingham Massachusetts 01701-9168 United States
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

Table of Contents

Release Control Record 3

1 Certificate of Conformity 4

2 Summary of Test Results 5

2.1 Test Instruments 6
2.2 Measurement Uncertainty 6
2.3 Modification Record 6

3 General Information 7

3.1 General Description of EUT 7
3.2 Description of Test Modes 8
3.3 Test Conditions 9
3.4 Assembly 9
3.5 Antenna Specifications 10
3.5.1 Antenna Gain 10
3.5.2 Antenna Pattern 10

4 Test Results 11

4.1 Frequency Tolerance Measurement 11
4.1.1 Limits of Frequency Tolerance Measurement 11
4.1.2 Test Setup 11
4.1.3 Test Results 11
4.2 Occupied Bandwidth Measurement (99% power bandwidth) 12
4.2.1 Limits of Occupied Bandwidth Measurement 12
4.2.2 Test Setup 12
4.2.3 Test Results 13
4.3 Spurious Emissions for Transmitter Measurement 19
4.3.1 Limits of Spurious Emissions 19
4.3.2 Teset Setup 19
4.3.3 Test Results 20
4.4 Antenna Power Measurement 43
4.4.1 Limits of Antenna Power 43
4.4.2 Test Setup 43
4.4.3 Test Results 44
4.5 Spurious Emissions for Receiver 45
4.5.1 Limits of Spurious Emissions For Receiver 45
4.5.2 Test Setup 45
4.5.3 Test Result 46
4.6 Interference Prevention Function 54
4.6.1 Limits of Interference Prevention Function 54
4.6.2 Test Setup 54
4.6.3 Test Results 54

5 Photographs of the Test Configuration 55

Appendix - Information of the Testing Laboratories 56

Release Control Record

Issue No.	Description	Date Issued
RJBAYG-WTW-P22030448-1	Original release.	2022/6/1

1 Certificate of Conformity

Product:	Wireless Headphone
Brand:	BOSE
Test Model:	911L
Sample Status:	Engineering sample
Applicant:	Bose Corporation
Test Date:	2022/3/18 ~ 2022/3/21
Standards:	ARIB STD-T66 (V3.7), MIC notice 88 Appendix 43 Certification Ordinance Article 2-1-19

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Annie Chang , **Date:** 2022/6/1

Annie Chang / Senior Specialist

Approved by : Jeremy Lin , **Date:** 2022/6/1

Jeremy Lin / Project Engineer

2 Summary of Test Results

The EUT has been tested according to the following specifications:

Notice 88 Appendix 43 Reference	ARIB STD-T66 Ref.	Report Reference	Parameter	Test Results (Note)
General Provisions				
C	3.2 (4)	4.1	Frequency tolerance	C
D	3.2 (7)	4.2	Occupied bandwidth	C
E	3.2 (6)	4.3	Spurious emissions	C
Transmitting Equipment				
F	3.2 (2)	4.4	Antenna power	C
--	--	--	SAR	NA
Transmitting Antenna				
--	--	3.5	Type, configuration, etc. of transmitting antenna	C
--	--	3.5	Direction pattern of transmitting antenna	C
Receiving Equipment				
G	3.3 (1)	4.5	Spurious emissions of receiver	C
--	--	3.5	Refer to all articles for transmitting antenna	C
Operating Frequency 2400 to 2483.5MHz				
--	3.7 (1)	3.4	High Frequency	C
--	3.7 (1)	3.4	Modulation section cannot be opened easily	C
--	3.1 (1)	3.1	Communication method	C
--	3.2 (1)a	3.1	Modulation method	C
--	3.2 (1)a	3.1	Spread spectrum method	C
--	3.2 (2)	4.4	Antenna power	C
--	3.6 (2)	4.4	Absolute gain of transmitting antenna	C
--	3.6 (2)	--	Angular width of principal radiation (AWPR)	NA
--	3.2 (10)	--	Number of carriers within 1 MHz bandwidth in OFDM	NA
--	3.2 (8)	--	Spreading bandwidth	NA
--	3.2 (9)	--	Spreading factor	NA
--	3.2 (11)	--	Frequency retention time (FH employed)	NA
--	3.4.1(1)	4.6	Interference Prevention Function	C
--	3.4.1(3)	--	Carrier Sense Capability	NA

Note:

1. C = Conform NC = Not Conform NT = Not Tested NA = Not Applicable
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until	Calibration Authority	Cal. Method
MIMO Power measurement Test set (4X4) KEYSIGHT	U2021XA	U2021XA_001	2021/6/16	2022/6/15	ETC	c)
Spectrum Analyzer R&S	FSV40	101042	2021/9/9	2022/9/8	ETC	c)
Spectrum Analyzer KEYSIGHT	N9030A	MY54490260	2021/7/23	2022/7/22	ETC	c)
Pulse Power Sensor Anritsu	MA2411B	0738404	2021/4/15	2022/4/14	ETC	c)
Peak Power meter Anritsu	ML2495A	0842014	2021/4/15	2022/4/14	ETC	c)
MXG Vector Signal Generator KEYSIGHT	N5182B	MY53052658	2021/5/19	2022/5/18	ETC	c)
True RMS Clamp Meter Fluke	325	31130711WS	2021/6/2	2022/6/1	ETC	c)
AC POWER SOURCE Schaffner	Profline2105-208 NSG1007	55616	2021/6/2	2022/6/1	ETC	c)
Programmable DC Power Supply (IDRC)	DSP80-180WE	701217	2022/3/3	2023/3/2	ETC	c)

NOTE: Calibration Method
a)：Calibration conducted by the National Institute of Information and Communications Technology(NICT) or a designated calibration agency under Article 102-18 paragraph (1) of the Radio Law.
b)： Calibration conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Law (Law No. 51 of 1992) Japan Calibration Service System.
c)： Calibration conducted in foreign countries, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
d)：Calibration conducted by using other equipment that listed above from a) to c)

2.2 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in TR 100 028-1.
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Parameter	Uncertainty
Occupied Bandwidth	206.50 Hz
Spurious emissions	3.93 dB
Output power density	1.11 dB
Out of band radiated power	3.93 dB
Frequency Tolerance	603.76 Hz

2.3 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless Headphone
Brand	BOSE
Test Model	911L
Status of EUT	Engineering sample
Nominal Voltage	3.85Vdc, 110mAh
Modulation Type	GFSK
Transfer Rate	Up to 2Mbps
Operating Frequency	2402 ~ 2480MHz
Number of Channel	40
Rated RF Output Power	Refer to note
Conducted RFOutput Power	Refer to note
Radiated RF Output Power	Refer to note
Antenna Type	LDS antenna with 1.01dBi gain
Antenna Connector	N/A
Accessory Device	Charging Case
Data Cable Supplied	Shielded USB Type C cable (0.3m)

Note:

1. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2. The power table as below:

Modulation Type	Rated power (mW)	Total Conducted RF output power (mW)	Radiated RF output power (mW)
GFSK (1Mbps)	7	6.776	8.550
GFSK (2Mbps)	7	6.902	8.709

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

3.2 Description of Test Modes

40 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	**2402**	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	**19**	**2440**	29	2460	**39**	**2480**

Note: The channels which were indicated in bold type of the above channel list were selected as representative test channel. Therefore only the data of the test channels were recorded in this report.

By means of test software provided by manufacture, the power levels during the tests were set according to the following codes:

Modulation type: GFSK (1Mbps)		**Modulation type: GFSK (2Mbps)**	
Channel	**Power setting**	**Channel**	**Power setting**
0	6	0	6
19	6	19	6
39	6	39	6

3.3 Test Conditions

Test Conditions		Voltage (Vdc)
V_{normal}	-	3.85
$V_{max.}$	+10%	4.235
$V_{min.}$	-10%	3.465

Test modes are presented in the report as below:

Test Item	Environmental Conditions
Frequency Tolerance	25 deg.C, 76% RH
Occupied Bandwidth	25 deg.C, 76% RH
Spurious Emissions for Transmitter	25 deg.C, 76% RH
Antenna Power	25 deg.C, 76% RH
Spurious Emissions for Receiver	25 deg.C, 76% RH
Interference Prevention Function	25 deg.C, 76% RH

3.4 Assembly

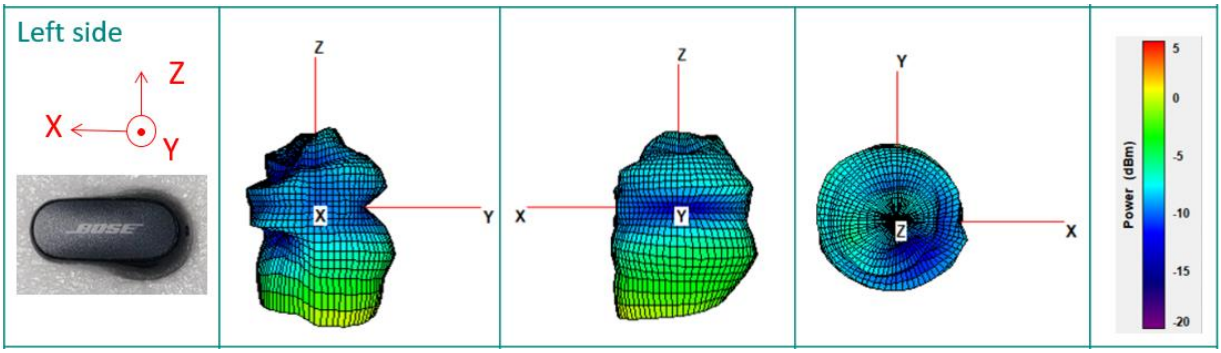
The EUT use ultrasonic welding to seal the product. Separating the two parts (i.e operating of the housing) was only possible by means of brute force.

3.5 Antenna Specifications

3.5.1 Antenna Gain

Antenna Type	Max. Gain (dBi)
LDS antenna	1.01

3.5.2 Antenna Pattern



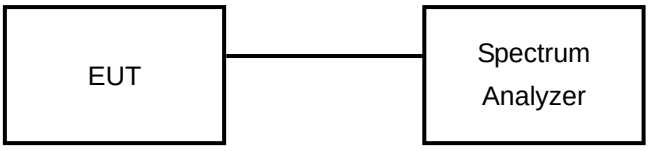
4 Test Results

4.1 Frequency Tolerance Measurement

4.1.1 Limits of Frequency Tolerance Measurement

Tolerance of frequency shall be +/- 50ppm

4.1.2 Test Setup



4.1.3 Test Results

GFSK (1Mbps)

Channel	Frequency (MHz)	V_{normal}		$V_{max.}$		$V_{min.}$	
		Carrier frequency (MHz)	Frequency tolerance (ppm)	Carrier frequency (MHz)	Frequency tolerance (ppm)	Carrier frequency (MHz)	Frequency tolerance (ppm)
0	2402	2401.997320	-1.115	2401.996840	-1.315	2401.996760	-1.348
19	2440	2439.996439	-1.459	2439.996360	-1.491	2439.996279	-1.525
39	2480	2480.000812	0.327	2479.995200	-1.935	2479.994680	-2.145

GFSK (2Mbps)

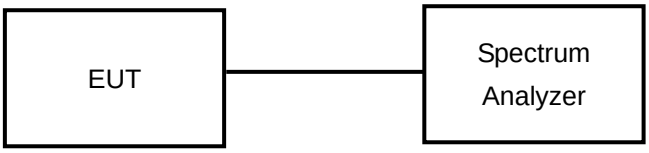
Channel	Frequency (MHz)	V_{normal}		$V_{max.}$		$V_{min.}$	
		Carrier frequency (MHz)	Frequency tolerance (ppm)	Carrier frequency (MHz)	Frequency tolerance (ppm)	Carrier frequency (MHz)	Frequency tolerance (ppm)
0	2402	2401.994440	-2.314	2401.994160	-2.431	2401.994080	-2.464
19	2440	2439.994039	-2.443	2439.993960	-2.475	2439.993960	-2.475
39	2480	2479.993879	-2.468	2479.993840	-2.483	2479.993799	-2.500

4.2 Occupied Bandwidth Measurement (99% power bandwidth)

4.2.1 Limits of Occupied Bandwidth Measurement

Item	Limit	Remark
Occupied bandwidth	<26MHz	-

4.2.2 Test Setup



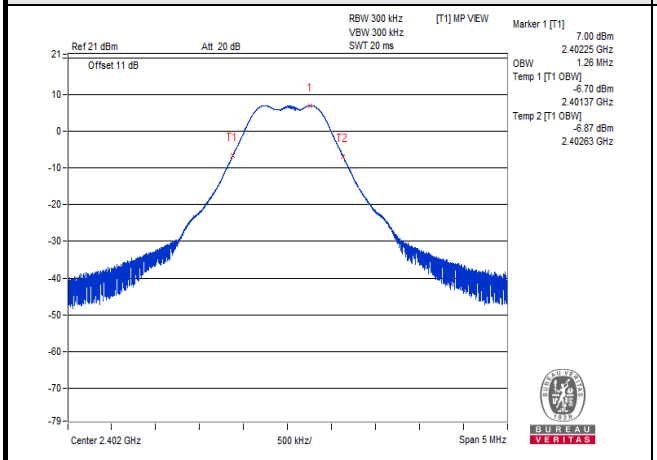
4.2.3 Test Results

GFSK (1Mbps)

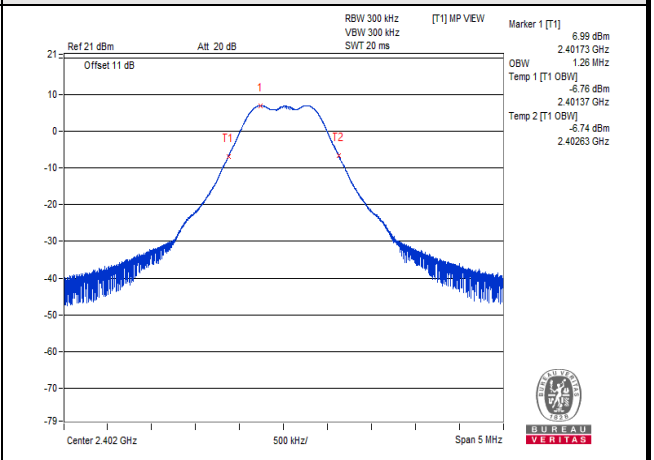
Channel	Frequency (MHz)	V_{normal}	$V_{max.}$	$V_{min.}$
		Occupied bandwidth (MHz)	Occupied bandwidth (MHz)	Occupied bandwidth (MHz)
0	2402	1.26	1.26	1.26
19	2440	1.26	1.26	1.26
39	2480	1.26	1.26	1.26

NOTE: For the test plots please refer to the below pages.

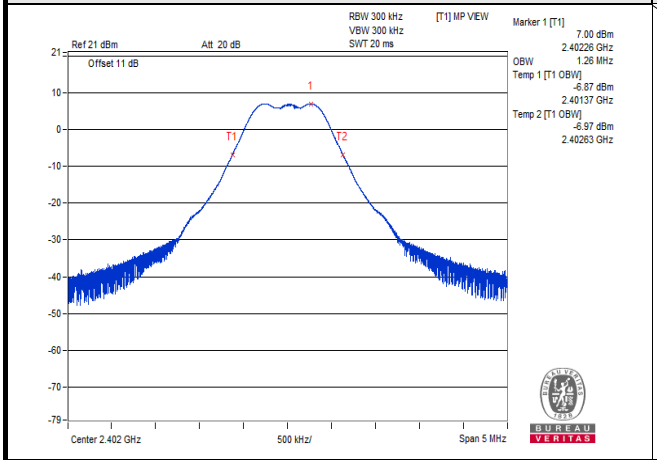
V_{normal}



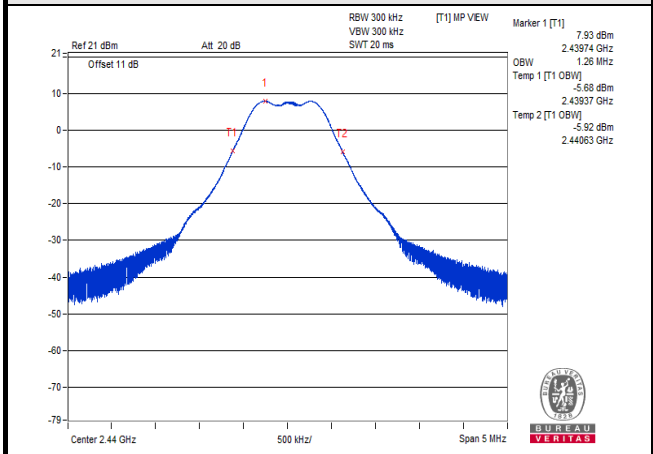
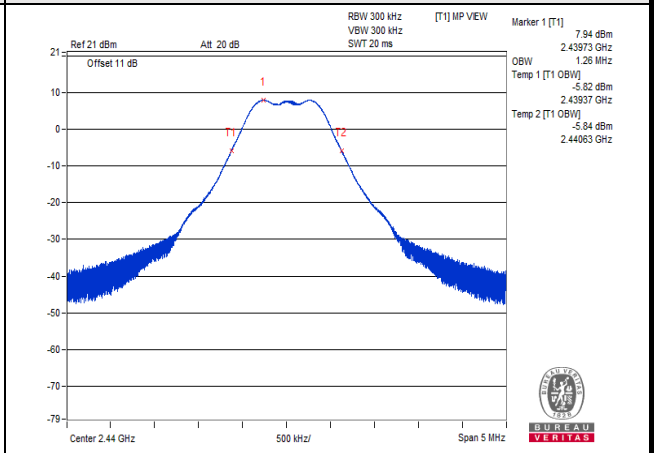
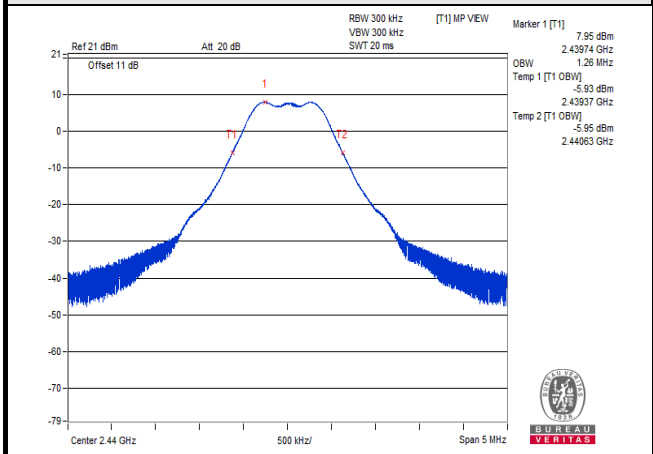
$V_{max.}$

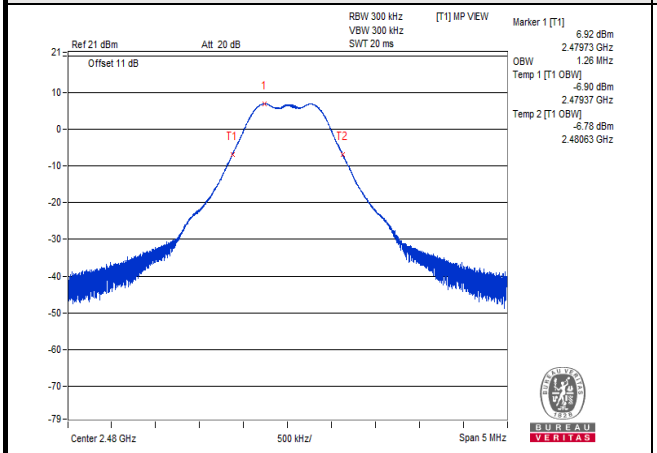
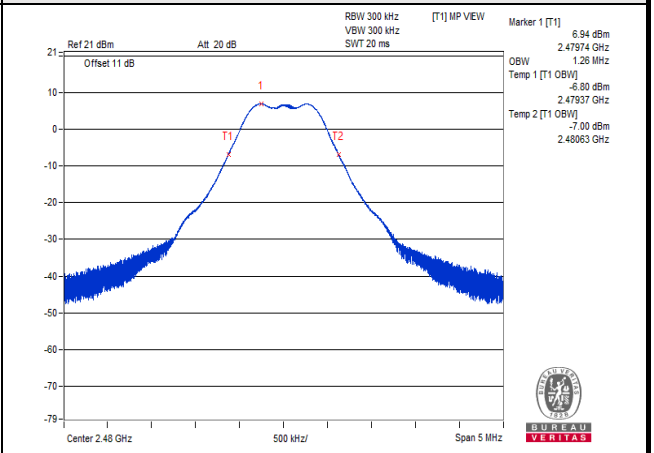
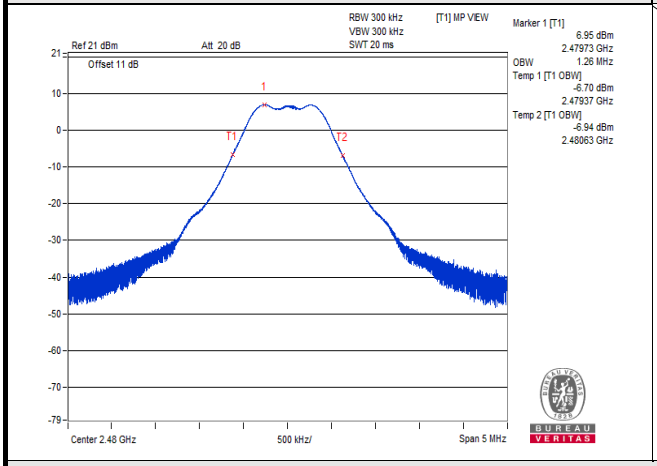


$V_{min.}$



CH 0 (2402MHz)

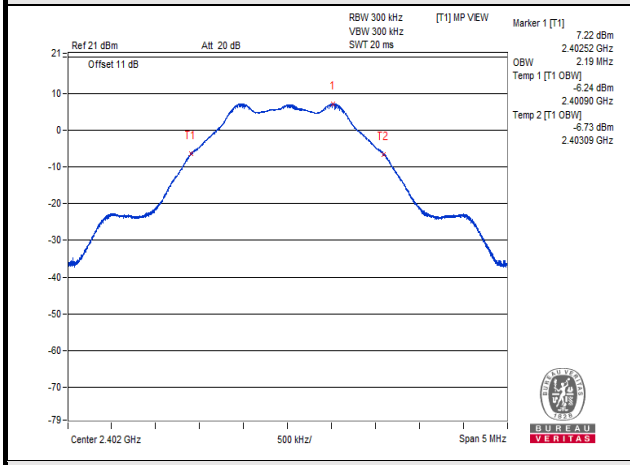
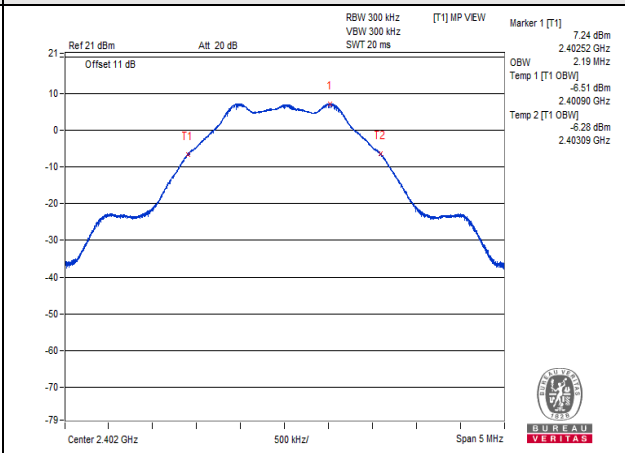
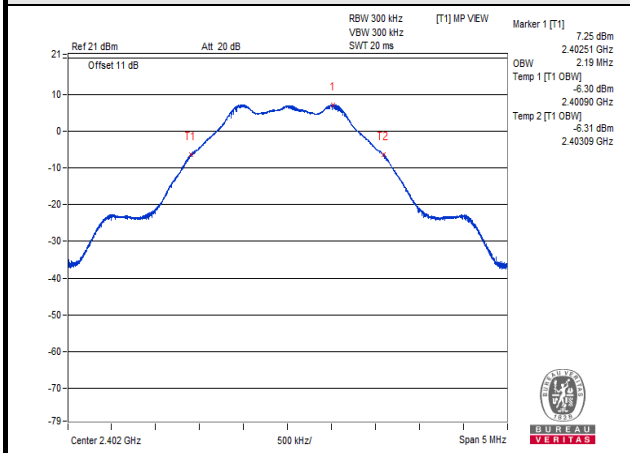
V_{normal}	$V_{max.}$
	
$V_{min.}$	
	
CH 19 (2440MHz)	

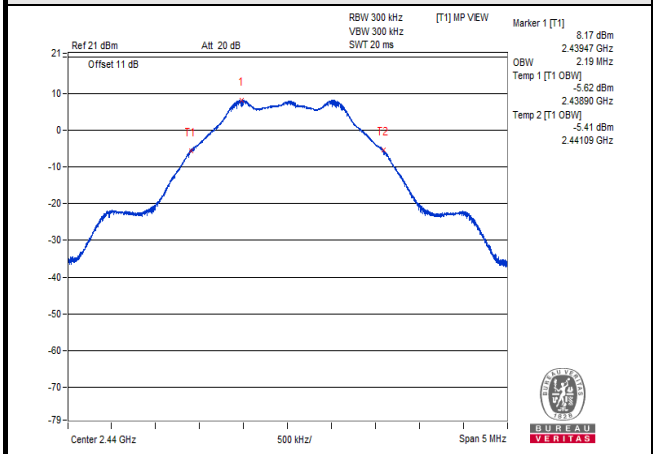
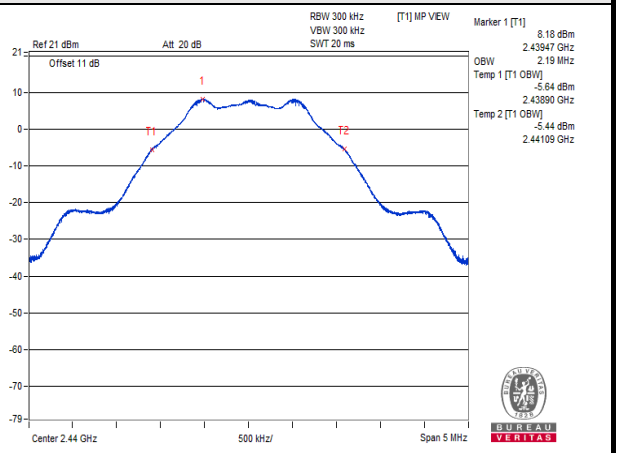
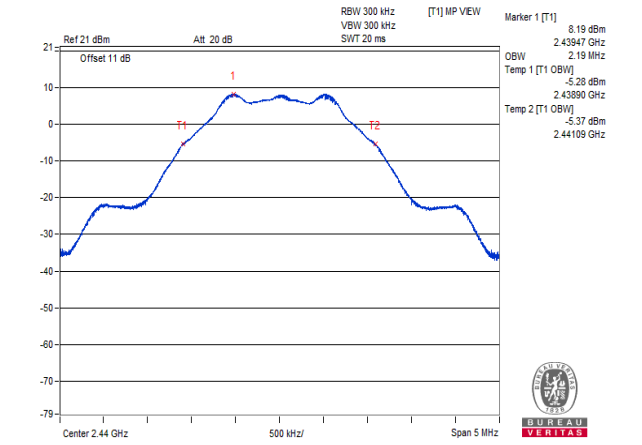
V_{normal}	$V_{max.}$
	
$V_{min.}$	
	
CH 39 (2480MHz)	

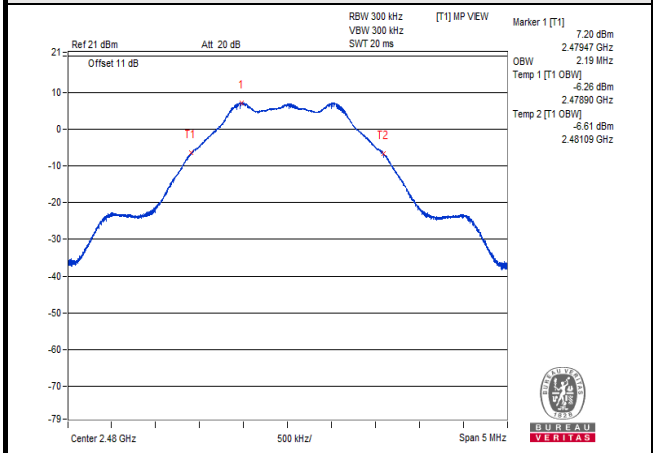
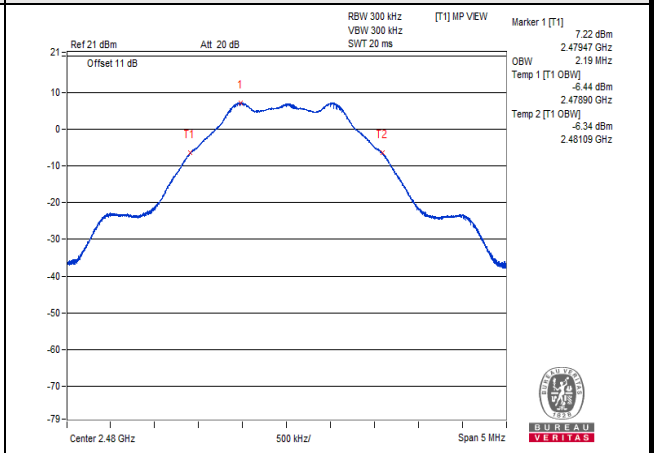
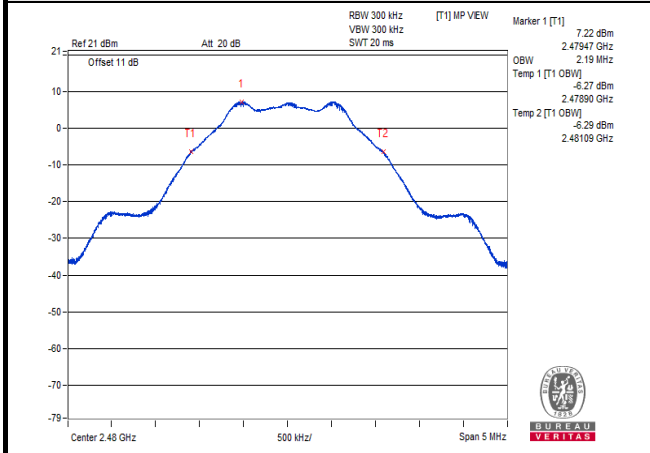
GFSK (2Mbps)

Channel	Frequency (MHz)	V_{normal}	$V_{max.}$	$V_{min.}$
		Occupied bandwidth (MHz)	Occupied bandwidth (MHz)	Occupied bandwidth (MHz)
0	2402	2.19	2.19	2.19
19	2440	2.19	2.19	2.19
39	2480	2.19	2.19	2.19

NOTE: For the test plots please refer to the below pages.

V_{normal}	$V_{max.}$
	
$V_{min.}$	
	
CH 0 (2402MHz)	

V_{normal}	$V_{max.}$
	
$V_{min.}$	
	
CH 19 (2440MHz)	

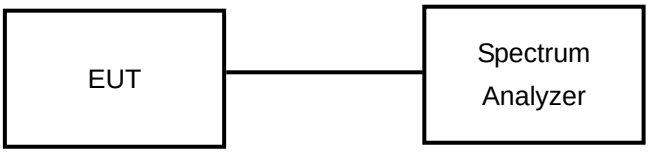
V_{normal}	$V_{max.}$
	
$V_{min.}$	
	
CH 39 (2480MHz)	

4.3 Spurious Emissions for Transmitter Measurement

4.3.1 Limits of Spurious Emissions

Frequencies (MHz)	Limit
Operating frequency 2400 to 2483.5MHz	
30.0MHz to 1000.0MHz	≦ 0.25 uW/100kHz
1000.0MHz to 2387MHz	≦ 2.5 uW/MHz
2387.0MHz to 2400.0MHz	≦ 25 uW/MHz
2483.5MHz to 2496.5MHz	≦ 25 uW/MHz
2496.5MHz to 12500.0MHz	≦ 2.5 uW/MHz

4.3.2 Teset Setup



4.3.3 Test Results

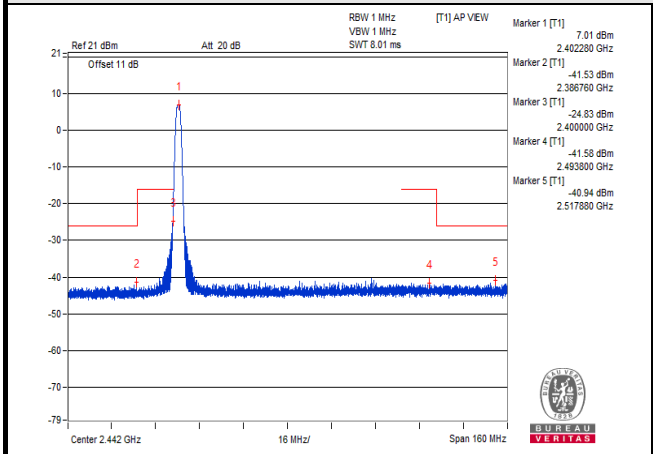
GFSK (1Mbps)

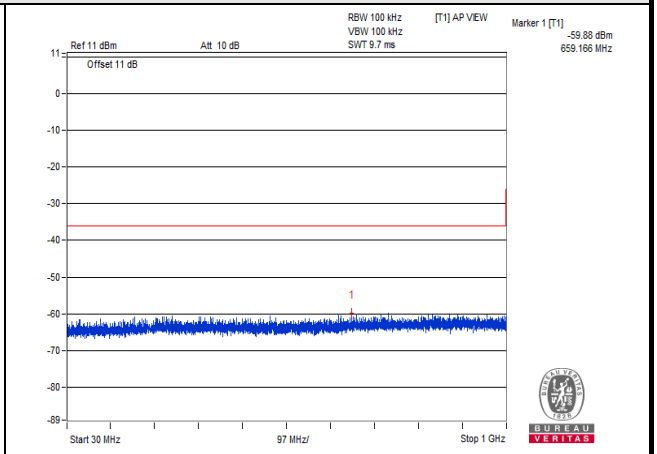
TEST CHANNEL		CH 0 (2402MHz)			
TEST CONDITION	FREQUENCY RANGE(MHz)	FREQUENCY (MHz)	MEASURE. VALUE(uW)	LIMIT (uW)	RESULT
V_{normal}	30MHz to 1000MHz	659.166	0.001028	0.25	PASS
	1000MHz to 2387MHz	2366.368	0.068865	2.5	PASS
	2387MHz to 2400MHz	2399.980	3.475362	25	PASS
	2483.5MHz to 2496.5MHz	2488.274	0.089950	25	PASS
	2496.5MHz to 12500MHz	11094.508	0.240991	2.5	PASS
$V_{max.}$	30MHz to 1000MHz	875.112	0.001107	0.25	PASS
	1000MHz to 2387MHz	1553.239	0.073114	2.5	PASS
	2387MHz to 2400MHz	2400.000	3.372873	25	PASS
	2483.5MHz to 2496.5MHz	2491.719	0.096605	25	PASS
	2496.5MHz to 12500MHz	11948.557	0.250035	2.5	PASS
$V_{min.}$	30MHz to 1000MHz	863.836	0.001312	0.25	PASS
	1000MHz to 2387MHz	2352.151	0.065013	2.5	PASS
	2387MHz to 2400MHz	2399.998	3.664376	25	PASS
	2483.5MHz to 2496.5MHz	2484.299	0.092683	25	PASS
	2496.5MHz to 12500MHz	6971.815	0.229087	2.5	PASS
TEST CHANNEL		CH 19 (2440MHz)			
V_{normal}	30MHz to 1000MHz	773.747	0.001125	0.25	PASS
	1000MHz to 2387MHz	2256.101	0.063241	2.5	PASS
	2387MHz to 2400MHz	2397.406	0.078524	25	PASS
	2483.5MHz to 2496.5MHz	2487.253	0.090991	25	PASS
	2496.5MHz to 12500MHz	11958.559	0.243220	2.5	PASS
$V_{max.}$	30MHz to 1000MHz	883.600	0.001125	0.25	PASS
	1000MHz to 2387MHz	2312.448	0.080910	2.5	PASS
	2387MHz to 2400MHz	2397.903	0.073790	25	PASS
	2483.5MHz to 2496.5MHz	2493.527	0.092683	25	PASS
	2496.5MHz to 12500MHz	11189.540	0.276058	2.5	PASS
$V_{min.}$	30MHz to 1000MHz	714.456	0.001245	0.25	PASS
	1000MHz to 2387MHz	2312.622	0.074817	2.5	PASS
	2387MHz to 2400MHz	2390.042	0.081470	25	PASS
	2483.5MHz to 2496.5MHz	2487.270	0.091833	25	PASS
	2496.5MHz to 12500MHz	12311.183	0.263027	2.5	PASS

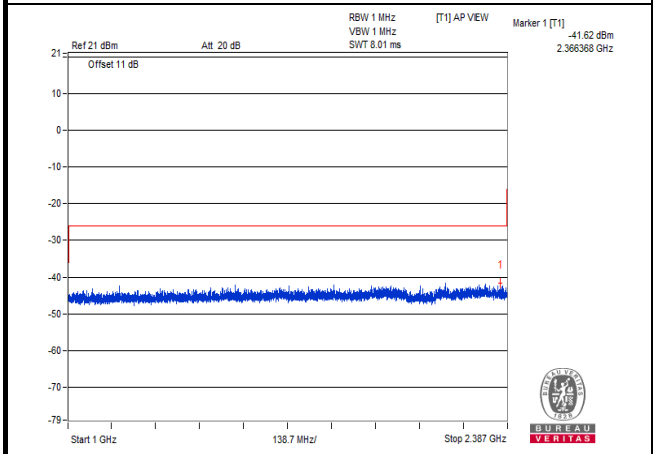
TEST CHANNEL		CH 39 (2480MHz)			
TEST CONDITION	FREQUENCY RANGE(MHz)	FREQUENCY (MHz)	MEASURE. VALUE(uW)	LIMIT (uW)	RESULT
V_{normal}	30MHz to 1000MHz	928.826	0.001279	0.25	PASS
	1000MHz to 2387MHz	2317.823	0.063096	2.5	PASS
	2387MHz to 2400MHz	2396.824	0.075683	25	PASS
	2483.5MHz to 2496.5MHz	2483.519	0.385478	25	PASS
	2496.5MHz to 12500MHz	11324.588	0.220800	2.5	PASS
$V_{max.}$	30MHz to 1000MHz	926.765	0.001107	0.25	PASS
	1000MHz to 2387MHz	2302.046	0.064269	2.5	PASS
	2387MHz to 2400MHz	2397.104	0.077090	25	PASS
	2483.5MHz to 2496.5MHz	2483.532	0.360579	25	PASS
	2496.5MHz to 12500MHz	10770.644	0.216770	2.5	PASS
$V_{min.}$	30MHz to 1000MHz	710.455	0.001064	0.25	PASS
	1000MHz to 2387MHz	2278.467	0.067453	2.5	PASS
	2387MHz to 2400MHz	2397.229	0.065917	25	PASS
	2483.5MHz to 2496.5MHz	2483.542	0.457088	25	PASS
	2496.5MHz to 12500MHz	11951.057	0.223357	2.5	PASS

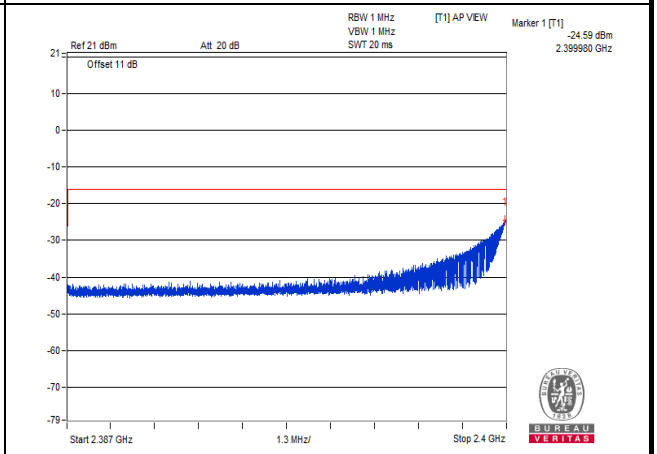
NOTE: The spectrum plots are attached on the following pages.

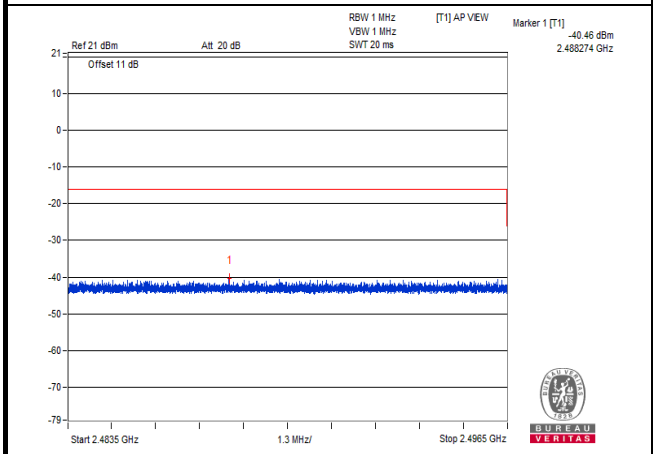
Vnormal

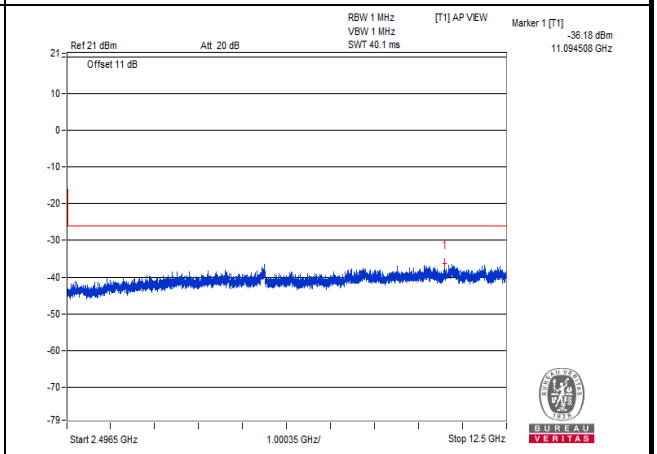






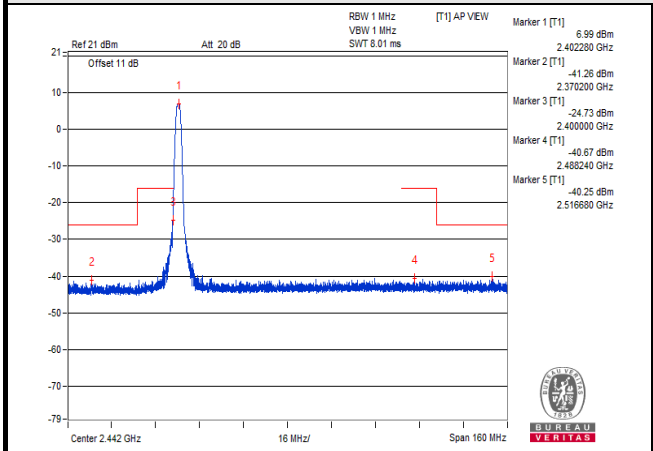


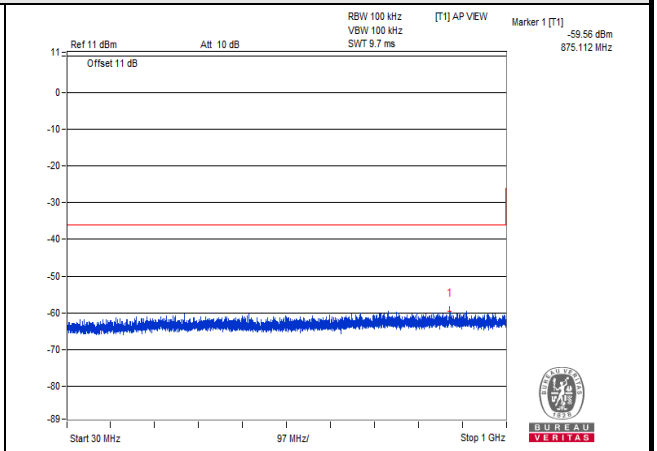


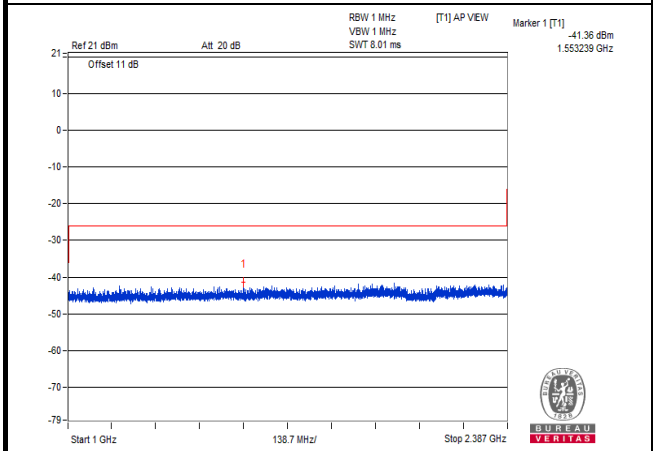


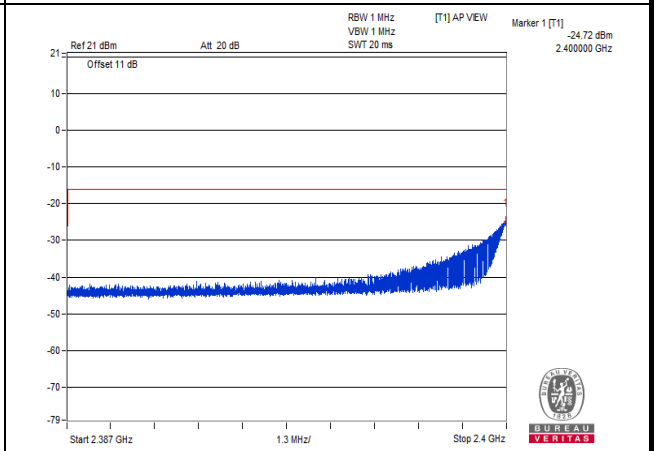
CH 0 (2402MHz)

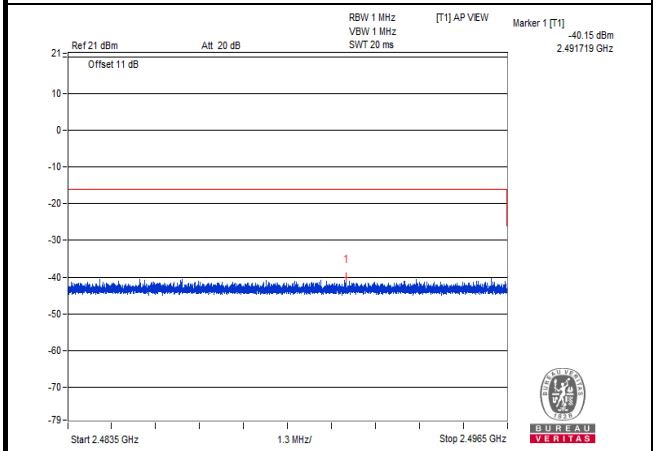
Vmax.

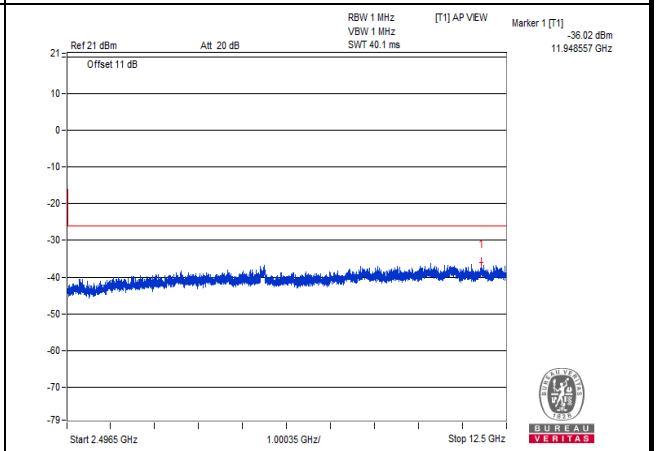






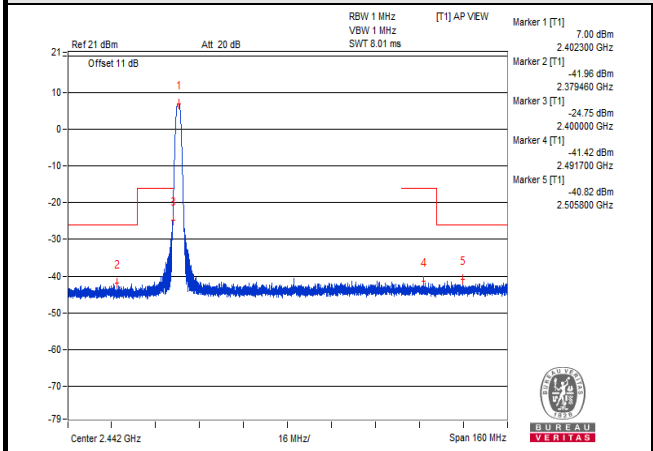


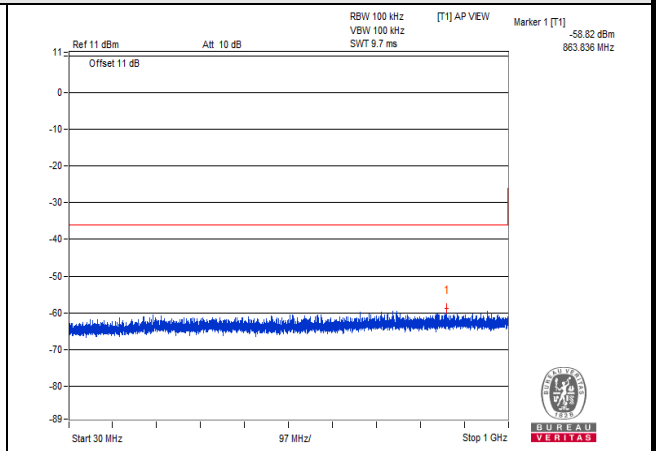


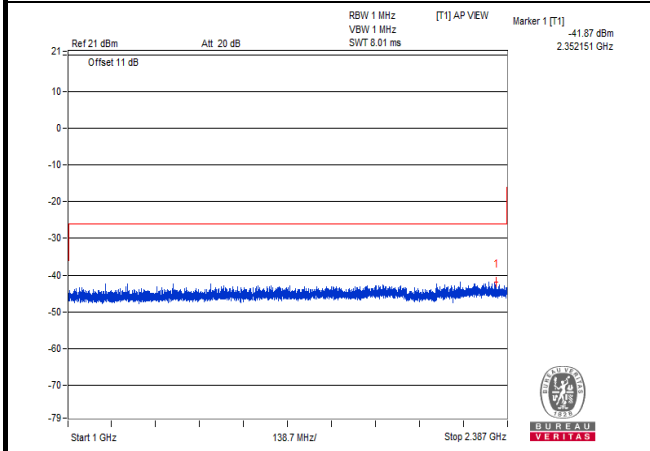


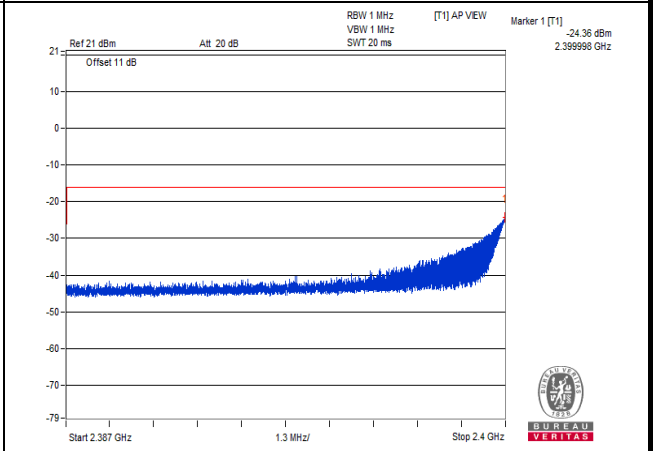
CH 0 (2402MHz)

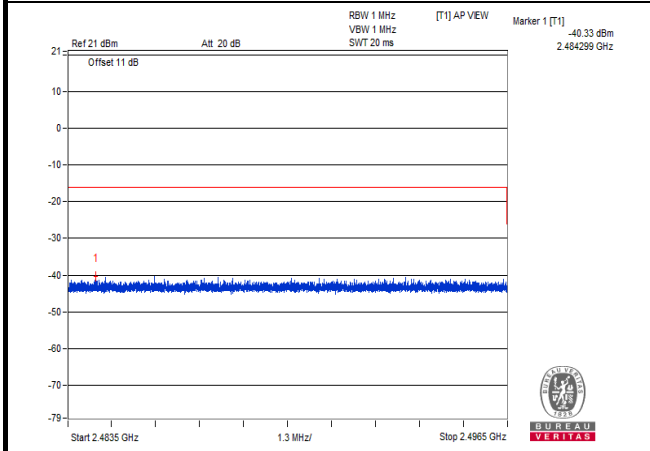
Vmin.

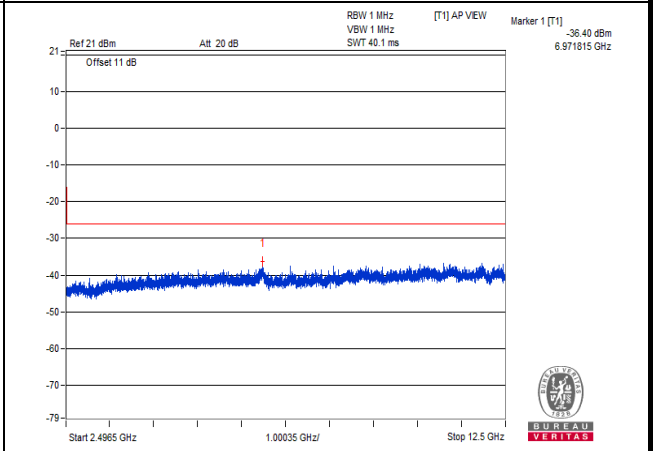






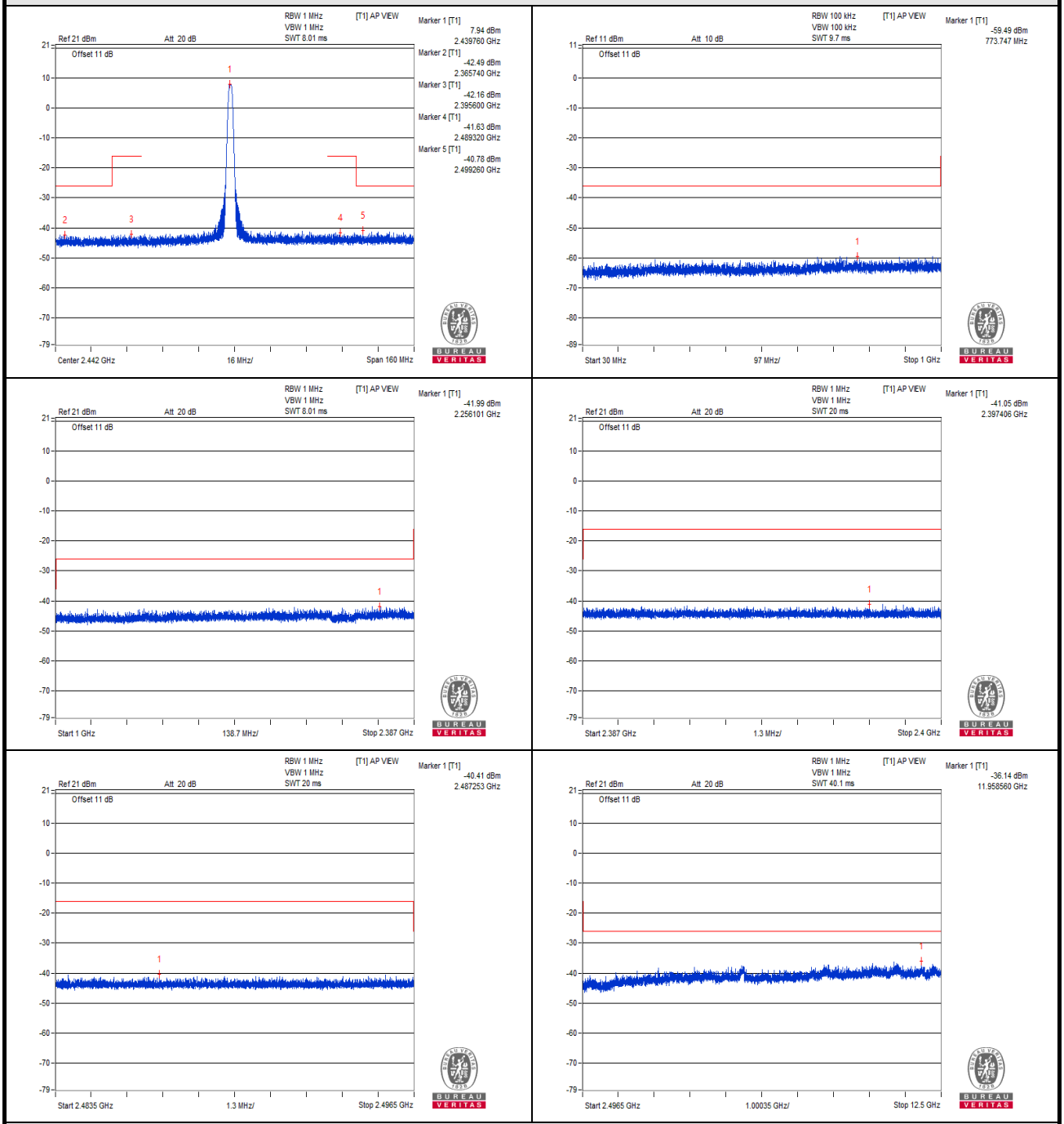






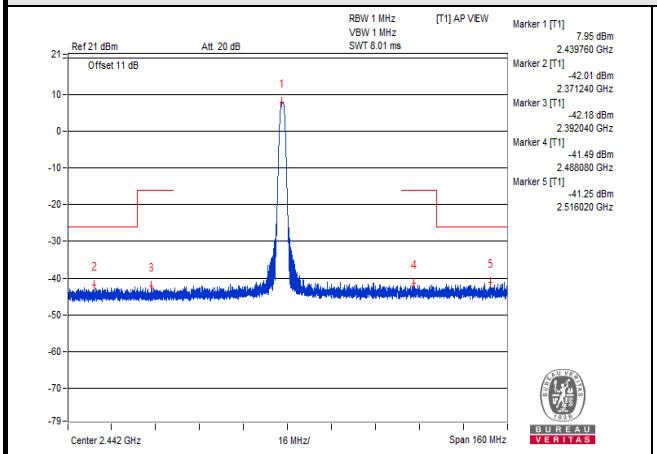
CH 0 (2402MHz)

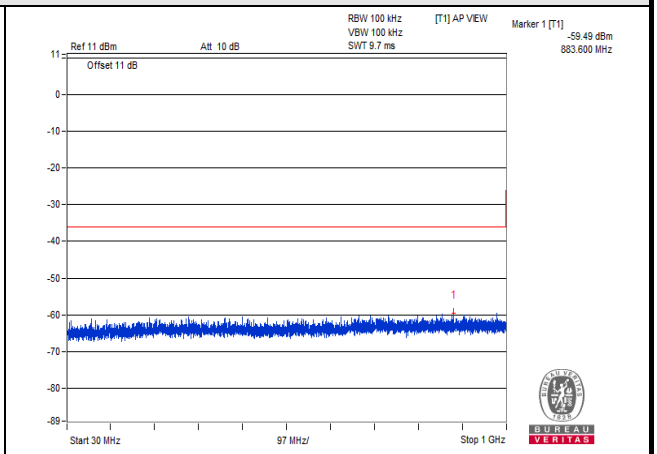
Vnormal

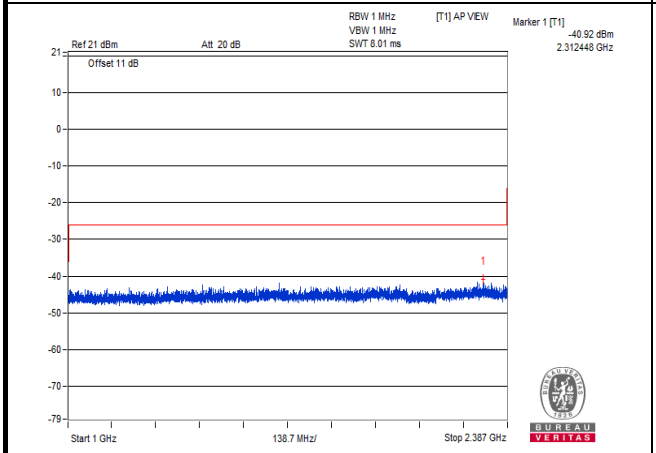


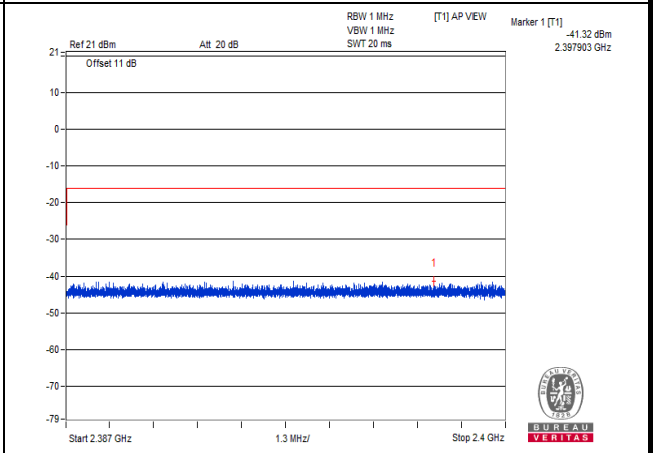
CH 19 (2440MHz)

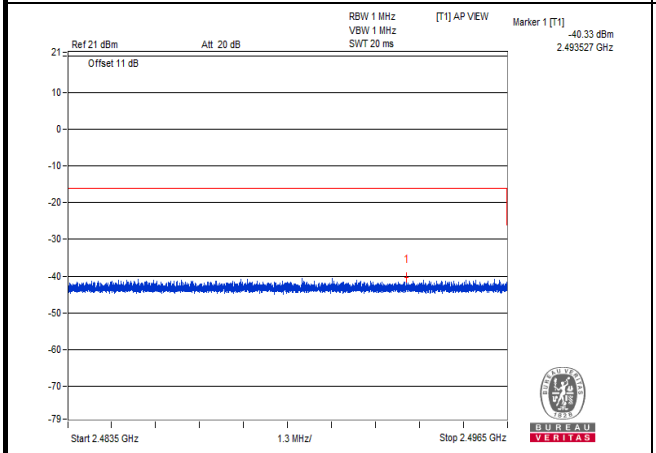
Vmax.

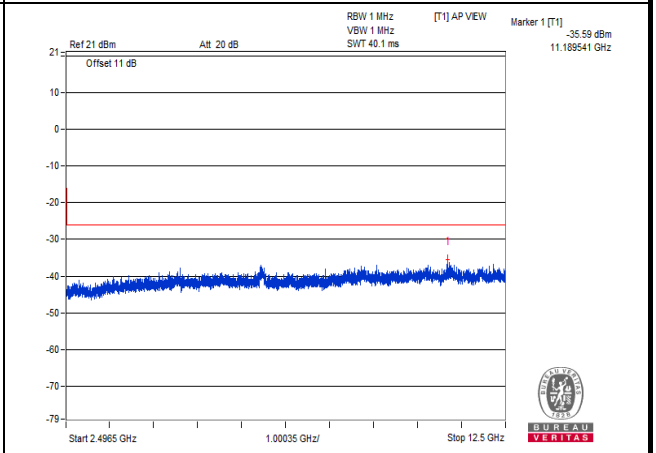






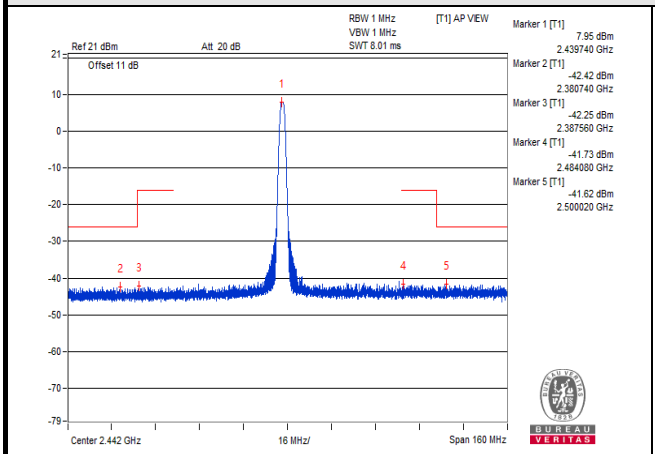


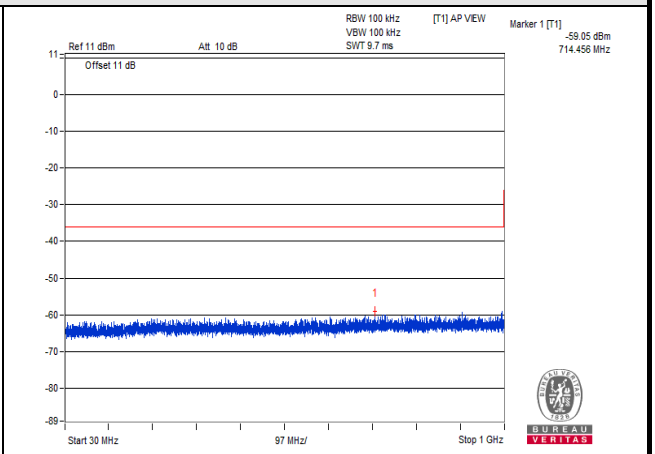


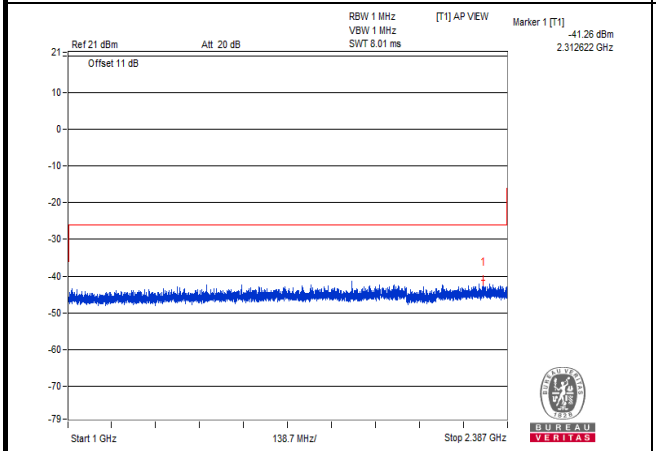


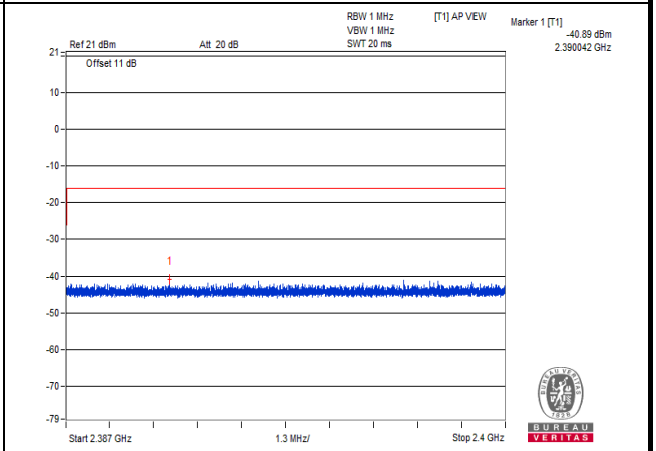
CH 19 (2440MHz)

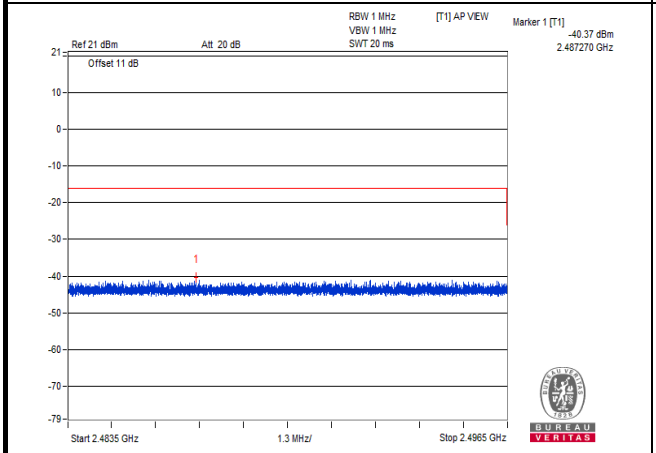
Vmin.

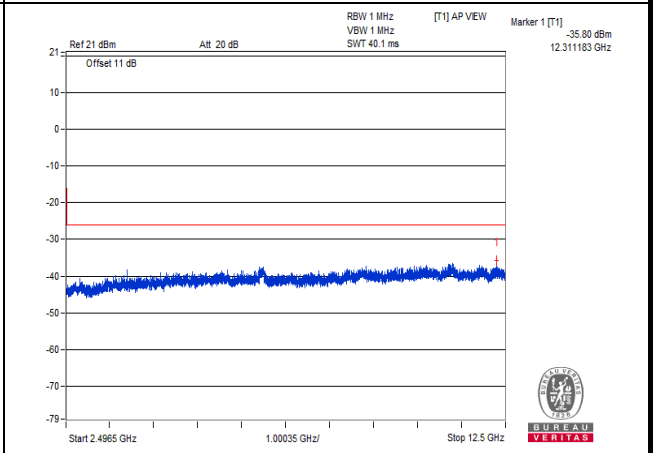






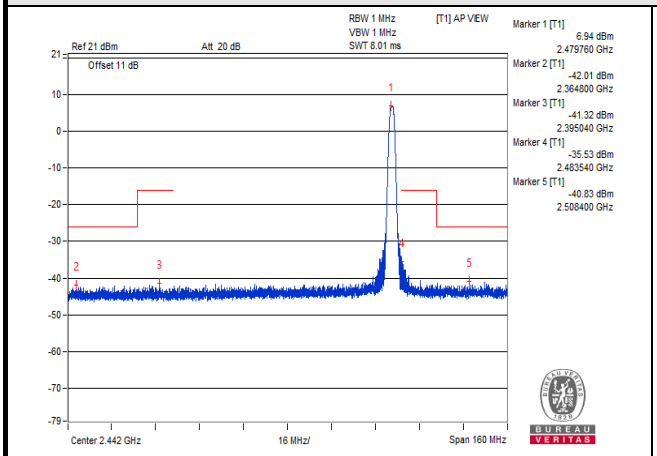


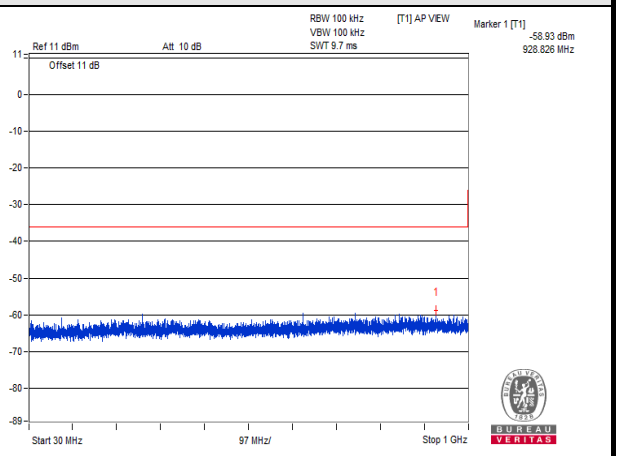


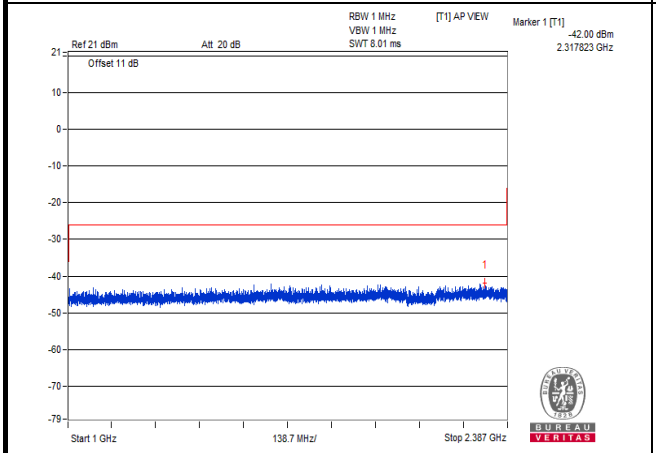


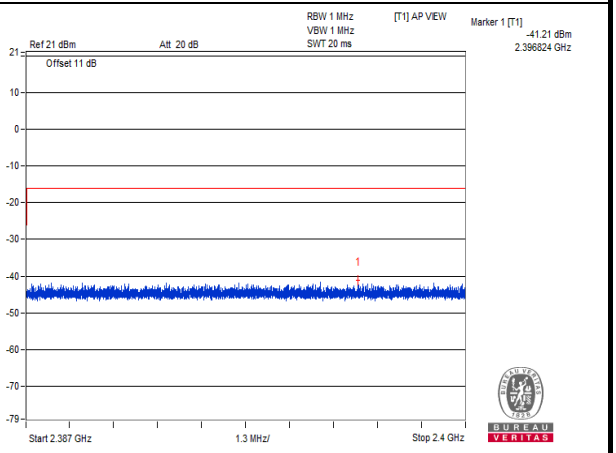
CH 19 (2440MHz)

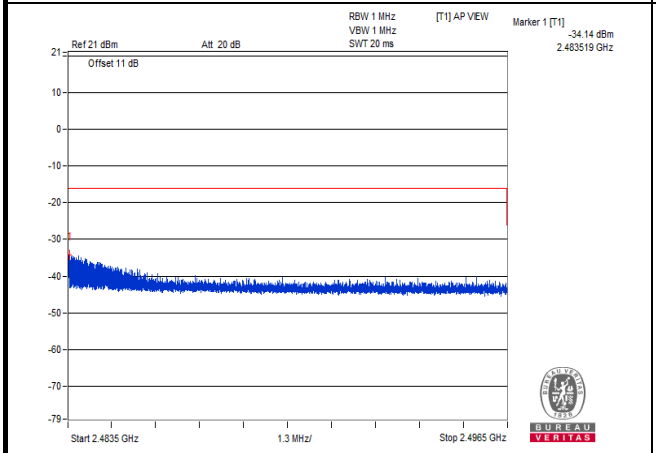
Vnormal

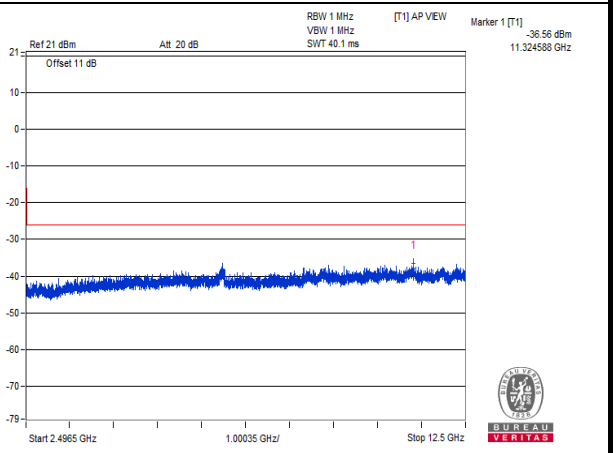






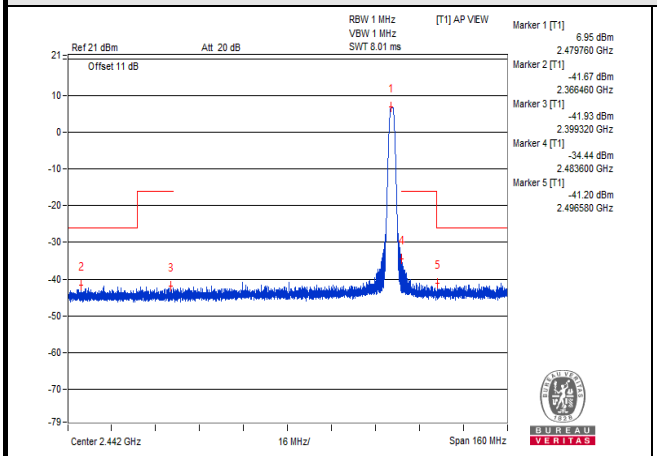


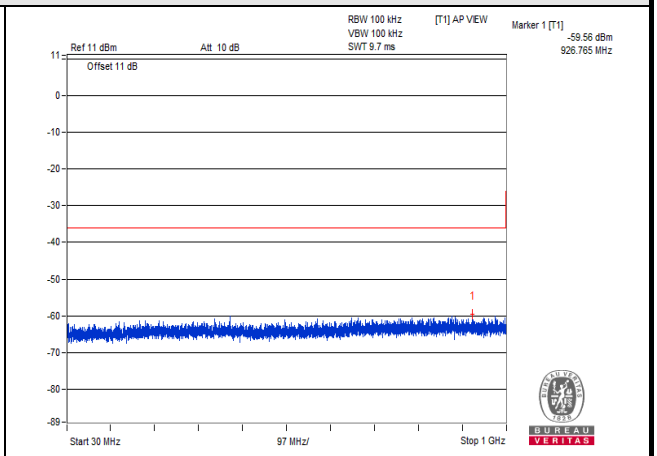


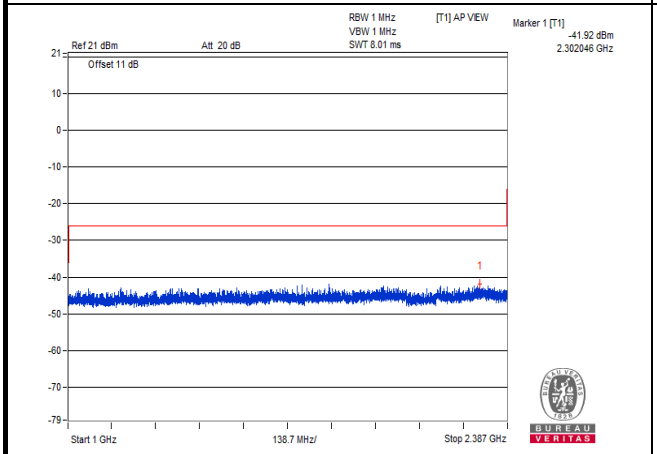


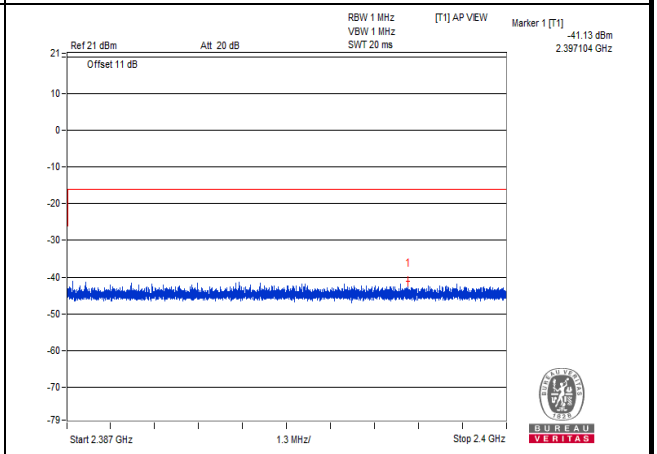
CH 39 (2480MHz)

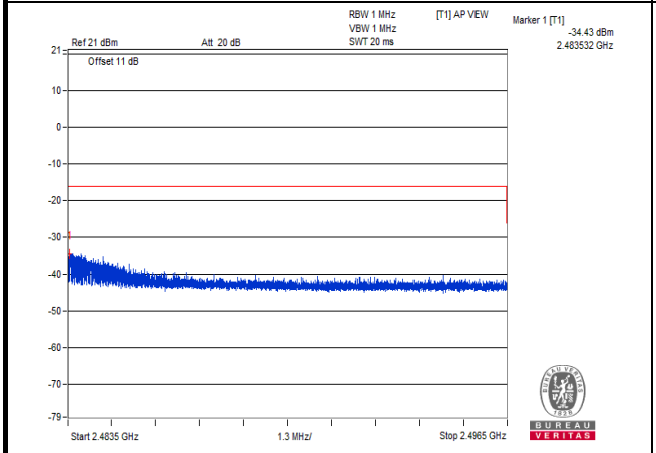
Vmax.

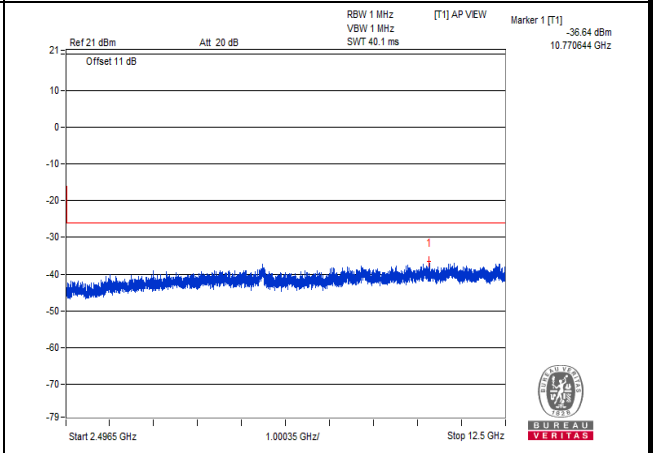






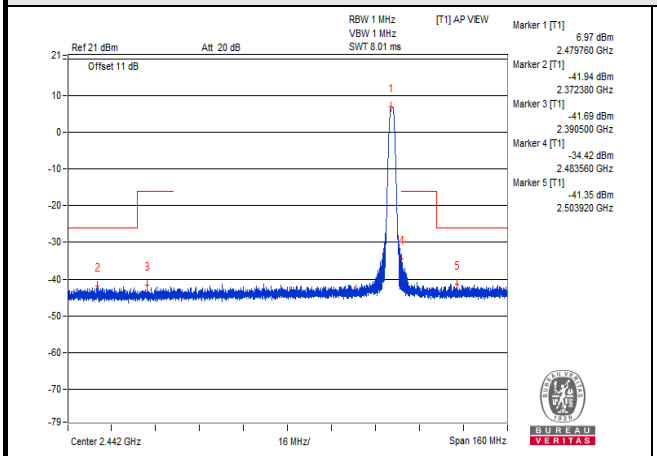


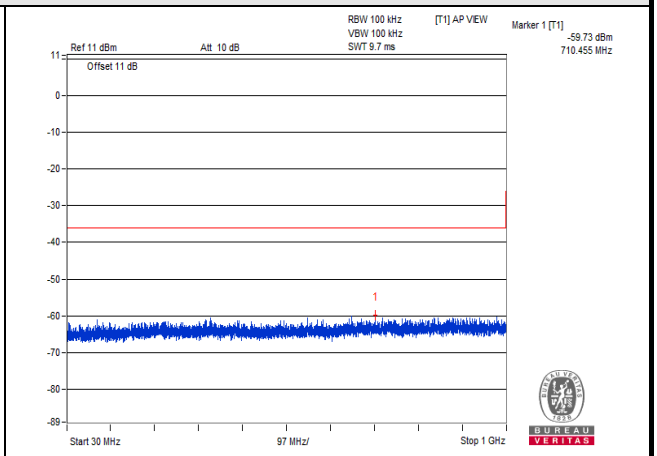


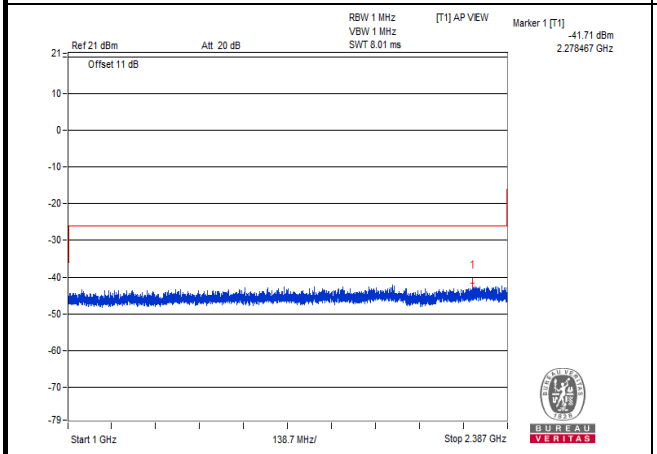


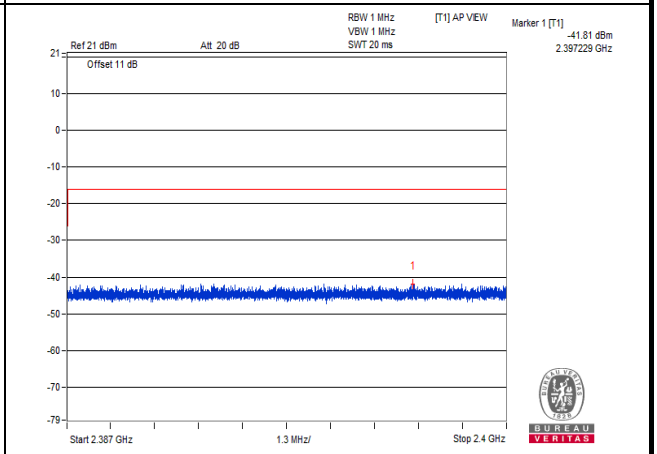
CH 39 (2480MHz)

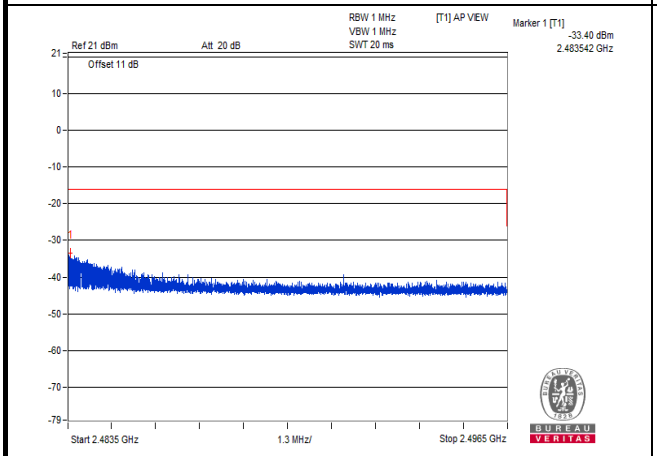
Vmin.

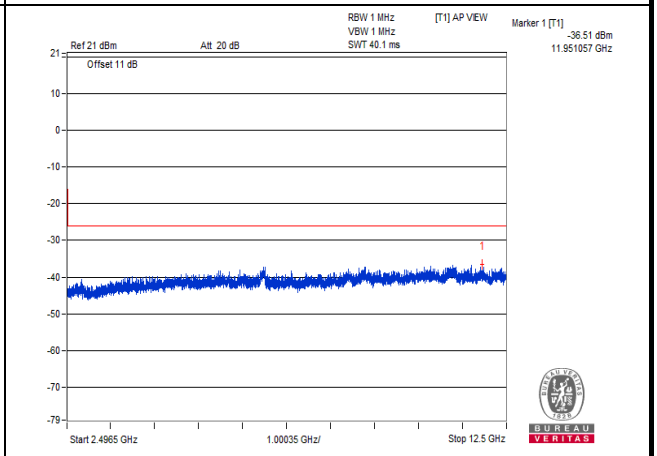












CH 39 (2480MHz)

GFSK (2Mbps)

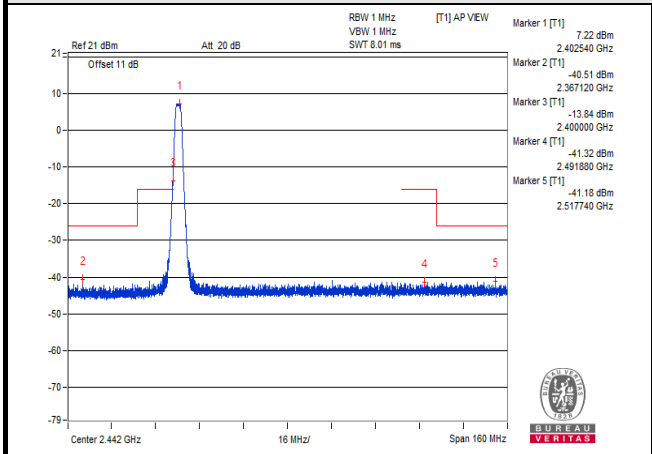
TEST CHANNEL		CH 0 (2402MHz)			
TEST CONDITION	FREQUENCY RANGE(MHz)	FREQUENCY (MHz)	MEASURE. VALUE(uW)	LIMIT (uW)	RESULT
V_{normal}	30MHz to 1000MHz	703.907	0.001208	0.25	PASS
	1000MHz to 2387MHz	2243.618	0.085901	2.5	PASS
	2387MHz to 2400MHz	2400.000	13.137373	25	PASS(1)
	2483.5MHz to 2496.5MHz	2488.344	0.087096	25	PASS
	2496.5MHz to 12500MHz	11338.343	0.209411	2.5	PASS
$V_{max.}$	30MHz to 1000MHz	848.316	0.001194	0.25	PASS
	1000MHz to 2387MHz	1948.881	0.065163	2.5	PASS
	2387MHz to 2400MHz	2399.991	12.935883	25	PASS(2)
	2483.5MHz to 2496.5MHz	2489.826	0.082794	25	PASS
	2496.5MHz to 12500MHz	11861.026	0.222331	2.5	PASS
$V_{min.}$	30MHz to 1000MHz	997.817	0.001112	0.25	PASS
	1000MHz to 2387MHz	2317.650	0.073790	2.5	PASS
	2387MHz to 2400MHz	2399.995	13.328901	25	PASS(3)
	2483.5MHz to 2496.5MHz	2493.545	0.082604	25	PASS
	2496.5MHz to 12500MHz	10102.911	0.228034	2.5	PASS
TEST CHANNEL		CH 19 (2440MHz)			
V_{normal}	30MHz to 1000MHz	799.695	0.001042	0.25	PASS
	1000MHz to 2387MHz	2279.334	0.056624	2.5	PASS
	2387MHz to 2400MHz	2391.574	0.070146	25	PASS
	2483.5MHz to 2496.5MHz	2489.122	0.082794	25	PASS
	2496.5MHz to 12500MHz	9107.563	0.267917	2.5	PASS
$V_{max.}$	30MHz to 1000MHz	762.956	0.001050	0.25	PASS
	1000MHz to 2387MHz	2267.891	0.066527	2.5	PASS
	2387MHz to 2400MHz	2393.436	0.075336	25	PASS
	2483.5MHz to 2496.5MHz	2494.740	0.082985	25	PASS
	2496.5MHz to 12500MHz	11245.811	0.236048	2.5	PASS
$V_{min.}$	30MHz to 1000MHz	976.962	0.001016	0.25	PASS
	1000MHz to 2387MHz	1994.479	0.074817	2.5	PASS
	2387MHz to 2400MHz	2388.904	0.075858	25	PASS
	2483.5MHz to 2496.5MHz	2490.550	0.085901	25	PASS
	2496.5MHz to 12500MHz	11322.087	0.211349	2.5	PASS

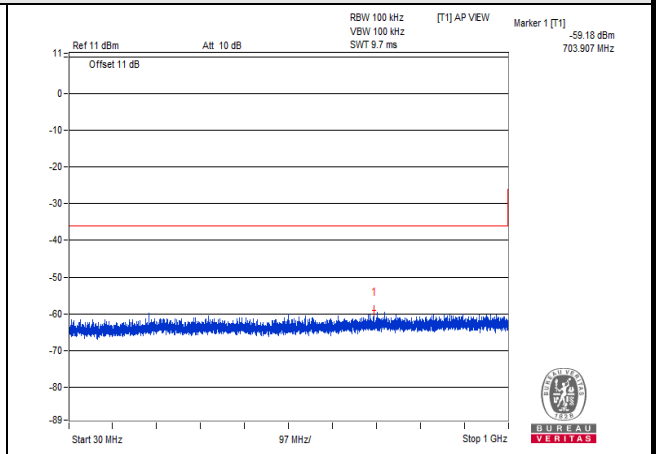
TEST CHANNEL		CH 39 (2480MHz)			
TEST CONDITION	FREQUENCY RANGE(MHz)	FREQUENCY (MHz)	MEASURE. VALUE(uW)	LIMIT (uW)	RESULT
V_{normal}	30MHz to 1000MHz	947.862	0.001227	0.25	PASS
	1000MHz to 2387MHz	1823.704	0.060814	2.5	PASS
	2387MHz to 2400MHz	2394.726	0.072444	25	PASS
	2483.5MHz to 2496.5MHz	2484.007	0.339625	25	PASS
	2496.5MHz to 12500MHz	6973.066	0.240436	2.5	PASS
$V_{max.}$	30MHz to 1000MHz	938.162	0.001086	0.25	PASS
	1000MHz to 2387MHz	2039.903	0.067764	2.5	PASS
	2387MHz to 2400MHz	2390.997	0.070307	25	PASS
	2483.5MHz to 2496.5MHz	2483.537	0.399945	25	PASS
	2496.5MHz to 12500MHz	6986.821	0.241546	2.5	PASS
$V_{min.}$	30MHz to 1000MHz	819.337	0.001297	0.25	PASS
	1000MHz to 2387MHz	2206.516	0.066069	2.5	PASS
	2387MHz to 2400MHz	2399.041	0.086099	25	PASS
	2483.5MHz to 2496.5MHz	2483.573	0.345939	25	PASS
	2496.5MHz to 12500MHz	11315.834	0.220293	2.5	PASS

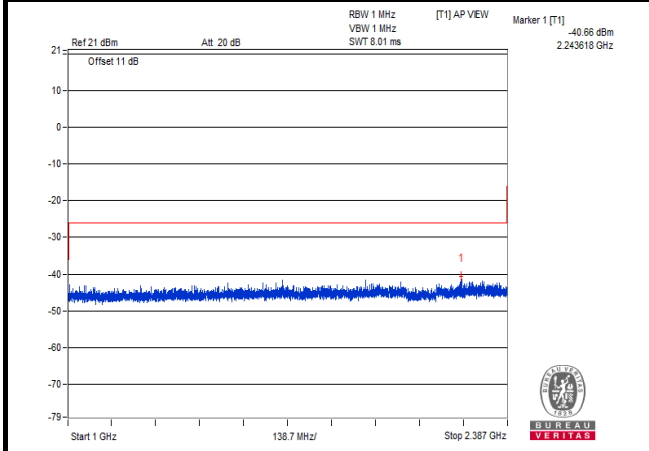
NOTE: 1. The spectrum plots are attached on the following pages.

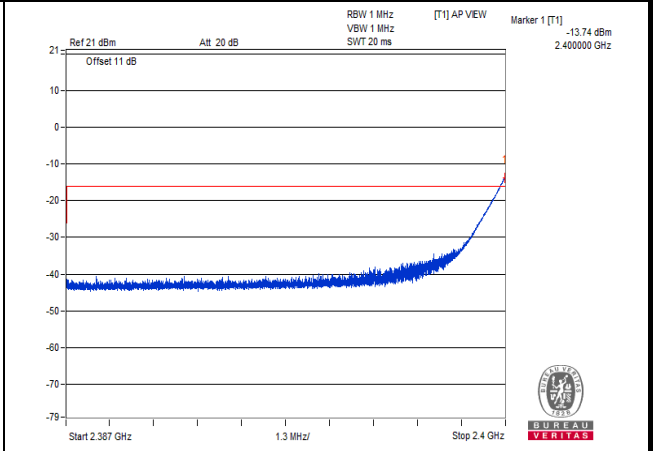
2. (No.): The value was tested under Measuring Mode *Zero Span.

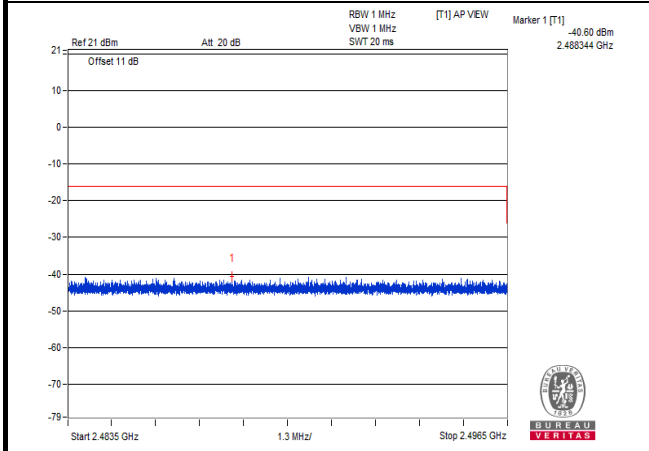
Vnormal

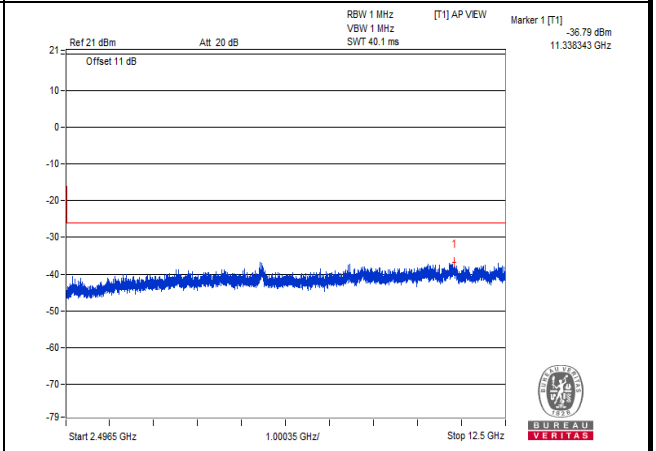






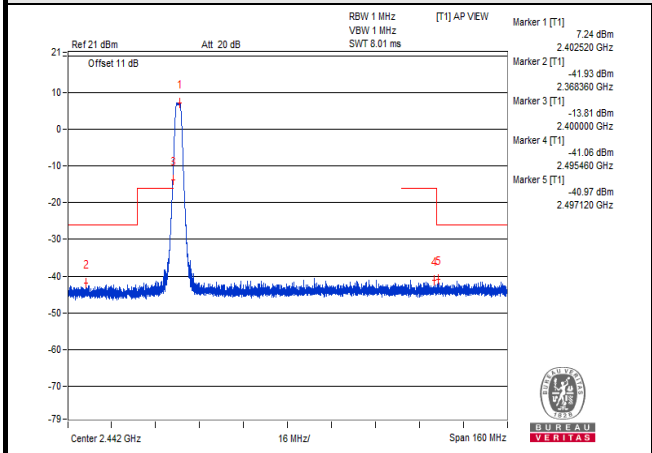


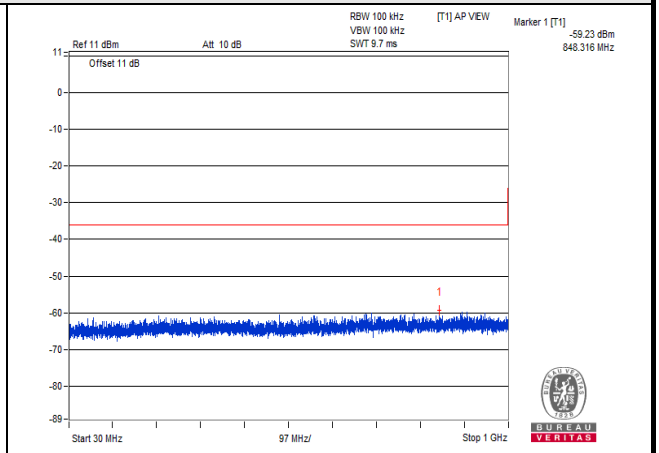


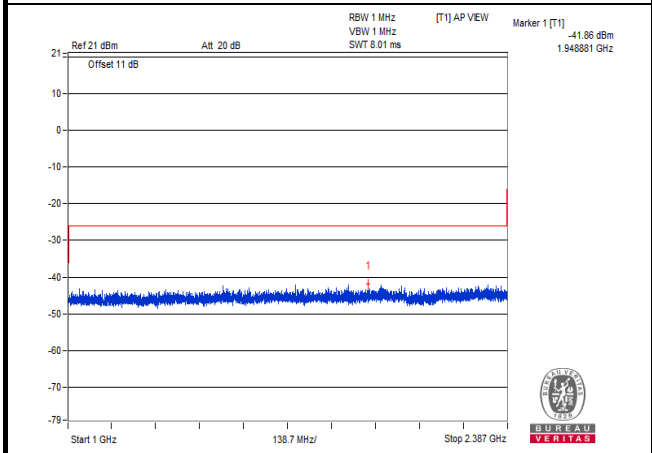


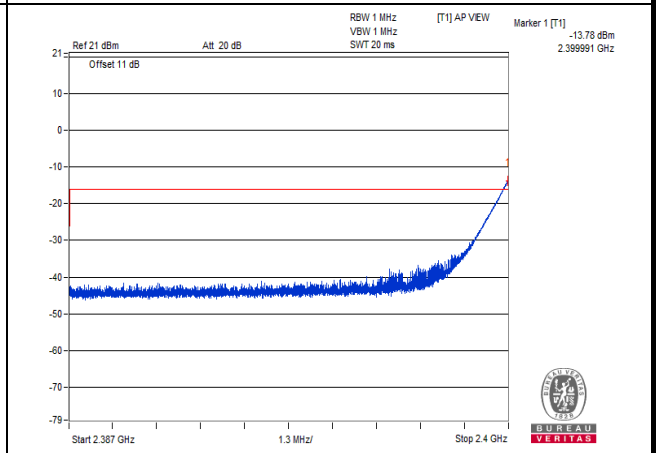
CH 0 (2402MHz)

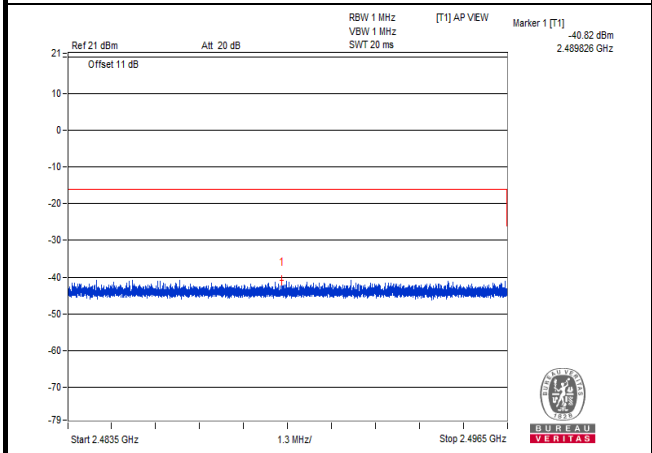
Vmax.

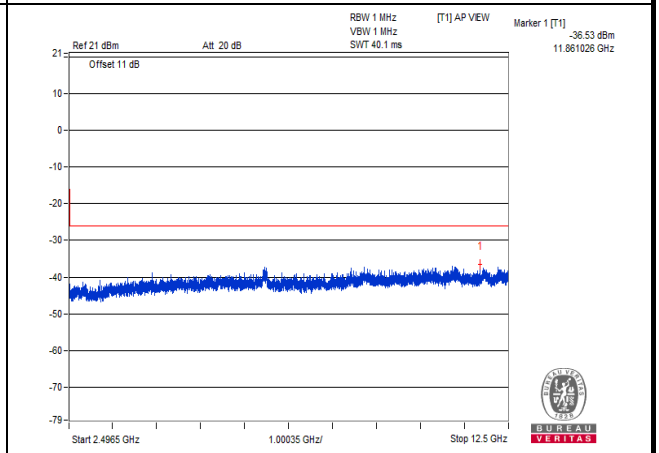






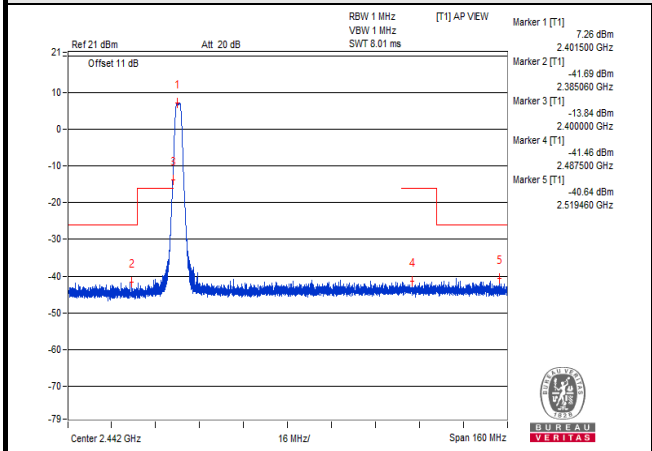


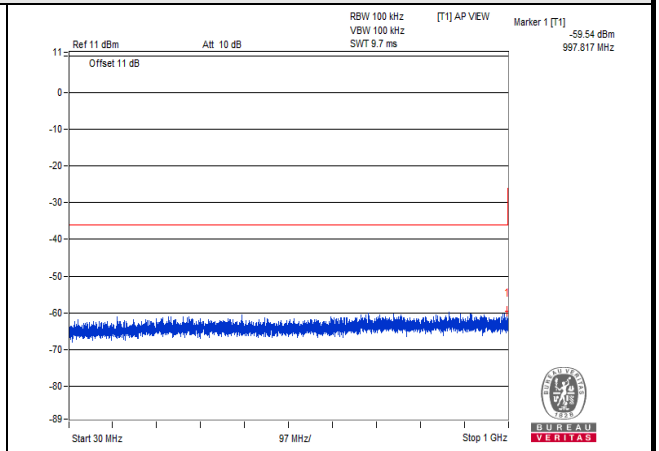


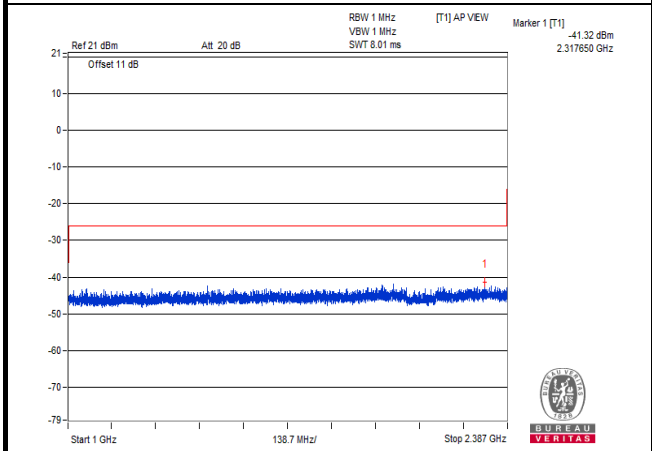


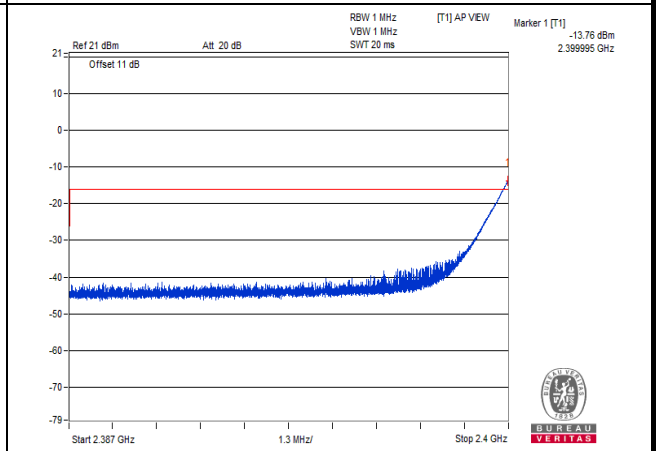
CH 0 (2402MHz)

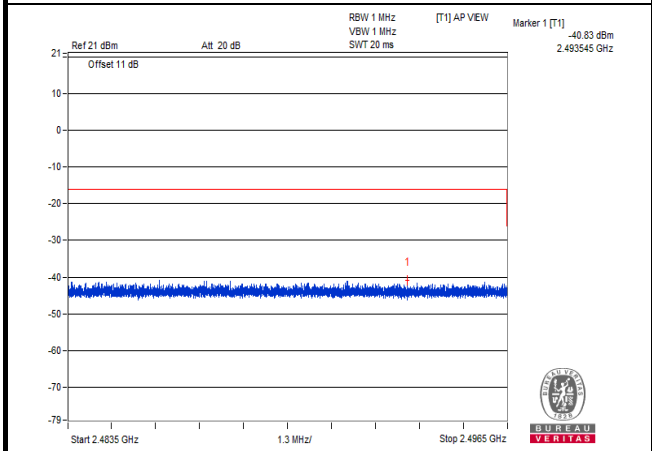
Vmin.

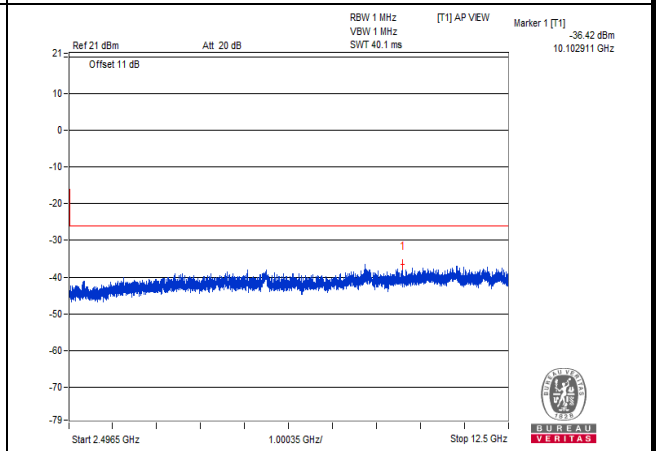






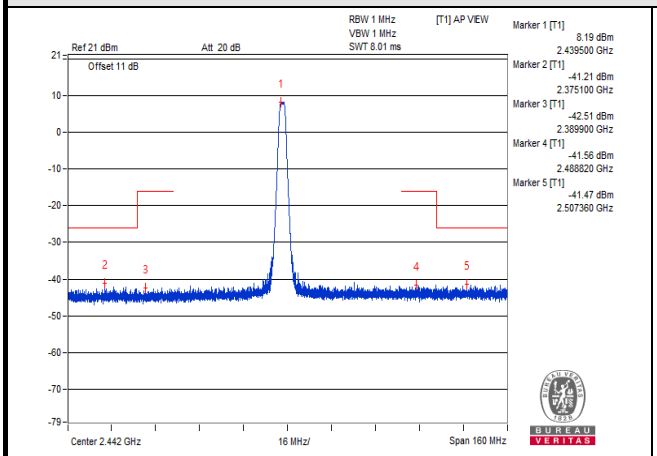


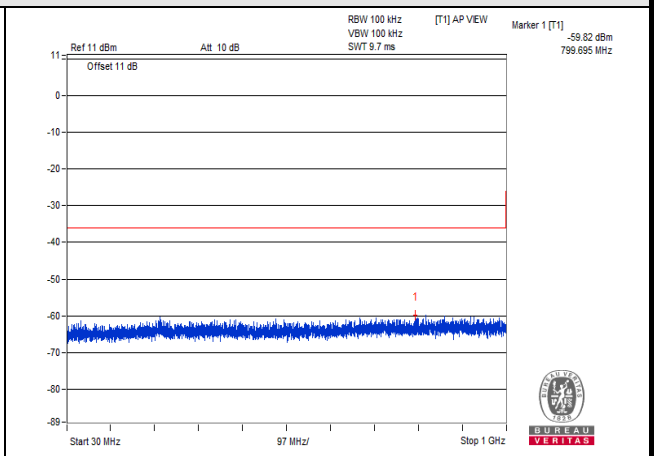


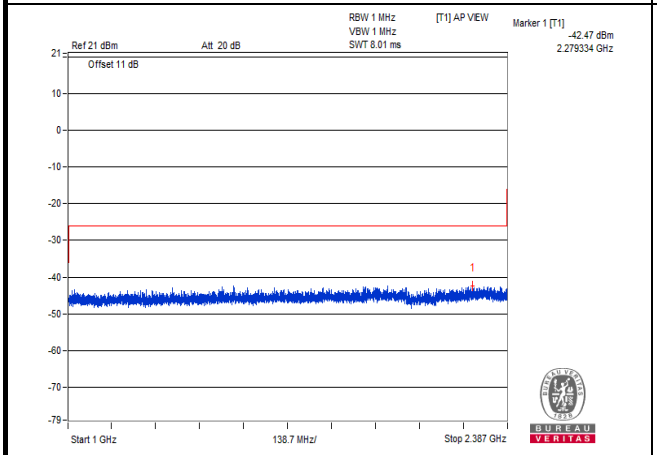


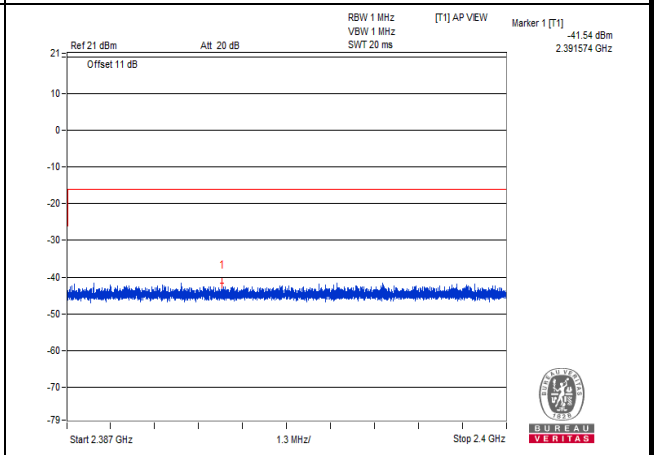
CH 0 (2402MHz)

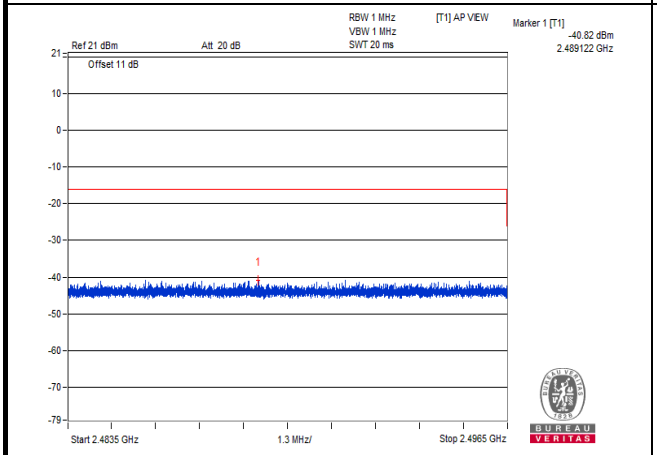
Vnormal

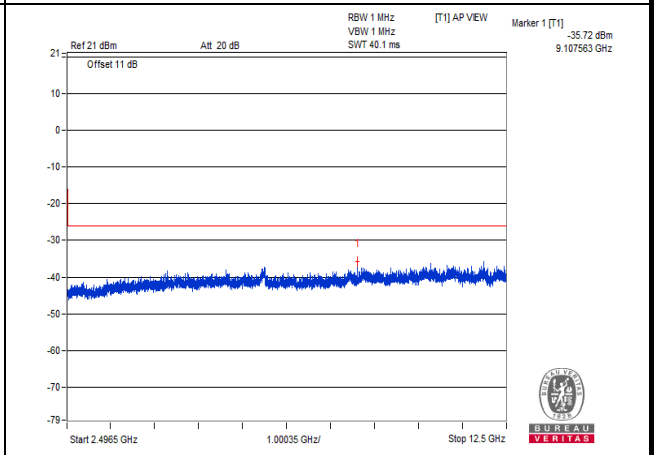






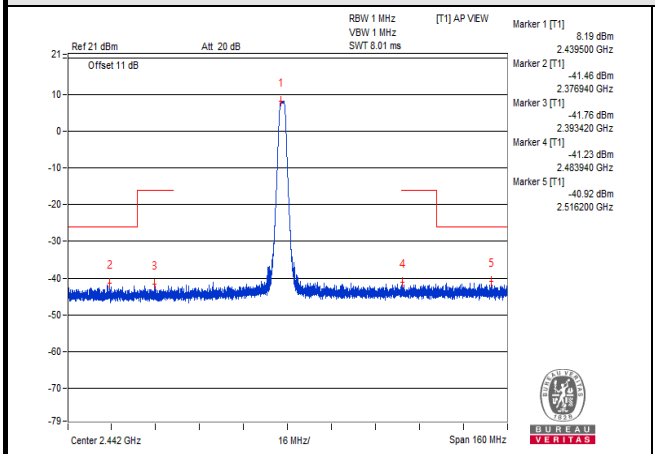


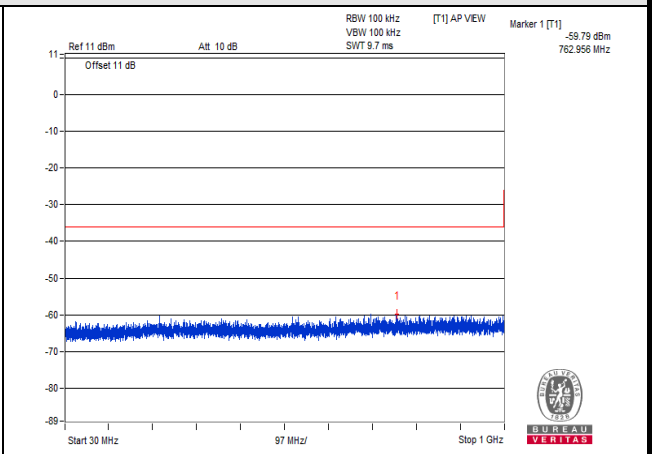


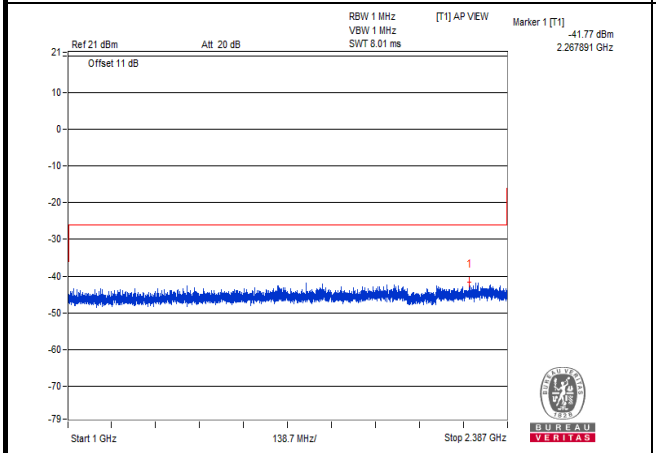


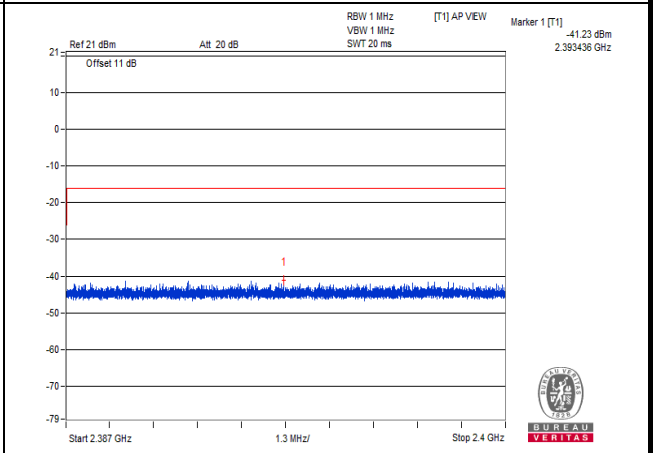
CH 19 (2440MHz)

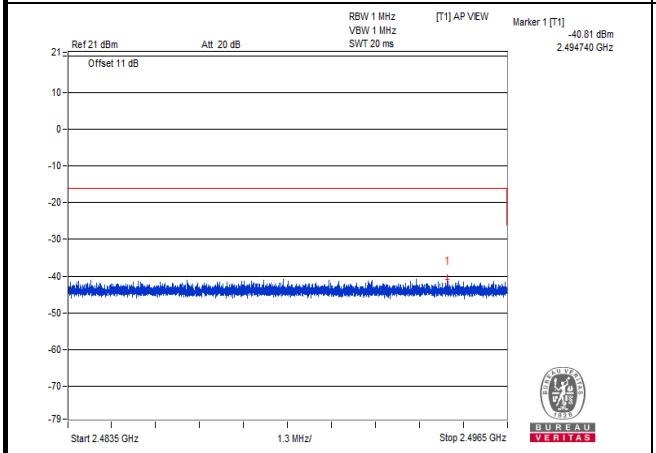
Vmax.

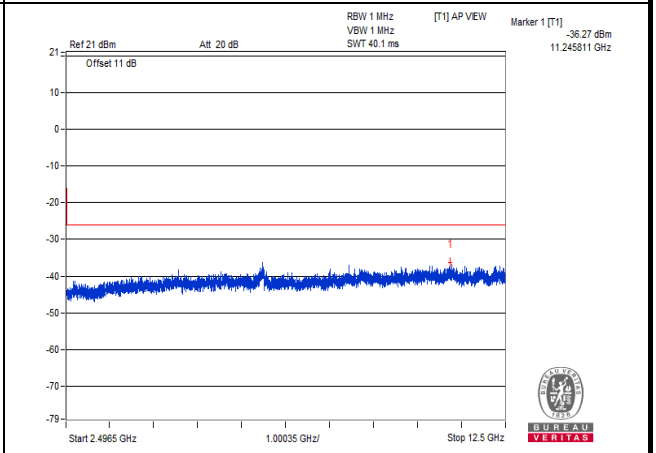






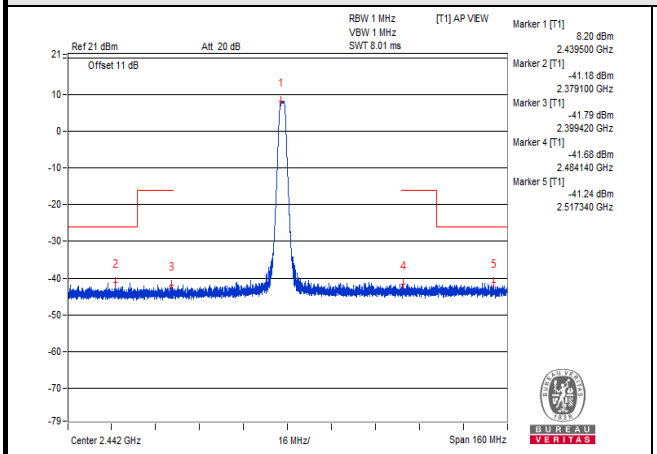


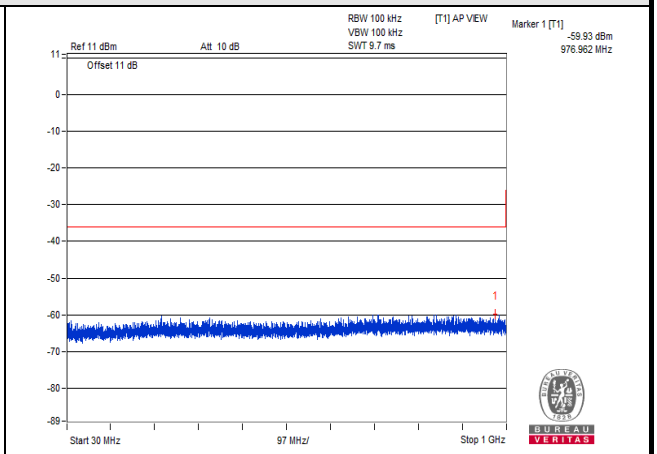


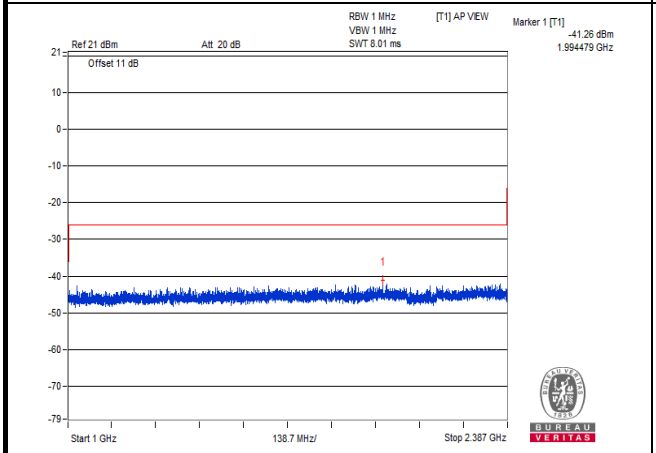


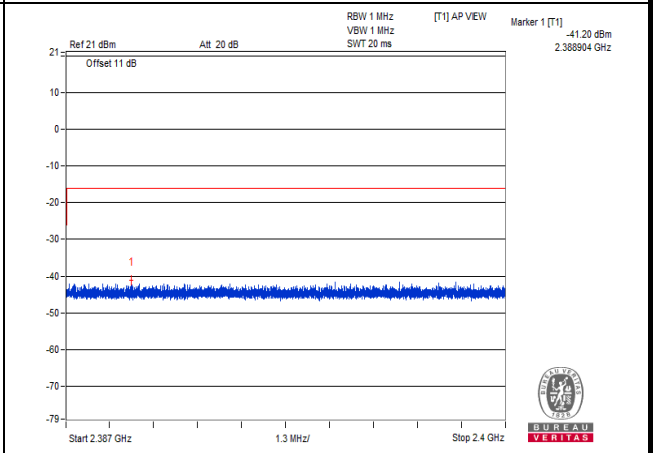
CH 19 (2440MHz)

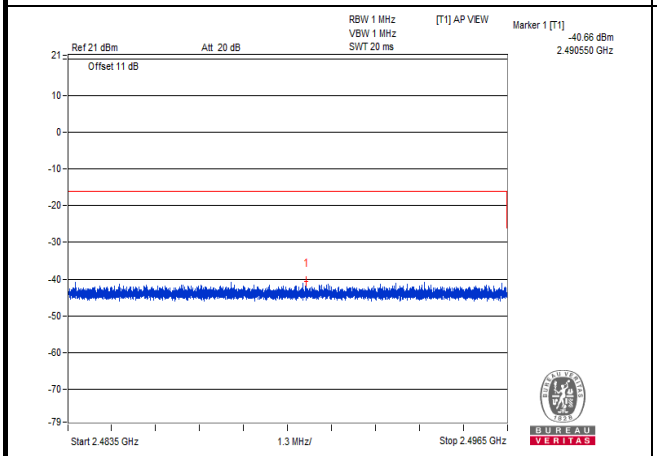
Vmin.

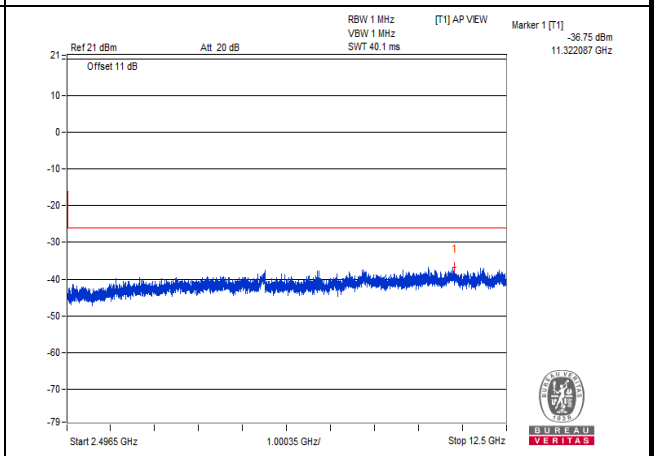






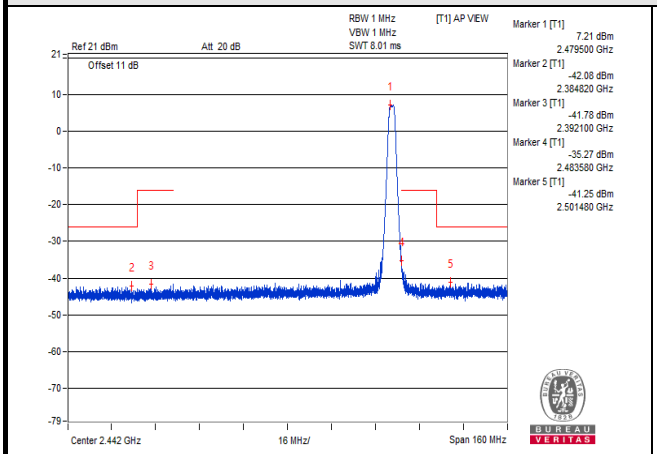


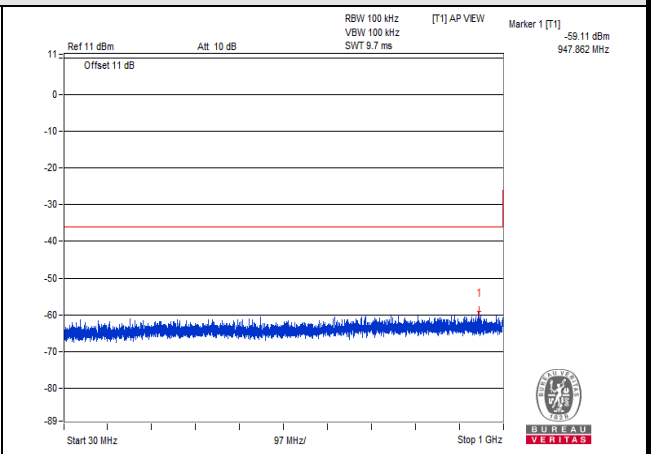


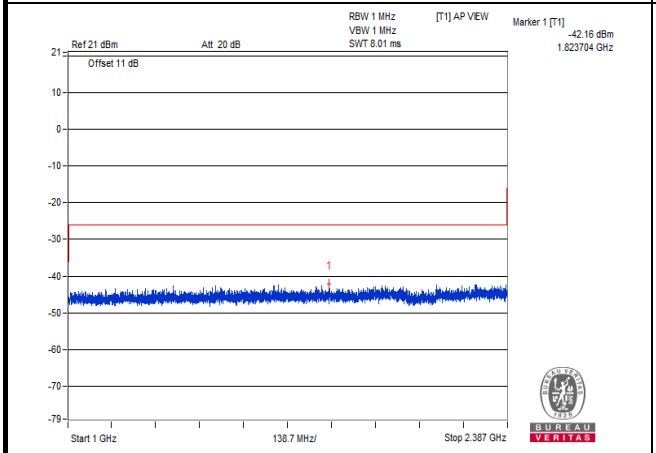


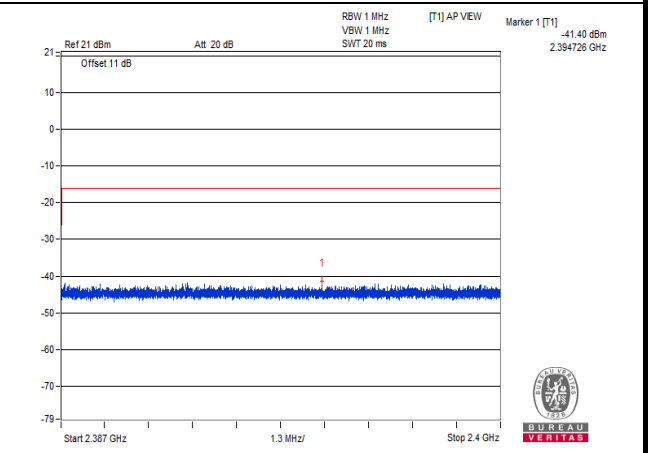
CH 19 (2440MHz)

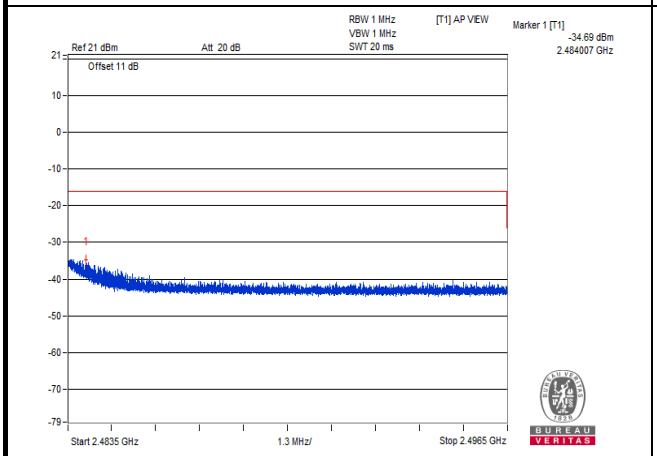
Vnormal

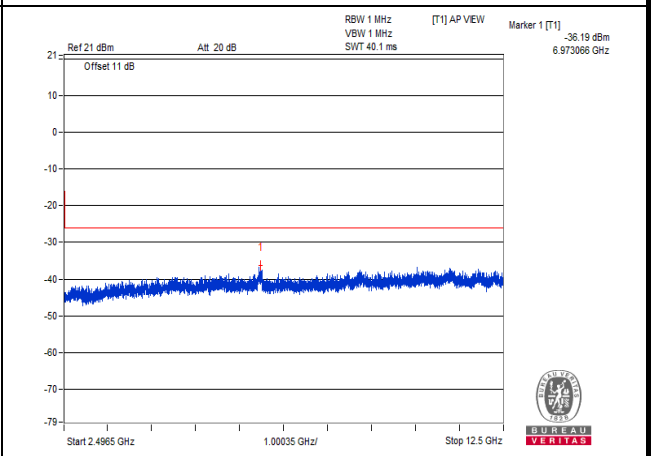






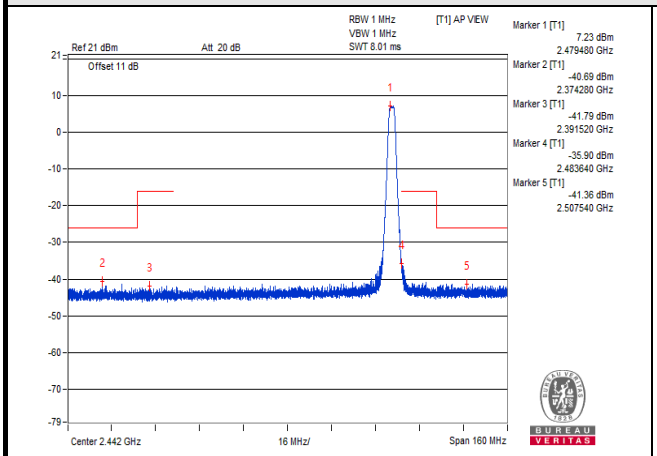


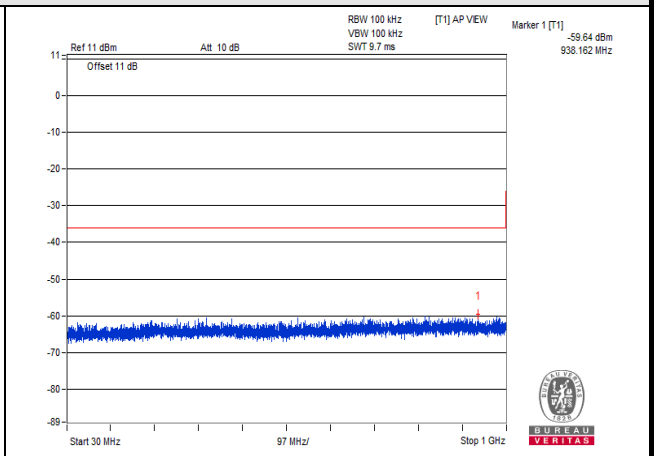


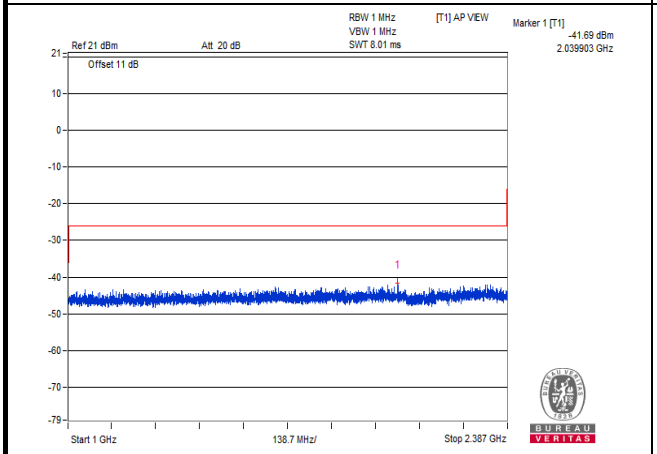


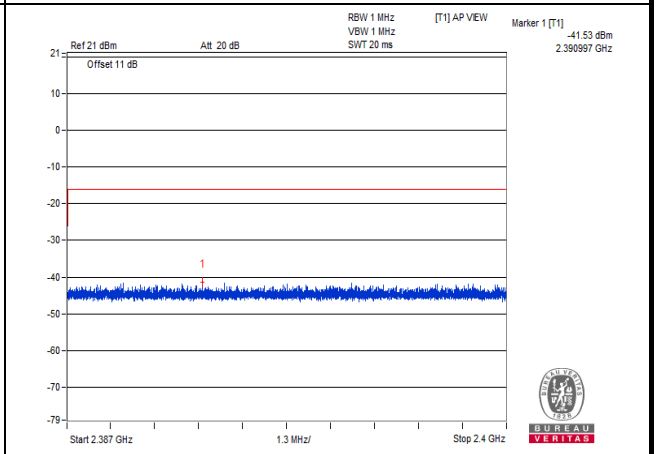
CH 39 (2480MHz)

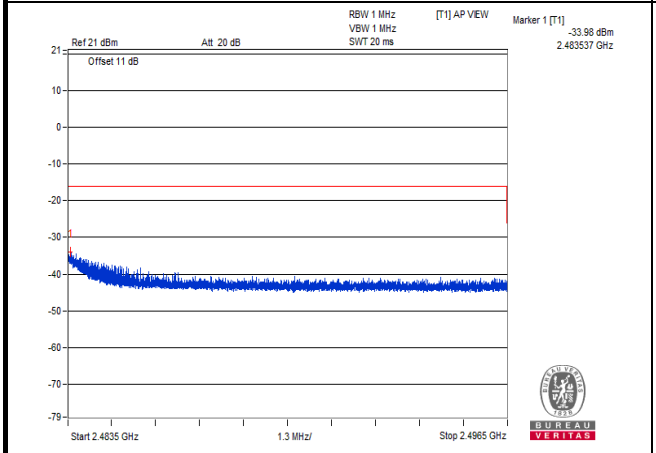
Vmax.

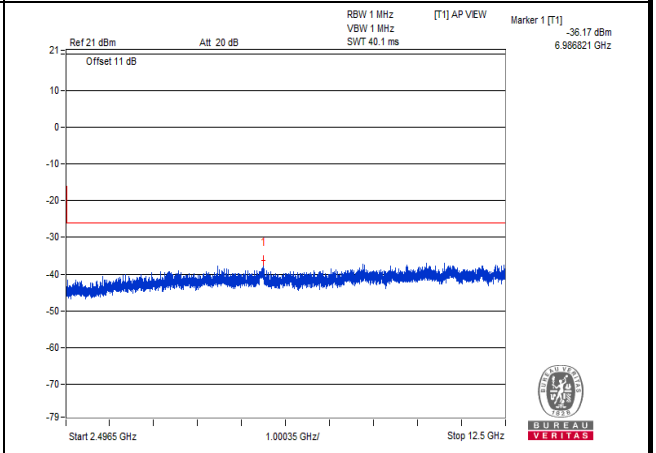






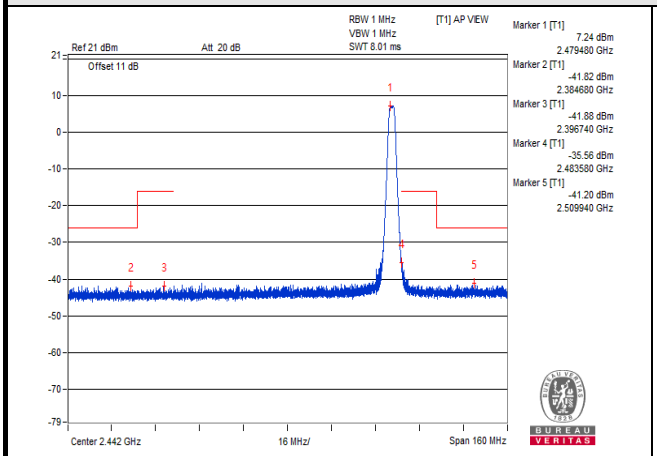


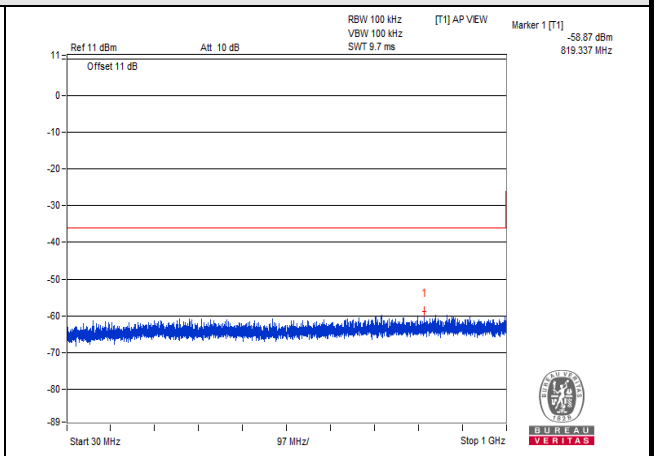


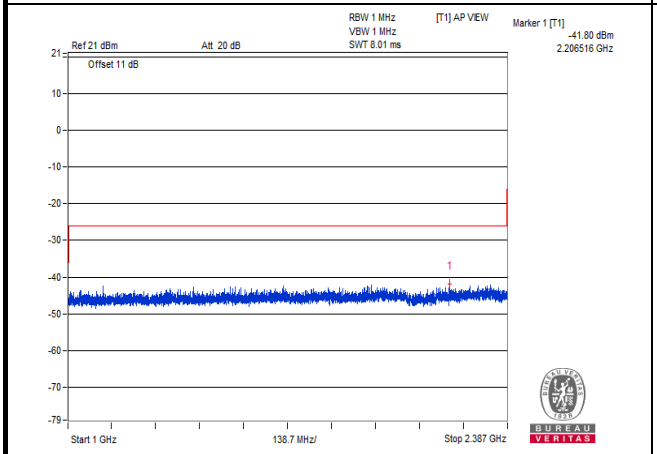


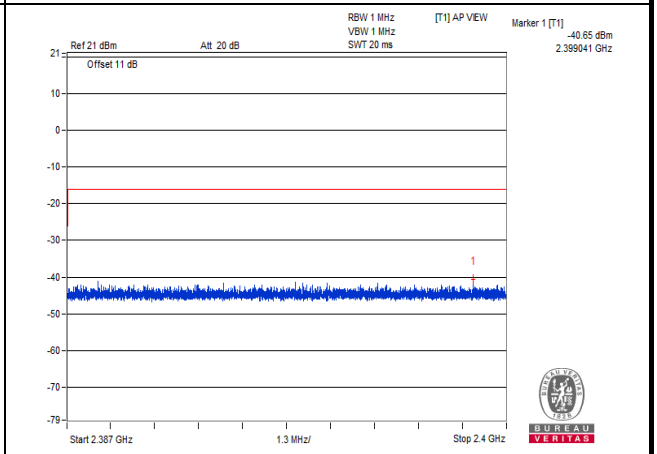
CH 39 (2480MHz)

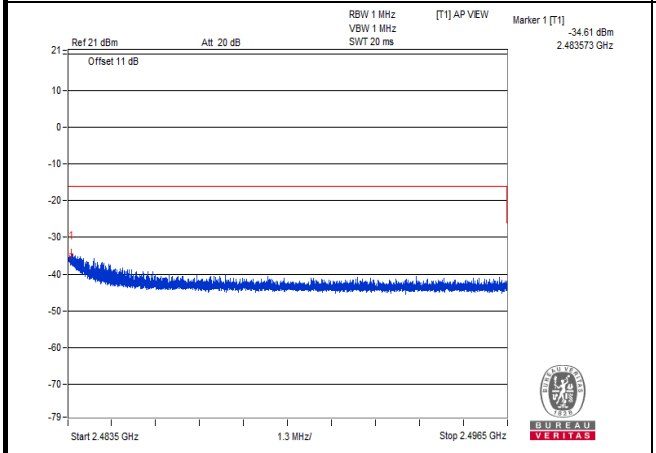
Vmin.

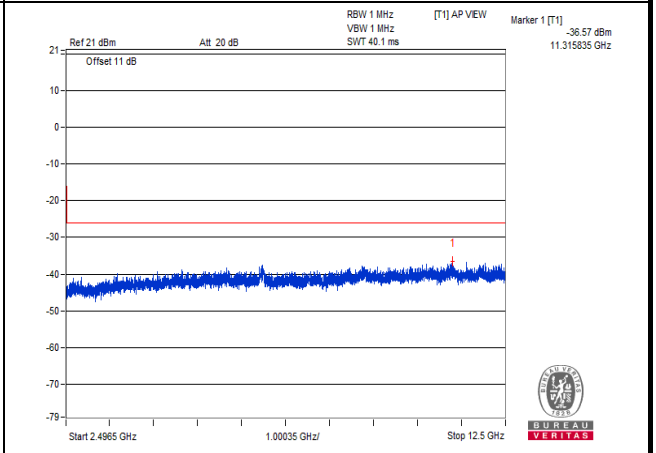








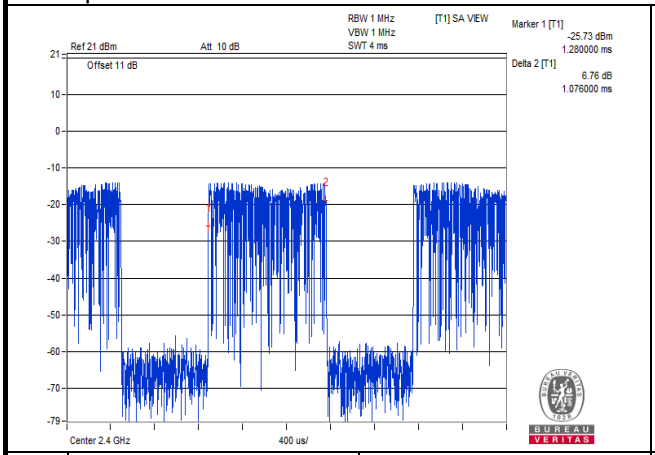




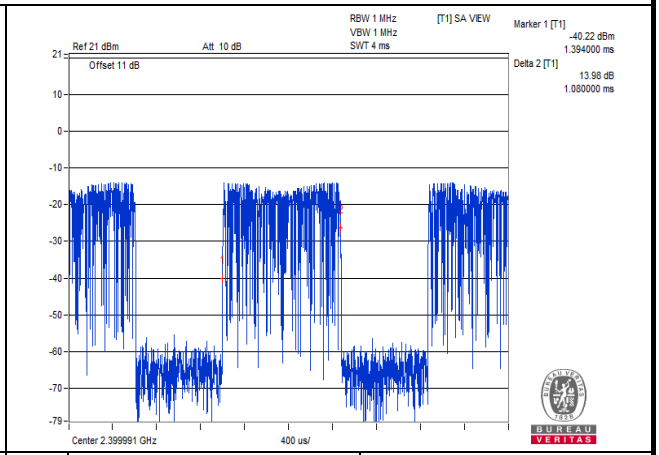
CH 39 (2480MHz)

Measuring Mode *Zero Span

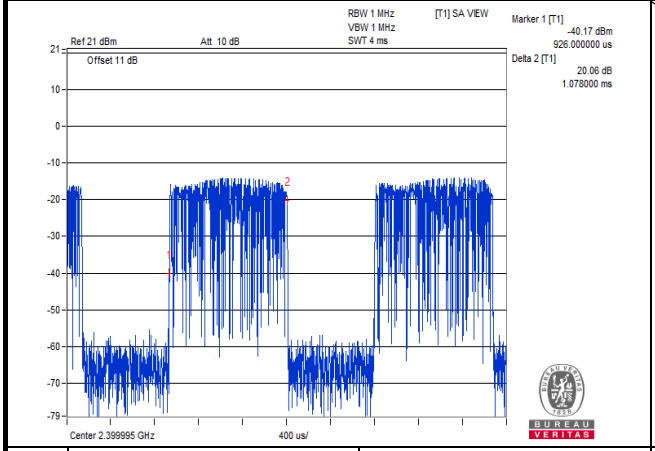
1. Set the spectrum analyzer as below and it takes in a value of all data point.
2. Regarding the all data value, it transforms the “dBm” value into “uW” value.
3. It adds the all values and calculates a grand total. Define a grand total as “P”.
4. It divides “P” by sample data point (ex.501) and calculates the mean value.
5. It reports the mean value.



1	2400.000MHz	P = 13.137373uW



2	2399.991MHz	P = 12.935883uW



3	2399.995MHz	P = 13.328901uW

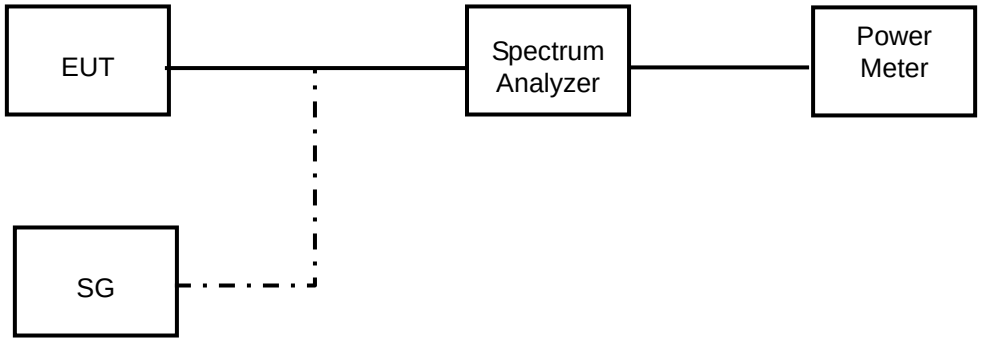
4.4 Antenna Power Measurement

4.4.1 Limits of Antenna Power

Modulation Method	Frequency Band Used	Antenna Power (Max.)	EIRP Limit (Note 3)
DSSS	2400 – 2483.5 MHz	10mW/MHz	12.14 dBm/MHz ~ 22.14 dBm/MHz (16.368 mW/MHz ~ 163.68 mW/MHz)
OFDM (Note 1)	2400 – 2483.5 MHz	10mW/MHz	12.14 dBm/MHz ~ 22.14 dBm/MHz (16.368 mW/MHz ~ 163.68 mW/MHz)
OFDM (Note 2)	2400 – 2483.5 MHz	5mW/MHz	9.13 dBm/MHz ~ 19.13 dBm/MHz (8.185 mW/MHz ~ 81.846 mW/MHz)
Other than the above	2400 – 2483.5 MHz	10mW	12.14 dBm ~ 22.14 dBm (16.368 mW ~ 163.68 mW)

Note:
1. Occupied bandwidth is less than 26MHz
2. Occupied bandwidth is more that 26MHz and less than 40MHz
3. EIRP limit is variable by the HPBA, the HPBA (half-power beam width) of the antenna shall be 360/A degrees or less, where A = EIRP/(2.14 dBi + “Antenna Power (limit)).
4. Tolerance of antenna power shall be +20% (upper value) and –80% (lower value).

4.4.2 Test Setup



4.4.3 Test Results

GFSK (1Mbps)

Voltage	Channel Number	Frequency (MHz)	Conducted RF Output Power (mW)	Radiated RF Output Power (mW)
V_{normal}	**0**	**2402**	5.585	7.047
	19	**2440**	**6.776**	**8.550**
	39	**2480**	5.212	6.577
$V_{max.}$	**0**	**2402**	5.508	6.950
	19	**2440**	6.622	8.356
	39	**2480**	4.977	6.280
$V_{min.}$	**0**	**2402**	5.754	7.261
	19	**2440**	6.607	8.337
	39	**2480**	5.035	6.353
Max. Limit (mW)			10	-
Rated Power (mW)			7	-
Tolerance of Antenna Power (mW)			1.4 ~ 8.4	-
Max. EIRP Limit (mW)			-	16.368

Note: 1. Antenna gain is 1.01 dBi.

2. The radiated RF output power is a “calculated” value derived from the conducted value.

3. Formula: Radiated RF output power = Conducted RF output power + Antenna gain

GFSK (2Mbps)

Voltage	Channel Number	Frequency (MHz)	Conducted RF Output Power (mW)	Radiated RF Output Power (mW)
V_{normal}	**0**	**2402**	5.715	7.211
	19	**2440**	6.855	8.650
	39	**2480**	5.236	6.607
$V_{max.}$	**0**	**2402**	5.598	7.064
	19	**2440**	6.546	8.260
	39	**2480**	5.176	6.531
$V_{min.}$	**0**	**2402**	5.715	7.211
	19	**2440**	**6.902**	**8.709**
	39	**2480**	5.395	6.808
Max. Limit (mW)			10	-
Rated Power (mW)			7	-
Tolerance of Antenna Power (mW)			1.4 ~ 8.4	-
Max. EIRP Limit (mW)			-	16.368

Note: 1. Antenna gain is 1.01 dBi.

2. The radiated RF output power is a “calculated” value derived from the conducted value.

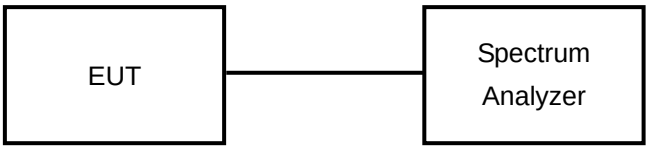
3. Formula: Radiated RF output power = Conducted RF output power + Antenna gain

4.5 Spurious Emissions for Receiver

4.5.1 Limits of Spurious Emissions For Receiver

Frequencies (MHz)	Limit
Below 1GHz	≦4nW (-54dBm)
Above 1GHz	≦20nW (-47dBm)

4.5.2 Test Setup

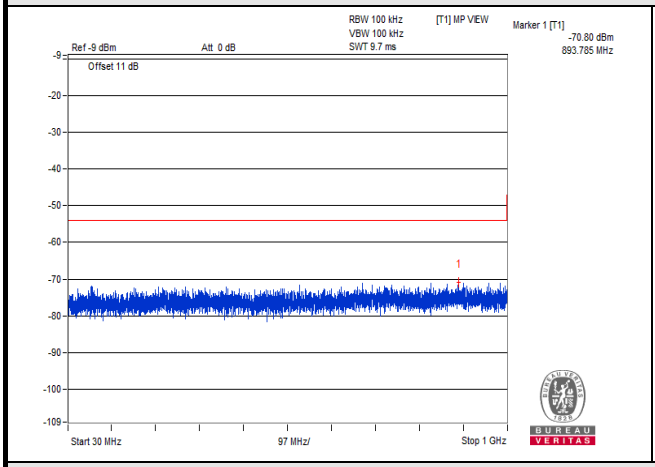


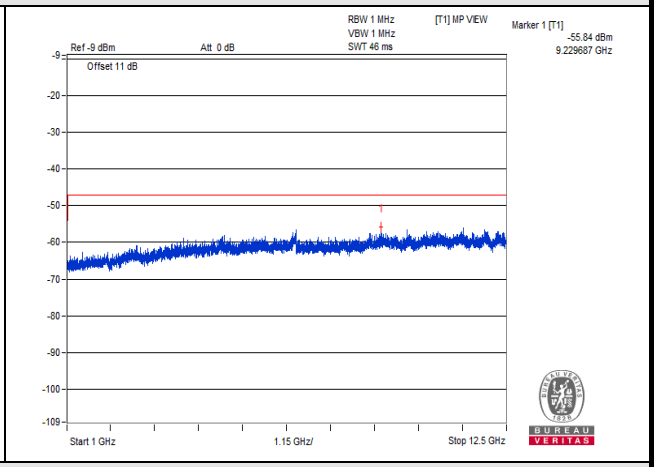
4.5.3 Test Result

GFSK (1Mbps)

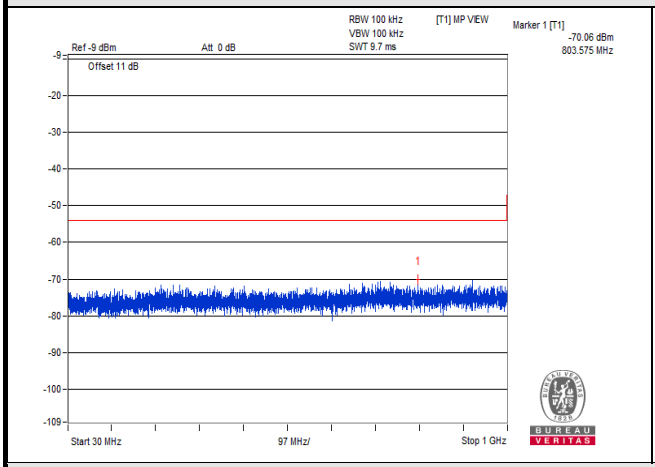
TEST CHANNEL		CH 0 (2402MHz)			
TEST CONDITION	FREQUENCY RANGE(MHz)	FREQUENCY (MHz)	MEASURE. VALUE(nW)	LIMIT (nW)	RESULT
V_{normal}	30MHz to 1000MHz	893.785	0.083176	4.0	PASS
	1000MHz to 12500MHz	9229.687	2.606154	20.0	PASS
$V_{max.}$	30MHz to 1000MHz	803.575	0.098628	4.0	PASS
	1000MHz to 12500MHz	10685.875	2.382319	20.0	PASS
$V_{min.}$	30MHz to 1000MHz	793.875	0.108893	4.0	PASS
	1000MHz to 12500MHz	11209.125	2.460368	20.0	PASS
TEST CHANNEL		CH 19 (2440MHz)			
V_{normal}	30MHz to 1000MHz	718.578	0.129122	4.0	PASS
	1000MHz to 12500MHz	11269.500	2.004472	20.0	PASS
$V_{max.}$	30MHz to 1000MHz	737.615	0.131826	4.0	PASS
	1000MHz to 12500MHz	11334.187	2.415461	20.0	PASS
$V_{min.}$	30MHz to 1000MHz	912.215	0.114815	4.0	PASS
	1000MHz to 12500MHz	11937.937	2.773320	20.0	PASS
TEST CHANNEL		CH 39 (2480MHz)			
V_{normal}	30MHz to 1000MHz	771.807	0.104954	4.0	PASS
	1000MHz to 12500MHz	11324.125	2.393316	20.0	PASS
$V_{max.}$	30MHz to 1000MHz	883.600	0.093541	4.0	PASS
	1000MHz to 12500MHz	11306.875	2.488857	20.0	PASS
$V_{min.}$	30MHz to 1000MHz	952.227	0.118850	4.0	PASS
	1000MHz to 12500MHz	11958.062	3.090295	20.0	PASS

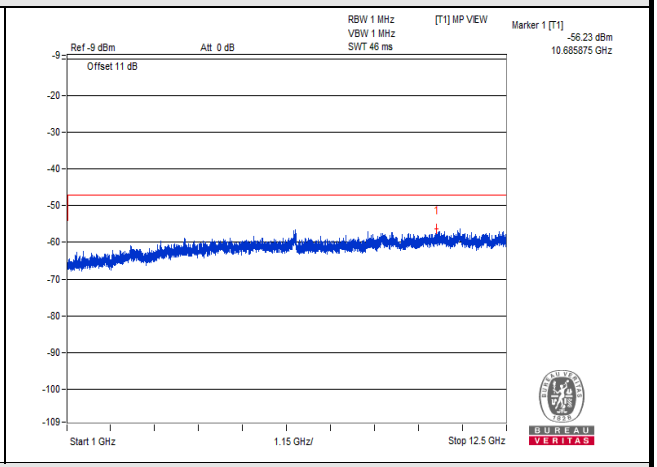
Vnormal



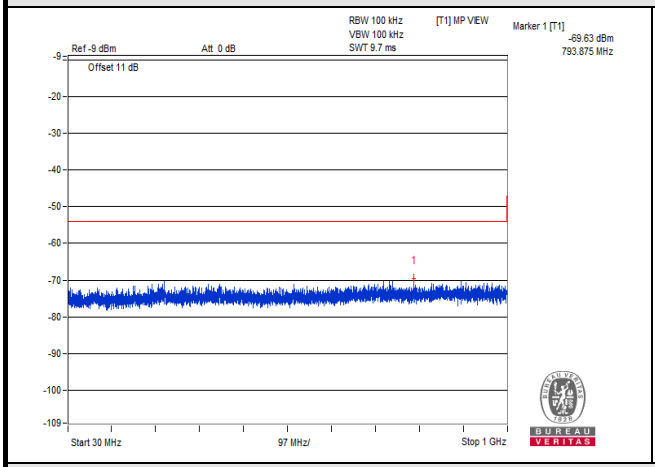


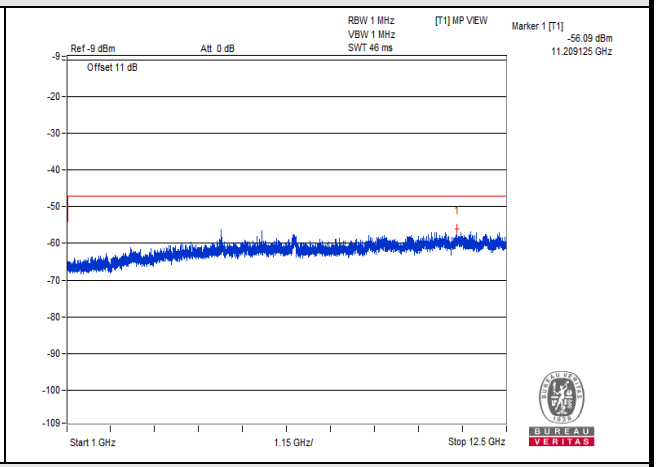
Vmax.





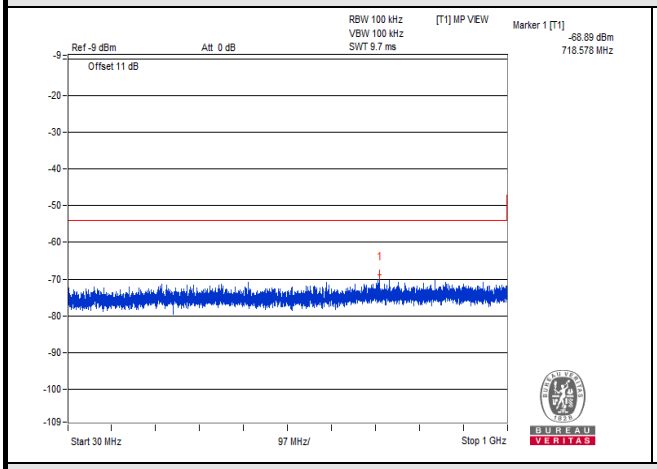
Vmin.

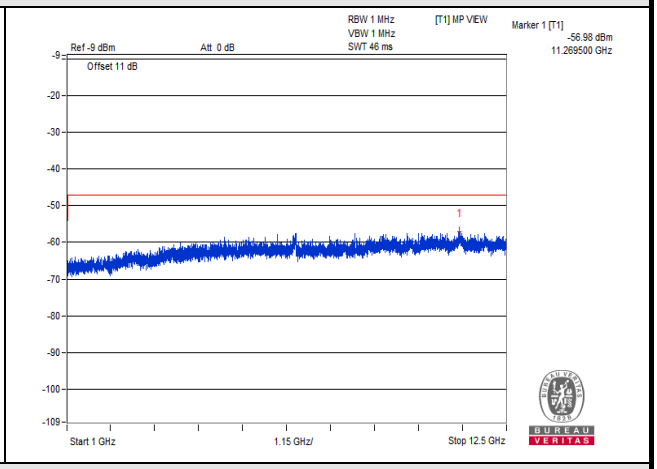




CH 0 (2402MHz)

Vnormal





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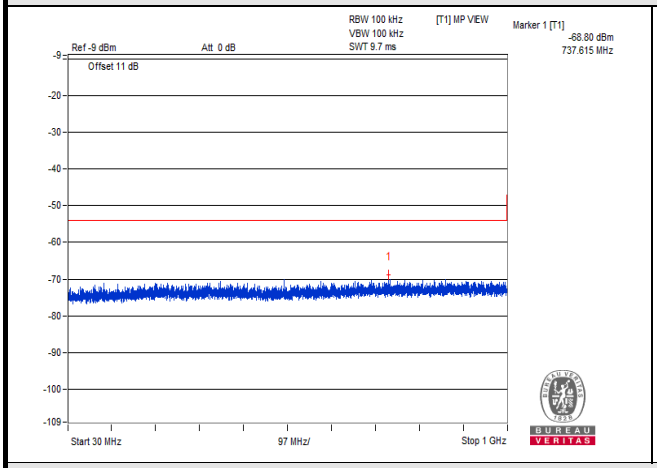
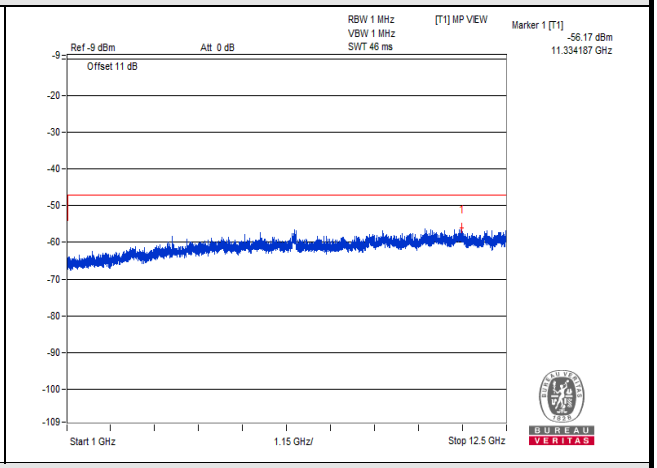
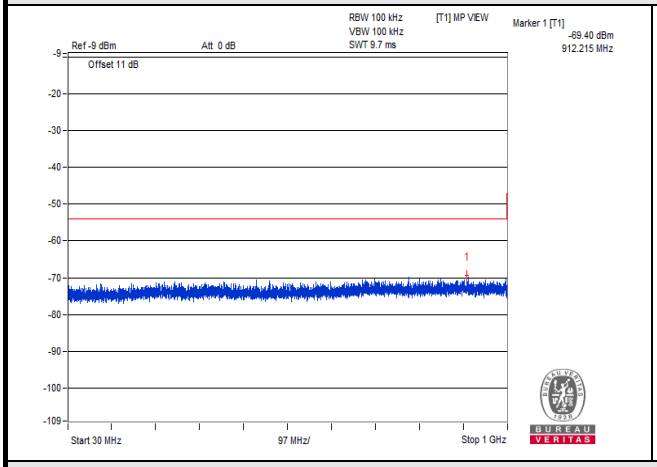
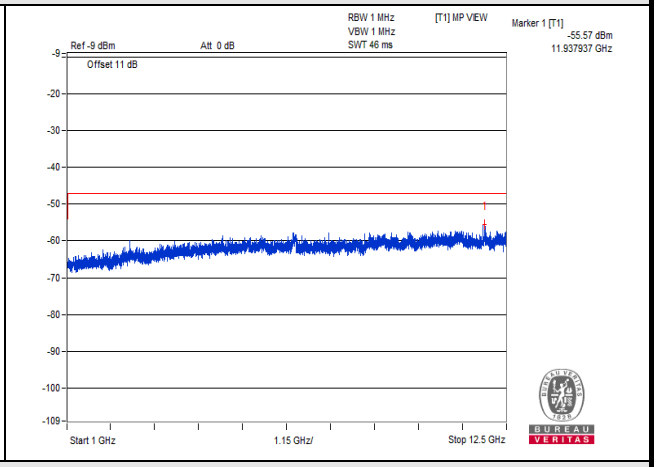




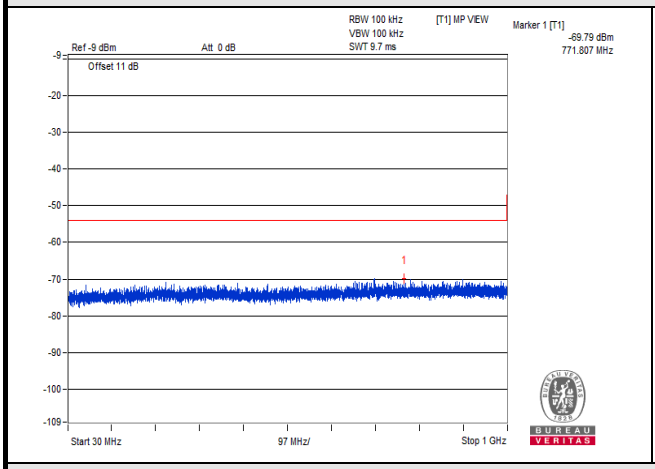
Vmin.

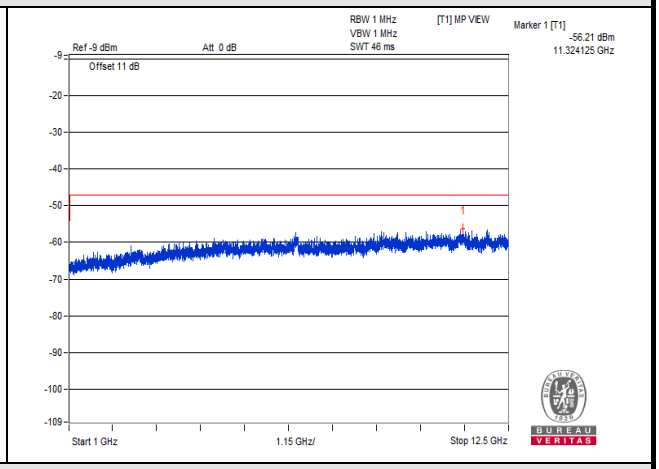




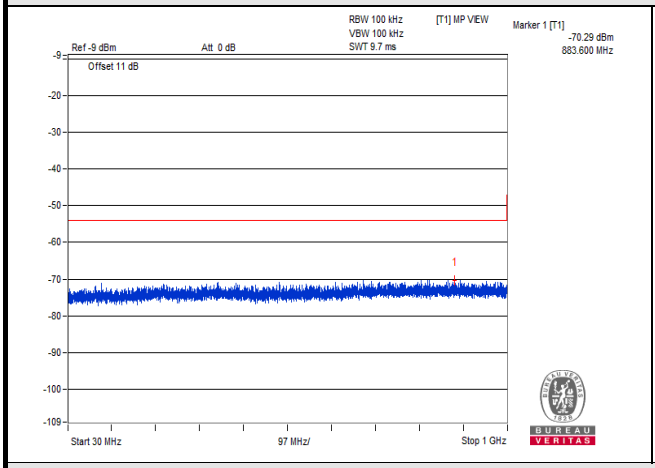
CH 19 (2440MHz)

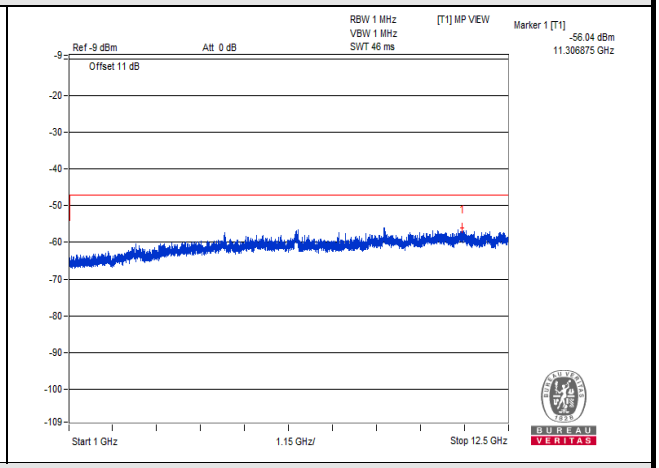
Vnormal



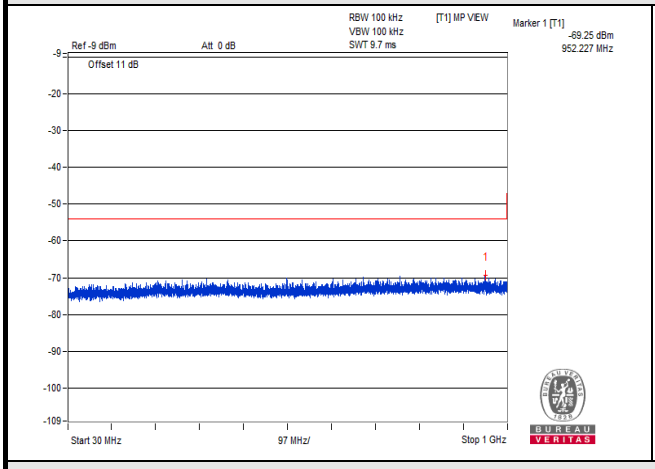


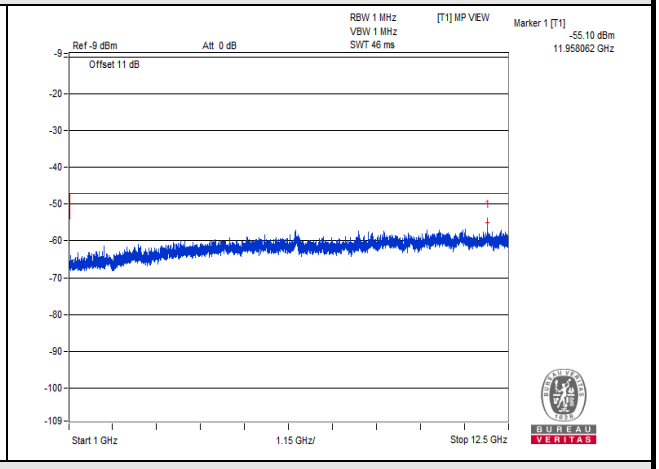
Vmax.





Vmin.



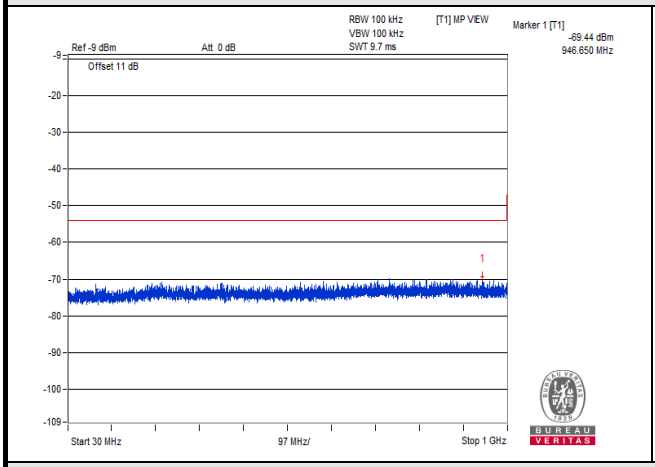


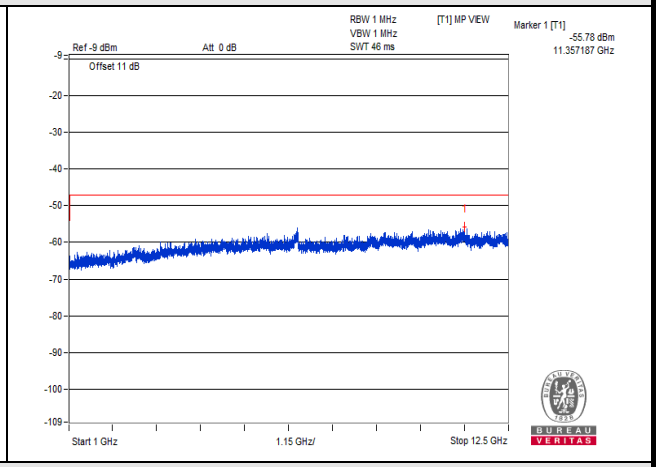
CH 39 (2480MHz)

GFSK (2Mbps)

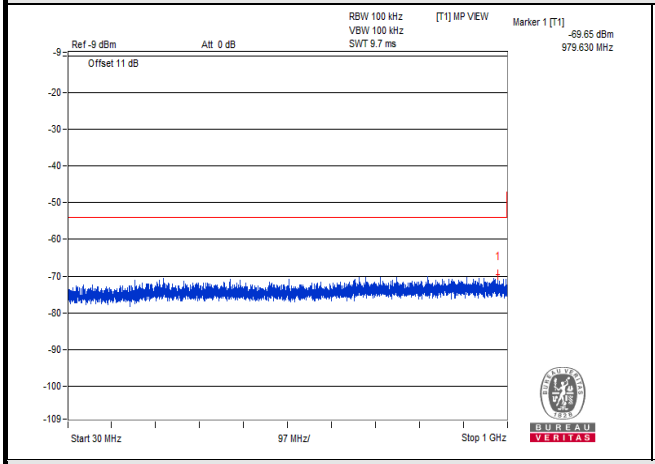
TEST CHANNEL		CH 0 (2402MHz)			
TEST CONDITION	FREQUENCY RANGE(MHz)	FREQUENCY (MHz)	MEASURE. VALUE(nW)	LIMIT (nW)	RESULT
V_{normal}	30MHz to 1000MHz	946.650	0.113763	4.0	PASS
	1000MHz to 12500MHz	11357.187	2.642409	20.0	PASS
$V_{max.}$	30MHz to 1000MHz	979.630	0.108393	4.0	PASS
	1000MHz to 12500MHz	10703.125	2.552701	20.0	PASS
$V_{min.}$	30MHz to 1000MHz	889.177	0.121899	4.0	PASS
	1000MHz to 12500MHz	11841.625	2.065380	20.0	PASS
TEST CHANNEL		CH 19 (2440MHz)			
V_{normal}	30MHz to 1000MHz	650.800	0.094189	4.0	PASS
	1000MHz to 12500MHz	11881.875	2.089296	20.0	PASS
$V_{max.}$	30MHz to 1000MHz	880.447	0.092683	4.0	PASS
	1000MHz to 12500MHz	11972.437	2.398833	20.0	PASS
$V_{min.}$	30MHz to 1000MHz	739.797	0.109396	4.0	PASS
	1000MHz to 12500MHz	10951.812	2.223310	20.0	PASS
TEST CHANNEL		CH 39 (2480MHz)			
V_{normal}	30MHz to 1000MHz	739.797	0.113240	4.0	PASS
	1000MHz to 12500MHz	12359.125	2.322737	20.0	PASS
$V_{max.}$	30MHz to 1000MHz	729.491	0.137088	4.0	PASS
	1000MHz to 12500MHz	11362.937	3.639150	20.0	PASS
$V_{min.}$	30MHz to 1000MHz	709.727	0.113501	4.0	PASS
	1000MHz to 12500MHz	6975.687	2.529298	20.0	PASS

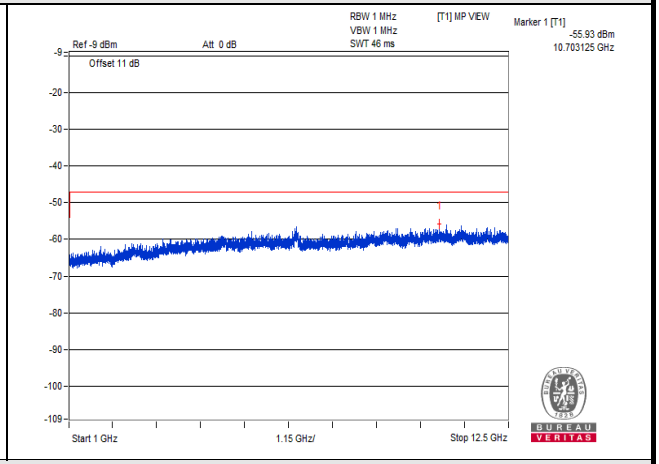
Vnormal



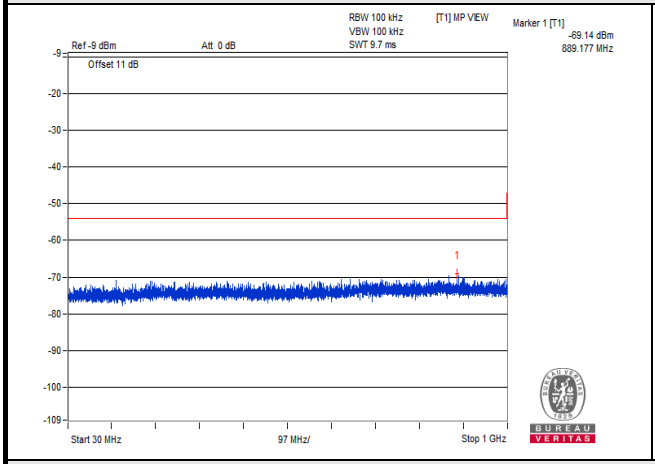


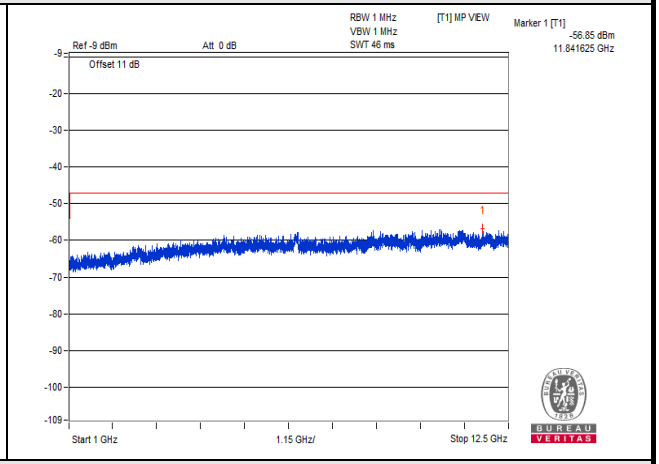
Vmax.





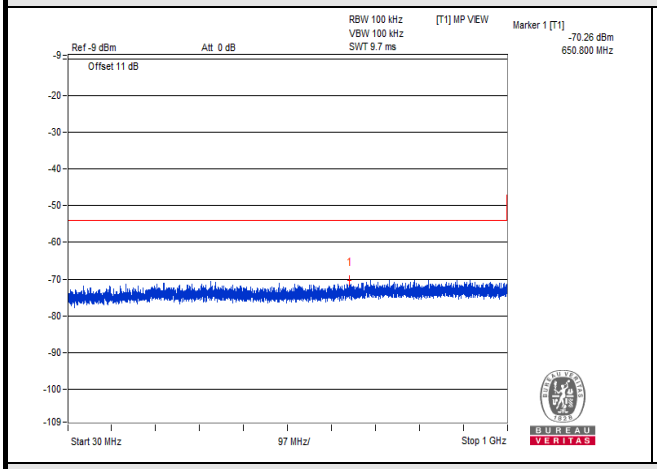
Vmin.

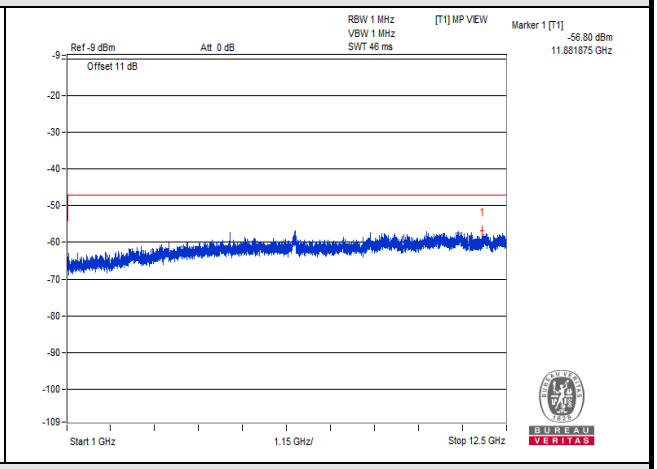




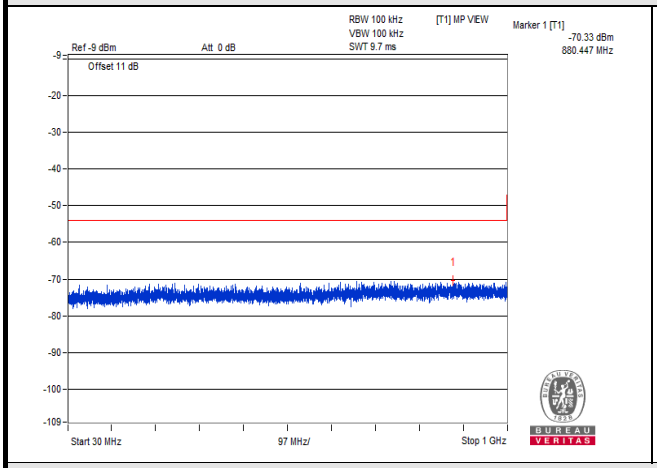
CH 0 (2402MHz)

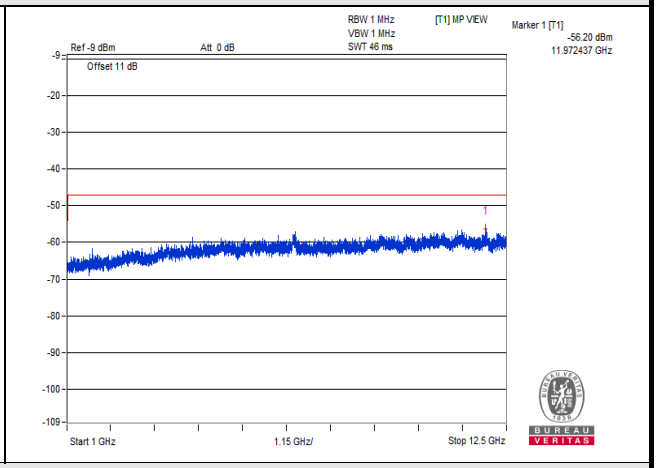
Vnormal





Vmax.





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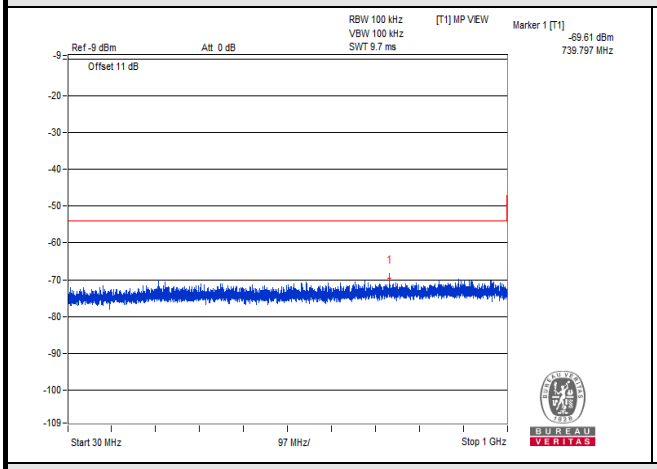
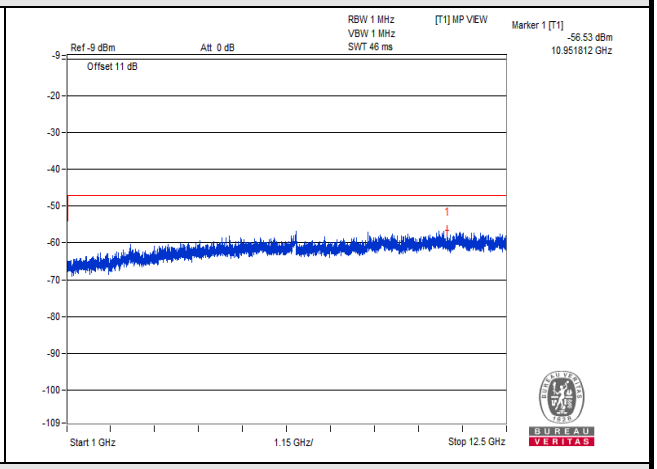
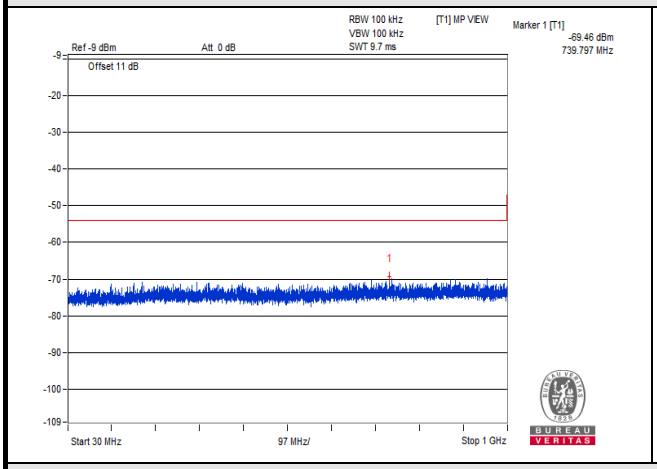
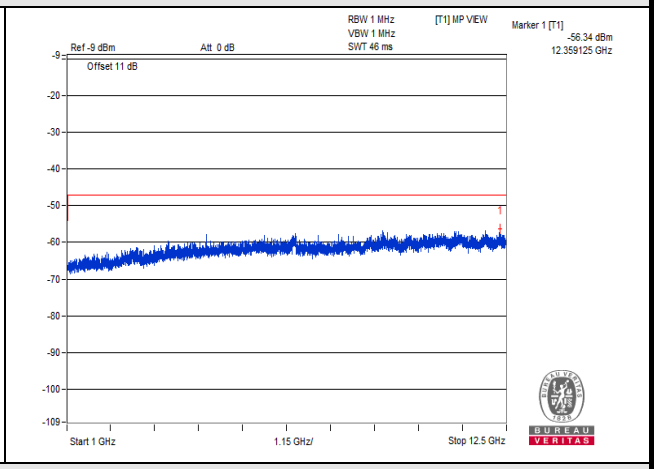




CH 19 (2440MHz)

Vnormal





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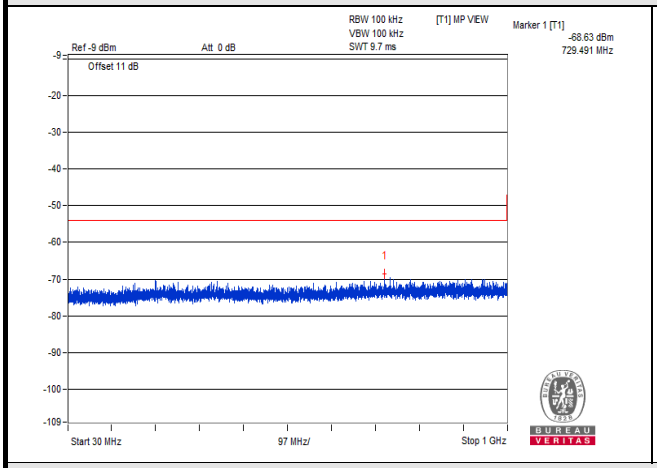

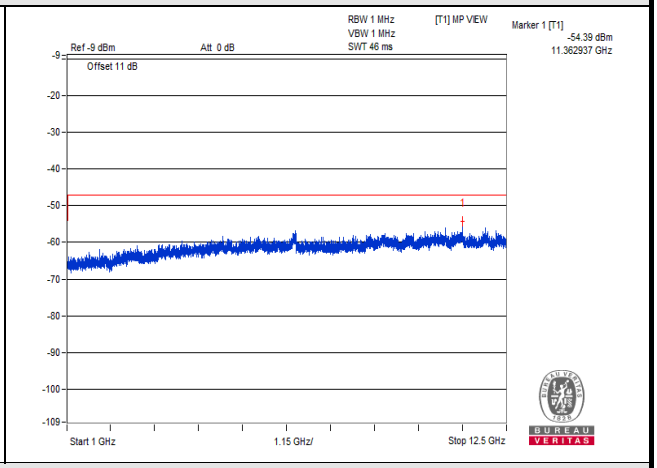

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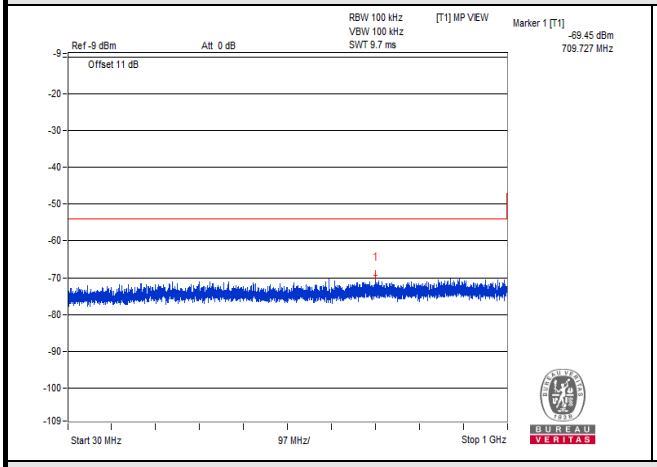
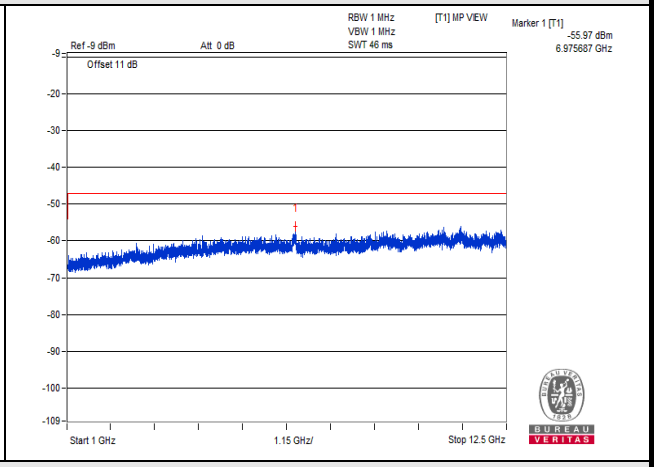




CH 39 (2480MHz)

4.6 Interference Prevention Function

4.6.1 Limits of Interference Prevention Function

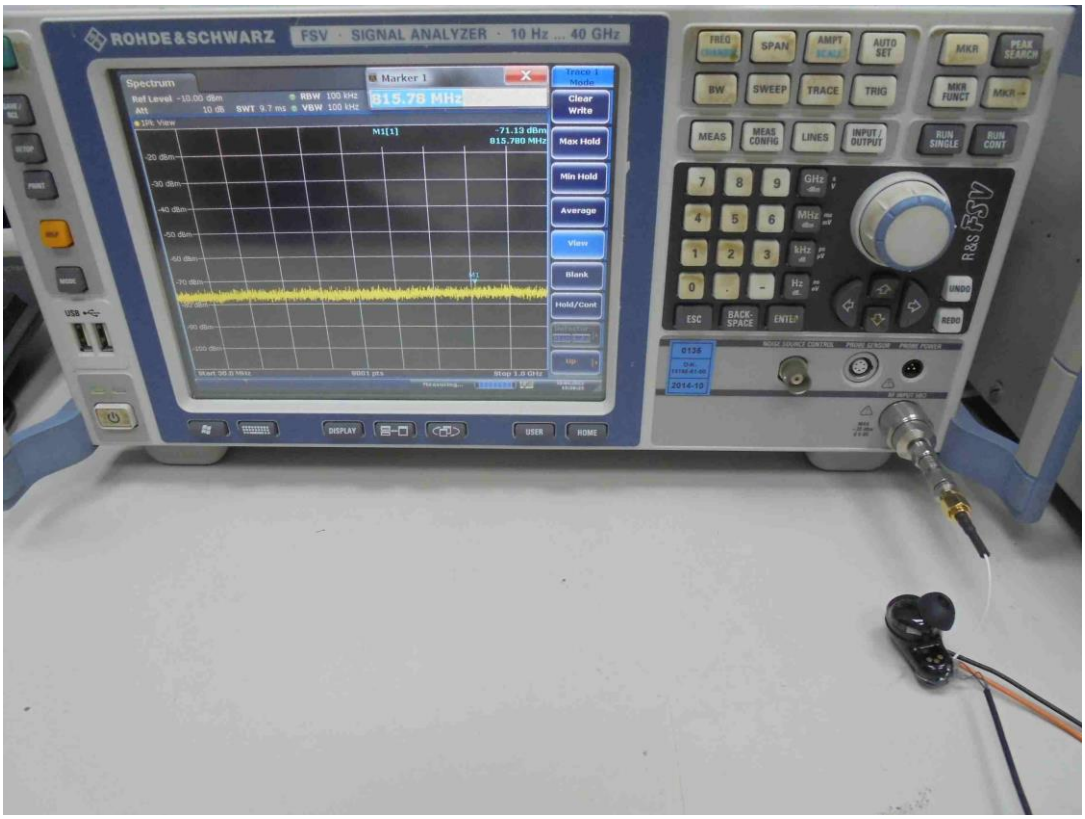
NA

4.6.2 Test Setup

4.6.3 Test Results

Link Mode	Test Result
Bluetooth	PASS

5 Photographs of the Test Configuration



Appendix - Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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