

Test Report for FCC & ISED

Report Number		ESTRGC2310-002		
Applicant	Company name	DAVOLINK Inc.		
	Address	112, Beolmal-ro, Dongan-gu, Anyang-si, Gyeonggi-do, Republic of Korea		
	Telephone	+82-031-387-3240		
Product	Product name	Wireless Access Gateway		
	Model No.	DVW-642	Manufacturer	TONGWEIELECTRONICS (VIETNAM) Co., Ltd
	Serial No.	NONE	Country of origin	KOREA
Test date	01-Aug-23 ~ 28-Sep-23		Date of issue	30-Oct-23
Testing location	140-16, Eongmalli-ro, Majang-myeon, Icheon-si, Gyeonggi-do, Rep. of Korea			
FCC ID	RZEDVW-642			
ISED ID	8081A-DVW642			
FCC Rule Part(s)	FCC PART 15 Subpart C (15.247), ANSI C 63.10(2013)			
ISED Rule Part(s)	RSS-247 (2017)			
Test result			Complied	
Measurement facility registration number	FCC:659627			
Measurement facility registration number	ISE:4475A			
Tested by	Engineer H.G. Lee		(Signature)	
Reviewed by	Engineering Manager I.K. Hong		(Signature)	
Abbreviation	OK, Pass = Complied, Fail = Failed, N/A = not applicable			
<p>* Note</p> <ul style="list-style-type: none"> - This test report is not permitted to copy partly without our permission - This test result is dependent on only equipment to be used - This test report is not related to KOLAS accreditation - This product is tested in a single channel at the request of the company. - This is the reissue report due to the change of the applicant 				

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1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report. ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd. ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co., Ltd.

Head Office : Suite 1015 World Meridian II, 123 Gasan Digital 2-ro, Geumcheon-gu,
Seoul 153-759, R. O. Korea

EMC/Telecom/Safety Test Lab : 140-16, Eongmalli-ro, Majang-myeon, Icheon-si,
Gyeonggi-do, Rep. of Korea

1.3 Official Qualification(s)

MSIP : Granted Accreditation from Ministry of Information & Communication for EMC, Safety
and Telecommunication

KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC

FCC : Filed Laboratory at Federal Communications Commission

VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

ISED : Accredited Lab By Canada Laboratory Accreditation

2. Description of EUT

2.1 Summary of Equipment Under Test

Product : Wireless Access Gateway

Model Number : DVW-642

Serial Number : NONE

Manufacturer : TONGWEI ELECTRONICS (VIETNAM) Co., Ltd

Transfer Rate : 802.11b/g/n20,n40, ac20, ax20, ac40, ax40

Channel Spacing : 20 MHz, 40 MHz

PEAK Output Power : 11b : 14.09 mW, Eirp:55.59 mW

Power Rating : INPUT: AC(100 - 240) V, (50-60)Hz, 0.75 A Max

OUTPUT: DC12.0 V, 2.0 A

Conducted test power : DC 12.0 V Adapter

Receipt Date : 2023-Jun-19

X-tal list(s) or Frequencies generated : The highest operating frequency is 2480 MHz(Bluetooth)

Bluetooth : 2.4 GHz

Soft ware Version:1627

Hard ware Version: V0.4

3. Test Standards

Test Standard : FCC PART 15 Subpart C (15.247)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Standard : RSS-247

RSS-Gen must be used in conjunction with other RSSs, as applicable to the specific type of radio apparatus, for assessing its compliance with ISED requirements.

Test Method : ANSI C 63.10 (2013)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain devices that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment. These methods apply to the measurement of individual units or systems comprised of multiple units.

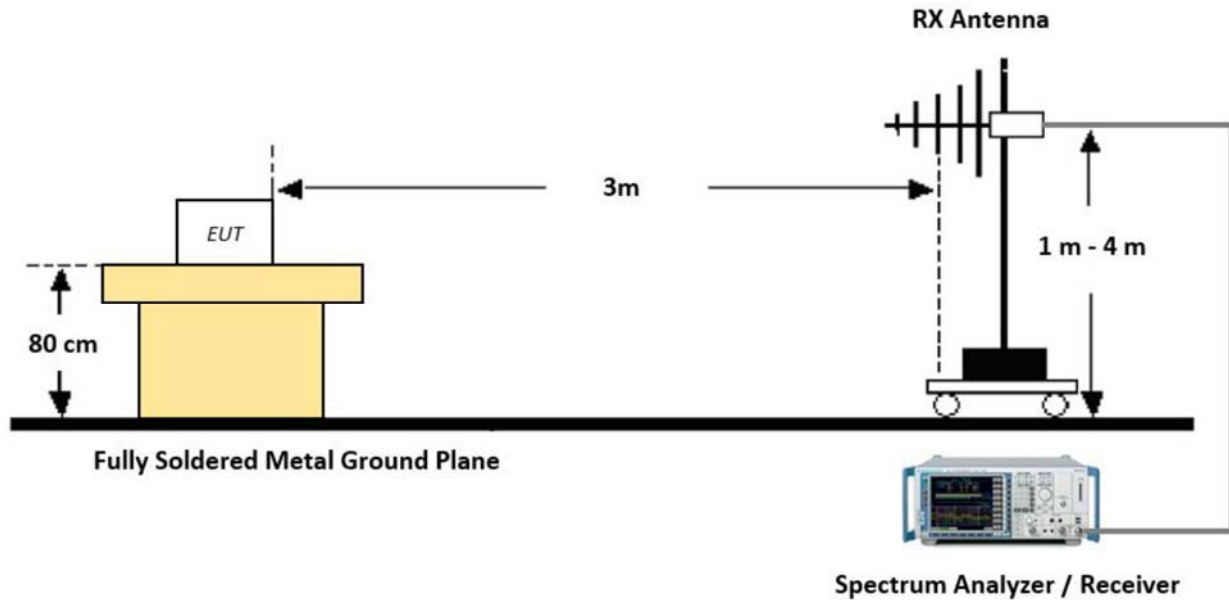
Data Rate / Enhanced Data Rate

Test Description	FCC Part Section(s)	ISED Part Section(s)	Test Result
Maximum conducted output power	15.247 (b)(3)	RSS 247 Issue 2, Section 5.4 (d)	Pass
Maximum Power Spectral Density	15.247(e)	RSS 247 Issue 2, Section 5.2 (b)	Pass
DTS Bandwidth	15.247(a)(2)	RSS 247 Issue 2, Section 5.2 (a)	Pass
Emissions in non-restricted frequency bands	15.247(d)	RSS 247 Issue 2, Section 5.5	Pass
Conducted Spurious Emission on AC Power lines	15.207	RSS-Gen Issue 5, Section 8.9 /8.10	Pass

Notes:

1). No tests were applied because the fundamental level did not exceed the spurious limit per part 15.209.

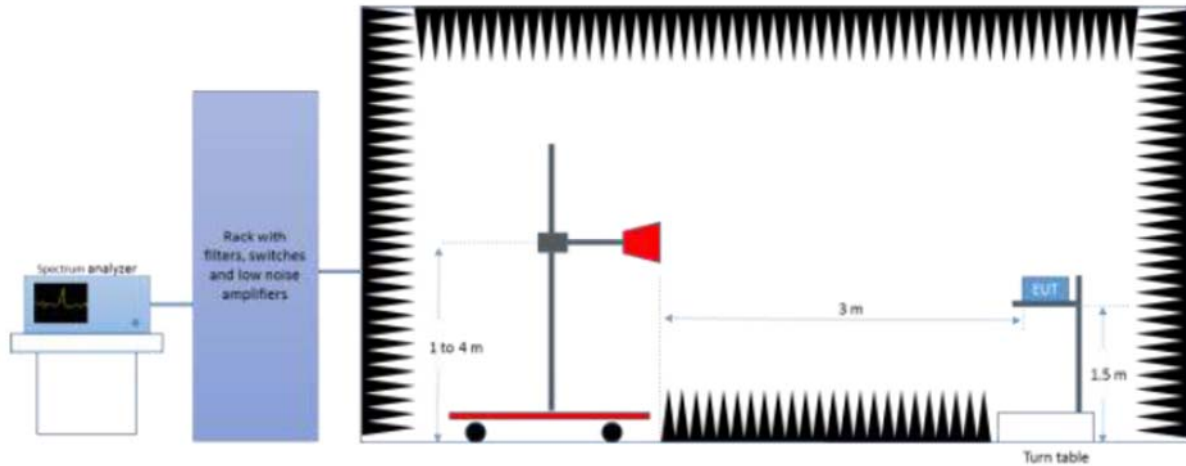
30 MHz - 1 GHz



Test Procedure of Radiated spurious emissions (Below 1GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
5. Spectrum Setting
 - (1) Measurement Type (Peak):
 - Measured Frequency Range: 30 MHz – 1 GHz
 - Detector = Peak
 - Trace = Max hold
 - RBW = 100 kHz
 - VBW $\geq 3 \times$ RBW
 - (2) Measurement Type(Quasi-peak):
 - Measured Frequency Range: 30 MHz – 1 GHz
 - Detector = Quasi-Peak
 - RBW = 120 kHz
6. Total = Reading Value + Antenna Factor (A.F) + Cable Loss (C.L)

1 GHz – 26.5 GHz



Test Procedure of Radiated spurious emissions (Above 1GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
4. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

5. Spectrum Setting

(1) Measurement Type (Peak):

- Measured Frequency Range: 1 GHz – 26.5 GHz
- Detector = Peak
- Trace = Max hold
- RBW = 1 MHz
- VBW $\geq 3 \times$ RBW

(2) Measurement Type(Average):

- Measured Frequency Range: 1 GHz – 26.5 GHz
- Detector = average or rms
- RBW = 1 MHz

In general, the method (1) is mainly used

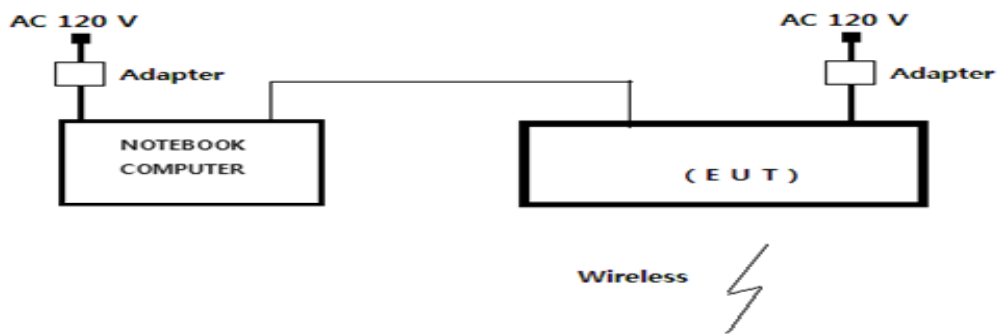
6. Total = Reading Value + Antenna Factor (A.F) + Cable Loss (C.L)

4. Measurement Condition

4.1 EUT Operation.

- * The EUT was in the following operation mode during all testing
- * The operational conditions of the EUT was determined by the manufacturer according to emission
- * Execute a RF test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- * Transmit mode was each test. Each channel (low, middle, high), also set the test after
- * The EUT was measured up to tenth harmonic or 40 GHz of the highest operating frequencies.

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark
Wireless Access Gateway	DVW-642	NONE	TONGWEI ELECTRONICS (VIETNAM) Co., Ltd	EUT
Adapter	SOY024B-1200200KR-063	NONE	Shenzhen SOY Technology Co.,Ltd.	
Notebook	80XL	NONE	LCFC(HeFei) Electronics Technology Co.,Ltd.	
Adapter	ADL45WCE	NONE	CHICONY POWER TECHNOLOGY(SUZHOU)CO LT	

4.4 List of frequencies

Frequency Band (MHz)	Channel No.	Channel Frequency (MHz)
2412 - 2462	1	2412
	2	2417
	3	2422
	4	2427
	5	2432
	6	2437
	7	2442
	8	2447
	9	2452
	10	2457
	11	2462

List of Wi-Fi center Frequencies

4.5 Antenna mode

Antenna (2T2R)	Ant0	5.96 dBi
	Ant1	5.93 dBi

4.6 Measurement equipments (Conducted Setup)

Description	Model	Serial Number	Cal. Date	Cal. Due Date
Spectrum Analyzer	E440A	US42041291	28-Nov-22	28-Nov-23
Spectrum Analyzer	FSV40	100939	28-Nov-22	28-Nov-23
RF Cable	Length: 100 cm	-		
-Spectrum Analyzer <=> EUT	Loss: 1 dB	-		

4.7 Measurement equipments(Radiated setup)

Equipment Name	Type	Manufacturer	Serial No.	Cal. Date	Cal. Due Date
TEST Receiver	ESCI7	ROHDE & SCHWARZ	100916	12-Jun-23	12-Jun-24
LOOP Antenna	HFH2-Z2	ROHDE & SCHWARZ	100188	29-Aug-22	29-Aug-24
Logbicon Antenna	VULB 9168	SCHWARZBECK	193	09-Dec-21	09-Dec-23
Turn Table	DT3000-2t	Innco System GmbH	N/A	-	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-	-
PREAMPLIFIER	8449B	HP	3008A00581	12-Jun-23	12-Jun-24
Horn Antenna	LB-42-15-C-SF	A-INFOMF	J2020079000055	11-Nov-22	11-Nov-23
Horn Antenna	BBHA9120D	SCHWARZBECK	469	08-Nov-22	08-Nov-23
TEST Receiver	ESU	ROHDE & SCHWARZ	100529	12-Jun-23	12-Jun-24
Turn Table	DT1500-S	Innco System GmbH	N/A	-	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-	-
Antenna Master & Turn table controller	CO2000-P	Innco System GmbH	CO2000/642 /28051111/L	-	-

4.8 Conducted Spurious Emission on AC Power lines Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Cal. Date	Cal. Due Date
TEST Receiver	ESHS 30	Rohde & Schwarz	828765/002	28-Jun-23	28-Jun-24
LISN	ESH2-Z5	Rohde & Schwarz	836679/025	28-Jun-23	28-Jun-24
Pulse Limiter	ESH3-Z2	Rohde & Schwarz	NONE	28-Jun-23	28-Jun-24

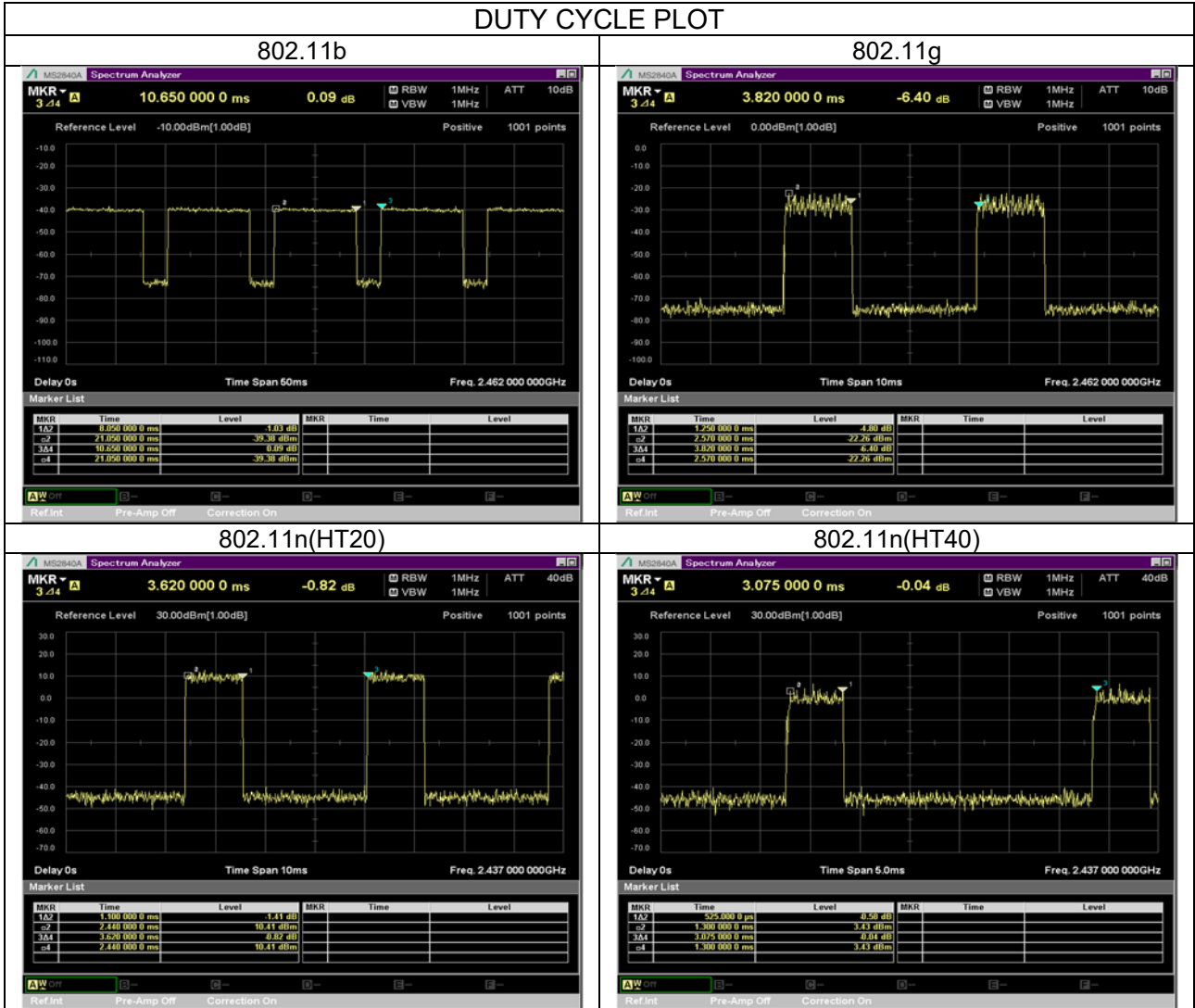
4.9 Duty Cycle of Test Signal

If duty cycle is $\geq 98\%$, duty factor is not required.
If duty cycle is $< 98\%$, duty factor shall be considered.
All the duty factor of other test mode have been considered.

TestMode	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Duty Cycle Correction Factor(dB)
802.11b	2437	8.05	10.65	75.58	1.22
802.11g	2437	1.25	3.82	32.72	4.85
802.11n(HT20)	2437	1.10	3.62	30.38	5.17
802.11n(HT40)	2437	0.525	3.075	17.07	7.68
802.11ac(VHT20)	2437	1.12	3.65	30.68	5.13
802.11ac(VHT40)	2437	0.525	3.075	17.07	7.68
802.11ax(HE20)	2437	1.10	3.62	30.38	5.17
802.11ax(HE40)	2437	0.475	3.025	15.70	8.04

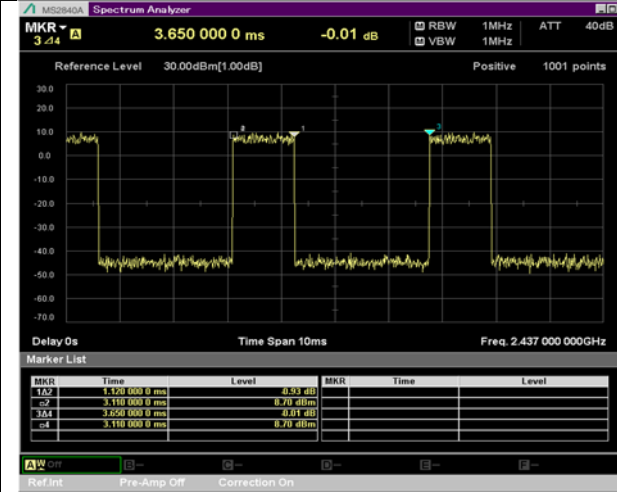
Note: The Duty Cycle of different channels in the same mode is the same, and the above test channels are represented in the report.

DUTY CYCLE PLOT

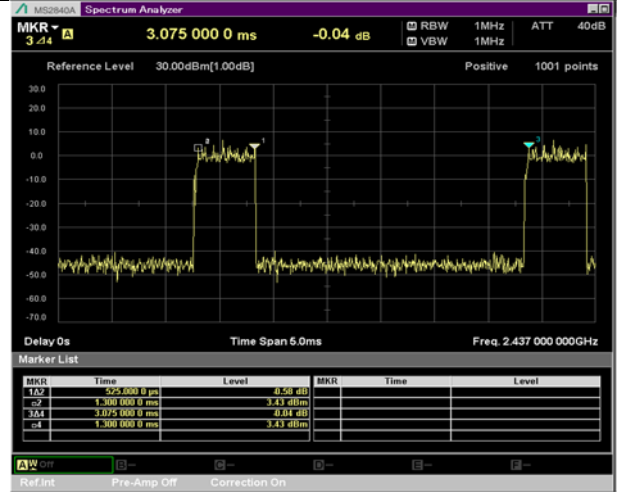


DUTY CYCLE PLOT

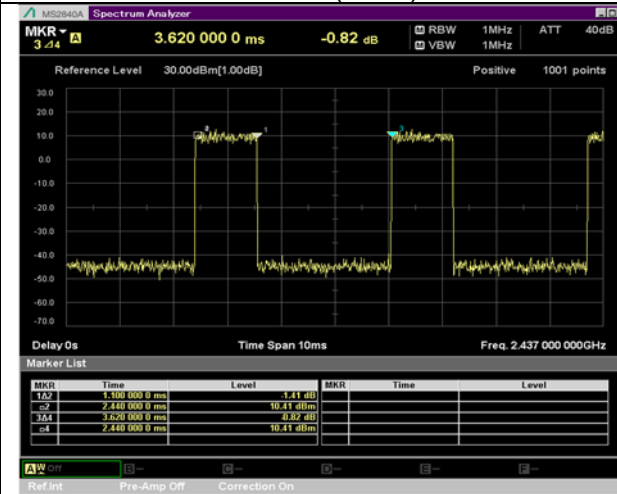
802.11ac(VHT20)



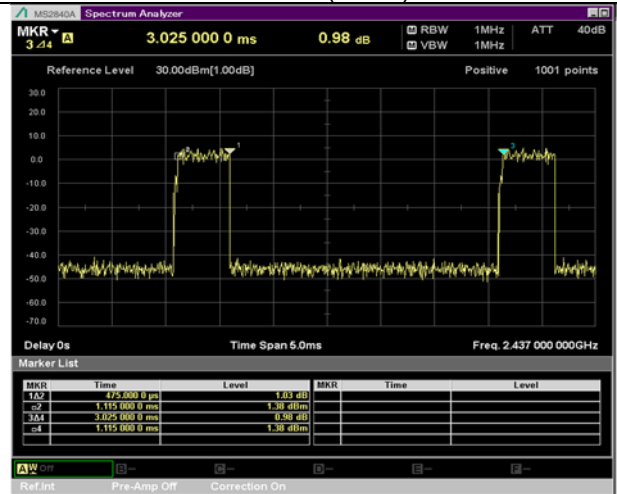
802.11ac(VHT40)



802.11ax(HE20)



802.11ax(HE40)



5. OPERATIONAL DESCRIPTION

Vscan Air SL is a handheld, pocket sized, battery powered general purpose diagnostic ultrasound system. The system consists of a probe with two heads. One for deep scanning (Sector) and another one for shallow scanning (Linear). The probe can be paired with a mobile device through WiFi, to see the ultrasound image. Mobile device needs an app (available in iOS & android) to enable pairing and ultrasound imaging. The internal battery operation is designed for providing approximately one hour of active scanning capacity with a fully charged battery. The probe supports Qi wireless charging to charge the battery. Probe will automatically turn off during charging.

6. TEST METHODOLOGY

6.1 Conducted Spurious Emission Test on AC Power Line

Measured levels of ac power-line conducted emission across the 50Ω LISN port (to which the EUT is connected). All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. The device is placed on the test table, raised 80cm above the reference ground plane. The vertical conducting plane is located 40cm to the rear of the device. AC Conducted emission measurement is made over frequency range from 150kHz to 30MHz, this measurement was performed with EUT powered by 2 methods and both method are tested individually, one with an AC adaptor with 110V AC 60Hz supply and second with Wireless charger with supply 110V AC 60Hz.

6.2 Radiated Emission Test

The radiated emission measurement was performed according to the procedures in ANSI C63.10-2013. The equipment under test (EUT) was placed at the middle of the 80 cm high turntable for below 1 GHz & 1.5 m height for above 1 GHz measurement, and the EUT is 3 meters far from the measuring antenna. The turntable was rotated 360° for obtaining the maximum emission. The height of the measuring antennas was scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained. The measurement above 1000 MHz was performed by horn antenna, The measurement below 30 MHz was performed by loop antenna, Measurement from 30 MHz to 200 MHz was performed by Baloon and Biconical Antenna, and mesurement from 200 MHz to 1 GHz was performed by Log-Periodic Antenna. The EUT was rotated around the X-, Y-, and Z-Axis and the results from worst case axis are recorded

7. TEST RESULTS FOR Wi-Fi

7.1 Maximum average Conducted Output Power

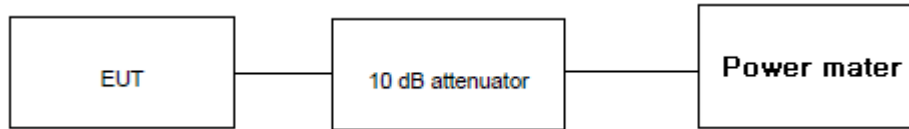
Result

Test Specification
Test Method
Detector
Port of testing
Requirement

Pass

FCC part 15 Subpart C 15.247 (b)(3) / RSS 247 Issue 2, Section 5.4 (d)
Subclause 11.9.2.2.6 of ANSI C63.10
Average
Antenna port
Power ≤ 1 W (30 dBm) & e.i.r.p ≤ 4 W (36 dBm)

Test Method



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.3 °C	Voltage =DC 12.0V Adapter	Relative humidity: 58%
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KDB Guidelines applied:

Measurements were made as per section 8.3.2.2 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Test results:

Note:

1. All the losses are included during measurement and final values are mentioned in the test report.
2. Peak Output power (dBm) = Measured Average power (dBm) + Attenuator factor (10dB) + Cable loss (1.0dB)
3. This product do not support additional beamforming gain / directional gain, it uses signal antenna and hence directional gain of the 2T2R antenna is ANT0:5.96 dBi, ANT1:5.93 dBi

Antenna Mode:ANT0

Modulation: 802.11b

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
1Mbps	2412	10.72	16.68	30	36
	2437	12.17	18.13	30	36
	2462	9.75	15.71	30	36

Modulation: 802.11g

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
6Mbps	2412	9.19	15.15	30	36
	2437	7.47	13.43	30	36
	2462	8.03	13.99	30	36

Modulation: 802.11n HT20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2412	6.63	12.59	30	36
	2437	6.25	12.21	30	36
	2462	6.79	12.75	30	36

Modulation: 802.11n HT40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2422	1.23	7.19	30	36
	2437	-0.4	5.56	30	36
	2452	0.22	6.18	30	36

Modulation: 802.11ac VHT20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2412	4.67	10.63	30	36
	2437	4.39	10.35	30	36
	2462	5.98	11.94	30	36

Modulation: 802.11ac VHT40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2422	-2.68	3.28	30	36
	2437	-1.30	4.66	30	36
	2452	-1.70	4.26	30	36

Modulation: 802.11ax HE20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2412	4.27	10.23	30	36
	2437	3.92	9.88	30	36
	2462	4.44	10.40	30	36

Modulation: 802.11 ax HE40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2422	-3.08	2.88	30	36
	2437	-3.00	2.96	30	36
	2452	-3.42	2.54	30	36

Antenna Mode:ANT1
Modulation: 802.11b

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
1Mbps	2412	10.69	16.65	30	36
	2437	11.49	17.45	30	36
	2462	11.16	17.12	30	36

Modulation: 802.11g

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
6Mbps	2412	7.81	13.74	30	36
	2437	7.88	13.81	30	36
	2462	7.03	12.96	30	36

Modulation: 802.11n HT20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2412	6.51	12.44	30	36
	2437	6.90	12.83	30	36
	2462	4.85	10.78	30	36

Modulation: 802.11n HT40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2422	-1.19	4.74	30	36
	2437	-1.19	4.74	30	36
	2452	-2.38	3.55	30	36

Modulation: 802.11ac VHT20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2412	4.67	10.60	30	36
	2437	5.00	10.93	30	36
	2462	4.83	10.76	30	36

Modulation: 802.11ac VHT40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2422	-1.87	4.06	30	36
	2437	-1.90	4.03	30	36
	2452	-2.23	8.16	30	36

Modulation: 802.11ax HE20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2412	4.17	10.1	30	36
	2437	4.37	10.3	30	36
	2462	5.33	11.26	30	36

Modulation: 802.11 ax HE40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2422	-3.67	2.26	30	36
	2437	-3.53	2.4	30	36
	2452	-3.97	1.96	30	36

Antenna Mode: MIMO ANT0

Modulation: 802.11n HT20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS8	2412	5.47	11.43	30	36
	2437	5.01	10.97	30	36
	2462	5.70	11.66	30	36

Modulation: 802.11n HT40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS8	2422	-1.57	4.39	30	36
	2437	-2.20	3.76	30	36
	2452	-1.66	4.30	30	36

Modulation: 802.11ac VHT20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2412	3.70	9.66	30	36
	2437	3.20	9.16	30	36
	2462	3.67	9.63	30	36

Modulation: 802.11ac VHT40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2422	-2.91	3.05	30	36
	2437	-2.81	3.15	30	36
	2452	-3.41	2.55	30	36

Modulation: 802.11ax HE20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2412	3.13	9.09	30	36
	2437	2.60	8.56	30	36
	2462	3.17	9.13	30	36

Modulation: 802.11 ax HE40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2422	-3.51	2.45	30	36
	2437	-3.57	2.39	30	36
	2452	-3.98	1.98	30	36

Antenna Mode: MIMO ANT1
Modulation: 802.11n HT20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS8	2412	5.42	11.35	30	36
	2437	5.75	11.05	30	36
	2462	6.65	12.58	30	36

Modulation: 802.11n HT40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS8	2422	-1.82	4.11	30	36
	2437	-1.77	4.16	30	36
	2452	-1.02	4.91	30	36

Modulation: 802.11ac VHT20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2412	3.54	9.47	30	36
	2437	3.85	9.78	30	36
	2462	4.80	10.73	30	36

Modulation: 802.11ac VHT40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2422	-3.72	2.21	30	36
	2437	-3.52	2.41	30	36
	2452	-3.75	2.18	30	36

Modulation: 802.11ax HE20

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2412	3.23	9.16	30	36
	2437	3.28	9.21	30	36
	2462	4.29	10.22	30	36

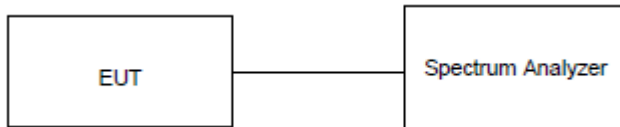
Modulation: 802.11 ax HE40

Data rate	Channel Frequency (MHz)	Measured Average Power (dBm)	Final Average power (e.i.r.p) (dBm)	Power Limit (dBm)	e.i.r.p Limit (dBm)
MCS0	2422	3.23	9.16	30	36
	2437	3.28	9.21	30	36
	2452	4.29	10.22	30	36

7.2 Maximum Power Spectral Density

Result	Pass
Test Specification	FCC part 15 Subpart C 15.247 (e) / RSS 247 Issue 2, Section 5.2 (b)
Test Method	Subclause 11.10.7 of ANSI C63.10
Measurement Bandwidth	10 kHz
Detector	Average sample detector mode
Port of testing	Antenna port
Requirement	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.3 °C	Voltage =DC 12.0V Adapter	Relative humidity: 58%
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KDB Guidelines applied:

Measurements were made as per section 8.4 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Test results:

Note:

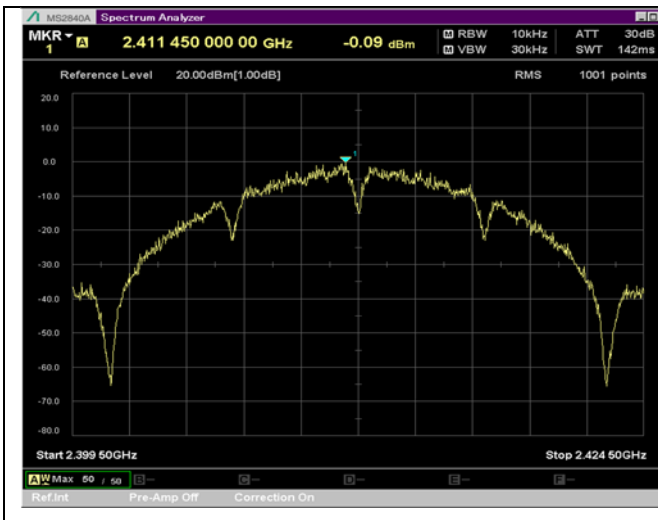
1. All the losses are included during measurement and final values are mentioned in the test report.
2. Peak Output power (dBm) = Measured peak power (dBm) + Cable loss (1.0dB)
3. This product do not support additional beamforming gain / directional gain, it uses signal antenna and hence directional gain of the 2T2R antenna is ANT0:5.96 dBi, ANT1:5.93 dBi

Antenna Mode:ANT0

Modulation: 802.11b

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
1Mbps	2412	-0.09	8
	2437	0.16	8
	2462	-0.93	8

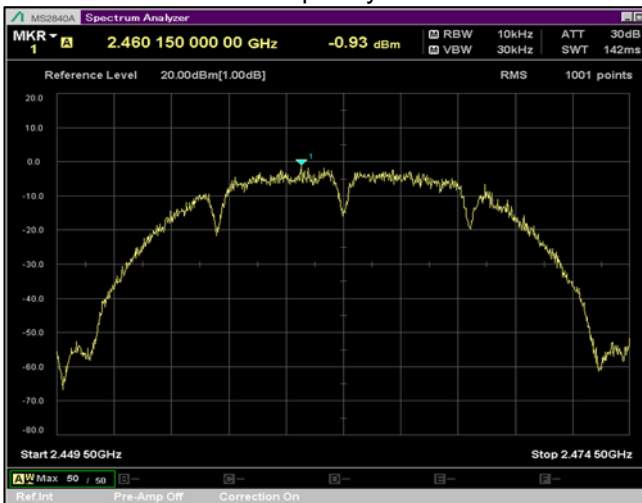
Data Rate : 1 Mbps



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

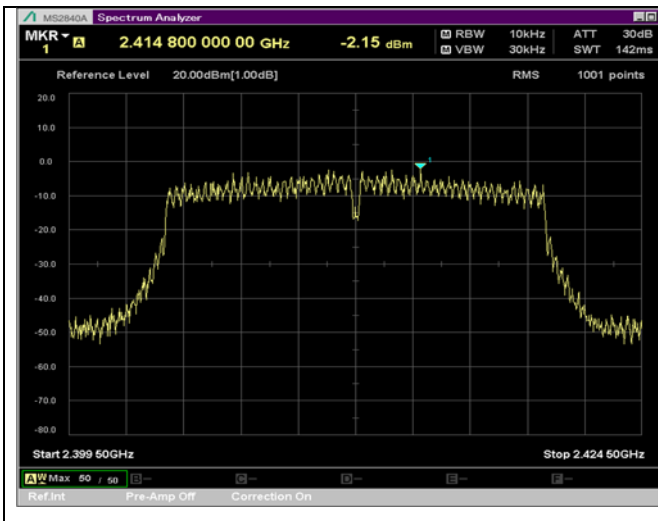


Channel Frequency: 2462MHz

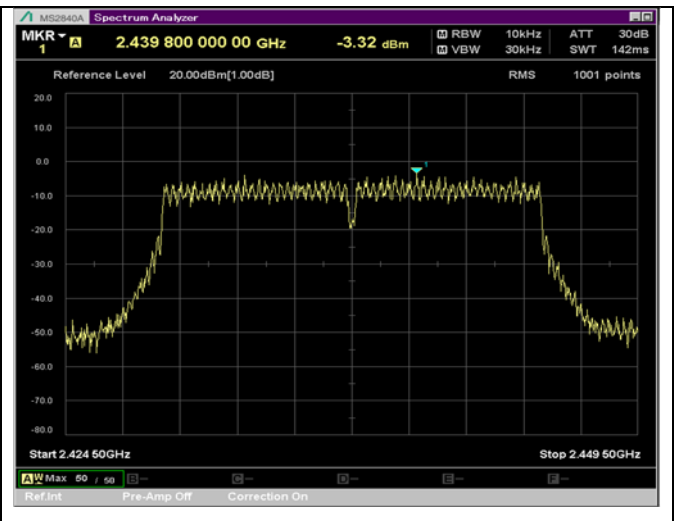
Modulation: 802.11g

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
6Mbps	2412	-2.15	8
	2437	-3.32	8
	2462	-2.54	8

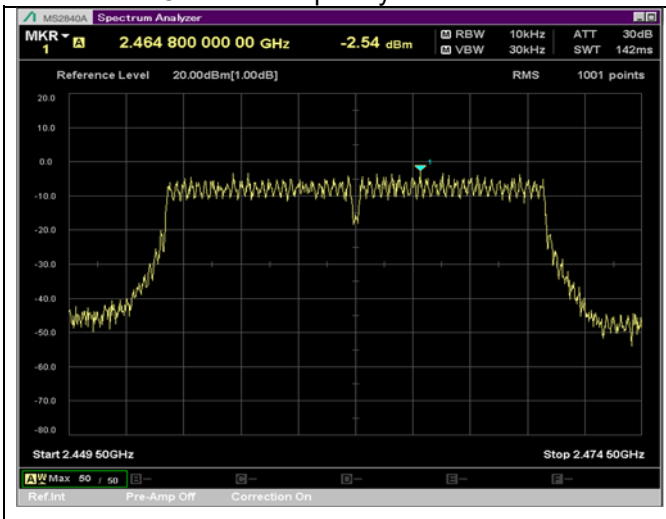
Data Rate : 6 Mbps



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

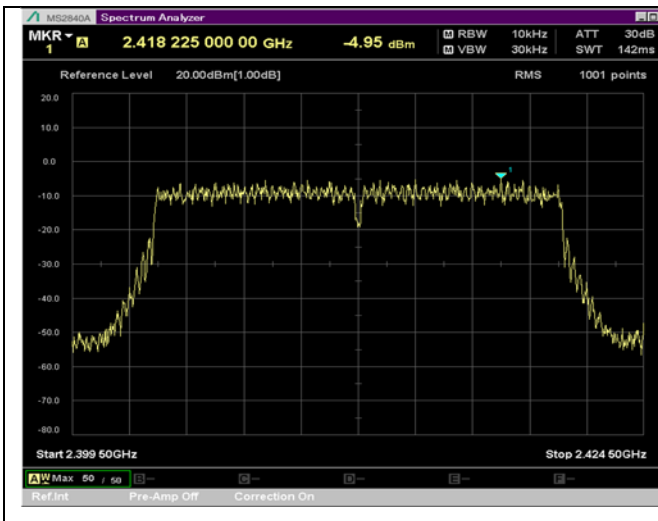


Channel Frequency: 2462MHz

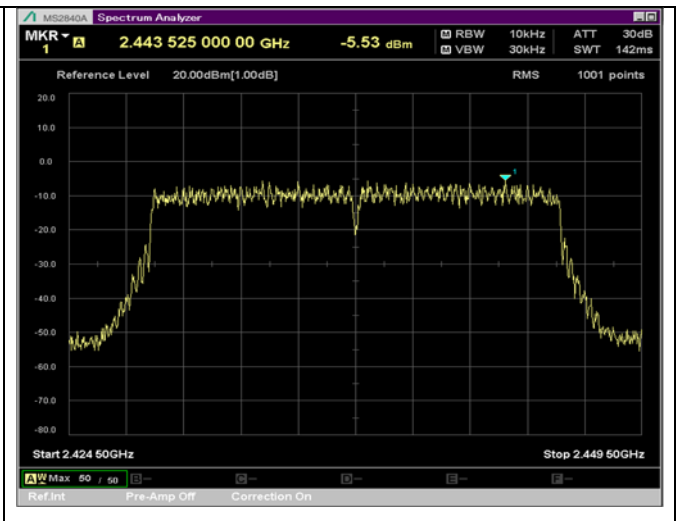
Modulation: 802.11n HT20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2412	-4.95	8
	2437	-5.53	8
	2462	-4.43	8

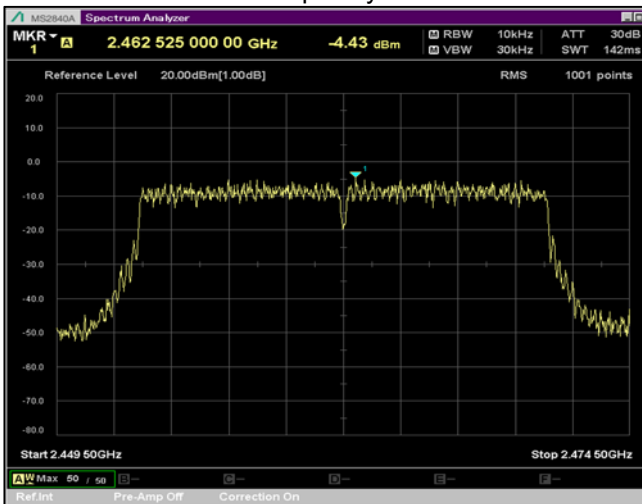
Data Rate : MCS0



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

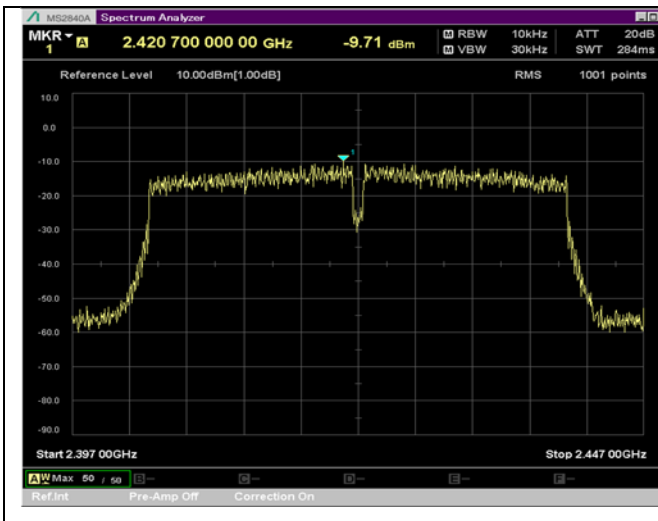


Channel Frequency: 2462MHz

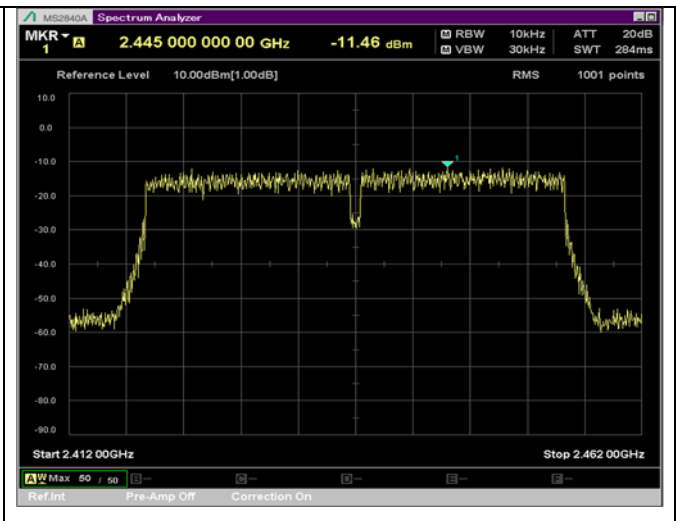
Modulation: 802.11n HT40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2422	-9.71	8
	2437	-11.46	8
	2452	-10.67	8

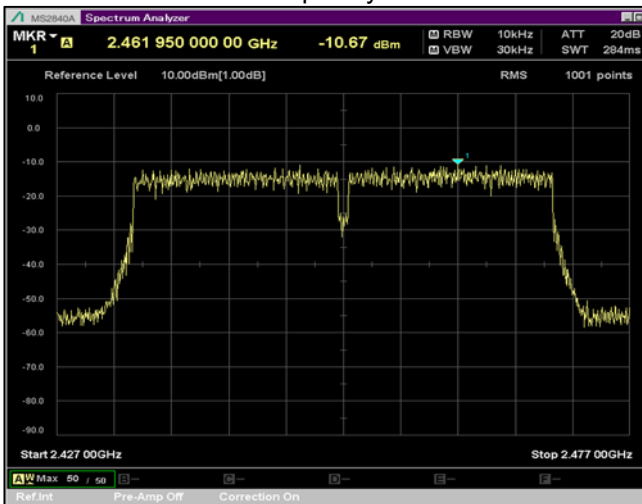
Data Rate : MCS0



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz

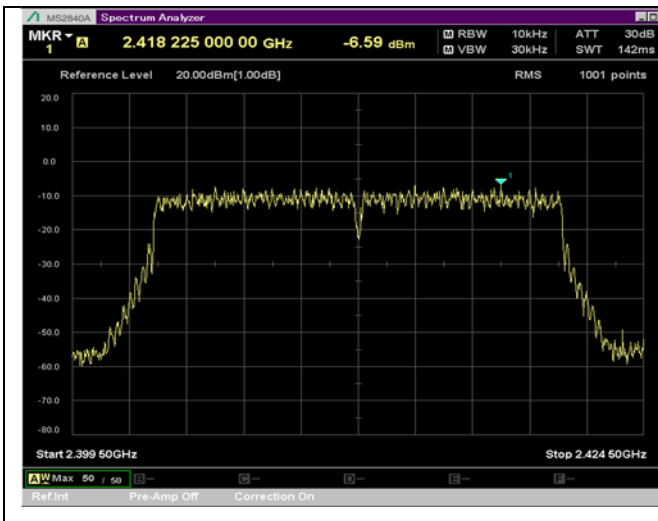


Channel Frequency: 2452MHz

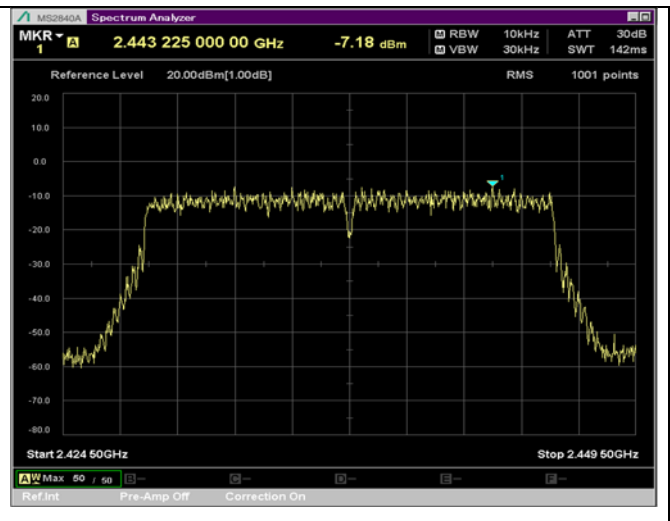
Modulation: 802.11ac VHT20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2412	-6.59	8
	2437	-7.18	8
	2462	-5.40	8

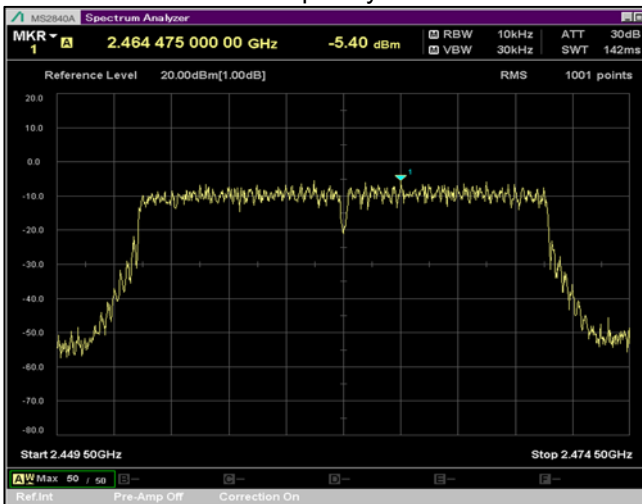
Data Rate : MCS0



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

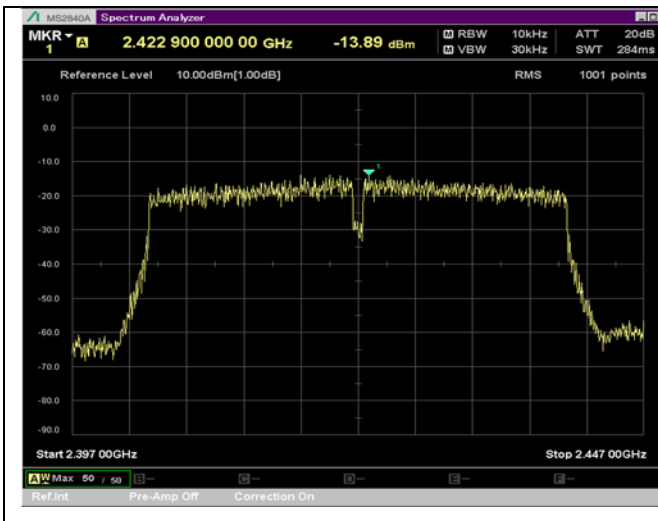


Channel Frequency: 2462MHz

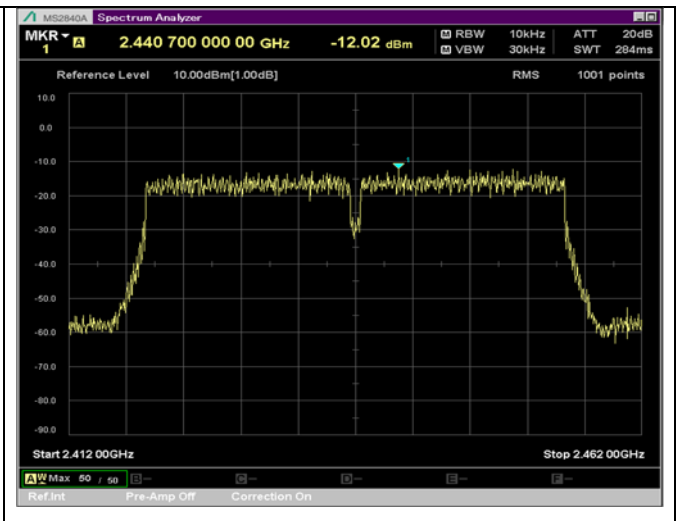
Modulation: 802.11ac VHT40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2422	-13.89	8
	2437	-12.02	8
	2452	-12.72	8

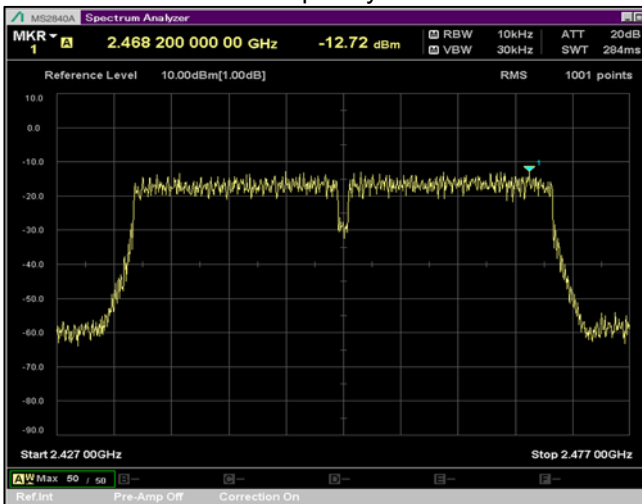
Data Rate : MCS0



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz

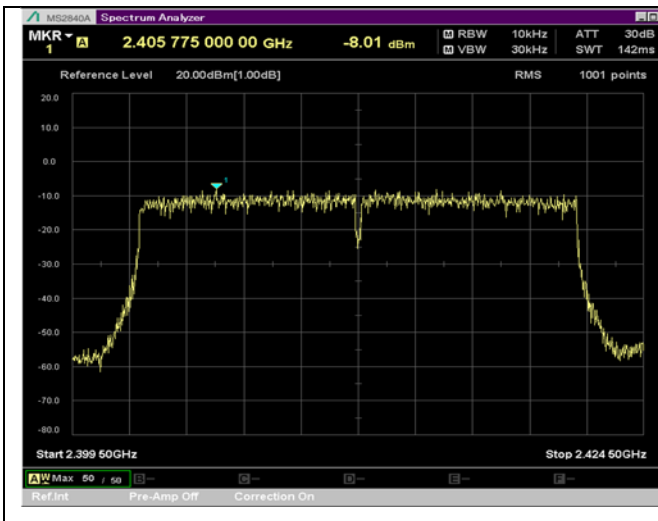


Channel Frequency: 2452MHz

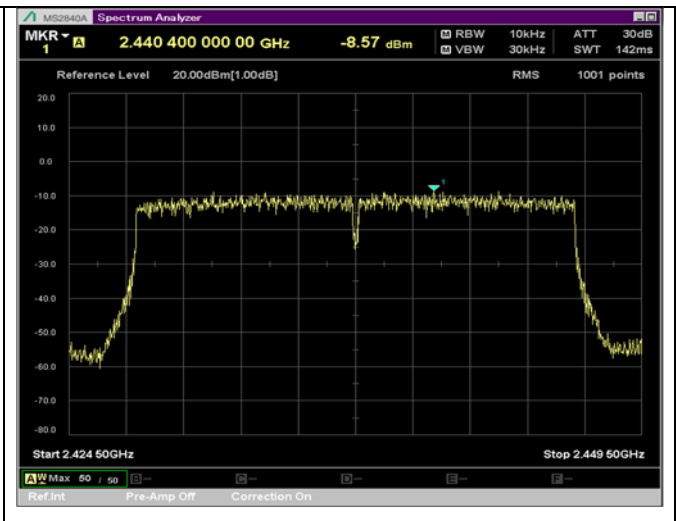
Modulation: 802.11ax HE20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2412	-8.01	8
	2437	-8.57	8
	2462	-6.85	8

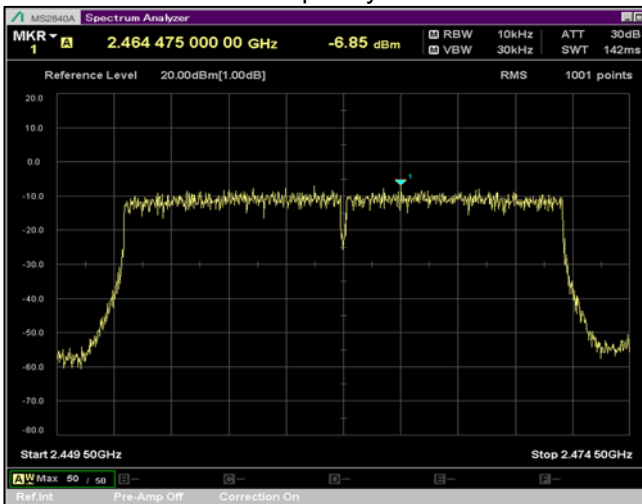
Data Rate : MCS0



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

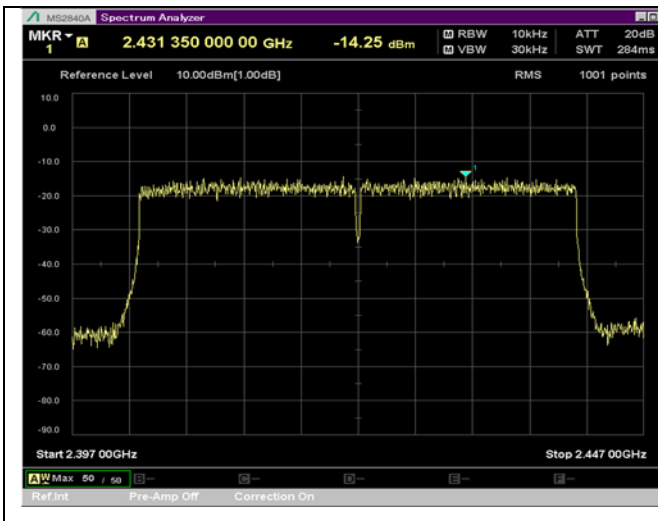


Channel Frequency: 2462MHz

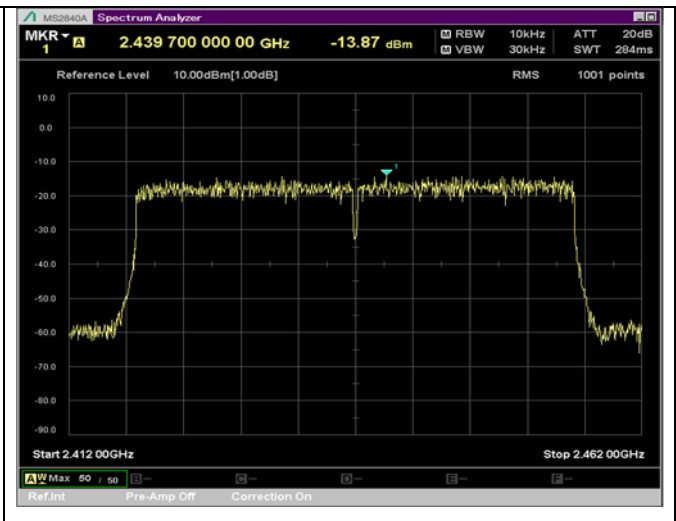
Modulation: 802.11ax HE40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2422	-14.25	8
	2437	-13.87	8
	2452	-14.19	8

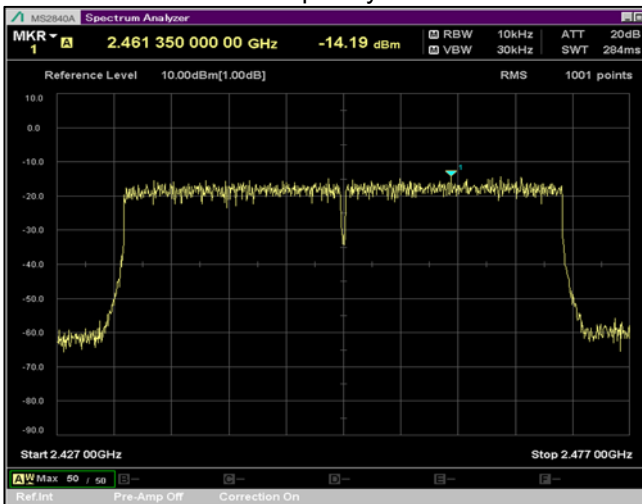
Data Rate : MCS0



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz



Channel Frequency: 2452MHz

Antenna Mode:ANT1

Modulation: 802.11b

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
1Mbps	2412	-1.13	8
	2437	1.05	8
	2462	-0.61	8

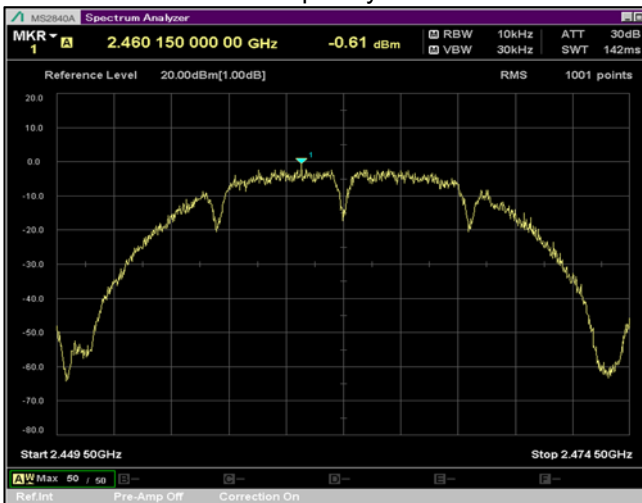
Data Rate : 1 Mbps



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

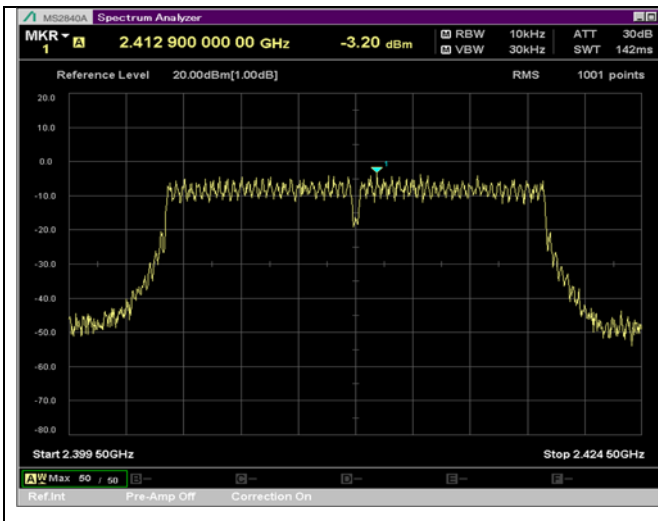


Channel Frequency: 2462MHz

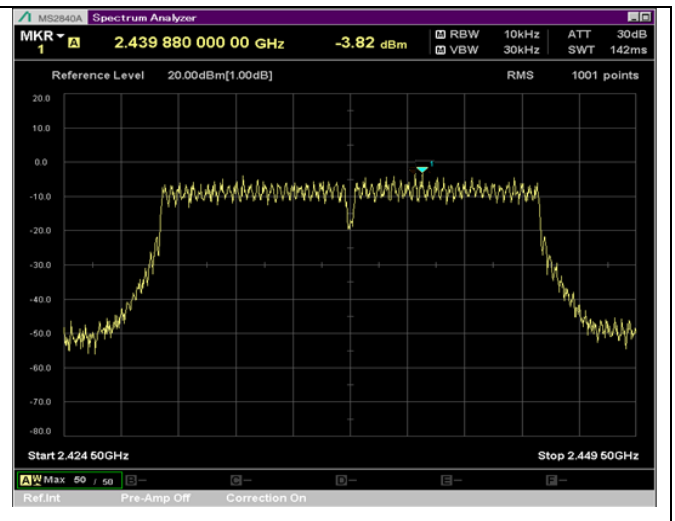
Modulation: 802.11g

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
6Mbps	2412	-3.20	8
	2437	-3.82	8
	2462	-3.61	8

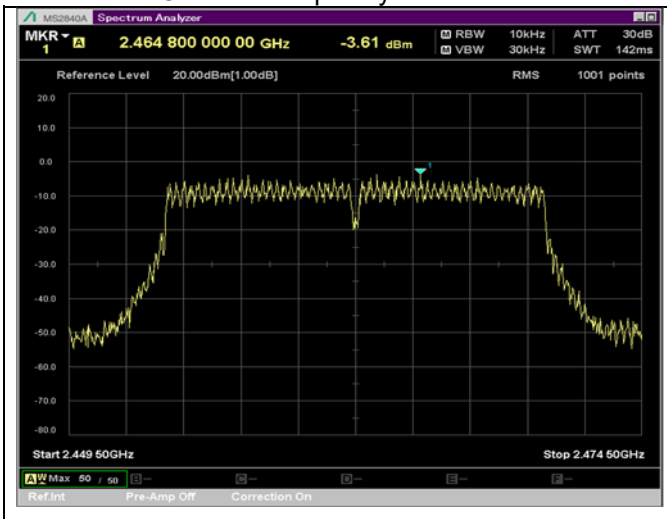
Data Rate : 6 Mbps



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

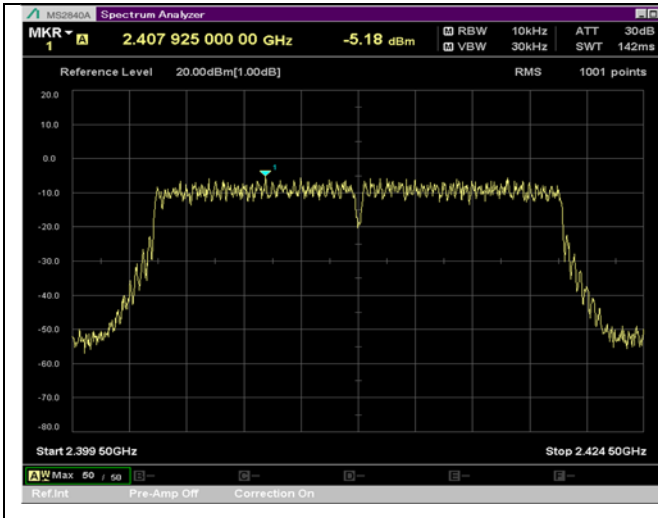


Channel Frequency: 2462MHz

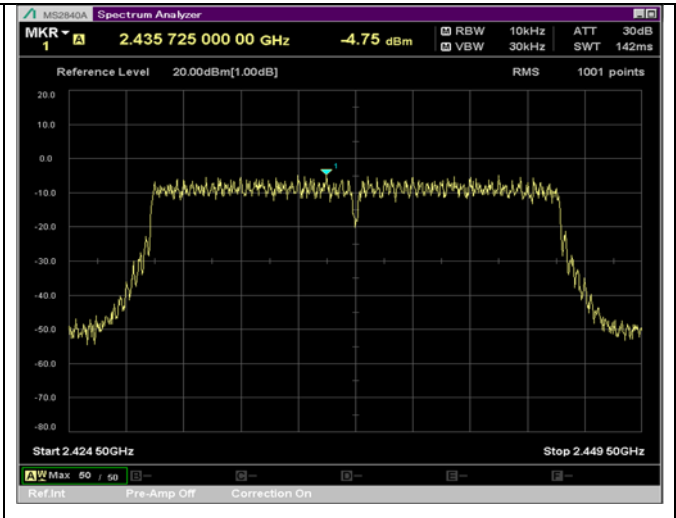
Modulation: 802.11n HT20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2412	-5.18	8
	2437	-4.75	8
	2462	-6.86	8

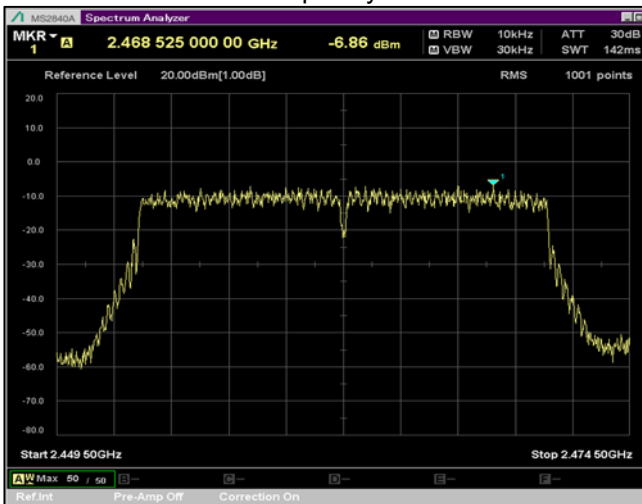
Data Rate : MCS0



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

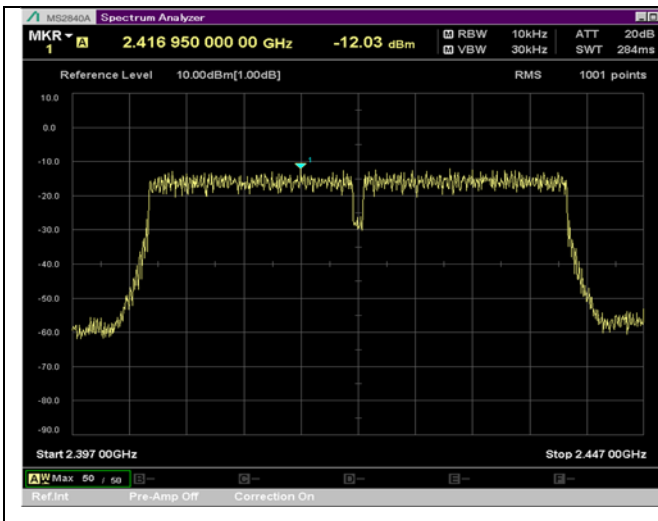


Channel Frequency: 2462MHz

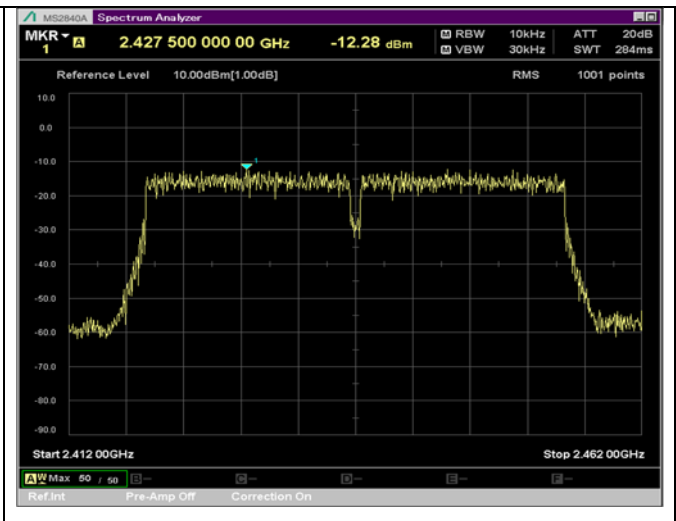
Modulation: 802.11n HT40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2422	-12.03	8
	2437	-12.28	8
	2452	-13.00	8

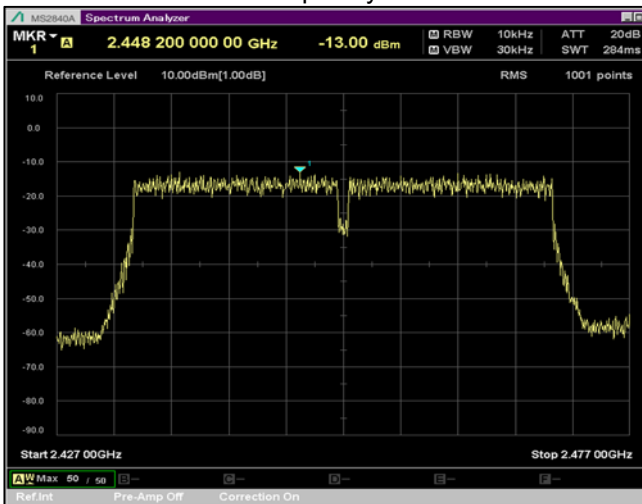
Data Rate : MCS0



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz

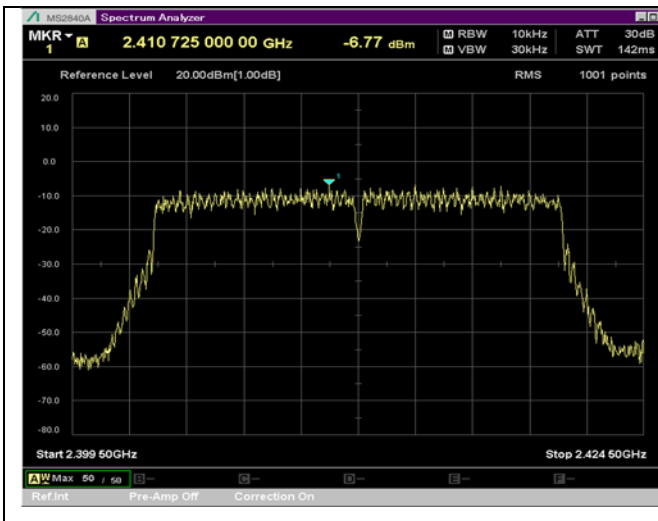


Channel Frequency: 2452MHz

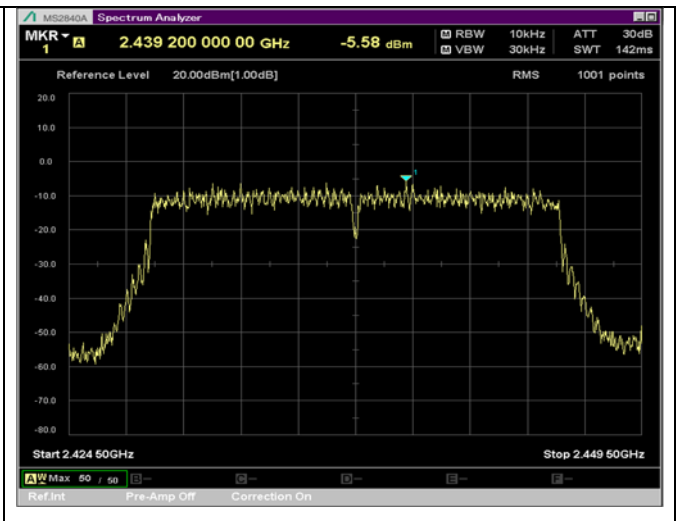
Modulation: 802.11ac VHT20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2412	-6.77	8
	2437	-5.58	8
	2462	-5.72	8

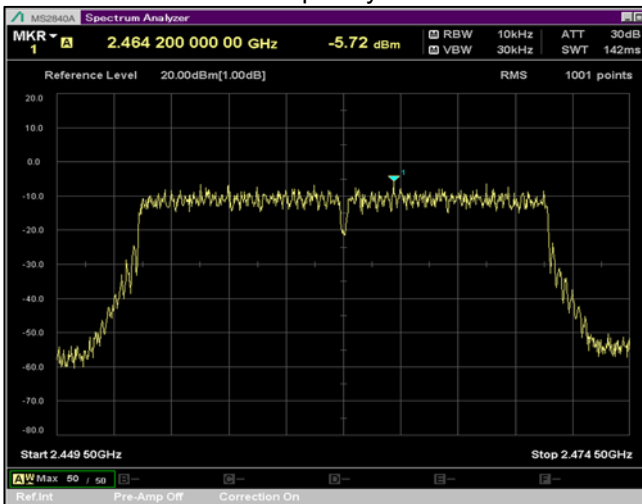
Data Rate : MCS0



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

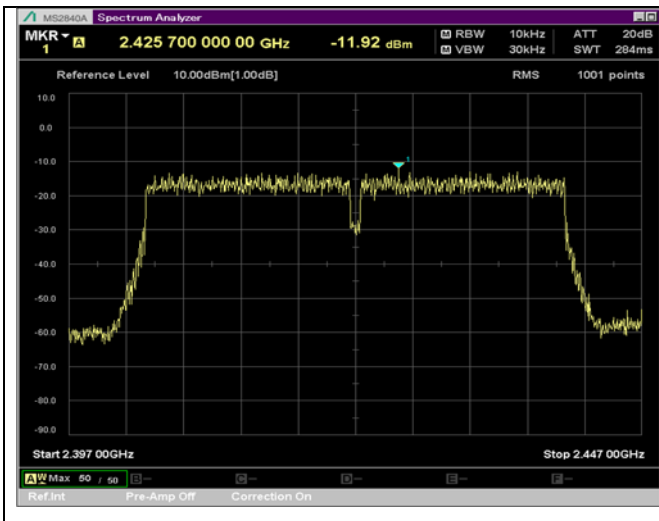


Channel Frequency: 2462MHz

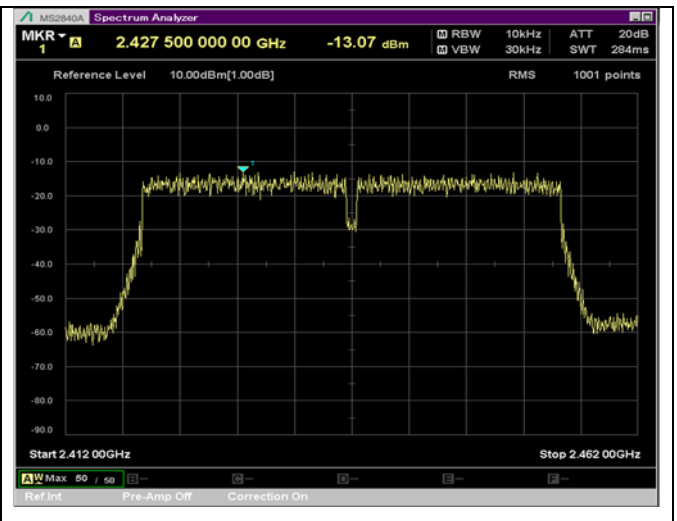
Modulation: 802.11ac VHT40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2422	-11.92	8
	2437	-13.07	8
	2452	-13.03	8

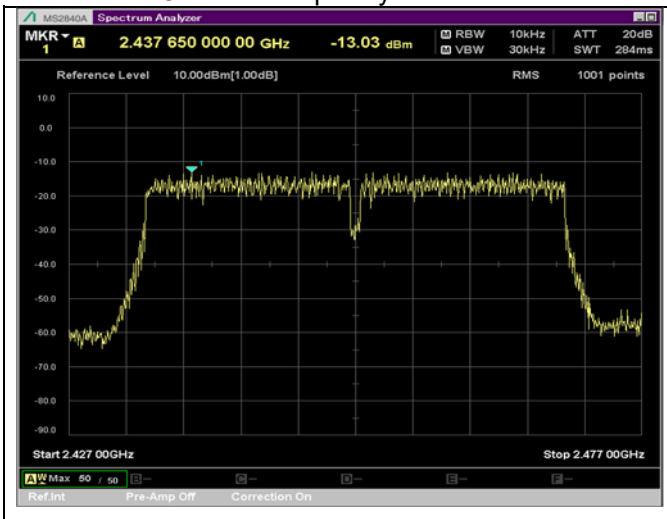
Data Rate : MCS0



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz

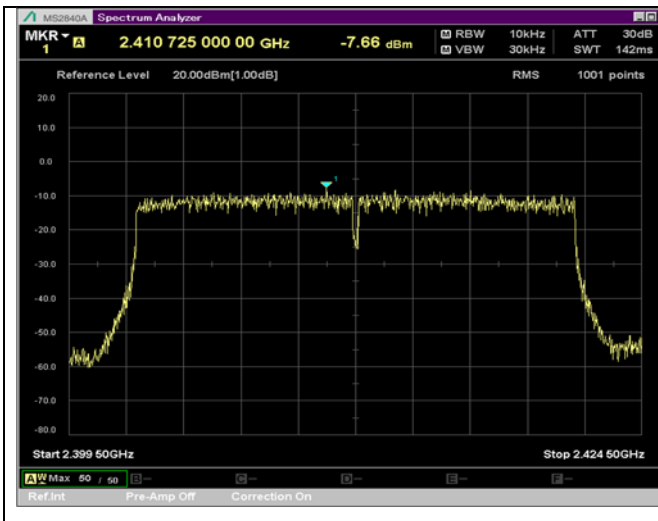


Channel Frequency: 2452MHz

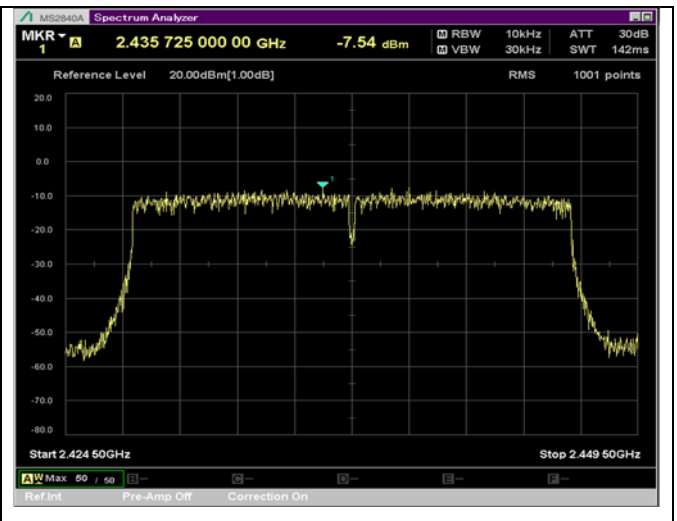
Modulation: 802.11ax HE20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2412	-7.66	8
	2437	-7.54	8
	2462	-6.98	8

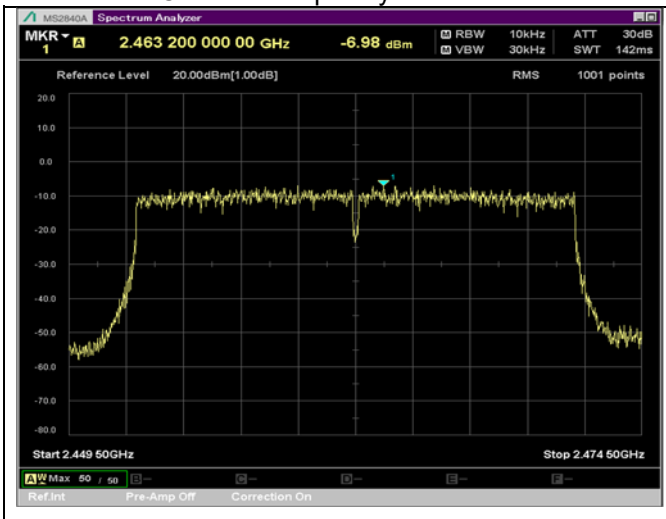
Data Rate : MCS0



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

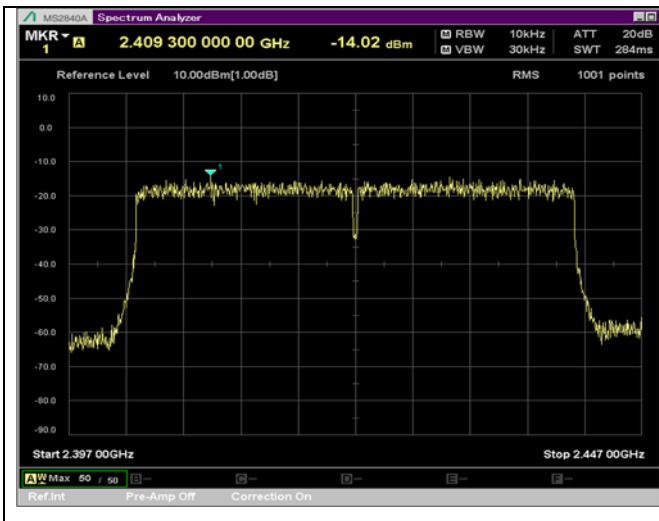


Channel Frequency: 2462MHz

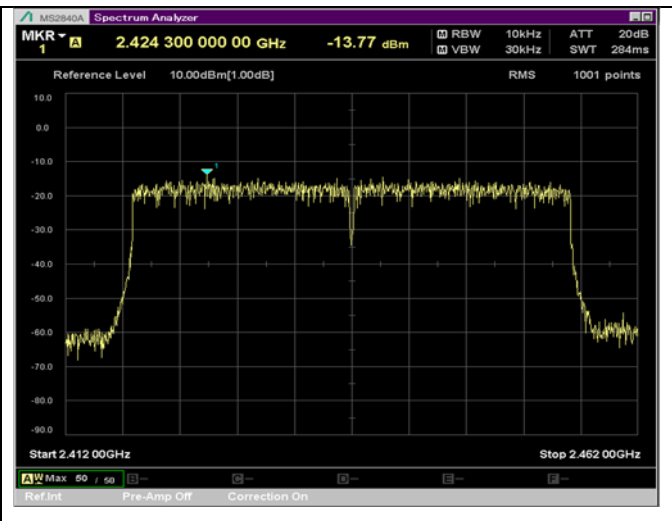
Modulation: 802.11ax HE40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2422	-14.02	8
	2437	-13.77	8
	2452	-14.14	8

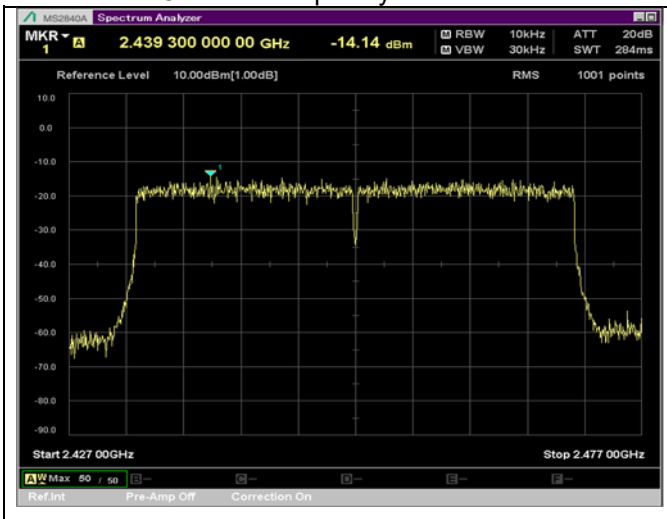
Data Rate : MCS0



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz



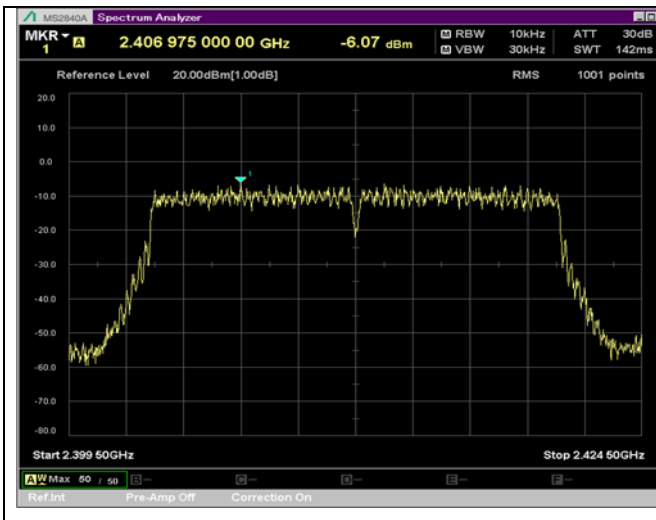
Channel Frequency: 2452MHz

Antenna Mode:MIMO ANT0

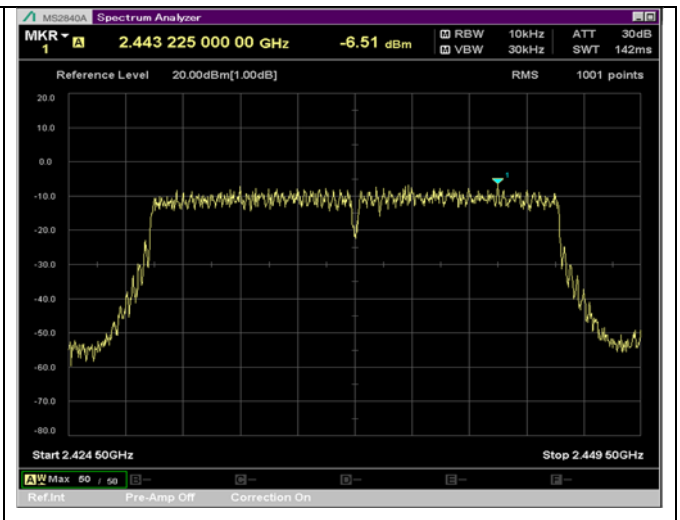
Modulation: 802.11n HT20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS8	2412	-6.07	8
	2437	-6.51	8
	2462	-5.55	8

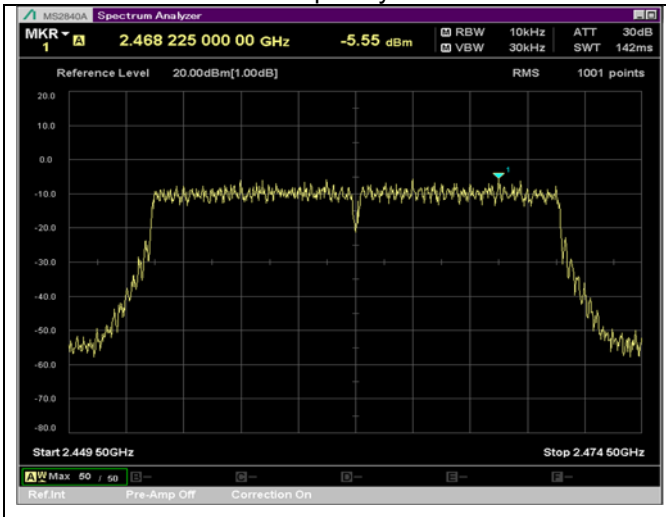
Data Rate : MCS8



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

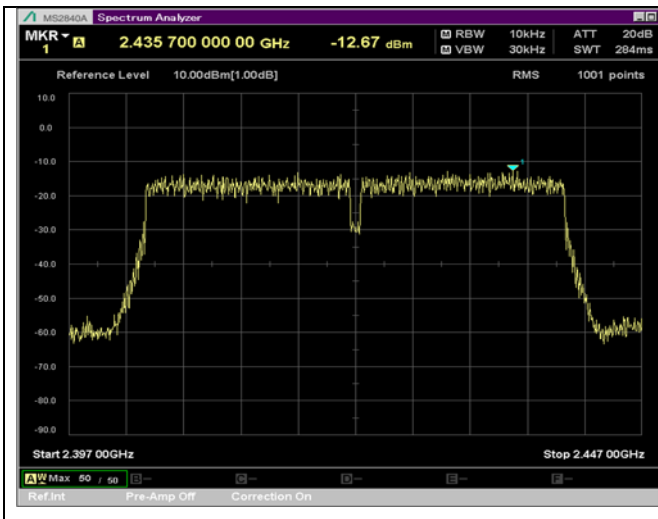


Channel Frequency: 2462MHz

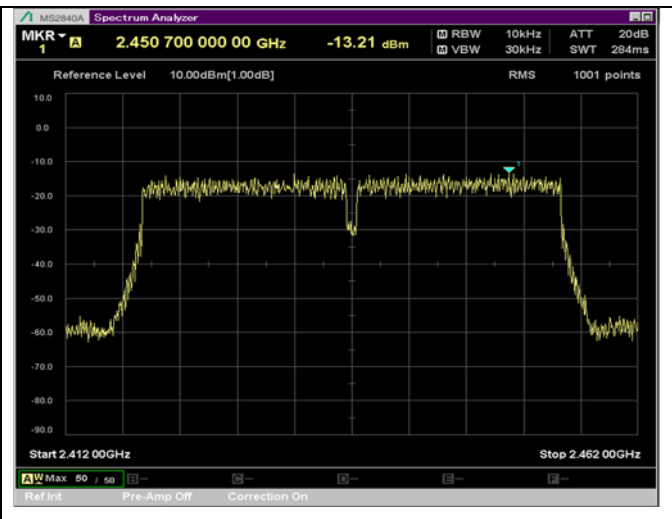
Modulation: 802.11n HT40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS8	2422	-12.67	8
	2437	-13.21	8
	2452	-12.64	8

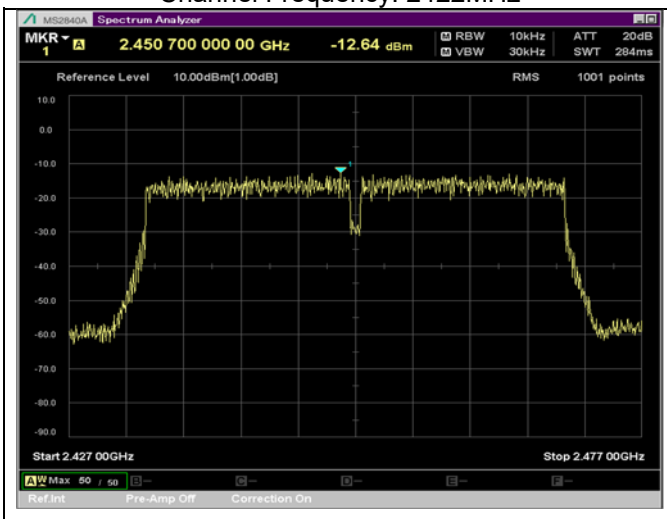
Data Rate : MCS8



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz

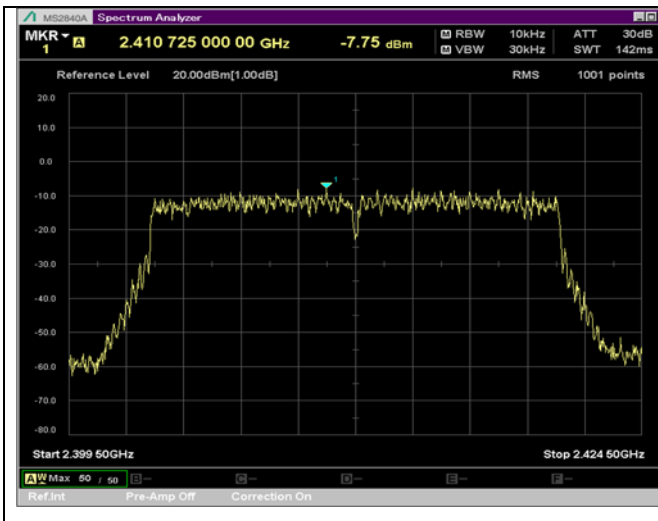


Channel Frequency: 2452MHz

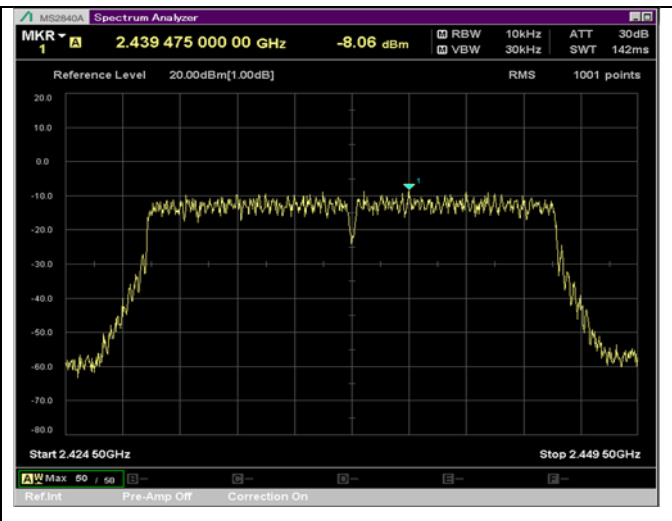
Modulation: 802.11ac VHT20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2412	-7.75	8
	2437	-8.06	8
	2462	-7.61	8

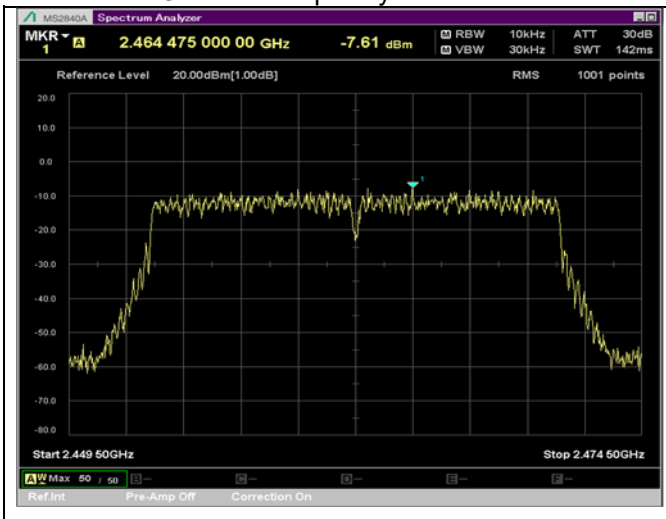
Data Rate : MCS0



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

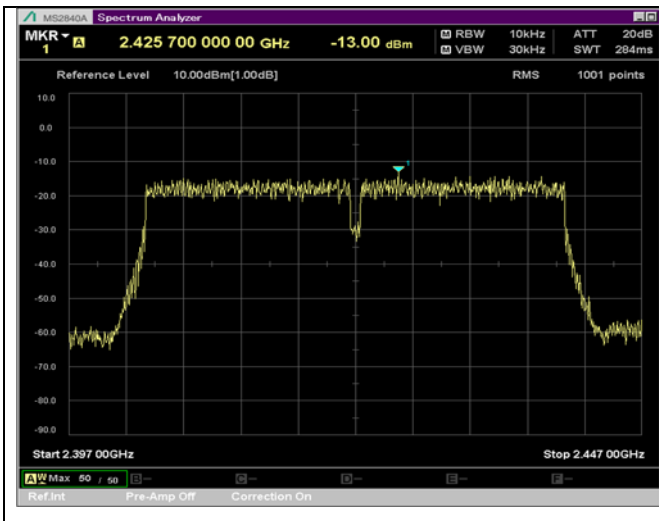


Channel Frequency: 2462MHz

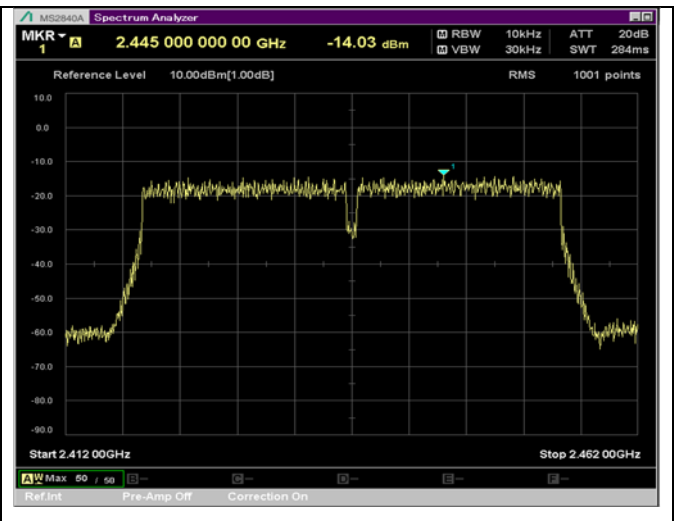
Modulation: 802.11ac VHT40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2422	-13.00	8
	2437	-14.03	8
	2452	-14.16	8

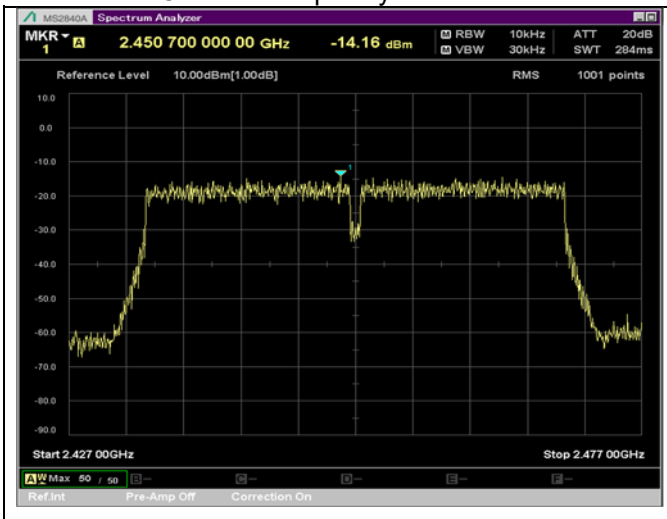
Data Rate : MCS0



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz

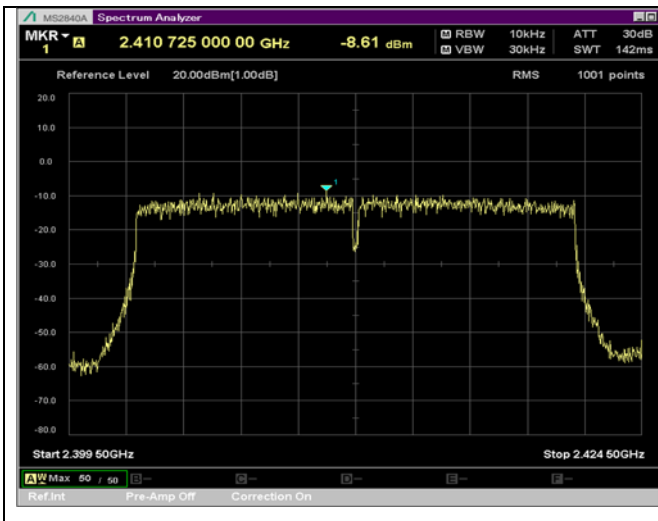


Channel Frequency: 2452MHz

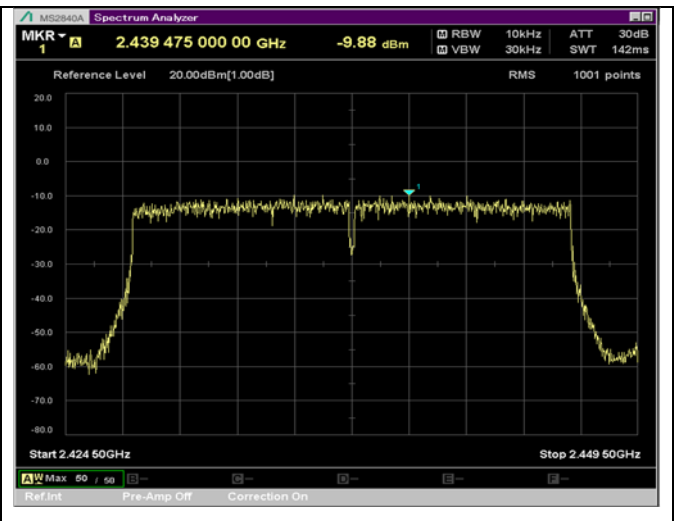
Modulation: 802.11ax HE20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2412	-8.61	8
	2437	-9.88	8
	2462	-8.32	8

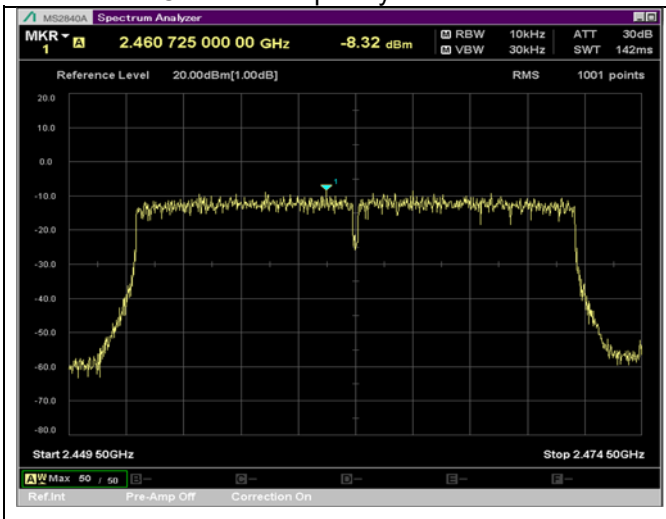
Data Rate : MCS0



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

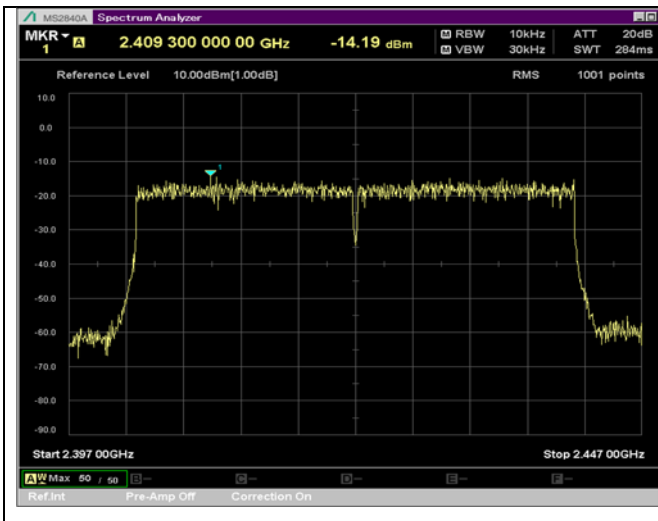


Channel Frequency: 2462MHz

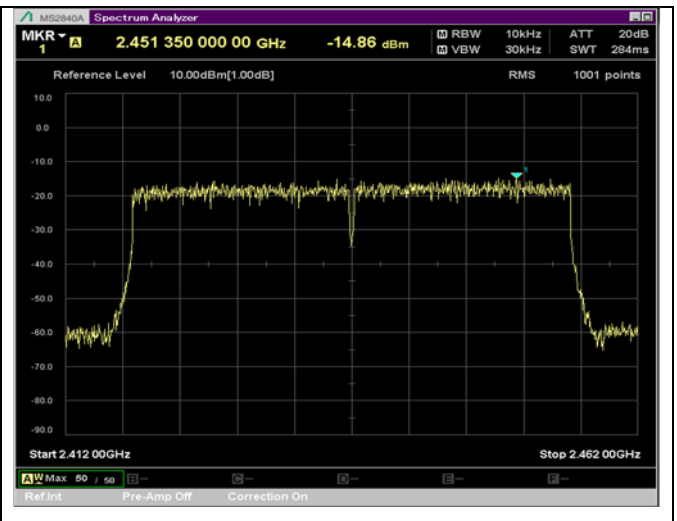
Modulation: 802.11ax HE40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS7	2422	-14.19	8
	2437	-14.86	8
	2452	-14.71	8

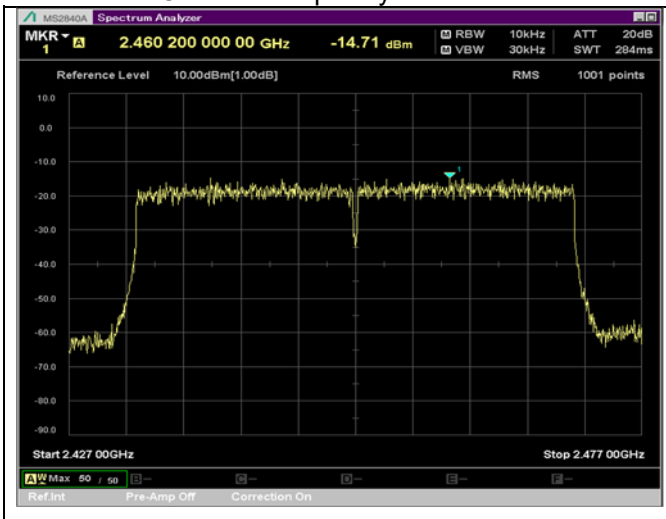
Data Rate : MCS0



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz



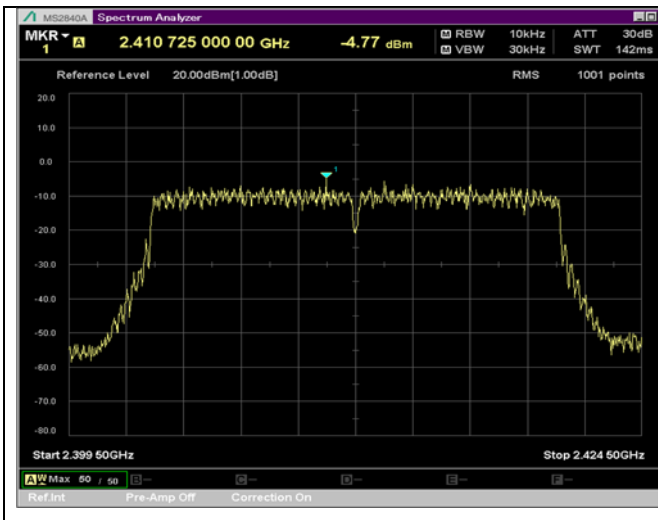
Channel Frequency: 2452MHz

Antenna Mode:MIMO ANT1

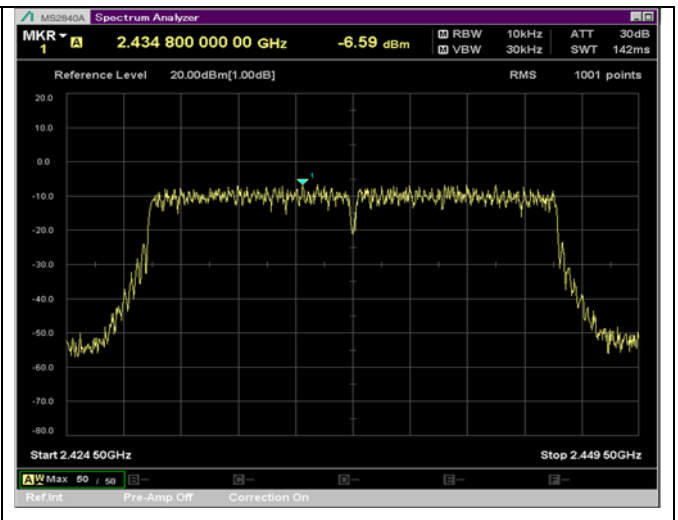
Modulation: 802.11n HT20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS8	2412	-4.77	8
	2437	-6.59	8
	2462	-5.14	8

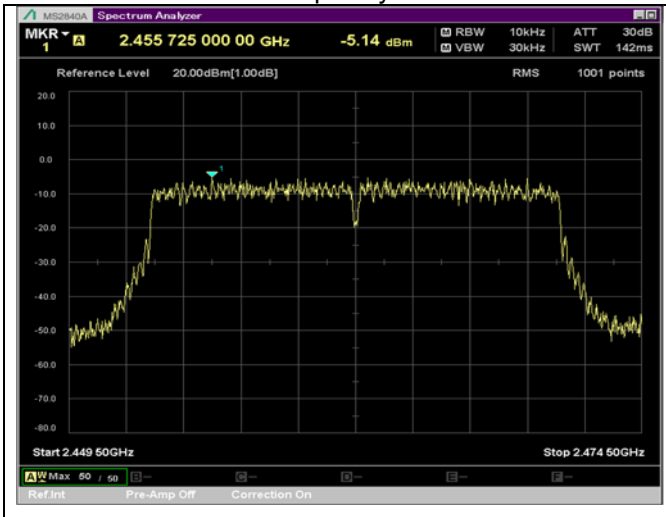
Data Rate : MCS8



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

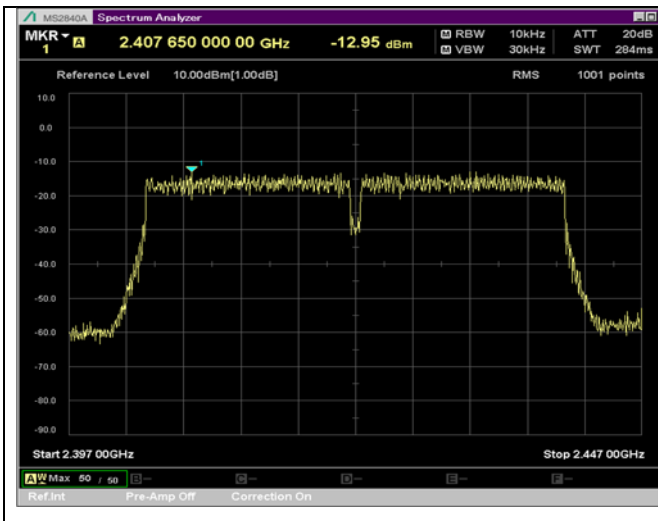


Channel Frequency: 2462MHz

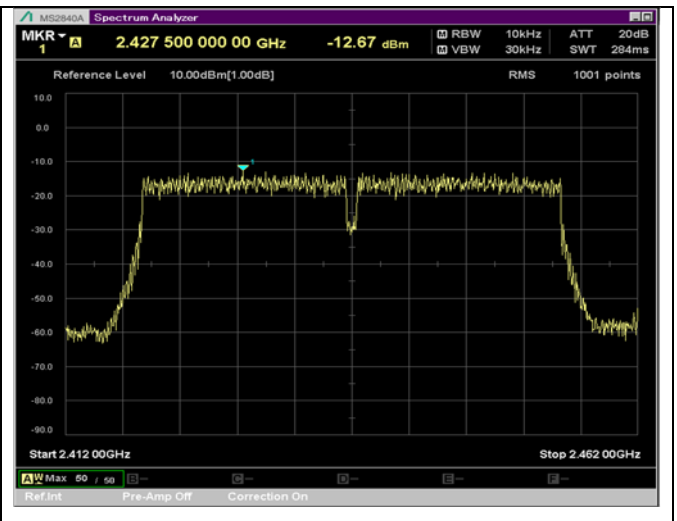
Modulation: 802.11n HT40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS8	2422	-12.95	8
	2437	-12.67	8
	2452	-12.04	8

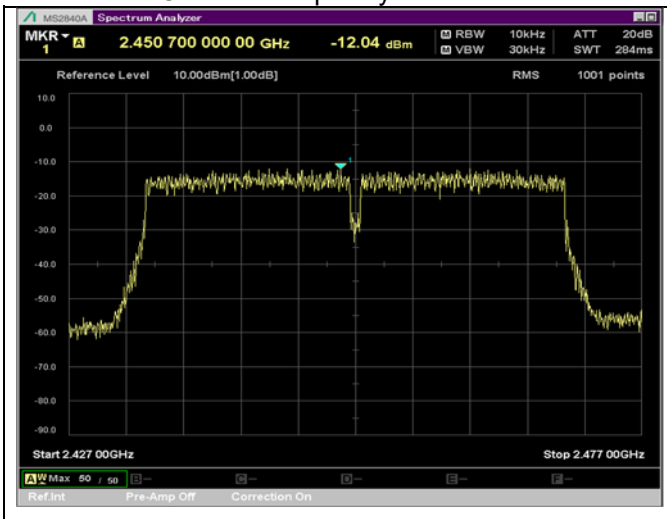
Data Rate : MCS8



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz

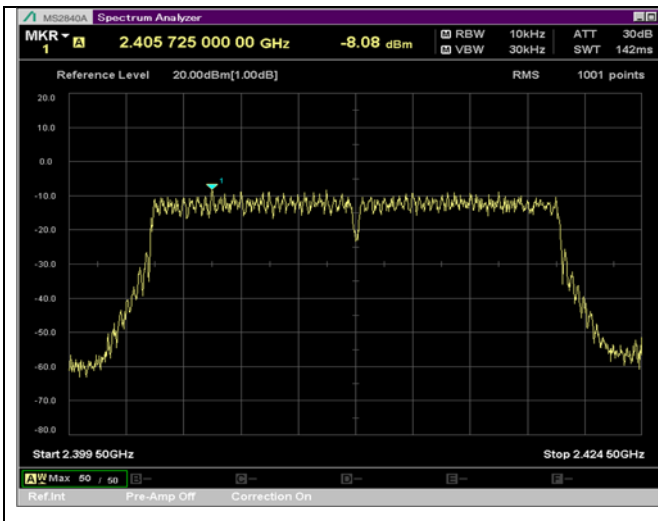


Channel Frequency: 2452MHz

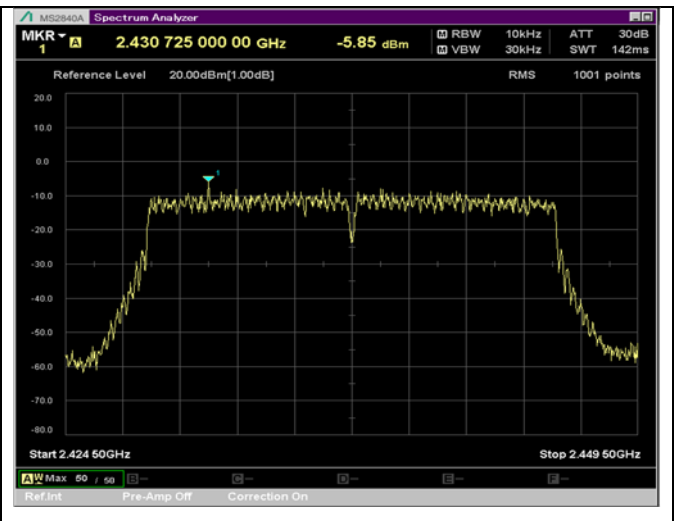
Modulation: 802.11ac VHT20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2412	-8.08	8
	2437	-5.85	8
	2462	-7.22	8

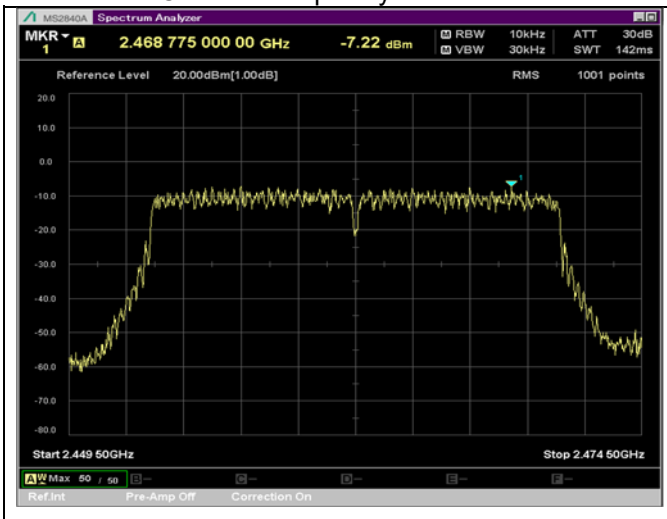
Data Rate : MCS0



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

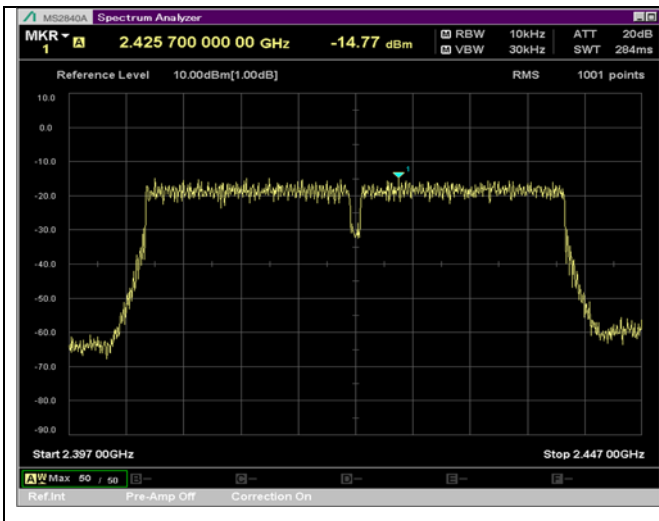


Channel Frequency: 2462MHz

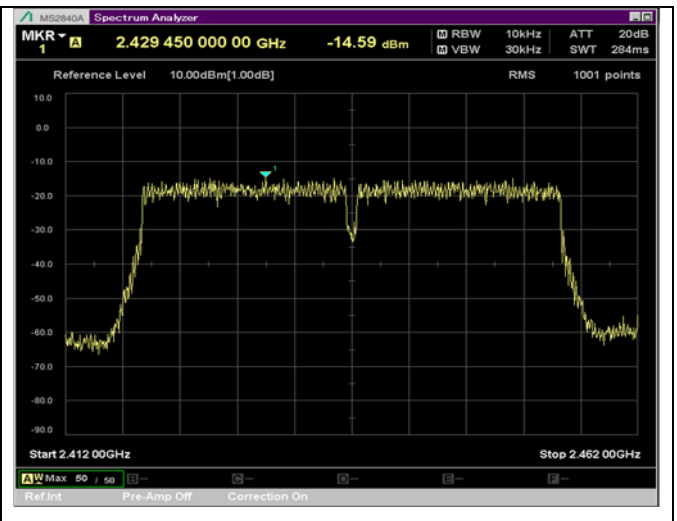
Modulation: 802.11ac VHT40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2422	-14.77	8
	2437	-14.59	8
	2452	-14.21	8

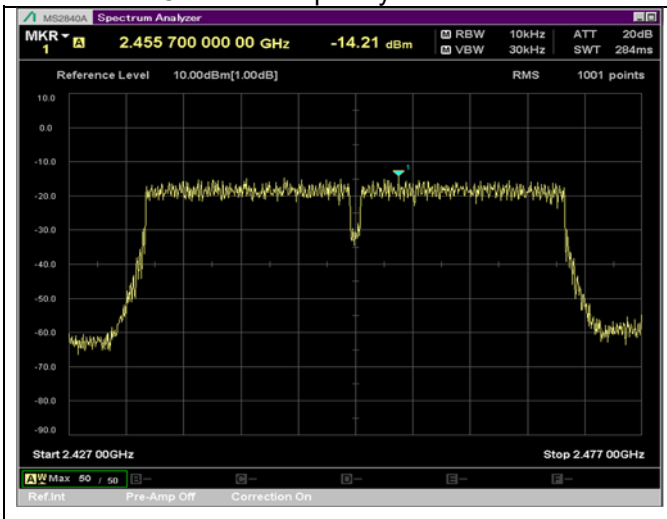
Data Rate : MCS0



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz

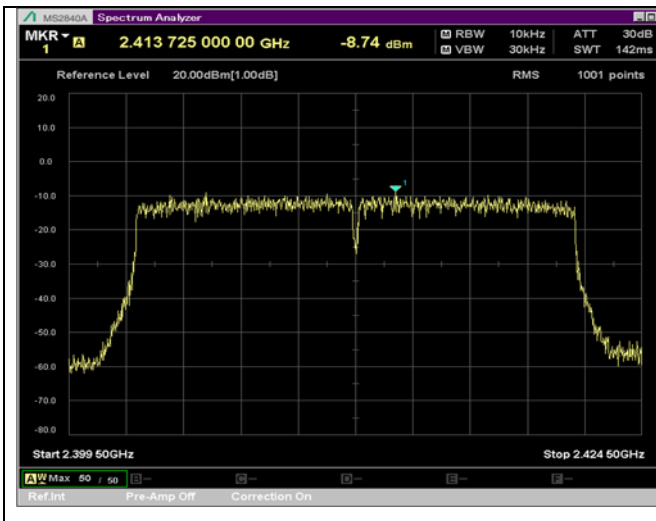


Channel Frequency: 2452MHz

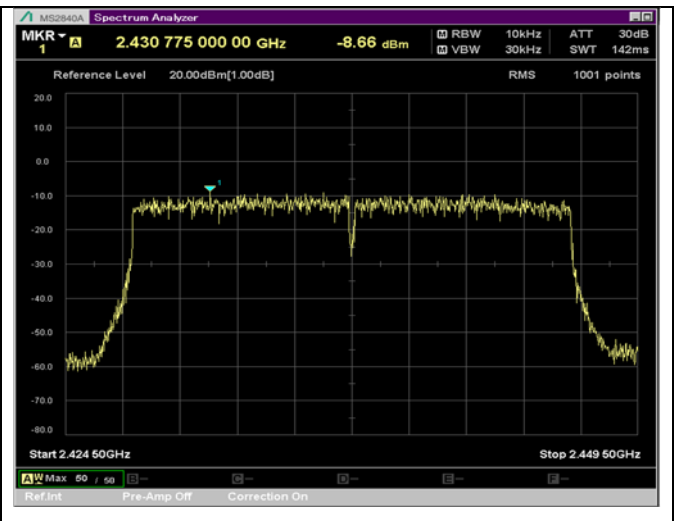
Modulation: 802.11ax HE20

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS0	2412	-8.74	8
	2437	-8.66	8
	2462	-7.43	8

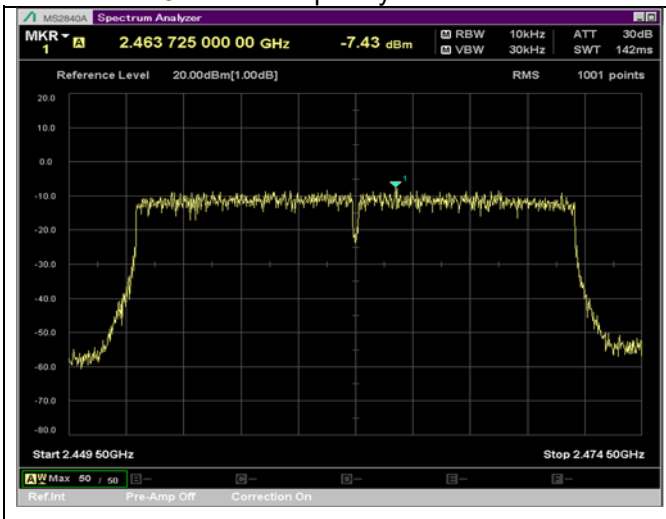
Data Rate : MCS0



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

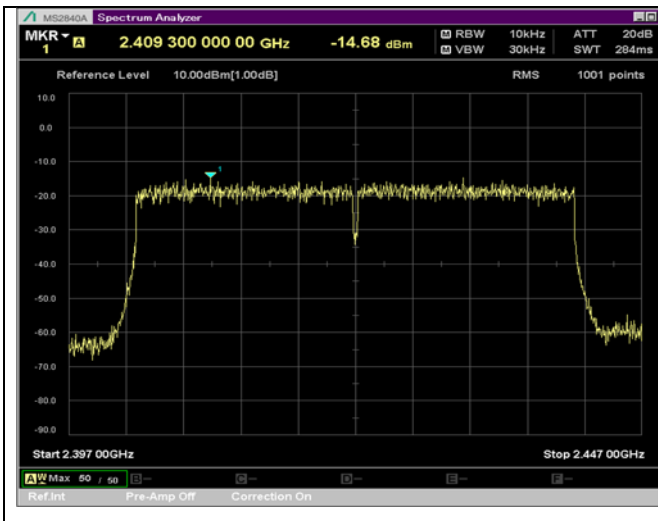


Channel Frequency: 2462MHz

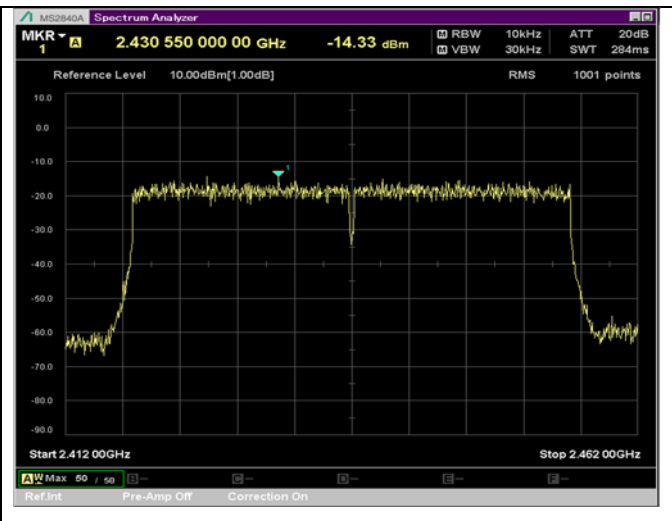
Modulation: 802.11ax HE40

Data rate	Channel Frequency (MHz)	Measured Average PSD (dBm/10 kHz)	PSD Limit (dBm/10 kHz)
MCS7	2422	-14.68	8
	2437	-14.33	8
	2452	-14.54	8

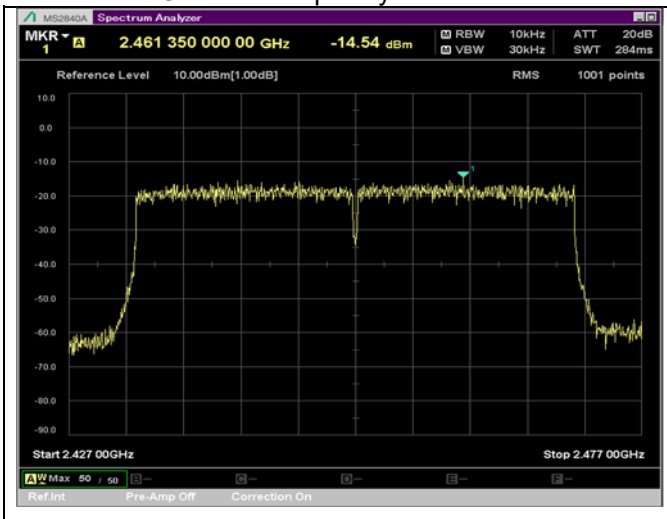
Data Rate : MCS0



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz

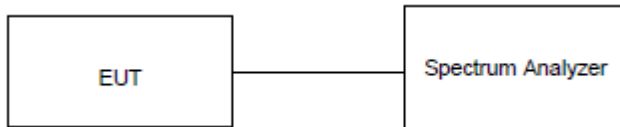


Channel Frequency: 2452MHz

7.3 DTS Bandwidth & 99% Bandwidth

Result	Pass
Test Specification	FCC part 15 Subpart C 15.247 (a) (2) / RSS 247 Issue 2, Section 5.2 (a)
Test Method	Subclause 11.8.1 of ANSI C63.10
Measurement Bandwidth	100 kHz for x dB bandwidth 1 to 5% of OCB for 99% bandwidth
Detector	Peak
Port of testing	Antenna port
Requirement	The minimum 6 dB bandwidth shall be at least 500 kHz

Test Method:



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.3 °C	Voltage =DC 12.0V Adapter	Relative humidity: 58%
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KDB Guidelines applied:

Measurements were made as per section 8.2 in KDB 558074 D01 15.247 Measurement Guidance v05r02.

Test results:

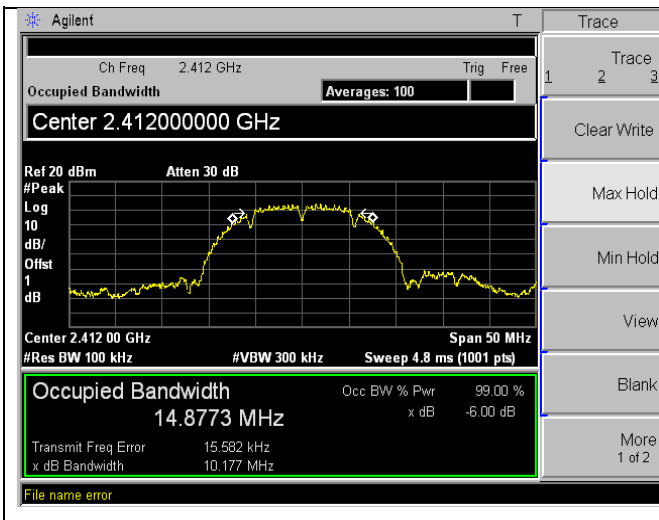
Note:

1. All the losses are included during measurement and final values are mentioned in the test report.
2. Peak Output power (dBm) = Measured Peak power (dBm) + Cable loss (1.0dB)
3. This product do not support additional beamforming gain / directional gain, it uses signal antenna and hence directional gain of the single antenna is 3.032 dBi

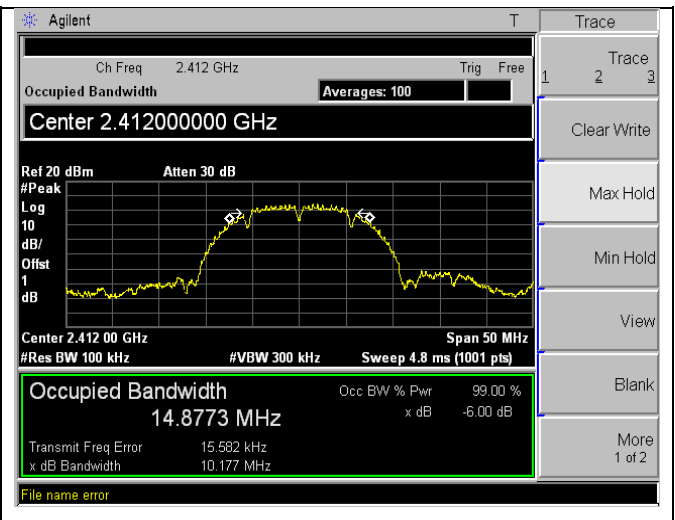
ANT 0
Modulation: 802.11b

Data rate	Channel Frequency (MHz)	6 dB Bandwidth (MHz)	99% OBW (MHz)	Minimum Limit (MHz)
1Mbps	2412	10.17	14.92	0.5
	2437	12.03	14.92	0.5
	2462	10.41	14.92	0.5

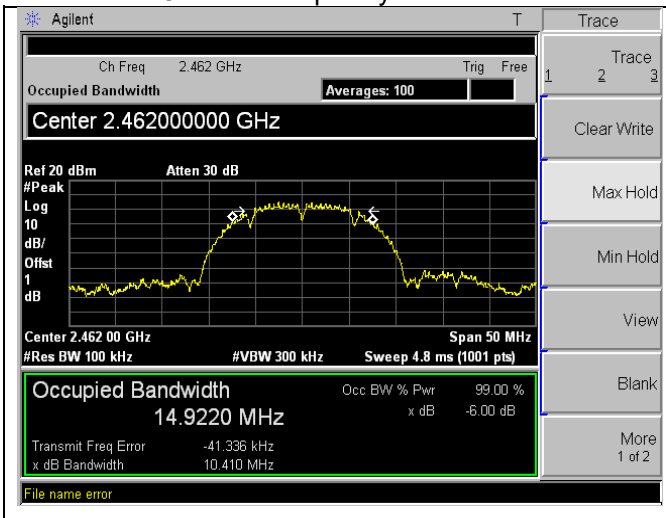
Data Rate : 1Mbps-6 dB Bandwidth



Channel Frequency: 2412MHz

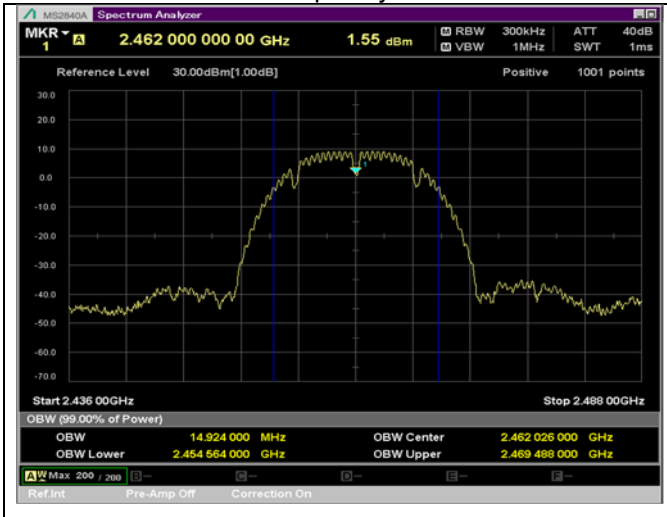
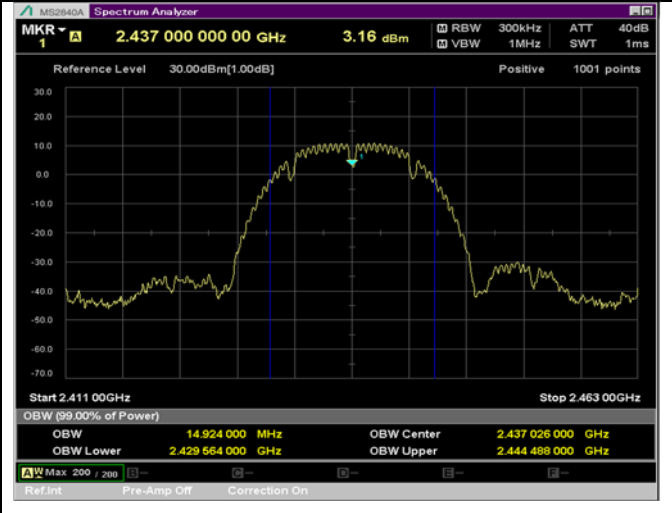
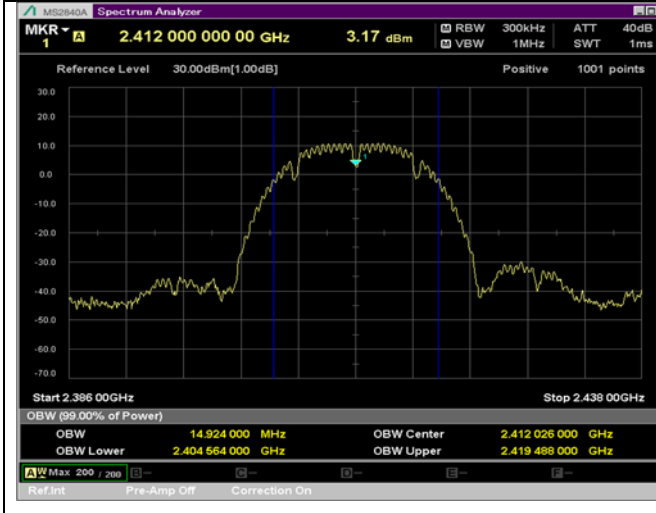


Channel Frequency: 2437MHz



Channel Frequency: 2462MHz

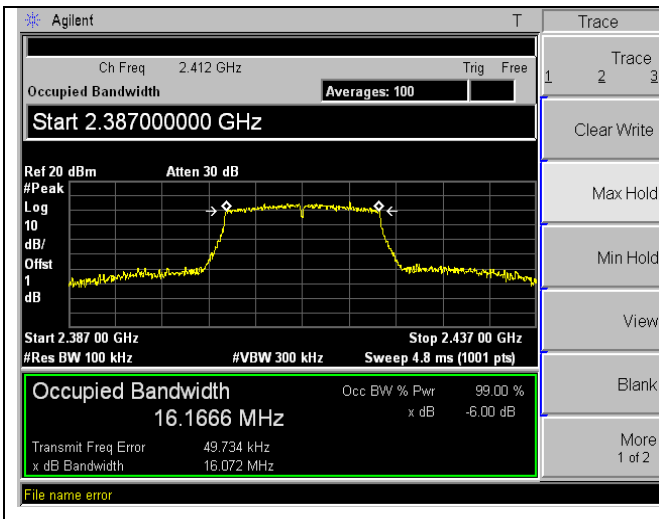
Data Rate : 1 Mbps-99 % Bandwidth



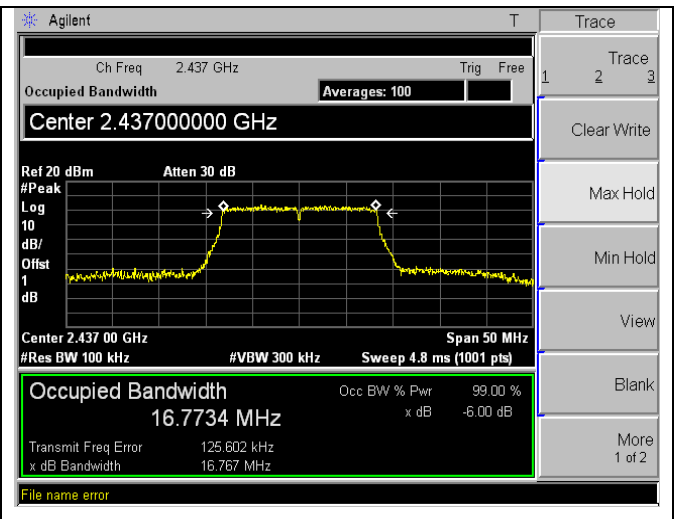
Modulation: 802.11g

Data rate	Channel Frequency (MHz)	6 dB Bandwidth (MHz)	99% OBW (MHz)	Minimum Limit (MHz)
6Mbps	2412	16.07	16.27	0.5
	2437	16.76	16.43	0.5
	2462	16.28	16.48	0.5

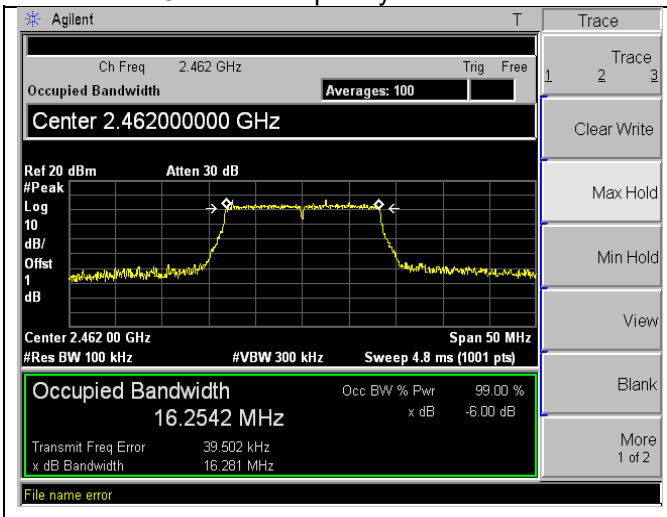
Data Rate : 6 Mbps-6 dB Bandwidth



Channel Frequency: 2412MHz

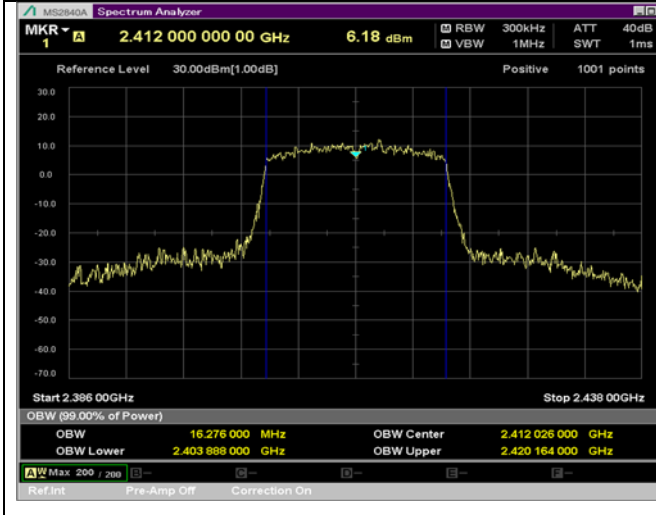


Channel Frequency: 2437MHz

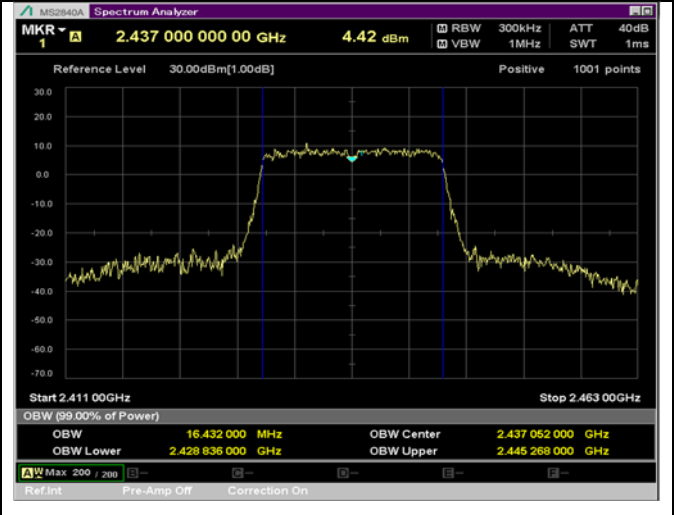


Channel Frequency: 2462MHz

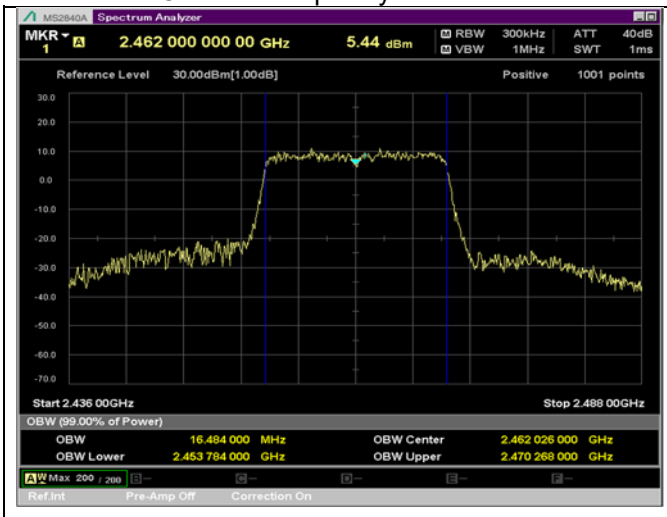
Data Rate : 6 Mbps-99% Bandwidth



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

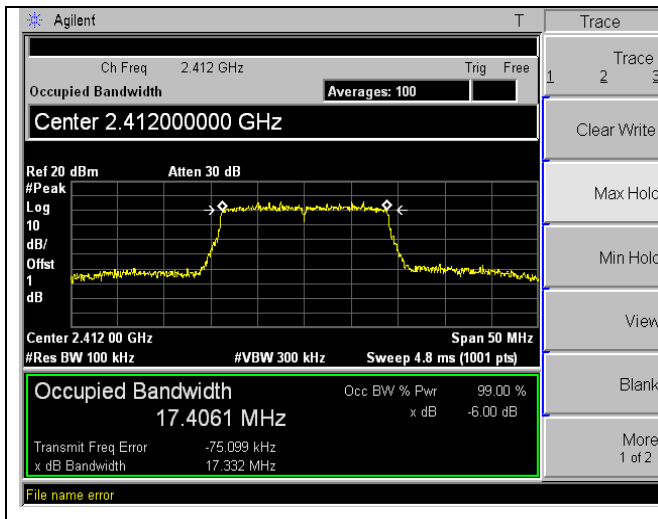


Channel Frequency: 2462MHz

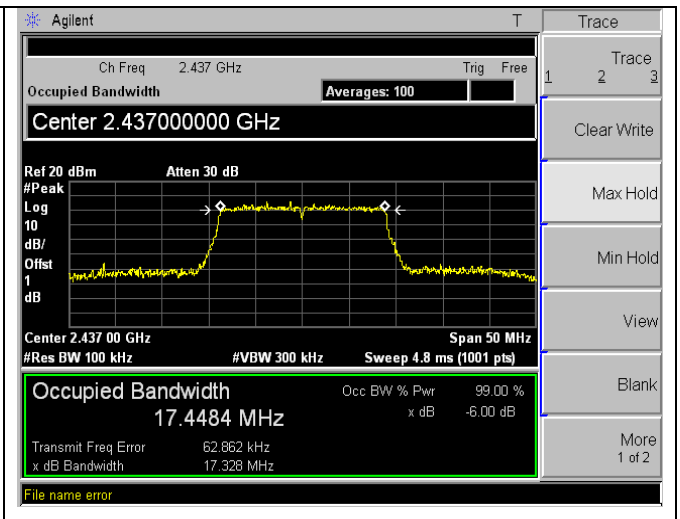
Modulation: 802.11n HT20

Data rate	Channel Frequency (MHz)	6 dB Bandwidth (MHz)	99% OBW (MHz)	Minimum Limit (MHz)
MCS0	2412	17.33	17.57	0.5
	2437	17.32	17.57	0.5
	2462	17.25	17.57	0.5

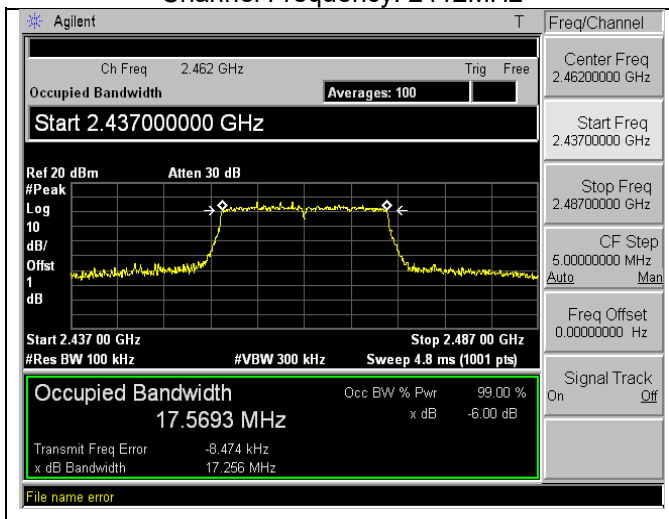
Data Rate : MCS0-6 dB Bandwidth



Channel Frequency: 2412MHz

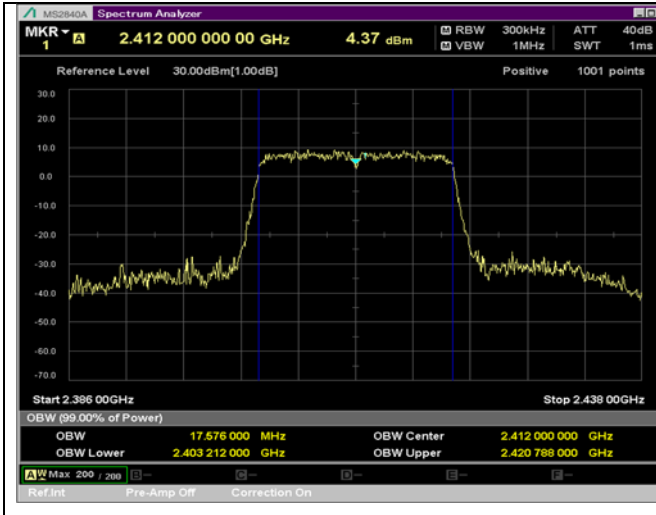


Channel Frequency: 2437MHz

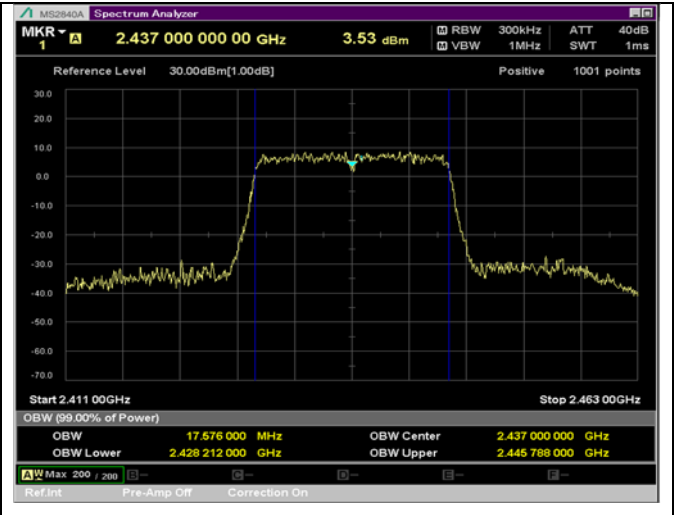


Channel Frequency: 2462MHz

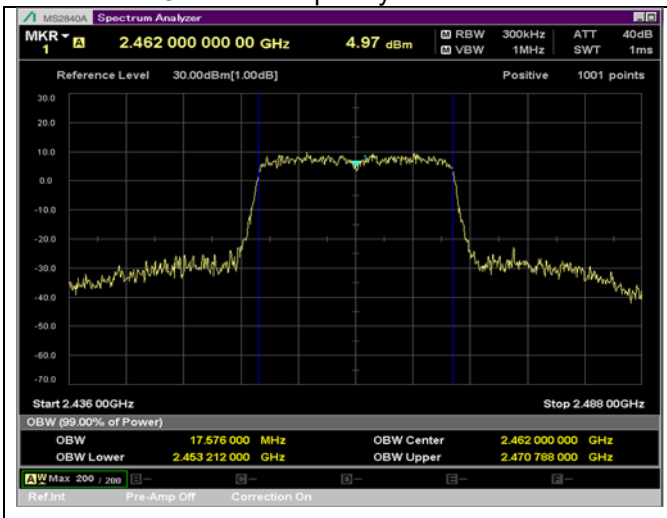
Data Rate : MCS0-99 % Bandwidth



Channel Frequency: 2412MHz



Channel Frequency: 2437MHz

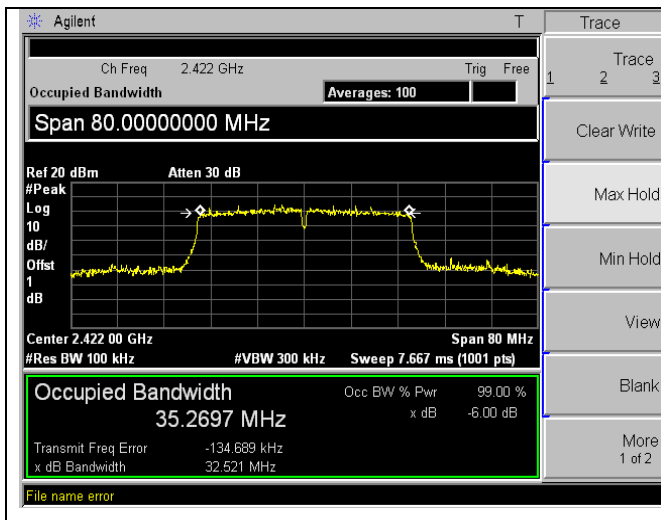


Channel Frequency: 2462MHz

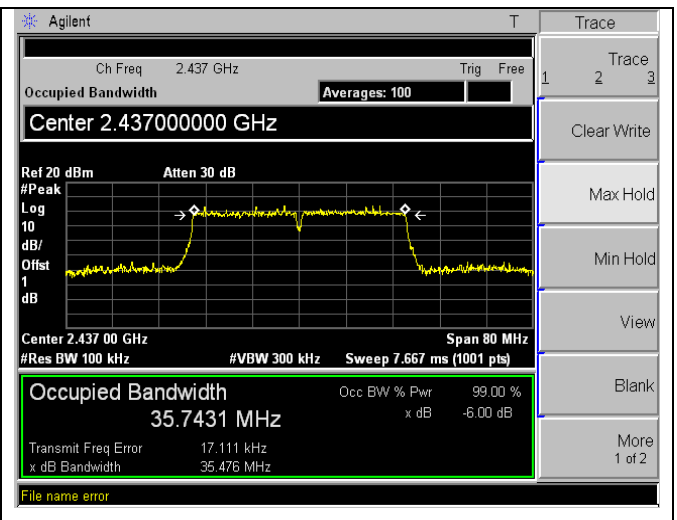
Modulation: 802.11n HT40

Data rate	Channel Frequency (MHz)	6 dB Bandwidth (MHz)	99% OBW (MHz)	Minimum Limit (MHz)
MCS0	2422	32.52	35.81	0.5
	2437	35.47	34.81	0.5
	2452	34.85	35.93	0.5

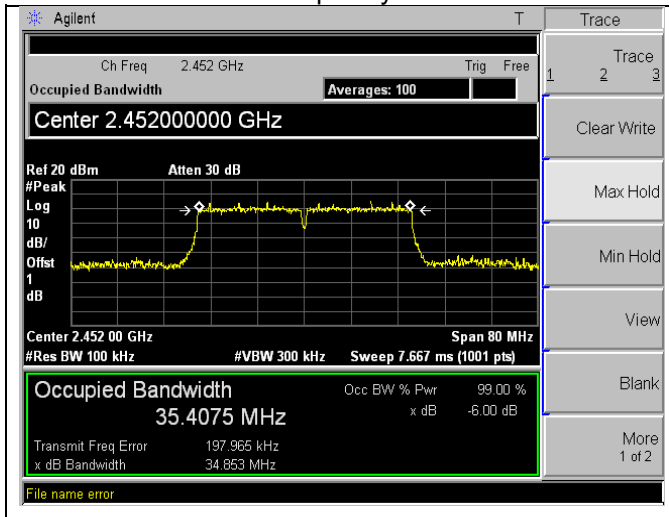
Data Rate : MCS0-6 dB Bandwidth



Channel Frequency: 2422MHz

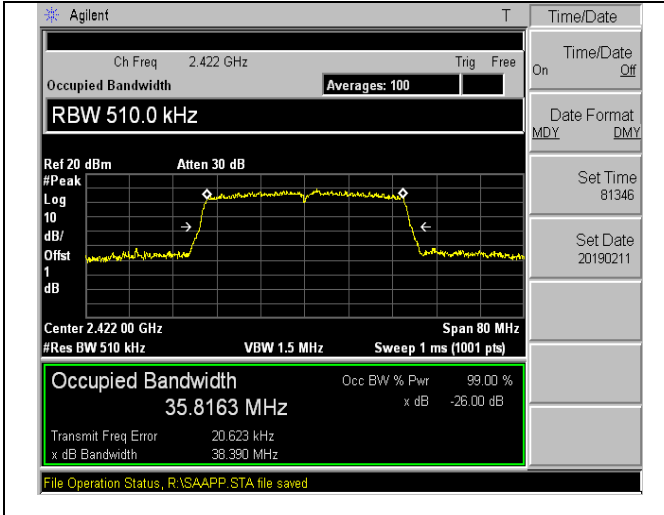


Channel Frequency: 2437MHz

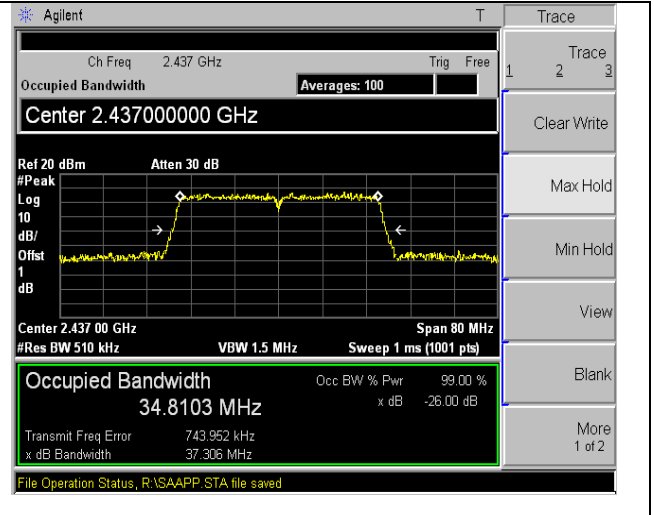


Channel Frequency: 2452MHz

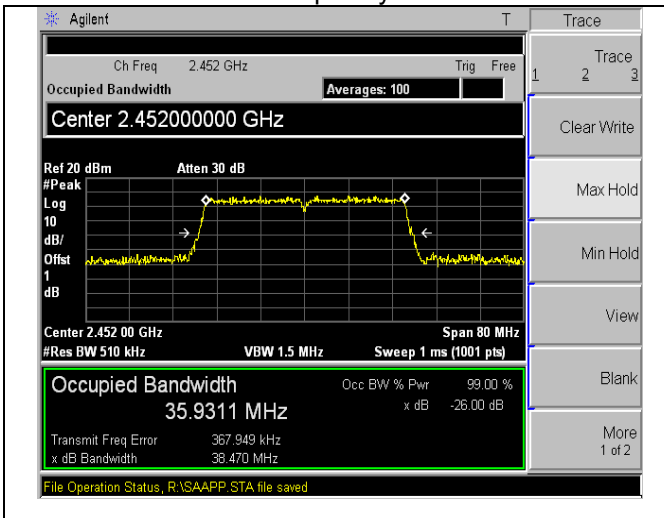
Data Rate : MCS0-99 % Bandwidth



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz

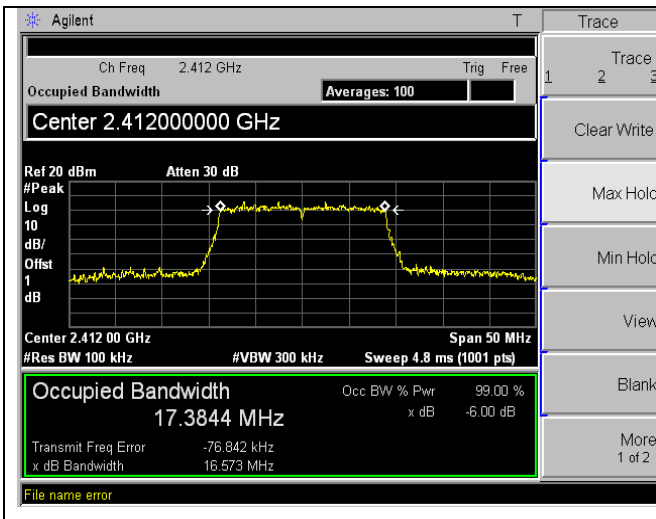


Channel Frequency: 2452MHz

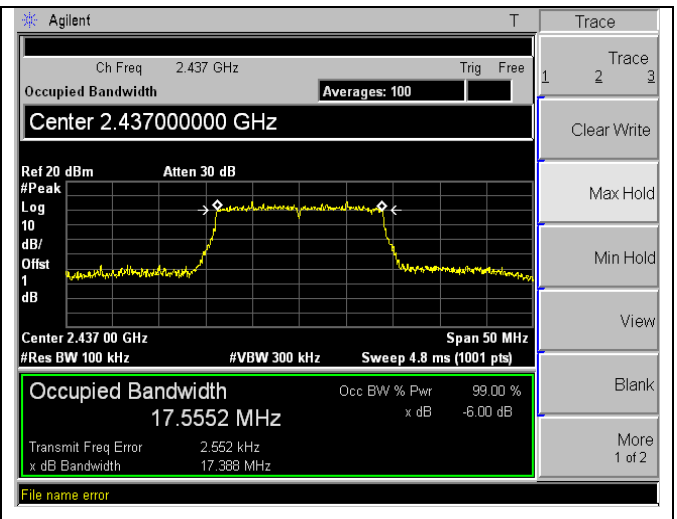
Modulation: 802.11ac VHT20

Data rate	Channel Frequency (MHz)	6 dB Bandwidth (MHz)	99% OBW (MHz)	Minimum Limit (MHz)
MCS0	2412	16.57	17.57	0.5
	2437	17.38	17.62	0.5
	2462	17.32	17.57	0.5

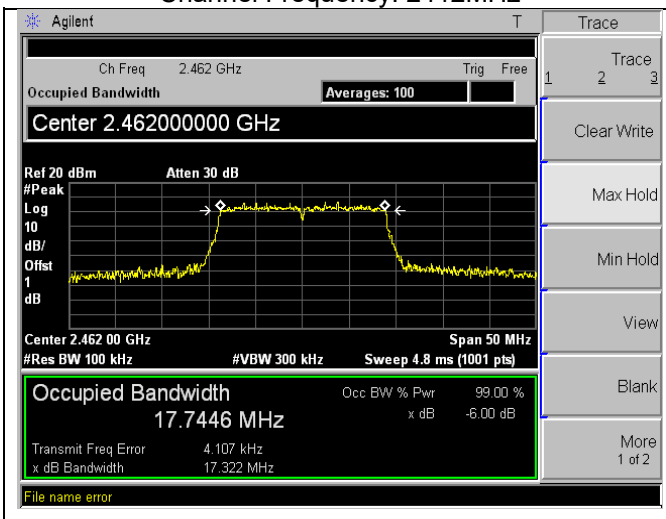
Data Rate : MCS0-6 dB Bandwidth



Channel Frequency: 2412MHz

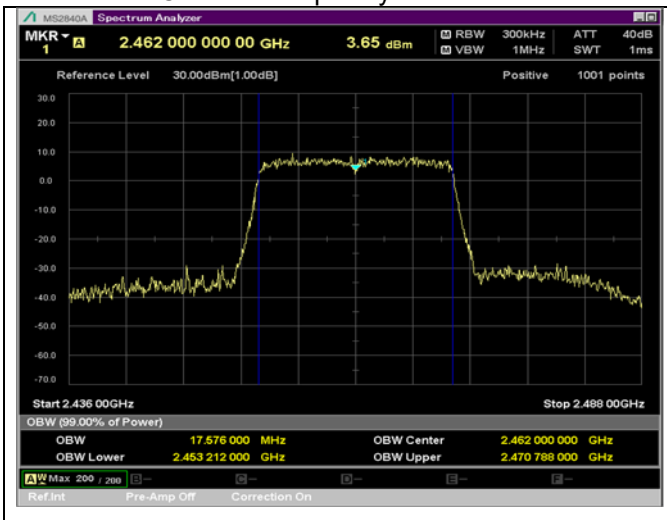
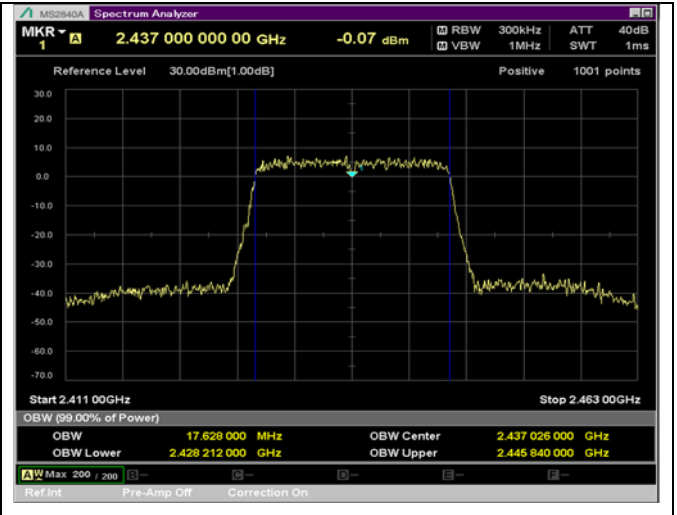
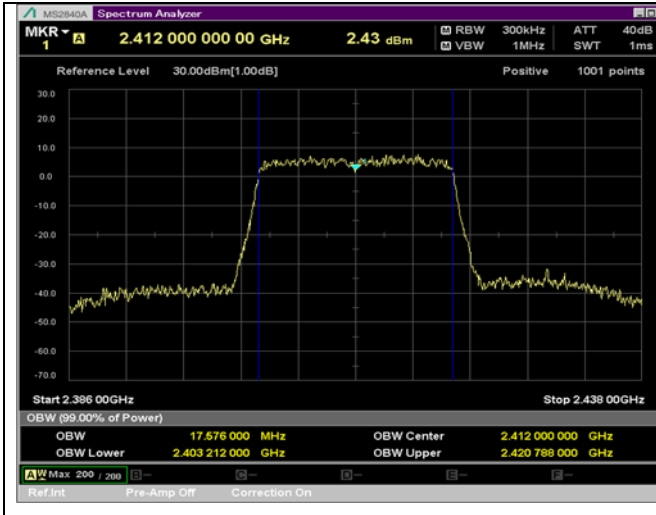


Channel Frequency: 2437MHz



Channel Frequency: 2462MHz

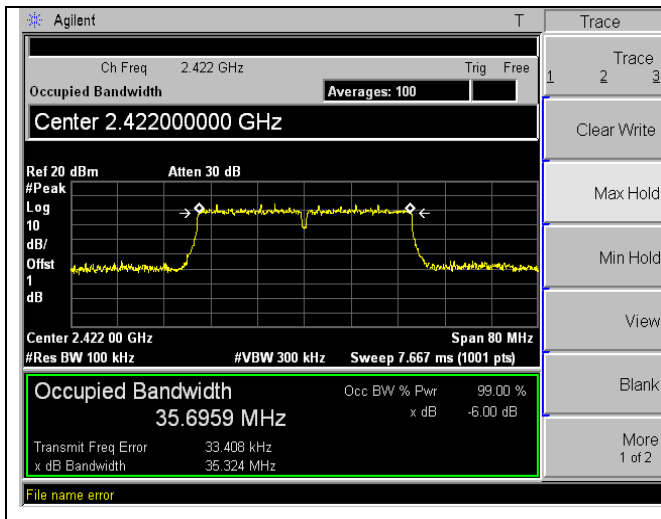
Data Rate : MCS0-99 % Bandwidth



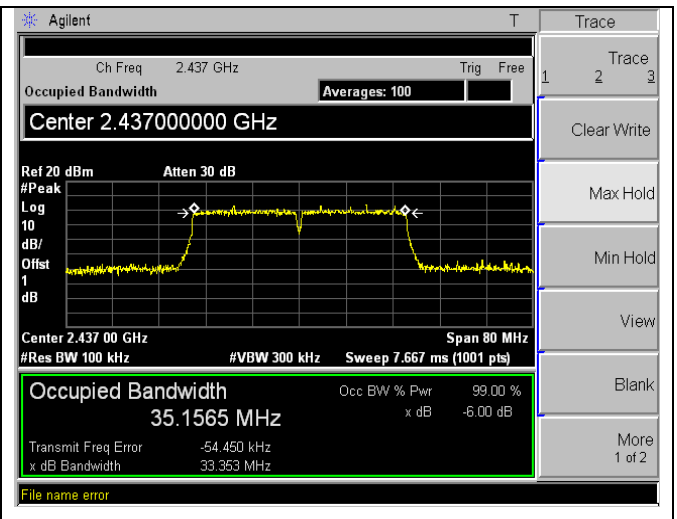
Modulation: 802.11ac VHT40

Data rate	Channel Frequency (MHz)	6 dB Bandwidth (MHz)	99% OBW (MHz)	Minimum Limit (MHz)
MCS0	2422	35.32	36.32	0.5
	2437	33.35	36.95	0.5
	2452	35.78	35.05	0.5

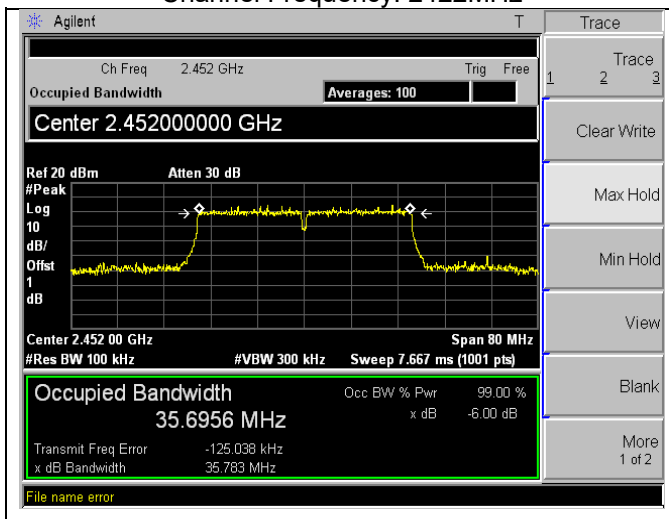
Data Rate : MCS0-6 dB Bandwidth



Channel Frequency: 2422MHz

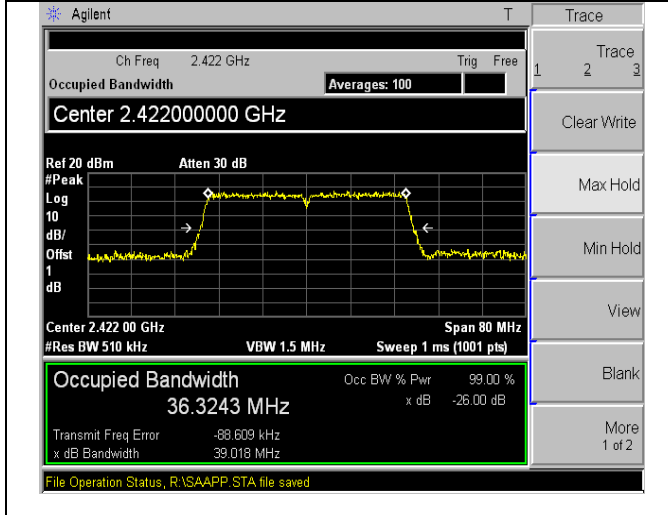


Channel Frequency: 2437MHz

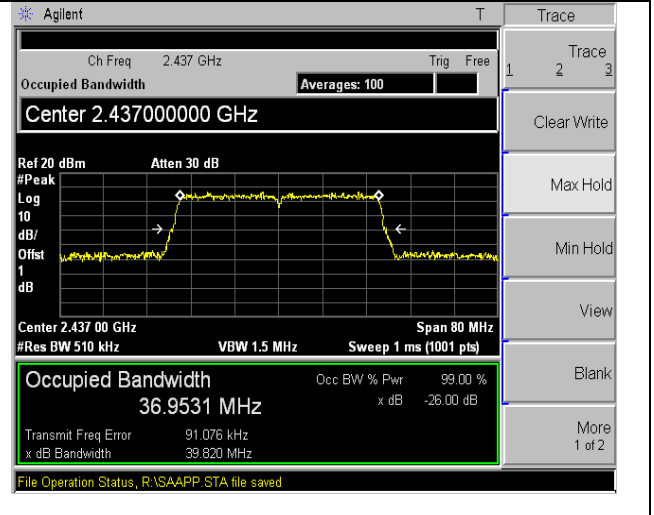


Channel Frequency: 2452MHz

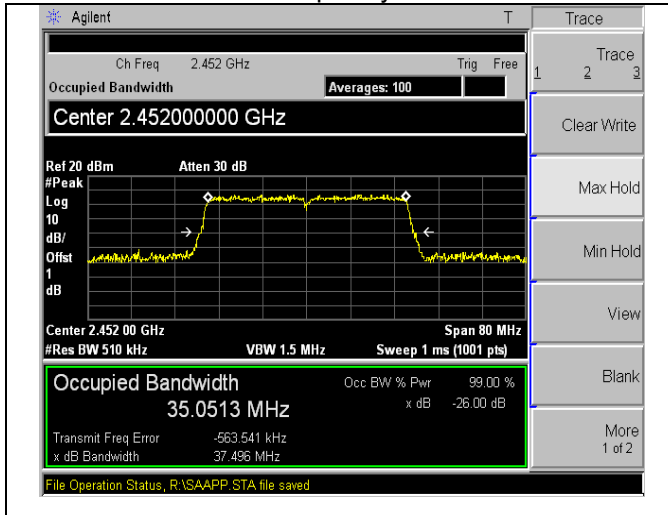
Data Rate : MCS0-99 % Bandwidth



Channel Frequency: 2422MHz



Channel Frequency: 2437MHz



Channel Frequency: 2452MHz