FCC RADIO TEST REPORT

FCC ID: 2A4THMJ-6709

Sample:	Barcode Scanner
Trade Name:	symcode alacrity
Main Model:	MJ-6709 Series
Additional Model:	MJ-1400 Series, MJ-1911 Series, MJ-2020 Series, MJ-2030 Series, MJ-2080 Series, MJ-2806 Series, MJ-6708 Series, MJ-6706 Series, MJ-9200 Series, MJ-1900 Series, MJ-1902 Series, MJ-1930 Series, MJ-1932 Series, MJ-2877 Series, R30, R35, R38, R40, R45, R50, R55, R60, R70, R80, R90, X5, X6, X7, X8, X9, Q10, R10
Report No.:	UNIA22021604ER-61

Prepared for

Shenzhen Alacrity Barcode Technology Co., Ltd

5F,Building B,Southern Pearl Technology Park,No.83,Yingtai Road,Dalang, Longhua,Shenzhen,Guangdong,China

Prepared by

Shenzhen United Testing Technology Co., Ltd.

2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd, Tiegang Community, XixiangStr, Bao'an District, Shenzhen, China

TEST RESULTCERTIFICATION

Applicant:	Shenzhen Alacrity Barcode Technology Co., Ltd
Address:	5F,Building B,Southern Pearl Technology Park,No.83,Yingtai Road,Dalang, Longhua,Shenzhen,Guangdong,China
Manufacturer:	Shenzhen Alacrity Barcode Technology Co., Ltd
Address:	5F,Building B,Southern Pearl Technology Park,No.83,Yingtai Road,Dalang, Longhua,Shenzhen,Guangdong,China

Product description

Product:	Barcode Scanner
Trade Name:	symcode alacrity
Model Name:	MJ-6709 Series, MJ-1400 Series, MJ-1911 Series, MJ-2020 Series, MJ-2030 Series, MJ-2080 Series, MJ-2806 Series, MJ-6708 Series, MJ-6706 Series, MJ-9200 Series, MJ-1900 Series, MJ-1902 Series, MJ-1930 Series, MJ-1932 Series, MJ-2877 Series, R30, R35, R38, R40, R45, R50, R55, R60, R70, R80, R90, X5, X6, X7, X8, X9, Q10, R10
Test Methods:	FCC Rules and Regulations Part 15 Subpart C Section 15.247 ANSI C63.10: 2013

This device described above has been tested by Shenzhen United Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date (s) of performance of tests:	Feb. 16, 2022 ~ Mar. 18, 2022
Date of Issue:	Mar. 18, 2022
Test Result:	Pass

Prepared by: Jackson Fang

Jackson Fang/Editor

Reviewer: kahn.yang

Kahn yang/Supervisor

Approved & Authorized Signer: liuze

Liuze/Manager

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GENERAL INFORMATION

GENERAL DESCRIPTION OF EUT

Product:	Barcode Scanner
Trade Name:	symcode alacrity
Main Model:	MJ-6709 Series
Additional Model:	MJ-1400 Series, MJ-1911 Series, MJ-2020 Series, MJ-2030 Series, MJ-2080 Series, MJ-2806 Series, MJ-6708 Series, MJ-6706 Series, MJ-9200 Series, MJ-1900 Series, MJ-1902 Series, MJ-1930 Series, MJ-1932 Series, MJ-2877 Series, R30, R35, R38, R40, R45, R50, R55, R60, R70, R80, R90, X5, X6, X7, X8, X9, Q10, R10
Model Difference:	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: MJ-6709 Series.
FCC ID:	2A4THMJ-6709
Operation Frequency:	2402MHz~2480MHz
Number of Channels:	79CH
Modulation Type:	GFSK, π/4 DQPSK, 8DPSK
Antenna Type:	PCB Antenna
Antenna Gain:	0dBi
Battery:	Li-ion 18650
Adapter:	N/A
Power Source:	DC 5.0V from USB Port of Laptop

CARRIER FREQUENCY OF CHANNELS

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	21	2423	42	2444	63	2465
01	2403	22	2424	43	2445	64	2466
02	2404	23	2425	44	2446	65	2467
03	2405	24	2426	45	2447	66	2468
04	2406	25	2427	46	2448	67	2469
05	2407	26	2428	47	2449	68	2470
06	2408	27	2429	48	2450	69	2471
07	2409	28	2430	49	2451	70	2472
08	2410	29	2431	50	2452	71	2473
09	2411	30	2432	51	2453	72	2474
10	2412	31	2433	52	2454	73	2475
11	2413	32	2434	53	2455	74	2476
12	2414	33	2435	54	2456	75	2477
13	2415	34	2436	55	2457	76	2478
14	2416	35	2437	56	2458	77	2479
15	2417	36	2438	57	2459	78	2480
16	2418	37	2439	58	2460		
17	2419	38	2440	59	2461		
18	2420	39	2441	60	2462		
19	2421	40	2442	61	2463		
20	2422	41	2443	62	2464		

1.3 EXAMPLE OF A HOPPING SEQUENCY IN DATA MODE

Example of a hopping sequence in data mode:

40, 21, 44, 23, 04, 15, 66, 56, 19, 78, 07, 28, 69, 55, 36, 45, 05, 13, 43, 74, 57, 35, 67, 76, 02, 34, 54, 63, 42, 11, 30, 06, 64, 25, 75, 48, 17, 33, 58, 01, 29, 14, 51, 72, 03, 31, 50, 61, 77, 18, 10, 47, 12, 68, 08, 49, 20, 00, 73, 09, 16, 60, 71, 41, 24, 53, 38, 26, 46, 37, 65, 32, 70, 52, 27, 59, 22, 62, 39

1.4 EST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013).

Radiated testing was performed at an antenna to EUT distance 3 meters.

2 MEASUREMENT UNCERTAINTY

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

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
UNI	ANSI	9kHz ~ 150kHz	2.96	
		150kHz ~ 30MHz	2.44	

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
UNI	ANSI	9kHz ~ 30MHz	2.50	
		30MHz ~ 1000MHz	4.80	
		Above 1000MHz	4.13	

3 DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel GFSK
2	Middle channel GFSK
3	High channel GFSK
4	Low channel π/4 DQPSK
5	Middle channel π/4 DQPSK
6	High channel π/4 DQPSK
7	Low channel 8DPSK
8	Middle channel 8DPSK
9	High channel 8DPSK
10	Hopping mode GFSK
11	Hopping mode π/4 DQPSK
12	Hopping mode 8DPSK

Note:

1.Only the result of the worst case was recorded in the report, if no other cases.

2. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

3. ForConductedTestmethod,atemporaryantennaconnectorisprovidedbythemanufacture.

4 SYSTEM TEST CONFIGURATION

4.1 CONFIGURATION OF EUT SYSTEM

Operation of EUT during Conducted and Radiation testing:

4.2 EQUIPMENT USED IN TESTED SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	Barcode Scanner	MJ-6709 Series	2A4THMJ-6709	EUT
2	Laptop	CQ45	Compaq	AE
3	N/A	N/A	N/A	N/A
4	N/A	N/A	N/A	N/A

4.3 SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
15.247 (b)(1)	Peak Output Power	Compliant
15.247(a)(1)	20 dB Bandwidth	Compliant
15.247 (d)	Conducted Spurious Emission	Compliant
15.209	Radiated Emission	Compliant
15.247 (a)(1)(iii)	Number of Hopping Frequency	Compliant
15.247 (a)(1)(iii)	Time of Occupancy	Compliant
15.247 (a)(1)	Frequency Separation	Compliant
15.207	Conducted Emission	Compliant

5 TEST FACILITY

Test Laboratory : Shenzhen United Testing Technology Co., Ltd.
Address : 2F, Annex Bldg, Jiahuangyuan Tech Park, #365 Baotian 1 Rd,Tiegang Community, XixiangStr, Bao'an District, Shenzhen, China

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.The testing quality system of our laboratory meets with ISO/IEC-17025 requirements. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:
A2LA Certificate Number: 4747.01
The EMC Laboratory has been accredited by A2LA, and in compliance with ISO/IEC 17025:2017 General Requirements for testing Laboratories.

FCC Registration Number: 674885
The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission.

IC Registration Number: 21947
The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada.

6 TEST EQUIPMENT OF RADIATED EMISSION TEST

Item	Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
Conduction Emissions Measurement					
1	Conducted Emission Test Software	EZ-EMC	Ver.CCS-3A1-CE	N/A	N/A
2	AMN	Schwarzbeck	NNLK8121	8121370	2022.09.22
3	AAN	TESEQ	T8-Cat6	38888	2022.09.22
4	Pulse Limiter	CYBRTEK	EM5010	E115010056	2022.05.17
5	EMI Test Receiver	Rohde&Schwarz	ESCI	101210	2022.09.22
Radiated Emissions Measurement					
1	Radiated Emission Test Software	EZ-EMC	Ver.CCS-03A1	N/A	N/A
2	Horn Antenna	Sunol	DRH-118	A101415	2022.09.27
3	Broadband Hybrid Antenna	Sunol	JB1	A090215	2024.02.26
4	PREAMP	HP	8449B	3008A00160	2022.09.22
5	PREAMP	HP	8447D	2944A07999	2022.05.17
6	EMI TEST RECEIVER	Rohde&Schwarz	ESR3	101891	2022.09.22
7	VECTOR Signal Generator	Rohde&Schwarz	SMU200A	101521	2022.09.22
8	Signal Generator	Agilent	E4421B	MY4335105	2022.09.22
9	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2022.09.22
10	MXA Signal Analyzer	Keysight	N9020A	MY51110104	2022.09.22
11	RF Power sensor	DARE	RPR3006W	15I00041SNO88	2022.05.17
12	RF Power sensor	DARE	RPR3006W	15I00041SNO89	2022.05.17
13	RF power divider	Anritsu	K241B	992289	2022.09.22
14	Wideband radio communication tester	Rohde&Schwarz	CMW500	154987	2022.09.22
15	Active Loop Antenna	Com-Power	AL-130R	10160009	2022.07.25
16	Broadband Hybrid Antennas	Schwarzbeck	VULB9163	VULB9163#958	2022.09.22
17	Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1680	2022.05.23
18	Horn Antenna	A-INFOMW	LB-180400-KF	J211060660	2022.09.27
19	Microwave Broadband Preamplifier	Schwarzbeck	BBV 9721	100472	2022.09.22
20	Signal Generator	Agilent	N5183A	MY47420153	2022.09.22
21	Spctrum Analyzer	Rohde&Schwarz	FSP 40	100501	2022.09.22
22	Power Meter	KEYSIGHT	N1911A	MY50520168	2022.09.22

23	Frequency Meter	VICTOR	VC2000	997406086	2022.09.22
24	DC Power Source	HYELEC	HY5020E	055161818	2022.09.22

7 PEAK OUTPUT POWER

7.1 MEASUREMENT PROCEDURE

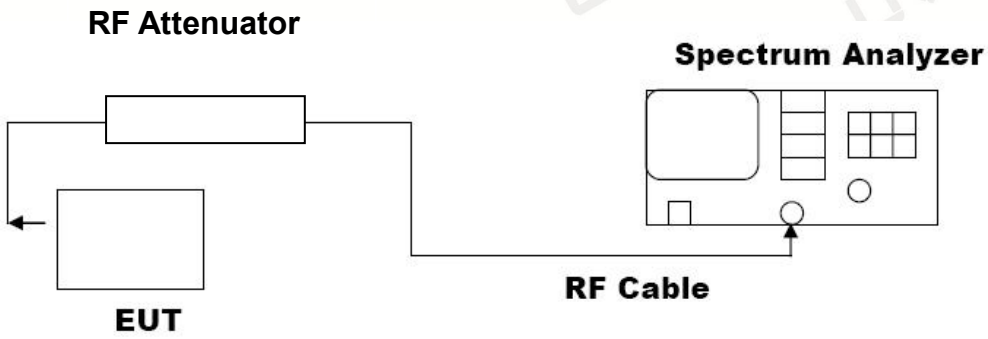
For peak power test:

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Span: Approximately five times the 20 dB bandwidth, centered on a hopping channel.
3. RBW > 20 dB bandwidth of the emission being measured.
4. VBW ≥RBW.
5. Sweep: Auto.
6. Detector function: Peak.
7. Trace: Max hold.

Allow trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power, after any corrections for external attenuators and cables.

7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

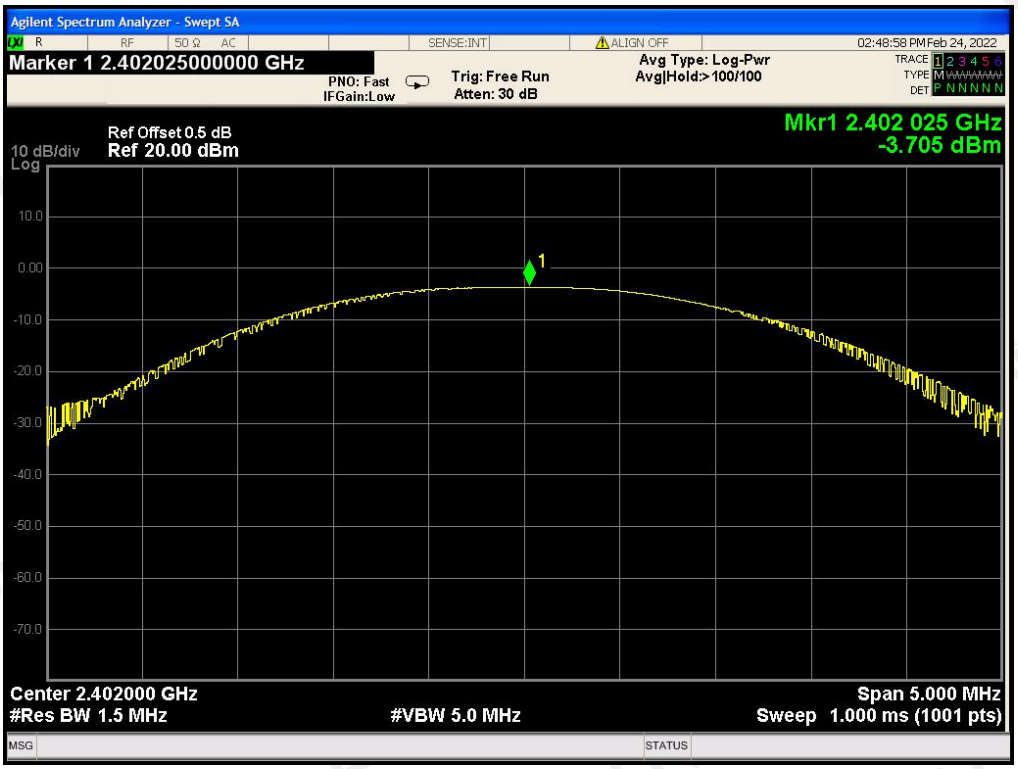
PEAK POWER TEST SETUP



7.3 LIMITS AND MEASUREMENT RESULT

PEAK OUTPUT POWER MEASUREMENT RESULT FOR GFSK MOUDULATION			
Frequency (GHz)	**Peak Power (dBm)**	**Applicable Limits (dBm)**	**Pass or Fail**
2.402	-3.705	21	Pass
2.441	-3.729	21	Pass
2.480	-4.435	21	Pass

CH0



CH39

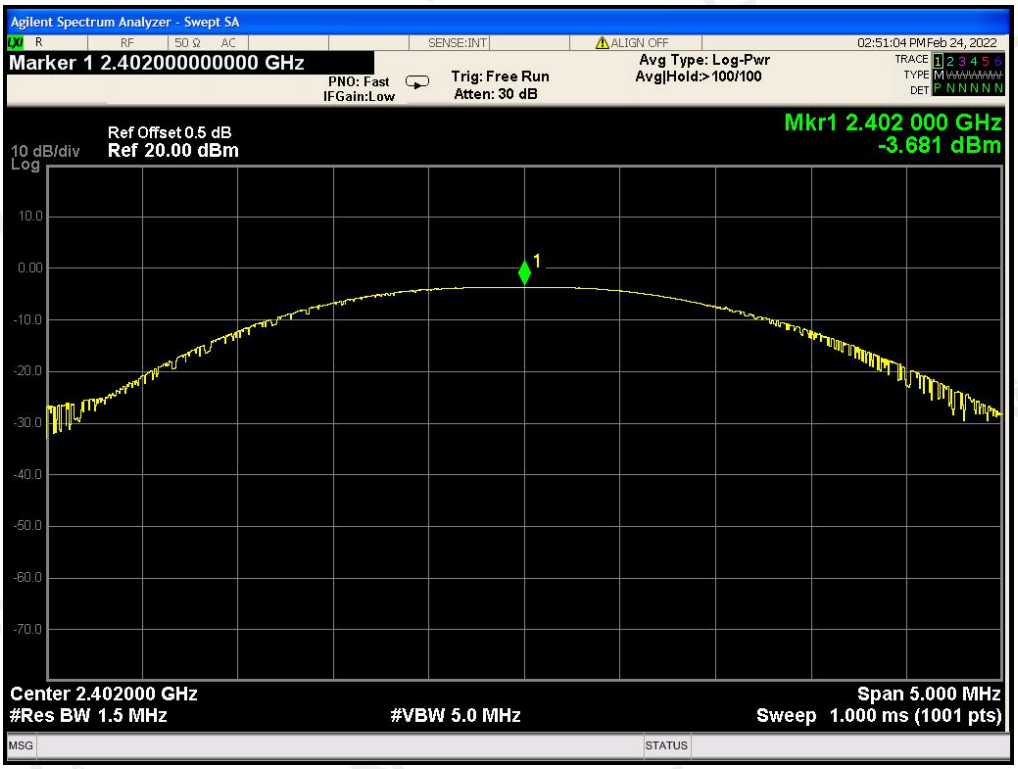

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.440995000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
02:49:45 PM Feb 24, 2022
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.440 995 GHz
-3.729 dBm
Center 2.441000 GHz
#Res BW 1.5 MHz
#VBW 5.0 MHz
Span 5.000 MHz
Sweep 1.000 ms (1001 pts)

CH78


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.479990000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
02:50:28 PM Feb 24, 2022
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.479 990 GHz
-4.435 dBm
Center 2.480000 GHz
#Res BW 1.5 MHz
#VBW 5.0 MHz
Span 5.000 MHz
Sweep 1.000 ms (1001 pts)

PEAK OUTPUT POWER MEASUREMENT RESULT FOR Π/4 DQPSK MODULATION			
Frequency (GHz)	**Peak Power (dBm)**	**Applicable Limits (dBm)**	**Pass or Fail**
2.402	-3.681	21	Pass
2.441	-3.717	21	Pass
2.480	-4.418	21	Pass

CH0



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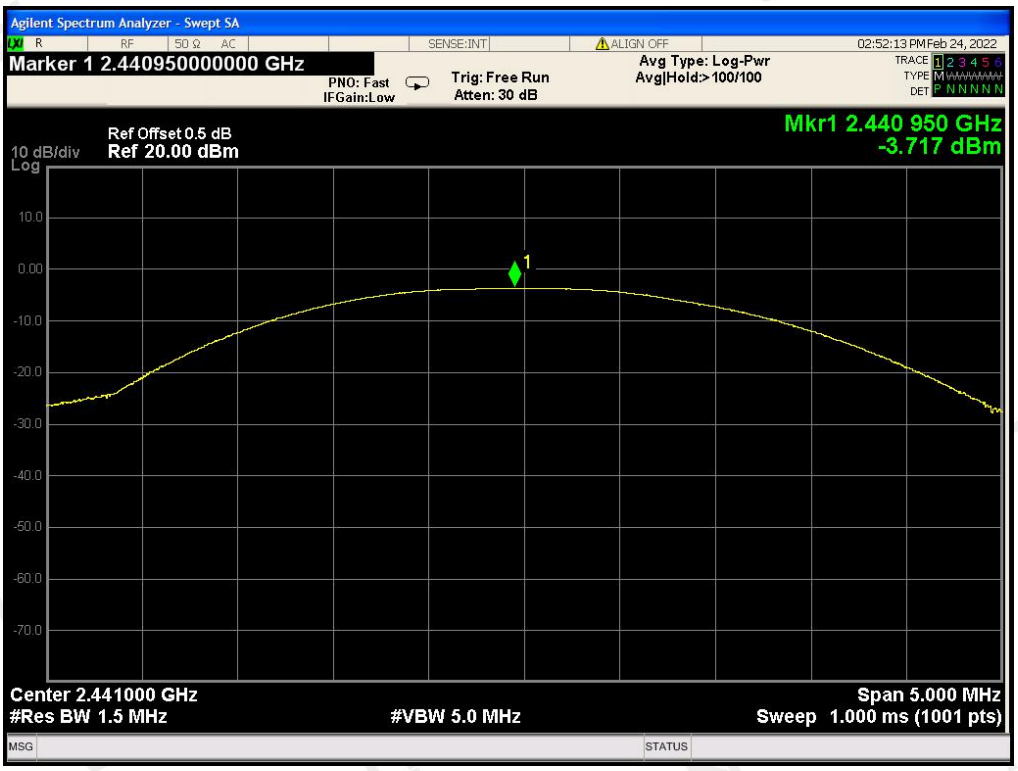
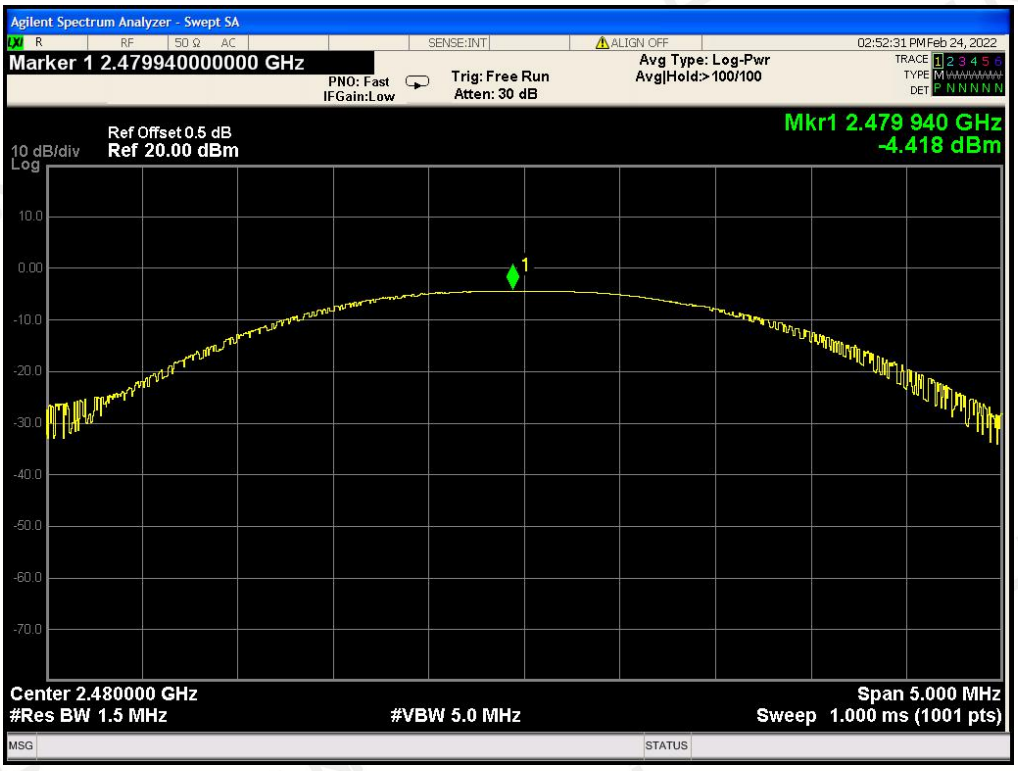
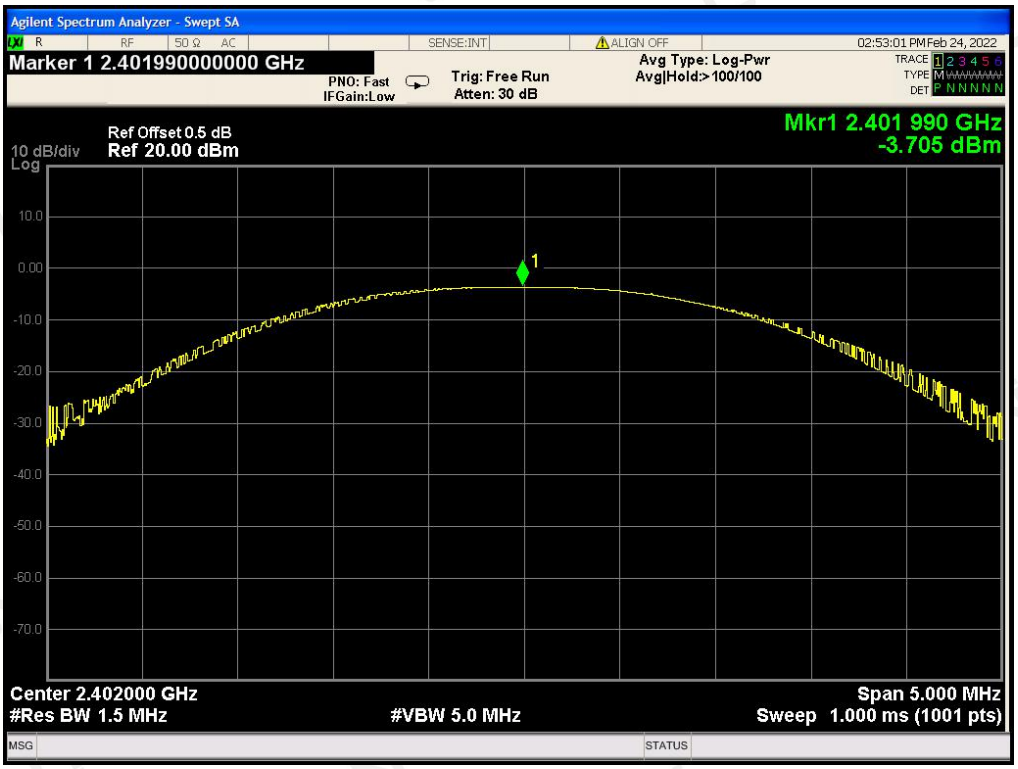

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.440950000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
02:52:13 PM Feb 24, 2022
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.440 950 GHz
-3.717 dBm
Center 2.441000 GHz
#Res BW 1.5 MHz
#VBW 5.0 MHz
Span 5.000 MHz
Sweep 1.000 ms (1001 pts)

CH78


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.479940000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
02:52:31 PM Feb 24, 2022
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.479 940 GHz
-4.418 dBm
Center 2.480000 GHz
#Res BW 1.5 MHz
#VBW 5.0 MHz
Span 5.000 MHz
Sweep 1.000 ms (1001 pts)

PEAK OUTPUT POWER MEASUREMENT RESULT FOR 8DPSK MODULATION			
Frequency (GHz)	**Peak Power (dBm)**	**Applicable Limits (dBm)**	**Pass or Fail**
2.402	-3.705	21	Pass
2.441	-3.745	21	Pass
2.480	-4.455	21	Pass

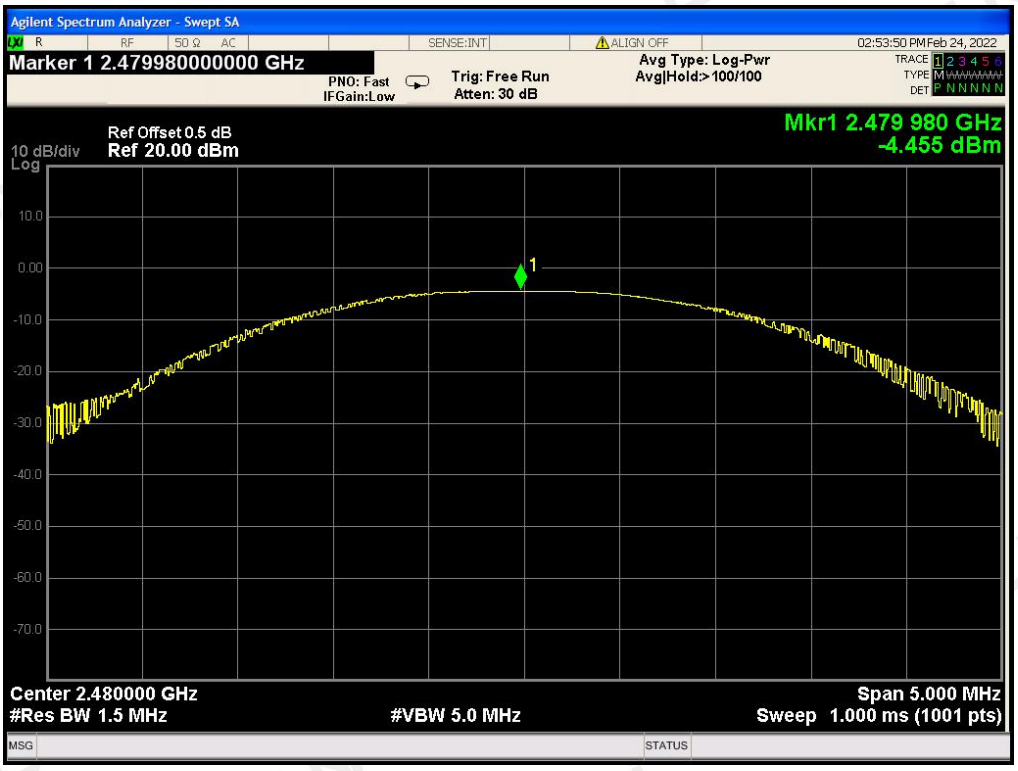
CH0



CH39


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.440995000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
02:53:28 PM Feb 24, 2022
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.440 995 GHz
-3.745 dBm
Center 2.441000 GHz
#Res BW 1.5 MHz
#VBW 5.0 MHz
Span 5.000 MHz
Sweep 1.000 ms (1001 pts)

CH78

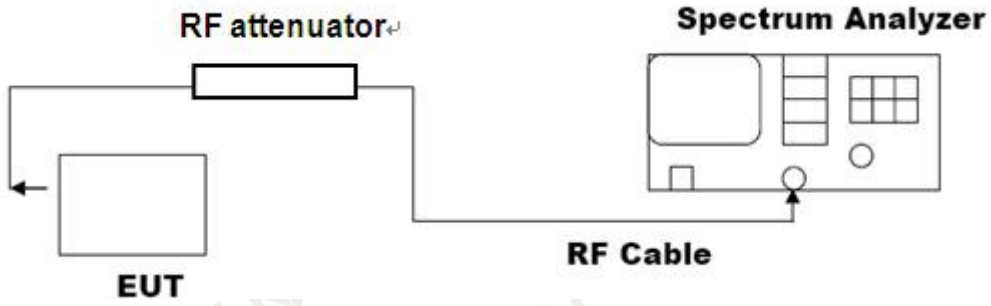

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.479980000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
02:53:50 PM Feb 24, 2022
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.479 980 GHz
-4.455 dBm
Center 2.480000 GHz
#Res BW 1.5 MHz
#VBW 5.0 MHz
Span 5.000 MHz
Sweep 1.000 ms (1001 pts)

8 20DB BANDWIDTH

8.1 MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set Span = approximately 2 to 5 times the 20 dB bandwidth, centered on a hoping channel
   The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW; Sweep = auto; Detector function = peak
4. Set SPA Trace 1 Max hold, then View.

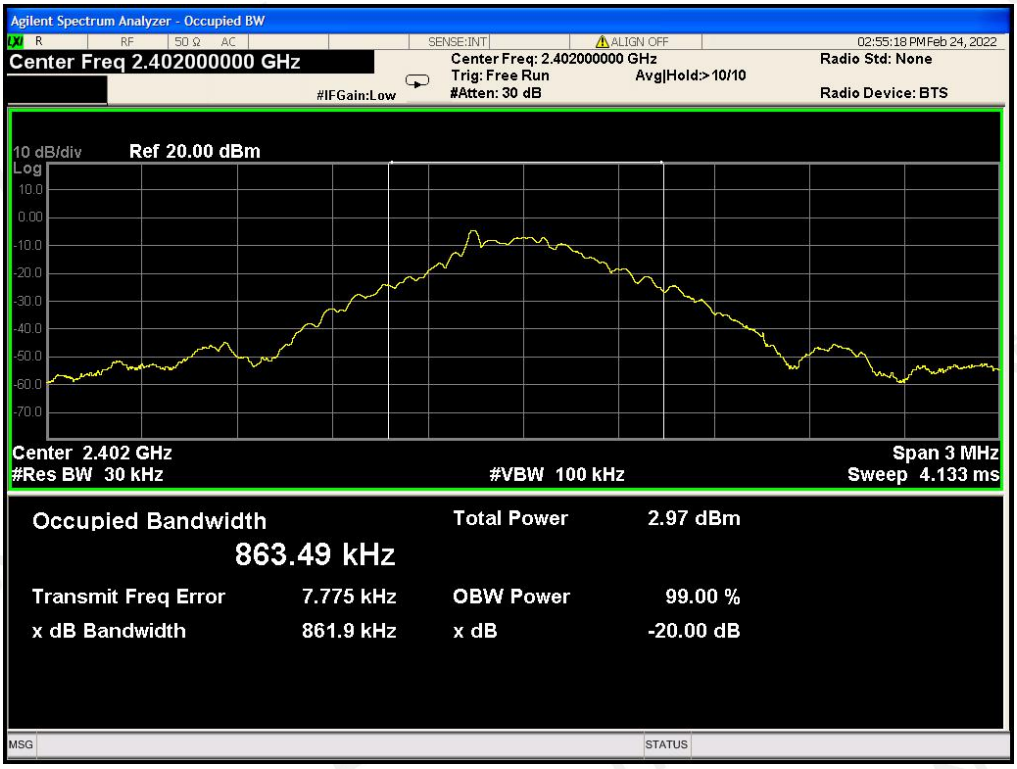
8.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



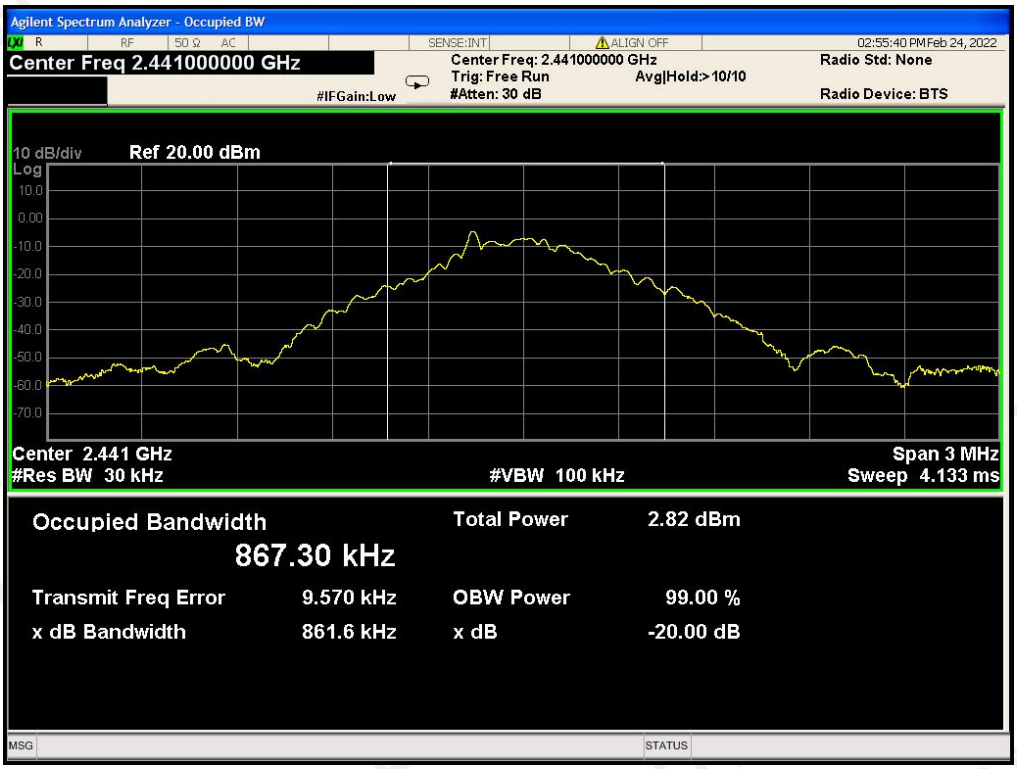
8.3 LIMITS AND MEASUREMENT RESULTS

GFSK MOUDULATION			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
N/A	Low Channel	0.862	PASS
	Middle Channel	0.862	PASS
	High Channel	0.918	PASS

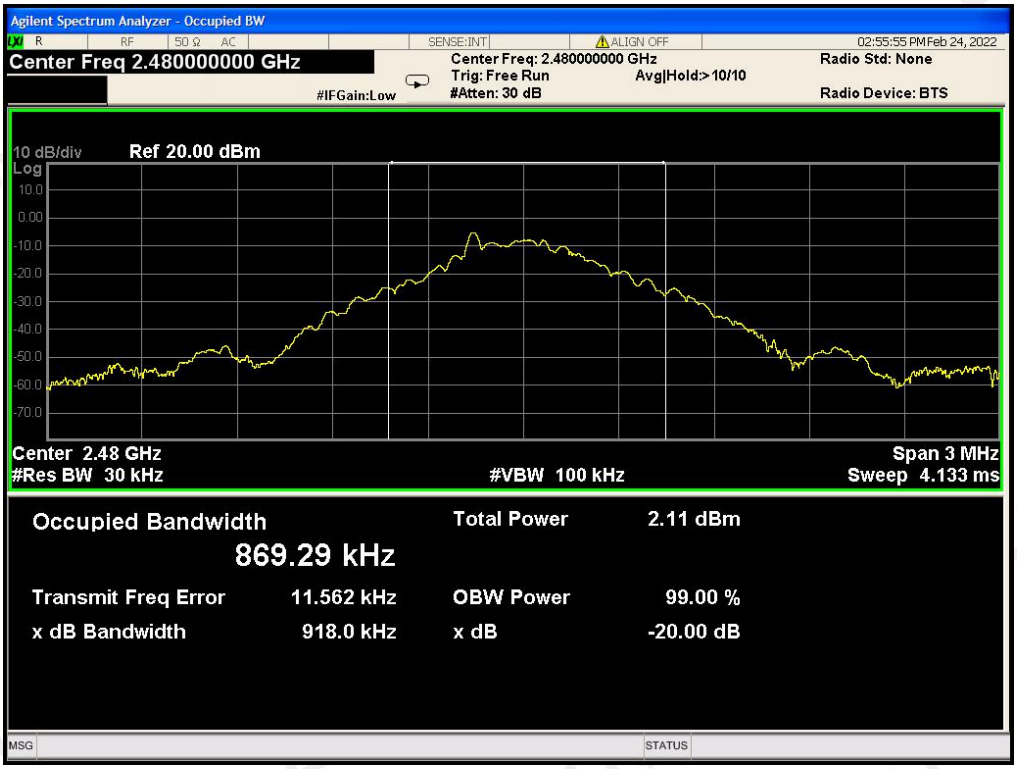
LOW CHANNEL



MIDDLE CHANNEL

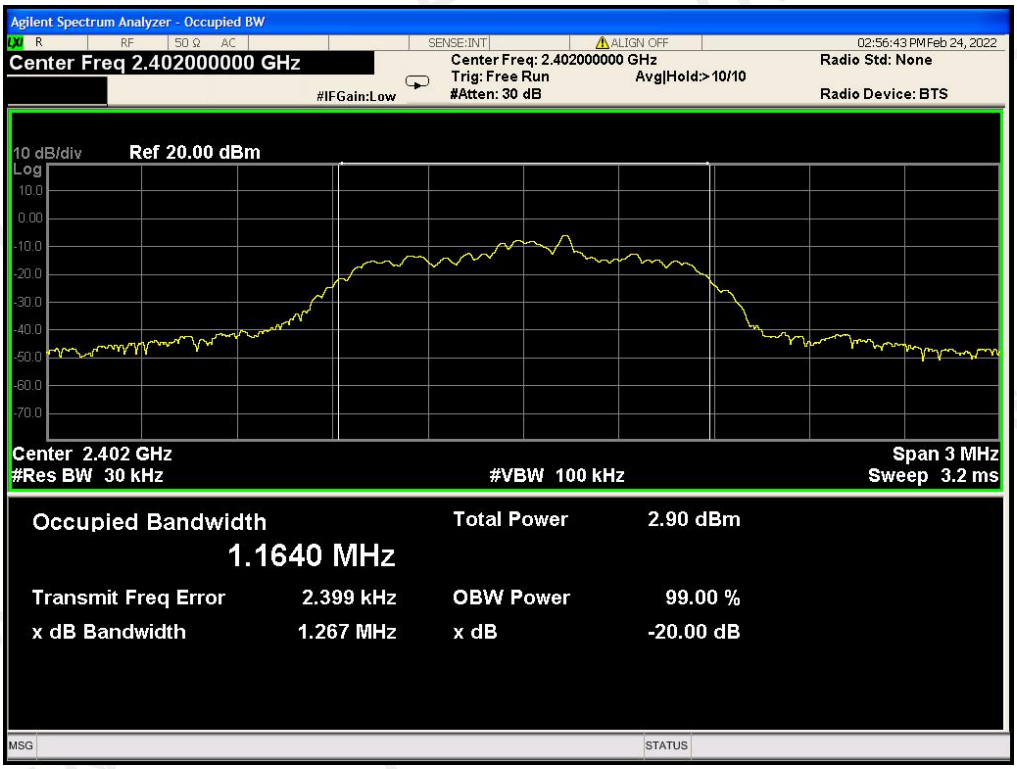


HIGH CHANNEL

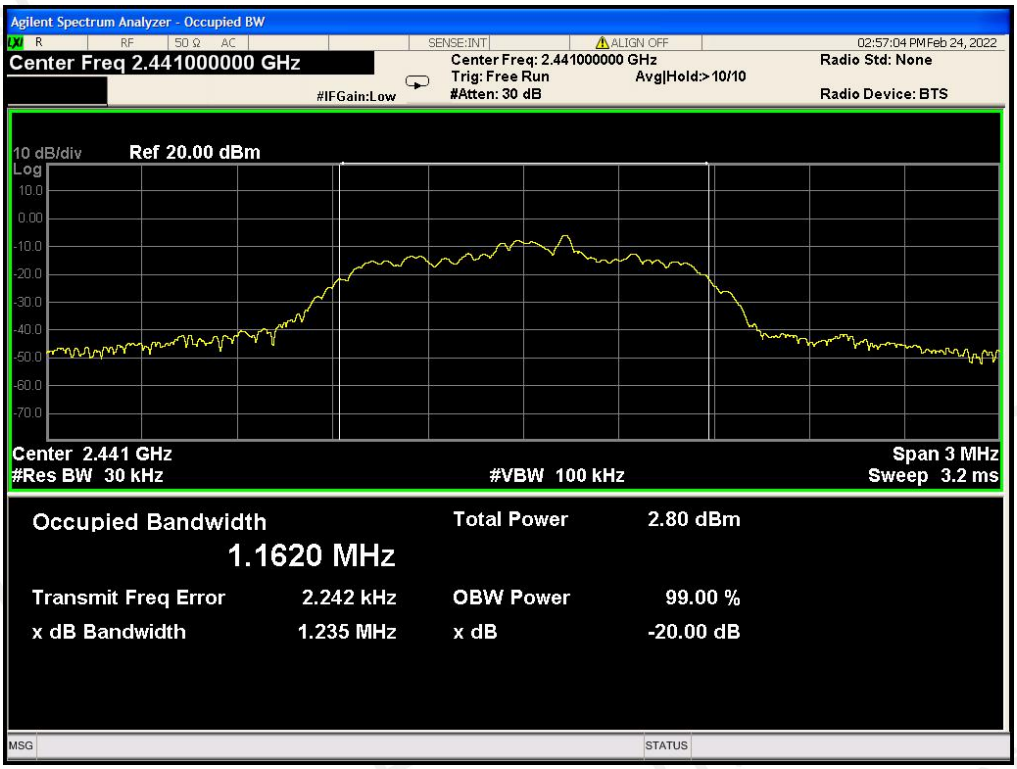


Π/4 DQPSK MODULATION			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
N/A	Low Channel	1.267	PASS
	Middle Channel	1.235	PASS
	High Channel	1.259	PASS

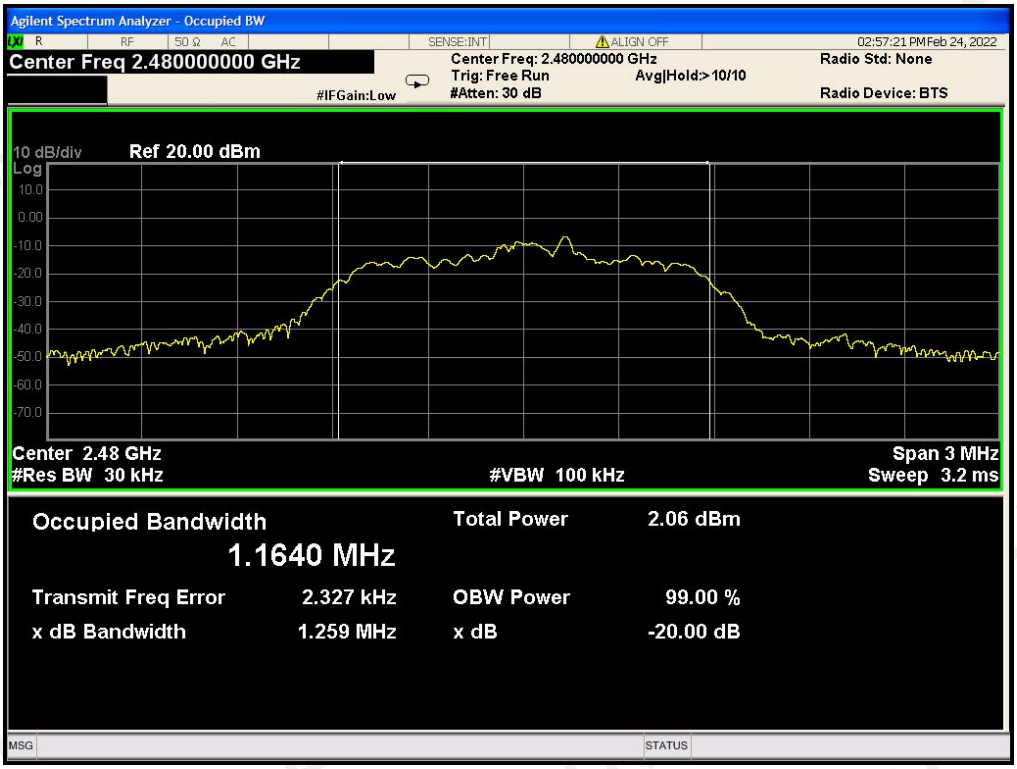
LOW CHANNEL



MIDDLE CHANNEL

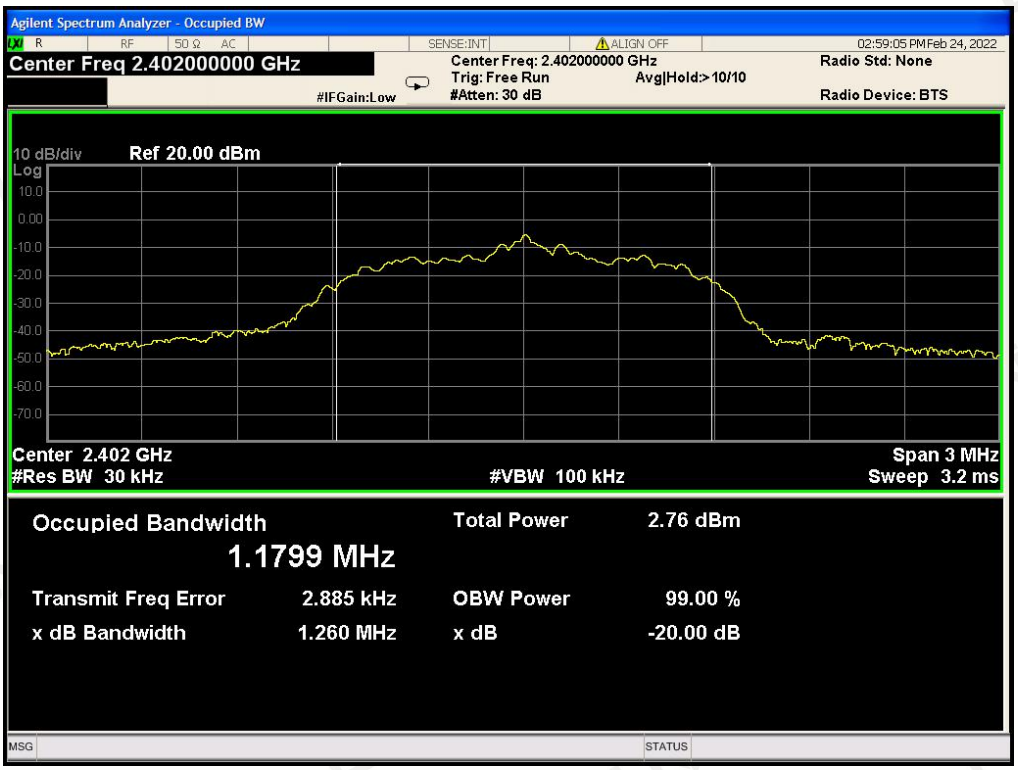


HIGH CHANNEL

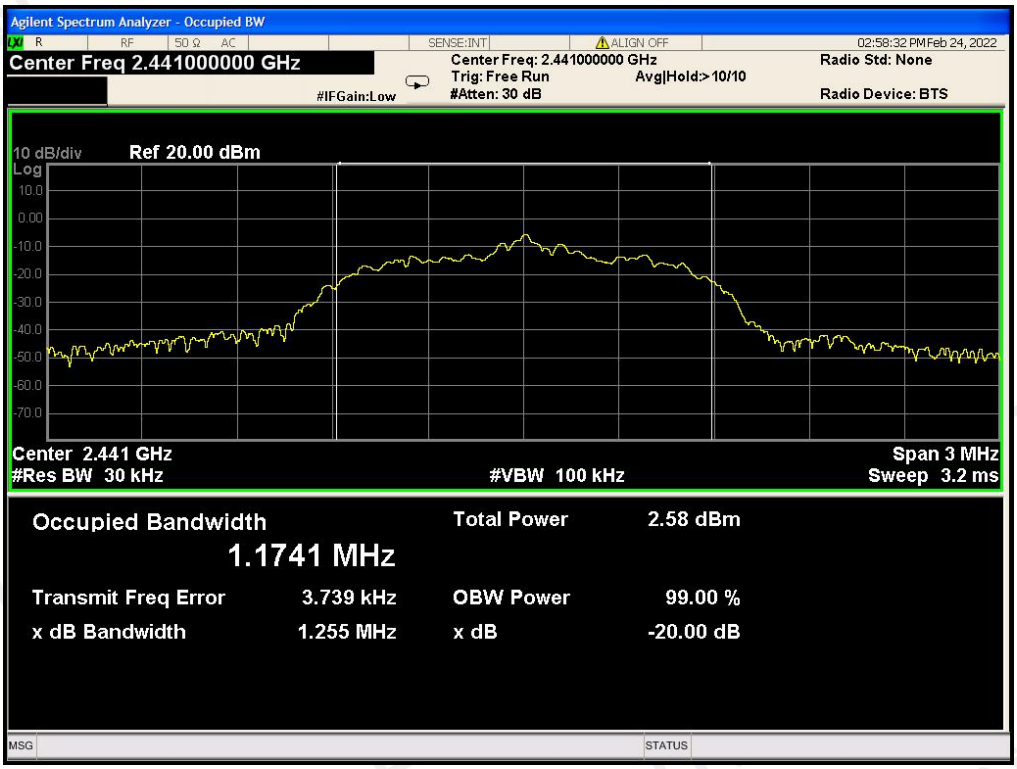


8DPSK MODULATION			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
N/A	Low Channel	1.260	PASS
	Middle Channel	1.255	PASS
	High Channel	1.265	PASS

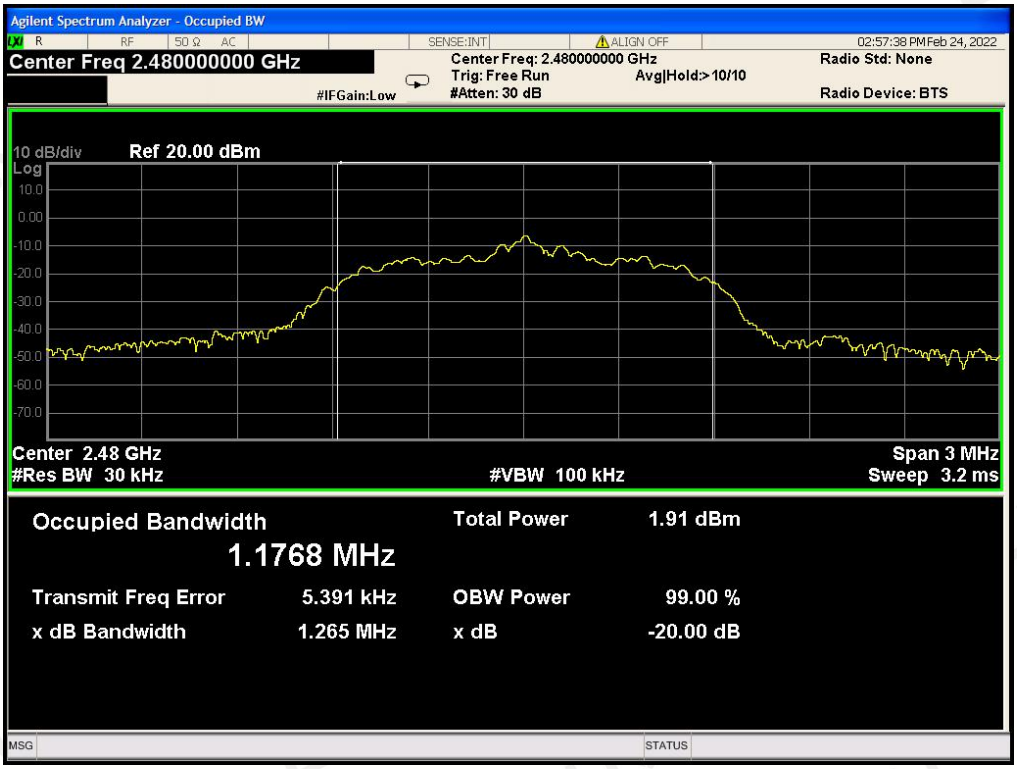
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



9 CONDUCTED SPURIOUS EMISSION

9.1 MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the Middle and the bottom operation frequency individually.
3. Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
   RBW = 100 kHz; VBW= 300 kHz; Sweep = auto; Detector function = peak.
4. Set SPA Trace 1 Max hold, then View.

9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2

9.3 MEASUREMENT EQUIPMENT USED

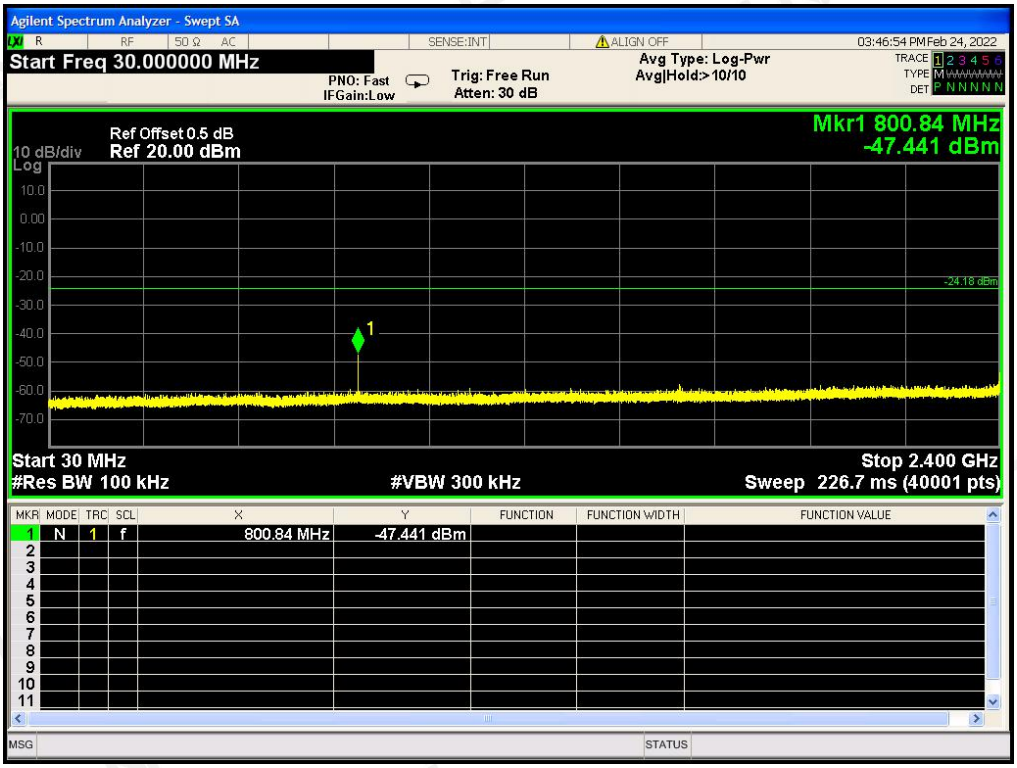
The same as described in section 6

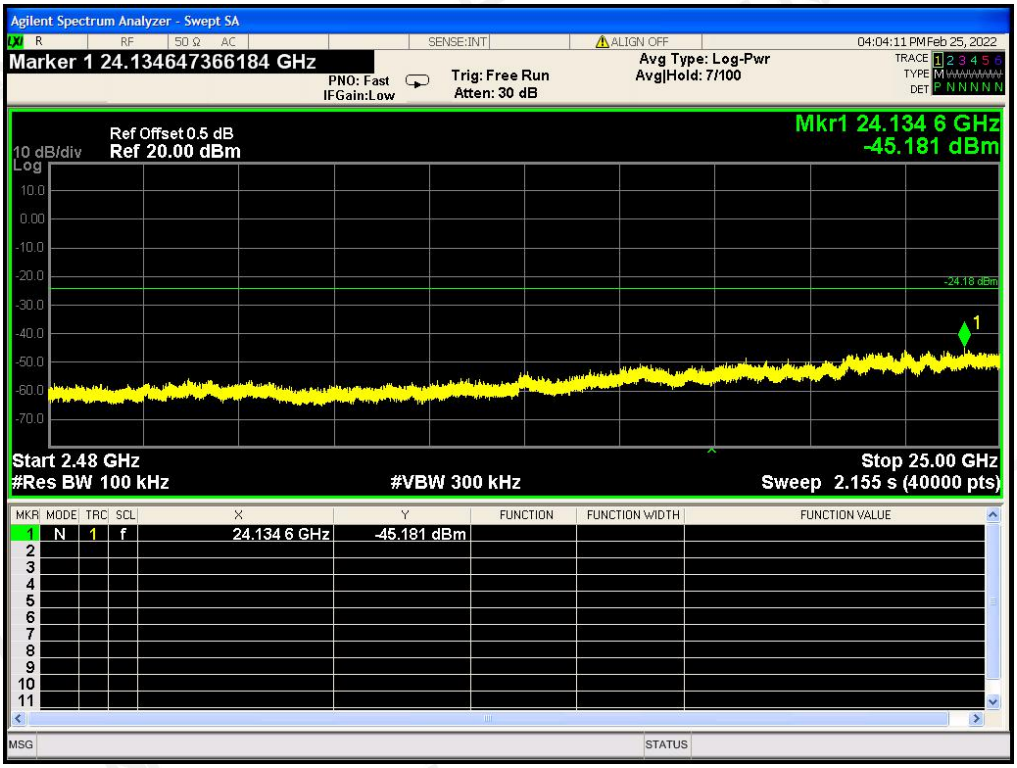
9.4 LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT		
Applicable Limits	**Measurement Result**	
	Test Data	**Criteria**
In any 100 kHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a))	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS
	At least -20dBc than the limit Specified on the TOP Channel	PASS

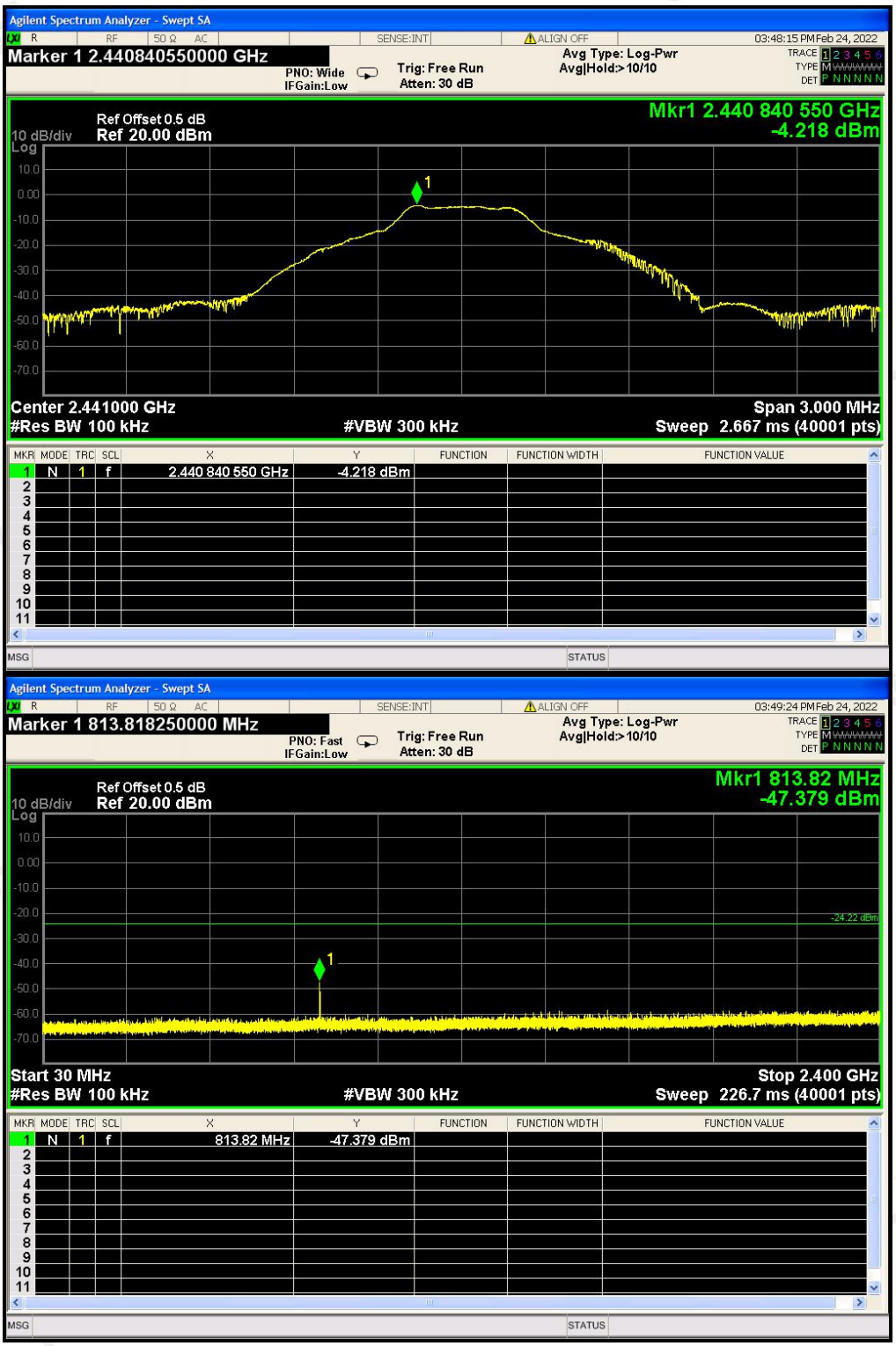
TEST RESULT FOR ENTIRE FREQUENCY RANGE

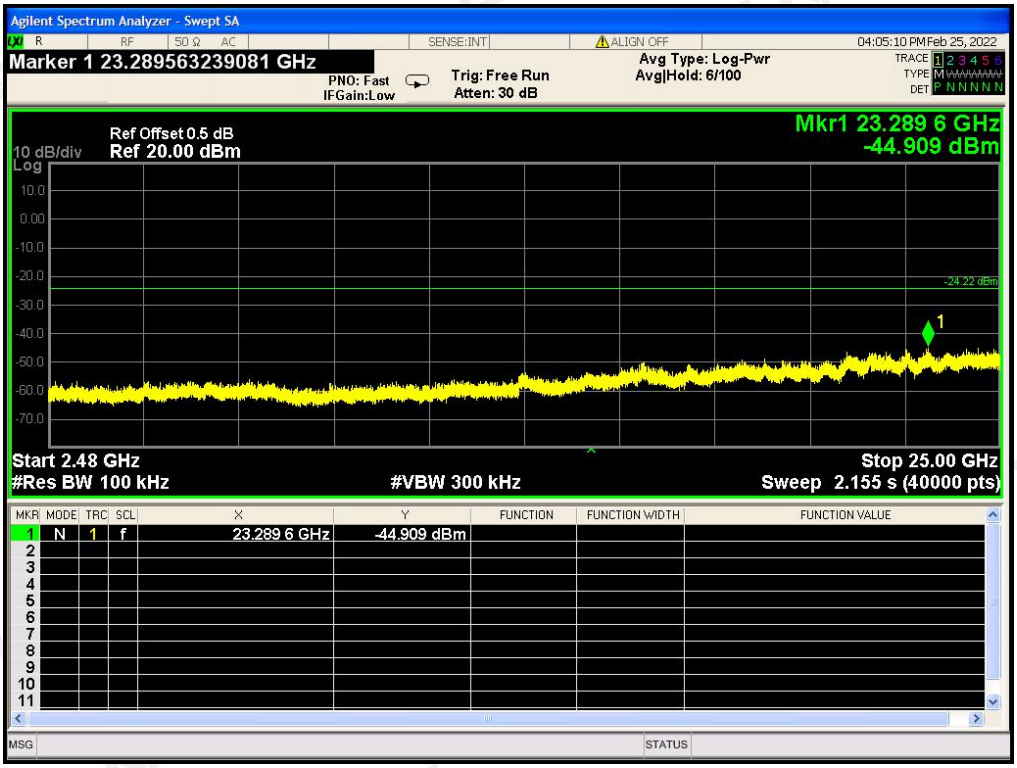
GFSK MODULATION IN LOW CHANNEL


Agilent Spectrum Analyzer - Swept SA
Start Freq 30.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold:>10/10
03:46:54 PM Feb 24, 2022
Ref Offset 0.5 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 800.84 MHz
-47.441 dBm
-24.18 dBm
Start 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.400 GHz
Sweep 226.7 ms (40001 pts)
MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE
1 N 1 f 800.84 MHz -47.441 dBm
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
SENSE:INT
ALIGN OFF
04:04:11 PM Feb 25, 2022
Marker 1 24.134647366184 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 7/100
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 24.134 6 GHz
-45.181 dBm
-24.18 dBm
Start 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.155 s (40000 pts)
1 N 1 f 24.134 6 GHz -45.181 dBm
MSG
STATUS

GFSK MODULATION IN MIDDLE CHANNEL




Agilent Spectrum Analyzer - Swept SA
SENSE:INT
ALIGN OFF
04:05:10 PM Feb 25, 2022
Marker 1 23.289563239081 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 6/100
Ref Offset 0.5 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 23.289 6 GHz
-44.909 dBm
-24.22 dBm
Start 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.155 s (40000 pts)
1 N 1 f 23.289 6 GHz -44.909 dBm
MSG
STATUS

GFSK MODULATION IN HIGH CHANNEL