FCC Test Report

Application Purpose	:	Original grant
Applicant Name:	:	HONG KONG LESIA TECHNOLOGY CO., LIMITED
FCC ID	:	2AM6RPRIMEP5
Equipment Type	:	Mobile phone
Model Name	:	Prime P5
Report Number	:	FCC17070616A-RF
Standard(S)	:	FCC Part 22H&24E Rules
Date Of Receipt	:	June 08, 2017
Date Of Issue	:	June 28, 2017
Test By	:	Dekun Liu *(Dekun Liu)*
Reviewed By	:	Sol Qin *(Sol Qin)*
Authorized by	:	 *(Michal Ling)*
Prepared by	:	**QTC Certification & Testing Co., Ltd.** 2nd Floor,Bl Building,Fengyeyuan Industrial Plant,, Liuxian 2st. Road, Xin'an Street, Bao'an District,,Shenzhen,518000 **Registration Number: 588523**

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	June 28, 2017	Valid	Original Report

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1 CERTIFICATION

Applicant	HONG KONG LESIA TECHNOLOGY CO., LIMITED
Address	UNIT 04，7/F BRIGHT WAY TOWER NO.33 MONG KOK RD KL
Manufacturer	Shenzhen Kleadtone Technology Co.,Ltd
Address	Room 506- 507,E Bldg, Dianzi Fuhua Jidi,Taojindi,Longsheng community,Longhua District,Shenzh
Equipment Type	Mobile phone
Brand Name	**Lesia**
Test Model	Prime P5
Hardware version:	FF253-02P
Software version:	FF253M02_P10_KLT_KT1705_V01_20170619_112337_notest
Series Model	N/A
Difference description	N/A
Deviation	None
Condition of Test Sample	Normal

We hereby certify that:

All measurement facilities used to collect the measurement data are located at QTC Certification & Testing Co., Ltd.
Registration Number: 588523

The data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C 63.4:2014 and TIA/EIA 603(2010). The sample tested as described in this report is in compliance with the FCC Rules Part 22H and 24E.
The test results of this report relate only to the tested sample identified in this report.

2 EUT INFORMATION

Table 2.1.1 General Information

Equipment Type:	Mobile phone
Frequency Bands:	☒GSM 850 ☒PCS 1900 (U.S. Bands)
Antenna Type:	Internal Antenna
Antenna gain:	PCS1900: 1.5dbi GSM850: 1.5dbi
Battery information:	Li-Polymer Battery : Prime Series Voltage: 3.7V Capacity: 800mAh Limited Charge Voltage: 4.2V
Adapter Information:	Adapter: Prime Series Input: AC 100-240V 50/60Hz 200mA Output: DC 5V⎓500mA
Card(S):	Card 1: GSM Card Slot
Max power:	See Table 2.1.2
Extreme Vol. Limits:	DC 3.45V to 4.2V (Normal: DC 3.7V)
Extreme Temp. Tolerance	-10~55℃

Note 1: The High Voltage DC 4.2V and Low Voltage DC 3.45V were declared by manufacturer, The EUT couldn't be operating normally with higher or lower voltage.

Table 2.1.2 The Basic Technical Specification for Working BAND(S).

OPERATION BAND(S)	Power Class	Mod.	Max Average (dBm)	Max Peak Power (dBm)
GSM850	Class 4	GMSK	33.08	33.16
DCS1900	Class 1	GMSK	29.97	30.33

3 TEST DESCRIPTION

3.1 Test Facility

The test site used to collect the radiated data is located at:
QTC Certification & Testing Co., Ltd.
Registration Number: 588523

3.2 EUT System 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.

Fig. 3.2-1 Configuration of EUT System

Table 3.2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Mobile phone	Prime P5	2AM6RPRIMEP5	EUT

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

3.3 Description Of Test Channels And Test Modes

Test channels:

GSM 850			
Test Channel	BW(MHz)	UL Channel	Frequency(MHz)
Low Range	0.2	128	824.2
Mid Range	0.2	190	836.6
High Range	0.2	251	848.8

PCS 1900			
Test Channel	BW(MHz)	UL Channel	Frequency(MHz)
Low Range	0.2	512	1850.2
Mid Range	0.2	661	1880
High Range	0.2	810	1909.8

Note 2: The worst condition was recorded in the test report if no other modes test data.

3.4 Equipment Modifications

Not available for this EUT intended for grant.

4 SUMMARY OF TEST REQUIREMENTS AND RESULTS

PCS 1900:

Test Item	FCC Rule No.	Requirements	Judgement
Effective (Isotropic) Radiated Power	§2.1046, §24.232(c)	EIRP ≤ 2W(33dBm)	Pass
Bandwidth	§2.1049 §24.238(a)	OBW: No limit. EBW: No limit.	Pass
Band Edges	§2.1051, §24.238(a)	-13dBm	Pass
Spurious Emission at Antenna Terminals	§2.1051, §24.238(a)	-13dBm	Pass
Field Strength of Spurious Radiation	§2.1053, §24.238(a)	-13dBm	Pass
Frequency Stability	§2.1055, §24.235	the fundamental emission stays within the authorized frequency block.	Pass
Peak to average ratio	§24.232(d)	<13dB	Pass

GSM850

Test Item	FCC Rule No.	Requirements	Judgement
Effective (Isotropic) Radiated Power	§2.1046, §2.913(a)	EIRP ≤ 7W(38.5dBm)	Pass
Occupied Bandwidth	§2.1049	OBW: No limit.	Pass
Emission Bandwidth	22.917(b)	EBW: No limit.	Pass
Band Edges Compliance	§2.1051, §22.917(a)(b)	KDB 971 168 D02 971168 D02 Misc OOBE License Digital Systems v01 &27.53(m) for detail the limit is upon different OBW	Pass
Spurious Emission at Antenna Terminals	§2.1051, §22.917	-13dBm	Pass
Field Strength of Spurious Radiation	§2.1053, §22.917	-13dBm	Pass
Frequency Stability	§2.1055, §22.355	the fundamental emissions stay within the authorized bands of operation. (2.5ppm)	Pass

MEASUREMENT INSTRUMENTS

NAME OF EQUIPMENT	MANUFACTURER	MODEL	SERIAL NUMBER	Calibration Date	Calibration Due.
EMI Test Receiver	R&S	ESCI	100005	08/19/2016	08/18/2017
LISN	AFJ	LS16	16010222119	08/19/2016	08/18/2017
LISN(EUT)	Mestec	AN3016	04/10040	08/19/2016	08/18/2017
Universal Radio Communication Tester	R&S	CMU 200	1100.0008.02	08/19/2016	08/18/2017
Coaxial cable	Megalon	LMR400	N/A	08/12/2016	08/11/2017
GPIB cable	Megalon	GPIB	N/A	08/12/2016	08/11/2017
Spectrum Analyzer	R&S	FSU	100114	08/19/2016	08/18/2017
Pre Amplifier	H.P.	HP8447E	2945A02715	10/13/2016	10/12/2017
Pre-Amplifier	CDSI	PAP-1G18-38	--	10/13/2016	10/12/2017
Loop Antenna	R&S	HFH2-Z2	100296	10/13/2016	10/12/2017
Bi-log Antenna	SUNOL Sciences	JB3	A021907	09/13/2016	09/12/2017
9*6*6 Anechoic	--	--	--	08/21/2016	08/20/2017
Horn Antenna	COMPLIANCE ENGINEERING	CE18000	--	09/13/2016	09/12/2017
Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-631	08/23/2016	08/22/2017
Power meter	Anritsu	ML2487A	6K00003613	08/23/2016	08/22/2017
Power meter	Anritsu	MA2491A	32263	08/23/2016	08/22/2017
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	04/24/2017	04/23/2018
System-Controller	CCS	N/A	N/A	N.C.R	N.C.R
Turn Table	CCS	N/A	N/A	N.C.R	N.C.R
Antenna Tower	CCS	N/A	N/A	N.C.R	N.C.R
RF cable	Murata	MXHQ87WA3000	-	08/21/2016	08/20/2017
Loop Antenna	EMCO	6502	00042960	08/22/2016	08/21/2017
Wideband Radio Communication Tester	R&S	CMW 500	103974	08/19/2016	08/18/2017
Horn Antenna	SCHWARZBECK	BBHA 9170	1123	08/19/2016	08/18/2017
H & T Chamber	Guangzhou gongwen	GDJS-500-40	0329	08/19/2016	08/18/2017

5 EFFECTIVE (ISOTROPIC) RADIATED POWER

Test limit:

According to §22.913, The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

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

See section 4.

Test procedure:

1. The setup of EUT is according with per TIA/EIA Standard 603 D: 2010 or KDB971168 D01 v02r02.

2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.

4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

5. ERP/EIRP = PMeas + GT − LC

where:

ERP/EIRP = effective or equivalent radiated power

PMeas = measured transmitter output power from SG

GT = gain of the substitution antenna

LC = cable loss between SG and substitution antenna.

GSM850 BAND:

Mode		Frequency (MHz)	Peak Power	Avg.Burst Power	Tolerance	Duty cycle Factor(dB)	Frame Power(dBm)
GSM850		824.2	33.13	33.06	0.07	-9	24.06
		836.6	33.12	32.98	0.14	-9	23.98
		848.8	**33.16**	**33.08**	0.08	-9	24.08
GPRS850	1 Tx Slots	824.2	32.72	32.21	0.51	-9.03	23.18
		836.6	32.68	32.32	0.36	-9.03	23.29
		848.8	32.62	32.22	0.40	-9.03	23.19
	2 Tx Slots	824.2	31.74	31.36	0.38	-6.02	25.34
		836.6	31.54	31.37	0.17	-6.02	25.35
		848.8	31.82	31.38	0.44	-6.02	25.36
	3 Tx Slots	824.2	31.02	30.53	0.49	-4.26	26.27
		836.6	31.06	30.52	0.54	-4.26	26.26
		848.8	31.07	30.55	0.52	-4.26	26.29
	4 Tx Slots	824.2	30.22	29.92	0.30	-3.01	26.91
		836.6	30.21	29.95	0.26	-3.01	26.94
		848.8	30.18	29.86	0.32	-3.01	26.85

PCS1900 BAND:

Mode		Frequency (MHz)	Peak Power	Avg.Burst Power	Tolerance	Duty cycle Factor(dB)	Frame Power(dBm)
GSM1900		1850.2	30.31	29.83	0.48	-9	20.83
		1880	30.19	29.95	0.24	-9	20.95
		1909.8	**30.33**	**29.97**	0.36	-9	20.97
GPRS1900	1 Tx Slots	1850.2	29.61	28.65	0.96	-9.03	19.62
		1880	29.23	28.97	0.26	-9.03	19.94
		1909.8	29.38	28.98	0.40	-9.03	19.95
	2 Tx Slots	1850.2	28.44	27.95	0.49	-6.02	21.93
		1880	28.21	27.83	0.38	-6.02	21.81
		1909.8	28.33	27.89	0.44	-6.02	21.87
	3 Tx Slots	1850.2	28.32	27.65	0.67	-4.26	23.39
		1880	27.89	27.46	0.43	-4.26	23.20
		1909.8	28.20	27.48	0.72	-4.26	23.22
	4 Tx Slots	1850.2	27.50	26.95	0.55	-3.01	23.94
		1880	27.30	26.98	0.32	-3.01	23.97
		1909.8	27.44	26.92	0.52	-3.01	23.91

Duty cycle Factor = 1 Tx Slots, 10*log(1/8)= -9.03dB, 2 Tx Slots, 10*log(2/8)= -6.02dB,
3Tx Slots, 10*log(3/8)= -4.26dB, 4 Tx Slots, 10*log(4/8)= -3.01dB

Radiated Power (ERP) for GSM 850 MHZ

Mode	Frequency (MHz)	P_{Mea} (dBm)	Amplifier Gain (dBi)	Path Loss	Antenna Gain	Correction (dB)	ERP (dBm)	Polarization
GSM850	**824.2**	2.78	31.23	1.02	1.5	2.15	32.34	H
	836.6	2.66	31.23	1.02	1.5	2.15	32.22	H
	848.8	2.56	31.23	1.02	1.5	2.15	32.12	H

Radiated Power (E.I.R.P) for PCS 1900 MHZ

Mode	Frequency (MHz)	P_{Mea} (dBm)	Amplifier Gain (dBi)	Path Loss (dB)	Antenna Gain (dB)	Correction (dB)	E.I.R.P. (dBm)	Polarization
GSM 1900	1850.2	-2.23	31.23	1.02	1.5	0.00	29.48	H
	1880.0	-2.32	31.23	1.02	1.5	0.00	29.39	H
	1909.8	-2.31	31.23	1.02	1.5	0.00	29.40	H

ERP or E.I.R.P = PMea + Amplifier Gain – Path Loss + Antenna Gain –Correction Factor

6 SPURIOUS EMISSION (Conducted and Radiated)

6.1 Measurement Result (Pre-measurement)

GSM850:

Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgment
Low Range	0.2	128	824.2	Pass
Middle Range	0.2	190	836.6	Pass
High Range	0.2	251	848.8	Pass

PCS 1900：

Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgment
Low Range	0.2	512	1850.2	Pass
Middle Range	0.2	661	1880.0	Pass
High Range	0.2	810	1909.8	Pass

Test Plot(s)

6.1.1 Conducted method

Test limit:

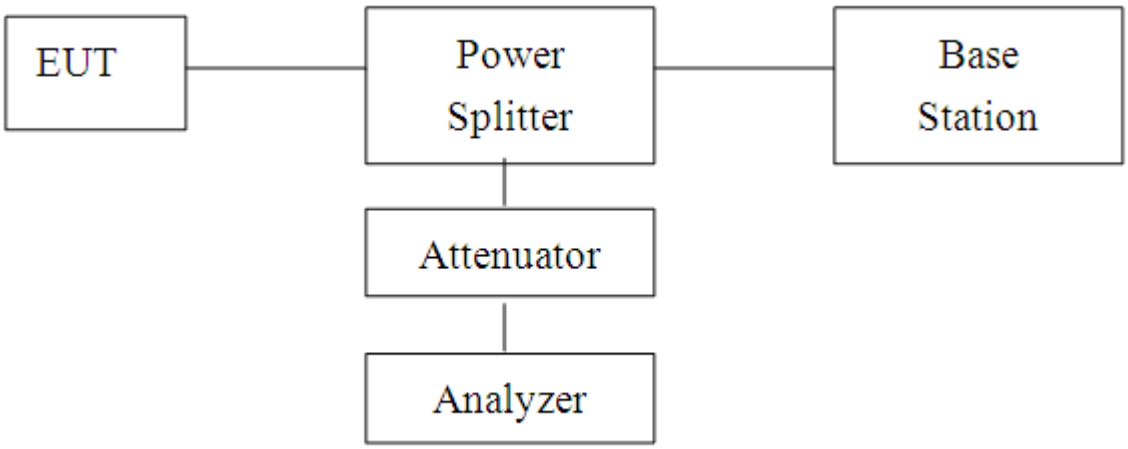
The spurious (unwanted) emission limits specified in the individual FCC rule parts applicable to licensed digital transmitters (typically referred to under the heading 'emission limits') normally apply to any and all emissions that are present outside of the authorized frequency band/block and apply to emissions in both the out-of-band and spurious domains. In some rule parts, the unwanted emission limits are specified by an emission mask that defines the applicable limit as a function of the frequency range relative to the authorized frequency block.

Typically, unwanted emissions are required by the licensed rule parts to be attenuated below the transmitter power by a factor of at least X + 10log(P) dB, where P represents the transmitter power expressed in watts and X is a specified scalar value (e.g., 43). This specification can be interpreted in one of two equivalent ways. First, the required attenuation can be construed to be relative to the mean carrier power, with the resultant of the equation X + 10log(P) being expressed in dBc (dB relative to the maximum carrier power). Alternatively, the specification can be interpreted as an absolute limit when the specified attenuation is actually subtracted from the maximum permissible transmitter power [i.e., 10log(P) – {X + 10log(P)}], resulting in an absolute level of -X dBW [or (-X + 30) dBm]. See section 4.

Test procedure:

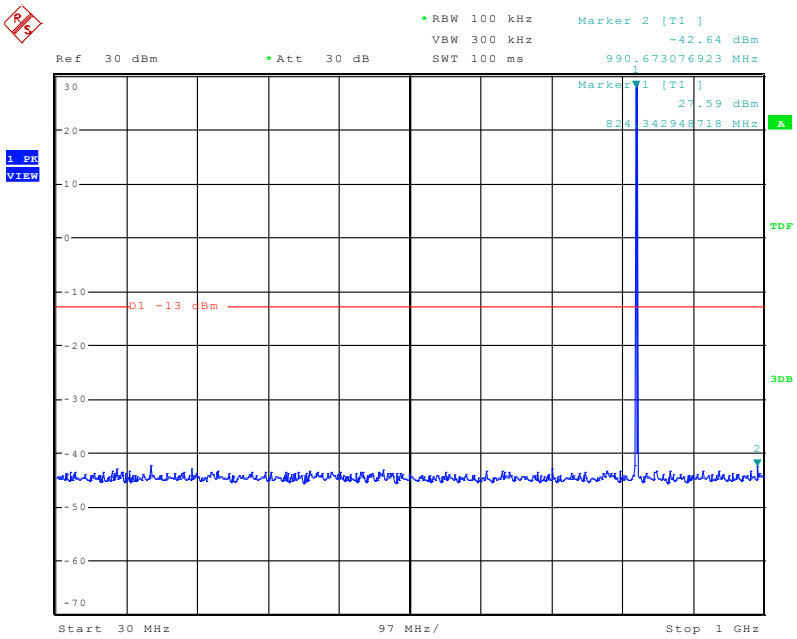
The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz below 1 GHz and 1 MHz above 1 GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonics.

Conducted Emission Test-Up:

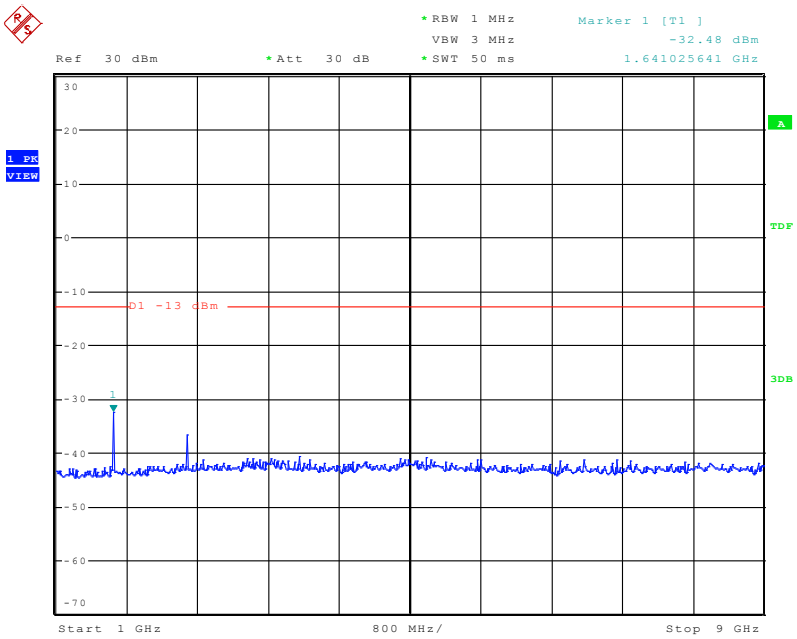


CONDUCTED EMISSION IN GSM850 BAND

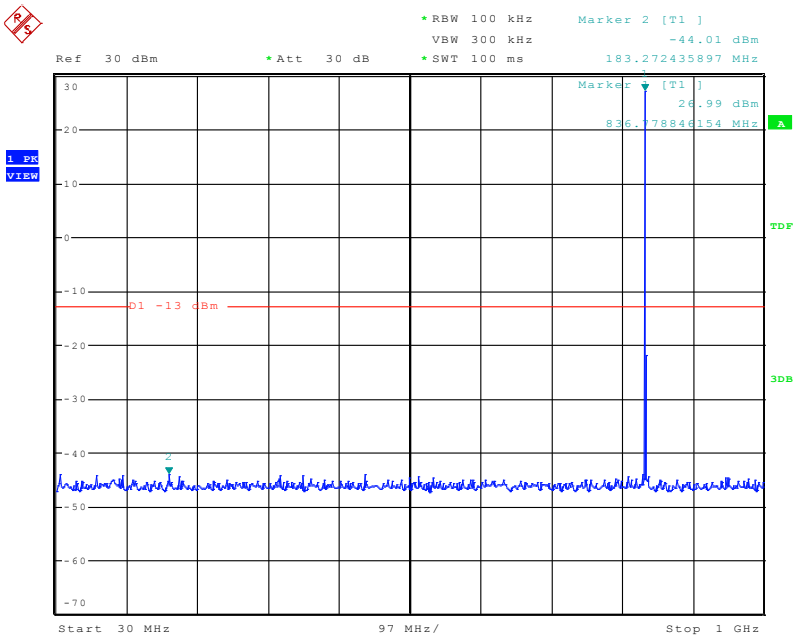
Conducted Emission Transmitting Mode CH 128 30MHz – 1GHz



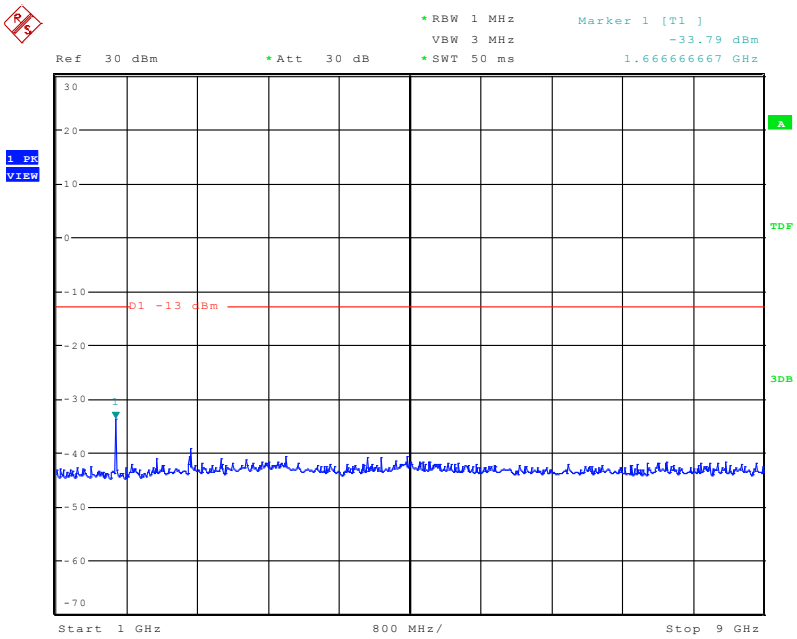
Conducted Emission Transmitting Mode CH 128 1GHz – 9GHz



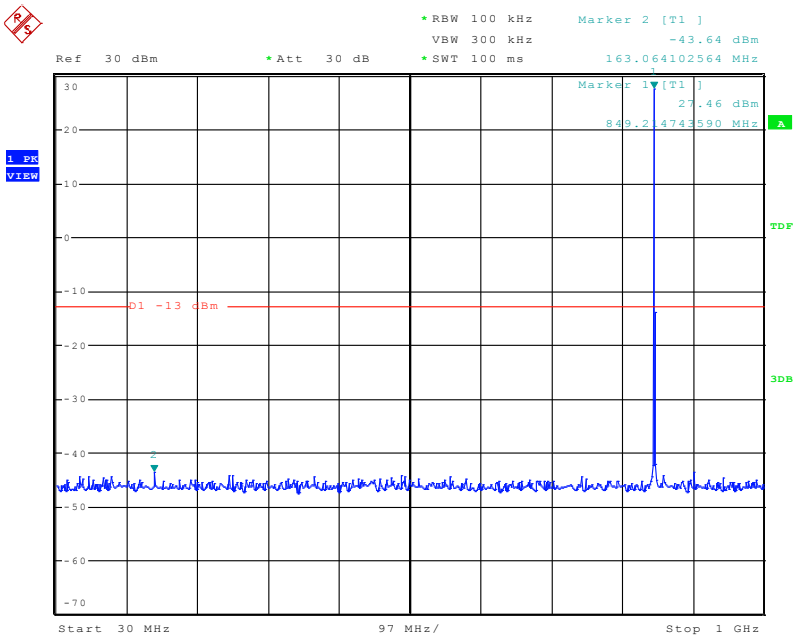
Conducted Emission Transmitting Mode CH 190 30MHz – 1GHz



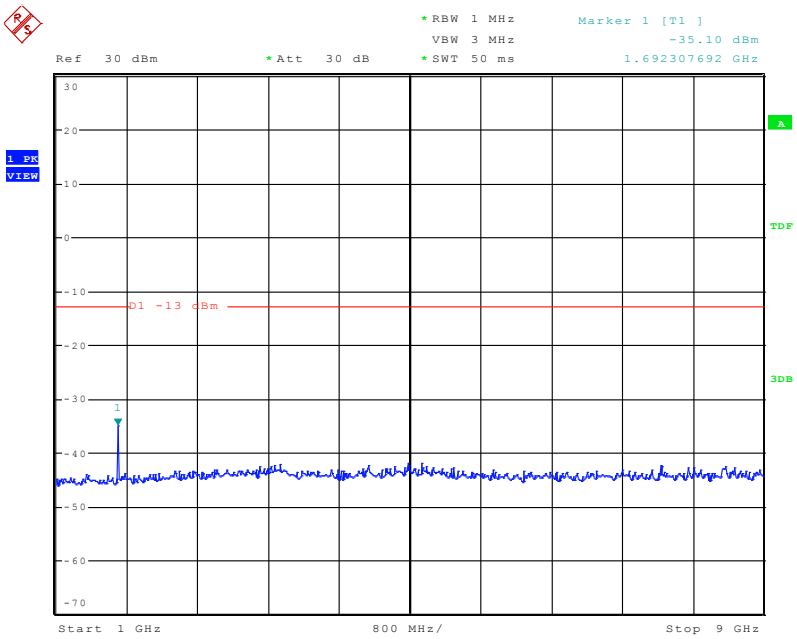
Conducted Emission Transmitting Mode CH 190 1GHz – 9GHz



Conducted Emission Transmitting Mode CH 251 30MHz – 1GHz

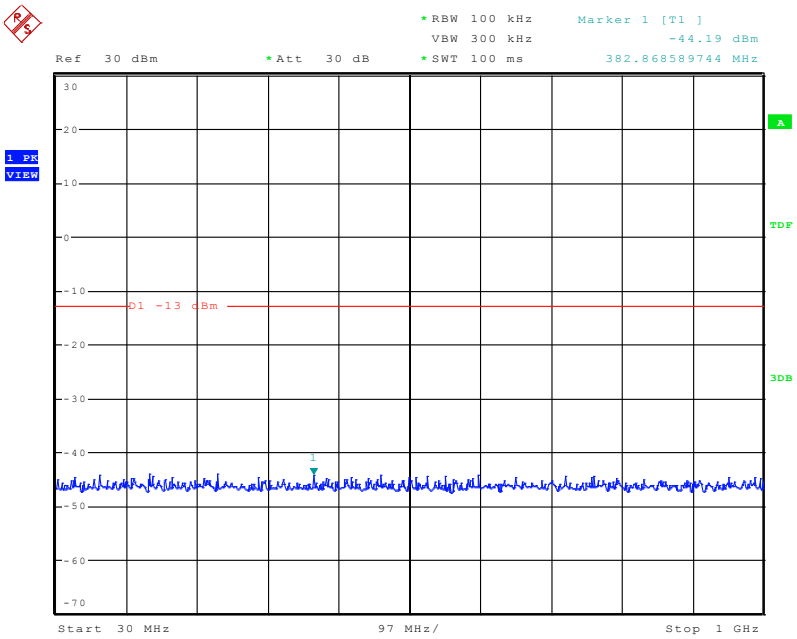


Conducted Emission Transmitting Mode CH 251 1GHz – 9GHz

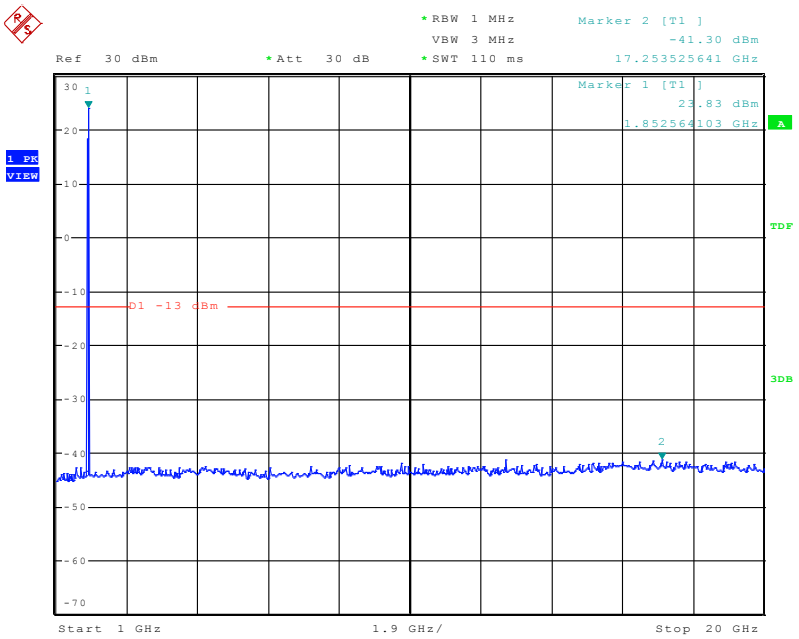


CONDUCTED EMISSION IN PCS1900 BAND

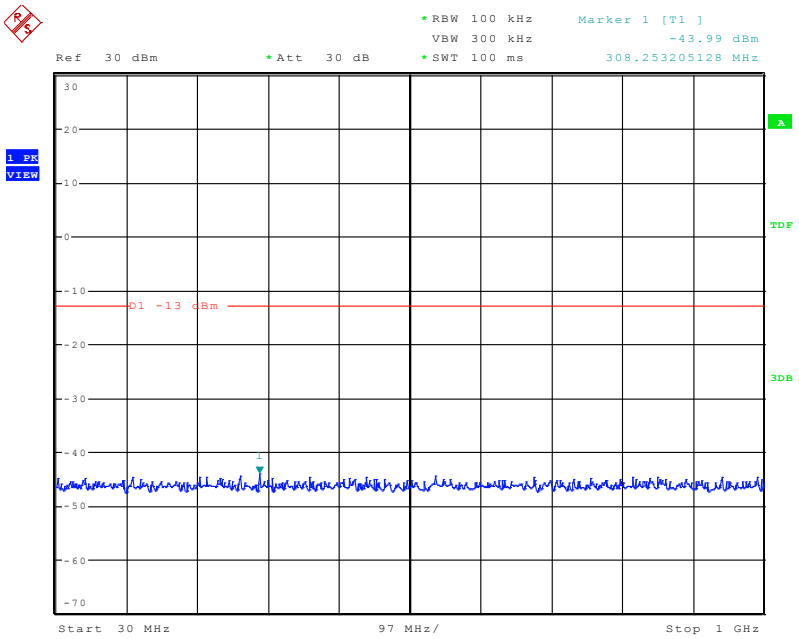
Conducted Emission Transmitting Mode CH 512 30MHz – 1GHz



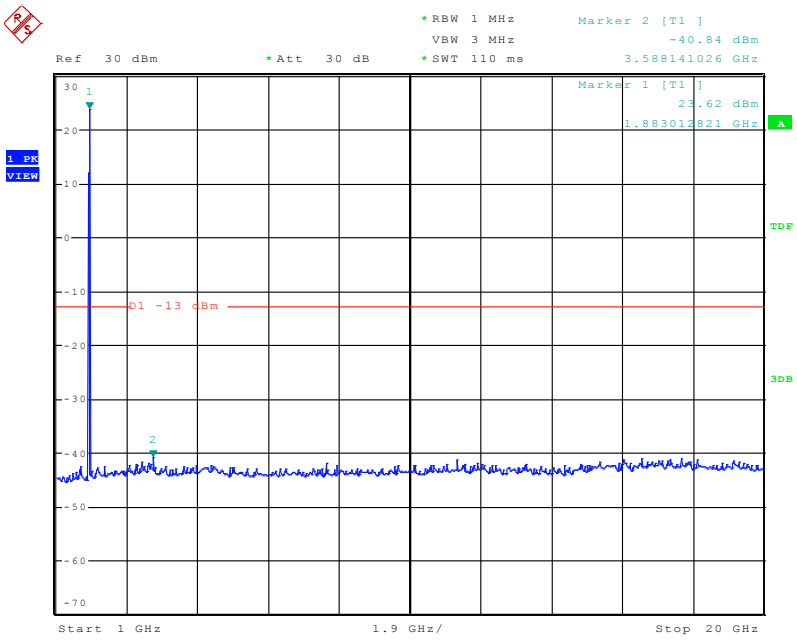
Conducted Emission Transmitting Mode CH 512 1GHz – 20GHz



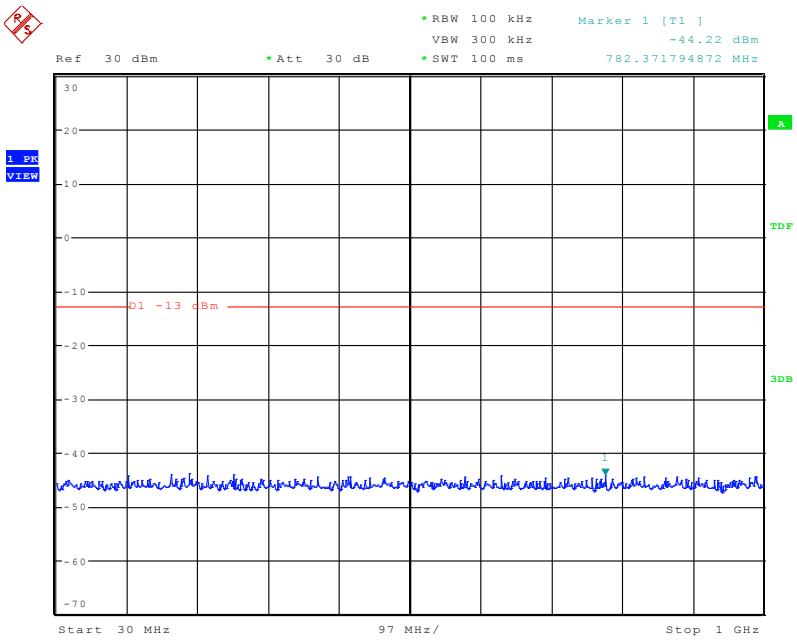
Conducted Emission Transmitting Mode CH 661 30MHz – 1GHz



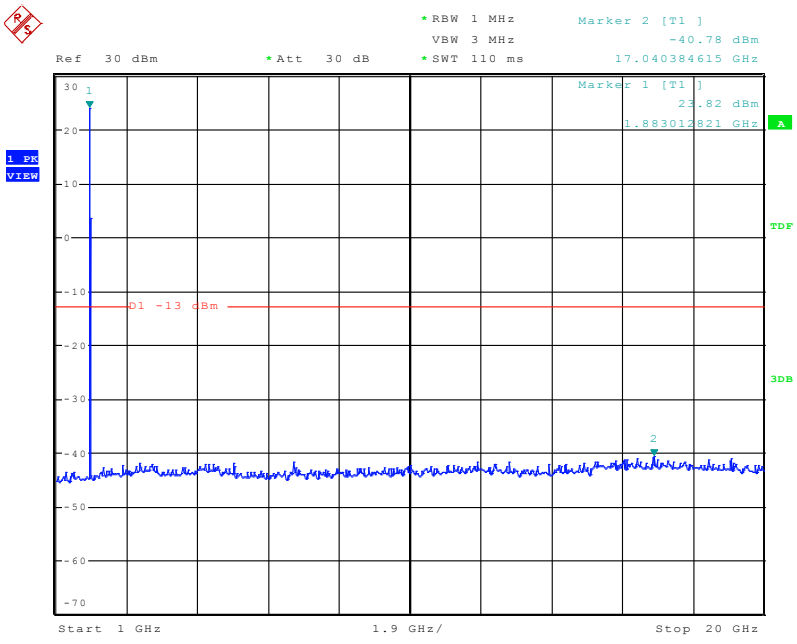
Conducted Emission Transmitting Mode CH 661 1GHz – 20GHz



Conducted Emission Transmitting Mode CH 810 30MHz – 1GHz



Conducted Emission Transmitting Mode CH 810 1GHz – 20GHz



6.1.1 Radiated method

Test limit:

The spurious (unwanted) emission limits specified in the individual FCC rule parts applicable to licensed digital transmitters (typically referred to under the heading 'emission limits') normally apply to any and all emissions that are present outside of the authorized frequency band/block and apply to emissions in both the out-of-band and spurious domains. In some rule parts, the unwanted emission limits are specified by an emission mask that defines the applicable limit as a function of the frequency range relative to the authorized frequency block.

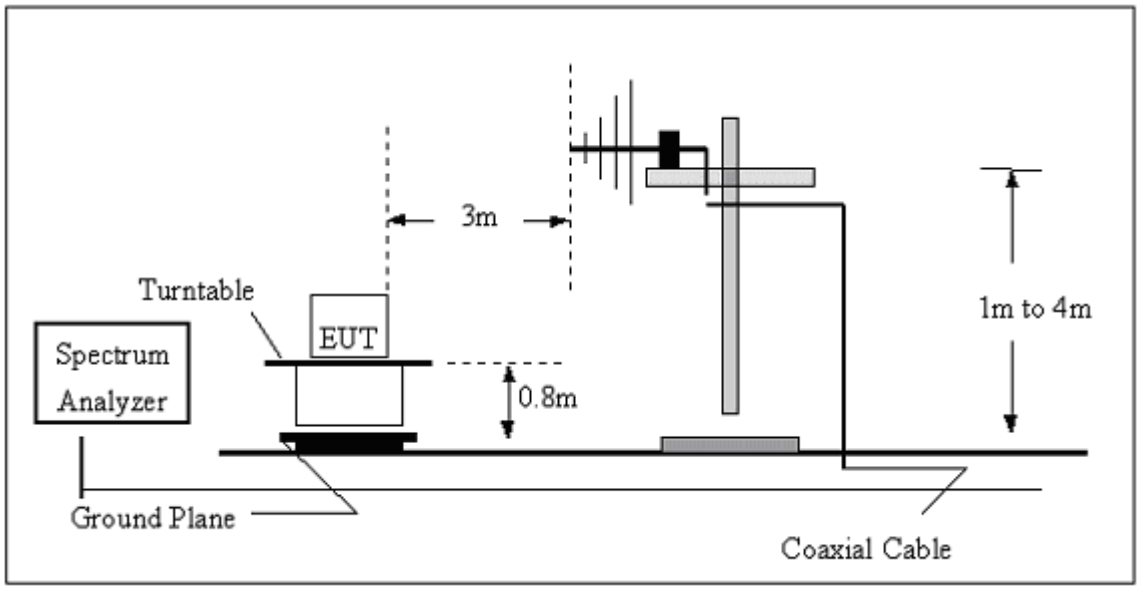
Typically, unwanted emissions are required by the licensed rule parts to be attenuated below the transmitter power by a factor of at least X + 10log(P) dB, where P represents the transmitter power expressed in watts and X is a specified scalar value (e.g., 43). This specification can be interpreted in one of two equivalent ways. First, the required attenuation can be construed to be relative to the mean carrier power, with the resultant of the equation X + 10log(P) being expressed in dBc (dB relative to the maximum carrier power). Alternatively, the specification can be interpreted as an absolute limit when the specified attenuation is actually subtracted from the maximum permissible transmitter power [i.e., 10log(P) – {X + 10log(P)}], resulting in an absolute level of -X dBW [or (-X + 30) dBm]. See section 4.

Test procedure:

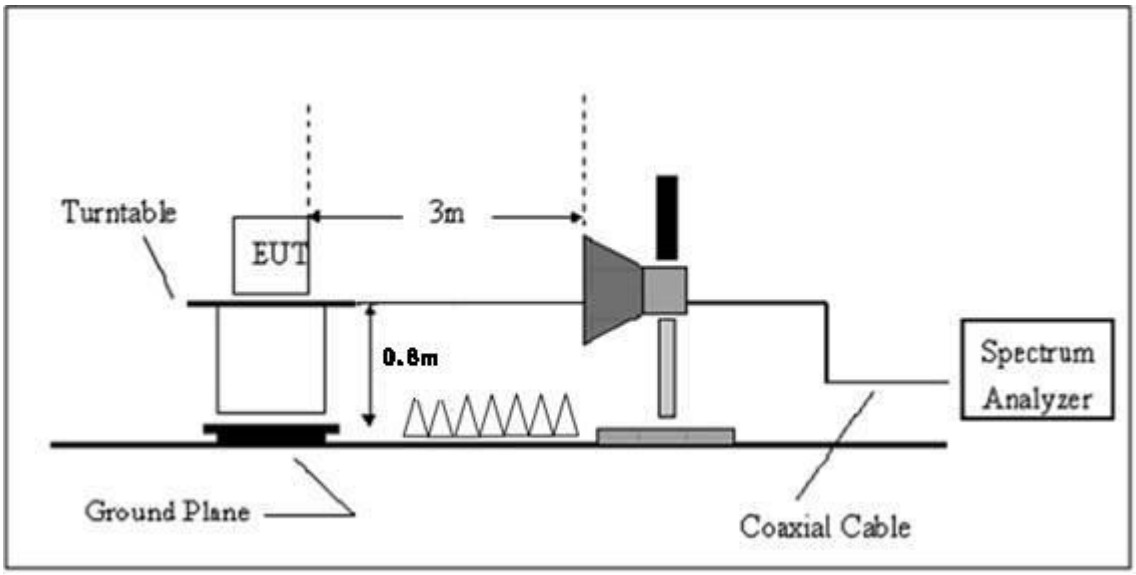
The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site. The resolution bandwidth of the spectrum analyzer was set at 100 kHz below 1 GHz and 1 MHz above 1 GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonics.

Test setup:

（A）Radiated Emission Test-Up Frequency 30MHz~1GHz



（B）Radiated Emission Test-Up Frequency Above 1GHz



Note:

1*, Below 30MHz no Spurious found.*

2, UE is poistioned at 3 axis at the pre-scan stage, and only the measurement of the worst case is reported in this part.

List of final test modes:

GSM850:

Mode	UL Channel	Frequency	Judgement
1	128	824.2	Pass
2	190	836.6	Pass
3	251	848.8	Pass

PCS1900

Mode	UL Channel	Frequency	Judgement
1	512	1850.2	Pass
2	661	1880	Pass
3	810	1909.8	Pass

Test record:

Note:

1. 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}

2. A_{Rpl} =Cable loss + Antenna gain

GSM850:

Mode 1					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dB)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1648.4	-28.04	2.52	-30.56	-13	Horizontal
1648.4	-34.75	2.52	-37.27	-13	Vertical
2472.6	-30.35	2.52	-32.87	-13	Horizontal
2472.6	-37.12	2.52	-39.64	-13	Vertical

Mode 2					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dB)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1673.2	-31.93	2.52	-34.45	-13	Horizontal
1673.2	-32.90	2.52	-35.42	-13	Vertical
2509.8	-34.43	2.52	-36.95	-13	Horizontal
2509.8	-37.42	2.52	-39.94	-13	Vertical

Mode 3					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dB)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1697.6	-36.43	2.52	-38.95	-13	Horizontal
1697.6	-30.06	2.52	-32.58	-13	Vertical
2546.4	-28.21	2.52	-30.73	-13	Horizontal
2546.4	-32.84	2.52	-35.36	-13	Vertical

PCS1900:

Mode 1					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dB)	P_{Mea}(dBm)	Limit（dBm）	Polarity
3700.4	-30.73	2.52	-33.25	-13	Horizontal
3700.4	-36.24	2.52	-38.76	-13	Vertical
5550.6	-33.94	2.52	-36.46	-13	Horizontal
5550.6	-34.53	2.52	-37.05	-13	Vertical

Mode 2					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dB)	P_{Mea}(dBm)	Limit（dBm）	Polarity
3760	-33.81	2.52	-36.33	-13	Horizontal
3760	-30.74	2.52	-33.26	-13	Vertical
5640	-36.45	2.52	-38.97	-13	Horizontal
5640	-37.28	2.52	-39.80	-13	Vertical

Mode 3					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dB)	P_{Mea}(dBm)	Limit（dBm）	Polarity
3819.6	-32.48	2.52	-35.00	-13	Horizontal
3819.6	-37.09	2.52	-39.61	-13	Vertical
5729.4	-28.17	2.52	-30.69	-13	Horizontal
5729.4	-34.80	2.52	-37.32	-13	Vertical

7 FREQUENCY STABILITY

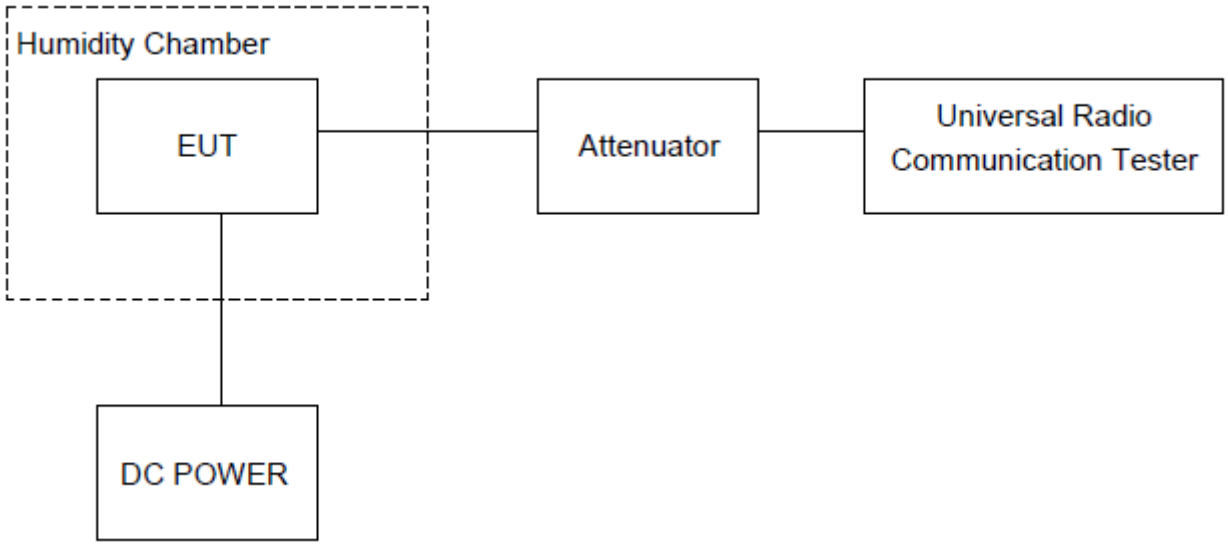
Test limit:

The frequency stability of the transmitter shall be measured while varying the ambient temperatures and supply voltages over the ranges specified in §2.1055. The specific frequency stability limits are provided in the relevant rules section(s). see section 4.

Test procedure:

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

Test setup:



7.1 Measurement Result（Worst）

Frequency Error against Voltage for GSM 850 band (Mid channel)

Voltage(V)	Frequency error(Hz)	Frequency error (ppm)
3.45	36	0.043
3.7	33	0.039
4.2	28	0.034

Frequency Error against Temperature for GSM 850 band (Mid channel)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	32	0.038
0	39	0.047
10	33	0.039
20	39	0.047
30	36	0.043
40	28	0.034
50	36	0.043

Frequency Error against Voltage for PCS 1900 band (Mid channel)

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.45	28	0.015
3.7	35	0.019
4.2	30	0.016

Frequency Error against Temperature for PCS 1900 band (Mid channel)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	37	0.020
0	36	0.019
10	40	0.021
20	37	0.020
30	29	0.015
40	29	0.015
50	37	0.020

Frequency Error against Voltage for GPRS 850 band (Mid channel)

Voltage(V)	Frequency error(Hz)	Frequency error (ppm)
3.45	33	0.040
3.7	40	0.048
4.2	39	0.047

Frequency Error against Temperature for GPRS 850 band (Mid channel)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	40	0.047
0	40	0.048
10	33	0.039
20	39	0.047
30	34	0.040
40	40	0.047
50	35	0.042

Frequency Error against Voltage for GPRS 1900 band (Mid channel)

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
3.45	30	0.016
3.7	32	0.017
4.2	34	0.018

Frequency Error against Temperature for GPRS 1900 band (Mid channel)

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	41	0.022
0	35	0.018
10	32	0.017
20	38	0.020
30	41	0.022
40	33	0.018
50	36	0.019

8 OCCUPIED BANDWIDTH& Emission Bandwidth

Test limit:

The occupied bandwidth (OBW), that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission, shall be measured when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user. [¡ì2.1049(h)]

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

The relative OBW must be measured and reported when it is specified in the applicable rule part; otherwise, the 99% OBW shall be measured and reported. The test report shall specify which OBW is reported.

A spectrum/signal analyzer or other instrument providing a spectral display is recommended for these measurements and the video bandwidth shall be set to a value at least three times greater than the IF/resolution bandwidth to avoid any amplitude smoothing. Video filtering shall not be used during occupied bandwidth tests.

The OBW shall be measured for all operating conditions that will affect the bandwidth results (e.g. variable modulations, coding, or channel bandwidth settings). See section 4.

Test procedure:

Occupied bandwidth – relative measurement procedure

The reference value is the highest level of the spectral envelope of the modulated signal.

a) 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.

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

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

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

e) The dynamic range of the spectrum analyzer at the selected RBW shall be at least 10 dB below the target “-X dB down” requirement (i.e., if the requirement calls for measuring the –26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference value).

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

g) 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).

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

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

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

Occupied bandwidth – power bandwidth (99%) measurement procedure

The following procedure shall be used for measuring (99 %) power bandwidth

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

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

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

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

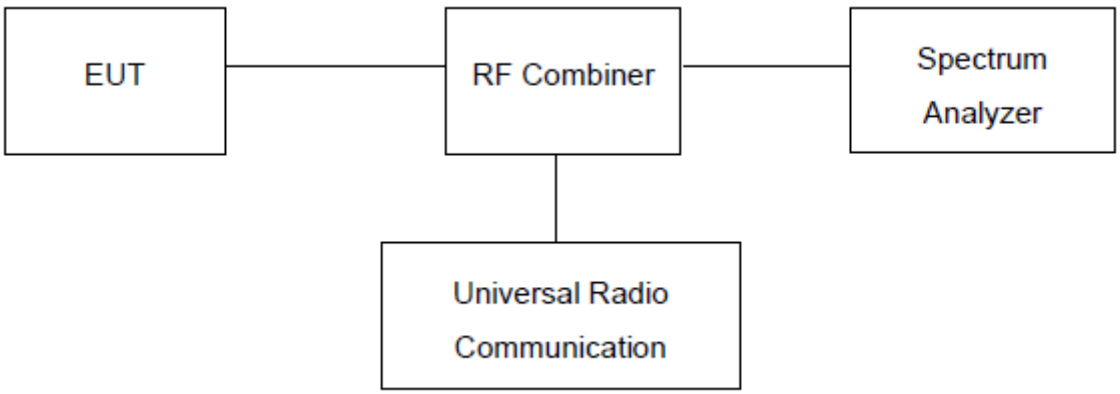
e) Set the detection mode to peak, and the trace mode to max hold..

f) Use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.

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

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

Test setup:



8.1 Measurement Result

GSM850:

Frequency	OBW(99%)	26dB BW
824.2	246.79KHz	320.83KHz
836.6	245.19KHz	314.42KHz
848.8	243.59KHz	318.91KHz

PCS1900:

Frequency	OBW(99%)	26dB BW
1850.2	243.59KHz	310.58KHz
1880	245.19KHz	311.22KHz
1909.8	246.79KHz	313.46KHz

GPRS850:

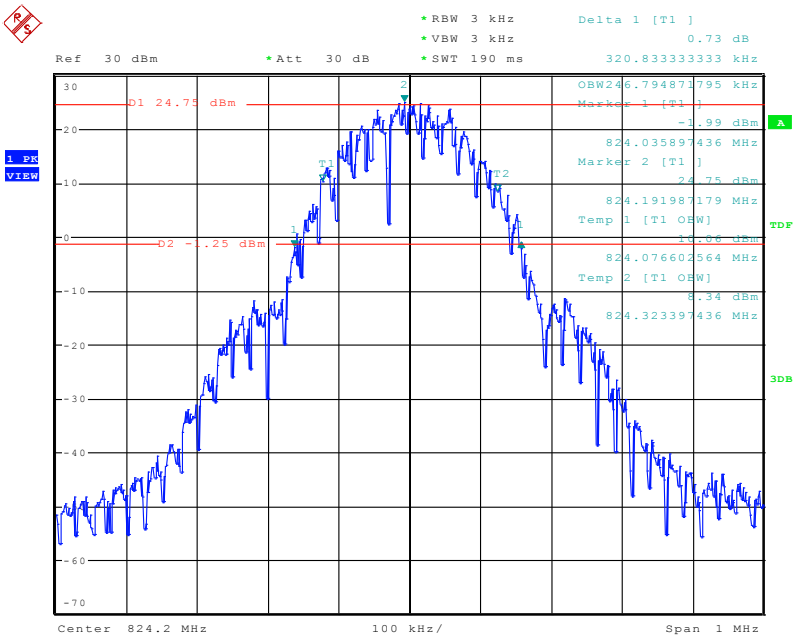
Frequency	OBW(99%)	26dB BW
824.2	246.80KHz	321.47KHz
836.6	246.80KHz	316.99KHz
848.8	248.40KHz	320.19KHz

GPRS 1900:

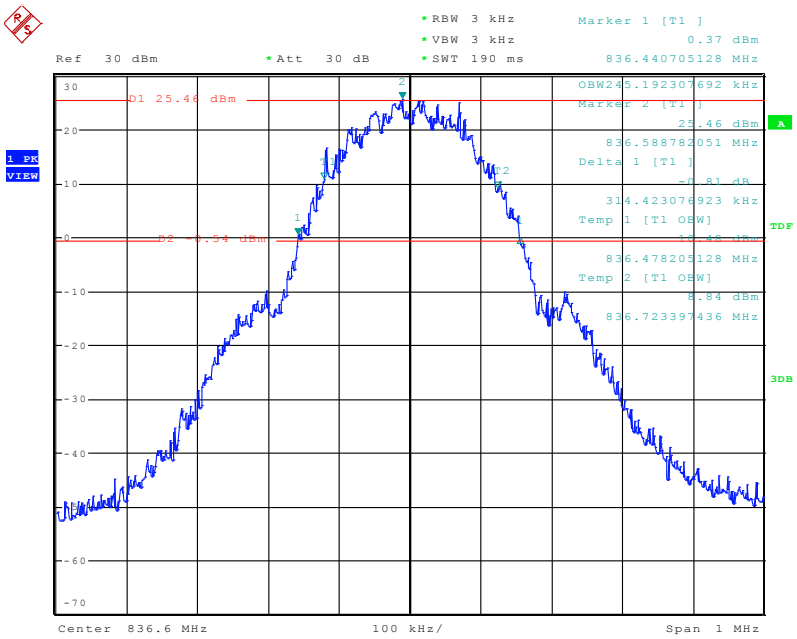
Frequency	OBW(99%)	26dB BW
1850.2	245.19KHz	316.67KHz
1880	245.19KHz	317.63KHz
1909.8	245.19KHz	317.63KHz

8.2 Test Plot(s)

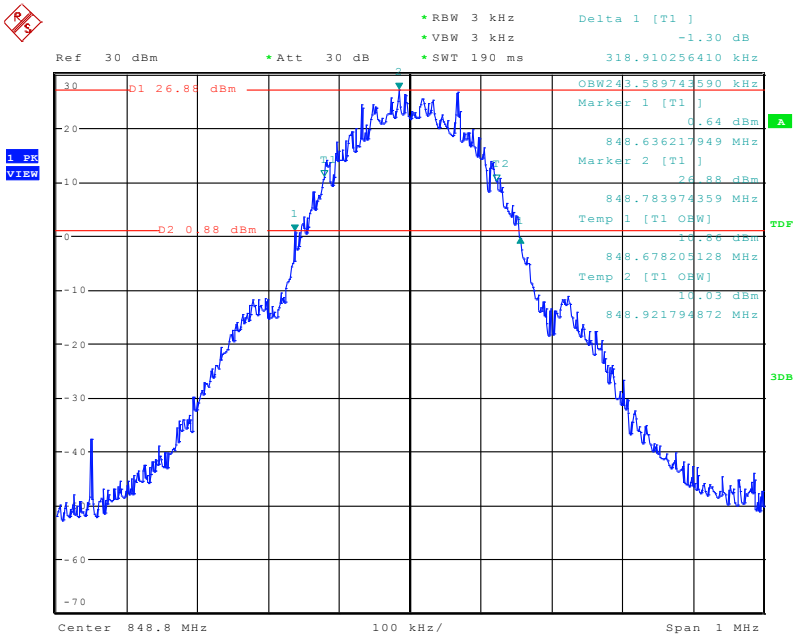
Occupied Bandwidth (99% and -26dBc) GSM 850 BAND CH 128



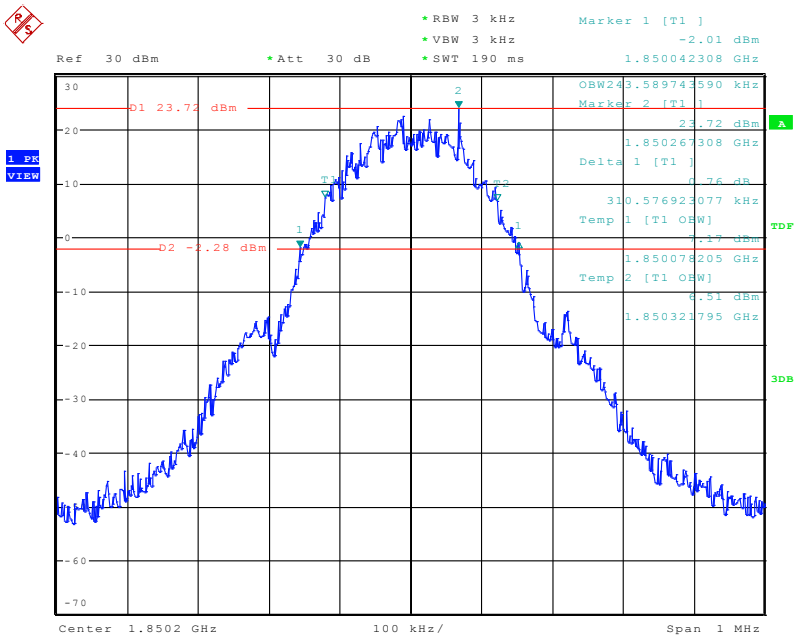
Occupied Bandwidth (99% and -26dBc) GSM 850 BAND CH 190



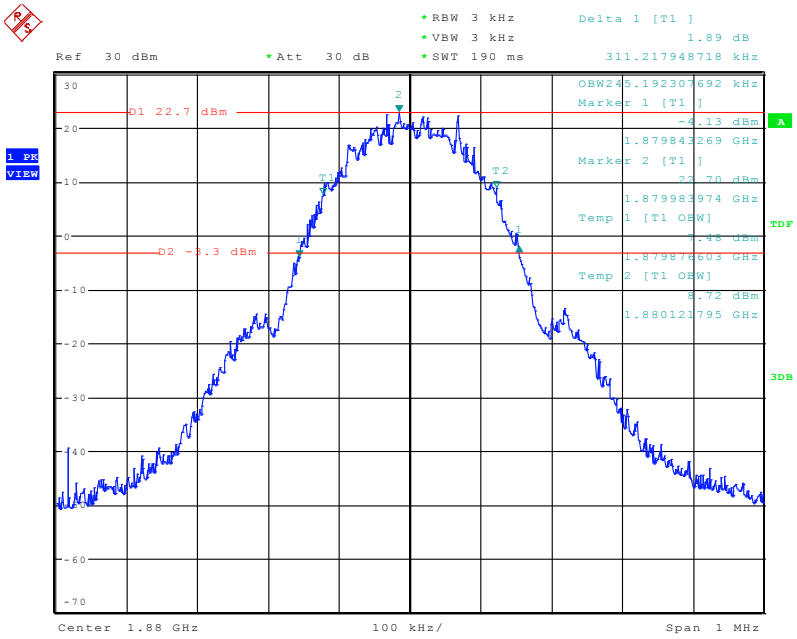
Occupied Bandwidth (99% and -26dBc) GSM 850 BAND CH 251



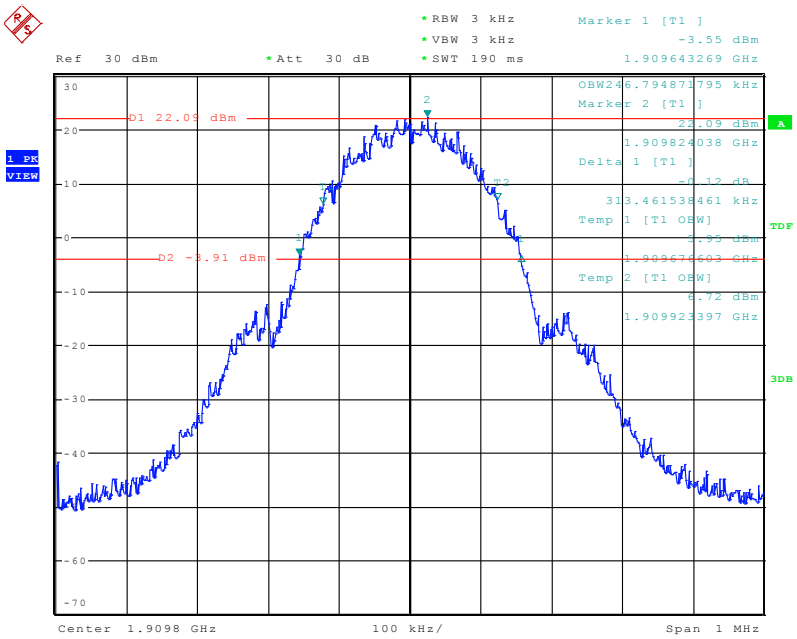
Occupied Bandwidth (99% and -26dBc) GSM 1900 BAND CH 512



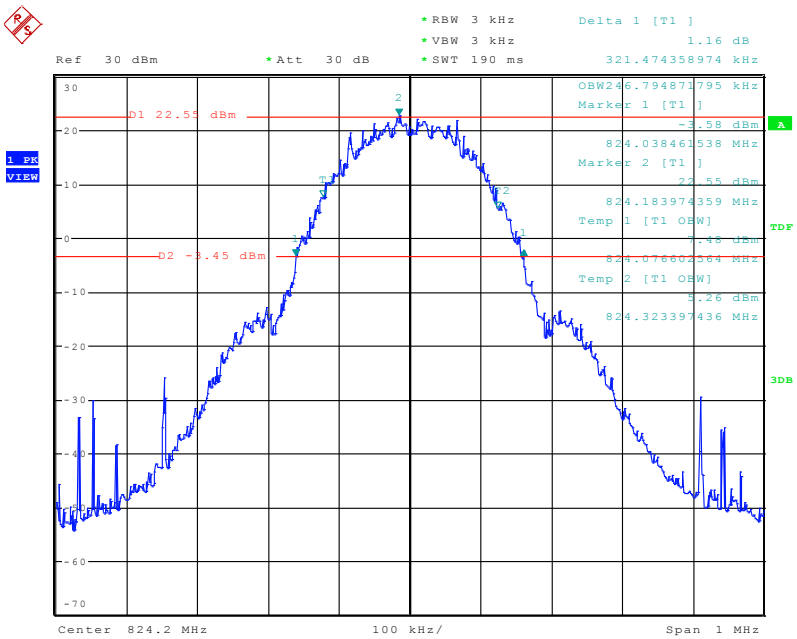
Occupied Bandwidth (99% and -26dBc) PCS 1900 BAND CH 661



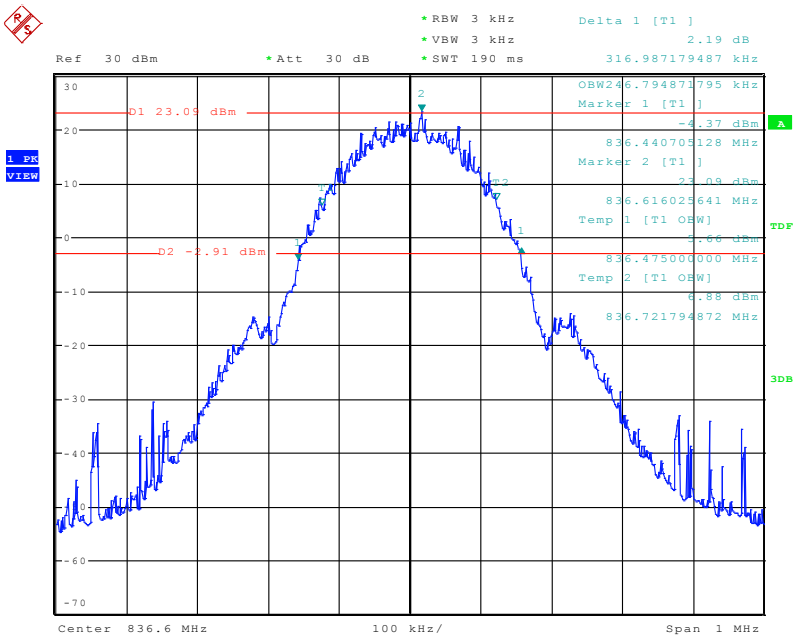
Occupied Bandwidth (99% and -26dBc) PCS 1900 BAND CH 810



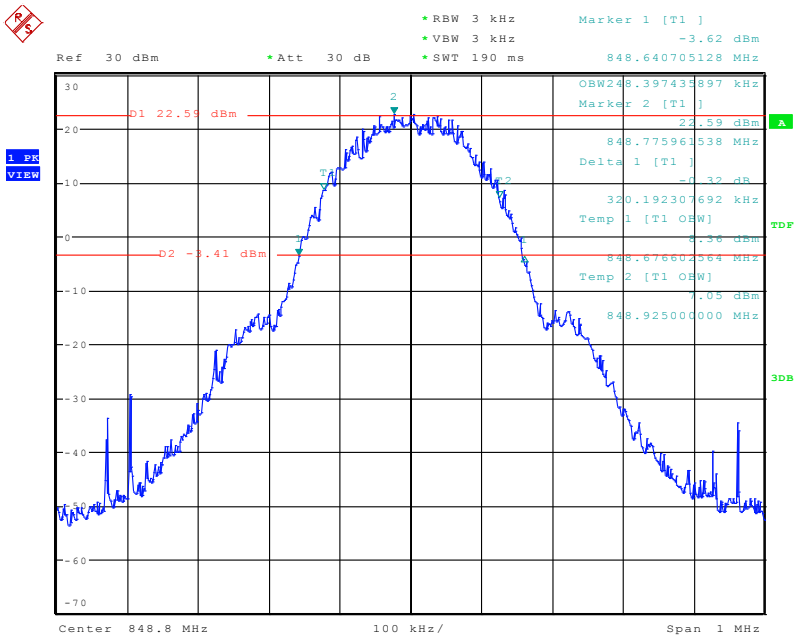
Occupied Bandwidth (99% and -26dBc) GPRS 850 BAND CH 128



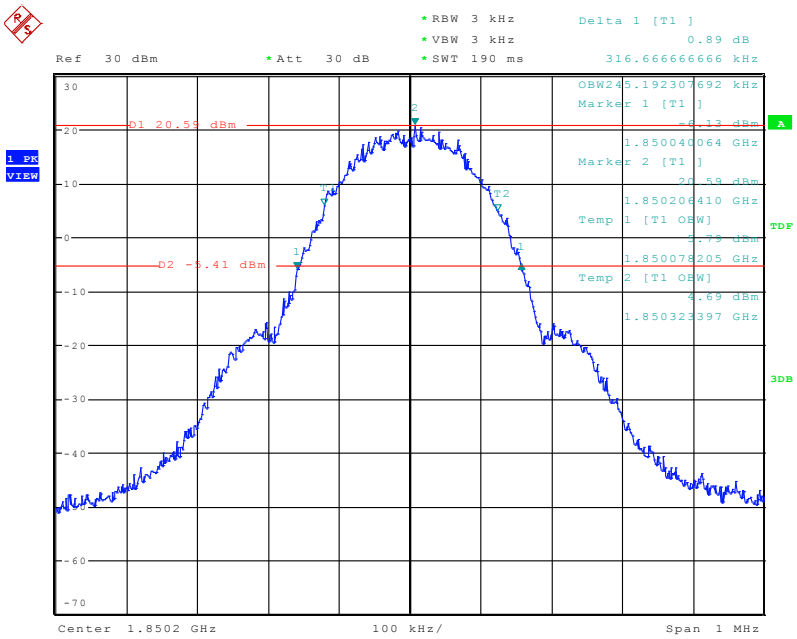
Occupied Bandwidth (99% and -26dBc) GPRS 850 BAND CH 190



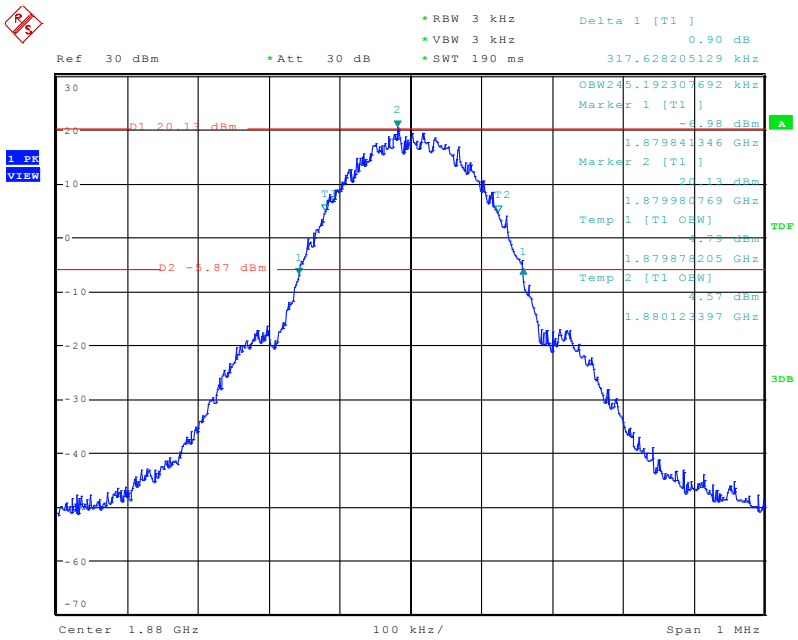
Occupied Bandwidth (99% and -26dBc) GPRS 850 BAND CH 251



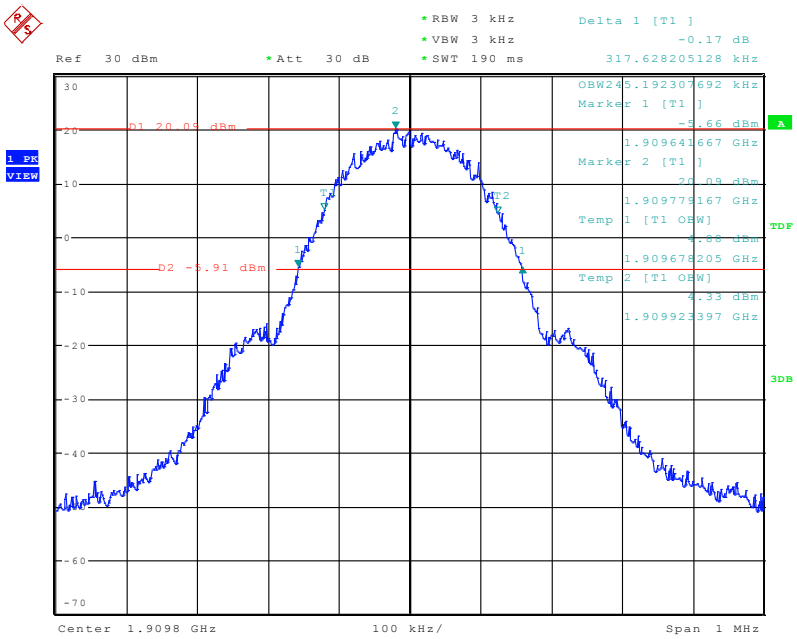
Occupied Bandwidth (99% and -26dBc) GPRS 1900 BAND CH 512



Occupied Bandwidth (99% and -26dBc) GPRS 1900 BAND CH 661



Occupied Bandwidth (99% and -26dBc) GPRS 1900 BAND CH 810



9 BAND EDGE

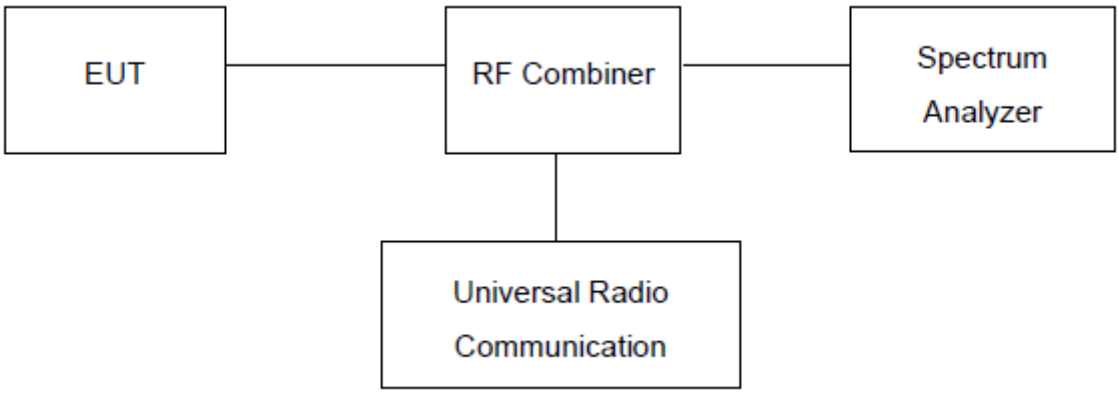
Test Limit:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show th e magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the con ditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below t he permissible value need not be specified. See section 4.

Test procedure:

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

Test setup:



9.1 Measurement Result

GSM850:

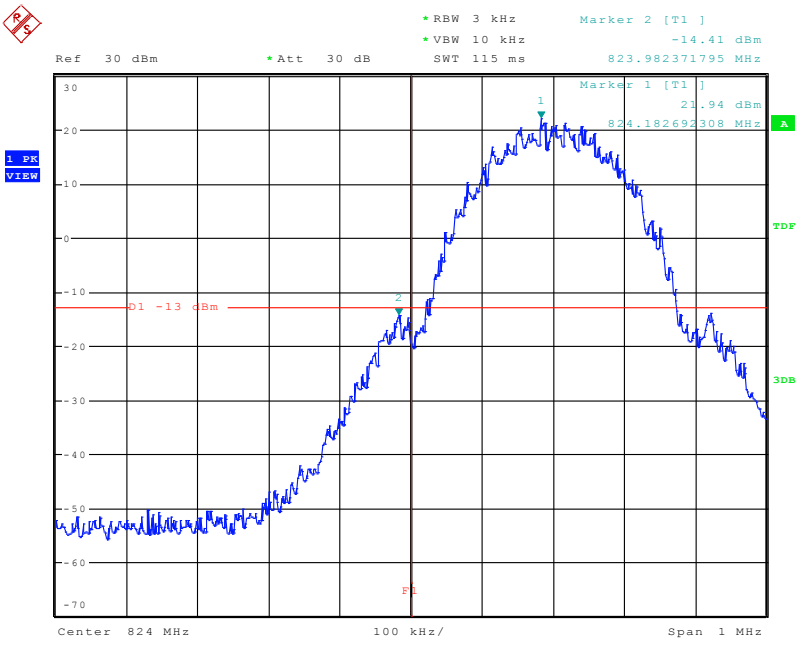
Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgement
Low Range	0.2	128	824.2	Pass
High Range	0.2	251	848.8	Pass

PCS 1900：

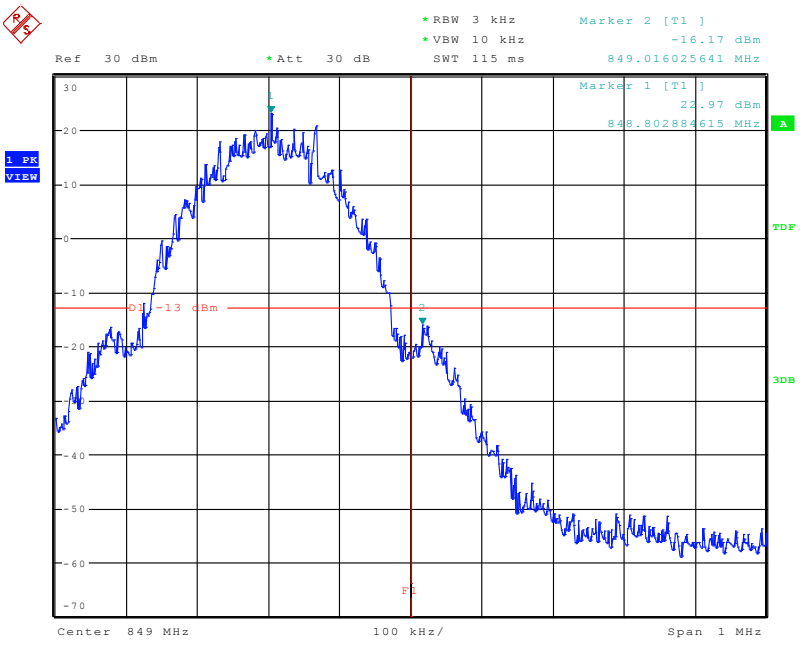
Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgement
Low Range	0.2	512	1850.2	Pass
High Range	0.2	810	1909.8	Pass

9.1 Test Plot(s)

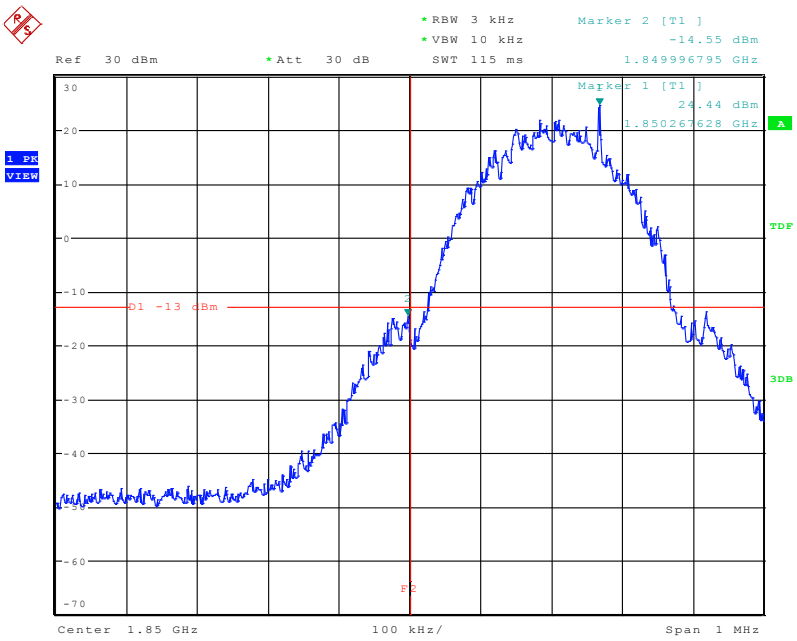
Low Band Edge GSM 850 BAND CH 128



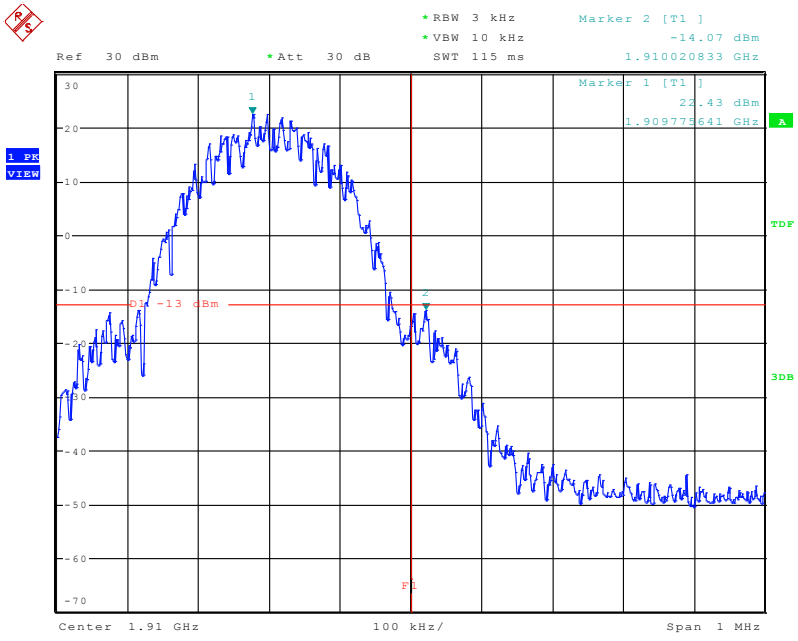
High Band Edge GSM 850 BAND CH 251



Low Band Edge PCS 1900 BAND CH 512

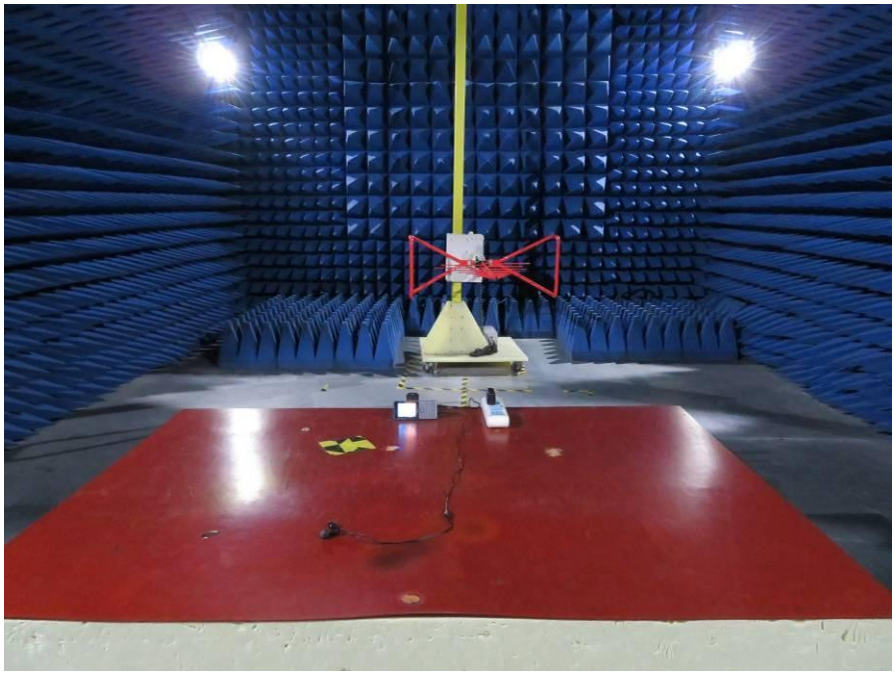


High Band Edge PCS 1900 BAND CH 810

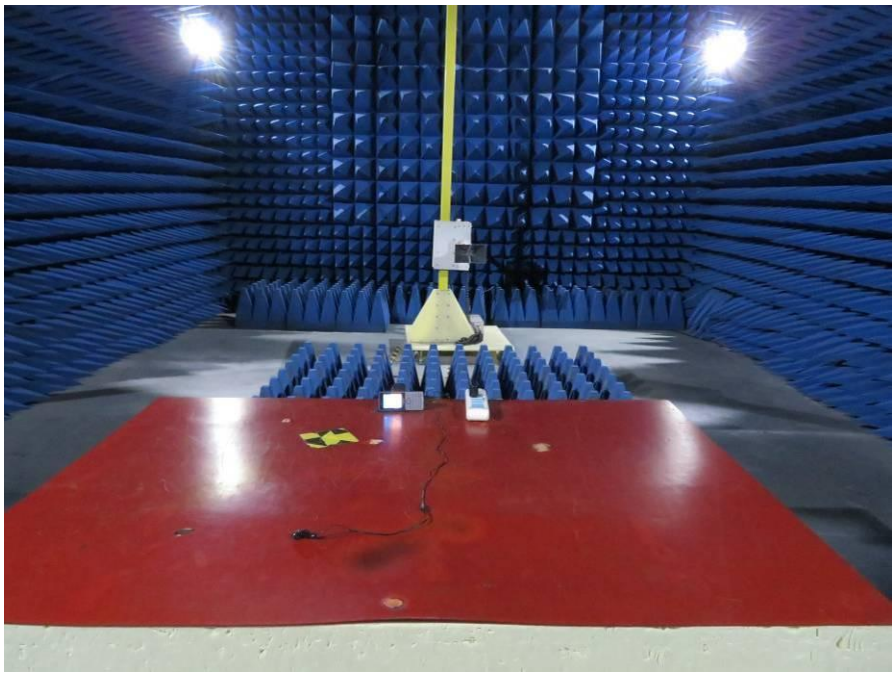


10 EUT TEST PHOTO

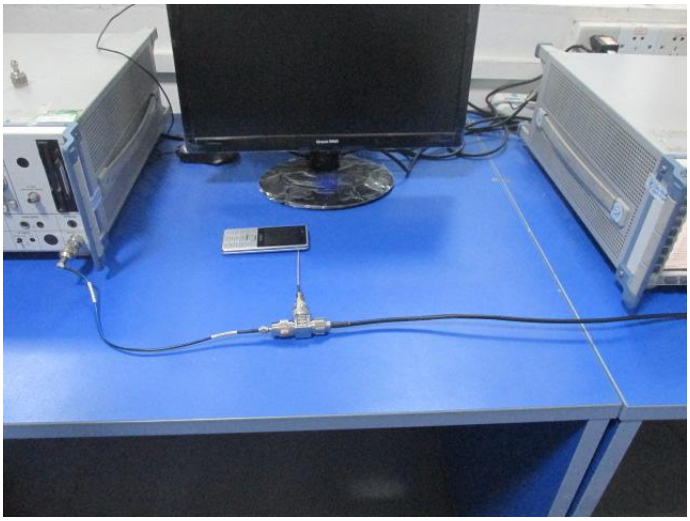
RADIATED EMISSION TEST



RADIATED EMISSION TEST



RF TEST



11 EUT PHOTO

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

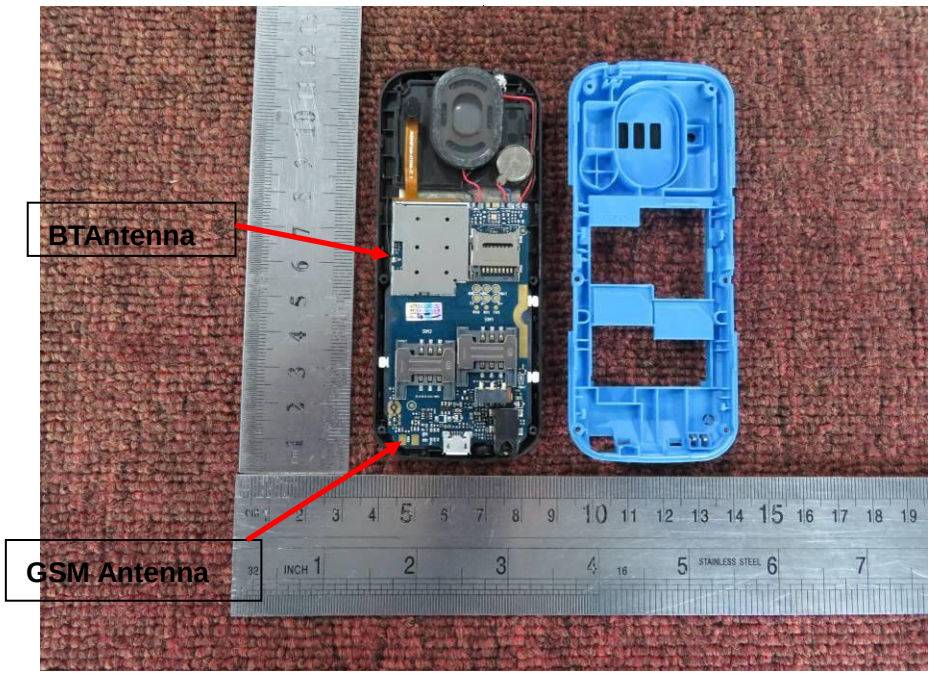
Internal photograph of EUT

Internal photograph of EUT

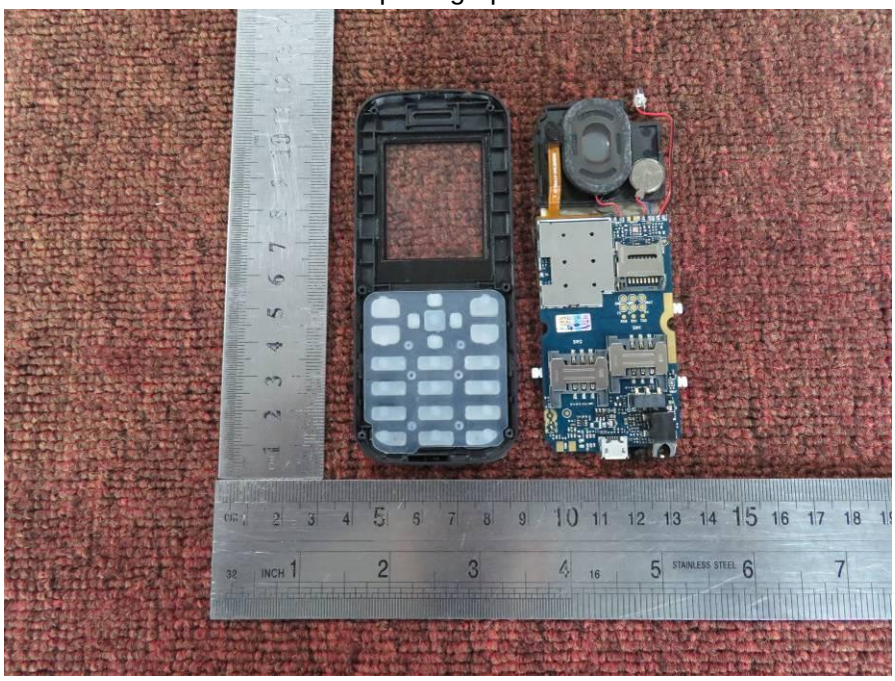
Internal photograph of EUT

Internal photograph of EUT

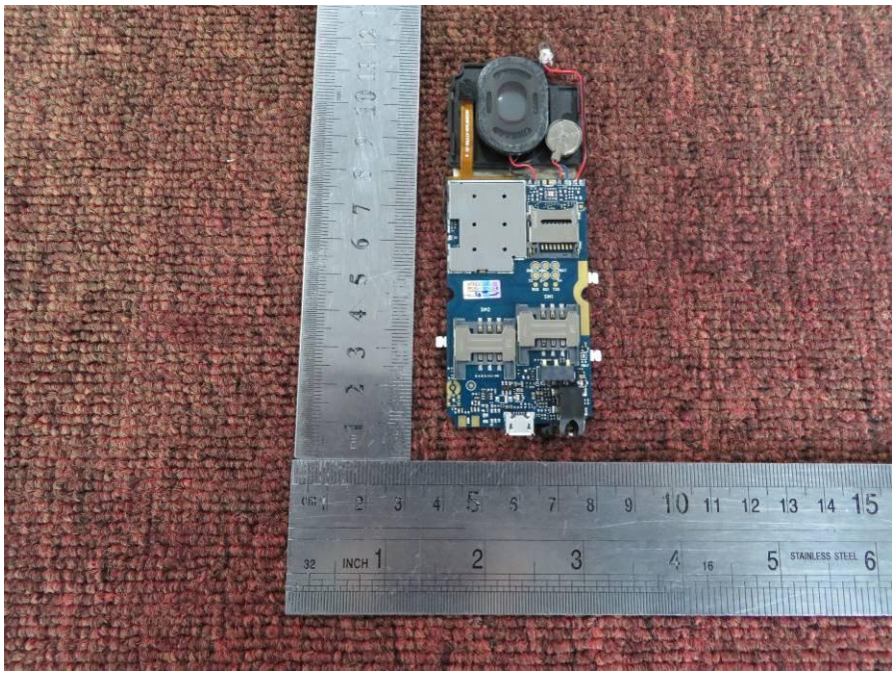
Internal photograph of EUT



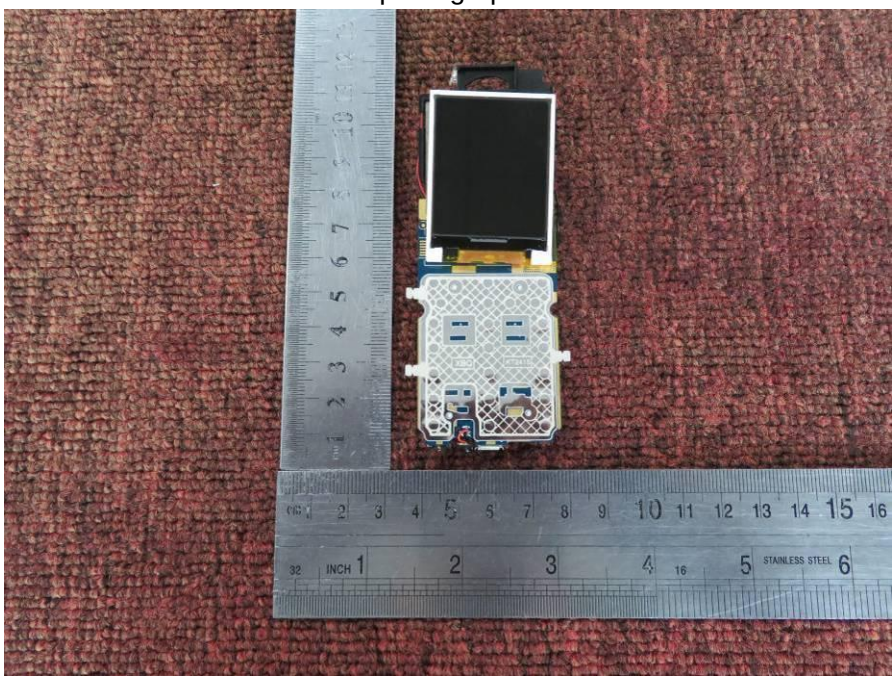
Internal photograph of EUT



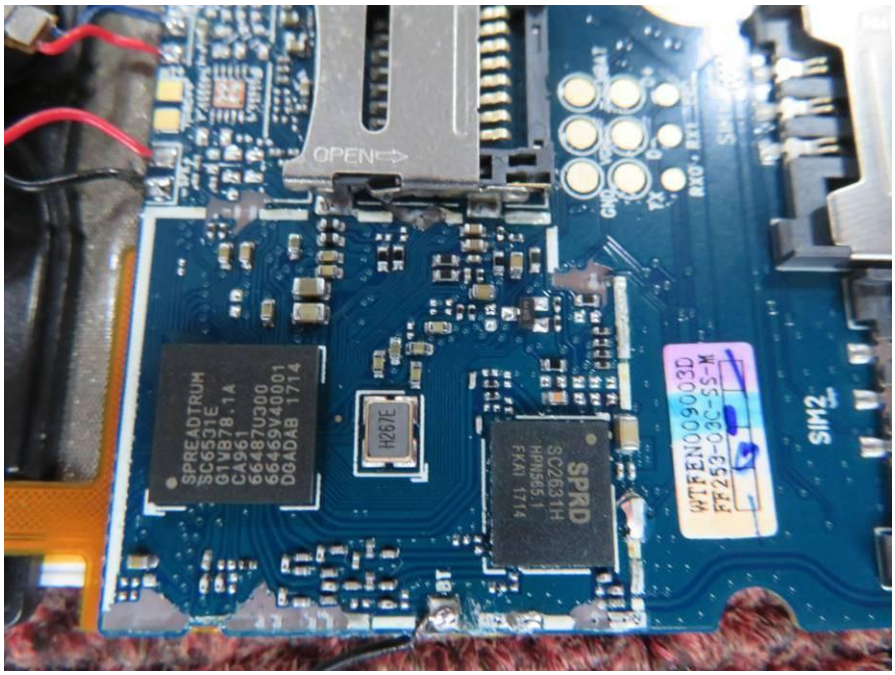
Internal photograph of EUT



Internal photograph of EUT



Internal photograph of EUT



---END OF REPORT---