

# 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. 4TH FL 135 LANE 235 BAOQIAO RD XINDIAN DISTRICT **Applicant:** NEW TAIPEI CITY 231 TAIWAN **Product Name:** Arm-based platform **Brand Name:** MOXA Model No.: UC-8220-T-LX Model Difference: N/A T190327W11-RP **Report Number:** FCC ID: **SLE-UC8200** FCC Rule Part: 2, 22H & 24E & 27F, L, H Issue Date: Jun. 24, 2019 Date of Test: Apr. 01, 2019 ~ May 30, 2019 Date of EUT Received: Apr. 01, 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
T190327W11-RP	Rev.00	Initial creation of document	All	Jun. 11, 2019	Elle Chang
T190327W11-RP	Rev.01	Updated section 8.5	Page 112~115	Jun. 24, 2019	Elle Chang

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# 1. GENERAL PRODUCT INFORMATION

## 1.1. Product Description

#### General:

Product Name:	Arm-based platform
Brand Name:	Моха
Model No.:	UC-8220-T-LX
Model Difference:	N/A
Hardware Version:	N/A
Software Version:	N/A
Power Supply:	12~48Vdc

#### **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
			LTE Band 2	1850 ~ 1910	2
MOXA	Dipole	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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	ERP / EIR	P (dBm)	W	Type of Emission
WCDMA Band II	25.12	EIRP	0.325	4M13F9W
HSDPA Band II	24.71	EIRP	0.296	4M14F9W
HSUPA Band II	24.71	EIRP	0.296	4M14F9W
WCDMA Band V	24.24	ERP	0.265	4M14F9W
HSDPA Band V	24.16	ERP	0.261	4M14F9W
HSUPA Band V	24.05	ERP	0.254	4M12F9W

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

LTE	BW	Modulation	ERP / EIRP		(W)	Type of
Band	DVV	wouldtion	(dB	m)	(VV)	Emission
2	1.4	QPSK	25.15	EIRP	0.327	1M12G7D
Z	1.4	16QAM	24.12	EIRP	0.258	1M12D7W
2	3	QPSK	25.14	EIRP	0.327	2M71G7D
Z	3	16QAM	24.58	EIRP	0.287	2M71D7W
2	5	QPSK	25.34	EIRP	0.342	4M52G7D
Z	5	16QAM	24.80	EIRP	0.302	4M52D7W
2	10	QPSK	25.22	EIRP	0.333	9M05G7D
Z	10	16QAM	24.53	EIRP	0.284	9M00D7W
2	15	QPSK	25.07	EIRP	0.321	13M5G7D
Z	15	16QAM	24.90	EIRP	0.309	13M5D7W
2	20	QPSK	26.04	EIRP	0.402	17M9G7D
Z	20	16QAM	25.11	EIRP	0.324	17M9D7W

LTE Band	BW	Modulation	ERP / (dB		(W)	Type of Emission
4	1.4	QPSK	26.08	EIRP	0.406	1M12G7D
4	1.4	16QAM	25.04	EIRP	0.319	1M11D7W
4	3	QPSK	25.75	EIRP	0.376	2M70G7D
4	3	16QAM	25.17	EIRP	0.329	2M72D7W
4	5	QPSK	26.06	EIRP	0.404	4M52G7D
4	5	16QAM	25.19	EIRP	0.330	4M52D7W
4	10	QPSK	26.42	EIRP	0.439	9M03G7D
4	10	16QAM	24.84	EIRP	0.305	8M99D7W
4	15	QPSK	26.48	EIRP	0.445	13M5G7D
4	10	16QAM	25.82	EIRP	0.382	13M5D7W
4	20	QPSK	26.05	EIRP	0.403	18M0G7D
4	20	16QAM	25.13	EIRP	0.326	18M0D7W

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LTE	BW	Modulation	ERP /	EIRP	(W)	Type of
Band	Dvv	Wouldtion	(dB	/	(**)	Emission
5	1.4	QPSK	21.86	ERP	0.153	1M12G7D
5	1.4	16QAM	21.00	ERP	0.126	1M11D7W
5	3	QPSK	21.91	ERP	0.155	2M71G7D
0	3	16QAM	21.17	ERP	0.131	2M71D7W
5	5	QPSK	21.85	ERP	0.153	4M52G7D
0	5	16QAM	21.00	ERP	0.126	4M52D7W
5	10	QPSK	21.47	ERP	0.140	9M02G7D
0	10	16QAM	21.42	ERP	0.139	9M01D7W
LTE	R/W	Modulation	ERP /	EIRP	(11)	Type of
LTE Band	BW	Modulation	ERP / (dB		(W)	Type of Emission
Band		Modulation QPSK			(W) 0.152	5.
	BW 5		(dB	m)	. ,	Emission
Band 13	5	QPSK	(dB 21.81	m) ERP	0.152	Emission 4M51G7D
Band		QPSK 16QAM	(dB 21.81 20.89	m) ERP ERP	0.152 0.123	Emission 4M51G7D 4M50D7W
Band 13	5	QPSK 16QAM QPSK	(dB 21.81 20.89 21.78	m) ERP ERP ERP	<b>0.152</b> <b>0.123</b> 0.151	Emission 4M51G7D 4M50D7W 8M94G7D
Band 13	5	QPSK 16QAM QPSK 16QAM	(dB 21.81 20.89 21.78	m) ERP ERP ERP ERP	0.152 0.123 0.151 0.120	Emission 4M51G7D 4M50D7W 8M94G7D
Band 13 13	5	QPSK 16QAM QPSK	(dB 21.81 20.89 21.78 20.80	m) ERP ERP ERP ERP	<b>0.152</b> <b>0.123</b> 0.151	Emission 4M51G7D 4M50D7W 8M94G7D 8M92D7W
Band 13 13 LTE Band	5 10 BW	QPSK 16QAM QPSK 16QAM	(dB 21.81 20.89 21.78 20.80 ERP /	m) ERP ERP ERP ERP	0.152 0.123 0.151 0.120	Emission 4M51G7D 4M50D7W 8M94G7D 8M92D7W Type of
Band 13 13 LTE	5	QPSK 16QAM QPSK 16QAM Modulation	(dB 21.81 20.89 21.78 20.80 ERP / (dB	m) ERP ERP ERP EIRP EIRP m)	0.152 0.123 0.151 0.120 (W)	Emission 4M51G7D 4M50D7W 8M94G7D 8M92D7W Type of Emission

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**OPSK** 

16QAM

17

10

21.82

20.97

ERP

ERP

0.152

0.125

9M00G7D

8M97D7W

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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)	3.6	10	13.6
High Band (Above 1 GHz)	3.9	10	13.9

## 2.5. Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
WCDMA B2		325
WCDMA B5		334
LTE Band 2		345
LTE Band 4	24	337
LTE Band 5		335
LTE Band 13		316
LTE Band 17		326

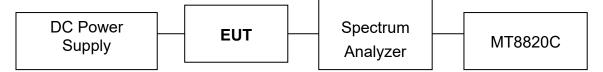
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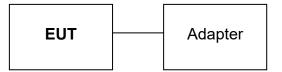


#### 2.6. Configuration of Tested System

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



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



**Remote Side** 



**Table 2-1 Equipment Used in Tested System** 

ltem	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Radio Communication Analyer	Anritsu	MT8820C	6201465317	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
WCDMA/HSPA Band II	E2-plan
WCDMA/HSPA Band V	E2-plan
LTE Band 2	E2-plan
LTE Band 4	E2-plan
LTE Band 5	E2-plan
LTE Band 13	E2-plan
LTE Band 17	E2-plan

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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	WCDMA 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
EIRP	18625 to 19175	18625, 18900, 19175	5MHz	QPSK, 16QAM, 64QAM	1 RB/ 0,24 RB Offest
EIKP	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	18700 to 19100	18700, 18900, 19100	20MHz	QPSK	1 RB, 0 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
EIRP	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
	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	20025 to 20325	20025, 20175, 20325	15MHz	QPSK,	1 RB,0 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	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB, 0 RB Offest
EMISSION	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	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB, 14 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
BAND EDGE	23205 to 23255	23205, 23255	5MHz	QPSK,	1 RB/ 0,24 RB Offest Full RB
DAND 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	QPSK	1 RB/ 24 RB Offest

#### LTE Band 17 MODE

TEST ITEM	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
	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	23755 to 23825	23755, 23790, 23825	5MHz	QPSK	1 RB, 24 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. Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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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.

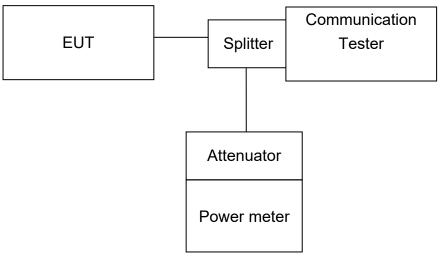
FCC 24.232(b) Mobile and portable stations are limited to 2 W EIRP.

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 Communication Analyer	Anritsu	MT8820C	6201465317	01/16/2019	01/15/2020

#### 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	21.98	2.00	21.83	23.98	33.00	-9.02
WCDMA	1880.0	9400	23.12	2.00	22.97	25.12	33.00	-7.88
	1907.6	9538	23.06	2.00	22.91	25.06	33.00	-7.94
	1852.4	9262	21.43	2.00	21.28	23.43	33.00	-9.57
HSDPA	1880.0	9400	22.71	2.00	22.56	24.71	33.00	-8.29
	1907.6	9538	22.70	2.00	22.55	24.70	33.00	-8.30
	1852.4	9262	21.47	2.00	21.32	23.47	33.00	-9.53
HSUPA	1880.0	9400	22.56	2.00	22.41	24.56	33.00	-8.44
	1907.6	9538	22.71	2.00	22.56	24.71	33.00	-8.29

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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	23.24	1.00	22.09	24.24	38.50	-14.26
WCDMA	836.6	4183	22.23	1.00	21.08	23.23	38.50	-15.27
	846.6	4233	23.19	1.00	22.04	24.19	38.50	-14.31
	826.4	4132	23.16	1.00	22.01	24.16	38.50	-14.34
HSDPA	836.6	4183	22.42	1.00	21.27	23.42	38.50	-15.08
	846.6	4233	23.15	1.00	22.00	24.15	38.50	-14.35
	826.4	4132	23.05	1.00	21.90	24.05	38.50	-14.45
HSUPA	836.6	4183	22.45	1.00	21.30	23.45	38.50	-15.05
	846.6	4233	23.05	1.00	21.90	24.05	38.50	-14.45

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## LTE Result: FDD Band 2

Antenna gain (dBi)

		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	21.95	23.95	33	-9.05
	18607	1850.7	QPSK	1	5	21.71	23.71	33	-9.29
	10007	1000.7	ULDY	3	2	21.91	23.91	33	-9.09
				6	0	21.01	23.01	33	-9.99
				1	0	23.15	25.15	33	-7.85
	18900	1880	QPSK	1	5	23.02	25.02	33	-7.98
	10900	0700 1000	ULDY	3	2	23.14	25.14	33	-7.86
				6	0	22.14	24.14	33	-8.86
				1	0	22.71	24.71	33	-8.29
	19193	1909.3	QPSK	1	5	22.51	24.51	33	-8.49
	19193			3	2	22.60	24.60	33	-8.4
1.4				6	0	21.61	23.61	33	-9.39
1.4				1	0	20.98	22.98	33	-10.02
	18607	1850.7	16QAM	1	5	20.32	22.32	33	-10.68
	10007	1030.7	TUQAM	3	2	20.94	22.94	33	-10.06
				6	0	20.06	22.06	33	-10.94
				1	0	22.00	24.00	33	-9
	18900	1880	16QAM	1	5	21.83	23.83	33	-9.17
	10900	1000	TOQAIM	3	2	22.12	24.12	33	-8.88
				6	0	21.36	23.36	33	-9.64
				1	0	22.07	24.07	33	-8.93
	19193	1909.3	16OAM	1	5	21.84	23.84	33	-9.16
	17173	1707.3	16QAM	3	2	21.43	23.43	33	-9.57
				6	0	20.68	22.68	33	-10.32

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Antenna gain (dBi)

	<b>Y</b>	Ľ	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	21.86	23.86	33	-9.14
	18615	1851.5	QPSK	1	14	21.76	23.76	33	-9.24
	10015	1031.3	UF SK	8	4	20.98	22.98	33	-10.02
				15	0	20.89	22.89	33	-10.11
				1	0	23.14	25.14	33	-7.86
	18900	1880	QPSK	1	14	22.90	24.90	33	-8.1
		1000	UF SK	8	4	22.12	24.12	33	-8.88
				15	0	22.18	24.18	33	-8.82
				1	0	22.94	24.94	33	-8.06
	19185	1908.5	QPSK	1	14	22.43	24.43	33	-8.57
				8	4	21.75	23.75	33	-9.25
3				15	0	21.80	23.80	33	-9.2
3				1	0	21.24	23.24	33	-9.76
	18615	1851.5	16QAM	1	14	21.06	23.06	33	-9.94
	10015	1031.3		8	4	19.95	21.95	33	-11.05
				15	0	19.92	21.92	33	-11.08
				1	0	22.58	24.58	33	-8.42
	18900	1880	16QAM	1	14	22.30	24.30	33	-8.7
	10900	1000	TUQAM	8	4	21.32	23.32	33	-9.68
				15	0	21.19	23.19	33	-9.81
				1	0	22.18	24.18	33	-8.82
	19185	1908.5	16QAM	1	14	21.67	23.67	33	-9.33
	17100	1900.0	TUQAIVI	8	4	20.98	22.98	33	-10.02
				15	0	20.97	22.97	33	-10.03

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Antenna gain (dBi)

	<b>.</b>	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	22.00	24.00	33	-9
	18625	1852.5	QPSK	1	24	21.73	23.73	33	-9.27
	10025	1032.3	UI SK	12	6	20.91	22.91	33	-10.09
				25	0	20.83	22.83	33	-10.17
				1	0	23.34	25.34	33	-7.66
	18900 1880	1880	QPSK	1	24	22.42	24.42	33	-8.58
		1000	UF SK	12	6	22.12	24.12	33	-8.88
				25	0	22.07	24.07	33	-8.93
				1	0	23.30	25.30	33	-7.7
	19175	1907.5	QPSK	1	24	22.46	24.46	33	-8.54
				12	6	22.03	24.03	33	-8.97
5				25	0	21.97	23.97	33	-9.03
5				1	0	20.86	22.86	33	-10.14
	18625	1852.5	16QAM	1	24	20.82	22.82	33	-10.18
	10020	1002.0	TOQAIN	12	6	19.82	21.82	33	-11.18
				25	0	19.82	21.82	33	-11.18
				1	0	22.47	24.47	33	-8.53
	18900	1880	16QAM	1	24	21.93	23.93	33	-9.07
	10900	1000	TOQAIN	12	6	21.18	23.18	33	-9.82
				25	0	21.04	23.04	33	-9.96
				1	0	22.80	24.80	33	-8.2
	19175	1907.5	160 0 0	1	24	21.73	23.73	33	-9.27
	17170	1907.0	16QAM	12	6	21.00	23.00	33	-10
				25	0	20.95	22.95	33	-10.05

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#### Antenna gain (dBi)

		Ľ	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	21.33	23.33	33	-9.67
	18650	1855	QPSK	1	49	22.06	24.06	33	-8.94
	10030	1055	QI SIX	25	12	20.85	22.85	33	-10.15
				50	0	20.93	22.93	33	-10.07
				1	0	22.27	24.27	33	-8.73
	18900 188	1880	QPSK	1	49	22.54	24.54	33	-8.46
		1000	UF SK	25	12	22.15	24.15	33	-8.85
				50	0	20.85	22.85	33	-10.15
			QPSK	1	0	23.22	25.22	33	-7.78
		1905		1	49	22.45	24.45	33	-8.55
	19150			25	12	22.36	24.36	33	-8.64
10				50	0	21.62	23.62	33	-9.38
10				1	0	21.23	23.23	33	-9.77
	18650	1855	16QAM	1	49	21.34	23.34	33	-9.66
	10030	1033	TUQAM	25	12	19.97	21.97	33	-11.03
				50	0	19.96	21.96	33	-11.04
				1	0	22.53	24.53	33	-8.47
	18900	1880	16QAM	1	49	21.55	23.55	33	-9.45
	10900	1000	TOQAIN	25	12	21.10	23.10	33	-9.9
				50	0	18.92	20.92	33	-12.08
				1	0	22.48	24.48	33	-8.52
	19150	1905	160 \	1	49	20.21	22.21	33	-10.79
	19100	1900	16QAM	25	12	21.34	23.34	33	-9.66
				50	0	20.58	22.58	33	-10.42

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Antenna	ntenna gain (dBi) 2 LTE Band 2_Uplink frequency band : 1850 to 1910 MHz												
		Ľ	TE Band 2_U	plink fr	equency band				-				
BW (MHz)	UL Channel	Frequency (MHz)	Modulation	RB Size	RB Offset	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Limit (dBm)	Margin (dB)				
				1	0	22.07	24.07	33	-8.93				
	18675	1857.5	QPSK	1	74	22.94	24.94	33	-8.06				
	10075	1007.0	UFJK	36	18	20.29	22.29	33	-10.71				
				75	0	21.15	23.15	33	-9.85				
				1	0	23.07	25.07	33	-7.93				
	18900	1880	QPSK	1	74	22.47	24.47	33	-8.53				
	18900 18	1000	UFJK	36	18	22.14	24.14	33	-8.86				
				75	0	22.11	24.11	33	-8.89				
			QPSK	1	0	22.24	24.24	33	-8.76				
	19125	5 1902.5		1	74	22.75	24.75	33	-8.25				
	17125			36	18	22.45	24.45	33	-8.55				
15				75	0	22.27	24.27	33	-8.73				
15				1	0	21.48	23.48	33	-9.52				
	18675	1857.5	16QAM	1	74	22.34	24.34	33	-8.66				
	10075	1007.0	TOCAM	36	18	19.99	21.99	33	-11.01				
				75	0	17.70	19.70	33	-13.3				
				1	0	22.90	24.90	33	-8.1				
	18900	1880	16QAM	1	74	21.14	23.14	33	-9.86				
	10700	1000		36	18	21.14	23.14	33	-9.86				
				75	0	18.40	20.40	33	-12.6				
				1	0	20.72	22.72	33	-10.28				
	19125	1902.5	160AM	1	74	22.06	24.06	33	-8.94				
	17125	1702.0	16QAM	36	18	21.50	23.50	33	-9.5				
				75	0	21.07	23.07	33	-9.93				

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Antenna	Antenna gain (dBi) 2											
		Ľ	TE Band 2_U	plink fr	equency band	l : 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	22.07	24.07	33	-8.93			
	18700	1860	QPSK	1	99	23.51	25.51	33	-7.49			
	10700	1000	UPSK	50	25	20.50	22.50	33	-10.5			
				100	0	21.48	23.48	33	-9.52			
				1	0	24.04	26.04	33	-6.96			
	18900	1880	QPSK	1	99	22.00	24.00	33	-9			
	10900	1000	ULDK	50	25	22.13	24.13	33	-8.87			
				100	0	22.13	24.13	33	-8.87			
			QPSK	1	0	21.79	23.79	33	-9.21			
	19100	1900		1	99	23.11	25.11	33	-7.89			
	17100			50	25	22.24	24.24	33	-8.76			
20				100	0	22.07	24.07	33	-8.93			
20				1	0	21.35	23.35	33	-9.65			
	18700	1860	16QAM	1	99	22.03	24.03	33	-8.97			
	10700	1000		50	25	20.27	22.27	33	-10.73			
				100	0	20.48	22.48	33	-10.52			
				1	0	23.11	25.11	33	-7.89			
	18000	1880	16QAM	1	99	21.30	23.30	33	-9.7			
	18900	1000		50	25	19.04	21.04	33	-11.96			
				100	0	21.07	23.07	33	-9.93			
				1	0	21.34	23.34	33	-9.66			
	19100	1900	16QAM	1	99	22.41	24.41	33	-8.59			
	17100	1700		50	25	21.17	23.17	33	-9.83			
				100	0	20.27	22.27	33	-10.73			

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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	22.81	24.81	30	-5.19				
	19957	1710.7	QPSK	1	5	22.78	24.78	30	-5.22				
	17737	1710.7	UFJK	3	2	22.80	24.80	30	-5.2				
				6	0	21.80	23.80	30	-6.2				
				1	0	24.08	26.08	30	-3.92				
	20175	1732.5	QPSK	1	5	23.91	25.91	30	-4.09				
	20175	20173 1732.3	UFJK	3	2	23.95	25.95	30	-4.05				
				6	0	22.99	24.99	30	-5.01				
	20393 1		QPSK	1	0	23.45	25.45	30	-4.55				
		1754.3		1	5	23.58	25.58	30	-4.42				
	20373			3	2	23.48	25.48	30	-4.52				
1.4				6	0	22.51	24.51	30	-5.49				
1.4				1	0	22.00	24.00	30	-6				
	19957	1710.7	16QAM	1	5	21.99	23.99	30	-6.01				
	17757	1710.7	TUCAM	3	2	21.73	23.73	30	-6.27				
				6	0	20.89	22.89	30	-7.11				
				1	0	23.04	25.04	30	-4.96				
	20175	1732.5	16QAM	1	5	22.92	24.92	30	-5.08				
	20175	1752.5	TUCAM	3	2	22.99	24.99	30	-5.01				
				6	0	22.15	24.15	30	-5.85				
				1	0	22.83	24.83	30	-5.17				
	20393	1754.3	16QAM	1	5	23.00	25.00	30	-5				
	20393	1754.3	16QAM	3	2	22.53	24.53	30	-5.47				
				6	0	21.61	23.61	30	-6.39				

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Antenna gain (dBi)

	gain (abi)	L	TE Band 4_U	plink f	requenc	cy 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	22.81	24.81	30	-5.19
	17703	1711.3	QI SK	8	4	21.77	23.77	30	-6.23
				15	0	21.79	23.79	30	-6.21
				1	0	23.61	25.61	30	-4.39
	20175	1732.5	QPSK	1	14	23.75	25.75	30	-4.25
	20175	1752.5	QI SK	8	4	22.98	24.98	30	-5.02
				15	0	23.02	25.02	30	-4.98
	20385 1753.5		1	0	23.14	25.14	30	-4.86	
		1753.5	QPSK	1	14	23.61	25.61	30	-4.39
	20303			8	4	22.45	24.45	30	-5.55
3				15	0	22.41	24.41	30	-5.59
5				1	0	21.67	23.67	30	-6.33
	19965	1711.5	16QAM	1	14	21.46	23.46	30	-6.54
	17705	1711.5	TOCAM	8	4	20.87	22.87	30	-7.13
				15	0	20.83	22.83	30	-7.17
				1	0	23.17	25.17	30	-4.83
	20175	1732.5	16QAM	1	14	23.12	25.12	30	-4.88
	20175	1752.5		8	4	21.94	23.94	30	-6.06
				15	0	22.05	24.05	30	-5.95
			1	0	22.40	24.40	30	-5.6	
	20385	1753 5	16QAM	1	14	22.66	24.66	30	-5.34
	20385	1753.5	16QAM	8	4	21.32	23.32	30	-6.68
				15	0	21.44	23.44	30	-6.56

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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	22.80	24.80	30	-5.2				
	19975	1712.5	QPSK	1	24	22.88	24.88	30	-5.12				
	17775	1712.0	UF JK	12	6	21.80	23.80	30	-6.2				
				25	0	21.78	23.78	30	-6.22				
				1	0	24.06	26.06	30	-3.94				
	20175	1732.5	QPSK	1	24	23.63	25.63	30	-4.37				
	20175	20113 1752.5	UF JK	12	6	23.02	25.02	30	-4.98				
				25	0	22.97	24.97	30	-5.03				
	20375 1752.5		1	0	23.06	25.06	30	-4.94					
		1752.5	QPSK	1	24	23.63	25.63	30	-4.37				
	20373			12	6	22.29	24.29	30	-5.71				
5				25	0	22.32	24.32	30	-5.68				
J				1	0	21.84	23.84	30	-6.16				
	19975	1712.5	16QAM	1	24	22.05	24.05	30	-5.95				
	17773	1712.3	TUQAM	12	6	20.82	22.82	30	-7.18				
				25	0	20.41	22.41	30	-7.59				
				1	0	23.19	25.19	30	-4.81				
	20175	1732.5	16QAM	1	24	22.65	24.65	30	-5.35				
	20175	1752.5	TUQAM	12	6	22.00	24.00	30	-6				
				25	0	21.96	23.96	30	-6.04				
			1	0	22.28	24.28	30	-5.72					
	20375	1752.5	16OAM	1	24	22.98	24.98	30	-5.02				
	20375 175	1752.5	16QAM	12	6	21.27	23.27	30	-6.73				
				25	0	21.28	23.28	30	-6.72				

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Antenna gain (dBi)

	<u> </u>	L	TE Band 4_U	lplink f	requenc	cy 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	22.77	24.77	30	-5.23
	20000	1715	QPSK	1	49	23.38	25.38	30	-4.62
	20000	1715	UPSK	25	12	21.16	23.16	30	-6.84
				50	0	21.22	23.22	30	-6.78
				1	0	24.42	26.42	30	-3.58
	20175	1732.5	QPSK	1	49	21.84	23.84	30	-6.16
	20175	1752.5	UF 3K	25	12	23.02	25.02	30	-4.98
				50	0	22.97	24.97	30	-5.03
				1	0	23.03	25.03	30	-4.97
	20375	1750	QPSK	1	49	21.95	23.95	30	-6.05
	20375			25	12	21.45	23.45	30	-6.55
10				50	0	22.23	24.23	30	-5.77
10				1	0	21.92	23.92	30	-6.08
	20000	1715	16QAM	1	49	22.64	24.64	30	-5.36
	20000	1715	TUQAM	25	12	20.92	22.92	30	-7.08
				50	0	20.91	22.91	30	-7.09
				1	0	22.70	24.70	30	-5.3
	20175	1732.5	16QAM	1	49	20.91	22.91	30	-7.09
	20175	1752.5	TOQAM	25	12	22.04	24.04	30	-5.96
	20375 1750			50	0	21.24	23.24	30	-6.76
			1	0	22.21	24.21	30	-5.79	
		1750	16001	1	49	22.84	24.84	30	-5.16
	20375	1750	1750 16QAM	25	12	20.38	22.38	30	-7.62
				50	0	21.21	23.21	30	-6.79

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Antenna gain (dBi)

	guin (ubl)	L	TE 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	22.86	24.86	30	-5.14
	20025	1717.5	QPSK	1	74	23.92	25.92	30	-4.08
	20023	1/1/.J	QF SK	36	18	21.64	23.64	30	-6.36
				75	0	22.31	24.31	30	-5.69
				1	0	24.48	26.48	30	-3.52
	20175	1732.5	QPSK	1	74	23.40	25.40	30	-4.6
	20175	1752.5		36	18	23.04	25.04	30	-4.96
				75	0	20.93	22.93	30	-7.07
		325 1747.5	1747.5 QPSK	1	0	23.22	25.22	30	-4.78
	20325			1	74	23.69	25.69	30	-4.31
	20323			36	18	22.12	24.12	30	-5.88
15				75	0	22.19	24.19	30	-5.81
15				1	0	22.24	24.24	30	-5.76
	20025	1717.5	16QAM	1	74	21.32	23.32	30	-6.68
	20025	1717.5	TOQAM	36	18	21.16	23.16	30	-6.84
				75	0	20.85	22.85	30	-7.15
				1	0	23.82	25.82	30	-4.18
	20175	1732.5	16QAM	1	74	22.76	24.76	30	-5.24
	20175	1752.5	TOQAM	36	18	22.07	24.07	30	-5.93
	20325 1747.5		75	0	21.77	23.77	30	-6.23	
			1	0	22.40	24.40	30	-5.6	
		16QAM	1	74	22.88	24.88	30	-5.12	
		16QAM	36	18	20.78	22.78	30	-7.22	
				75	0	21.19	23.19	30	-6.81

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Antenna gain (dBi) 2											
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)		
20	20050	1720	QPSK	1	0	22.95	24.95	30	-5.05		
				1	99	24.05	26.05	30	-3.95		
				50	25	18.19	20.19	30	-9.81		
				100	0	22.56	24.56	30	-5.44		
		1732.5	QPSK	1	0	23.89	25.89	30	-4.11		
	20175			1	99	22.98	24.98	30	-5.02		
				50	25	23.00	25.00	30	-5		
				100	0	23.02	25.02	30	-4.98		
	20300	1745	QPSK	1	0	23.44	25.44	30	-4.56		
				1	99	22.46	24.46	30	-5.54		
				50	25	22.01	24.01	30	-5.99		
				100	0	22.22	24.22	30	-5.78		
	20050	1720	16QAM	1	0	20.70	22.70	30	-7.3		
				1	99	22.75	24.75	30	-5.25		
				50	25	18.13	20.13	30	-9.87		
				100	0	21.52	23.52	30	-6.48		
	20175	1732.5	16QAM	1	0	23.13	25.13	30	-4.87		
				1	99	22.31	24.31	30	-5.69		
				50	25	21.95	23.95	30	-6.05		
				100	0	21.98	23.98	30	-6.02		
	20300	1745	16QAM	1	0	21.80	23.80	30	-6.2		
				1	99	22.87	24.87	30	-5.13		
				50	25	20.79	22.79	30	-7.21		
				100	0	21.18	23.18	30	-6.82		

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## **FDD Band 5**

Antenna g	ain (dBi)	1									
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)	
1.4	20407	824.7	QPSK	1	0	22.81	21.66	23.81	38.45	-14.64	
				1	5	22.97	21.82	23.97	38.45	-14.48	
				3	2	23.01	21.86	24.01	38.45	-14.44	
				6	0	21.94	20.79	22.94	38.45	-15.51	
	20525	836.5	QPSK	1	0	21.86	20.71	22.86	38.45	-15.59	
				1	5	22.06	20.91	23.06	38.45	-15.39	
				3	2	21.99	20.84	22.99	38.45	-15.46	
				6	0	21.21	20.06	22.21	38.45	-16.24	
	20643	848.3	QPSK	1	0	22.77	21.62	23.77	38.45	-14.68	
				1	5	22.76	21.61	23.76	38.45	-14.69	
				3	2	22.78	21.63	23.78	38.45	-14.67	
				6	0	21.82	20.67	22.82	38.45	-15.63	
	20407	824.7	16QAM	1	0	22.01	20.86	23.01	38.45	-15.44	
				1	5	22.12	20.97	23.12	38.45	-15.33	
				3	2	21.83	20.68	22.83	38.45	-15.62	
				6	0	21.00	19.85	22.00	38.45	-16.45	
	20525	836.5	16QAM	1	0	20.94	19.79	21.94	38.45	-16.51	
				1	5	20.66	19.51	21.66	38.45	-16.79	
				3	2	21.16	20.01	22.16	38.45	-16.29	
				6	0	20.19	19.04	21.19	38.45	-17.26	
	20643	848.3	16QAM	1	0	22.15	21.00	23.15	38.45	-15.3	
				1	5	22.14	20.99	23.14	38.45	-15.31	
				3	2	21.78	20.63	22.78	38.45	-15.67	
				6	0	20.96	19.81	21.96	38.45	-16.49	

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Antenna	Antenna gain (dBi) 1											
			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	22.82	21.67	23.82	38.45	-14.63		
	20415	825.5	QPSK	1	14	23.06	21.91	24.06	38.45	-14.39		
	20415	820.0	QPSK	8	4	22.24	21.09	23.24	38.45	-15.21		
				15	0	22.18	21.03	23.18	38.45	-15.27		
				1	0	21.89	20.74	22.89	38.45	-15.56		
	20525	836.5	QPSK	1	14	22.19	21.04	23.19	38.45	-15.26		
	20323	030.5	QLOK	8	4	21.19	20.04	22.19	38.45	-16.26		
				15	0	21.16	20.01	22.16	38.45	-16.29		
		847.5	QPSK	1	0	22.48	21.33	23.48	38.45	-14.97		
	20635			1	14	22.26	21.11	23.26	38.45	-15.19		
	20000			8	4	21.82	20.67	22.82	38.45	-15.63		
3				15	0	21.80	20.65	22.80	38.45	-15.65		
Ū				1	0	21.47	20.32	22.47	38.45	-15.98		
	20415	825.5	16QAM	1	14	22.32	21.17	23.32	38.45	-15.13		
	20110	02010	10 21 111	8	4	21.09	19.94	22.09	38.45	-16.36		
				15	0	21.07	19.92	22.07	38.45	-16.38		
				1	0	21.07	19.92	22.07	38.45	-16.38		
	20525	836.5	16QAM	1	14	21.36	20.21	22.36	38.45	-16.09		
	20325			8	4	20.03	18.88	21.03	38.45	-17.42		
				15	0	19.99	18.84	20.99	38.45	-17.46		
				1	0	22.06	20.91	23.06	38.45	-15.39		
	20635	847.5	16QAM	1	14	21.74	20.59	22.74	38.45	-15.71		
		847.5		8	4	20.87	19.72	21.87	38.45	-16.58		
				15	0	20.83	19.68	21.83	38.45	-16.62		

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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	23.00	21.85	24.00	38.45	-14.45			
	20425	826.5	QPSK	1	24	22.75	21.60	23.75	38.45	-14.7			
	20420	020.0	UFSK	12	6	22.24	21.09	23.24	38.45	-15.21			
				25	0	22.19	21.04	23.19	38.45	-15.26			
				1	0	22.09	20.94	23.09	38.45	-15.36			
	20525	836.5	QPSK	1	24	22.22	21.07	23.22	38.45	-15.23			
	20323	030.5	QI SK	12	6	21.20	20.05	22.20	38.45	-16.25			
				25	0	21.20	20.05	22.20	38.45	-16.25			
		846.5	QPSK	1	0	22.70	21.55	23.70	38.45	-14.75			
	20625			1	24	22.53	21.38	23.53	38.45	-14.92			
	20025			12	6	21.82	20.67	22.82	38.45	-15.63			
5				25	0	21.83	20.68	22.83	38.45	-15.62			
5				1	0	22.15	21.00	23.15	38.45	-15.3			
	20425	826.5	16QAM	1	24	21.69	20.54	22.69	38.45	-15.76			
	20423	020.5	TOQAM	12	6	21.14	19.99	22.14	38.45	-16.31			
				25	0	21.07	19.92	22.07	38.45	-16.38			
				1	0	21.46	20.31	22.46	38.45	-15.99			
	20525	836.5	16QAM	1	24	21.54	20.39	22.54	38.45	-15.91			
	20525	030.5	TOQAM	12	6	20.07	18.92	21.07	38.45	-17.38			
	20625			25	0	20.08	18.93	21.08	38.45	-17.37			
				1	0	22.07	20.92	23.07	38.45	-15.38			
		846.5	160AM	1	24	21.54	20.39	22.54	38.45	-15.91			
		0-0.0	160AM	12	6	20.80	19.65	21.80	38.45	-16.65			
				25	0	20.70	19.55	21.70	38.45	-16.75			

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Antenna gain (dBi)

			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	22.39	21.24	23.39	38.45	-15.06
	20450	829	QPSK	1	49	22.35	21.20	23.35	38.45	-15.1
	20430	029	UFSK	25	12	21.98	20.83	22.98	38.45	-15.47
				50	0	20.97	19.82	21.97	38.45	-16.48
				1	0	22.21	21.06	23.21	38.45	-15.24
	20525	836.5	QPSK	1	49	22.62	21.47	23.62	38.45	-14.83
	20525	20525 836.5	UFSK	25	12	21.22	20.07	22.22	38.45	-16.23
				50	0	21.32	20.17	22.32	38.45	-16.13
			QPSK	1	0	22.41	21.26	23.41	38.45	-15.04
	20/00			1	49	22.52	21.37	23.52	38.45	-14.93
	20000			25	12	20.83	19.68	21.83	38.45	-16.62
10				50	0	21.64	20.49	22.64	38.45	-15.81
10				1	0	22.57	21.42	23.57	38.45	-14.88
	20450	829	16QAM	1	49	21.64	20.49	22.64	38.45	-15.81
	20400	029	TOQAIN	25	12	20.79	19.64	21.79	38.45	-16.66
				50	0	20.87	19.72	21.87	38.45	-16.58
				1	0	21.45	20.30	22.45	38.45	-16
	20525	836.5	16QAM	1	49	21.89	20.74	22.89	38.45	-15.56
	20525	030.0	TOQAIN	25	12	19.02	17.87	20.02	38.45	-18.43
	20600			50	0	20.19	19.04	21.19	38.45	-17.26
				1	0	21.41	20.26	22.41	38.45	-16.04
		844	160AM	1	49	21.51	20.36	22.51	38.45	-15.94
		844	16QAM	25	12	20.79	19.64	21.79	38.45	-16.66
				50	0	20.72	19.57	21.72	38.45	-16.73

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# FDD Band 13

Antenna gain (dBi)

	LTE Band 13_Uplink frequency band : 777 to 787 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	20.81	19.66	21.81	34.77	-12.96			
	23205	779.5	QPSK	1	24	22.96	21.81	23.96	34.77	-10.81			
	23200	119.0	UFSK	12	6	21.12	19.97	22.12	34.77	-12.65			
				25	0	21.28	20.13	22.28	34.77	-12.49			
				1	0	21.96	20.81	22.96	34.77	-11.81			
	23230	782	QPSK	1	24	21.91	20.76	22.91	34.77	-11.86			
	23230	102	UP SK	12	6	21.70	20.55	22.70	34.77	-12.07			
				25	0	21.52	20.37	22.52	34.77	-12.25			
				1	0	22.76	21.61	23.76	34.77	-11.01			
	23255	784.5	QPSK	1	24	22.48	21.33	23.48	34.77	-11.29			
	23233	704.3		12	6	20.90	19.75	21.90	34.77	-12.87			
5				25	0	21.20	20.05	22.20	34.77	-12.57			
J				1	0	20.14	18.99	21.14	34.77	-13.63			
	23205	779.5	16QAM	1	24	21.81	20.66	22.81	34.77	-11.96			
	23203	117.5	TOCAIN	12	6	20.02	18.87	21.02	34.77	-13.75			
				25	0	20.25	19.10	21.25	34.77	-13.52			
				1	0	20.76	19.61	21.76	34.77	-13.01			
	23230	782	16QAM	1	24	21.02	19.87	22.02	34.77	-12.75			
	23230	102	TOCAIN	12	6	20.74	19.59	21.74	34.77	-13.03			
				25	0	20.49	19.34	21.49	34.77	-13.28			
	23255 784.5			1	0	22.04	20.89	23.04	34.77	-11.73			
		784.5	160AM	1	24	21.94	20.79	22.94	34.77	-11.83			
				12	6	20.05	18.90	21.05	34.77	-13.72			
				25	0	20.25	19.10	21.25	34.77	-13.52			

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Antenna gain (dBi)

	<u></u>		LTE Band	d 13_U	lplink fre	equency band	: 777 to 787 Mł	Ηz																						
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	20.65	19.50	21.65	34.77	-13.12																				
	23230	782	QPSK	1	49	22.93	21.78	23.93	34.77	-10.84																				
	23230			25	12	20.81	19.66	21.81	34.77	-12.96																				
10				50	0	21.14	19.99	22.14	34.77	-12.63																				
10			16QAM	1	0	19.96	18.81	20.96	34.77	-13.81																				
	23230	782		160AM	160414	160414	160414	160414	160414	160414	160.00	1604M	160014	160.00	16OAM	16OAM	16001	160404	160414	160AM	160AM	160AM	160AM	1	49	21.95	20.80	22.95	34.77	-11.82
		/82		25	12	20.42	19.27	21.42	34.77	-13.35																				
				50	0	20.12	18.97	21.12	34.77	-13.65																				

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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	22.60	21.45	23.60	34.77	-11.17		
	23755	706.5	QPSK	1	24	23.46	22.31	24.46	34.77	-10.31		
	23755	700.0	UF 3K	12	6	22.13	20.98	23.13	34.77	-11.64		
				25	0	22.18	21.03	23.18	34.77	-11.59		
				1	0	23.05	21.90	24.05	34.77	-10.72		
	23790	710	QPSK	1	24	22.27	21.12	23.27	34.77	-11.5		
	23770	710	QF3K	12	6	22.30	21.15	23.30	34.77	-11.47		
				25	0	22.17	21.02	23.17	34.77	-11.6		
				1	0	23.16	22.01	24.16	34.77	-10.61		
5	23825	713.5	QPSK	1	24	22.37	21.22	23.37	34.77	-11.4		
5	23023	713.5	QI SIX	12	6	22.31	21.16	23.31	34.77	-11.46		
				25	0	22.17	21.02	23.17	34.77	-11.6		
				1	0	22.05	20.90	23.05	34.77	-11.72		
	23755	706.5	16QAM	1	24	22.79	21.64	23.79	34.77	-10.98		
	20100	700.0	100/101	12	6	21.01	19.86	22.01	34.77	-12.76		
	23790 710			25	0	21.06	19.91	22.06	34.77	-12.71		
				1	0	22.25	21.10	23.25	34.77	-11.52		
		710	160AM	1	24	21.87	20.72	22.87	34.77	-11.9		
		710	16QAM	12	6	21.15	20.00	22.15	34.77	-12.62		
				25	0	21.10	19.95	22.10	34.77	-12.67		

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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	22.54	21.39	23.54	34.77	-11.23		
	23780	709	QPSK	1	49	21.96	20.81	22.96	34.77	-11.81		
	23700	709	QFSK	25	12	22.26	21.11	23.26	34.77	-11.51		
				50	0	21.84	20.69	22.84	34.77	-11.93		
				1	0	22.71	21.56	23.71	34.77	-11.06		
	23790	710	QPSK	1	49	22.14	20.99	23.14	34.77	-11.63		
	23790	710	UFSK	25	12	22.21	21.06	23.21	34.77	-11.56		
				50	0	21.87	20.72	22.87	34.77	-11.9		
		711		1	0	22.97	21.82	23.97	34.77	-10.8		
	23800		QPSK	1	49	22.22	21.07	23.22	34.77	-11.55		
	23000			25	12	21.92	20.77	22.92	34.77	-11.85		
10				50	0	21.87	20.72	22.87	34.77	-11.9		
10				1	0	22.12	20.97	23.12	34.77	-11.65		
	23780	709	16QAM	1	49	20.65	19.50	21.65	34.77	-13.12		
	23700	107	TOCAM	25	12	21.01	19.86	22.01	34.77	-12.76		
				50	0	20.87	19.72	21.87	34.77	-12.9		
				1	0	21.52	20.37	22.52	34.77	-12.25		
	23790	710	16QAM	1	49	21.20	20.05	22.20	34.77	-12.57		
	23770	710	TOCAM	25	12	21.11	19.96	22.11	34.77	-12.66		
				50	0	20.93	19.78	21.93	34.77	-12.84		
				1	0	22.02	20.87	23.02	34.77	-11.75		
	23800	711	16QAM	1	49	21.15	20.00	22.15	34.77	-12.62		
	20000	/11	16QAM	25	12	20.96	19.81	21.96	34.77	-12.81		
			_	50	0	20.97	19.82	21.97	34.77	-12.8		

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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:  $\beta$  values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

Sub-test	βc	βd	β₀ (SF)	β <sub>c</sub> /β <sub>d</sub>	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	Ανς	Avg. Power (dBm) Channel						
	1031	9262.00	9400.00	9538.00					
	1	21.43	22.71	22.70					
HSDPA II	2	21.46	22.69	22.71					
	3	21.03	22.28	22.30					
	4	21.02	22.30	22.32					

Mode	Sub test	Ανς	Avg. Power (dBm) Channel						
	1031	4132.00	4183.00	4233.00					
	1	23.16	22.42	23.15					
HSDPA V	2	23.09	22.41	23.10					
HODPA V	3	22.66	21.99	22.70					
	4	22.67	22.05	22.68					

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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 <sub>ed</sub> (SF)	β <sub>ed</sub> (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 <sub>ed</sub> 1: 47/15 β <sub>ed</sub> 2: 47/15	4 4	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:**

	Sub test	Av	g. Power (dB	sm)
Mode			Channel	
		9262.00	9400.00	9538.00
	1	21.47	22.56	22.71
	2	21.45	22.64	22.68
HSUPA II	3	21.03	22.26	22.28
	4	21.49	22.67	22.72
	5	21.01	22.25	22.24

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Mode	Sub test	Avg. Power (dBm) Channel					
	1031	4132.00	4183.00	4233.00			
	1	23.05	22.45	23.05			
	2	23.07	22.41	23.08			
HSUPA V	3	22.62	22.00	22.57			
	4	23.13	22.43	23.14			
	5	22.62	21.96	22.57			

## 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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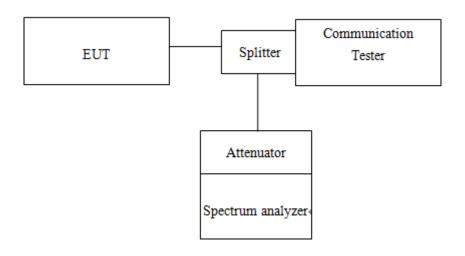


# 7. OCCUPIED BANDWIDTH MEASUREMENT

# 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 NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	N9010A	MY53400256	11/21/2018	11/20/2019
Radio Communication Analyer	Anritsu	MT8820C	6201465317	01/16/2019	01/15/2020
DC Block	PASTERNACK	PE8210	RF256	02/26/2019	02/25/2020
Splitter	Woken	DOM35LW1A2	RF83	02/26/2019	02/25/2020
Attenuator	Marvelous	MVE2213-10	RF80	02/26/2019	02/25/2020

## 7.5. Measurement Result

Erog		99	99% BW (MHz)			26 dB BW (MHz)		
Freq. (MHz)	СН	WCDMA II	HSDPA II	HSUPA II	WCDMA II	HSDPA II	HSUPA II	
1852.40	9262	4.13056	4.10633	4.11710	4.710	4.659	4.661	
1880.00	9400	4.12167	4.10991	4.10620	4.712	4.677	4.658	
1907.60	9538	4.13084	4.13623	4.13583	4.686	4.718	4.747	
Erog		99	9% BW (MH	lz)	26 dB BW (MHz)			
Freq. (MHz)	СН	WCDMA	HSDPA	HSUPA	WCDMA	HSDPA	HSUPA	
(11112)		V	V	V	V	V	V	
826.40	4132	4.11314	4.09898	4.09969	4.654	4.681	4.666	
836.60	4183	4.14097	4.14333	4.12174	4.687	4.685	4.679	
846.60	4233	4.10690	4.09859	4.11015	4.665	4.670	4.664	

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LTE BAND 2 Channel bandwidth: 1.4MHz								
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)			
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM			
1850.7	18607	1.1179	1.1118	1.498	1.481			
1880.0	18900	1.1191	1.1150	1.512	1.482			
1909.3	19193	1.1163	1.1124	1.499	1.496			

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	4.5216	4.5126	5.331	5.446			
1880.0	18900	4.5134	4.5106	5.430	5.344			
1907.5	19175	4.5171	4.5162	5.452	5.344			

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	13.510	13.520	16.275	16.580				
1880.0	18900	13.536	13.521	16.580	16.534				
1902.5	19125	13.510	13.520	17.091	16.456				

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	2.7054	2.7062	3.148	3.203			
1880.0	18900	2.7081	2.7050	3.158	3.141			
1908.5	19185	2.7054	2.7088	3.163	3.195			

LTE BAND 2 Channel bandwidth: 10MHz								
Freq.	СН	99% BV	V (MHz)	26 dB B	W (MHz)			
(MHz)	CH	QPSK	16QAM	QPSK	16QAM			
1855.0	18650	9.0480	9.0031	11.325	10.707			
1880.0	18900	9.0152	8.9923	11.495	10.305			
1905.0	19150	9.0316	9.0015	11.478	10.125			

LTE BAND 2 Channel bandwidth: 20MHz								
Freq.	СН	99% BV	V (MHz)	26 dB B	W (MHz)			
(MHz)	СН	QPSK	16QAM	QPSK	16QAM			
1860.0	18700	17.931	17.943	20.067	19.765			
1880.0	18900	17.915	17.933	20.175	19.923			
1900.0	19100	17.854	17.897	20.120	19.895			

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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	1.1167	1.1134	1.499	1.457				
1732.5	20175	1.1164	1.1104	1.451	1.464				
1754.3	20393	1.1180	1.1134	1.507	1.469				

LTE BAND 4 Channel bandwidth: 5MHz								
Freq.	СН	99% B\	N (MHz)	26 dB B	W (MHz)			
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM			
1712.5	19957	4.5196	4.5197	5.398	5.377			
1732.5	20175	4.5126	4.5109	5.342	5.391			
1752.5	20375	4.5183	4.5141	5.453	5.349			

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	13.459	13.474	14.774	14.763			
1732.5	20175	13.463	13.470	14.762	14.722			
1747.5	20325	13.480	13.495	14.800	14.849			

LTE BAND 5 Channel bandwidth: 1.4MHz								
Freq.	СН	99% B\	N (MHz)	26 dB BW (MHz)				
(MHz)	СП	QPSK	16QAM	QPSK	16QAM			
824.7	20407	1.1152	1.1124	1.456	1.478			
836.5	20525	1.1163	1.1124	1.483	1.483			
848.3	20643	1.1168	1.1123	1.485	1.481			

LTE BAND 5 Channel bandwidth: 5MHz								
Freq.	СН	99% B\	N (MHz)	26 dB BW (MHz)				
(MHz)	CIT	QPSK 16QAM		QPSK 16QAN				
826.5	20425	4.5068	4.4975	5.238	5.181			
836.5	20525	4.5153	4.5154	5.304	5.164			
846.5	20625	4.5059	4.5045	5.314	5.245			

LTE BAND 4 Channel bandwidth: 3MHz								
Freq.	СН	99% BW (MHz)			26 dB BW (MHz)			
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM			
1711.5	19965	2.7037	2.7202	3.107	2.929			
1732.5	20175	5 2.7024 2.7178		3.149	3.160			
1753.5	20385	2.7038	2.7026	3.177	3.204			

LTE BAND 4 Channel bandwidth: 10MHz							
Freq.	СН	99% B\	N (MHz)	26 dB BW (MHz)			
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM		
1715.0	20000	9.0268	8.9758	10.101	9.942		
1732.5	20175	9.0063	8.9728	9.972	9.898		
1750.0	20350	9.0258	8.9857	10.010	9.926		

LTE BAND 4 Channel bandwidth: 20MHz							
Freq.	СН	99% B\	N (MHz)	26 dB BW (MHz)			
(MHz)	СП	QPSK 16QAM		QPSK 16QAM			
1720.0	20050	20050 17.885 17.902		19.353 19.326			
1732.5	20175	17.878 17.881		19.374	19.358		
1745.0	20300	17.951	17.979	19.382	19.495		

LTE BAND 5 Channel bandwidth: 3MHz								
Freq.	СН	99% BV	26 dB BW (MHz)					
(MHz)	Сп	QPSK	16QAM	QPSK	16QAM			
825.5	20415	2.7036	2.7134	3.141	3.178			
836.5	20525	2.7082	2.7147	3.171	3.184			
847.5	20635	2.7124	2.7085	3.160	3.167			

LTE BAND 5 Channel bandwidth: 10MHz								
Freq.	СН	99% BW (MHz)			26 dB BW (MHz)			
(MHz)	CIT	QPSK	QPSK 16QAM		16QAM			
829.0	20450	8.9894	8.9494	9.854	9.895			
836.5	20525	9.0179	9.0090	9.985	9.991			
844.0	20600	8.9548	8.9549	9.872	9.906			

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LTE BAND 13 Channel bandwidth: 5MHz								
Freq.	СН	99% BW (MHz)		26 dB BW (MHz)				
(MHz)	СП	QPSK	16QAM	QPSK	16QAM			
779.5	23205	4.5028	4.4953	5.147	5.093			
782.0	23230	4.5056	4.5018	5.139	5.113			
784.5	23255	4.5067	4.4988	5.154	5.110			

LTE BAND 17 Channel bandwidth: 5MHz							
Freq.	СН	99% B\	N (MHz)	26 dB BW (MHz)			
(MHz)	CH	QPSK	16QAM	QPSK	16QAM		
706.5	23755	4.5207	4.5182	5.556	5.628		
710.0	23790	4.5224	4.5138	5.840	5.667		
713.5	23825	4.5612	4.5345	6.709	6.969		

LTE BAND 13 Channel bandwidth: 10MHz						
Freq.	СН	99% B\	N (MHz)	26 dB BW (MHz)		
(MHz)	СП	QPSK	16QAM	QPSK	16QAM	
782.0	23230	8.940	8.923	9.814	9.842	

LTE BAND 17 Channel bandwidth: 10MHz							
Freq.	СН	99% BW (MHz)			26 dB BW (MHz)		
(MHz)	CIT	QPSK 16QAM		QPSK	16QAM		
709.0	23780	23780 8.9588 8.9170		9.887	9.885		
710.0	23790	8.9878	8.9433	9.963	9.866		
711.0	23800	8.9998	8.9710	9.983	9.883		

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#### WCDMA\_B2\_LowCH9262-1852.4

M Agilent Spect	rum Analyzer -		BW								
Center Fr		50 Q D	00 GH	z	Center Fi	NSE:3NT reg: 1.85240	0000 GHz	ALIGN AUTO	Radio St	3 PN Apr 16, 2019 d: None	Frequency
				Sain:Low	Trig: Fre #Atten: 3		Avg Hold	: 50/50	Radio De	vice: BTS	
10 dB/div		fset 13.9 0.00 d									
20.0		Marine	~~~~	പംപംപ	ahayini (Theyse				an an		Center Freq 1.852400000 GHz
-10.0 -20.0	1	-	_								
-30.0	~									~~~~	
-80.0		-									CF Step
Center 1.1 #Res BW					#VE	3W 150 k	Hz			pan 6 MHz ep 2.6 ms	
Occup	ied Ba			06 MH	Ηz	Total P	ower	29.8	dBm		Freq Offset 0 Hz
Transm	nit Freq	Error		-24	Hz	OBW P	ower	99	.00 %		
x dB Ba	andwidt	h		4.710 M	IHz	x dB		-26.	00 dB		
MSG								STATUS			

#### 03:56:58 PM Apr 16 Radio Std: None ter Freq 1.880000000 GHz e: BTS Ref Offset 13.9 dE Ref 30.00 dBm Center Fr CF Ste Span 6 MH 1.88 GHz N 47 kHz #VBW 150 kHz Sweep 2.6 tes Bi Occupied Bandwidth Total Powe 30.2 dBm Freq Offs 4.1217 MHz 01 Transmit Freg Error -9.458 kHz **OBW Power** 99.00 % 4.712 MHz -26.00 dB x dB Bandwidth x dB

WCDMA\_B2\_MidCH9400-1880

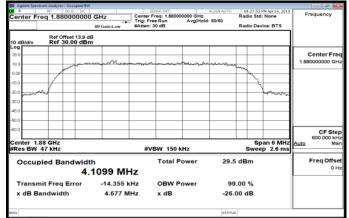
## WCDMA\_B2\_HighCH9538-1907.6

Agilent Spectr	rum Analyzer - Occupied BW							- # <b>-</b>
Center Fre	eq 1.907600000	GHz	SENSE:INT Center Freq: 1.90 Trig: Free Run #Atten: 30 dB	7600000 GHz Avg Hold	ALIGN AUTO	03:58:00 PM / Radio Std: No Radio Device	one	Frequency
I0 dB/div	Ref Offset 13.9 dE Ref 30.00 dBm	3	watten: 30 tib			Radio Device		
20.0		-de-ora	mannam	to manue	n men m	Marine Carlos		Center Free 1.907600000 GH:
10.0 20.0 30.0							- www.	
80.0 50.0								
center 1.9			#VBW 15	0 kHz		Spar Sweep	6 MHz 4	CF Step 600.000 kH Suto Mar
	ied Bandwidt	հ 1308 MH		Power	30.3	dBm		FreqOffse 0H
	nit Freq Error Andwidth	6.249 ki 4.686 Mi		Power		0.00 % 00 dB		
56					STATUS	5		

#### HSDPA B2 LowCH9262-1852.4

Agilent Spectru	m Analyzer - Occupied BW					
Center Fre	rg 1.852400000 (	Trig: I	SENSE:INT r Freq: 1.862400000 GHz Free Run Avg Hol h: 30 dB	Radio d: 50/50	32 PN Apr16, 2019 Std: None Device: BTS	Frequency
10 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm					
20.0	warman and a second	man		Vander and the state		Center Fre 1.852400000 GH
10.0					L	
30.0 40.0						
80.0						CF Ste 600.000 kH
Center 1.85 Res BW 4		#	VBW 150 kHz	Sw	Span 6 MHz eep 2.6 ms	Auto Mi
Occupi	ed Bandwidth 4.1	063 MHz	Total Power	29.2 dBm		Freq Offs 0 F
Transmi	t Freq Error	-9.543 kHz	OBW Power	99.00 %		
x dB Bar	ndwidth	4.659 MHz	x dB	-26.00 dB		
156				STATUS		

## HSDPA\_B2\_MidCH9400-1880



#### HSDPA\_B2\_HighCH9538-1907.6

	nit Freq Error Andwidth	5.092 kHz 4.718 MHz	OBW Power x dB		0.00 % 00 dB		
Occup	ied Bandwidt 4.	<sup>h</sup> 1362 MHz	Total Power	29.5	i dBm		Freq Offs 0 F
Res BW			#VBW 150 kHz		Sp Swee	an 6 MHz p 2.6 ms	Auto Ma
90.0							CF Ste 600.000 kH
0.0							
0.0							
0.0	$\sim$				$\square$	man	
0.00							
10.0		un managene	unannan	-	m		1.907600000 GH
0 dB/div	Ref 30.00 dBn						Center Fre
	Ref Offset 13.9 dl	3					
enter Fr	eq 1.907600000	Trig	ter Freq: 1.907600000 G : Free Run Avg en: 30 dB	Hz Hold: 50/50	Radio Std		riequency
	RF 50 Ω DC		SENSE:INT	ALIGN AUTO		PM Apr 16, 2019	Frequency

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#### HSUPA\_B2\_LowCH9262-1852.4

M Agilent Spect	rum Analyzer - Oc									
Center Fr	RF 50 eq 1.8524		Hz	Center F	NSE:INT req: 1.85240	0000 GHz	ALIGN AUTO	04:31:17 Radio Std	PM Apr 16, 2019 : None	Frequency
			Gain:Low	#Atten: 3	e Run 0 dB	Avg Hold	: 50/50	Radio Dev	ice: BTS	
			Gameeow							l
10 dB/div	Ref Offse Ref 30.	t 13.9 dB 00 dBm					_			
20.0										Center Freq
10.0		-	- marine		man	mun	-			1.852400000 GHz
0.00	- Arr							man		
-10.0								4		
	. /									
-20.0 -70.0	~								man	
40.0										
-50.0										
-60.0										
-60.0										CF Step 600.000 kHz
Center 1.4 #Res BW					SW 150 k			Sp	an 6 MHz p 2.6 ms	Auto Man
#Res BW	47 KHZ			#71	5W 15U K	nz		Swee	p 2.6 ms	
Occup	ied Ban	dwidth			Total P	ower	29.2	dBm		Freq Offset
		4.11	71 MI	Iz						0 Hz
Transm	nit Freq E	rror	-9.822	Hz	OBW P	ower	99	.00 %		
x dB Ba	andwidth		4.661 N	IHz	x dB		-26.	00 dB		
MSG							STATUS	5		

#### 04:32:06 PM Apr 16 Radio Std: None ter Freq 1.880000000 GHz ce: BTS Ref Offset 13.9 dE Ref 30.00 dBm Center Fr CF Ste Span 6 MH 1.88 GHz N 47 kHz #VBW 150 kHz Sweep 2.6 tes Bi Occupied Bandwidth Total Powe 29.5 dBm Freq Offs 4.1062 MHz 01 Transmit Freg Error -17.714 kHz **OBW Power** 99.00 % 4.658 MHz -26.00 dB x dB Bandwidth x dB

HSUPA\_B2\_MidCH9400-1880

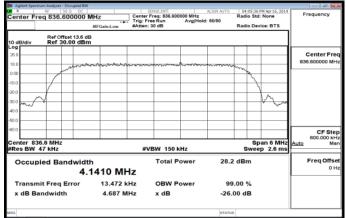
## HSUPA\_B2\_HighCH9538-1907.6

M Agilent Spectro	um Analyzer - Occupied BW								
R	RF 50 Ω DC	011-		NSE:INT reg: 1.90760		ALIGN AUTO	04:32:57 Radio Sto	PM Apr 16, 2019	Frequency
Center Fre	eq 1.907600000	GHZ			AvgiHold	50/50	Radio Sto	: None	
		AIFGain:Low	#Atten: 3	0 dB	-		Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 dE Ref 30.00 dBm								
Log	Rel 30.00 UBII							_	
20.0									Center Free
									1.907600000 GH
10.0	- marine			montene	- Martin Con		m		1.207000000 011
0.00	AV4	_					- N		
10.0	1211						\		
								4	
20.0 00000	~							hornarda	
30.0									
40.0									
-50.0		_							
									CF Step
Center 1.9	08 GH7	_					Sr	an 6 MHz	600.000 kH
FRes BW			#VE	3W 150 k	Hz		Swee	p 2.6 ms	<u>Auto</u> ma
-				Total P		20.0	i dBm		Freq Offse
Occup	ied Bandwidt			l otal P	ower	29.0	aBm		0 H
	4.1	1358 MI	lz						
Transm	it Freq Error	-1.593	kHz	OBW P	ower	99	.00 %		
	ndwidth	4.747 N		x dB		26	00 dB		
х ав ва	nawiam	4./4/ N	Inz	xaB		-26.	ou dB		
190						STATUS			

#### WCDMA B5 LowCH4132-826.4

	m Analyzer - Occupied Bi	V						
Center Fre	eq 826.400000	MHz AlFGain:Low	Center Freq: 826. Trig: Free Run #Atten: 30 dB	400000 MHz Avg Hold	ALIGN AUTO	Radio Dev		Frequency
0 dB/div	Ref Offset 13.6 d Ref 30.00 dB							
20.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	an and the second second	mintersuperson				Center Fr 826.400000 M
0.0								
	$\checkmark$						~~	
0.0								CFSt
enter 826 Res BW 4			#VBW 15	0 kHz		Sp Swee	an 6 MHz p 2.6 ms	600.000 k
Occupi	ied Bandwid 4	<sup>th</sup> .1131 MI		Power	27.5	dBm		Freq Offs 0
Transmi	it Freq Error	7.961	KHZ OBW	Power	99.	00 %		
x dB Ba	ndwidth	4.654 N	IHz x dB		-26.0	0 dB		
99					STATUS			

## WCDMA\_B5\_MidCH4183-836.6



#### WCDMA\_B5\_HighCH4233-846.6

	nit Freq Erro andwidth		6 kHz MHz	OBW P x dB	ower		.00 % 00 dB			
Occup	ied Bandw	vidth 4.1069	/Hz	Total P	ower	27.3	dBm		Freq	Offse 0 H
enter 84 Res BW			#\	/BW 1501	KHz			pan 6 MHz ep 2.6 ms	Auto	Ma
0.0									600.0	F Step
0.0										
								1 Jan		
10								M.		
0.0			-							
.00	1 Alexandre		-	_			m.			
10.0		w.h.h.	mumm	m-rationale-	however	me-marine			846.6000	00 MH
og 20.0									Cente	er Fre
0 dB/div	Ref Offset 1: Ref 30.00									
		#FGain:Low	#Atten		AvgiHold	:>80/80	Radio De	vice: BTS		
enter Fr	eq 846.6000	00 MHz	Center	SENSE (INT) Freq: 846.600 ree Run		ALIGN AUTO	Radio Sto	PN Apr 16, 2019 d: None	Frequer	ncy

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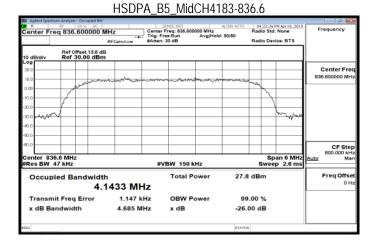
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## Report No.: T190327W11-RP Page 54 of 199

#### HSDPA\_B5\_LowCH4132-826.4

M Agilent Spec	trum Analyzer		pied BW										
Center F		50 Ω 400	000 MH2	,	Center Fi	NSE:1NT reg: 826.400	000 MHz	ALIGN AUTO			N Apr 16, 2019 None	F	requency
Conterri	04 020.	100		Gain:Low	#Atten: 3		Avg Hold	: 50/50	Radio	o Devi	ce: BTS		
10 dB/div			13.6 dB 0 dBm										
20.0		~	, And the second se	and the second	-	-	and way the						Center Freq 5.400000 MHz
-10.0	1	_							7	Z			
-30.0 -40.0	~~										Long to the second		
-50.0													CF Step 600.000 kHz
Center 8 #Res BW					#VE	SW 150 k	Hz		S	Sp: weep	an 6 MHz p 2.6 ms	Auto	Man
Occu	oied Ba	nd		90 MH	łz	Total P	ower	27.4	dBn	n			Freq Offset 0 Hz
	nit Freq		or	10.383 k		OBW P	ower		.00 %	•			
x dB B	andwidt	th		4.681 M	Hz	x dB		-26.	00 dE	в			
MSG								STATUS	1				



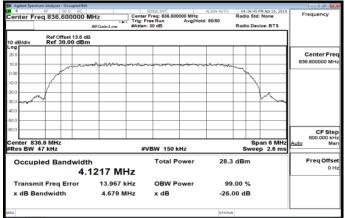
## HSDPA\_B5\_HighCH4233-846.6

Anient Spects	um Analyzer - Or	counied BW								- # <b>*</b>
R Center Fre	RF 50	o 0000 M	Hz #FGain:Low	Center F			ALIGN AUTO	Radio	22 PM Apr 16, 2019 Std: None Device: BTS	Frequency
10 dB/div		et 13.6 dB 00 dBm								
20.0 10.0 0.00		- maryo	and the second		Anna	henterezetit	mm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Center Free 846.600000 MH:
10.0 20.0 30.0 Juwer									how	
0.0 0.0 Center 844									Span 6 MHz	CF Stej 600.000 kH Auto Ma
Res BW 4	17 kHz			#VI	BW 150 k	Hz		Sw	eep 2.6 ms	
Occup	ied Ban		986 MI	Ηz	Total P	ower	27.5	dBm		Freq Offse
	it Freq E ndwidth	rror	-20.562   4.670 N		OBW P	ower		.00 % 00 dB		
156							STATUS			

#### HSUPA B5 LowCH4132-826.4

	nit Freq Error Andwidth	-8 4.666	51 Hz MHz	OBW Po x dB	ower		.00 % 00 dB		
		4.0997 N		Total P		2110	dBm		Freq O
Center 82			#V	BW 150 k	Hz			pan 6 MHz ep 2.6 ms	Auto
80.0									CF
0.0			_						
0.0 <del>~~</del> 0.0	~							July	
0.0	./								
0.00									
10.0			monim		ورادتار د اورو <sub>مع</sub> در ر	**`>***	m		826.400000
og 20.0	Rei 30.00 (								Center
0 dB/div	Ref Offset 13 Ref 30.00 d								
enter Fr	eq 826.4000	AIFGain:Low	Trig: Fri #Atten:		Avg Hold	: 50/50	Radio Ste		
		×		ENSE: INT		ALIGN AUTO		PM Apr 16, 2019	Frequenc

## HSUPA\_B5\_MidCH4183-836.6



#### HSUPA\_B5\_HighCH4233-846.6

	nit Freq Error andwidth	-18.117 4.664		OBW Po x dB	ower		.00 % 00 dB			
Occup	ied Bandw	<sup>idth</sup> 4.1101 M	Hz	Total P	ower	27.8	dBm		Fre	qOffse 0H
enter 84 Res BW			#VI	BW 150 k	Hz			oan 6 MHz ep 2.6 ms	Auto	Ma
0.0										CF Step
0.0										
0.0	~~							how		
0.0										
0.00			-		110000	10000 - Shake - Sala	m.			
10.0		and	and and a	-	0.000	a nation a				terFre 0000 MH
0 dB/div	Ref Offset 13 Ref 30.00 d									
		#FGain:Low	#Atten: 3		Avg Hold	: 80/80	Radio De	vice: BTS		
enter Fr	eq 846.60000		Center F	NSE:3NT reg: 846.600	000 MHz	ALIGN AUTO	Radio Sto	PN Apr 16, 2019 I: None	Frequ	ency

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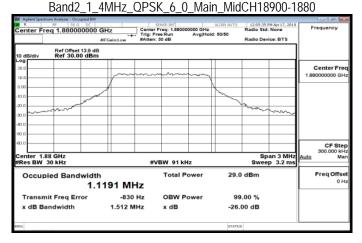
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#### Band2\_1\_4MHz\_QPSK\_6\_0\_Main\_LowCH18607-1850.7

	um Analyzer - Occupied BV	1				
Center Fre	eq 1.85070000	Tri	SENSE:INT Inter Freq: 1.850700000 GH g: Free Run Avg H tten: 30 dB	Iz Radio Iold: 50/50	3:14 PM Apr 17, 2019 Std: None Device: BTS	Frequency
10 dB/div	Ref Offset 13.9 d Ref 30.00 dB					
20.0			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		_	Center Freq 1.850700000 GHz
-10.0		$\downarrow$				
-20.0 -30.0					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
-40.0					_	
Center 1.8 #Res BW			#VBW 91 kHz	Sv	Span 3 MHz veep 3.2 ms	CF Step 300.000 kHz Auto Man
Occup	ied Bandwid 1	<sup>th</sup> 1179 MHz	Total Power	28.3 dBm		Freq Offset 0 Hz
	it Freq Error ndwidth	-1.141 kHz 1.498 MHz	OBW Power x dB	99.00 % -26.00 dB		
MSG				STATUS		



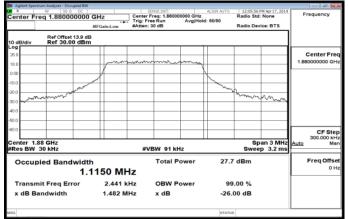
## Band2\_1\_4MHz\_QPSK\_6\_0\_Main\_HighCH19193-1909.3

Agilent Spectru	im Analyzer - Occupied BW				
Center Fre	eq 1.909300000 €	Trig: F	SENSE:INT r Freq: 1.909300000 GHz free Run Avg Ho h: 30 dB	ALIGN AUTO 12:10:49 P Radio Std: Id: 50/50 Radio Devi	
0 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm				
og 20.0			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Center Fr 1.909300000 G
0.0				Marken and M	
0.0					~~~~
0.0					CF St
enter 1.9 Res BW 3		#	VBW 91 kHz	Sp Swee	an 3 MHz <u>Auto</u> M p 3.2 ms
Occupi	ied Bandwidth 1.1	163 MHz	Total Power	28.1 dBm	Freq Offs 0
Transmi x dB Bai	it Freq Error ndwidth	-1.264 kHz 1.499 MHz	OBW Power x dB	99.00 %	
x dB Bar	ndwidth	1.499 MHz	x dB	-26.00 dB	

#### Band2\_1\_4MHz\_16QAM\_6\_0\_Main\_LowCH18607-1850.7

Agilent Spectru	m Analyzer - Occupied BW					
Center Fre	re 50 Ω DC q 1.850700000	Trig	sense:INT ter Freq: 1.850700000 GHz : Free Run Avg Ho en: 30 dB	Radio St Id: 50/50	3 PM Apr 17, 2019 d: None wice: BTS	Frequency
0 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm					
20.0 10.0		mm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Center Fre 1.850700000 GH
0.0						
0.0 0.0 ,					~~~~	
0.0						
enter 1.83 Res BW 3			#VBW 91 kHz	Swe	pan 3 MHz ep 3.2 ms	CF Ste 300.000 kH Auto Ma
Occupi	ed Bandwidth 1.1	, 1118 MHz	Total Power	27.3 dBm	<u> </u>	Freq Offs 0
Transmi	t Freq Error	4.432 kHz	OBW Power	99.00 %		
x dB Bar	ndwidth	1.481 MHz	x dB	-26.00 dB		
99				STATUS		

#### Band2\_1\_4MHz\_16QAM\_6\_0\_Main\_MidCH18900-1880



#### Band2\_1\_4MHz\_16QAM\_6\_0\_Main\_HighCH19193-1909.3

📕 Agilent Spectri	um Analyzer - Occupied BW								# <b>-</b>
R R	eg 1.909300000	GHz	Center F	NSE:INT reg: 1.909300		ALIGN AUTO	12:11:22 Radio Std	PM Apr 17, 2019 : None	Frequency
	1000000000		#Atten: 3		Avg Hole	1: 50/50	Radio Dev	ice: BTS	
10 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm								
20.0									Center Fre
10.0		normal	manon	m	manny				1.909300000 GH
0.00		- <u>I</u>				V			
10.0		4—				- m			
30.0	ann		-			-	hanne	m	
30.0 00/ 10/14								"VJ~m	
40.0			-						
50.0									
90.0									CF Ste 300.000 kH
Center 1.9 Res BW			#VI	3W 91 kH	z		Sp Swee	an 3 MHz p 3.2 ms	Auto Ma
Occup	ied Bandwidth	ı		Total Po	wer	27.4	dBm		Freq Offse
	1.1	124 M	Hz						01
Transm	it Freq Error	3.178	kHz	OBW Po	wer	99	.00 %		
x dB Ba	ndwidth	1.496	MHz	x dB		-26.	00 dB		
195						STATU			

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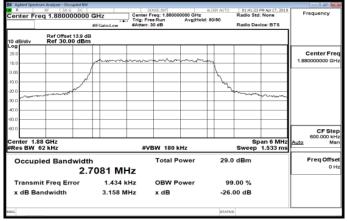
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#### Band2\_3MHz\_QPSK\_15\_0\_Main\_LowCH18615-1851.5

M Agilent Spectre	um Analyzer - Occupied BW								
Center Fre	eq 1.851500000	GHz #FGain:Low	Center Freq Trig: Free R #Atten: 30 d	: 1.851500 un		ALIGN AUTO	01:39:18 Radio Sto Radio De		Frequency
10 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm								
20.0		m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	-			Center Freq 1.851500000 GHz
-10.0						- La			
-20.0 -30.0 mm-mm	- marker						······	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
-50.0									CF Step
Center 1.8 #Res BW			#VBW	180 kH	łz		Si Sweep	oan 6 MHz 1.533 ms	600.000 kHz <u>Auto</u> Man
Occup	ied Bandwidth 2.7	, 7054 MH		otal Po	wer	28.	3 dBm		Freq Offset 0 Hz
	it Freq Error ndwidth	4.235 ki 3.148 Mi		BW Po dB	wer		9.00 % .00 dB		
MSG						STATL	JS		

#### Band2\_3MHz\_QPSK\_15\_0\_Main\_MidCH18900-1880

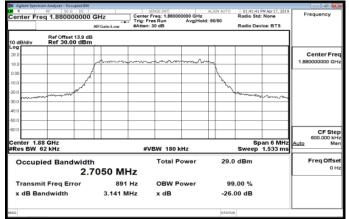


#### Band2\_3MHz\_QPSK\_15\_0\_Main\_HighCH19185-1908.5

Agilent Spectr	rum Analyzer - Occupied BW									
Center Fr	eq 1.908500000	GHz	Center Fr	eg: 1.90850	0000 GHz	ALIGN /		Radio Ste	PM Apr 17, 2019 1: None	Frequency
		#FGain:Low	Trig: Free #Atten: 3		Avg Hold	: 50/50	)	Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 dE Ref 30.00 dBm									
20.0										Center Free
10.0		hours	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m	mm	-				1.908500000 GH
0.00		4				HA				
10.0						Η.	h.			
20.0	manana					$\vdash$		and the second	man	
0.0		+++				$\vdash$	-			
0.0						H				
0.0										
										CF Ste 600.000 kH
enter 1.9 Res BW			#VB	W 180 k	Hz			Sj Sweep	pan 6 MHz 1.533 ms	Auto Ma
Occup	ied Bandwidt	'n		Total P	ower		28.7	dBm		Freq Offse
		7054 MH	z							он
Transm	it Freq Error	3.569 kl	Hz	OBW P	ower		99.	.00 %		
x dB Ba	andwidth	3.163 MI	Hz	x dB			-26.0	00 dB		
9G							STATUS			

#### Band2\_3MHz\_16QAM\_15\_0\_Main\_LowCH18615-1851.5 01:39:46 PM Apr 1 Radio Std: None nter Freq 1.851500000 GHz 1.851500000 GHz AvalHold: 50/50 Center Freq vice: BTS Ref Offset 13.9 dE Ref 30.00 dBm Center Fre CF Ste er 1.852 GHz BW 62 kHz Span 6 MH Sweep 1.533 m #VBW 180 kHz Occupied Bandwidth Total Power 27.5 dBm Freq Offs 0 2.7062 MHz Transmit Freg Error 4.950 kHz **OBW Power** 99.00 % x dB Bandwidth 3.203 MHz -26.00 dB x dB

#### Band2\_3MHz\_16QAM\_15\_0\_Main\_MidCH18900-1880



#### Band2\_3MHz\_16QAM\_15\_0\_Main\_HighCH19185-1908.5

Center Freq 1.908500000 GHz #Figure 1.908500000 GHz #Figure 1.908500000 GHz #Figure 1.908 Conter Freq 1.908500000 GHz #Figure 1.908 Conter Freq 1.908500000 GHz #Figure 1.908 Conter Freq 1.908500000 GHz Radio Std. None Radio Std. None	Agilent Spectri	um Analyzer - Occup	ried BW									- 4
Affeint.cor     Affein: 30 dB     Radio Device: BTS       10 dB/dV     Ref 30.00 dBm     Center Fre       209	Center Fre	eq 1.908500	0000 G	Hz	Center Fi	reg: 1.90850						Frequency
0 dBlaid 0 dBla			A				Avg Hold	: 50	50	Radio De	vice: BTS	
203     Center Fre       204     Span 6 MHz       205     Sweep 1.533 ms       Occupied Bandwidth     Total Power     28.0 dBm       2.7088 MHz     Freq Offss       Transmit Freq Error     2.900 kHz     OBW Power       99.00 %     Center Fre										-		
Image: Constraint of the second sec	-											Center Fre
00     00<	10.0			mm	man	mon	mm	m				1.908500000 GH
00	.00		A									
CF Step     Span 6 MHz     CF Step       00     0	0.0		$ \land$	-					~			
Span 6 MHz     Span 6 MHz     Cr Sta       00     0 <td>0.0</td> <td>manne</td> <td><math> \rightarrow </math></td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td>~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~</td> <td>m</td> <td>maria</td> <td></td>	0.0	manne	$ \rightarrow $	-					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m	maria	
Span 6 MHz     Cr State       00     0												
Comparing the sector of the sector			-	-								
Lenster 1.909 GHz Lenster 1.909 GHz Res BW 62 kHz Sweep 1.533 ms Occupied Bandwidth 2.7088 MHz Transmit Freq Error 2.900 kHz OBW Power 99.00 %												
Concupied Bandwidth Total Power 28.0 dBm Freq offs   2.7088 MHz Auto 0	0.0											
2.7088 MHz Transmit Freq Error 2.900 kHz OBW Power 99.00 %					#VE	3W 180 k	Hz	_		Sp Sweep	an 6 MHz 1.533 ms	Auto Ma
2.7088 MHZ Transmit Freq Error 2.900 kHz OBW Power 99.00 %	Occup	ied Bandv	vidth			Total P	ower		28.0	dBm		FreqOffse
			2.7	088 MH	Iz							0 H
x dB Bandwidth 3 194 MHz x dB _26 00 dB	Transm	it Freq Erro	or	2.900 k	Hz	OBW P	ower		99	.00 %		
x db bandwiddi 3.154 milz X db -20.00 db	x dB Ba	ndwidth		3.194 M	IHz	x dB			-26.	00 dB		
sc. status												

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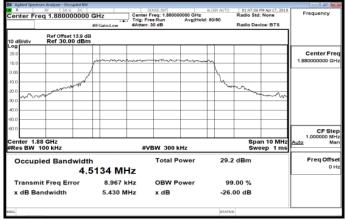
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#### Band2\_5MHz\_QPSK\_25\_0\_Main\_LowCH18625-1852.5

M Agilent Spectry	um Analyzer - Occupied BW									
Center Fre	eq 1.852500000	GHz MFGain:Low				ALIGN A		01:45:44 Radio Std Radio Dev		Frequency
10 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm									
20.0		monorm	b-Mr-Amoral M	and the state of the		na	_			Center Freq 1.852500000 GHz
-10.0						4		we way		
-30.0 water									han	
-50.0										CF Step
Center 1.8 #Res BW 1			#VE	SW 300 k	Hz				n 10 MHz ep 1 ms	<u>Auto</u> Man
Occupi	ied Bandwidth 4.5	5216 M⊦	Iz	Total P	ower	:	28.2	dBm		Freq Offset 0 Hz
	it Freq Error ndwidth	11.507 k 5.331 M		OBW Po x dB	ower		99. -26.0	00 % 0 dB		
MSG						s	STATUS			

#### Band2\_5MHz\_QPSK\_25\_0\_Main\_MidCH18900-1880



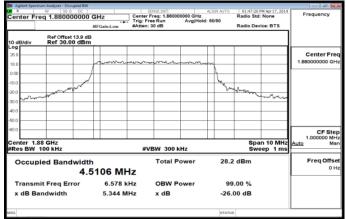
## Band2\_5MHz\_QPSK\_25\_0\_Main\_HighCH19175-1907.5

	um Analyzer - Occupied BW					
Center Fre	eq 1.907500000	Trig: I	SENSE:INT r Freq: 1.907500000 GHz Free Run Avg Hol h: 30 dB	Ra d: 50/50	dio Std: None dio Device: BTS	Frequency
10 dB/div	Ref Offset 13.9 dE Ref 30.00 dBm					
20.0		, more marked	manna	~~	_	Center Freq 1.907500000 GHz
10.00				- La a		
20.0 30.0	manna			~~n/va	hanner	
40.0 50.0						
So.0 Center 1.9					Span 10 MHz	CF Step 1.000000 MH: Auto Mar
Res BW	100 kHz	#	VBW 300 kHz		Sweep 1 ms	
Occup	ied Bandwidtl 4.	<sup>h</sup> 5171 MHz	Total Power	29.1 dE	3m	Freq Offse 0 H
Transm	it Freq Error	12.202 kHz	OBW Power	99.00	%	
x dB Ba	ndwidth	5.452 MHz	x dB	-26.00	dB	
156				STATUS		

# Band2\_5MHz\_16QAM\_25\_0\_Main\_LowCH18625-1852.5

Agilent Spectrum Analyze	er - Occupied BW					ALIGN AUTO	01:46:12	PM Apr 17, 2019	
Center Freq 1.8		GHz		reg: 1.85250			Radio Sto		Frequency
		MFGain:Low	#Atten: 3		Avginoid	. 00/00	Radio De	vice: BTS	
	Offset 13.9 dB 30.00 dBm								
20.0									Center Fr
10.0		man	un no		- Connetton				1.852500000 G
0.00									
0.0	/								
0.0 0.0	monor					- M.	m		
0.0 marmont								maria	
0.0									
0.0									
0.0									CFSt
enter 1.853 GH							0.00	an 10 MHz	1.000000 M
Res BW 100 kH			#VE	BW 300 k	Hz		Sw	eep 1 ms	Auto M
Occupied B	andwidth			Total P	ower	27.	) dBm		Freq Offs
	4.5	126 MH	Iz						0
Transmit Free	gError	12.967 k	Hz	OBW P	ower	91	9.00 %		
x dB Bandwid	ith	5.446 M	IHz	x dB		-26	00 dB		
95						STATU	5		

#### Band2\_5MHz\_16QAM\_25\_0\_Main\_MidCH18900-1880



#### Band2\_5MHz\_16QAM\_25\_0\_Main\_HighCH19175-1907.5

Agilent Spectru	um Analyzer - Occi										
Center Fre	eq 1.90750		GHz	Center F	req: 1.90750	AvgiHold	ALIGN		Radio Std	PM Apr 17, 2019 1: None	Frequency
			AIFGain:Low	#Atten:		Avginoid	: 0010	•	Radio De	vice: BTS	
0 dB/div	Ref Offset Ref 30.0										
.og 20.0											Center Fre
0.0	_		man	mennin		m	-				1.907500000 GH
.00	-			-			Ηh				
0.0		N					H	" North	ma		
	month								* 1×2m	mm	
0.0				-			$\square$				
0.0							$\vdash$				CF Ste
enter 1.9										an 10 MHz	1.000000 MH Auto Ma
Res BW 1	100 kHz			#V	BW 300 H	Hz			Sw	eep 1ms	
Occupi	ied Band	width	1		Total P	ower		27.9	dBm		Freq Offse
		4.5	162 M	Hz							01
Transm	it Freq En	ror	8.774	kHz	OBW P	ower		99	.00 %		
x dB Ba	ndwidth		5.344	MHz	x dB			-26.0	00 dB		
20								STATUS			

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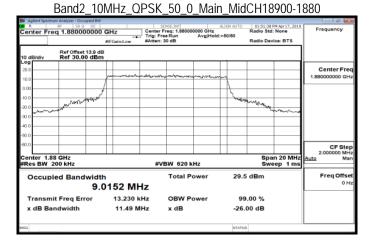
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#### Band2\_10MHz\_QPSK\_50\_0\_Main\_LowCH18650-1855

M Agilent Spect	rum Analyzer - Occupied Bi	N							
Center Fr	eq 1.85500000	0 GHz	Center Fr	vse:3NT eq: 1.85500		ALIGN AUTO	Radio Sta	PM Apr 17, 2019 1: None	Frequency
		AIFGain:Low	#Atten: 3		Avg Hold	:>50/50	Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 d Ref 30.00 dB								
20.0		parameter	wallwager*	mann	mon	-			Center Freq 1.85500000 GHz
0.00		A				ha			
-20.0 -30.0 Janarray	- Marting Martin					- 494	warm	and and	
-40.0									
Center 1.8									CF Step 2.000000 MHz
#Res BW			#VE	SW 620 k	Hz		Sw	an 20 MHz 'eep 1 ms	<u>Auto</u> Man
Occup	ied Bandwid	<sup>th</sup> .0480 MH	1~	Total P	ower	28.2	2 dBm		Freq Offset 0 Hz
<b>T</b>	-	25.312 k		OBW P			.00 %		
	nit Freq Error andwidth	25.312 K		x dB	ower		00 dB		
MSG						STATU	-		
MSG						STATU	9		

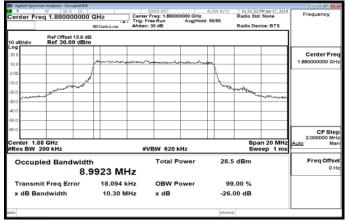


#### Band2\_10MHz\_QPSK\_50\_0\_Main\_HighCH19150-1905

🛤 Agilent Spectr	um Analyzer - Occupied BW						
Center Fre	eq 1.905000000	GHz	Center Freq: 1.900		ALIGN AUTO	01:53:02 PM Apr 1 Radio Std: None	
		AIFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hole	1: 50/50	Radio Device: B	тя
10 dB/div	Ref Offset 13.9 de Ref 30.00 dBm			1			
20.0		manyan	m.h.a.pressioner	-	-		Center Free 1.905000000 GHz
0.00		A					
10.0	wwwwwww				101	Marg Mar	
30.0						nord Marine	Ann
0.0							_
90.0							_
							2.000000 MH
Center 1.9 Res BW			#VBW 620	kHz		Span 20 Sweep	MHz <u>Auto</u> Mar 1 ms
Occup	ied Bandwidt	h	Total	Power	28.	7 dBm	Freq Offse
	9.	0316 MH	z				0 H:
Transm	it Freq Error	15.806 kł	Iz OBW	Power	9	9.00 %	
x dB Ba	ndwidth	11.48 MH	Hz xdB		-26	.00 dB	
195						-	
90					STAT	05	

#### Band2\_10MHz\_16QAM\_50\_0\_Main\_LowCH18650-1855 01:50:40 PM Apr 1 Radio Std: None ter Freq 1.855000000 GHz 000 GHz vice: BTS Ref Offset 13.9 dE Ref 30.00 dBm Center Fr CF Ste Span 20 MH Sweep 1 m 1.855 GHz W 200 kHz #VBW 620 kHz Occupied Bandwidth Total Power 27.3 dBm Freq Offs 0 9.0031 MHz Transmit Freg Error 31.610 kHz **OBW Power** 99.00 % x dB Bandwidth 10.71 MHz -26.00 dB x dB

#### Band2\_10MHz\_16QAM\_50\_0\_Main\_MidCH18900-1880



#### Band2\_10MHz\_16QAM\_50\_0\_Main\_HighCH19150-1905

Agilent Spectri	wm Analyzer - Occupied BW RF 50 Q DC		4	INSEINT		ALIGN AUT	0 01-53-26	PM Apr 17, 2019	- 4 -
Center Fre	eq 1.90500000	GHz		reg: 1.905000			Radio Ste		Frequency
		#FGain:Low	#Atten:		Avginoid		Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 d Ref 30.00 dBr								
20.0							_		Center Free
10.0		and a second second		mon	and the	~	_		1.905000000 GH
		A				$\square$	_		
0.0		~				$\parallel$	A4		
0.0	and and and a second						- his a share a	matrice .	
0.0									
0.0									
0.0			-						
0.0									CF Ste
Center 1.9 Res BW 2			#V	BW 620 ki	Hz			an 20 MHz eep 1 ms	2.000000 MH <u>Auto</u> Ma
Occup	ied Bandwidt	:h		Total Po	wer	2	8.7 dBm		Freq Offse
	9.	0015 M	Hz						0 H
Transm	it Freq Error	22.619	kHz	OBW Po	wer		99.00 %		
x dB Ba	ndwidth	10.12	/Hz	x dB		-2	6.00 dB		
G							ATUS		

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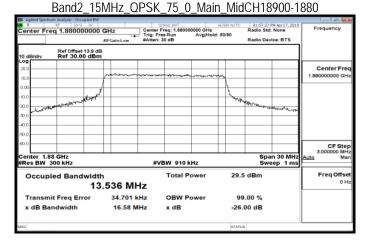
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#### Band2\_15MHz\_QPSK\_75\_0\_Main\_LowCH18675-1857.5

M Agilent Spec	trum Analyzer - Occupied B	W							
Center Fr	reg 1.85750000	0 GHz	Center Fr	NSE:3NT reg: 1.85750	0000 GHz	ALIGN AUTO	Radio Sto	PM Apr 17, 2019 : None	Frequency
		#FGain:Low	#Atten: 3		Avg Hold	: 50/50	Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 Ref 30.00 dB			-	_				
20.0			and the state						Center Freq 1.857500000 GHz
0.00 -10.0	4.00	1					<b>n</b>		
-20.0 -30.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	www.www.www.www.						. chailed and a factor of the	(and planet)	
-40.0									
-60.0									CF Step 3.000000 MHz
Center 1. #Res BW			#VE	3W 910 k	Hz		Spa Sw	an 30 MHz eep 1 ms	<u>Auto</u> Man
Occup	bied Bandwid	<sup>lth</sup> 3.510 MH	łz	Total P	ower	28	3 dBm		Freq Offset 0 Hz
Transn	nit Freq Error	59.934 k	Hz	OBW P	ower	9	9.00 %		
x dB B	andwidth	16.28 M	Hz	x dB		-26	.00 dB		
MSG						STAT	us		



## Band2\_15MHz\_QPSK\_75\_0\_Main\_HighCH19125-1902.5

Agilent Spectrum	m Analyzer - Occupied BW				- 4
	RF 50 Ω DC q 1.902500000	#FGain:Low #Att	sense:INT ter Freq: 1.902500000 GHz : Free Run Avg Hol en: 30 dB	Radio Std	
0 dB/div	Ref Offset 13.9 dl Ref 30.00 dBn				
20.0		manana	manmmanter	m	Center Fre 1.902500000 GH
0.0	- survey by Longer			h. h.	
2.0 2.0	- Angen 19 ph marted			and	VLERAND Mindenneger
1.0					CF Ste
enter 1.90 Res BW 3			#VBW 910 kHz	Spa Sw	an 30 MHz Auto Ma eep 1 ms
Occupie	ed Bandwidt 13	<sup>h</sup> 3.510 MHz	Total Power	29.2 dBm	Freq Offs 0 F
	t Freq Error	57.249 kHz	OBW Power	99.00 %	
x dB Ban	ndwidth	17.09 MHz	x dB	-26.00 dB	
25				STATUS	

#### Band2\_15MHz\_16QAM\_75\_0\_Main\_LowCH18675-1857.5 01:56:32 PN Apr 1 Radio Std: None nter Freq 1.857500000 GHz 1.857500 000 GHz ice: BTS Ref Offset 13.9 dE Ref 30.00 dBm Center Fr CF Ste Span 30 MH Sweep 1 m 1.858 GHz W 300 kHz #VBW 910 kHz Occupied Bandwidth Total Power 27.5 dBm Freq Offs 0 13.520 MHz Transmit Freg Error 34.835 kHz **OBW Power** 99.00 %

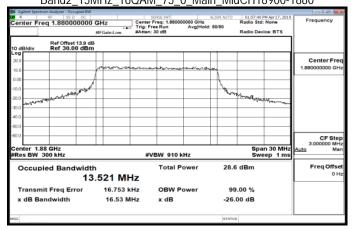
## Band2\_15MHz\_16QAM\_75\_0\_Main\_MidCH18900-1880

x dB

-26.00 dB

16.58 MHz

x dB Bandwidth



#### Band2\_15MHz\_16QAM\_75\_0\_Main\_HighCH19125-1902.5

Agilent Spectr	rum Analyzer - Occupie								
Center Fre	eq 1.9025000	× 000 GHz	Center	ENSE:3NT Freq: 1.902500	000 GHz	ALIGN AUTO	Radio St	5 PM Apr 17, 2019 d: None	Frequency
		#FGain:Low	Trig: Free Run Avg Hold: 50/50 MFGein:Low #Atten: 30 dB Radio Device: BTS						
10 dB/div	Ref Offset 13 Ref 30.00 d								
20.0							_		Center Fre
10.0		man		mon	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	-	_		1.902500000 GH
0.00			_				_		
0.0		MD .				1	-		
0.0	www.angloward						and and a start of the	Murran	
10.0	-						_	- where	
0.0									
0.0			_				_	-	
0.0	+								CF Ste
enter 1.9	03 GHz						Sn	an 30 MHz	3.000000 MH Auto Ma
Res BW			#V	BW 910 kH	z		Sw	reep 1 ms	Auto ma
Occup	ied Bandw	idth		Total Po	wer	28	.6 dBm		FreqOffse
		13.520 N	ΛHz						0 H
Transm	it Freq Error	31.48	5 kHz	OBW Po	wer	9	9.00 %		
x dB Ba	andwidth	16.46	MHz	x dB		-26	5.00 dB		
G						STAT	US		

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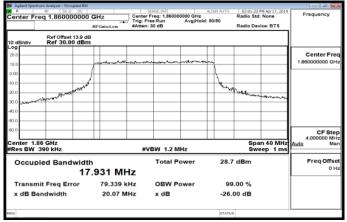
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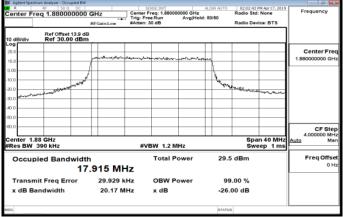
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#### Band2\_20MHz\_QPSK\_100\_0\_Main\_LowCH18700-1860





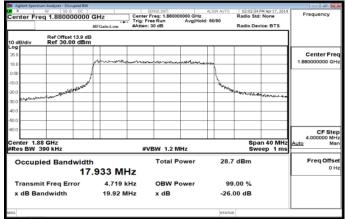


## Band2\_20MHz\_QPSK\_100\_0\_Main\_HighCH19100-1900

M Agilent Spectr	um Analyzer - Occupied BW								- 2 2
Center Fre	RF 50 2 DC eq 1.900000000		Trig: Free Run Avg Hold: 50/50						
10 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm						_		
20.0		mon	ali, in a start		ann an	-			Center Freq 1.90000000 GHz
0.00		1				J. Market	~~~		
20.0 30.0 40.0	Angers-Manager Stad Willer						"Wardentown	Marian M	
90.0									CF Ster
Center 1.9 Res BW			#VE	3W 1.2 M	Hz		Sp Sv	an 40 MHz /eep 1 ms	4.000000 MH
Occup	ied Bandwidth 17	854 MH	łz	Total P	ower	29	0 dBm		Freq Offse 0 Ha
	it Freq Error	58.920 k		OBW P	ower	9	9.00 %		
x dB Ba	indwidth	20.12 M	Hz	x dB		-26	.00 dB		
195						STAT	us		L

#### Band2\_20MHz\_16QAM\_100\_0\_Main\_LowCH18700-1860 02:01:48 PM Apr 1 Radio Std: None nter Freq 1.860000000 GHz 000 GHz ice: BTS Ref Offset 13.9 d Ref 30.00 dB Center Fre (Perfil CF Ste Span 40 MH Sweep 1 m 1.86 GHz W 390 kH: #VBW 1.2 MHz Occupied Bandwidth Total Power 27.7 dBm Freq Offs 0 17.943 MHz Transmit Freg Error 63.781 kHz **OBW Power** 99.00 % 19.76 MHz -26.00 dB dB Bandwidth x dB

#### Band2\_20MHz\_16QAM\_100\_0\_Main\_MidCH18900-1880



#### Band2\_20MHz\_16QAM\_100\_0\_Main\_HighCH19100-1900

📕 Agilent Spectri	um Analyzer - Occupied BV	1				
Center Fre	eq 1.900000000		SENSE:INT Center Freq: 1.900000 Trig: Free Run	ALIGN AUTO 000 GHz AvgiHold: 50/50	02:05:24 PM Apr 17, 3 Radio Std: None	Frequency
			#Atten: 30 dB		Radio Device: BTS	_
0 dB/div	Ref Offset 13.9 d Ref 30.00 dBr					
og 20.0						Center Fre
0.0		perman	, mar and a start and a start and a start a st	mann		1.90000000 GH
00		<u> </u>				-
0.0		4		- New Contraction	N.N.	
2.0 Jajuwere	and an and the second second				an war and a war and	
2.0						2
0.0						_
0.0						CF Ste
enter 1.9	GHz				Span 40 M	4.000000 MH Hz Auto Ma
Res BW 🗧	390 kHz		#VBW 1.2 MI	Hz	Sweep 1 r	ns
Occup	ied Bandwid	th	Total Po	wer 28.	9 dBm	Freq Offse
	17	7.897 MH	z			01
Transm	it Freq Error	61.468 kH	z OBW Po	wer 9	9.00 %	
x dB Ba	ndwidth	19.90 MH	z xdB	-26	.00 dB	
20				STAT	_	

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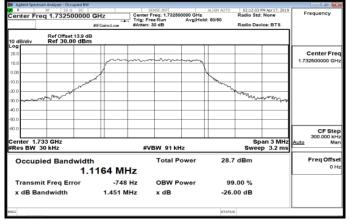
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#### Band4\_1\_4MHz\_QPSK\_6\_0\_Main\_LowCH19957-1710.7

M Agilent Spect	rum Analyzer - Occupied BW					
Center Fr	eq 1.710700000		SENSE:INT ar Freq: 1.710700000 GHz	Radio St	2 PM Apr 17, 2019 d: None	Frequency
		100:	FreeRun Avg Hol m: 30 dB	d: 50/50 Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 dE Ref 30.00 dBm					
20.0			~~~~~			Center Freq 1.710700000 GHz
0.00						
-10.0		ď		man and a second		
-30.0	- m				-	
-40.0						
-60.0						CF Step 300.000 kHz
Center 1.7 #Res BW			FVBW 91 kHz	Swe	pan 3 MHz ep   3.2 ms	Auto Man
Occup	ied Bandwidt		Total Power	28.9 dBm		Freq Offset 0 Hz
	1.1	1167 MHz				0 Hz
Transm	nit Freq Error	-484 Hz	OBW Power	99.00 %		
x dB Ba	andwidth	1.499 MHz	x dB	-26.00 dB		
MSG				STATUS		

#### Band4\_1\_4MHz\_QPSK\_6\_0\_Main\_MidCH20175-1732.5

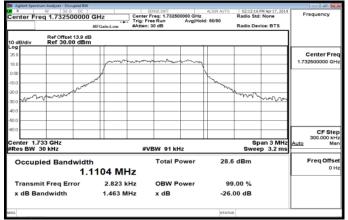


#### Band4\_1\_4MHz\_QPSK\_6\_0\_Main\_HighCH20393-1754.3

M Agilent Spectr	rum Analyzer - Occupied BW								- 4 -
Center Fr	eq 1.754300000		Center Fr	eg: 1.75430		ALIGN AUTO	Radio Std	None	Frequency
		AIFGain:Low	Trig: Free #Atten: 3	Run 0 dB	Avg Hole	1: 50/50	Radio Dev	ice: BTS	
10 dB/div	Ref Offset 13.9 dE Ref 30.00 dBm						-		
20.0									Center Free
10.0		mon	***	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m				1.754300000 GH
0.00		1				4			
10.0						Jun			
20.0	and the second s						Land .		
							-www	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
40.0									
0.0									
									CF Ste 300.000 kH
Center 1.7 Res BW			#VB	W 91 kH	z		Sp Swee	an 3 MHz p 3.2 ms	<u>Auto</u> Ma
Occup	ied Bandwidt	h		Total P	ower	28.7	dBm		Freq Offse
	1.1	1180 MH	z						он
Transm	it Freq Error	-440	Hz	OBW P	ower	99	.00 %		
x dB Ba	andwidth	1.506 MI	Ηz	x dB		-26.	00 dB		
96						STATU	1		t

	ed Bandwidt 1. t Freg Error	h 1134 MHz 2.802 kHz	Total Power	27.8 dBm 99.00 %		Freq Offs 0 F
Res BW 3		1	#VBW 91 kHz		pan 3 MHz p 3.2 ms	
10.0 10.0						CF Ste 300.000 ki
0.0 0.0 0.0	som man			- Mark	m	
0.00						
0.0		m	www.my			Center Fr 1.710700000 G
0 dB/div	Ref Offset 13.9 dl Ref 30.00 dBn					
enter Fre	eq 1.710700000	Trig	SENSE:INT er Freq: 1.710700000 GHz Free Run Avg Hole m: 30 dB	Radio Std		Frequency

#### Band4\_1\_4MHz\_16QAM\_6\_0\_Main\_MidCH20175-1732.5



#### Band4\_1\_4MHz\_16QAM\_6\_0\_Main\_HighCH20393-1754.3

📕 Agilent Spectr	rum Analyzer - Occupied BW RF 50 Q DC		1	NSEINT		ALIGN AUTO	1 02 00 000	PN Apr 17, 2019	
Center Fr	eq 1.754300000	GHz	Center F	reg: 1.754300	0000 GHz AvgiHold		Radio Std		Frequency
		AIFGain:Low	#Atten: 3		Avginoid	1:>00/00	Radio Dev	ice: BTS	
I0 dB/div	Ref Offset 13.9 d Ref 30.00 dBr						-		
20.0									Center Fre
10.0		monor	hann	m	m				1.754300000 GH
.00		_/	-			1			
0.0			-			~			
0.0	una						n m	mm	
								and a straight	
0.0									
0.0									
									CF Ste 300.000 kH
enter 1.7 Res BW			#VE	BW 91 kH	z		Sp Swee	an 3 MHz p 3.2 ms	<u>Auto</u> Ma
Occup	ied Bandwidt	h		Total Po	ower	28.2	dBm		Freq Offse
	1.	1134 M	Hz						0 H
Transm	nit Freq Error	4.723	kHz	OBW Po	ower	99	.00 %		
x dB Ba	andwidth	1.469	MHz	x dB		-26.	00 dB		
96						STATUS			

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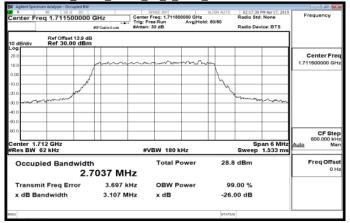
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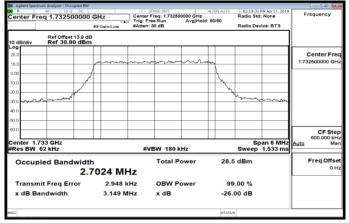
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#### Band4\_3MHz\_QPSK\_15\_0\_Main\_LowCH19965-1711.5



#### Band4\_3MHz\_QPSK\_15\_0\_Main\_MidCH20175-1732.5

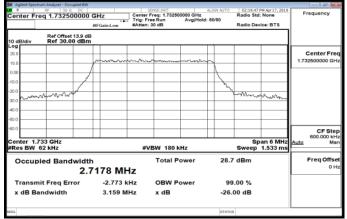


#### Band4\_3MHz\_QPSK\_15\_0\_Main\_HighCH20385-1753.5

Agilent Spectr	rum Analyzer - Occupied BW								
Center Fre	eq 1.753500000		Center Fr	eq: 1.753500	0000 GHz	ALIGN AUT	Radio Sto	PM Apr 17, 2019 I: None	Frequency
		#FGain:Low	Trig: Free Run Avg Hold: 50/50 #Atten: 30 dB					vice: BTS	
10 dB/div	Ref Offset 13.9 dB Ref 30.00 dBm								
20.0							_		Center Free
10.0		mon		$\sim$	non-hon	~	_		1.753500000 GH
0.00	J	1				- h.	_		
0.0						1	\n.		
20.0	manner						- Jarres		
0.0									
0.0									
									CF Ste 600.000 kH
enter 1.7 Res BW			#VE	W 180 k	Hz		Sı Sweep	oan 6 MHz 1.533 ms	Auto Ma
Occup	ied Bandwidth	ı		Total Po	ower	2	3.4 dBm		FreqOffse
	2.7	7038 MH	z						он
Transm	it Freq Error	6.229 k	Hz	OBW Po	ower		99.00 %		
x dB Ba	andwidth	3.177 M	Hz	x dB		-2	6.00 dB		
9G						5T/	TUS		

#### Band4\_3MHz\_16QAM\_15\_0\_Main\_LowCH19965-1711.5 02:18:04 PM Apr 1 Radio Std: None Center Freq: 1.711500000 GHz nter Freq 1.711500000 GHz io Device: BTS Ref Offset 13.9 d Ref 30.00 dB Center Fre CF Ste 1.712 GHz W 62 kHz Span 6 MH Sweep 1.533 m #VBW 180 kHz Occupied Bandwidth Total Power 29.1 dBm Freq Offs 0 2.7202 MHz Transmit Freg Error -10.410 kHz **OBW Power** 99.00 % 2.929 MHz -26.00 dB dB Bandwidth x dB

#### Band4\_3MHz\_16QAM\_15\_0\_Main\_MidCH20175-1732.5



#### Band4\_3MHz\_16QAM\_15\_0\_Main\_HighCH20385-1753.5

Agilent Spect	num Analyzer - Occup											-   #
	eq 1.75350	0000 G	Hz	Center F	NSE:INT reg: 1.76360			OTUA N	Radio Std	PN Apr 17, 2019 1: None	Freq	quency
		A	IFGain:Low	#Atten: 3		Avg Hold	1: 50	/50	Radio De	vice: BTS		
0 dB/div	Ref Offset 1 Ref 30.00											
og 20.0											Ce	nter Fre
10.0	_		m	mon	min	mm	-					00000 GH
0.00	_							<u> </u>				
0.0	_	-/						1				
0.0	_	$ \land$						~				
0.0	m						$\square$		- AND AND	mm		
0.0	_											
0.0	_						+					
0.0	_						+					CF Ste
Center 1.	754 GHz								Sr	oan 6 MHz	6 Auto	00.000 kH
Res BW				#VE	3W 180 F	Hz				1.533 ms		
Occup	ied Bandy	width			Total P	ower		28.4	dBm		Fr	eqOffs
			026 MI	Iz								0 H
Transn	nit Freq Erro	or	5.734	Hz	OBW P	ower		99	.00 %			
x dB B	andwidth		3.204 N	IHz	x dB			-26.	00 dB			
50								STATUS	5			

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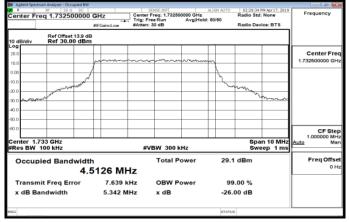
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#### Band4\_5MHz\_QPSK\_25\_0\_Main\_LowCH19975-1712.5

M Agilent Spectru	um Analyzer - Occupied BW								- 4 <b>-</b>
Center Fre	eq 1.712500000	GHz	Center Fre	e:int  q: 1.71250	0000 GHz	ALIGN AUT	02:28:02 Radio Sto	PN Apr 17, 2019 I: None	Frequency
		AIFGain:Low	#Atten: 30		Avg Hold	50/50	Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 dE Ref 30.00 dBm								
20.0			warn	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mam	~	_		Center Freq
0.00		4				X			
-10.0	and a second						manna a		
30.0 AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	~~							multin	
-50.0									
-60.0									CF Step 1.000000 MHz
Center 1.7 #Res BW 1			#VB	W 300 k	Hz			an 10 MHz eep 1 ms	<u>Auto</u> Man
Occupi	ied Bandwidtl			Total Po	ower	29	.2 dBm		Freq Offset
	4.9	5196 MH	z						0 112
Transm	it Freq Error	13.019 k	Hz	OBW Po	ower	1	99.00 %		
x dB Ba	ndwidth	5.398 M	Hz	x dB		-2	6.00 dB		
MSG						STA	TUS		

#### Band4\_5MHz\_QPSK\_25\_0\_Main\_MidCH20175-1732.5

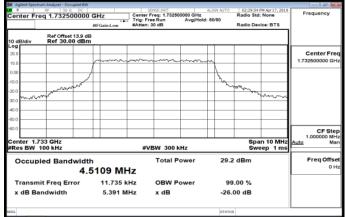


## Band4\_5MHz\_QPSK\_25\_0\_Main\_HighCH20375-1752.5

M Agilent Spectru	um Analyzer - Occupied BW								- 4 <b>-</b>
Center Fre	eq 1.752500000	GHz	Center Fre	seant Ig: 1.752500 Run IdB		ALIGN AUTO	Radio Device	one	Frequency
10 dB/div	Ref Offset 13.9 dE Ref 30.00 dBm	,							
20.0						m			Center Freq 1.752500000 GHz
10.00						À.	m.		
30.0 40.0	******							~~~~	
90.0									CF Step 1.000000 MH
Center 1.7 Res BW 1			#VB	W 300 kH	łz		Span Swee	10 MHz p 1 ms	Auto Mar
Occupi	ied Bandwidtl 4.	5183 MH		Total Po	wer	29	.4 dBm		Freq Offse 0 Ha
	it Freq Error ndwidth	17.451 k 5.453 M		OBW Po x dB	wer		99.00 % 5.00 dB		
150						STA			

#### Band4\_5MHz\_16QAM\_25\_0\_Main\_LowCH19975-1712.5 02:28:31 PM Apr 1 Radio Std: None Center Freq: 1.712500000 GHz Trig: Free Run Avg|Hold: 50/50 nter Freq 1.712500000 GHz o Device: BTS Ref Offset 13.9 dE Ref 30.00 dBm Center Fre CF Ste Span 10 MH Sweep 1 m 1.713 GHz W 100 kHz #VBW 300 kHz Occupied Bandwidth Total Power 27.6 dBm Freq Offs 0 4.5197 MHz Transmit Freg Error 11.854 kHz **OBW Power** 99.00 % x dB Bandwidth 5.377 MHz -26.00 dB x dB

#### Band4\_5MHz\_16QAM\_25\_0\_Main\_MidCH20175-1732.5



#### Band4\_5MHz\_16QAM\_25\_0\_Main\_HighCH20375-1752.5

📕 Agilent Spectru	um Analyzer - Occupied B	W							
Center Fre	eq 1.75250000	0 GHz	Center	ENSEINT Freg: 1.76250	0000 GHz	ALIGN AU	Radio St	8 PN Apr 17, 2019 d: None	Frequency
		AIFGain:Low	#Atten:		Avg Hold	: 50/50	Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 Ref 30.00 dB								
og 20.0							_		Center Fre
10.0		manne	m	- Annor	m	~	_		1.752500000 GH
.00						H.	_		
0.0		r 2 <sup>4</sup>	-			4	ma	-	
0.0	-					$\vdash$	VINE	manna	
	1								
0.0									
0.0									
									CF Ste 1.000000 MH
enter 1.7 Res BW 1			#V	BW 300 k	Hz			an 10 MHz /eep 1 ms	<u>Auto</u> Ma
Occupi	ied Bandwid	ith		Total Po	ower	2	8.1 dBm		Freq Offse
	4	.5141 M	Hz						0 H
Transmi	it Freq Error	14.130	kHz	OBW Po	ower		99.00 %		
x dB Ba	ndwidth	5.349 1	/Hz	x dB		-	26.00 dB		
99						51	ATUS		

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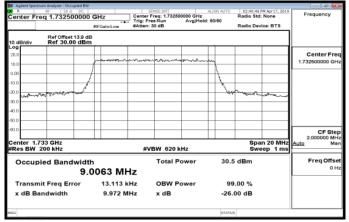
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#### Band4\_10MHz\_QPSK\_50\_0\_Main\_LowCH20000-1715

M Agilent Spectr	um Analyzer - Occupied BW									
Center Fre	eq 1.715000000	GHz	Center Fr	vse:1NT  eg: 1.71500		ALIGN A		02:38:05 Radio Ste	PM Apr 17, 2019 1: None	Frequency
	•	AIFGain:Low	#Atten: 3		Avg Hold	1: 50/50	•	Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 dE Ref 30.00 dBm									
20.0							_			Center Freq
10.0		/				T				1.7 1800000 GH2
-10.0										
-20.0							7	~~~~		
30.0						$\square$		* hun	verner au	
-40.0						++				
-50.0						++				
-60.0										CF Step 2.000000 MHz
Center 1.7 #Res BW 1			#VB	SW 620 k	Hz			Sp: Sw	an 20 MHz eep 1 ms	<u>Auto</u> Man
Occup	ied Bandwidtl	'n		Total P	ower		29.9	dBm		Freq Offset
	9.0	0268 MH	z							0 Hz
Transm	it Freq Error	31.130 k	Hz	OBW P	ower		99.	00 %		
x dB Ba	ndwidth	10.10 M	Hz	x dB			-26.0	0 dB		
MSG							STATUS			

#### Band4\_10MHz\_QPSK\_50\_0\_Main\_MidCH20175-1732.5

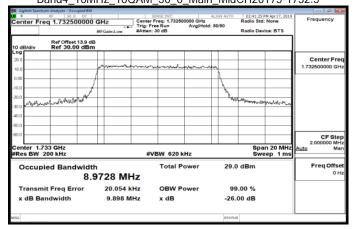


## Band4\_10MHz\_QPSK\_50\_0\_Main\_HighCH20350-1750

🌉 Agilent Spectr	um Analyzer - Occupied BW								
Center Fre	eq 1.750000000	GHz	Center Freq:	1.750000000	3Hz	IGN AUTO	02:43:05 Radio Ste	PM Apr 17, 2019 I: None	Frequency
		AlFGain:Low	#Atten: 30 dB		Hold: 5	0/50	Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 dE Ref 30.00 dBm								
20.0									Center Freq
10.0		manner	marin	man	Nachury	1			1.750000000 GHz
0.00	+ +	$A \rightarrow A$				4			
10.0						1			
-20.0	mannamman					<u> </u>	and the second	-42-02-04	
30.0		+++							
40.0					-	-			
50.0									
60.0						+			CF Step 2.000000 MH
Center 1.7 #Res BW 3			#VBW	620 kHz			Sp. Sw	an 20 MHz eep 1 ms	Auto Mar
Occup	ied Bandwidt	'n	то	tal Powe	r	29.2	2 dBm		Freq Offset
		0258 MH	z						0 Hz
Transm	it Freq Error	32.770 kl	Hz OF	<b>3W Powe</b>	r	99	.00 %		
x dB Ba	ndwidth	10.01 MI	Hz x	dB		-26.	00 dB		
155						STATU	5		

#### Band4\_10MHz\_16QAM\_50\_0\_Main\_LowCH20000-1715 nter Freq 1.715000000 GHz 02:38:49 PM Apr 1 Radio Std: None 1.715000000 GHz AvalHold: 50/50 vice: BTS Ref Offset 13.9 d Ref 30.00 dBr Center Fre CF Ste Span 20 MH Sweep 1 m 1.715 GHz W 200 kHz #VBW 620 kHz Occupied Bandwidth Total Power 28.3 dBm Freq Offs 0 8.9758 MHz Transmit Freg Error 32.396 kHz **OBW Power** 99.00 % x dB Bandwidth 9.942 MHz -26.00 dB x dB

## Band4\_10MHz\_16QAM\_50\_0\_Main\_MidCH20175-1732.5



#### Band4\_10MHz\_16QAM\_50\_0\_Main\_HighCH20350-1750

Agilent Spectru	em Analyzer - Occupied BW									- 4
Center Fre	RF 50 Ω DC	GHz	Center F	NSE:INT reg: 1.75000	0000 GHz	ALIGN		Radio Sto	PN Apr 17, 2019 1: None	Frequency
		AIFGain:Low	#Atten: 3		Avg Hold	: 50/5		Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 d Ref 30.00 dBr									
-og 20.0										Center Fre
10.0		mount	man	monan	man	4				1.75000000 GH
		A				H	_			
0.0		4				H,	$\setminus$			
0.0	monande					$\vdash$	<u>`</u>	۲۰۰۰ میریک	mon	
		++				$\vdash$				
0.0						H				
0.0		++				H				
0.0										CF Ste 2.000000 MH
enter 1.7 Res BW 2			#VE	3W 620 k	Hz			Spa Sw	an 20 MHz eep 1 ms	Auto Ma
Occupi	ied Bandwidt	:h		Total P	ower		28.6	dBm		Freq Offse
	8.	9857 MI	Ηz							0 H
Transm	it Freq Error	38.535	KHz	OBW P	ower		99.	00 %		
x dB Ba	ndwidth	9.926 N	IHz	x dB			-26.0	0 dB		
96							STATUS			

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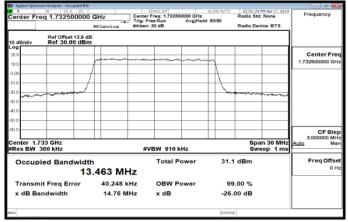
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#### Band4\_15MHz\_QPSK\_75\_0\_Main\_LowCH20025-1717.5

M Agilent Spect	trum Analyzer - Occupied BW			VSE-INT					
Center Fr	eq 1.71750000	) GHz	Center Fr	eq: 1.71750	0000 GHz	ALIGN AUTO	Radio Ste	PM Apr 17, 2019 1: None	Frequency
		AFGain:Low	#Atten: 3		Avg Hold	: 50/50	Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 d Ref 30.00 dBr			_	_				
20.0		paristan sudd	-		man	~~			Center Freq 1.717500000 GHz
0.00		A							
-20.0	- and the second state	, 				1	man	have a start and the	
-40.0									
-60.0									CF Step 3.000000 MHz
Center 1. #Res BW			#VB	SW 910 k	Hz			an 30 MHz eep 1 ms	Auto Man
Occup	oied Bandwidt			Total P	ower	29.	2 dBm		Freq Offset
	1;	3.459 MH	IZ						
Transn	nit Freq Error	56.697 k	Hz	OBW P	ower	9	9.00 %		
x dB B	andwidth	14.77 M	Hz	x dB		-26	.00 dB		
MSG						STAT	15		I

#### Band4\_15MHz\_QPSK\_75\_0\_Main\_MidCH20175-1732.5

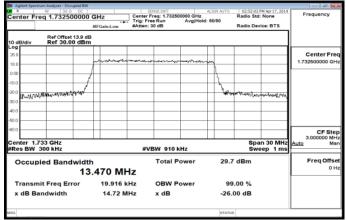


#### Band4\_15MHz\_QPSK\_75\_0\_Main\_HighCH20325-1747.5

M Agilent Spectru	m Analyzer - Occupied B	w						
Center Fre	g 1.74750000	0 GHz	SENSE:INT Center Freg: 1.747	500000 GHz	ALIGN AUTO	Radio Std:	N Apr 17, 2019 None	Frequency
		AIFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold:	50/50	Radio Devi	ce: BTS	
10 dB/div	Ref Offset 13.9 Ref 30.00 dE	dB Sm						
20.0								Center Freq
10.0		- manner		and the second s	-			1.747500000 GHz
0.00				_	<u> </u>			
-10.0		/		_				
-20.0	and the second second				- ~ ·	-	whene	
-30.0				_				
-40.0								
-50.0								
-60.0								CF Step 3.000000 MHz
Center 1.7 #Res BW 3			#VBW 910	kHz			n 30 MHz ep 1 ms	
Occupi	ied Bandwid	ith	Total	Power	29.3	dBm		Freq Offset
		3.480 MI	Ηz					0 Hz
Transm	it Freq Error	51.440 k	Hz OBW	Power	99	.00 %		
x dB Ba	ndwidth	14.80 N	lHz xdB		-26.	00 dB		
MSG					STATU	5		r

#### Band4\_15MHz\_16QAM\_75\_0\_Main\_LowCH20025-1717.5 02:48:32 PN Apr 1 Radio Std: None nter Freq 1.717500000 GHz 1.717500000 GHz AvalHold: 50/ Center Freq Trig: Free Ru vice: BTS Ref Offset 13.9 d Ref 30.00 dBr Center Fre CF Ste 1.718 GHz W 300 kHz Span 30 MH Sweep 1 ms #VBW 910 kHz Occupied Bandwidth Total Power 28.2 dBm Freq Offs 0 13.474 MHz Transmit Freg Error 46.983 kHz **OBW Power** 99.00 % x dB Bandwidth 14.76 MHz -26.00 dB x dB

#### Band4\_15MHz\_16QAM\_75\_0\_Main\_MidCH20175-1732.5



#### Band4\_15MHz\_16QAM\_75\_0\_Main\_HighCH20325-1747.5

Agilent Spectr	um Analyzer - Occupies	BW							- # <b>-</b>
R Center Fre	eq 1.7475000	000 GHz	Center	Freg: 1.74750	0000 GHz	ALIGN AUTO	Radio Ste	DPM Apr 17, 2019 d: None	Frequency
		#FGain:Low	#Atten		Avg Hold:	50/50	Radio De	vice: BTS	
10 dB/div	Ref Offset 13 Ref 30.00 d								
20.0			_			_			Center Free
0.0		perman			-willing. Willing	m			1.747500000 GH
.00		- 1	_			-\-			
0.0			-				-	-	
0.0	mannan	£   -				- <b>\</b>	Maren James	www.	
0.0						-			
0.0									
0.0						-			
0.0									CF Ste 3.000000 MH
enter 1.7 Res BW			#	/BW 910 k	Hz		Sp. Sw	an 30 MHz reep 1 ms	<u>Auto</u> Ma
Occup	ied Bandwi	idth		Total Po	ower	28	.5 dBm		Freq Offse
		13.495	ИНz						0 H
Transm	it Freq Error	41.54	6 kHz	OBW Po	ower	1	9.00 %		
x dB Ba	ndwidth	14.8	5 MHz	x dB		-2	6.00 dB		
6						STA			

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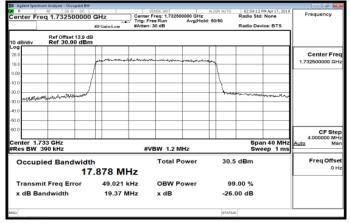
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#### Band4\_20MHz\_QPSK\_100\_0\_Main\_LowCH20050-1720

M Agilent Spectr	um Analyzer - Occupied BW								
Center Fre	eq 1.720000000	GHZ	Center Fr	ISE:INT eq: 1.72000	0000 GHz	ALIGN AUTO	02:57:42 Radio Ste	PM Apr 17, 2019 1: None	Frequency
Conterint	1112000000	AIEGain:Low	#Atten: 30		Avg Hold:	50/50	Radio De	vice: BTS	
10 dB/div	Ref Offset 13.9 di Ref 30.00 dBn								
Log									
20.0		m	-	. constrant	mann				Center Freq 1.720000000 GHz
10.0			4.4.18.1						1.72000000 GH2
0.00		/					-		
-10.0		/							
-20.0	<i>i</i>					-	and the second and the		
-30.0	and a second and a s							and a starting	
-40.0									
-50.0									
-60.0									
									CF Step 4.000000 MHz
Center 1.7 #Res BW			#VB	W 1.2 M	H7			an 40 MHz eep 1 ms	<u>Auto</u> Man
								cep mis	
Occup	ied Bandwidt			Total P	ower	29.	9 dBm		Freq Offset 0 Hz
	17	7.885 MI	z						0 Hz
Transm	it Freq Error	81.053 k	Hz	OBW P	ower	9	9.00 %		
	ndwidth	19.35 M	Hz	x dB		-26	.00 dB		
						-20			
MSG						STAT			
512/4						STAT	05		

#### Band4\_20MHz\_QPSK\_100\_0\_Main\_MidCH20175-1732.5



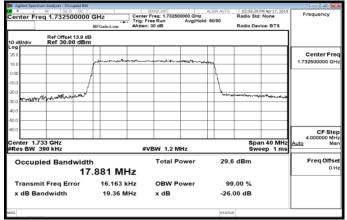
## Band4\_20MHz\_QPSK\_100\_0\_Main\_HighCH20300-1745

A cleant for sta	um Analyzer - Occupied BW				_ 3		
R	eq 1.745000000	GHz #FGain:Low	SENSE:INT Center Freq: 1.740 Trig: Free Run #Atten: 30 dB	000000 GHz Avg Hold	ALIGN AUTO 1: 50/50	03:01:22 PM Apr Radio Std: Nor Radio Device: 8	Frequency
10 dB/div	Ref Offset 13.9 dl Ref 30.00 dBm						
-og 20.0 10.0		manna		- and an of the Property of th	-		Center Fre 1.745000000 GH
0.00							
0.0 0.0	a Marine and the second second second				008	- Colorador - Colo	100 <sup>1</sup>
0.0							CF Ste
Res BW			#VBW 1.2	MHz		Span 4 Sweep	0 MHz <u>Auto</u> Ma 1 ms
Occup	ied Bandwidt 17	հ 7.951 MH		Power	29.4	dBm	Freq Offse 0 H
	it Freq Error	69.944 kH		Power		.00 %	
x dB Ba	ndwidth	19.38 MH	lz xdB		-26.	00 dB	
96					STATU	5	1

Center Fr	eq 1.72000		Hz FGain:Low	Center Trig: F		Avg Hol	d: 50/50	Radio Std		Frequency
0 dB/div	Ref Offset Ref 30.0	13.9 dB	IF Gain:Low	and the second				Radio De		
og 20.0			1		and the second second					Center Fr 1.720000000 G
.00		-/					R			
0.0	-							www.els.t.shorter		
0.0 <b>hardum</b>	have a second	Martini							1000 California	
0.0										
enter 1.7									n 40 MHz	CF Sto 4.000000 M Auto M
Res BW				#\	VBW 1.2 N				eep 1ms	
Occup	ied Band		902 MI	Ηz	Total P	ower	29	).0 dBm		Freq Offs 0
Transm	it Freq Err	or	84.913	KHz	OBW P	ower		99.00 %		
x dB Ba	ndwidth		19.33 N	IHz	x dB		-2	6.00 dB		

Band4 20MHz 16OAM 100 0 Main LowCH20050-1720

#### Band4\_20MHz\_16QAM\_100\_0\_Main\_MidCH20175-1732.5



#### Band4\_20MHz\_16QAM\_100\_0\_Main\_HighCH20300-1745

Agilent Spectr	rum Analyzer - Occupied BW									
Center Fre	eq 1.745000000		Center Fr	eg: 1.74500	0000 GHz	ALIGN A		3:01:48 P lio Std:	N Apr 17, 2019 None	Frequency
		#FGain:Low	Trig: Free #Atten: 3		Avg Hold	: 50/50	Rad	lio Devi	ce: BTS	
Ref Offset 13.9 dB I0 dB/dlv Ref 30.00 dBm										
20.0										Center Free
10.0		ensure	~~~~	-	warm	na_				1.745000000 GH
0.00		A I I				H.				
10.0	,	4								
20.0		+++				11		unil a c	1-systemation	
30.0	and a second second second					$\vdash$		-1	~~*******	
40.0						$\vdash$				
50.0		+++				$\vdash$	_			
90.0		+++				$\vdash$				CF Ste
Center 1.7	745 GHz							Spa	n 40 MHz	4.000000 MH Auto Mar
Res BW			#VE	W 1.2 M	Hz			Swe	ep 1 ms	
Occup	ied Bandwidt	h		Total P	ower	:	28.2 dB	m		Freq Offse
	17	.979 MH	z							он
Transm	it Freq Error	50.915 ki	Hz	OBW P	ower		99.00	%		
x dB Ba	andwidth	19.49 MI	Hz	x dB			-26.00 d	B		
50							TATUS			

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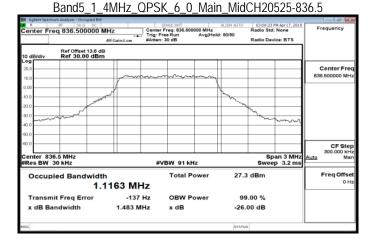
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程智科技股份有限公司



#### Band5\_1\_4MHz\_QPSK\_6\_0\_Main\_LowCH20407-824.7

🌉 Agilent Spectro	um Analyzer - Occupied BW								
Center Fre	eq 824.700000 N	Hz	Center Fr	eq: 824.700		ALIGN AUTO	03:07:55 Radio Sto	PM Apr 17, 2019 : None	Frequency
		AIEGain:Low	#Atten: 3		Avg Hold	1: 50/50	Radio De	vice: BTS	
	Ref Offset 13.6 dB								
10 dB/div Log	Ref 30.00 dBm							_	
20.0									Center Freq
10.0		m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m	mound				824.700000 MHz
0.00		1				L			
-10.0		JA .				where .			
-20.0	and the second					3	<u> </u>		
-20.0 -30.0 - The Hard	mann						Marchark	mar	
-40.0									
-50.0									
-60.0									
									CF Step 300.000 kHz
Center 824 #Res BW			#VE	W 91 kH	z		Sl Swee	oan 3 MHz ep 3.2 ms	<u>Auto</u> Man
Occup	ied Bandwidth	1		Total P	ower	28.7	dBm		Freq Offset
	1.1	152 MH	z						0 Hz
Transm	it Freq Error	-1.057 k	Hz	OBW P	ower	99	.00 %		
	ndwidth	1.456 M	Hz	x dB		-26	00 dB		
						2.01			
MSG						STATUS			



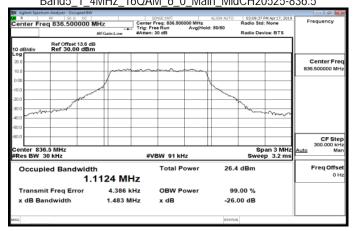
#### Band5\_1\_4MHz\_QPSK\_6\_0\_Main\_HighCH20643-848.3

R	rum Analyzer - Occupied BW RF 50 Ω DC eq 848.300000 N	Tria.	SENSE:INT Inter Freq: 848.300000 MH g: Free Run Avg Itten: 30 dB	ALIGN AUTO Iz Hold: 50/50	03:10:51 PM Apr17 Radio Std: None Radio Device: BT	Frequency
10 dB/div	Ref Offset 13.6 dB Ref 30.00 dBm					
20.0 10.0				~		Center Free 848.300000 MH
0.00				h		
0.0	and and a second				and the second	***\am
0.0						CF Stej 300.000 kH
enter 84 Res BW			#VBW 91 kHz		Span 3 Sweep 3.2	MHz <u>Auto</u> Ma ? ms
Occup	ied Bandwidth 1.1	, 1168 MHz	Total Power	28.5	ō dBm	Freq Offse 0 H
Transm	it Freq Error	-3.939 kHz	OBW Power	99	0.00 %	
x dB Ba	andwidth	1.485 MHz	x dB	-26.	00 dB	
99				STATU		

R	um Analyzer - Occupied B RF 50 Ω DC eq 824.700000	MHz	Center F			ALIGN AUTO	Radio Std		Frequency
	Ref Offset 13.6	MFGain:Low	#Atten: 3	30 dB			Radio De	vice: BTS	
0 dB/div	Ref 30.00 dE	3m							
20.0		~~~~	mm	mon	m				Center F 824.700000 M
0.00									
0.0									
0.0 <b>~~~~~</b> 0.0	mmm		-				and the second	manag	
0.0									
0.0									CF S
enter 824 Res BW			#VI	BW 91 kHz			Sµ Swee	oan 3 MHz ep 3.2 ms	Auto 1
Occup	ied Bandwid			Total Pov	ver	28.2	dBm		Freq Off
	1	.1124 M	Hz						
Transm	it Freq Error	4.262	kHz	OBW Pow	/er	99	.00 %		
x dB Ba	ndwidth	1.478	MHz	x dB		-26.	00 dB		
99						STATUS			

Band5 1 4MHz 16OAM 6 0 Main LowCH20407-824.7

# Band5\_1\_4MHz\_16QAM\_6\_0\_Main\_MidCH20525-836.5



#### Band5\_1\_4MHz\_16QAM\_6\_0\_Main\_HighCH20643-848.3

Agilent Spectrum	m Analyzer - Occupied BW							- # E
enter Fre	g 848.300000		SENSE:INT Center Freq: 848.30		ALIGN AUTO	03:11:19 P Radio Std:	N Apr 17, 2019 None	Frequency
			Trig: Free Run #Atten: 30 dB	Avg Hol	d: 50/50	Radio Devi	ce: BTS	
10 dB/div	Ref Offset 13.6 d Ref 30.00 dBr							
og 20.0								Center Fre
10.0		1 mm	mm	m				848.300000 MH
.00		_/		-	N.			
0.0		4 +		-				
0.0	where we we			-	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www.www.www		
0.0 0.0 m~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						· · · · · · · · · · · · · · · · · · ·	~~~~	
0.0								
0.0								
0.0				-				CF Ste 300.000 kH
enter 848. Res BW 3			#VBW 91 k	Hz		Spa Sweep	an 3 MHz 3.2 ms	Auto Ma
Occupi	ed Bandwidt	:h	Total I	Power	27.4	dBm		Freq Offs
	1.	1123 MH	z					0 H
Transmit	t Freq Error	363 H	Z OBW F	Power	99	.00 %		
x dB Bar	ndwidth	1.481 MH	z xdB		-26.	00 dB		
a					STATUS			

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