

FCC 2G, 3G REPORT

Certification

Applicant Name: SAMSUNG Electronics Co., Ltd.	Date of Issue: February 13, 2019 Location:
Address:	HCT CO., LTD.,
129, Samsung-ro, Yeongtong-gu,	74, Seoicheon-ro 578beon-gil, Majang-myeon,
Suwon-si, Gyeonggi-do, 16677, Rep. of Korea	Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
	Report No.: HCT-RF-1902-FC014-R2

FCC ID: A3LSMM105G

APPLICANT: SAMSUNG Electronics Co., Ltd.

According to the Evaluation report, all of the data contained herein is reused from the reference FCC ID : A3LSMM105F report. [Exceptions : Test was Fully perform for WCDMA850]

[Exceptions : rest na	
Model(s):	SM-M105G/DS
Additional Model:	SM-M105G
EUT Type:	Mobile Phone
FCC Classification:	Licensed Non-Broadcast Transmitter Held to Ear (TNE)

§22, §2

FCC Rule Part(s):

			Emission	ERP	
Mode	Tx Frequency (MHz)	Rx Frequency (MHz)	Designator	Max. Power (W)	Max. Power (dBm)
GSM850			238 KGXW	0.269	24.29
GSM850 EDGE	824.2 – 848.8	869.2 – 893.8	243 KG7W	0.083	19.17
WCDMA850	826.4 - 846.6	871.4 – 891.6	4M16F9W	0.027	14.30

The measurements shown in this report were made in accordance with the procedures specified in CFR47 section §2.947. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. **HCT CO., LTD.** Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Report prepared by : Jae Ryang Do Engineer of Telecommunication Testing Center Report approved by : Jong Seok Lee Manager of Telecommunication Testing Center

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.



<u>Version</u>

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1902-FC014	February 12, 2019	- First Approval Report
HCT-RF-1902-FC014-R1	February 13, 2019	- Revised on 14,15 page
HCT-RF-1902-FC014-R2	February 13, 2019	- Revised the worst case on page 13 -14.

Report No.: HCT-RF-1902-FC014-R2

CO.,LTD.



1. GENERAL INFORMATION
2. INTRODUCTION
2.1. DESCRIPTION OF EUT
2.2. MEASURING INSTRUMENT CALIBRATION5
2.3. TEST FACILITY
3. DESCRIPTION OF TESTS
3.1 TEST PROCEDURE
3.2 RADIATED POWER7
3.3 RADIATED SPURIOUS EMISSIONS8
3.4 OCCUPIED BANDWIDTH9
3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL10
3.6 BAND EDGE
3.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE
3.8 WORST CASE(CONDUCTED TEST)13
3.9 WORST CASE(RADIATED TEST)14
4. LIST OF TEST EQUIPMENT
5. MEASUREMENT UNCERTAINTY16
6. SUMMARY OF TEST RESULTS
7. SAMPLE CALCULATION
8. TEST DATA
8.1 EFFECTIVE RADIATED POWER
8.2 RADIATED SPURIOUS EMISSIONS
8.3 OCCUPIED BANDWIDTH23
8.4 CONDUCTED SPURIOUS EMISSIONS
8.5 BAND EDGE
8.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE
9. TEST PLOTS
10. APPENDIX A TEST SETUP PHOTO

MEASUREMENT REPORT

1. GENERAL INFORMATION

Applicant Name:	SAMSUNG Electronics Co., Ltd.
Address:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
FCC ID:	A3LSMM105G
Application Type:	Certification
FCC Classification:	Licensed Non-Broadcast Transmitter Held to Ear (TNE)
FCC Rule Part(s):	§22, §2
EUT Type:	Mobile Phone
Model(s):	SM-M105G/DS
Additional Model:	SM-M105G
Tx Frequency:	824.20 - 848.80 MHz (GSM850) 826.40 - 846.60 MHz (WCDMA850)
Rx Frequency:	869.20 - 893.80 MHz (GSM850) 871.40 - 891.60 MHz (WCDMA850)
Date(s) of Tests:	December 10, 2018 ~ December 17, 2018 WCDMA B5 : January 29, 2019 ~ February 08, 2019



2. INTRODUCTION

2.1. DESCRIPTION OF EUT

The EUT was a Mobile Phone with GSM/GPRS/EGPRS/UMTS and LTE. It also supports IEEE 802.11b/g/n (HT20), Bluetooth.

2.2. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

2.3. TEST FACILITY

The Fully-anechoic chamber and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.

3. DESCRIPTION OF TESTS

3.1 TEST PROCEDURE

Test Description	Test Procedure Used
Occupied Bandwidth	- KDB 971168 D01 v03r01 – Section 4.3 - ANSI C63.26-2015 – Section 5.4.4
Band Edge	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Spurious and Harmonic Emissions at Antenna Terminal	- KDB 971168 D01 v03r01 – Section 6.0 - ANSI C63.26-2015 – Section 5.7
Conducted Output Power	- N/A (See SAR Report)
Peak- to- Average Ratio	 - KDB 971168 D01 v03r01 – Section 5.7 - ANSI C63.26-2015 – Section 5.2.3.4 - ANSI C63.26-2015 – Section 5.2.6(only GSM)
Frequency stability	- ANSI C63.26-2015 – Section 5.6
Effective Radiated Power/ Effective Isotropic Radiated Power	- KDB 971168 D01 v03r01 – Section 5.2 & 5.8 - ANSI C63.26-2015 – Section 5.2 - ANSI/TIA-603-E-2016 – Section 2.2.17
Radiated Spurious and Harmonic Emissions	- KDB 971168 D01 v03r01 – Section 6.2 - ANSI/TIA-603-E-2016 – Section 2.2.12

3.2 RADIATED POWER

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

The equipment under test is placed on a non-conductive table 3-meters away from the receive antenna in accordance with ANSI/TIA-603-E-2016 Clause 2.2.17.

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power"

measurement capability for signals with continuous operation.

- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW \ge 3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points > 2 x span / RBW
- 6. Detector = RMS
- 7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with

continuous operation.

- 9. Trace mode = trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize

Test Note

- 1. The turntable is rotated through 360 degrees, and the receiving antenna scans in order to determine the level of the maximized emission.
- 2. A half wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator and the previously recorded signal was duplicated.

The power is calculated by the following formula;

 $P_{d(dBm)} = Pg_{(dBm)} - cable loss_{(dB)} + antenna gain_{(dB)}$

Where: P_d is the dipole equivalent power and P_g is the generator output power into the substitution antenna.

3. The maximum value is calculated by adding the forward power to the calibrated source plus its appropriate gain value.

These steps are repeated with the receiving antenna in both vertical and horizontal polarization. the difference between the gain of the horn and an isotropic antenna are taken into consideration

- 4. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- 5. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

3.3 RADIATED SPURIOUS EMISSIONS

Test Overview

Radiated tests are performed in the Fully-anechoic chamber.

Radiated Spurious Emission Measurements at 3 meters by Substitution Method according to ANSI/TIA-603-E-2016.

Test Settings

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW \ge 3 x RBW
- 3. Span = 1.5 times the OBW
- 4. No. of sweep points > 2 x span / RBW
- 5. Detector = Peak
- 6. Trace mode = Max Hold
- 7. The trace was allowed to stabilize
- 8. Test channel : Low/ Middle/ High
- 9. Frequency range : We are performed all frequency to 10th harmonics from 9 kHz.

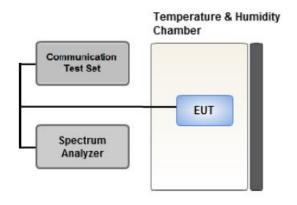
Test Note

- Measurements value show only up to 3 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
- 2. The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.

The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the test data



3.4 OCCUPIED BANDWIDTH.



Test setup

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

The EUT makes a call to the communication simulator.

The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

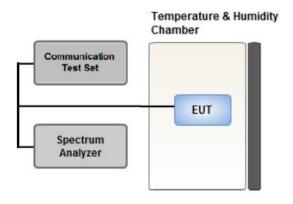
The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth

Test Settings

- 1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
- 2. RBW = 1 5% of the expected OBW
- 3. VBW \geq 3 x RBW
- 4. Detector = Peak
- 5. Trace mode = max hold
- 6. Sweep = auto couple
- 7. The trace was allowed to stabilize
- 8. If necessary, steps 2 7 were repeated after changing the RBW such that it would be within
 - 1-5% of the 99% occupied bandwidth observed in Step 7



3.5 SPURIOUS AND HARMONIC EMISSIONS AT ANTENNA TERMINAL



Test setup

Test Overview

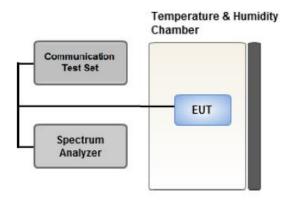
The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Settings

- 1. RBW = 1 MHz
- 2. VBW ≥ 3 MHz
- 3. Detector = Peak
- 4. Trace Mode = max hold
- 5. Sweep time = auto
- 6. Number of points in sweep ≥ 2 * Span / RBW



3.6 BAND EDGE



Test setup

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Settings

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW > 1% of the emission bandwidth
- 4. VBW > $3 \times RBW$
- 5. Detector = RMS
- 6. Number of sweep points $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = trace average
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

Test Notes

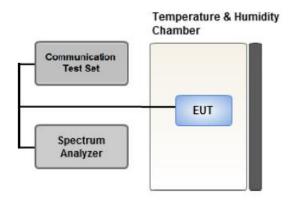
According to FCC 22.917, 24.238, 27.53 specified that power of any emission outside of The authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

All measurements were done at 2 channels(low and high operational frequency range.)

The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.



3.7 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE



Test setup

Test Overview

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26-2015. The frequency stability of the transmitter is measured by:

1. Temperature:

The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

- 2. Primary Supply Voltage:
 - Unless otherwise specified, vary primary supply voltage from 85% to 115% of the nominal value for other than hand carried battery equipment.
 - .- For hand carried, battery powered equipment, reduce the primary ac or dc supply voltage to the battery operating end point, which shall be specified by the manufacturer.

Test Settings

- The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.



3.8 WORST CASE(CONDUCTED TEST)

- All modes of operation were investigated and the worst case configuration results are reported.
- SM-M105G/DS & SM-M105G were tested and the worst case results are reported.

(Worst case : SM-M105G/DS)

Test Description	Modulation	Test Channel
Occupied Bandwidth	2G : Voice & EDGE(1 TX Slot) 3G : QPSK	Low, Mid, High
Occupied Bandwidth	2G : EDGE(1 TX Slot)	Low, Mid, High
Band Edge	2G : Voice & EDGE(1 TX Slot) 3G : QPSK	Low, High
Spurious and Harmonic Emissions at Antenna Terminal	2G : Voice 3G : QPSK	Low, Mid, High

[Worst case]

[Test Channel]

	UplinkChannel	
	2G 3G	
	(GSM 850)	(WCDMA B5)
Low	128	4132
Mid	190	4183
High	251	4233

3.9 WORST CASE(RADIATED TEST)

- The EUT was tested in three orthogonal planes(X, Y, Z) and in all possible test configurations and positioning.
- All modes of operation were investigated and the worst case configuration results are reported.
- The worst case is reported with the EUT positioning, modulations, and paging service configurations shown in the test data.
- Please refer to the table below.

[Worst case_3G]				
Test Description	Modulation	Paging Service	Axis	Test Channel
Effective Radiated Power	QPSK (WCDMA)	12.2 kbps RMC	WCDMA B5 : Y	Low, Mid, High
Radiated Spurious and Harmonic Emissions	QPSK (WCDMA)	12.2 kbps RMC	WCDMA B5 : Z	Low, Mid, High

~ ~ ~

,

[Worst case_2G]

Test Description	Mod	Axis	Test Channel
Effective Dedicted Dewer	Voice,	Y	Low, Mid, High
Effective Radiated Power	EDGE(1 TX Slot)	Y	High
Radiated Spurious and Harmonic Emissions	Voice	Z	Low, Mid, High

[Test Channel]

	UplinkChannel		
	2G 3G		
(GSM 850)		(WCDMA B5)	
Low	128	4132	
Mid	190	4183	
High	251	4233	

Note:

SM-M105G/DS & SM-M105G were tested and the worst case results are reported.

(Worst case : SM-M105G/DS)

4. LIST OF TEST EQUIPMENT

Manufacture	Model/ Equipment	Serial Number	Calibration Date	Calibration Interval	Calibration Due
REOHDE & SCHWARZ	SCU 18 / AMPLIFIER	10094	04/17/2018	Annual	04/17/2019
Wainwright	WHK1.2/15G-10EF/H.P.F	4	04/04/2018	Annual	04/04/2019
Wainwright	WHK3.3/18G-10EF/H.P.F	2	04/04/2018	Annual	04/04/2019
Hewlett Packard	11667B / Power Splitter(DC~26.5 GHz)	5001	06/07/2018	Annual	06/07/2019
Agilent	E3632A/DC Power Supply	KR75303243	05/09/2018	Annual	05/09/2019
Schwarzbeck	UHAP/ Dipole Antenna	557	03/31/2017	Biennial	03/31/2019
Schwarzbeck	UHAP/ Dipole Antenna	558	03/31/2017	Biennial	03/31/2019
ESPEC	SU-642 / Chamber	93000718	08/07/2018	Annual	08/07/2019
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	147	09/14/2018	Annual	09/14/2019
Schwarzbeck	BBHA 9120D/ Horn Antenna(1~18GHz)	9120D-1298	10/04/2018	Annual	10/04/2019
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170342	04/25/2017	Biennial	04/25/2019
Schwarzbeck	BBHA 9170/ Horn Antenna(15~40GHz)	BBHA9170124	04/25/2017	Biennial	04/25/2019
Agilent	N9020A/Signal Analyzer(10Hz~26.5GHz)	MY52090906	06/08/2018	Annual	06/08/2019
Hewlett Packard	8493C/ATTENUATOR(20dB)	17280	06/21/2018	Annual	06/21/2019
REOHDE & SCHWARZ	FSV40/Spectrum Analyzer(10Hz~40GHz)	100931	10/22/2018	Annual	10/22/2019
Agilent	8960 (E5515C)/ Base Station	MY48360800	09/27/2018	Annual	09/27/2019
Schwarzbeck	FMZB1513/ Loop Antenna(9kHz~30MHz)	1513-175	08/23/2018	Biennial	08/23/2020
Schwarzbeck	VULB9160/ Bilog Antenna	9160-3368	08/09/2018	Biennial	08/09/2020
Schwarzbeck	VULB9160/ Hybrid Antenna	760	04/06/2017	Biennial	04/06/2019
REOHDE & SCHWARZ	SMB100A/ SIGNAL GENERATOR (100kHz~40GHz)	177633	07/19/2018	Annual	07/19/2019
REOHDE & SCHWARZ	ESU40 / EMI TEST RECEIVER	100524	07/27/2018	Annual	07/27/2019
HCT CO., LTD.,	FCC LTE Mobile Conducted RF Automation Test Software	-	-	-	-

Note:

1. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

5. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.71

6. SUMMARY OF TEST RESULTS

6.1 Test Condition : Conducted Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Occupied Bandwidth	§2.1049	N/A	PASS
Band Edge / Spurious and Harmonic Emissions at Antenna Terminal.	§2.1051, §22.917(a)	< 43 + 10log10 (P[Watts]) at Band Edge and for all out-of-band emissions	PASS
Conducted Output Power	§2.1046	N/A	See Note1
Frequency stability / variation of ambient temperature	§2.1055, § 22.355	< 2.5 ppm	PASS

Note:

1. See SAR Report

6.2 Test Condition : Radiated Test

Test Description	FCC Part Section(s)	Test Limit	Test Result
Effective Radiated Power	§22.913(a)(5)	< 7 Watts max. ERP	PASS
Radiated Spurious and Harmonic	§2.1053,	< 43 + 10log10 (P[Watts]) for	PASS
Emissions	§22.917(a)	all out-of band emissions	LY22

7. SAMPLE CALCULATION

7.1 ERP Sample Calculation

Ch	./ Freq.	Measured	Substitute	Ant. Gain	C.L	Pol.	EF	RP
channel	Freq.(MHz)	Level(dBm)	Level(dBm)	(dBd)	U.L	FOI.	w	dBm
128	824.20	-21.37	38.40	-10.61	0.95	Н	0.483	26.84

ERP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

- 1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
- 2) During the test , the turn table is rotated until the maximum signal is found.
- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of effective radiated power.

7.2 EIRP Sample Calculation

Ch	./ Freq.	Measured	Substitute	Ant. Gain	C.L	Pol.	EII	RP
channel	Freq.(MHz)	Level(dBm)	Level(dBm)	(dBi)	U.L	101.	w	dBm
20175	1,732.50	-15.75	18.45	9.90	1.76	Н	0.456	26.59

EIRP = Substitute LEVEL(dBm) + Ant. Gain – CL(Cable Loss)

- 1) The EUT mounted on a non-conductive turntable is 2.5 meter above test site ground level.
- 2) During the test , the turn table is rotated until the maximum signal is found.
- 3) Record the field strength meter's level.
- 4) Replace the EUT with dipole/Horn antenna that is connected to a calibrated signal generator.
- 5) Increase the signal generator output till the field strength meter's level is equal to the item (3).
- 6) The signal generator output level with Ant. Gain and cable loss are the rating of equivalent isotropic radiated power.

GSM Emission Designator

Emission Designator = 249KGXW GSM BW = 249 kHz G = Phase Modulation X = Cases not otherwise covered W = Combination (Audio/Data)

EDGE Emission Designator

Emission Designator = 249KG7W GSM BW = 249 kHz G = Phase Modulation 7 = Quantized/Digital Info W = Combination (Audio/Data)

WCDMA Emission Designator

Emission Designator = 4M17F9W WCDMA BW = 4.17 MHz F = Frequency Modulation 9 = Composite Digital Info W = Combination (Audio/Data)

QPSK Modulation

Emission Designator = 4M48G7D LTE BW = 4.48 MHz G = Phase Modulation 7 = Quantized/Digital Info D = Data transmission; telemetry; telecommand

<u>16QAM Modulation</u> Emission Designator = 4M48W7D LTE BW = 4.48 MHz W = Amplitude/Angle Modulated 7 = Quantized/Digital Info D = Data transmission; telemetry; telecommand



8. TEST DATA

8.1 EFFECTIVE RADIATED POWER

	Ch	/ Freq.	Measured	Substitute	Ant. Gain			Limit	ERP	
Mode	lode Level LEVEL (dBd) C.I channel Freq.(MHz) (dBm) (dBm) (dBd) C.I	C.L	Pol.	W	w	dBm				
	128	824.2	-28.90	32.38	-10.27	0.86	V		0.133	21.25
GSM850	190	836.6	-26.94	35.36	-10.21	0.87	V	. 7.00	0.268	24.28
	251	848.8	-27.15	35.32	-10.16	0.87	V	< 7.00	0.269	24.29
EDGE	251	848.8	-32.27	30.20	-10.16	0.87	V	-	0.083	19.17

Mode	Ch./ Freq.		Measured	Substitute	Ant. Gain		Limit		ERP	
	channel	Freq.(MHz)	Level (dBm)	LEVEL (dBm)	(dBd)	C.L	Pol.	W	W	dBm
	4132	826.4	-37.27	24.14	-10.26	0.86	Н		0.020	13.02
WCDMA850	4183	836.6	-37.40	24.90	-10.21	0.87	Н	< 7.00	0.024	13.82
	4233	846.6	-37.00	25.34	-10.17	0.87	Н		0.027	14.30



Report No.: HCT-RF-1902-FC014-R2

8.2 RADIATED SPURIOUS EMISSIONS

MEASURED OUTPUT POWER:	24.29 dBm = 0.269 W

MODULATION SIGNAL: <u>GSM850</u>

DISTANCE:

3 meters

LIMIT: 43 + 10 log10 (W) =

|--|

Ch.	Freq.(MHz)	<u>Measured</u> <u>Level</u> [dBm]	Ant. Gain (dBd)	<u>Substitute</u> Level [dBm]	C.L	Pol.	Result (dBm)	dBc
	1,648.40	-47.10	7.46	-55.99	1.27	Н	-51.95	76.24
128 (824.2)	2,472.60	-40.29	8.64	-46.23	1.58	Н	-41.32	65.62
	3,296.80	-56.96	10.25	-62.95	1.86	V	-56.71	81.01
	1,673.20	-46.72	7.53	-55.71	1.28	V	-51.61	75.90
190 (836.6)	2,509.80	-36.08	8.83	-42.40	1.62	V	-37.34	61.63
	3,346.40	-56.42	10.51	-62.74	1.91	V	-56.29	80.58
	1,697.60	-50.55	7.74	-59.55	1.29	V	-55.25	79.54
251 (848.8)	2,546.40	-34.21	8.86	-40.24	1.62	V	-35.15	59.44
	3,395.20	-57.24	10.57	-63.38	1.95	Н	-56.91	81.20
	4,244.00	-51.88	10.80	-55.69	2.20	Н	-49.24	73.53



■ MEASURED OUTPUT POWER: <u>14.30 dBm = 0.027 W</u>

MODULATION SIGNAL: WCDMA850

DISTANCE:

<u>3 meters</u>

■ LIMIT: 43 + 10 log10 (W) =

<u>27.30 dBc</u>

Ch.	Freq.(MHz)	<u>Measured</u> <u>Level</u> [dBm]	Ant. Gain (dBd)	<u>Substitute</u> Level [dBm]	C.L	Pol.	Result (dBm)	dBc
	1,652.80	-57.70	7.46	-66.59	1.27	н	-62.55	76.85
4132 (826.4)	2,479.20	-58.41	8.71	-64.78	1.60	н	-59.82	74.12
	3,305.60	-56.55	10.32	-62.58	1.87	V	-56.28	70.58
	1,673.20	-56.66	7.53	-65.65	1.28	V	-61.55	75.84
4183 (836.6)	2,509.80	-58.27	8.83	-64.59	1.62	н	-59.53	73.83
	3,346.40	-55.46	10.51	-61.78	1.91	Н	-55.33	69.63
	1,693.20	-58.02	7.67	-67.05	1.28	V	-62.81	77.11
4233 (846.6)	2,539.80	-49.08	8.85	-54.86	1.61	V	-49.77	64.07
	3,386.40	-54.91	10.56	-61.19	1.93	Н	-54.71	69.01



8.3 OCCUPIED BANDWIDTH

Band	Channel	Frequency(MHz)	Data (GSM: kHz / WCDMA : MHz)
	128	824.2	237.91
GSM850	190	836.6	238.04
	251	848.8	237.29
GSM850 EDGE	128	824.2	242.58
	4132	826.4	4.1160
WCDMA850	4183	836.6	4.1289
	4233	846.6	4.1547

Note:

1. Plots of the EUT's Occupied Bandwidth are shown Page 28 ~ 34.



8.4 CONDUCTED SPURIOUS EMISSIONS

Band	Channel	Frequency of Maximum Harmonic (GHz)	Factor (dB)	Measurement Maximum Data (dBm)	Result	(dBm)
	128	1.6491	27.976	-56.91	-28.929	
GSM850	190	3.7204	27.976	-57.88	-29.905	
	251	2.3675	27.976	-57.38	-29.399	10.00
	4132	3.3032	27.976	-76.189	-48.213	-13.00
WCDMA850	4183	3.3435	27.976	-76.371	-48.395	
	4233	3.3839	27.976	-76.797	-48.821	

Note:

1. Plots of the EUT's Conducted Spurious Emissions are shown Page 51 ~ 56.

2. Result (dBm) = Measurement Maximum Data (dBm) + Factor (dB)

3. Factor(dB) = Cable Loss + Attenuator + Power Splitter

Frequency Range (GHz)	Factor [dB]
0.03 – 1	25.270
1 – 5	27.976
5 – 10	28.591
10 – 15	29.116
15 – 20	29.489
Above 20	30.131

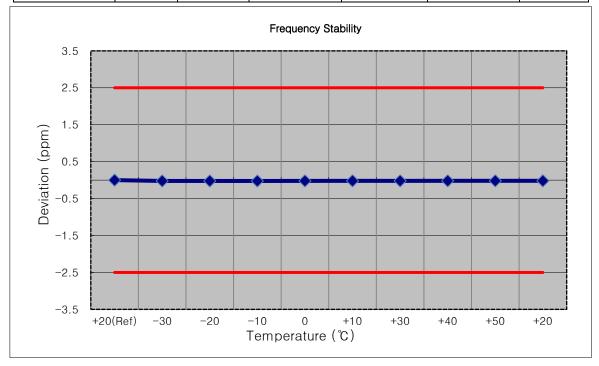
8.5 BAND EDGE

- Plots of the EUT's Band Edge are shown Page 35 ~ 50.

8.6 FREQUENCY STABILITY / VARIATION OF AMBIENT TEMPERATURE

MODE:	<u>GSM850</u>
OPERATING FREQUENCY:	<u>836,600,000 Hz</u>
CHANNEL:	<u>190</u>
REFERENCE VOLTAGE:	<u>3.85 VDC</u>
DEVIATION LIMIT:	<u>± 0.000 25 % or 2.5 ppm</u>

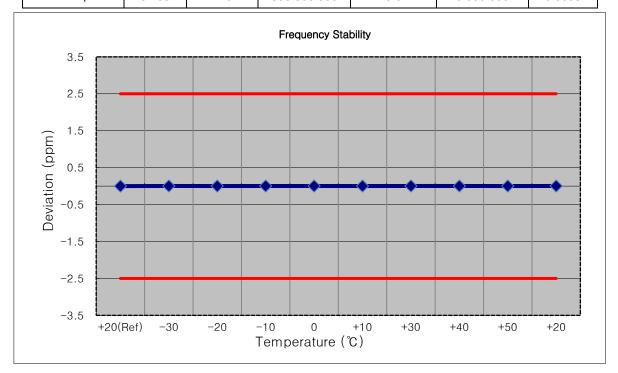
Voltage	Power	Temp.	Frequency	Frequency	Deviation	
(%)	(VDC)	(°°)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	836 599 982	0.0	0.000 000	0.0000
100%		-30	836 599 963	-18.7	-0.000 002	-0.0223
100%		-20	836 599 963	-18.6	-0.000 002	-0.0222
100%		-10	836 599 962	-19.1	-0.000 002	-0.0228
100%	3.850	0	836 599 964	-17.5	-0.000 002	-0.0210
100%		+10	836 599 965	-16.5	-0.000 002	-0.0197
100%		+30	836 599 965	-17.0	-0.000 002	-0.0203
100%		+40	836 599 966	-15.9	-0.000 002	-0.0190
100%		+50	836 599 966	-15.8	-0.000 002	-0.0189
Batt. Endpoint	3.600	+20	836 599 966	-15.6	-0.000 002	-0.0186





Mode:	WCDMA850
OPERATING FREQUENCY:	<u>836,600,000 Hz</u>
CHANNEL:	<u>4183</u>
REFERENCE VOLTAGE:	<u>3.85 VDC</u>
DEVIATION LIMIT:	<u>± 0.000 25 % or 2.5 ppm</u>

Voltage	Power	Temp.	Frequency	Frequency	Deviation	
(%)	(VDC)	(°C)	(Hz)	Error (Hz)	(%)	ppm
100%		+20(Ref)	836 600 003	0.0	0.000 000	0.0000
100%	3.850	-30	836 600 006	3.1	0.000 000	0.0037
100%		-20	836 600 004	1.6	0.000 000	0.0019
100%		-10	836 600 005	2.6	0.000 000	0.0031
100%		0	836 600 005	2.1	0.000 000	0.0025
100%		+10	836 600 004	1.6	0.000 000	0.0019
100%		+30	836 600 005	2.8	0.000 000	0.0033
100%		+40	836 600 006	3.0	0.000 000	0.0036
100%]	+50	836 600 005	2.0	0.000 000	0.0024
Batt. Endpoint	3.400	+20	836 600 006	3.0	0.000 000	0.0035



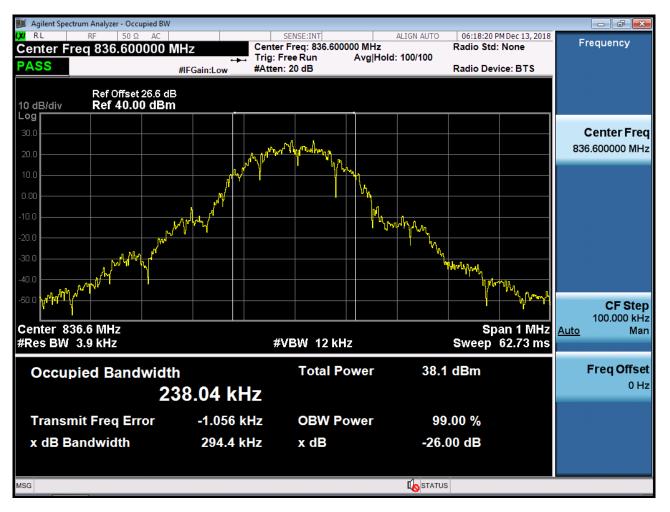


9. TEST PLOTS

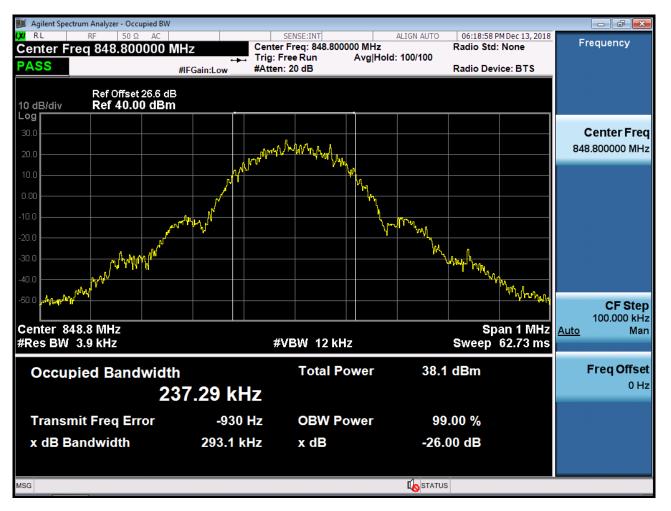


Agilent Spectrum Analyzer - Occu							
KL RF 50 Ω Center Freq 824.200		SENSE:INT		ALIGN AUTO	06:16:31 P Radio Std:	M Dec 13, 2018	Frequency
PASS	-+-	Takes Frank Dave	Avg Hold	: 100/100			
	#IFGain:Low	#Atten: 20 dB			Radio Dev	ICE: BIS	
Ref Offset 10 dB/div Ref 40.0							
Log 30.0							Center Free
		Mar and war also a					824.200000 MH
20.0		Mr. M.	1				
10.0			TW .				
0.00							
-10.0	and the of		<u> </u>	LAN 10			
-20.0	Jan Yr		<u></u>	ar · Mary			
-30.0	, M			Y.			
-40.0	¥				NI MANNER		
1					1 · · · V _{by}	Whink of	
-50.0							CF Step
Center 824.2 MHz					Sp	an 1 MHz	100.000 kH Auto Mar
#Res BW 3.9 kHz		#VBW 12 ki	lz			62.73 ms	
Occupied Band	width	Total P	ower	38.2	dBm		Freq Offse
	237.91 kH	lz					0 H:
Transmit Freq Err	ror -221	Hz OBW P	ower	99	.00 %		
x dB Bandwidth	296.7 k	Hz x dB		-26 ()0 dB		
	200.7 K			2010			
				r or			
MSG							

■ GSM850 MODE (128 CH.) Occupied Bandwidth



■ GSM850 MODE (190 CH.) Occupied Bandwidth



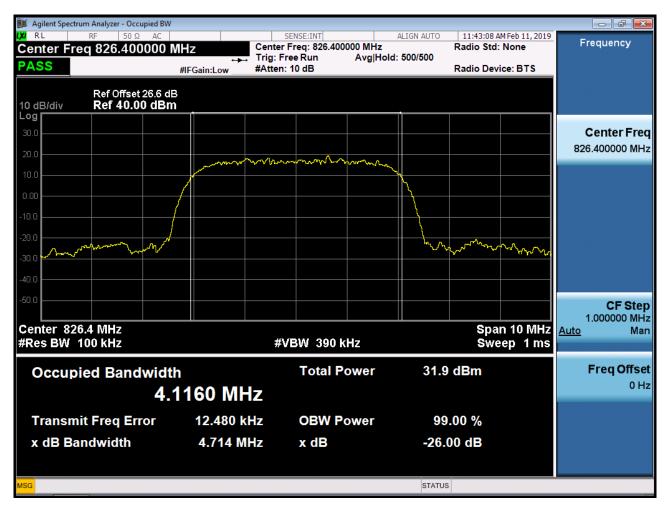
■ GSM850 MODE (251 CH.) Occupied Bandwidth





■ GSM850 EDGE (128 CH.) Occupied Bandwidth





■ WCDMA850 MODE (4132 CH.) Occupied Bandwidth



🎉 Agilent Spectrum A	Analyzer - Occupied BW									- 6 💌
	F 50 Ω AC 836.600000			NSE:INT reg: 836.600		ALIGN AUTO	11:44:11 A Radio Std:	M Feb 11, 2019	Fred	quency
PASS	030.000000 N	+	, Trig: Fre	e Run	Avg Hold:	500/500				
PASS		#IFGain:Low	#Atten: 1	0 dB			Radio Dev	ice: BTS		
10 dB/div	Ref Offset 26.6 dE Ref 40.00 dBm									
Log 30.0									6	enter Freg
										00000 MHz
20.0			-	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www.				000.0	00000 11112
10.0		n n n n n n n n n n n n n n n n n n n			<u></u>					
0.00										
-10.0		[
-20.0						<u>کر</u>	* ~~~ A	N - -		
-30.0	han when the					~~~	Y W	mon		
-40.0										
-50.0										CF Step
Center 836.6	MH2						Sna	n 10 MHz	1.0	00000 MHz Man
#Res BW 100			#VE	3W 390 k	Hz			ep 1 ms	Auto	wan
Occupied	d Bandwidt	h		Total P	ower	31.8	dBm		Fr	req Offset
	4.1289 MHz						0 Hz			
Transmit I	Freq Error	15.977	kHz	OBW P	ower	99	.00 %			
x dB Band		4.723 N		x dB		-26 (00 dB			
				X UD		-201				
MSG						STATUS				

■ WCDMA850 MODE (4183 CH.) Occupied Bandwidth



🎉 Agilent Spectre	um Analyzer - Occupied BW								×
LXI RL	RF 50 Ω AC		SENSE:INT		ALIGN AUTO	11:44:47 A Radio Std:	M Feb 11, 2019	Frequency	
	eq 846.600000 N	lifiz	Trig: Free Run	Avg Hold	: 500/500	Raulo Stu.	None		
PASS		#IFGain:Low	#Atten: 10 dB			Radio Devi	ice: BTS		
	Ref Offset 26.6 dB								
10 dB/div	Ref 40.00 dBm								
Log									
30.0								Center Fr	· · I
20.0			La Jan Jan Jan Jan Jan	ω. Λ				846.600000 M	Hz
10.0				a the second	\				
0.00		1			N.				
0.00	(
-10.0	/								
-20.0	NON and in the					matrin			
-20.0					` ` ∽∽	and generation of the second	- www.		
-40.0									
-50.0								CF Ste	en
								1.000000 M	
Center 840							n 10 MHz	<u>Auto</u> M	lan
#Res BW	100 KHZ		#VBW 390	KHZ		Swe	ep 1 ms		
Occup	ied Bandwidth	•	Total I	Power	32.0	dBm		Freq Offs	set
Cecup									Hz
	4.1	1547 MH	Z						
Transm	it Freq Error	-2.172 kł	-Iz OBW F	Power	99	.00 %			
	ndwidth	4.734 MI			26.0				
	nawiaui	4.734 MI			-20.0)0 dB			
MSG					STATUS				
	-								_

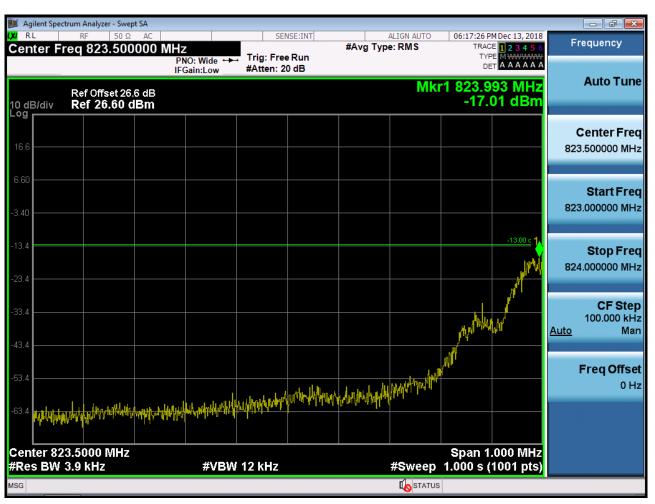
■ WCDMA850MODE (4233 CH.) Occupied Bandwidth





■ GSM850 MODE (128 CH.) Block Edge 1





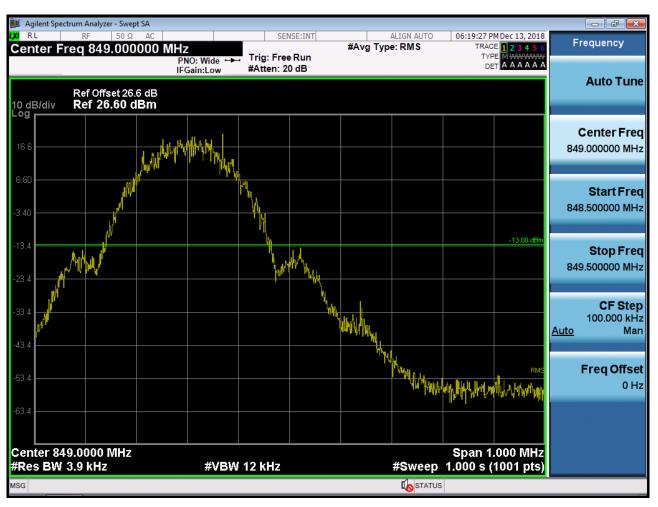
■ GSM850 MODE (128 CH.) Block Edge 2



RL	ctrum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT	ALIGN AUTO	06:17:54 PM Dec 13, 2018	
Center F	req 821.000000	MHz PNO: Wide ↔ IFGain:Low	⊢ Trig: Free Run #Atten: 20 dB	#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE M WWWW DET A A A A A A	Frequency
0 dB/div og	Ref Offset 26.6 dB Ref 10.00 dBm			Mk	1 823.000 MHz -52.05 dBm	Auto Tun
).00						Center Fre 821.000000 MH
0.0 					-13.00 dBm	Start Fre 819.000000 M⊦
).0 						Stop Fre 823.000000 MH
		ىرىمىرىغۇمىرىمىرىكىيە بىرىكىيە بىرىكىيە بىرىكىيە بىرىكىيە بىرىكىيە بىرىكىيە بىرىكىيە بىرىكىيە بىرىكىيە بىرىكىي	t, playerang any any the start of the start	nterg an effect from an interference of the	www.weyshiren.com	CF Ste 400.000 kł <u>Auto</u> Ma
.0						Freq Offs 0 I
enter 82	21.000 MHz				Span 4 000 MHz	
	100 kHz	#VBV	V 300 kHz	#Sweep	Span 4.000 MHz 1.000 s (1001 pts)	

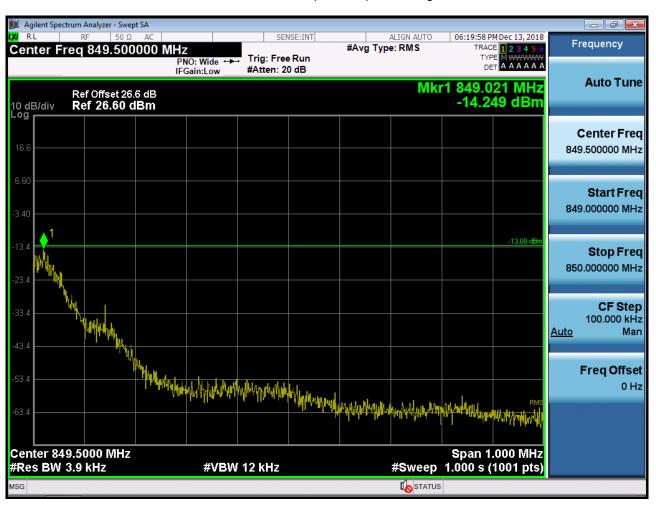
■ GSM850 MODE (128 CH.) Block Edge 3





■ GSM850 MODE (251 CH.) Block Edge 1





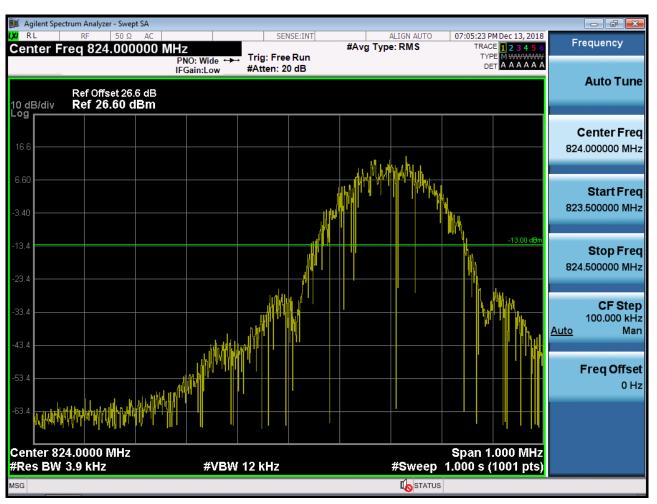
■ GSM850 MODE (251 CH.) Block Edge 2



📜 Agilent Spec	ctrum Analyzer - Swept SA RF 50 Ω AC		CENCEANT		00-20-20 PMD - 12 2010	
	RF 50 Ω AC req 852.000000	OMHz PNO: Wide ↔ IFGain:Low	, Trig: Free Run #Atten: 20 dB	ALIGN AUTO #Avg Type: RMS	06:20:28 PMDec 13, 2018 TRACE 1 2 3 4 5 6 TYPE MWWWW DET A A A A A A	Frequency
10 dB/div Log	Ref Offset 26.6 dB Ref 10.00 dBm			Mk	r1 850.004 MHz -51.981 dBm	Auto Tune
0.00						Center Freq 852.000000 MHz
-10.0					-13.00 dBm	Start Freq 850.000000 MHz
30.0 40.0 						Stop Fred 854.000000 MHz
50.0 1 50.0	erense and a complete and the angle	underforder and and standing and	an yafa yafa yafa ya kata ta	nterningensetensetensetensetensetensetensetens	RMS	CF Step 400.000 kHz <u>Auto</u> Mar
70.0						Freq Offset 0 Hz
	52.000 MHz				Span 4.000 MHz 1.000 s (1001 pts)	
#Res BW	100 kHz	#VBW	/ 300 kHz	#Sweep		

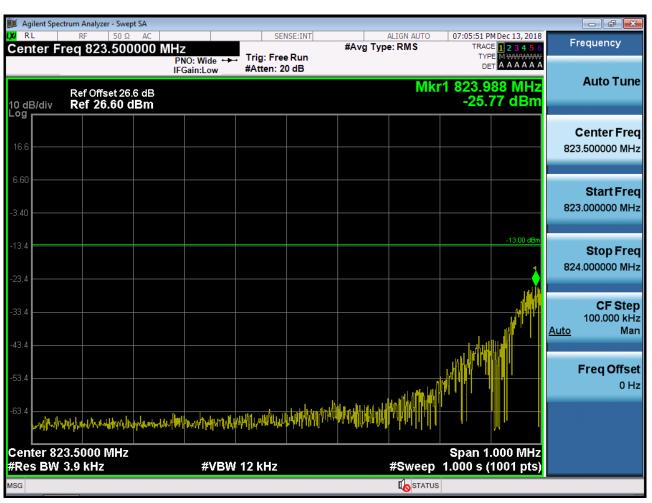
■ GSM850 MODE (251 CH.) Block Edge 3





■ EDGE MODE (128 CH.) Block Edge 1





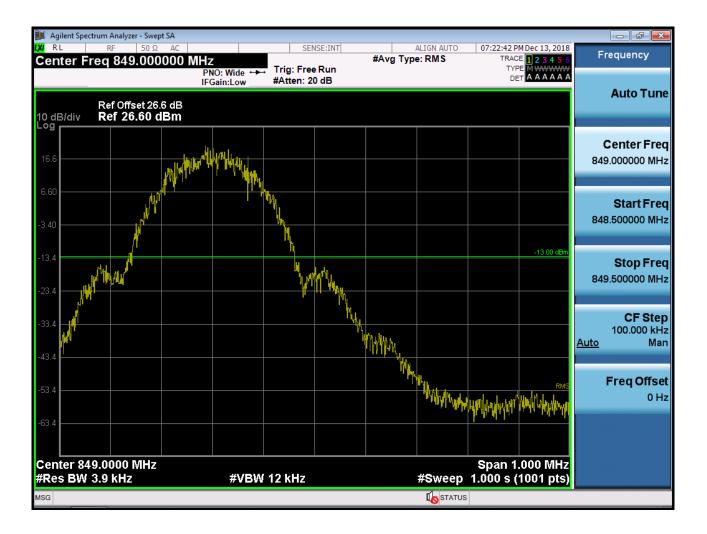
■ EDGE MODE (128 CH.) Block Edge 2



						- Swept SA	ectrum Analy:	🎉 Agilent Spe
	07:06:18 PM Dec 13, 2018	ALIGN AUTO	E:INT	SEN		50 Ω AC	RF	LXI RL
Frequency	TRACE 1 2 3 4 5 6 TYPE M WWWW DET A A A A A A	g Type: RMS	Run	Trig: Free #Atten: 20	NHZ PNO: Wide ↔ IFGain:Low	000000 N	req 82	Center F
Auto Tune	1 822.996 MHz -54.24 dBm	Mkı				et 26.6 dB 00 dBm		10 dB/div Log r
Center Freq 821.000000 MHz								0.00
Start Freq 819.000000 MHz	-13.00 dBm							-10.0
Stop Freq 823.000000 MHz								-30.0
CF Step 400.000 kHz <u>Auto</u> Man		gd.ordinegdloregder.brighter		Anguna and second	utup salas takan dala pro	Regendersta / Julio Madeita, m	a	-50.0
Freq Offset 0 Hz								-70.0
								-80.0
	Span 4.000 MHz 1.000 s (1001 pts)	#Sweep		/ 300 kHz	#VBW	lz		Center 8 #Res BW
		I STATUS						MSG

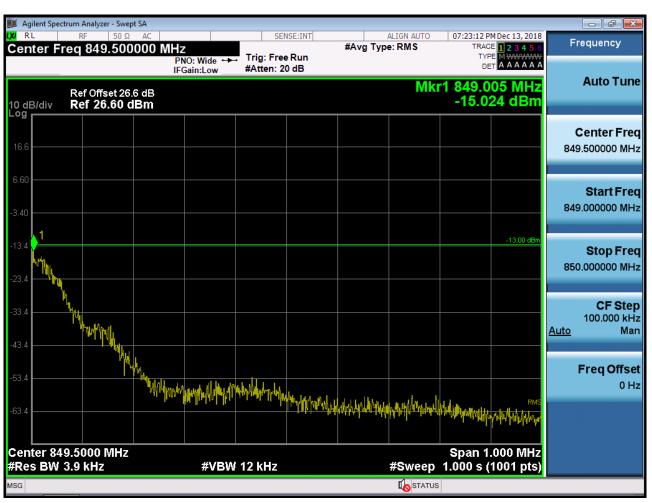
■ EDGE MODE (128 CH.) Block Edge 3





■ EDGE MODE (251 CH.) Block Edge 1





■ EDGE MODE (251 CH.) Block Edge 2



🚺 Agilent Spe	ctrum Analyzer - Swept SA					
XI RL	RF 50 Ω AC		SENSE:INT	ALIGN AUTO	07:23:43 PM Dec 13, 2018	
Center F	req 852.000000	MHz PNO: Wide ↔→ IFGain:Low	Trig: Free Run #Atten: 20 dB	#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE M WWWWW DET A A A A A A	Frequency
10 dB/div Log	Ref Offset 26.6 dB Ref 10.00 dBm			Mk	1 850.060 MHz -51.897 dBm	Auto Tune
0.00						Center Fred 852.000000 MHz
						852.000000 MH:
10.0					-13.00 dBm	Start Free
20.0						850.000000 MH;
30.0						Stop Fre
40.0						854.000000 MH
50.0						CF Ste 400.000 kH
مى نىمەسىمە 60.0	forester and a start for the start and the s	dergener of the state of the state	ىرىياس اس ، دىرىيا يەركىي <mark>انىڭ بى</mark> لىرى سەسىلىسىل	^{เม} ารู้กัดสุขสารแบบทร์มาไปสูงของขับเหล่าสุขารับการสาวเปลาสุขาริตาล	RMS	Auto Ma
70.0						Freq Offse
0.0						0 H
30.0						
	52.000 MHz 100 kHz	#\(D)4/	300 kHz	#Supar	Span 4.000 MHz 1.000 s (1001 pts)	
	TUU KHZ	#787	JUU KHZ			
SG						

■ EDGE MODE (251 CH.) Block Edge 3



	trum Analyzer - Swept SA									- 6 x
X/RL	RF 50 Ω AC		SENS	E:INT	ALIG #Avg Type: R	N AUTO		Feb 11, 2019	Fr	equency
Center Fi	req 824.00000	PNO: Wide ++- IFGain:Low	. Trig: Free #Atten: 10		#Avg Type. R	1413	TYPE	<u>1</u> 23450 A WWWW A A A A A A A		
10 dB/div Log	Ref Offset 26.6 dB Ref 26.60 dBm					Mkr1	824.00 -25.07	0 MHz 3 dBm		Auto Tune
16.6										enter Freq
6.60					and and a second design of the	*******	ale and a construction	RMS		
-3.40									820	Start Freq
-13.4				/				-13.00 dBm		Stop Freq
-23.4				1					827	.500000 MHz
33.4			\sim						<u>Auto</u>	CF Step 700.000 kHz Man
43.4 53.4 									1	Freq Offse
63.4										0 H:
Center 82 #Res BW	4.000 MHz 51 kHz	#VBW	160 kHz		#S	weep 1	Span 7.0 .000 s (1	000 MHz 001 pts)		
ISG						STATUS				

■ WCDMA850 MODE (4132 CH.) Block Edge



	100 kHz	#VBW	300 kHz	#	Sweep 1	1.000 s (100 ⁷	i pts)	
	21.000 MHz					Span 4.000	MHz	
3.4								
3.4								0 H
								Freq Offse
3.4							Auto	<u>o</u> Ma
3.4								CF Stej 400.000 kH
23.4								
							ε	823.000000 MH
3.4						-11	3.00 dBm	Stop Fre
3.40								319.000000 MH
								Start Fre
6.60								
16.6							٤	321.000000 MH
° ^g [Center Fre
0 dB/div	Ref Offset 26.6 dE Ref 26.60 dBm	5			Mkr1	822.920 -31.089 c	MHZ 1Bm	Auto Tuli
		PNO: Wide ++- IFGain:Low	#Atten: 10 dB					Auto Tun
	req 821.00000) MHz		#Avg Type:		TRACE 12	3456	Frequency
RL	ctrum Analyzer - Swept SA RF 50 Ω AC		SENSE:INT		IGN AUTO	11:43:44 AM Feb 1	1 2010	

■ WCDMA850 MODE (4132 CH.) – 4 MHz Span



Agilent Spec	ctrum Analyzer - Swept SA RF 50 Ω AC		0.51	CE-INT.			11.45.05.1	NC-11-2010		- #
	RF 50 Ω AC req 849.000000	MHz PNO:Wide ↔ IFGain:Low			#Avg Typ	ALIGN AUTO e: RMS	TRAC	M Feb 11, 2019 E 1 2 3 4 5 6 E A WWWWW T A A A A A A	Freq	uency
dB/div	Ref Offset 26.6 dB Ref 26.60 dBm					Mk	r1 849.0 -27.2	00 MHz 33 dBm	A	uto Tur
5 .6										nter Fre
60 	1970-1971 - Mary Stiller D'Making og Plage Same Syna	J+++++++++++++++++++++++++++++++++++++								tart Fre
.4				1				-13.00 dBm		Stop Fre
4					James	and the second	~	RMS	70 <u>Auto</u>	CF Ste 00.000 kl M
4									Fr	e q Offs 0
.4 enter 84	9.000 MHz						Span 7	.000 MHz		
es BW	51 kHz	#VBN	/ 160 kHz			#Sweep	1.000 s (1001 pts)		
3						STATUS				

■ WCDMA850MODE (4233 CH.) Block Edge



🎉 Agilent S	pectrum Analyzer - Swept SA								- 6 ×
X/RL	RF 50 Ω AC		SENSE:INT		LIGN AUTO	11:45:23 AM	Feb 11, 2019	En	
Center	Freq 852.000000	PNO: Wide +++ Irig	: Free Run en: 10 dB	#Avg Type	RMS	TRACE TYPE DET	1 2 3 4 5 6 A WWWWW A A A A A A A		equency
10 dB/div Log	Ref Offset 26.6 dB Ref 26.60 dBm				Mkı	1 850.08 -29.73	8 MHz 6 dBm		Auto Tune
16.6									enter Freq 000000 MHz
6.60									Start Freq
-3.40							-13.00 dBm		Stop Freq
-23.4								854.	000000 MHz CF Step
43.4		Neldown Concernance and a second			tengen fil star men andere		RMS	<u>Auto</u>	400.000 kHz Mar
53.4								F	F req Offse 0 Ha
-63.4									
	852.000 MHz N 100 kHz	#VBW 300	kHz	ŧ	#Sweep	Span 4.0 1.000 s (1	000 MHz 001 pts)		
//SG					STATUS				

■ WCDMA850MODE (4233 CH.) – 4 MHz Span



	trum Analyzer - Swept SA								
K/RL	RF 50Ω AC req 5.0150000		SEM	ISE:INT	#Avg Typ	ALIGN AUTO		M Dec 13, 2018	Frequency
senter Fi	req 5.0150000	PNO: Fast IFGain:Low			#/18 I)		TYF DE		
10 dB/div	Ref 10.00 dBn	n				Mk	r1 1.649 -56.9	9 1 GHz 05 dBm	Auto Tune
0.00 -10.0 -20.0	¥2								Center Free 5.015000000 GH:
30.0 40.0 50.0	↓ ↓ ↓ ↓								Start Free 30.000000 MH;
-60.0 -70.0 -80.0		a lan kan da kan a sa kan a s Kan a sa kan							Stop Fred 10.000000000 GH
Start 30 N #Res BW		#V	BW 3.0 MHz		S	Sweep 17	Stop 10 .33 ms (2	.000 GHz 0001 pts)	CF Ster 997.000000 MH
MKR MODE TR	RC SCL	× 1.649 1 GHz	Y -56.905 dE	3m	CTION FU	NCTION WIDTH	FUNCTIO	DN VALUE	<u>Auto</u> Mar
2 N 1 3 4 5 5		825.1 MHz	<u>5.796 d</u>	3m					Freq Offse 0 H
6 7 8 9 10									
11 									
G									

■ GSM850 MODE (128 CH.) Conducted Spurious Emissions



	ctrum Analyzer - S									
X RL Center F	_{RF} 5 req 5.015	0 Ω AC 0000000 C	CHZ PNO: Fast			#Avg Ty	ALIGN AUTO	TRAC	PM Dec 13, 2018 DE 1 2 3 4 5 6 PE M WWWWW ET P P P P P F	Frequency
10 dB/div	Ref 10.0	0 dBm	In Gam. Low				Mk	r1 3.72 -57.8	0 4 GHz 81 dBm	Auto Tune
- og 0.00 -10.0 -20.0	¥2									Center Fred 5.015000000 GH;
30.0 40.0 50.0				.1						Start Free 30.000000 MH:
60.0 Historica 70.0 Historica 80.0 Historica									PEAk	Stop Free 10.000000000 GH:
tart 30 M Res BW	1.0 MHz	X	#VE	SW 3.0 MHz			Sweep 17	.33 ms (2	.000 GHz 0001 pts)	CF Stej 997.000000 MH <u>Auto</u> Ma
1 N 1 2 N 1 3 4 5 6	1 f	3.7	20 4 GHz 37.1 MHz	-57.881 dE 6.282 dE	m			FUNCTI		Freq Offse 0 H
7 8 9 10 11									-	
SG				III				; 	•	

■ GSM850 MODE (190 CH.) Conducted Spurious Emissions



	m Analyzer - Swept SA	1					
enter Fre	RF 50 Ω AC q 5.015000000		SENSE:	#Avg	ALIGN AUTO	06:20:41 PM Dec 13, 20: TRACE 1 2 3 4 5	Frequency
	•	PNO: Fast ↔ IFGain:Low	#Atten: 20 dl			TYPE MWWW DET PPPP	
I0 dB/div	Ref 10.00 dBm				Mk	r1 2.367 5 GH -57.375 dBn	
0.00 10.0 20.0	2						Center Free 5.015000000 GH
30.0 40.0 50.0	↓ ↓ ↓						Start Free 30.000000 MH
60.0 70.0 80.0					kine en til filte som filter i dyn politiker en bygge Program for benen var filter og på filter i som en gener 	PER Production of the second	Stop Fre 10.000000000 GH
Start 30 MH Res BW 1.	0 MHz	#VBV	V 3.0 MHz	FUNCTION	Sweep 17	Stop 10.000 GH: .33 ms (20001 pts	CF Ste 997.000000 MH <u>Auto</u> Ma
1 N 1 2 N 1 3 4 5 5 6 7 7 8	f 2.3	867 5 GHz 849.5 MHz	-57.375 dBm 6.332 dBm				Freq Offse
9 10 10 11			III			4	•

■ GSM850 MODE (251 CH.) Conducted Spurious Emissions



	trum Analyzer - Swept							
enter Fi	RF 50 Ω req 5.015000	AC 0000 GHz PNO: Fast IFGain:Low	Trig: Free Ru #Atten: 10 dl	#Avı un	ALIGN AUTO g Type: RMS	TRACE	1 Feb 11, 2019 1 2 3 4 5 6 A WWWWW A A A A A A A	Frequency
0 dB/div	Ref 0.00 dB	m			Mk	r1 3.303 -76.18	2 GHz 9 dBm	Auto Tun
. og 10.0 20.0 30.0	⊘ 2							Center Fre 5.015000000 GH
io.o io.o								Start Fre 30.000000 M⊦
'0.0 30.0 90.0		,					RMS	Stop Fre 10.000000000 G⊦
tart 30 N Res BW	/IHz 1.0 MHz	#VE	SW 3.0 MHz		Sweep 17	Stop 10. .33 ms (20	000 GHz 1001 pts)	CF Ste 997.000000 MH Auto Ma
KR MODE TR	f	× 3.303 2 GHz	Y -76.189 dBm		FUNCTION WIDTH	FUNCTIO	N VALUE	
2 N 1 3 4 5 5		827.1 MHz	<u>-8.101 dBm</u>				=	Freq Offs 0 H
6 7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9								
10			III					
G					STATUS			

■ WCDMA850 MODE (4132 CH.) Conducted Spurious Emissions



Agilent Spectrum Analyzer - Swept SA								
RL RF 50 Ω AC enter Freq 5.015000000	GHz PNO: Fast ↔ IFGain:Low	SENSE: → Trig: Free Ru #Atten: 10 dl	#Avş un	ALIGN AUTO g Type: RMS	TYPE	Feb 11, 2019	Frequency	
0 dB/div Ref 0.00 dBm				Mk	(r1 3.343 -76.37	5 GHz I dBm	Auto Tune	
og 0.0 20.0 00.0 00.0							Center Free 5.015000000 GH	
10.0 50.0 50.0							Start Fre 30.000000 MH	
						RMS	Stop Fre 10.000000000 G⊢	
tart 30 MHz Res BW 1.0 MHz	#VBV	N 3.0 MHz		Sweep 17	Stop 10.0 .33 ms (200	001 pts)	CF Ste 997.000000 MH Auto Ma	
	343 5 GHz	Y -76.371 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION	VALUE	<u>Auto</u> Wa	
2 N 1 f 3 3 4 5	837.6 MHz	-8.484 dBm				E	Freq Offs 0 ⊦	
6 7 8 9 0 1								
		III				E F		

■ WCDMA850 MODE (4183 CH.) Conducted Spurious Emissions



	ctrum Analyzer - Swept SA							- ē <mark>-</mark> ×	
<mark>(</mark> RL	RF 50 Ω AC req 5.01500000		SENSE		ALIGN AUTO		Feb 11, 2019	Frequency	
Senter F	req 5.01500000	PNO: Fast + IFGain:Low	Trig: Free R #Atten: 10 d	un	g type. Kino	TYPE DET	A A A A A A		
10 dB/div	Ref 0.00 dBm				Mk	r1 3.383 -76.79	9 GHz 7 dBm	Auto Tune	
- 09 -10.0 -20.0 -30.0	\\2 							Center Freq 5.015000000 GHz	
40.0 50.0 60.0								Start Free 30.000000 MH;	
-70.0 -80.0 -90.0							RMS	Stop Fred 10.000000000 GHz	
Start 30 M #Res BW	MHz 1.0 MHz	#VB	W 3.0 MHz		Sweep 17	Stop 10.0 .33 ms (20	001 pts)	CF Step 997.000000 MH Auto Mai	
		3.383 9 GHz	۲ -76.797 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION	VALUE 🔺		
2 N 1 3 4 5		846.0 MHz	-8.262 dBm					Freq Offse 0 H:	
6 7 8 9 10									
11			III				+		
SG					STATUS				

■ WCDMA850MODE (4233 CH.) Conducted Spurious Emissions

10. APPENDIX A_ TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-1902-FC012-P
2	HCT-RF-1902-FC013-P
3	HCT-RF-1902-FC014-P