

Supplemental “CA Mode” Test Report

Report No.: RFBEOO-WTW-P21020573-1

FCC ID: MAD-G2021-49-01B

Test Model: G2021-49-01B

Received Date: Mar. 31, 2021

Test Date: May 11 ~ Jun. 24, 2021

Issued Date: Jul. 05, 2021

Applicant: Microelectronics Technology Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location (1): No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
33383, Taiwan

FCC Registration /

Designation Number (1): 788550 / TW0003

Test Location (2): E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan

FCC Registration /

Designation Number (2): 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RFBEOO-WTW-P21020573-1	Original release.	Jul. 05, 2021

1 Certificate of Conformity

Product: Dual Mid Band RU

Brand: MTI

Test Model: G2021-49-01B

Sample Status: Engineering sample

Applicant: Microelectronics Technology Inc.

Test Date: May 11 ~ Jun. 24, 2021

Standards: FCC Part 27, Subpart L
FCC Part 2

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen, **Date:** Jul. 05, 2021
Pettie Chen / Senior Specialist

Approved by : Bruce Chen, **Date:** Jul. 05, 2021
Bruce Chen / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(d)(2)	Equivalent Isotropically radiated power	PASS	Meet the requirement of limit.
2.1049 27.53	Occupied Bandwidth	PASS	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -49.29 dB at 8355.00MHz.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.4 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Test Site and Instruments

For Radiated Spurious Emissions Test:

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 24, 2021	May 23, 2022
Loop Antenna Electro-Metrics	EM-6879	264	Mar. 05, 2021	Mar. 04, 2022
RF Cable	5D-FB	LOOPCAB-001	Jan. 07, 2021	Jan. 06, 2022
RF Cable	5D-FB	LOOPCAB-002	Jan. 07, 2021	Jan. 06, 2022
Pre-Amplifier Mini-Circuits	ZFL-1000VH2	QA0838008	Oct. 20, 2020	Oct. 19, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 05, 2020	Nov. 04, 2021
RF Cable	8D	966-3-1	Mar. 16, 2021	Mar. 15, 2022
RF Cable	8D	966-3-2	Mar. 16, 2021	Mar. 15, 2022
RF Cable	8D	966-3-3	Mar. 16, 2021	Mar. 15, 2022
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 24, 2020	Sep. 23, 2021
Horn Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC104-SM-SM-1500	180504	Apr. 26, 2021	Apr. 25, 2022
RF Cable	EMC104-SM-SM-2000	180601	Jun. 09, 2020	Jun. 08, 2021
			Jun. 08, 2021	Jun. 07, 2022
RF Cable	EMC104-SM-SM-6000	210201	May 13, 2021	May 12, 2022
Spectrum Analyzer Keysight	N9030A	MY54490679	Jul. 13, 2020	Jul. 12, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 11, 2021	Jan. 10, 2022
Horn Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC-KM-KM-4000	200214	Mar. 10, 2021	Mar. 09, 2022
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: Jun. 16 ~ Jun. 28, 2021

For other test:

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer Keysight	N9030B	MY60070562	Jan. 06, 2021	Jan. 05, 2022
Fixed Attenuator Woken	00800N1G03H-30	01	NA	NA

- NOTE:**
1. The test was performed in Oven room 2.
 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 3. Tested Date: Jun. 23 ~ Jun. 24, 2021

3 General Information

3.1 General Description of EUT

Product	Dual Mid Band RU				
Brand	MTI				
Test Model	G2021-49-01B				
Status of EUT	Engineering sample				
Power Supply Rating	-40.5Vdc to -58.5Vdc				
Modulation Type	QPSK, 16QAM, 64QAM, 256QAM				
Modulation Technology	5G NR FDD				
Operating Frequency	Band n66	Channel Bandwidth: 5MHz	ANT0	2112.5MHz ~ 2197.5MHz	
			ANT1		
			ANT2		
			ANT3		
		Channel Bandwidth: 10MHz	ANT0	2115.0MHz ~ 2195.0MHz	
			ANT1		
			ANT2		
			ANT3		
		Channel Bandwidth: 15MHz	ANT0	2117.5MHz ~ 2192.5MHz	
			ANT1		
			ANT2		
			ANT3		
	Channel Bandwidth: 20MHz	ANT0	2120.0MHz ~ 2190.0MHz		
		ANT1			
		ANT2			
		ANT3			
	Band n70	Channel Bandwidth: 5MHz	ANT0	1997.5MHz ~ 2017.5MHz	
			ANT1		
			ANT2		
			ANT3		
Channel Bandwidth: 10MHz		ANT0	2000.0MHz ~ 2015.0MHz		
		ANT1			
		ANT2			
		ANT3			
Channel Bandwidth: 15MHz		ANT0	2002.5MHz ~ 2012.5MHz		
		ANT1			
		ANT2			
		ANT3			
Channel Bandwidth: 20MHz		ANT0	2005.0MHz ~ 2010.0MHz		
		ANT1			
		ANT2			
		ANT3			
Antenna Type	Directional Cross-Polarized Sector antenna with Band n66 Gain = 15 dBi Band n70 Gain = 17 dBi				
Antenna Connector	4x4.3-10 Female				
Accessory Device	NA				
Data Cable Supplied	NA				

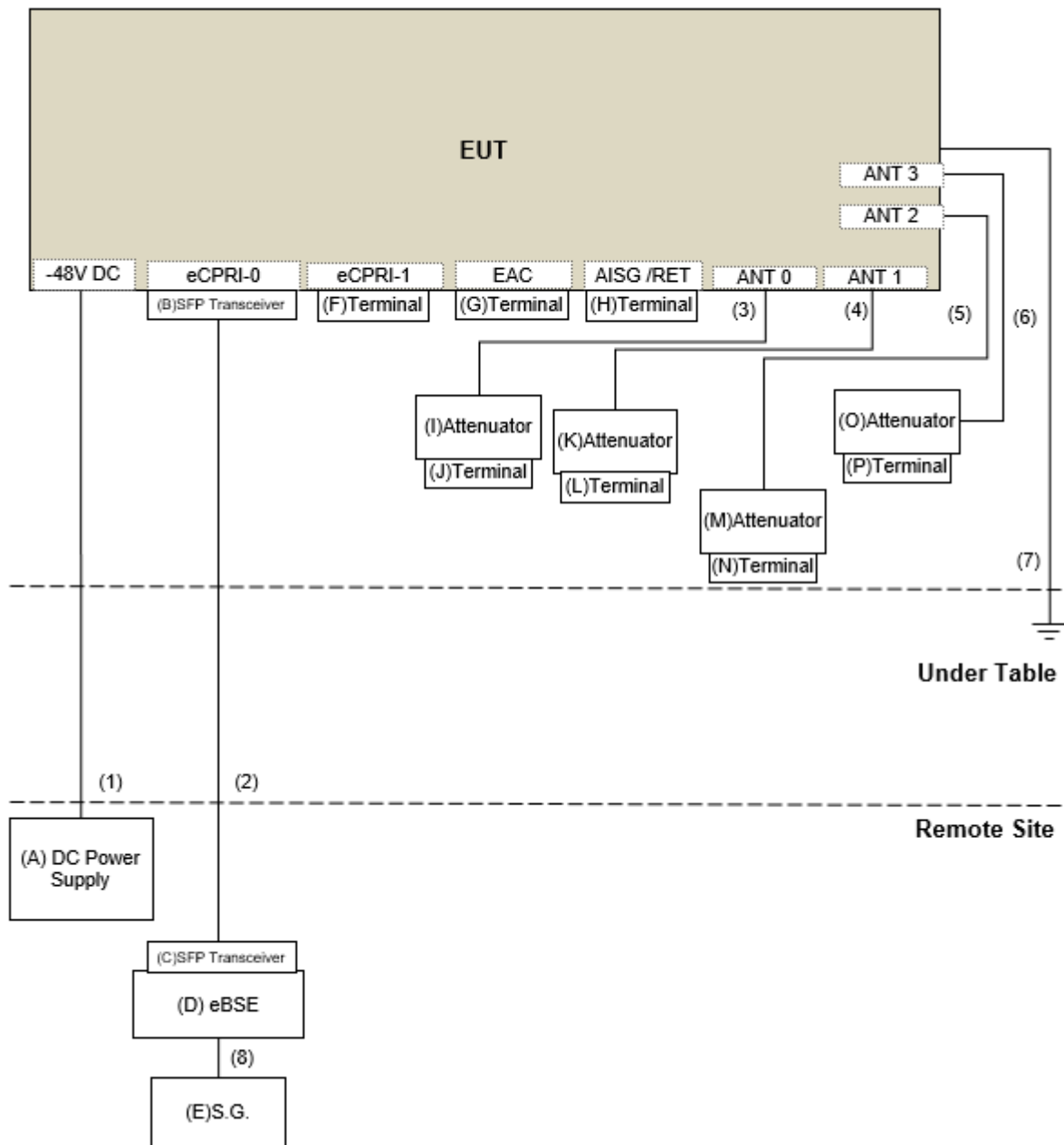
Note:

1. The EUT incorporates a MIMO function.

Band n66			
Channel Bandwidth	Modulation	TX & RX configuration	
5MHz	QPSK, 16QAM, 64QAM, 256QAM	4TX	4RX
10MHz	QPSK, 16QAM, 64QAM, 256QAM	4TX	4RX
15MHz	QPSK, 16QAM, 64QAM, 256QAM	4TX	4RX
20MHz	QPSK, 16QAM, 64QAM, 256QAM	4TX	4RX
Band n70			
Channel Bandwidth	Modulation	TX & RX configuration	
5MHz	QPSK, 16QAM, 64QAM, 256QAM	4TX	4RX
10MHz	QPSK, 16QAM, 64QAM, 256QAM	4TX	4RX
15MHz	QPSK, 16QAM, 64QAM, 256QAM	4TX	4RX
20MHz	QPSK, 16QAM, 64QAM, 256QAM	4TX	4RX

2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.
3. The above antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
4. Based on the maximum RF power (conducted & EIRP) listed in this report, considerations pertaining to the maximum allowed EIRP (conducted power level), signal type and antenna gain should be considered for each installation.

3.2 Configuration of System under Test



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	DC Power Supply	NA	NA	NA	NA	Supplied by client
B	SFP Transceiver	NA	NA	NA	NA	Supplied by client
C	SFP Transceiver	NA	NA	NA	NA	Supplied by client
D	eBSE (Note 2)	NA	NA	NA	NA	Supplied by client
E	S.G	Agilent	E4438C	NA	NA	Provided by Lab
F	Terminal	NA	NA	NA	NA	Supplied by client
G	Terminal	NA	NA	NA	NA	Supplied by client
H	Terminal	NA	NA	NA	NA	Supplied by client
I	Attenuator	NA	NA	NA	NA	Supplied by client
J	Terminal	NA	NA	NA	NA	Supplied by client
K	Attenuator	NA	NA	NA	NA	Supplied by client
L	Terminal	NA	NA	NA	NA	Supplied by client
M	Attenuator	NA	NA	NA	NA	Supplied by client
N	Terminal	NA	NA	NA	NA	Supplied by client
O	Attenuator	NA	NA	NA	NA	Supplied by client
P	Terminal	NA	NA	NA	NA	Supplied by client

NOTE:

1. All power cords of the above support units are non-shielded (1.8 m).
2. eBSE: Based Station Emulator which is to transmit/receive the waveform

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	DC Power Cable	1	10	Yes	0	Supplied by client
2	Coaxial Cable	1	10	Yes	0	Supplied by client
3	RF Cable	1	1.5	Yes	0	Supplied by client
4	RF Cable	1	1.5	Yes	0	Supplied by client
5	RF Cable	1	1.5	Yes	0	Supplied by client
6	RF Cable	1	1.5	Yes	0	Supplied by client
7	GND Cable	1	3	No	0	Provided by Lab
8	RF Cable	1	3	No	0	Supplied by client

3.3 Test Mode Applicability and Tested Channel Detail

Test modes are presented in the report as below, detailed test mode.

Test Mode	Description
1	One Carrier: Band n66 5MHz(40W)_Ch 439500 (2197.5MHz) + Band n70 5MHz(40W)_Ch 399500 (1997.5MHz)
2	One Carrier: Band n66 10MHz(60W)_Ch 439000 (2195.0MHz) + Band n70 5MHz(20W)_Ch 399500 (1997.5MHz)
3	One Carrier: Band n66 20MHz(60W)_Ch 438000 (2190.0MHz) + Band n70 20MHz(20W)_Ch 401000 (2005.0MHz)

Following test modes were selected for the final test:

Test Item	Test Mode
EIRP	1, 2, 3
Occupied Bandwidth	3
Radiated Emission	1, 2, 3

Test Condition:

Test Item	Environmental Conditions	Input Power (System)	Tested By
ERP	25deg. C, 63%RH	120Vac, 60Hz	James Yang
OBW	25deg. C, 63%RH	120Vac, 60Hz	Charlie Yang
Radiated Emission	25deg. C, 70%RH	120Vac, 60Hz	Ryan Du

3.4 General Description of Applied Standards

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

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 27, Subpart L

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 971168 D01 Power Meas License Digital Systems v03r01

All test items have been performed and recorded as per the above standards and KDB test guidance.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

According to FCC 27.50(d)(2) that the power of each fixed or base station transmitting in the 1995-2000 MHz, the 2110-2155 MHz 2155-2180 MHz band, or 2180-2200 MHz band and situated in any geographic location other than that described in paragraph (d)(1) of this section is limited to:

- (i) An equivalent isotropically radiated power (EIRP) of 1640 watts when transmitting with an emission bandwidth of 1 MHz or less;
- (ii) An EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

4.1.2 Test Procedures

EIRP Measurement:

Conducted Power Measurement:

- a. A spectrum analyzer was used on the output port of the EUT and recorded output power from the spectrum analyzer.
- b. The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation as follows:

$$\begin{aligned} \text{EIRP} &= \text{PMeas} + \text{GT} \\ \text{ERP} &= \text{PMeas} + \text{GT} - 2.15 \end{aligned}$$

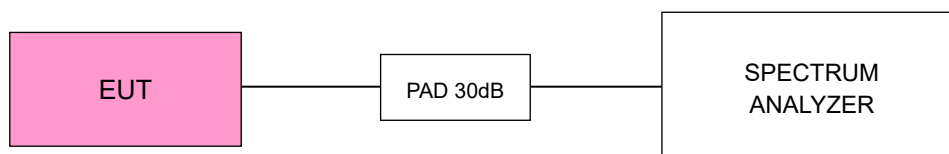
Where ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as PMeas, e.g., dBm or dBW)

PMeas : measured transmitter output power or PSD, in dBm or dBW

GT : gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

4.1.3 Test Setup

Conducted Power Measurement:



4.1.4 Test Results (Mode 1)

Band n66 5MHz (40W)_Ch 439500 (2197.5MHz) + Band n70 5MHz (40W)_Ch 399500 (1997.5MHz)

Channel Number	Freq. (MHz)	QPSK									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 439500	2197.5	38.34	38.62	38.38	38.50	44.48	15	59.48	887.70	1640.00	PASS
n70 399500	1997.5	38.42	38.42	38.37	38.24	44.38	17	61.38	1374.51	1640.00	PASS

Channel Number	Freq. (MHz)	16QAM									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 439500	2197.5	38.78	38.77	38.57	38.69	44.73	15	59.73	938.95	1640.00	PASS
n70 399500	1997.5	38.47	38.65	38.67	38.47	44.58	17	61.58	1440.02	1640.00	PASS

Channel Number	Freq. (MHz)	64QAM									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 439500	2197.5	38.45	38.56	38.31	38.39	44.45	15	59.45	880.50	1640.00	PASS
n70 399500	1997.5	38.37	38.49	38.50	38.38	44.46	17	61.46	1398.38	1640.00	PASS

Channel Number	Freq. (MHz)	256QAM									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 439500	2197.5	38.34	38.45	38.11	38.21	44.30	15	59.30	851.18	1640.00	PASS
n70 399500	1997.5	38.28	38.30	38.26	38.07	44.25	17	61.25	1332.93	1640.00	PASS

4.1.5 Test Results (Mode 2)

Band n66 10MHz (60W) Ch 439000 (2195.0MHz) + Band n70 5MHz (20W) Ch 399500 (1997.5MHz)

Channel Number	Freq. (MHz)	QPSK									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 439000	2195	37.17	37.24	37.01	37.20	43.17	15	58.17	656.82	1640.00	PASS
n70 399500	1997.5	35.36	35.47	35.52	35.18	41.41	17	58.41	692.67	1640.00	PASS

Channel Number	Freq. (MHz)	16QAM									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 439000	2195	37.35	37.53	37.33	37.53	43.46	15	58.46	700.87	1640.00	PASS
n70 399500	1997.5	35.63	35.63	35.70	35.58	41.65	17	58.65	733.59	1640.00	PASS

Channel Number	Freq. (MHz)	64QAM									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 439000	2195	37.20	37.34	36.82	37.24	43.18	15	58.18	657.08	1640.00	PASS
n70 399500	1997.5	35.47	35.44	35.43	35.40	41.45	17	58.45	700.51	1640.00	PASS

Channel Number	Freq. (MHz)	256QAM									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 439000	2195	37.24	37.33	37.06	37.14	43.21	15	58.21	662.87	1640.00	PASS
n70 399500	1997.5	35.27	35.36	35.45	35.26	41.35	17	58.35	684.39	1640.00	PASS

4.1.6 Test Results (Mode 3)

Band n66 20MHz (60W) Ch 438000 (2190.0MHz) + Band n70 20MHz (20W) Ch 401000 (2005.0MHz)

Channel Number	Freq. (MHz)	QPSK									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 438000	2190	34.80	34.84	34.76	34.87	40.84	15	58.85	767.11	1640.00	PASS
n70 401000	2005	30.00	30.06	30.04	30.08	36.07	17	56.08	405.14	1640.00	PASS

Channel Number	Freq. (MHz)	16QAM									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 438000	2190	34.57	34.73	34.58	34.60	40.64	15	58.65	733.06	1640.00	PASS
n70 401000	2005	29.91	29.97	29.78	29.82	35.89	17	55.90	389.18	1640.00	PASS

Channel Number	Freq. (MHz)	64QAM									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 438000	2190	33.91	33.96	33.85	34.03	39.96	15	54.96	313.23	1640.00	PASS
n70 401000	2005	29.16	29.22	29.18	29.21	35.21	17	52.21	166.46	1640.00	PASS

Channel Number	Freq. (MHz)	256QAM									PASS /FAIL
		Conducted Average Power (dBm/MHz)					Gain	EIRP (dBm /MHz)	EIRP (W/MHz)	Limit (W/MHz)	
		Ant. TX 0	Ant. TX 1	Ant. TX 2	Ant. TX 3	Total					
n66 438000	2190	34.05	34.16	34.08	34.11	40.12	15	55.12	325.15	1640.00	PASS
n70 401000	2005	29.14	29.20	29.16	29.18	35.19	17	52.19	165.60	1640.00	PASS

4.2 Emission Bandwidth Measurement

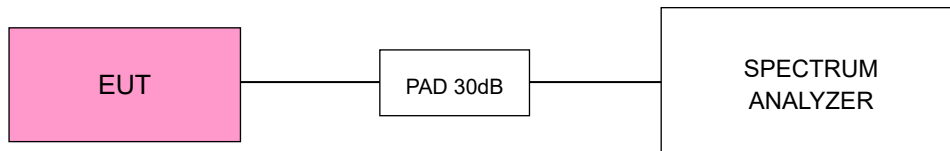
4.2.1 Limits of Emission Bandwidth Measurement

The frequency shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

4.2.2 Test Procedure

All measurements were done at low, middle and high operational frequency range. EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.2.3 Test Setup



4.2.4 Test Results (Mode 3)

Band n66 20MHz (60W) Ch 438000 (2190.0MHz) + Band n70 20MHz (20W) Ch 401000 (2005.0MHz)

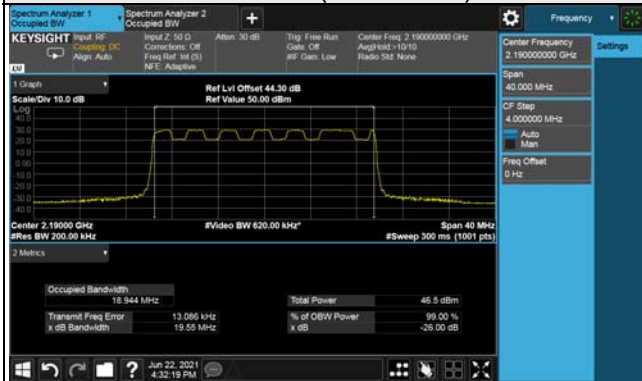
Channel Number	Freq. (MHz)	OCP 99 Bandwidth (MHz)															
		Ant. TX0				Ant. TX1				Ant. TX2				Ant. TX3			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
n66 438000	2190	18.94	18.94	18.90	18.89	18.94	18.94	18.90	18.89	18.94	18.94	18.90	18.89	18.94	18.94	18.90	18.89
n70 401000	2005	18.94	18.94	18.90	18.89	18.94	18.94	18.90	18.89	18.94	18.94	18.90	18.89	18.94	18.94	18.90	18.89
Total		37.88	37.88	37.80	37.78	37.88	37.88	37.80	37.78	37.88	37.88	37.80	37.78	37.88	37.88	37.80	37.78

Ant. TX 0

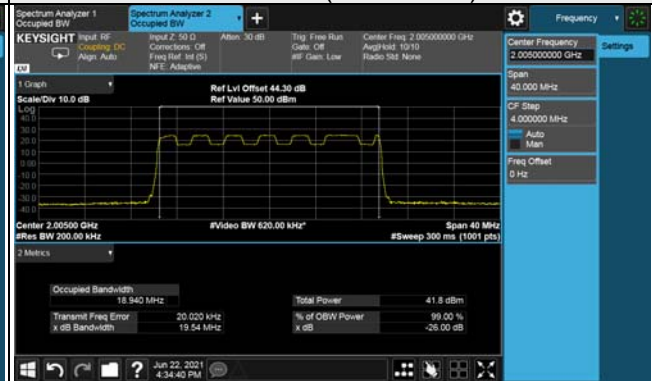
Spectrum Plot of Worst Value

QPSK

Ch 438000 (2190.0MHz)

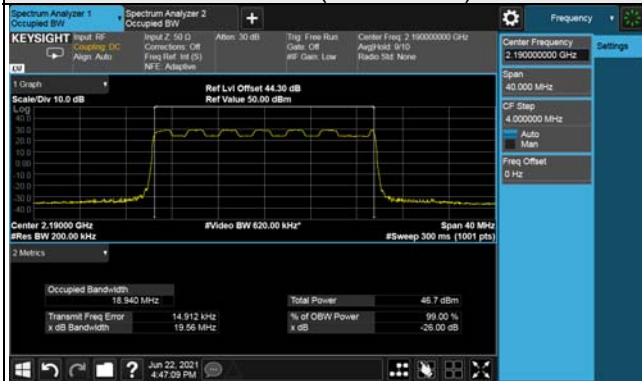


Ch 401000 (2005.0MHz)

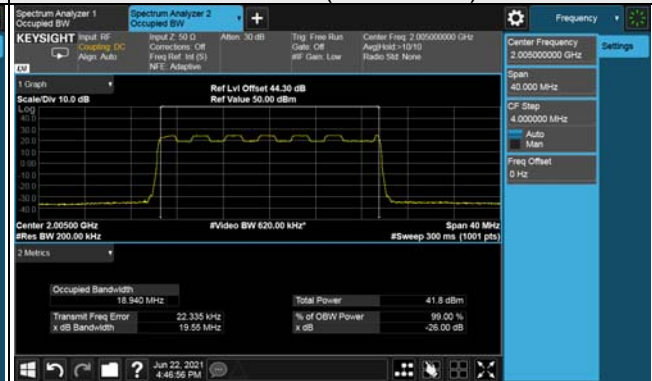


16QAM

Ch 438000 (2190.0MHz)

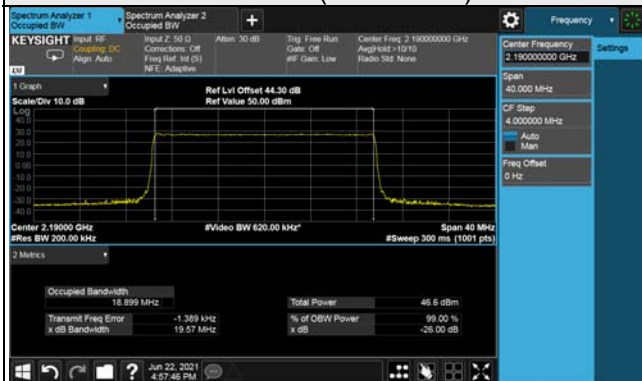


Ch 401000 (2005.0MHz)

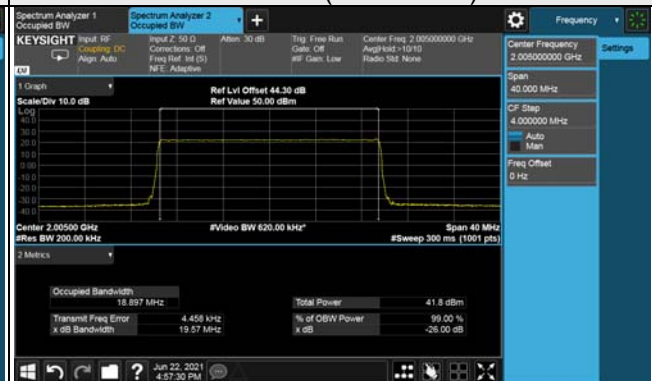


64QAM

Ch 438000 (2190.0MHz)

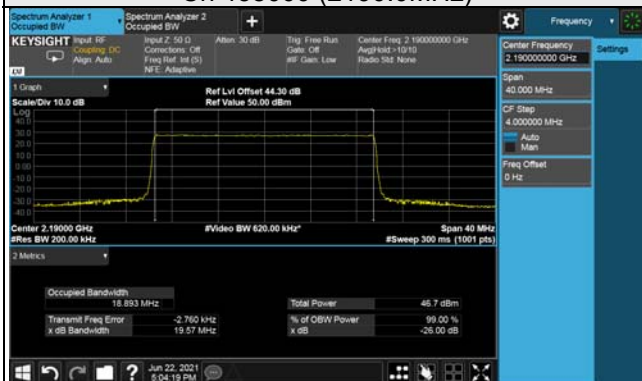


Ch 401000 (2005.0MHz)



256QAM

Ch 438000 (2190.0MHz)



Ch 401000 (2005.0MHz)

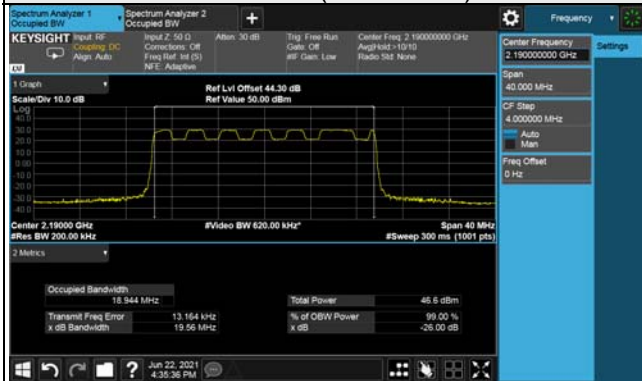


Ant. TX 1

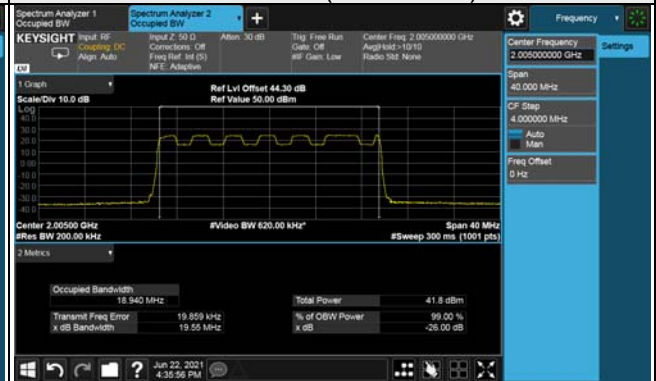
Spectrum Plot of Worst Value

QPSK

Ch 438000 (2190.0MHz)

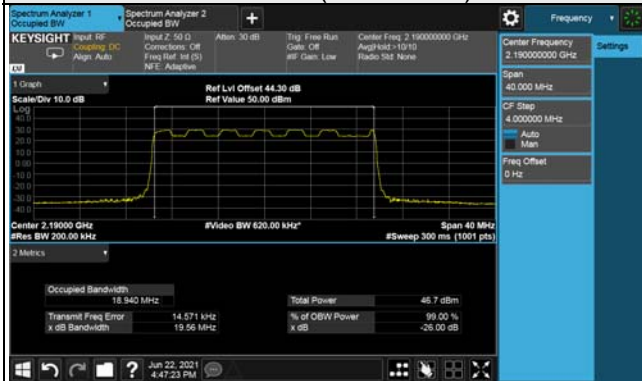


Ch 401000 (2005.0MHz)

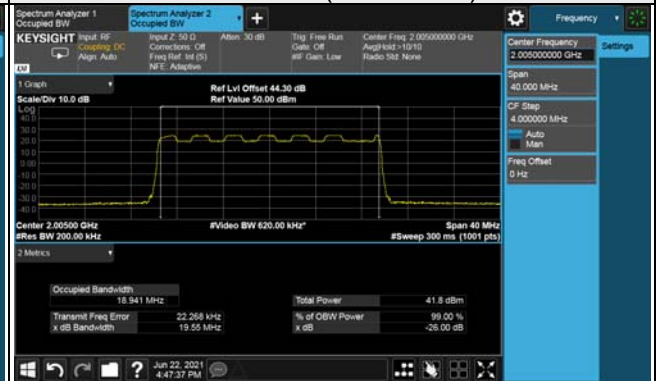


16QAM

Ch 438000 (2190.0MHz)

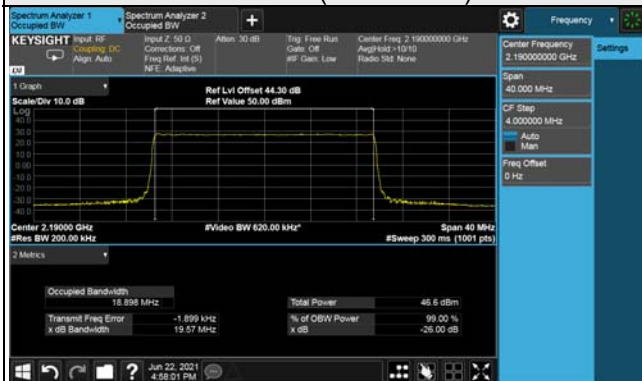


Ch 401000 (2005.0MHz)

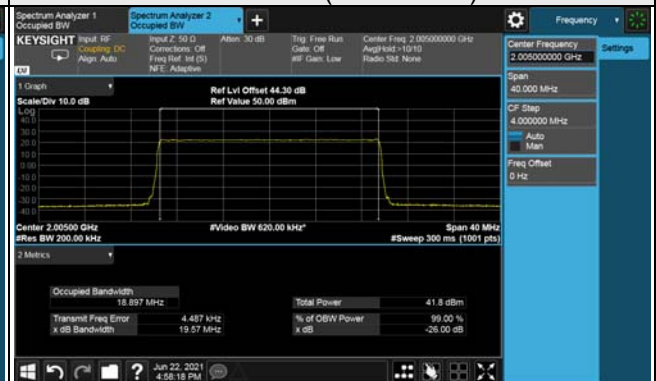


64QAM

Ch 438000 (2190.0MHz)

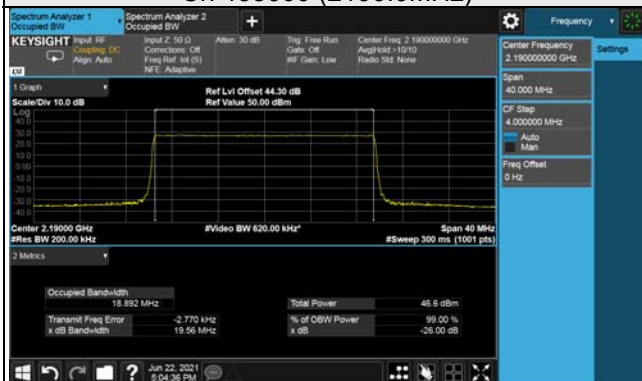


Ch 401000 (2005.0MHz)



256QAM

Ch 438000 (2190.0MHz)



Ch 401000 (2005.0MHz)

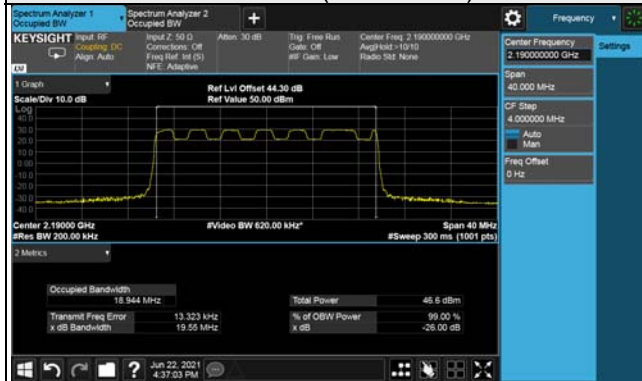


Ant. TX 2

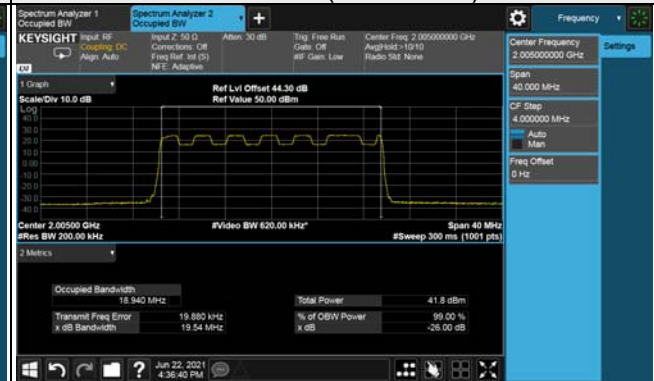
Spectrum Plot of Worst Value

QPSK

Ch 438000 (2190.0MHz)

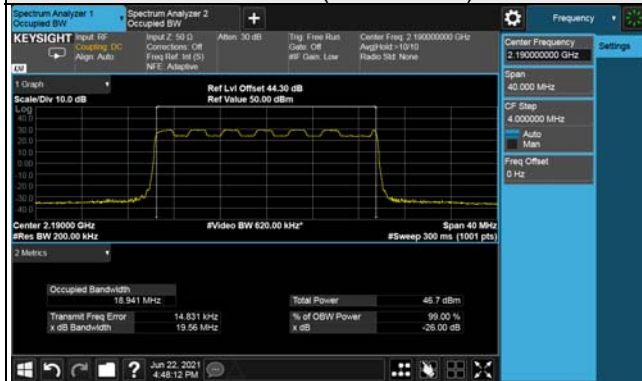


Ch 401000 (2005.0MHz)

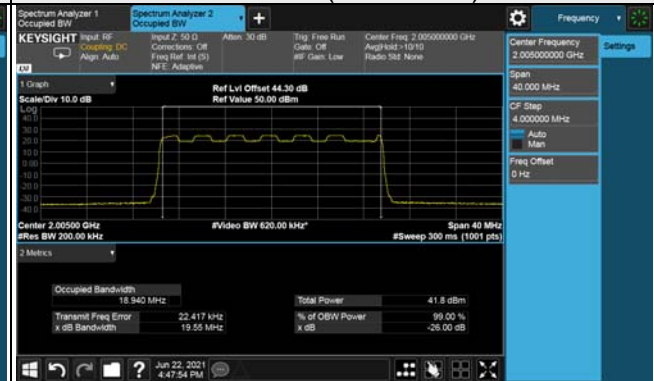


16QAM

Ch 438000 (2190.0MHz)



Ch 401000 (2005.0MHz)

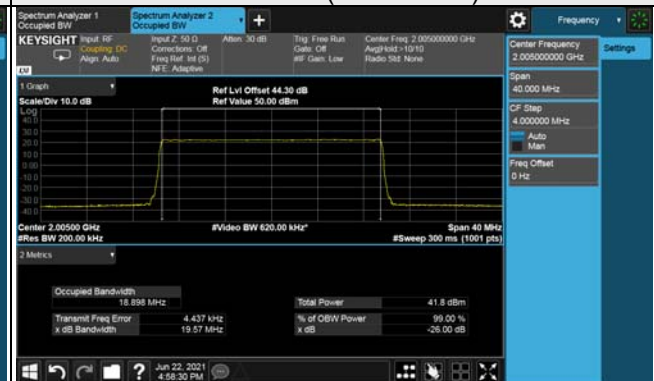


64QAM

Ch 438000 (2190.0MHz)

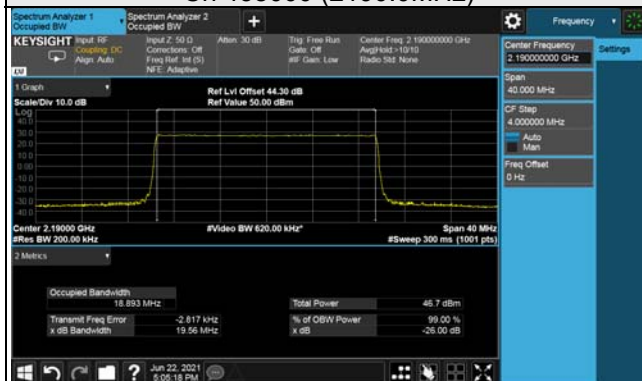


Ch 401000 (2005.0MHz)

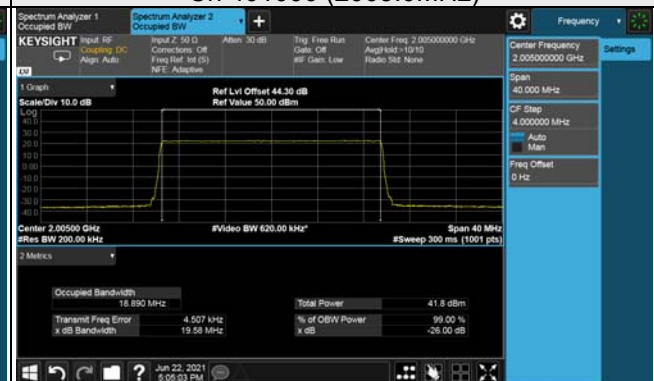


256QAM

Ch 438000 (2190.0MHz)



Ch 401000 (2005.0MHz)



Ant. TX 3

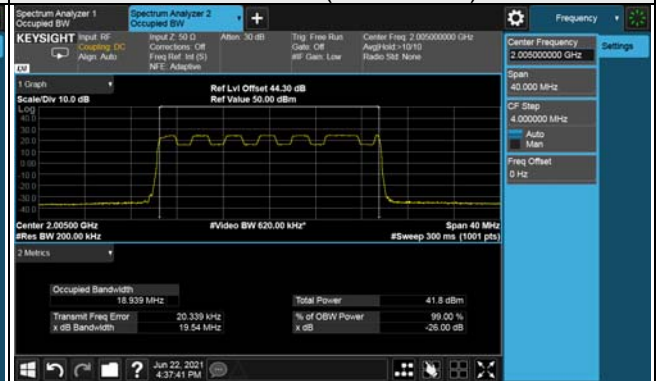
Spectrum Plot of Worst Value

QPSK

Ch 438000 (2190.0MHz)

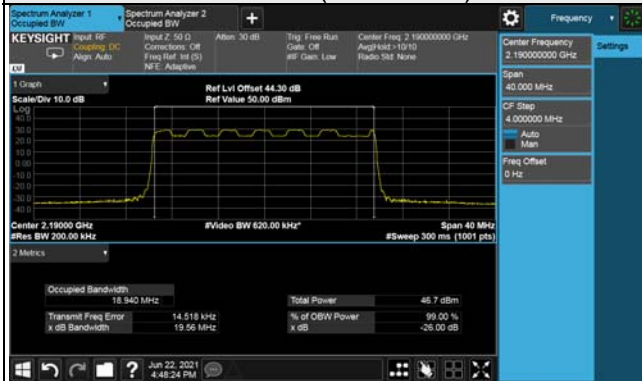


Ch 401000 (2005.0MHz)

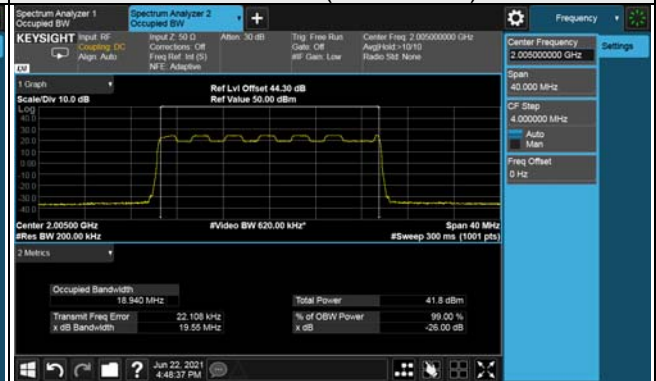


16QAM

Ch 438000 (2190.0MHz)

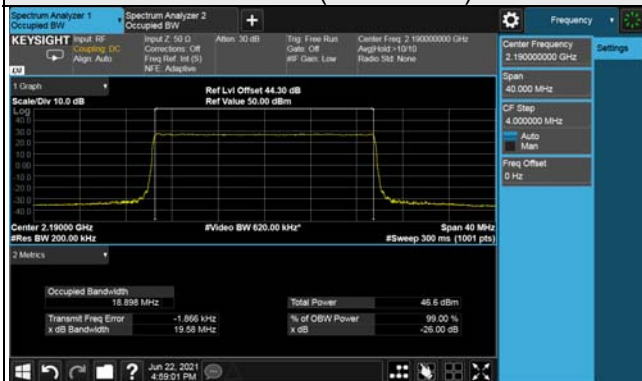


Ch 401000 (2005.0MHz)



64QAM

Ch 438000 (2190.0MHz)

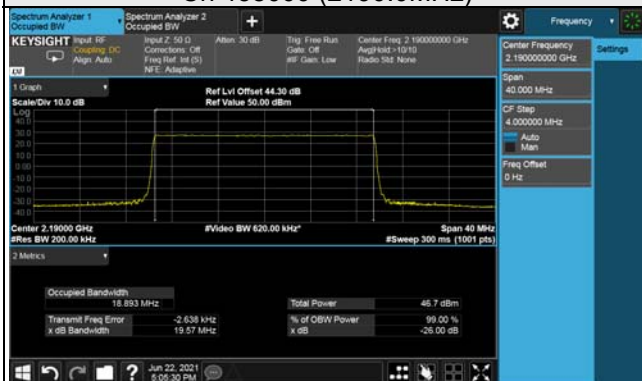


Ch 401000 (2005.0MHz)



256QAM

Ch 438000 (2190.0MHz)



Ch 401000 (2005.0MHz)



4.3 Radiated Emission Measurement

4.3.1 Limits of Radiated Emission Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB. The limit of emission is equal to -13 dBm.

4.3.2 Test Procedure

- a. The field strength was measured with Spectrum Analyzer.
- b. Measurement in the semi-anechoic chamber, EUT placed on the 0.8m/1.5m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor.
- c. Perform a field strength measurement and then mathematically convert the measured field strength level to EIRP level.
- d. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = Read Value (dB μ V/m) + Correction Factor @ 3m

Correction Factor (dB) @ 3m = $20\log(D) - 104.8$; where D is the measurement distance @3m = -95.26dB

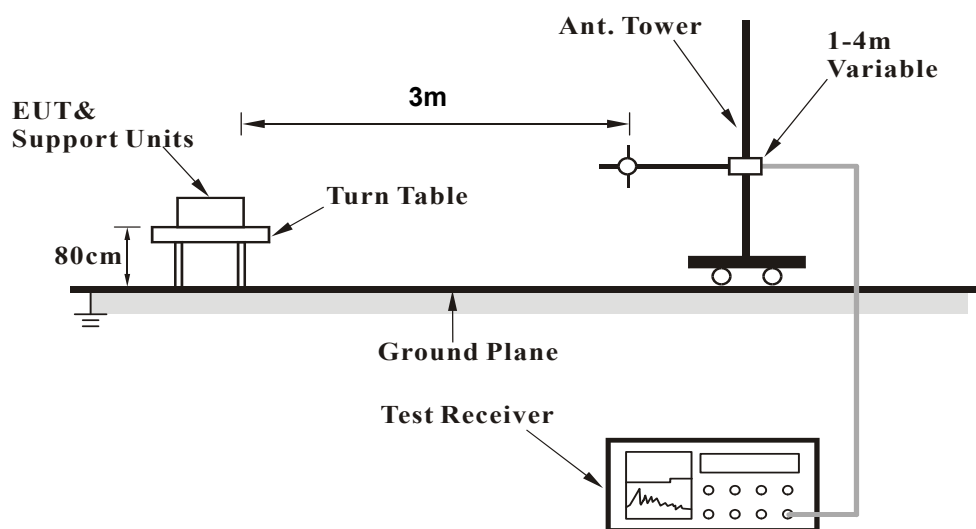
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.3.3 Deviation from Test Standard

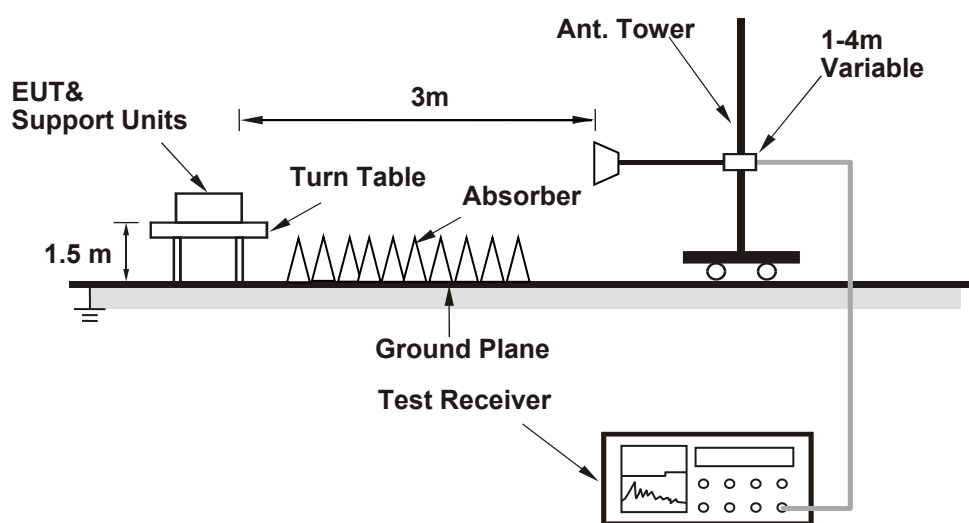
No deviation.

4.3.4 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.3.5 Test Results (Mode 1)

Below 1GHz

Test Frequency	2197.5MHz+1997.5MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	30.87	-65.90	-13.00	-52.90	1.50 H	231	38.85	-104.75
2	109.40	-72.84	-13.00	-59.84	1.50 H	124	33.20	-106.04
3	148.84	-71.33	-13.00	-58.33	2.00 H	29	31.55	-102.88
4	196.46	-68.92	-13.00	-55.92	1.50 H	247	36.87	-105.79
5	311.04	-71.26	-13.00	-58.26	2.00 H	229	30.09	-101.35
6	485.76	-67.69	-13.00	-54.69	2.00 H	81	29.00	-96.69

Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	30.53	-63.38	-13.00	-50.38	1.00 V	47	41.28	-104.66
2	47.85	-66.43	-13.00	-53.43	1.00 V	78	36.92	-103.35
3	106.47	-70.16	-13.00	-57.16	1.00 V	36	36.27	-106.43
4	158.98	-69.75	-13.00	-56.75	1.00 V	154	33.08	-102.83
5	197.76	-72.82	-13.00	-59.82	1.50 V	68	32.98	-105.80
6	379.54	-68.39	-13.00	-55.39	1.00 V	332	31.20	-99.59

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = Reading (dBuV/m) + Correction Factor @ 3m
2. Correction Factor (dB) = $20\log(D) - 104.8$; where D is the measurement distance @3m

Above 1GHz

Test Frequency	2197.5MHz+1997.5MHz	Frequency Range	1GHz ~ 30GHz
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	4195.00	-63.65	-13.00	-50.65	1.50 H	129	29.37	-93.02
2	5243.75	-63.35	-13.00	-50.35	2.00 H	45	27.49	-90.84
3	6292.50	-63.70	-13.00	-50.70	1.50 H	311	25.45	-89.15
4	7341.25	-63.11	-13.00	-50.11	1.50 H	172	22.31	-85.42
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	4195.00	-63.40	-13.00	-50.40	1.50 V	129	29.62	-93.02
2	5243.75	-62.74	-13.00	-49.74	1.50 V	261	28.10	-90.84
3	6292.50	-62.51	-13.00	-49.51	1.50 V	223	26.64	-89.15
4	7341.25	-62.90	-13.00	-49.90	1.00 V	84	22.52	-85.42

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = Reading (dBuV/m) + Correction Factor @ 3m
2. Correction Factor (dB) = $20\log(D) - 104.8$; where D is the measurement distance @3m

4.3.6 Test Results (Mode 2)

Below 1GHz

Test Frequency	2195.0MHz+1997.5MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	30.97	-65.97	-13.00	-52.97	2.00 H	134	38.80	-104.77
2	108.91	-72.75	-13.00	-59.75	2.00 H	12	33.32	-106.07
3	148.36	-71.09	-13.00	-58.09	1.50 H	58	31.81	-102.90
4	196.11	-68.91	-13.00	-55.91	1.50 H	73	36.87	-105.78
5	310.58	-71.26	-13.00	-58.26	1.50 H	86	30.11	-101.37
6	485.58	-67.22	-13.00	-54.22	2.00 H	66	29.48	-96.70
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	30.54	-63.52	-13.00	-50.52	1.50 V	134	41.14	-104.66
2	47.46	-66.65	-13.00	-53.65	1.00 V	83	36.74	-103.39
3	106.04	-69.90	-13.00	-56.90	1.00 V	79	36.62	-106.52
4	158.87	-69.55	-13.00	-56.55	1.00 V	334	33.29	-102.84
5	197.31	-73.09	-13.00	-60.09	1.00 V	52	32.71	-105.80
6	379.87	-68.83	-13.00	-55.83	1.00 V	44	30.75	-99.58

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = Reading (dBuV/m) + Correction Factor @ 3m
2. Correction Factor (dB) = $20\log(D) - 104.8$; where D is the measurement distance @3m

Above 1GHz

Test Frequency	2195.0MHz+1997.5MHz	Frequency Range	1GHz ~ 30GHz
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	4192.50	-63.73	-13.00	-50.73	1.50 H	81	29.29	-93.02
2	5240.63	-63.19	-13.00	-50.19	1.50 H	73	27.65	-90.84
3	6288.75	-63.20	-13.00	-50.20	1.50 H	122	25.97	-89.17
4	7336.88	-63.38	-13.00	-50.38	1.50 H	292	22.06	-85.44
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	4192.50	-63.37	-13.00	-50.37	1.50 V	267	29.65	-93.02
2	5240.63	-62.84	-13.00	-49.84	1.00 V	49	28.00	-90.84
3	6288.75	-62.48	-13.00	-49.48	1.50 V	314	26.69	-89.17
4	7336.88	-62.87	-13.00	-49.87	1.50 V	103	22.57	-85.44

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = Reading (dBuV/m) + Correction Factor @ 3m
2. Correction Factor (dB) = $20\log(D) - 104.8$; where D is the measurement distance @3m

4.3.7 Test Results (Mode 3)

Below 1GHz

Test Frequency	2190.0MHz+2005.0MHz	Frequency Range	Below 1000 MHz
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Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	30.91	-65.42	-13.00	-52.42	1.00 H	132	39.34	-104.76
2	106.55	-69.84	-13.00	-56.84	1.00 H	175	36.57	-106.41
3	148.96	-71.36	-13.00	-58.36	1.50 H	145	31.51	-102.87
4	196.28	-69.22	-13.00	-56.22	1.50 H	86	36.57	-105.79
5	310.65	-71.44	-13.00	-58.44	1.50 H	42	29.92	-101.36
6	485.70	-67.21	-13.00	-54.21	1.00 H	68	29.49	-96.70
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	30.78	-63.17	-13.00	-50.17	1.50 V	162	41.55	-104.72
2	47.72	-66.03	-13.00	-53.03	1.50 V	76	37.33	-103.36
3	106.41	-70.61	-13.00	-57.61	1.00 V	218	35.84	-106.45
4	158.88	-69.68	-13.00	-56.68	1.50 V	128	33.16	-102.84
5	197.53	-72.50	-13.00	-59.50	1.00 V	242	33.30	-105.80
6	379.69	-68.48	-13.00	-55.48	1.50 V	124	31.10	-99.58

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = Reading (dBuV/m) + Correction Factor @ 3m
2. Correction Factor (dB) = $20\log(D) - 104.8$; where D is the measurement distance @3m

Above 1GHz

Test Frequency	2190.0MHz+2005.0MHz	Frequency Range	1GHz ~ 30GHz
----------------	---------------------	-----------------	--------------

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	4195.00	-63.47	-13.00	-50.47	1.50 H	165	29.55	-93.02
2	6292.50	-62.95	-13.00	-49.95	1.50 H	302	26.20	-89.15
3	8355.00	-62.51	-13.00	-49.51	1.50 H	186	22.75	-85.26
4	10487.50	-62.61	-13.00	-49.61	1.50 H	213	18.89	-81.50
Antenna Polarity & Test Distance : Vertical at 3m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	4195.00	-63.28	-13.00	-50.28	1.50 V	188	29.74	-93.02
2	6292.50	-62.72	-13.00	-49.72	1.50 V	225	26.43	-89.15
3	8355.00	-62.29	-13.00	-49.29	1.50 V	142	22.97	-85.26
4	10487.50	-62.83	-13.00	-49.83	1.50 V	64	18.67	-81.50

Remarks:

1. Follow ANSI 63.26 section 5.2.7 d), Emission Value (dBm) = Reading (dBuV/m) + Correction Factor @ 3m
2. Correction Factor (dB) = $20\log(D) - 104.8$; where D is the measurement distance @3m

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

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Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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