



FCC RF Test Report

FCC ID : UZ7EM45B2
EQUIPMENT : Enterprise Mobile
BRAND NAME : Zebra
Model Name : EM45B2
APPLICANT : Zebra Technologies Corporation
3 Overlook Point, Lincolnshire, IL 60069 USA
MANUFACTURER : Zebra Technologies Corporation
3 Overlook Point, Lincolnshire, IL 60069 USA
STANDARD : 47 CFR Part 22(H), 27(H), 27(F), 27(N)
CLASSIFICATION : PCS Licensed Transmitter Held to Ear (PCE)
TEST DATE(S) : Jul. 08, 2024 ~ Aug. 26, 2024

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (Kunshan)

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China



TABLE OF CONTENTS

REVISION HISTORY	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Product Feature of Equipment Under Test.....	5
1.2 Product Specification of Equipment Under Test.....	6
1.3 Modification of EUT	6
1.4 Maximum ERP Power and Emission Designator	7
1.5 Testing Location	8
1.6 Test Software.....	8
1.7 Applicable Standards.....	9
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	10
2.1 Test Mode	10
2.2 Connection Diagram of Test System.....	12
2.3 Support Unit used in test configuration and system	12
2.4 Measurement Results Explanation Example.....	12
2.5 Frequency List of Low/Middle/High Channels	13
3 CONDUCTED TEST ITEMS	16
3.1 Measuring Instruments	16
3.2 Test Setup	16
3.3 Test Result of Conducted Test	16
3.4 Conducted Output Power and ERP	17
3.5 Peak-to-Average Ratio	19
3.6 Occupied Bandwidth	20
3.7 Conducted Band Edge	21
3.8 Conducted Spurious Emission	23
3.9 Frequency Stability	24
4 RADIATED TEST ITEMS	25
4.1 Measuring Instruments	25
4.2 Test Setup	25
4.3 Test Result of Radiated Test	26
4.4 Radiated Spurious Emission	27
5 LIST OF MEASURING EQUIPMENT	28
6 MEASUREMENT UNCERTAINTY	29
APPENDIX A. TEST RESULTS OF CONDUCTED TEST	
APPENDIX B. TEST RESULTS OF RADIATED TEST	
APPENDIX C. TEST SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG460508D	Rev. 01	Initial issue of report	Sep. 11, 2024

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.4	§2.1046	Conducted Output Power	-	Report Only	-
	§22.913(a)(5)	Effective Radiated Power (Band 5) (Band 26)	ERP < 7 Watt	PASS	-
	§27.50(b)(10) §27.50(c)(10)	Effective Radiated Power (Band 13) (Band 17) (Band 71)	ERP < 3 Watt		-
3.5	N/A	Peak-to-Average Ratio	<13 dB	PASS	-
3.6	§2.1049	Occupied Bandwidth	-	Report Only	-
3.7	§2.1051 §22.917(a) §27.53(c)(2)(4) §27.53(g)	Conducted Band Edge Measurement (Band 5)(Band 13) (Band 17)(Band 26) (Band 71)	< 43+10log ₁₀ (P[Watts])	PASS	-
3.8	§2.1051 §22.917(a) §27.53(c)(2) §27.53(g)	Conducted Spurious Emission (Band 5)(Band 13) (Band 17)(Band 26) (Band 71)	< 43+10log ₁₀ (P[Watts])	PASS	-
3.9	§2.1055 §22.355	Frequency Stability Temperature & Voltage	< 2.5 ppm for Part 22	PASS	-
	§2.1055 §27.54		Within Authorized Band		
4.4	§2.1053 §22.917(a) §27.53(c)(2) §27.53(f) §27.53(g)	Radiated Spurious Emission (Band 5)(Band 13) (Band 17)(Band 26) (Band 71)	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 20.07 dB at 1560.00 MHz

Conformity Assessment Condition:

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
- The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

1 General Description

1.1 Product Feature of Equipment Under Test

Product Feature	
Equipment	Enterprise Mobile
Brand Name	Zebra
Model Name	EM45B2
FCC ID	UZ7EM45B2
IMEI Code	Conducted: 350854420028793/350854420029353 Radiation: 350854420030211/350854420030229
HW Version	EV2.5
SW Version	13-32-02.00-TG-U06-STD-ATH-04
MFD	02AUG24
EUT Stage	Identical Prototype

Specification of Accessory			
Battery	Brand Name	Zebra	Model
			BT-000501
			Part Number
			BT-000501-2000

Supported Unit used in test configuration and system				
AC Adapter 1 (Type C Wall Charger 1)	Brand Name	Zebra	Model	SAWA-102-22520A
			Part Number	PWR-WUA5V45W1US
AC Adapter 2 (Type A Wall Charger 2)	Brand Name	Zebra	Model	SAWA-65-20005A
			Part Number	PWR-WUA5V12W0US
Earphone 1 (Wired headset USB-C)	Brand Name	Zebra	Part Number	HDST-USBC-PTT1-01
Earphone 2 (Rugged Bluetooth Headset)	Brand Name	Zebra	Part Number	HS3100-OTH
Earphone 3 (3.5mm PTT Headset)	Brand Name	Zebra	Part Number	HDST-35MM-PTT1-02
Earphone 4 (Rugged Headset)	Brand Name	Zebra	Part Number	HS2100-OTH
3.5mm to 3.5mm audio connector	Brand Name	Zebra	Part Number	CBL-HS2100-3MS1-01
Type C-Audio Cable (Type C to 3.5mm)	Brand Name	Zebra	Part Number	ADP-USBC-35MM1-01
USB Cable 1 (USB-C to C Cable)	Brand Name	Zebra	Part Number	CBL-EC5X-USBC3A-01
USB Cable 2 (USB-A to C Cable)	Brand Name	Zebra	Part Number	CBL-TC5X-USBC2A-01
EM45 Protective Case	Brand Name	Zebra	Part Number	SG-EM45EXO1-01



1.2 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	LTE Band 5 : 824 MHz ~ 849 MHz LTE Band 13 : 777 MHz ~ 787 MHz LTE Band 17 : 704 MHz ~ 716 MHz LTE Band 26 : 824 MHz ~ 849 MHz LTE Band 71: 663 MHz ~ 698 MHz
Rx Frequency	LTE Band 5 : 869 MHz ~ 894 MHz LTE Band 13 : 746 MHz ~ 756 MHz LTE Band 17 : 734 MHz ~ 746 MHz LTE Band 26 : 869 MHz ~ 894 MHz LTE Band 71: 617 MHz ~ 652 MHz
Bandwidth	LTE Band 5 : 1.4MHz / 3MHz / 5MHz / 10MHz LTE Band 13 : 5MHz / 10MHz LTE Band 17 : 5MHz / 10MHz LTE Band 26 : 1.4MHz / 3MHz / 5MHz / 10MHz / 15MHz LTE Band 71 : 5MHz / 10MHz / 15MHz / 20MHz
Maximum Output Power to Antenna	Ant0: LTE Band 5 : 22.84 dBm LTE CA_5B : 22.84 dBm LTE Band 13 : 22.78 dBm LTE Band 17 : 22.75 dBm LTE Band 26 : 23.95 dBm LTE Band 71 : 22.98 dBm Ant1: LTE Band 5 : 21.66 dBm LTE CA_5B : 21.66 dBm LTE Band 13 : 21.77 dBm LTE Band 17 : 21.78 dBm LTE Band 26 : 21.64 dBm LTE Band 71 : 21.87 dBm
Antenna Gain	Ant0: LTE Band 5 : -3 dBi LTE Band 13 : -2 dBi LTE Band 17 : -2.5 dBi LTE Band 26 : -3 dBi LTE Band 71 : -2 dBi Ant1: LTE Band 5 : -2.11 dBi LTE Band 13 : -2.34 dBi LTE Band 17 : -2.04 dBi LTE Band 26 : -2.11 dBi LTE Band 71 : -3.24 dBi
Type of Modulation	QPSK / 16QAM / 64QAM / 256QAM

Note: The maximum ERP is calculated from max output power and max antenna gain, so only the maximum ERP of Antenna 0 for LTE Band5/5B/13/17/26/71 is shown in the report.

1.3 Modification of EUT

No modifications are made to the EUT during all test items.



1.4 Maximum ERP Power and Emission Designator

LTE Band 5		QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
1.4	824.7 ~ 848.3	0.0557	1M09G7D	0.0444	1M09W7D
3	825.5 ~ 847.5	0.0565	2M71G7D	0.0494	2M73W7D
5	826.5 ~ 846.5	0.0558	4M49G7D	0.0493	4M50W7D
10	829.0 ~ 844.0	0.0587	9M01G7D	0.0511	8M99W7D
LTE Band 13		QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
5	779.5 ~ 784.5	0.0711	4M48G7D	0.0627	4M48W7D
10	782.0	0.0729	8M99G7D	0.0641	8M99W7D
LTE Band 17		QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
5	706.5 ~ 713.5	0.0637	4M49G7D	0.0558	4M50W7D
10	709.0 ~ 711.0	0.0646	9M15G7D	0.0568	9M03W7D
LTE Band 26		QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
1.4	824.7 ~ 848.3	0.0577	1M09G7D	0.0454	1M09W7D
3	825.5 ~ 847.5	0.0585	2M71G7D	0.0500	2M73W7D
5	826.5 ~ 846.5	0.0582	4M49G7D	0.0508	4M50W7D
10	829.0 ~ 844.0	0.0574	9M01G7D	0.0511	8M99W7D
15	831.5 ~ 841.5	0.0759	13M5G7D	0.0532	13M5W7D
CH26790	824.0	0.0612	13M4G7D	0.0508	13M5W7D
LTE Band 71		QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Frequency Range (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
5	665.5 ~ 695.5	0.0729	4M51G7D	0.0638	4M47W7D
10	668.0 ~ 693.0	0.0728	8M97G7D	0.0634	9M05W7D
15	670.5 ~ 690.5	0.0724	13M4G7D	0.0637	13M4W7D
20	673.0 ~ 688.0	0.0764	17M8G7D	0.0665	17M7W7D



LTE Band CA_5B	QPSK		16QAM/64QAM/256QAM	
BW (MHz)	Maximum ERP(W)	Emission Designator (99%OBW)	Maximum ERP(W)	Emission Designator (99%OBW)
3MHz+5MHz	0.0586	7M56G7D	0.0507	7M56W7D
5MHz+3MHz	0.0579	7M50G7D	0.0508	7M51W7D
5MHz+10MHz	0.0582	13M8G7D	0.0501	13M8W7D
10MHz+5MHz	0.0583	13M9G7D	0.0486	13M9W7D
10MHz+10MHz	0.0587	18M7G7D	0.0512	18M6W7D

Note:

1. LTE Band 26 overlaps the entire frequency range of LTE Band 5. Therefore, the test results provided in this report covers Band 26 as well as Band 5..
2. All modulations have been tested, and only the worst test results of PSK & QAM are shown in the report.

1.5 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH04-KS TH01-KS	CN1257	314309

1.6 Test Software

Item	Site	Manufacture	Name	Version
1.	TH01-KS	SPORTON	FCC LTE_Ver2.0 Auto_china_210503	2.0
2.	03CH04-KS	AUDIX	E3	210616



1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 22(H), 27(H), 27(F), 27(N)
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



2 Test Configuration of Equipment Under Test

2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas License Digital Systems v03r01 with maximum output power.

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes to find the maximum emission. (X/Y-Plane)

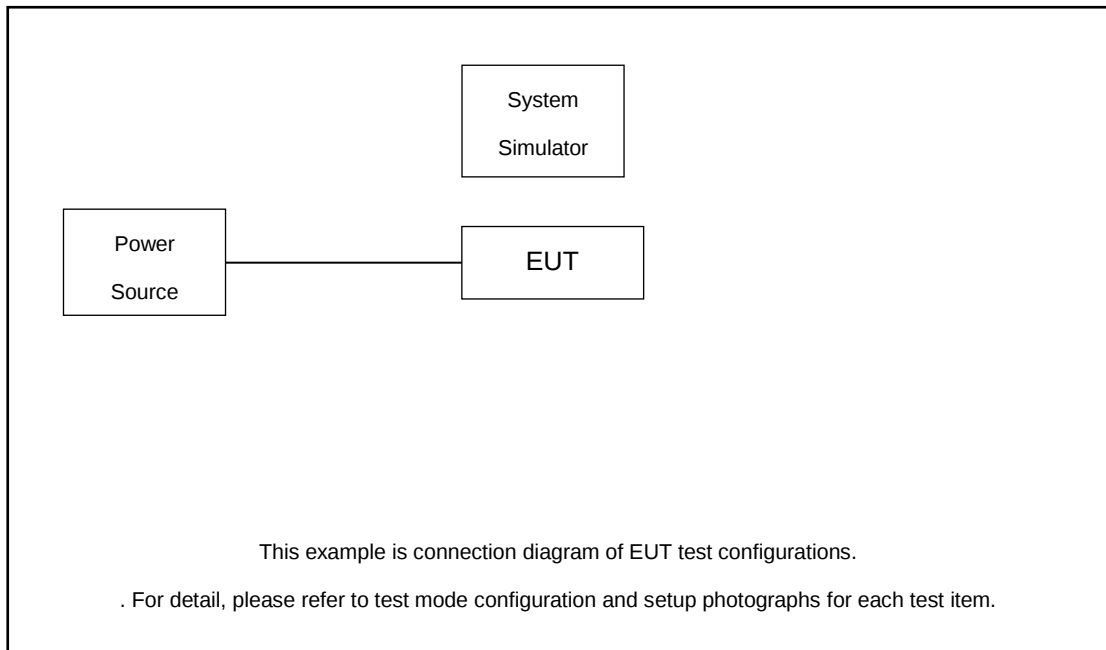
Test Items	Band	Bandwidth (MHz)						Modulation				RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	5	v	v	v	v	-	-	v	v	v	v	v		v	v	v	v
	13	-	-	v	v	-	-	v	v	v	v	v		v	v	v	v
	17	-	-	v	v	-	-	v	v	v	v	v		v	v	v	v
	26	v	v	v	v	v	-	v	v	v	v	v		v	v	v	v
	71	-	-	v	v	v	v	v	v	v	v	v		v	v	v	v
Peak-to-Average Ratio	13	-	-		v	-	-	v	v	v	v			v		v	
	17	-	-		v	-	-	v	v	v	v			v		v	
	26					v	-	v	v	v	v			v		v	
	71	-	-				v	v	v	v	v			v		v	
26dB and 99% Bandwidth	13	-	-	v	v	-	-	v	v					v		v	
	17	-	-	v	v	-	-	v	v					v		v	
	26	v	v	v	v	v	-	v	v					v		v	
	71	-	-	v	v	v	v	v	v					v		v	
Conducted Band Edge	13	-	-	v	v	-	-	v	v	v	v	v		v	v		v
	17	-	-	v	v	-	-	v	v	v	v	v		v	v		v
	26	v	v	v	v	v	-	v	v	v	v	v		v	v		v
	71	-	-	v	v	v	v	v	v	v	v	v		v	v		v
Conducted Spurious Emission	13	-	-	v	v	-	-	v				v			v	v	v
	17	-	-	v	v	-	-	v				v			v	v	v
	26	v	v	v	v	v	-	v				v			v	v	v
	71	-	-	v	v	v	v	v				v			v	v	v
Frequency Stability	13	-	-		v	-	-	v						v		v	
	17	-	-		v	-	-	v						v		v	
	26				v		-	v						v		v	
	71	-	-		v			v						v		v	
E.R.P	5	v	v	v	v	-	-	v	v	v	v	v			v	v	v
	13	-	-	v	v	-	-	v	v	v	v	v			v	v	v
	17	-	-	v	v	-	-	v	v	v	v	v			v	v	v
	26	v	v	v	v	v	-	v	v	v	v	v			v	v	v
	71	-	-	v	v	v	v	v	v	v	v	v			v	v	v
Radiated Spurious Emission	13	Worst Case													v	v	v
	17	Worst Case													v	v	v
	26	Worst Case													v	v	v
	71	Worst Case													v	v	v



Test Items	Band	Bandwidth (MHz)						Modulation				RB #			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Note		1. The mark "v" means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported.															

Test Items	Band	Bandwidth (MHz)								Modulation				RB #			Test Channel		
		5+10	10+10	5+15	10+5	5+10	5+5	5+3	3+5	QPSK	16QAM	64QAM	256QAM	1	Half	Full	L	M	H
Max. Output Power	5B_CA	-	v	-	v	v	-	v	v	v	v	v	v	v			v	v	v
26dB and 99% Bandwidth	5B_CA	-	v	-	v	v	-	v	v	v	v					v		v	
Conducted Band Edge	5B_CA	-	v	-	v	v	-	v	v	v	v	v	v	v		v	v		v
Conducted Spurious Emission	5B_CA	-	v	-	v	v	-	v	v	v				v			v	v	v
E.R.P.	5B_CA	-	v	-	v	v	-	v	v	v	v	v	v	v			v	v	v
Radiated Spurious Emission	5B_CA	Worst Case															v	v	v
Note		1. The mark "v" means that this configuration is chosen for testing 2. The mark "-" means that this bandwidth is not supported. 3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. 4. All test items are based on engineering evaluation. 5. For QAM modulation mode, the whole testing has assessed 16QAM&64QAM mode by referring to the higher conducted power																	

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	Power Supply	GWINSTEK	PSS-2002	N/A	N/A	Unshielded, 1.8 m
2.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss

Offset = RF cable loss

Following shows an offset computation example with cable loss 4.6 dB

Example :

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} \\
 &= 4.6 \text{ (dB)}
 \end{aligned}$$



2.5 Frequency List of Low/Middle/High Channels

LTE Band 5 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	20450	20525	20600
	Frequency	829	836.5	844
5	Channel	20425	20525	20625
	Frequency	826.5	836.5	846.5
3	Channel	20415	20525	20635
	Frequency	825.5	836.5	847.5
1.4	Channel	20407	20525	20643
	Frequency	824.7	836.5	848.3

LTE Band 13 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	-	23230	-
	Frequency	-	782	-
5	Channel	23205	23230	23255
	Frequency	779.5	782	784.5

LTE Band 17 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
10	Channel	23780	23790	23800
	Frequency	709	710	711
5	Channel	23755	23790	23825
	Frequency	706.5	710	713.5



LTE Band 26 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
15	Channel	26865	26915	26965
	Frequency	831.5	836.5	841.5
10	Channel	26840	26915	26990
	Frequency	829	836.5	844
5	Channel	26815	26915	27015
	Frequency	826.5	836.5	846.5
3	Channel	26805	26915	27025
	Frequency	825.5	836.5	847.5
1.4	Channel	26797	26915	27033
	Frequency	824.7	836.5	848.3

LTE Band 71 Channel and Frequency List				
BW [MHz]	Channel/Frequency(MHz)	Lowest	Middle	Highest
20	Channel	133222	133322	133372
	Frequency	673.0	680.5	688.0
15	Channel	133197	133297	133397
	Frequency	670.5	680.5	690.5
10	Channel	133172	133272	133422
	Frequency	668.0	678.0	693.0
5	Channel	133147	133247	133447
	Frequency	665.5	675.5	695.5



LTE Band 5B_CA Channel and Frequency List					
BW [MHz]	Channel/Frequency(MHz)		Lowest	Middle	Highest
3 + 5	PCC	Channel	20416	20501	20586
		Frequency	825.6	834.1	842.6
	SCC	Channel	20455	20540	20625
		Frequency	829.5	838.0	846.5
5 + 3	PCC	Channel	20425	20510	20595
		Frequency	826.5	835.0	843.5
	SCC	Channel	20464	20549	20634
		Frequency	830.4	838.9	847.4
5 + 10	PCC	Channel	20428	20478	20528
		Frequency	826.8	831.8	836.8
	SCC	Channel	20500	20550	20600
		Frequency	834	839	844
10 + 5	PCC	Channel	20450	20500	20550
		Frequency	829	834	839
	SCC	Channel	20522	20572	20622
		Frequency	836.2	841.2	846.2
10 + 10	PCC	Channel	20450	20476	20501
		Frequency	829	831.6	834.1
	SCC	Channel	20549	20575	20600
		Frequency	838.9	841.5	844

3 Conducted Test Items

3.1 Measuring Instruments

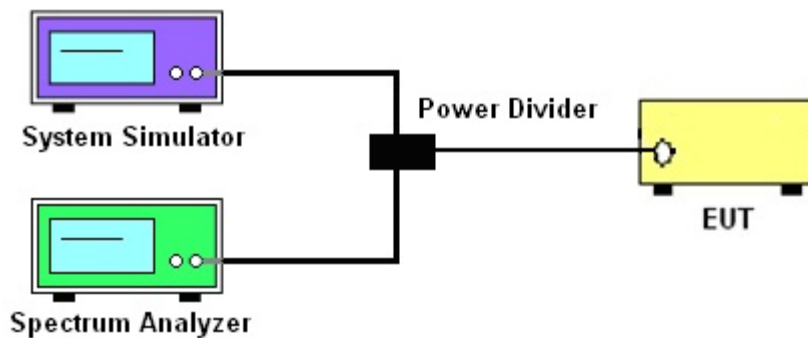
See list of measuring instruments of this test report.

3.2 Test Setup

3.2.1 Conducted Output Power



3.2.2 Peak-to-Average Ratio, Occupied Bandwidth ,Conducted Band-Edge and Conducted Spurious Emission



3.2.3 Frequency Stability



3.3 Test Result of Conducted Test

Please refer to Appendix A.

3.4 Conducted Output Power and ERP

3.4.1 Description of the Conducted Output Power Measurement and ERP Measurement

A system simulator was used to establish communication with the EUT. Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for LTE Band 5 and Band 26.

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 13 and Band 17 and Band 71.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

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

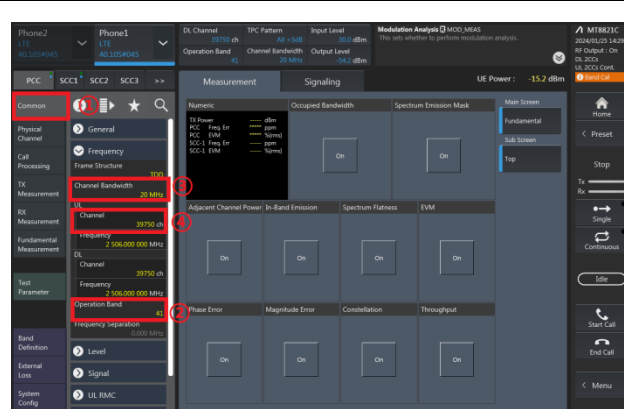
3.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

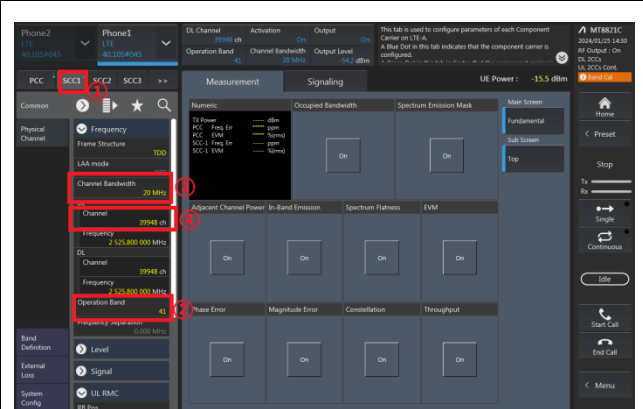
3.4.3 Test Procedures for LTE ULCA

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter PCC & SCC output ports were connected to the system simulator.
3. Set EUT at maximum power, set the PCC/SCC CA band, channel, bandwidth and RB config.

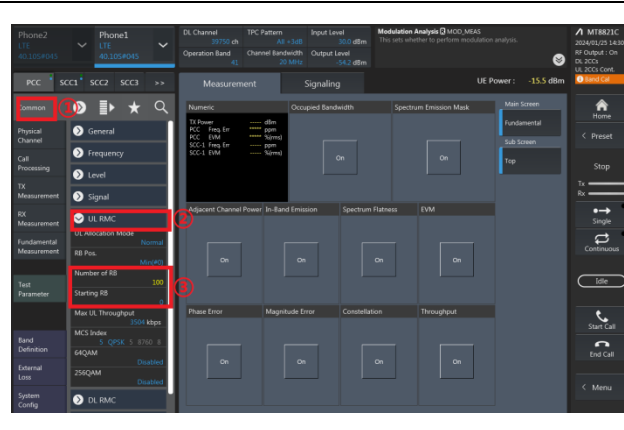
PCC config_ (Channel Bandwidth / Channel / Band)



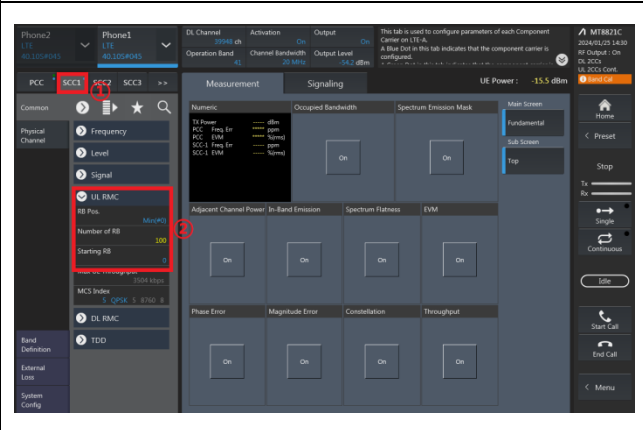
SCC config_ (Channel Bandwidth / Channel / Band)



PCC config_ (Number of RB / Starting RB)

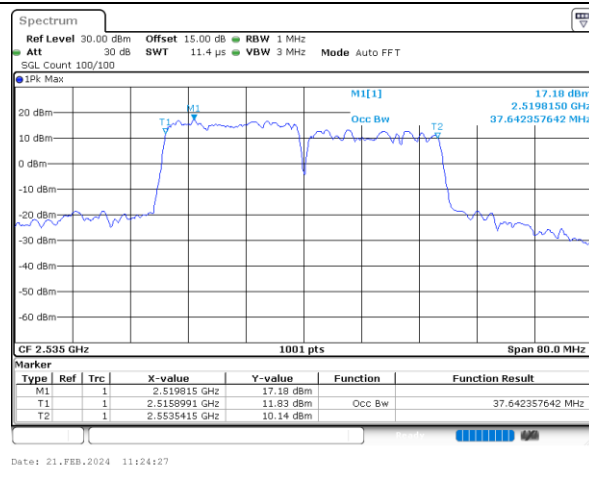


SCC config_ (Number of RB / Starting RB)

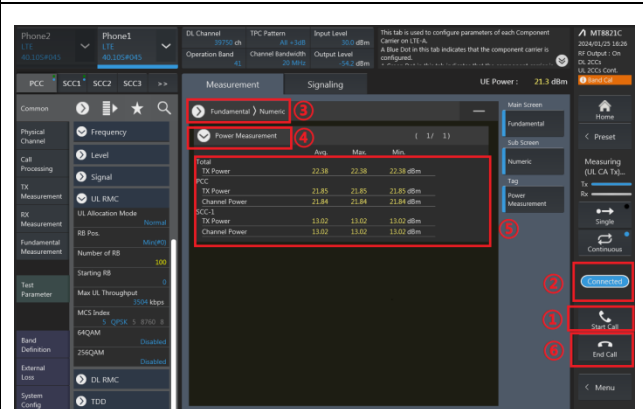


4. Select lowest, middle, and highest channels for each ULCA band and different modulation.
5. Check the ULCA spectrum and record the total power from the system simulator.

Check the ULCA spectrum (eg. 20M+20M)



Read the Total UL CA output power (PCC+SCC)



3.5 Peak-to-Average Ratio

3.5.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. 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.

3.5.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2.3.4 (CCDF).
2. The EUT was connected to spectrum and system simulator via a power divider.
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
5. Record the deviation as Peak to Average Ratio.

3.6 Occupied Bandwidth

3.6.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is 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 transmitted power.

The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

3.6.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.4
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
4. The nominal resolution bandwidth (RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
5. Set the detection mode to peak, and the trace mode to max hold.
6. Determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace.
(this is the reference value)
7. Determine the “-26 dB down amplitude” as equal to (Reference Value – X).
8. Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the “-X dB down amplitude” determined in step 6. If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.
9. Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

3.7 Conducted Band Edge

3.7.1 Description of Conducted Band Edge Measurement

22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

27.53 (c)

For operations in the 776-788 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 100 kHz bandwidth. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed. In addition, the power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least $65 + 10 \log_{10} p(\text{watts})$, dB, for mobile and portable equipment.

27.53 (g)

For operations in the 600MHz band and 698 -746 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

3.7.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The band edges of low and high channels for the highest RF powers were measured.
4. Set RBW $\geq$ 1% EBW in the 1MHz band immediately outside and adjacent to the band edge.
5. Beyond the 1 MHz band from the band edge, RBW=1MHz was used
6. Set spectrum analyzer with RMS detector.
7. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
8. Checked that all the results comply with the emission limit line.

Example:

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

$= P(W) - [43 + 10\log(P)]$ (dB)

$= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB) = -13dBm.

9. When using the integration method, the starting frequency of the integration shall be centered at one-half of the RBW away from the band edge.

3.8 Conducted Spurious Emission

3.8.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

3.8.2 Test Procedures

1. The testing follows ANSI C63.26 section 5.7
2. The EUT was connected to spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz.
7. Set spectrum analyzer with RMS detector.
8. Taking the record of maximum spurious emission.
9. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
10. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)]$ (dB)
 $= [30 + 10\log(P)]$ (dBm) - $[43 + 10\log(P)]$ (dB)
 $= -13$ dBm.

3.9 Frequency Stability

3.9.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

3.9.2 Test Procedures for Temperature Variation

1. The testing follows ANSI C63.26 section 5.6.4
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C step up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

3.9.3 Test Procedures for Voltage Variation

1. The testing follows ANSI C63.26 section 5.6.5
2. The EUT was placed in a temperature chamber at $20\pm 5^{\circ}\text{C}$ and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value for other than hand carried battery equipment.
4. For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.
5. The variation in frequency was measured for the worst case.

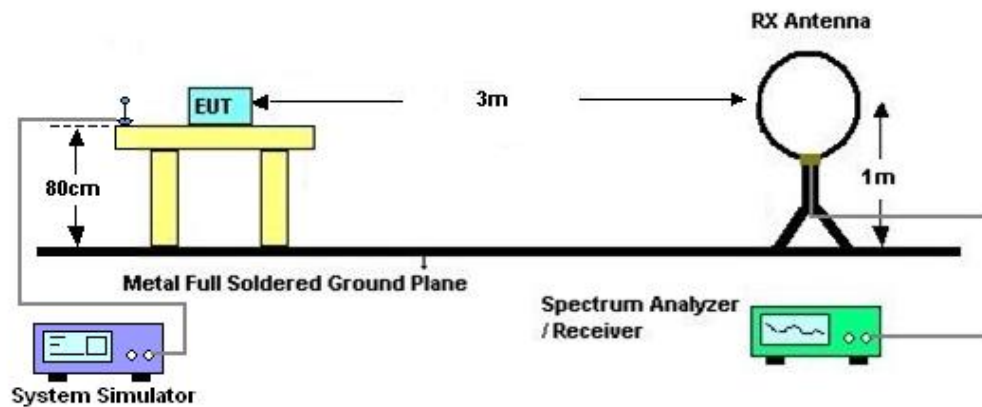
4 Radiated Test Items

4.1 Measuring Instruments

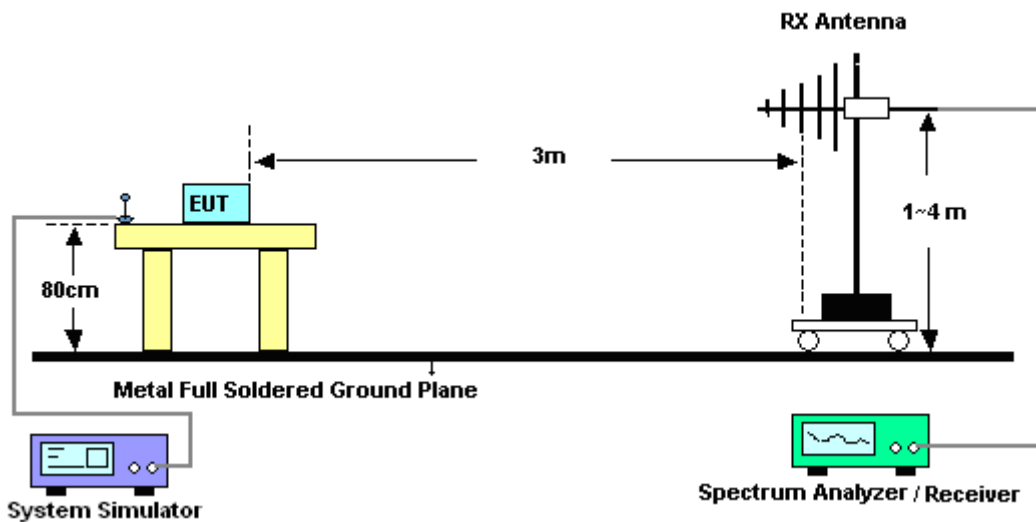
See list of measuring instruments of this test report.

4.2 Test Setup

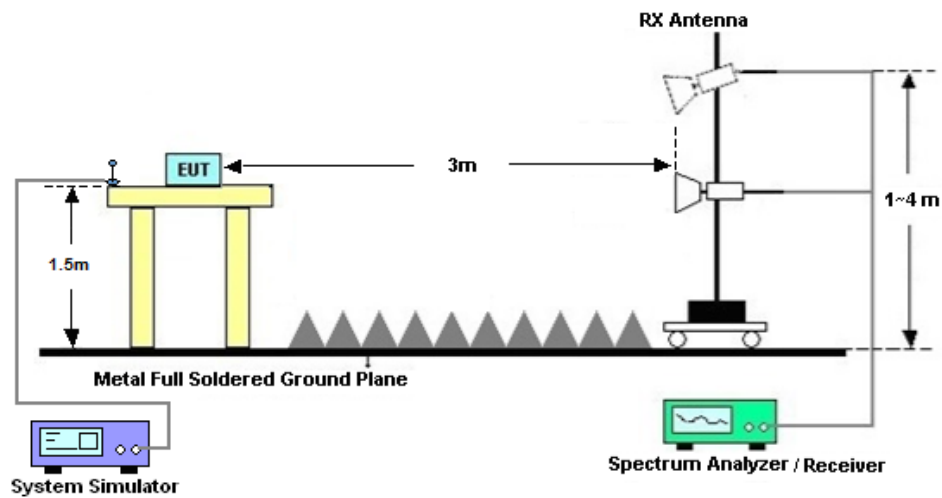
4.2.1 For radiated test below 30MHz



4.2.2 For radiated test from 30MHz to 1GHz



4.2.3 For radiated test above 1GHz



4.3 Test Result of Radiated Test

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

Please refer to Appendix B.



4.4 Radiated Spurious Emission

4.4.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI C63.26. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

For LTE Band 13

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions 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.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a turntable with 0.8 meter height for frequency below 1GHz and 1.5 meter height for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the receiving antenna mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between 1m to 4m to search the maximum spurious emission for both horizontal and vertical polarizations.
6. During the measurement, the system simulator parameters were set to force the EUT transmitting at maximum output power.
7. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
8. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
9. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
10. $\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$
11. $\text{ERP (dBm)} = \text{EIRP} - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$



5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 11, 2023	Jul. 08, 2024~ Jul. 11, 2024	Oct. 10, 2024	Conducted (TH01-KS)
Power divider	STI	STI08-0055	-	0.5~40GHz	NCR	Jul. 08, 2024~ Jul. 11, 2024	NCR	Conducted (TH01-KS)
Temperature & humidity chamber	Hongzhan	LP-150U	H2014011440	-40~+150°C 20%~95%RH	Jul. 04, 2024	Jul. 08, 2024~ Jul. 11, 2024	Jul. 03, 2025	Conducted (TH01-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY57471079	10Hz~44G,MAX 30dB	Oct. 11, 2023	Aug. 12, 2024~ Aug. 26, 2024	Oct. 10, 2024	Radiation (03CH04-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 11 2023	Aug. 12, 2024~ Aug. 26, 2024	Sep. 10, 2024	Radiation (03CH04-KS)
Bilog Antenna	TeseQ	CBL6111D	59913	30MHz~1GHz	Aug. 18, 2023	Aug. 12, 2024~ Aug. 26, 2024	Aug. 17, 2025	Radiation (03CH04-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	75957	1GHz~18GHz	Oct. 23, 2023	Aug. 12, 2024~ Aug. 26, 2024	Oct. 22, 2024	Radiation (03CH04-KS)
SHF-EHF Horn	Com-power	AH-840	101070	18GHz~40GHz	Jan. 27, 2024	Aug. 12, 2024~ Aug. 26, 2024	Jan. 26, 2025	Radiation (03CH04-KS)
Amplifier	SONOMA	310N	413740	9KHz~1GHz	Jan. 03, 2024	Aug. 12, 2024~ Aug. 26, 2024	Jan. 02, 2025	Radiation (03CH04-KS)
Amplifier	EM	EM18G40GA	060728	18~40GHz	Jan. 02, 2024	Aug. 12, 2024~ Aug. 26, 2024	Jan. 01, 2025	Radiation (03CH04-KS)
high gain Amplifier	EM	EM01G18GA	060840	1Ghz~18Ghz	Oct. 11, 2023	Aug. 12, 2024~ Aug. 26, 2024	Oct. 10, 2024	Radiation (03CH04-KS)
Amplifier	EM	EM01G18GA	060892	1Ghz~18Ghz	Oct. 11, 2023	Aug. 12, 2024~ Aug. 26, 2024	Oct. 10, 2024	Radiation (03CH04-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Aug. 12, 2024~ Aug. 26, 2024	NCR	Radiation (03CH04-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Aug. 12, 2024~ Aug. 26, 2024	NCR	Radiation (03CH04-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Aug. 12, 2024~ Aug. 26, 2024	NCR	Radiation (03CH04-KS)

NCR: No Calibration Required

6 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Spurious Emission & Bandedge	±2.22 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.50 dB
Peak to Average Ratio	±0.50 dB
Frequency Stability	±0.04 ppm

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.83dB
---	--------

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.83dB
---	--------

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.82dB
---	--------

----- THE END -----



Appendix A. Test Results of Conducted Test

Test Engineer :	Smile Wang	Temperature :	22~23°C
		Relative Humidity :	40~42%

Conducted Output Power(Average power) and ERP

LTE Band 5:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				20450	20525	20600			
Frequency (MHz)				829	836.5	844	L	M	H
10	QPSK	1	0	22.74	22.84	22.79	0.0574	0.0587	0.0581
10	QPSK	1	49	22.80	22.83	22.74	0.0582	0.0586	0.0574
10	QPSK	50	0	21.85	21.96	21.90	0.0468	0.0480	0.0473
10	16QAM	1	0	22.22	22.21	22.23	0.0509	0.0508	0.0511
10	64QAM	1	0	20.92	20.94	20.87	0.0378	0.0379	0.0373
10	256QAM	1	0	17.83	17.69	17.82	0.0185	0.0179	0.0185
Channel				20425	20525	20625	ERP(W)		
Frequency (MHz)				826.5	836.5	846.5	L	M	H
5	QPSK	1	0	22.54	22.62	22.56	0.0548	0.0558	0.0551
5	16QAM	1	0	22.08	22.05	21.98	0.0493	0.0490	0.0482
Channel				20415	20525	20635	ERP(W)		
Frequency (MHz)				825.5	836.5	847.5	L	M	H
3	QPSK	1	0	22.60	22.67	22.59	0.0556	0.0565	0.0555
3	16QAM	1	0	22.09	22.09	22.00	0.0494	0.0494	0.0484
Channel				20407	20525	20643	ERP(W)		
Frequency (MHz)				824.7	836.5	848.3	L	M	H
1.4	QPSK	1	0	22.47	22.61	22.43	0.0540	0.0557	0.0535
1.4	16QAM	1	0	21.62	21.42	21.46	0.0444	0.0424	0.0428

LTE Band 13:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				23230					
Frequency (MHz)				782				M	
10	QPSK	1	0	22.67	22.78	22.65	0.0711	0.0729	0.0708
10	QPSK	1	49	22.68	22.77	22.65	0.0713	0.0728	0.0708
10	QPSK	50	0	21.79	21.94	21.76	0.0581	0.0601	0.0577
10	16QAM	1	0	22.20	22.14	22.22	0.0638	0.0630	0.0641
10	64QAM	1	0	20.84	20.86	20.87	0.0467	0.0469	0.0470
10	256QAM	1	0	17.70	17.66	17.80	0.0226	0.0224	0.0232
Channel				23205	23230	23255	ERP(W)		
Frequency (MHz)				779.5	782	784.5	L	M	H
5	QPSK	1	0	22.60	22.67	22.60	0.0700	0.0711	0.0700
5	16QAM	1	0	22.11	22.07	22.12	0.0625	0.0619	0.0627



LTE Band 17:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				23780	23790	23800			
Frequency (MHz)				709	710	711	L	M	H
10	QPSK	1	0	22.70	22.75	22.68	0.0638	0.0646	0.0635
10	QPSK	1	49	22.73	22.73	22.61	0.0643	0.0643	0.0625
10	QPSK	50	0	21.80	21.91	21.89	0.0519	0.0532	0.0530
10	16QAM	1	0	22.19	22.16	22.10	0.0568	0.0564	0.0556
10	64QAM	1	0	20.89	20.83	20.80	0.0421	0.0415	0.0412
10	256QAM	1	0	17.76	17.54	17.74	0.0205	0.0195	0.0204
Channel				23755	23790	23825	ERP(W)		
Frequency (MHz)				706.5	710	713.5	L	M	H
5	QPSK	1	0	22.63	22.69	22.66	0.0628	0.0637	0.0632
5	16QAM	1	0	21.97	22.02	22.12	0.0540	0.0546	0.0558

LTE Band 26:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)			
Channel				26790	26865	26915	26965				
Frequency (MHz)				824	831.5	836.5	841.5	Straddle Ch	L	M	H
15	QPSK	1	0	23.02	23.04	23.95	22.89	0.0612	0.0615	0.0759	0.0594
15	QPSK	1	74	22.95	22.93	22.87	22.84	0.0603	0.0600	0.0592	0.0587
15	QPSK	75	0	22.09	22.14	21.97	21.99	0.0494	0.0500	0.0481	0.0483
15	16QAM	1	0	22.21	22.34	22.37	22.41	0.0508	0.0524	0.0527	0.0532
15	64QAM	1	0	21.15	21.11	20.97	20.93	0.0398	0.0394	0.0382	0.0378
15	256QAM	1	0	17.84	17.76	17.96	17.98	0.0186	0.0182	0.0191	0.0192
Channel				26790	26840	26915	26990	ERP(W)			
Frequency (MHz)				824	829	836.5	844	Straddle Ch	L	M	H
10	QPSK	1	0	22.75	22.74	22.71	22.73	0.0575	0.0574	0.0570	0.0573
10	16QAM	1	0	22.03	22.06	22.07	22.23	0.0488	0.0491	0.0492	0.0511
Channel				26790	26815	26915	27015	ERP(W)			
Frequency (MHz)				824	826.5	836.5	846.5	Straddle Ch	L	M	H
5	QPSK	1	0	22.75	22.80	22.69	22.65	0.0575	0.0582	0.0568	0.0562
5	16QAM	1	0	22.13	22.21	22.18	22.12	0.0499	0.0508	0.0505	0.0498
Channel				26790	26815	26915	27025	ERP(W)			
Frequency (MHz)				824	825.5	836.5	847.5	Straddle Ch	L	M	H
3	QPSK	1	0	22.85	22.82	22.72	22.70	0.0589	0.0585	0.0571	0.0569
3	16QAM	1	0	22.13	22.10	22.14	22.08	0.0499	0.0495	0.0500	0.0493
Channel				26790	26797	26915	27033	ERP(W)			
Frequency (MHz)				824	824.7	836.5	848.3	Straddle Ch	L	M	H
1.4	QPSK	1	0	22.73	22.76	22.74	22.67	0.0573	0.0577	0.0574	0.0565
1.4	16QAM	1	0	21.67	21.66	21.72	21.69	0.0449	0.0448	0.0454	0.0451



LTE Band 71:

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	ERP(W)		
Channel				133222	133322	133372			
Frequency (MHz)				673	683	688	L	M	H
20	QPSK	1	0	22.82	22.98	22.96	0.0736	0.0764	0.0760
20	QPSK	1	99	22.91	22.89	22.90	0.0752	0.0748	0.0750
20	QPSK	100	0	21.92	22.07	21.97	0.0598	0.0619	0.0605
20	16QAM	1	0	22.38	22.36	22.34	0.0665	0.0662	0.0659
20	64QAM	1	0	21.01	21.06	20.95	0.0485	0.0491	0.0479
20	256QAM	1	0	18.02	17.86	18.00	0.0244	0.0235	0.0243
Channel				133197	133297	133397	EIRP(W)		
Frequency (MHz)				670.5	680.5	690.5	L	M	H
15	QPSK	1	0	22.73	22.69	22.75	0.0721	0.0714	0.0724
15	16QAM	1	0	22.16	22.12	22.19	0.0632	0.0627	0.0637
Channel				133172	133272	133422	EIRP(W)		
Frequency (MHz)				668	678	693	L	M	H
10	QPSK	1	0	22.74	22.77	22.73	0.0723	0.0728	0.0721
10	16QAM	1	0	22.08	22.13	22.17	0.0621	0.0628	0.0634
Channel				133147	133247	133447	EIRP(W)		
Frequency (MHz)				665.5	675.5	695.5	L	M	H
5	QPSK	1	0	22.70	22.78	22.75	0.0716	0.0729	0.0724
5	16QAM	1	0	22.20	22.15	22.14	0.0638	0.0631	0.0630

LTE CA_5B:

Combination 10MHz+10MHz (50RB+50RB)							
Channel	Modulation	PCC		SCC		Measured Power	ERP(W)
		RB Size	RB offset	RB Size	RB offset		
L	QPSK	1	Max	1	0	22.84	0.0587
M	QPSK	1	Max	1	0	22.81	0.0583
H	QPSK	1	Max	1	0	22.74	0.0574
L	16QAM	1	Max	1	0	22.22	0.0509
M	16QAM	1	Max	1	0	22.15	0.0501
H	16QAM	1	Max	1	0	22.24	0.0512
L	64QAM	1	Max	1	0	20.94	0.0379
M	64QAM	1	Max	1	0	20.89	0.0375
H	64QAM	1	Max	1	0	20.90	0.0376
L	256QAM	1	Max	1	0	17.82	0.0185
M	256QAM	1	Max	1	0	17.79	0.0184
H	256QAM	1	Max	1	0	17.91	0.0189
Combination 10MHz+5MHz (50RB+25RB)							
Channel	Modulation	PCC		SCC		Measured Power	ERP(W)
		RB Size	RB offset	RB Size	RB offset		
L	QPSK	1	Max	1	0	22.81	0.0583
H	16QAM	1	Max	1	0	22.02	0.0486
Combination 5MHz+10MHz (25RB+50RB)							
Channel	Modulation	PCC		SCC		Measured Power	ERP(W)
		RB Size	RB offset	RB Size	RB offset		



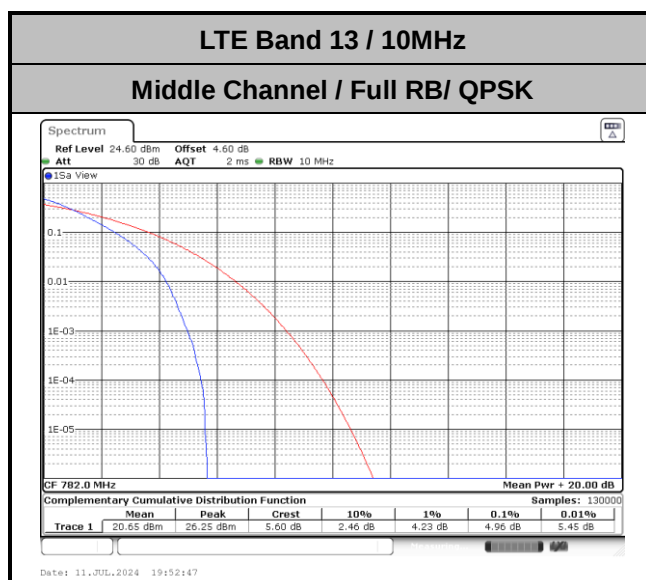
L	QPSK	1	Max	1	0	22.80	0.0582
H	16QAM	1	Max	1	0	22.15	0.0501
Combination 5MHz+3MHz (25RB+15RB)							
Channel	Modulation	PCC		SCC		Measured Power	ERP(W)
		RB Size	RB offset	RB Size	RB offset		
L	QPSK	1	Max	1	0	22.78	0.0579
H	16QAM	1	Max	1	0	22.21	0.0508
Combination 3MHz+5MHz (15RB+25RB)							
Channel	Modulation	PCC		SCC		Measured Power	ERP(W)
		RB Size	RB offset	RB Size	RB offset		
L	QPSK	1	Max	1	0	22.83	0.0586
H	16QAM	1	Max	1	0	22.20	0.0507



LTE Band 13

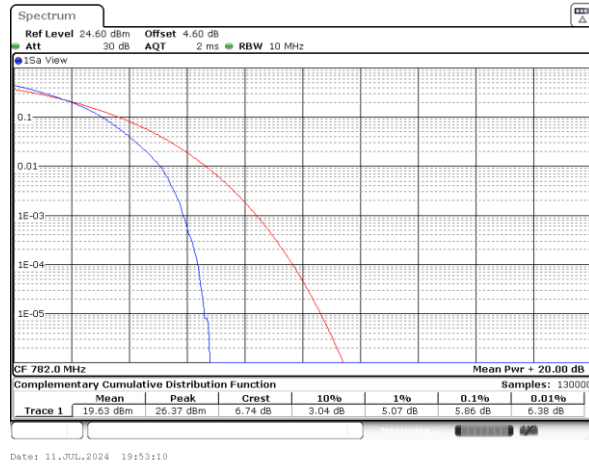
Peak-to-Average Ratio

Mode	LTE Band 13 / 10MHz				
Mod.	QPSK	16QAM	64QAM	256QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Full RB	Result
Middle CH	4.96	5.86	6.67	6.49	PASS

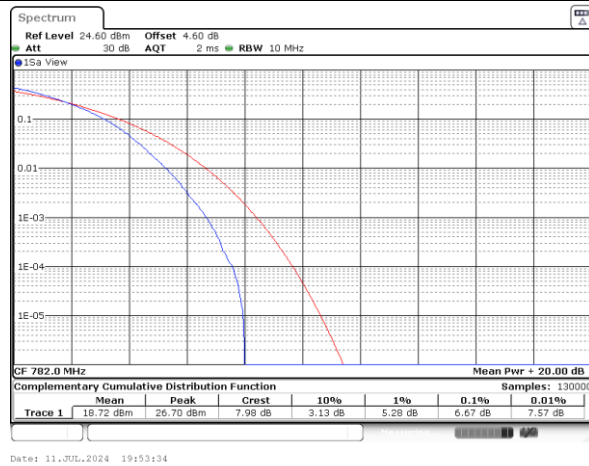




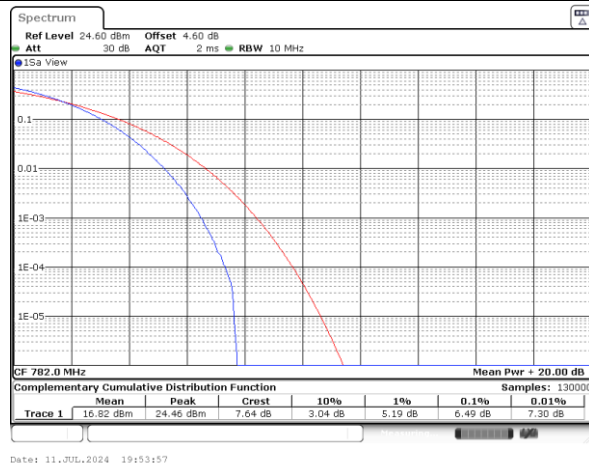
Middle Channel / Full RB/ 16QAM



Middle Channel / Full RB/ 64QAM

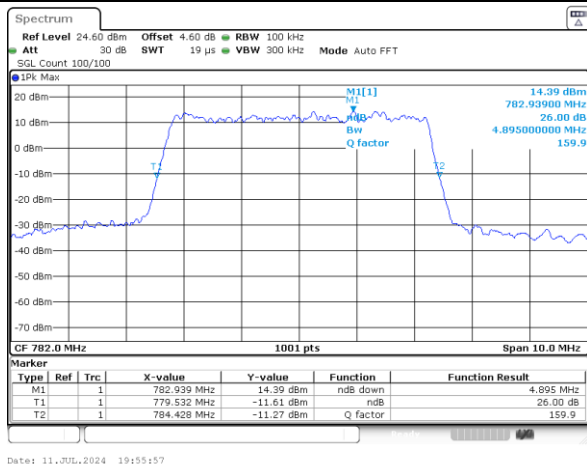
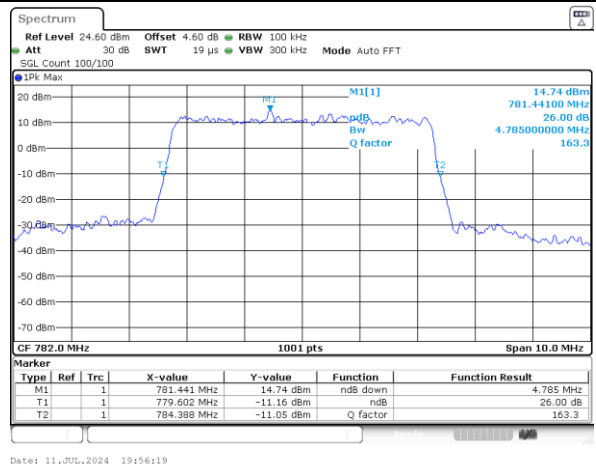
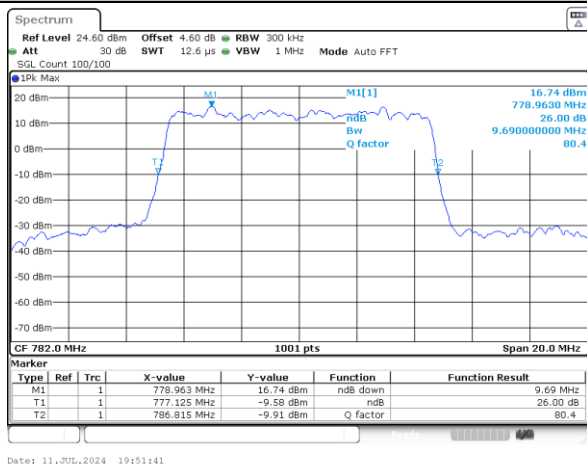
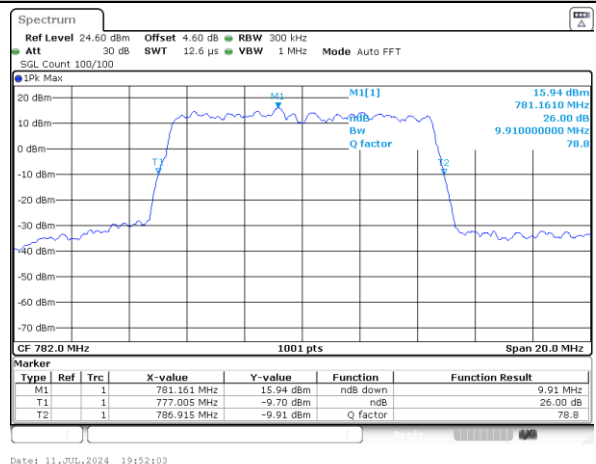


Middle Channel / Full RB/ 256QAM



**26dB Bandwidth**

Mode	LTE Band 13 : 26dB BW(MHz)	
BW	5MHz	
Mod.	QPSK	16QAM
Middle CH	4.90	4.79
BW	10MHz	
Mod.	QPSK	16QAM
Middle CH	9.69	9.91

LTE Band 13**Middle Channel / 5MHz / QPSK****Middle Channel / 5MHz / 16QAM****LTE Band 13****Middle Channel / 10MHz / QPSK****Middle Channel / 10MHz / 16QAM**

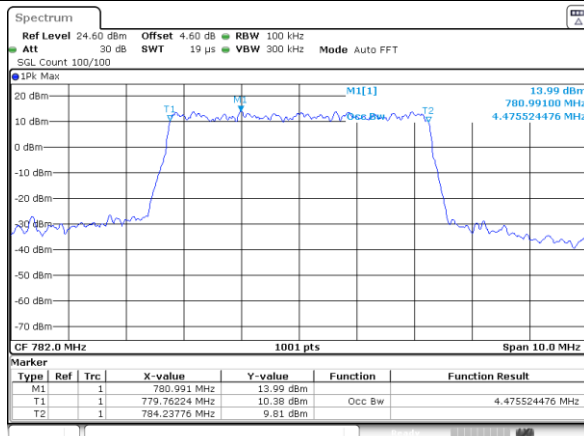


Occupied Bandwidth

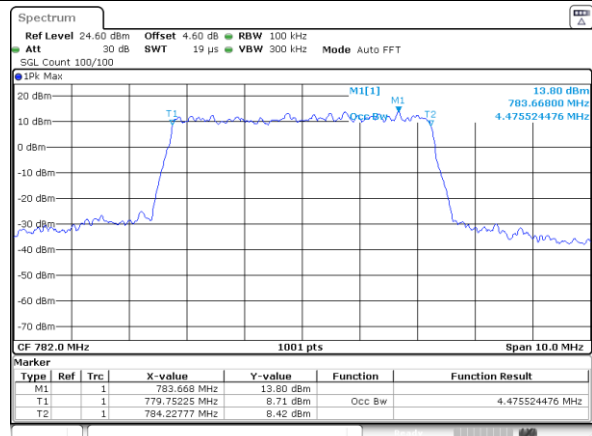
Mode	LTE Band 13 : 99%OBW(MHz)	
BW	5MHz	
Mod.	QPSK	16QAM
Middle CH	4.48	4.48
BW	10MHz	
Mod.	QPSK	16QAM
Middle CH	8.99	8.99

LTE Band 13

Middle Channel / 5MHz / QPSK

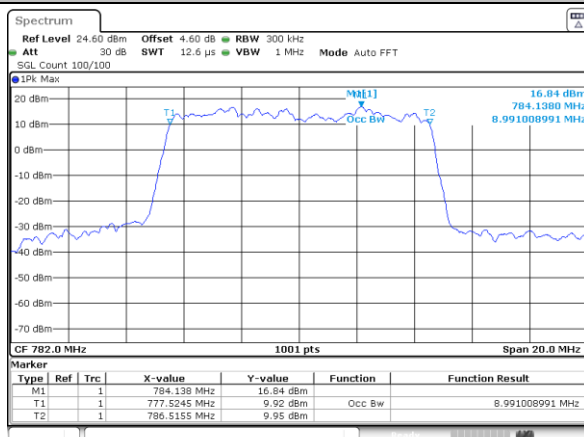


Middle Channel / 5MHz / 16QAM

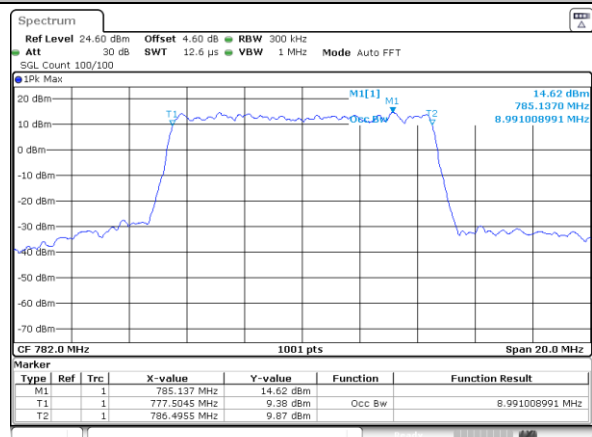


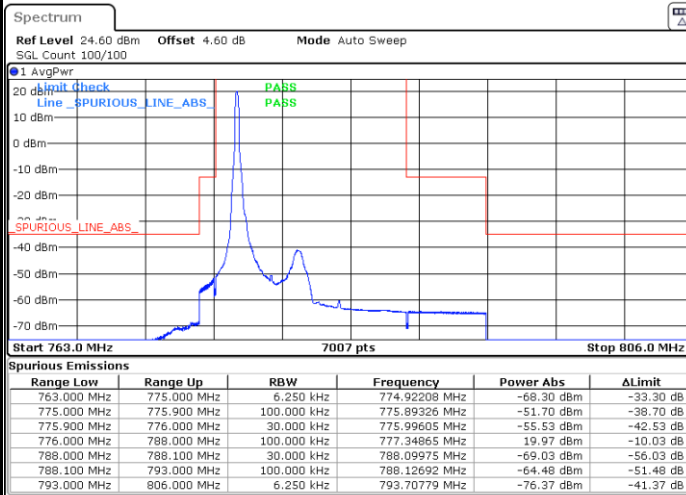
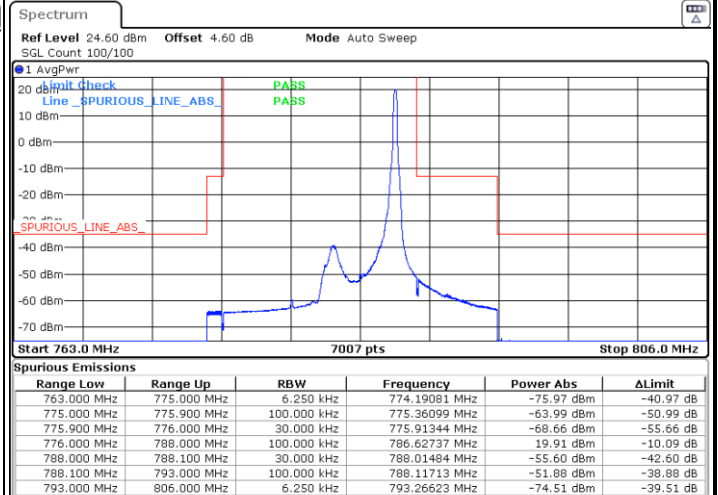
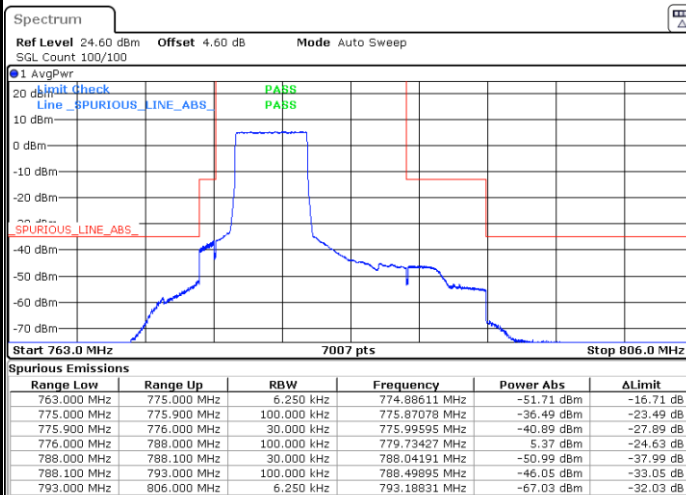
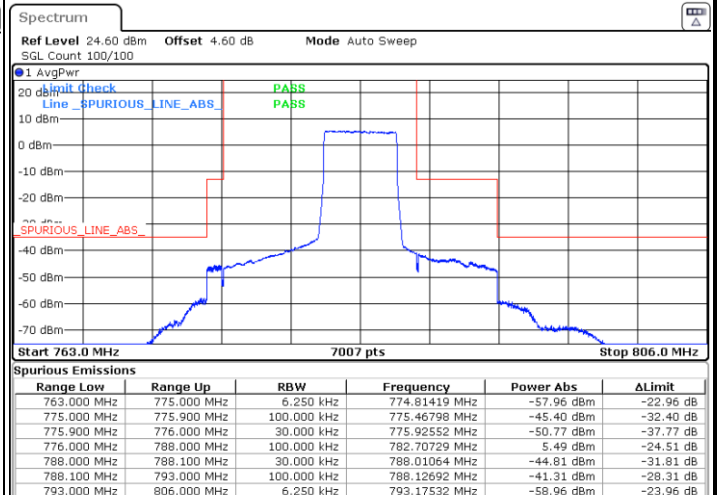
LTE Band 13

Middle Channel / 10MHz / QPSK



Middle Channel / 10MHz / 16QAM

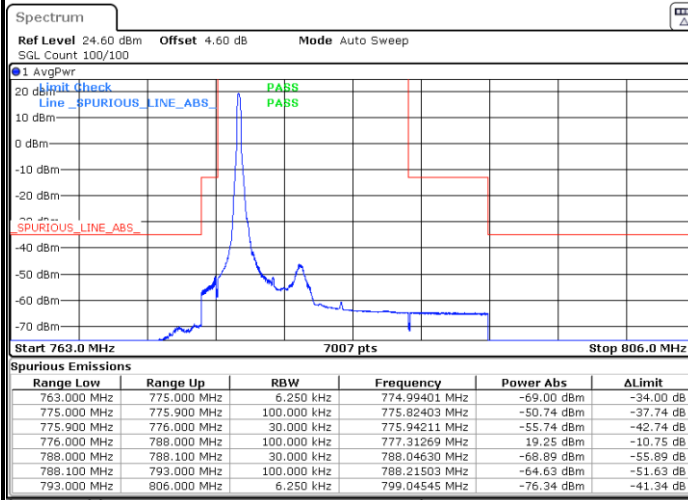


**Conducted Band Edge****LTE Band 13 / 5MHz / QPSK****Lowest Band Edge / 1 RB****Highest Band Edge / 1 RB****Lowest Band Edge / Full RB****Highest Band Edge / Full RB**



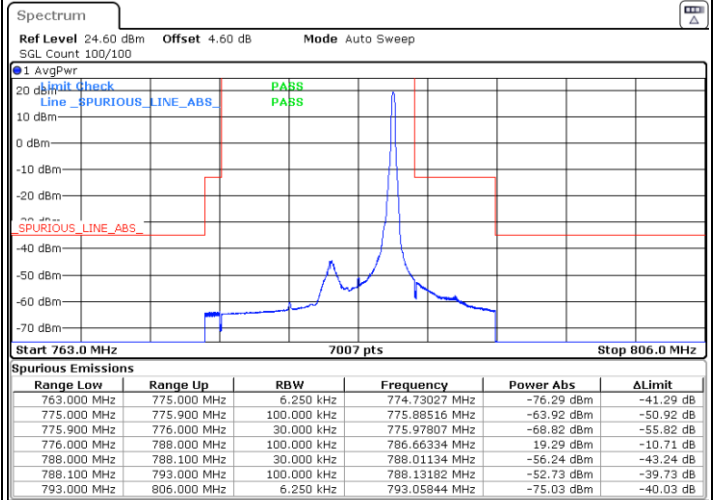
LTE Band 13 / 5MHz / 16QAM

Lowest Band Edge / 1RB



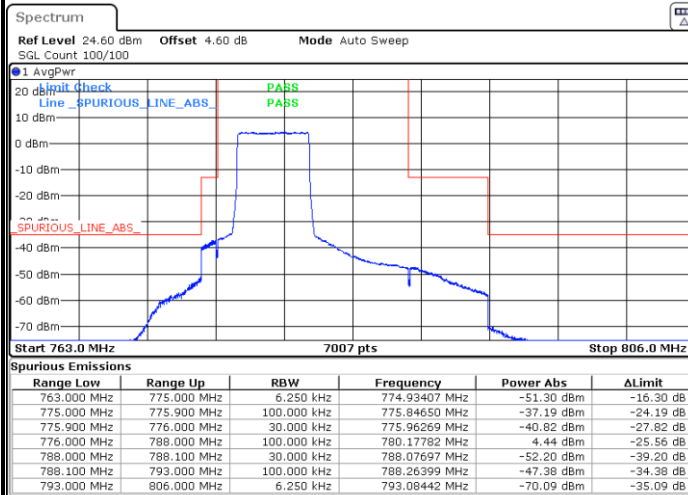
Date: 11.JUL.2024 18:57:25

Highest Band Edge / 1 RB



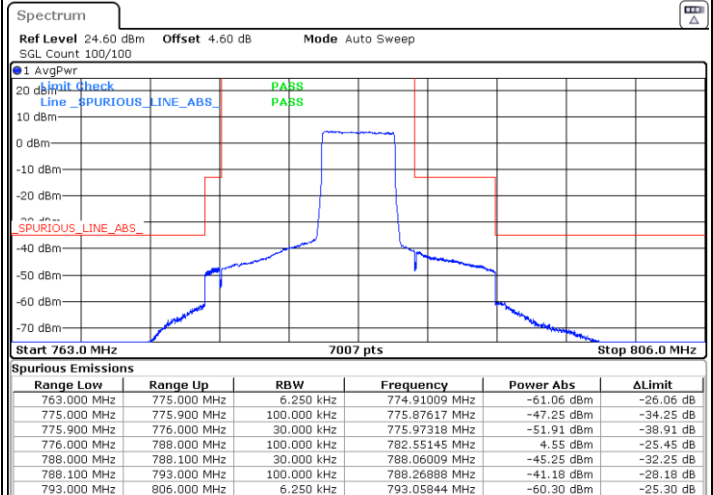
Date: 11.JUL.2024 19:16:18

Lowest Band Edge / Full RB



Date: 11.JUL.2024 19:04:52

Highest Band Edge / Full RB

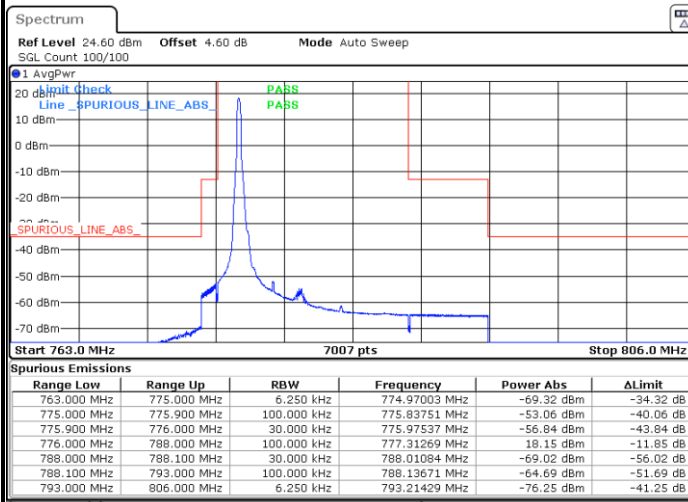


Date: 11.JUL.2024 19:23:45



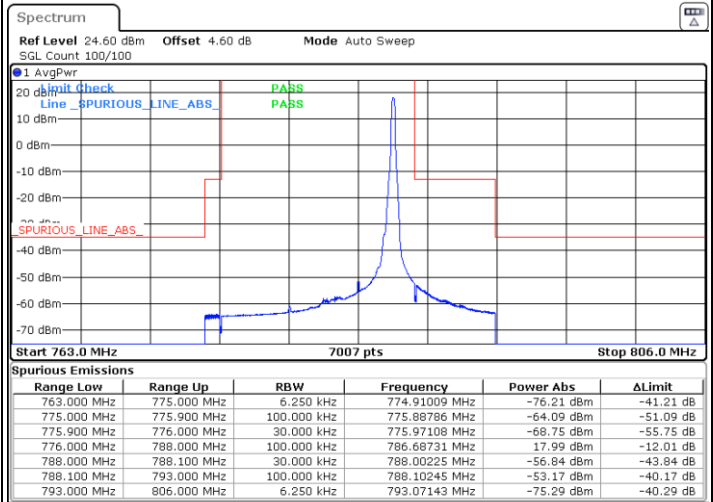
LTE Band 13 / 5MHz / 64QAM

Lowest Band Edge / 1RB



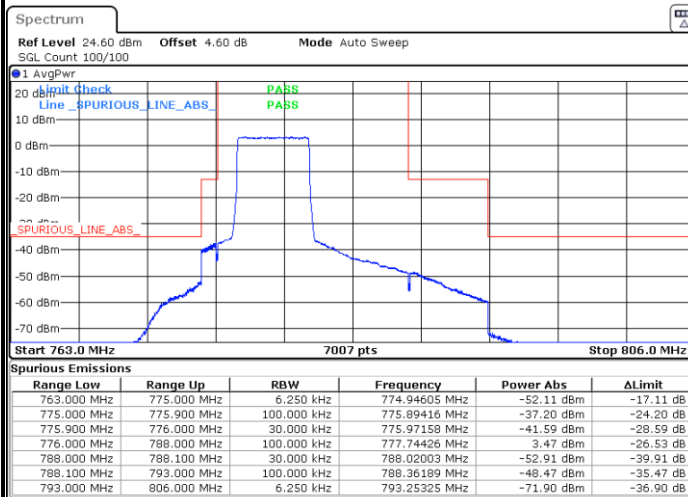
Date: 11.JUL.2024 18:59:16

Highest Band Edge / 1 RB



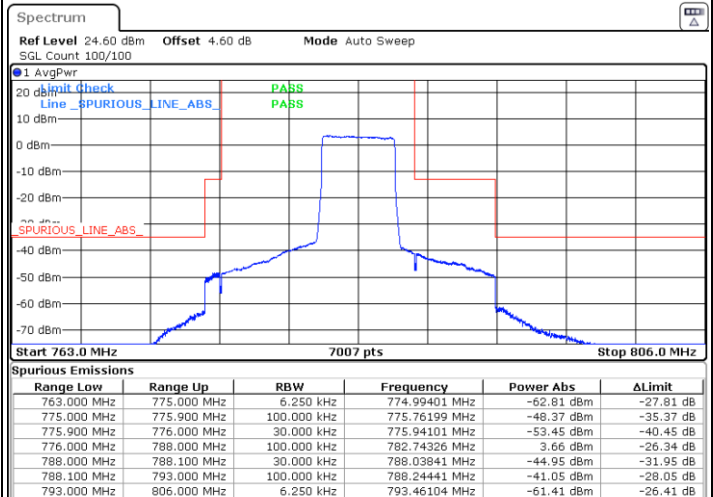
Date: 11.JUL.2024 19:18:09

Lowest Band Edge / Full RB



Date: 11.JUL.2024 19:06:43

Highest Band Edge / Full RB

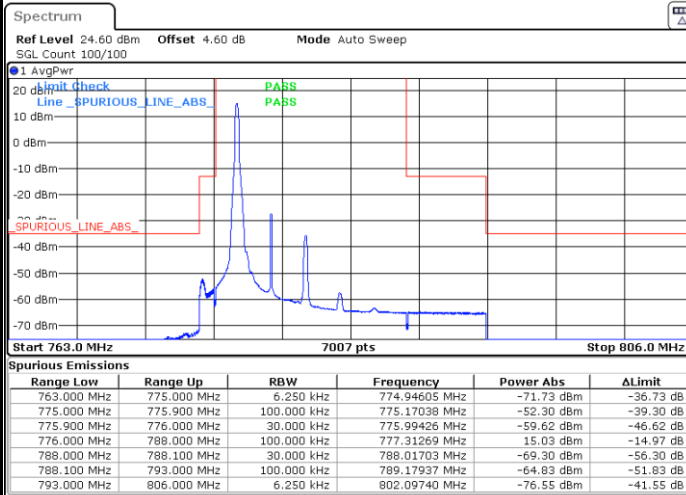


Date: 11.JUL.2024 19:25:36

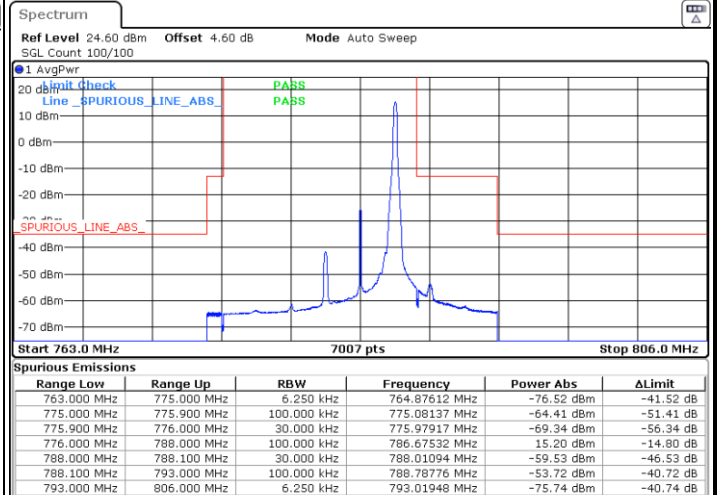


LTE Band 13 / 5MHz / 256QAM

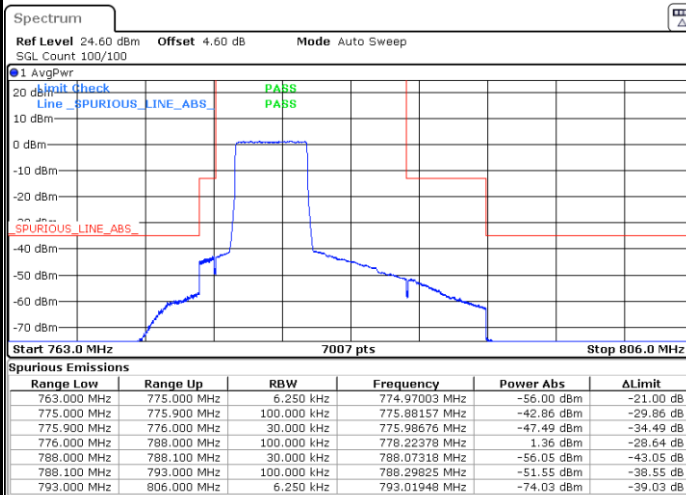
Lowest Band Edge / 1RB



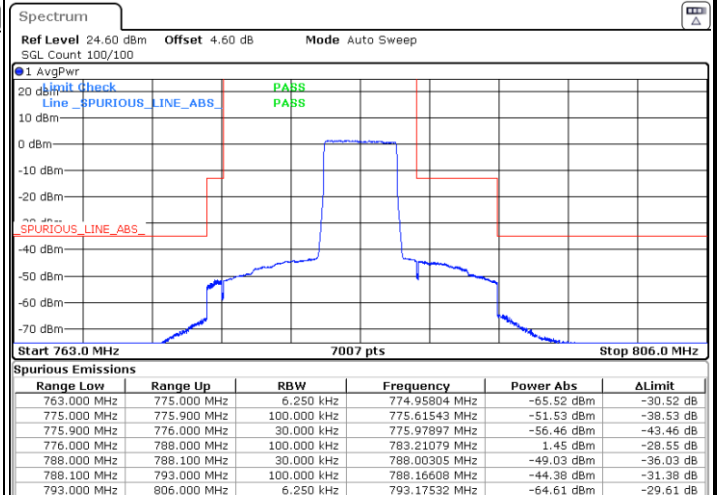
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



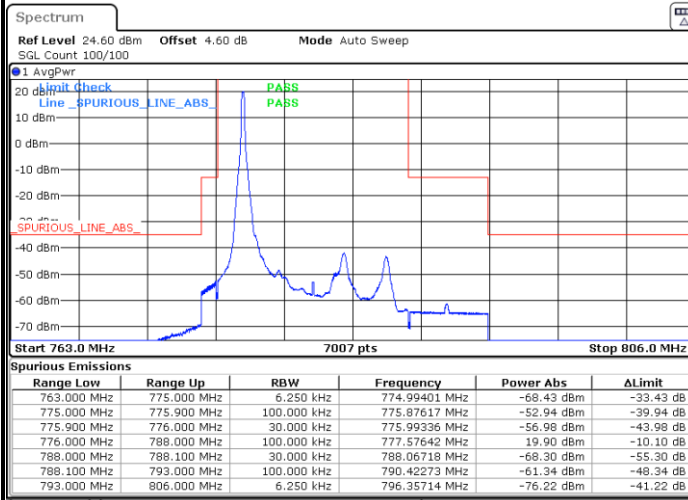
Highest Band Edge / Full RB





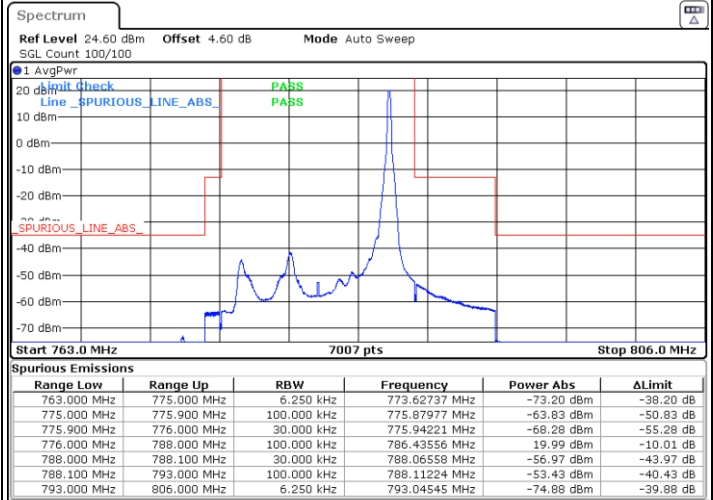
LTE Band 13 / 10MHz / QPSK

middle Band Edge / 1 RB



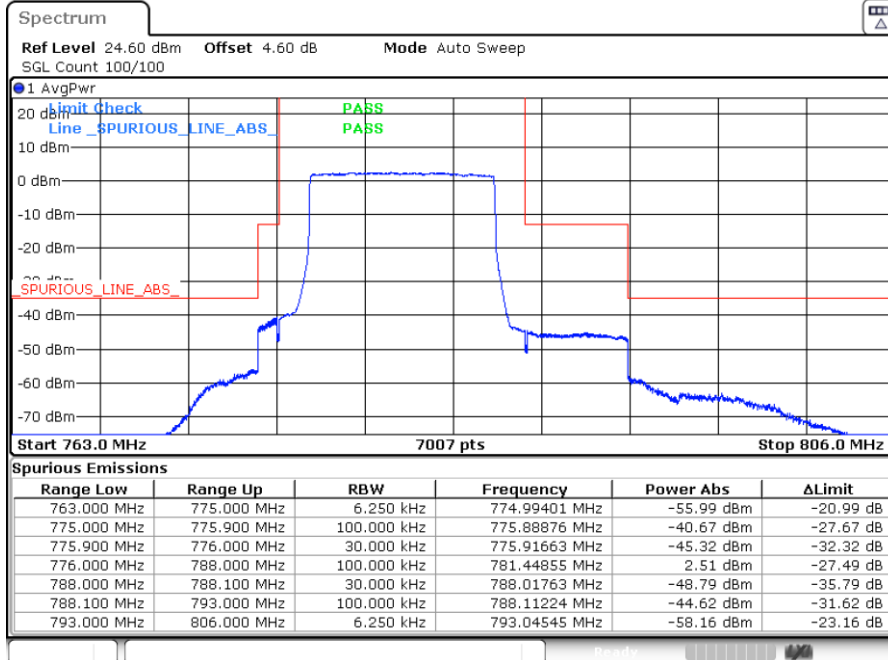
Date: 11.JUL.2024 19:30:43

middle Band Edge / 1 RB



Date: 11.JUL.2024 19:45:26

Middle Band Edge / Full RB

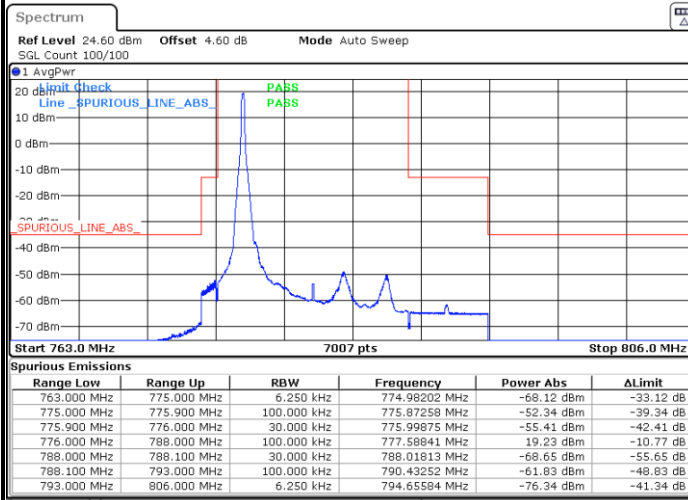


Date: 11.JUL.2024 19:38:04



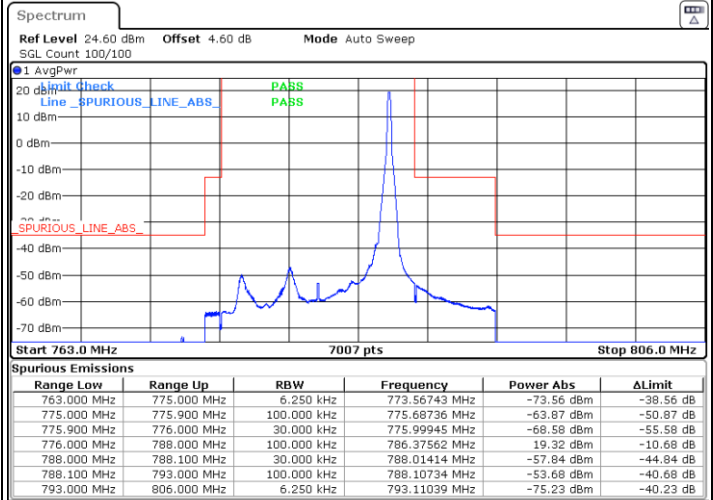
LTE Band 13 / 10MHz / 16QAM

middle Band Edge / 1 RB



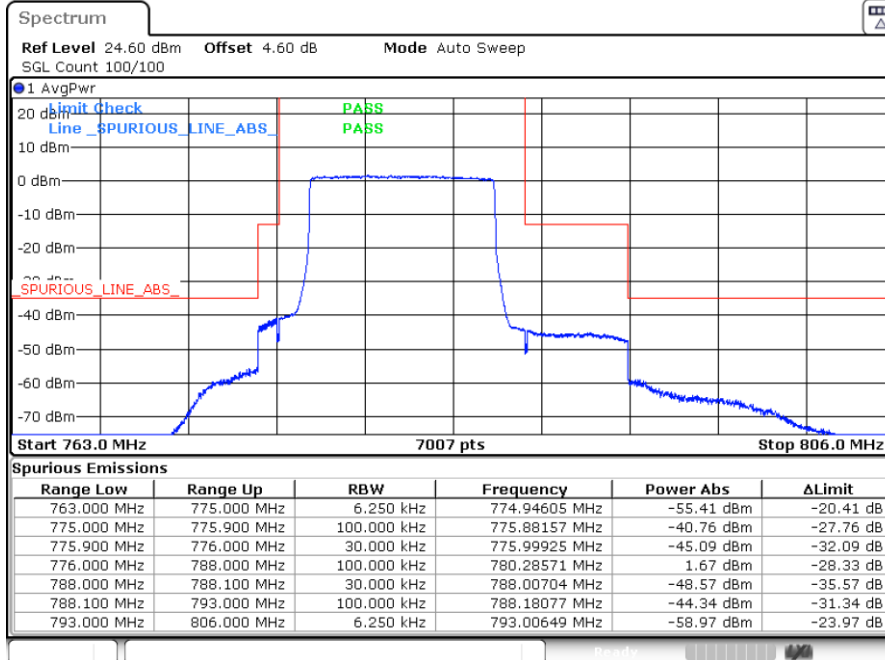
Date: 11.JUL.2024 19:32:33

middle Band Edge / 1 RB



Date: 11.JUL.2024 19:47:16

middle Band Edge / Full RB

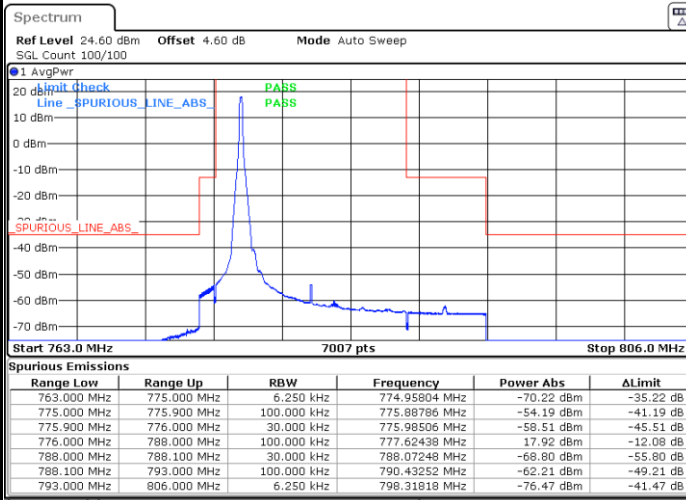


Date: 11.JUL.2024 19:39:54



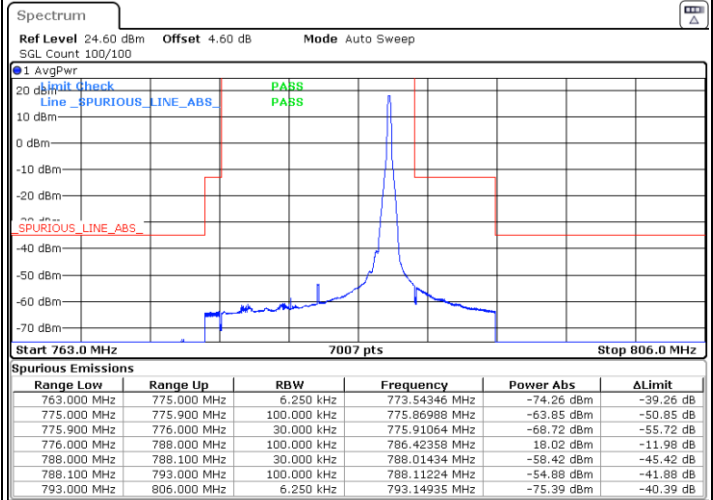
LTE Band 13 / 10MHz / 64QAM

middle Band Edge / 1 RB



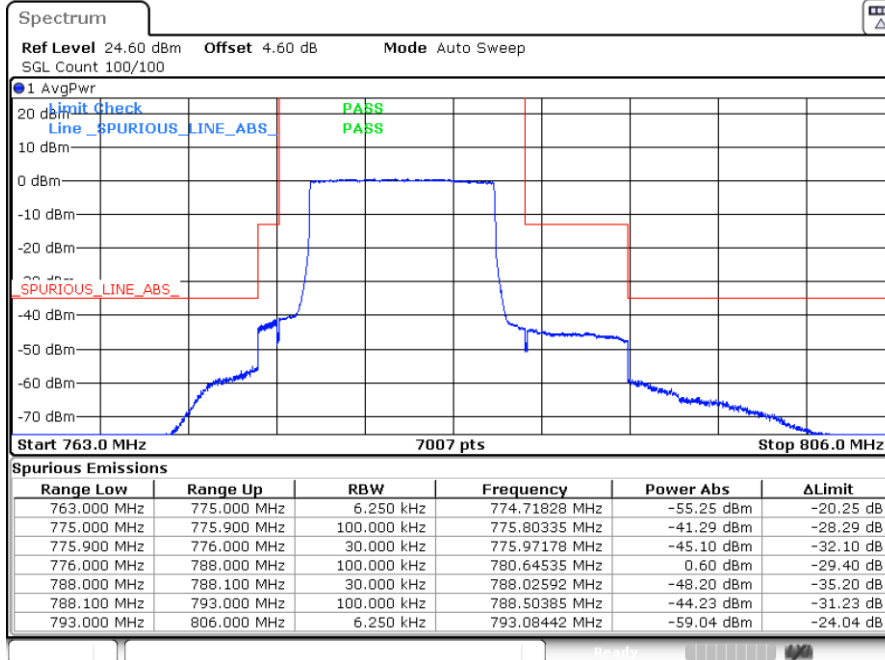
Date: 11.JUL.2024 19:34:24

middle Band Edge / 1 RB



Date: 11.JUL.2024 19:49:06

middle Band Edge / Full RB

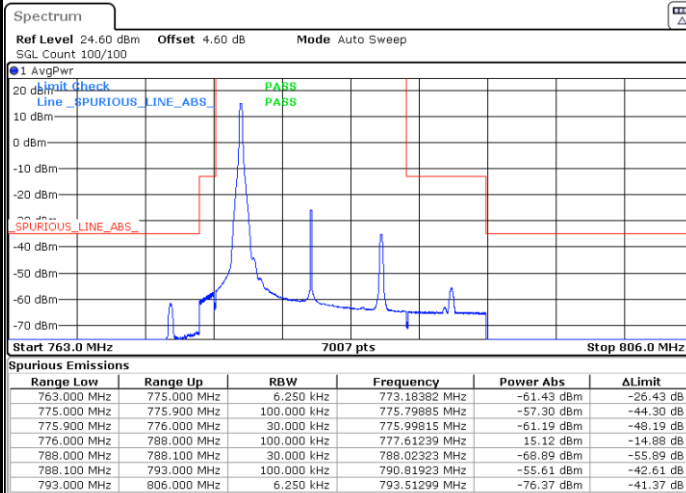


Date: 11.JUL.2024 19:41:44



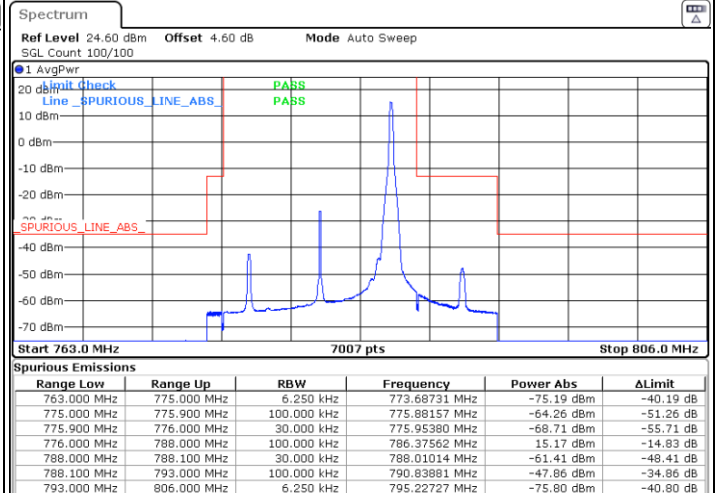
LTE Band 13 / 10MHz / 256QAM

middle Band Edge / 1 RB



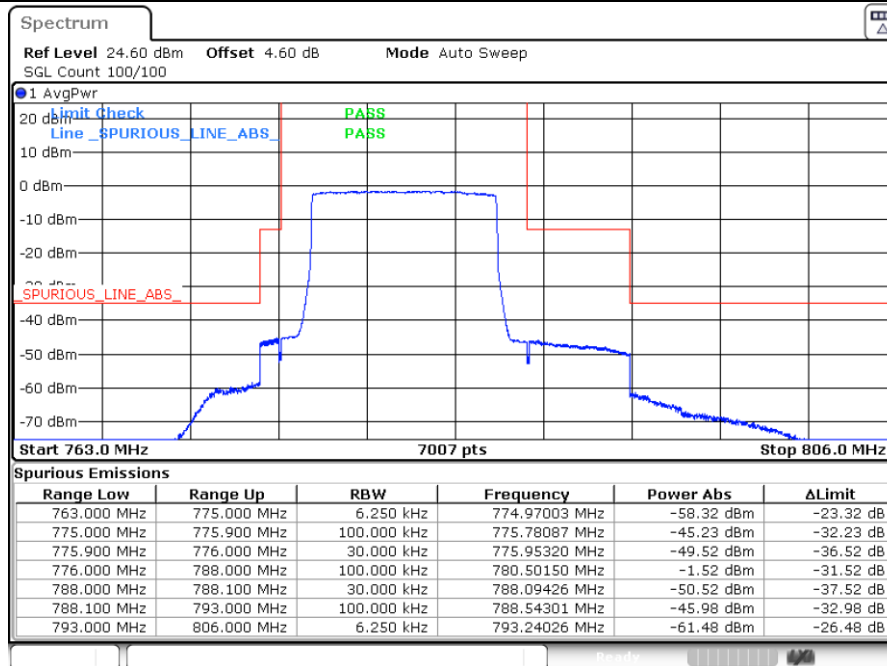
Date: 11.JUL.2024 19:36:14

middle Band Edge / 1 RB



Date: 11.JUL.2024 19:50:57

middle Band Edge / Full RB



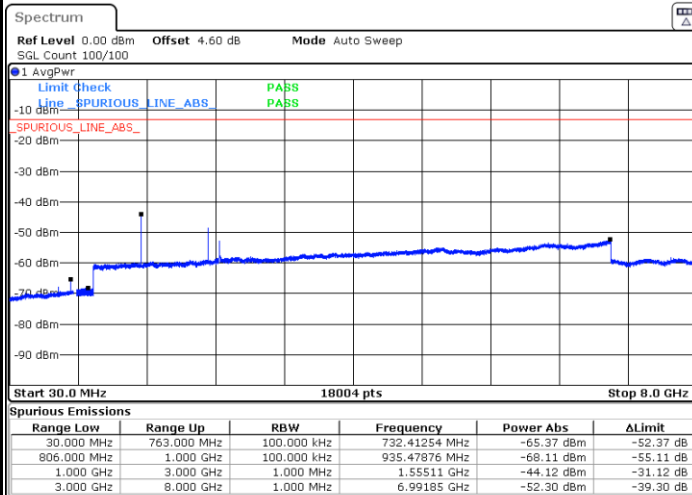
Date: 11.JUL.2024 19:43:35



Conducted Spurious Emission

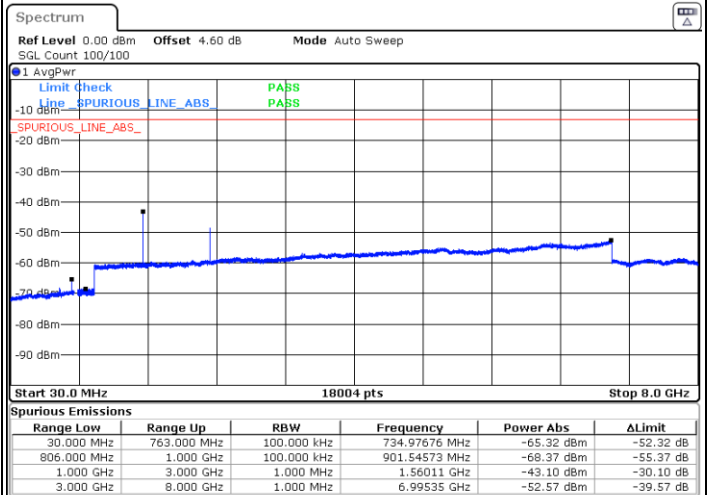
LTE Band 13 / 5MHz

Lowest Channel / QPSK



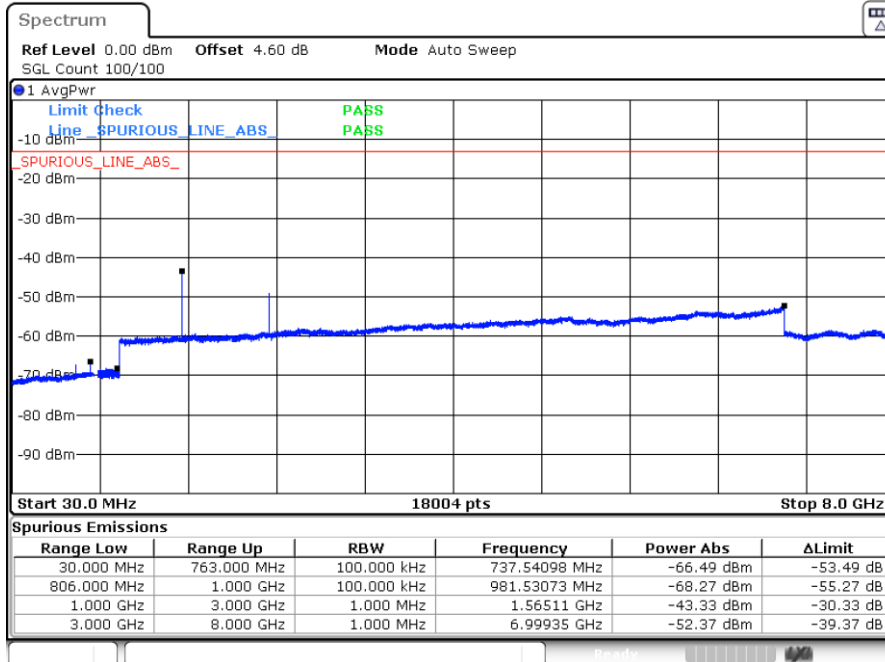
Date: 11.JUL.2024 18:53:43

Middle Channel / QPSK



Date: 11.JUL.2024 19:11:12

Highest Channel / QPSK

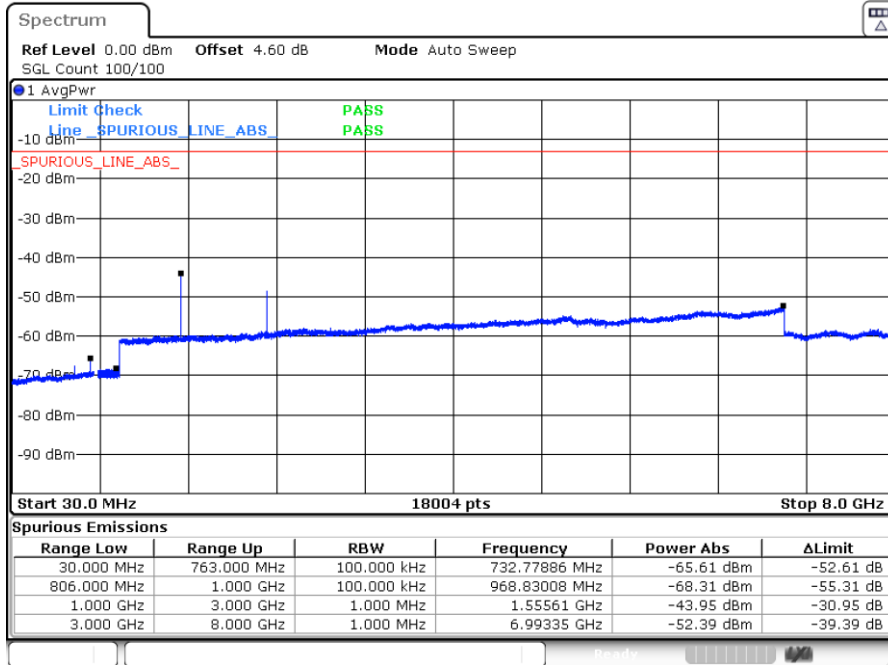


Date: 11.JUL.2024 19:12:35



LTE Band 13 / 10MHz

Middle Channel / QPSK



Date: 11.JUL.2024 19:28:52

Frequency Stability

Test Conditions		LTE Band 13 (QPSK) / Middle Channel	Limit
Temperature (°C)	Voltage (Volt)	BW 10MHz	Note 2.
		Deviation (ppm)	Result
50	Normal Voltage	0.0021	PASS
40	Normal Voltage	0.0034	
30	Normal Voltage	0.0022	
20(Ref.)	Normal Voltage	0.0000	
10	Normal Voltage	0.0053	
0	Normal Voltage	0.0008	
-10	Normal Voltage	0.0017	
-20	Normal Voltage	0.0019	
-30	Normal Voltage	0.0063	
20	Maximum Voltage	0.0067	
20	Normal Voltage	0.0000	
20	Battery End Point	0.0046	

Note:

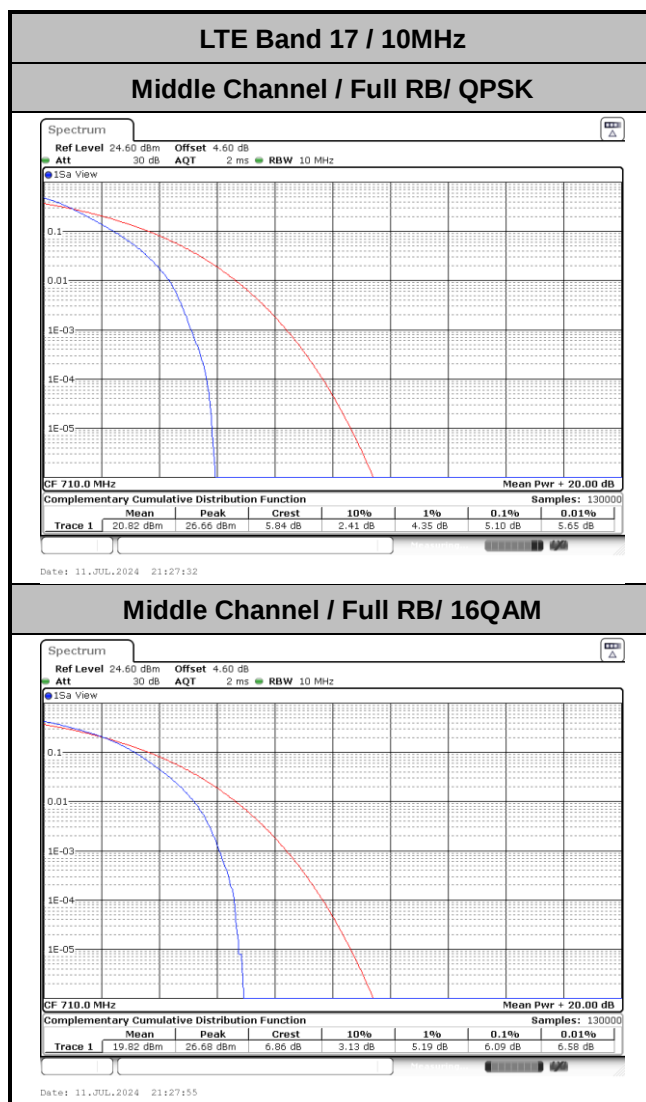
1. Normal Voltage =3.85 V. ; Minimum Voltage =3.5 V. ; Maximum Voltage =4.41 V.
2. Note: The frequency fundamental emissions stay within the authorized frequency block.

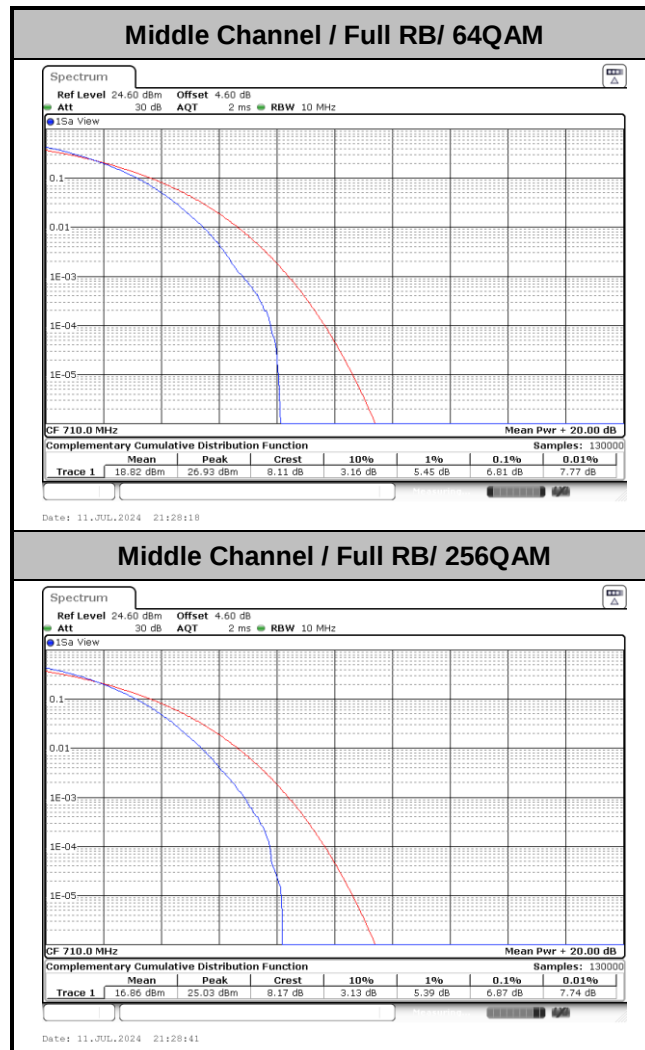


LTE Band 17

Peak-to-Average Ratio

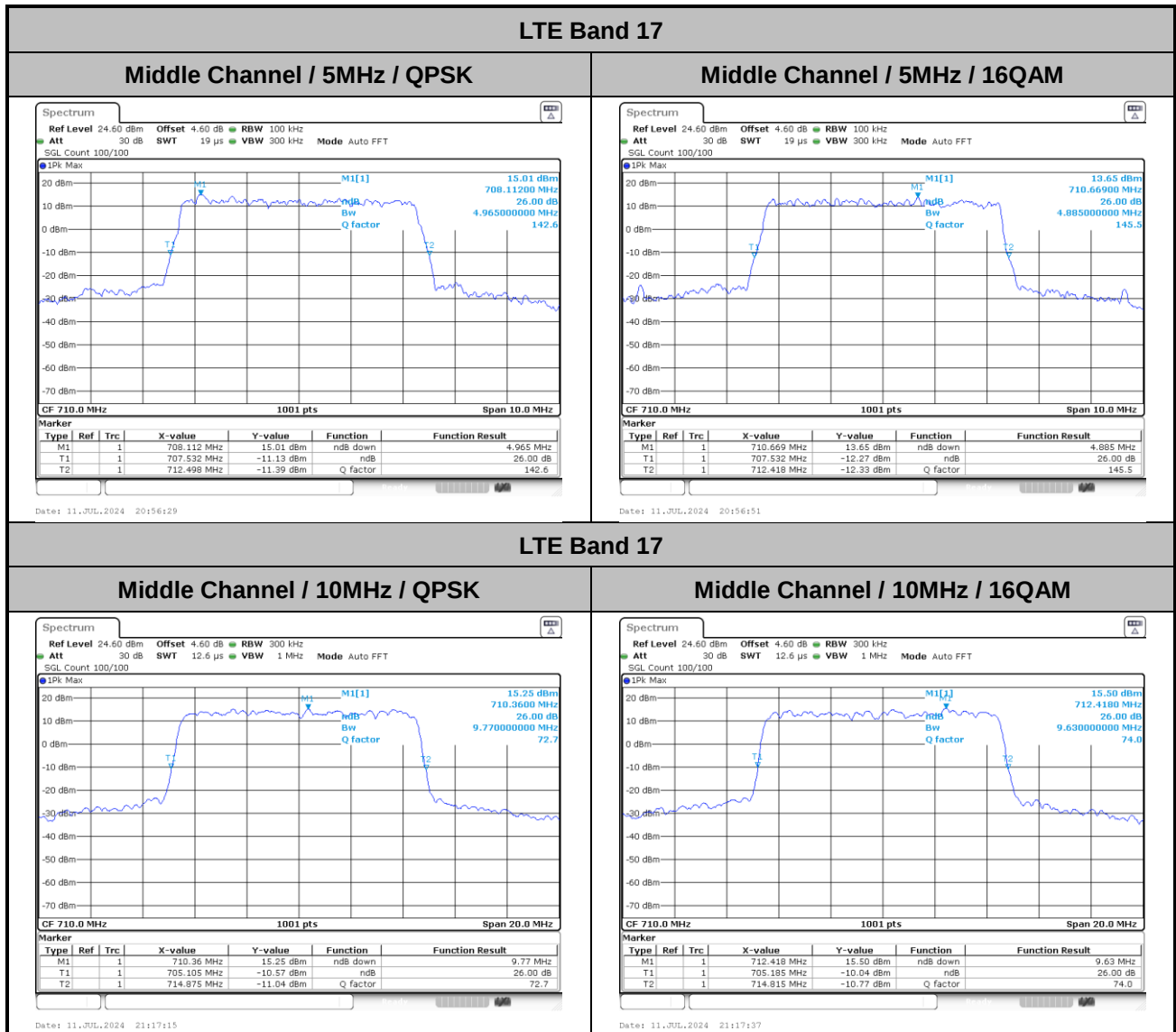
Mode	LTE Band 17 / 10MHz				
Mod.	QPSK	16QAM	64QAM	256QAM	Limit: 13dB
RB Size	Full RB	Full RB	Full RB	Full RB	Result
Middle CH	5.10	6.09	6.81	6.87	PASS





**26dB Bandwidth**

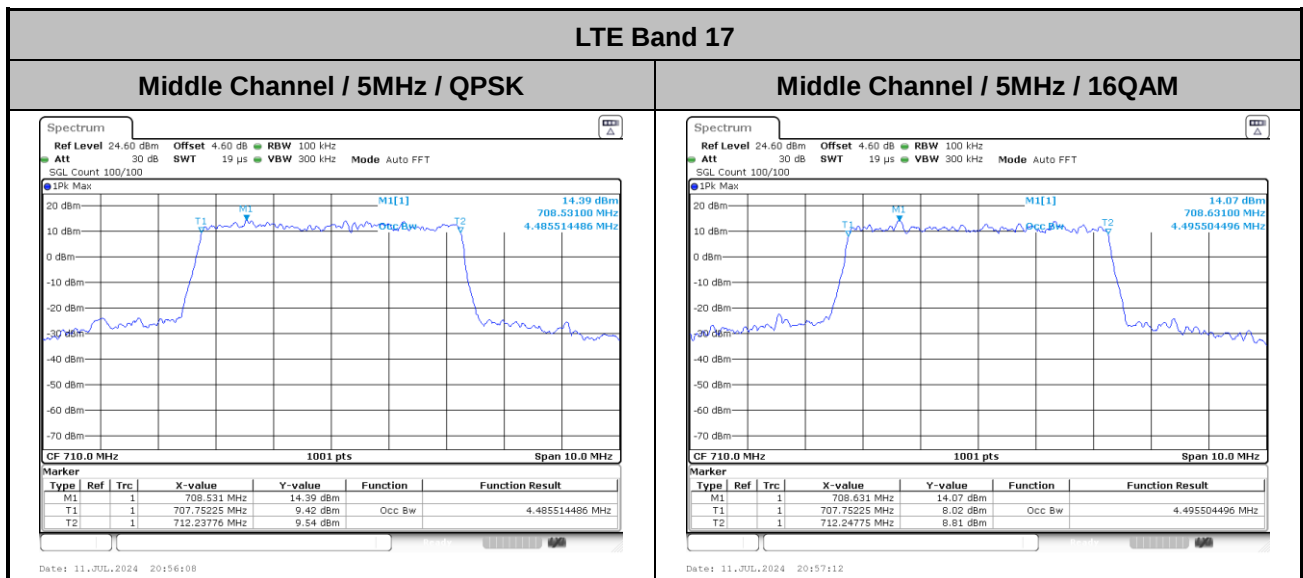
Mode	LTE Band 17 : 26dB BW(MHz)	
BW	5MHz	
Mod.	QPSK	16QAM
Middle CH	4.97	4.89
BW	10MHz	
Mod.	QPSK	16QAM
Middle CH	9.77	9.63





Occupied Bandwidth

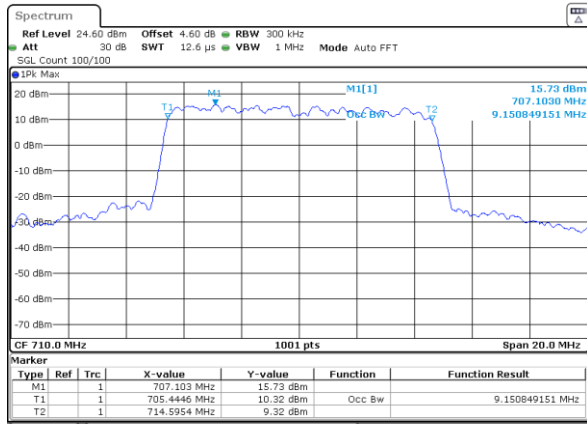
Mode	LTE Band 17 : 99%OBW(MHz)	
BW	5MHz	
Mod.	QPSK	16QAM
Middle CH	4.49	4.50
BW	10MHz	
Mod.	QPSK	16QAM
Middle CH	9.15	9.03



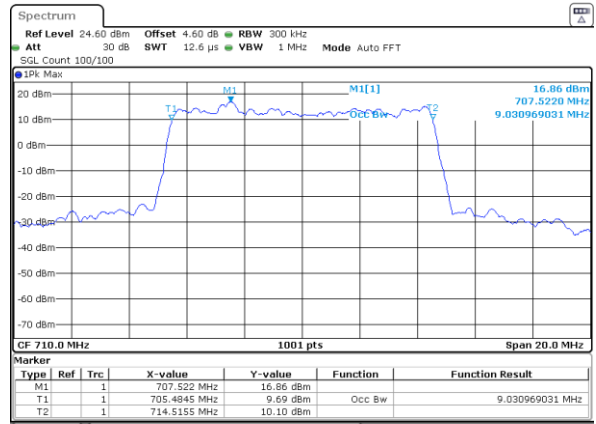


LTE Band 17

Middle Channel / 10MHz / QPSK



Middle Channel / 10MHz / 16QAM

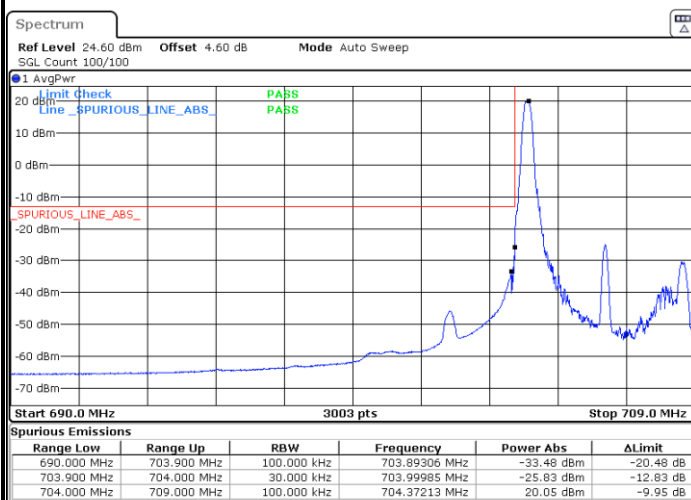




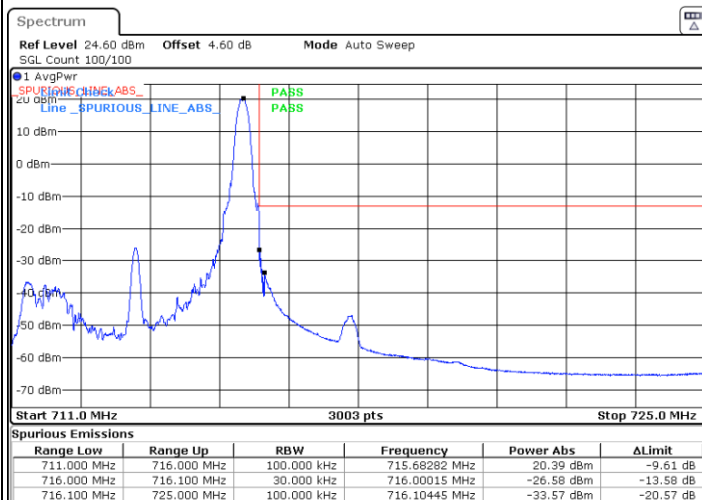
Conducted Band Edge

LTE Band 17 / 5MHz / QPSK

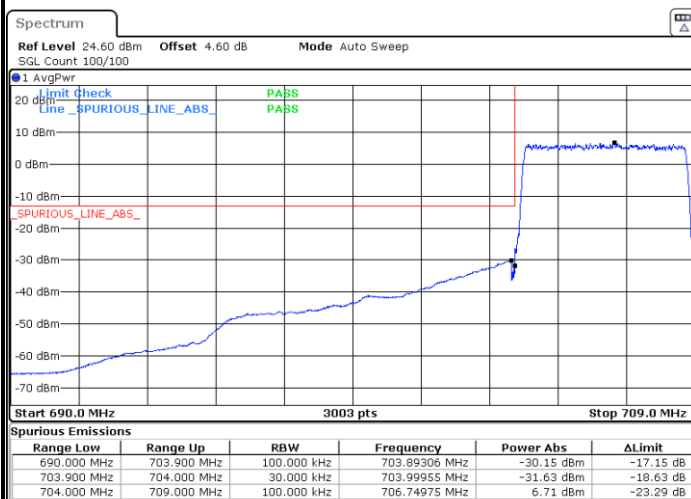
Lowest Band Edge / 1 RB



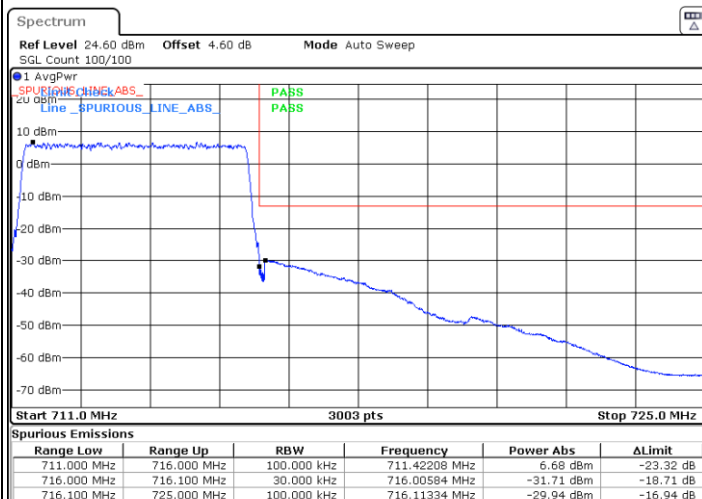
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



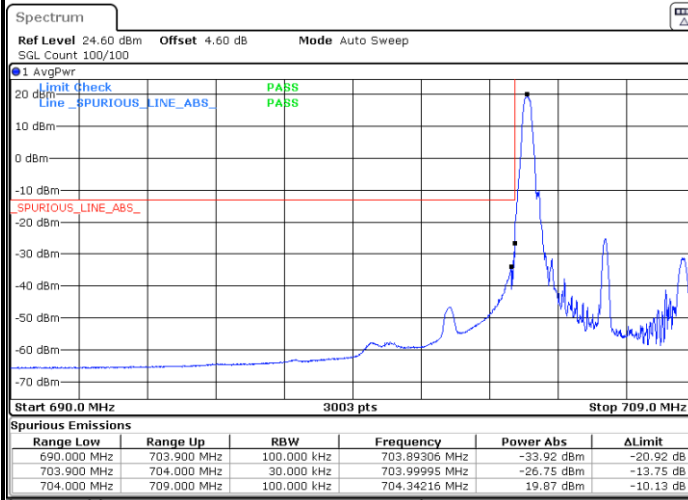
Highest Band Edge / Full RB



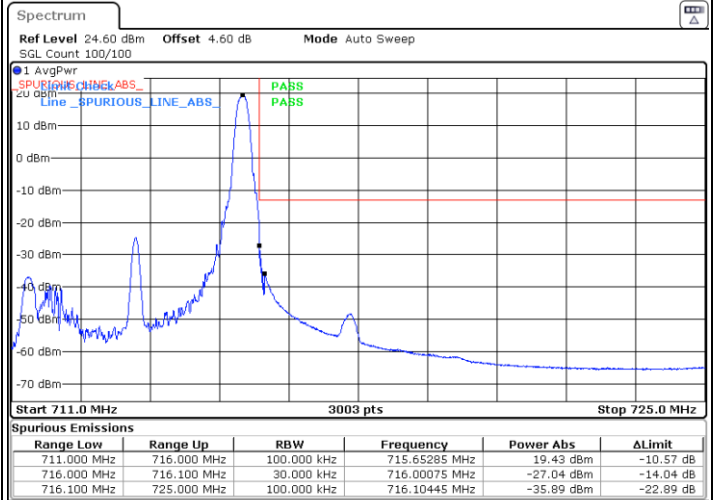


LTE Band 17 / 5MHz / 16QAM

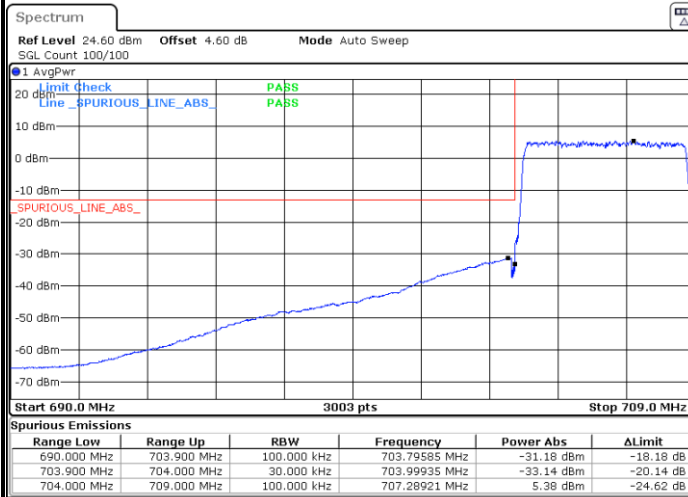
Lowest Band Edge / 1RB



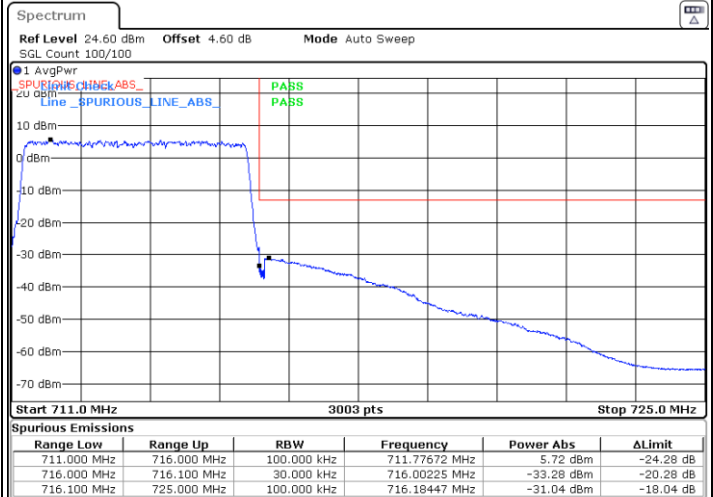
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



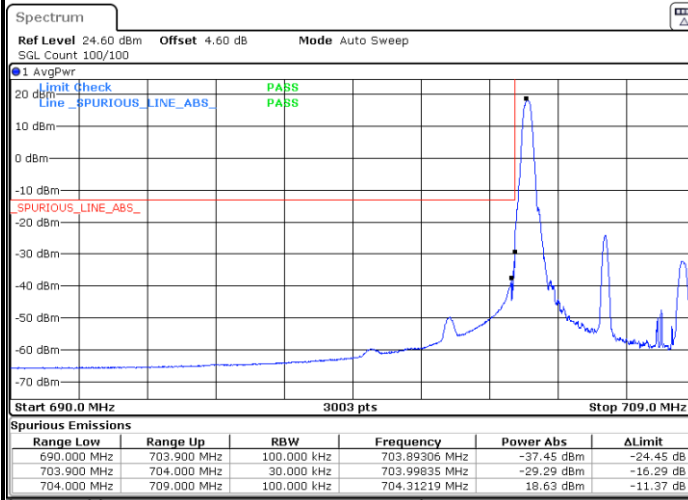
Highest Band Edge / Full RB



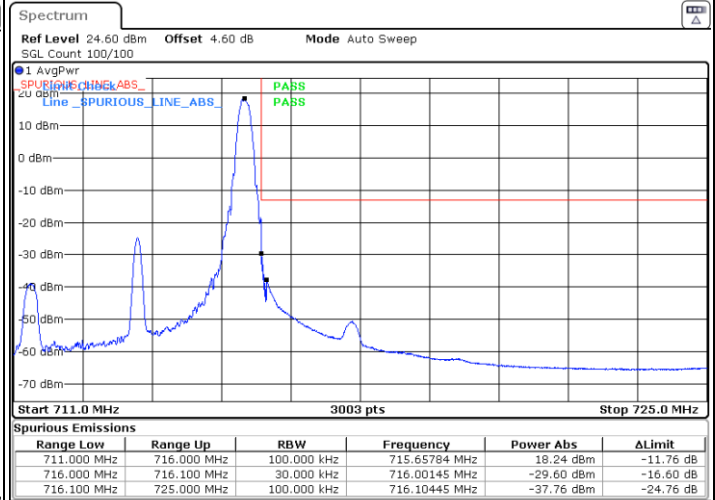


LTE Band 17 / 5MHz / 64QAM

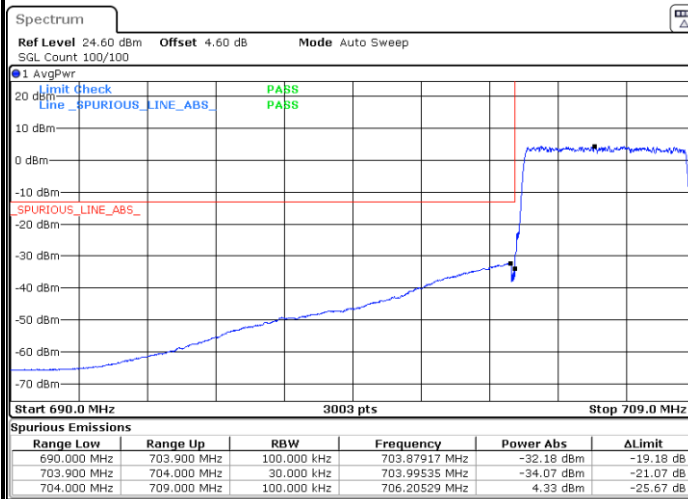
Lowest Band Edge / 1RB



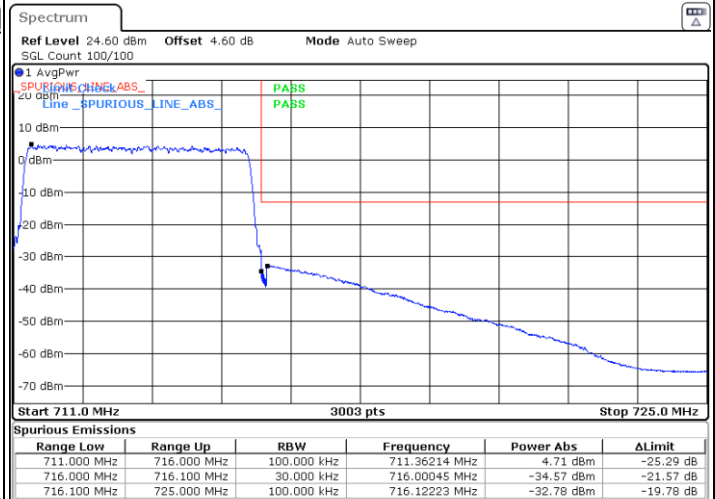
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



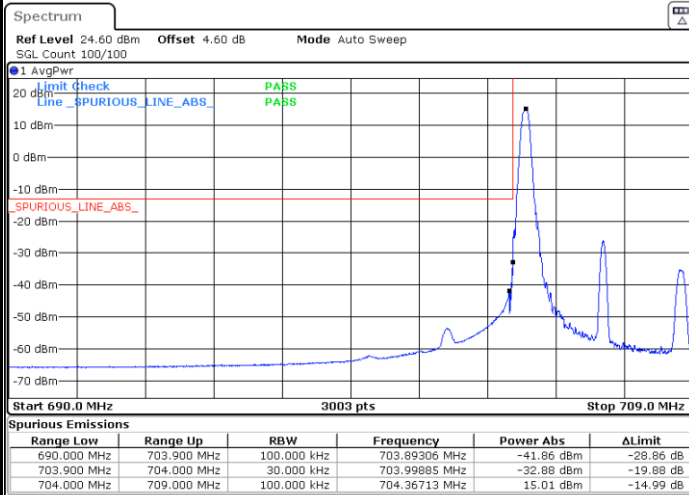
Highest Band Edge / Full RB



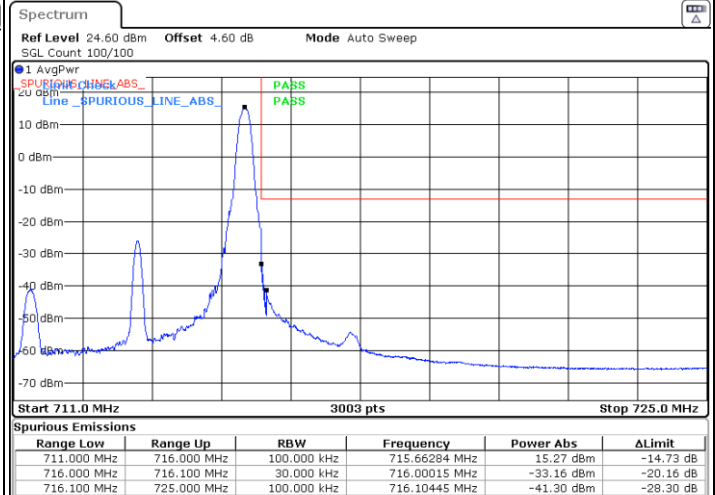


LTE Band 17 / 5MHz / 256QAM

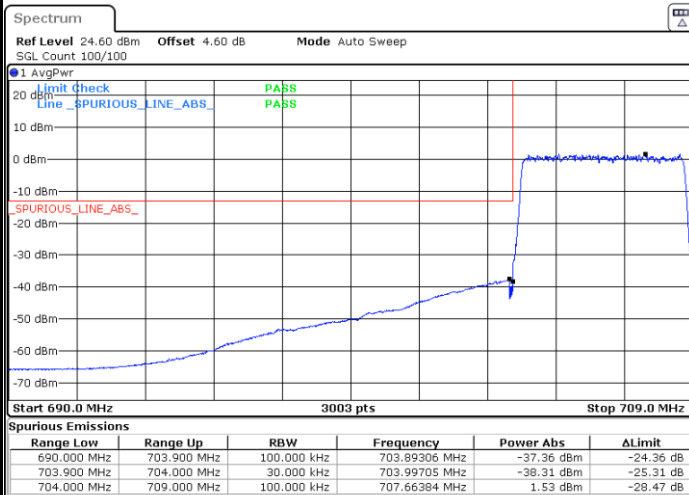
Lowest Band Edge / 1RB



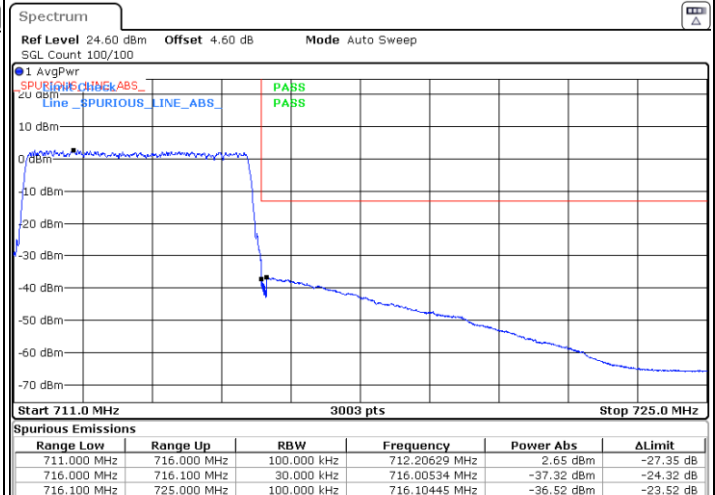
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



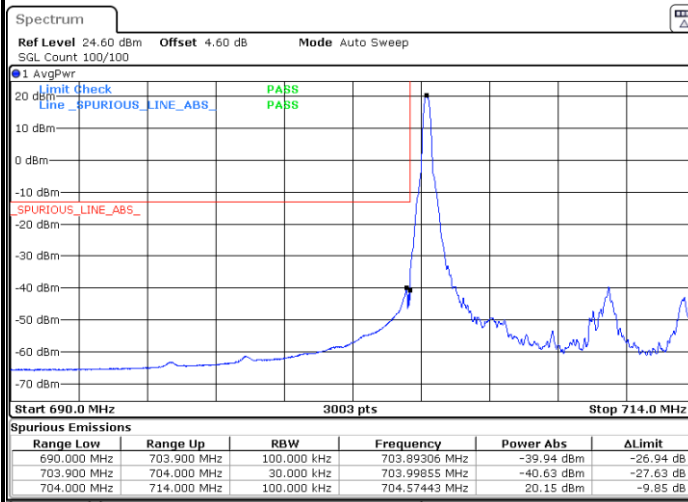
Highest Band Edge / Full RB



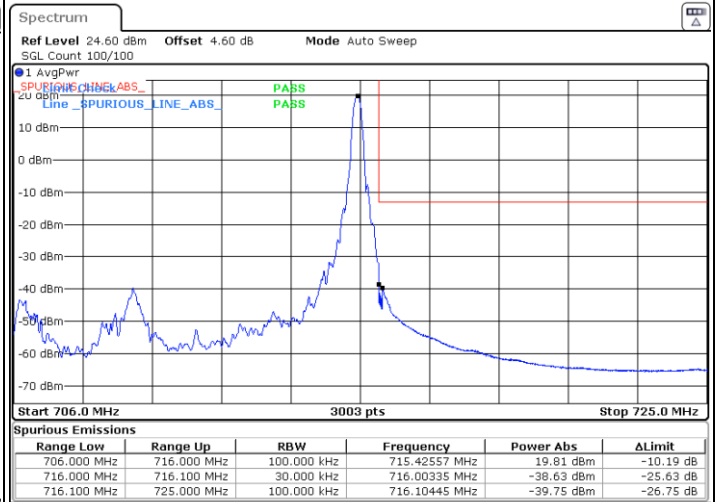


LTE Band 17 / 10MHz / QPSK

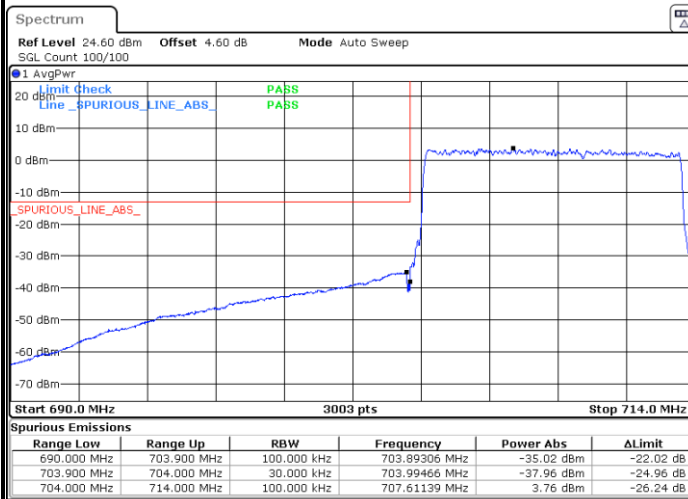
Lowest Band Edge / 1 RB



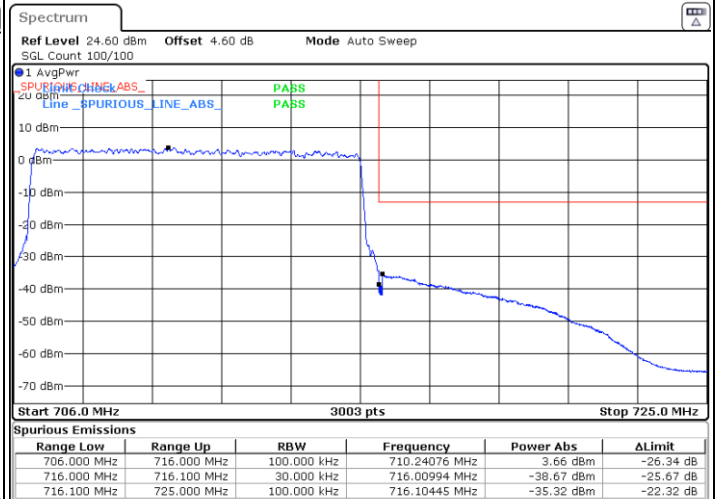
Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



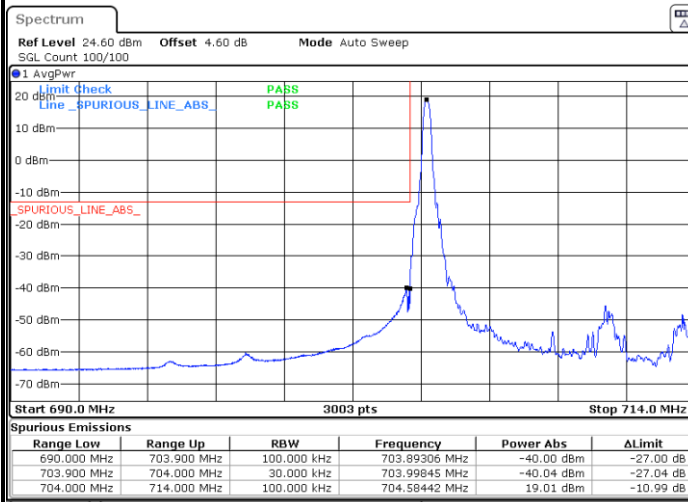
Highest Band Edge / Full RB



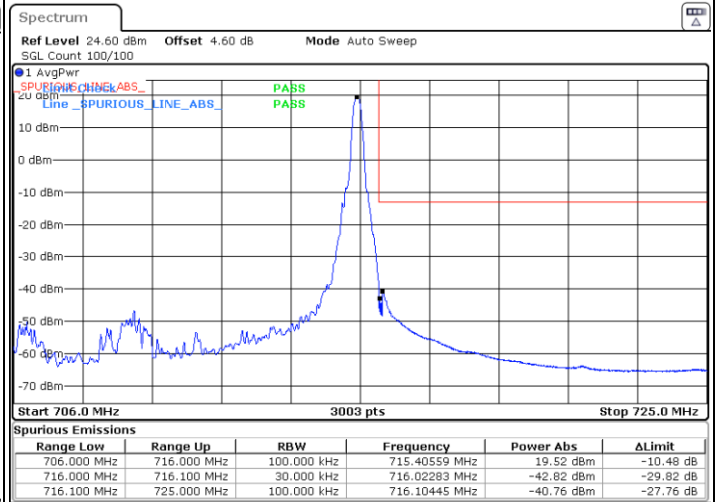


LTE Band 17 / 10MHz / 16QAM

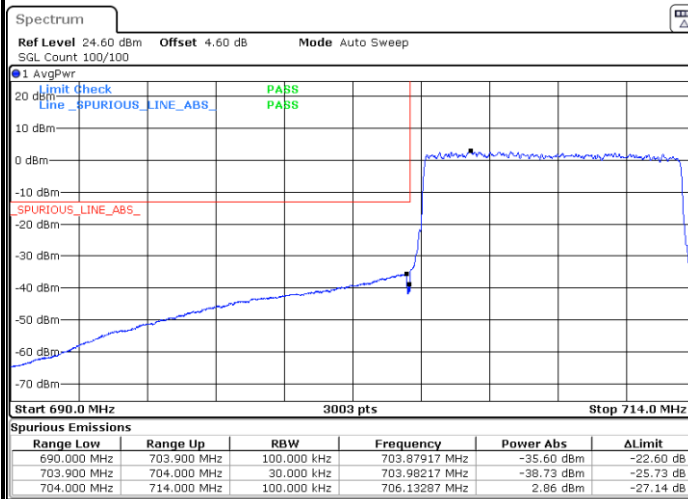
Lowest Band Edge / 1 RB



Highest Band Edge / 1 RB



Lowest Band Edge / Full RB



Highest Band Edge / Full RB

