FCC RF TEST REPORT

Report No.:	R201907005
Model No.:	CB64
Grant No.:	JOY
FCC ID:	JOYCB64
Date of Receipt:	Jun 17, 2019
Date of Test:	Jun 17, 2019 ~ Jul 07, 2019
Date of Issue:	Jul 07, 2019
Test Result:	Passed

Applicant:	Kyocera Corporation
Manufacturer:	Kyocera Corporation
Factory:	Kyocera Corporation
Product Name	GSM/WCDMA/LTE Mobile Telephone
Trade Mark	KYOCERA
Address:	2-1-1 Kagahara, Tsuzuki-ku, Yokohama-shi, Kanagawa, Japan, 224-8502
Issued By:	BYD Precise Manufacture Co., Ltd.
Lab Location:	No. 3001, Baohe Road, Baolong Longgang, Shenzhen, 518116, People's Republic of China

Table of Contents

1 REPORT ISSUED HISTORY

Version	Description	Issued Date
Rev. 01	Original issue	Jul 07, 2019

2 CERTIFICATION

PRODUCT:	GSM/WCDMA/LTE Mobile Telephone
MODEL:	CB64
BRAND:	Kyocera Corporation
APPLICANT:	Kyocera Corporation
TEST SAMPLE:	ENGINEERING SAMPLE
IMEI:	356283100010075 / 356283100010448
HW Version:	CB64
SW Version:	Msm8937_64-userdebug 9
TESTED:	Jun 17, 2019 ~ Jul 07, 2019
STANDARDS:	FCC 47 CFR Part2,22(H),24(E),27(L)

The above equipment has been tested by **BYD Precise Manufacture Co., Ltd.,** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE:** **Jul 07, 2019**
(Fen Lu / Engineer)

TECHNICAL ACCEPTANCE : _____ , **DATE:** **Jul 07, 2019**
Responsible for EMS (Zhaohui Feng / Manager)

APPROVED BY : _____ , **DATE:** **Jul 07, 2019**
(Jie Yan / Director)

3 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

IMEI	FCC RULE	Description	RESULT	REMARK
356283100010075	§2.1046	Conducted Output Power	Passed	Reporting Only
	§24.232(d)	peak-to-average ratio	Passed	<13dB
	§2.1049 §22.917 (b) §24.238(b) §27.53(g)	Bandwidth	Passed	Reporting Only
	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Band Edges	Passed	<43+10log10(P[Watts])
	§2.1051 §22.917(a) §24.238(a) §27.53(h)	Spurious Emission	Passed	<43+10log10(P[Watts])
	§2.1055 §22.355 §24.235 §27.54	Frequency Stability	Passed	<2.5ppm for Part22 Within Authorized Band
	§Part22.913(a)(2) §Part24.232(c) §Part27.50(d)(4)	ERP/EIRP	Passed	Band5:ERP<7W Band2:EIRP<2W Band4:EIRP<1W
356283100010448	§2.1053 §22.917(a) §24.238(a) §27.53(h)	Field Strength of Spurious Radiation	Passed	<43+10log10(P[Watts])

3.1 Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5%
RF output power, Conducted	±0.59dB
Bandwidth, conducted	±1.78kHz
Unwanted Emissions, conducted	±0.9dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.8dB

4 GENERAL INFORMATION

4.1 Test Equipments List

Description & Manufacturer	MODEL NO.	SERIAL NO.	Next Calibration date
WIDEBAND RADIO COMMUNICATION TESTER ROHDE & SCHWARZ	CMW500	148277	2019/10/16
SIGNAL ANALYZER ROHDE & SCHWARZ	FSQ26	200393	2020/4/1
Attenuation	H+S 6610_SMA-50-1	-	-
Temperature Chamber WEISS	Temperature Chamber	'58226074850010	2020/7/2
DC Power Supply Agilent	E3632A	MY40021860	2019/10/18
RF cable	Huber Suhner SUCOFLEX 104PE	-	-
PC	-	30008979	-
Power Divider	-	C279810-01	-
Universal radio communication tester	CMU 200	115880	2020.04.01
Universal radio communication tester	CMW500	148351	2019.10.16
Antenna	ETS 3142C	79888	2021.01.28
Antenna	ETS 3117	57412	2021.01.25
ANTENNA mast	ETS 2090	00069146	-
ANTENNA mast	MF T-E-TAC-4.0	MF780208498	-
EMI test receiver	ESU	100041	2020.04.01
EMC32 software	R&S	-	-

NOTE: Calibration cycle 12 months.

4.2 Description of Test Modes

Test items	function type	Channel
Conducted Output Power	PCS1900(GMSK+GPRS)+WCDMA BAND2/4(RMC 12.2kbps)	L/M/H
peak-to-average ratio		L/M/H
Bandwidth		L/M/H
Band Edges		L/H
Spurious Emission		L/M/H
Frequency Stability		M
Effective Radiated Power and Effective Isotropic Radiated Power		L/M/H
Filed Strength of Spurious Radiation	PCS 1900 TX mode/ WCDMA Band2/4 TX mode	M

4.3 Test Environment and List of Software and Accessory

Test Items	Software	Accessory	Environment
Conducted Output Power	-	USB Cable、Fake battery、Power Divider、Attenuation	Temp.:25℃±3
			Humi:30%~60%
			Volt.:3.85V
peak-to-average ratio	-	USB Cable、Fake battery、Power Divider、Attenuation	Temp.:25℃±3
			Humi:30%~60%
			Volt.:3.85V
Bandwidth	-	USB Cable、Fake battery、Power Divider、Attenuation	Temp.:25℃±3
			Humi:30%~60%
			Volt.:3.85V
Band Edges	-	USB Cable、Fake battery、Power Divider、Attenuation	Temp.:25℃±3
			Humi:30%~60%
			Volt.:3.85V
Spurious Emission	-	USB Cable、Fake battery、Power Divider、Attenuation	Temp.:25℃±3
			Humi:30%~60%
			Volt.:3.85V
Frequency Stability	-	USB Cable、Fake battery、Power Divider、Attenuation	Temp.:-20℃~60℃
			Humi:30%~60%
			Volt.:3.85、3.465、4.235V
	-		Temp.:25℃±3
			Humi:30%~60%

Effective Radiated Power and Effective Isotropic Radiated Power		USB Cable、Fake battery、Power Divider、Attenuation	Volt.:3.8V
Filed Strength of Spurious Radiation	EMC32	Charger: KYCAV1 Headset: HSEJ03JY(Mi)	Temp.:25℃±3
			Humi:30%~60%
			Volt.:3.8V

4.4 Testing Location

Test Site	BYD Precise Manufacture Co., Ltd.
Test Site Location	No. 3001, Baohe Road, Baolong Longgang, Shenzhen, 518116, People's Republic of China
Post Code	518116
Telephone	+86-755 8489 8888 55501
Fax	+86-755 8964 3771

4.5 Test Facility

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

• A2LA (Certificate No. 4886.01)

BYD Precise Manufacture Co., Ltd., Baolong Shenzhen Laboratory is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4886.01.

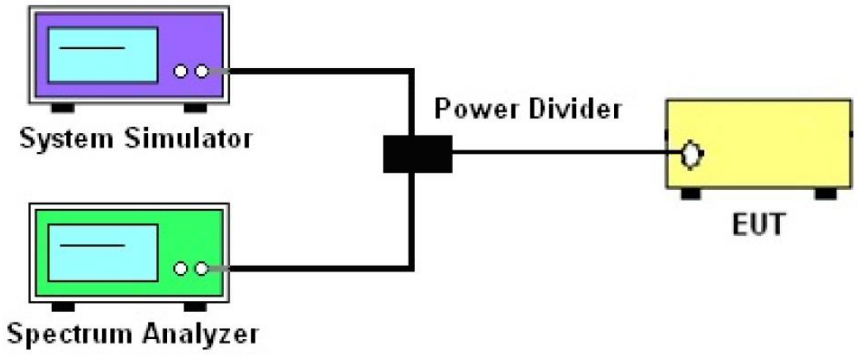
• FCC –Designation Number: CN1232

BYD Precise Manufacture Co., Ltd., Baolong Shenzhen Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1232.

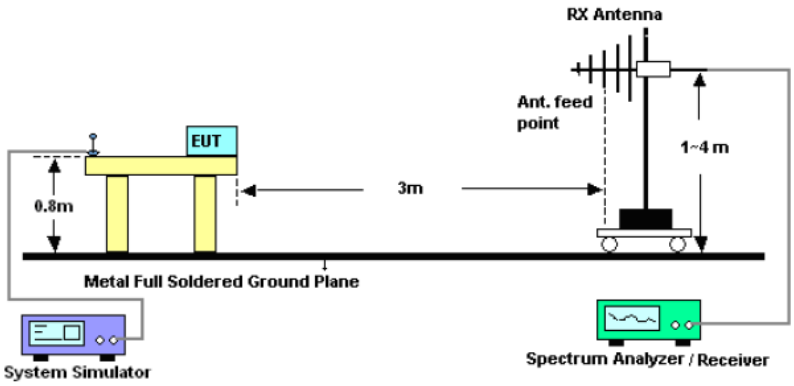
4.6 Configuration of System Under Test

Conducted:

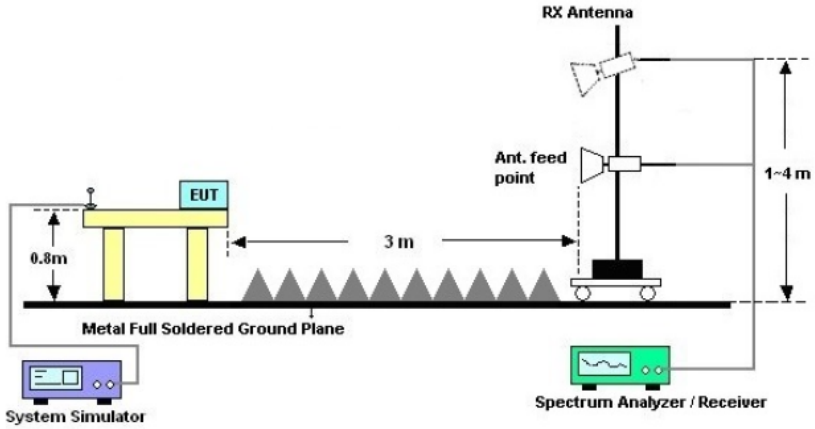


Radiated:

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



4.7 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part2, 22(H), 24(E), 27(L)

ANSI/TIA/EIA-603-D-2010

FCC KDB 971168 D01 Power Meas. License Digital Systems v02r02

All test items have been performed and recorded as per the above standards.

5 TEST TYPES AND RESULTS

5.1 Conducted Output Power (Reporting Only)

5.1.1 Description of the Conducted Output Power

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported

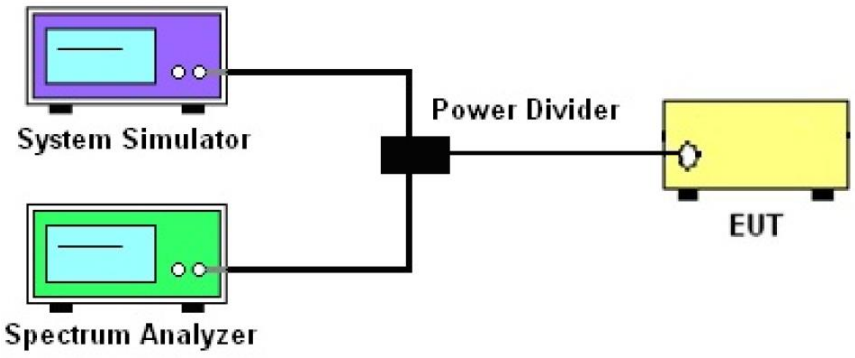
5.1.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

5.1.3 Test Procedure

a. The transmitter output port was connected to the system simulator.
b. Set EUT at maximum power through system simulator.
c. Select lowest, middle, and highest channels for each band and different modulation.
d. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.

5.1.4 Test Setup



5.1.5 Test Result

Conducted Output Power (Average power) – Result

Modes	PCS1900			Modes	Band II		
Channel	512	661	810	Channel	9262	9400	9538
Frequency(MHz)	1850.2	1880.0	1909.8	Frequency(MHz)	1852.4	1880.0	1907.6
Conducted Power (dBm)	29.98	30.04	30.03	Conducted Power(dBm)	23.21	23.14	23.34
Modes	Band IV						
Channel	1312	1413	1513				
Frequency(MHz)	1712.4	1732.6	1752.6				
Conducted Power(dBm)	23.23	22.88	23.12				
Modes	GPRS1900						
Channel	512	661	810				
Frequency(MHz)	1850.2	1880.0	1909.8				
Conducted Power (dBm)	29.63	29.79	30.05				

5.2 Peak-To-Average Ratio

5.2.1 Description

The peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

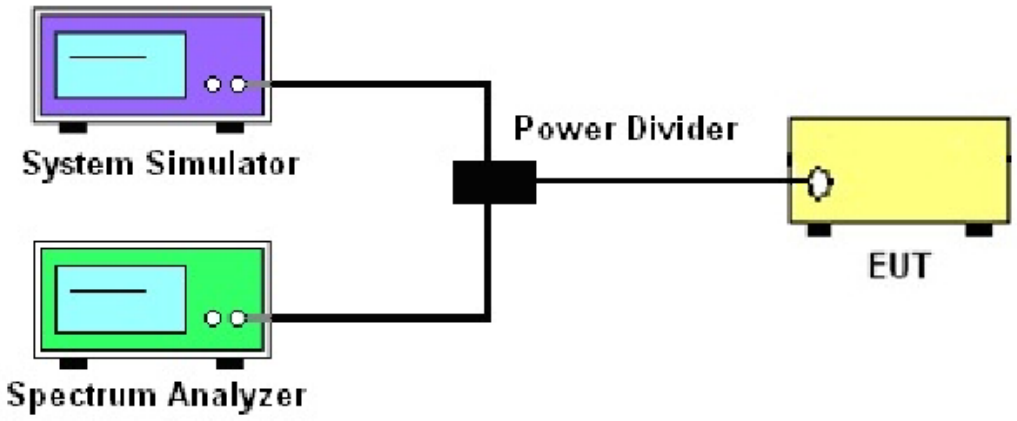
5.2.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

5.2.3 Test Procedure

a. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
b. Set EUT in maximum power output.
c. For GSM, Set spectrum analyzer: RBW=1MHz, VBW=3MHz, Peak detector on spectrum analyzer for first trace, RMS detector on spectrum analyzer for second trace. Record the deviation as Peak to Average Ratio.
d. For WCDMA, Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.

5.2.4 Test Setup



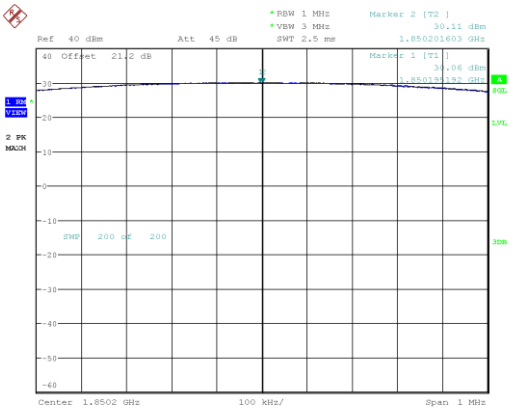
5.2.5 Test Result

Peak-to-Average Ratio – Result

Modes	PCS1900			Band II		
Channel	512	661	810	9262	9400	9538
Frequency(MHz)	1850.2	1880.0	1909.8	1852.4	1880.0	1907.6
Peak-to-Average Ratio(dB)	0.05	0.05	0.05	2.82	3.08	2.82
Result(<13dB)	Passed	Passed	Passed	Passed	Passed	Passed
Modes	Band IV					
Channel	1312	1413	1513			
Frequency(MHz)	1712.4	1732.6	1752.6			
Peak-to-Average Ratio(dB)	3.01	3.21	3.27			
Result(<13dB)	Passed	Passed	Passed			
Modes	GPRS1900					
Channel	512	661	810			
Frequency(MHz)	1850.2	1880.0	1909.8			
Peak-to-Average Ratio(dB)	0.05	0.04	0.07			
Result(<13dB)	Passed	Passed	Passed			

Peak-to-Average Ratio – Photograph

GSM PCS1900 Channel512 PCL0



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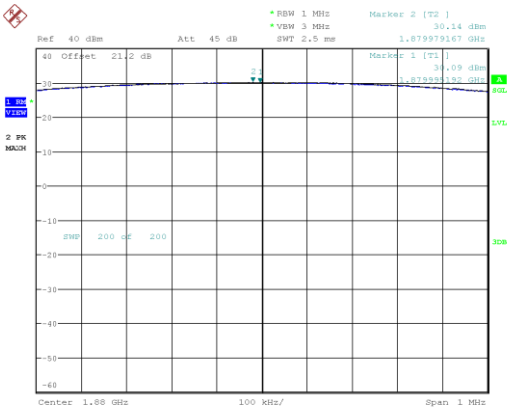
GSM PCS1900 Channel661 PCL0



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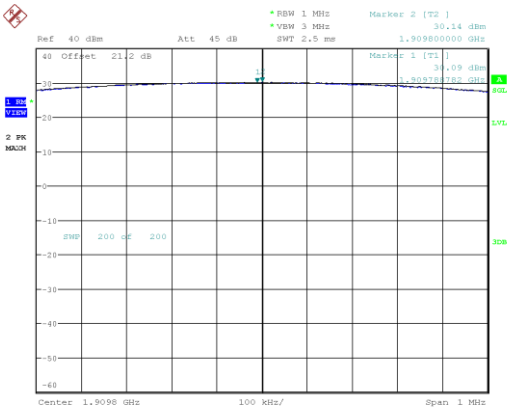
GSM PCS1900 Channel810 PCL0



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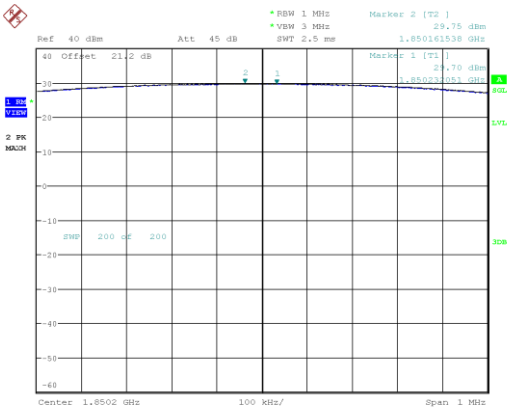
GPRS PCS1900 Channel512 PCL0



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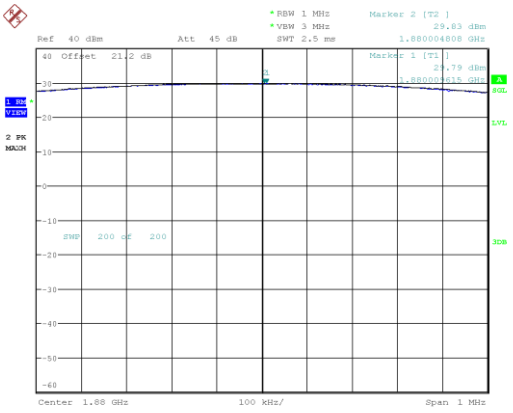
GPRS PCS1900 Channel661 PCL0



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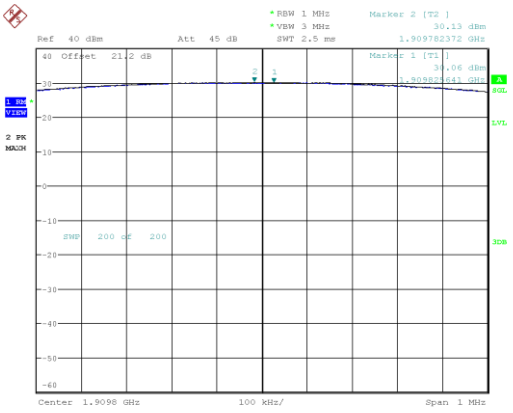
GPRS PCS1900 Channel810 PCL0



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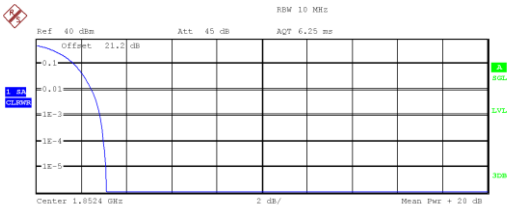
WCDMA Band II Channel9262

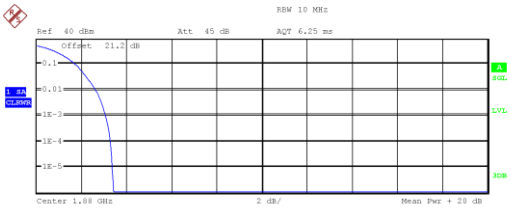


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	23.51 dBm
Peak	26.61 dBm
Crest	3.10 dB
10 %	1.67 dB
1 %	2.44 dB
.1 %	2.82 dB
.01 %	2.98 dB

Date: 4.APR.6302 02:53:58

WCDMA Band II Channel9400

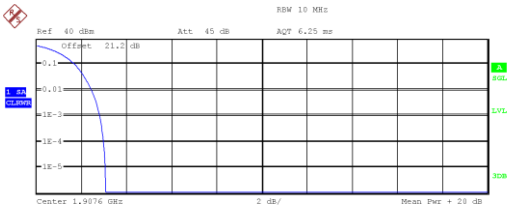


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	23.21 dBm
Peak	26.62 dBm
Crest	3.41 dB
10 %	1.73 dB
1 %	2.63 dB
.1 %	3.08 dB
.01 %	3.27 dB

Date: 4.APR.6302 02:55:53

WCDMA Band II Channel9538

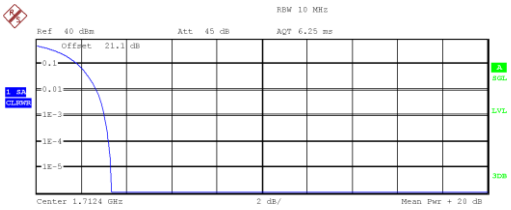


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	23.51 dBm
Peak	26.56 dBm
Crest	3.06 dB
10 %	1.70 dB
1 %	2.44 dB
.1 %	2.82 dB
.01 %	2.98 dB

Date: 4.APR.6302 02:57:17

WCDMA Band IV Channel1312

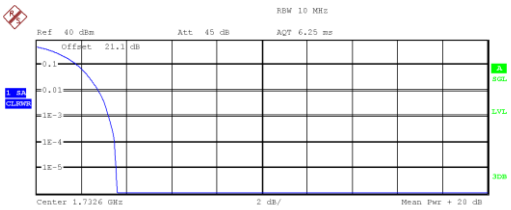


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	23.41 dBm
Peak	26.71 dBm
Crest	3.31 dB
10 %	1.83 dB
1 %	2.66 dB
.1 %	3.01 dB
.01 %	3.21 dB

Date: 4.APR.6302 03:00:20

WCDMA Band IV Channel1413

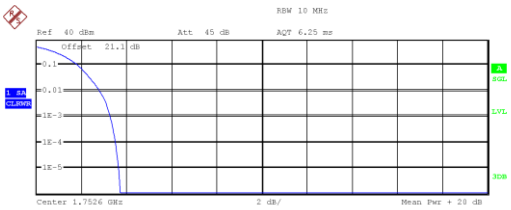


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	22.95 dBm
Peak	26.52 dBm
Crest	3.56 dB
10 %	1.83 dB
1 %	2.76 dB
.1 %	3.21 dB
.01 %	3.46 dB

Date: 4.APR.6302 03:02:18

WCDMA Band IV Channel1513



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	23.05 dBm
Peak	26.75 dBm
Crest	3.71 dB
10 %	1.83 dB
1 %	2.79 dB
.1 %	3.27 dB
.01 %	3.49 dB

Date: 4.APR.6302 03:03:40

5.3 99% & 26dB Occupied Bandwidth (Reporting Only)

5.3.1 Description of 99% Occupied Bandwidth and 26 dB Bandwidth Measurement

The 99% occupied band width is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

The emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

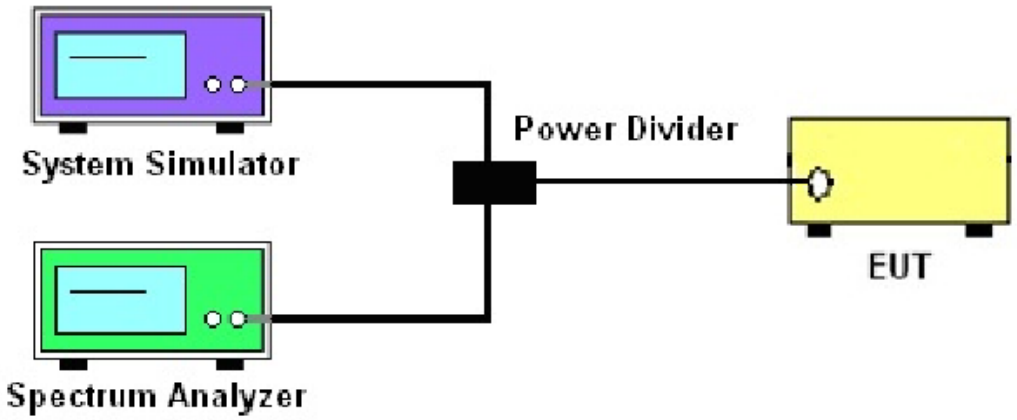
5.3.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

5.3.3 Test Procedure

a. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
b. The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be between two and five times the anticipated OBW.
c. The 99% occupied bandwidth were measured, set RBW=1~5% of the anticipated OBW, VBW≥3*RBW, peak detector, trace maximum hold.
d. 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)
e. Use the 99% power bandwidth function of the spectrum analyzer and report the measured bandwidth.
f. Use the N dB Down function of the spectrum analyzer and report the measured bandwidth.

5.3.4 Test Setup



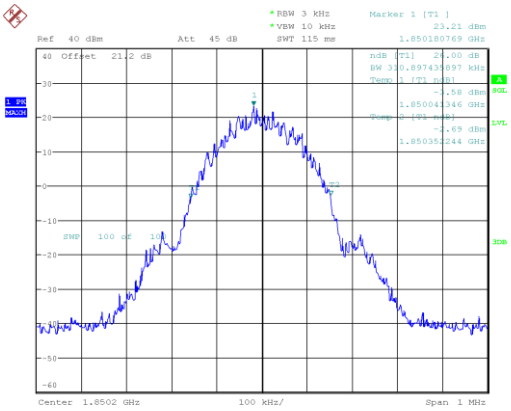
5.3.5 Test Result

26dB Bandwidth & Occupied Bandwidth – Result

Modes	PCS1900			Band II		
Channel	512	661	810	9262	9400	9538
Frequency(MHz)	1850.2	1880.0	1909.8	1852.4	1880.0	1907.6
26dB OBW(kHz)	310.90	314.10	26dB OBW(MHz)	4.70	4.73	4.73
99% OBW(kHz)	245.19	245.19	99% OBW(MHz)	4.15	4.13	4.13
Modes	Band IV					
Channel	1312	1413	1513			
Frequency(MHz)	1712.4	1732.6	1752.6			
26dB OBW(MHz)	4.71	4.71	4.71			
99% OBW(MHz)	4.13	4.13	4.13			
Modes	GPRS1900					
Channel	512	661	810			
Frequency(MHz)	1850.2	1880.0	1909.8			
26dB OBW(kHz)	317.31	296.47	312.50			
99% OBW(kHz)	245.19	243.59	243.59			

26dB Bandwidth – Photograph

GSM PCS1900 Channel512 PCL0



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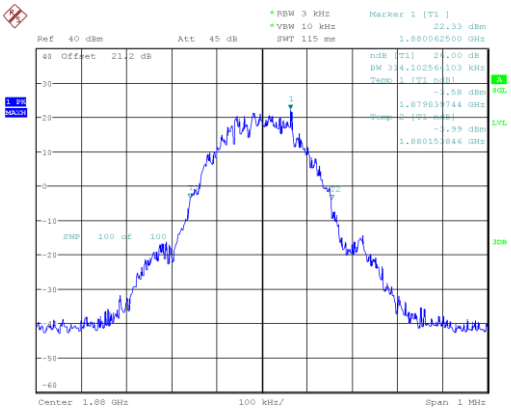
GSM PCS1900 Channel661 PCL0



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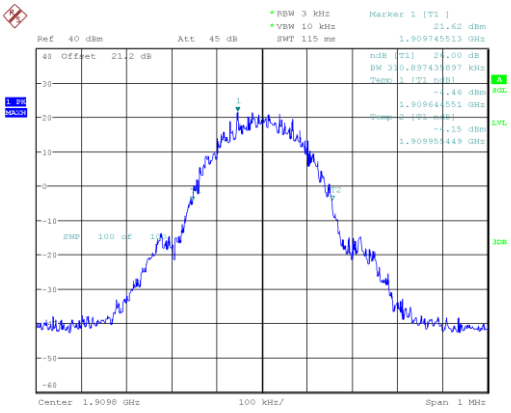
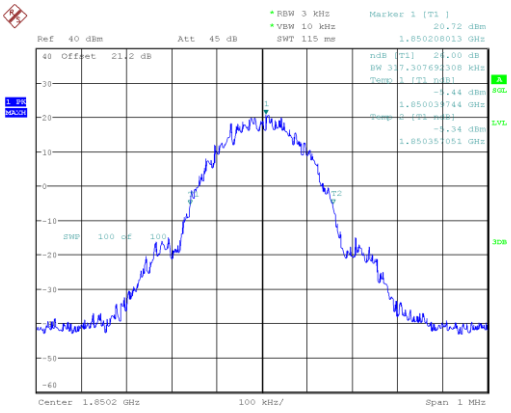
GSM PCS1900 Channel810 PCL0



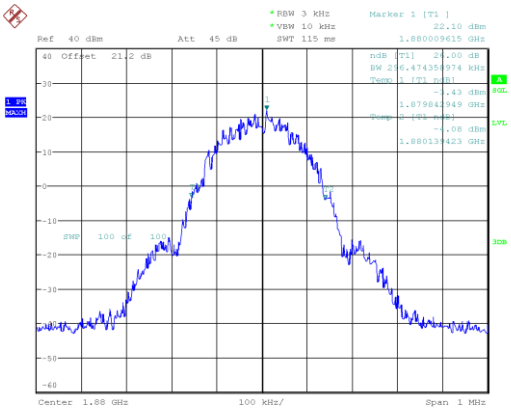
Date: 4.APR.6302 02:36:57

GPRS PCS1900 Channel512 PCL0



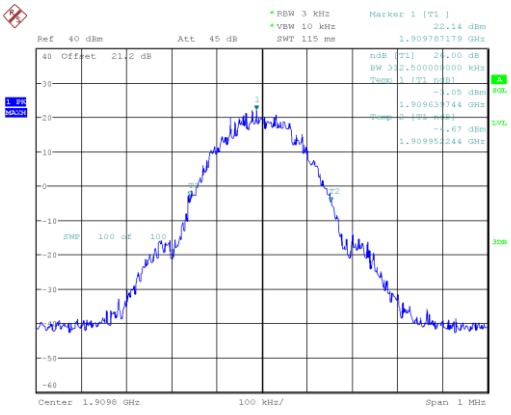
Date: 4.APR.6302 02:40:17

GPRS PCS1900 Channel661 PCL0



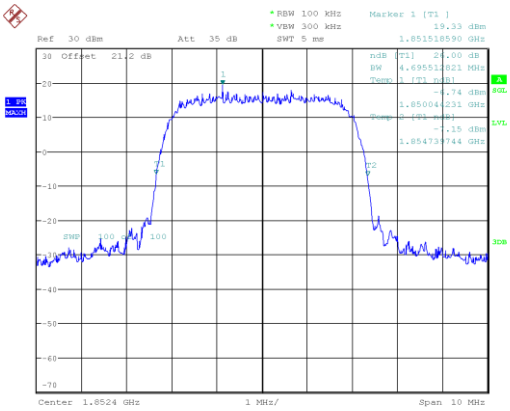
Date: 4.APR.6302 02:42:22

GPRS PCS1900 Channel810 PCL0



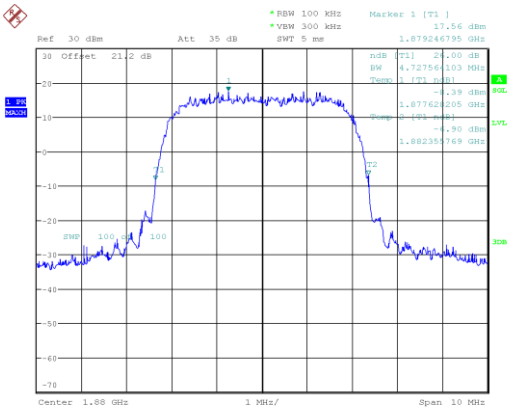
Date: 4.APR.6302 02:44:03

WCDMA Band II Channel9262



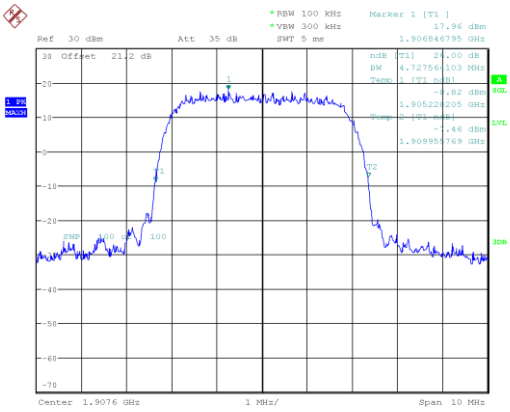
Date: 4.APR.6302 02:54:26

WCDMA Band II Channel9400



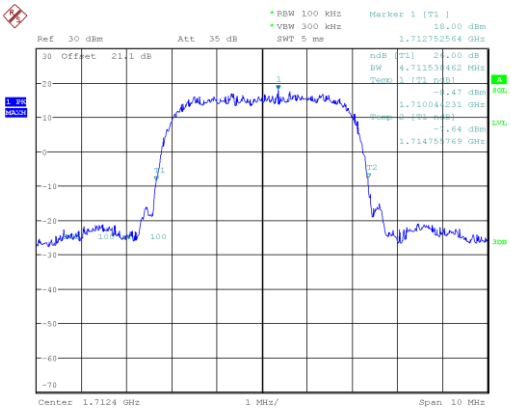
Date: 4.APR.6302 02:56:20

WCDMA Band II Channel9538



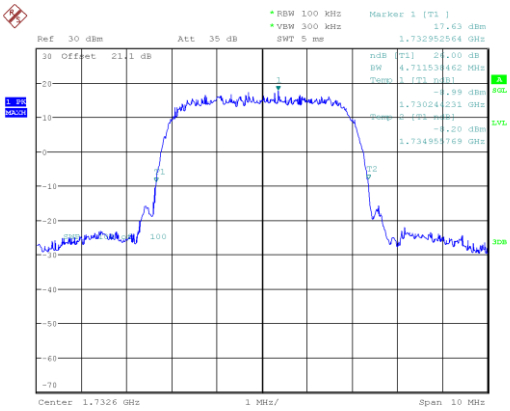
Date: 4.APR.6302 02:57:48

WCDMA Band IV Channel1312



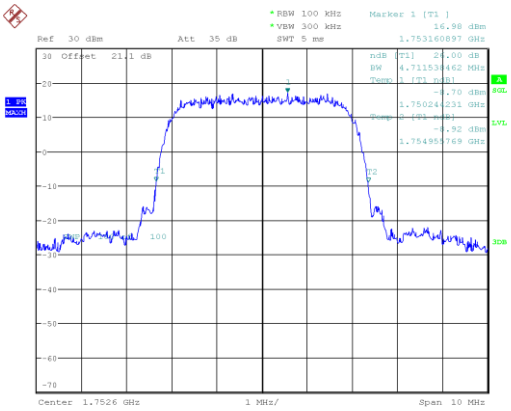
Date: 4.APR.6302 03:00:50

WCDMA Band IV Channel1413



Date: 4.APR.6302 03:02:45

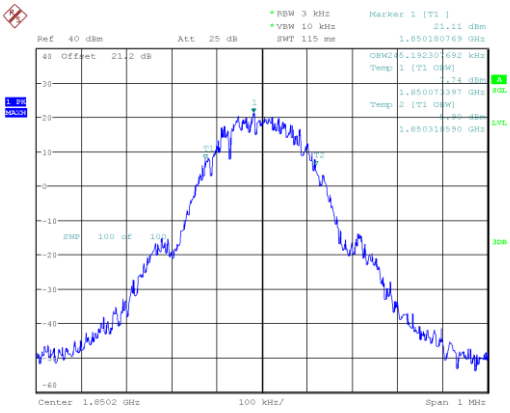
WCDMA Band IV Channel1513



Date: 4.APR.6302 03:04:09

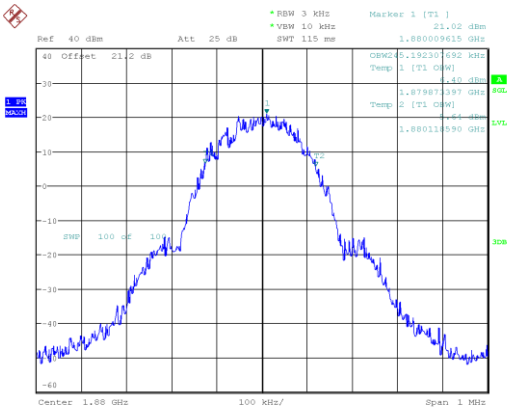
Occupied Bandwidth – Photograph

GSM PCS1900 Channel512 PCL0



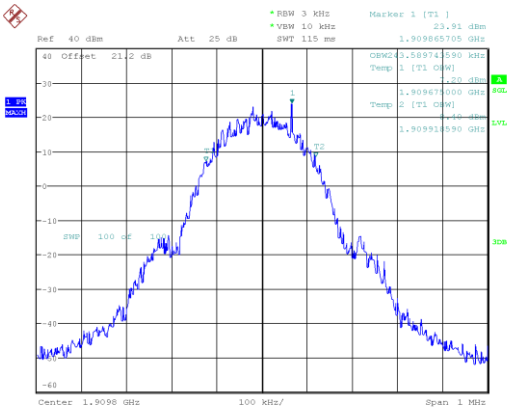
Date: 4.APR.6302 02:32:46

GSM PCS1900 Channel661 PCL0



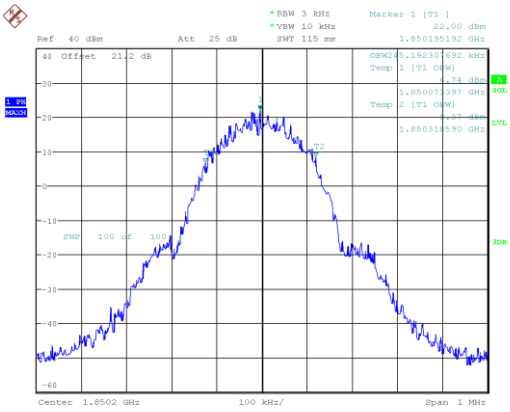
Date: 4.APR.6302 02:34:53

GSM PCS1900 Channel810 PCL0



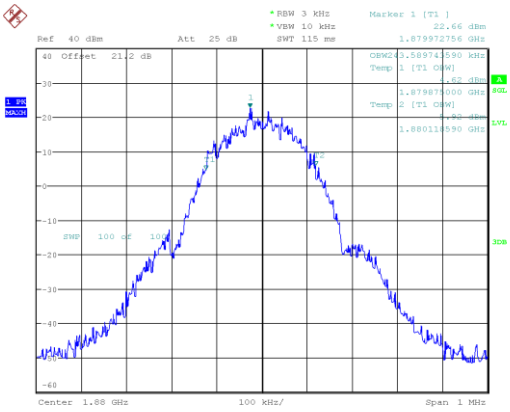
Date: 4.APR.6302 02:36:35

GPRS PCS1900 Channel512 PCL0



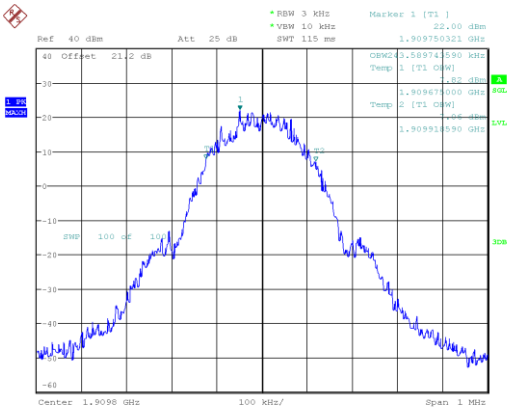
Date: 4.APR.6302 02:39:54

GPRS PCS1900 Channel661 PCL0



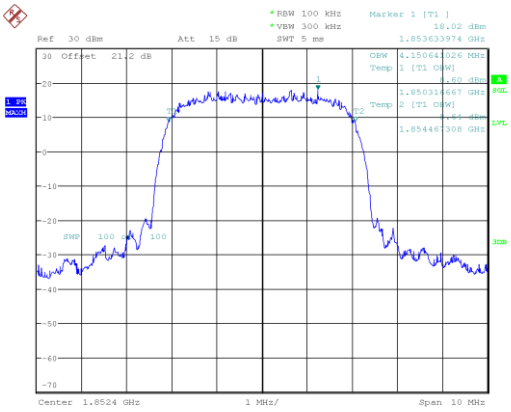
Date: 4.APR.6302 02:41:59

GPRS PCS1900 Channel810 PCL0



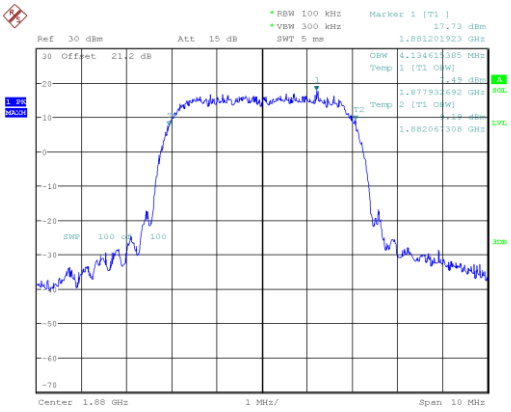
Date: 4.APR.6302 02:43:41

WCDMA Band II Channel9262



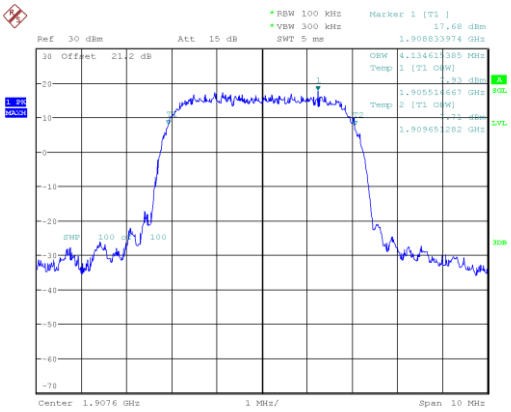
Date: 4.APR.6302 02:54:12

WCDMA Band II Channel9400



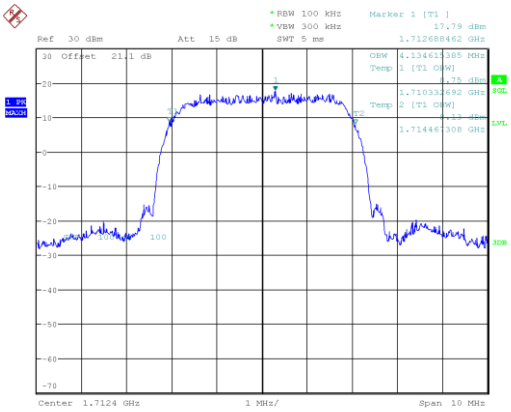
Date: 4.APR.6302 02:56:07

WCDMA Band II Channel9538



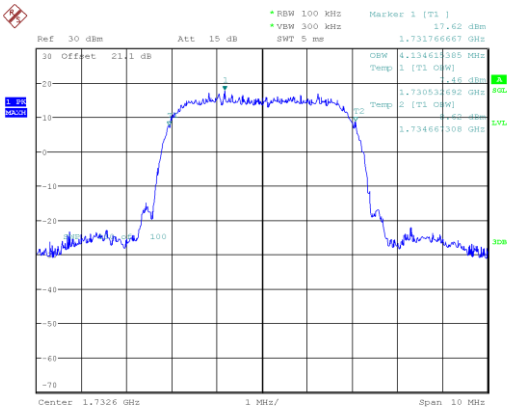
Date: 4.APR.6302 02:57:33

WCDMA Band IV Channel1312



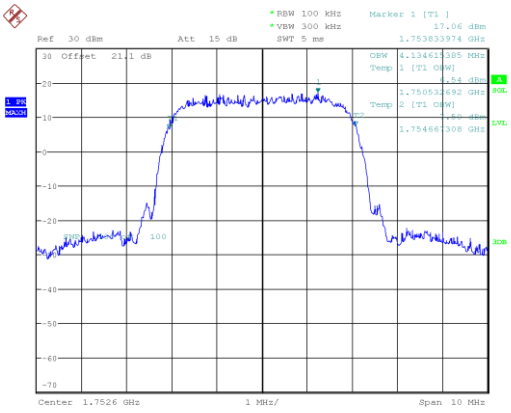
Date: 4.APR.6302 03:00:35

WCDMA Band IV Channel1413



Date: 4.APR.6302 03:02:32

WCDMA Band IV Channel1513



Date: 4.APR.6302 03:03:54

5.4 Conducted Band Edge

5.4.1 Description of Conducted Band Edge Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43 + 10log (P) dB.

5.4.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

5.4.3 Test Procedure

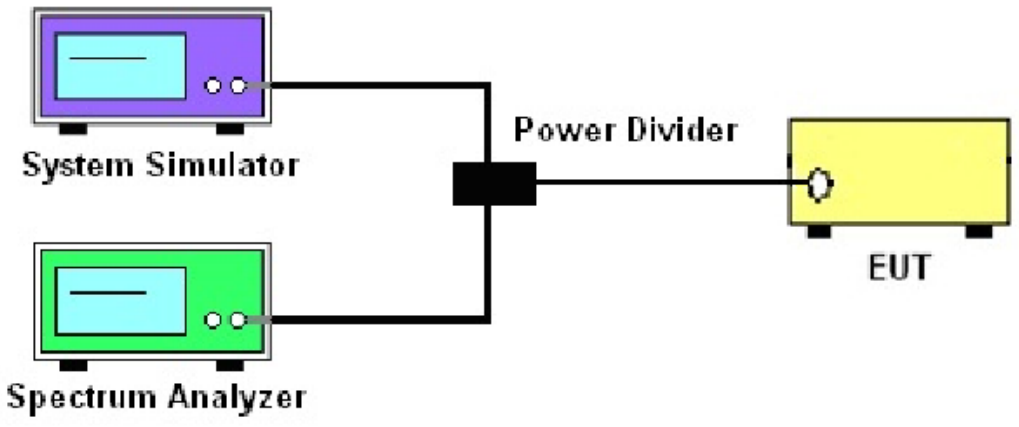
a. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
b. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
c. The band edges of low and high channels for the highest RF powers were measured.
d. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
e. The limit line is derived from 43+ 10log (P) dB below the transmitter power P (Watts).

= P(W)-[43 + 10log(P)](dB)

= [30 + 10log (P)] (dBm)-[43+10log (P)](dB)

= -13dBm.

5.4.4 Test Setup



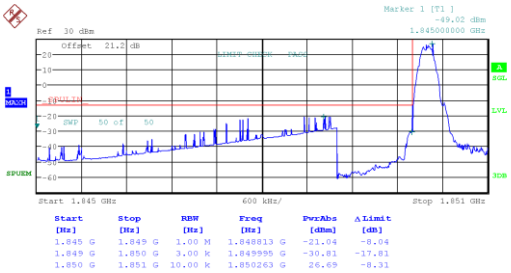
5.4.5 Test Result

Conducted Band Edge – Result

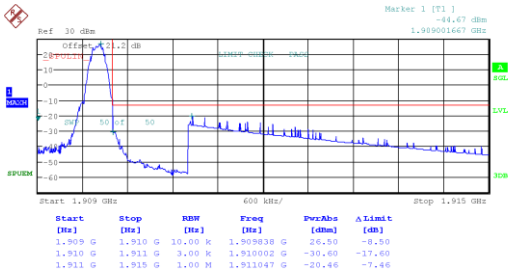
Modes	PCS1900		Band II	
Channel	512	810	9262	9538
Band edge(<-13dBm)	Passed	Passed	Passed	Passed
Modes	Band IV			
Channel	1312	1513		
Band edge(<-13dBm)	Passed	Passed		
Modes	GPRS1900			
Channel	512	810		
Band edge(<-13dBm)	Passed	Passed		

Conducted Band Edge – Photograph

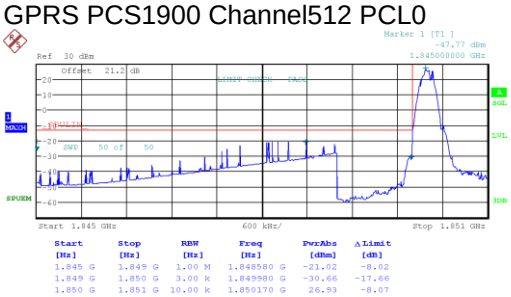
GSM PCS1900 Channel512 PCL0



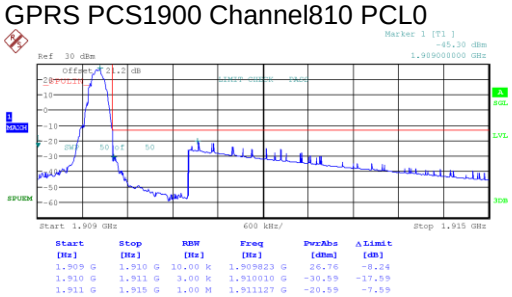
GSM PCS1900 Channel810 PCL0



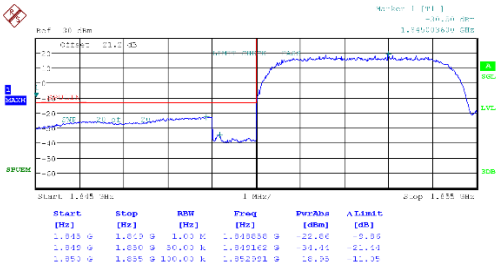
GPRS PCS1900 Channel512 PCL0



GPRS PCS1900 Channel810 PCL0

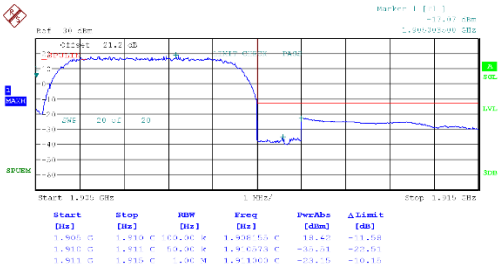


WCDMA Band II Channel9262



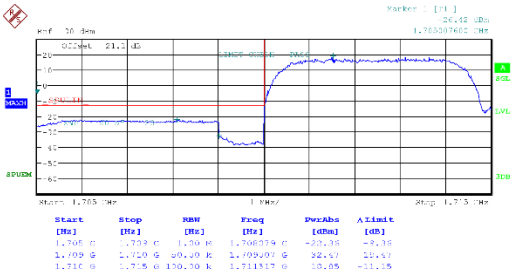
Date: 4.APR.6302 02:54:57

WCDMA Band II Channel9538



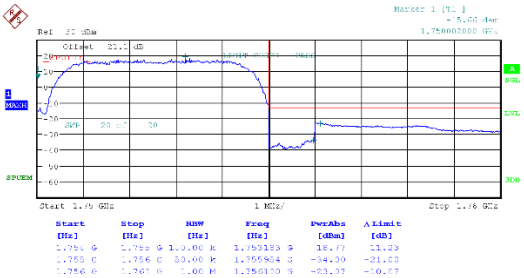
Date: 4.APR.6302 02:58:10

WCDMA Band IV Channel1312



Date: 4.APR.6302 03:01:21

WCDMA Band IV Channel1513



Date: 4.APR.6302 03:04:39

5.5 Conducted Spurious Emissions

5.5.1 Description of Conducted Spurious Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least 43+10log (P) dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10^{th} harmonic.

5.5.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

5.5.3 Test Procedure

a. The EUT was connected to the spectrum analyzer and system simulator via a power divider.

b. The RF output of the EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

c. The middle channel for the highest RF power within the transmitting frequency was measured.

d. The conducted spurious emission for the whole frequency range was taken.

e. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

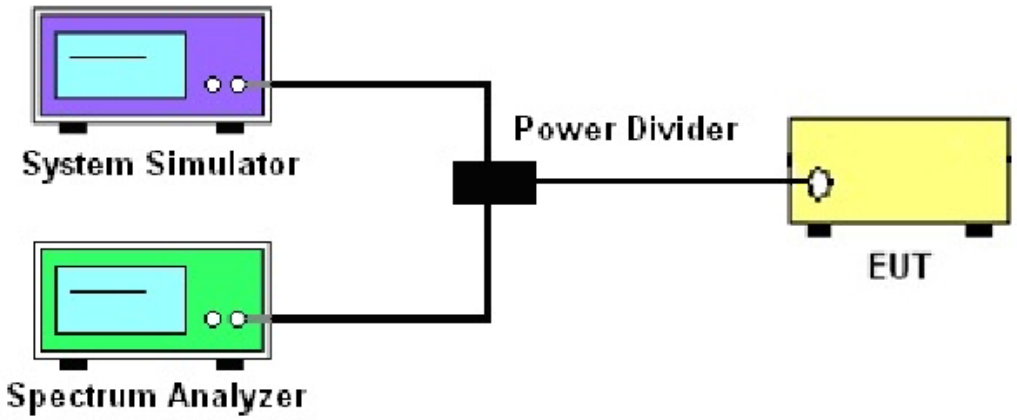
f. The limit line is derived from 43+10log (P) dB below the transmitter power P (Watts).

= P(W)-[43 + 10log(P)](dB)

= [30 + 10log (P)] (dBm)-[43+10log (P)](dB)

= -13dBm.

5.5.4 Test Setup



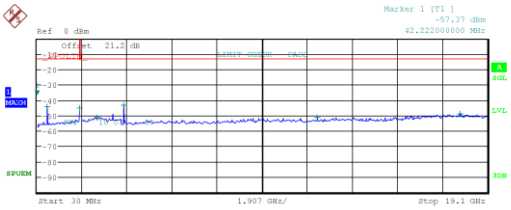
5.5.5 Test Result

Conducted Spurious Emission – Result

Modes	PCS1900			Band II		
Channel	512	661	810	9262	9400	9538
Conducted Spurious emissions(<-13dBm)	Passed	Passed	Passed	Passed	Passed	Passed
Modes	Band IV					
Channel	1312	1413	1513			
Conducted Spurious emissions(<-13dBm)	Passed	Passed	Passed			
Modes	GPRS1900					
Channel	512	661	810			
Conducted Spurious emissions(<-13dBm)	Passed	Passed	Passed			

Conducted Spurious Emission – Photograph

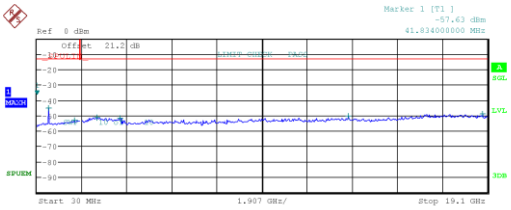
GSM PCS1900 Channel512 PCL0



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	461.068000 M	-44.36	-31.36
1.000 G	1.845 G	1.00 M	1.841789 G	-45.48	-32.48
1.915 G	3.000 G	1.00 M	2.580648 G	-51.30	-38.30
3.000 G	7.000 G	1.00 M	3.700400 G	-43.61	-30.61
7.000 G	13.600 G	1.00 M	11.882020 G	-51.38	-38.38
13.600 G	19.100 G	1.00 M	17.948850 G	-48.86	-35.86

Date: 4.APR.6302 02:34:05

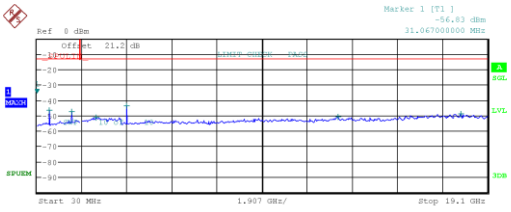
GSM PCS1900 Channel661 PCL0



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	505.979000 M	-45.11	-32.11
1.000 G	1.845 G	1.00 M	1.631553 G	-53.35	-40.35
1.915 G	3.000 G	1.00 M	2.560358 G	-51.38	-38.38
3.000 G	7.000 G	1.00 M	3.540000 G	-51.66	-38.66
7.000 G	13.600 G	1.00 M	13.202020 G	-50.54	-37.54
13.600 G	19.100 G	1.00 M	18.884950 G	-49.13	-36.13

Date: 4.APR.6302 02:35:47

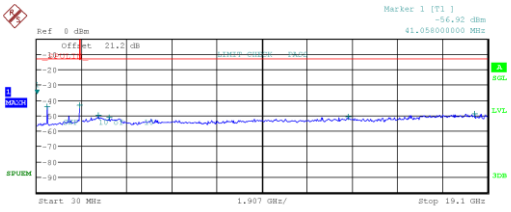
GSM PCS1900 Channel810 PCL0



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	550.599000 M	-46.57	-33.57
1.000 G	1.845 G	1.00 M	1.505395 G	-47.53	-34.53
1.915 G	3.000 G	1.00 M	2.527700 G	-51.19	-38.19
3.000 G	7.000 G	1.00 M	3.819600 G	-43.95	-30.95
7.000 G	13.600 G	1.00 M	12.778960 G	-51.02	-38.02
13.600 G	19.100 G	1.00 M	17.981300 G	-49.12	-36.12

Date: 4.APR.6302 02:37:55

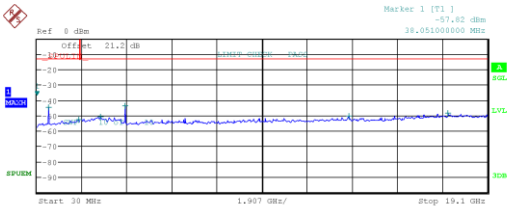
GPRS PCS1900 Channel512 PCL0



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	460.971000 M	-44.54	-31.54
1.000 G	1.845 G	1.00 M	1.842718 G	-43.39	-30.39
1.915 G	3.000 G	1.00 M	2.618731 G	-50.10	-37.10
3.000 G	7.000 G	1.00 M	3.088000 G	-51.38	-38.38
7.000 G	13.600 G	1.00 M	13.215220 G	-51.06	-38.06
13.600 G	19.100 G	1.00 M	18.545600 G	-49.06	-36.06

Date: 4.APR.6302 02:41:12

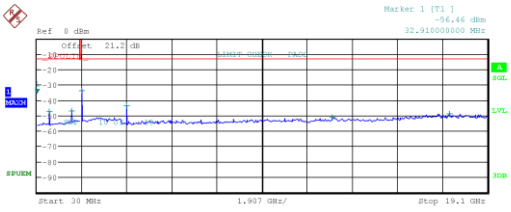
GPRS PCS1900 Channel661 PCL0



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	505.979000 M	-44.88	-31.88
1.000 G	1.845 G	1.00 M	1.810355 G	-52.86	-39.86
1.915 G	3.000 G	1.00 M	2.728533 G	-50.81	-37.81
3.000 G	7.000 G	1.00 M	3.760000 G	-43.90	-30.90
7.000 G	13.600 G	1.00 M	13.231720 G	-50.55	-37.55
13.600 G	19.100 G	1.00 M	17.426350 G	-48.74	-35.74

Date: 4.APR.6302 02:42:54

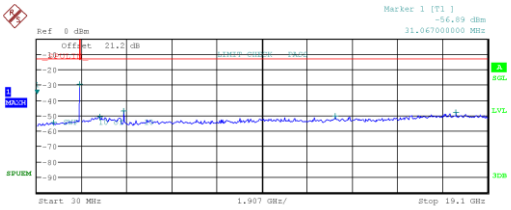
GPRS PCS1900 Channel810 PCL0



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	550.599000 M	-47.46	-34.46
1.000 G	1.845 G	1.00 M	1.505479 G	-47.36	-34.36
1.915 G	3.000 G	1.00 M	1.915109 G	-33.90	-20.90
3.000 G	7.000 G	1.00 M	3.819600 G	-44.12	-31.12
7.000 G	13.600 G	1.00 M	12.526180 G	-51.36	-38.36
13.600 G	19.100 G	1.00 M	17.472550 G	-48.97	-35.97

Date: 4.APR.6302 02:45:01

WCDMA Band II Channel9262



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	741.980000 M	-54.49	-41.49
1.000 G	1.845 G	1.00 M	1.842972 G	-29.92	-16.92
1.915 G	3.000 G	1.00 M	2.698478 G	-50.92	-37.92
3.000 G	7.000 G	1.00 M	3.703200 G	-47.17	-34.17
7.000 G	13.600 G	1.00 M	12.660820 G	-50.38	-37.38
13.600 G	19.100 G	1.00 M	17.769000 G	-48.08	-35.08

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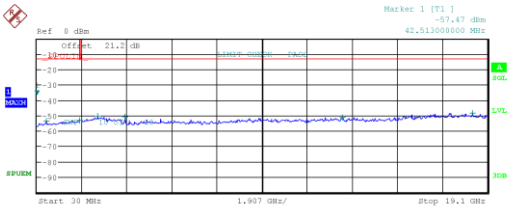
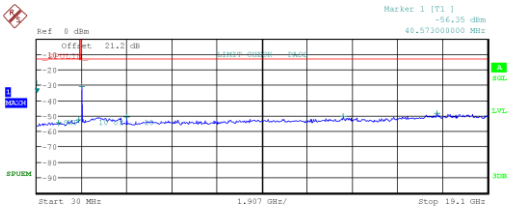
WCDMA Band II Channel9400



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	413.247000 M	-53.93	-40.93
1.000 G	1.845 G	1.00 M	1.840353 G	-53.23	-40.23
1.915 G	3.000 G	1.00 M	2.605277 G	-50.54	-37.54
3.000 G	7.000 G	1.00 M	3.760800 G	-51.03	-38.03
7.000 G	13.600 G	1.00 M	12.968380 G	-51.42	-38.42
13.600 G	19.100 G	1.00 M	18.444400 G	-48.42	-35.42

Date: 4.APR.6302 02:56:54

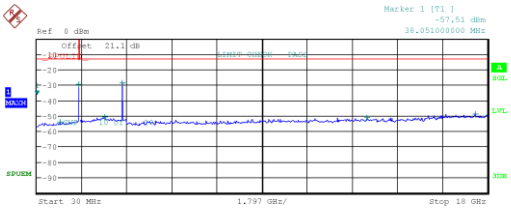
WCDMA Band II Channel9538



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	960.424000 M	-54.76	-41.76
1.000 G	1.845 G	1.00 M	1.811031 G	-52.93	-39.93
1.915 G	3.000 G	1.00 M	1.916085 G	-31.29	-18.29
3.000 G	7.000 G	1.00 M	3.817600 G	-50.93	-37.93
7.000 G	13.600 G	1.00 M	13.000060 G	-50.37	-37.37
13.600 G	19.100 G	1.00 M	16.965450 G	-48.76	-35.76

Date: 4.APR.6302 02:58:52

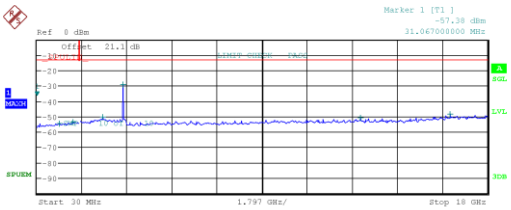
WCDMA Band IV Channel1312



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	956.835000 M	-54.03	-41.03
1.000 G	1.705 G	1.00 M	1.704859 G	-29.75	-16.75
1.760 G	3.000 G	1.00 M	2.723728 G	-51.10	-38.10
3.000 G	7.000 G	1.00 M	3.426400 G	-28.72	-15.72
7.000 G	13.600 G	1.00 M	13.199380 G	-51.29	-38.29
13.600 G	18.000 G	1.00 M	17.505000 G	-49.13	-36.13

Date: 4.APR.6302 03:01:54

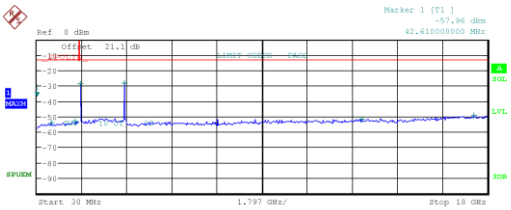
WCDMA Band IV Channel1413



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	918.326000 M	-54.79	-41.79
1.000 G	1.705 G	1.00 M	1.458039 G	-53.89	-40.89
1.760 G	3.000 G	1.00 M	2.643624 G	-50.59	-37.59
3.000 G	7.000 G	1.00 M	3.462800 G	-29.34	-16.34
7.000 G	13.600 G	1.00 M	12.940000 G	-51.05	-38.05
13.600 G	18.000 G	1.00 M	16.491240 G	-48.56	-35.56

Date: 4.APR.6302 03:03:17

WCDMA Band IV Channel1513



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
30.000 M	1.000 G	1.00 M	615.298000 M	-54.36	-41.36
1.000 G	1.705 G	1.00 M	1.548913 G	-53.41	-40.41
1.760 G	3.000 G	1.00 M	1.762356 G	-28.75	-15.75
3.000 G	7.000 G	1.00 M	3.506800 G	-28.32	-15.32
7.000 G	13.600 G	1.00 M	12.980260 G	-51.70	-38.70
13.600 G	18.000 G	1.00 M	17.457480 G	-49.63	-36.63

Date: 4.APR.6302 03:05:13

5.6 Frequency Stability

5.6.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within ±0.00025%(±2.5ppm) of the center frequency.

5.6.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

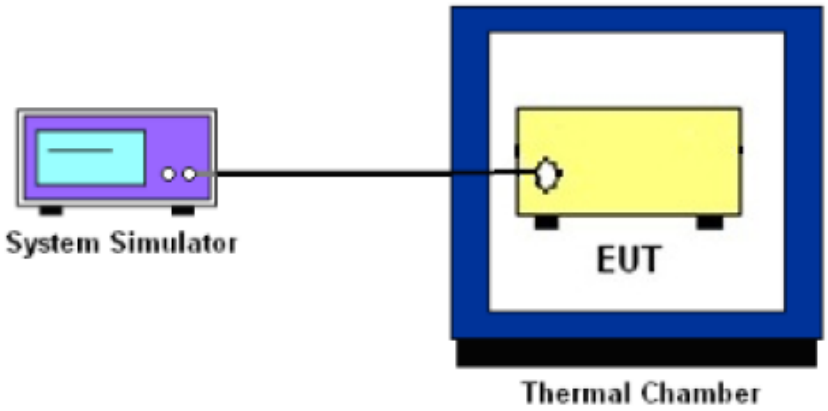
5.6.3 Test Procedure for Temperature Variation

a. The EUT was set up in the thermal chamber and connected with the system simulator.
b. With power OFF, the temperature was decreased to -20℃ and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
c. With power OFF, the temperature was raised in 10℃ steps up to 60℃. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

5.6.4 Test Procedure for Voltage Variation

a. The EUT was placed in a temperature chamber at 25±5℃ and connected with the system simulator.
b. The power supply voltage to the EUT was varied from 3.42V to 4.18V measured at the input to the EUT.
c. The variation in frequency was measured for the worst case.

5.6.5 Test Setup



5.6.6 Test Result

Test Result of Temperature Variation

Band:	PCS1900		Channel:	661
Limit(ppm)	2.5		Frequency:	1880.0MHZ
Temperature (℃)	GSM Deviation (ppm)	GPRS Deviation (ppm)	Result	
-20	+0.01	+0.01	Pass	
-10	+0.01	+0.01		
0	+0.01	+0.01		
10	+0.01	+0.02		
20(Ref.)	+0.01	+0.02		
30	+0.01	+0.02		
40	+0.01	+0.02		
50	+0.01	+0.02		
60	+0.01	+0.02		

Band:	WCDMA BAND2	Channel:	9400
Limit(ppm)	2.5	Frequency:	1880MHZ
Temperature(℃)	Deviation(ppm)		Result
-20	0.00		Pass
-10	0.00		Pass
0	0.00		Pass
10	0.00		Pass
20(Ref.)	0.00		Pass
30	0.00		Pass
40	0.00		Pass
50	0.00		Pass
60	0.00		Pass

Band:	WCDMA BAND4	Channel:	1413
Limit(ppm)	2.5	Frequency:	1732.6MHZ
Temperature(℃)	Deviation(ppm)		Result
-20	0.00		Pass
-10	0.00		Pass
0	0.00		Pass
10	0.00		Pass
20(Ref.)	0.00		Pass
30	0.00		Pass
40	0.00		Pass
50	0.00		Pass
60	0.00		Pass

Test Result of Voltage Variation

Band Channel	Mode	Voltage	Deviation(ppm)	Limit(ppm)	Result
PCS 1900 CH661	GSM	LV	+0.01	2.5	Pass
		NV	+0.01	2.5	Pass
		HV	+0.01	2.5	Pass
	GPRS	LV	+0.02	2.5	Pass
		NV	+0.01	2.5	Pass
		HV	+0.02	2.5	Pass
WCDMA BAND2 CH9400	RMC 12.2Kbps	LV	+0.00	2.5	Pass
		NV	+0.00	2.5	Pass
		HV	+0.00	2.5	Pass
WCDMA BAND4 CH1413	RMC 12.2Kbps	LV	+0.00	2.5	Pass
		NV	+0.00	2.5	Pass
		HV	+0.00	2.5	Pass

5.7 Effective radiated power and effective isotropic radiated power measurement

5.7.1 Description of the ERP/EIRP Measurement

The ERP of mobile transmitters must not exceed 7 Watts (Cellular Band) and the EIRP of mobile transmitters are limited to 2 Watts (PCS Band) and 1 Watts (AWS Band).

5.7.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

5.7.3 Test Procedure

Effective Isotropic Radiated Power (EIPR) was calculated with the correction factor, EIPR=Conducted Output Power + Substitution antenna gain. ERP=EIRP-2.15.

5.7.4 Test Result

EIPR / ERP Result

Modes	PCS1900		
Channel	512	661	810
Frequency(MHz)	1850.2	1880.0	1909.8
Antenna Gain(dBi)	-0.68	-0.68	-0.68
EIRP(dBm)	29.3	29.36	29.35
Limit	<= 2W(33dBm)		
Result	Passed		

Modes	Band II		
Channel	9262	9400	9538
Frequency(MHz)	1852.4	1880.0	1907.6
Antenna Gain(dBi)	-0.68	-0.68	-0.68
EIRP(dBm)	22.53	22.46	22.66
Limit	<= 2W(33dBm)		
Result	Passed		

Modes	Band IV		
Channel	1312	1413	1513
Frequency(MHz)	1712.4	1732.6	1752.6
Antenna Gain(dBi)	-0.13	-0.13	-0.13
EIRP(dBm)	23.1	22.75	22.99
Limit	<= 1W(30dBm)		
Result	Passed		

Modes	GPRS1900		
Channel	512	661	810
Frequency(MHz)	1850.2	1880.0	1909.8
Antenna Gain(dBi)	-0.68	-0.68	-0.68
EIRP(dBm)	28.95	29.11	29.37
Limit	<= 2W(33dBm)		
Result	Passed		

5.8 Filed Strength of Spurious Radiation

5.8.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

5.8.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

5.8.3 Test Procedures

a. The EUT was placed on a rotatable wooden table 0.8 meters above the ground.
b. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest spurious emission.
d. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
e. Make the measurement with the spectrum analyzer RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
f. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
g. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
h. Taking the record of output power at antenna port.
i. Repeat step 7 to step 8 for another polarization.
j. EIRP (dBm) = S.G. Power – Tx Cable Loss + Tx Antenna Gain
k. ERP (dBm) =EIRP-2.15
l. The limit line is derived from 43 + 10log(P) dB below the transmitter power P(Watts)

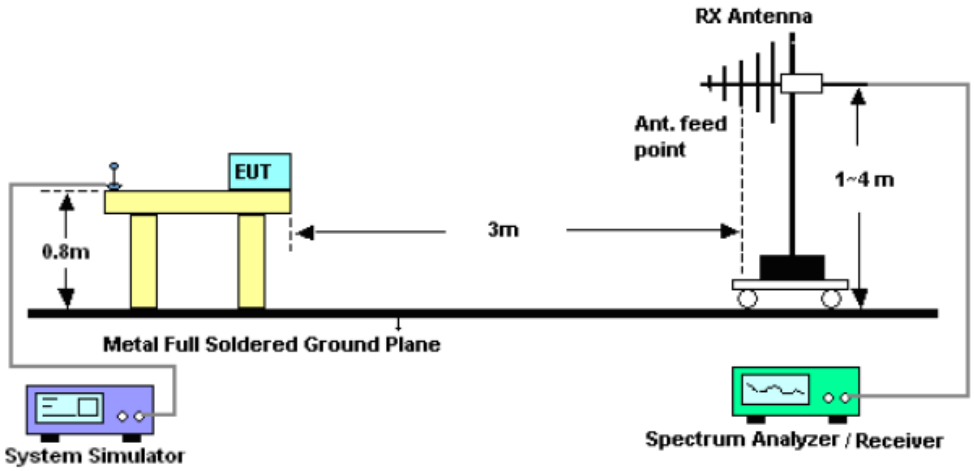
=P(W) – [43 + 10log(P)](dB)

=[30 + 10log(P)](dBm) – [43 + 10log(P)](dB)

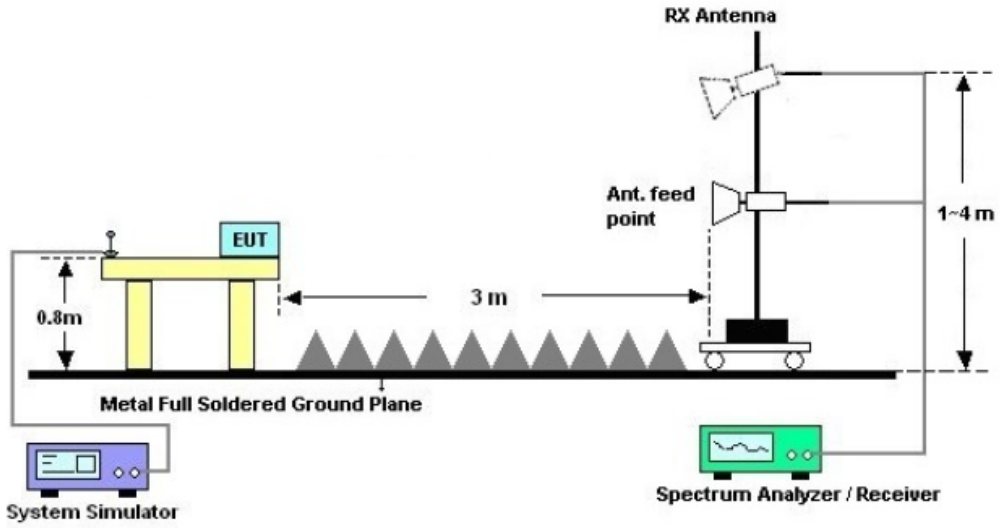
=-13dBm.

5.8.4 Test Setup

For radiated emissions from 30MHz to 1GHz



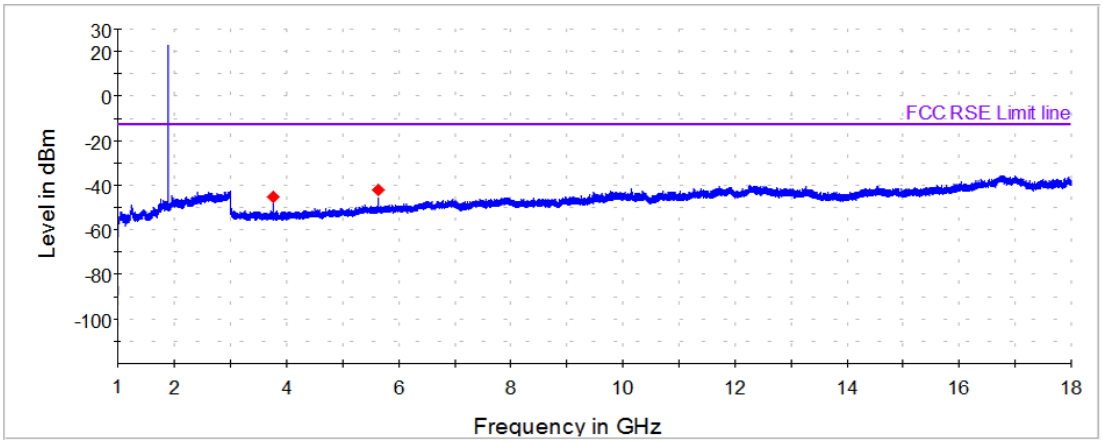
For radiated emissions above 1GHz



5.8.5 Test Result

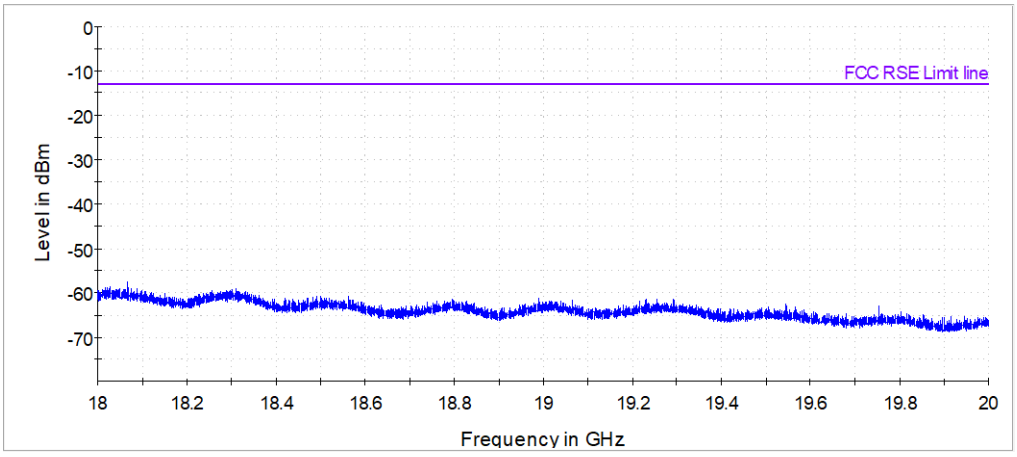
Spurious emissions below 1GHz were found more than 20dB below limit line

PCS1900 (position1)



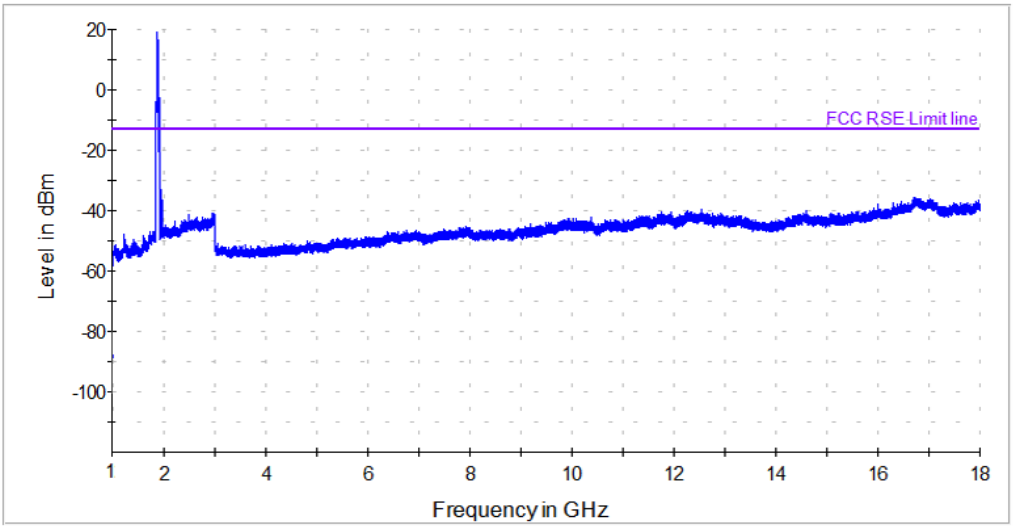
Frequency	MaxPeak	Limit	Margin	SG	Cable loss	Gain	Read	Height	Pol	Azimuth
MHz	dBm	dBm	dB	dBm				cm		deg
3759.924333	-45.04	-13.00	32.04	-49.0	2.49	6.45	46.56	152.8	V	26.0
5639.765000	-42.25	-13.00	29.25	-45.7	4.50	7.95	43.35	141.7	V	247.0

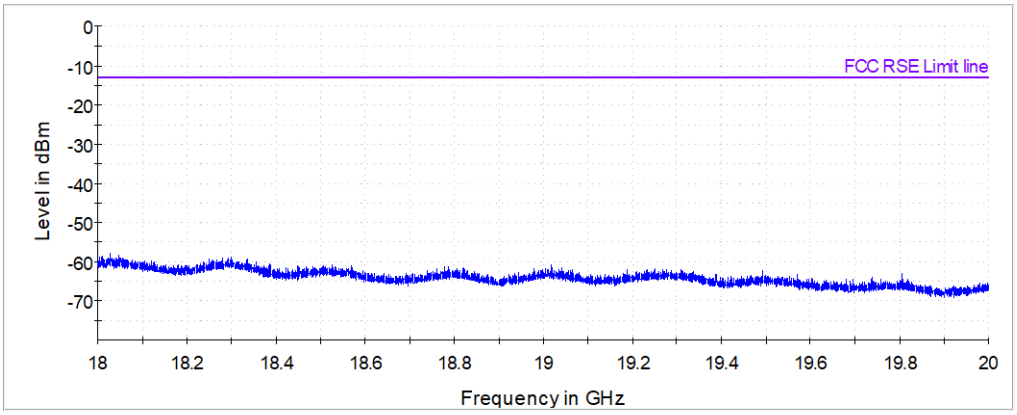
EIRP=SG Power - cable loss + Tx ant gain
ERP=EIRP-2.15



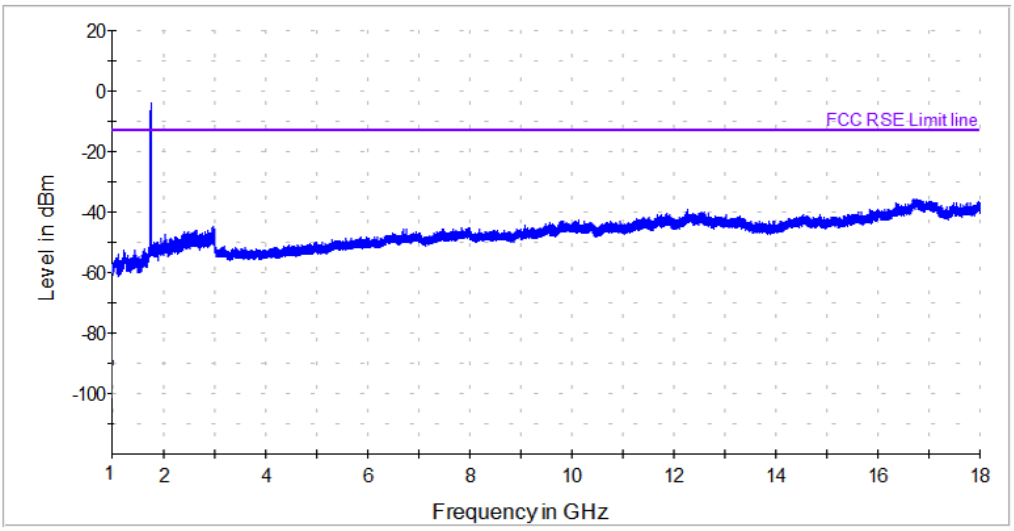
Spurious emissions below 1GHz were found more than 20dB below limit line

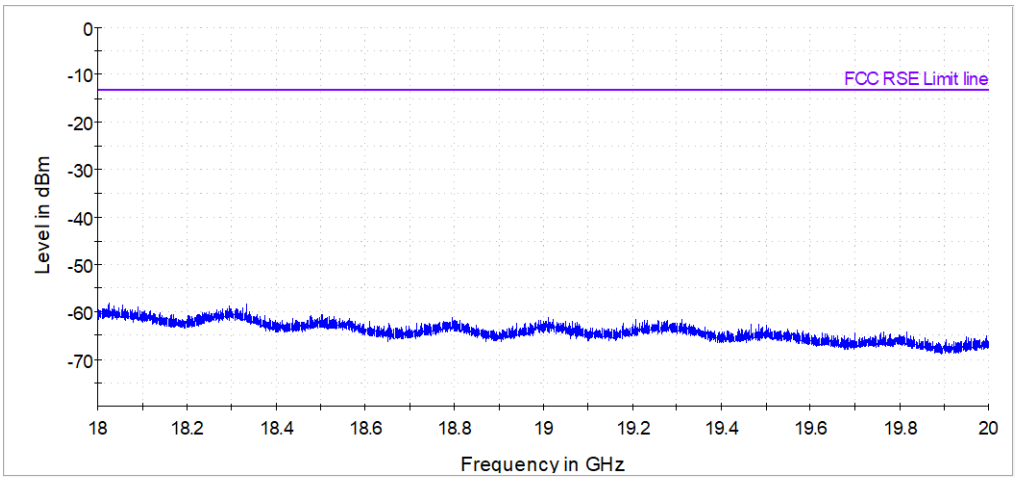
WCDMA Band 2 （ position 1 ）





WCDMA Band4 (positon1)





6 APPENDIX A. TEST SETUP AND SAMPLE PHOTOGRAPHS

Reference attachment : Sample Pictures.

7 APPENDIX B. INFORMATION ON THE TESTING LABORATORIES

We, BYD Precise Manufacture Co., Ltd., were founded in 2007 to provide our best service in RF, Radio consultation. Our laboratories are accredited by the following accreditation bodies according to ISO/IEC 17025 (2005) .

USA	A2LA Certificate No.: 4886.01

Copies of accreditation certificates could be inquired from our office. If you have any comments, please feel free to contact us at the following:

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