MOTOROLA SOLUTIONS

CERTIFICATE 2518.08

SAMM 825

MOTOROLA PENANG ADV. COMM. LABORATORY
Motorola Solutions Malaysia Sdn. Bhd.
Plot 2A Medan Bayan Lepas,
Mukim 12, S.W.D. 11900 Bayan Lepas,
Penang, Malaysia.

FCC / ISED TEST REPORT

Report Revision : Rev.A

Date/s Tested	:	22-March-2024 - 24-July-2024
Report Issue Date	:	25-July-2024
Manufacturer/Location	:	Motorola Solutions Malaysia Sdn Bhd Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia
Requestor	:	WONG CHEW LOOI
Product Type	:	Portable
Product Marketing Name (PMN)	:	R7
Hardware Version Identification Number (HVIN)	:	AAH06RDN9RA1AN (IC Model: PMUE5722ABB)
Frequency Band	:	2.402 - 2.480 GHz
Max RF Output Power	:	GFSK – 12.59 mWatts DQPSK, 8DPSK – 15.85 mWatts
Applicant Name	:	Motorola Solutions Inc
Applicant Address	:	Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia
FCC Registrations	:	461337
IC Registrations	:	MY0001
Firmware Version Identification Number (FVIN)	:	D02.24.02.0078

The equipment was tested accordance to the requirement listed below:

(2.4GHz BT) **FCC 47CFR Part 15C** **ISED RSS 247 Issue 2,** **February 2017**	**PASS**

Prepared By:

NUR ALIEYA BINTI MAT YUSOFF
Test Personnel

Approved Signatory:

MAHESHVARAN A/L RAJAGOPAL
Responsible Engineer

Table of Contents

1.0. General Information 3
2.0. Summary of Test Results 5
3.0. Measurement Uncertainty 5
4.0. Equipment List 6
5.0. Test Mode Applicability and Test Channel Detail 7
6.0. Transmitter Test Parameters 8
6.1. Conducted RF Output Power (Peak) 8
6.1.1. Test Setup 8
6.1.2. Test Limits: 8
6.1.3. Test Data: 8
6.2. 20dB Channel Bandwidth 12
6.2.1. Test Setup 12
6.2.2. Test Limits: 12
6.2.3. Test Data: 12
6.3. Band-edge Conducted Spurious Emission 16
6.3.1. Test Setup 16
6.3.2. Test Limits 16
6.3.3. Test Result 16
6.4. Dwell time on each channel 20
6.4.1. Test Setup 20
6.4.2. Test Limits: 20
6.4.3. Test Result 21
6.5. Number of hopping Frequency 25
6.5.1. Test Setup 25
6.5.2. Test Limits: 25
6.5.3. Test Result 25
6.6. Channel Separation 27
6.6.1. Test Setup 27
6.6.2. Test Limits: 27
6.6.3. Test Result 27
6.7. Conducted Spurious Emission 31
6.7.1. Test Setup 31
6.7.2. Test Limits: 31
6.7.3. Test Data: 31
6.8. Radiated Emission within restricted Bands 35
6.8.1. Test Setup 35
6.8.2. Test Limits: 36
6.8.3. Test Data: 37
6.9. AC Powerline Conducted Emission 85
6.9.1. Test Setup 85
6.9.2. Test Limits: 86
6.9.3. Test Result 87

REVISION HISTORY

Revision History	Description	Date	Originator
Rev. A	Initial Report	**25-July-2024**	**Alieya**

1.0. General Information

EUT Description:

Technologies	2.4GHz BT
TX Frequency range	2402MHz – 2480MHz
Modulation Type	GFSK, Pi/4 DQPSK,8DPSK
Connector type	PROGRAMMING, TEST & ALIGNMENT CABLE
Antenna type	PCB

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
ANTENNA, STAMPED METAL,UHF SLIM WHIP ANTENNA (400-527MHZ) 400 - 527MHz	MOTOROLA	PMAE4079A
BATTERY PACK,BATT IMPRES LIION TIA4950 IP68 3200T	MOTOROLA	PMNN4810A
POWER SUPPLY ADAPTOR,IMPRES SUC LEVEL V SMPS NA CORD	MOTOROLA	WPLN4253B

Channel number and frequency information:

79 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, the EUT is to comply with the requirements of the following standards:

FCC 47 CFR Part 15 Subpart C
KDB 558074 D01 15.247 Meas Guidance v05
ANSI C63.10-2013

Deviation from standard

Not applicable as no deviation from standard test method

Modifications to EUT

For RF conducted measurements a pigtail was soldered out of the board while for radiated measurements there were no modifications to the device

2.0. Summary of Test Results

FCC Clause	ISED Clause	Test Item	Result	Remark	Serial number tested	Tested by
15.247 (b)(1)	RSS-247 5.4(b)	Conducted RF Output Power (Peak)	Pass	Highest output power: 10.849 dBm (12.159 mW)	865EAD9539	Hidayati
15.247 (a)(1)	RSS-247 5.1(a) RSS-247 5.1(b)	(1) 20dB Channel Bandwidth (2) Channel Separation	Pass	GFSK – 0.862MHz 862KF1D Pi/4 DQPSK – 1.172MHz 1M17G1D 8DPSK – 1.179MHz 1M18G1D	865EAD9539	Hidayati
15.247(a)(1)(iii)	RSS-247 5.1(d)	Number of hopping Frequency used	Pass	Meet the limit requirement.	865EAD9539	Hidayati
15.247(a)(1)(iii)	RSS-247 5.1(d)	Dwell time on each channel	Pass	Meet the limit requirement.	865EAD9539	Hidayati
15.247 (d)	RSS-247 5.5	Band Edge Conducted Spurious Emission	Pass	Worst case emission: -43.74 dB	865EAD9539	Hidayati
15.247 (d)	RSS-247 5.5	Conducted Spurious Emission	Pass	Worst case emission: -43.45 dBm	865EAD9539	Hidayati
15.205, 15.209, 15.247 (d)	RSS-247 5.5	Radiated Emission within Restricted Bands	Pass	Worst case emission: RBE: 42.7535 dBuV/m (margin: 11.2465 dBuV/m) RSE: 65.2459 dBuV/m (margin: 8.7541 dBuV/m), Noise floor	865EAD9538	Nazrin & Rezza
15.207	RSS-Gen 8.8	AC Powerline Conducted Emission	NA	Meet the limit requirement.	865EAD9538	Shidee
15.203	-	Antenna Requirement	NA	Internal antenna is not accessible to the end-user	NA	NA

3.0. Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±dB)
AC Power Line Conducted Spurious Emission	150KHz ~ 30MHz	3.48
Radiated Emissions up to 1 GHz	30MHz ~ 1000MHz	5.88
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.84
	18GHz ~ 40GHz	6.02
Conducted Spurious Emissions	9kHz ~ 12.75GHz	2.82

4.0. Equipment List

Bluetooth ATE # 1 (SW Version: Ate Main_3.1.12_R1)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
CHAMBER	SH-641	92003820	18-Jul-23	18-Jul-24
POWER SUPPLY	6652A	3541A02371	18-Jul-23	18-Jul-24
PULSE SENSOR	MA2411B	1726287	22-Aug-23	22-Aug-24
PULSE POWER METER	ML2495A	1845014	16-Aug-23	16-Aug-24
SPECTRUM ANALYZER	E4440A	MY48250517	8-Nov-23	8-Nov-24

Radiated Emission Station (SW Version: EMC FCC RE v1.6.5)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
DRG HORN FREQ.	SAS-571	1143	08-Mar-23	08-Mar-25
DRG HORN FREQ.	SAS-571	720	18-Apr-23	18-Apr-25
DC Power Supply	NR973A	MY54180189	30-Aug-23	30-Aug-24
SIGNAL GENERATOR	SMB 100A	182511	04-Sep-21	04-Sep-24
EMI TEST RECEIVER	ESW44	101731	11-Aug-23	11-Aug-24
5m SEMI-ANECHOIC CHAMBER	S800-HX	J2308	No Cal. Req'd	No Cal. Req'd
BILOG ANTENNA	CBL6112B	2950	14-Dec-23	14-Dec-24
BILOG ANTENNA	CBL6112B	2964	25-Sep-23	25-Sep-24
DATA LOGGER THERMOHYGROMETER	SDL500	A.016800	26-Jun-24	26-Jun-25
SYSTEM CONTROLLER	SC104V	050806-1	No Cal. Req'd	No Cal. Req'd
TURNTABLE FLUSH MOUNT 2M	FM2011	NA	No Cal. Req'd	No Cal. Req'd
ANTENNA POSITIONING TOWER	TLT2	NA	No Cal. Req'd	No Cal. Req'd
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170143	28-Aug-2023	28-Aug-2024
PREAMPLIFIER 18-40GHz	Miteq Hi Gain Sucoflex	002	No Cal. Req'd	No Cal. Req'd
PREAMPLIFIER	PAM-0118P	574	19-Mar-24	19-Mar-25
LOOP ANTENNA	6502	00203479	06-Mar-24	06-Mar-25

AC Powerline Station (SW Version: EMC32 Ver.10.60.10)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
DATA LOGGER	DSB	16344143	21-Jun-23	21-Jun-24
V-NETWORK 2-LINE	ENV216V	101039	13-Dec-23	13-Dec-24
EMI TEST RECEIVER	ESIB40	100225	19-Sep-23	19-Sep-24
PROGRAMMABLE AC SOURCE	61604	ABR000000926	25-Jul-23	25-Jul-24

5.0. Test Mode Applicability and Test Channel Detail

Radiated Emission Test (Above 1GHz)

☒Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Environmental Conditions
Test Mode	0 to 78	0,39,78	FHSS	GFSK, Pi/4 DQPSK,8DPSK	22.8°C, 70.1%RH

Radiated Emission Test (Below 1GHz)

☒Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Environmental Conditions
Test Mode	0 to 78	0,39,78	FHSS	GFSK, Pi/4 DQPSK,8DPSK	22.8°C, 70.1%RH

Power Line Conducted Emission Test

☐Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☐Following channel(s) was (were) selected for the final test as listed below.

NAEUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Environmental Conditions
Application Mode	0 to 78	AUTO	FHSS	AUTO	NA

Antenna Port Conducted Measurement:

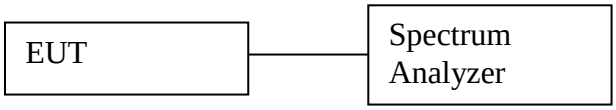
☒This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Environmental Conditions
Test Mode	0 to 78	0,39,78	FHSS	GFSK, Pi/4 DQPSK,8DPSK	25°C, 54.8%RH

6.0. Transmitter Test Parameters

6.1. Conducted RF Output Power (Peak)

6.1.1. Test Setup



a) Check and ensure the spectrum analyzer well calibrate.
b) Turn on the EUT and set EUT to transmit maximum data rate with hopping disable.
c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
d) Setting of Spectrum analyzer :
   a. RBW = > 20 dB bandwidth
   b. VBW = RBW
   c. Detector mode = Peak
   d. AMPLITUDE → Scale/Div = 10 dB
   e. Trace = Max hold
   f. Sweep = auto
e) Measure the captured power within the band and recording the plot.
f) Repeat above procedure with other different mode of operation.

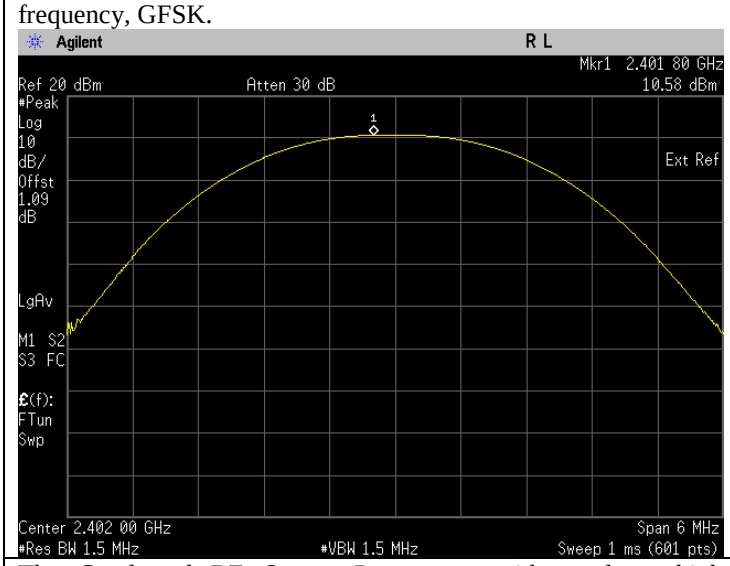
6.1.2. Test Limits:

Normal Condition (25 ° C)
≤ 125mW (or 20.9dBm)

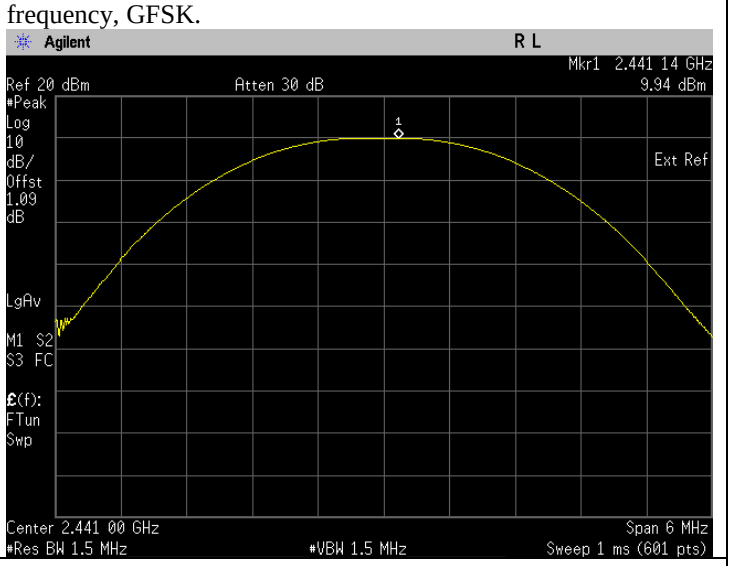
6.1.3. Test Data:

Test Conditions		Test Frequency (GHz)	Results	
Modulation	Voltage(V)		dBm	Status
GFSK	7.50	2.4020	10.583	Pass
		2.4410	9.935	Pass
		2.4800	9.709	Pass
Pi/4DQPSK	7.50	2.4020	10.628	Pass
		2.4410	9.991	Pass
		2.4800	9.764	Pass
8DPSK	7.50	2.4020	10.849	Pass
		2.4410	10.231	Pass
		2.4800	10.019	Pass

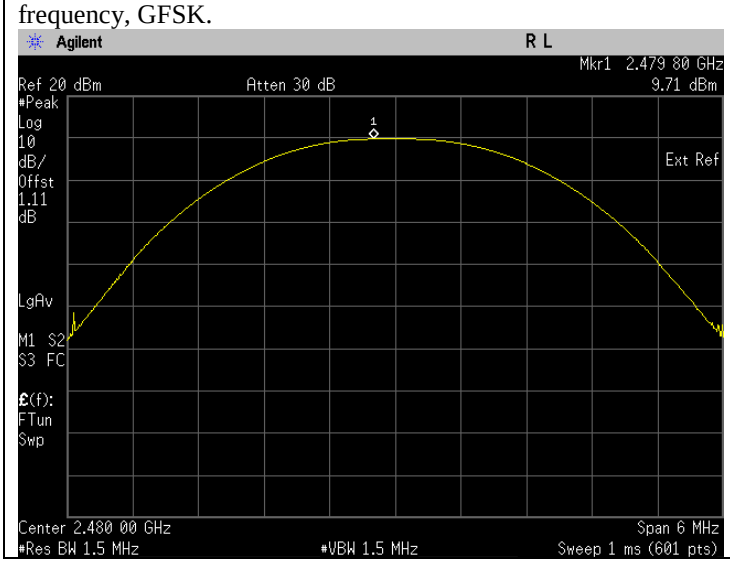
The Conducted RF Output Power test with result at low frequency, GFSK.



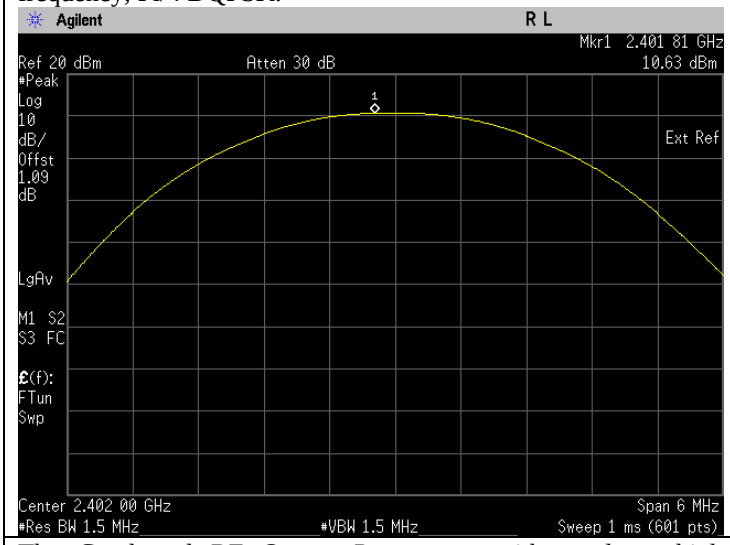
The Conducted RF Output Power test with result at mid frequency, GFSK.



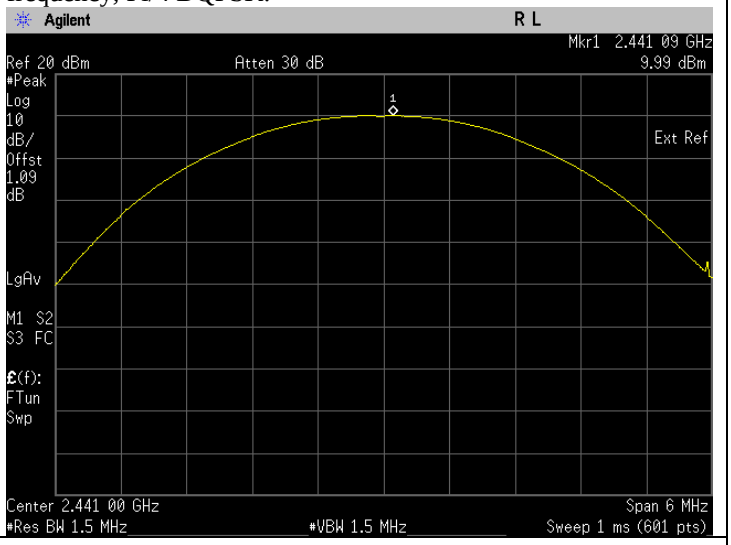
The Conducted RF Output Power test with result at high frequency, GFSK.



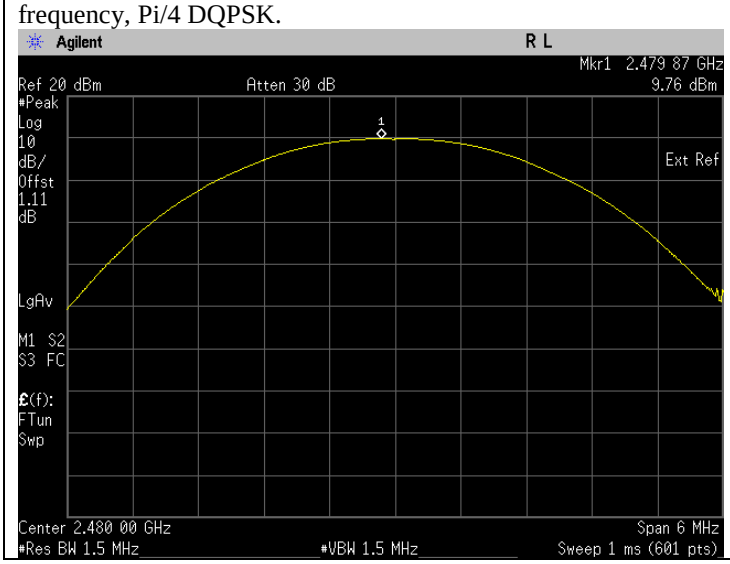
The Conducted RF Output Power test with result at low frequency, Pi/4 DQPSK.



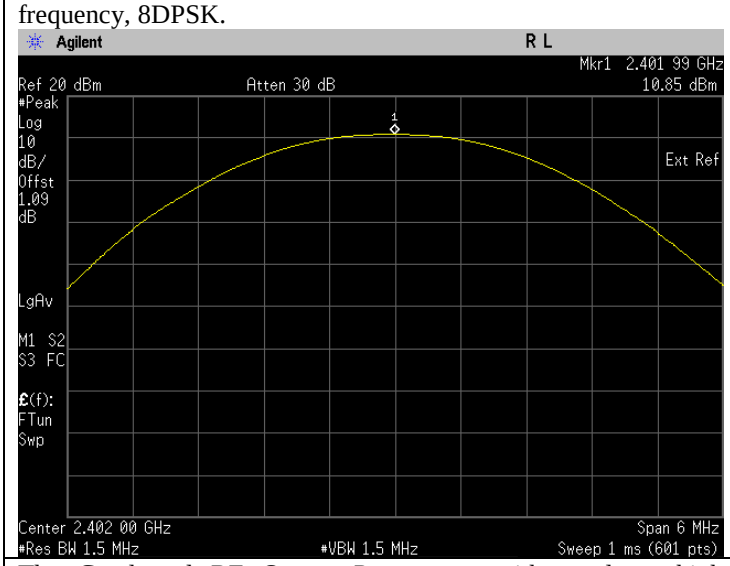
The Conducted RF Output Power test with result at mid frequency, Pi/4 DQPSK.



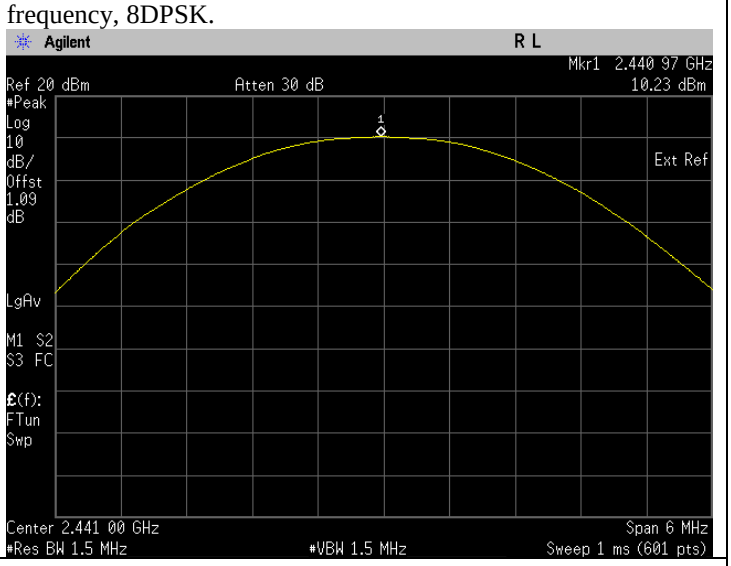
The Conducted RF Output Power test with result at high frequency, Pi/4 DQPSK.



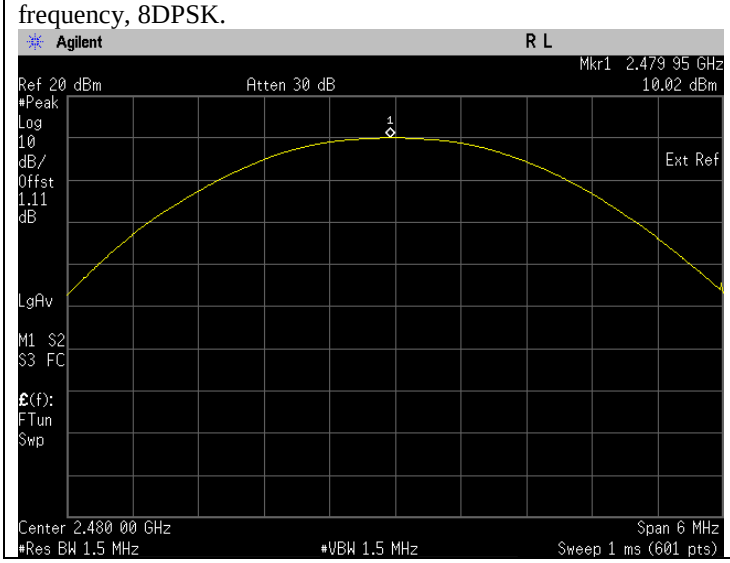
The Conducted RF Output Power test with result at low frequency, 8DPSK.



The Conducted RF Output Power test with result at mid frequency, 8DPSK.

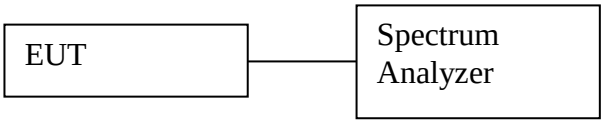


The Conducted RF Output Power test with result at high frequency, 8DPSK.



6.2. 20dB Channel Bandwidth

6.2.1. Test Setup



a) Check and ensure the spectrum analyzer well calibrate.
b) Turn on the EUT and set EUT to transmit maximum data rate with hopping disable.
c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
d) Setting of Spectrum analyzer :
   a. RBW = 30 kHz
   b. VBW = 100 kHz
   c. SPAN = 3 MHz, center on test frequency
   d. AMPLITUDE → Scale/Div = 10 dB
   e. Detector mode = Peak
   f. Trace = Max hold
   g. Sweep = auto
e) Measure the freq different of two frequencies that were attenuated 20dB from peak of the emission & record the frequency difference as the emission bandwidth.
f) Save the plot result from spectrum analyzer screen.
g) Repeat above procedure with other different mode of operation.

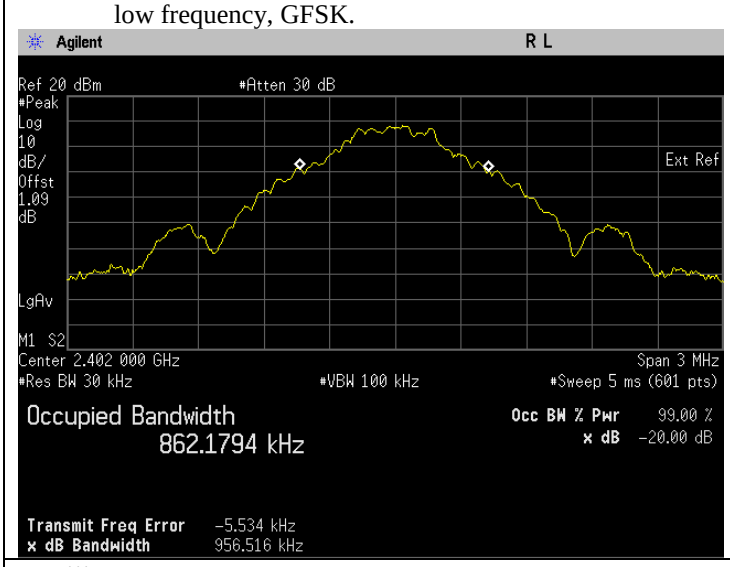
6.2.2. Test Limits:

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

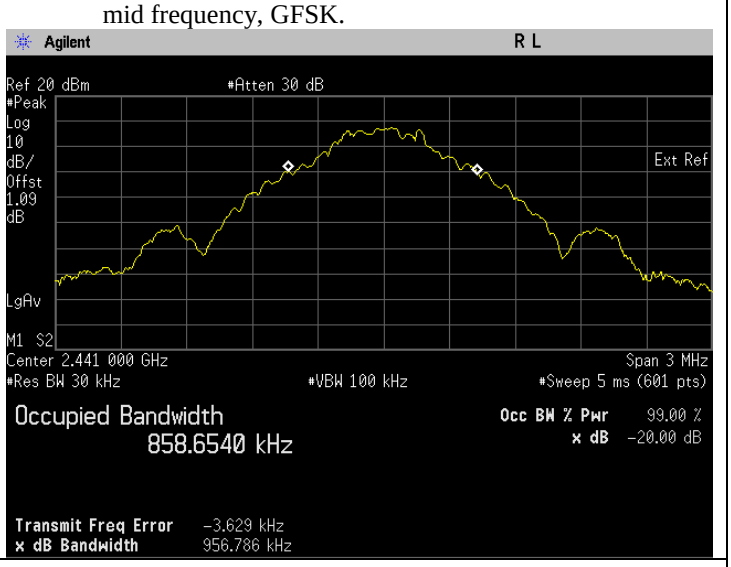
6.2.3. est Data:

Test Conditions		Test Frequency TX (GHz)	Results (MHz)		
Modulation Type	Voltage(V)		20dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Status
GFSK	7.50	2.4020	0.957	0.862	Pass
		2.4410	0.957	0.859	Pass
		2.4800	0.957	0.859	Pass
Pi/4 DQPSK	7.50	2.4020	1.313	1.172	Pass
		2.4410	1.306	1.172	Pass
		2.4800	1.288	1.170	Pass
8DPSK	7.50	2.4020	1.299	1.179	Pass
		2.4410	1.306	1.177	Pass
		2.4800	1.300	1.173	Pass

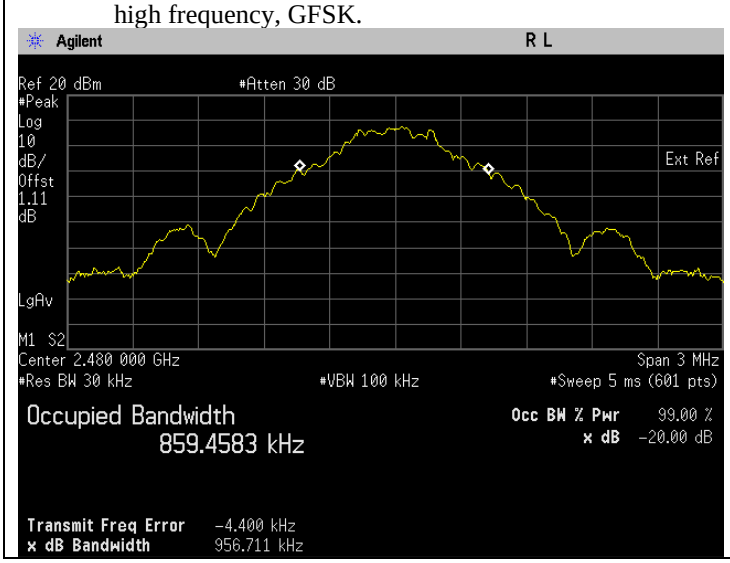
i. The 20 dB BW & occupied bandwidth test with result at low frequency, GFSK.



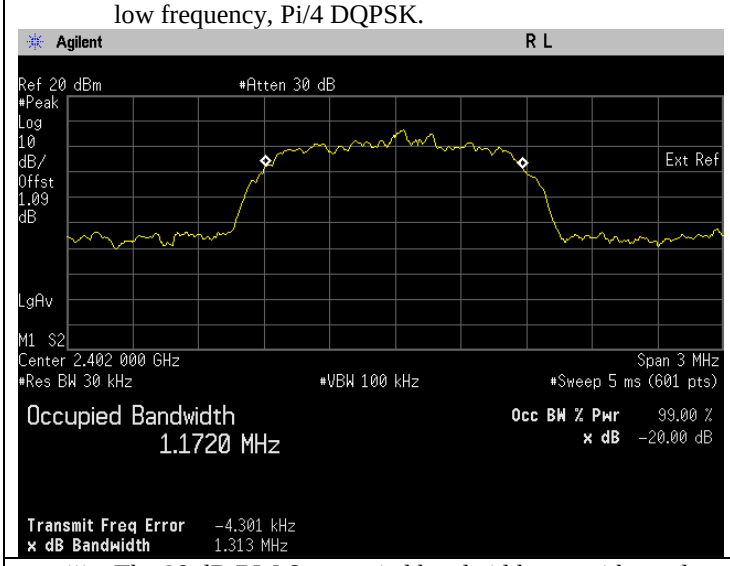
ii. The 20 dB BW & occupied bandwidth test with result at mid frequency, GFSK.



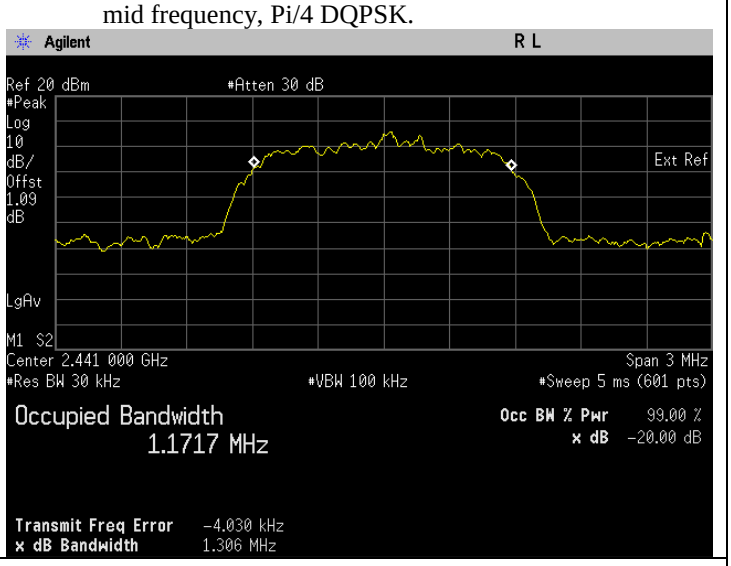
iii. The 20 dB BW & occupied bandwidth test with result at high frequency, GFSK.



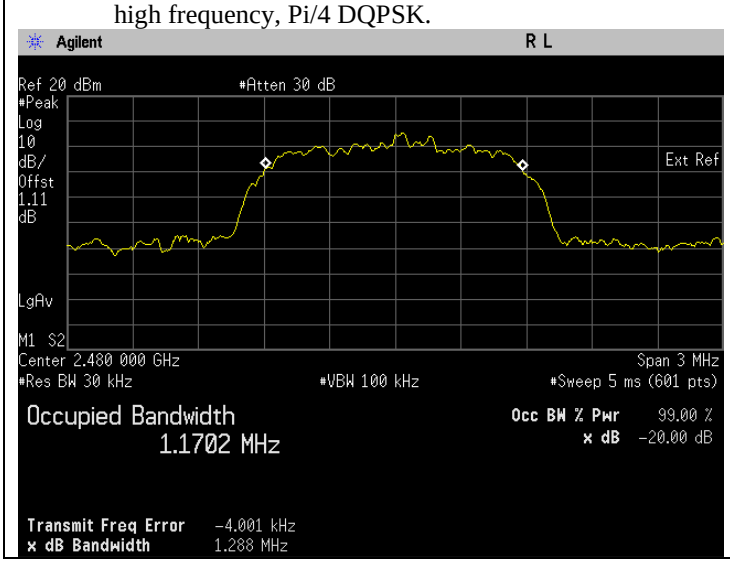
i. The 20 dB BW & occupied bandwidth test with result at low frequency, Pi/4 DQPSK.



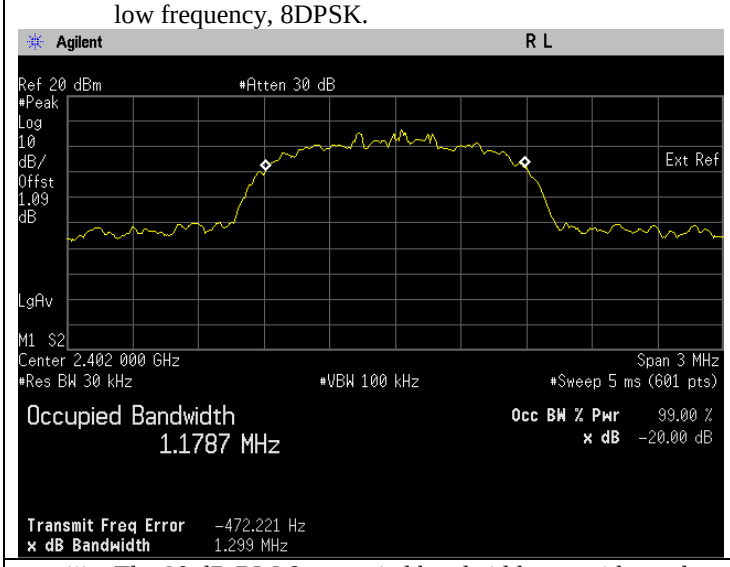
ii. The 20 dB BW & occupied bandwidth test with result at mid frequency, Pi/4 DQPSK.



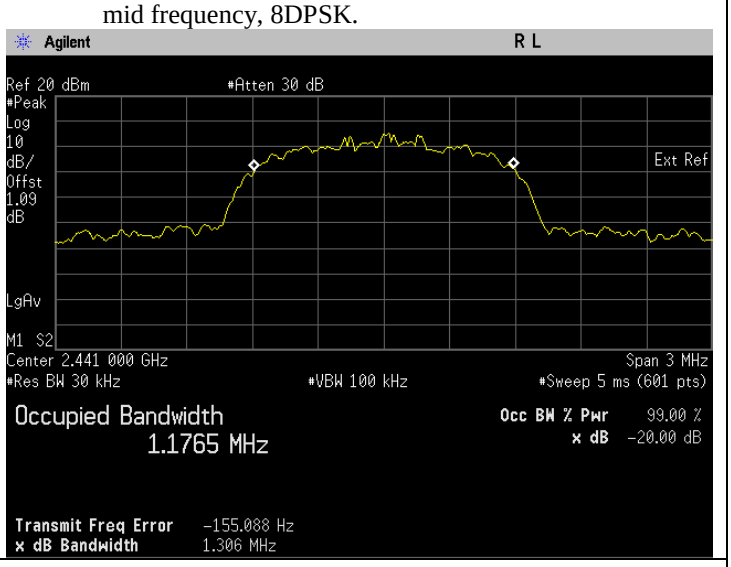
iii. The 20 dB BW & occupied bandwidth test with result at high frequency, Pi/4 DQPSK.



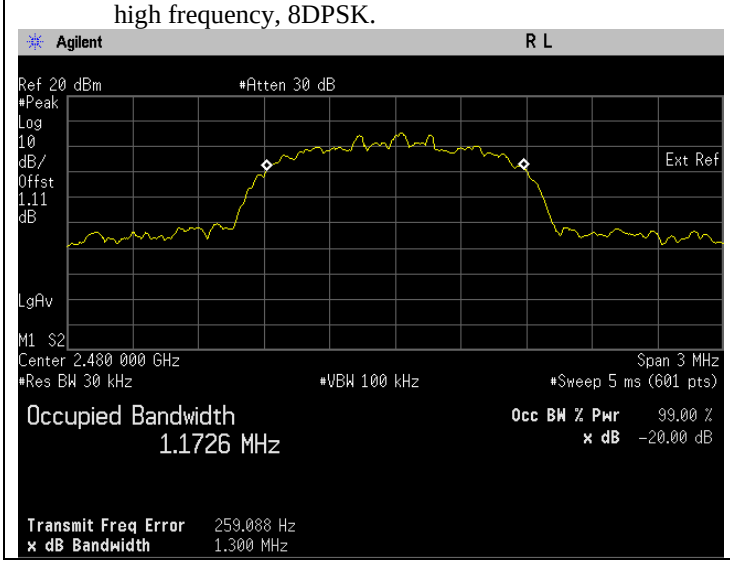
i. The 20 dB BW & occupied bandwidth test with result at low frequency, 8DPSK.



ii. The 20 dB BW & occupied bandwidth test with result at mid frequency, 8DPSK.

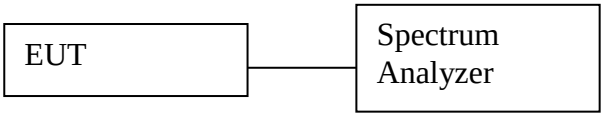


iii. The 20 dB BW & occupied bandwidth test with result at high frequency, 8DPSK.



6.3. Band-edge Conducted Spurious Emission

6.3.1. Test Setup



a) Check and ensure the spectrum analyzer well calibrate.
b) Turn on the EUT and keep the EUT in hopping mode.
c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
d) Setting of Spectrum analyzer :
   a. RBW = 100 kHz
   b. VBW = 300 kHz
   c. SPAN = 4 MHz (Low channel) or 6MHz(High Channel)
   d. Detector mode = Peak
   e. AMPLITUDE → Scale/Div = 10 dB
   f. Trace = Max hold
   g. Sweep = auto
e) Measure the captured band edge emission result and recording the plot.
f) Repeat above on EUT with hopping disable.
g) Repeat above procedure with other different test frequency.

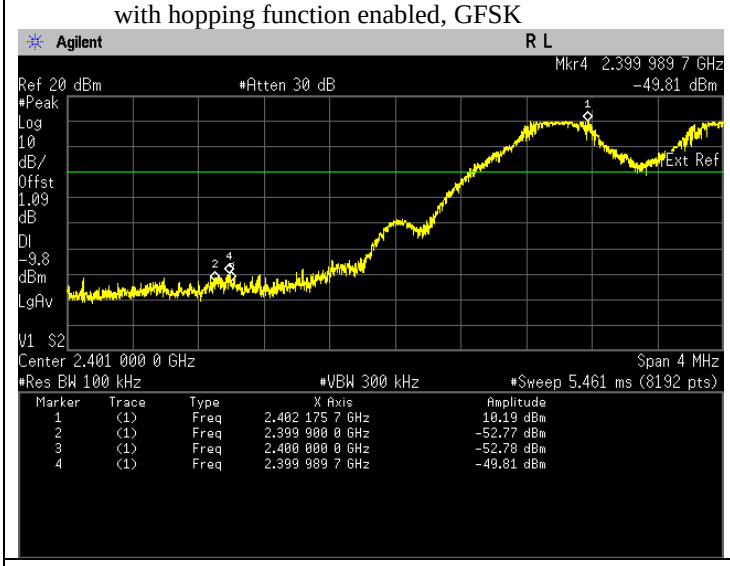
6.3.2. Test Limits

Normal Condition (25 º C)
Shall be at least 20 dB below the peak power.

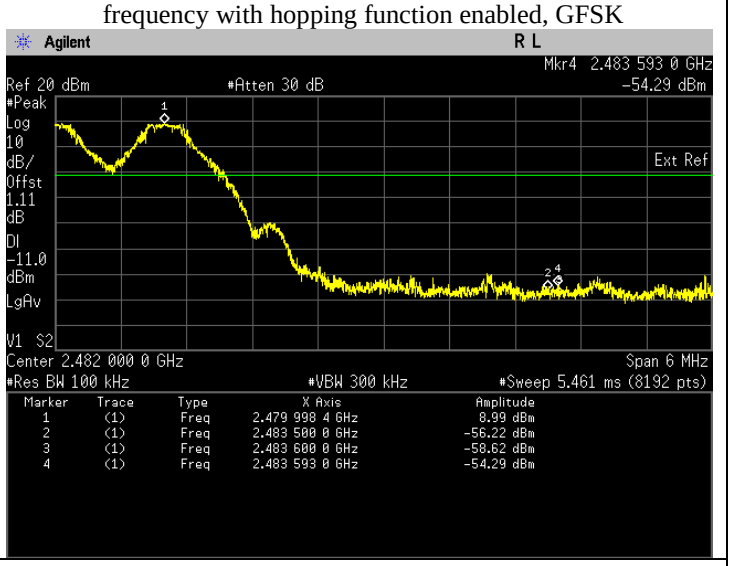
6.3.3. Test Result

Test Conditions		Hopping Method	Test Frequency(GHz)	Results	
Modulation	Voltage(V)			dB	Status
GFSK	7.50	Enabled (continuously)	2.4020	-49.81	Pass
			2.4800	-54.29	Pass
		Disabled (constantly)	2.4020	-50.02	Pass
			2.4800	-55.24	Pass
Pi/4 DQPSK	7.50	Enabled (continuously)	2.4020	-50.25	Pass
			2.4800	-56.28	Pass
		Disabled (constantly)	2.4020	-47.51	Pass
			2.4800	-55.26	Pass
8DPSK	7.50	Enabled (continuously)	2.4020	-46.11	Pass
			2.4800	-54.97	Pass
		Disabled (constantly)	2.4020	-43.74	Pass
			2.4800	-53.51	Pass

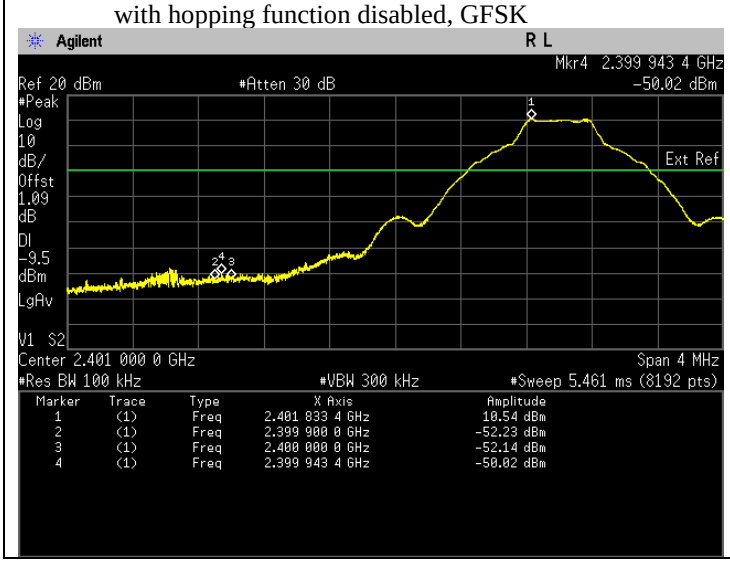
i. The highest band edge emission at low carrier frequency with hopping function enabled, GFSK



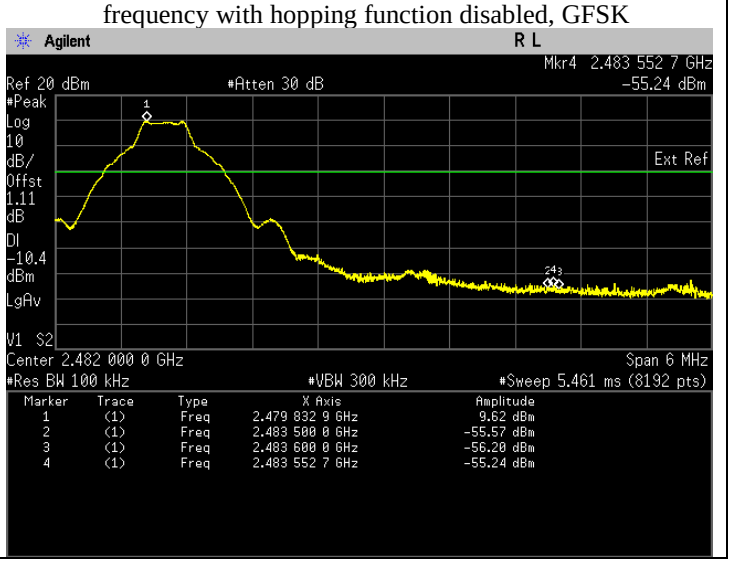
ii. The highest band edge emission at high carrier frequency with hopping function enabled, GFSK



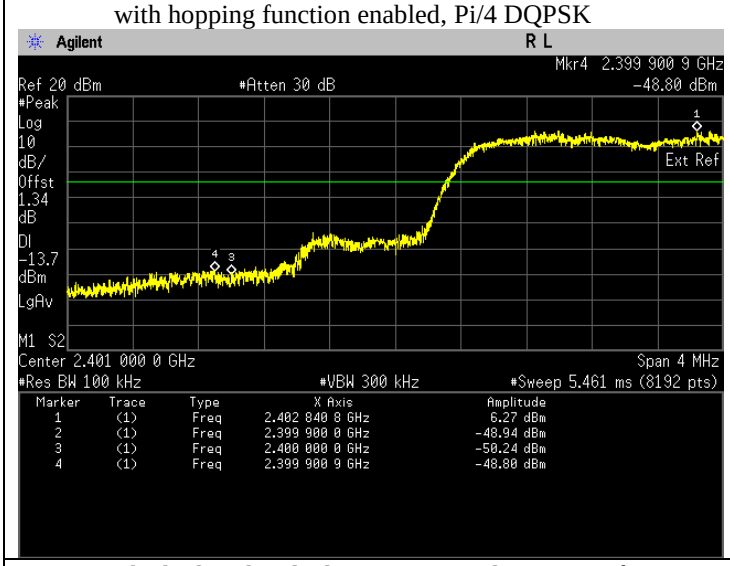
iii. The highest band edge emission at low carrier frequency with hopping function disabled, GFSK



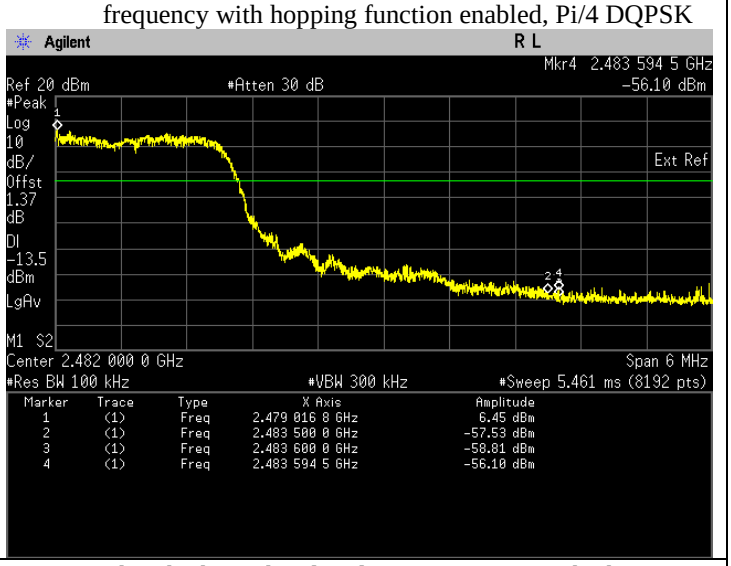
iv. The highest band edge emission at high carrier frequency with hopping function disabled, GFSK



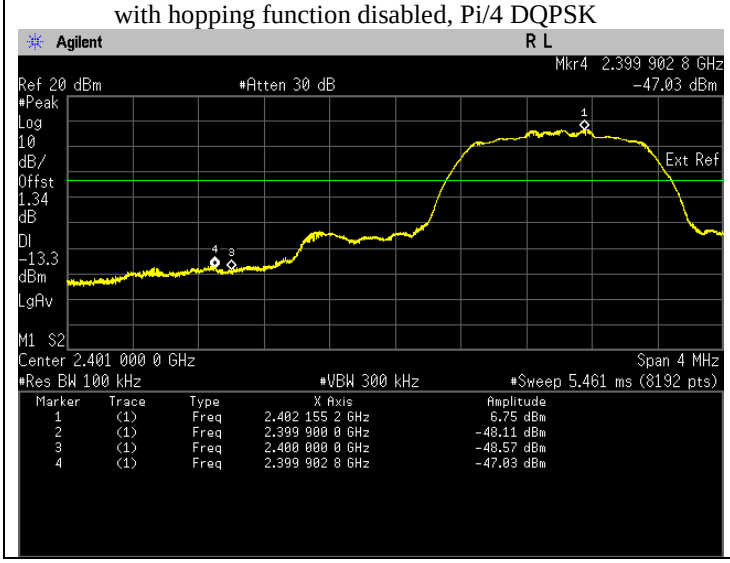
i. The highest band edge emission at low carrier frequency with hopping function enabled, Pi/4 DQPSK



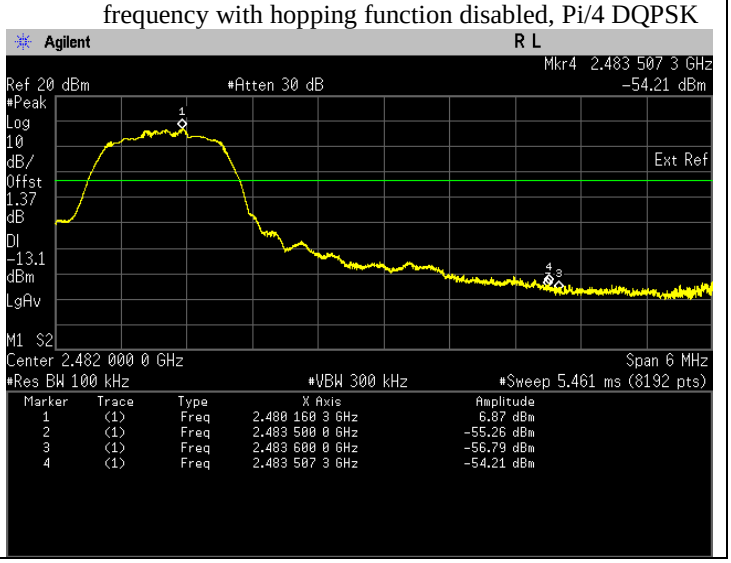
ii. The highest band edge emission at high carrier frequency with hopping function enabled, Pi/4 DQPSK



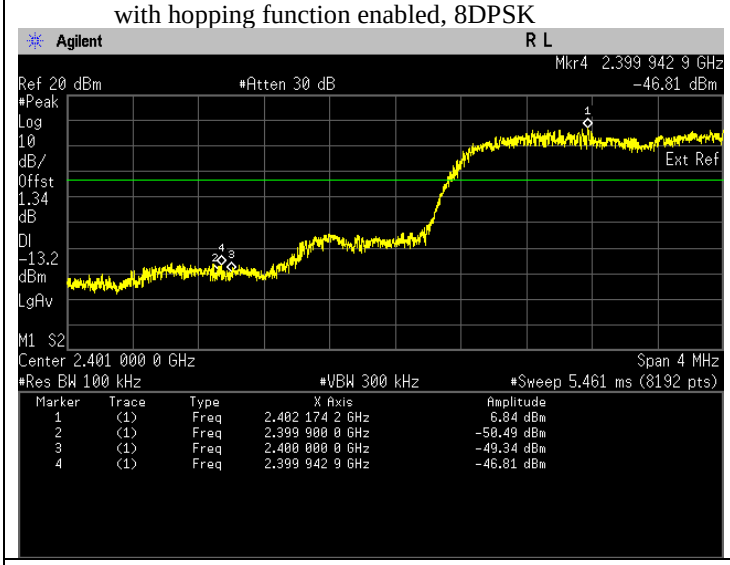
iii. The highest band edge emission at low carrier frequency with hopping function disabled, Pi/4 DQPSK



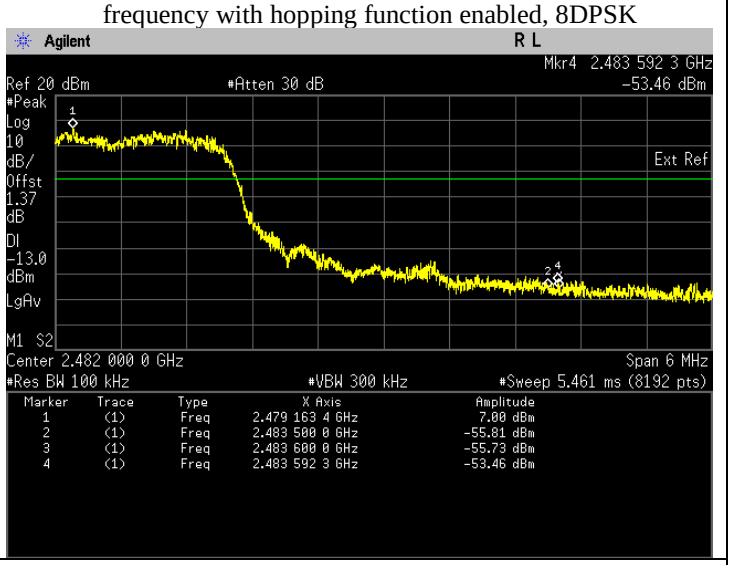
iv. The highest band edge emission at high carrier frequency with hopping function disabled, Pi/4 DQPSK



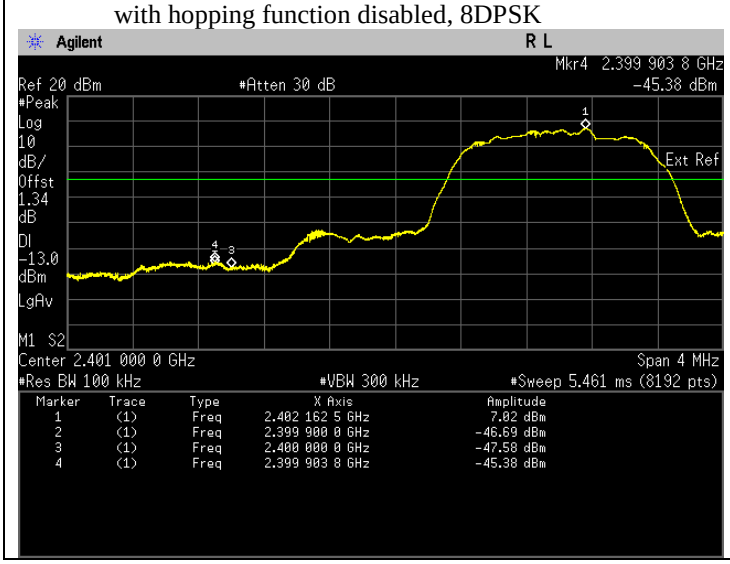
i. The highest band edge emission at low carrier frequency with hopping function enabled, 8DPSK



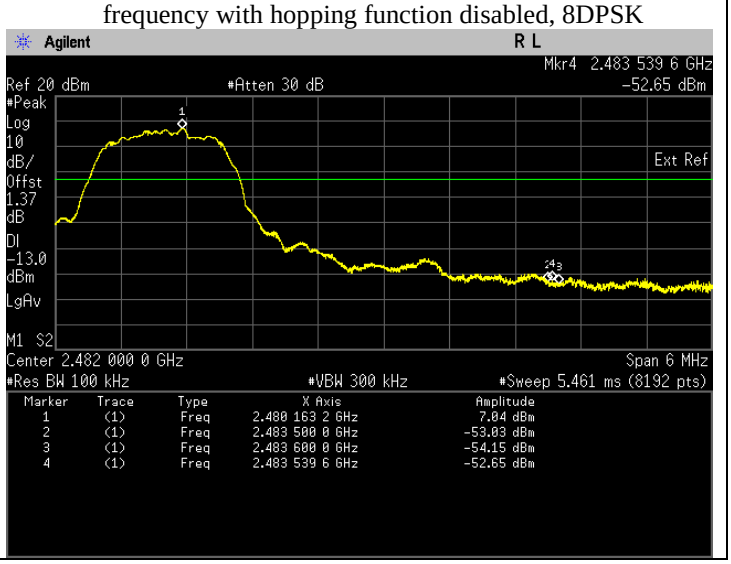
ii. The highest band edge emission at high carrier frequency with hopping function enabled, 8DPSK



iii. The highest band edge emission at low carrier frequency with hopping function disabled, 8DPSK

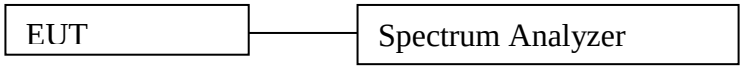


iv. The highest band edge emission at high carrier frequency with hopping function disabled, 8DPSK



6.4. Dwell time on each channel

6.4.1. Test Setup



a) Check and ensure the spectrum analyzer well calibrate.
b) Turn on the EUT and keep the EUT in hopping mode.
c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
d) Setting of Spectrum analyzer :
    a. RBW = 100 kHz
    b. VBW = 300 kHz
    c. SPAN = Zero SPAN, center on hopping frequency
    d. Detector mode = Peak
    e. Trace = Max hold
    f. Sweep time = 5second
    g. Sweep = Single
e) Measure total numbers of transmissions occur in 5 second and save the plot.
f) Change the setting of spectrum analyzer :
    a. RBW = 100 kHz
    b. VBW = 300 kHz
    c. Sweep time = sufficient to capture dwell time for 1 transmission
    d. Sweep = Single
g) Measure dwell time for 1 transmission and save the plot.
h) Calculate accumulate dwell time in a given period equal to number of hopping frequencies x 0.4
i) Repeat above procedure with other different mode of operation.

6.4.2. Test Limits:

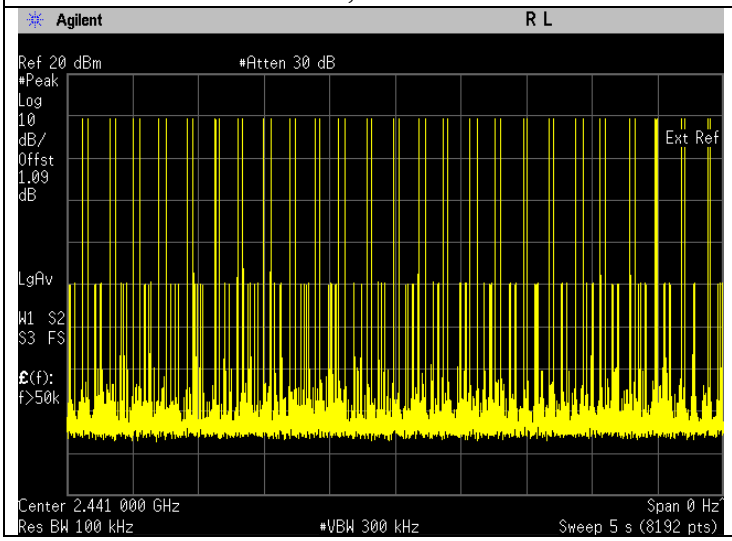
Normal Condition (25 º C)
≤ 400ms

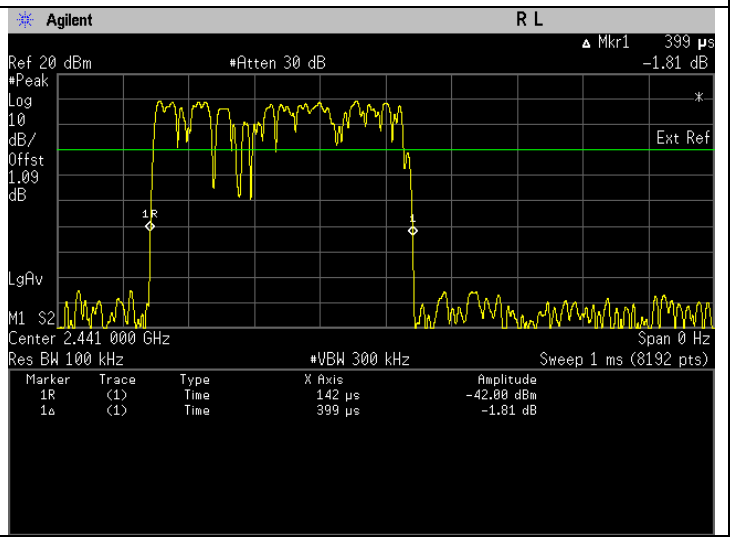
6.4.3. Test Result

Test Conditions			Data Package	Results			
Modulation	Voltage (V)	Test Frequency (GHz)		No. of transmission in 5s **(a)**	Dwell time in one transmission **(b) (msec)**	Total accumulate dwell time in 31.6s. **(c) (msec)**	Status
GFSK	7.50	2.4410	DH1	51	0.399	128.605680	Pass
			DH3	26	1.654	271.785280	Pass
			DH5	19	2.902	348.472160	Pass
Pi/4 DQPSK	7.50		DH1	50	0.401	126.716000	Pass
			DH3	29	1.653	302.961840	Pass
			DH5	18	2.902	330.131520	Pass
8 DPSK	7.50		DH1	51	0.401	129.250320	Pass
			DH3	22	1.651	229.555040	Pass
			DH5	13	2.901	238.346160	Pass

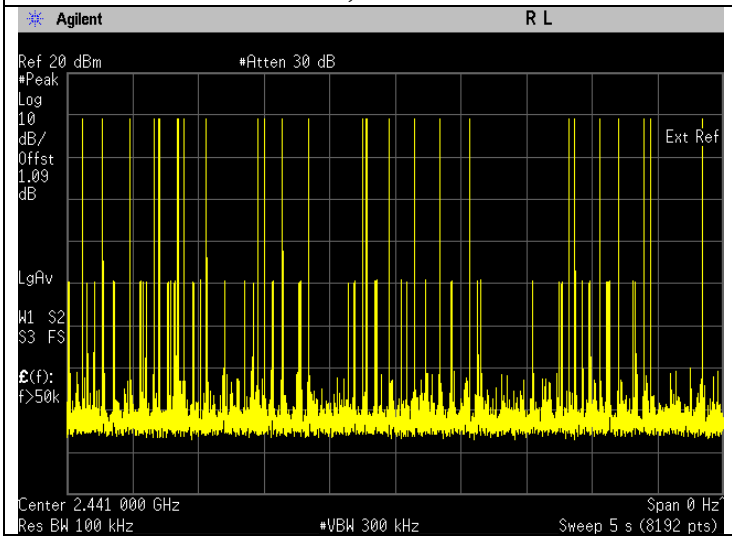
****Note:** Total dwell time 31.6s (79Hopping*0.4), (c) = (a) x 6.32 x (b)

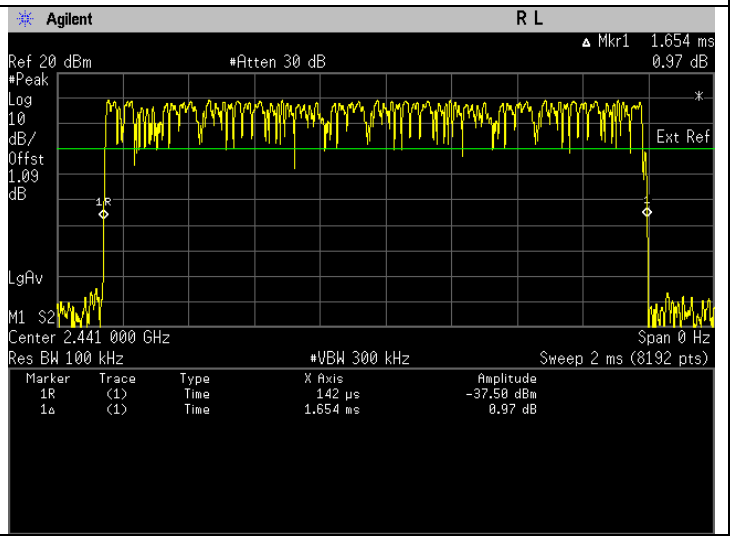
i. Dwell Time at DH1, GFSK



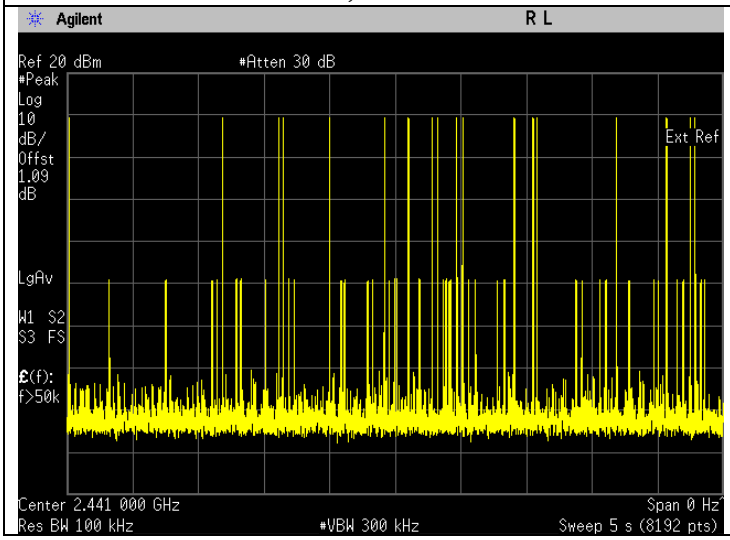


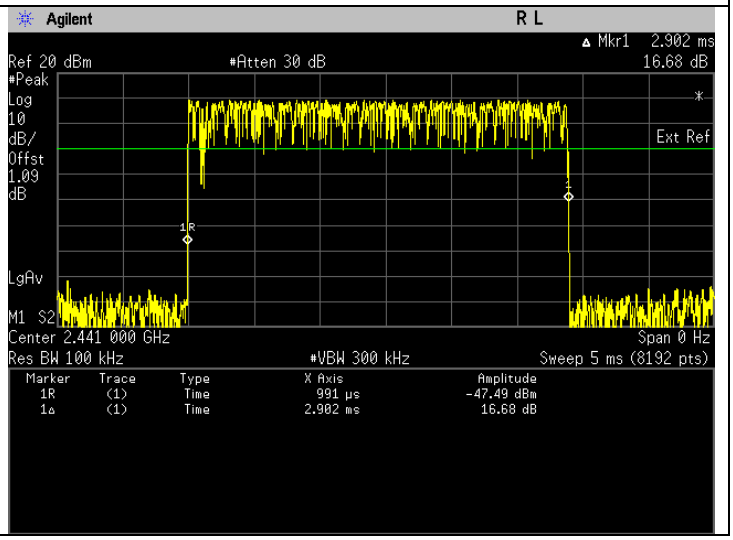
ii. Dwell Time at DH3, GFSK



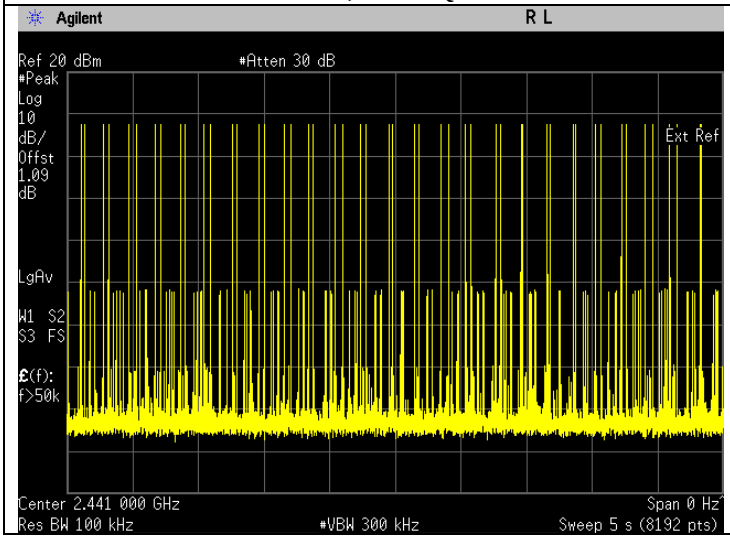


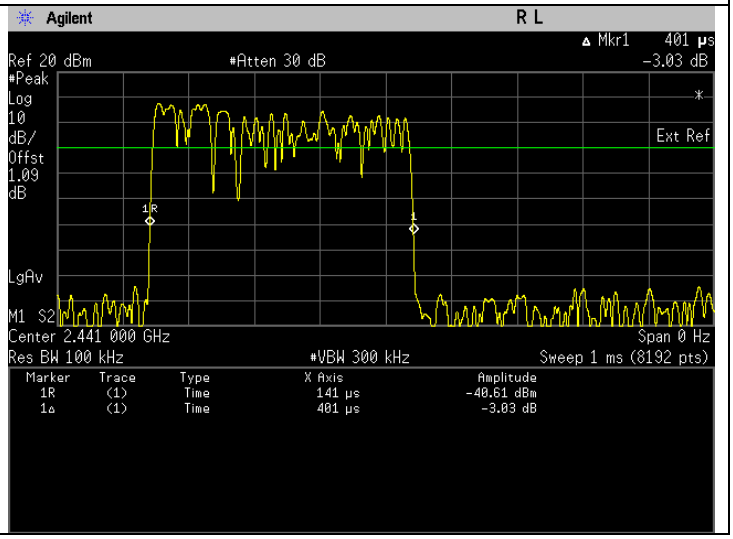
iii. Dwell Time at DH5, GFSK



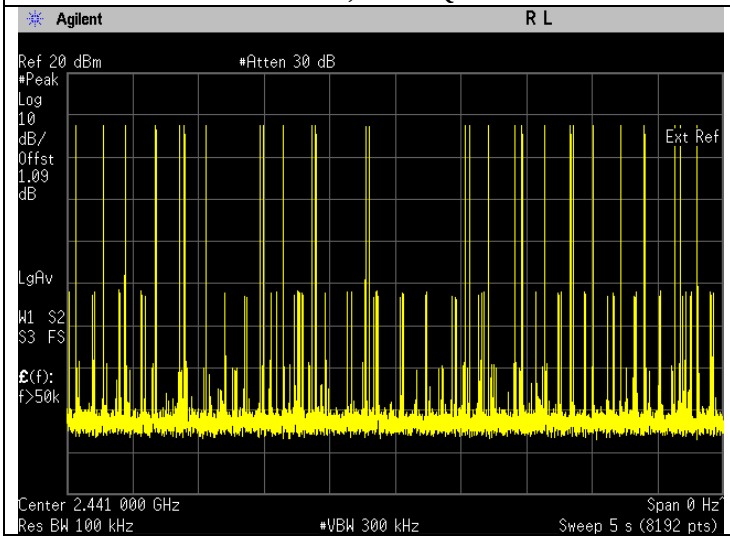


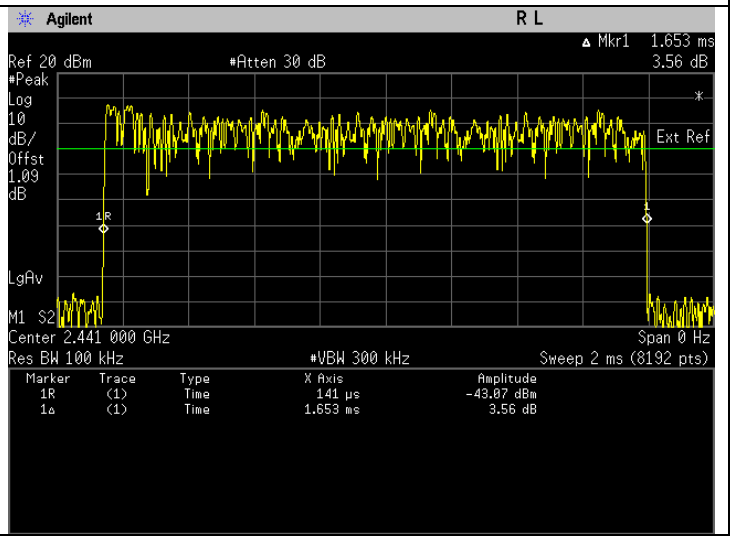
iv. Dwell Time at DH1, PI/4DQPSK



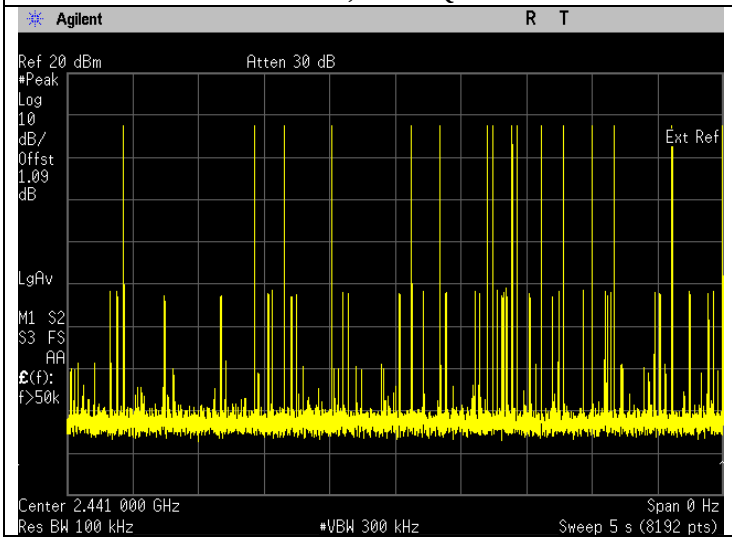


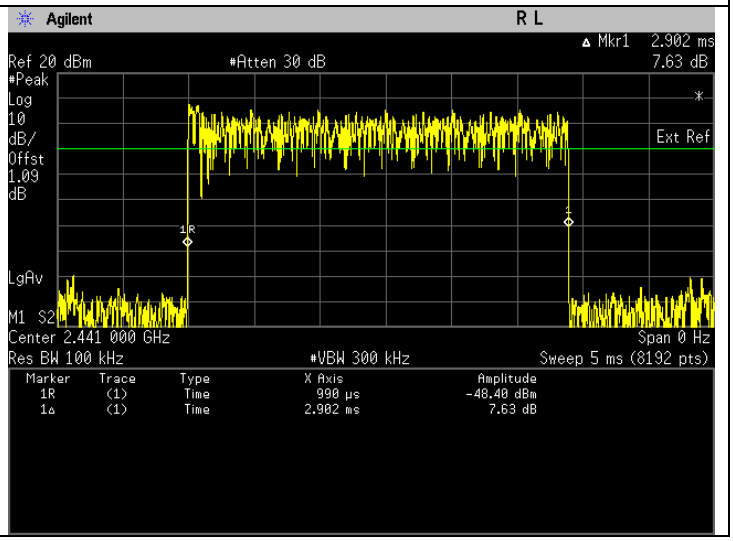
v. Dwell Time at DH3, PI/4DQPSK



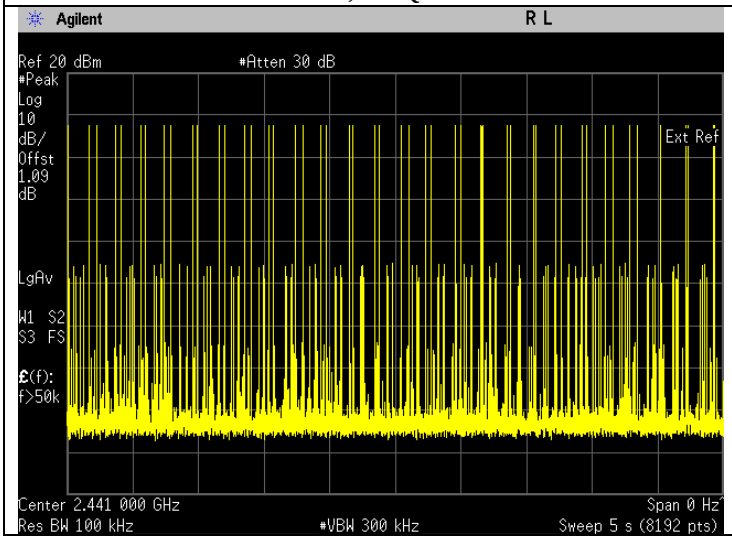


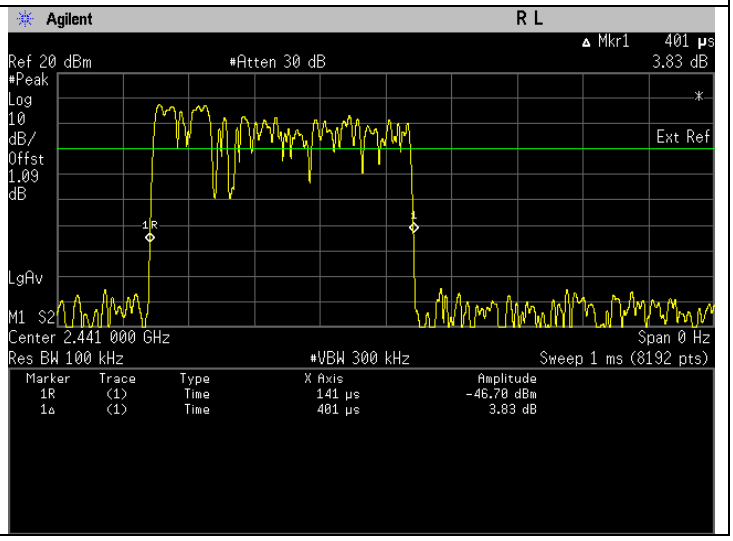
vi. Dwell Time at DH5, PI/4DQPSK



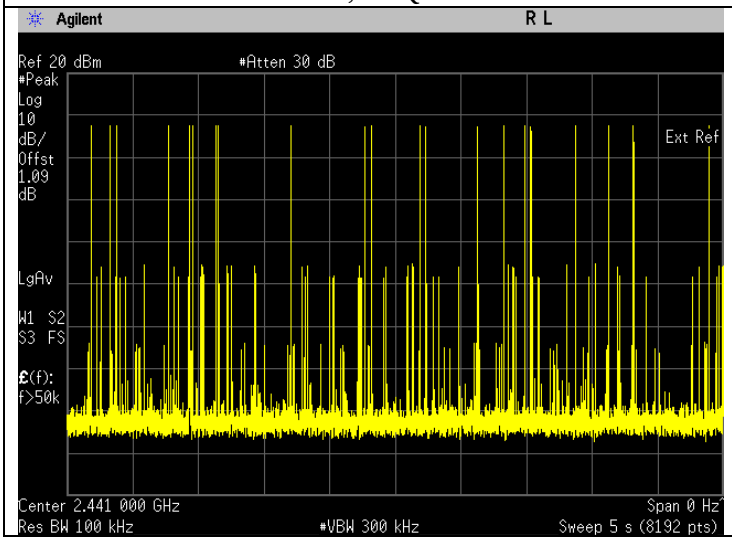


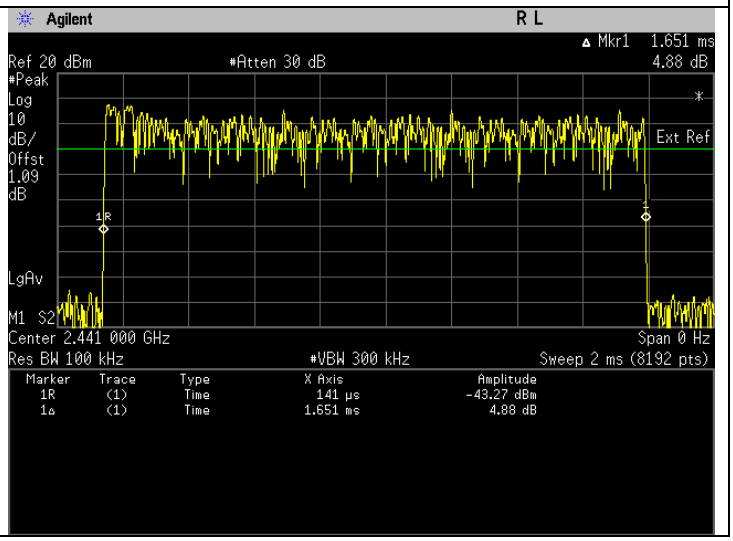
vii. Dwell Time at DH1, 8DQPSK



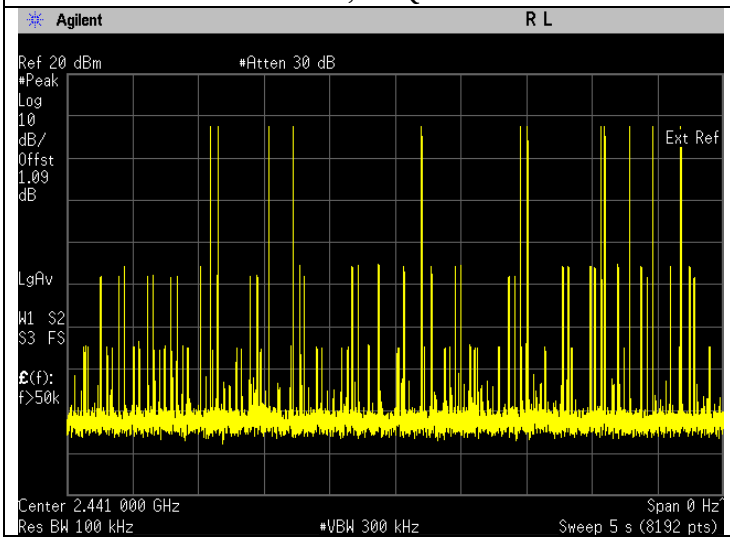


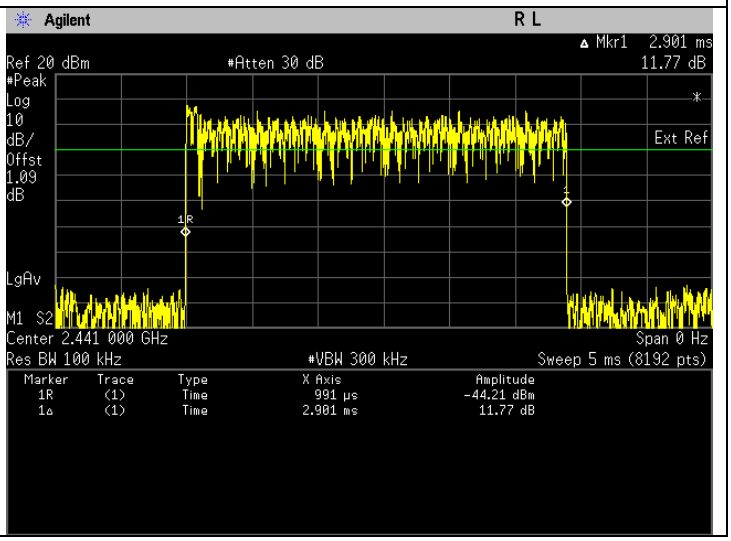
viii. Dwell Time at DH3, 8DQPSK





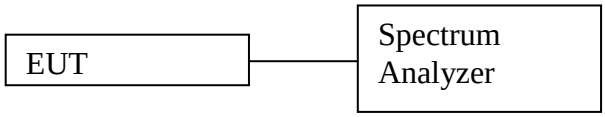
ix. Dwell Time at DH5, 8DQPSK





6.5. Number of hopping Frequency

6.5.1. Test Setup



a) Check and ensure the spectrum analyzer well calibrate.
b) Turn on the EUT and keep the EUT in hopping mode.
c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
d) Setting of Spectrum analyzer :
   a. RBW = 300 kHz
   b. VBW = 300 kHz
   c. Detector mode = Peak
   d. Trace = Max hold
e) Allow the trace to stabilized & save the plot result from spectrum analyzer screen.
f) Count number of channel frequency in the operating.
g) Repeat above procedure for other test frequency.

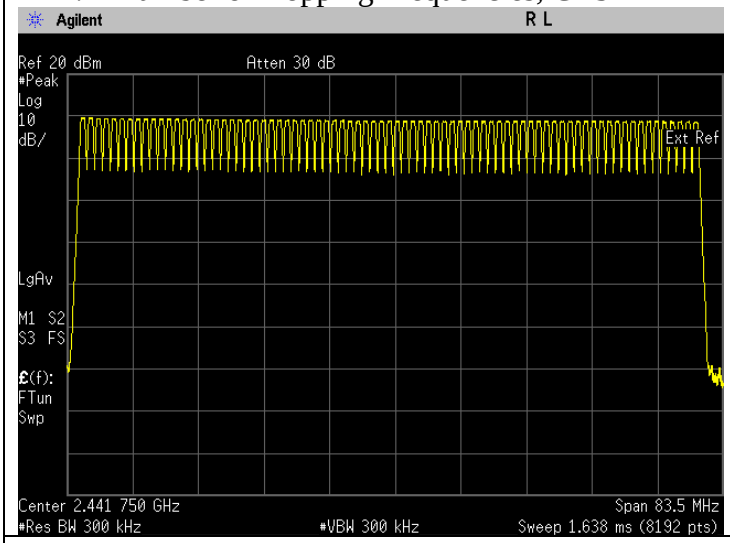
6.5.2. Test Limits:

Normal Condition (25 º C)
≥ 15

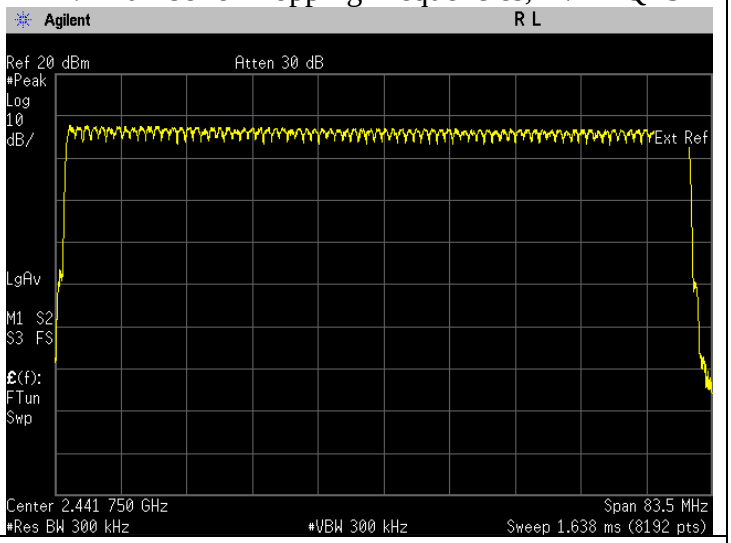
6.5.3. Test Result

Test Conditions		Sweep Range (GHz)	Results	
Modulation	Voltage(V)		No. of Hopping Frequencies	Status
GFSK	7.50	2.4000-2.4835	79	Pass
Pi/4DQPSK	7.50	2.4000-2.4835	79	Pass
8DPSK	7.50	2.4000-2.4835	79	Pass

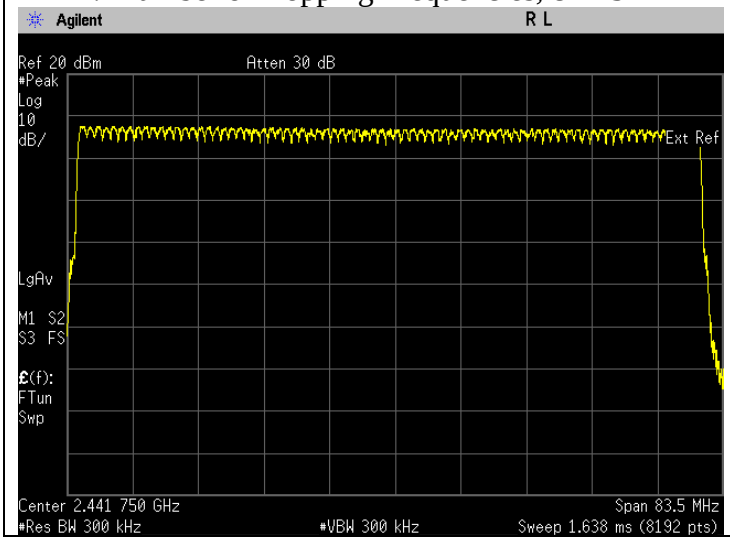
i. Number of Hopping Frequencies, GFSK



ii. Number of Hopping Frequencies, Pi/4 DQPSK

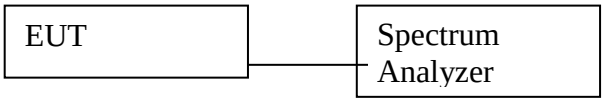


iii. Number of Hopping Frequencies, 8DPSK



6.6. Channel Separation

6.6.1. Test Setup



a) Check and ensure the spectrum analyzer well calibrate.
b) Turn on the EUT and keep the EUT in hopping mode.
c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
d) Setting of Spectrum analyzer :
   a. RBW = 300 kHz
   b. VBW = 300 kHz
   c. SPAN = 3 MHz, center on test frequency
   d. AMPLITUDE → Scale/Div = 5 dB
   e. Detector mode = Peak
   f. Trace = Max hold
   g. Sweep = auto
e) Measure the frequency different of these two adjacent channels with marker delta function & record the measurement results.
f) Repeat above procedure with other different mode of operation.

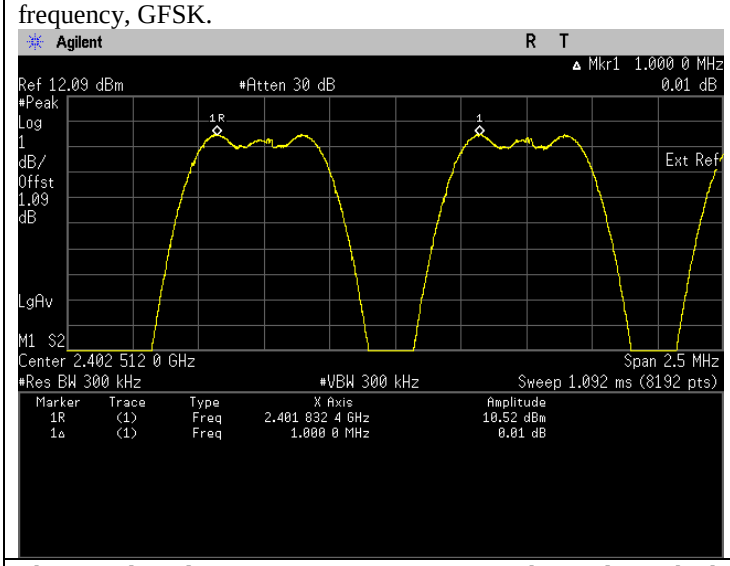
6.6.2. Test Limits:

Normal Condition (25 º C)
≥ 2/3 of 20dB Bandwidth

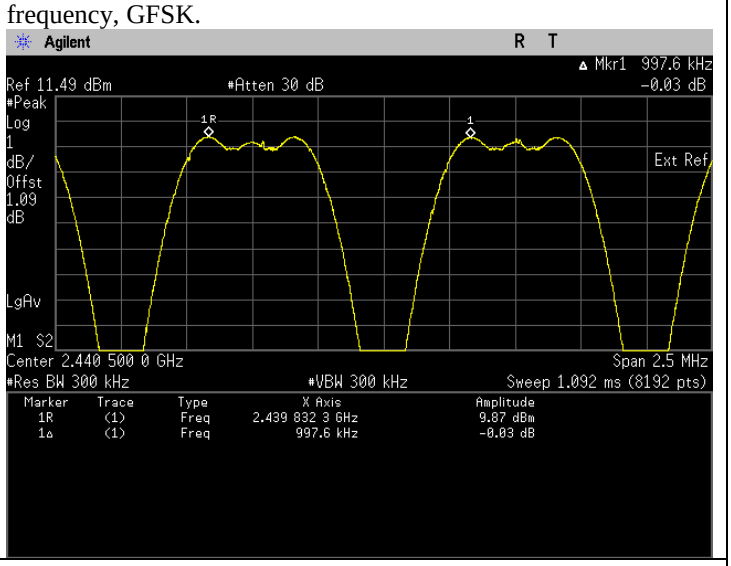
6.6.3. Test Result

Test Conditions		Test Frequency (GHz)	Results			
Modulation	Voltage(V)		Test Data Adjacent Channel Separation (MHz)	20dB Bandwidth (MHz)	Min Limit = 2/3 of 20dB Bandwidth (kHz)	Status
GFSK	7.50	2.4020	1.000	0.957	638.000	Pass
		2.4410	0.998	0.957	638.000	Pass
		2.4800	0.996	0.957	638.000	Pass
Pi/4DQPSK	7.50	2.4020	0.996	1.313	875.333	Pass
		2.4410	1.000	1.306	870.667	Pass
		2.4800	0.999	1.288	858.667	Pass
8DPSK	7.50	2.4020	1.000	1.299	866.000	Pass
		2.4410	1.005	1.306	870.667	Pass
		2.4800	0.993	1.300	866.667	Pass

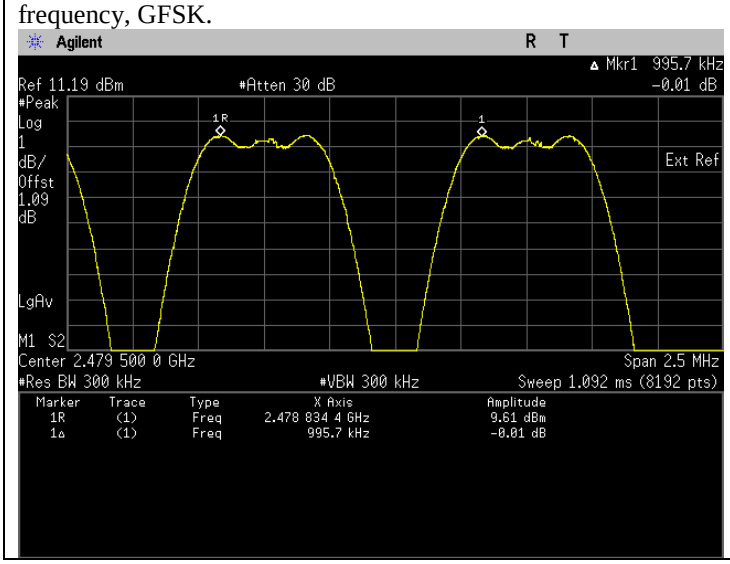
The Conducted RF Output Power test with result at low frequency, GFSK.



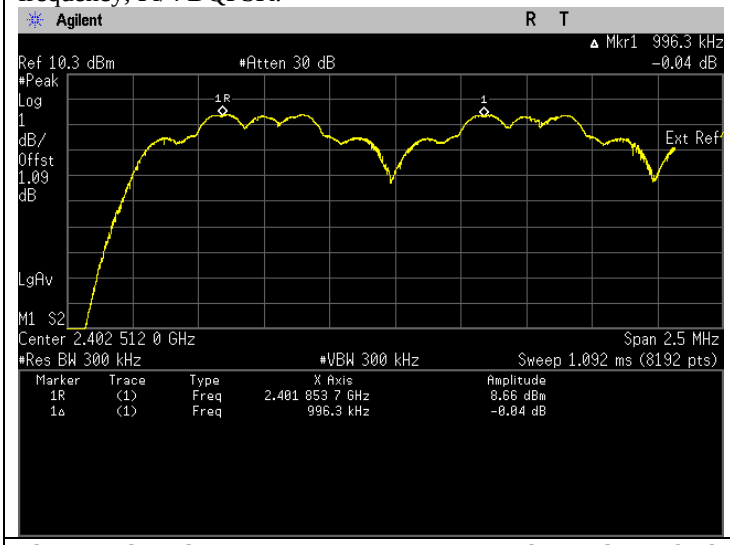
The Conducted RF Output Power test with result at mid frequency, GFSK.



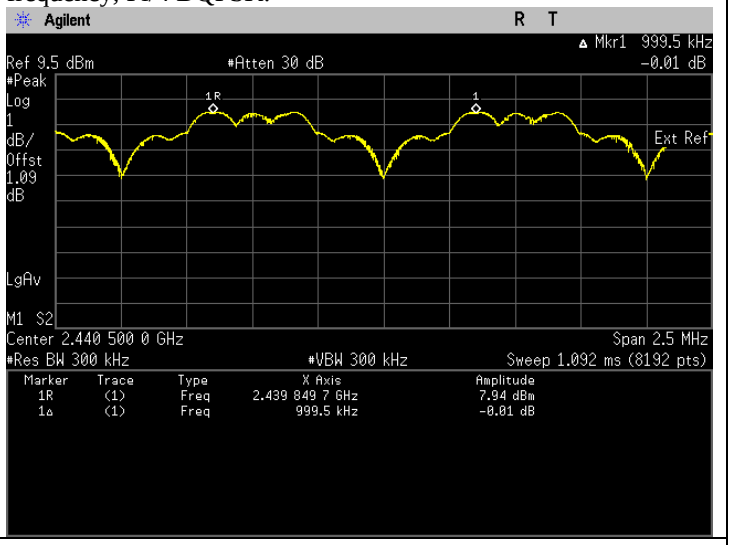
The Conducted RF Output Power test with result at high frequency, GFSK.



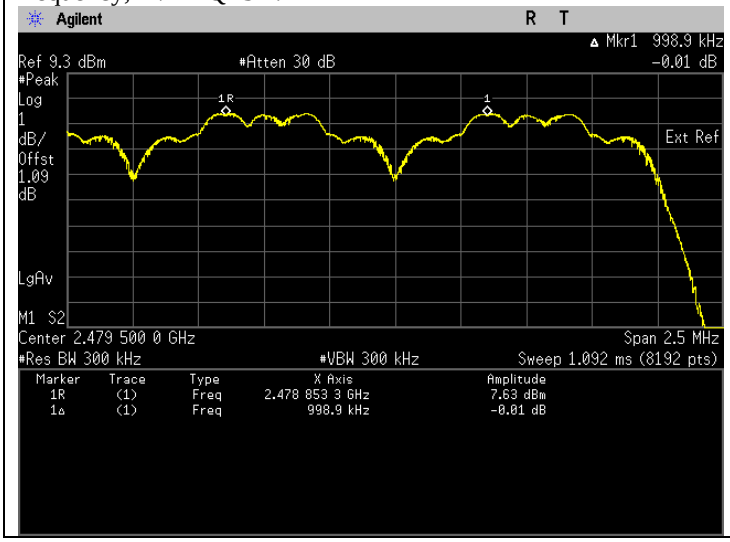
The Conducted RF Output Power test with result at low frequency, Pi/4 DQPSK.



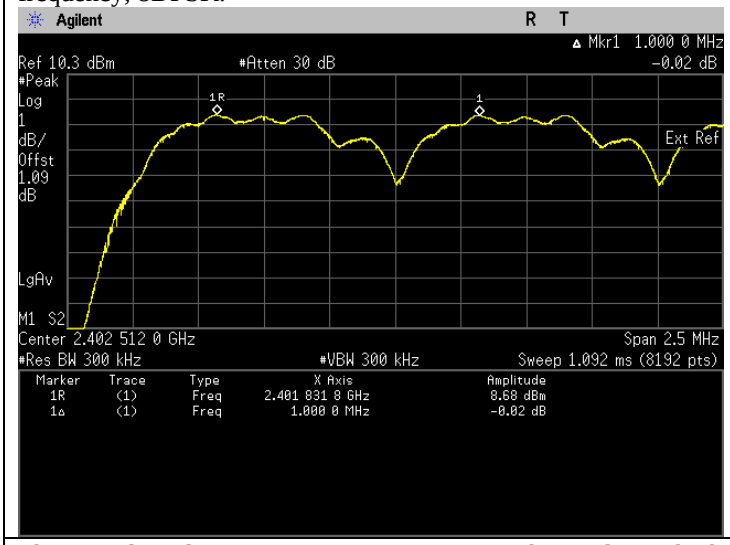
The Conducted RF Output Power test with result at mid frequency, Pi/4 DQPSK.



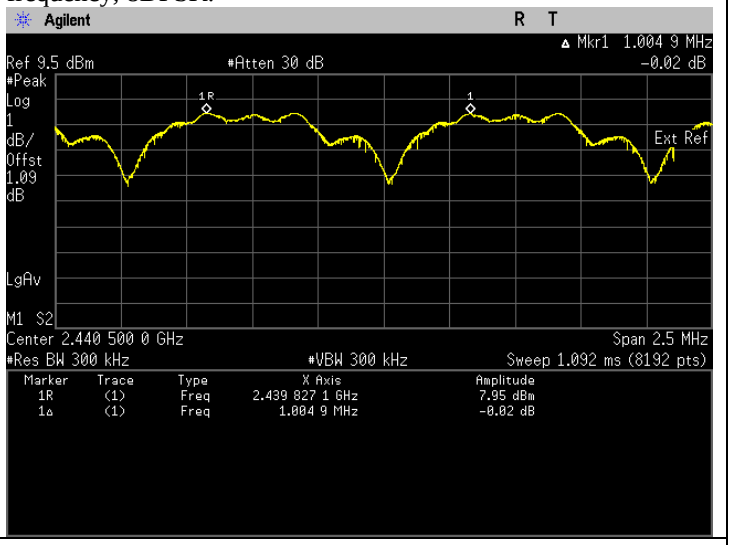
The Conducted RF Output Power test with result at high frequency, Pi/4 DQPSK.



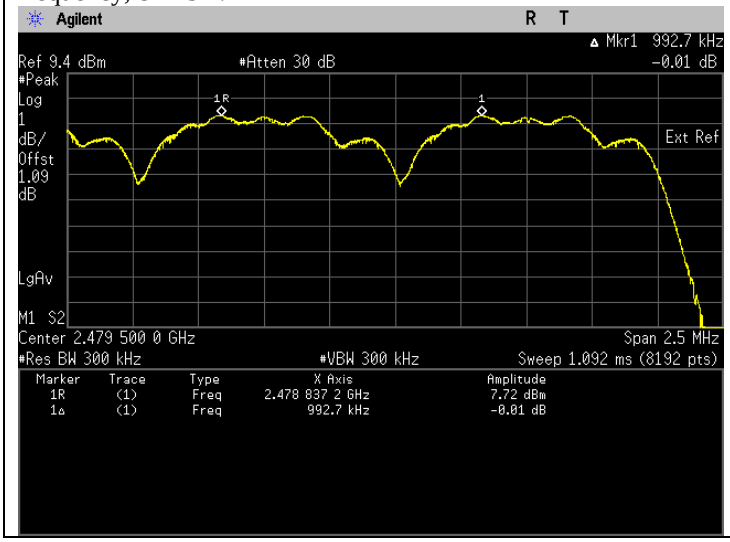
The Conducted RF Output Power test with result at low frequency, 8DPSK.



The Conducted RF Output Power test with result at mid frequency, 8DPSK.

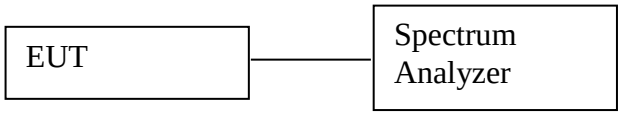


The Conducted RF Output Power test with result at high frequency, 8DPSK.



6.7. Conducted Spurious Emission

6.7.1. Test Setup



a) Check and ensure the spectrum analyzer well calibrate.
b) Turn on the EUT and set EUT to transmit maximum data rate with hopping disable.
c) Connect EUT's antenna terminal to spectrum analyzer with a low loss cable.
d) Setting of Spectrum analyzer :
   a. RBW = 100 kHz
   b. VBW = 300 kHz
   c. SPAN = Cover until 10th harmonic
   d. Detector mode = Peak
   e. AMPLITUDE → Scale/Div = 10 dB
   f. Trace = Max hold
   g. Sweep = auto
e) Measure the captured spurious emission result and recording the plot.
f) Repeat above procedure with other different mode of operation.

6.7.2. Test Limits:

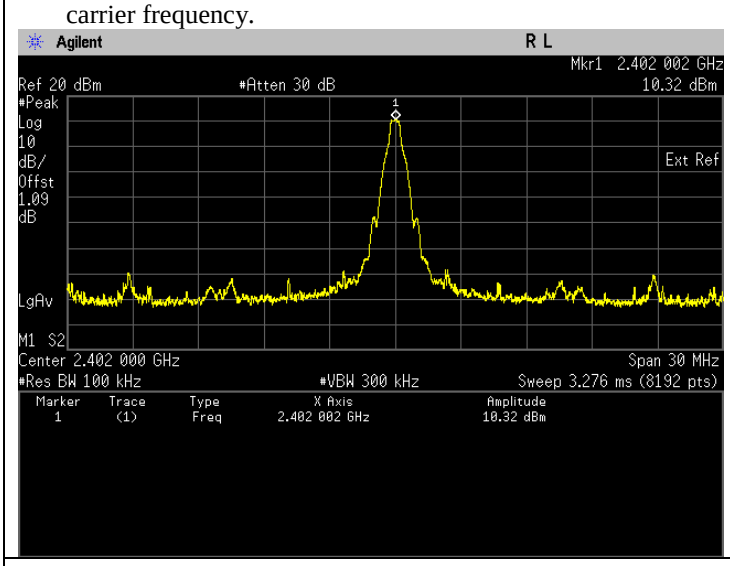
Normal Condition (25 ° C)
Shall be at least 20 dB below for peak power.

6.7.3. Test Data:

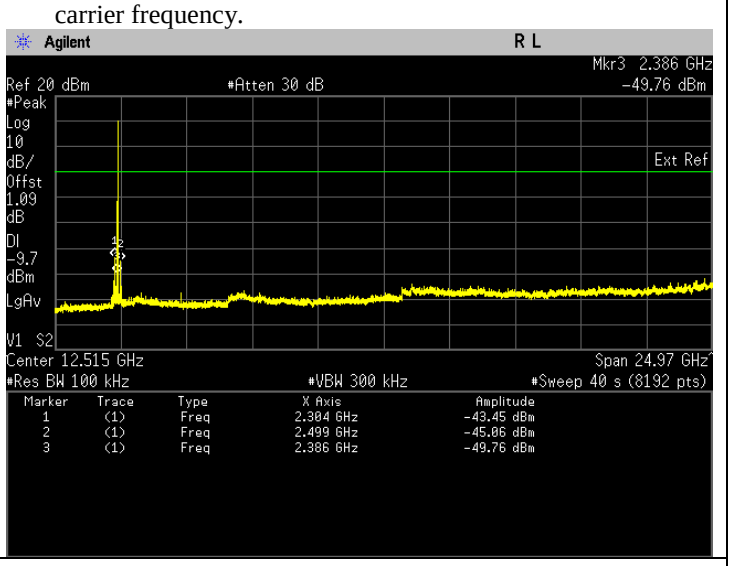
Test Conditions			Results		
Modulation	Voltage(V)	Test Frequency (GHz)	Spurs (MHz)	Level (dBm)	Status
GFSK	7.50	2.4020	2304.000	-43.450	Pass
		2.4410	2344.000	-44.600	Pass
		2.4800	2377.000	-45.324	Pass
Pi/4 DQPSK	7.50	2.4020	2496.000	-50.650	Pass
		2.4410	2341.000	-50.270	Pass
		2.4800	24966.000	-52.500	Pass
8DPSK	7.50	2.4020	24960.000	-52.430	Pass
		2.4410	2341.000	-49.159	Pass
		2.4800	2325.000	-48.648	Pass

GFSK Modulation:

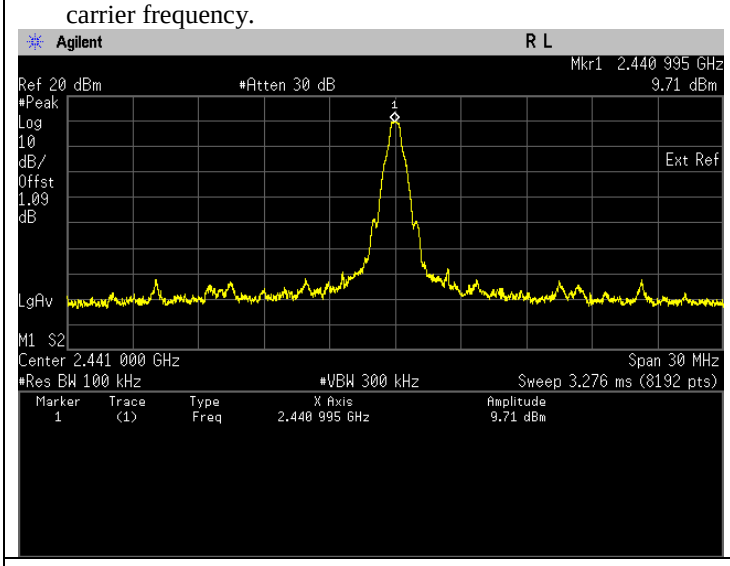
- The high emission level within the assigned band at low carrier frequency.



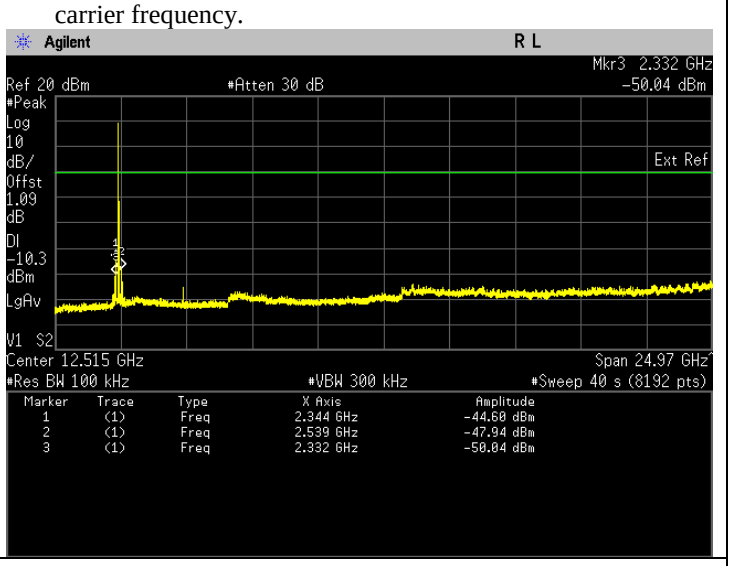
- Spurious emission measurement in 30MHz – 25GHz at low carrier frequency.



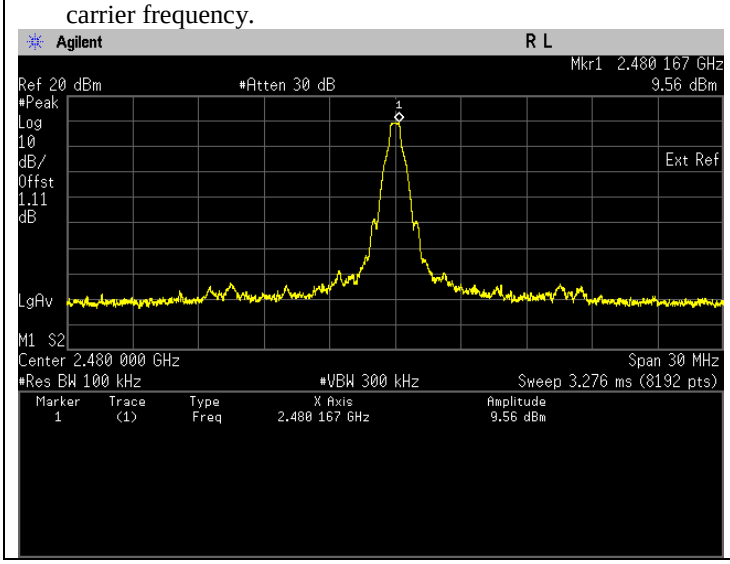
- The high emission level within the assigned band at mid carrier frequency.



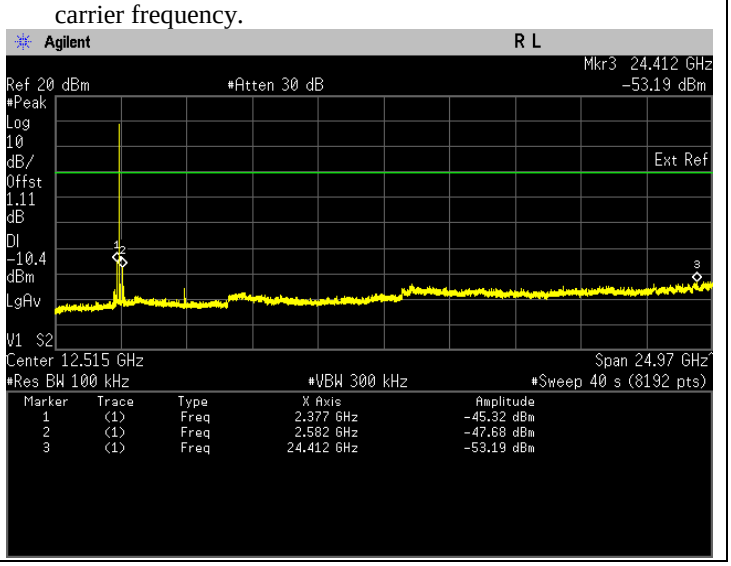
- Spurious emission measurement in 30MHz – 25GHz at mid carrier frequency.



- The high emission level within the assigned band at high carrier frequency.

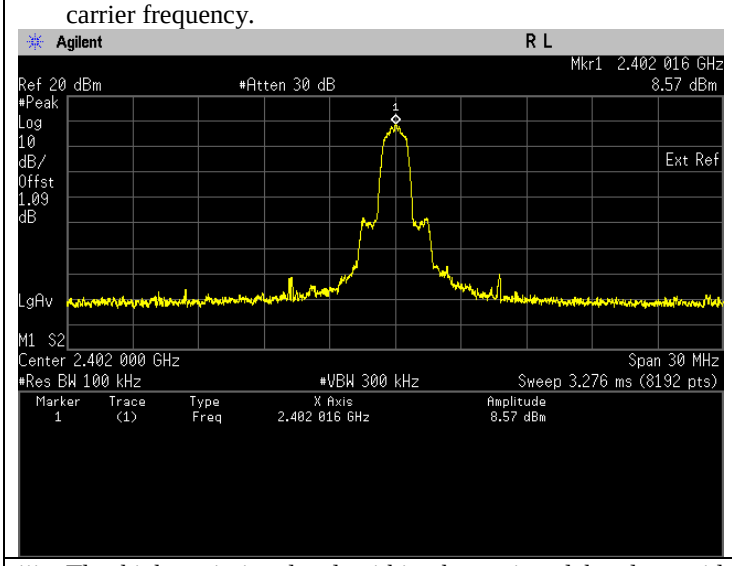


- Spurious emission measurement in 30MHz – 25GHz at high carrier frequency.

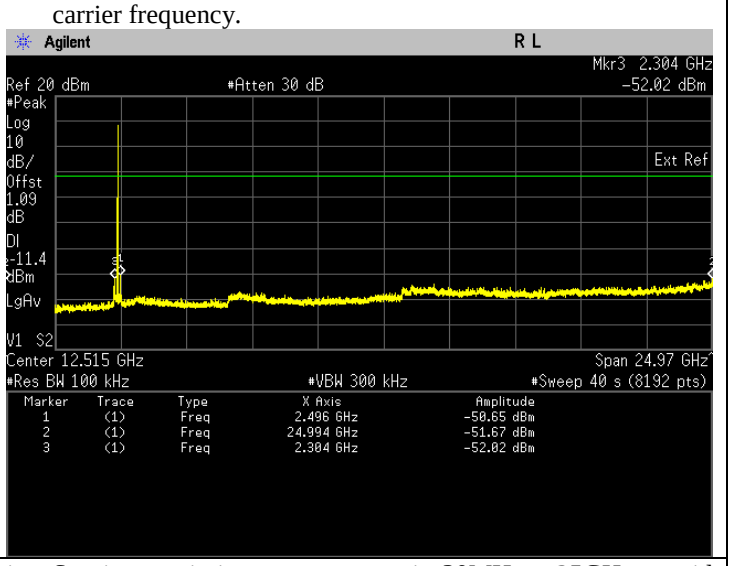


Pi/4 DQPSK Modulation:

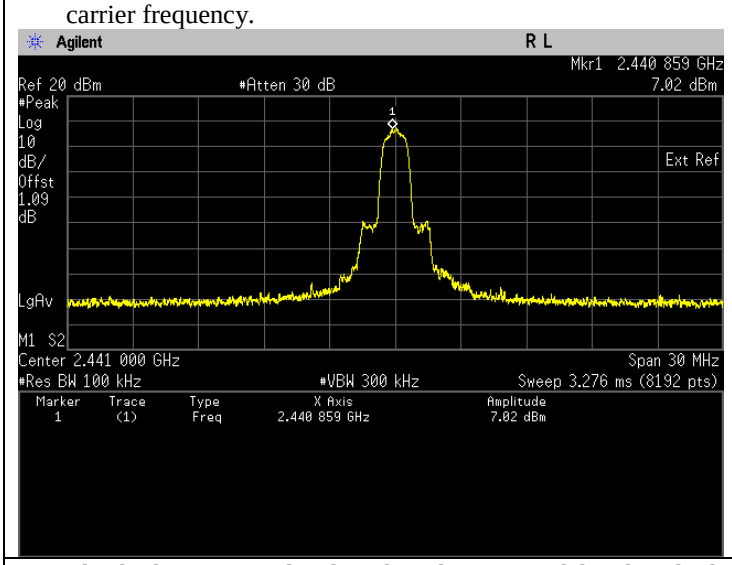
i. The high emission level within the assigned band at low carrier frequency.



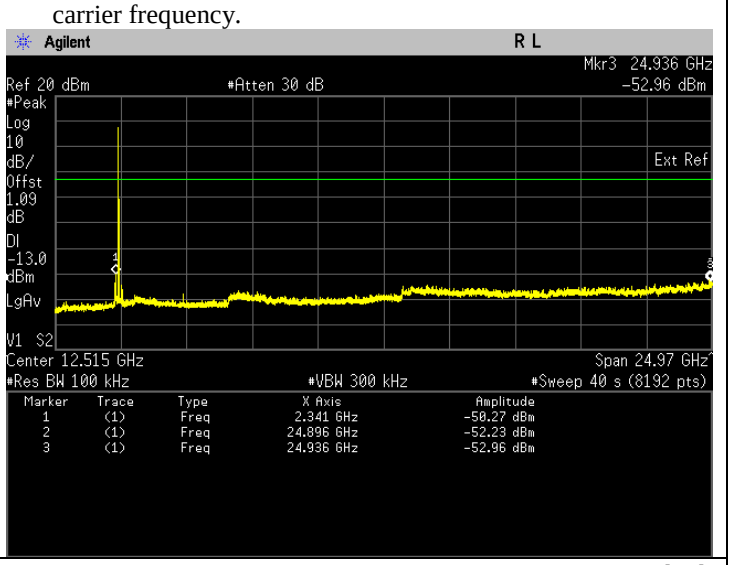
ii. Spurious emission measurement in 30MHz – 25GHz at low carrier frequency.



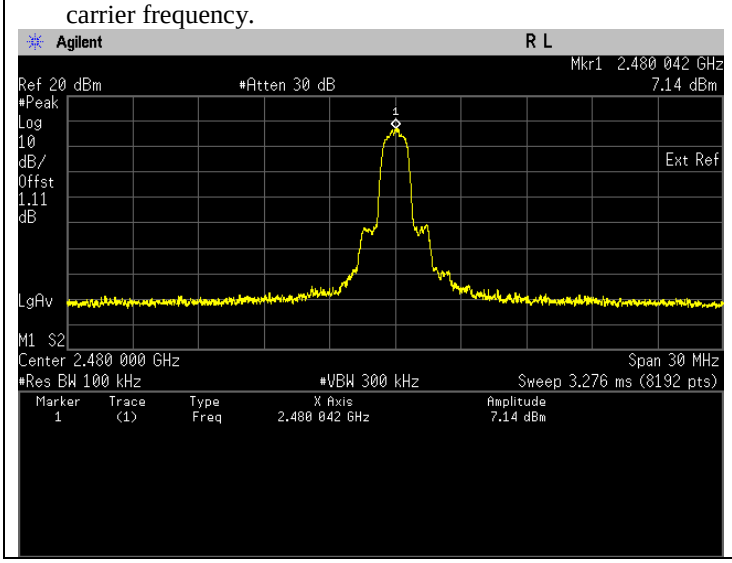
iii. The high emission level within the assigned band at mid carrier frequency.



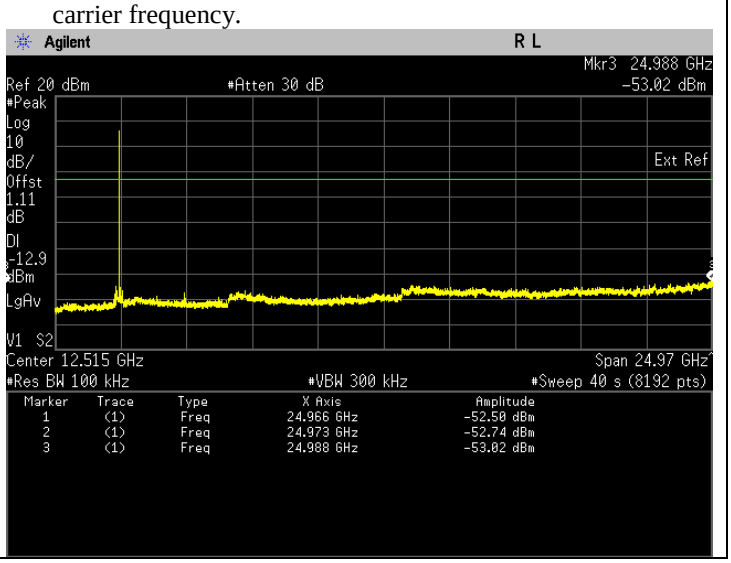
iv. Spurious emission measurement in 30MHz – 25GHz at mid carrier frequency.



v. The high emission level within the assigned band at high carrier frequency.

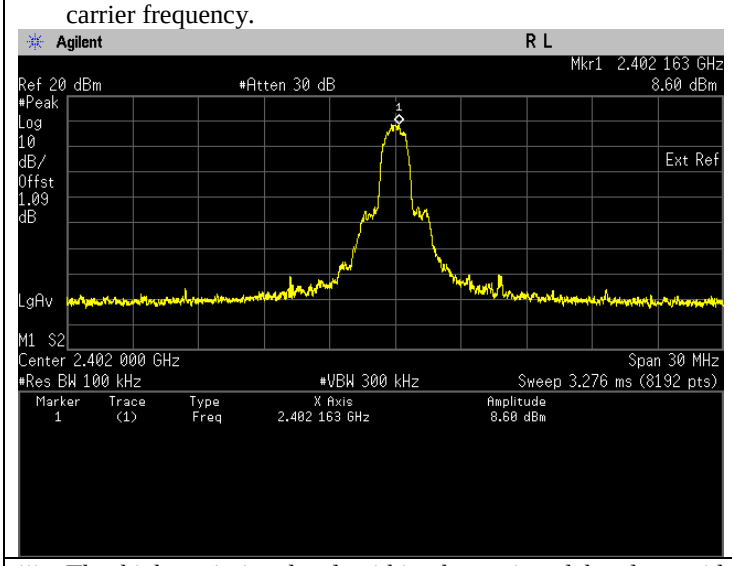


vi. Spurious emission measurement in 30MHz – 25GHz at high carrier frequency.

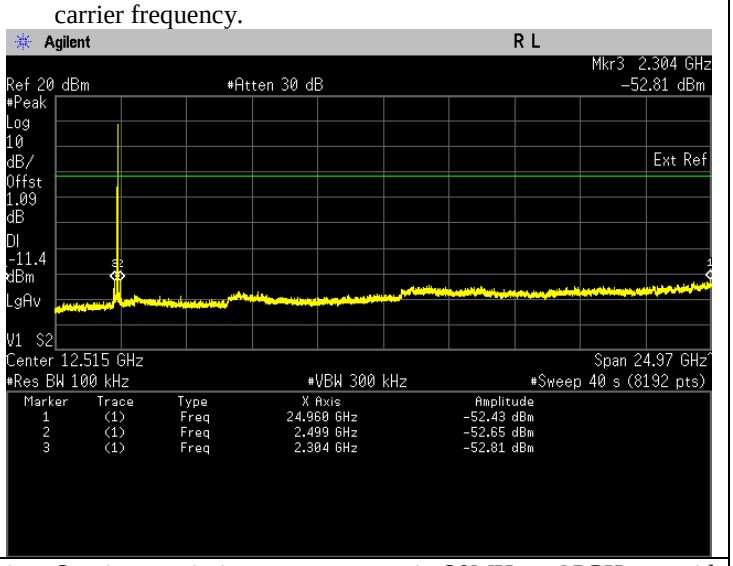


8DPSK Modulation:

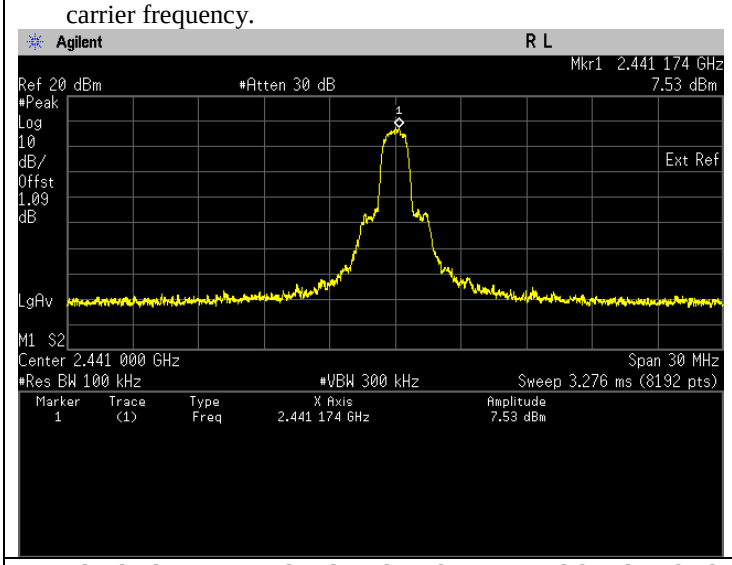
i. The high emission level within the assigned band at low carrier frequency.



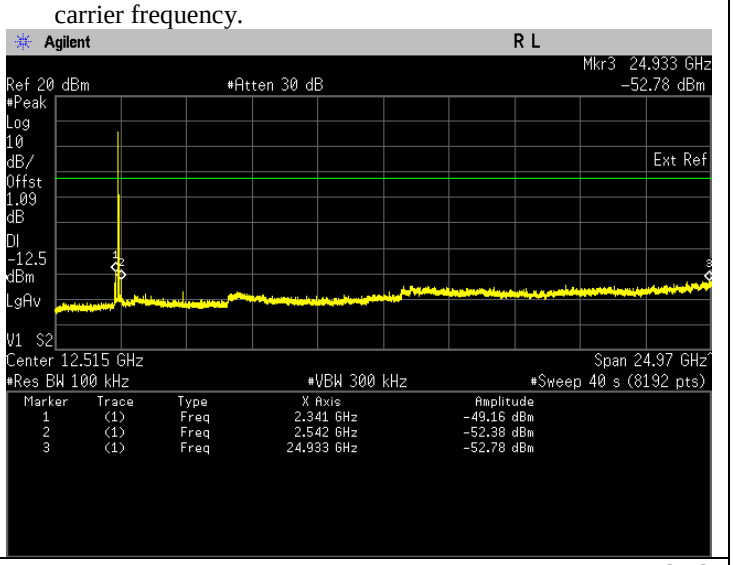
ii. Spurious emission measurement in 30MHz – 25GHz at low carrier frequency.



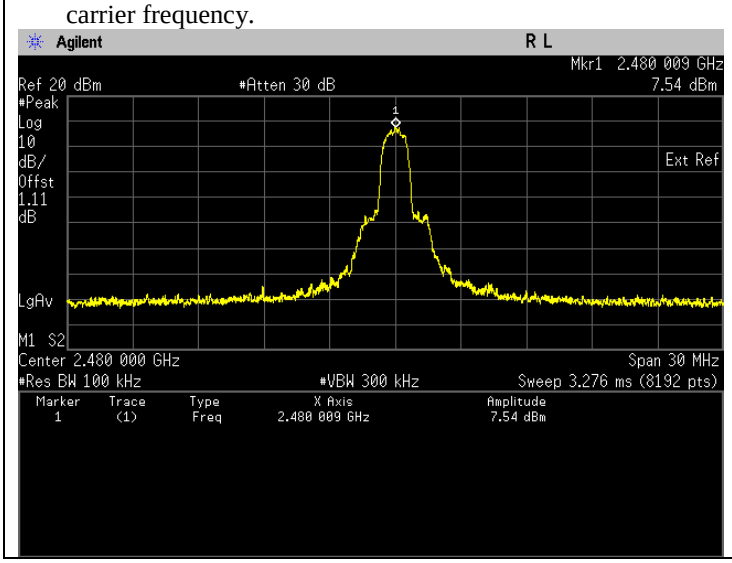
iii. The high emission level within the assigned band at mid carrier frequency.



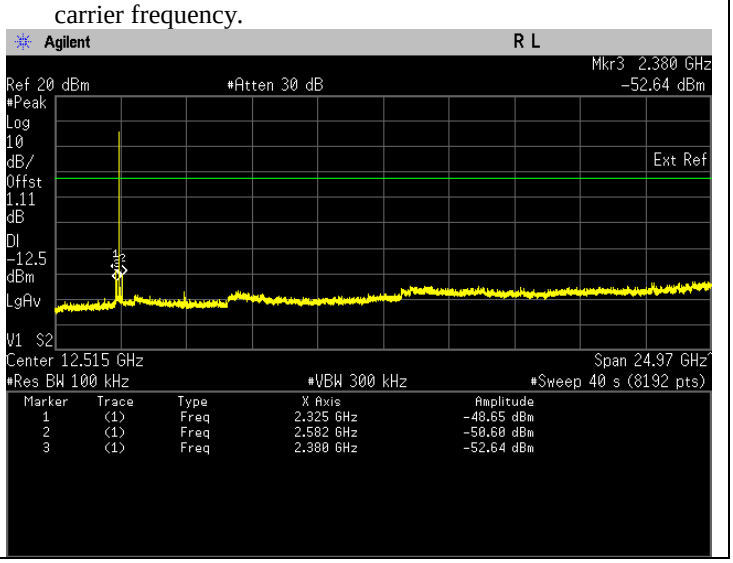
iv. Spurious emission measurement in 30MHz – 25GHz at mid carrier frequency.



v. The high emission level within the assigned band at high carrier frequency.

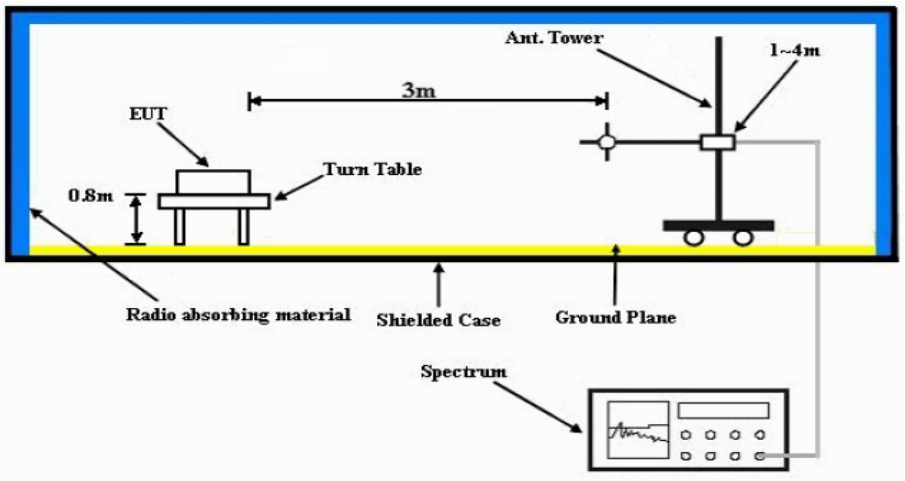


vi. Spurious emission measurement in 30MHz – 25GHz at high carrier frequency.



6.8. Radiated Emission within restricted Bands

6.8.1. Test Setup



a. The EUT is placed on the top of a rotating table 0.8m (<1GHz) or 1.5m (>1GHz) above the ground at a 3m semi-anechoic chamber. The table is rotated 360 degrees to determine the position of the highest radiation.
b. The EUT is set 3m away from the interference-receiving antenna, which is mounted on the top of a variable-height antenna tower.
c. The antenna is Bilog/Horn antenna depend on which frequency range uses, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT is arranged to its worst case and then the antenna is tuned to heights from 1m to 4m and the rotatable table is turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system is set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode is fall within the range of 10dB from the limit specified, the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. Otherwise, the testing could be stopped and the peak values of the EUT would be reported.

NOTE:
a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1GHz.
b. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1 GHz.
c. All modes of operation were investigated and the worst-case emissions are reported.

6.8.2. Test Limits:

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

NOTE:

a. The lower limit shall apply at the transition frequencies.
b. Emission level (dBuV/m) = 20 log Emission level (uV/m).
c. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

6.8.3. Test Data:

Test: Bluetooth SAC Restricted Band Edge
Model Number: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: Low Test Frequency: 2402.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (GFSK)

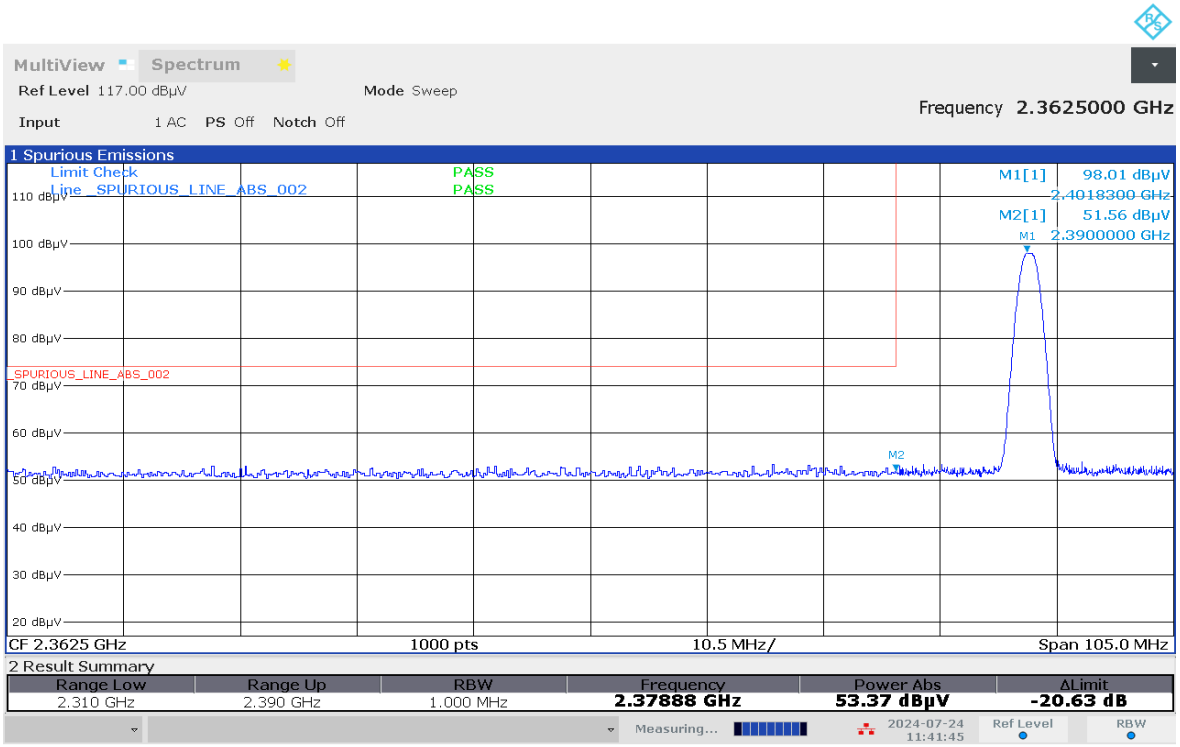
Restricted Band Edge (Low Channel) tabular data

Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
2390.0000	-	50.9438	40.8033	-	74.0000	54.0000	-	23.0562	13.1967	-
Horizontal Radiated Emission Result										
2390.0000	-	52.4397	41.3944	-	74.0000	54.0000	-	21.5603	12.6056	-

Remarks: Pass Result	Marginal Result	Fail Result

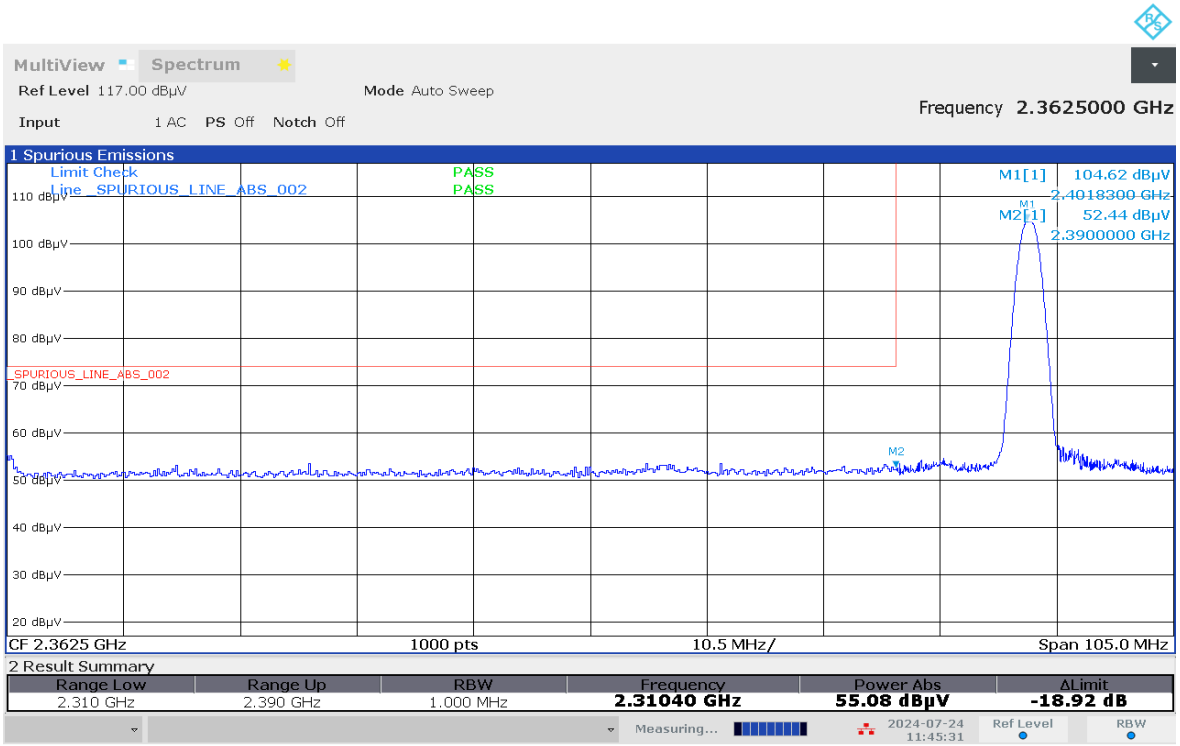
Temperature (degC): 23.4 **Humidity (%): 69.3**
Test Performed by: Nazrin & Rezza **Test Date: Wed, 24 Jul, 2024**
System MU: 5.84dB

Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



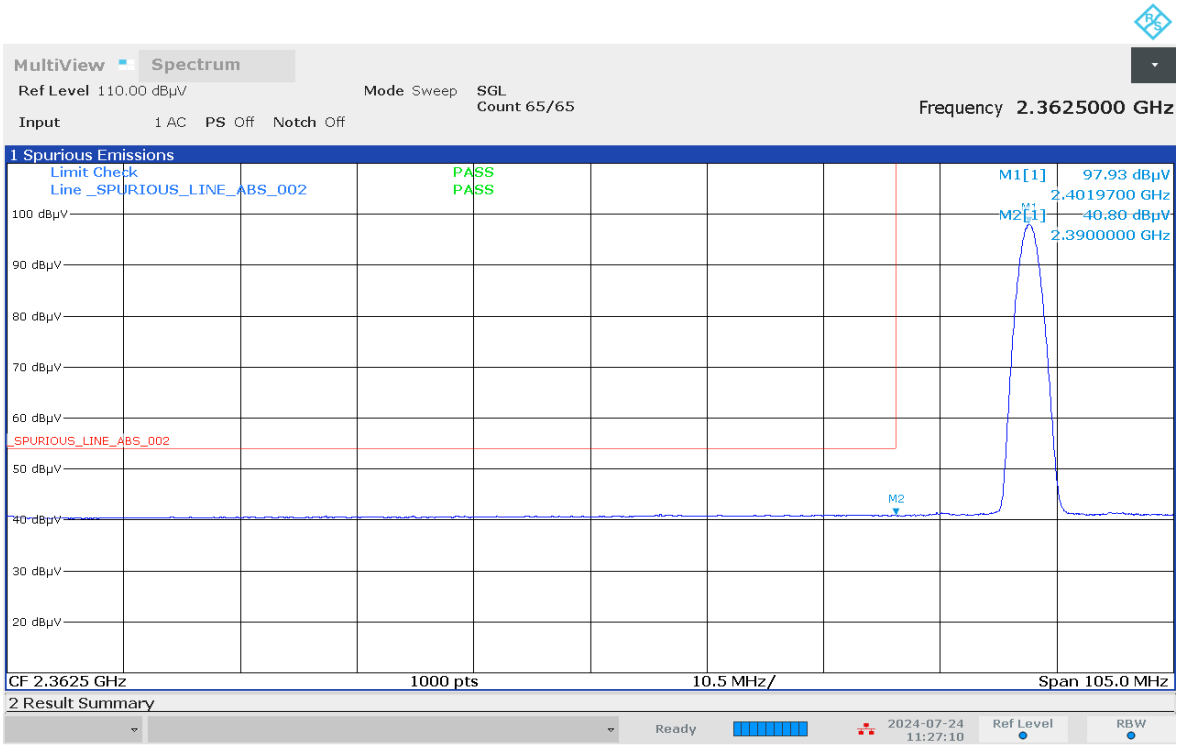
11:41:46 AM 07/24/2024

Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot



11:45:32 AM 07/24/2024

Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



11:27:10 AM 07/24/2024

Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot

11:31:02 AM 07/24/2024

Test: Bluetooth SAC Restricted Band Edge
Model Number: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: High Test Frequency: 2480.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (GFSK)

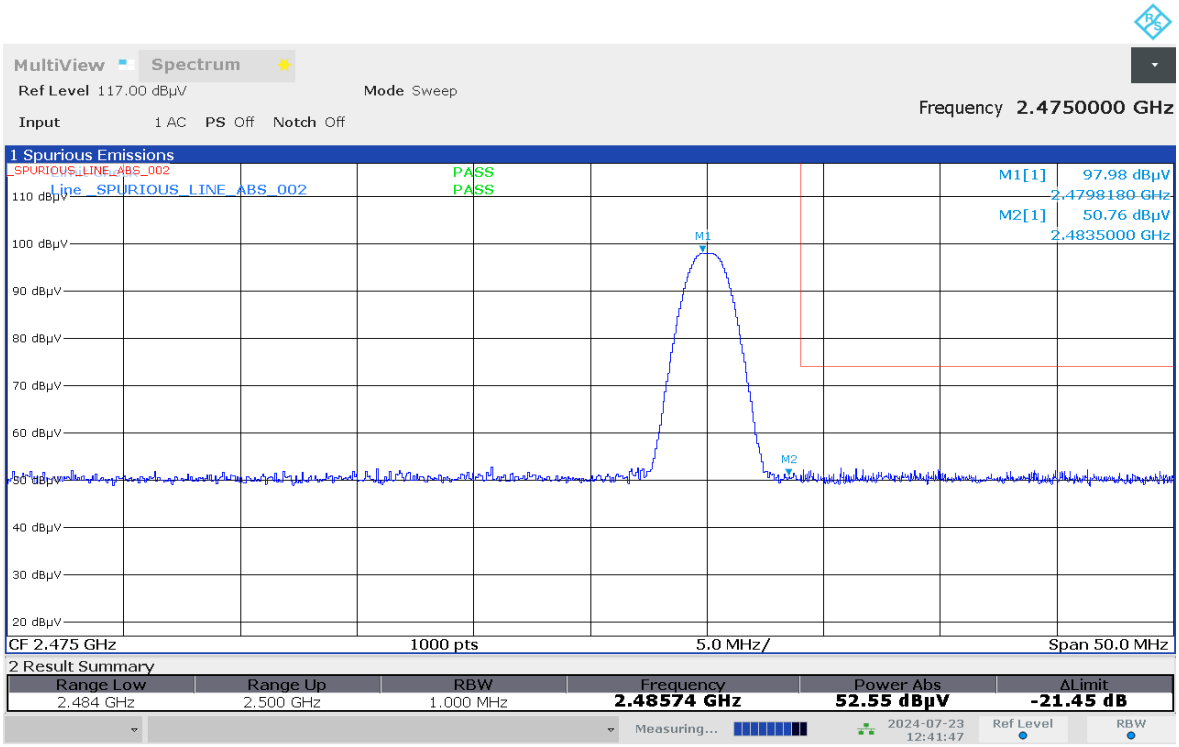
Restricted Band Edge (High Channel) tabular data

Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
2483.5000	-	50.7649	41.3467	-	74.0000	54.0000	-	23.2351	12.6533	-
Horizontal Radiated Emission Result										
2483.5000	-	51.3648	42.7535	-	74.0000	54.0000	-	22.6352	11.2465	-

Remarks: Pass Result	Marginal Result	Fail Result

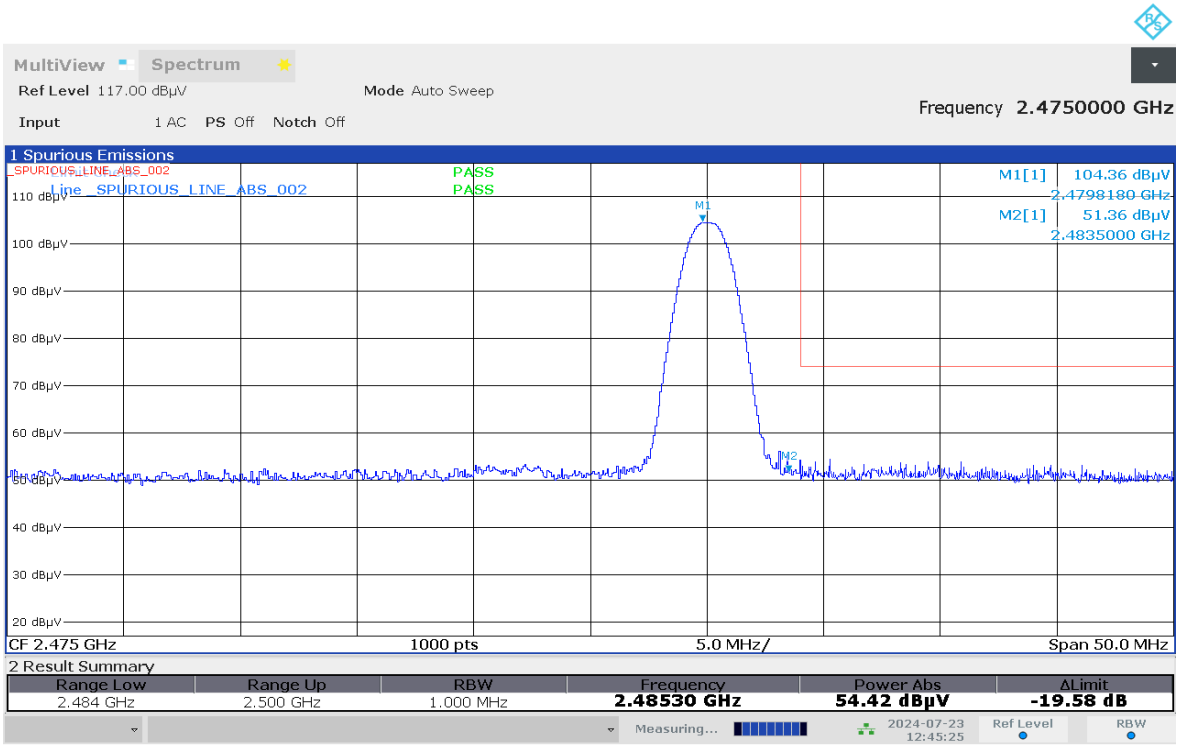
Temperature (degC): 23.4 **Humidity (%): 69.3**
Test Performed by: Nazrin & Rezza **Test Date: Tue, 23 Jul, 2024**
System MU: 5.84dB

Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



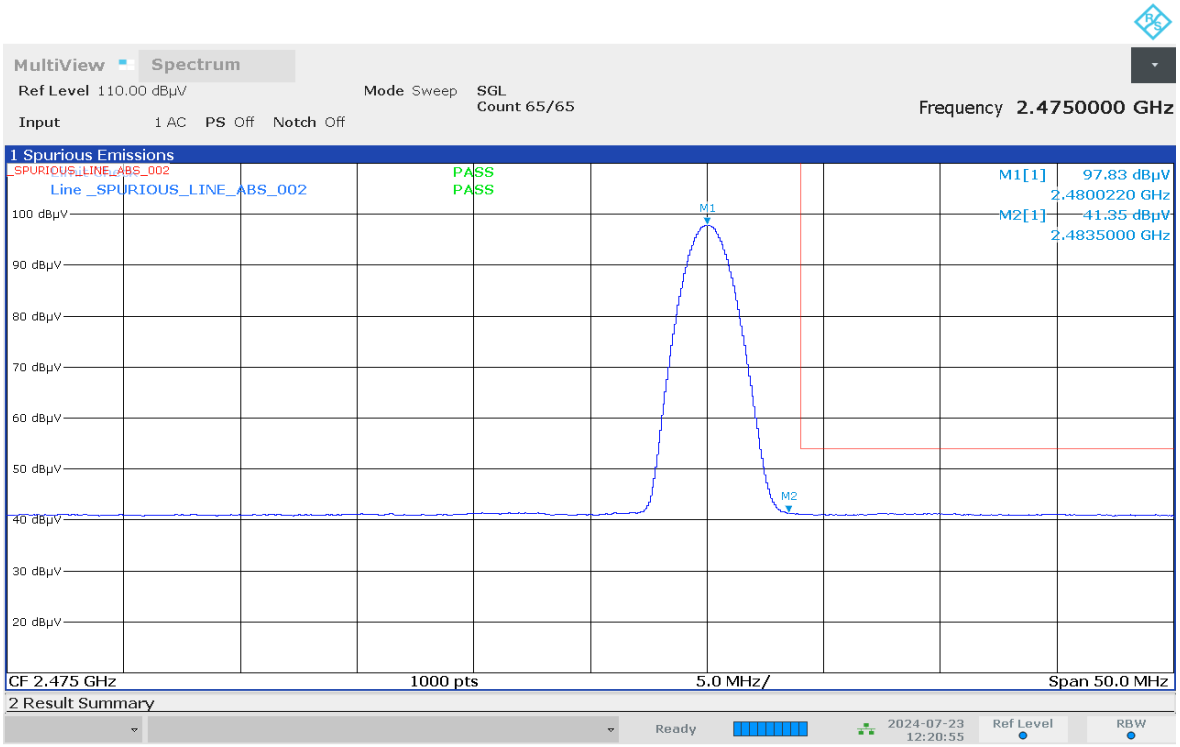
12:41:48 PM 07/23/2024

Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot



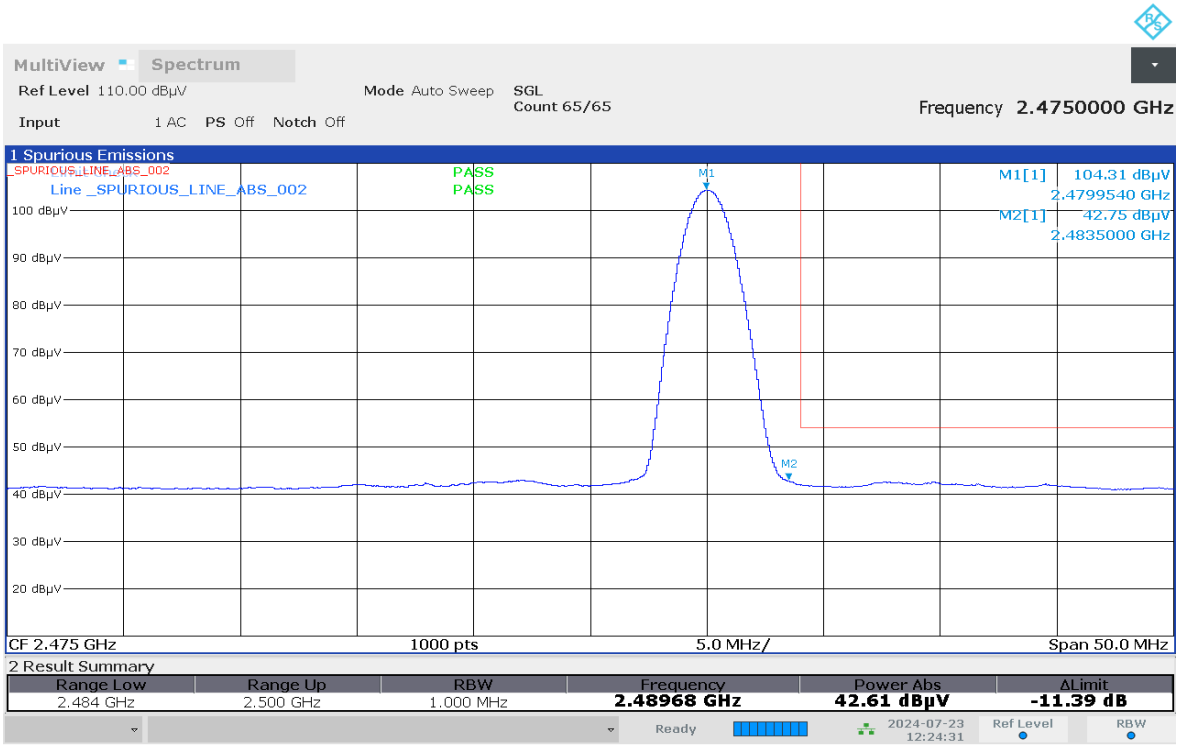
12:45:25 PM 07/23/2024

Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



12:20:56 PM 07/23/2024

Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot



12:24:32 PM 07/23/2024

Test: Bluetooth SAC Restricted Band Edge
Model Number: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: Low Test Frequency: 2402.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (Pi/4 DQPSK)

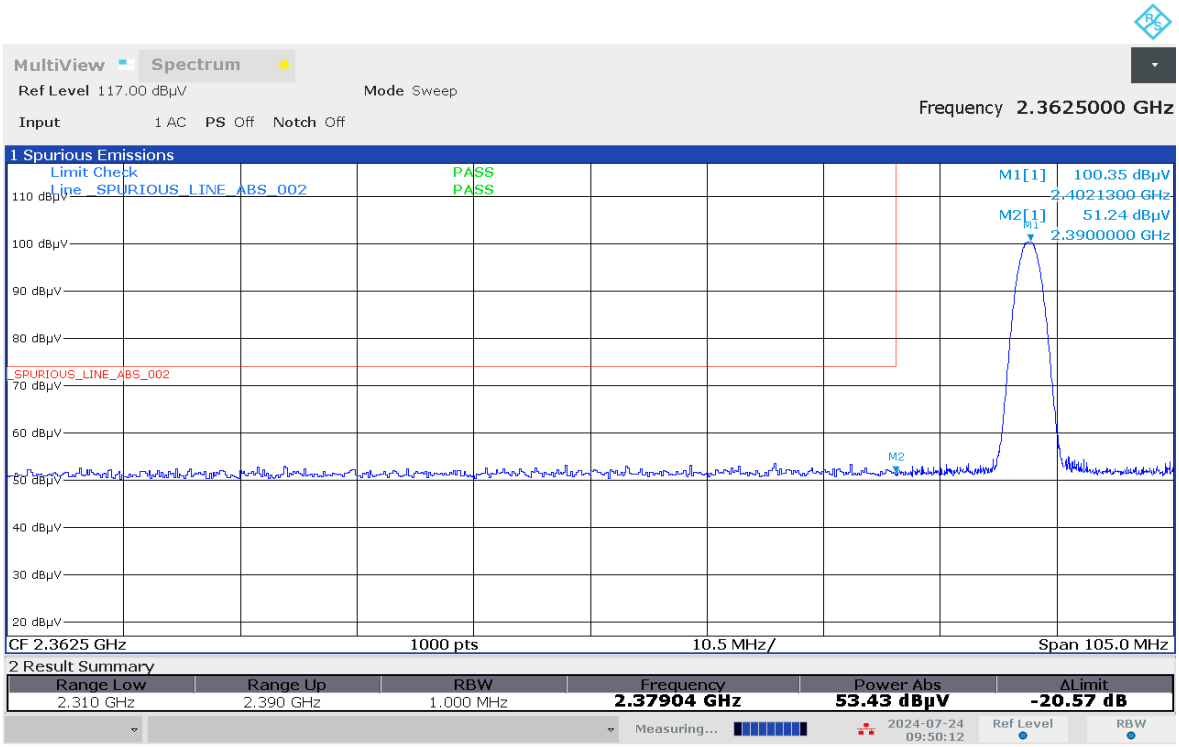
Restricted Band Edge (Low Channel) tabular data

Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
2390.0000	-	51.2377	40.8440	-	74.0000	54.0000	-	22.7623	13.1560	-
Horizontal Radiated Emission Result										
2390.0000	-	50.9610	40.9248	-	74.0000	54.0000	-	23.0390	13.0752	-

Remarks: Pass Result	Marginal Result	Fail Result

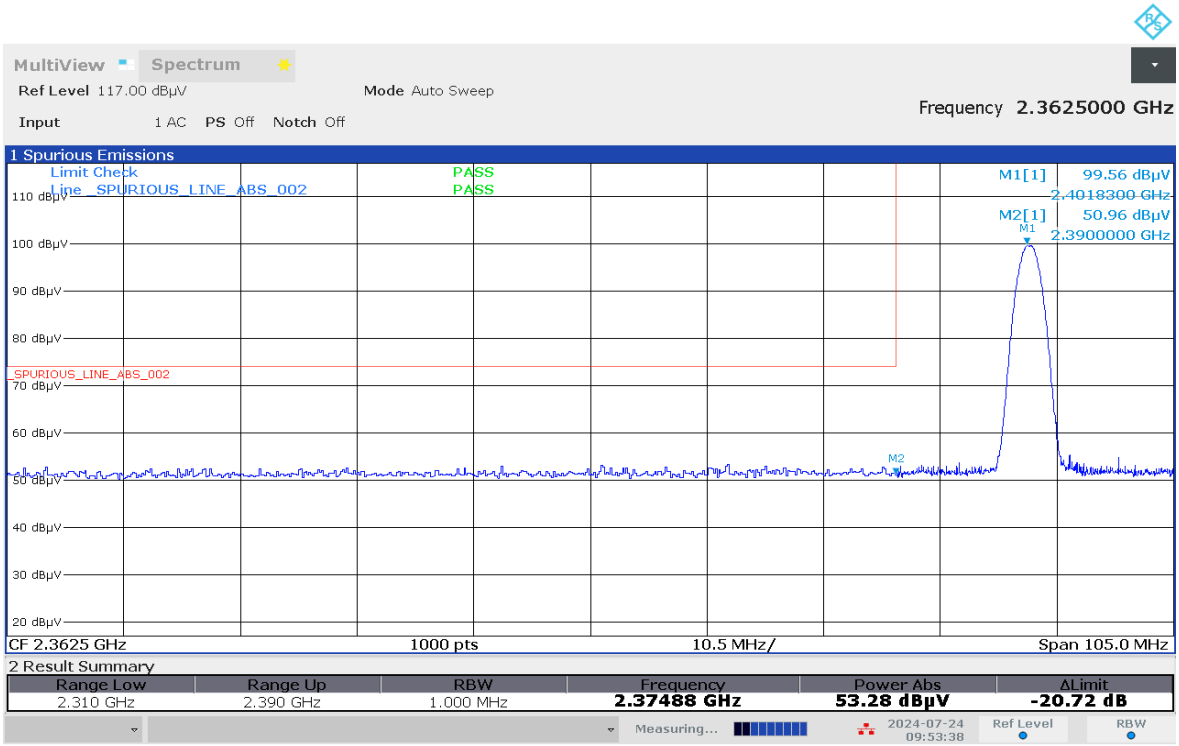
Temperature (degC): 23.4 **Humidity (%): 69.3**
Test Performed by: Nazrin & Rezza **Test Date: Wed, 24 Jul, 2024**
System MU: 5.84dB

Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



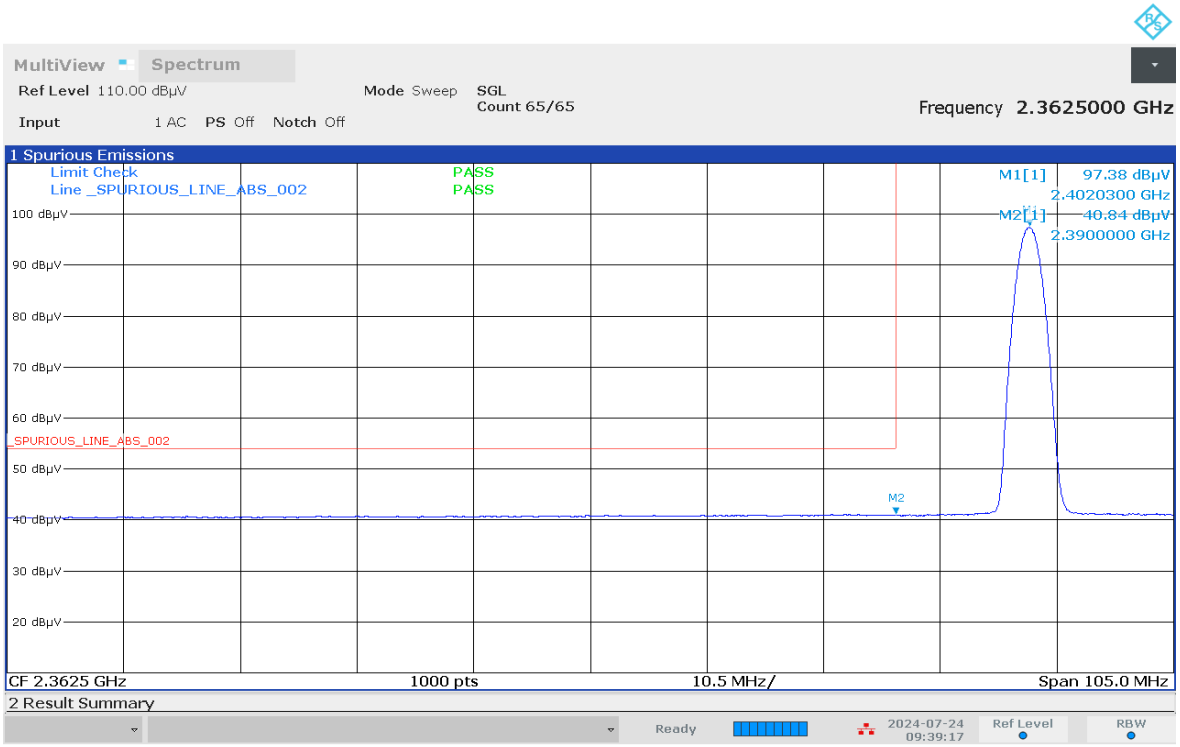
09:50:12 AM 07/24/2024

Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot



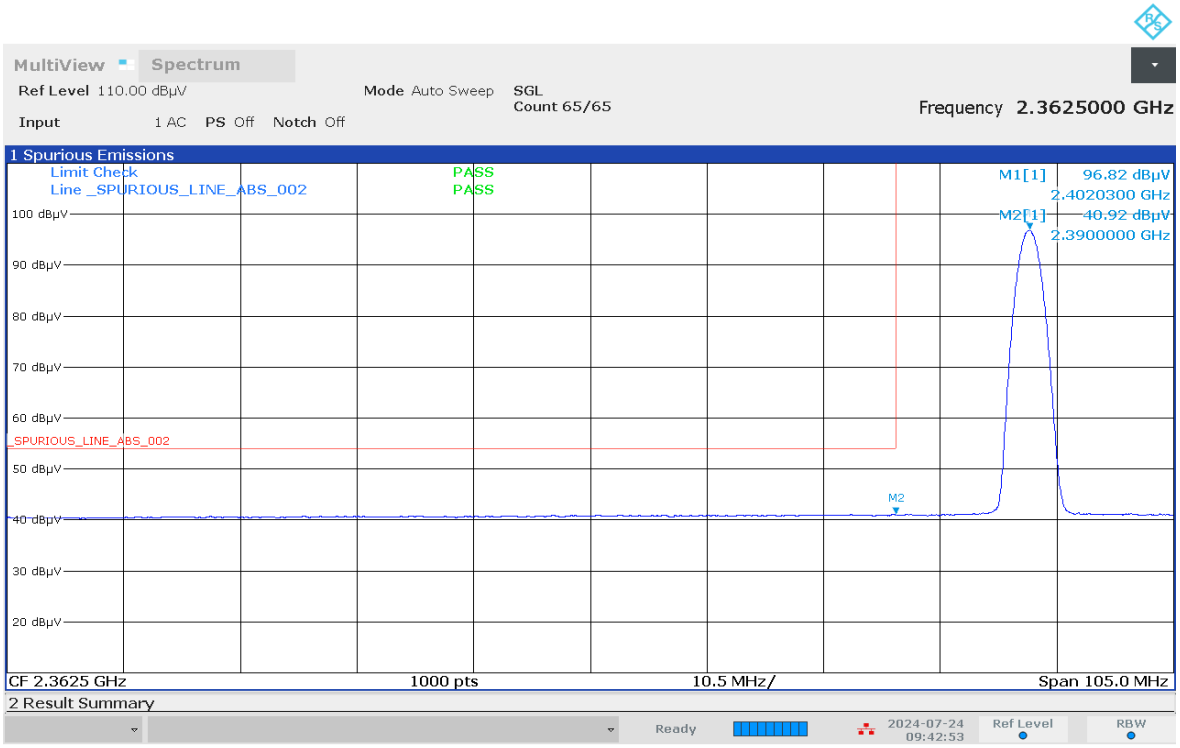
09:53:39 AM 07/24/2024

Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



09:39:18 AM 07/24/2024

Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



09:42:53 AM 07/24/2024

Test: Bluetooth SAC Restricted Band Edge
Model Number: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: High Test Frequency: 2480.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (Pi/4 DQPSK)

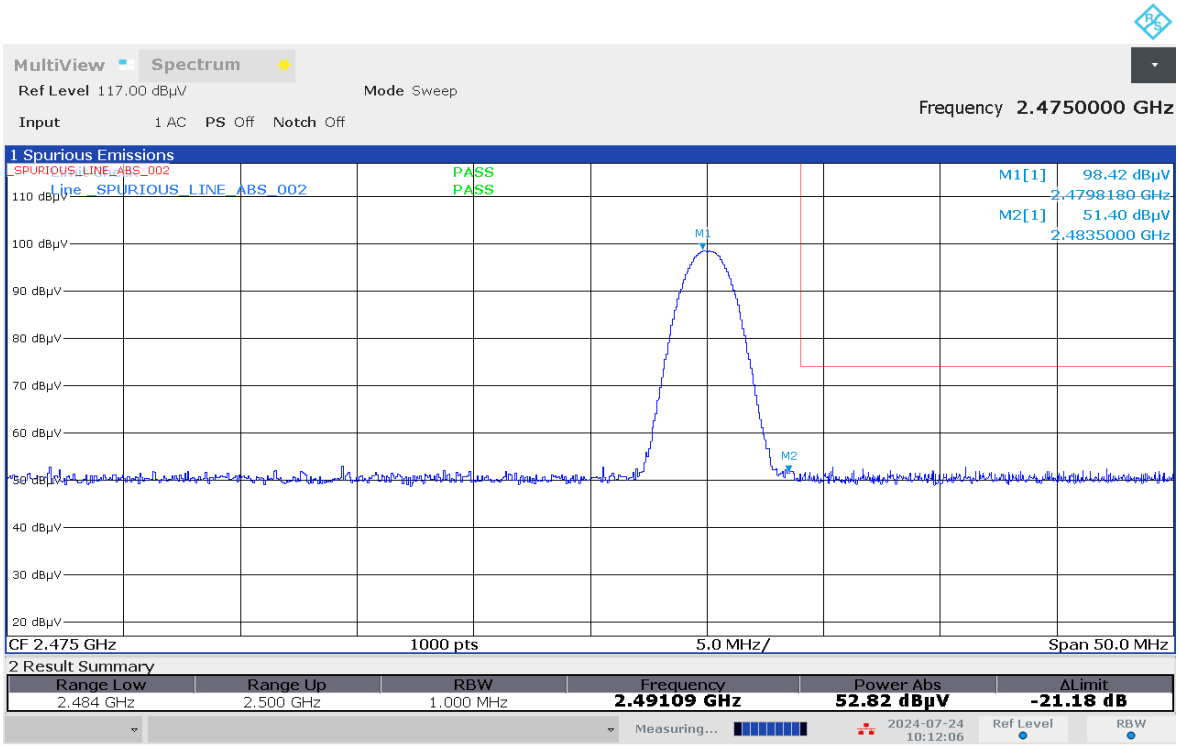
Restricted Band Edge (High Channel) tabular data

Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
2483.5000	-	51.3970	41.4730	-	74.0000	54.0000	-	22.6030	12.5270	-
Horizontal Radiated Emission Result										
2483.5000	-	51.8490	42.1947	-	74.0000	54.0000	-	22.1510	11.8053	-

Remarks: Pass Result	Marginal Result	Fail Result

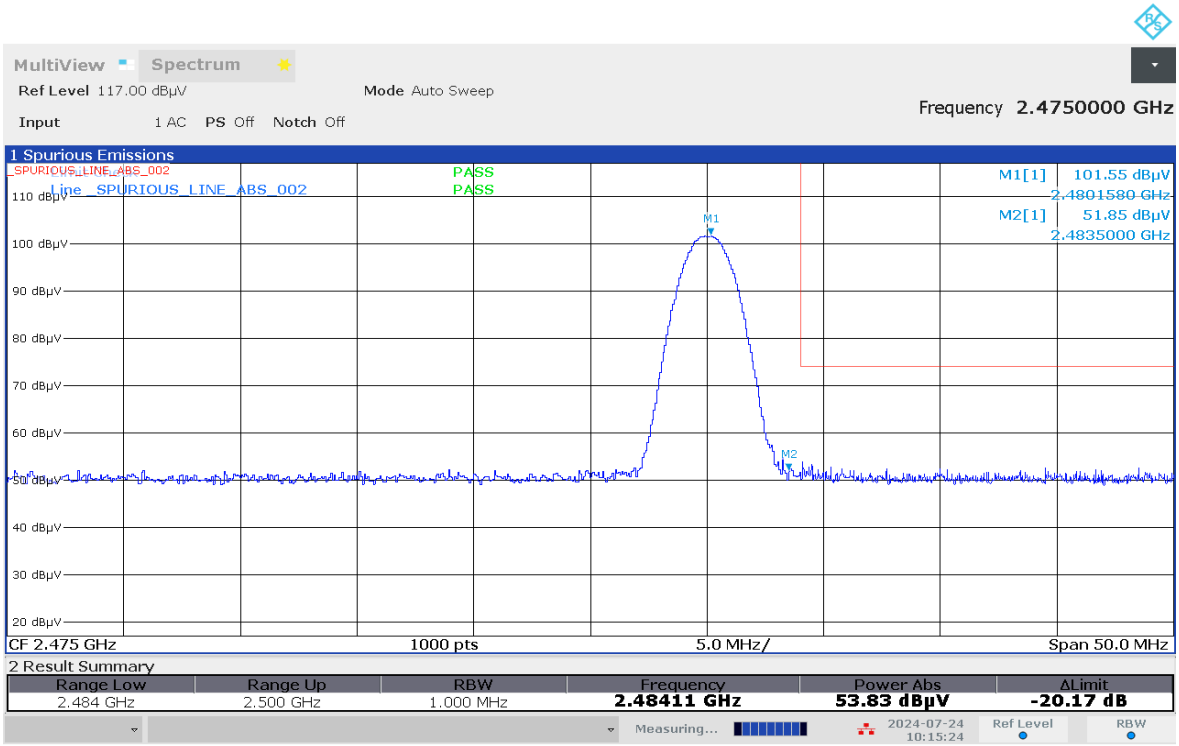
Temperature (degC): 23.4 **Humidity (%): 69.3**
Test Performed by: Nazrin & Rezza **Test Date: Wed, 24 Jul, 2024**
System MU: 5.84dB

Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



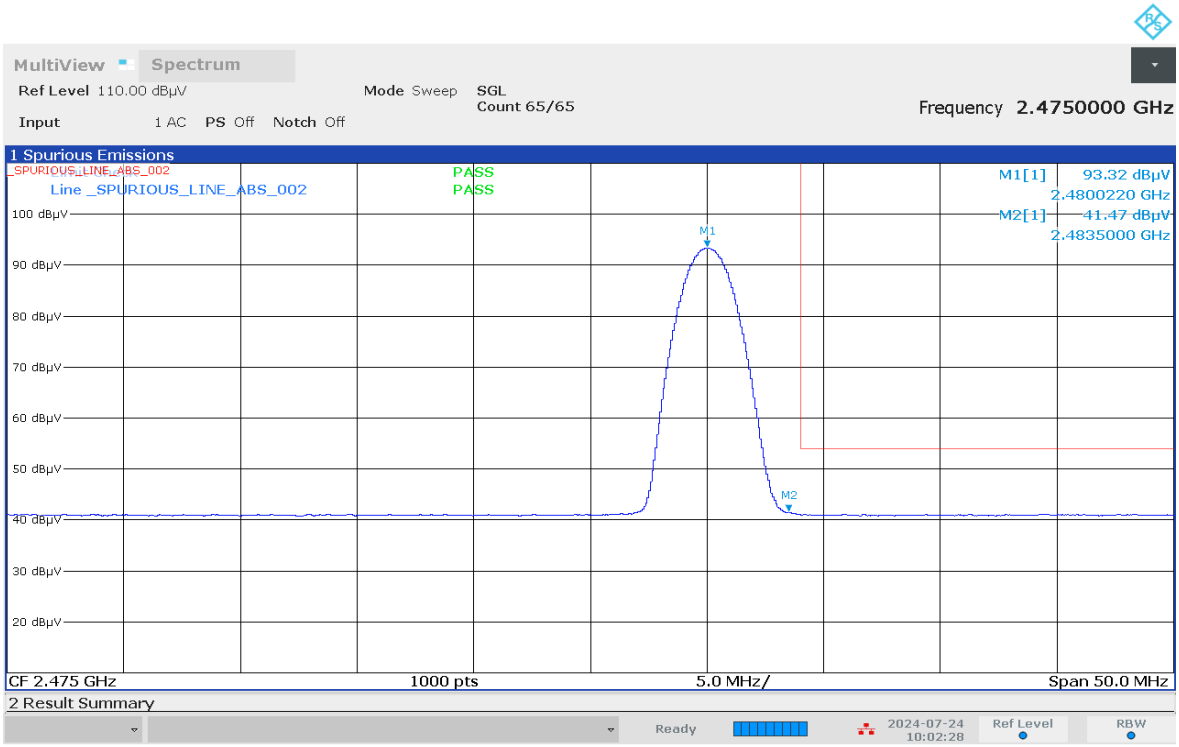
10:12:07 AM 07/24/2024

Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot



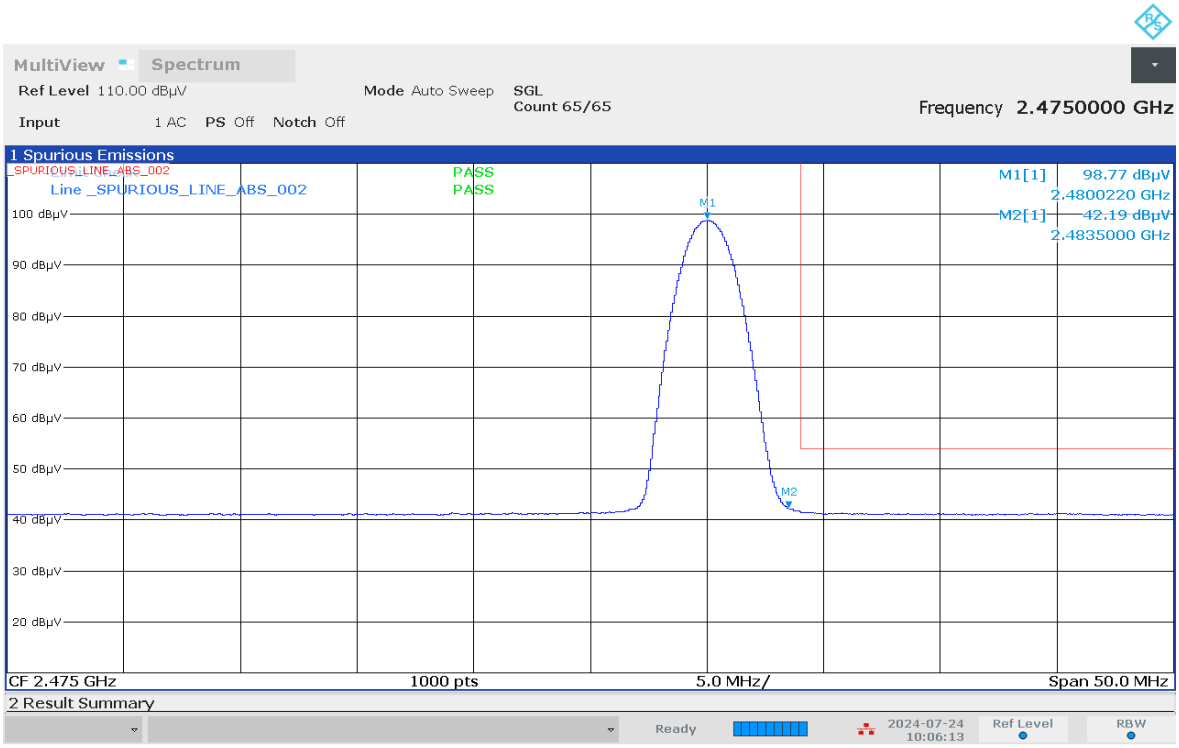
10:15:24 AM 07/24/2024

Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



10:02:29 AM 07/24/2024

Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot



10:06:13 AM 07/24/2024

Test: Bluetooth SAC Restricted Band Edge
Model Number: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: Low Test Frequency: 2402.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (8DPSK)

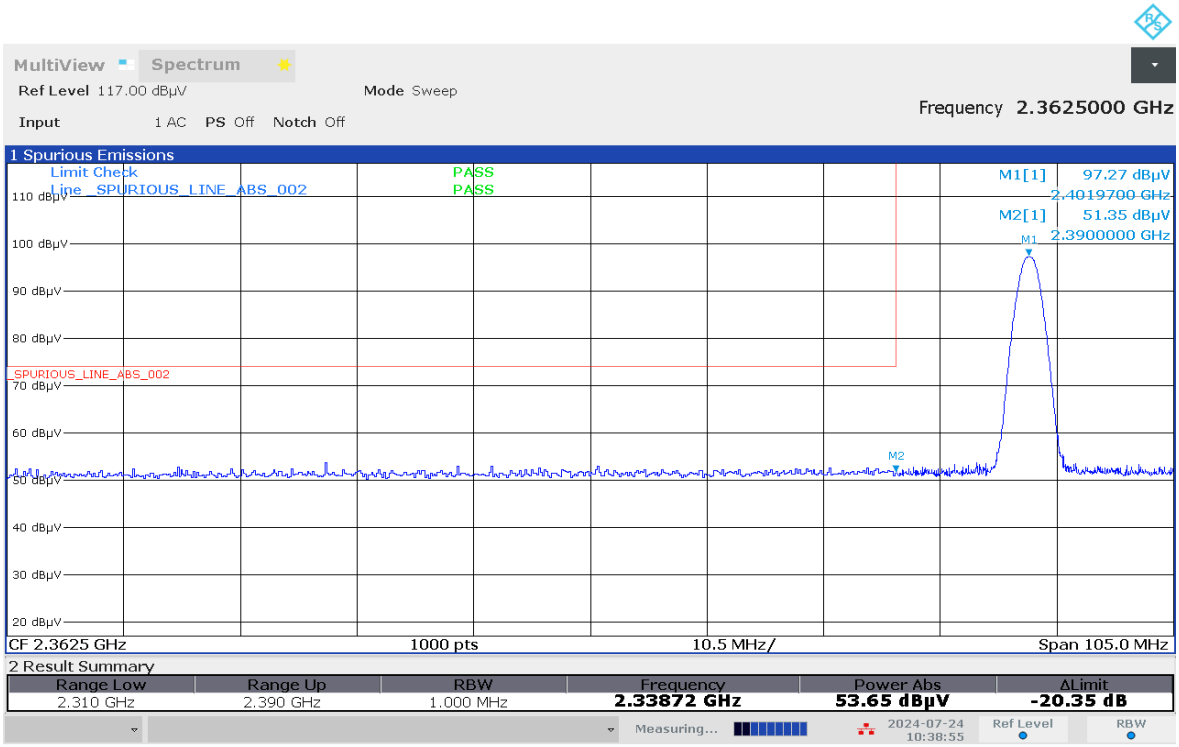
Restricted Band Edge (Low Channel) tabular data

Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
2390.0000	-	51.3520	41.0446	-	74.0000	54.0000	-	22.6480	12.9554	-
Horizontal Radiated Emission Result										
2390.0000	-	52.4326	41.1628	-	74.0000	54.0000	-	21.5674	12.8372	-

Remarks: Pass Result	Marginal Result	Fail Result

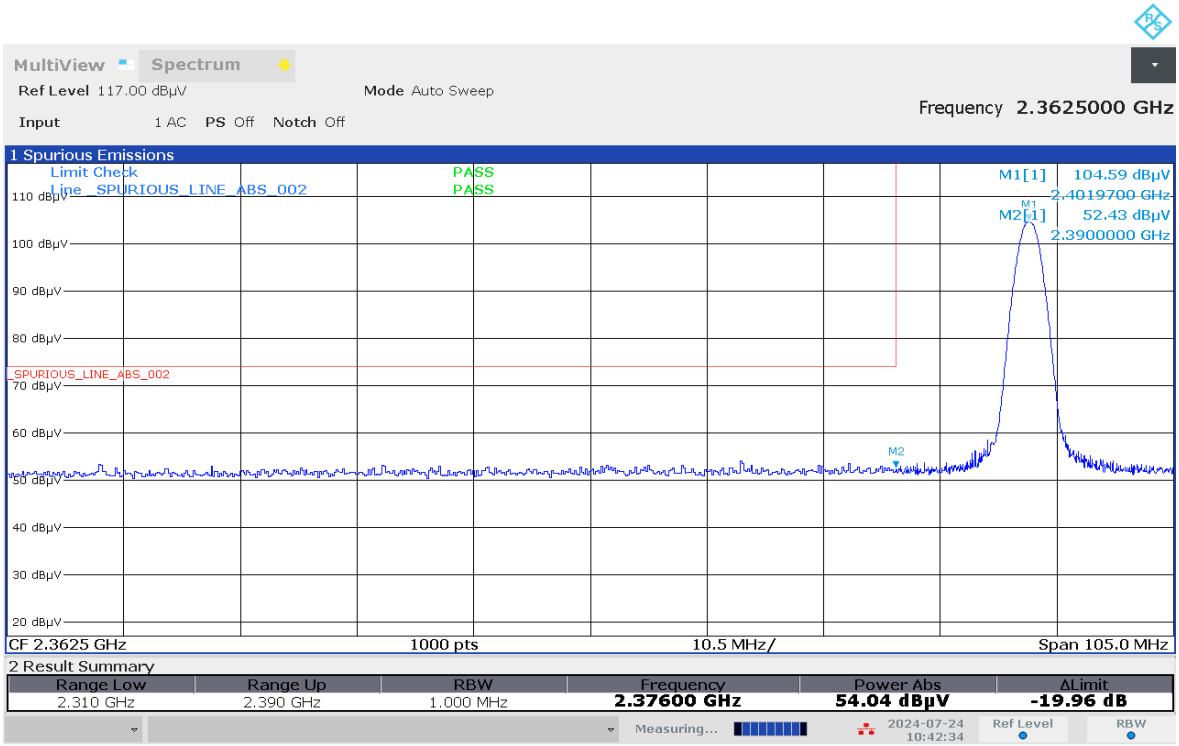
Temperature (degC): 23.4 **Humidity (%): 69.3**
Test Performed by: Nazrin & Rezza **Test Date: Wed, 24 Jul, 2024**
System MU: 5.84dB

Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



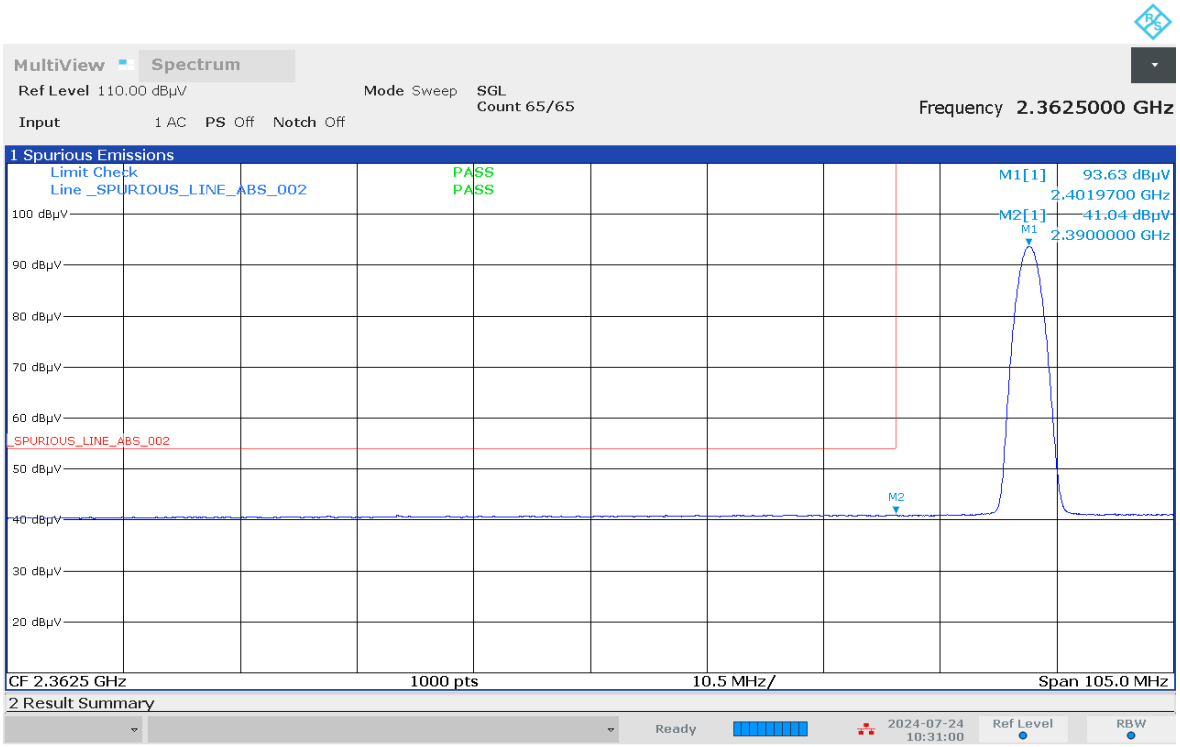
10:38:55 AM 07/24/2024

Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot



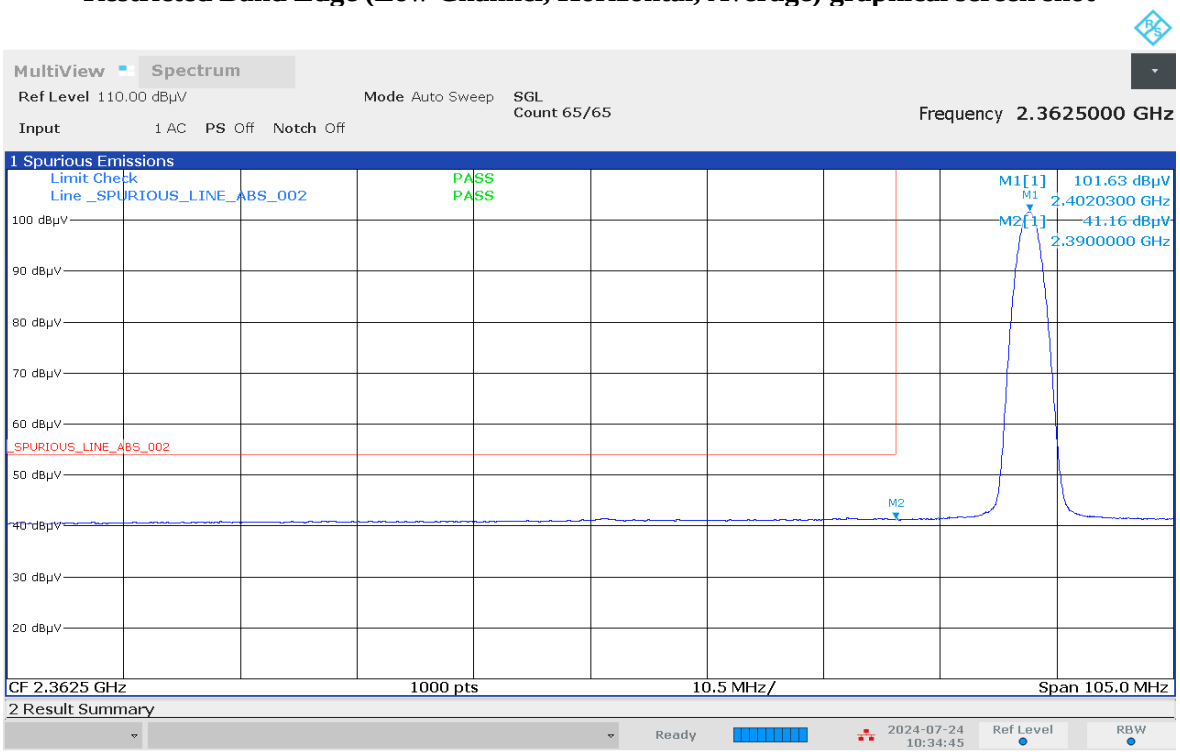
10:42:34 AM 07/24/2024

Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



10:31:01 AM 07/24/2024

Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



10:34:45 AM 07/24/2024

Test: Bluetooth SAC Restricted Band Edge
Model Number: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: High Test Frequency: 2480.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (8DPSK)

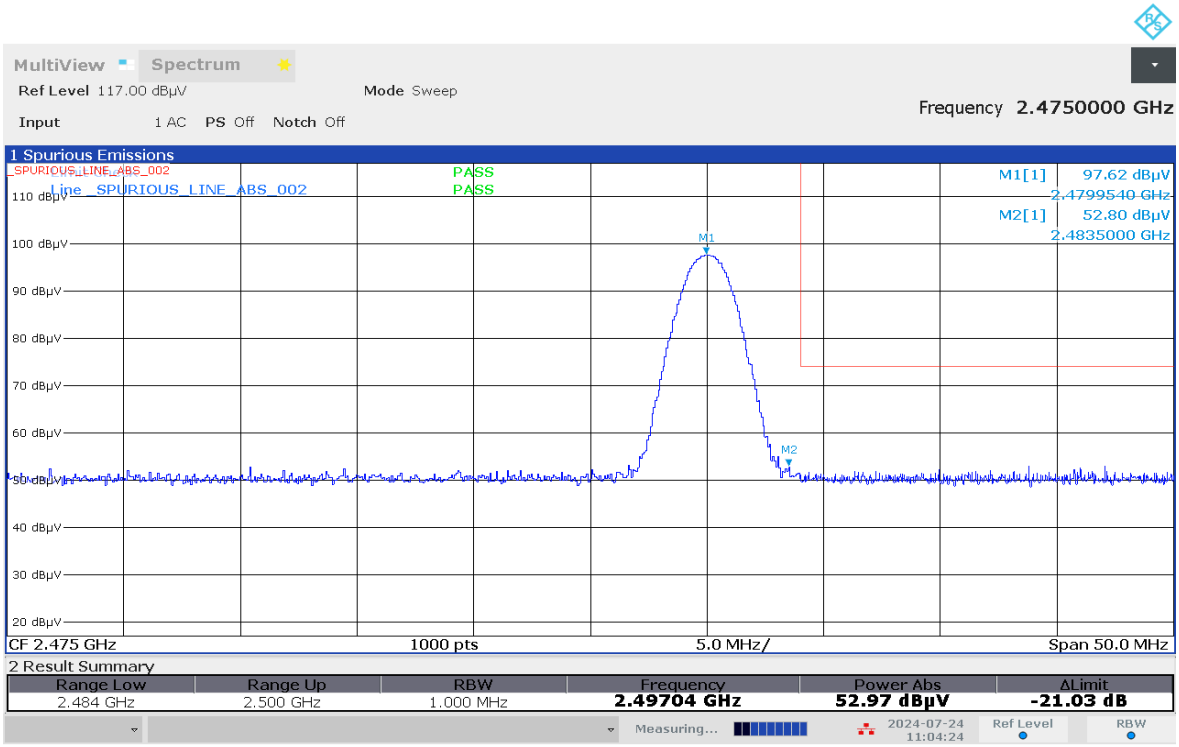
Restricted Band Edge (High Channel) tabular data

Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
2483.5000	-	52.7978	42.2236	-	74.0000	54.0000	-	21.2022	11.7764	-
Horizontal Radiated Emission Result										
2483.5000	-	53.5787	42.7535	-	74.0000	54.0000	-	20.4213	11.2465	-

Remarks: Pass Result	Marginal Result	Fail Result

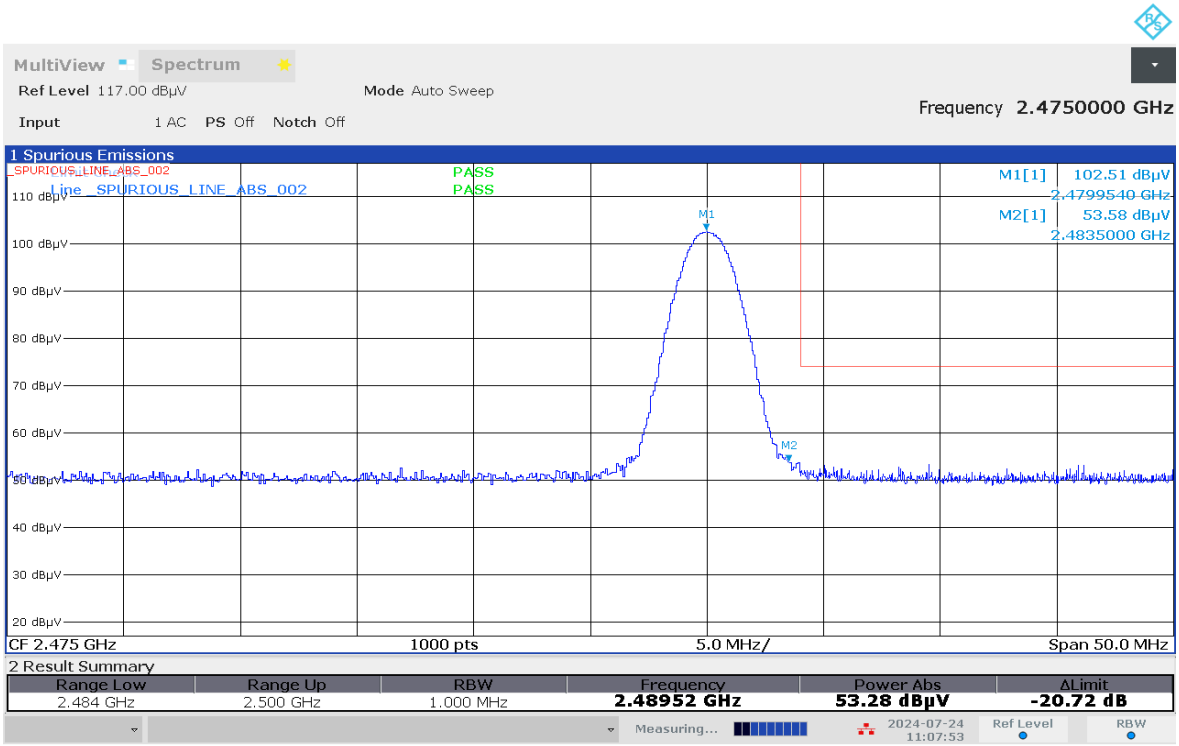
Temperature (degC): 23.4 **Humidity (%): 69.3**
Test Performed by: Nazrin & Rezza **Test Date: Wed, 24 Jul, 2024**
System MU: 5.84dB

Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



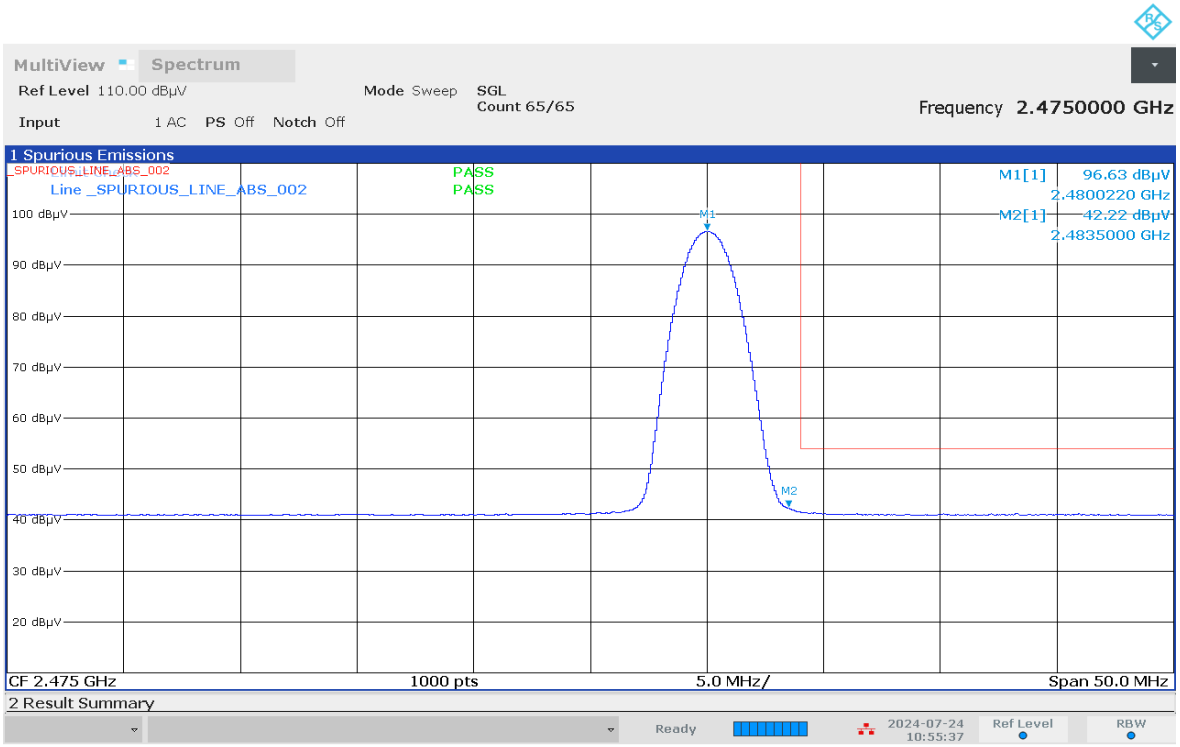
11:04:24 AM 07/24/2024

Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot



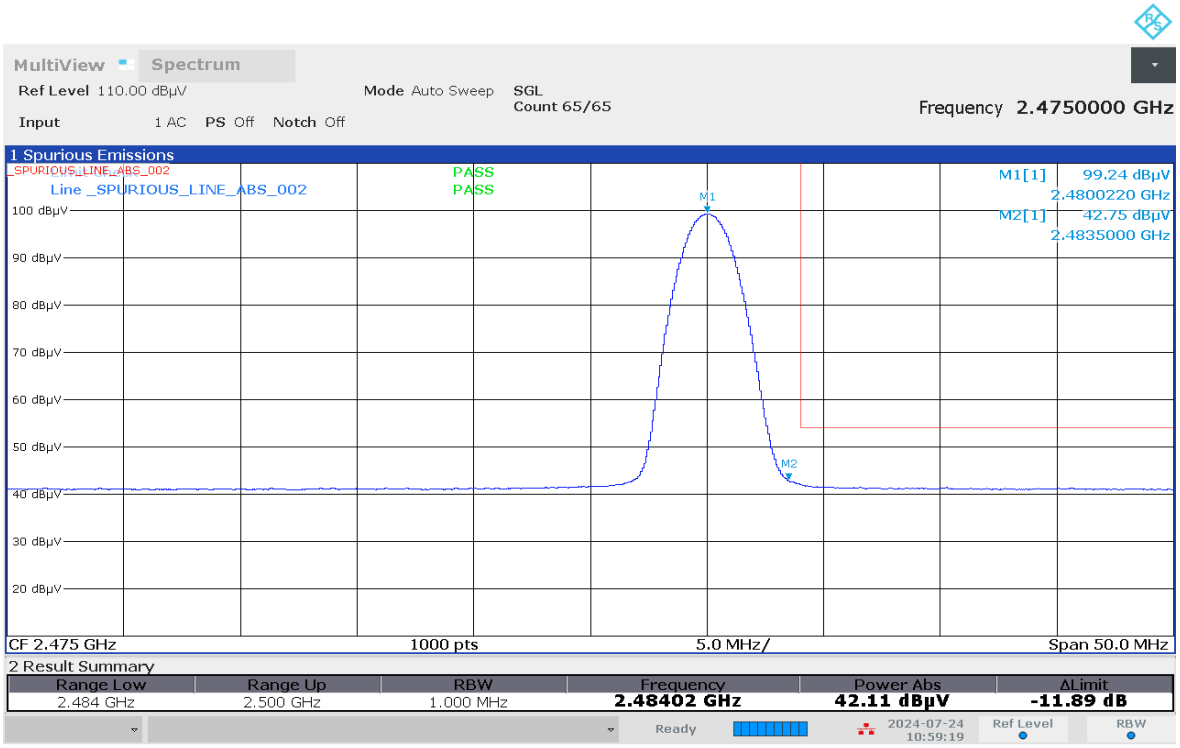
11:07:54 AM 07/24/2024

Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



10:55:37 AM 07/24/2024

Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot



10:59:19 AM 07/24/2024

Test: Bluetooth SAC Transmitter Radiated Emission
Model#: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: Low Test Frequency: 2402.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (GFSK)

Radiated Emission (Low Channel) tabular data

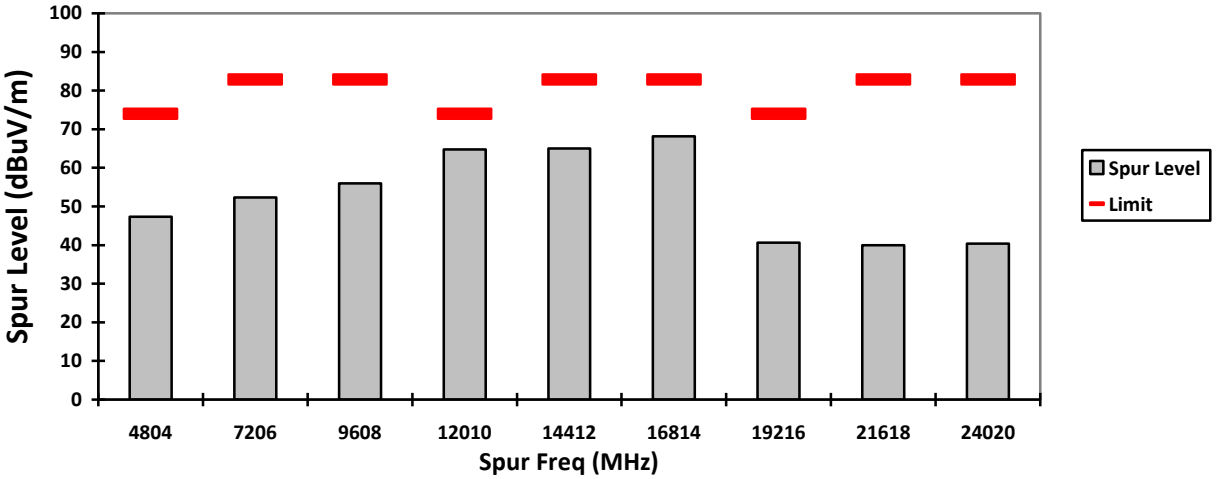
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4804	-	47.3496**	-	-	74.0000	-	-	26.6504	-	-
7206	-	52.2915**	-	-	82.7978	-	-	30.5063	-	102.7978
9608	-	55.9839**	-	-	82.7978	-	-	26.8139	-	102.7978
12010	-	64.7348**	42.2348**	-	74.0000	54.0000	-	9.2652	11.7652	-
14412	-	65.0415**	-	-	82.7978	-	-	17.7563	-	102.7978
16814	-	68.1926**	-	-	82.7978	-	-	14.6052	-	102.7978
19216	-	40.6025**	-	-	74.0000	-	-	33.3975	-	-
21618	-	39.9877**	-	-	82.7978	-	-	42.8101	-	102.7978
24020	-	40.3588**	-	-	82.7978	-	-	42.4390	-	102.7978
Horizontal Radiated Emission Result										
4804	-	46.4475**	-	-	74.0000	-	-	27.5525	-	-
7206	-	52.7628**	-	-	82.7978	-	-	30.0350	-	102.7978
9608	-	55.3017**	-	-	82.7978	-	-	27.4961	-	102.7978
12010	-	65.2459**	42.7459**	-	74.0000	54.0000	-	8.7541	11.2541	-
14412	-	64.2230**	-	-	82.7978	-	-	18.5748	-	102.7978
16814	-	66.3165**	-	-	82.7978	-	-	16.4813	-	102.7978
19216	-	39.3267**	-	-	74.0000	-	-	34.6733	-	-
21618	-	40.5185**	-	-	82.7978	-	-	42.2793	-	102.7978
24020	-	38.5412**	-	-	82.7978	-	-	44.2566	-	102.7978

Remarks: Pass Result	Marginal Result	Fail Result

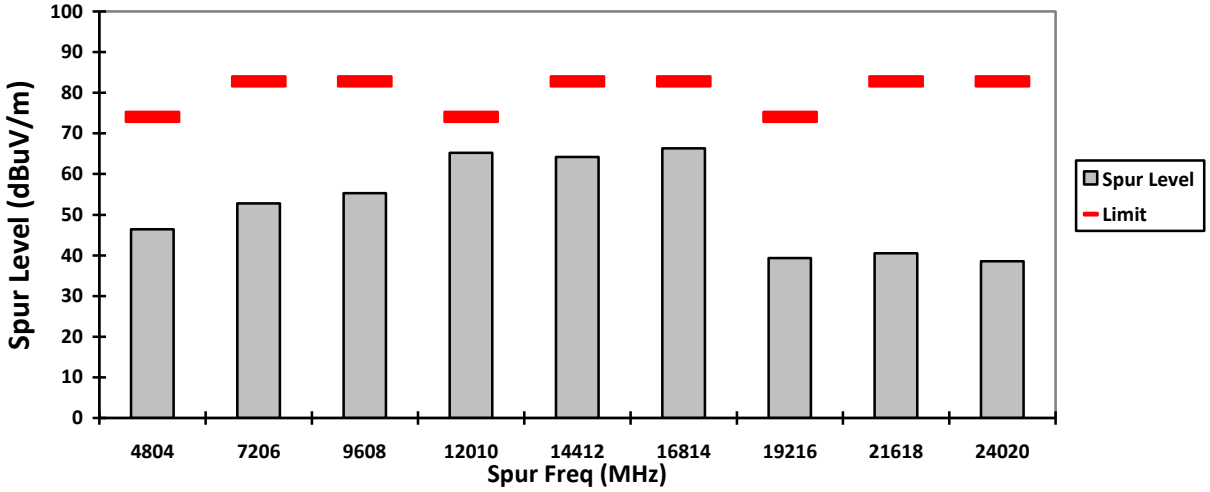
Temperature (degC): 23.5 Humidity (%): 69.4
Test Performed by: Nazrin & Rezza Test Date: Tue, 23 Apr, 2024
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

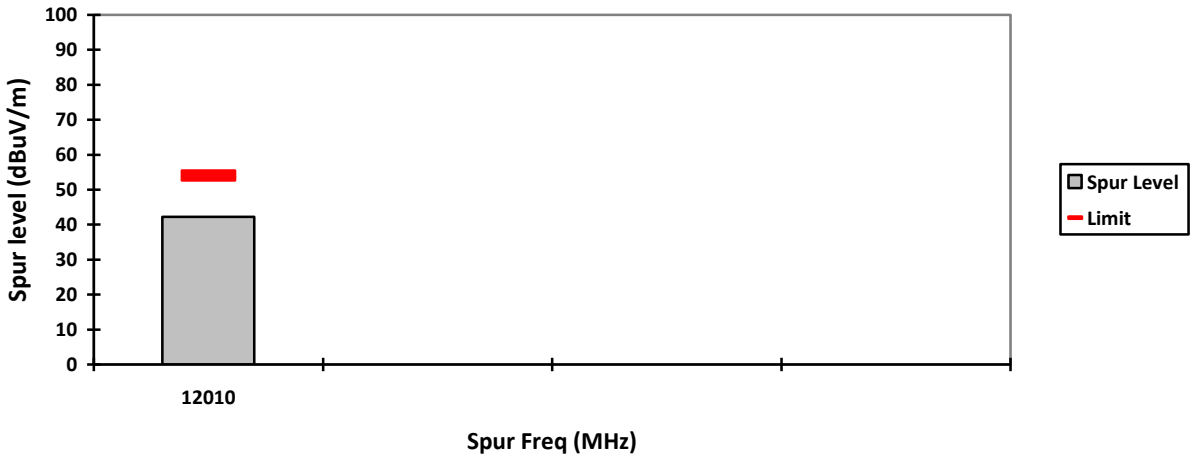
VERTICAL, PK



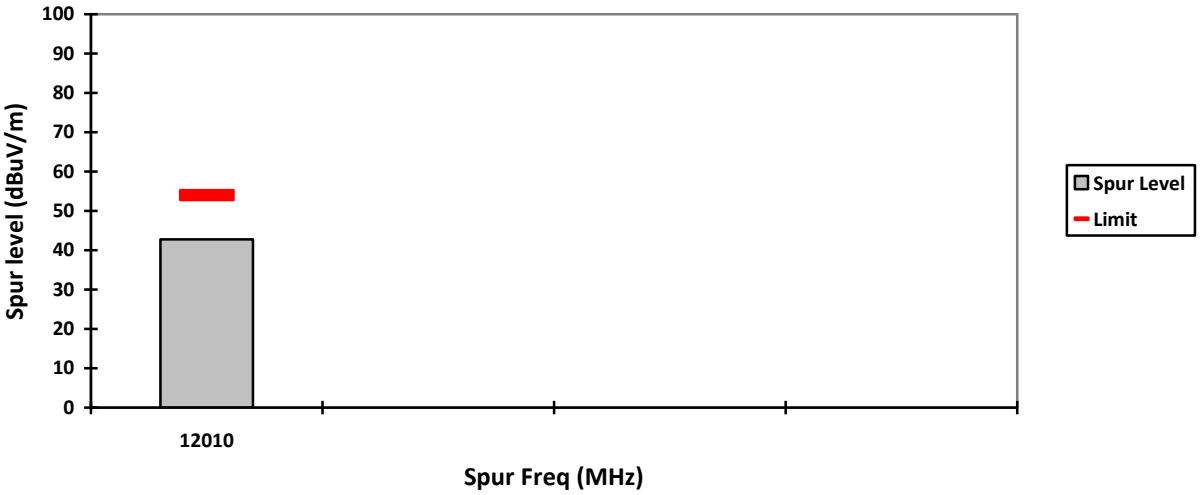
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: Mid Test Frequency: 2441.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (GFSK)

Radiated Emission (Mid Channel) tabular data

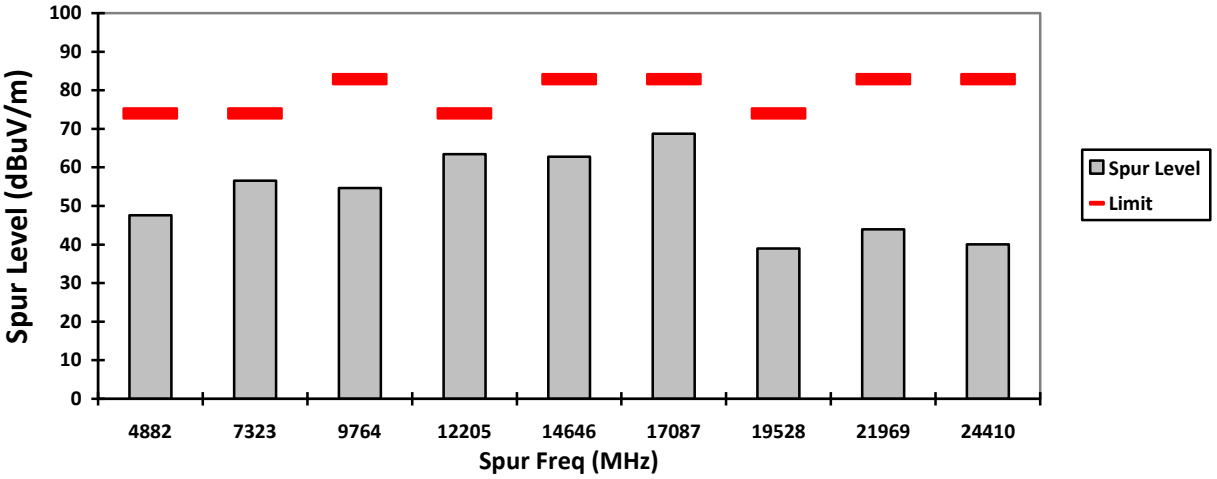
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4882	-	47.5657**	-	-	74.0000	-	-	26.4343	-	-
7323	-	56.5820**	34.0820**	-	74.0000	54.0000	-	17.4180	19.9180	-
9764	-	54.6745**	-	-	82.7978	-	-	28.1233	-	102.7978
12205	-	63.4725**	40.9725**	-	74.0000	54.0000	-	10.5275	13.0275	-
14646	-	62.7503**	-	-	82.7978	-	-	20.0475	-	102.7978
17087	-	68.7135**	-	-	82.7978	-	-	14.0843	-	102.7978
19528	-	39.0041**	-	-	74.0000	-	-	34.9959	-	-
21969	-	43.9848**	-	-	82.7978	-	-	38.8130	-	102.7978
24410	-	40.0825**	-	-	82.7978	-	-	42.7153	-	102.7978
Horizontal Radiated Emission Result										
4882	-	47.9319**	-	-	74.0000	-	-	26.0681	-	-
7323	-	56.4828**	33.9828**	-	74.0000	54.0000	-	17.5172	20.0172	-
9764	-	55.4975**	-	-	82.7978	-	-	27.3003	-	102.7978
12205	-	63.8302**	41.3302**	-	74.0000	54.0000	-	10.1698	12.6698	-
14646	-	62.7714**	-	-	82.7978	-	-	20.0264	-	102.7978
17087	-	67.3581**	-	-	82.7978	-	-	15.4397	-	102.7978
19528	-	39.5268**	-	-	74.0000	-	-	34.4732	-	-
21969	-	40.9083**	-	-	82.7978	-	-	41.8895	-	102.7978
24410	-	40.7091**	-	-	82.7978	-	-	42.0887	-	102.7978

Remarks: Pass Result	Marginal Result	Fail Result

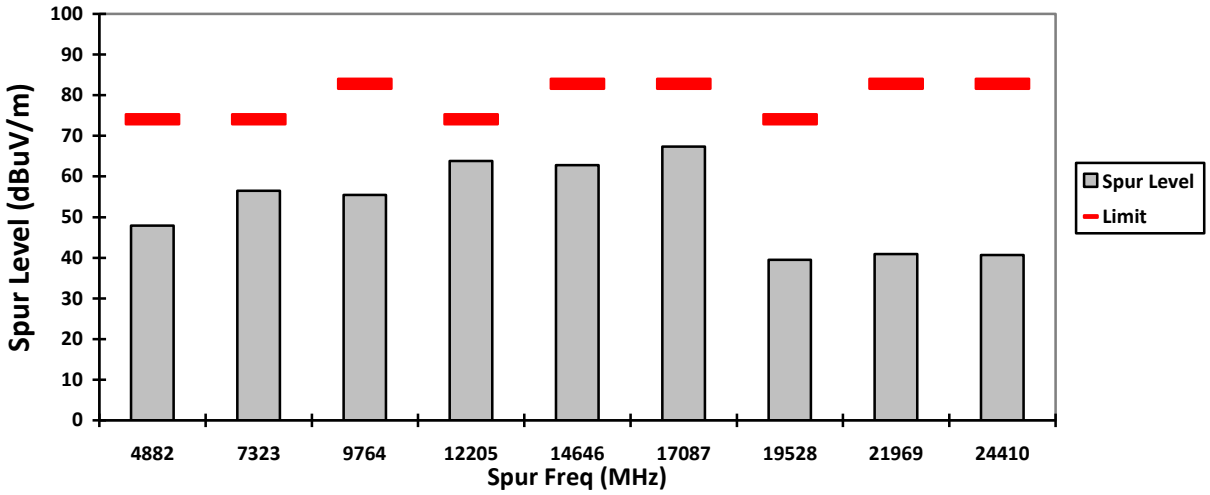
Temperature (degC): 23.5 Humidity (%): 69.4
Test Performed by: Nazrin & Rezza Test Date: Tue, 23 Apr, 2024
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

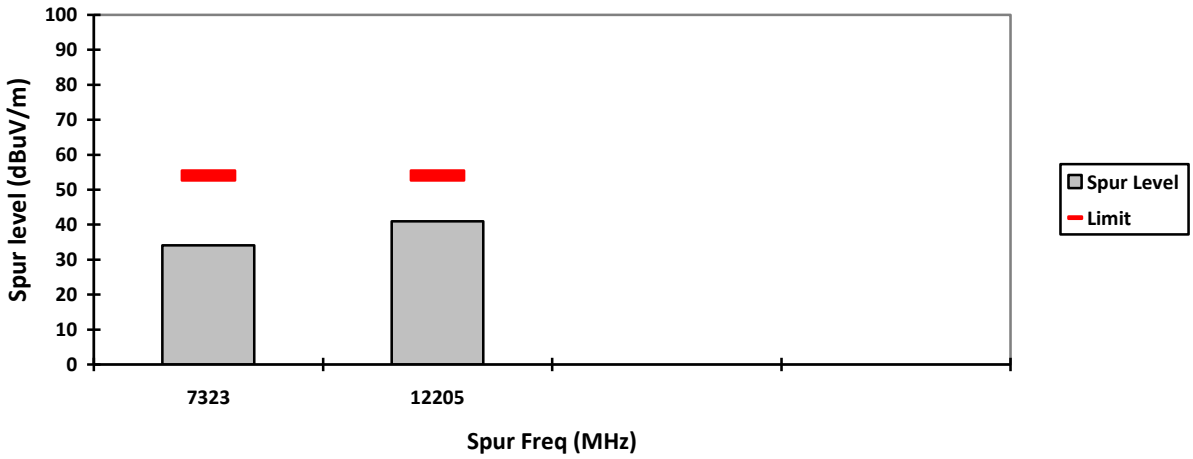
VERTICAL, PK



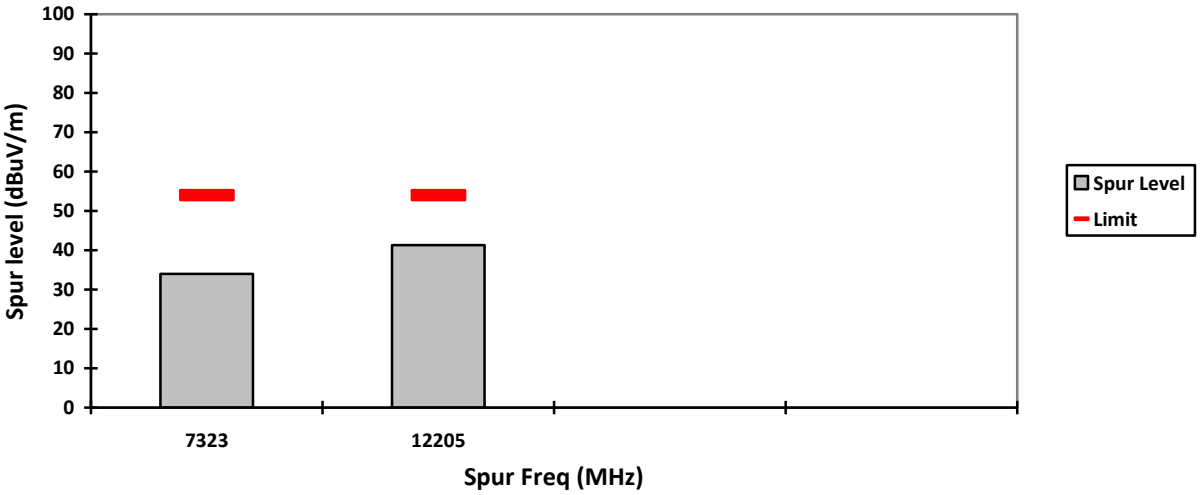
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: High Test Frequency: 2480.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (GFSK)

Radiated Emission (High Channel) tabular data

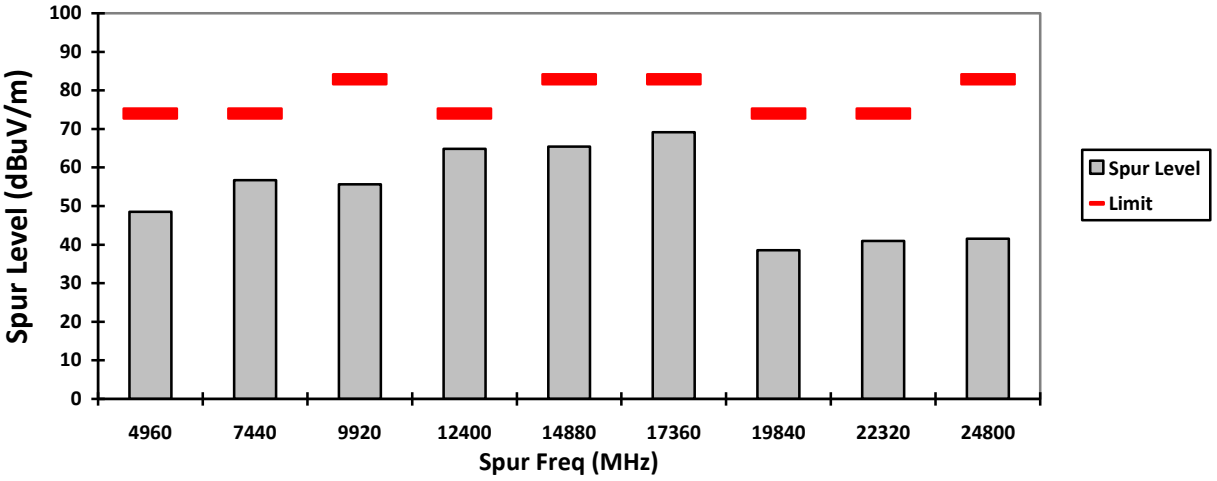
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4960	-	48.5314**	-	-	74.0000	-	-	25.4686	-	-
7440	-	56.7501**	34.2501**	-	74.0000	54.0000	-	17.2499	19.7499	-
9920	-	55.6095**	-	-	82.7978	-	-	27.1883	-	102.7978
12400	-	64.8703**	42.3703**	-	74.0000	54.0000	-	9.1297	11.6297	-
14880	-	65.4525**	-	-	82.7978	-	-	17.3453	-	102.7978
17360	-	69.1366**	-	-	82.7978	-	-	13.6612	-	102.7978
19840	-	38.5174**	-	-	74.0000	-	-	35.4826	-	-
22320	-	40.9211**	-	-	74.0000	-	-	33.0789	-	-
24800	-	41.5806**	-	-	82.7978	-	-	41.2172	-	102.7978
Horizontal Radiated Emission Result										
4960	-	47.2542**	-	-	74.0000	-	-	26.7458	-	-
7440	-	56.3815**	33.8815**	-	74.0000	54.0000	-	17.6185	20.1185	-
9920	-	56.6920**	-	-	82.7978	-	-	26.1058	-	102.7978
12400	-	64.7376**	42.2376**	-	74.0000	54.0000	-	9.2624	11.7624	-
14880	-	65.0524**	-	-	82.7978	-	-	17.7454	-	102.7978
17360	-	70.0752**	-	-	82.7978	-	-	12.7226	-	102.7978
19840	-	39.7796**	-	-	74.0000	-	-	34.2204	-	-
22320	-	41.2540**	-	-	74.0000	-	-	32.7460	-	-
24800	-	40.6535**	-	-	82.7978	-	-	42.1443	-	102.7978

Remarks: Pass Result	Marginal Result	Fail Result

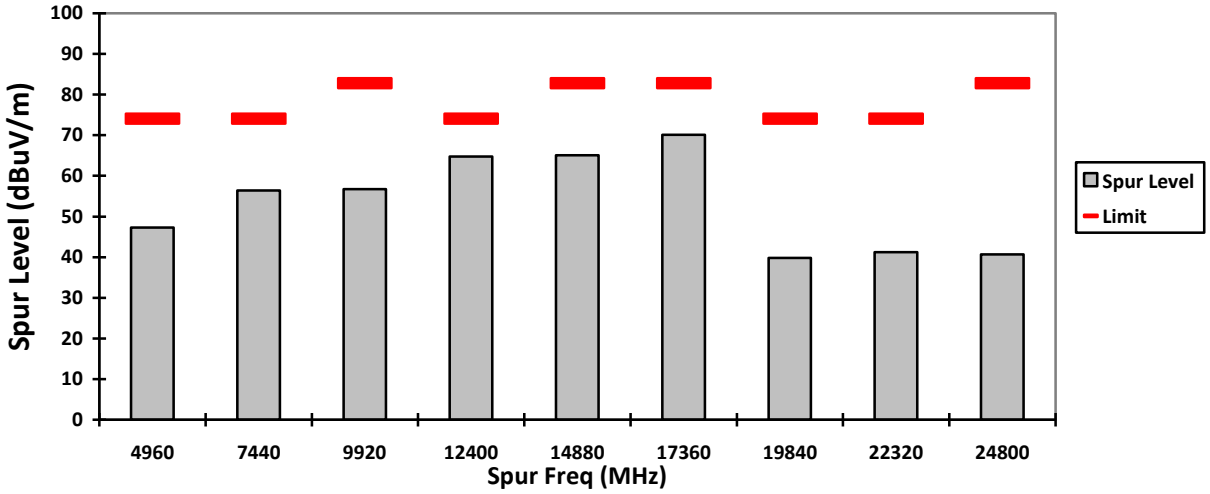
Temperature (degC): 23.5 Humidity (%): 69.4
Test Performed by: Nazrin & Rezza Test Date: Tue, 23 Apr, 2024
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

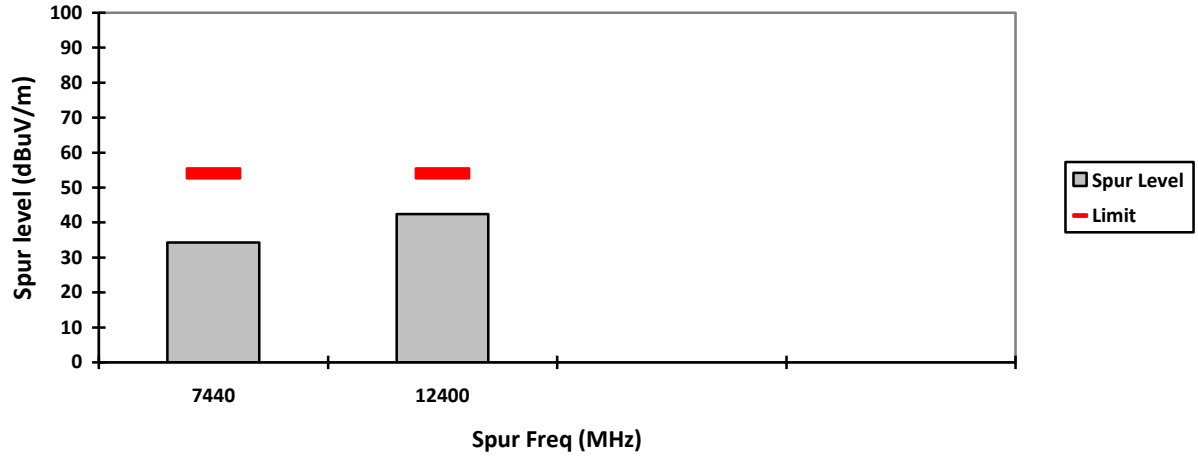
VERTICAL, PK



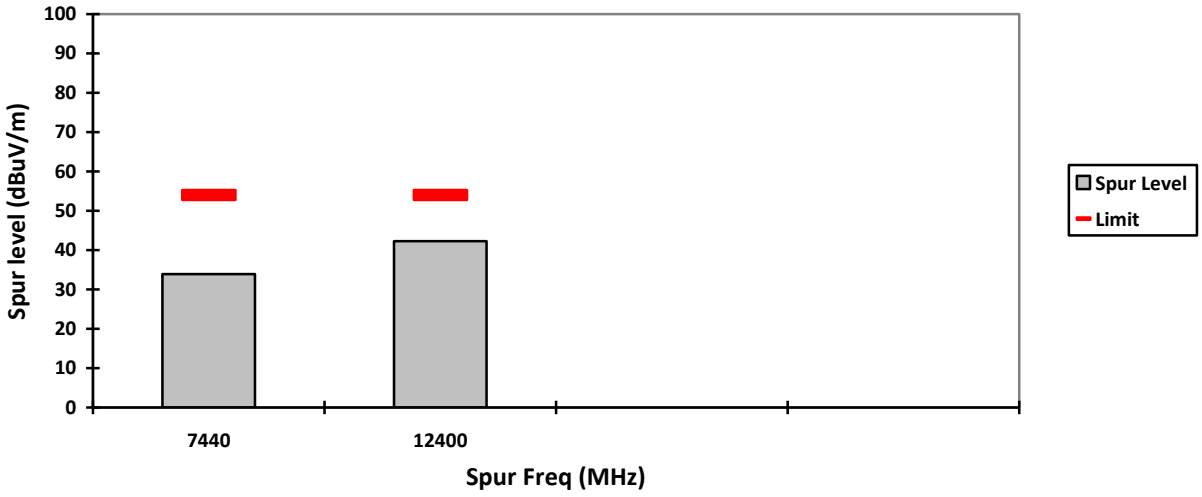
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



NOTE:
Transmitter Duty Cycle Calculation, FCC Rule 15.35 (b,c)

Based on the Bluetooth Specification Version 2.1+EDR, and worst case AFH mode, transmitter ON time is independent of packet type (DH1, DH3 and DH5) and packet length, the AFH mode Duty cycle connection factor as below:

Channel hop rate = 800 hops/second (AFH Mode)
Adjusted channel hop rate for DH5 mode = 133.33 hops/second
Time per channel hop = 1 / 133.33 hops/second = 7.5 ms
Time to cycle through all channels = 7.5 x 20 channels = 150 ms
Number of times transmitter hits on one channel = 100 ms / 150 ms = 1 time(s)
Worst case dwell time = 7.5 ms
Duty cycle connection factor = $20\log_{10}$ (7.5ms / 100ms) = **-22.5 dB**

Test: Bluetooth SAC Transmitter Radiated Emission
Model#: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: Low Test Frequency: 2402.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (Pi/4 DQPSK)

Radiated Emission (Low Channel) tabular data

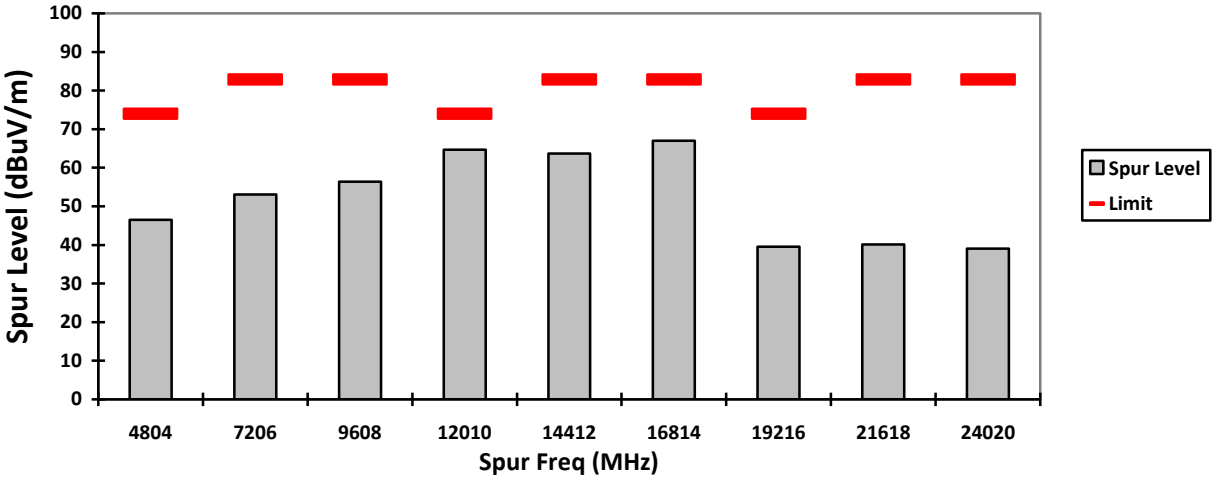
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4804	-	46.5099**	-	-	74.0000	-	-	27.4901	-	-
7206	-	53.0538**	-	-	82.7978	-	-	29.7440	-	102.7978
9608	-	56.3728**	-	-	82.7978	-	-	26.4250	-	102.7978
12010	-	64.7046**	42.2046**	-	74.0000	54.0000	-	9.2954	11.7954	-
14412	-	63.6797**	-	-	82.7978	-	-	19.1181	-	102.7978
16814	-	66.9681**	-	-	82.7978	-	-	15.8297	-	102.7978
19216	-	39.5491**	-	-	74.0000	-	-	34.4509	-	-
21618	-	40.1402**	-	-	82.7978	-	-	42.6576	-	102.7978
24020	-	39.0630**	-	-	82.7978	-	-	43.7348	-	102.7978
Horizontal Radiated Emission Result										
4804	-	46.2547**	-	-	74.0000	-	-	27.7453	-	-
7206	-	52.3055**	-	-	82.7978	-	-	30.4923	-	102.7978
9608	-	55.2850**	-	-	82.7978	-	-	27.5128	-	102.7978
12010	-	64.9042**	42.4042**	-	74.0000	54.0000	-	9.0958	11.5958	-
14412	-	64.1778**	-	-	82.7978	-	-	18.6200	-	102.7978
16814	-	68.9874**	-	-	82.7978	-	-	13.8104	-	102.7978
19216	-	40.7262**	-	-	74.0000	-	-	33.2738	-	-
21618	-	39.7781**	-	-	82.7978	-	-	43.0197	-	102.7978
24020	-	40.0345**	-	-	82.7978	-	-	42.7633	-	102.7978

Remarks: Pass Result	Marginal Result	Fail Result

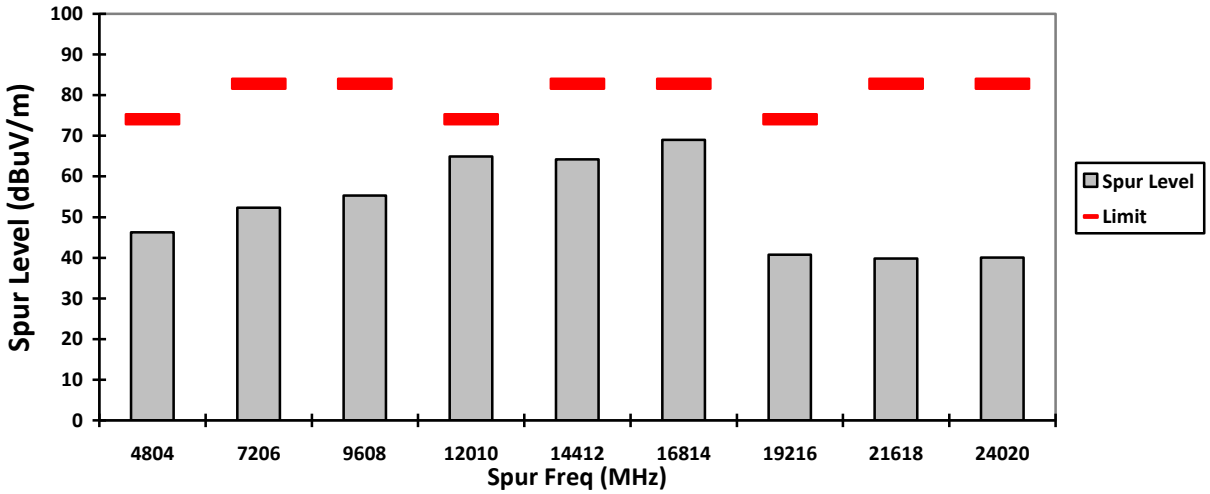
Temperature (degC): 23.5 Humidity (%): 69.4
Test Performed by: Nazrin & Rezza Test Date: Tue, 23 Apr, 2024
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

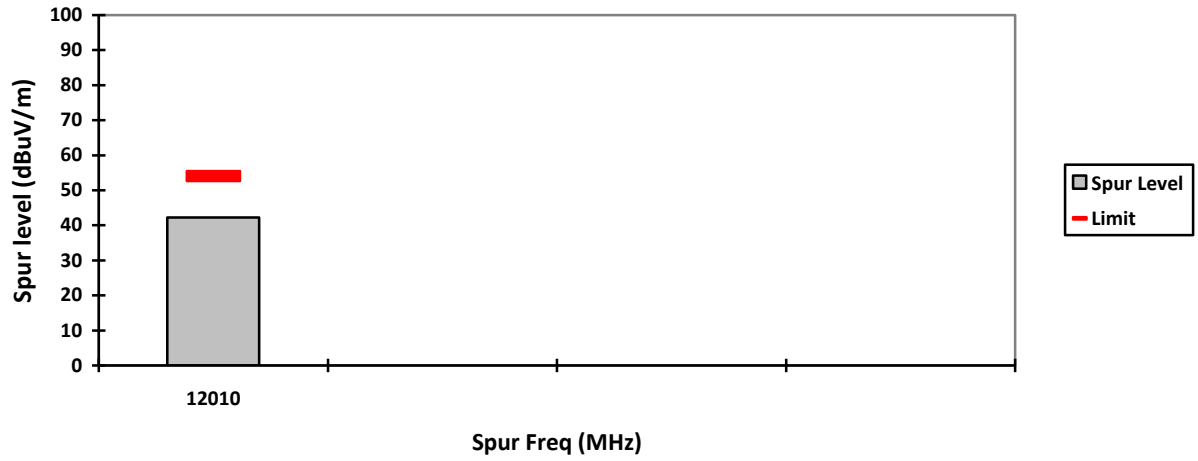
VERTICAL, PK



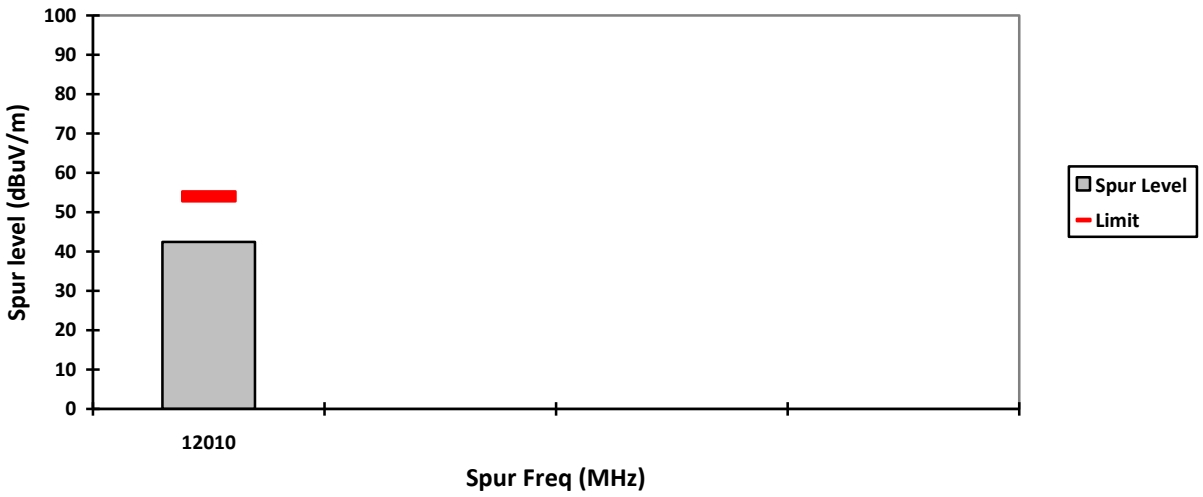
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: Mid Test Frequency: 2441.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (Pi/4 DQPSK)

Radiated Emission (Mid Channel) tabular data

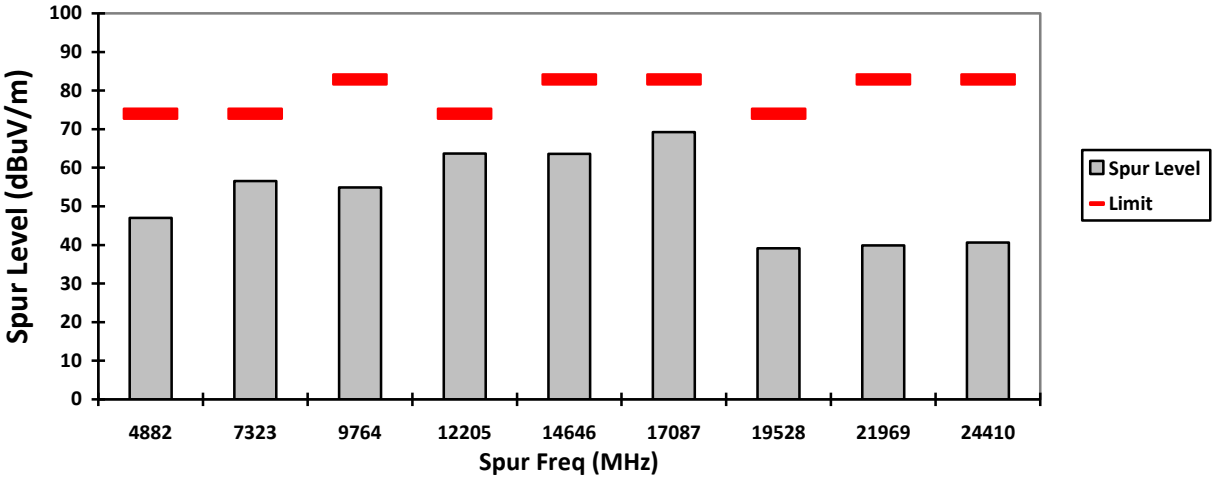
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4882	-	47.0113**	-	-	74.0000	-	-	26.9887	-	-
7323	-	56.5728**	34.0728**	-	74.0000	54.0000	-	17.4272	19.9272	-
9764	-	54.8578**	-	-	82.7978	-	-	27.9400	-	102.7978
12205	-	63.7059**	41.2059**	-	74.0000	54.0000	-	10.2941	12.7941	-
14646	-	63.6026**	-	-	82.7978	-	-	19.1952	-	102.7978
17087	-	69.2381**	-	-	82.7978	-	-	13.5597	-	102.7978
19528	-	39.1053**	-	-	74.0000	-	-	34.8947	-	-
21969	-	39.9197**	-	-	82.7978	-	-	42.8781	-	102.7978
24410	-	40.6471**	-	-	82.7978	-	-	42.1507	-	102.7978
Horizontal Radiated Emission Result										
4882	-	48.1427**	-	-	74.0000	-	-	25.8573	-	-
7323	-	56.5013**	34.0013**	-	74.0000	54.0000	-	17.4987	19.9987	-
9764	-	55.1344**	-	-	82.7978	-	-	27.6634	-	102.7978
12205	-	63.4988**	40.9988**	-	74.0000	54.0000	-	10.5012	13.0012	-
14646	-	62.8658**	-	-	82.7978	-	-	19.9320	-	102.7978
17087	-	68.7275**	-	-	82.7978	-	-	14.0703	-	102.7978
19528	-	39.5032**	-	-	74.0000	-	-	34.4968	-	-
21969	-	40.9125**	-	-	82.7978	-	-	41.8853	-	102.7978
24410	-	41.3162**	-	-	82.7978	-	-	41.4816	-	102.7978

Remarks: Pass Result	Marginal Result	Fail Result

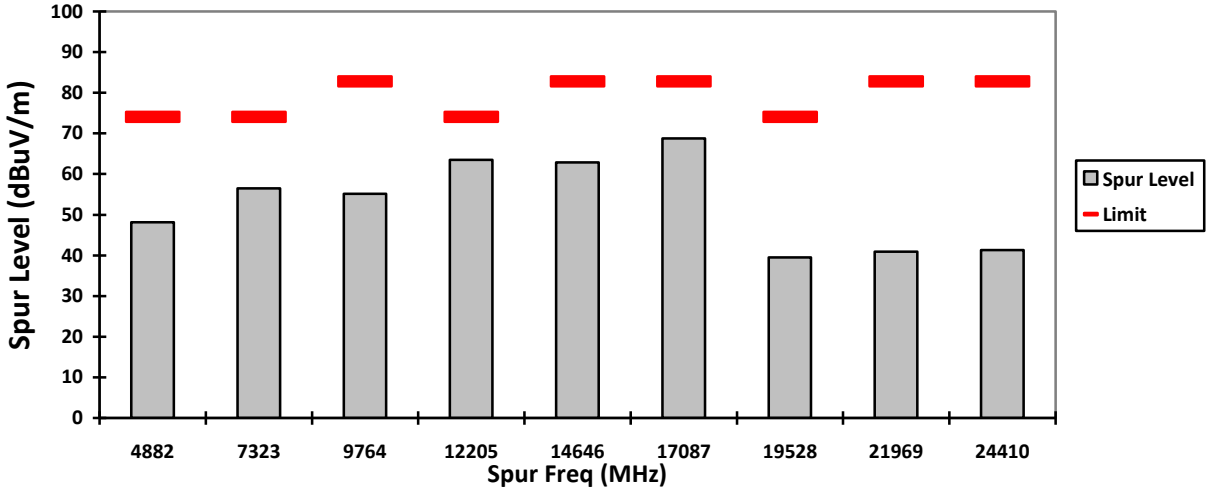
Temperature (degC): 23.5 Humidity (%): 69.4
Test Performed by: Nazrin & Rezza Test Date: Tue, 23 Apr, 2024
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

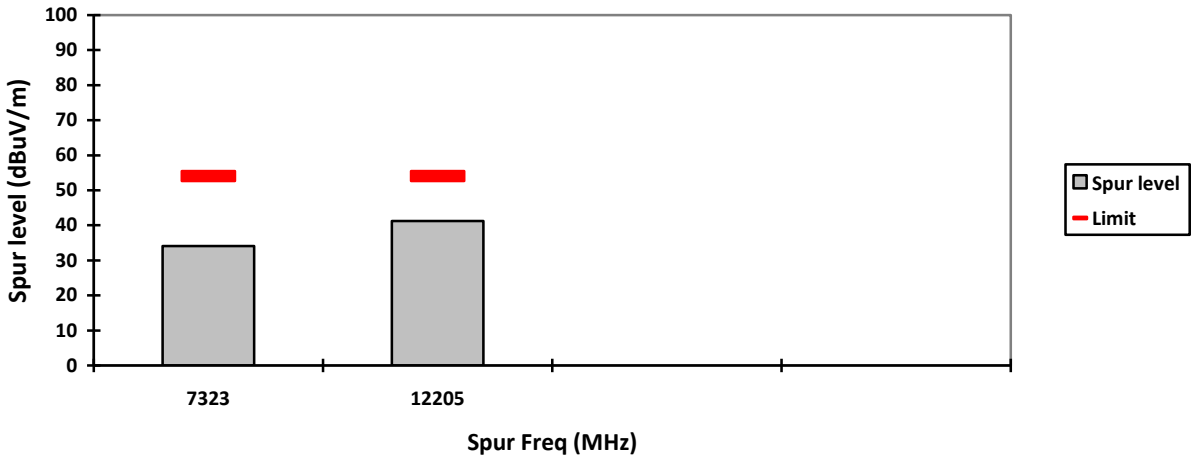
VERTICAL, PK



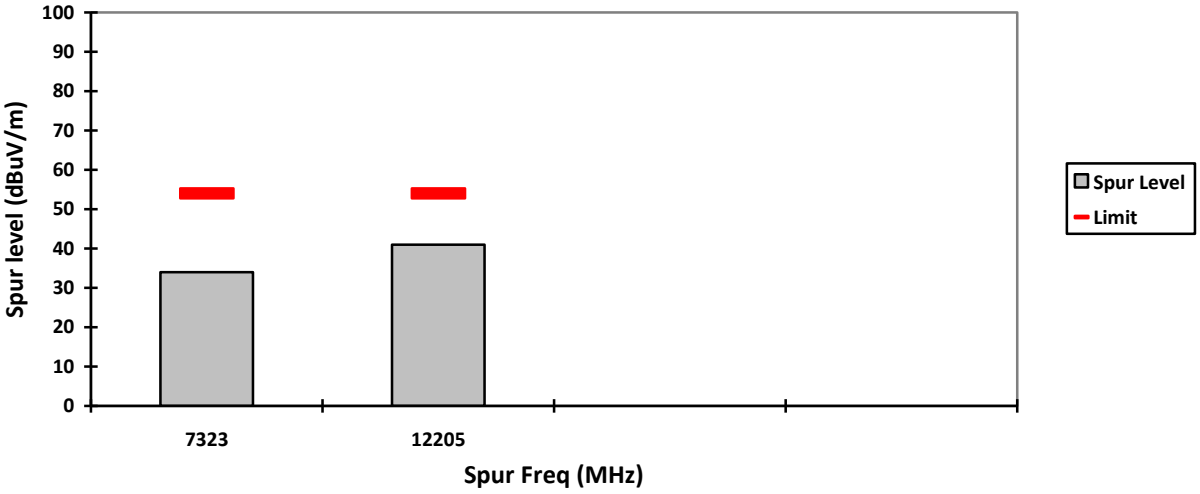
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: High Test Frequency: 2480.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (Pi/4 DQPSK)

Radiated Emission (High Channel) tabular data

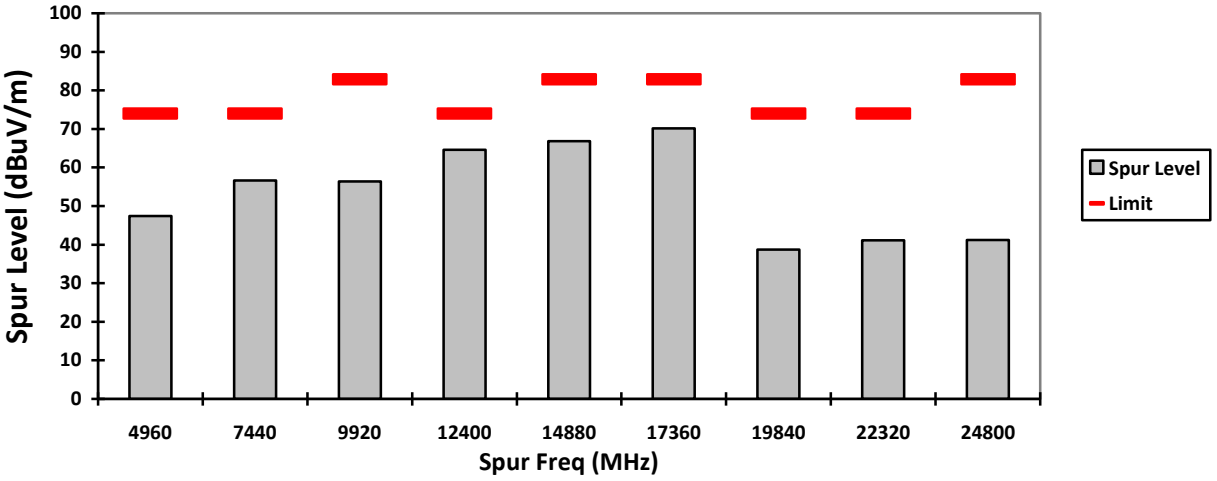
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4960	-	47.4072**	-	-	74.0000	-	-	26.5928	-	-
7440	-	56.6055**	34.1055**	-	74.0000	54.0000	-	17.3945	19.8945	-
9920	-	56.3643**	-	-	82.7978	-	-	26.4335	-	102.7978
12400	-	64.5798**	42.0798**	-	74.0000	54.0000	-	9.4202	11.9202	-
14880	-	66.8478**	-	-	82.7978	-	-	15.9500	-	102.7978
17360	-	70.1098**	-	-	82.7978	-	-	12.6880	-	102.7978
19840	-	38.7042**	-	-	74.0000	-	-	35.2958	-	-
22320	-	41.1520**	-	-	74.0000	-	-	32.8480	-	-
24800	-	41.1922**	-	-	82.7978	-	-	41.6056	-	102.7978
Horizontal Radiated Emission Result										
4960	-	48.1030**	-	-	74.0000	-	-	25.8970	-	-
7440	-	56.3190**	33.8190**	-	74.0000	54.0000	-	17.6810	20.1810	-
9920	-	56.2995**	-	-	82.7978	-	-	26.4983	-	102.7978
12400	-	64.6623**	42.1623**	-	74.0000	54.0000	-	9.3377	11.8377	-
14880	-	65.8602**	-	-	82.7978	-	-	16.9376	-	102.7978
17360	-	69.2146**	-	-	82.7978	-	-	13.5832	-	102.7978
19840	-	39.3251**	-	-	74.0000	-	-	34.6749	-	-
22320	-	40.2812**	-	-	74.0000	-	-	33.7188	-	-
24800	-	40.6409**	-	-	82.7978	-	-	42.1569	-	102.7978

Remarks: Pass Result	Marginal Result	Fail Result

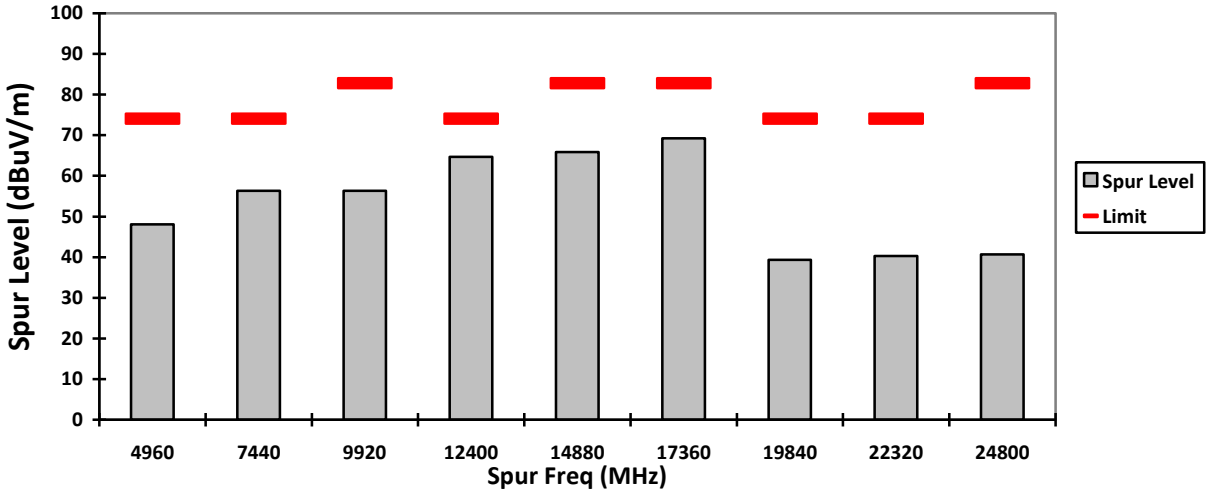
Temperature (degC): 23.5 Humidity (%): 69.4
Test Performed by: Nazrin & Rezza Test Date: Tue, 23 Apr, 2024
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

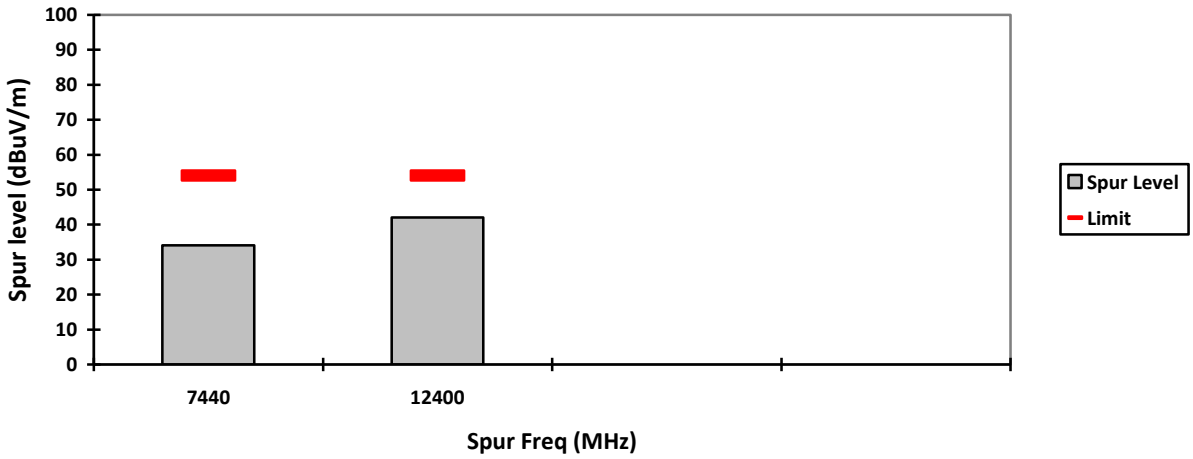
VERTICAL, PK



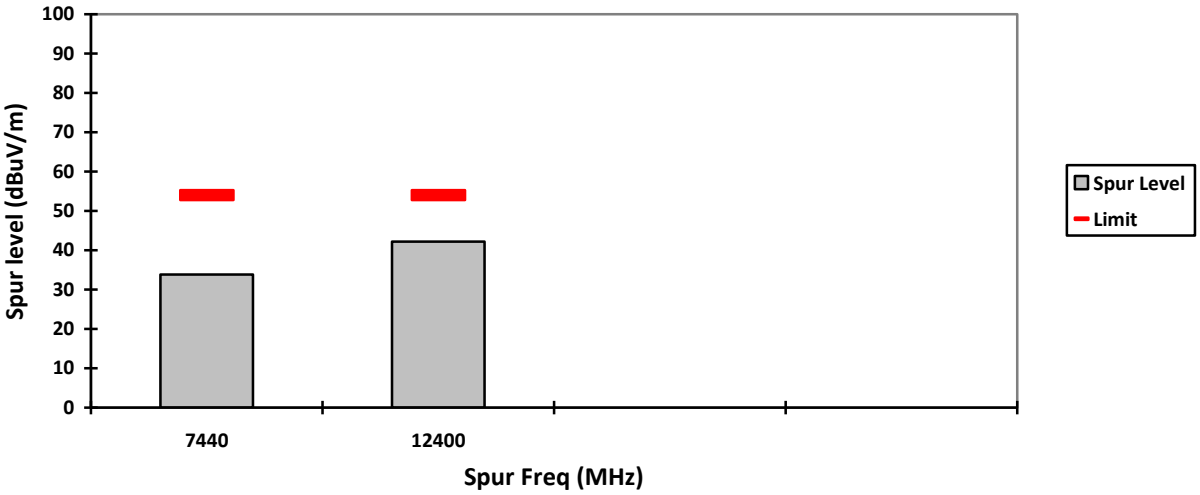
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



NOTE:
Transmitter Duty Cycle Calculation, FCC Rule 15.35 (b,c)

Based on the Bluetooth Specification Version 2.1+EDR, and worst case AFH mode, transmitter ON time is independent of packet type (DH1, DH3 and DH5) and packet length, the AFH mode Duty cycle connection factor as below:

Channel hop rate = 800 hops/second (AFH Mode)
Adjusted channel hop rate for DH5 mode = 133.33 hops/second
Time per channel hop = 1 / 133.33 hops/second = 7.5 ms
Time to cycle through all channels = 7.5 x 20 channels = 150 ms
Number of times transmitter hits on one channel = 100 ms / 150 ms = 1 time(s)
Worst case dwell time = 7.5 ms
Duty cycle connection factor = $20\log_{10}$ (7.5ms / 100ms) = **-22.5 dB**

Test: Bluetooth SAC Transmitter Radiated Emission
Model#: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: Low Test Frequency: 2402.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (8DPSK)

Radiated Emission (Low Channel) tabular data

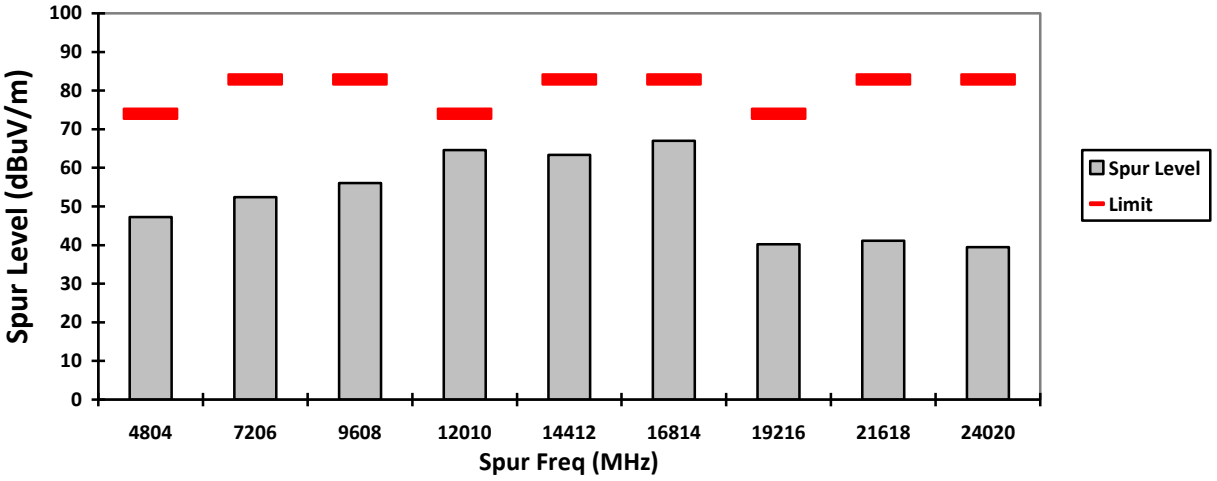
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4804	-	47.2321**	-	-	74.0000	-	-	26.7679	-	-
7206	-	52.3901**	-	-	82.7978	-	-	30.4077	-	102.7978
9608	-	56.0130**	-	-	82.7978	-	-	26.7848	-	102.7978
12010	-	64.6060**	42.1060**	-	74.0000	54.0000	-	9.3940	11.8940	-
14412	-	63.3632**	-	-	82.7978	-	-	19.4346	-	102.7978
16814	-	67.0071**	-	-	82.7978	-	-	15.7907	-	102.7978
19216	-	40.2127**	-	-	74.0000	-	-	33.7873	-	-
21618	-	41.1234**	-	-	82.7978	-	-	41.6744	-	102.7978
24020	-	39.4540**	-	-	82.7978	-	-	43.3438	-	102.7978
Horizontal Radiated Emission Result										
4804	-	46.8750**	-	-	74.0000	-	-	27.1250	-	-
7206	-	53.9217**	-	-	82.7978	-	-	28.8761	-	102.7978
9608	-	54.9994**	-	-	82.7978	-	-	27.7984	-	102.7978
12010	-	64.8834**	42.3834**	-	74.0000	54.0000	-	9.1166	11.6166	-
14412	-	64.6150**	-	-	82.7978	-	-	18.1828	-	102.7978
16814	-	67.1953**	-	-	82.7978	-	-	15.6025	-	102.7978
19216	-	40.0341**	-	-	74.0000	-	-	33.9659	-	-
21618	-	40.2048**	-	-	82.7978	-	-	42.5930	-	102.7978
24020	-	39.0884**	-	-	82.7978	-	-	43.7094	-	102.7978

Remarks: Pass Result	Marginal Result	Fail Result

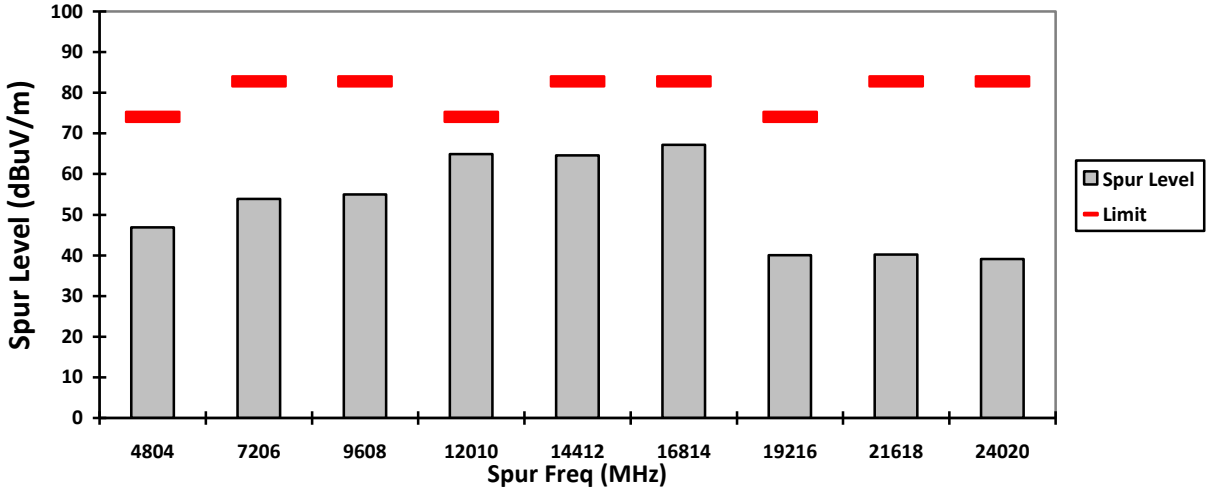
Temperature (degC): 23.5 Humidity (%): 69.4
Test Performed by: Nazrin & Rezza Test Date: Tue, 23 Apr, 2024
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

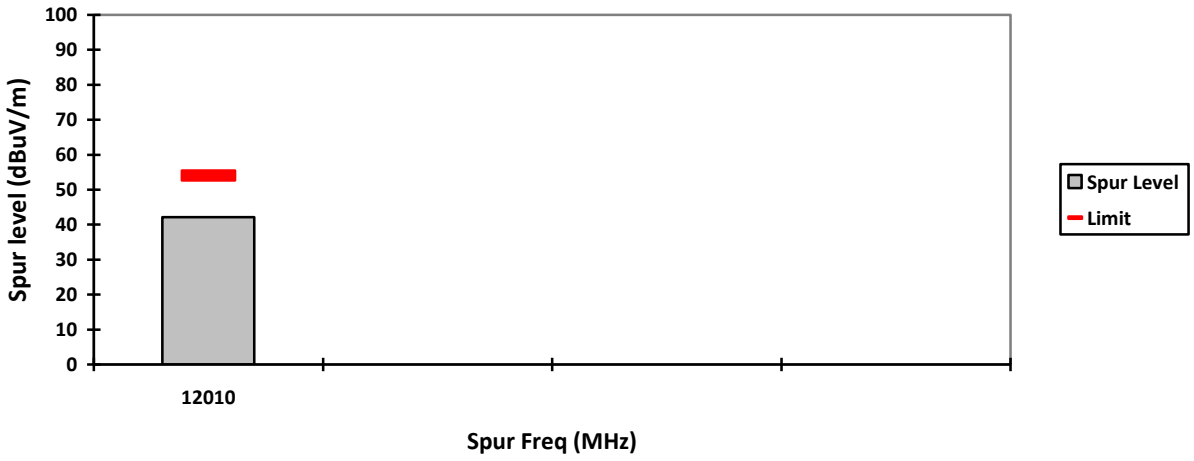
VERTICAL, PK



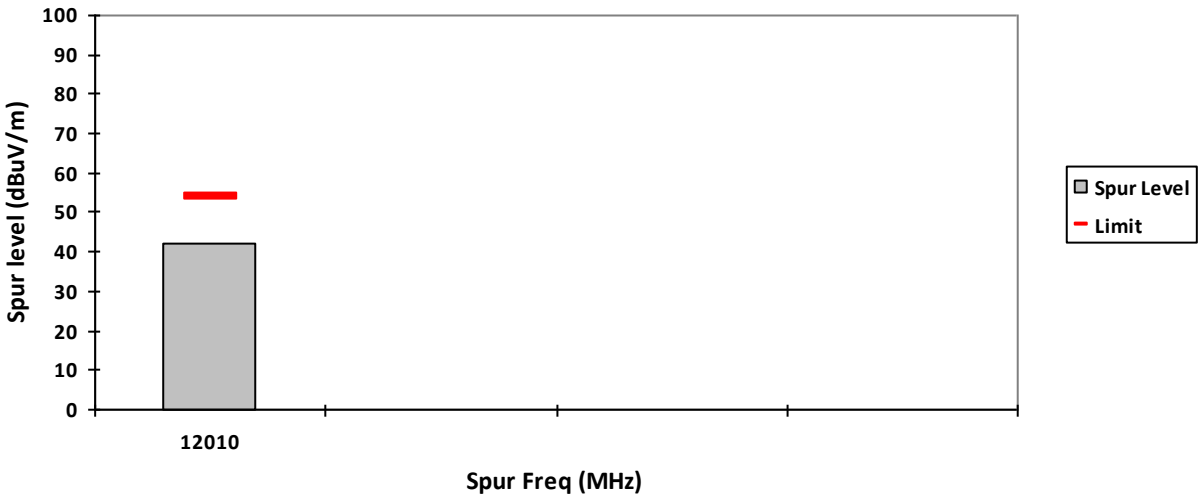
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: Mid Test Frequency: 2441.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (8DPSK)

Radiated Emission (Mid Channel) tabular data

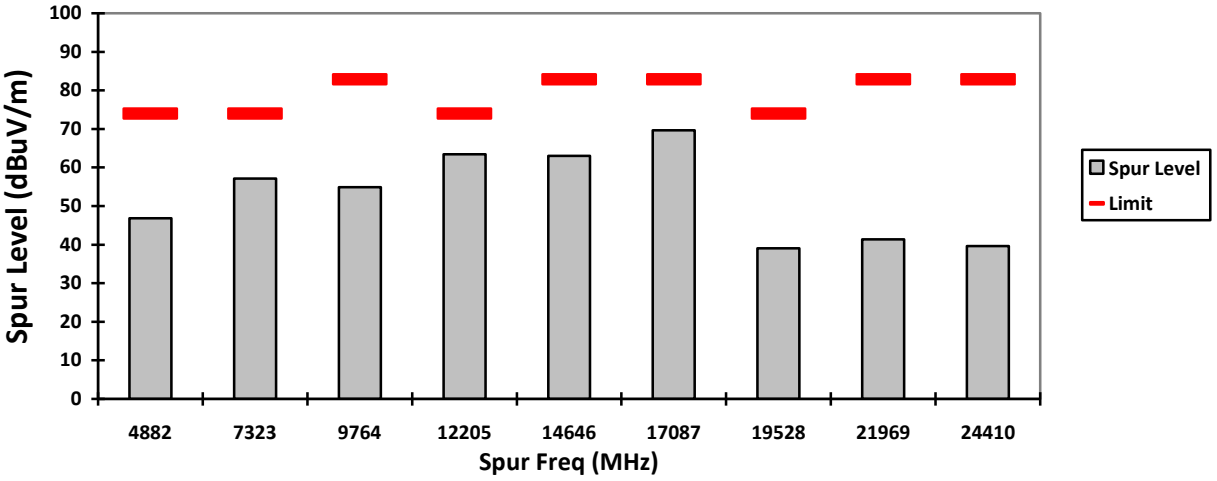
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4882	-	46.8750**	-	-	74.0000	-	-	27.1250	-	-
7323	-	57.0960**	34.5960**	-	74.0000	54.0000	-	16.9040	19.4040	-
9764	-	54.8817**	-	-	82.7978	-	-	27.9161	-	102.7978
12205	-	63.4738**	40.9738**	-	74.0000	54.0000	-	10.5262	13.0262	-
14646	-	63.0264**	-	-	82.7978	-	-	19.7714	-	102.7978
17087	-	69.6297**	-	-	82.7978	-	-	13.1681	-	102.7978
19528	-	39.0623**	-	-	74.0000	-	-	34.9377	-	-
21969	-	41.3993**	-	-	82.7978	-	-	41.3985	-	102.7978
24410	-	39.6740**	-	-	82.7978	-	-	43.1238	-	102.7978
Horizontal Radiated Emission Result										
4882	-	47.6641**	-	-	74.0000	-	-	26.3359	-	-
7323	-	56.6327**	34.1327**	-	74.0000	54.0000	-	17.3673	19.8673	-
9764	-	55.4032**	-	-	82.7978	-	-	27.3946	-	102.7978
12205	-	63.5172**	41.0172**	-	74.0000	54.0000	-	10.4828	12.9828	-
14646	-	62.7523**	-	-	82.7978	-	-	20.0455	-	102.7978
17087	-	69.4300**	-	-	82.7978	-	-	13.3678	-	102.7978
19528	-	39.3423**	-	-	74.0000	-	-	34.6577	-	-
21969	-	40.6572**	-	-	82.7978	-	-	42.1406	-	102.7978
24410	-	39.2753**	-	-	82.7978	-	-	43.5225	-	102.7978

Remarks: Pass Result	Marginal Result	Fail Result

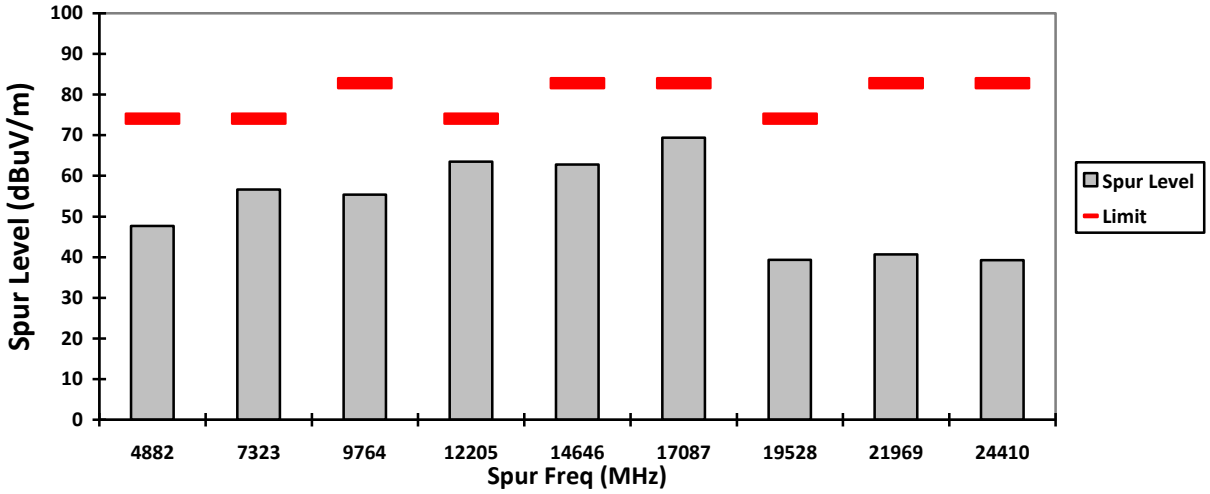
Temperature (degC): 23.5 Humidity (%): 69.4
Test Performed by: Nazrin & Rezza Test Date: Tue, 23 Apr, 2024
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

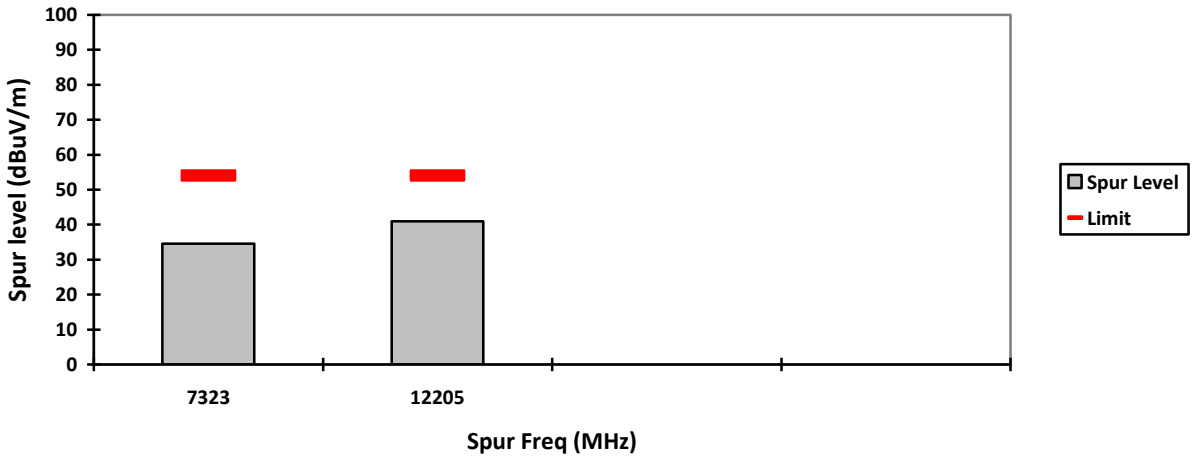
VERTICAL, PK



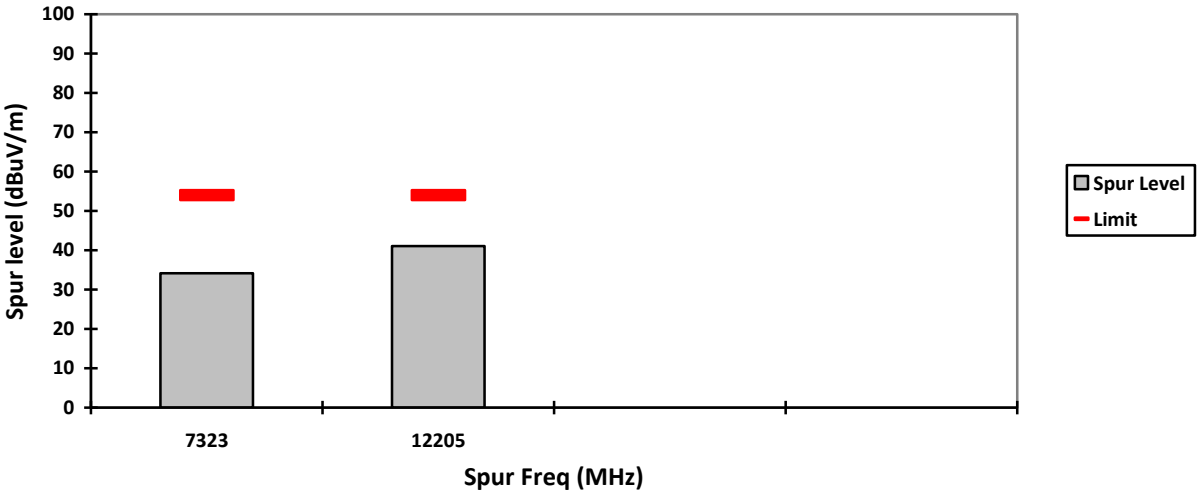
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: AAH06RDN9RA1AN S/N: 865EAD9538 EMC SR ID#: 0512P01-EMC-00006
Battery: PMNN4810A Accessory: PMAE4079A
Test Channel: High Test Frequency: 2480.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (8DPSK)

Radiated Emission (High Channel) tabular data

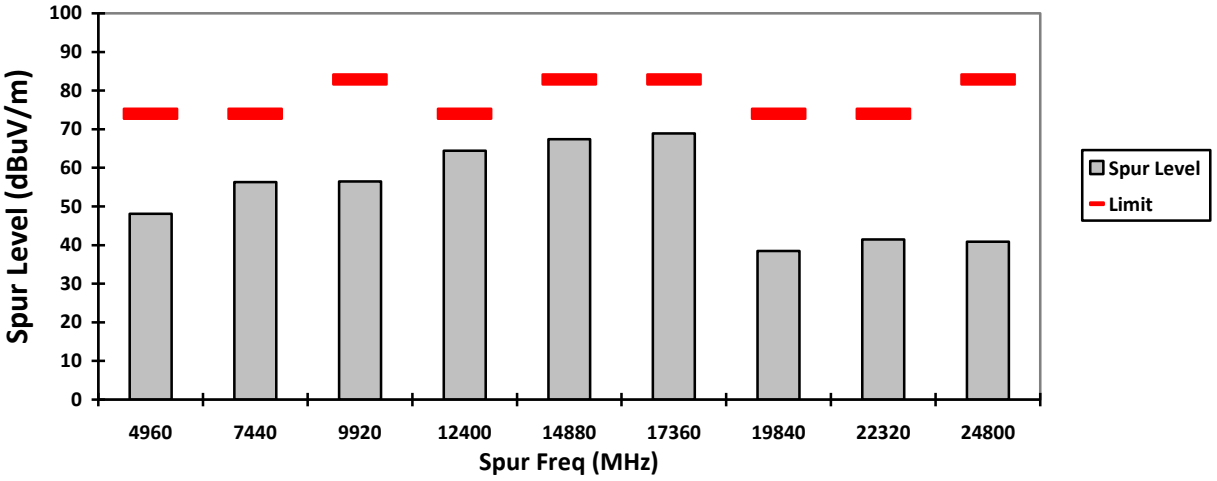
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4960	-	48.0566**	-	-	74.0000	-	-	25.9434	-	-
7440	-	56.2689**	33.7689**	-	74.0000	54.0000	-	17.7311	20.2311	-
9920	-	56.4399**	-	-	82.7978	-	-	26.3579	-	102.7978
12400	-	64.4295**	41.9295**	-	74.0000	54.0000	-	9.5705	12.0705	-
14880	-	67.4316**	-	-	82.7978	-	-	15.3662	-	102.7978
17360	-	68.9180**	-	-	82.7978	-	-	13.8798	-	102.7978
19840	-	38.5145**	-	-	74.0000	-	-	35.4855	-	-
22320	-	41.4542**	-	-	74.0000	-	-	32.5458	-	-
24800	-	40.8927**	-	-	82.7978	-	-	41.9051	-	102.7978
Horizontal Radiated Emission Result										
4960	-	46.4764**	-	-	74.0000	-	-	27.5236	-	-
7440	-	56.2201**	33.7201**	-	74.0000	54.0000	-	17.7799	20.2799	-
9920	-	55.1227**	-	-	82.7978	-	-	27.6751	-	102.7978
12400	-	64.4961**	41.9961**	-	74.0000	54.0000	-	9.5039	12.0039	-
14880	-	65.3824**	-	-	82.7978	-	-	17.4154	-	102.7978
17360	-	69.5335**	-	-	82.7978	-	-	13.2643	-	102.7978
19840	-	39.4607**	-	-	74.0000	-	-	34.5393	-	-
22320	-	41.4828**	-	-	74.0000	-	-	32.5172	-	-
24800	-	41.2533**	-	-	82.7978	-	-	41.5445	-	102.7978

Remarks: Pass Result	Marginal Result	Fail Result

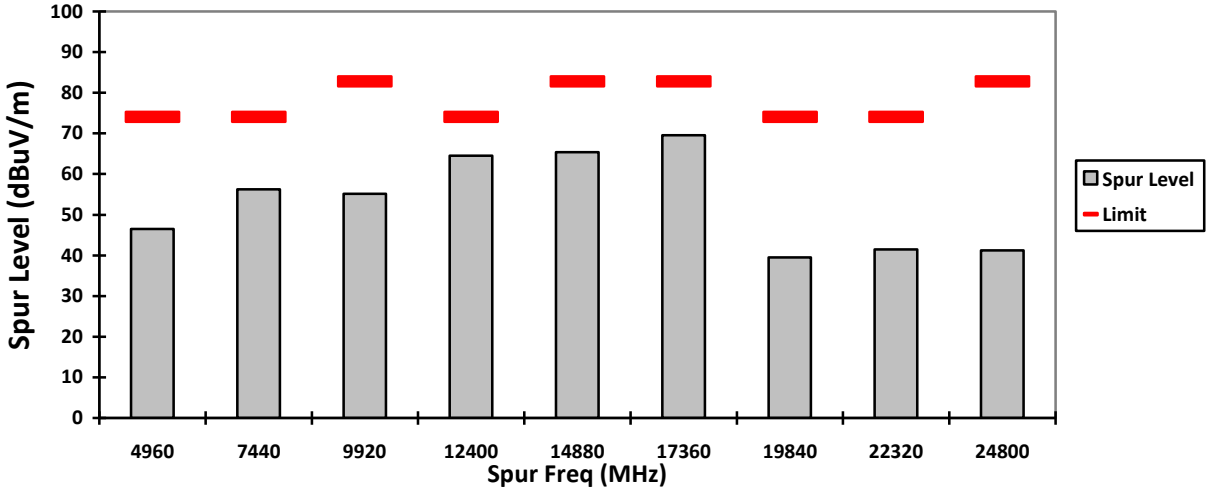
Temperature (degC): 23.5 Humidity (%): 69.4
Test Performed by: Nazrin & Rezza Test Date: Tue, 23 Apr, 2024
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

Remarks: ** Indicates the spurious emission could not be detected due to noise limitations or ambient.
***Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.**

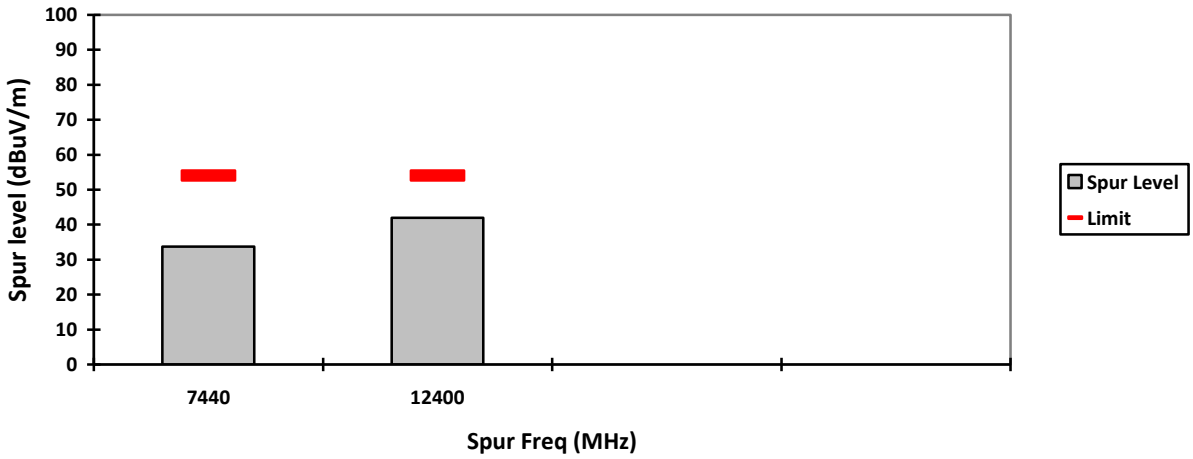
VERTICAL, PK



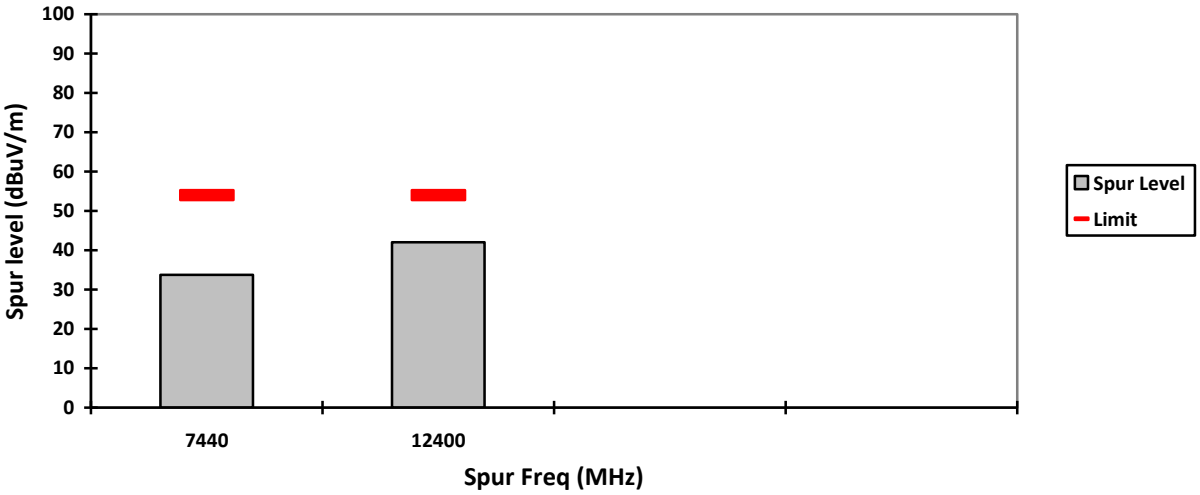
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



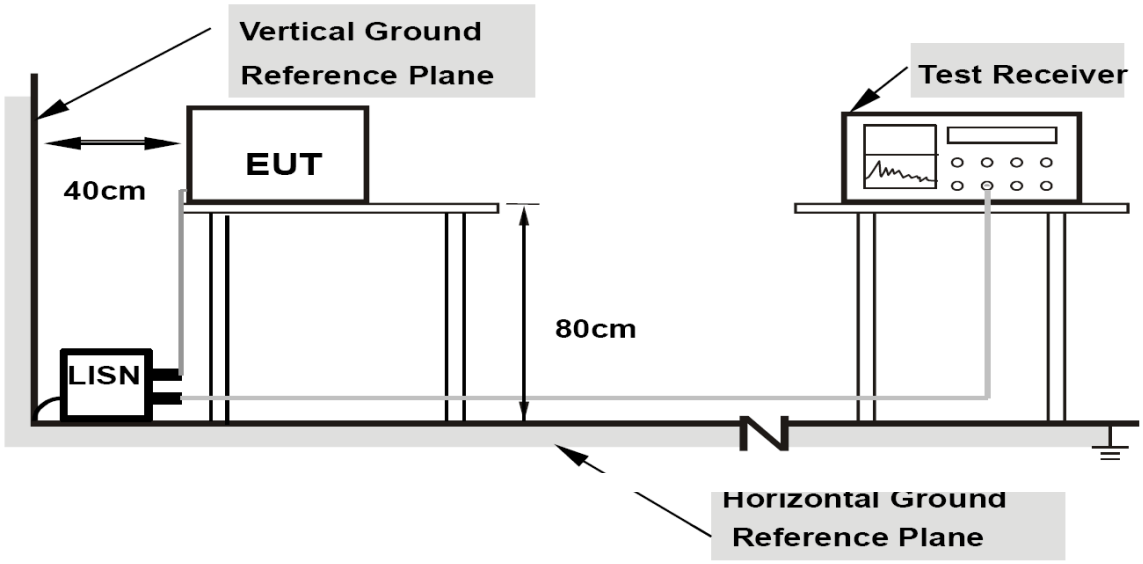
NOTE:
Transmitter Duty Cycle Calculation, FCC Rule 15.35 (b,c)

Based on the Bluetooth Specification Version 2.1+EDR, and worst case AFH mode, transmitter ON time is independent of packet type (DH1, DH3 and DH5) and packet length, the AFH mode Duty cycle connection factor as below:

Channel hop rate = 800 hops/second (AFH Mode)
Adjusted channel hop rate for DH5 mode = 133.33 hops/second
Time per channel hop = 1 / 133.33 hops/second = 7.5 ms
Time to cycle through all channels = 7.5 x 20 channels = 150 ms
Number of times transmitter hits on one channel = 100 ms / 150 ms = 1 time(s)
Worst case dwell time = 7.5 ms
Duty cycle connection factor = $20\log_{10}$ (7.5ms / 100ms) = **-22.5 dB**

6.9. AC Powerline Conducted Emission

6.9.1. Test Setup



1) Tests were conducted for both Receive and Transmit Mode of the EUT.
2) The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50uH of coupling impedance for the measuring instrument.
3) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
4) The frequency range from 150 kHz to 30MHz was measured.

6.9.2. Test Limits:

For AC Power Line Conducted Test Limit can be Class A or B depends on product classification.

Limits for conducted disturbance at the mains ports of class A ITE

Frequency range MHz	Limits dB(µV)	
	Quasi-peak	Average
0,15 to 0,50	79	66
0,50 to 30	73	60
NOTE The lower limit shall apply at the transition frequency.		

Table 1: Limits for Conducted Disturbance at the Mains Ports of Class A ITE.

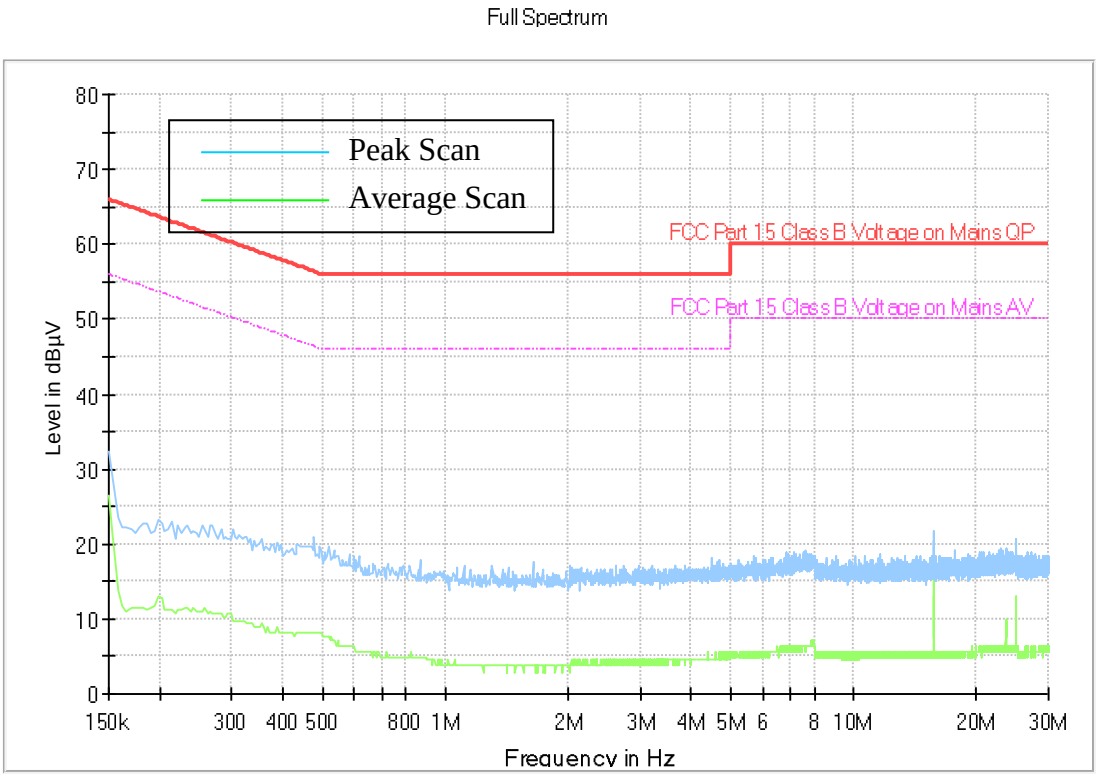
Limits for conducted disturbance at the mains ports of class B ITE

Frequency range MHz	Limits dB(µV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50
NOTE 1 The lower limit shall apply at the transition frequencies. NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

Table 2: Limits for Conducted Disturbance at the Mains Ports of Class B ITE

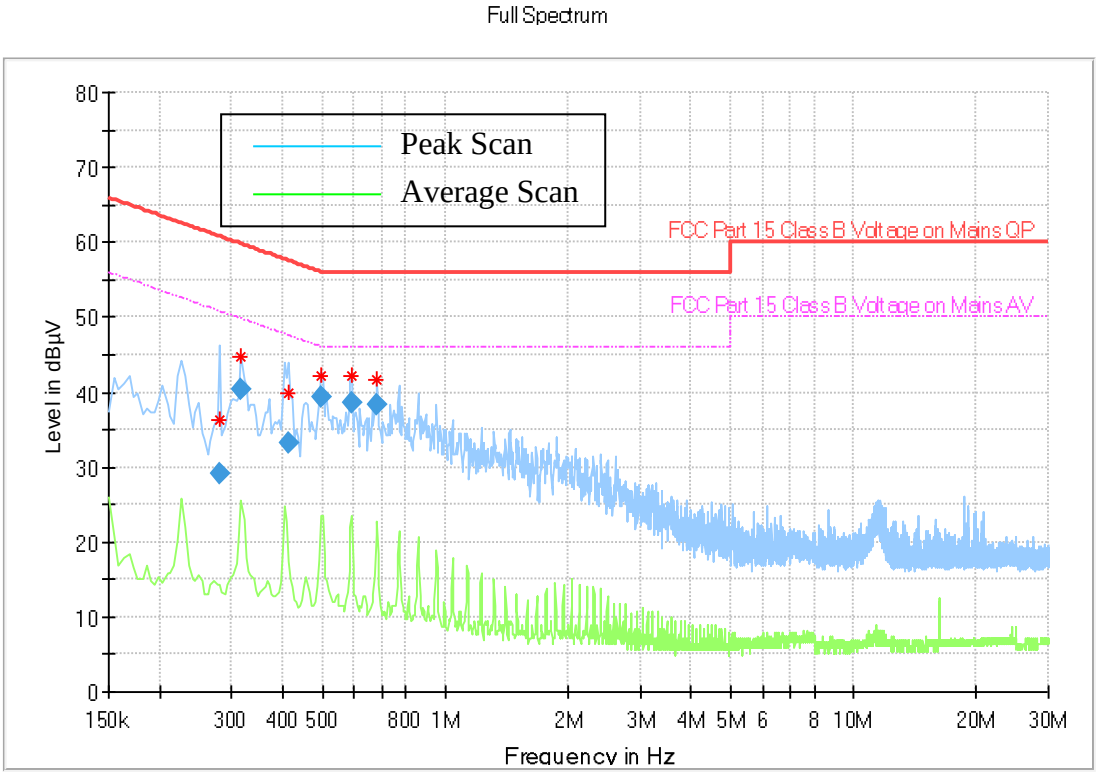
6.9.3. Test Result

1. Ambient



120 Vac, 60Hz

1) Charger Alone

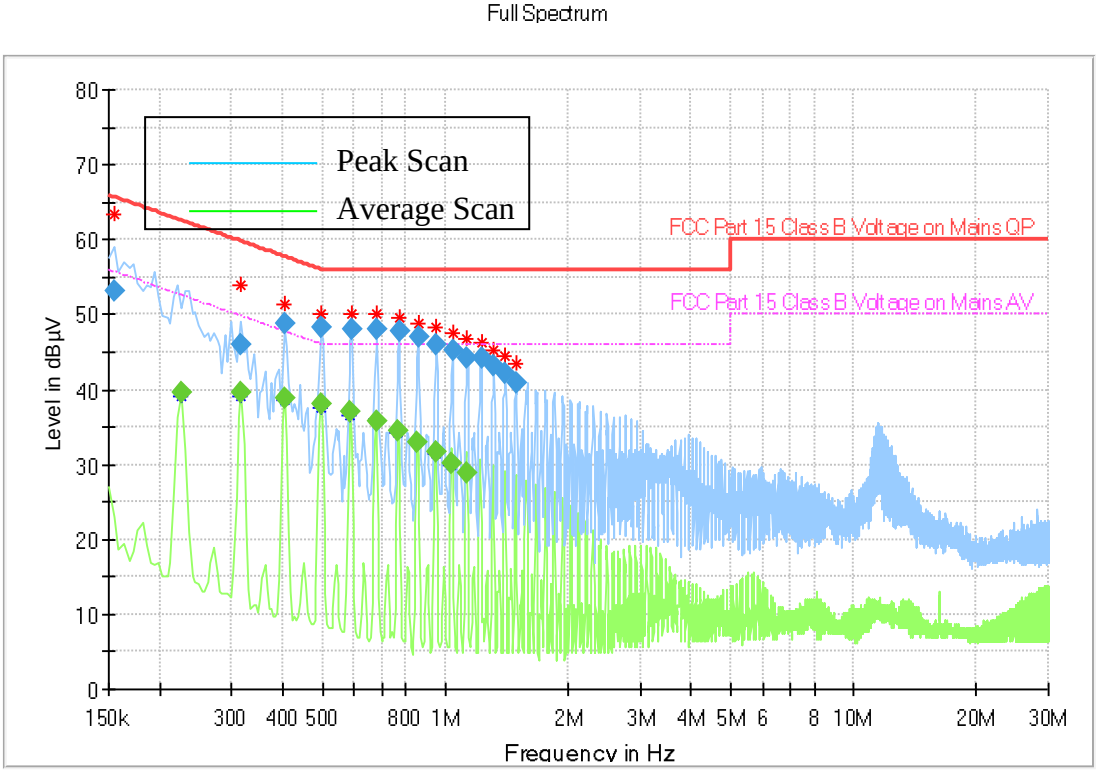


Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
0.280500	29.06	---	60.80	31.74	1000.0	9.000	L1	ON	10.3	Pass
0.316500	40.34	---	59.80	19.46	1000.0	9.000	N	ON	10.3	Pass
0.415500	33.24	---	57.54	24.30	1000.0	9.000	L1	ON	10.3	Pass
0.496500	39.47	---	56.06	16.59	1000.0	9.000	L1	ON	10.3	Pass
0.591000	38.72	---	56.00	17.28	1000.0	9.000	L1	ON	10.3	Pass
0.681000	38.38	---	56.00	17.62	1000.0	9.000	L1	ON	10.3	Pass

*** Expanded Uncertainty (U) = +/- 3.48dB**

2) Charger + Radio Off

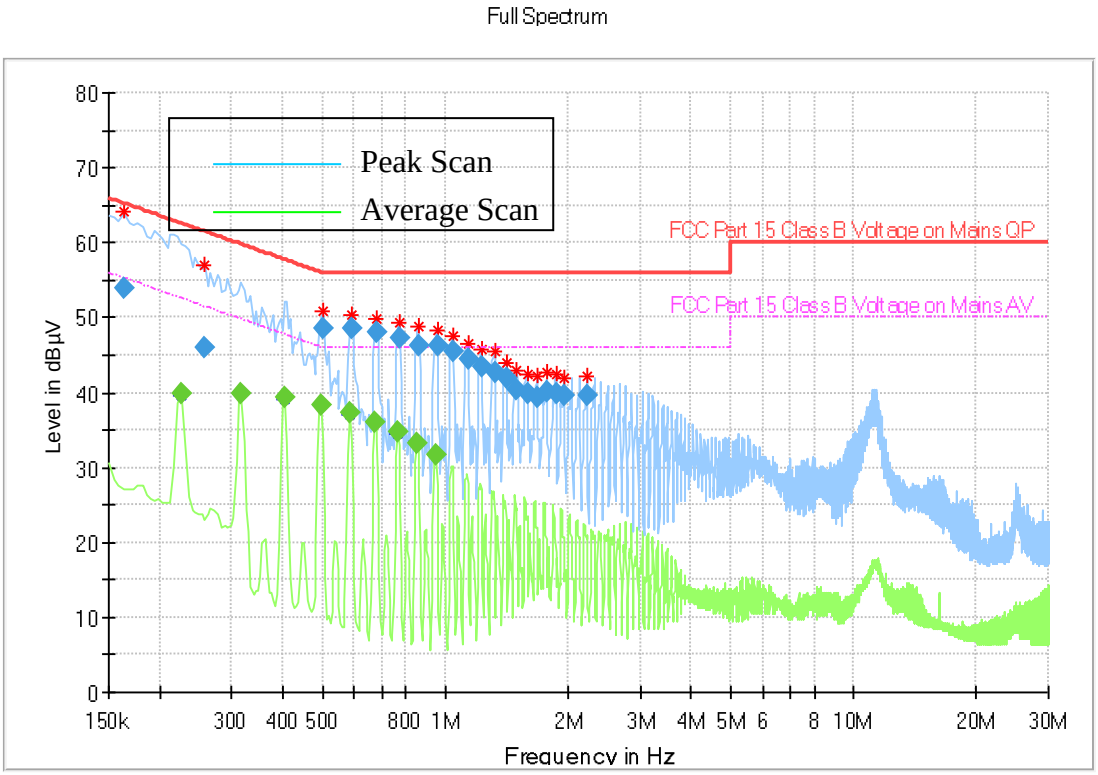


Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
0.154500	53.06	---	65.75	12.70	1000.0	9.000	L1	ON	10.3	Pass
0.226500	---	39.57	52.58	13.01	1000.0	9.000	L1	ON	10.3	Pass
0.316500	46.08	---	59.80	13.71	1000.0	9.000	N	ON	10.3	Pass
0.316500	---	39.58	49.80	10.22	1000.0	9.000	L1	ON	10.3	Pass
0.406500	48.77	---	57.72	8.95	1000.0	9.000	L1	ON	10.3	Pass
0.406500	---	38.91	47.72	8.81	1000.0	9.000	L1	ON	10.3	Pass
0.496500	---	38.04	46.06	8.02	1000.0	9.000	L1	ON	10.3	Pass
0.496500	48.25	---	56.06	7.81	1000.0	9.000	L1	ON	10.3	Pass
0.586500	---	36.95	46.00	9.05	1000.0	9.000	L1	ON	10.3	Pass
0.591000	48.01	---	56.00	7.99	1000.0	9.000	L1	ON	10.3	Pass
0.676500	---	35.75	46.00	10.25	1000.0	9.000	L1	ON	10.3	Pass
0.681000	48.06	---	56.00	7.94	1000.0	9.000	L1	ON	10.3	Pass
0.766500	---	34.44	46.00	11.56	1000.0	9.000	L1	ON	10.3	Pass
0.771000	47.71	---	56.00	8.29	1000.0	9.000	L1	ON	10.3	Pass
0.856500	---	33.09	46.00	12.91	1000.0	9.000	L1	ON	10.3	Pass
0.861000	46.95	---	56.00	9.05	1000.0	9.000	L1	ON	10.3	Pass
0.946500	---	31.66	46.00	14.34	1000.0	9.000	L1	ON	10.3	Pass
0.951000	46.03	---	56.00	9.97	1000.0	9.000	L1	ON	10.3	Pass
1.036500	---	30.26	46.00	15.74	1000.0	9.000	L1	ON	10.3	Pass
1.041000	45.13	---	56.00	10.87	1000.0	9.000	L1	ON	10.3	Pass
1.126500	---	28.82	46.00	17.18	1000.0	9.000	L1	ON	10.3	Pass
1.131000	44.20	---	56.00	11.80	1000.0	9.000	L1	ON	10.3	Pass
1.225500	44.19	---	56.00	11.81	1000.0	9.000	L1	ON	10.3	Pass
1.315500	43.25	---	56.00	12.75	1000.0	9.000	L1	ON	10.3	Pass
1.405500	42.09	---	56.00	13.91	1000.0	9.000	L1	ON	10.3	Pass
1.495500	40.86	---	56.00	15.14	1000.0	9.000	L1	ON	10.3	Pass

*** Expanded Uncertainty (U) = +/- 3.48dB**

3) Charger + Radio Standby

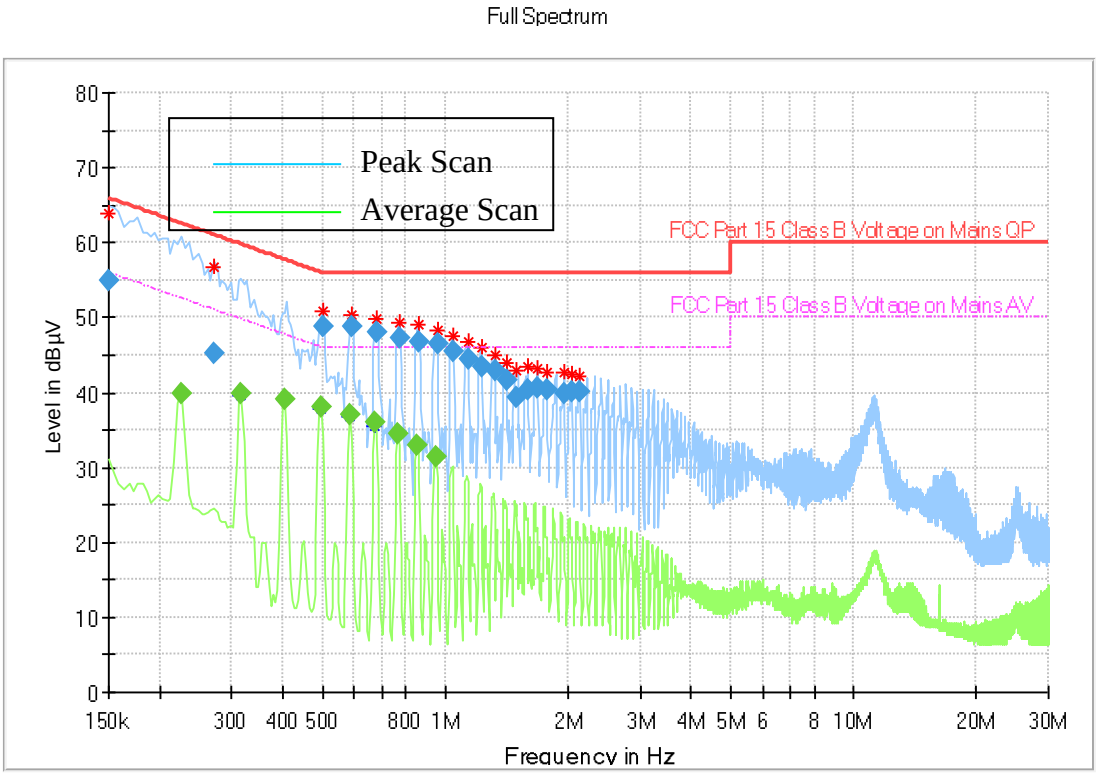


Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
0.163500	54.00	---	65.28	11.28	1000.0	9.000	N	ON	10.3	Pass
0.226500	---	39.91	52.58	12.67	1000.0	9.000	L1	ON	10.3	Pass
0.258000	46.02	---	61.50	15.48	1000.0	9.000	L1	ON	10.3	Pass
0.316500	---	39.95	49.80	9.85	1000.0	9.000	L1	ON	10.3	Pass
0.406500	---	39.28	47.72	8.44	1000.0	9.000	L1	ON	10.3	Pass
0.496500	---	38.35	46.06	7.70	1000.0	9.000	L1	ON	10.3	Pass
0.501000	48.56	---	56.00	7.44	1000.0	9.000	L1	ON	10.3	Pass
0.586500	---	37.23	46.00	8.77	1000.0	9.000	L1	ON	10.3	Pass
0.591000	48.57	---	56.00	7.43	1000.0	9.000	L1	ON	10.3	Pass
0.672000	---	36.04	46.00	9.96	1000.0	9.000	L1	ON	10.3	Pass
0.681000	48.06	---	56.00	7.94	1000.0	9.000	L1	ON	10.3	Pass
0.762000	---	34.66	46.00	11.34	1000.0	9.000	L1	ON	10.3	Pass
0.771000	47.21	---	56.00	8.79	1000.0	9.000	L1	ON	10.3	Pass
0.856500	---	33.16	46.00	12.84	1000.0	9.000	L1	ON	10.3	Pass
0.865500	46.29	---	56.00	9.71	1000.0	9.000	L1	ON	10.3	Pass
0.946500	---	31.70	46.00	14.30	1000.0	9.000	L1	ON	10.3	Pass
0.955500	46.21	---	56.00	9.79	1000.0	9.000	L1	ON	10.3	Pass
1.045500	45.55	---	56.00	10.45	1000.0	9.000	L1	ON	10.3	Pass
1.135500	44.53	---	56.00	11.47	1000.0	9.000	L1	ON	10.3	Pass
1.225500	43.41	---	56.00	12.59	1000.0	9.000	L1	ON	10.3	Pass
1.320000	42.76	---	56.00	13.24	1000.0	9.000	L1	ON	10.3	Pass
1.410000	41.96	---	56.00	14.04	1000.0	9.000	L1	ON	10.3	Pass
1.500000	40.42	---	56.00	15.58	1000.0	9.000	N	ON	10.3	Pass
1.590000	39.98	---	56.00	16.02	1000.0	9.000	N	ON	10.3	Pass
1.680000	39.46	---	56.00	16.54	1000.0	9.000	N	ON	10.3	Pass
1.774500	40.05	---	56.00	15.95	1000.0	9.000	N	ON	10.3	Pass
1.864500	39.87	---	56.00	16.13	1000.0	9.000	N	ON	10.3	Pass
1.954500	39.51	---	56.00	16.49	1000.0	9.000	N	ON	10.3	Pass
2.229000	39.65	---	56.00	16.35	1000.0	9.000	N	ON	10.3	Pass

*** Expanded Uncertainty (U) = +/- 3.48dB**

4) Charger + Radio TX BT EDR



Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
0.150000	54.86	---	66.00	11.14	1000.0	9.000	N	ON	10.3	Pass
0.226500	---	39.97	52.58	12.61	1000.0	9.000	L1	ON	10.3	Pass
0.271500	45.32	---	61.07	15.75	1000.0	9.000	L1	ON	10.3	Pass
0.316500	---	39.86	49.80	9.94	1000.0	9.000	L1	ON	10.3	Pass
0.406500	---	39.13	47.72	8.59	1000.0	9.000	L1	ON	10.3	Pass
0.496500	---	38.15	46.06	7.90	1000.0	9.000	L1	ON	10.3	Pass
0.501000	48.92	---	56.00	7.08	1000.0	9.000	L1	ON	10.3	Pass
0.582000	---	37.18	46.00	8.82	1000.0	9.000	L1	ON	10.3	Pass
0.591000	48.77	---	56.00	7.23	1000.0	9.000	L1	ON	10.3	Pass
0.672000	---	35.94	46.00	10.06	1000.0	9.000	L1	ON	10.3	Pass
0.681000	48.08	---	56.00	7.92	1000.0	9.000	L1	ON	10.3	Pass
0.762000	---	34.55	46.00	11.45	1000.0	9.000	L1	ON	10.3	Pass
0.771000	47.22	---	56.00	8.78	1000.0	9.000	L1	ON	10.3	Pass
0.852000	---	33.03	46.00	12.97	1000.0	9.000	L1	ON	10.3	Pass
0.865500	46.80	---	56.00	9.20	1000.0	9.000	L1	ON	10.3	Pass
0.946500	---	31.50	46.00	14.50	1000.0	9.000	L1	ON	10.3	Pass
0.955500	46.42	---	56.00	9.58	1000.0	9.000	L1	ON	10.3	Pass
1.045500	45.47	---	56.00	10.53	1000.0	9.000	L1	ON	10.3	Pass
1.135500	44.35	---	56.00	11.65	1000.0	9.000	L1	ON	10.3	Pass
1.230000	43.44	---	56.00	12.56	1000.0	9.000	L1	ON	10.3	Pass
1.320000	42.89	---	56.00	13.11	1000.0	9.000	L1	ON	10.3	Pass
1.410000	41.76	---	56.00	14.24	1000.0	9.000	L1	ON	10.3	Pass
1.486500	39.37	---	56.00	16.63	1000.0	9.000	L1	ON	10.3	Pass
1.594500	40.43	---	56.00	15.57	1000.0	9.000	N	ON	10.3	Pass
1.684500	40.66	---	56.00	15.34	1000.0	9.000	N	ON	10.3	Pass
1.774500	40.38	---	56.00	15.62	1000.0	9.000	N	ON	10.3	Pass
1.959000	39.78	---	56.00	16.22	1000.0	9.000	N	ON	10.3	Pass
2.049000	40.21	---	56.00	15.79	1000.0	9.000	N	ON	10.3	Pass
2.139000	40.05	---	56.00	15.95	1000.0	9.000	N	ON	10.3	Pass

*** Expanded Uncertainty (U) = +/- 3.48dB**

END OF TEST REPORT