TECHNICAL REPORT

ISO/IEC17025Accredited Lab.

Report No:	FCC 1405171-03
File reference No:	2014-04-12
Applicant:	Maysun Info Technology Co., Limited
Product:	Smartphone
Model No:	MID5502F, MID5502, MID5502D, MID5502E, Max5.5, CALYPSO- SY-SP55Q81, KUDU- SY-SP45Q41, WOXTER ZIELO S50
Trademark:	SYTECH® Nakamichi®
Test Standards:	FCC Part 22H&24E requirements.
Test result:	It is herewith confirmed and found to comply with the requirements set up by FCC Part 22H&24E regulations for the evaluation of electromagnetic compatibility

Approved By

Jack Chung

Jack Chung

Manager

Dated: April 12, 2014

Results appearing herein relate only to the sample tested

The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

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Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAL. This approval result is accepted by MRA of APLAC.

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

CNAL-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC- Registration No.: IC5205A-02

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-02.

1.0 General Details

1.1 Test Lab Details

Name : SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO LTD

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District, Shenzhen,CHINA.

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Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-02

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: Maysun Info Technology Co., Limited

Address: 10th floor, B10 Building, Lilang Industrial Zone, Buji Town, Longgang District, Shenzhen, China

Telephone: --

Fax: --

1.3 Description of EUT

Product: Smartphone

Manufacturer: Maysun Info Technology Co., Limited

Address: 10th floor, B10 Building, Lilang Industrial Zone, Buji Town, Longgang District, Shenzhen, China

Brand Name:

Additional Brand Name: SYTECH® Nakamichi®

Model Number: MID5502F

Additional Model Number: MID5502, MID5502D, MID5502E, Max5.5, CALYPSO- SY-SP55Q81, KUDU- SY-SP45Q41, WOXTER ZIELO S50

Frequency Bands:

☒GSM 850 ☒PCS 1900 (U.S. Bands)

☒GSM 900 ☒DCS 1800 (Non-U.S. Bands)

U.S. Bands:

☐UMTS FDD Band II ☐UMTS FDD Band V

Non-U.S. Bands:

☒UMTS FDD Band I ☒UMTS FDD Band VIII

Antenna: Integral Antenna

Antenna gain(GSM): 1.0dBi(GSM)

Power Supply: DC 3.8V by Battery
Adapter Power: Input: AC100-240V, 50-60Hz, 0.25A; Output: DC5.0V, 1000mA
Dual Card: Card 1: WCDMA / GSM Card Slot, Card 2: GSM Card Slot
GPRS Class 12
Extreme Vol. Limits: DC3.6V to 4.35 V (Normal: DC3.8 V)
Extreme Temp. Tolerance -10℃ to +50℃
Note: The High Voltage DC4.35V and Low Voltage DC3.6V were declared by manufacturer, The EUT couldn't be operating normally with higher or lower voltage.
Other functions have been performed according to verification procedure except for Bluetooth, WiFi and MS function. Card 1 can't transmit with Card 2 simultaneously.

1.4 Submitted Sample: 2 Samples

1.5 Test Duration
2014-04-03 to 2014-04-11

1.6 Test Uncertainty
Conducted Emissions Uncertainty =3.6dB
Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer Terry Tang

The sample tested by _____

Print Name: Terry Tang

Models difference

Rating：3.8V by Battery		
No.	**Model No.**	**Trade Name**
1	MID5502F	
2	MID5502	
3	MID5502D	
4	MID5502E	
5	Max5.5	
6	CALYPSO- SY-SP55Q81	SYTECH®
7	KUDU- SY-SP45Q41	
8	WOXTER ZIELO S50	Nakamichi

Note: All models are identical in circuitry and electrical, mechanical and physical construction, only different on model name, trade name, color and silk-screen.
All tests carried out on MID5502F.

2.0	Test Equipments				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2013-08-23	2014-08-22
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2013-08-23	2014-08-22
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2013-08-23	2014-08-22
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2013-08-25	2014-08-24
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2013-08-23	2014-08-22
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2013-08-24	2014-08-23
System Controller	CT	SC100	-	--	--
Printer	EPSON	PHOTO EX3	CFNH234850	--	--
Computer	IBM	8434	1S8434KCE99BLXLO*	-	-
Loop Antenna	EMCO	6502	00042960	2013-08-23	2014-08-22
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2013-08-23	2014-08-22
3m OATS	--	--	N/A	2013-08-22	2014-08-21
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2013-08-24	2014-08-23
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2013-08-24	2014-08-23
Power meter	Anritsu	ML2487A	6K00003613	2013-08-24	2014-08-23
Power sensor	Anritsu	MA2491A	32263	2013-08-24	2014-08-23
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2013-08-24	2014-08-23
LISN	AFJ	LS16C	10010947251	2013-08-23	2014-08-22
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2013-08-23	2014-08-22
9*6*6 Anechoic	--	--	N/A	2013-08-22	2014-08-21
EMI Test Receiver	RS	ESCS30	100139	2013-08-23	2014-08-22
Universal Radio Communication Tester	RS	CMU200	1100.0008.02	2013-11-28	2014-11-27
Spectrum Analyzer	Agilent	E4440A	US44300286	2014-03-23	2015-03-22

2.1 AUXILIARY EQUIPMENT

Name	Model No.	Serial No.	Manufacturer	Cable	FCC ID/DOC
TF Card	--	--	Kingston	--	--
Passive Earphone	--	--	--	--	--

2.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AB8PMID5502F**, filing to comply with the FCC Part 22H&24E requirements.

2.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of ANSI C 63.4: 2003; TIA/EIA 603 and FCC CFR 47 Rules of 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057.

2.4 TEST FACILITY

The test site used to collect the radiated data is located at:

2.5 SPECIAL ACCESSORIES

The battery and the charger, earphone supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

2.6 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. SYSTEM TEST CONFIGURATION

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

3.3 GENERAL TECHNICAL REQUIREMENTS

Item Number	Item Description		FCC Rules
1	Output Power	Conducted output power	2.1046/22.913(a) (2) / 24.232 (c)
		Radiated output power	
2	Peak-to-Average Ratio	Peak-to-Average Ratio	24.232(d)
3	Spurious Emission	Conducted spurious emission	2.1051 / 22.917 / 24.238
		Radiated spurious emission	
4	Mains Conducted Emission		15.107 / 15.207
5	Frequency Stability		2.1055/22.355 /24.235
6	Occupied Bandwidth		2.1049 (h)(i)
7	Emission Bandwidth		22.917(a)/24.238(a)
8	Band Edge		22.917(a)/24.238(a)

3.4 CONFIGURATION OF EUT SYSTEM

Fig. 2-1 Configuration of EUT System

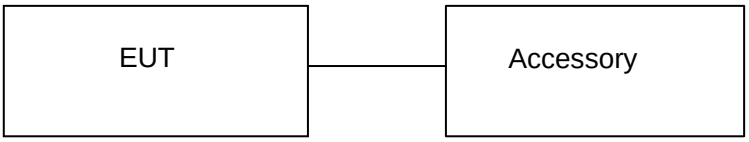


Table 2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile Phone	MID5502F	FCC ID: 2AB8PMID5502F	EUT
2	Adapter	PS05I050K1000EU	DC5.0V / 1000mA	Accessory
3	Battery	inco Colossus III	DC3.8V/ 2500 mAh	Accessory
4	Earphone	MID5502F	N/A	Accessory
5	USB Cable	MID5502F	N/A	Accessory

****Note: All the accessories have been used during the test. The following "EUT" in setup diagram means EUT system.*

4. SUMMARY OF TEST RESULTS

Item Number	Item Description		FCC Rules	Result
1	Output Power	Conducted Output Power	2.1046/22.913(a) (2) / 24.232 (c)	Pass
		Radiated Output Power		
2	Peak-to-Average Ratio	Peak-to-Average Ratio	24.232(d)	Pass
3	Spurious Emission	Conducted Spurious Emission	2.1051 / 22.917 / 24.238	Pass
		Radiated Spurious Emission		
4	Mains Conducted Emission		15.107 / 15.207	Pass
5	Frequency Stability		2.1055/22.355/24.235	Pass
6	Occupied Bandwidth		2.1049 (h)(i)	Pass
7	Emission Bandwidth		22.917(a)/24.238(a)	Pass
8	Band Edge		22.917(a)/24.238(a)	Pass

5. DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMU 200) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both GSM and PCS frequency band.

*****Note:** GSM/GPRS850, GSM/GPRS1900 mode for each SIM Card have been tested during the test

The worst condition was recorded in the test report if no other modes test data.

6. OUTPUT POWER

6.1 Conducted Output Power

6.1.1 MEASUREMENT METHOD

The EUT was setup for the max output power with pseudo random data modulation. Power was measured with Spectrum Analyzer. The measurements were performed on all modes (GSM/ GPRS850, GSM/GPRS1900) at 3 typical channels (the Top Channel, the Middle Channel and the Bottom Channel) for each band.

6.1.2 MEASUREMENT RESULT

Conducted Output Power Limits for GSM850 band		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
GSM	33 dBm (2W)	±1
Conducted Output Power Limits for PCS1900 band		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
GSM	30 dBm (1W)	±1

GSM 850:

SIM 1

Mode	Frequency (MHz)	Reference Power	Peak Power	Tolerance	Avg.Burst Power	Duty cycle Factor(dB)	Frame Power(dBm)
GSM850	824.2	33	33.46	0.46	33.23	-9	24.23
	836.6	33	33.33	0.33	**33.27**	-9	24.27
	848.8	33	33.39	0.39	33.18	-9	24.18
GPRS850 (1 Slot)	824.2	33	**33.49**	0.49	33.21	-9	24.21
	836.6	33	33.49	0.49	33.26	-9	24.26
	848.8	33	33.34	0.34	33.16	-9	24.16
GPRS850 (2 Slot)	824.2	30	32.36	2.36	32.29	-6	26.29
	836.6	30	32.49	2.49	32.25	-6	26.25
	848.8	30	32.28	2.28	32.28	-6	26.28
GPRS850 (3 Slot)	824.2	28.23	30.67	2.44	30.40	-4.26	26.14
	836.6	28.23	30.45	2.22	30.43	-4.26	26.17
	848.8	28.23	30.50	2.27	30.36	-4.26	26.10
GPRS850 (4 Slot)	824.2	27	29.76	2.76	29.54	-3	26.54
	836.6	27	29.64	2.64	29.58	-3	26.58
	848.8	27	29.70	2.70	29.55	-3	26.55

SIM 2

Mode	Frequency (MHz)	Reference Power	Peak Power	Tolerance	Avg.Burst Power	Duty cycle Factor(dB)	Frame Power(dBm)
GSM850	824.2	33	33.52	0.52	33.44	-9	24.44
	836.6	33	33.75	0.75	**33.49**	-9	24.49
	848.8	33	33.68	0.68	33.36	-9	24.36
GPRS850 (1 Slot)	824.2	33	33.46	0.46	33.45	-9	24.45
	836.6	33	**33.78**	0.78	33.48	-9	24.48
	848.8	33	33.65	0.65	33.39	-9	24.39
GPRS850 (2 Slot)	824.2	30	33.54	3.54	33.42	-6	27.42
	836.6	30	32.56	2.56	32.49	-6	26.49
	848.8	30	32.40	2.40	32.40	-6	26.40
GPRS850 (3 Slot)	824.2	28.23	30.86	2.63	30.68	-4.26	26.42
	836.6	28.23	30.83	2.60	30.73	-4.26	26.47
	848.8	28.23	30.80	2.57	30.58	-4.26	26.32
GPRS850 (4 Slot)	824.2	27	29.84	2.84	29.75	-3	26.75
	836.6	27	30.06	3.06	29.82	-3	26.82
	848.8	27	29.99	2.99	29.71	-3	26.71

PCS 1900:

SIM 1

Mode	Frequency (MHz)	Reference Power	Peak Power	Tolerance	Avg.Burst Power	Duty cycle Factor(dB)	Frame Power(dBm)
GSM1900	1850.2	30	30.17	0.17	30.03	-9	21.03
	1880	30	30.39	0.39	30.22	-9	21.22
	1909.8	30	30.34	0.34	30.07	-9	21.07
GPRS1900 (1 Slot)	1850.2	30	30.18	0.18	30.12	-9	21.12
	1880	30	**30.43**	0.43	**30.24**	-9	21.24
	1909.8	30	30.14	0.14	30.05	-9	21.05
GPRS1900 (2 Slot)	1850.2	27	29.01	2.01	29.00	-6	23.00
	1880	27	29.45	2.45	29.20	-6	23.20
	1909.8	27	29.24	2.24	29.10	-6	23.10
GPRS1900 (3 Slot)	1850.2	25.23	27.44	2.21	27.17	-4.26	22.91
	1880	25.23	27.43	2.20	27.42	-4.26	23.16
	1909.8	25.23	27.52	2.29	27.29	-4.26	23.03
GPRS1900 (4 Slot)	1850.2	24	26.61	4.61	26.31	-3	25.31
	1880	24	26.80	2.80	26.59	-3	23.59
	1909.8	24	26.63	2.63	26.48	-3	23.48

SIM 2

Mode	Frequency (MHz)	Reference Power	Peak Power	Tolerance	Avg.Burst Power	Duty cycle Factor(dB)	Frame Power(dBm)
GSM1900	1850.2	30	30.14	0.14	29.84	-9	20.84
	1880	30	30.23	0.23	**30.03**	-9	21.03
	1909.8	30	30.16	0.16	29.93	-9	20.93
GPRS1900 (1 Slot)	1850.2	30	29.89	-0.11	29.86	-9	20.86
	1880	30	**30.27**	0.27	30.02	-9	21.02
	1909.8	30	30.12	0.12	29.96	-9	20.96
GPRS1900 (2 Slot)	1850.2	27	28.89	1.89	28.81	-6	22.81
	1880	27	29.27	2.27	29.05	-6	23.05
	1909.8	27	29.27	2.27	28.99	-6	22.99
GPRS1900 (3 Slot)	1850.2	25.23	27.25	2.02	27.04	-4.26	22.78
	1880	25.23	27.40	2.17	27.26	-4.26	23.00
	1909.8	25.23	27.36	2.13	27.22	-4.26	22.96
GPRS1900 (4 Slot)	1850.2	24	26.33	2.33	26.09	-3	23.09
	1880	24	26.44	2.44	26.39	-3	23.39
	1909.8	24	26.62	2.62	26.38	-3	23.38

6.2 RADIATED OUTPUT POWER

6.2.1 MEASUREMENT METHOD

The measurements procedures specified in TIA-603C-2004 were applied.

1 In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.

2 The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as ARpl=Pin + 2.15 - Pr. The ARpl is the attenuation of “reference path loss”, and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

3 The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

4 From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

5 The EUT is then put into continuously transmitting mode at its maximum power level.

6 Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.

7 This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

8 ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi..

6.2.2 PROVISIONS APPLICABLE

This is the test for the maximum radiated power from the EUT. Rule Part 24.232(b) specifies, “Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power” and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.” Rule Part 22.913(a) specifies “Maximum ERP. The effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 500 Watts. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.”

Mode	Nominal Peak Power
GSM 850	<=38.45 dBm (7W)
PCS 1900	<=33 dBm (2W)

6.2.3 MEASUREMENT RESULT

Radiated Power (ERP) for GSM 850 MHZ				
Mode	Frequency	Result		Conclusion
		Max. Peak ERP (dBm)	Polarization Of Max. ERP	
GSM850	824.2	30.88	Horizontal	Pass
	836.6	30.13	Horizontal	Pass
	848.8	30.41	Horizontal	Pass

Radiated Power (E.I.R.P) for PCS 1900 MHZ				
Mode	Frequency	Result		Conclusion
		Max. Peak E.I.R.P.(dBm)	Polarization Of Max. E.I.R.P.	
GSM 1900	1850.2	29.16	Horizontal	Pass
	1880.0	28.68	Horizontal	Pass
	1909.8	28.49	Horizontal	Pass

Note: 1. Above is worst mode data.

2.Both of Vertical and Horizontal direction are evaluated, and only the worst results are shown in this report

6.3. Peak-to-Average Ratio

6.3.1 MEASUREMENT METHOD

The following steps outline the procedure used to measure the Peak-to-Average Ratio from the EUT.

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. For GSM/EGPRS operating modes:

a. Set the RBW = 1MHz, VBW = 1MHz, Peak detector in spectrum analyzer.

b. Set EUT in maximum power output, and triggered the burst signal.

c. Measured respectively the Peak level and Mean level, and the deviation was recorded as Peak to Average Ratio.

6.3.2 PROVISIONS APPLICABLE

This is the test for the Peak-to-Average Ratio from the EUT.

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. 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.

6.3.3 MEASUREMENT RESULT

Modes	GSM850(GSM)		
Channel	128	190	251
	(Low)	(Mid)	(High)
Frequency (MHz)	824.2	836.6	848.8
Peak-To-Average Ratio (dB)	0.18	0.33	0.04

Modes	PCS 1900 (GSM)		
Channel	512	661	810
	(Low)	(Mid)	(High)
Frequency (MHz)	1850.2	1880	1909.8
Peak-To-Average Ratio (dB)	0.64	0.59	0.79

7. SPURIOUS EMISSION

7.1 CONDUCTED SPURIOUS EMISSION

7.1.1 MEASUREMENT METHOD

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1, Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 9 GHz.

2, Determine EUT transmit frequencies: the following typical channels were chosen to conducted emissions testing.

Typical Channels for testing of GSM 850 MHz	
Channel	Frequency (MHz)
128	824.2
190	836.6
251	848.8

Typical Channels for testing of PCS 1900 MHz	
Channel	Frequency (MHz)
512	1850.2
661	1880.0
810	1909.8

7.1.2 PROVISIONS APPLICABLE

On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

7.1.3 MEASUREMENT RESULT

Please refer to Appendix A for compliance test plots for CONDUCTED SPURIOUS EMISSION.

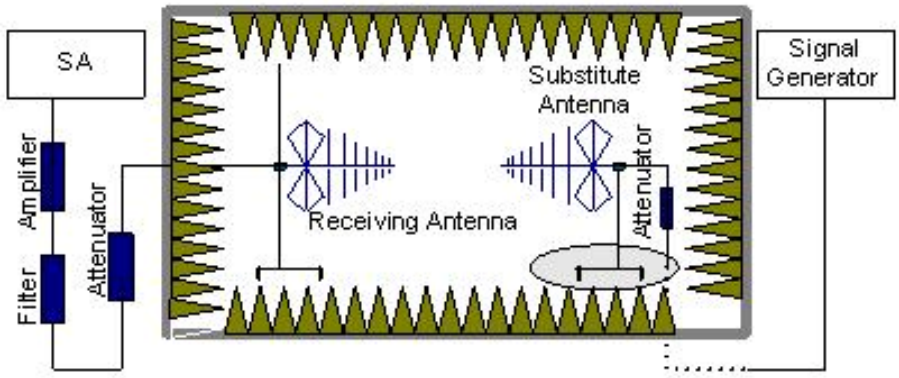
7.2 Radiated Spurious Emission

7.2.1 MEASUREMENT METHOD

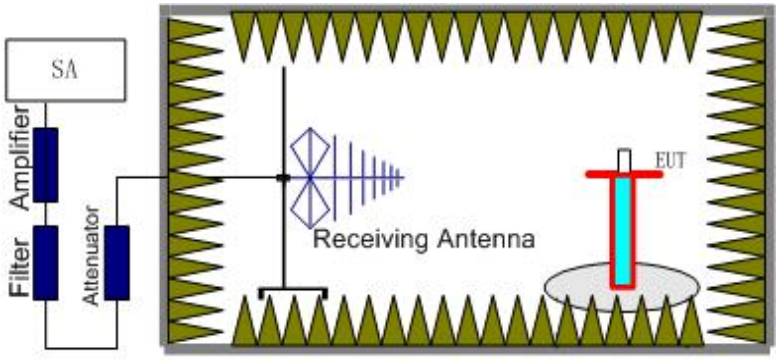
The measurements procedures specified in TIA-603C-2004 were used for testing. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment. The resolution bandwidth is set 1MHz as outlined in Part 24.238. The measurements were performed on all modes(GPRS850, GPRS1900) at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.

The procedure of radiated spurious emissions is as follows:

a) Pre-calibration With pre-calibration method, the Radiated Spurious Emissions(RSE) is calculated as, RSE=Rx（dBuV）+CL（dB）+SA（dB）+Gain（dBi）-107（dBuV to dBm）The SA is calibrated using following setup.



b) EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the test item for emission measurements. The height of receiving antenna is 0.8m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the test item and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and 1MHz bandwidth.



Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the PCS 1900 band (1850.2 MHz, 1880 MHz and 1909.8 MHz), GSM850 band (824.2MHz, 836.6MHz, 848.8MHz). It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of any band into any of the other blocks.

The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established and the A_{Rpl} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss and the air loss. The measurement results are obtained as described below:

$Power=P_{Mea}+A_{Rpl}$

7.2.2 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee’s frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Note: only result the worst condition of each test mode:

7.2.3 MEASUREMENT RESULT

GSM 850:

The Worst Test Results for Channel 251/848.8 MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit （dBm）	Polarity
1697.60	-37.29	-3.01	-40.30	-13.00	Horizontal
2546.40	-36.68	-2.68	-39.36	-13.00	Horizontal
1697.60	-37.65	3.46	-34.19	-13.00	Vertical
2546.40	-38.39	2.69	-35.70	-13.00	Vertical

PCS 1900:

The Worst Test Results for Channel 810/1909.8MHz					
Frequency(MHz)	Power(dBm)	ARpl (dBm)	PMea(dBm)	Limit （dBm）	Polarity
3819.60	-41.37	-3.22	-44.59	-13.00	Vertical
5729.40	-40.09	-1.24	-41.33	-13.00	Vertical
3819.60	-40.60	3.98	-36.62	-13.00	Horizontal
5729.40	-42.94	-2.26	-45.20	-13.00	Horizontal

Note: Below 30MHz no Spurious found and The GSM modes is the worst condition.

8. MAINS CONDUCTED EMISSION

8.1 MEASUREMENT METHOD

The measurement procedure specified in ANSI C63.4-2003 was used for testing. Conducted Emission was measured with travel charger.

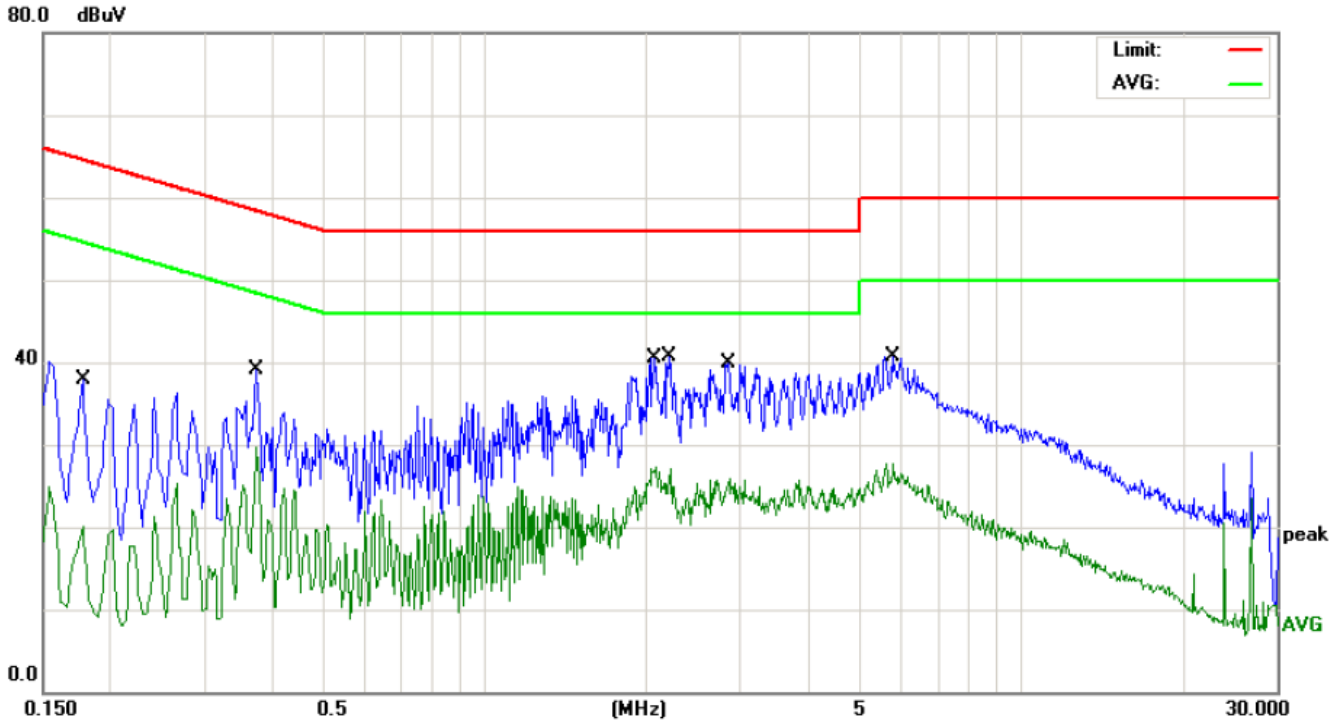
8.2 PROVISIONS APPLICABLE

Frequency of Emission (MHz)	Conducted Limit(dBuV)	
	Quasi-Peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50
*Decreases with the logarithm of the frequency. *The lower limit shall apply at the transition frequency.		

Note: The GSM850 mode is the worst condition and the test result as following:

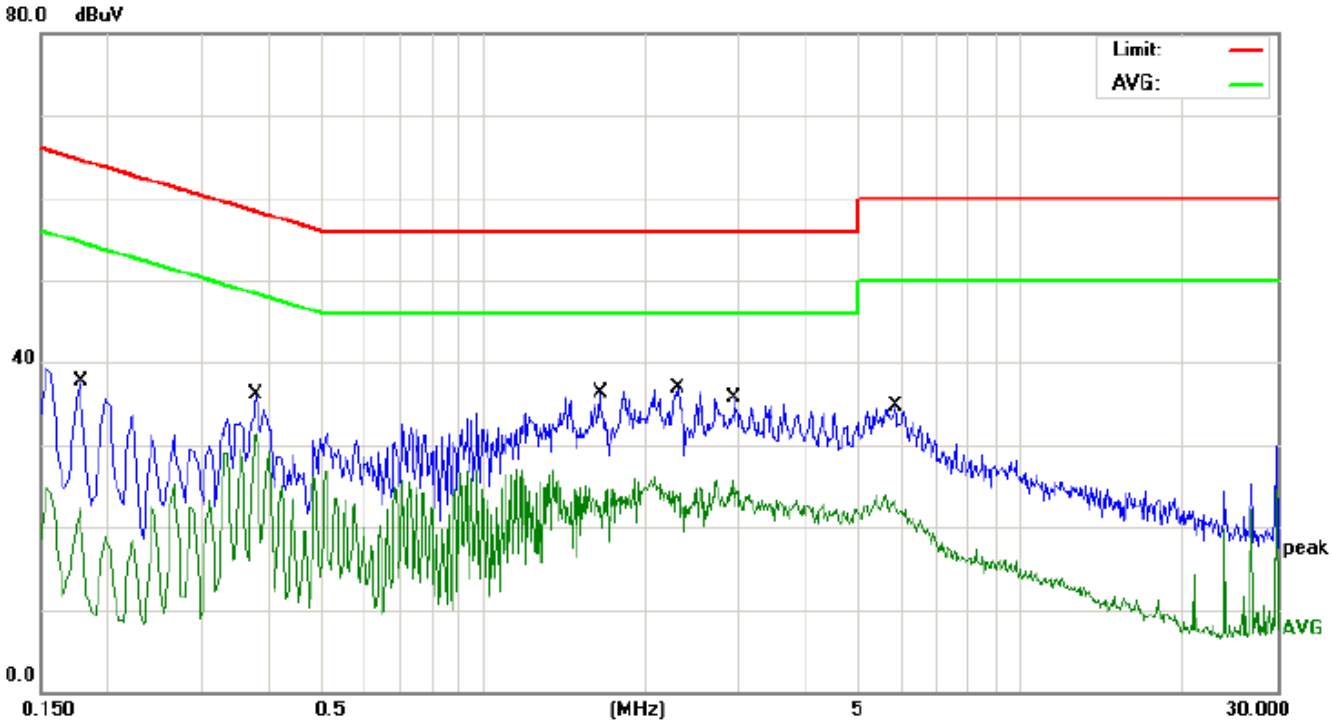
8.3 MEASUREMENT RESULT

LINE CONDUCTED EMISSION - L



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1780	27.58	10.37	37.95	64.57	-26.62	QP
2		0.1780	9.75	10.37	20.12	54.57	-34.45	AVG
3		0.3750	27.64	10.54	38.18	58.39	-20.21	QP
4		0.3750	18.67	10.54	29.21	48.39	-19.18	AVG
5		2.0740	29.86	10.71	40.57	56.00	-15.43	QP
6		2.0740	16.31	10.71	27.02	46.00	-18.98	AVG
7	*	2.2060	29.95	10.70	40.65	56.00	-15.35	QP
8		2.2060	15.62	10.70	26.32	46.00	-19.68	AVG
9		2.8460	29.29	10.68	39.97	56.00	-16.03	QP
10		2.8460	14.32	10.68	25.00	46.00	-21.00	AVG
11		5.7819	28.31	10.57	38.88	60.00	-21.12	QP
12		5.7819	17.22	10.57	27.79	50.00	-22.21	AVG

LINE CONDUCTED EMISSION - N



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1787	25.10	10.36	35.46	64.54	-29.08	QP
2		0.1787	10.13	10.36	20.49	54.54	-34.05	AVG
3		0.3780	25.52	10.53	36.05	58.32	-22.27	QP
4	*	0.3780	20.69	10.53	31.22	48.32	-17.10	AVG
5		1.6580	23.49	10.73	34.22	56.00	-21.78	QP
6		1.6580	11.77	10.73	22.50	46.00	-23.50	AVG
7		2.2980	26.15	10.70	36.85	56.00	-19.15	QP
8		2.2980	12.51	10.70	23.21	46.00	-22.79	AVG
9		2.9340	25.11	10.68	35.79	56.00	-20.21	QP
10		2.9340	14.20	10.68	24.88	46.00	-21.12	AVG
11		5.8460	24.16	10.57	34.73	60.00	-25.27	QP
12		5.8460	12.13	10.57	22.70	50.00	-27.30	AVG

Note: The GSM850 mode is the worst condition.

9. FREQUENCY STABILITY

9.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

1 , Measure the carrier frequency at room temperature.

2 , Subject the EUT to overnight soak at -10℃.

3 , With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 band , channel 190 for GSM 850 band, channel 9400 for UMTS band II and
channel 4175 for UMTS band V measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

4 , Repeat the above measurements at 10℃ increments from -10℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

5 , Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

6 , Subject the EUT to overnight soak at +50℃.

7 , With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

8 , Repeat the above measurements at 10℃ increments from +50℃ to -10℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

9 , At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

9.2 PROVISIONS APPLICABLE

9.2.1 For Hand carried battery powered equipment

According to the JTC standard the frequency stability of the carrier shall be accurate to within 2.5 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the

lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.6VDC and 4.35VDC, with a nominal voltage of 3.8VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.

9.2.2 For equipment powered by primary supply voltage

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment, the normal environment temperature is 20^{o}C.

9.3 MEASUREMENT RESULT (WORST)

Frequency Error Against Voltage for GSM850 band		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.6	39	0.047
3.8	35	0.042
4.35	38	0.045

Frequency Error Against Temperature for GSM850 band		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	37	0.044
0	33	0.039
10	36	0.043
20	34	0.041
30	39	0.047
40	37	0.044
50	38	0.045

Note: The EUT doesn't work below -10℃

Frequency Error Against Voltage for PCS1900 band		
Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.6	47	0.025
3.8	39	0.021
4.35	49	0.026

Frequency Error Against Temperature for PCS1900 band		
temperature(℃)	Frequency error(Hz)	Frequency error(ppm)
-10	48	0.026
0	39	0.021
10	40	0.021
20	35	0.019
30	37	0.020
40	41	0.022
50	39	0.021

Note: The EUT doesn't work below -10℃

10. OCCUPIED BANDWIDTH

10.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

10.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

10.3 MEASUREMENT RESULT

Occupied Bandwidth (99%) for GSM850 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
LOW CHANNEL	**824.2**	241.99
MIDDLE CHANNEL	**836.6**	246.79
HIGH CHANNEL	**848.8**	248.40

Occupied Bandwidth (99%) for PCS1900 band		
Mode	Frequency(MHz)	Occupied Bandwidth (99%)(kHz)
LOW CHANNEL	**1850.2**	246.79
MIDDLE CHANNEL	**1880.0**	245.19
HIGH CHANNEL	**1909.8**	246.79

Please refer to Appendix B for compliance test plots for Occupied Bandwidth (99%).

11. EMISSION BANDWIDTH

11.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

11.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

11.3 MEASUREMENT RESULT

Emission Bandwidth (-26dBc) for GSM850 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
LOW CHANNEL	**824.2**	312.50
MIDDLE CHANNEL	**836.6**	315.71
HIGH CHANNEL	**848.8**	312.50

Emission Bandwidth (-26dBc) for PCS1900 band		
Mode	Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)
LOW CHANNEL	**1850.2**	310.90
MIDDLE CHANNEL	**1880.0**	312.50
HIGH CHANNEL	**1909.8**	310.90

Please refer to Appendix C for compliance test plots for Emission Bandwidth (-26dBc).

12. BAND EDGE

12.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

12.2 PROVISIONS APPLICABLE

As Specified in FCC rules of 22.917(a) and 24.238(a)

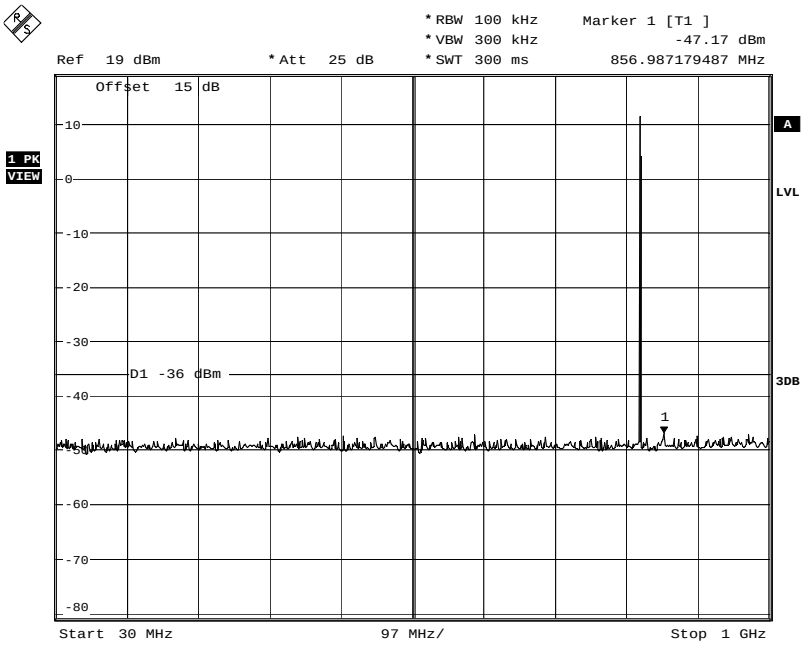
12.3 MEASUREMENT RESULT

Please refer to Appendix D for compliance test plots for band edges.

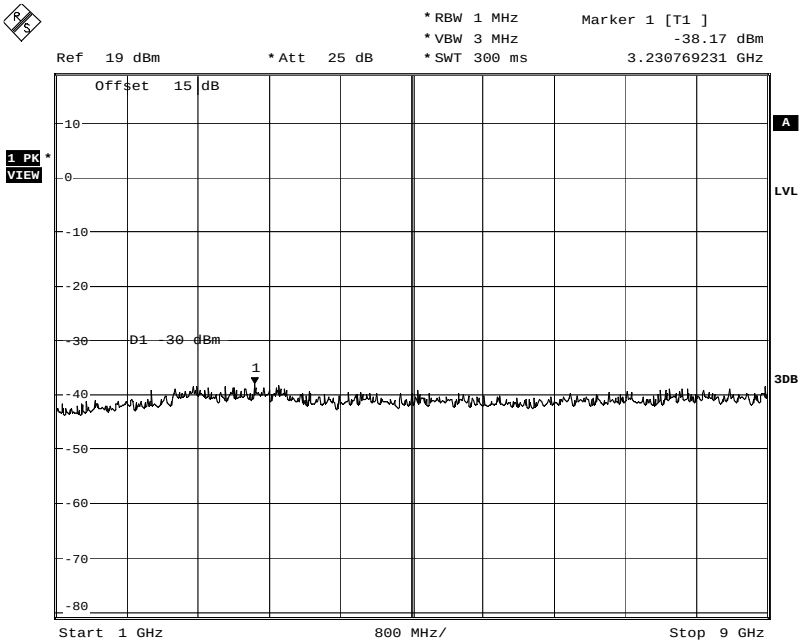
APPENDIX A:

CONDUCTED SPURIOUS EMISSION IN GSM850 BAND

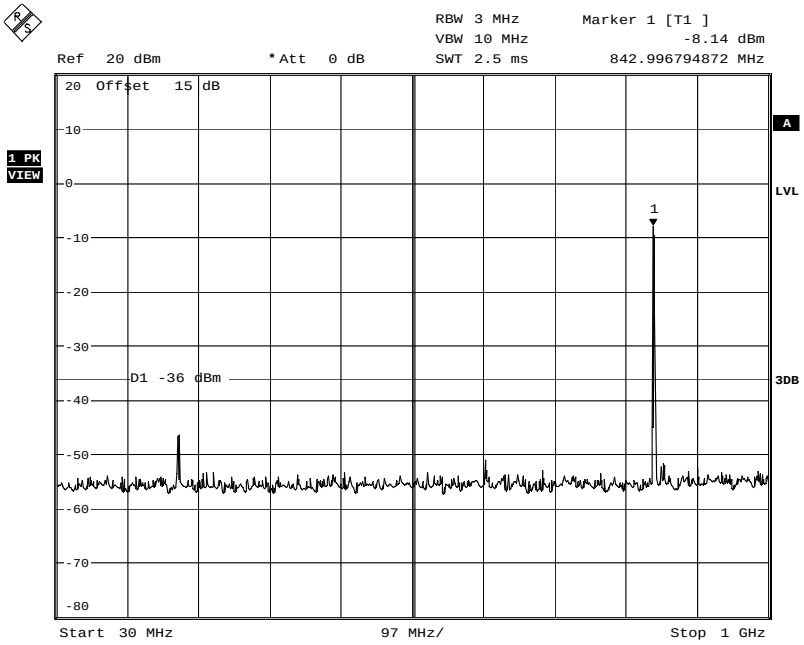
Conducted Emission Transmitting Mode CH 128 30MHz – 1GHz



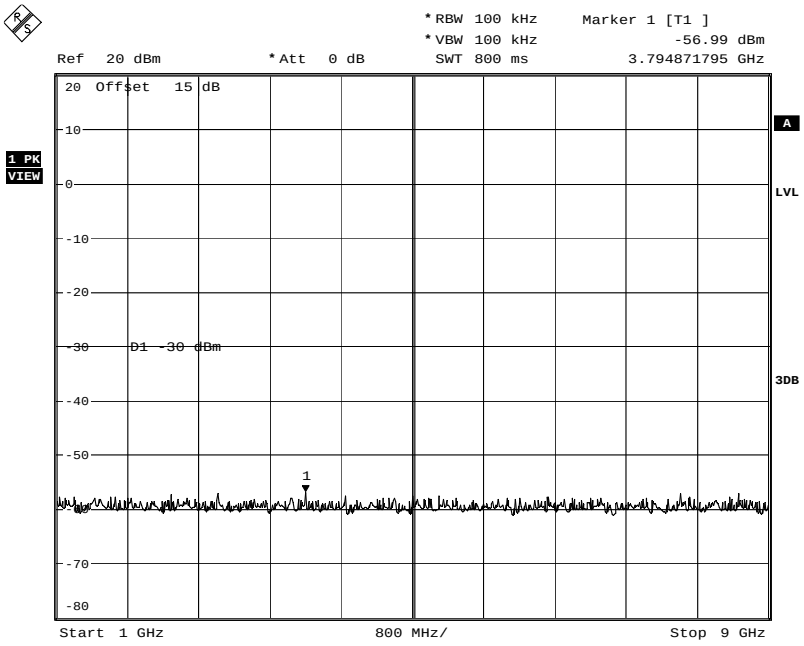
Conducted Emission Transmitting Mode CH 128 1GHz – 9GHz



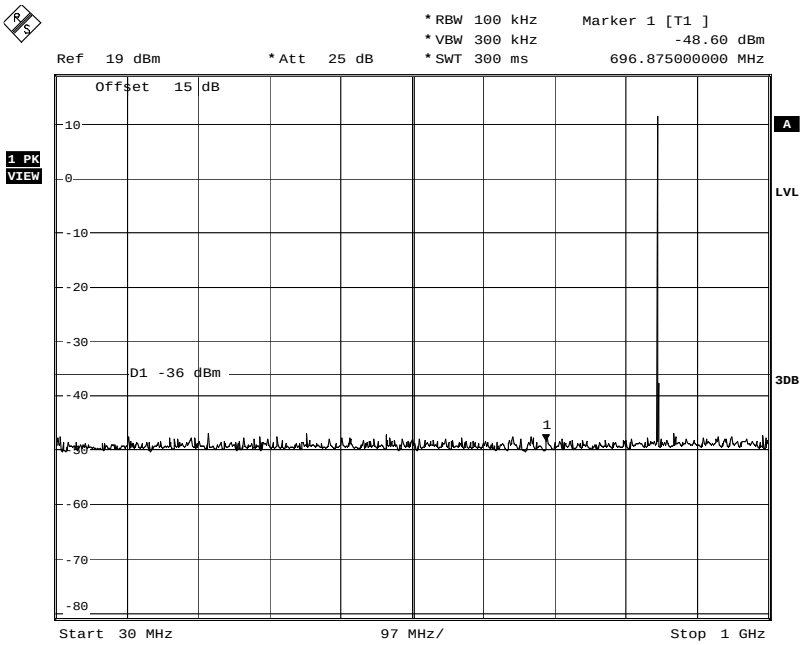
Conducted Emission Transmitting Mode CH 190 30MHz – 1GHz



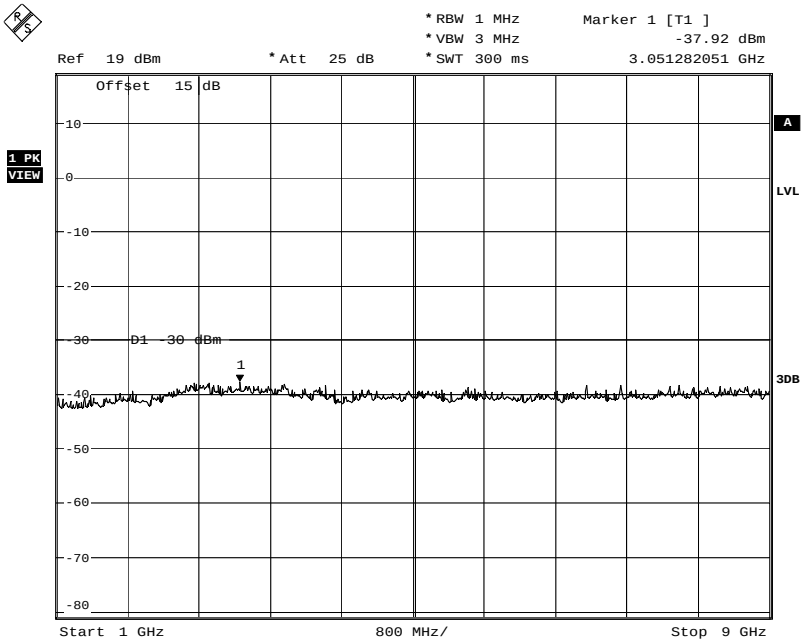
Conducted Emission Transmitting Mode CH 190 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 251 30MHz – 1GHz

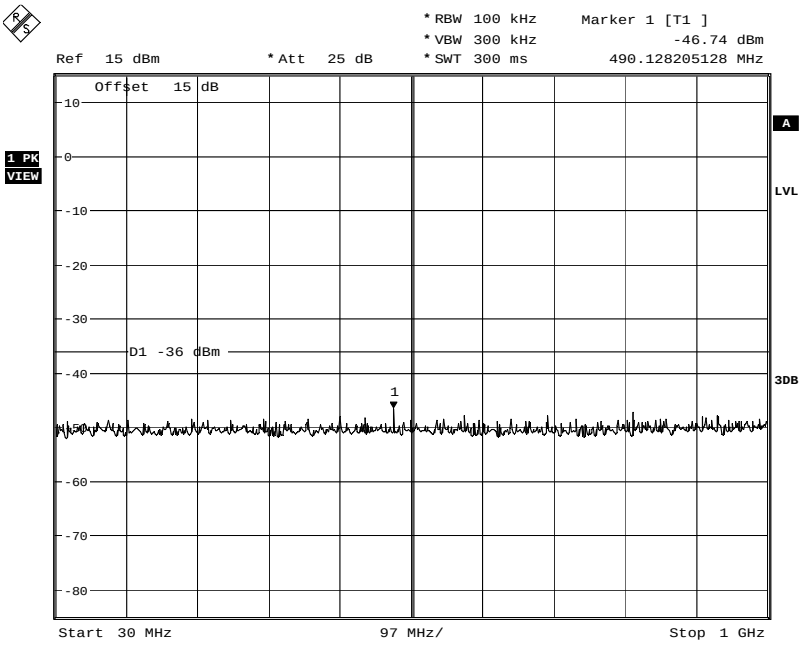


Conducted Emission Transmitting Mode CH 251 1GHz – 9GHz

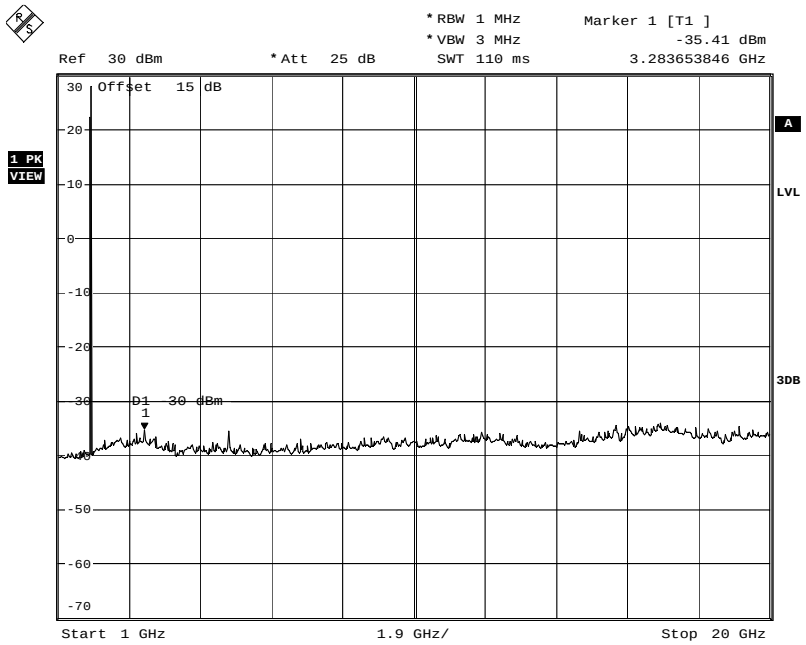


CONDUCTED EMISSION IN PCS1900 BAND

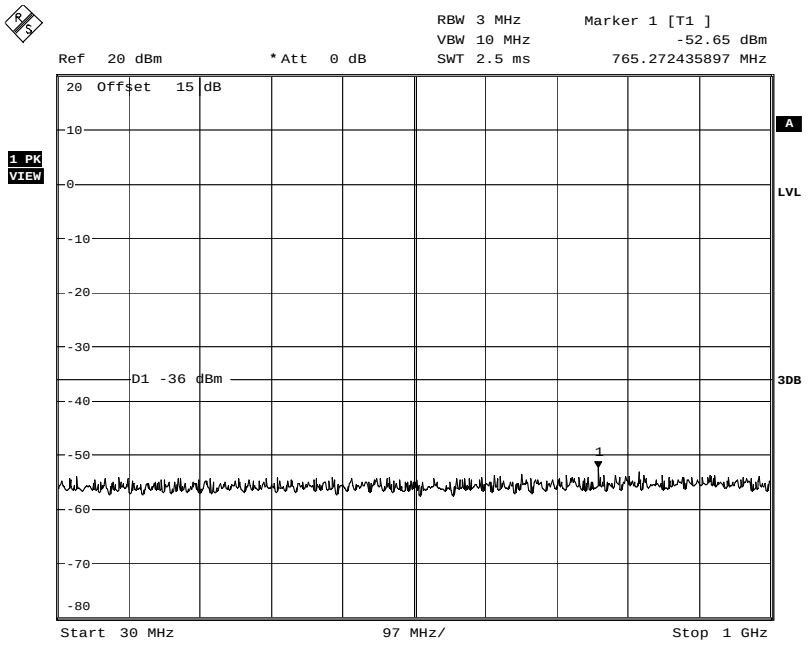
Conducted Emission Transmitting Mode CH 512 30MHz – 1GHz



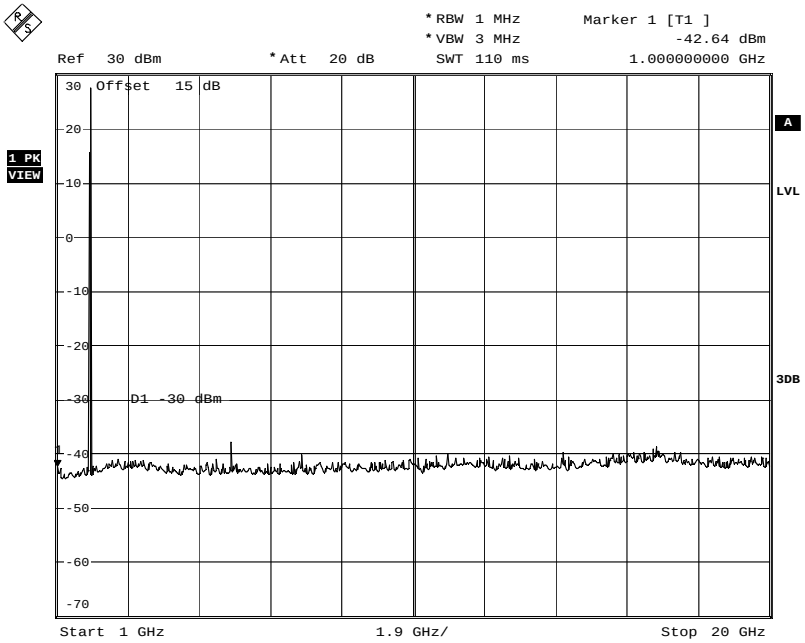
Conducted Emission Transmitting Mode CH 512 1GHz – 20GHz



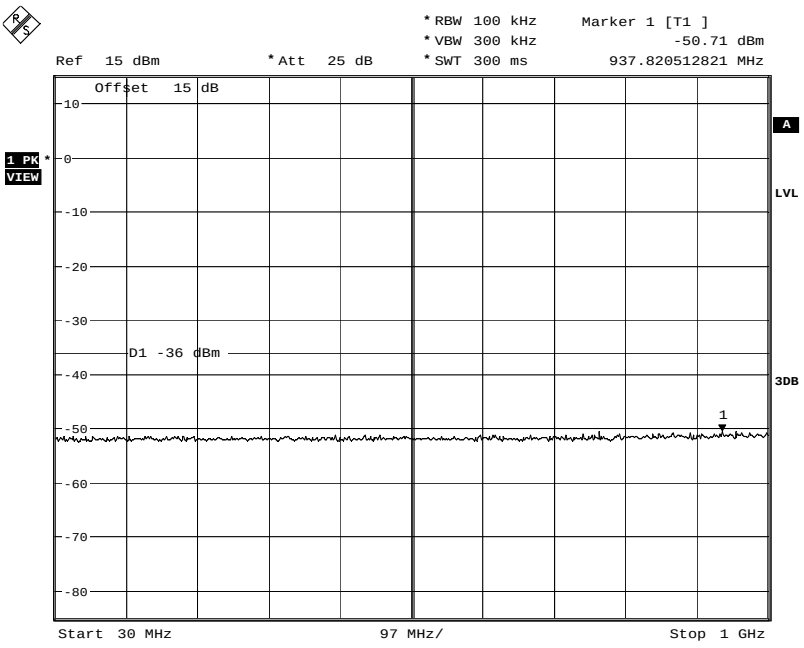
Conducted Emission Transmitting Mode CH 661 30MHz – 1GHz



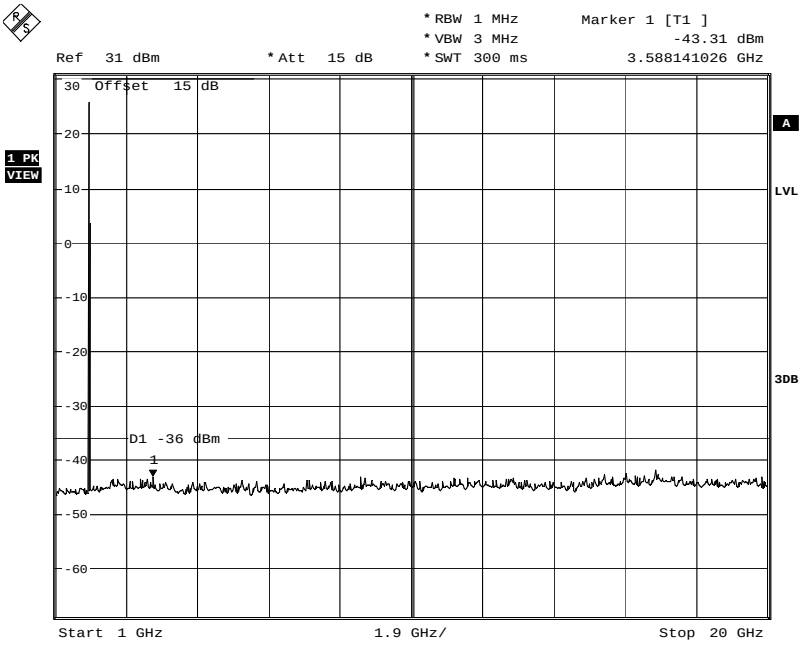
Conducted Emission Transmitting Mode CH 661 1GHz – 20GHz



Conducted Emission Transmitting Mode CH 810 30MHz – 1GHz



Conducted Emission Transmitting Mode CH 810 1GHz – 20GHz

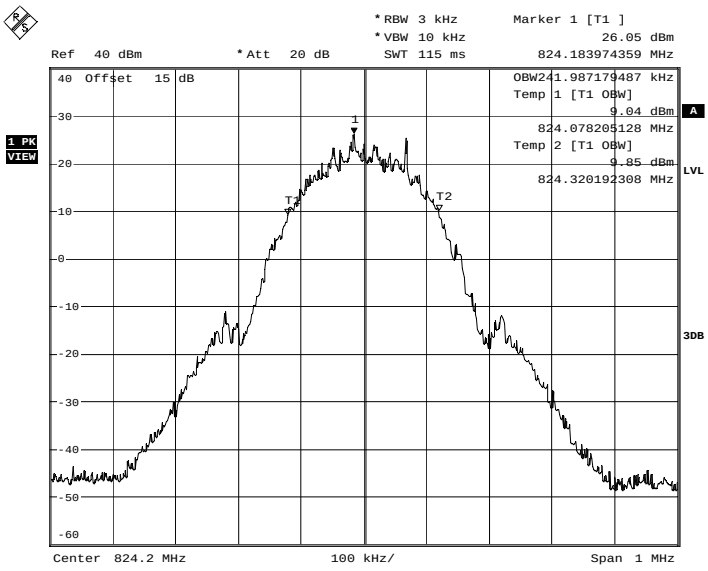


Note: 1. Below 30MHZ no Spurious found and the GSM modes is the worst condition.

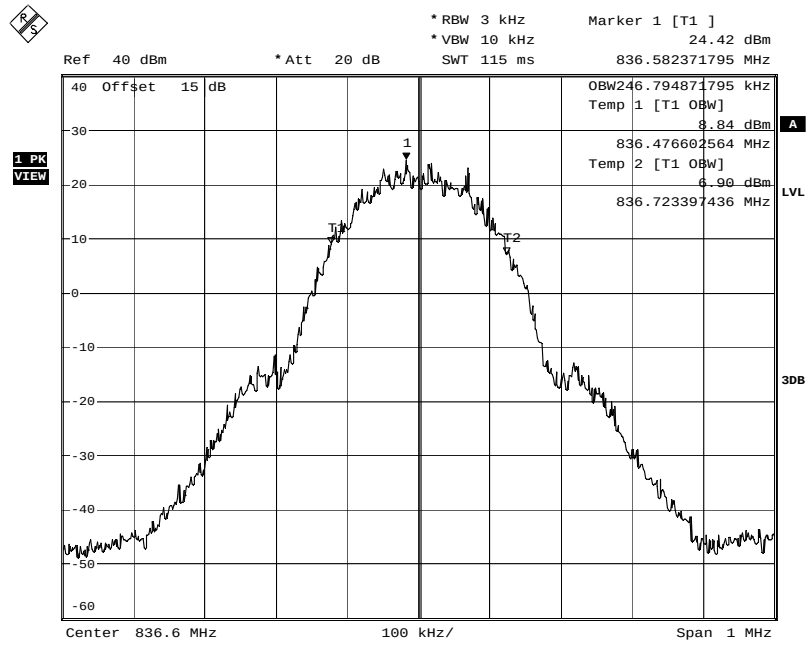
2. As no emission found in standby or receive mode, no recording in this report.

APPENDIX B:
TEST PLOTS FOR OCCUPIED BANDWIDTH (99%)

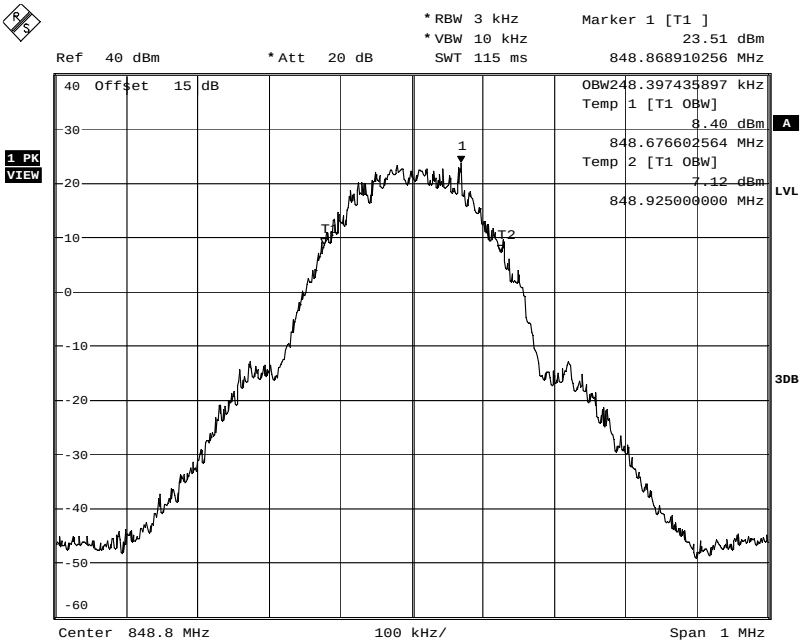
Occupied Bandwidth (99%) GSM 850 BAND CH 128



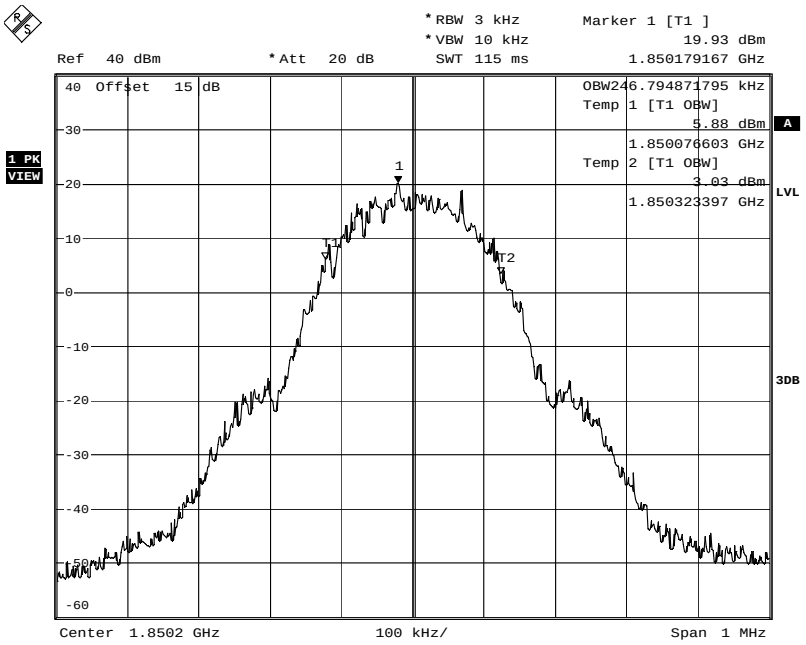
Occupied Bandwidth (99%) GSM 850 BAND CH 190



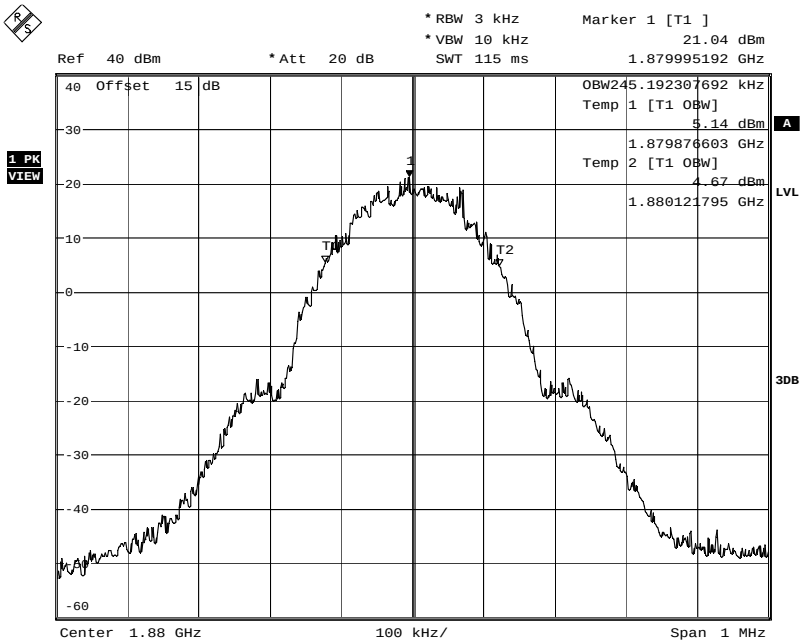
Occupied Bandwidth (99%) GSM 850 BAND CH 251



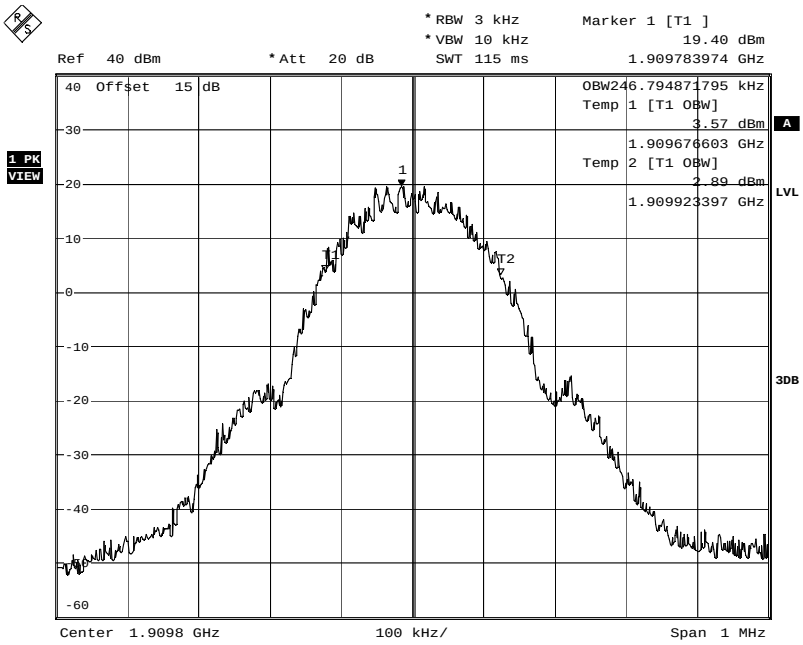
Occupied Bandwidth (99%) PCS 1900 BAND CH 512



Occupied Bandwidth (99%) PCS 1900 BAND CH 661

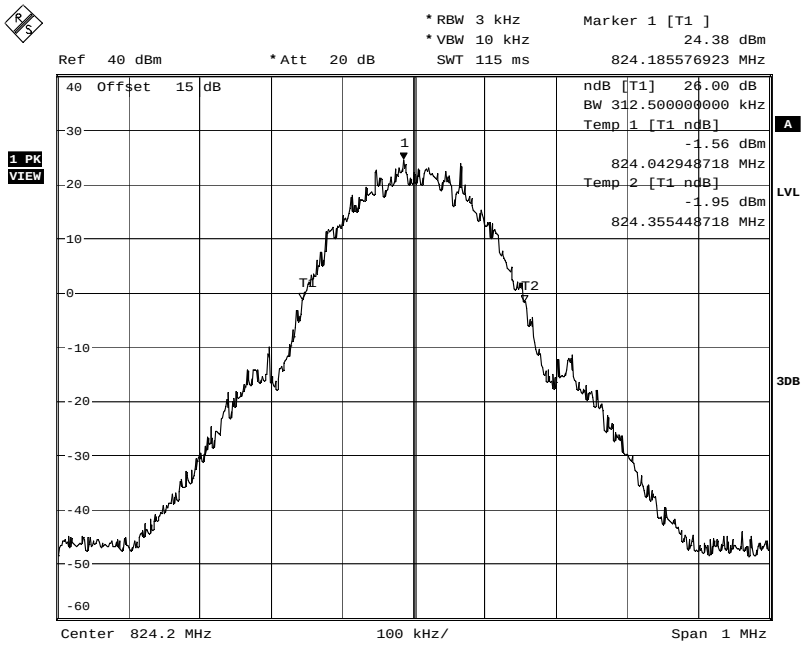


Occupied Bandwidth (99%) PCS 1900 BAND CH 810

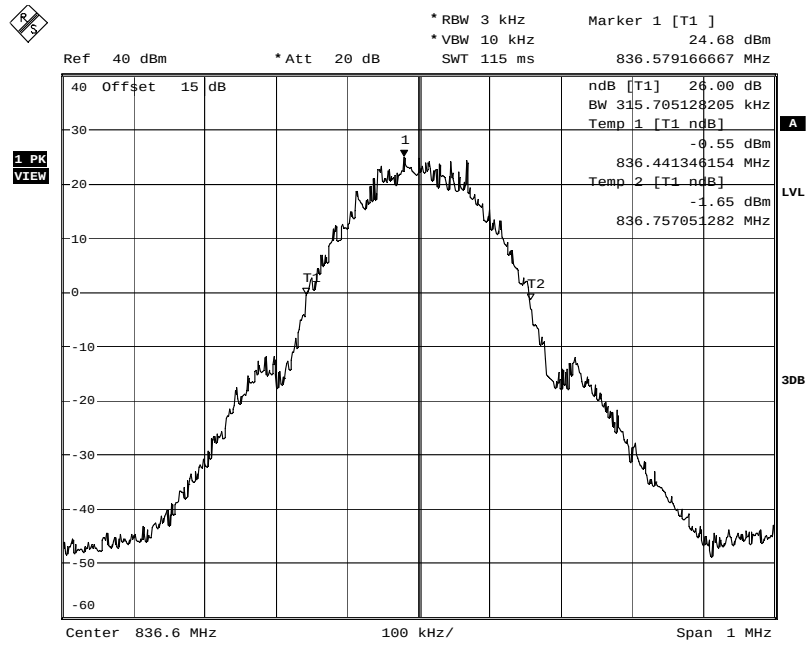


APPENDIX C:
TEST PLOTS FOR EMISSION BANDWIDTH (-26dBC)

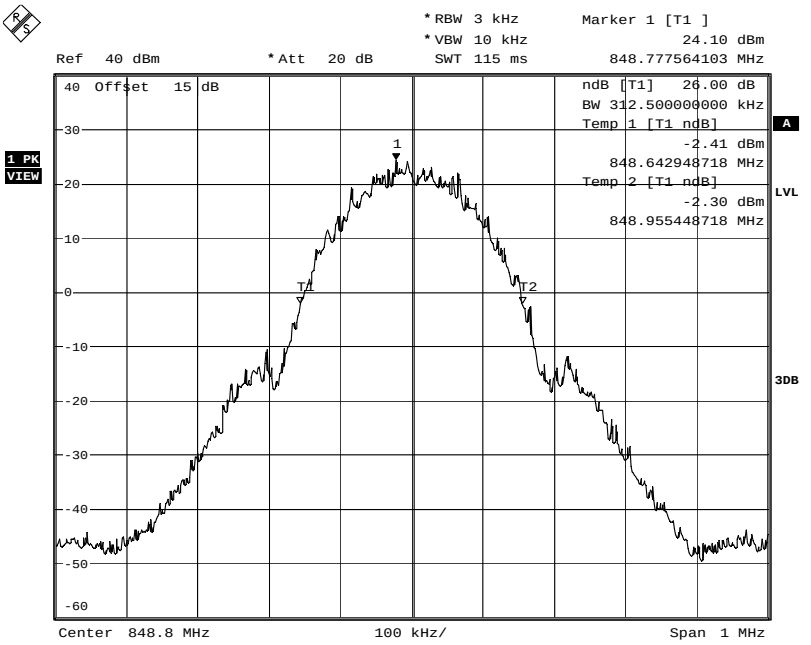
Occupied Bandwidth (-26dBC) GSM 850 BAND CH 128



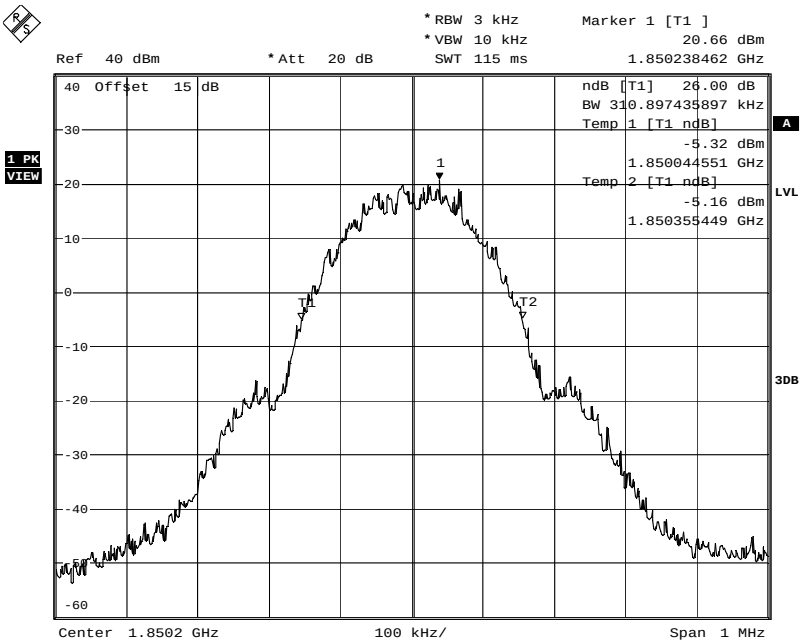
Occupied Bandwidth (-26dBC) GSM 850 BAND CH 190



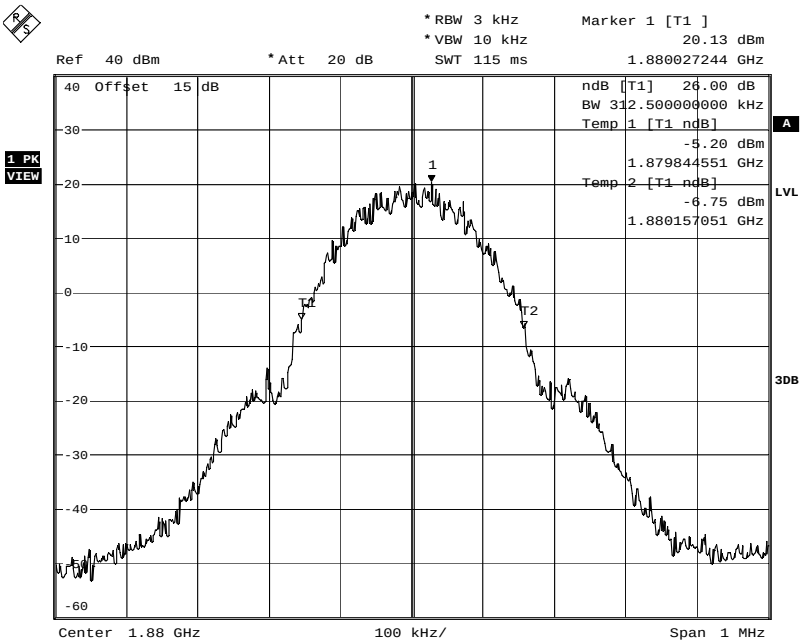
Occupied Bandwidth (-26dBC) GSM 850 BAND CH 251



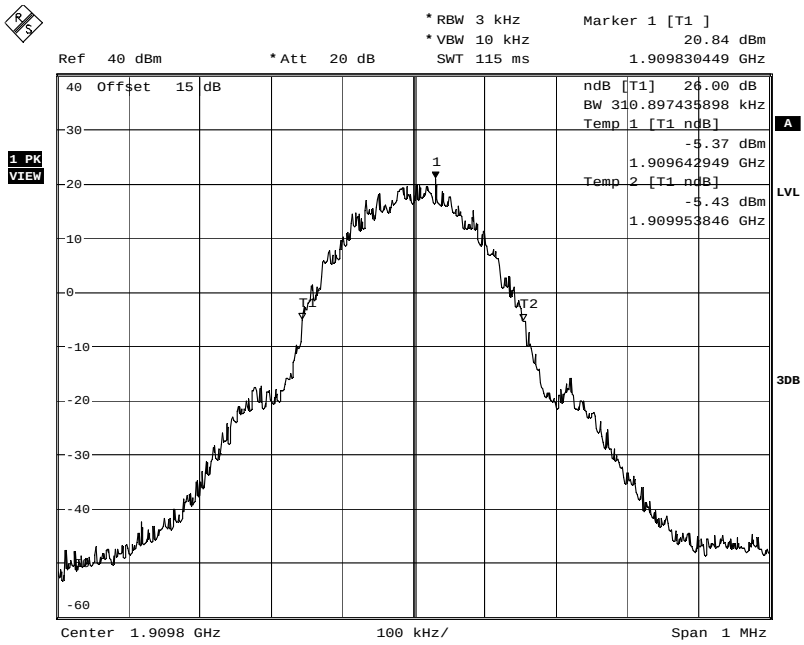
Occupied Bandwidth (-26dBC) PCS 1900 BAND CH 512



Occupied Bandwidth (-26dBC) PCS 1900 BAND CH 661

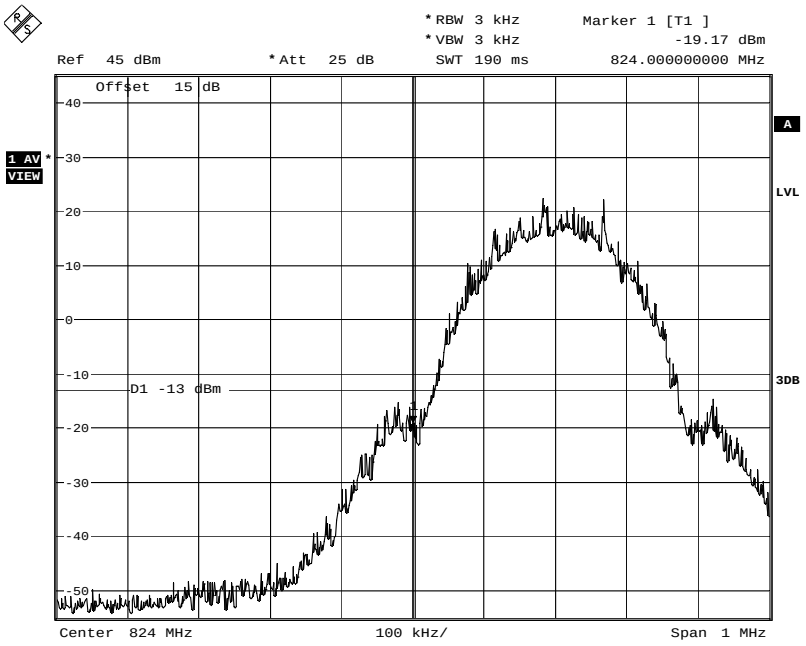


Occupied Bandwidth (-26dBC) PCS 1900 BAND CH 810

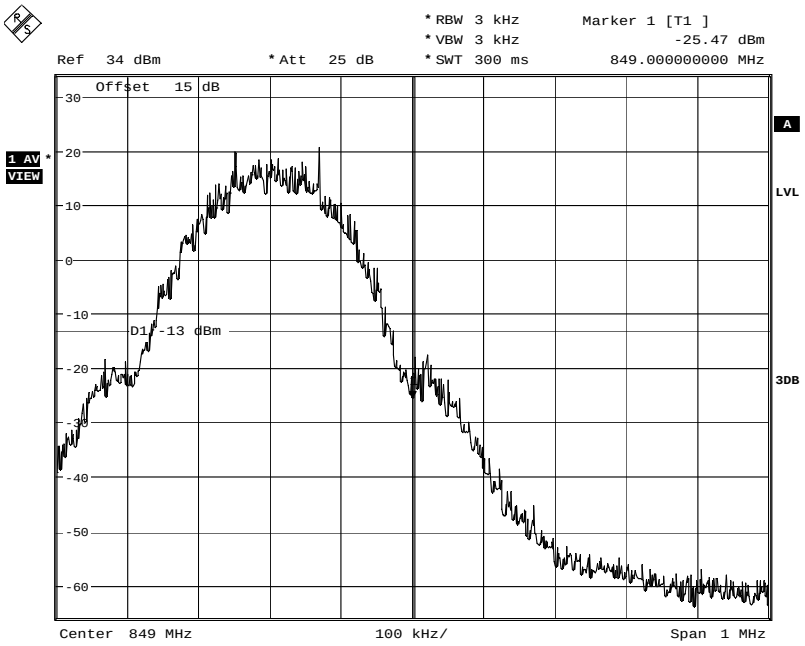


APPENDIX D: TEST PLOTS FOR BAND EDGES

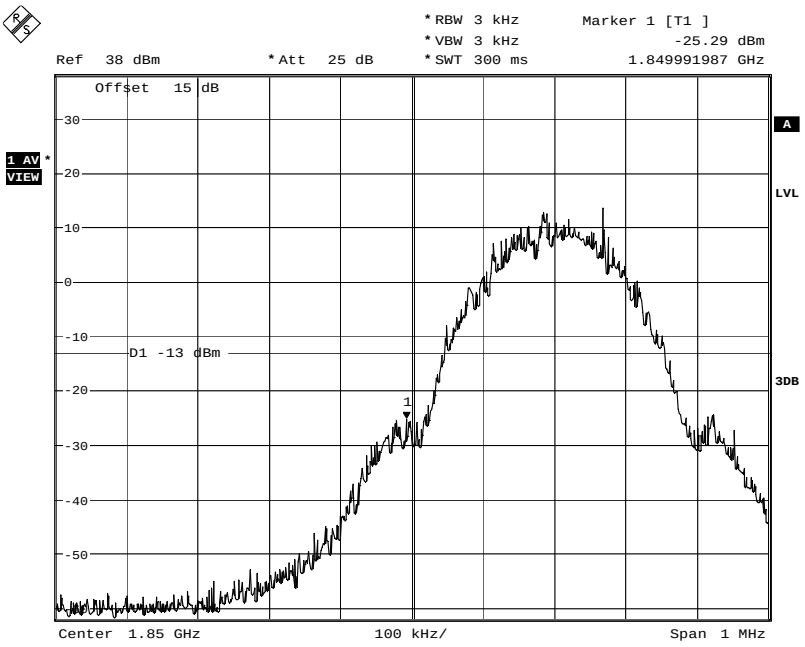
Low Band Edge GSM 850 BAND CH 128



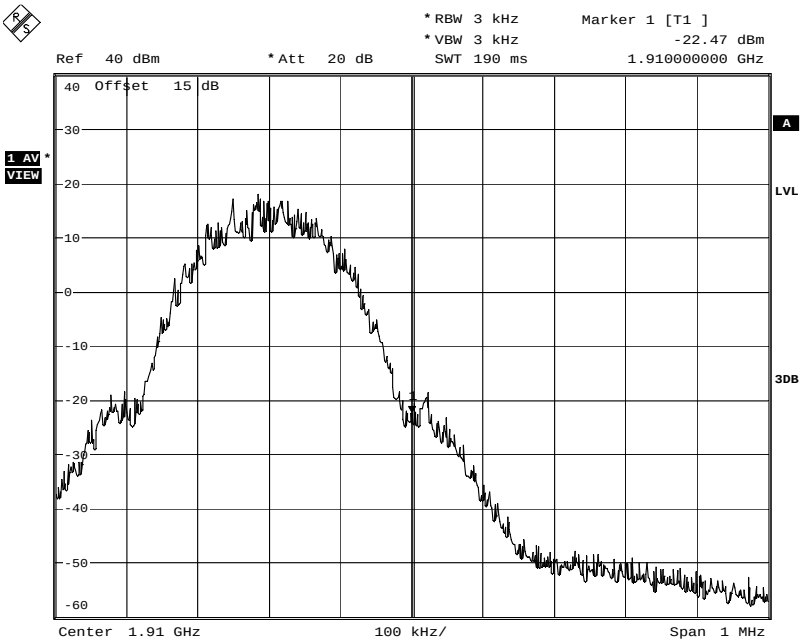
High Band Edge GSM 850 BAND CH 251



Low Band Edge PCS 1900 BAND CH 512

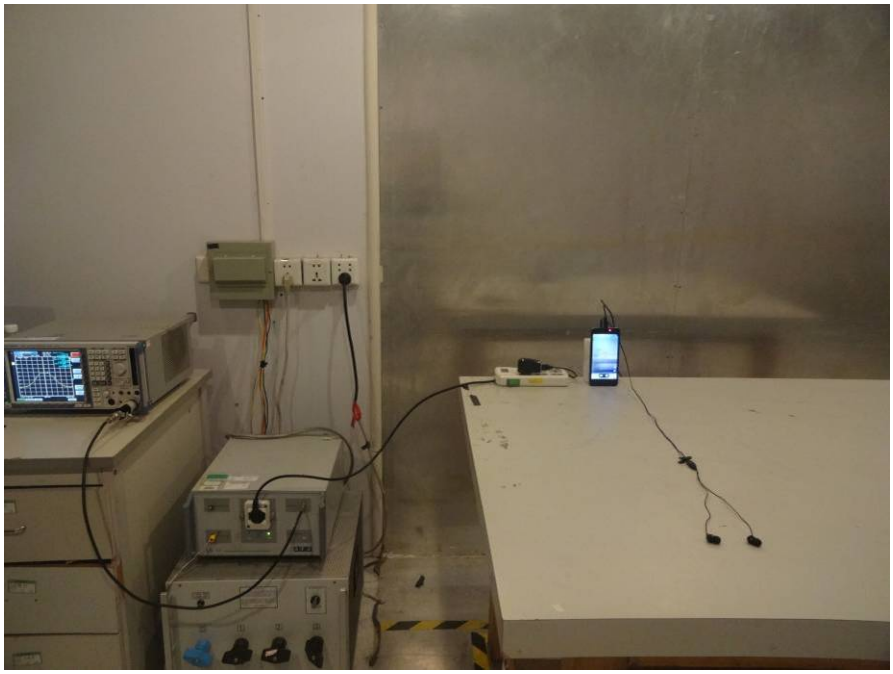


High Band Edge PCS 1900 BAND CH 810

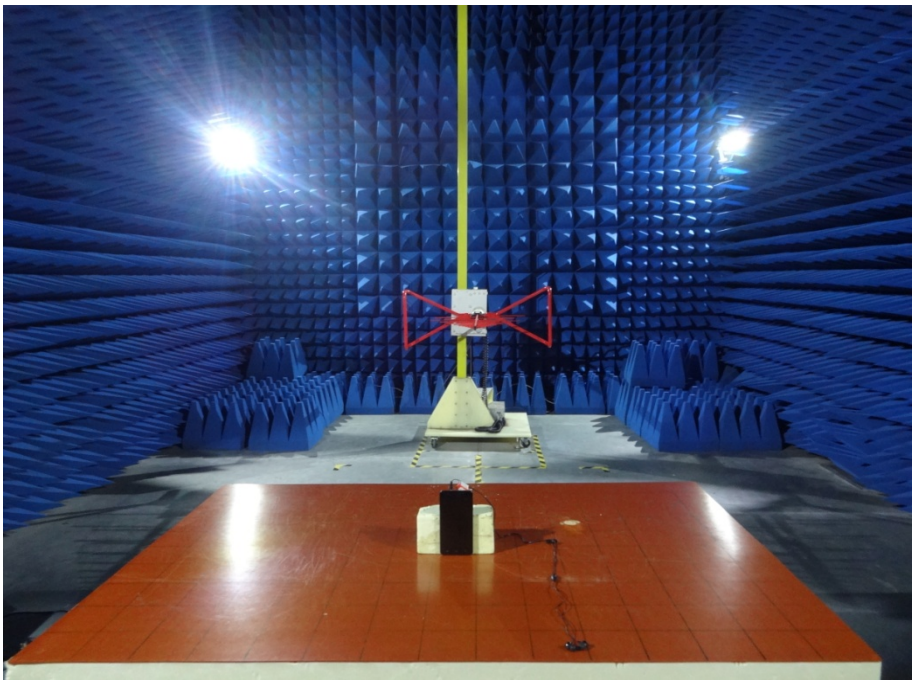


APPENDIX E: PHOTOGRAPHS OF TEST SETUP

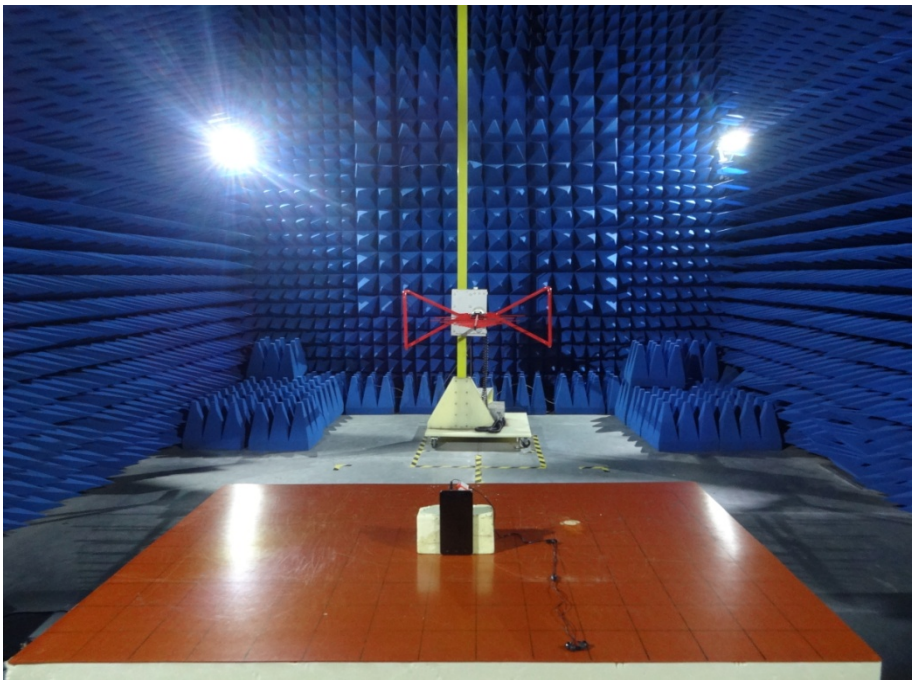
CONDUCTED EMISSION TEST



RADIATED SPURIOUS EMISSION TEST-GSM850



RADIATED SPURIOUS EMISSION TEST-PCS1900



APPENDIX F: PHOTOGRAPHS OF EUT

Appearance photograph of EUT

Appearance photograph of EUT

Appearance photograph of EUT

Appearance photograph of EUT

Appearance photograph of EUT

Appearance photograph of EUT

Appearance photograph of EUT

Appearance photograph of EUT

Internal photograph of EUT

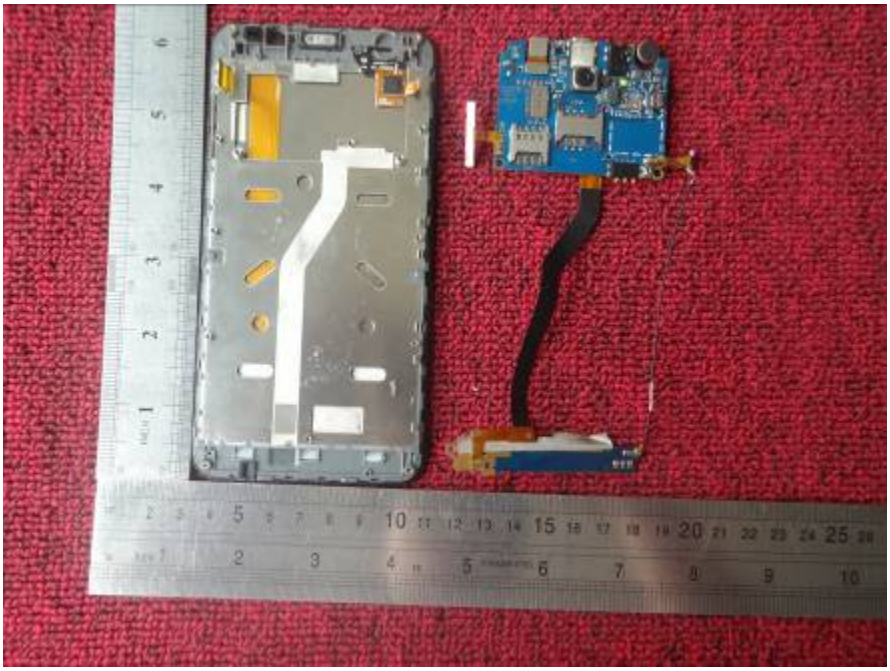
Internal photograph of EUT

Internal photograph of EUT

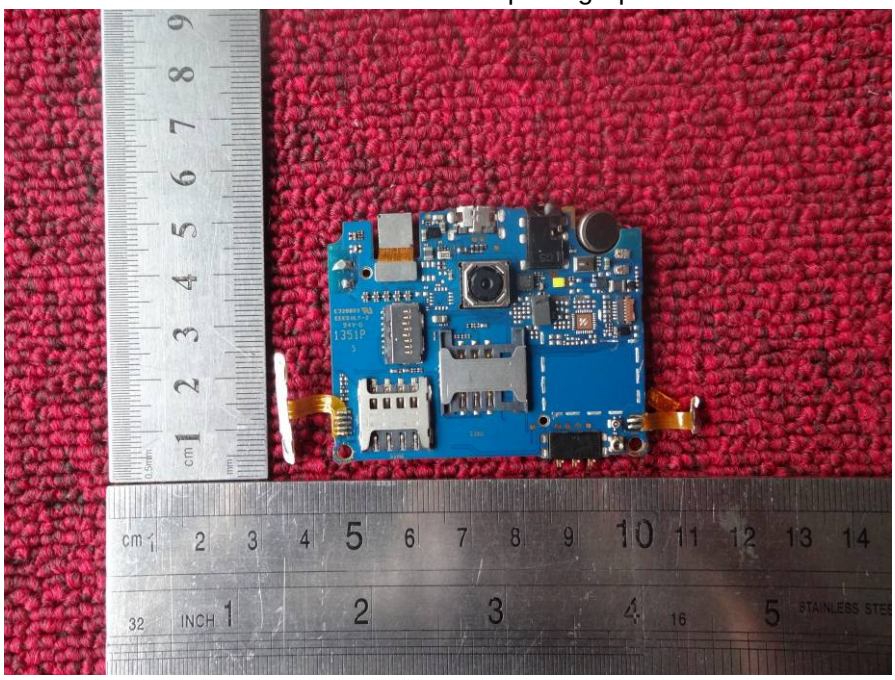
Internal photograph of EUT

Internal photograph of EUT

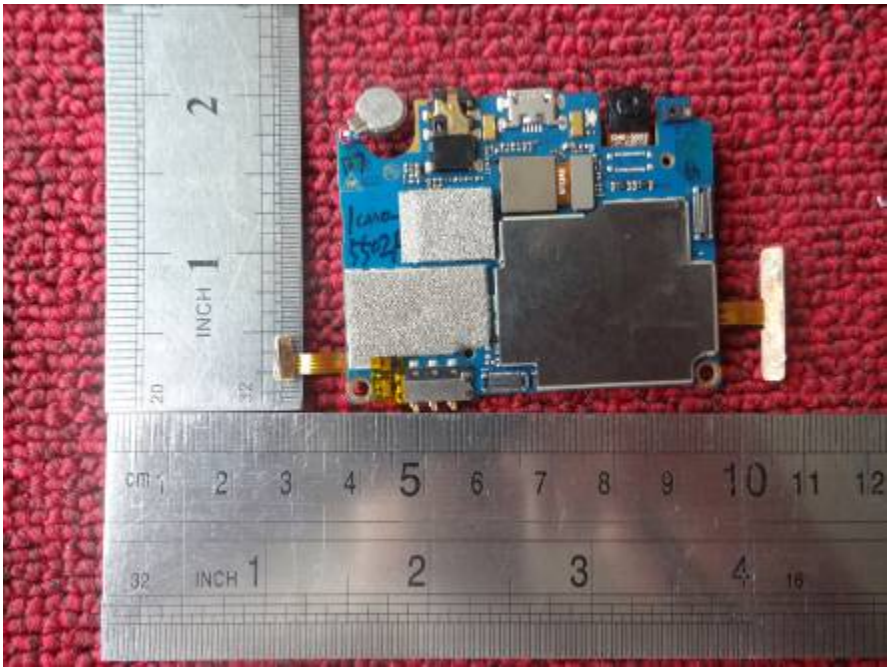
Internal photograph of EUT



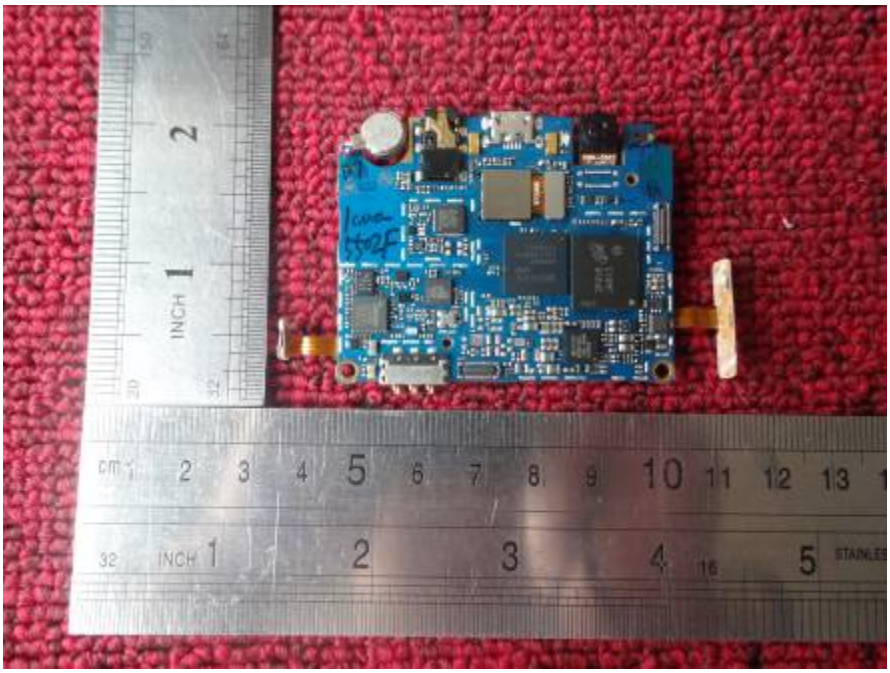
Internal photograph of EUT



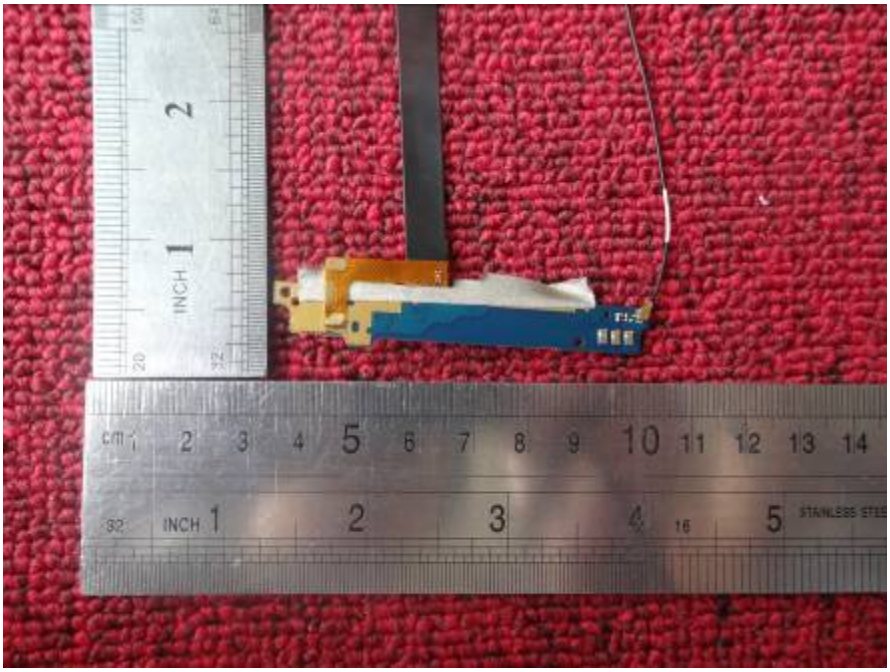
Internal photograph of EUT



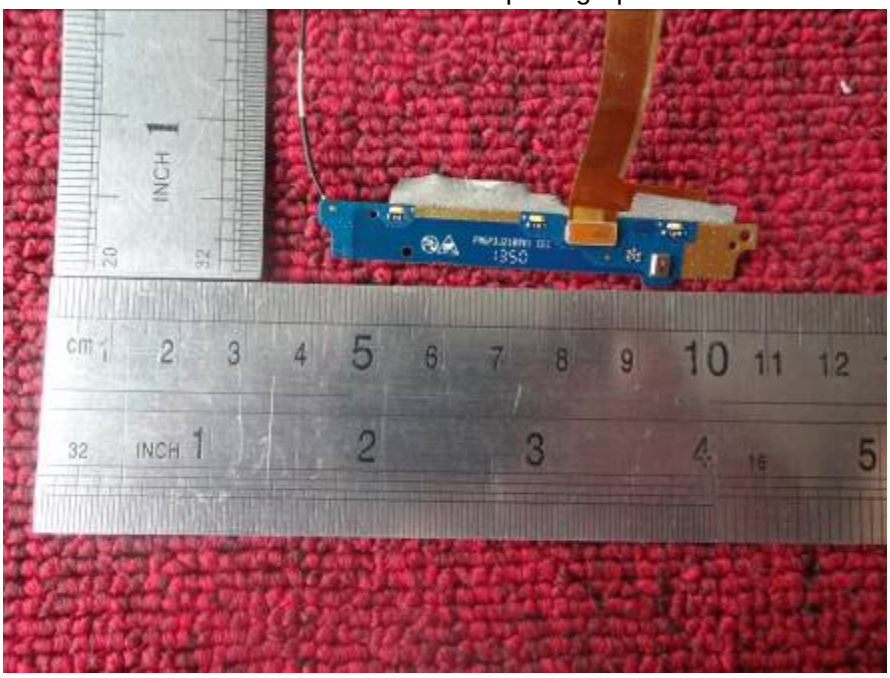
Internal photograph of EUT



Internal photograph of EUT



Internal photograph of EUT



———END OF REPORT———