

FCC REPORT

(GSM & WCDMA)

Applicant: Sun Cupid Technology (HK) Ltd.

Address of Applicant: 16/F, CEO Tower, 77 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong.

Equipment Under Test (EUT)

Product Name: LTE Smart phone

Model No.: N6201L, G4

Trade mark: NUU

FCC ID: 2ADINN6201L

Applicable standards: FCC CFR Title 47 Part 2
FCC CFR Title 47 Part 22 Subpart H
FCC CFR Title 47 Part 24 Subpart E
FCC CFR Title 47 Part 27 Subpart L

Date of sample receipt: 14 Dec., 2018

Date of Test: 14 Dec., to 22 Dec., 2018

Date of report issued: 25 Dec., 2018

Test Result: PASS*

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2. Version

Version No.	Date	Description
00	25 Dec., 2018	Original

Tested by:

Carey Chen

Date:

25 Dec., 2018

Test Engineer

Reviewed by:

Wimer Zhang

Date:

25 Dec., 2018

Project Engineer

3. Contents

	Page
1. COVER PAGE	1
2. VERSION.....	2
3. CONTENTS.....	3
4. TEST SUMMARY	4
5. GENERAL INFORMATION	5
5.1 CLIENT INFORMATION.....	5
5.2 GENERAL DESCRIPTION OF E.U.T.....	5
5.3 TEST MODES.....	7
5.4 DESCRIPTION OF SUPPORT UNITS.....	7
5.5 MEASUREMENT UNCERTAINTY.....	7
5.6 LABORATORY FACILITY.....	7
5.7 LABORATORY LOCATION	8
5.8 TEST INSTRUMENTS LIST.....	8
6. TEST RESULTS.....	9
6.1 CONDUCTED OUTPUT POWER, ERP AND EIRP	9
6.2 PEAK-TO-AVERAGE POWER RATIO	13
6.3 OCCUPY BANDWIDTH	16
6.4 MODULATION CHARACTERISTIC.....	25
6.5 OUT OF BAND EMISSION AT ANTENNA TERMINALS	25
6.6 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT.....	35
6.7 FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT.....	41
6.8 FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT	45
7 TEST SETUP PHOTO.....	48
8 EUT CONSTRUCTIONAL DETAILS	49

4. Test Summary

Test Item	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Pass (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 22.913 (a)(2) Part 24.232 (c) Part 27.50 (d)(4)	Pass
Peak-to-Average Power Ratio	Part 24.232 (d) Part 27.50(d)(5)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 22.917(b) Part 24.238(b) Part 27.53(h)	Pass
Out of band emission at antenna terminals	Part 2.1053 Part 22.917 (a) Part 24.238 (a) Part 27.53 (h)	Pass
Field strength of spurious radiation	Part 22.917 (a) Part 24.238 (a) Part 27.53 (h)	Pass
Frequency stability vs. temperature	Part 22.355 Part 24.235 Part 27.54 Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 22.355 Part 24.235 Part 27.54 Part 2.1055(d)(2)	Pass
Pass: The EUT complies with the essential requirements in the standard.		

5. General Information

5.1 Client Information

Applicant:	Sun Cupid Technology (HK) Ltd.
Address:	16/F, CEO Tower, 77 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong.
Manufacturer	Sun Cupid Technology (HK) Ltd.
Address:	16/F, CEO Tower, 77 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong.
Factory:	SUNCUPID (ShenZhen) Electronic Ltd
Address:	Baolong Industrial City, Longgang District, Shenzhen Hi-Tech Road, Building 1, A 7, China.

5.2 General Description of E.U.T.

Product Name:	LTE Smart phone
Model No.:	N6201L, G4
Operation Frequency range:	GSM 850: 824.20MHz-848.80MHz PCS1900: 1850.20MHz-1909.80MHz WCDMA Band V: 826.4MHz-846.6MHz WCDMA Band II: 1852.4 MHz-1907.6 MHz WCDMA Band IV: 1712.4 MHz-1752.6 MHz
Modulation type:	GSM/GPRS: GMSK, UMTS: QPSK, EGPRS: 8PSK
Antenna type:	Internal Antenna
Antenna gain:	GSM 850: -1.53 dBi PCS 1900: 0.11 dBi WCDMA Band V: -0.12 dBi WCDMA Band II: 0.12 dBi WCDMA Band IV: 0.50 dBi
Power supply:	Rechargeable Li-ion Battery DC 3.85V, 3750mAh
AC adapter:	Model: HJ-FC001K7-US Input: AC100-240V, 50/60Hz, 0.6A Output: DC 5.0V, 2000mA / DC 9.0V, 2000mA
Test Sample Condition:	The test samples were provided in good working order with no visible defects.
Remark:	N6201L, G4 were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being model name and for different areas. They all have two memory configurations, 1: 4G(RAM) + 64G(ROM); 2: 6G(RAM) + 128G(ROM).

Operation Frequency List:

GSM 850		PCS1900	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
128	824.20	512	1850.20
129	824.40	513	1850.40
....			
189	836.40	660	1879.80
190	836.60	661	1880.00
191	836.80	662	1880.20
...	...	...	...
250	848.60	809	1909.60
251	848.80	810	1909.80
WCDMA Band V		WCDMA Band II	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
4132	826.40	9262	1852.40
4133	826.60	9263	1852.60
....			
4182	836.40	9399	1879.80
4183	836.60	9400	1880.00
4184	836.80	9401	1880.20
...	...	...	...
4232	846.40	9537	1907.40
4233	846.60	9538	1907.60
WCDMA Band IV			
Channel	Frequency (MHz)		
1312	1712.40		
1313	1712.60		
....			
1412	1732.40		
1413	1732.60		
1414	1732.80		
...	...		
1512	1752.40		
1513	1752.60		

Regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

GSM850			PCS1900		
Channel		Frequency(MHz)	Channel		Frequency(MHz)
Lowest channel	128	824.20	Lowest channel	512	1850.20
Middle channel	190	836.60	Middle channel	661	1880.00
Highest channel	251	848.80	Highest channel	810	1909.80
WCDMA Band V			WCDMA Band II		
Channel		Frequency(MHz)	Channel		Frequency(MHz)
Lowest channel	4132	826.40	Lowest channel	9262	1852.40
Middle channel	4183	836.60	Middle channel	9400	1880.00
Highest channel	4233	846.60	Highest channel	9538	1907.60
WCDMA Band IV					
Channel		Frequency(MHz)			
Lowest channel	1312	1712.40			
Middle channel	1413	1732.60			
Highest channel	1513	1752.60			

5.3 Test modes

Operating Environment:	
Temperature:	Normal: 15°C ~ 35°C, Extreme: -30°C ~ +50°C
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1008 mbar
Voltage:	Nominal: 3.85Vdc, Extreme: Low 3.5 Vdc, High 4.40 Vdc
Test mode:	
GSM mode	Keep the EUT communication with simulated station in GSM mode
GPRS mode	Keep the EUT communication with simulated station in GPRS mode
EGPRS mode	Keep the EUT communication with simulated station in EGPRS mode
RMC mode	Keep the EUT communication with simulated station in RMC mode
HSDPA	Keep the EUT communication with simulated station in HSDPA mode
HSUPA	Keep the EUT communication with simulated station in HSUPA mode
Remark: The EUT has been tested under continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for these modes with power adaptor, earphone and Data cable. Just the worst case position (H mode) shown in report.	

5.4 Description of Support Units

Test Equipment	Manufacturer	Model No.	Serial No.
Simulated Station	Anritsu	MT8820C	6201026545

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Radiated Emission (9kHz ~ 30MHz)	±2.76 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.28 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.72 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±2.88 dB (k=2)

5.6 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Registration No.: 727551**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

- **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.7 Laboratory Location

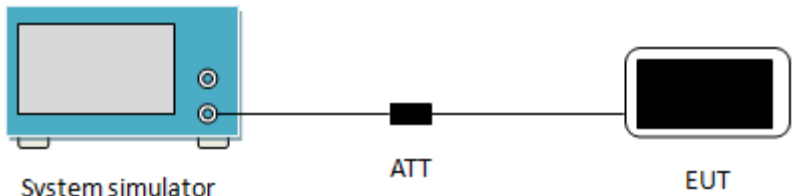
Shenzhen Zhongjian Nanfang Testing Co., Ltd.
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Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

5.8 Test Instruments list

Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-16-2018	03-15-2019
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-21-2018	11-20-2019
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-07-2018	03-06-2019
Pre-amplifier	CD	PAP-1G18	11804	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP40	100363	11-21-2018	11-20-2019
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-07-2018	03-06-2019
Spectrum Analyzer	Agilent	N9020A	MY50510123	11-10-2018	11-09-2019
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-07-2018	03-06-2019
Signal Generator	R&S	SMR20	1008100050	03-07-2018	03-06-2019
RF Switch Unit	MWRFTTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTTEST	MTS8200	Version: 2.0.0.0		
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2018	03-06-2019
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2018	03-06-2019
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2018	03-06-2019
DC Power Supply	XinNuoEr	WYK-10020K	1409050110020	10-31-2018	10-30-2019
Temperature Humidity Chamber	HengPu	HPGDS-500	20140828008	09-24-2018	09-23-2019
Simulated Station	Rohde & Schwarz	CMW500	140493	07-16-2018	07-15-2019

6. Test results

6.1 Conducted Output Power, ERP and EIRP

Test Requirement:	FCC part 22.913(a)(2), FCC part 24.232(c), FCC part 27.50(d)(4)
Test Method:	ANSI/TIA-603-D 2010
Limit:	GSM 850: 7W, PCS 1900: 2W WCDMA Band V: 7W, WCDMA Band II: 2W, WCDMA Band IV: 1W
Test setup:	 The diagram illustrates the test setup. On the left is a blue 'System simulator' with a screen and two ports. A line connects one of its ports to a black rectangular block labeled 'ATT' (attenuator). Another line connects the other side of the 'ATT' block to a black rectangular block labeled 'EUT' (Equipment Under Test).
Test Procedure:	The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the simulated station. Transmitter output power was read off in dBm.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

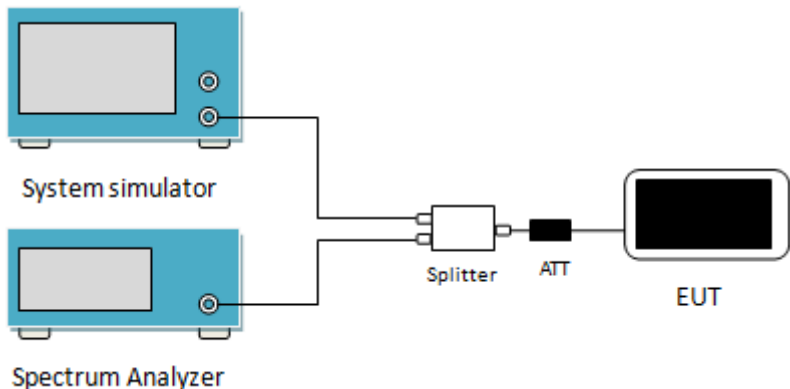
Measurement Data:

EUT Mode	Burst Average power (dBm)		
	128	190	251
	824.20 (MHz)	836.60 (MHz)	848.80 (MHz)
GSM 850	32.04	33.05	33.04
GPRS 850 (1 Uplink slot)	32.94	32.93	32.96
GPRS 850 (2 Uplink slot)	32.16	32.18	32.2
GPRS 850 (3 Uplink slot)	30.26	30.31	30.36
GPRS 850 (4 Uplink slot)	29.00	29.07	29.12
Antenna Gain (dBi)	-1.53		
Max. ERP (dBm)	29.37		
ERP Limit (dBm)	38.45		
EGPRS 850 (1 Uplink slot)	27.46	27.39	27.45
EGPRS 850 (2 Uplink slot)	26.07	26.10	26.11
EGPRS 850 (3 Uplink slot)	23.79	23.71	23.82
EGPRS 850 (4 Uplink slot)	22.40	22.33	22.42
Antenna Gain (dBi)	-1.53		
Max. ERP (dBm)	23.78		
ERP Limit (dBm)	38.45		
EUT Mode	Burst Average power (dBm)		
	512	661	810
	1850.20 (MHz)	1880.00 (MHz)	1909.80 (MHz)
PCS 1900	29.79	29.81	29.85
GPRS 1900 (1 Uplink slot)	29.72	29.74	29.79
GPRS 1900 (2 Uplink slot)	28.87	28.9	28.98
GPRS 1900 (3 Uplink slot)	26.85	26.91	27.01
GPRS 1900 (4 Uplink slot)	25.76	25.82	25.92
Antenna Gain (dBi)	0.11		
Max. EIRP (dBm)	29.96		
EIRP Limit (dBm)	33.00		
EGPRS 1900 (1 Uplink slot)	25.99	25.92	25.82
EGPRS 1900 (2 Uplink slot)	24.71	24.62	24.59
EGPRS 1900 (3 Uplink slot)	22.67	22.58	22.42
EGPRS 1900 (4 Uplink slot)	21.33	21.2	21.08
Antenna Gain (dBi)	0.11		
Max. EIRP (dBm)	26.10		
EIRP Limit (dBm)	33.00		
Note: EIRP (dBm) = Burst Average power (dBm) + Antenna Gain (dBi).			
ERP (dBm) = EIRP (dBm) - 2.15 (dB).			

EUT Mode		Burst Average power (dBm)		
		4132	4183	4233
		826.40 (MHz)	836.60 (MHz)	846.60 (MHz)
UMTS 850 HSDPA	Subtest 1	22.82	22.84	22.87
	Subtest 2	22.48	22.43	22.48
	Subtest 3	20.93	20.91	20.91
	Subtest 4	20.86	20.85	20.95
UMTS 850 HSUPA	Subtest 1	22.33	22.35	22.38
	Subtest 2	22.79	22.79	22.82
	Subtest 3	20.37	20.36	20.34
	Subtest 4	22.86	22.81	22.89
	Subtest 5	21.40	21.29	21.34
UMTS 850 RMC	12.2kbps	23.91	23.89	23.91
UMTS 850 AMR	12.2kbps	23.82	23.79	23.69
Antenna Gain (dBi)		-0.12		
Max. ERP (dBm)		21.64		
ERP Limit (dBm)		38.45		
EUT Mode		Burst Average power (dBm)		
		9262	9400	9538
		1852.40 (MHz)	1880.00 (MHz)	1907.60 (MHz)
UMTS 1900 HSDPA	Subtest 1	22.19	22.07	22.06
	Subtest 2	21.71	21.71	21.68
	Subtest 3	20.14	20.20	20.11
	Subtest 4	20.15	20.06	20.01
UMTS 1900 HSUPA	Subtest 1	21.63	21.67	21.56
	Subtest 2	22.03	22.01	22.01
	Subtest 3	19.74	19.75	19.60
	Subtest 4	22.06	22.01	21.96
	Subtest 5	20.61	20.64	20.49
UMTS 1900 RMC	12.2kbps	23.14	23.15	23.21
UMTS 1900 AMR	12.2kbps	23.06	23.02	23.03
Antenna Gain (dBi)		0.12		
Max. EIRP (dBm)		23.33		
EIRP Limit (dBm)		33.00		
Note: EIRP (dBm) = Burst Average power (dBm) + Antenna Gain (dBi).				
ERP (dBm) = EIRP (dBm) - 2.15 (dB).				

EUT Mode		Burst Average power (dBm)		
		1312	1412	1513
		1712.40 (MHz)	1732.40 (MHz)	1752.60 (MHz)
UMTS 1700 HSDPA	Subtest 1	21.93	22.03	21.9
	Subtest 2	21.61	21.61	21.6
	Subtest 3	20.21	20.09	19.96
	Subtest 4	20.23	20.26	20.08
UMTS 1700 HSUPA	Subtest 1	21.72	21.68	21.57
	Subtest 2	22.04	22	21.99
	Subtest 3	19.79	19.81	19.61
	Subtest 4	22.04	22.04	22.02
	Subtest 5	20.64	20.63	20.61
UMTS 1700 RMC	12.2kbps	23.14	23.11	22.96
UMTS 1700 AMR	12.2kbps	23.01	22.98	22.82
Antenna Gain (dBi)		0.50		
Max. EIRP (dBm)		23.57		
EIRP Limit (dBm)		30.00		
Note: EIRP (dBm) = Burst Average power (dBm) + Antenna Gain (dBi).				

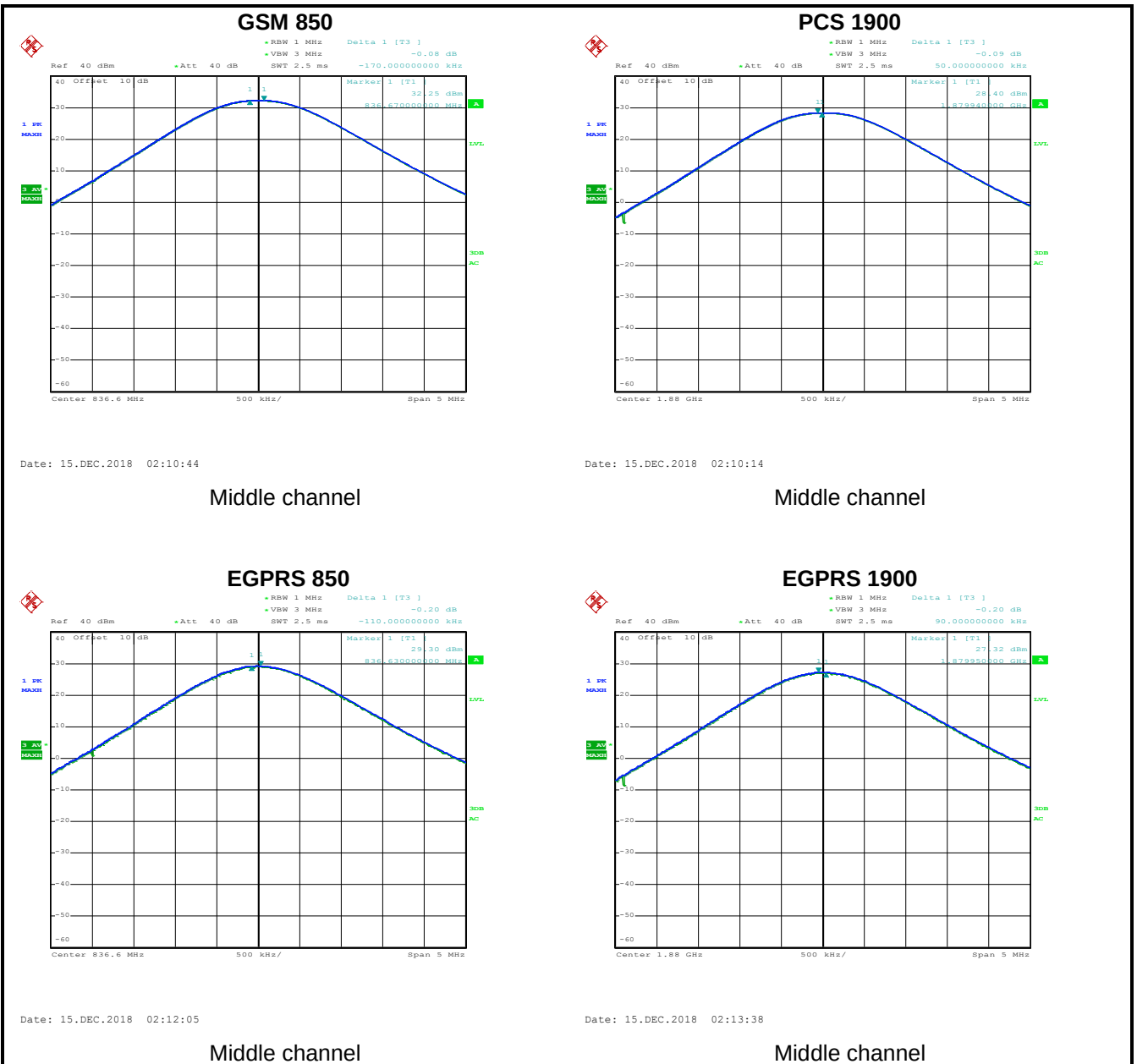
6.2 Peak-to-Average Power Ratio

Test Requirement:	FCC part 24.232(d), FCC part 27.50(d)(5)
Test Method	ANSI/TIA-603-D 2010
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test setup:	 The diagram shows a test setup for measuring the Peak-to-Average Power Ratio (PAR). It includes a System simulator, a Spectrum Analyzer, a Splitter, an ATT (Attenuator), and the EUT (Equipment Under Test). The System simulator and Spectrum Analyzer are connected to the Splitter. The Splitter is connected to the ATT, which is then connected to the EUT.
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 Set the CCDF option in spectrum analyzer, RBW $\geq$ OBW, 3 Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level. 4 Repeat step 1~3 at other frequency and modulations.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

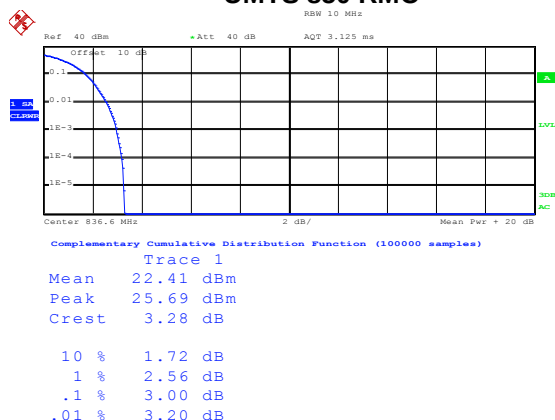
Measurement Data:

Modulation	Test channel	PAPR
GSM 850	190	-0.08
EGPRS 850	190	-0.09
PCS 1900	661	-0.20
EGPRS 1900	661	-0.20
UMTS 850 RMC	4183	3.00
UMTS 1900 RMC	9400	3.20
UMTS1700 RMC	1413	2.88

Test plots as below:



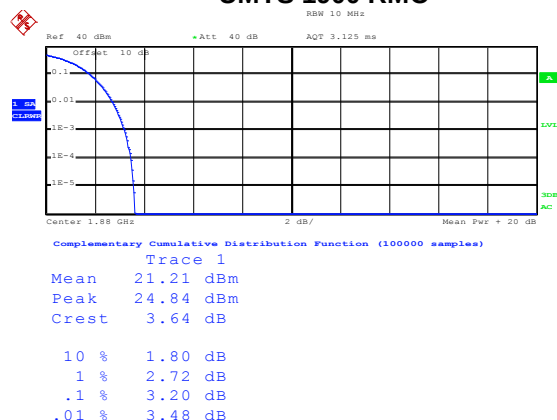
UMTS 850 RMC



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Middle channel

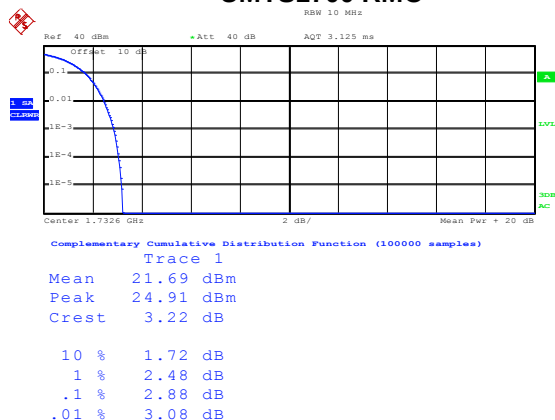
UMTS 1900 RMC



Date: 15.DEC.2018 02:49:10

Middle channel

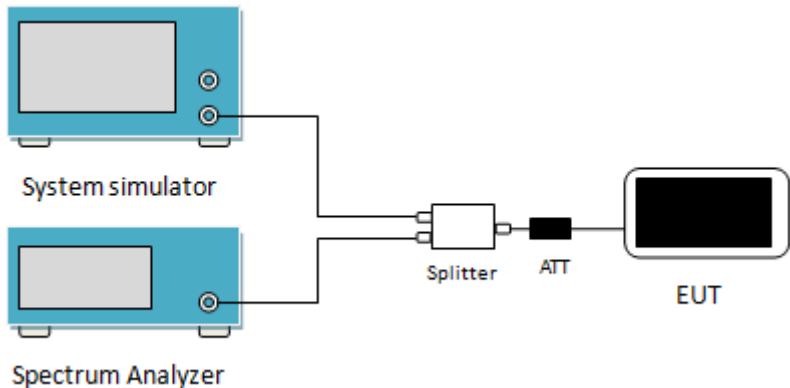
UMTS1700 RMC



Date: 15.DEC.2018 02:49:33

Middle channel

6.3 Occupy Bandwidth

Test Requirement:	FCC part 22.917(b), FCC part 24.238(b), FCC Part 27.53(h)
Test Method:	ANSI/TIA-603-D 2010
Test setup:	 The diagram illustrates the test setup. On the left, there are two blue rectangular units: the top one is labeled 'System simulator' and the bottom one is labeled 'Spectrum Analyzer'. Both have a single output port. These two ports are connected to a central 'Splitter' unit. From the 'Splitter', one line goes to an 'ATT' (Attenuator) unit, and another line goes to the 'EUT' (Equipment Under Test), which is represented by a black rectangle with rounded corners.
Test Procedure:	1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% of emission BW, VBW= 3 times RBW. 3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (kHz)	-26dB bandwidth (kHz)
GSM 850	128	824.2	248	318
	190	836.6	244	314
	251	848.8	244	328
EGPRS850	128	824.2	246	312
	190	836.6	244	316
	251	848.8	250	312
PCS 1900	512	1850.2	242	320
	661	1880.0	250	318
	810	1909.8	246	318
EGPRS1900	512	1850.2	250	318
	661	1880.0	248	318
	810	1909.8	250	314
UMTS 850 12.2k RMC	4132	826.4	4180	4740
	4183	836.6	4180	4720
	4233	846.6	4180	4700
UMTS 1900 12.2k RMC	9262	1852.4	4180	4680
	9400	1880.0	4200	4720
	9538	1907.6	4180	4720
UMTS 1700 12.2k RMC	1312	1712.40	4180	4720
	1413	1732.60	4180	4720
	1513	1752.60	4180	4740

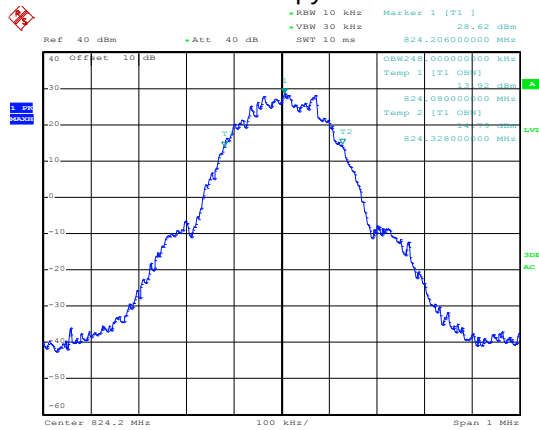
Note:

GSM & GPRS use the same modulation technical (GMSK), and with the same channels, so the 99% OBW and the -26dB of GPRS not performed.

Test plot as follows:

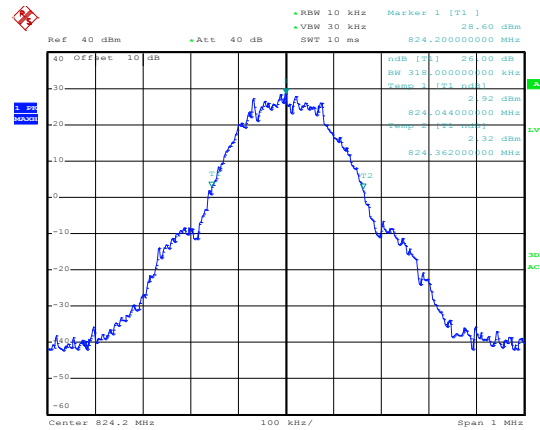
GSM 850

99% Occupancy bandwidth



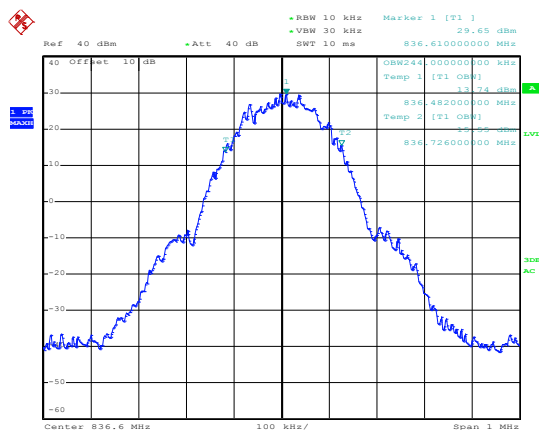
Date: 15.DEC.2018 02:03:19

26dB Emission Bandwidth



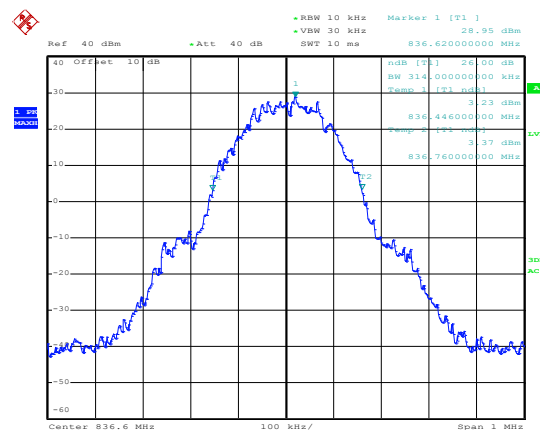
Date: 15.DEC.2018 02:03:29

Lowest channel



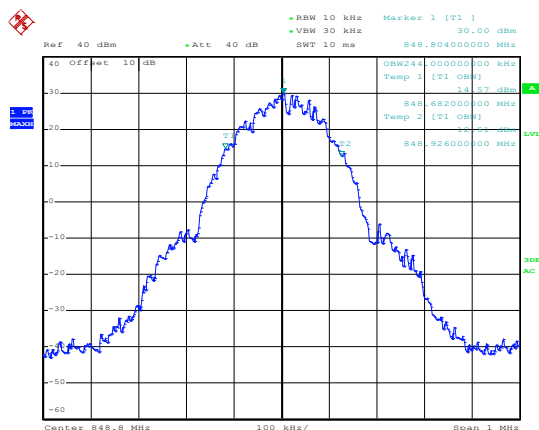
Date: 15.DEC.2018 02:03:54

Lowest channel



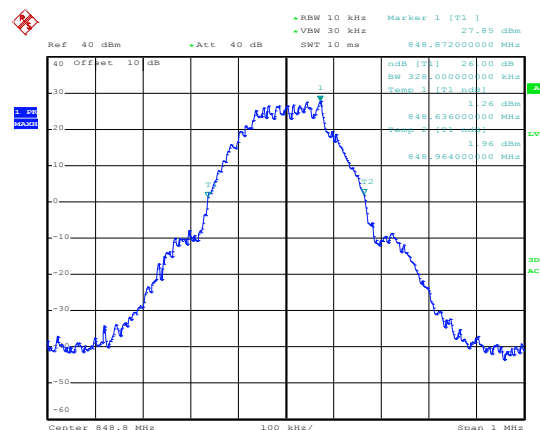
Date: 15.DEC.2018 02:03:41

Middle channel



Date: 15.DEC.2018 02:04:23

Middle channel



Date: 15.DEC.2018 02:04:31

Highest channel

Highest channel

99% Occupy bandwidth



26dB Emission Bandwidth



Date: 15.DEC.2018 02:21:41

Date: 15.DEC.2018 02:21:31

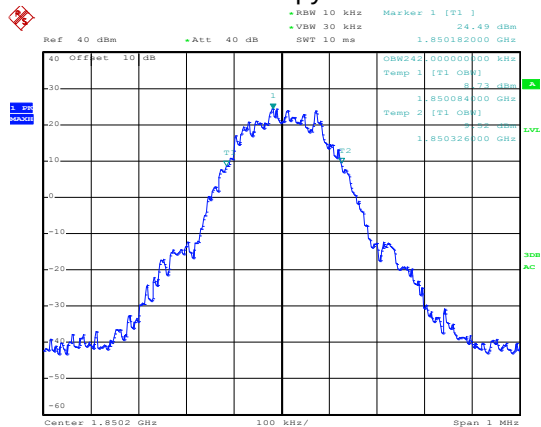
Date: 15.DEC.2018 02:21:53

Date: 15.DEC.2018 02:22:04

Highest channel

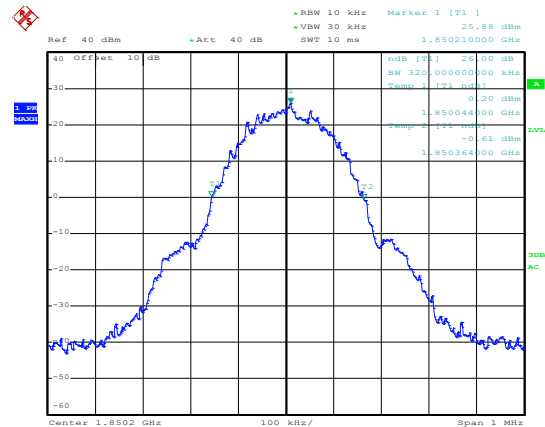
PCS 1900

99% Occupancy bandwidth



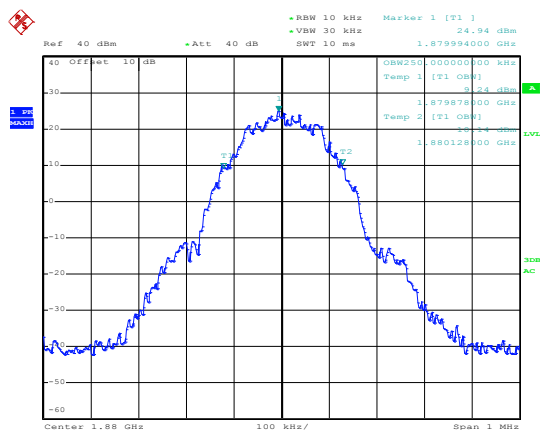
Date: 15.DEC.2018 02:05:10

26dB Emission Bandwidth



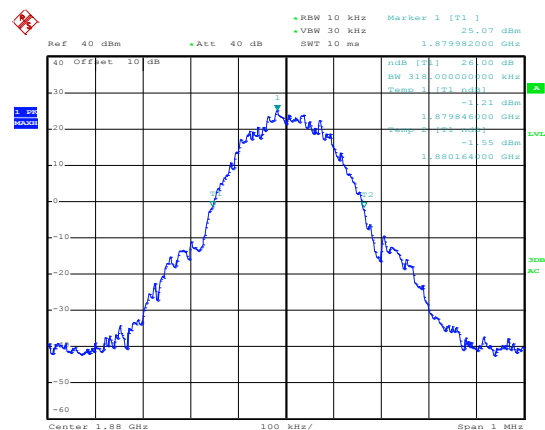
Date: 15.DEC.2018 02:05:02

Lowest channel



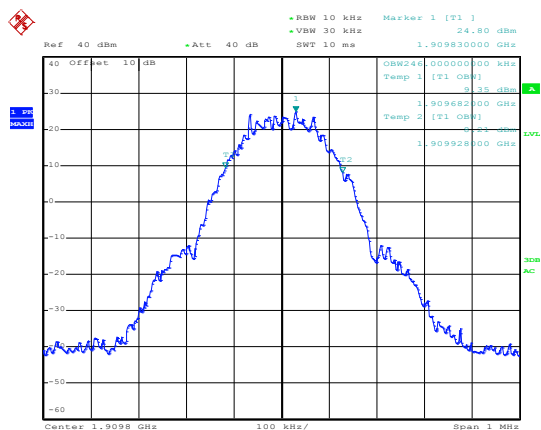
Date: 15.DEC.2018 02:05:21

Lowest channel



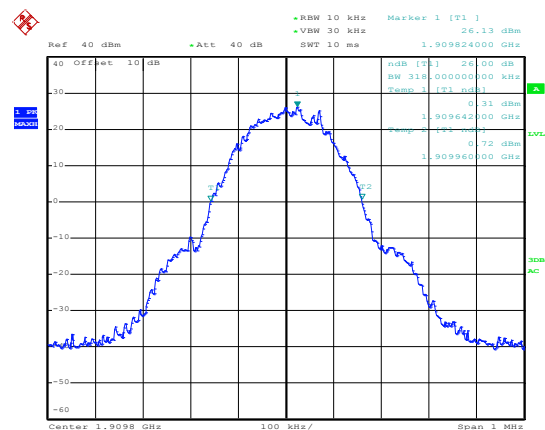
Date: 15.DEC.2018 02:05:30

Middle channel



Date: 15.DEC.2018 02:06:12

Middle channel



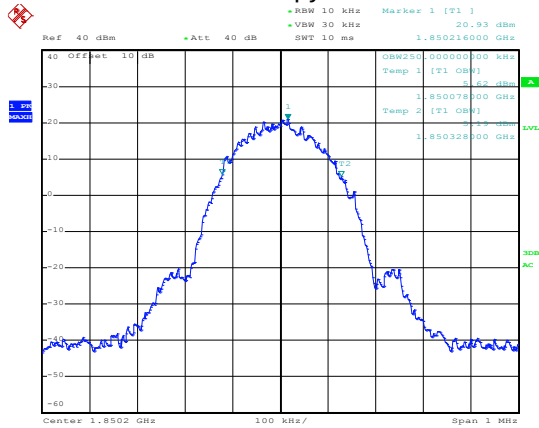
Date: 15.DEC.2018 02:06:04

Highest channel

Highest channel

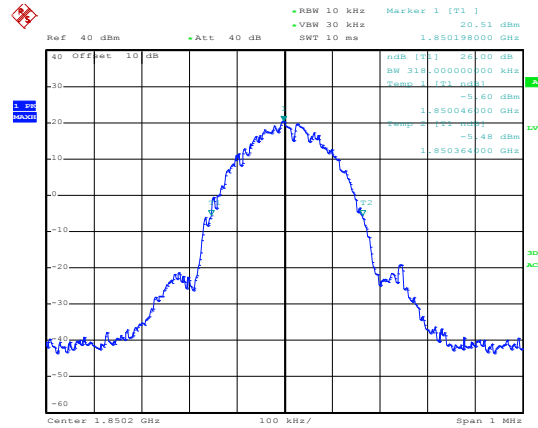
EGPRS 1900

99% Occupancy bandwidth



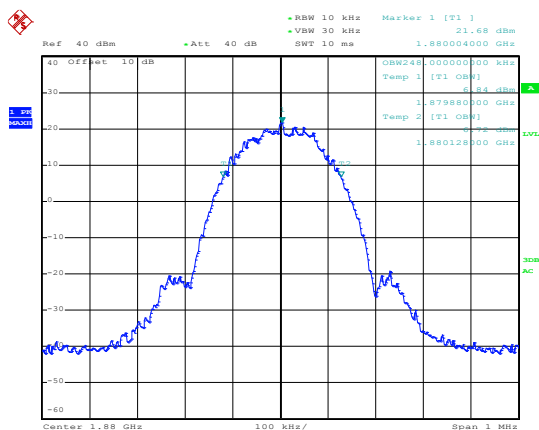
Date: 15.DEC.2018 02:19:01

26dB Emission Bandwidth



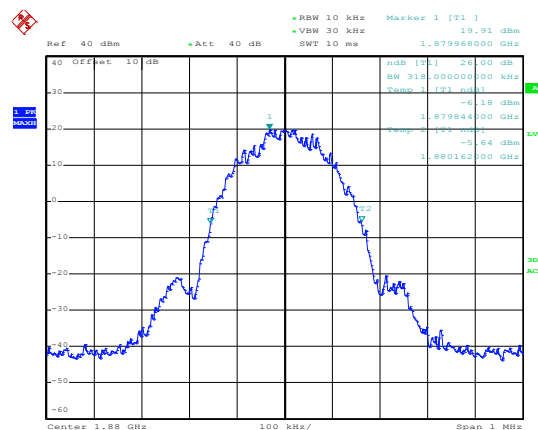
Date: 15.DEC.2018 02:18:50

Lowest channel



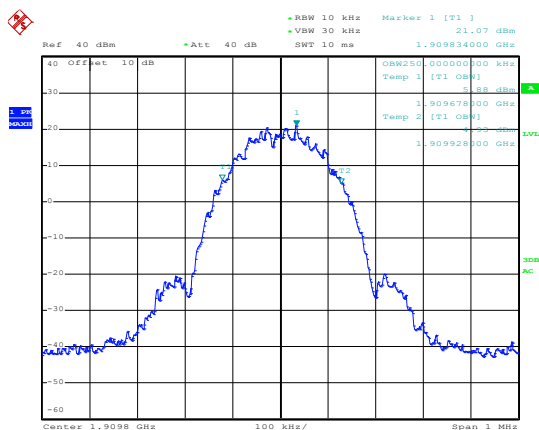
Date: 15.DEC.2018 02:18:16

Lowest channel



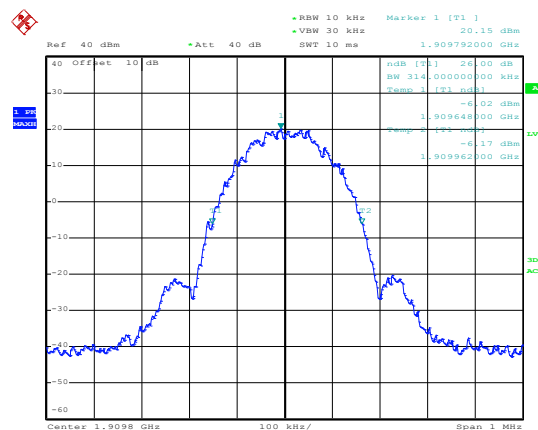
Date: 15.DEC.2018 02:18:24

Middle channel



Date: 15.DEC.2018 02:17:22

Middle channel



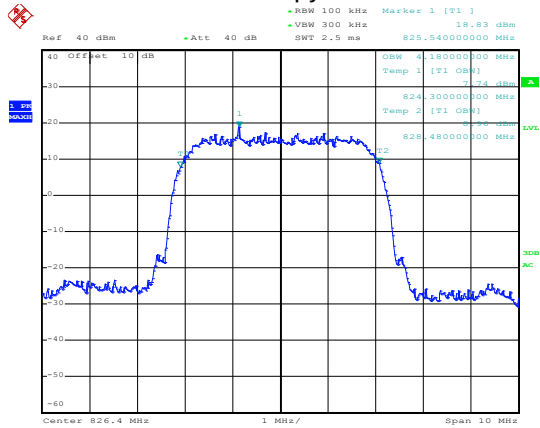
Date: 15.DEC.2018 02:17:37

Highest channel

Highest channel

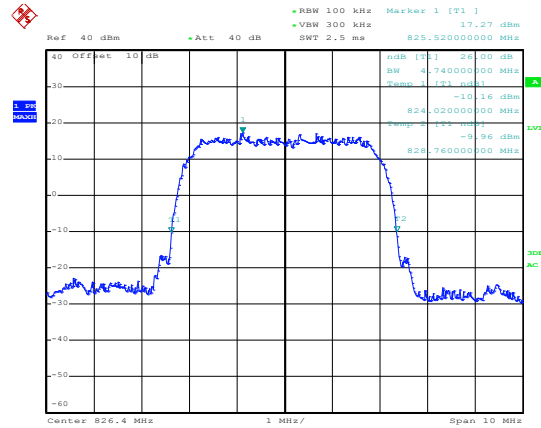
UMTS 850 12.2k RMC

99% Occupancy bandwidth



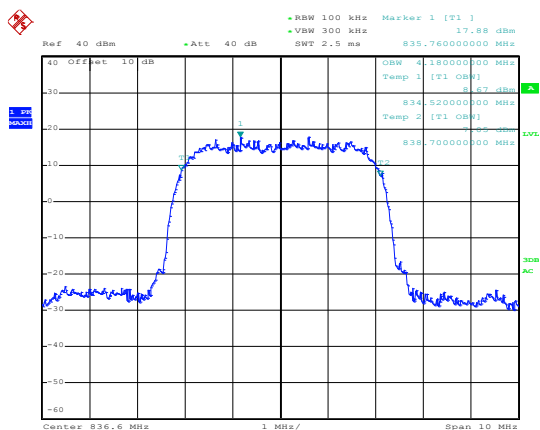
Date: 15.DEC.2018 02:28:11

26dB Emission Bandwidth



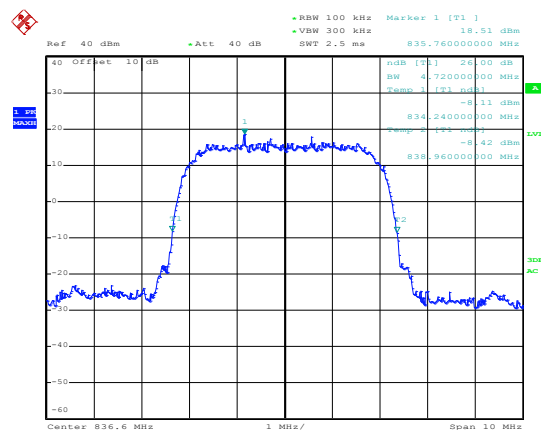
Date: 15.DEC.2018 02:28:19

Lowest channel



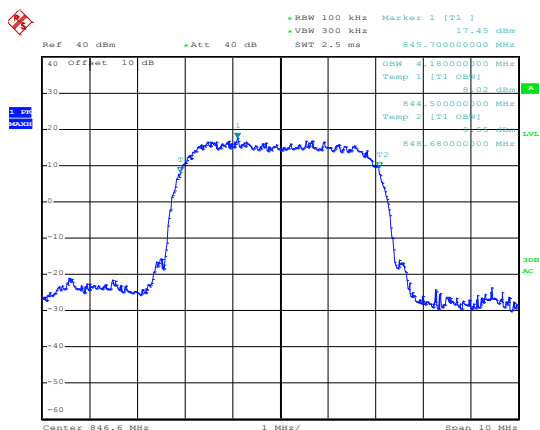
Date: 15.DEC.2018 02:27:56

Lowest channel



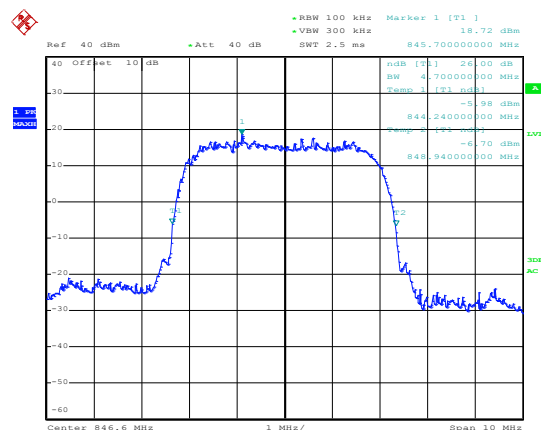
Date: 15.DEC.2018 02:27:47

Middle channel



Date: 15.DEC.2018 02:27:22

Middle channel



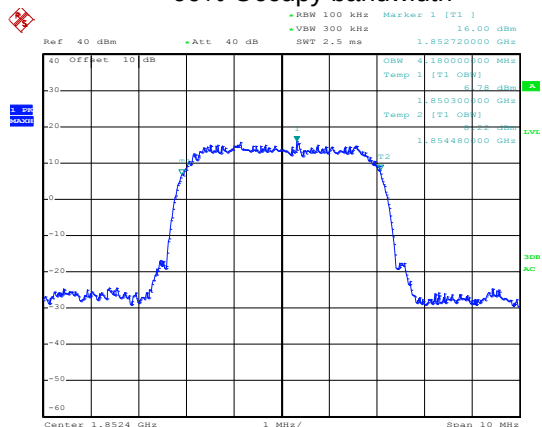
Date: 15.DEC.2018 02:27:32

Highest channel

Highest channel

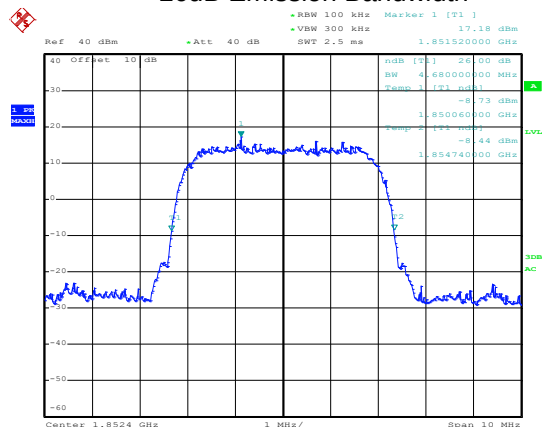
UMTS 1900 12.2k RMC

99% Occupancy bandwidth



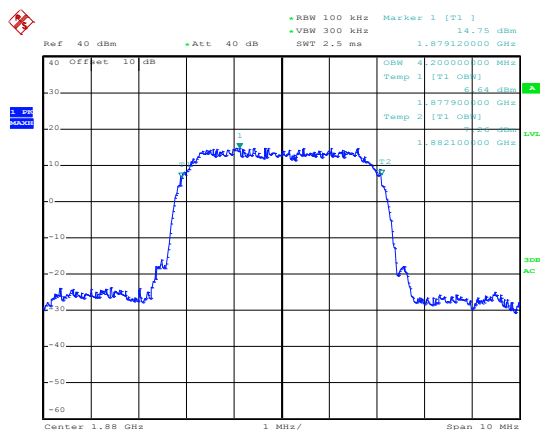
Date: 15.DEC.2018 02:38:27

26dB Emission Bandwidth



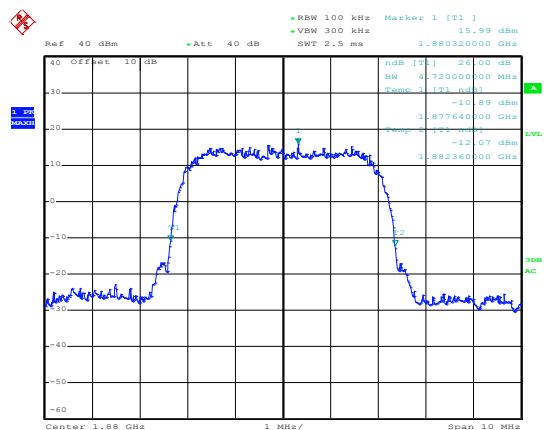
Date: 15.DEC.2018 02:38:36

Lowest channel



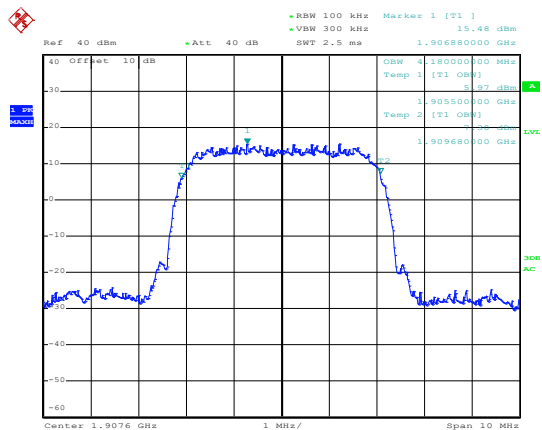
Date: 15.DEC.2018 02:38:59

Lowest channel



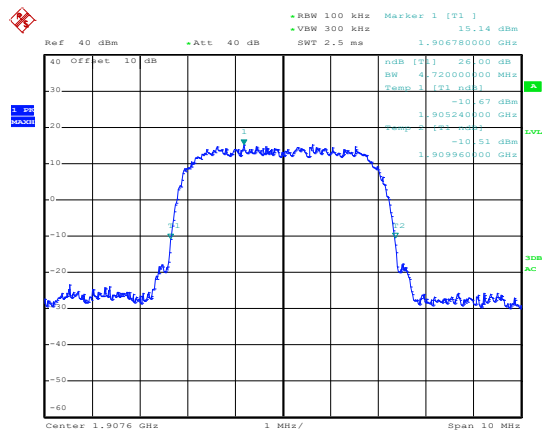
Date: 15.DEC.2018 02:38:52

Middle channel



Date: 15.DEC.2018 02:39:14

Middle channel



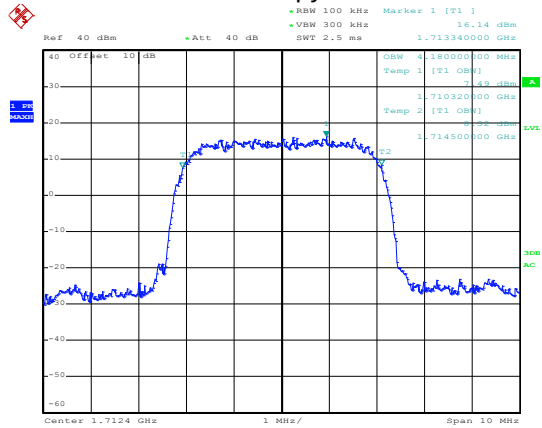
Date: 15.DEC.2018 02:39:23

Highest channel

Highest channel

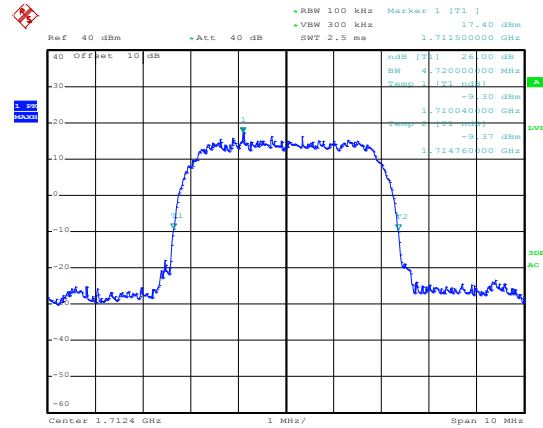
UMTS 1700 12.2k RMC

99% Occupancy bandwidth



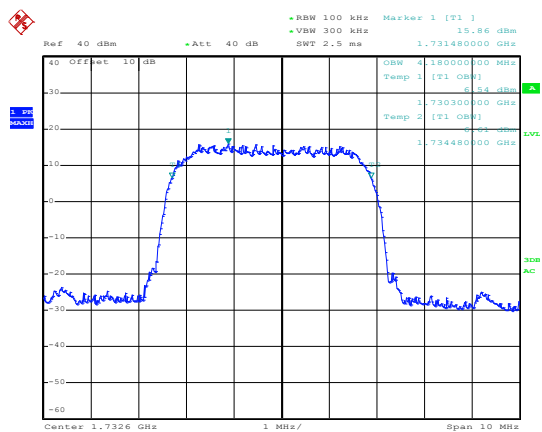
Date: 15.DEC.2018 02:32:14

26dB Emission Bandwidth



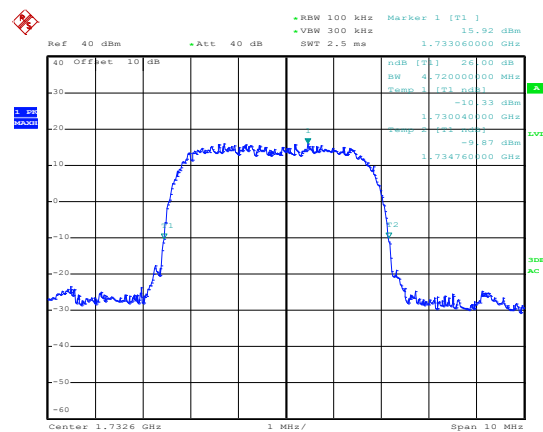
Date: 15.DEC.2018 02:32:22

Lowest channel



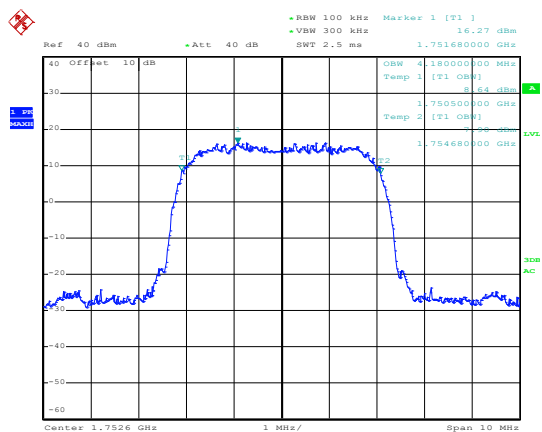
Date: 15.DEC.2018 02:31:57

Lowest channel



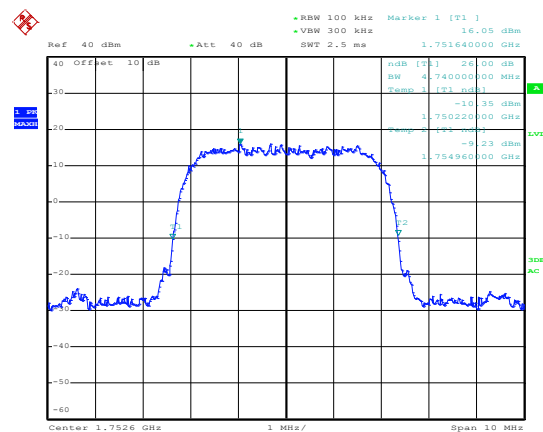
Date: 15.DEC.2018 02:31:50

Middle channel



Date: 15.DEC.2018 02:31:21

Middle channel



Date: 15.DEC.2018 02:31:29

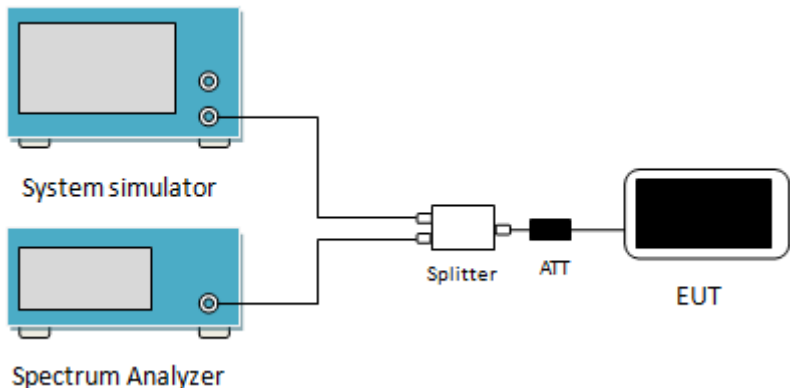
Highest channel

Highest channel

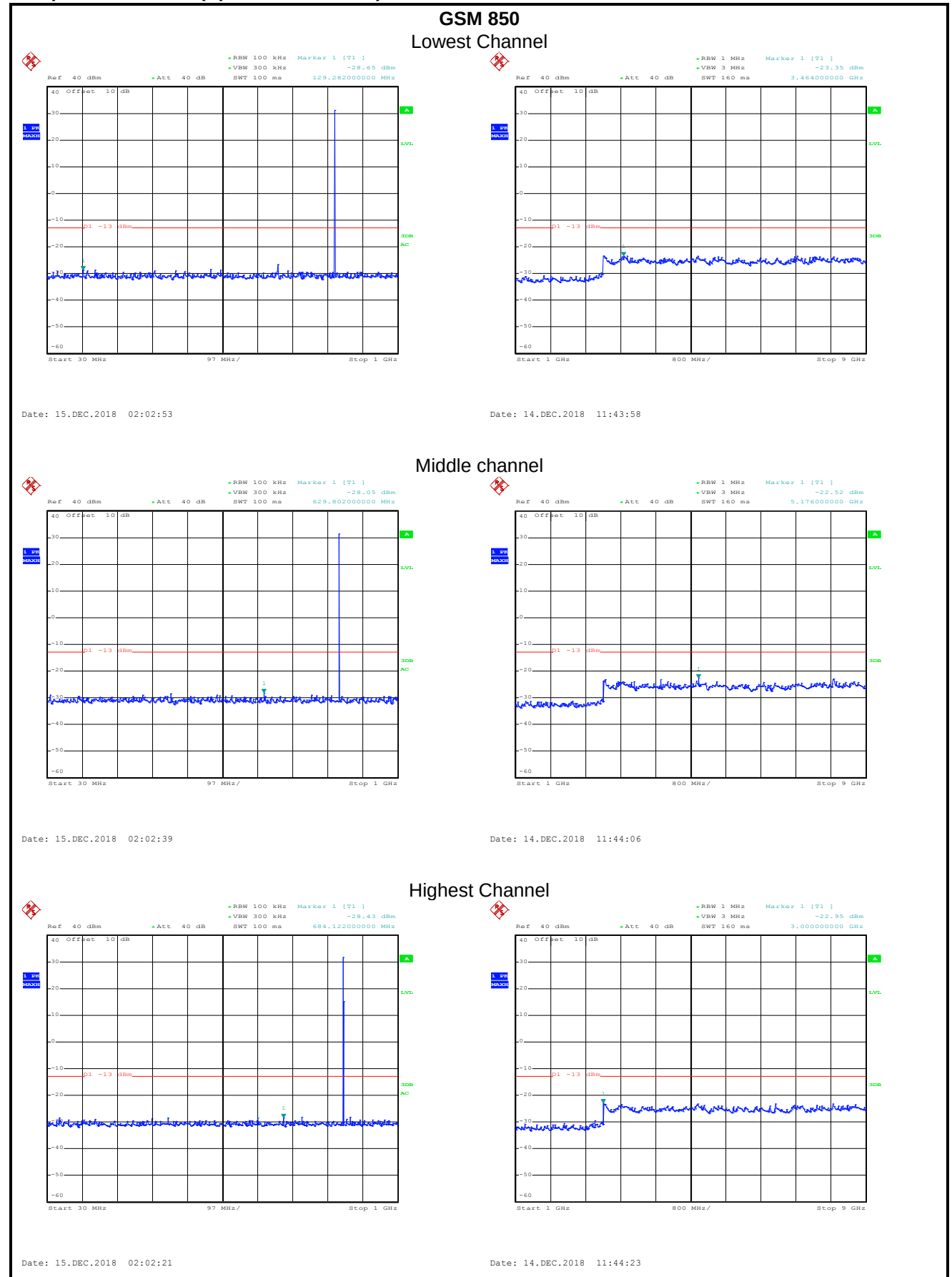
6.4 Modulation Characteristic

According to FCC § 2.1047(d), Part 22H & 24E & 27L there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

6.5 Out of band emission at antenna terminals

Test Requirement:	FCC part 22.917(a), FCC part 24.238(a), FCC Part 27.53 (h)
Test Method:	ANSI/TIA-603-D 2010
Limit:	-13dBm
Test setup:	 The diagram illustrates the test setup. On the left, there are two blue rectangular units: the top one is labeled 'System simulator' and the bottom one is labeled 'Spectrum Analyzer'. Both have a single output port. These two ports are connected to a single input port of a white rectangular unit labeled 'Splitter'. The 'Splitter' has two output ports. One output port is connected to a black rectangular unit labeled 'ATT' (Attenuator). The other output port of the 'Splitter' is connected to the input port of a black rectangular unit labeled 'EUT' (Equipment Under Test).
Test Procedure:	1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. 3 For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic. 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Test plots as follows (Spurious emission):



• RBW 100 kHz Marker 1 [T1]
 • VBW 300 kHz -28.73 dBm
 SNT 100 ms 557.68000000 MHz

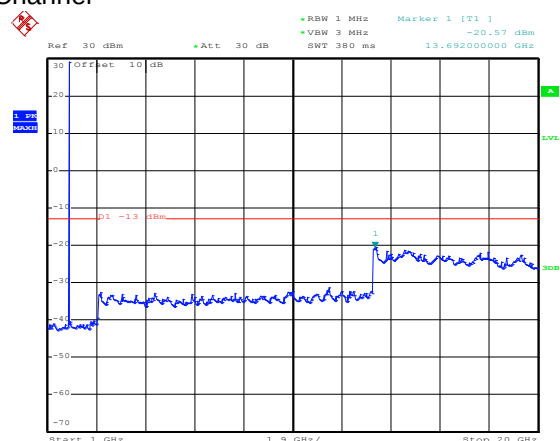
Ref 40 dBm • Att 40 dB
 40 Off Ref 10 dB
 30
 20
 10
 0
 -10
 -20
 -30
 -40
 -50
 -60

1.00
 0.000000

01 -13 dBm
 1
 557.68

Start: 0.000000 Stop: 0.000000
 0.000000 0.000000

Date: 15.DEC.2018 02:07:28



Date: 14.DEC.2018 11:46:26

Ref 40 dBm Att 40 dB SMT 100 ms 516.940000000 MHz

40 Off Set 10 dB

30

20

10

0

-10

-20

-30

-40

-50

-60

30 MHz 57 MHz

Step 1 Off

Step 2 On

Step 3 On

Step 4 On

Step 5 On

Step 6 On

Step 7 On

Step 8 On

Step 9 On

Step 10 On

Step 11 On

Step 12 On

Step 13 On

Step 14 On

Step 15 On

Step 16 On

Step 17 On

Step 18 On

Step 19 On

Step 20 On

Step 21 On

Step 22 On

Step 23 On

Step 24 On

Step 25 On

Step 26 On

Step 27 On

Step 28 On

Step 29 On

Step 30 On

Step 31 On

Step 32 On

Step 33 On

Step 34 On

Step 35 On

Step 36 On

Step 37 On

Step 38 On

Step 39 On

Step 40 On

Step 41 On

Step 42 On

Step 43 On

Step 44 On

Step 45 On

Step 46 On

Step 47 On

Step 48 On

Step 49 On

Step 50 On

Step 51 On

Step 52 On

Step 53 On

Step 54 On

Step 55 On

Step 56 On

Step 57 On

Step 58 On

Step 59 On

Step 60 On

Step 61 On

Step 62 On

Step 63 On

Step 64 On

Step 65 On

Step 66 On

Step 67 On

Step 68 On

Step 69 On

Step 70 On

Step 71 On

Step 72 On

Step 73 On

Step 74 On

Step 75 On

Step 76 On

Step 77 On

Step 78 On

Step 79 On

Step 80 On

Step 81 On

Step 82 On

Step 83 On

Step 84 On

Step 85 On

Step 86 On

Step 87 On

Step 88 On

Step 89 On

Step 90 On

Step 91 On

Step 92 On

Step 93 On

Step 94 On

Step 95 On

Step 96 On

Step 97 On

Step 98 On

Step 99 On

Step 100 On

Step 101 On

Step 102 On

Step 103 On

Step 104 On

Step 105 On

Step 106 On

Step 107 On

Step 108 On

Step 109 On

Step 110 On

Step 111 On

Step 112 On

Step 113 On

Step 114 On

Step 115 On

Step 116 On

Step 117 On

Step 118 On

Step 119 On

Step 120 On

Step 121 On

Step 122 On

Step 123 On

Step 124 On

Step 125 On

Step 126 On

Step 127 On

Step 128 On

Step 129 On

Step 130 On

Step 131 On

Step 132 On

Step 133 On

Step 134 On

Step 135 On

Step 136 On

Step 137 On

Step 138 On

Step 139 On

Step 140 On

Step 141 On

Step 142 On

Step 143 On

Step 144 On

Step 145 On

Step 146 On

Step 147 On

Step 148 On

Step 149 On

Step 150 On

Step 151 On

Step 152 On

Step 153 On

Step 154 On

Step 155 On

Step 156 On

Step 157 On

Step 158 On

Step 159 On

Step 160 On

Step 161 On

Step 162 On

Step 163 On

Step 164 On

Step 165 On

Step 166 On

Step 167 On

Step 168 On

Step 169 On

Step 170 On

Step 171 On

Step 172 On

Step 173 On

Step 174 On

Step 175 On

Step 176 On

Step 177 On

Step 178 On

Step 179 On

Step 180 On

Step 181 On

Step 182 On

Step 183 On

Step 184 On

Step 185 On

Step 186 On

Step 187 On

Step 188 On

Step 189 On

Step 190 On

Step 191 On

Step 192 On

Step 193 On

Step 194 On

Step 195 On

Step 196 On

Step 197 On

Step 198 On

Step 199 On

Step 200 On

Step 201 On

Step 202 On

Step 203 On

Step 204 On

Step 205 On

Step 206 On

Step 207 On

Step 208 On

Step 209 On

Step 210 On

Step 211 On

Step 212 On

Step 213 On

Step 214 On

Step 215 On

Step 216 On

Step 217 On

Step 218 On

Step 219 On

Step 220 On

Step 221 On

Step 222 On

Step 223 On

Step 224 On

Step 225 On

Step 226 On

Step 227 On

Step 228 On

Step 229 On

Step 230 On

Step 231 On

Step 232 On

Step 233 On

Step 234 On

Step 235 On

Step 236 On

Step 237 On

Step 238 On

Step 239 On

Step 240 On

Step 241 On

Step 242 On

Step 243 On

Step 244 On

Step 245 On

Step 246 On

Step 247 On

Step 248 On

Step 249 On

Step 250 On

Step 251 On

Step 252 On

Step 253 On

Step 254 On

Step 255 On

Step 256 On

Step 257 On

Step 258 On

Step 259 On

Step 260 On

Step 261 On

Step 262 On

Step 263 On

Step 264 On

Step 265 On

Step 266 On

Step 267 On

Step 268 On

Step 269 On

Step 270 On

Step 271 On

Step 272 On

Step 273 On

Step 274 On

Step 275 On

Step 276 On

Step 277 On

Step 278 On

Step 279 On

Step 280 On

Step 281 On

Step 282 On

Step 283 On

Step 284 On

Step 285 On

Step 286 On

Step 287 On

Step 288 On

Step 289 On

Step 290 On

Step 291 On

Step 292 On

Step 293 On

Step 294 On

Step 295 On

Step 296 On

Step 297 On

Step 298 On

Step 299 On

Step 300 On

Step 301 On

Step 302 On

Step 303 On

Step 304 On

Step 305 On

Step 306 On

Step 307 On

Step 308 On

Step 309 On

Step 310 On

Step 311 On

Step 312 On

Step 313 On

Step 314 On

Step 315 On

Step 316 On

Step 317 On

Step 318 On

Step 319 On

Step 320 On

Step 321 On

Step 322 On

Step 323 On

Step 324 On

Step 325 On

Step 326 On

Step 327 On

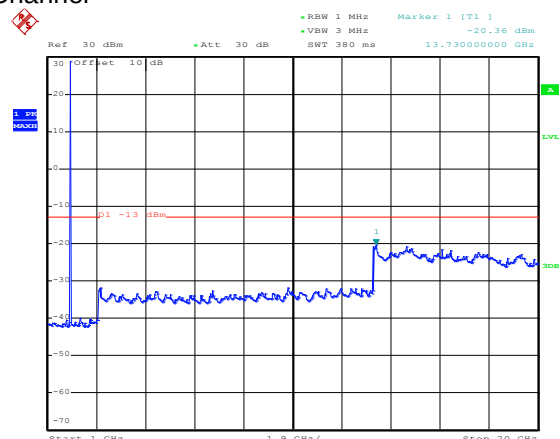
Step 328 On

Step 329 On

Step 330 On

Step 3

Date: 15.DEC.2018 02:07:36



Date: 14.DEC.2018 11:47:10

• RBW 100 kHz Marker 1 [T1]
 • VBW 300 kHz -28.53 dBm
 SNT 100 ms 862.26000000 MHz

Ref 40 dBm • Att 40 dB

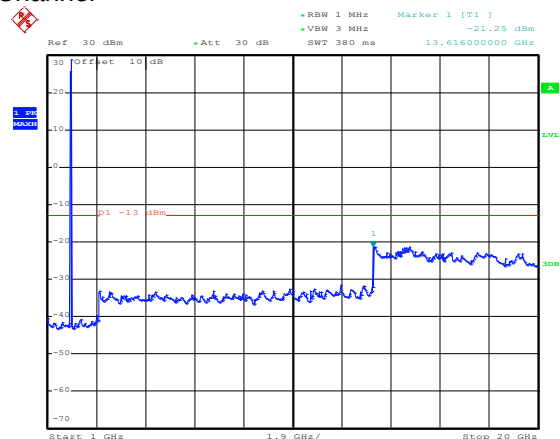
40 Offset 10 dB
 30
 20
 10
 0
 -10
 -20
 -30
 -40
 -50
 -60

01 -13 dBm

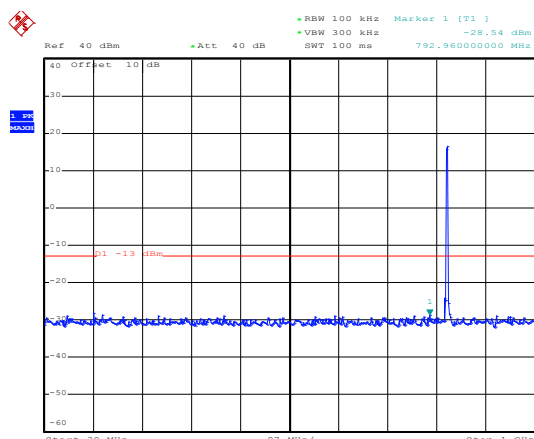
2

Start 30. MHz 97 MHz/ Stop 3. GHz

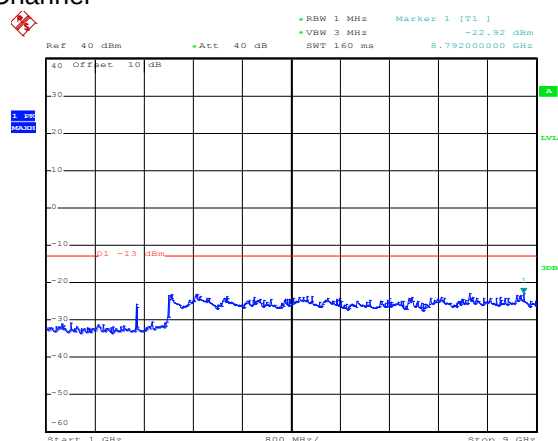
Date: 15.DEC.2018 02:07:45



Date: 14.DEC.2018 11:47:28

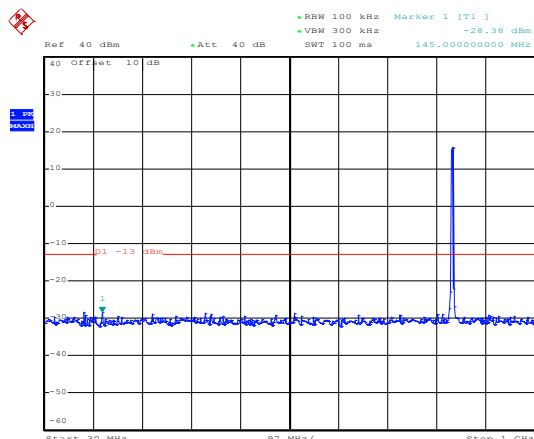
UMTS 850 12.2k RMC
Lowest Channel

Date: 15.DEC.2018 02:26:25

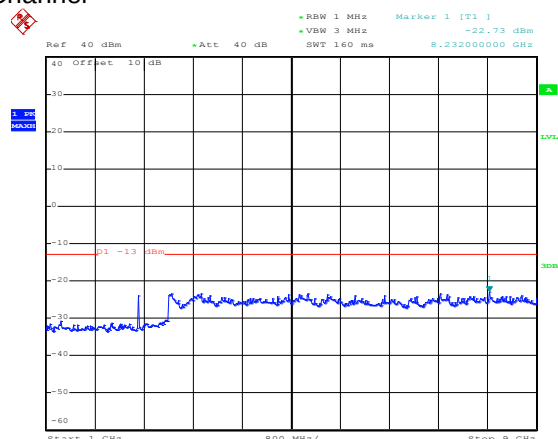


Date: 14.DEC.2018 11:39:36

Middle Channel

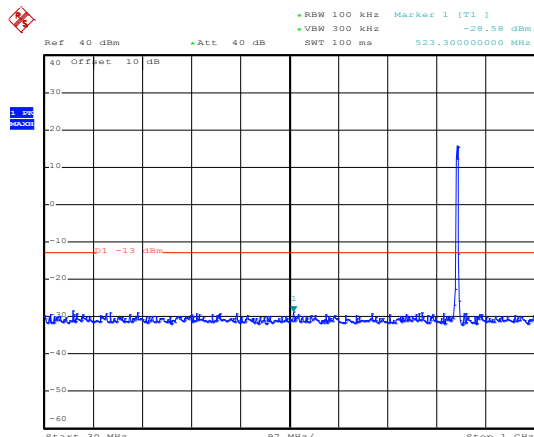


Date: 15.DEC.2018 02:26:43

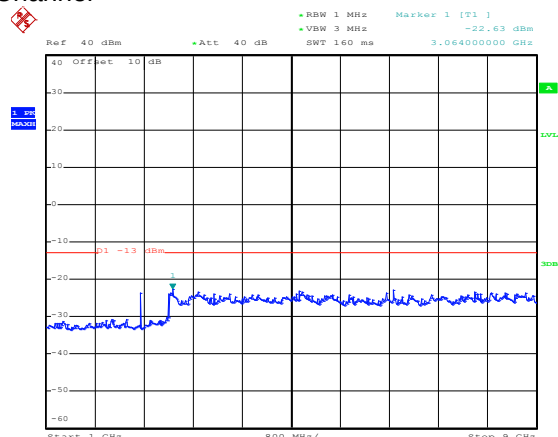


Date: 14.DEC.2018 11:39:48

Highest Channel

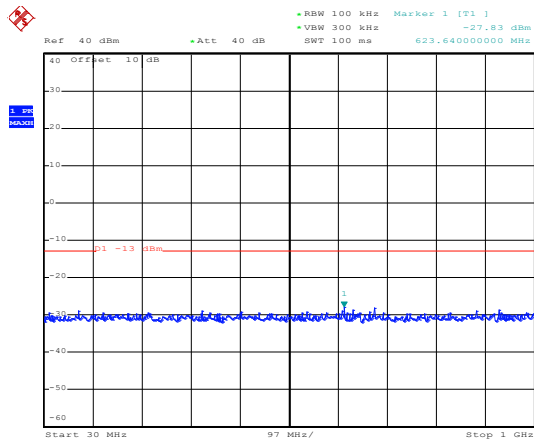


Date: 15.DEC.2018 02:26:58

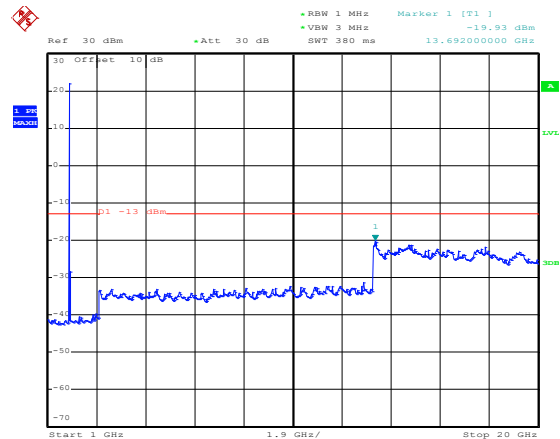


Date: 14.DEC.2018 11:39:59

UMTS 1900 12.2k RMC Lowest Channel

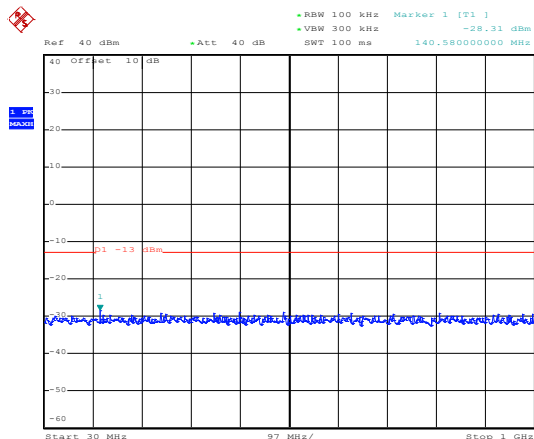


Date: 15.DEC.2018 02:36:15

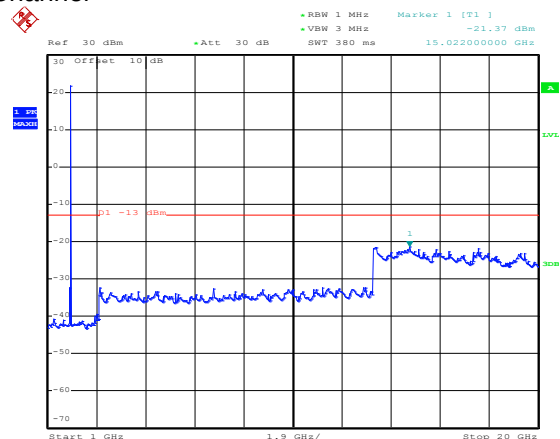


Date: 14.DEC.2018 11:35:42

Middle Channel

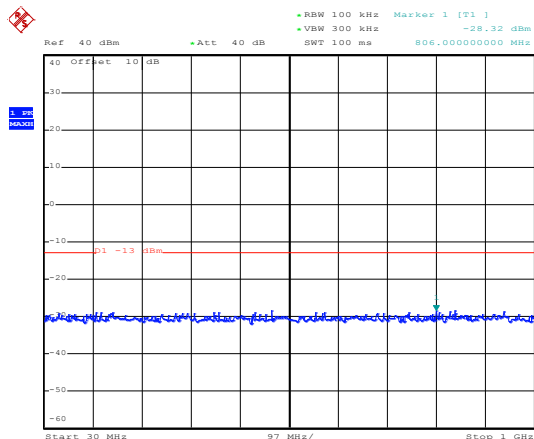


Date: 15.DEC.2018 02:36:24

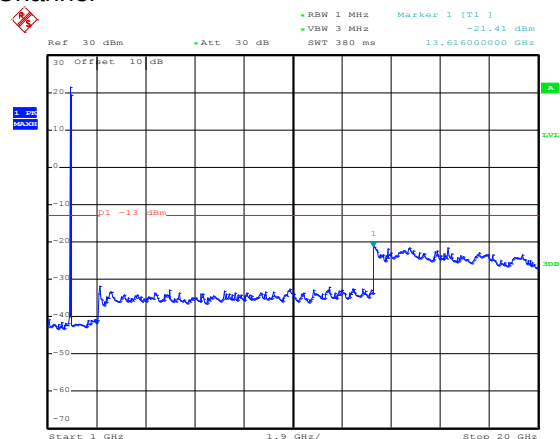


Date: 14.DEC.2018 11:36:00

Highest Channel

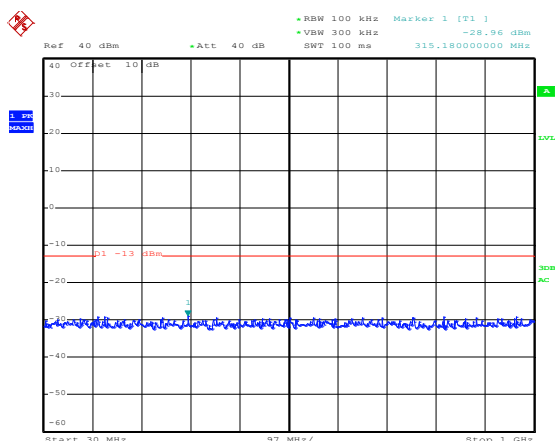


Date: 15.DEC.2018 02:36:43

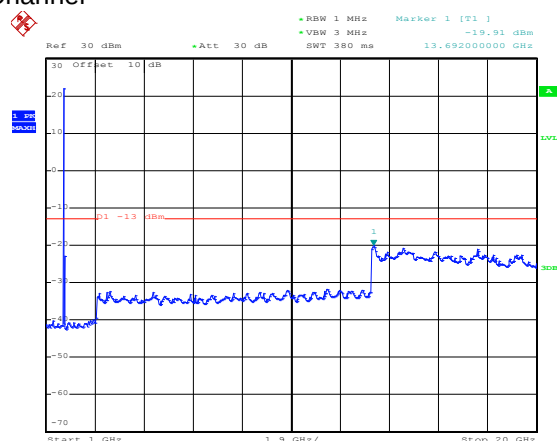


Date: 14.DEC.2018 11:36:18

UMTS 1700 12.2k RMC Lowest Channel

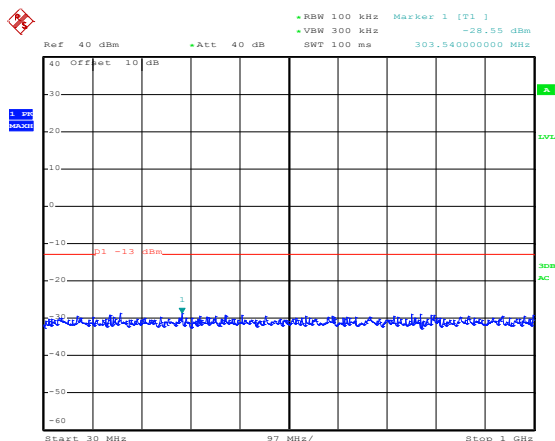


Date: 15.DEC.2018 02:35:44

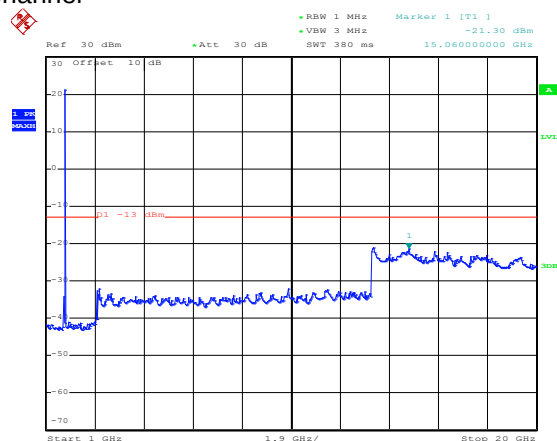


Date: 14.DEC.2018 11:34:30

Middle Channel

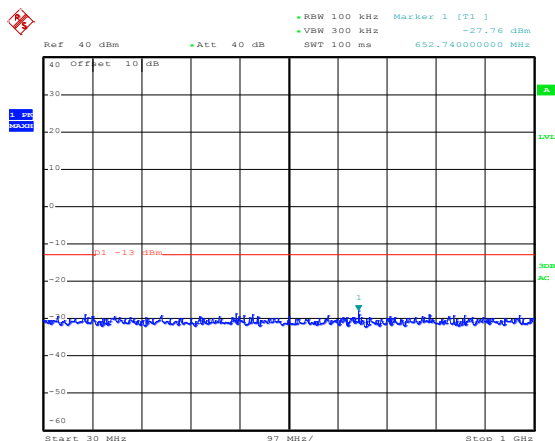


Date: 15.DEC.2018 02:35:36

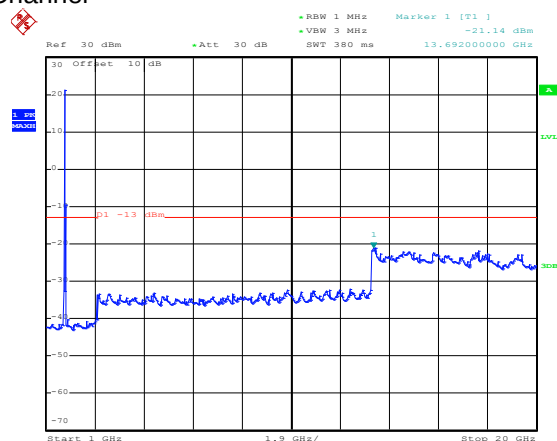


Date: 14.DEC.2018 11:34:45

Highest Channel



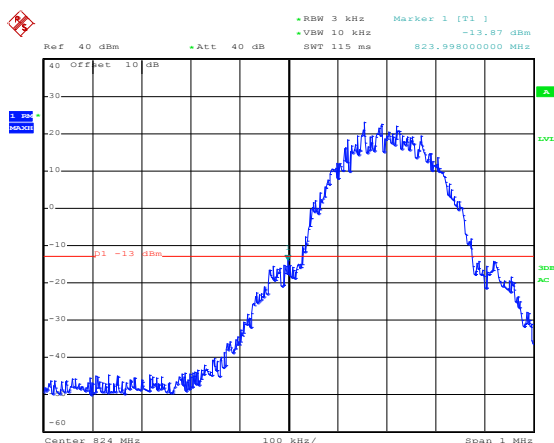
Date: 15.DEC.2018 02:35:27



Date: 14.DEC.2018 11:35:01

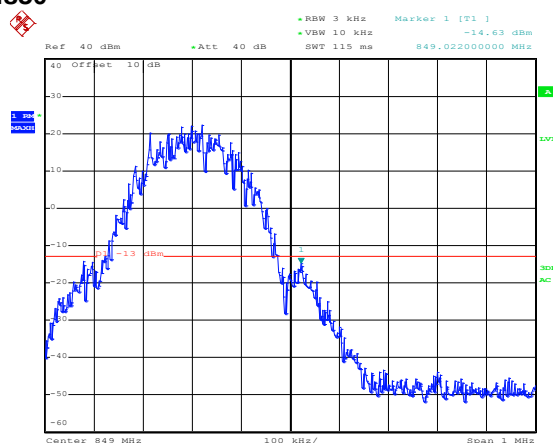
Band edge emission:

GSM850



Date: 15.DEC.2018 01:59:57

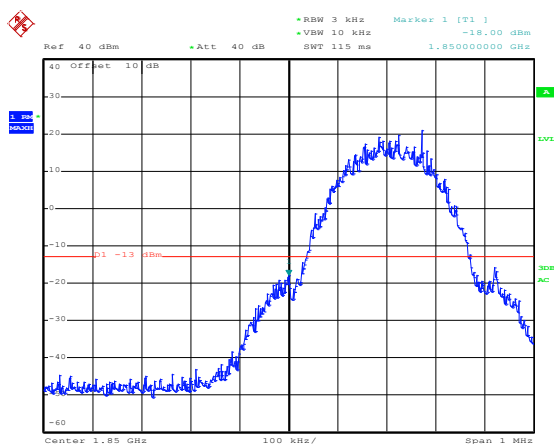
Lowest channel



Date: 15.DEC.2018 02:00:59

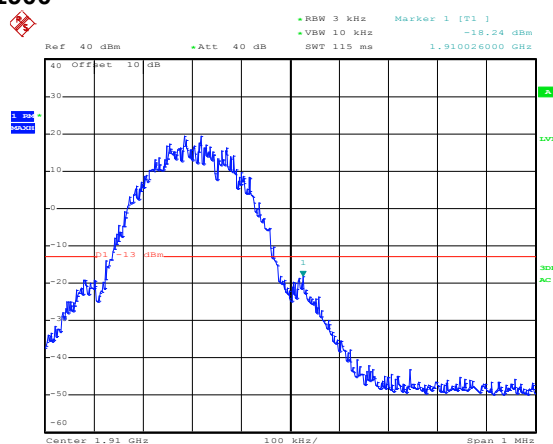
Highest channel

PCS1900



Date: 15.DEC.2018 02:07:05

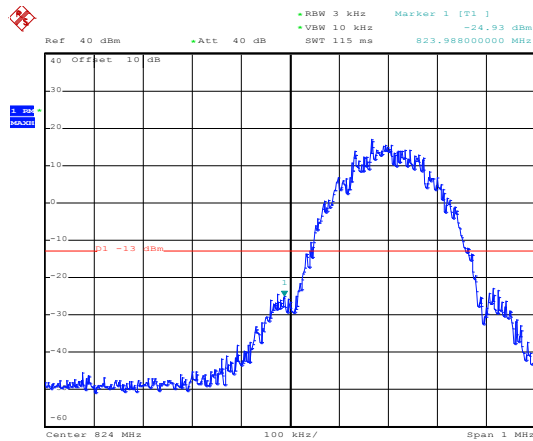
Lowest channel



Date: 15.DEC.2018 02:06:41

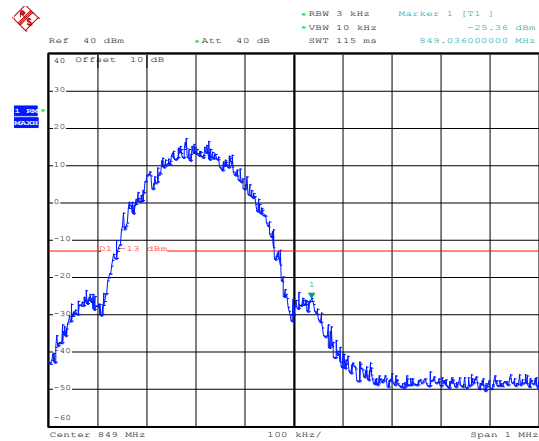
Highest channel

EGPRS850



Date: 15.DEC.2018 02:22:58

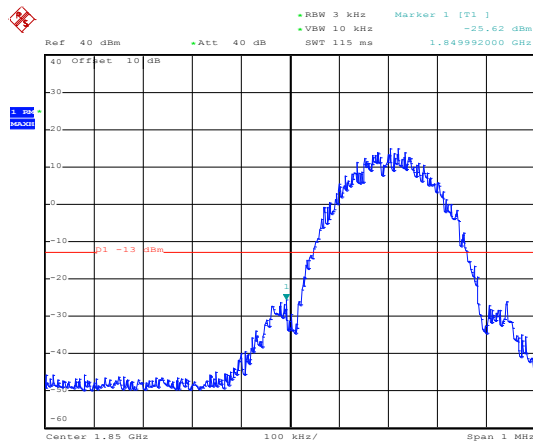
Lowest channel



Date: 15.DEC.2018 02:22:38

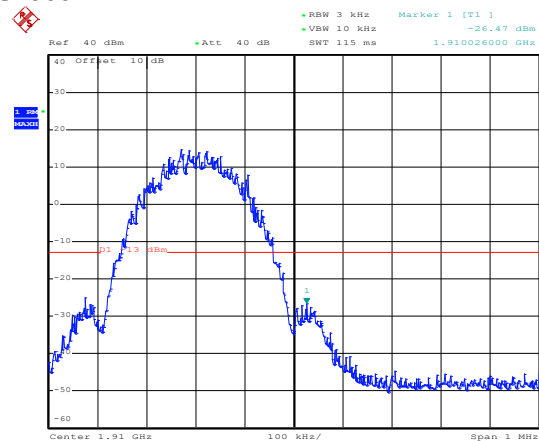
Highest channel

EGPRS1900



Date: 15.DEC.2018 02:15:18

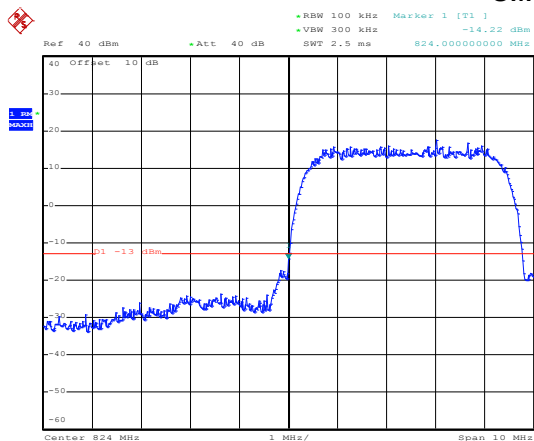
Lowest channel



Date: 15.DEC.2018 02:15:49

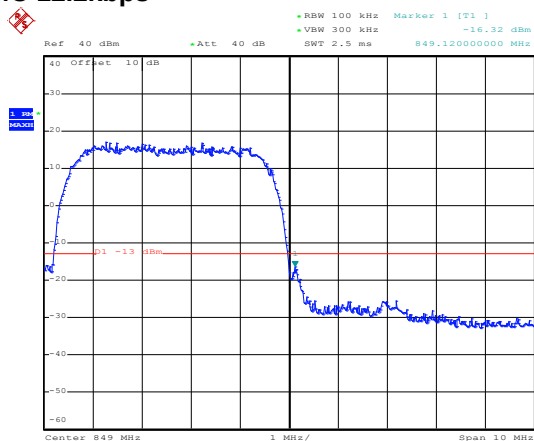
Highest channel

UMTS 850 RMC 12.2kbps



Date: 15.DEC.2018 02:25:56

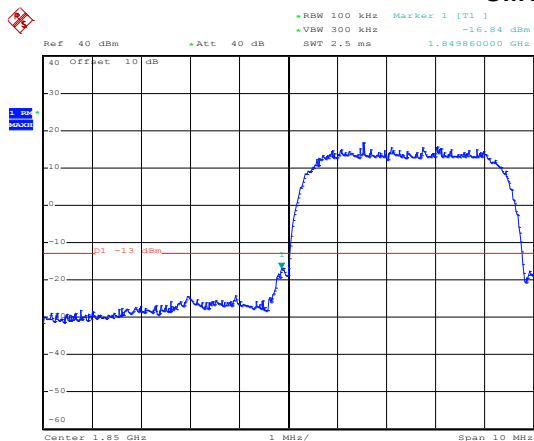
Lowest channel



Date: 15.DEC.2018 02:25:37

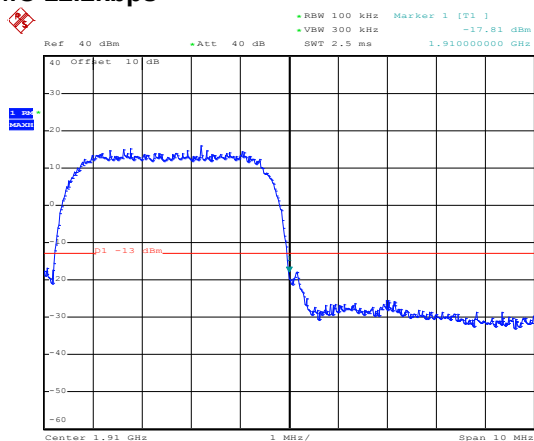
Highest channel

UMTS 1900 RMC 12.2kbps



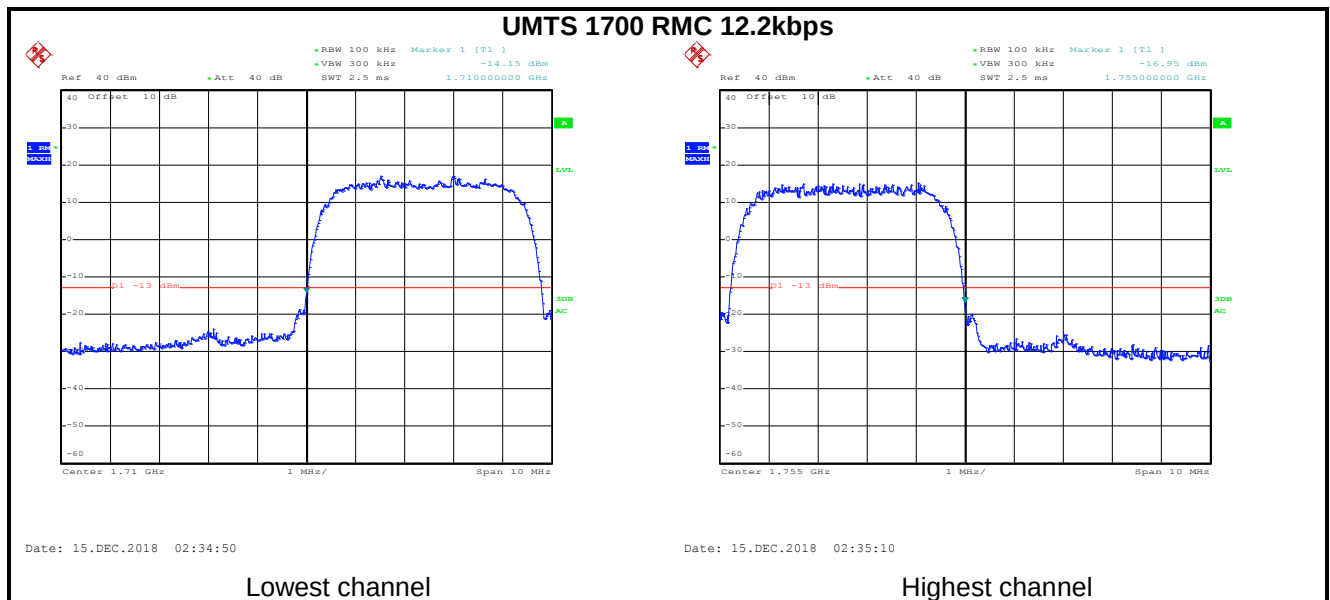
Date: 15.DEC.2018 02:38:01

Lowest channel

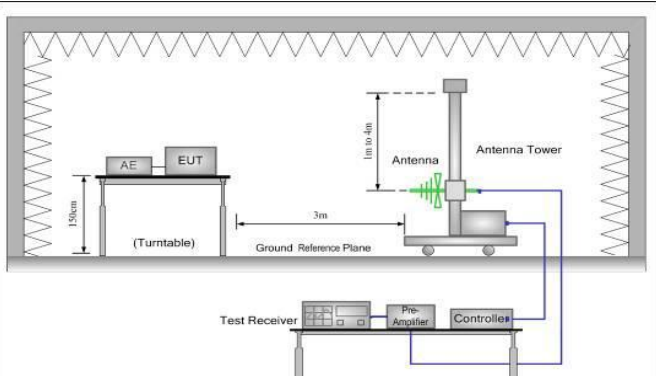
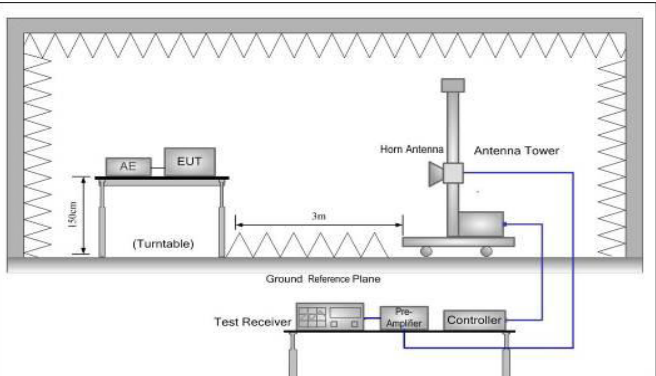


Date: 15.DEC.2018 02:37:34

Highest channel



6.6 Field strength of spurious radiation measurement

Test Requirement:	FCC part 22.917(a), FCC part 24.238(a), FCC part 27.53(h)
Test Method:	ANSI/TIA-603-D 2010
Limit:	-13dBm
Test setup:	Below 1GHz  Above 1GHz 
Test Procedure:	1. The EUT was placed on an 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. 2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. 3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method. 4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency. $ERP / EIRP = S.G. \text{ output (dBm) } + \text{Antenna Gain(dB/dBi) } - \text{Cable Loss (dB)}$
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details.
Test results:	Passed

Measurement Data (worst case):

GSM850				
Lowest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1648.40	Vertical	-52.31	-13.00	Pass
2472.60	V	-55.83		
3296.80	V	-54.54		
1648.40	Horizontal	-54.02	-13.00	Pass
2472.60	H	-55.35		
3296.80	H	-54.42		
Middle channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.20	Vertical	-54.98	-13.00	Pass
2509.80	V	-54.34		
3346.40	V	-54.01		
1673.20	Horizontal	-54.00	-13.00	Pass
2509.80	H	-54.27		
3346.40	H	-52.97		
Highest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1697.60	Vertical	-55.32	-13.00	Pass
2546.40	V	-53.64		
3395.20	V	-54.09		
1697.60	Horizontal	-54.66	-13.00	Pass
2546.40	H	-53.68		
3395.20	H	-53.64		
Remark:				
1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.				

PCS1900				
Lowest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3700.40	Vertical	-52.00	-13.00	Pass
5550.60	V	-45.36		
3700.40	Horizontal	-54.09	-13.00	Pass
5550.60	H	-44.81		
Middle channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-41.74	-13.00	Pass
5640.00	V	-41.85		
3760.00	Horizontal	-41.74	-13.00	Pass
5640.00	H	-41.85		
Highest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3819.60	Vertical	-41.79	-13.00	Pass
5729.40	V	-41.94		
3819.60	Horizontal	-52.70	-13.00	Pass
5729.40	H	-46.14		
Remark:				
1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.				

WCDMA BAND V 12.2k RMC				
Lowest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1652.80	Vertical	-54.50	-13.00	Pass
2479.20	V	-47.41		
3305.60	V	-53.80		
1652.80	Horizontal	-53.06	-13.00	Pass
2479.20	H	-51.56		
3305.60	H	-53.62		
Middle channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1673.20	Vertical	-52.16	-13.00	Pass
2509.80	V	-44.64		
3346.40	V	-54.53		
1673.20	Horizontal	-53.01	-13.00	Pass
2509.80	H	-49.36		
3346.40	H	-54.77		
Highest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1693.20	Vertical	-57.31	-13.00	Pass
2539.80	V	-44.52		
3386.40	V	-54.44		
1693.20	Horizontal	-58.79	-13.00	Pass
2539.80	H	-46.08		
3386.40	H	-53.77		
Remark:				
1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.				

WCDMA Band II 12.2k RMC				
Lowest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3704.80	Vertical	-53.28	-13.00	Pass
5557.20	V	-48.28		
3704.80	Horizontal	-54.03	-13.00	Pass
5557.20	H	-49.01		
Middle channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3760.00	Vertical	-52.88	-13.00	Pass
5640.00	V	-47.90		
3760.00	Horizontal	-54.10	-13.00	Pass
5640.00	H	-47.46		
Highest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3815.20	Vertical	-51.37	-13.00	Pass
5722.80	V	-47.61		
3815.20	Horizontal	-53.34	-13.00	Pass
5722.80	H	-46.40		
Remark:				
1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.				

WCDMA Band IV 12.2k RMC				
Lowest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3424.40	Vertical	-52.91	-13.00	Pass
5136.60	V	-41.65		
3424.40	Horizontal	-52.72	-13.00	Pass
5136.60	H	-41.67		
Middle channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3464.80	Vertical	-52.25	-13.00	Pass
5197.20	V	-35.26		
3464.80	Horizontal	-50.30	-13.00	Pass
5197.20	H	-39.50		
Highest channel				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
3505.20	Vertical	-53.17	-13.00	Pass
5257.80	V	-36.47		
3505.20	Horizontal	-53.30	-13.00	Pass
5257.80	H	-39.29		
Remark:				
1. The emission levels of below 1 GHz are very lower than the limit and not show in test report.				

6.7 Frequency stability V.S. Temperature measurement

Test Requirement:	FCC Part 22.355, FCC Part 24.235, FCC Part 27.54, FCC Part 2.1055(a)(1)(b)
Test Method:	ANSI/TIA-6-3-D 2010
Limit:	±2.5 ppm
Test setup:	The diagram illustrates the test setup. A Power Source is connected to a Temperature & Humidity Chamber. Inside the chamber is the EUT (Equipment Under Test). A Divider is connected to the EUT and also to two external devices, SS (Spectrum Analyzer) and SA (Spectrum Analyzer).
Test procedure:	1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

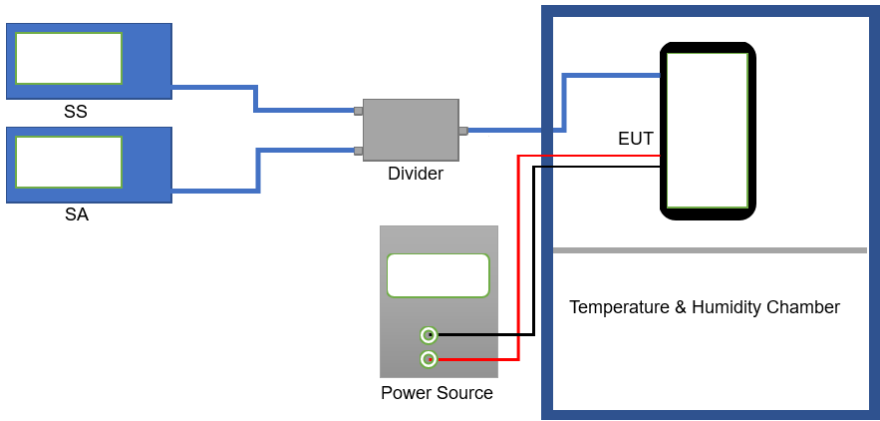
Measurement Data (the worst channel):

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.85	-30	173	0.206789	±2.5	Pass
	-20	154	0.184078		
	-10	135	0.161367		
	0	124	0.148219		
	10	113	0.135071		
	20	141	0.168539		
	30	138	0.164953		
	40	127	0.151805		
	50	116	0.138656		
Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.85	-30	177	0.09415	±2.5	Pass
	-20	154	0.08191		
	-10	140	0.07447		
	0	128	0.06809		
	10	124	0.06596		
	20	115	0.06117		
	30	106	0.05638		
	40	137	0.07287		
	50	145	0.07713		
Note: Only the worst case shown in the report.					

Reference Frequency: EGPRS850 Middle channel=190 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.85	-30	176	0.210375	±2.5	Pass
	-20	157	0.187664		
	-10	138	0.164953		
	0	127	0.151805		
	10	116	0.138656		
	20	144	0.172125		
	30	141	0.168539		
	40	130	0.155391		
	50	119	0.142242		
Reference Frequency: EGPRS 1900 Middle channel=661 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.85	-30	181	0.096277	±2.5	Pass
	-20	158	0.084043		
	-10	144	0.076596		
	0	132	0.070213		
	10	128	0.068085		
	20	119	0.063298		
	30	110	0.058511		
	40	141	0.075000		
	50	149	0.079255		
Note: Only the worst case shown in the report.					

Reference Frequency: WCDMA BAND V 12.2k RMC Middle channel=4183 channel=836.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.85	-30	168	0.200813	±2.5	Pass
	-20	141	0.168539		
	-10	134	0.160172		
	0	121	0.144633		
	10	107	0.127899		
	20	159	0.190055		
	30	161	0.192446		
	40	137	0.163758		
	50	144	0.172125		
Reference Frequency: WCDMA BAND II 12.2k RMC Middle channel=9400 channel=1880MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.85	-30	188	0.10000	±2.5	Pass
	-20	150	0.07979		
	-10	141	0.07500		
	0	164	0.08723		
	10	143	0.07606		
	20	125	0.06649		
	30	146	0.07766		
	40	134	0.07128		
	50	150	0.07979		
Reference Frequency: UMTS1700 12.2k RMC Middle channel=1413 channel=1732.6MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.85	-30	174	0.100427	±2.5	Pass
	-20	144	0.083112		
	-10	145	0.083689		
	0	128	0.073877		
	10	110	0.063488		
	20	146	0.084266		
	30	170	0.098118		
	40	160	0.092347		
	50	131	0.075609		
Note: Only the worst case shown in the report.					

6.8 Frequency stability V.S. Voltage measurement

Test Requirement:	FCC Part 22.355, FCC Part 24.235, FCC Part 27.54, FCC Part 2.1055(d)(2)
Test Method:	ANSI/TIA-603-D 2010
Limit:	±2.5ppm
Test setup:	 The diagram illustrates the test setup. On the left, there are two blue boxes labeled 'SS' (Signal Source) and 'SA' (Spectrum Analyzer). Both are connected to a central grey box labeled 'Divider'. The output of the 'Divider' is connected to a black box labeled 'EUT' (Equipment Under Test) inside a larger blue box labeled 'Temperature & Humidity Chamber'. Below the chamber, there is a grey box labeled 'Power Source' with two green circles representing terminals. Red and black wires connect the 'Power Source' to the 'EUT'.
Test procedure:	1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 5.8 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data (the worst channel):

Reference Frequency: GSM850 Middle channel=190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.40	84	0.100406	±2.5	Pass
	3.85	77	0.092039		
	3.50	67	0.080086		
Reference Frequency: PCS1900 Middle channel=661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.40	88	0.04681	±2.5	Pass
	3.85	72	0.03830		
	3.50	78	0.04149		
Reference Frequency: EGPRS 850 Middle channel= 190 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.40	98	0.117141	±2.5	Pass
	3.85	90	0.107578		
	3.50	72	0.086063		
Reference Frequency: EGPRS 1900 Middle channel= 661 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.40	87	0.046277	±2.5	Pass
	3.85	76	0.040426		
	3.50	88	0.046809		
Note: Only the worst case shown in the report.					

Note: Only the worst case shown in the report.

Reference Frequency: UMTS 850 12.2k RMC Middle channel=4183 channel=836.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.40	86	0.102797	±2.5	Pass
	3.85	92	0.109969		
	3.50	65	0.077695		
Reference Frequency: UMTS 1900 12.2k RMC Middle channel=9400 channel=1880MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.40	80	0.042553	±2.5	Pass
	3.85	83	0.044149		
	3.50	71	0.037766		
Reference Frequency: UMTS1700 12.2k RMC Middle channel=1413 channel=1732.6MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	4.40	92	0.053099	2.5	Pass
	3.85	86	0.049636		
	3.50	59	0.034053		
Note: Only the worst case shown in the report.					