

FCC TEST REPORT

(PART 90)

Applicant:	Lenovo (Shanghai) Electronics Technology Co., Ltd.
Address:	Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone

Manufacturer or Supplier	Lenovo PC HK Limited
Address	23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, China
Product	Portable Tablet Computer
Brand Name	Lenovo
Model Name	TB311XU
FCC ID	O57TB311XU
Date of tests	Aug. 15, 2024~Sep. 24, 2024

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 90, Subpart R, S**
☒ **ANSI/TIA/EIA-603- D**
☒ **FCC Part 2**

☒ **ANSI/TIA/EIA-603-E**
☒ **ANSI C63.26-2015**

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Simon Wang
Engineer / Mobile Department

Approved by Luke Lu
Manager / Mobile Department

Simon Wang

Luke Lu

Date: Sep. 24, 2024

Date: Sep. 24, 2024

This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions> and is intended 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. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; 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.



Table of Contents

RELEASE CONTROL RECORD	4
1 SUMMARY OF TEST RESULTS	5
1.1 MEASUREMENT UNCERTAINTY	6
1.2 TEST SITE AND INSTRUMENTS	7
2 GENERAL INFORMATION	9
2.1 GENERAL DESCRIPTION OF EUT	9
2.2 CONFIGURATION OF SYSTEM UNDER TEST	11
2.3 DESCRIPTION OF SUPPORT UNITS	12
2.4 DESCRIPTION OF TEST MODES	12
2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS	14
3 TEST TYPES AND RESULTS	15
3.1 OUTPUT POWER MEASUREMENT	15
3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT	15
3.1.2 TEST PROCEDURES	15
3.1.3 TEST SETUP	16
3.1.4 TEST RESULTS	17
3.2 FREQUENCY STABILITY MEASUREMENT	25
3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT	25
3.2.2 TEST PROCEDURE	25
3.2.3 TEST SETUP	25
3.2.4 TEST RESULTS	26
3.3 OCCUPIED BANDWIDTH MEASUREMENT	27
3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT	27
3.3.2 TEST SETUP	27
3.3.3 TEST PROCEDURES	27
3.3.4 TEST RESULTS	28
3.4 EMISSION MASK MEASUREMENT	29
3.4.1 LIMITS OF EMISSION MASK MEASUREMENT	29
3.4.2 TEST SETUP	29
3.4.3 TEST PROCEDURES	30
3.4.4 TEST RESULTS	31
3.5 CONDUCTED SPURIOUS EMISSIONS	32
3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT	32
3.5.2 TEST PROCEDURE	32
3.5.3 TEST SETUP	32
3.5.4 TEST RESULTS	33
3.6 RADIATED EMISSION MEASUREMENT	34
3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT	34
3.6.2 TEST PROCEDURES	34
3.6.3 DEVIATION FROM TEST STANDARD	34
3.6.4 TEST SETUP	35
3.6.5 TEST RESULTS	37
3.7 PEAK TO AVERAGE RATIO	51
3.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT	51
3.7.2 TEST SETUP	51
3.7.3 TEST PROCEDURES	51
3.7.4 TEST RESULTS	52
4 INFORMATION ON THE TESTING LABORATORIES	53
5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	54



6 APPENDIX	55
LTE BAND26.....	55
PEAK-TO-AVERAGE RATIO(CCDF).....	55
TEST RESULT	55
TEST GRAPHS	57
26DB BANDWIDTH AND OCCUPIED BANDWIDTH.....	65
TEST RESULT	65
TEST GRAPHS	66
BAND EDGE.....	74
TEST RESULT	74
TEST GRAPHS	75
CONDUCTED SPURIOUS EMISSION	81
TEST RESULT	81
TEST GRAPHS	82
FREQUENCY STABILITY.....	87
TEST RESULT	87



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
PSU-NQN2407300216RF05	Original release	Sep. 24, 2024



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 90 & Part 2		
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT
§2.1046 §90.635(b)	Conducted Output Power	PASS
§2.1055 §90.213	Frequency Stability	PASS
§2.1049 §90.209	Occupied Bandwidth	PASS
§2.1051 §90.691	Emission Masks	PASS
§2.1051 §90.691	Conducted Spurious Emissions	PASS
§2.1053 §90.691	Radiated Spurious Emissions	PASS

*Test Lab Information Reference

Lab A:

Huarui 7Layers High Technology (Suzhou) Co., Ltd.

Lab Address:

Tower N, Innovation Center, 88 Zuyi Road, High-tech District, Suzhou City, Anhui Province

Accredited Test Lab Cert 6613.01

The FCC Site Registration No. is 434559; The Designation No. is CN1325.



1.1 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	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.66dB
Radiated emissions	9KHz ~ 30MHz	2.68dB
	30MHz ~ 1GHz	3.26dB
	1GHz ~ 18GHz	4.48dB
	18GHz ~ 40GHz	4.12dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.



1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Pre-Amplifier	R&S	SCU18F1	100815	Aug.30,22	Aug.29,24
Pre-Amplifier	R&S	SCU18F1	100815	Aug.29,24	Aug.28,26
Pre-Amplifier	R&S	SCU08F1	101028	Sep.16,22	Sep.15,24
Pre-Amplifier	R&S	SCU08F1	101028	Sep.15,24	Sep.14,26
Vector Signal Generator	R&S	SMBV100B	102176	Mar.29,24	Mar.28,26
Signal Generator	R&S	SMB100A	182185	Mar.29,24	Mar.28,26
3m Fully-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-01Chamber	Nov.25,22	Nov.24,25
3m Semi-anechoic Chamber	TDK	9m*6m*6m	HRSW-SZ-EMC-02Chamber	Nov.25,22	Nov.24,25
EMI TEST Receiver	R&S	ESR26	101734	Mar.28,24	Mar.27,26
EMI TEST Receiver	R&S	ESW44	101973	Mar.28,24	Mar.27,26
Bilog Antenna	SCHWARZBECK	VULB 9163	1264	Dec.26,23	Dec.25,25
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.22,22	Aug.21,24
Horn Antenna	ETS-LINDGREN	3117	227836	Aug.21,24	Aug.20,26
Horn Antenna (18GHz-40GHz)	Steatite Q-par Antennas	QMS 00880	23486	Jul.15,24	Jul.14,26
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.22,22	Aug.21,24
Horn Antenna	Steatite Q-par Antennas	QMS 00208	23485	Aug.21,24	Aug.20,26
Loop Antenna	SCHWARZ	HFH2-Z2/Z2E	100976	Feb.22,24	Feb.21,26
WIDEBANDRADIO COMMUNICATION TESTER	R&S	CMW500	169399	Jun.19,24	Jun.18,26
Test Software	EMC32	EMC32	N/A	N/A	N/A
6DB attenuator	Tonscend Technology Co., Ltd	N/A	23062787	N/A	N/A
Test Software	ELEKTRA	ELEKTRA4.32	N/A	N/A	N/A
Open Switch and Control Unit	R&S	OSP220	101964	Oct.01,22	Sep.30,24
DC Source	HYELEC	HY3010B	551016	Aug.31,22	Aug.30,24
DC Source	HYELEC	HY3010B	551016	Aug.30,24	Aug.29,26
Hygrothermograph	DELI	20210528	SZ014	Sep.06,22	Sep.05,24
Hygrothermograph	DELI	20210528	SZ014	Sep.05,24	Sep.04,26
PC	LENOVO	E14	HRSW0024	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-7.00M	N/A	N/A	N/A
TMC-AMI18843A(CABLE)	R&S	HF290-NMNM-4.00M	N/A	N/A	N/A
CABLE	R&S	W13.02	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	W12.14	N/A	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-069	Apr.27,24	Apr.26,25
CABLE	R&S	J12J103539-00-1	SEP-03-20-070	Apr.27,24	Apr.26,25
Temperature Chamber	votsch	VT4002	58566078100050	May.30,24	May.29,26



Test Report No.: PSU-NQN2407300216RF05

- NOTE:**
1. The calibration interval of the above test instruments is 12/24/36 months and the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.
 2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.
 3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 434559; The Designation No. is CN 1325.



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Portable Tablet Computer	
BRAND NAME	Lenovo	
MODEL NAME	TB311XU	
NOMINAL VOLTAGE	5Vdc (Adapter or host equipment) 3.9Vdc (Li-Polymer, battery)	
MODULATION TECHNOLOGY	LTE	QPSK, 16QAM, 64QAM
FREQUENCY RANGE	LTE Band 26 (Channel Bandwidth: 1.4MHz)	814.7MHz ~ 823.3MHz
	LTE Band 26 (Channel Bandwidth: 3MHz)	815.5MHz ~ 822.5MHz
	LTE Band 26 (Channel Bandwidth: 5MHz)	816.5MHz ~ 821.5MHz
	LTE Band 26 (Channel Bandwidth: 10MHz)	819MHz
EMISSION DESIGNATOR	LTE Band 26 (Channel Bandwidth: 1.4MHz)	QPSK: 1M09G7D
		16QAM: 1M09W7D
		64QAM: 1M08W7D
	LTE Band 26 (Channel Bandwidth: 3MHz)	QPSK: 2M68G7D
		16QAM: 2M68W7D
		64QAM: 2M68W7D
	LTE Band 26 (Channel Bandwidth: 5MHz)	QPSK: 4M48G7D
		16QAM: 4M48W7D
		64QAM: 4M47W7D
	LTE Band 26 (Channel Bandwidth: 10MHz)	QPSK: 8M94G7D
		16QAM: 8M95W7D
		64QAM: 8M94W7D
MAX. EIRP POWER	LTE Band 26 (Channel Bandwidth: 1.4MHz)	96.83mW
	LTE Band 26 (Channel Bandwidth: 3MHz)	97.05mW
	LTE Band 26 (Channel Bandwidth: 5MHz)	96.83mW
	LTE Band 26 (Channel Bandwidth: 10MHz)	98.4mW
ANTENNA TYPE	PIFA Antenna	
ANTENNA GAIN	ANT1: -2.86 dBi for LTE Band 26 ANT2: -3.42 dBi for LTE Band 26	
HW VERSION	TB311XU	
SW VERSION	TB311XU_RF01_20240921	



I/O PORTS	Refer to user's manual
DATA CABLE	N/A
EXTREME TEMPERATURE	-10-55 °C
EXTREME VOLTAGE	3.5V – 4.5V

NOTE:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receivers.

MODULATION MODE	TX FUNCTION
LTE Band26	1TX/1RX

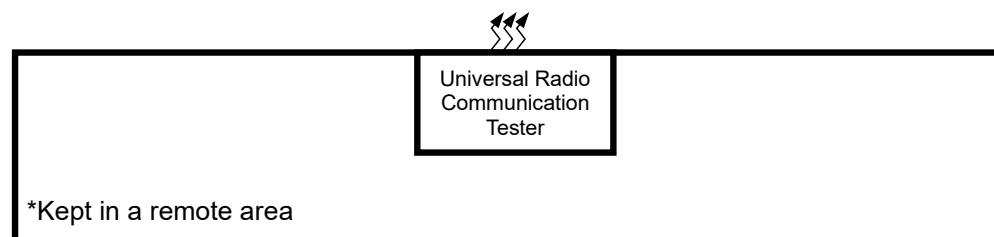
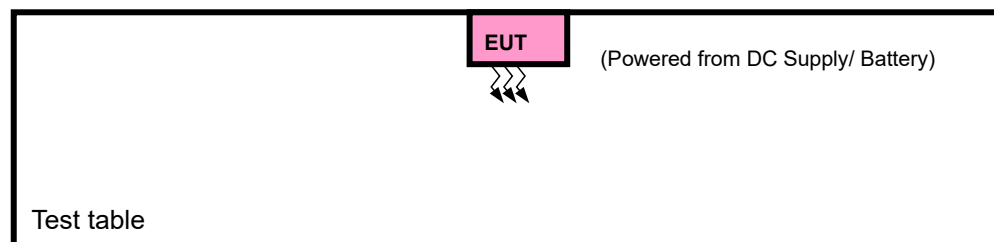
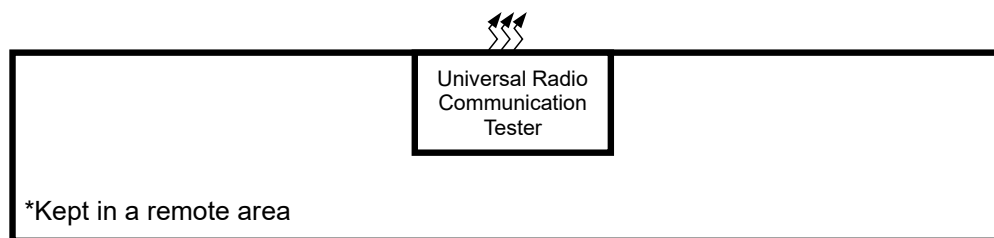
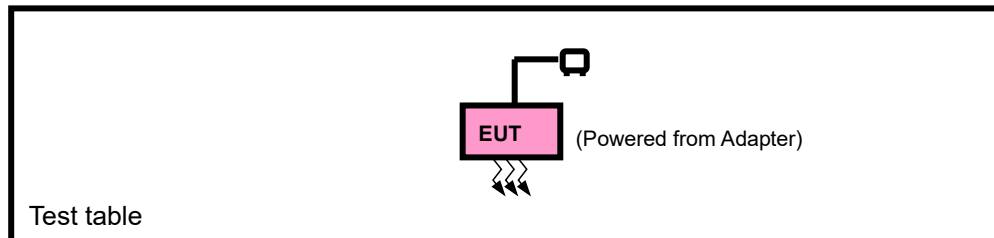
- For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

ACCESSORIES	BRAND	MANUFACTURER	MODEL	SPECIFICATION
Battery 1	N/A	Zhejiang Sunwoda Electronic Co., Ltd.	L24D1P32	Nominal Energy: 19.55Wh , Typical Energy: 19.95Wh
Battery 2	N/A	Ningde Amperex Technology Limited	L24D1P32	Nominal Energy: 19.55Wh , Typical Energy: 19.95Wh
AC Adapter 1	Salcomp	Salcomp (Shenzhen) Co., Ltd	MC-201L (US)	AC Input: 100-240V~, 50/60Hz, 0.7A DC Output: 5.0Vdc 3.0A 15W 10Vdc 2.0A 20W 12Vdc 1.67A 20W
AC Adapter 2	Aohai	Jiangxi Jian Aohai Technology Co., Ltd.	MC-201L (US)	AC Input: 100-240V~, 50/60Hz, 0.7A DC Output: 5.0Vdc 3.0A 15W 10Vdc 2.0A 20W 12Vdc 1.67A 20W
USB Cable 1 (support unit)	Saibao	Saibao (Jiangxi) Industrial Co., LTD	SLQ-A263A	Signal Line, 1.0meter
USB Cable 2	Jieye	Jiangxi Jieye Electronics Co., LTD	JY-C03-422	Signal Line, 1.0meter
Earphone(optional)	Lenovo	N/A	E310	N/A
Pen(optional)	Lenovo	N/A	passive pen	N/A



2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST





2.3 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
1	Laptop	Lenovo	ThinkPad E14	HRSW00024	N/A
2aa	Earphone	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB Cable: Unshielded, Detachable, 1.0m;

2.4 DESCRIPTION OF TEST MODES

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 in ERP/EIRP and radiated emission was found when positioned on X-plane for LTE. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + Adapter + USB Cable with LTE link
B	EUT + DC Supply with LTE link



LTE BAND 26 MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
A	ERP	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26740	26740	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	26740	26740	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
A	OCCUPIED BANDWIDTH	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		26740	26740	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
A	BAND EDGE	26697 to 26783	26697	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
			26783	1.4MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		26705 to 26775	26705	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
			26775	3MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		26715 to 26765	26715	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
			26765	5MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		26740	26740	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
			26740	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		26740	26740	10MHz	QPSK, 16QAM, 64QAM	1 RB / 49 RB Offset
			26740	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		26740	26740	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
			26740	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
A	CONDUCTED EMISSION	26697 to 26783	26697, 26740, 26783	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26705 to 26775	26705, 26740, 26775	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26715 to 26765	26715, 26740, 26765	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		26740	26740	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
A	PEAK-TO-AVERAGE RATIO	26740	26740	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
A	RADIATED EMISSION	26697 to 26783	26740	1.4MHz	QPSK	1 RB / 0 RB Offset
		26705 to 26775	26740	3MHz	QPSK	1 RB / 0 RB Offset
		26715 to 26765	26740	5MHz	QPSK	1 RB / 0 RB Offset
		26740	26740	10MHz	QPSK	1 RB / 0 RB Offset

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

**TEST CONDITION:**

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP(ERP)	24deg. C, 60%RH	DC 3.9V By Battery	Jace Hu
FREQUENCY STABILITY	24deg. C, 61%RH	DC 5V By DC Source	James Fu
OCCUPIED BANDWIDTH	24deg. C, 61%RH	DC 3.9V By Battery	James Fu
BAND EDGE	24deg. C, 61%RH	DC 3.9V By Battery	James Fu
CONDUCTED EMISSION	24deg. C, 61%RH	DC 3.9V By Battery	James Fu
RADIATED EMISSION	23deg. C, 70%RH	AC 120V/60Hz	Jace Hu

2.5 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:

FCC 47 CFR Part 2

FCC 47 CFR Part 90

ANSI/TIA/EIA-603-D

ANSI/TIA/EIA-603-E

ANSI C63.26-2015

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



3 TEST TYPES AND RESULTS

3.1 OUTPUT POWER MEASUREMENT

3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Per FCC Part 90.635(a)(b)

The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw).

3.1.2 TEST PROCEDURES

EIRP / ERP MEASUREMENT:

Per KDB 971168 D01 Power Meas License Digital Systems v03r01 or subclause 5.2.5.5 of ANSI C63.26-2015, the relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T - L_C$$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively

(expressed in the same units as P_{Meas} , typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB

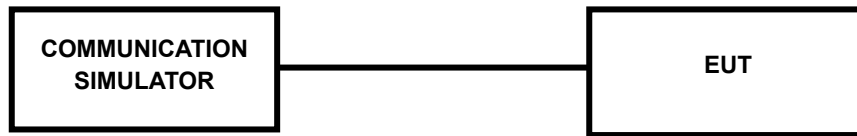
CONDUCTED POWER MEASUREMENT:

- The EUT was set up for the maximum power with LTE 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.



3.1.3 TEST SETUP

CONDUCTED POWER MEASUREMENT:



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



3.1.4 TEST RESULTS

AVERAGE CONDUCTED OUTPUT POWER (dBm)

LTE Band 26

Band/BW	Modulation	RB Size	RB Offset	Low CHG 26697	Mid CH 26740	High CH 26783
				Frequency 814.7 MHz	Frequency 819 MHz	Frequency 823.3 MHz
26/ 1.4	QPSK	1	0	22.93	22.85	22.84
		1	2	23.07	23.04	22.98
		1	5	22.89	22.82	22.89
		3	0	22.82	23.02	22.91
		3	1	23.13	22.98	22.92
		3	3	23.03	23.05	22.94
		6	0	21.80	21.79	21.85
	16QAM	1	0	22.11	22.01	22.08
		1	2	22.17	22.29	22.23
		1	5	22.05	22.01	22.16
		3	0	21.95	21.81	21.87
		3	1	21.98	21.87	22.04
		3	3	22.08	22.12	22.00
		6	0	20.89	21.02	20.94
	64QAM	1	0	21.02	21.12	21.17
		1	2	21.23	21.20	21.23
		1	5	20.92	21.11	21.04
		3	0	20.96	20.91	20.98
		3	1	20.94	20.90	20.95
		3	3	21.02	21.05	21.08
		6	0	20.00	19.99	19.91



Band/BW	Modulation	RB Size	RB Offset	Low CHG 26705	Mid CH 26740	High CH 26775
				Frequency 815.5 MHz	Frequency 819 MHz	Frequency 822.5 MHz
26/ 3	QPSK	1	0	22.82	22.89	22.88
		1	7	23.06	23.04	23.09
		1	14	22.94	22.81	23.01
		8	0	21.92	21.99	22.01
		8	3	22.15	21.99	21.96
		8	7	21.97	22.06	21.93
		15	0	21.87	21.80	21.85
	16QAM	1	0	22.12	22.14	22.22
		1	7	22.27	22.31	22.27
		1	14	22.06	21.92	22.09
		8	0	20.93	20.93	20.89
		8	3	20.95	20.94	20.99
		8	7	21.09	20.99	21.04
		15	0	20.92	21.01	20.97
	64QAM	1	0	21.12	21.03	21.11
		1	7	21.22	21.23	21.15
		1	14	20.96	21.08	21.08
		8	0	19.84	19.94	20.01
		8	3	19.87	19.97	20.08
		8	7	20.12	20.01	20.00
		15	0	19.97	19.99	19.92



Band/BW	Modulation	RB Size	RB Offset	Low CHG 26715	Mid CH 26740	High CH 26765
				Frequency 816.5 MHz	Frequency 819 MHz	Frequency 821.5 MHz
26/ 5	QPSK	1	0	22.97	22.94	22.99
		1	12	23.18	23.09	23.10
		1	24	22.97	22.95	23.03
		12	0	21.96	22.09	22.06
		12	6	22.19	22.08	22.07
		12	13	22.06	22.13	22.04
		25	0	21.95	21.91	21.93
	16QAM	1	0	22.16	22.16	22.23
		1	12	22.31	22.38	22.36
		1	24	22.07	22.07	22.20
		12	0	21.06	20.95	20.97
		12	6	21.04	20.98	21.08
		12	13	21.10	21.13	21.12
		25	0	21.01	21.13	21.06
	64QAM	1	0	21.17	21.14	21.23
		1	12	21.28	21.28	21.29
		1	24	21.07	21.17	21.10
		12	0	19.98	19.99	20.08
		12	6	20.01	20.04	20.09
		12	13	20.15	20.16	20.11
		25	0	20.02	20.10	19.98



Band/BW	Modulation	RB Size	RB Offset	/	Mid CH 26740	/
				/	Frequency 819 MHz	/
26/ 10	QPSK	1	0	/	23.07	/
		1	24	/	23.24	/
		1	49	/	23.05	/
		25	0	/	22.10	/
		25	12	/	22.22	/
		25	25	/	22.16	/
		50	0	/	22.05	/
	16QAM	1	0	/	22.31	/
		1	24	/	22.40	/
		1	49	/	22.22	/
		25	0	/	21.09	/
		25	12	/	21.12	/
		25	25	/	21.17	/
		50	0	/	21.15	/
	64QAM	1	0	/	21.25	/
		1	24	/	21.30	/
		1	49	/	21.19	/
		25	0	/	20.09	/
		25	12	/	20.15	/
		25	25	/	20.20	/
		50	0	/	20.12	/



ERP

LTE BAND 26

CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26697	814.7	23.13	-2.86	18.12	64.86	100
26740	819	23.05	-2.86	18.04	63.68	100
26783	823.3	22.98	-2.86	17.97	62.66	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26697	814.7	22.17	-2.86	17.16	52	100
26740	819	22.29	-2.86	17.28	53.46	100
26783	823.3	22.23	-2.86	17.22	52.72	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

CHANNEL BANDWIDTH: 1.4MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26697	814.7	21.23	-2.86	16.22	41.88	100
26740	819	21.2	-2.86	16.19	41.59	100
26783	823.3	21.23	-2.86	16.22	41.88	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).



LTE BAND 26

CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26705	815.5	23.06	-2.86	18.05	63.83	100
26740	819	23.04	-2.86	18.03	63.53	100
26775	822.5	23.09	-2.86	18.08	64.27	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26705	815.5	22.27	-2.86	17.26	53.21	100
26740	819	22.31	-2.86	17.3	53.7	100
26775	822.5	22.27	-2.86	17.26	53.21	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

CHANNEL BANDWIDTH: 3MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26705	815.5	21.22	-2.86	16.21	41.78	100
26740	819	21.23	-2.86	16.22	41.88	100
26775	822.5	21.15	-2.86	16.14	41.11	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).



LTE BAND 26

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26715	816.5	23.18	-2.86	18.17	65.61	100
26740	819	23.09	-2.86	18.08	64.27	100
26765	821.5	23.1	-2.86	18.09	64.42	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26715	816.5	22.31	-2.86	17.3	53.7	100
26740	819	22.38	-2.86	17.37	54.58	100
26765	821.5	22.36	-2.86	17.35	54.33	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

CHANNEL BANDWIDTH: 5MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26715	816.5	21.28	-2.86	16.27	42.36	100
26740	819	21.28	-2.86	16.27	42.36	100
26765	821.5	21.29	-2.86	16.28	42.46	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).



LTE BAND 26

CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26740	819	23.24	-2.86	18.23	66.53	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26740	819	22.4	-2.86	17.39	54.83	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G _T -L _C (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26740	819	21.3	-2.86	16.29	42.56	100

REMARKS: ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).



3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

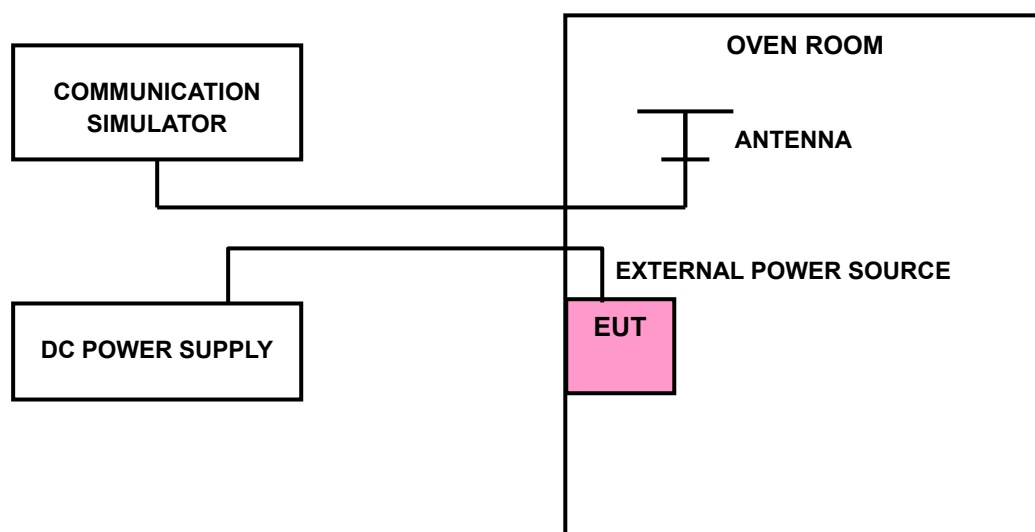
The frequency stability of mobile, portable and control transmitters operating in the wideband segment must be 1.25 parts per million or better when AFC is locked to a base station, and 5 parts per million or better when AFC is not locked

3.2.2 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 $\pm 0.5^{\circ}\text{C}$ 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.

3.2.3 TEST SETUP





3.2.4 TEST RESULTS

Please Refer to Appendix Of this test report.

Note: VL = Low voltage(3.6V); VN/NV = Normal voltage(3.87V); VH = High voltage(4.45V);
NT = Normal temperature (25°C)

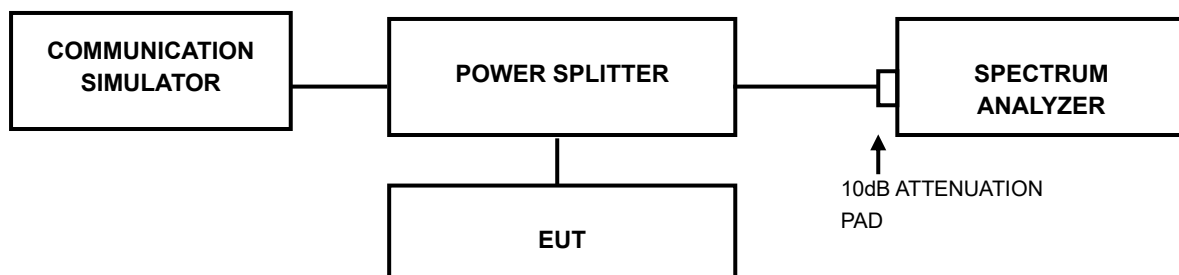


3.3 OCCUPIED BANDWIDTH MEASUREMENT

3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

3.3.2 TEST SETUP



3.3.3 TEST PROCEDURES

- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.



BUREAU VERITAS Test Report No.: PSU-NQN2407300216RF05

3.3.4 TEST RESULTS

Please Refer to Appendix Of this test report.



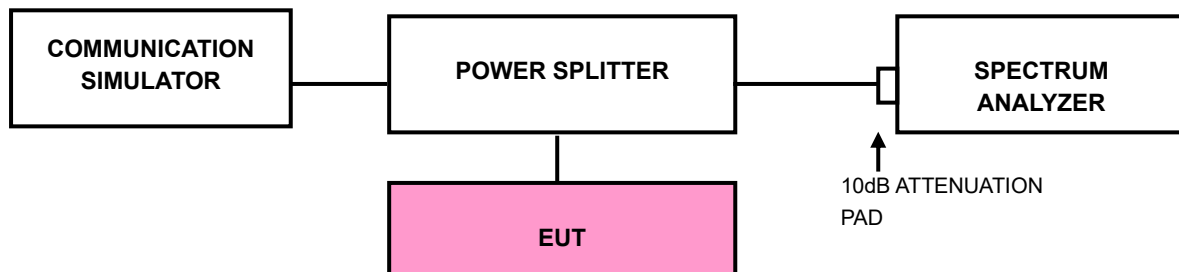
3.4 EMISSION MASK MEASUREMENT

3.4.1 LIMITS OF EMISSION MASK MEASUREMENT

According to FCC part 90.691 shall be tested the emission mask. For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

3.4.2 TEST SETUP





3.4.3 TEST PROCEDURES

- a) Connect the transmitter to the spectrum analyzer via coaxial cable while ensuring proper impedance matching.
- b) Tune the analyzer to the nominal center frequency of the emission bandwidth (EBW).
- c) Set the resolution bandwidth (RBW) $\geq 1\%$ EBW in the 1MHz band immediately outside and adjacent to the band edge.
- d) Beyond the 1MHz band from the band edge, RBW=1MHz was used.
- e) Set the video bandwidth (VBW) to $\geq 3 \times$ RBW.
- f) Select the average power (RMS) display detector.
- g) Set the number of measurement points to ≥ 1001 .
- h) Use auto-coupled sweep time.
- i) Perform the measurement over an interval of time when the transmission is continuous and at its maximum power level.
- j) The RF fundamental frequency should be excluded against the limit line in the operating frequency band and use RBW is 10KHz or 100KHz.
- k) Record the max trace plot into the test report.



3.4.4 TEST RESULTS

Please Refer to Appendix Of this test report.



3.5 CONDUCTED SPURIOUS EMISSIONS

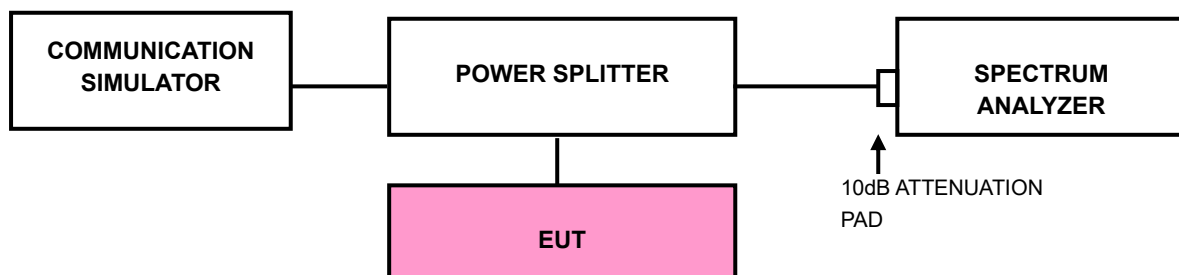
3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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

3.5.2 TEST PROCEDURE

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

3.5.3 TEST SETUP





3.5.4 TEST RESULTS

NOTE : The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

Please Refer to Appendix Of this test report.



3.6 RADIATED EMISSION MEASUREMENT

3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

(2) For operations in the 763–775 MHz and 793–805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

3.6.2 TEST PROCEDURES

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m 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 spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value” of step a. Record the power level of S.G
- c. $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,
 $\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}.$

NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

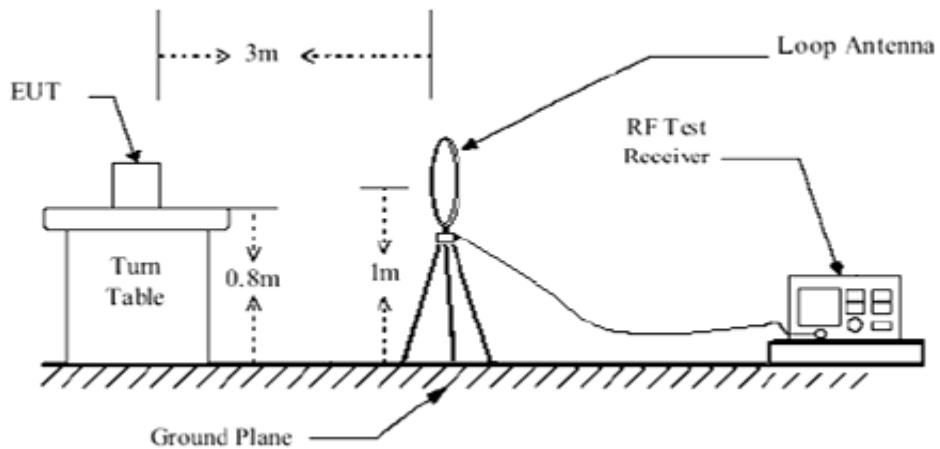
3.6.3 DEVIATION FROM TEST STANDARD

No deviation

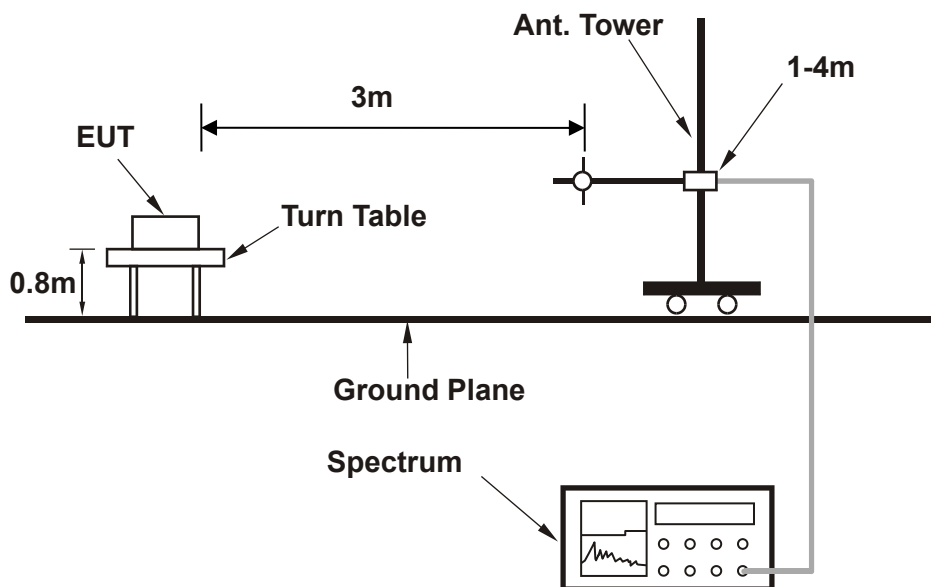


3.6.4 TEST SETUP

<Below 30MHz>

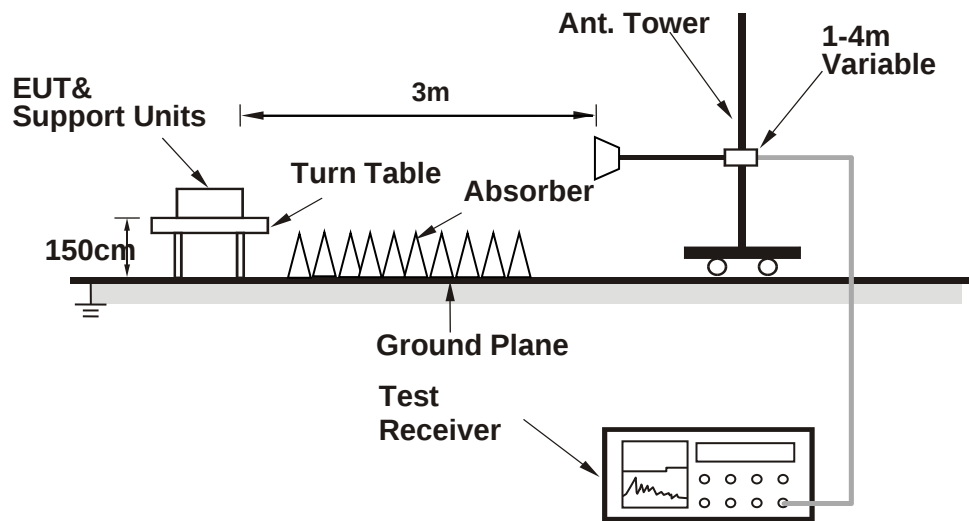


< Frequency Range 30MHz~1GHz >





< Frequency Range above 1GHz >



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



3.6.5 TEST RESULTS

NOTE : The 9K~30MHz amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required in the report.

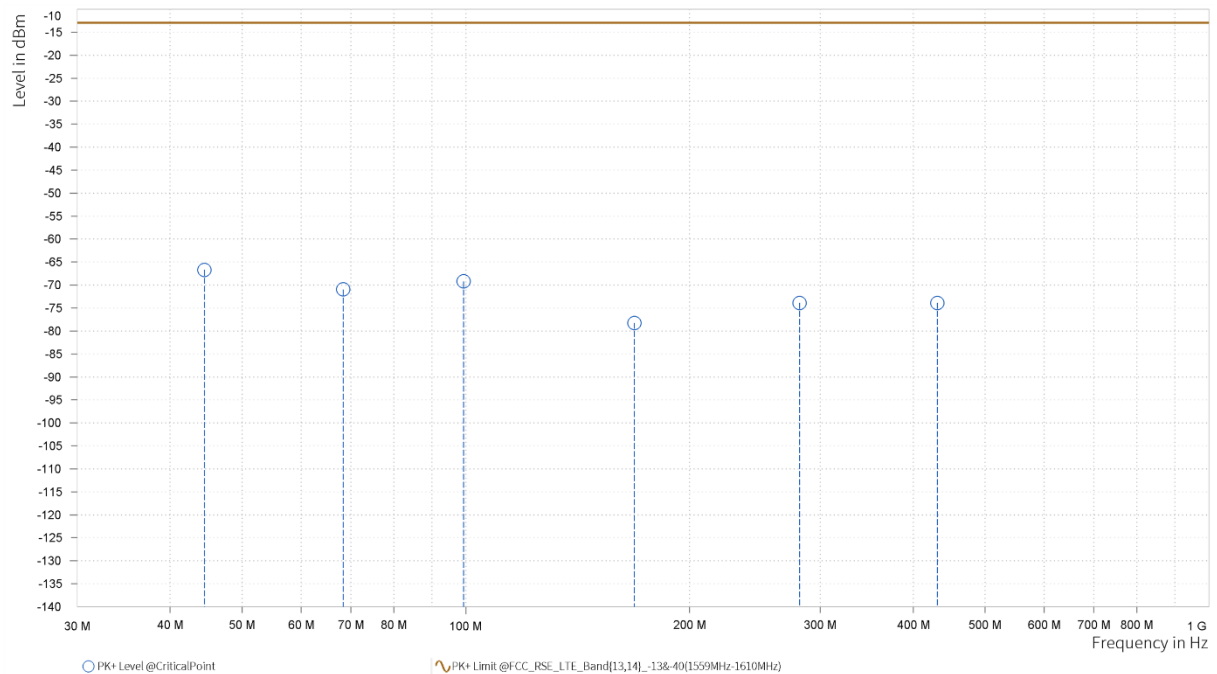
BELOW 1GHz WORST-CASE DATA

30 MHz – 1GHz data:

LTE Band 26:

CHANNEL BANDWIDTH: 10MHz / QPSK

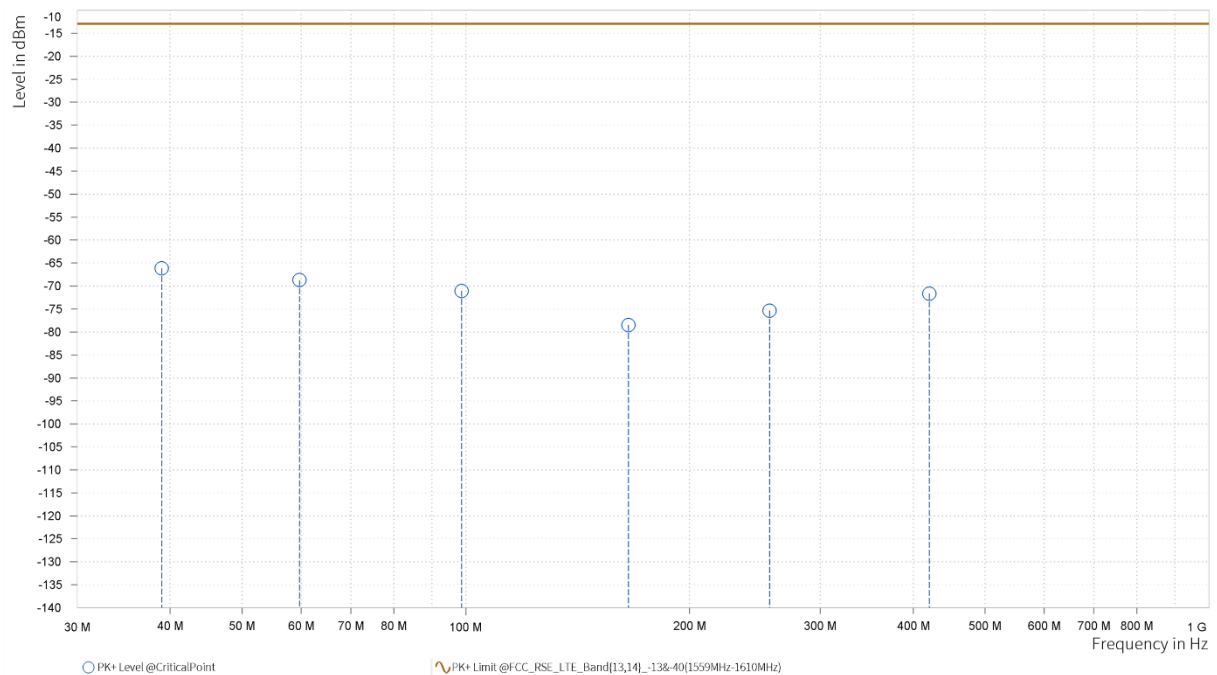
MODE		TX channel 26740		FREQUENCY RANGE		Below 1000MHz		
ENVIRONMENTAL CONDITIONS		23deg. C, 70%RH		INPUT POWER		AC 120V 60HZ		
TESTED BY		Jace Hu						
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	44.5	-66.72	-13.0	53.72	-1.16	H	356.4	2.0
1	68.35	-70.94	-13.0	57.94	-3.23	H	0.1	1.0
1	99.35	-69.2	-13.0	56.2	-4.37	H	356.4	2.0
1	168.55	-78.24	-13.0	65.24	-8.25	H	173.8	2.0
1	281.25	-73.91	-13.0	60.91	0.2	H	359.9	2.0
1	431.05	-73.9	-13.0	60.9	0.86	H	0.1	2.0





MODE	TX channel 26740	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
1	38.95	-66.11	-13.0	53.11	-1.27	V	360.0	1.0
1	59.75	-68.71	-13.0	55.71	-0.79	V	355.8	2.0
1	98.75	-71.07	-13.0	58.07	-0.33	V	172.6	2.0
1	165.5	-78.48	-13.0	65.48	-5.71	V	0.1	1.0
1	256.15	-75.35	-13.0	62.35	-1.16	V	360.0	1.0
1	420.3	-71.64	-13.0	58.64	1.69	V	191.1	1.0





BUREAU VERITAS Test Report No.: PSU-NQN2407300216RF05
ABOVE 1GHz

Note: For higher frequency, the emission is too low to be detected.

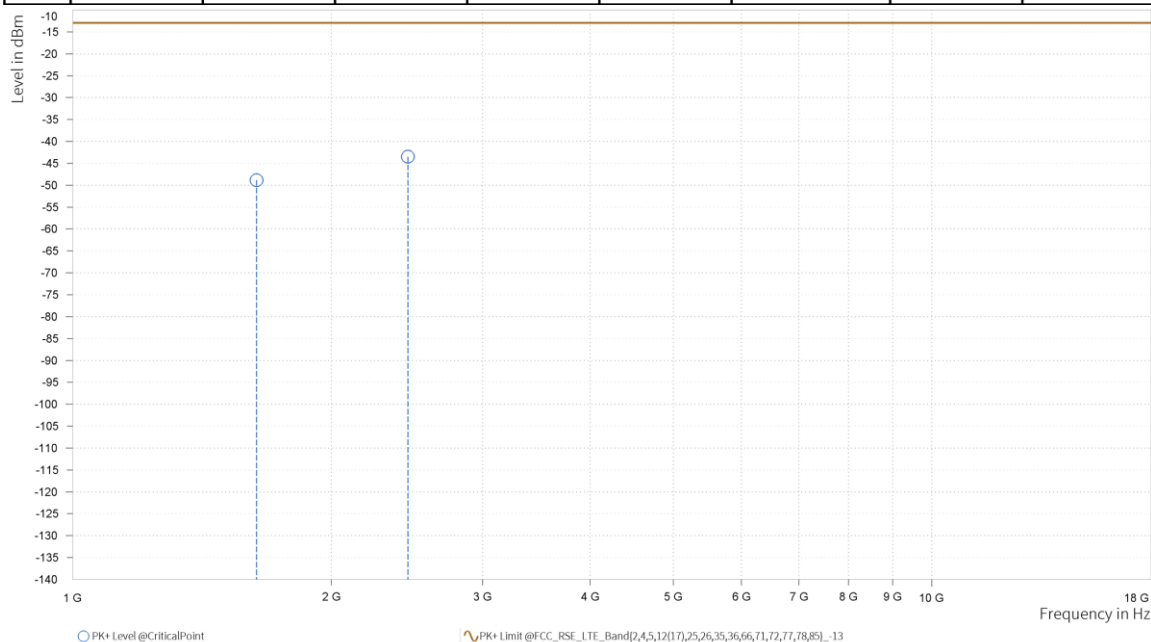
LTE BAND 26

CHANNEL BANDWIDTH: 1.4MHz / QPSK

MODE	TX channel 26740	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,636.740	-48.83	-13.0	35.83	20.78	H	287.6	2.0
3	2,455.110	-43.49	-13.0	30.49	26.92	H	1.0	1.0

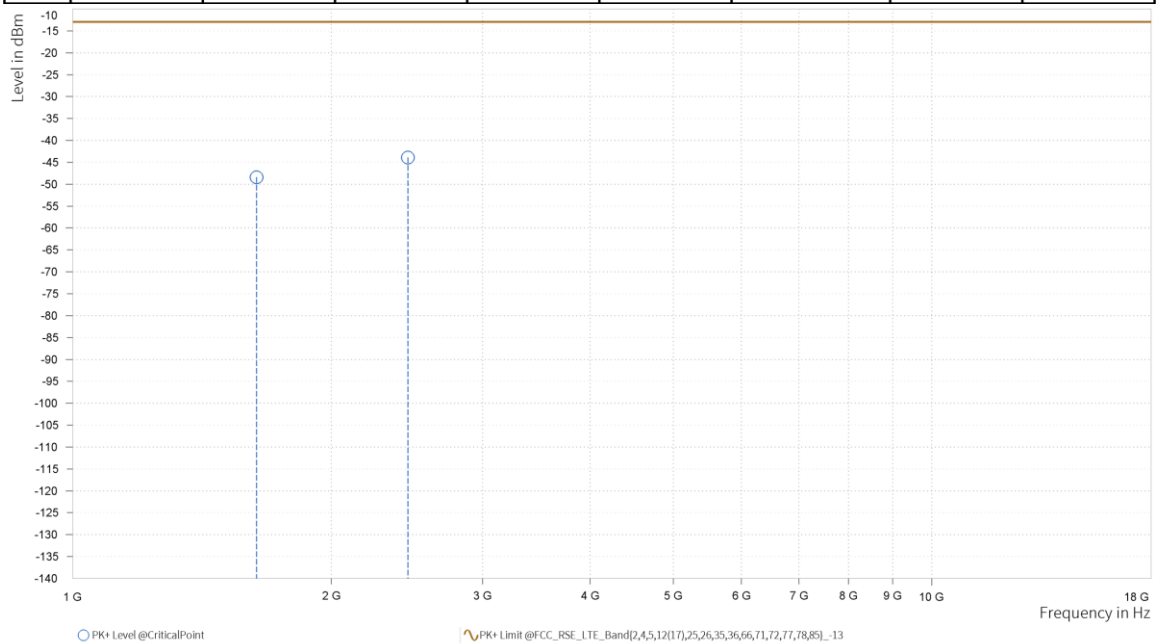




MODE	TX channel 26740	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,636.740	-48.41	-13.0	35.41	20.39	V	70	1.0
3	2,455.110	-43.9	-13.0	30.9	26.7	V	1	1.0





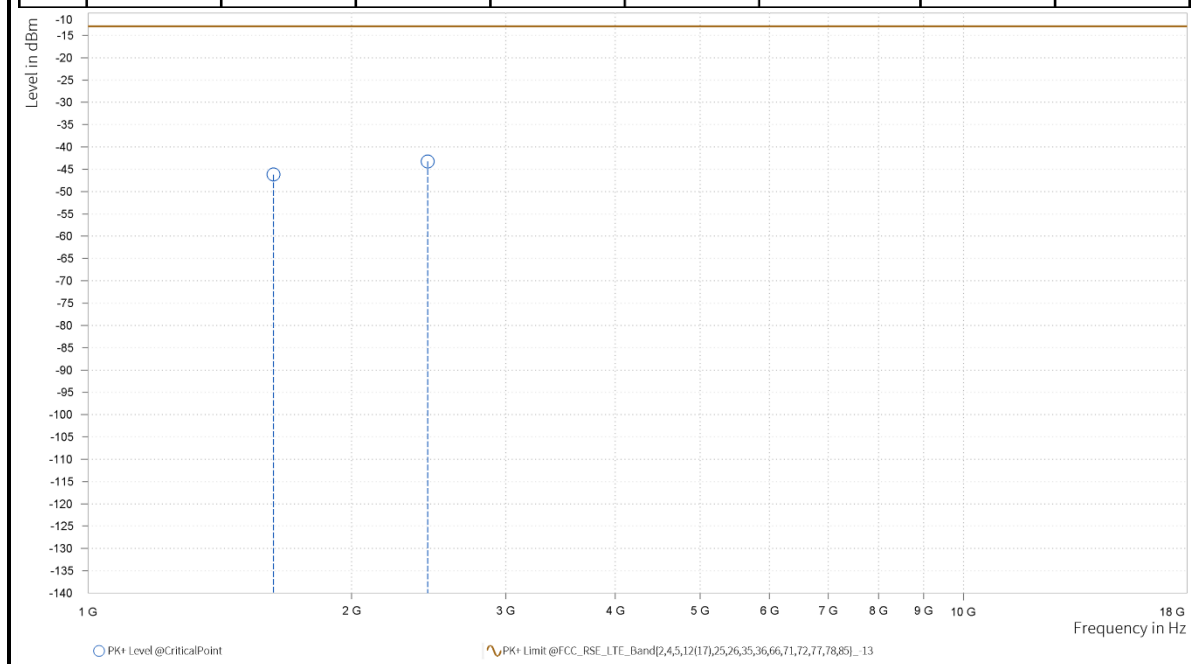
BUREAU VERITAS Test Report No.: PSU-NQN2407300216RF05
CHANNEL BANDWIDTH: 3MHz / QPSK

CH26740

MODE	TX channel 26705	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,628.300	-46.17	-13.0	33.17	20.87	H	1.0	2.0
3	2,442.450	-43.25	-13.0	30.25	27.3	H	359.1	1.0

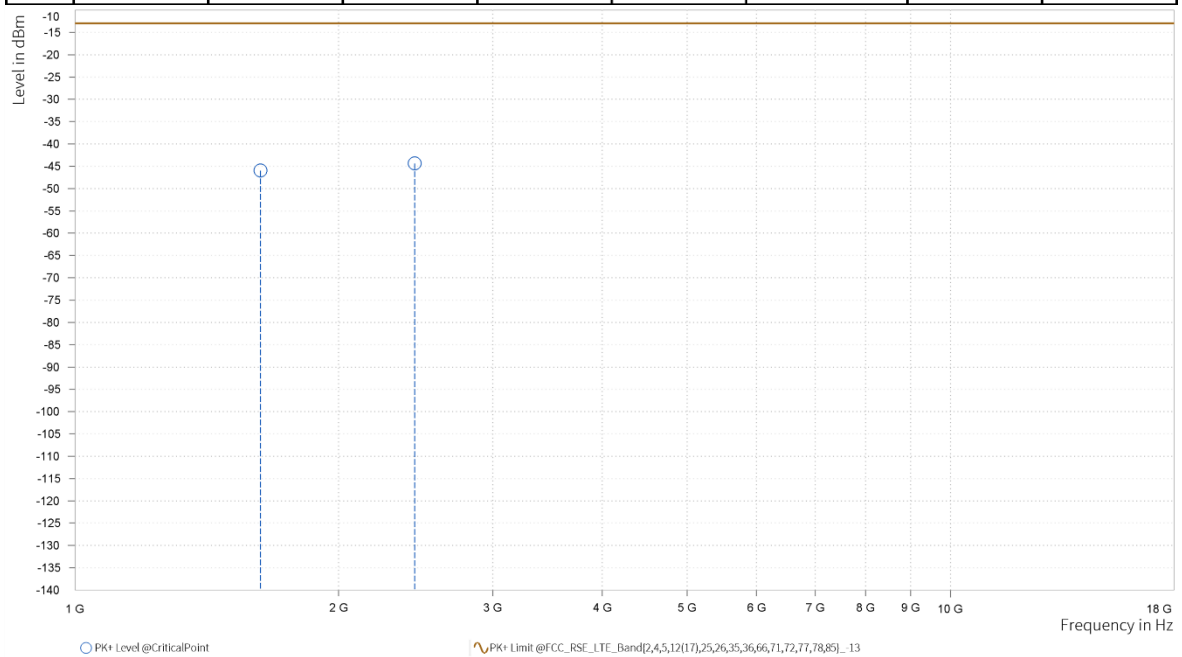




MODE	TX channel 26705	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,628.300	-45.96	-13.0	32.96	20.58	V	293.5	2.0
3	2,442.450	-44.38	-13.0	31.38	27.13	V	359.0	1.0

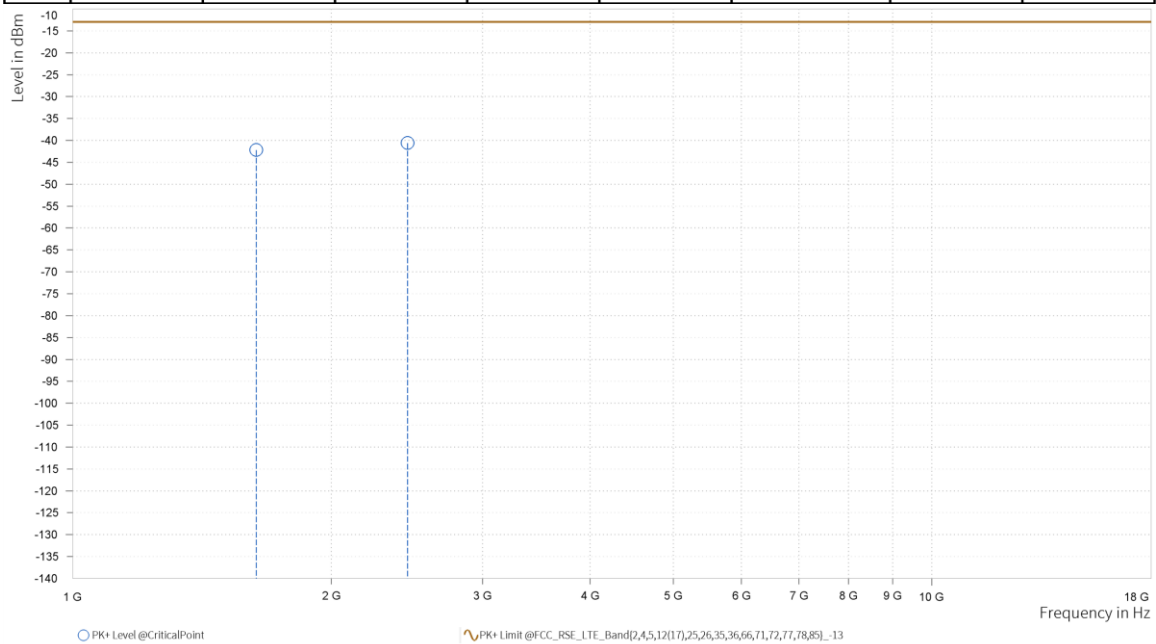




MODE	TX channel 26740	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,635.300	-42.21	-13.0	29.21	20.79	H	359.1	1.0
3	2,452.950	-40.58	-13.0	27.58	26.84	H	359.1	1.0

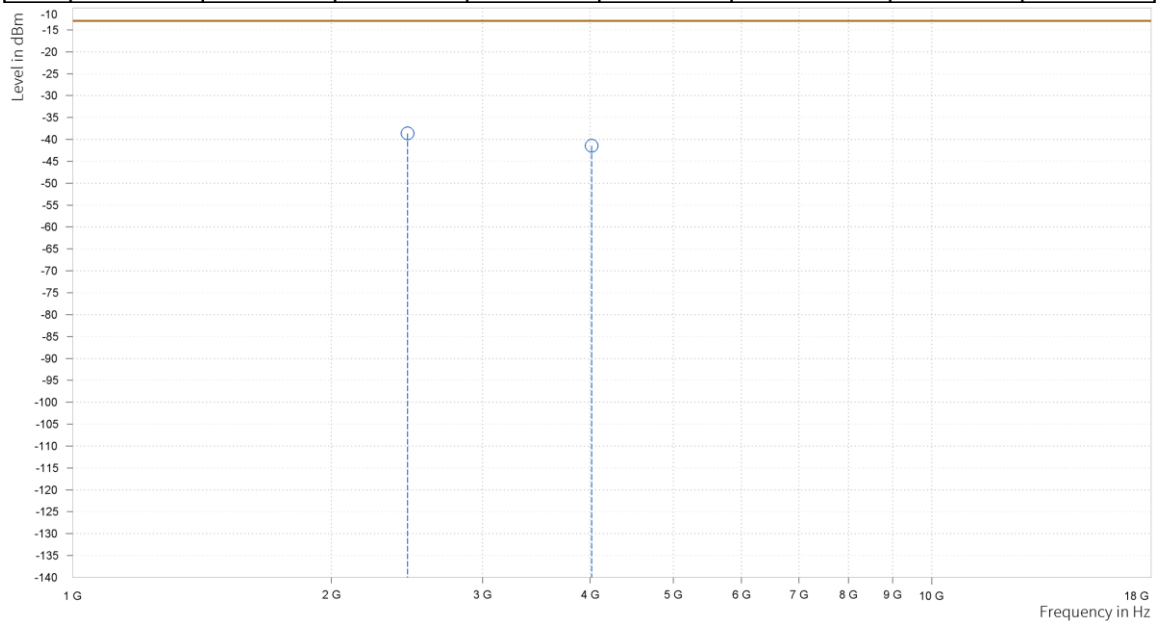




MODE	TX channel 26740	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
3	2,453.000	-38.63	-13.0	25.63	26.63	V	359	2.0
4	1,635.300	-41.47	-13.0	28.47	28.32	V	359	2.0

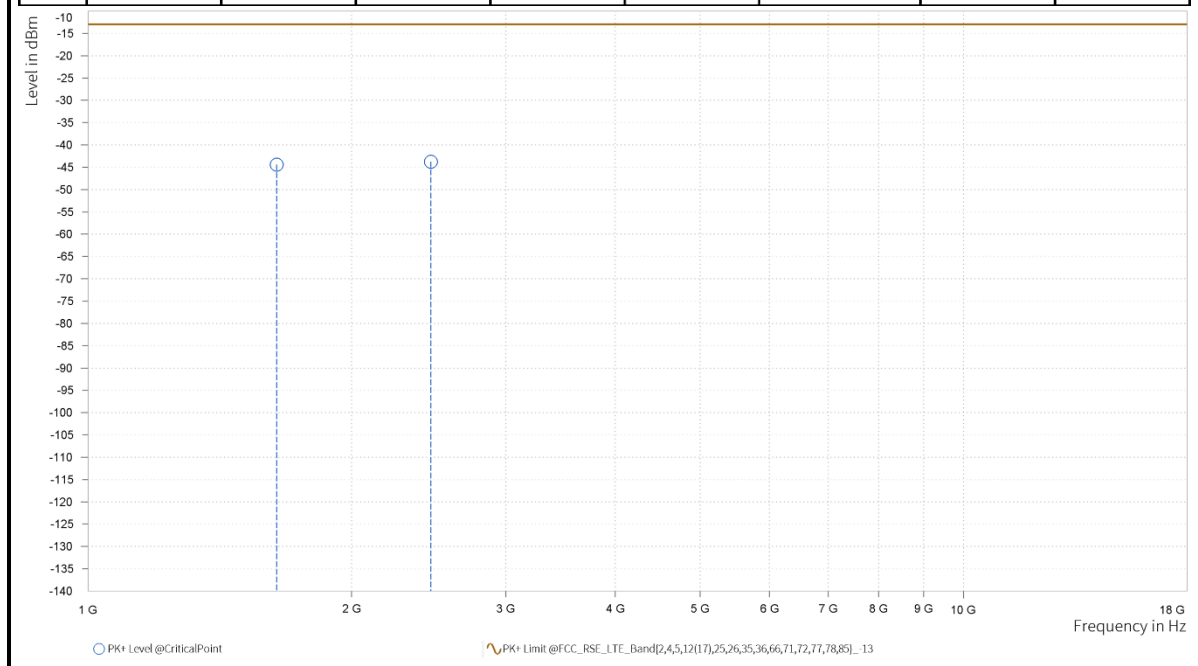




MODE	TX channel 26775	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,642.300	-44.42	-13.0	31.42	21.14	H	359.0	2.0
3	2,463.450	-43.77	-13.0	30.77	26.82	H	229.1	2.0

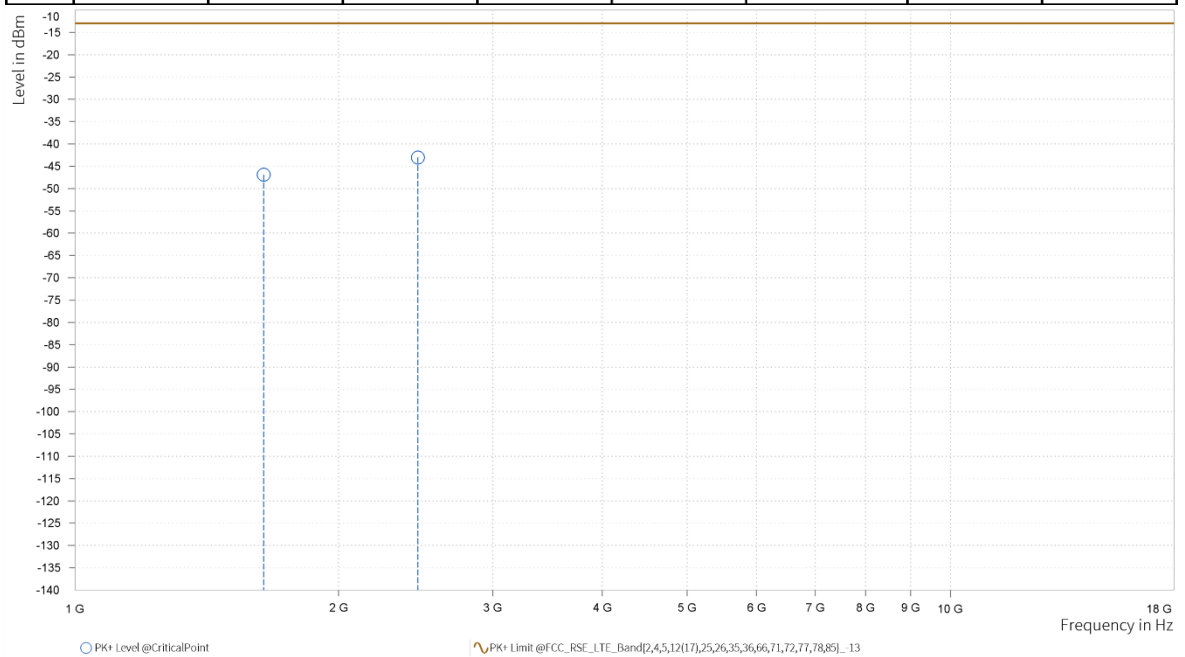




MODE	TX channel 26775	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,642.300	-46.93	-13.0	33.93	20.69	V	359.1	1.0
3	2,463.450	-43.03	-13.0	30.03	26.56	V	359.0	2.0



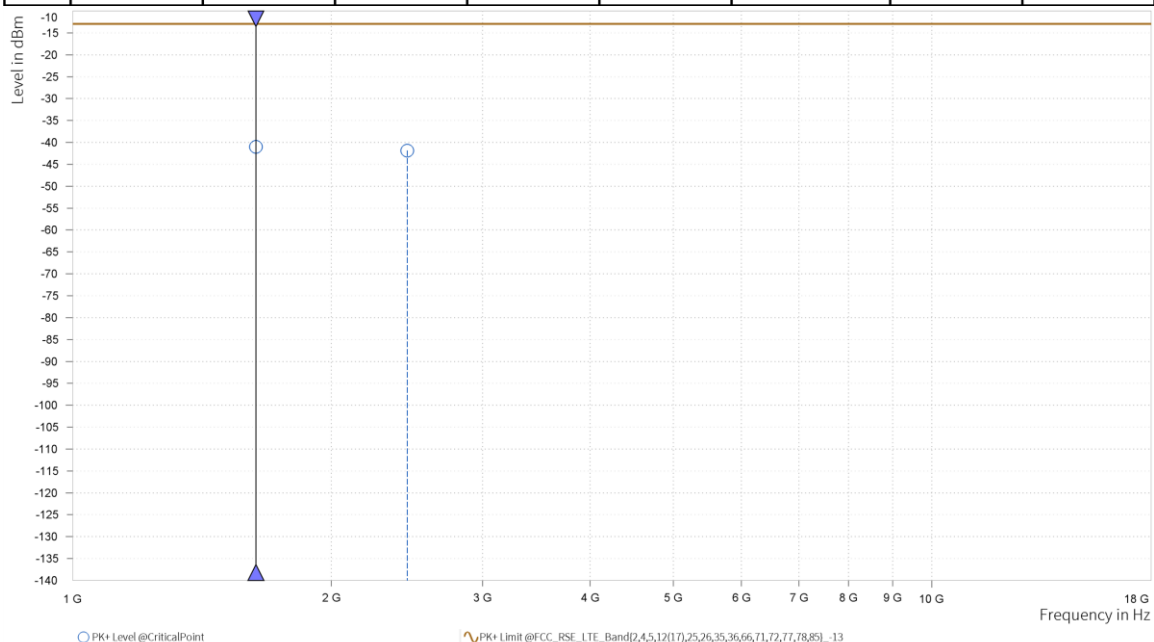


CHANNEL BANDWIDTH: 5MHz / QPSK

MODE	TX channel 26740	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,634.000	-41.0	-13.0	28.0	20.81	H	1	1.0
3	2,450.250	-41.86	-13.0	28.86	26.72	H	1	1.0

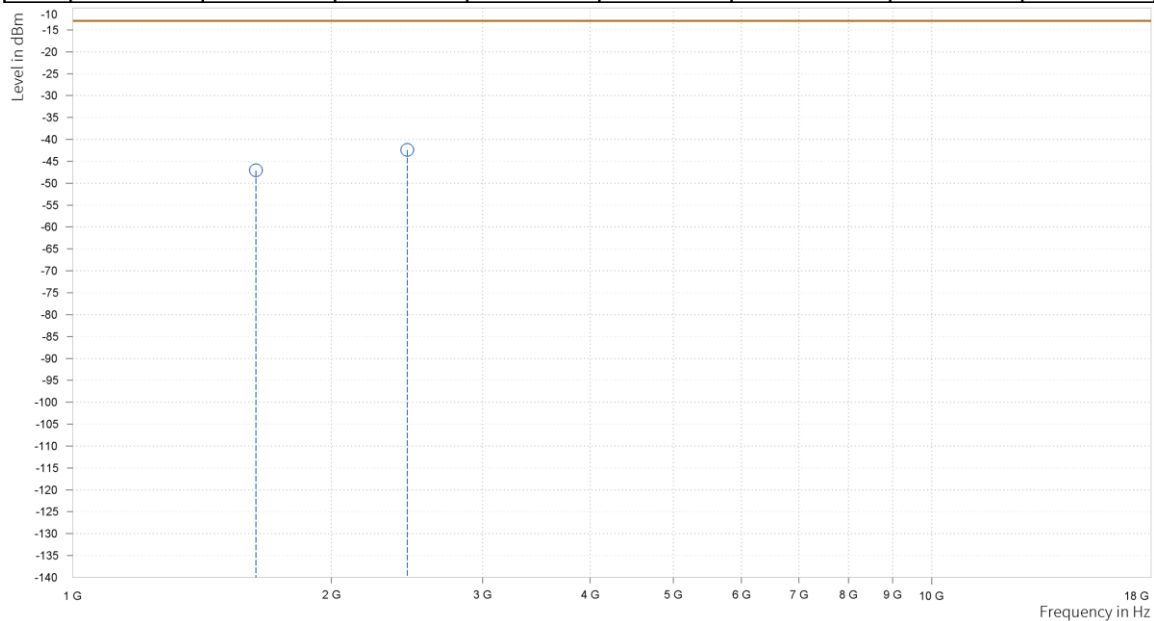




MODE	TX channel 26740	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,633.500	-47.04	-13.0	34.04	20.47	V	285.1	2.0
3	2,450.250	-42.4	-13.0	29.4	26.52	V	359.0	2.0

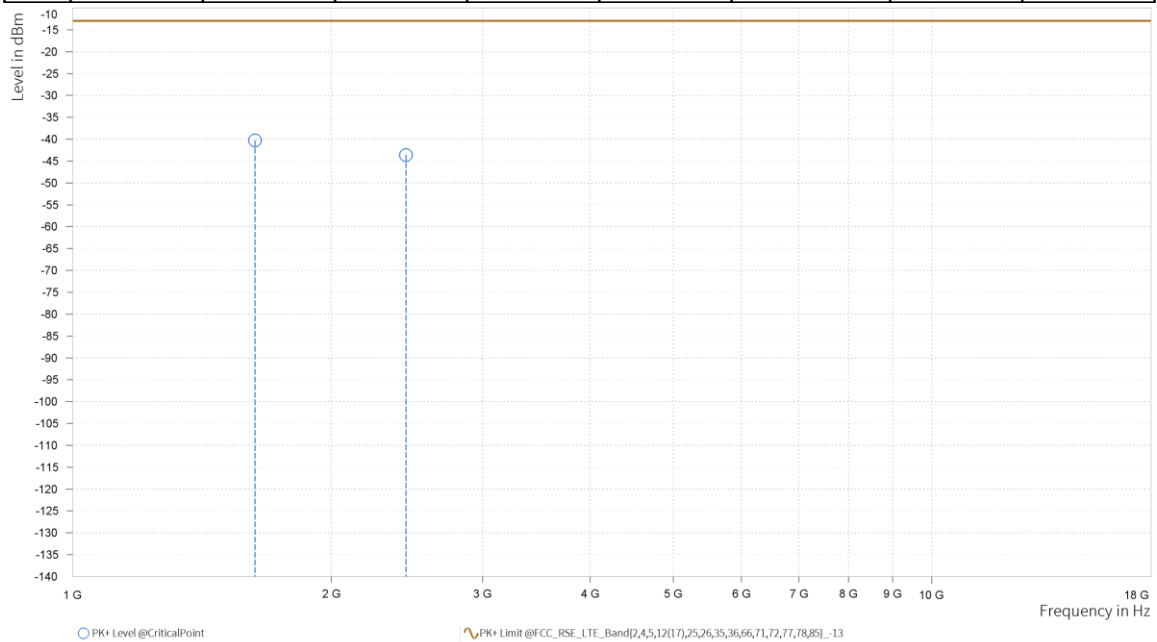


**CHANNEL BANDWIDTH: 10MHz / QPSK**

MODE	TX channel 26740	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,629.000	-40.28	-13.0	27.28	20.87	H	1	1.0
3	2,443.500	-43.61	-13.0	30.61	27.22	H	223	2.0

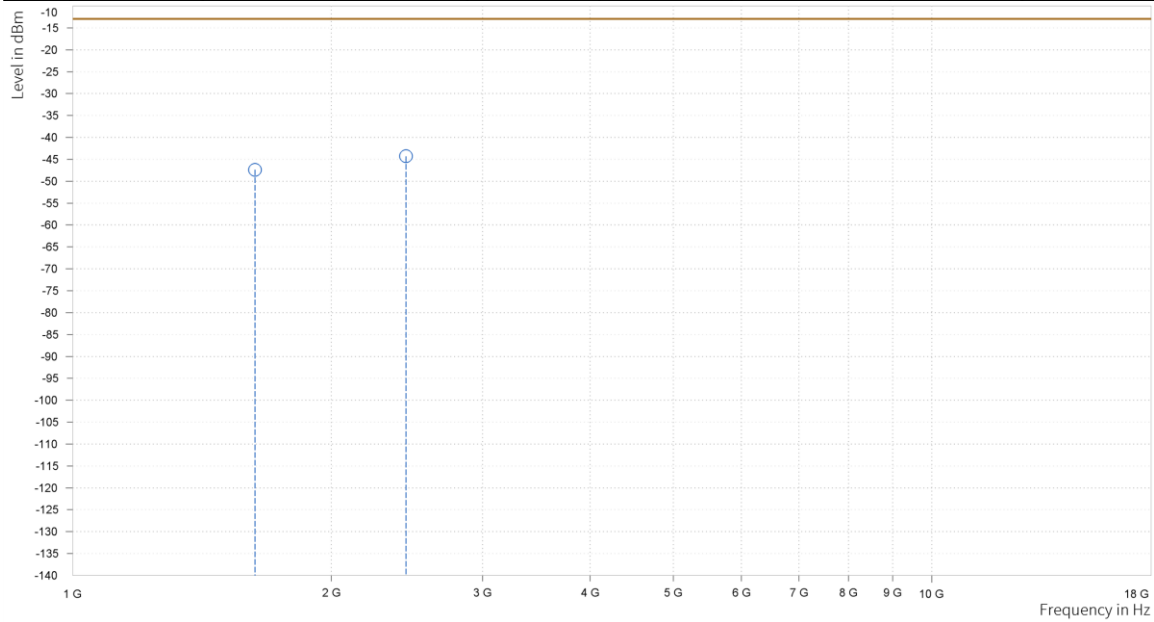




MODE	TX channel 26740	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	AC 120V 60HZ
TESTED BY	Jace Hu		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

Rg	Frequency [MHz]	PK+ Level [dBm]	PK+ Limit [dBm]	PK+ Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]
2	1,629.000	-47.39	-13.0	34.39	20.58	V	288.8	2.0
3	2,443.500	-44.29	-13.0	31.29	27.05	V	219.5	2.0

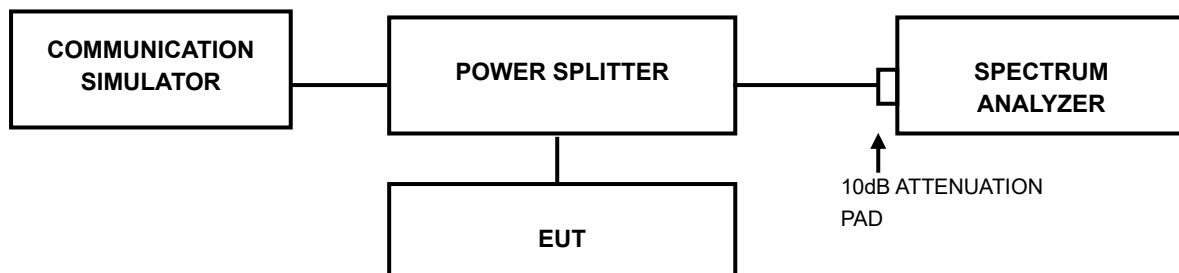


3.7 PEAK TO AVERAGE RATIO

3.7.1 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

3.7.2 TEST SETUP



3.7.3 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%.



3.7.4 TEST RESULTS

Please Refer to Appendix Of this test report.



4 INFORMATION ON THE TESTING LABORATORIES

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 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:

Shenzhen EMC/RF Lab:

Tel: +86-755-88696566

Fax: +86-755-88696577

Email: customerservice.sw@bureauveritas.com

Web Site: www.adt.com.tw

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



5 MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.



6 APPENDIX

LTE BAND26

PEAK-TO-AVERAGE RATIO(CCDF)

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band26	1.4MHz	QPSK	26697	1RB#0	4.90	13	PASS
Band26	1.4MHz	QPSK	26697	6RB#0	5.32	13	PASS
Band26	1.4MHz	QPSK	26740	1RB#0	4.36	13	PASS
Band26	1.4MHz	QPSK	26740	6RB#0	5.10	13	PASS
Band26	1.4MHz	QPSK	26783	1RB#0	4.98	13	PASS
Band26	1.4MHz	QPSK	26783	6RB#0	5.34	13	PASS
Band26	1.4MHz	16QAM	26697	1RB#0	5.56	13	PASS
Band26	1.4MHz	16QAM	26697	6RB#0	6.12	13	PASS
Band26	1.4MHz	16QAM	26740	1RB#0	5.40	13	PASS
Band26	1.4MHz	16QAM	26740	6RB#0	5.98	13	PASS
Band26	1.4MHz	16QAM	26783	1RB#0	5.82	13	PASS
Band26	1.4MHz	16QAM	26783	6RB#0	6.18	13	PASS
Band26	1.4MHz	64QAM	26697	1RB#0	6.04	13	PASS
Band26	1.4MHz	64QAM	26697	6RB#0	6.54	13	PASS
Band26	1.4MHz	64QAM	26740	1RB#0	5.76	13	PASS
Band26	1.4MHz	64QAM	26740	6RB#0	6.46	13	PASS
Band26	1.4MHz	64QAM	26783	1RB#0	6.30	13	PASS
Band26	1.4MHz	64QAM	26783	6RB#0	6.58	13	PASS
Band26	3MHz	QPSK	26705	1RB#0	4.80	13	PASS
Band26	3MHz	QPSK	26705	15RB#0	5.44	13	PASS
Band26	3MHz	QPSK	26740	1RB#0	4.40	13	PASS
Band26	3MHz	QPSK	26740	15RB#0	5.16	13	PASS
Band26	3MHz	QPSK	26775	1RB#0	4.66	13	PASS
Band26	3MHz	QPSK	26775	15RB#0	5.26	13	PASS
Band26	3MHz	16QAM	26705	1RB#0	5.72	13	PASS
Band26	3MHz	16QAM	26705	15RB#0	6.20	13	PASS
Band26	3MHz	16QAM	26740	1RB#0	5.24	13	PASS
Band26	3MHz	16QAM	26740	15RB#0	6.04	13	PASS
Band26	3MHz	16QAM	26775	1RB#0	5.44	13	PASS
Band26	3MHz	16QAM	26775	15RB#0	6.18	13	PASS
Band26	3MHz	64QAM	26705	1RB#0	5.86	13	PASS
Band26	3MHz	64QAM	26705	15RB#0	6.60	13	PASS
Band26	3MHz	64QAM	26740	1RB#0	5.64	13	PASS
Band26	3MHz	64QAM	26740	15RB#0	6.54	13	PASS
Band26	3MHz	64QAM	26775	1RB#0	5.78	13	PASS
Band26	3MHz	64QAM	26775	15RB#0	6.52	13	PASS
Band26	5MHz	QPSK	26715	1RB#0	4.90	13	PASS
Band26	5MHz	QPSK	26715	25RB#0	5.38	13	PASS
Band26	5MHz	QPSK	26740	1RB#0	4.72	13	PASS
Band26	5MHz	QPSK	26740	25RB#0	5.26	13	PASS
Band26	5MHz	QPSK	26765	1RB#0	4.62	13	PASS
Band26	5MHz	QPSK	26765	25RB#0	5.38	13	PASS

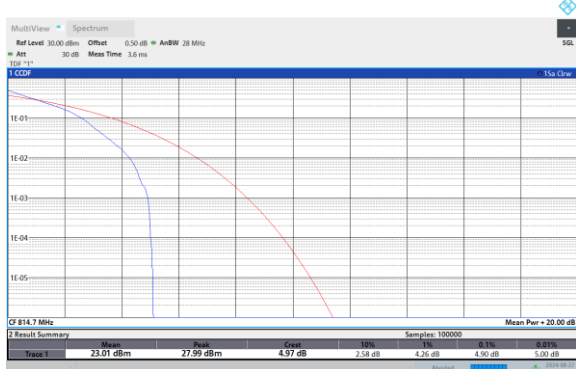


Band26	5MHz	16QAM	26715	1RB#0	5.58	13	PASS
Band26	5MHz	16QAM	26715	25RB#0	6.12	13	PASS
Band26	5MHz	16QAM	26740	1RB#0	5.58	13	PASS
Band26	5MHz	16QAM	26740	25RB#0	6.08	13	PASS
Band26	5MHz	16QAM	26765	1RB#0	5.36	13	PASS
Band26	5MHz	16QAM	26765	25RB#0	6.02	13	PASS
Band26	5MHz	64QAM	26715	1RB#0	5.96	13	PASS
Band26	5MHz	64QAM	26715	25RB#0	6.56	13	PASS
Band26	5MHz	64QAM	26740	1RB#0	5.94	13	PASS
Band26	5MHz	64QAM	26740	25RB#0	6.48	13	PASS
Band26	5MHz	64QAM	26765	1RB#0	5.78	13	PASS
Band26	5MHz	64QAM	26765	25RB#0	6.52	13	PASS
Band26	10MHz	QPSK	26740	1RB#0	4.50	13	PASS
Band26	10MHz	QPSK	26740	50RB#0	5.46	13	PASS
Band26	10MHz	16QAM	26740	1RB#0	5.48	13	PASS
Band26	10MHz	16QAM	26740	50RB#0	6.16	13	PASS
Band26	10MHz	64QAM	26740	1RB#0	5.92	13	PASS
Band26	10MHz	64QAM	26740	50RB#0	6.64	13	PASS

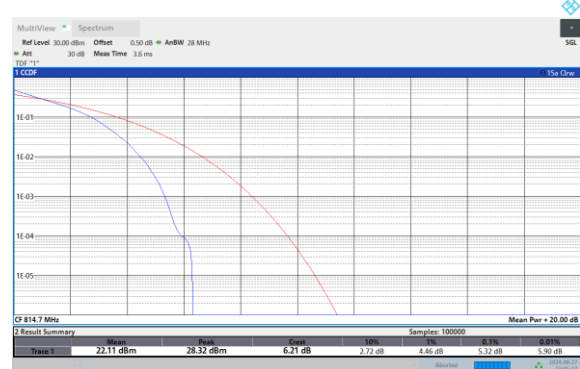


Test Graphs

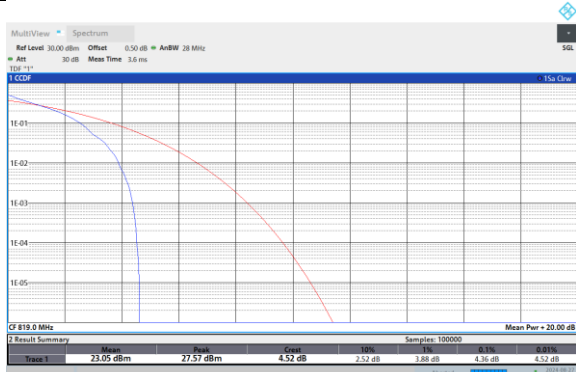
Band26-1.4MHz-QPSK-26697-1RB#0



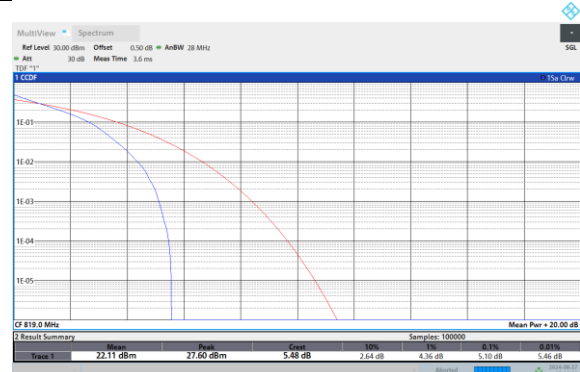
Band26-1.4MHz-QPSK-26697-6RB#0



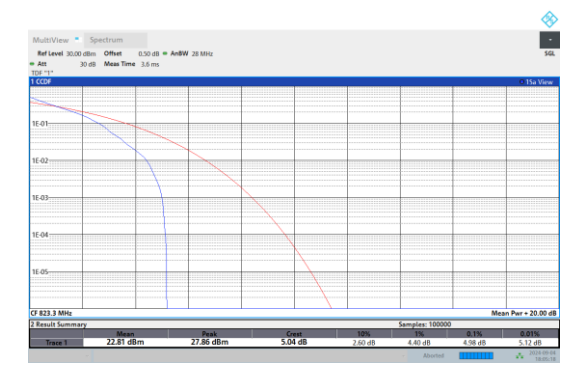
Band26-1.4MHz-QPSK-26740-1RB#0



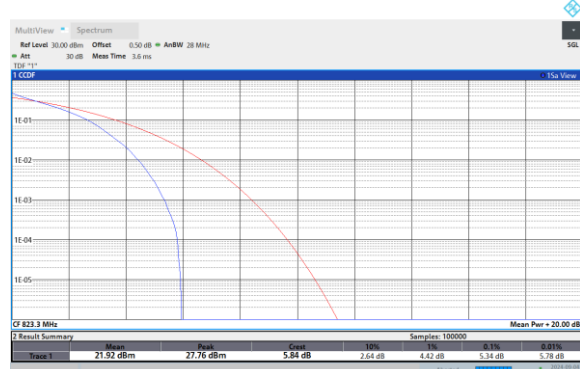
Band26-1.4MHz-QPSK-26740-6RB#0



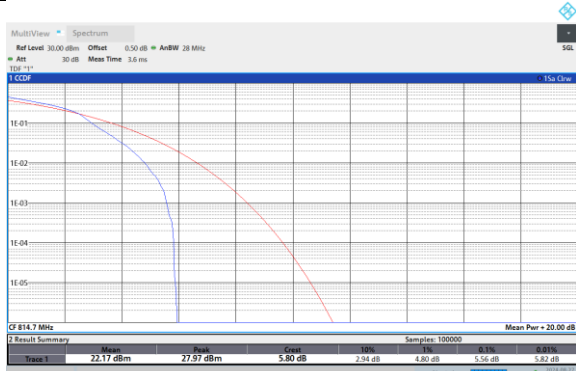
Band26-1.4MHz-QPSK-26783-1RB#0



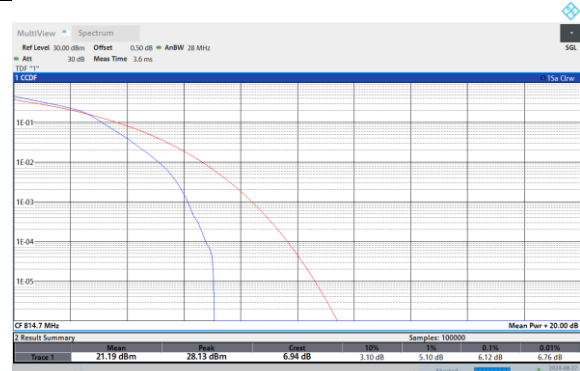
Band26-1.4MHz-QPSK-26783-6RB#0



Band26-1.4MHz-16QAM-26697-1RB#0

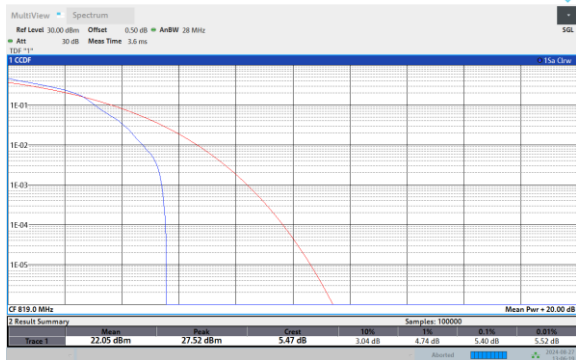


Band26-1.4MHz-16QAM-26697-6RB#0

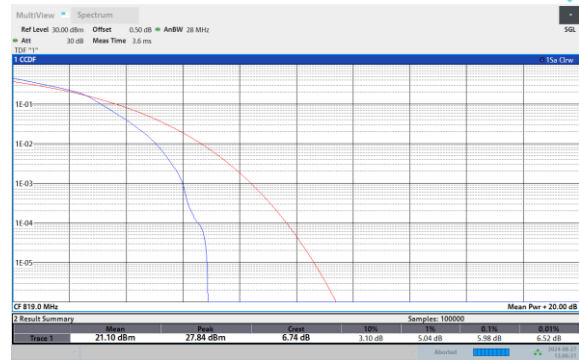


Band26-1.4MHz-16QAM-26740-1RB#0

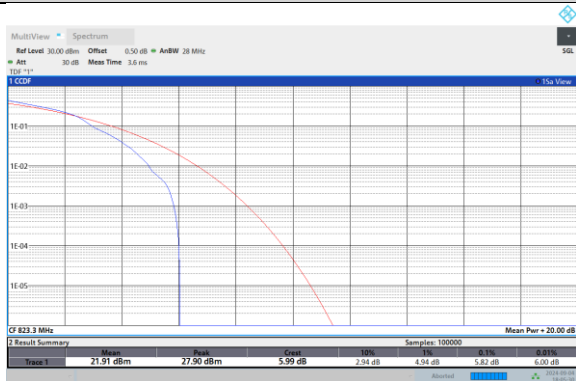
Band26-1.4MHz-16QAM-26740-6RB#0



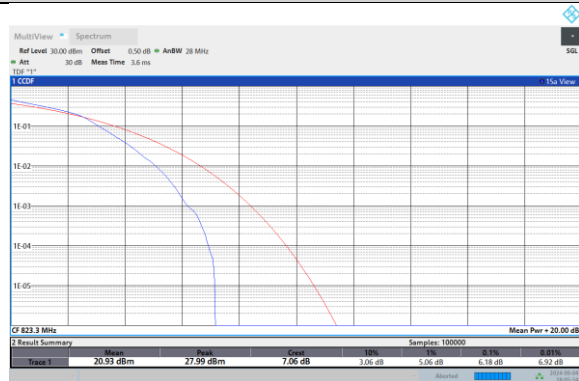
Band26-1.4MHz-16QAM-26783-1RB#0



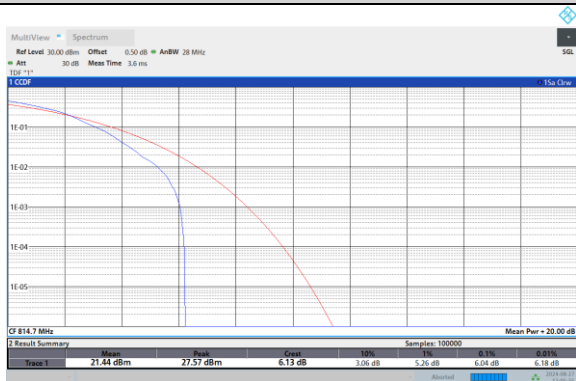
Band26-1.4MHz-16QAM-26783-6RB#0



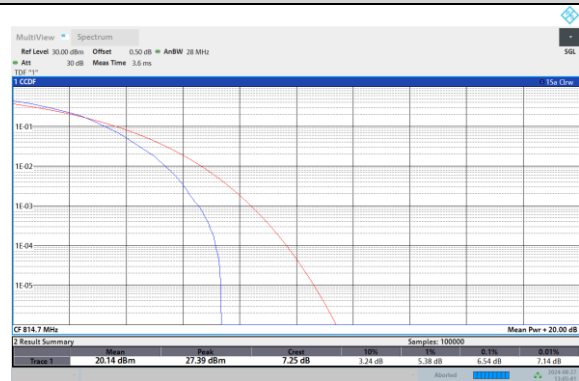
Band26-1.4MHz-64QAM-26697-1RB#0



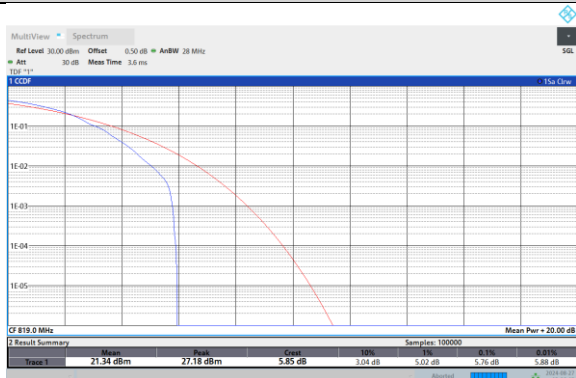
Band26-1.4MHz-64QAM-26697-6RB#0



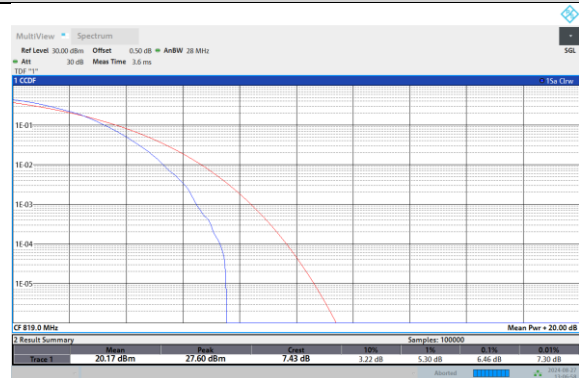
Band26-1.4MHz-64QAM-26740-1RB#0



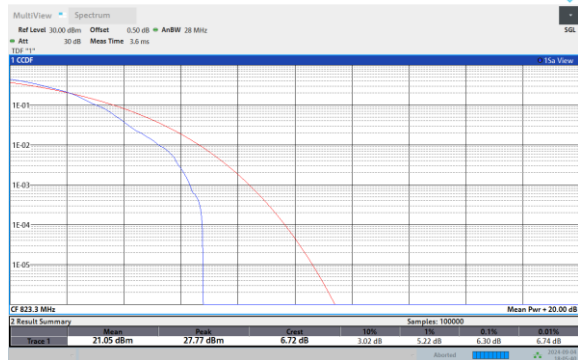
Band26-1.4MHz-64QAM-26740-6RB#0



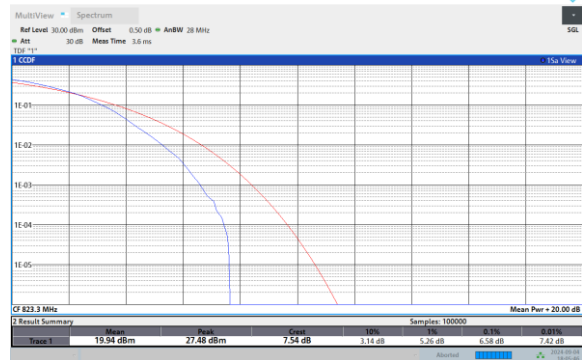
Band26-1.4MHz-64QAM-26783-1RB#0



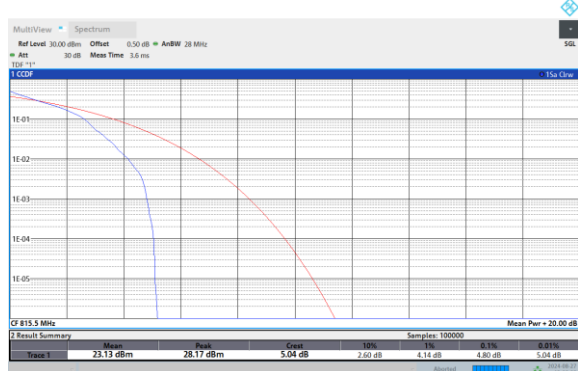
Band26-1.4MHz-64QAM-26783-6RB#0



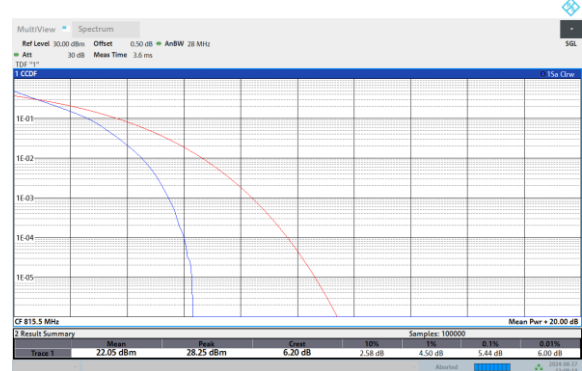
Band26-3MHz-QPSK-26705-1RB#0



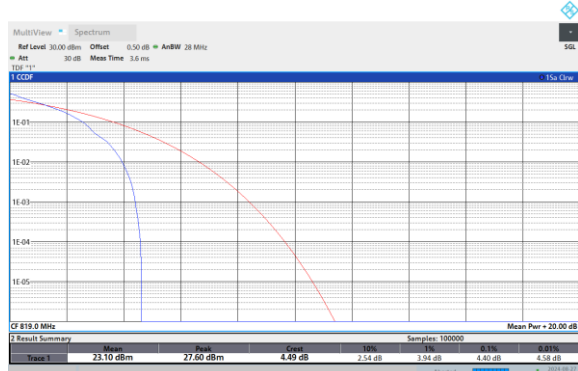
Band26-3MHz-QPSK-26705-15RB#0



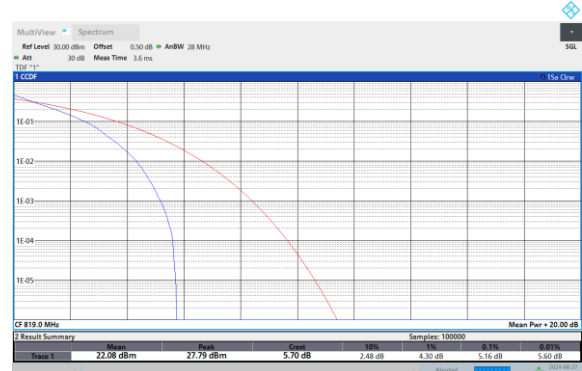
Band26-3MHz-QPSK-26740-1RB#0



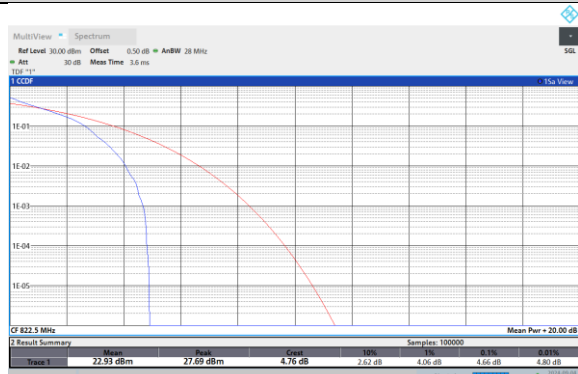
Band26-3MHz-QPSK-26740-15RB#0



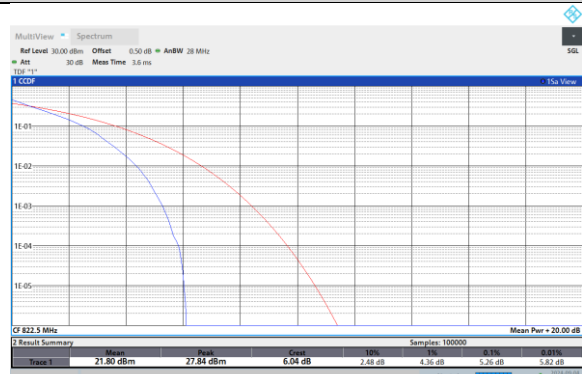
Band26-3MHz-QPSK-26775-1RB#0



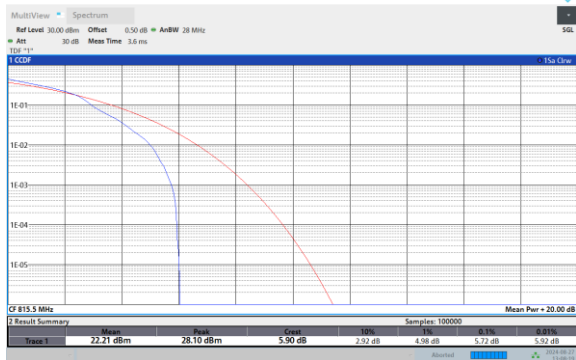
Band26-3MHz-QPSK-26775-15RB#0



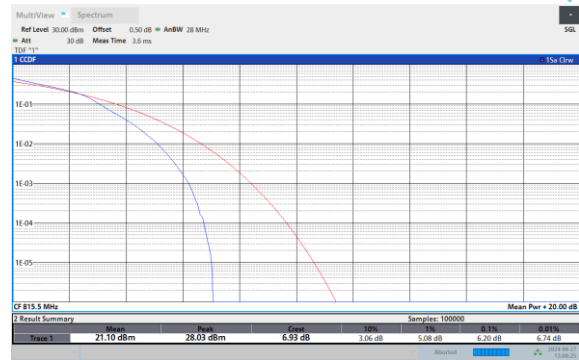
Band26-3MHz-16QAM-26705-1RB#0



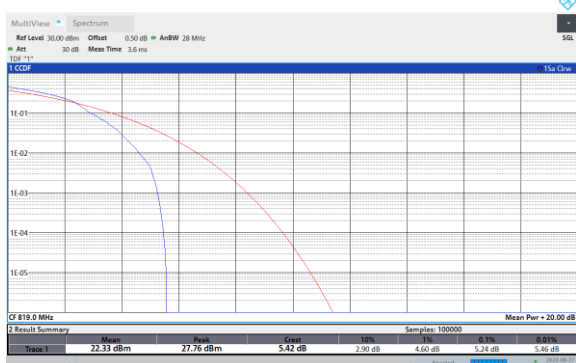
Band26-3MHz-16QAM-26705-15RB#0



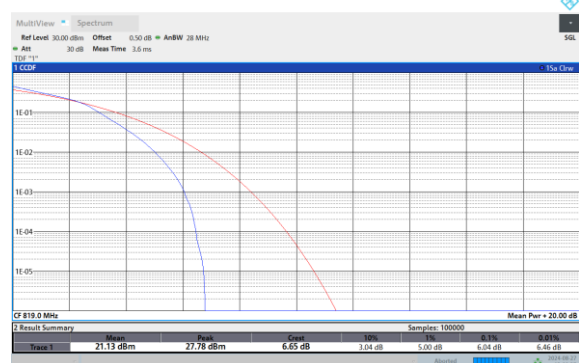
Band26-3MHz-16QAM-26740-1RB#0



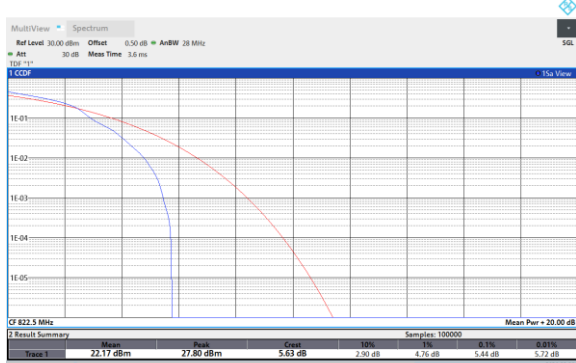
Band26-3MHz-16QAM-26740-15RB#0



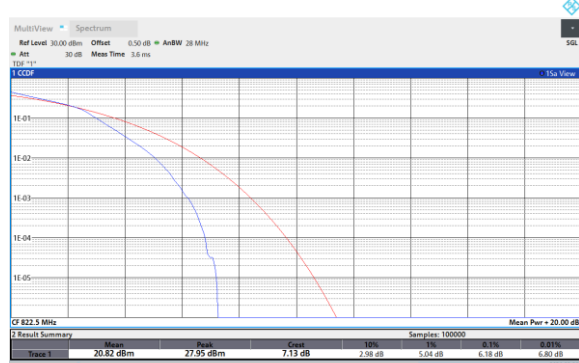
Band26-3MHz-16QAM-26775-1RB#0



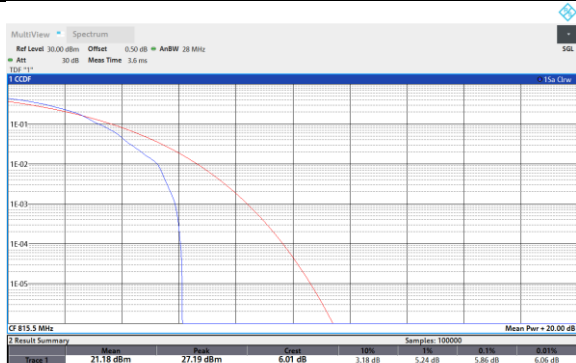
Band26-3MHz-16QAM-26775-15RB#0



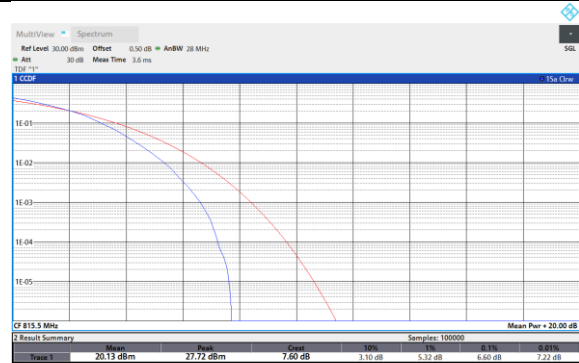
Band26-3MHz-64QAM-26705-1RB#0



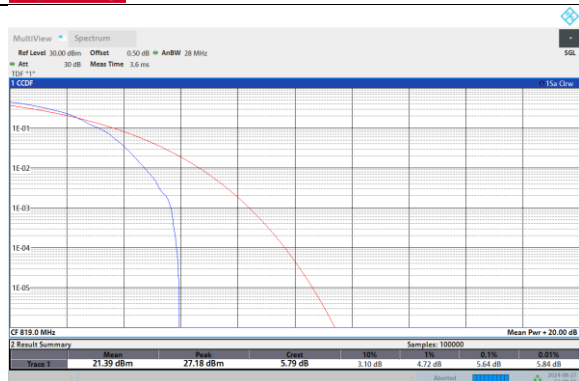
Band26-3MHz-64QAM-26705-15RB#0



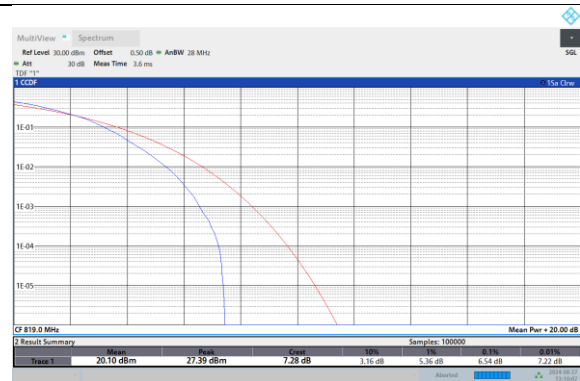
Band26-3MHz-64QAM-26740-1RB#0



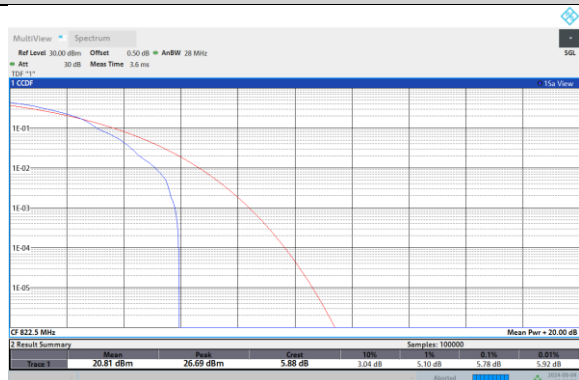
Band26-3MHz-64QAM-26740-15RB#0



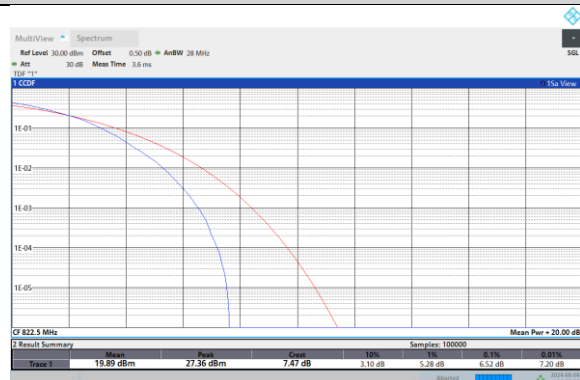
Band26-3MHz-64QAM-26775-1RB#0



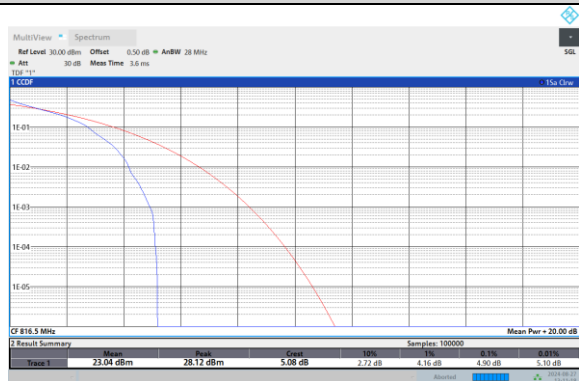
Band26-3MHz-64QAM-26775-15RB#0



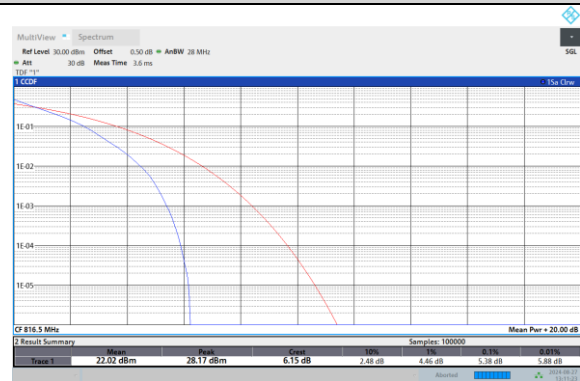
Band26-5MHz-QPSK-26715-1RB#0



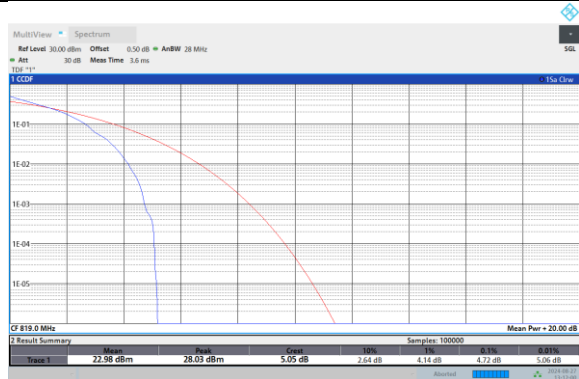
Band26-5MHz-QPSK-26715-25RB#0



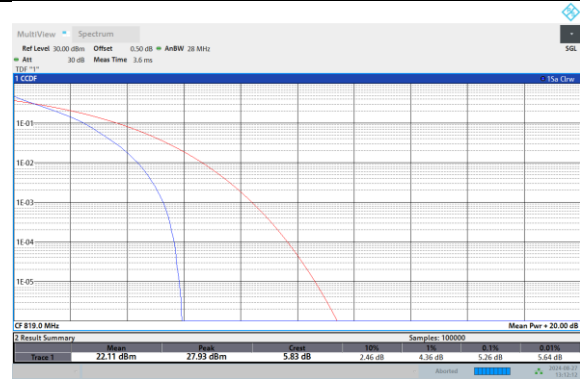
Band26-5MHz-QPSK-26740-1RB#0



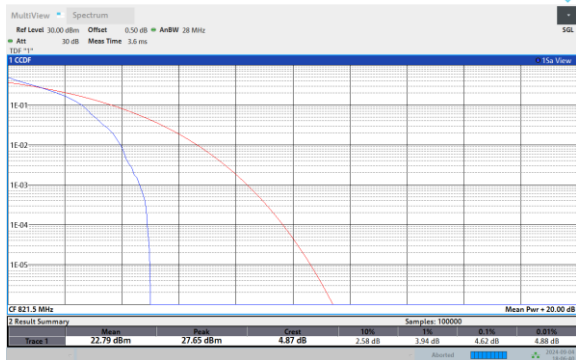
Band26-5MHz-QPSK-26740-25RB#0



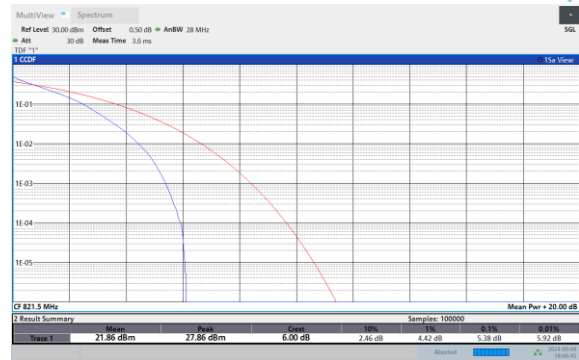
Band26-5MHz-QPSK-26765-1RB#0



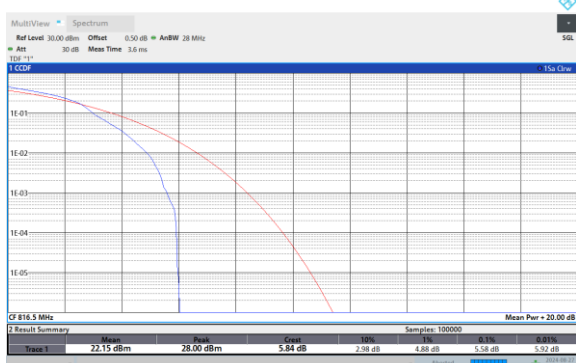
Band26-5MHz-QPSK-26765-25RB#0



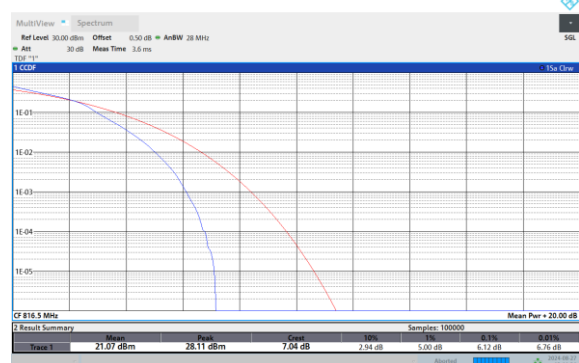
Band26-5MHz-16QAM-26715-1RB#0



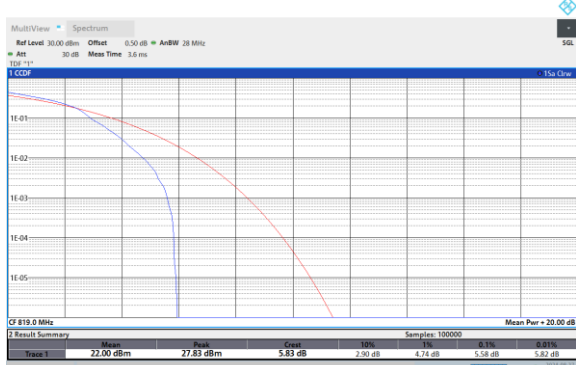
Band26-5MHz-16QAM-26715-25RB#0



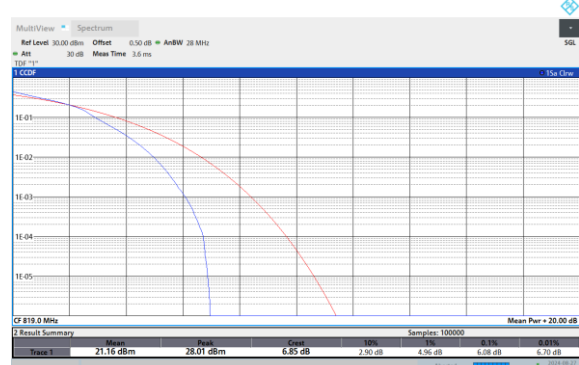
Band26-5MHz-16QAM-26740-1RB#0



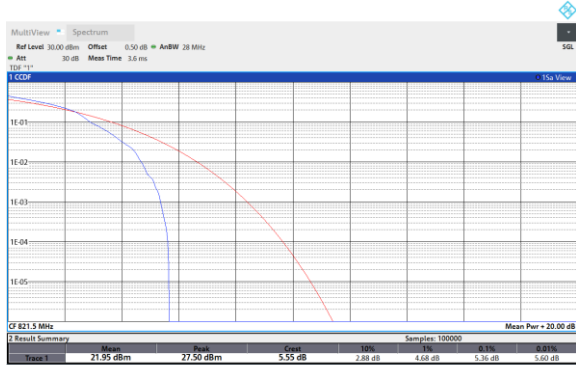
Band26-5MHz-16QAM-26740-25RB#0



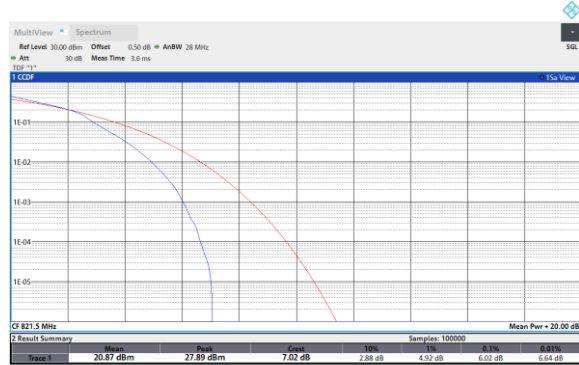
Band26-5MHz-16QAM-26765-1RB#0



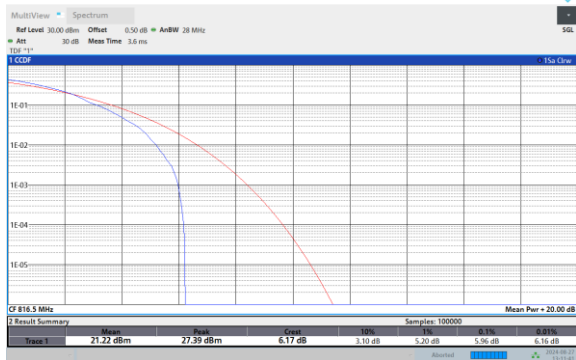
Band26-5MHz-16QAM-26765-25RB#0



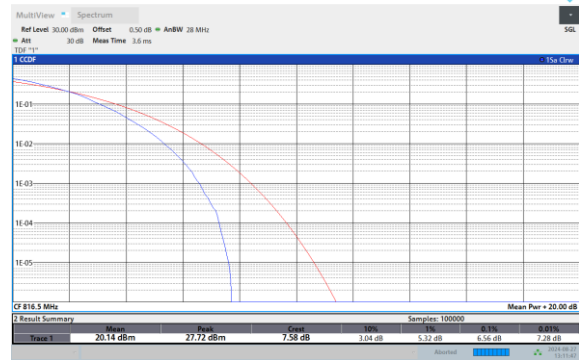
Band26-5MHz-64QAM-26715-1RB#0



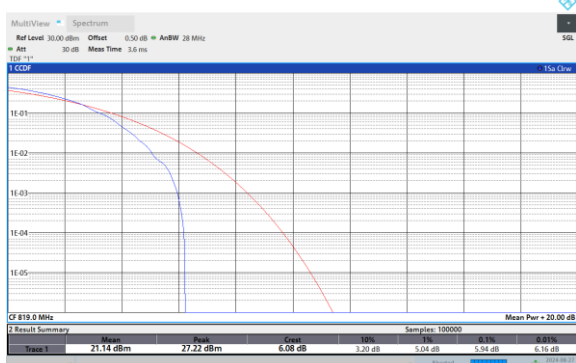
Band26-5MHz-64QAM-26715-25RB#0



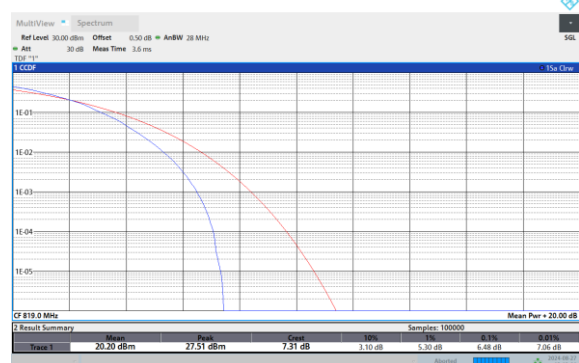
Band26-5MHz-64QAM-26740-1RB#0



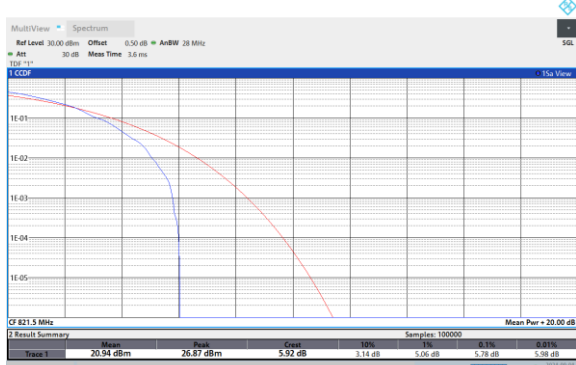
Band26-5MHz-64QAM-26740-25RB#0



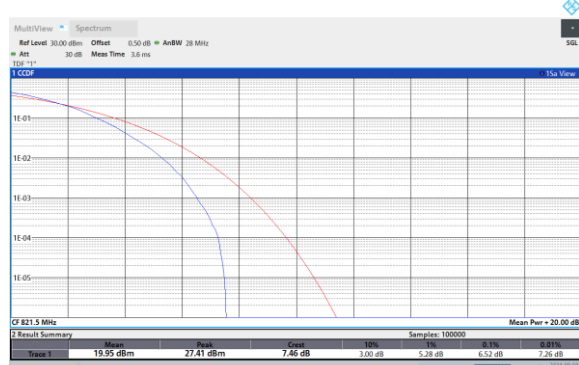
Band26-5MHz-64QAM-26765-1RB#0



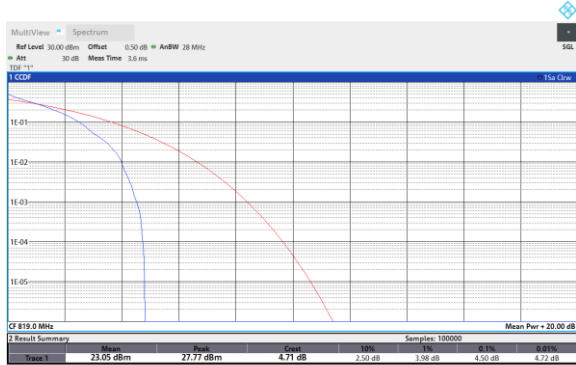
Band26-5MHz-64QAM-26765-25RB#0



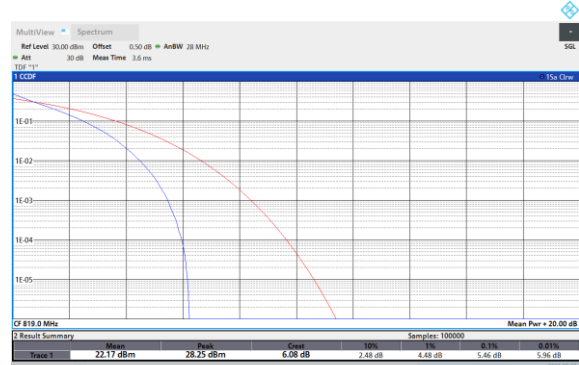
Band26-10MHz-QPSK-26740-1RB#0



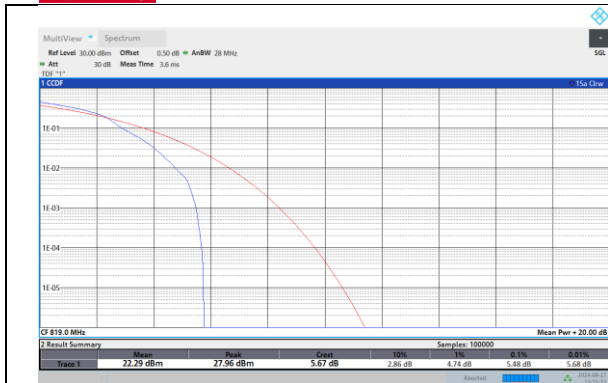
Band26-10MHz-QPSK-26740-50RB#0



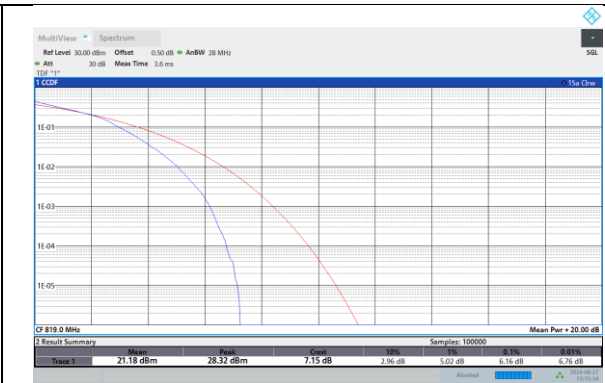
Band26-10MHz-16QAM-26740-1RB#0



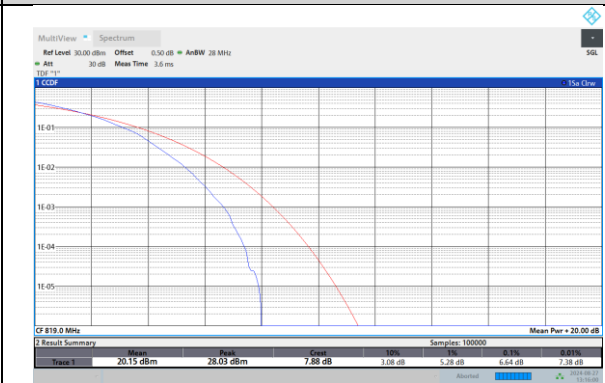
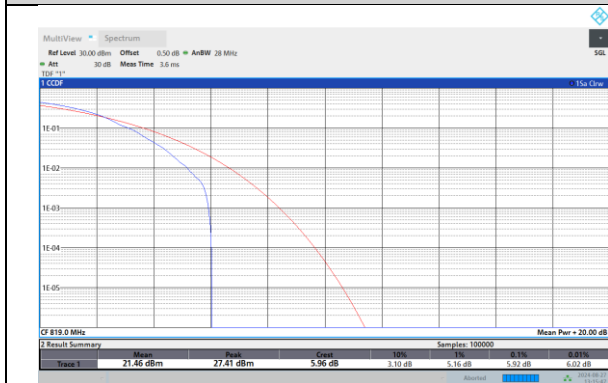
Band26-10MHz-16QAM-26740-50RB#0



Band26-10MHz-64QAM-26740-1RB#0



Band26-10MHz-64QAM-26740-50RB#0





BUREAU VERITAS Test Report No.: PSU-NQN2407300216RF05
26DB BANDWIDTH AND OCCUPIED BANDWIDTH

TEST RESULT

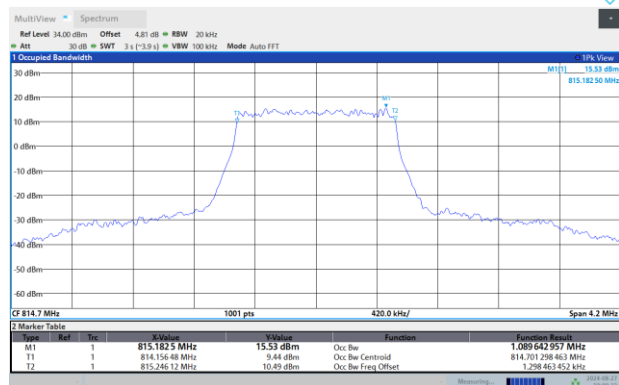
Band	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band26	1.4MHz	QPSK	26697	6RB#0	1.090	1.26	PASS
Band26	1.4MHz	QPSK	26740	6RB#0	1.087	1.28	PASS
Band26	1.4MHz	QPSK	26783	6RB#0	1.082	1.26	PASS
Band26	1.4MHz	16QAM	26697	6RB#0	1.084	1.29	PASS
Band26	1.4MHz	16QAM	26740	6RB#0	1.089	1.26	PASS
Band26	1.4MHz	16QAM	26783	6RB#0	1.087	1.26	PASS
Band26	1.4MHz	64QAM	26697	6RB#0	1.082	1.27	PASS
Band26	1.4MHz	64QAM	26740	6RB#0	1.082	1.27	PASS
Band26	1.4MHz	64QAM	26783	6RB#0	1.081	1.25	PASS
Band26	3MHz	QPSK	26705	15RB#0	2.679	2.90	PASS
Band26	3MHz	QPSK	26740	15RB#0	2.682	2.88	PASS
Band26	3MHz	QPSK	26775	15RB#0	2.679	2.86	PASS
Band26	3MHz	16QAM	26705	15RB#0	2.677	2.88	PASS
Band26	3MHz	16QAM	26740	15RB#0	2.681	2.87	PASS
Band26	3MHz	16QAM	26775	15RB#0	2.677	2.88	PASS
Band26	3MHz	64QAM	26705	15RB#0	2.683	2.88	PASS
Band26	3MHz	64QAM	26740	15RB#0	2.683	2.87	PASS
Band26	3MHz	64QAM	26775	15RB#0	2.683	2.87	PASS
Band26	5MHz	QPSK	26715	25RB#0	4.482	4.86	PASS
Band26	5MHz	QPSK	26740	25RB#0	4.470	4.83	PASS
Band26	5MHz	QPSK	26765	25RB#0	4.482	4.84	PASS
Band26	5MHz	16QAM	26715	25RB#0	4.470	4.76	PASS
Band26	5MHz	16QAM	26740	25RB#0	4.483	4.86	PASS
Band26	5MHz	16QAM	26765	25RB#0	4.469	4.78	PASS
Band26	5MHz	64QAM	26715	25RB#0	4.471	4.81	PASS
Band26	5MHz	64QAM	26740	25RB#0	4.471	4.81	PASS
Band26	5MHz	64QAM	26765	25RB#0	4.471	4.84	PASS
Band26	10MHz	QPSK	26740	50RB#0	8.940	9.56	PASS
Band26	10MHz	16QAM	26740	50RB#0	8.945	9.53	PASS
Band26	10MHz	64QAM	26740	50RB#0	8.943	9.56	PASS



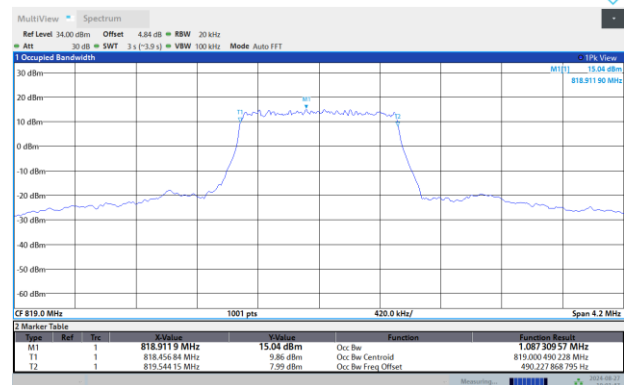
Test Graphs

Occupied Bandwidth

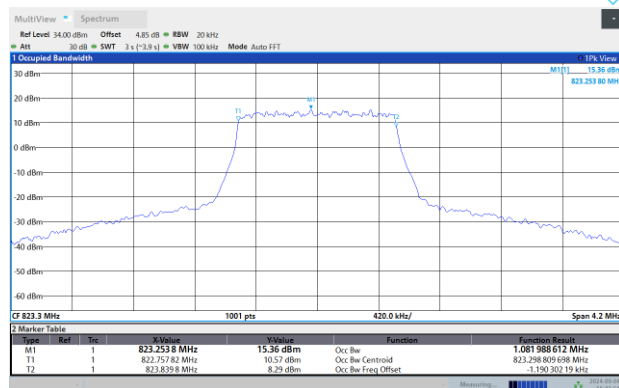
Band26-1.4MHz-QPSK-26697-6RB#0



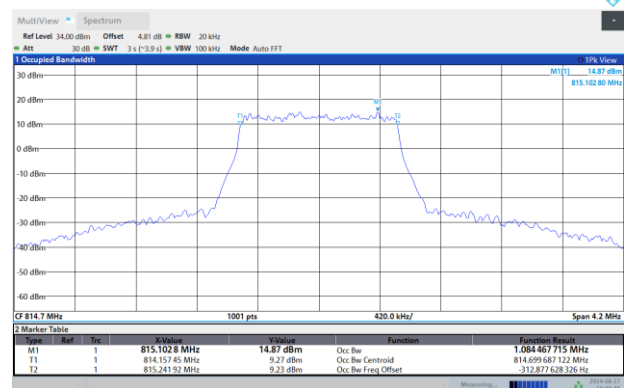
Band26-1.4MHz-QPSK-26740-6RB#0



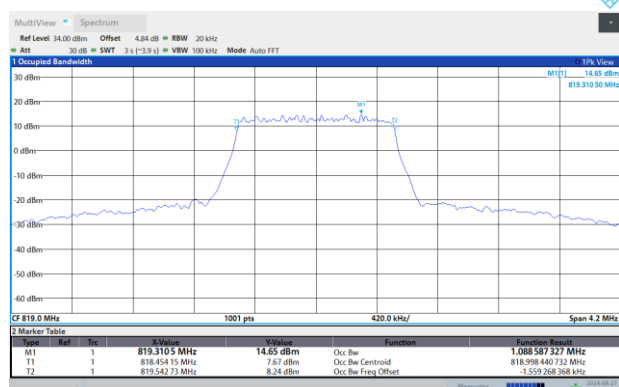
Band26-1.4MHz-QPSK-26783-6RB#0



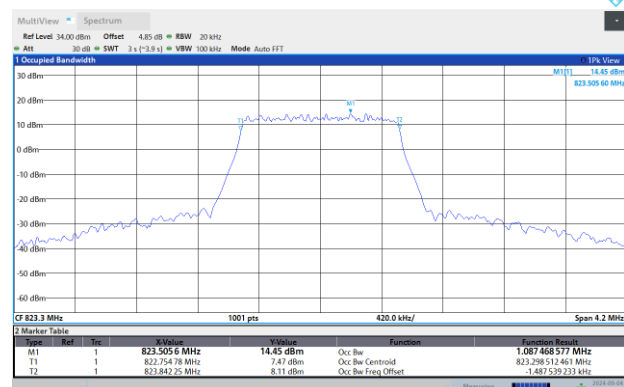
Band26-1.4MHz-16QAM-26697-6RB#0



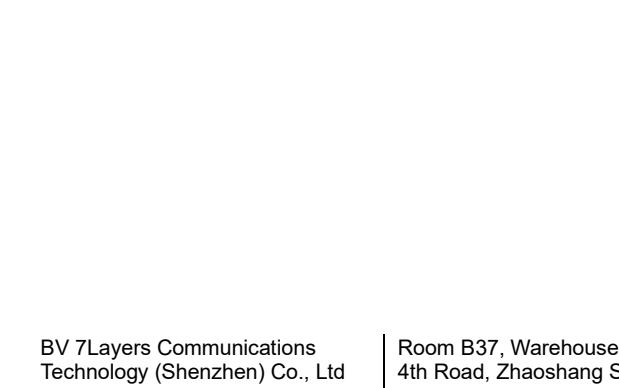
Band26-1.4MHz-16QAM-26740-6RB#0



Band26-1.4MHz-16QAM-26783-6RB#0



Band26-1.4MHz-64QAM-26697-6RB#0



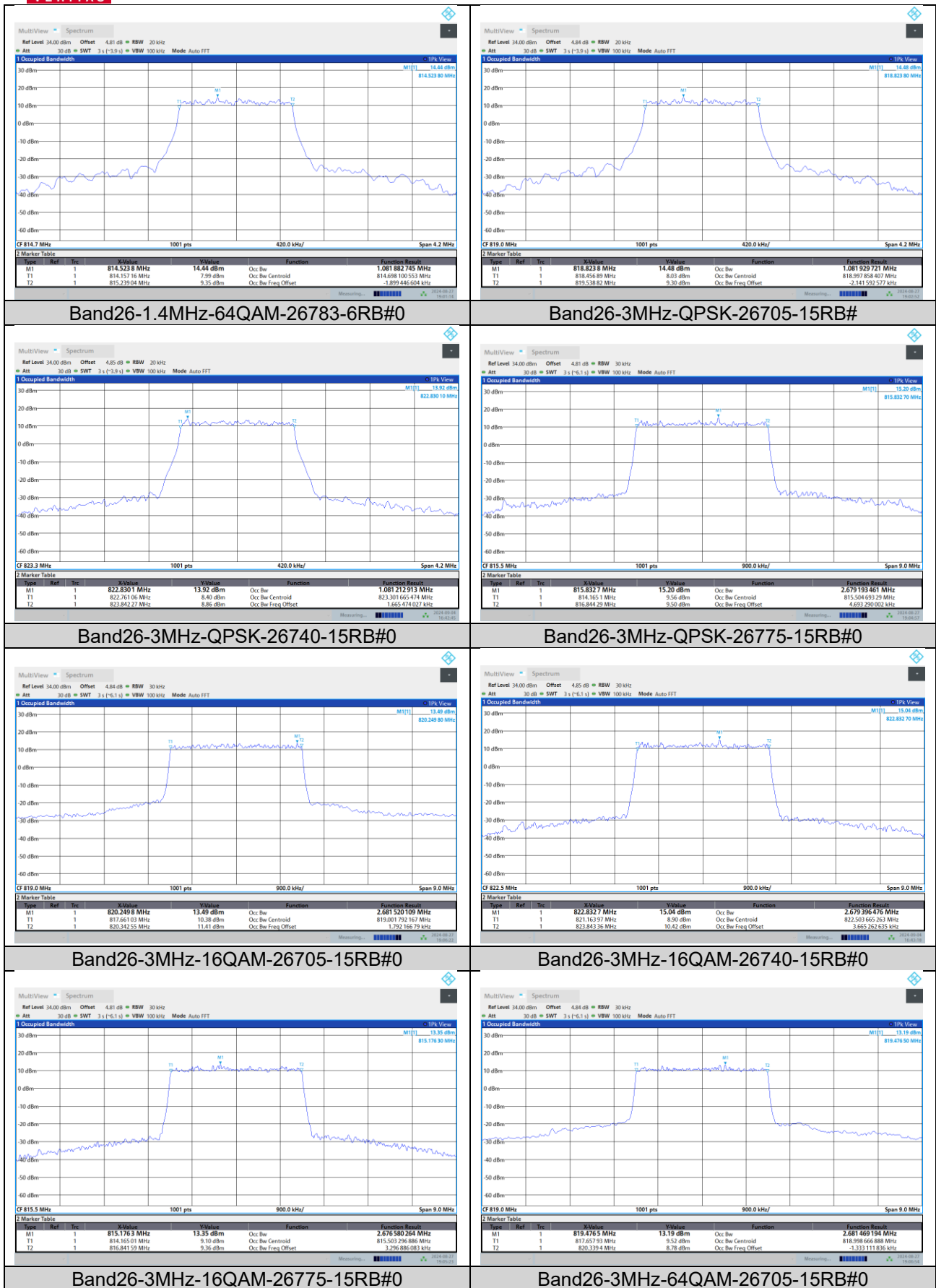
Band26-1.4MHz-64QAM-26740-6RB#0





BUREAU
VERITAS

Test Report No.: PSU-NQN2407300216RF05



BV 7Layers Communications
Technology (Shenzhen) Co., Ltd

Room B37, Warehouse A5, No.3 Chiwan
4th Road, Zhaoshang Street, Nanshan
District Shenzhen, Guangdong, People's
Republic of China

Tel: +86 755 8869 6566
Fax: +86 755 8869 6577
Email:

customerservice.sw@bureauveritas.com