TEST REPORT

FCC ID: YF7WITURA2009

Applicant： Witura Corporation Sdn bhd

Address : 101-12-03 & 04, Menara Perdana, Jalan Gurdwara, 10300 Penang, Malaysia

Equipment Under Test(EUT):

Name	:	GSM Remote Monitoring, Control and alarm system
Model	:	WT-2009,WT-9001,WT-9002,WT-009,WT-215, WT-211,WT-1041,WT-1021,WT-1010,WT-1018 ， WT-1011

In Accordance with: FCC PART 2; FCC PART 22H; FCC PART 24E

Report No : ATS10051712

Date of Test : May 17---19, 2010

Date of Issue : May 21, 2010

Test Result: **PASS**

In the configuration tested, the EUT complied with the standards specified above

Authorized Signature

Bruce

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(Bruce)

General Manager

The manufacture should ensure that all the products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of Asia Technology Service Limited. Or test done by Asia Technology Service Limited. Approvals in connection with, distribution or use of the product described in this report must be approved by Asia Technology Service Limited. Approvals in writing.

Contents

1. General Information

1.1. Description of Device (EUT)

EUT	:	GSM Remote Monitoring, Control and alarm system
Model No.	:	WT-2009,WT-9001,WT-9002,WT-009,WT-215, WT-211,WT-1041,WT-1021,WT-1010,WT-1018 ,WT-1011
DIFFERENT	:	All the modle are totally identical,just for different factory
Power supply	:	DC 12V POWER SUPPLY ADAPTER
Radio Technology	:	GSM/GPRS 850/900/1800/1900
GPRS Multislot Class	:	Class 10
Power class	:	GSM/GPRS 850/900: Class 4 GSM/GPRS 1800/1900: Class 1
Operation frequency	:	824.2MHz—848.8MHz and 1850.2MHz—1909.8MHz
FCC Operation frequency	:	824.2MHz—848.8MHz and 1850.2MHz—1909.8MHz
Modulation	:	GMSK
Antenna Type	:	External antenna, Gain:2.5dBi
Applicant	:	Witura Corporation Sdn bhd
Address	:	101-12-03 & 04, Menara Perdana, Jalan Gurdwara, 10300 Penang, Malaysia
Manufacturer	:	ShenZhen Witura Telecommunications Co.,Ltd.
Address	:	Huangmabu Village, Xixiang Town, Baoan Zone, ShenZhen, China

1.2. Test Lab information

Asia Technology Service Limited
1/F, A Building, Hao-yu Industrial Park, Qi-Feng road
DongGuan, 523001, China
FCC Registered No.:583180

2. Summary of test

2.1. Summary of test result

Description of Test Item	Standard	Results
Conducted Output power	FCC PART 2: 2.1046 FCC PART 22H: 22.913 (a) FCC PART 24E: 24.232 (c)	PASS
Radiated Output power(erp/eirp)	FCC PART 22H:22.913 (a) FCC PART 24E:24.232(c)	PASS
Occupied bandwidth	FCC PART 2: 2.1049 FCC PART 22H: 22.917 (b) FCC PART 24E: 24.238 (b)	PASS
Frequency stability	FCC PART 2: 2.1055 FCC PART 22H: 22.355 FCC PART 24E: 24.235	PASS
Conducted spurious emission (Antenna terminal)	FCC PART 2: 2.1051 FCC PART 22H: 22.917 FCC PART 24E: 24.238	PASS
Radiated spurious emissions	FCC PART 2: 2.1053 FCC PART 22H: 22.917 FCC PART 24E: 24.238	PASS
Block edge compliance	FCC PART 22H: 22.917 (b) FCC PART 24E: 24.238 (b)	PASS
Power Line Conducted Emission Test	FCC Part 15: 15.207 ANSI C63.4: 2003	PASS

2.2. Assistant equipment used for test

N/A

2.3. Test mode

During all testing, EUT is in link mode with base station emulator at maximum power level in each test mode and channel as below:

Mode	Channel	Frequency(MHz)
GSM 850	128	824.2
	190	836.6
	251	848.8
PCS 1900	512	1850.2
	661	1880.0
	810	1909.8

2.4. Test Environment Conditions

Temperature range	21-25℃
Humidity range	40-75%
Pressure range	86-106kPa

2.5. Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.42dB	
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	4.1dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.08dB	Polarize: H
	2.56dB	Polarize: V
Uncertainty for radio frequency	1×10-9	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2℃	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

2.6. Test Equipment

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	16/06/2009	1Year
Spectrum analyzer	Agilent	E4443A	MY46185649	06/06/2009	1Year
Receiver	R&S	ESCI	100492	04/06/2009	1Year
Receiver	R&S	ESCI	101202	07/01/2010	1Year
Bilog Antenna	Sunol	JB3	A121206	04/06/2009	1Year
Horn Antenna	EMCO	3115	640201028-06	04/06/2009	1Year
Power Meter	Anritsu	ML2487A	6K00001491	23/02/2010	1Year
ETS Horn Antenna	ETS	3160	SEL0076	12/08/2009	1Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	15/06/2009	1Year
Cable	Resenberger	N/A	No.1	04/06/2009	1Year
Cable	SCHWARZBECK	N/A	No.2	04/06/2009	1Year
Cable	SCHWARZBECK	N/A	No.3	04/06/2009	1Year
Pre-amplifier	R&S	AFS42-00101800-25-S-42	SEL0081	18/06/2009	1Year
Pre-amplifier	R&S	AFS33-18002650-30-8P-44	SEL0080	18/06/2009	1Year
Base station	Agilent	E5515C	GB44300243	08/05/2010	1 Year
Temperature controller	Terchy	MHQ	120	08/05/2010	1Year
Power divider	Anritsu	K240C	020346	08/05/2010	1 Year
Signal Generator	HP	83732B	VS3449051	08/05/2010	1 Year
Attenuator	Agilent	8491B	MY39262165	08/05/2010	1 Year
GPS Signal	Welnavigate	GS50	6423517	N/A	N/A

3. Conducted Output power

3.1. Block Diagram of Test Setup

3.2. Limit

Cellular Telephone 850MHz	PCS 1900MHz
38.5dBm(ERP)	33dBm(EIRP)

3.3. Test Procedure

(1) The EUT's RF output port was connected to base station.
(2) Set EUT at maximum power level through base station by power level command
(3) Measure the maximum output power of EUT at each frequency band and mode by base station.

3.4. Test Result

EUT:GSM Remote Monitoring, Control and alarm system M/N: WT-2009 Power: DC 12V POWER SUPPLY ADAPTER						
Ambient Temperature:24℃		Relative Humidity: 62%				
Test date: 2010-05-18		Test site: RF site Tested by: Breeze				
Conclusion: PASS						
Mode	Channel	PK Output Power(dBm)	ERP (dBm)	EIRP (dBm)	Limit	
					ERP(dBm)	EIRP(dBm)
GSM 850	128	30.82	31.17	/	38.5	/
	190	30.71	31.06	/	38.5	/
	251	30.68	31.03	/	38.5	/
PCS 1900	512	28.24	/	30.74	/	33
	661	28.17	/	30.67	/	33
	810	28.29	/	30.79	/	33
Note: EIRP=Pk output power +Antenna Gain(2.5dBi); ERP=PK output power + Antenna Gain(2.5dBi) -2.15						

4. POWER LINE CONDUCTED EMISSION

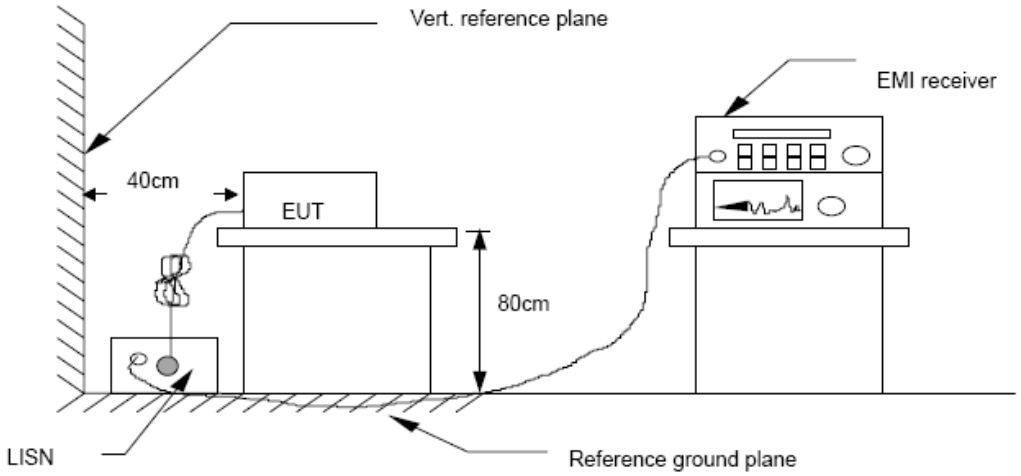
4.1. Conducted Emission Limits(15.209&249)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.The limit decreases in line with the logarithm of the frequency in the rang of 0.15 to 0.50 MHz.

4.2. Test Setup



4.3. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.4-2003 on Conducted Emission Measurement.
The bandwidth of test receiver (R & S ESCS30) is set at 9 kHz.

4.4. Test Resluts

PASS

Detailed information please see the following page.

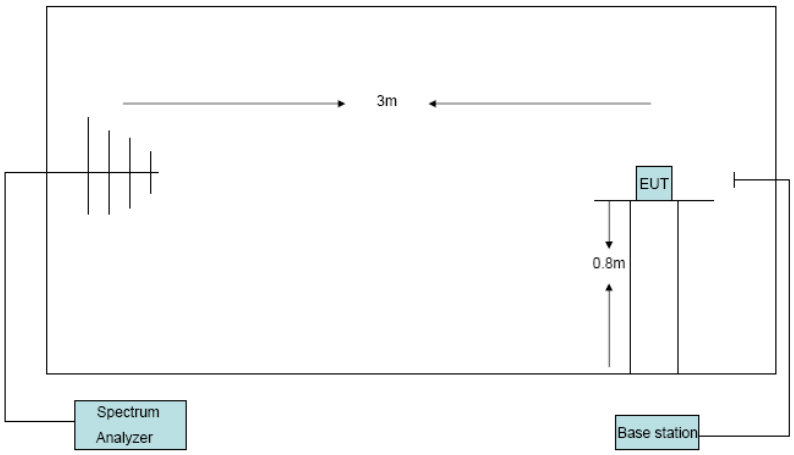
EUT	GSM Remote Monitoring,Control and alarm system	Model Name	WT-2009
Temperature	25°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC 12VPOWER SUPPLY ADAPTER
Test Mode	Noraml		

FREQ MHz	PEAK RAW dBuV	Q.P. RAW dBuV	AVG RAW dBuV	Q.P. Limit dBuV	AVG Limit dBuV	Q.P. Margin dB	AVG Margin dB	NOTE
0.242	48.37	---	---	63.35	53.35	---	-4.98	L1
0.290	47.54	---	---	61.97	51.97	---	-4.43	L1
0.806	35.46	---	---	56.00	46.00	---	-10.54	L1
1.013	35.46	---	---	56.00	46.00	---	-10.54	L1
11.691	43.18	---	---	60.00	50.00	---	-6.82	L1
13.791	43.62	---	---	60.00	50.00	---	-6.38	L1
0.305	48.17	---	---	61.55	51.55	---	-3.38	L2
0.405	38.53	---	---	58.69	48.69	---	-10.16	L2
0.802	33.71	---	---	56.00	46.00	---	-12.29	L2
1.113	33.46	---	---	56.00	46.00	---	-12.54	L2
11.675	42.74	---	---	60.00	50.00	---	-7.26	L2
17.655	38.36	---	---	60.00	50.00	---	-11.64	L2

Note: L1=Line One (Live Line) /L2= Line Two (Neutral Line)

5. Radiated Output power

5.1. Block Diagram of Test Setup



5.2. Limit

Cellular Telephone 850MHz	PCS 1900MHz
38.5dBm(ERP)	33dBm(EIRP)

5.3. Test Procedure

1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 3MHz,VBW= 3MHz and peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (for frequency below 1GHz) or Horn antenna (for frequency above 1GHz) at same location with same polarize of receiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain –Substitution antenna Loss(only for Dipole antenna) - Analyzer reading. Then the EUT's

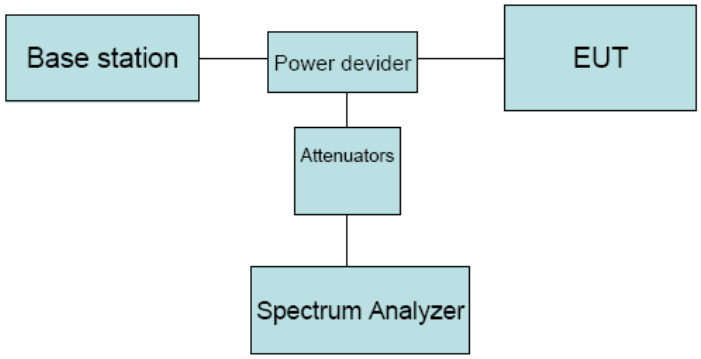
EIRP was calculated with the correction factor, EIRP= LVL + Correction factor and ERP = EIRP – 2.15

5.4. Test Result

EUT: GSM Remote Monitoring, Control and alarm system M/N: WT-2009					
Power: DC 12V POWER SUPPLY ADAPTER					
Ambient Temperature:23℃			Relative Humidity: 60%		
Test date: 2010-05-18			Test site: RF site	Tested by: Breeze	
Conclusion: PASS					
Mode	Channel	LVL (dBm)	Correction factor(dB)	ERP (dBm)	EIRP (dBm)
GSM 850	128	1.02	30.42	29.29	/
	190	1.68	30.21	29.74	/
	251	1.24	30.05	29.14	/
PCS 1900	512	-21.48	46.80	/	25.32
	661	-21.49	46.45	/	24.96
	810	-21.51	46.58	/	25.07
ERP=LVL+Correction factor -2.15 EIRP=LVL+Correction factor					

6. Occupied Bandwidth

6.1. B lock Diagram of Test Setup



6.2. Limit

N/A

6.3. Test Procedure

1. The EUT' RF output port was connected to Spectrum Analyzer and Base Station via power divider.

2. Spectrum analyzer's occupied bandwidth measure function was used to measure 99% bandwidth and -26dBc bandwidth

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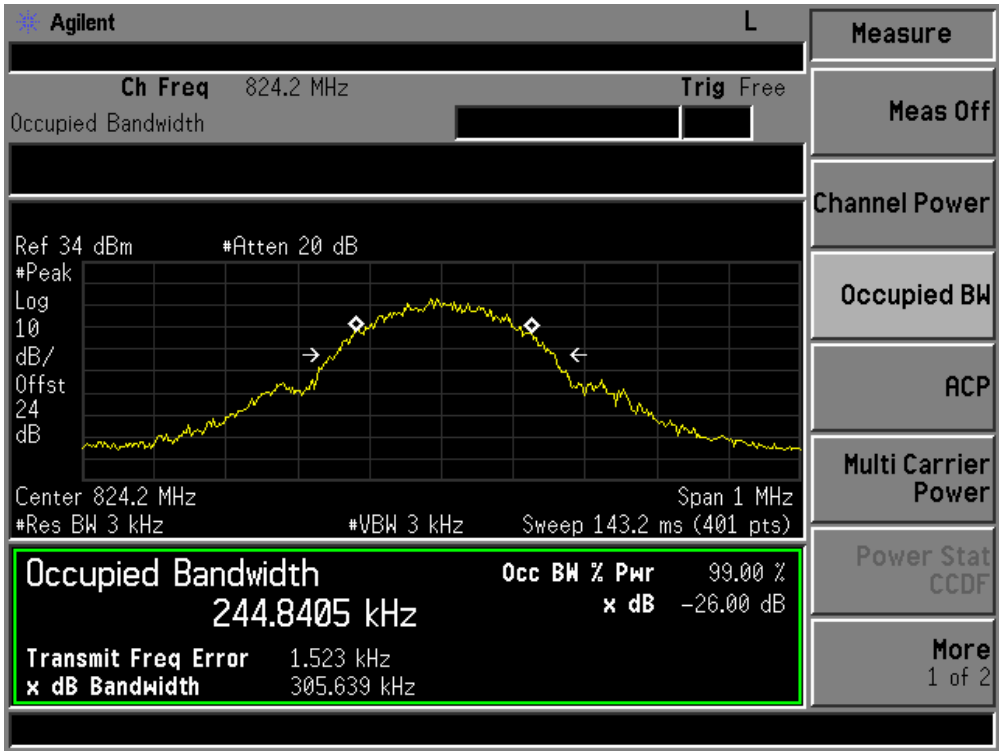
6.4. Test Result

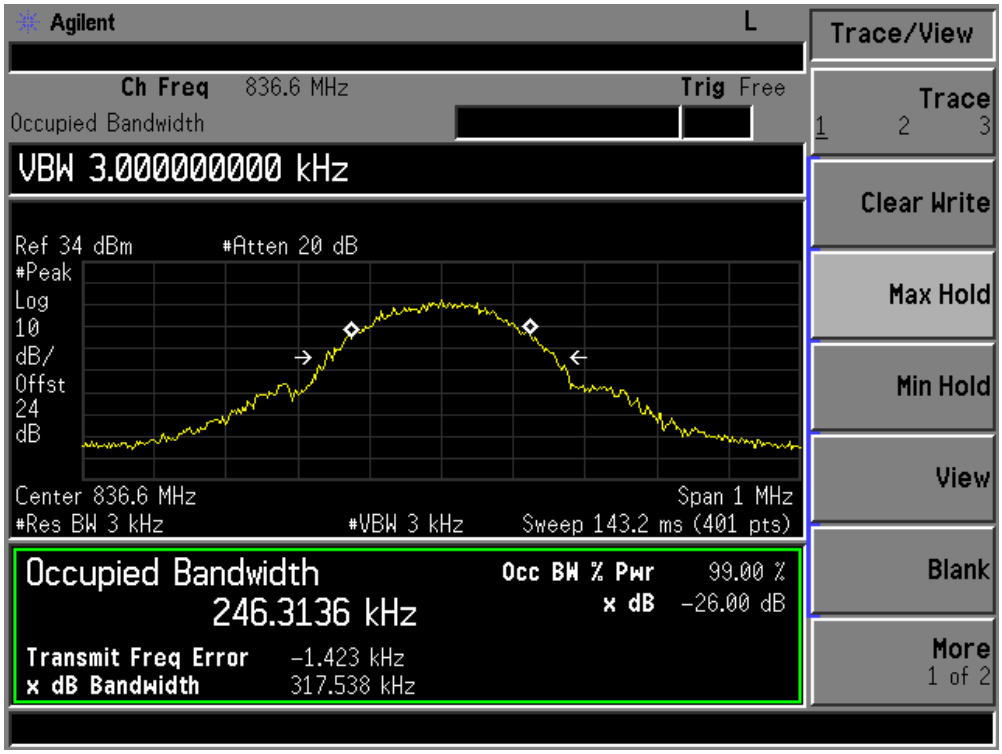
EUT: GSM Remote Monitoring, Control and alarm system M/N: WT-2009			
Power: DC 12V POWER SUPPLY ADAPTER			
Ambient Temperature:23℃		Relative Humidity: 60%	
Test date: 2010-05-18		Test site: RF site	Tested by: Breeze
Mode	Channel	99% bandwidth (KHz)	-26dBc bandwidth (KHz)
GSM 850	128	244.84	305.639
	190	246.31	317.54
	251	245.03	311.36
PCS 1900	512	246.65	309.01
	661	246.00	315.44
	810	247.68	311.02

6.5. Orginal test data

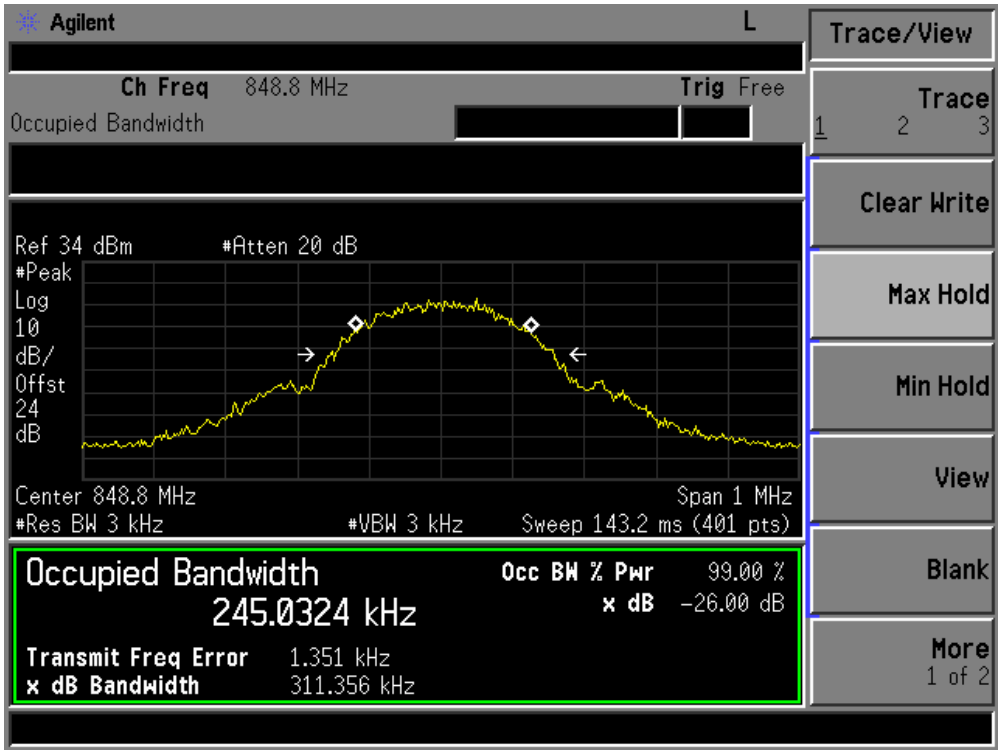
GSM 850 CH128



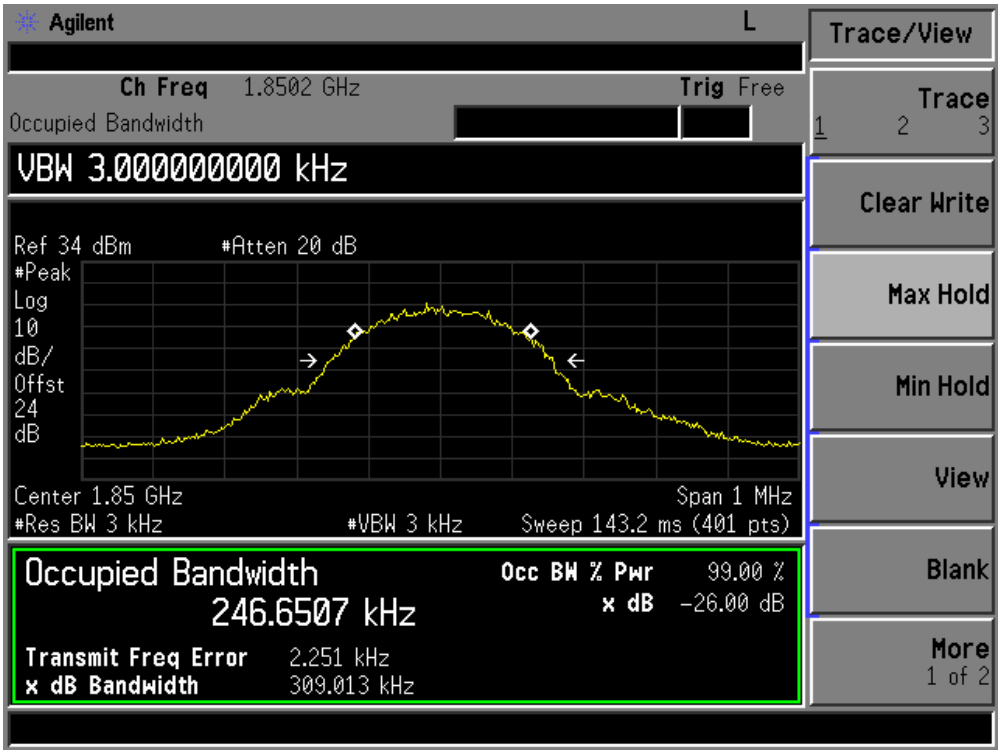
GSM 850 CH190



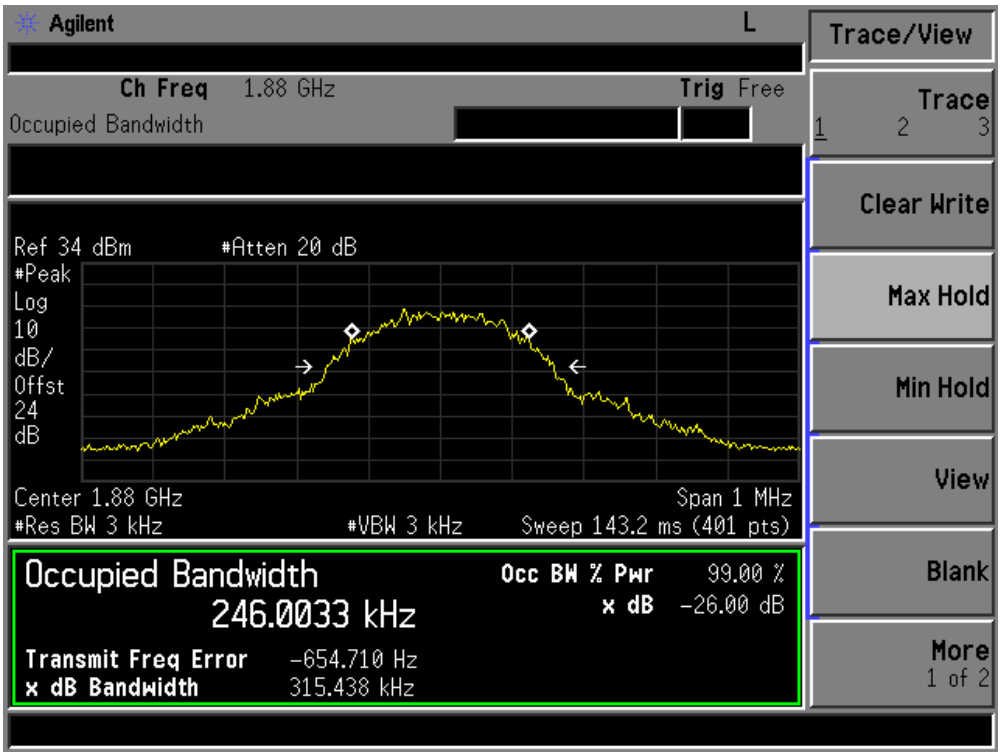
GSM 850 CH251



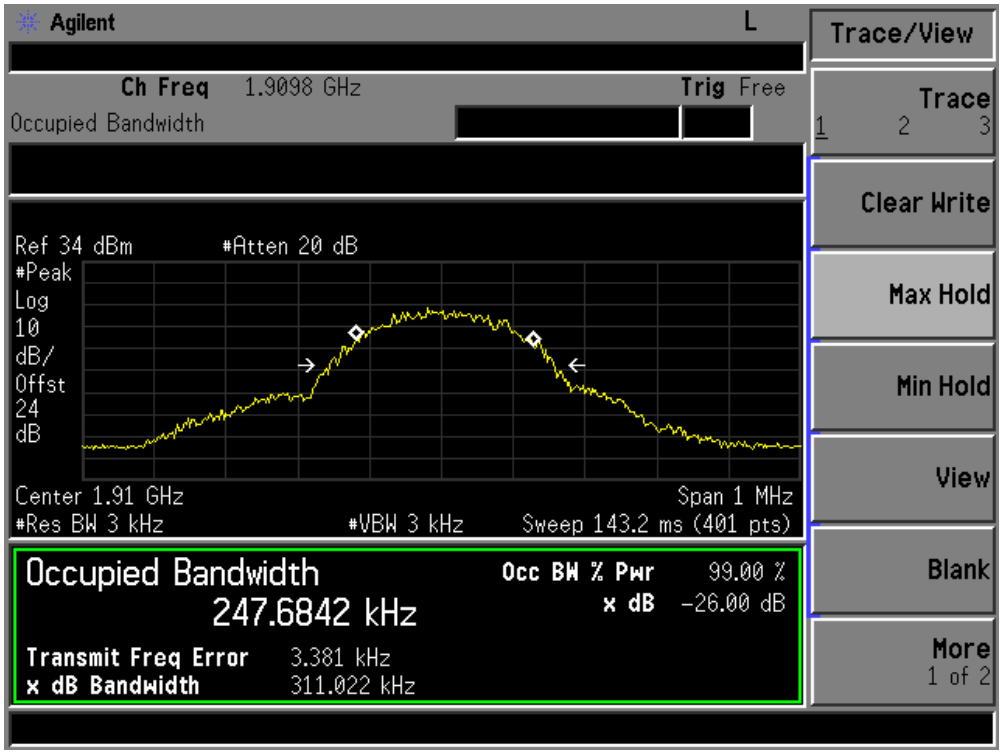
PCS 1900 CH512



PCS 1900 CH661

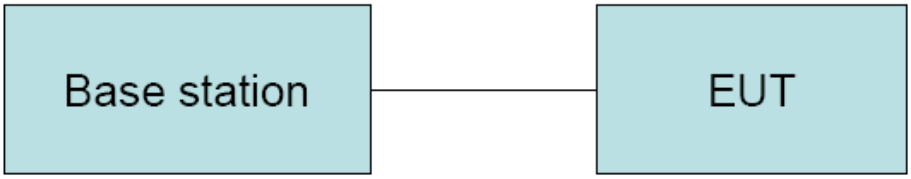


PCS 1900 CH810



7. Frequency stability

7.1. Block Diagram of Test Setup



7.2. Limit

Cellular Telephone 850MHz	PCS 1900MHz
± 2.5 ppm	Must stay within the authorized frequency block

7.3. Test Procedure

Test Procedures for Temperature Variation:

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT can not be turned on at -30°C, the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5° C and connected with the base station.
2. The power supply voltage to the EUT was varied from 15V to 9V(Note)
3. The variation in frequency was measured for the worst case.

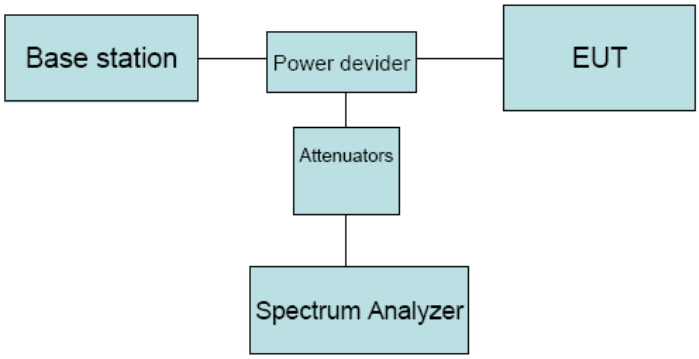
7.4. Test Result

EUT: GSM Remote Monitoring, Control and alarm system M/N: WT-2009			
Power: DC 12V POWER SUPPLY ADAPTER			
Ambient Temperature:23℃		Relative Humidity: 60%	
Test date: 2010-05-18		Test site: RF site	Tested by: Breeze
Conclusion:PASS			
Mode	Voltage (V)	Frequency error (Hz)	frequency error (ppm)
GSM 850 CH 190	15V	29	0.035
	14V	-27	-0.032
	13V	-27	-0.032
	12V	-25	-0.030
	11V	31	0.037
	10V	-33	-0.039
	9V	31	0.037
PCS 1900 CH661	15V	-33	-0.018
	14V	39	0.021
	13V	37	0.020
	12V	-36	-0.019
	11V	-31	-0.016
	10V	-39	-0.021
	9V	-32	-0.017

Mode	Temperature (℃)	Frequency error (Hz)	frequency error (ppm)
GSM 850 CH190	-30	27	0.032
	-20	-25	-0.030
	-10	-19	-0.023
	0	30	0.036
	10	-29	-0.035
	20	-22	-0.026
	30	22	0.026
	40	-27	-0.032
	50	24	0.029
PCS 1900 CH661	-30	-24	-0.013
	-20	-27	-0.014
	-10	38	0.020
	0	-19	-0.010
	10	-29	-0.015
	20	25	0.013
	30	-24	-0.013
	40	-23	-0.012
	50	23	0.012

8. Conducted spurious emissions

8.1. Block Diagram of Test Setup



8.2. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least (43 + 10 log P) dB, in this case, -13dBm.

8.3. Test Procedure

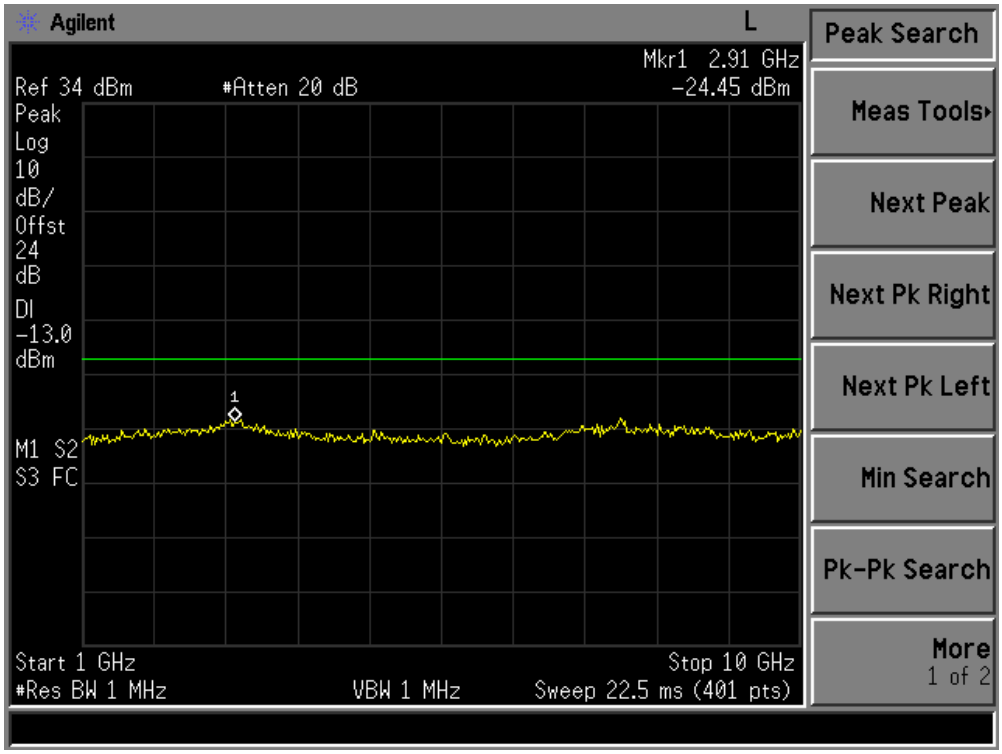
1. The EUT was connected to spectrum analyzer and base station via power divider.

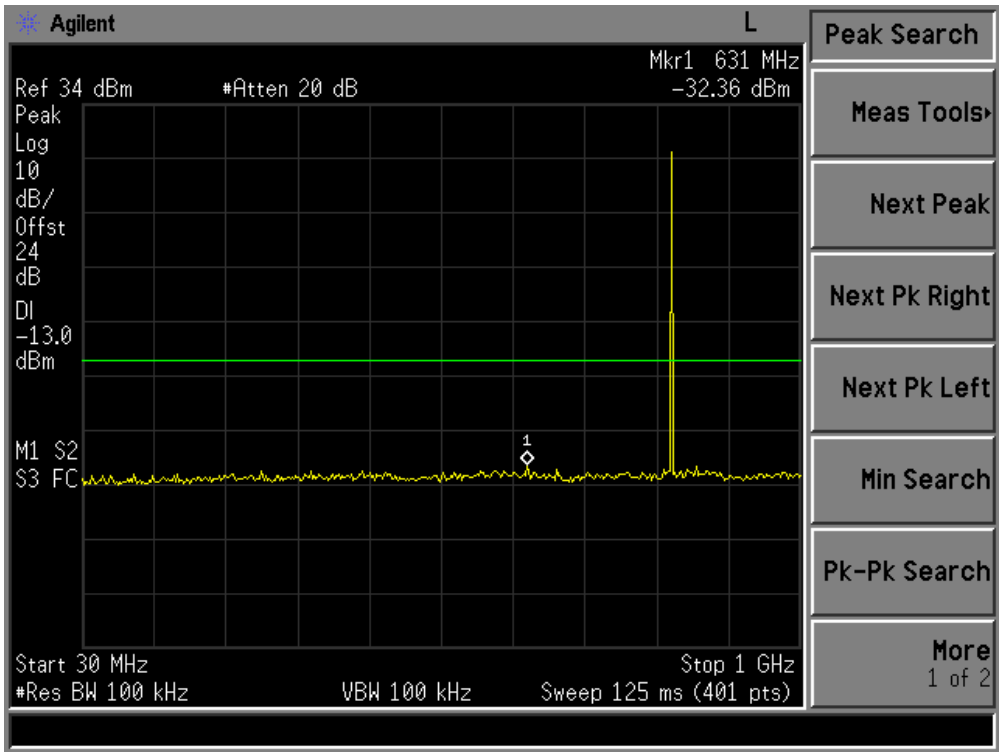
2. The low,middle and high channels of each band and mode's spurious emissions for 30MHz to 10th Harmonic were measured by Spectrum analyzer.

8.4. Test Result

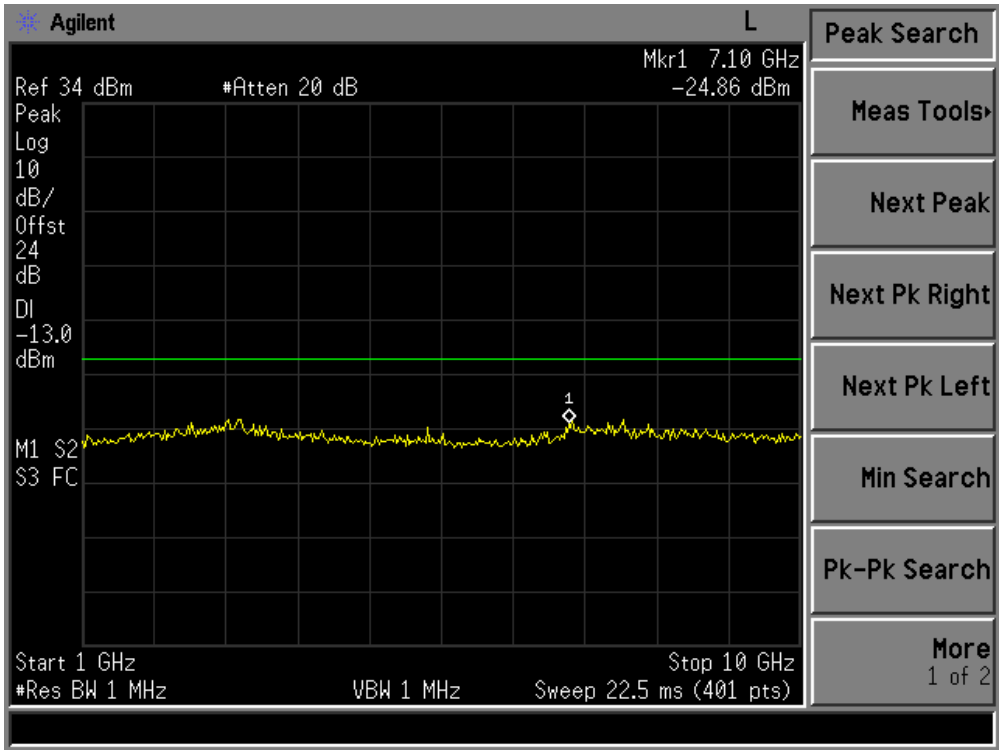
PASS

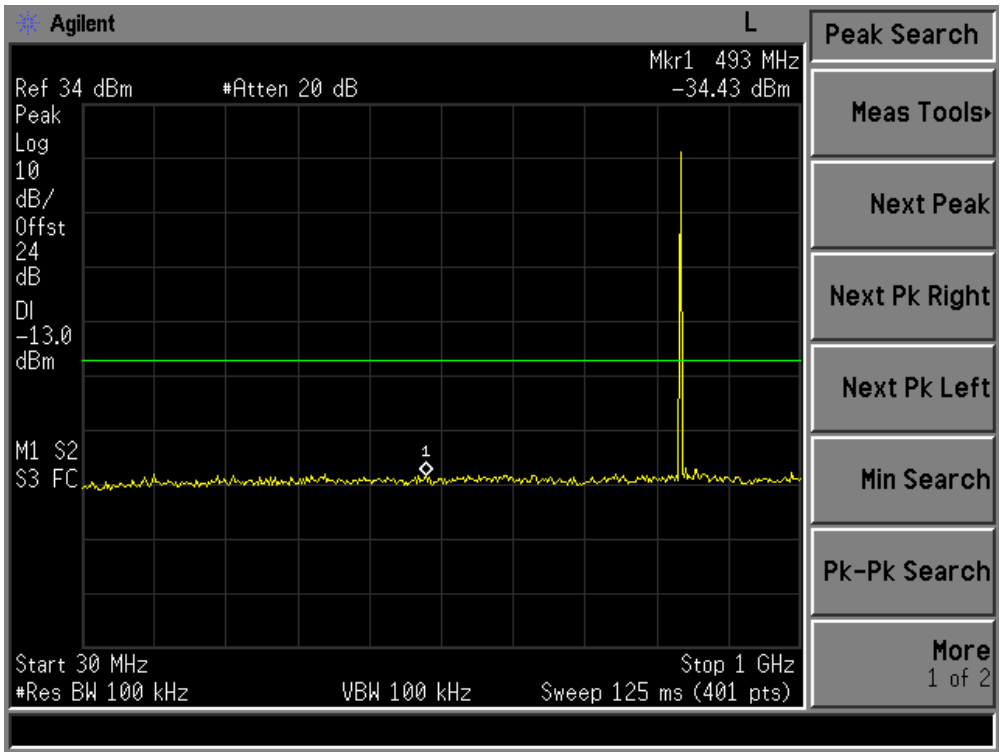
Test Mode: GSM 850 CH 128



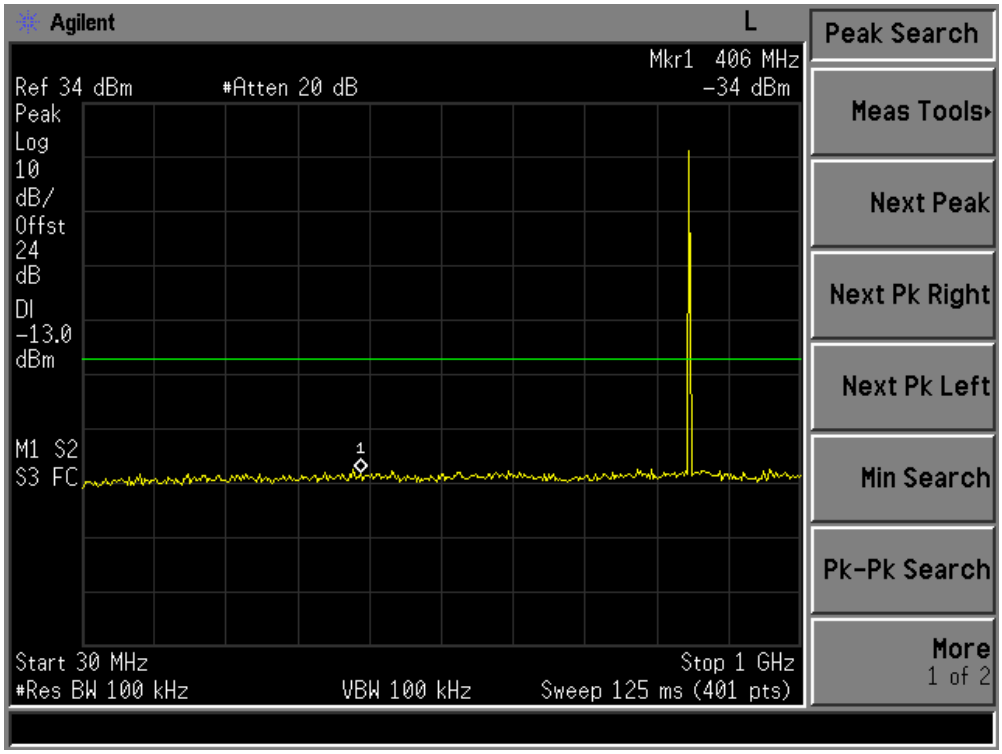


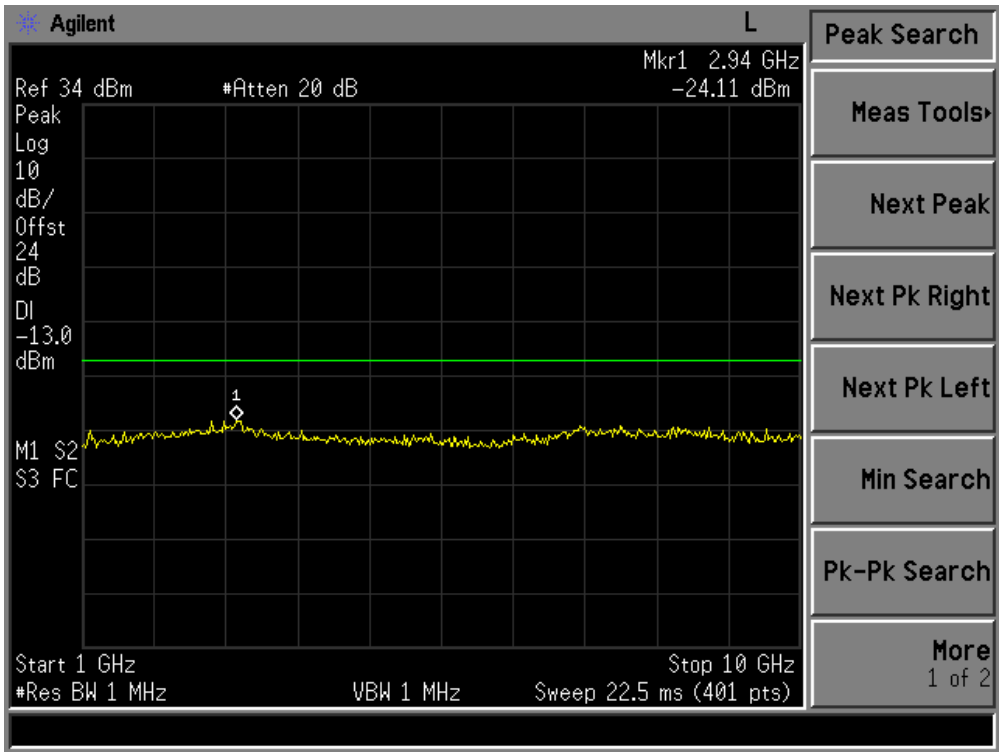
Test Mode: GSM 850 CH 190



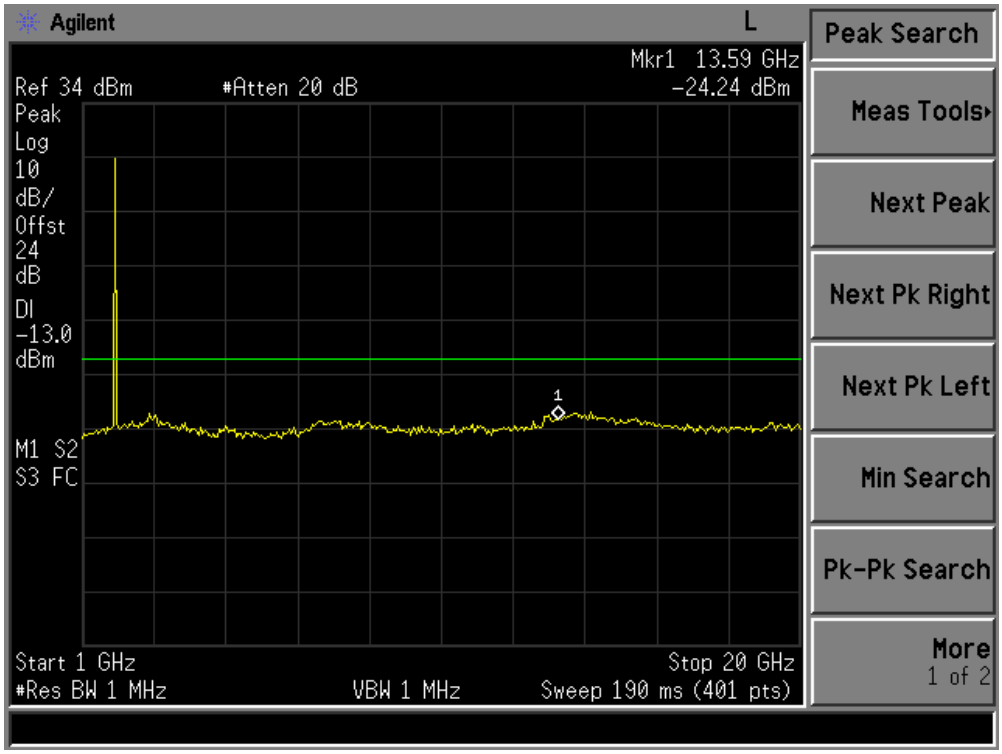


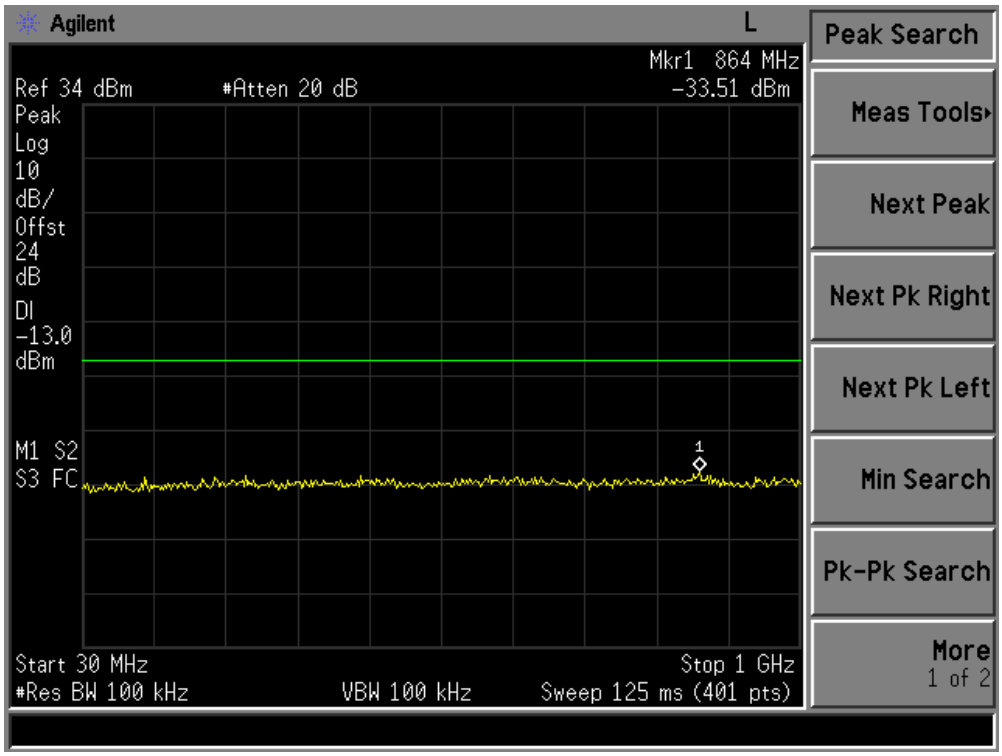
Test Mode: GSM 850 CH 251



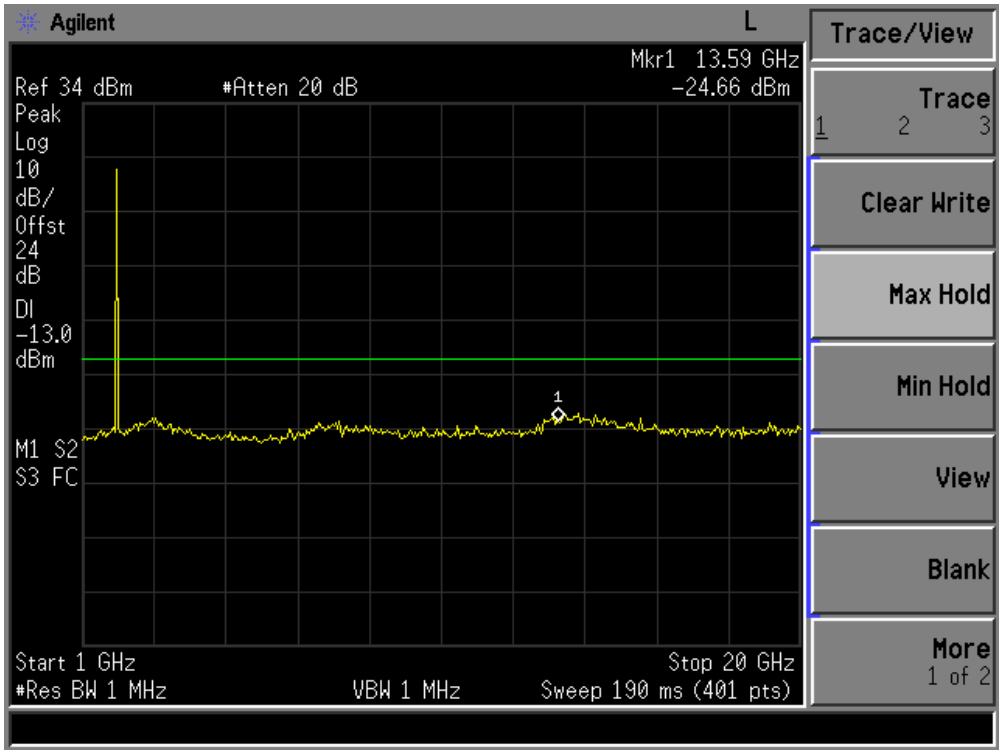


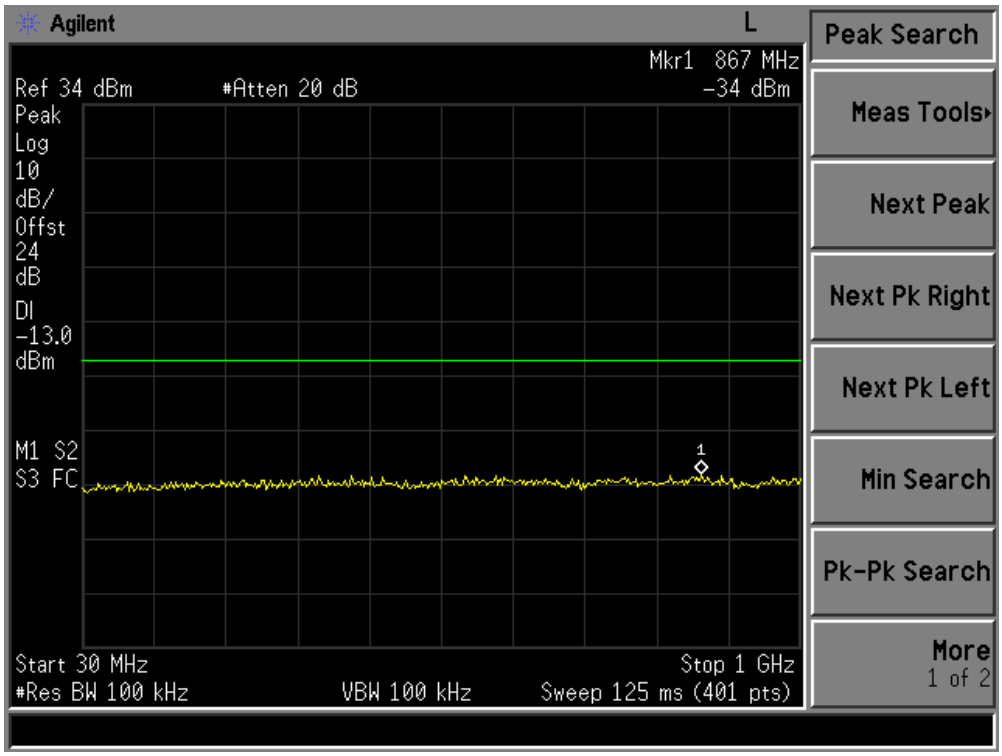
Test Mode: GSM 1900 CH 512



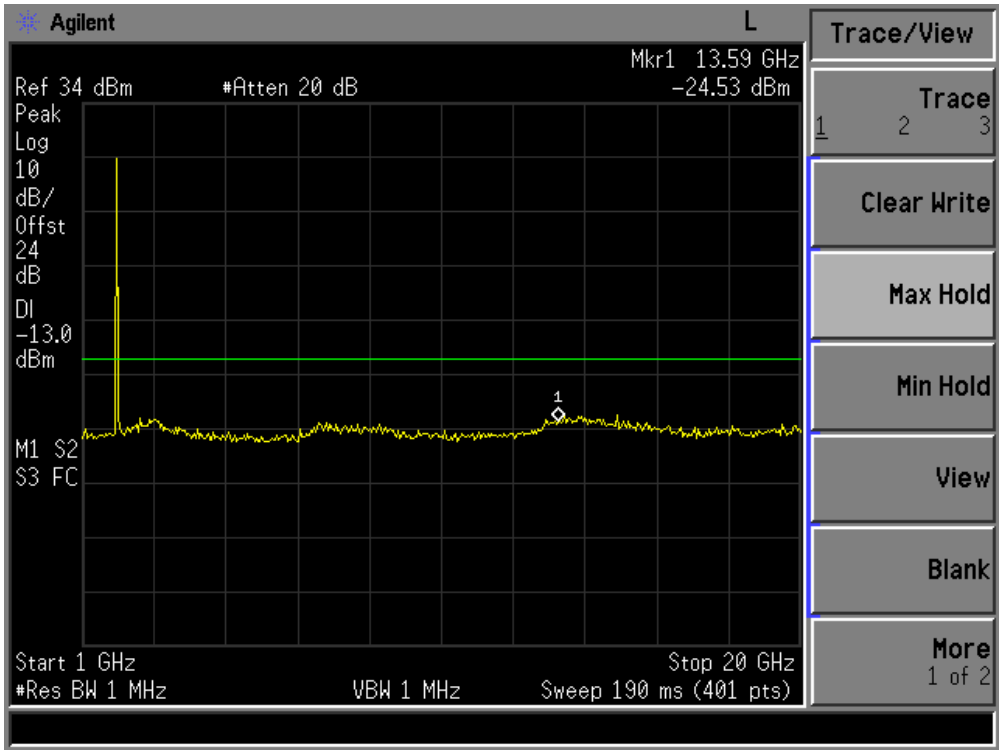


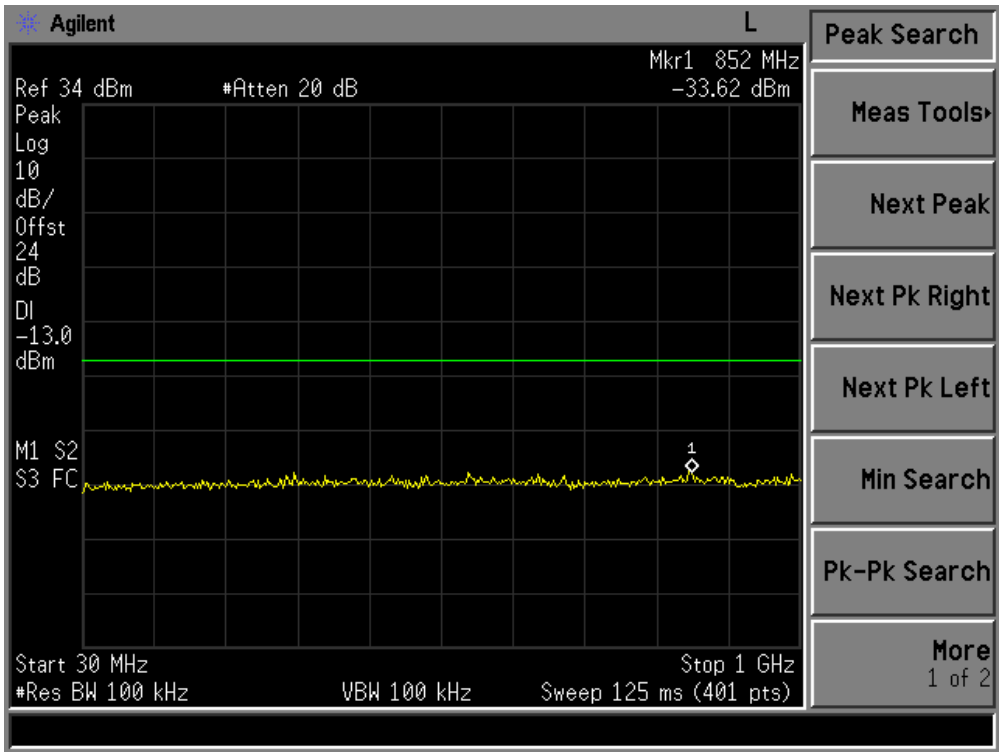
Test Mode: GSM 1900 CH 661





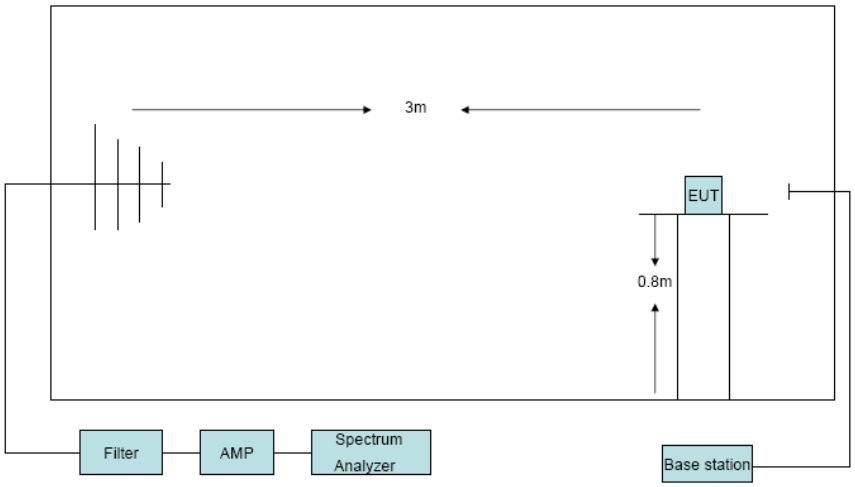
Test Mode: GSM 1900 CH 810





9. Radiated Spurious emissions

9.1. Block Diagram of Test Setup



9.2. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least (43 + 10 log P) dB, in this case, -13dBm.

9.3. Test Procedure

1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated spurious emissions from 30MHz to 10^{th} harmonious of fundamental frequency were measured at 3m with a test antenna and a spectrum analyzer with RBW= 1MHz,VBW= 1MHz ,peak detector settings.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station.All the spurious emissions(record as LVL) at 3m were measured by rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Final spurious emissions levels were measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (for frequency lelow 1GHz) or Horn antenna(for frequecny above 1GHz) at same location with same polarize of reveiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain –Substitution antenna Loss(only for Dipole antenna) - Analyzer reading. Then final

spurious emissions were calculated with the correction factor, EIRP= LVL + Correction

factor and ERP = EIRP – 2.15

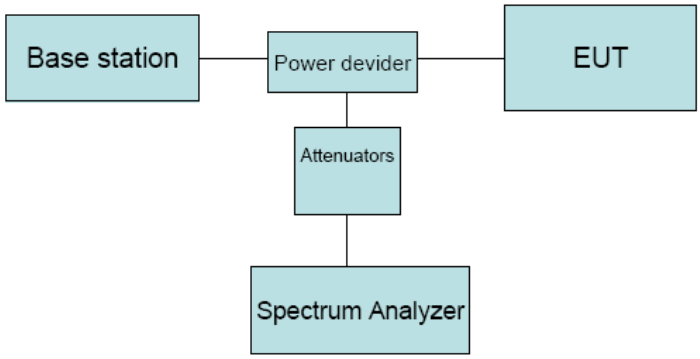
9.4. Test Result

EUT: GSM Remote Monitoring, Control and alarm system M/N: WT-2009						
Power: DC 12V POWER SUPPLY ADAPTER						
Test Date: 2010-05-18		Test site: RF Chamber		Tested by: Breeze		
Ambient Temperature: 24℃		Relative Humidity: 60%				
Conclusion:PASS						
Test result						
Test Mode：GSM 850 CH128						
Frequency (MHz)	Antenna polarization	LVL (dBm)	Correction factor(dB)	Result (ERP)(dBm)	Limit (dBm)	Margin (dB)
1648.4	H	-59.34	11.50	-49.99	-13	36.99
1648.4	V	-57.23	10.56	-48.82	-13	35.82
Test Mode： GSM 850 CH190						
1673.2	H	-65.12	10.94	-56.33	-13	43.33
2509.8	H	/	/	/	-13	/
1673.2	V	-61.43	10.90	-52.68	-13	39.68
2509.8	V	/	/	/	-13	/
Test mode: GSM 850 CH251						
1697.6	H	-64.32	11.67	-54.8	-13	41.8
2546.4	H	/	/	/	-13	/
1697.6	V	-59.23	11.13	-50.25	-13	37.25
2546.4	V	/	/	/	-13	/

Test Mode：GSM 1900 CH512						
Frequency (MHz)	Antenna polarization	LVL (dBm)	Correction factor(dB)	Result (EIRP)(dBm)	Limit (dBm)	Margin (dB)
3700.4	H	-55.43	8.57	-46.86	-13	33.86
5550.6	H	/	/	/	-13	/
3700.4	V	-53.12	8.37	-44.75	-13	31.75
5550.6	V	/	/	/	-13	/
Test Mode： GSM 1900 CH661						
3760	H	-54.19	8.75	-45.44	-13	32.44
5640	H	/	/	/	-13	/
3760	V	-54.34	8.55	-45.79	-13	32.79
5640	V	/	/	/	-13	/
Test mode: GSM 1900 CH810						
3819.6	H	-56.23	8.94	-47.29	-13	34.29
5729.4	H	/	/	/	-13	/
3819.6	V	-55.12	8.72	-46.40	-13	33.40
5729.4	V	/	/	/	-13	/
Note: All the other emissions not recorded were too low to read, and deemed to comply with limit.						

10. Block Edge Compliance

10.1. Block Diagram of Test Setup



10.2. Limit

The mean power of emissions must be attenuated below the mean power of the unmodulated carrier (P) on any frequency outside the frequency band by at least (43 + 10 log P) dB, in this case, -13dBm.

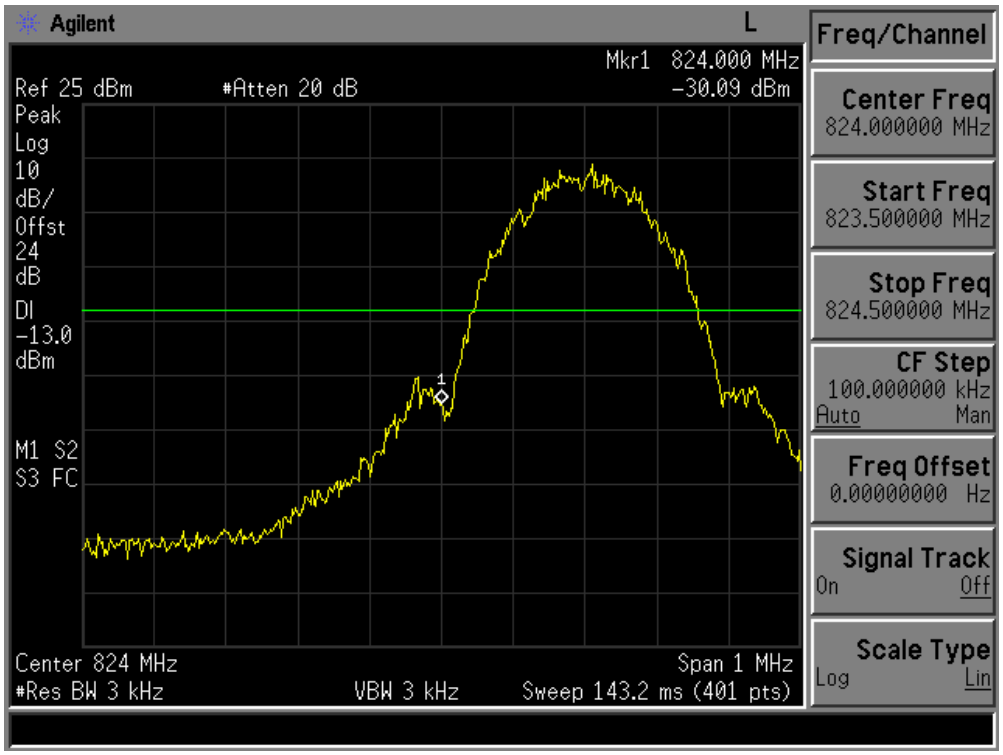
10.3. Test Procedure

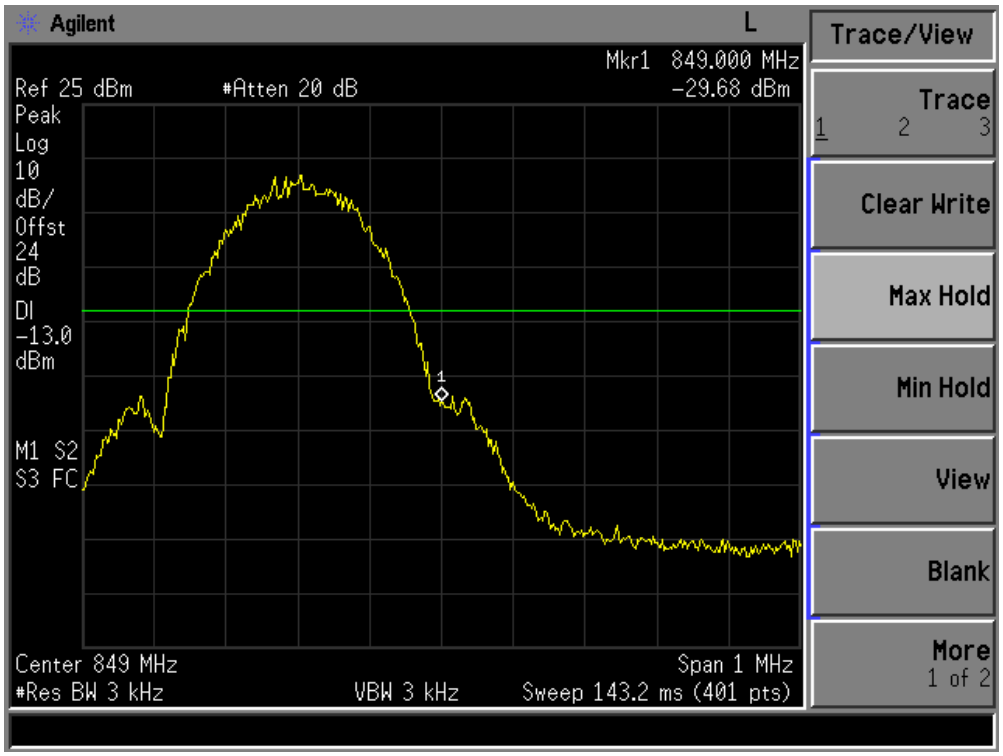
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured.

10.4. Test Result

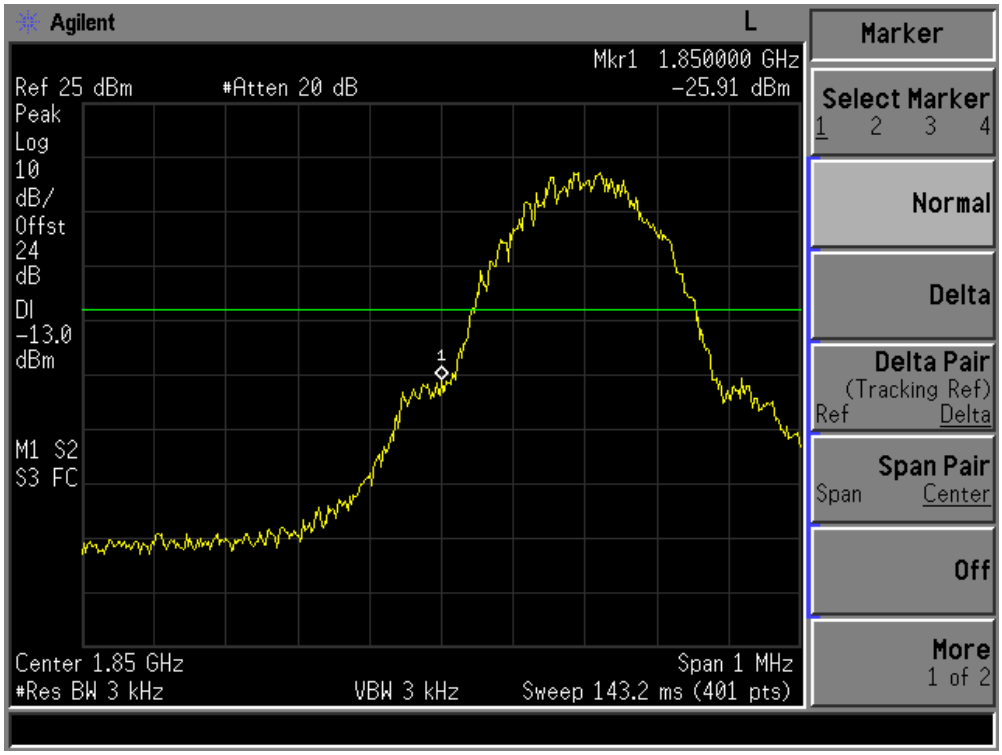
PASS

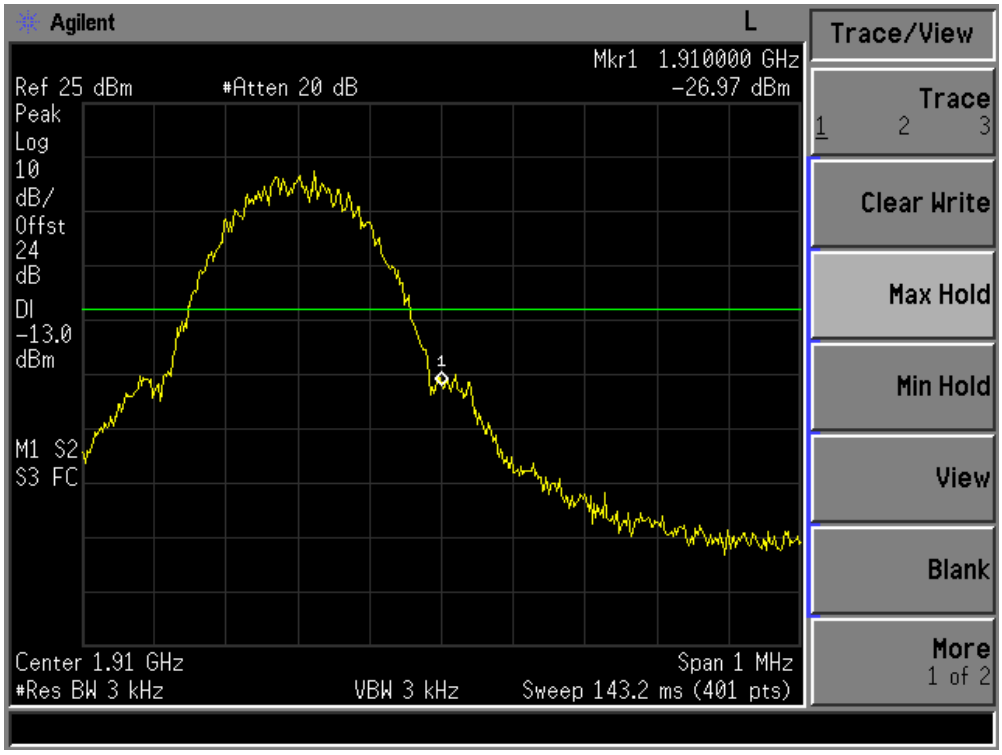
Test Mode: GSM 850



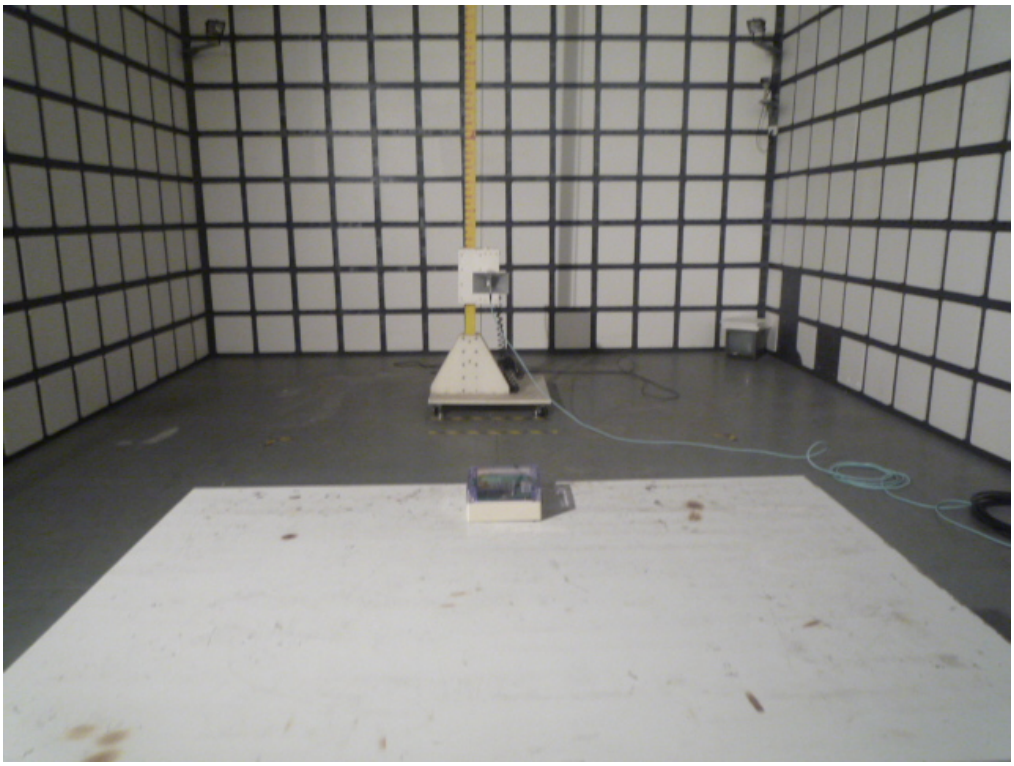


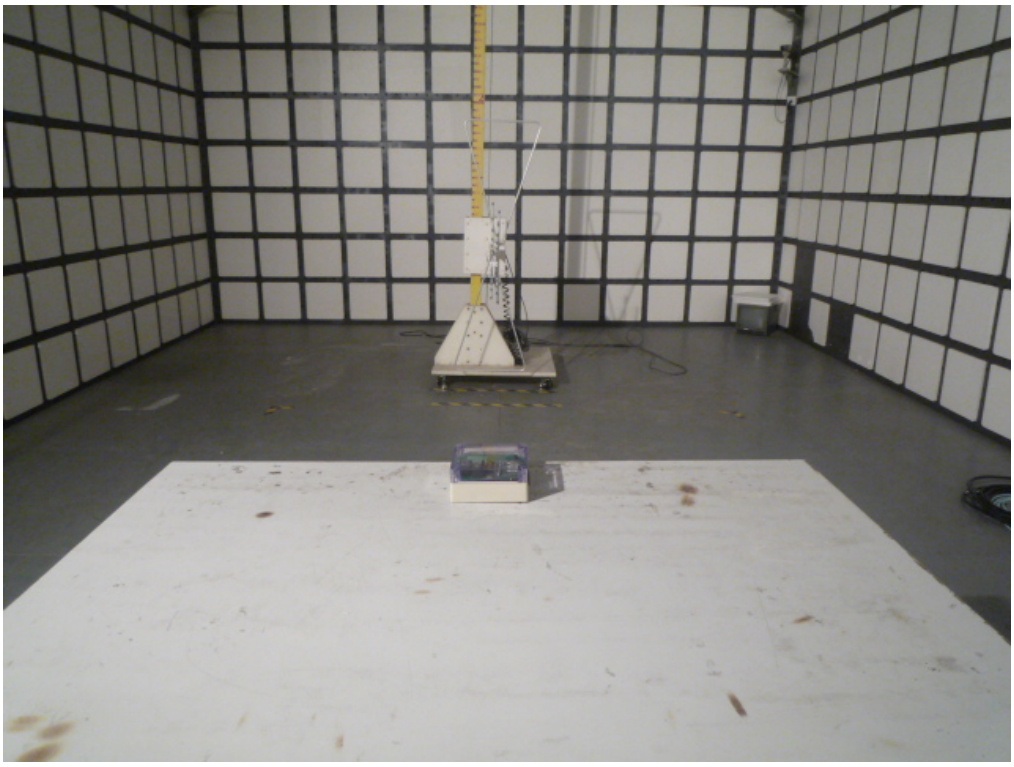
Test Mode: GSM 1900



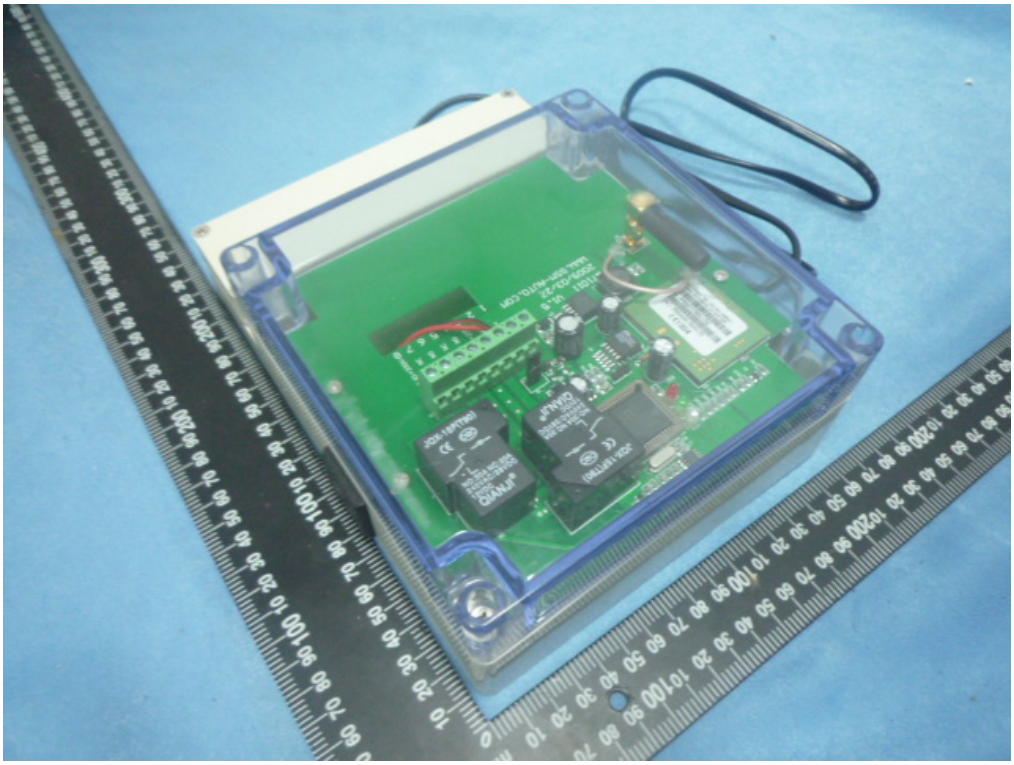


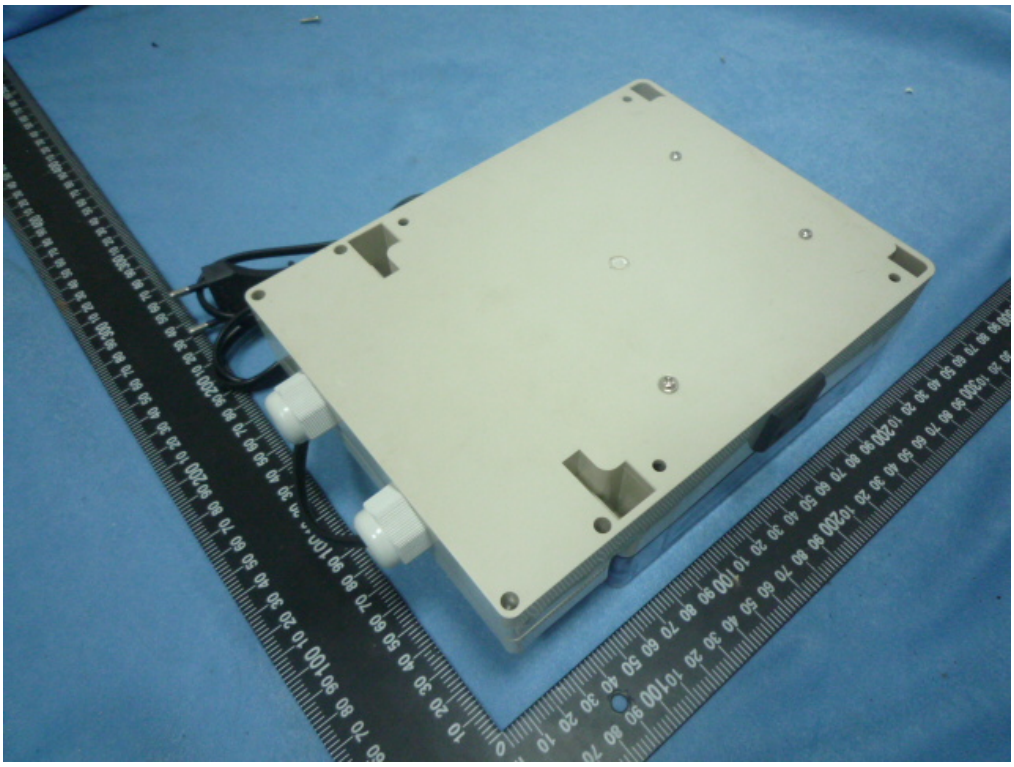
11. Testsetup photo

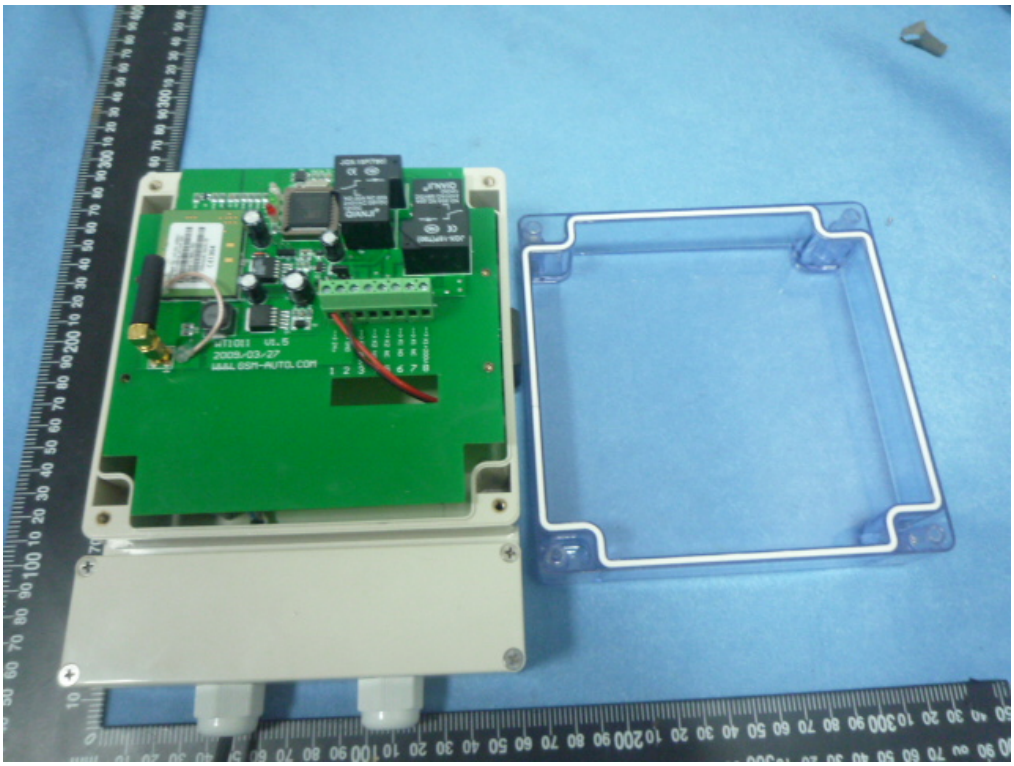


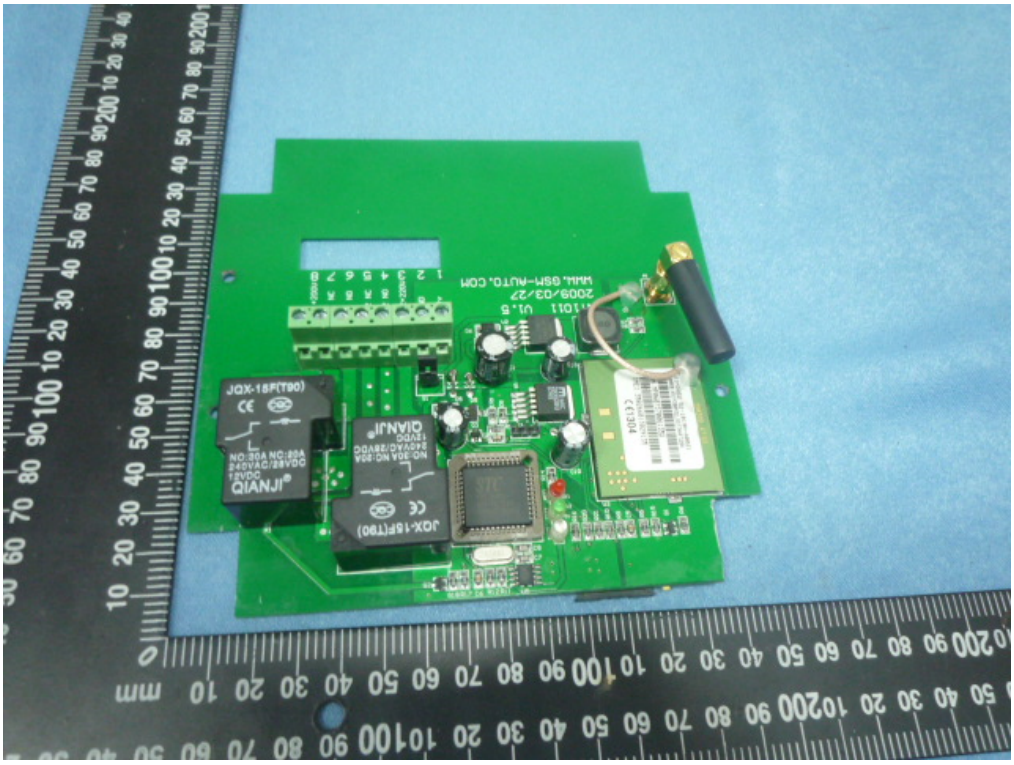


12. Photos of EUT





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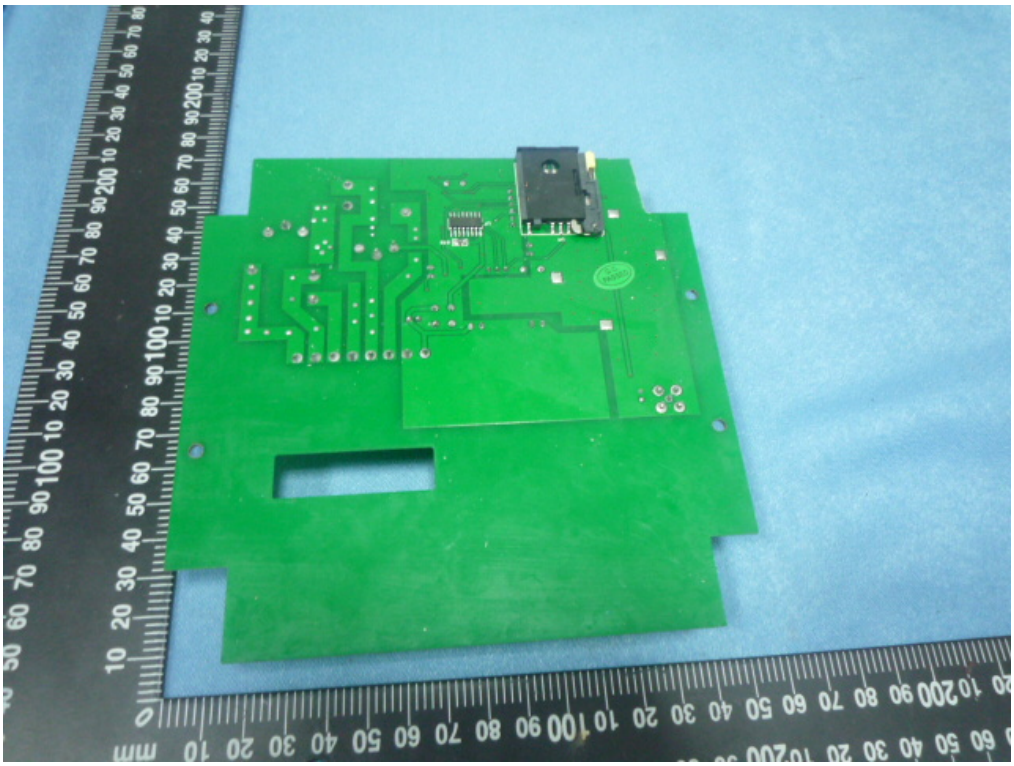

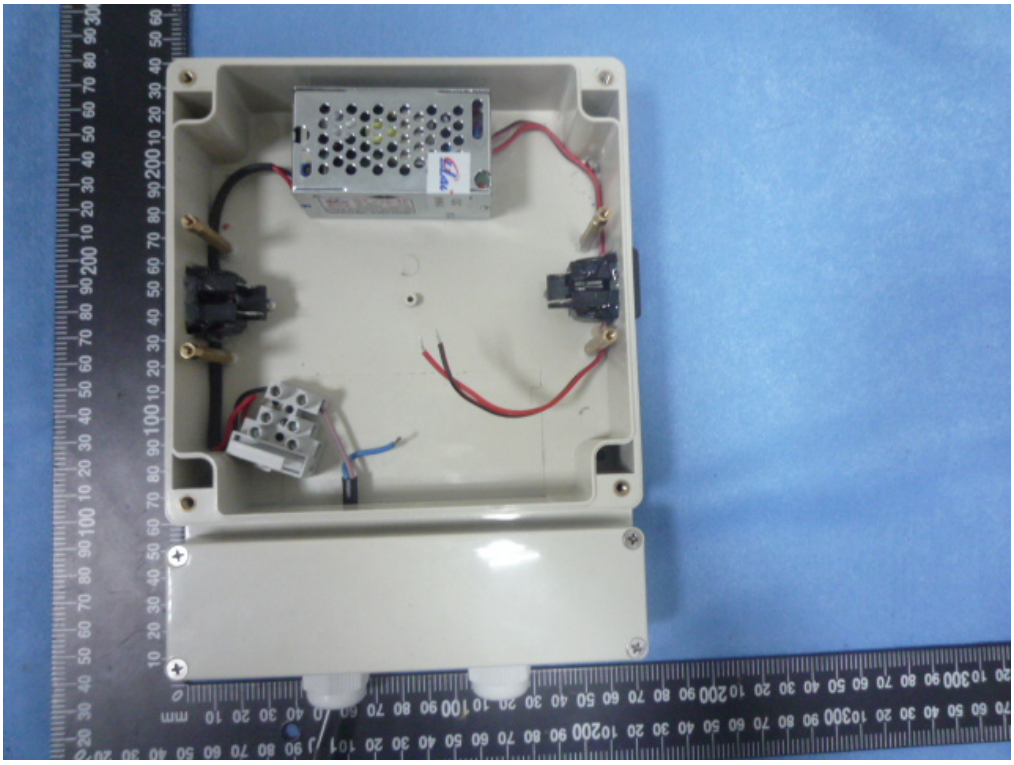

END OF REPORT