

Test Report for FCC & IC

Report Number		ESTRGC2304-006(1)		
Applicant	Company name	ID Secure LLC		
	Address	10 Crooked Hill Oakland New Jersey United States 07436		
	Telephone	+82-031-607-7537		
Product	Product name	Portable Data Collection Terminal		
	Model No.	RP1600X	Manufacturer	Gen2wave
	Serial No.	NONE	Country of origin	KOREA
Test date	06-Apr-23 ~ 19-Apr-23		Date of issue	15-Jun-23
Testing location	140-16, Eongmali-ro, Majang-myeon, Icheon-si, Gyeonggi-do, Rep. of Korea			
FCC ID	2BA25-RP1600X			
ISED ID	30760-RP1600X			
FCC Rule Part(s)	FCC Part 15 Subpart E 15.247, 15.407, 15.207, 15.205 & 15.209			
ISED Rule Part(s)	RSS 247 Issue 2 and RSS GEN Issue 5			
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			
* Note - 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 (Bluetooth)

Product : Portable Data Collection Terminal

Model Number : RP1600X

Serial Number : NONE

Manufacturer : Gen2wave

No. of Channels: (Refer Table 2)

Operating Frequency Range: UNII-1 _ 5150MHz to 5250MHz, UNII-3 _ 5725MHz to 5825MHz

Channel Spacing : 20 MHz, 40 MHz, 80 MHz

Average Output Power : -16.4 dBm at 802.11a 54 Mbps UNII-1 5180 MHz

Supply Voltage to Product : 3.7 V Battery

Power Rating : INPUT: AC(100 - 240) V, (50-60)Hz, 0.58 A

OUTPUT: DC 5 V, 4.0 A

Receipt Date : 2023-Mar-13

X-tal list(s) or Frequencies generated : The highest operating frequency is 5 825 MHz(Wifi-5G)

WLAN : 5 GHz

2.2 General descriptions of EUT

General Characteristics	CPU / RAM / ROM	Hexa core CPU (Cortex A72 Dual-core 1.8GHz, Cortex A53 Quad core 1.4Ghz)
	RAM / ROM	4GB RAM / 32GB ROM
	OS	Android 11
	Dimensions	139mm/5.47inch(W) x 230mm/2.87inch(H) x 28(22)mm, 1.10/(0.86)inch : (D)(Minimum Thickness)
	Weight	320g/11.3oz with 4,000mA battery
	Buttons	5 front buttons / 5 side buttons
	Battery / Backup battery	Standard : 1860mAh Li-Ion / Extended : 4000mAh Li-Ion / NFC, IC Card Battery : 2860mAh Li-Ion Backup battery : 200mAh Li-Polymer
	Audio / LED / Sensor	Audio : Speaker, Receiver, Mic / LED : 1 charging status Sensor : Acceleration, Compass, Proximity, Ambient Light Sensor
	Display / Touch	4.3 Inch, WVGA(480x800) / Capacitive, multi touch, Gorilla glass 3
	Expansion Slot / SAM	Micro SDXC / 2 SAM Slot
	Communication	USB Host/Client : USB2.0 High Speed, External Serial RS232C, RJ45 Port (Use 1Slot/4Slot Cradle)
	Power	DC Jack 5V / 3.5A Adaptor

Integrated Radio	Wireless LAN	IEEE 802.11 a/b/g/n/ac (2.4, 5GHz)
	Bluetooth	Bluetooth 4.2 BLE
	GPS	AGPS
DATA CAPTURE	Camera	Rear Camera : 13MP Auto Focus / 1 LED Flash
	RFID	NXP PN548 / HF 13.56Mhz / 14443A/B, 15693
	Contact Smart Card	Contact type Smart Card Reader : ISO7816 compliant
	Dual Iris Scanner	Camera : 5MP B&W CMOS sensor Operating Range : 320±40mm (11"~14") Resolution : Above 160 pixel/cm Iris Capture Volume : 130mm x 45mm x 80mm Illumination : IR LED Image : 2592 x 920 x 30 Frame
User Environment	Operating Temp	-20°C ~ 60°C (-4°F ~ 140°F)
	Storage Temp	-30°C ~ 70°C (-22°F ~ 158°F)
	Humidity	Non-condensing, 93%
	Drop	1.5m (5ft.)
Supported Software	Development Tools	Android Studio, Eclipse
	Development SDK	With Java SDK : Fingerprint, Smart card, Iris, Camera

3. Test Standards

Test Standard : FCC PART 15 Subpart C 15.247, 15.247,15.407,15.207, 15.205 & 15.209

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-247and RSS GEN

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.

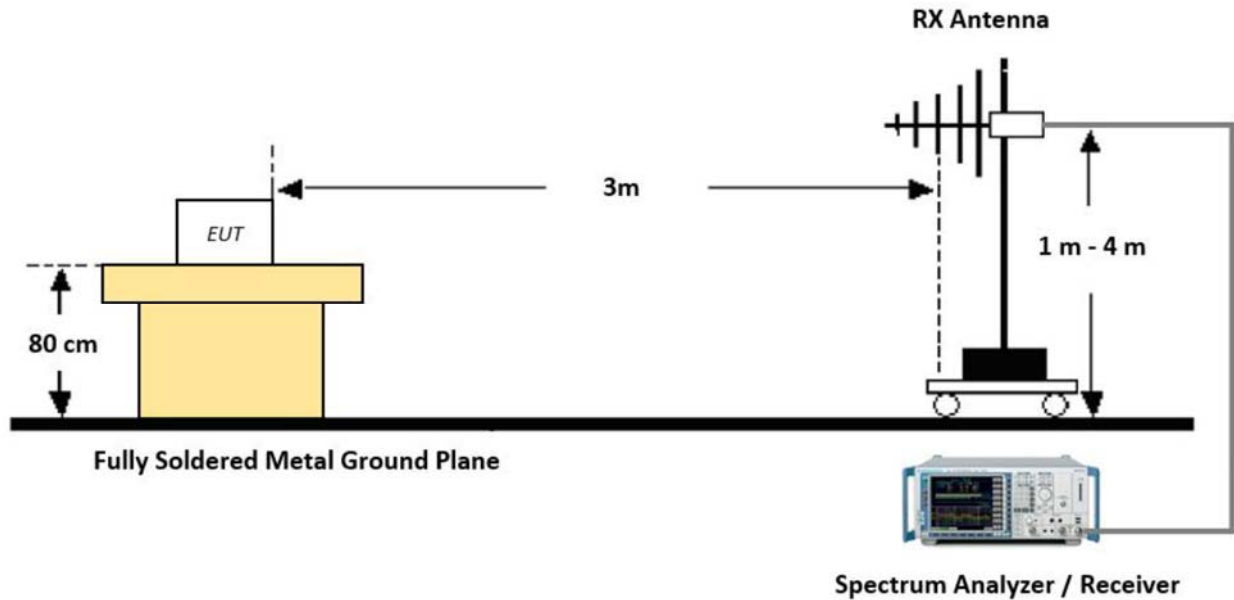
Test Method : ANSI C 63.10 (2013)

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.

BT Basic Data Rate / Enhanced Data Rate

Test Description	FCC Part Section(s)	ISED Part Section(s)	Test Result
Emission Bandwidth	15.407 (a) & (e)	RSS Gen Issue 5 Section 6.7 RSS 247 Issue 2 Section 6.2.4.1	Pass
Frequency Stability	15.407 (g)	RSS Gen Issue 5 Section 8.11	Pass
Maximum conducted output power	15.407 (a)	RSS 247 Issue 2 Section 6.2.1; 6.2.2; 6.2.3; & Section 6.2.4	Pass
Maximum Power spectral density	15.407 (a)	RSS 247 Issue 2 Section 6.2.1; 6.2.2; 6.2.3; & Section 6.2.4	Pass
Spurious Radiated Emissions & Restricted Bands of Operation	15.407 (b) / (15.205 & 15.209)	RSS 247 Issue 2 Section 6.2.1; 6.2.2; 6.2.3; & Section 6.2.4 RSS Gen Issue 5 Section 8.9 & 8.10	Pass
Conducted AC Power Lines	15.207	RSS Gen Issue 5 Section 8.8	Pass

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

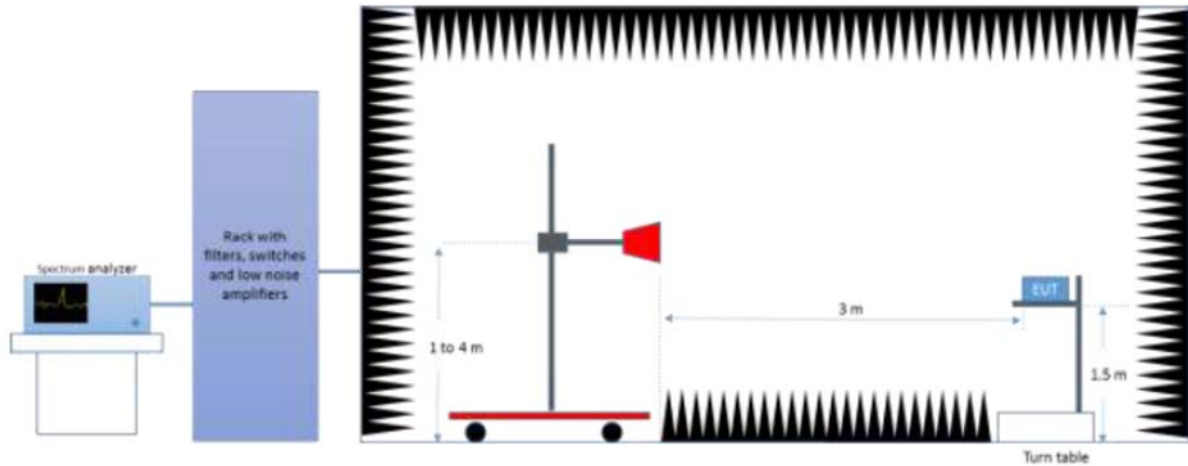
(2) Measurement Type(Quasi-peak):

- Measured Frequency Range: 30 MHz – 1 GHz
- Detector = Quasi-Peak
- RBW = 120 kHz

In general, the method (1) is mainly used

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

1 GHz – 18 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 – 18 GHz
- Detector = Peak
- Trace = Max hold
- RBW = 1 MHz
- VBW $\geq 3 \times$ RBW

(2) Measurement Type(Average):

- Measured Frequency Range: 1 GHz – 18 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. TEST SET-UP AND OPERATION MODE

4.1 Operation and Software of the EUT

Driver Version: 20.70.0.2

Hard ware Version: V1.1

4.3 Special Accessories and Auxiliary Equipment

- None

4.4 Simultaneous Transmission

This product doesn't supports Simultaneous operation

4.5 Countermeasures to achieve EMC Compliance

- None

4.6 List of frequencies

Frequency Band (MHz)	Channel No.	Channel Frequency (MHz)
5150 - 5250 MHz	36	5180
	38	5190
	46	5230
	48	5240

Frequency Band (MHz)	Channel No.	Channel Frequency (MHz)
5725 - 5825 MHz	149	5745
	151	5755
	159	5795
	165	5825

Table1 : List of Wi-Fi center Frequencies

Channel used for Wi-Fi Testing

Channel Bandwidth (20MHz)	Channel Bandwidth (40MHz)	Channel Bandwidth (80MHz)
5180	5190	5210
5 220	-	-
5240	5230	-
5745	5755	5775
5 785	-	-
5825	5795	-

Table 2: List of Wi-Fi center Frequencies

4.7 Measurement equipments (Conducted Setup)

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E440A	US42041291	28-Nov-23
Spectrum Analyzer	FSV40	100939	28-Nov-23
RF Cable	Length: 30 cm	-	
-Spectrum Analyzer <=> EUT	Loss: 1 dB	-	

4.8 Measurement equipments(Radiated setup)

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESC17	ROHDE & SCHWARZ	100916	29-Jun-23
LOOP Antenna	HFH2-Z2	ROHDE & SCHWARZ	100188	29-Aug-24
Logbicon Antenna	VULB 9168	SCHWARZBECK	193	9-Dec-23
Turn Table	DT3000-2t	Innco System GmbH	N/A	-
Antenna Mast	MA4000-EP	Innco System GmbH	N/A	-
PREAMPLIFIER	8449B	HP	3008A00581	29-Jun-23
Horn Antenna	LB-42-15-C-SF	A-INFOMF	J2020079000055	11-Nov-23
Horn Antenna	BBHA9120D	SCHWARZBECK	469	08-Nov-23
TEST Receiver	ESU	ROHDE & SCHWARZ	100529	29-Jun-23
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	-

4.9 Conducted Spurious Emission on AC Power lines Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receiver	ESHS 30	Rohde & Schwarz	828765/002	29-Jun-23
LISN	ESH2-Z5	Rohde & Schwarz	836679/025	29-Jun-23
Pulse Limiter	ESH3-Z2	Rohde & Schwarz	NONE	29-Jun-23

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 50 Ω 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 120V AC 60Hz supply and second with Wireless charger with supply 120V 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 Balloon and Biconical Antenna, and measurement 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 Emission Bandwidth

Result

Pass

Test Specification	FCC part 15 Subpart C 15.407 (a) & (e) / RSS 247 Issue 2, Section 6.2.4.1 & RSS Gen Issue 5, Section 6.7
Test Method	Subclause 6.9.3 of ANSI C63.10
Measurement Bandwidth	Refer Test Method below
Detector	Refer Test Method below
Port of testing	Antenna port
Requirement	1. 99% emission band width measurement for reporting purpose only in the band 5150-5250 MHz 2. For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz

Test Method



The following procedure shall be used for measuring (99%) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency
2. Set span = 1.5 times to 5.0 times the OBW
3. Set RBW = 1% to 5% of the OBW
4. Set VBW ≥ 3 RBW
5. Use the 99% power bandwidth function of the instrument
6. Use sample detector with single sweep mode, or use Peak detector and Max Hold mode (until the trace is stabilized)

The following procedure shall be used for measuring 6dB or 26dB emission bandwidth:

1. Set center frequency to the nominal EUT channel center frequency
2. Set span = 1.5 times to 5.0 times the OBW
3. Set RBW = 1% to 5% of the OBW (for 26 dB BW) & 100 kHz (for 6dB BW)
4. Set VBW ≥ 3 RBW
5. Determine the “-xx dB down amplitude” using [(reference value) - xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument.

Note : All the steps in measurement method of KDB 789033 D02, ANSI C63.10 section 6.9.2 & 6.9.3, RSS GEN section 6.9 are followed

Test Condition**Normal Test Condition:**

Temperature (Norm) = + 22.3 °C	Voltage =3.7 V battery	Relative humidity: 54 %
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KDB Guidelines applied:

Measurements were made as per section C & D in KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Test results:**Modulation: 802.11a**

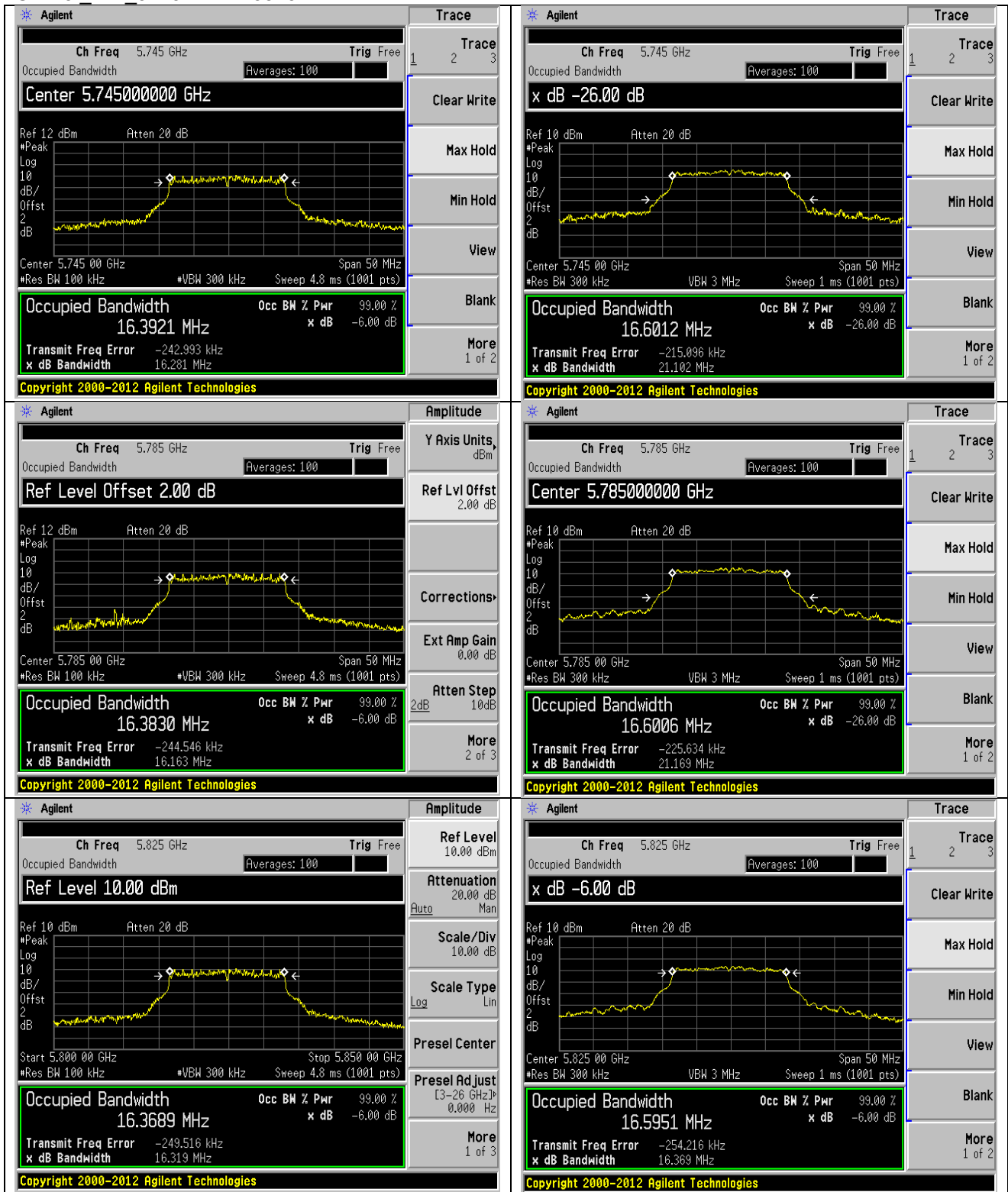
Data rate	Channel Frequency (MHz)	26 dB emission bandwidth (MHz)	99% Occupied Bandwidth (MHz)
54 Mbps	5180	21.05	16.59
	5220	21.23	16.62
	5240	21.09	16.58

Data rate	Channel Frequency (MHz)	6 dB emission bandwidth (MHz)	99% Occupied Bandwidth (MHz)
54 Mbps	5745	16.28	16.60
	5785	16.18	16.60
	5825	16.32	16.57

UNII-1 11a 5150MHz to 5250MHz



UNII-3_11a_5725MHz to 5825MHz

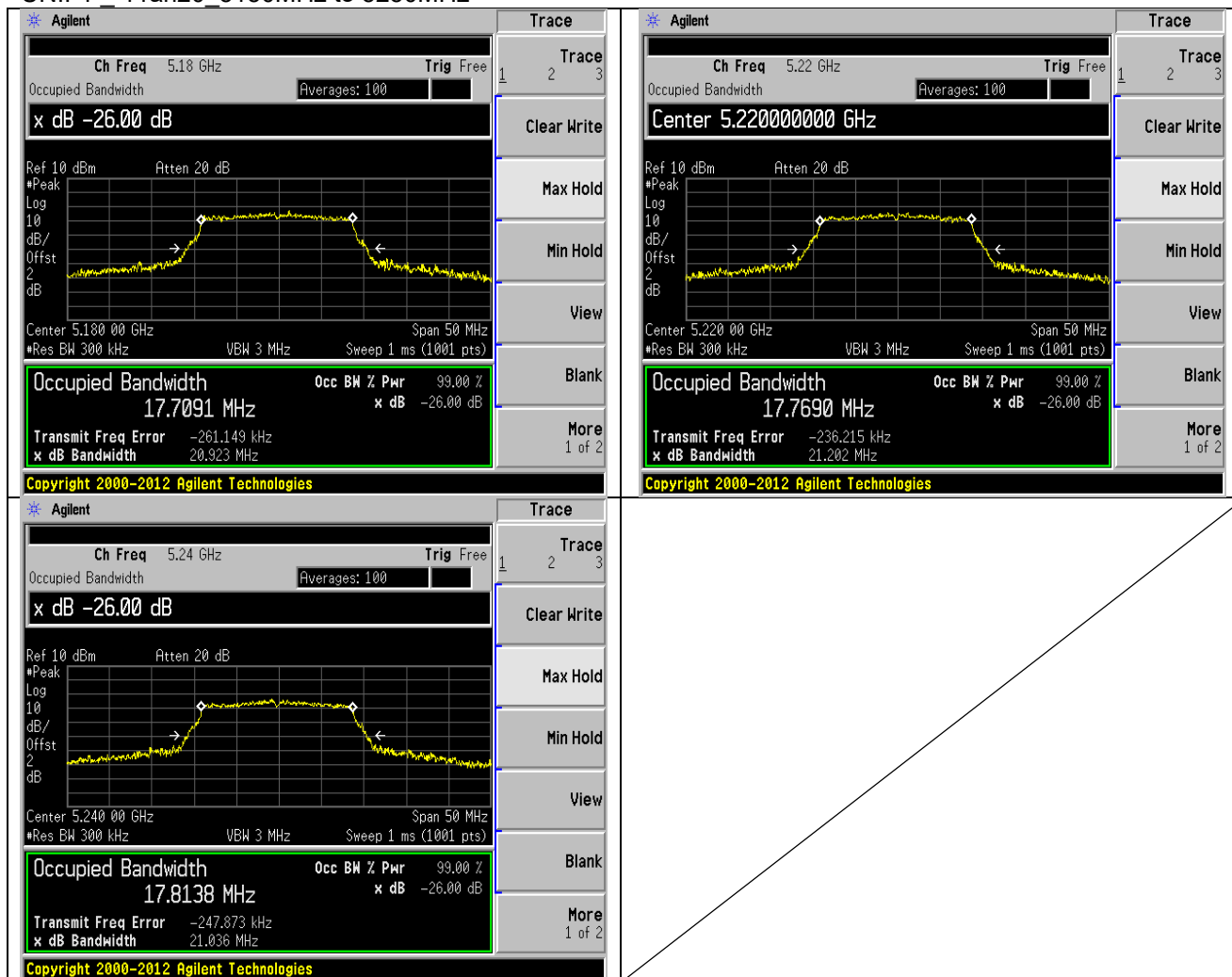


Modulation: 802.11n HT20

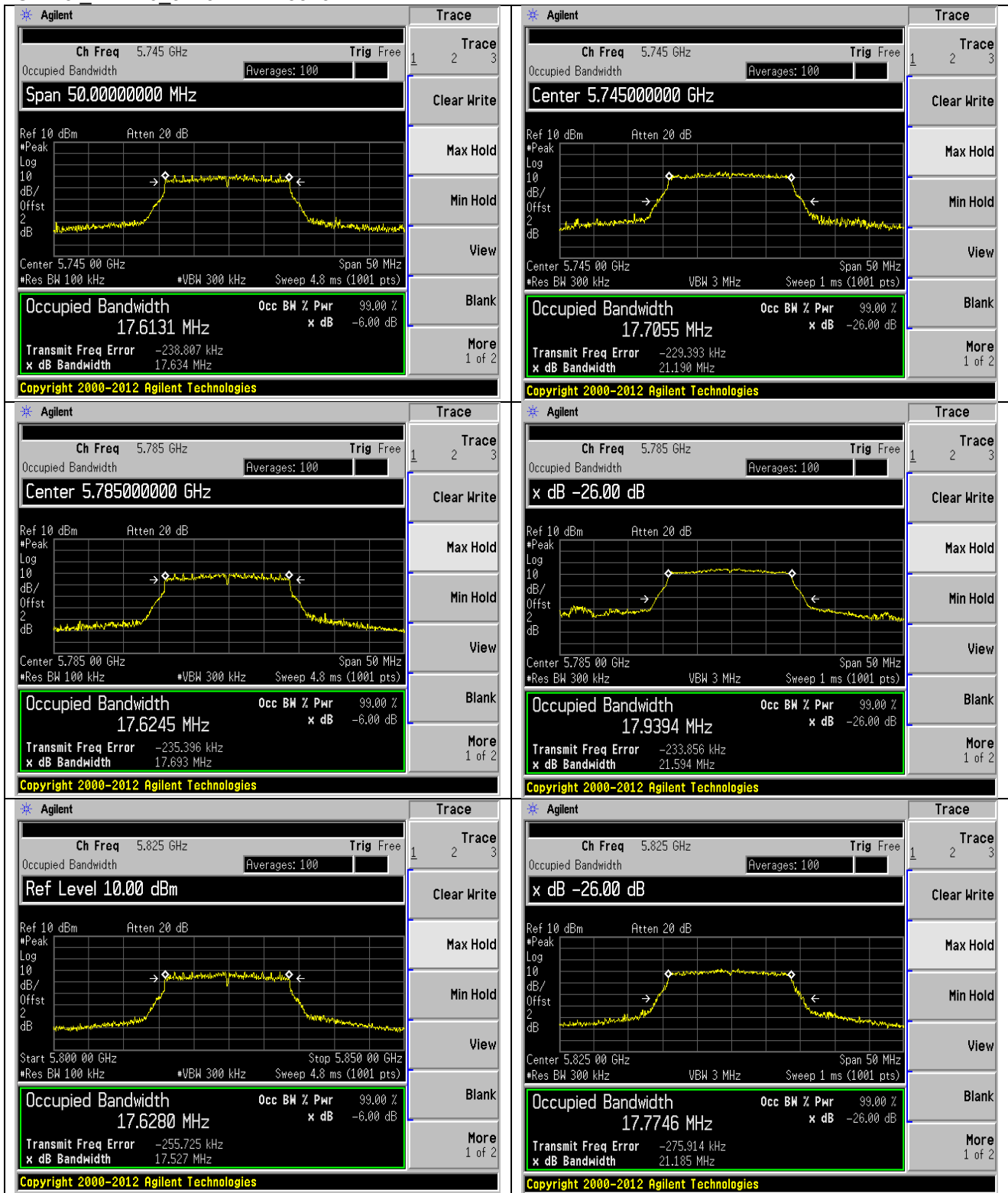
Data rate	Channel Frequency (MHz)	26 dB emission bandwidth (MHz)	99% Occupied Bandwidth (MHz)
MCS7	5180	20.93	17.71
	5220	21.20	17.77
	5240	21.04	17.81

Data rate	Channel Frequency (MHz)	6 dB emission bandwidth (MHz)	99% Occupied Bandwidth (MHz)
MCS7	5745	17.63	17.71
	5785	17.69	17.94
	5825	17.53	17.77

UNII-1 11an20 5150MHz to 5250MHz



UNII-3_11an20_5725MHz to 5825MHz

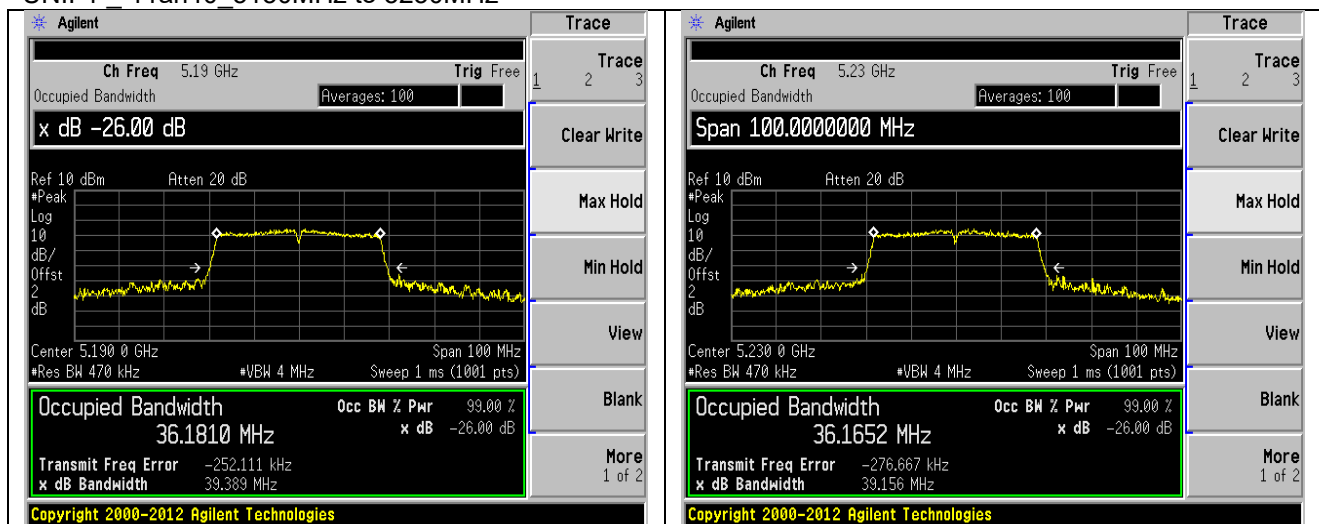


Modulation: 802.11n HT40

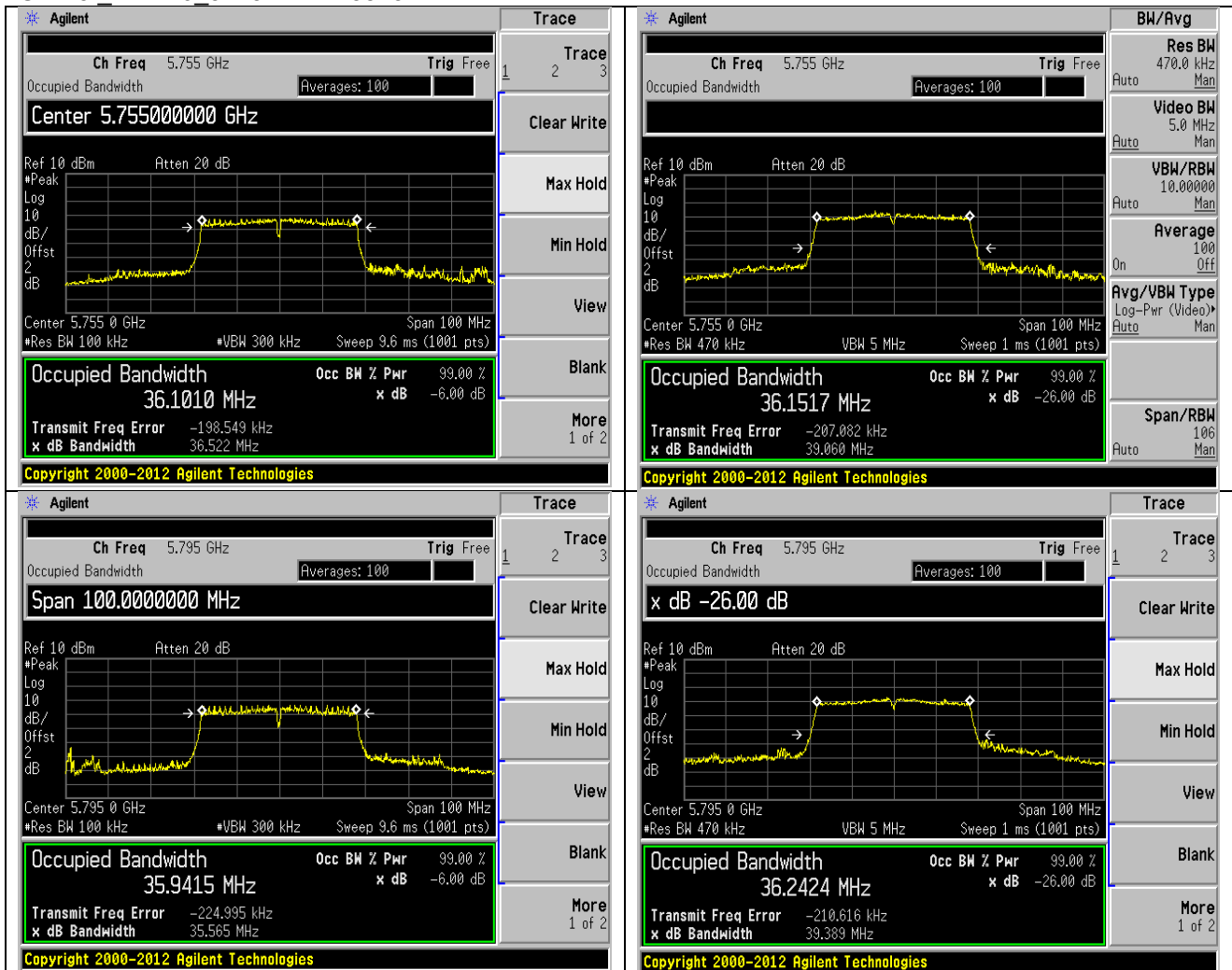
Data rate	Channel Frequency (MHz)	26 dB emission bandwidth (MHz)	99% Occupied Bandwidth (MHz)
MCS8	5190	39.39	36.18
	5230	39.16	36.17

Data rate	Channel Frequency (MHz)	6 dB emission bandwidth (MHz)	99% Occupied Bandwidth (MHz)
MCS8	5755	36.52	36.15
	5795	35.57	36.24

UNII-1 11an40_5150MHz to 5250MHz



UNII-3_11an40_5725MHz to 5825MHz

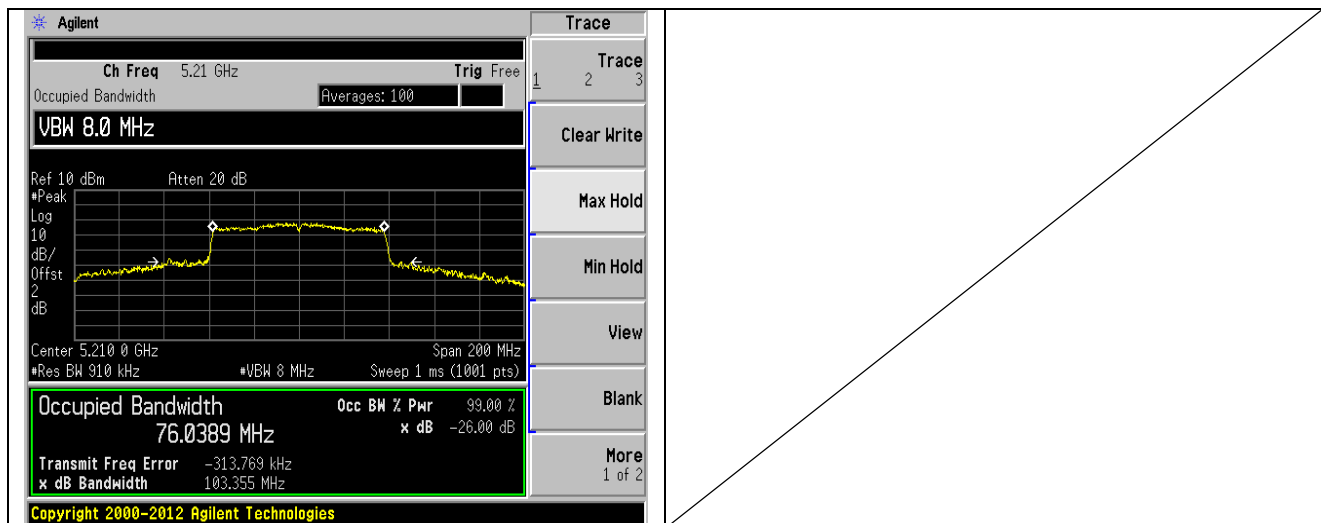


Modulation: 802.11ac VHT80

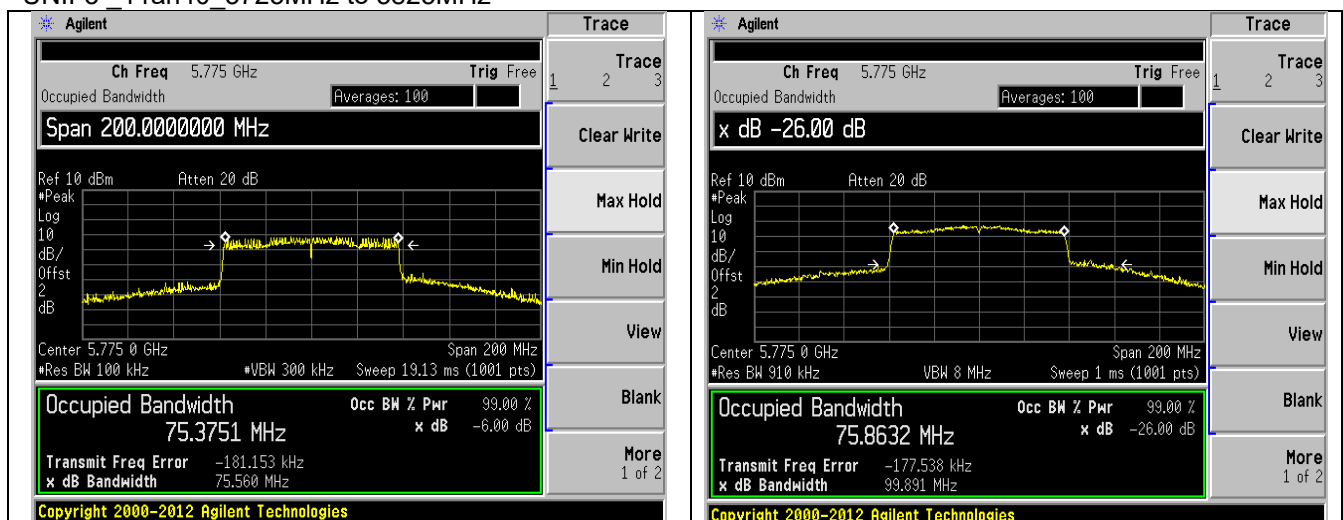
Data rate	Channel Frequency (MHz)	26 dB emission bandwidth (MHz)	99% Occupied Bandwidth (MHz)
MCS9	5210	103.36	76.04

Data rate	Channel Frequency (MHz)	6 dB emission bandwidth (MHz)	99% Occupied Bandwidth (MHz)
MCS9	5775	75.56	75.86

UNII-1 _ 11ac80_5150MHz to 5250MHz



UNII-3 _ 11an40_5725MHz to 5825MHz



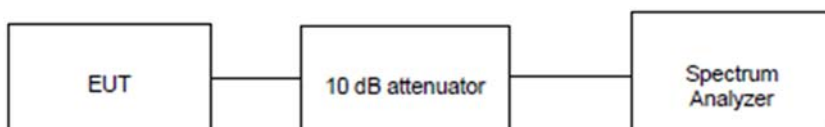
7.2 Maximum Conducted Output Power

Result

Pass

Test Specification	FCC part 15 Subpart C 15.407 (a)(1)(iv) & (a)(3) / RSS 247 Issue 2, Section 6.2.1.1 & Section 6.2.4.1
Test Method	Subclause 12.3.2.6 of ANSI C63.10
Measurement Bandwidth	Refer Test Method below
Detector	Average sample detector mode
Port of testing	Antenna port
Requirement	1. For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW 2. For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11\text{dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz 3. For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W

Test Method



Test Condition

Normal Test Condition:

Temperature (Norm) = + 22.3 °C	Voltage =3.7 V Li-Ion battery	Relative humidity: 54%
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KDB Guidelines applied:

Measurements were made as per section E (2) sub-section (d) in KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Test results:

Note:

1. All the losses are included during measurement and final values are mentioned in the test report
10 dB attenuator + 1.0 dB Cable loss = 11.0 dB total offset
2. This product do not support additional beamforming gain / directional gain, it uses signal antenna and hence directional gain of the single antenna is (For UNII 1: 0.771 dBi and for UNII 3: -0.145 dBi.)

Modulation: 802.11a

Data Rate (Mbps)	Channel Frequency (MHz)	Measured Average Power (dBm)	Duty Cycle (%)	Duty cycle correction factor (dB)	Maximum Average output power (dBm)	Final Average output power (e.i.r.p) (dBm)	FCC Power Limit (dBm)	IC Power Limit (e.i.r.p) (dBm)
54	5180	-16.40	59.28	2.27	-14.13	-13.358	24	22.32
	5220	-16.56	59.28	2.27	-14.29	-13.518	24	22.32
	5240	-16.41	59.28	2.27	-14.14	-13.368	24	22.32
	5745	-17.20	59.28	2.27	-14.93	-15.074	30	30.00
	5785	-18.60	59.28	2.27	-16.33	-16.474	30	30.00
	5825	-20.08	59.28	2.27	-17.81	-17.954	30	30.00

Modulation: 802.11n HT20

Data Rate (Mbps)	Channel Frequency (MHz)	Measured Average Power (dBm)	Duty Cycle (%)	Duty cycle correction factor (dB)	Maximum Average output power (dBm)	Final Average output power (e.i.r.p) (dBm)	FCC Power Limit (dBm)	IC Power Limit (e.i.r.p) (dBm)
MCS7	5180	-19.64	61.50	2.11	-17.53	-16.757	24	22.32
	5220	-18.98	61.50	2.11	-16.87	-16.097	24	22.32
	5240	-19.36	61.50	2.11	-17.25	-16.477	24	22.32
	5745	-19.39	61.50	2.11	-17.28	-17.423	30	30.00
	5785	-21.03	61.50	2.11	-18.92	-19.063	30	30.00
	5825	-22.23	61.50	2.11	-20.12	-20.263	30	30.00

Modulation: 802.11n HT40

Data Rate (Mbps)	Channel Frequency (MHz)	Measured Average Power (dBm)	Duty Cycle (%)	Duty cycle correction factor (dB)	Maximum Average output power (dBm)	Final Average output power (e.i.r.p) (dBm)	FCC Power Limit (dBm)	IC Power Limit (e.i.r.p) (dBm)
MCS8	5190	-23.58	49.25	3.08	-20.50	-19.733	24	25.54
	5230	-23.49	49.25	3.08	-20.41	-19.643	24	25.54
	5755	-24.7	49.25	3.08	-21.62	-21.769	30	30.00
	5795	-26.05	49.25	3.08	-22.97	-23.119	30	30.00

Modulation: 802.11ac VHT80

Data Rate (Mbps)	Channel Frequency (MHz)	Measured Average Power (dBm)	Duty Cycle (%)	Duty cycle correction factor (dB)	Maximum Average output power (dBm)	Final Average output power (e.i.r.p) (dBm)	FCC Power Limit (dBm)	IC Power Limit (e.i.r.p) (dBm)
MCS9	5210	-23.48	40.44	3.93	-19.55	-18.779	24	28.76
	5775	-24.91	40.44	3.93	-20.98	-21.125	30	30.00

7.3 Maximum Power Spectral Density

Result

Pass

Test Specification

FCC part 15 Subpart C 15.407 (a) / RSS 247 Issue 2
Section 6.2.1; 6.2.2; 6.2.3; & Section 6.2.4

Test Method

Subclause 12.5 of ANSI C63.10

Measurement Bandwidth

1MHz & 500kHz

Detector

Average sample detector

Port of testing

Antenna port

Requirement for FCC

1. For client devices in the 5.15-5.25 GHz band, the maximum power spectral density shall not exceed 11 dBm in any 1 MHz band

Requirement for IC

2. For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band
1. For the band 5.15-5.25 GHz, The e.i.r.p. spectral density shall not exceed 10 dBm in any 1 MHz band
2. For the band 5.725-5.85 GHz, The output power spectral density shall not exceed 30 dBm in any 500 kHz band

Test Method:



The following procedure shall be used:

1. Set center frequency to the nominal EUT channel center frequency
2. Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal
3. Set RBW = 1MHz (5.15-5.25 GHz band) / 500kHz (5.725-5.85 GHz band)
4. Set VBW $\geq 3 \times$ RBW
5. Number of points in sweep $\geq 2 \times$ span / RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)
6. Sweep time = auto
7. Detector = power peak, if available. Otherwise, use sample detector mode
8. Do not use sweep triggering. Allow the sweep to "free run."
9. Trace average at least 100 traces and Compute power by integrating the spectrum across the EBW
10. Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission)
11. If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:
 - a. Set RBW = 300 kHz
 - b. Set VBW ≥ 3 RBW
 - c. If measurement bandwidth of Maximum PSD is specified in 500 kHz

$$\text{PSD bandwidth correction Factor} = 10 * \log(500 \text{ kHz} / \text{RBW})$$

Test Condition**Normal Test Condition:**

Temperature (Norm) = + 22.3 °C	Voltage =3.7 V battery	Relative humidity: 54%
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KDB Guidelines applied:

Measurements were made as per section F in KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Test results:**Note:**

1. All the losses are included during measurement and final values are mentioned in the test report.
2. Duty cycle correction factor is considered in Final Average power Duty cycle Correction factor = $10 * \log(1/X)$ Where X is Duty Cycle
3. This product do not support additional beamforming gain / directional gain, it uses signal antenna and hence directional gain of the single antenna is (For UNII 1: 0.771dBi and for UNII 3: - 0.145 dBi.)
4. e.i.r.p = Maximum Average PSD (dBm) + Antenna gain in dBi

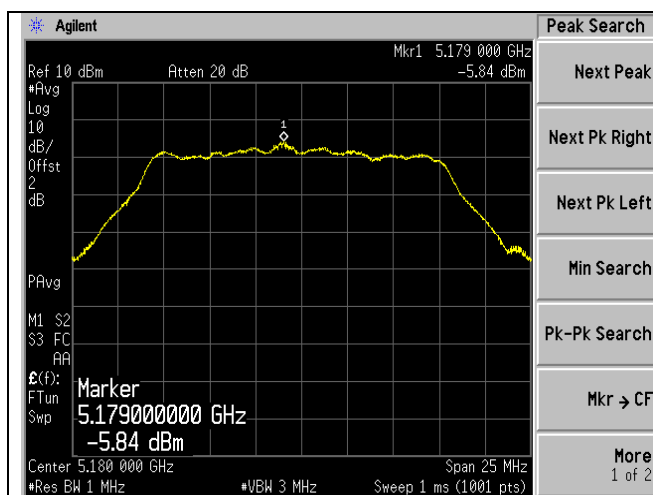
Modulation: 802.11a

Band: UNII 1

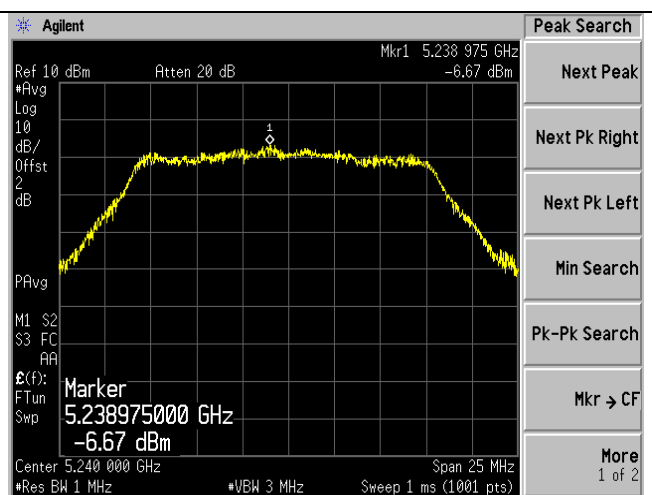
Data rate (Mbps)	Measured Frequency (MHz)	Measured Average PSD (dBm/1MHz)	Duty cycle correction factor (dB)	Measured Average PSD (dBm/1MHz)	PSD (e.i.r.p) (dBm/1MHz)	FCC PSD Limit (dBm/1MHz)	IC e.i.r.p PSD (dBm/1MHz)
54	5180	-5.84	2.27	-3.57	-2.799	11	10
	5240	-6.67	2.27	-4.40	-3.629	11	10

Band: UNII 3

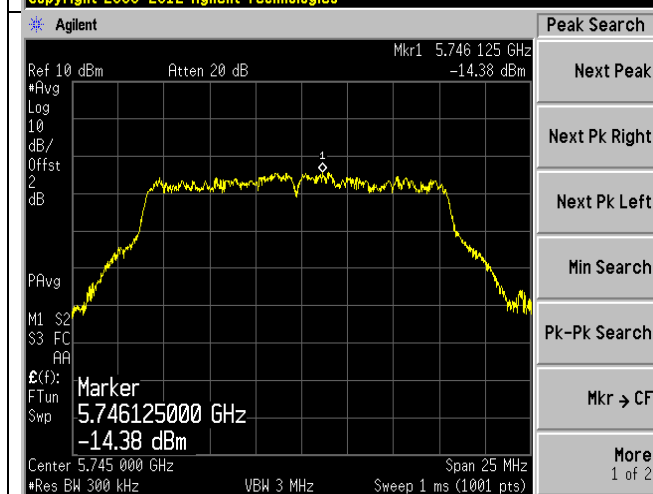
Data rate (Mbps)	Measured Frequency (MHz)	Measured Average PSD (dBm/500kHz)	Duty cycle correction factor (dB)	Maximum Average PSD (dBm/500kHz)	PSD (e.i.r.p) (dBm/500kHz)	FCC PSD Limit (dBm/500kHz)	IC e.i.r.p PSD (dBm/500kHz)
54	5745	-14.38	2.27	-12.11	-12.255	30	30
	5825	-16.44	2.27	-14.17	-14.315	30	30



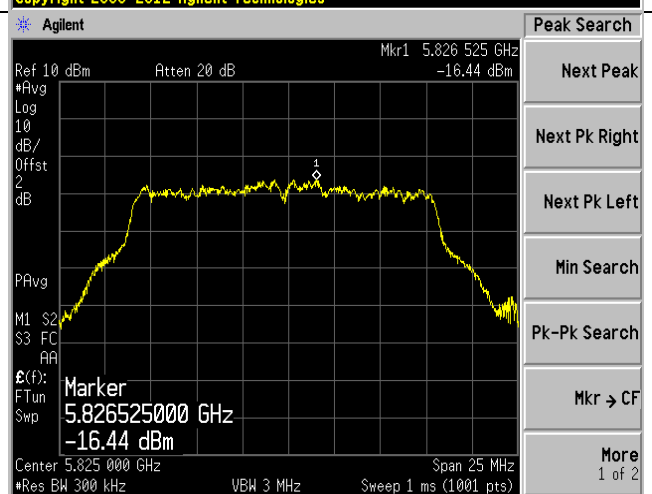
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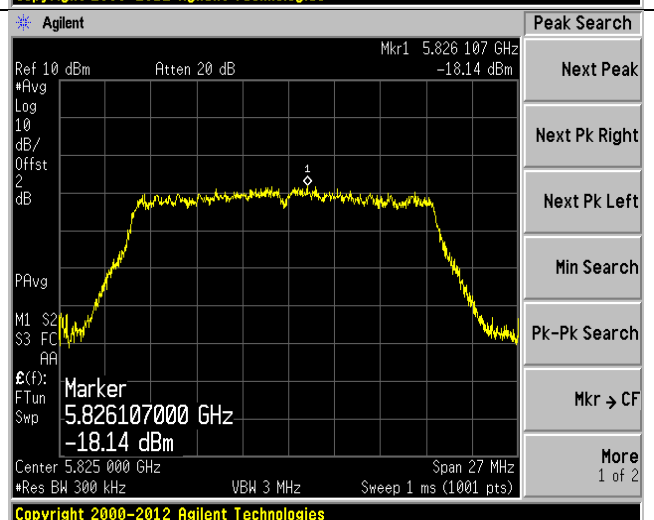
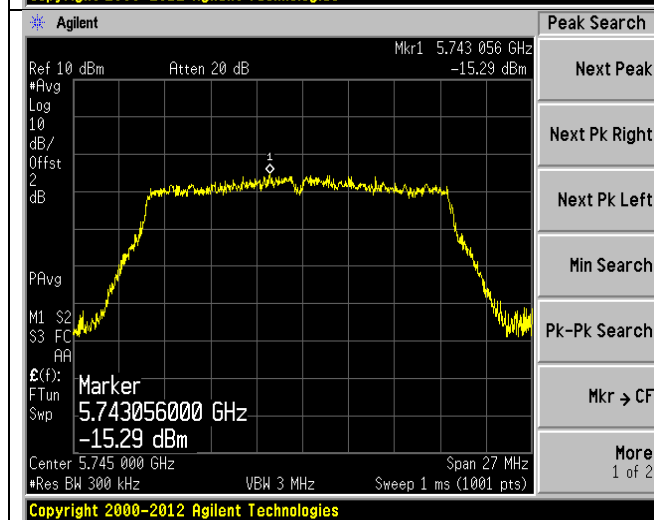
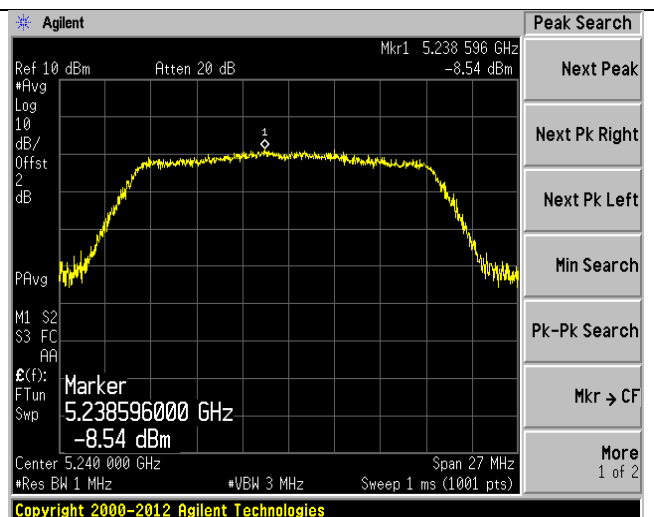
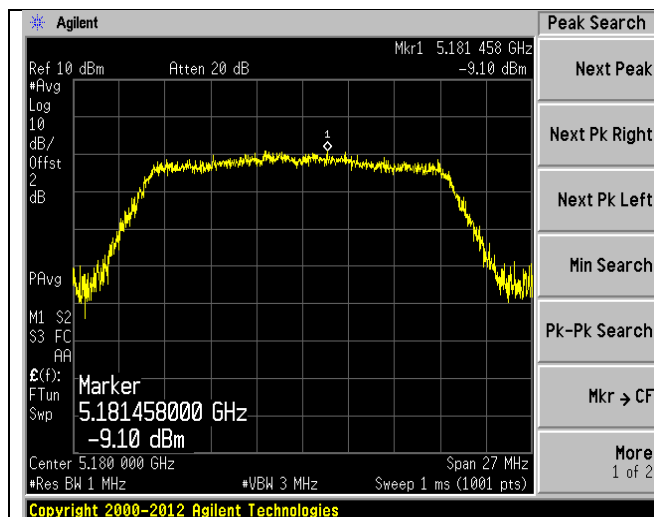
Modulation: 802.11n HT20

Band: UNII 1

Data rate (Mbps)	Measured Frequency (MHz)	Measured Average PSD (dBm/1MHz)	Duty cycle correction factor (dB)	Maximum Average PSD (dBm/1MHz)	PSD (e.i.r.p) (dBm/1MHz)	FCC PSD Limit (dBm/1MHz)	IC e.i.r.p PSD (dBm/1MHz)
MCS7	5180	-9.10	2.11	-6.99	-6.219	11	10
	5240	-8.54	2.11	-6.43	-5.659	11	10

Band: UNII 3

Data rate (Mbps)	Measured Frequency (MHz)	Measured Average PSD (dBm/500kHz)	Duty cycle correction factor (dB)	Maximum Average PSD (dBm/500kHz)	PSD (e.i.r.p) (dBm/500kHz)	FCC PSD Limit (dBm/500kHz)	IC e.i.r.p PSD (dBm/500kHz)
MCS7	5745	-15.29	2.11	-13.18	-13.325	30	30
	5825	-18.14	2.11	-16.03	-16.175	30	30



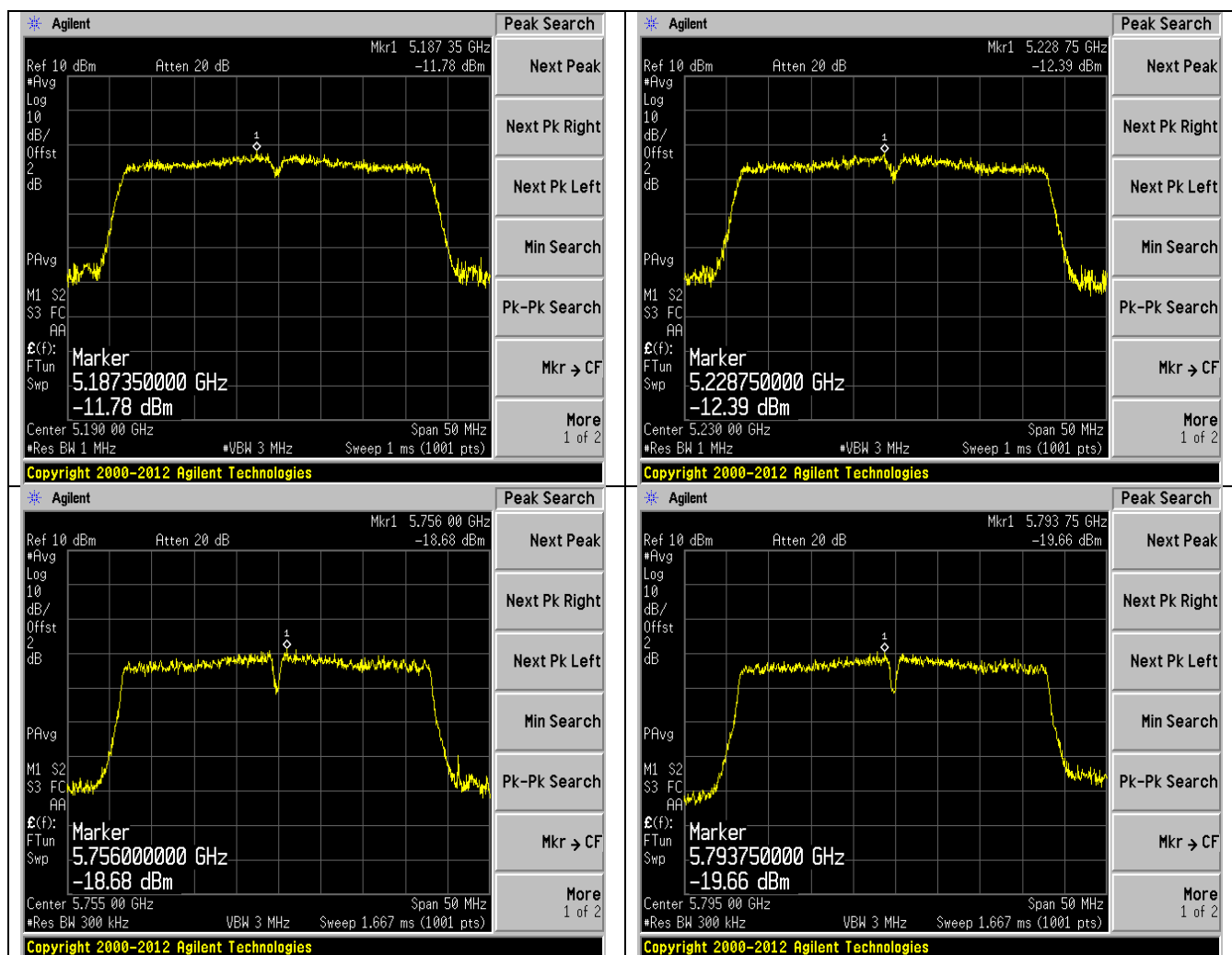
Modulation: 802.11n HT40

Band: UNII 1

Data rate (Mbps)	Measured Frequency (MHz)	Measured Average PSD (dBm/1MHz)	Duty cycle correction factor (dB)	Maximum Average PSD (dBm/1MHz)	PSD (e.i.r.p) (dBm/1MHz)	FCC PSD Limit (dBm/1MHz)	IC e.i.r.p PSD (dBm/1MHz)
MCS8	5190	-11.78	3.08	-8.70	-7.929	11	10
	5230	-12.39	3.08	-9.31	-8.539	11	10

Band: UNII 3

Data rate (Mbps)	Measured Frequency (MHz)	Measured Average PSD (dBm/500kHz)	Duty cycle correction factor (dB)	Maximum Average PSD (dBm/500kHz)	PSD (e.i.r.p) (dBm/500kHz)	FCC PSD Limit (dBm/500kHz)	IC e.i.r.p PSD (dBm/500kHz)
MCS8	5755	-18.68	3.08	-15.60	-15.745	30	30
	5795	-19.66	3.08	-16.58	-16.725	30	30

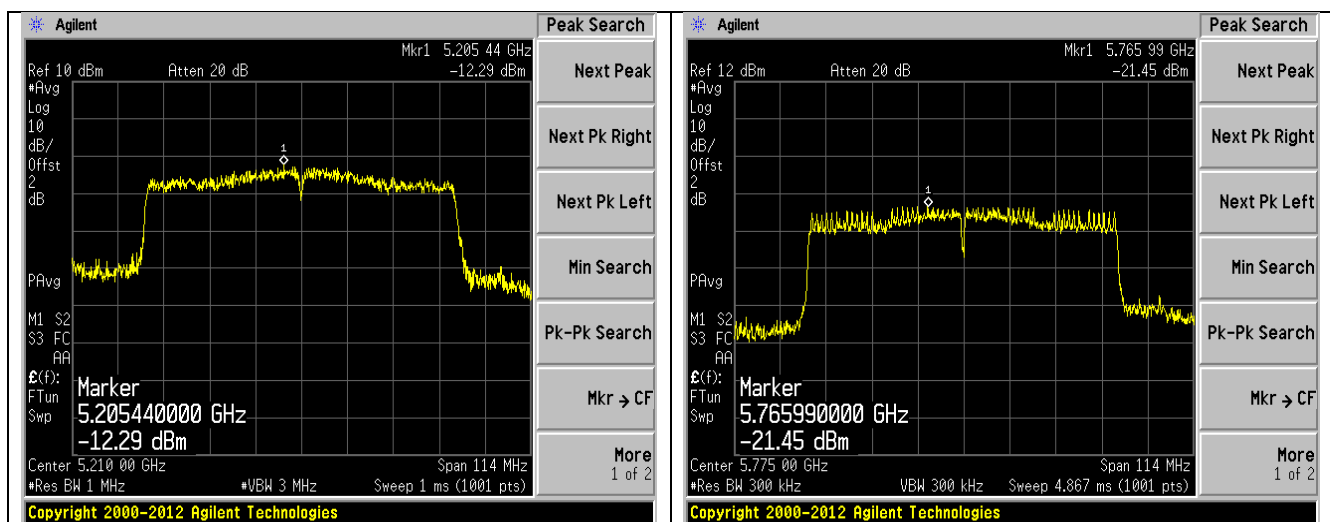


Modulation: 802.11ac VHT80
Band: UNII 1

Data rate (Mbps)	Measured Frequency (MHz)	Measured Average PSD (dBm/1MHz)	Duty cycle correction factor (dB)	Maximum Average PSD (dBm/1MHz)	PSD (e.i.r.p) (dBm/1MHz)	FCC PSD Limit (dBm/1MHz)	IC e.i.r.p PSD (dBm/1MHz)
MCS9	5210	-12.29	3.93	-8.36	-7.589	11	10

Band: UNII 3

Data rate (Mbps)	Measured Frequency (MHz)	Measured Average PSD (dBm/500kHz)	Duty cycle correction factor (dB)	Maximum Average PSD (dBm/500kHz)	PSD (e.i.r.p) (dBm/500kHz)	FCC PSD Limit (dBm/500kHz)	IC e.i.r.p PSD (dBm/500kHz)
MCS9	5775	-21.45	3.93	-17.52	-17.665	30	30



7.4 Spurious Radiated Emissions & Restricted Bands of Operation

Result

Pass

Test Specification	FCC part 15 Subpart C Section 15.407 (b) (15.205 & 15.209) / RSS 247 Issue 2 Section 6.2.1.2 & 6.2.4.2 / RSS Gen Issue 5 Section 8.9 & 8.10
Test Method	ANSI C 63.10 – 2013
Measurement Bandwidth	100kHz for below 1GHz 1MHz for above 1GHz
Measuring Distance	3 m
Detector	Refer Remark
Requirement	As per the limits mentioned in the below table
Test setup	Refer TEST METHODOLOGY

Limit:

Table : Undesirable emission limits

Frequency Band	Limit
5.15-5.25 GHz	e.i.r.p. -27dBm [68.2 dBuV/3m]
5.25-5.35 GHz	e.i.r.p. -27dBm [68.2 dBuV/3m]
5.47-5.725 GHz	e.i.r.p. -27dBm [68.2 dBuV/3m]
5.725-5.85 GHz	5.715 GHz to 5.725 GHz - e.i.r.p. -17dBm [78.2 dBuV/3m] 5.85 GHz to 5.86 GHz - e.i.r.p. -17dBm [78.2 dBuV/3m] other frequency range - e.i.r.p. -27dBm [68.2 dBuV/3m]

Table : Transmitter limits for Radiated emission

Frequency (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Distance of Measurement (m)
0.009 – 0.490	2400/F(kHz)	6.37/F(F in kHz)	300*
0.490 – 1.705	24000/F(kHz)	63.7/F(F in kHz)	30*
1.705 – 30	30	0.08	30*
30-88	100	100	3
88-216	150	150	3
216-960	200	200	3
Above 960	500	500	3

Remark:

The limit shows in the table above of frequency range 0.009 – 0.490, 0.490 – 1.705 MHz and 1.705-30MHz is at 300 meter, 30 meter and 30 meter range respectively, which corresponds to 128.51 – 93.80, 73.80 – 62.96 and 69.54 dBμV/m at 3m range by extrapolation calculation and the measurement of loop antenna.

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector.

Test Condition**Normal Test Condition:**

Temperature (Norm) = + 22.3 °C	Voltage =3.7 V battery	Relative humidity: 54 %
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Test procedures

Radiated emissions from the EUT were measured according to the dictates in section 11.11 & 11.12 of ANSI C63.10-2013 and only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

Test Procedures for emission above 30 MHz

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic chamber test site below 1 GHz and 1.5 meters above the ground at a 3 meter anechoic chamber test site above 1 GHz. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 3 meter away from the interference-receiving antenna.
3. The antenna is a bi-log antenna, a horn antenna and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. For measurements below 1 GHz resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.
6. For measurements Above 1 GHz resolution bandwidth is set to 1 MHz, the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements..

Test results:

Note: All the losses are included during measurement and final values are mentioned in the test report. Refer TEST METHODOLOGY for more details

Test results for Frequency range : 9kHz – 30MHz

No Emissions found in the frequency range 9kHz – 30MHz

Test results for frequency range 30MHz – 1GHz

TEST MODE : 802.11a (CH : 44 - 5 220 MHz)								
Frequency (MHz)	Reading (dB μV)	Position (V/H)	Height (m)	Correction Factor		Result Value(Quasi-peak)		
				Ant Factor (dB)	Cable (dB)	Limit (dB $\mu V/m$)	Result (dB $\mu V/m$)	Margin (dB)
250.00	18.74	V	1.0	11.80	2.33	46.00	32.87	-13.13
400.00	18.62	V	1.1	15.50	1.87	46.00	35.99	-10.01
530.80	10.81	V	1.3	18.22	3.64	46.00	32.67	-13.33
625.00	8.54	V	1.2	20.35	3.96	46.00	32.85	-13.15
875.00	10.45	H	1.0	23.10	4.70	46.00	38.25	-7.75
1000.00	5.91	V	1.0	24.20	5.08	54.00	35.19	-18.81
Remark	H : Horizontal, V : Vertical *Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position) *CL = Cable Loss(In case of below 1 000 MHz) *Result Value = Reading + Ant Factor + Cable loss *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1 GHz. *Worst case test data							

Test results for the frequencies in the range 1 GHz to 40 GHz
Test Data(CH-36)

802.11a 54 Mbps

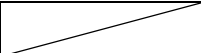
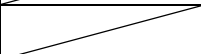
Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB μV /m)	Result (dB μV /m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5150.00	53.94	H	1.8	31.90	-26.79		74.00	59.05	-14.95
5150.00	50.76	V	1.5	31.90	-26.79		74.00	55.87	-18.13
10300.00	48.54	H	1.8	39.32	-42.39		74.00	45.47	-28.53
10300.00	47.75	V	1.5	39.32	-42.39		74.00	44.68	-29.32
AV(RBW: 1 MHz VBW: 3 MHz)									
5150.00	39.87	H	1.8	31.90	-26.79	2.27	54.00	47.25	-6.75
5150.00	36.67	V	1.5	31.90	-26.79	2.27	54.00	44.05	-9.95
10300.00	34.85	H	1.8	39.32	-42.39	2.27	54.00	34.05	-19.95
10300.00	34.84	V	1.5	39.32	-42.39	2.27	54.00	34.04	-19.96
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 36 - 5 180 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Test Data(CH-44)

802.11a 54 Mbps

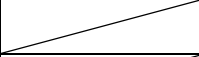
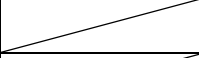
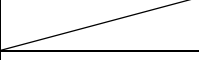
Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB $\mu V/m$)	Result (dB $\mu V/m$)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
10440.00	48.01	H	1.7	39.65	-42.46		74.00	45.20	-28.80
10440.00	47.59	V	1.6	39.65	-42.46		74.00	44.78	-29.22
AV(RBW: 1 MHz VBW: 3 MHz)									
10440.00	34.84	H	1.7	39.65	-42.46	2.27	54.00	34.30	-19.70
10440.00	34.86	V	1.6	39.65	-42.46	2.27	54.00	34.32	-19.68
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 44 - 5 220 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Test Data(CH-48)

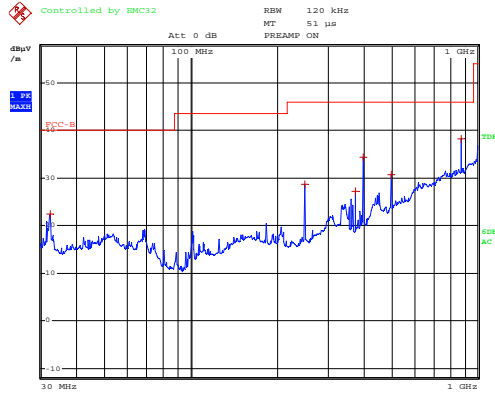
802.11a 54 Mbps

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB $\mu V/m$)	Result (dB $\mu V/m$)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5350.00	47.72	H	1.7	31.82	-26.70		74.00	52.84	-21.16
5350.00	48.38	V	1.6	31.82	-26.70		74.00	53.50	-20.50
10480.00	47.88	H	1.5	39.75	-42.48		74.00	45.15	-28.85
10480.00	47.73	V	1.5	39.75	-42.48		74.00	45.00	-29.00
AV(RBW: 1 MHz VBW: 3 MHz)									
5350.00	36.60	H	1.7	31.82	-26.70	2.27	54.00	43.99	-10.01
5350.00	36.51	V	1.6	31.82	-26.70	2.27	54.00	43.90	-10.10
10480.00	34.60	H	1.5	39.75	-42.48	2.27	54.00	34.14	-19.86
10480.00	34.52	V	1.5	39.75	-42.48	2.27	54.00	34.06	-19.94
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 48 -5 240 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

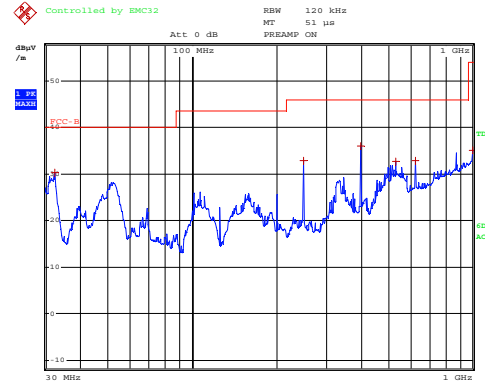
Modulation: 802.11a (Worst Case test data)

Data rate: 54 Mbps



ESTR-23-00065

Polarity:Horizontal



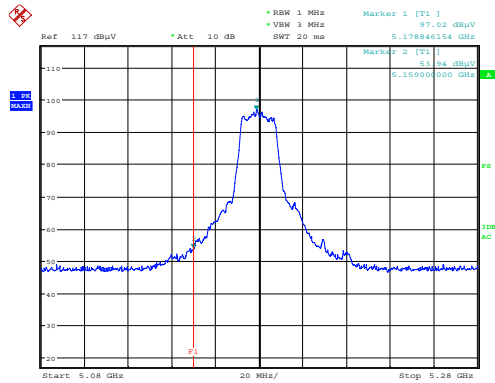
ESTR-23-00065

Polarity:Vertical

Restricted Band Edges

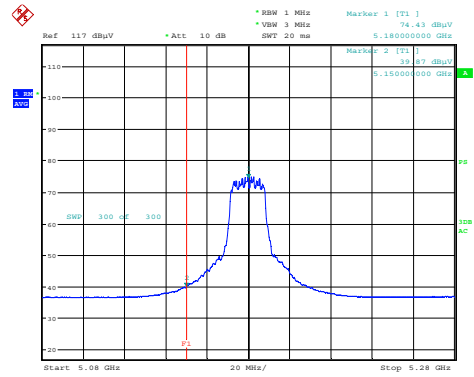
Modulation: 802.11a CH 38

Detector mode : Peak



ESTR-23-00065

Detector mode : Average

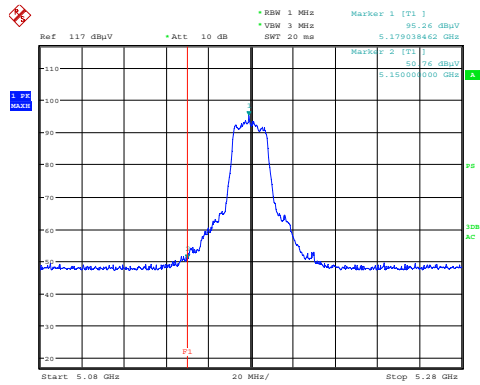


ESTR-23-00065

Polarity:Horizontal

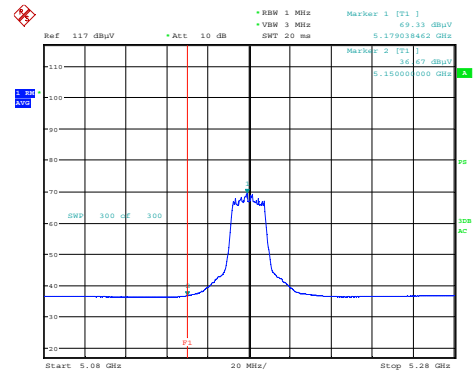
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065

Detector mode : Average



ESTR-23-00065

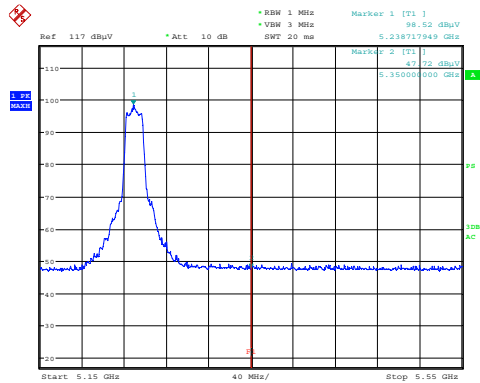
Polarity:Vertical

Polarity:Vertical

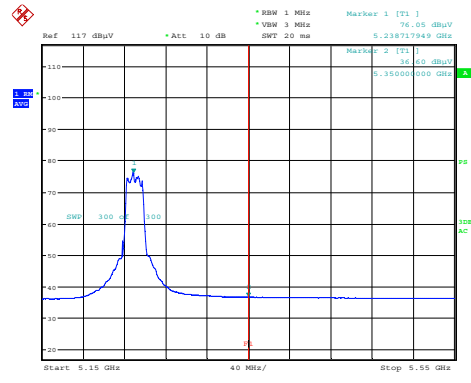
Restricted Band Edges

Modulation: 802.11a CH 48

Detector mode : Peak



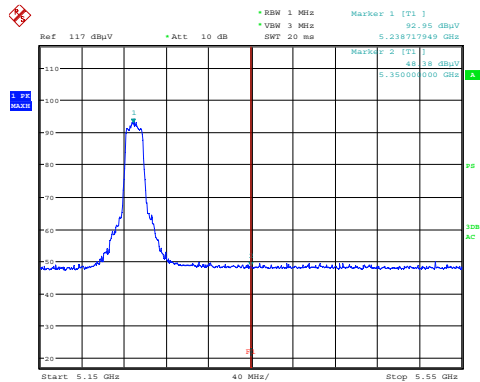
Detector mode : Average



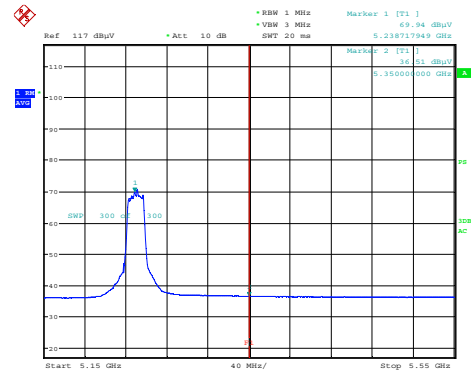
Polarity:Horizontal

Polarity:Horizontal

Detector mode : Peak



Detector mode : Average



Polarity:Vertical

Polarity:Vertical

Test Data(CH-149)

802.11a 54 Mbps

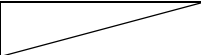
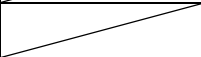
Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5650.00	46.86	H	1.5	32.02	-26.55		74.00	52.33	-21.67
5650.00	48.76	V	1.5	32.02	-26.55		74.00	54.23	-19.77
11490.00	47.50	H	1.5	40.11	-42.14		74.00	45.47	-28.53
11490.00	48.17	V	1.5	40.11	-42.14		74.00	46.14	-27.86
AV(RBW: 1 MHz VBW: 3 MHz)									
5650.00	36.16	H	1.5	32.02	-26.55	2.27	54.00	43.90	-10.10
5650.00	36.13	V	1.5	32.02	-26.55	2.27	54.00	43.87	-10.13
11490.00	34.42	H	1.5	40.11	-42.14	2.27	54.00	34.66	-19.34
11490.00	34.39	V	1.5	40.11	-42.14	2.27	54.00	34.63	-19.37
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 149 - 5 745 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Test Data(CH157)

802.11a 54 Mbps

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB $\mu V/m$)	Result (dB $\mu V/m$)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
11570.00	48.25	H	1.5	39.91	-42.03		74.00	46.13	-27.87
11570.00	47.23	V	1.6	39.91	-42.03		74.00	45.11	-28.89
AV(RBW: 1 MHz VBW: 3 MHz)									
11570.00	34.63	H	1.6	39.91	-42.03	2.27	54.00	34.78	-19.22
11570.00	34.52	V	1.6	39.91	-42.03	2.27	54.00	34.67	-19.33
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 157 - 5 785 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Test Data(CH-165)

802.11a 54 Mbps

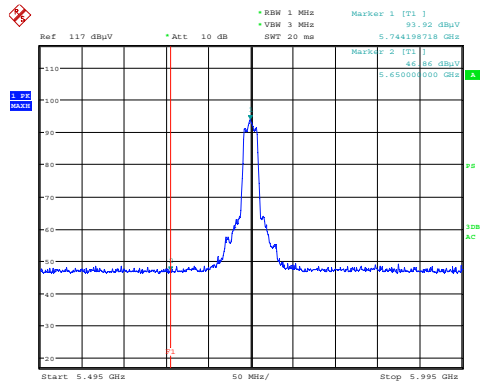
Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5930.00	48.60	H	1.6	32.46	-26.42		74.00	54.64	-19.36
5930.00	46.97	V	1.7	32.46	-26.42		74.00	53.01	-20.99
11650.00	47.92	H	1.6	39.71	-41.92		74.00	45.71	-28.29
11650.00	47.68	V	1.7	39.71	-41.92		74.00	45.47	-28.53
AV(RBW: 1 MHz VBW: 3 MHz)									
5930.00	36.24	H	1.6	32.46	-26.42	2.27	54.00	44.55	-9.45
5930.00	36.22	V	1.7	32.46	-26.42	2.27	54.00	44.53	-9.47
11650.00	35.13	H	1.6	39.71	-41.92	2.27	54.00	35.19	-18.81
11650.00	35.07	V	1.7	39.71	-41.92	2.27	54.00	35.13	-18.87
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 165 -5 825 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Restricted Band Edges

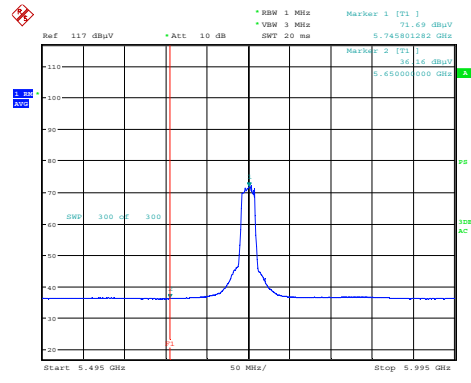
Modulation: 802.11a CH-149

Detector mode : Peak



ESTR-23-00065

Detector mode : Average

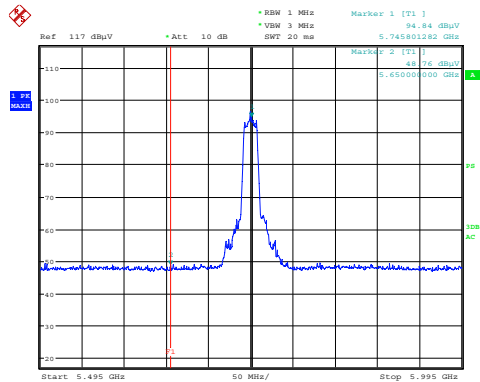


ESTR-23-00065
Power: 73.338 74.73 75.17.14

Polarity:Horizontal

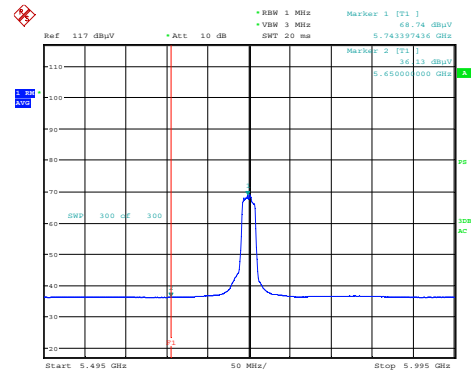
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065

Detector mode : Average



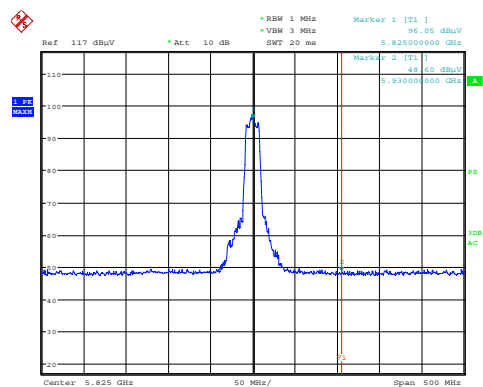
ESTR-23-00065

Polarity:Vertical

Polarity:Vertical

Restricted Band Edges Modulation: 802.11a CH-165

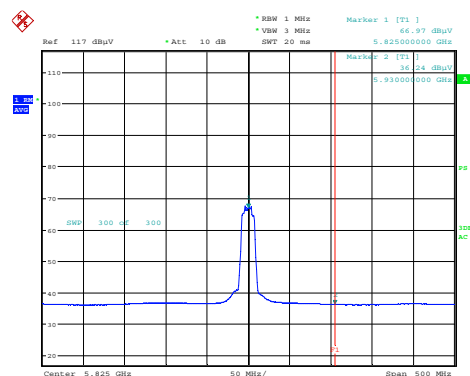
Detector mode : Peak



ESTR-23-00065

Polarity:Horizontal

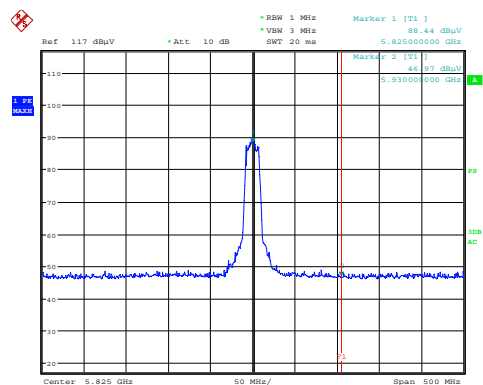
Detector mode : Average



ESTR-23-00065

Polarity:Horizontal

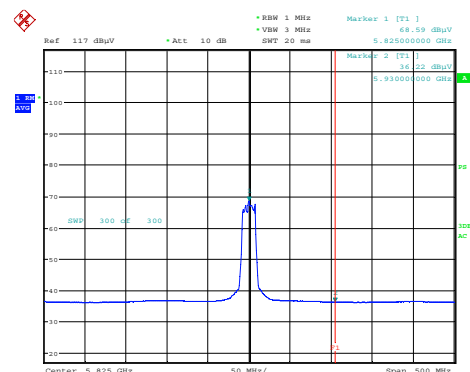
Detector mode : Peak



ESTR-23-00065

Polarity:Vertical

Detector mode : Average



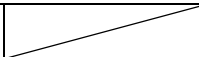
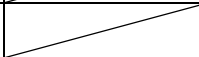
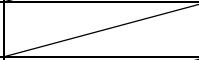
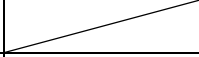
ESTR-23-00065

Polarity:Vertical

Test Data(CH-36)

802.11an20 Mcs7

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5150.00	53.75	H	1.8	31.90	-26.79		74.00	58.86	-15.14
5150.00	50.88	V	1.5	31.90	-26.79		74.00	55.99	-18.01
10300.00	47.21	H	1.8	39.32	-42.39		74.00	44.14	-29.86
10300.00	47.83	V	1.5	39.32	-42.39		74.00	44.76	-29.24
AV(RBW: 1 MHz VBW: 3 MHz)									
5150.00	37.61	H	1.8	31.90	-26.79	2.11	54.00	44.83	-9.17
5150.00	35.97	V	1.5	31.90	-26.79	2.11	54.00	43.19	-10.81
10300.00	34.89	H	1.8	39.32	-42.39	2.11	54.00	33.93	-20.07
10300.00	34.92	V	1.5	39.32	-42.39	2.11	54.00	33.96	-20.04
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 36 - 5 180 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Test Data(CH-44)

802.11an20 Mcs7

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB $\mu V/m$)	Result (dB $\mu V/m$)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
10440.00	47.11	H	1.5	39.65	-42.46		74.00	44.30	-29.70
10440.00	47.38	V	1.5	39.65	-42.46		74.00	44.57	-29.43
AV(RBW: 1 MHz VBW: 3 MHz)									
10440.00	34.59	H	1.5	39.65	-42.46	2.11	54.00	33.89	-20.11
10440.00	34.71	V	1.5	39.65	-42.46	2.11	54.00	34.01	-19.99
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 44 - 5 220 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Test Data(CH-48)

802.11an20 Mcs7

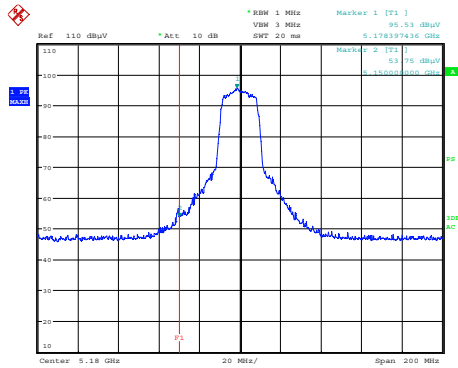
Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5350.00	47.76	H	1.7	31.82	-26.70		74.00	52.88	-21.12
5350.00	46.80	V	1.6	31.82	-26.70		74.00	51.92	-22.08
10480.00	47.12	H	1.5	39.75	-42.48		74.00	44.39	-29.61
10480.00	47.64	V	1.5	39.75	-42.48		74.00	44.91	-29.09
AV(RBW: 1 MHz VBW: 3 MHz)									
5350.00	35.86	H	1.7	31.82	-26.70	2.11	54.00	43.09	-10.91
5350.00	35.84	V	1.6	31.82	-26.70	2.11	54.00	43.07	-10.93
10480.00	34.62	H	1.5	39.75	-42.48	2.11	54.00	34.00	-20.00
10480.00	34.61	V	1.5	39.75	-42.48	2.11	54.00	33.99	-20.01
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 48 -5 240 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Restricted Band Edges

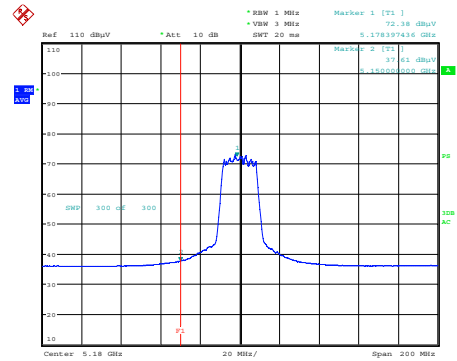
Modulation: 802.11a20 CH 36

Detector mode : Peak



ESTR-23-00065

Detector mode : Average

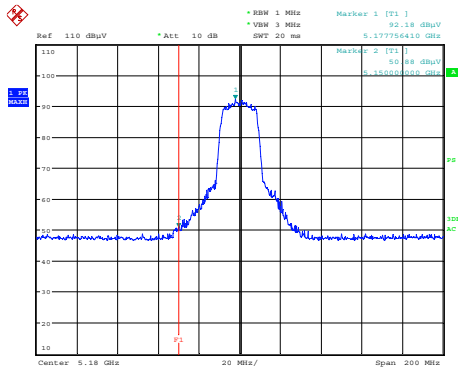


ESTR-23-00065

Polarity:Horizontal

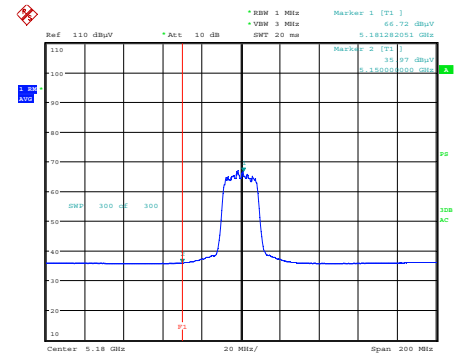
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065

Detector mode : Average



ESTR-23-00065

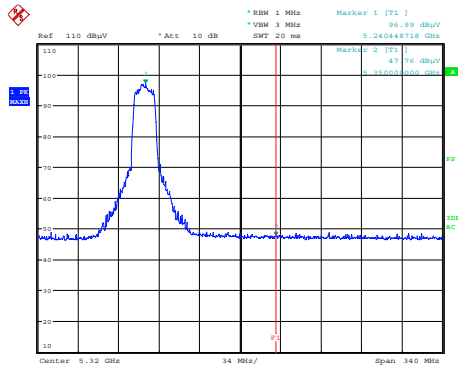
Polarity:Vertical

Polarity:Vertical

Restricted Band Edges

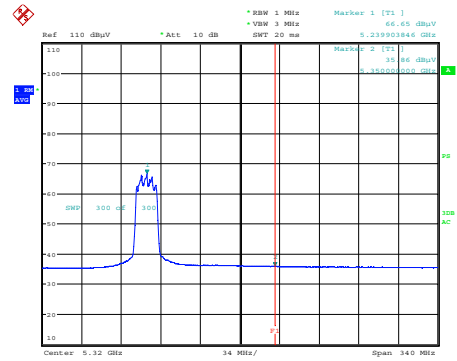
Modulation: 802.11a20 CH 48

Detector mode : Peak



ESTR-23-00065

Detector mode : Average

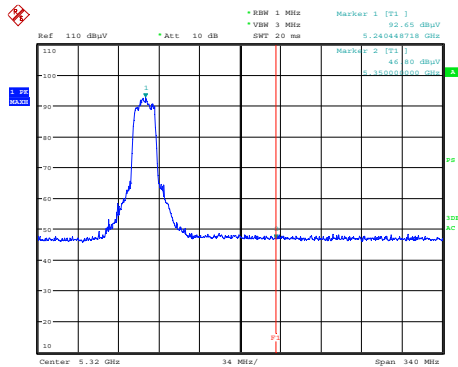


ESTR-23-00065

Polarity:Horizontal

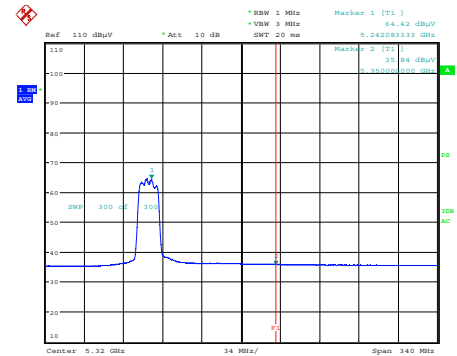
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065

Detector mode : Average



ESTR-23-00065

Polarity:Vertical

Polarity:Vertical

Test Data(CH-149)

802.11an20 Mcs7

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5650.00	47.78	H	1.5	32.02	-26.55		74.00	53.25	-20.75
5650.00	47.44	V	1.5	32.02	-26.55		74.00	52.91	-21.09
11490.00	47.10	H	1.5	40.11	-42.14		74.00	45.07	-28.93
11490.00	47.41	V	1.5	40.11	-42.14		74.00	45.38	-28.62
AV(RBW: 1 MHz VBW: 3 MHz)									
5650.00	35.49	H	1.5	32.02	-26.55	2.11	54.00	43.07	-10.93
5650.00	35.44	V	1.5	32.02	-26.55	2.11	54.00	43.02	-10.98
11490.00	34.60	H	1.5	40.11	-42.14	2.11	54.00	34.68	-19.32
11490.00	34.56	V	1.5	40.11	-42.14	2.11	54.00	34.64	-19.36
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 149 - 5 745 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Test Data(CH157)

802.11an20 Mcs7

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB $\mu V/m$)	Result (dB $\mu V/m$)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
11570.00	48.01	H	1.5	39.91	-42.03		74.00	45.89	-28.11
11570.00	47.55	V	1.5	39.91	-42.03		74.00	45.43	-28.57
AV(RBW: 1 MHz VBW: 3 MHz)									
11570.00	34.68	H	1.5	39.91	-42.03	2.11	54.00	34.67	-19.33
11570.00	34.63	V	1.5	39.91	-42.03	2.11	54.00	34.62	-19.38
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 157 - 5 785 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Test Data(CH-165)

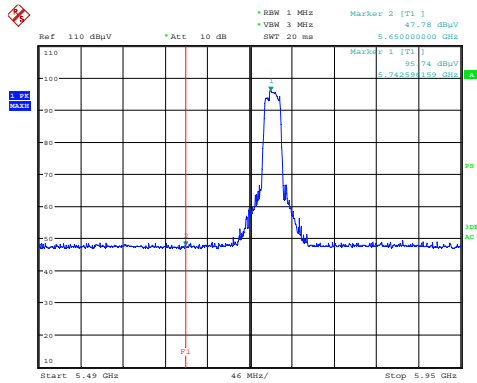
802.11an20 Mcs7

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5930.00	45.52	H	1.6	32.46	-26.42		74.00	51.56	-22.44
5930.00	46.20	V	1.5	32.46	-26.42		74.00	52.24	-21.76
11650.00	48.44	H	1.6	39.71	-41.92		74.00	46.23	-27.77
11650.00	48.61	V	1.5	39.71	-41.92		74.00	46.40	-27.60
AV(RBW: 1 MHz VBW: 3 MHz)									
5930.00	35.58	H	1.5	32.46	-26.42	2.11	54.00	43.73	-10.27
5930.00	35.61	V	1.5	32.46	-26.42	2.11	54.00	43.76	-10.24
11650.00	35.13	H	1.5	39.71	-41.92	2.11	54.00	35.03	-18.97
11650.00	35.07	V	1.5	39.71	-41.92	2.11	54.00	34.97	-19.03
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 165 -5 825 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

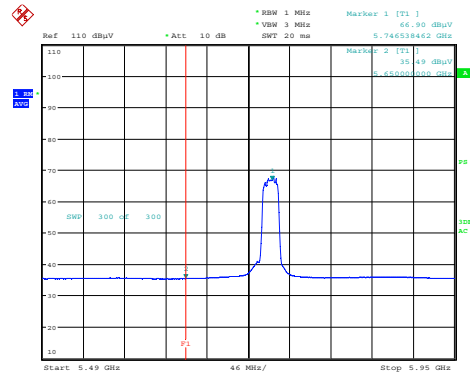
Restricted Band Edges Modulation: 802.11a20 CH-149

Detector mode : Peak



ESTR-23-00065

Detector mode : Average

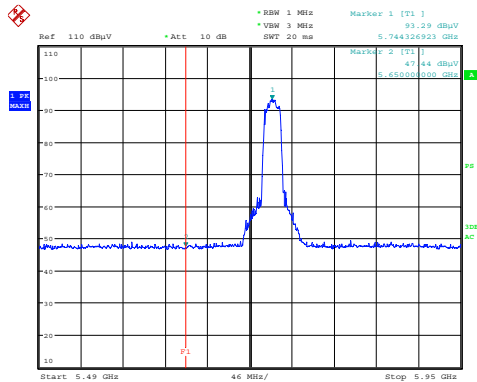


ESTR-23-00065

Polarity:Horizontal

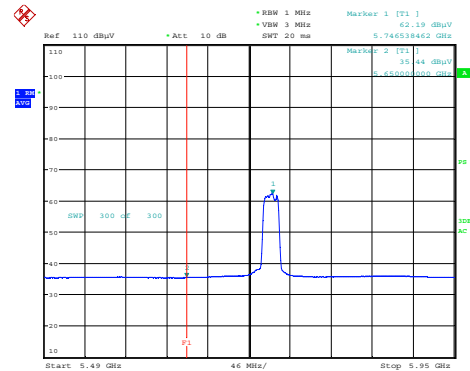
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065

Detector mode : Average



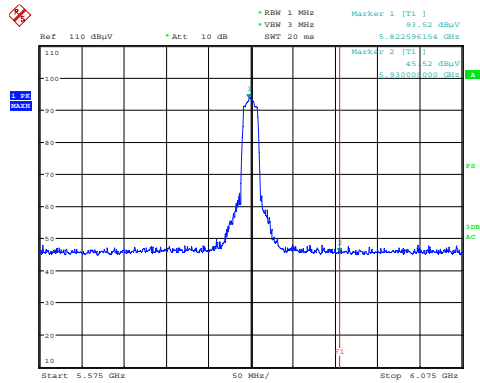
ESTR-23-00065

Polarity:Vertical

Polarity:Vertical

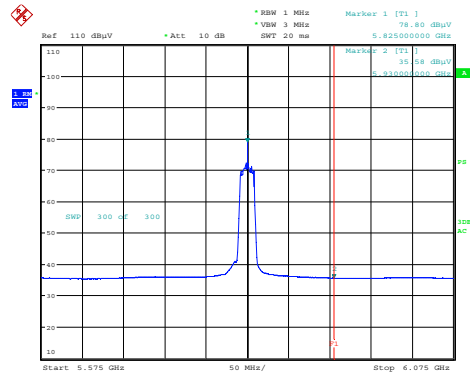
Restricted Band Edges Modulation: 802.11an20 CH-165

Detector mode : Peak



ESTR-23-00065

Detector mode : Average

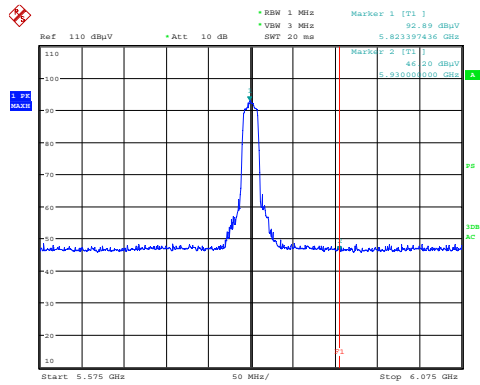


ESTR-23-00065

Polarity:Horizontal

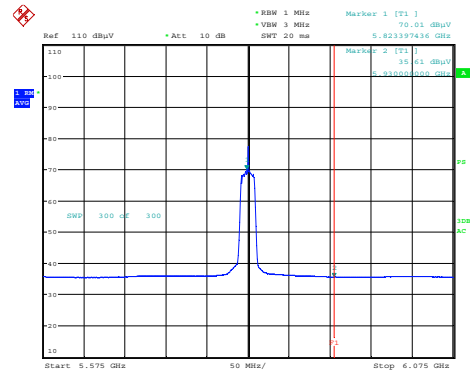
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065

Detector mode : Average



ESTR-23-00065

Polarity:Vertical

Polarity:Vertical

Test Data(CH-38)

802.11an40 Mcs7

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB μV /m)	Result (dB μV /m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5150.00	56.23	H	1.5	31.90	-26.79		74.00	61.34	-12.66
5150.00	54.56	V	1.5	31.90	-26.79		74.00	59.67	-14.33
5147.37	55.25	V	1.5	31.90	-26.79		74.00	60.36	-13.64
10380.00	48.08	H	1.5	39.51	-42.43		74.00	45.16	-28.84
10380.00	49.06	V	1.5	39.51	-42.43		74.00	46.14	-27.86
AV(RBW: 1 MHz VBW: 3 MHz)									
5150.00	38.60	H	1.8	31.90	-26.79	3.08	54.00	46.79	-7.21
5150.00	39.18	V	1.5	31.90	-26.79	3.08	54.00	47.37	-6.63
10380.00	35.15	H	1.8	39.51	-42.43	3.08	54.00	35.31	-18.69
10380.00	35.08	V	1.5	39.51	-42.43	3.08	54.00	35.24	-18.76
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 38 - 5 190 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Test Data(CH-46)

802.11an40 Mcs7

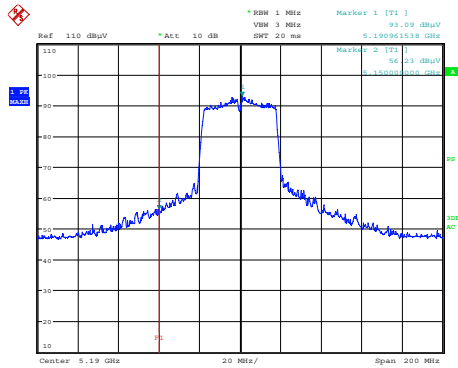
Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5350.00	47.25	H	1.7	31.82	-26.70		74.00	52.37	-21.63
5350.00	47.34	V	1.6	31.82	-26.70		74.00	52.46	-21.54
10460.00	47.63	H	1.7	39.70	-42.47		74.00	44.86	-29.14
10460.00	48.09	V	1.6	39.70	-42.47		74.00	45.32	-28.68
AV(RBW: 1 MHz VBW: 3 MHz)									
5350.00	35.86	H	1.7	31.82	-26.70	3.08	54.00	44.06	-9.94
5350.00	35.71	V	1.6	31.82	-26.70	3.08	54.00	43.91	-10.09
10460.00	34.92	H	1.7	39.70	-42.47	3.08	54.00	35.23	-18.77
10460.00	34.82	V	1.6	39.70	-42.47	3.08	54.00	35.13	-18.87
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 46 -5 230 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Restricted Band Edges

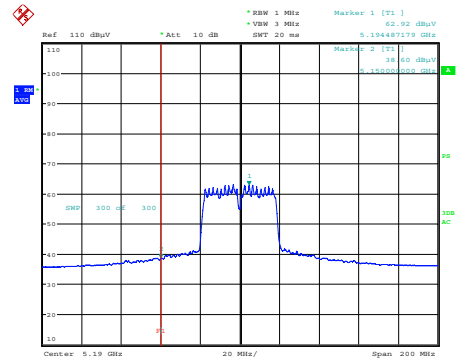
Modulation: 802.11an40 CH 38

Detector mode : Peak



ESTR-23-00065

Detector mode : Average

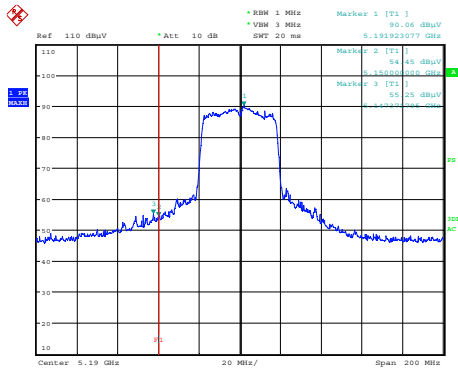


ESTR-23-00065

Polarity:Horizontal

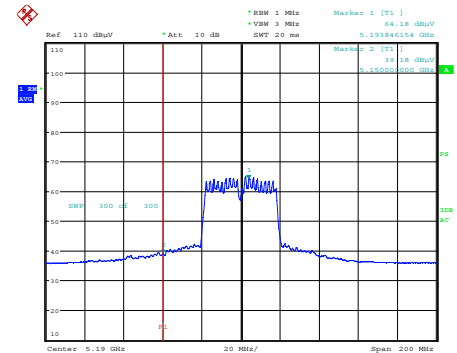
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065

Detector mode : Average



ESTR-23-00065

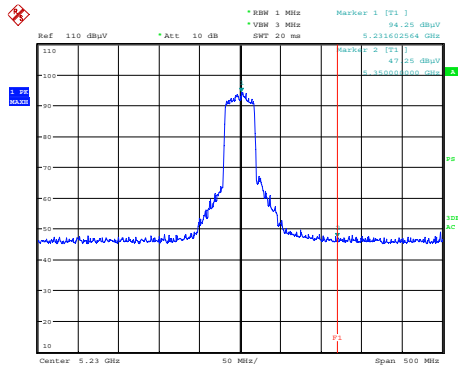
Polarity:Vertical

Polarity:Vertical

Restricted Band Edges

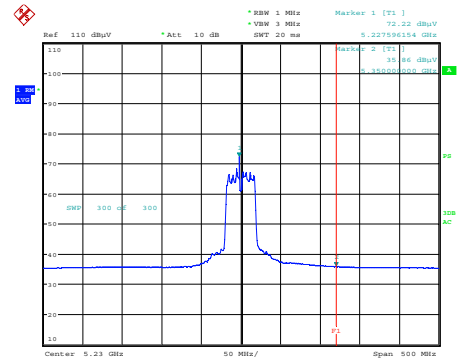
Modulation: 802.11an40 CH 46

Detector mode : Peak



ESTR-23-00065

Detector mode : Average

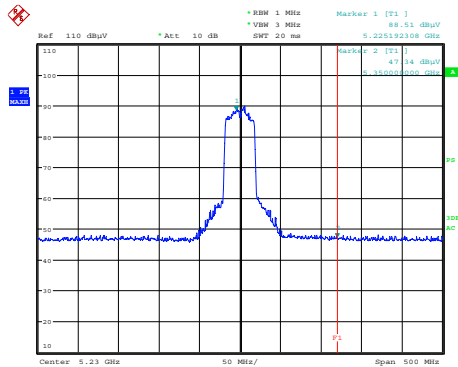


ESTR-23-00065

Polarity:Horizontal

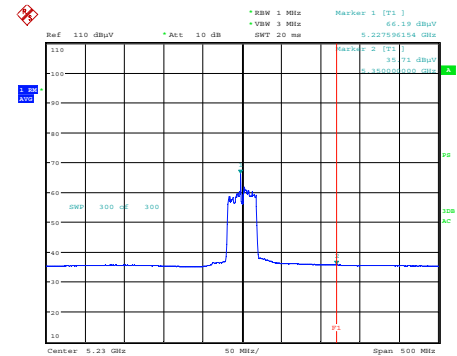
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065

Detector mode : Average



ESTR-23-00065

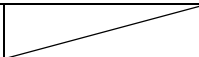
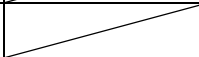
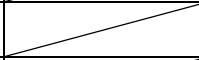
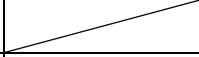
Polarity:Vertical

Polarity:Vertical

Test Data(CH-151)

802.11an40 Mcs7

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5650.00	47.73	H	1.7	32.02	-26.55		74.00	53.20	-20.80
5650.00	46.53	V	1.6	32.02	-26.55		74.00	52.00	-22.00
11510.00	48.39	H	1.5	40.07	-42.12		74.00	46.34	-27.66
11510.00	48.15	V	1.5	40.07	-42.12		74.00	46.10	-27.90
AV(RBW: 1 MHz VBW: 3 MHz)									
5650.00	35.30	H	1.7	32.02	-26.55	3.08	54.00	43.85	-10.15
5650.00	35.27	V	1.6	32.02	-26.55	3.08	54.00	43.82	-10.18
11510.00	34.93	H	1.5	40.07	-42.12	3.08	54.00	35.96	-18.04
11510.00	34.98	V	1.5	40.07	-42.12	3.08	54.00	36.01	-17.99
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 151 - 5 755 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Test Data(CH-159)

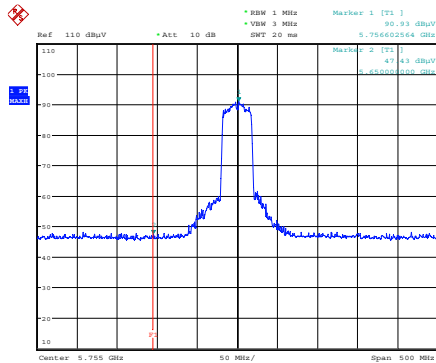
802.11an40 Mcs7

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB $\mu V/m$)	Result (dB $\mu V/m$)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5930.00	47.39	H	1.5	32.46	-26.42		74.00	53.43	-20.57
5930.00	46.34	V	1.5	32.46	-26.42		74.00	52.38	-21.62
11490.00	47.89	H	1.5	40.11	-42.14		74.00	45.86	-28.14
11490.00	48.44	V	1.5	40.11	-42.14		74.00	46.41	-27.59
AV(RBW: 1 MHz VBW: 3 MHz)									
5930.00	35.36	H	1.5	32.46	-26.42	3.08	54.00	44.48	-9.52
5930.00	35.42	V	1.5	32.46	-26.42	3.08	54.00	44.54	-9.46
11490.00	34.98	H	1.5	40.11	-42.14	3.08	54.00	36.03	-17.97
11490.00	34.91	V	1.5	40.11	-42.14	3.08	54.00	35.96	-18.04
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 159 -5 795 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

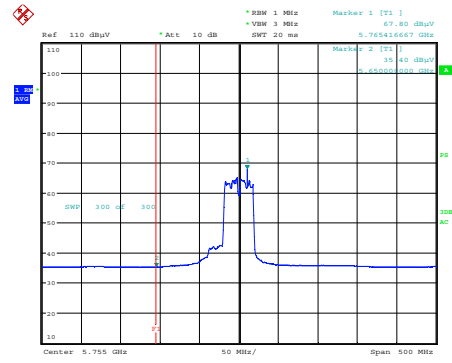
Restricted Band Edges Modulation: 802.11an40 CH-151

Detector mode : Peak



ESTR-23-00065
Date: 5.APR.2023 14:09:46

Detector mode : Average

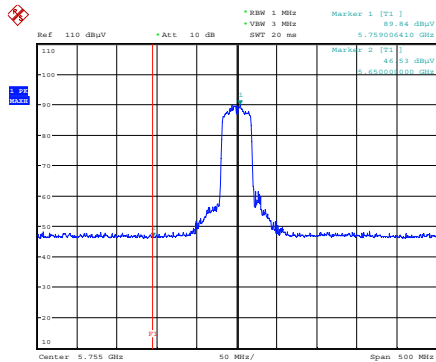


ESTR-23-00065
Date: 5.APR.2023 14:07:50

Polarity:Horizontal

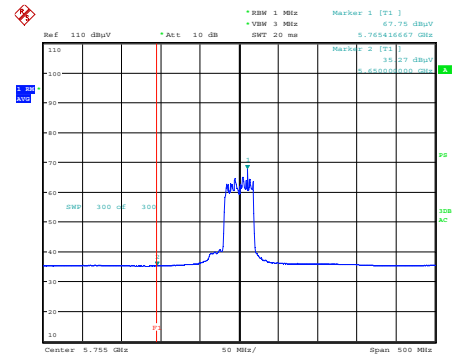
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065
Date: 5.APR.2023 14:14:00

Detector mode : Average



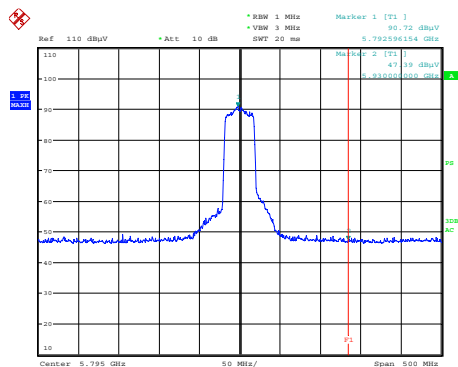
ESTR-23-00065
Date: 5.APR.2023 14:22:01

Polarity:Vertical

Polarity:Vertical

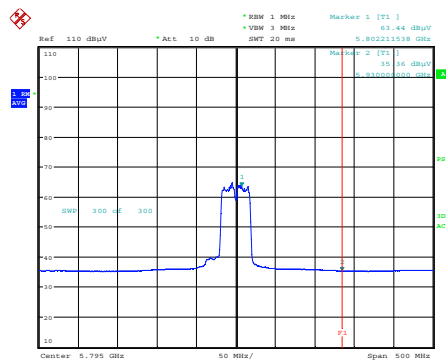
Restricted Band Edges Modulation: 802.11an40 CH-159

Detector mode : Peak



ESTR-23-00065
Date: 5.APR.2023 15:25:11

Detector mode : Average

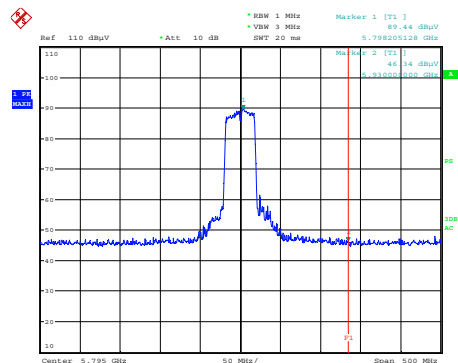


ESTR-23-00065
Date: 5.APR.2023 17:23:04

Polarity:Horizontal

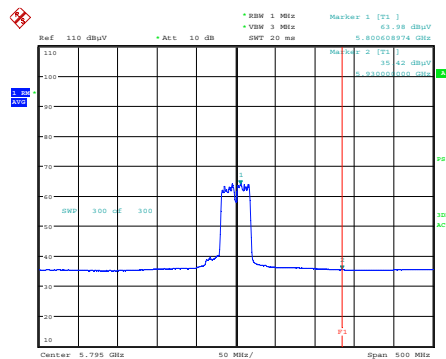
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065
Date: 5.APR.2023 15:15:07

Detector mode : Average



ESTR-23-00065
Date: 5.APR.2023 15:17:19

Polarity:Vertical

Polarity:Vertical

Test Data(CH-42)

802.11ac80 Mcs9

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB μV /m)	Result (dB μV /m)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5150.00	63.44	H	1.5	31.90	-26.79		74.00	68.55	-5.45
5150.00	61.99	V	1.6	31.90	-26.79		74.00	67.10	-6.90
10420.00	47.65	H	1.5	39.60	-42.45		74.00	44.80	-29.20
10420.00	48.37	V	1.5	39.60	-42.45		74.00	45.52	-28.48
AV(RBW: 1 MHz VBW: 3 MHz)									
5650.00	41.98	H	1.5	31.90	-26.79	3.93	54.00	51.02	-2.98
5650.00	42.28	V	1.6	31.90	-26.79	3.93	54.00	51.32	-2.68
10420.00	35.01	H	1.5	39.60	-42.45	3.93	54.00	36.09	-17.91
10420.00	35.07	V	1.5	39.60	-42.45	3.93	54.00	36.15	-17.85
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 42 - 5 210 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Test Data(CH-155)

802.11ac80 Mcs9

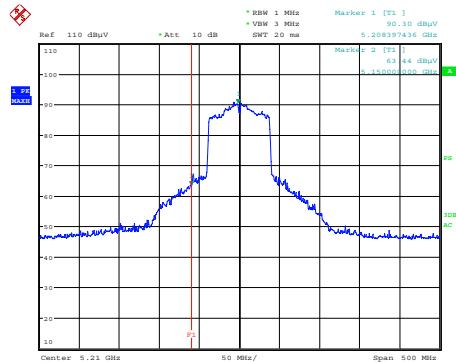
Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μV)	Position (V/H)	Height (m)	Correction Factor		Duty Cycle Correction(dB)	Result Value		
				Ant Factor (dB)	AMP & Cable (dB)		Limit (dB $\mu V/m$)	Result (dB $\mu V/m$)	Margin (dB)
PEAK(RBW: 1 MHz VBW: 3 MHz)									
5930.00	46.86	H	1.6	32.46	-26.42		74.00	52.90	-21.10
5930.00	46.84	V	1.7	32.46	-26.42		74.00	52.88	-21.12
11550.00	48.15	H	1.6	39.97	-42.06		74.00	46.06	-27.94
11550.00	48.23	V	1.7	39.97	-42.06		74.00	46.14	-27.86
AV(RBW: 1 MHz VBW: 3 MHz)									
5930.00	35.72	H	1.6	32.46	-26.42	3.93	54.00	45.69	-8.31
5930.00	35.88	V	1.7	32.46	-26.42	3.93	54.00	45.85	-8.15
11550.00	34.92	H	1.6	39.97	-42.06	3.93	54.00	36.76	-17.24
11550.00	34.93	V	1.7	39.97	-42.06	3.93	54.00	36.77	-17.23
Remark	H : Horizontal, V : Vertical TEST MODE : CH : 155 -5 775 MHz (x postion)								
	*The TX signal wasn't detected from 5th harmonics.								
	*Checked in all 3 axis and the maximum measured data were reported.(Worst data is X axis of position)								
	*Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain + Duty Cycle Correction								
	*This test was radiated up to 40.0 GHz but no noise was measured.								

Restricted Band Edges

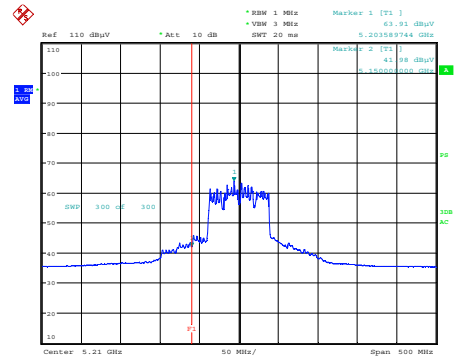
Modulation: 802.11ac80 CH-42

Detector mode : Peak



ESTR-23-00065

Detector mode : Average

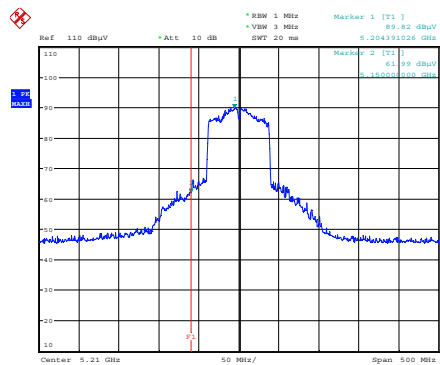


ESTR-23-00065

Polarity:Horizontal

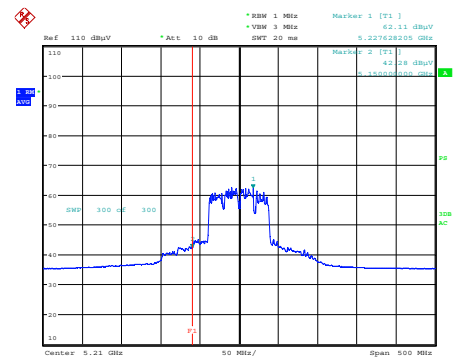
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065

Detector mode : Average



ESTR-23-00065

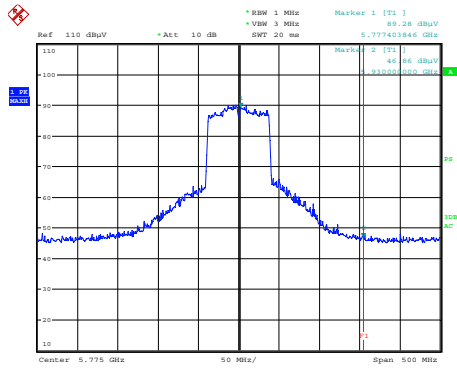
Polarity:Vertical

Polarity:Vertical

Restricted Band Edges

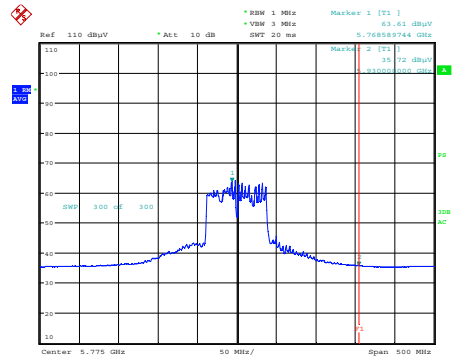
Modulation: 802.11ac80 CH-155

Detector mode : Peak



ESTR-23-00065

Detector mode : Average

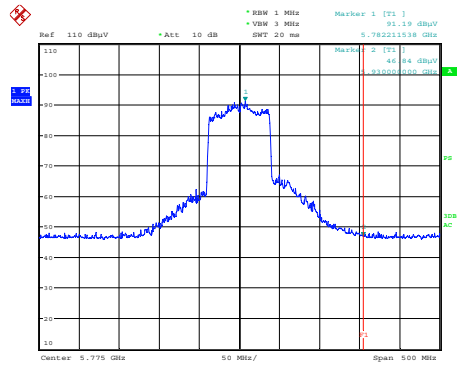


ESTR-23-00065

Polarity:Horizontal

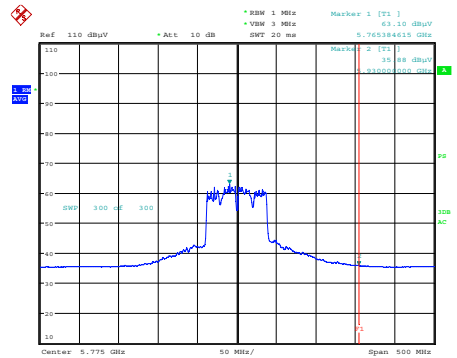
Polarity:Horizontal

Detector mode : Peak



ESTR-23-00065

Detector mode : Average



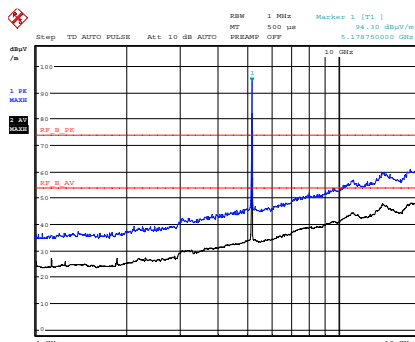
ESTR-23-00065

Polarity:Vertical

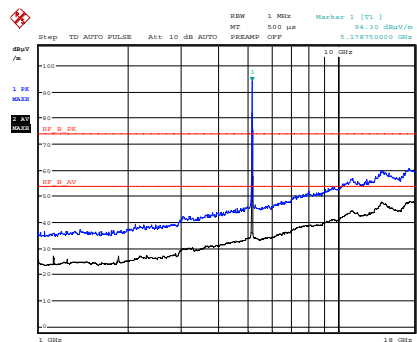
Polarity:Vertical

Restricted Band Edges(1 GHz – 18 GHz)

Modulation: 802.11a CH-36

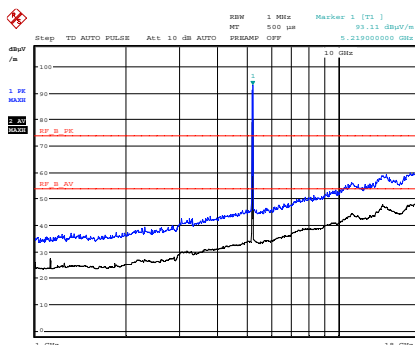


Polarity:Horizontal

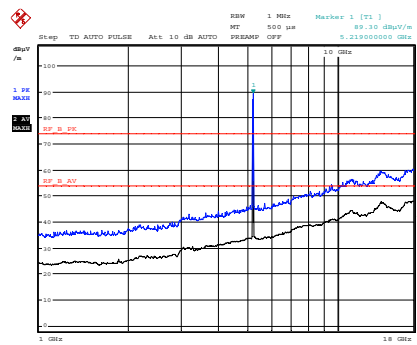


Polarity:Vertical

Modulation: 802.11a CH-44



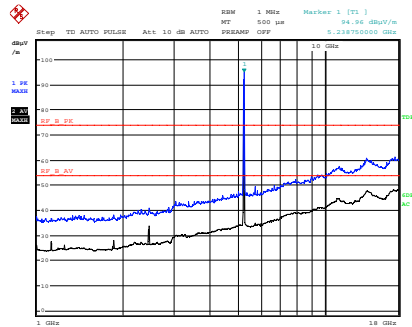
Polarity:Horizontal



Polarity:Vertical

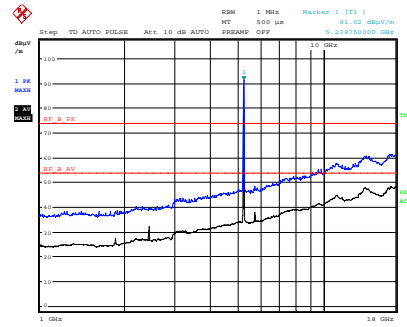
Restricted Band Edges

Modulation: 802.11a CH-48



ESTR-23-00065

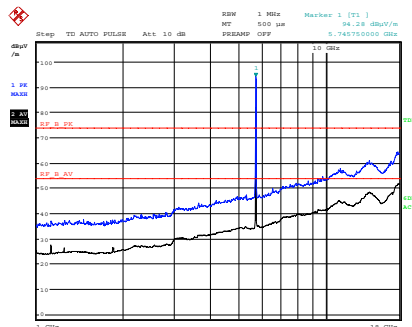
Polarity:Horizontal



ESTR-23-00065

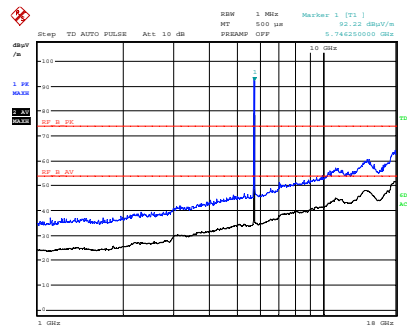
Polarity:Vertical

Modulation: 802.11a CH-149



ESTR-23-00065

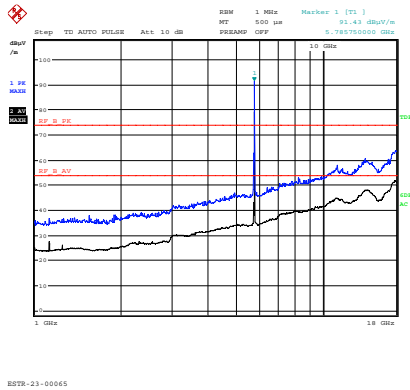
Polarity:Horizontal



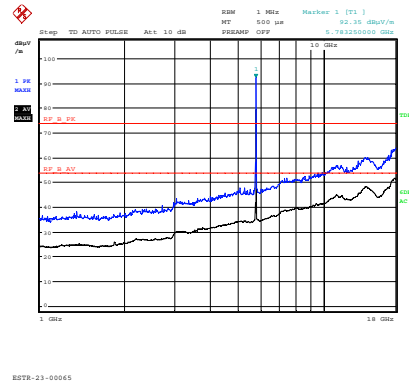
ESTR-23-00065

Polarity:Vertical

Restricted Band Edges Modulation: 802.11a CH-157

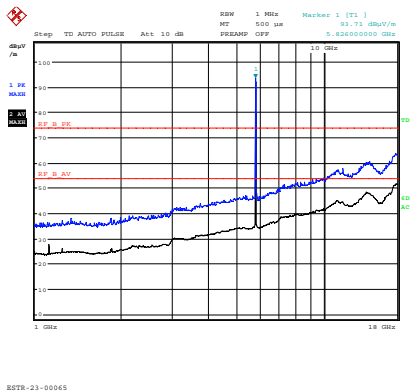


Polarity:Horizontal

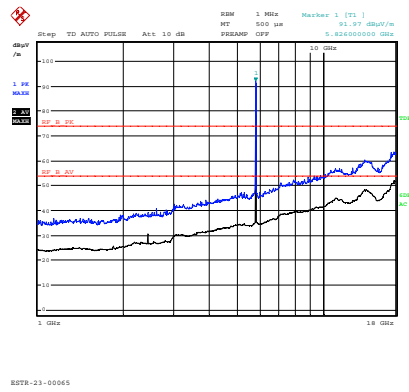


Polarity:Vertical

Modulation: 802.11a CH-165



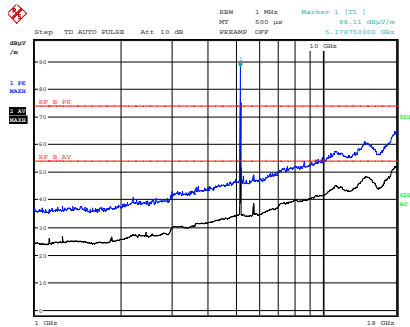
Polarity:Horizontal



Polarity:Vertical

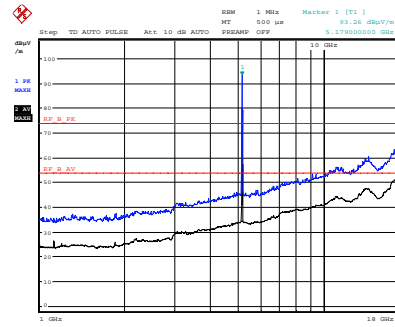
Restricted Band Edges

Modulation: 802.11an20 CH-36



ESTR-23-00065

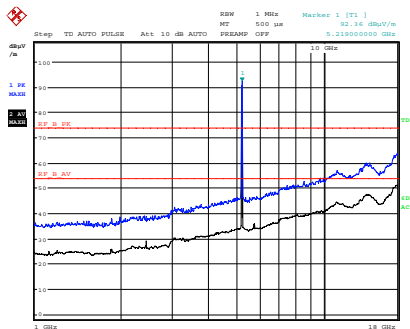
Polarity:Horizontal



ESTR-23-00065

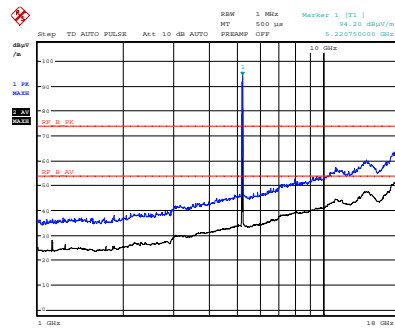
Polarity:Vertical

Modulation: 802.11an20 CH-44



ESTR-23-00065

Polarity:Horizontal

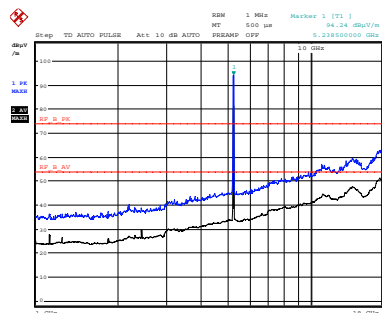


ESTR-23-00065

Polarity:Vertical

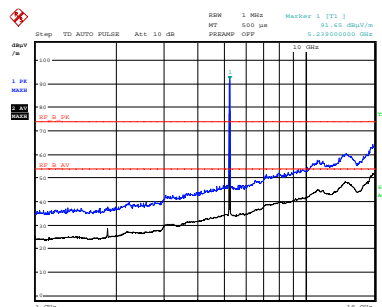
Restricted Band Edges

Modulation: 802.11an20 CH-48



ESTR-23-00065

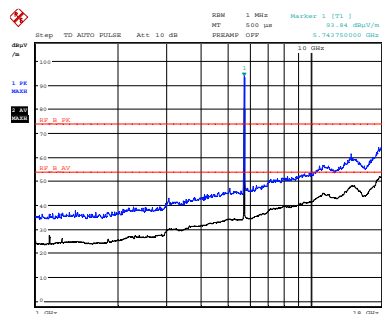
Polarity:Horizontal



ESTR-23-00065

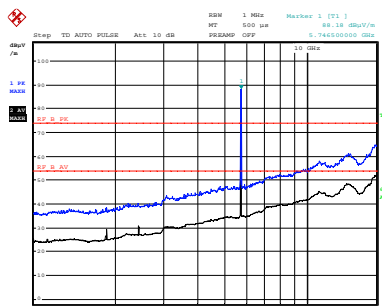
Polarity:Vertical

Modulation: 802.11an20 CH-149



ESTR-23-00065

Polarity:Horizontal

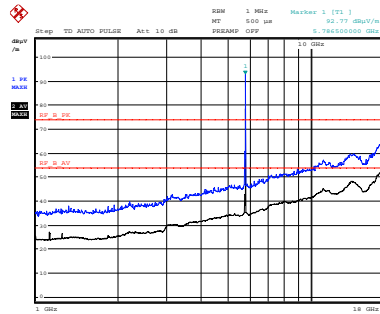


ESTR-23-00065

Polarity:Vertical

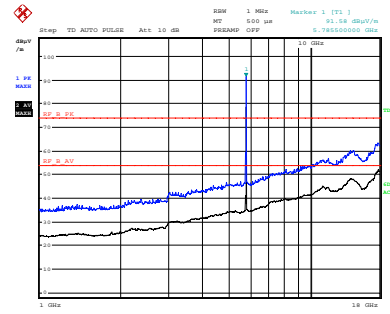
Restricted Band Edges

Modulation: 802.11an20 CH-157



ESTR-23-00065

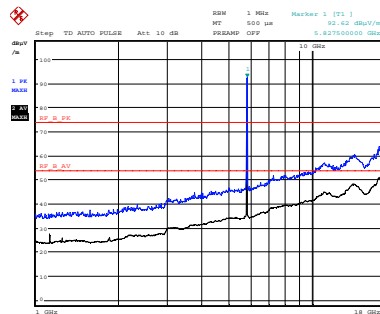
Polarity:Horizontal



ESTR-23-00065

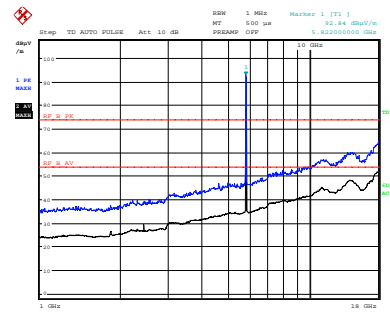
Polarity:Vertical

Modulation: 802.11an20 CH-165



ESTR-23-00065

Polarity:Horizontal

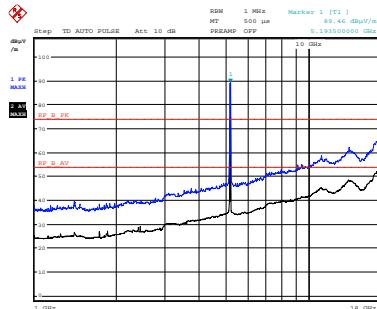


ESTR-23-00065

Polarity:Vertical

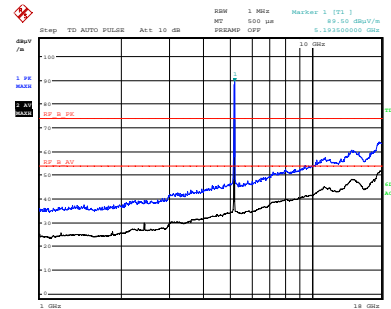
Restricted Band Edges

Modulation: 802.11an40 CH-38



ESTR-23-00065

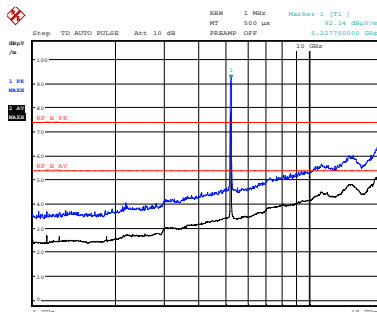
Polarity:Horizontal



ESTR-23-00065

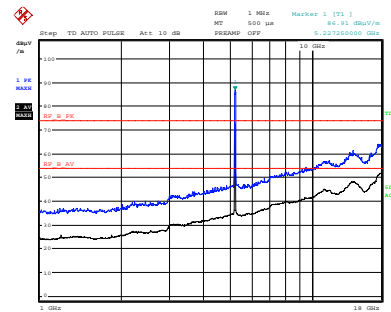
Polarity:Vertical

Modulation: 802.11an40 CH-46



ESTR-23-00065

Polarity:Horizontal

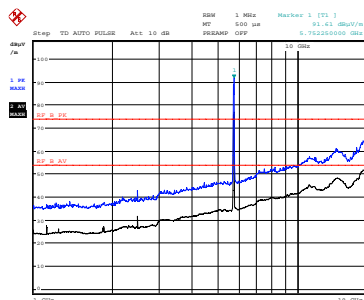


ESTR-23-00065

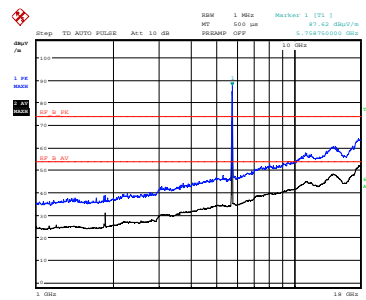
Polarity:Vertical

Restricted Band Edges

Modulation: 802.11an40 CH-151

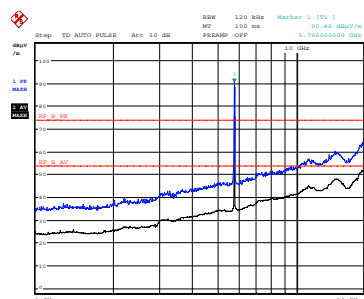


Polarity:Horizontal

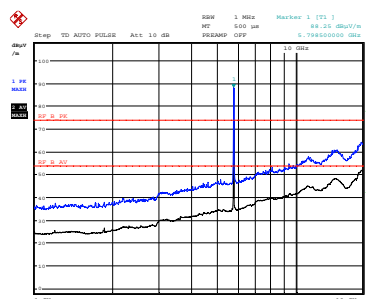


Polarity:Vertical

Modulation: 802.11an40 CH-159



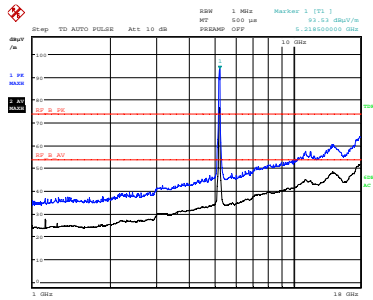
Polarity:Horizontal



Polarity:Vertical

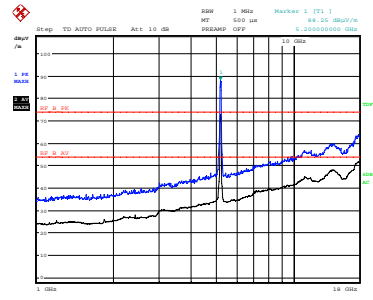
Restricted Band Edges

Modulation: 802.11ac80 CH-42



ESTR-23-00065

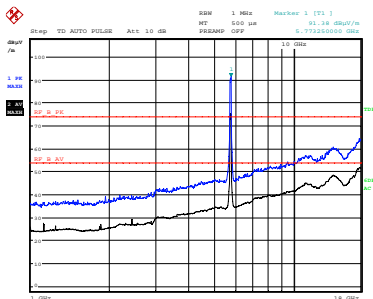
Polarity:Horizontal



ESTR-23-00065

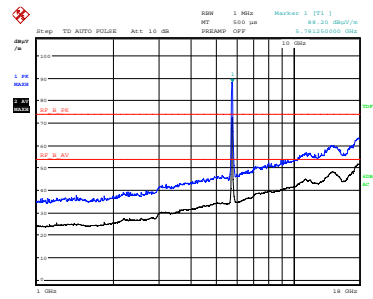
Polarity:Vertical

Modulation: 802.11ac80 CH-155



ESTR-23-00065

Polarity:Horizontal

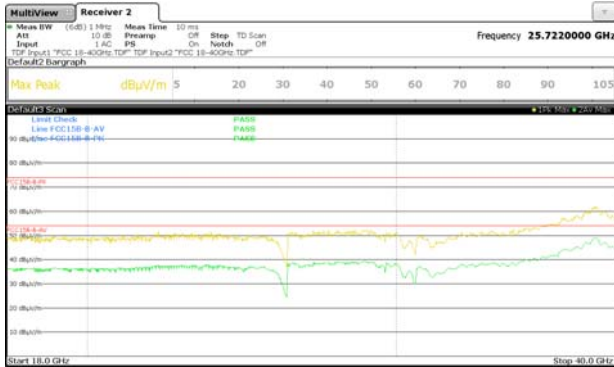


ESTR-23-00065

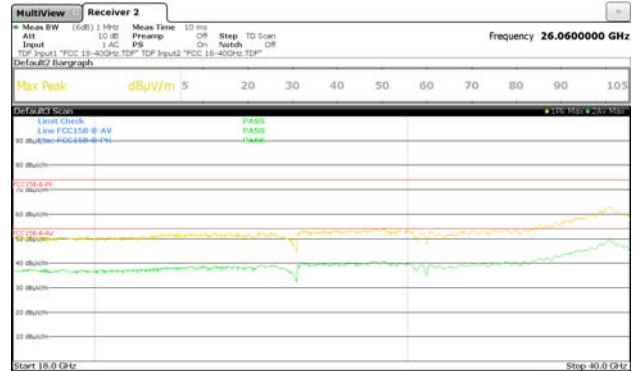
Polarity:Vertical

Restricted Band Edges (18 GHz – 40 GHz)

Modulation: 802.11a CH-36 (worst case test data)

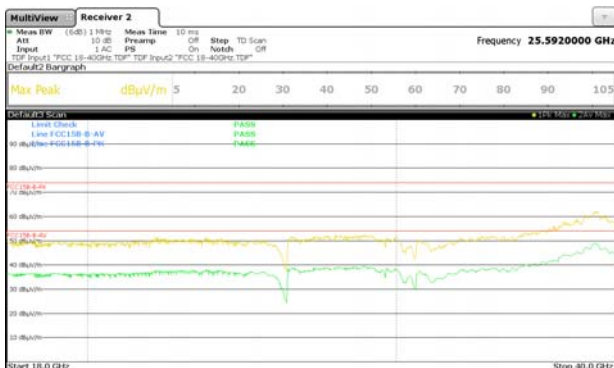


Polarity:Horizontal

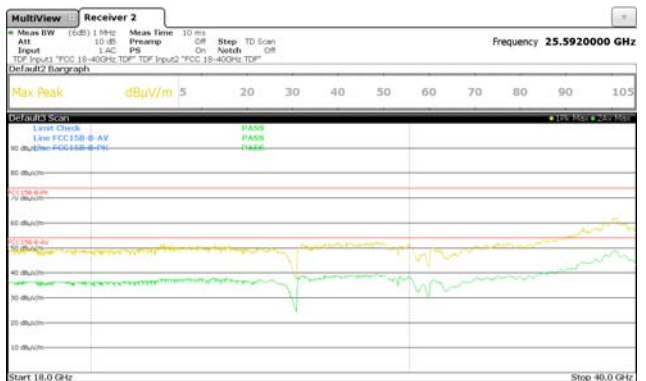


Polarity:Vertical

Modulation: 802.11a CH-44



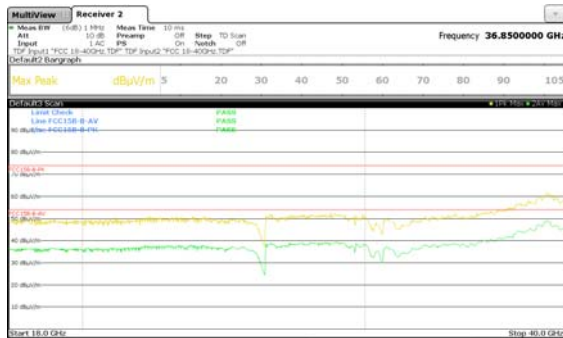
Polarity:Horizontal



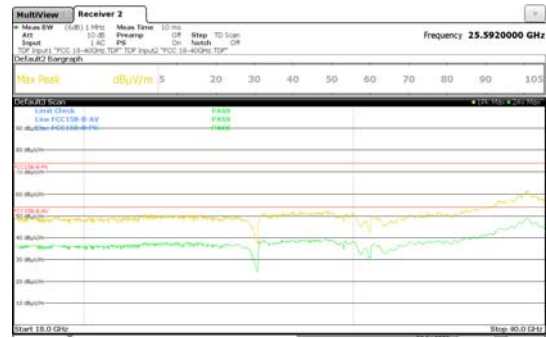
Polarity:Vertical

Restricted Band Edges (18 GHz – 40 GHz)

Modulation: 802.11a CH-48

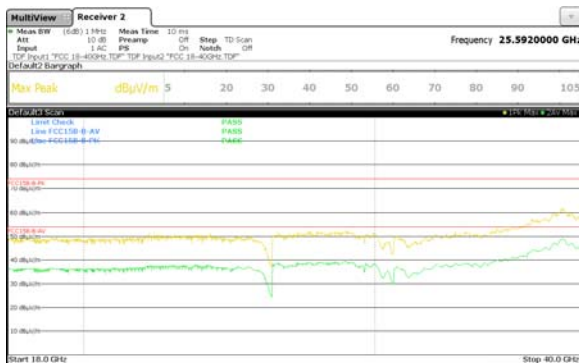


Polarity:Horizontal

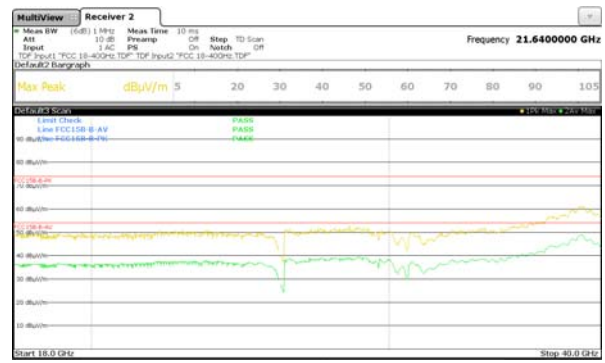


Polarity:Vertical

Modulation: 802.11a CH-149



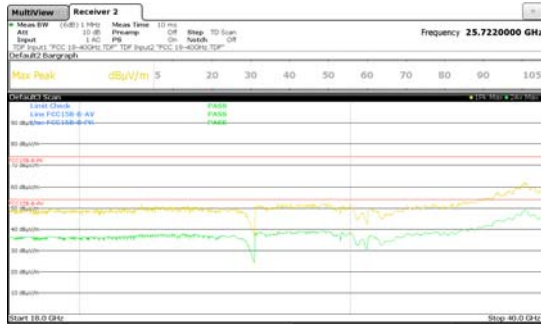
Polarity:Horizontal



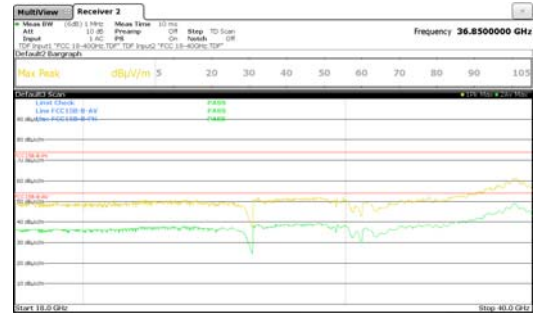
Polarity:Vertical

Restricted Band Edges (18 GHz – 40 GHz)

Modulation: 802.11a CH-157

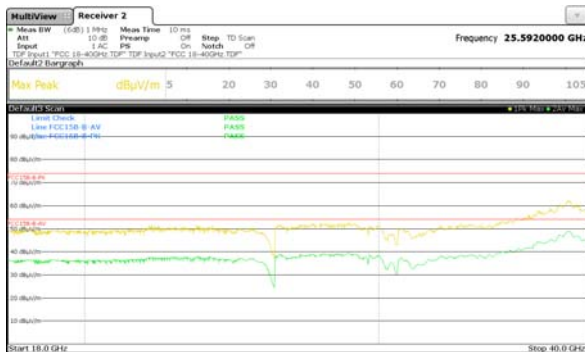


Polarity:Horizontal

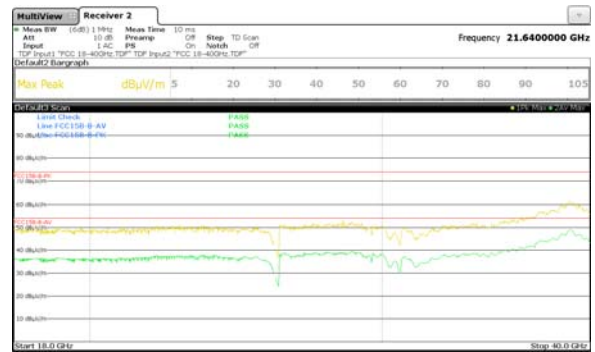


Polarity:Vertical

Modulation: 802.11a CH-165



Polarity:Horizontal



Polarity:Vertical

8 Conducted Spurious Emission on AC Power lines

Result
Pass

Test Specification	FCC Part 15 Section 15.207 / RSS Gen Issue 5 Section 8.8
Test Method	ANSI C 63.10-2013
Testing Location	Screened room
Measurement Bandwidth	9 kHz
Frequency Range	150kHz – 30MHz
Supply Voltage	: 120VAC,60Hz
Test Method	Refer TEST METHODOLOGY

***Note:** The product has tested with AC to DC adapter

Limits of section 15.207

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak (dBμV)	Average (dBμV)
0.15-0.5	66-56*	56-46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency

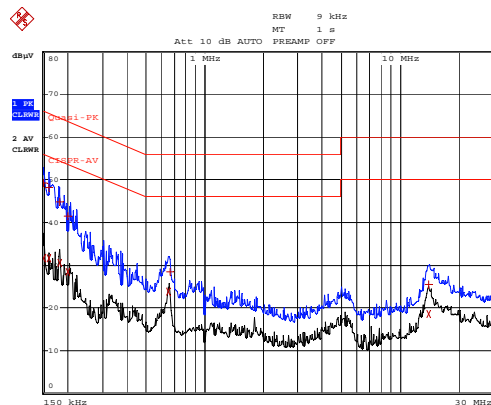
Normal Test Condition:

Temperature (Norm) = + 22.3 °C	Voltage =3.7 V battery	Relative humidity: 54 %
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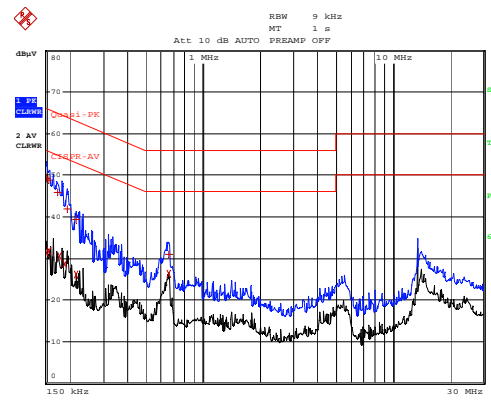
Test results

802.11a 54 Mbps									
Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dB μV)	Reading (dB μV)	Result (dB μV)	Limit (dB μV)	Reading (dB μV)	Result (dB)
0.15	0.04	0.15	N	66.00	49.27	49.46	56.00	31.34	31.53
0.16	0.04	0.15	N	65.67	48.80	48.99	55.67	31.90	32.09
0.17	0.04	0.15	N	64.91	45.78	45.97	54.91	30.56	30.75
0.18	0.05	0.14	H	64.49	44.85	45.05	54.49	30.58	30.78
0.20	0.04	0.14	N	63.82	41.89	32.92	53.82	28.69	28.87
0.21	0.04	0.14	N	63.09	39.32	39.50	53.09	26.21	26.39
Remark	H : Hot Line, N : Neutral Line *Correction Factor = Lisn + Cable *Result = Correction Factor + Reading *worst case test data								

Test Plots



HOT LINE



NUETRAL LINE