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	:	08-Aug-2023 - 13-Sept-2023
Report Issue Date	:	16-Oct-2023
Manufacturer/Location	:	Motorola Solutions Malaysia Sdn Bhd Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia
Requestor	:	HOMICIL HARLY
Product Type	:	Portable
Product Version (PMN)	:	APX N50
Model Number (HVIN)	:	H25XDF9PW6AN
Frequency Band	:	2.402 - 2.480 GHz
Max RF Output Power	:	14.13 mWatts
Applicant Name	:	Motorola Solutions Inc
Applicant Address	:	8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322
FCC Registrations	:	461337
IC Registrations	:	MY0001
Firmware Version (FVIN)	:	L06221125

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:

hidayati

SITI NUR HIDAYATI BINTI ABDUL HALIM
Test Personnel

Approved Signatory:

VINCENT FOONG CHUEN KIT
Responsible Engineer

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REVISION HISTORY

Revision History	Description	Date	Originator
Rev. A	Initial Report	**16-October-2023**	**Hidayati**

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	BT/WiFi Antenna (2.4-2.48 GHz)

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
BATT LIION IMPRES 2 IP68 2850T	MOTOROLA	PMNN4813A
UHF Whip Antenna (380 – 520 MHz) 380-520MHz	MOTOROLA	AN000452A01
CHGR DEKSTOP MULTI UNIT IMPRES 2 1 DISPLAYS BASE ONLY	MOTOROLA	PMPN4593A
CHGR DEKSTOP SINGLE UNIT IMPRES 2 BASE ONLY	MOTOROLA	PMPN4819A
CGAI mini programming cable and test cable, non-DIV1	MOTOROLA	PMKN4231A

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: 10.226 dBm (10.534 mW)	657BWT0099	Hidayati
15.247 (a)(1)	RSS-247 5.1(a) RSS-247 5.1(b)	(1) 20dB Channel Bandwidth (2) Channel Separation	Pass	GFSK – (0.858MHz) 858KF1D Pi/4 DQPSK - (1.145MHz) 1M15G1D 8DPSK – (1.189MHz) 1M19G1D	657BWT0099	Hidayati
15.247(a)(1)(iii)	RSS-247 5.1(d)	Number of hopping Frequency used	Pass	Meet the limit requirement.	657BWT0099	Hidayati
15.247(a)(1)(iii)	RSS-247 5.1(d)	Dwell time on each channel	Pass	Meet the limit requirement.	657BWT0099	Hidayati
15.247 (d)	RSS-247 5.5	Band Edge Conducted Spurious Emission	Pass	Worst case emission: -50.72 dB	657BWT0099	Hidayati
15.247 (d)	RSS-247 5.5	Conducted Spurious Emission	Pass	Worst case emission: -44.496 dBm	657BWT0099	Hidayati
15.205, 15.209, 15.247 (d)	RSS-247 5.5	Radiated Emission within Restricted Bands	Pass	Worst case emission: RBE: 43.9094 dBuV/m (margin:10.0906 dB) RSE: 63.8063 dBuV/m (margin: 10.1937 dB), Noise floor	287TZP0060	Haikal & Rezza
15.207	RSS-Gen 8.8	AC Powerline Conducted Emission	NA	Meet the limit requirement	287TZP0060	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	3640A02967	19-Oct-22	19-Oct-23
SPECTRUM ANALYZER	E4440A	MY46185415	27-Dec-22	27-Dec-23

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	6033A	3211A06649	12-Jun-22	12-Jun-24
SIGNAL GENERATOR	SMB 100A	182511	4-Jun-21	4-Jun-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	CBL6112D	30991	5-Jan-23	5-Jan-24
BILOG ANTENNA	CBL6112D	55546	23-Jun-22	23-Dec-23
DATA LOGGER THERMOHYGROMETER	SDL500	A.016800	21-Jun-23	21-Jun-24
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	BBHA9170255	22-Feb-23	22-Feb-24
PREAMPLIFIER 18-40GHz	Miteq Hi Gain Sucoflex	002	No Cal. Req'd	No Cal. Req'd
PREAMPLIFIER	PAM-0118P	269	28-Mar-23	28-Mar-24
LOOP ANTENNA	6502	00208416	12-Oct-22	12-Oct-23

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-2023	23-Jun-2024
V-NETWORK 2-LINE	ENV216	101268	15-Nov-2022	15-Nov-2023
EMI TEST RECEIVER	ESCI	100225	9-Nov-2022	9-Nov-2023
PROGRAMMABLE AC SOURCE	61604	616040003502	12-Dec-2022	12-Dec-2023

4.1. 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:

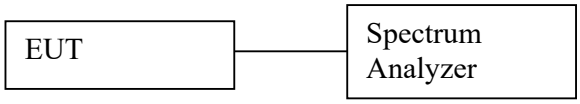
☒This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).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

5.0. Transmitter Test Parameters

5.1. Conducted RF Output Power (Peak)

5.1.1. 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.

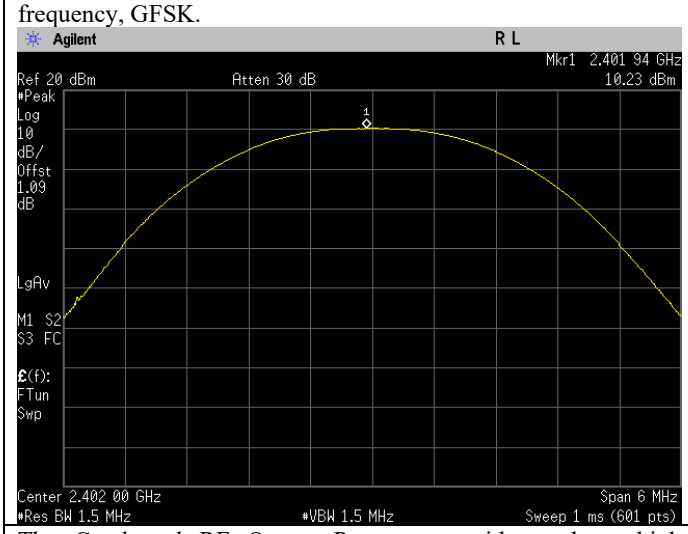
5.1.2. Test Limits:

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

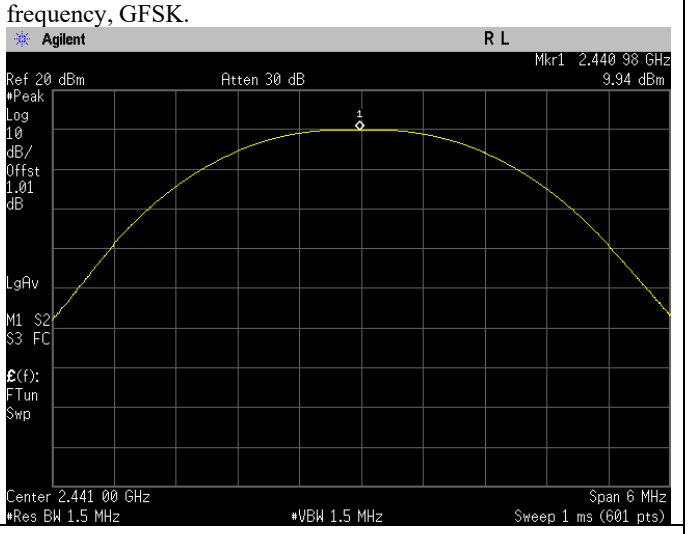
5.1.3. Test Data:

Test Conditions		Test Frequency (GHz)	Results	
Modulation	Voltage(V)		dBm	Status
GFSK	7.50	2.4020	10.226	Pass
		2.4410	9.935	Pass
		2.4800	9.310	Pass
Pi/4DQPSK	7.50	2.4020	6.528	Pass
		2.4410	6.217	Pass
		2.4800	5.582	Pass
8DPSK	7.50	2.4020	6.791	Pass
		2.4410	6.491	Pass
		2.4800	5.866	Pass

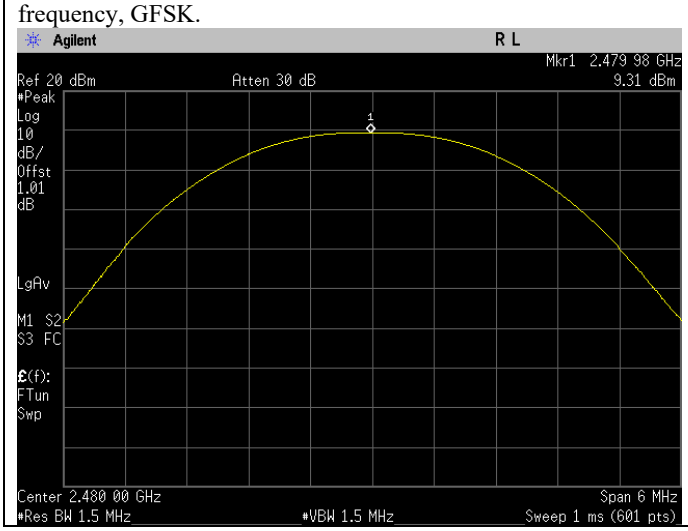
The Conducted RF Output Power test with result at low frequency, GFSK.



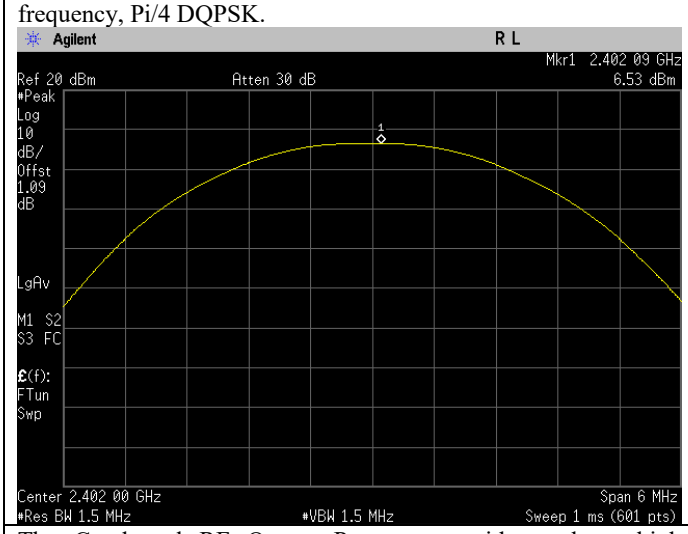
The Conducted RF Output Power test with result at mid frequency, GFSK.



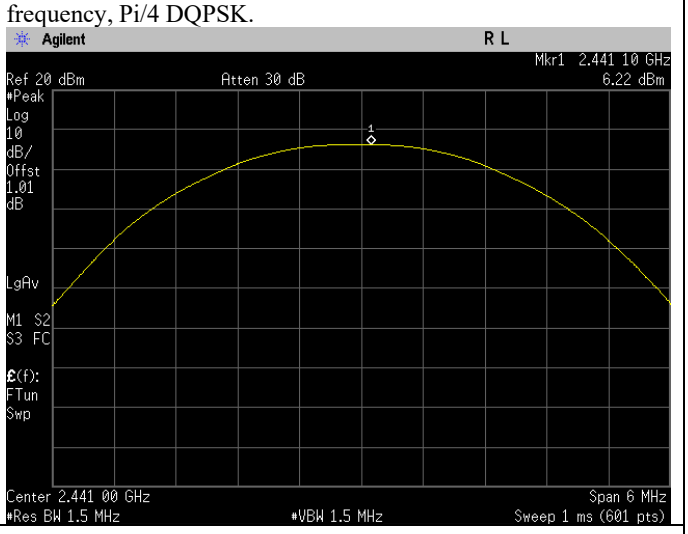
The Conducted RF Output Power test with result at high frequency, GFSK.



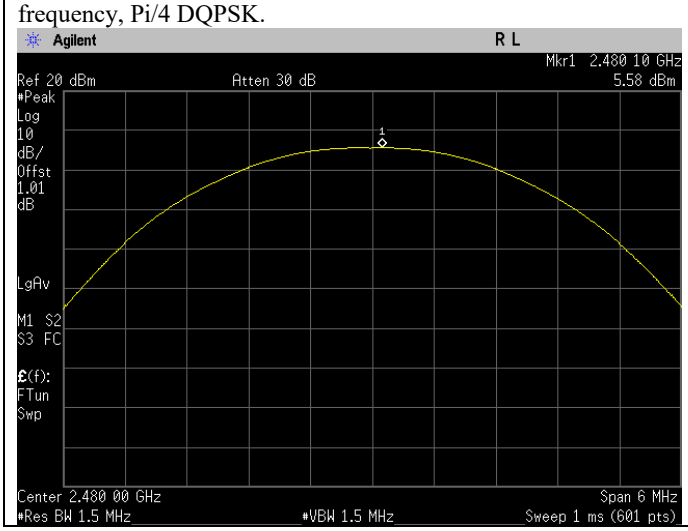
The Conducted RF Output Power test with result at low frequency, Pi/4 DQPSK.



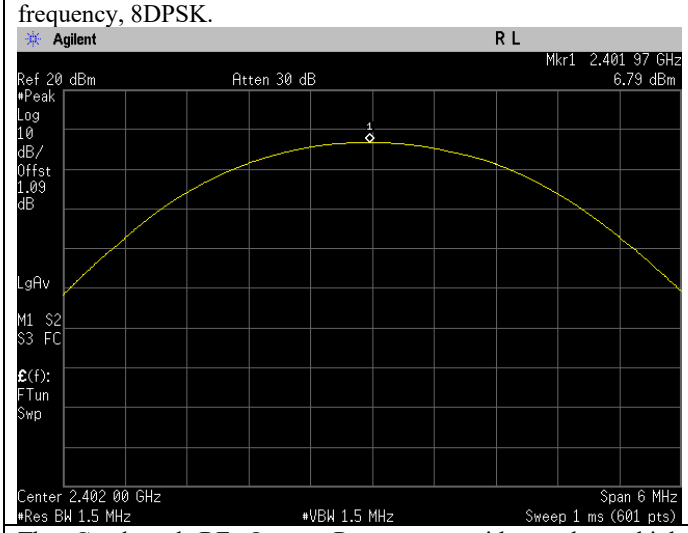
The Conducted RF Output Power test with result at mid frequency, Pi/4 DQPSK.



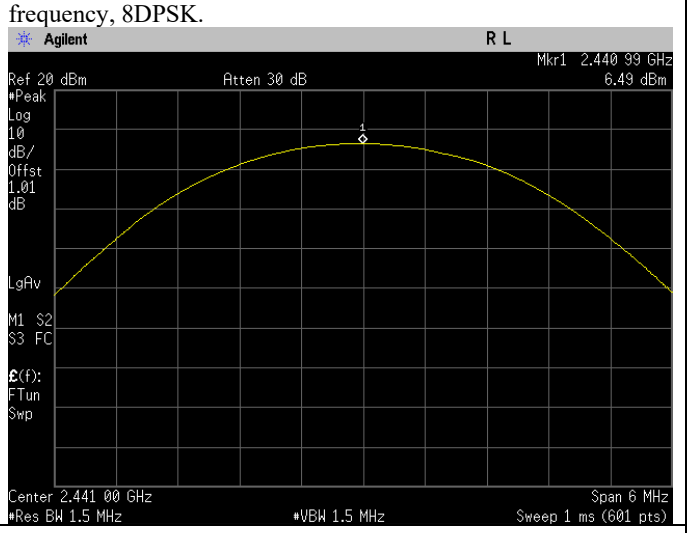
The Conducted RF Output Power test with result at high frequency, Pi/4 DQPSK.



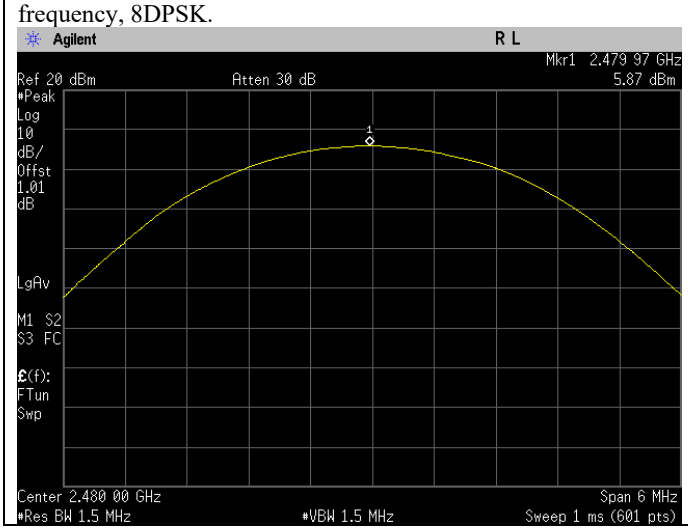
The Conducted RF Output Power test with result at low frequency, 8DPSK.



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

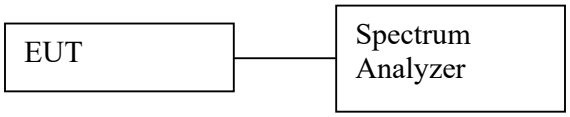


The Conducted RF Output Power test with result at high frequency, 8DPSK.



5.2. 20dB Channel Bandwidth

5.2.1. 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.

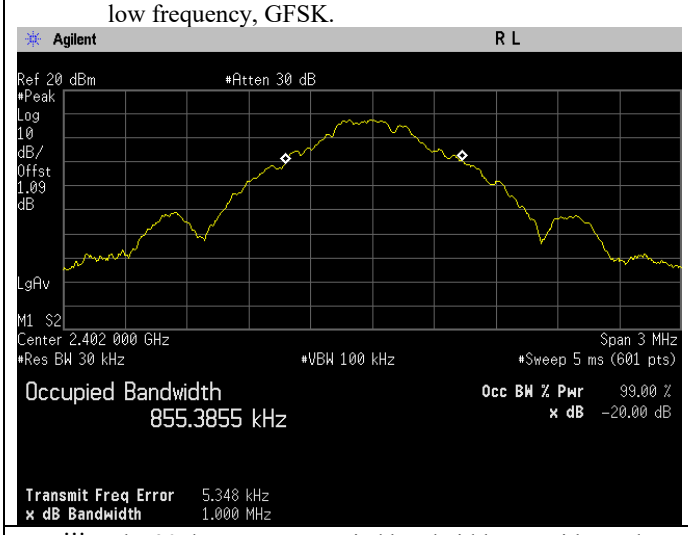
5.2.2. Test Limits:

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.

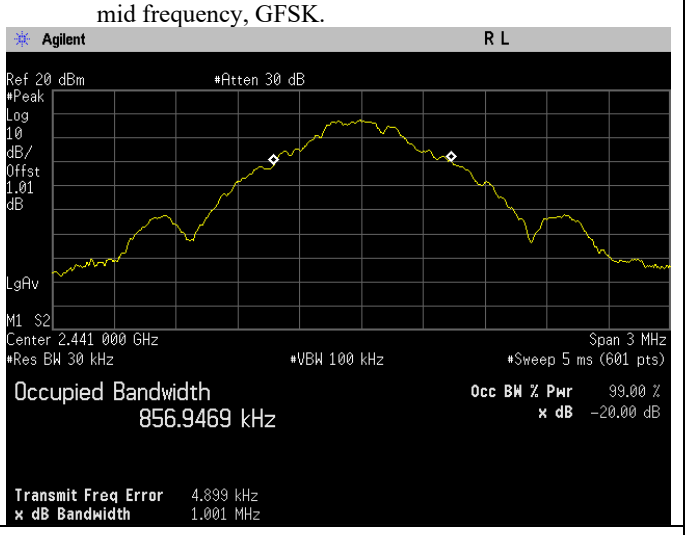
5.2.3. Test Data:

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	1.000	0.855	Pass
		2.4410	1.001	0.857	Pass
		2.4800	1.004	0.858	Pass
Pi/4 DQPSK	7.50	2.4020	1.278	1.145	Pass
		2.4410	1.278	1.145	Pass
		2.4800	1.279	1.144	Pass
8DPSK	7.50	2.4020	1.261	1.189	Pass
		2.4410	1.269	1.188	Pass
		2.4800	1.269	1.188	Pass

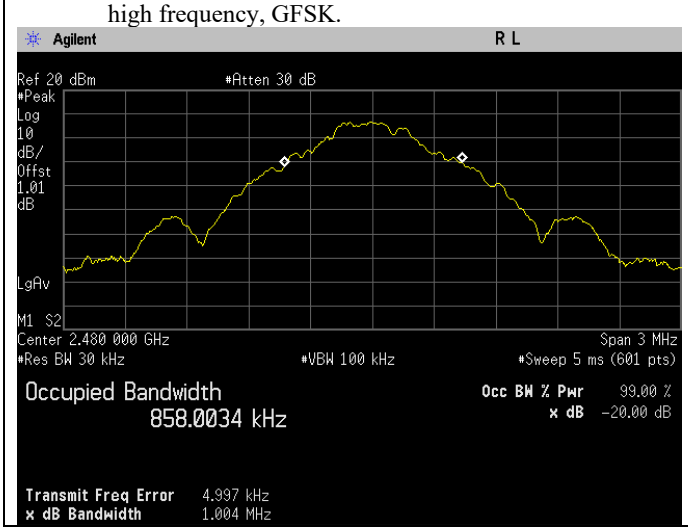
i. The 20 dB BW & occupied bandwidth test with result at low frequency, GFSK.



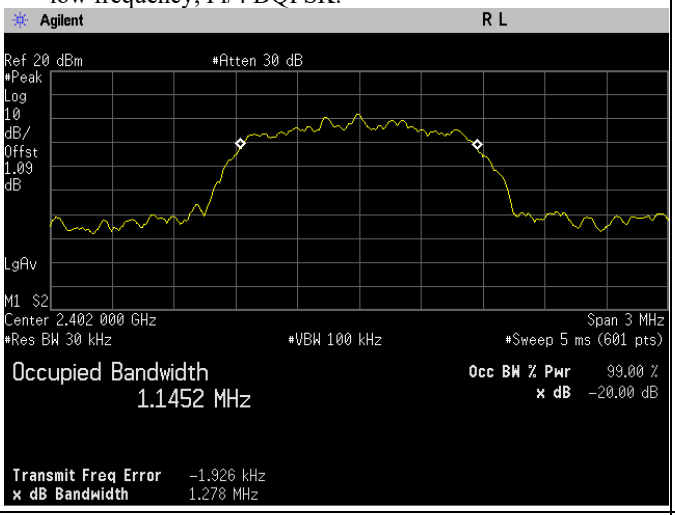
ii. The 20 dB BW & occupied bandwidth test with result at mid frequency, GFSK.



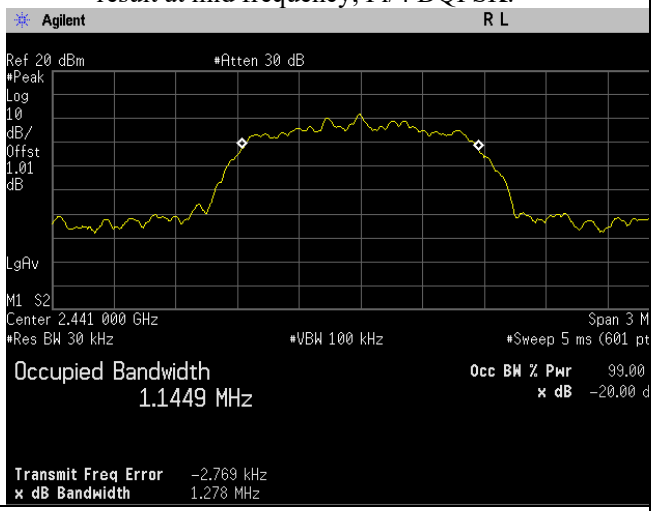
iii. The 20 dB BW & occupied bandwidth test with result at high frequency, GFSK.



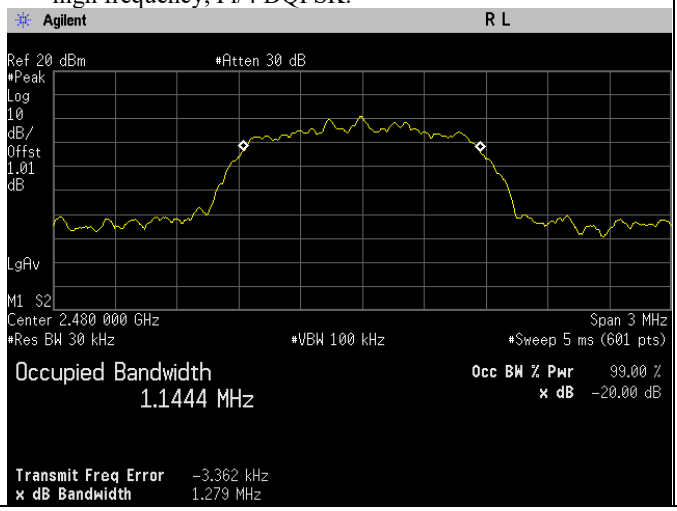
i. The 20 dB BW & occupied bandwidth test with result at low frequency, Pi/4 DQPSK.



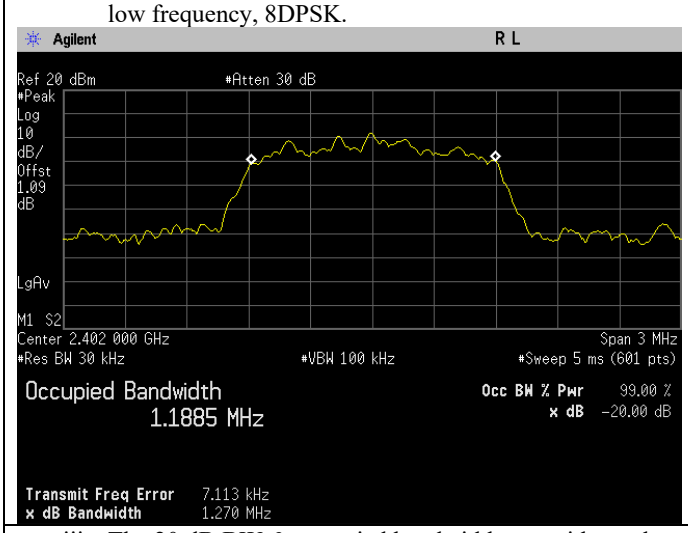
ii. The 20 dB BW & occupied bandwidth test with result at mid frequency, Pi/4 DQPSK.



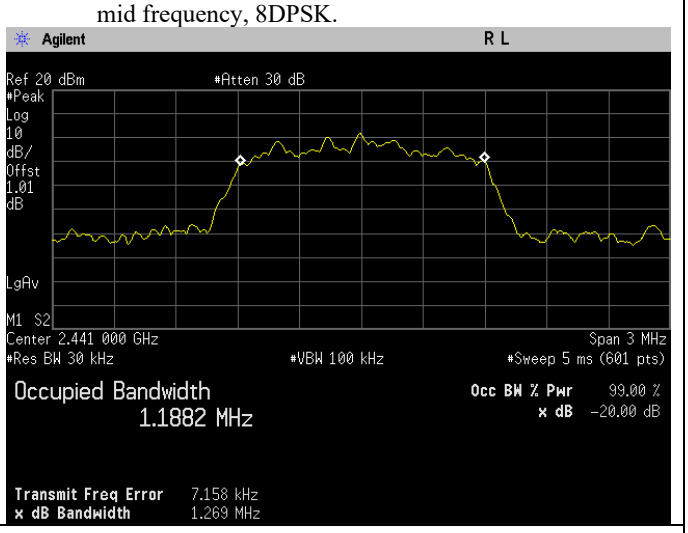
iii. The 20 dB BW & occupied bandwidth test with result at high frequency, Pi/4 DQPSK.



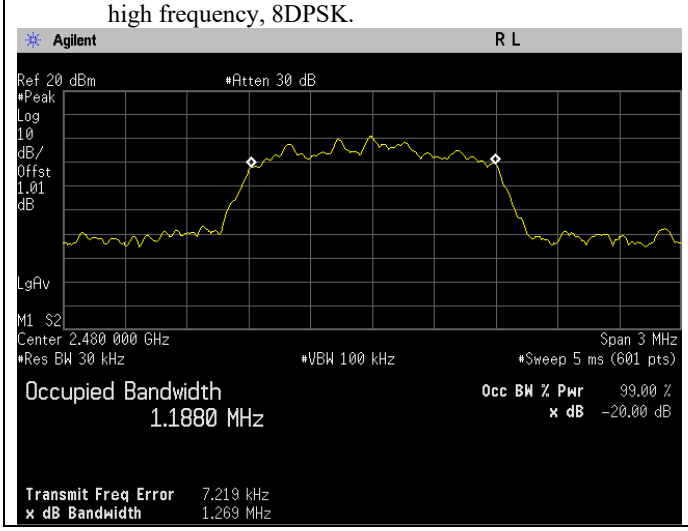
i. The 20 dB BW & occupied bandwidth test with result at low frequency, 8DPSK.



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

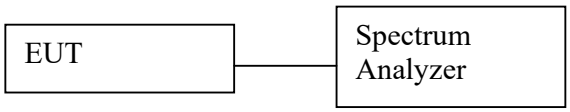


iii. The 20 dB BW & occupied bandwidth test with result at high frequency, 8DPSK.



5.3. Band-edge Conducted Spurious Emission

5.3.1. 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.

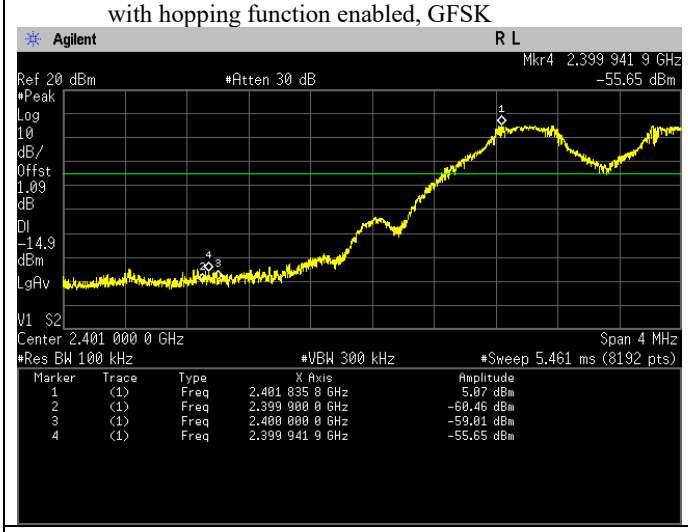
5.3.2. Test Limits

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

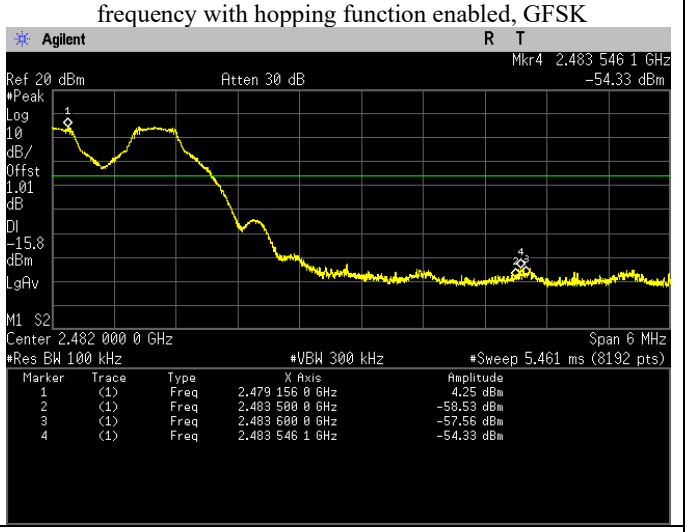
5.3.3. Test Result

Test Conditions		Hopping Method	Test Frequency(GHz)	Results	
Modulation	Voltage(V)			dB	Status
GFSK	7.50	Enabled (continuously)	2.4020	-55.65	Pass
			2.4800	-54.33	Pass
		Disabled (constantly)	2.4020	-50.72	Pass
			2.4800	-55.92	Pass
Pi/4 DQPSK	7.50	Enabled (continuously)	2.4020	-54.73	Pass
			2.4800	-60.17	Pass
		Disabled (constantly)	2.4020	-52.83	Pass
			2.4800	-57.96	Pass
8DPSK	7.50	Enabled (continuously)	2.4020	-51.91	Pass
			2.4800	-59.22	Pass
		Disabled (constantly)	2.4020	-50.87	Pass
			2.4800	-56.94	Pass

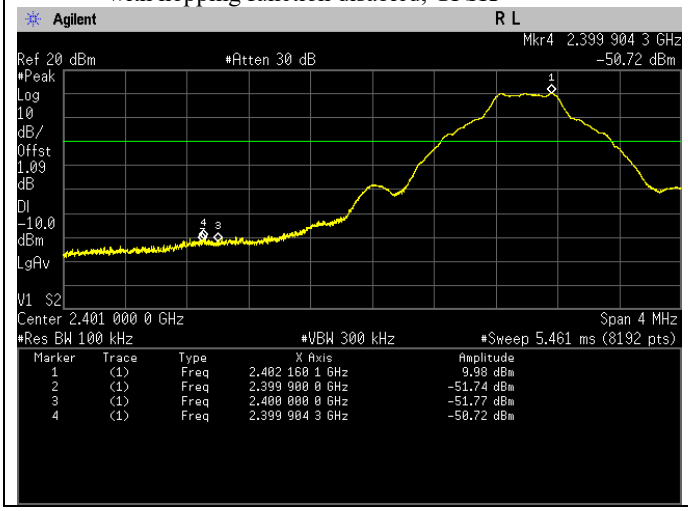
i. The highest band edge emission at low carrier frequency with hopping function enabled, GFSK



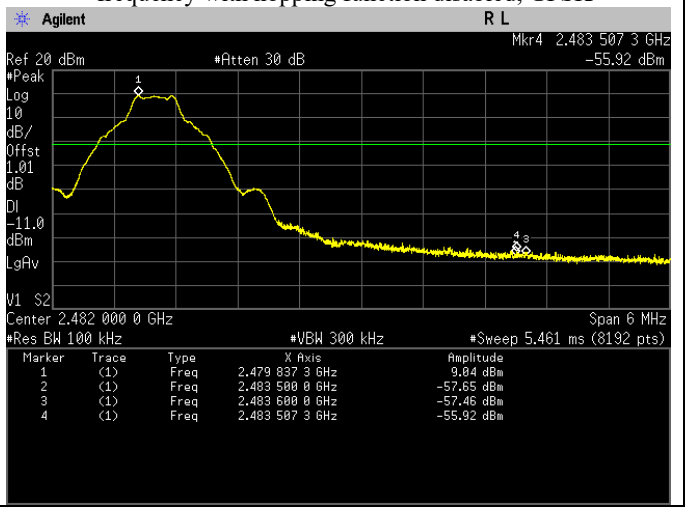
ii. The highest band edge emission at high carrier frequency with hopping function enabled, GFSK



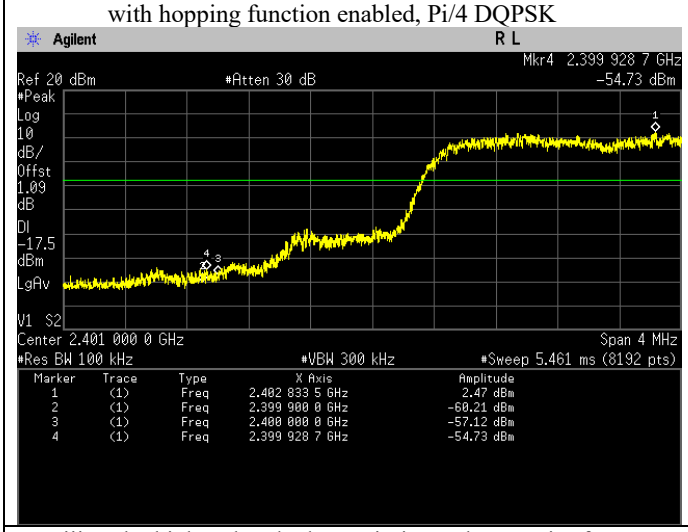
iii. The highest band edge emission at low carrier frequency with hopping function disabled, GFSK



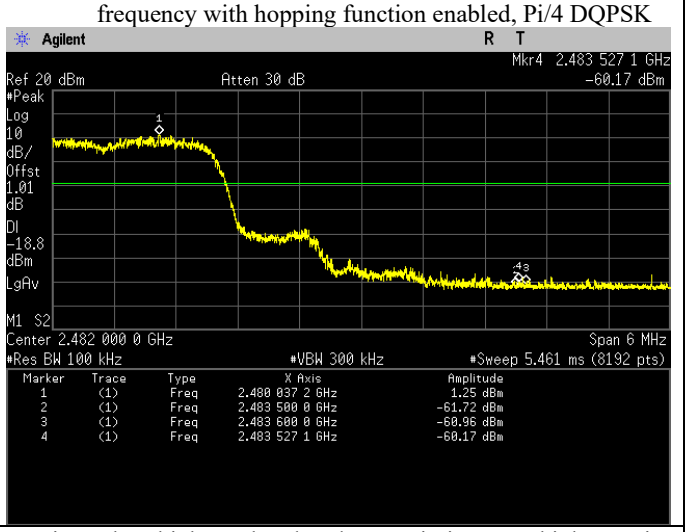
iv. The highest band edge emission at high carrier frequency with hopping function disabled, GFSK



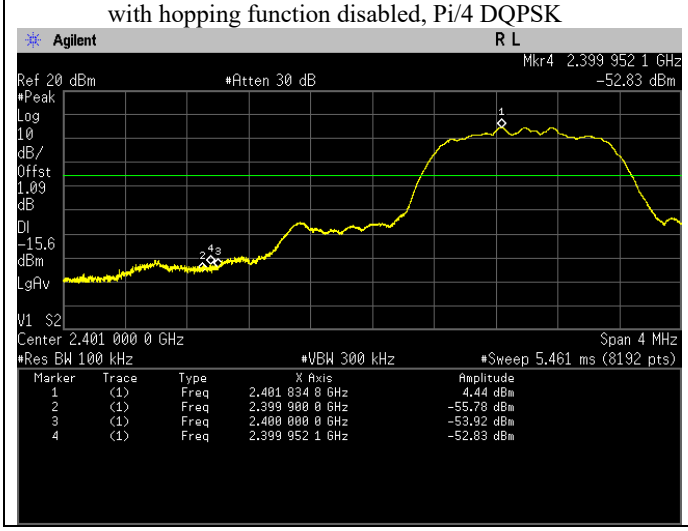
i. The highest band edge emission at low carrier frequency with hopping function enabled, Pi/4 DQPSK



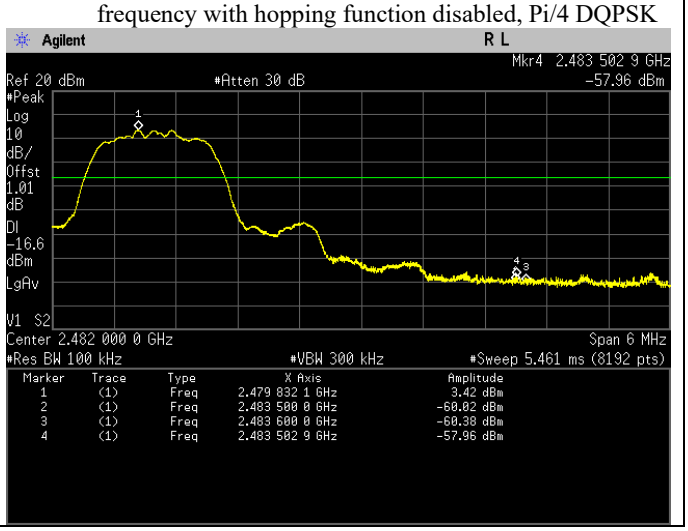
ii. The highest band edge emission at high carrier frequency with hopping function enabled, Pi/4 DQPSK



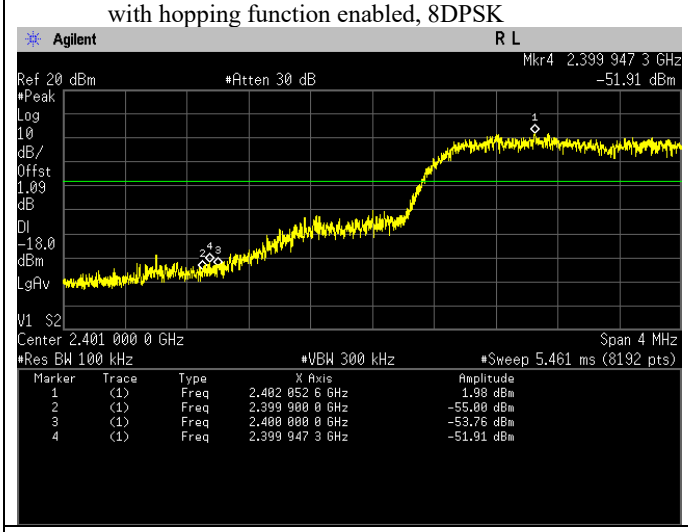
iii. The highest band edge emission at low carrier frequency with hopping function disabled, Pi/4 DQPSK



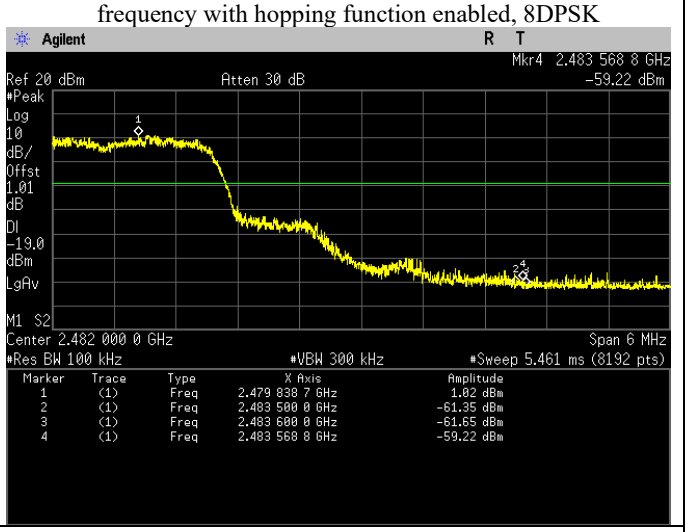
iv. The highest band edge emission at high carrier frequency with hopping function disabled, Pi/4 DQPSK



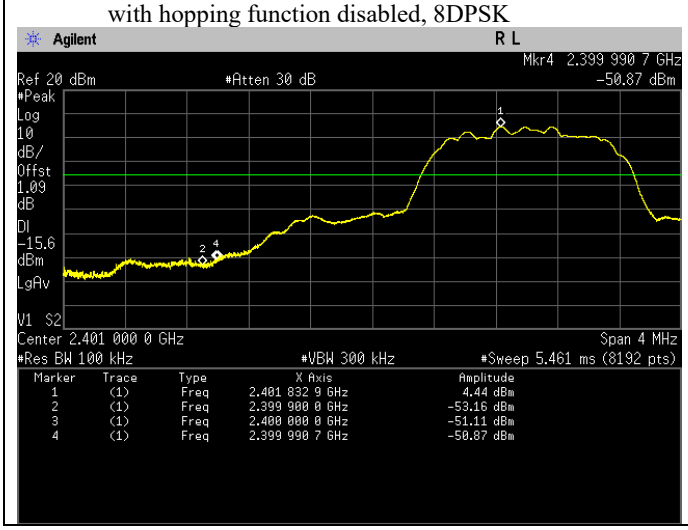
i. The highest band edge emission at low carrier frequency with hopping function enabled, 8DPSK



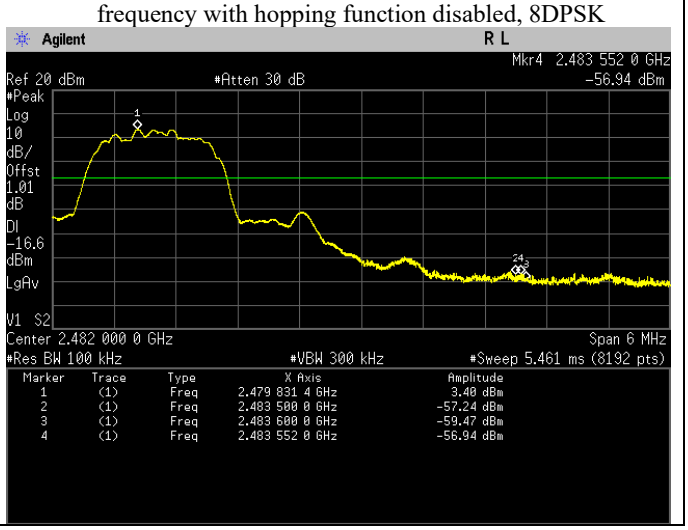
ii. The highest band edge emission at high carrier frequency with hopping function enabled, 8DPSK



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

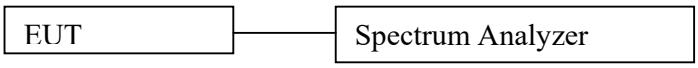


iv. The highest band edge emission at high carrier frequency with hopping function disabled, 8DPSK



5.4. Dwell time on each channel

5.4.1. 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.

5.4.2. Test Limits:

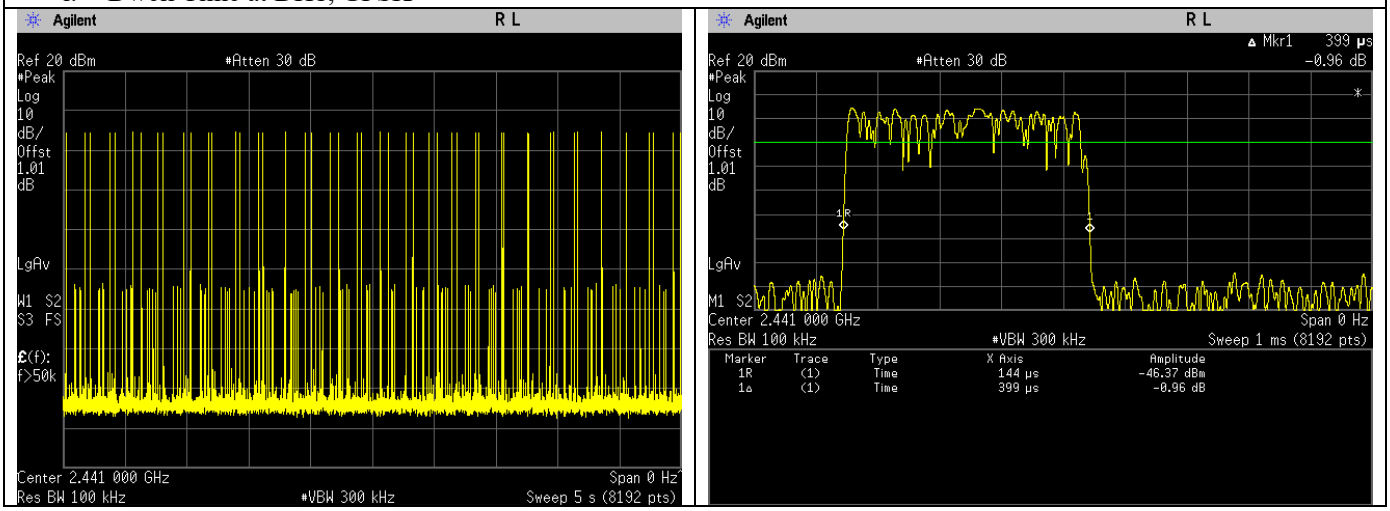
Normal Condition (25 º C)
≤ 400ms

5.4.3. Test Result

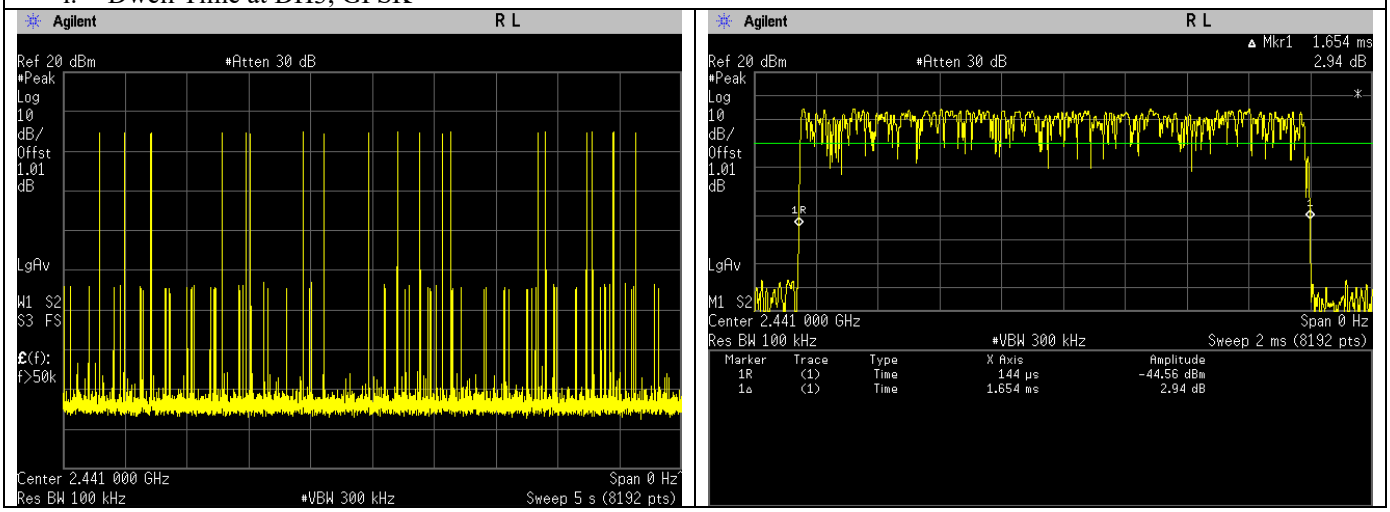
Test Conditions			Data Package	Results			
Modulation	Voltage (V)	Test Frequency (GHz)		No. of transmission in 5s **(a)**	Dwell time in one transmission **(b) (msec)**	Total accumulate dwell time in 31.6s. **(c) (msec)**	Status
GFSK	7.50	2.4410	DH1	49	0.399	123.562320	Pass
			DH3	20	1.654	209.065600	Pass
			DH5	17	2.902	311.790880	Pass
Pi/4 DQPSK	7.50		DH1	51	0.401	129.250320	Pass
			DH3	24	1.653	250.727040	Pass
			DH5	19	2.901	348.352080	Pass
8 DPSK	7.50		DH1	51	0.401	129.250320	Pass
			DH3	24	1.651	250.423680	Pass
			DH5	19	2.902	348.472160	Pass

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

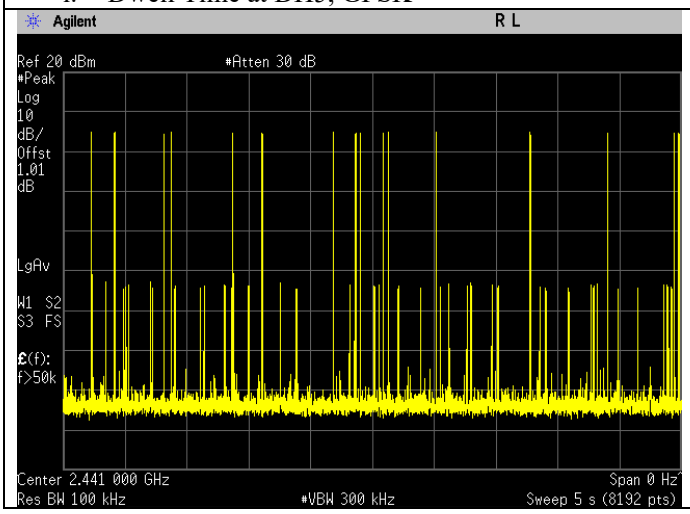
i. Dwell Time at DH1, GFSK

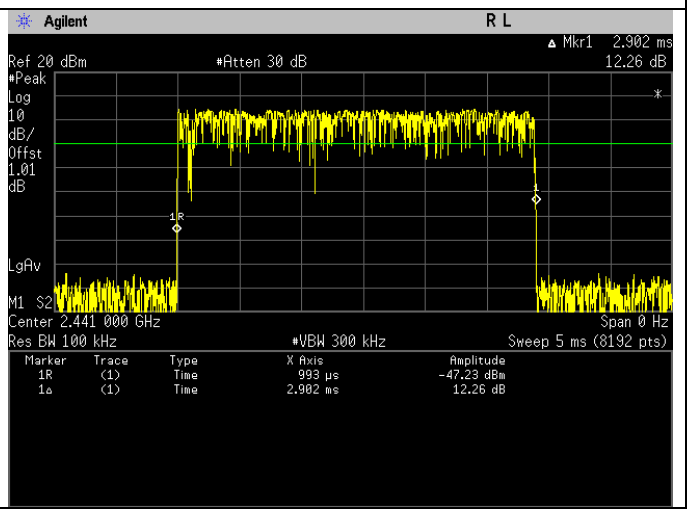


i. Dwell Time at DH3, GFSK

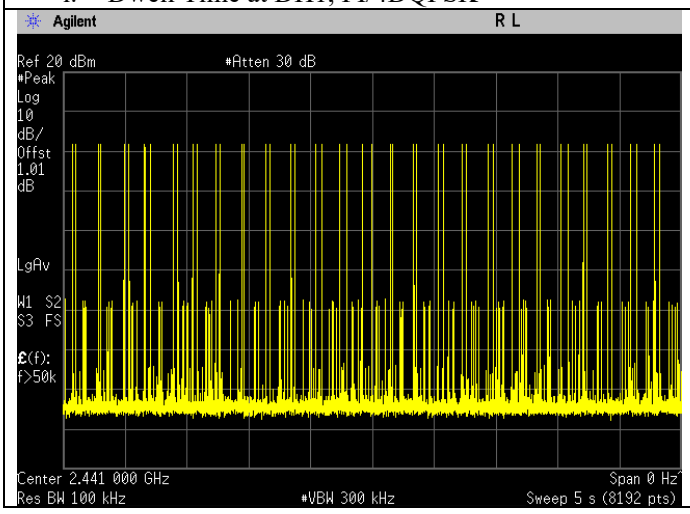


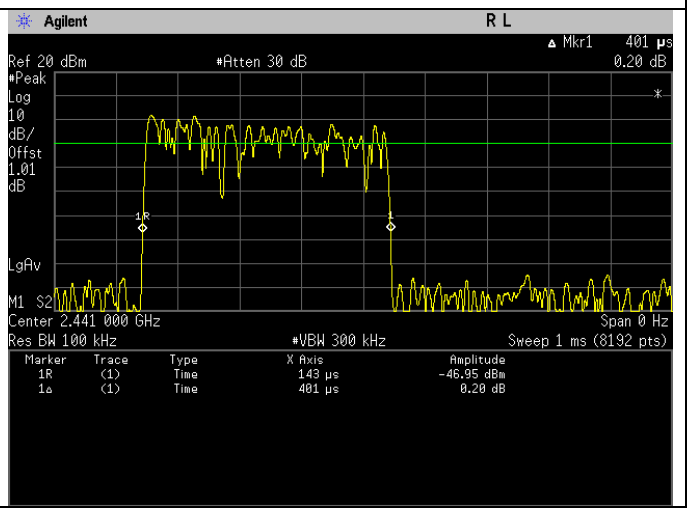
i. Dwell Time at DH5, GFSK



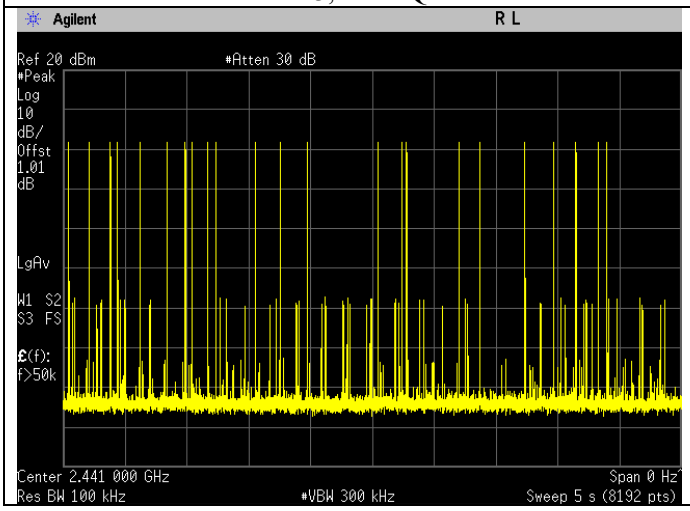


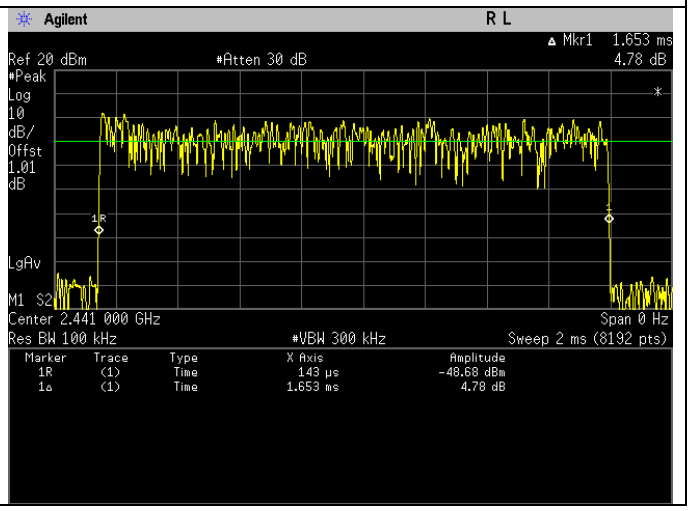
i. Dwell Time at DH1, PI/4DQPSK



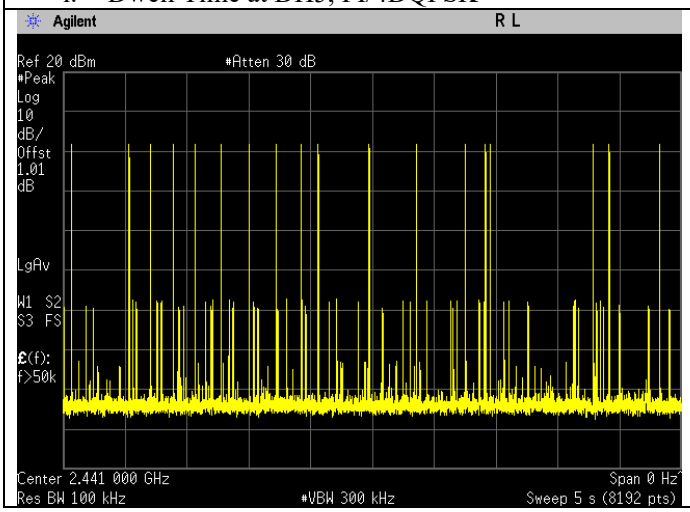


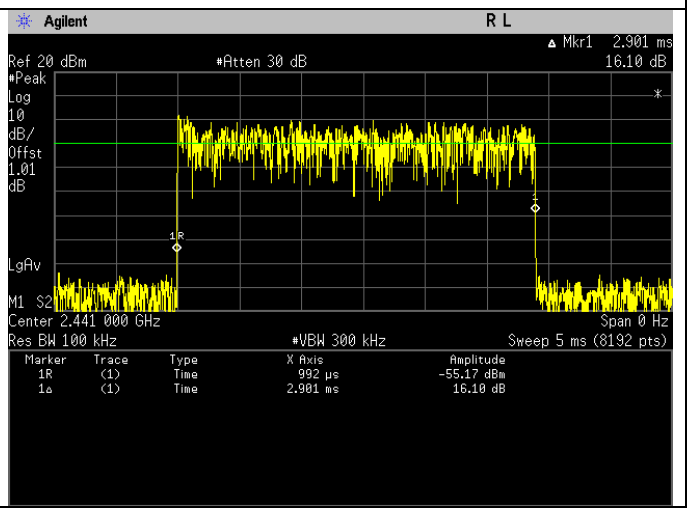
i. Dwell Time at DH3, PI/4DQPSK



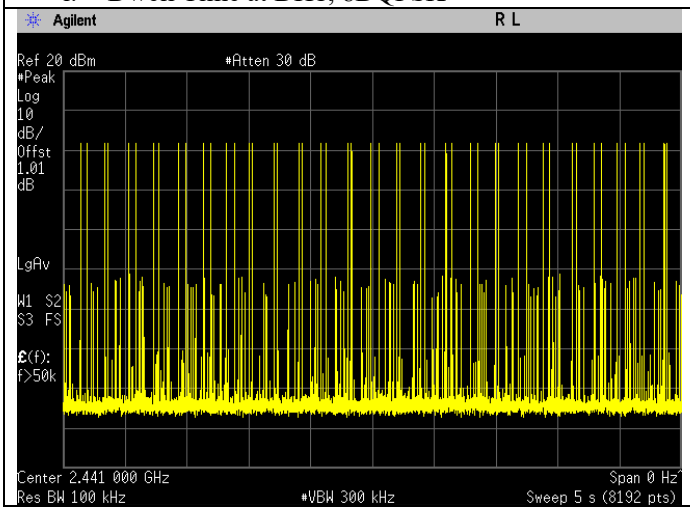


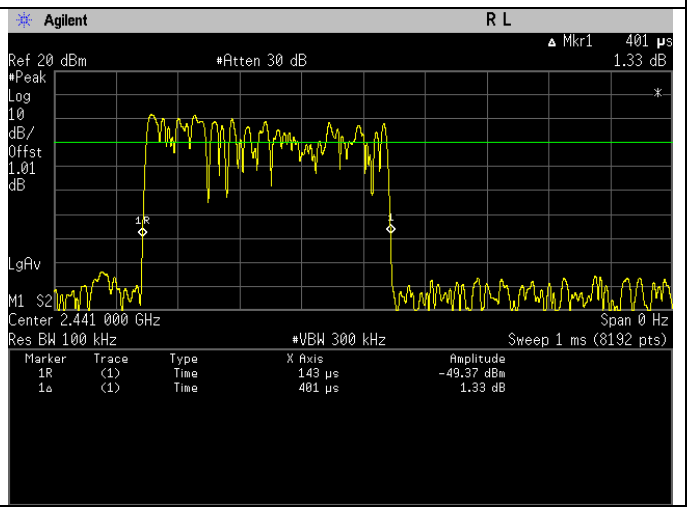
i. Dwell Time at DH5, PI/4DQPSK



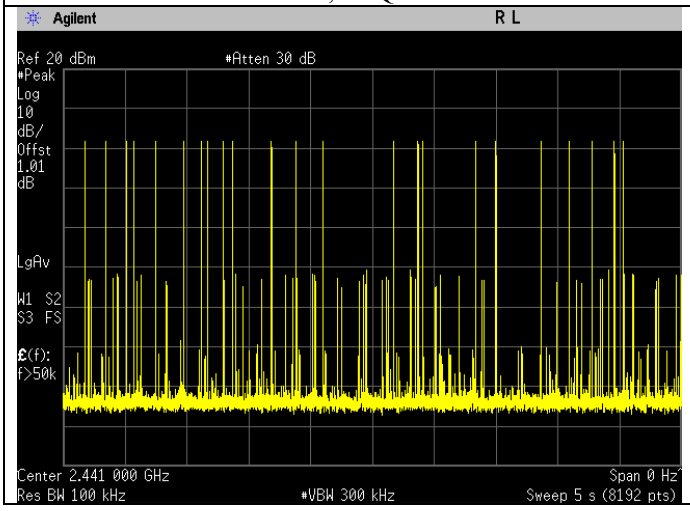


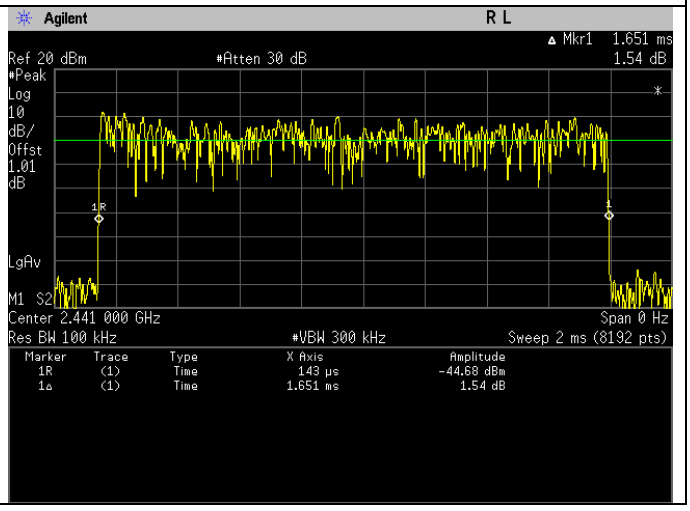
i. Dwell Time at DH1, 8DQPSK



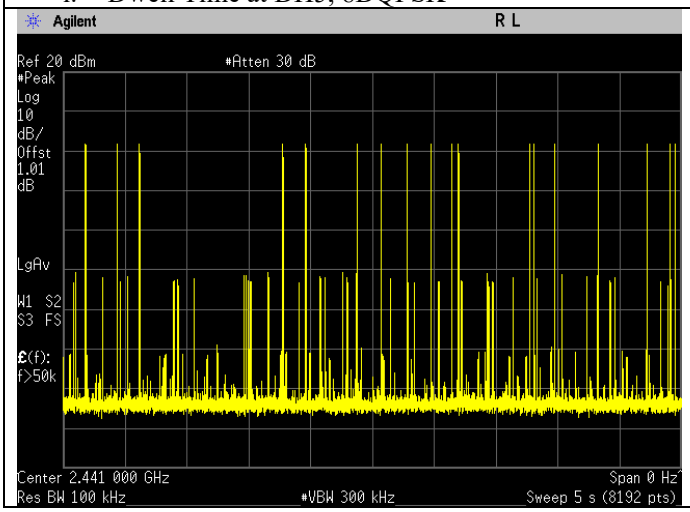


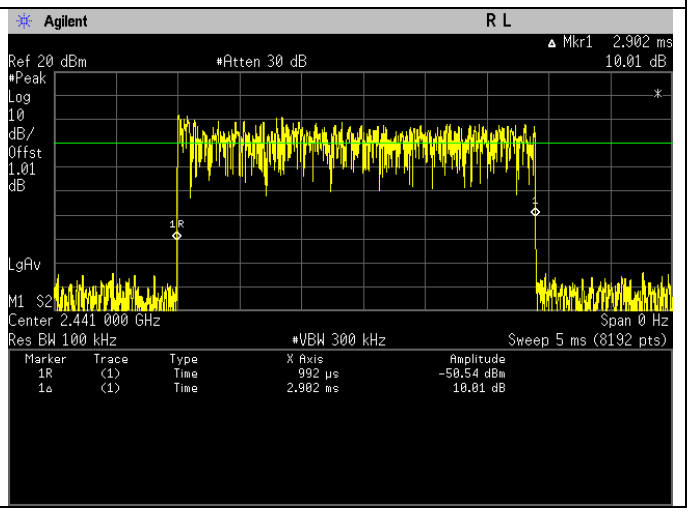
i. Dwell Time at DH3, 8DQPSK





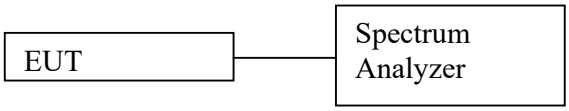
i. Dwell Time at DH5, 8DQPSK





5.5. Number of hopping Frequency

5.5.1. 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.

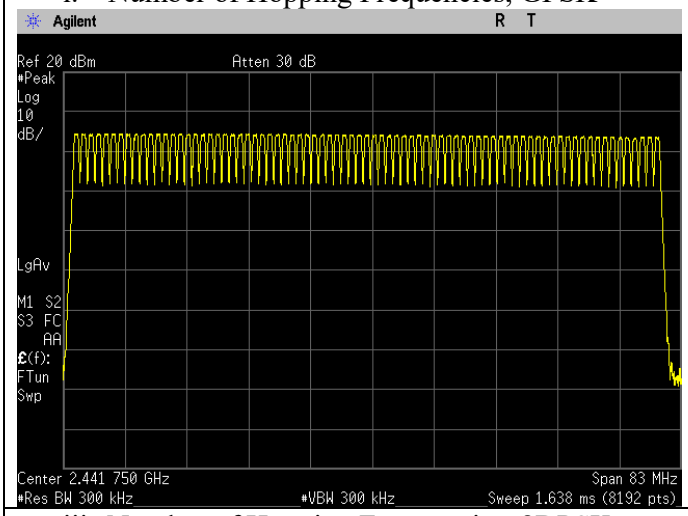
5.5.2. Test Limits:

Normal Condition (25 º C)
≥ 15

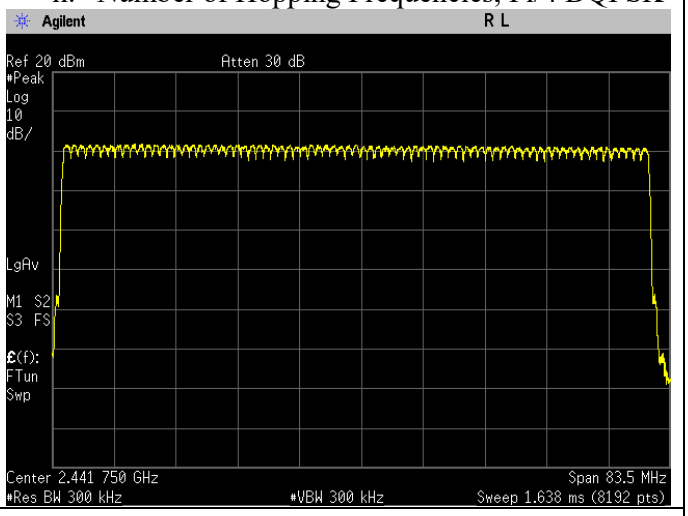
5.5.3. Test Result

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

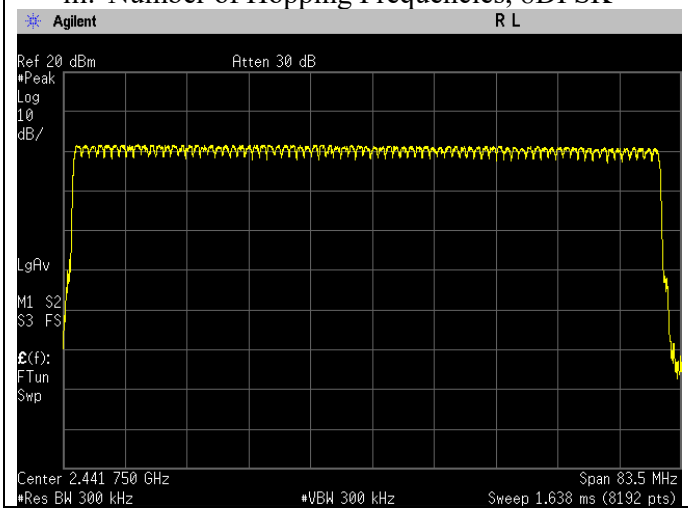
i. Number of Hopping Frequencies, GFSK



ii. Number of Hopping Frequencies, Pi/4 DQPSK

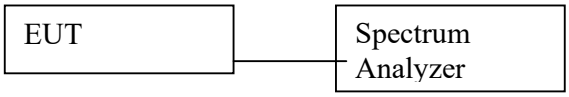


iii. Number of Hopping Frequencies, 8DPSK



5.6. Channel Separation

5.6.1. 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.

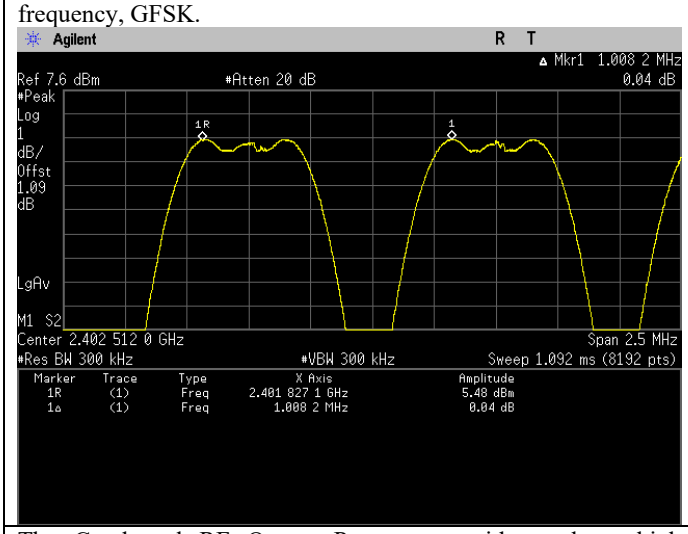
5.6.2. Test Limits:

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

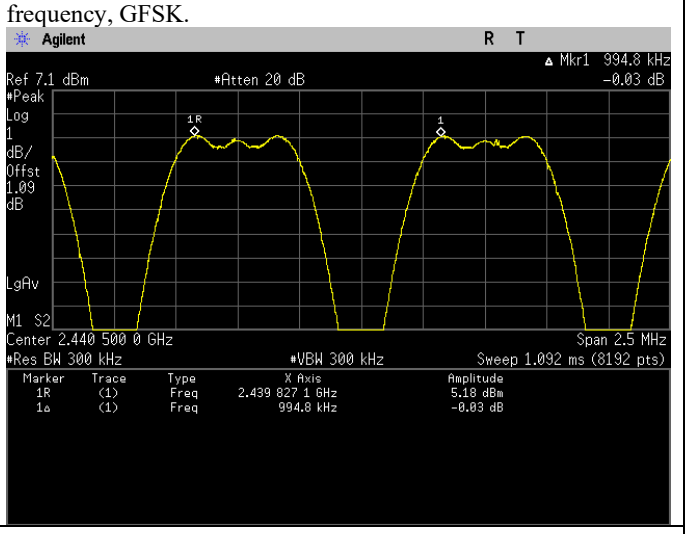
5.6.3. Test Result

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	1.000	666.666	Pass
		2.4410	0.994	1.001	667.333	Pass
		2.4800	0.998	1.004	669.333	Pass
Pi/4DQPSK	7.50	2.4020	0.993	1.278	852.091	Pass
		2.4410	1.000	1.278	851.685	Pass
		2.4800	1.004	1.279	852.405	Pass
8DPSK	7.50	2.4020	0.992	1.261	840.666	Pass
		2.4410	0.995	1.269	846.000	Pass
		2.4800	1.002	1.269	846.000	Pass

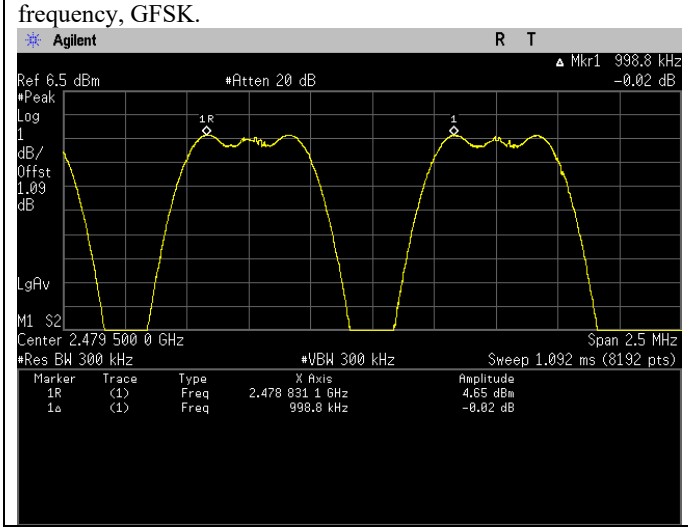
The Conducted RF Output Power test with result at low frequency, GFSK.



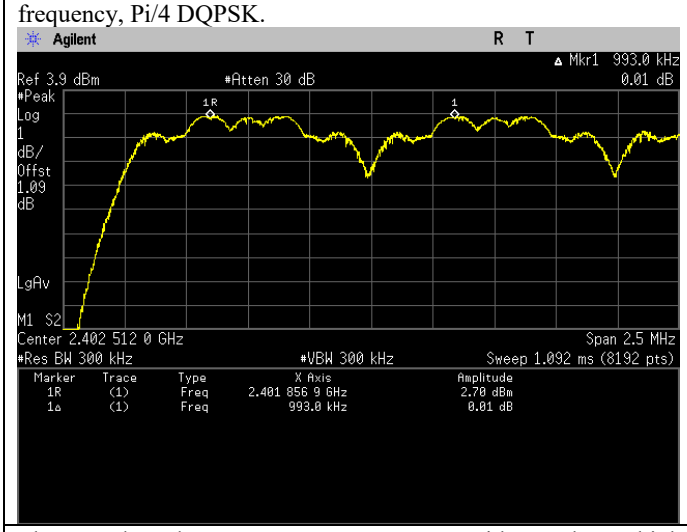
The Conducted RF Output Power test with result at mid frequency, GFSK.



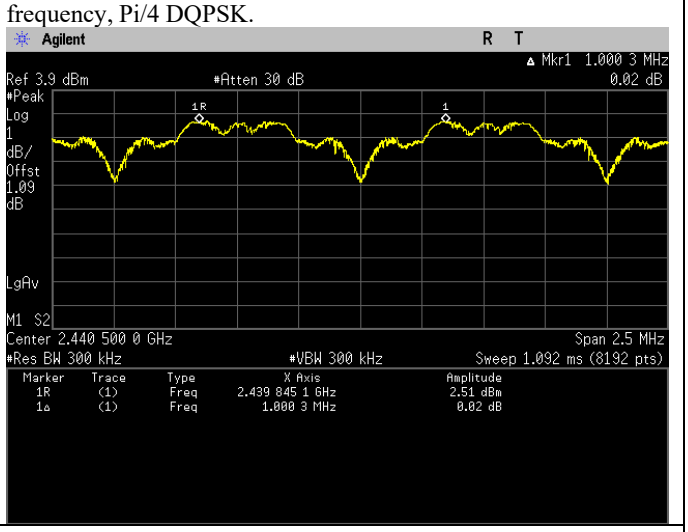
The Conducted RF Output Power test with result at high frequency, GFSK.



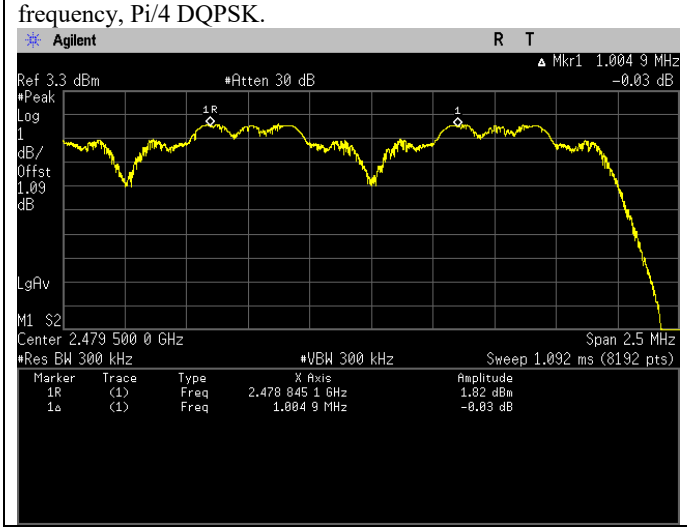
The Conducted RF Output Power test with result at low frequency, Pi/4 DQPSK.



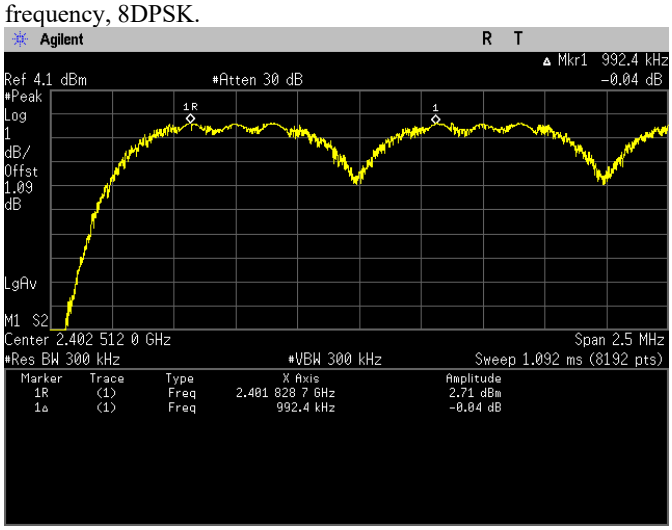
The Conducted RF Output Power test with result at mid frequency, Pi/4 DQPSK.



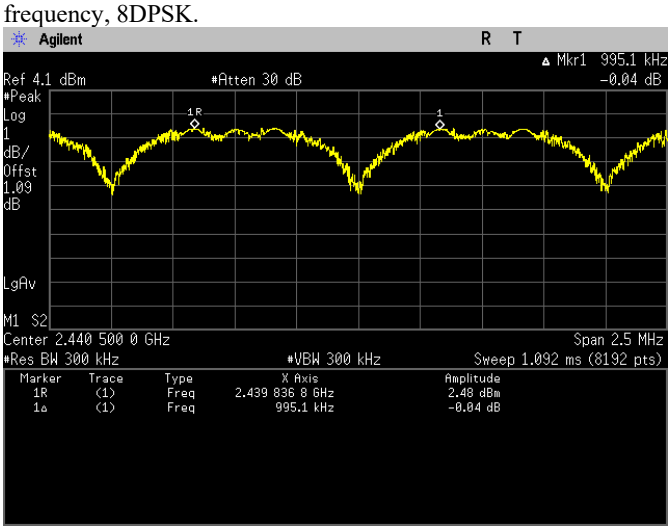
The Conducted RF Output Power test with result at high frequency, Pi/4 DQPSK.



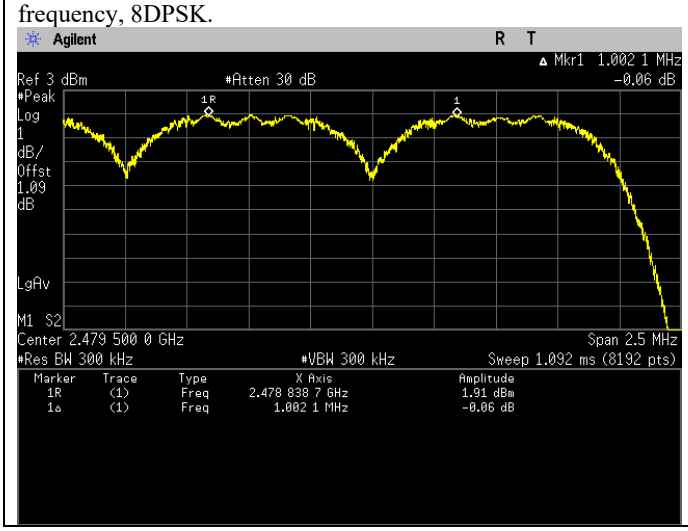
The Conducted RF Output Power test with result at low frequency, 8DPSK.



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

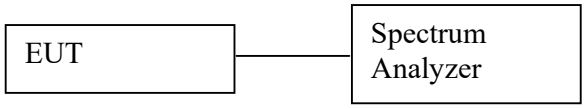


The Conducted RF Output Power test with result at high frequency, 8DPSK.



5.7. Conducted Spurious Emission

5.7.1. 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.

5.7.2. Test Limits:

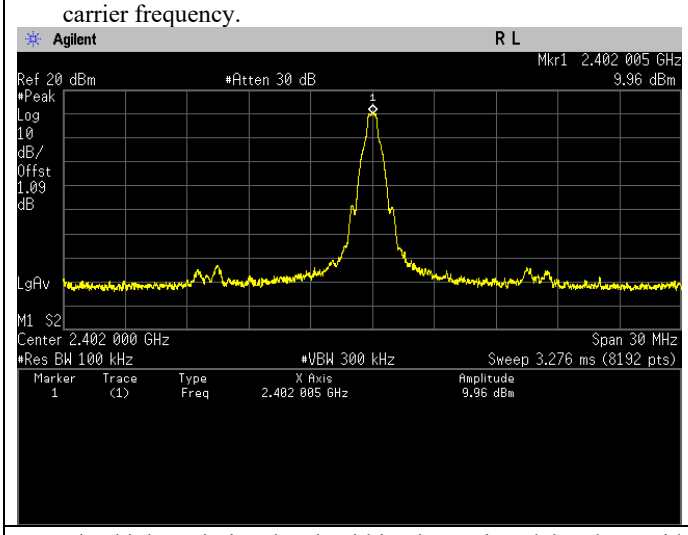
Normal Condition (25 º C)
Shall be at least 20 dB below for peak power.

5.7.3. Test Data:

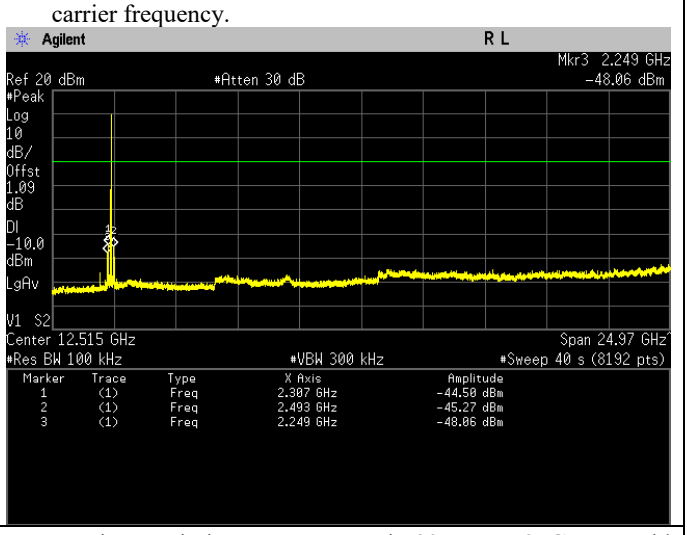
Test Conditions			Results		
Modulation	Voltage(V)	Test Frequency (GHz)	Spurs (MHz)	Level (dBm)	Status
GFSK	7.50	2.4020	2307.000	-44.496	Pass
		2.4410	2347.000	-44.733	Pass
		2.4800	2383.000	-44.762	Pass
Pi/4 DQPSK	7.50	2.4020	24689.000	-52.943	Pass
		2.4410	2344.000	-51.827	Pass
		2.4800	24951.000	-52.966	Pass
8DPSK	7.50	2.4020	24960.000	-52.435	Pass
		2.4410	24317.000	-53.096	Pass
		2.4800	2325.000	-51.966	Pass

GFSK Modulation:

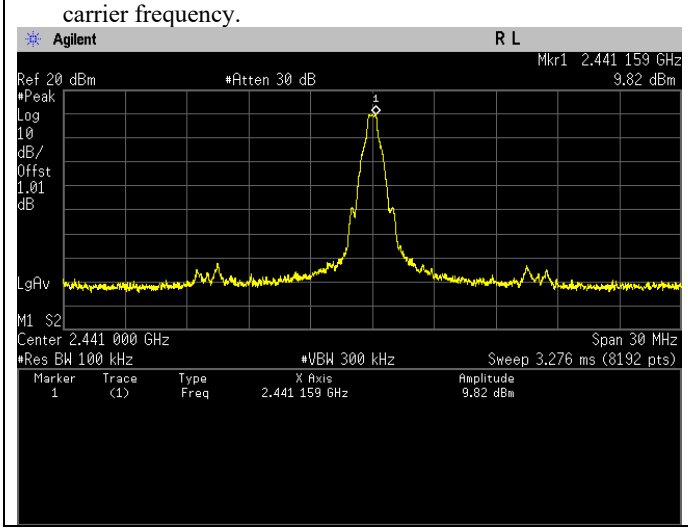
- The high emission level within the assigned band at low carrier frequency.



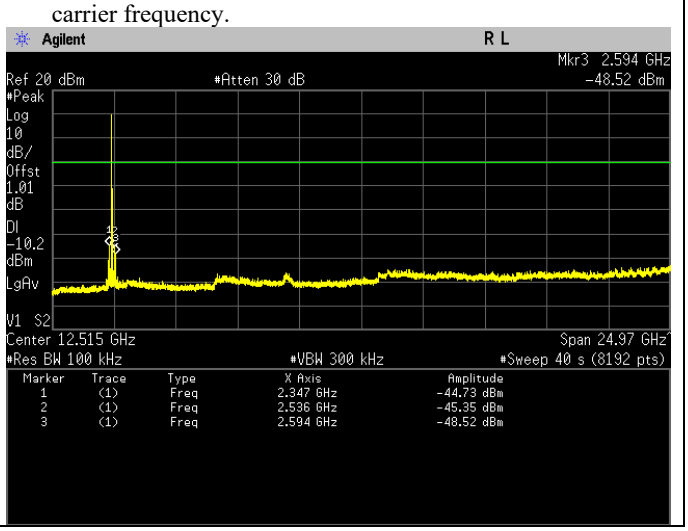
- Spurious emission measurement in **30MHz – 25GHz** at low carrier frequency.



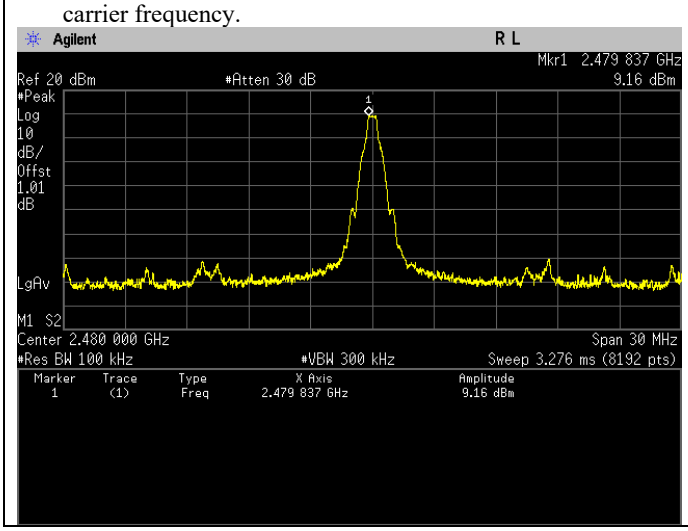
- The high emission level within the assigned band at mid carrier frequency.



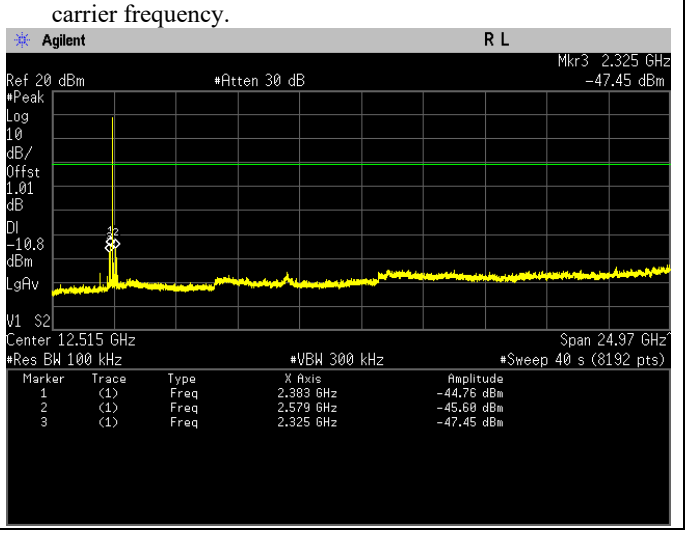
- Spurious emission measurement in **30MHz – 25GHz** at mid carrier frequency.



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

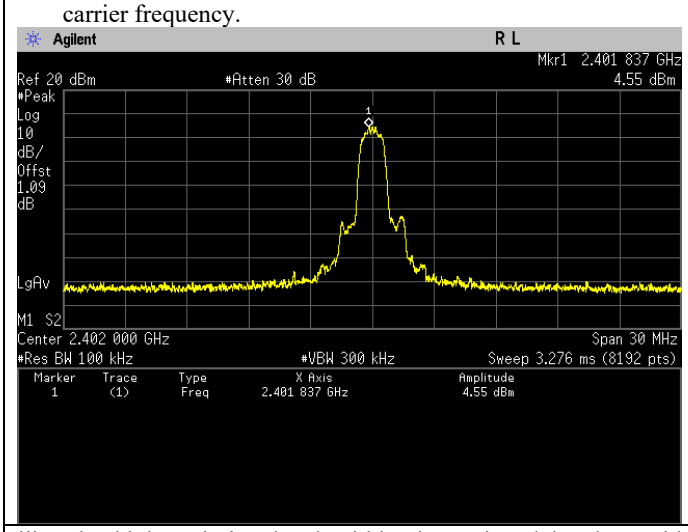


- Spurious emission measurement in **30MHz – 25GHz** at high carrier frequency.

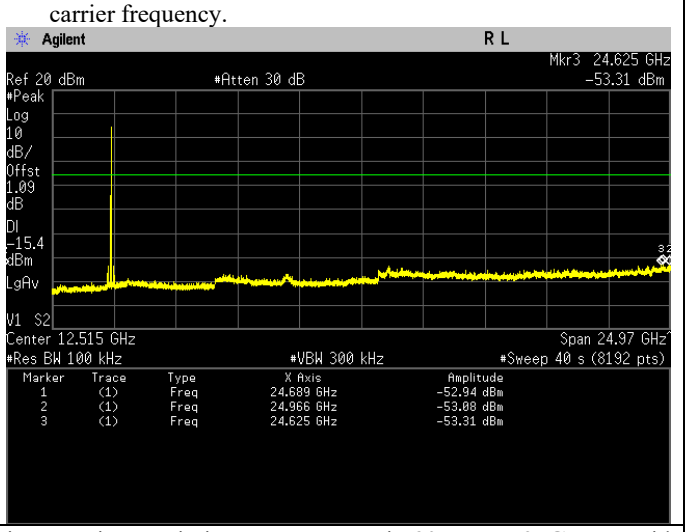


Pi/4 DQPSK Modulation:

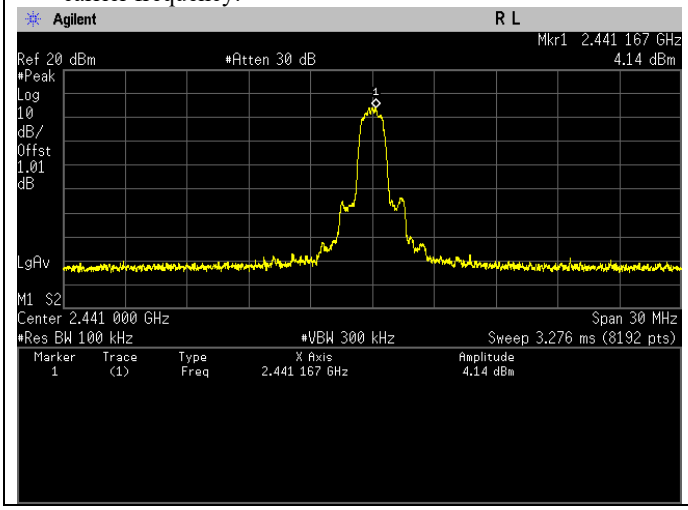
i. The high emission level within the assigned band at low carrier frequency.



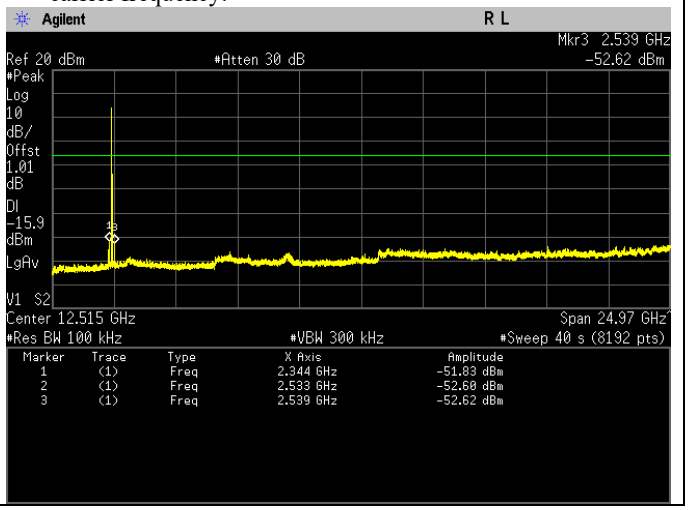
ii. Spurious emission measurement in **30MHz – 25GHz** at low carrier frequency.



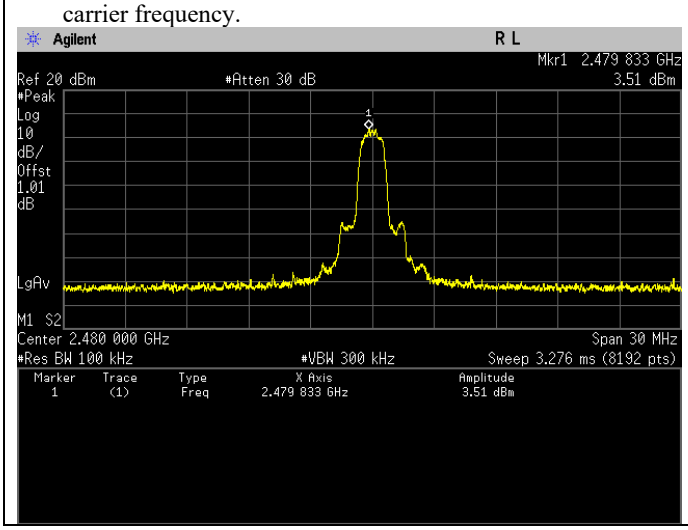
iii. The high emission level within the assigned band at mid carrier frequency.



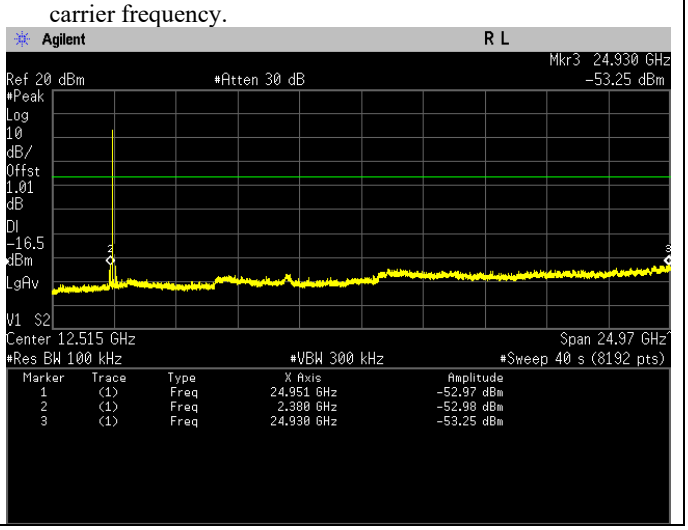
iv. Spurious emission measurement in **30MHz – 25GHz** at mid carrier frequency.



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

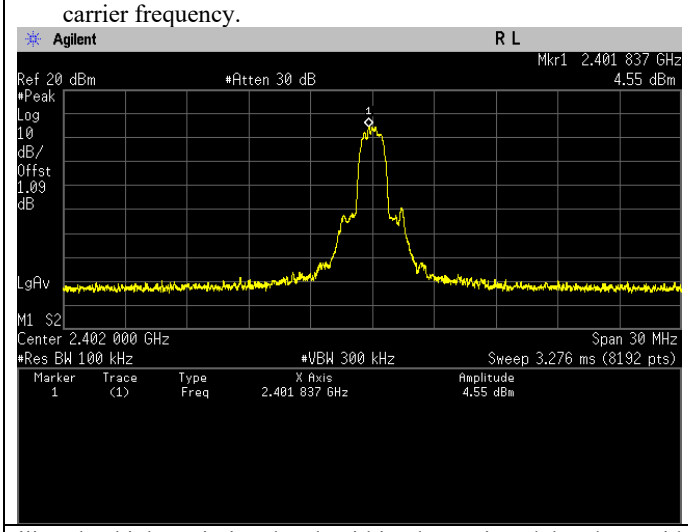


vi. Spurious emission measurement in **30MHz – 25GHz** at high carrier frequency.

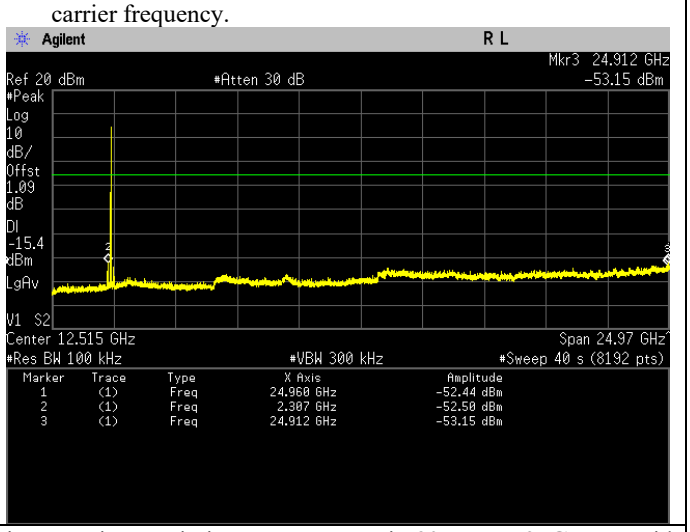


8DPSK Modulation:

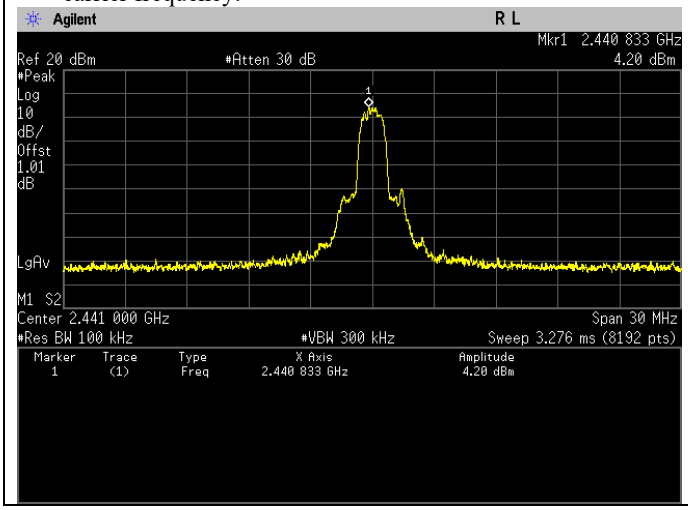
i. The high emission level within the assigned band at low carrier frequency.



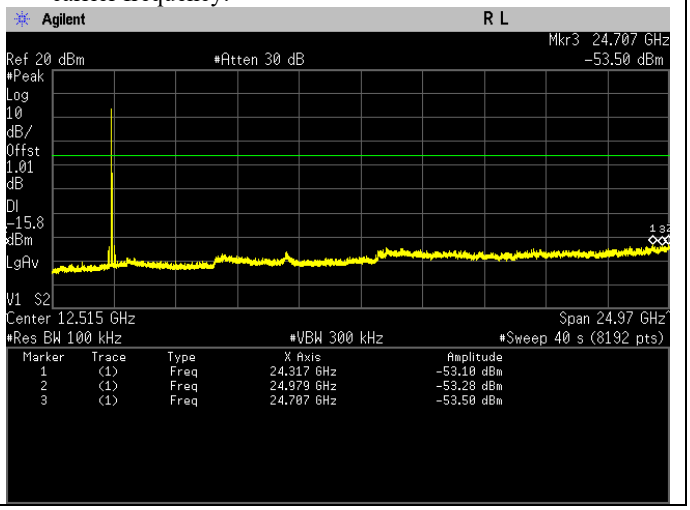
ii. Spurious emission measurement in **30MHz – 25GHz** at low carrier frequency.



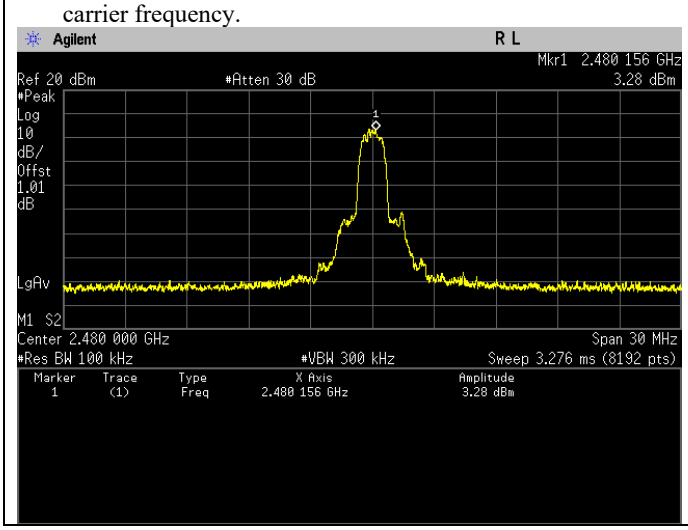
iii. The high emission level within the assigned band at mid carrier frequency.



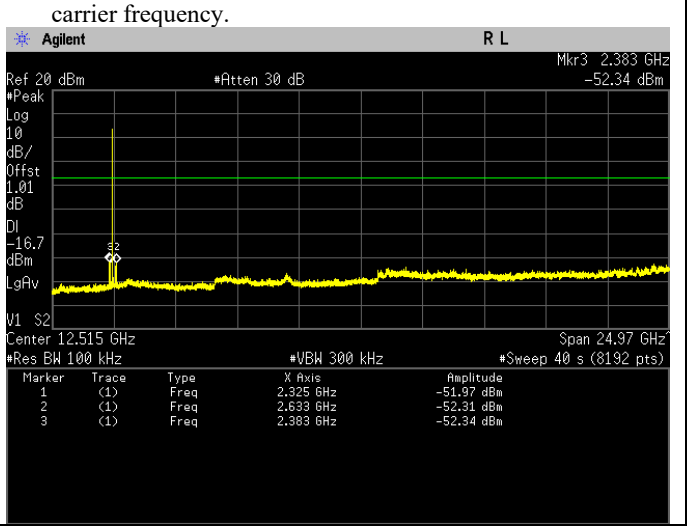
iv. Spurious emission measurement in **30MHz – 25GHz** at mid carrier frequency.



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

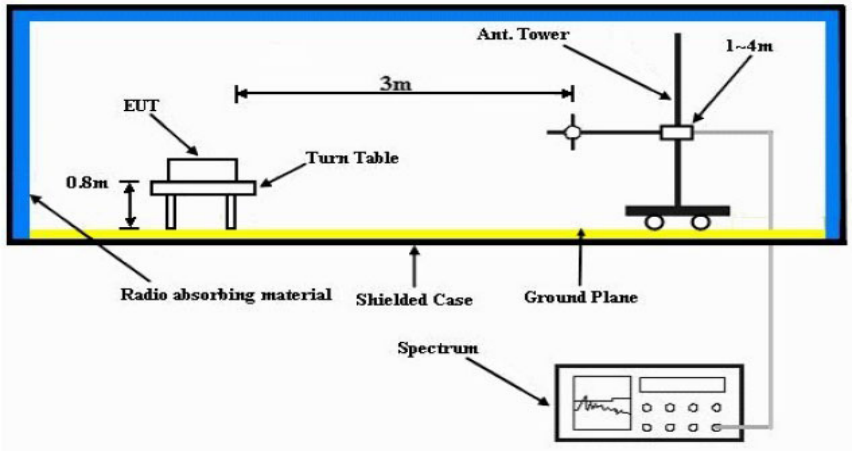


vi. Spurious emission measurement in **30MHz – 25GHz** at high carrier frequency.



5.8. Radiated Emission within restricted Bands

5.8.1. 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.

5.8.2. 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.

5.8.3. Test Data:

Test: Bluetooth SAC Restricted Band Edge
Model Number: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
Test Channel: Low Test Frequency: 2402.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (GFSK)

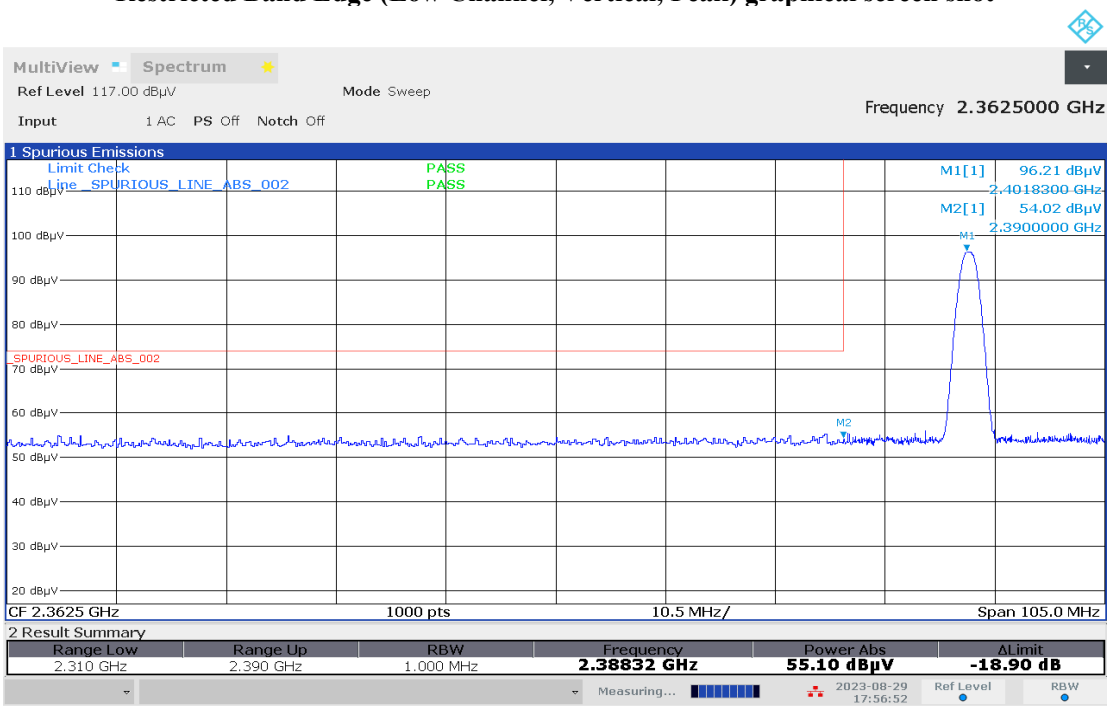
Restricted Band Edge (Low Channel) tabular data

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	-	54.0236	43.1248	-	74.0000	54.0000	-	19.9764	10.8752	-
Horizontal Radiated Emission Result										
2390.0000	-	54.2965	43.2361	-	74.0000	54.0000	-	19.7035	10.7639	-

Remarks: Pass Result	Marginal Result	Fail Result

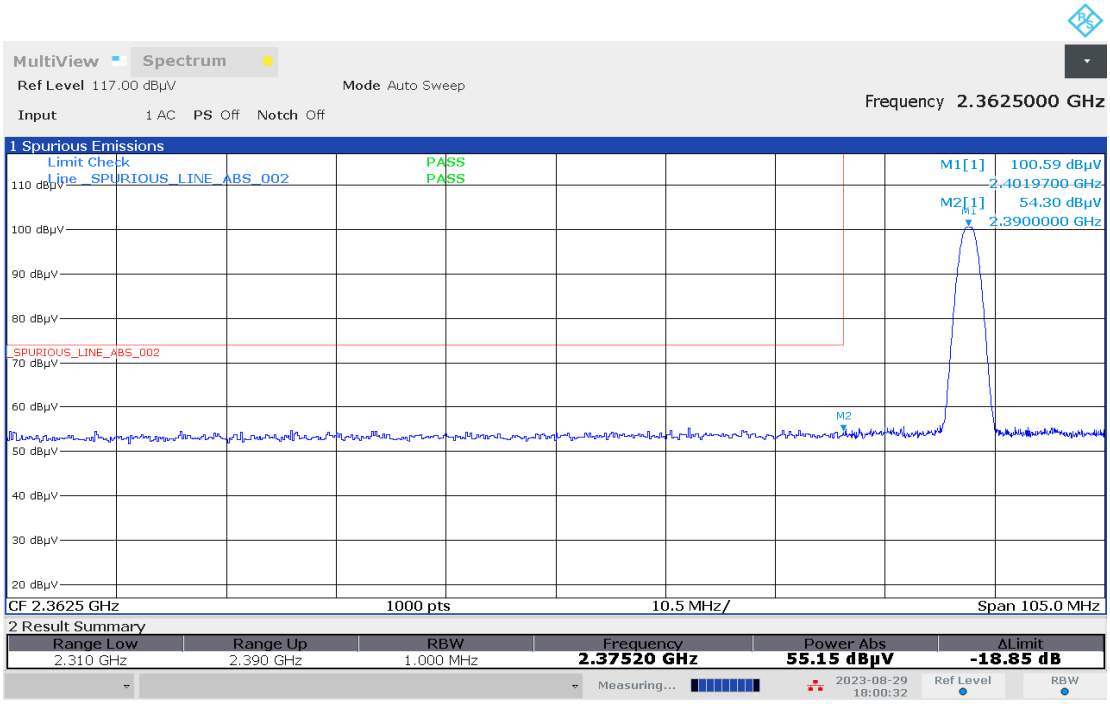
Temperature (degC):23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Tue, 29 Aug, 2023**
System MU: 4.03dB

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



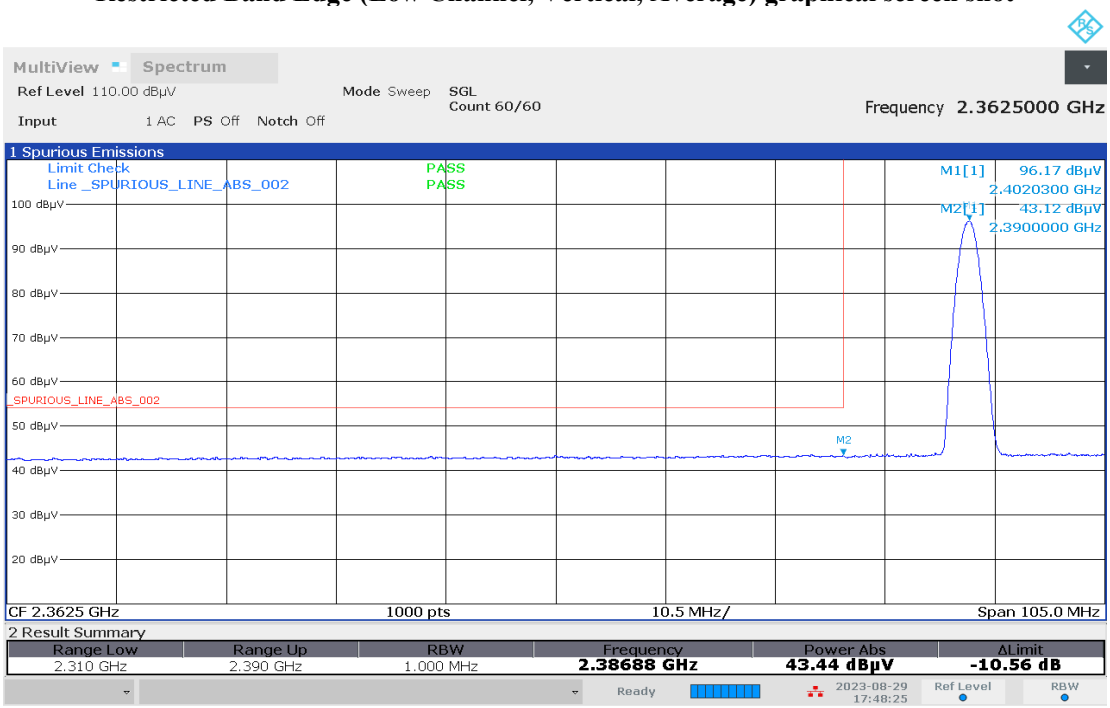
05:56:53 PM 08/29/2023

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



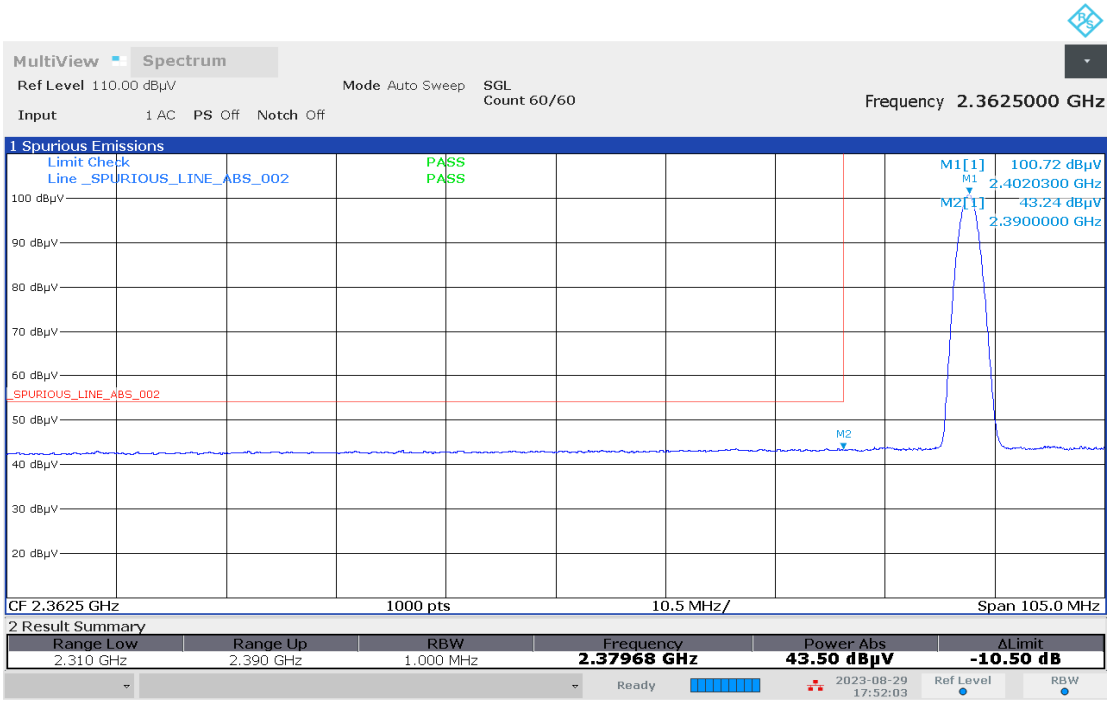
06:00:33 PM 08/29/2023

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



05:48:26 PM 08/29/2023

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



05:52:04 PM 08/29/2023

Test: Bluetooth SAC Restricted Band Edge
Model Number: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
Test Channel: High Test Frequency: 2480.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (GFSK)

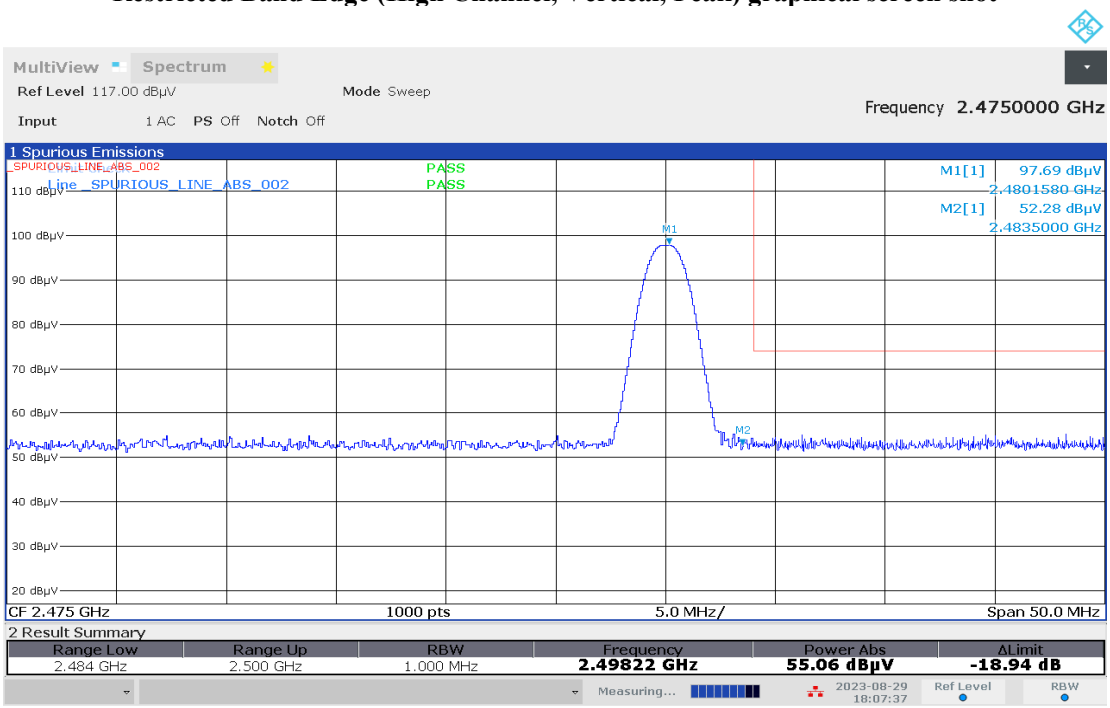
Restricted Band Edge (High Channel) tabular data

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	-	52.2844	43.5437	-	74.0000	54.0000	-	21.7156	10.4563	-
Horizontal Radiated Emission Result										
2483.5000	-	54.4131	43.8194	-	74.0000	54.0000	-	19.5869	10.1806	-

Remarks: Pass Result	Marginal Result	Fail Result

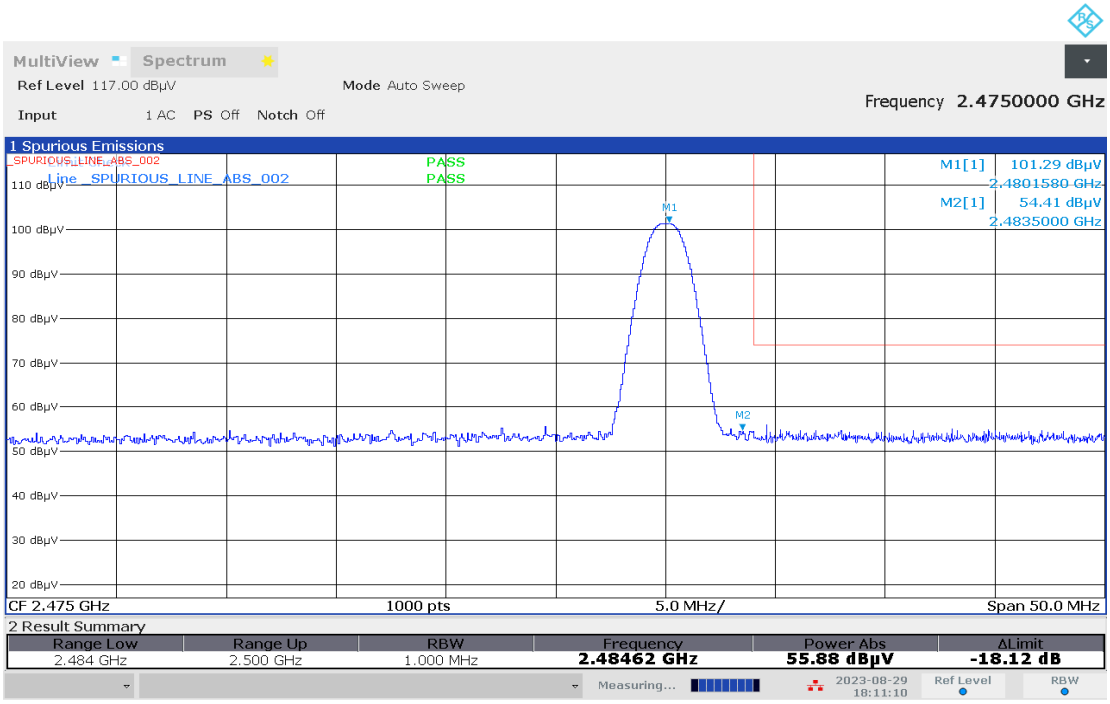
Temperature (degC):23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Wed, 30 Aug, 2023**
System MU: 5.84dB

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



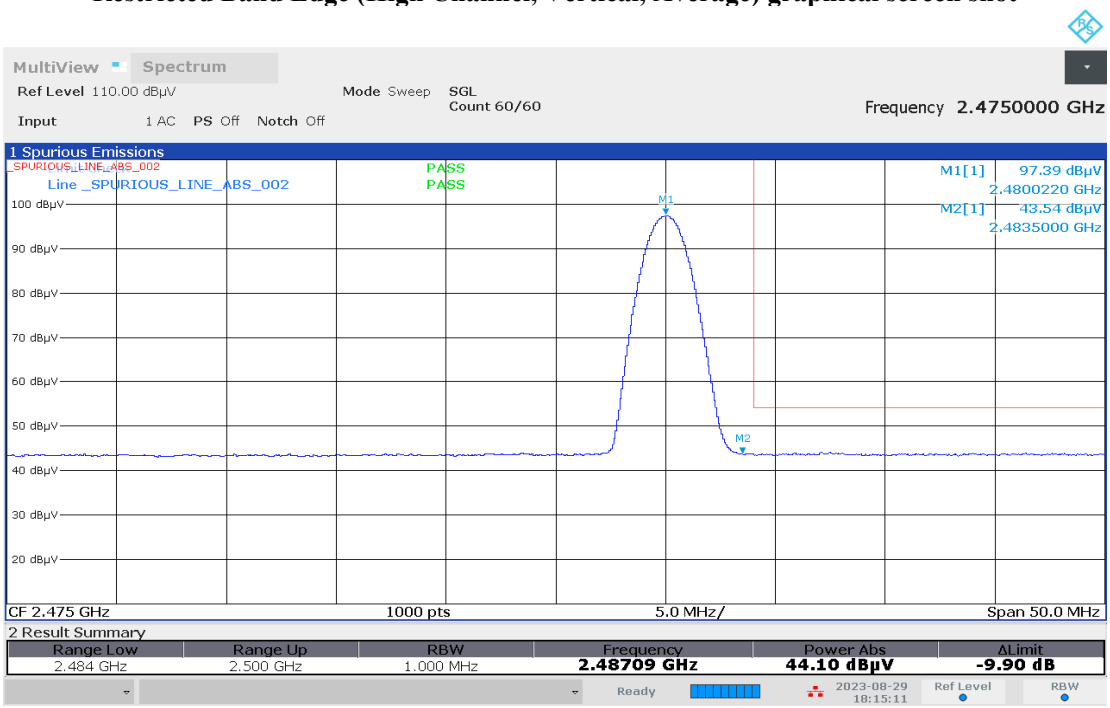
06:07:38 PM 08/29/2023

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



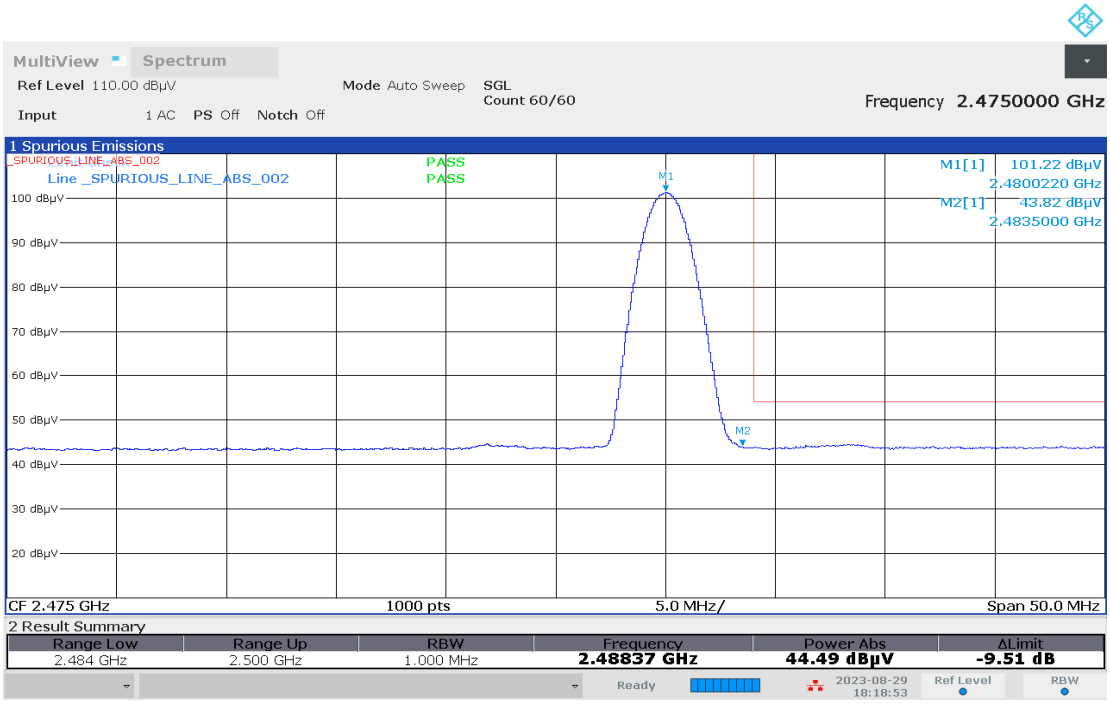
06:11:11 PM 08/29/2023

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



06:15:13 PM 08/29/2023

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



06:18:53 PM 08/29/2023

Test: Bluetooth SAC Restricted Band Edge
Model Number: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
Test Channel: Low Test Frequency: 2402.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (DQPSK)

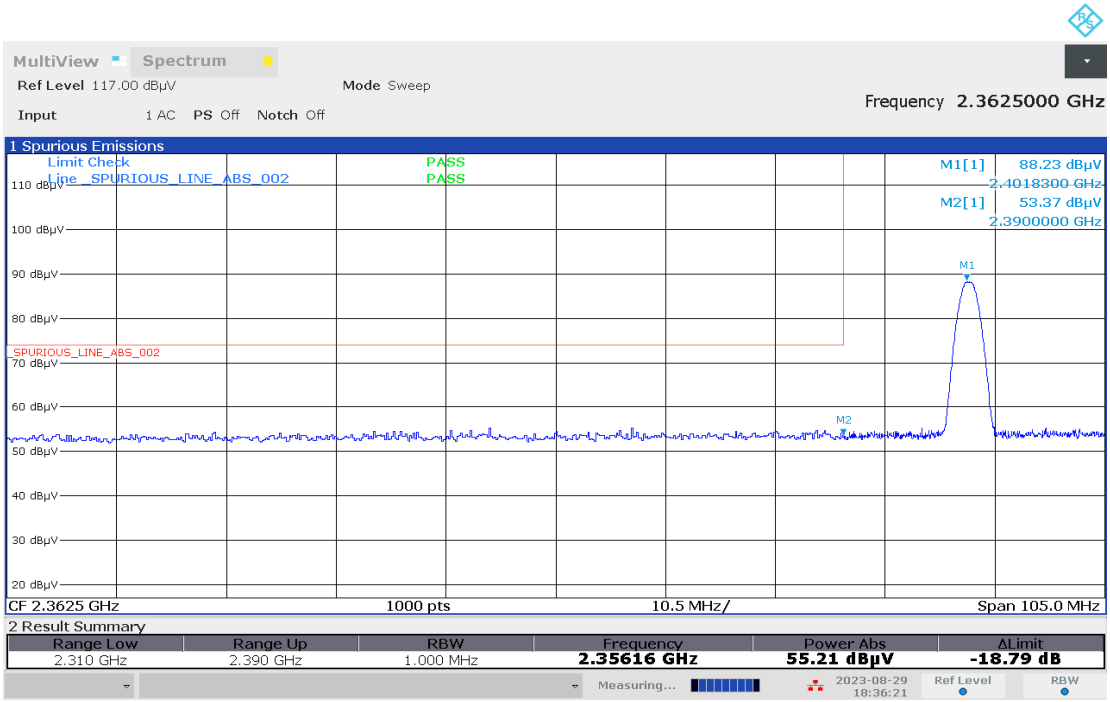
Restricted Band Edge (Low Channel) tabular data

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	-	53.3681	43.4547	-	74.0000	54.0000	-	20.6319	10.5453	-
Horizontal Radiated Emission Result										
2390.0000	-	53.2155	43.2361	-	74.0000	54.0000	-	20.7845	10.7639	-

Remarks: Pass Result	Marginal Result	Fail Result

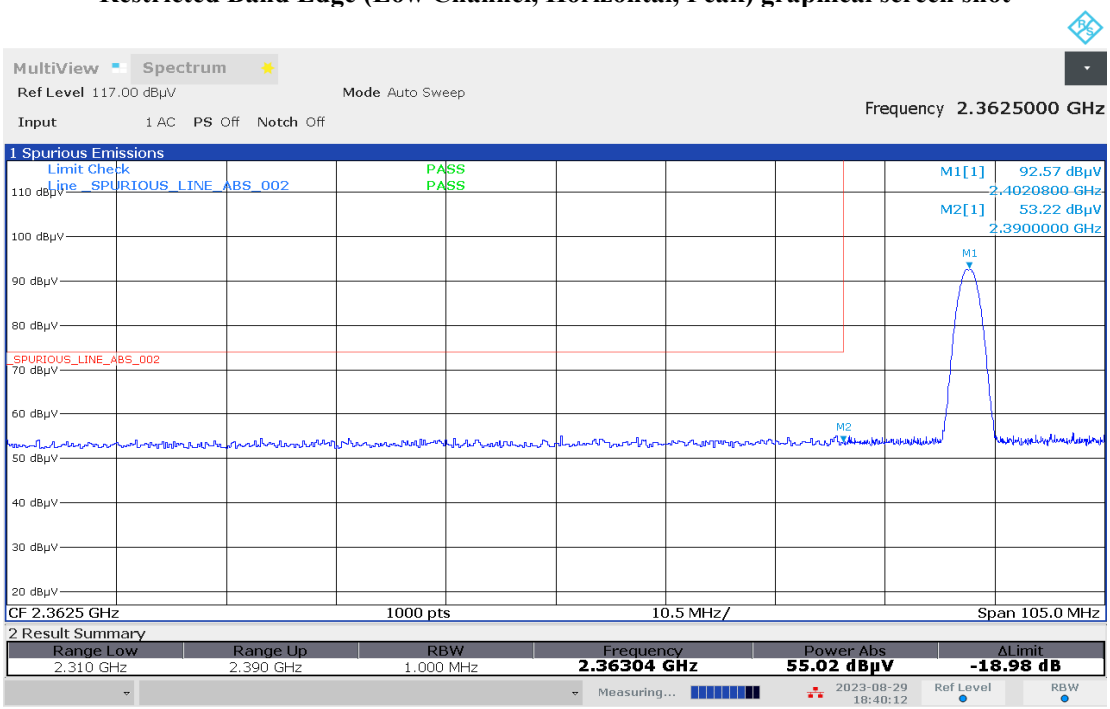
Temperature (degC):23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Wed, 30 Aug, 2023**
System MU: 5.84dB

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



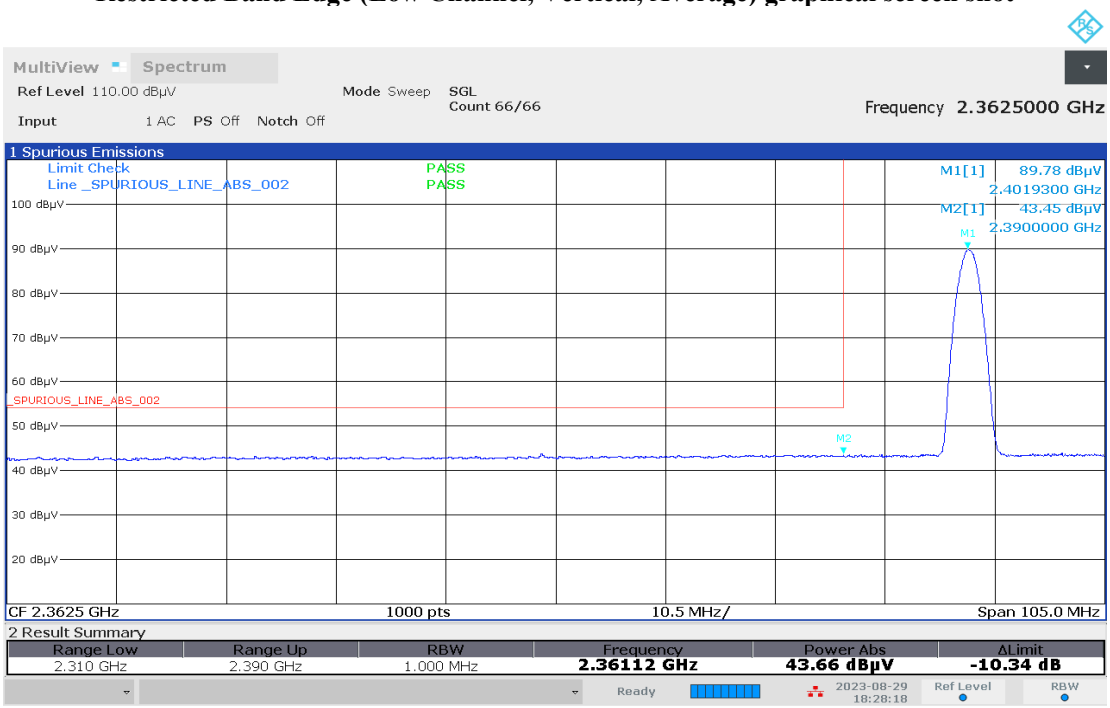
06:36:21 PM 08/29/2023

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



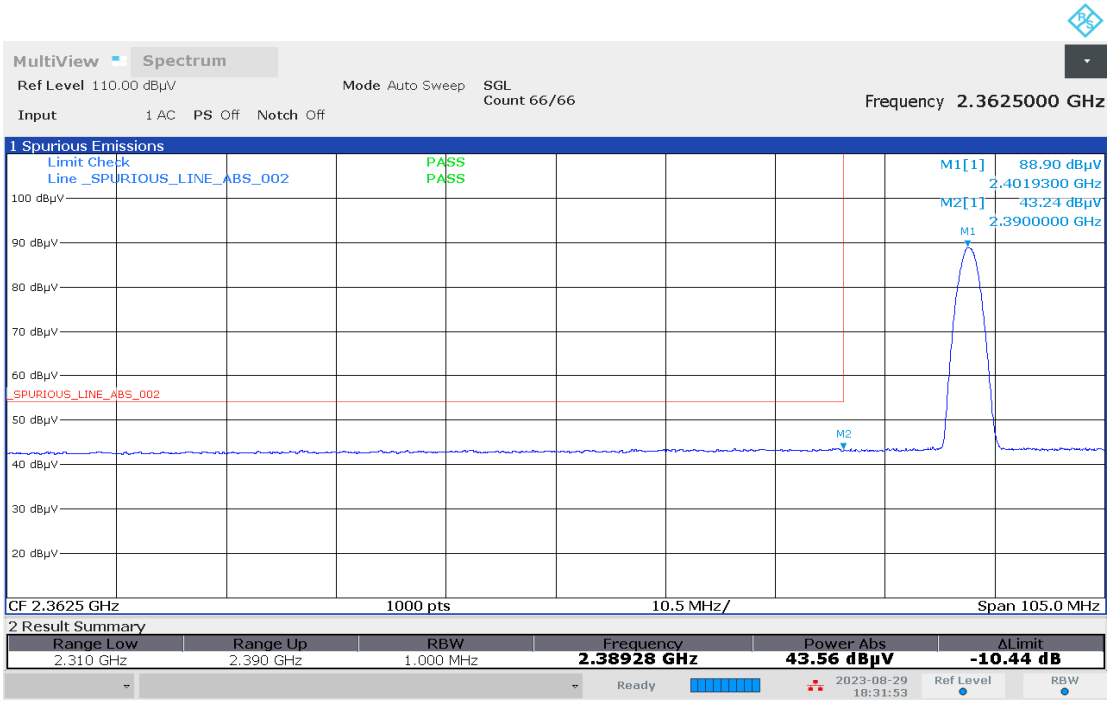
06:40:13 PM 08/29/2023

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



06:28:19 PM 08/29/2023

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



06:31:54 PM 08/29/2023

Test: Bluetooth SAC Restricted Band Edge
Model Number: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
Test Channel: High Test Frequency: 2480.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (DQPSK)

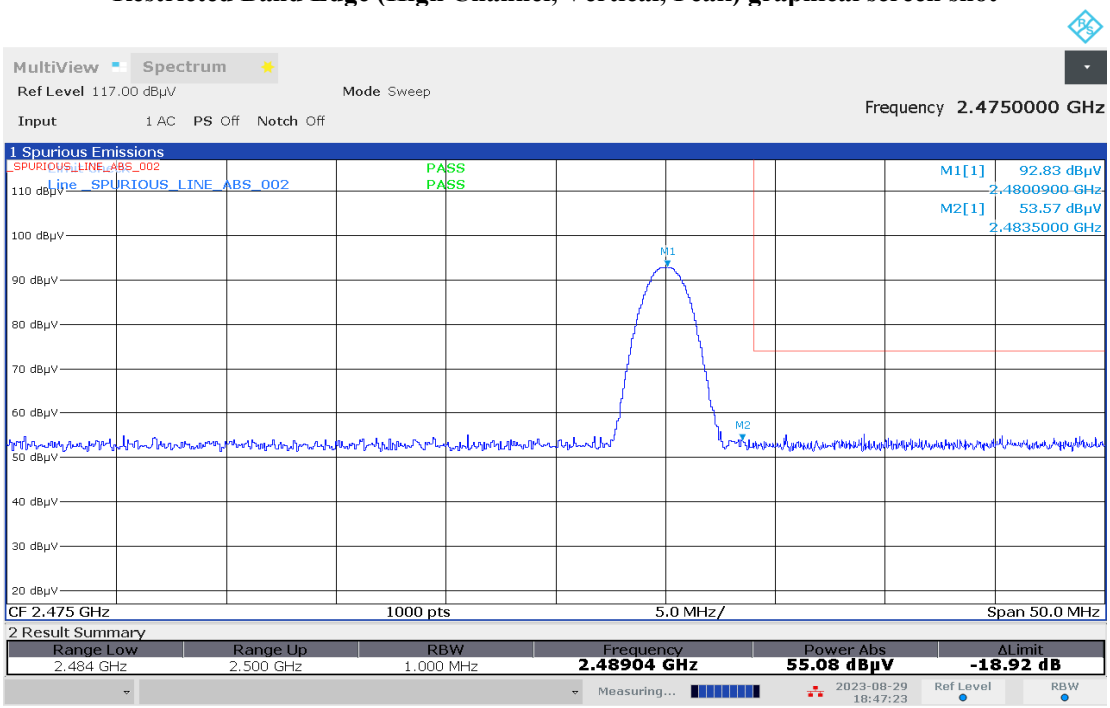
Restricted Band Edge (High Channel) tabular data

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	-	53.5652	43.7285	-	74.0000	54.0000	-	20.4348	10.2715	-
Horizontal Radiated Emission Result										
2483.5000	-	52.8950	43.9094	-	74.0000	54.0000	-	21.1050	10.0906	-

Remarks: Pass Result	Marginal Result	Fail Result

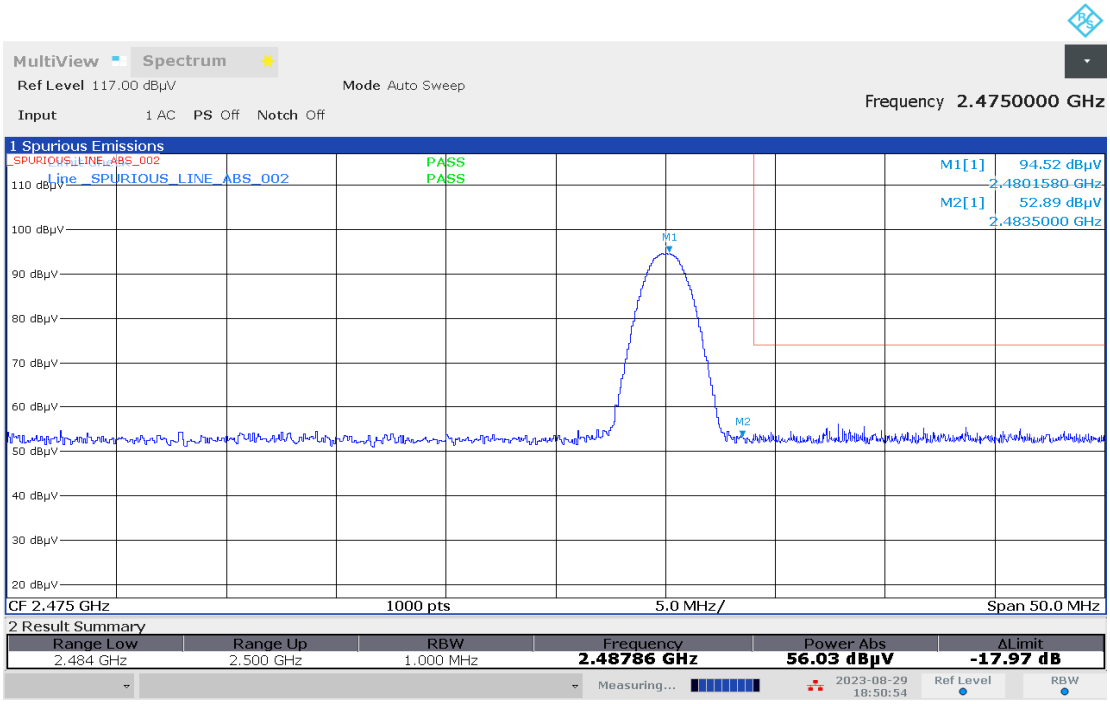
Temperature (degC):23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Wed, 30 Aug, 2023**
System MU: 5.84dB

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



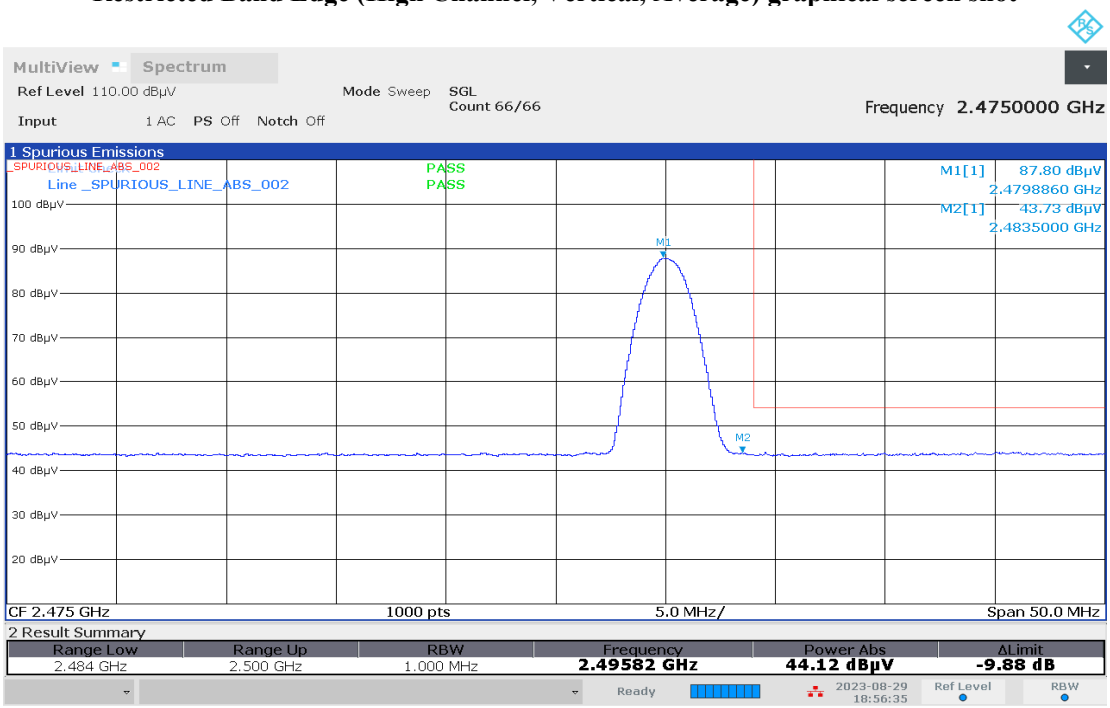
06:47:24 PM 08/29/2023

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



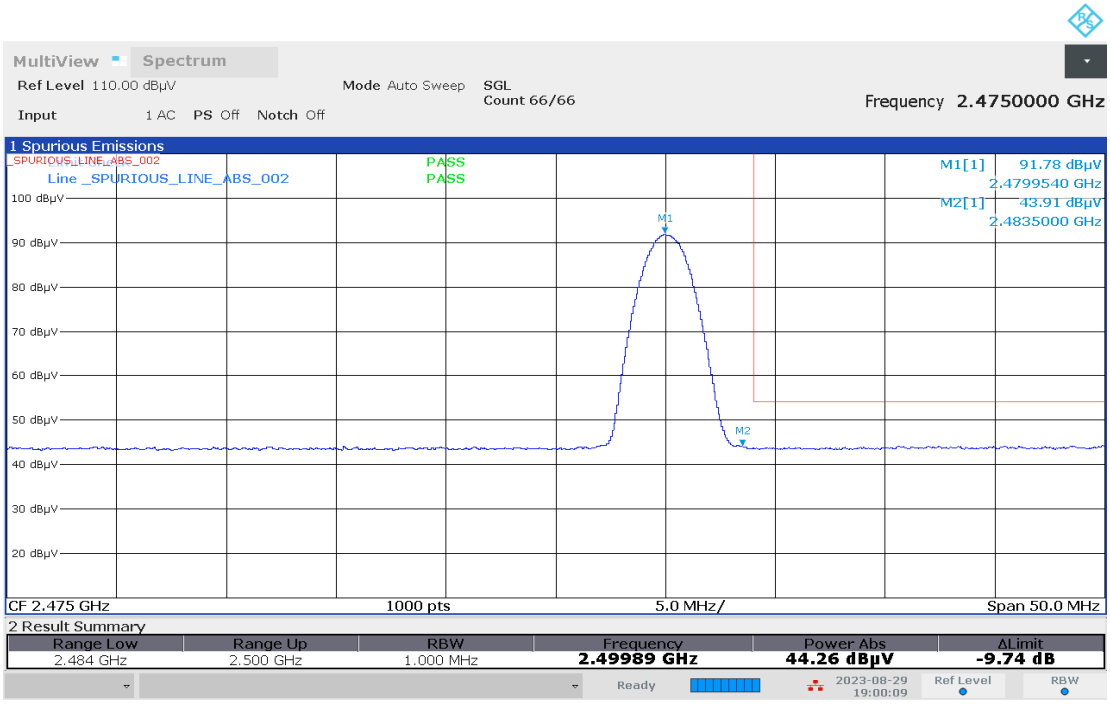
06:50:54 PM 08/29/2023

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



06:56:35 PM 08/29/2023

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



07:00:09 PM 08/29/2023

Test: Bluetooth SAC Restricted Band Edge
Model Number: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
Test Channel: Low Test Frequency: 2402.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (8DPSK)

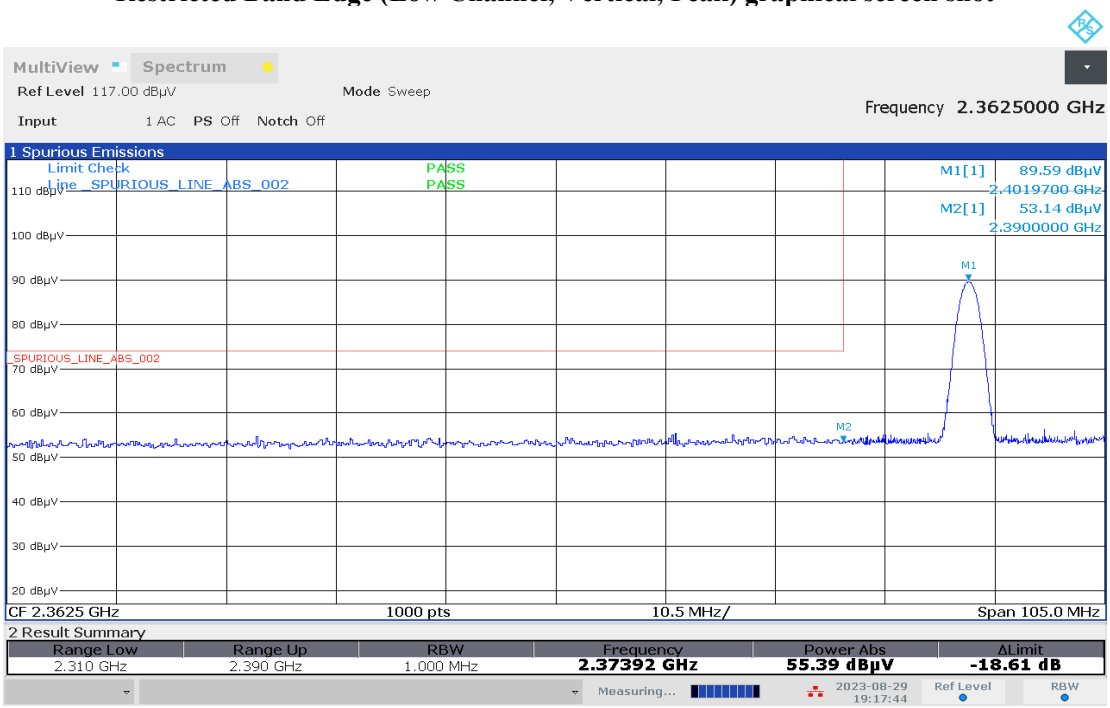
Restricted Band Edge (Low Channel) tabular data

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	-	53.1409	43.0120	-	74.0000	54.0000	-	20.8591	10.9880	-
Horizontal Radiated Emission Result										
2390.0000	-	52.8924	43.2361	-	74.0000	54.0000	-	21.1076	10.7639	-

Remarks: Pass Result	Marginal Result	Fail Result

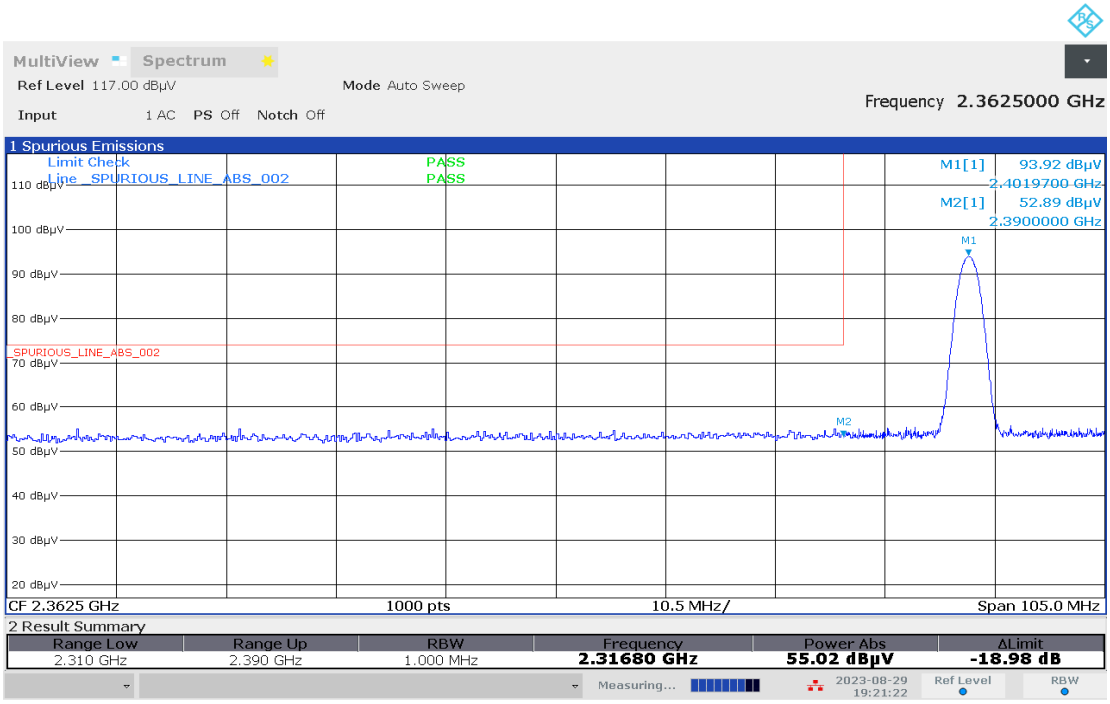
Temperature (degC):23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Wed, 30 Aug, 2023**
System MU: 5.84dB

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



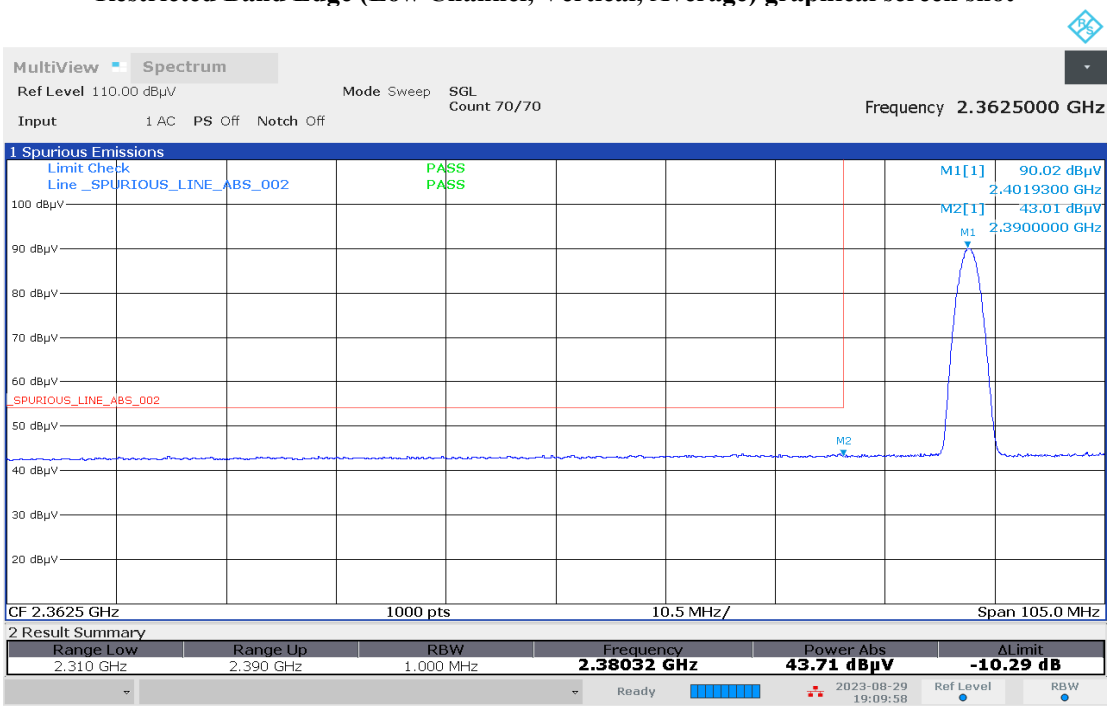
07:17:45 PM 08/29/2023

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



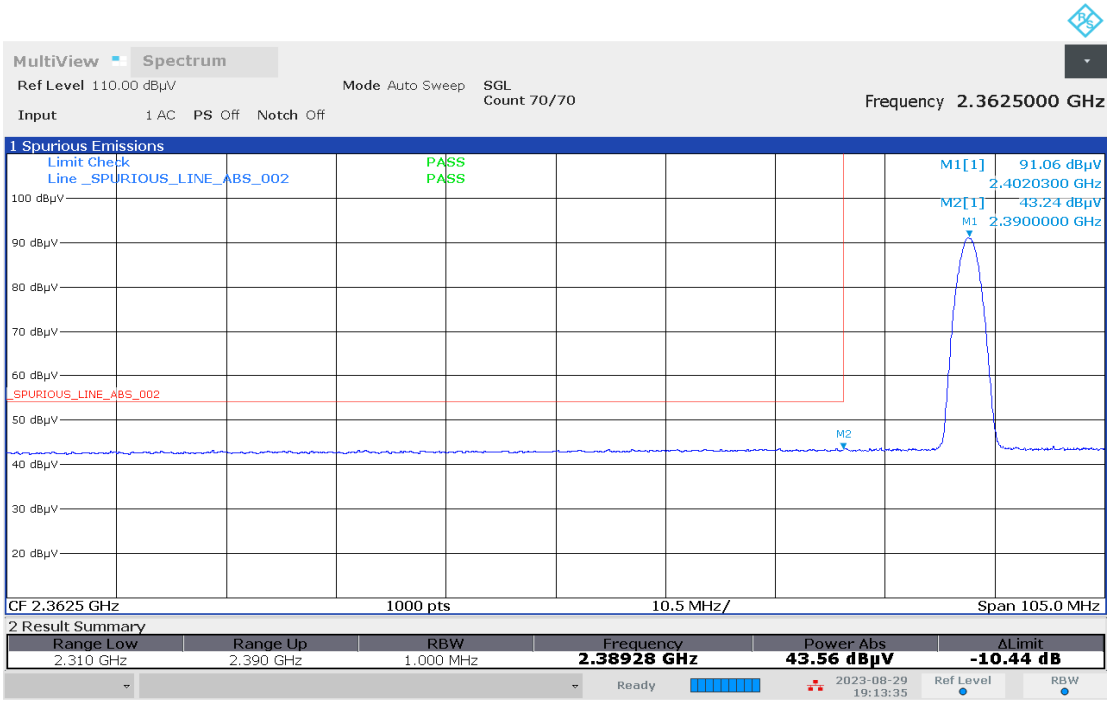
07:21:23 PM 08/29/2023

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



07:09:58 PM 08/29/2023

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



07:13:36 PM 08/29/2023

Test: Bluetooth SAC Restricted Band Edge
Model Number: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
Test Channel: High Test Frequency: 2480.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Z-Plane (8DPSK)

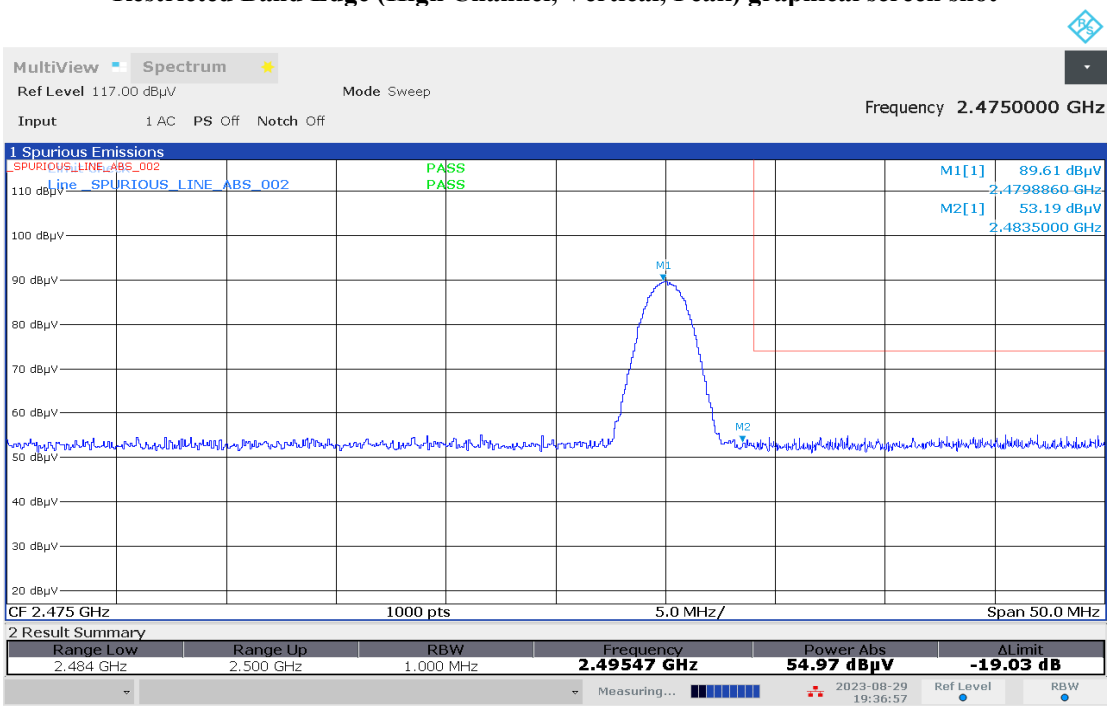
Restricted Band Edge (High Channel) tabular data

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	-	53.1867	43.6826	-	74.0000	54.0000	-	20.8133	10.3174	-
Horizontal Radiated Emission Result										
2483.5000	-	51.8614	43.6826	-	74.0000	54.0000	-	22.1386	10.3174	-

Remarks: Pass Result	Marginal Result	Fail Result

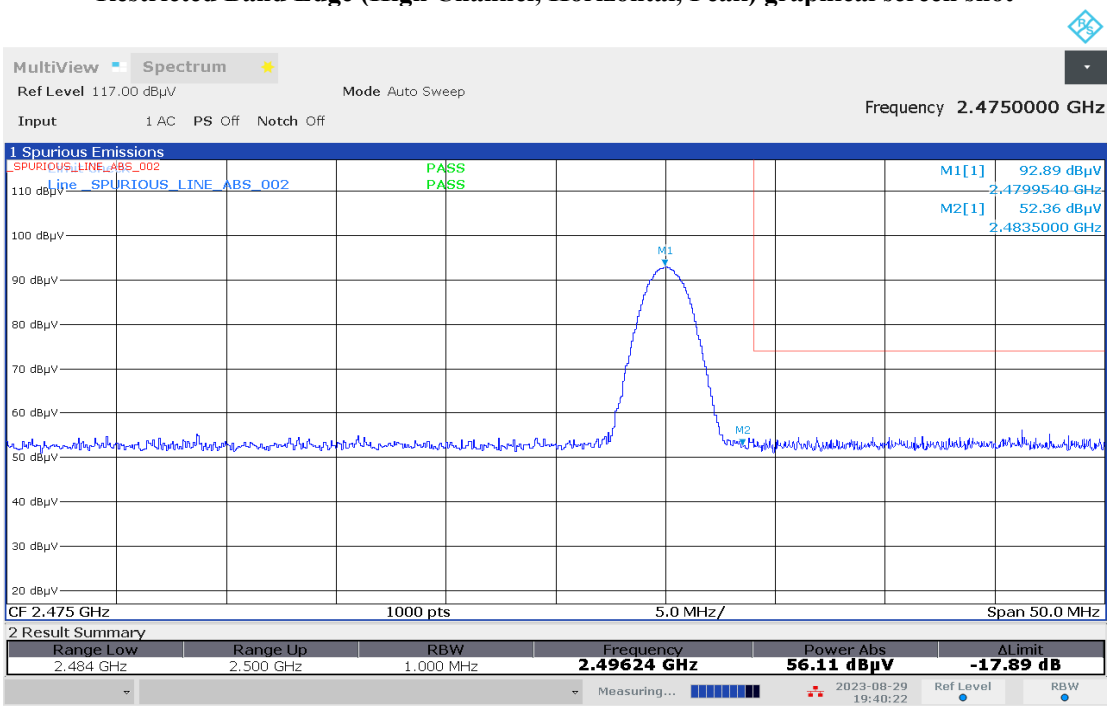
Temperature (degC):23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Wed, 30 Aug, 2023**
System MU: 5.84dB

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



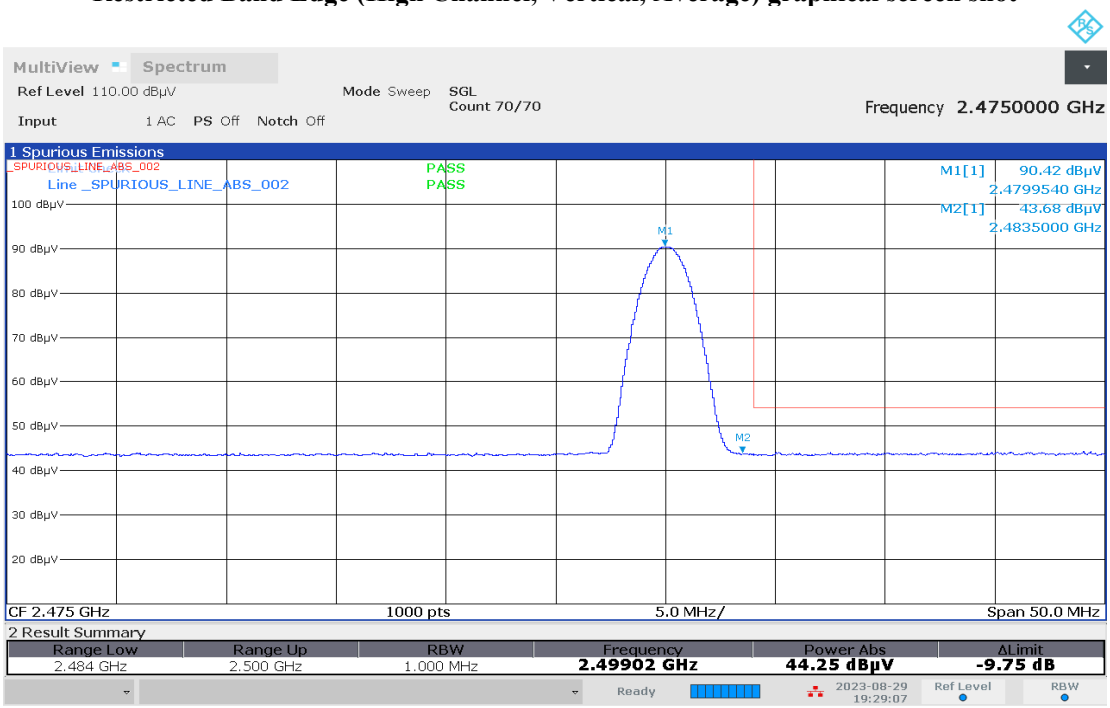
07:36:58 PM 08/29/2023

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



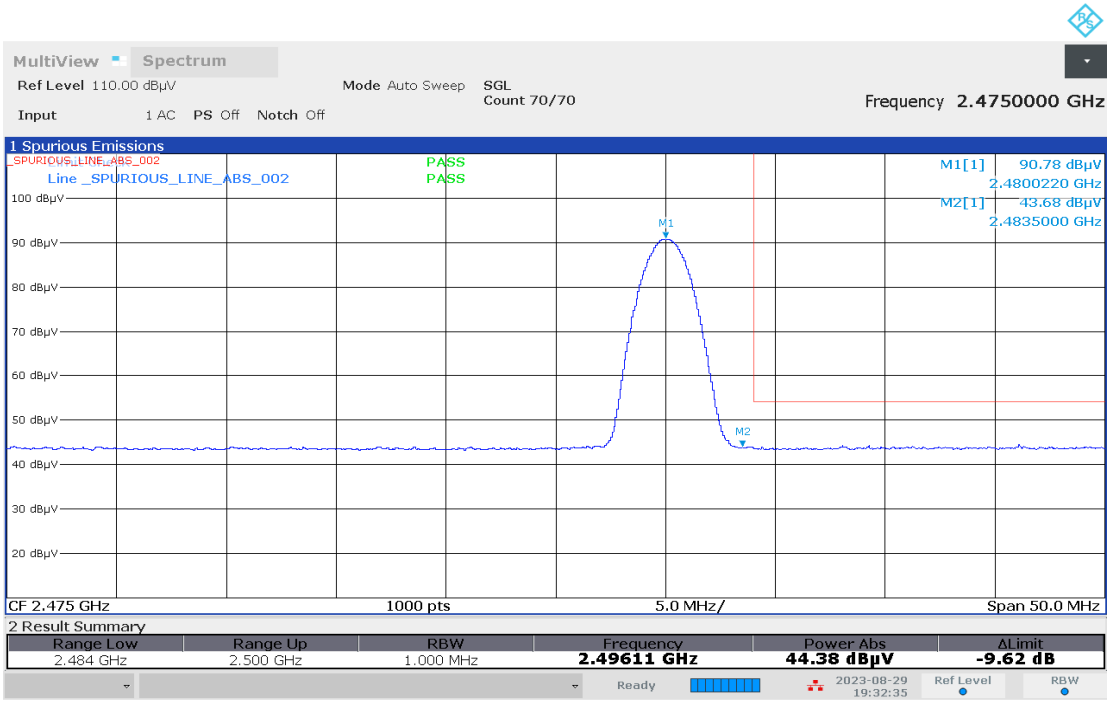
07:40:23 PM 08/29/2023

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



07:29:08 PM 08/29/2023

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



07:32:35 PM 08/29/2023

Test: Bluetooth SAC Transmitter Radiated Emission
Model#: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
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

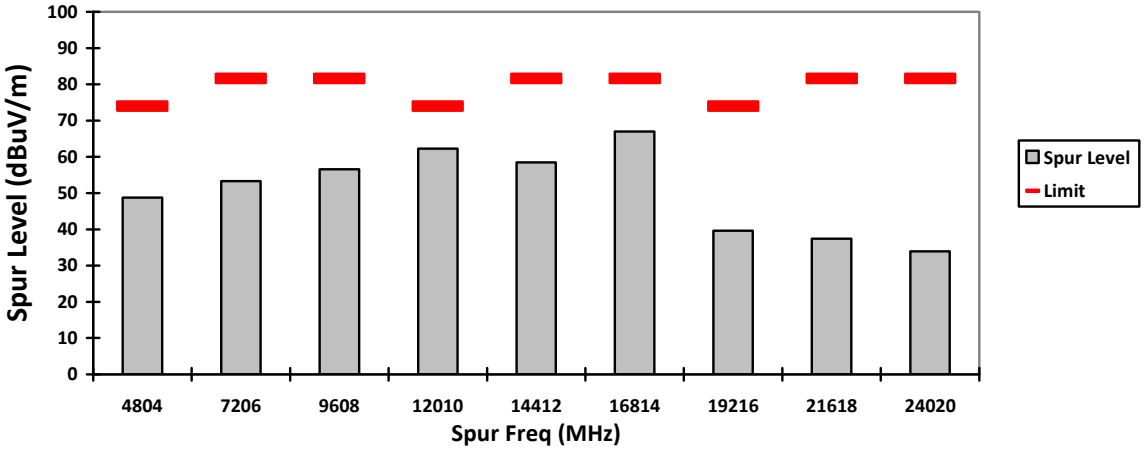
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4804	-	48.7784**	-	-	74.0000	-	-	25.2216	-	-
7206	-	53.3570**	-	-	81.5595	-	-	28.2025	-	101.5595
9608	-	56.5674**	-	-	81.5595	-	-	24.9921	-	101.5595
12010	-	62.2730**	39.7730**	-	74.0000	54.0000	-	11.7270	14.2270	-
14412	-	58.4585**	-	-	81.5595	-	-	23.1010	-	101.5595
16814	-	67.0292**	-	-	81.5595	-	-	14.5303	-	101.5595
19216	-	39.6439**	-	-	74.0000	-	-	34.3561	-	-
21618	-	37.4337**	-	-	81.5595	-	-	44.1258	-	101.5595
24020	-	33.9003**	-	-	81.5595	-	-	47.6592	-	101.5595
Horizontal Radiated Emission Result										
4804	-	48.4365**	-	-	74.0000	-	-	25.5635	-	-
7206	-	53.3778**	-	-	81.5595	-	-	28.1817	-	101.5595
9608	-	55.5081**	-	-	81.5595	-	-	26.0514	-	101.5595
12010	-	62.4138**	39.9138**	-	74.0000	54.0000	-	11.5862	14.0862	-
14412	-	60.4605**	-	-	81.5595	-	-	21.0990	-	101.5595
16814	-	66.7189**	-	-	81.5595	-	-	14.8406	-	101.5595
19216	-	40.3689**	-	-	74.0000	-	-	33.6311	-	-
21618	-	36.9401**	-	-	81.5595	-	-	44.6194	-	101.5595
24020	-	34.0483**	-	-	81.5595	-	-	47.5112	-	101.5595

Remarks: Pass Result	Marginal Result	Fail Result

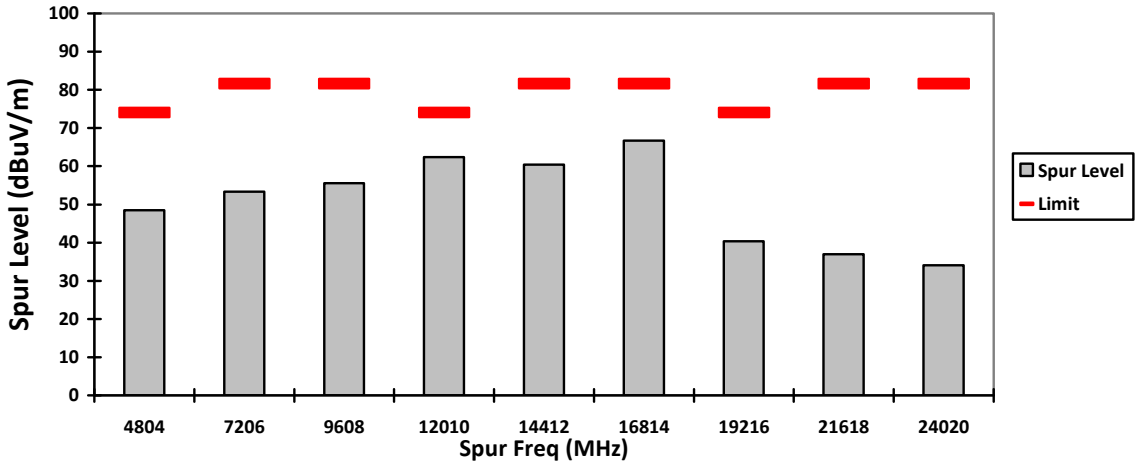
Temperature (degC): 23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Tue, 29 Aug, 2023**
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

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.**

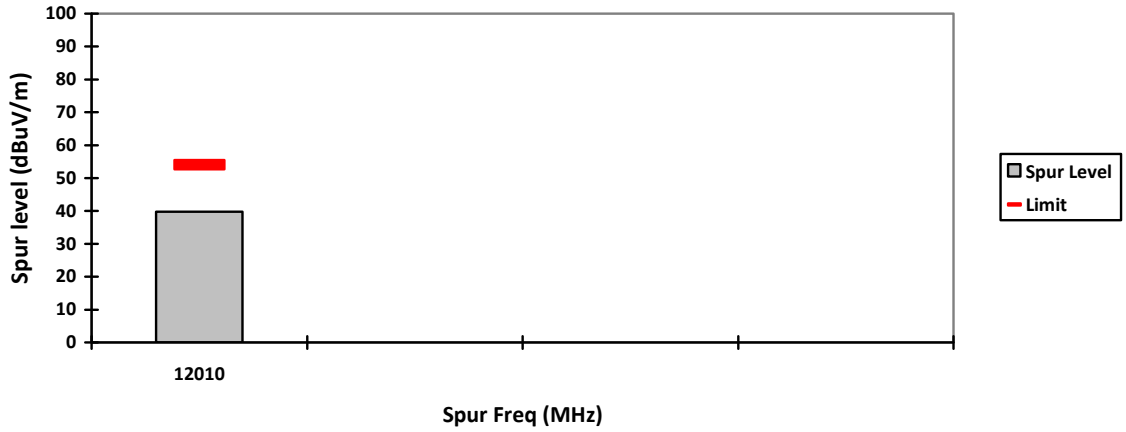
VERTICAL, PK



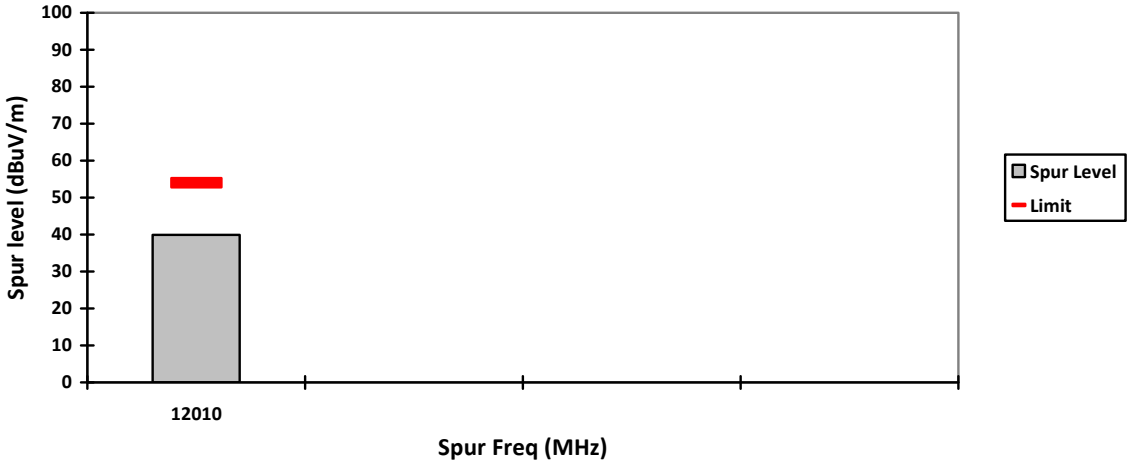
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
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

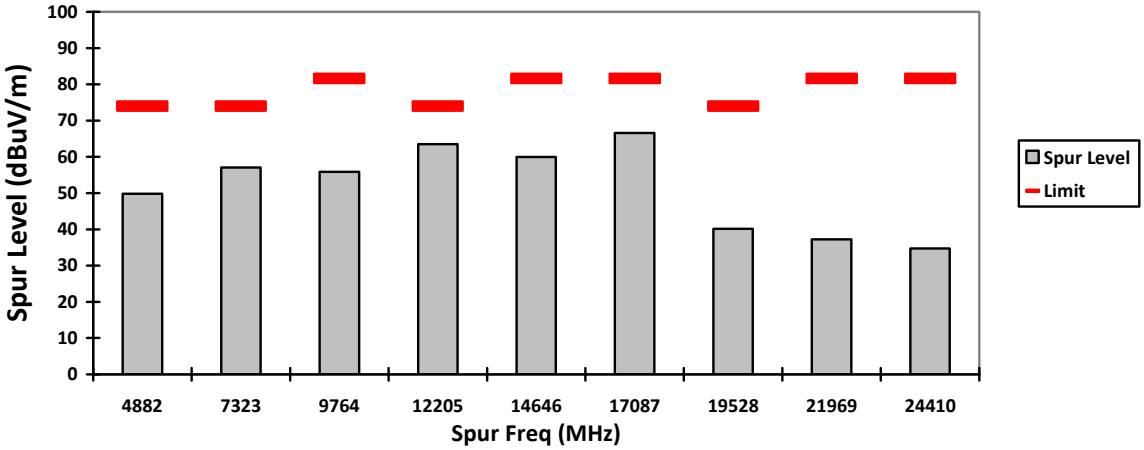
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4882	-	49.7953**	-	-	74.0000	-	-	24.2047	-	-
7323	-	57.0434**	34.5434**	-	74.0000	54.0000	-	16.9566	19.4566	-
9764	-	55.9219**	-	-	81.5595	-	-	25.6376	-	101.5595
12205	-	63.5064**	41.0064**	-	74.0000	54.0000	-	10.4936	12.9936	-
14646	-	59.9790**	-	-	81.5595	-	-	21.5805	-	101.5595
17087	-	66.5868**	-	-	81.5595	-	-	14.9727	-	101.5595
19528	-	40.1079**	-	-	74.0000	-	-	33.8921	-	-
21969	-	37.2719**	-	-	81.5595	-	-	44.2876	-	101.5595
24410	-	34.7367**	-	-	81.5595	-	-	46.8228	-	101.5595
Horizontal Radiated Emission Result										
4882	-	49.0309**	-	-	74.0000	-	-	24.9691	-	-
7323	-	57.2120**	34.7120**	-	74.0000	54.0000	-	16.7880	19.2880	-
9764	-	55.7517**	-	-	81.5595	-	-	25.8078	-	101.5595
12205	-	62.8828**	40.3828**	-	74.0000	54.0000	-	11.1172	13.6172	-
14646	-	60.2641**	-	-	81.5595	-	-	21.2954	-	101.5595
17087	-	67.6160**	-	-	81.5595	-	-	13.9435	-	101.5595
19528	-	40.5799**	-	-	74.0000	-	-	33.4201	-	-
21969	-	38.6948**	-	-	81.5595	-	-	42.8647	-	101.5595
24410	-	35.2071**	-	-	81.5595	-	-	46.3524	-	101.5595

Remarks: Pass Result	Marginal Result	Fail Result

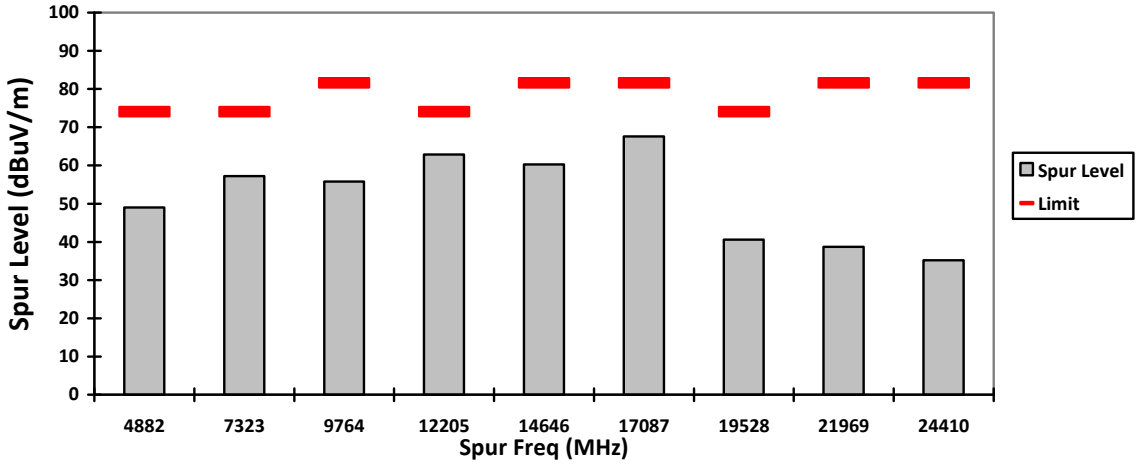
Temperature (degC): 23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Tue, 29 Aug, 2023**
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

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.**

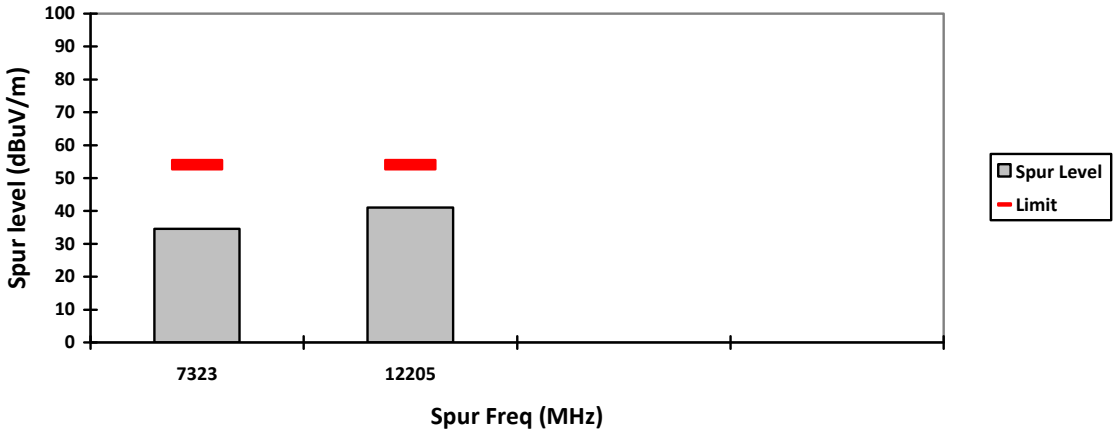
VERTICAL, PK



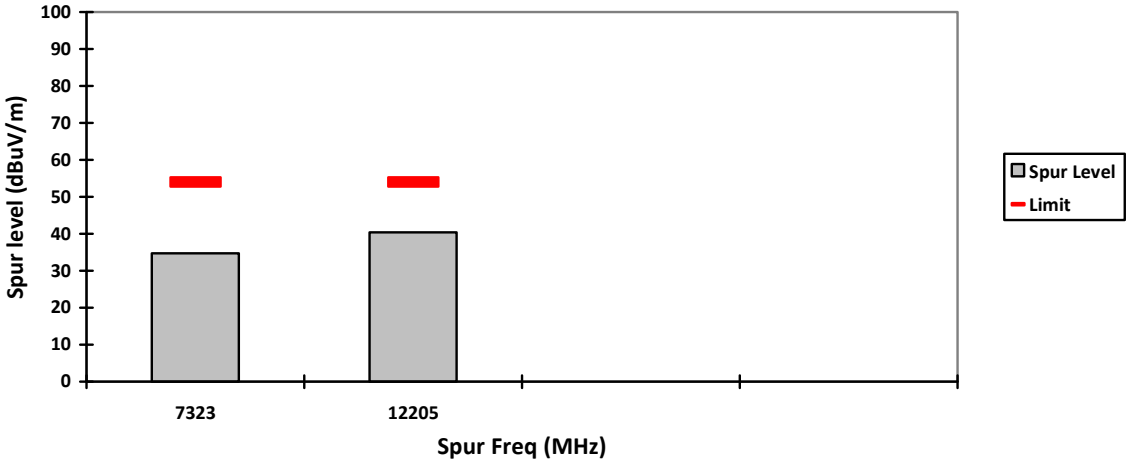
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
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

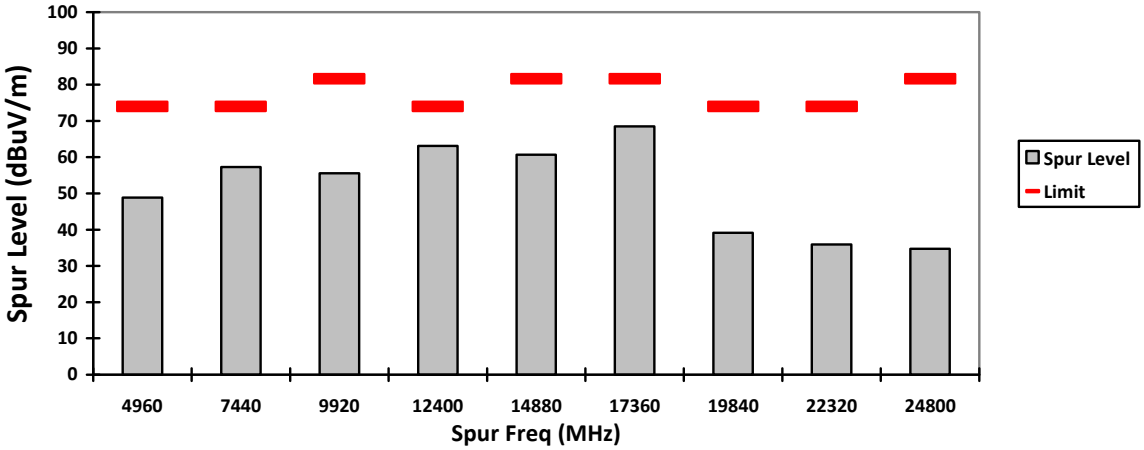
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4960	-	48.8289**	-	-	74.0000	-	-	25.1711	-	-
7440	-	57.2790**	34.7790**	-	74.0000	54.0000	-	16.7210	19.2210	-
9920	-	55.5620**	-	-	81.5595	-	-	25.9975	-	101.5595
12400	-	63.1127**	40.6127**	-	74.0000	54.0000	-	10.8873	13.3873	-
14880	-	60.7375**	-	-	81.5595	-	-	20.8220	-	101.5595
17360	-	68.4774**	-	-	81.5595	-	-	13.0821	-	101.5595
19840	-	39.1430**	-	-	74.0000	-	-	34.8570	-	-
22320	-	35.8920**	-	-	74.0000	-	-	38.1080	-	-
24800	-	34.7774**	-	-	81.5595	-	-	46.7821	-	101.5595
Horizontal Radiated Emission Result										
4960	-	50.2311**	-	-	74.0000	-	-	23.7689	-	-
7440	-	57.9449**	35.4449**	-	74.0000	54.0000	-	16.0551	18.5551	-
9920	-	56.7964**	-	-	81.5595	-	-	24.7631	-	101.5595
12400	-	63.2197**	40.7197**	-	74.0000	54.0000	-	10.7803	13.2803	-
14880	-	60.4244**	-	-	81.5595	-	-	21.1351	-	101.5595
17360	-	69.6254**	-	-	81.5595	-	-	11.9341	-	101.5595
19840	-	38.5843**	-	-	74.0000	-	-	35.4157	-	-
22320	-	37.6417**	-	-	74.0000	-	-	36.3583	-	-
24800	-	36.4262**	-	-	81.5595	-	-	45.1333	-	101.5595

Remarks: Pass Result	Marginal Result	Fail Result

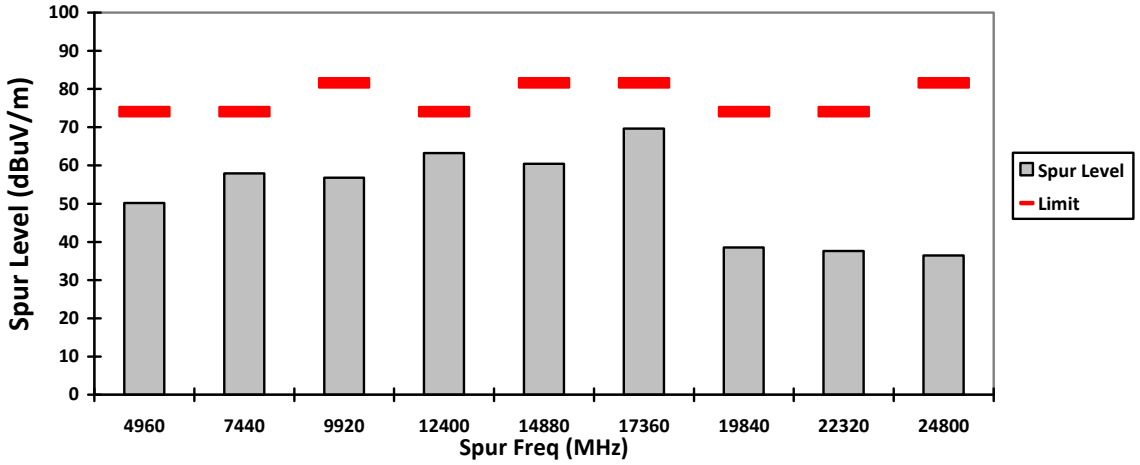
Temperature (degC): 23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Tue, 29 Aug, 2023**
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

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.**

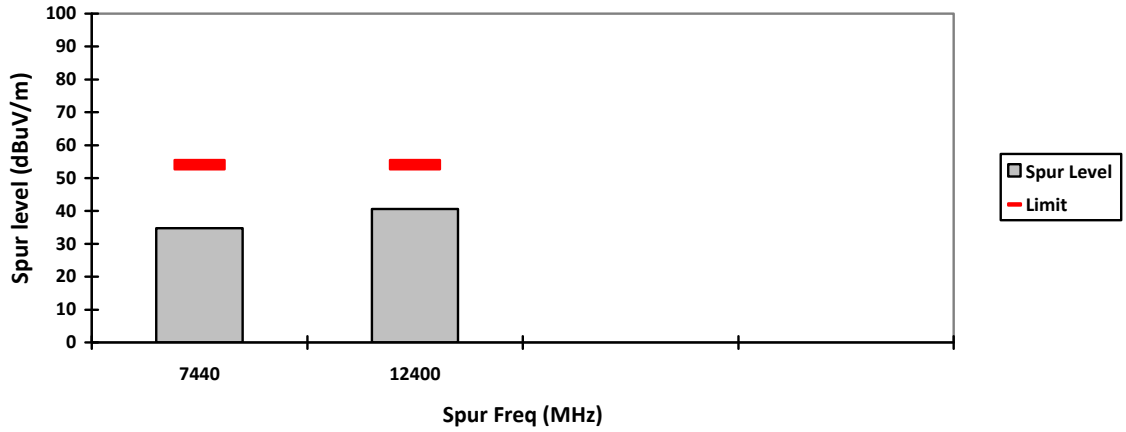
VERTICAL, PK



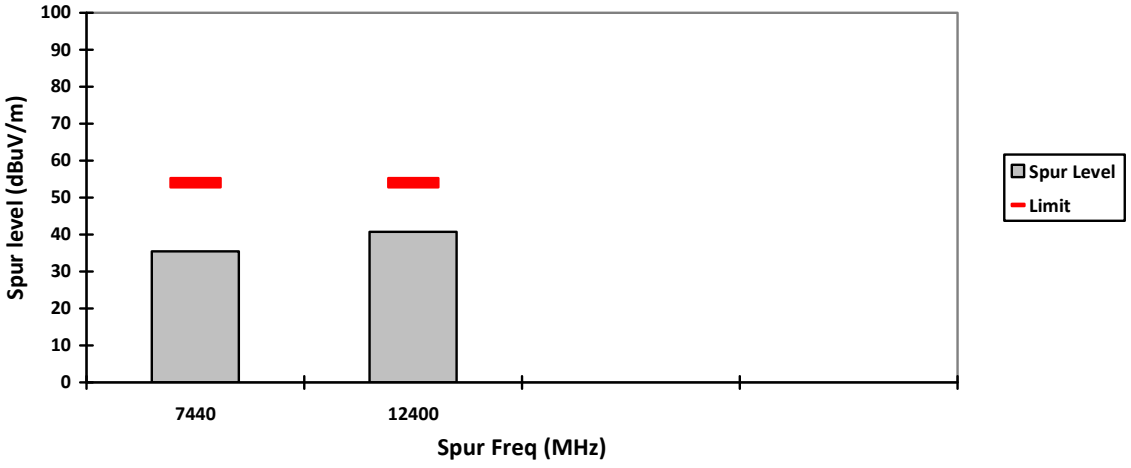
HORIZONTAL, PK



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#: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
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

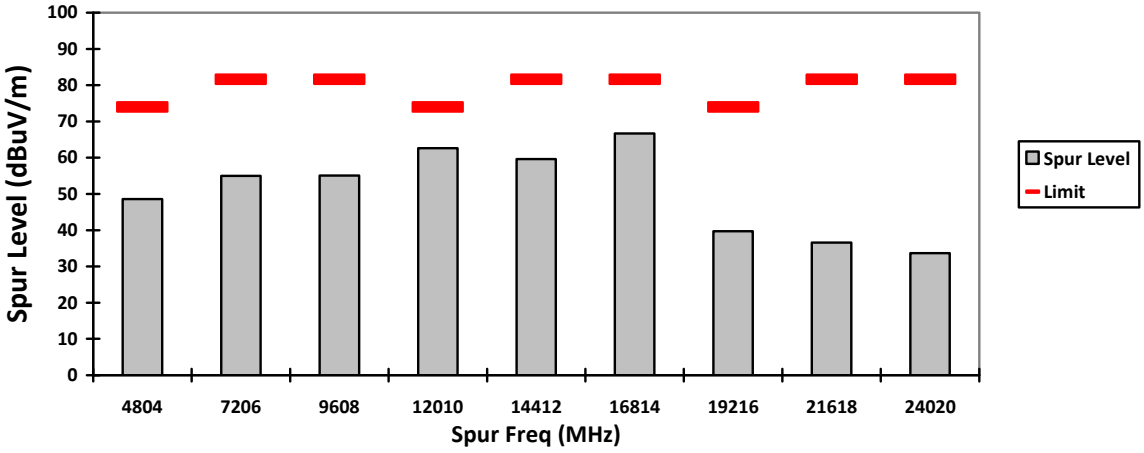
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4804	-	48.5642**	-	-	74.0000	-	-	25.4358	-	-
7206	-	54.9482**	-	-	81.5595	-	-	26.6113	-	101.5595
9608	-	55.0741**	-	-	81.5595	-	-	26.4854	-	101.5595
12010	-	62.6416**	40.1416**	-	74.0000	54.0000	-	11.3584	13.8584	-
14412	-	59.6336**	-	-	81.5595	-	-	21.9259	-	101.5595
16814	-	66.6603**	-	-	81.5595	-	-	14.8992	-	101.5595
19216	-	39.6869**	-	-	74.0000	-	-	34.3131	-	-
21618	-	36.5412**	-	-	81.5595	-	-	45.0183	-	101.5595
24020	-	33.6737**	-	-	81.5595	-	-	47.8858	-	101.5595
Horizontal Radiated Emission Result										
4804	-	48.4732**	-	-	74.0000	-	-	25.5268	-	-
7206	-	53.4539**	-	-	81.5595	-	-	28.1056	-	101.5595
9608	-	56.5023**	-	-	81.5595	-	-	25.0572	-	101.5595
12010	-	62.3997**	39.8997**	-	74.0000	54.0000	-	11.6003	14.1003	-
14412	-	59.8149**	-	-	81.5595	-	-	21.7446	-	101.5595
16814	-	65.0600**	-	-	81.5595	-	-	16.4995	-	101.5595
19216	-	39.0696**	-	-	74.0000	-	-	34.9304	-	-
21618	-	37.6186**	-	-	81.5595	-	-	43.9409	-	101.5595
24020	-	33.5328**	-	-	81.5595	-	-	48.0267	-	101.5595

Remarks: Pass Result	Marginal Result	Fail Result

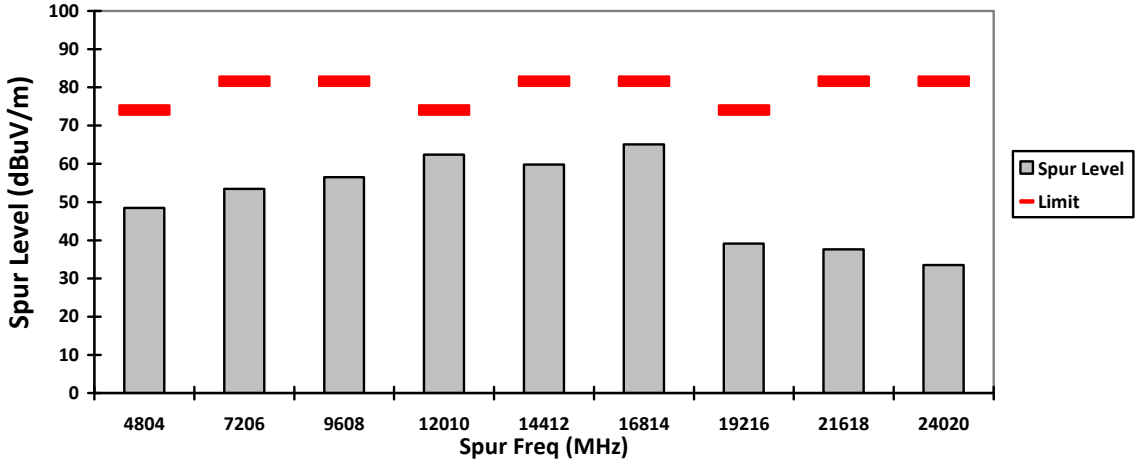
Temperature (degC): 23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Tue, 29 Aug, 2023**
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

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.**

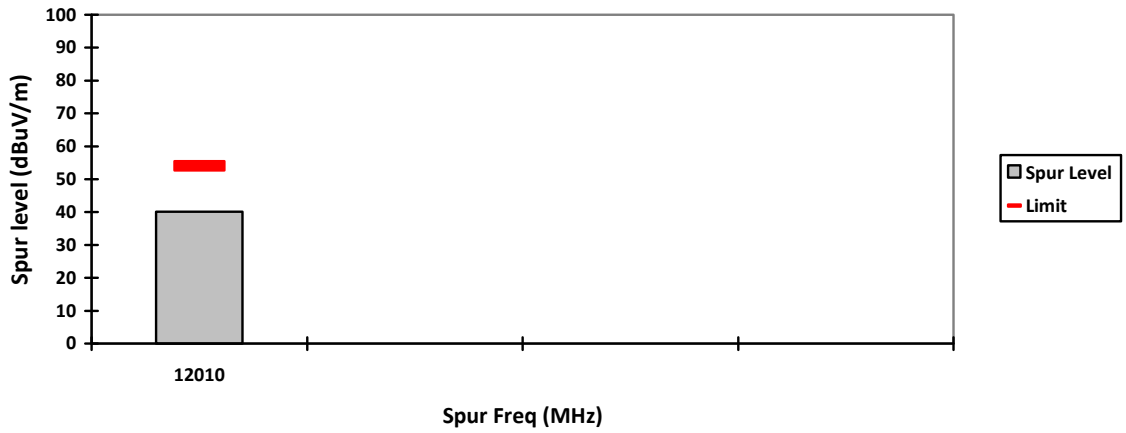
VERTICAL, PK



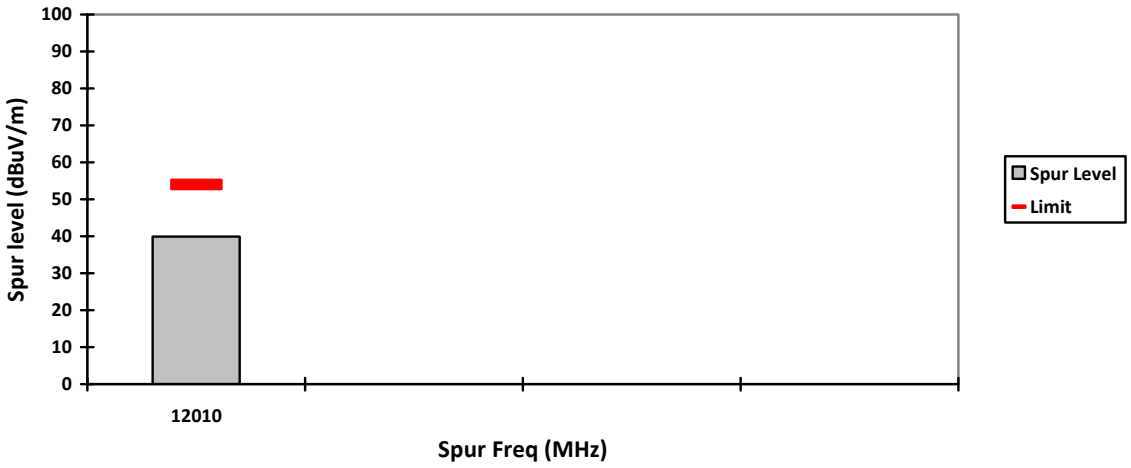
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
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

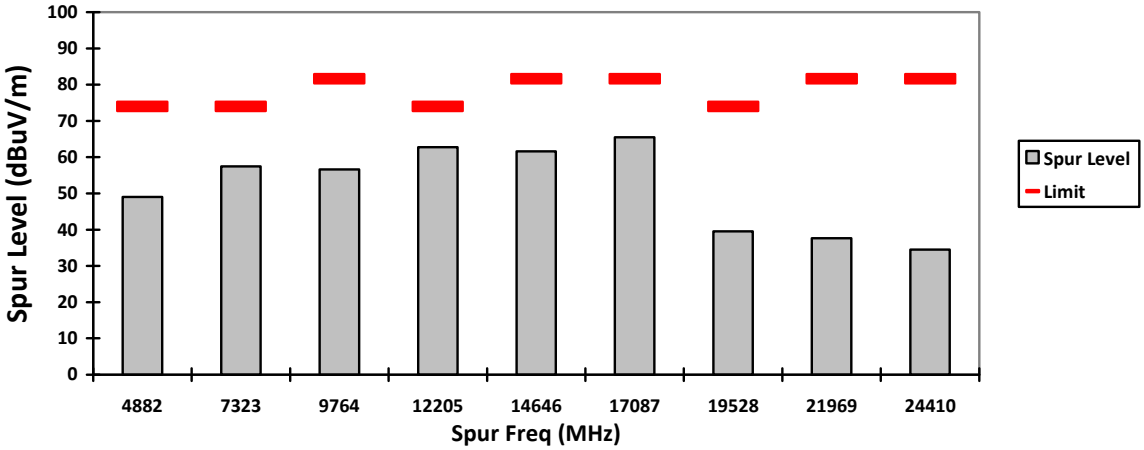
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4882	-	48.9637**	-	-	74.0000	-	-	25.0363	-	-
7323	-	57.4293**	34.9293**	-	74.0000	54.0000	-	16.5707	19.0707	-
9764	-	56.6720**	-	-	81.5595	-	-	24.8875	-	101.5595
12205	-	62.7950**	40.2950**	-	74.0000	54.0000	-	11.2050	13.7050	-
14646	-	61.6438**	-	-	81.5595	-	-	19.9157	-	101.5595
17087	-	65.5389**	-	-	81.5595	-	-	16.0206	-	101.5595
19528	-	39.5752**	-	-	74.0000	-	-	34.4248	-	-
21969	-	37.6228**	-	-	81.5595	-	-	43.9367	-	101.5595
24410	-	34.4811**	-	-	81.5595	-	-	47.0784	-	101.5595
Horizontal Radiated Emission Result										
4882	-	50.1656**	-	-	74.0000	-	-	23.8344	-	-
7323	-	57.5024**	35.0024**	-	74.0000	54.0000	-	16.4976	18.9976	-
9764	-	56.2239**	-	-	81.5595	-	-	25.3356	-	101.5595
12205	-	63.8063**	41.3063**	-	74.0000	54.0000	-	10.1937	12.6937	-
14646	-	60.7223**	-	-	81.5595	-	-	20.8372	-	101.5595
17087	-	66.5404**	-	-	81.5595	-	-	15.0191	-	101.5595
19528	-	40.0875**	-	-	74.0000	-	-	33.9125	-	-
21969	-	38.0005**	-	-	81.5595	-	-	43.5590	-	101.5595
24410	-	34.8095**	-	-	81.5595	-	-	46.7500	-	101.5595

Remarks: Pass Result	Marginal Result	Fail Result

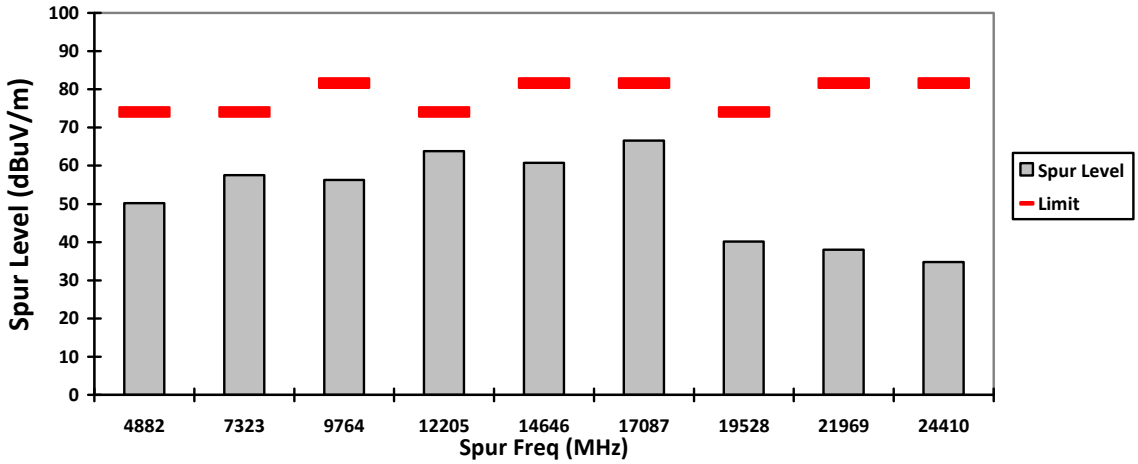
Temperature (degC): 23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Tue, 29 Aug, 2023**
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

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.**

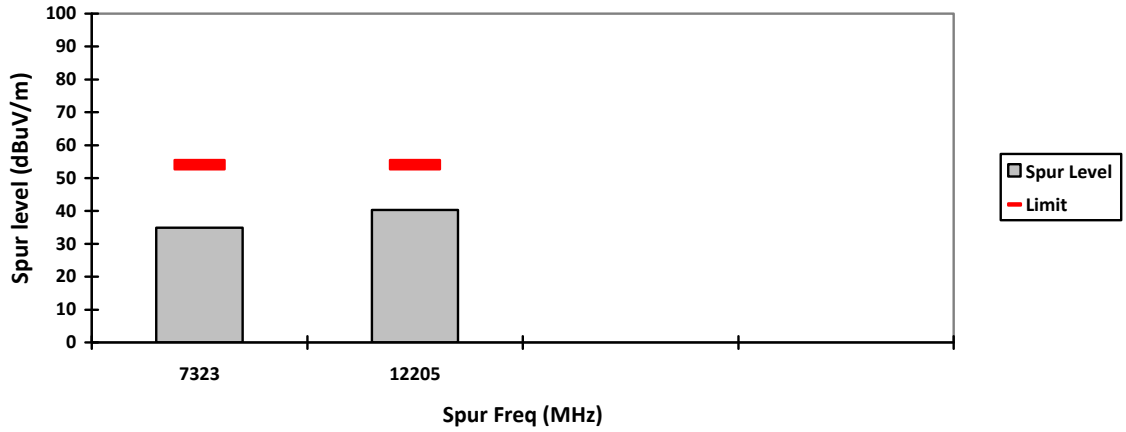
VERTICAL, PK



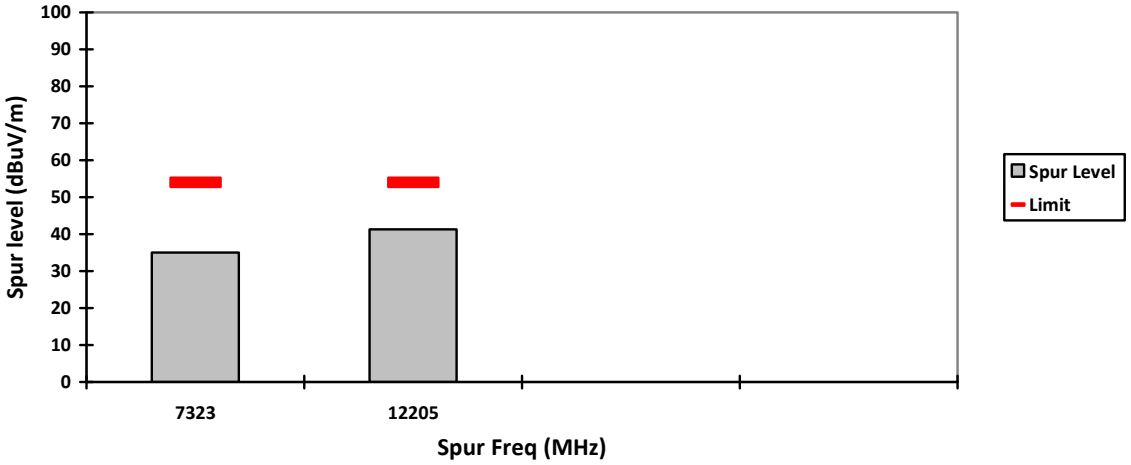
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
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

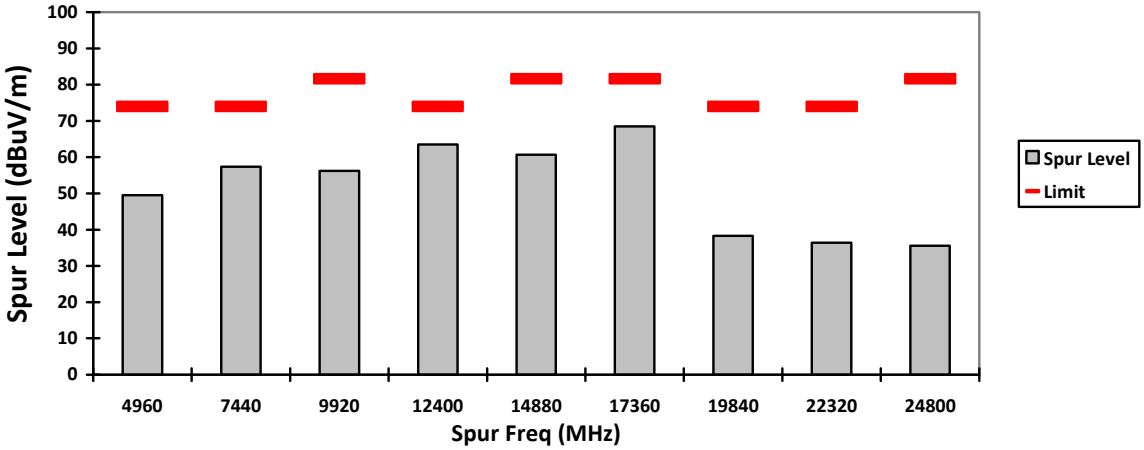
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4960	-	49.4752**	-	-	74.0000	-	-	24.5248	-	-
7440	-	57.3743**	34.8743**	-	74.0000	54.0000	-	16.6257	19.1257	-
9920	-	56.2445**	-	-	81.5595	-	-	25.3150	-	101.5595
12400	-	63.5265**	41.0265**	-	74.0000	54.0000	-	10.4735	12.9735	-
14880	-	60.7017**	-	-	81.5595	-	-	20.8578	-	101.5595
17360	-	68.5161**	-	-	81.5595	-	-	13.0434	-	101.5595
19840	-	38.2833**	-	-	74.0000	-	-	35.7167	-	-
22320	-	36.4133**	-	-	74.0000	-	-	37.5867	-	-
24800	-	35.5703**	-	-	81.5595	-	-	45.9892	-	101.5595
Horizontal Radiated Emission Result										
4960	-	48.9005**	-	-	74.0000	-	-	25.0995	-	-
7440	-	57.3386**	34.8386**	-	74.0000	54.0000	-	16.6614	19.1614	-
9920	-	56.8462**	-	-	81.5595	-	-	24.7133	-	101.5595
12400	-	60.4344**	40.4509**	-	74.0000	54.0000	-	13.5656	13.5491	-
14880	-	61.2716**	-	-	81.5595	-	-	20.2879	-	101.5595
17360	-	68.6155**	-	-	81.5595	-	-	12.9440	-	101.5595
19840	-	39.6090**	-	-	74.0000	-	-	34.3910	-	-
22320	-	37.2243**	-	-	74.0000	-	-	36.7757	-	-
24800	-	35.2912**	-	-	81.5595	-	-	46.2683	-	101.5595

Remarks: Pass Result	Marginal Result	Fail Result

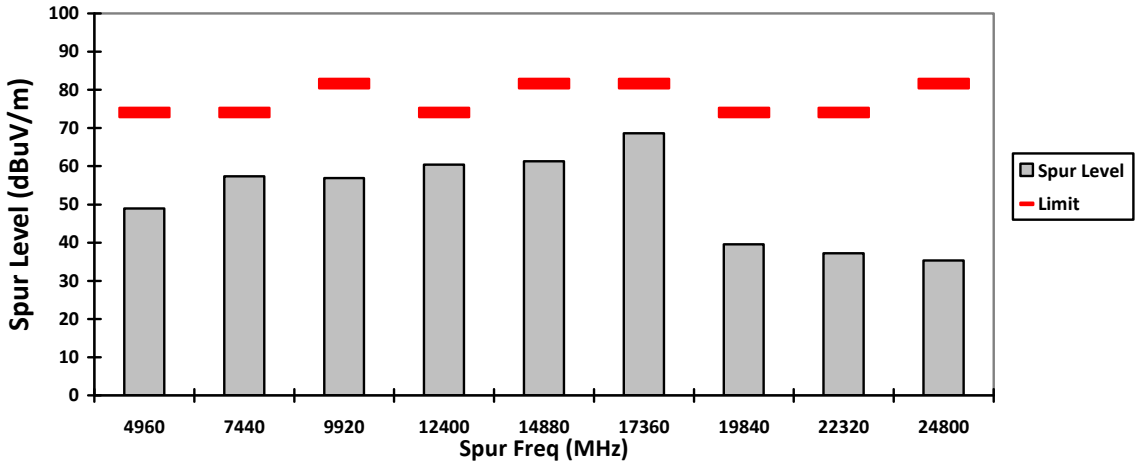
Temperature (degC): 23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Tue, 29 Aug, 2023**
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

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.**

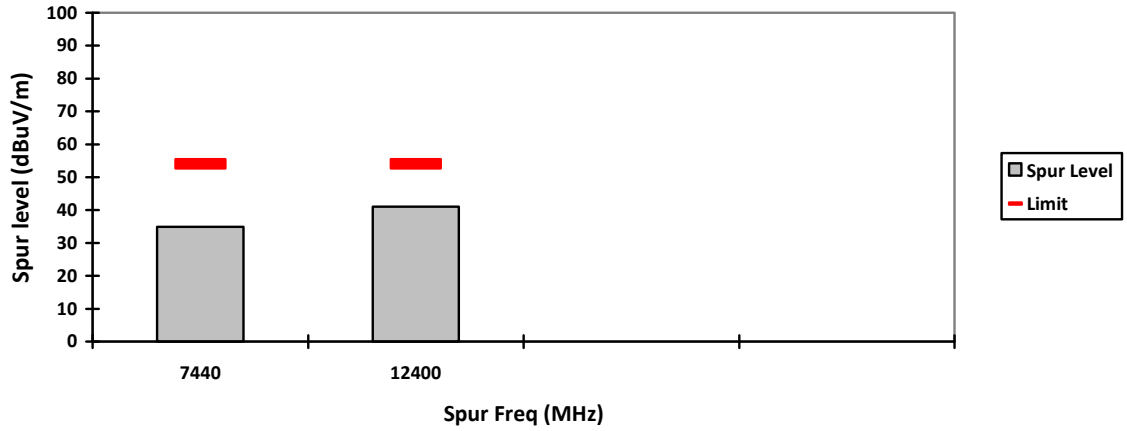
VERTICAL, PK



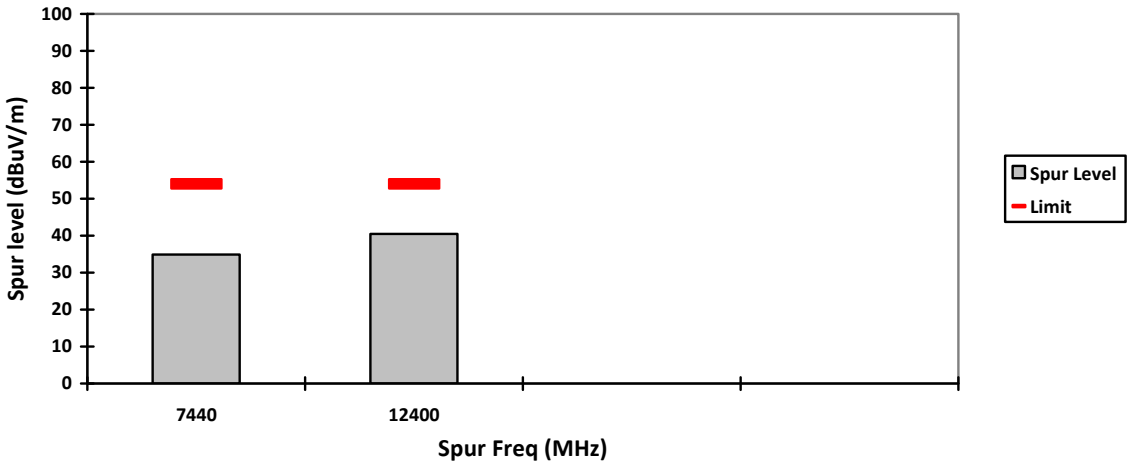
HORIZONTAL, PK



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#: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
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

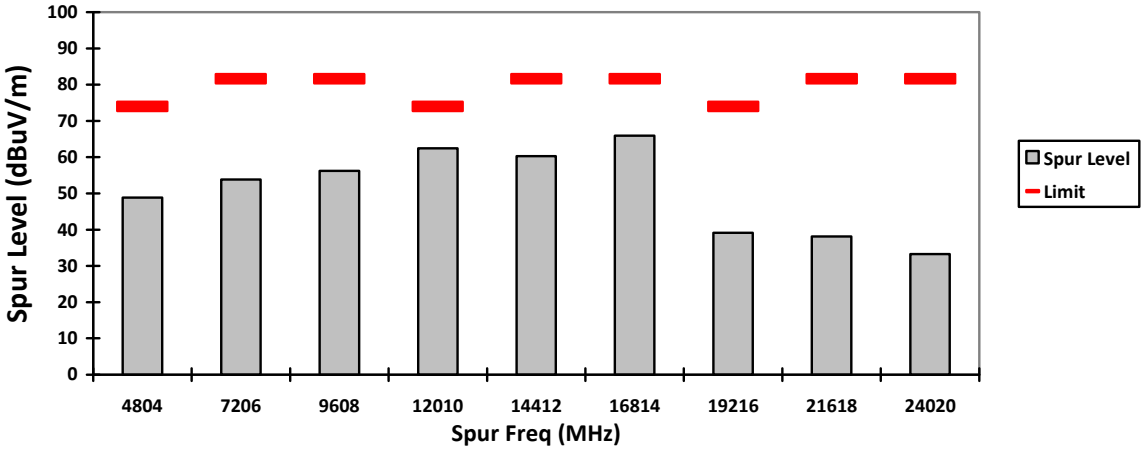
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4804	-	48.8450**	-	-	74.0000	-	-	25.1550	-	-
7206	-	53.7841**	-	-	81.5595	-	-	27.7754	-	101.5595
9608	-	56.2341**	-	-	81.5595	-	-	25.3254	-	101.5595
12010	-	62.4112**	39.9112**	-	74.0000	54.0000	-	11.5888	14.0888	-
14412	-	60.2431**	-	-	81.5595	-	-	21.3164	-	101.5595
16814	-	65.9114**	-	-	81.5595	-	-	15.6481	-	101.5595
19216	-	39.1696**	-	-	74.0000	-	-	34.8304	-	-
21618	-	38.1126**	-	-	81.5595	-	-	43.4469	-	101.5595
24020	-	33.2497**	-	-	81.5595	-	-	48.3098	-	101.5595
Horizontal Radiated Emission Result										
4804	-	48.8013**	-	-	74.0000	-	-	25.1987	-	-
7206	-	55.2088**	-	-	81.5595	-	-	26.3507	-	101.5595
9608	-	57.6798**	-	-	81.5595	-	-	23.8797	-	101.5595
12010	-	62.7283**	40.2283**	-	74.0000	54.0000	-	11.2717	13.7717	-
14412	-	60.6835**	-	-	81.5595	-	-	20.8760	-	101.5595
16814	-	66.8116**	-	-	81.5595	-	-	14.7479	-	101.5595
19216	-	39.1820**	-	-	74.0000	-	-	34.8180	-	-
21618	-	37.5839**	-	-	81.5595	-	-	43.9756	-	101.5595
24020	-	32.5021**	-	-	81.5595	-	-	49.0574	-	101.5595

Remarks: Pass Result	Marginal Result	Fail Result

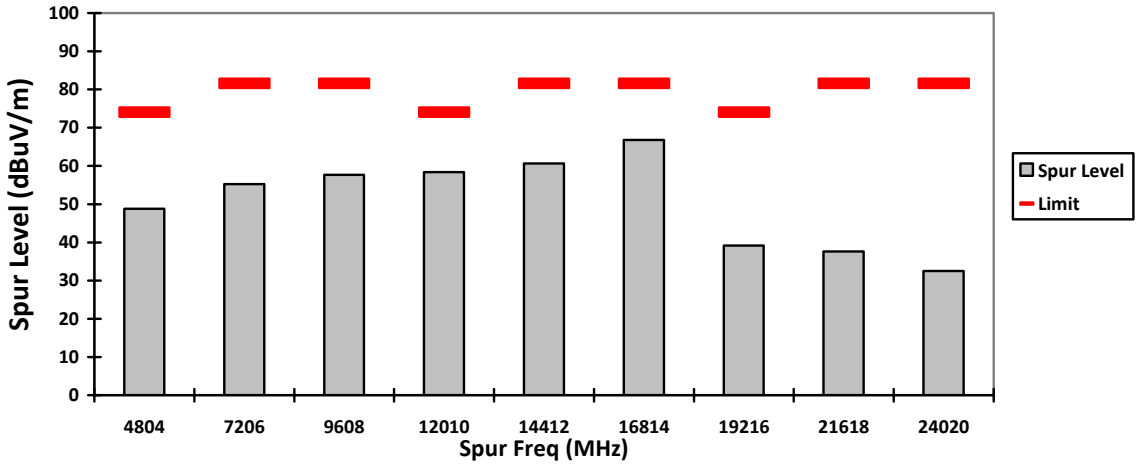
Temperature (degC): 23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Tue, 29 Aug, 2023**
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

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.**

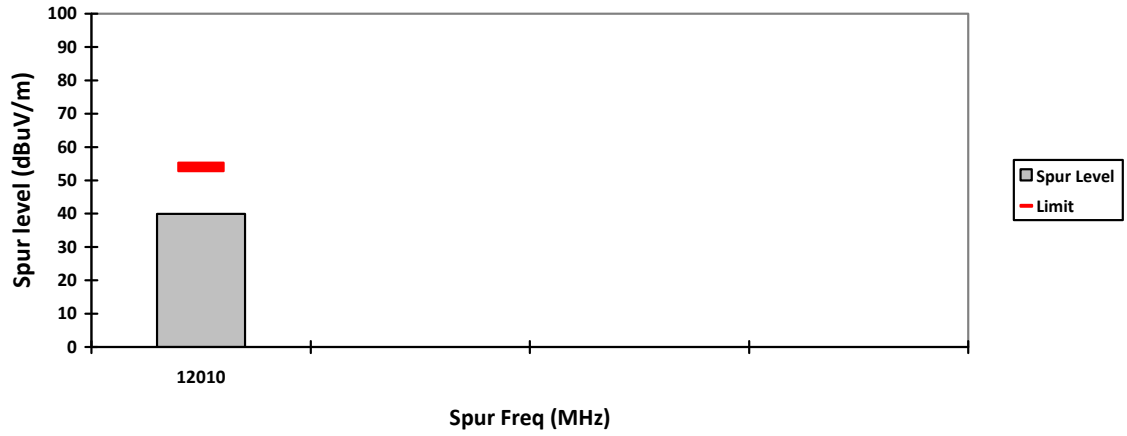
VERTICAL, PK



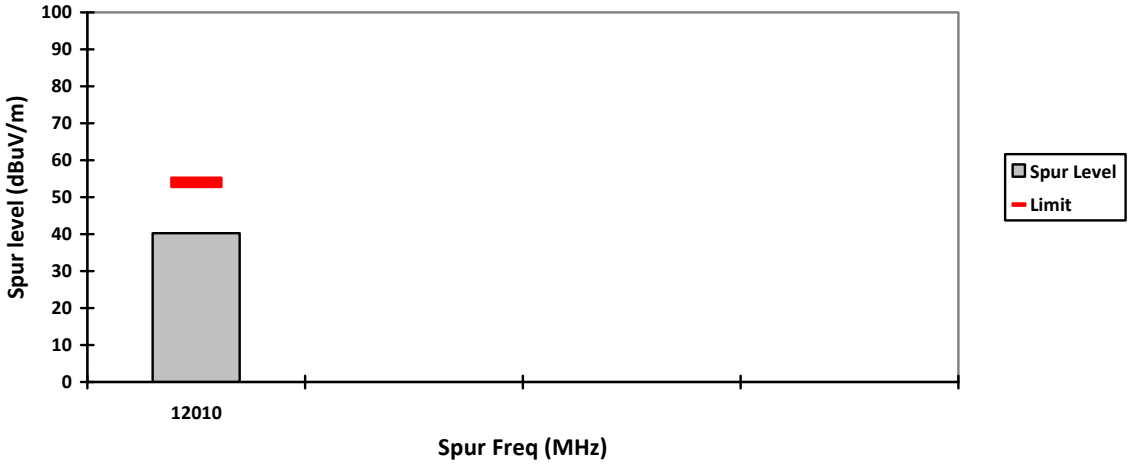
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
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

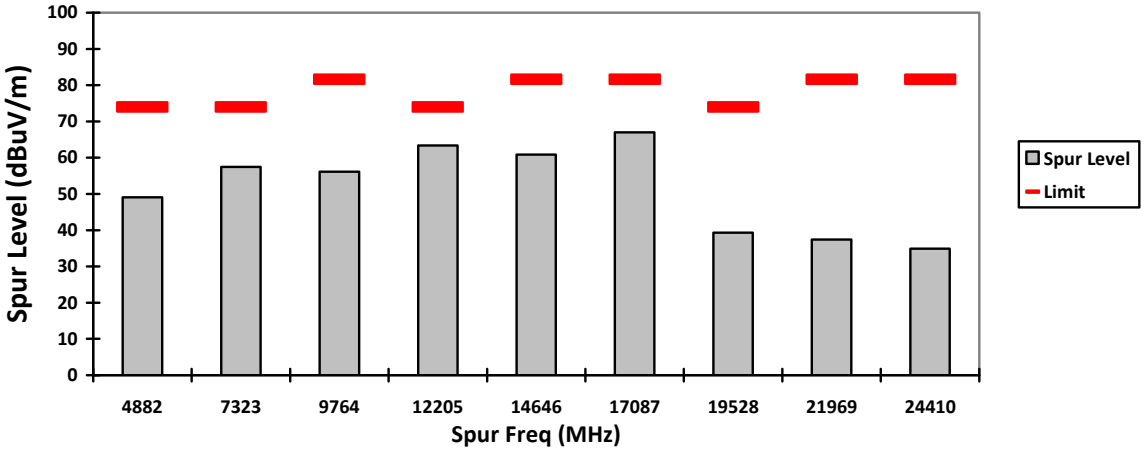
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4882	-	49.0906**	-	-	74.0000	-	-	24.9094	-	-
7323	-	57.4589**	34.9589**	-	74.0000	54.0000	-	16.5411	19.0411	-
9764	-	56.1425**	-	-	81.5595	-	-	25.4170	-	101.5595
12205	-	63.3283**	40.8283**	-	74.0000	54.0000	-	10.6717	13.1717	-
14646	-	60.8964**	-	-	81.5595	-	-	20.6631	-	101.5595
17087	-	67.0287**	-	-	81.5595	-	-	14.5308	-	101.5595
19528	-	39.3410**	-	-	74.0000	-	-	34.6590	-	-
21969	-	37.4065**	-	-	81.5595	-	-	44.1530	-	101.5595
24410	-	34.9058**	-	-	81.5595	-	-	46.6537	-	101.5595
Horizontal Radiated Emission Result										
4882	-	49.9728**	-	-	74.0000	-	-	24.0272	-	-
7323	-	57.3703**	34.8703**	-	74.0000	54.0000	-	16.6297	19.1297	-
9764	-	56.9990**	-	-	81.5595	-	-	24.5605	-	101.5595
12205	-	63.1920**	40.6920**	-	74.0000	54.0000	-	10.8080	13.3080	-
14646	-	61.0596**	-	-	81.5595	-	-	20.4999	-	101.5595
17087	-	67.2390**	-	-	81.5595	-	-	14.3205	-	101.5595
19528	-	39.8713**	-	-	74.0000	-	-	34.1287	-	-
21969	-	37.7766**	-	-	81.5595	-	-	43.7829	-	101.5595
24410	-	35.0988**	-	-	81.5595	-	-	46.4607	-	101.5595

Remarks: Pass Result	Marginal Result	Fail Result

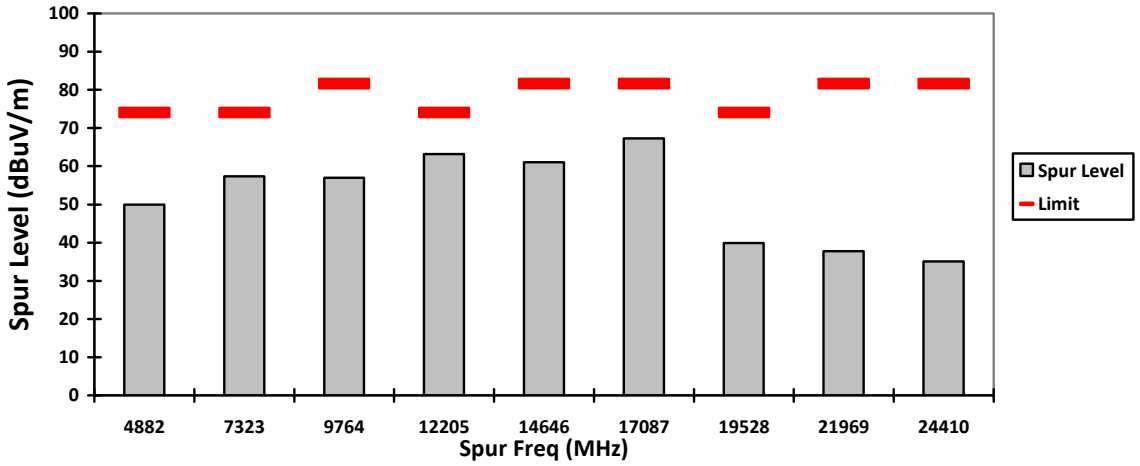
Temperature (degC): 23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Tue, 29 Aug, 2023**
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

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.**

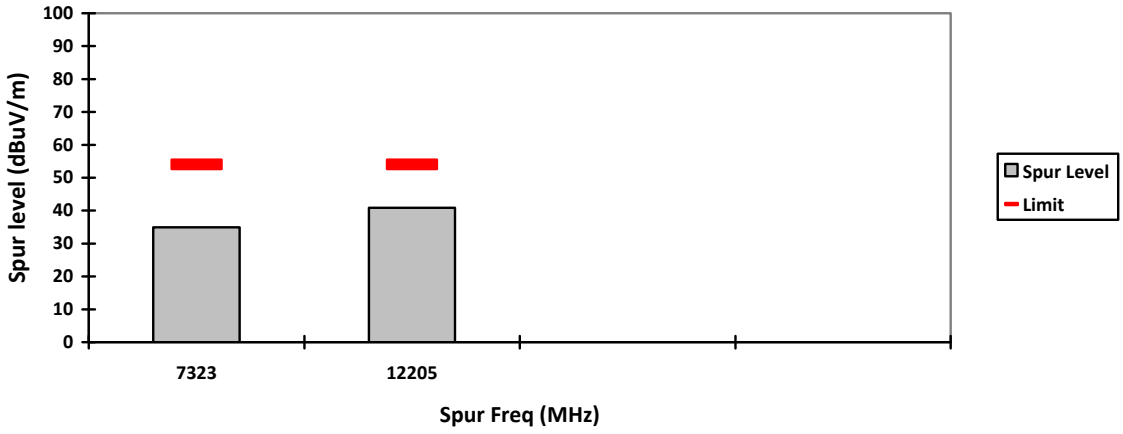
VERTICAL, PK



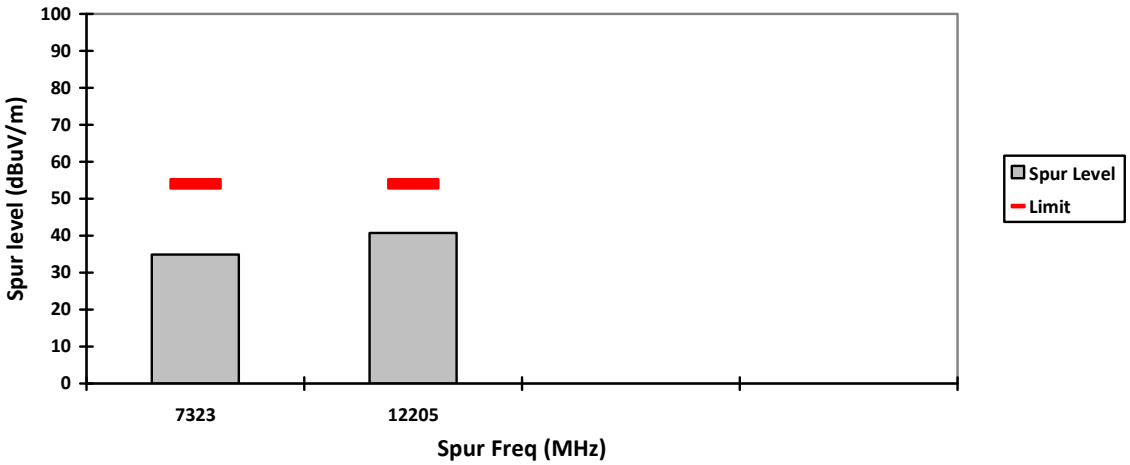
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission
Model#: H25XDF9PW6AN S/N: 287TZP0060 EMC SR ID#: 39809-EMC-00049
Battery: PMNN4813A Accessory: AN000452A01
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

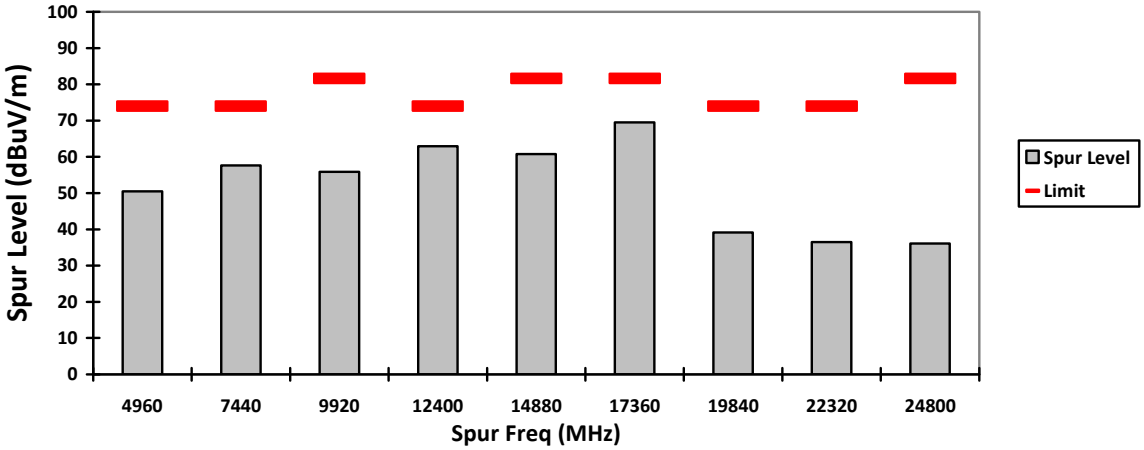
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
4960	-	50.4911**	-	-	74.0000	-	-	23.5089	-	-
7440	-	57.5914**	35.0914**	-	74.0000	54.0000	-	16.4086	18.9086	-
9920	-	55.8482**	-	-	81.5595	-	-	25.7113	-	101.5595
12400	-	62.9509**	40.4509**	-	74.0000	54.0000	-	11.0491	13.5491	-
14880	-	60.7985**	-	-	81.5595	-	-	20.7610	-	101.5595
17360	-	69.4955**	-	-	81.5595	-	-	12.0640	-	101.5595
19840	-	39.1166**	-	-	74.0000	-	-	34.8834	-	-
22320	-	36.5025**	-	-	74.0000	-	-	37.4975	-	-
24800	-	36.1106**	-	-	81.5595	-	-	45.4489	-	101.5595
Horizontal Radiated Emission Result										
4960	-	48.7738**	-	-	74.0000	-	-	25.2262	-	-
7440	-	58.0503**	35.5503**	-	74.0000	54.0000	-	15.9497	18.4497	-
9920	-	55.3824**	-	-	81.5595	-	-	26.1771	-	101.5595
12400	-	63.4929**	40.9929**	-	74.0000	54.0000	-	10.5071	13.0071	-
14880	-	61.1157**	-	-	81.5595	-	-	20.4438	-	101.5595
17360	-	69.2992**	-	-	81.5595	-	-	12.2603	-	101.5595
19840	-	40.2163**	-	-	74.0000	-	-	33.7837	-	-
22320	-	37.3469**	-	-	74.0000	-	-	36.6531	-	-
24800	-	35.0082**	-	-	81.5595	-	-	46.5513	-	101.5595

Remarks: Pass Result	Marginal Result	Fail Result

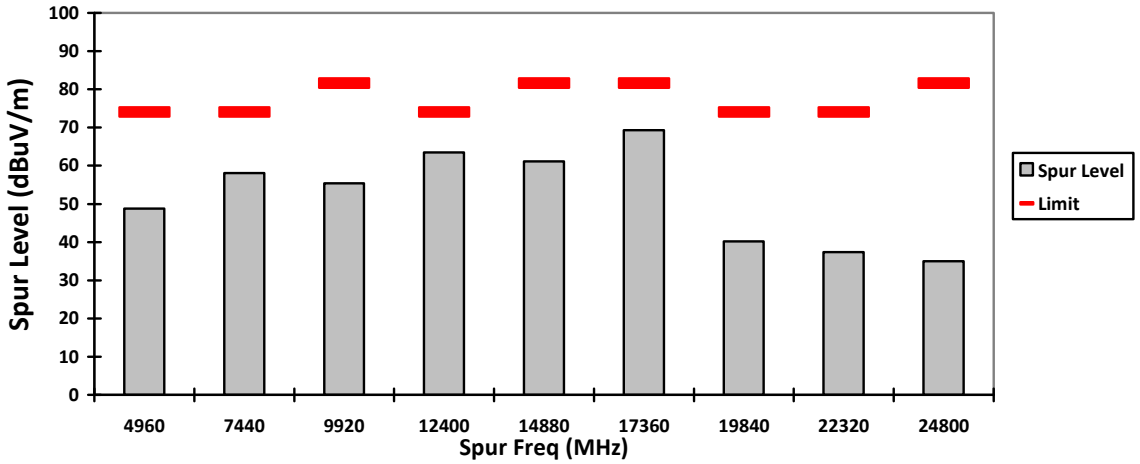
Temperature (degC): 23.5 **Humidity (%): 69.9**
Test Performed by: Rezza & Nazrin **Test Date: Tue, 29 Aug, 2023**
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

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.**

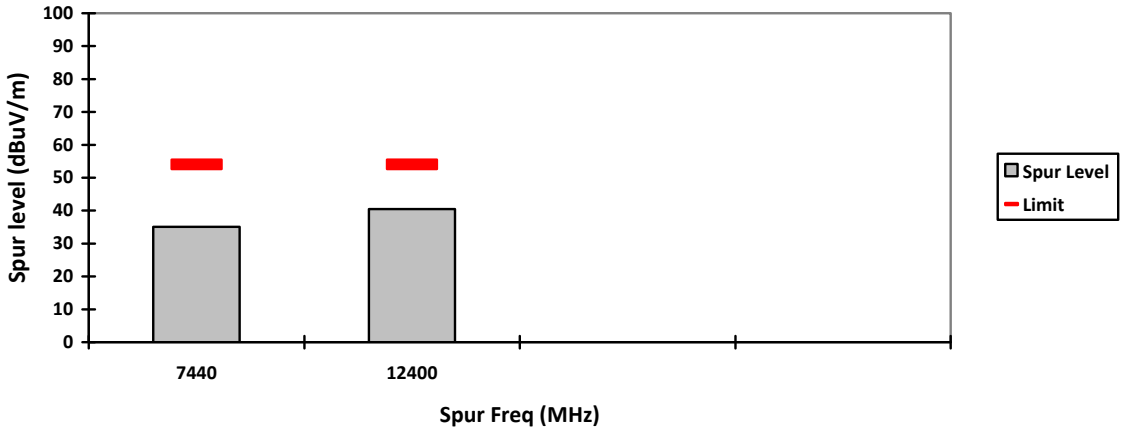
VERTICAL, PK



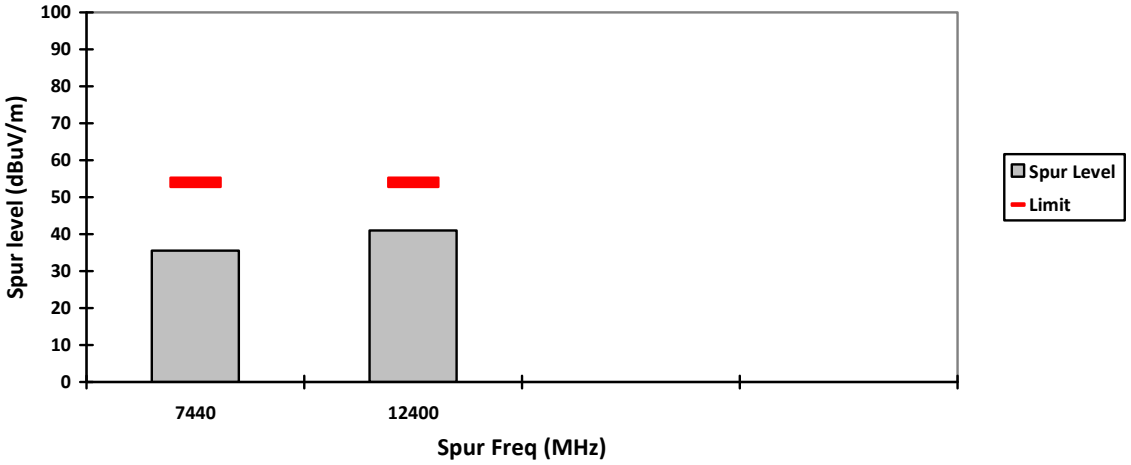
HORIZONTAL, PK



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
Model#: H25XDF9PW6AN **S/N: 287TZP0060, 287TZP0062, 287TZP0065**
EMC SR ID#: 39809-EMC-00056
Battery: PMNN4813A **Accessory: PMPN4593A-C9, AN000452A01, PS000242A01-C14, 3087791G01**
Test Channel: Mid **Test Frequency: 2441.0000 MHz** **Test Standard: ANSI C63.10-2013**
Worst Case Plane: Y-Plane (Pi/4 DQPSK)

Radiated Emission (Mid Channel) tabular data

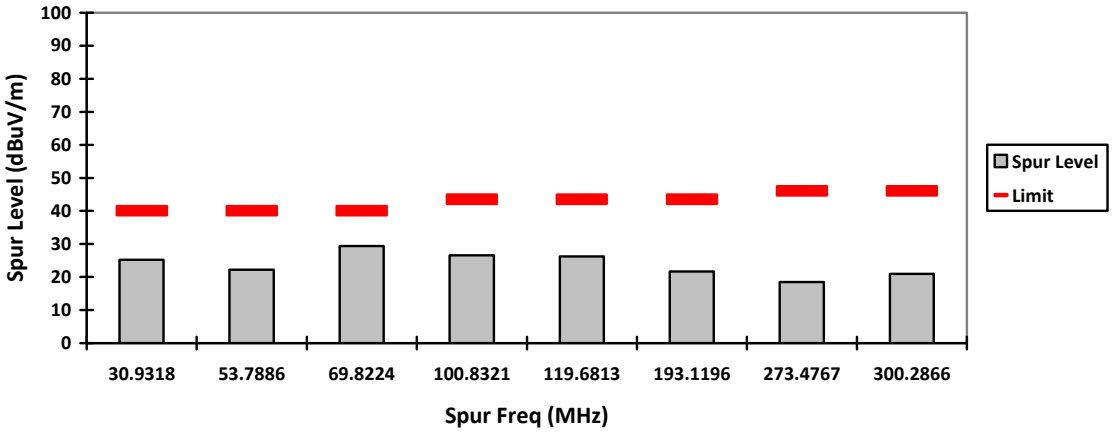
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBµV/m)	Spur level PK (dBµV/m)	Spur level AV (dBµV/m)	Limit QPK (dBµV/m)	Limit PK (dBµV/m)	Limit AV (dBµV/m)	Margin QPK (dBµV/m)	Margin PK (dBµV/m)	Margin AV (dBµV/m)	Carrier PK Power (dBµV/m)
30.9318	25.2411	-	-	40.0000	-	-	14.7589	-	-	-
53.7886	22.2470	-	-	40.0000	-	-	17.7530	-	-	-
69.8224	29.4074	-	-	40.0000	-	-	10.5926	-	-	-
100.8321	26.5899	-	-	43.5000	-	-	16.9101	-	-	-
119.6813	26.1751	-	-	43.5000	-	-	17.3249	-	-	-
193.1196	21.6882 *	-	-	43.5000	-	-	21.8118	-	-	-
273.4767	18.4483 *	-	-	46.0000	-	-	27.5517	-	-	-
300.2866	20.9142 *	-	-	46.0000	-	-	25.0858	-	-	-
Horizontal Radiated Emission Result										
30.2745	23.0031	-	-	40.0000	-	-	16.9969	-	-	-
53.4899	14.6585 *	-	-	40.0000	-	-	25.3415	-	-	-
69.8104	16.7410 *	-	-	40.0000	-	-	23.2590	-	-	-
100.8870	24.2182	-	-	43.5000	-	-	19.2818	-	-	-
119.9650	27.0875	-	-	43.5000	-	-	16.4125	-	-	-
192.8529	27.2428	-	-	43.5000	-	-	16.2572	-	-	-
272.8983	25.3972 *	-	-	46.0000	-	-	20.6028	-	-	-
299.3835	23.4878 *	-	-	46.0000	-	-	22.5122	-	-	-

Remarks: Pass Result	Marginal Result	Fail Result

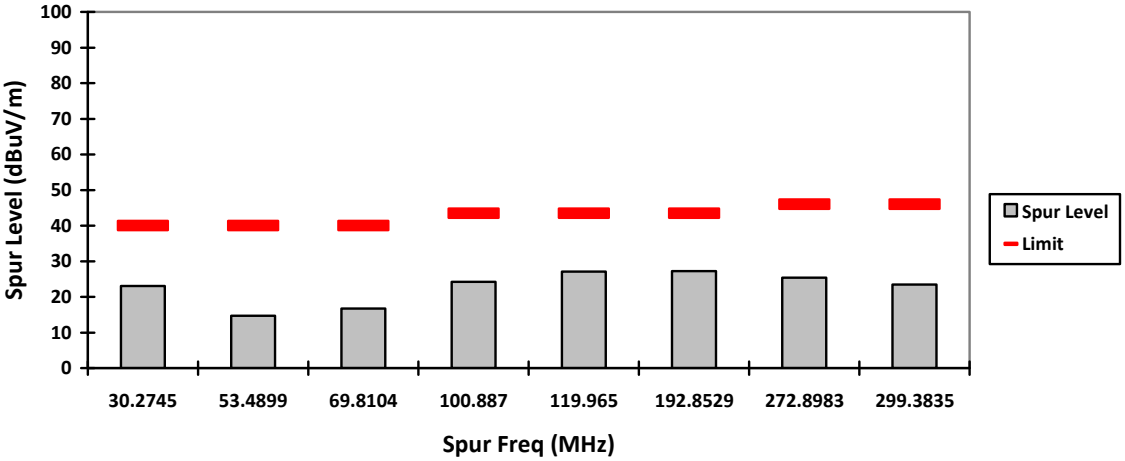
Temperature (degC): 23.7 **Humidity (%): 69.5**
Test Performed by: Haikal & Rezza **Test Date: Tue, 12 Sep, 2023**
System MU: 5.88 dB (30-1000MHz), 5.84 dB (1000-18000MHz), 6.02 dB (18000MHz-40000MHz)

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, QPK

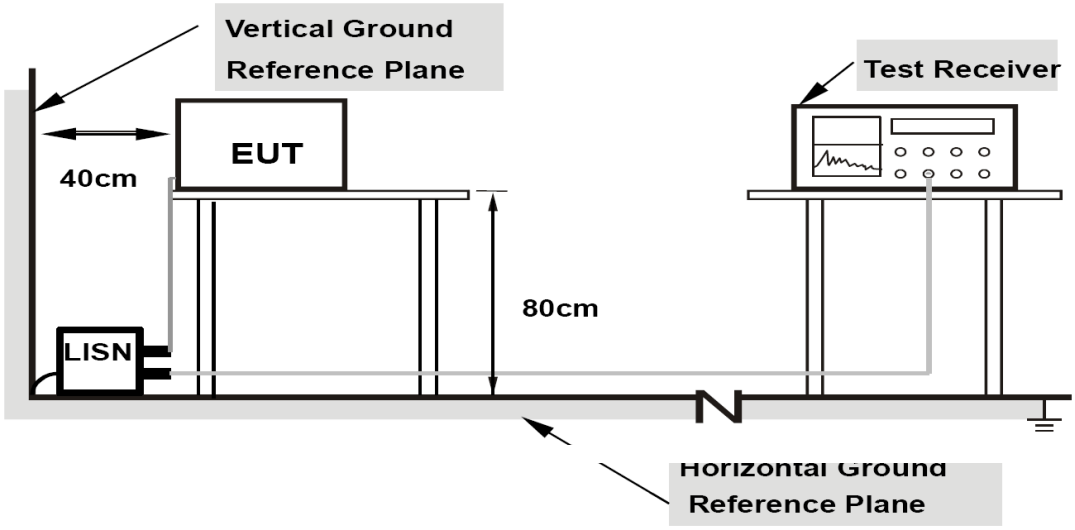


HORIZONTAL, QPK



5.9. AC Powerline Conducted Emission

5.9.1. 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.

5.9.2. 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

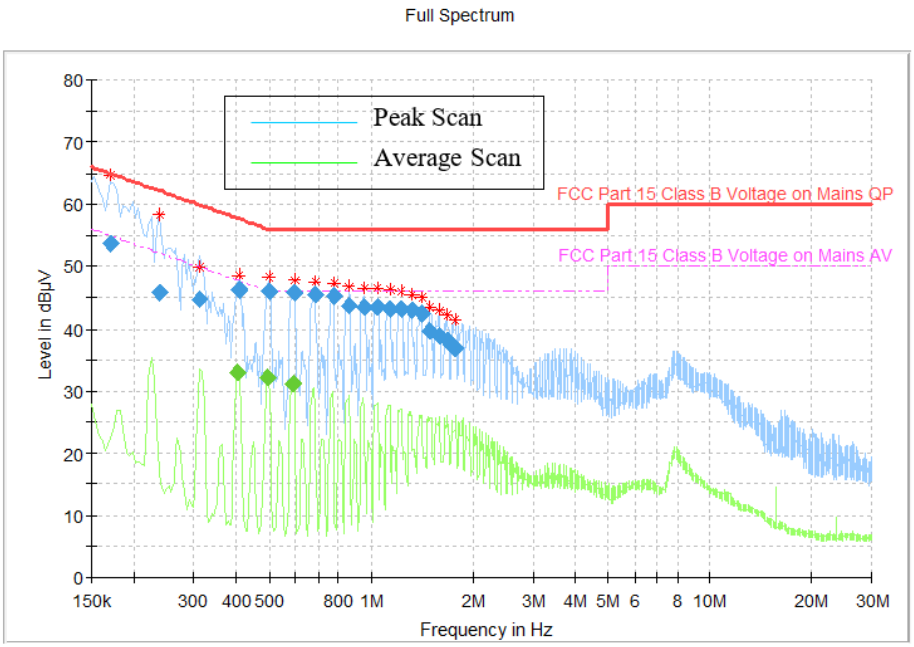
5.9.3. Test Result

Report ID.:	:	39809-EMC-00049
Ambient Temperature:	:	20.2 °C
Humidity:	:	59.3 %RH
Tester:	:	Shidee
Date of test:	:	06 September 2023

120 VAC , 60Hz

SUC

1) Charger + Radio TX with BT EDR



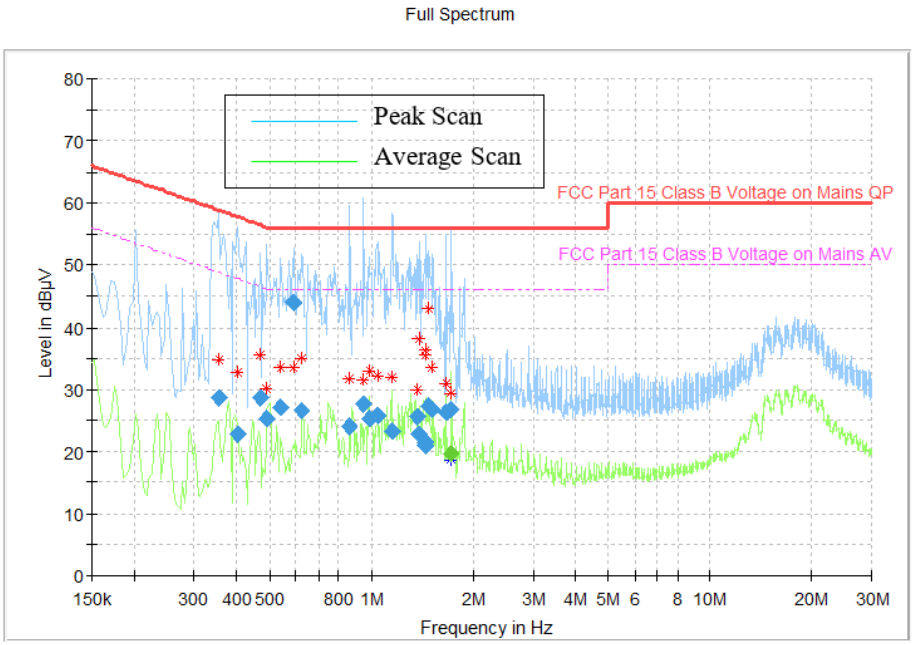
Quasipeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)	Comment
0.170000	53.55	---	64.96	11.41	1000.0	9.000	N	ON	10.6	Pass
0.238000	45.79	---	62.17	16.38	1000.0	9.000	L1	ON	10.2	Pass
0.314000	44.67	---	59.86	15.19	1000.0	9.000	N	ON	10.3	Pass
0.406000	---	32.99	47.73	14.74	1000.0	9.000	L1	ON	10.3	Pass
0.410000	46.28	---	57.65	11.37	1000.0	9.000	N	ON	10.3	Pass
0.498000	---	32.15	46.03	13.88	1000.0	9.000	L1	ON	10.3	Pass
0.502000	46.11	---	56.00	9.89	1000.0	9.000	N	ON	10.3	Pass
0.590000	---	31.26	46.00	14.74	1000.0	9.000	L1	ON	10.3	Pass
0.594000	45.78	---	56.00	10.22	1000.0	9.000	N	ON	10.3	Pass
0.686000	45.52	---	56.00	10.48	1000.0	9.000	N	ON	10.3	Pass
0.778000	45.20	---	56.00	10.80	1000.0	9.000	N	ON	10.3	Pass
0.866000	43.60	---	56.00	12.40	1000.0	9.000	N	ON	10.3	Pass
0.958000	43.44	---	56.00	12.56	1000.0	9.000	N	ON	10.3	Pass
1.050000	43.38	---	56.00	12.62	1000.0	9.000	N	ON	10.2	Pass
1.142000	43.27	---	56.00	12.73	1000.0	9.000	N	ON	10.2	Pass
1.234000	43.13	---	56.00	12.87	1000.0	9.000	N	ON	10.2	Pass
1.326000	42.84	---	56.00	13.16	1000.0	9.000	N	ON	10.2	Pass
1.418000	42.38	---	56.00	13.62	1000.0	9.000	N	ON	10.2	Pass
1.498000	39.56	---	56.00	16.44	1000.0	9.000	N	ON	10.2	Pass
1.590000	38.81	---	56.00	17.19	1000.0	9.000	N	ON	10.2	Pass
1.682000	38.03	---	56.00	17.97	1000.0	9.000	N	ON	10.2	Pass
1.770000	36.91	---	56.00	19.09	1000.0	9.000	N	ON	10.2	Pass

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

MUC

2) Charger + Radio TX with 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
0.354000	28.59	---	58.87	30.28	1000.0	9.000	N	ON	10.3	Pass
0.406000	22.72	---	57.73	35.01	1000.0	9.000	L1	ON	10.3	Pass
0.470000	28.71	---	56.51	27.81	1000.0	9.000	L1	ON	10.3	Pass
0.494000	25.41	---	56.10	30.69	1000.0	9.000	N	ON	10.3	Pass
0.542000	27.21	---	56.00	28.79	1000.0	9.000	L1	ON	10.3	Pass
0.590000	44.05	---	56.00	11.95	1000.0	9.000	N	ON	10.3	Pass
0.622000	26.56	---	56.00	29.44	1000.0	9.000	L1	ON	10.3	Pass
0.866000	23.98	---	56.00	32.02	1000.0	9.000	N	ON	10.3	Pass
0.954000	27.62	---	56.00	28.38	1000.0	9.000	L1	ON	10.3	Pass
0.986000	25.29	---	56.00	30.71	1000.0	9.000	L1	ON	10.3	Pass
1.042000	25.87	---	56.00	30.13	1000.0	9.000	L1	ON	10.2	Pass
1.158000	23.20	---	56.00	32.80	1000.0	9.000	L1	ON	10.2	Pass
1.370000	25.49	---	56.00	30.51	1000.0	9.000	L1	ON	10.2	Pass
1.378000	22.81	---	56.00	33.19	1000.0	9.000	N	ON	10.2	Pass
1.442000	21.53	---	56.00	34.47	1000.0	9.000	N	ON	10.2	Pass
1.450000	20.99	---	56.00	35.01	1000.0	9.000	N	ON	10.2	Pass
1.482000	27.27	---	56.00	28.73	1000.0	9.000	N	ON	10.2	Pass
1.510000	26.87	---	56.00	29.13	1000.0	9.000	L1	ON	10.2	Pass
1.666000	26.39	---	56.00	29.61	1000.0	9.000	N	ON	10.2	Pass
1.714000	---	19.74	46.00	26.26	1000.0	9.000	L1	ON	10.2	Pass
1.718000	26.84	---	56.00	29.16	1000.0	9.000	L1	ON	10.2	Pass

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

END OF TEST REPORT