Test Report

Product:	USB-A Wireless Car Screen Projection Adapter
Trade Mark:	N/A
Model Number:	CP02
FCC ID:	2BAUM-CP0001

Prepared for

Shenzhen kingminson Electronic Co., Ltd.

301, No. 192, jiangshi Road, Shiwai Community, Martian Street, Guangming District, Shenzhen, Guangdong, China

Prepared by

Shenzhen HongBiao Certification& Testing Co., Ltd

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Website: http://www.sz-hongbiao.com

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TEST RESULT CERTIFICATION

Applicant's Name................. :	Shenzhen kingminson Electronic Co., Ltd.
Address .... :	301, No. 192, jiangshi Road, Shiwai Community, Martian Street, Guangming District, Shenzhen, Guangdong, China
Manufacturer's Name .... :	Shenzhen kingminson Electronic Co., Ltd.
Address .... :	301, No. 192, jiangshi Road, Shiwai Community, Martian Street, Guangming District, Shenzhen, Guangdong, China
Product description	
Product name .... :	USB-A Wireless Car Screen Projection Adapter
Model Number .... :	CP02
Standards .... :	FCC Part 15.247
Test procedure....................... :	IEEE/ANSI C63.10-2020 KDB558074 D01 15.247 Meas Guidance v05r02

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

Date of Test

Date (s) of performance of tests.............:	Aug. 08, 2024~ Sept. 03, 2024
Test Result...:	**Pass**

Testing Engineer : Zoe Su

(Z o e S u)

Technical Manager : Ming Liu

(M i n g L i u)

Authorized Signatory : Leo Su

(L e o S u)

Revision History

Revised No.	Date of Issue	Description
01	Sept. 03, 2024	Original

1 General Description

1.1 Description of EUT

Product name:	USB-A Wireless Car Screen Projection Adapter
Model name:	CP02
Series Model:	CP01, CP03, CP04, CP05, CP06, CP07, CP08, CP09, CP10
Different of series model:	All models are the same circuit and module, except for model number and color.
Operation frequency:	802.11b/g/n/ax20:2412~2462 MHz 802.11n40/ax40:2422~2452 MHz
Modulation type:	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ax: OFDMA (1024QAM, 256QAM, 64QAM, 16QAM, QPSK, BPSK)
Bit Rate of transmitter:	802.11b:1-54Mbps 802.11g: 1-54Mbps 802.11n20/n40 use 800 ns GI: MCS0~MCS7 IEEE 802.11ax-HE20/ HE40: Up to MCS0~MCS11
Antenna type:	On board Antenna
Antenna gain:	-0.27dBi
Max. output power:	17.73dBm
Hardware version:	V1.0
Software version:	V1.0
Battery:	N/A
Power supply:	DC 5V from the USB port of the car screen
Adapter information:	N/A

1.2 Test Mode

Channel List for 802.11b/g/n/ax (20)

Channel	Channel	Frequency (MHz)
Low	01	2412
Middle	06	2437
High	11	2462

Channel List for 802.11n (40)

Channel	Channel	Frequency (MHz)
Low	03	2422
Middle	06	2437
High	09	2452

1.3 Operation Channel list

Channel List for 802.11b/g/n/ax (20)

Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437	\	\

Channel List for 802.11n/ax (40)

Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	07	2442
04	2427	08	2447
05	2432	09	2452
06	2437	\	\

1.4 Test Setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.5 Ancillary Equipment

Equipment	Model	S/N	Manufacturer
Laptop	NbDE-WFH9	/	HUAWEI

Note: The laptop is used to assist the RF test. In order to prevent the laptop from causing unnecessary impact on the test, the laptop will be removed from the test environment after the EUT successfully transmits at a fixed frequency using the laptop.

2 Summary of Test Result

No.	Standard Section	Test Item	Result	Remark
1	15.203	Antenna Requirement	Pass	
2	15.247 (b)	Peak Output Power	Pass	
3	15.207	Conducted Emission	N/A	
4	15.247 (d) & 15.209	Radiated Spurious Emission	Pass	
5	15.247 (e)	Power Spectral Density	Pass	
6	15.247 (a)(2)	6dB Bandwidth	Pass	
7	558074 D01 15.247 Meas Guidance v05r02 Chapter 6	Duty Cycle	Pass	
8	15.205	Band Edge Emission	Pass	
9	15.247(d)	Spurious RF Conducted Emissions	Pass	

3 Test Facilities and Accreditations

3.1 Test Laboratory

Test Site	Shenzhen HongBiao Certification& Testing Co., Ltd
Test Site Location	Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone:	(86-755) 2998 9321
Fax:	(86-755) 2998 5110
FCC Registration No.:	CN1341
A2LA Certificate No.:	6765.01

3.2 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15ºC~35ºC
Relative Humidity:	20%~75%
Air Pressure:	98kPa~101kPa

3.3 Measurement Uncertainty

The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.
The data and results quoted in this document are true and accurate values, and uncertainties are not involved in the calculations.
In addition, components and mass production processes that are similar to testing equipment may introduce additional deviations, and the manufacturer is solely responsible for the continued compliance of the equipment.

Measurement Frequency Range	U，(dB)	Note
RF frequency	$2x\ 10^{-5}$	
RF power, conducted	± 0.57 dB	
Conducted emission(150kHz~30MHz)	± 2.5 dB	
Radiated emission(9kHz-30MHz)	± 2.5 dB	
Radiated emission(30MHz~1GHz)	± 4.2 dB	
Radiated emission (above 1GHz)	± 4.7 dB	
Occupied Bandwidth	±3%	
Temperature	±1 degree	
Humidity	± 5 %	

3.4 Test Software

Software name	Manufacturer	Model	Version
Conducted Emission test Software	Farad	EZ-EMC	EMC-CON 3A1.1+
Radiated Emission test Software	Farad	EZ-EMC	FA-03A2
RF Test System	MWRF	MTS 8310	2.0.0.0

4 List of Test Equipment

Radiation emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E001	Horn Antenna	Schwarzbeck	BBHA 9120D	02592	2024-05-18	2026-05-17
2	HB-E002	Biconical log-periodic composite antenna	Schwarzbeck	VULB 9168	01340	2024-05-18	2026-05-17
3	HB-E003	SHF-EHF Horn	Schwarzbeck	BBHA 91270	01193	2024-05-18	2026-05-17
4	HB-E005	Preamplifier	Noyetec	LAN-0118	NYCM1420102	2024-05-17	2025-05-16
5	HB-E006	Preamplifier	Noyetec	LAN-1840	NYCM1420103	2024-05-17	2025-05-16
6	HB-E007	EMI TEST RECEIVER	R&S	ESR7	102520	2024-05-17	2025-05-16
7	HB-E009	POSITINAL COTROLLER	Noyetec	N/A	N/A	/	/
8	HB-E013	RF switch	Noyetec	NY-RF4	NY0CM1420204	/	/
9	HB-E066	Illuminance Tester	TASI	TA8121	N/A	2024-05-21	2025-05-20
10	HB-E075	Active loop antenna	Schwarzbeck	FMZB 1519B	1519B-245	2024-05-18	2026-05-17
11	HB-E076	Preamplifier	Hewlett Packard	8447D	1937A02278	2024-05-17	2025-05-16
Conduction emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E014	4 Path V-LISN	Schwarzbeck	NNLK 8121	00770	2024-05-17	2025-05-16
2	HB-E015	Pulse Limiter	Schwarzbeck	VTSD 9561-F	00949	2024-05-17	2025-05-16
3	HB-E016	ZN23201	Noyetec	ZN23201	N/A	2024-05-21	2025-05-20
4	HB-E059	Attenuator	Xianghua	TS2-6-1	220215166	2024-05-17	2025-05-16
5	HB-E069	EMI TEST RECEIVER	R&S	ESCI	N/A	2024-05-17	2025-05-16

RF							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E041	MXG Anaiog Signal	Agilent	N5181A	MY47070421	2024-05-17	2025-05-16

		Generator					
2	HB-E042	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW500	132108	2024-05-17	2025-05-16
3	HB-E043	MXG Anaiog Signal Generator	Agilent	N5182A	US46240335	2024-05-17	2025-05-16
4	HB-E044	Signal& spectrum Analyzer	R&S	FSV3044	101264	2024-05-17	2025-05-16
5	HB-E045	RF Control Box	Noyetec	NY100-R FCB	N/A	2024-08-19	2025-08-18
6	HB-E058	Thermometer Clock Humidity Monitor	N/A	HTC-1	N/A	/	/

Note1: the calibration interval of the above test instruments is 12&24 months and the calibrations are traceable to international system unit (SI).

Note2: The instrument RF Control Box, numbered HB-E045, contains power meter.

5 Test Item And Results

5.1 Antenna Requirement

5.1.1 Standard Requirement

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device

5.1.2 Test Result

The EUT antenna is On board Antenna. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

5.2 Conducted Emission

5.2.1 Limits

Limits – Class B		
Frequency (MHz)	Limit (dBμV)	
	Quasi-Peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50

Note:
1. the tighter limit applies at the band edges.
2. the limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

5.2.2 Test Procedures

a) EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

b) The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

c) The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

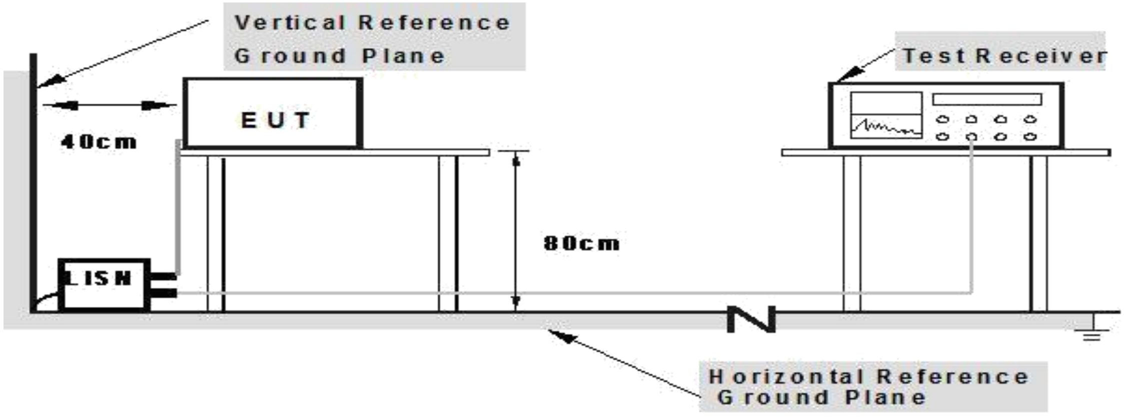
d) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

e) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

f) LISN is at least 80 cm from nearest part of EUT chassis.

g) For the actual test configuration, please refer to the related Item – photographs of the test setup.

5.2.3 Test Setup



5.2.4 Test Result

Note: This device belongs to the vehicle product, the power supply mode is DC power supply, not applicable to conducted radiation.

5.3 Radiated Emission

5.3.1 Limits

Frequencies (MHz)	Field Strength (micorvolts/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

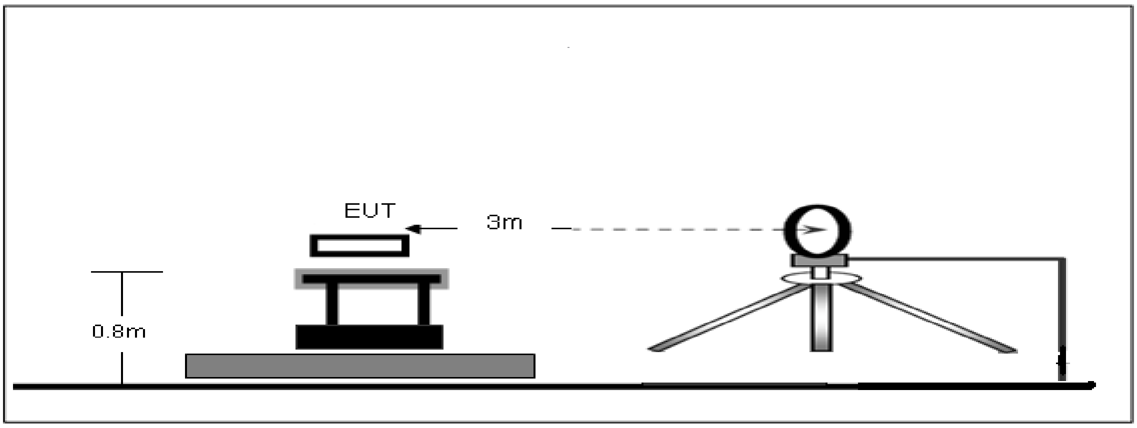
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

5.3.2 Test Procedures

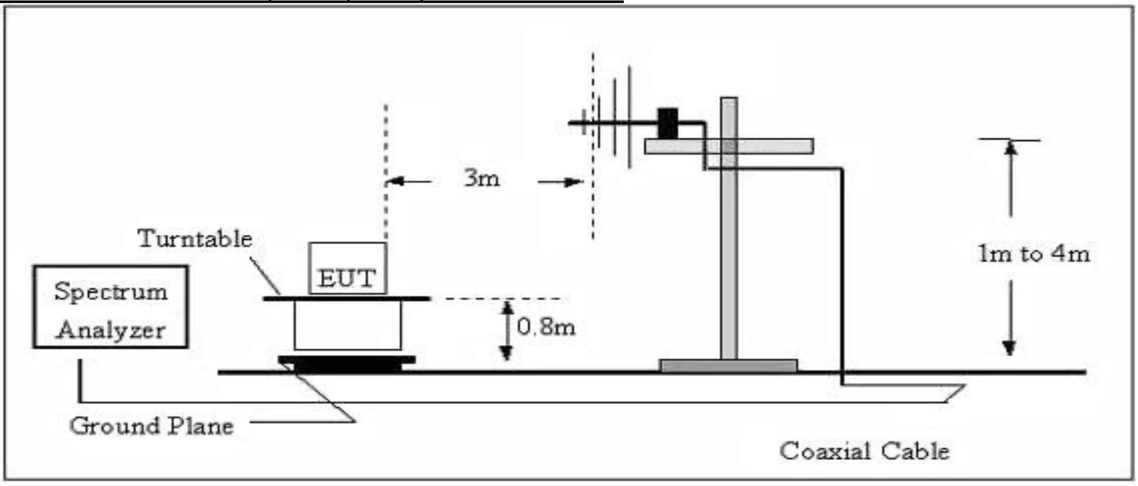
a) The radiated emission tests were performed in the 3 meters.
b) The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
c) The height of the test antenna shall vary between 1m to 4m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d) If the peak mode measured value compliance with and lower than quasi peak mode limit, the EUT shall be deemed to meet QP limits and then no additional QP mode measurement performed.
e) If the peak mode measured value compliance with and lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.
f) For the actual test configuration, please refer to the related item – EUT test photos.

5.3.3 Test Setup

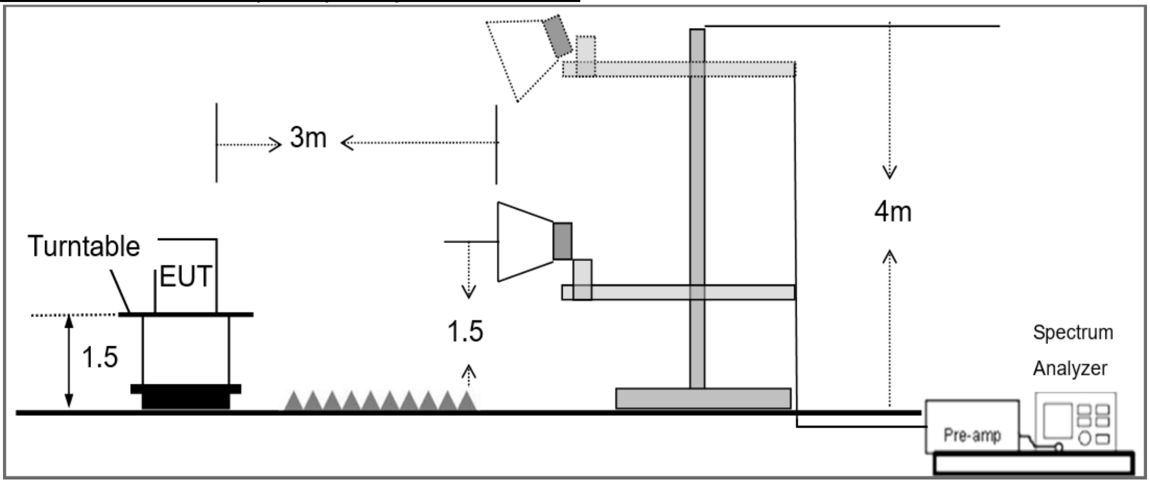
Radiated Emission Test-Up Frequency Below 30MHz



Radiated Emission Test-Up Frequency 30MHz~1GHz



Radiated emission test-up frequency above 1GHz



5.3.4 Test Result

Below 30MHz

EUT:	USB-A Wireless Car Screen Projection Adapter	Model Name:	CP02
Pressure:	1010 hPa	Test Voltage:	DC 5V from the USB port of the car screen
Test Mode:	TX	Polarization:	--

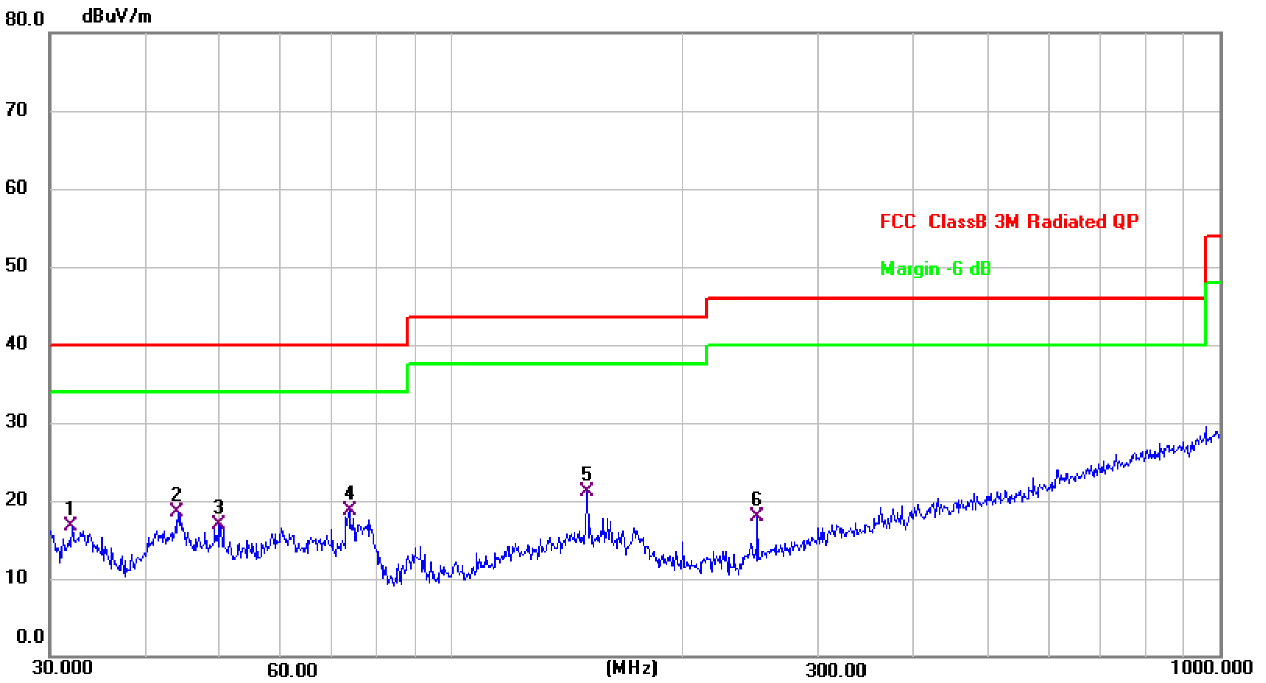
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	Pass
--	--	--	--	Pass

Note:

1. For 9kHz-30MHz, the amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
2. Distance extrapolation factor =40 log (specific distance/test distance)(dB);
3. Limit line = specific limits (dBuV) + distance extrapolation factor.

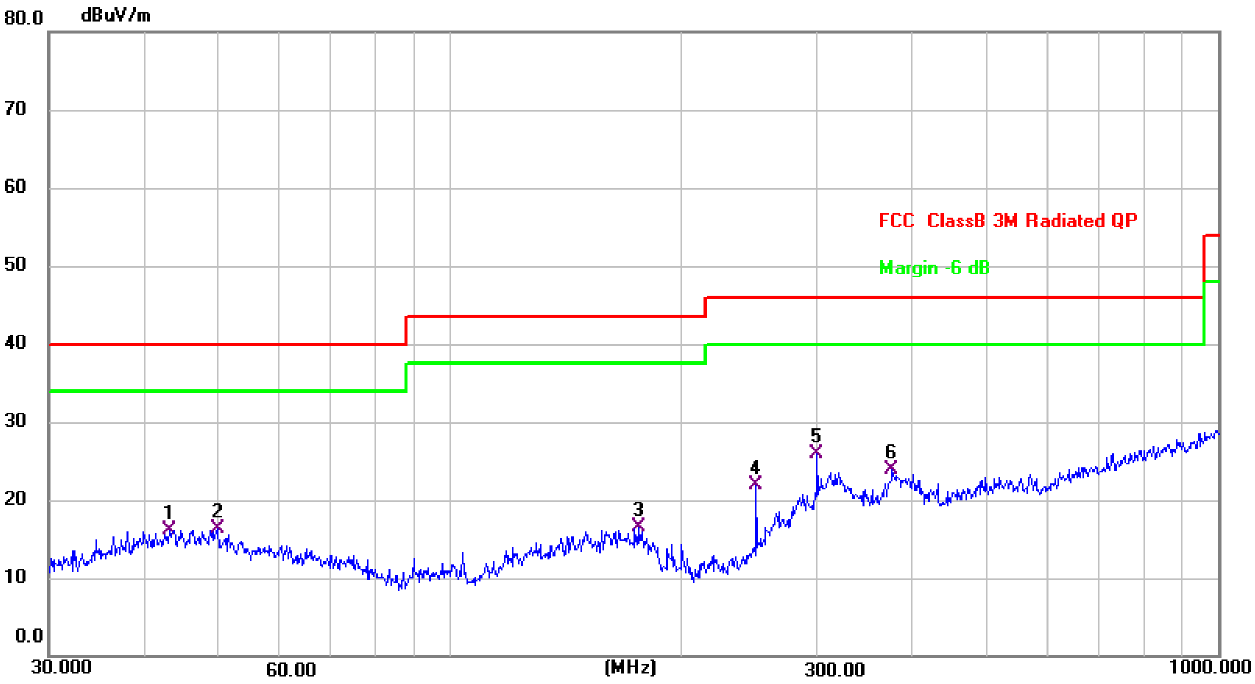
Frequency range (30MHz – 1GHz)

EUT:	USB-A Wireless Car Screen Projection Adapter	Model Name:	CP02
Test Mode:	TX	Phase:	Vertical
Test Voltage:	DC 5V from the USB port of the car screen		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	32.0667	31.73	-15.10	16.63	40.00	-23.37	QP
2	44.1200	32.72	-14.17	18.55	40.00	-21.45	QP
3	49.8813	31.09	-14.28	16.81	40.00	-23.19	QP
4 *	73.6170	35.15	-16.50	18.65	40.00	-21.35	QP
5	150.0107	34.55	-13.53	21.02	43.50	-22.48	QP
6	250.3009	32.72	-14.90	17.82	46.00	-28.18	QP

EUT:	USB-A Wireless Car Screen Projection Adapter	Model Name:	CP02
Test Mode:	TX	Phase:	Horizontal
Test Voltage:	DC 5V from the USB port of the car screen		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	43.0504	30.36	-14.18	16.18	40.00	-23.82	QP
2	49.8813	30.61	-14.28	16.33	40.00	-23.67	QP
3	175.6516	31.00	-14.52	16.48	43.50	-27.02	QP
4	250.3009	36.78	-14.90	21.88	46.00	-24.12	QP
5 *	300.3672	38.52	-12.56	25.96	46.00	-20.04	QP
6	375.9384	34.35	-10.39	23.96	46.00	-22.04	QP

Frequency range (1GHz-25GHz)

Frequency	Read Level	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Remark	Comment
(MHz)	(dBμV)	(dB)	dB/m	(dB)	(dBμV/m)	(dBμV/m)	(dB)		
Low Channel (2412 MHz)(802.11b)--Above 1G									
4824.161	62.90	4.36	32.92	45.53	54.65	74.00	-19.35	Pk	Vertical
4824.161	43.76	4.36	32.92	45.53	35.51	54.00	-18.49	AV	Vertical
7236.396	60.06	5.02	37.63	45.56	57.15	74.00	-16.85	Pk	Vertical
7236.396	41.12	5.02	37.63	45.56	38.21	54.00	-15.79	AV	Vertical
4824.154	63.28	4.36	32.92	45.53	55.03	74.00	-18.97	Pk	Horizontal
4824.154	42.47	4.36	32.92	45.53	34.22	54.00	-19.78	AV	Horizontal
7236.168	64.22	5.02	37.63	45.56	61.31	74.00	-12.69	Pk	Horizontal
7236.168	42.70	5.02	37.63	45.56	39.79	54.00	-14.21	AV	Horizontal
Middle Channel (2437 MHz)(802.11b)--Above 1G									
4874.112	62.64	4.41	33.01	45.76	54.30	74.00	-19.70	Pk	Vertical
4874.112	43.97	4.41	33.01	45.76	35.63	54.00	-18.37	AV	Vertical
7311.247	59.72	5.02	37.68	45.59	56.83	74.00	-17.17	Pk	Vertical
7311.247	41.52	5.02	37.68	45.59	38.63	54.00	-15.37	AV	Vertical
4874.132	62.52	4.41	33.01	45.76	54.18	74.00	-19.82	Pk	Horizontal
4874.132	44.69	4.41	33.01	45.76	36.35	54.00	-17.65	AV	Horizontal
7311.085	61.75	5.02	37.68	45.59	58.86	74.00	-15.14	Pk	Horizontal
7311.085	42.89	5.02	37.68	45.59	40.00	54.00	-14.00	AV	Horizontal
High Channel (2462 MHz)(802.11b)--Above 1G									
4924.169	63.48	4.50	33.26	46.07	55.17	74.00	-18.83	Pk	Vertical
4924.169	43.51	4.50	33.26	46.07	35.20	54.00	-18.80	AV	Vertical
7386.215	61.11	5.02	37.78	45.77	58.14	74.00	-15.86	Pk	Vertical
7386.215	41.01	5.02	37.78	45.77	38.04	54.00	-15.96	AV	Vertical
4924.045	64.30	4.50	33.26	46.07	55.99	74.00	-18.01	Pk	Horizontal
4924.045	44.63	4.50	33.26	46.07	36.32	54.00	-17.68	AV	Horizontal
7386.132	60.80	5.02	37.78	45.77	57.83	74.00	-16.17	Pk	Horizontal
7386.132	42.87	5.02	37.78	45.77	39.90	54.00	-14.10	AV	Horizontal

Note:
1. Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor
2. All other emissions more than 20dB below the limit.
3. The three modulated high, medium and low channels have been tested. The report only shows the worst mode. The worst mode is 802.11b.

5.3.5 Radiated Band Edge

Frequency	Read Level	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Limits	Margin	Remark	Comment
(MHz)	(dBμV)	(dB)	dB/m	(dB)	(dBμV/m)	(dBμV/m)	(dB)		

802.11b									
2310.00	58.44	2.40	27.70	40.40	48.14	74	-25.86	Pk	Horizontal
2310.00	43.32	2.40	27.70	40.40	33.02	54	-20.98	AV	Horizontal
2310.00	58.84	2.40	27.70	40.40	48.54	74	-25.46	Pk	Vertical
2310.00	42.01	2.40	27.70	40.40	31.71	54	-22.29	AV	Vertical
2390.00	57.31	2.44	28.30	40.10	47.95	74	-26.05	Pk	Vertical
2390.00	42.28	2.44	28.30	40.10	32.92	54	-21.08	AV	Vertical
2390.00	56.58	2.44	28.30	40.10	47.22	74	-26.78	Pk	Horizontal
2390.00	41.22	2.44	28.30	40.10	31.86	54	-22.14	AV	Horizontal
2483.50	58.01	2.48	28.70	39.80	49.39	74	-24.61	Pk	Vertical
2483.50	43.08	2.48	28.70	39.80	34.46	54	-19.54	AV	Vertical
2483.50	59.17	2.48	28.70	39.80	50.55	74	-23.45	Pk	Horizontal
2483.50	41.32	2.48	28.70	39.80	32.70	54	-21.30	AV	Horizontal
802.11g									
2310.00	59.09	2.40	27.70	40.40	48.79	74	-25.21	Pk	Horizontal
2310.00	43.87	2.40	27.70	40.40	33.57	54	-20.43	AV	Horizontal
2310.00	56.65	2.40	27.70	40.40	46.35	74	-27.65	Pk	Vertical
2310.00	43.21	2.40	27.70	40.40	32.91	54	-21.09	AV	Vertical
2390.00	57.40	2.44	28.30	40.10	48.04	74	-25.96	Pk	Vertical
2390.00	41.99	2.44	28.30	40.10	32.63	54	-21.37	AV	Vertical
2390.00	57.54	2.44	28.30	40.10	48.18	74	-25.82	Pk	Horizontal
2390.00	43.95	2.44	28.30	40.10	34.59	54	-19.41	AV	Horizontal
2483.50	58.51	2.48	28.70	39.80	49.89	74	-24.11	Pk	Vertical
2483.50	44.38	2.48	28.70	39.80	35.76	54	-18.24	AV	Vertical
2483.50	59.11	2.48	28.70	39.80	50.49	74	-23.51	Pk	Horizontal
2483.50	42.27	2.48	28.70	39.80	33.65	54	-20.35	AV	Horizontal

802.11n20									
2310.00	57.77	2.40	27.70	40.40	47.47	74	-26.53	Pk	Horizontal
2310.00	44.32	2.40	27.70	40.40	34.02	54	-19.98	AV	Horizontal
2310.00	59.20	2.40	27.70	40.40	48.90	74	-25.10	Pk	Vertical
2310.00	41.91	2.40	27.70	40.40	31.61	54	-22.39	AV	Vertical
2390.00	58.03	2.44	28.30	40.10	48.67	74	-25.33	Pk	Vertical
2390.00	42.55	2.44	28.30	40.10	33.19	54	-20.81	AV	Vertical
2390.00	56.35	2.44	28.30	40.10	46.99	74	-27.01	Pk	Horizontal
2390.00	42.37	2.44	28.30	40.10	33.01	54	-20.99	AV	Horizontal
2483.50	57.79	2.48	28.70	39.80	49.17	74	-24.83	Pk	Vertical
2483.50	43.05	2.48	28.70	39.80	34.43	54	-19.57	AV	Vertical
2483.50	59.16	2.48	28.70	39.80	50.54	74	-23.46	Pk	Horizontal
2483.50	41.96	2.48	28.70	39.80	33.34	54	-20.66	AV	Horizontal
802.11n40									
2310.00	59.47	2.40	27.70	40.40	49.17	74	-24.83	Pk	Horizontal
2310.00	43.98	2.40	27.70	40.40	33.68	54	-20.32	AV	Horizontal
2310.00	57.16	2.40	27.70	40.40	46.86	74	-27.14	Pk	Vertical
2310.00	43.10	2.40	27.70	40.40	32.80	54	-21.20	AV	Vertical
2390.00	58.15	2.44	28.30	40.10	48.79	74	-25.21	Pk	Vertical
2390.00	42.03	2.44	28.30	40.10	32.67	54	-21.33	AV	Vertical
2390.00	58.38	2.44	28.30	40.10	49.02	74	-24.98	Pk	Horizontal
2390.00	43.18	2.44	28.30	40.10	33.82	54	-20.18	AV	Horizontal
2483.50	58.75	2.48	28.70	39.80	50.13	74	-23.87	Pk	Vertical
2483.50	44.30	2.48	28.70	39.80	35.68	54	-18.32	AV	Vertical
2483.50	58.89	2.48	28.70	39.80	50.27	74	-23.73	Pk	Horizontal
2483.50	42.31	2.48	28.70	39.80	33.69	54	-20.31	AV	Horizontal

Note:
1. All Readings are Peak Value (VBW=3MHz) and AV Value (VBW=10Hz).
2. Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor.
3. All the modulation modes have been tested, and only the worst results are reflected in the report.

5.3.6 Spurious Emission in Restricted Band 1000MHz-25000MHz

All the modulation modes have been tested, and the worst result was report as below:

Frequency (MHz)	Read Level (dBμV)	Cable loss (dB)	Antenna Factor dB/m	Preamp Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark	Comment
3260	60.79	3.27	30.02	38.05	56.03	74	-17.97	Pk	Vertical
3260	39.26	3.27	30.02	38.05	34.50	54	-19.50	AV	Vertical
3260	59.48	3.27	30.02	38.05	54.72	74	-19.28	Pk	Horizontal
3260	36.65	3.27	30.02	38.05	31.89	54	-22.11	AV	Horizontal
3332	60.24	3.31	30.00	37.91	55.64	74	-18.36	Pk	Vertical
3332	38.99	3.31	30.00	37.91	34.39	54	-19.61	AV	Vertical
3332	60.31	3.31	30.00	37.91	55.71	74	-18.29	Pk	Horizontal
3332	36.15	3.31	30.00	37.91	31.55	54	-22.45	AV	Horizontal
17797	42.67	8.63	44.23	39.60	55.93	74	-18.07	Pk	Vertical
17797	28.51	8.63	44.23	39.60	41.77	54	-12.23	AV	Vertical
17788	42.67	8.63	44.23	39.60	55.93	74	-18.07	Pk	Horizontal
17788	27.69	8.63	44.23	39.60	40.95	54	-13.05	AV	Horizontal

5.4 Peak Output Power

5.4.1 Limit

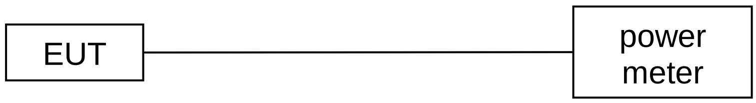
FCC Part15 Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
15.247(b)(3)	Peak output power	1 watt or 30dBm	2400-2483.5

5.4.2 Test Procedure

1. PKPM1 Peak power meter measurement

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

5.4.3 Test Setup



5.4.4 Test Results

EUT:	USB-A Wireless Car Screen Projection Adapter	Model Name:	CP02
Test Mode:	TX	Test Voltage:	DC 5V from the USB port of the car screen

802.11b

Test Channel	Frequency (MHz)	Maximum Peak Conducted Output Power(dBm)	Limit (dBm)
CH01	2412	17.36	30
CH06	2437	16.63	30
CH11	2462	16.31	30

802.11g

Test Channel	Frequency (MHz)	Maximum Peak Conducted Output Power(dBm)	Limit (dBm)
CH01	2412	17.52	30
CH06	2437	16.34	30
CH11	2462	15.92	30

802.11n20

Test Channel	Frequency (MHz)	Maximum Peak Conducted Output Power(dBm)	Limit (dBm)
CH01	2412	17.63	30
CH06	2437	16.8	30
CH11	2462	16.51	30

802.11n40

Test Channel	Frequency (MHz)	Maximum Peak Conducted Output Power(dBm)	Limit (dBm)
CH03	2422	17.15	30
CH06	2437	16.81	30
CH09	2452	16.66	30

802.11ax20

Test Channel	Frequency (MHz)	Maximum Peak Conducted Output Power(dBm)	Limit (dBm)
CH01	2412	17.73	30
CH06	2437	17.28	30
CH11	2462	17.05	30

802.11ax40

Test Channel	Frequency (MHz)	Maximum Peak Conducted Output Power(dBm)	Limit (dBm)
CH03	2422	17.43	30
CH06	2437	17.01	30
CH09	2452	17.13	30

5.5 Power Spectral Density

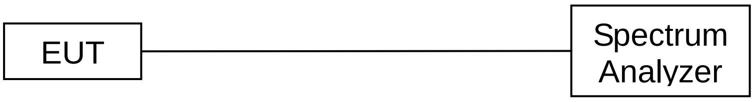
5.5.1 Limit

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
15.247	Power Spectral Density	8 dBm (in any 3kHz)	2400-2483.5

5.5.2 Test Procedure

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW ≥ 3 kHz.
4. Set the VBW ≥ 3 x RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

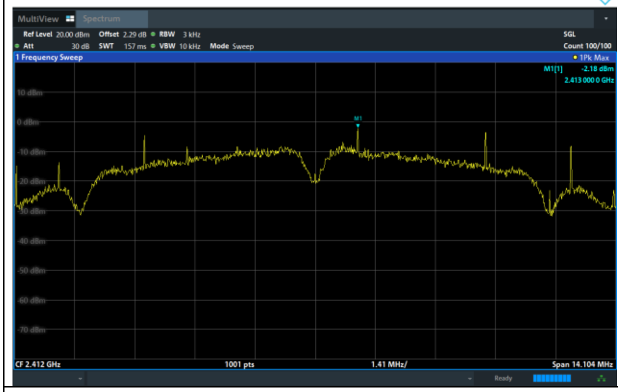
5.5.3 Test Setup



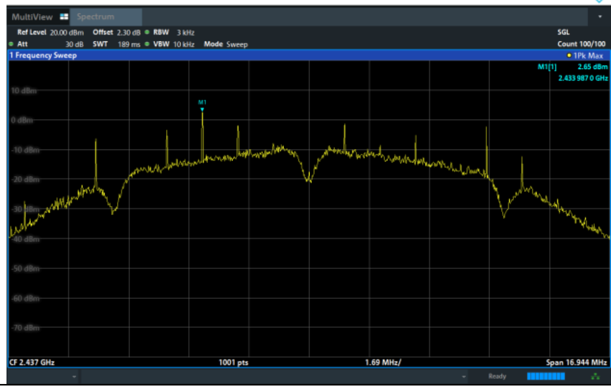
5.5.4 Test Results

802.11b			
Frequency	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-2.18	8	Pass
2437 MHz	2.65	8	Pass
2462 MHz	4.35	8	Pass

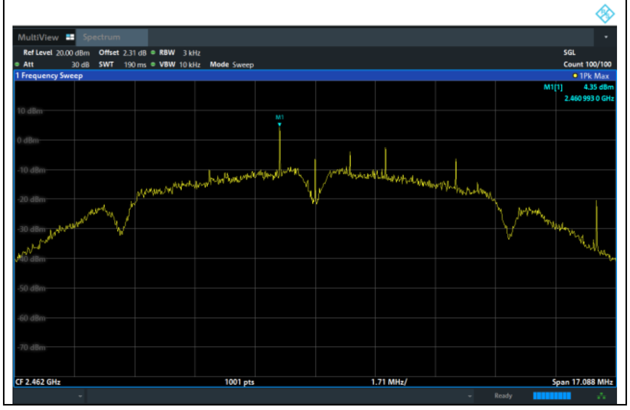
TX CH01



TX CH06

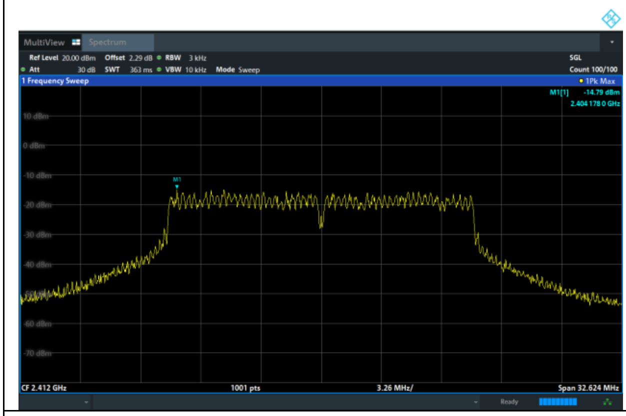


TX CH11

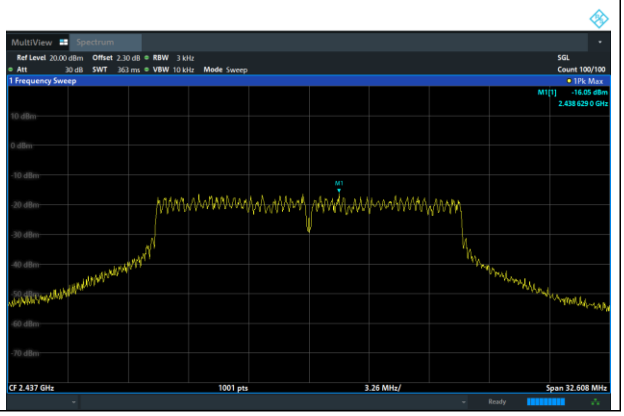


802.11g			
Frequency	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-14.79	8	Pass
2437 MHz	-16.05	8	Pass
2462 MHz	-15.83	8	Pass

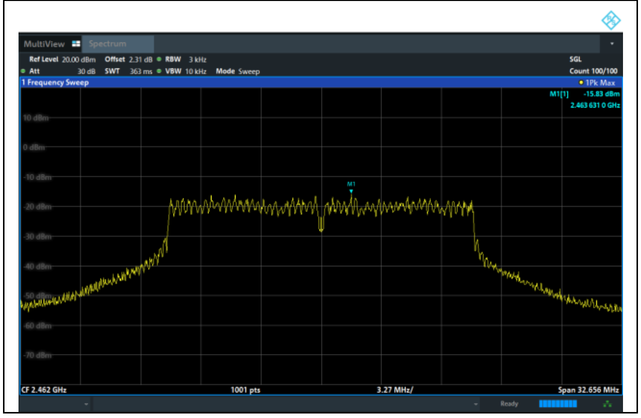
TX CH01



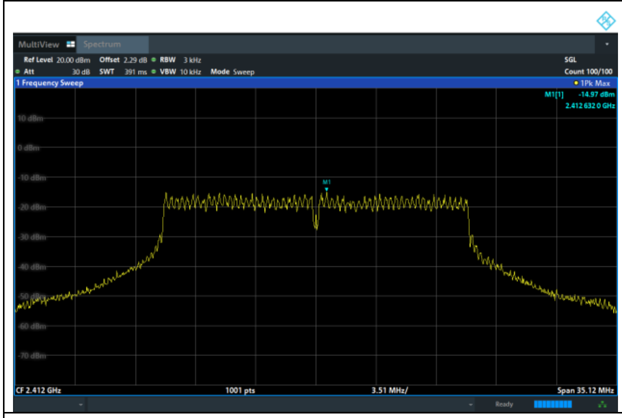
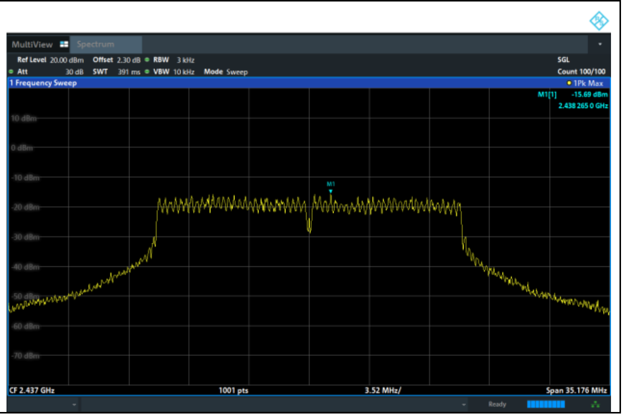
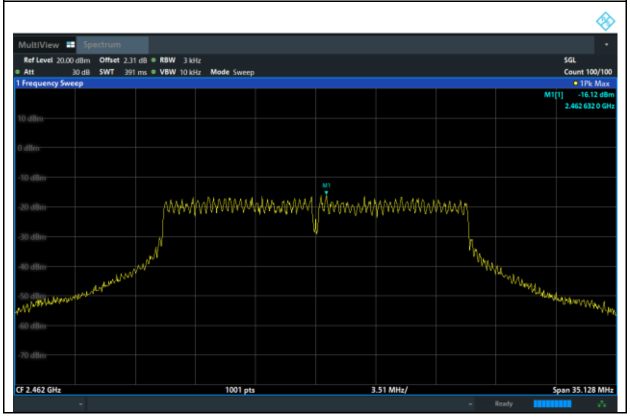
TX CH06



TX CH11

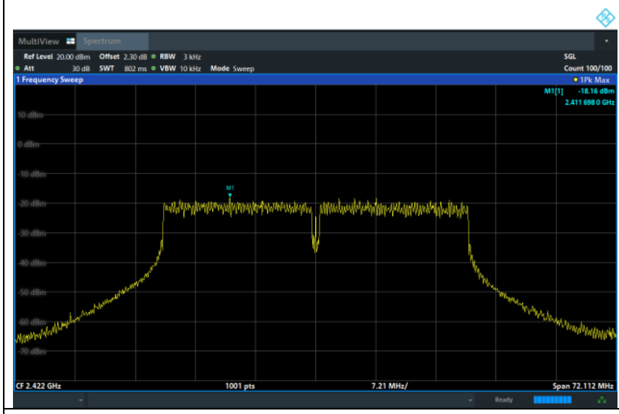


802.11n20			
Frequency	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-14.97	8	Pass
2437 MHz	-15.69	8	Pass
2462 MHz	-16.12	8	Pass

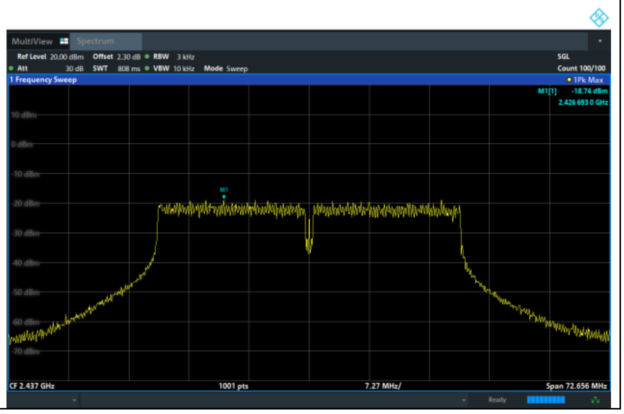
TX CH01	TX CH06
	
TX CH11	
	

802.11n40			
Frequency	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2422 MHz	-18.16	8	Pass
2437 MHz	-18.74	8	Pass
2452 MHz	-18.62	8	Pass

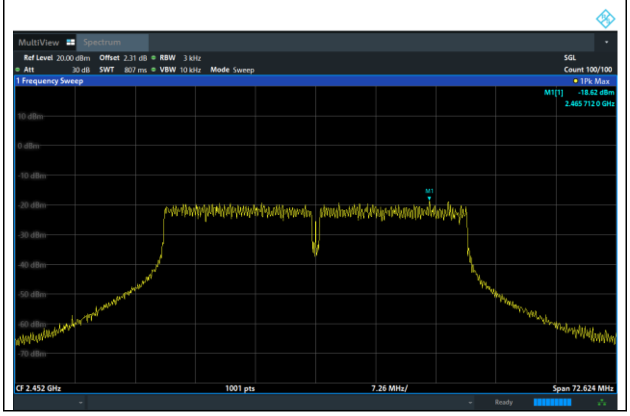
TX CH03



TX CH06

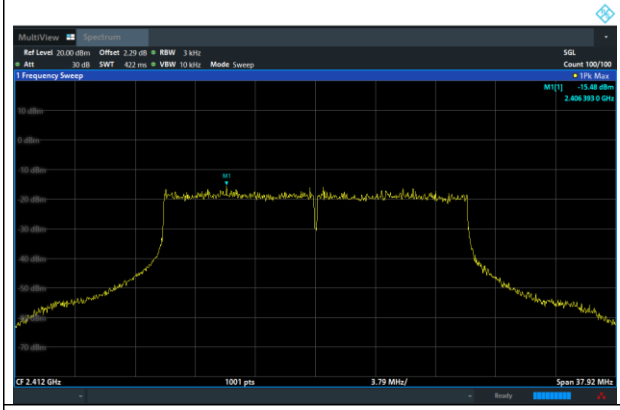


TX CH9

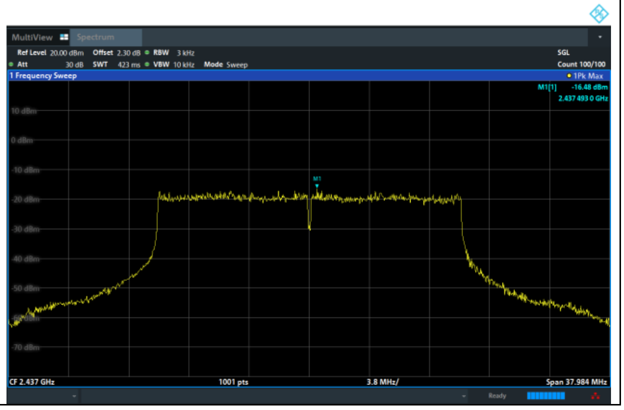


802.11ax20			
Frequency	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2412 MHz	-15.48	8	Pass
2437 MHz	-16.48	8	Pass
2462 MHz	-16.73	8	Pass

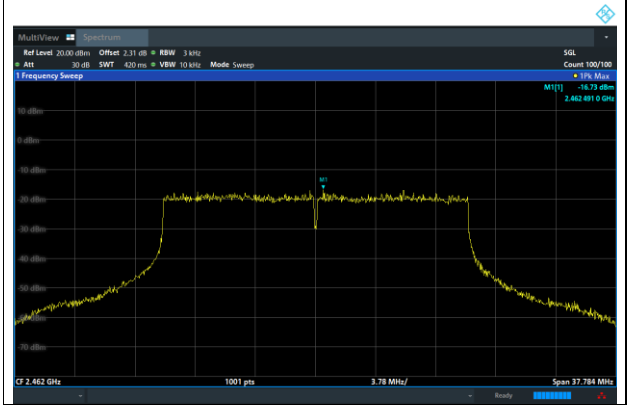
TX CH01



TX CH06

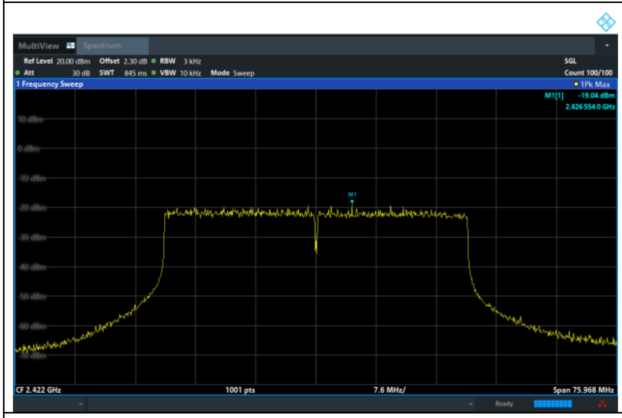


TX CH11

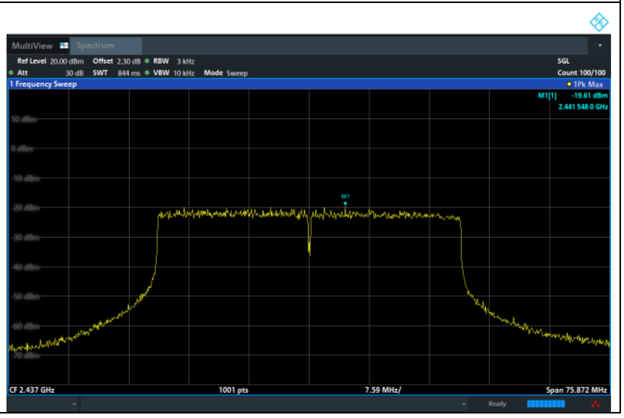


802.11ax40			
Frequency	Power Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2422 MHz	-19.04	8	Pass
2437 MHz	-19.61	8	Pass
2452 MHz	-18.31	8	Pass

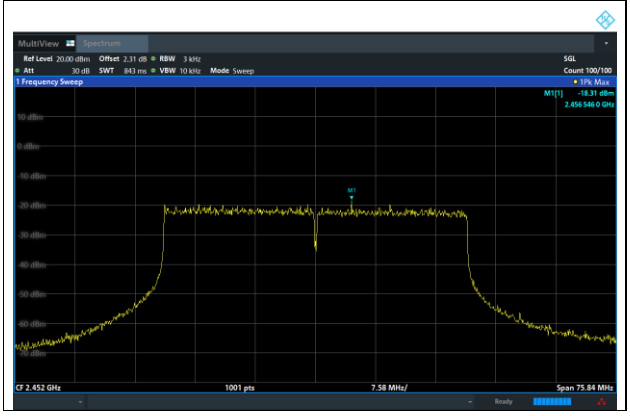
TX CH03



TX CH06



TX CH9



5.6 6dB Bandwidth

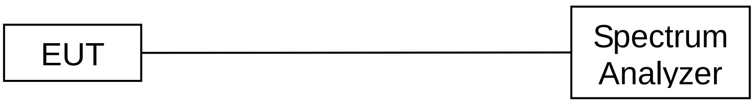
5.6.1 Limit

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
15.247(a)(2)	Bandwidth	>= 500kHz (6dB bandwidth)	2400-2483.5

5.6.2 Test Procedure

1. Set RBW= 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.6.3 Test Setup

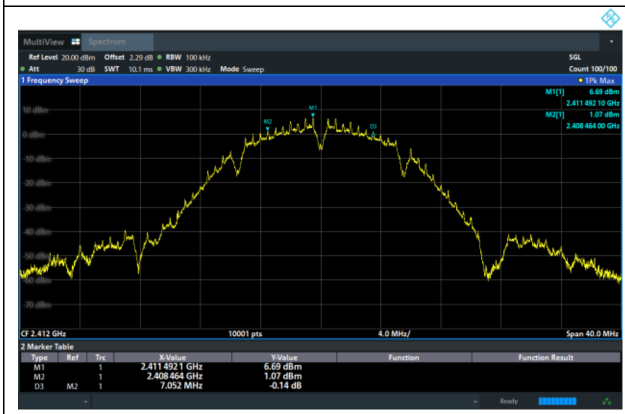
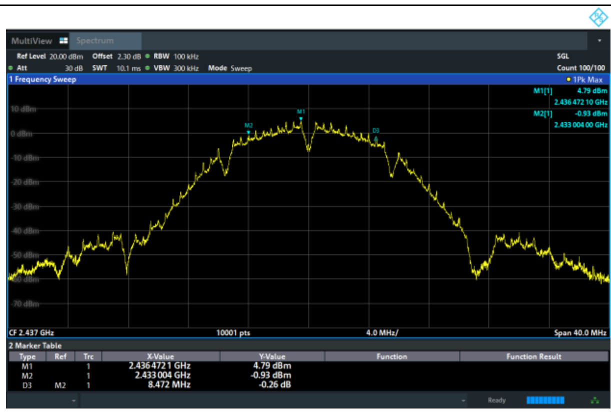
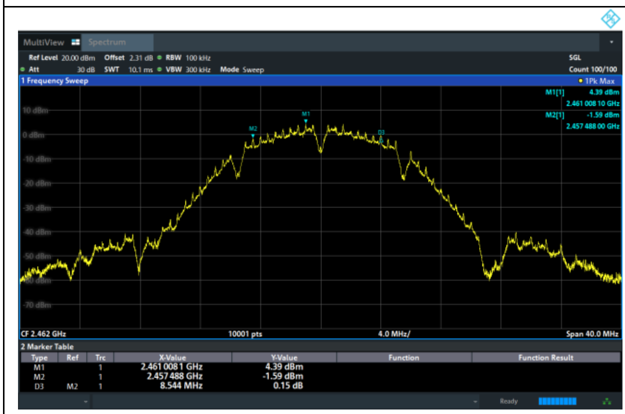


5.6.4 Test Results

EUT:	USB-A Wireless Car Screen Projection Adapter	Model Name:	CP02
Pressure:	1012 hPa	Test Voltage:	DC 5V from the USB port of the car screen
Test Mode:	TX b Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	7.052	500	Pass
Middle	2437	8.472	500	Pass
High	2462	8.544	500	Pass

Test plots

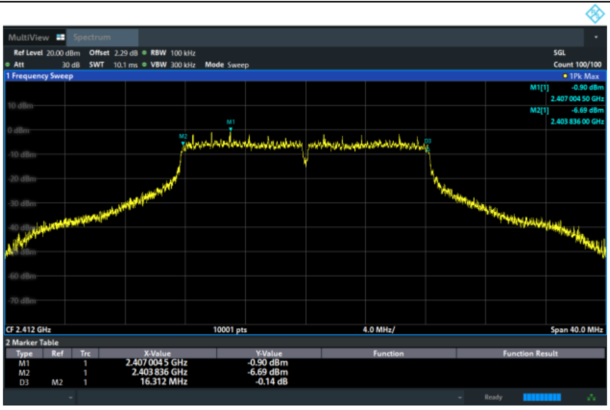
TX CH 01	TX CH 06
	
TX CH 11	/
	/

EUT:	USB-A Wireless Car Screen Projection Adapter	Model Name:	CP02
Pressure:	1012 hPa	Test Voltage:	DC 5V from the USB port of the car screen
Test Mode:	TX g Mode /CH01, CH06, CH11		

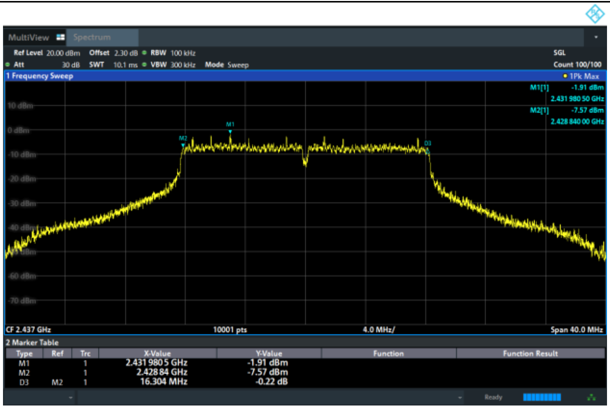
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.312	500	Pass
Middle	2437	16.304	500	Pass
High	2462	16.328	500	Pass

Test plots

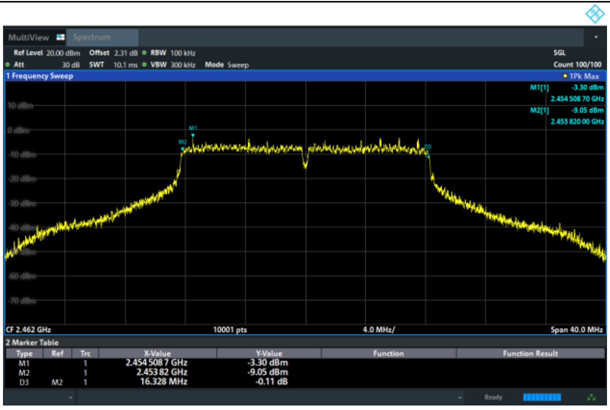
TX CH 01



TX CH 06



TX CH 11



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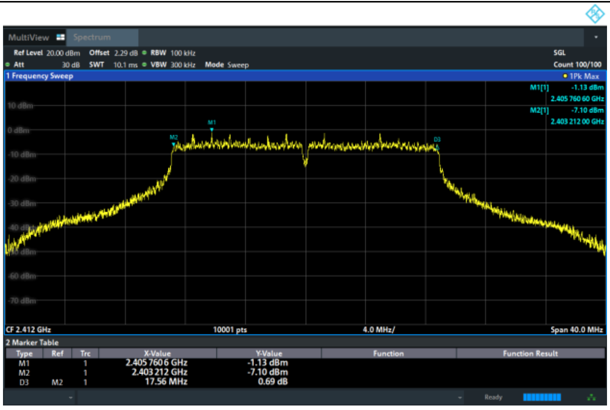
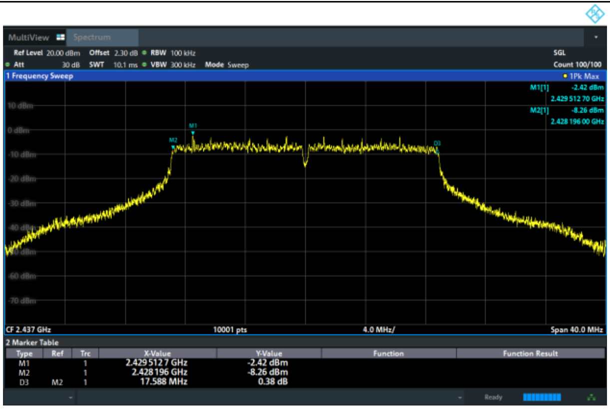
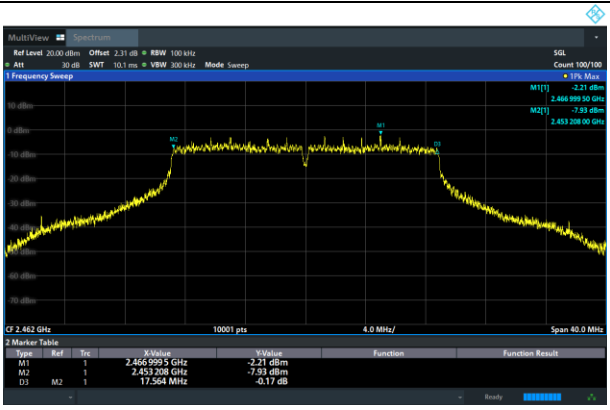
EUT:	USB-A Wireless Car Screen Projection Adapter	Model Name:	CP02
Pressure:	1012 hPa	Test Voltage:	DC 5V from the USB port of the car screen
Test Mode:	TX n20 Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.56	500	Pass
Middle	2437	17.588	500	Pass
High	2462	17.564	500	Pass

Test plots

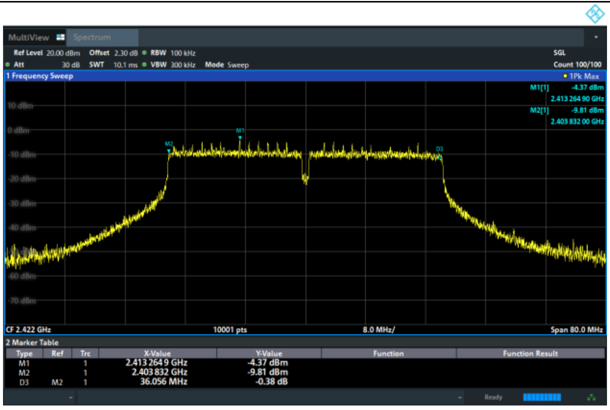
TX CH 01	TX CH 06
	
TX CH 11	/
	/

EUT:	USB-A Wireless Car Screen Projection Adapter	Model Name:	CP02
Pressure:	1012 hPa	Test Voltage:	DC 5V from the USB port of the car screen
Test Mode:	TX n40 Mode /CH03, CH06, CH09		

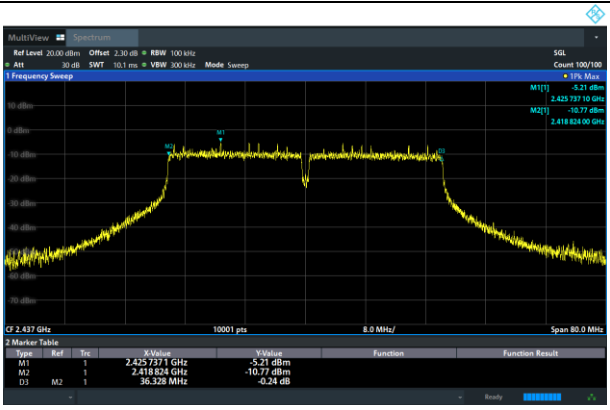
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2422	36.056	500	Pass
Middle	2437	36.328	500	Pass
High	2452	36.312	500	Pass

Test plots

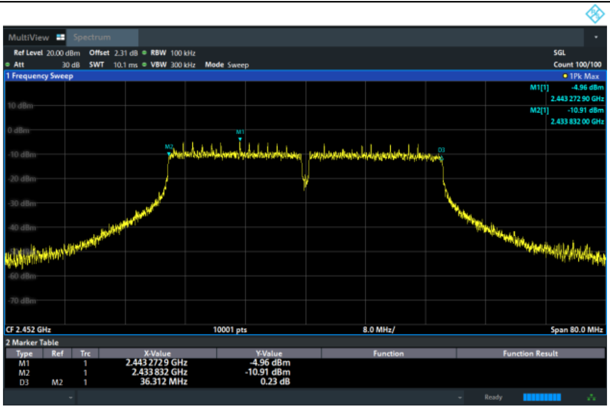
TX CH 03



TX CH 06



TX CH 09



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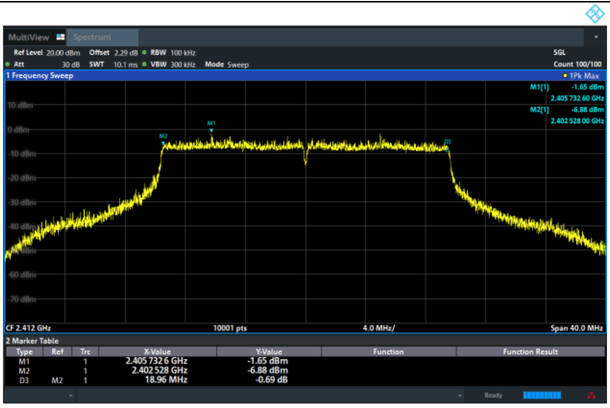
EUT:	USB-A Wireless Car Screen Projection Adapter	Model Name:	CP02
Pressure:	1012 hPa	Test Voltage:	DC 5V from the USB port of the car screen
Test Mode:	TX ax20 Mode /CH01, CH06, CH11		

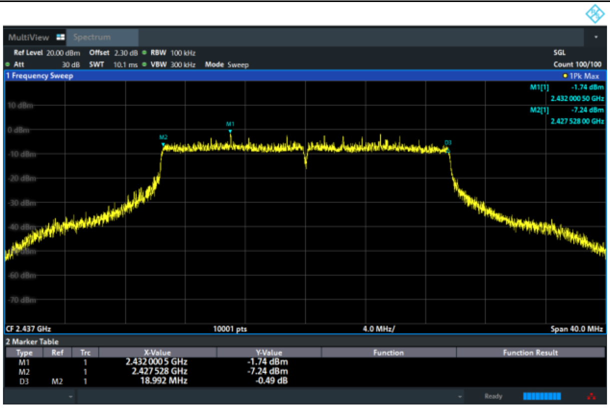
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	18.96	500	Pass
Middle	2437	18.992	500	Pass
High	2462	18.892	500	Pass

Test plots

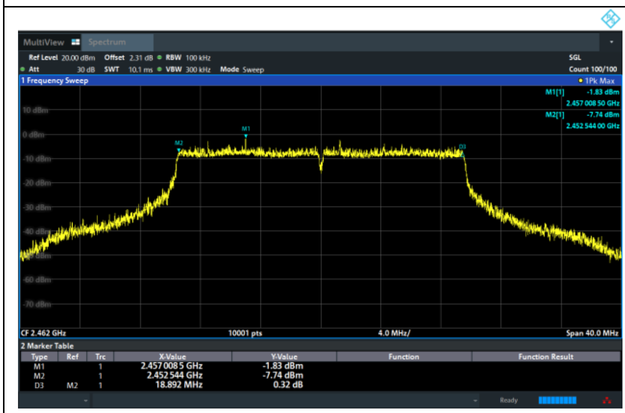
TX CH 01



TX CH 06



TX CH 11



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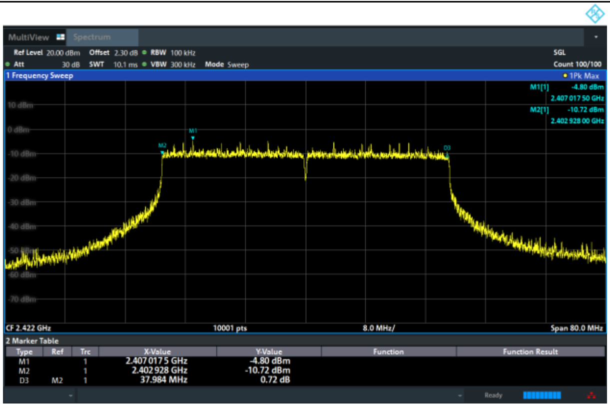
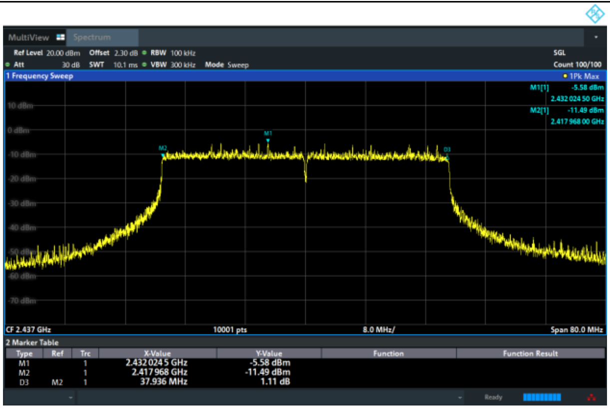
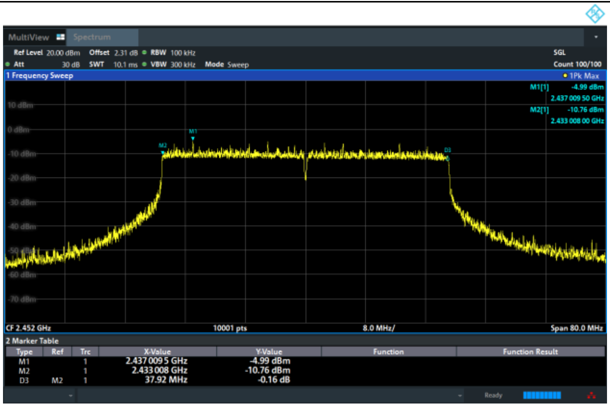
EUT:	USB-A Wireless Car Screen Projection Adapter	Model Name:	CP02
Pressure:	1012 hPa	Test Voltage:	DC 5V from the USB port of the car screen
Test Mode:	TX ax40 Mode /CH03, CH06, CH09		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2422	37.984	500	Pass
Middle	2437	37.936	500	Pass
High	2452	37.92	500	Pass

Test plots

TX CH 03	TX CH 06
	
TX CH 09	/
	/

5.7 Duty Cycle

5.7.1 Limit

No limit requirement.

5.7.2 Test Procedure

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

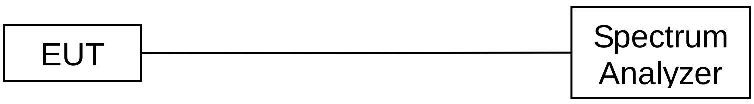
The transmitter output is connected to the Spectrum Analyzer. We tested according to the zero-span measurement method, 6.0(b) in KDB 558074 D01 DTS Meas Guidance v05r02.

The largest availble value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if T ≤ 6.25 microseconds. (50/6.25 = 8)

The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/T.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
Set to the maximum power setting and enable the EUT transmit continuously.
The EUT was operating in controlled its channel.
Use the following spectrum analyzer settings:
Span = Zero Span
RBW = 10MHz (the largest available value)
VBW = 10MHz (≥ RBW)
Number of points in Sweep >100
Detector function = peak
Trace = Clear write
Measure Total and Ton
Calculate Duty Cycle = Ton / Total

5.7.3 Test Setup



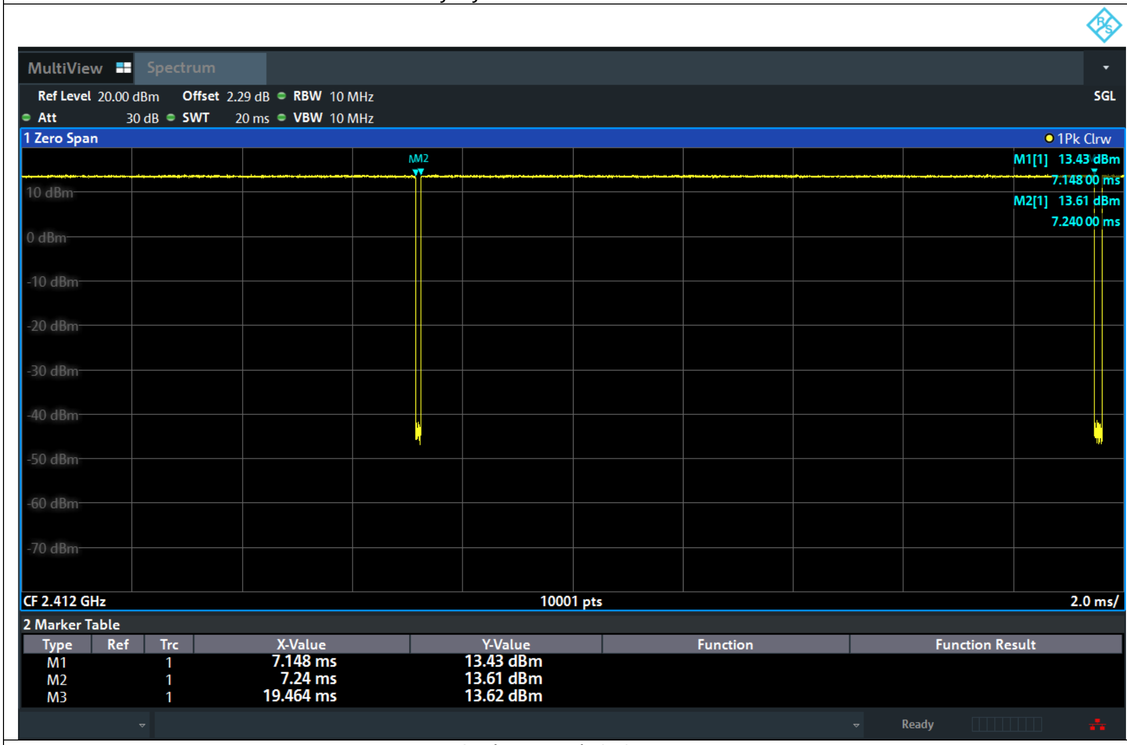
5.7.4 Test Results

EUT:	USB-A Wireless Car Screen Projection Adapter	Model Name:	CP02
Pressure:	1012 hPa	Test Voltage:	DC 5V from the USB port of the car screen
Test Mode:	TX b/g/n/ax(20/40) Mode		

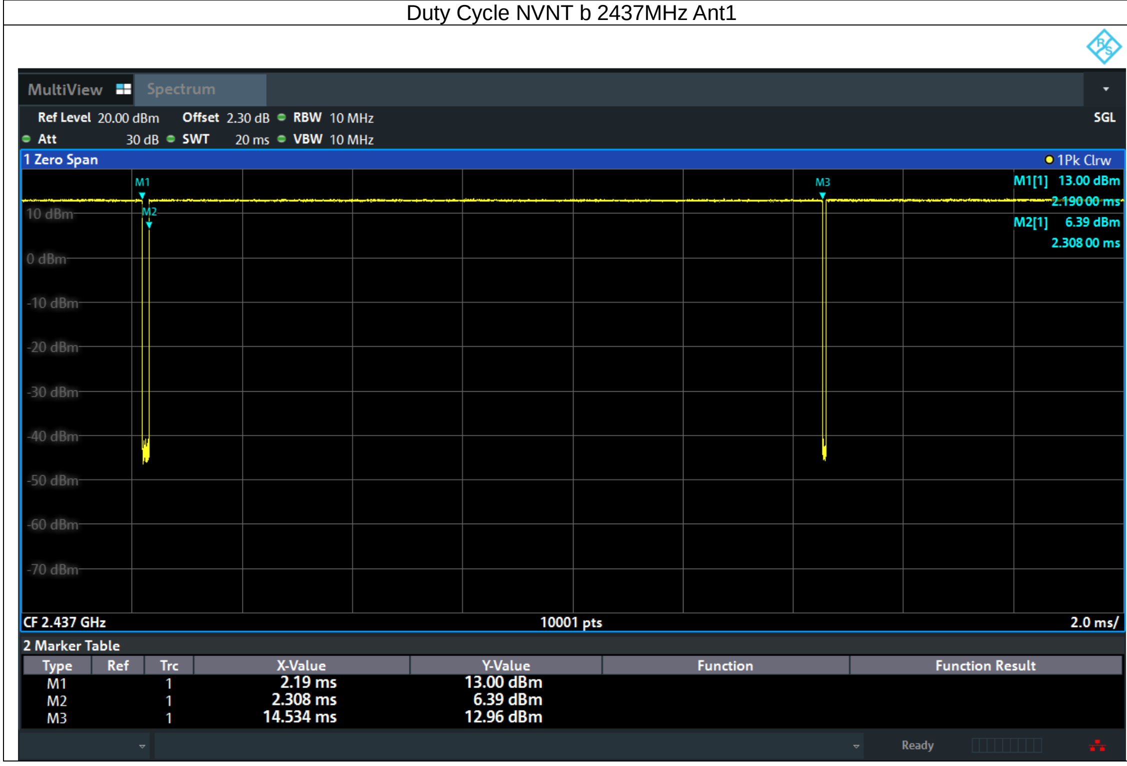
Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	b	2412	99.25	0	0.08
NVNT	b	2437	99.04	0	0.08
NVNT	b	2462	99.25	0	0.08
NVNT	g	2412	93.56	0.29	0.49
NVNT	g	2437	95.13	0.22	0.49
NVNT	g	2462	94.95	0.23	0.49
NVNT	n20	2412	96.93	0.14	0.53
NVNT	n20	2437	91.84	0.37	0.53
NVNT	n20	2462	91.49	0.39	0.53
NVNT	n40	2422	93.01	0.31	1.07
NVNT	n40	2437	89.62	0.48	1.07
NVNT	n40	2452	94.91	0.23	1.07
NVNT	ax20	2412	97.28	0.12	0.26
NVNT	ax20	2437	96.26	0.17	0.26
NVNT	ax20	2462	98.67	0	0.26
NVNT	ax40	2422	92.1	0.36	0.51
NVNT	ax40	2437	97.41	0.11	0.51
NVNT	ax40	2452	94.5	0.25	0.51

Test Graphs

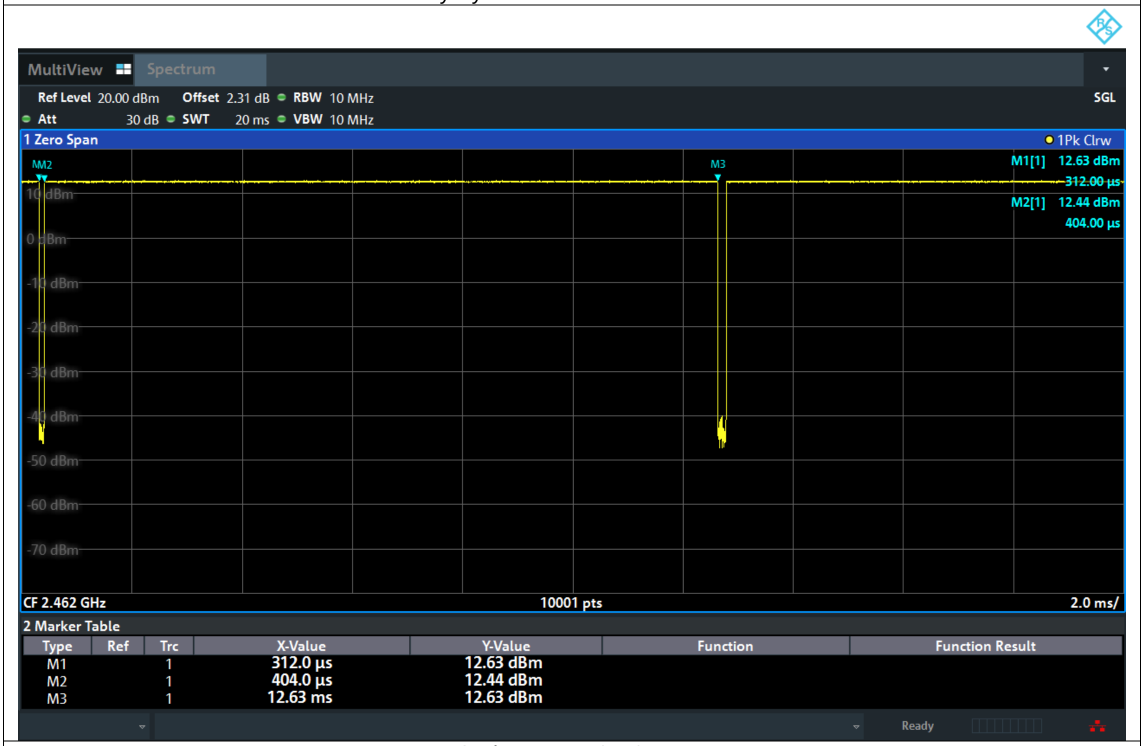
Duty Cycle NVNT b 2412MHz Ant1



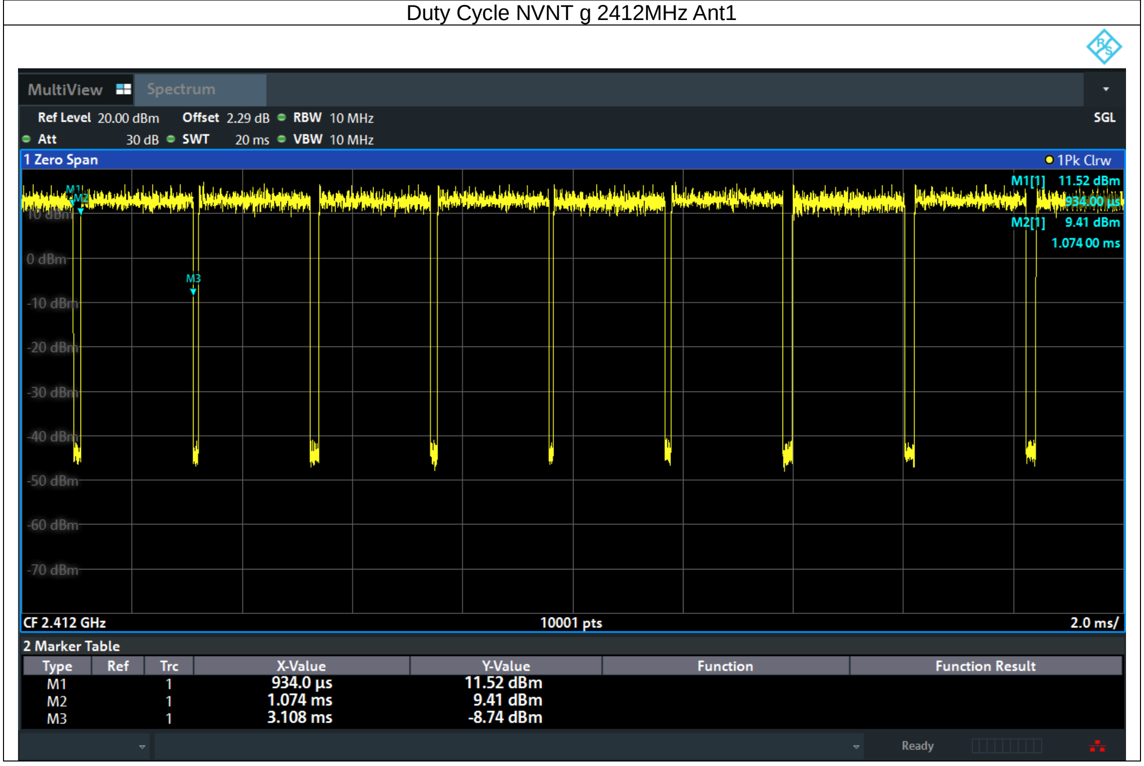
Duty Cycle NVNT b 2437MHz Ant1



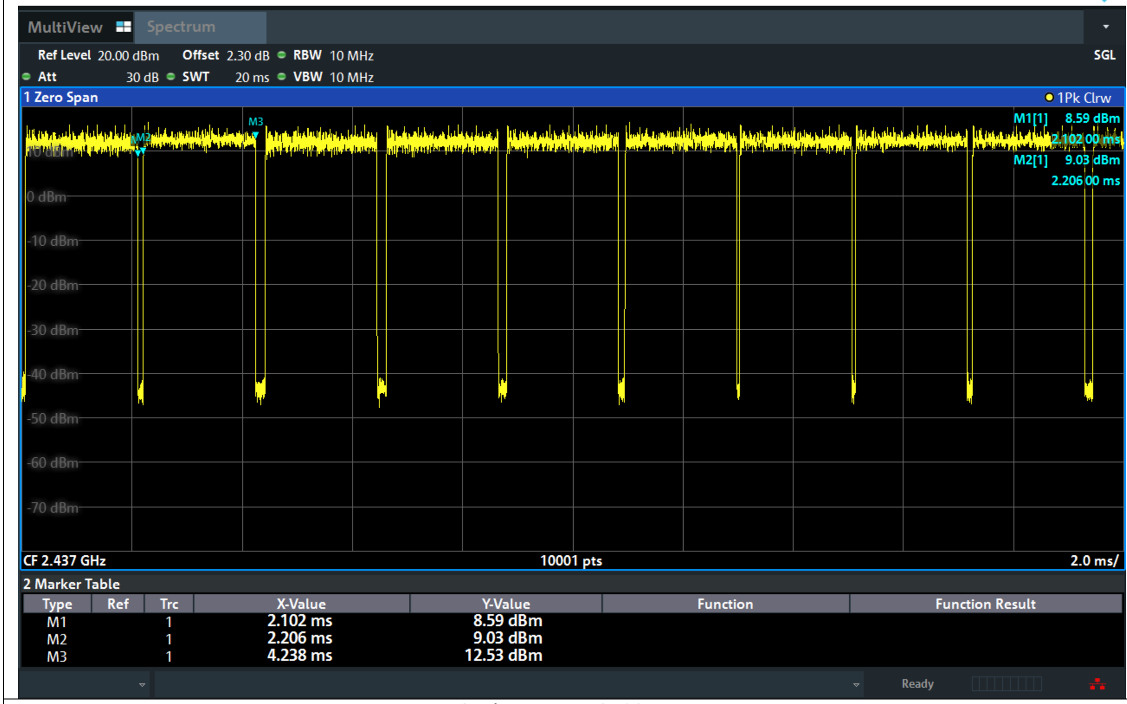
Duty Cycle NVNT b 2462MHz Ant1



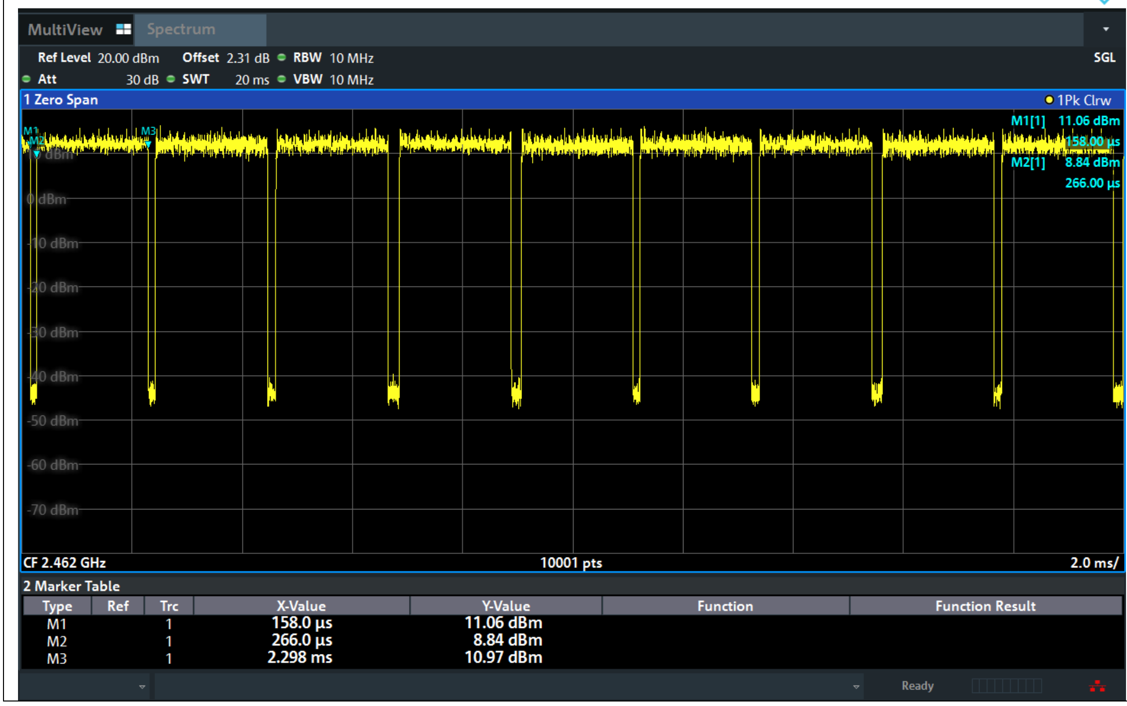
Duty Cycle NVNT g 2412MHz Ant1



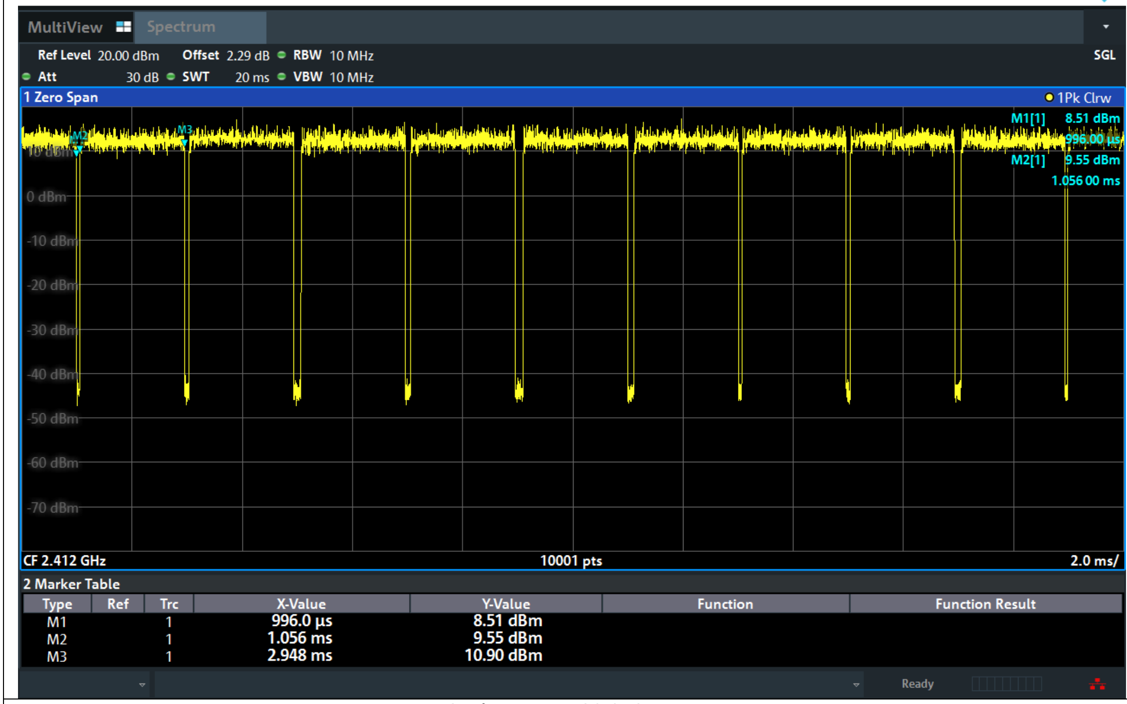
Duty Cycle NVNT g 2437MHz Ant1



Duty Cycle NVNT g 2462MHz Ant1



Duty Cycle NVNT n20 2412MHz Ant1



Duty Cycle NVNT n20 2437MHz Ant1