FCC Test Report

Application Purpose	:	Original grant
Applicant Name:	:	Jiangxi Jade IOT-Sensing Technology Co., Ltd
FCC ID	:	2ALRU-JD-GP11
Equipment Type	:	Control Panel
Model Name	:	JD-GP11
Report Number	:	FCC17030205A-2
Standard(S)	:	FCC Part 22H & 24E Rules
Date Of Receipt	:	March 24, 2017
Date Of Issue	:	April 24, 2017
Test By	:	Dekun Liu *(Daisy Qin)*
Reviewed By	:	Sol Qin *(Sol Qin)*
Authorized by	:	 *(Michal Ling)*
Prepared by	:	**QTC Certification & Testing Co., Ltd.** 2nd Floor,B1 Buiding,Fengyeyuan Industrial Plant,,Liuxian 2st.Road,Xin'an Street,Bao'an District,,Shenzhen, 518000China. **Registration Number: 588523**

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	April 24, 2017	Valid	Original Report

TABLE OF CONTENTS

1. CERTIFICATION

Applicant	Jiangxi Jade IOT-Sensing Technology Co., Ltd
Address	Jade Industrial Park,Gantong Street No.109,Ganzhou economic development district,Ganzhou City,Jiangxi Province,China.
Manufacturer	Jiangxi Jade IOT-Sensing Technology Co., Ltd
Address	Jade Industrial Park,Gantong Street No.109,Ganzhou economic development district,Ganzhou City,Jiangxi Province,China.
Equipment Type	Control Panel
Brand Name	JADE
Test Model	JD-GP11
Hardware version:	V1.0
Software version:	V1.0
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 D(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. GENERAL INFORMATION

2.1.EUT Description

Equipment Type:	Control Panel
Hardware version:	V1.0
Software version:	V1.0
Frequency Bands:	☒GPRS 850 ☒PCS 1900 (U.S. Bands)
Antenna Type:	Internal Antenna
Antenna gain:	3dBi
Battery information:	Lithium ion batteries : GN 628064 Capacity:1800mAh Voltage: 7.4V
Adapter Information:	Adapter: LY012SPS-120100UH Input: AC 100~240V 50/60Hz 0.35A Output: DC 12V⎓1A
Card(S):	Card : UMTS Card Slot
Max power:	See note 6
GPRS Class:	12
Extreme Temp. Tolerance	-10℃ to +55℃

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

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

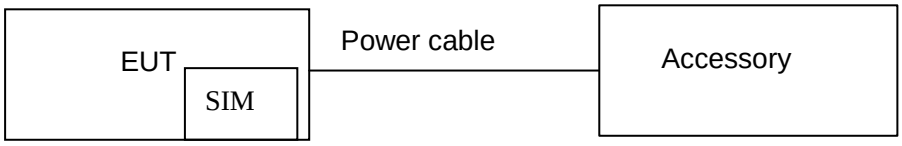


Table 3.2-1 Equipment Used in EUT System

Item	Equipment	Model No.	ID or Specification	Note
1	Control Panel	JD-GP11	2ALRU-JD-GP11	EUT
2	DC SOURCE	LY012SPS-120100UH	Series: 2008006875	Power supply

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

3.2.Description Of Test Channels And 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 following frequency band(s).

Test channels:

Band	Channel		Frequency (MHz)
GPRS850	Low	128	824.2
	Middle	190	836.6
	High	251	848.8

Band	Channel		Frequency (MHz)
PCS1900	Low	512	1850.2
	Middle	661	1880
	High	810	1909.8

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

3.3.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

GPRS850：

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

5. 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
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI	101139	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
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
Cable	TIME MICROWAVE	LMR-400	N-TYPE04	04/25/2016	04/24/2017
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
Horn Antenna	SCHWARZBECK	BBHA 9170	1123	08/19/2016	08/18/2017
Three-way connector	Weinschel	1506A	A1213	08/19/2016	08/18/2017
Attenuator	MCL	BW-W40W5+	1306	08/19/2016	08/18/2017
Signal generator	Agilent	8920B	VS36141817	08/19/2016	08/18/2017
Power amplifier	rflight	NTWPA-00810150100E	13103205	08/19/2016	08/18/2017
Power amplifier	rflight	NTWPA-1060040E	13104214	08/19/2016	08/18/2017
Bi-log Antenna	A.H. Systems Inc.	SAS-522-3	1326	08/21/2016	08/20/2017

6. 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.

Measurement Result

Conducted Output Power Limits for GPRS 850 band		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
GPRS850	30 dBm (2W)	+/- 1
Conducted Output Power Limits for PCS1900 band		
Mode	**Nominal Peak Power**	**Tolerance(dB)**
PCS1900	27 dBm (1W)	+/- 1

GPRS 850:

Card 1:

Mode	Frequency (MHz)	Peak Power (dBm)	Avg. Burst Power (dBm)	PAPR (dB)	Duty cycle Factor(dB)	Frame Power(dBm)
GPRS850	824.2	30.25	29.79	0.46	-9	20.79
	836.6	30.11	**29.94**	0.17	-9	20.94
	848.8	**30.41**	29.63	0.78	-9	20.63

PCS 1900:

Card 1:

Mode	Frequency (MHz)	Peak Power (dBm)	Avg. Burst Power (dBm)	PAPR (dB)	Duty cycle Factor(dB)	Frame Power (dBm)
GPRS1900	1850.2	27.22	26.72	0.50	-9	17.72
	1880	27.23	26.64	0.59	-9	17.64
	1909.8	**27.41**	**26.78**	0.63	-9	17.78

Radiated Power (ERP) for GSM 850 MHZ				
Mode	Frequency	Result		Conclusion
		Max. Peak ERP (dBm)	Polarization Of Max. ERP	
GPRS850	824.2	29.34	Horizontal	Pass
	836.6	29.42	Horizontal	Pass
	848.8	29.62	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.	
GPRS1900	1850.2	26.18	Horizontal	Pass
	1880.0	26.29	Horizontal	Pass
	1909.8	26.43	Horizontal	Pass

7. SPURIOUS EMISSION (Conducted and Radiated)

7.1 Measurement Result (Pre-measurement)

GPRS850:

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)

7.1.1 Conducted method

Test limit:

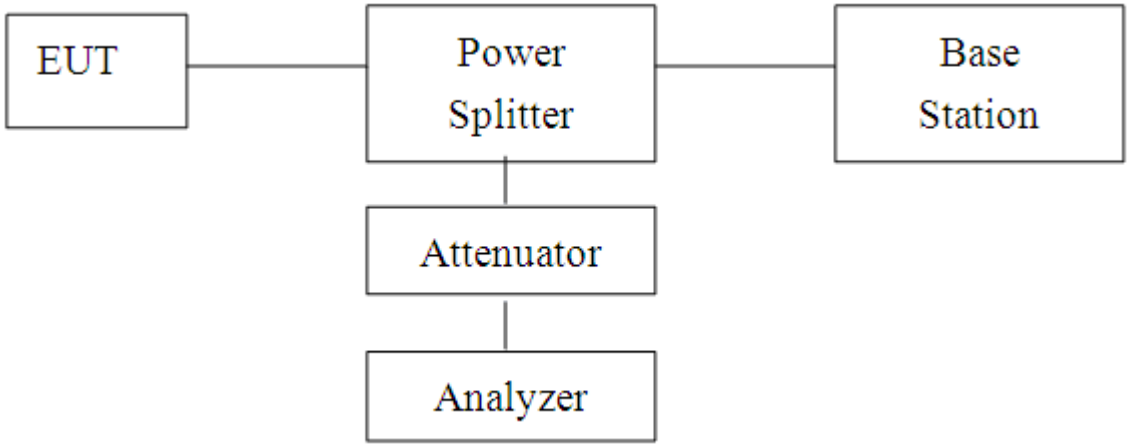
The spurious (unwanted) emission limits specified in the individual FCC rule parts applicable to licensed digital transmitters (typically referred to under the heading ‘emission limits’) normally apply to any and all emissions that are present outside of the authorized frequency band/block and apply 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:

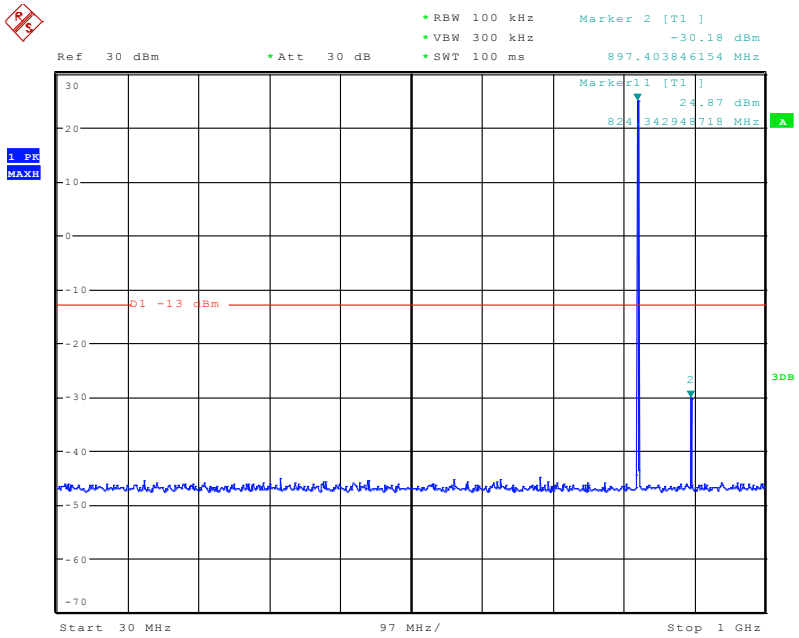
The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz below 1 GHz and 1 MHz above 1 GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonics.

Conducted Emission Test-Up:



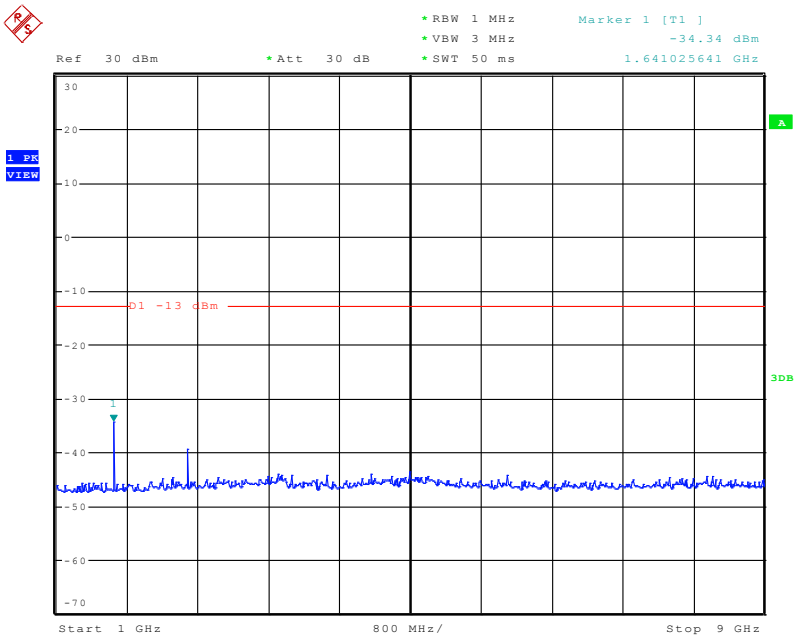
CONDUCTED EMISSION IN GPRS 850 BAND

Conducted Emission Transmitting Mode CH 128 30MHz – 1GHz



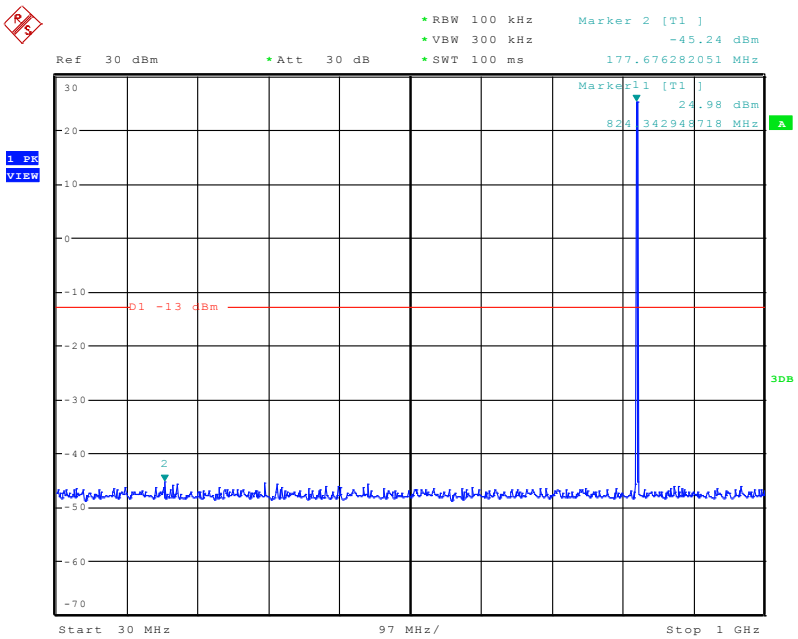
Date: 8.APR.2017 15:00:21

Conducted Emission Transmitting Mode CH 128 1GHz – 9GHz



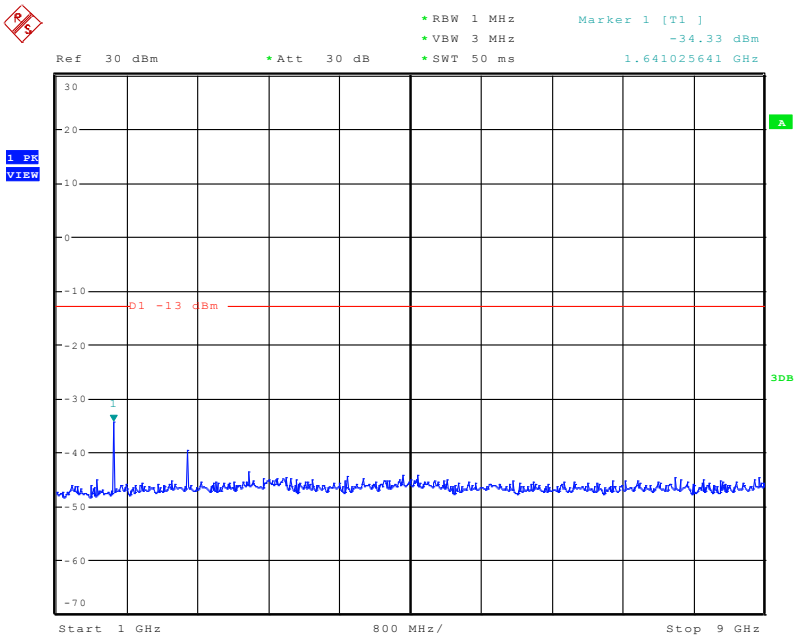
Date: 8.APR.2017 15:02:22

Conducted Emission Transmitting Mode CH 190 30MHz – 1GHz



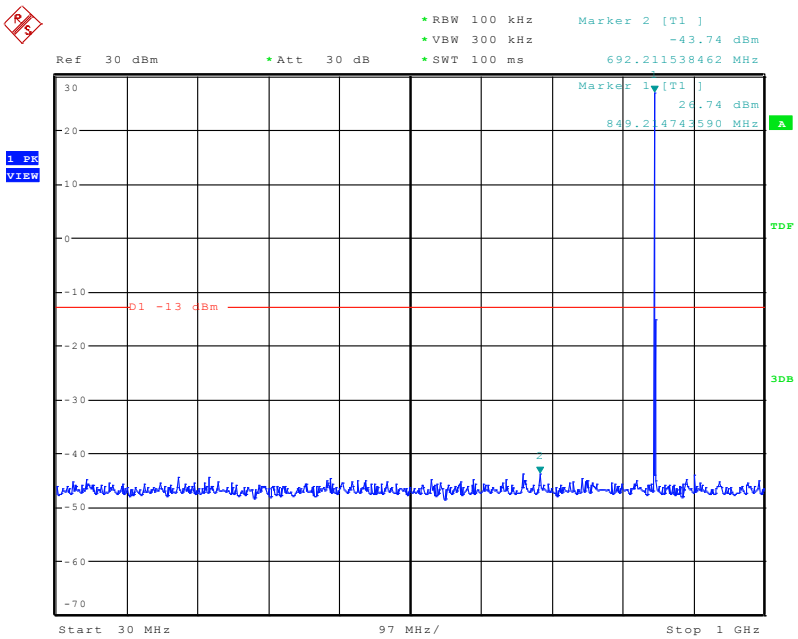
Date: 8.APR.2017 15:06:56

Conducted Emission Transmitting Mode CH 190 1GHz – 9GHz



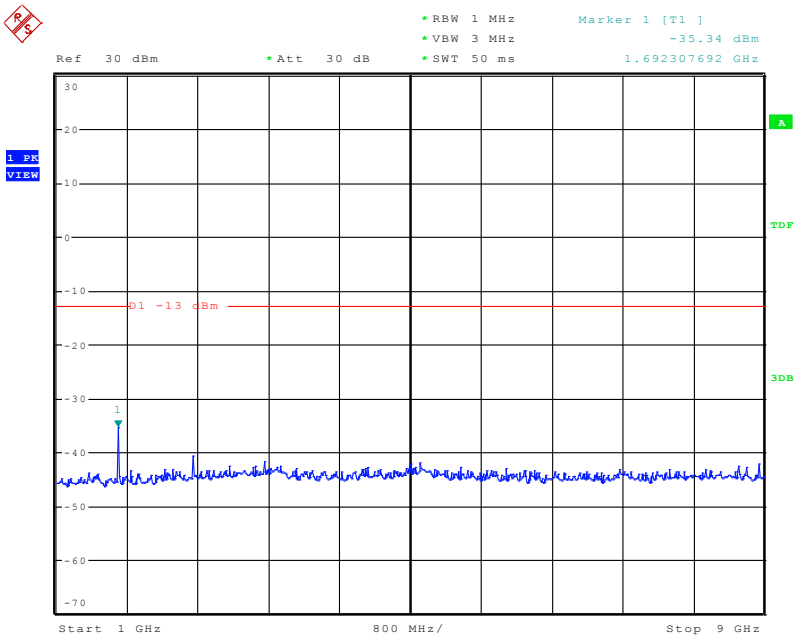
Date: 8.APR.2017 15:08:10

Conducted Emission Transmitting Mode CH 251 30MHz – 1GHz



Date: 8.APR.2017 15:10:30

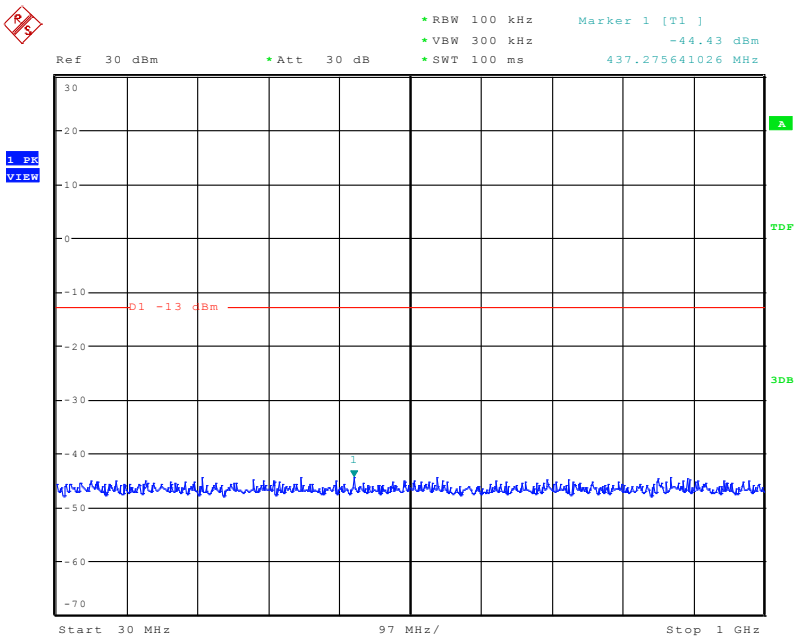
Conducted Emission Transmitting Mode CH 251 1GHz – 9GHz



Date: 8.APR.2017 15:12:07

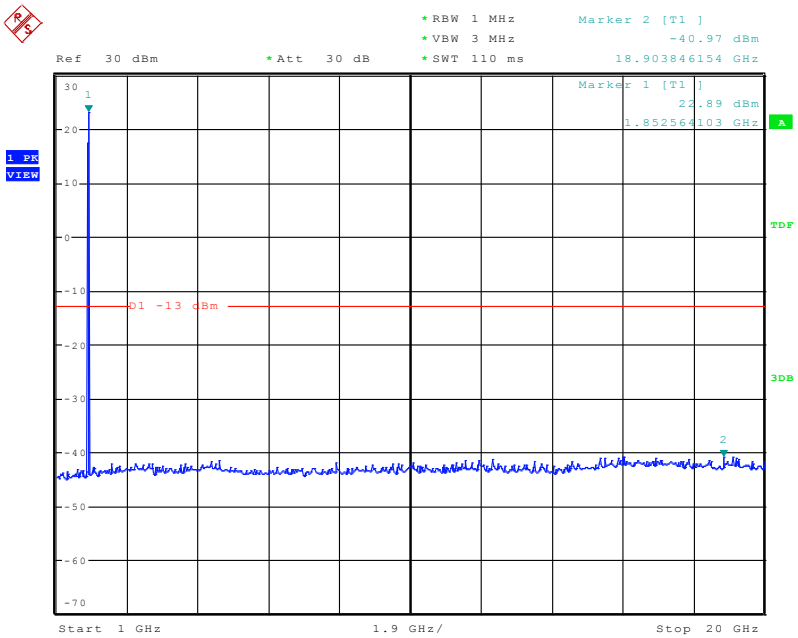
CONDUCTED EMISSION IN PCS1900 BAND

Conducted Emission Transmitting Mode CH 512 30MHz – 1GHz



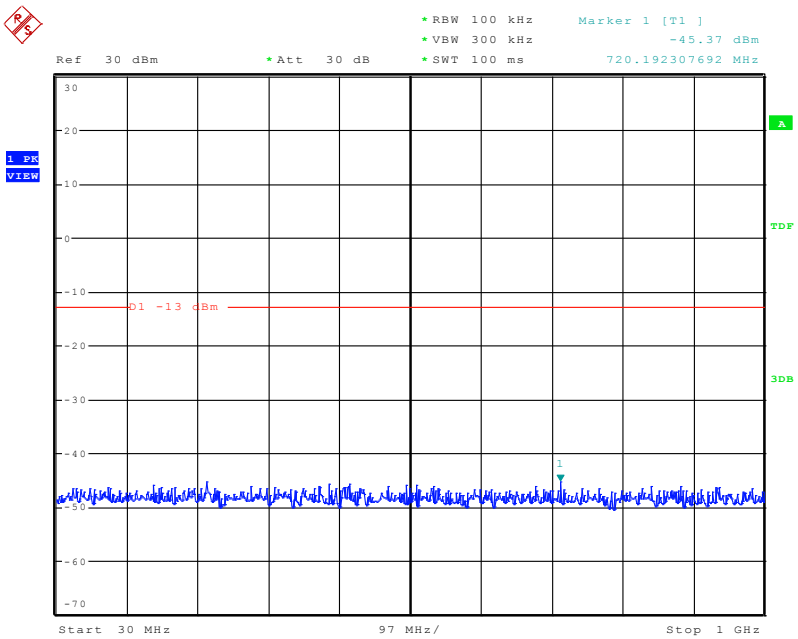
Date: 8.APR.2017 15:15:24

Conducted Emission Transmitting Mode CH 512 1GHz – 20GHz



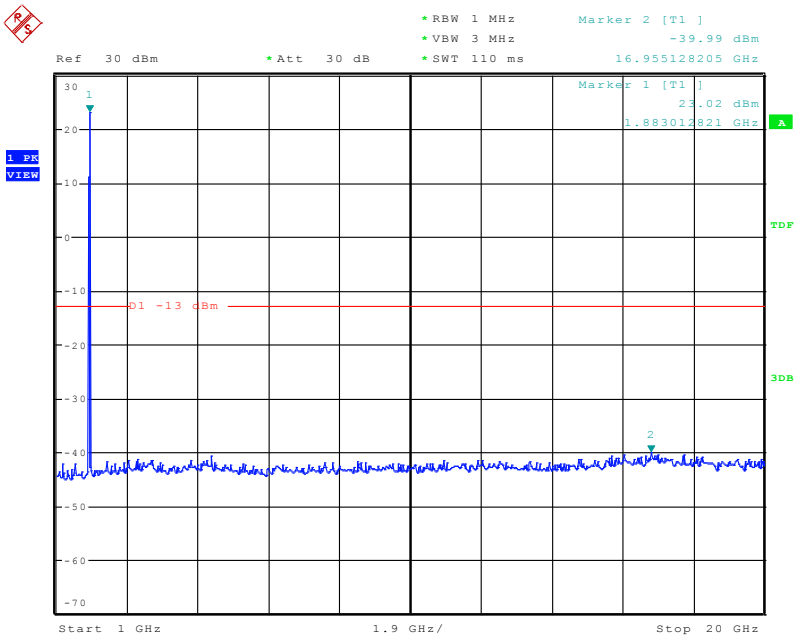
Date: 8.APR.2017 15:17:09

Conducted Emission Transmitting Mode CH 661 30MHz – 1GHz



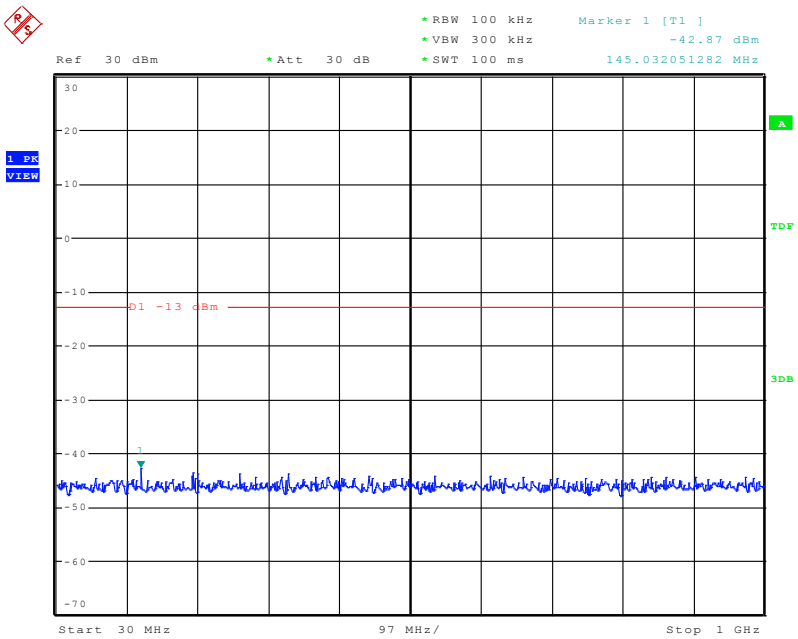
Date: 8.APR.2017 15:19:16

Conducted Emission Transmitting Mode CH 661 1GHz – 20GHz



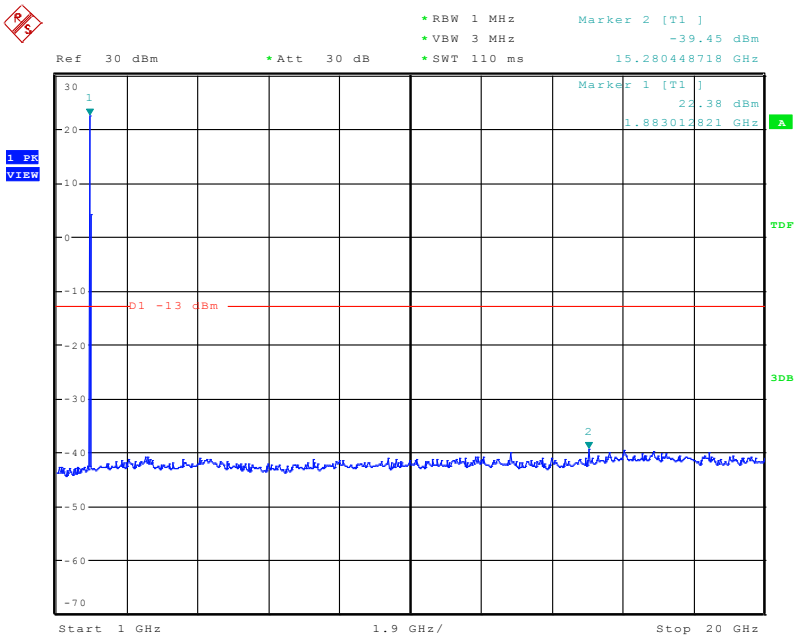
Date: 8.APR.2017 15:21:07

Conducted Emission Transmitting Mode CH 810 30MHz – 1GHz



Date: 8.APR.2017 15:25:16

Conducted Emission Transmitting Mode CH 810 1GHz – 20GHz



Date: 8.APR.2017 15:27:22

7.2. 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.

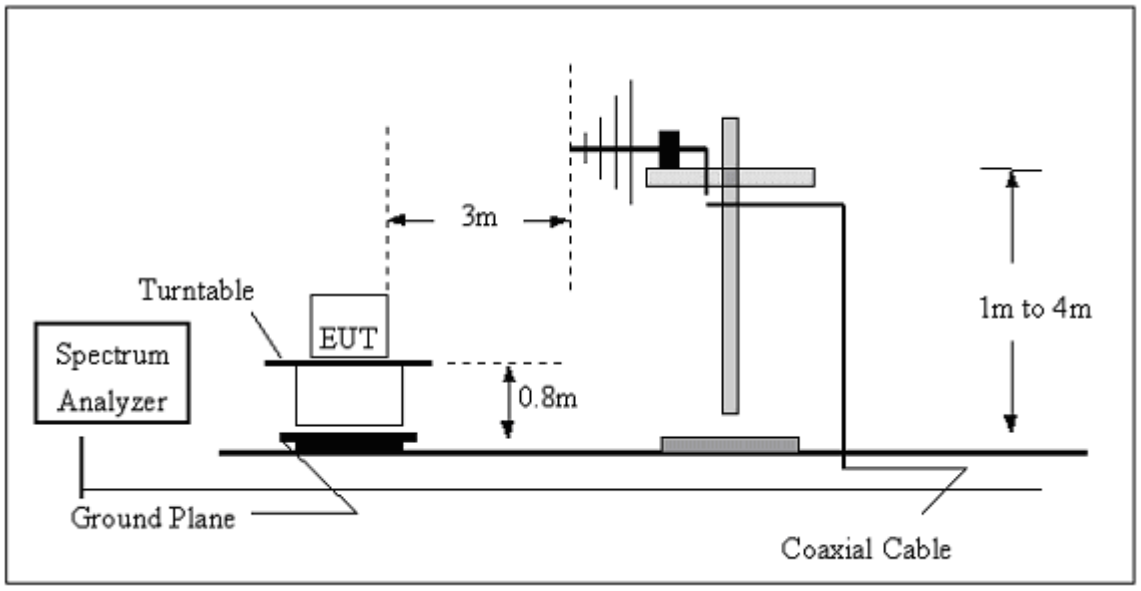
Typically, unwanted emissions are required by the licensed rule parts to be attenuated below the transmitter power by a factor of at least X + 10log(P) dB, where P represents the transmitter power expressed in watts and X is a specified scalar value (e.g., 43). This specification can be interpreted in 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:

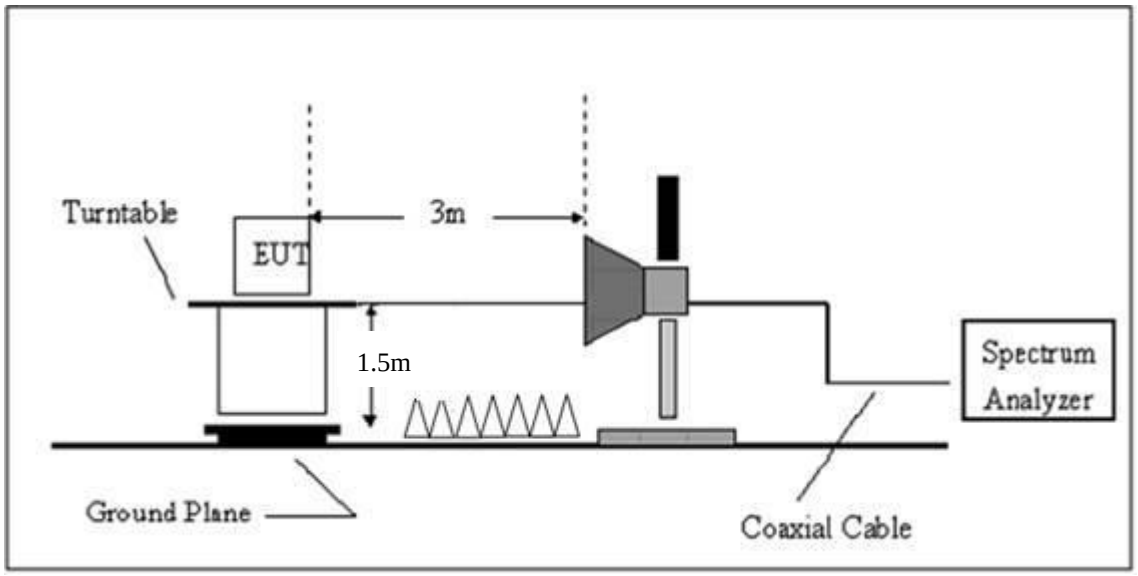
The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site. The resolution bandwidth of the spectrum analyzer was set at 100 kHz below 1 GHz and 1 MHz above 1 GHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonics.

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

Measurement Result

GPRS850:

The Worst Test Results for Channel 128/824.2MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
127.97	-26.54	-4.99	-21.55	-13	Horizontal
222.06	-34.97	-2.45	-32.52	-13	Vertical
652.74	-28.52	3.61	-32.13	-13	Horizontal
888.45	-32.00	2.82	-34.82	-13	Vertical

The Worst Test Results for Channel 190/836.6MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
127.97	-28.49	-4.99	-23.50	-13	Horizontal
222.06	-33.54	-2.45	-31.09	-13	Vertical
652.74	-29.77	3.61	-33.38	-13	Horizontal
888.45	-27.14	2.82	-29.96	-13	Vertical

The Worst Test Results for Channel 251/848.8MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1697.6	-32.81	-4.99	-27.82	-13	Horizontal
2546.4	-34.89	-2.45	-32.44	-13	Vertical
3395.2	-34.88	3.61	-38.49	-13	Horizontal
4244	-31.92	2.82	-34.74	-13	Vertical

PCS1900:

The Worst Test Results for Channel 512/1850.2MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
90.14	-25.83	-3.21	-22.62	-13	Horizontal
321.97	-28.11	0.34	-28.45	-13	Vertical
542.15	-27.36	3.95	-31.31	-13	Horizontal
768.17	-32.21	-2.26	-29.95	-13	Vertical

The Worst Test Results for Channel 661/1880MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
90.14	-26.26	-3.21	-23.05	-13	Horizontal
321.97	-32.12	0.34	-32.46	-13	Vertical
542.15	-27.88	3.95	-31.83	-13	Horizontal
768.17	-33.06	-2.26	-30.80	-13	Vertical

The Worst Test Results for Channel 810/1909.8MHz					
Frequency(MHz)	Power(dBm)	A_{Rpl} (dBm)	P_{Mea}(dBm)	Limit（dBm）	Polarity
1697.6	-31.01	-3.21	-27.80	-13	Horizontal
2546.4	-29.73	0.34	-30.07	-13	Vertical
3395.2	-27.04	3.95	-30.99	-13	Horizontal
4244	-31.29	-2.26	-29.03	-13	Vertical

Note: Below 30MHZ no Spurious found.

8. FREQUENCY STABILITY

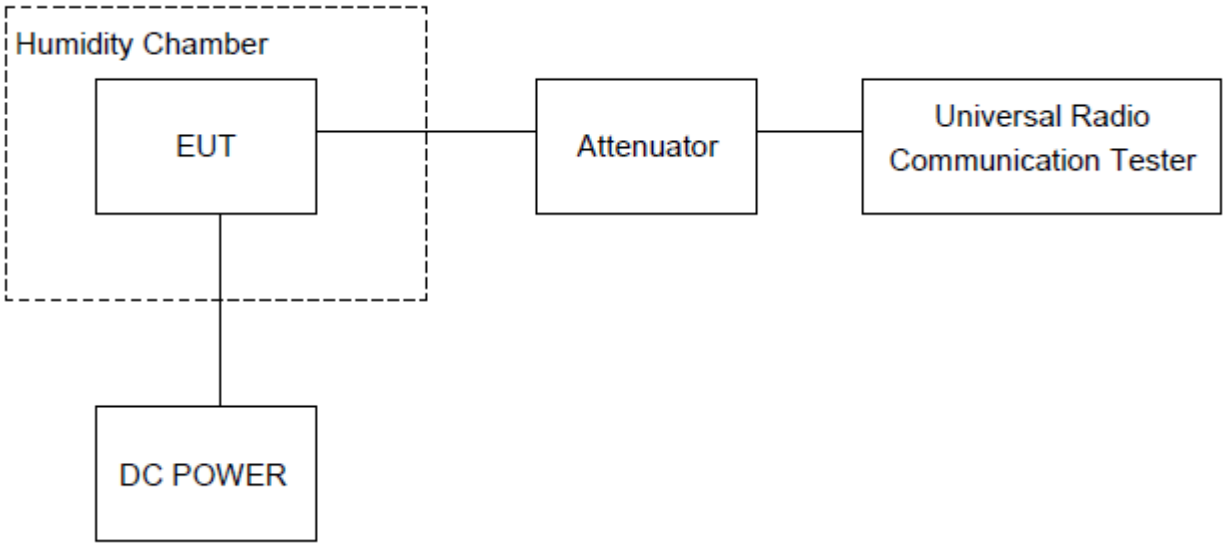
Test limit:

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:



Measurement Result (WORST)

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

Voltage(V)	Frequency error(Hz)	Frequency error (ppm)
6.9	40	0.048
7.4	39	0.047
8.4	34	0.041

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

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	36	0.044
0	34	0.040
10	40	0.048
20	28	0.034
30	41	0.049
40	31	0.038
50	38	0.045

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

Voltage(V)	Frequency error(Hz)	Frequency error(ppm)
6.9	32	0.017
7.4	31	0.016
8.4	36	0.019

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

Temperature(°C)	Frequency error(Hz)	Frequency error(ppm)
-10	39	0.021
0	31	0.016
10	40	0.021
20	34	0.018
30	30	0.016
40	28	0.015
50	40	0.021

9. 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.

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.

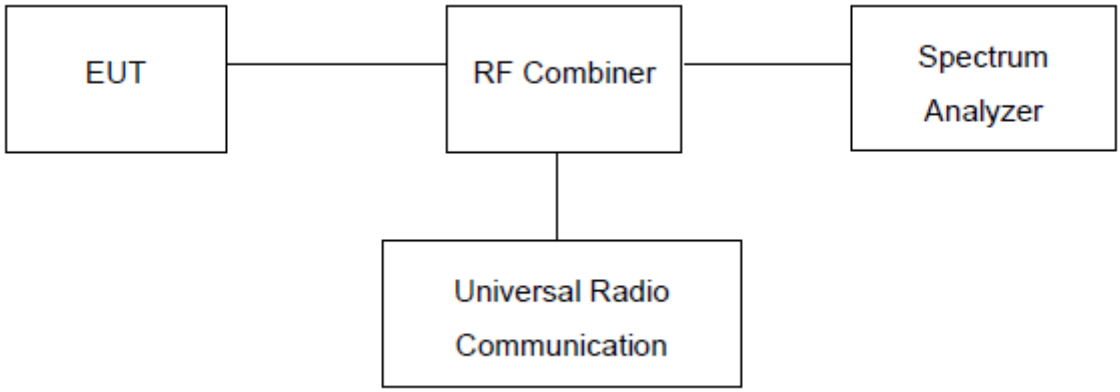
e) Set the detection mode to peak, and the trace mode to max hold..

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:



GPRS 850:

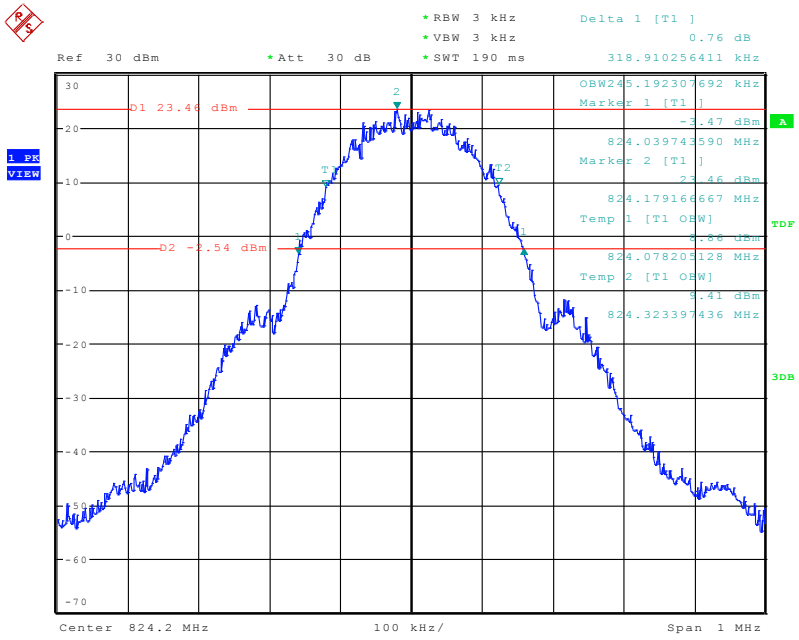
Frequency (MHz)	OBW(99%)	26dB BW
824.2	245.192KHz	318.910KHz
836.6	245.192KHz	318.910KHz
848.8	243.590KHz	312.500KHz

GPRS 1900:

Frequency (MHz)	OBW(99%)	26dB BW
1850.2	245.192KHz	318.910KHz
1880	241.987KHz	315.705KHz
1909.8	246.795KHz	314.103KHz

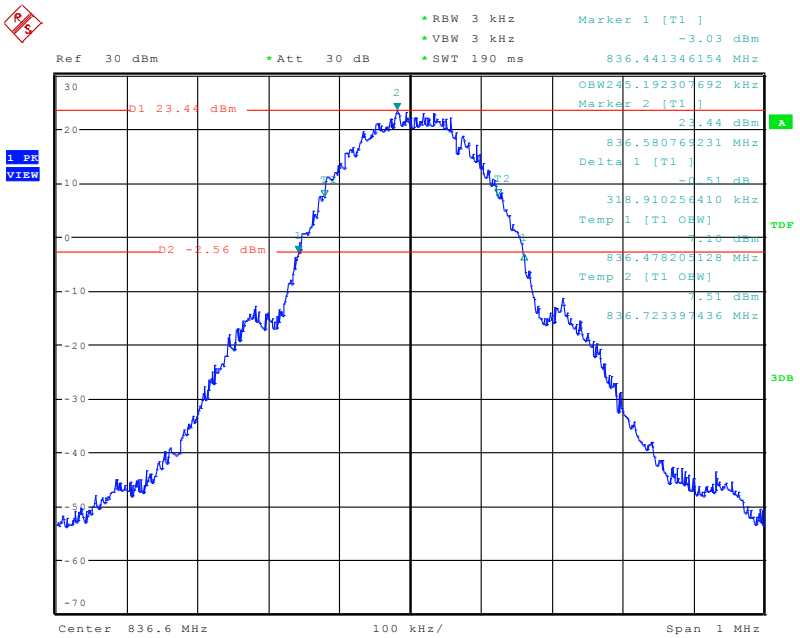
Measurement Result

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



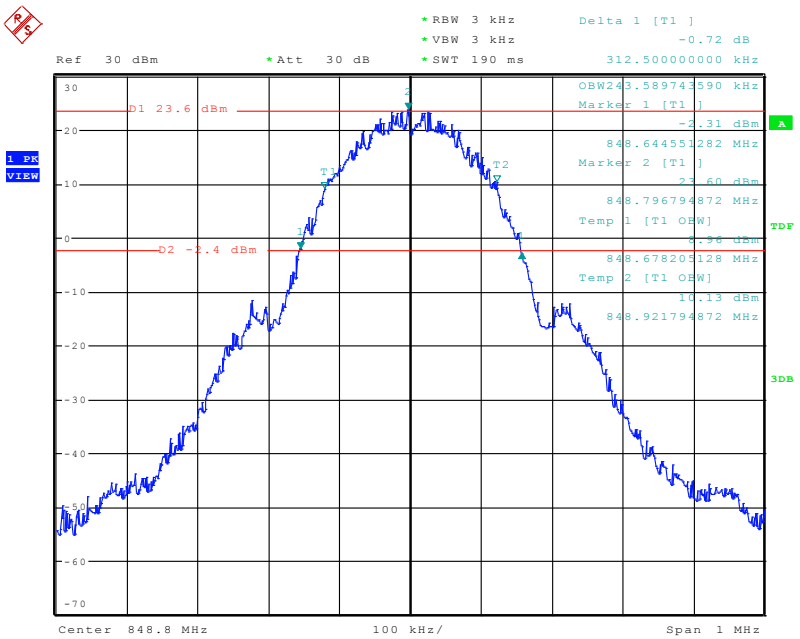
Date: 8.APR.2017 16:12:26

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



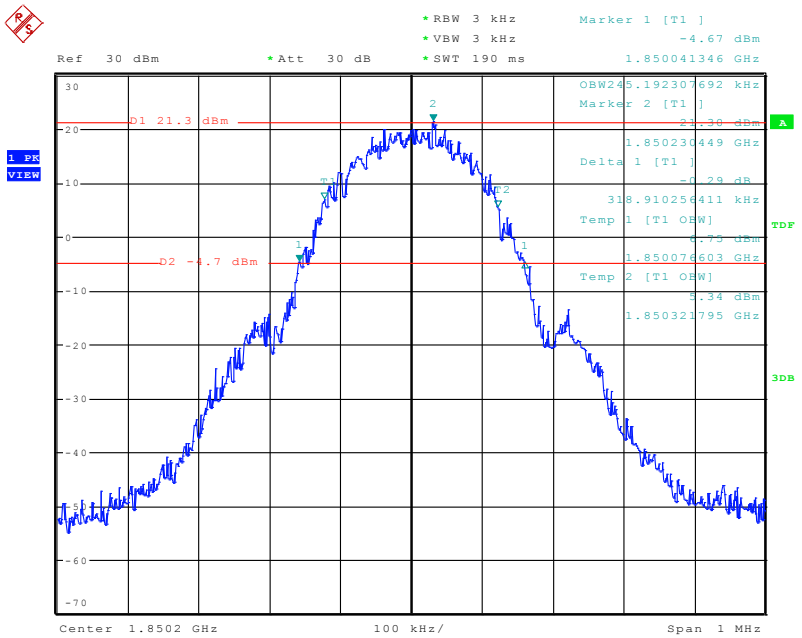
Date: 8.APR.2017 16:13:58

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



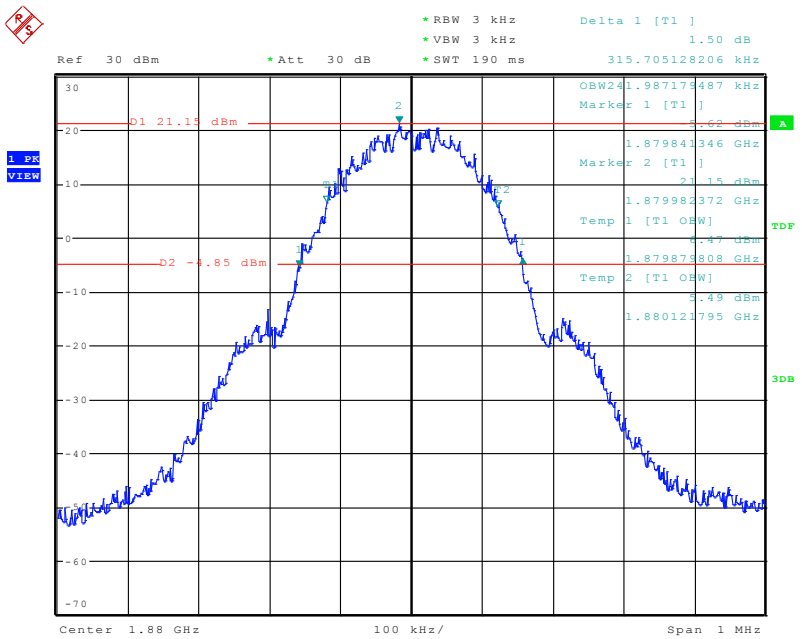
Date: 8.APR.2017 16:16:20

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



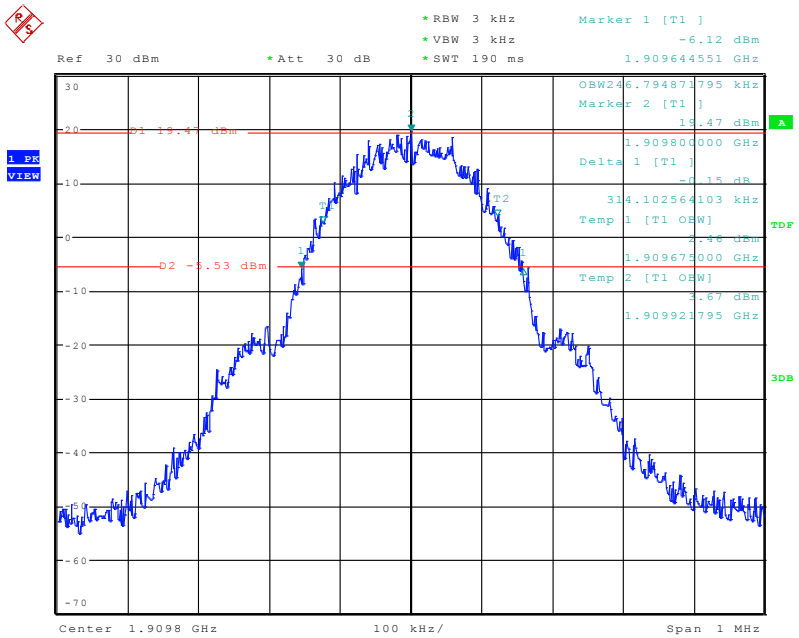
Date: 8.APR.2017 16:18:37

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



Date: 8.APR.2017 16:20:24

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



Date: 8.APR.2017 16:22:04

10. BAND EDGE

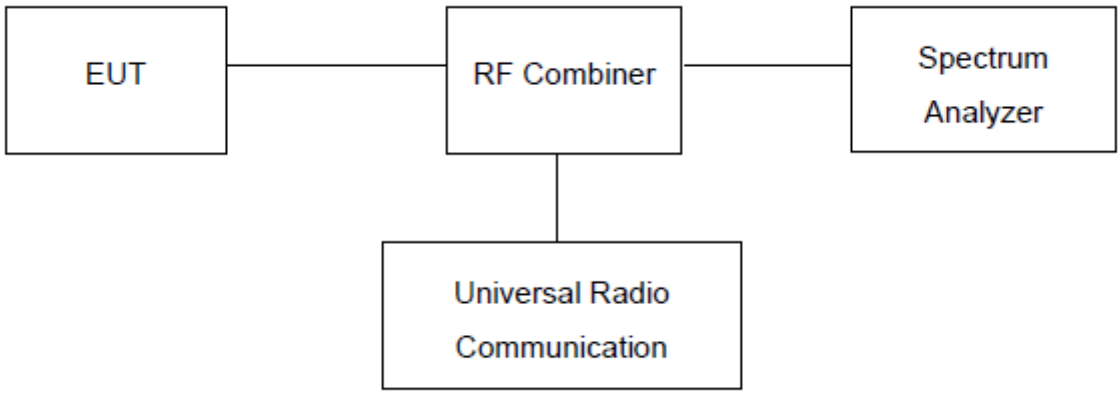
Test Limit:

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 the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the 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:



Measurement Result

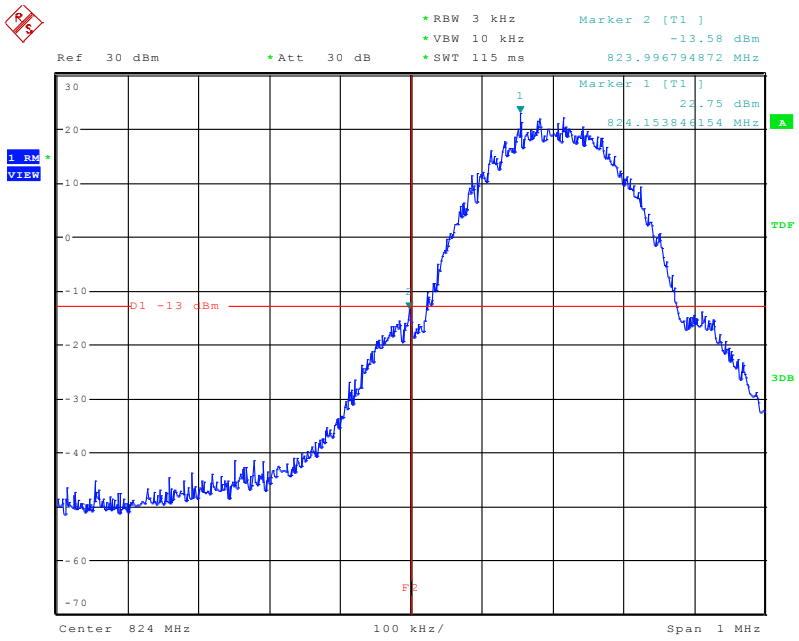
GPRS 850:

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

PCS 1900：

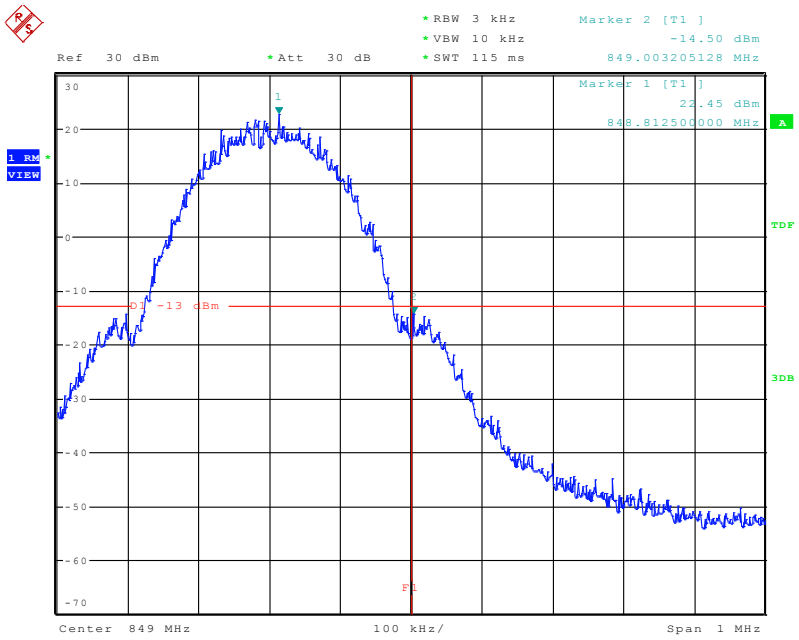
Test Channel	BW(MHz)	UL Channel	Frequency(MHz)	Judgment
Low Range	0.2	512	1850.2	Pass
High Range	0.2	810	1909.8	Pass

Low Band Edge GPRS 850 BAND CH 128



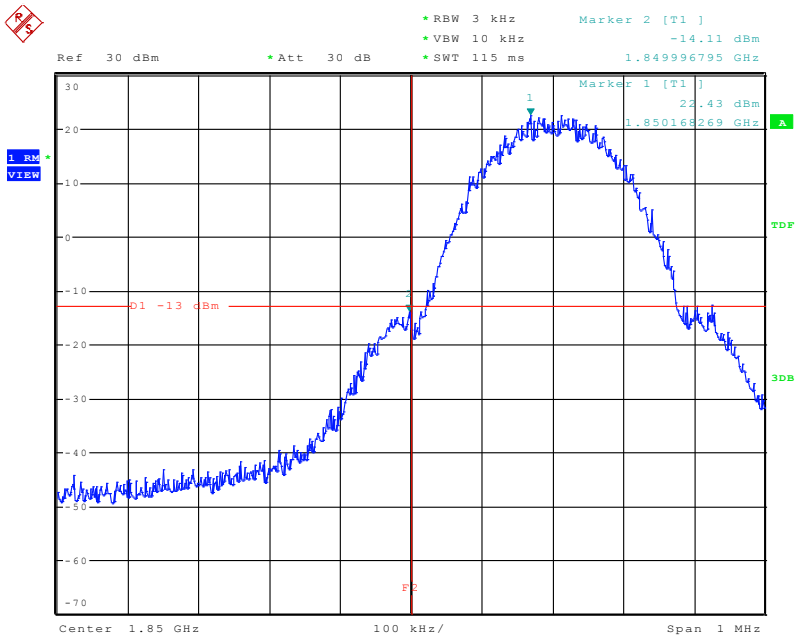
Date: 3.JUN.2017 09:57:28

High Band Edge GPRS 850 BAND CH 251



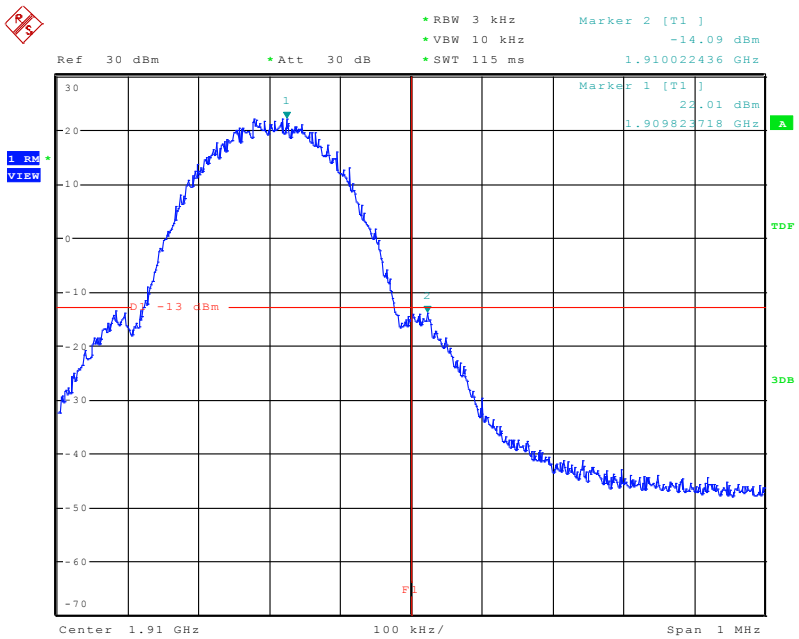
Date: 3.JUN.2017 10:01:18

Low Band Edge PCS 1900 BAND CH 512



Date: 3.JUN.2017 10:14:07

High Band Edge PCS 1900 BAND CH 810

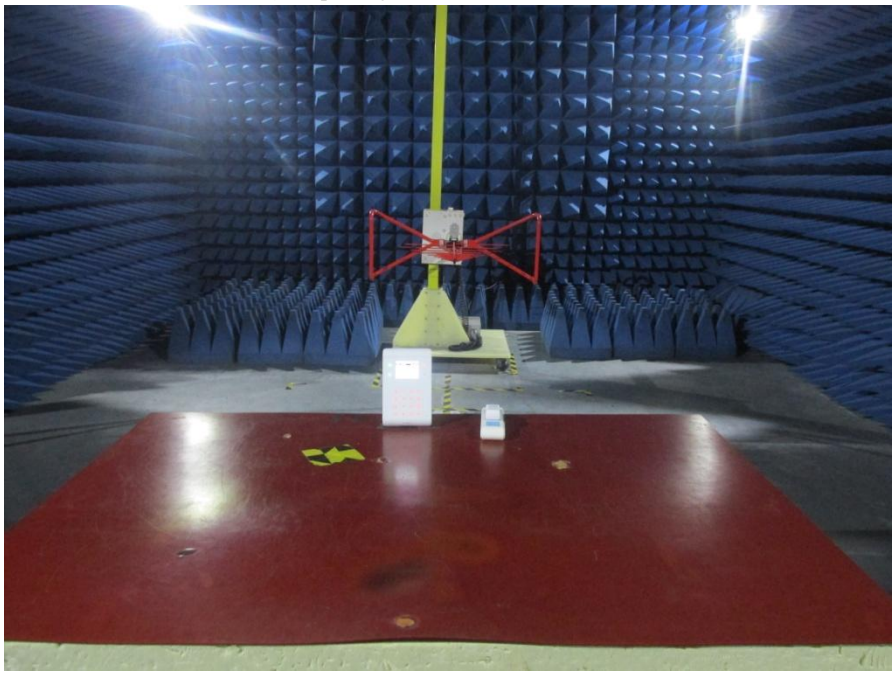


Date: 3.JUN.2017 10:19:01

11. EUT TEST PHOTO

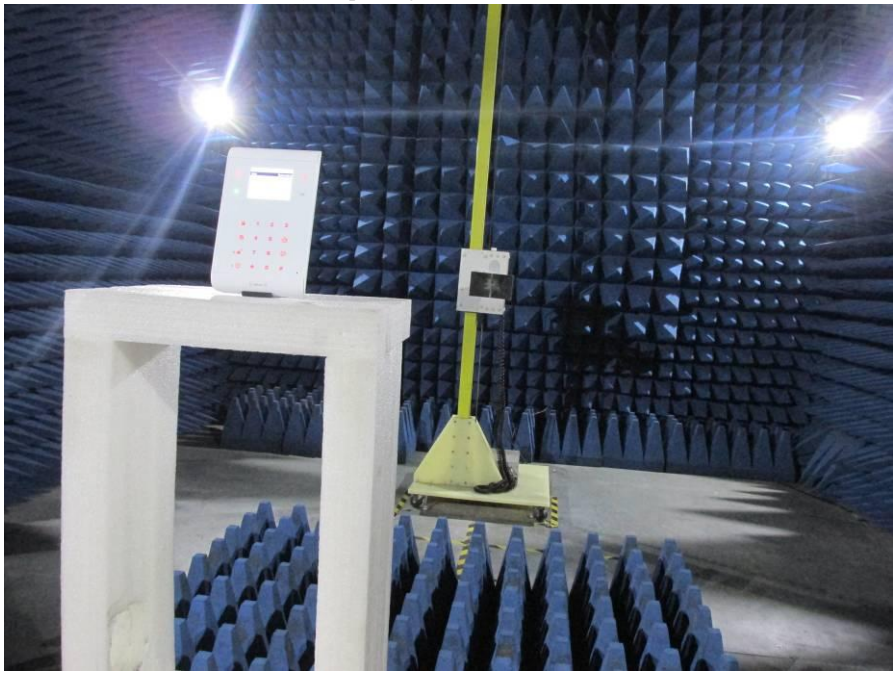
RADIATED EMISSION TEST

(Frequency from 30MHz to 1GHz)

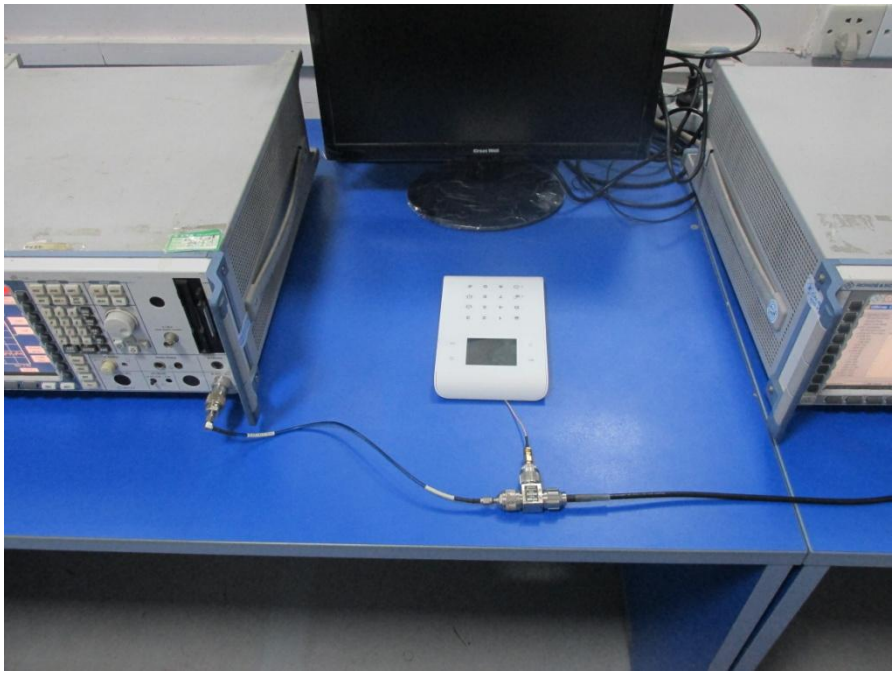


RADIATED EMISSION TEST

(Frequency above 1GHz)



RF TEST



12. EUT PHOTO

Appearance photograph of EUT

Appearance photograph of EUT

Appearance photograph of EUT

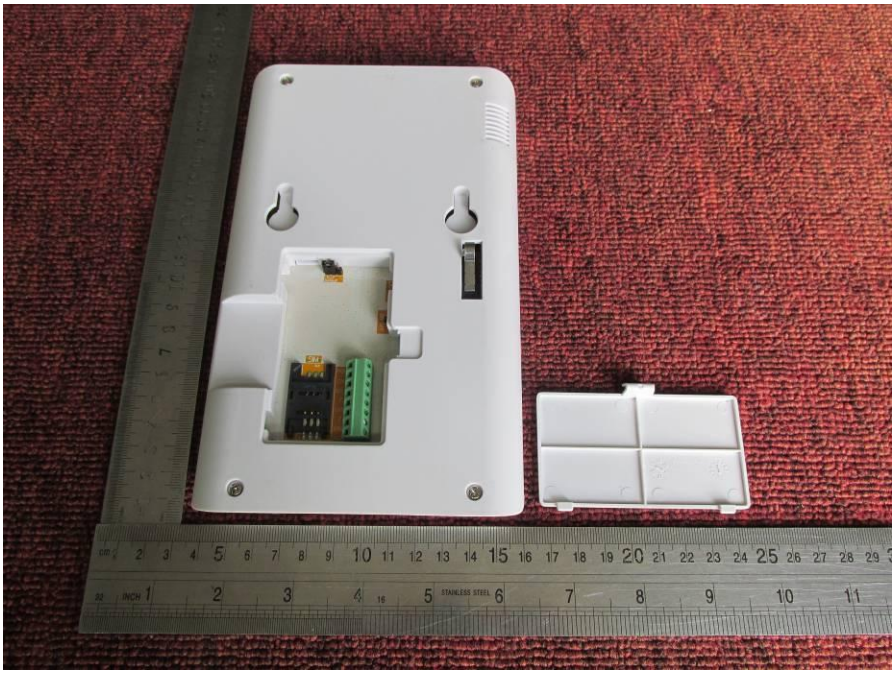
Appearance photograph of EUT

Appearance photograph of EUT

Appearance photograph of EUT

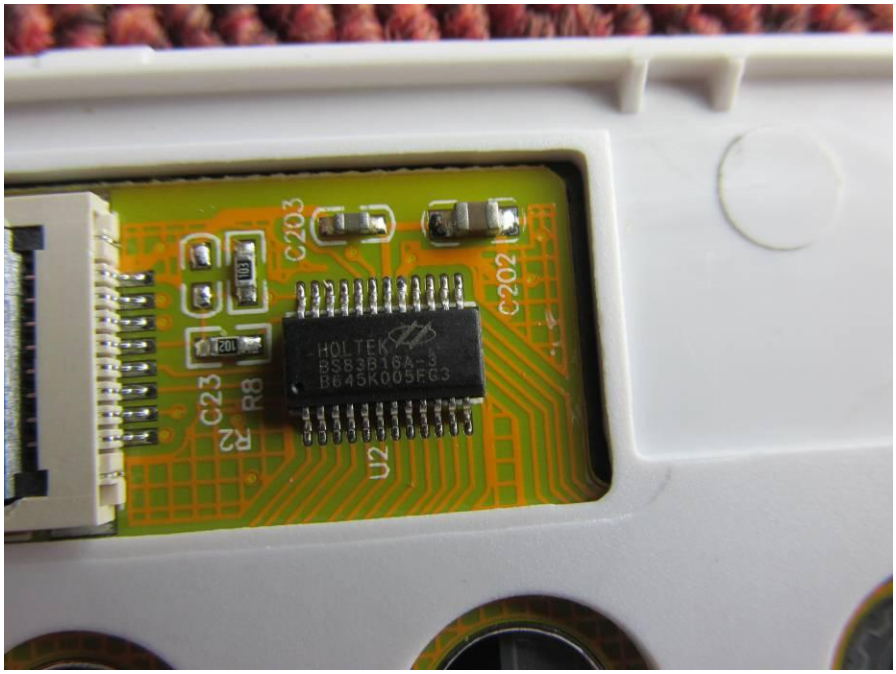
Appearance photograph of EUT

Appearance photograph of EUT

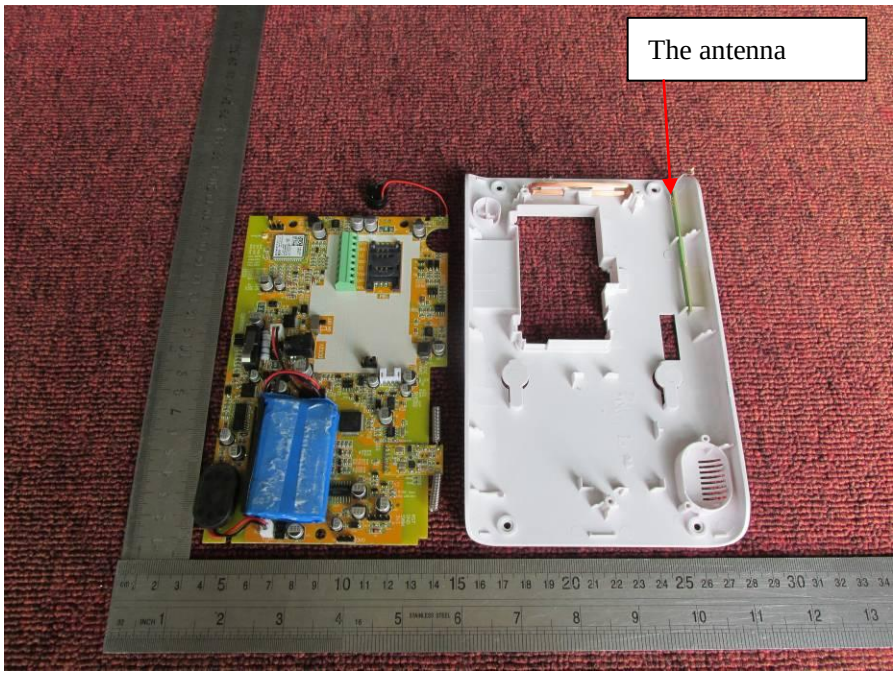


Internal photograph of EUT

Internal photograph of EUT



Internal photograph of EUT

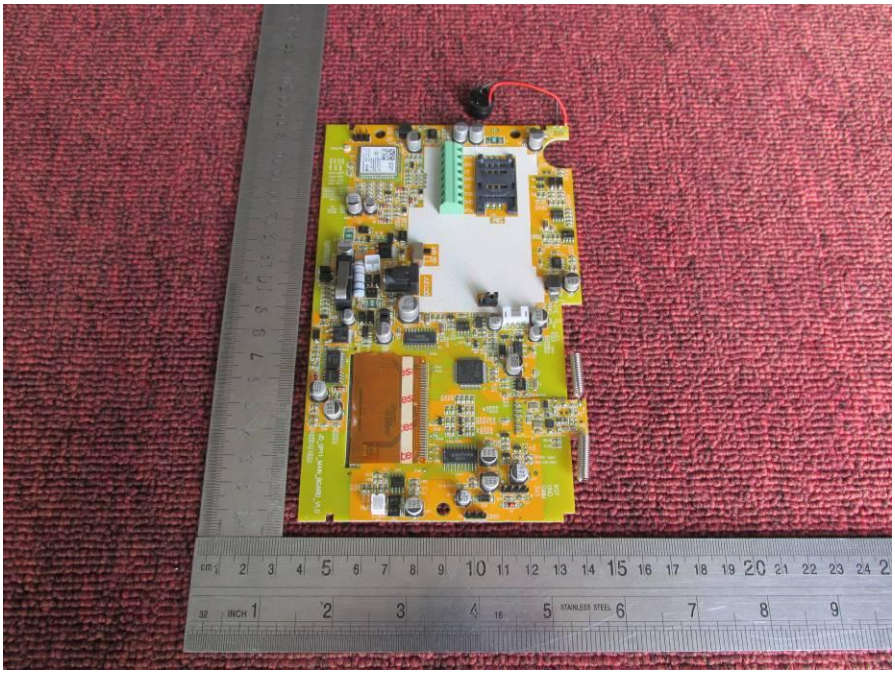


Internal photograph of EUT

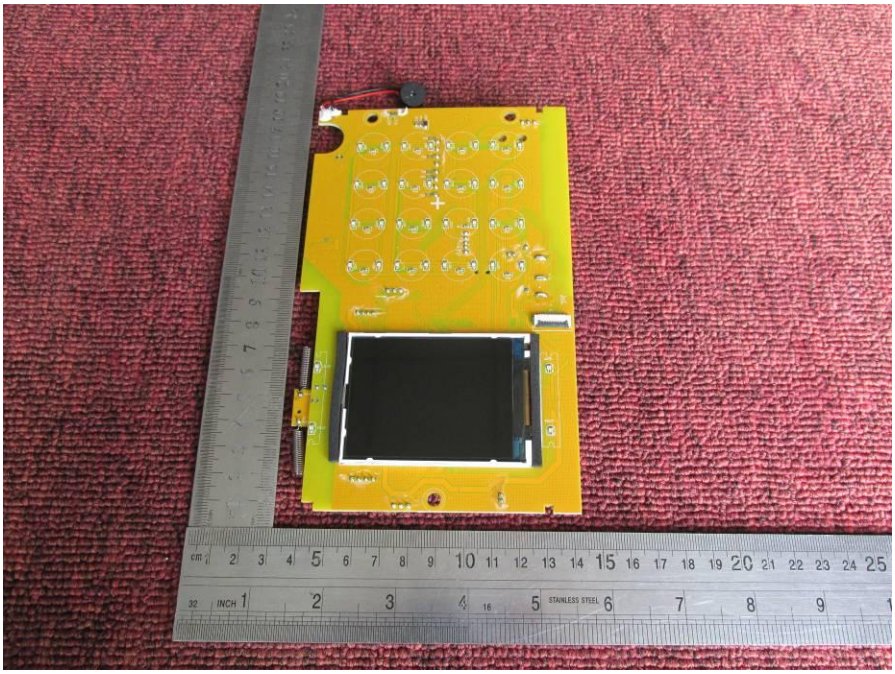
Internal photograph of EUT

Internal photograph of EUT

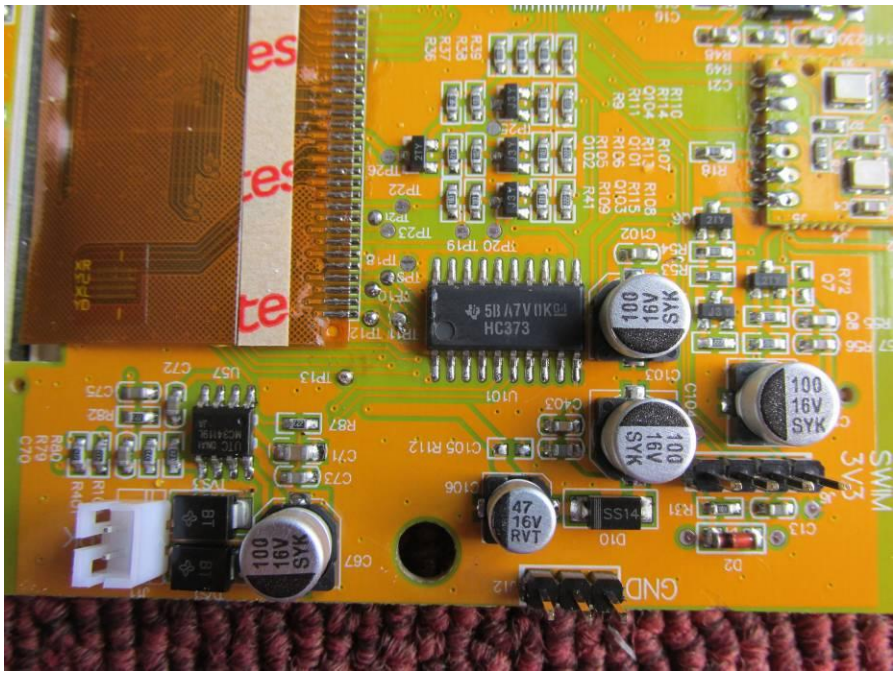
Internal photograph of EUT



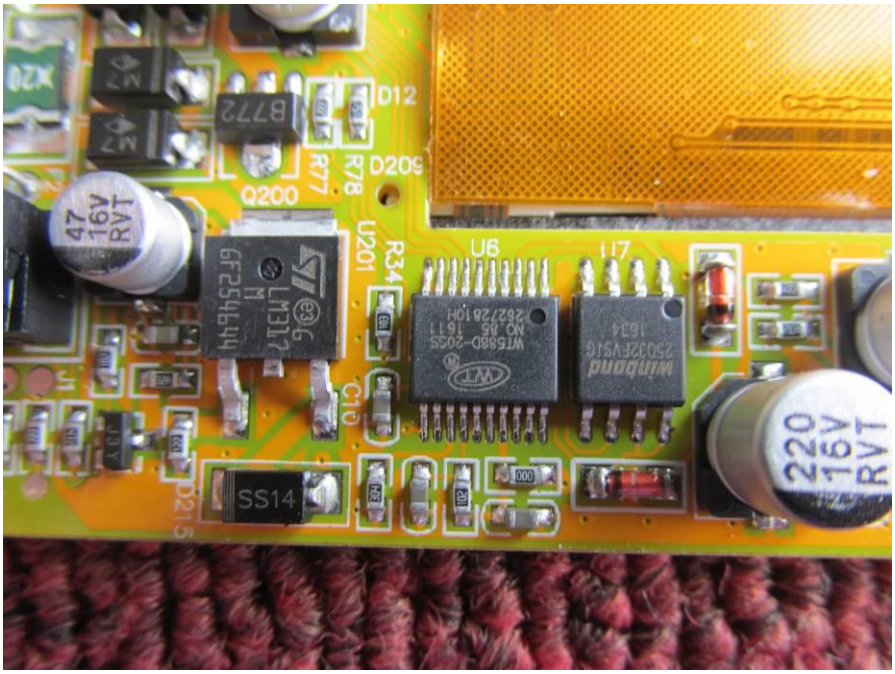
Internal photograph of EUT



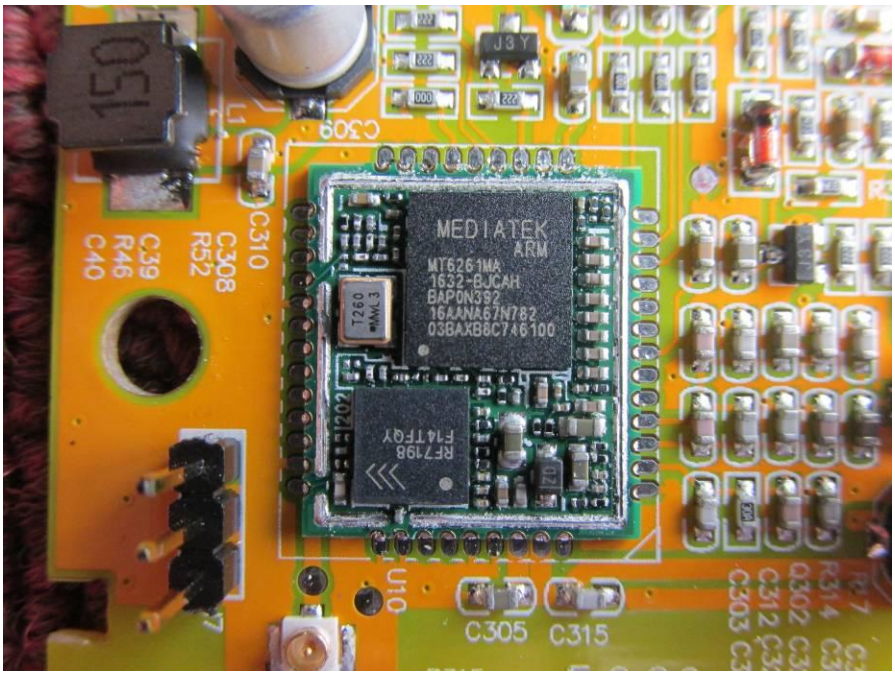
Internal photograph of EUT



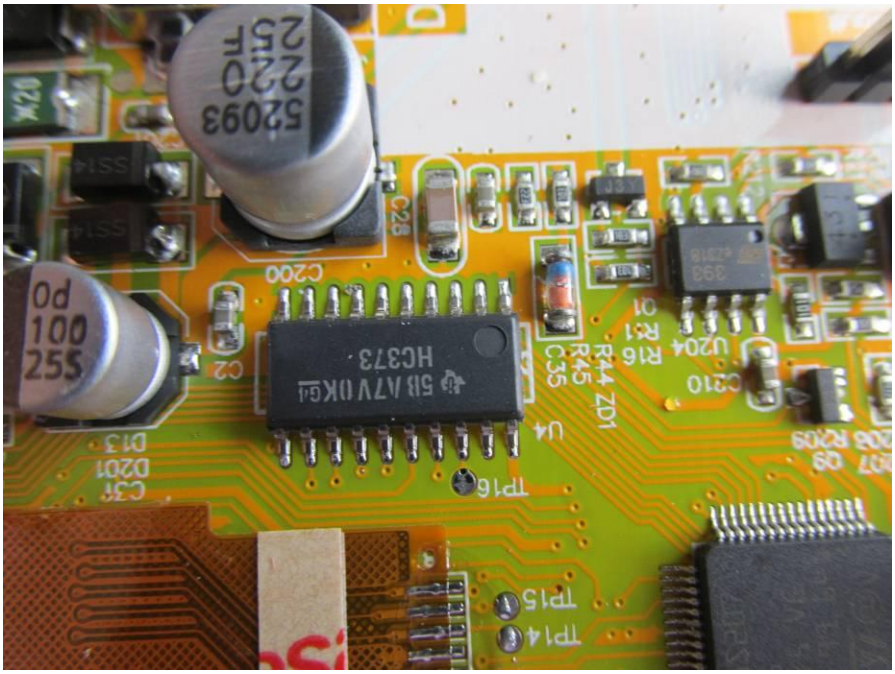
Internal photograph of EUT



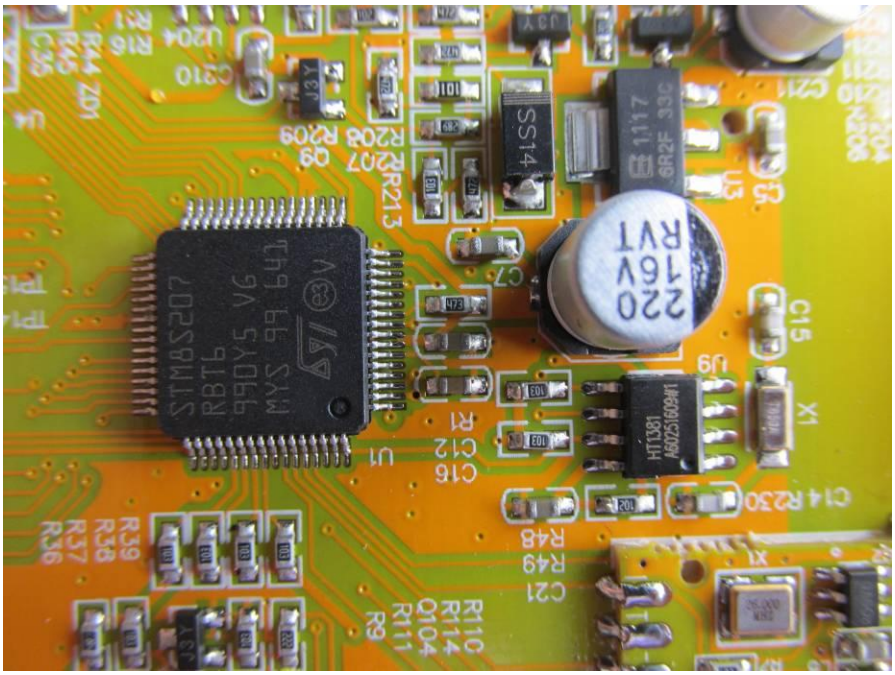
Internal photograph of EUT



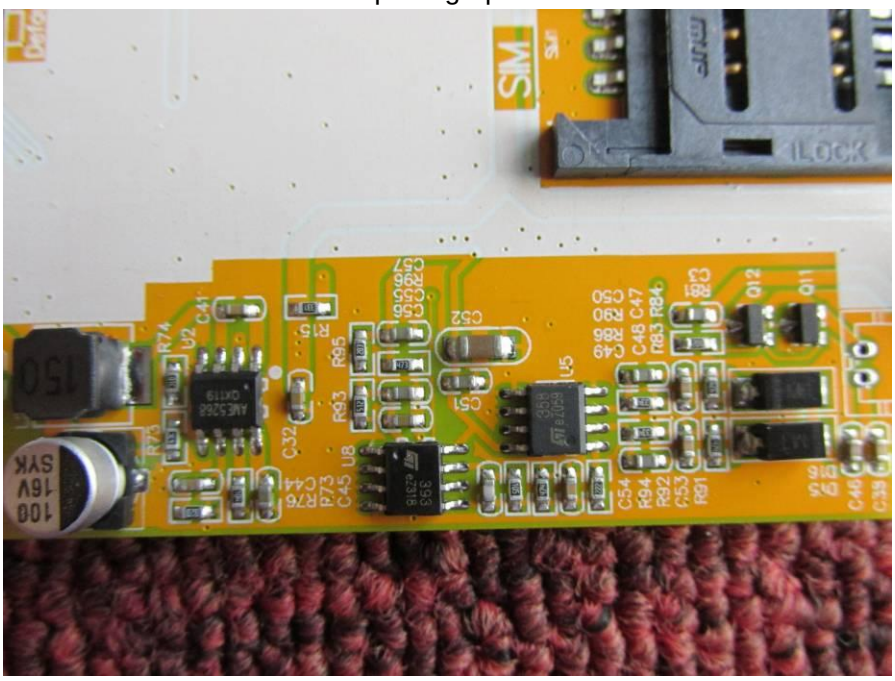
Internal photograph of EUT



Internal photograph of EUT



Internal photograph of EUT



---END OF REPORT---