

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E and PART 27 SUBPART F, L, H REQUIREMENT

OF

Moxa Inc. **Applicant:** 4TH FL 135 LANE 235 BAOQIAO RD XINDIAN DISTRICT NEW TAIPEI CITY 231 TAIWAN **Product Name:** Arm-based platform **Brand Name:** Moxa Model No.: UC-8112A-ME-T-LX Model Difference: N/A **Report Number:** T190304W05-RP FCC ID: SLE-UC8112A FCC Rule Part: 2, 22H & 24E & 27F, L, H Issue Date: Jun. 26, 2019 Mar. 04, 2019 ~ Mar. 27, 2019 Date of Test: Date of EUT Received: Mar. 04. 2019 Compliance Certification Services Inc.Wugu Lab. No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Issued by: Taiwan. (R.O.C.) service@ccsrf.com

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.26: 2015 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory).

Tested By:

Henry Chiang / Engineer

Approved By:

Kevin Tsai / Deputy Manager



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Revision History

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
T190304W05-RP	Rev.00	Initial creation of document	All	Apr. 29, 2019	Elle Chang
T190304W05-RP	Rev.01	Updated Power Supply	Page 4	Jun. 26, 2019	Elle Chang

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	SYSTEM TEST CONFIGURATION

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1. GENERAL PRODUCT INFORMATION

1.1. Product Description

General:

Product Name:	Arm-based platform
Brand Name:	Моха
Model No.:	UC-8112A-ME-T-LX
Model Difference:	N/A
Hardware Version:	N/A
Software Version:	N/A
Power Supply:	12-36Vdc

Antenna Designation

Vendor	Туре	Antenna Part No.	Modulation Frequency (MHz)		Peak Antenna Gain (dBi)				
			WCDMA / HSPA Band II	1852.4 ~ 1907.6	2				
							WCDMA / HSPA Band V	826.4 ~ 846.6	1
	MOXA Dipole ANT-LTEUS-ASM-01	LTE Band 2	1850 ~ 1910	2					
MOXA		ANT-LTEUS-ASM-01	LTE Band 4	1710 ~ 1755	2				
			LTE Band 5	824 ~ 849	1				
			LTE Band 13	777 ~ 787	1				
			LTE Band 17	704 ~ 716	1				

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1.2. WCDMA / LTE: Cellular Phone Standards Frequency Range

Operating Frequency (MHz)				
WCDMA / HSPA+ Band II	1852.4	-	1907.6	
WCDMA / HSPA+ Band V	826.4	-	846.6	

LTE Band	BW (MHz)	Operation F	requer	ncy (MHz)
	1.4	1850.7	-	1909.3
	3	1851.5	-	1908.5
2	5	1852.5	-	1907.5
Z	10	1855.0	-	1905.0
	15	1857.5	-	1902.5
	20	1860.0	-	1900.0
	1.4	1710.7	-	1754.3
	3	1711.5	-	1753.5
4	5	1712.5	-	1752.5
4	10	1715.0	-	1750.0
	15	1717.5	-	1747.5
	20	1720.0	-	1745.0
	1.4	824.7	-	848.3
5	3	825.5	-	847.5
5	5	826.5	-	846.5
	10	829.0	-	844.0
13	5	779.5	-	784.5
13	10		782	
17	5	706.5	-	713.5
17	10	709.0	-	711.0

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1.3. Type of Emission & Max ERP/EIRP Power Measurement Result:

	ERP / EIR	ERP / EIRP (dBm)		Type of Emission
WCDMA Band II	24.73	EIRP	0.297	4M14F9W
HSDPA Band II	24.71	EIRP	0.296	4M13F9W
HSUPA Band II	24.72	EIRP	0.296	4M12F9W
WCDMA Band V	23.03	ERP	0.201	4M13F9W
HSDPA Band V	22.94	ERP	0.197	4M12F9W
HSUPA Band V	22.95	ERP	0.197	4M13F9W

LTE	BW	Modulation	ERP/	EIRP	(W)	Type of
Band	DVV	wouldtion	(dB	m)	(~~)	Emission
2	1.4	QPSK	24.64	EIRP	0.291	1M12G7D
Z	1.4	16QAM	24.12	EIRP	0.258	1M12D7W
2	3	QPSK	24.60	EIRP	0.288	2M72G7D
Z	3	16QAM	23.50	EIRP	0.224	2M73D7W
2	5	QPSK	24.73	EIRP	0.297	4M53G7D
Z	5	16QAM	23.79	EIRP	0.239	4M52D7W
2	10	QPSK	24.53	EIRP	0.284	9M26G7D
Z	10	16QAM	23.82	EIRP	0.241	9M27D7W
2	15	QPSK	24.60	EIRP	0.288	13M5G7D
Z	15	16QAM	24.10	EIRP	0.257	13M5D7W
2	20	QPSK	24.62	EIRP	0.290	18M0G7D
Ζ	20	16QAM	23.71	EIRP	0.235	18M0D7W

ERP / EIRP

(dBm)

EIRP

25.02

24.40

24.97

24.04

24.82

24.29

25.06

24.59

25.15

24.39

25.18

24.47

LTE	BW	BW Modulation ERP / E		EIRP	(W)	Type of
Band	DVV	Nouulation	(dBm)		(~~)	Emission
5	1.4	QPSK	20.88	ERP	0.122	1M11G7D
5	1.4	16QAM	20.11	ERP	0.103	1M12D7W
5	3	QPSK	20.87	ERP	0.122	2M71G7D
5	3	16QAM	20.10	ERP	0.102	2M72D7W
5	5	QPSK	20.79	ERP	0.120	4M52G7D
5	5	16QAM	20.14	ERP	0.103	4M52D7W
5	10	QPSK	21.00	ERP	0.126	9M05G7D
5	10	16QAM	20.46	ERP	0.111	9M01D7W

LTE Band	BW	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission	
13	5	QPSK	20.93	ERP	0.124	4M53G7D	
13	5	5	16QAM	20.06	ERP	0.101	4M53D7W
13	10	QPSK	20.86	ERP	0.122	8M96G7D	
15	10	16QAM	19.63	ERP	0.092	8M94D7W	

	LTE Band	BW	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
	17	5	QPSK	21.25	ERP	0.133	4M54G7D
	17 5	5	16QAM	20.36	ERP	0.109	4M53D7W
	17	10	QPSK	20.86	ERP	0.122	8M98G7D
L	17	10	16QAM	20.10	ERP	0.102	8M95D7W

Type of

Emission

1M12G7D

1M12D7W

2M71G7D

2M72D7W

4M52G7D

4M52D7W

9M02G7D

8M98D7W

13M5G7D

13M5D7W

17M9G7D

18M0D7W

(W)

0.318

0.275

0.314

0.254

0.303

0.269

0.321

0.288

0.327

0.275

0.330

0.280

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LTE

Band

4

4

4

4

4

4

BW

1.4

3

5

10

15

20

Modulation

QPSK

16QAM

QPSK

16QAM

QPSK

16QAM

QPSK

16QAM

QPSK

16QAM QPSK

16QAM

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1.4. Test Methodology of Applied Standards

CC 47 CFR Part 2, 22, 24, 27.

ANSI C63.26-2015

KDB971168 D01 Power Meas license Digital System v03

KDB941225 D01 SAR test for 3G devices v03r01 (SAR Measurement Procedures for 3G Devices, WCDMA / HSPA) was used for EUT and Base station setting.

TS 151 010-1 is used to set, and measure the output power.

Note: All test items have been performed and record as per the above standards.

1.5. Test Facility

Compliance Certification Services Inc. Wugu Lab. No.11, Wugong 6th Rd.,

Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.) (TAF code 1309)

FCC Designation number: TW1309

1.6. Special Accessories

No special accessories were used during testing.

1.7. Equipment Modifications

There were no modifications incorporated into the EUT.

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2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The EUT (Transmitter) was operated in the continuous transmission mode employed with the simulator of the Base Station that fixates at test default channels to fix the Tx frequency which was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Measurement at Antenna Port

According to measurement procured ANSI C63.26-2015, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

According to measurement procured ANSI C63.26-2015, The EUT is a placed on as turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 8 and 13.

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 and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

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Note:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Following shows an offset computation in physical test.

	RF cable loss (dB)	Attenuation factor(dB)	offset(dB)
Low Band (Below 1GHz)	0.2	14.8	15
High Band (Above 1 GHz)	0.4	14.5	14.9

2.5. Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
WCDMA B2		0.25
WCDMA B5		0.25
LTE Band 2		0.26
LTE Band 4	24	0.25
LTE Band 5		0.21
LTE Band 13		0.21
LTE Band 17		0.22

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2.6. Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed Channel-Conducted)

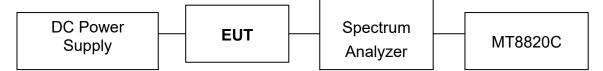
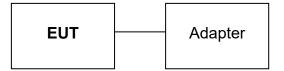


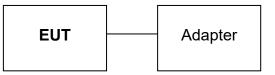
Fig. 2-2 Configuration of Tested System (Fixed Channel-Radiated)



Remote Side



Fig. 2-3 Configuration of Tested System (Fixed Channel-Radiated, Wireless Charging Mode)



Remote Side

CMW 500

Table 2-1 Equipment Used in Tested System

Ī	ltem	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
Ē	1.	Wideband Radio Communication Tester	R&S	CMW 500	116875	shielded	Un-shielded
	2.	DC Power Supply	Anritsu	E3640A	MY52410006	N/A	Unshielded

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3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§2.1046(a) §22.913(a)(5) §24.232(c) §27.50(c)(10) 27.50(d)(4) §27.50(h)(2)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% & 26dB Occuupied Bandwidth	Compliant
§2.1051 §22.917(a)	Out of Band Emissions at Antenna	
§24.238(a) §27.53(g) (h)	Terminals and Band Edge /	Compliant
§27.53(m)(4)	Emission mask requirements	
§2.1053 §22.917(a) §24.238(a) §27.53(g) (h) §27.53(m)(4)	Field Strength of Spurious Radiation	Compliant
§24.232(d)	Peak to Average Ratio	Compliant
§2.1055(a)(1) §22.355 §24.235 §27.54	Frequency Stability	Compliant

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4. DESCRIPTION OF TEST MODES

4.1. The Worst Test Modes and Channel Details

- 1. The EUT has been tested under operating condition.
- 2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X(E1)Y(E2)Z(H) axis and antenna ports. The worst case was found as listed below. Following channel(s) was (were) selected for the final test as listed below:

BAND	RADIATED EMISSION and Wireless charging Cover
WCDMA/HSPA Band II	H-plan
WCDMA/HSPA Band V	H-plan
LTE Band 2	H-plan
LTE Band 4	H-plan
LTE Band 5	H-plan
LTE Band 13	H-plan
LTE Band 17	H-plan

Note: Additional emissions testing were performed per KDB 648474 D03 and reported herein and identified as WPC. Per KDB 648474 D03, spurious emissions measurement data was also investigated with the wireless charging battery cover.

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WCDMA/HSPA MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band V
EIRP	9262 to 9538	9262, 9400, 9583	WCDMA/HSPA Band II
FREQUENCY	4132 to 4233	4183	WCDMA Band II
STABILITY	9262 to 9538	9400	WCDMA Band V
OCCUPIED	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band II
BANDWIDTH	9262 to 9538	9262, 9400, 9583	WCDMA/HSPA Band V
PEAK TO AVERAGE	4132 to 4233	4132, 4183, 4233	WCDMA/HSPA Band II
RATIO	9262 to 9538	9262, 9400, 9583	WCDMA/HSPA Band V
BAND EDGE	4132 to 4233	4132, 4233	WCDMA Band II
	9262 to 9538	9262, 9583	WCDMA Band V
CONDCUDETED	4132 to 4233	4132, 4183, 4233	WCDMA Band II
EMISSION	9262 to 9538	9262, 9400, 9583	WCDMA Band V
RADIATED EMISSION	4132 to 4233	4132, 4183, 4233	HSDPA Band II
	9262 to 9538	9262, 9400, 9583	WCDMA Band V

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LTE Band 2 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,5 RB Offest
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,14 RB Offest
ГІЛЛ	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,24 RB Offest
EIRP	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,49 RB Offest
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,74 RB Offest
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,99 RB Offest
FREQUENCY STA- BILITY	18650 to 19150	18900	10MHz	QPSK,	Full RB
	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK, 16QAM, 64QAM	Full RB
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK, 16QAM, 64QAM	Full RB
OCCUPIED BAND-	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM, 64QAM	Full RB
WIDTH	18650 to 19150	18650, 18900, 19150	10MHz	QPSK, 16QAM, 64QAM	Full RB
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK, 16QAM, 64QAM	Full RB
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK, 16QAM, 64QAM	Full RB
	18607 to 19193	18607, 18900, 19193	1.4MHz	64QAM	Full RB
	18615 to 19185	18615, 18900, 19185	3MHz	64QAM	Full RB
PEAK TO AVERAGE	18625 to 19175	18625, 18900, 19175	5MHz	64QAM	Full RB
RATIO	18650 to 19150	18650, 18900, 19150	10MHz	64QAM	Full RB
	18675 to 19125	18675, 18900, 19125	15MHz	64QAM	Full RB
	18700 to 19100	18700, 18900, 19100	20MHz	64QAM	Full RB
	18607 to 19193	18607, 19193	1.4MHz	QPSK,	1 RB/ 0,5 RB Offes Full RB
	18615 to 19185	18615, 19185	3MHz	QPSK,	1 RB/ 0,14 RB Offest Full RB
	18625 to 19175	18625, 19175	5MHz	QPSK,	1 RB/ 0,24 RB Offest Full RB
BAND EDGE	18650 to 19150	18650, 19150	10MHz	QPSK,	1 RB/ 0,49 RB Offest Full RB
	18675 to 19125	18675, 19125	15MHz	QPSK,	1 RB/ 0,74 RB Offest Full RB
	18700 to 19100	18700, 19100	20MHz	QPSK,	1 RB/ 0,99 RB Offest Full RB
	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,	1 RB, 0 RB Offest
	18615 to 19185	18615, 18900, 19185	3MHz	QPSK,	1 RB, 0 RB Offest
CONDCUDETED	18625 to 19175	18625, 18900, 19175	5MHz	QPSK,	1 RB, 0 RB Offest
EMISSION	18650 to 19150	18650, 18900, 19150	10MHz	QPSK,	1 RB, 0 RB Offest
	18675 to 19125	18675, 18900, 19125	15MHz	QPSK,	1 RB, 0 RB Offest
	18700 to 19100	18700, 18900, 19100	20MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMIS- SION	18625 to 19175	18625, 18900, 19175	3MHz	QPSK	1 RB, 14 RB Offest

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LTE Band 4 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE	
	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,5 RB Offest	
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,14 RB Offest	
	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,24 RB Offest	
EIRP	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,49 RB Offest	
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,74 RB Offest	
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,99 RB Offest	
FREQUENCY STA- BILITY	20000 to 20350	20175	10MHz	QPSK,	Full RB	
	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK, 16QAM, 64QAM	Full RB	
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK, 16QAM, 64QAM	Full RB	
OCCUPIED BAND-	19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM, 64QAM	Full RB	
WIDTH	20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM, 64QAM	Full RB	
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM, 64QAM	Full RB	
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM, 64QAM	Full RB	
	19957 to 19393	19957, 20175, 19393	1.4MHz	64QAM	Full RB	
	19965 to 22385	19965, 20175, 22385	3MHz	64QAM	Full RB	
PEAK TO AVERAGE	19975 to 20375	19975, 20175, 20375	5MHz	64QAM	Full RB	
RATIO	20000 to 20350	20000, 20175, 20350	10MHz	64QAM	Full RB	
i witho	20025 to 20325	20025, 20175, 20325	15MHz	64QAM	Full RB	
	20050 to 20300	20050, 20175, 20300	20MHz	64QAM	Full RB	
	19957 to 19393	19957, 19393	1.4MHz	QPSK,	1 RB/ 0,5 RB Offes Full RB	
	19965 to 22385	19965, 22385	3MHz	QPSK,	1 RB/ 0,14 RB Offest Full RB	
	19975 to 20375	19975, 20375	5MHz	QPSK,	1 RB/ 0,24 RB Offest Full RB	
BAND EDGE	20000 to 20350	20000, 20350	10MHz	QPSK,	1 RB/ 0,49 RB Offest Full RB	
	20025 to 20325	20025, 20325	15MHz	QPSK,	1 RB/ 0,74 RB Offest Full RB	
	20050 to 20300	20050, 20300	20MHz	QPSK,	1 RB/ 0,99 RB Offest Full RB	
	19957 to 19393	19957, 20175, 19393	1.4MHz	QPSK,	1 RB, 0 RB Offest	
	19965 to 22385	19965, 20175, 22385	3MHz	QPSK,	1 RB, 0 RB Offest	
CONDCUDETED	19975 to 20375	19975, 20175, 20375	5MHz	QPSK,	1 RB, 0 RB Offest	
EMISSION	20000 to 20350	20000, 20175, 20350	10MHz	QPSK,	1 RB, 0 RB Offest	
	20025 to 20325	20025, 20175, 20325	15MHz	QPSK,	1 RB, 0 RB Offest	
	20050 to 20300	20050, 20175, 20300	20MHz	QPSK,	1 RB, 0 RB Offest	
RADIATED EMIS- SION	20000 to 20350	20000, 20175, 20350	10MHz	QPSK,	1 RB, 49 RB Offest	

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LTE Band 5 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,5 RB Offest
ERP	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,14 RB Offest
LKF	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,24 RB Offest
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,49 RB Offest
FREQUENCY STABILITY	20450 to 20600	20525	10MHz	QPSK	Full RB
	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK, 16QAM, 64QAM	Full RB
OCCUPIED BAND-	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM, 64QAM	Full RB
WIDTH	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM, 64QAM	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM, 64QAM	Full RB
	20470 to 20643	20470, 20525, 20643	1.4MHz	64QAM	Full RB
PEAK TO AVERAGE	20415 to 20635	20415, 20525, 20635	3MHz	64QAM	Full RB
RATIO	20425 to 20625	20425, 20525, 20625	5MHz	64QAM	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	64QAM	Full RB
	20470 to 20643	20470, 20643	1.4MHz	QPSK	1 RB/ 0,5 RB Offes Full RB
	20415 to 20635	20415, 20635	3MHz	QPSK	1 RB/ 0,14 RB Offest Full RB
BAND EDGE	20425 to 20625	20425, 20625	5MHz	QPSK	1 RB/ 0,24 RB Offest Full RB
	20450 to 20600	20450, 20600	10MHz	QPSK	1 RB/ 0,49 RB Offest Full RB
	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK	1 RB, 0 RB Offest
CONDCUDETED EMISSION	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB, 0 RB Offest
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK	1 RB, 0 RB Offest
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB, 0 RB Offest

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LTE Band 13 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,24 RB Offest
EKP	23230	23230	10MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,49 RB Offest
FREQUENCY STA- BILITY	23230	23230	10MHz	QPSK,	Full RB
OCCUPIED BAND-	23205 to 23255	23205, 23230, 23255	5MHz	QPSK, 16QAM, 64QAM	Full RB
WIDTH	23230	23230	10MHz	QPSK, 16QAM, 64QAM	Full RB
PEAK TO AVERAGE	23205 to 23255	23205, 23230, 23255	5MHz	64QAM	Full RB
RATIO	23230	23230	10MHz	64QAM	Full RB
	23205 to 23255	23205, 23255	5MHz	QPSK,	1 RB/ 0,24 RB Offest Full RB
BAND EDGE	23230	23230	10MHz	QPSK,	1 RB/ 0,49 RB Offest Full RB
CONDCUDETED	23205 to 23255	23205, 23230, 23255	5MHz	QPSK,	1 RB, 0 RB Offest
EMISSION	23230	23230	10MHz	QPSK,	1 RB, 0 RB Offest
RADIATED EMIS- SION	23205 to 23255	23205, 23230, 23255	5MHz	16QAM	1 RB/ 0 RB Offest

LTE Band 17 MODE

TEST ITEM	AVAILABLE Channel	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,24 RB Offest
EKP	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,49 RB Offest
FREQUENCY STABILITY	23780 to 23800	23790	10MHz	QPSK	Full RB
OCCUPIED	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM, 64QAM	Full RB
BANDWIDTH	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM, 64QAM	Full RB
PEAK TO AV-	23755 to 23825	23755, 23790, 23825	5MHz	64QAM	Full RB
ERAGE RATIO	23780 to 23800	23780, 23790, 23800	10MHz	64QAM	Full RB
BAND EDGE	23755 to 23825	23755, 23825	5MHz	QPSK	1 RB/ 0,24 RB Offest Full RB
BAND EDGE	23780 to 23800	23780, 23800	10MHz	QPSK	1 RB/ 0,49 RB Offest Full RB
CONDCUDETED	23755 to 23825	23755, 23790, 23825	5MHz	QPSK	1 RB, 0 RB Offest
EMISSION	23780 to 23800	23780, 23790, 23800	10MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	23780 to 23800	23780, 23790, 23800	10MHz	QPSK	1 RB, 49 RB Offest

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5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
RF Output Power	+/- 1.15 dB
99% Occupied Bandwidth	+/- 0.89%
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 0.89 dB
Frequency Stability vs. Temperature	+/- 2.64 Hz
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12 dB
3M Semi Anechoic Chamber / 200MHz ~ 1GHz	+/- 4.68
3M Semi Anechoic Chamber / 1GHz ~ 8GHz	+/- 5.18
3M Semi Anechoic Chamber / 8GHz ~ 18GHz	+/- 5.47
3M Semi Anechoic Chamber / 18GHz ~ 26GHz	+/- 3.81
3M Semi Anechoic Chamber / 26GHz ~ 40GHz	+/- 3.87

Note:

- 1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- 2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.
- 3. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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6. RF CONDUCTED OUTPUT POWER MEASUREMENT

6.1. Standard Applicable

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals.

ERP/EIRP LIMIT

According to FCC §2.1046

FCC 22.913(a) (5) mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

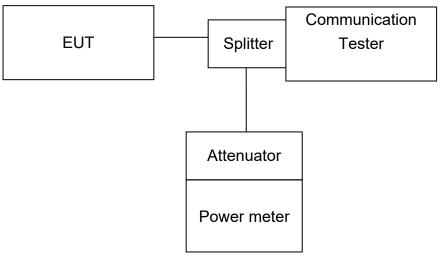
FCC 24.232(b) Mobile and portable stations are limited to 2 W EIRP.

FCC 27.50(c)(10) Portable stations (hand-held devices) are limited to 3 watts ERP.

FCC 27.50(d)(4) Mobile and portable (hand-held) stations are limited to 1 watts EIRP.

FCC 27, 50(h)(2) Mobile and other user stations. Mobile stations are limited to 2 W EIRP

6.2. Test Set-up



Note: Measurement setup for testing on Antenna connector

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6.3. Measurement Procedure

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. TS 151 010-1 is reference to conduct the test measurement of output power.

The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, (WCD-MA/HSPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing, and KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results

All LTE bands conducted average power is obtained from the simulator telecommunication test set.

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP.

TEST PROCEDURE:

ANSI C63.26:2015 KDB 971168 Section 5.6

ERP/EIRP = PMeas + GT-LC

where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);

PMeas = measured transmitter output power or PSD, in dBm or dBW;

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

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.2 For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

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6.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUM- BER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Radio Communica- tion Analyer	Anritsu	MT8820C	6201465316	03/31/2018	03/30/2019
Spectrum Analyzer	Agilent	N9010A	MY51440113	06/20/2018	06/19/2019
DC Block	PASTERNACK	PE8210	RF29	02/26/2019	02/25/2020
Splitter	Woken	DOM35LW1A2	RF36	02/26/2019	02/25/2020
Attenuator	Marvelous	WATT-218FS-10	RF245	02/26/2019	02/25/2020
Coaxial Cables	Woken	00100A1F1A185C	RF12	02/26/2019	02/25/2020
Coaxial Cables	Woken	00100A1F1A185C	RF202	02/26/2019	02/25/2020
DC Power Supply	Agilent	E3640A	MY40000811	12/11/2018	12/10/2019

6.5. Measurement Result

RF Conducted Output PowerWCDMA MODE:

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.4.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7). RMC 12.2kps is used for this testing.

Results:

WCDMA/HSUPA/HSDPA Band II Result:

EUT Mode	Freq. (MHz)	СН	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
	1852.4	9262	22.12	2.00	21.97	24.12	33.00	-8.88
WCDMA	1880.0	9400	22.73	2.00	22.58	24.73	33.00	-8.27
	1907.6	9538	22.71	2.00	22.56	24.71	33.00	-8.29
	1852.4	9262	22.06	2.00	21.91	24.06	33.00	-8.94
HSDPA	1880.0	9400	22.71	2.00	22.56	24.71	33.00	-8.29
	1907.6	9538	22.64	2.00	22.49	24.64	33.00	-8.36
	1852.4	9262	22.11	2.00	21.96	24.11	33.00	-8.89
HSUPA	1880.0	9400	22.72	2.00	22.57	24.72	33.00	-8.28
	1907.6	9538	22.65	2.00	22.50	24.65	33.00	-8.35

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WCDMA/HSUPA/HSDPA Band V Result:

EUT Mode	Freq. (MHz)	СН	Conducted Avg. Power (dBm)	Antenna Gain (dBi)	ERP (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
	826.4	4132	21.88	1.00	20.73	22.88	38.50	-15.62
WCDMA	836.6	4183	21.91	1.00	20.76	22.91	38.50	-15.59
	846.6	4233	22.03	1.00	20.88	23.03	38.50	-15.47
	826.4	4132	21.73	1.00	20.58	22.73	38.50	-15.77
HSDPA	836.6	4183	21.84	1.00	20.69	22.84	38.50	-15.66
	846.6	4233	21.94	1.00	20.79	22.94	38.50	-15.56
	826.4	4132	21.83	1.00	20.68	22.83	38.50	-15.67
HSUPA	836.6	4183	21.86	1.00	20.71	22.86	38.50	-15.64
	846.6	4233	21.95	1.00	20.80	22.95	38.50	-15.55

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LTE Result: FDD Band 2

Antenna gain (dBi)

2

		LI	FE Band 2_U	plink fr	equency band	: 1850 to 1910) MHz		
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
				1	0	22.03	24.03	33	-8.97
	18607	1850.7	QPSK	1	5	21.99	23.99	33	-9.01
	10007	1030.7	QLOK	3	2	21.99	23.99	33	-9.01
				6	0	20.90	22.90	33	-10.1
				1	0	22.62	24.62	33	-8.38
	18900	1880	QPSK	1	5	22.64	24.64	33	-8.36
	10700	1000	QLOK	3	2	22.64	24.64	33	-8.36
				6	0	21.81	23.81	33	-9.19
			QPSK	1	0	22.50	24.50	33	-8.5
	19193	1909.3		1	5	22.43	24.43	33	-8.57
	17175	1707.3		3	2	22.44	24.44	33	-8.56
1.4				6	0	21.56	23.56	33	-9.44
1.4				1	0	21.34	23.34	33	-9.66
	18607	1850.7	16QAM	1	5	21.20	23.20	33	-9.8
	10007	1050.7	TOQAM	3	2	20.98	22.98	33	-10.02
				6	0	20.15	22.15	33	-10.85
				1	0	22.12	24.12	33	-8.88
	18900	1880	16QAM	1	5	21.92	23.92	33	-9.08
	10700	1000		3	2	21.73	23.73	33	-9.27
				6	0	20.84	22.84	33	-10.16
				1	0	21.77	23.77	33	-9.23
	19193	1909.3	160AM	1	5	21.64	23.64	33	-9.36
	17175	19193 1909.3	16QAM	3	2	21.57	23.57	33	-9.43
				6	0	20.56	22.56	33	-10.44

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Antenna gain (dBi)

	gain (abiy	Ľ	FE Band 2_U	plink fr	equency band	1: 1850 to 1910) MHz		
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
				1	0	21.97	23.97	33	-9.03
	18615	1851.5	QPSK	1	14	21.80	23.80	33	-9.2
	10013	1031.3	QI SIX	8	4	21.04	23.04	33	-9.96
				15	0	21.00	23.00	33	-10
				1	0	22.60	24.60	33	-8.4
	18900	1880	QPSK	1	14	22.40	24.40	33	-8.6
	10900	1000	UF JK	8	4	21.77	23.77	33	-9.23
				15	0	21.32	23.32	33	-9.68
			QPSK	1	0	22.53	24.53	33	-8.47
	19185	1908.5		1	14	22.22	24.22	33	-8.78
	19100			8	4	21.61	23.61	33	-9.39
3				15	0	21.67	23.67	33	-9.33
J				1	0	20.93	22.93	33	-10.07
	18615	1851.5	16QAM	1	14	21.02	23.02	33	-9.98
	10015	1001.0	TOQAIVI	8	4	20.19	22.19	33	-10.81
				15	0	20.18	22.18	33	-10.82
				1	0	21.50	23.50	33	-9.5
	18900	1880	16QAM	1	14	21.24	23.24	33	-9.76
	10900	1000	TOQAIVI	8	4	20.87	22.87	33	-10.13
				15	0	20.75	22.75	33	-10.25
				1	0	20.85	22.85	33	-10.15
	10105	1008 5	16OAM	1	14	21.11	23.11	33	-9.89
	19185	1908.5	16QAM	8	4	20.51	22.51	33	-10.49
				15	0	20.51	22.51	33	-10.49

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Antenna gain (dBi)

	guin (ubly	LI	FE Band 2_U	plink fr	equency band	: 1850 to 1910) MHz		
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
				1	0	22.11	24.11	33	-8.89
	18625	1852.5	QPSK	1	24	21.86	23.86	33	-9.14
	10025	1052.5	QUSK	12	6	21.05	23.05	33	-9.95
				25	0	21.05	23.05	33	-9.95
			QPSK	1	0	22.73	24.73	33	-8.27
	18900	1880		1	24	22.34	24.34	33	-8.66
	10900	1000	UP SK	12	6	21.76	23.76	33	-9.24
				25	0	21.72	23.72	33	-9.28
		1907.5	QPSK	1	0	22.31	24.31	33	-8.69
	19175			1	24	22.32	24.32	33	-8.68
	19175			12	6	21.68	23.68	33	-9.32
5				25	0	21.58	23.58	33	-9.42
5				1	0	21.49	23.49	33	-9.51
	18625	1852.5	16QAM	1	24	21.16	23.16	33	-9.84
	10025	1032.3	TUQAIN	12	6	20.14	22.14	33	-10.86
				25	0	20.09	22.09	33	-10.91
				1	0	21.79	23.79	33	-9.21
	18900	1880	16QAM	1	24	21.61	23.61	33	-9.39
	10900	1000	TOQAIN	12	6	20.79	22.79	33	-10.21
				25	0	20.75	22.75	33	-10.25
				1	0	20.73	22.73	33	-10.27
	10175	1007 F	16 0 M	1	24	20.71	22.71	33	-10.29
	17175	19175 1907.5	16QAM —	12	6	20.68	22.68	33	-10.32
				25	0	20.54	22.54	33	-10.46

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Antenna gain (dBi)

Antonna	<u>, , , , , , , , , , , , , , , , , , , </u>	L	TE Band 2_U	plink fr	equency band	: 1850 to 1910	MHz		
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
				1	0	22.05	24.05	33	-8.95
	18650	1855	QPSK	1	49	21.81	23.81	33	-9.19
	10030	1033	QF SK	25	12	20.91	22.91	33	-10.09
				50	0	20.93	22.93	33	-10.07
			QPSK	1	0	22.53	24.53	33	-8.47
	18900	1880		1	49	22.26	24.26	33	-8.74
		1000	QF SK	25	12	21.70	23.70	33	-9.3
				50	0	21.58	23.58	33	-9.42
			QPSK	1	0	21.87	23.87	33	-9.13
	19150	1905		1	49	22.35	24.35	33	-8.65
	17130			25	12	21.25	23.25	33	-9.75
10				50	0	21.25	23.25	33	-9.75
10				1	0	21.30	23.30	33	-9.7
	18650	1855	16QAM	1	49	21.05	23.05	33	-9.95
	10030	1033	TUQAIN	25	12	19.99	21.99	33	-11.01
				50	0	20.08	22.08	33	-10.92
				1	0	21.79	23.79	33	-9.21
	18900	1880	16QAM	1	49	21.59	23.59	33	-9.41
	10900	1000	TOQAIN	25	12	20.68	22.68	33	-10.32
				50	0	20.55	22.55	33	-10.45
				1	0	21.34	23.34	33	-9.66
	19150	1005	16OAM	1	49	21.82	23.82	33	-9.18
	17100	1905	16QAM	25	12	20.20	22.20	33	-10.8
				50	0	20.31	22.31	33	-10.69

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Antenna gain (dBi)

	č	LI	FE Band 2_U	plink fr	equency band	: 1850 to 1910) MHz		
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
				1	0	21.90	23.90	33	-9.1
	18675	1857.5	QPSK	1	74	21.77	23.77	33	-9.23
	10075	1037.3	QUSK	36	18	20.80	22.80	33	-10.2
				75	0	20.83	22.83	33	-10.17
			QPSK	1	0	22.60	24.60	33	-8.4
	18900	1880		1	74	22.41	24.41	33	-8.59
	10700	1000	QI SIX	36	18	21.58	23.58	33	-9.42
				75	0	21.62	23.62	33	-9.38
			5 QPSK	1	0	21.61	23.61	33	-9.39
	19125	1902.5		1	74	22.28	24.28	33	-8.72
	17125			36	18	21.29	23.29	33	-9.71
15				75	0	21.29	23.29	33	-9.71
15				1	0	20.91	22.91	33	-10.09
	18675	1857.5	16QAM	1	74	20.98	22.98	33	-10.02
	10075	1037.5	TOCAM	36	18	19.60	21.60	33	-11.4
				75	0	19.89	21.89	33	-11.11
				1	0	21.27	23.27	33	-9.73
	18900	1880	16QAM	1	74	21.29	23.29	33	-9.71
	10900	1000		36	18	20.49	22.49	33	-10.51
				75	0	20.54	22.54	33	-10.46
				1	0	21.12	23.12	33	-9.88
	19125	1902.5	160AM	1	74	22.10	24.10	33	-8.9
	17125	9125 1902.5	16QAM	36	18	20.29	22.29	33	-10.71
				75	0	20.28	22.28	33	-10.72

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Antenna	gain (abi)	L	E Band 2_U	plink fr	equency band	: 1850 to 1910) MHz			
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)	
				1	0	22.08	24.08	33	-8.92	
	18700	1860	QPSK	1	99	22.22	24.22	33	-8.78	
	10700	1000	QLOK	50	25	20.76	22.76	33	-10.24	
				100	0	20.64	22.64	33	-10.36	
				1	0	22.62	24.62	33	-8.38	
	18900	1880	QPSK	1	99	22.46	24.46	33	-8.54	
	10900	1000	UFJK	50	25	21.51	23.51	33	-9.49	
				100	0	21.64	23.64	33	-9.36	
			QPSK	1	0	21.68	23.68	33	-9.32	
	19100	1900		1	99	22.51	24.51	33	-8.49	
	19100			50	25	20.90	22.90	33	-10.1	
20				100	0	21.08	23.08	33	-9.92	
20				1	0	20.89	22.89	33	-10.11	
	18700	1860	16QAM	1	99	21.03	23.03	33	-9.97	
	10700	1000	TOQAM	50	25	19.81	21.81	33	-11.19	
				100	0	20.00	22.00	33	-11	
				1	0	21.60	23.60	33	-9.4	
	18900	1880	16QAM	1	99	21.37	23.37	33	-9.63	
	10900	1000	TOQAIN	50	25	20.45	22.45	33	-10.55	
				100	0	20.49	22.49	33	-10.51	
				1	0	20.59	22.59	33	-10.41	
	19100	1900	16OAM	1	99	21.71	23.71	33	-9.29	
	17100	1700	16QAM	50	25	20.05	22.05	33	-10.95	
					100	0	20.18	22.18	33	-10.82

Antenna gain (dBi)

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FDD Band 4

Antenna gain (dBi)

	LTE Band 4_Uplink frequency band : 1710 to 1755 MHz												
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)				
				1	0	22.62	24.62	30	-5.38				
	19957	1710.7	QPSK	1	5	22.70	24.70	30	-5.3				
	17757	1710.7	UF SK	3	2	22.65	24.65	30	-5.35				
				6	0	21.56	23.56	30	-6.44				
				1	0	23.00	25.00	30	-5				
	20175	1732.5	QPSK	1	5	22.91	24.91	30	-5.09				
	20175		QI SIX	3	2	23.02	25.02	30	-4.98				
			6	0	22.09	24.09	30	-5.91					
	20393 1754.3		1	0	22.56	24.56	30	-5.44					
		1754.3	754.3 QPSK	1	5	22.64	24.64	30	-5.36				
	20070			3	2	22.57	24.57	30	-5.43				
1.4				6	0	21.61	23.61	30	-6.39				
				1	0	21.91	23.91	30	-6.09				
	19957	1710.7	16QAM	1	5	21.88	23.88	30	-6.12				
	17707	17 10.7	1002/101	3	2	21.37	23.37	30	-6.63				
				6	0	20.63	22.63	30	-7.37				
				1	0	22.40	24.40	30	-5.6				
	20175	1732.5	16QAM	1	5	22.36	24.36	30	-5.64				
	20170	1702.0	1002/101	3	2	22.01	24.01	30	-5.99				
	20393 1754.3			6	0	21.25	23.25	30	-6.75				
				1	0	21.96	23.96	30	-6.04				
		1754.3	16QAM	1	5	22.13	24.13	30	-5.87				
		1704.3		3	2	21.58	23.58	30	-6.42				
			6	0	20.69	22.69	30	-7.31					

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Antenna gain (dBi)

	guiri (ubi)	Ľ	FE Band 4_U	plink f	requenc	y band : 1710:	to 1755 MHz		
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
				1	0	22.50	24.50	30	-5.5
	19965	1711.5	QPSK	1	14	22.67	24.67	30	-5.33
	17703	1711.5	QI SK	8	4	21.66	23.66	30	-6.34
				15	0	21.65	23.65	30	-6.35
				1	0	22.97	24.97	30	-5.03
	20175	1732.5	QPSK	1	14	22.85	24.85	30	-5.15
	20175	1752.5	QUSIC	8	4	22.11	24.11	30	-5.89
				15	0	22.09	24.09	30	-5.91
	20385 1753.5		1	0	22.47	24.47	30	-5.53	
		1753.5	53.5 QPSK	1	14	22.62	24.62	30	-5.38
	20303	1755.5		8	4	21.63	23.63	30	-6.37
3				15	0	21.65	23.65	30	-6.35
5				1	0	21.27	23.27	30	-6.73
	19965	1711.5	16QAM	1	14	21.66	23.66	30	-6.34
	17703	1711.5		8	4	20.63	22.63	30	-7.37
				15	0	20.57	22.57	30	-7.43
				1	0	22.00	24.00	30	-6
	20175	1732.5	16QAM	1	14	21.89	23.89	30	-6.11
	20175	1752.5		8	4	21.07	23.07	30	-6.93
	20385 1753.5			15	0	21.09	23.09	30	-6.91
			1	0	21.92	23.92	30	-6.08	
		1753 5	160AM	1	14	22.04	24.04	30	-5.96
		1700.0	16QAM	8	4	20.71	22.71	30	-7.29
				15	0	20.56	22.56	30	-7.44

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Antenna	Antenna gain (dBi) 2											
		LI	FE Band 4_U	plink f	requenc	y band : 1710	to 1755 MHz					
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)			
				1	0	22.61	24.61	30	-5.39			
	19975	1712.5	QPSK	1	24	22.56	24.56	30	-5.44			
	19970	1712.0	UFJK	12	6	21.63	23.63	30	-6.37			
				25	0	21.64	23.64	30	-6.36			
				1	0	22.82	24.82	30	-5.18			
	20175	1732.5	QPSK	1	24	22.78	24.78	30	-5.22			
	20175	1752.5	UI JK	12	6	22.10	24.10	30	-5.9			
	20375 1			25	0	22.11	24.11	30	-5.89			
		1752.5		1	0	22.53	24.53	30	-5.47			
			QPSK	1	24	22.70	24.70	30	-5.3			
	20373			12	6	21.59	23.59	30	-6.41			
5				25	0	21.60	23.60	30	-6.4			
5				1	0	21.84	23.84	30	-6.16			
	19975	1712.5	16QAM	1	24	21.83	23.83	30	-6.17			
	17775	1712.5	100/101	12	6	20.55	22.55	30	-7.45			
				25	0	20.65	22.65	30	-7.35			
				1	0	22.29	24.29	30	-5.71			
	20175	1732.5	16QAM	1	24	22.25	24.25	30	-5.75			
	20170	1702.0	10 2/ 10	12	6	21.13	23.13	30	-6.87			
	20375 1			25	0	21.14	23.14	30	-6.86			
				1	0	21.73	23.73	30	-6.27			
		1752.5	16QAM	1	24	21.66	23.66	30	-6.34			
		17.52.0		12	6	20.46	22.46	30	-7.54			
				25	0	20.60	22.60	30	-7.4			

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Antenna	gain (dBi)	2							
		Ľ	TE Band 4_U	plink f	requenc	:y band : 1710			
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
				1	0	22.62	24.62	30	-5.38
	20000	1715	QPSK	1	49	22.47	24.47	30	-5.53
	20000	1715	UF SK	25	12	21.56	23.56	30	-6.44
				50	0	21.56	23.56	30	-6.44
				1	0	23.06	25.06	30	-4.94
	20175	1732.5	QPSK	1	49	23.04	25.04	30	-4.96
	20175	1752.5		25	12	22.16	24.16	30	-5.84
				50	0	22.15	24.15	30	-5.85
	20375	1750	QPSK	1	0	22.85	24.85	30	-5.15
				1	49	22.64	24.64	30	-5.36
				25	12	21.52	23.52	30	-6.48
10				50	0	21.63	23.63	30	-6.37
10	20000	1715	16QAM	1	0	21.81	23.81	30	-6.19
				1	49	21.81	23.81	30	-6.19
				25	12	20.50	22.50	30	-7.5
				50	0	20.53	22.53	30	-7.47
		1732.5	16QAM	1	0	22.07	24.07	30	-5.93
	20175			1	49	22.59	24.59	30	-5.41
	20175			25	12	21.04	23.04	30	-6.96
				50	0	21.07	23.07	30	-6.93
		1750	16QAM	1	0	21.88	23.88	30	-6.12
	20375			1	49	21.86	23.86	30	-6.14
	20070			25	12	20.62	22.62	30	-7.38
				50	0	20.67	22.67	30	-7.33

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Antenna	gain (dBi)	2							
		Ľ	TE Band 4_U	plink f	requenc	:y band : 1710			
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
				1	0	22.74	24.74	30	-5.26
	20025	1717.5	QPSK	1	74	22.55	24.55	30	-5.45
	20025	1717.5	UF SK	36	18	21.61	23.61	30	-6.39
				75	0	21.55	23.55	30	-6.45
				1	0	22.82	24.82	30	-5.18
	20175	1732.5	QPSK	1	74	23.15	25.15	30	-4.85
	20173	1732.5		36	18	22.22	24.22	30	-5.78
				75	0	22.18	24.18	30	-5.82
	20325	1747.5	QPSK	1	0	22.97	24.97	30	-5.03
				1	74	22.77	24.77	30	-5.23
				36	18	21.51	23.51	30	-6.49
15				75	0	21.81	23.81	30	-6.19
15	20025	1717.5	16QAM	1	0	20.53	22.53	30	-7.47
				1	74	20.20	22.20	30	-7.8
				36	18	20.53	22.53	30	-7.47
				75	0	20.52	22.52	30	-7.48
		1732.5	16QAM	1	0	22.39	24.39	30	-5.61
	20175			1	74	22.12	24.12	30	-5.88
	20173			36	18	21.11	23.11	30	-6.89
				75	0	21.07	23.07	30	-6.93
		1747.5		1	0	22.33	24.33	30	-5.67
	20325		16QAM	1	74	22.23	24.23	30	-5.77
				36	18	20.82	22.82	30	-7.18
				75	0	20.60	22.60	30	-7.4

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Antenna	gain (dBi)	2							
		LI	TE Band 4_U	plink f	requenc	:y band : 1710			
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
				1	0	22.84	24.84	30	-5.16
	20050	1720	QPSK	1	99	22.74	24.74	30	-5.26
	20030	1720	UF SK	50	25	21.58	23.58	30	-6.42
				100	0	21.64	23.64	30	-6.36
				1	0	23.16	25.16	30	-4.84
	20175	1732.5	QPSK	1	99	23.18	25.18	30	-4.82
	20175	1752.5		50	25	22.20	24.20	30	-5.8
				100	0	22.22	24.22	30	-5.78
	20300	1745	QPSK	1	0	23.06	25.06	30	-4.94
				1	99	22.91	24.91	30	-5.09
				50	25	21.78	23.78	30	-6.22
20				100	0	21.84	23.84	30	-6.16
20	20050	1720	16QAM	1	0	22.17	24.17	30	-5.83
				1	99	22.07	24.07	30	-5.93
				50	25	20.62	22.62	30	-7.38
				100	0	20.67	22.67	30	-7.33
			16QAM	1	0	22.33	24.33	30	-5.67
	20175	1732.5		1	99	22.47	24.47	30	-5.53
	20175			50	25	21.14	23.14	30	-6.86
				100	0	21.14	23.14	30	-6.86
		1745		1	0	22.42	24.42	30	-5.58
	20300		16QAM	1	99	22.18	24.18	30	-5.82
	20000			50	25	20.64	22.64	30	-7.36
				100	0	20.61	22.61	30	-7.39

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FDD Band 5

Antenna gain (dBi)

	LTE Band 5_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)		
				1	0	21.90	20.75	22.90	38.45	-15.55		
	20407	824.7	QPSK	1	5	21.98	20.83	22.98	38.45	-15.47		
	20407	024.7	UPSK	3	2	22.01	20.86	23.01	38.45	-15.44		
				6	0	21.05	19.90	22.05	38.45	-16.4		
				1	0	21.75	20.60	22.75	38.45	-15.7		
	20525	836.5	QPSK	1	5	21.70	20.55	22.70	38.45	-15.75		
	20525	630.3		3	2	21.67	20.52	22.67	38.45	-15.78		
				6	0	20.78	19.63	21.78	38.45	-16.67		
	20643	848.3	QPSK	1	0	22.03	20.88	23.03	38.45	-15.42		
				1	5	21.93	20.78	22.93	38.45	-15.52		
				3	2	21.94	20.79	22.94	38.45	-15.51		
1.4				6	0	20.95	19.80	21.95	38.45	-16.5		
1.4	20407	824.7	16QAM	1	0	20.39	19.24	21.39	38.45	-17.06		
				1	5	20.97	19.82	21.97	38.45	-16.48		
				3	2	20.93	19.78	21.93	38.45	-16.52		
				6	0	20.08	18.93	21.08	38.45	-17.37		
		836.5	16QAM	1	0	21.24	20.09	22.24	38.45	-16.21		
	20525			1	5	21.18	20.03	22.18	38.45	-16.27		
	20323	030.5		3	2	20.61	19.46	21.61	38.45	-16.84		
				6	0	19.71	18.56	20.71	38.45	-17.74		
		848.3		1	0	21.26	20.11	22.26	38.45	-16.19		
	20643		16QAM	1	5	21.26	20.11	22.26	38.45	-16.19		
	20043		TOQAIVI	3	2	20.69	19.54	21.69	38.45	-16.76		
				6	0	20.00	18.85	21.00	38.45	-17.45		

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Antenna gain (dBi)

	LTE Band 5_Uplink frequency band : 824 to 849 MHz											
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)		
				1	0	21.95	20.80	22.95	38.45	-15.5		
	20415	825.5	QPSK	1	14	21.98	20.83	22.98	38.45	-15.47		
	20413	020.0	UFJK	8	4	21.14	19.99	22.14	38.45	-16.31		
				15	0	21.02	19.87	22.02	38.45	-16.43		
				1	0	21.60	20.45	22.60	38.45	-15.85		
	20525	836.5	QPSK	1	14	21.66	20.51	22.66	38.45	-15.79		
	20525	830.5		8	4	20.73	19.58	21.73	38.45	-16.72		
				15	0	20.77	19.62	21.77	38.45	-16.68		
	20635	847.5	QPSK	1	0	22.02	20.87	23.02	38.45	-15.43		
				1	14	21.84	20.69	22.84	38.45	-15.61		
				8	4	20.82	19.67	21.82	38.45	-16.63		
3				15	0	20.89	19.74	21.89	38.45	-16.56		
J	20415	825.5	16QAM	1	0	21.24	20.09	22.24	38.45	-16.21		
				1	14	21.25	20.10	22.25	38.45	-16.2		
				8	4	20.11	18.96	21.11	38.45	-17.34		
				15	0	20.01	18.86	21.01	38.45	-17.44		
			16QAM	1	0	20.70	19.55	21.70	38.45	-16.75		
	20525	836.5		1	14	20.78	19.63	21.78	38.45	-16.67		
	20323	030.5		8	4	19.57	18.42	20.57	38.45	-17.88		
				15	0	19.64	18.49	20.64	38.45	-17.81		
		847.5		1	0	21.10	19.95	22.10	38.45	-16.35		
	20635		16QAM	1	14	20.93	19.78	21.93	38.45	-16.52		
	20030			8	4	18.68	17.53	19.68	38.45	-18.77		
				15	0	19.81	18.66	20.81	38.45	-17.64		

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Antenna gain (dBi)

	guin (ubi)		LTE Ban	d 5_Up	link frequency	/ band : 824 to	849 MHz								
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)					
				1	0	21.84	20.69	22.84	38.45	-15.61					
	20425	826.5	QPSK	1	24	21.77	20.62	22.77	38.45	-15.68					
	20423	020.5	UF JK	12	6	20.99	19.84	21.99	38.45	-16.46					
				25	0	20.91	19.76	21.91	38.45	-16.54					
			QPSK	1	0	21.52	20.37	22.52	38.45	-15.93					
	20525	836.5		1	24	21.71	20.56	22.71	38.45	-15.74					
	20020	030.3	UFJK	12	6	20.64	19.49	21.64	38.45	-16.81					
			25	0	20.64	19.49	21.64	38.45	-16.81						
			5 QPSK	1	0	21.94	20.79	22.94	38.45	-15.51					
	20625	846.5		1	24	21.64	20.49	22.64	38.45	-15.81					
	20025			UF 3K	12	6	20.87	19.72	21.87	38.45	-16.58				
5				25	0	20.85	19.70	21.85	38.45	-16.6					
J				1	0	20.74	19.59	21.74	38.45	-16.71					
	20425	826.5	16QAM	1	24	20.74	19.59	21.74	38.45	-16.71					
	20423	020.5	TOCAN	12	6	20.04	18.89	21.04	38.45	-17.41					
				25	0	20.01	18.86	21.01	38.45	-17.44					
				1	0	20.83	19.68	21.83	38.45	-16.62					
	20525	836.5	160AM	1	24	20.45	19.30	21.45	38.45	-17					
	20323	030.5	16QAM	16QAM	16QAM	16QAM	16QAM	16QAM	12	6	19.52	18.37	20.52	38.45	-17.93
	20625			25	0	19.56	18.41	20.56	38.45	-17.89					
				1	0	21.29	20.14	22.29	38.45	-16.16					
		846 5	16QAM	1	24	21.06	19.91	22.06	38.45	-16.39					
		846.5		12	6	19.87	18.72	20.87	38.45	-17.58					
			-	25	0	19.83	18.68	20.83	38.45	-17.62					

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Antenna gain (dBi)

	gain (abi)		LTE Ban	d 5_Up	link frequency	band : 824 to	849 MHz							
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)				
				1	0	22.15	21.00	23.15	38.45	-15.3				
	20450	829	QPSK	1	49	21.85	20.70	22.85	38.45	-15.6				
	20450		UFSK	25	12	20.98	19.83	21.98	38.45	-16.47				
				50	0	20.94	19.79	21.94	38.45	-16.51				
			QPSK	1	0	21.43	20.28	22.43	38.45	-16.02				
	20525	836.5		1	49	21.76	20.61	22.76	38.45	-15.69				
	20323	030.3	UF SK	25	12	20.70	19.55	21.70	38.45	-16.75				
				50	0	20.63	19.48	21.63	38.45	-16.82				
		844	QPSK	1	0	21.73	20.58	22.73	38.45	-15.72				
	20600			1	49	21.62	20.47	22.62	38.45	-15.83				
	20000			QI SIK	UF JK	25	12	20.76	19.61	21.76	38.45	-16.69		
10				50	0	20.81	19.66	21.81	38.45	-16.64				
10				1	0	21.61	20.46	22.61	38.45	-15.84				
	20450	829	16QAM	1	49	21.27	20.12	22.27	38.45	-16.18				
	20430	027		25	12	19.83	18.68	20.83	38.45	-17.62				
				50	0	19.99	18.84	20.99	38.45	-17.46				
				1	0	20.74	19.59	21.74	38.45	-16.71				
	20525	836.5	16OAM	1	49	21.06	19.91	22.06	38.45	-16.39				
	20323	030.5	16QAM	16QAM	16QAM	TOQAIVI	TOQAIVI	25	12	19.62	18.47	20.62	38.45	-17.83
				50	0	19.60	18.45	20.60	38.45	-17.85				
	20600			1	0	20.30	19.15	21.30	38.45	-17.15				
		844	16QAM	1	49	20.14	18.99	21.14	38.45	-17.31				
		844		25	12	19.61	18.46	20.61	38.45	-17.84				
				50	0	19.45	18.30	20.45	38.45	-18				

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FDD Band 13

Antenna gain (dBi)

	¥ · · ·		LTE Band	l 13_U	plink fre	equency band	: 777 to 787 M	Hz		
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)
				1	0	20.71	19.56	21.71	34.77	-13.06
	23205	779.5	QPSK	1	24	21.81	20.66	22.81	34.77	-11.96
	23203	117.5	UP SK	12	6	20.42	19.27	21.42	34.77	-13.35
				25	0	20.74	19.59	21.74	34.77	-13.03
				1	0	21.34	20.19	22.34	34.77	-12.43
	23230	782	QPSK	1	24	21.77	20.62	22.77	34.77	-12
	23230	102	UP SK	12	6	20.53	19.38	21.53	34.77	-13.24
				25	0	20.56	19.41	21.56	34.77	-13.21
			QPSK	1	0	21.86	20.71	22.86	34.77	-11.91
	23255	784.5		1	24	22.08	20.93	23.08	34.77	-11.69
	23233			12	6	20.78	19.63	21.78	34.77	-12.99
5				25	0	20.82	19.67	21.82	34.77	-12.95
5				1	0	20.21	19.06	21.21	34.77	-13.56
	23205	779.5	16QAM	1	24	21.21	20.06	22.21	34.77	-12.56
	23203	117.5	TOCAM	12	6	19.71	18.56	20.71	34.77	-14.06
				25	0	19.81	18.66	20.81	34.77	-13.96
				1	0	20.75	19.60	21.75	34.77	-13.02
	23230	782	16QAM	1	24	20.99	19.84	21.99	34.77	-12.78
	23230	102	TOCAN	12	6	19.54	18.39	20.54	34.77	-14.23
	23255			25	0	19.55	18.40	20.55	34.77	-14.22
				1	0	20.98	19.83	21.98	34.77	-12.79
		784 5		1	24	21.20	20.05	22.20	34.77	-12.57
		784.5		12	6	19.70	18.55	20.70	34.77	-14.07
				25	0	19.79	18.64	20.79	34.77	-13.98

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Antenna gain (dBi)

	<u>y</u> (s=)		LTE Band	113_U	plink fre	equency band	: 777 to 787 M	Hz																			
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)																	
	23230	782	QPSK	1	0	21.13	19.98	22.13	34.77	-12.64																	
				1	49	22.01	20.86	23.01	34.77	-11.76																	
	23230			U JK	25	12	20.55	19.40	21.55	34.77	-13.22																
10				50	0	20.66	19.51	21.66	34.77	-13.11																	
10				1	0	19.77	18.62	20.77	34.77	-14																	
	23230	700	16QAM	14000	16001	160.00	140014	160AM	160AM	16OAM	16001	16OAM	14001	140014	16001	16OAM	16OAM	1/04/4	160404	14001	1	49	20.78	19.63	21.78	34.77	-12.994
	23230	782		25	12	19.46	18.31	20.46	34.77	-14.31																	
				50	0	19.61	18.46	20.61	34.77	-14.16																	

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FDD Band 17

Antenna gain (dBi)

	LTE Band 17_Uplink frequency band : 704 to 716 MHz													
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)				
				1	0	21.80	20.65	22.80	34.77	-11.97				
	23755	706.5	QPSK	1	24	22.23	21.08	23.23	34.77	-11.54				
	23755		UF SK	12	6	21.00	19.85	22.00	34.77	-12.77				
				25	0	21.02	19.87	22.02	34.77	-12.75				
				1	0	22.13	20.98	23.13	34.77	-11.64				
	23790	710	QPSK	1	24	21.84	20.69	22.84	34.77	-11.93				
	23790	710	UF SK	12	6	21.16	20.01	22.16	34.77	-12.61				
				25	0	21.15	20.00	22.15	34.77	-12.62				
			QPSK	1	0	22.40	21.25	23.40	34.77	-11.37				
	23825	713.5		1	24	22.01	20.86	23.01	34.77	-11.76				
	23025			12	6	20.41	19.26	21.41	34.77	-13.36				
5				25	0	21.03	19.88	22.03	34.77	-12.74				
5				1	0	20.66	19.51	21.66	34.77	-13.11				
	23755	706.5	16QAM	1	24	20.90	19.75	21.90	34.77	-12.87				
	23733	700.5	TOQAM	12	6	20.10	18.95	21.10	34.77	-13.67				
				25	0	20.07	18.92	21.07	34.77	-13.7				
				1	0	21.34	20.19	22.34	34.77	-12.43				
	23790	710	16QAM	1	24	21.29	20.14	22.29	34.77	-12.48				
	23770	710	TOQAM	12	6	20.11	18.96	21.11	34.77	-13.66				
	23825			25	0	20.04	18.89	21.04	34.77	-13.73				
				1	0	21.51	20.36	22.51	34.77	-12.26				
		713.5	16QAM	1	24	21.28	20.13	22.28	34.77	-12.49				
		/13.5		12	6	20.02	18.87	21.02	34.77	-13.75				
				25	0	20.17	19.02	21.17	34.77	-13.6				

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Antenna gain (dBi)

	LTE Band 17_Uplink frequency band : 704 to 716 MHz													
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	ERP Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)				
				1	0	21.64	20.49	22.64	34.77	-12.13				
	23780	709	QPSK	1	49	21.46	20.31	22.46	34.77	-12.31				
	23700	709	UF SK	25	12	20.87	19.72	21.87	34.77	-12.9				
				50	0	20.76	19.61	21.76	34.77	-13.01				
		710	QPSK	1	0	21.83	20.68	22.83	34.77	-11.94				
	23790			1	49	21.67	20.52	22.67	34.77	-12.1				
		710	QLOK	25	12	21.08	19.93	22.08	34.77	-12.69				
				50	0	20.96	19.81	21.96	34.77	-12.81				
		711	QPSK	1	0	22.01	20.86	23.01	34.77	-11.76				
	23800			1	49	21.79	20.64	22.79	34.77	-11.98				
	23000			25	12	20.60	19.45	21.60	34.77	-13.17				
10				50	0	20.89	19.74	21.89	34.77	-12.88				
10				1	0	21.00	19.85	22.00	34.77	-12.77				
	23780	709	16QAM	1	49	21.03	19.88	22.03	34.77	-12.74				
	23700	107	TOCAIN	25	12	20.02	18.87	21.02	34.77	-13.75				
				50	0	19.94	18.79	20.94	34.77	-13.83				
				1	0	21.25	20.10	22.25	34.77	-12.52				
	23790	710	16QAM	1	49	21.03	19.88	22.03	34.77	-12.74				
	23770	710	TOCAIN	25	12	20.06	18.91	21.06	34.77	-13.71				
				50	0	19.98	18.83	20.98	34.77	-13.79				
				1	0	21.08	19.93	22.08	34.77	-12.69				
	23800	711	16QAM	1	49	21.10	19.95	22.10	34.77	-12.67				
				25	12	20.13	18.98	21.13	34.77	-13.64				
				50	0	20.05	18.90	21.05	34.77	-13.72				

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HSDPA Release 6 MODE:

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing.

HSDPA SUB-TEST Setting

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

Sub-test	βc	βd	β₀ (SF)	β _c /β _d	βнs (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

Note: The recommended HSDPA MPRs are implemented as per following sub-tests.

Results:

Mode	Sub test	Avg. Power (dBm) Channel			Mode	Sub test	Avg. Power (dBm) Channel			
	1031	9262.00	9400.00	9538.00		1031	4132.00	4183.00	4233.00	
	1	21.71	22.30	22.04		1	21.83	21.97	22.25	
HSDPA II	2	21.69	22.28	22.02	HSDPA V	2	21.82	21.94	22.21	
IISUFA II	3	21.28	21.87	21.55		3	21.40	21.57	21.76	
	4	21.26	21.86	21.57	1	4	21.39	21.56	21.75	

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HSPA (HSDPA & HSUPA) Release 6 MODE

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX RMS power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing **HSPA SUB-TEST Setting**

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

Sub- test	βc	βa	βd (SF)	βc/βd	βнs	ßec	βed	β _{ed} (SF)	β _{ed} (Code s)	CM (dB)	MPR (dB)	AG Index	E-TFCI	RMC (Kbps)
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/22 5	1309/225	4	1	1.0	0.0	20	75	12.2
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	12.2
3	15/15	9/15	64	15/9	30/15	30/15	β _{ed} 1: 47/15 β _{ed} 2: 47/15		2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

Note: The recommended HSUPA MPRs are implemented as per following sub-tests.

Results:

	Curk	Av	g. Power (dB	Sm)
Mode	Sub test		Channel	
		9262.00	9400.00	9538.00
	1	21.49	22.18	21.84
	2	21.47	22.14	21.81
HSUPA II	3	21.06	21.73	21.41
	4	21.52	22.16	21.85
	5	21.04	21.69	21.38

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Mode	Sub test	Avg. Power (dBm) Channel						
	1031	4132.00	4183.00	4233.00				
	1	21.75	22.21	22.14				
	2	21.74	22.20	22.13				
HSUPA V	3	21.31	21.84	21.68				
	4	21.78	22.24	22.17				
	5	21.28	21.83	21.66				

WCDMA/HSDPA/HSUPA band V

The EUT output power was controlled by simulator. Set Communication Tester MT8820C function key "UE Power Control" and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm. Then record the read (see page 15 for measurement data). The min. power was measures by a function key "minimum power" then record the read. It is -52.3dBm. The power variation can be 0.1dB step by setting.

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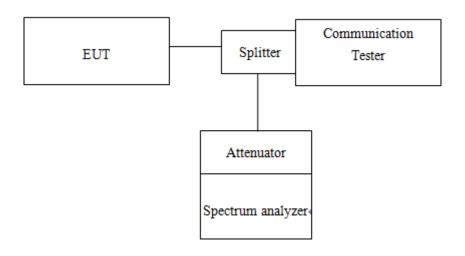


7. OCCUPIED BANDWIDTH MEASUREMENT

7.1. Standard Applicable

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power.

7.2. Test Set-up



7.3. Measurement Procedure

99% &26dB Bandwidth with detector peak

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

99% Bandwidth with detector sample

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% ~ 5% of emission BW, VBW= 3 times RBW, -20dBc display line was placed on the screen (or 20dB bandwidth). Set RBW to 99% bandwidth, RBW= 1% ~ 5%, VBW= 3 RBW, with span > 2 * Signal BW, set % Power = 99%.

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7.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUM- BER	SERIAL NUM- BER	LAST CAL.	CAL DUE.
Radio Communication Analyer	Anritsu	MT8820C	6201465316	03/31/2018	03/30/2019
Spectrum Analyzer	Agilent	N9010A	MY51440113	06/20/2018	06/19/2019
DC Block	PASTERNACK	PE8210	RF29	02/26/2019	02/25/2020
Splitter	Woken	DOM35LW1A2	RF36	02/26/2019	02/25/2020
Attenuator	Marvelous	WATT-218FS-10	RF245	02/26/2019	02/25/2020
Coaxial Cables	Woken	00100A1F1A185C	RF12	02/26/2019	02/25/2020
Coaxial Cables	Woken	00100A1F1A185C	RF202	02/26/2019	02/25/2020
DC Power Supply	Agilent	E3640A	MY40000811	12/11/2018	12/10/2019

7.5. Measurement Result

Erog		99 9	% BW (MH	z)	26 d	IB BW (Mł	łz)
Freq. (MHz)	СН	WCDMA	HSDPA	HSUPA	WCDMA	HSDPA	HSUPA
、 <i>,</i>		Π	I	II	I	II	II
1852.40	9262	4.13530	4.11360	4.12260	4.701	4.688	4.667
1880.00	9400	4.12810	4.11660	4.11150	4.698	4.660	4.695
1907.60	9538	4.12490	4.12620	4.11020	4.695	4.673	4.672
Erog		99 9	% BW (MH	z)	26 c	IB BW (Mł	Hz)
Freq. (MHz)	СН	WCDMA	HSDPA	HSUPA	WCDMA	HSDPA	HSUPA
		V	V	V	V	V	V
826.40	4132	4.11700	4.11290	4.12100	4.667	4.669	4.680
826.40 836.60	4132 4183	4.11700 4.12530	4.11290 4.11030	4.12100 4.12860	4.667 4.681	4.669 4.685	4.680 4.680

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LTE BAND 2 Channel bandwidth: 1.4MHz								
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)			
(MHz)	CH	QPSK	16QAM	QPSK	16QAM			
1850.7	18607	1.1131	1.1147	1.479	1.480			
1880.0	18900	1.1156	1.1159	1.500	1.479			
1909.3	19193	1.1185	1.1175	1.493	1.481			

LTE BAND 2 Channel bandwidth: 5MHz								
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)			
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM			
1852.5	18625	4.5227	4.5137	5.283	5.248			
1880.0	18900	4.5246	4.5136	5.242	5.241			
1907.5	19175	4.5257	4.5183	5.251	5.288			

LTE BAND 2 Channel bandwidth: 3MHz									
Freq.	СН	99% BV	V (MHz)	26 dB B	W (MHz)				
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM				
1851.5	18615	2.7220	2.7284	3.503	3.610				
1880.0	18900	2.7212	2.7254	3.491	3.606				
1908.5	19185	2.7199	2.7282	3.537	3.619				

LTE BAND 2 Channel bandwidth: 10MHz								
Freq.	СН	99% BV	V (MHz)	26 dB B	W (MHz)			
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM			
1855.0	18650	9.2218	9.1755	15.098	14.895			
1880.0	18900	9.2530	9.2652	15.056	14.986			
1905.0	19150	9.2561	9.2181	14.975	14.901			

L	LTE BAND 2 Channel bandwidth: 15MHz									
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)					
(MHz)	CH	QPSK	16QAM	QPSK	16QAM					
1857.5	18675	13.476	13.488	14.812	14.893					
1880.0	18900	13.505	13.494	14.791	14.963					
1902.5	19125	13.505	13.492	14.821	14.865					

	LTE BAND 2 Channel bandwidth: 20MHz								
Freq.	СН	99% BV	V (MHz)	26 dB B	W (MHz)				
(MHz)	CH	QPSK	16QAM	QPSK	16QAM				
1860.0	18700	17.911	17.924	19.454	19.385				
1880.0	18900	17.945	17.928	19.514	19.416				
1900.0	19100	17.954	17.955	19.510	19.506				

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LTE BAND 4 Channel bandwidth: 1.4MHz								
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)			
(MHz)	СП	QPSK	16QAM	QPSK	16QAM			
1710.7	19957	1.1172	1.1154	1.489	1.467			
1732.5	20175	1.1156	1.1143	1.492	1.472			
1754.3	20393	1.1168	1.1134	1.570	1.482			

	LTE BAND 4 Channel bandwidth: 5MHz									
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)					
(MHz)	CH	QPSK	16QAM	QPSK	16QAM					
1712.5	19957	4.5175	4.5164	5.307	5.264					
1732.5	20175	4.5157	4.5170	5.299	5.268					
1752.5	20375	4.5166	4.5138	5.316	5.224					

L	LTE BAND 4 Channel bandwidth: 15MHz								
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)				
(MHz)	СП	QPSK	16QAM	QPSK	16QAM				
1717.5	20025	13.444	13.453	14.740	14.782				
1732.5	20175	13.517	13.498	14.787	14.871				
1747.5	20325	13.479	13.464	14.807	14.801				
L	TE BAN	LTE BAND 5 Channel bandwidth: 1.4MHz							
Frag					I IZ				
Freq.	СЦ	99% B\	N (MHz)		W (MHz)				
Freq. (MHz)	СН	99% B\ QPSK	N (MHz) 16QAM						
	CH 20407		· · ·	26 dB B	W (MHz)				
(MHz)	-	QPSK	16QAM	26 dB B QPSK	W (MHz) 16QAM				

LTE BAND 5 Channel bandwidth: 5MHz										
Freq. CH	99% BW (MHz)		26 dB BW (MHz)							
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM					
826.5	20425	4.5241	4.5206	5.377	5.408					
836.5	20525	4.5226	4.5225	5.412	5.409					
846.5	20625	4.5208	4.5153	5.366	5.364					

LTE BAND 4 Channel bandwidth: 3MHz									
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)				
(MHz)	СП	QPSK	16QAM	QPSK	16QAM				
1711.5	19965	2.7080	2.7195	3.155	3.173				
1732.5	20175	2.7141	2.7160	3.124	3.177				
1753.5	20385	2.7074	2.7160	3.179	3.199				

LTE BAND 4 Channel bandwidth: 10MHz									
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)				
(MHz)	СП	QPSK	16QAM	QPSK	16QAM				
1715.0	20000	9.0122	8.9736	10.047	9.964				
1732.5	20175	9.0109	8.9796	10.074	9.981				
1750.0	20350	9.0243	8.9845	10.013	9.920				

LTE BAND 4 Channel bandwidth: 20MHz									
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)				
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM				
1720.0	20050	17.891	17.918	19.452	19.340				
1732.5	20175	17.929	17.960	19.488	19.415				
1745.0	20300	17.895	17.924	19.464	19.347				

LTE BAND 5 Channel bandwidth: 3MHz									
Freq.	СН	99% BV	V (MHz)	26 dB B	W (MHz)				
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM				
825.5	20415	2.7065	2.7168	3.131	3.162				
836.5	20525	2.7068	2.7158	3.166	3.184				
847.5	20635	2.7065	2.7200	3.158	3.147				

LTE BAND 5 Channel bandwidth: 10MHz									
Freq.	СН	99% BV	V (MHz)	26 dB B	W (MHz)				
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM				
829.0	20450	9.0379	8.9947	10.988	10.260				
836.5	20525	9.0515	9.0134	11.630	10.315				
844.0	20600	9.0206	8.9776	10.714	10.274				

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LTE BAND 13 Channel bandwidth: 5MHz									
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)				
(MHz)	СП	QPSK	16QAM	QPSK	16QAM				
779.5	23205	4.4774	4.4784	5.106	5.063				
782.0	23230	4.5286	4.5250	5.158	5.143				
784.5	23255	4.5058	4.5073	5.111	5.119				

LTE BAND 17 Channel bandwidth: 5MHz									
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)				
(MHz)	СП	QPSK	16QAM	QPSK	16QAM				
706.5	23755	4.5292	4.5337	5.559	5.611				
710.0	23790	4.5260	4.5219	5.519	5.514				
713.5	23825	4.5442	4.5327	5.581	5.478				

LTE BAND 13 Channel bandwidth: 10MHz									
Freq.		99% BW (MHz)		26 dB BW (MHz)					
(MHz)	СП	QPSK	16QAM	QPSK	16QAM				
782.0	23230	8.957	8.938	9.893	10.022				

LTE BAND 17 Channel bandwidth: 10MHz									
Freq.	СН	99% BV	V (MHz)	26 dB B	W (MHz)				
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM				
709.0	23780	8.9770	8.9274	9.930	9.449				
710.0	23790	8.9781	8.9543	9.962	9.928				
711.0	23800	8.9760	8.9544	9.654	9.928				

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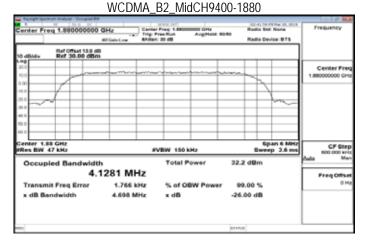
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WCDMA_B2_LowCH9262-1852.4

Kayaight Spectrum Analyzer					
Center Freq 1.85	400000 GH	Trip	r Frag 1.863400000 GHz Fras Run AvgPlaid: 6 h: 20 dB	Radio Stal Nev Radio Device: 8	Frequency
10 dB/div Ref 3	het 13.9 dB 0.00 dBm				
200 200 000			annes, et de faire de la company		Center Fre 1.852400000 GH
30.0					
50 0 40 0 Center 1,852 GHz				Span 6	MH2
Res BW 47 kHz			VBW 150 kHz	Sweep 2.	6 ms 600.000 kF
Occupied Ba		FO 1411-	Total Power	31.5 dBm	Auto Ma
		53 MHz			FreqOffs
Transmit Freq	Error	-376 Hz	% of OBW Power	99.00 %	
x dB Bandwidt	h	4.700 MHz	x dB	-26.00 dB	
490				arrena	



WCDMA B2 HighCH9538-1907.6

	eq 1.907600000	GHz Carrie	r Frag 1.907600000 GHz Fras Run Avg/Hald 5010 h: 20 dB	Radio Still None Radio Device: 815	Frequency
0 dB/div	Ref Offset 13.9 dl Ref 30.00 dBn	8			
000 100 000 000 000 000 000 000				~~~	Center Fre 1.807600000 GH
enter 1.9			VBW 150 kHz	Span 6 MHz Sweep 2.6 ms	II Crotes
	ied Bandwidt			32.3 dBm	Freq Offse
	it Freq Error Indwidth	5.822 kHz 4.695 MHz	% of OBW Power x dB	99.00 % -26.00 dB	ОН
10				annova	

HSDPA_B2_LowCH9262-1852.4

Raysight Spect	rum Analyzer - Occupied BW		and the second s			
enter Fre	q 1.852400000 c	Trip I	r Frag 1.852400000 GHa Fras Run Avg/Hald 5 1: 20 dB	Radio 5nd		Frequency
10 dBAdiv	Ref 0ffset 13.9 dB Ref 30.00 dBm					
200 100 100 300					~~~~	Center Fre 1.852400000 GH
0.0 0.0 0.0 center 1,8				Sp-	in 6 MHz	CF Ste
Res BW 4		-	VBW 150 kHz Total Power	31.7 dBm	2.6 ms	600.000 ki Aula: M
Occupi	ied Bandwidth 4.1	136 MHz	Total Power	31.7 dam		Freq Offs
	it Freq Error ndwidth	-923 Hz 4.688 MHz	% of OBW Power x dB	99.00 % -26.00 dB		0)
				11111		

eq 1.880000000	GHz Carrie	Free Run Avg/H		Radio Stal None Radio Device: BTS	Frequency
					Center Fre 1.88000000 GH
IB GHZ 47 kHz		VBW 150 kHz		Span 6 MHz Sweep 2.6 ms	CF Ste
		Total Power	32.	2 dBm	Auto No
it Freq Error Indwidth	-654 Hz 4.660 MHz	% of OBW Po x dB			01
	Ref 01.880000000 Ref 01.99 d m Ref 30.09 d m Ref 30.09 d m r r s GHz s GHz led Bandwidt 4, it Freq Error	Ref 0.00 dBm Ref 0.00 dBm Ref 0.00 dBm s GHz r KHz led Bandwidth 4.1166 MHz it Freq Error -654 Hz	Ref 0.68000000 GHz Billion to the second of	Ref 0.0000000 GHz Bit of the second of the	Total Power 32.2 dBm 4 Child Bandwidth Kitte 1-000 Kite 3 dB Scherer 2000 Kite 3 dB Scher

HEDDA B2 MidCH0400 1880

HSDPA_B2_HighCH9538-1907.6

Raysight Spectr	rum Analyzer - Occupied BN		SENSE INC	10 10 10 PM No. 20, 201	0.00
Center Fre	q 1.907600000	GHz Carta	Freig 1.907600000 GHz	Radio Std. None	* Frequency
		#FGainLow #Atter	20 68	Radio Device: BTS	
10 dB/div	Ref 0ffset 13.9 dl Ref 30.00 dBm				
200 100					Center Freq 1.907600000 GHz
-10.0 -20.0					9
-30.0 40.0 50.0					
40.0	+ + +		+ + +		
Center 1.9 IRes BW 4			VBW 150 kHz	Span 6 MH Sweep 2.6 m	
Occupi	led Bandwidt		Total Power	32.1 dBm	Auto Mar
	4.1	1262 MHz			Freq Offset
Transm	it Freq Error	1.825 kHz	% of OBW Power	99.00 %	0 Hz
x dB Ba	ndwidth	4.673 MHz	x dB	-26.00 dB	
MRG .				874708	

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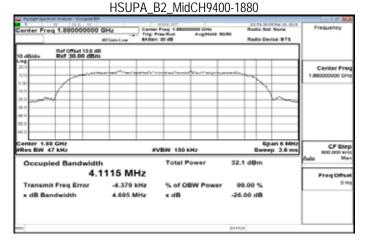
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HSUPA_B2_LowCH9262-1852.4

Kaysight Spect	rum Analyser - Occupied BW				0 9
Senter Fre	ng 1.852400000	Trip I	r Frag 1.852400000 GHa Fras Run Avg/Hald S 1: 20 dB	Radio Device: 815	Frequency
10 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm				
000 000 000 000	/	and the trainwood			Center Fre
enter 1.8			VEW 150 kHz	Span 6 MH Sweep 2.6 m	2 CF Ste 600,000 M
Occup	ied Bandwidth		Total Power	31.6 dBm	Auto M
	4.1	226 MHz			FreqOffs
	it Freq Error ndwidth	-2.339 kHz 4.667 MHz	% of OBW Power x dB	99.00 % -26.00 dB	•
10				BRATUR .	



HSUPA_B2_HighCH9538-1907.6

	eq 1.907600000	GHz Carta	Freq 1.907600000 GHz Freq 1.907600000 GHz Fres Run Avg(Hald 5010 1: 20 6B	Radio Stal None Radio Stal None Radio Device: 815	Frequency
0 dB/div	Ref Offset 13.9 dl Ref 30.00 dBn				
000 100 100 100 100 100 100 100 100 100	~			~	Center Fred 1.907600000 GH
enter 1.5 Res BW		· · · .	VBW 150 kHz	Span 6 MHz Sweep 2.6 ms	CF Step
Occup	ied Bandwidt 4.	h 1102 MHz	Total Power	32.1 dBm	Aula Me Freq Offse
	it Freq Error andwidth	3.864 kHz 4.672 MHz	% of OBW Power x dB	99.00 % -26.00 dB	0 14
10				UTATUS.	

WCDMA_B5_LowCH4132-826.4

Kaysight Spectrum Analyzer - Occupied BW		MINU IN	10.11.21 PM May 20.20	0128
enter Freq 826.400000 M		Free Run Avg/Hald 50	Radio Ind None	Frequency
		n: 30 dB	Radio Device: BT5	_
Ref Offset 13.7 dB to dB/div Ref 30.00 dBm				
200				Center Fre
	+			826.400000 MP
1.00				
0.0				
				<u>م</u>
				1
0.0				
enter 826.4 MHz			Span 6 MH	
Res BW 47 kHz		VBW 150 kHz	Sweep 2.6 m	600.000 ki
Occupied Bandwidth		Total Power	31.4 dBm	Auto M
4.1	170 MHz			FreqOffs
Transmit Freq Error	-3.329 kHz	% of OBW Power	99.00 %	01
x dB Bandwidth	4.667 MHz	x dB	-26.00 dB	
0			STATUS	-

	eq 836.600000 N	Trip I	Freq 836.600000 MHz Freq 836.600000 MHz Free Run Avg(Held: 50/50 1: 30 dB	Radio Device: BTS	Trequency
0 dBAdiv 20 0 10 0 10 0 20 0 20 0 20 0 20 0 20 0	Ref Offset 13.7 dl Ref 30.00 dlBm				Center Free 836.600000 MH
co co co co co co co co co co co co co c			VBW 150 kHz	Span 6 MH Sweep 2.6 m	CF Step
		1253 MHz		32.0 dBm	Freq Offse
	iit Freq Error Indwidth	5.589 kHz 4.681 MHz	% of OBW Power x dB	99.00 % -26.00 dB	

WCDMA_B5_HighCH4233-846.6

Kaysight Spect	num Analyser - Occupied	ŧw		NAME OF				0.00
Center Fre	eq 846.600000	MHz	Cartar Trig P	Center Freig B&L 600000 MHz		Radio Std. None		Frequency
		#FGainLow	BA/Bar	30 68		Radio Devi	DA: BTS	
10 dBAdiv	Ref 30.00 dl				_			
200 100		and sectors and the sectors of				-		Center Freq 846.600000 MHz
10.0	\overline{V}		-					
310 310 310	4						m~~	
40.0							_	
40.0			-					
Center 84				VBW 150 kHz	-	Spa Sweep	n 6 MHz 2.6 ms	CF Step
Occup	ied Bandwid	ith		Total Power	31.	5 dBm		Auto Men
	4	.1136 N	/Hz					Freq Offset
Transm	it Freq Error	-5.76	1 kHz	% of OBW Pow	er 9	9.00 %		0 Hz
x dB Ba	indwidth	4.695	MHz	x dB	-26	.00 dB		
M90					10.00	ve		

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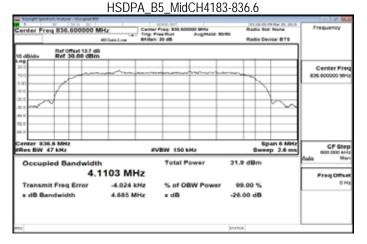
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HSDPA_B5_LowCH4132-826.4

Center Freq 826.4000	0 MHz Care	ar Press E26.400000 Minu Free Run Avg/Hald St n: 20 dB	Radio Std: None Radio Device: 81	Frequency
Ref Offset 13 10 dB/div Ref 30.00 (
				Center Free 826.400000 MH
Center 826.4 MHz Res BW 47 kHz		FVBW 150 kHz	Span 6 8 Sweep 2.6	AHZ CF Ste
Occupied Bandw	idth 4.1129 MHz	Total Power	31.7 dBm	Aulia Ma
Transmit Freq Error x dB Bandwidth	1.282 kHz 4.669 MHz	% of OBW Power x dB	99.00 % -26.00 dB	0.0
00			1014/101	



HSDPA_B5_HighCH4233-846.6

enter Fr	eq 846.600000	Trie Trie	ter Freig Ball 600000 Minta Freis Rum Avg/Hald 6 ten: 30 dB	Radio Std	
o dBlaiv	Ref Offset 13.7 d Ref 30.00 dBr				
10 00000000000000000000000000000000000				~~~	Center Prise
enter 84				5p-	An 6 MHz CF Ste
Res BW	47 kHz		#VBW 150 kHz	Swee	2.6 ms 600.000 ki
Occup	ied Bandwid 4.	th 1167 MHz	Total Power	32.4 dBm	FreqOffs
	hit Freq Error andwidth	-5.552 kHz 4.684 MHz	% of OBW Power x dB	99.00 % -26.00 dB	0)
				014708	

HSUPA_B5_LowCH4132-826.4

	q 826.400000	MHz Can	territ (INT Ter Free E26.400000 Mins Free Run AvgPlaid I		Frequency
	Ref Offset 13.7 d		en: 20 dB	Radio Device: BT	<u>`</u>
10 dB/div	Ref 30.00 dBr	n			
120					Center Fre 826.400000 MP
0.0					_
	1			- long	-
0.0					
0.0	+++				_
10.0					
enter 826 Res BW 4			#VBW 150 kHz	Span 6 1 Sweep 2.6	MHz CF Ste ms 600.000 ki
Occupi	ied Bandwid	th	Total Power	31.8 dBm	Auto M
	4.	1210 MHz			Freq Offs
Transmi	it Freq Error	-6.033 kHz	% of OBW Power	99.00 %	01
x dB Ba	ndwidth	4.680 MHz	x dB	-26.00 dB	
				1747.0	

	eq 836.600000 N	Trip I	r Pres B36.800000 Minu Pres Bun AvgPhald >50 1: 30 dB	Radio Device: BT	Frequency
10 dB/div	Ref 0ffset 13.7 dB Ref 30.00 dBm				
					Center Free 836.600000 MH
enter 83 Res BW		· · ·	VBW 150 kHz	Span 6 h Sweep 2.6	MHZ CF Ste
Occup	ied Bandwidth 4.1	286 MHz	Total Power	32.0 dBm	Aula Me
	it Freq Error Indwidth	3.247 kHz 4.680 MHz	% of OBW Power x dB	99.00 % -26.00 dB	0.4
				ana man	

HSLIPA R5 MidCH/183-8366

HSUPA_B5_HighCH4233-846.6

🕳 Kaynight Speck	trum Analyzer - Occupied Bi	N			0 2 5
Center Fre	eq 846.600000	Trip I	Pres Ball 500000 Mirts Free Run Avg/Held 5		Frequency
_		#FGainLow #After	1: 30 dB	Radio Device: 815	_
10 dB/div	Ref 30.00 dBr				
20.0		-	-		Center Freq
12.0		and a second	and the second second		846.600000 MHz
0.00	1				
-30.0	1				
30 J	9			- N.	
40.0					
50.0					
40.0	+++-				-
Center 840	6.6.8847			Span 6 M	
Res BW			VBW 150 kHz	Sweep 2.6 r	600.000 kHz
Occup	ied Bandwidt	th	Total Power	31.8 dBm	Auto Man
	4.	1117 MHz			FreqOffset
Transm	it Freq Error	-9.189 kHz	% of OBW Power	99.00 %	0 Hz
x dB Ba	indwidth	4.680 MHz	x dB	-26.00 dB	
				an an an	

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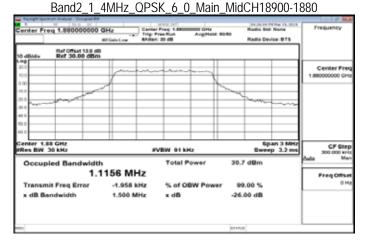
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Band2_1_4MHz_QPSK_6_0_Main_LowCH18607-1850.7

Center Freq 1.850700000	Trip I	r Fraug 1, 860700000 GHz Frau Run Avg(Hald: 5 1: 30 dB	Radio Device: 815	Frequency
Ref Offset 13.9 dl 10 dB/div Ref 30.00 dBm				
200 100				Center Fre 1.850700000 GH
000 000 000 000				
50.0 Center 1.851 GHz			Epan 3 MHz	
Res BW 30 kHz		VBW 91 kHz	Sweep 3.2 ms	CF Ste 300.000 ki
Occupied Bandwidt	h 1131 MHz	Total Power	30.0 dBm	dude M
			00.00 K	Freq Offs 0)
Transmit Freq Error x dB Bandwidth	-1.065 kHz 1.479 MHz	% of OBW Power x dB	99.00 % -26.00 dB	
-			Internet	



Band2 1 4MHz QPSK 6 0 Main HighCH19193-1909.3

Raynight Spec	drum Analyser - Occupied BW			104 (01 44 PM Mar 19, 2019	1012 00
Senter Fr	eq 1.909300000	Trip I	r Frag: 1.909300000 GHz	Radio 5nd None	Frequency
10 dB/div	Ref Offset 13.9 dl Ref 30.00 dBm				
10.0		1000			Center Freq 1.909300000 GH
10.0 20.0	marrie				
30.0				Contract.	
50.0					
0.0					
Center 1. Res BW			VBW 91 kHz	Span 3 MHz Sweep 3.2 ms	CF Step 300.000 kH
Occup	bled Bandwidt	1185 MHz	Total Power	30.7 dBm	duda Me
	nit Freq Error endwidth	-2.096 kHz 1.493 MHz	% of OBW Power x dB	99.00 % -26.00 dB	Freq Offse 0 H
29				01A008	

Band2_1_4MHz_16QAM_6_0_Main_LowCH18607-1850.7

enter Freq 1.8507000	Trip	r Pres 1.850700000 GHz Free Run Avg/Hald 50 h: 20 dB	Radio Device: BTS	Frequency
Ref Offset 13. Ref 30.00 d	Bm .			
00 200 200	1			Center Fre 1.850700000 GH
			han	
0.0				
enter 1.851 GHz Res BW 30 kHz		VBW 91 kHz	Span 3 MHz Sweep 3.2 ms	CF Str 300.000 ki
Occupied Bandwi	_{dth} 1.1147 MHz	Total Power	29.2 dBm	Freq Offs
Transmit Freq Error x dB Bandwidth	4.622 kHz 1.480 MHz	% of OBW Power x dB	99.00 % -26.00 dB	0)
			anana -	

Band2_1_4MHz_16QAM_6_0_Main_MidCH18900-1880



Band2 1 4MHz 16QAM 6 0 Main HighCH19193-1909.3

Raysight Spectr	rum Analyzer - Occupied BW		MINU INT	04-28-40 PM Nor 16-202	0.00
Center Fre	q 1.909300000	GHz Carta	Freq 1.000300000 GHz	Radio Std. None	Frequency
		AFGainLow MAR	12 20 68	Radio Device: BTS	_
10 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm				
20.0					Center Freq
12.0		1	- And		1.909300000 GHz
10.00		1			
	mm			- marine	1
30.0					
40.0					4
50.0					1
60.0					1
Center 1.9 Res BW 3			VBW 91 kHz	Span 3 MH Sweep 3.2 m	CF Step
Occupi	ied Bandwidth		Total Power	29.5 dBm	dada Mar
		175 MHz			FreqOffset
Transmi	it Freq Error	3.915 kHz	% of OBW Power	99.00 %	0 Ha
x dB Ba	ndwidth	1.481 MHz	x dB	-26.00 dB	
				anana -	

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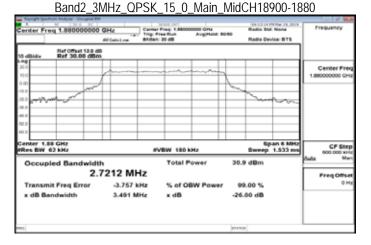
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Band2_3MHz_QPSK_15_0_Main_LowCH18615-1851.5

Center Freq 1.85150000	Trig I	r Frag 1.851500000 GHz Frag Run Avg/Hald St	Radio Sta		Frequency
Ref Offset 13.9 d Ref 30.00 dB/					
100 0.00	/				Center Fre 1.851500000 GH
10.0 20.0				~	
40.0					
00.0					
enter 1.852 GHz Res BW 62 kHz		VBW 180 kHz		1.533 ms	CF Ste 600.000 ki
Occupied Bandwid		Total Power	30.7 dBm		Auto M
2.	7220 MHz				Freq Offs
Transmit Freq Error	-1.791 kHz	% of OBW Power	99.00 %		01
x dB Bandwidth	3.503 MHz	x dB	-26.00 dB		
-			internet.		



Band2 3MHz QPSK 15 0 Main HighCH19185-1908.5

Raysight Spect	trum Analyzer - Occupied BA		L MANU AND			-	11 Har 15, 2015	0.00
Center Fre	eq 1.908500000	GHz #FGainLow	Cantar Frag 1.908 Trig: Frae Run #Attan: 30 dB	AvgPlant 6	0160	Radio De	E None	Frequency
10 dB/div	Ref 0ffset 13.9 d Ref 30.00 dBn							
20.0 10.0		h		~~~~~				Center Freq 1.908500000 GHz
10.0 20.0 20.0 20.0	and the second					~~~	~~~	
40.0 50.0								
enter 1.9 Res BW			#VBW 180	kHz	_		an 6 MHz 1.533 ms	CF Step 600.000 kH
Occup	ied Bandwidt	ь 7199 MH		Power	31.0	dBm		Auto Mar
	z. hit Freq Error andwidth	-1.488 k 3.537 M	Hz % of 6	OBW Power		00 % 00 dB		Freq Offset 0 Hz
90					jane o			

Band2_3MHz_16QAM_15_0_Main_LowCH18615-1851.5

Center Freq 1.85150000	0 GHz Carta	r Freigi 1.851800000 GHz Freigi 1.851800000 GHz Freigi Rum Avg(Hold: 50 ti 30 dB	Radio 5nd 1		Frequency
Ref Offset 13.9 d Ið dB/div Ref 30.00 dB					
000 20.0 10.0	/				Center Fre
			فكمستر	and the second	
0.0					
0.0	++			_	
enter 1.852 GHz Res BW 62 kHz		VBW 180 kHz	Spa Sweep 1	n 6 MHz 1.533 ms	CF Str 600.000 ki
Occupied Bandwid	th	Total Power	29.7 dBm	<u>^</u>	ás M
2	.7284 MHz				Freq Offs
Transmit Freq Error	-248 Hz	% of OBW Power	99.00 %		01
x dB Bandwidth	3.610 MHz	x dB	-26.00 dB		
			17476.0		

Band2_3MHz_16QAM_15_0_Main_MidCH18900-1880



Band2_3MHz_16QAM_15_0_Main_HighCH19185-1908.5

Raysight Spectrum Ana	typer - Occupied BW								_	0 9 10
enter Freq 1.	90850000	GHz #Cale Low	Cantar Fr Trig: Free BAtten: 3		AvgPlant 8	010	Radio Sta	None vice: BTS	Fn	Hourney
10 dB/div Re	f 30.00 dBm									
20.0		/								Center Fred
0.0	**						Sany	·~~~~		
0.0										
enter 1.909 G				W 180 k				an 6 MHz 1.533 ms	\vdash	CF Ste
Occupied I	Bandwidt			Total Po		30.0	dBm	1.555 114	Auto	600.000 kH
Transmit Fro x dB Bandw	eq Error	-4.139 J 3.619 M	Hz	% of OB x dB	W Power		0.00 % 00 dB		Ľ.	Freq Offse 0 H
0						31470				

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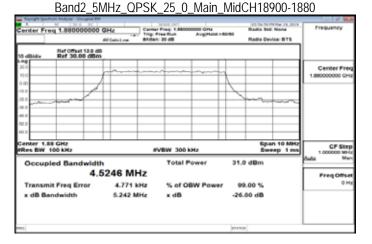
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Band2_5MHz_QPSK_25_0_Main_LowCH18625-1852.5

Center Freq 1.852		Trip I	r Frag 1.853500000 GHa Frag Run Avg/Hald S 1: 20 dB	Radio Std. Nor Radio Device:	ne Frequency
10 dB/div Ref 30	set 13.9 dB 3.00 dBm			_	
20.0 10.0 0.00					Center Fre 1.852500000 GH
10.0 20.0 20.0	~/			-	~~~
0.0					
enter 1,853 GHz Res BW 100 kHz		· · ·	VBW 300 kHz	Span 10 Sweep	0 MHz CF Str 1 ms 1.000000 M
Occupied Bar		227 MHz	Total Power	30.6 dBm	fulz M
Transmit Freq i x dB Bandwidt		6.622 kHz 5.283 MHz	% of OBW Power x dB	99.00 % -26.00 dB	0)
80				ana ana	



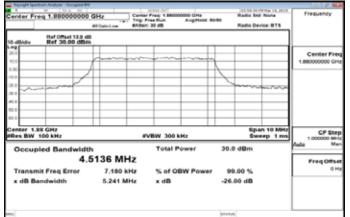
Band2 5MHz QPSK 25 0 Main HighCH19175-1907.5

Kaynight Spec	trum Analyser - Occupied BV	v	Manual and		103 S7 30 PM Har 11	0 2 10
Center Fre	Freq 1.907500000 GHz		Cantar Frag 1.907800 Trig: Fras Run 8Attan: 20 dB	Avg/Hald: 60/60	Radio Stal None Radio Device: 81	Frequency
10 dB/div	Ref Offset 13.9 d Ref 30.00 dBn					
200 100 0.00	/				·	Center Prec 1.90760000 CHu
Center 1.6			#VBW 300 ki	Hz	Span 10 Sweep	
Occup	ied Bandwidt 4.	ь 5257 MH	Total Po Z	ower 30).9 dBm	fudia Mar Freq Offse
	iit Freq Error andwidth	11.047 ki 5.251 Mi			99.00 % 6.00 dB	0 Hz
49G				100	7/8	

Band2 5MHz 16QAM 25 0 Main LowCH18625-1852.5

Center Freq 1.85250000		Center Pres 1.853500000 GHz Trig Free Run Avg/Hald AAten: 20 dB	Radio	Stat None Device: 815	Frequency
Ref Offset 13.9 4 10 dB/div Ref 30.00 dB					
100 000	/				Center Fre 1.852500000 GH
0.0 0.0 0.0	4			······	
0.0					
enter 1.853 GHz Res BW 100 kHz		#VBW 300 kHz		ipan 10 MHz Sweep 1 ms	CF Ste 1.000000 M
Occupied Bandwid	th .5137 MF	Total Power	29.6 dBm	•	Freq Offs
Transmit Freq Error x dB Bandwidth	5.943 k 5.248 M		er 99.00 % -26.00 dB		01
10			ananya.		

Band2_5MHz_16QAM_25_0_Main_MidCH18900-1880



Band2 5MHz 16QAM 25 0 Main HighCH19175-1907.5

Kaynight Spectru	m Analyser - Occupied BW		and the second s			0.0
Center Free	g 1.907500000	GHz Carte	r Frag 1.907500000 GHz	Ratio	Stat None	Frequency
	•	THE THE	Free Run Avg(Held: 50 h: 30 dB		Device: BTS	
10 dBAdiv	Ref Offset 13.9 dB Ref 30.00 dBm					
200						Center Freq
0.00		4				1.307 900000 015
10.0				N.		
30.0	and				1947 august 1	
40.0				\vdash	_	
60.0						
Center 1.90 Res BW 1			VBW 300 kHz		Span 10 MHz Sweep 1 ms	CF Step 1.000000 MH
Occupie	ed Bandwidt	1	Total Power	29.9 dBn	,	Auto Men
		5183 MHz				FreqOffset
Transmit	t Freq Error	9.210 kHz	% of OBW Power	99.00 %	6	0 Hs
x dB Bar	ndwidth	5.288 MHz	x dB	-26.00 di	3	
				111110		
99				000000		

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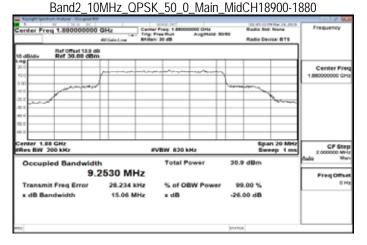
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Report No.: T190304W05-RP Page 57 of 206

Band2_10MHz_QPSK_50_0_Main_LowCH18650-1855

Raysight Spectrum Analyzer - Occ	upod BW			0 2 4
Center Freq 1.85500		ter Freig 1.85500000 GHz	Radio Stat None	Frequency
		p Free Run Avg(Held: 8 ten: 20 dB	Radio Device: 815	_
Ref Offset 10 dB/div Ref 30.00				
200				Center Fre
12.0			1	1.855000000 GH
0.00	and the second s		www.	
200				
N. D. Marker, P.				-
40.0				
00.0				
Center 1.855 GHz			Span 20 Mi	
Res BW 200 kHz		#VBW 620 kHz	Sweep 1 n	15 2.000000 Mi
Occupied Band	width	Total Power	30.3 dBm	Auto M.
	9.2218 MHz			Freq Offs
Transmit Freq Err	or 26.095 kHz	% of OBW Power	99.00 %	0)
x dB Bandwidth	15.10 MHz	x dB	-26.00 dB	
90			814708	



Band2 10MHz QPSK 50 0 Main HighCH19150-1905

Raysight Spect	trum Analyzer - Occupied BA		MANU AND			012 🖬
enter Fr	eq 1.905000000	term Tr	Center Pres 1, 90600000 GHz Trig: Free Bun Avg/Hald: 5010 6Atten: 20 dB		Radio Stal Nors Radio Device: 8	Frequency
0 dB/div	Ref 0ffset 13.9 d Ref 30.00 dBn					
00 00						Center Fre 1.905000000 GH
10		1		4		_
10	·				<u> </u>	~~~~~
1.0						
enter 1.5 tes BW			#VBW 620 kH	,	Span 20 Sweep	1 ms 2.000000 M
Occupied Bandwidth 9.2561 MHz			Total Por	wer 30).8 dBm	Aula Mi
		37.559 kHz 14.97 MHz	% of OBV x dB		99.00 % 6.00 dB	01
				in a		

Band2_10MHz_16QAM_50_0_Main_LowCH18650-1855

Raysophil Spectrum. And	IND R I			ocari Martanao			Radio Int	19 Mar 19, 2019	Frequency
Senter Freq 1.	855000000	GHz	Trig: Free BAtten: 20	Run	Avg/Hald	60/60	Radio Dev		
84	r Offset 13.9 dl		Bridden: Bri				Hard De		
0 dB/div Ro	ef 30.00 dBm	· · · · ·				-			
120		/				\downarrow			Center Fr 1.855000000 G
0.00	man					have	-		
× 0						-		mon	
0.0									
0.0						-			
enter 1.855 G Res BW 200 I			#VB	W 620 k	Hz			n 20 MHz eep 1 ms	CF St 2.000000 M
Occupied	Bandwidt	1		Total P	ower	29.6	dBm		Auto M
	9.1	1755 MH	z						Freq Offs
Transmit Fr	eq Error	21.476 kH	tz	% of OE	W Powe	r 99	.00 %		0
x dB Bandw	ridth	14.89 MF	tz.	x dB		-26.	00 dB		
80						STATUS.			

Band2_10MHz_16QAM_50_0_Main_MidCH18900-1880

Raysight Spectrum Analyzer - Oc	capied #W			012 8
Center Freq 1.88000	GOODO GH2	Center Freq 1.80000000 GHz Trig Freq Bun AvgPlaid 50 6After 20 dB	Radio Device: 815	Frequency
0 dB/div Ref 0ffset	13.9 48	Bridden, av dø	And Denies Die	
20	man			Center Fre 1.880000000 GH
0.0	mot		man	
0.0			- marc	
0.0				
enter 1,88 GHz Res BW 200 kHz		#VBW 620 kHz	Span 20 MHz Sweep 1 ms	CF Ste 2.000000 Mi-
Occupied Band		Total Power	30.2 dBm	Auto Ma
	9.2652 MH	iz		Freq Offse
Transmit Freq En	for 12.571 k	Hz % of OBW Power	99.00 %	0 H
x dB Bandwidth	14.99 M	Hz xdB	-26.00 dB	
			anamus.	

Band2 10MHz 16QAM 50 0 Main HighCH19150-1905

Kaynight Spect	trum Analyzer - Occupied BW		1	ou and				PH Mar 19, 2019	0 0 0
Center Fre	eq 1.905000000	GHz #FGaintee	Cantar Frag 1.00500000 GHa Trig: Fras Run Avg(Hald: 50/50 &Attan: 20 dB		Radio Sol None Radio Device: 815		Frequency		
10 dBldiv	Ref 30.00 dBm								
20.0		7	47-19-17-19-	ar and a		1			Center Freq 1.905000000 GHz
-10.0 -00.0 -00.0						1	na-	here	
40.0									
Center 1,5			FVB	W 620 k	Hz			an 20 MHz eep 1 ms	CF Step 2.000000 MH
Occupied Bandwidth 9.2		h 2181 MH		Total P	ower	30.0 dBm		Freq Offset	
	andwidth	32.190 k 14.90 M		% of OE x dB	BW Power	-	00 % 00 dB		0 Hz
490						jet Artice			

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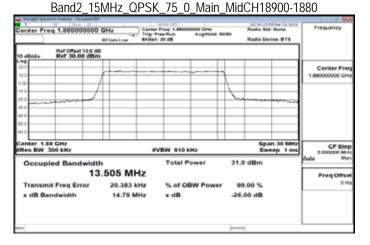
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Band2_15MHz_QPSK_75_0_Main_LowCH18675-1857.5

Raysight Spectrum Analyser - Occupied BA R 1/ 5/-0 00		NAME OF T		19 Mar 13, 2113	Frequency
Center Freq 1.857500000	Servic Trip I		0.00	Radio Std None	
	#FGainLow #After	29 68	Radio De	vice: BTS	
Ref Offset 13.9 dl 10 dB/div Ref 30.00 dB/r					
.0g 20.0					Center Fre
10.0	harmon	wint the state of	<u>ا ا</u>		1.857500000 GH
0.00	A	+ + +	A		
10.0	·				
20.0			Town and	and all and	
~					
0.0					
00.0					
Center 1,858 GHz Res BW 300 kHz		VBW 910 kHz		eep 1ms	CF Ste 3.000000 M
Occupied Bandwidt	h	Total Power	30.1 dBm		Auto Ma
13	.476 MHz				Freq Offs
Transmit Freq Error	26.957 kHz	% of OBW Power	99.00 %		0,
x dB Bandwidth	14.81 MHz	x dB	-26.00 dB		
80.			an an an		



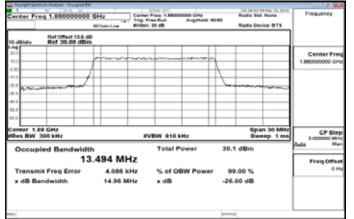
Band2 15MHz QPSK 75 0 Main HighCH19125-1902.5

Raysight Spect	trum Analyzer - Occupied BA		MANA ANT		102 30 54 PM Mar 18, 2018	0 2 2
Center Fre	eq 1.902500000	GHz	Cantar Frag 1.90360 Trig: Fras Run #Attan: 30 dB	0000 GHa Avg/Hald >60/60	Radio Stat None Radio Device: 815	Frequency
10 dB/div	Ref Offset 13.9 dl Ref 30.00 dBn]
20.0 10.0 10.0 10.0 30.0		/			a martin and a starting of the	Center Free 1.902500000 GH
10.0 10.0 10.0 Center 1.6					tipan 30 MHz	
Occup	ied Bandwidt	ь 3.505 MH	Total Po		Sweep 1 ms	3.000000 MH Auto Me
Transmit Freq Error 23.38		23.384 kł 14.82 Mł	tz % of OE		99.00 % 6.00 dB	Freq Offse 0 H
490				jen	7/8	

Band2_15MHz_16QAM_75_0_Main_LowCH18675-1857.5

Center Freq 1.857500000	GHz Carta	Free Dun Avg/Hald >1 1: 20 dB	Radio 514		Frequency
Ref Offset 13.9 dl 10 dB/div Ref 30.00 dBn					
100	personana	an a			Center Fre 1.857500000 GH
10.0 20.0 20.0			Laman		
40 0 90 0					
Center 1,858 GHz Res BW 300 kHz		VBW 910 kHz		n 30 MHz	CF Ste
Occupied Bandwidt	-	Total Power	29.1 dBm	rep 1 ms	3.000000 Mi Aula
	.488 MHz				FreqOffs
Transmit Freq Error	9.418 kHz	% of OBW Power	99.00 %		01
x dB Bandwidth	14.89 MHz	x dB	-26.00 dB		
			ana ana		

Band2_15MHz_16QAM_75_0_Main_MidCH18900-1880



Band2 15MHz 16QAM 75 0 Main HighCH19125-1902.5

Kaysight Spectrum.	Instyler - Occupied BW						0 2 2
Center Freq	1.902500000 0		mar Frag 1.902500000		Radio Std. N	ar 19,2019	Frequency
		1000	g: Free Bun Ave Men: 30 dB	Paid 50'50	Radio Device	BTS	
10 dB/div F	tef Offset 13.9 dB Ref 30.00 dBm						
20.0							Center Freq
0.00							
20.0 345,000,000	mand			~		·~~~~~	
0.0						_	
50.0 00.0							
Center 1,903 Res BW 300			#VBW 910 kHz			30 MHz p 1 ms	CF Step
Occupied	Bandwidth		Total Powe	tal Power 29.7 dBm		Auto Mar	
	13.	492 MHz					Freq Offse
Transmit F	req Error	7.898 kHz	% of OBW I	Power 9	9.00 %		0 H
x dB Band	width	14.86 MHz	x dB	-26	.00 dB		
90				10.40	va		

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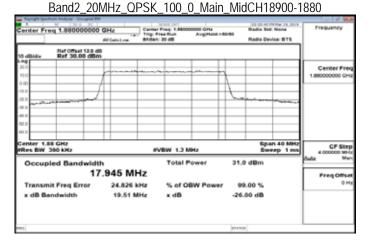
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Band2_20MHz_QPSK_100_0_Main_LowCH18700-1860

Center Freq 1.86000000	0 GHz Carta	Trig: Free Run Avg/Hand > 60/80			Frequency
Ref Offset 13.9 / Ref 30.00 dB					
100 000					Center Fre 1.850000000 GH
10.0 20.0 20.0	/		\		
eb 0 50.0 00.0					
Res BW 390 kHz		VBW 1.2 MHz	Sp. Sw	an 40 MHz reep 1 ms	CF Ste 4.000000 M
Occupied Bandwid	th 7.911 MHz	Total Power	30.5 dBm		Auto M
					Freq Offs 01
Transmit Freq Error x dB Bandwidth	20.540 kHz 19.45 MHz	% of OBW Power x dB	99.00 % -26.00 dB		
no.]			111110		



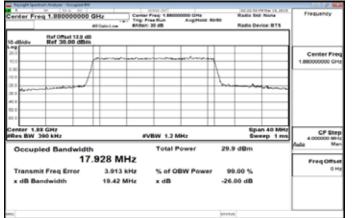
Band2 20MHz QPSK 100 0 Main HighCH19100-1900

Raynight Spect	trum Analyzer - Occupied INA			10000		0 2 2
enter Fre	eq 1.900000000		er Frag 1.90000000 GHz	Ratio	Stat None	Frequency
		#FGainLow #Atte	in: 20 dB	Radio	Device: BTS	
10 dB/div	Ref Offset 13.9 dl Ref 30.00 dBn					
200						Center Free
20		man		1 -	_	1.900000000 GH
		A		R I		
0.0				1 mar		
	man			have	- man	
1.0						
0.0						
enter 1.5 Res BW			VBW 1.2 MHz		pan 40 MHz weep 1 ms	CF Ste 4.000000 Mi
Occup	led Bandwidt	h	Total Power	30.8 dBm		Auto Ma
	17	.954 MHz				FreqOffs
Transm	it Freq Error	30.089 kHz	% of OBW Power	99.00 %		01
	andwidth	19.51 MHz	x dB	-26.00 dB		
				ananya.		

Band2 20MHz 16QAM 100 0 Main LowCH18700-1860

Raysight Spectrum Analyzer - Occupied IP	*	MAN IN	IN ALL OF THIS IS	0 2 8
enter Freq 1.86000000		Canter Freq 1.860000000 GHz Trig: Free Run Avg(Hald St Atten: 20 dB	Radio Std No.	ne Frequency
Ref Offset 13.9 d 0 dB/div Ref 30.00 dB/				
00 20 20				Center Fre 1.86000000 GP
0.0	4		Lanna	
0.0				
enter 1.86 GHz Res BW 300 kHz		#VBW 1.2 MHz	Span 4 Sweep	1 ms 4.000000 M
Occupied Bandwid		Total Power	29.4 dBm	Auto M
13	7.924 MHz			FreqOffs
Transmit Freq Error	17.963 kHz	z % of OBW Power	99.00 %	01
x dB Bandwidth	19.38 MH	z xdB	-26.00 dB	
-			01470.0	

Band2_20MHz_16QAM_100_0_Main_MidCH18900-1880



Band2 20MHz 16QAM 100 0 Main HighCH19100-1900

Kaynight Spect	trum Analyzer - Occupied BA		1	wa ne					0.00
Center Fre	eq 1.900000000	GHz	Cantar Frag 1.80000000 GHz Trig Frag Run Avg/Hald 5010				Radio Std. None		Frequency
		#FGainLow	BAden: 2	0 68			Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 dl Ref 30.00 dBn								
20.0									Center Freq
12.0		perman			Contraction of the local	\leftarrow			1.90000000 GHz
0.00		A I	-			۸			
-10.0						Jac			
10.0 Aug								m	
40.0									
50.0									
40.0		++	-						
Center 1.6 Res BW			#VI	#VBW 1.2 MHz				eep 1 ms	
Occup	ied Bandwidt	h		Total Por	ver	30.0	30.0 dBm		Auto Mer
	17	.955 MI	Hz						FreqOffset
Transm	it Freq Error	3.178	kHz	% of OBV	V Power	99	.00 %		0 Ha
x dB Be	indwidth	19.51 M	AHz.	x dB		-26.	00 dB		
						an an an			

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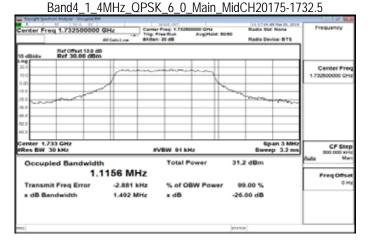
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Band4_1_4MHz_QPSK_6_0_Main_LowCH19957-1710.7

Keysight Spectrum Analyzer - Occupied BW			111 114 117 MP THE 20, 201	0 9 8
enter Freg 1.710700000 0		Freg 1.710700000 GHz	Radio Std None	 Frequency
	El Gaint.cm MAter	Free Bun Avg/Held 6 1: 20 dB	Radio Device: 815	
Ref Offset 13.9 dB 10 dB/div Ref 30.00 dBm				
000 20.0 10.0	-	man		Center Fre
0.00	1			
0.0				
0.0				
0.0				
0.0				
Res BW 30 kHz		VBW 91 kHz	Span 3 MH Sweep 3.2 m	CF Ste
Occupied Bandwidth		Total Power	31.1 dBm	Auto M
1.1	172 MHz			FreqOffs
Transmit Freq Error	-2.016 kHz	% of OBW Power	99.00 %	0)
x dB Bandwidth	1.489 MHz	x dB	-26.00 dB	
K0			37470B	



Band4 1 4MHz QPSK 6 0 Main HighCH20393-1754.3

Raysopher Speci	Anum Analyzer - Occupied BW			10.07.00.00104-00.0011	1012 1
enter Fr	eq 1.754300000	GHz Carrie	r Freig 1,754300000 GHz	Radio Std. None	Frequency
			Free Run Avg/Held 601 n: 30 dB	Radio Device: BTS	_
o dB/div	Ref Offset 13.9 dB Ref 30.00 dBm]
A					Center Free
20		- Prono			1.754300000 GH
20		A	- N.		
0.0	1	~		~~	
0.0	- Cont			Veran -	
				A COLORADO	
enter 1.2	754 CH2			Span 3 MHz	L
Res BW			VBW 91 kHz	Sweep 3.2 ms	300.000 kH
Occup	eled Bandwidt	h	Total Power	30.6 dBm	Auto Me
	1.1	1168 MHz			Freq Offs
Transm	nit Freq Error	-2.585 kHz	% of OBW Power	99.00 %	01
x dB Be	andwidth	1.570 MHz	x dB	-26.00 dB	
				ananua.	

Band4_1_4MHz_16QAM_6_0_Main_LowCH19957-1710.7

enter Freq 1.7107000	Trip	Free Run AvgPlate Bot 1: 20 dB	Radio Device: BTS	Frequency
Ref Offset 13 10 dB/div Ref 30.00 d	9 dll. 16m			
000 200 200 200				Center Fre 1.710700000 GH
00 mm			<u>}</u>	
0.0				
Res BW 30 kHz		WBW 91 kHz	Span 3 MHz Sweep 3.2 ms	CF Ste 300.000 ki
Occupied Bandw	idth 1.1154 MHz	Total Power	30.0 dBm	Freq Offs
Transmit Freq Error x dB Bandwidth	3.281 kHz 1.467 MHz	% of OBW Power x dB	99.00 % -26.00 dB	0)
n			anana.	

Band4_1_4MHz_16QAM_6_0_Main_MidCH20175-1732.5



Band4 1 4MHz 16QAM 6 0 Main HighCH20393-1754.3

Raysight Spect	rum Analyzer - Occupied BW				0 2 40
Center Fre	eq 1.754300000		Freig 1,754300000 GHz	Radio Std. None	Trequency
		THE THE	Free Run Avg/Held 8 1: 20 dB	Radio Device: BTS	
10 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm				
20.0		m			Center Free 1.754300000 GH
0.00		4			-
30.0 CMC	er and a second			- marce	2
50.0 00.0					
enter 1.7 Res BW			VBW 91 kHz	Span 3 M Sweep 3.2 r	Hz CF Ster
Occup	ied Bandwidth		Total Power	29.5 dBm	dula Me
		1134 MHz			Freq Offse
	it Freq Error	3.895 kHz	% of OBW Power		04
x dB Ba	indwidth	1.482 MHz	x dB	-26.00 dB	
90				314748	

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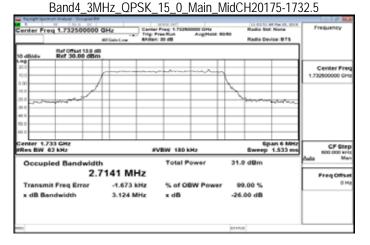
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and offenders may be prosecuted to the fullest extent of the law.



Band4_3MHz_QPSK_15_0_Main_LowCH19965-1711.5

Center Freq 1.711500000	Trip I	r Frag 1.711800000 GHz Frae Run Avg/Hald St h: 20 dB	Radio 514		Frequency
Ref Offset 13.9 dB 10 dB/div Ref 30.00 dBm					
200 100 0.00					Center Fre 1.711500000 GH
				~~~	
Res BW 62 kHz		VBW 180 kHz		an 6 MHz 1.533 ms	CF Ste
Occupied Bandwidth		Total Power	31.0 dBm		600.000 ki Auto Mi
Z.I Transmit Freq Error	2.024 kHz	% of OBW Power	99.00 %		Freq Offs 01
x dB Bandwidth	3.155 MHz	x dB	-26.00 dB		
			ana ana		



#### Band4 3MHz QPSK 15 0 Main HighCH20385-1753.5

Raysight Spect	Anum Analyzar - Occupied BW		I MARKE DWT				AT 154 20, 2018	0 2 0
Senter Fre	eq 1.753500000	GHz	Cantar Frag. 1.7	13500000 GHz		Radio Ste		Frequency
	-	#FGainLow	Trig: Free Run #Atten: 20 dB	Avg/Hald	60.60	Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 dl Ref 30.00 dBm							
200								Center Free
20		1			m –	-		1.753500000 GH
0.00	+ $+$ $/$	9		_	HN-	-		
0.0	+			_	$\mapsto$	-		
0.0	man				<u> </u>	ma	m	
						-		
						-		
0.0				-		-		
0.0				_		-		
enter 1.7						64	an 6 MHz	CF Ster
Res BW	62 kHz		#VBW 13	IÓ kHz		Sweep	1.533 ms	600.000 kH
Occup	eled Bandwidt	h	Tota	Power	30.	7 dBm		Auto Me
	2.3	7074 MH	iz					Freq Offse
Transm	nit Freq Error	-319	Hz % of	OBW Pow	er 9	9.00 %		0 H
	andwidth	3.179 M	Hz x dB		-26	00 dB		
10					jan an	19		

#### Band4_3MHz_16QAM_15_0_Main_LowCH19965-1711.5

enter Freq 1.7115000	Trip	Freq 1.711500000 GHz Free Run Avg/Held 80 1: 20 dB	Radio Stat P Radio Devic	None Fr	equency
Ref Offset 13. 10 dB/div Ref 30.00 d					
100 000					Center Fre
0.0 0.0 0.0			1	~~~.,	
0.0					
enter 1.712 GHz Res BW 62 kHz	··· · ·	VBW 180 kHz	Spa Sweep 1	n 6 MHz 533 ms	CF Ste
Occupied Bandw	dth 2.7195 MHz	Total Power	30.3 dBm	duda I	Ma Freq Offs
Transmit Freq Error x dB Bandwidth	-526 Hz 3.173 MHz	% of OBW Power x dB	99.00 % -26.00 dB		0.1
			87476		

#### Band4_3MHz_16QAM_15_0_Main_MidCH20175-1732.5



#### Band4 3MHz 16QAM 15 0 Main HighCH20385-1753.5

Kaysight Spart	rum Analyzer - Occupied BM		NAME OF		AT THE 25, 2013	0.0
Center Fre	rq 1.753500000	Ser in Trie	nar Frag 1.763600000 GHz Frag Run Avg/Hald 1 Ian: 30 dB	Radio St		Frequency
10 dB/div	Ref 0ffset 13.9 d Ref 30.00 dBn					
20.0 10.0 0.00		/ ******				Center Free 1.753500000 GH
20.0 N 0 N 0 N 0					,	
Center 1.7			#VBW 180 kHz		pan 6 MHz 1.533 ms	CF Ste
Occupi	ied Bandwidt 2.	h 7160 MHz	Total Power	29.8 dBm		Auda Me Freq Offse
	it Freq Error ndwidth	-873 Hz 3.199 MHz	% of OBW Power x dB	99.00 % -26.00 dB		0.1
90				87.4748		

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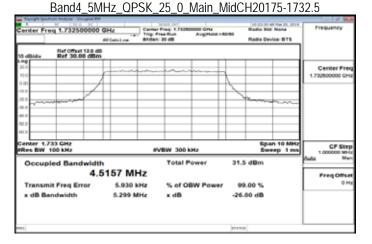
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## Report No.: T190304W05-RP Page 62 of 206

#### Band4_5MHz_QPSK_25_0_Main_LowCH19975-1712.5

1.7120000       000       000       000       000       000       000       000       000       000       000       000       000       000       000       000       000       000       000       000       000       000       000       000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       0000       00000       00000 <td< th=""><th>Center Freq 1.71</th><th>2500000 G</th><th>The Trip</th><th>far Freq 1.713500000 GHz Free Run Avg/Hald 8</th><th>Radio</th><th>on of the 20, 2011 Bull None</th><th>Frequency</th></td<>	Center Freq 1.71	2500000 G	The Trip	far Freq 1.713500000 GHz Free Run Avg/Hald 8	Radio	on of the 20, 2011 Bull None	Frequency
Center 1,713 GHz Gener 1,713 GHz Bires BW 100 kHz Cocupled Bandwidth 4,5175 MHz Transmit Freq Error 6.705 kHz % of OBW Power 99.00 %		ffset 13.9 dB	rGainLow MA	an: 22 88	Radio	Device: 015	
Center 1,713 GHz Res BW 100 kHz Cocupled Bandwidth 4.5175 MHz Transmit Freq Error 6.705 kHz % of OBW Power 99.00 %	200 100 0.00						Center Free 1.712500000 GH
Senser         1.713 GHz         Span 10 MHz         Span 10 MHz         CF           Res BW 100 kHz         svBw 300 kHz         Sweep 1 ms         4.0000         4.0000         4.0000         4.0000         4.0000         4.0000         4.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.0000         5.00000         5.00000         5.00000         5.00000         5.00000         5.00000         5.00000         5.00000         5.00000         5.00000         5.000000         5.000000         5.000000         5.000000         5.000000	20.0 20.0	~				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Occupied Bandwidth Total Power 31.1 dBm 44.5175 MHz Freq C	Center 1.713 GHz			208W 300 kHz			CF Ste
Transmit Freq Error 6.705 kHz % of OBW Power 99.00 %							1.000000 Mi Aulia Ma
		4.5	175 MHz				Freq Offse
							01
20 December 2010							



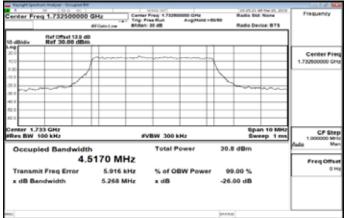
#### Band4 5MHz QPSK 25 0 Main HighCH20375-1752.5

Raysophe Spec	Anum Analyser - Decuginal BW				LO US NO WE WANT	8.80
enter Fr	eq 1.752500000	GHz C	anter Freq 1,783500 rig: Free Run	Avg/Hall# \$0/50	Radio Std Nor	
		#FGainLow B	Atten: 30 dB		Radio Device:	875
10 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm					
20						Center Fre
20						1.752500000 GH
0.00						_
10.0			_			_
20.0	and the second	+++			howing	-
× 1			_			4. MA
0.0		+++-				_
50.0						
60.0			_			
Center 1.3 Res BW			#VBW 300 ki	Hz	Span 10 Sweep	1 ms
Occup	eled Bandwidth	1	Total Po	wer 3	0.8 dBm	Auto Ma
	4.5	5166 MHz				FreqOffse
Transm	nit Freq Error	4.017 kHz	% of OB	W Power	99.00 %	0 H
x dB Br	andwidth	5.315 MHz	x dB	-3	6.00 dB	
00				in the second	008	

#### Band4_5MHz_16QAM_25_0_Main_LowCH19975-1712.5

Center Freq 1.7125	00000 GHz	Cantar Frag 1.712500000 GH Trig Frag Run Avg/H BAtten: 20 dB	# Ra	dio Std: None dio Device: 815	Frequency
10 dB/div Ref 30.	et 13.9 dB 00 dBm				
000	/		-		Center Fre 1.712500000 GH
0 0 0 0 0 0 0 0				~~~~~	
20 center 1,713 GHz				Span 10 MHz	CF Ste
Res BW 100 kHz		#VBW 300 kHz		Sweep 1 ms	1.000000 MP
Occupied Ban	dwidth 4.5164 M	Total Power	30.0 di	Im	Freq Offse
Transmit Freq E x dB Bandwidth			wer 99.00 -26.00		01
-			874708		

#### Band4_5MHz_16QAM_25_0_Main_MidCH20175-1732.5



#### Band4 5MHz 16QAM 25 0 Main HighCH20375-1752.5

Kaysight Spart	rum Analyser - Occupied B	w	Server and		AT 154 20, 2019	0.0	
Center Fre	q 1.75250000	GHz	mar Frag 1,782800000 GHz	Radio Str.		Frequency	
		All Gain Low MA	ten: 20 dB	Radio De	vice: BTS		
10 dB/div	Ref Offset 13.9 d Ref 30.00 dBr						
20.0						Center Free	
12.0	+ +	man				1.752500000 GH	
0.00		AL					
0.0				N			
	and the second				hand		
0.0							
0.0		++					
0.0		++					
enter 1.7 Res BW 1			FVBW 300 kHz	tip. Sw	eep 1 ms	CF Ste 1.000000 MH	
Occupi	ied Bandwid	th	Total Power	29.8 dBm		Auto Ma	
	4.	5138 MHz				Freq Offse	
Transm	it Freq Error	5.526 kHz	% of OBW Power	99.00 %		01	
x dB Ba	ndwidth	5.224 MHz	x dB	-26.00 dB			
PO				814798			

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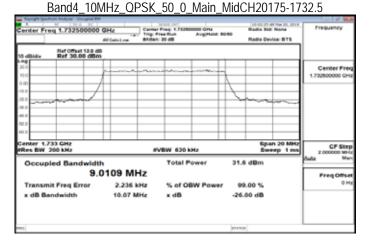
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## Report No.: T190304W05-RP Page 63 of 206

#### Band4_10MHz_QPSK_50_0_Main_LowCH20000-1715

Reysight Spectrum Analyzer - Occupied BW					0 2 5
enter Freg 1.715000000 (		Freq 1,718000000 GHz	Radio S	Millione 20, 2019	Frequency
	THE THE	Free Run Avg/Hald IS 1: 30 dB		evice: BTS	
Ref Offset 13.9 dB					
.0g 20.0					Center Fre
10.0					1.715000000 GH
0.00					
100			$\times$		
20.0 30.0			- man	· · · · · · · · · · · · · · · · · · ·	
0.0					
50.0					
0.0					
Res BW 200 kHz		VBW 620 kHz		an 20 MHz reep 1 ms	CF Ste
Occupied Bandwidth		Total Power	31.2 dBm		Auto Ma
	122 MHz				FreqOffs
Transmit Freq Error	6.613 kHz	% of OBW Power	99.00 %		• •
x dB Bandwidth	10.05 MHz	x dB	-26.00 dB		
ND			STATUS		



#### Band4 10MHz QPSK 50 0 Main HighCH20350-1750

Raysight Spec	trum Analyzer - Occupied BW		MANULANCE INC.		Toto and the set that post post	0 9 8
enter Fre	eq 1.750000000	GHz Care	Freq 1,78000000 GHz		Radio Std None	<ol> <li>Frequency</li> </ol>
			n: 20 dB	10 10	Radio Device: 815	_
0 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm					
<b>A9</b> X1 O						Center Fre
20		procession and second		1		1.750000000 GH
00				$\wedge$		
				+		
10	- martin				man and	
						1
						1
1.0						
enter 1.2					Span 20 MH	
tes BW			VBW 620 kHz		Sweep 1 m	CF Ste 2.000000 M
Occup	led Bandwidt	1	Total Power	31.0	dBm	Auto M
	9.0	0243 MHz				FreqOffs
Transm	it Freq Error	9.485 kHz	% of OBW Power	99.	00 %	01
x dB Ba	andwidth	10.01 MHz	x dB	-26.0	0 dB	
				in a num		
1				2004		

#### Band4_10MHz_16QAM_50_0_Main_LowCH20000-1715

Center Freq 1.71500000	Trip I	Frag 1.715000000 GHa Fras Run Avg/Hald 5 1: 20 dB	Radio 2nd		Frequency
Ref Offset 13.9 d 10 dB/div Ref 30.00 dB/					
200 100 0.00	/*************************************				Center Fre 1.715000000 GH
100 200 200 200 200 200 200 200 200 200			harris	~~~~	
50.0 00.0					
Center 1.715 GHz Res BW 200 kHz		VBW 620 kHz	Spa Swe	n 20 MHz Mp 1 ms	CF Str 2.000000 M
Occupied Bandwid 8	th 9736 MHz	Total Power	30.3 dBm		Aula M
Transmit Freq Error x dB Bandwidth	19.332 kHz 9.964 MHz	% of OBW Power x dB	99.00 % -26.00 dB		01
-			an an un		

#### Band4_10MHz_16QAM_50_0_Main_MidCH20175-1732.5



#### Band4 10MHz 16QAM 50 0 Main HighCH20350-1750

Kaysight Spectrum Analyzer - Occup	with the				0 2 2
Center Freq 1.750000		Freq 1.78000000 GHz	Radio St	MI THE 20, 2015	Frequency
	#FGainLow #Atter	Free Run Avg(Held)H 1: 30 dB		evice: BTS	
Ref Offset 13 10 dB/div Ref 30.00 d					
20.0	parrenteren				Center Freq 1.76000000 GHz
0.00	AL		$\wedge =$		
30.0 30.0 40.0			hours		
40.0 60.0					
Center 1.75 GHz Res BW 200 kHz		VBW 620 kHz		an 20 MHz veep 1 ms	CF Step
Occupied Bandw	idth 8.9845 MHz	Total Power	29.9 dBm		Auto Man
Transmit Freq Error	13.377 kHz	% of OBW Power			Freq Offset 0 Hz
x dB Bandwidth	9.920 MHz	x dB	-26.00 dB		
eo.			81A748		

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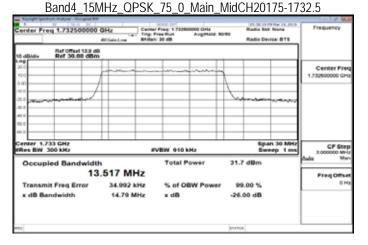
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#### Band4_15MHz_QPSK_75_0_Main_LowCH20025-1717.5

Raysoft Spectrum Analyzer - Occupied In	*	Manual and	lan ar as	PR No. 15, 2015	012 🖬
enter Freq 1.717500000	GHz Carta	Freq 1,717800000 GHz	Radio St		Frequency
		1: 30 dB		rvice: BTS	
Ref Offset 13.9 d 10 dB/div Ref 30.00 dBr					
200					Center Fre
10.0	-		N →		1.717500000 GH
0.00	AL L		R -		
10.0					
00 vanan arglaran			Manager and	and a strength of the state of	
0.0					
0.0					
10.0					
enter 1.718 GHz			50	an 30 MHz	
Res BW 300 kHz		VBW 910 kHz		reep 1 ms	CF Ste 3.000000 Mi
Occupied Bandwidt	th	Total Power	30.7 dBm		dude Mr
1:	3.444 MHz				Freq Offs
Transmit Freq Error	17.240 kHz	% of OBW Power	99.00 %		0,
x dB Bandwidth	14.74 MHz	x dB	-26.00 dB		
90			814708		



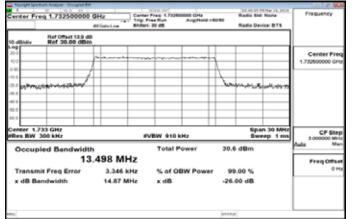
#### Band4_15MHz_QPSK_75_0_Main_HighCH20325-1747.5

Raynight Spec	Anum Analyzer - Occupied BA				0 2 2
enter Fr	eq 1.747500000		Preg 1,747800000 GHz	Radio Std. None	Frequency
		Al-GainLow BAtte	Free Run Avg/Held: 60/ n: 20 dB	Radio Device: B1	5
o dB/div	Ref Offset 13.9 dl Ref 30.00 dBn				
<b>00</b>					Center Fre
0.0		provident de service	www.www.www		1.747500000 GH
00		AI I			_
	+ $+$ $/$	·		$\downarrow$ $\vdash$	_
0.0	manuel				
1.0					
1.0					
enter 1.2 Res BW			VBW 910 kHz	Span 30 M Sweep 1	
Occup	ed Bandwidt	h	Total Power	31.3 dBm	Auto M.
	13	3.479 MHz			FreqOffs
Transm	nit Freg Error	39.060 kHz	% of OBW Power	99.00 %	0)
x dB Ba	andwidth	14.81 MHz	x dB	-26.00 dB	
o				annual	

#### Band4_15MHz_16QAM_75_0_Main_LowCH20025-1717.5

Center Freq 1.71750000	GHz Care	Pres Sun AvgPlant S n: 20 dB	Radio Int I		Frequency
10 dB/div Ref 30.00 dB/					
20.0 10.0	p	~~~~~			Center Fre 1.717500000 GH
100 200 200 200 200 200 200 200 200 200			marine	Auro	
to a				30 MHz	
Res BW 300 kHz		FVBW 910 kHz	Swee	p 1 ms	CF Ste 3.000000 Mi
Occupied Bandwid	th	Total Power	30.3 dBm		ula Ma
1:	3.453 MHz			Г	Freq Offs
Transmit Freq Error x dB Bandwidth	7.360 kHz 14.78 MHz	% of OBW Power x dB	99.00 % -26.00 dB	ŀ	0+
			17470.0		

#### Band4_15MHz_16QAM_75_0_Main_MidCH20175-1732.5



#### Band4 15MHz 16QAM 75 0 Main HighCH20325-1747.5

Kaynight Spectre	um Analyzer - Occupied BA						0 2 2
Center Fre	g 1.747500000	GHz	Center Freig 1,747500000 GH		Ratio Int No		Frequency
			Inig: Free Bun Avg/H Men: 30 dB	Mail# 60/60	Radio Device	BTS	
10 dB/div	Ref Offset 13.9 dl Ref 30.00 dBn	8					
22.0				-			Center Freq
10.0							1.747500000 GH
10.0	/						
20.0	Remand	+++		- No.	mar	1-110	
0.0						-	
0.0							
0.0		+++				_	
enter 1.74			EVEW 910 kHz		Span 3		CF Ste
	ed Bandwidt	h	Total Power	30.1	dBm		3.000000 MH Aulia Me
o coup.		.464 MH					FreqOffse
Transmi	it Freq Error	14.264 kH	z % of OBW Po	wer 99	.00 %		01
x dB Bar	ndwidth	14.80 MH	z xdB	-26.0	00 dB		
90				3147/8			

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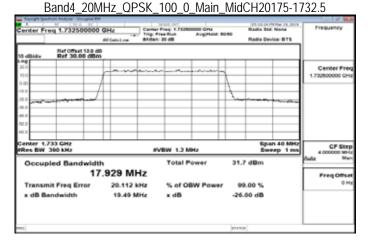
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#### Band4_20MHz_QPSK_100_0_Main_LowCH20050-1720

Center Freq 1.72000000	Trip I	r Frag 1,720000000 GHz Frag Bun Avg/Hald H 1: 20 dB	Radio St	rithe 15,203 d: None rvice: BTS	Frequency
Ref Offset 13.9 10 dB/div Ref 30.00 dB	5B				
100 000		****			Center Fre 1.720000000 GH
0.0 0.0 0.0 0.0	4		1		
10 0 0 0 0 0					
enter 1.72 GHz Res BW 390 kHz		VBW 1.2 MHz		an 40 MHz Heep 1 ms	CF Str 4.000000 M
Occupied Bandwid	th 7.891 MHz	Total Power	31.3 dBm		Freq Offs
Transmit Freq Error x dB Bandwidth	27.510 kHz 19.45 MHz	% of OBW Power x dB	99.00 % -26.00 dB		01
an.			an an an		



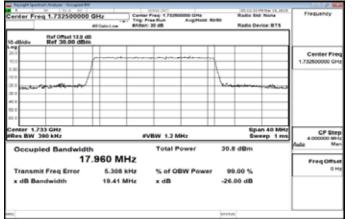
#### Band4 20MHz QPSK 100 0 Main HighCH20300-1745

Hum Analyzer - Occupied B	*	1 mars and			0 2 2
eq 1.745000000		Center Freig 1,74500		Radio Std None	<ol> <li>Frequency</li> </ol>
	#FGainLow	Aften: 20 dB	Villian man	Radio Device: 815	_
					Center Fre
+ +	m		- Annual		1.745000000 GH
+ +	/1 +				
					1
marsuren				and a state of the	
	+++				-
+ +	+++				-
745 GHz		AVEN 12M			
	th				4.00000 M
					FreqOffs
		-	W Power	99.00 %	01
	10.40 814			0.00 00	
	Ref 0754 133 d Ref 0754 133 d Ref 0754 133 d Ref 30.00 dBr	eq 1.745000000 GHz Bit of the second	eq 1.745000000 GHz BFGalature Ref 0.09 dHz Ref 30.09 dHz Ref 3	eg 1.745000000 GHz Billowicza Ref 300 gBm Ref 30 gB	en 1.745000000 GHz en 1.745000000 GHz en 1.745000000 GHz en 1.745000000 GHz en 1.745000000 GHz Ref 30.00 GBm Ref 30.00 GBm Fer 30.00 G

#### Band4 20MHz 16QAM 100 0 Main LowCH20050-1720

enter Freq 1.72000000	GHz Carta	r Frag 1.72000000 GHz Frag Run Avg/Hald > 5 1: 20 dB	Radio 5	evice: BTS	Frequency
Ref Offset 13.9 dl 10 dB/div Ref 30.00 dBm					
200 100					Center Fre 1.720000000 GH
0.0					
10 maria and a second for a second			- Manuras		
0.0	++	+ + +			
0.0					
enter 1.72 GHz Res BW 390 kHz		VBW 1.2 MHz		an 40 MHz weep 1 ms	CF Str.
Occupied Bandwidtl	1	Total Power	30.4 dBm		Auto M
17	.918 MHz				Freq Offs
Transmit Freq Error	10.808 kHz	% of OBW Power	99.00 %		01
x dB Bandwidth	19.34 MHz	x dB	-26.00 dB		
			10000		

#### Band4_20MHz_16QAM_100_0_Main_MidCH20175-1732.5



#### Band4 20MHz 16QAM 100 0 Main HighCH20300-1745

Raysight Spectr	um Analyser - Occupied BW		MANU INC.		5.1.3.50 PM Mar 18		2	
Center Fre	q 1.745000000	GHz Canter Freq 1,745000000 GHz Trig: Free Run Avg/Held 5010			dio Stat Name dio Device: 81	Freque	Frequency	
10 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm							
20.0				1		Cent 1.745000	er Freq 000 GHz	
-10.0 -30.0 -30.0	manum				national.			
40.0 90.0 60.0								
Center 1.7			#VBW 1.2 MHz		Span 40 f Sweep 1		F Step	
Occupi	ied Bandwidth 17	h .924 MHz	Total Power	30.3 di	Bm	Auto Fran	Offse	
	it Freq Error ndwidth	26.320 kHz 19.35 MHz	% of OBW Powe	er 99.00 -26.00			0 Hz	
490				814748				

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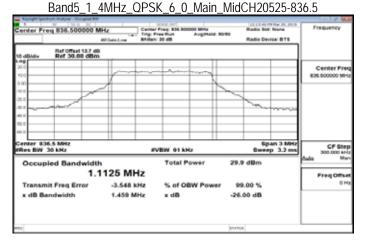
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#### Band5_1_4MHz_QPSK_6_0_Main_LowCH20407-824.7

Congred WV				0128
00000 MHz	Cantler	Freis: 824.700000 MHz	Radio End None	Frequency
#F Gal			Radio Device: BTS	_
et 13.7 dB 00 dBm				
		man		Center Fre
				-
1			And and sold	~
				-
				1
	#V	BW 91 kHz		CP Ste 300.000 ki
dwidth		Total Power	30.2 dBm	Auto M.
1.114	5 MHz			Freq Offs
rror -	2.436 kHz	% of OBW Power	99.00 %	0)
1	.467 MHz	x dB	-26.00 dB	
			1014/101	
	dwidth 1.114	dwidth 1.1145 MHz reconstruction 1.1145 MHz reconstruction 1.1145 MHz reconstruction 1.2436 kHz	Const Prog Ed. Josoco Minu arcanica de dem et 13.7 cm et 13.7	dwidth Total Power 30.2 dBm t.1145 MHz rror -2.436 kHz % of OBW Power 99.00 % 1.467 MHz x dB -26.00 dB



#### Band5 1 4MHz QPSK 6 0 Main HighCH20643-848.3

Raysight Spect	Inum Analyzer - Occupied BW				THE REAL PROPERTY AND ADDRESS	0.12 🖬
enter Fre	eq 848.300000 M	Trig	er Freig Ball 300000 Mirks Freis Rum Avg/Pati en: 30 dB	6 60/60	Radio Std. None Radio Device: BTS	Frequency
0 dB/div	Ref 30.00 dBm					]
x10 10.0		Jan-				Center Free 848.300000 MH
0.0		1 +		~	Partition and the second	
0.0						
enter 84 Res BW			FVBW 91 kHz		Span 3 MHz Sweep 3.2 ms	300.000 kH
Occup	ied Bandwidti 1.1	h 1139 MHz	Total Power	29.	9 dBm	Freq Offse
	hit Freq Error andwidth	-4.161 kHz 1.515 MHz	% of OBW Pow x dB		9.00 % .00 dB	0.1
				anan.		

#### Band5 1 4MHz 16QAM 6 0 Main LowCH20407-824.7

Center Freq 824.700000 M	ter Trip	Free B24.700000 Mins Free Run Avg(Plant: 50 1: 20 dB	12 14 54 79 Mar 20, 2019 Radio Sul None Radio Device: BTS	Frequency
Ref Offset 13.7 dB 10 dB/div Ref 30.00 dBm				]
000 100 0.00				Center Fre 824.700000 Mi
			mone	
enter 824.7 MHz			Span 3 MHz	
Res BW 30 kHz		VBW 91 kHz	Sweep 3.2 ms	300.000 ki
Occupied Bandwidth	138 MHz	Total Power	29.3 dBm	Auto Mi
Transmit Freq Error x dB Bandwidth	3.876 kHz 1.471 MHz	% of OBW Power x dB	99.00 % -26.00 dB	Freq Offs 01
			874/9/B	

#### Band5_1_4MHz_16QAM_6_0_Main_MidCH20525-836.5



#### Band5_1_4MHz_16QAM_6_0_Main_HighCH20643-848.3

Raysight Spect	rum Analyzer - Occupied BW				0 2 🖬
enter Fre	9 848.300000 N		Freig BAB 300000 Minta	Radio Std No	
		Ali Gain Low MAtter	Free Burk Avg(Held.> 1: 30 dB	Radio Device:	875
10 dB/div	Ref Offset 13.7 dB Ref 30.00 dBm				
200 100					Center Free 848.300000 MH
0.0		4 –			_
					Chan.
0.0					
enter 841					
Res BW			VBW 91 kHz	Span Sweep 3	300.000 kH
Occup	ied Bandwidth		Total Power	29.0 dBm	Auto Ma
	1.1	152 MHz			FreqOffse
Transm	it Freq Error	2.616 kHz	% of OBW Power	99.00 %	0 H
x dB Ba	ndwidth	1.482 MHz	x dB	-26.00 dB	
0				101470.0	

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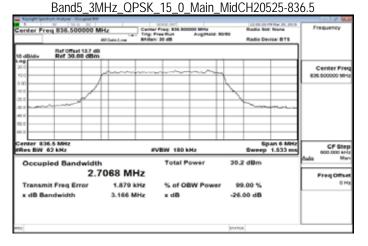
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#### Band5_3MHz_QPSK_15_0_Main_LowCH20415-825.5

enter Freq 825.500000	Trip I	Frag 826,800000 Minu Fras Run Avg/Hald 50 1: 20 dB	Radio Int.		Frequency
Ref Offset 13.7 d Ref 30.00 dB/	10 70				
000					Center Fre 825.500000 MH
00 00 80			\	~~~~	
0 0 0 0					
enter 825.5 MHz Res BW 62 kHz		VBW 180 kHz		in 6 MHz 1.533 ms	CF Ste 600.000 ki
Occupied Bandwide 2.	th 7065 MHz	Total Power	30.8 dBm		FreqOffs
Transmit Freq Error x dB Bandwidth	1.391 kHz 3.131 MHz	% of OBW Power x dB	99.00 % -26.00 dB		0+
			ananan l		



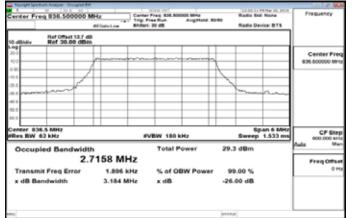
#### Band5 3MHz QPSK 15 0 Main HighCH20635-847.5

Raysight Spect	Anum Analyzer - Occupied BW		MANU AND			2 400 55 PM Har		0 2 2
enter Fre	eq 847.500000 N	AHz S	Center Freq 847.600		18.4	adia Stat Nor		Frequency
		#FGainLes 1	Mitten: 30 dB	Avg/Hald 50	** R/	dio Device:	BTS	
10 dB/div	Ref Offset 13.7 dB Ref 30.00 dBm							
200								Center Free
10.0		Anne	~~~~~	m	-			847.500000 MH
0.00		4			$\leftarrow$	_		
10.0		+++			$\rightarrow +$		_	
20.0		+++	_		<u> </u>	-	_	
10.0						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~	
40.0		+++		+ ++			_	
50.0		+++	_				_	
40.0		+++	_				_	
enter 84						Span		CF Ste
Res BW	62 kHz		#VBW 1801	kHz	5	weep 1.5		600.000 kH
Occup	ed Bandwidt	h	Total P	ower	30.3 di	Bm	- P	ulia Mar
	2.7	7065 MH2					- Г	Freq Offse
Transm	nit Freq Error	-1.602 kH	z % of Q	BW Power	99.00	5 %	- 1	0 H
x dB Ba	andwidth	3,158 MH	z xdB		-26.00	dB	- 1	
90					STATUS.			

#### Band5_3MHz_16QAM_15_0_Main_LowCH20415-825.5

Center Freq 825.50000	0 MHz Carts	Freq 826.500000 Mine Free Run Avg/Held 50 h: 20 dB	Radio Ind		Frequency
Ref Offset 13. Ref 30.00 d					
200 100	/*****				Center Fre 825.500000 MH
			have		
50.0 Co.0 Center 825.5 MHz				an 6 MHz	
Res BW 62 kHz		VBW 180 kHz		1.533 ms	CF Ste 600.000 ki
Occupied Bandwi	dth 2.7168 MHz	Total Power	29.8 dBm		Freq Offs
Transmit Freq Error x dB Bandwidth	1.733 kHz 3.162 MHz	% of OBW Power x dB	99.00 % -26.00 dB		0+
-			874708		

#### Band5_3MHz_16QAM_15_0_Main_MidCH20525-836.5



#### Band5 3MHz 16QAM 15 0 Main HighCH20635-847.5

Raysight Spect	trum Analyzer - Occupied BN							_	0 2 10
Center Fre	eq 847.500000 M	AHz	Canter Freig 847.8		18 al	dia 51d	None	Fn	equency
		#FGainLow	Trig: Free Run BAtten: 30 dB	Avg/Hald: BC		dia Dev	ice: BTS		
10 dB/div	Ref Offset 13.7 dl Ref 30.00 dBm	1							
20.0		/							enter Freq 500000 MHs
0.00					<u> </u>				
20.0 x coloritik 40.0	and the second					·····			
50.0				+ +					
enter 842 Res BW (			#VBW 180	kHz	Sv		an 6 MHz 1.533 ms		CF Ste
Occup	ied Bandwidt	h 7200 MH		Power	29.4 de	Im		Auto	Ma
	it Freq Error	-2.984 k	Hz % of C	BW Power	99.00			Ľ	Veq Offse 0 H
x dB Ba	indwidth	3.147 M	Hz xdB		-26.00	an			
10					314749				

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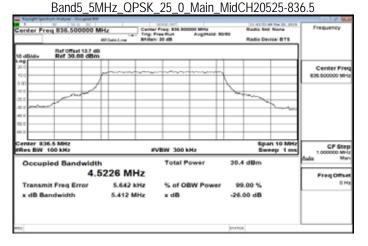
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#### Band5_5MHz_QPSK_25_0_Main_LowCH20425-826.5

Asysget Spectrum Analyzer - Docupied BV A NY NO C		MARK INC.	11.41.21.00	
Senter Freq 826.500000	Trip I	r Frank 828,500000 Mirks Frank Rum Avg(Plank 50 1: 20 dB	Radio Stat No Radio Device	
Ref Offset 13.7 d	8		Hadro Device.	<u> </u>
100 100	; /			Center Fre 826.500000 MP
0.0 0.0 0.0			James Contraction	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
enter 826.5 MHz Res BW 100 kHz		VBW 300 kHz	Span 1 Sweep	1 ms 1.000000 Mi
Occupied Bandwidt	^ь 5241 MHz	Total Power	30.7 dBm	Freq Offs
Transmit Freq Error	6.479 kHz	% of OBW Power		0)
x dB Bandwidth	5.377 MHz	x dB	-26.00 dB	
			anana -	



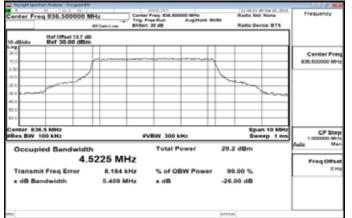
#### Band5 5MHz QPSK 25 0 Main HighCH20625-846.5

Raysight Spec	Anum Analyzer - Occupied BW		MANA AND		100		012.00
enter Fr	eq 846.500000 N	Hz .	Center Freq 846.8 Trig: Free Run	Avg/Hald: 50	Ra	Radio Ind None Frequen	
		#FGainLow	#Atten: 20 dB	Augment to		dio Device: BTS	
o dB/div	Ref Offset 13.7 dB Ref 30.00 dBm						
00 00							Center Fre 845.500000 MH
00	+ $+$	1			+		
1.0	-market				~~~		
1.0 00000	~					-	
0.0							
enter 84 Res BW			#VBW 300	kHz		Span 10 MHz Sweep 1 ms	CF Ste 1.000000 Mi
Occup	eled Bandwidth	1	Total	Power	30.3 de	Im	Auto Ma
	4.5	5208 MH	iz				Freq Offse
Transm	nit Freq Error	-18	Hz % of C	BW Power	99.00	*	0 H
x dB Ba	andwidth	5.366 M	Hz xdB		-26.00	di	
9					314393		

#### Band5 5MHz 16QAM 25 0 Main LowCH20425-826.5

Center Freq 826.500000	MHz Carta	Frag 826.800000 Mine Frag 826.800000 Mine Frag Run Avg/Hald 80 h: 20 dB	Radio Device: BTS	Frequency
Ref Offset 13.7 / Ref 30.00 dB				
20.0 10.0 0.00	parmente			Center Fre 826.500000 MP
00 00 00 00 00 00				
0 0 0 0				
Res BW 100 kHz		VBW 300 kHz	Span 10 MHz Sweep 1 ms	1.000000 M
Occupied Bandwid	5206 MHz	Total Power	29.7 dBm	Freq Offs
Transmit Freq Error x dB Bandwidth	8.628 kHz 5.408 MHz	% of OBW Power x dB	99.00 % -26.00 dB	0)
			anama .	

#### Band5_5MHz_16QAM_25_0_Main_MidCH20525-836.5



#### Band5 5MHz 16QAM 25 0 Main HighCH20625-846.5

Kaynight Spectr	rum Analyzer - Occupied BY	·				E E
Center Fre	g 846.500000 l	MHz Care	ter Freig Ball 800000 Mirts	Radio St	et har 20, 2019.	Frequency
		THE THE	Free Run Avg(Hold: 6 en: 20 dB		vice: BTS	
10 dB/div	Ref Offset 13.7 d Ref 30.00 dBn					
20.0						Center Freq
10.0		mana	~	+		846.500000 MHz
0.00		AL L		K I		
-10.0 -20.0	m			Jona Maria		
				No.	man	
40.0					P	
50.0						
40.0						
Center 840 Res BW			FVBW 300 kHz		an 10 MHz eep 1 ms	CF Step 1.000000 MHz
Occupi	ied Bandwidt	h	Total Power	29.3 dBm		Auto Mer
	4.	5153 MHz				Freq Offse
Transm	it Freq Error	3.741 kHz	% of OBW Power	99.00 %		0 Ho
x dB Ba	ndwidth	5.364 MHz	x dB	-26.00 dB		
90				874708		

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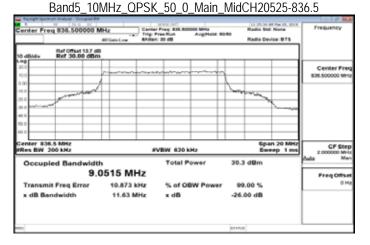
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## Report No.: T190304W05-RP Page 69 of 206

#### Band5_10MHz_QPSK_50_0_Main_LowCH20450-829

Center Freq 829.0000	00 MHz Care	Free Bun Avg/Hald St 12 20 00000 MHz Free Bun Avg/Hald St 11 20 dB	Radio Device	ne Frequency
Ref Offset 53 10 dB/div Ref 30.00				
100	Jamashan	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Center Fre 829.000000 MH
10.0 20.0	~		Joner -	
0.0				
0.0		+ + +		
enter 829 MHz Res BW 200 kHz		WBW 620 kHz	Span 2 Sweep	1 ms 2.000000 MP
Occupied Bandw		Total Power	30.5 dBm	Auto M
	9.0379 MHz		00.00 F	Freq Offs
Transmit Freq Erro x dB Bandwidth	1.129 kHz 10.99 MHz	% of OBW Power x dB	99.00 % -26.00 dB	
-			anana -	



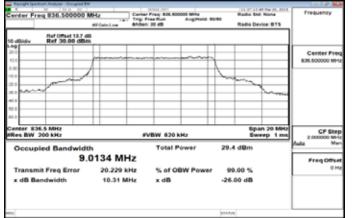
#### Band5 10MHz QPSK 50 0 Main HighCH20600-844

Raysight Spect	trum Analyzer - Occupied BV	· .	1 more and				0 9 1
enter Fre	eq 844.000000 I		anter Freq 844.000000 rig: FreeBun Av	gHale 6010	Radio Device		requency
0 dB/div	Ref Offset 13.7 d Ref 30.00 dBn	8			Paters Derive		
00 00		-		~~~			Center Fre
00	manand				som a		
			_				
1.0							
enter 84 les BW			#VBW 620 kHz			20 MHz 2 1 ms	CF Ste 2.000000 Mi
Occup	ied Bandwidt 9,	հ 0206 MHz	Total Pow	er 30	).2 dBm	Auto	FreqOffs
	iit Freq Error andwidth	11.279 kHz 10.71 MHz			99.00 % 6.00 dB		01
				100	7/8		

#### Band5 10MHz 16QAM 50 0 Main LowCH20450-829

enter Freq 829.000000 N		Frag 825.00000 MHz Prag 825.000000 MHz Prag Run Avg/Hald: 60 1: 20 dB	Radio Ind		Frequency
Ref Offset 13.7 dB 0 dB/div Ref 30.00 dBm					
000 200 100	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				Center Fre 829.000000 MH
0.0 0.0			-		
0.0				and an and the second	
0.0					
enter 829 MHz Res BW 200 kHz		VBW 620 kHz	tpa Swe	n 20 MHz Mp 1 ms	CF Str 2.000000 M
Occupied Bandwidth	1	Total Power	29.9 dBm		Auto M
8.8	9947 MHz				Freq Offs
Transmit Freq Error	8.199 kHz	% of OBW Power	99.00 %		01
x dB Bandwidth	10.26 MHz	x dB	-26.00 dB		
			111110		

#### Band5_10MHz_16QAM_50_0_Main_MidCH20525-836.5



#### Band5_10MHz_16QAM_50_0_Main_HighCH20600-844

Kaysight Spectrum Analyzer - O	coupled BW			0 2 2
Center Freq 844.00	VVVV MITSE	ter Pres BLL 00000 Minu Pres Run Avg/Paid 50 en: 20 dB	Radio Soli None Radio Device: BTS	Frequency
Ref Offse 10 dB/div Ref 30.0	1 13.7 dB 00 dBm			
10.0				Center Freq 844.000000 MHz
100 30.0 30.0			man more	
40.0 50.0 40.0				
Center 844 MHz IRes BW 200 kHz		FVBW 620 kHz	Span 20 MHz Sweep 1 ms	2.000000 MHz
Occupied Ban	dwidth 8.9776 MHz	Total Power	29.4 dBm	dada Men
Transmit Freq Er x dB Bandwidth		% of OBW Power x dB	99.00 % -26.00 dB	Freq Offset 0 Hz
M9G			annus -	

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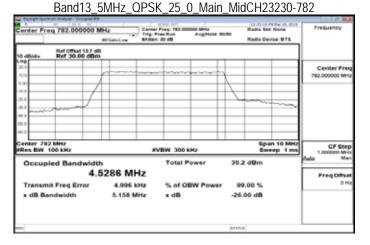
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#### Band13_5MHz_QPSK_25_0_Main_LowCH23205-779.5

enter Freq 779.500000	MHz Carta	Free Tun Avg/Hald St	Radio 514		Frequency
Ref Offset 13.7 d 10 dB/div Ref 30.00 dBn					
000 20.0 20.0					Center Fre 779.500000 M
	,		1	·~~~	
0.0					
enter 779.5 MHz Res BW 100 kHz	·· · ·	VBW 300 kHz		n 10 MHz Mp 1 ms	CF Str 1.000000 M
Occupied Bandwidt		Total Power	30.2 dBm		Auto M
	4774 MHz				Freq Offs
Transmit Freq Error x dB Bandwidth	21.212 kHz 5.106 MHz	% of OBW Power x dB	99.00 % -26.00 dB		0,
			ana ana		



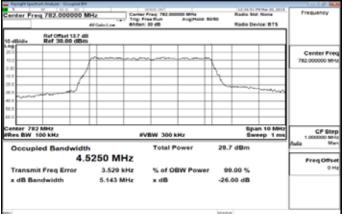
#### Band13 5MHz QPSK 25 0 Main HighCH23255-784.5

Raynight Spec	Anum Analyzer - Occupied BW				1.2 33 39 79 19		012 00
Center Fr	eq 784.500000 N		Center Free 764.600 Trig: Free Run 6Aften: 30 dB	Avg/Halid 80/80	Radio Std No Radio Device	ine P	requency
10 dB/div	Ref Offset 13.7 dB Ref 30.00 dBm						
20.0 10.0							Center Free
10.0 20.0 30.0 40.0	manuel				James of the second	~~~~	
40.0 60.0							
Center 78 IRes BW			#VBW 300 k	lHz	tipan t Sweep		CF Step
Occup	eled Bandwidth 4.5	5058 MH	Total P	ower 3	0.3 dBm	Auto	Me Freq Offse
	hit Freq Error andwidth	8.753 kH 5.111 MH		BW Power	99.00 % 26.00 dB		0 H
PPG				je je	A70.0		

#### Band13_5MHz_16QAM_25_0_Main_LowCH23205-779.5

enter Freq 779.500	Trian Trian	Harr Frang 778.800000 Mirks gi Fran Rum Avg(Hald S tan: 30 dB	Radio Devic	None Frequ	uency
Ref Offset 10 dB/div Ref 30.00					
000		m			ter Fre
0.0	<i>/</i>		Amount		
enter 779.5 MHz Res BW 100 kHz		#VBW 300 kHz	Span Swee		CF Str
Occupied Band		Total Power	29.1 dBm	Auto	M
	4.4784 MHz			Fre	iq Offs
Transmit Freq Err	or 17.211 kHz	% of OBW Power	99.00 %		01
x dB Bandwidth	5.063 MHz	x dB	-26.00 dB		
-			11110		

#### Band13_5MHz_16QAM_25_0_Main_MidCH23230-782



#### Band13_5MHz_16QAM_25_0_Main_HighCH23255-784.5

Kaysight Spe	drum Analyzer - Occupied B	N		No. 197				PN Mar 20, 20		9
Center Fr	eq 784.500000	MHz		Tel: 784.8000	OD MINU Available B		Radio Std. None		Frequ	ency
		#FGainLow	BAden: 2	10 dB			Radio De	vice: BTS	_	
10 dB/div	Ref Offset 13.7 d Ref 30.00 dBr									
20.0									Cerr	ler Freq
12.0		how				$\leftarrow$	-	-	784.500	000 MH
0.00		<u>л —</u>	-			<u>₹</u>	-	-		
10.0 20.0	/	++	-			H\	-	-	1	
20.0 30.0	manut									
0.0								-	~	
90.0						-				
60.0						-	-	-		
enter 78						-		an 10 MH		CF Step
Res BW	100 kHz		#VI	BW 300 kF	42		Sw	eep 1m		000 MH
Occup	oled Bandwid	th		Total Po	wer	29.3	3 dBm		Challe .	Mar
	4.	5073 M	Hz						Fre	q Offse
Transm	nit Freq Error	11.580	kHz	% of OB	W Power	91	9.00 %			0 Ht
x dB B	andwidth	5.119	MHz	x dB		-26	00 dB			
90						31404	9			

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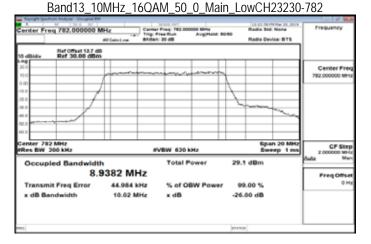
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## Report No.: T190304W05-RP Page 71 of 206

#### Band13_10MHz_QPSK_50_0_Main_LowCH23230-782

Center Fre	q 782.000000 M	Trip I	Frag 782,000000 Minu Fras Run Avg/Hald St 1: 20 dB	Radio	Device: BTS	Frequency
10 dB/div	Ref Offset 13.7 dll Ref 30.00 dlBm					
200						Center Fre 782.000000 MH
0.0 0.0 0.0				\		
0.0					_	
enter 782 Res BW 2			VBW 620 kHz	6	pan 20 MHz weep 1 ms	CF Str 2.000000 M
Occupi	ed Bandwidti 8.1	h 9568 MHz	Total Power	30.1 dBm		Freq Offs
Transmi x dB Bar	it Freq Error ndwidth	44.509 kHz 9.892 MHz	% of OBW Power x dB	99.00 % -26.00 dB		01
				anama .		



#### Band17 5MHz QPSK 25 0 Main LowCH23755-706.5

Raynight Spe	drum Analyzer - Occupied BW				102 (21-31 PM PM 20-20)	0 9 🖬
enter Fr	eq 706.500000 N	Trans Tr	unter Frag: 706.800000 MI	Na Phane > 60.10	Radio Std None Radio Device: 815	Frequency
o dB/div	Ref 0ffset 13.7 dll Ref 30.00 dlBm					
20.0 10.0 0.00						Center Free 705.500000 MH
10.0 20.0 20.0 20.0 20.0						
50.0 00.0					Epan 10 MH	
Res BW			#VBW 300 kHz		Sweep 1 m	1.000000 MH
Occup	ied Bandwidti 4.5	5292 MHz	Total Power	r 30	.8 dBm	Freq Offse
	nit Freq Error andwidth	9.952 kHz 5.559 MHz	% of OBW F x dB		9.00 % 5.00 dB	он
00				10.00	va	

#### Band17_5MHz_QPSK_25_0_Main_MidCH23790-710

Center Freq 710.000000	Trip	r Frag 710.000000 Minta Frae Run Avg/Hald St h: 20 dB	Radio 2nd		Frequency
Ref Offset 13.7 10 dB/div Ref 30.00 dB					
20 0 10 0 0 00	/				Center Fre 710.000000 MH
0.0 0.0 0.0				\	
40.0					
50.0					
Res BW 100 kHz		VBW 300 kHz	Spa Swe	n 10 MHz wp 1 ms	CF Ste 1.000000 M
Occupied Bandwid		Total Power	31.0 dBm		Auto Ma
4	.5260 MHz				FreqOffs
Transmit Freq Error	-337 Hz	% of OBW Power	99.00 %		01
x dB Bandwidth	5.519 MHz	x dB	-26.00 dB		
			10000		

#### Band17_5MHz_QPSK_25_0_Main_HighCH23825-713.5

Raysight Spectrum Analyzer - Occu	pied BW	MANU INC.	100 30 30 PM Mar 20	0.2
Center Freq 713.5000	Tria	nar Franji 713.800000 Mirka Fran Rum Avg(Plaid B an: 30 dB	Radio Std None	Frequency
Ref Offset 1 10 dB/div Ref 30.00	3.7 dB dBm			
20.0 10.0				Center Free 713.500000 MH
10.0 20.0 20.0	-		-	
0.0				
Colorer 713.5 MHz		EVEW 300 kHz	Span 10	
Occupied Bandy	vidth	Total Power	30.8 dBm	1.000000 MH
	4.5442 MHz			Freq Offse
Transmit Freq Erro	r -8.599 kHz	% of OBW Power		0 H
x dB Bandwidth	5.581 MHz	x dB	-26.00 dB	
			1117.0	

#### Band17 5MHz 16QAM 25 0 Main LowCH23755-706.5

Raysight Spectry	um Analyzer - Occupied BV	·					0 2 2
Center Fre	q 706.500000 I	MHz	Cantar Frag 708.80 Trig: Frag Run	Avg/Hald 50	Radio 5	179 Har 20, 2019 Mil None	Frequency
		#FGainLow	#Atten: 20 dB	Augusta au		evice: BTS	
10 dB/div	Ref Offset 13.7 d Ref 30.00 dBn	8					
20.0							Center Fre
0.0		horne		- marine			706.500000 MH
0.00							
0.0					- and	<u> </u>	
0.0 4479044	1					have	
0.0							
0.0							
enter 706	5 MHz				for the second se	an 10 MHz	
Res BW 1			#VBW 300	kHz		weep 1 ms	CF Ste 1.000000 MH
Occupi	ed Bandwidt	h	Total	Power	29.8 dBm		Auto Ma
	4.	5337 MH	iz				Freq Offse
Transmit	t Freq Error	12.835 ki	Hz % of C	BW Power	99.00 %		01
x dB Bar	ndwidth	5.611 M	Hz xdB		-26.00 dB		
9)					87A7V8		

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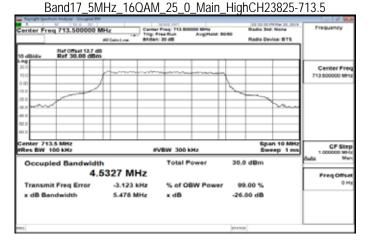
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## Report No.: T190304W05-RP Page 72 of 206

#### Band17_5MHz_16QAM_25_0_Main_MidCH23790-710

Raysight Spectrum Analys	er - Occupied #W					0 2 4	
enter Freq 710	.000000 MH		Pres 710.000000 Minu	Radio Ind	Radio Stat None Frequency		
		THE THE	Free Run Avg(Held: 50 h: 20 dB	Radio Dev	ice: BTS		
Ref 0	fiset 13.7 dB 30.00 dBm						
<b>69</b>						Center Fre	
0.0	$\rightarrow$	-				710.000000 M	
00		+ + -	+ + +				
0.0	min			man a			
0.0					have		
0.0							
0.0		+ + -					
enter 710 MHz Res BW 100 kH	,	· · · ·	VBW 300 kHz		n 10 MHz Mp 1 ms	CF St	
Occupied B	andwidth		Total Power	29.8 dBm		Auto M	
		219 MHz				Freq Offs	
Transmit Freq	Error	5.474 kHz	% of OBW Power	99.00 %		0	
x dB Bandwid	ith	5.514 MHz	x dB	-26.00 dB			
				ana na			
				and a second sec			



#### Band17 10MHz QPSK 50 0 Main LowCH23780-709

ency ter Free
CF Ste 2.000000 Mi-
м.
q Offs
01

#### Band17 10MHz QPSK 50 0 Main MidCH23790-710

enter Freq 710.000000	Trip I	r Frag 710.000000 Minu Frag Run Avg(Hald 60 1: 30 dB	Radio Device: 8	<ul> <li>Frequency</li> </ul>
Ref Offset 13.7 d I0 dB/div Ref 30.00 dB/				
200 100	/			Center Fre 710.000000 Mi
00 00 00 00 00			Lanna	_
				~~~
Center 710 MHz Res BW 200 kHz		VBW 620 kHz	6pan 20 Sweep	1 ms 2.000000 M
Occupied Bandwidt 8.	th 9781 MHz	Total Power	30.7 dBm	Auto M
Transmit Freq Error x dB Bandwidth	-4.586 kHz 9.962 MHz	% of OBW Power x dB	99.00 % -26.00 dB	01
			11110	

Band17_10MHz_QPSK_50_0_Main_HighCH23800-711



Band17 10MHz 16QAM 50 0 Main LowCH23780-709

Kaysight Spectr	um Analyzer - Occupied BN									0 2 5
Center Fre	q 709.000000 M	AHz	Canter Fre	a 708.000	AvaPhale 8		Ratio Std None Frequency			Frequency
		Million AvgHald 5010 Million AAtan: 20 dB					Radio Device: BTS		BTS	
10 dB/div	Ref Offset 13.7 dl Ref 30.00 dBm									
20.0		TA T								Center Free
12.0		h marine	~~~~~	and the second s		\leftarrow	-	+	_	709.000000 MH
10.0		1				Î.		+	_	-
20.0										
10.0	man					~	"Anna	~~~~		
		+++					-	+		
50.0		+++				-	-	+	_	
0.0		+++				-	-	+	_	
	enter 709 MHz Span 20 MHz Res BW 200 kHz Sweep 1 ms							CF St		
Occupi	ed Bandwidt	h		Total P	ower	30.	6 dBm			Auto Ma
	8.1	9274 MH	z							Freq Offse
Transmit Freq Error 11.618 ki			Hz '	% of Of	BW Power	ver 99.00 %			0 H	
x dB Ba	ndwidth	9.449 M	Hz)	c dB		-26	.00 dB			
10						jan any				

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Band17_10MHz_16QAM_50_0_Main_MidCH23790-710

	q 710.000000		Center Freq 715.00000	0 MPHa	Radio Stat Name	Frequency
Jenser Pre	ng 7 10.000000	#FGainLow		Avg/Hald 60/60	Radio Device: BTS	
10 dB/div	Ref Offset 13.7 d Ref 30.00 dB					
00 200 100				m		Center Fre 710.000000 MH
0.00						
30.0 0000000000000000000000000000000000	-				-	
Center 710					Span 20 MHz	
Res BW 2			#VBW 620 kH	CF Step 2.000000 MH Auto Mer Freq Offset		
Occupied Bandwidth 8.9543 MH			Total Por		wer 29	9 dBm
Transmi x dB Bar	it Freq Error ndwidth	2.981 k 9.928 M			9.00 % 1.00 dB	0.4
490				0.00		

Band17_10MHz_16QAM_50_0_Main_HighCH23800-711

Kaysight Spectrum Analyzer - Occupied BV	*			0 2 5
Center Freq 711.000000	Trip P	Free Trans 711.000000 Minte Trans Rum Avg(Plane: 60 1: 20 dB	Radio Device: 815	Frequency
10 dB/div Ref 30.00 dBn				
20.0	/	mm		Center Freq 711.000000 MHz
10.0				
0.0			Chan and and an	5.5
Conter 711 MHz			Epan 20 M	
Res BW 200 kHz		VBW 620 kHz	Sweep 1 r	2.000000 MH
Occupied Bandwidt	th 9544 MHz	Total Power	30.0 dBm	Auto Mer
O. Transmit Freq Error x dB Bandwidth	2.898 kHz 9.928 MHz	% of OBW Power	99.00 %	Freq Offse 0 H
90			81ARV8	

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8. OUT OF BAND EMISSION AT ANTENNA TERMINALS

8.1. Standard Applicable

FCC §22.917(a), §24.238(a), Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

FCC §27.53(g) (h)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. 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.

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

FCC §27.53(h) (3)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz 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. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

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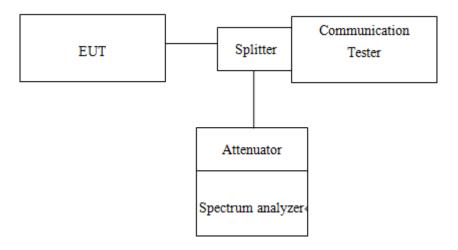
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FCC §27.53(m) (4)

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. Measurement procedure. Compliance with these rules is based on the use of measurement nstrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

8.2. Test SET-UP



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8.3. Measurement Procedure **Conducted Emission**

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

- To connect Antenna Port of EUT to Spectrum.
- Set RBW = 1MHz & VBW = 1MHz on Spectrum.
- Allow trace to fully stabilize
- 4. Repeat above procedures until all default test channel measured were complete.

Band Edge

- 1. To connect Antenna Port of EUT to Spectrum.
- 2. The band edge of low and high channels for the highest RF powers was measured. Setting RBW \geq 1% EBW.
- 3. Allow trace to fully stabilize
- 4. Repeat above procedures until all default test channel measured were complete.

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8.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUM- BER	LAST CAL.	CAL DUE.
Radio Communication Analyer	Anritsu	MT8820C	6201465316	03/31/2018	03/30/2019
Spectrum Analyzer	Agilent	N9010A	MY51440113	06/20/2018	06/19/2019
DC Block	PASTERNACK	PE8210	RF29	02/26/2019	02/25/2020
Splitter	Woken	DOM35LW1A2	RF36	02/26/2019	02/25/2020
Attenuator	Marvelous	WATT-218FS-10	RF245	02/26/2019	02/25/2020
Coaxial Cables	Woken	00100A1F1A185C	RF12	02/26/2019	02/25/2020
Coaxial Cables	Woken	00100A1F1A185C	RF202	02/26/2019	02/25/2020
DC Power Supply	Agilent	E3640A	MY40000811	12/11/2018	12/10/2019

8.5. Measurement Result:

Refer to next pages.

NOTE: The occurrence of the spike on the conducted emission is the signal of the fundamental emission.

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