

## ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E and PART 27 SUBPART **B, C & SUBPART L REQUIREMENT**

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Applicant:	Sharp Corporation, Mobile Communication B.U. 2-13-1, Hachihonmatsu-Iida, Higashi-hiroshima-shi, Hiroshima 739-0192, Japan
Manufacturer:	Sharp Corporation 1 Takumi-cho, Sakai-ku, Sakai-Shi, Osaka 590-8522, Japan
Product Name:	Smart Phone
Report Number:	ER/2018/80112
FCC ID:	APYHRO00266
FCC Rule Part:	2 , 22H & 24E & 27B, C & L
Issue Date:	Oct. 02, 2018
Date of Test:	Aug. 01, 2018 ~ Sep. 05, 2018
Date of EUT Received:	Aug. 01, 2018
We hereby cortify that:	

OF

#### We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.26-2015 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits.

The test results of this report relate only to the tested sample identified in this report.

Marcus Tseng

Tested By:

Marcus Tseng / Sr. Engineer

Approved By: CHUN, CHIZEH, CHIEN, CHIEN, CHUN-CHIEH, CHEN/

Asst. Supervisor

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



# **Revision History**

Report Number	Revision	Description	Effected Page	Issue Date	Revised By
ER/2018/80112	Rev.00	Initial creation of document	All	Oct. 02, 2018	Yuri Tsai



# Contents

1.	GENERAL PRODUCT INFORMATION	4
2.	SYSTEM TEST CONFIGURATION	7
3.	SUMMARY OF TEST RESULTS	10
4.	DESCRIPTION OF TEST MODES	11
5.	MEASUREMENT UNCERTAINTY	15
6.	RF CONDUCTED OUTPUT POWER MEASUREMENT	16
7.	EFFECTIVE RADIATED POWER AND EQUIVALENT ISOTROPIC RADIATED	
	POWER MEASUREMENT	33
8.	OCCUPIED BANDWIDTH MEASUREMENT	49
9.	OUT OF BAND EMISSION AT ANTENNA TERMINALS	67
10.	FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT	96
11.	FREQUENCY STABILITY MEASUREMENT	137
12.	PEAK TO AVERAGE RATIO	145



### **1. GENERAL PRODUCT INFORMATION**

### **1.1. Product Description**

#### General:

Product Name:	Smart Phone
Hardware Version:	DVT
Software Version:	N/A
Power Supply:	3.85V from Rechargeable Li-ion Battery
IMEI:	004401116493012 / 004401116492501

#### 1.2. GSM / WCDMA / LTE: Cellular Phone Standards Frequency Range

Operating Frequency (MHz)				
GSM/GPRS 850	824.2	-	848.8	
GSM/GPRS 1900	1850.2	-	1909.8	

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

LTE Band	BW (MHz)	Operation Frequency (MHz)			
	1.4	824.7	-	848.3	
5	3	825.5	-	847.5	
5	5	826.5	-	846.5	
	10	829.0	-	844.0	
	1.4	699.7	-	715.3	
12	3	700.5	-	714.5	
12	5	701.5	-	713.5	
	10	704.0	-	711.0	
17	5	706.5	-	713.5	
17	10	709.0	-	711.0	

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

	ERP / EIRP (dBm)		(W)	Type of Emission
GSM 850	23.66	ERP	0.232	243KGXW
GPRS 850	24.83	ERP	0.304	243KGXW
GSM 1900	24.42	EIRP	0.277	241KGXW
GPRS 1900	26.19	EIRP	0.416	244KGXW

	ERP / EIRP (dBm)		(W)	Type of Emission
WCDMA Band V	21.14	ERP	0.130	4M13F9W
HSDPA Band V	22.45	ERP	0.176	4M12F9W
HSUPA Band V	22.22	ERP	0.167	4M13F9W

LTE Band	BW (MHz)	Modulation		ERP / EIRP (dBm)		Type of Emission
	1.4	QPSK	23.28	ERP	0.213	1M09G7D
	1.4	16QAM	22.42	ERP	0.175	1M09D7W
	3	QPSK	23.11	ERP	0.205	2M70G7D
5	3	16QAM	22.35	ERP	0.172	2M70D7W
5	5	QPSK	24.63	ERP	0.290	4M50G7D
	5	16QAM	23.93	ERP	0.247	4M50D7W
	10	QPSK	23.16	ERP	0.207	9M01G7D
	10	16QAM	22.36	ERP	0.172	8M97D7W
	5	QPSK	23.2	ERP	0.209	4M50G7D
17	5	16QAM	22.47	ERP	0.177	4M51D7W
17	10	QPSK	23.29	ERP	0.213	9M01G7D
	10	16QAM	22.75	ERP	0.188	8M96D7W

LTE Band	BW (MHz)	Modulation	ERP / EIRP (dBm)		(W)	Type of Emission
	1.4	QPSK	23.27	ERP	0.212	1M09G7D
	1.4	16QAM	22.27	ERP	0.169	1M10D7W
	3	QPSK	22.99	ERP	0.199	2M70G7D
12	3	16QAM	22.26	ERP	0.168	2M77D7W
12	5 QPS	QPSK	22.92	ERP	0.196	4M50G7D
	5	16QAM	22.25	ERP	0.168	4M50D7W
	10	QPSK	23.52	ERP	0.225	8M98G7D
	10	16QAM	22.08	ERP	0.161	8M96D7W



#### 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

SGS Taiwan Ltd. Electronics & Communication Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803 code 0513)

FCC Registration Numbers are: 509634 / TW0001

#### 1.6. Special Accessories

**1.7.** No special accessories were used during testing.

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#### Equipment Modifications

There were no modifications incorporated into the EUT.

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### 2. SYSTEM TEST CONFIGURATION

#### 2.1. EUT Configuration

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

#### 2.2. EUT Exercise

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

#### 2.3. Test Procedure

#### 2.3.1 Conducted Measurement at Antenna Port

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

#### 2.3.2 Radiated Emissions (ERP/EIRP)

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

#### 2.4. Measurement Results Explanation Example

#### For all conducted test items:

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

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#### Note:

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

Following shows an offset computation in physical test.

	RF cable loss (dB)	Attenuation factor(dB)	offset(dB)
Low Band (Below 1GHz)	0.2	21	21.2
High Band (Above 1 GHz)	0.5	21.36	21.86

### 2.5. Final Amplifier Voltage and Current Information:

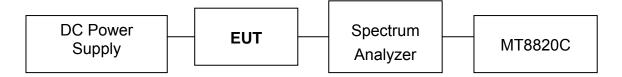
Test Mode	DC voltage (V)	DC current (mA)
GSM 850		324
GSM 1900	3.85	375
WCDMA B5		634
LTE Band 5		609.380
LTE Band 12		615.670
LTE Band 17		618.160

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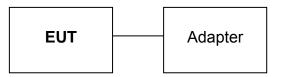


#### 2.6. Configuration of Tested System

#### 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

ltem	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Radio Communication Analyer	Anritsu	MT8820C	6201465317	shielded	Un-shielded

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Report No.: ER/2018/80112 Page 10 of 158



### 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(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)	Terminals and Band Edge /	Compliant
§27.53(m)(4)	Emission mask requirements	
§2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(m)(4)	Field Strength of Spurious Radiation	Compliant
§24.232(d) §22.913	Peak to Average Ratio	Compliant
§2.1055(a)(1) §22.355 §24.235 §27.54	Frequency Stability	Compliant



### 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	ERP/EIRP	RADIATED EMISSION
GSM/GPRS 850	H-plan	H-plan
GSM/GPRS 1900	H-plan	H-plan
WCDMA/HSPA Band V	H-plan	H-plan
LTE Band 5	H-plan	H-plan
LTE Band 12	H-plan	H-plan
LTE Band 17	H-plan	H-plan

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#### **GSM/GPRS MODE**

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	128 to 251	128, 190, 251	GSM/GPRS 850
EIRP	512 to 810	512, 661, 810	GSM/GPRS 1900
FREQUENCY STABILITY	128 to 251	190	GPRS 850
	512 to 810	661	GPRS 1900
OCCUPIED BANDWIDTH	128 to 251	190	GSM/GPRS 850
	512 to 810	661	GSM/GPRS 1900
PEAK TO AVERAGE RATIO	128 to 251	128, 190, 251	GSM/GPRS 850
	512 to 810	512, 661, 810	GSM/GPRS 1900
BAND EDGE	128 to 251	128, 251	GSM/GPRS 850
	512 to 810	512, 810	GSM/GPRS 1900
CONDCUDETED EMISSION	128 to 251	128, 190, 251	GSM/GPRS 850
	512 to 810	512, 661, 810	GSM/GPRS 1900
RADIATED EMISSION	128 to 251	128, 190, 251	GPRS 850
	512 to 810	512, 661, 810	GPRS 1900

#### WCDMA/HSPA MODE

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



#### LTE Band 5 MODE

TEST ITEM	AVAILABLE	TESTED	CHANNEL	MODULATION	MODE
	CHANNEL	CHANNEL	BANDWIDTH	MODULATION	WODE
	20470 to 20643	20470, 20525, 20643	1.4MHz	QPSK, 16QAM,	1 RB/ 0,5 RB Offest
ERP	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM,	1 RB/ 0,14 RB Offest
EKP	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM,	1 RB/ 0,24 RB Offest
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM,	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,	Full RB
OCCUPIED BAND-	20415 to 20635	20415, 20525, 20635	3MHz	QPSK, 16QAM,	Full RB
WIDTH	20425 to 20625	20425, 20525, 20625	5MHz	QPSK, 16QAM,	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK, 16QAM,	Full RB
	20470 to 20643	20470, 20525, 20643	1.4MHz	16QAM	Full RB
PEAK TO AVERAGE	20415 to 20635	20415, 20525, 20635	3MHz	16QAM	Full RB
RATIO	20425 to 20625	20425, 20525, 20625	5MHz	16QAM	Full RB
	20450 to 20600	20450, 20525, 20600	10MHz	16QAM	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	16QAM	1 RB, 0 RB Offest



#### LTE Band 12 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM,	1 RB/ 0,5 RB Offest
ERP	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM,	1 RB/ 0,14 RB Offest
EKP	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM,	1 RB/ 0,24 RB Offest
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM,	1 RB/ 0,49 RB Offest
FREQUENCY STABILITY	23060 to 23130	23095	10MHz	QPSK	Full RB
	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK, 16QAM,	Full RB
OCCUPIED	23025 to 23165	23025, 23095, 23165	3MHz	QPSK, 16QAM,	Full RB
BANDWIDTH	23035 to 23155	23035, 23095, 23155	5MHz	QPSK, 16QAM,	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK, 16QAM,	Full RB
	23017 to 23173	23017, 23095, 23173	1.4MHz	16QAM	Full RB
PEAK TO AV-	23025 to 23165	23025, 23095, 23165	3MHz	16QAM	Full RB
ERAGE RATIO	23035 to 23155	23035, 23095, 23155	5MHz	16QAM	Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	16QAM	Full RB
	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK	1 RB/ 0,5 RB Offes Full RB
	23025 to 23165	23025, 23095, 23165	3MHz	QPSK	1 RB/ 0,14 RB Offest Full RB
BAND EDGE	23035 to 23155	23035, 23095, 23155	5MHz	QPSK	1 RB/ 0,24 RB Offest Full RB
	23060 to 23130	23060, 23095, 23130	10MHz	QPSK	1 RB/ 0,49 RB Offest Full RB
CONDCU-	23017 to 23173	23017, 23095, 23173	1.4MHz	QPSK	1 RB, 0 RB Offest
DETED EMIS-	23025 to 23165	23025, 23095, 23165	3MHz	QPSK	1 RB, 0 RB Offest
	23035 to 23155	23035, 23095, 23155	5MHz	QPSK	1 RB, 0 RB Offest
SION	23060 to 23130	23060, 23095, 23130	10MHz	QPSK	1 RB, 0 RB Offest
RADIATED EMISSION	23017 to 23173	23017, 23095, 23173	1.4MHz	16QAM	1 RB, 0 RB Offest

#### LTE Band 17 MODE

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
ERP	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM,	1 RB/ 0,24 RB Offest
EKP	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM,	1 RB/ 0,49 RB Offest
FREQUENCY STABILITY	23780 to 23800	23790	10MHz	QPSK	Full RB
OCCUPIED BAND-	23755 to 23825	23755, 23790, 23825	5MHz	QPSK, 16QAM,	Full RB
WIDTH	23780 to 23800	23780, 23790, 23800	10MHz	QPSK, 16QAM,	Full RB
PEAK TO AVERAGE	23755 to 23825	23755, 23790, 23825	5MHz	16QAM	Full RB
RATIO	23780 to 23800	23780, 23790, 23800	10MHz	16QAM	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	16QAM	1 RB, 0 RB Offest



### 5. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
RF Power Output	+/- 1.10 dB
ERP/ EIRP measurement	Vertical Polarization = +/- 4.74dB Horizontal Polarization =+/- 4.62dB
99% Occupied Bandwidth	+/- 5.19 Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 0.70 dB
Peak to Average Ratio	+/- 0.70 dB
Frequency Stability vs. Temperature	+/- 5.19 Hz
Frequency Stability vs. Voltage	+/- 5.19 Hz
Temperature	+/- 0.65 °C
Humidity	+/- 4.6 %
DC / AC Power Source	DC= +/- 0.13%, AC=+/- 0.2%

#### Radiated Spurious Emission:

Measurement uncertainty (Polarization : <b>Vertical</b> )	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 180MHz: +/- 3.37dB
	180MHz -417MHz: +/- 3.19dB
	0.417GHz-1GHz: +/- 3.19dB
	1GHz - 18GHz: +/- 4.04dB
	18GHz - 40GHz: +/- 4.04dB

	9kHz – 30MHz: +/- 2.87 dB
	30MHz - 167MHz: +/- 4.22dB
Measurement uncertainty (Polarization : <b>Horizontal</b> )	167MHz -500MHz: +/- 3.44dB
	0.5GHz-1GHz: +/- 3.39dB
	1GHz - 18GHz: +/- 4.08dB
	18GHz - 40GHz: +/- 4.08dB

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

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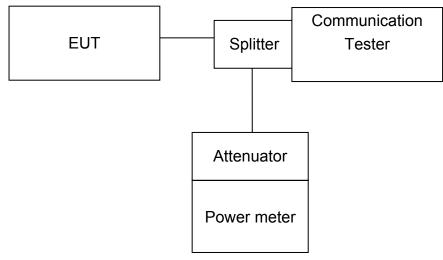


### 6. RF CONDUCTED OUTPUT POWER MEASUREMENT

#### 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 freguency on the transmitter output terminals.

#### 6.2. Test Set-up



Note: Measurement setup for testing on Antenna connector

#### 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

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#### 6.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUM- BER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Radio Communi- cation Analyer	Anritsu	MT8820C	6201107337	2018/06/15	2019/06/14
Radio Communi- cation Analyer	Anritsu	MT8815B	6200711454	2018/04/05	2019/04/04
DC Power Supply	DHA	DPS-3003	9411005787	2018/08/14	2019/08/13
Attenuator	Marvelous	MVE2213-10	RF31	2017/12/26	2018/12/25
DC Block	PASTERNACK	PE8210	RF29	2017/12/26	2018/12/25
Coaxial Cables	Woken	00100A1F1A185C	RF231	2017/12/26	2018/12/25

#### 6.5. Measurement Result

#### **RF Conducted Output Power**

#### GSM/GPRS/EDGE (GMSK; 8-PSK) Result:

EUT Mode	Freq. (MHz)	СН	Conducted Avg. Power (dBm)	ERP /EIRP (dBm)	Limit (dBm)	Margin (dB)
	824.2	128	32.61	32.61	38.50	-5.89
GSM 850	836.6	190	32.57	32.57	38.50	-5.93
	848.8	251	32.59	32.59	38.50	-5.91
	1850.2	512	28.87	28.87	33.00	-4.13
GSM 1900	1880.0	661	28.88	28.88	33.00	-4.12
1700	1909.8	810	28.77	28.77	33.00	-4.23

#### GSM/GPRS/EDGE (GMSK; 8-PSK) Result:

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



EUT Mode	Frequency (MHz)	СН	Average Burst Power (1DN 1UP) Class 8 (dBm)	Average Burst Power (1DN 2UP) Class 10 (dBm)	Average Burst Power (1DN 3UP) Class 12 (dBm)	Average Burst Power (1DN 4UP) Class 12 (dBm)
	824.2	128	32.61	31.16	29.22	28.10
GPRS 850	836.6	190	32.57	31.07	29.20	27.79
	848.8	251	32.59	30.88	28.89	27.76
	1850.2	512	28.87	26.51	24.60	23.84
GPRS 1900	1880.0	661	28.88	26.50	24.63	23.91
1700	1909.8	810	28.77	26.48	24.52	23.77



#### WCDMA 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 V Result:

EUT Mode	Freq. (MHz)	СН	Conducted Avg. Power (dBm)	EIRP (dBm)	Limit (dBm)	Margin (dB)
	826.4	4132	22.96	22.96	38.50	-15.54
WCDMA	836.6	4183	22.83	22.83	38.50	-15.67
	846.6	4233	22.90	22.90	38.50	-15.60
	826.4	4132	22.27	22.27	38.50	-16.23
HSDPA	836.6	4183	22.22	22.22	38.50	-16.28
	846.6	4233	22.38	22.38	38.50	-16.12
	826.4	4132	22.35	22.35	38.50	-16.15
HSUPA	836.6	4183	22.31	22.31	38.50	-16.19
	846.6	4233	22.35	22.35	38.50	-16.15

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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### LTE Result: FDD Band 5

Antenna	gain (dBi)	0							
		LTE Ban	d 5_Uplink fr	equen	cy band	: 824 to 849	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	23.16	23.16	38.45	-15.29
	20407	824.7	QPSK	1	5	23.23	23.23	38.45	-15.22
	20407	824.7	UPSK	3	2	22.35	22.35	38.45	-16.1
				6	0	22.39	22.39	38.45	-16.06
				1	0	23.00	23.00	38.45	-15.45
	20525	836.5	QPSK	1	5	23.10	23.10	38.45	-15.35
	20525	030.3	UPSK	3	2	22.34	22.34	38.45	-16.11
				6	0	22.36	22.36	38.45	-16.09
		848.3	QPSK	1	0	23.28	23.28	38.45	-15.17
	20643			1	5	22.44	22.44	38.45	-16.01
	20043			3	2	22.43	22.43	38.45	-16.02
1.4				6	0	22.14	22.14	38.45	-16.31
1.4				1	0	22.42	22.42	38.45	-16.03
	20407	824.7	16QAM	1	5	22.22	22.22	38.45	-16.23
	20407	024.7	TOQAM	3	2	21.55	21.55	38.45	-16.9
				6	0	21.35	21.35	38.45	-17.1
				1	0	22.26	22.26	38.45	-16.19
	20525	836.5	16QAM	1	5	22.18	22.18	38.45	-16.27
	20323	030.5	TOQAM	3	2	21.26	21.26	38.45	-17.19
				6	0	21.28	21.28	38.45	-17.17
				1	0	22.36	22.36	38.45	-16.09
	20643	848.3	16QAM	1	5	21.92	21.92	38.45	-16.53
	20043	070.0		3	2	21.15	21.15	38.45	-17.3
				6	0	21.16	21.16	38.45	-17.29



Antenna	gain (dBi)	0							
		LTE Ban	d 5_Uplink fr	equen	cy band	: 824 to 849	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	22.83	22.83	38.45	-15.62
	20415	825.5	QPSK	1	14	22.94	22.94	38.45	-15.51
	20415	020.0	ULDV	8	4	22.40	22.40	38.45	-16.05
				15	0	22.30	22.30	38.45	-16.15
				1	0	22.98	22.98	38.45	-15.47
	20525	836.5	QPSK	1	14	22.98	22.98	38.45	-15.47
	20323	030.0	UF SK	8	4	22.34	22.34	38.45	-16.11
				15	0	22.36	22.36	38.45	-16.09
		847.5	QPSK	1	0	23.11	23.11	38.45	-15.34
	20635			1	14	22.16	22.16	38.45	-16.29
				8	4	22.31	22.31	38.45	-16.14
3				15	0	22.38	22.38	38.45	-16.07
5				1	0	22.32	22.32	38.45	-16.13
	20415	825.5	16QAM	1	14	22.35	22.35	38.45	-16.1
	20413	023.3		8	4	21.33	21.33	38.45	-17.12
				15	0	21.38	21.38	38.45	-17.07
				1	0	22.25	22.25	38.45	-16.2
	20525	836.5	16QAM	1	14	21.87	21.87	38.45	-16.58
	20323	030.3		8	4	21.25	21.25	38.45	-17.2
				15	0	21.12	21.12	38.45	-17.33
				1	0	22.28	22.28	38.45	-16.17
	20635	847 5	16QAM	1	14	21.70	21.70	38.45	-16.75
	20635	847.5		8	4	21.26	21.26	38.45	-17.19
				15	0	21.11	21.11	38.45	-17.34



Antenna	gain (dBi)	0							
		LTE Ban	d 5_Uplink fr	equen	cy band	: 824 to 849	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	24.55	24.55	38.45	-13.9
	20425	826.5	QPSK	1	24	24.52	24.52	38.45	-13.93
	20420	020.0	ULDV	12	6	23.38	23.38	38.45	-15.07
				25	0	23.39	23.39	38.45	-15.06
				1	0	24.57	24.57	38.45	-13.88
	20525	836.5	QPSK	1	24	24.46	24.46	38.45	-13.99
	20323	030.0		12	6	23.46	23.46	38.45	-14.99
				25	0	23.49	23.49	38.45	-14.96
		846.5	QPSK	1	0	24.59	24.59	38.45	-13.86
	20625			1	24	24.63	24.63	38.45	-13.82
	20025			12	6	23.57	23.57	38.45	-14.88
5				25	0	23.58	23.58	38.45	-14.87
5				1	0	23.82	23.82	38.45	-14.63
	20425	826.5	16QAM	1	24	23.83	23.83	38.45	-14.62
	20420	020.0	TOQAIN	12	6	22.47	22.47	38.45	-15.98
				25	0	22.43	22.43	38.45	-16.02
				1	0	23.80	23.80	38.45	-14.65
	20525	836.5	16QAM	1	24	23.73	23.73	38.45	-14.72
	20020	030.0	TOQAIN	12	6	22.51	22.51	38.45	-15.94
				25	0	22.49	22.49	38.45	-15.96
				1	0	23.91	23.91	38.45	-14.54
	20625	846.5	16QAM	1	24	23.93	23.93	38.45	-14.52
	20020	040.0	TOQAIVI	12	6	22.66	22.66	38.45	-15.79
				25	0	22.62	22.62	38.45	-15.83



Antenna	gain (dBi)	0							
		LTE Ban	d 5_Uplink fr	equen	cy band	: 824 to 849	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	23.05	23.05	38.45	-15.4
	20450	829	QPSK	1	49	23.03	23.03	38.45	-15.42
	20430	029	ULDV	25	12	22.36	22.36	38.45	-16.09
				50	0	22.37	22.37	38.45	-16.08
				1	0	23.13	23.13	38.45	-15.32
	20525	836.5	QPSK	1	49	23.16	23.16	38.45	-15.29
	20020	030.0	ULDK	25	12	22.35	22.35	38.45	-16.1
				50	0	22.27	22.27	38.45	-16.18
	20600	844	QPSK	1	0	22.91	22.91	38.45	-15.54
				1	49	22.27	22.27	38.45	-16.18
	20000			25	12	22.47	22.47	38.45	-15.98
10				50	0	22.27	22.27	38.45	-16.18
10				1	0	22.30	22.30	38.45	-16.15
	20450	829	16QAM	1	49	22.34	22.34	38.45	-16.11
	20430	027	TUQAIN	25	12	21.53	21.53	38.45	-16.92
				50	0	21.06	21.06	38.45	-17.39
				1	0	22.35	22.35	38.45	-16.1
	20525	836.5	16QAM	1	49	22.36	22.36	38.45	-16.09
	20323	030.3		25	12	21.29	21.29	38.45	-17.16
				50	0	21.40	21.40	38.45	-17.05
				1	0	22.23	22.23	38.45	-16.22
	20600	811	16QAM	1	49	21.83	21.83	38.45	-16.62
	20000	844		25	12	21.29	21.29	38.45	-17.16
				50	0	21.36	21.36	38.45	-17.09



#### FDD Band 12

Antenna gain (dBi) 0									
		LTE Band	l 12_Uplink fi	requer	icy band	l : 699 to 716	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	22.70	22.70	34.77	-12.07
	23017	699.7	QPSK	1	5	22.70	22.70	34.77	-12.07
	23017	077.7	UI SK	3	2	22.76	22.76	34.77	-12.01
				6	0	21.99	21.99	34.77	-12.78
			QPSK	1	0	23.11	23.11	34.77	-11.66
	23095	707.5		1	5	22.86	22.86	34.77	-11.91
		101.5		3	2	22.99	22.99	34.77	-11.78
				6	0	22.02	22.02	34.77	-12.75
		715.5	QPSK	1	0	22.83	22.83	34.77	-11.94
	23173			1	5	22.70	22.70	34.77	-12.07
				3	2	23.27	23.27	34.77	-11.5
1.4				6	0	21.94	21.94	34.77	-12.83
1.7				1	0	21.63	21.63	34.77	-13.14
	23017	699.7	16QAM	1	5	21.68	21.68	34.77	-13.09
	23017	077.7	100/10	3	2	21.87	21.87	34.77	-12.9
				6	0	20.47	20.47	34.77	-14.3
				1	0	22.27	22.27	34.77	-12.5
	23095	707.5	16QAM	1	5	21.82	21.82	34.77	-12.95
	23073	101.5	TOQAIN	3	2	22.03	22.03	34.77	-12.74
				6	0	20.88	20.88	34.77	-13.89
				1	0	21.73	21.73	34.77	-13.04
	23173	715.5	16OAM	1	5	21.85	21.85	34.77	-12.92
	2J1/J	110.0	16QAM	3	2	21.97	21.97	34.77	-12.8
				6	0	20.69	20.69	34.77	-14.08



Antenna	gain (dBi)	0							
		LTE Band	l 12_Uplink fi	requer	ncy band	d : 699 to 716	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	22.49	22.49	34.77	-12.28
	23025	700.5	QPSK	1	14	22.58	22.58	34.77	-12.19
	23023	700.5	ULDV	8	4	21.90	21.90	34.77	-12.87
				15	0	21.84	21.84	34.77	-12.93
				1	0	22.99	22.99	34.77	-11.78
	23095	707.5	QPSK	1	14	22.65	22.65	34.77	-12.12
	23090	707.5	UF SK	8	4	22.16	22.16	34.77	-12.61
				15	0	22.12	22.12	34.77	-12.65
		714.5	QPSK	1	0	22.63	22.63	34.77	-12.14
	23165			1	14	22.92	22.92	34.77	-11.85
	23100			8	4	22.09	22.09	34.77	-12.68
3				15	0	21.92	21.92	34.77	-12.85
5				1	0	21.99	21.99	34.77	-12.78
	23025	700.5	16QAM	1	14	22.12	22.12	34.77	-12.65
	23025	700.5	TOQAIN	8	4	20.94	20.94	34.77	-13.83
				15	0	20.93	20.93	34.77	-13.84
				1	0	22.26	22.26	34.77	-12.51
	23095	707.5	16QAM	1	14	22.07	22.07	34.77	-12.7
	23073	101.5	TUQAIN	8	4	21.07	21.07	34.77	-13.7
				15	0	20.89	20.89	34.77	-13.88
				1	0	21.88	21.88	34.77	-12.89
	23165	714.5	16QAM	1	14	22.00	22.00	34.77	-12.77
	23103	/ 14.0	TUCAIN	8	4	20.86	20.86	34.77	-13.91
				15	0	20.60	20.60	34.77	-14.17



Antenna	gain (dBi)	0							
		LTE Band	l 12_Uplink fi	requer	ncy band	d : 699 to 716	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	22.72	22.72	34.77	-12.05
	23035	701.5	QPSK	1	24	22.89	22.89	34.77	-11.88
	23030	701.5	ULDV	12	6	22.09	22.09	34.77	-12.68
				25	0	21.87	21.87	34.77	-12.9
				1	0	22.92	22.92	34.77	-11.85
	23095	707.5	QPSK	1	24	22.55	22.55	34.77	-12.22
	23073	101.5	QLOK	12	6	22.09	22.09	34.77	-12.68
				25	0	22.10	22.10	34.77	-12.67
	23155	713.5	QPSK	1	0	22.49	22.49	34.77	-12.28
				1	24	22.89	22.89	34.77	-11.88
	20100			12	6	22.02	22.02	34.77	-12.75
5				25	0	22.03	22.03	34.77	-12.74
Ũ				1	0	21.47	21.47	34.77	-13.3
	23035	701.5	16QAM	1	24	22.05	22.05	34.77	-12.72
	20000	701.0	100/101	12	6	20.98	20.98	34.77	-13.79
				25	0	20.93	20.93	34.77	-13.84
				1	0	22.25	22.25	34.77	-12.52
	23095	707.5	16QAM	1	24	21.85	21.85	34.77	-12.92
	20070	10110	10 27 111	12	6	21.03	21.03	34.77	-13.74
				25	0	21.09	21.09	34.77	-13.68
				1	0	21.95	21.95	34.77	-12.82
	23155	713.5	16QAM	1	24	21.59	21.59	34.77	-13.18
	23155	23155 /13.5		12	6	21.02	21.02	34.77	-13.75
				25	0	21.11	21.11	34.77	-13.66



Antenna	Antenna gain (dBi) 0								
		LTE Band	l 12_Uplink fi	requer	icy band	d : 699 to 716	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	23.21	23.21	34.77	-11.56
	23060	704	QPSK	1	49	23.52	23.52	34.77	-11.25
	23000	704	ULDV	25	12	22.10	22.10	34.77	-12.67
				50	0	22.04	22.04	34.77	-12.73
				1	0	23.04	23.04	34.77	-11.73
	23095	707.5	QPSK	1	49	23.31	23.31	34.77	-11.46
	23073	101.5	UPSK	25	12	22.14	22.14	34.77	-12.63
				50	0	21.95	21.95	34.77	-12.82
	23130	711		1	0	23.11	23.11	34.77	-11.66
			QPSK	1	49	23.25	23.25	34.77	-11.52
			QF3K	25	12	22.10	22.10	34.77	-12.67
10				50	0	22.05	22.05	34.77	-12.72
10				1	0	21.98	21.98	34.77	-12.79
	23060	704	16QAM	1	49	22.08	22.08	34.77	-12.69
	23000	704	TOQAIVI	25	12	21.09	21.09	34.77	-13.68
				50	0	21.03	21.03	34.77	-13.74
				1	0	21.91	21.91	34.77	-12.86
	23095	707.5	16QAM	1	49	21.91	21.91	34.77	-12.86
	23090	707.5	TOQAIVI	25	12	21.25	21.25	34.77	-13.52
				50	0	21.14	21.14	34.77	-13.63
				1	0	22.06	22.06	34.77	-12.71
	22120	711	140 4 14	1	49	22.04	22.04	34.77	-12.73
	23130	711	16QAM	25	12	21.32	21.32	34.77	-13.45
				50	0	21.17	21.17	34.77	-13.6



#### FDD Band 17

Antenna	gain (dBi)	0							
		LTE Band	l 17_Uplink fi	requer	icy band	d : 704 to 716	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	22.78	22.78	34.77	-11.99
	23755	706.5	QPSK	1	24	22.37	22.37	34.77	-12.4
	23700	700.5	ULDU	12	6	21.66	21.66	34.77	-13.11
				25	0	21.65	21.65	34.77	-13.12
				1	0	22.21	22.21	34.77	-12.56
	23790	710	QPSK	1	24	22.43	22.43	34.77	-12.34
	23770	710		12	6	21.69	21.69	34.77	-13.08
				25	0	21.61	21.61	34.77	-13.16
				1	0	22.14	22.14	34.77	-12.63
	23825	713.5	QPSK	1	24	23.20	23.20	34.77	-11.57
	20020	710.0	QI SIX	12	6	21.71	21.71	34.77	-13.06
5				25	0	21.61	21.61	34.77	-13.16
Ũ				1	0	22.20	22.20	34.77	-12.57
	23755	706.5	16QAM	1	24	21.51	21.51	34.77	-13.26
	20700			12	6	20.99	20.99	34.77	-13.78
				25	0	21.06	21.06	34.77	-13.71
				1	0	21.61	21.61	34.77	-13.16
	23790	710	16QAM	1	24	21.64	21.64	34.77	-13.13
				12	6	21.09	21.09	34.77	-13.68
				25	0	20.87	20.87	34.77	-13.9
				1	0	21.66	21.66	34.77	-13.11
	23825	713.5	16QAM	1	24	22.47	22.47	34.77	-12.3
	'			12	6	20.96	20.96	34.77	-13.81
				25	0	21.35	21.35	34.77	-13.42

Antenna	gain (dBi)	0							
		LTE Band	l 17_Uplink fi	requer	icy band	d : 704 to 716	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	22.80	34.77	-11.97
	23780	709	QPSK	1	49	23.29	23.29	34.77	-11.48
	23780	709	UPSK	25	12	21.74	21.74	34.77	-13.03
				50	0	21.68	21.68	34.77	-13.09
				1	0	22.69	22.69	34.77	-12.08
	23790	710	QPSK	1	49	23.11	23.11	34.77	-11.66
	23790	710	UFJK	25	12	21.56	21.56	34.77	-13.21
				50	0	21.62	21.62	34.77	-13.15
		711	QPSK	1	0	22.34	22.34	34.77	-12.43
	23800			1	49	23.21	23.21	34.77	-11.56
	23000			25	12	21.48	21.48	34.77	-13.29
10				50	0	21.87	21.87	34.77	-12.9
10				1	0	22.15	22.15	34.77	-12.62
	23780	709	16QAM	1	49	22.75	22.75	34.77	-12.02
	20700		10 21 111	25	12	21.10	21.10	34.77	-13.67
				50	0	21.31	21.31	34.77	-13.46
				1	0	21.96	21.96	34.77	-12.81
	23790	710	16QAM	1	49	22.15	22.15	34.77	-12.62
	20170			25	12	20.98	20.98	34.77	-13.79
				50	0	21.13	21.13	34.77	-13.64
				1	0	21.44	21.44	34.77	-13.33
	23800	711	16QAM	1	49	22.63	22.63	34.77	-12.14
				25	12	20.92	20.92	34.77	-13.85
				50	0	20.99	20.99	34.77	-13.78



#### **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 ( <b>SF</b> )	βc/βd	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	Av	g. Power (dE Channel	3m)	Power Class 3 Limitation (dBm)	Comments
	1051	4132.00	4183.00	4233.00		
	1	22.27	22.22	22.38	20.3dBm – 25.7dBm	Pass
HSDPA V	2	21.79	21.75	21.98	20.3dBm – 25.7dBm	Pass
	3	21.79	21.78	21.98	19.8dBm – 25.7dBm	Pass
	4	21.78	21.75	21.97	19.8dBm – 25.7dBm	Pass

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



#### 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	β <sub>d</sub> (SF)	βσ/βα	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		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:**

Mode	Sub test	Av	vg. Power (dB Channel	m)	Power Class 3 Limitation (dBm)	Comments
	1051	4132.00	4183.00	4233.00		
	1	22.35	22.31	22.35	18.8dBm – 25.7dBm	Pass
	2	20.38	20.21	20.31	16.8dBm – 25.7dBm	Pass
HSUPA V	3	21.32	21.32	21.32	17.8dBm – 25.7dBm	Pass
	4	20.40	20.28	20.30	16.8dBm – 25.7dBm	Pass
	5	22.20	22.19	22.23	18.8dBm – 25.7dBm	Pass

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



#### **Minimum Communications Power Measurement**

#### PCS 1900 band

PCL	0	1	2	3	4	5	6	7	8
Output power (dBm)	29.17	27.25	25.34	23.74	21.62	19.87	17.34	15.28	13.22
								_	
PCL	9	10	11	12	13	14	15		
Output power (dBm)	11.19	9.83	7.51	5.22	3.71	1.52	-1.29		

Note: The EUT output power was controlled by simulator. Set Communication Tester MT8820C PCL as above, and get the mobile phone output power reading.

#### 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.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



### 7. EFFECTIVE RADIATED POWER AND EQUIVALENT ISOTROPIC RADIATED POWER MEASUREMENT

#### 7.1. Standard Applicable

According to FCC §2.1046

FCC 22.913(a) Mobile station is limited to 7W ERP.

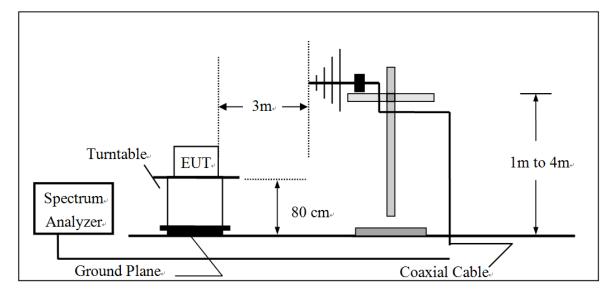
FCC 24.232(b) Mobile and portable stations are limited to 2W EIRP.

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

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

#### 7.2. Test SET-UP

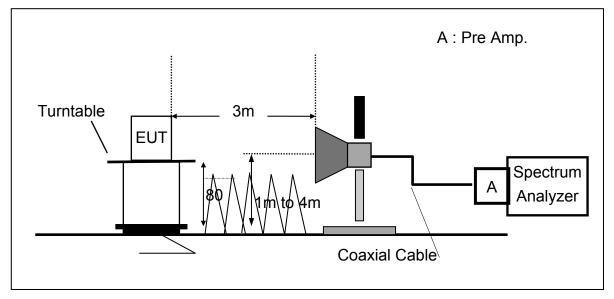
(A) Radiated Power Test Set-Up, Frequency Below1000MHz



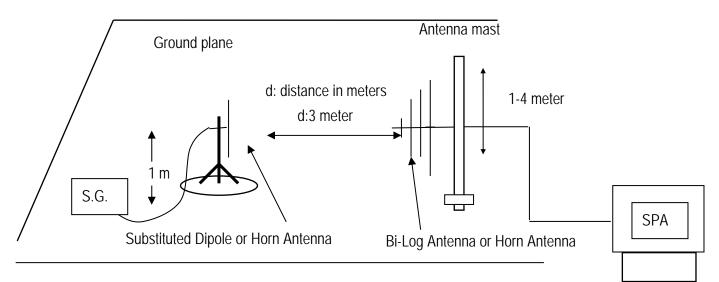
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only



#### Radiated Power Test Set-UP Frequency Over 1 GHz (B)



(C) Substituted Method Test Set-UP



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



#### 7.3. Measurement Procedure

- The testing follows the Measurement Procedure of FCC KDB 971168 D01
- 2. The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.
- 3. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated
- 4. The testing follows the Measurement Procedure of FCC KDB 971168 D01
- 5. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G.
- 6. ERP = S.G. output (dBm) + Antenna Gain (dBd) Cable Loss (dB)
- 7. EIRP = S.G. output (dBm) + Antenna Gain (dBi) Cable Loss (dB)
- 8. Spectrum setting:

(1) Detector = Peak, marker the highest value of the detector by maximum hold, set RBW wide enough to capture the entire signal of emission, and VBW > =3xRBW.

(2) KDB 971168 D01 is adopted, and the procedure as lists under item 4, Measurement of the Average Power over the Fundamental Signal Bandwidth, is followed to set correspondingly for the acquisition of proper measurement data.

Set frequency = nominal signal center frequency;

Set span = 2 X occupied BW;

Set RBW ≈ 1~5% of the span, not to exceed 1 MHz

Set VBW =  $3 \times RBW$ ;

Select average power (RMS) detector

Set sweep time and number of measurement points to achieve a minimum of 1 millisecond/pt integration time (ex. Point = 601 points, then sweet time =  $601*10^{-3}$  = 6s.

Activate trace averaging routine over a minimum of 10 sweeps;

Activate marker/span pair and set span = signal or channel bandwidth;

Activate the band/interval power marker function;

Record the band power level;

Record adjusted value as the average signal power level. Then activate the occupied bandwidth measurement function.

The proper adjustment due to limitation of spectrum capability is given compensated to spectrum with conversion factor of 10\*log (TBW/RBW), where TBW is the transmission of UE exceeding the maximum BW UE can extends, and RBW is the resolution BW in UE.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

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#### 7.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Bi-log Antenna	SCHWAZBECK	VULB9168	378	2017/12/29	2018/12/28
Horn Antenna	Schwarzbeck	BBHA9120D	1441	2017/08/04	2019/08/03
Horn Antenna	Schwarzbeck	BBHA9170	184	2017/12/12	2018/12/11
Loop Antenna	ETS.LINDGREN	6502	148045	2017/09/26	2018/09/25
Loop Antenna	ETS.LINDGREN	6502	148045	2018/09/26	2019/09/25
3m Site NSA	SGS	966 chamber	N/A	2018/01/02	2019/01/01
Spectrum Analyzer	Agilent	E4446A	MY51100003	2018/05/15	2019/05/14
EMI Test Receiver	R&S	ESCI7	100335	2018/02/02	2019/02/01
Pre-Amplifier	HP	8449B	3008A00578	2018/01/02	2019/01/01
Pre-Amplifier	HP	8447D	2944A07676	2018/01/02	2019/01/01
Pre-Amplifier	EMC Instru- ments	EMC184045B	980135	2017/10/27	2018/10/26
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	2018/01/02	2019/01/01
Filter 5150-5350 MHz	Micro-Tronics	BRM50703	1	2018/01/02	2019/01/01
Low Loss Cable	Huber Suhner	966_RX	9	2018/01/02	2019/01/01



	EUT		_	_	Measur	ement	le ssERPLimit3dBmdBm3.1118.7838.453.1117.638.453.3215.6238.453.3221.1738.453.3221.1738.453.1723.6638.453.1720.6838.453.1120.8438.453.1120.1638.45				
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit			
	MHz		V/H	dBm	dBd	dB	dBm	dBm			
	824.2	128	V	18.44	3.45	-3.11	18.78	38.45			
GSM 850	024.2	120	Н	17.26	3.45	-3.11	17.6	38.45			
	836.6 1	190	V	15.49	3.45	-3.32	15.62	38.45			
		190	Н	21.04	3.45	-3.32	21.17	38.45			
	848.8	251	V	23.37	3.46	-3.17	23.66	38.45			
	040.0	201	Н	20.39	3.46	-3.17	20.68	38.45			
	824.2	128	V	20.5	3.45	-3.11	20.84	38.45			
	024.2	120	Н	19.82	3.45	-3.11	20.16	38.45			
GPRS	836.6	190	V	20.52	3.45	-3.32	20.65	38.45			
850	030.0	190	Н	23.93	3.45	-3.32	24.06	38.45			
	848.8	251	V	24.53	3.46	-3.16	24.83	38.45			
	040.0	201	Н	22.83	3.46	-3.16	23.13	38.45			

# 7.5. Measurement Result: (Peak) –using option of peak measurement

Remark: (1)The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
	MHz		V/H	dBm	dBi	dB	dBm	dBm
	1850.2	512	V	16.33	9.77	-4.66	21.44	33.00
GSM 1900	1000.2	512	Н	16.62	9.77	-4.66	21.73	33.00
	1880.0	661	V	14.8	9.86	-4.7	19.96	33.00
		001	Н	19.26	9.86	-4.7	24.42	33.00
	1000.9	810	V	17.3	9.94	-4.72	22.52	33.00
	1909.8	010	Н	19.11	9.94	-4.72	24.33	33.00
	1950 0	512	V	20.38	9.77	-4.66	25.49	33.00
	1850.2	512	Н	21.07	9.77	-4.66	26.18	33.00
GPRS	1990.0	661	V	18.4	9.86	-4.7	23.56	33.00
1900	1880.0	661	Н	19.79	9.86	-4.7	24.95	33.00
	1909.8 8	010	V	19.5	9.94	-4.72	24.72	33.00
		810	Н	20.97	9.94	-4.72	26.19	33.00

Remark: (1)The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	926 4	4120	V	20.86	3.45	-3.17	21.14	38.45
	826.4	4132	Н	19.7	3.45	-3.19	19.96	38.45
WCDMA	836.6	4183	V	20.31	3.45	-3.31	20.45	38.45
Band V	030.0	4105	Н	18.63	3.45	-3.31	18.77	38.45
	846.6	4233	V	18.68	3.46	-3.34	18.8	38.45
		7200	Н	18.07	3.46	-3.34	18.19	38.45
	826.4	4132	V	22.17	3.45	-3.17	22.45	38.45
	020.4	4152	Н	20.61	3.45	-3.19	20.87	38.45
HSDPA	000 0	1100	V	21.99	3.45	-3.31	22.13	38.45
Band V	836.6	4183	Н	19.86	3.45	-3.31	20	38.45
	846.6	4233	V	19.67	3.46	-3.34	19.79	38.45
	040.0	4233	Н	18.48	3.46	-3.34	18.6	38.45
	826.4	4132	V	21.94	3.45	-3.17	22.22	38.45
	020.4	4152	Н	19.88	3.45	-3.19	20.14	38.45
HSUPA	926.6	1100	V	21.76	3.45	-3.31	21.9	38.45
Band V	836.6	4183	Н	19.86	3.45	-3.31	20	38.45
	946.6	1000	V	19.31	3.46	-3.34	19.43	38.45
	040.0	46.6 4233 -	Н	17.69	3.46	-3.34	17.81	38.45

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	824.7	20407	V	19.2	3.45	-3.17	19.48	38.45
LTE	024.7	20407	Н	15.4	3.45	-3.17	15.68	38.45
BAND 5 BW: 1.4M	836.5	20525	V	20.21	3.45	-3.29	20.37	38.45
QPSK	050.5	20525	Н	15.76	3.45	-3.28	15.93	38.45
RB: 1,0	848.3	20643	V	18.64	3.46	-3.35	18.75	38.45
	0+0.0	20043	Н	15.49	3.46	-3.36	15.59	38.45
	824.7	20407	V	18.3	3.45	-3.11	18.64	38.45
LTE	024.7	20407	Н	14.63	3.45	-3.11	14.97	38.45
BAND 5 BW: 1.4M QPSK	836.5	20525	V	19.09	3.45	-3.3	19.24	38.45
	000.0	20020	Н	15.84	3.45	-3.29	16	38.45
RB: 1,5	848.3	20643	V	18.7	3.46	-3.3	18.86	38.45
		20043	Н	16.95	3.46	-3.3	17.11	38.45
	824.7	20407	V	19.33	3.45	-3.17	19.61	38.45
	024.7	20407	Н	15.91	3.45	-3.17	16.19	38.45
BAND 5 BW: 1.4M	836.5	20525	V	19.72	3.45	-3.29	19.88	38.45
16QAM	000.0	20020	Н	17.47	3.45	-3.29	17.63	38.45
RB: 1,0	848.3	20643	V	19.41	3.46	-3.35	19.52	38.45
	0+0.0	20040	Н	15.85	3.46	-3.35	15.96	38.45
	824.7	20407	V	18.83	3.45	-3.1	19.18	38.45
	027.7	20707	Н	14.39	3.45	-3.1	14.74	38.45
BAND 5 BW <sup>.</sup> 1 4M	836.5	20525	V	20.87	3.45	-3.3	21.02	38.45
BW: 1.4M 16QAM RB: 1,5	000.0	20020	Н	17.15	3.45	-3.3	17.3	38.45
	848.3 2	20643	V	19.82	3.46	-3.27	20.01	38.45
Dements	0-10.0	20070	Н	16.88	3.46	-3.28	17.06	38.45

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	825.5	20415	V	19.97	3.45	-3.17	20.25	38.45
LTE	025.5	20415	Н	14.48	3.45	-3.17	14.76	38.45
BAND 5 BW: 3M	836.5	20525	V	19.22	3.45	-3.28	19.39	38.45
QPSK	030.5	20525	Н	17.03	3.45	-3.28	17.2	38.45
RB: 1,0	847.5	20635	V	18.29	3.46	-3.42	18.33	38.45
		20055	Н	17.33	3.46	-3.42	17.37	38.45
	825.5	20415	V	18.99	3.45	-3.16	19.28	38.45
LTE	025.5	20415	Н	15.19	3.45	-3.16	15.48	38.45
BAND 5 BW: 3M QPSK	836.5	20525	V	19.49	3.45	-3.31	19.63	38.45
	050.5	20525	Н	16.78	3.45	-3.31	16.92	38.45
RB: 1,14	847.5	20635	V	18.43	3.46	-3.29	18.6	38.45
		20035	Н	16.22	3.46	-3.3	16.38	38.45
	825.5	20415	V	20.08	3.45	-3.17	20.36	38.45
LTE	025.5	20413	Н	15.91	3.45	-3.17	16.19	38.45
BAND 5 BW: 3M	836.5	20525	V	21.34	3.45	-3.28	21.51	38.45
16QAM	050.5	20323	Н	17.26	3.45	-3.28	17.43	38.45
RB: 1,0	847.5	20635	V	19.04	3.46	-3.43	19.07	38.45
	0-7.5	20000	Н	17.12	3.46	-3.42	17.16	38.45
	825.5	20415	V	19.12	3.45	-3.15	19.42	38.45
	023.5	20413	Н	15.07	3.45	-3.16	15.36	38.45
BAND 5 BW: 3M 16QAM RB: 1,14	836.5	20525	V	20.78	3.45	-3.31	20.92	38.45
	000.0	20525-	Н	18.13	3.45	-3.31	18.27	38.45
	847.5 2	20635-	V	20.08	3.46	-3.3	20.24	38.45
Demonstration	0.170	20000	Н	17.83	3.46	-3.29	18	38.45

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	826.5	20425	V	19.5	3.45	-3.18	19.77	38.45
LTE	020.5	20420	Н	15.25	3.45	-3.18	15.52	38.45
BAND 5 BW: 5M	926 E	20525	V	20.19	3.45	-3.26	20.38	38.45
QPSK	836.5	20525	Н	16.24	3.45	-3.27	16.42	38.45
RB: 1,0	846.5	20625	V	18.85	3.46	-3.4	18.91	38.45
	040.5	20625	Н	17.32	3.46	-3.4	17.38	38.45
	826.5	20425	V	18.31	3.45	-3.19	18.57	38.45
LTE	020.5	20423	Н	16.22	3.45	-3.18	16.49	38.45
BAND 5 BW: 5M QPSK	836.5	20525	V	18.87	3.45	-3.32	19	38.45
	050.5	20525	Н	16.5	3.45	-3.32	16.63	38.45
RB: 1,24	846.5	20625	V	19.29	3.46	-3.28	19.47	38.45
		20025	Н	16.59	3.46	-3.3	16.75	38.45
	826.5	20425	V	20.39	3.45	-3.17	20.67	38.45
LTE	020.0	20723	Н	16.62	3.45	-3.17	16.9	38.45
BAND 5 BW: 5M	836.5	20525	V	20.62	3.45	-3.27	20.8	38.45
16QAM	000.0	20020	Н	16.98	3.45	-3.26	17.17	38.45
RB: 1,0	846.5	20625	V	18.85	3.46	-3.4	18.91	38.45
	0+0.0	20020	Н	17.3	3.46	-3.4	17.36	38.45
	826.5	20425	V	19.22	3.45	-3.18	19.49	38.45
	020.0	20720	Н	14.61	3.45	-3.18	14.88	38.45
BAND 5 BW: 5M 16QAM RB: 1,24	836.5	20525	V	20.51	3.45	-3.32	20.64	38.45
		20020	Н	18.03	3.45	-3.32	18.16	38.45
	846.5 2	20625-	V	19.71	3.46	-3.29	19.88	38.45
Demonstration 1	0+0.0	20020	Н	17.08	3.46	-3.29	17.25	38.45

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	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	829.0	20450	V	19.44	3.45	-3.18	19.71	38.45
LTE	029.0	20450	Н	-5.8	3.45	-3.18	-5.53	38.45
BAND 5 BW: 10M	836.5	20525	V	19.99	3.45	-3.23	20.21	38.45
QPSK	030.5	20525	Н	16.18	3.45	-3.24	16.39	38.45
RB: 1,0	844.0	20600	V	19.05	3.46	-3.33	19.18	38.45
	044.0	20000	Н	16.33	3.46	-3.33	16.46	38.45
	829.0	20450	V	19.02	3.45	-3.25	19.22	38.45
LTE	029.0	20400	Н	16.68	3.45	-3.25	16.88	38.45
BAND 5 BW: 10M QPSK	836.5	20525	V	18.68	3.46	-3.35	18.79	38.45
	030.5	20525	Н	15.69	3.46	-3.35	15.8	38.45
RB: 1,49	844.0	20600	V	17.27	3.46	-3.33	17.4	38.45
		20000	Н	16.64	3.46	-3.32	16.78	38.45
	829.0	20450	V	19.76	3.45	-3.18	20.03	38.45
	023.0	20430	Н	16.69	3.45	-3.18	16.96	38.45
BAND 5 BW: 10M	836.5	20525	V	15.06	3.45	-3.23	15.28	38.45
16QAM	000.0	20020	Н	17.25	3.45	-3.23	17.47	38.45
RB: 1,0	844.0	20600	V	20.7	3.46	-3.33	20.83	38.45
		20000	Н	17.58	3.46	-3.34	17.7	38.45
	829.0	20450	V	20.2	3.45	-3.25	20.4	38.45
	020.0	20100	Н	16.77	3.45	-3.25	16.97	38.45
BAND 5 BW: 10M 16QAM RB: 1,49	836.5	20525	V	20.42	3.46	-3.35	20.53	38.45
	000.0	20525	Н	16.79	3.46	-3.35	16.9	38.45
	844.0 2	20600-	V	17.67	3.46	-3.28	17.85	38.45
Demerk :	011.0		Н	17.15	3.46	-3.31	17.3	38.45



	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	699.7	23017	V	19.82	3.67	-2.1	21.39	24.77
LTE	099.7	23017	Н	13.13	3.67	-2.09	14.71	24.77
BAND 12 BW: 1.4M	707 5	23095	V	19.89	3.65	-1.82	21.72	24.77
QPSK	707.5	23095	Н	14.97	3.65	-1.83	16.79	24.77
RB: 1,0	715.3	22172	V	20.12	3.62	-2.3	21.44	24.77
	715.5	23173	Н	14.96	3.62	-2.31	16.27	24.77
	699.7	23017	V	19.43	3.68	-2.26	20.85	24.77
LTE	099.7	23017	Н	14.32	3.67	-2.03	15.96	24.77
BAND 12 BW: 1.4M QPSK	707.5	23095	V	20.43	3.65	-1.88	22.2	24.77
	707.5	23095	Н	15.21	3.65	-1.87	16.99	24.77
RB: 1,5	715.3	23173	V	20.43	3.62	-2.36	21.69	24.77
		23173	Н	14.78	3.62	-2.37	16.03	24.77
	699.7	23017	V	19.67	3.67	-2.11	21.23	24.77
LTE	099.7	23017	Н	14.24	3.67	-2.09	15.82	24.77
BAND 12 BW: 1.4M	707.5	23095	V	21.26	3.65	-1.81	23.1	24.77
16QAM	707.5	20090	Н	16.65	3.65	-1.81	18.49	24.77
RB: 1,0	715.3	23173	V	21.31	3.62	-2.31	22.62	24.77
	715.5	20170	Н	15.35	3.62	-2.3	16.67	24.77
	699.7	23017	V	20.26	3.68	-2.26	21.68	24.77
	033.1	23017	Н	14.48	3.67	-2.04	16.11	24.77
BAND 12	707.5	23005	V	21.04	3.65	-1.87	22.82	24.77
BW: 1.4M 16QAM RB: 1,5	101.5	23095-	Н	15.26	3.65	-1.89	17.02	24.77
	715.3 2	23173-	V	20.67	3.62	-2.36	21.93	24.77
	710.0		Н	14.83	3.62	-2.37	16.08	24.77

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	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	700.5	22025	V	18.82	3.67	-2.12	20.37	24.77
LTE	700.5	23025	Н	14.27	3.67	-2.11	15.83	24.77
BAND 12 BW: 3M	707.5	23095	V	20.76	3.66	-1.83	22.59	24.77
QPSK	707.5	23095	Н	15.08	3.66	-1.83	16.91	24.77
RB: 1,0	714.5	23165	V	20.57	3.63	-2.21	21.99	24.77
	714.5	23105	Н	14.57	3.63	-2.23	15.97	24.77
	700.5	23025	V	19.4	3.68	-2.19	20.89	24.77
LTE	700.5	23023	Н	14.34	3.67	-2.16	15.85	24.77
BAND 12 BW: 3M QPSK	707.5	23095	V	20.54	3.65	-1.92	22.27	24.77
	707.5	20000	Н	14.54	3.65	-1.94	16.25	24.77
RB: 1,14	714.5	23165	V	19.74	3.62	-2.35	21.01	24.77
		23103	Н	13.67	3.62	-2.35	14.94	24.77
	700.5	23025	V	20.1	3.67	-2.11	21.66	24.77
	700.5	23023	Н	14.68	3.67	-2.11	16.24	24.77
BAND 12 BW: 3M	707.5	23095	V	21.4	3.66	-1.82	23.24	24.77
16QAM	101.5	20090	Н	14.58	3.66	-1.83	16.41	24.77
RB: 1,0	714.5	23165	V	20.07	3.63	-2.21	21.49	24.77
	714.0	20100	Н	15.51	3.63	-2.21	16.93	24.77
	700.5	23025	V	20.84	3.67	-2.18	22.33	24.77
	700.0	20020	Н	15.19	3.67	-2.17	16.69	dBm   24.77
BAND 12	707.5	23095	V	20.91	3.65	-1.93	22.63	24.77
BW: 3M 16QAM RB: 1,14	101.0	20000	Н	15.29	3.65	-1.93	17.01	24.77
	714.5 2	23165	V	19.9	3.62	-2.37	21.15	24.77
Demonstration 1	7 17.5	20100	Н	15.65	3.62	-2.37	16.9	24.77

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	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	701.5	23035	V	19.24	3.67	-2.11	20.8	24.77
LTE	701.5	23035	Н	13.95	3.67	-2.08	15.54	24.77
BAND 12 BW: 5M QPSK	707 5	23095	V	20.41	3.66	-1.89	22.18	24.77
	707.5	23095	Н	14.56	3.66	-1.89	16.33	24.77
RB: 1,0	713.5	23155	V	20.03	3.64	-2.08	21.59	24.77
	715.5	23133	Н	14.43	3.63	-2.1	15.96	24.77
	701.5	23035	V	20.14	3.67	-2.03	21.78	24.77
LTE	701.5	23033	Н	14.02	3.67	-2.05	15.64	24.77
BAND 12 BW: 5M QPSK	707.5	23095	V	19.43	3.64	-1.97	21.1	24.77
	101.5	20030	Н	14.66	3.64	-2	16.3	24.77
RB: 1,24	713.5	23155	V	19.78	3.62	-2.35	21.05	24.77
		20100	Н	14.7	3.62	-2.36	15.96	24.77
	701.5	23035	V	19.83	3.67	-2.1	21.4	24.77
	701.5	20000	Н	13.92	3.67	-2.09	15.5	24.77
BAND 12 BW: 5M	707.5	23095	V	20.77	3.66	-1.9	22.53	24.77
16QAM	101.5	20030	Н	15.45	3.66	-1.9	17.21	24.77
RB: 1,0	713.5	23155	V	19.97	3.64	-2.09	21.52	24.77
	713.5	20100	Н	14.81	3.64	-2.09	16.36	24.77
	701.5	23035	V	20.84	3.67	-2.02	22.49	24.77
	701.0	20000	Н	14.55	3.65	-1.82	16.38	dBm   24.77
BAND 12 BW: 5M	707.5	23095	V	20.22	3.64	-1.99	21.87	24.77
BW: 5M 16QAM RB: 1,24	101.0	20000	Н	14.67	3.64	-1.99	16.32	24.77
	713.5 2	23155	V	20.76	3.62	-2.36	22.02	24.77
D	110.0	20100	Н	15.65	3.62	-2.37	16.9	24.77

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	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	704.0	23060	V	18.86	3.67	-2.09	20.44	24.77
LTE	704.0	23000	Н	13.9	3.67	-2.07	15.5	24.77
BAND 12 BW: 10M	707.5	23095	V	19.03	3.67	-2.09	20.61	24.77
QPSK	707.5	20090	Н	13.04	3.65	-1.8	14.89	24.77
RB: 1,0	711.0	23130	V	19.39	3.65	-1.8	21.24	24.77
	711.0	20100	Н	13.27	3.65	-1.8	15.12	24.77
	704.0	23060	V	19.65	3.65	-1.9	21.4	24.77
LTE BAND 12 BW: 10M QPSK	704.0	20000	H	13.67	3.65	-1.9	15.42	24.77
	707.5	23095	V	20.04	3.63	-2.12	21.55	24.77
	101.0	20000	Н	14.38	3.63	-2.13	15.88	24.77
RB: 1,49	711.0	23130	V	18.4	3.62	-2.34	19.68	24.77
			H	12.95	3.62	-2.37	14.2	24.77
	704.0	23060	V	20.1	3.67	-2.08	21.69	24.77
LTE BAND 12			Н	13.57	3.67	-2.07	15.17	24.77
BAND 12 BW: 10M	707.5	23095	V	20.42	3.67	-2.07	22.02	24.77
16QAM			Н	14.09	3.65	-1.82	15.92	24.77
RB: 1,0	711.0	23130	V	21.19	3.66	-1.83	23.02	24.77
			Н	15.02	3.66	-1.83	16.85	24.77
	704.0	23060	V	19.76	3.65	-1.91	21.5	24.77
LTE BAND 12			Н	15.38	3.65	-1.9	17.13	24.77
BAND 12 BW: 10M 16QAM RB: 1,49	707.5	23095	V	19.82	3.63	-2.12	21.33	24.77
	707.5 2	23095	H	15.3	3.63	-2.13	16.8	24.77
	711.0 2	23130-	V	19.42	3.62	-2.34	20.7	24.77
Demerk :	•	_0.00	Н	13.83	3.62	-2.34	15.11	24.77



	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	706.5	22755	V	18.79	3.65	-1.86	20.58	34.77
LTE	700.5	23755	Н	14.05	3.65	-1.86	15.84	dBm
BAND 17 BW: 5M	710.0	23790	V	19.67	3.65	-1.87	21.45	34.77
QPSK	710.0	23790	Н	14.03	3.65	-1.88	15.8	34.77
RB: 1,0	713.5	23825	V	19.23	3.64	-2.09	20.78	34.77
		20020	Н	14.09	3.64	-2.08	15.65	34.77
	706.5	23755	V	19.37	3.65	-1.92	21.1	34.77
LTE	700.5	23700	Н	13.68	3.65	-1.94	15.39	34.77
BAND 17 BW: 5M QPSK	710.0	23790	V	19.67	3.63	-2.14	21.16	34.77
	710.0	23790	Н	13.82	3.63	-2.15	15.3	34.77
RB: 1,24	713.5	23825	V	19.73	3.62	-2.36	20.99	34.77
		23025	Н	14.24	3.62	-2.36	15.5	34.77
	706.5	23755	V	20.3	3.65	-1.85	22.1	34.77
LTE	700.5	23733	Н	15.1	3.65	-1.87	16.88	34.77
BAND 17 BW: 5M	710.0	23790	V	20.22	3.65	-1.87	22	34.77
16QAM	710.0	23790	Н	14.34	3.65	-1.87	16.12	34.77
RB: 1,0	713.5	23825	V	20.02	3.64	-2.09	21.57	34.77
	710.0	20020	Н	15.04	3.64	-2.09	16.59	34.77
	706.5	23755	V	19.58	3.65	-1.93	21.3	34.77
	700.5	20100	Н	15.18	3.65	-1.92	16.91	34.77
BAND 17	710.0	23790	V	19.77	3.63	-2.14	21.26	34.77
BW: 5M 16QAM RB: 1,24	710.0	20130	Н	14.94	3.63	-2.15	16.42	34.77
	713.5 2	23825	V	20.12	3.62	-2.35	21.39	34.77
Demonstration 1	110.0	20020	Н	14.74	3.62	-2.37	15.99	34.77

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



	EUT				Measur	ement		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
	MHz		V/H	dBm	dBd	dB	dBm	dBm
	709.0	23780	V	1.11	3.65	-1.88	2.88	34.77
LTE	709.0	23/00	Н	14.59	3.65	-1.87	16.37	34.77
BAND 17 BW: 10M	710.0	23790	V	19.42	3.66	-1.87	21.21	34.77
QPSK	710.0		Н	13.46	3.66	-1.86	15.26	34.77
RB: 1,0	711.0	23800	V	19.68	3.65	-1.81	21.52	34.77
			Н	13.79	3.66	-1.81	15.64	34.77
	709.0	23780	V	19.83	3.63	-2.21	21.25	34.77
LTE	709.0		Н	14.9	3.63	-2.22	16.31	34.77
BAND 17 BW: 10M	710.0	23790	V	20.58	3.62	-2.27	21.93	34.77
QPSK	710.0		Н	13.81	3.62	-2.29	15.14	34.77
RB: 1,49	711.0	23800	V	19.5	3.62	-2.34	20.78	34.77
			Н	13.66	3.62	-2.35	14.93	34.77
	709.0	23780	V	15.06	3.65	-1.86	16.85	34.77
LTE	709.0	23700	Н	14.91	3.65	-1.9	16.66	34.77
BAND 17 BW: 10M	710.0	23790	V	20.98	3.66	-1.88	22.76	34.77
16QAM	710.0	23730	Н	15.37	3.66	-1.87	17.16	34.77
RB: 1,0	711.0	23800	V	21.55	3.66	-1.83	23.38	34.77
	711.0	20000	Н	15.6	3.65	-1.8	17.45	34.77
	709.0	23780	V	21.65	3.63	-2.2	23.08	34.77
	100.0	20100	Н	13.71	3.62	-2.25	15.08	34.77
BAND 17 BW: 10M	710.0	23790	V	21.47	3.62	-2.27	22.82	34.77
16QAM	/ 10.0	20100	Н	15.44	3.62	-2.29	16.77	34.77
RB: 1,49	711.0	23800	V	19.88	3.62	-2.35	21.15	34.77
Bomork :	, , , , , , , , , , , , , , , , , , , ,	_0000	Н	14.37	3.62	-2.34	15.65	34.77

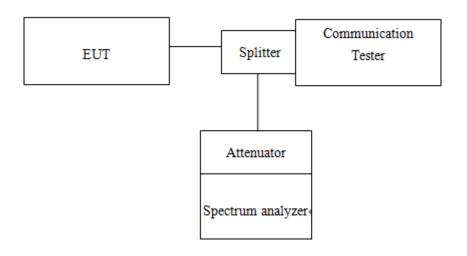


# 8. OCCUPIED BANDWIDTH MEASUREMENT

# 8.1. 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.

# 8.2. Test Set-up



# 8.3. 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%.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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# 8.4. Measurement Equipment Used

EQUIPMENT TYPE	MFR	MODEL NUM- BER	SERIAL NUM- BER	LAST CAL.	CAL DUE.
EXA Spectrum Ana- lyzer	Agilent	N9010A	MY57120290	2018/02/14	2019/02/13
Radio Communication Analyer	Anritsu	MT8815B	6200711454	2018/04/05	2019/04/04
Radio Communication Analyer	Anritsu	MT8820C	6200995019	2018/04/05	2019/04/04
DC Power Supply	Anritsu	E3640A	MY52410006	2017/11/28	2018/11/27
Temperature Cham- ber	TERCHY	MHG-120LF	911009	2018/05/18	2019/05/17
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
DC Block	Mini-Circuits	BLK-18-S+	1	2018/01/02	2019/01/01
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	2018/01/02	2019/01/01
Coaxial Cable	Huber Su- hner	SUCOFLEX 102EPA	MY2616/2	2018/01/02	2019/01/01

# 8.5. Measurement Result

Freq. (MHz)		99% BV	V (MHz)	26 dB BW (MHz)		
	СН	GSM	GPRS	GSM	GPRS	
		850	850	850	850	
824.2	128	0.24143	0.24282	0.30617	0.31427	
836.6	190	0.24044	0.24270	0.30539	0.32576	
848.8	251	0.24314	0.24134	0.30568	0.31634	

Freq. (MHz)		99% BV	V (MHz)	26 dB BW (MHz)		
	СН	GSM	GPRS	GSM	GPRS	
		1900	1900	1900	1900	
1850.2	512	0.24108	0.24286	0.31160	0.31392	
1880.0	661	0.24084	0.24424	0.31016	0.31651	
1909.8	810	0.24087	0.24382	0.30644	0.32098	



Freq		<b>99</b> 9	% BW (MH	z)	26 dB BW (MHz)			
Freq. (MHz)	СН	WCDMA	HSDPA	HSUPA	WCDMA	HSDPA	HSUPA	
		V	V	V	V	V	V	
826.40	4132	4.13300	4.11570	4.13030	4.67670	4.67040	4.69690	
836.60	4183	4.10190	4.11040	4.11400	4.67590	4.68440	4.67000	
846.60	4233	4.06570	4.07020	4.06510	4.62680	4.64430	4.63350	

L	LTE BAND 5 Channel bandwidth: 1.4MHz								
Freq.	СН	99% B\	N (MHz)	26 dB BW (MHz)					
(MHz)	CIT	QPSK 16QAM		QPSK	16QAM				
824.7	20407	1.0977	1.0997	1.2763	1.2908				
836.5	20525	1.0987	1.1005	1.2923	1.2877				
848.3	20643	1.0983	1.1029	1.2764	1.3043				

	LTE BAND 5 Channel bandwidth: 5MHz									
Freq.	СН	99% B\	N (MHz)	26 dB BW (MHz)						
(MHz)	CIT	QPSK 16QAM		QPSK	16QAM					
826.5	20425	4.5011	4.5047	5.0157	5.0306					
836.5	20525	4.4986	4.4984	4.9908	5.0020					
846.5	20625	4.4756	4.4688	4.9694	4.9619					
Ľ	te bani	D 12 Chan	inel bandw	idth: 1.4M	Hz					
Freq.	СН	99% B\	N (MHz)	26 dB BW (MHz)						
(MHz)	СП	QPSK	16QAM	QPSK	16QAM					
699.7	23017	1.0965	1.1039	1.2922	1.2931					
707.5	23095	1.0980	1.0990	1.2827	1.2587					
715.3	23173	1.0950	1.1085	1.2585	1.2571					

LTE BAND 5 Channel bandwidth: 3MHz								
Freq.	СН	99% BV	V (MHz)	26 dB BW (MHz)				
(MHz)	СП	QPSK 1		QPSK	16QAM			
825.5	20415	2.7051	2.7016	2.9857	3.0045			
836.5	20525	2.6975	2.7010	2.9899	2.9826			
847.5	20635	2.6986	2.6975	2.9837	2.9676			

	LTE BAND 5 Channel bandwidth: 10MHz									
Freq.	CLL	99% BV	V (MHz)	26 dB BW (MHz)						
(MHz)	СН	QPSK 16QAM		QPSK	16QAM					
829.0	20450	8.9885	8.9407	9.834	9.744					
836.5	20525	8.9587	8.9277	9.843	9.740					
844.0	20600	8.9215	8.8777	9.753	9.710					
LTE BAND 12 Channel bandwidth: 3MHz										
	LTE BAN	VD 12 Chai	nnel bandw	idth: 3MH	Z					
Freq.			nnel bandw V (MHz)		z W (MHz)					
Freq. (MHz)	LTE BAN									
		99% BV	V (MHz)	26 dB B	W (MHz)					
(MHz)	СН	99% BV QPSK	V (MHz) 16QAM	26 dB B QPSK	W (MHz) 16QAM					

l	LTE BAND 12 Channel bandwidth: 5MHz									
Freq.	СН	99% B\	N (MHz)	26 dB BW (MHz)						
(MHz)	CIT	QPSK	16QAM	QPSK	16QAM					
701.5	23035	4.5049	4.5004	5.0173	5.0303					
707.5	23095	4.4750	4.4911	4.9849	4.9994					
713.5	23155	4.5055	4.5073	5.0488	5.0221					

	LTE BAND 12 Channel bandwidth: 10MHz									
Freq.	СН	99% BV	V (MHz)	26 dB BW (MHz)						
(MHz)	MHz)	QPSK	16QAM	QPSK	16QAM					
704.0	23060	8.9924	8.9492	9.841	9.741					
707.5	23095	8.9380	8.8759	9.748	9.711					
711.0	23130	9.0050	9.818							



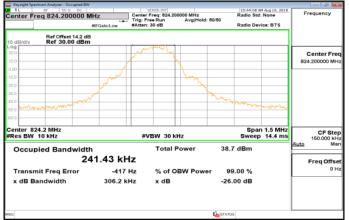
l	LTE BAND 17 Channel bandwidth: 5MHz					LTE BAND 17 Channel bandwidth: 10MHz					łz
Freq. CH	99% B\	N (MHz)	26 dB BW (MHz)		Freq.	СН	99% BW (MHz)		26 dB BW (MHz)		
(MHz)	СП	QPSK	16QAM	QPSK	16QAM	(MHz)	СП	QPSK	16QAM	QPSK	16QAM
706.5	23755	4.4775	4.4721	4.9887	4.8196	709.0	23780	8.9473	8.8942	9.790	9.742
710.0	23790	4.4912	4.4926	4.9999	4.9841	710.0	23790	8.9694	8.9164	9.785	9.780
713.5	23825	4.5144	4.5170	5.0540	5.0504	711.0	23800	8.9953	8.9577	9.863	9.824

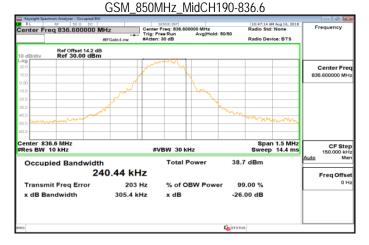
Please refer to next page.



# Report No.: ER/2018/80112 Page 53 of 158

# GSM\_850MHz\_LowCH128-824.2

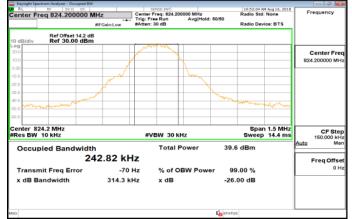


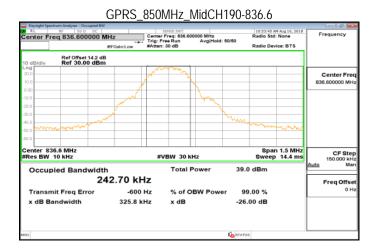


# GSM 850MHz HighCH251-848.8

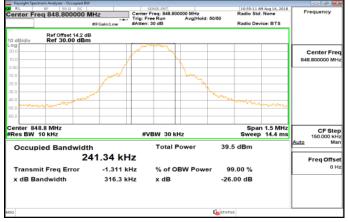


#### GPRS\_850MHz\_LowCH128-824.2





# GPRS 850MHz HighCH251-848.8



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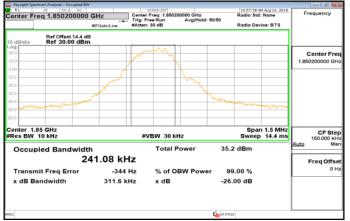
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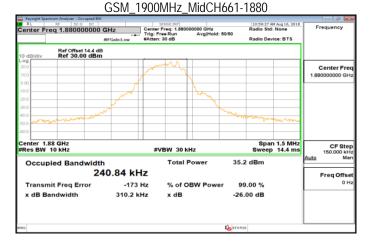
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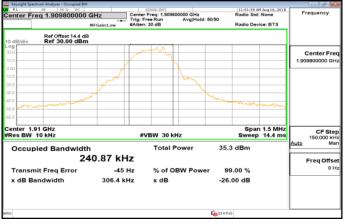
# Report No.: ER/2018/80112 Page 54 of 158

### GSM\_1900MHz\_LowCH512-1850.2

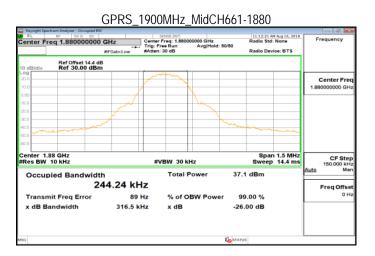




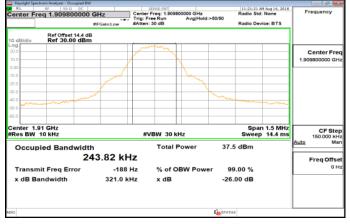
# GSM 1900MHz HighCH810-1909.8



#### GPRS\_1900MHz\_LowCH512-1850.2 11:05:54 AM Aug 16, Radio Std: None enter Freq 1.850200000 GHz Center Freq: 1.8 00 GHz Radio Device: BTS Ref Offset 14.4 dB Ref 30.00 dBm Center Fre 1.85 GHz W 10 kHz Span 1.5 MH weep 14.4 m CF Step #VBW 30 kHz Occupied Bandwidth Total Power 36.5 dBm 242.86 kHz Freq Offs Transmit Freg Error -210 Hz % of OBW Power 99.00 % x dB Bandwidth 313.9 kHz x dB -26.00 dB



# GPRS 1900MHz HighCH810-1909.8



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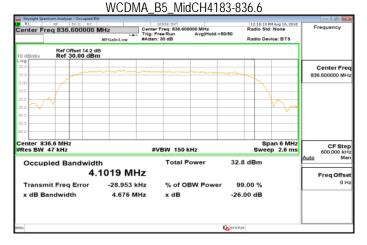
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# Report No.: ER/2018/80112 Page 55 of 158

## WCDMA\_B5\_LowCH4132-826.4

			_		
	rum Analyzer - Occupied BV				
RL	RF 50 Ω DC		er Freg: 826,400000 MHz	12:14:26 PM Aug 16, 20 Radio Std: None	Frequency
Senter Fre	eq 826.400000 I	AHZ Cent	Free Run Avg Hold:		
			en: 30 dB	Radio Device: BTS	
0 dB/div	Ref Offset 14.2 dl Ref 30.00 dBn				
o dB/div	Ref 30.00 dBh	1			-
20.0					Center Fre
0.0		mon	mannen	m	826.400000 MH
	1			~~~	020.400000 mir
3.0	1				
0.0	J				
0.0	V V				<u> </u>
0.0					
3.0					
3.0					
enter 826	5.4 MHz			Span 6 MH	17
Res BW 4			VBW 150 kHz	Sweep 2.6 m	
					Auto Ma
Occupi	ied Bandwidt	h	Total Power	32.5 dBm	
	4	1330 MHz			
		1330 MINZ			Freq Offse
Transmi	it Freg Error	18.053 kHz	% of OBW Power	r 99.00 %	01
	ndwidth	4.677 MHz	x dB	-26.00 dB	
хавва	nawiath	4.0// MHZ	xab	-26.00 dB	
6				5 STATUS	
-				<b>O</b>	

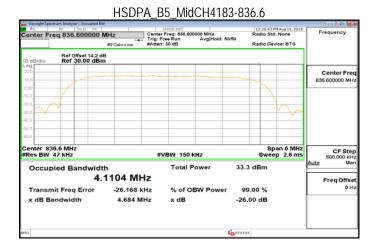


# WCDMA\_B5\_HighCH4233-846.6

R L	rum Analyzer - Occupied BV IV 50 Ω DC	v	SENSE:INT		1	2:18:01 PM A	16.2018	
enter Fre	g 846.600000 I	MHz	Center Freq: 846.6		Ra	dio Std: N		Frequency
		#IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold: 50		dio Device	BTS	
0 dB/div	Ref Offset 14.2 d Ref 30.00 dBn							
0.0								Center Fre
1.0	- m	~~~~~~	- marine -	- marine	nnen			846.600000 MH
						~	_	
.0							_	
u n	<b>√</b>     _						~	
						· · · ·	M	
1.0								
3.0								
enter 846 Res BW 4			#VBW 150	kHz		Span Sweep	6 MHz 2.6 ms	CF Ste 600.000 kH
Occupi	ied Bandwidt	h	Total	Power	32.7 di	32.7 dBm		<u>Auto</u> Ma
	4.	0657 MH	z					Freq Offs
Transmi	it Freg Error	-39.855 kl	Hz % of C	BW Power	99.00	%		01
x dB Ba	ndwidth	4.627 M	lz xdB		-26.00	dB		
5					STATUS			L
<u> </u>					•			

#### HSDPA\_B5\_LowCH4132-826.4

	trum Analyzer - Occupied BW							
RL Enter En	eq 826.400000 N	LH Cente	Freq: 826,400000 MHz		12:20:39 PF Radio Std:	Aug 16, 2018	Frequ	Jency
enter I I	64 020.400000 h	Trig:	FreeRun Avg Hold n: 30 dB	1:>50/50	Radio Devi	ce: BTS		
0 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm							
og	Rel 30.00 dBill						<u> </u>	
0.0				mamman				nter Fre
0.0	-						826.40	0000 M
.00					~		<u> </u>	
0.0								
0.0	$\checkmark$					m		
0.0 K V	Y							
0.0								
0.0								
0.0								
enter 82	6.4 MHz				Spa	an 6 MHz	<u> </u>	CF Ste
Res BW	47 kHz	4	VBW 150 kHz		Sweep	o 2.6 ms	60	0.000 k
Occup	ied Bandwidth	,	Total Power	32.8	dBm		Auto	м
Occup		157 MHz					<u> </u>	
	4.						Fre	eq Offs
Transm	nit Freq Error	20.682 kHz	% of OBW Pow	er 99.	00 %		I	01
x dB Ba	andwidth	4.670 MHz	x dB	-26.0	0 dB			
0				<b>STATUS</b>				



# HSDPA B5 HighCH4233-846.6

Keysight Spect	trum Analyzer - Occupied	BW						Aug 16, 2018		S 23
	q 846.60000			Freq: 846.6000	00 MHz Avg Hold: 50	R	adio Std:		Freque	ency
		#FGain:Low		: 30 dB	Avginoid: 50		adio Devi	ce: BTS		
10 dB/div	Ref Offset 14.2 Ref 30.00 dE									
20.0				_					Cent	er Fred
10.0	- And And				mm	m	-		846.600	000 MH
0.00							$\mathbf{n}$			
20.0										
a.a 🔨	V			_				M-		
40.0										
50.0			-							
60.0										
Center 84			#	VBW 150 k	Hz			an 6 MHz 5 2.6 ms	600	CF Ste
Occup	ied Bandwid	ith		Total Po	ower	32.5 d	IBm		Auto	Ma
	4	.0702	/Hz						Free	Offse
Transm	it Freg Error	-42.62	3 kHz	% of OE	W Power	99.0	0 %			0 H
x dB Ba	ndwidth	4.644	MHz	x dB		-26.00	dB		<u> </u>	
						1				
83						STATUS				

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# Report No.: ER/2018/80112 Page 56 of 158

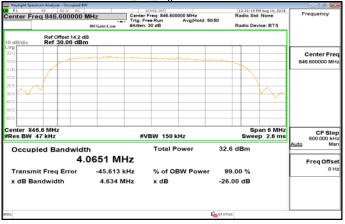
# HSUPA B5 LowCH4132-826.4

	rum Analyzer - Occupied BW					
Center Fre	N 50 Ω DC Q 826.400000 N			ld:>50/50	12:22:28 PM Aug 16, 2018 Radio Std: None	Frequency
		#IFGain:Low #	Atten: 30 dB		Radio Device: BTS	
10 dB/div	Ref Offset 14.2 dE Ref 30.00 dBm					
20.0						Center Freq
0.00						826.400000 MH
10.0	1					
20.0					- Mm	
40.0	Y					
60.0						
60.0						
Center 826 Res BW 4			#VBW 150 kHz		Span 6 MHz Sweep 2.6 ms	CF Step 600.000 kH
Occupi	ied Bandwidtl	h	Total Power	32.6	dBm	Auto Mar
		1303 MHz	2			Freq Offse
Transm	it Freq Error	19.444 kH	% of OBW Pov	ver 99	.00 %	0 H
x dB Ba	ndwidth	4.697 MH	z xdB	-26.	00 dB	
49G						

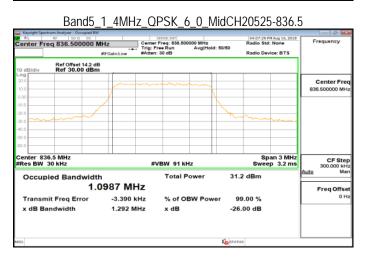


# HSUPA\_B5\_MidCH4183-836.6

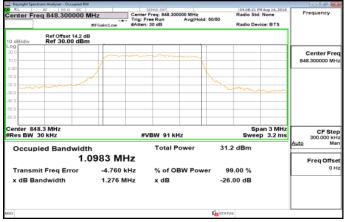
# HSUPA B5 HighCH4233-846.6



#### Band5\_1\_4MHz\_QPSK\_6\_0\_LowCH20407-824.7 04:06:27 PM Aug 16 Radio Std: None enter Freq 824.700000 MHz Center Freq: 824.70 00 MHz Avg|Hold:>50/50 Frequency Radio Device: BTS Ref Offset 14.2 dB Ref 30.00 dBm Center Fre 824.700000 MH r 824.7 MHz BW 30 kHz Span 3 MH CF Step #VBW 91 kHz Occupied Bandwidth Total Power 31.3 dBm 1.0977 MHz Freq Offs Transmit Freg Error -1.654 kHz % of OBW Power 99.00 % x dB Bandwidth 1.276 MHz -26.00 dB x dB



# Band5 1 4MHz QPSK 6 0 HighCH20643-848.3



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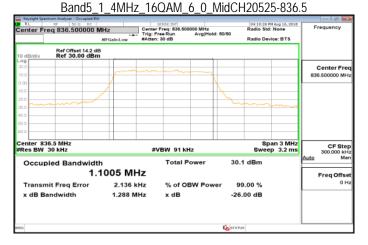
台	<b>灣檢驗科技股份有限公司</b>



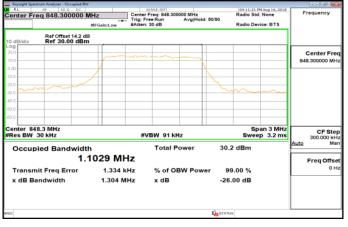
# Report No.: ER/2018/80112 Page 57 of 158

# Band5\_1\_4MHz\_16QAM\_6\_0\_LowCH20407-824.7

	Analyzer - Occupied BW					
Center Freq	824.700000 MH		sense: INT ter Freq: 824.700000 MHz : Free Run AvgiHol	Radio S	9 PM Aug 16, 2018 td: None	Frequency
	a1		ten: 30 dB		evice: BTS	
10 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm					
20.0						Center Free
10.0		- manuar				824.700000 MHz
0.00		/		1		
20.0				<u>∧</u>		
30.0	mont			mon		
40.0						
-50.0						
60.0						
Center 824.7 #Res BW 30			#VBW 91 kHz		ipan 3 MHz ep 3.2 ms	CF Step 300.000 kHz
Occupie	d Bandwidth		Total Power	29.9 dBm		Auto Mar
		97 MHz				Freq Offset
Transmit	Freq Error	4.828 kHz	% of OBW Pov	ver 99.00 %		0 Ha
x dB Band	dwidth	1.291 MHz	x dB	-26.00 dB		
15G				STATUS		

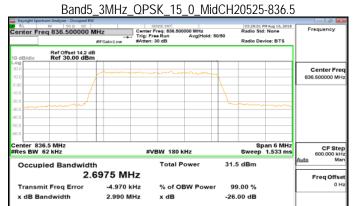


# Band5 1 4MHz 16QAM 6 0 HighCH20643-848.3

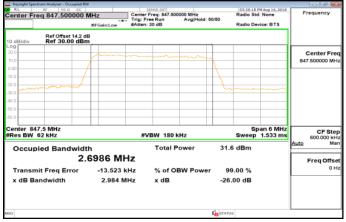


#### :27:48 PM Aug 16 tio Std: None enter Freq 825.500000 MHz Center Freq: 825. Trig: Free Run 00 MHz Avg|Hold: 50/5 Frequency Radio Device: BTS Ref Offset 14.2 dB Ref 30.00 dBm Center Fre 25.500000 MH r 825.5 MHz BW 62 kHz Span 6 MH CF Step #VBW 180 kHz Occupied Bandwidth Total Power 31.5 dBm 2.7051 MHz Freq Offs Transmit Freg Error 5.901 kHz % of OBW Power 99.00 % x dB Bandwidth 2.986 MHz -26.00 dB x dB

Band5\_3MHz\_QPSK\_15\_0\_LowCH20415-825.5



# Band5 3MHz QPSK 15 0 HighCH20635-847.5



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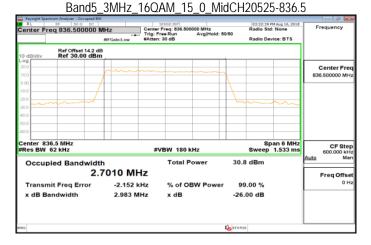
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# Report No.: ER/2018/80112 Page 58 of 158

## Band5\_3MHz\_16QAM\_15\_0\_LowCH20415-825.5

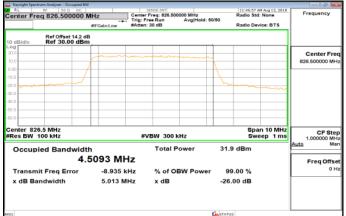
Keynight Spectrum Analyzer - Occupied BW RL RF 50 Ω DC Center Freq 825.500000 M	Hz Cent	sense:ant er Freq: 825.500000 MHz	Radio St	PM Aug 16, 2018 d: None	Frequency
	Trig:	FreeRun Avg Hold: t n: 30 dB	50/50 Radio De	vice: BTS	
Ref Offset 14.2 dE 0 dB/div Ref 30.00 dBm					
0 g 20.0					Center Fre
.0					825.500000 MH
0.0					
0.0			how	mm	
0.0					
0.0					
0.0					
enter 825.5 MHz Res BW 62 kHz		VBW 180 kHz		pan 6 MHz 1.533 ms	CF Ste 600.000 kH
Occupied Bandwidt	h	Total Power	30.6 dBm	4	uto Ma
	7016 MHz			Ē	Freq Offse
Transmit Freq Error	6.771 kHz	% of OBW Power	r 99.00 %		0 H
x dB Bandwidth	3.005 MHz	x dB	-26.00 dB		
83			to status		



# Band5\_3MHz\_16QAM\_15\_0\_HighCH20635-847.5

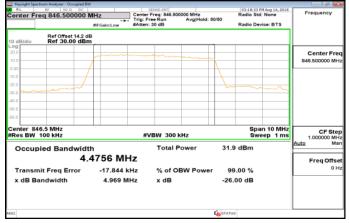
Keysight Spect	trum Analyzer - Occupied BW		SENSE:IN			02.24.12	PM Aug 16, 2018	
	eq 847.500000 N	MHz	Center Freq: 8	47.500000 MHz		Radio St	d: None	Frequency
		#FGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hol	d: 50/50	Radio De	vice: BTS	
) dB/div	Ref Offset 14.2 dE Ref 30.00 dBm							
10		-				_		Center Fre
		(Trans	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		m -	_		847.500000 MH
		/				_		
.0								
						m	m	
.0								
.0								
nter 84	7.5 MHz					S	oan 6 MHz	
es BW			#VBW	180 kHz			1.533 ms	CF Ste 600.000 ki
Occup	ied Bandwidt	h	Total Power 3			.5 dBm	Auto Ma	
		6975 MH	Iz					Freq Offs
Transm	nit Freg Error	-8.871 k	Hz % d	of OBW Pov	ver 9	99.00 %		0
	andwidth	2.968 M				6.00 dB		
		2.000 m		-	-2.			
					1 STAT			
					NO DIAL			

#### Band5\_5MHz\_QPSK\_25\_0\_LowCH20425-826.5



#### Band5\_5MHz\_QPSK\_25\_0\_MidCH20525-836.5 03:16:42 PM Aug nter Freq 836.500 Radio Device: BTS Ref Offset 14.2 dB Ref 30.00 dBm Center Fre 36.500000 MH er 836.5 MHz BW 100 kHz Span 10 MH Sweep 1 m CF Step 1.000000 MH #VBW 300 kHz Occupied Bandwidth Total Power 31.6 dBm 4.4986 MHz Freq Offs Transmit Freg Error -13.851 kHz % of OBW Power 99.00 % x dB Bandwidth 4.991 MHz -26.00 dB x dB

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



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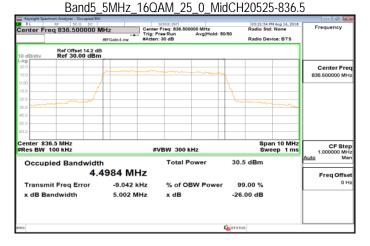
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# Report No.: ER/2018/80112 Page 59 of 158

#### Band5\_5MHz\_16QAM\_25\_0\_LowCH20425-826.5

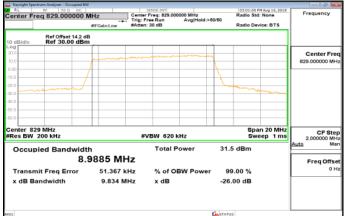
Keysight Spectro	um Analyzer - Occupied BW								
	g 826.500000 M	Hz	Center Fr	req: 826.500			Radio S	0 PM Aug 16, 2018 itd: None	Frequency
		#IFGain:Low	#Atten: 3	e Run 0 dB	Avg Hold:	50/50	Radio D	evice: BTS	
10 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm								
20.0									Center Freq
10.0							-		826.500000 MHz
0.00						1			
20.0	1								
30.0	m								
40.0						_	_		
60.0						-	-	_	
60.0						-			
Center 826 #Res BW 1			#VE	300 k	Hz			oan 10 MHz weep 1 ms	
Occupi	ed Bandwidth	1		Total P	ower	30.	.5 dBm		Auto Mar
	4.5	5047 M⊦	lz						Freq Offse
Transmi	t Freq Error	17.304 k	Hz	% of OE	W Powe	r 9	9.00 %		0 H
x dB Bar	ndwidth	5.031 M	Hz	x dB		-26	5.00 dB		
									1
193						<b>Co</b> STAT	us		

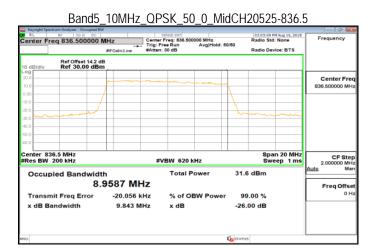


# Band5\_5MHz\_16QAM\_25\_0\_HighCH20625-846.5

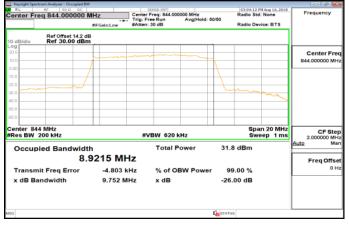
Keysight Spectr	rum Analyzer - Occupied BW							
	g 846.500000 N	IHz		846.500000 MH		Radio St	PM Aug 16, 2018 d: None	Frequency
		#IFGain:Low	Trig: Free Ru #Atten: 30 dB		lold: 50/50	Radio De	vice: BTS	
dB/div	Ref Offset 14.2 dB Ref 30.00 dBm							
9 <b>9</b>								Center Fre
				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		_		846.500000 MH
	/					_		
0	/							
.0							-	
							m	
						_		
0						_		
.0								
enter 846 tes BW 1			#VBW	300 kHz			an 10 MHz /eep 1 ms	CF Ste 1.000000 MH
Occupi	ied Bandwidth	ı	то	tal Power	3	0.8 dBm		Auto Ma
	4.4	1688 MH	z					Freq Offs
Transmi	it Freg Error	-15.978 k	Hz %	of OBW Po	wer	99.00 %		01
	ndwidth	4.962 M	Hz v	dB	-	26.00 dB		
		1002			-			
5					<b>L</b> ast	ATUS		

#### Band5\_10MHz\_QPSK\_50\_0\_LowCH20450-829





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



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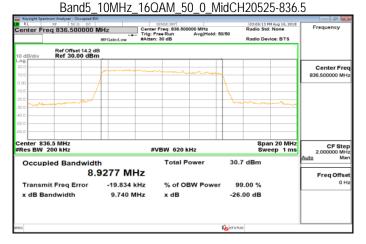
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# Report No.: ER/2018/80112 Page 60 of 158

# Band5 10MHz 16QAM 50 0 LowCH20450-829

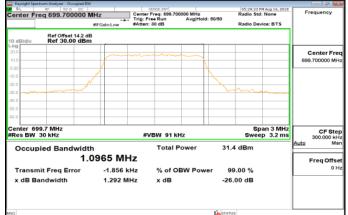
	trum Analyzer - Occupied BW								
RL	U 50 Ω DC		Center Fre				03:05:22 PM Au Radio Std: No	g 16, 2018	Frequency
Senter Fre	eq 829.000000 N	/HZ	Trig: Free I	Run	Avg Hold:>6	50/50	Raulo atu, Re	ALL C.	
		#FGain:Low	#Atten: 30	dB			Radio Device	BTS	
10 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm								
20.0						1			
10.0		man		m	and the second				Center Fre 829.000000 MH
		1				N.			829.000000 MH
0.00		/				N			
-10.0						1			
-20.0	mannet					100	- marine		
-30.0						-	and the second second	mon	
40.0						-			
-60.0						-			
-60.0						-			
Center 82			#VBI	V 620 kł	47			0 MHz	CF Ste
									2.000000 MH Auto Ma
Occup	ied Bandwidt	h		Total Po	ower	30.5	5 dBm		
	8.9	9407 MI	Ηz						Freq Offse
Transm	it Freq Error	57.049 k	(Hz 9	% of OB	W Power	99	9.00 %		0 H
x dB Ba	ndwidth	9.744 N	Hz :	k dB		-26.	00 dB		
190						<b>STATU</b>	5		

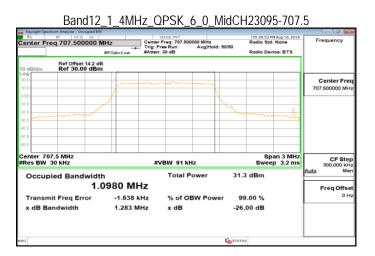


# Band5\_10MHz\_16QAM\_50\_0\_HighCH20600-844

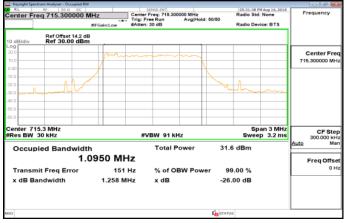
RL   IV   S0 O   DC     enter Freq 844.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.00000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.0000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.000000   644.0000000   644.0000000   644.0000000   644.0000000   644.00000000   644.000000000   644.00000		sense:int ter Freg: 844.000000 MHz	03:07:11 PM Aug 16, 3	2018 Frequency
enter Freq 844.0000	Trig	: Free Run Avg Hold: 50 en: 30 dB		
Ref Offset 14.3 dB/div Ref 30.00 d				
9				Center Fre
0				844.000000 Mi
0				
0	/			
m	/		hours	
0				~
0				
0				
nter 844 MHz es BW 200 kHz		#VBW 620 kHz	Span 20 M Sweep 1	IHz CF Ste ms 2.000000 M
Occupied Bandwidth		Total Power	30.5 dBm	Auto Ma
1	B.8777 MHz			Freq Offs
Transmit Freg Error	-3.447 kHz	% of OBW Power	99.00 %	01
x dB Bandwidth	9.710 MHz	x dB	-26.00 dB	
			STATUS	

#### Band12\_1\_4MHz\_QPSK\_6\_0\_LowCH23017-699.7





# Band12 1 4MHz QPSK 6 0 HighCH23173-715.3



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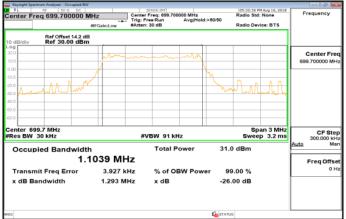
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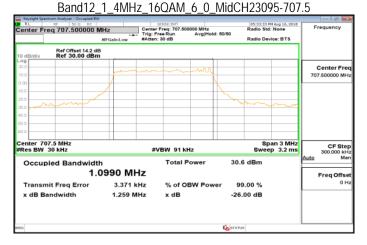
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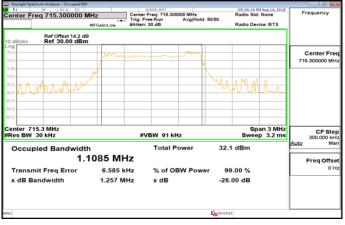
# Report No.: ER/2018/80112 Page 61 of 158

# Band12\_1\_4MHz\_16QAM\_6\_0\_LowCH23017-699.7



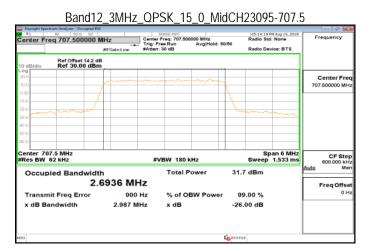


# Band12\_1\_4MHz\_16QAM\_6\_0\_HighCH23173-715.3

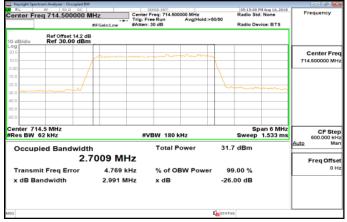


#### 05:13:14 PM Aug 16 Radio Std: None enter Freq 700.500000 MHz Center Freq: 700 Trig: Free Run 00 MHz Avg|Hold:>50/50 Frequency Radio Device: BTS Ref Offset 14.2 dB Ref 30.00 dBm Center Fre 00.500000 MH 700.5 MHz W 62 kHz Span 6 MH CF Step #VBW 180 kHz Occupied Bandwidth Total Power 31.6 dBm 2.7002 MHz Freq Offs Transmit Freg Error -110 Hz % of OBW Power 99.00 % x dB Bandwidth 2.981 MHz -26.00 dB x dB

Band12\_3MHz\_QPSK\_15\_0\_LowCH23025-700.5



# Band12 3MHz QPSK 15 0 HighCH23165-714.5



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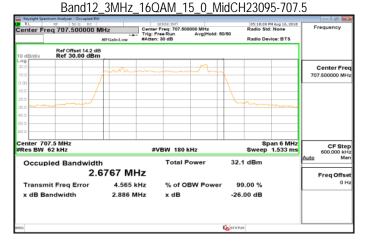
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# Report No.: ER/2018/80112 Page 62 of 158

## Band12\_3MHz\_16QAM\_15\_0\_LowCH23025-700.5

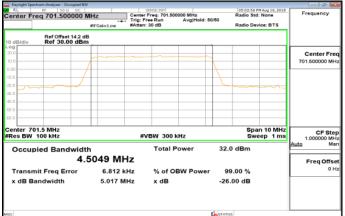
RL	trum Analyzer - Occupied BW 10 50 Ω DC Eq 700.500000 N	Il In Capita	SENSE:INT		13 PM Aug 16, 2018 Std: None	Frequency
senter Fre	eq 700.500000 W	Trig:	Free Run Avg Hold: 1	50/50	Device: BTS	
		mFGain:Low #Atte	n. 30 ub	Raulo	Device. B13	
10 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm					
og	Ref 00.00 dBm					
20.0		m		~		Center Free
10.0						700.500000 MH
10.0	/					
20.0						
10.0	man			h		
40.0						
0.0				-		
60.0						
Center 70	0.5 MHz				Span 6 MHz	
Res BW		#	VBW 180 kHz		p 1.533 ms	CF Stej 600.000 kH
0			Total Power	31.1 dBm		Auto Ma
Occup	ied Bandwidth		rotal Power	31.1 dBm		
	2.1	7018 MHz				Freq Offse
Transm	it Freq Error	3.588 kHz	% of OBW Power	r 99.00 %		0 H
x dB Ba	ndwidth	3.003 MHz	x dB	-26.00 dB		
so				STATUS		

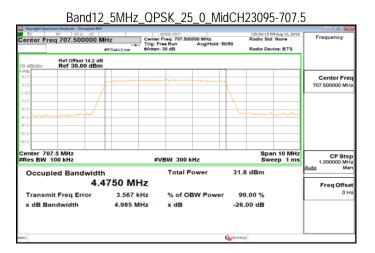


# Band12 3MHz 16QAM 15 0 HighCH23165-714.5

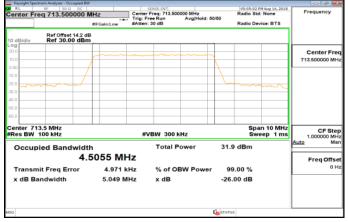
RL RL	trum Analyzer - Occupied BW IU 50 Ω DC		SENSE					PM Aug 16, 2018	
enter Fre	eq 714.500000 M	Center Freq Trig: Free R	714.5000	Avg Hold:	50/60	Radio Sto	I: None	Frequency	
		#IFGain:Low	#Atten: 30 d		Avginoid.	~~~~	Radio De	vice: BTS	
0 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm								
20 0.0									Center Fre
			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			1			714.500000 MH
	/					A.			
.0	- /						-		
.0						$+ \lambda$			
						-			
.0						-			
.0						-			
1.0						-	-		
enter 71 Res BW			#VBW	180 ki	Hz			an 6 MHz 1.533 ms	CF Ste 600.000 kH
Occupied Bandwidth		1	Total Power			30	30.6 dBm		Auto Ma
	2.7	′037 M⊦	Iz						Freq Offs
Transm	it Freq Error	9.174 k	Hz %	of OB	W Powe	r 9	9.00 %		01
x dB Ba	ndwidth	2.998 M	Hz x	dB		-26	5.00 dB		
5						5 STAT	us		

#### Band12\_5MHz\_QPSK\_25\_0\_LowCH23035-701.5





# Band12 5MHz QPSK 25 0 HighCH23155-713.5



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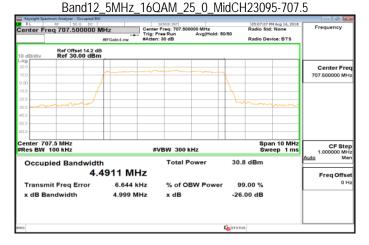
4	灣檢驗科技服	19份有限	公司
	19124241124	CM 73 10	CA -1



# Report No.: ER/2018/80112 Page 63 of 158

# Band12\_5MHz\_16QAM\_25\_0\_LowCH23035-701.5

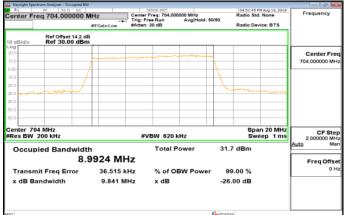
	rum Analyzer - Occupied BW				- 2 -
RL Center Fre	Q 701.500000 M		Freq: 701,500000 MHz	05:06:12 PM Aug 16, Radio Std: None	Frequency
o orikor 110	•	Trig:	Free Run Avg Hold: n: 30 dB	50/50 Radio Device: BT	.
		ir Gain Low write			<u> </u>
10 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm				
20.0					
10.0				~	Center Free 701.500000 MH
1000	1				701.500000 MH
10.0	/				
30.0	m			mener	~
40.0					
10.0					
60.0					
Center 701 Res BW 1		*	VBW 300 kHz	Span 10 M Sweep 1	
Occupi	ed Bandwidth		Total Power	30.8 dBm	Auto Mar
	4.5	004 MHz			Freq Offse
Transmi	it Freq Error	8.917 kHz	% of OBW Powe	r 99.00 %	0 H
x dB Bar	ndwidth	5.030 MHz	x dB	-26.00 dB	
sa				STATUS	

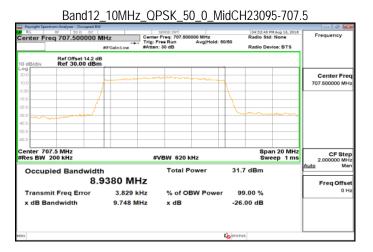


# Band12 5MHz 16QAM 25 0 HighCH23155-713.5

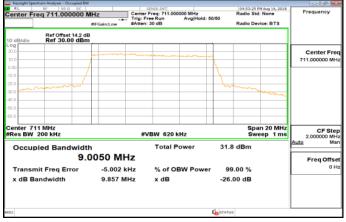
RL RL	trum Analyzer - Occupied BW	,	SEN	SECONT			05:07:54	PM Aug 16, 2018	- 2 2
enter Fre	eq 713.500000 M	ИНz	Center Fre	q: 713.500	000 MHz Avg Hold:	50/50	Radio St	d: None	Frequency
		#FGain:Low	#Atten: 30		Avginoid.	00/00	Radio D	evice: BTS	
) dB/div	Ref Offset 14.2 dl Ref 30.00 dBn								
10			-			_			Center Fre
.0							-		713.500000 MH
		/				X	-		
.0	- /					15			
0	mont					1	m	manun	
.0						-			
0						-			
0						-			
enter 71 tes BW			#VB	W 300 k	Hz			an 10 MHz /eep 1 ms	CF Ste 1.000000 MH
Occup	ied Bandwidt	h		Total Power 30			30.8 dBm		Auto Ma
	4.	5073 MH	Ιz						Freq Offs
Transmit Freg Error 11.320 kHz			Hz	% of OBW Power 99			9.00 %		01
x dB Ba	andwidth	5.022 M	Hz	x dB		-26	5.00 dB		
						<b>C</b> STAT	us		

#### Band12\_10MHz\_QPSK\_50\_0\_LowCH23060-704





# Band12 10MHz QPSK 50 0 HighCH23130-711



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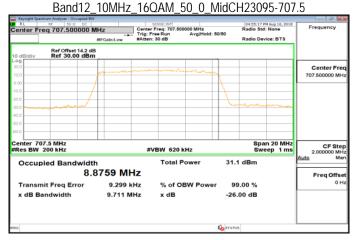
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# Report No.: ER/2018/80112 Page 64 of 158

### Band12 10MHz 16QAM 50 0 LowCH23060-704

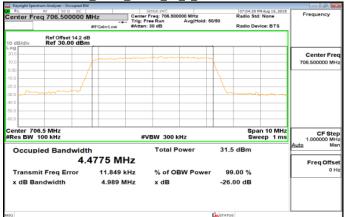
Keysight Spectrum Analyz									
Center Freq 704	50 Ω DC	lz	Center Fr	eq: 704.000			Radio S	PM Aug 16, 2018 td: None	Frequency
		FGain:Low	#Atten: 3		Avg Hold: 8	0/50	Radio D	evice: BTS	
10 dB/div Ref	)ffset 14.2 dB 30.00 dBm								
20.0					-un man				Center Freq
0.00									704.000000 MHz
-10.0	- /								
-20.0	ma					1	mm	monu	
-30.0									
-60.0						-			
-60.0						-	-		
Center 704 MHz #Res BW 200 kH	z		#VB	W 620 k	Hz			an 20 MHz veep 1 ms	
Occupied Ba	andwidth			Total P	ower	31.	0 dBm		<u>Auto</u> Man
	8.9	492 MH	lz						Freq Offset
Transmit Freq	Error	40.756 k	Hz	% of OE	BW Power	9	9.00 %		0 Hz
x dB Bandwid	lth	9.741 M	Hz	x dB		-26	.00 dB		
						-1			
MSG						<b>K</b> STAT	US		



# Band12 10MHz 16QAM 50 0 HighCH23130-711

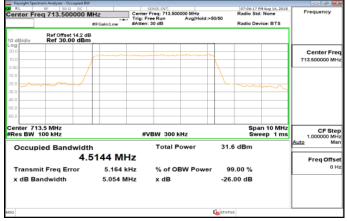
Keysight Spectrum Analyzer - Occupied BV RL BF 50.0 DC	/						
enter Freq 711.000000 I	Tr				:15 PM Aug 16, 2018 Std: None	Frequency	
Ref Offset 14.2 d	в	itten: 30 dB		Radio	Device: BTS		
dB/div Ref 30.00 dBn	n						
0						Center Fre	
0	1		- many			711.000000 Mi	
0	/						
				$\mathbf{X}$			
monum				mon	~ .		
					manne		
,							
nter 711 MHz es BW 200 kHz		#VBW 620	kHz		Span 20 MHz Sweep 1 ms	CF Ste 2.000000 MI	
Occupied Bandwidt	h	Total F	Power	30.8 dBn	1	Auto Ma	
	9513 MHz					Freq Offs	
Transmit Freg Error	-6.196 kHz	% of O	BW Power	99.00 %	6	0	
x dB Bandwidth	9.818 MHz	x dB		-26.00 dE	3		
				STATUS			
			4	O STATUS			

#### Band17\_5MHz\_QPSK\_25\_0\_LowCH23755-706.5



#### Band17\_5MHz\_QPSK\_25\_0\_MidCH23790-710 :05:20 PM Aug 1 nter Freq 710.00 Radio Device: BTS Ref Offset 14.2 dB Ref 30.00 dBm Center Fre 10.000000 MH er 710 MHz BW 100 kHz Span 10 MH Sweep 1 m CF Step 1.000000 MH #VBW 300 kHz Occupied Bandwidth Total Power 31.6 dBm 4.4912 MHz Freq Offs Transmit Freg Error -11.550 kHz % of OBW Power 99.00 % x dB Bandwidth 5.000 MHz -26.00 dB x dB

# Band17 5MHz QPSK 25 0 HighCH23825-713.5



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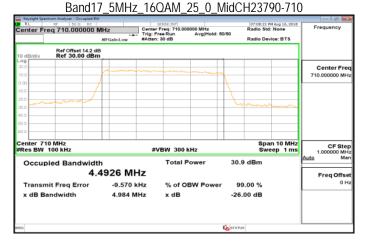
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# Report No.: ER/2018/80112 Page 65 of 158

## Band17\_5MHz\_16QAM\_25\_0\_LowCH23755-706.5

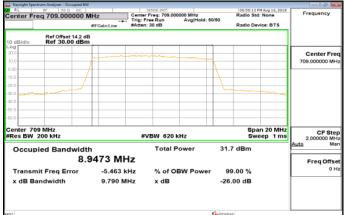
Keysight Spectrum Analyzer - Occupi		SENSE:INT	07:07:35 PM Aug 16, 2	
Center Freq 706.5000	00 MHz	Center Freq: 706,500000 MHz	Radio Std: None	Frequency
	#IFGain:Low	Trig: Free Run Avg Hold: #Atten: 30 dB	80/50 Radio Device: BTS	
Ref Offset 14				
20.0		A		Center Fre
10.0			~	706.500000 MH
1.00				_
0.0	/			-11
0.0			human	
0.0				~
0.0				
50.0				
enter 706.5 MHz Res BW 100 kHz		#VBW 300 kHz	Span 10 M Sweep 1 r	
Occupied Bandw	idth	Total Power	31.8 dBm	Auto Ma
	4.4721 MH	z		Freq Offse
Transmit Freq Erro	12.692 kł	Iz % of OBW Powe	er 99.00 %	0 H
x dB Bandwidth	4.820 MI	lz xdB	-26.00 dB	
o			STATUS	

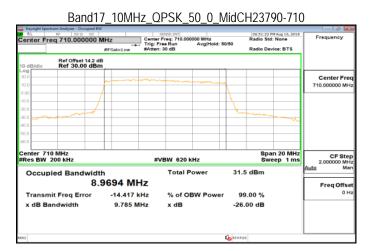


# Band17\_5MHz\_16QAM\_25\_0\_HighCH23825-713.5

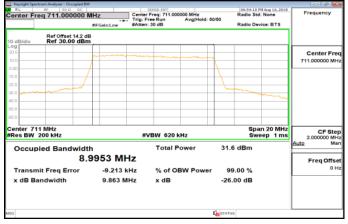
Keysight Spect	trum Analyzer - Occupied BW		SENSE:INT			7:09:06 PM Aug 16, 2018	
	eq 713.500000 M	IHz	dio Std: None	Frequency			
#FGain:Low			Trig: Free Run Atten: 30 dB	Avg Hold: 50	Ra	dio Device: BTS	
0 dB/div	Ref Offset 14.2 dB Ref 30.00 dBm						
200							Center Fre
							713.500000 MH
					1		-
.0							
0	man				have	min	
.0							
.0							
.0							
.0							
Center 713.5 MHz #Res BW 100 kHz #VBW 300 kHz						Span 10 MHz Sweep 1 ms	CF Ste 1.000000 MH
Occup	ied Bandwidth	1	Total	Power	30.9 di	3m	Auto Ma
	4.5	5170 MH	z				Freq Offs
Transm	it Freg Error	5.893 kH	z % of C	BW Power	99.00	%	0
	ndwidth	5.050 MH	z xdB		-26.00	dB	
5				l	STATUS		

#### Band17\_10MHz\_QPSK\_50\_0\_LowCH23780-709





# Band17 10MHz QPSK 50 0 HighCH23800-711



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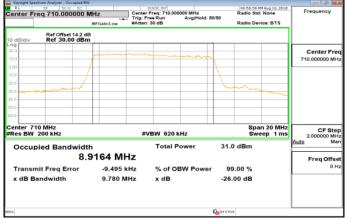
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## Band17\_10MHz\_16QAM\_50\_0\_LowCH23780-709

Keysight Spectrum Anal	yzer - Occupied BW				6:10 PM Aug 16, 2018	
Center Freq 709.000000 MHz			Center Freq: 709.000000 MHz Radio Std: Non			Frequency
			rig: Free Run Avg Hold Atten: 30 dB	I: 50/50 Radi	o Device: BTS	
	Offset 14.2 dB 30.00 dBm					
20.0						Center Free
0.0		man	and a star and a star and a star a start	- L		709.000000 MHz
	/					
0.0	/					
0.0						
0.0	man				man	
0.0						
0.0					_	
0.0					_	
enter 709 MHz Res BW 200 k			#VBW 620 kHz		Span 20 MHz Sweep 1 ms	CF Step 2.000000 MHz
Occupied E	Bandwidth		Total Power	31.1 dBr	n	Auto Mar
	8.8	942 MHz				Freq Offse
Transmit Fre	q Error	-4.337 kHz	% of OBW Pow	er 99.00	%	0 Ha
x dB Bandwi	dth	9.742 MHz	x dB	-26.00 d	в	
G				STATUS		



# Band17\_10MHz\_16QAM\_50\_0\_MidCH23790-710

#### Band17\_10MHz\_16QAM\_50\_0\_HighCH23800-711

RL RL	rum Analyzer - Occupied BW IU <sup>1</sup> 50 Ω DC			SE:INT				PM Aug 16, 2018	
enter Fre	q 711.000000 M	ИНz		eq: 711.000	Avg Hold: 5	0/60	Radio St	d: None	Frequency
		#IFGain:Low	#Atten: 3		Avginoid. a	0.00	Radio De	vice: BTS	
) dB/div	Ref Offset 14.2 di Ref 30.00 dBn								
1.0							_		Center Fre
.0		1			we have a second	<b>\</b>			711.000000 MH
						X			
0						1			
0	manna					1	m		
	- martin						- Ularla	- mark	
.0									
.0						-			
enter 711 tes BW 2			#VB	W 620 k	Span 20 MH kHz Sweep 1 m				
Occupi	ied Bandwidt	h		Total Power 30			30.8 dBm		
	8.	9577 MH	lz						Freq Offs
Transmit Freg Error -5.852 kH		Hz	% of OE	W Power	9	9.00 %		01	
x dB Ba	ndwidth	9.824 M	Hz	x dB		-26	.00 dB		
						20			
5						<b>K</b> STAT	35		

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# 9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

# 9.1. Standard Applicable

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

FCC §27.53(g)

Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC §27.53(h) (3)

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

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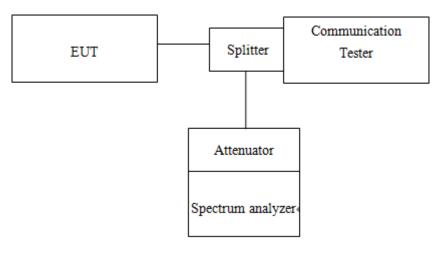


FCC §27.53(m) (4)

For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all freguencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Measurement procedure. Compliance with these rules is based on the use of measurement nstrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

# 9.2. Test SET-UP



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only

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# 9.3. Measurement Procedure **Conducted Emission**

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

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

# **Band Edge**

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

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUM- BER	LAST CAL.	CAL DUE.
EXA Spectrum Analyz- er	Agilent	N9010A	MY57120290	2018/02/14	2019/02/13
Radio Communication Analyer	Anritsu	MT8815B	6200711454	2018/04/05	2019/04/04
Radio Communication Analyer	Anritsu	MT8820C	6200995019	2018/04/05	2019/04/04
DC Power Supply	Anritsu	E3640A	MY52410006	2017/11/28	2018/11/27
Temperature Chamber	TERCHY	MHG-120LF	911009	2018/05/18	2019/05/17
Attenuator	Mini-Circuit	BW-S10W2+	2	2018/01/02	2019/01/01
DC Block	Mini-Circuits	BLK-18-S+	1	2018/01/02	2019/01/01
Splitter	RF-LAMBAD	RFLT2W1G18G	11-JSPF412-018	2018/01/02	2019/01/01
Coaxial Cable	Huber Suhner	SUCOFLEX 102EPA	MY2616/2	2018/01/02	2019/01/01

# 9.4. Measurement Equipment Used

# 9.5. Measurement Result:

Refer to next pages.

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

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