FCC RF TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Fixed Wireless Phone

ISSUED TO
Shenzhen Guo Wei Electronics Co. Ltd

No. 3038, Luosha Road, Liantang, Luohu District, Shenzhen, Guangdong, China

Report No.:	BL-SZ1810276-501
EUT Name:	Fixed Wireless Phone
Model Name:	FW200L
Brand Name:	Motorola
Test Standard:	47 CFR Part 2 (10-1-17 Edition) 47 CFR Part 22 (10-1-17 Edition) 47 CFR Part 24 (10-1-17 Edition)
FCC ID:	2AA3E-FW200L
Test Conclusion:	Pass
Test Date:	Jan. 23, 2018 ~ Jul. 20, 2018
Date of Issue:	Jul. 23, 2018

Tested by: Heng Aiming (Engineer) Date: Jul. 23, 2018

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Revision History

Version	Issue Date	Revisions Content
Rev. 01	Jun. 25, 2018	Initial Issue
Rev. 02	Jul. 23, 2018	Added pre-amplifier, RF filter and RF cable information in section 4.2.
		Added PAR exclusion description in annex A.2.
		Deleted the battery “AAA55H”.
		Retested the EIRP/ERP and revised test data in annex A.1.2.

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1 GENERAL INFORMATION

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China.
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China.
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory is a testing organization accredited by FCC as an accredited testing laboratory. The designation number is CN1196. The laboratory is a testing organization accredited by American Association for Laboratory Accreditation(A2LA) according to ISO/IEC 17025. The accreditation certificate number is 4344.01. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Test Environment Condition

Ambient Temperature	20 to 35 °C
Ambient Relative Humidity	30 to 60 %
Ambient Pressure	98 to 102KPa

1.4 Announce

(1) The test report reference to the report template version v4.5.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Shenzhen Guo Wei Electronics Co. Ltd
Address	No. 3038, Luosha Road, Liantang, Luohu District, Shenzhen, Guangdong, China

2.2 Manufacturer Information

Manufacturer	Shenzhen Guo Wei Electronics Co. Ltd
Address	No. 3038, Luosha Road, Liantang, Luohu District, Shenzhen, Guangdong, China

2.3 Factory Information

Factory	Meizhou Guowei Electronics Co., Ltd.
Address	AD1 section, The economy exploitation area, Meizhou, Guangdong, P.R.China

2.4 General Description for Equipment under Test (EUT)

EUT Name	Fixed Wireless Phone
Model Name	FW200L
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	V0.4
Software Version	6260S
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A
Network and Wireless connectivity	2G Network GSM 850/900/1800/1900 MHz FM
About the Product	The equipment is Fixed Wireless Phone, intended for used with information technology equipment.

2.5 Ancillary Equipment

Ancillary Equipment 1	Battery 1	
	Brand Name	HP
	Model No.	AAAJ550
	Serial No.	N/A
	Capacity	550 mAh
	Rated Voltage	1.2 V
	Limit Charge Voltage	1.5 V
Ancillary Equipment 2	Adapter	
	Brand Name	Ten Pao
	Model No.	S005AYU0500050
	Serial No.	N/A
	Rated Input	100-240 V~, 0.2 A, 50/60 Hz
	Rated Output	5 V⎓ 0.5 A
Ancillary Equipment 3	USB Cable	
	Length (Approx.)	1.5 m

2.6 Technical Information

The requirement for the following technical information of the EUT was tested in this report:

Frequency Bands	GSM 850/1900	
Modulation Type	GSM	GMSK
TX Frequency Range	GSM 850: 824 - 849 MHz GSM 1900: 1850 - 1910 MHz	
Rx Frequency Range	GSM 850: 869 - 894 MHz GSM 1900: 1930 - 1990 MHz	
Power Class	GSM 850: 4 GSM 1900: 1	
Antenna Type	External Antenna	
Antenna Gain	GSM 850: 2.5 dBi GSM 1900:2.5 dBi	

Note 1: The EUT information are declared by manufacturer. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2 (10－1－17 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 Subpart H (10－1－17 Edition)	Cellular Radiotelephone Service
3	47 CFR Part 24 Subpart E (10－1－17 Edition)	Broadband PCS
4	ANSI/TIA-603-E-2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
5	KDB 971168 D01 v03	Measurement Guidance for Certification of Licensed Digital Transmitters

3.2 Test Verdict

No.	Description	FCC Part No.	Test Result	Verdict
1	Conducted RF Output Power	2.1046	Reporting only (ANNEX A.1)	Pass
2	Effective (Isotropic) Radiated Power	2.1046 22.913 24.232	ANNEX A.1	Pass
3	Peak to average radio	2.1046 24.232(d)	ANNEX A.2	Pass
4	Occupied Bandwidth	2.1049 22.917 24.238	ANNEX A.3	Pass
5	Frequency Stability	2.1055 22.355 24.235	ANNEX A.4	Pass
6	Spurious Emission at Antenna Terminals	2.1051 22.917 24.238	ANNEX A.5	Pass
7	Band Edge	2.1051 22.917 24.238	ANNEX A.6	Pass
8	Field Strength of Spurious Radiation	2.1053 22.917 24.238	ANNEX A.7	Pass

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

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

Test Voltage of the EUT	NV (Normal Voltage)	5 V
	LV (Low Voltage)	4.5 V
	HV (High Voltage)	5.5 V
Test Temperature of the EUT	LT (Low Temperature)	0 °C
	HT (High Temperature)	40 °C

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Software /Firmware Version	Cal. Date	Cal. Due
Conducted Test System						
Test Software 1	R&S	CMUgo	N/A	V2.0.1	N/A	N/A
Test Software 2	R&S	CMWRun	N/A	V1.8.9	N/A	N/A
Test Software 3	BALUN	BL410R	N/A	V2.1.1.355	N/A	N/A
Universal Radio Communication Tester	R&S	CMU 200	123666	V5.21	2017.11.02	2018.11.01
Wireless Communications Test Set	R&S	CMW 500	102318	V3.2.71	2017.06.12	2018.06.11
Spectrum Analyzer	R&S	FSV-30	103118	2.30.SP1	2017.06.12	2018.06.11
Spectrum Analyzer	AGILENT	E4440A	MY45304434	A.11.21	2017.11.02	2018.11.01
DC Power Supply	R&S	IT6863A	60001401068 7210020	N/A	2017.06.12	2018.06.11
Temperature Chamber	AHK	SP20	1412	N/A	2017.07.20	2018.07.19
Power Sensor	R&S	NRP-Z21	103971	N/A	2017.06.12	2018.06.11
Power Splitter	KMW	DCPD-LDC	1305003215	N/A	N/A	N/A
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	N/A	N/A	N/A
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	N/A	N/A	N/A
RF cable	N/A	SM(m)-SMA(m)	N/A	N/A	N/A	N/A
Radiated Test System						
Test Software	BALUN	BL410_E	N/A	V16.921	N/A	N/A
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	N/A	2015.07.22	2018.07.21
Test Antenna-Bi-Log(30 MHz-3 GHz)	SCHWARZBECK	VULB 9163	9163-624	N/A	2015.07.22	2018.07.21
Test Antenna-	SCHWARZBE	VHBB9124	9124-594	N/A	2015.08.13	2018.08.12

Description	Manufacturer	Model	Serial No.	Software /Firmware Version	Cal. Date	Cal. Due
Biconical	CK					
Test Antenna-LPDA	SCHWARZBECK	VUSLP9111B	9111B-091	N/A	2015.08.13	2018.08.12
Test Antenna-Horn(1-18 GHz)	SCHWARZBECK	BBHA 9120D	9120D-1600	N/A	2016.07.12	2019.07.11
Test Antenna-Horn(18-40 GHz)	A-INFO	LB-180400KF	J211060273	N/A	2017.01.06	2019.01.05
Anechoic Chamber	EMC Electronic Co., Ltd	20.10m*11.60m*7.35m	N/A	N/A	2016.08.09	2018.08.08
EMI Receiver	AGILENT	E4440A	MY46181663	A.11.21	2017.11.02	2018.11.01
EMI Receiver	KEYSIGHT	N9038A	MY53220118	A.14.16	2017.11.08	2018.11.07
Wideband Radio Communication Tester	R&S	CMW 500	121551	V3.2.73	2018.05.07	2019.05.06
Broadband Preamplifier	SCHWARZBECK	BBV 9743	9743-0062	N/A	N/A	N/A

Reject Band	Pass Band	Manufacturer	Model	Reject Attenuation	Impedance
Filters for radiated emission measurement					
824 ~ 849 MHz	DC ~ 814& 859 ~ 2500MHz	KMW	ZBSF-C836.5-25-1232	≥50dBc	50Ω
1850 ~ 1910 MHz	DC ~ 1840& 1920 ~ 3300MHz	KMW	ZBSF-C1880-60-1201	≥50dBc	50Ω

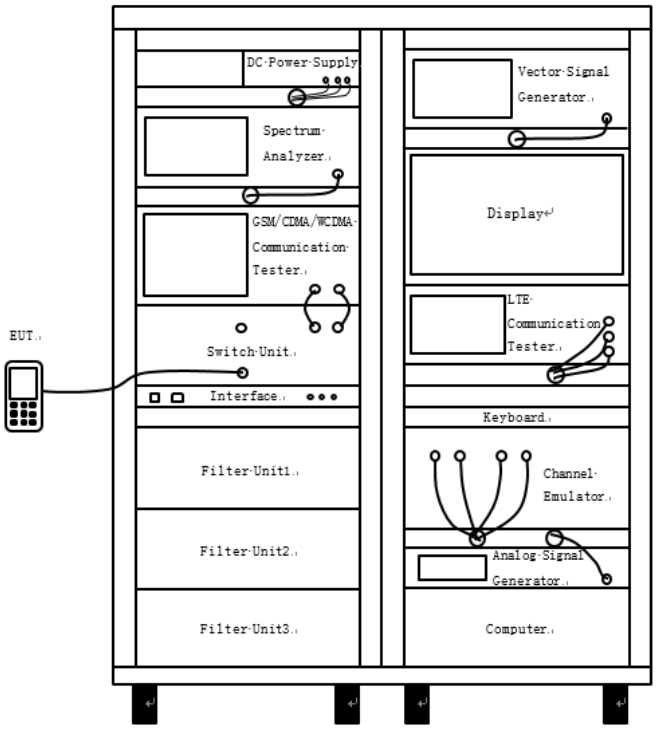
4.3 Test Configurations

Test Items	Test Mode	Test Channel		
		LCH	MCH	HCH
E.R.P/E.I. R.P	GSM 850	v	v	v
	GSM 1900	v	v	v
Occupied Bandwidth	GSM 850	v	v	v
	GSM 1900	v	v	v
Frequency Stability	GSM 850	v	v	v
	GSM 1900	v	v	v
Spurious Emission at Antenna Terminals	GSM 850	v	v	v
	GSM 1900	v	v	v
Band Edge	GSM 850	v	--	v
	GSM 1900	v	--	v
Field Strength of Spurious Radiation	GSM 850	v	v	v
	GSM 1900	v	v	v
Note 1: The mark “v” means that this configuration is chosen for testing.				

Test Mode	UL Channel	UL Channel No.	UL Frequency (MHz)
GSM 850	LCH	128	824.2
	MCH	190	836.6
	HCH	251	848.8
GSM 1900	LCH	512	1850.2
	MCH	661	1880.0
	HCH	810	1909.8

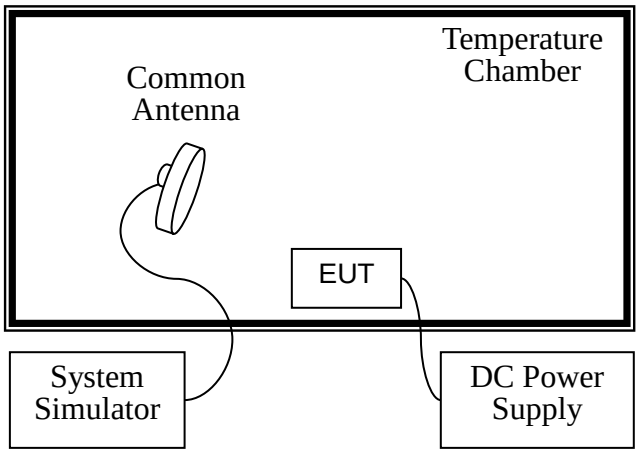
4.4 Test Setup

4.4.1 For Antenna Port Test



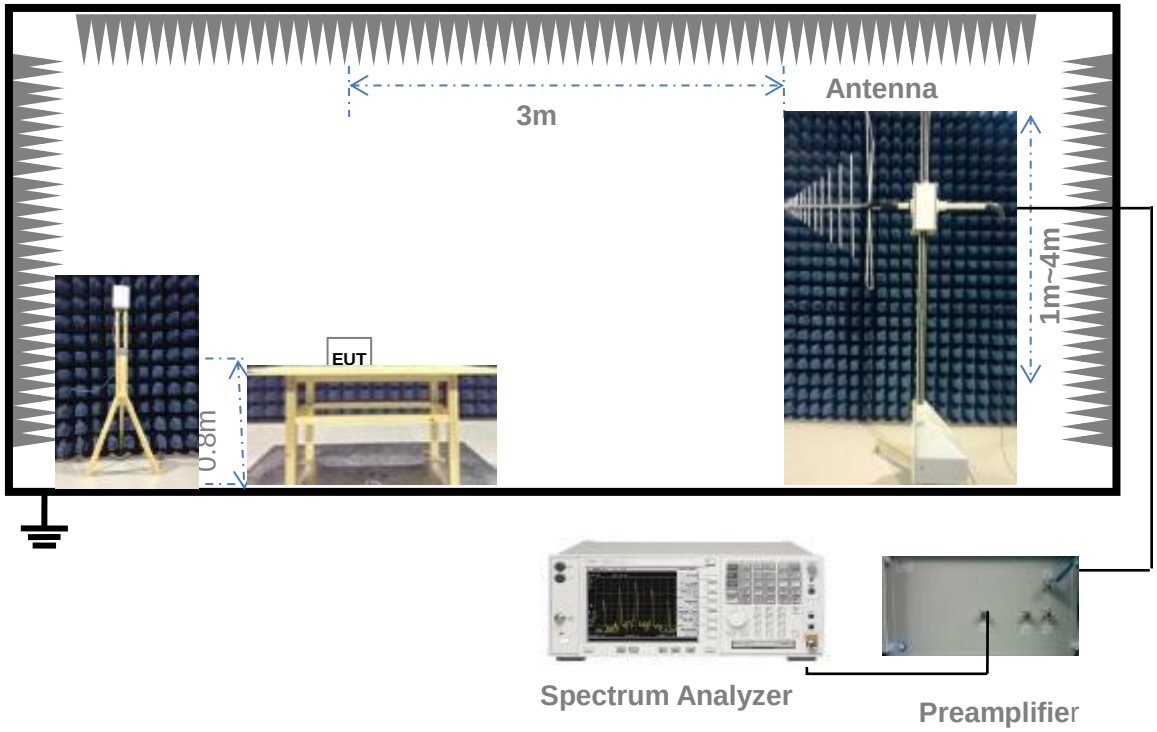
(Diagram 1)

4.4.2 For Frequency Stability Test



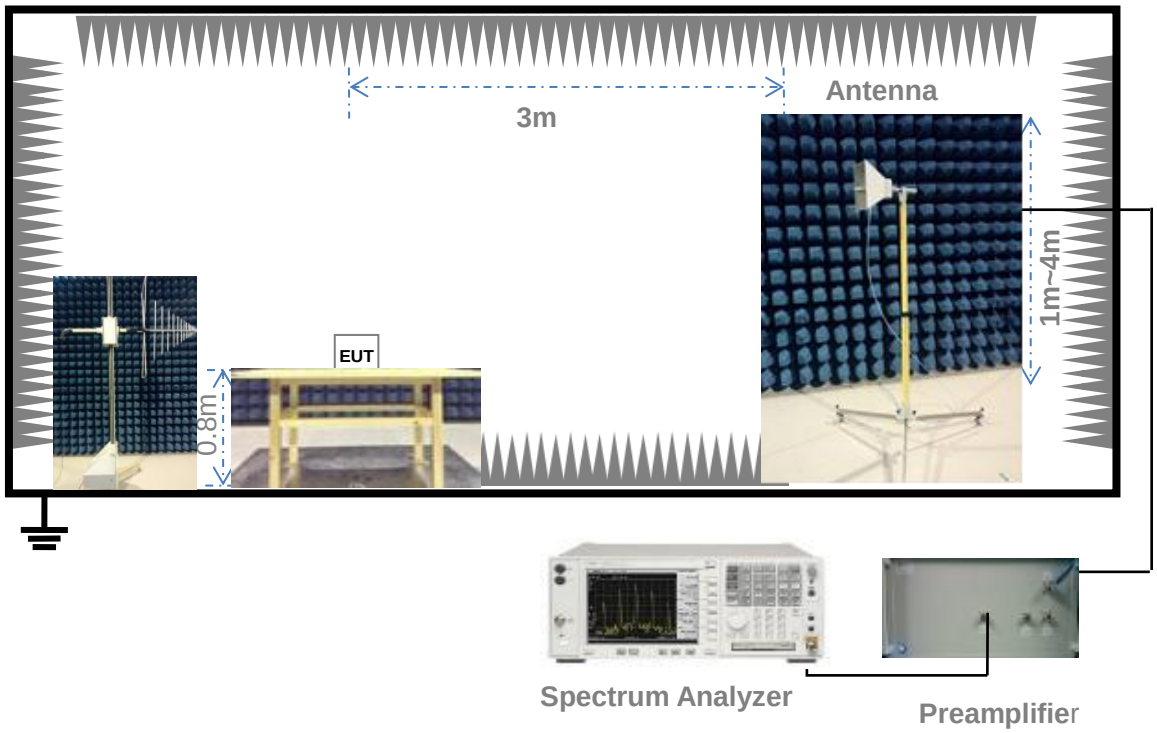
(Diagram 2)

4.4.3 For Radiated Test (30 MHz-1 GHz)



(Diagram 3)

4.4.4 For Radiated Test (Above 1 GHz)



(Diagram 4)

5 TEST ITEMS

5.1 Transmitter Radiated Power (EIRP/ERP)

5.1.1 Limit

FCC § 2.1046(a) & 22.913(a) & 24.232(c)

According to FCC section 22.913(a) (2), the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to FCC section 24.232(c), Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

5.1.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description is used for this test. The photo of test setup please refer to ANNEX B.

5.1.3 Test Procedure

Description of the Conducted Output Power Measurement

The EUT is coupled to the SS with attenuator through power splitter; the RF load attached to EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. A system simulator is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

Note: Reference test setup 4.4.1 (Diagram 1)

The relevant equation for determining the conducted measured value is:
Conducted Output Power Value (dBm) = Measured Value (dBm) + Path Loss (dB)

where:
Conducted Output Power Value = final conducted measured value in the conducted power test, in dBm;
Measured Value = measured conducted power received by spectrum analyzer or power meter, in dBm;
Path Loss = signal attenuation in the connecting cable between the transmitter and spectrum analyzer or power meter, including external cable loss, in dB;

During the test, the data of Path Loss (dB) is added in the spectrum analyzer or power meter, so Measured Value (dBm) is the final values which contains the data of Path Loss (dB).

For example:
In the conducted output power test, when measured value for GSM850 is 24.7 dBm, and path loss is 8.5 dB, then final conducted output power value is:
Conducted Output Power Value (dBm) = 24.7 dBm + 8.5 dB = 33.2 dBm

Description of the Transmitter Radiated Power Measurement

In many cases, the RF output power limits for licensed digital transmission devices is specified in terms of effective radiated power (ERP) or equivalent isotropic radiated power (EIRP). Typically, ERP is specified when the operating frequency is less than or equal to 1 GHz and EIRP is specified when the operating frequency is greater than 1 GHz. Both are determined by adding the transmit antenna gain to the conducted RF output power with the primary difference between the two being that when determining the ERP, the transmit antenna gain is referenced to a dipole antenna (i.e., dBd) whereas when determining the EIRP, the transmit antenna gain is referenced to an isotropic antenna (dBi).

Final measurement calculation as below:

The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

ERP/EIRP = P_{Meas} + GT − LC

where:

ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);

P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

dBd (ERP)=dBi (EIRP) -2.15 dB

LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

For example:
In the ERP test, when P_{Meas} value for GSM850 is 33.2 dBm, LC is 0.6 dB, and GT is -3.4 dB, then final ERP value is:
ERP for GSM 850 = 33.2 dBm - 3.4 dBi - 0.6 dB = 29.2 dBm

Note: Reference test setup 4.4.1 (Diagram 1)

The relevant equation for determining the ERP/EIRP from the radiated RF output power is:

ERP/EIRP (dBm) = SA Read Value (dBm) + Correction Factor (dB)

where:
ERP/EIRP = effective or equivalent radiated power, in dBm;
SA Read Value = measured transmitter power received by EMI receiver or spectrum analyzer, in dBm;
Correction Factor = total correction factor including cable loss, in dB;

During the test, the data of Correction Factor (dB) is added in the EMI receiver or spectrum analyzer, so SA Read Value (dBm) is the final values which contains the data of Correction Factor (dB).

For example:
In the ERP test, when SA read value for GSM850 is 21dBm, and correction factor is 8dB, then final ERP value for GSM850 is:
ERP (dBm) = 21dBm + 8dB = 29dBm

Note: Reference test setup 4.4.3 and 4.4.4 (Diagram 3, 4)

5.1.4 Test Result

Please refer to ANNEX A.1.

5.2 Peak to average ratio

5.2.1 Limit

FCC § 2.1046 & 24.232(d)

In addition, when the transmitter power is measured in terms of average value, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

According to FCC section 24.232(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with 24.232 (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of § 24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

For FCC section 24.232(e), peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

5.2.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description is used for this test. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

Here the lowest, middle and highest channels are selected to perform testing to verify the peak-to-average ratio.

According to KDB 971168 D01, there is CCDF procedure for PAPR:

a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval as follows:

1) for continuous transmissions, set to 1 ms,

2) for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.

e) Record the maximum PAPR level associated with a probability of 0.1%.

Alternate procedure for PAPR:

Use one of the procedures presented in 4.1 to measure the total peak power and record as P_{Pk}. Use one of the applicable procedures presented 4.2 to measure the total average power and record as P_{Avg}. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

PAPR (dB) = P_{Pk} (dBm) - P_{Avg} (dBm).

Note: Reference test setup 4.4.1 (Diagram 1).

5.2.4 Test Result

Please refer to ANNEX A.2.

5.3 Occupied Bandwidth

5.3.1 Limit

FCC § 2.1049

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Many of the individual rule parts specify a relative OBW in lieu of the 99% OBW. In such cases, the OBW is defined as the width of the signal between two points, one below the carrier center frequency and on above the carrier center frequency, outside of which all emissions are attenuated by at least X dB below the transmitter power, where the value of X is typically specified as 26.

5.3.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description is used for this test. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

The following procedure shall be used for measuring power bandwidth.

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the anticipated OBW).

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.

c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.

d) NOTE—Steps a) through c) may require iteration to adjust within the specified tolerances.

e) For -26 dB OBW, the dynamic range of the spectrum analyzer at the selected RBW shall be at least 10dB below the target “-X dB down” requirement, e.g. -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be 36dB below the reference value.

f) Set the detection mode to peak, and the trace mode to max hold.

g) For 99% OBW, use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.

If the instrument does not have a 99 % power bandwidth function, the trace data points are to be recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99 % power bandwidth is the difference between these two frequencies.

h) For -26 dB OBW, determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).

Determine the “-X dB down amplitude” as equal to (reference value -X). Alternatively, this calculation can be performed by the analyzer by using the marker-delta function.

Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below “-X dB down amplitude” determined in step g). If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.

i) The OBW shall be reported by providing plot(s) of the measuring instrument display. The frequency and amplitude axes and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

j) Change variable modulations, coding, or channel bandwidth settings, then repeat above test procedures.

Note: Reference test setup 4.4.1 (Diagram 1).

5.3.4 Test Result

Please refer to ANNEX A.3.

5.4 Frequency Stability

5.4.1 Limit

FCC § 2.1055 & 22.355 & 24.235

FCC § 2.1055

The frequency stability shall be measured with variation of ambient temperature as follows:

(1) The temperature is varied from -30°C to +50°C.

(2) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10°C through the range.

The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating and point which shall be specified by the manufacture.

(3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

FCC § 22.355

Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.

Table C-1—Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency range (MHz)	Base, fixed (ppm)	Mobile > 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

FCC § 24.235

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

5.4.2 Test Setup

The section 4.4.2 (Diagram 2) test setup description is used for this test. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

1. The EUT is placed in a temperature chamber.
2. The temperature is set to 20°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured.
3. The temperature is increased by not more than 10 degrees, allowed to stabilize and soak, and then repeat the frequency error measurement.
4. Repeat procedure 3 until +50°C is reached.
5. Change supply voltage, and repeat measurement until extreme voltage is reached.

Note: Reference test setup 4.4.2 (Diagram 2).

5.4.4 Test Result

Please refer to ANNEX A.4.

5.5 Spurious Emission at Antenna Terminals

5.5.1 Limit

FCC § 2.1051 & 22.917(a) & 24.238(a)

In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC § 22.917(a) & 24.238(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P) dB. This is calculated to be -13 dBm.

5.5.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency blocks a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

1. The EUT is coupled to the system simulator and spectrum analyzer; the RF load attached to EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2. CMW500 is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power.

3. The RF output of the transmitter is connected to the input of the spectrum analyzer through sufficient attenuation.

4. Spurious emissions are tested with 0.001MHz RBW for frequency less than 150kHz, 0.01MHz RBW for frequency less than 30MHz, 0.1MHz RBW for frequency less than 1GHz, and 1MHz RBW for frequency above 1GHz. And sweep point number are at least 401, referring to following formula.

Sweep point number = Span/RBW

VBW=3*RBW

Detector Mode=mean or average power

5. Record the frequencies and levels of spurious emissions.

Note: Reference test setup 4.4.1 (Diagram 1).

5.5.4 Test Result

Please refer to ANNEX A.5.

5.6 Band Edge

5.6.1 Limit

FCC § 2.1051 & 22.917(a) & 24.238(a)

In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.
The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC § 22.917 & 24.238

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P) dB. This is calculated to be -13 dBm.

5.6.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

The EUT, which is powered by the Battery, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50 Ohm; the path loss as the factor is calibrated to correct the reading.

1.The EUT is coupled to the system simulator and spectrum analyzer; the RF load attached to EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2. CMW500 is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power.

3. The RF output of the transmitter is connected to the input of the spectrum analyzer through sufficient attenuation.
4. The center of the spectrum analyzer was set to block edge frequency.

5. Band edge are tested with 1%*cBW (RBW), and sweep point number referred to following formula.

Sweep point number = 2*Span/RBW

VBW=3RBW

6. Record the frequencies and levels of spurious emissions.

Note: Reference test setup 4.4.1 (Diagram 1).

5.6.4 Test Result

Please refer to ANNEX A.6.

5.7 Field Strength of Spurious Radiation

5.7.1 Limit

FCC § 2.1053 & 22.917(a) & 24.238(a)

FCC § 22.917(a) & 24.238(a)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43+10*log(P) dB. This is calculated to be -13 dBm.

5.7.2 Test Setup

The section 4.4.3 and 4.4.4 (Diagram 3, 4) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.7.3 Test Procedure

1. On a test site, the EUT shall be placed at 80cm height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.
4. During the measurement of the EUT, the resolution bandwidth was to 1 MHz and the average bandwidth was set to 1 MHz.
5. The transmitter shall be switched on; the measuring receiver shall be tuned to the frequency of the transmitter under test.
6. The test antenna shall be raised and lowered through the specified range of height until the maximum signal level is detected by the measuring receiver.
7. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
8. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
9. The maximum signal level detected by the measuring receiver shall be noted.
10. The EUT was replaced by half-wave dipole (824 ~ 849 MHz) or horn antenna (1 850 ~ 1 910 MHz) connected to a signal generator.
11. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
12. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
13. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring received, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
14. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
15. The measurement shall be repeated with the test antenna and the substitution antenna orientated for

horizontal polarization.

Final measurement calculation as below:

The relevant equation for determining the ERP/EIRP from the radiated RF output power is:
ERP/EIRP (dBm) = SA Read Value (dBm) + Correction Factor (dB)

where:
ERP/EIRP = effective or equivalent radiated power, in dBm;
SA Read Value = measured transmitter power received by EMI receiver or spectrum analyzer, in dBm;
Correction Factor = total correction factor including cable loss, in dB;

During the test, the data of Correction Factor (dB) is added in the EMI receiver or spectrum analyzer, so SA Read Value (dBm) is the final values which contains the data of Correction Factor (dB).

For example:
In the ERP test, when SA read value for GSM850 is 21dBm, and correction factor is 8dB, then final ERP value for GSM850 is:
ERP (dBm) = 21dBm + 8dB = 29dBm
Note: Reference test setup 4.4.3 and 4.4.4 (Diagram 3, 4)

5.7.4 Test Result

Please refer to ANNEX A.7.

ANNEX A TEST RESULTS

A.1 Transmitter Output Power

A.1.1 Transmitter Conducted Output Power

GSM Mode Test Data

Test Band	Test Channel	PCL	Conducted Output Peak Power (dBm)	Conducted Output Peak Power (W)
GSM 850	LCH	5	32.40	1.74
	MCH	5	32.64	1.84
	HCH	5	32.87	1.94

Test Band	Test Channel	PCL	Conducted Output Peak Power (dBm)	Conducted Output Peak Power (W)
GSM 1900	LCH	0	30.86	1.22
	MCH	0	30.74	1.19
	HCH	0	30.86	1.22

Note 1: Set PCL to 5 for GSM 850 (power class 4) and 0 for GSM 1900 (power class 1).

A.1.2 Transmitter Radiated Output Power(EIRP/ERP)

GSM Mode Test Data

Test Band	Channel	PCL	Measured ERP		Limit (W)	Verdict
			ERP (dBm)	ERP (W)		
GSM 850	LCH	5	31.057	1.28	7	Pass
	MCH	5	30.918	1.24		Pass
	HCH	5	29.873	0.97		Pass

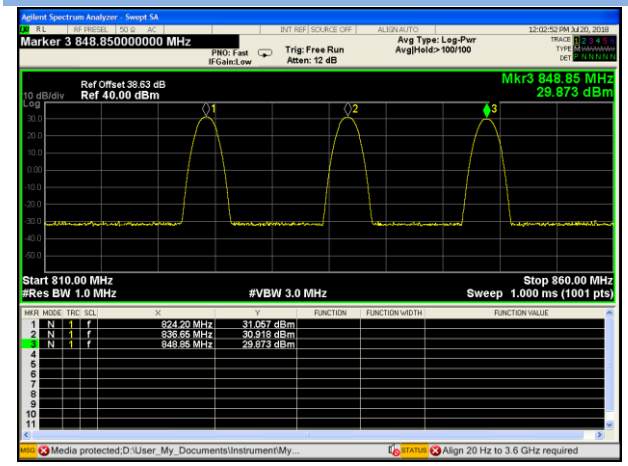
Test Band	Channel	PCL	Measured EIRP		Limit (W)	Verdict
			EIRP (dBm)	EIRP (W)		
GSM 1900	LCH	0	27.774	0.60	2	Pass
	MCH	0	26.152	0.41		Pass
	HCH	0	27.981	0.63		Pass

Note 1: ERP/EIRP = SA Read Value + Correction Factor
where:
ERP/EIRP = effective or equivalent radiated power, in dBm;
SA Read Value = measured transmitter power received by EMI receiver or spectrum analyzer, in dBm;
Correction Factor = total correction factor including cable loss, in dB;

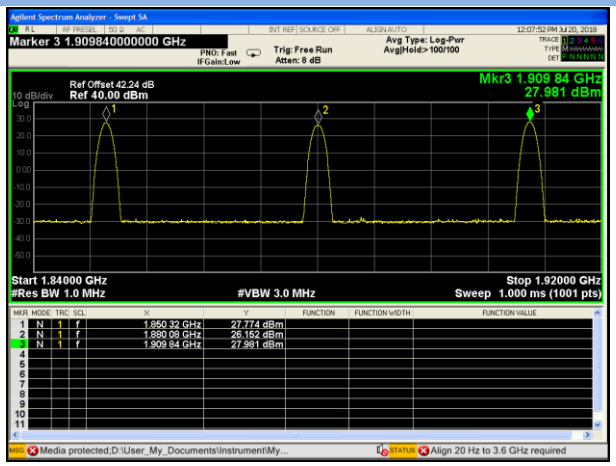
Note 2: Set PCL to 5 for GSM 850 (power class 4) and 0 for GSM 1900 (power class 1).

GSM Mode Test Plots

GSM 850



GSM 1900



A.2 Peak to Average Ratio

According to KDB 971168 D01, if peak power or power density is used to demonstrate compliance, a PAR measurement is not required.

For GSM in this report, there are peak power to demonstrate compliance, so PAPR measurements are not required.

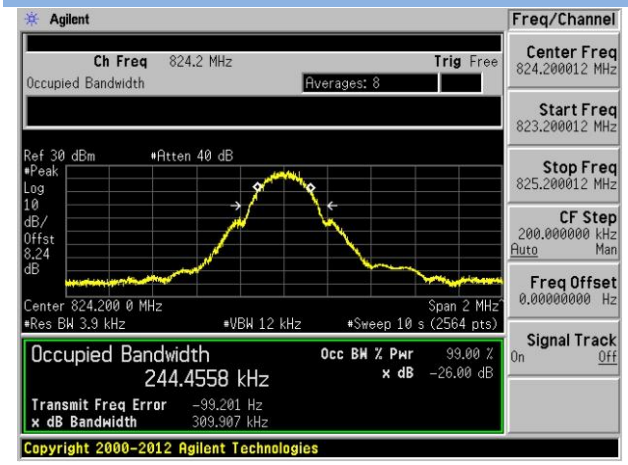
A.3 Occupied Bandwidth

Note 1: All modes were tested, but only the typical data were reported in this report.

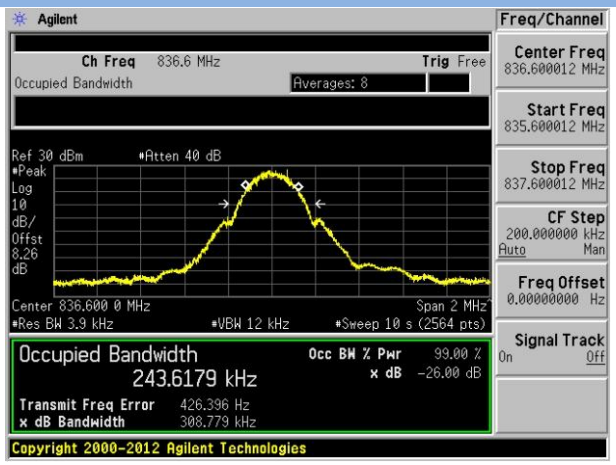
GSM Mode Test Data

Test Band	Test Channel	Measured 99% Occupied Bandwidth (MHz)	Measured -26 dB Occupied Bandwidth (MHz)
GSM 850	LCH	0.24	0.31
	MCH	0.24	0.31
	HCH	0.25	0.31
GSM 1900	LCH	0.25	0.31
	MCH	0.25	0.31
	HCH	0.24	0.31

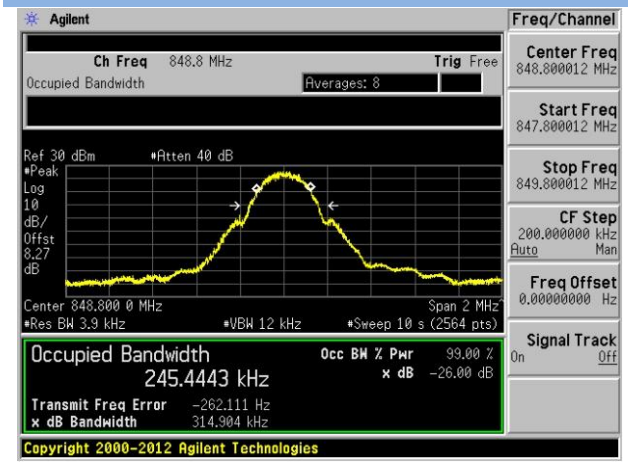
GSM 850 LOW CHANNEL



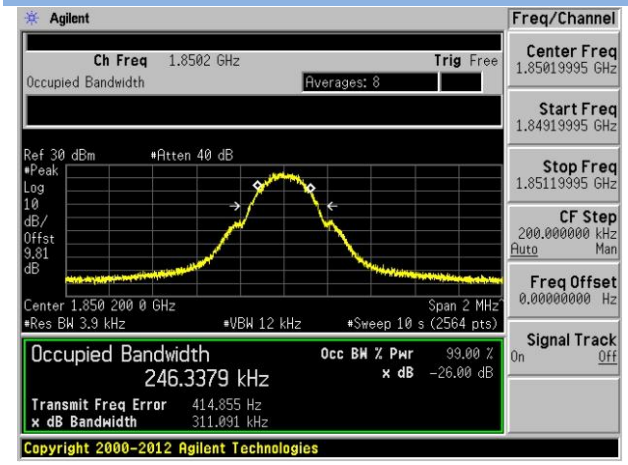
GSM 850 MIDDLE CHANNEL



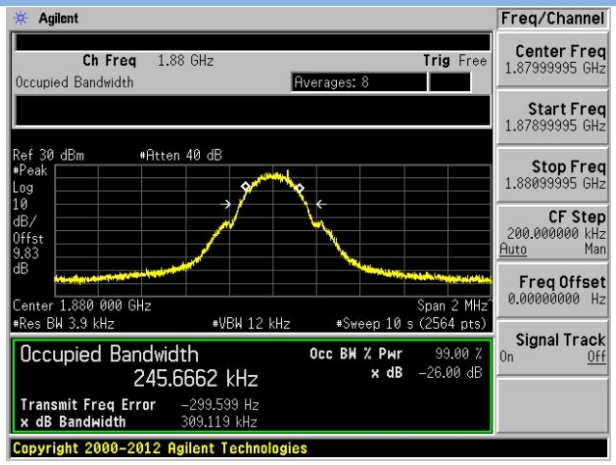
GSM 850 HIGH CHANNEL



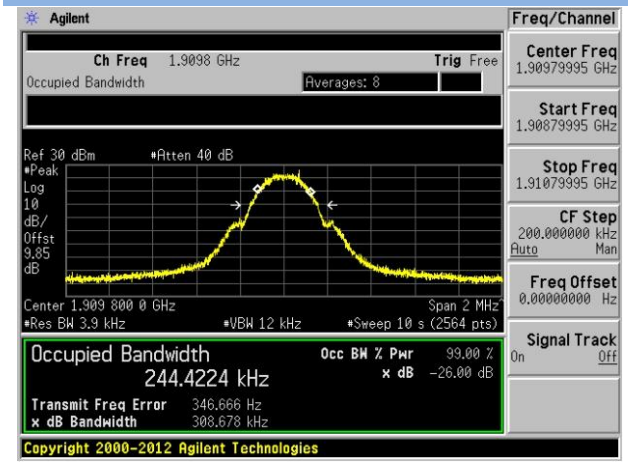
GSM 1900 LOW CHANNEL



GSM 1900 MIDDLE CHANNEL



GSM 1900 HIGH CHANNEL



A.4 Frequency Stability

GSM 850

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	LCH 824.2 MHz		MCH 836.6 MHz		HCH 848.8 MHz		
		Value (Hz)	Limits (Hz)	Value (Hz)	Limits (Hz)	Value (Hz)	Limits (Hz)	
5	+0	-21.76	±2060.5	-22.89	±2091.5	-24.12	±2122	Pass
	+5	-20.02		-24.25		-22.89		
	+10	-17.76		-24.25		-22.02		
	+15	-21.31		-20.76		-18.47		
	+20	-18.34		-15.43		-17.43		
	+30	-20.08		-22.41		-18.85		
	+40	-14.33		-21.73		-17.79		
5.5	+25	-22.57		-18.47		-19.11		
4.5	+25	-18.56		-15.85		-21.31		

GSM 1900

Test Conditions		Frequency Deviation						Verdict
Power (VDC)	Temperature (°C)	LCH 1850.2 MHz		MCH 1880 MHz		HCH 1909.8 MHz		
		Value (Hz)	Limits (Hz)	Value (Hz)	Limits (Hz)	Value (Hz)	Limits (Hz)	
5	0	-39.49	±4625.5	-37.26	±4700.0	-32.74	±4774.5	Pass
	5	-54.21		-59.92		-37.61		
	10	-44.20		-38.97		-33.61		
	15	-46.56		-50.50		-34.42		
	20	-36.52		-41.49		-36.03		
	30	-37.00		-33.29		-40.97		
	40	-41.26		-42.23		-34.32		
5.5	+25	-37.84		-42.07		-35.61		
4.5	+25	-31.48		-35.19		-30.87		

A.5 Spurious Emission at Antenna Terminals

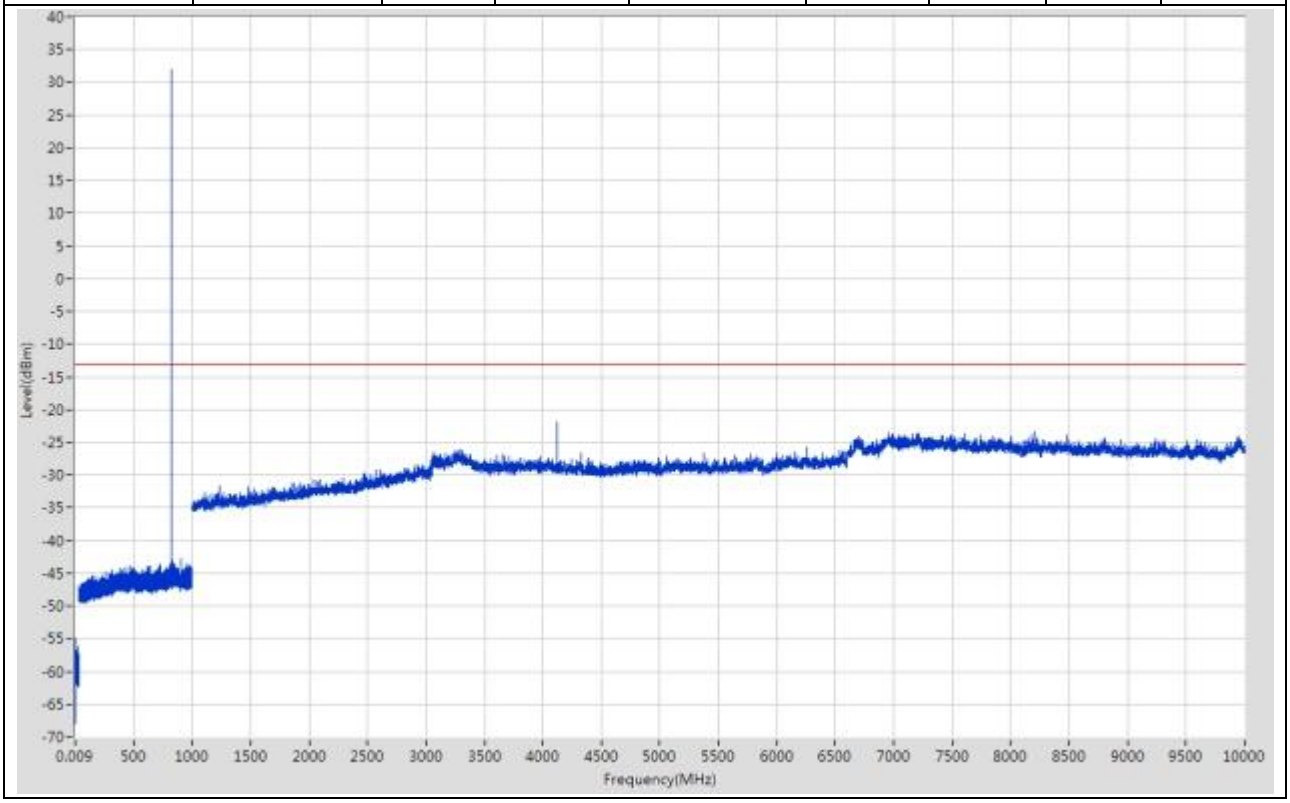
Note 1: The frequencies of verdict which are marked by "N/A" should be ignored because they are MS carrier frequency.

GSM Mode Test Verdict

Test Band	Test Channel	Verdict
GSM 850	LCH	Pass
	MCH	Pass
	HCH	Pass
GSM 1900	LCH	Pass
	MCH	Pass
	HCH	Pass

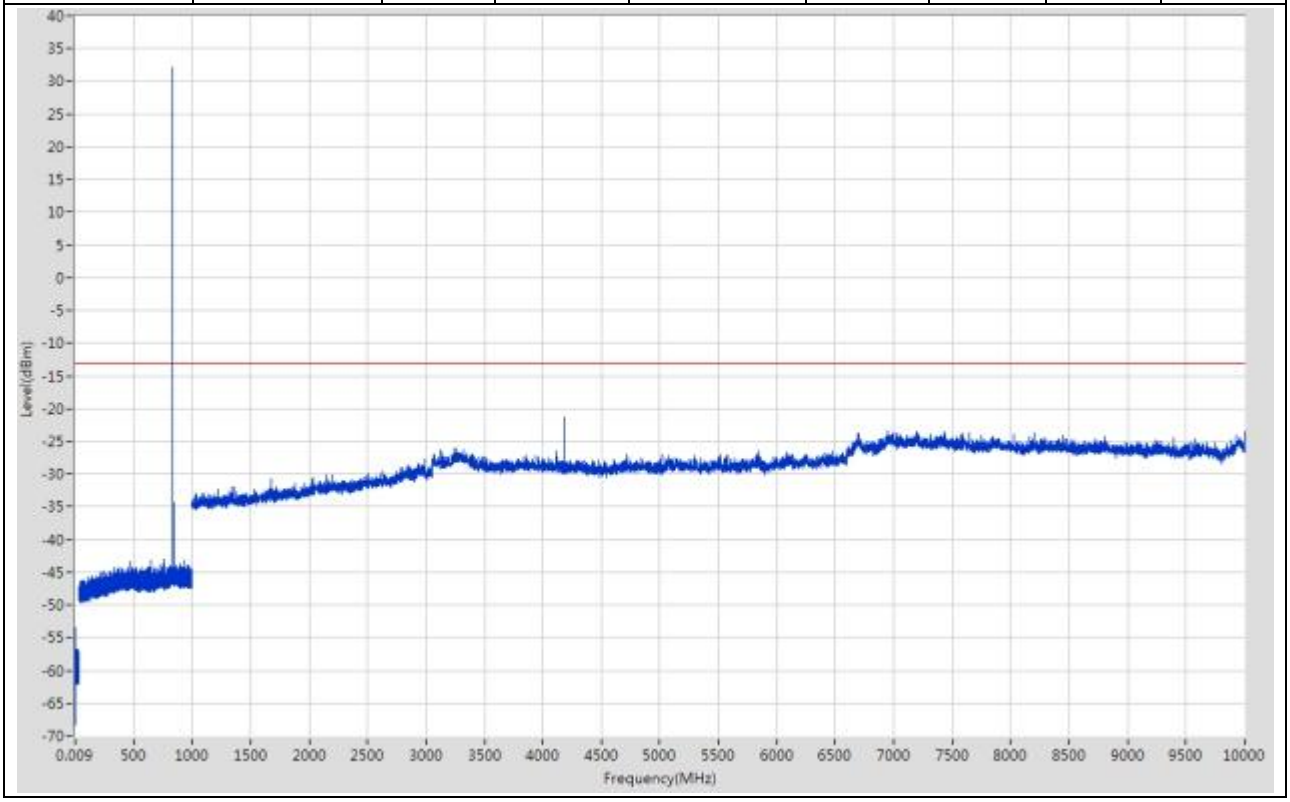
GSM 850 LOW CHANNEL

Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
0.009	0.15	0.001	Peak	0.009	-56.86	-13	Pass	401
0.15	30	0.01	Peak	0.28	-54.93	-13	Pass	2985
30	500	0.1	Peak	475.195	-43.98	-13	Pass	4700
500	1000	0.1	Peak	824.265	31.92	-13	N/A	5000
1000	10000	1	Peak	4121.381	-21.96	-13	Pass	9000



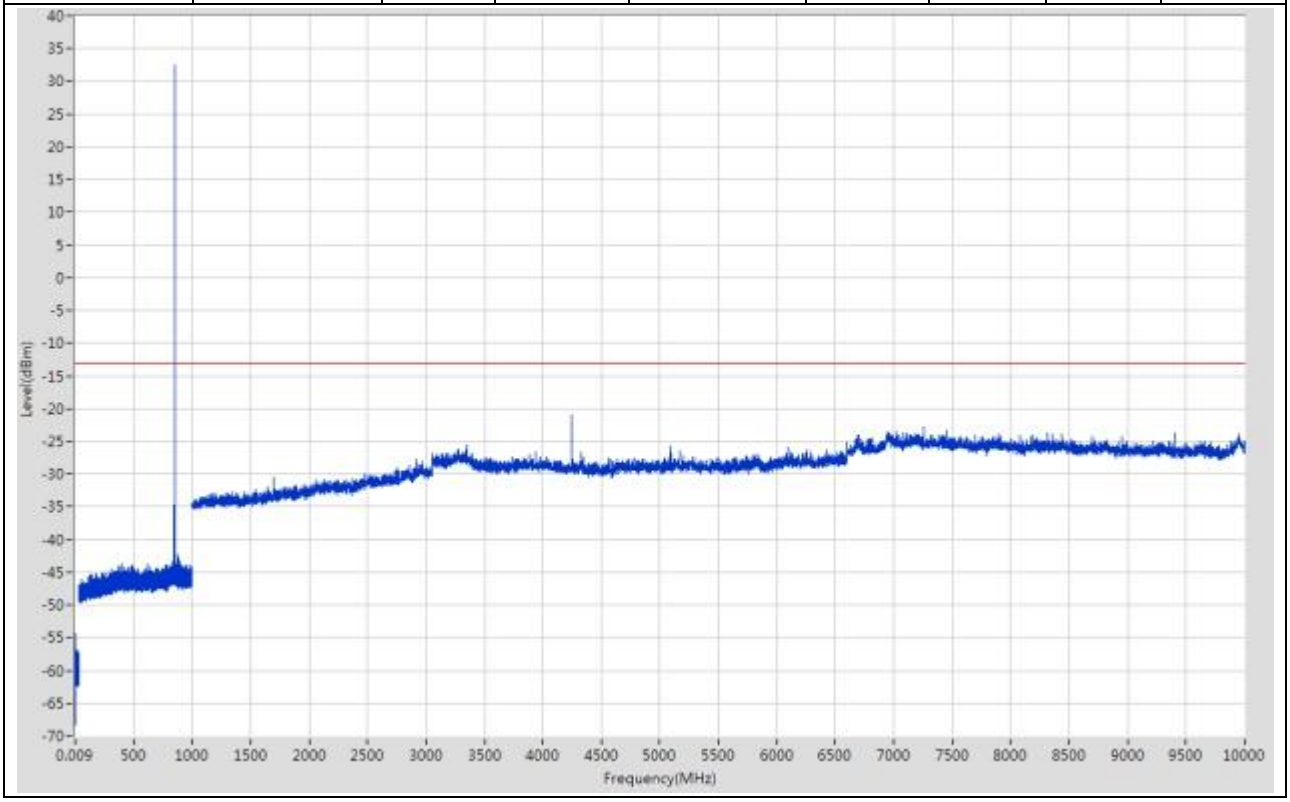
GSM 850 MIDDLE CHANNEL

Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
0.009	0.15	0.001	Peak	0.009	-56.26	-13	Pass	401
0.15	30	0.01	Peak	0.17	-53.4	-13	Pass	2985
30	500	0.1	Peak	475.795	-43.36	-13	Pass	4700
500	1000	0.1	Peak	836.567	32.08	-13	N/A	5000
1000	10000	1	Peak	4183.389	-21.38	-13	Pass	9000



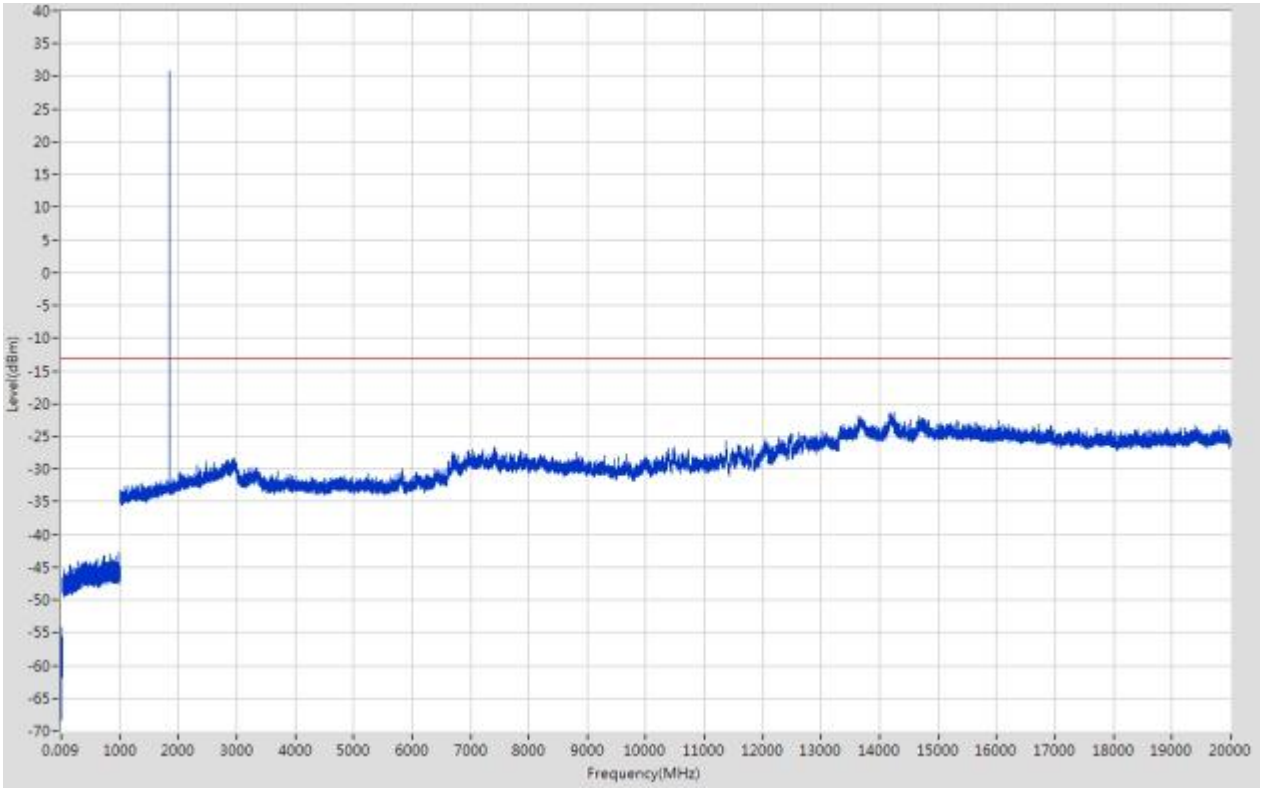
GSM 850 HIGH CHANNEL

Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
0.009	0.15	0.001	Peak	0.01	-55.66	-13	Pass	401
0.15	30	0.01	Peak	0.16	-54.4	-13	Pass	2985
30	500	0.1	Peak	401.679	-43.76	-13	Pass	4700
500	1000	0.1	Peak	848.77	32.45	-13	N/A	5000
1000	10000	1	Peak	4244.396	-21.05	-13	Pass	9000



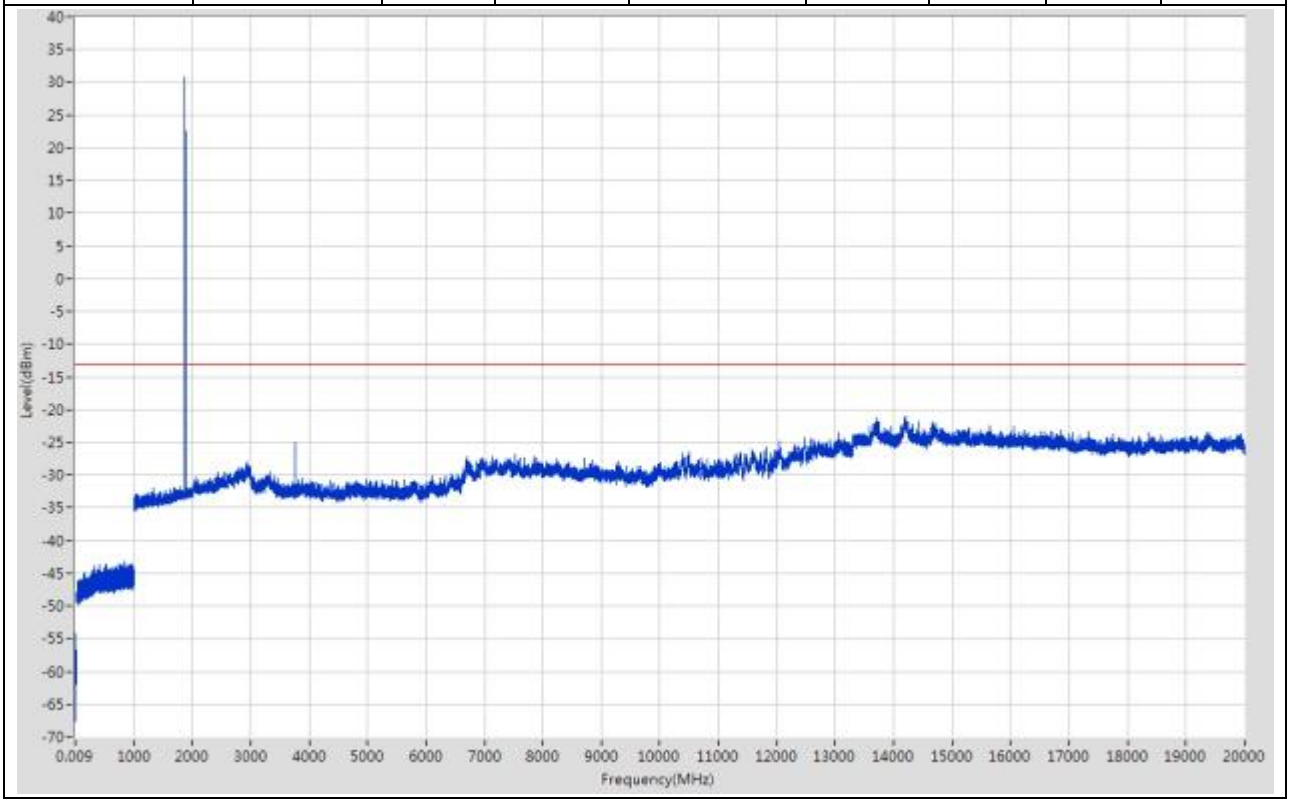
GSM 1900 LOW CHANNEL

Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
0.009	0.15	0.001	Peak	0.009	-57.04	-13	Pass	401
0.15	30	0.01	Peak	0.2	-54.18	-13	Pass	2985
30	1000	0.1	Peak	992.19	-42.88	-13	Pass	9699
1000	3000	1	Peak	1850.425	30.84	-13	N/A	2000
3000	20000	1	Peak	14235.372	-21.36	-13	Pass	17000



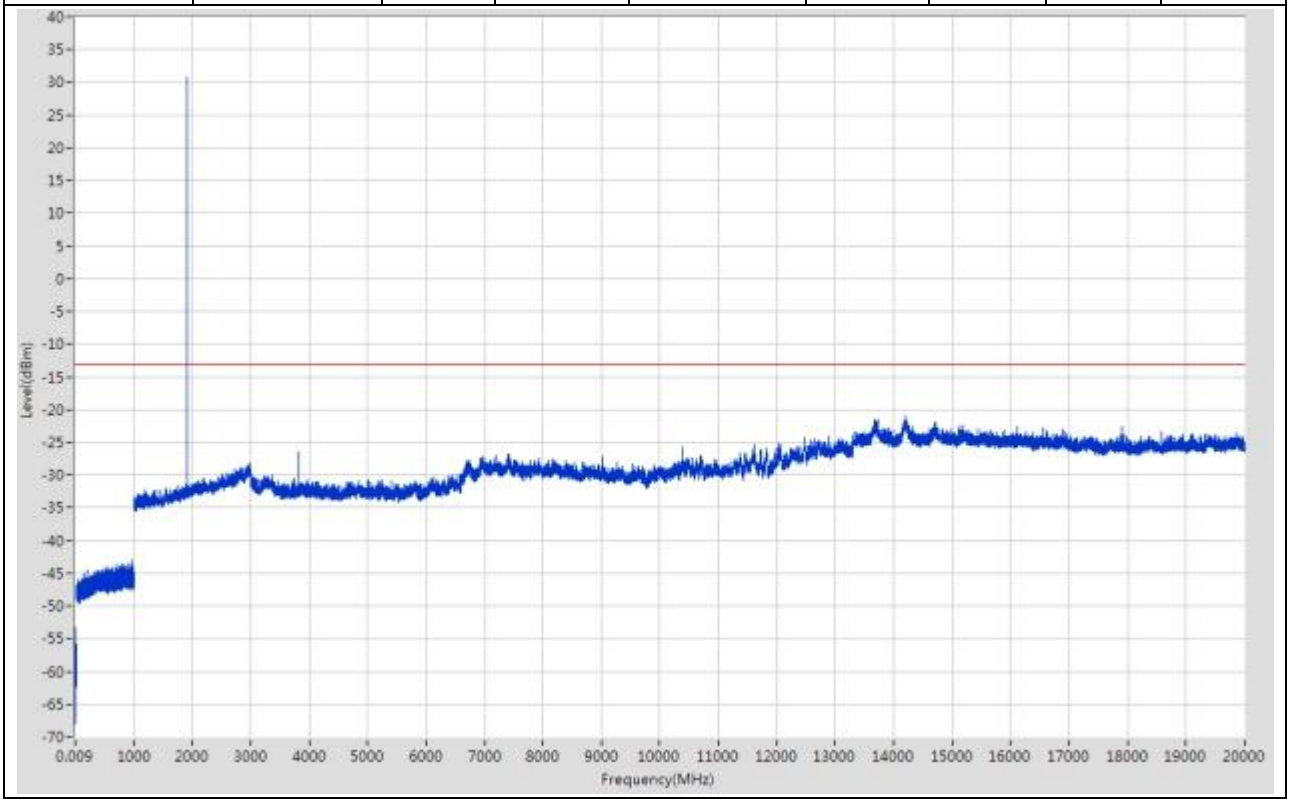
GSM 1900 MIDDLE CHANNEL

Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
0.009	0.15	0.001	Peak	0.011	-56.36	-13	Pass	401
0.15	30	0.01	Peak	0.15	-54.14	-13	Pass	2985
30	1000	0.1	Peak	848.2	-43.1	-13	Pass	9699
1000	3000	1	Peak	1880.44	30.84	-13	N/A	2000
3000	20000	1	Peak	14195.367	-20.9	-13	Pass	17000



GSM 1900 HIGH CHANNEL

Start Frequency (MHz)	Stop Frequency (MHz)	RBW (MHz)	Detector	Frequency (MHz)	Power (dBm)	Limit (dBm)	Verdict	Sweep Point
0.009	0.15	0.001	Peak	0.009	-56.5	-13	Pass	401
0.15	30	0.01	Peak	0.57	-53.25	-13	Pass	2985
30	1000	0.1	Peak	973.164	-42.98	-13	Pass	9699
1000	3000	1	Peak	1909.455	30.78	-13	N/A	2000
3000	20000	1	Peak	14204.368	-20.91	-13	Pass	17000

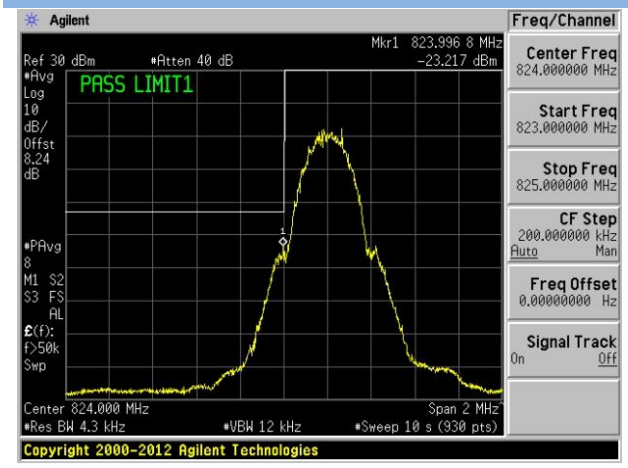


A.6 Band Edge

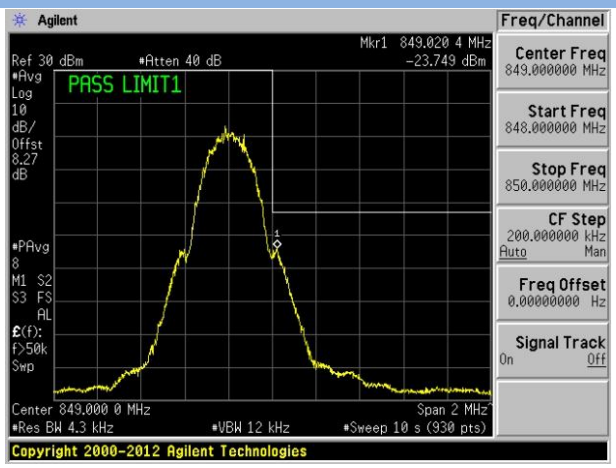
GSM Mode Test Verdict

Test Band	Test Channel	Verdict
GSM 850	LCH	Pass
	HCH	Pass
GSM 1900	LCH	Pass
	HCH	Pass

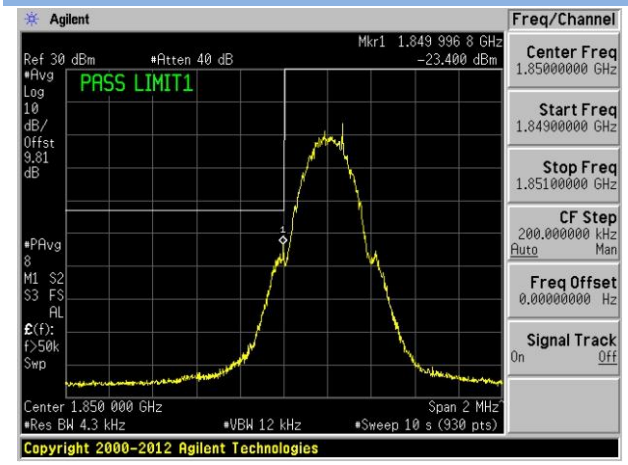
GSM 850 LOW CHANNEL



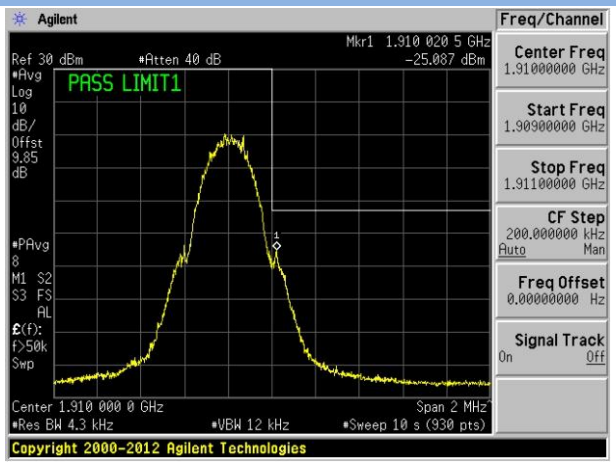
GSM 850 HIGH CHANNEL



GSM 1900 LOW CHANNEL



GSM 1900 HIGH CHANNEL



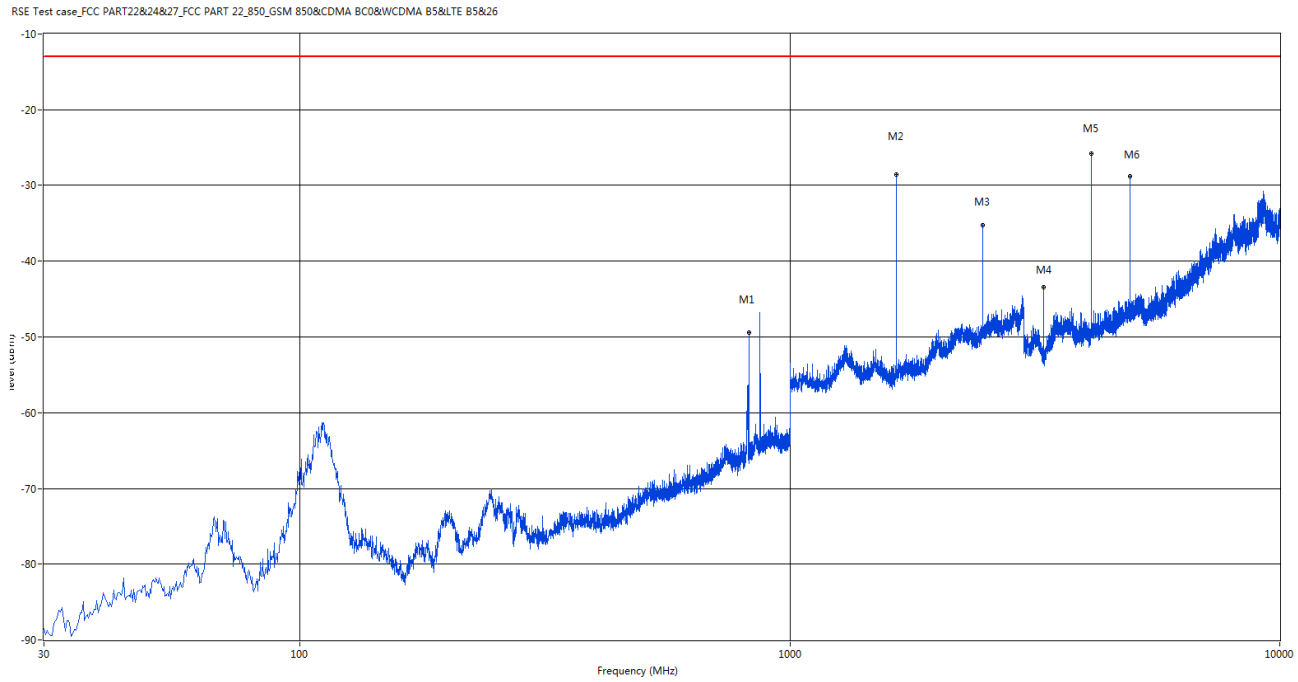
A.7 Field Strength of Spurious Radiation

Note 1: The frequencies of verdict which are marked by "N/A" should be ignored because they are MS carrier frequency.

GSM Mode Test Verdict

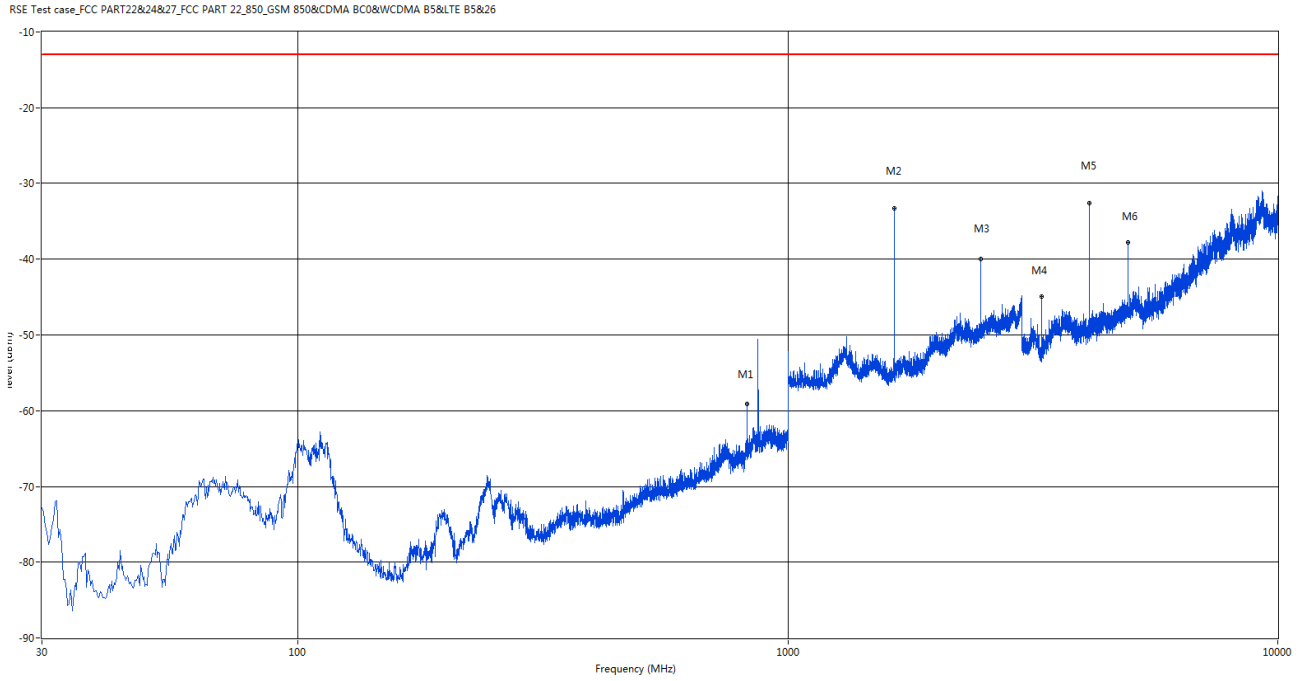
Test Band	Test Channel	Verdict
GSM 850	LCH	Pass
	MCH	Pass
	HCH	Pass
GSM 1900	LCH	Pass
	MCH	Pass
	HCH	Pass

GSM 850-Low Channel, ANT H, EUT H



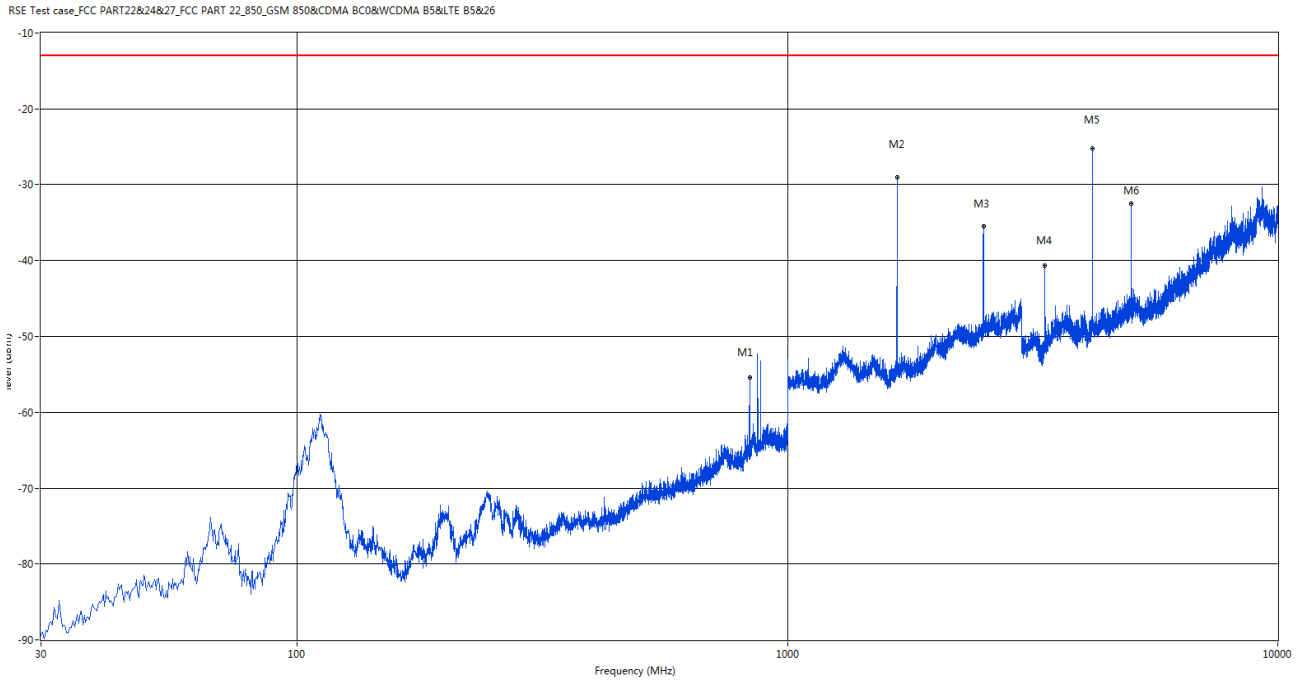
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
824.188	-49.40	6.10	-13.0	36.40	328.00	Horizontal	Horizontal	N/A
1648.500	-28.52	1.10	-13.0	15.52	270.00	Horizontal	Horizontal	Pass
2472.500	-35.22	7.95	-13.0	22.22	170.00	Horizontal	Horizontal	Pass
3297.000	-43.40	7.05	-13.0	30.40	28.00	Horizontal	Horizontal	Pass
4121.000	-25.77	8.37	-13.0	12.77	336.00	Horizontal	Horizontal	Pass
4946.000	-28.77	11.23	-13.0	15.77	328.00	Horizontal	Horizontal	Pass

GSM 850-Low Channel, ANT V, EUT H



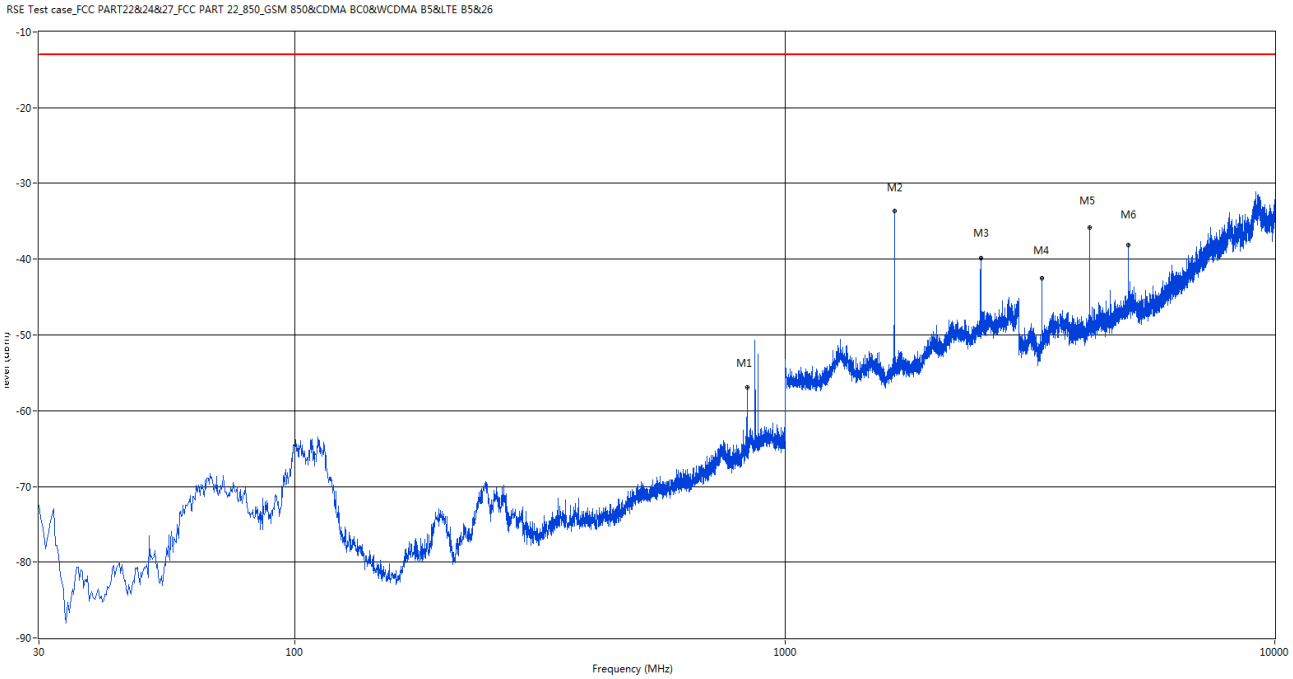
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
824.188	-59.14	6.10	-13.0	46.14	36.00	Vertical	Horizontal	N/A
1648.500	-33.33	1.10	-13.0	20.33	55.00	Vertical	Horizontal	Pass
2472.500	-39.98	7.95	-13.0	26.98	278.00	Vertical	Horizontal	Pass
3297.000	-44.94	7.05	-13.0	31.94	82.00	Vertical	Horizontal	Pass
4121.000	-32.59	8.37	-13.0	19.59	197.00	Vertical	Horizontal	Pass
4945.000	-37.77	11.20	-13.0	24.77	182.00	Vertical	Horizontal	Pass

GSM 850-Middle Channel, ANT H, EUT H



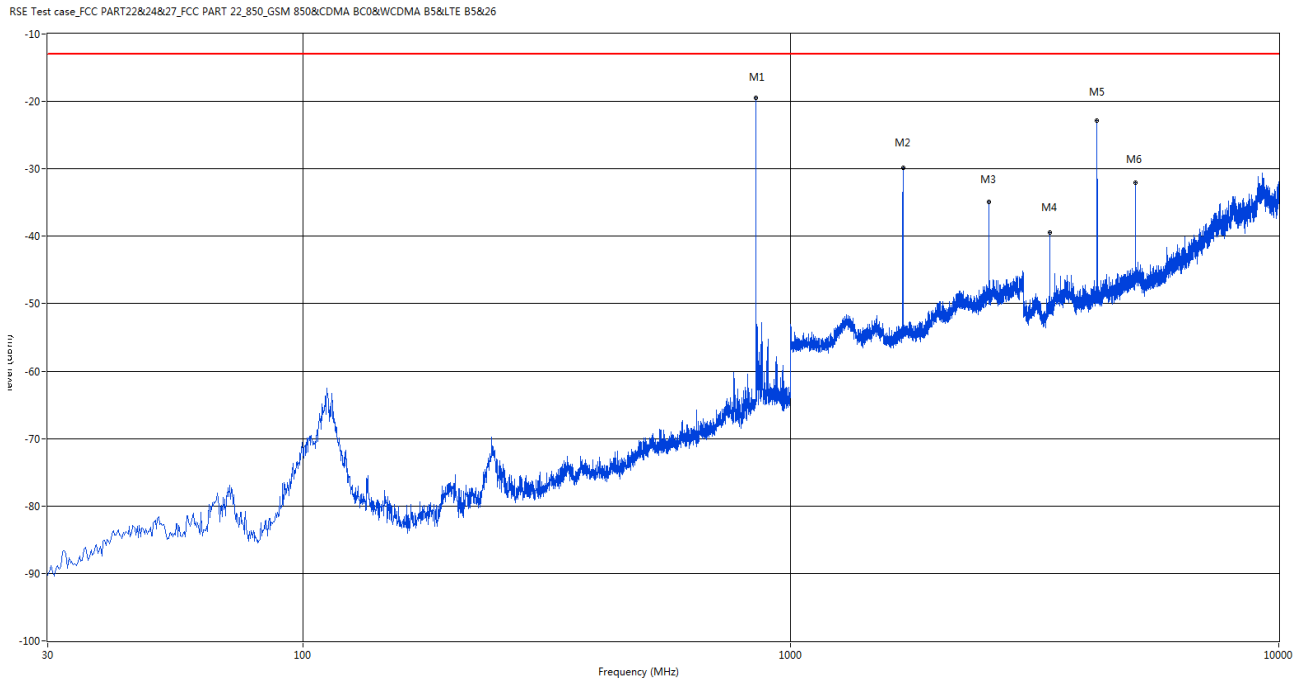
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
836.555	-55.36	6.54	-13.0	42.36	243.00	Horizontal	Horizontal	N/A
1673.000	-28.97	1.69	-13.0	15.97	201.00	Horizontal	Horizontal	Pass
2510.000	-35.44	8.08	-13.0	22.44	163.00	Horizontal	Horizontal	Pass
3346.000	-40.72	8.12	-13.0	27.72	28.00	Horizontal	Horizontal	Pass
4183.000	-25.22	8.79	-13.0	12.22	336.00	Horizontal	Horizontal	Pass
5020.000	-32.46	11.32	-13.0	19.46	266.00	Horizontal	Horizontal	Pass

GSM 850-Middle Channel, ANT V, EUT H



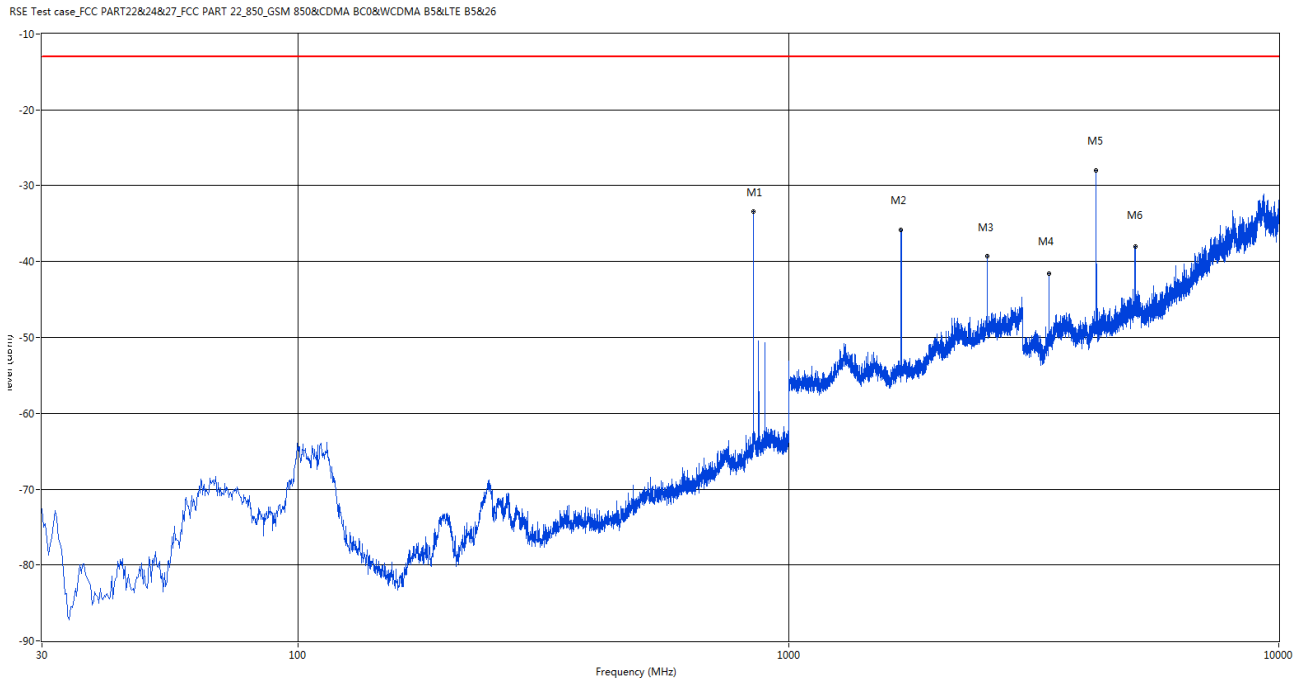
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
836.555	-56.96	6.54	-13.0	43.96	36.00	Vertical	Horizontal	N/A
1673.000	-33.61	1.69	-13.0	20.61	124.00	Vertical	Horizontal	Pass
2510.000	-39.91	8.08	-13.0	26.91	2.00	Vertical	Horizontal	Pass
3347.000	-42.45	8.05	-13.0	29.45	205.00	Vertical	Horizontal	Pass
4183.000	-35.87	8.79	-13.0	22.87	243.00	Vertical	Horizontal	Pass
5019.000	-38.14	11.34	-13.0	25.14	190.00	Vertical	Horizontal	Pass

GSM 850-High Channel, ANT H, EUT H



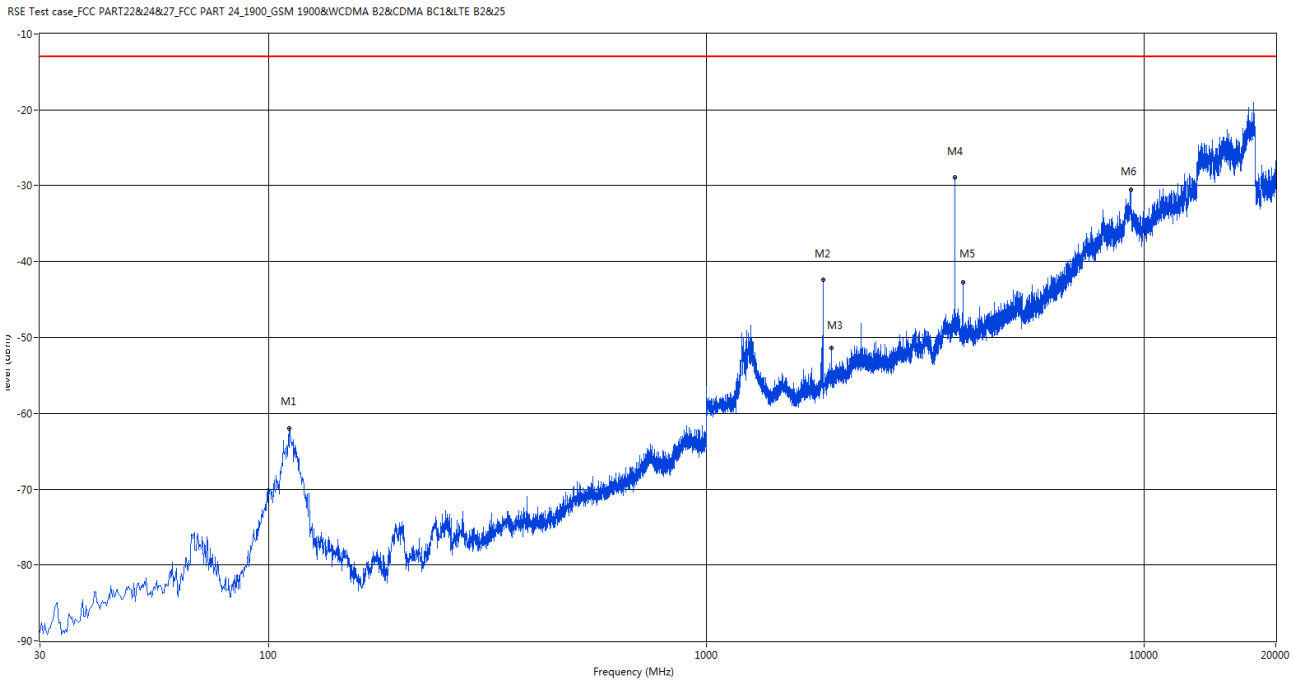
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
848.680	-19.51	7.40	-13.0	6.51	0.00	Horizontal	Horizontal	N/A
1697.500	-29.90	1.23	-13.0	16.90	209.00	Horizontal	Horizontal	Pass
2546.500	-34.92	8.98	-13.0	21.92	63.00	Horizontal	Horizontal	Pass
3396.000	-39.38	8.79	-13.0	26.38	36.00	Horizontal	Horizontal	Pass
4244.000	-22.80	8.81	-13.0	9.80	259.00	Horizontal	Horizontal	Pass
5092.000	-32.02	11.73	-13.0	19.02	320.00	Horizontal	Horizontal	Pass

GSM 850- High Channel, ANT V, EUT H



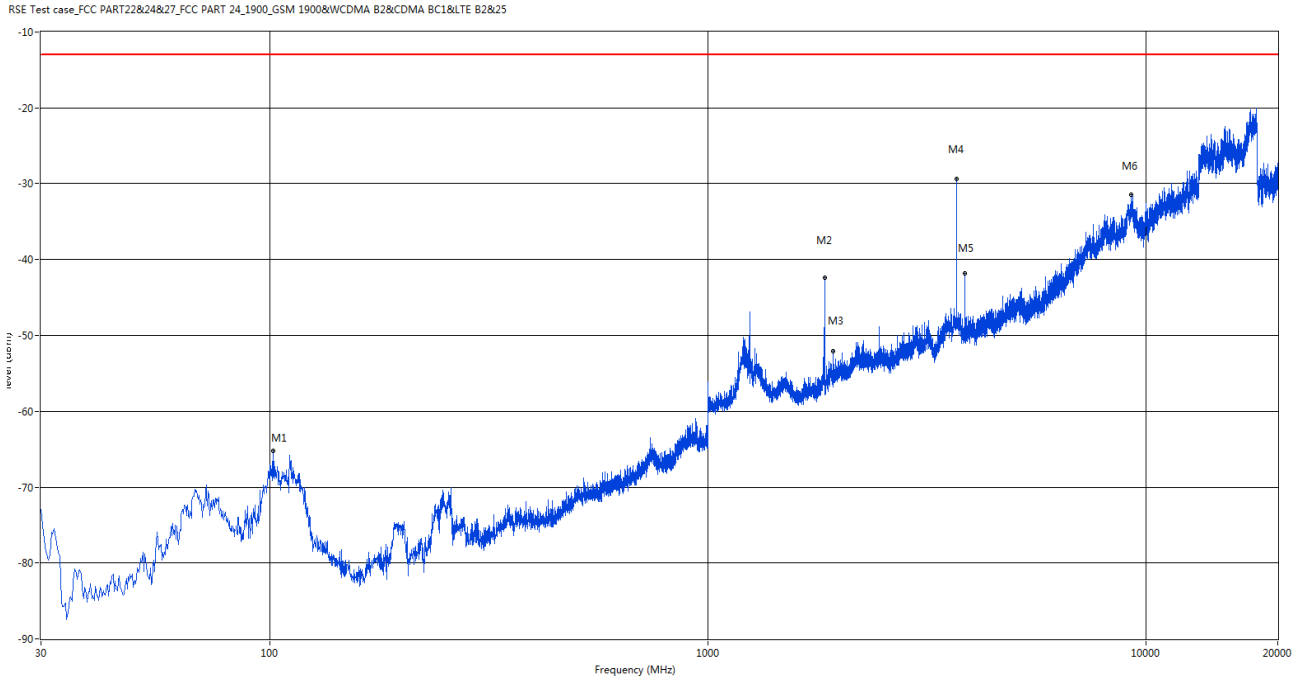
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
848.680	-33.40	7.40	-13.0	20.40	174.00	Vertical	Horizontal	N/A
1697.500	-35.78	1.23	-13.0	22.78	117.00	Vertical	Horizontal	Pass
2546.500	-39.27	8.98	-13.0	26.27	357.00	Vertical	Horizontal	Pass
3395.000	-41.57	8.58	-13.0	28.57	266.00	Vertical	Horizontal	Pass
4244.000	-28.00	8.81	-13.0	15.00	190.00	Vertical	Horizontal	Pass
5093.000	-38.02	11.81	-13.0	25.02	128.00	Vertical	Horizontal	Pass

GSM 1900-Low Channel, ANT H, EUT H



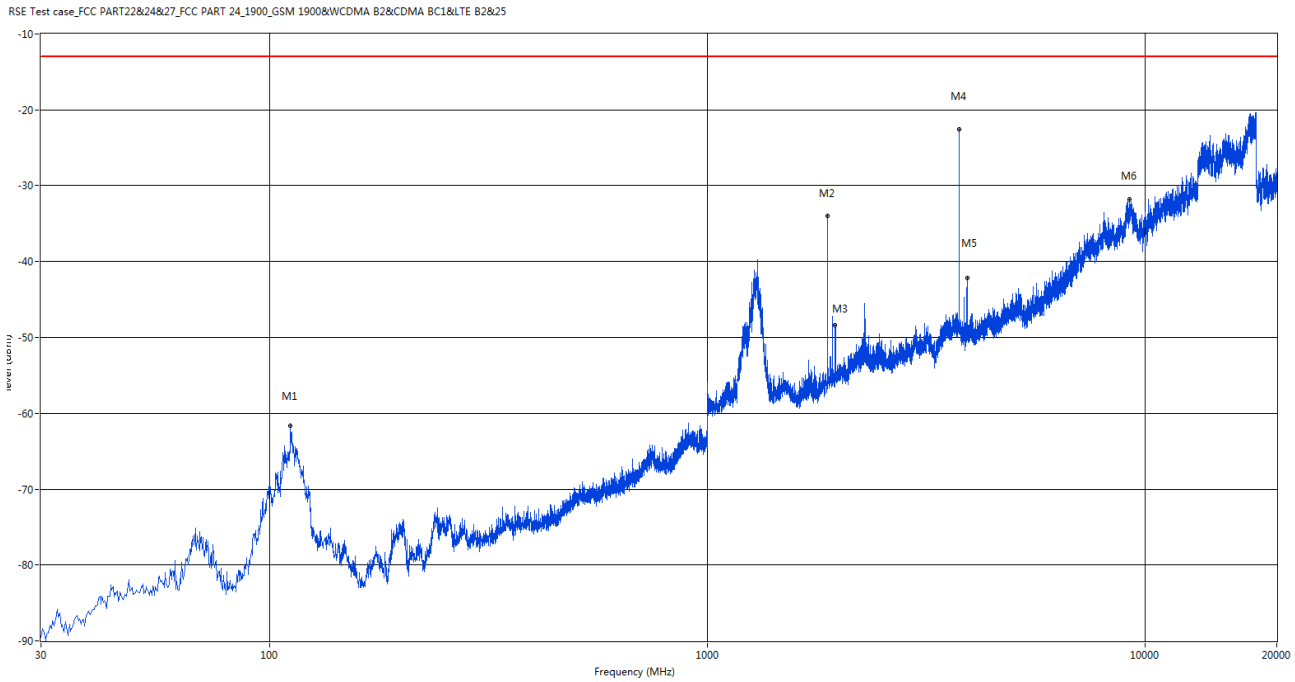
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
111.480	-62.04	-2.28	-13.0	49.04	147.00	Horizontal	Horizontal	Pass
1850.000	-42.37	0.76	-13.0	29.37	0.00	Horizontal	Horizontal	N/A
1930.000	-51.44	0.56	-13.0	38.44	182.00	Horizontal	Horizontal	N/A
3700.000	-28.92	9.85	-13.0	15.92	340.00	Horizontal	Horizontal	Pass
3860.000	-42.68	8.52	-13.0	29.68	255.00	Horizontal	Horizontal	Pass
9341.688	-30.52	23.17	-13.0	17.52	90.00	Horizontal	Horizontal	Pass

GSM 1900-Low Channel, ANT V, EUT V



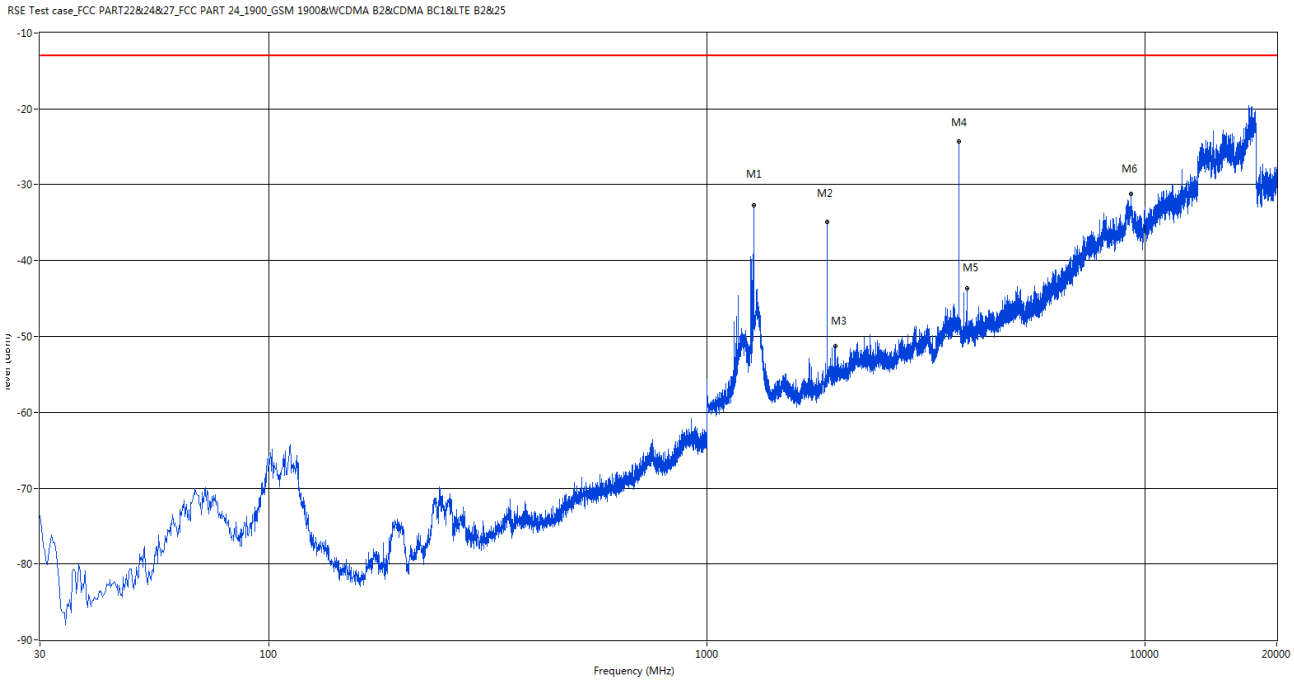
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
101.780	-65.22	-3.09	-13.0	52.22	286.00	Vertical	Vertical	Pass
1850.000	-42.38	0.76	-13.0	29.38	358.00	Vertical	Vertical	N/A
1930.000	-52.12	0.56	-13.0	39.12	28.00	Vertical	Vertical	N/A
3700.000	-29.32	9.85	-13.0	16.32	194.00	Vertical	Vertical	Pass
3860.000	-41.82	8.52	-13.0	28.82	132.00	Vertical	Vertical	Pass
9245.375	-31.41	23.79	-13.0	18.41	297.00	Vertical	Vertical	Pass

GSM 1900-Middle Channel, ANT H, EUT H



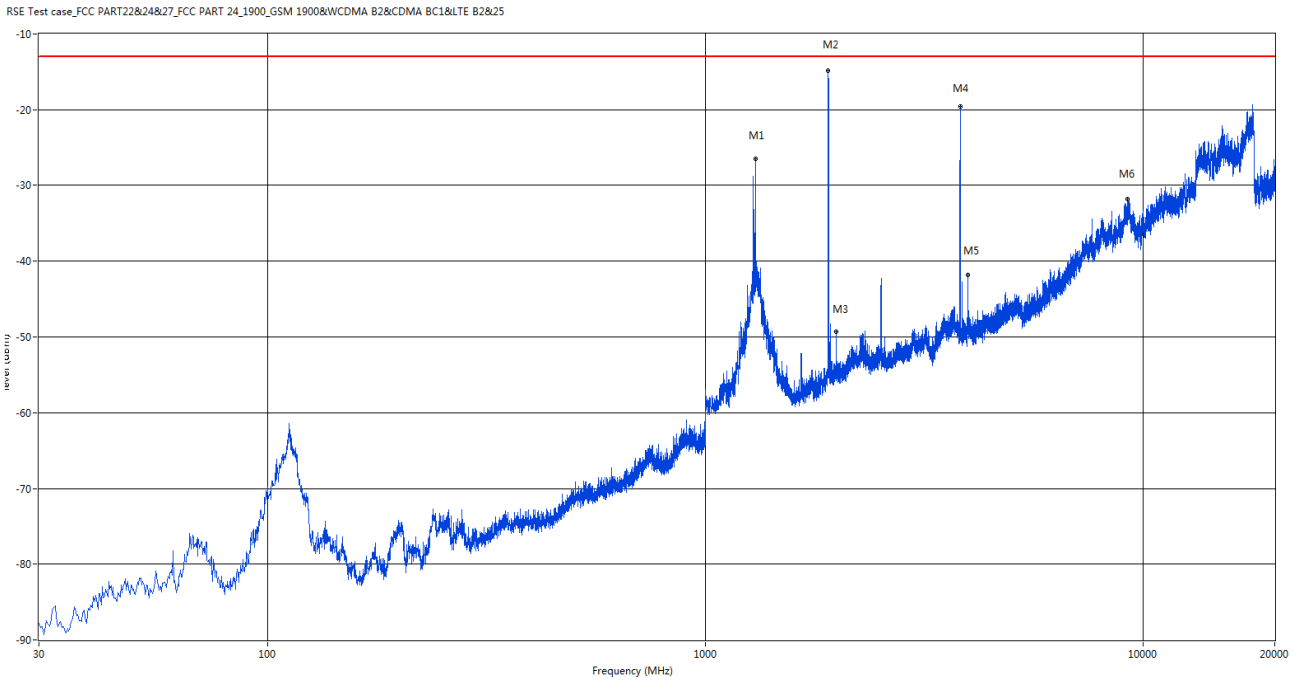
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
111.480	-61.59	-2.28	-13.0	48.59	155.00	Horizontal	Horizontal	Pass
1880.000	-33.98	1.42	-13.0	20.98	355.00	Horizontal	Horizontal	N/A
1960.000	-48.37	1.19	-13.0	35.37	51.00	Horizontal	Horizontal	N/A
3760.000	-22.51	8.88	-13.0	9.51	255.00	Horizontal	Horizontal	Pass
3920.000	-42.18	8.80	-13.0	29.18	332.00	Horizontal	Horizontal	Pass
9219.500	-31.74	23.34	-13.0	18.74	305.00	Horizontal	Horizontal	Pass

GSM 1900-Middle Channel, ANT V, EUT V



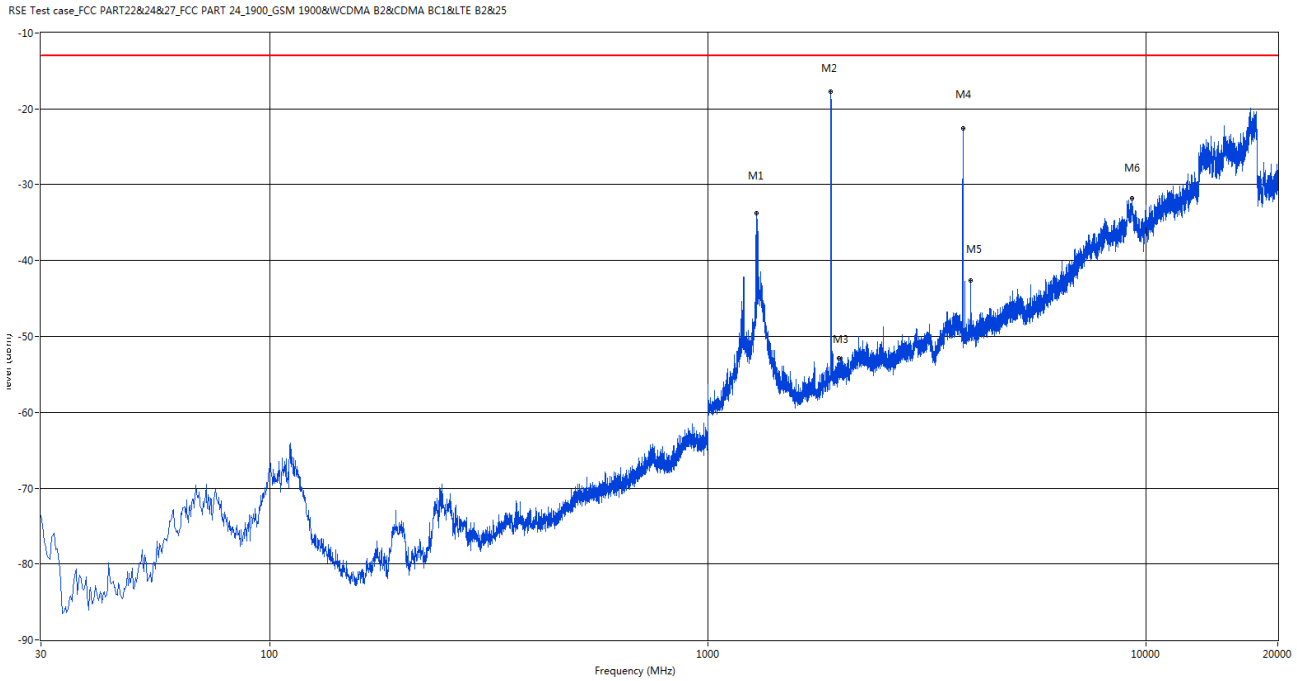
Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
1279.500	-32.76	1.59	-13.0	19.76	324.00	Vertical	Vertical	Pass
1880.000	-34.93	1.42	-13.0	21.93	40.00	Vertical	Vertical	N/A
1960.500	-51.30	1.21	-13.0	38.30	286.00	Vertical	Vertical	N/A
3760.000	-24.29	8.88	-13.0	11.29	190.00	Vertical	Vertical	Pass
3919.000	-43.69	8.83	-13.0	30.69	151.00	Vertical	Vertical	Pass
9311.500	-31.24	24.36	-13.0	18.24	340.00	Vertical	Vertical	Pass

GSM 1900- High Channel, ANT H, EUT H



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
1300.000	-26.53	2.39	-13.0	13.53	240.00	Horizontal	Horizontal	Pass
1910.000	-14.82	2.21	-13.0	1.82	347.00	Horizontal	Horizontal	N/A
1990.000	-49.25	1.39	-13.0	36.25	170.00	Horizontal	Horizontal	N/A
3820.000	-19.61	8.23	-13.0	6.61	182.00	Horizontal	Horizontal	Pass
3979.000	-41.76	8.98	-13.0	28.76	266.00	Horizontal	Horizontal	Pass
9216.625	-31.74	23.29	-13.0	18.74	178.00	Horizontal	Horizontal	Pass

GSM 1900- High Channel, ANT V, EUT V



Frequency (MHz)	Result (dBm)	Factor (dB)	PK Limit (dBm)	Margin (dB)	Table (o)	ANT	EUT	Verdict
1292.500	-33.80	2.11	-13.0	20.80	336.00	Vertical	Vertical	Pass
1910.000	-17.67	2.21	-13.0	4.67	43.00	Vertical	Vertical	N/A
1994.000	-52.84	1.94	-13.0	39.84	74.00	Vertical	Vertical	N/A
3820.000	-22.54	8.23	-13.0	9.54	293.00	Vertical	Vertical	Pass
3979.000	-42.64	8.98	-13.0	29.64	247.00	Vertical	Vertical	Pass
9302.875	-31.78	24.73	-13.0	18.78	51.00	Vertical	Vertical	Pass

ANNEX B TEST SETUP PHOTOS

Please refer to the document “BL-SZ1810276-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer to the document “BL- SZ1810276-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer to the document “BL- SZ1810276-AI.PDF”.

-END OF REPORT--