TEST REPORT

ETSI EN 301 511 V12.5.1 (2017-03)

MEASUREMENT AND TEST REPORT
For

OpenVox Communication Co., Ltd.

Room 624, 6/F, Tsinghua Information Port, Qingqing Road, Longhua Street, Longhua District, Shenzhen, Guangdong , China

Model: UC120P

2024-04-15

This Report Concerns:	**Equipment Type:**
☒ Original Report	IP-PBX

Test Engineer:	Blue Hu/ Blue Hu
Report Number:	TH2403326-C03-R01
Test Date:	2024-03-29 to 2024-04-15
Reviewed By:	Neo Dong/ Neo Dong
Approved By:	Prince Huang/ Prince Huang
Prepared By:	**Shenzhen Tian Hai Test Technology Co., Ltd.** 125-126, No.66, Zhangge Road, Zhangge Community, Fucheng Street, Longhua District, Shenzhen, Guangdong, China Tel: +86-755-86615100 Fax: +86-755-86615105

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen Tian Hai Test Technology Co., Ltd.

TEST REPORT

ETSI EN 301 511 V12.5.1 (2017-03)

Report Reference No.	TH2403326-C03-R01
Tested by (signature)	Blue Hu/
Reviewed by (signature)	Neo Dong/
Approved by (signature)	Prince Huang/
Date of issue	2024-04-15

Testing Laboratory Name	**Shenzhen Tian Hai Test Technology Co., Ltd.**
Address	125-126, No.66, Zhangge Road, Zhangge Community, Fucheng Street, Longhua District, Shenzhen, Guangdong, China
Testing location	Same as above
Applicant's Name	**OpenVox Communication Co., Ltd.**
Address	Room 624, 6/F, Tsinghua Information Port, Qingqing Road, Longhua Street, Longhua District, Shenzhen, Guangdong , China
Manufacturer's Name	**OpenVox Communication Co., Ltd.**
Address	Room 201, Building I, Jinchangda, Building 00082, Shangwei Industrial Zone, Zhangkengjing Community, Guanhu Street, Longhua District, Shenzhen, Guangdong, China
Test specification	
Standard	ETSI EN 301 511 V12.5.1 (2017-03)
TRF Originator	Shenzhen Tian Hai Test Technology Co., Ltd.
Master TRF	Dated 2019-03

Test item description	**IP-PBX**
Trade mark	OpenVox
Model and/or type reference	UC120P
Model Difference:	N/A
Rating(s)	DC12V,1A,12W
Note	N/A

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1 Test Standard

The tests were performed according to following standards:

ETSI EN 301 511 V12.5.1 (2017-03) – Global System for Mobile communications (GSM); Mobile Stations (MS) equipment; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

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2 Summary

2.1 Product Description

The "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

EUT Description:	IP-PBX
Trade mark:	OpenVox
Model No.:	UC120P
Tx/Rx Frequency Range:	GSM/GPRS 900: Tx: 880~915MHz; Rx: 925~960MHz GSM/GPRS 1800: Tx: 1710~1785 MHz; Rx:1805~1880MHz
Modulation Type:	GSM/GPRS:GMSK
GSM / GPRS Class	GPRS 900: 4,GPRS 1800: 1
Antenna Type:	SMA Antenna
Antenna Gain:	3dBi (Provided by customer)
Rating:	DC12V,1A,12W
Power Supply:	INPUT:100-240V~50/60Hz, 0.75A OUTPUT:12⎓ 2.0A 24W
Adapter:	Model:OLD120200AEU5D
Battery:	/
Sample No.	TH2403326-C03-R01#
Note:	/

2.2 Equipment Under Test

For more details, refer to the user's manual of the EUT.

2.3 EUT operation mode

The EUT and test equipment were configured for testing according to ETSI EN 301 511 V12.5.1 (2017-03), where refer to ETSI TS 151 010-1 V13.3.0 (2017-03) for details.

2.4 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

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2.5 Modifications

No modifications were implemented to meet testing criteria.

2.6 Test frequency channel

GSM900

Channel	Frequency (MHz)
975	880.2MHz
60	902.0MHz
124	914.8MHz

GSM1800

Channel	Frequency (MHz)
512	1710.2MHz
700	1747.8MHz
885	1784.8MHz

GPRS900

Channel	Frequency (MHz)
975	880.2MHz
60	902.0MHz
124	914.8MHz

GPRS1800

Channel	Frequency (MHz)
512	1710.2MHz
700	1747.8MHz
885	1784.8MHz

During testing, the EUT is setup by a system simulator (CMW500) followed the procedures in TS 151 010-1.

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2.6Test Conditions

	Normal Test Conditions	Extreme Test Conditions
Temperature	15°C - 35°C	0°C ~ 45°C Note: (1)
Relative Humidity	20% - 75%	N/A

Note:

(1) Where tests at extreme temperatures are required, measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer.
The HT 45°C and LT -0°C was declared by manufacturer, The EUT couldn't be operate normally with higher or lower temperature.

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3 Test Environment

3.1 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature: 25 °C
High Temperature: 45 °C
Low Temperature: 0 °C
Normal Voltage: 3.7V
High Voltage: 4.2V
Low Voltage: 3.4V
Relative Humidity: 55 %
Air Pressure: 989 HPa

3.2 Test Description

Summary of Test Result		
Item	**Description of Test**	**Result**
1	Transmitter - Frequency error and phase error	Pass
3	Frequency error and phase error in GPRS multislot configuration	Pass
4	Transmitter output power and burst timing	Pass
5	Transmitter - Output RF spectrum	Pass
6	Transmitter output power in GPRS multislot configuration	Pass
7	Output RF spectrum in GPRS multislot configuration	Pass
8	Conducted spurious emissions - MS allocated a channel	Pass
9	Conducted spurious emissions - MS in idle mode	Pass
10	Radiated spurious emissions - MS allocated a channel	Pass
11	Radiated spurious emissions - MS in idle mode	Pass
12	Receiver Blocking and spurious response - speech channels	Pass
13	Frequency error and Modulation accuracy in EGPRS Configuration	N/A
14	EGPRS Transmitter output power	N/A
15	Output RF spectrum in EGPRS configuration	N/A

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3.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 1" and TR-100028-02 "Electromagnetic compatibilityand Radio spectrum Matters (ERM);Uncertainties in the measurementof mobile radio equipment characteristics;Part 2 " and is documented in the Bontek Compliance Testing Laboratory quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similarto that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

3GPP TS 51.010-1	Test Description	Uncertainty
12.1.1	Conducted spurious emissions-MS Allocated a Channel Emissions@100kHz<f<2GHz Emissions@2GHz <f<12.75GHz	 0.593dB 1.123 dB
12.1.2	Conducted spurious emissions- MS in Idle Mode Emissions@100kHz<f<2GHz Emissions@2GHz <f<12.75GHz	 0.649 dB 1.123 dB
12.2.1 12.2.2	Radiated spurious emissions	2.2dB
13.1 13.2 13.16.1 13.17.1 13.17.2	Frequency error and phase error Frequency error under multipath and interference conditions Frequency error and phase error in GPRS multislot configuration Frequency error and Modulation accuracy in EGPRS Configuration Frequency error under multipath and interference conditions in EGPRS Configuration	Freq Err<11.5Hz RMS Phase Err 1.0degrees Peak Phase Error 4.0degrees
13.3.4.1 13.16.2.4.1 13.17.3.4.1	Transmitter output power and burst timing Transmitter output power in GPRS multislot configuration EGPRS Transmitter output power	0.593dB
13.4 13.16.3 13.17.4	Output RF spectrum Transmitter output power in GPRS(or EGPRS)multislot configuration	0.593dB
14.7.1 14.18.5	Receiver Blocking and spurious response - speech channels Blocking and spurious response in EGPRS Configuration Wanted Signal@f<2GHz Blocking Signal@100kHz<f<2GHz Blocking Signal@2GHz<f<12.75GHz	 0.649 dB 0.593 dB 1.035 dB

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

(3) The measurement uncertainty is not included in the test result.

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3.4 Equipments Used during the Test

Radiated Emission (3m)				
Kind of Equipment	**Manufacturer**	**Type**	**S/N**	**Calibrate until**
EMI Test Receiver	R&S	ESR7	102333	2024-11-13
MXA Signal Analyzer	Keysight	N9020A	MY51281805	2024-04-20
Bilog Antenna	Schwarzbeck	VULB 9168	01148	2024-11-15
Pre-Amplifier	Schwarzbeck	BBV 9718 C	00109	2024-11-13
Pre-Amplifier	Schwarzbeck	BBV 9743 B	00253	2024-11-13
Pre-Amplifier	GUANGGU ELECTRONIC	GLNA18-40GK-5372	20210331001	2024-11-20
Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00148	2024-11-20
Horn Antenna	Schwarzbeck	BBHA 9120	02379	2024-11-14
Broadband horn antenna	OCEAN MICROWAVE	0BH100400	26999002	2024-11-20
Test software	FALA	/	FA-03A2 RE	/
RF Test System				
Wideband radio communication tester	R&S	CMW500	131134	2024-04-15
EXA Signal Analyzer	Keysight	N9010A	MY54488841	2024-04-15
MXG Vector Signal Generator	Agilent	N5182B	MY59100603	2024-04-15
Signal Generator	R&S	SMB100A	113650	2024-04-15
RF control unit	Tonscend	JS0806-2	21C8060397	/
DC Power supply	Agilent	E3632A	MY50120052	/
RF test system	Tonscend	/	V2.6.88.0346	/
Software Version Information				
EMI Conduction Test	FALA	E-EMC	Ver. EMC-CON 3A1.1	N/A
EMI Radiation test	FALA	E-EMC	Ver. FA-03A2 RE+	N/A
RF test system	Tonscend	TS1120-3	Ver: 2.6.88.0346	N/A
RF Communication test system	R&S	CMW 500	Ver: V3.7.90	N/A

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4 Test conditions and results

4.1 Frequency error and phase error

4.1.1. Definition

The frequency error is the difference in frequency, after adjustment for the effect of the modulation and phase error, between the RF transmission from the MS and either:
- the RF transmission from the BS; or
- the nominal frequency for the ARFCN used.

The phase error is the difference in phase, after adjustment for the effect of the frequency error, between the RF transmission from the MS and the theoretical transmission according to the intended modulation.

4.1.2 Test Procedure Limits

Frequency error
For all measured bursts, the frequency error, shall be less than 10E-7.

Phase error
For all measured bursts, the RMS phase error, shall not exceed 5 degrees.
For all measured bursts, each individual phase error, shall not exceed 20 degrees.

4.1.3 Test Procedures

Follow the test procedure as described in TS 151 010-1 Clause 13.1.3 to measure the frequency error and phase error at normal, extreme and vibration conditions.

4.1.4 Test Result

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GSM 900 (Middle Channel)

MS under maximum level

GSM900	test condition	Frequency Error (Hz)	Limit (Hz)	Result	Phase error (deg)		Limit (deg)	Result
Frequency 897.4 (MHZ)	Normal	-2.45	90.2	Pass	RMS	0.66	5	Pass
					Peak	1.98	20	Pass
	L.V.L.T.	-2.25	90.2	Pass	RMS	0.68	5	Pass
					Peak	1.95	20	Pass
	L.V.H.T.	-2.65	90.2	Pass	RMS	0.69	5	Pass
					Peak	1.99	20	Pass
	H.V.L.T.	-2.43	90.2	Pass	RMS	0.79	5	Pass
					Peak	1.88	20	Pass
	H.V.H.T	-2.15	90.2	Pass	RMS	0.64	5	Pass
					Peak	1.92	20	Pass
	Vibration(X)	-2.50	90.2	Pass	RMS	0.68	5	Pass
					Peak	1.92	20	Pass
	Vibration(X)	-2.50	90.2	Pass	RMS	0.75	5	Pass
					Peak	1.93	20	Pass
	Vibration(X)	-2.50	90.2	Pass	RMS	0.65	5	Pass
					Peak	1.88	20	Pass

MS under minimum level

GSM900	test condition	Frequency Error (Hz)	Limit (Hz)	Result	Phase error (deg)		Limit (deg)	Result
Frequency 902 (MHZ)	Normal	-2.10	90.2	Pass	RMS	0.63	5	Pass
					Peak	1.75	20	Pass
	L.V.L.T.	-2.15	90.2	Pass	RMS	0.56	5	Pass
					Peak	1.70	20	Pass
	L.V.H.T.	-2.25	90.2	Pass	RMS	0.55	5	Pass
					Peak	1.57	20	Pass
	H.V.L.T.	-1.99	90.2	Pass	RMS	0.53	5	Pass
					Peak	1.56	20	Pass
	H.V.H.T	-2.05	90.2	Pass	RMS	0.67	5	Pass
					Peak	1.72	20	Pass
	Vibration(X)	-2.03	90.2	Pass	RMS	0.65	5	Pass
					Peak	1.73	20	Pass
	Vibration(X)	-2.03	90.2	Pass	RMS	0.59	5	Pass
					Peak	1.72	20	Pass
	Vibration(X)	-2.03	90.2	Pass	RMS	0.54	5	Pass
					Peak	1.74	20	Pass

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GSM1800 (Middle channel)

MS under maximum level

GSM1800	test condition	Frequency Error (Hz)	Limit (Hz)	Result	Phase error (deg)		Limit (deg)	Result
Frequency 1747.8 (MHZ)	Normal	-18.31	174.78	Pass	RMS	0.90	5	Pass
					Peak	3.31	20	Pass
	L.V.L.T.	-18.52	174.78	Pass	RMS	0.85	5	Pass
					Peak	3.25	20	Pass
	L.V.H.T.	-17.63	174.78	Pass	RMS	0.85	5	Pass
					Peak	3.30	20	Pass
	H.V.L.T.	-17.58	174.78	Pass	RMS	0.82	5	Pass
					Peak	3.26	20	Pass
	H.V.H.T	-17.40	174.78	Pass	RMS	0.89	5	Pass
					Peak	3.27	20	Pass
	Vibration(X)	-18.00	174.78	Pass	RMS	0.85	5	Pass
					Peak	3.25	20	Pass
	Vibration(X)	-18.00	174.78	Pass	RMS	0.83	5	Pass
					Peak	3.30	20	Pass
	Vibration(X)	-18.00	174.78	Pass	RMS	0.87	5	Pass
					Peak	3.40	20	Pass

MS under minimum level

GSM1800	test condition	Frequency Error (Hz)	Limit (Hz)	Result	Phase error (deg)		Limit (deg)	Result
Frequency 1747.8 (MHZ)	Normal	-6.75	174.78	Pass	RMS	0.75	5	Pass
					Peak	2.21	20	Pass
	L.V.L.T.	-6.65	174.78	Pass	RMS	0.72	5	Pass
					Peak	2.28	20	Pass
	L.V.H.T.	-6.55	174.78	Pass	RMS	0.73	5	Pass
					Peak	2.25	20	Pass
	H.V.L.T.	-6.72	174.78	Pass	RMS	0.74	5	Pass
					Peak	2.23	20	Pass
	H.V.H.T	-6.73	174.78	Pass	RMS	0.79	5	Pass
					Peak	2.21	20	Pass
	Vibration(X)	-8.00	174.78	Pass	RMS	0.71	5	Pass
					Peak	2.30	20	Pass
	Vibration(X)	-8.00	174.78	Pass	RMS	0.69	5	Pass
					Peak	2.22	20	Pass
	Vibration(X)	-8.00	174.78	Pass	RMS	0.75	5	Pass
					Peak	2.19	20	Pass

Test plots of normal test condition as below:

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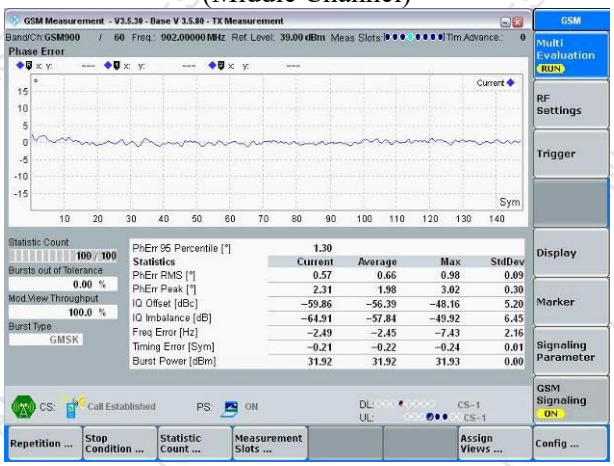
Normal Condition:

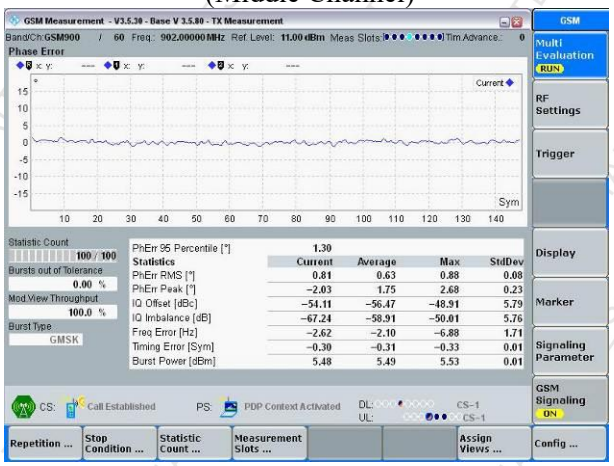
(GSM900)Power Control Level 5

(Middle Channel)



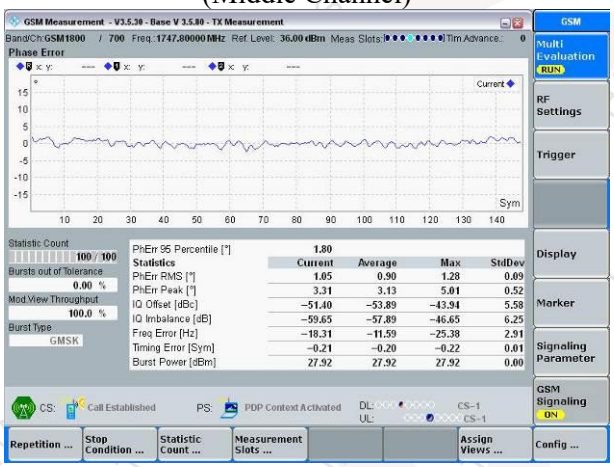
(GSM900)Power Control Level19

(Middle Channel)



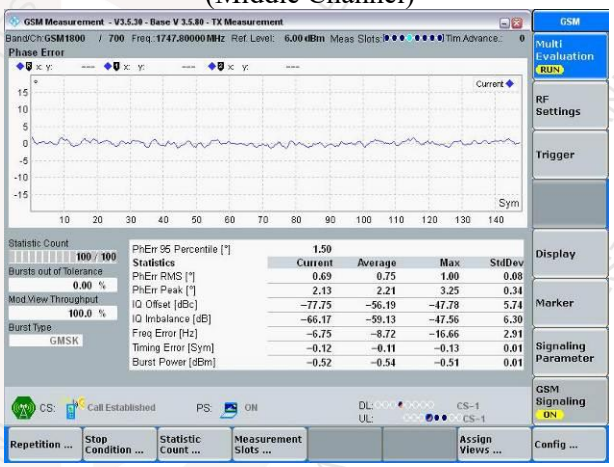
(GSM1800)Power Control Level 0

(Middle Channel)



(GSM1800)Power Control Level 15

(Middle Channel)



4.1.5 Frequency error and phase error in GPRS multislot configuration

4.1.6 Definition

The frequency error is the difference in frequency, after adjustment for the effect of the modulation and phase error, between the RF transmission from the MS and either:
-The RF transmission from the BS; or
-The nominal frequency for the ARFCN used.
The phase error is the difference in phase, after adjustment for the effect of the frequency error, between the RF transmission from the MS and the theoretical transmission according to the intended modulation.

4.1.7 Limits

Frequency error
For all measured bursts, the frequency error, shall be less than 10E-7.

Phase error
For all measured bursts, the RMS phase error, shall not exceed 5 degrees.
For all measured bursts, each individual phase error, shall not exceed 20 degrees.

4.1.8 Test Procedures

Follow the test procedure as described in TS 151 010-1 Clause 13.16.1.4 to measure the frequency error and phase error in GPRS multislot configuration at normal, extreme and vibration conditions.

4.1.9 Test Result

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GPRS 900 (Middle Channel)

MS under maximum level

DCSS900 (GPRS)	test condition	Frequency Error (Hz)	Limit (Hz)	Result	Phase error (deg)		Limit (deg)	Result
Frequency 902 (MHZ)	Normal	-2.55	90.2	Pass	RMS	0.66	5	Pass
					Peak	1.99	20	Pass
	L.V.L.T.	-2.58	90.2	Pass	RMS	0.62	5	Pass
					Peak	1.95	20	Pass
	L.V.H.T.	-2.52	90.2	Pass	RMS	0.68	5	Pass
					Peak	1.95	20	Pass
	H.V.L.T.	-2.53	90.2	Pass	RMS	0.67	5	Pass
					Peak	1.98	20	Pass
	H.V.H.T	-2.49	90.2	Pass	RMS	0.61	5	Pass
					Peak	1.96	20	Pass
	Vibration(X)	-2.00	90.2	Pass	RMS	0.68	5	Pass
					Peak	1.95	20	Pass
	Vibration(X)	-2.00	90.2	Pass	RMS	0.61	5	Pass
					Peak	1.89	20	Pass
	Vibration(X)	-2.00	90.2	Pass	RMS	0.61	5	Pass
					Peak	1.96	20	Pass

MS under minimum level

DCSS900 (GPRS)	test condition	Frequency Error (Hz)	Limit (Hz)	Result	Phase error (deg)		Limit (deg)	Result
Frequency 902 (MHZ)	Normal	-3.68	90.2	Pass	RMS	0.61	5	Pass
					Peak	1.80	20	Pass
	L.V.H.T.	-3.65	90.2	Pass	RMS	0.57	5	Pass
					Peak	1.79	20	Pass
	H.V.L.T.	-3.55	90.2	Pass	RMS	0.63	5	Pass
					Peak	1.78	20	Pass
	H.V.H.T	-3.62	90.2	Pass	RMS	0.62	5	Pass
					Peak	1.79	20	Pass
	Vibration(X)	-3.00	90.2	Pass	RMS	0.59	5	Pass
					Peak	1.77	20	Pass
	Vibration(X)	-3.00	90.2	Pass	RMS	0.59	5	Pass
					Peak	1.76	20	Pass
	Vibration(X)	-3.00	90.2	Pass	RMS	0.58	5	Pass
					Peak	1.77	20	Pass

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GPRS1800 (Middle channel)

MS under maximum level

DCS1800 (GPRS)	test condition	Frequency Error (Hz)	Limit (Hz)	Result	Phase error (deg)		Limit (deg)	Result
Frequency 1747.8 (MHZ)	Normal	-0.22	174.78	Pass	RMS	0.75	5	Pass
					Peak	2.21	20	Pass
	L.V.L.T.	-0.23	174.78	Pass	RMS	0.65	5	Pass
					Peak	2.21	20	Pass
	L.V.H.T.	-0.21	174.78	Pass	RMS	0.73	5	Pass
					Peak	2.17	20	Pass
	H.V.L.T.	-0.25	174.78	Pass	RMS	0.72	5	Pass
					Peak	2.26	20	Pass
	H.V.H.T	-0.26	174.78	Pass	RMS	0.69	5	Pass
					Peak	2.14	20	Pass
	Vibration(X)	-0.20	174.78	Pass	RMS	0.73	5	Pass
					Peak	2.24	20	Pass
	Vibration(X)	-0.20	174.78	Pass	RMS	0.75	5	Pass
					Peak	2.19	20	Pass
	Vibration(X)	-0.20	174.78	Pass	RMS	0.73	5	Pass
					Peak	2.18	20	Pass

MS under minimum level

DCS1800 (GPRS)	test condition	Frequency Error (Hz)	Limit (Hz)	Result	Phase error (deg)		Limit (deg)	Result
Frequency 1747.8 (MHZ)	Normal	-8.07	174.78	Pass	RMS	0.75	5	Pass
					Peak	2.20	20	Pass
	L.V.L.T.	-8.06	174.78	Pass	RMS	0.75	5	Pass
					Peak	2.15	20	Pass
	L.V.H.T.	-8.05	174.78	Pass	RMS	0.79	5	Pass
					Peak	2.17	20	Pass
	H.V.L.T.	-8.10	174.78	Pass	RMS	0.72	5	Pass
					Peak	2.12	20	Pass
	H.V.H.T	-8.12	174.78	Pass	RMS	0.71	5	Pass
					Peak	2.15	20	Pass
	Vibration(X)	-8.00	174.78	Pass	RMS	0.74	5	Pass
					Peak	2.14	20	Pass
	Vibration(X)	-8.00	174.78	Pass	RMS	0.74	5	Pass
					Peak	2.25	20	Pass
	Vibration(X)	-7.00	174.78	Pass	RMS	0.75	5	Pass
					Peak	2.13	20	Pass

Test plots of normal test condition as below:

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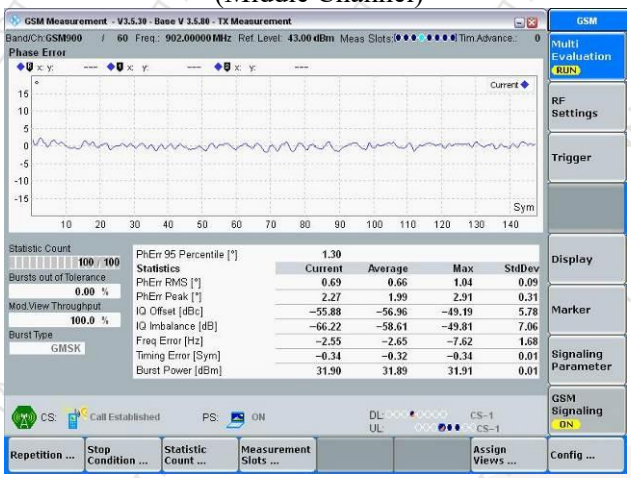
Normal Condition:

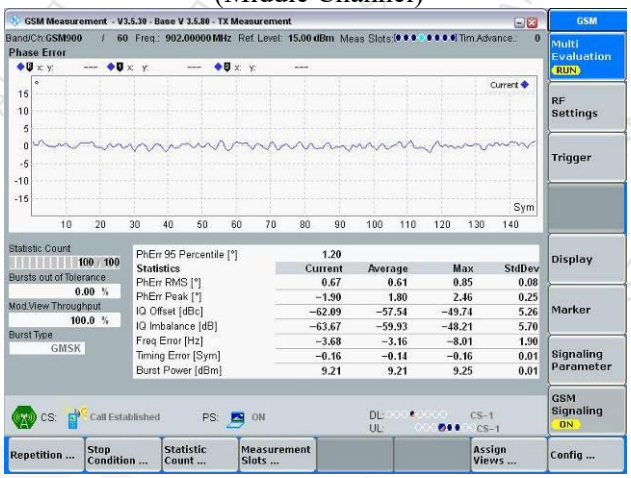
(GPRS900)Power Control Level 3

(Middle Channel)



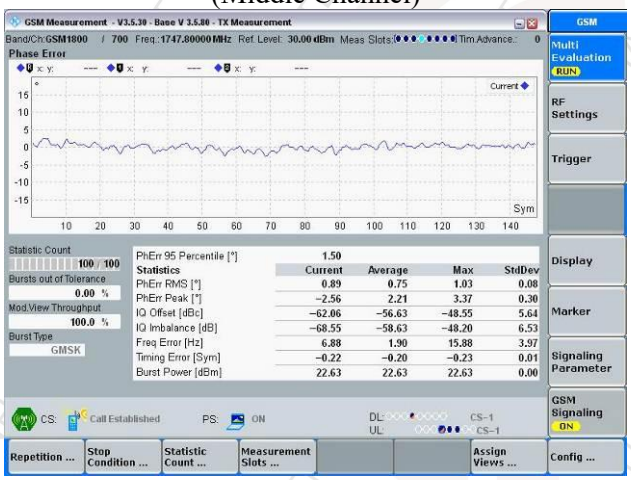
(GPRS900)Power Control Level17

(Middle Channel)



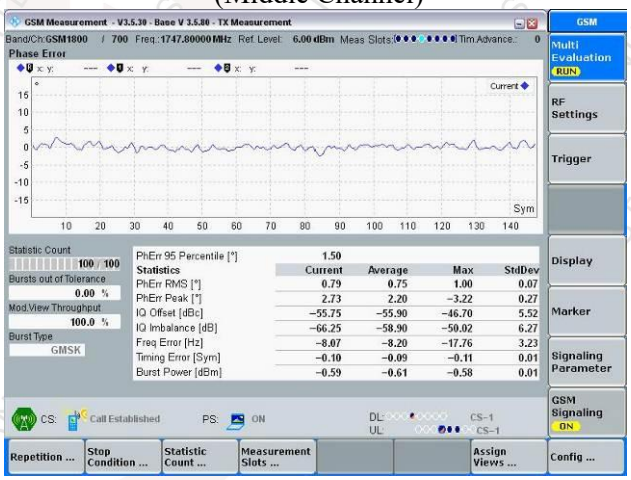
(GPRS1800)Power Control Level 3

(Middle Channel)



(GPRS1800)Power Control Level 18

(Middle Channel)



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4.2 Transmitter output power and burst timing

4.2.1 Applicable Standard Definition

The transmitter output power is the average value of the power delivered to an artificial antenna or radiated by the MS and its integral antenna, over the time that the useful information bits of one burst are transmitted. The transmit burst timing is the envelope of the RF power transmitted with respect to time. The timings are referenced to the transition from bit 13 to bit 14 of the Training Sequence ("midamble") before differential decoding. The timing of the modulation is referenced to the timing of the received signal from the SS.

4.2.2 Limits

1. The MS maximum output power shall be as defined in 3GPP TS 05.05, subclause 4.1.1, table for GMSK modulation, according to its power class, with a tolerance of ±2 dB under normal conditions; 3GPP TS 05.05, subclause 4.1.1, table for GMSK modulation.
2. The MS maximum output power shall be as defined in 3GPP TS 05.05, subclause 4.1.1, table for GMSK modulation, according to its power class, with a tolerance of ±2,5 dB under extreme conditions; 3GPP TS 05.05,
subclause 4.1.1, table for GMSK modulation; 3GPP TS 05.05 annex D in subclauses D.2.1 and D.2.2.
3. The power control levels shall have the nominal output power levels as defined in 3GPP TS 05.05, subclause 4.1.1, from the lowest power control level up to the maximum output power corresponding to the class
of the MS (for tolerance on maximum output power see conformance requirements 1), with a tolerance of ±3 dB, ±4 dB or ±5 dB under normal conditions; 3GPP TS 05.05, subclause 4.1.1.
4. The power control levels shall have the nominal output power levels as defined in 3GPP TS 05.05, 4.1.1, from the lowest power control level up to the maximum output power corresponding to the class of the MS (for
tolerance on maximum output power see conformance requirements 2), with a tolerance of ±4 dB, ±5 dB or ±6 dB under extreme conditions; 3GPP TS 05.05, subclause 4.1.1; 3GPP TS 05.05 annex D subclauses D.2.1 and D.2.2.
5. The output power actually transmitted by the MS at consecutive power control levels shall form a monotonic sequence and the interval between power control levels shall be 2 ± 1,5 dB (1 ± 1dB between power control
level 30 and 31 for PCS 1 900); 3GPP TS 05.05, subclause 4.1.1.
6. The transmitted power level relative to time for a normal burst shall be within the power/time template given in 3GPP TS 05.05, annex B in figure B.1:
6.1 Under normal conditions; 3GPP TS 05.05, subclause 4.5.2.
6.2 Under extreme conditions; 3GPP TS 05.05, subclause 4.5.2, 3GPP TS 05.05 annex D in subclauses D.2.1 and D.2.2.
7. When accessing a cell on the RACH and before receiving the first power command during a communication on a DCCH or TCH (after an IMMEDIATE ASSIGNMENT), all GSM, class 1 and class 2 DCS 1 800 and PCS 1 900 MS shall use the power control level defined by the MS_TXPWR_MAX_CCH parameter broadcast on the BCCH of the cell, or if MS_TXPWR_MAX_CCH corresponds to a power control level not supported by the MS as defined by its power class, the MS shall act as though the closest supported power control level had been broadcast. A Class 3 DCS 1 800 MS shall use the POWER_OFFSET parameter.
8. The transmissions from the MS to the BS, measured at the MS antenna, shall be 468,75 - TA bit periods behind the transmissions received from the BS, where TA is the last timing advance received from the current serving
BS. The tolerance on these timings shall be ±1 bit period:
8.1 Under normal conditions; 3GPP TS 05.10, subclause 6.4.
8.2 Under extreme conditions; 3GPP TS 05.10, subclause 6.4, 3GPP TS 05.05 annex D in subclauses D.2.1 and
D.2.2.
9. The transmitted power level relative to time for a random access burst shall be within the power/time template given in 3GPP TS 05.05, annex B in figure B.3:
9.1 Under normal conditions; 3GPP TS 05.05, subclause 4.5.2.
9.2 Under extreme conditions; 3GPP TS 05.05, subclause 4.5.2, 3GPP TS 05.05 annex D in subclauses D.2.1 and D.2.2.
10. The MS shall use a TA value of 0 for the Random Access burst sent:
10.1 Under normal conditions; 3GPP TS 05.10, subclause 6.6.
10.2 Under extreme conditions; 3GPP TS 05.10, subclause 6.6, 3GPP TS 05.05 annex D in subclauses D.2.1 and D.2.2.
11. In addition, if the network indicates support for MS power reduction by broadcasting parameter INIT_PWR_RED (see 3GPP TS 44.018) and if the latest RLA-value, RLA_C or RLA_P (see section 6.1) for the
measured signal strength from the BTS the MS is accessing is -48 dBm or higher immediately before the access attempt, the MS power shall not exceed.
PRED = min{(MS_TXPWR_MAX_CCH, (LB_MS_TXPWR_MAX_CCH + Band_offset), (P5-

INIT_PWR_RED)} for GSM 400, GSM 700, T-GSM 810, GSM 850 and GSM 900 and
PRED = min{ MS_TXPWR_MAX_CCH, (P0+2-INIT_PWR_RED)} for DCS 1800 and PCS 1900, where P5 and P0 are the power control levels for respective band in 3GPP TS 45.005.
The power reduction only applies for the first transmission of the access burst on the RACH. If the initial transmission fails due to no response from the network, the MS shall not apply power reduction in remaining transmissions. The power reduction also applies for DCCH or TCH (after an IMMEDIATE ASSIGNMENT) under the same received signal strength conditions until the ordered power control level in the SACCH L1 header differs from MS_TXPWR_MAX_CCH or LB_MS_TXPWR_MAX_CCH + Band_offset, whichever is
applicable or a L3 message with a valid power control command is received.
If INIT_PWR_RED is not broadcast, no power reduction shall apply.
3GPP TS 45.008, subclause 4.2, 3GPP TS 44.018, subclause 10.5.2.33b.11.1 Under normal conditions;
3GPP TS 05.10, subclause 6.6.

4.2.3 Test Procedures

Follow the test procedure as described in TS 151 010-1 Clause 13.3.3 to measure the transmitter output power and burst timingat normal and extreme conditions.

4.2.4 Test Result

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DCS 900 Output Power in GSM

High Channel F =914.80 MHz						
Power Control Level	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
5	31.44	32.02	32.06	32.04	32.05	Pass
6	30.52	30.64	30.61	30.62	30.63	Pass
7	30.44	28.63	28.6	28.61	28.59	Pass
8	26.68	26.7	26.67	26.68	26.66	Pass
9	24.71	24.73	24.7	24.71	24.69	Pass
10	22.75	22.76	22.73	22.74	22.72	Pass
11	20.79	20.79	20.76	20.77	20.75	Pass
12	18.82	18.84	18.81	18.82	18.8	Pass
13	16.87	16.87	16.84	16.85	16.83	Pass
14	14.93	14.94	14.91	14.92	14.9	Pass
15	12.98	13.01	12.98	12.99	12.97	Pass
16	11.04	11.04	11.01	11.02	11.01	Pass
17	9.05	9.07	9.04	9.05	9.03	Pass
18	7.11	7.1	7.07	7.08	7.06	Pass
19	5.17	6.01	5.93	5.99	5.87	Pass
Middle Channel F = 902.00 MHz						
γ=	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
5	31.82	31.31	31.36	31.38	31.35	Pass
6	30.95	30.57	30.55	30.56	30.58	Pass
7	30.82	28.56	28.54	28.55	28.57	Pass
8	26.56	26.57	26.55	26.56	26.58	Pass
9	24.61	24.62	24.6	24.61	24.63	Pass
10	22.65	22.67	22.65	22.66	22.68	Pass
11	20.67	20.7	20.68	20.69	20.71	Pass
12	18.72	18.73	18.71	18.72	18.74	Pass
13	16.69	16.7	16.68	16.69	16.71	Pass
14	14.66	14.67	14.65	14.66	14.68	Pass
15	12.59	12.62	12.6	12.61	12.63	Pass
16	11.67	11.67	11.65	11.66	11.68	Pass
17	9.74	9.76	9.74	9.75	9.77	Pass
18	7.88	7.89	7.87	7.88	7.9	Pass
19	5.38	3.22	3.24	3.23	3.28	Pass

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Low Channel F = 880.2 MHz						
γ=	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
5	32.60	31.31	31.28	31.27	31.29	Pass
6	31.75	30.57	30.55	30.54	30.56	Pass
7	30.60	28.61	28.58	28.57	28.59	Pass
8	26.63	26.65	26.63	26.62	26.64	Pass
9	24.66	24.7	24.68	24.67	24.69	Pass
10	22.67	22.69	22.67	22.66	22.68	Pass
11	20.71	20.74	20.72	20.71	20.73	Pass
12	18.69	18.71	18.69	18.68	18.71	Pass
13	16.74	16.74	16.72	16.71	16.73	Pass
14	14.79	14.81	14.79	14.78	14.8	Pass
15	12.84	12.88	12.86	12.85	12.87	Pass
16	10.86	10.87	10.85	10.84	10.86	Pass
17	8.91	8.92	8.9	8.89	8.91	Pass
18	7.02	7.05	7.03	7.02	7.04	Pass
19	5.63	6.02	6.01	5.91	5.95	Pass

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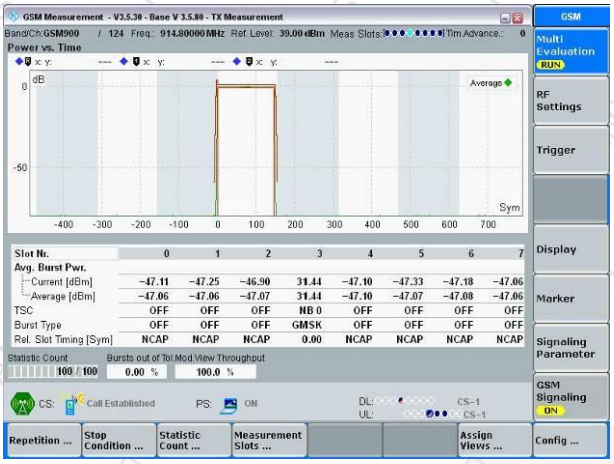
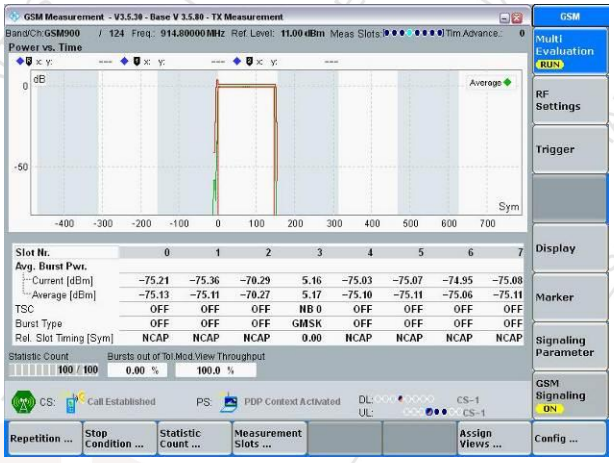
Normal Condition:

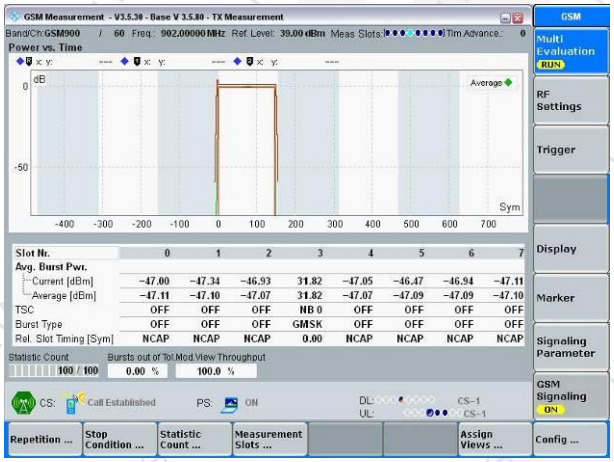
Normal Condition (γ=5), High Channel



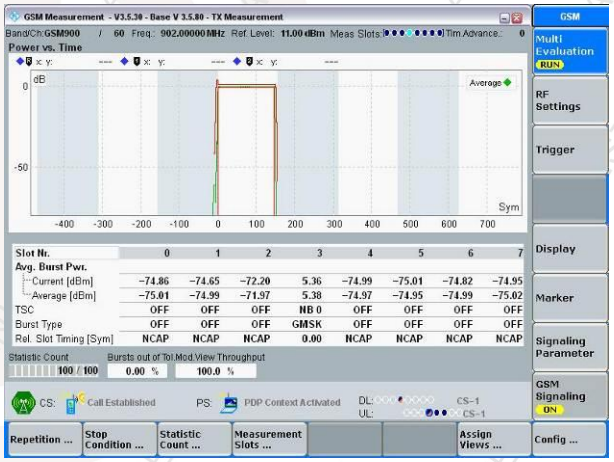
Normal Condition (γ=19), High Channel



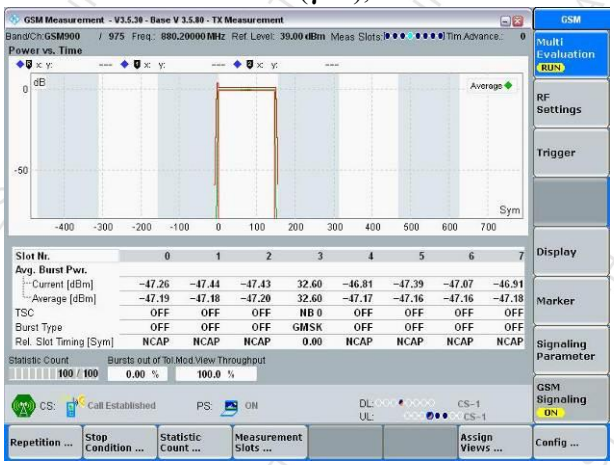
Normal Condition (γ=5), Middle Channel



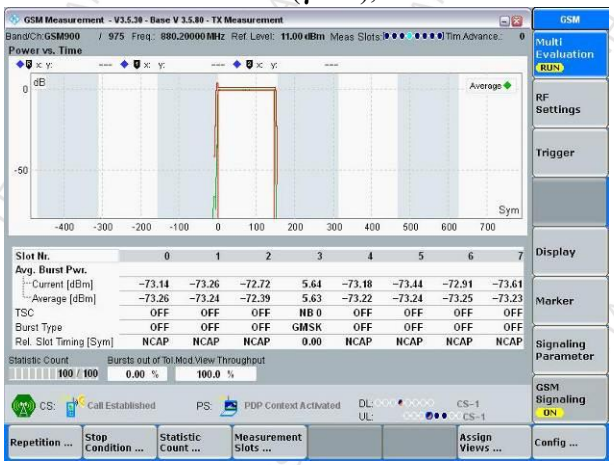
Normal Condition (γ=19), Middle Channel



Normal Condition (γ=5), Low Channel



Normal Condition (γ=19), Low Channel



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DCS1800 Output Power in GSM

High Channel F = 1784.8 MHz						
γ=	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
0	28.60	26.75	26.79	26.77	26.76	Pass
1	25.01	25.05	25.02	25.03	25.06	Pass
2	23.08	23.08	23.05	23.06	23.09	Pass
3	21.14	21.15	21.12	21.13	21.16	Pass
4	19.22	19.22	19.19	19.2	19.23	Pass
5	17.26	17.27	17.24	17.25	17.28	Pass
6	15.29	15.3	15.27	15.28	15.31	Pass
7	13.34	13.35	13.32	13.33	13.36	Pass
8	11.39	11.42	11.39	11.4	11.43	Pass
9	9.45	9.47	9.44	9.45	9.48	Pass
10	7.46	7.48	7.45	7.46	7.49	Pass
11	5.52	5.53	5.5	5.51	5.54	Pass
12	3.59	3.6	3.57	3.58	3.61	Pass
13	1.54	1.55	1.52	1.53	1.56	Pass
14	0.13	0.18	0.11	0.09	0.14	Pass
15	0.07	-13.42	-14.35	-14.37	-14.31	Pass
Middle Channel F = 1747.8 MHz						
γ=	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
0	27.81	29.42	29.51	29.48	29.47	Pass
1	25.41	25.44	25.47	25.48	25.46	Pass
2	23.48	23.47	23.5	23.51	23.49	Pass
3	21.53	21.54	21.57	21.58	21.56	Pass
4	19.58	19.57	19.6	19.61	19.59	Pass
5	17.63	17.6	17.63	17.64	17.62	Pass
6	15.62	15.63	15.66	15.67	15.65	Pass
7	13.67	13.66	13.69	13.7	13.68	Pass
8	11.71	11.73	11.76	11.77	11.75	Pass
9	9.78	9.78	9.81	9.82	9.81	Pass
10	7.82	7.83	7.86	7.87	7.85	Pass
11	5.86	5.86	5.89	5.9	5.88	Pass
12	3.95	3.97	3.89	3.91	3.99	Pass
13	1.86	1.8	1.87	1.84	1.82	Pass
14	0.03	0.03	0.06	0.07	0.05	Pass
15	-0.63	1.02	1.01	1.03	1.04	Pass

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Low Channel F = 1710.2 MHz						
γ=	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
0	27.2	27.61	27.57	27.54	27.59	Pass
1	25.47	25.46	25.51	25.47	25.49	Pass
2	23.52	23.53	23.57	23.54	23.56	Pass
3	21.57	21.56	21.61	21.57	21.59	Pass
4	19.63	19.59	19.63	19.6	19.62	Pass
5	17.64	17.62	17.66	17.63	17.65	Pass
6	15.72	15.69	15.73	15.7	15.72	Pass
7	13.76	13.74	13.78	13.75	13.77	Pass
8	11.79	11.77	11.81	11.78	11.8	Pass
9	9.85	9.84	9.88	9.85	9.87	Pass
10	7.88	7.87	7.91	7.88	7.90	Pass
11	5.01	4.99	5.03	5.01	5.02	Pass
12	3.09	3.08	3.12	3.09	3.11	Pass
13	1.24	1.19	1.26	1.25	1.27	Pass
14	0.15	0.15	0.19	0.16	0.18	Pass
15	-0.84	-3.11	-3.08	-3.15	-3.09	Pass

Test plots of normal test condition as below:

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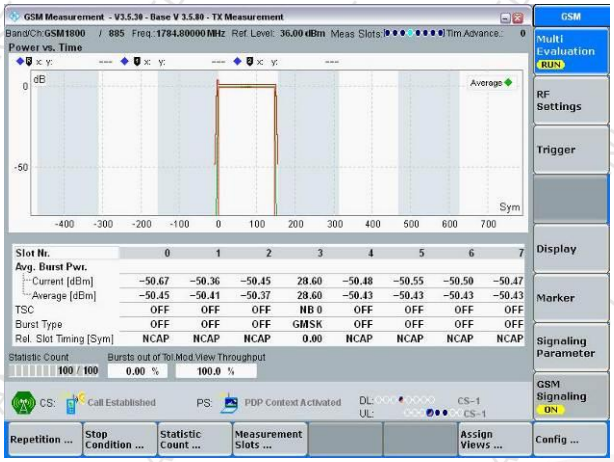
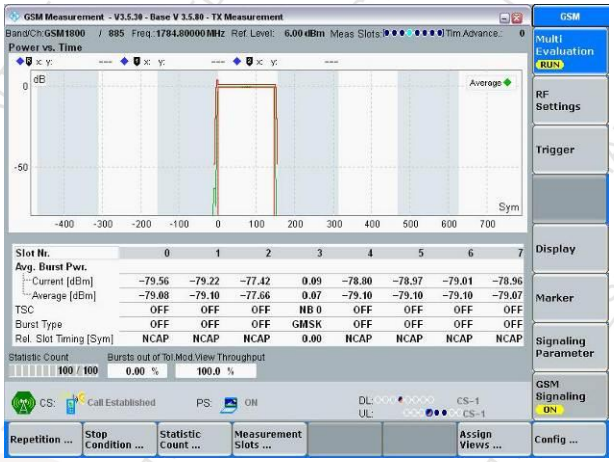
Normal Condition:

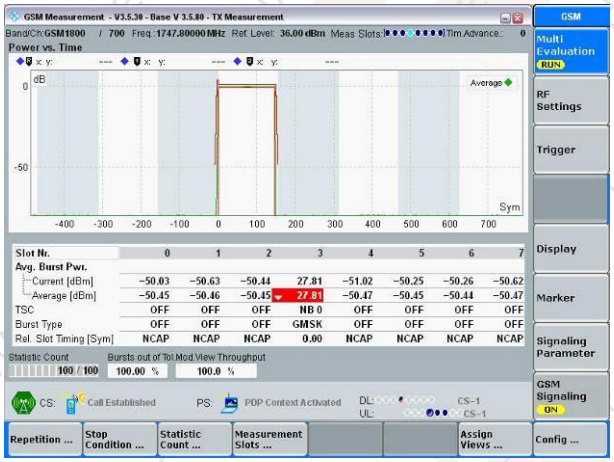
Normal Condition (γ=0), High Channel



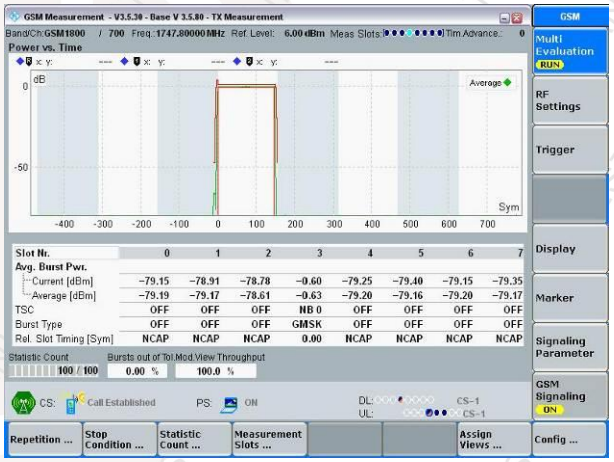
Normal Condition (γ=15), High Channel



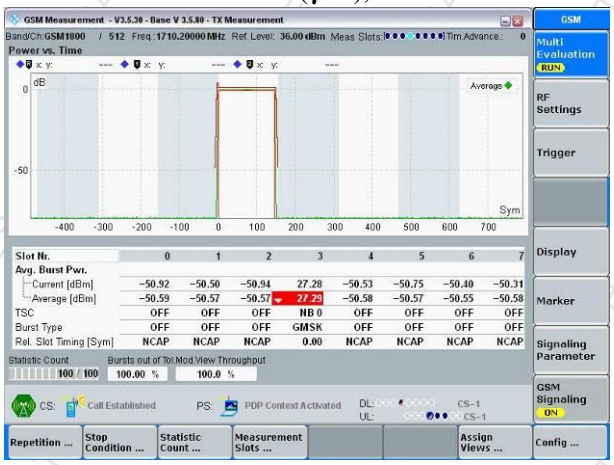
Normal Condition (γ=0), Middle Channel



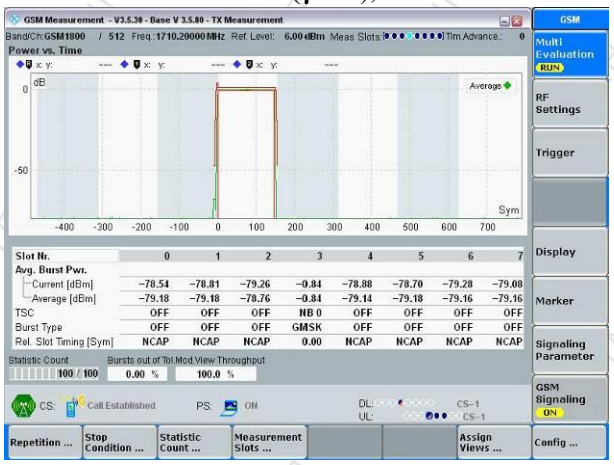
Normal Condition (γ=15), Middle Channel



Normal Condition (γ=0), Low Channel



Normal Condition (γ=15), Low Channel



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4.3. Output RF spectrum

4.3.1 Definition

The output RF spectrum is the relationship between the frequency offset from the carrier and the power, measured in a specified bandwidth and time, produced by the MS due to the effects of modulation and power ramping.

4.3.2 Limits

1.The level of the output RF spectrum due to modulation shall be no more than that given in table 4.7-1, table 4.7-2 and table 4.7-3.

Table 4.7-1: GSM 900 Spectrum due to modulation out to less than 1 800 kHz offset

	power levels in dB relative to the measurement at FT				
Power level	**Frequency offset (kHz)**				
(dBm)	**0-100**	**200**	**250**	**400**	**600 to < 1 800**
39	+0,5	-30	-33	-60	-66
37	+0,5	-30	-33	-60	-64
35	+0,5	-30	-33	-60	-62
<= 33	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-51

Table 13.16.3-2: DCS 1 800 Spectrum due to modulation out to less than 1 800 kHz offset

	power levels in dB relative to the measurement at FT				
Power level	**Frequency offset (kHz)**				
(dBm)	**0-100**	**200**	**250**	**400**	**600 to < 1 800**
<= 36	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-56

Table 4.7-3: Spectrum due to modulation from 1 800 kHz offset to the edge of the transmit band (wideband noise)

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power levels in dB relative to the measurement at FT						
GSM 900				**DCS 1 800**		
Power	**Frequency offset**			**Power**	**Frequency offset**	
Level	**kHz**			**level**	**KHz**	
(dBm)	**1 800 to < 3 000**	**3 000 to < 6 000**	**>= 6 000**	**(dBm)**	**1 800 to < 6 000**	**>= 6 000**
39	-69	-71	-77	36	-71	-79
37	-67	-69	-75	34	-69	-77
35	-65	-67	-73	32	-67	-75
<= 33	-63	-65	-71	30	-65	-73
				28	-63	-71
				26	-61	-69
				<= 24	-59	-67
The values above are subject to the minimum absolute levels (dBm) below.						
	-46	-46	-46		-51	-51

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2.The level of the output RF spectrum due to switching transients shall be no more than given in table 4.7-4 and 4.7-5.

Table 4.7-4: GSM 900 Spectrum due to switching transients

Power level	Maximum level for various offsets from carrier frequency			
	400 kHz	600 kHz	1 200 kHz	1 800 kHz
39 dBm	-13 dBm	-21 dBm	-21 dBm	-24 dBm
37 dBm	-15 dBm	-21 dBm	-21 dBm	-24 dBm
35 dBm	-17 dBm	-21 dBm	-21 dBm	-24 dBm
33 dBm	-19 dBm	-21 dBm	-21 dBm	-24 dBm
31 dBm	-21 dBm	-23 dBm	-23 dBm	-26 dBm
29 dBm	-23 dBm	-25 dBm	-25 dBm	-28 dBm
27 dBm	-23 dBm	-26 dBm	-27 dBm	-30 dBm
25 dBm	-23 dBm	-26 dBm	-29 dBm	-32 dBm
23 dBm	-23 dBm	-26 dBm	-31 dBm	-34 dBm
<= +21 dBm	-23 dBm	-26 dBm	-32 dBm	-36 dBm

Table 4.7-5: DCS 1 800 Spectrum due to switching transients

Power level	Maximum level for various offsets from carrier frequency			
	400 kHz	600 kHz	1200 kHz	1 800 kHz
36 dBm	-16 dBm	-21 dBm	-21 dBm	-24 dBm
34 dBm	-18 dBm	-21 dBm	-21 dBm	-24 dBm
32 dBm	-20 dBm	-22 dBm	-22 dBm	-25 dBm
30 dBm	-22 dBm	-24 dBm	-24 dBm	-27 dBm
28 dBm	-23 dBm	-25 dBm	-26 dBm	-29 dBm
26 dBm	-23 dBm	-26 dBm	-28 dBm	-31 dBm
24 dBm	-23 dBm	-26 dBm	-30 dBm	-33 dBm
22 dBm	-23 dBm	-26 dBm	-31 dBm	-35 dBm
<= +20 dBm	-23 dBm	-26 dBm	-32 dBm	-36 dBm

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3.Spurious emissions in the MS receive bands

Table 4.7-6: Spurious emissions in the MS receive bands

Band (MHz)	Spurious emissions level (dBm) GSM 900 and DCS 1 800
925 to 935	-67
935 to 960	-79
1 805 to 1 880	-71

4.3.3 Test Procedures

Follow the test procedure as described in TS 151 010-1 Clause 13.16.3.4 to measure the output RF spectrum in GPRS multislot configuration at normal and extreme conditions.

4.3.4 Test Results

Please refer to following:

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GSM900							
Channel	Power control level	conditions					Result
975	5	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	Pass
	19	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
60	5	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
	19	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
124	5	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
	19	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	

GSM1800							
Channel	Power control level	conditions					Result
512	0	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	Pass
	15	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
700	0	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
	15	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
885	0	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
	15	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	

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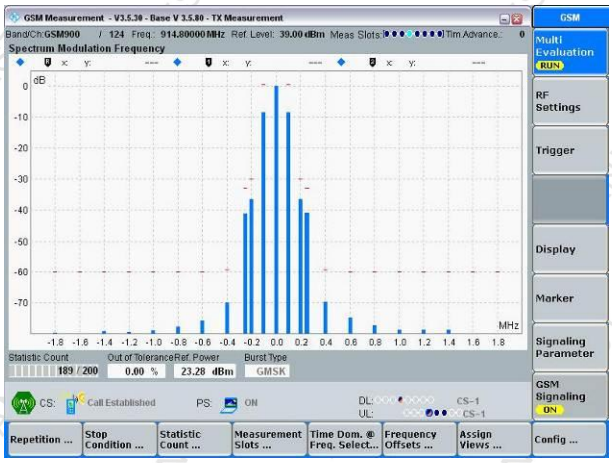
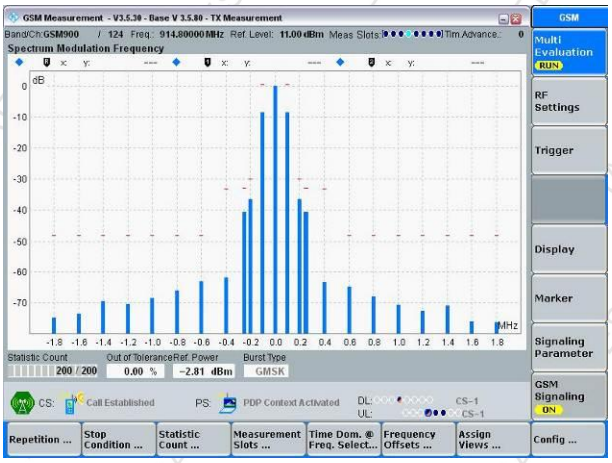
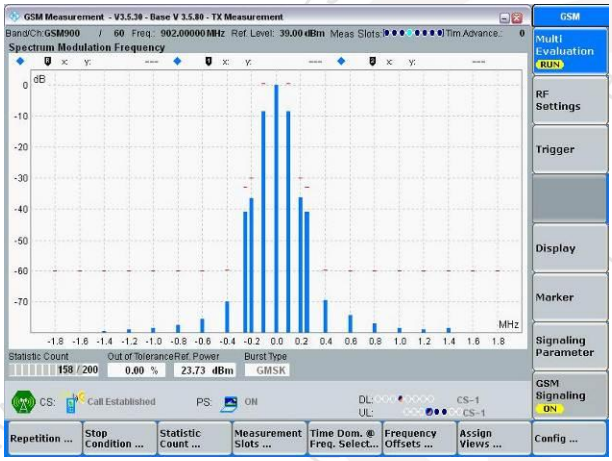
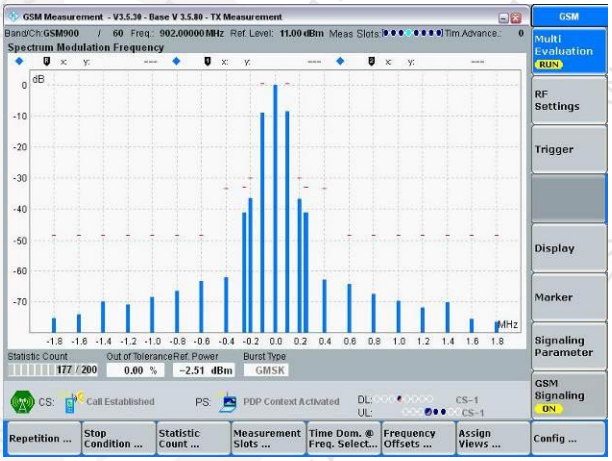
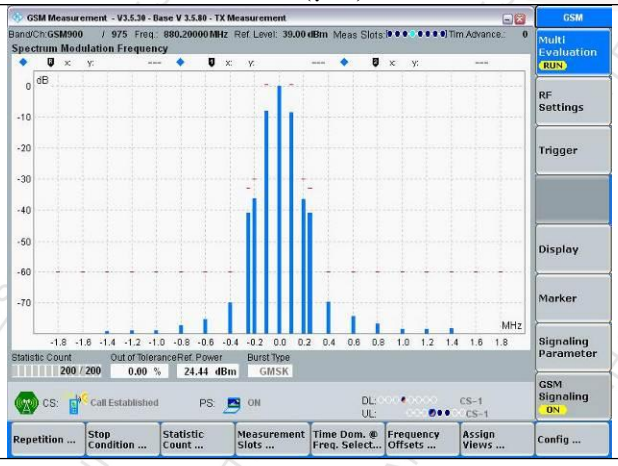
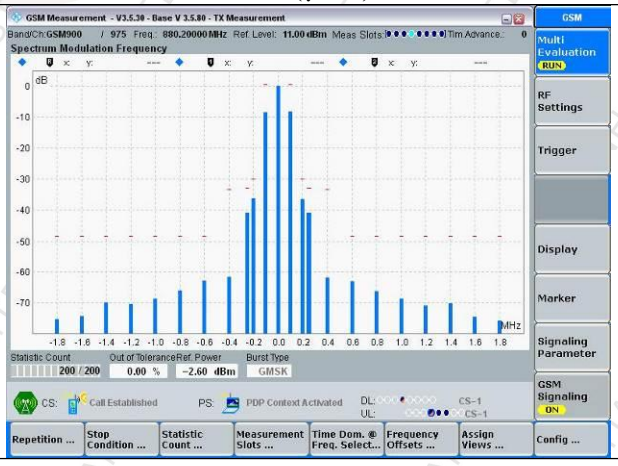
GSM 900

Normal Condition (γ=5), High Channel	Normal Condition (γ=19), High Channel
	
Normal Condition (γ=5),Middle Channel	Normal Condition (γ=19), Middle Channel
	
Normal Condition (γ=5), Low Channel	Normal Condition (γ=19), Low Channel
	

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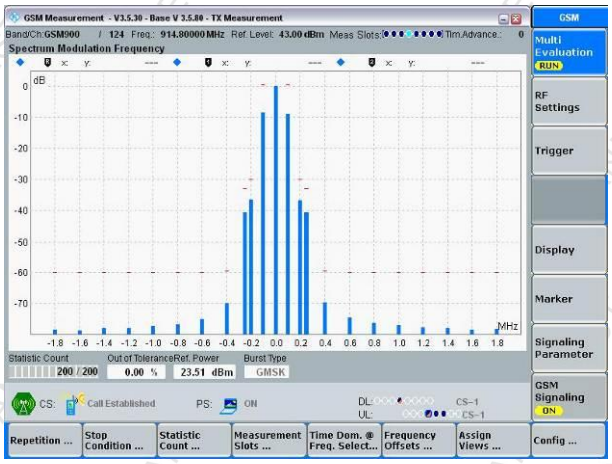
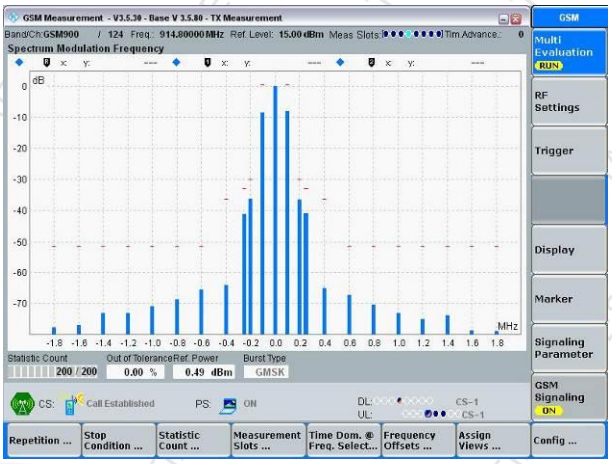
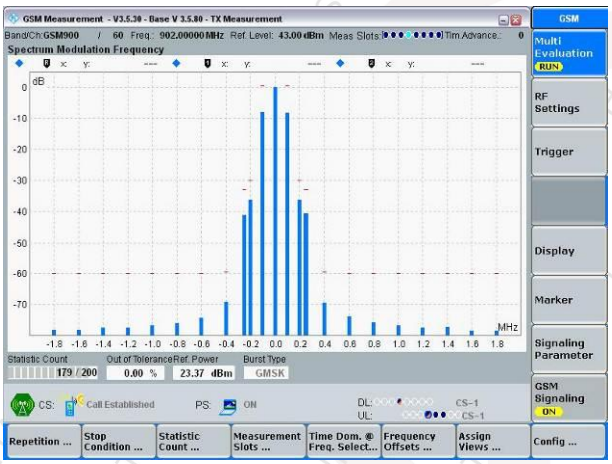
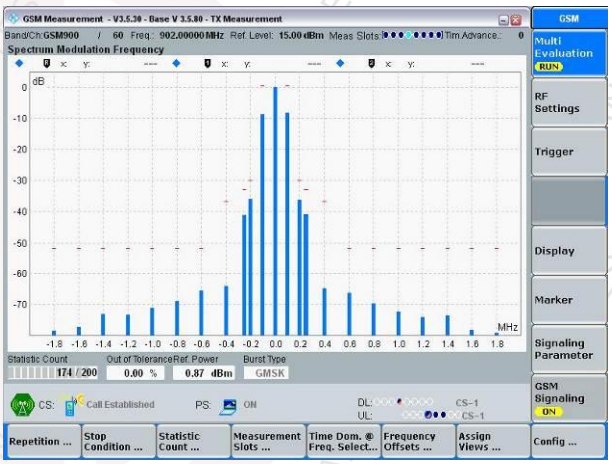
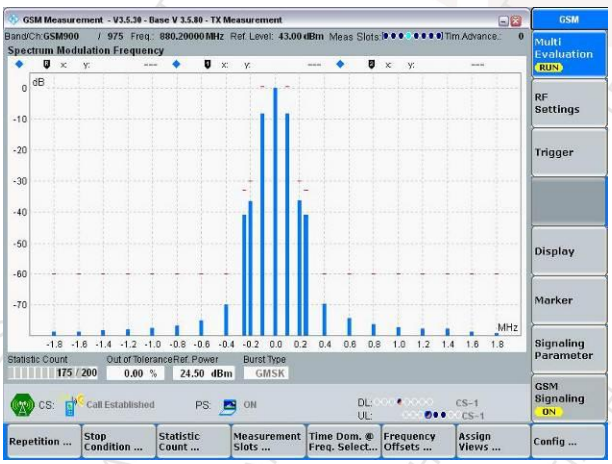
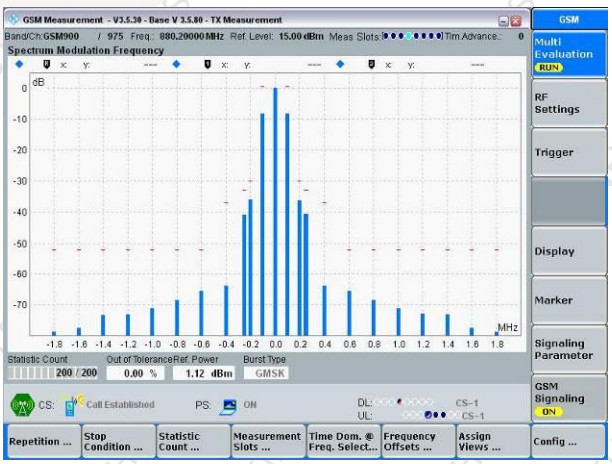
Extreme Condition

HT,HV Condition (γ=5), High Channel	HT,HV Condition (γ=19), High Channel
	
HT,HV Condition (γ=5), Middle Channel	HT,HV Condition (γ=19), Middle Channel
	
HT,HV Condition (γ=5), Low Channel	HT,HV Condition (γ=19), Low Channel
	

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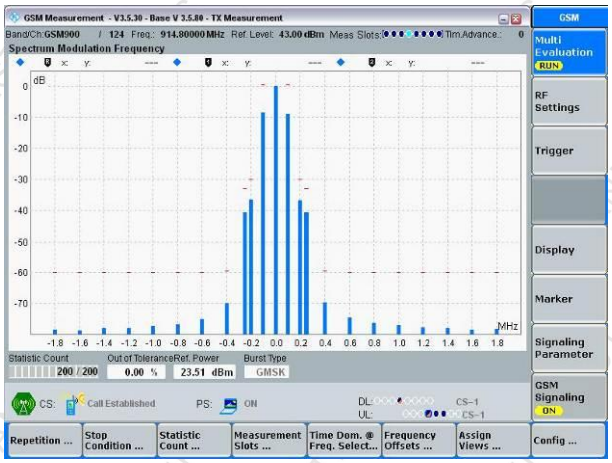
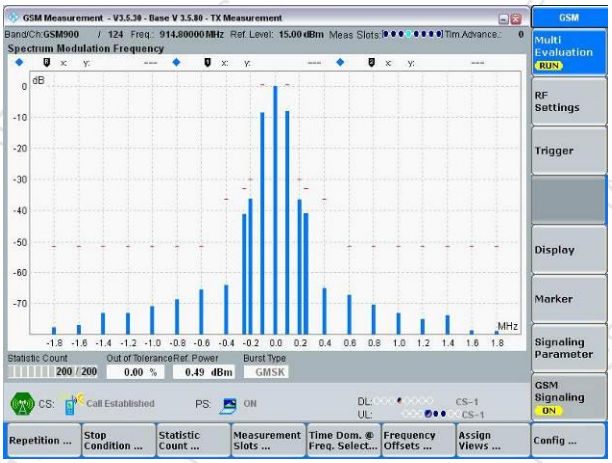
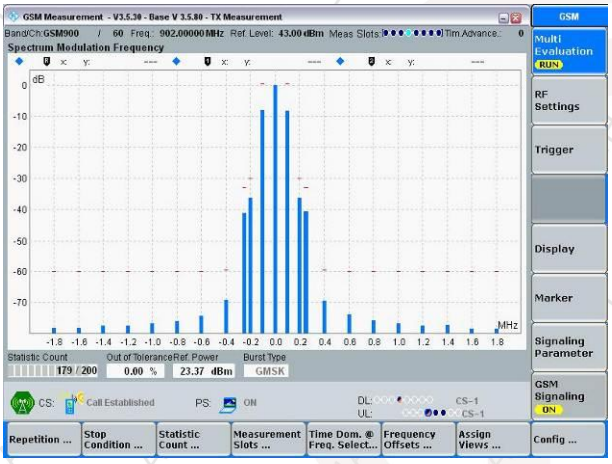
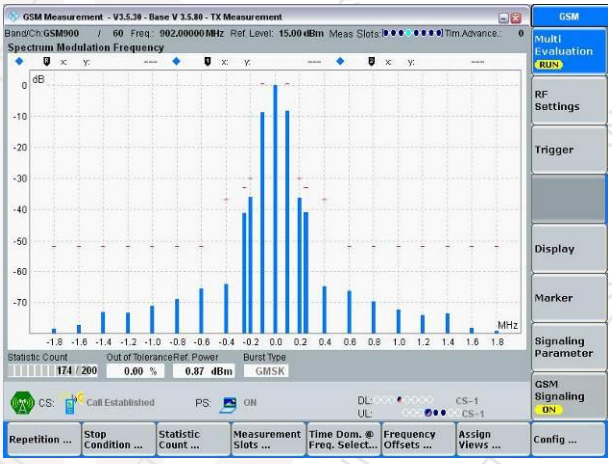
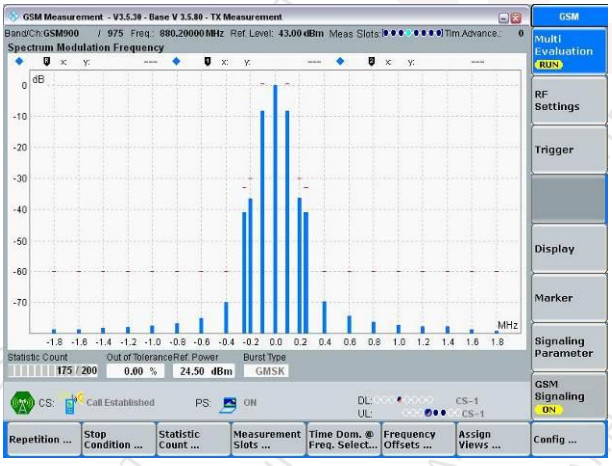
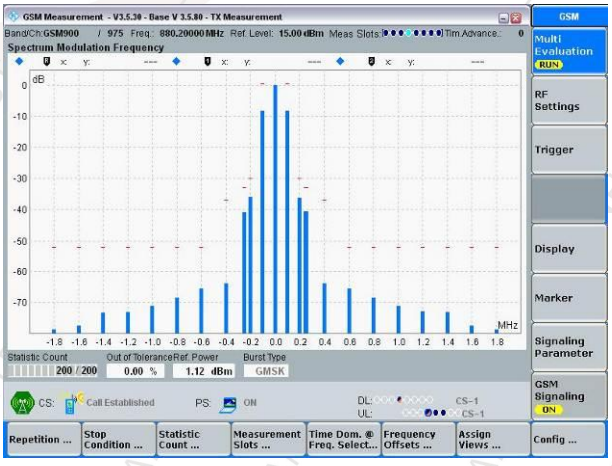
Extreme Condition

LT,HV Condition (γ=5), High Channel	LT,HV Condition (γ=19), High Channel
	
LT,HV Condition (γ=5), Middle Channel	LT,HV Condition (γ=19), Middle Channel
	
LT,HV Condition (γ=5), Low Channel	LT,HV Condition (γ=19), Low Channel
	

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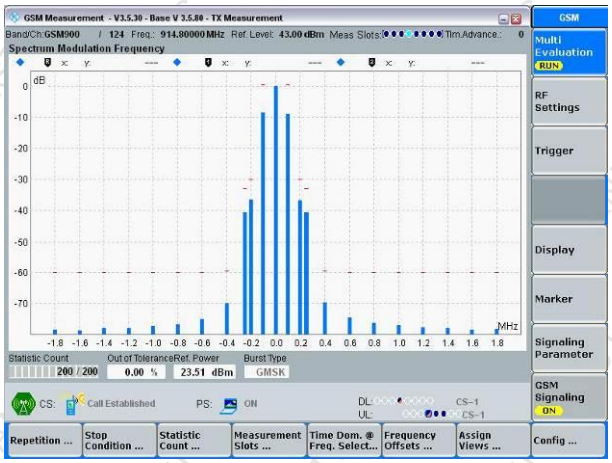
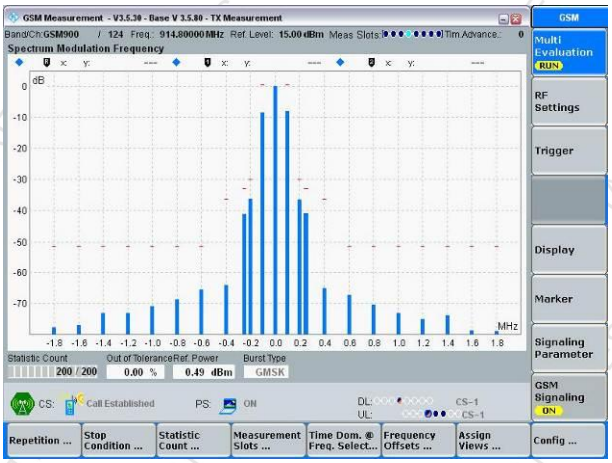
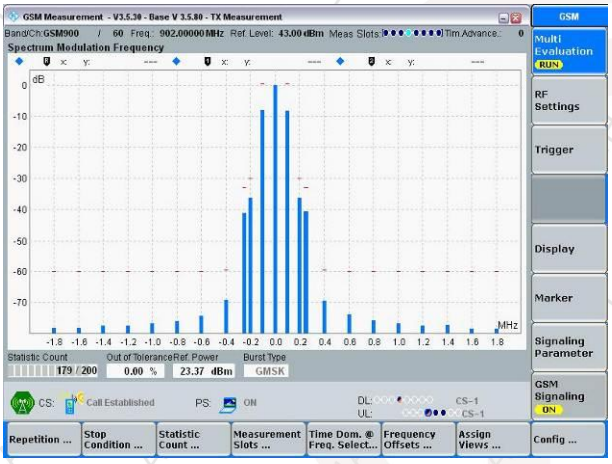
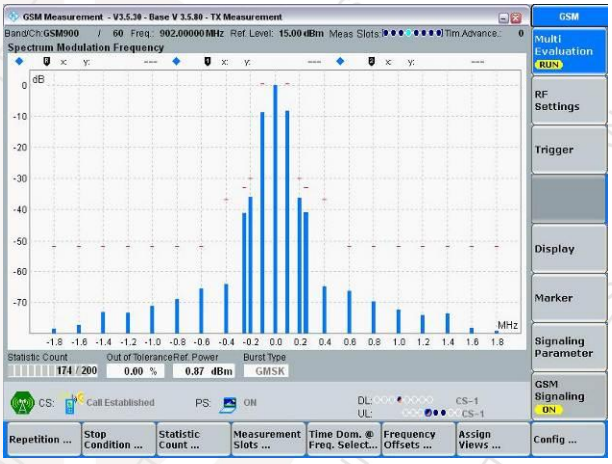
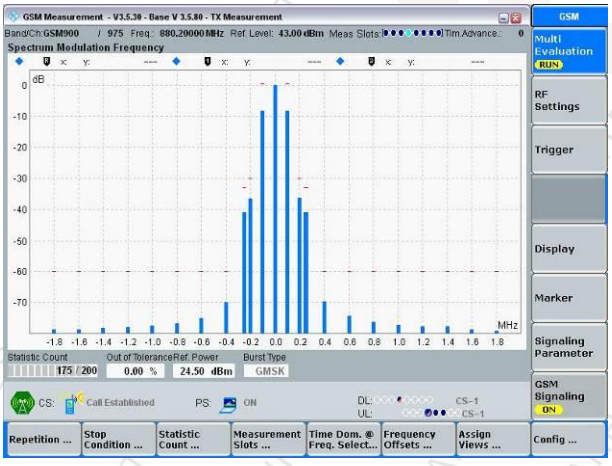
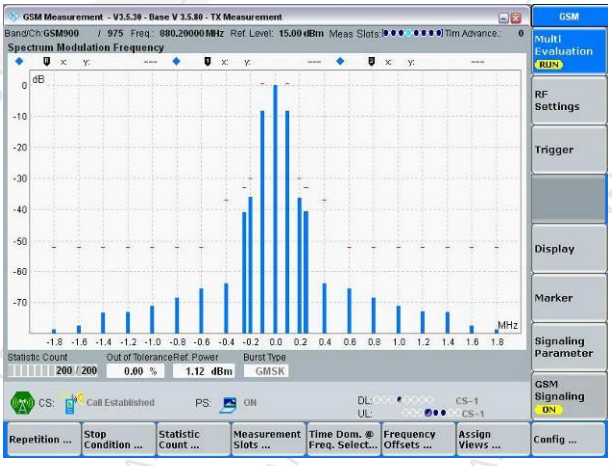
Extreme Condition

LT,LV Condition (γ=5), High Channel	LT,LV Condition (γ=19), High Channel
	
LT,LV Condition (γ=5), Middle Channel	LT,LV Condition (γ=19), Middle Channel
	
LT,LV Condition (γ=5), Low Channel	LT,LV Condition (γ=17), Low Channel
	

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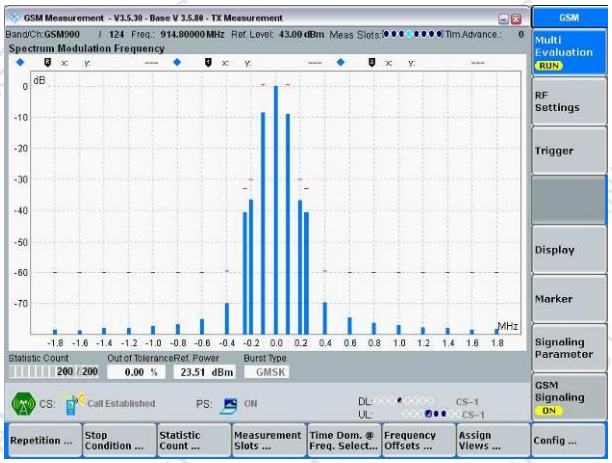
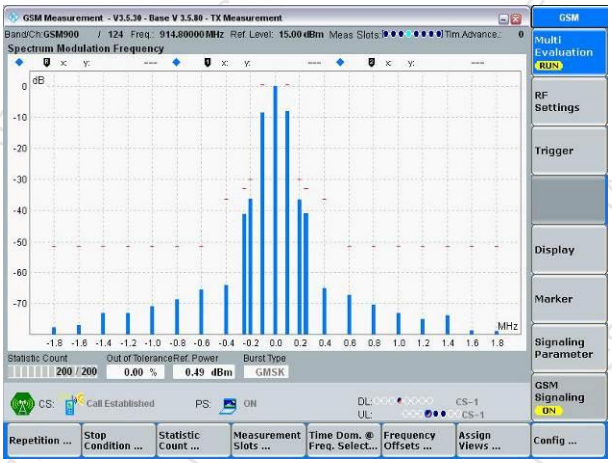
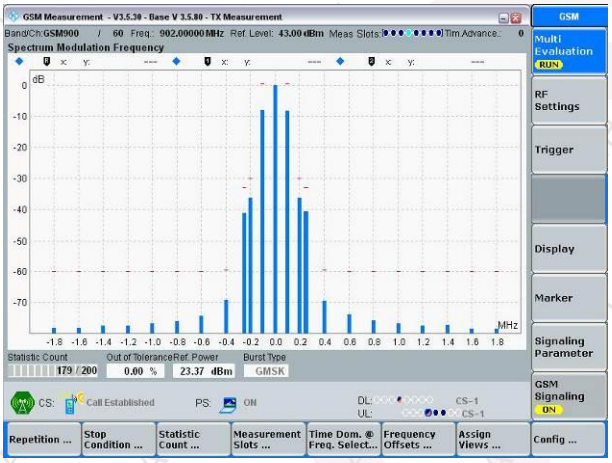
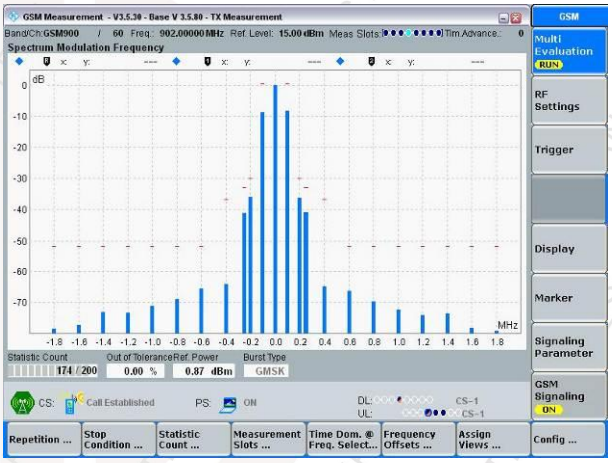
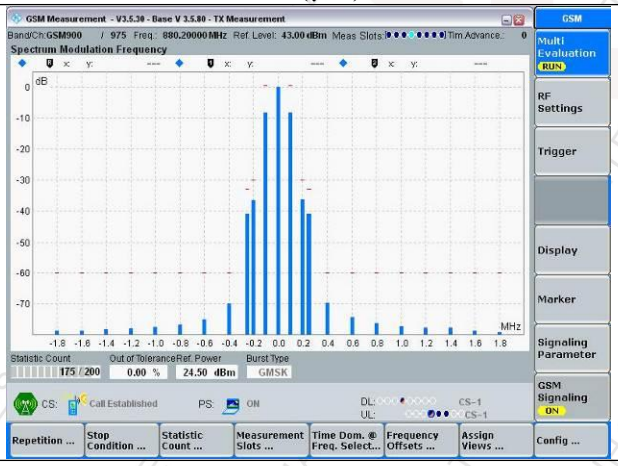
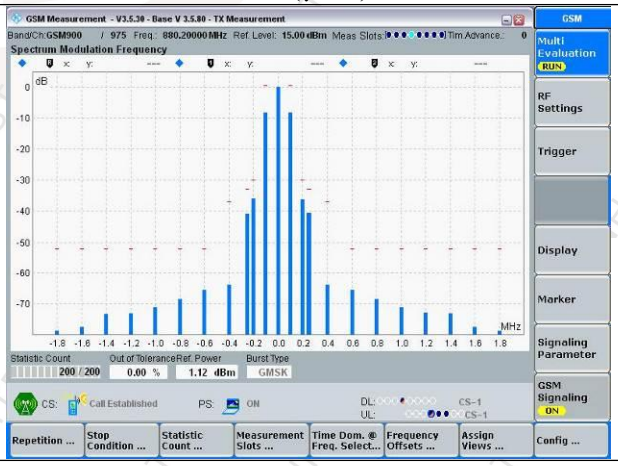
Extreme Condition

HT,LV Condition (γ=3), High Channel	HT,LV Condition (γ=17), High Channel
	
HT,LV Condition (γ=3), Middle Channel	HT,LV Condition (γ=17), Middle Channel
	
HT,LV Condition (γ=3), Low Channel	HT,LV Condition (γ=17), Low Channel
	

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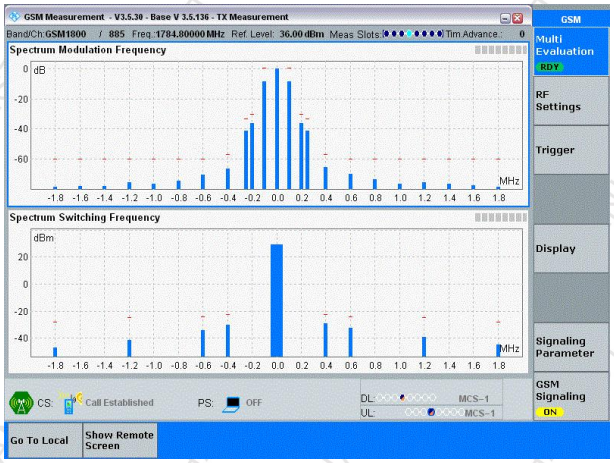
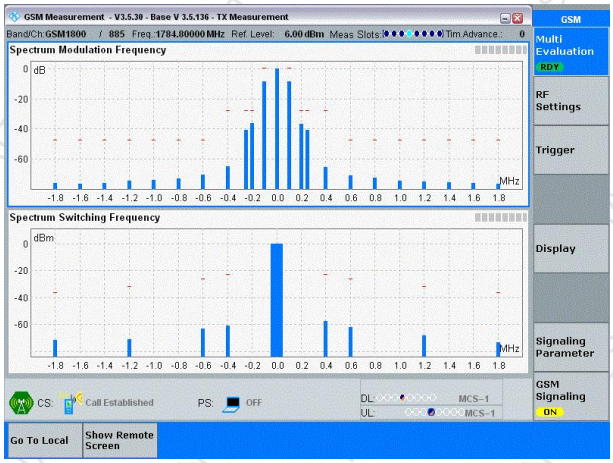
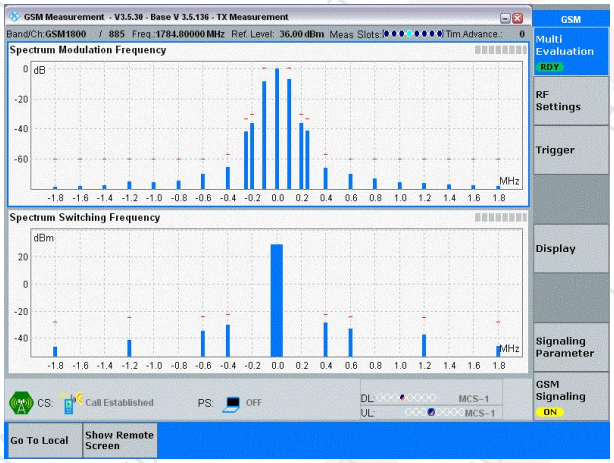
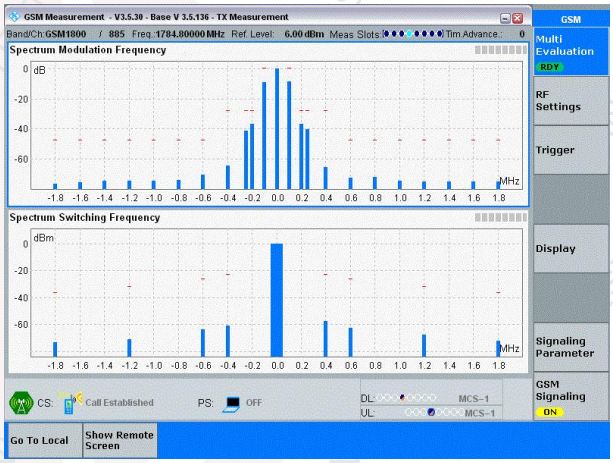
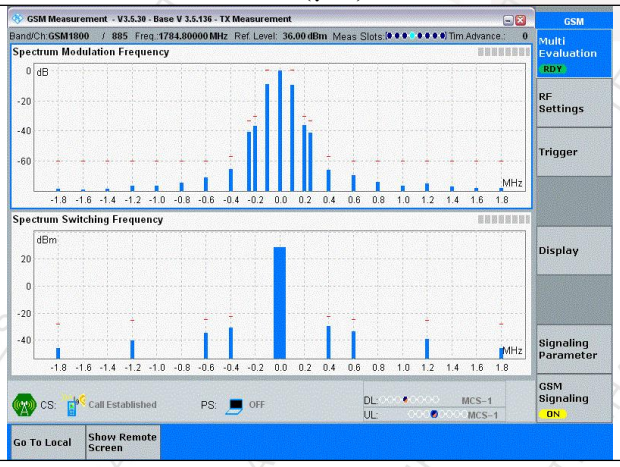
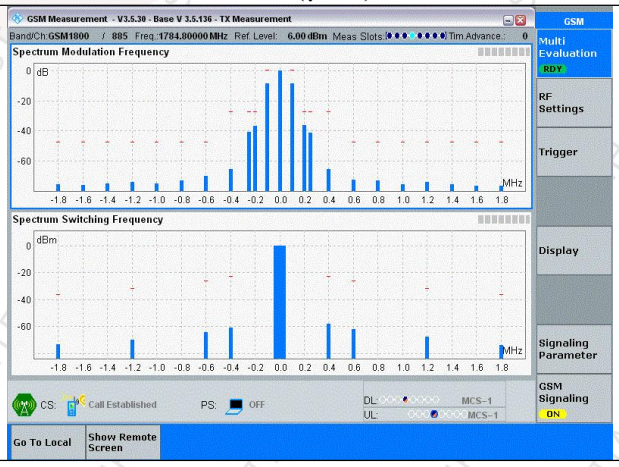
GSM 1800

Normal Condition (γ=0), High Channel	Normal Condition (γ=15), High Channel
	
Normal Condition (γ=0),Middle Channel	**Normal Condition (γ=15), Middle Channel**
	
Normal Condition (γ=0), Low Channel	**Normal Condition (γ=15), Low Channel**
	

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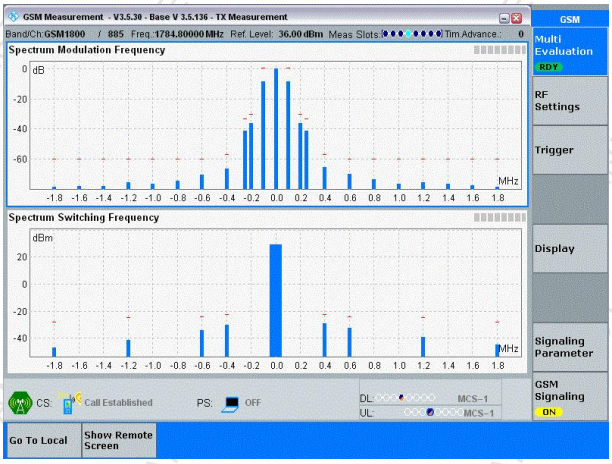
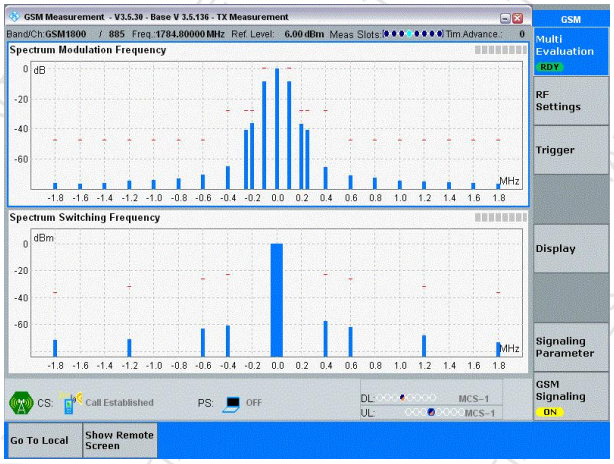
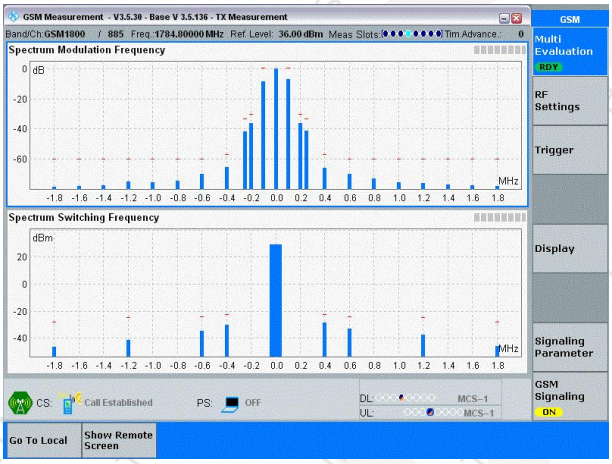
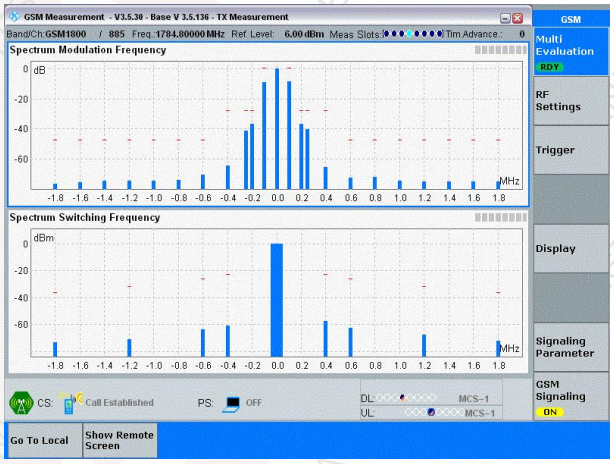
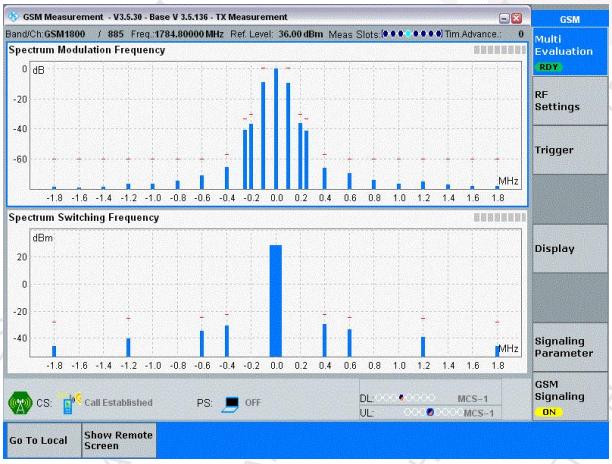
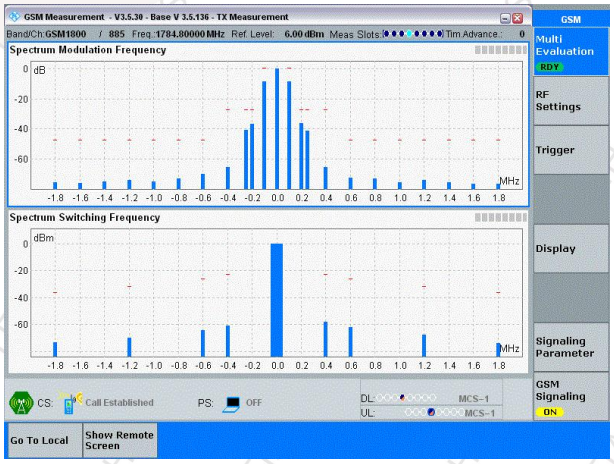
Extreme Condition

HT,HV Condition (γ=0), High Channel	HT,HV Condition (γ=15), High Channel
	
HT,HV Condition (γ=0), Middle Channel	HT,HV Condition (γ=15), Middle Channel
	
HT,HV Condition (γ=0), Low Channel	HT,HV Condition (γ=15), Low Channel
	

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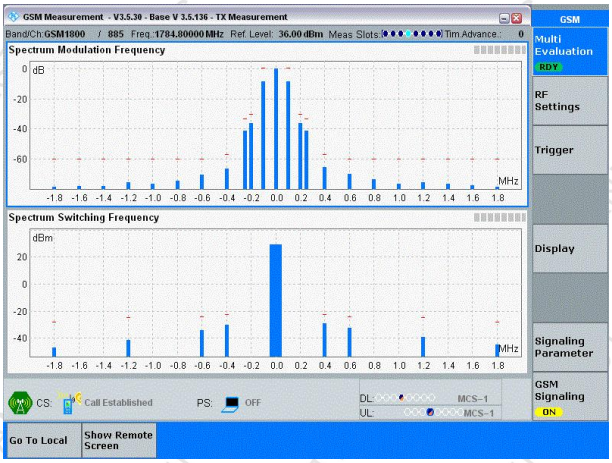
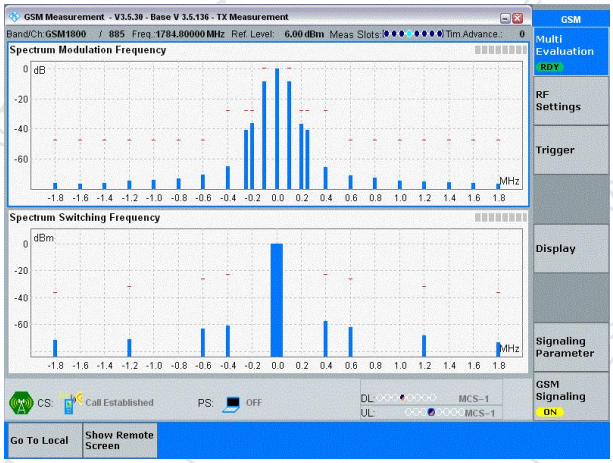
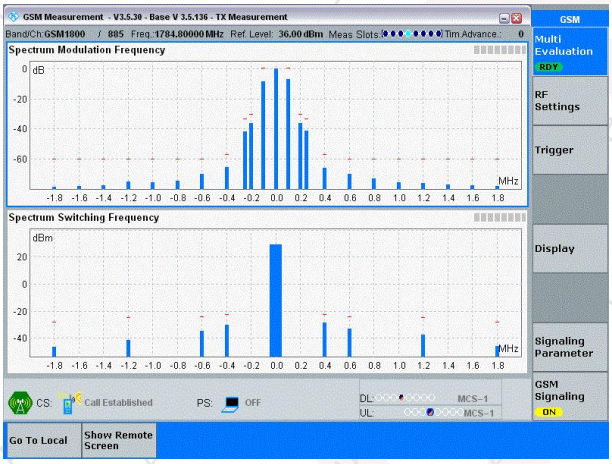
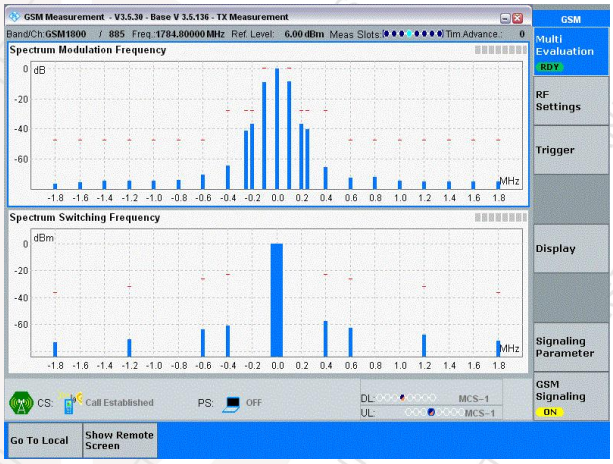
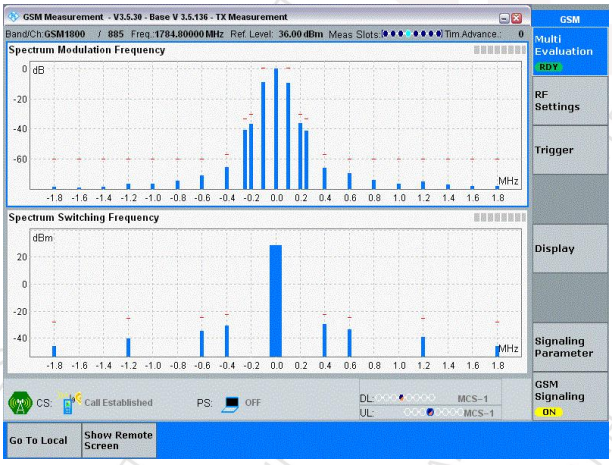
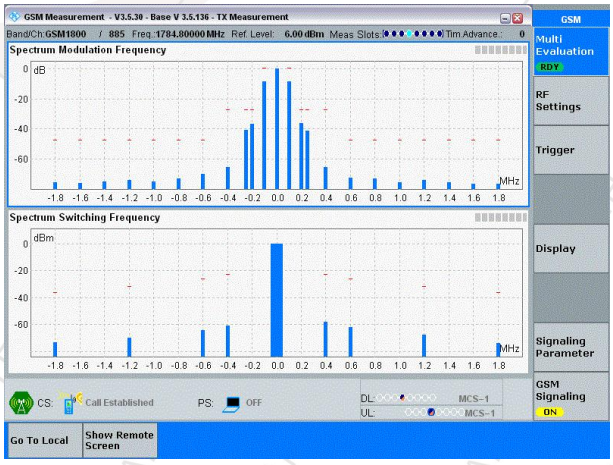
Extreme Condition

LT,HV Condition (γ=0), High Channel	LT,HV Condition (γ=15), High Channel
	
LT,HV Condition (γ=0), Middle Channel	**LT,HV Condition (γ=15), Middle Channel**
	
LT,HV Condition (γ=0), Low Channel	**LT,HV Condition (γ=15), Low Channel**
	

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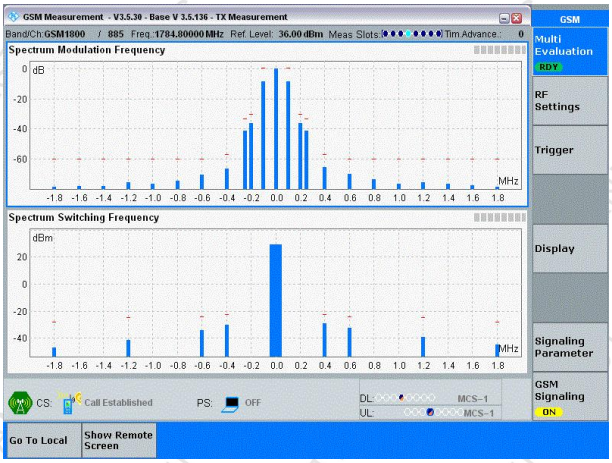
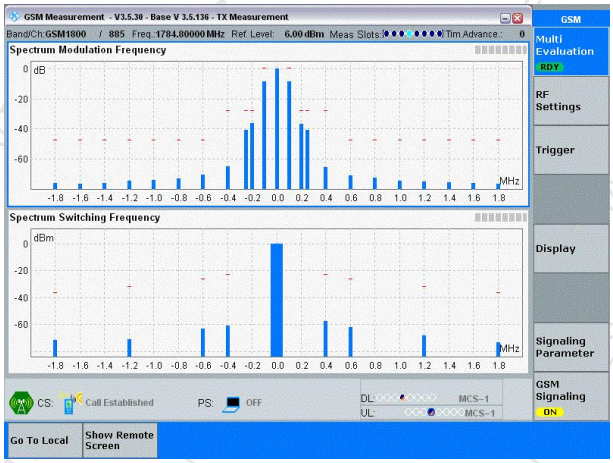
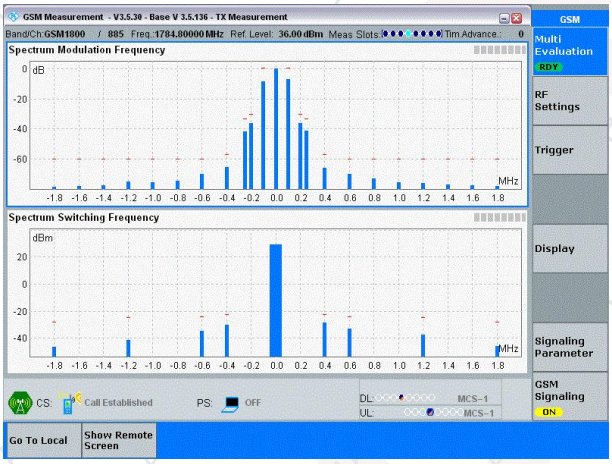
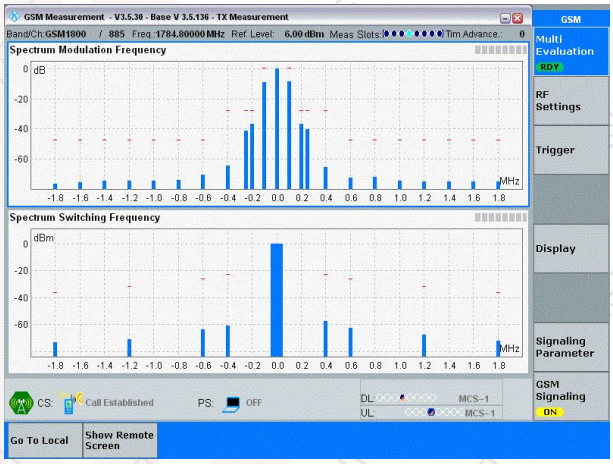
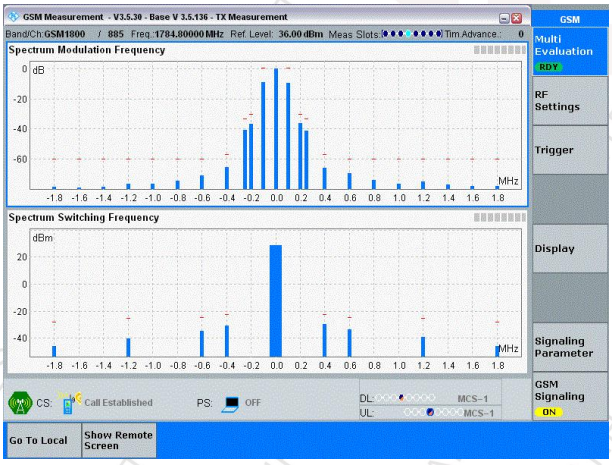
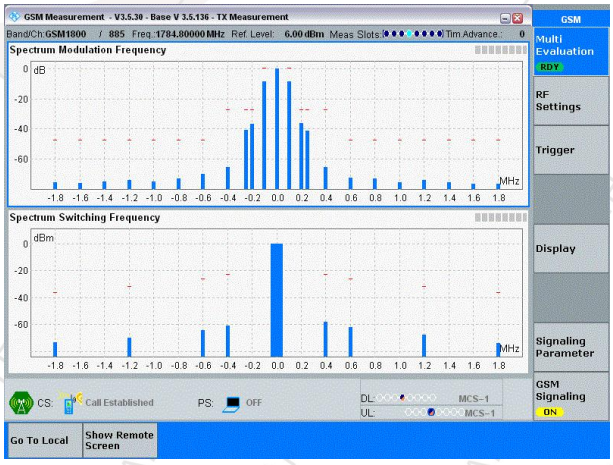
Extreme Condition

LT,LV Condition (γ=0), High Channel	LT,LV Condition (γ=15), High Channel
	
LT,LV Condition (γ=0), Middle Channel	**LT,LV Condition (γ=15), Middle Channel**
	
LT,LV Condition (γ=0), Low Channel	**LT,LV Condition (γ=15), Low Channel**
	

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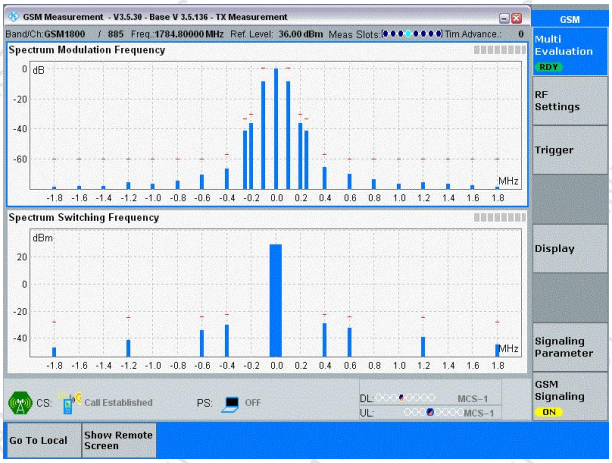
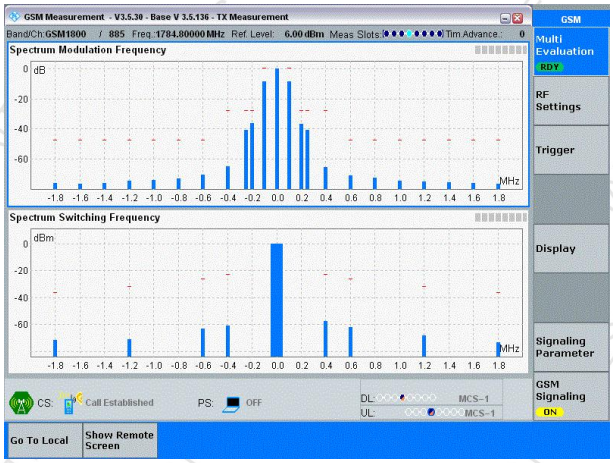
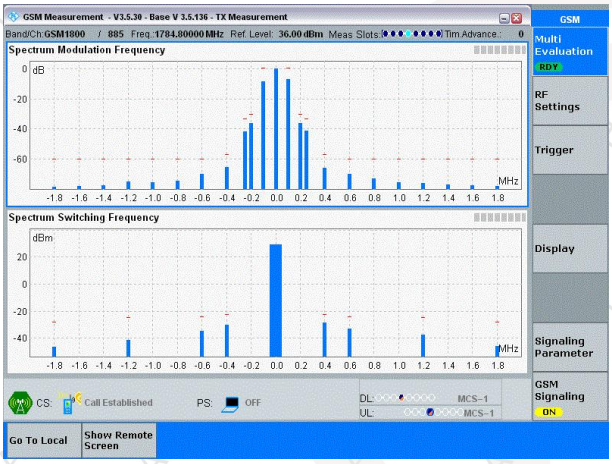
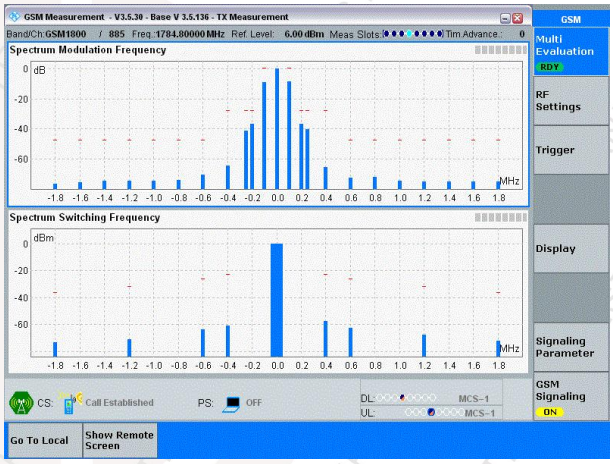
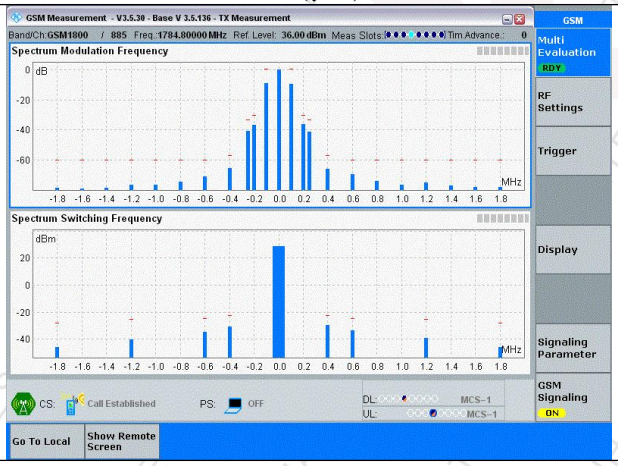
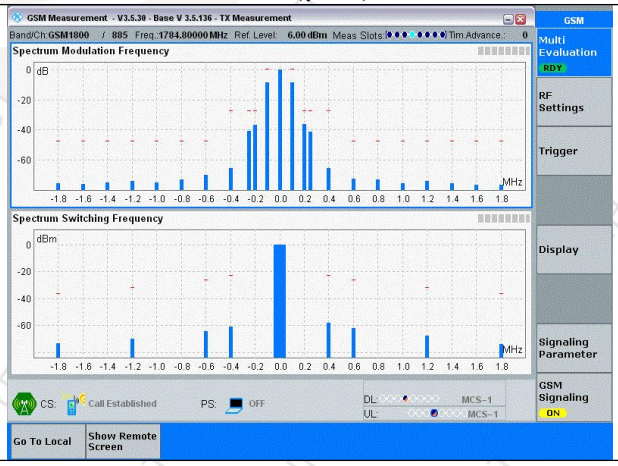
Extreme Condition

HT,LV Condition (γ=0), High Channel	HT,LV Condition (γ=15), High Channel
	
HT,LV Condition (γ=0), Middle Channel	HT,LV Condition (γ=15), Middle Channel
	
HT,LV Condition (γ=0), Low Channel	HT,LV Condition (γ=15), Low Channel
	

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4.4. Transmitter output power in GPRS multislot configuration

4.4.1 Definition

The transmitter output power is the average value of the power delivered to an artificial antenna or radiated by the MS and its integral antenna, over the time that the useful information bits of one burst are transmitted.

4.4.2 Limits

a)The transmitter output power, under every combination of normal and extreme test conditions, for normal bursts and access bursts, at each frequency and for each power control level applicable to the MS power class, shall be at the relevant level shown in table 4.6-1a, table 4.6-1b, table 4.6-1c and table 4.6-1d.

Table 4.6-1a: GPRS900 transmitter output power for different power classes

Power class				Power control level (note 4)	GAMMA_TN (Γ_{CH})	Transmitter output power (note 2,3)	Tolerances	
2	3	4	5			dBm	normal	extreme
·				2	0	39	±2 dB	±2,5 dB
·	·			3	1	37	±3 dB (note 1)	±4 dB (note 1)
·	·			4	2	35	±3 dB	±4 dB
·	·	·		5	3	33	±3 dB (note 1)	±4 dB (note 1)
·	·	·		6	4	31	±3 dB	±4 dB
·	·	·	·	7	5	29	±3 dB (note 1)	±4 dB (note 1)
·	·	·	·	8	6	27	±3 dB	±4 dB
·	·	·	·	9	7	25	±3 dB	±4 dB
·	·	·	·	10	8	23	±3 dB	±4 dB
·	·	·	·	11	9	21	±3 dB	±4 dB
·	·	·	·	12	10	19	±3 dB	±4 dB
·	·	·	·	13	11	17	±3 dB	±4 dB
·	·	·	·	14	12	15	±3 dB	±4 dB
·	·	·	·	15	13	13	±3 dB	±4 dB
·	·	·	·	16	14	11	±5 dB	±6 dB
·	·	·	·	17	15	9	±5 dB	±6 dB
·	·	·	·	18	16	7	±5 dB	±6 dB
·	·	·	·	19	17	5	±5 dB	±6 dB

NOTE1: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2,0 dB under normal test conditions and 2,5 dB under extreme test conditions.
NOTE 2: For R99 and Rel-4, the maximum output power in a multislot configuration must be lower within the limits defined in table 13.16.2-1a. From Rel-5 onwards, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.16.2-1b.
NOTE 3: For a MS using reduced interslot dynamic range in multislot configurations, the MS may restrict the interslot output power control range to a 10 dB window, on a TDMA frame basis. On those timeslots where the ordered power level is more than 10 dB lower than the applied power level of the highest power timeslot, the MS shall transmit at a lowest possible power level within 10 dB range from the highest applied power level, if not transmitting at the actual ordered power level.
NOTE 4: There is no requirement to test power control levels 20-31.

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Table 4.6-1b: R99 and Rel-4: GPRS900 allowed maximum output power reduction in a multislot configuration

Number of timeslots in uplink assignment	Permissible nominal reduction of maximum output power, (dB)
1	0
2	0 to 3,0
3	1,8 to 4,8
4	3,0 to 6,0

Table 4.6-1c: DCS 1 800 transmitter output power for different power classes

Power class			Power control level (note 4)	GAMMA_TN (Γ_{CH}	Transmitter output power (note 2,3)	Tolerances	
1	2	3			dBm	normal	extreme
		·	29	0	36	±2,0 dB	±2,5 dB
		·	30	1	34	±3,0 dB	±4,0 dB
		·	31	2	32	±3,0 dB	±4,0 dB
·		·	0	3	30	±3,0 dB (note_1)	±4 dB (note_1)
·		·	1	4	28	±3 dB	±4 dB
·		·	2	5	26	±3 dB	±4 dB
·	·	·	3	6	24	±3 dB (note_1)	±4 dB (note_1)
·	·	·	4	7	22	±3 dB	±4 dB
·	·	·	5	8	20	±3 dB	±4 dB
·	·	·	6	9	18	±3 dB	±4 dB
·	·	·	7	10	16	±3 dB	±4 dB
·	·	·	8	11	14	±3 dB	±4 dB
·	·	·	9	12	12	±4 dB	±5 dB
·	·	·	10	13	10	±4 dB	±5 dB
·	·	·	11	14	8	±4 dB	±5 dB
·	·	·	12	15	6	±4 dB	±5 dB
·	·	·	13	16	4	±4 dB	±5 dB
·	·	·	14	17	2	±5 dB	±6 dB
·	·	·	15	18	0	±5 dB	±6 dB

NOTE1: When the power control level corresponds to the power class of the MS, then the tolerances shall be 2,0 dB under normal test conditions and 2,5 dB under extreme test conditions.
NOTE 2: For R99 and Rel-4, the maximum output power in a multislot configuration must be lower within the limits defined in table 13.16.2-2a. From Rel-5 onwards, the maximum output power in a multislot configuration may be lower within the limits defined in table 13.16.2-2b.
NOTE 3: For a MS using reduced interslot dynamic range in multislot configurations, the MS may restrict the interslot output power control range to a 10 dB window, on a TDMA frame basis. On those timeslots where the ordered power level is more than 10 dB lower than the applied power level of the highest power timeslot, the MS shall transmit at a lowest possible power level within 10 dB range from the highest applied power level, if not transmitting at the actual ordered power level.
NOTE 4: There is no requirement to test power control levels 16-28.

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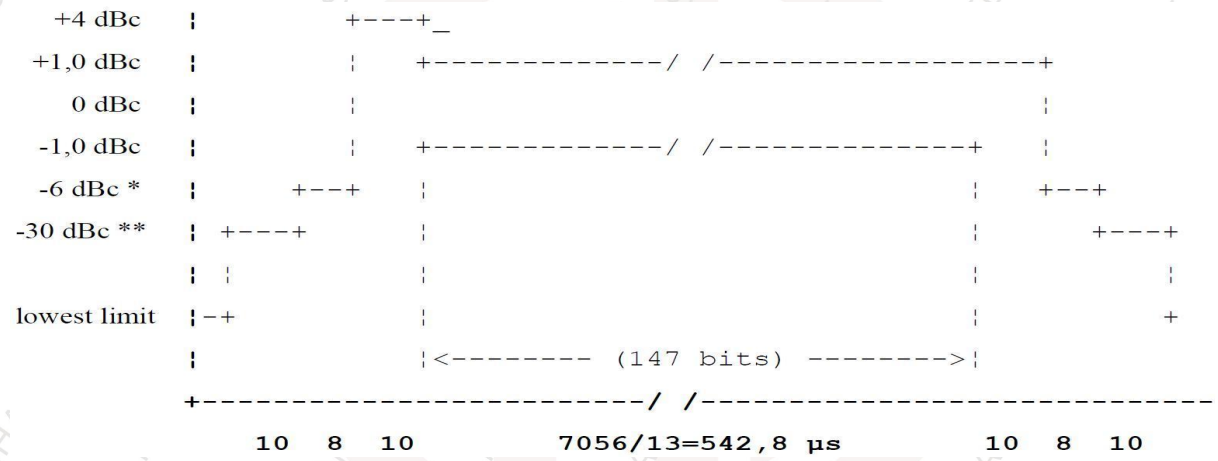
Table 4.6-1d: R99 and Rel-4: DCS 1 800 allowed maximum output power reduction in a multislot configuration

0	Permissible nominal reduction of maximum output power, (dB)
1	0
2	0 to 3,0
3	1,8 to 4,8
4	3,0 to 6,0

b)The difference between the transmitter output power at two adjacent power control levels, measured at the same frequency, shall not be less than 0,5 dB and not be more than 3,5 dB. For PCS 1 900 Class 3 the difference between the transmitter output power at power controls level 30 and 31, measured at the same frequency, shall not be less than 0 dB and not be more than 2 dB.
For R99 and Rel-4 MS, if one or both of the adjacent output power levels are reduced according to the number of timeslots, the difference between the transmitter output power at two adjacent power control levels, measured at the same frequency, shall not be less than -1dB and not be more than 3.5 dB.
c)The power/time relationship of the measured samples for normal bursts shall be within the limits of the power time template of figure below at each frequency, under every combination of normal and extreme test conditions and at each power control level measured.



* For bands other than DCS 1800 and PCS 1900 MS:
-4 dBc for power control level 16; -2 dBc for power control level 17; -1 dBc for power control levels 18 and 19.
For DCS 1 800 and PCS 1 900 MS:
-4 dBc for power control level 11; -2 dBc for power control level 12; -1 dBc for power control levels 13, 14 and 15.
** For bands other than DCS 1800 and PCS 1900 MS: -30 dBc or -17 dBm, whichever is the higher.
For DCS 1 800 and PCS 1 900MS: -30 dBc or -20 dBm, whichever is the higher.

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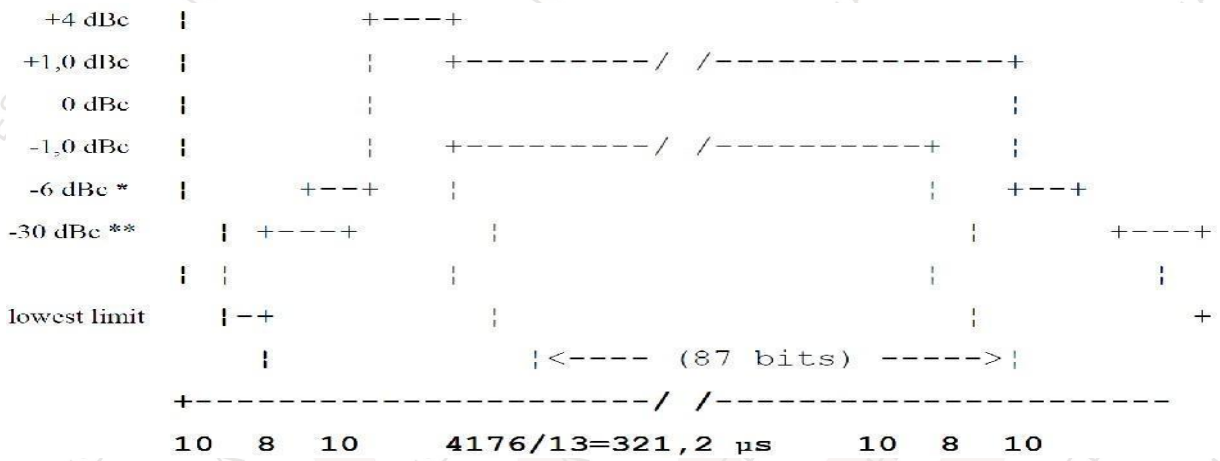
Table 4.6-2a: Lowest measurement limit for power / time template

	lowest limit
GSM900	-59 dBc or -54 dBm whichever is the highest, except for the timeslot preceding the active slot, for which the allowed level is -59 dBc or -36 dBm, whichever is the highest
DCS 1800	-48 dBc or -48 dBm whichever is the highest

d)All the power control levels, for the type and power class of the MS as stated by the manufacturer, shall be implemented in the MS.
e)When the transmitter is commanded to a power control level outside of the capability corresponding to the type and power class of the MS as stated by the manufacturer, then the transmitter output power shall be within the tolerances for the closest power control level corresponding to the type and power class as stated by the manufacturer.
f)The power/time relationship of the measured samples for access bursts shall be within the limits of the power time template of figure 13-7-3 at each frequency, under every combination of normal and extreme test conditions and at each power control level measured.



*For bands other than DCS 1800 and PCS 1900 MS:
-4 dBc for power control level 16;
-2 dBc for power control level 17;
-1 dBc for power control levels 18 and 19
For DCS 1 800 and PCS 1 900 MS:
-4 dBc for power control level 11;
-2 dBc for power control level 12;
-1 dBc for power control levels 13, 14 and 15.
**For bands other than DCS 1800 and PCS 1900 MS:
-30 dBc or -17 dBm, whichever is the higher.
For DCS 1 800 and PCS 1 900 MS:
-30 dBc or -20 dBm, whichever is the higher.
g)For MS supporting RACH Power Reduction conformance requirement 9 has to be met where the MS shall apply power reduction with 10dB.

4.4.3 Test Procedures

Follow the test procedure as described in TS 151 010-1 Clause 13.16.2.4 to measure the transmitter output power in GSM multislot configuration at normal and extreme conditions.

4.4.4 Test Results

Please refer to following:

DCS 900 Output Power in GPRS

High Channel F =914.80 MHz						
Power Control Level	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
3	31.44	30.02	30.04	30.01	30.05	Pass
4	29.65	29.64	29.61	29.62	29.63	Pass
5	28.61	28.63	28.60	28.61	28.59	Pass
6	26.68	26.70	26.67	26.68	26.66	Pass
7	24.71	24.73	24.70	24.71	24.69	Pass
8	22.75	22.76	22.73	22.74	22.72	Pass
9	20.79	20.79	20.76	20.77	20.75	Pass
10	18.82	18.84	18.81	18.82	18.8	Pass
11	16.87	16.87	16.84	16.85	16.83	Pass
12	14.93	14.94	14.91	14.92	14.9	Pass
13	12.98	13.01	12.98	12.99	12.97	Pass
14	11.04	11.04	11.01	11.02	11.01	Pass
15	9.05	9.07	9.04	9.05	9.03	Pass
16	8.91	7.10	7.07	7.08	7.06	Pass
17	8.88	4.12	4.13	4.09	4.17	Pass
Middle Channel F = 902.00 MHz						
γ=	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
3	31.78	29.51	29.46	29.48	29.55	Pass
4	29.07	29.04	29.05	29.06	29.08	Pass
5	28.53	28.56	28.54	28.55	28.57	Pass
6	26.56	26.57	26.55	26.56	26.58	Pass
7	24.61	24.62	24.6	24.61	24.63	Pass
8	22.65	22.67	22.65	22.66	22.68	Pass
9	20.67	20.70	20.68	20.69	20.71	Pass
10	18.72	18.73	18.71	18.72	18.74	Pass
11	16.69	16.70	16.68	16.69	16.71	Pass
12	14.66	14.67	14.65	14.66	14.68	Pass
13	12.59	12.62	12.60	12.61	12.63	Pass
14	11.67	11.67	11.65	11.66	11.68	Pass
15	9.74	9.76	9.74	9.75	9.77	Pass
16	9.52	7.89	7.87	7.88	7.9	Pass
17	9.09	3.82	3.84	3.83	3.78	Pass

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Low Channel F = 880.2 MHz						
γ=	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
3	32.61	29.41	29.48	29.47	29.39	Pass
4	29.15	29.07	29.05	29.14	29.06	Pass
5	28.57	28.6	28.58	28.57	28.59	Pass
6	26.63	26.65	26.63	26.62	26.64	Pass
7	24.66	24.7	24.68	24.67	24.69	Pass
8	22.67	22.69	22.67	22.66	22.68	Pass
9	20.71	20.74	20.72	20.71	20.73	Pass
10	18.69	18.71	18.69	18.68	18.7	Pass
11	16.74	16.74	16.72	16.71	16.73	Pass
12	14.79	14.81	14.79	14.78	14.8	Pass
13	12.84	12.88	12.86	12.85	12.87	Pass
14	10.86	10.87	10.85	10.84	10.86	Pass
15	10.23	8.92	8.90	8.89	8.91	Pass
16	9.46	7.05	7.03	7.02	7.04	Pass
17	9.44	3.52	3.49	3.49	3.45	Pass

Test plots of normal test condition as below:

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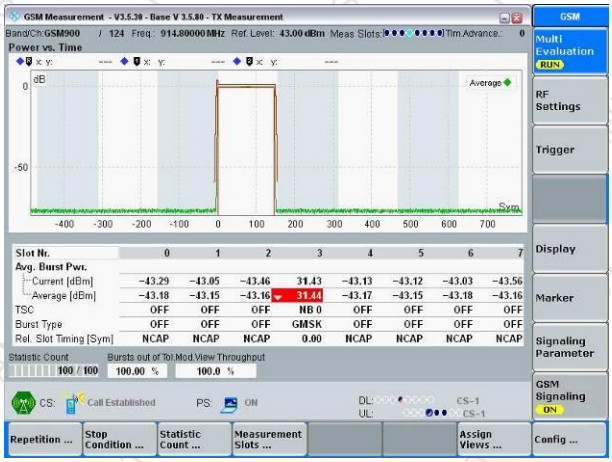
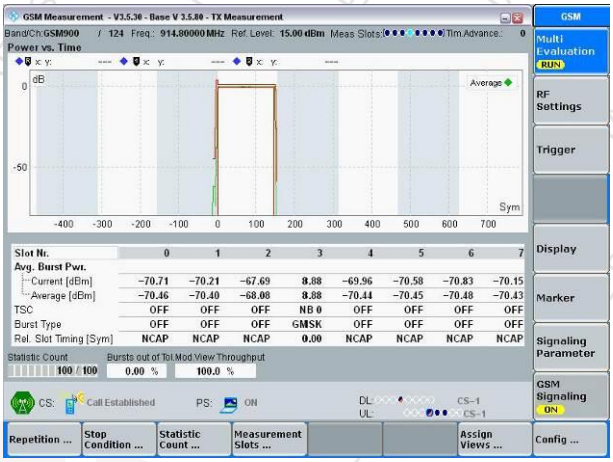
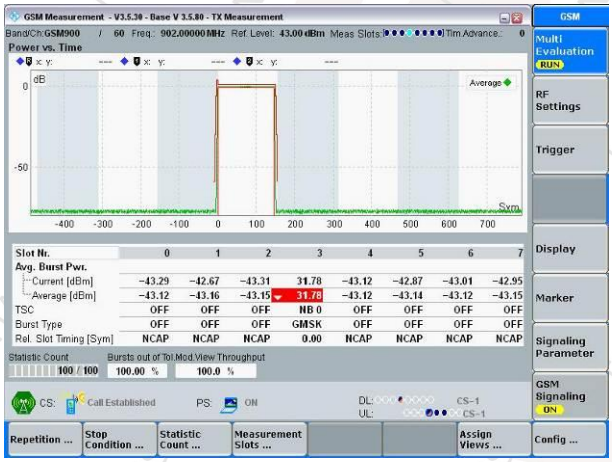
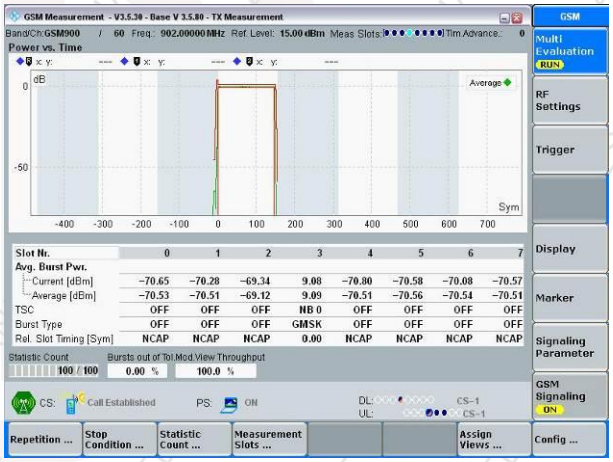
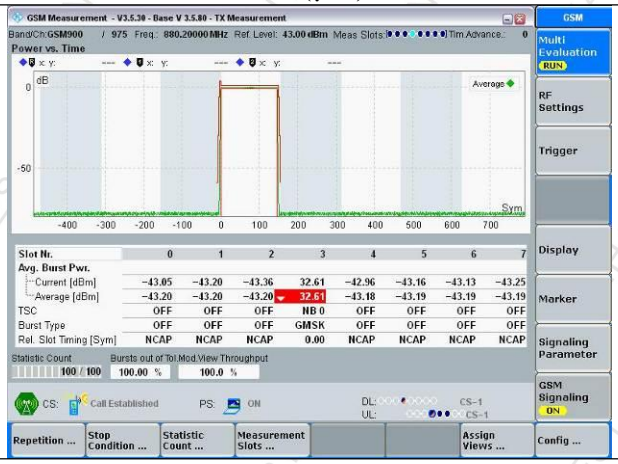
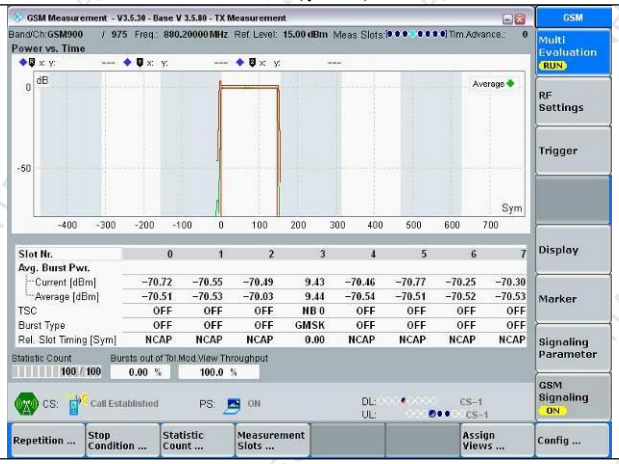
Normal Condition:

Normal Condition (γ=3), High Channel	Normal Condition (γ=17), High Channel
	
Normal Condition (γ=3), Middle Channel	Normal Condition (γ=17), Middle Channel
	
Normal Condition (γ=3), Low Channel	Normal Condition (γ=17), Low Channel
	

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DCS1800 Output Power in GPRS

High Channel F = 1784.8 MHz						
γ=	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
3	23.41	24.15	24.21	24.17	24.16	Pass
4	23.01	23.05	23.02	23.03	23.06	Pass
5	22.08	22.08	22.05	22.06	22.09	Pass
6	21.14	21.15	21.12	21.13	21.16	Pass
7	19.22	19.22	19.19	19.2	19.23	Pass
8	17.26	17.27	17.24	17.25	17.28	Pass
9	15.29	15.3	15.27	15.28	15.31	Pass
10	13.34	13.35	13.32	13.33	13.36	Pass
11	11.39	11.42	11.39	11.4	11.43	Pass
12	9.45	9.47	9.44	9.45	9.48	Pass
13	7.46	7.48	7.45	7.46	7.49	Pass
14	5.52	5.53	5.5	5.51	5.54	Pass
15	3.59	3.6	3.57	3.58	3.61	Pass
16	1.54	1.55	1.52	1.53	1.56	Pass
17	0.13	0.18	0.11	0.09	0.14	Pass
18	-0.06	-0.72	-0.65	-0.77	-0.71	Pass
Middle Channel F = 1747.8 MHz						
γ=	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
3	22.51	23.52	23.51	23.58	23.63	Pass
4	22.41	22.44	22.47	22.48	22.46	Pass
5	21.78	21.77	21.59	21.81	21.99	Pass
6	21.03	21.04	21.07	21.08	21.06	Pass
7	19.58	19.57	19.6	19.61	19.59	Pass
8	17.63	17.6	17.63	17.64	17.62	Pass
9	15.62	15.63	15.66	15.67	15.65	Pass
10	13.67	13.66	13.69	13.7	13.68	Pass
11	11.71	11.73	11.76	11.77	11.75	Pass
12	9.78	9.78	9.81	9.82	9.81	Pass
13	7.82	7.83	7.86	7.87	7.85	Pass
14	5.86	5.86	5.89	5.9	5.88	Pass
15	3.95	3.97	3.89	3.91	3.99	Pass
16	1.86	1.8	1.87	1.84	1.82	Pass
17	0.03	0.03	0.06	0.07	0.05	Pass
18	-0.73	-1.22	-1.06	-1.31	-1.28	Pass

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Low Channel F = 1710.2 MHz						
γ=	Output Power(dBm)					Result
	Normal	L.T.L.V	H.T.L.V	L.T.H.V.	H.T.H.V	
3	21.89	23.51	23.47	23.54	23.47	Pass
4	21.55	22.46	22.51	22.47	22.49	Pass
5	21.52	21.53	21.57	21.54	21.56	Pass
6	20.57	20.56	20.61	20.57	20.59	Pass
7	19.63	19.59	19.63	19.6	19.62	Pass
8	17.64	17.62	17.66	17.63	17.65	Pass
9	15.72	15.69	15.73	15.7	15.72	Pass
10	13.76	13.74	13.78	13.75	13.77	Pass
11	11.79	11.77	11.81	11.78	11.8	Pass
12	9.85	9.84	9.88	9.85	9.87	Pass
13	7.88	7.87	7.91	7.88	7.9	Pass
14	5.01	4.99	5.03	5	5.02	Pass
15	3.09	3.08	3.12	3.09	3.11	Pass
16	1.24	1.19	1.26	1.25	1.27	Pass
17	0.15	0.15	0.19	0.16	0.18	Pass
18	-0.86	-1.31	-1.28	-1.35	-1.29	Pass

Test plots of normal test condition as below:

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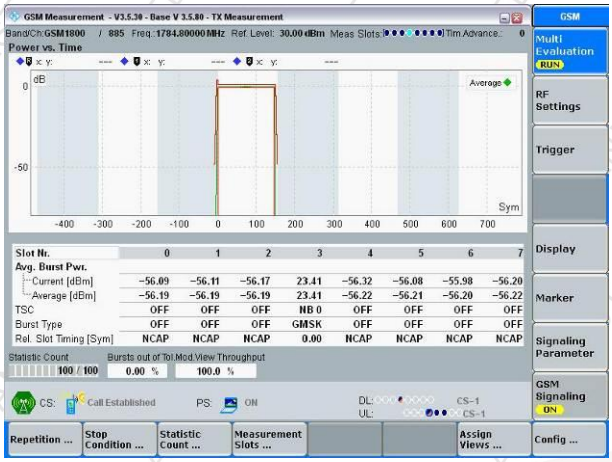
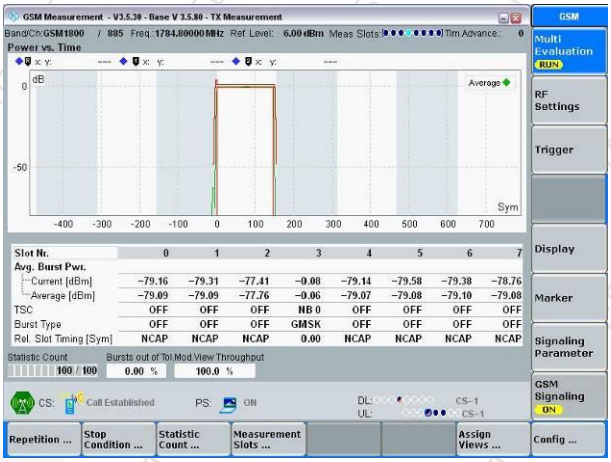
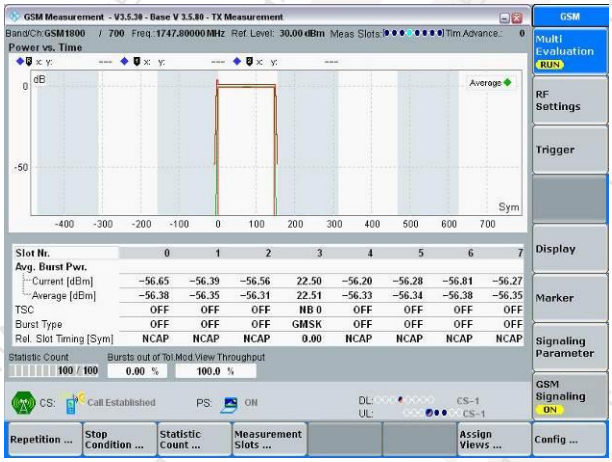
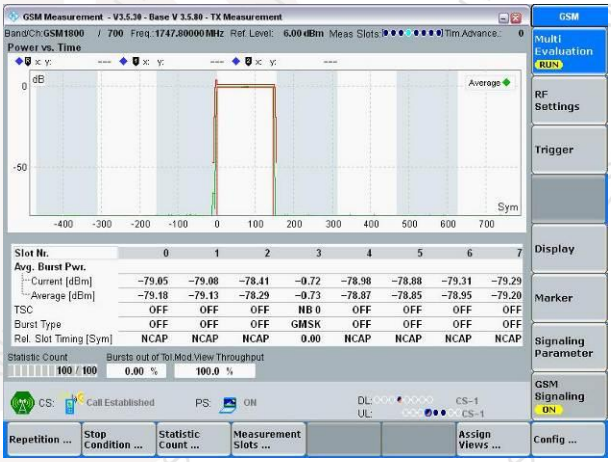
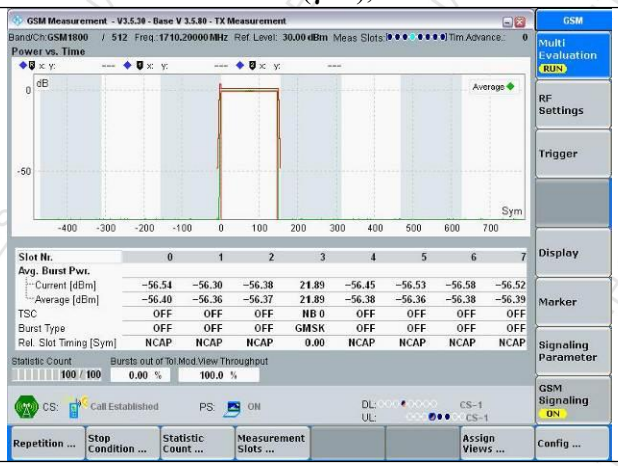
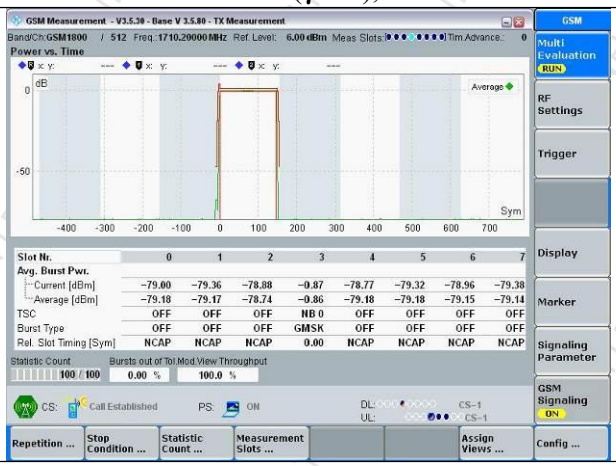
Normal Condition:

Normal Condition (γ=3), High Channel	Normal Condition (γ=18), High Channel
	
Normal Condition (γ=3), Middle Channel	Normal Condition (γ=18), Middle Channel
	
Normal Condition (γ=3), Low Channel	Normal Condition (γ=18), Low Channel
	

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4.5. Output RF spectrum in GPRS multislot configuration

4.5.1 Definition

The output RF spectrum is the relationship between the frequency offset from the carrier and the power, measured in a specified bandwidth and time, produced by the MS due to the effects of modulation and power ramping.

4.5.2 Limits

1.The level of the output RF spectrum due to modulation shall be no more than that given in table 4.7-1, table 4.7-2 and table 4.7-3.

1.The level of the output RF spectrum due to modulation shall be no more than that given in table 4.7-1, table 4.7-2 and table 4.7-3.

Table 4.7-1: GSM 900 Spectrum due to modulation out to less than 1 800 kHz offset

	power levels in dB relative to the measurement at FT				
Power level	**Frequency offset (kHz)**				
(dBm)	**0-100**	**200**	**250**	**400**	**600 to < 1 800**
39	+0,5	-30	-33	-60	-66
37	+0,5	-30	-33	-60	-64
35	+0,5	-30	-33	-60	-62
<= 33	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-51

Table 13.16.3-2: DCS 1 800 Spectrum due to modulation out to less than 1 800 kHz offset

	power levels in dB relative to the measurement at FT				
Power level	**Frequency offset (kHz)**				
(dBm)	**0-100**	**200**	**250**	**400**	**600 to < 1 800**
<= 36	+0,5	-30	-33	-60	-60
The values above are subject to the minimum absolute levels (dBm) below.					
	-36	-36	-36	-36	-56

Table 4.7-3: Spectrum due to modulation from 1 800 kHz offset

to the edge of the transmit band (wideband noise)

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power levels in dB relative to the measurement at FT						
GSM 900				**DCS 1 800**		
Power	**Frequency offset**			**Power**	**Frequency offset**	
Level	**kHz**			**level**	**KHz**	
(dBm)	**1 800 to < 3 000**	**3 000 to < 6 000**	**>= 6 000**	**(dBm)**	**1 800 to < 6 000**	**>= 6 000**
39	-69	-71	-77	36	-71	-79
37	-67	-69	-75	34	-69	-77
35	-65	-67	-73	32	-67	-75
<= 33	-63	-65	-71	30	-65	-73
				28	-63	-71
				26	-61	-69
				<= 24	-59	-67
The values above are subject to the minimum absolute levels (dBm) below.						
	-46	-46	-46		-51	-51

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2.The level of the output RF spectrum due to switching transients shall be no more than given in table 4.7-4 and 4.7-5.

Table 4.7-4: GSM 900 Spectrum due to switching transients

Power level	Maximum level for various offsets from carrier frequency			
	400 kHz	600 kHz	1 200 kHz	1 800 kHz
39 dBm	-13 dBm	-21 dBm	-21 dBm	-24 dBm
37 dBm	-15 dBm	-21 dBm	-21 dBm	-24 dBm
35 dBm	-17 dBm	-21 dBm	-21 dBm	-24 dBm
33 dBm	-19 dBm	-21 dBm	-21 dBm	-24 dBm
31 dBm	-21 dBm	-23 dBm	-23 dBm	-26 dBm
29 dBm	-23 dBm	-25 dBm	-25 dBm	-28 dBm
27 dBm	-23 dBm	-26 dBm	-27 dBm	-30 dBm
25 dBm	-23 dBm	-26 dBm	-29 dBm	-32 dBm
23 dBm	-23 dBm	-26 dBm	-31 dBm	-34 dBm
<= +21 dBm	-23 dBm	-26 dBm	-32 dBm	-36 dBm

Table 4.7-5: DCS 1 800 Spectrum due to switching transients

Power level	Maximum level for various offsets from carrier frequency			
	400 kHz	600 kHz	1200 kHz	1 800 kHz
36 dBm	-16 dBm	-21 dBm	-21 dBm	-24 dBm
34 dBm	-18 dBm	-21 dBm	-21 dBm	-24 dBm
32 dBm	-20 dBm	-22 dBm	-22 dBm	-25 dBm
30 dBm	-22 dBm	-24 dBm	-24 dBm	-27 dBm
28 dBm	-23 dBm	-25 dBm	-26 dBm	-29 dBm
26 dBm	-23 dBm	-26 dBm	-28 dBm	-31 dBm
24 dBm	-23 dBm	-26 dBm	-30 dBm	-33 dBm
22 dBm	-23 dBm	-26 dBm	-31 dBm	-35 dBm
<= +20 dBm	-23 dBm	-26 dBm	-32 dBm	-36 dBm

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3.Spurious emissions in the MS receive bands

Table 4.7-6: Spurious emissions in the MS receive bands

Band (MHz)	Spurious emissions level (dBm) GSM 900 and DCS 1 800
925 to 935	-67
935 to 960	-79
1 805 to 1 880	-71

4.5.3 Test Procedure

Follow the test procedure as described in TS 151 010-1 Clause 13.16.3.4 to measure the output RF spectrum in GPRS multislot configuration at normal and extreme conditions.

4.5.4 Test Results

Please refer to following:

GPRS900							
Channel	Power control level	conditions					Result
975	3	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	Pass
	17	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
60	3	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
	17	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
124	3	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
	17	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	

GPRS1800							
Channel	Power control level	conditions					Result
512	3	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	Pass
	18	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
700	3	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
	18	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
885	3	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	
	18	Normal	L.V.L.T.	L.V.H.T.	H.V.L.T.	H.V.H.T.	

Test plots of normal test condition as below:

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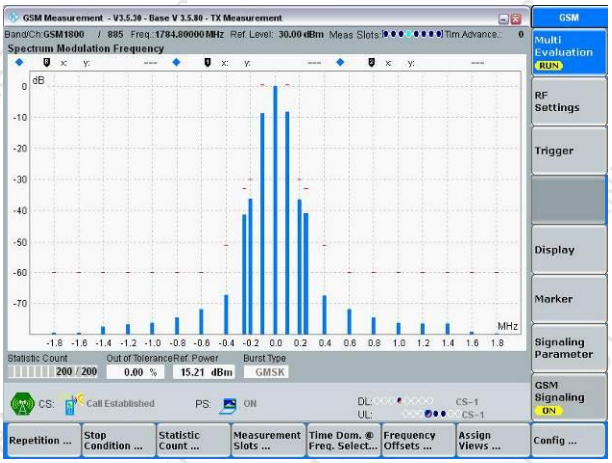
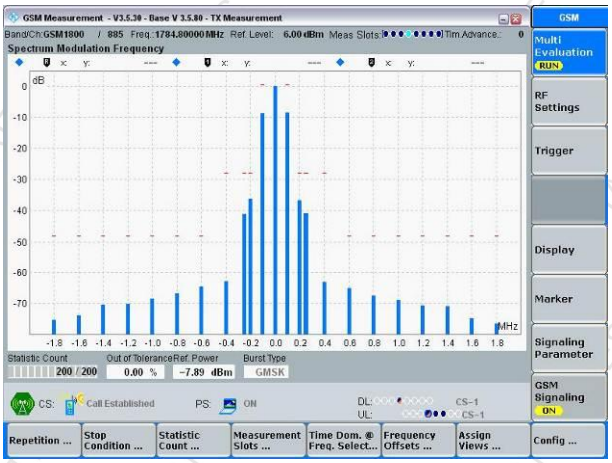
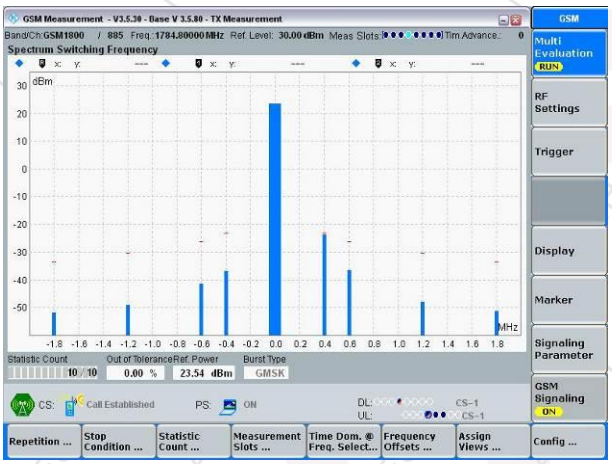
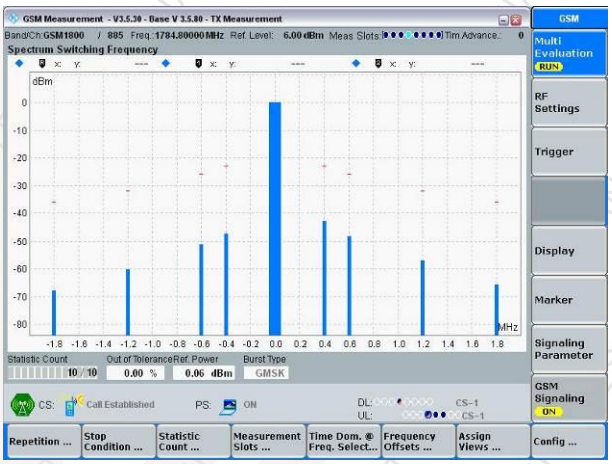
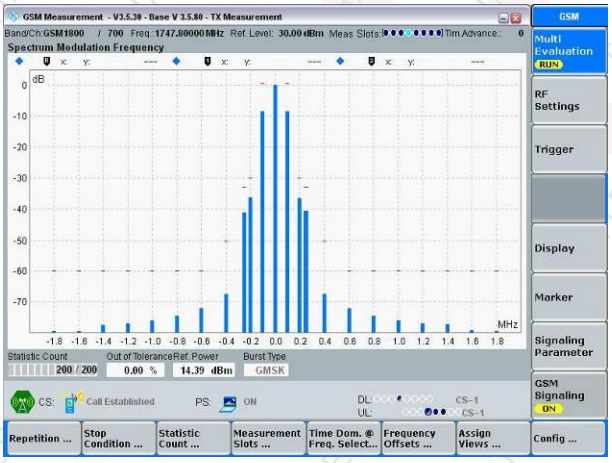
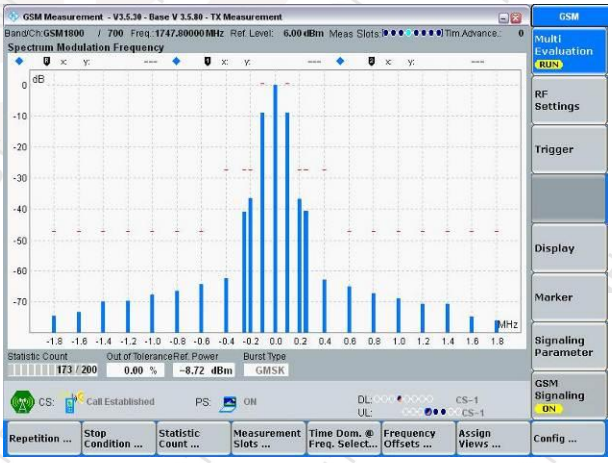
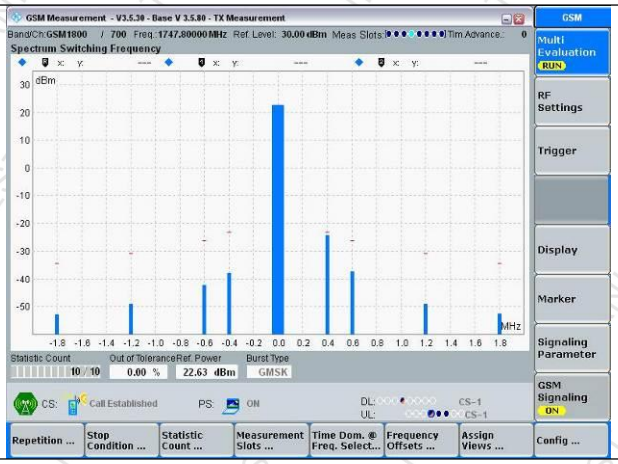
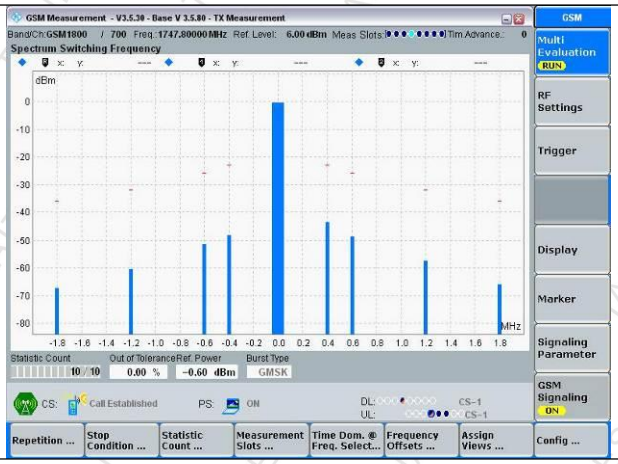
GPRS 1800

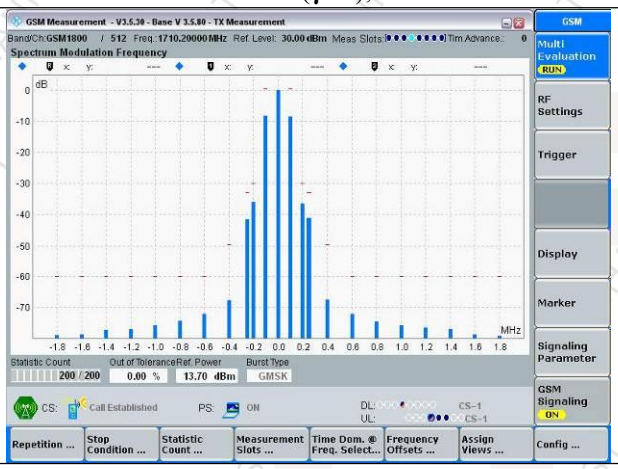
Normal Condition (γ=3), High Channel	Normal Condition (γ=18), High Channel
	
	
Normal Condition (γ=3), Middle Channel	Normal Condition (γ=18), Middle Channel
	

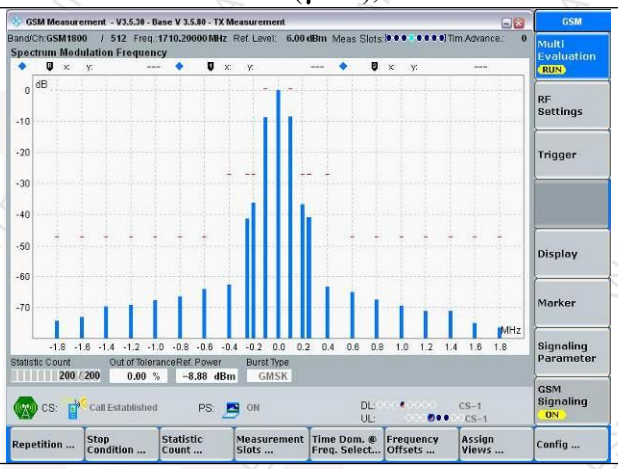


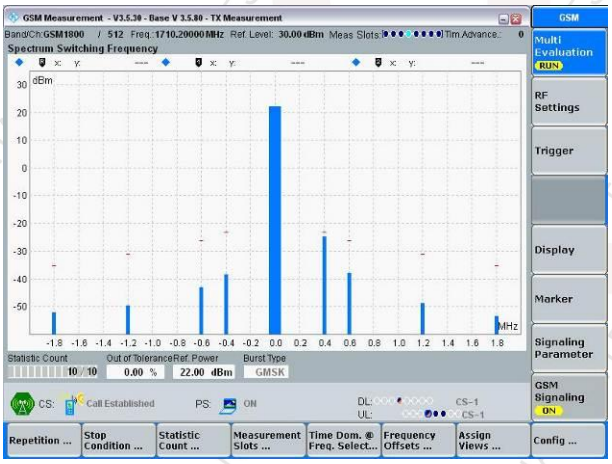
Normal Condition (γ=3), Low Channel

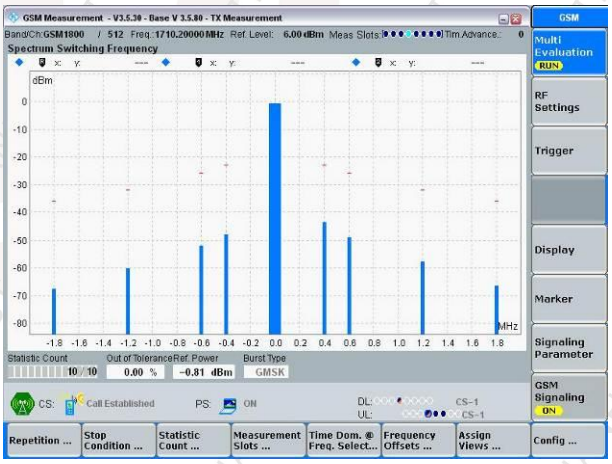


Normal Condition (γ=18), Low Channel

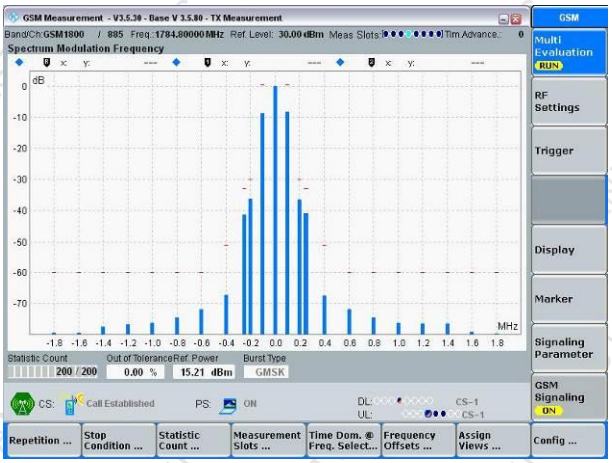
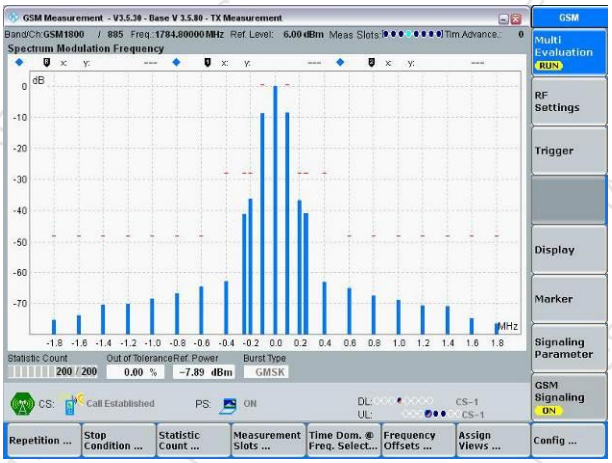
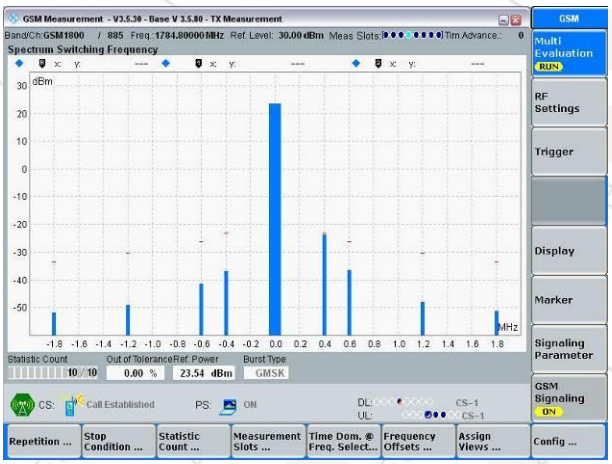
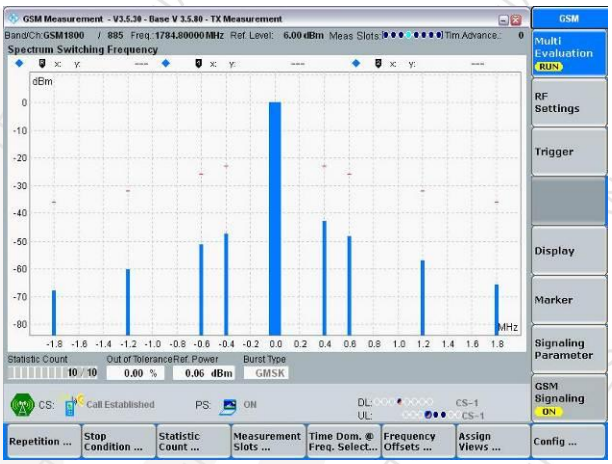
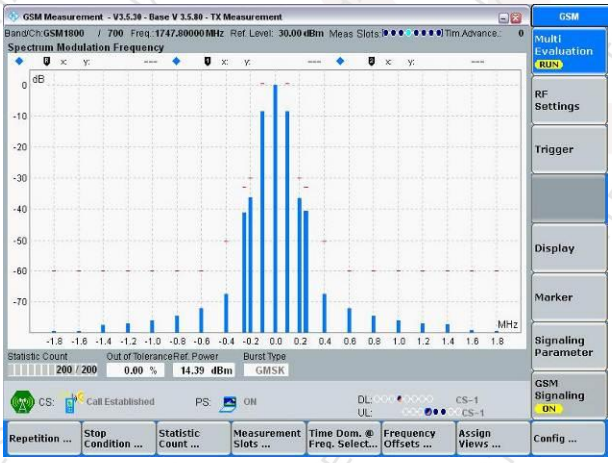
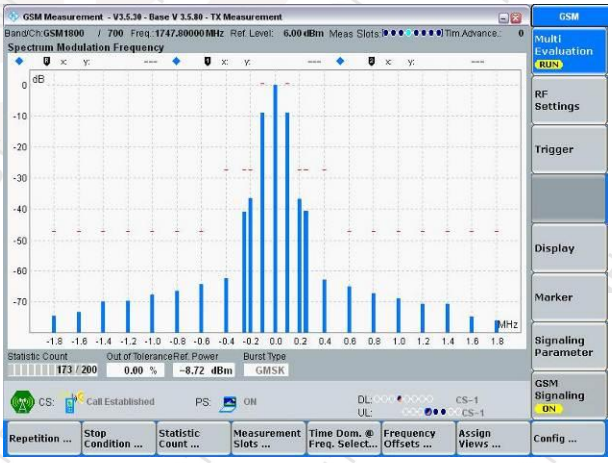








Extreme Condition

LT,LV (γ=3), High Channel	LT,LV (γ=18), High Channel
	
	
LT,LV Condition (γ=3), Middle Channel	LT,LV Condition (γ=18), Middle Channel
	

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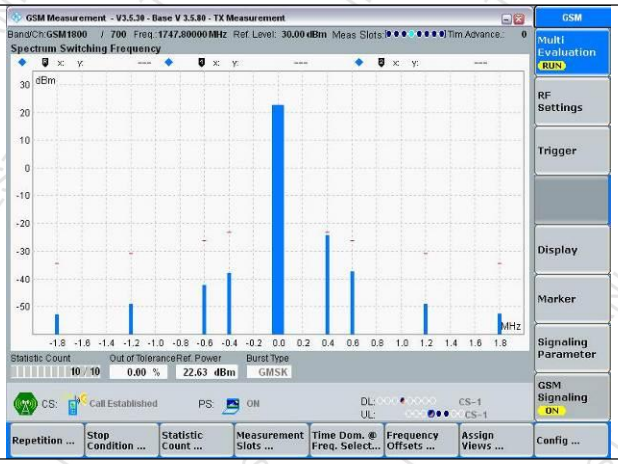
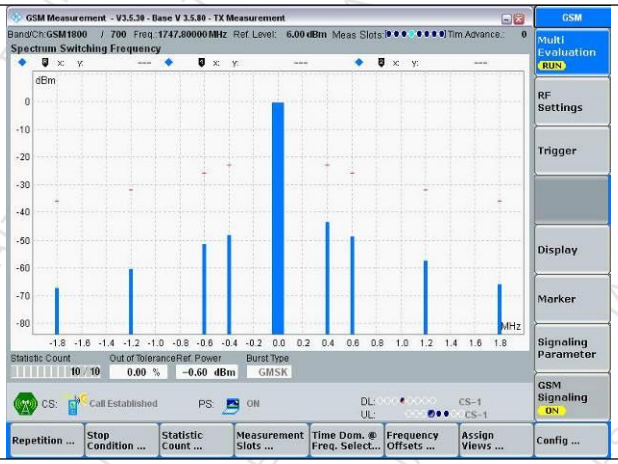
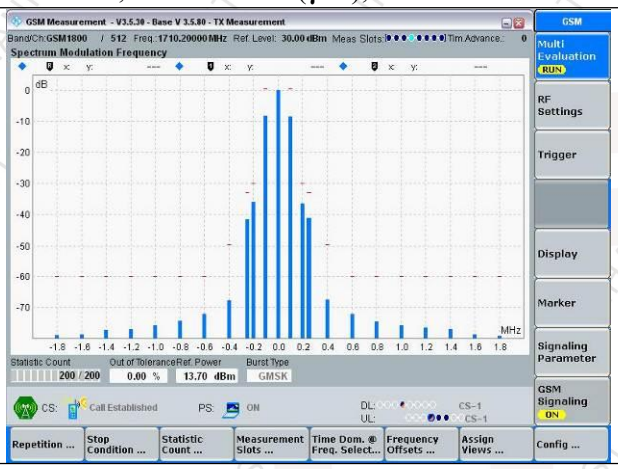
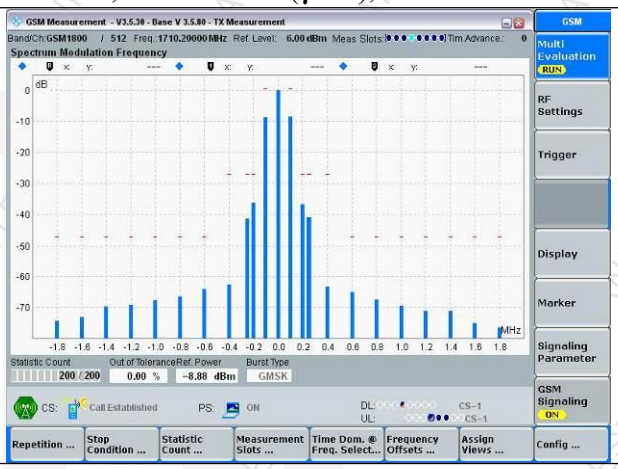


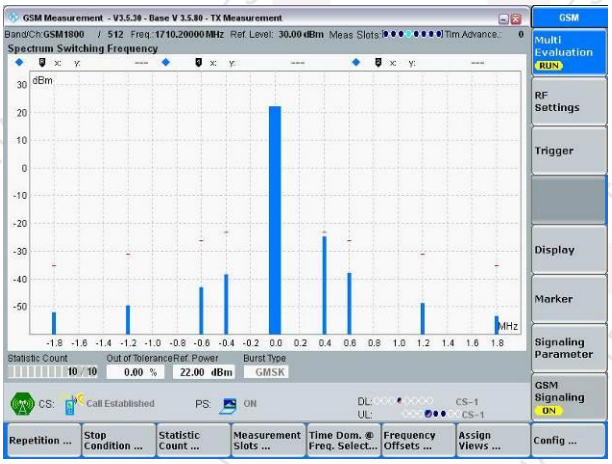
LT,LV Condition (γ=3), Low Channel

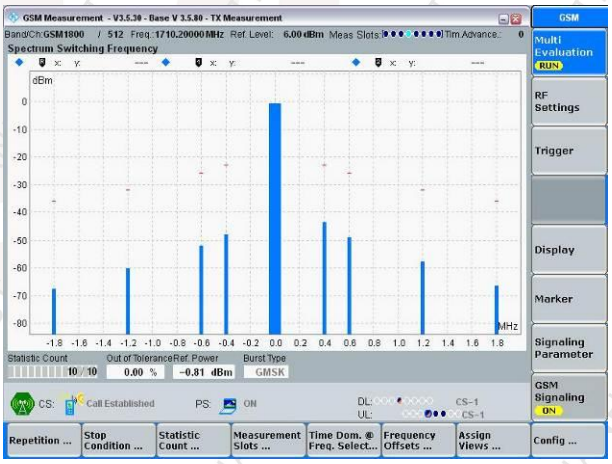


LT,LV Condition (γ=18), Low Channel

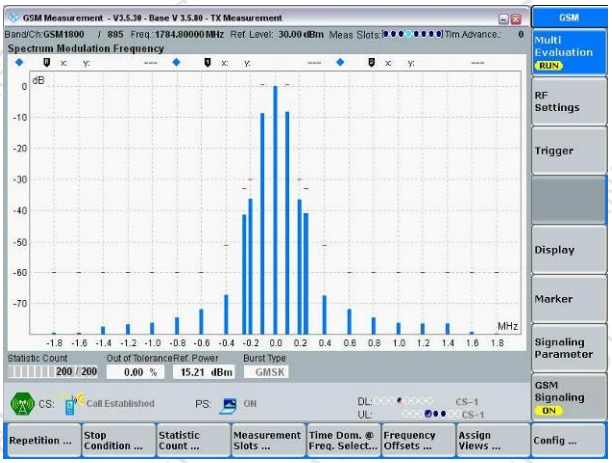
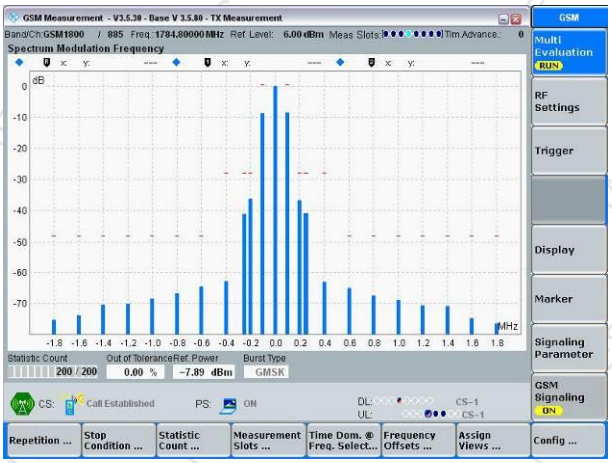
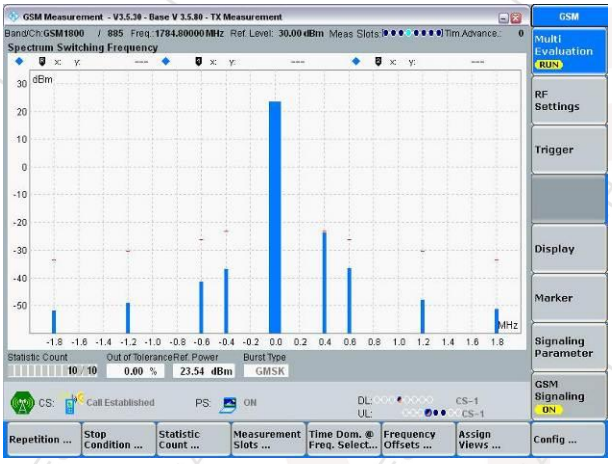
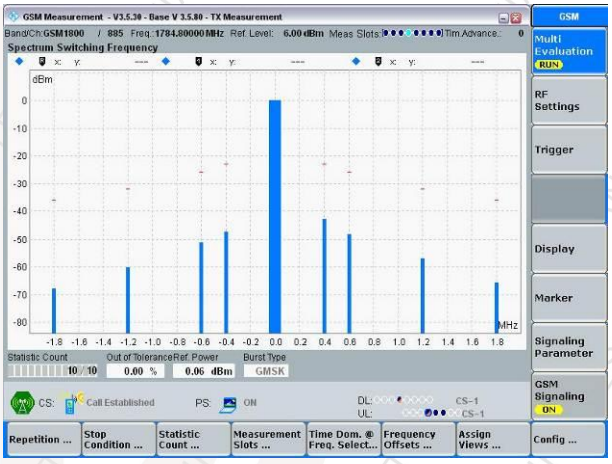
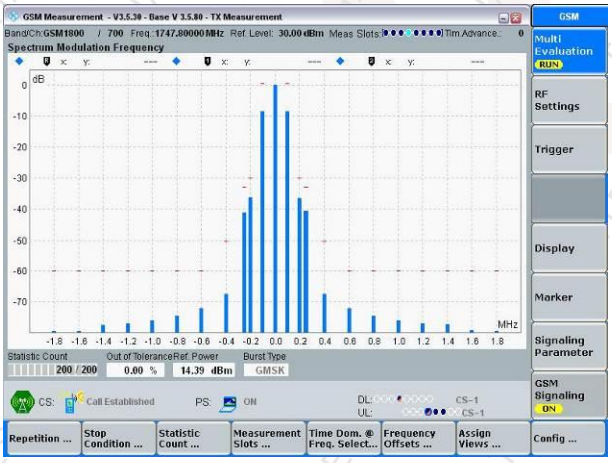
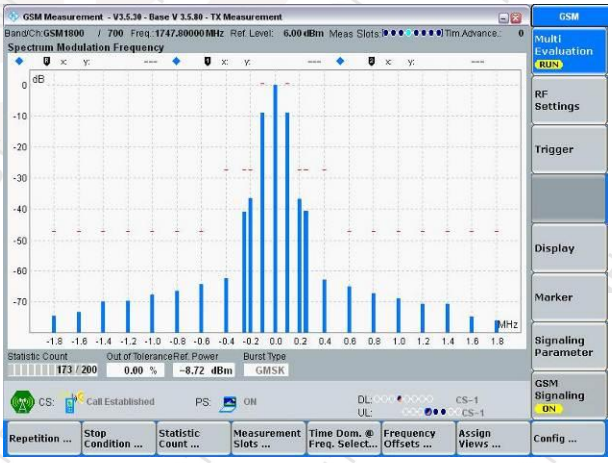








Extreme Condition

LT,HV Condition (γ=3), High Channel	LT,HV Condition (γ=18), High Channel
	
	
LT,HV Condition (γ=3), Middle Channel	LT,HV Condition (γ=18), Middle Channel
	

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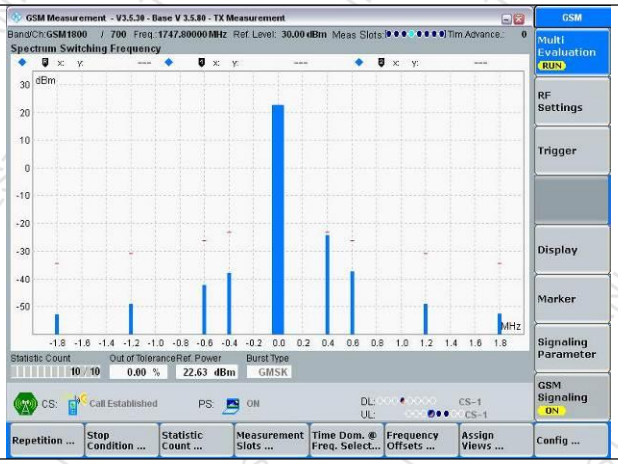
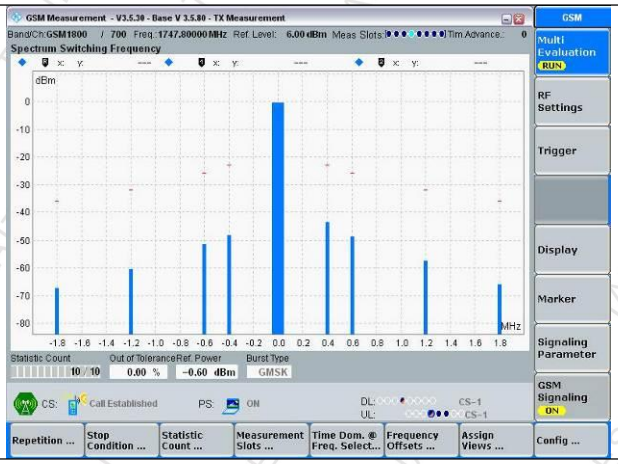
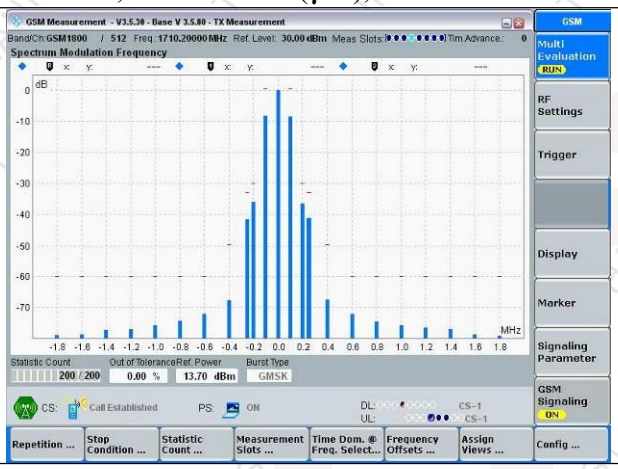
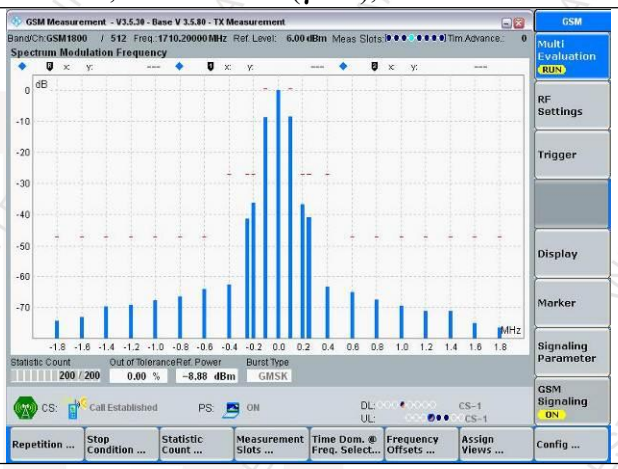


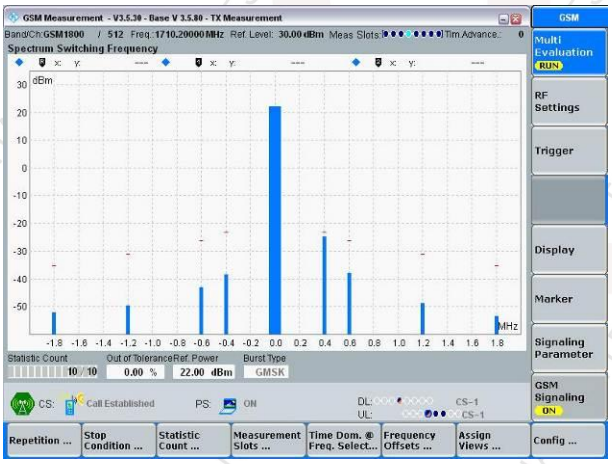
LT,HV Condition (γ=3), Low Channel

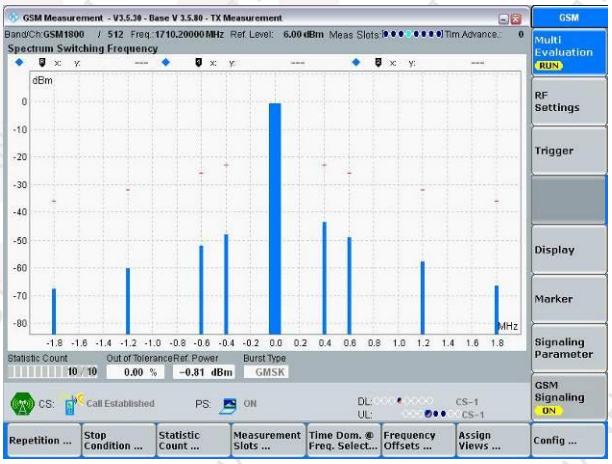


LT,HV Condition (γ=18), Low Channel

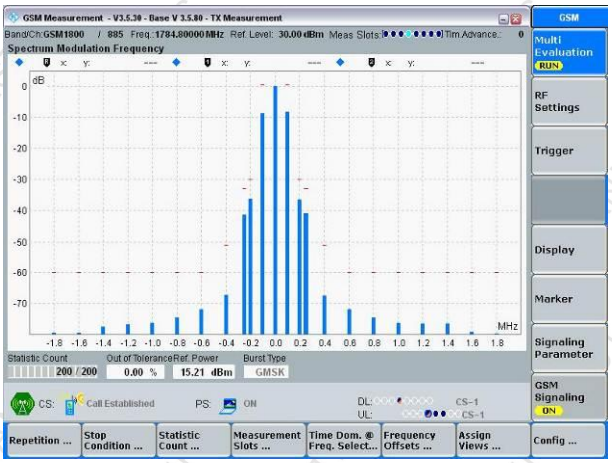
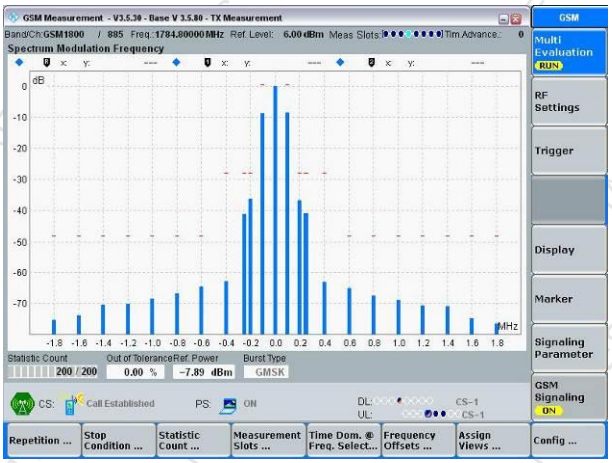
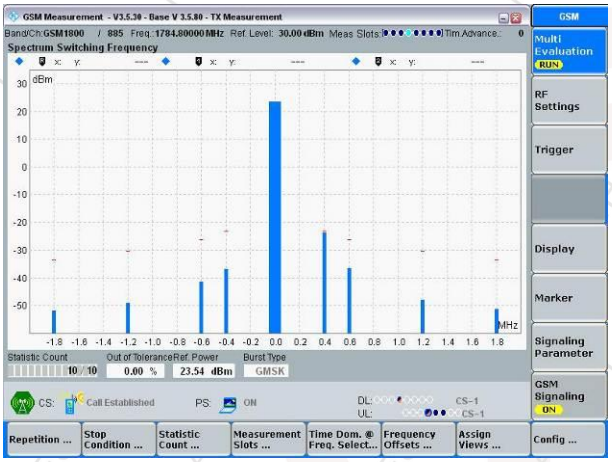
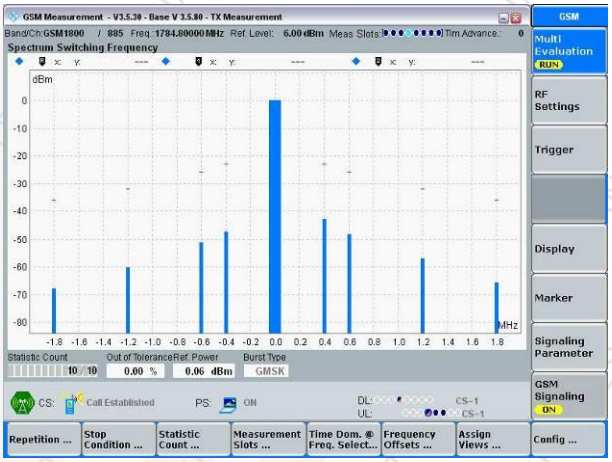
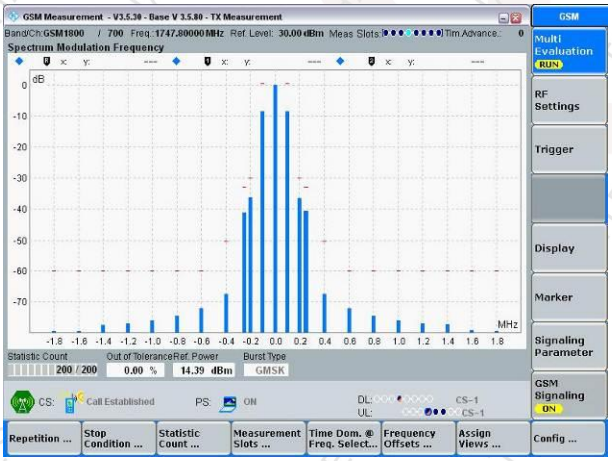
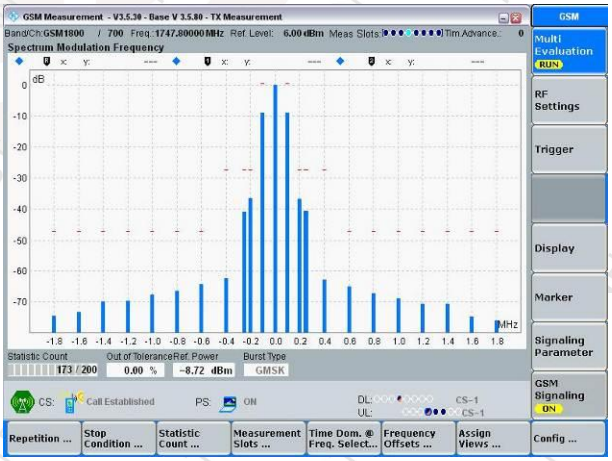








Extreme Condition

HT,HV Condition (γ=3), High Channel	HT,HV Condition (γ=18), High Channel
	
	
HT,HV Condition (γ=3), Middle Channel	HT,HV Condition (γ=18), Middle Channel
	

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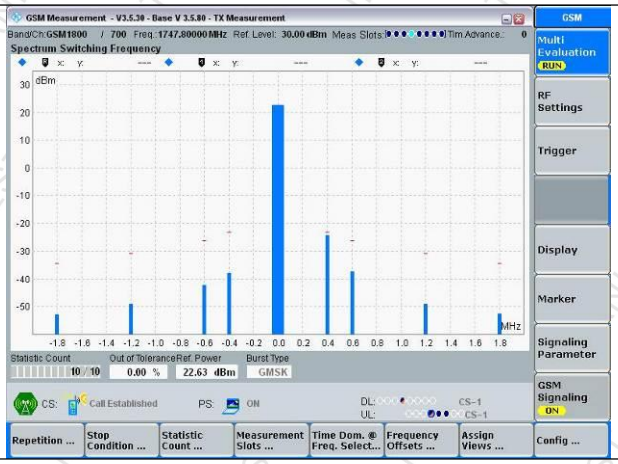
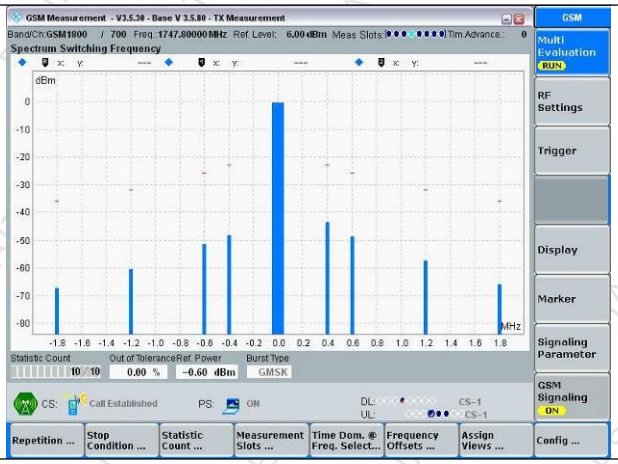
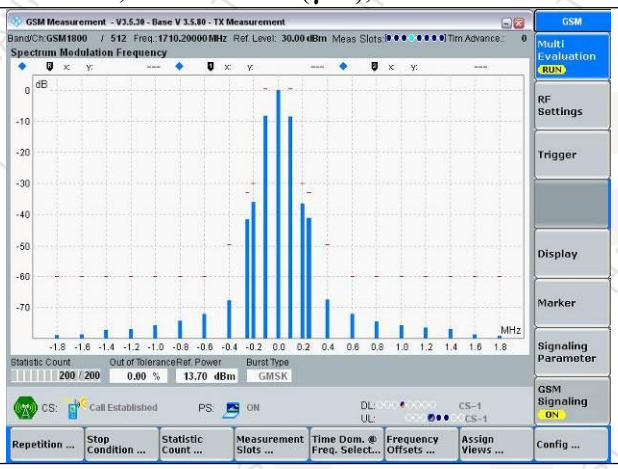
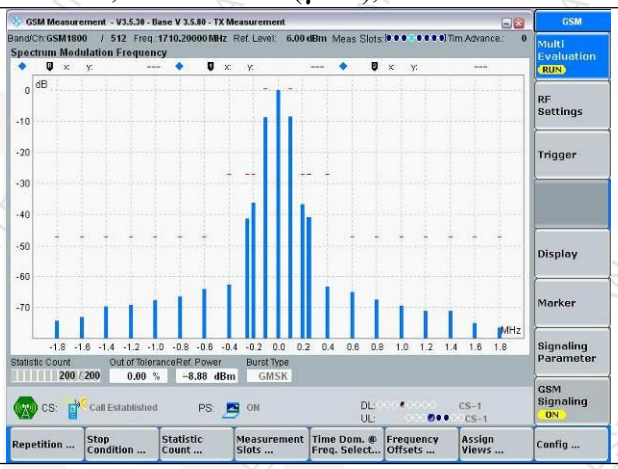


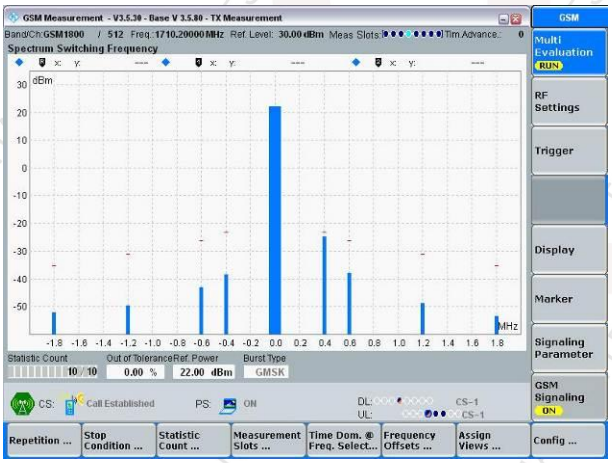
HT,HV Condition (γ=3), Low Channel

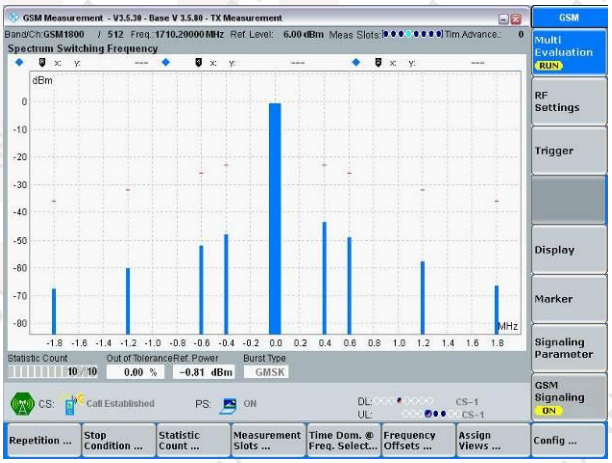


HT,HV Condition (γ=18), Low Channel

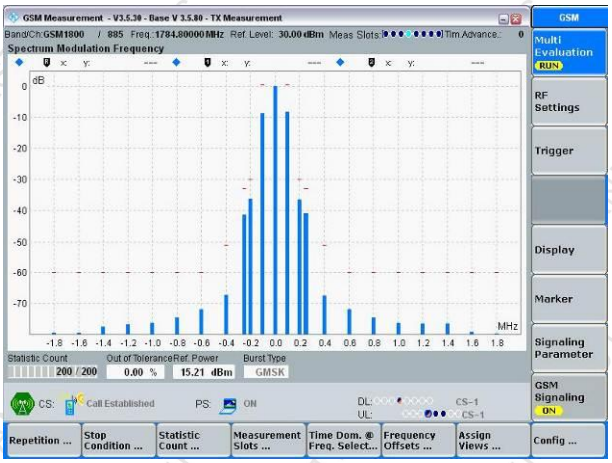
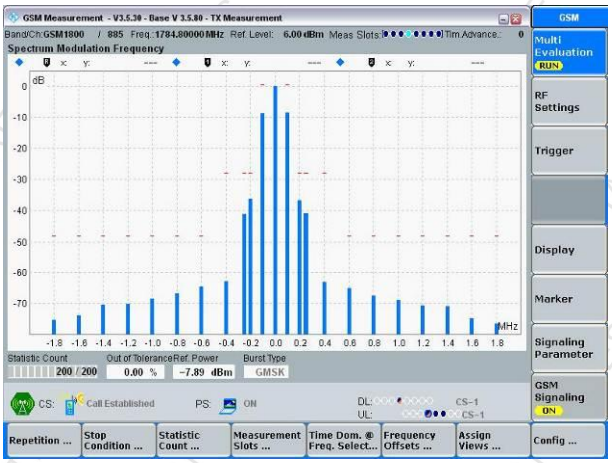
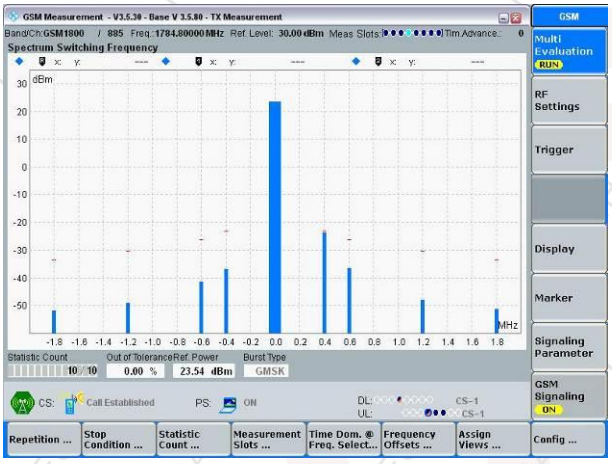
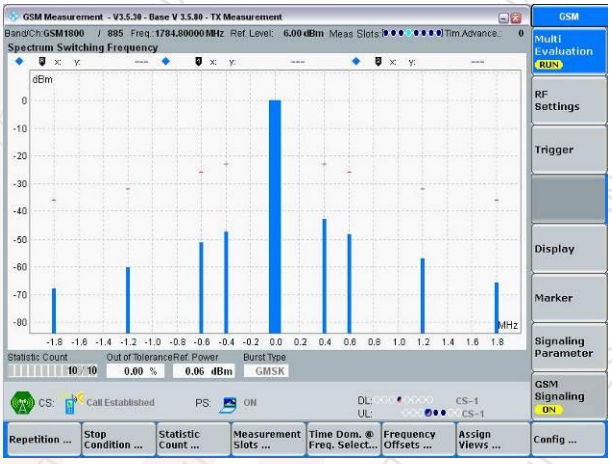
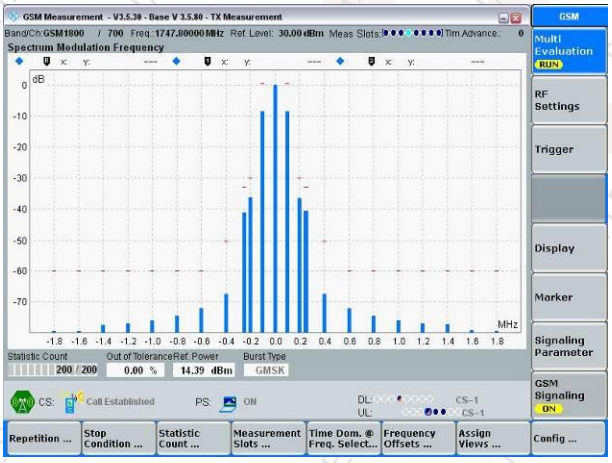
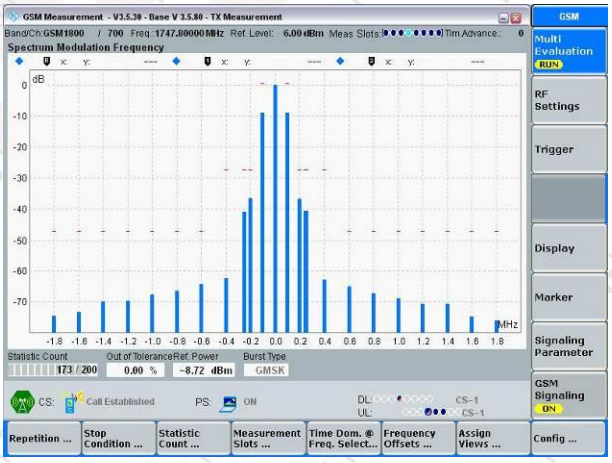








Extreme Condition

HT,LV Condition (γ=3), High Channel	HT,LV Condition (γ=18), High Channel
	
	
HT,LV Condition (γ=3), Middle Channel	HT,LV Condition (γ=18), Middle Channel
	

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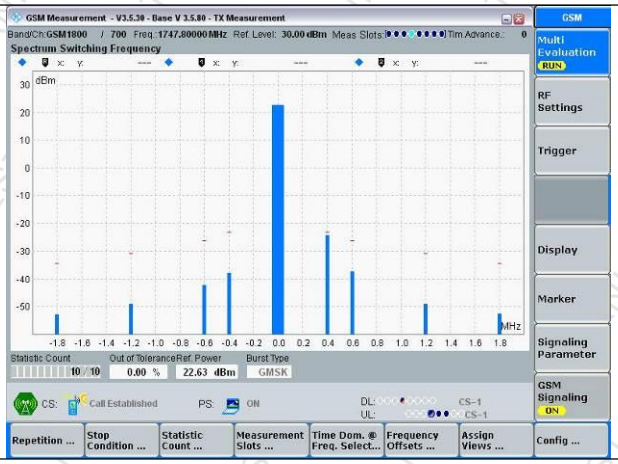
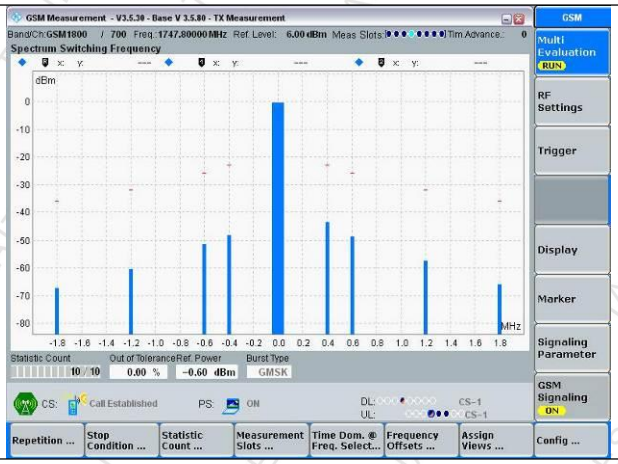
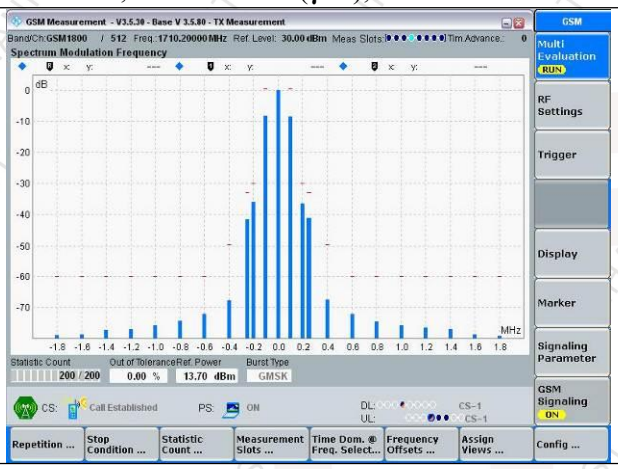
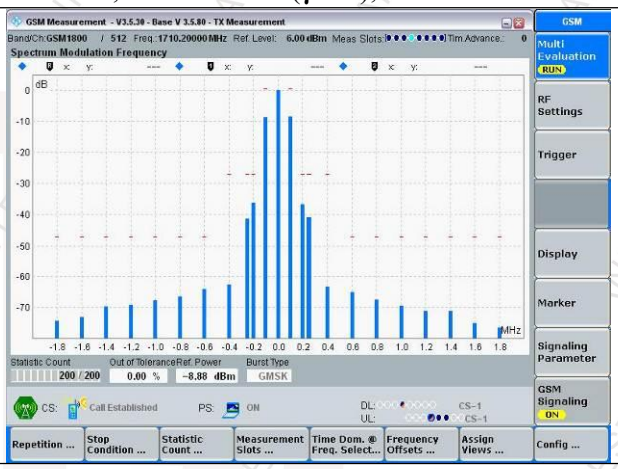


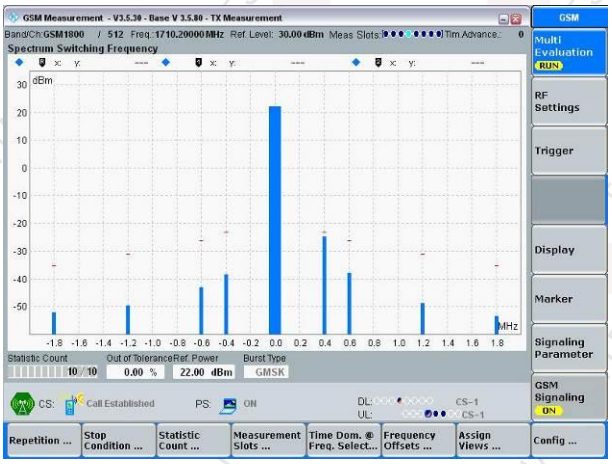
HT,LV Condition (γ=3), Low Channel

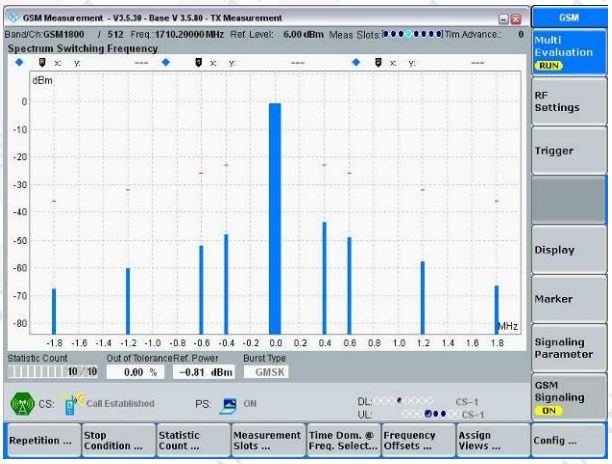


HT,LV Condition (γ=18), Low Channel









4.6. Conducted spurious emissions - MS allocated a channel

4.6.1 Definition

Conducted spurious emissions, when the MS has been allocated a channel, are emissions from the antenna connector at frequencies other than those of the carrier and sidebands associated with normal modulation.

4.6.2 Limits

The conducted spurious power emitted by the MS, when allocated a channel, shall be no more than the levels in table below

Frequency range	Power level in dBm	
	GSM 900	DCS 1 800
9 kHz to 1 GHz	-36	-36
1 GHz to 12,75 GHz	-30	
1 GHz to 1 710 MHz		-30
1 710 MHz to 1 785 MHz		-36
1 785 MHz to 12,75 GHz		-30

4.6.3 Test Procedure

Follow the test procedure as described in TS 151 010-1 Clause 12.1.1.4 to measure the conducted spurious emissions - MS allocated a channel at normal voltage and extreme voltage conditions.

4.6.4 Test Results

Please refer to following:

GSM900				
Channel	Power control level	Conditions		Result
60	3	Normal voltage	Extreme voltage	Pass
DCS1800				
Channel	Power control level	Conditions		Result
700	3	Normal voltage	Extreme voltage	Pass

GSM900(GPRS)				
Channel	Power control level	conditions		Result
60	3	Normal voltage	Extreme voltage	Pass
DCS1800(GPRS)				
Channel	Power control level	Conditions		Result
700	3	Normal voltage	Extreme voltage	Pass

Test plots of normal voltage test condition as below:

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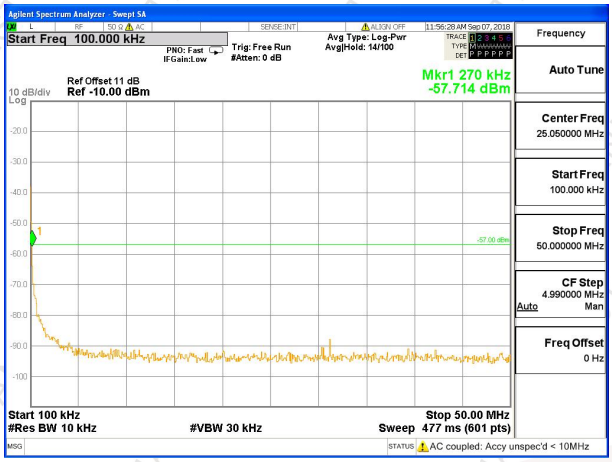
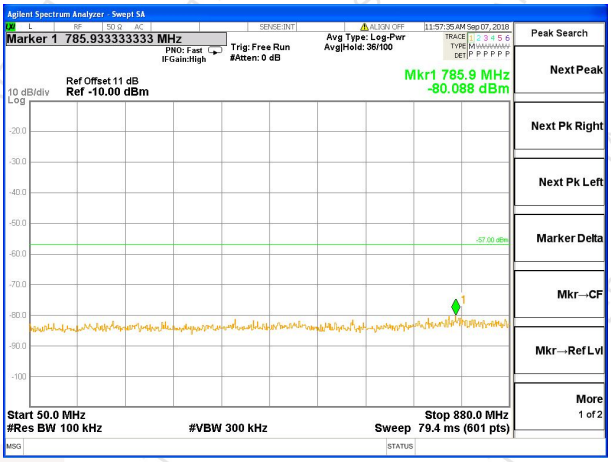
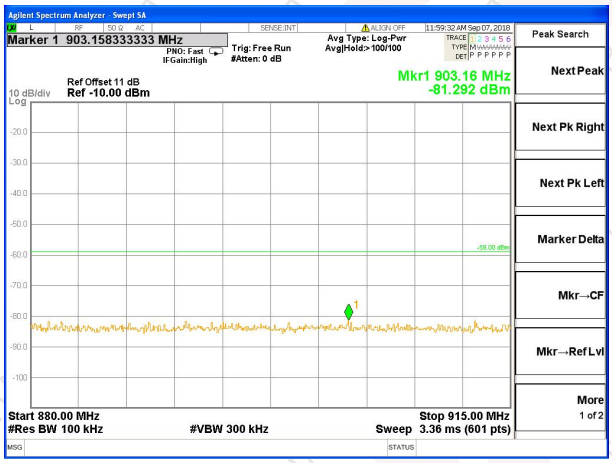
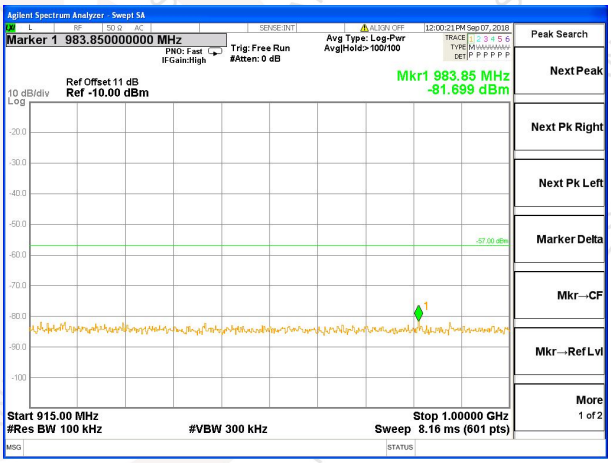
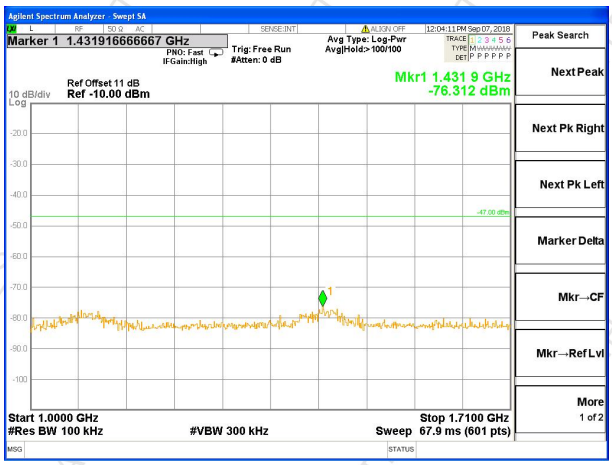
Test Plot
GSM 900 Normal Voltage Condition at Middle Channel

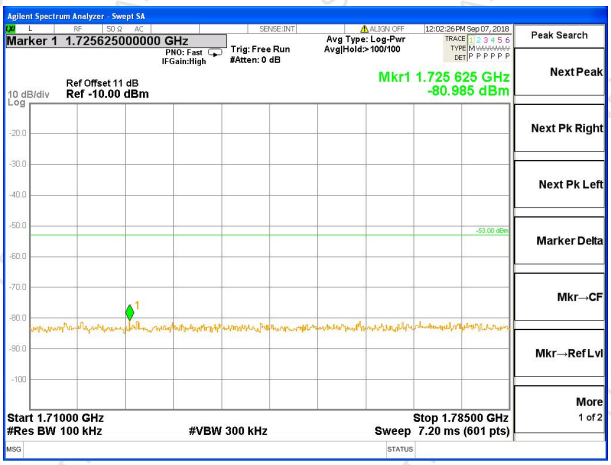












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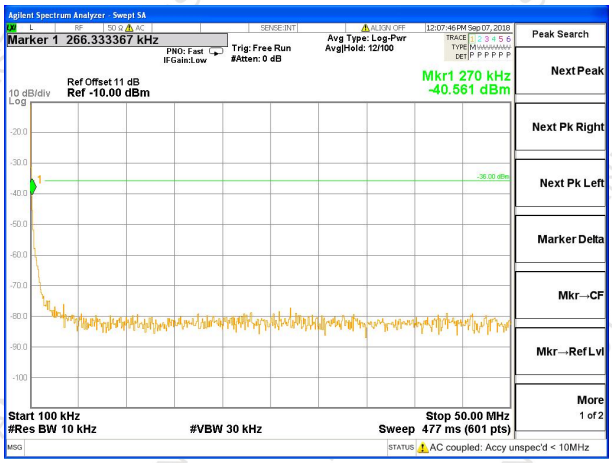
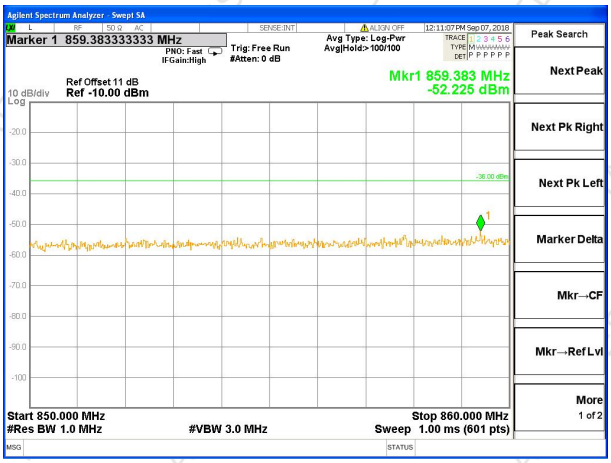
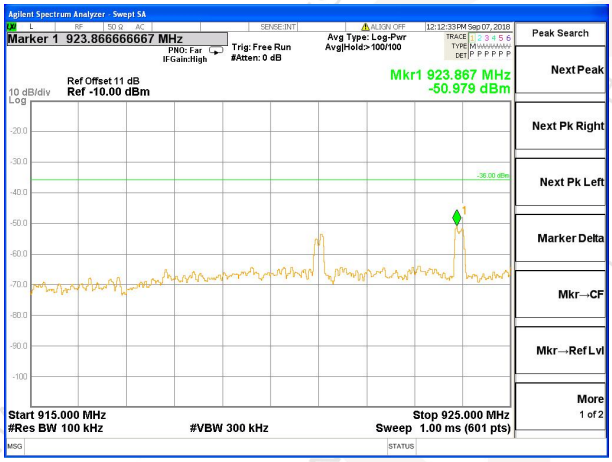
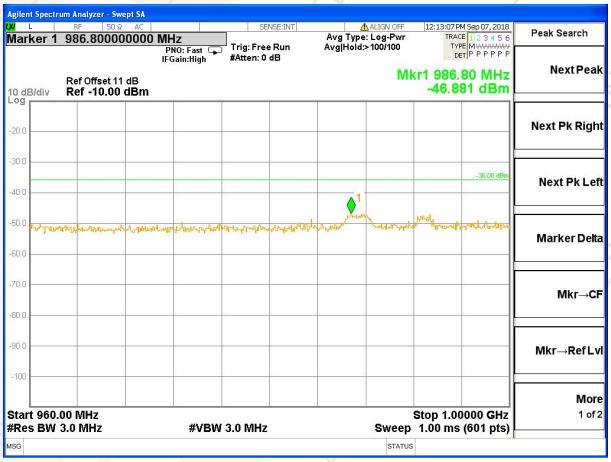
GSM 900 Normal Voltage Condition at Middle Channel

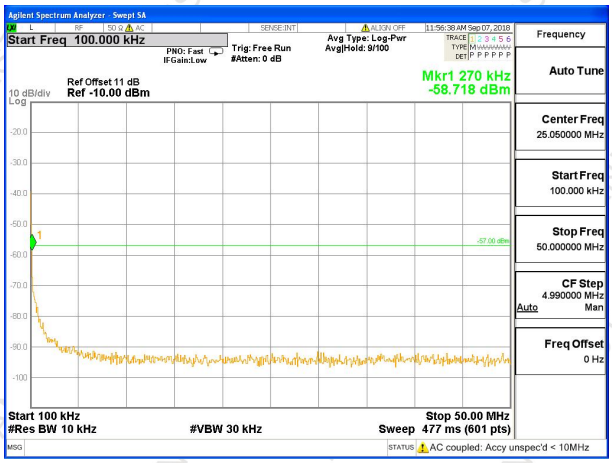


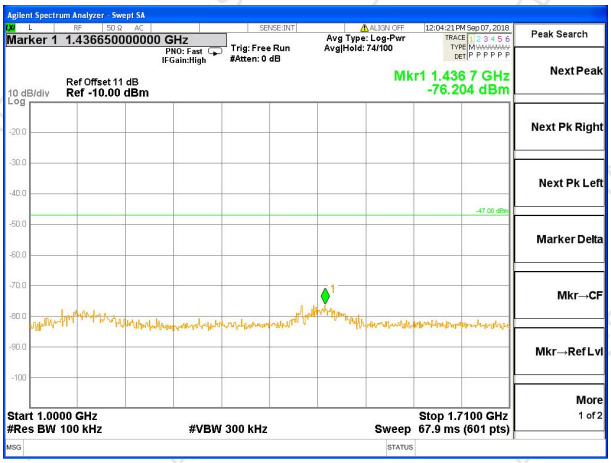


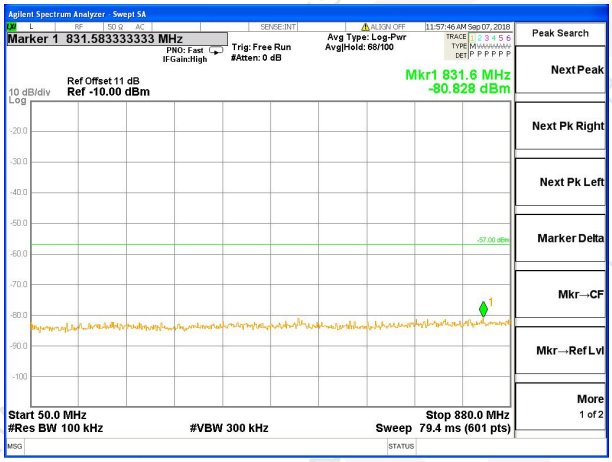


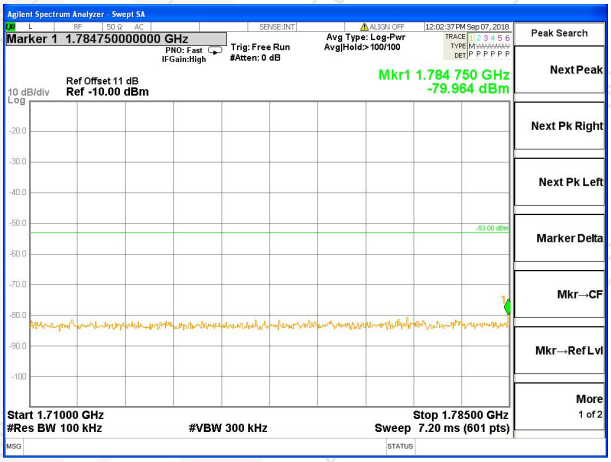


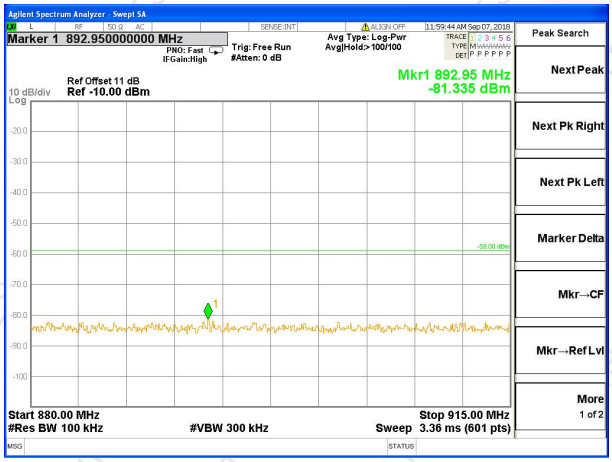
GSM 1800 Normal Voltage Condition at Middle Channel

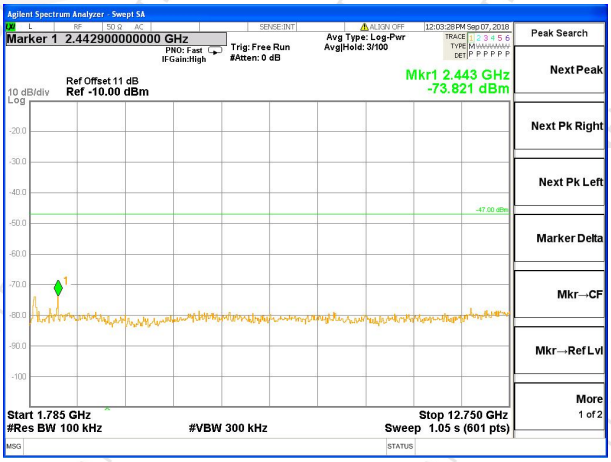












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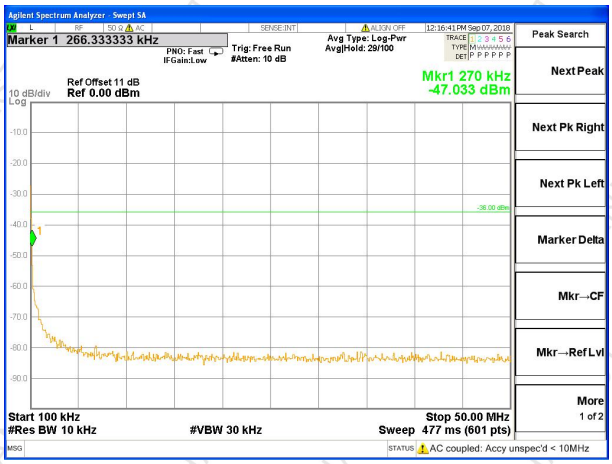
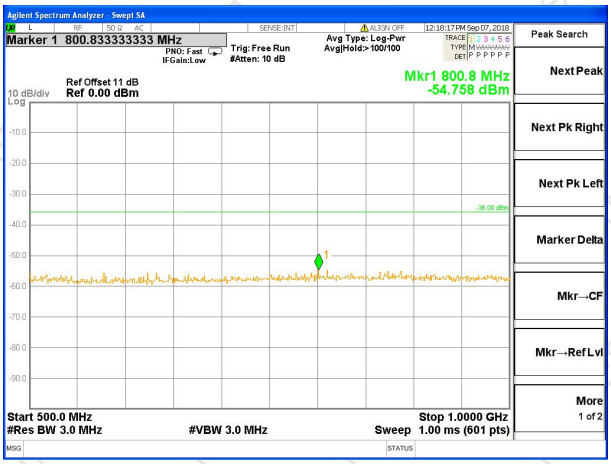
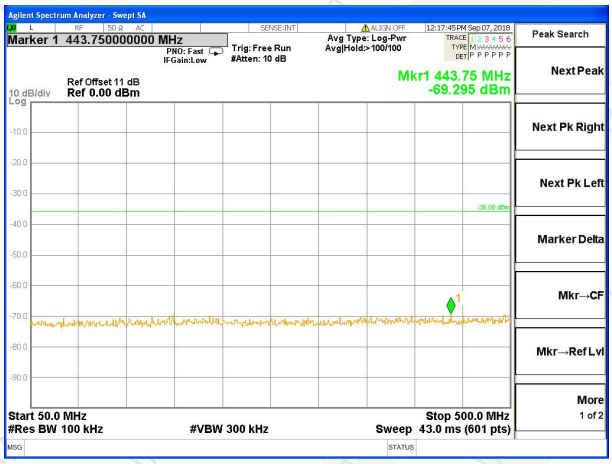
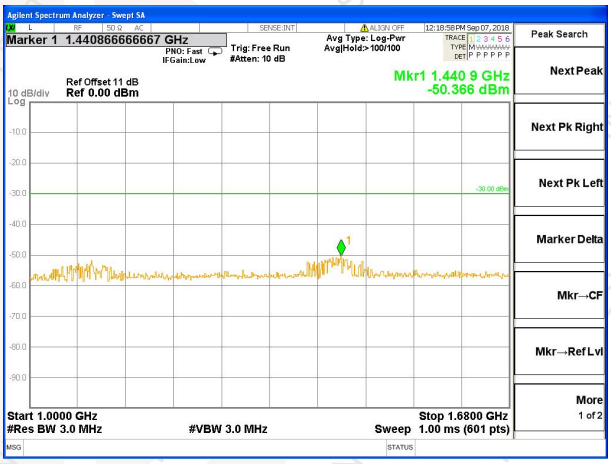
GSM 1800 Normal Voltage Condition at Middle Channel









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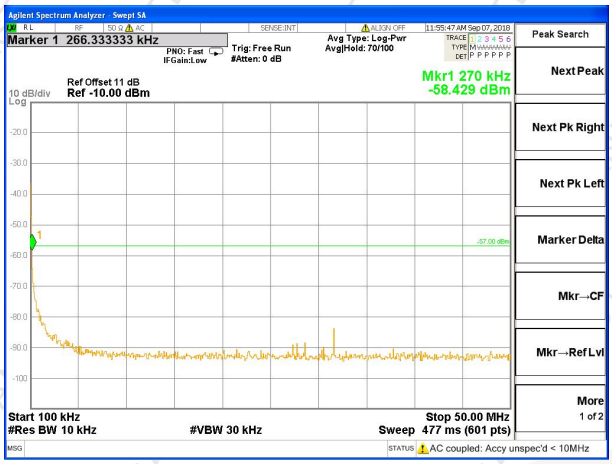
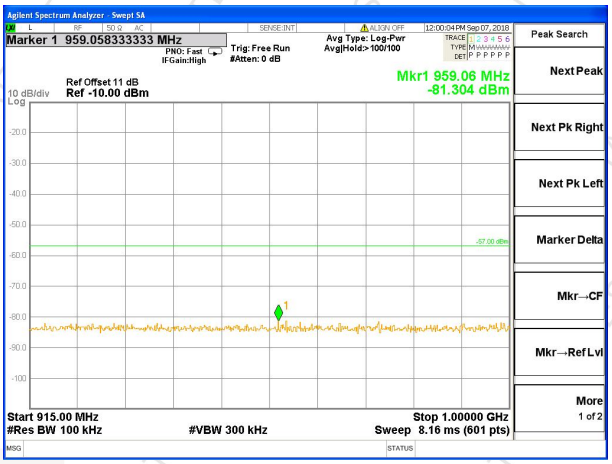
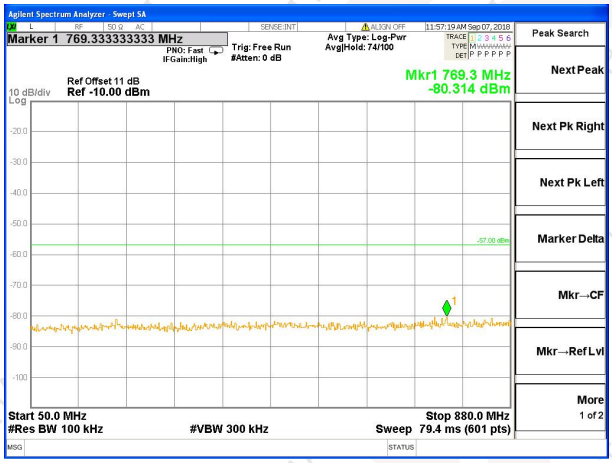
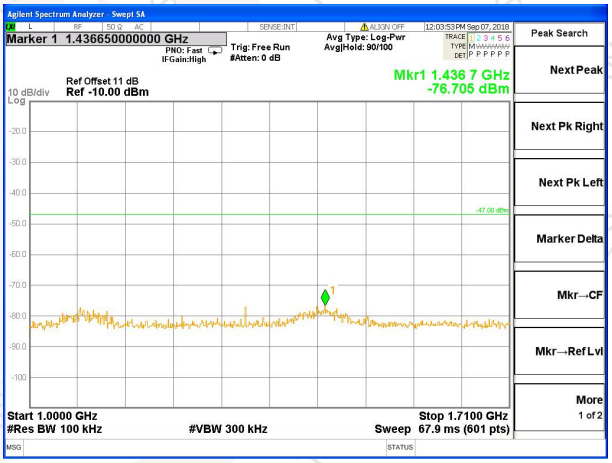
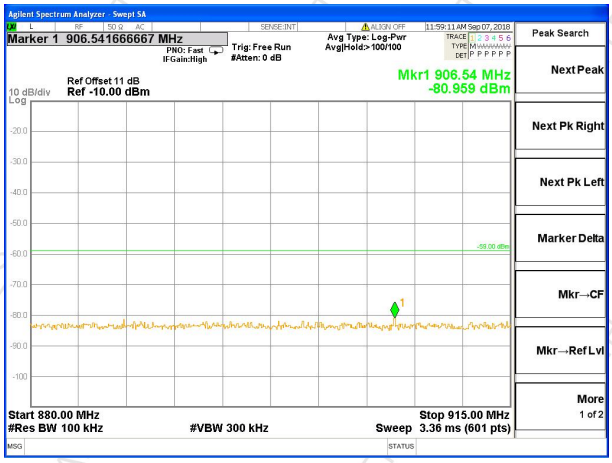
Test Plot
GPRS 900 Normal Voltage Condition at Middle Channel

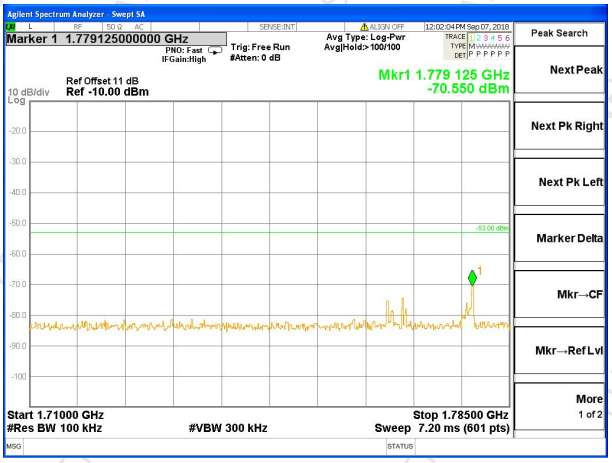












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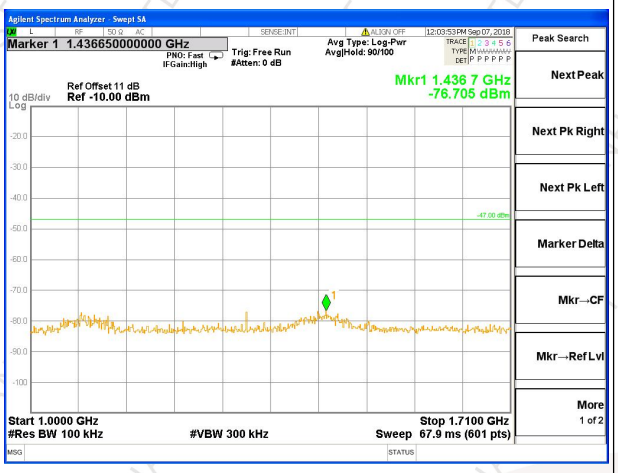
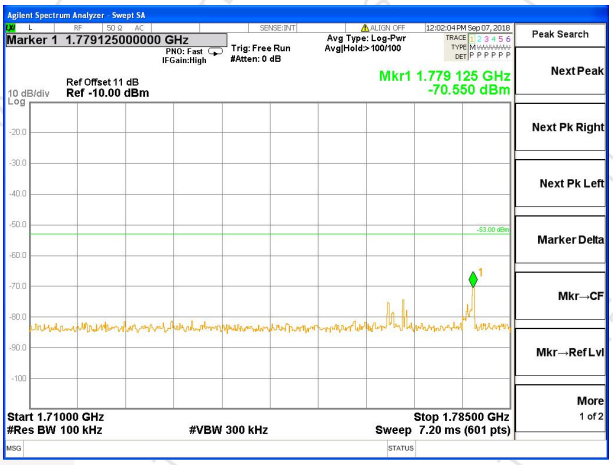
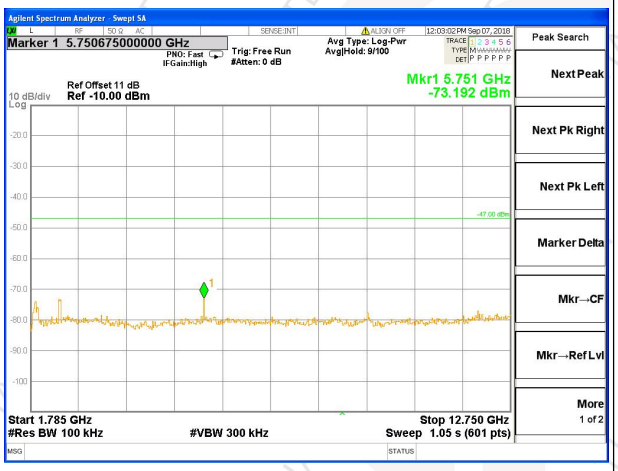
GPRS 900 Normal Voltage Condition at Middle Channel







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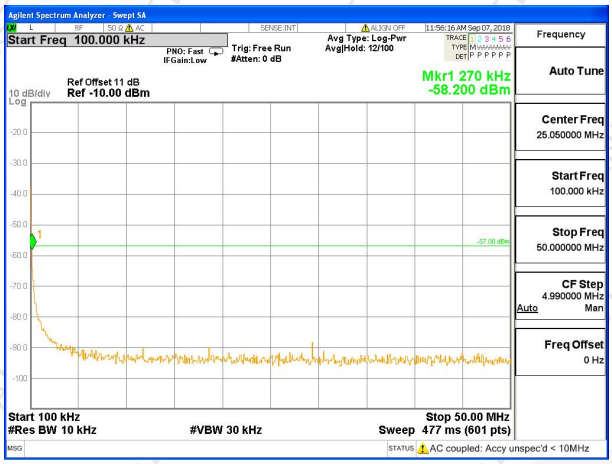
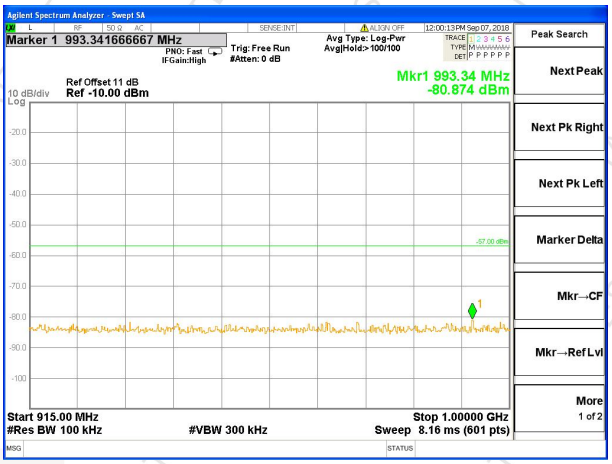
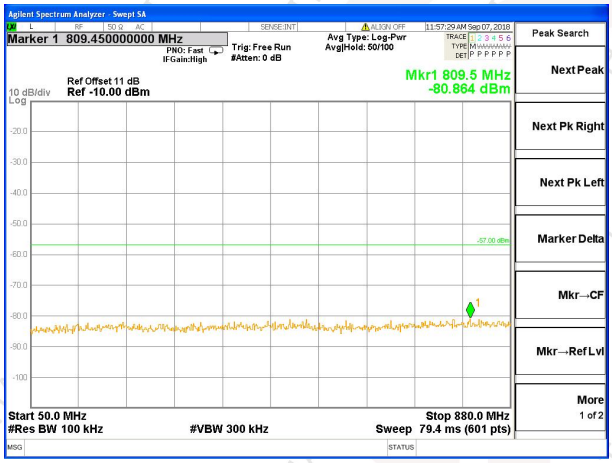
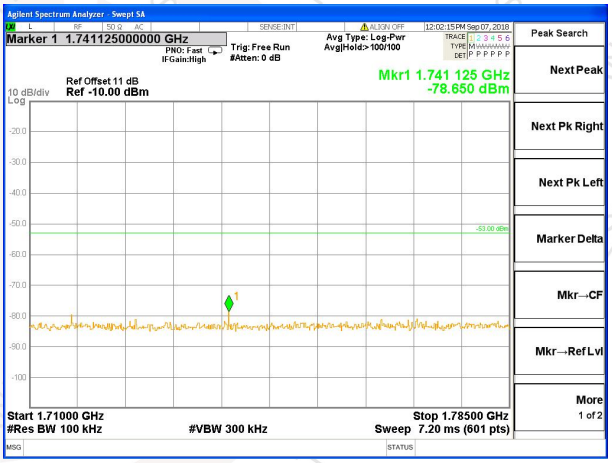
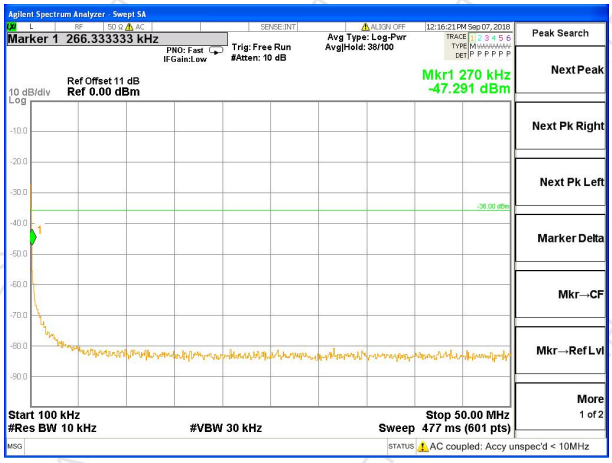
GPRS 1800 Normal Voltage Condition at Middle Channel

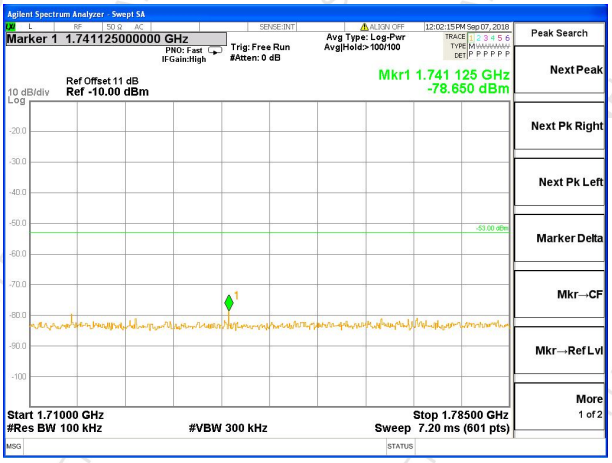




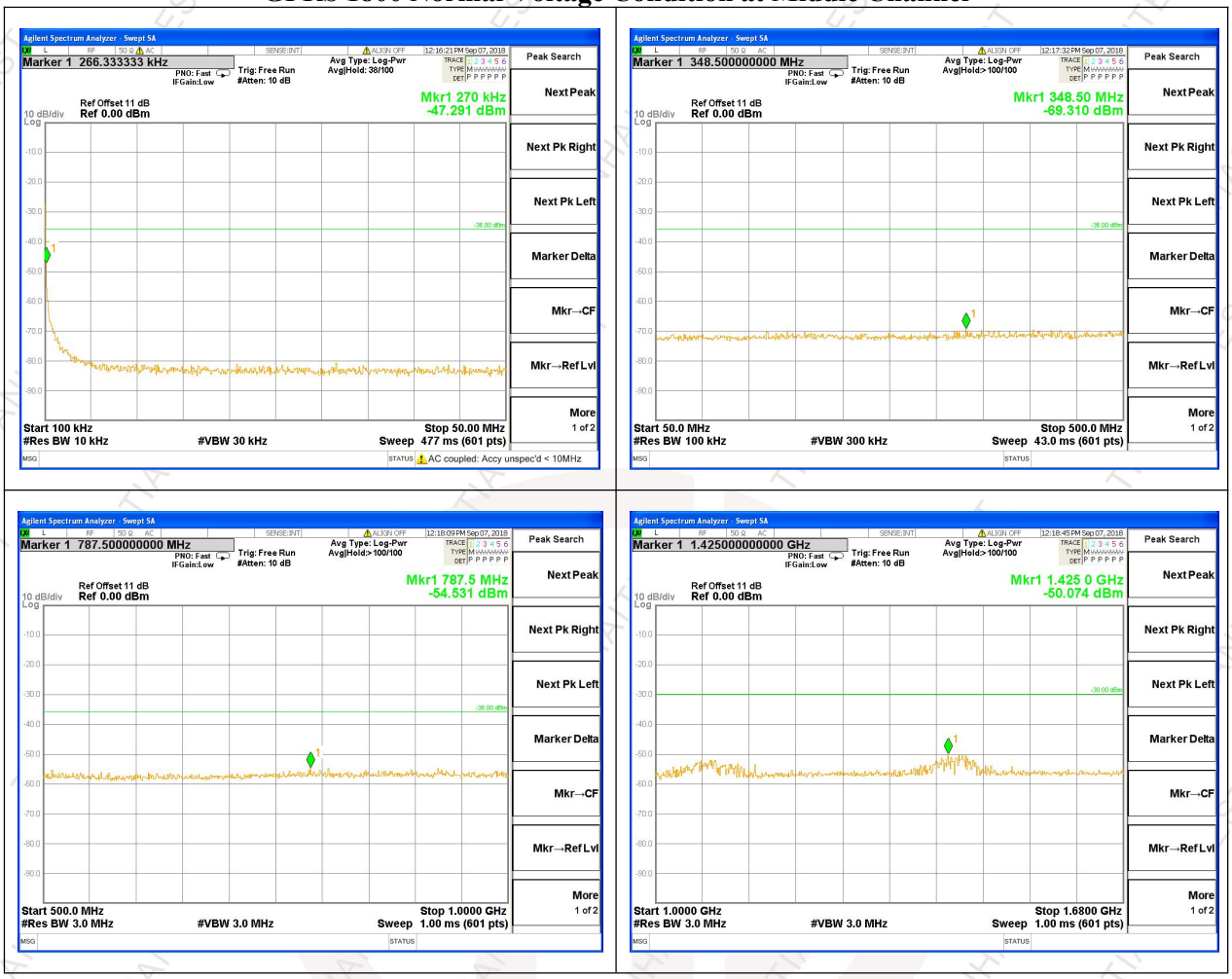








GPRS 1800 Normal Voltage Condition at Middle Channel



4.7. Conducted spurious emissions - MS in idle mode

4.7.1 Applicable Standard Definition

Conducted spurious emissions, when the MS has been allocated a channel, are emissions from the antenna connector at frequencies other than those of the carrier and sidebands associated with normal modulation.

4.7.2 Limits

The conducted spurious power emitted by the MS, when allocated a channel, shall be no more than the levels in table below.

Frequency range		Power level in dBm
		GSM 900, DCS 1 800
9 kHz to	880 MHz	-57
880 MHz to	915 MHz	-59
915 MHz to	1000 MHz	-57
1 GHz to	1 710 MHz	-47
1 710 MHz to	1 785 MHz	-53
1 785 MHz to	12,75 GHz	-47

4.7.3 Test Procedure

Follow the test procedure as described in TS 151 010-1 Clause 12.1.2.4 to measure the conducted spurious emissions - MS in idle mode timing at normal voltage and extreme voltage conditions.

4.7.4 Test Results

GSM900				
Channel	Power control level	conditions		Result
60	3	Normal voltage	Extreme voltage	Pass
DCS1800				
Channel	Power control level	Conditions		Result
700	3	Normal voltage	Extreme voltage	Pass

GSM900(GPRS)				
Channel	Power control level	conditions		Result
60	3	Normal voltage	Extreme voltage	Pass
DCS1800(GPRS)				
Channel	Power control level	Conditions		Result
700	3	Normal voltage	Extreme voltage	Pass

Test plots of normal test condition as below:

Test Plot

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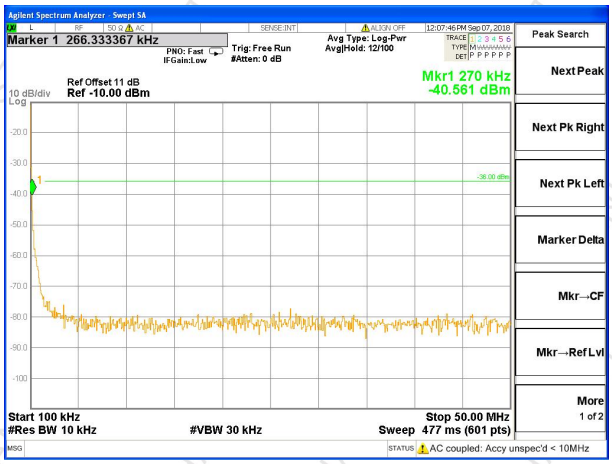
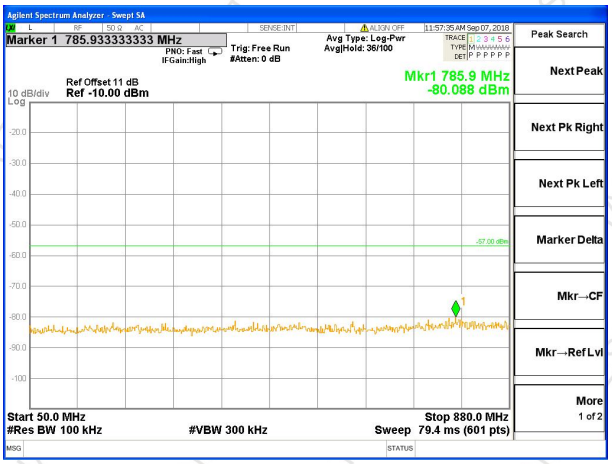
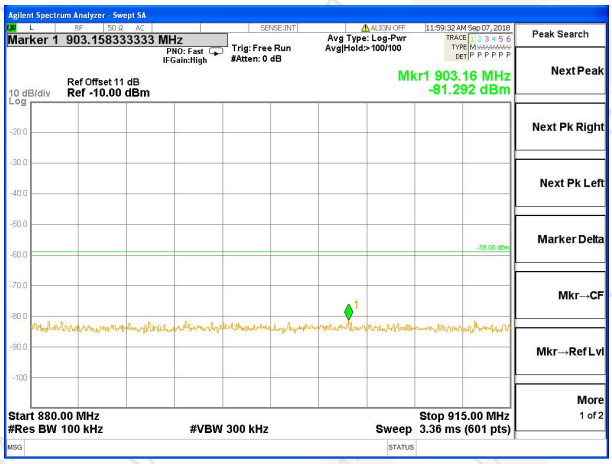
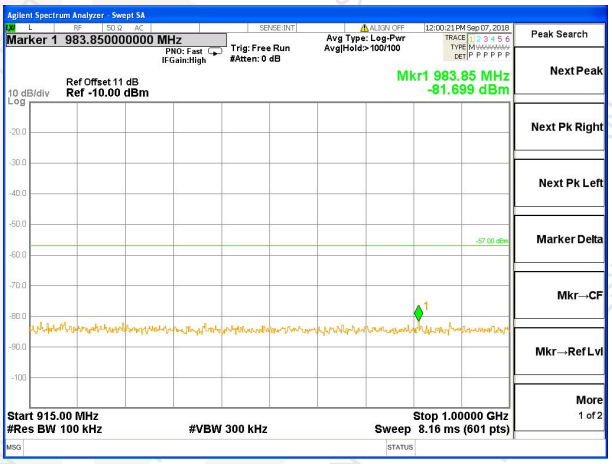
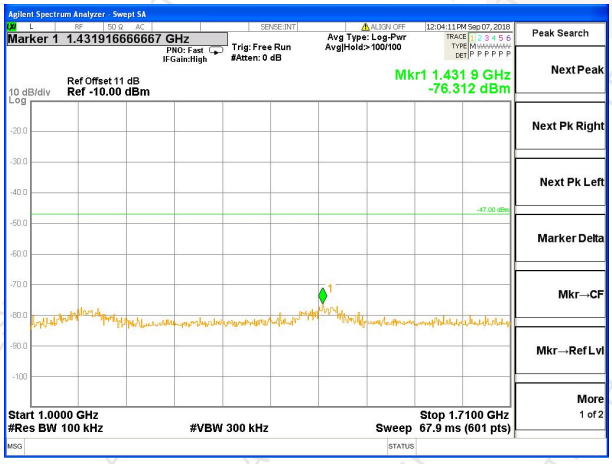
GSM 900 Normal Voltage Condition at idle mode

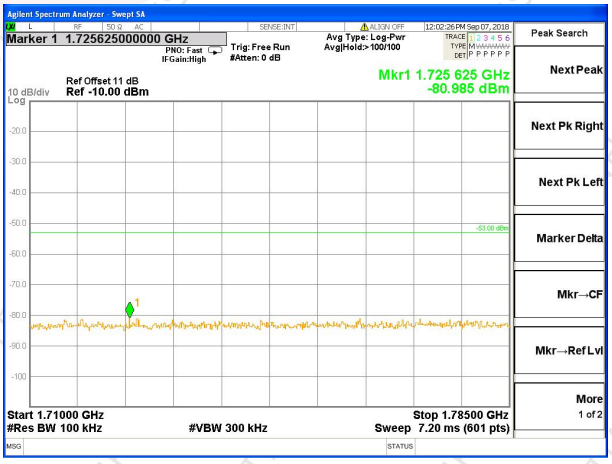












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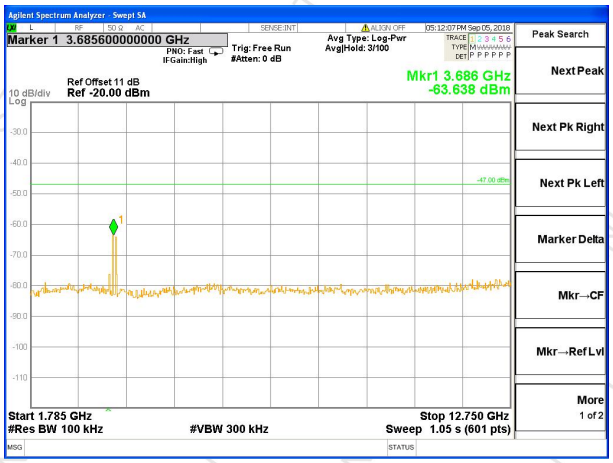
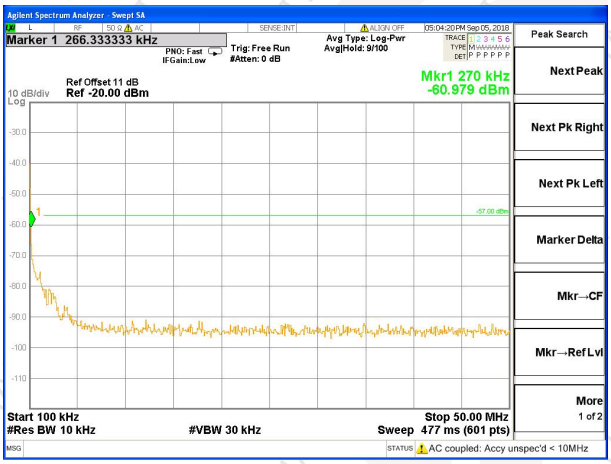
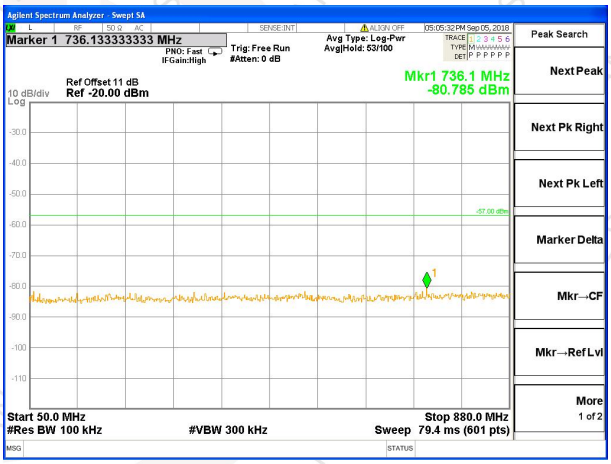
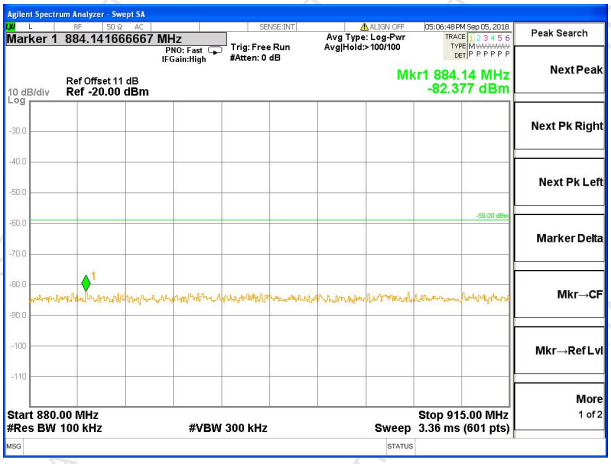


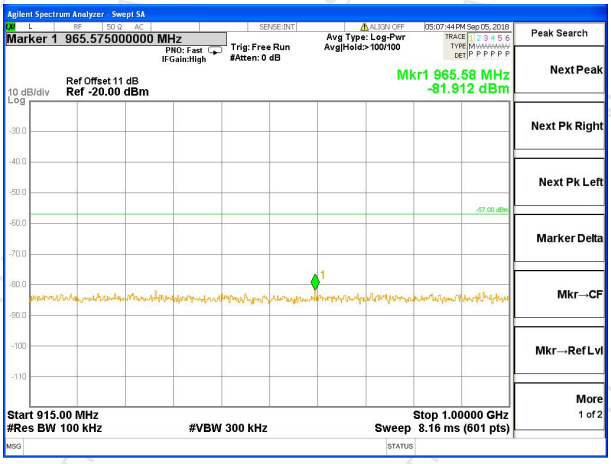
/

Test Plot
GSM 1800 Normal Voltage Condition at idle mode









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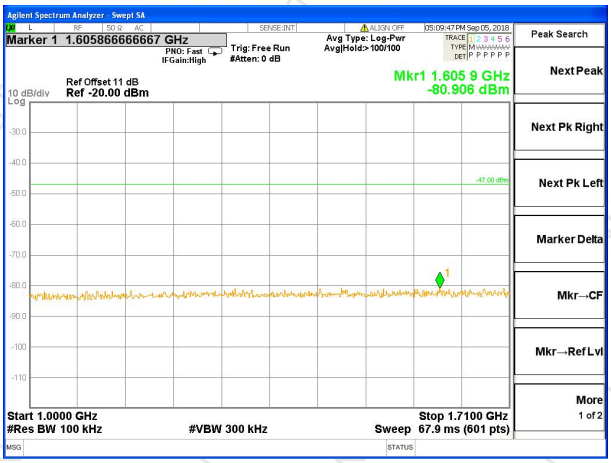
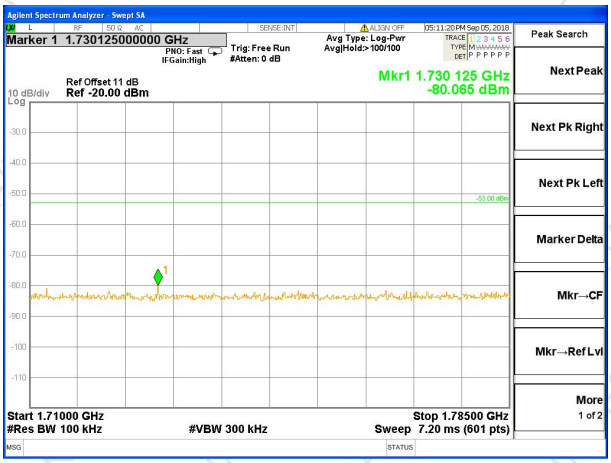
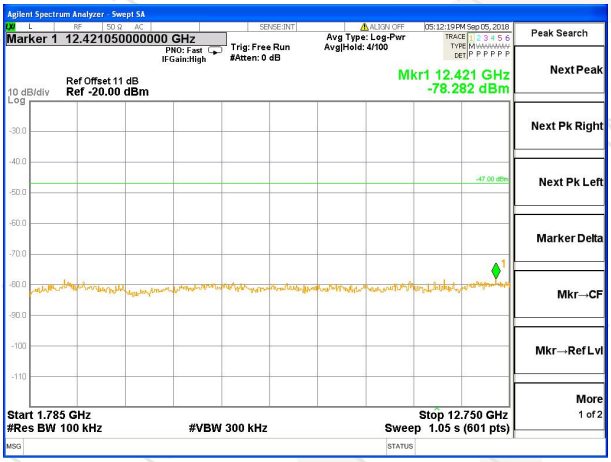
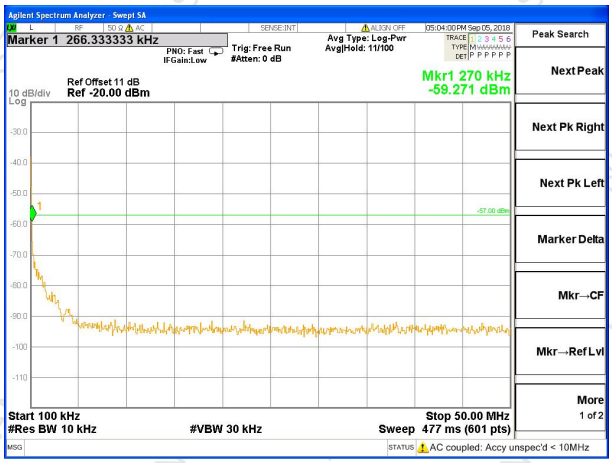

Agilent Spectrum Analyzer - Swept SA
Marker 1 1.605866666667 GHz
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 11 dB
10 dB/div
Ref -20.00 dBm
Mkr1 1.605 9 GHz
-80.906 dBm
Start 1.0000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.7100 GHz
Sweep 67.9 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

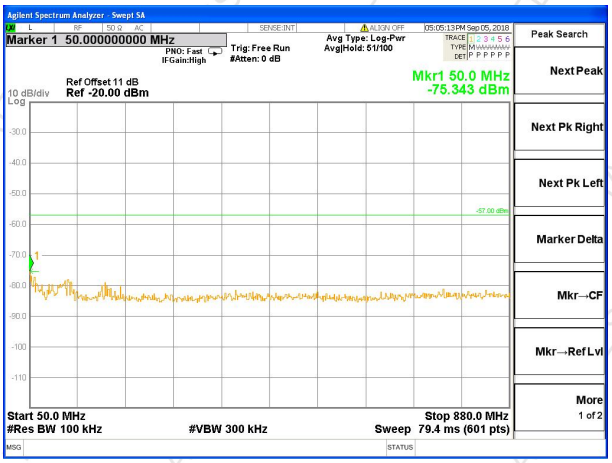

Agilent Spectrum Analyzer - Swept SA
Marker 1 1.730125000000 GHz
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 11 dB
10 dB/div
Ref -20.00 dBm
Mkr1 1.730 125 GHz
-80.065 dBm
Start 1.71000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 1.78500 GHz
Sweep 7.20 ms (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

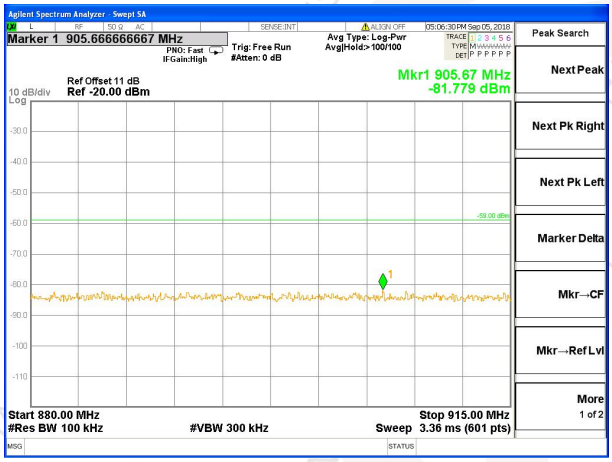

Agilent Spectrum Analyzer - Swept SA
Marker 1 12.421050000000 GHz
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Log-Pwr
Avg|Hold: 4/100
Ref Offset 11 dB
10 dB/div
Ref -20.00 dBm
Mkr1 12.421 GHz
-78.282 dBm
Start 1.785 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 12.750 GHz
Sweep 1.05 s (601 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

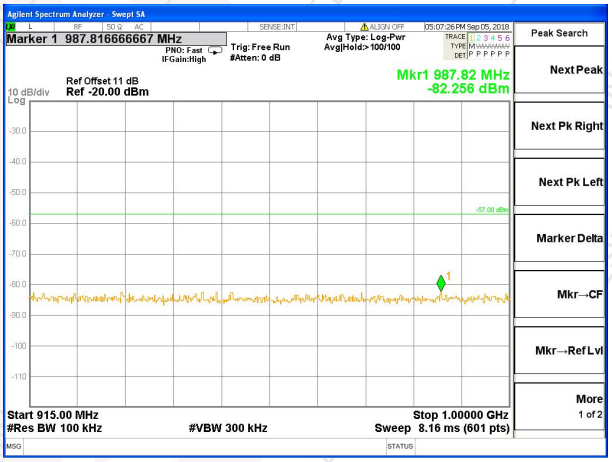
/

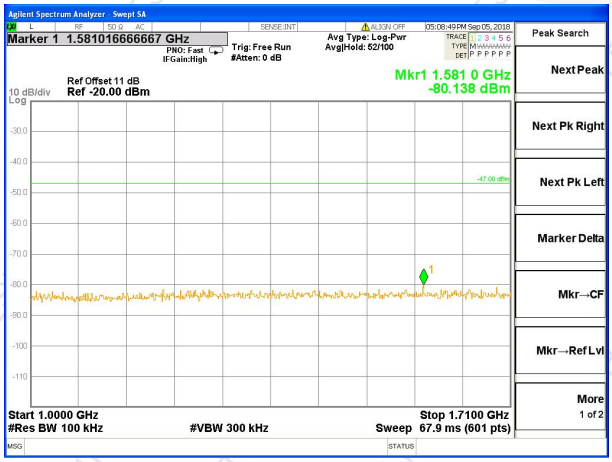
Test Plot
GPRS 900 Normal Voltage Condition at idle mode

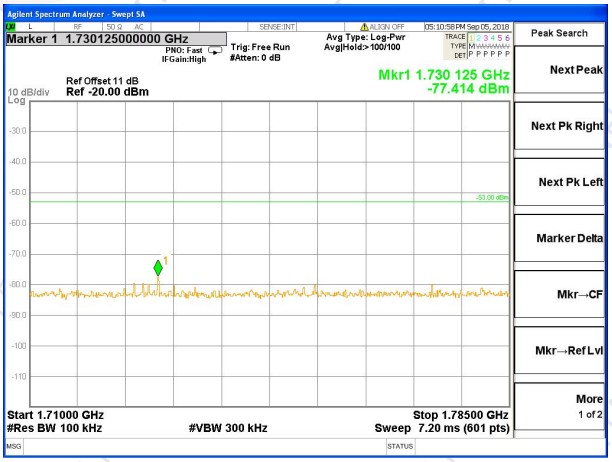












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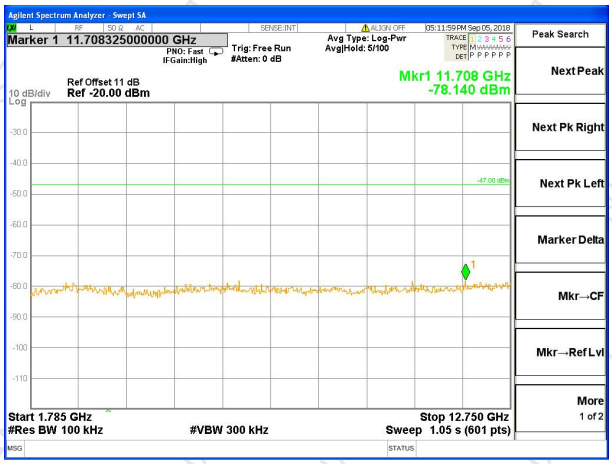

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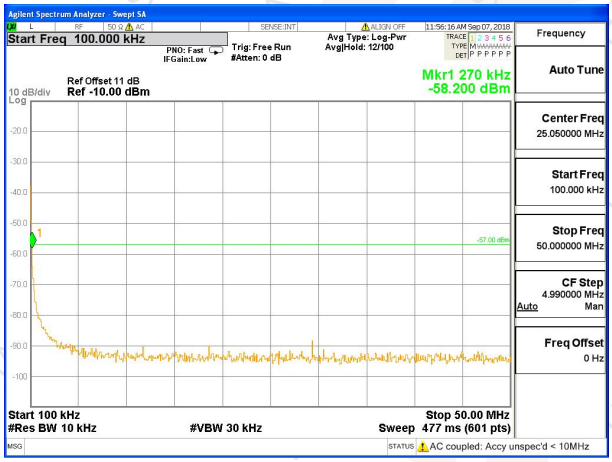
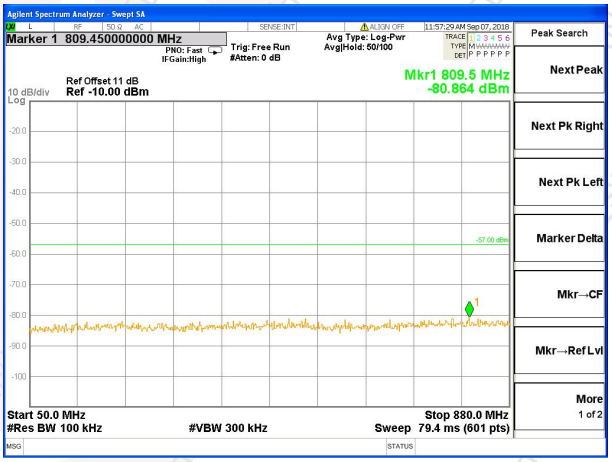
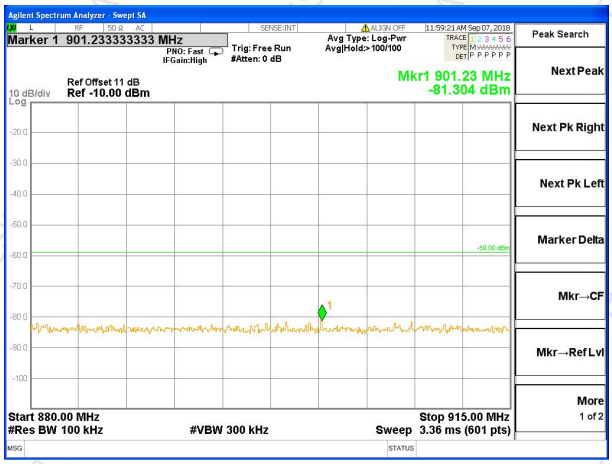
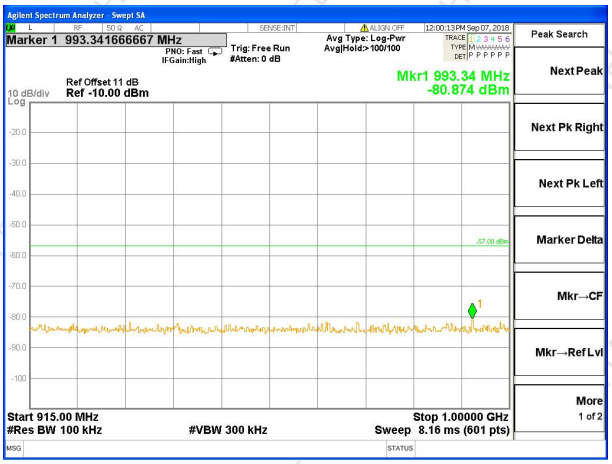
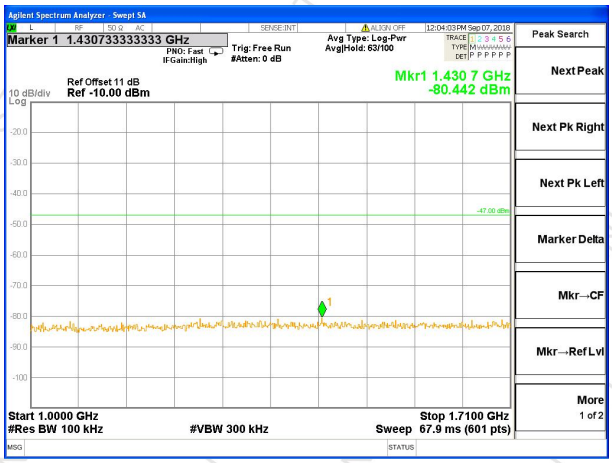
Test Plot
GPRS 1800 Normal Voltage Condition at idle mode

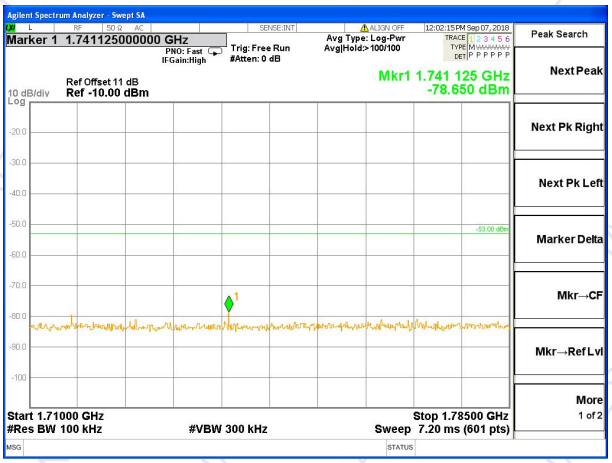


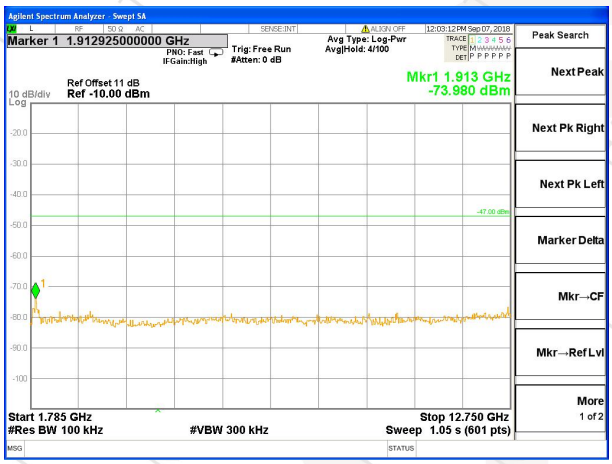












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4.8. Radiated spurious emissions - MS allocated a channel

4.8.1 Definition

Radiated spurious emissions, when the MS has been allocated a channel, are any emissions radiated by the cabinet and structure of the mobile station, including all interconnecting cables.
This is also known as "cabinet radiation".
The test applies to all types of MS with the exception of the test at extreme voltages for an MS where a practical connection, to an external power supply, is not possible.

4.8.2 Limits

The radiated spurious power emitted by the MS, when allocated a channel, shall be no more than the levels in table below.

Frequency range		Power level in dBm		
		GSM 400, GSM 700, GSM 850, GSM 900	DCS 1 800	PCS 1 900
30 MHz to	1 GHz	-36	-36	-36
1 GHz to	4 GHz	-30		-30
1 GHz to	1 710 MHz		-30	
1 710 MHz to	1 785 MHz		-36	
1 785 MHz to	4 GHz		-30	

4.8.3 Test Procedure

Follow the test procedure as described in TS 151 010-1 Clause 12.2.1.4 to measure the radiated spurious emissions - MS allocated a channel and burst timing at normal voltage and extreme voltage conditions.

4.8.4 Test Results

Please refer to following:

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GSM900

Frequency (MHz)	Polar (H/V)	ReadingLevel (dBm)	Factor	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
operation frequency:Middle channel						
65.7125	V	-71.19	28.86	-42.33	-36	-6.33
232.2461	V	-75.10	22.87	-52.23	-36	-16.23
526.3527	V	-80.34	33.53	-46.81	-36	-10.81
1357.7354	V	-36.11	-4.51	-40.62	-30	-10.62
1750.6524	V	-32.50	-6.89	-39.39	-30	-9.39
2457.2457	V	-36.34	-5.06	-41.40	-30	-11.40
95.9547	H	-80.19	28.92	-51.27	-36	-15.27
450.7244	H	-70.84	22.84	-48.00	-36	-12.00
814.8041	H	-81.11	31.47	-49.64	-36	-13.64
1472.3575	H	-36.80	-4.71	-41.51	-30	-11.51
2305.7142	H	-34.20	-4.53	-38.73	-30	-8.73
2865.3655	H	-32.85	-6.89	-39.74	-30	-9.74

GSM1800

Frequency (MHz)	Polar (H/V)	ReadingLevel (dBm)	Factor	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
operation frequency:Middle channel						
63.2827	V	-80.58	28.52	-52.06	-36	-16.06
315.5212	V	-73.06	23.56	-49.50	-36	-13.50
524.6034	V	-75.16	27.94	-47.22	-36	-11.22
1354.7515	V	-37.65	-4.66	-42.31	-30	-12.31
1919.5714	V	-40.56	-2.09	-42.65	-30	-12.65
2425.6244	V	-45.07	2.01	-43.06	-30	-13.06
42.4213	H	-81.72	28.21	-53.51	-36	-17.51
250.7929	H	-75.01	22.18	-52.83	-36	-16.83
677.7638	H	-77.21	30.2	-47.01	-36	-11.01
1155.6254	H	-34.58	-4.67	-39.25	-30	-9.25
1851.1224	H	-38.06	-2.09	-40.15	-30	-10.15
2736.5612	H	-44.97	2.02	-42.95	-30	-12.95

Note 1: Absolute Level= Reading Level+ Factor, Margin= Absolute Level - Limit
Note 2: Only the worst mode data is reflected.

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GSM900_middle channel 902MHz

Spurious Emissions Level				
Frequency (MHz)	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
1804.00	H	-42.28	-30.00	12.28
1804.00	V	-43.02	-30.00	13.02
2706.00	H	-44.62	-30.00	14.62
2706.00	V	-45.00	-30.00	15.00
3608.00	H	-50.83	-30.00	20.83
3608.00	V	-50.45	-30.00	20.45
809.88	H	-57.04	-36.00	21.04
893.30	V	-56.87	-36.00	20.87

DCS1800_middle channel 1747.8MHz

Spurious Emissions Level				
Frequency (MHz)	**Antenna Polarization**	**Level (dBm)**	**Limit (dBm)**	**Margin (dB)**
3495.60	H	-39.89	-30.00	9.89
3495.60	V	-38.60	-30.00	8.60
809.88	H	-56.15	-36.00	20.15
757.50	V	-59.82	-36.00	23.82

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4.9. Frequency error and Modulation accuracy in EGPRS Configuration

4.9.1 Definition

Radiated spurious emissions, when the MS is in idle mode, are any emissions radiated by the cabinet and structure of the mobile station, including all interconnecting cables.
This is also known as "cabinet radiation".
The test applies to all types of MS with the exception of the test at extreme voltages for an MS where a practical connection, to an external power supply, is not possible.

4.9.2 Limits

The radiated spurious power emitted by the MS, when in idle mode, shall be no more than the levels in table below.

Frequency range		**Power level in dBm**
		GSM 900, DCS 1 800
30 MHz to	880 MHz	-57
880 MHz to	915 MHz	-59
915 MHz to	1 000 MHz	-57
1 GHz to	1 710 MHz	-47
1 710 MHz to	1 785 MHz	-53
1 785 MHz to	4GHz	-47

4.9.3 Test Procedure

Follow the test procedure as described in TS 151 010-1 Clause 12.2.2.4 to measure the radiated spurious emissions - MS in idle mode at normal voltage and extreme voltage conditions.

4.9.4 Test Results

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GSM900

Frequency (MHz)	Polar (H/V)	ReadingLevel (dBm)	Factor	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
operation frequency:Middle channel						
43.3025	V	-90.47	22.54	-67.93	-57	-10.93
172.2121	V	-92.68	22.81	-69.87	-57	-12.87
545.21438	V	-92.08	28.73	-63.35	-57	-6.35
1547.2425	V	-53.78	-6.25	-60.03	-47	-13.03
1824.1752	V	-53.58	-2.91	-56.49	-47	-9.49
2584.3473	V	-59.62	0.33	-59.29	-47	-12.29
82.3755	H	-99.60	22.51	-77.09	-57	-20.09
204.1768	H	-108.31	34.44	-73.87	-57	-16.87
382.4523	H	-95.85	26.49	-69.36	-57	-12.36
1732.6325	H	-54.78	-4.57	-59.35	-47	-12.35
2525.4753	H	-54.40	-3.24	-57.64	-47	-10.64
3614.7257	H	-60.37	-2.25	-62.62	-47	-15.62

GSM1800

Frequency (MHz)	Polar (H/V)	ReadingLevel (dBm)	Factor	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
operation frequency:Middle channel						
72.4524	V	-99.62	29.14	-70.48	-57	-13.48
172.3245	V	-99.57	23.46	-76.11	-57	-19.11
527.3474	V	-101.49	35.13	-66.36	-57	-9.36
1472.4115	V	-52.15	-8.56	-60.71	-47	-13.71
2252.7234	V	-57.69	-3.52	-61.21	-47	-14.21
3122.2245	V	-50.29	-4.99	-55.28	-47	-8.28
63.4258	H	-100.61	27.48	-73.13	-57	-16.13
235.7578	H	-95.48	24.01	-71.47	-57	-14.47
756.2255	H	-109.76	38.02	-71.74	-57	-14.74
1647.2647	H	-51.22	-7.84	-59.06	-47	-12.06
2750.3614	H	-60.03	-3.18	-63.21	-47	-16.21
3268.7512	H	-61.71	-0.68	-62.39	-47	-15.39

Note 1: Absolute Level= Reading Level+ Factor, Margin= Absolute Level - Limit
Note 2: Only the worst mode data is reflected.

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4.10. Receiver Blocking and spurious response - speech channels

4.10.1 Definition

Blocking is a measure of the ability of the receiver to receive a modulated wanted input signal in the presence of an unwanted input signal, on frequencies other than those of the spurious responses or the adjacent channels, without exceeding a given degradation.

4.10.2 Test Procedure

Follow the test procedure as described in TS 151 010-1 Clause 14.7.1.3 to measure the receiver blocking and spurious response - speech channels.

4.10.3 Test Result

GSM/GPRS 900

Channel frequency (MHZ)	FBER (%)	Limit (%)	Result
880.2	0.0014	2.439	Pass
898.4	0.0055	2.439	Pass
914.8	0.0025	2.439	Pass

GSM/GPRS 1800

Channel frequency (MHZ)	FBER (%)	Limit (%)	Result
1710.2	0.0172	2.439	Pass
1747.8	0.0159	2.439	Pass
1784.8	0.0035	2.439	Pass

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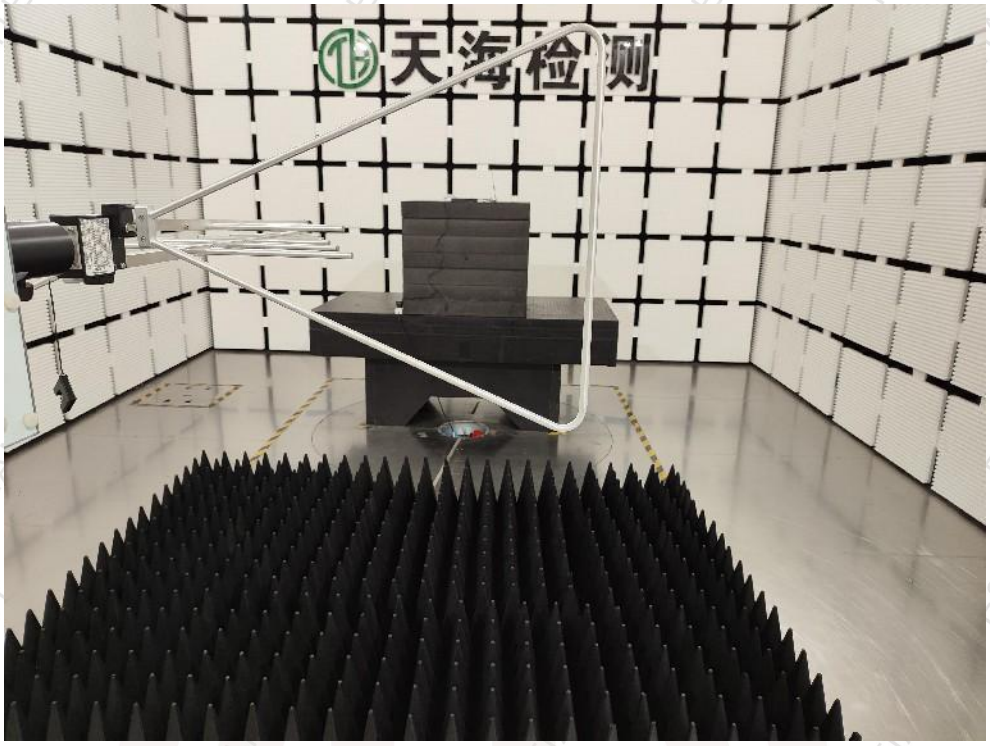
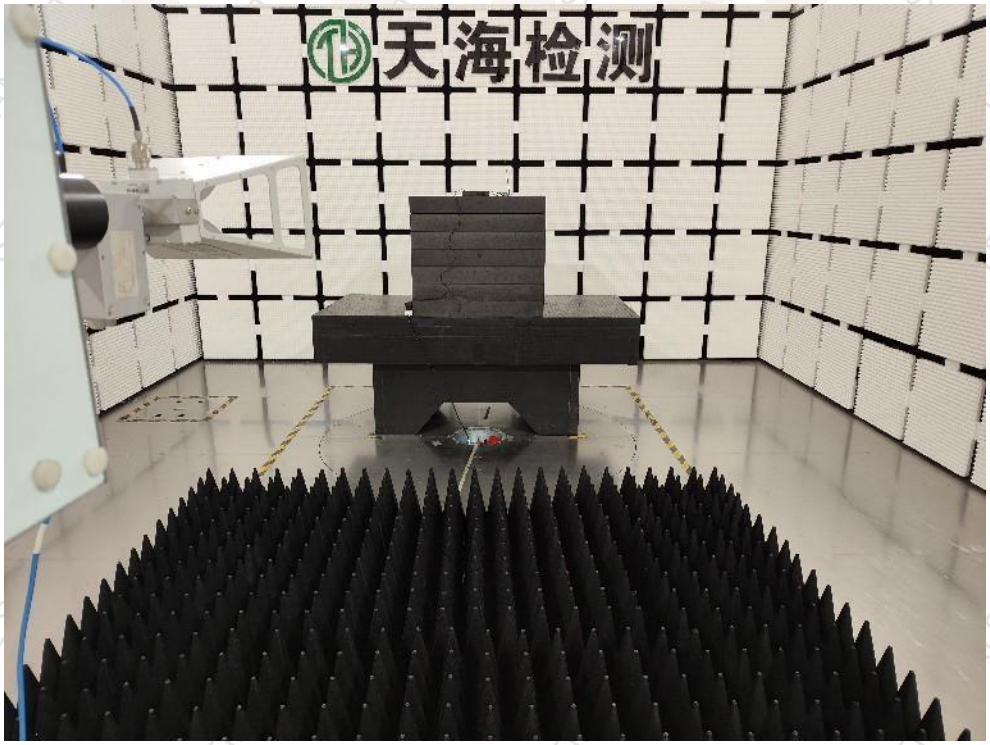
5. Photographs of the test configuration

Emissions in the spurious (Below 1GHz)



Emissions in the spurious (Above 1GHz)



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6.External and Internal Photos of the EUT

Reference to the test report No.: TH2403326-C05-R01.

**********END OF THE REPORT**********

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