

FCC Test Report

(PART 22)

Report No.: RF200605C24-11

FCC ID: V65E7110

Test Model: E7110

Received Date: Jun. 29, 2020

Test Date: Aug. 11 ~ Aug. 29, 2020

Issued Date: Nov. 17, 2020

Applicant: Kyocera Corporation % Kyocera International, Inc.

Address: 8611 Balboa Avenue, San Diego, CA 92123

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

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

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

**FCC Registration /
Designation Number:** 788550 / TW0003



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results.....	6
2.1 Measurement Uncertainty.....	6
2.2 Test Site and Instruments	7
3 General Information	8
3.1 General Description of EUT	8
3.2 Configuration of System under Test.....	9
3.2.1 Description of Support Units	9
3.3 Test Mode Applicability and Tested Channel Detail	10
3.4 EUT Operating Conditions	13
3.5 General Description of Applied Standards and references.....	13
4 Test Types and Results	14
4.1 Output Power Measurement.....	14
4.1.1 Limits of Output Power Measurement	14
4.1.2 Test Procedures.....	14
4.1.3 Test Setup.....	14
4.1.4 Test Results	16
4.2 Modulation Characteristics Measurement	30
4.2.1 Limits of Modulation Characteristics	30
4.2.2 Test Setup.....	30
4.2.3 Test Procedure	30
4.2.4 Test Results	31
4.3 Frequency Stability Measurement	32
4.3.1 Limits of Frequency Stability Measurement	32
4.3.2 Test Procedure	32
4.3.3 Test Setup.....	32
4.3.4 Test Results	33
4.4 Occupied Bandwidth Measurement.....	37
4.4.1 Test Procedure	37
4.4.2 Test Setup.....	37
4.4.3 Test Result.....	38
4.5 Band Edge Measurement	42
4.5.1 Limits of Band Edge Measurement	42
4.5.2 Test Setup.....	42
4.5.3 Test Procedures.....	42
4.5.4 Test Results	43
4.6 Peak to Average Ratio	47
4.6.1 Limits of Peak to Average Ratio Measurement	47
4.6.2 Test Setup.....	47
4.6.3 Test Procedures.....	47
4.6.4 Test Results	48
4.7 Conducted Spurious Emissions	50
4.7.1 Limits of Conducted Spurious Emissions Measurement	50
4.7.2 Test Setup.....	50
4.7.3 Test Procedure	50
4.7.4 Test Results	51
4.8 Radiated Emission Measurement.....	55
4.8.1 Limits of Radiated Emission Measurement	55
4.8.2 Test Procedure	55
4.8.3 Deviation from Test Standard	55
4.8.4 Test Setup.....	56
4.8.5 Test Results	57

5 Pictures of Test Arrangements.....	67
Appendix – Information of the Testing Laboratories	68

Release Control Record

Issue No.	Description	Date Issued
RF200605C24-11	Original Release	Nov. 17, 2020

1 Certificate of Conformity

Product: Smart Phone

Brand: Kyocera

Test Model: E7110

Sample Status: Identical Prototype

Applicant: Kyocera Corporation % Kyocera International, Inc.

Test Date: Aug. 11 ~ Aug. 29, 2020

Standards: FCC Part 22, Subpart H

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 : Gina Liu, **Date:** Nov. 17, 2020
Gina Liu / Specialist

Approved by : Dylan Chiou, **Date:** Nov. 17, 2020
Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 22 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 22.913 (a)	Effective Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
22.913 (d)	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1055 22.355	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
22.917	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 22.917	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 22.917	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -20.2 dB at 51.34 MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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) (±)
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	3.63 dB
	200 MHz ~ 1000 MHz	3.64 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.29 dB
	18 GHz ~ 40 GHz	2.29 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Dec. 31, 2019	Dec. 30, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 23, 2019	Sep. 22, 2020
Spectrum Analyzer KEYSIGHT	N9030B	MY57140953	Jul. 02, 2020	Jul. 01, 2021
Radio Communication Analyzer Anritsu	MT8000A	6262012865	Dec. 12, 2019	Dec. 11, 2020
MXG Vector signal generator Agilent	N5182B	MY53050162	Jan. 14, 2020	Jan. 13, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-158	Nov. 08, 2019	Nov. 07, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Nov. 11, 2019	Nov. 10, 2020
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10631	Jun. 08, 2020	Jun. 07, 2021
Preamplifier KEYSIGHT (Above 1GHz)	83017A	MY53270295	Jun. 08, 2020	Jun. 07, 2021
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH4-01	Aug. 16, 2020	Aug. 15, 2021
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	Aug. 16, 2020	Aug. 15, 2021
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Jun. 08, 2020	Jun. 07, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Jun. 08, 2020	Jun. 07, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Standard Temperature And Humidity Chamber	MHU-225AU	920842	May 28, 2020	May 27, 2021
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	Jun. 06, 2020	Jun. 05, 2021

- 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 HwaYa Chamber 4.

3 General Information

3.1 General Description of EUT

Product	Smart Phone	
Brand	Kyocera	
Test Model	E7110	
Status of EUT	Identical Prototype	
Power Supply Rating	3.85 Vdc (Battery) 5 Vdc / 9 Vdc / 12 Vdc (Adapter)	
Modulation Type	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	
Waveform Type	CP-OFDM, DFT-s-OFDM	
Frequency Range	n5 (Channel Bandwidth 5MHz)	826.5~846.5MHz
	n5 (Channel Bandwidth 10MHz)	829.0~844.0MHz
	n5 (Channel Bandwidth 15MHz)	831.5~841.5MHz
	n5 (Channel Bandwidth 20MHz)	834.0~839.0MHz
Max. ERP Power	n5 (Channel Bandwidth 5MHz)	83.176 mW (19.2 dBm)
	n5 (Channel Bandwidth 10MHz)	87.096 mW (19.4 dBm)
	n5 (Channel Bandwidth 15MHz)	89.125 mW (19.5 dBm)
	n5 (Channel Bandwidth 20MHz)	87.096 mW (19.4 dBm)
Emission Designator	n5 (Channel Bandwidth 5MHz)	4M50G7D
	n5 (Channel Bandwidth 10MHz)	9M25D7W
	n5 (Channel Bandwidth 15MHz)	14M1D7W
	n5 (Channel Bandwidth 20MHz)	18M8G7D
Antenna Type	Monopole Antenna with -3.0 dBi gain	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

1. The EUT contains following accessory devices.

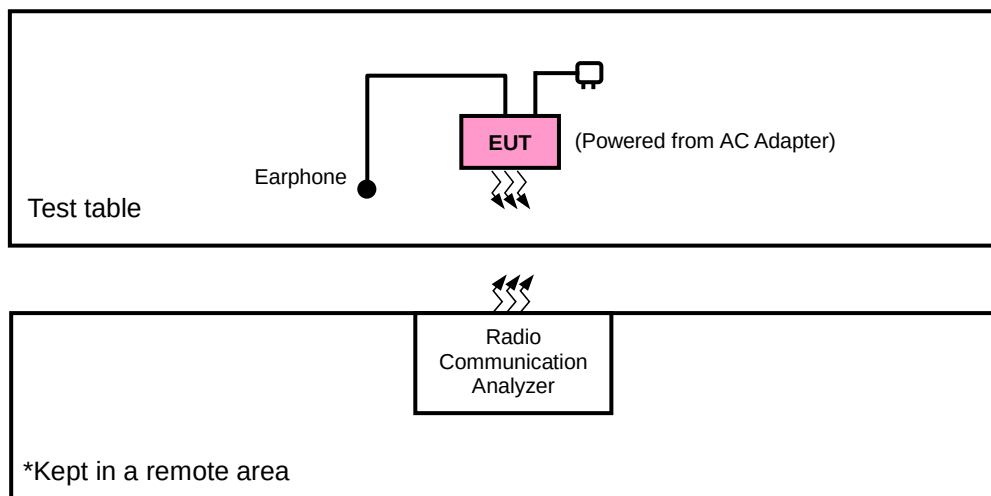
Product	Brand	Model	Description
Adapter	Kyocera	SCP-53ADT	I/P: 100-240 Vac, 50/60 Hz, 0.6 A O/P: 5 Vdc, 3 A; 9 Vdc, 3 A; 15 Vdc, 1.8 A; 20 Vdc, 1.35 A
USB Cable	Kyocera	SCP-27SDC	-

2. 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.
3. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.
4. The EUT support the following ENDC Configuration.

FCC 5G FR1			ENDC
Band	SCS	Bandwidth(MHz)	
n5	15kHz	5/10/15/20	Band 2/66
n2	15kHz	5/10/15/20	Band 5/13
n66	15kHz	5/10/15/20	Band 5/13

5. The LTE Band of 5GNR ENDC mode is similar to digital modulation in LTE single frequency band, only check LTE power, other LTE test data please refer to BV CPS report no.: RF200605C24-7 & RF200605C24-8.

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.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports.

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	ERP	Radiated Emission
n5	X-plane	X-axis

n5

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	165300 to 169300	165300(826.5MHz), 167300(836.5MHz), 169300(846.5MHz)	5 MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	3 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 167300(836.5MHz), 168800(844.0MHz)	10 MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 167300(836.5MHz), 168300(841.5MHz)	15 MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167300(836.5MHz), 167800(839.0MHz)	20 MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	166800 to 167800	167300 (836.5MHz)	20 MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	106 RB / 0 RB Offset
-	Frequency Stability	165300 to 169300	165300(826.5MHz), 169300(846.5MHz)	5 MHz	$\pi/2$ BPSK	12 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 168800(844.0MHz)	10 MHz	$\pi/2$ BPSK	26 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 168300(841.5MHz)	15 MHz	$\pi/2$ BPSK	39 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167800(839.0MHz)	20 MHz	$\pi/2$ BPSK	50 RB / 0 RB Offset
-	Occupied Bandwidth	165300 to 169300	165300(826.5MHz), 167300(836.5MHz), 169300(846.5MHz)	5 MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	12 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 167300(836.5MHz), 168800(844.0MHz)	10 MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	26 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 167300(836.5MHz), 168300(841.5MHz)	15 MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	39 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167300(836.5MHz), 167800(839.0MHz)	20 MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	165300 to 169300	165300(826.5MHz) 169300(846.5MHz)	5 MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
						1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz) 168800(844.0MHz)	10 MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
						1 RB / 51 RB Offset
						52 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 168300(841.5MHz)	15 MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
						1 RB / 78 RB Offset
						79 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167800(839.0MHz)	20 MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
						1 RB / 105 RB Offset
						106 RB / 0 RB Offset
-	Peak to Average Ratio	165300 to 169300	165300(826.5MHz), 167300(836.5MHz), 169300(846.5MHz)	5MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 167300(836.5MHz), 168800(844.0MHz)	10MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 167300(836.5MHz), 168300(841.5MHz)	15MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167300(836.5MHz), 167800(839.0MHz)	20MHz	$\pi/2$ BPSK, QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Conducted Emission	165300 to 169300	165300(826.5MHz), 167300(836.5MHz), 169300(846.5MHz)	5MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 167300(836.5MHz), 168800(844.0MHz)	10MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 167300(836.5MHz), 168300(841.5MHz)	15MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167300(836.5MHz), 167800(839.0MHz)	20MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
-	Radiated Emission	165300 to 169300	165300(826.5MHz), 167300(836.5MHz), 169300(846.5MHz)	5MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		165800 to 168800	165800(829.0MHz), 167300(836.5MHz), 168800(844.0MHz)	10MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		166300 to 168300	166300(831.5MHz), 167300(836.5MHz), 168300(841.5MHz)	15MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset
		166800 to 167800	166800(834.0MHz), 167300(836.5MHz), 167800(839.0MHz)	20MHz	$\pi/2$ BPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in $\pi/2$ BPSK modulation. Therefore, only ERP, modulation characteristics, occupied bandwidth and peak to average ratio items had been tested under $\pi/2$ BPSK, QPSK, 16QAM, 64QAM mode, the other items were performed under $\pi/2$ BPSK mode only.

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP	25 deg. C, 70 % RH	120 Vac, 60 Hz	Noah Chang
Modulation Characteristics	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
Frequency Stability	25 deg. C, 65 % RH	3.85Vdc	Getaz Yang
Occupied Bandwidth	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
Band Edge	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
Peak to Average Ratio	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
Conducted Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Getaz Yang
Radiated Emission	25 deg. C, 70 % RH	120 Vac, 60 Hz	Noah Chang

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency.

3.5 General Description of Applied Standards and references

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

Test Standard:

FCC 47 CFR Part 2

FCC 47 CFR Part 22

ANSI 63.26-2015

Note: 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

ANSI/TIA/EIA-603-E 2016

Note: All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 7 watts e.r.p.

4.1.2 Test Procedures

EIRP / ERP Measurement:

- a. All measurements were done at low, middle and high operational frequency range. RBW is 1 MHz for 5 MHz 、 10 MHz 、 15 MHz 、 20 MHz for n5 mode, and VBW $\geq 3 \times$ RBW.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15 dB.

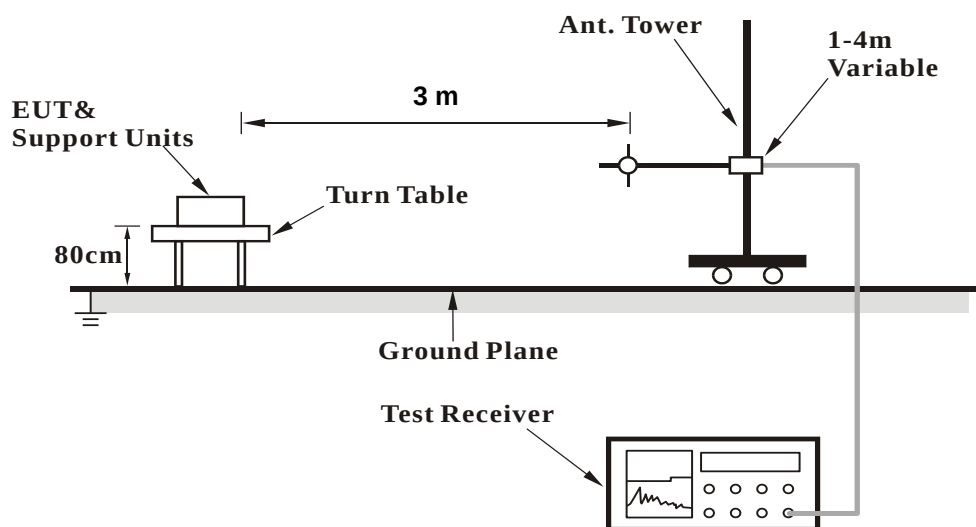
Conducted Power Measurement:

The EUT was set up for the maximum power with 5GNR link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

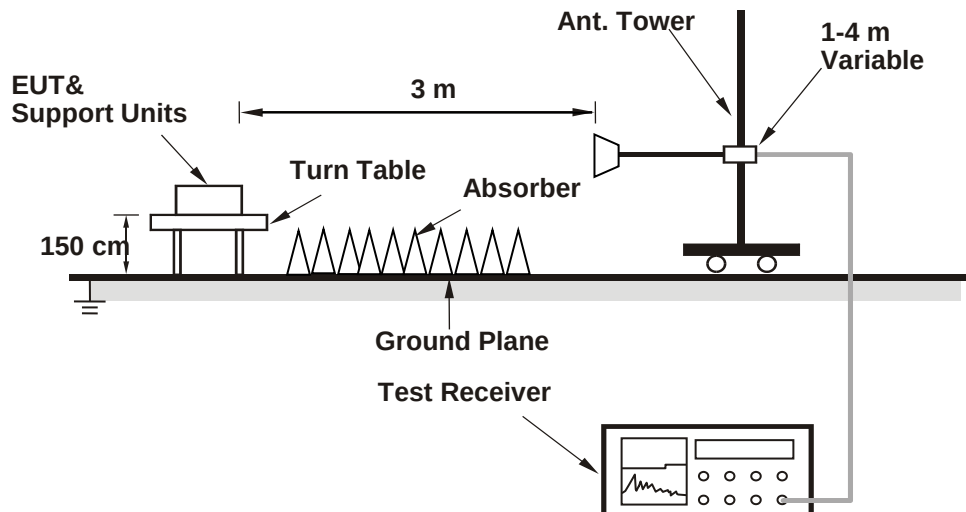
4.1.3 Test Setup

EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

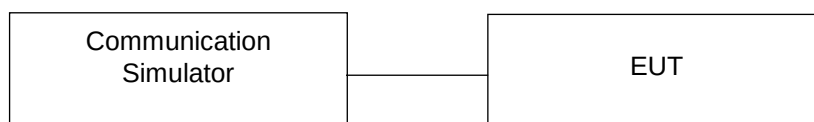


<Radiated Emission above 1 GHz>



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

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		165300	167300	169300
		Frequency (MHz)		826.5	836.5	846.5
5M	DFT-S $\pi/2$ BPSK	1	1	24.83	24.90	24.87
		1	13	24.64	24.70	24.59
		1	23	24.61	24.60	24.51
		12	0	24.31	24.34	24.26
		12	6	24.70	24.78	24.66
		12	13	24.21	24.28	24.24
		25	0	24.13	24.19	24.08
	DFT-S QPSK	1	1	24.88	24.91	24.80
		1	13	24.61	24.71	24.61
		1	23	24.53	24.54	24.49
		12	0	23.85	23.89	23.81
		12	6	24.73	24.73	24.71
		12	13	23.61	23.71	23.59
		25	0	23.81	23.81	23.81
	DFT-S 16QAM	1	1	23.72	23.75	23.79
	DFT-S 64QAM	1	1	22.25	22.30	22.18
	CP QPSK	1	1	23.33	23.40	23.27
	CP 16QAM	1	1	22.99	23.06	23.03
	CP 64QAM	1	1	21.24	21.37	21.31

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		165800	167300	168800
		Frequency (MHz)		829.0	836.5	844.0
10M	DFT-S $\pi/2$ BPSK	1	1	24.81	24.90	24.78
		1	26	24.62	24.69	24.65
		1	50	24.59	24.60	24.56
		25	0	24.26	24.27	24.22
		25	12	24.64	24.68	24.63
		25	26	24.25	24.29	24.22
		50	0	24.14	24.13	24.14
	DFT-S QPSK	1	1	24.88	24.87	24.84
		1	26	24.64	24.66	24.61
		1	50	24.46	24.57	24.50
		25	0	23.82	23.79	23.78
		25	12	24.79	24.79	24.77
		25	26	23.62	23.67	23.67
		50	0	23.76	23.87	23.82
	DFT-S 16QAM	1	1	23.74	23.79	23.79
	DFT-S 64QAM	1	1	22.27	22.34	22.19
	CP QPSK	1	1	23.28	23.34	23.27
	CP 16QAM	1	1	23.03	23.09	22.99
	CP 64QAM	1	1	21.32	21.27	21.30

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		166300	167300	168300
		Frequency (MHz)		831.5	836.5	841.5
15M	DFT-S $\pi/2$ BPSK	1	1	24.84	24.84	24.85
		1	40	24.57	24.64	24.55
		1	77	24.58	24.64	24.59
		36	0	24.26	24.26	24.23
		36	18	24.72	24.74	24.71
		36	40	24.27	24.25	24.19
		75	0	24.15	24.22	24.11
	DFT-S QPSK	1	1	24.85	24.86	24.86
		1	40	24.61	24.67	24.59
		1	77	24.43	24.52	24.50
		36	0	23.80	23.81	23.75
		36	18	24.74	24.78	24.72
		36	40	23.68	23.65	23.58
		75	0	23.80	23.79	23.76
	DFT-S 16QAM	1	1	23.78	23.81	23.74
	DFT-S 64QAM	1	1	22.21	22.33	22.23
	CP QPSK	1	1	23.29	23.37	23.30
	CP 16QAM	1	1	22.96	23.04	23.01
	CP 64QAM	1	1	21.27	21.31	21.31

n5						
BW	MCS Index	RB Size	RB Offset	Low	Mid	High
		Channel		166800	167300	167800
		Frequency (MHz)		834	836.5	839
20M	DFT-S $\pi/2$ BPSK	1	1	24.89	24.93	24.87
		1	53	24.67	24.71	24.65
		1	104	24.63	24.67	24.61
		50	0	24.32	24.36	24.30
		50	25	24.74	24.78	24.72
		50	53	24.30	24.34	24.28
		100	0	24.19	24.23	24.17
	DFT-S QPSK	1	1	24.92	24.96	24.90
		1	53	24.67	24.71	24.65
		1	104	24.53	24.57	24.51
		50	0	23.85	23.89	23.83
		50	25	24.79	24.83	24.77
		50	53	23.69	23.73	23.67
		100	0	23.84	23.88	23.82
	DFT-S 16QAM	1	1	23.81	23.85	23.79
	DFT-S 64QAM	1	1	22.30	22.34	22.28
	CP QPSK	1	1	23.38	23.42	23.36
	CP 16QAM	1	1	23.05	23.09	23.03
	CP 64QAM	1	1	21.33	21.37	21.31

LTE Band 2															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		18700	18900	19100				Channel		18675	18900	19125	
		Frequency (MHz)		1860.0	1880.0	1900.0				Frequency (MHz)		1857.5	1880.0	1902.5	
20M	QPSK	1	0	22.09	21.93	21.77	0	15M	QPSK	1	0	22.00	21.95	21.77	0
		1	50	22.00	21.96	21.69	0			1	37	22.01	21.98	21.65	0
		1	99	22.05	21.98	21.52	0			1	74	21.92	21.93	21.51	0
		50	0	21.01	20.99	20.85	1			36	0	21.02	20.96	20.84	1
		50	25	20.97	20.94	20.82	1			36	19	21.03	20.98	20.77	1
		50	50	21.03	20.92	20.77	1			36	39	20.96	21.04	20.64	1
	16QAM	100	0	21.00	20.93	20.84	1			75	0	20.88	20.88	20.73	1
		1	0	21.04	20.92	20.91	1		16QAM	1	0	20.96	20.98	20.88	1
		1	50	20.90	20.96	20.77	1			1	37	21.02	20.99	20.72	1
		1	99	21.03	21.06	20.69	1			1	74	20.84	21.05	20.69	1
		50	0	20.08	19.98	19.64	2			36	0	19.88	19.92	19.53	2
		50	25	19.98	19.82	19.68	2			36	19	19.94	19.99	19.66	2
	64QAM	50	50	19.83	19.90	19.65	2			36	39	20.03	19.98	19.57	2
		100	0	20.05	19.91	19.66	2			75	0	20.00	19.86	19.70	2
		1	0	19.96	19.99	20.08	2		64QAM	1	0	20.00	19.97	20.02	2
		1	50	20.04	19.89	19.76	2			1	37	19.91	19.86	19.77	2
		1	99	19.95	19.85	19.68	2			1	74	20.03	19.98	19.65	2
		50	0	19.01	18.96	18.89	3			36	0	19.02	19.01	18.97	3
		50	25	18.97	18.90	18.85	3			36	19	18.98	18.94	18.96	3
		50	50	18.99	18.96	18.83	3			36	39	18.84	18.93	18.88	3
		100	0	18.98	18.89	18.85	3			75	0	18.90	18.92	18.98	3
10M	QPSK	1	0	21.99	21.85	21.69	0	5M	QPSK	1	0	22.01	21.98	21.55	0
		1	24	21.97	21.88	21.58	0			1	12	22.02	21.98	21.57	0
		1	49	21.90	21.84	21.45	0			1	24	22.04	21.85	21.42	0
		25	0	20.97	20.94	20.65	1			12	0	20.95	20.82	20.66	1
		25	12	21.01	21.00	20.65	1			12	6	20.87	21.02	20.56	1
		25	25	21.02	20.96	20.69	1			12	13	20.85	21.03	20.61	1
	16QAM	50	0	21.04	21.03	20.73	1			25	0	21.04	20.89	20.71	1
		1	0	20.99	20.95	20.79	1		16QAM	1	0	20.86	21.04	20.74	1
		1	24	20.93	20.99	20.55	1			1	12	20.99	20.87	20.61	1
		1	49	20.99	21.02	20.51	1			1	24	20.86	20.97	20.57	1
		25	0	19.69	19.89	19.56	2			12	0	19.89	19.73	19.49	2
		25	12	20.05	19.97	19.71	2			12	6	19.86	19.97	19.57	2
	64QAM	25	25	20.01	19.89	19.49	2			12	13	19.97	19.71	19.45	2
		50	0	19.91	19.71	19.48	2			25	0	19.84	19.70	19.47	2
		1	0	20.02	20.08	19.94	2		64QAM	1	0	20.02	19.97	20.00	2
		1	24	19.89	19.79	19.70	2			1	12	19.83	19.75	19.61	2
		1	49	19.97	19.88	19.54	2			1	24	19.99	19.97	19.56	2
		25	0	18.89	18.95	19.01	3			12	0	18.96	18.87	18.92	3
		25	12	19.04	19.04	19.06	3			12	6	18.92	19.01	18.87	3
		25	25	18.94	18.95	18.96	3			12	13	18.91	18.89	18.91	3
		50	0	18.92	18.86	18.94	3			25	0	19.05	19.00	18.86	3
3M	QPSK	1	0	22.02	22.01	21.50	0	1.4M	QPSK	1	0	21.96	21.90	21.77	0
		1	7	21.99	21.87	21.55	0			1	2	21.97	21.95	21.55	0
		1	14	21.97	21.90	21.27	0			1	5	21.98	21.92	21.37	0
		8	0	20.97	20.93	20.67	1			3	0	21.95	21.93	21.74	0
		8	3	20.95	20.90	20.69	1			3	1	21.97	21.93	21.73	0
		8	7	21.00	20.92	20.53	1			3	3	22.03	21.88	21.67	0
	16QAM	15	0	21.07	20.93	20.57	1			6	0	21.05	20.92	20.76	1
		1	0	21.01	21.02	20.72	1		16QAM	1	0	20.97	20.96	20.79	1
		1	7	21.00	20.90	20.67	1			1	2	20.92	20.93	20.72	1
		1	14	20.96	20.86	20.61	1			1	5	21.03	20.85	20.58	1
		8	0	19.73	19.77	19.52	2			3	0	20.75	20.81	20.55	1
		8	3	19.92	19.98	19.70	2			3	1	20.90	20.79	20.71	1
	64QAM	8	7	19.97	19.87	19.53	2			3	3	20.94	20.86	20.63	1
		15	0	19.97	19.82	19.46	2			6	0	19.97	19.76	19.51	2
		1	0	19.98	19.91	19.98	2		64QAM	1	0	20.03	19.93	19.94	2
		1	7	19.81	19.86	19.63	2			1	2	19.91	19.83	19.56	2
		1	14	19.99	19.82	19.60	2			1	5	19.91	19.85	19.57	2
		8	0	18.95	18.90	18.94	3			3	0	19.94	19.90	19.97	2
		8	3	18.96	19.03	18.91	3			3	1	19.94	20.02	20.01	2
		8	7	18.94	19.04	18.90	3			3	3	19.78	19.80	19.79	2
		15	0	19.01	19.07	18.95	3			6	0	18.83	18.81	18.77	3

LTE Band 66															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		132072	132322	132572				Channel		132047	132322	132597	
		Frequency (MHz)		1720.0	1745.0	1770.0				Frequency (MHz)		1717.5	1745.0	1772.5	
20M	QPSK	1	0	20.95	20.94	20.93	0	15M	QPSK	1	0	20.80	20.91	20.75	0
		1	50	20.77	21.04	20.31	0			1	37	20.61	20.95	20.20	0
		1	99	20.75	20.91	20.97	0			1	74	20.67	21.02	20.95	0
		50	0	19.69	19.80	19.71	1			36	0	19.66	19.83	19.67	1
		50	25	20.03	20.13	19.61	1			36	19	19.89	19.89	19.39	1
		50	50	20.07	19.94	19.75	1			36	39	19.94	20.16	19.64	1
		100	0	19.94	19.98	19.50	1			75	0	19.80	19.89	19.27	1
		1	0	19.61	19.65	20.27	1		16QAM	1	0	19.54	19.43	20.13	1
	16QAM	1	50	19.97	20.17	19.53	1			1	37	20.02	20.09	19.39	1
		1	99	19.86	20.17	19.97	1			1	74	19.71	20.03	19.90	1
		50	0	18.90	18.99	18.90	2			36	0	18.72	18.92	18.76	2
		50	25	19.17	18.92	18.71	2			36	19	19.03	19.15	18.68	2
		50	50	18.92	18.91	18.62	2			36	39	18.91	19.10	18.47	2
		100	0	18.99	19.13	18.69	2			75	0	18.84	18.98	18.40	2
		1	0	18.61	18.56	18.94	2		64QAM	1	0	18.48	18.55	19.09	2
	64QAM	1	50	19.16	19.06	18.49	2			1	37	19.08	18.98	18.23	2
		1	99	18.80	19.12	19.01	2			1	74	18.71	18.96	18.91	2
		50	0	17.87	17.89	17.84	3			36	0	17.86	17.85	17.74	3
		50	25	18.11	18.18	17.66	3			36	19	17.97	17.99	17.54	3
		50	50	17.96	18.17	17.64	3			36	39	18.07	17.98	17.54	3
		100	0	18.04	18.02	17.62	3			75	0	18.00	17.93	17.41	3
		1	0	18.04	18.02	17.62	3			75	0	18.00	17.93	17.41	3
10M	QPSK	1	0	20.19	20.29	20.61	0	5M	QPSK	1	0	20.29	20.33	20.79	0
		1	24	20.61	20.90	20.05	0			1	12	20.75	20.96	20.09	0
		1	49	20.68	20.96	20.64	0			1	24	20.64	21.07	20.71	0
		25	0	19.55	19.75	19.52	1			12	0	19.55	19.63	19.47	1
		25	12	19.81	19.99	19.41	1			12	6	19.93	20.04	19.29	1
		25	25	19.99	20.10	19.59	1			12	13	19.97	20.16	19.43	1
		50	0	19.80	19.86	19.35	1			25	0	19.83	19.95	19.20	1
		1	0	19.45	19.42	20.21	1		16QAM	1	0	19.54	19.48	20.18	1
	16QAM	1	24	20.13	20.07	19.37	1			1	12	20.11	20.08	19.31	1
		1	49	19.80	20.03	19.97	1			1	24	19.65	20.09	19.79	1
		25	0	18.74	18.89	18.88	2			12	0	18.80	18.77	18.83	2
		25	12	19.11	19.02	18.65	2			12	6	19.05	19.05	18.55	2
		25	25	19.12	19.18	18.46	2			12	13	19.09	19.06	18.51	2
		50	0	18.92	19.06	18.44	2			25	0	18.88	19.01	18.57	2
		1	0	18.41	18.41	19.12	2		64QAM	1	0	18.43	18.52	19.02	2
	64QAM	1	24	19.11	19.04	18.28	2			1	12	19.12	19.01	18.36	2
		1	49	18.70	18.98	18.86	2			1	24	18.68	19.01	18.81	2
		25	0	17.75	17.78	17.76	3			12	0	17.77	17.81	17.77	3
		25	12	17.90	18.00	17.52	3			12	6	17.97	18.18	17.69	3
		25	25	18.07	18.10	17.48	3			12	13	18.11	18.08	17.51	3
		50	0	18.00	17.95	17.46	3			25	0	17.96	17.90	17.53	3
		1	0	18.00	17.95	17.46	3			25	0	17.96	17.90	17.53	3
3M	QPSK	1	0	20.30	20.31	20.84	0	1.4M	QPSK	1	0	20.08	20.67	20.19	0
		1	7	20.48	20.84	20.25	0			1	2	20.12	20.70	20.27	0
		1	14	20.54	20.83	20.80	0			1	5	20.14	20.64	20.22	0
		8	0	19.53	19.66	19.61	1			3	0	20.11	20.70	20.19	0
		8	3	19.84	19.94	19.52	1			3	1	20.19	20.81	20.30	0
		8	7	20.00	20.02	19.61	1			3	3	20.16	20.74	20.20	0
		15	0	19.83	19.88	19.51	1			6	0	19.15	19.67	19.29	1
		1	0	19.55	19.46	20.13	1		16QAM	1	0	19.42	19.83	19.41	1
	16QAM	1	7	20.08	19.94	19.33	1			1	2	19.46	19.94	19.55	1
		1	14	19.71	20.03	19.90	1			1	5	19.32	19.93	19.52	1
		8	0	18.74	18.78	18.82	2			3	0	19.22	19.72	19.25	1
		8	3	19.09	19.15	18.53	2			3	1	19.28	19.83	19.37	1
		8	7	19.14	19.10	18.53	2			3	3	19.26	19.76	19.26	1
		15	0	18.92	19.10	18.57	2			6	0	18.34	18.84	18.43	2
		1	0	18.40	18.32	19.08	2		64QAM	1	0	18.03	18.60	18.16	2
	64QAM	1	7	18.97	18.98	18.32	2			1	2	18.13	18.60	18.25	2
		1	14	18.74	19.08	18.82	2			1	5	18.06	18.69	18.19	2
		8	0	17.66	17.76	17.72	3			3	0	18.12	18.61	18.21	2
		8	3	18.00	17.97	17.59	3			3	1	18.12	18.76	18.18	2
		8	7	18.12	18.06	17.52	3			3	3	18.12	18.69	18.13	2
		15	0	17.98	17.94	17.46	3			6	0	17.04	17.64	17.21	3
		1	0	17.98	17.94	17.46	3			6	0	17.04	17.64	17.21	3

ERP Power (dBm)

Modulation Type: $\pi/2$ BPSK

n5, Channel Bandwidth: 5MHz

Mode		TX Channel 165300, 167300, 169300					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	826.50	-12.1	19.0	0.0	19.0	38.5	-19.5
2	836.50	-12.6	18.6	0.2	18.8	38.5	-19.7
3	846.50	-11.7	18.8	0.4	19.2	38.5	-19.3
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	826.50	-16.5	15.4	0.0	15.4	38.5	-23.1
2	836.50	-17.1	14.7	0.2	14.9	38.5	-23.6
3	846.50	-16.5	14.7	0.4	15.1	38.5	-23.4

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 10MHz

Mode		TX Channel 165800, 167300, 168800					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	829.00	-12.0	19.0	0.1	19.1	38.5	-19.4
2	836.50	-12.5	18.7	0.2	18.9	38.5	-19.6
3	844.00	-11.6	19.0	0.4	19.4	38.5	-19.1
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	829.00	-17.4	14.4	0.1	14.5	38.5	-24.0
2	836.50	-17.1	14.7	0.2	14.9	38.5	-23.6
3	844.00	-16.8	14.7	0.4	15.1	38.5	-23.4

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 15MHz

Mode		TX Channel 166300, 167300, 168300					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	831.50	-11.6	19.4	0.1	19.5	38.5	-19.0
2	836.50	-12.5	18.7	0.2	18.9	38.5	-19.6
3	841.50	-12.0	18.8	0.3	19.1	38.5	-19.4
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	831.50	-16.4	15.3	0.1	15.4	38.5	-23.1
2	836.50	-17.1	14.7	0.2	14.9	38.5	-23.6
3	841.50	-16.7	14.9	0.3	15.2	38.5	-23.3

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 20MHz

Mode		TX Channel 166800, 167300, 167800					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	834.00	-12.2	18.8	0.2	19.0	38.5	-19.5
2	836.50	-12.0	19.2	0.2	19.4	38.5	-19.1
3	839.00	-12.1	18.8	0.3	19.1	38.5	-19.4
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	834.00	-17.1	14.6	0.2	14.8	38.5	-23.7
2	836.50	-16.8	15.0	0.2	15.2	38.5	-23.3
3	839.00	-17.3	14.4	0.3	14.7	38.5	-23.8

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Modulation Type: QPSK

n5, Channel Bandwidth: 5MHz

Mode		TX Channel 165300, 167300, 169300					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	826.50	-12.6	18.5	0.0	18.5	38.5	-20.0
2	836.50	-13.2	18.0	0.2	18.2	38.5	-20.3
3	846.50	-12.1	18.4	0.4	18.8	38.5	-19.7
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	826.50	-17.0	14.9	0.0	14.9	38.5	-23.6
2	836.50	-17.5	14.3	0.2	14.5	38.5	-24.0
3	846.50	-16.9	14.3	0.4	14.7	38.5	-23.8

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 10MHz

Mode		TX Channel 165800, 167300, 168800					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	829.00	-12.5	18.5	0.1	18.6	38.5	-19.9
2	836.50	-13.0	18.2	0.2	18.4	38.5	-20.1
3	844.00	-12.1	18.5	0.4	18.9	38.5	-19.6
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	829.00	-17.7	14.1	0.1	14.2	38.5	-24.3
2	836.50	-17.6	14.2	0.2	14.4	38.5	-24.1
3	844.00	-17.0	14.5	0.4	14.9	38.5	-23.6

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 15MHz

Mode		TX Channel 166300, 167300, 168300					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	831.50	-12.3	18.7	0.1	18.8	38.5	-19.7
2	836.50	-13.0	18.2	0.2	18.4	38.5	-20.1
3	841.50	-12.4	18.4	0.3	18.7	38.5	-19.8
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	831.50	-17.1	14.6	0.1	14.7	38.5	-23.8
2	836.50	-17.9	13.9	0.2	14.1	38.5	-24.4
3	841.50	-17.2	14.4	0.3	14.7	38.5	-23.8

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 20MHz

Mode		TX Channel 166800, 167300, 167800					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	834.00	-12.8	18.3	0.2	18.5	38.5	-20.0
2	836.50	-12.7	18.5	0.2	18.7	38.5	-19.8
3	839.00	-12.6	18.3	0.3	18.6	38.5	-19.9
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	834.00	-17.5	14.2	0.2	14.4	38.5	-24.1
2	836.50	-17.3	14.5	0.2	14.7	38.5	-23.8
3	839.00	-17.8	13.9	0.3	14.2	38.5	-24.3

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Modulation Type: 16QAM

n5, Channel Bandwidth: 5MHz

Mode		TX Channel 165300, 167300, 169300					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	826.50	-13.2	17.9	0.0	17.9	38.5	-20.6
2	836.50	-13.8	17.4	0.2	17.6	38.5	-20.9
3	846.50	-12.8	17.7	0.4	18.1	38.5	-20.4
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	826.50	-17.6	14.3	0.0	14.3	38.5	-24.2
2	836.50	-18.0	13.8	0.2	14.0	38.5	-24.5
3	846.50	-17.5	13.7	0.4	14.1	38.5	-24.4

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 10MHz

Mode		TX Channel 165800, 167300, 168800					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	829.00	-13.1	17.9	0.1	18.0	38.5	-20.5
2	836.50	-13.6	17.6	0.2	17.8	38.5	-20.7
3	844.00	-12.8	17.8	0.4	18.2	38.5	-20.3
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	829.00	-18.2	13.6	0.1	13.7	38.5	-24.8
2	836.50	-18.2	13.6	0.2	13.8	38.5	-24.7
3	844.00	-17.8	13.7	0.4	14.1	38.5	-24.4

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 15MHz

Mode		TX Channel 166300, 167300, 168300					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	831.50	-12.8	18.2	0.1	18.3	38.5	-20.2
2	836.50	-13.5	17.7	0.2	17.9	38.5	-20.6
3	841.50	-13.1	17.7	0.3	18.0	38.5	-20.5
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	831.50	-17.8	13.9	0.1	14.0	38.5	-24.5
2	836.50	-18.2	13.6	0.2	13.8	38.5	-24.7
3	841.50	-17.7	13.9	0.3	14.2	38.5	-24.3

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 20MHz

Mode		TX Channel 166800, 167300, 167800					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	834.00	-13.4	17.7	0.2	17.9	38.5	-20.6
2	836.50	-13.4	17.8	0.2	18.0	38.5	-20.5
3	839.00	-13.6	17.4	0.3	17.7	38.5	-20.8
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	834.00	-18.2	13.5	0.2	13.7	38.5	-24.8
2	836.50	-18.1	13.7	0.2	13.9	38.5	-24.6
3	839.00	-18.5	13.2	0.3	13.5	38.5	-25.0

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

Modulation Type: 64QAM

n5, Channel Bandwidth: 5MHz

Mode		TX Channel 165300, 167300, 169300					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	826.50	-14.0	17.1	0.0	17.1	38.5	-21.4
2	836.50	-14.6	16.6	0.2	16.8	38.5	-21.7
3	846.50	-13.6	16.9	0.4	17.3	38.5	-21.2
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	826.50	-18.4	13.5	0.0	13.5	38.5	-25.0
2	836.50	-18.9	12.9	0.2	13.1	38.5	-25.4
3	846.50	-18.3	12.9	0.4	13.3	38.5	-25.2

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 10MHz

Mode		TX Channel 165800, 167300, 168800					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	829.00	-13.9	17.1	0.1	17.2	38.5	-21.3
2	836.50	-14.4	16.8	0.2	17.0	38.5	-21.5
3	844.00	-13.7	16.9	0.4	17.3	38.5	-21.2
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	829.00	-18.9	12.9	0.1	13.0	38.5	-25.5
2	836.50	-18.8	13.0	0.2	13.2	38.5	-25.3
3	844.00	-18.5	13.0	0.4	13.4	38.5	-25.1

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 15MHz

Mode		TX Channel 166300, 167300, 168300					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	831.50	-13.6	17.4	0.1	17.5	38.5	-21.0
2	836.50	-14.2	16.9	0.2	17.1	38.5	-21.4
3	841.50	-13.9	16.9	0.3	17.2	38.5	-21.3
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	831.50	-18.8	12.9	0.1	13.0	38.5	-25.5
2	836.50	-18.8	13.0	0.2	13.2	38.5	-25.3
3	841.50	-18.5	13.1	0.3	13.4	38.5	-25.1

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

n5, Channel Bandwidth: 20MHz

Mode		TX Channel 166800, 167300, 167800					
Antenna Polarity & Test Distance : Horizontal at 3 m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	834.00	-14.1	16.9	0.2	17.1	38.5	-21.4
2	836.50	-14.1	17.1	0.2	17.3	38.5	-21.2
3	839.00	-14.1	16.8	0.3	17.1	38.5	-21.4
Antenna Polarity & Test Distance : Vertical at 3m							
No	Frequency (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	834.00	-19.0	12.7	0.2	12.9	38.5	-25.6
2	836.50	-18.7	13.1	0.2	13.3	38.5	-25.2
3	839.00	-19.3	12.4	0.3	12.7	38.5	-25.8

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

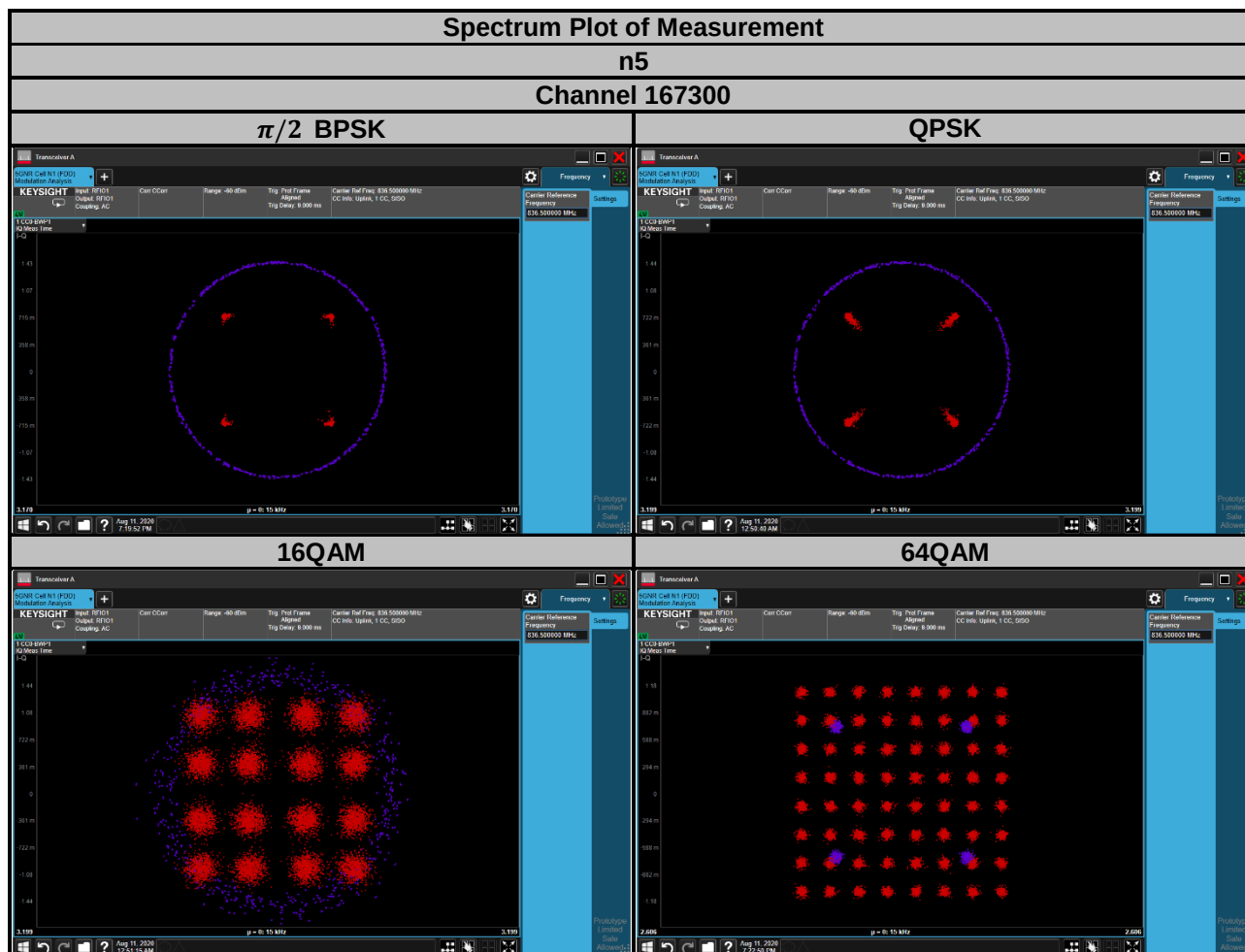
4.2.2 Test Setup



4.2.3 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector. The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.4 Test Results



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

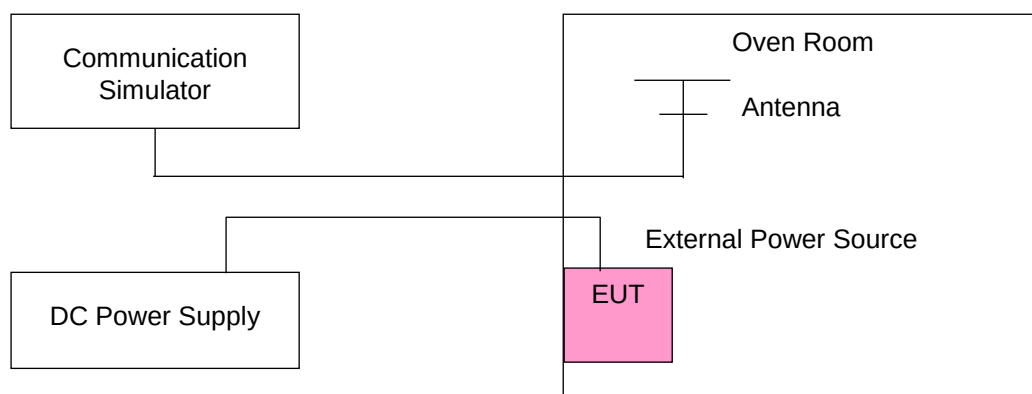
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

4.3.2 Test Procedure

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	n5				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	826.500003	0.003	846.499996	-0.004	2.5
3.45	826.500002	0.002	846.499998	-0.002	2.5
4.23	826.500001	0.002	846.499999	-0.001	2.5

Note: The applicant defined the normal working voltage is from 3.45 Vdc to 4.23 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n5				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-20	826.500004	0.004	846.500002	0.002	2.5
-10	826.500001	0.002	846.500004	0.005	2.5
0	826.500002	0.002	846.500003	0.003	2.5
10	826.499998	-0.002	846.500002	0.002	2.5
20	826.499996	-0.005	846.500003	0.003	2.5
30	826.499997	-0.003	846.500003	0.004	2.5
40	826.499999	-0.002	846.499999	-0.001	2.5
50	826.499998	-0.003	846.499998	-0.003	2.5
60	826.499996	-0.005	846.499997	-0.004	2.5

Frequency Error vs. Voltage

Voltage (Volts)	n5				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	829.000002	0.003	843.999996	-0.005	2.5
3.45	829.000002	0.002	843.999997	-0.004	2.5
4.23	829.000002	0.003	843.999997	-0.004	2.5

Note: The applicant defined the normal working voltage is from 3.45 Vdc to 4.23 Vdc.

Frequency Error vs. Temperature

Frequency Error vs. Temperature					
Temp. (°C)	n5				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-20	829.000004	0.005	844.000004	0.004	2.5
-10	829.000002	0.002	844.000002	0.003	2.5
0	829.000003	0.004	844.000001	0.002	2.5
10	828.999999	-0.002	844.000002	0.003	2.5
20	828.999997	-0.004	844.000002	0.002	2.5
30	828.999997	-0.004	844.000004	0.005	2.5
40	828.999998	-0.002	843.999999	-0.001	2.5
50	828.999996	-0.004	843.999996	-0.005	2.5
60	828.999997	-0.004	843.999998	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	n5				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	831.500003	0.004	841.499997	-0.004	2.5
3.45	831.500001	0.002	841.499996	-0.004	2.5
4.23	831.500002	0.003	841.499998	-0.002	2.5

Note: The applicant defined the normal working voltage is from 3.45 Vdc to 4.23 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	n5				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-20	831.500004	0.004	841.500002	0.002	2.5
-10	831.500001	0.001	841.500002	0.002	2.5
0	831.500002	0.002	841.500003	0.004	2.5
10	831.499996	-0.005	841.500004	0.004	2.5
20	831.499998	-0.002	841.500002	0.002	2.5
30	831.499999	-0.002	841.500002	0.002	2.5
40	831.499998	-0.003	841.499996	-0.004	2.5
50	831.499997	-0.003	841.499998	-0.003	2.5
60	831.499998	-0.003	841.499998	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	n5				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.85	834.000001	0.002	838.999998	-0.003	2.5
3.45	834.000002	0.002	838.999996	-0.004	2.5
4.23	834.000001	0.001	838.999998	-0.003	2.5

Note: The applicant defined the normal working voltage is from 3.45 Vdc to 4.23 Vdc.

Frequency Error vs. Temperature

Frequency Error vs. Temperature					
Temp. (°C)	n5				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-20	834.000003	0.004	839.000004	0.004	2.5
-10	834.000004	0.004	839.000004	0.005	2.5
0	834.000003	0.004	839.000002	0.003	2.5
10	833.999997	-0.004	839.000003	0.003	2.5
20	833.999996	-0.005	839.000004	0.004	2.5
30	833.999996	-0.004	839.000004	0.004	2.5
40	833.999997	-0.004	838.999997	-0.004	2.5
50	833.999998	-0.003	838.999996	-0.004	2.5
60	833.999996	-0.004	838.999997	-0.004	2.5

4.4 Occupied Bandwidth Measurement

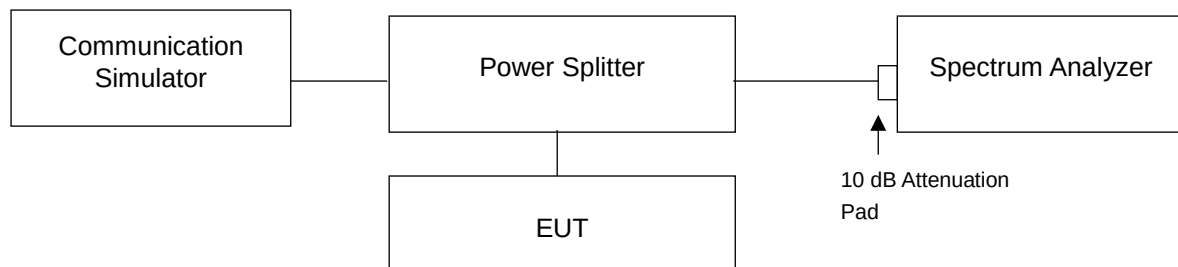
4.4.1 Test Procedure

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a 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.

26dBc Bandwidth:

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW =100 kHz (5 MHz bandwidth), 200 kHz (10 MHz bandwidth), 300 kHz (15 MHz bandwidth), 430 kHz (20 MHz bandwidth). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4.4.2 Test Setup



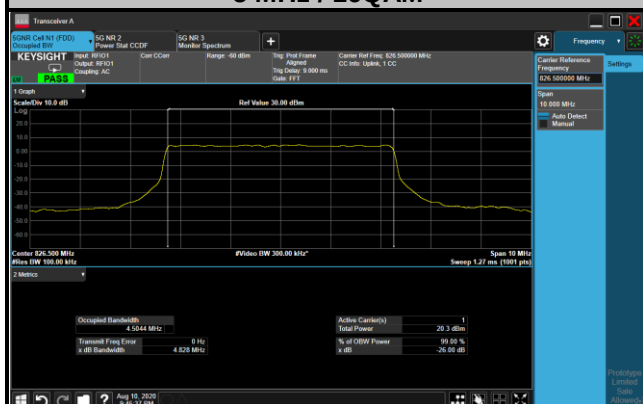
4.4.3 Test Result

Occupied Bandwidth

n5					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
165300	826.5	4.4834	4.5010	4.5044	4.5018
167300	836.5	4.4853	4.4892	4.4899	4.4895
169300	846.5	4.4878	4.4888	4.4895	4.4889
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
165800	829.0	9.2188	9.2179	9.2546	9.2152
167300	836.5	9.1715	9.1753	9.2137	9.1791
168800	844.0	9.2423	9.2459	9.2436	9.2420
Channel Bandwidth: 15 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
166300	831.5	14.050	14.045	14.059	14.007
167300	836.5	13.995	13.981	14.000	13.947
168300	841.5	13.998	13.986	14.044	13.980
Channel Bandwidth: 20 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
166800	834.0	18.817	18.809	18.808	18.801
167300	836.5	18.823	18.754	18.806	18.756
167800	839.0	18.751	18.737	18.734	18.734

Spectrum Plot of Worst Value 99 % Occupied Bandwidth

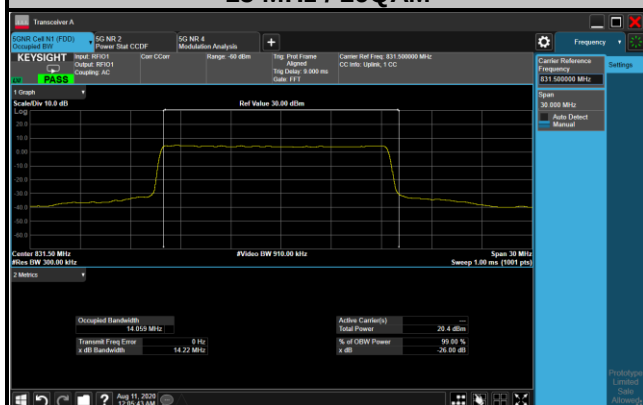
5 MHz / 16QAM



10 MHz / 16QAM



15 MHz / 16QAM



20 MHz / $\pi/2$ BPSK

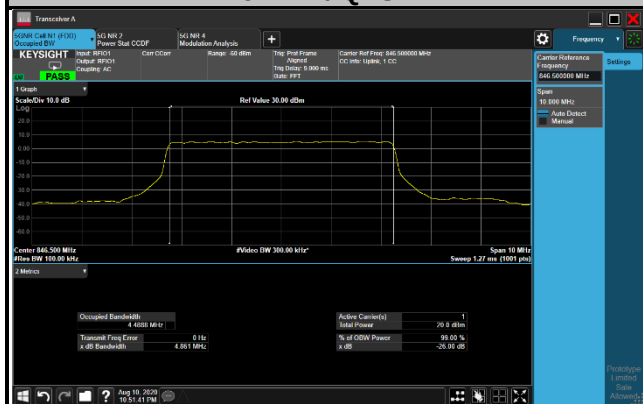


26dB Bandwidth

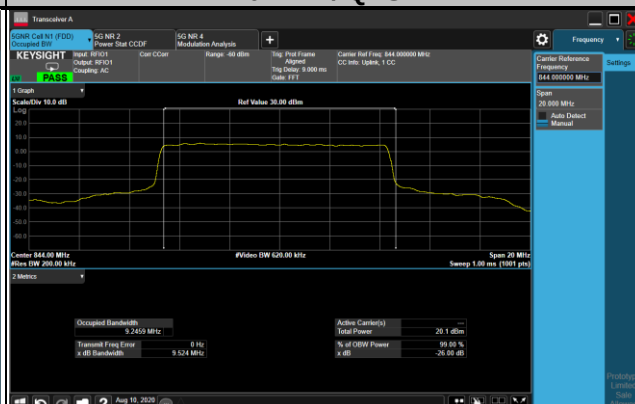
n5					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
165300	826.5	4.816	4.816	4.828	4.815
167300	836.5	4.847	4.834	4.822	4.829
169300	846.5	4.852	4.861	4.841	4.790
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
165800	829.0	9.516	9.470	9.050	9.490
167300	836.5	9.480	9.484	9.484	9.480
168800	844.0	9.485	9.524	9.516	9.484
Channel Bandwidth: 15 MHz					
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
166300	831.5	14.25	14.26	14.22	14.21
167300	836.5	14.20	14.20	14.20	14.20
168300	841.5	14.21	14.20	14.19	14.19
Channel Bandwidth: 20 MHz					
Channel	Frequency (MHz)	26 dB Bandwidth (MHz)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
166800	834.0	18.97	18.98	18.98	18.97
167300	836.5	18.98	18.98	18.96	18.96
167800	839.0	18.97	18.96	18.97	18.96

Spectrum Plot of Worst Value 26 dB Bandwidth

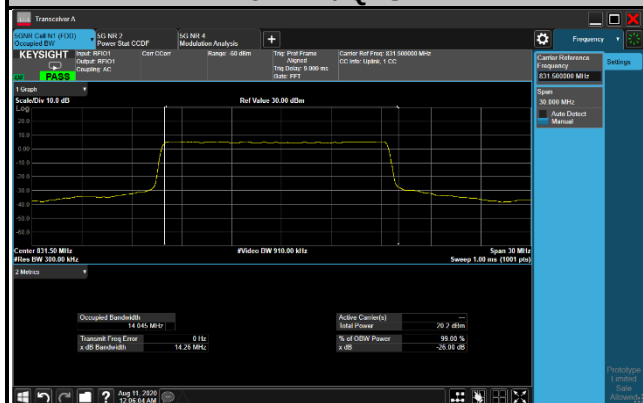
5 MHz / QPSK



10 MHz / QPSK



15 MHz / QPSK



20 MHz / $\pi/2$ BPSK

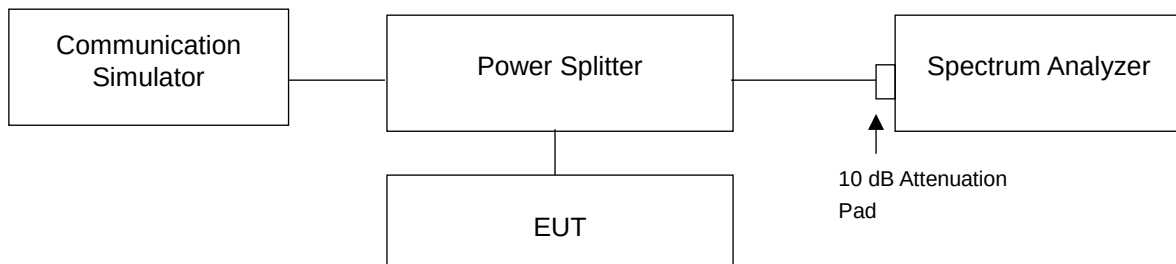


4.5 Band Edge Measurement

4.5.1 Limits of Band Edge Measurement

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

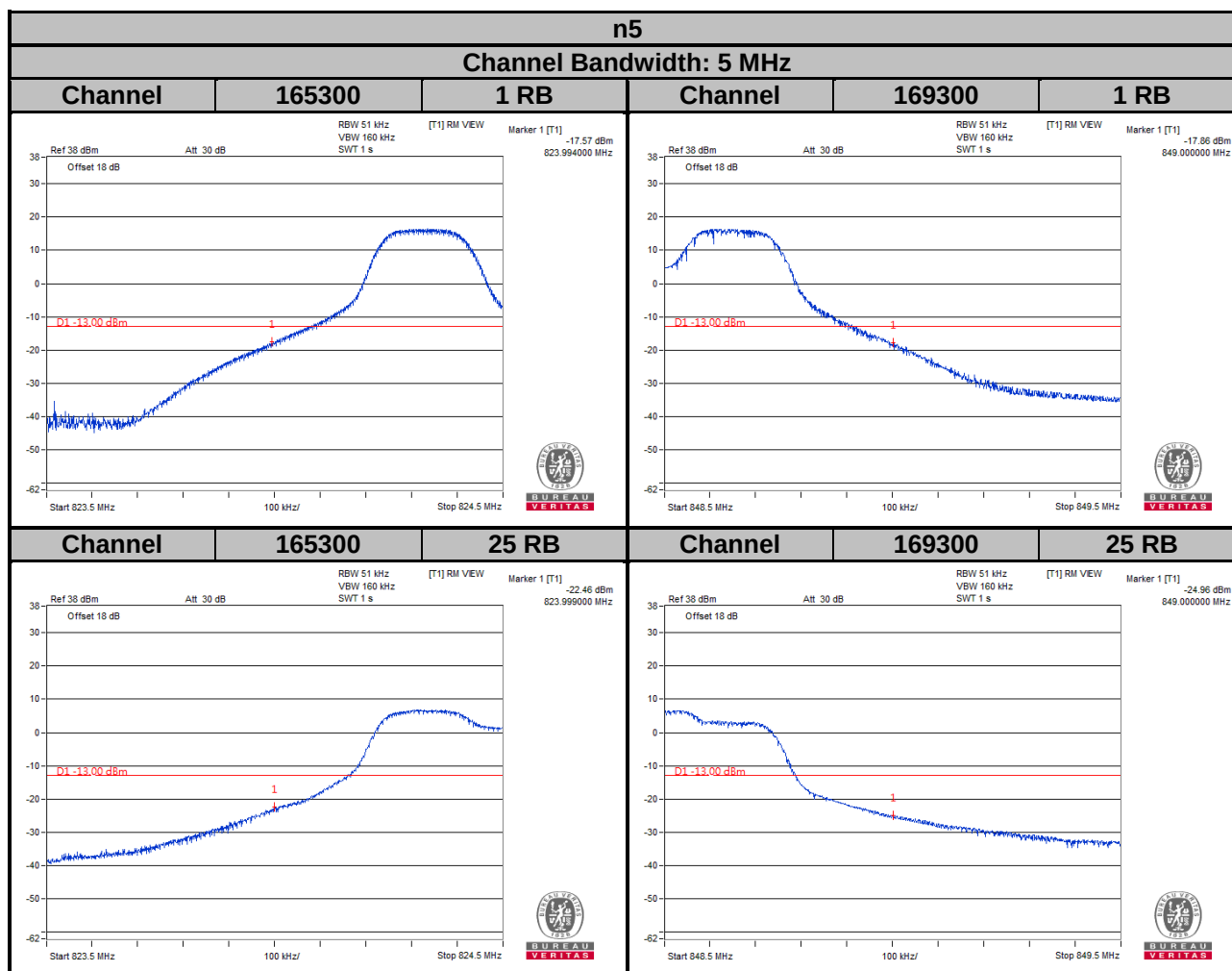
4.5.2 Test Setup

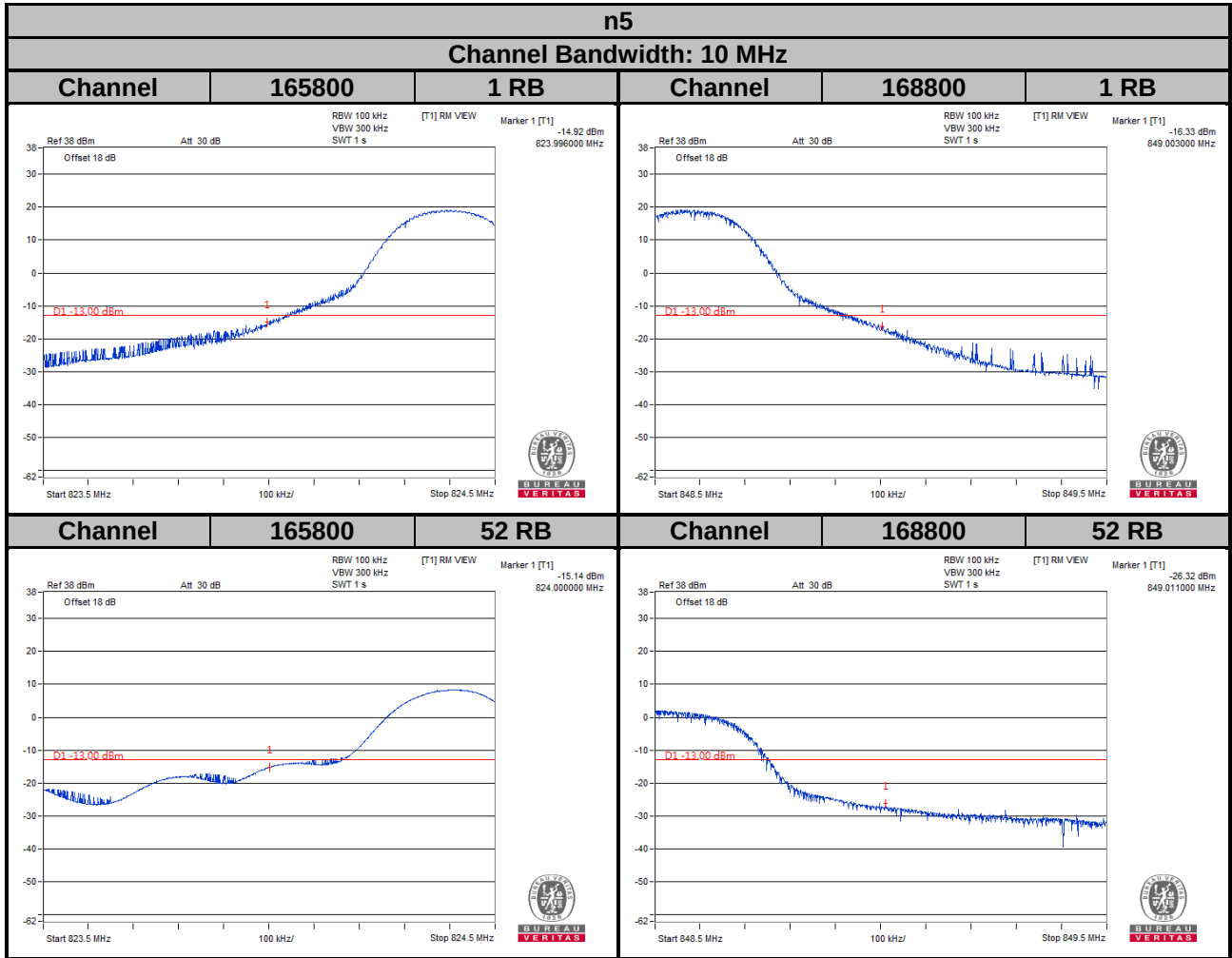


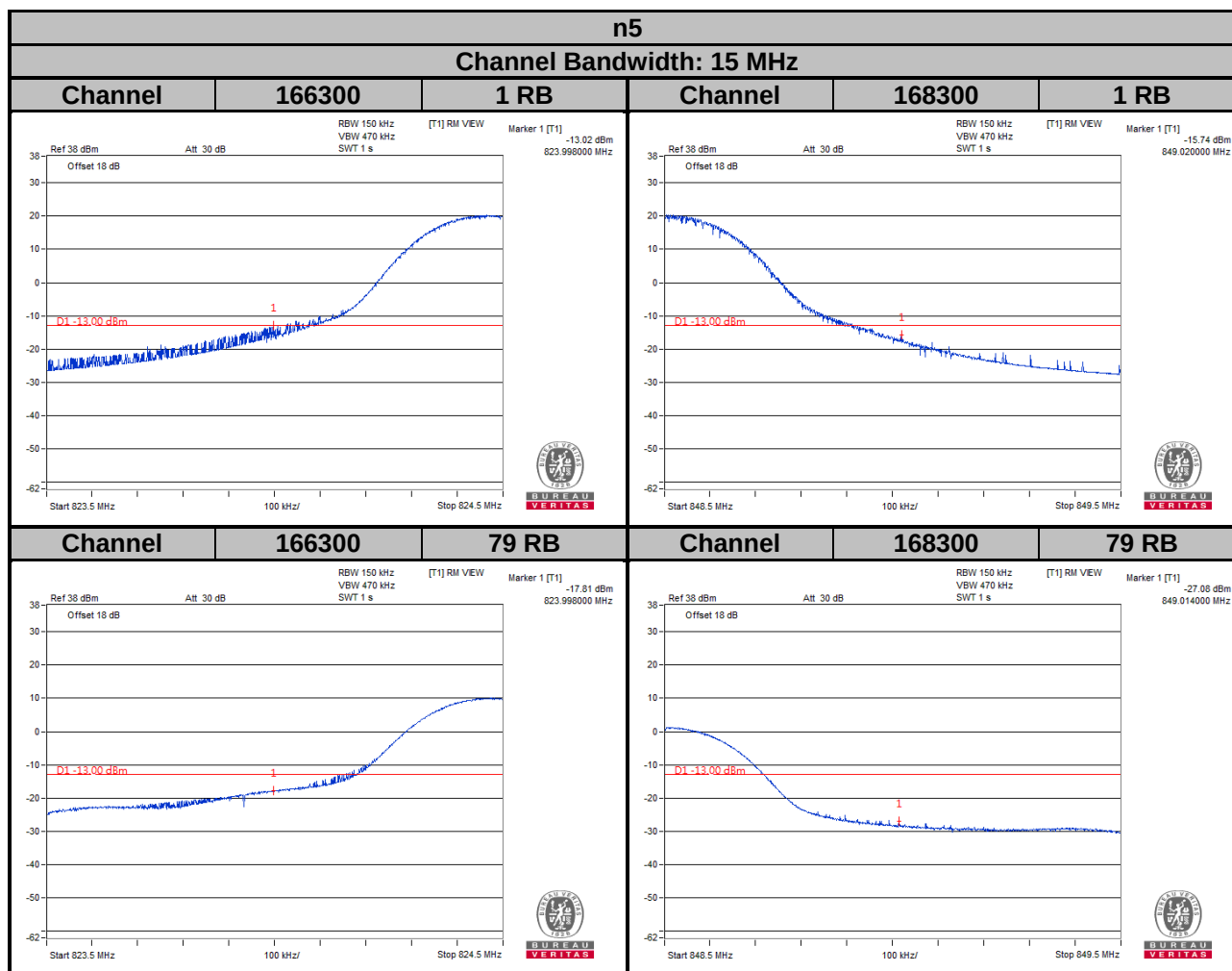
4.5.3 Test Procedures

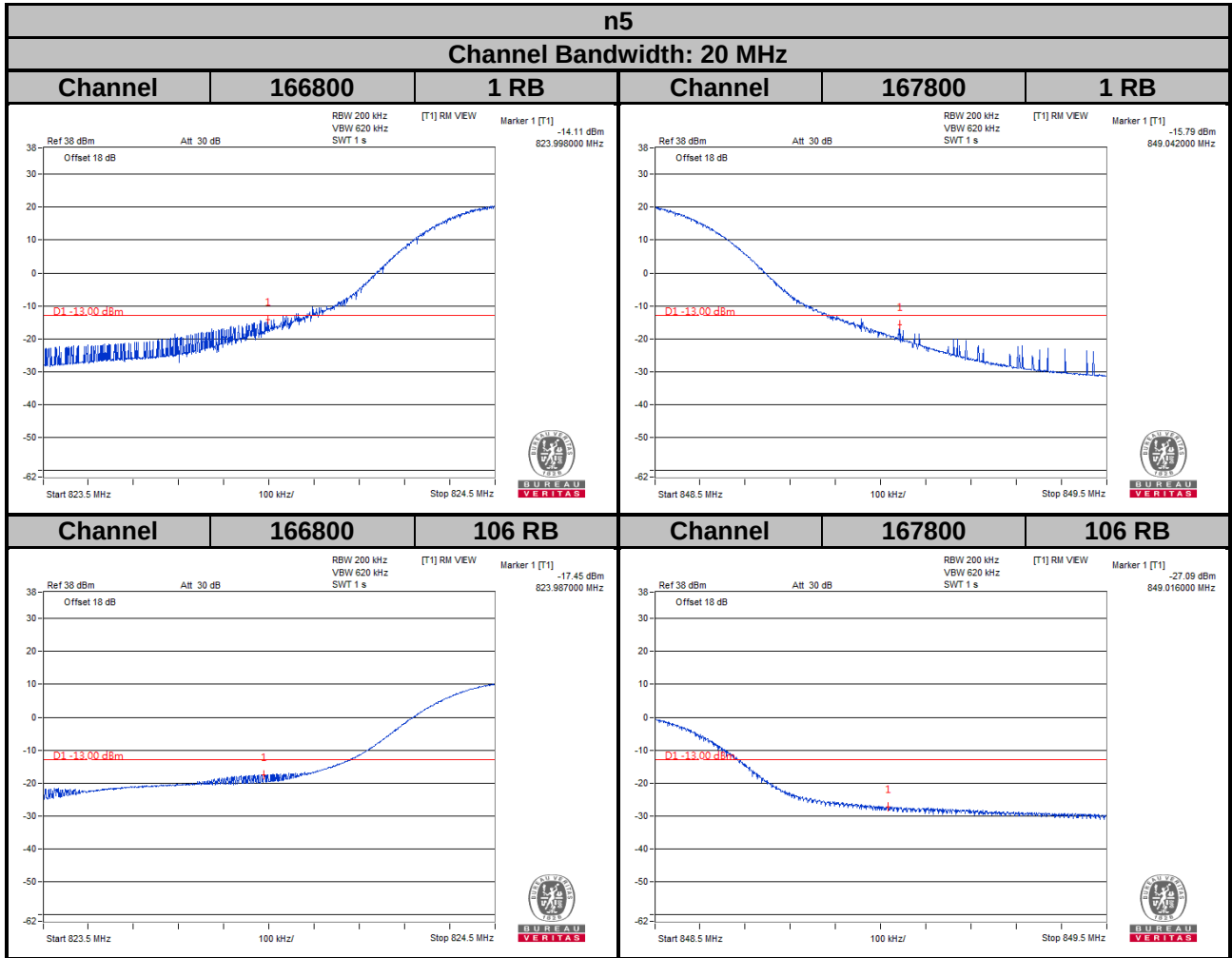
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (Channel Bandwidth 5MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (Channel Bandwidth 10MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (Channel Bandwidth 15MHz).
- The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 200kHz and VB of the spectrum is 620kHz (Channel Bandwidth 20MHz).
- Record the max trace plot into the test report.

4.5.4 Test Results







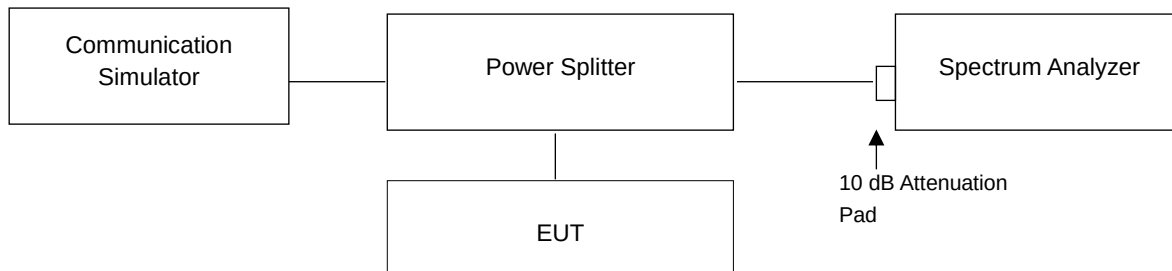


4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.6.2 Test Setup



4.6.3 Test Procedures

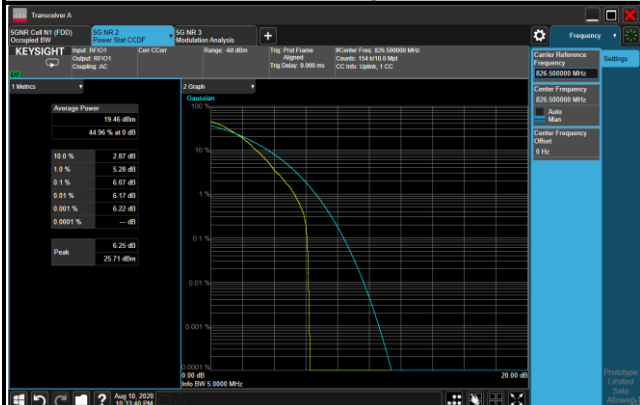
1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.6.4 Test Results

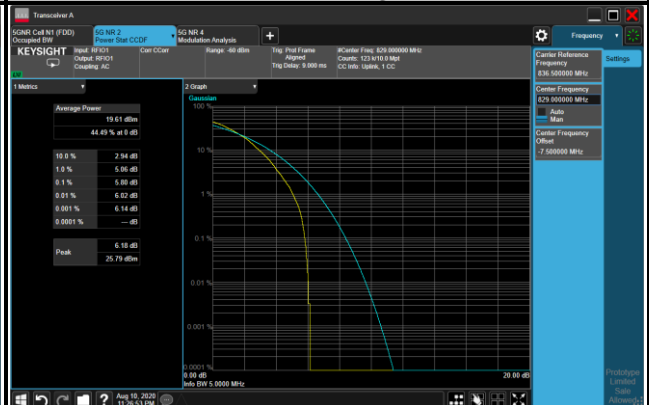
n5					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
165300	826.5	4.02	4.33	5.54	6.07
167300	836.5	3.97	4.41	5.46	6.01
169300	846.5	3.93	4.40	5.50	6.03
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
165800	829.0	4.08	4.49	5.43	5.80
167300	836.5	3.96	4.45	5.48	5.87
168800	844.0	4.46	4.47	5.39	5.84
Channel Bandwidth: 15 MHz					
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
166300	831.5	4.12	4.74	5.63	6.10
167300	836.5	4.03	4.75	5.61	6.06
168300	841.5	4.32	4.71	5.71	6.10
Channel Bandwidth: 20 MHz					
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			
		$\pi/2$ BPSK	QPSK	16QAM	64QAM
166800	834.0	4.03	4.70	5.72	6.05
167300	836.5	3.94	4.82	5.73	6.01
167800	839.0	4.07	4.70	5.67	6.04

Spectrum Plot of Worst Value

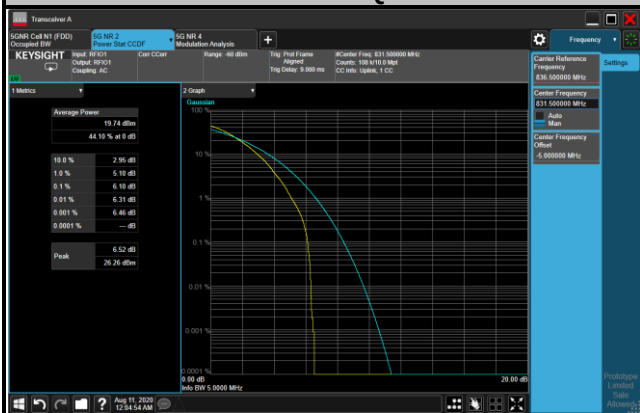
5 MHz / 64QAM



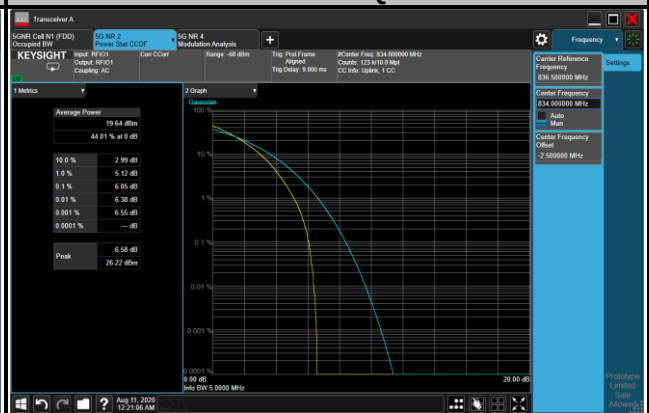
10 MHz / 64QAM



15 MHz / 64QAM



20 MHz / 64QAM

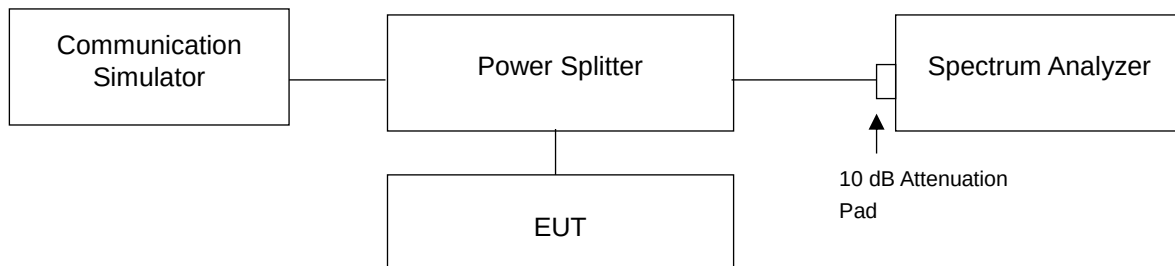


4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13 dBm.

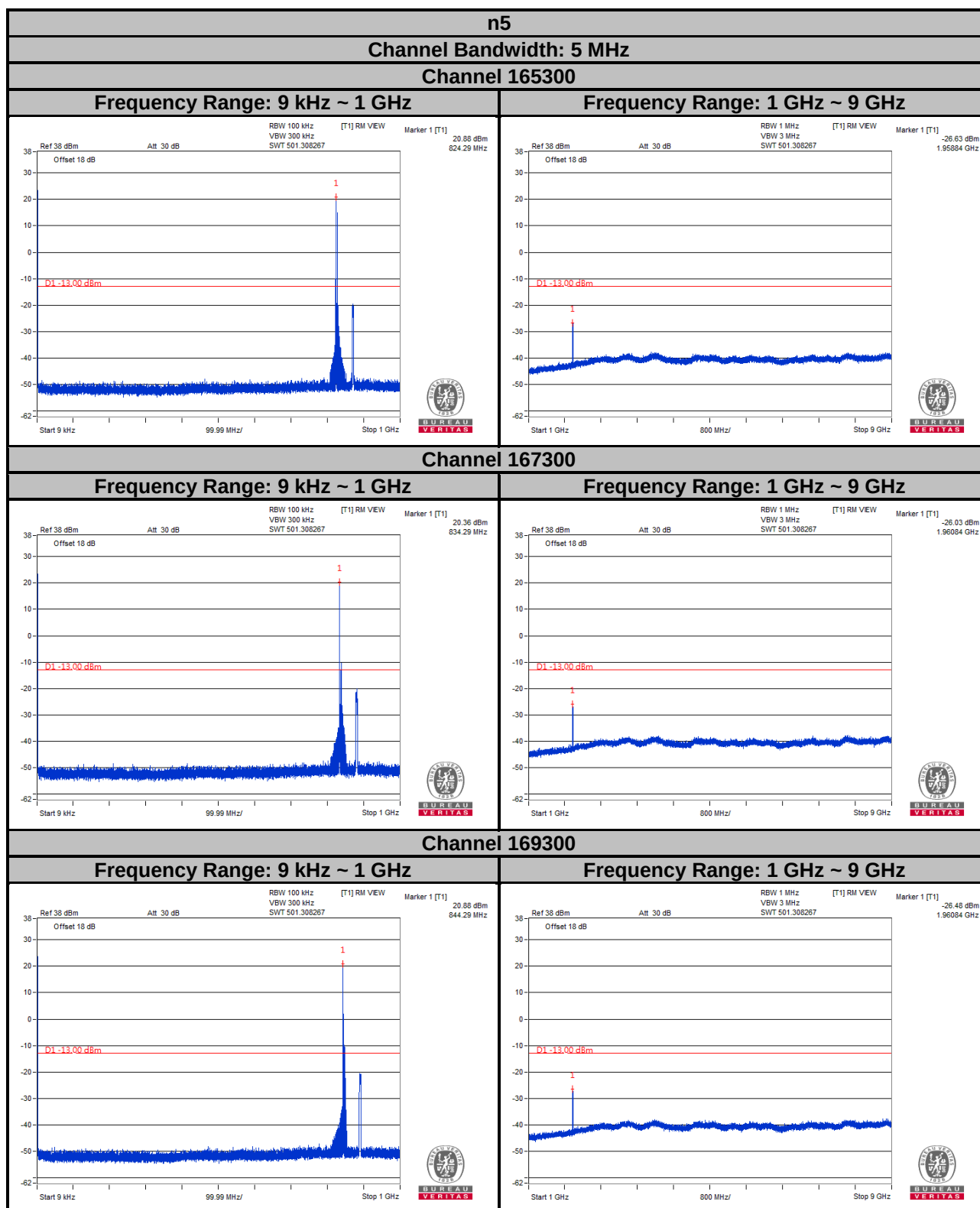
4.7.2 Test Setup



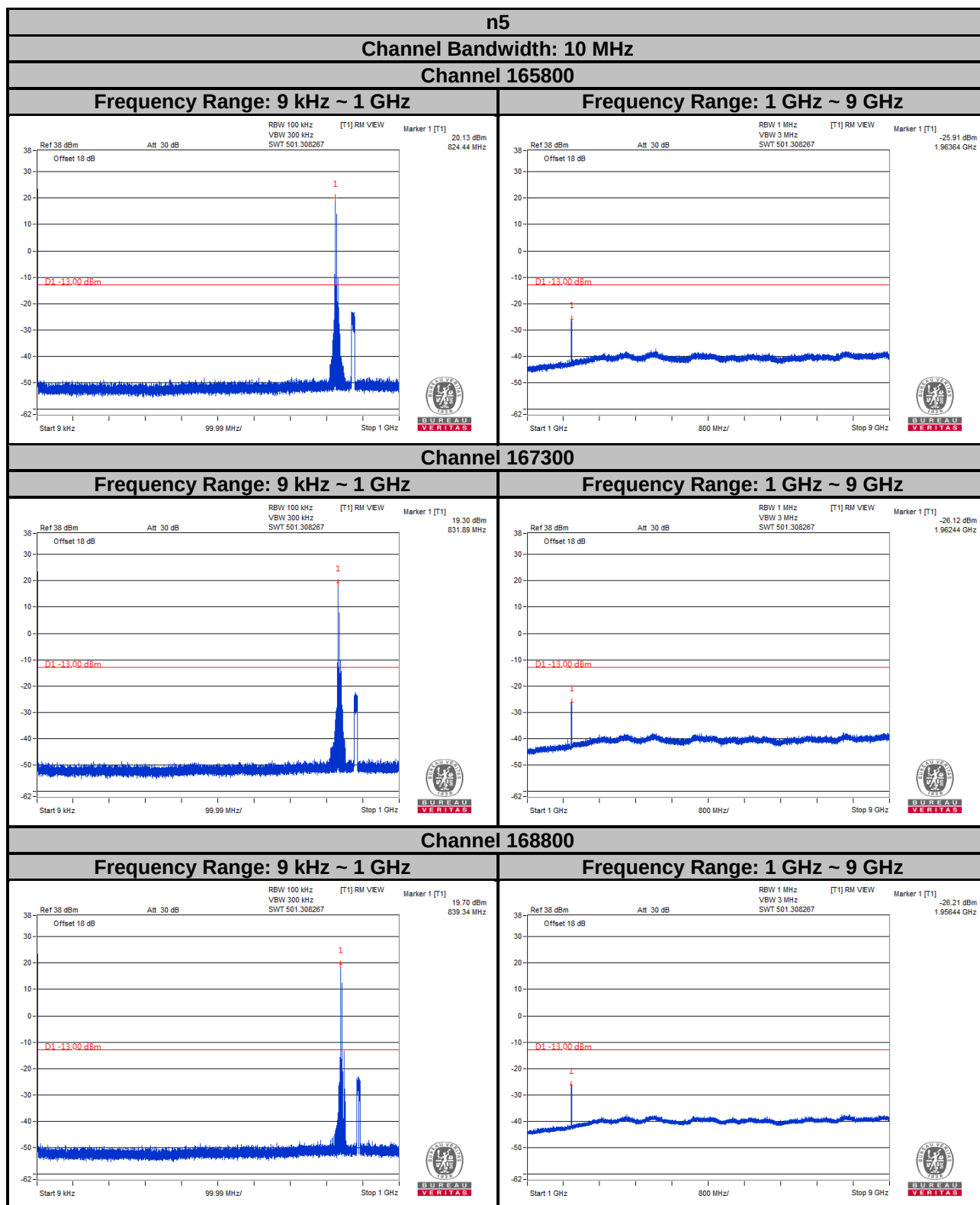
4.7.3 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 100 kHz and VBW = 300 kHz is used for conducted emission measurement.
- Measuring frequency range is from 1 GHz to 9 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

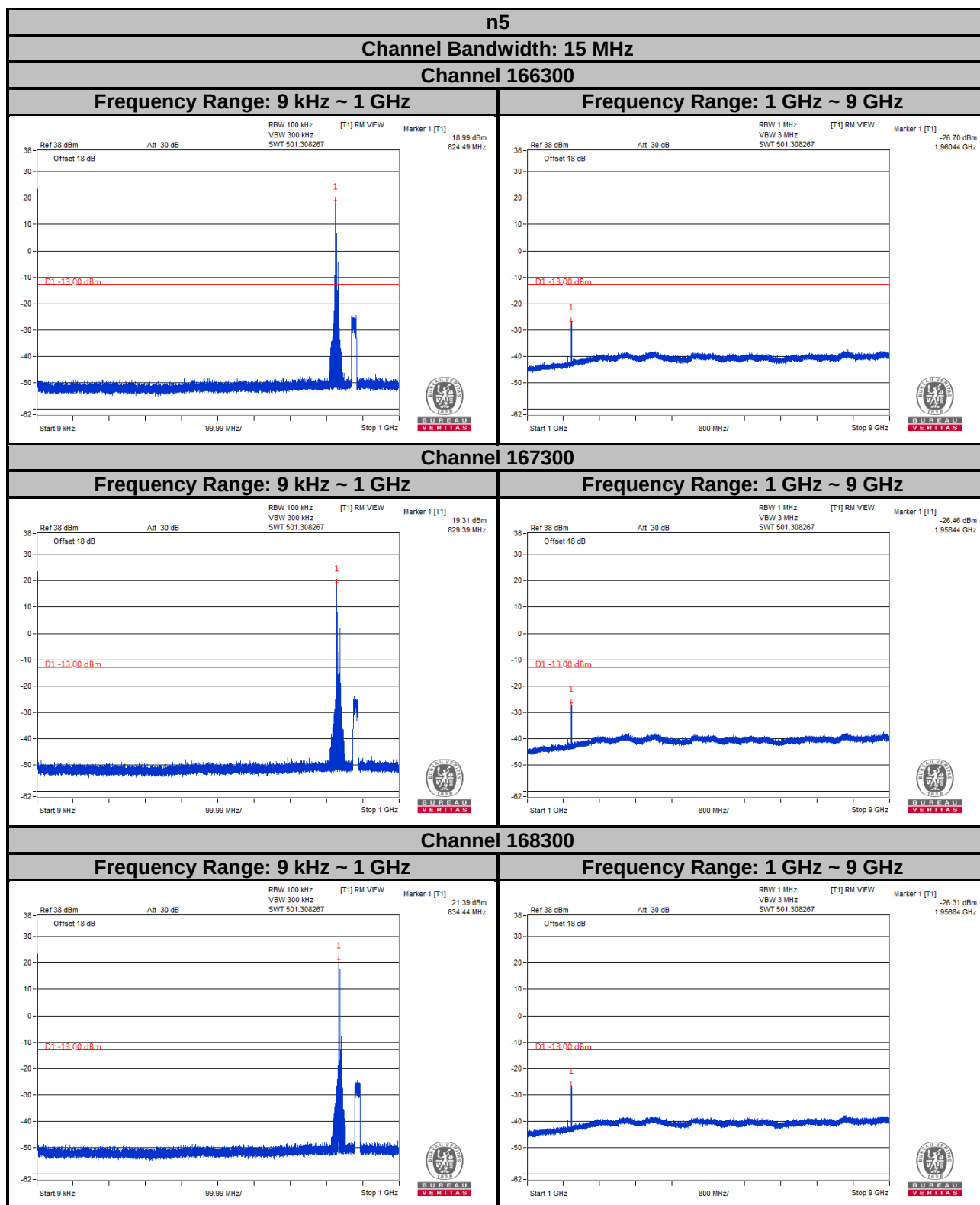
4.7.4 Test Results



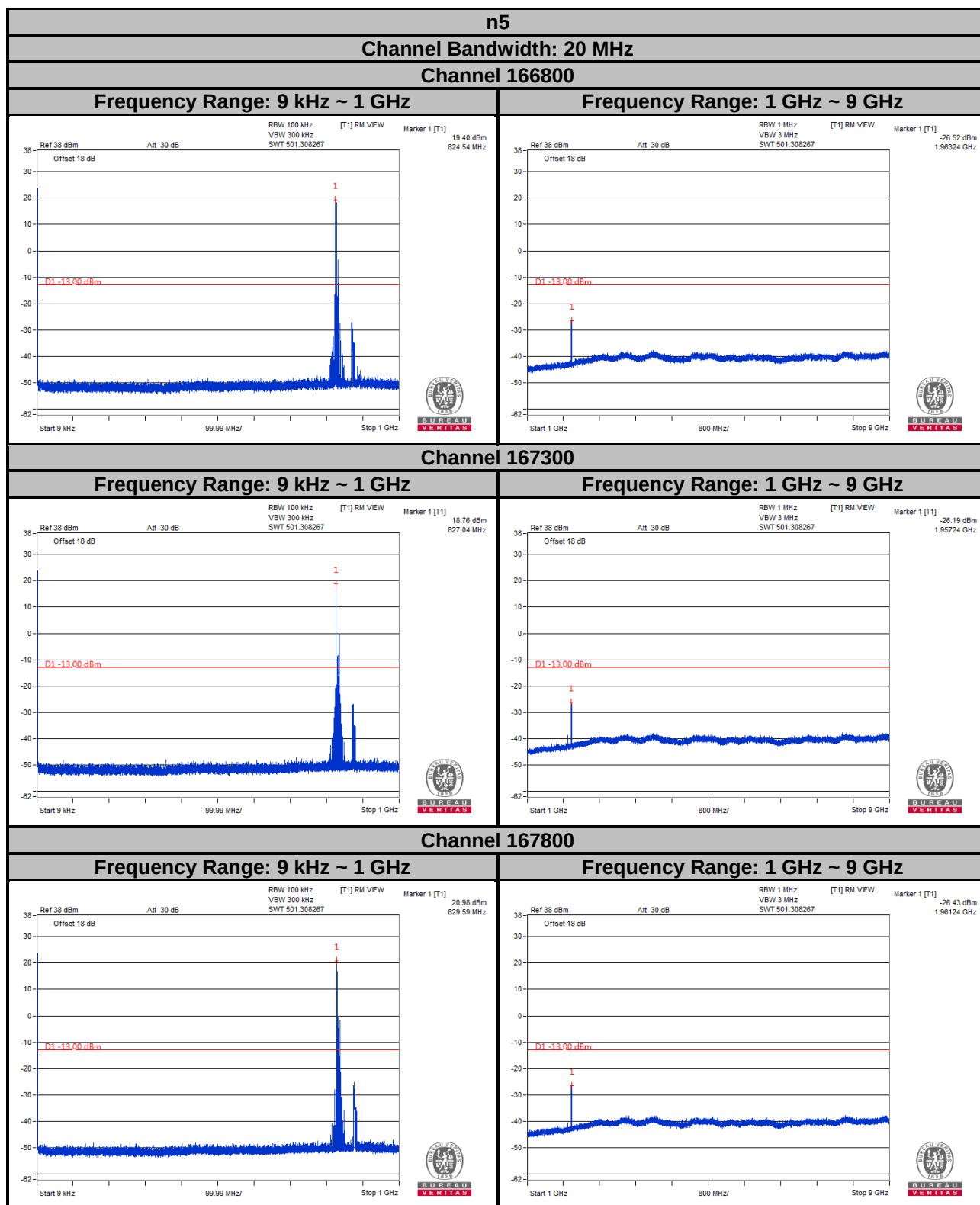
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.

4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit is equal to -13 dBm.

4.8.2 Test Procedure

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
- c. E.R.P power can be calculated from E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15 dB.

NOTE:

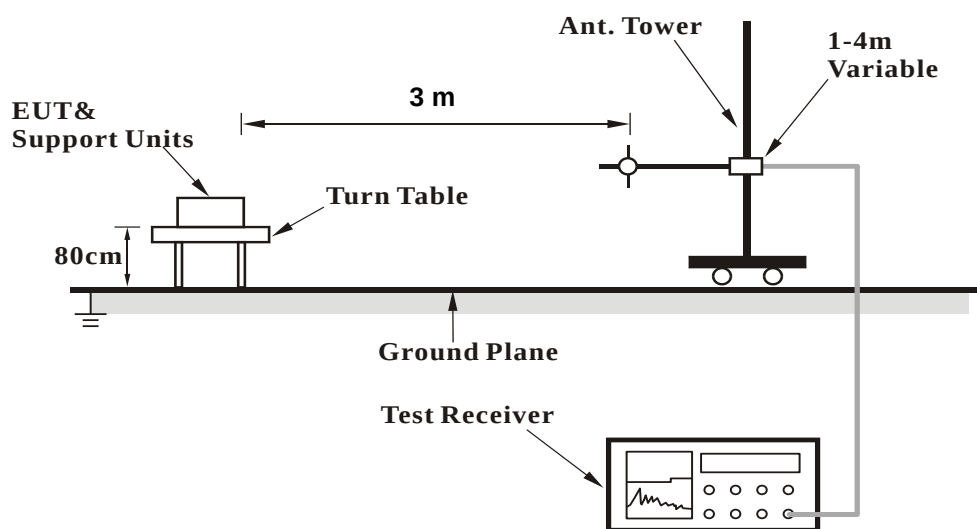
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.
2. The emission levels were against the limit of frequency range 9 kHz ~ 30 MHz:
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

4.8.3 Deviation from Test Standard

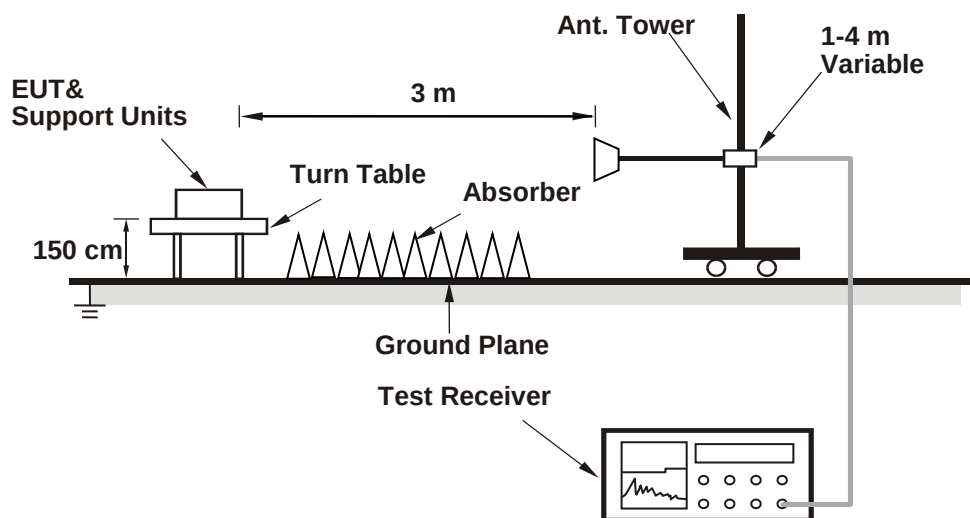
No deviation.

4.8.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

4.8.5 Test Results

Below 1GHz

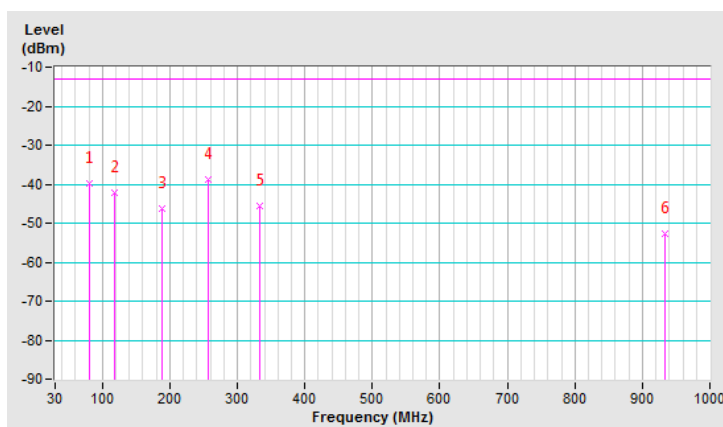
n5, Channel Bandwidth: 20MHz

Mode	TX channel 167300 (836.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	80.44	-36.9	-38.3	-1.6	-39.9	-13.0	-26.9
2	117.30	-41.1	-42.4	0.2	-42.2	-13.0	-29.2
3	189.08	-49.4	-50.5	4.1	-46.4	-13.0	-33.4
4	256.98	-43.1	-44.0	5.3	-38.7	-13.0	-25.7
5	332.64	-49.9	-50.7	5.2	-45.5	-13.0	-32.5
6	934.04	-56.8	-56.7	3.9	-52.8	-13.0	-39.8

Remarks:

- ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
- Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB) + 2.15dB.

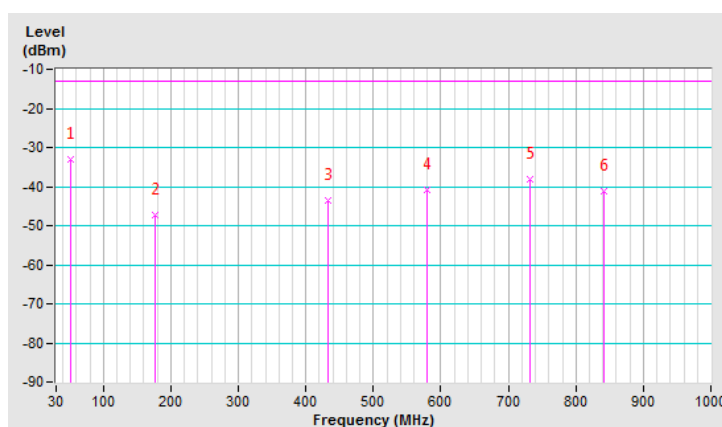


Mode	TX channel 167300 (836.5MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	51.34	-22.2	-24.3	-8.9	-33.2	-13.0	-20.2
2	177.44	-48.7	-49.8	2.6	-47.2	-13.0	-34.2
3	433.52	-48.0	-48.6	5.2	-43.4	-13.0	-30.4
4	579.02	-44.9	-45.3	4.5	-40.8	-13.0	-27.8
5	732.28	-42.8	-42.9	4.9	-38.0	-13.0	-25.0
6	840.92	-45.1	-45.1	4.0	-41.1	-13.0	-28.1

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB) + 2.15dB.



Above 1GHz

n5, Channel Bandwidth: 5MHz

Mode	TX channel 165300 (826.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1653.00	-67.3	-70.6	5.5	-65.1	-13.0	-52.1
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1653.00	-68.7	-69.7	5.5	-64.2	-13.0	-51.2

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB) + 2.15dB.

Mode	TX channel 167300 (836.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-67.2	-70.3	5.5	-64.8	-13.0	-51.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-68.2	-69.0	5.5	-63.5	-13.0	-50.5

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB) + 2.15dB.

Mode	TX channel 169300 (846.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1693.00	-67.7	-70.5	5.6	-64.9	-13.0	-51.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1693.00	-68.5	-69.1	5.6	-63.5	-13.0	-50.5

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB) + 2.15dB.

n5, Channel Bandwidth: 10MHz

Mode	TX channel 165800 (829.0MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1658.00	-67.2	-70.4	5.5	-64.9	-13.0	-51.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1658.00	-68.3	-69.3	5.5	-63.8	-13.0	-50.8

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB) + 2.15dB.

Mode	TX channel 167300 (836.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-67.4	-70.4	5.5	-64.9	-13.0	-51.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-68.2	-68.9	5.5	-63.4	-13.0	-50.4

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB) + 2.15dB.

Mode	TX channel 168800 (844.0MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1688.00	-67.0	-69.8	5.5	-64.3	-13.0	-51.3
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1688.00	-68.5	-69.0	5.5	-63.5	-13.0	-50.5

Remarks:

1. $ERP (dBm) = S.G \text{ Value (dBm)} + \text{Correction Factor (dB)}$.
2. $\text{Correction Factor (dB)} = \text{Substitution Antenna Gain (dB)} + \text{Cable Loss (dB)} + 2.15dB$.

n5, Channel Bandwidth: 15MHz

Mode	TX channel 166300 (831.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1663.00	-67.1	-70.4	5.6	-64.8	-13.0	-51.8
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1663.00	-68.5	-69.6	5.6	-64.0	-13.0	-51.0

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB) + 2.15dB.

Mode	TX channel 167300 (836.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-67.0	-70.0	5.5	-64.5	-13.0	-51.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-68.7	-69.4	5.5	-63.9	-13.0	-50.9

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB) + 2.15dB.

Mode	TX channel 168300 (841.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1683.00	-67.2	-70.0	5.5	-64.5	-13.0	-51.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1683.00	-68.5	-69.1	5.5	-63.6	-13.0	-50.6

Remarks:

1. $ERP (dBm) = S.G \text{ Value (dBm)} + \text{Correction Factor (dB)}$.
2. $\text{Correction Factor (dB)} = \text{Substitution Antenna Gain (dB)} + \text{Cable Loss (dB)} + 2.15dB$.

n5, Channel Bandwidth: 20MHz

Mode	TX channel 166800 (834.0MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1668.00	-67.4	-70.5	5.6	-64.9	-13.0	-51.9
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1668.00	-68.2	-69.2	5.6	-63.6	-13.0	-50.6

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB) + 2.15dB.

Mode	TX channel 167300 (836.5MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-67.5	-70.5	5.5	-65.0	-13.0	-52.0
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1673.00	-68.0	-68.7	5.5	-63.2	-13.0	-50.2

Remarks:

1. ERP (dBm) = S.G Value (dBm) + Correction Factor (dB).
2. Correction Factor (dB) = Substitution Antenna Gain (dB) + Cable Loss (dB) + 2.15dB.

Mode	TX channel 167800 (839.0MHz)	Frequency Range	1GHz ~ 18GHz
Environmental Conditions	25deg. C, 70%RH	Input Power	120Vac, 60Hz
Tested By	Noah Chang		

Antenna Polarity & Test Distance: Horizontal at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1678.00	-67.0	-70.0	5.5	-64.5	-13.0	-51.5
Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	1678.00	-68.2	-69.0	5.5	-63.5	-13.0	-50.5

Remarks:

1. $ERP (dBm) = S.G \text{ Value (dBm)} + \text{Correction Factor (dB)}$.
2. $\text{Correction Factor (dB)} = \text{Substitution Antenna Gain (dB)} + \text{Cable Loss (dB)} + 2.15dB$.

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 FCC recognized accredited test firms and accredited 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/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

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.

--- END ---