Shenzhen Certification Technologh Service Co., Ltd
3F, Bldg27,Area A, Tanglang Industrial Zone, Xili Town, Nanshan District, ShenZhen, Guang dong, P.R. China.

TEST REPORT

FCC ID: X3U-TK310

Applicant： Topten electronics Technology Limited

Address : Room2007,Tower B,Gaoke Building, 908 Tianhe North Road, Guangzhou,China

Equipment Under Test(EUT):

Name : GPS Vehicle Tracker

Model : TK310

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

Report No : STE100104011

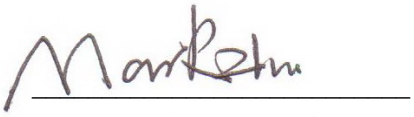
Date of Test : Jan 05---06, 2010

Date of Issue : Jan 08, 2010

Test Result: **PASS**

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

Authorized Signature



(Mark Zhu)

General Manager

Contents

1. General Information

1.1. Description of Device (EUT)

EUT	:	GPS Vehicle Tracker
Model No.	:	TK310
Power supply	:	DC 12V
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
FCC Operation frequency	:	824.2MHz—848.8MHz and 1850.2MHz—1909.8MHz
Modulation	:	GMSK
Antenna Type	:	External antenna, Gain: 3.5dBi
Applicant	:	Topten electronics Technology Limited
Address	:	Room2007,Tower B,Gaoke Building, 908 Tianhe North Road, Guangzhou,China

1.2. Test Lab information

Shenzhen Certification Technology Service Co.,Ltd.
3F, Bldg.27, Area A, Tanglang Industrial Zone, Xili Town, Nanshan District,
Shenzhen 518055, Guangdong, P.R. China
FCC Registered No.:305283

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	N/A

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	07/01/2009	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	02/23/2009	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	May.08, 09	1 Year
Temperature controller	Terchy	MHQ	120	May.08, 09	1Year
Power divider	Anritsu	K240C	020346	May.08, 09	1 Year
Signal Generator	HP	83732B	VS3449051	May.08, 09	1 Year
Attenuator	Agilent	8491B	MY39262165	May.08, 09	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

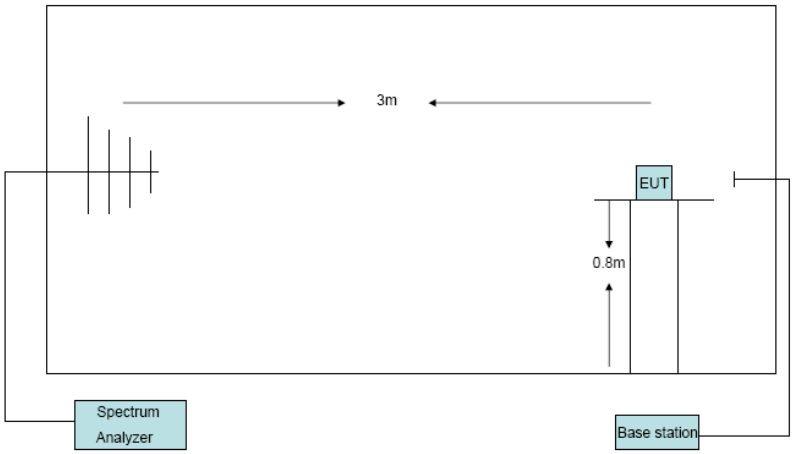
(1) The EUT's RF output port was connected to base station.
(2) A call is set up by the SS according to the generic call set up procedure
(3) Set EUT at maximum power level through base station by power level command
(4) Measure the maximum output power of EUT at each frequency band and mode by base station.

3.4. Test Result

EUT: GPS Vehicle Tracker		M/N:TK310	Power: DC 12V			
Ambient Temperature:24℃		Relative Humidity: 62%				
Test date: 2010-01-05		Test site: RF site	Tested by: TaTa_Chen			
Conclusion:PASS						
Mode	Channel	PK Output Power(dBm)	ERP (dBm)	EIRP (dBm)	Limit	
					ERP(dBm)	EIRP(dBm)
GSM 850	128	31.72	33.07	/	38.5	/
	190	31.73	33.08	/	38.5	/
	251	31.63	32.98	/	38.5	/
PCS 1900	512	29.03	/	32.53	/	33
	661	29.07	/	32.57	/	33
	810	29.02	/	32.52	/	33
Note: EIRP=Pk output power +Antenna Gain(3.5dBi); ERP=PK output power + Antenna Gain(3.5dBi) -2.15						

4. Radiated Output power

4.1. Block Diagram of Test Setup



4.2. Limit

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

4.3. 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 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 the EUT's

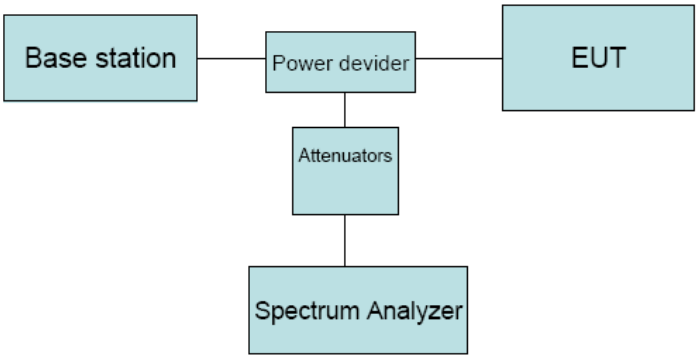
EIRP was calculated with the correction factor, EIRP= LVL + Correction factor and ERP = EIRP – 2.15

4.4. Test Result

EUT: GPS Vehicle Tracker M/N:TK310					
Power:DC 12V					
Ambient Temperature:23℃			Relative Humidity: 60%		
Test date: 2010-01-05			Test site: RF site	Tested by: TaTa_Chen	
Conclusion: PASS					
Mode	Channel	LVL (dBm)	Correction factor(dB)	ERP (dBm)	EIRP (dBm)
GSM 850	128	1.05	30.42	29.32	/
	190	1.17	30.21	29.23	/
	251	1.52	30.05	29.42	/
PCS 1900	512	-20.01	46.80	/	26.79
	661	-19.56	46.45	/	26.89
	810	-19.71	46.58	/	26.87
ERP=LVL + Correction factor -2.15 EIRP=LVL+ Correction factor					

5. Occupied Bandwidth

5.1. B lock Diagram of Test Setup



5.2. Limit

N/A

5.3. 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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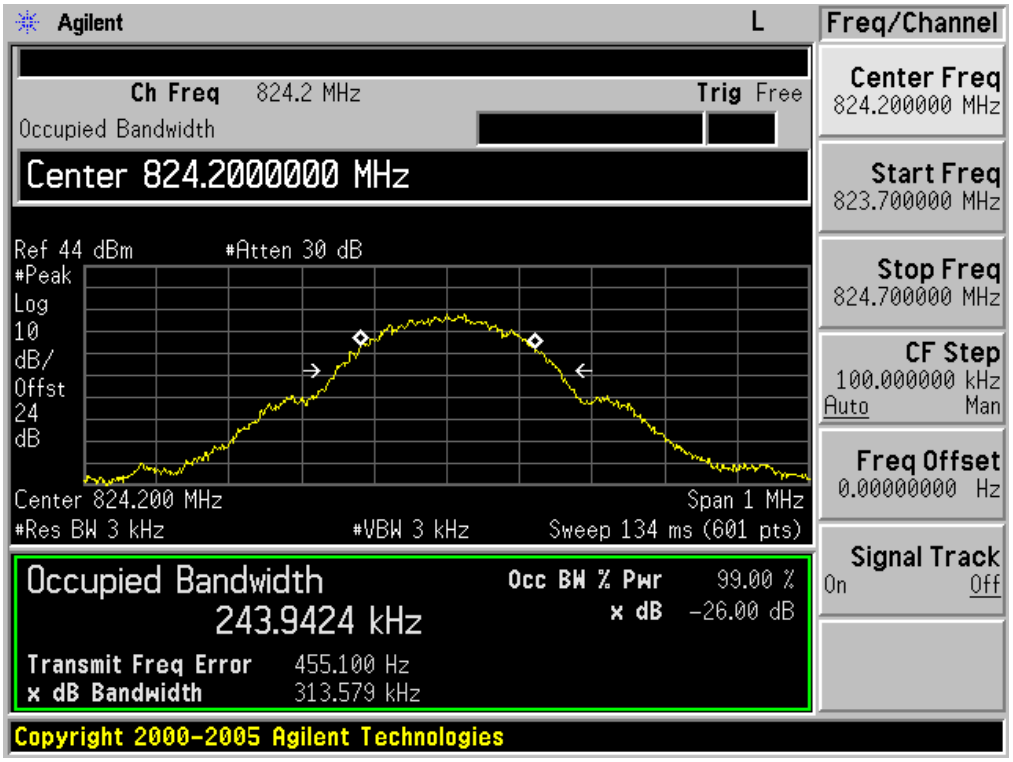
5.4. Test Result

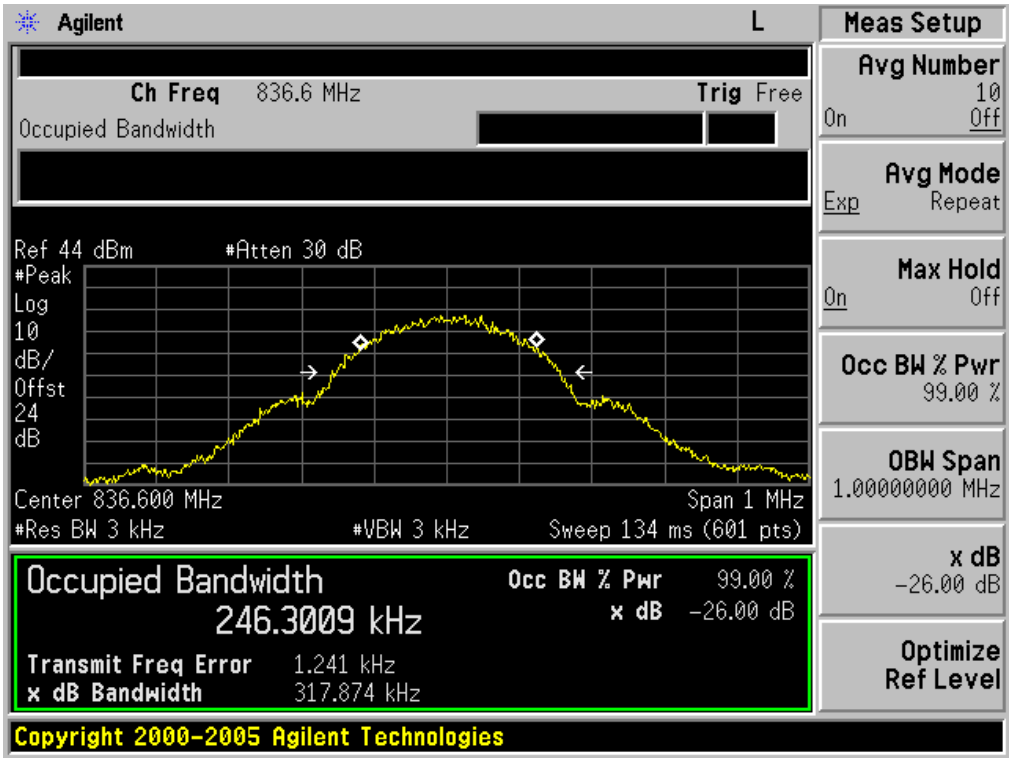
EUT: GPS Vehicle Tracker M/N:TK310			
Power:DC 12V			
Ambient Temperature:23℃		Relative Humidity: 60%	
Test date: 2010-01-05		Test site: RF site	Tested by: TaTa_Chen
Mode	Channel	99% bandwidth (KHz)	-26dBc bandwidth (KHz)
GSM 850	128	243.94	313.58
	190	246.30	317.87
	251	244.45	315.27
PCS 1900	512	244.70	312.21
	661	248.43	307.06
	810	250.21	312.93

5.5. Orginal test data

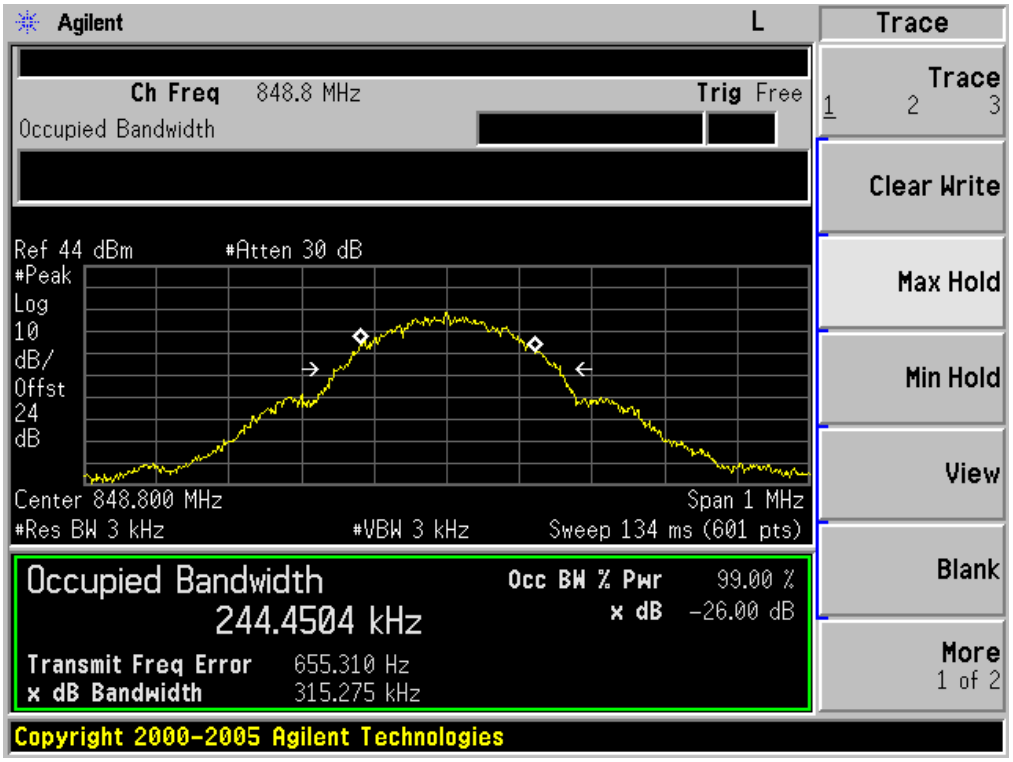
GSM 850 CH128



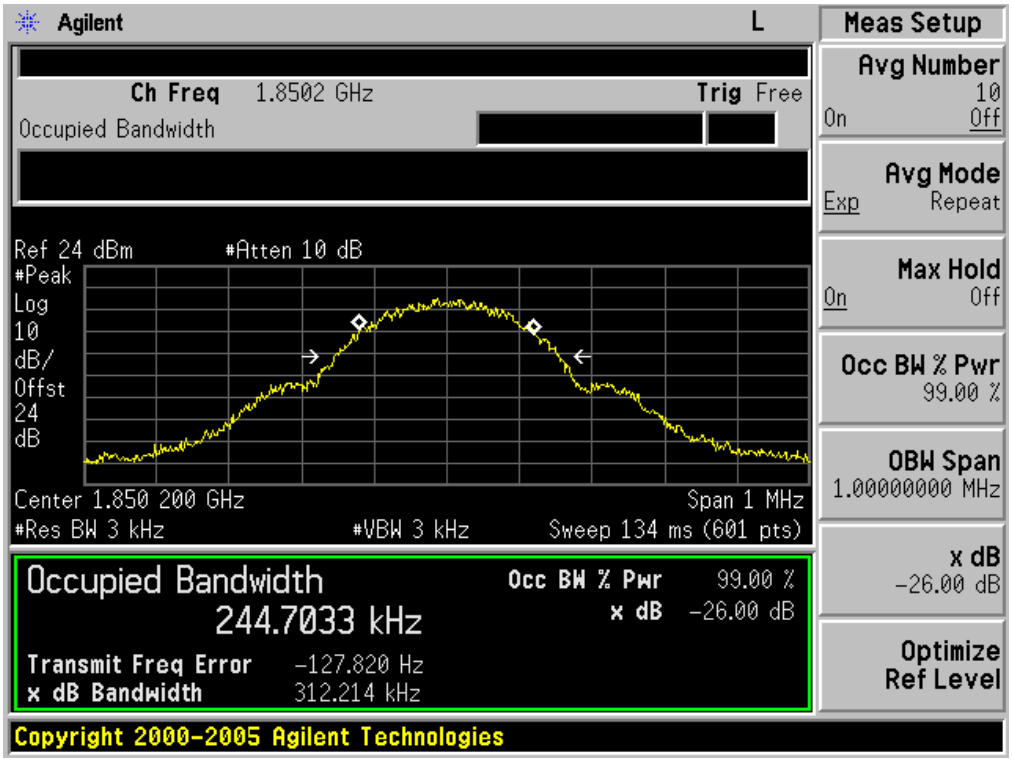
GSM 850 CH190



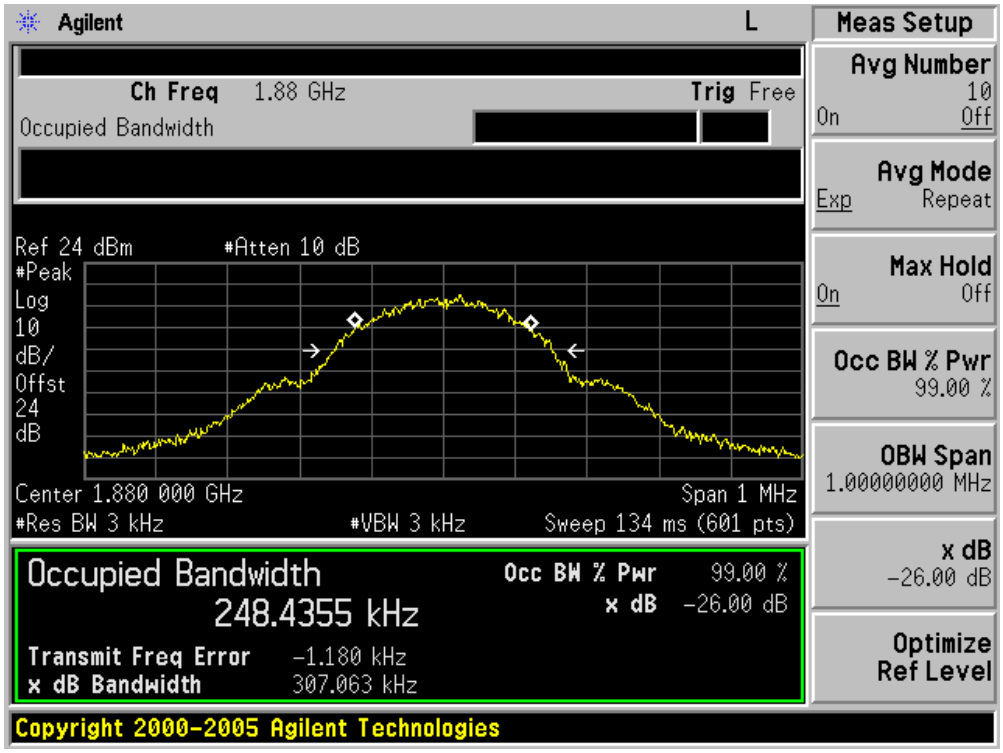
GSM 850 CH251



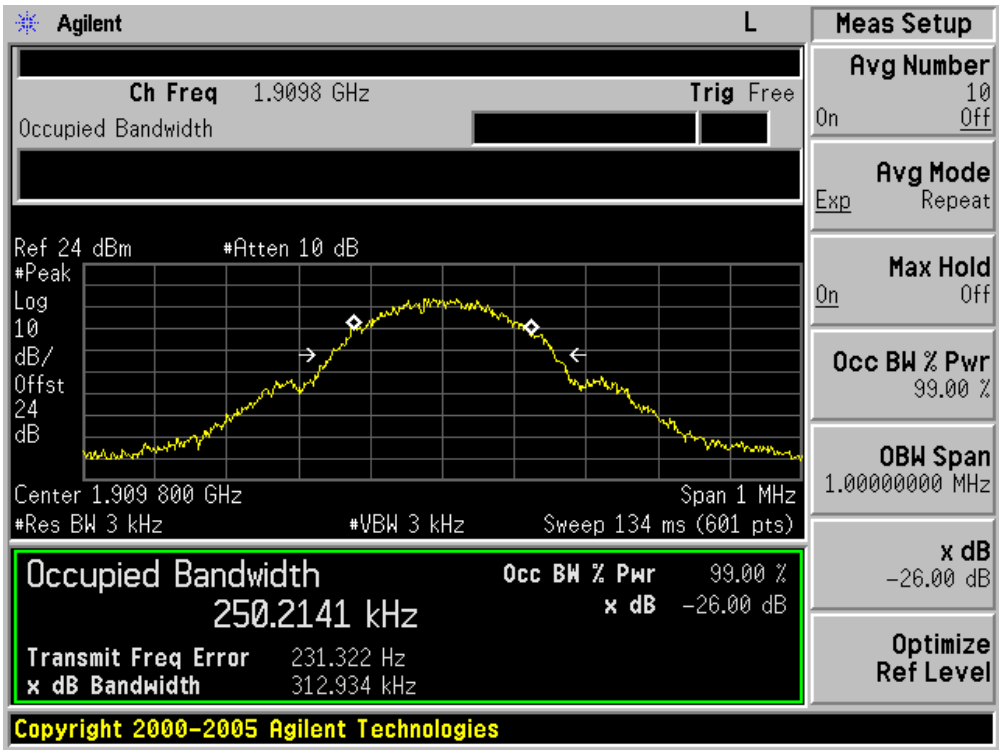
PCS 1900 CH512



PCS 1900 CH661

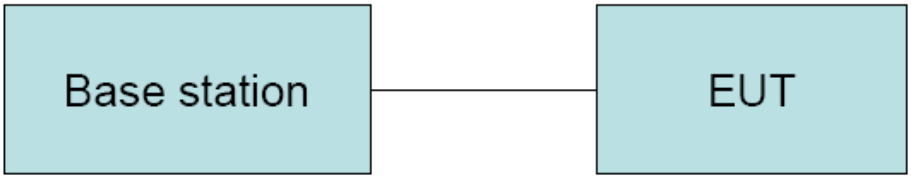


PCS 1900 CH810



6. Frequency stability

6.1. Block Diagram of Test Setup



6.2. Limit

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

6.3. 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.

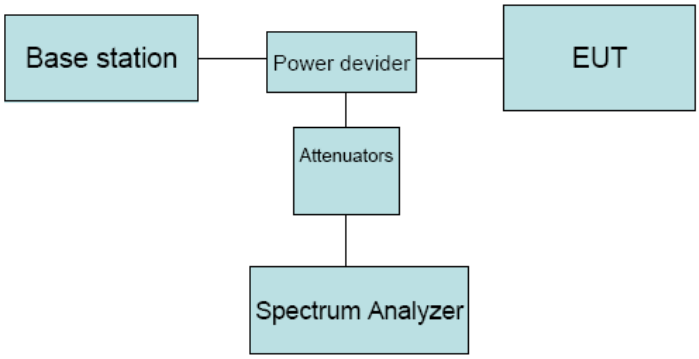
6.4. Test Result

EUT: GPS Vehicle Tracker M/N:TK310			
Power:DC 12V			
Ambient Temperature:23℃		Relative Humidity: 60%	
Test date: 2010-01-05		Test site: RF site	Tested by: TaTa_Chen
Conclusion:PASS			
Mode	Voltage (V)	Frequency error (Hz)	frequency error (ppm)
GSM 850 CH 190	15V	-26	-0.031
	14V	-28	-0.033
	13V	25	0.030
	12V	-24	-0.029
	11V	21	0.025
	10V	-23	-0.027
	9V	-32	-0.038
PCS 1900 CH661	15V	32	0.017
	14V	-33	-0.018
	13V	-31	-0.016
	12V	34	0.018
	11V	-29	-0.015
	10V	-31	-0.016
	9V	30	0.016

Mode	Temperature (℃)	Frequency error (Hz)	frequency error (ppm)
GSM 850 CH190	-30	23	0.027
	-20	32	0.038
	-10	-23	-0.027
	0	-23	-0.027
	10	32	0.038
	20	33	0.039
	30	-21	-0.025
	40	32	0.038
	50	-21	-0.025
PCS 1900 CH661	-30	-22	-0.012
	-20	-26	-0.014
	-10	28	0.015
	0	32	0.017
	10	-34	-0.018
	20	21	0.011
	30	-26	-0.014
	40	25	0.013
	50	-21	-0.011

7. Conducted spurious emissions

7.1. Block Diagram of Test Setup



7.2. 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.

7.3. Test Procedure

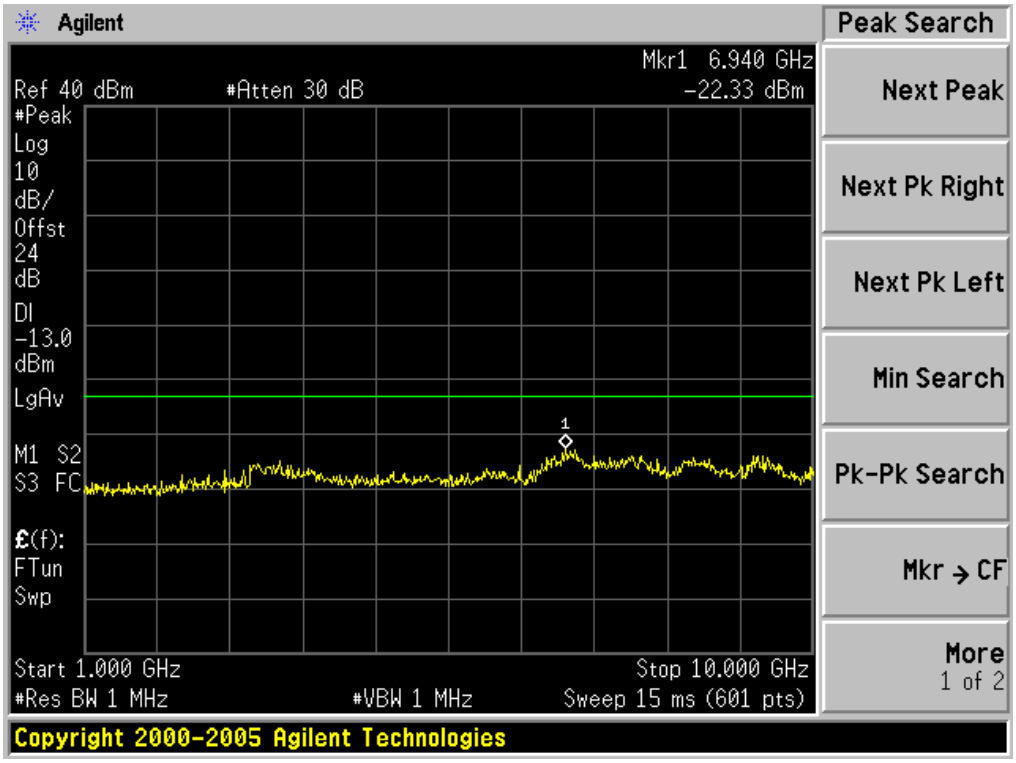
1. The EUT was connected to spectrum analyzer and base station via power divider.

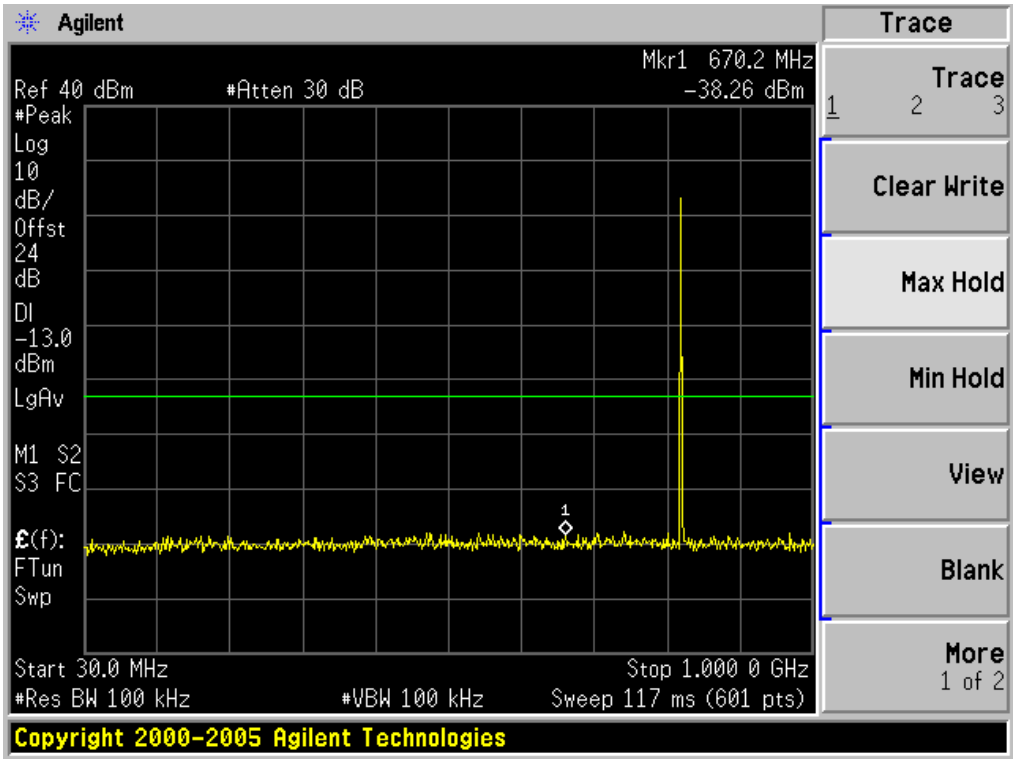
2. The low,middle and high channels of each band and mode's spurious emissions for 30MHz to 10th Harmonic were measured by Spectrum analyzer.

7.4. Test Result

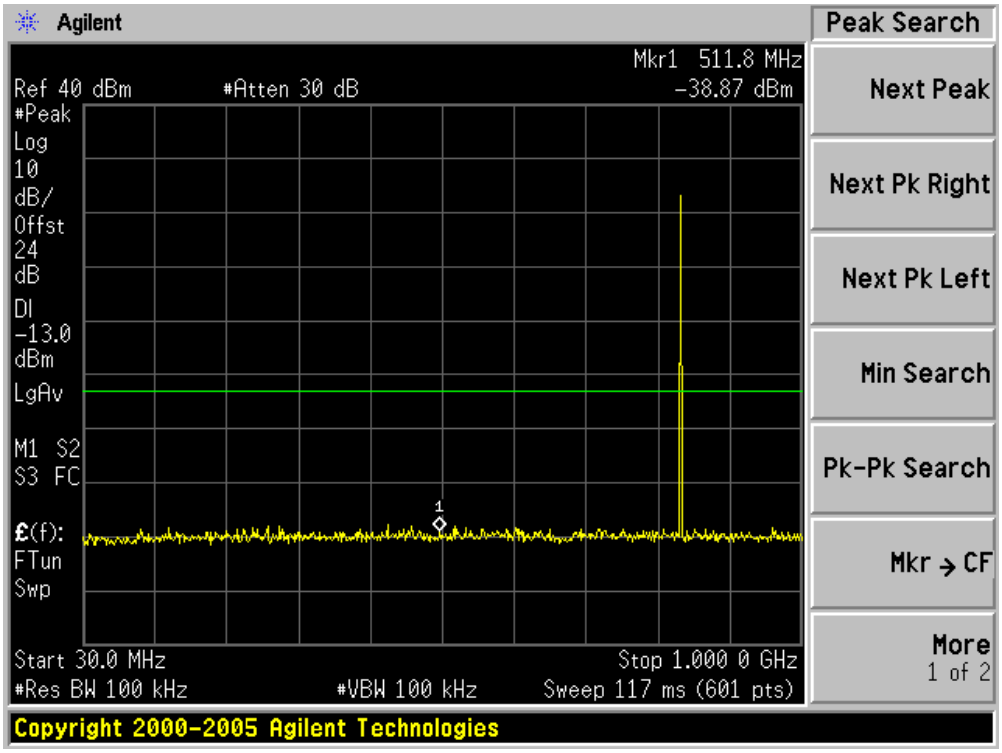
PASS

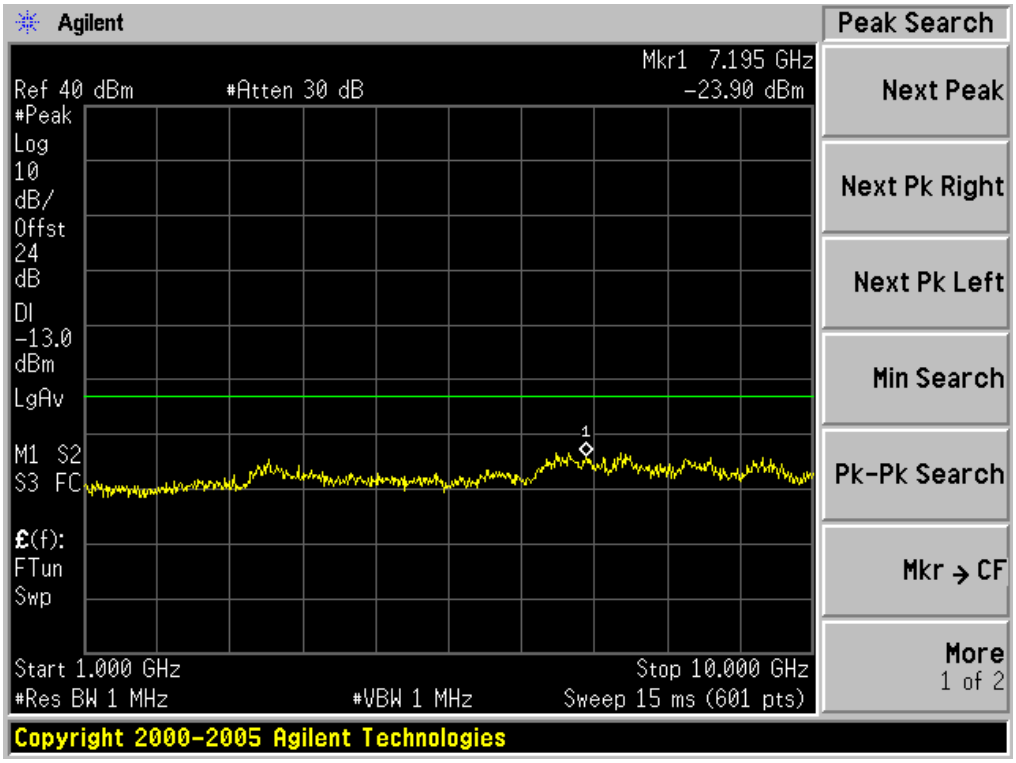
Test Mode: GSM 850 CH 128



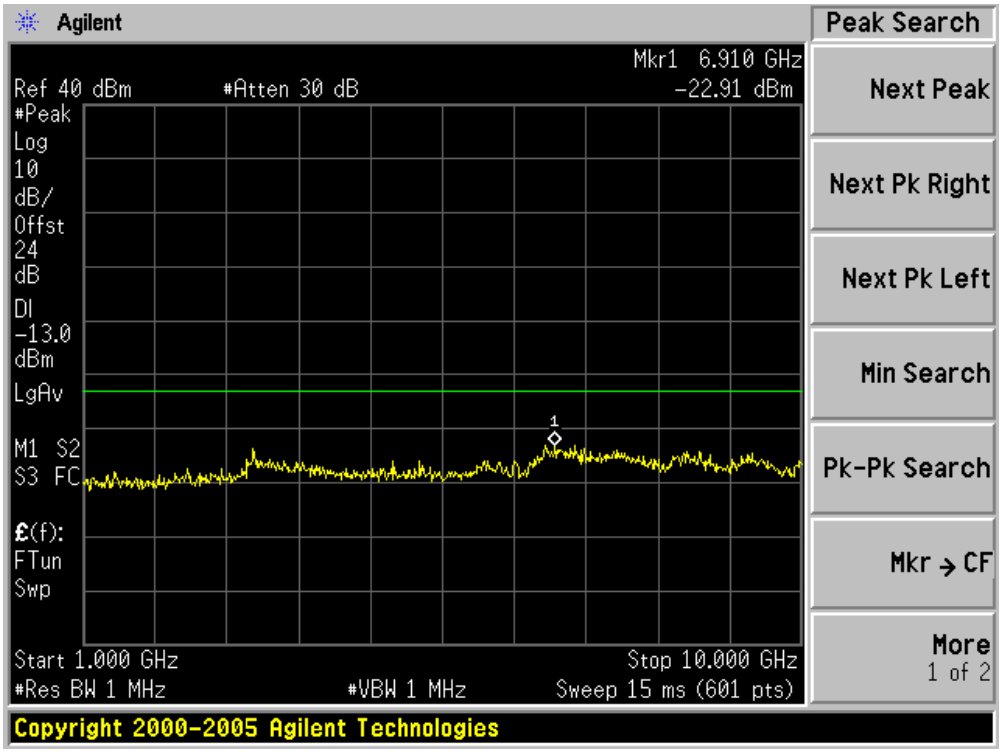


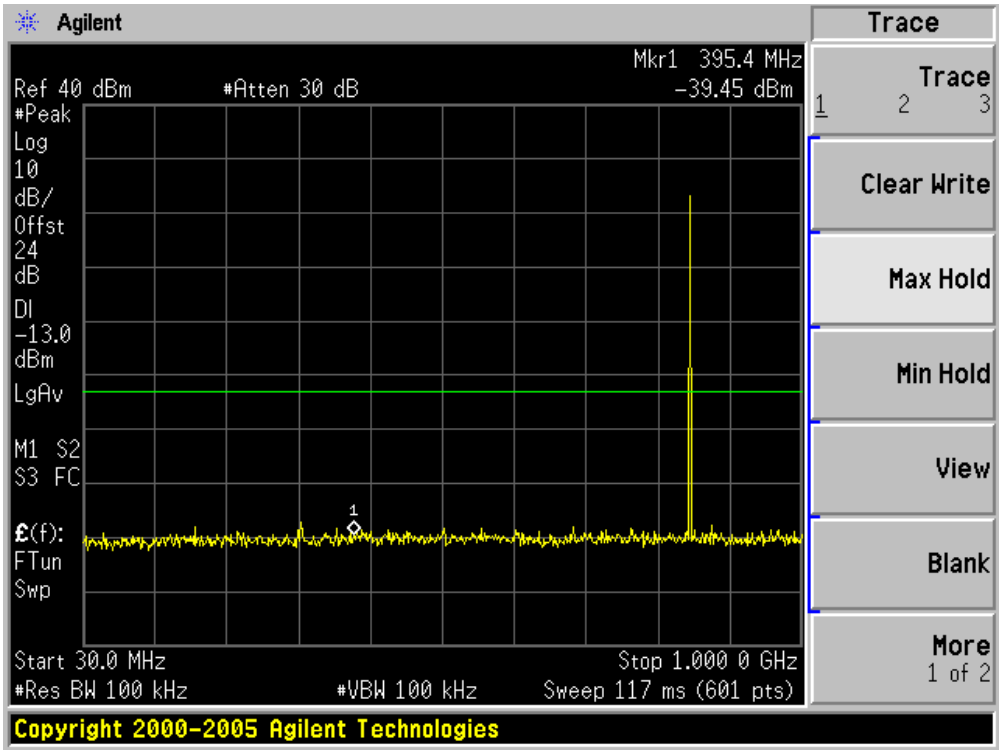
Test Mode: GSM 850 CH 190



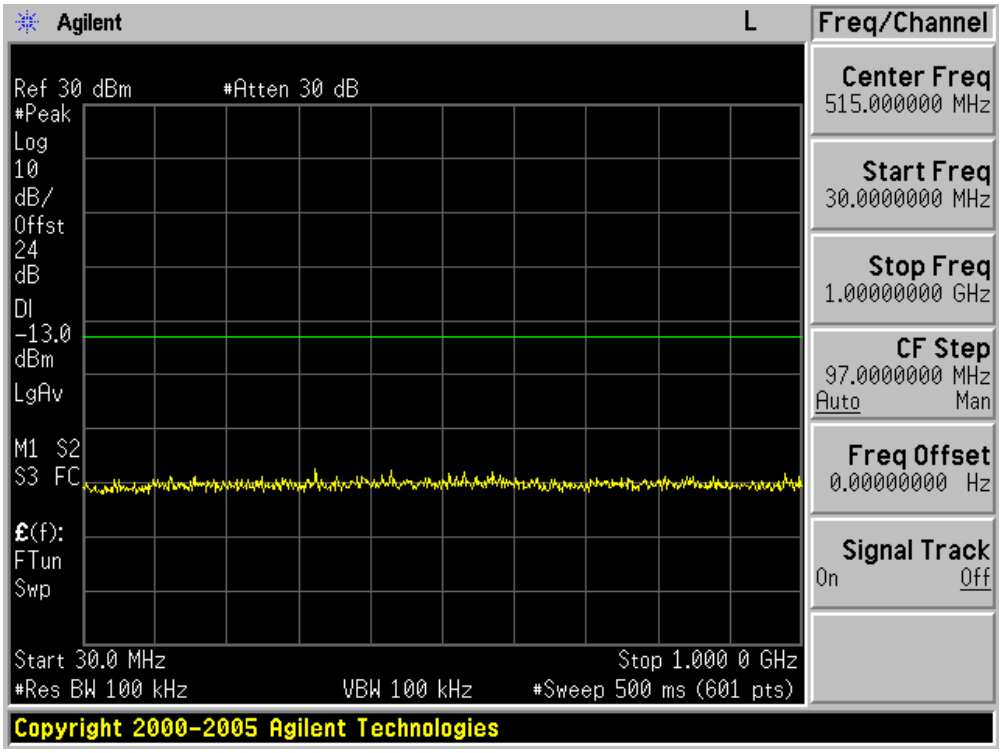


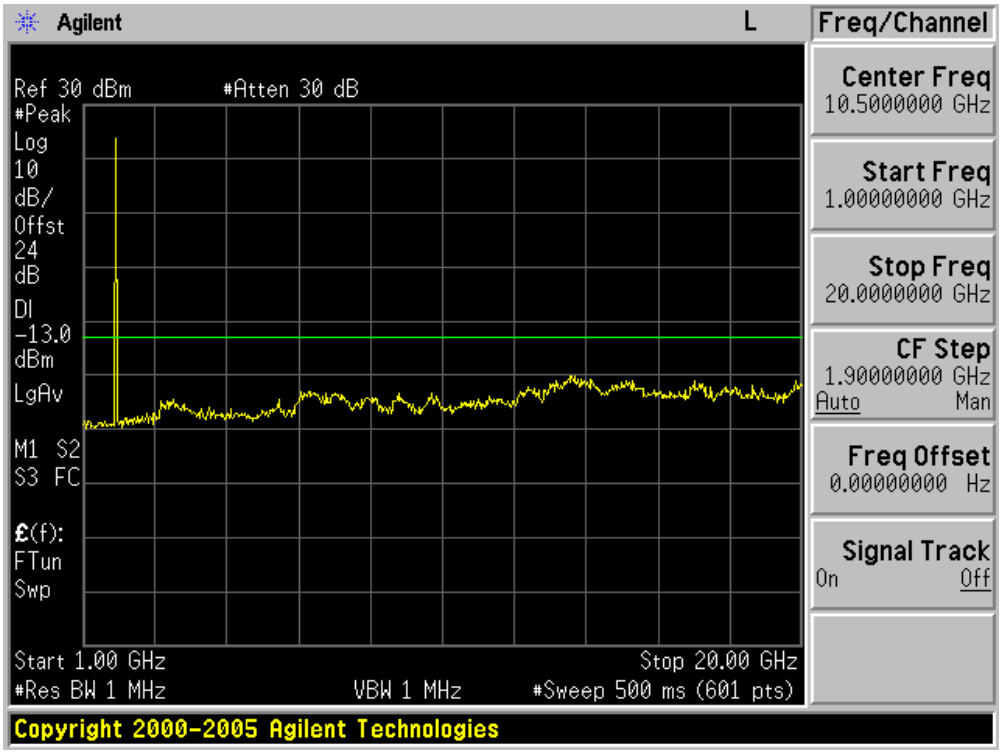
Test Mode: GSM 850 CH 251



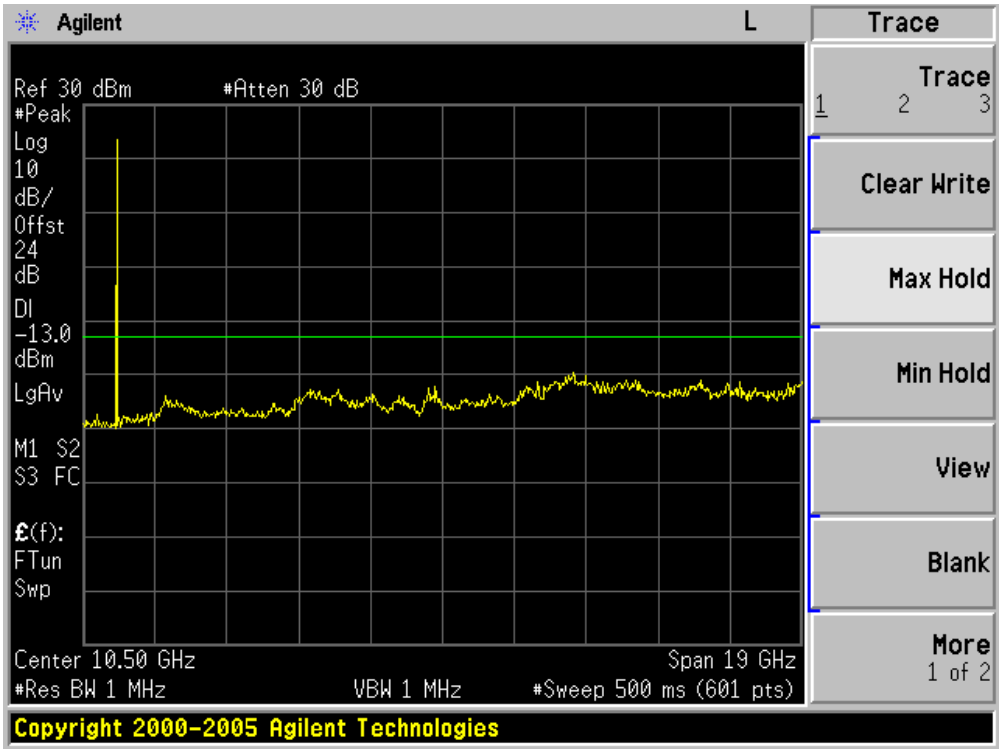


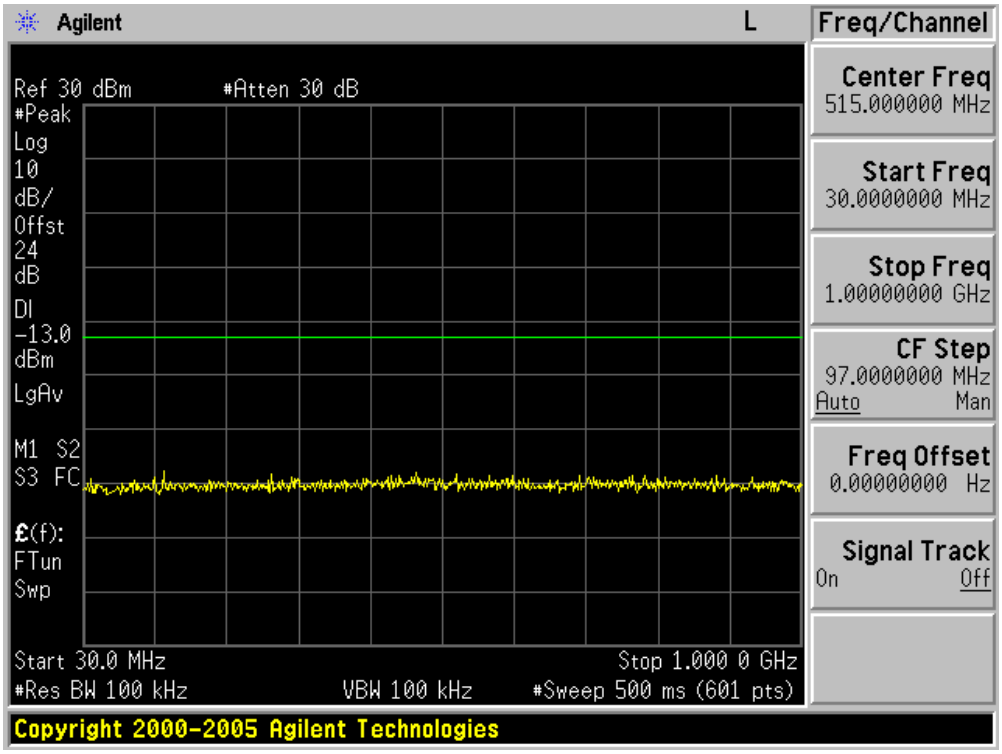
Test Mode: GSM 1900 CH 512



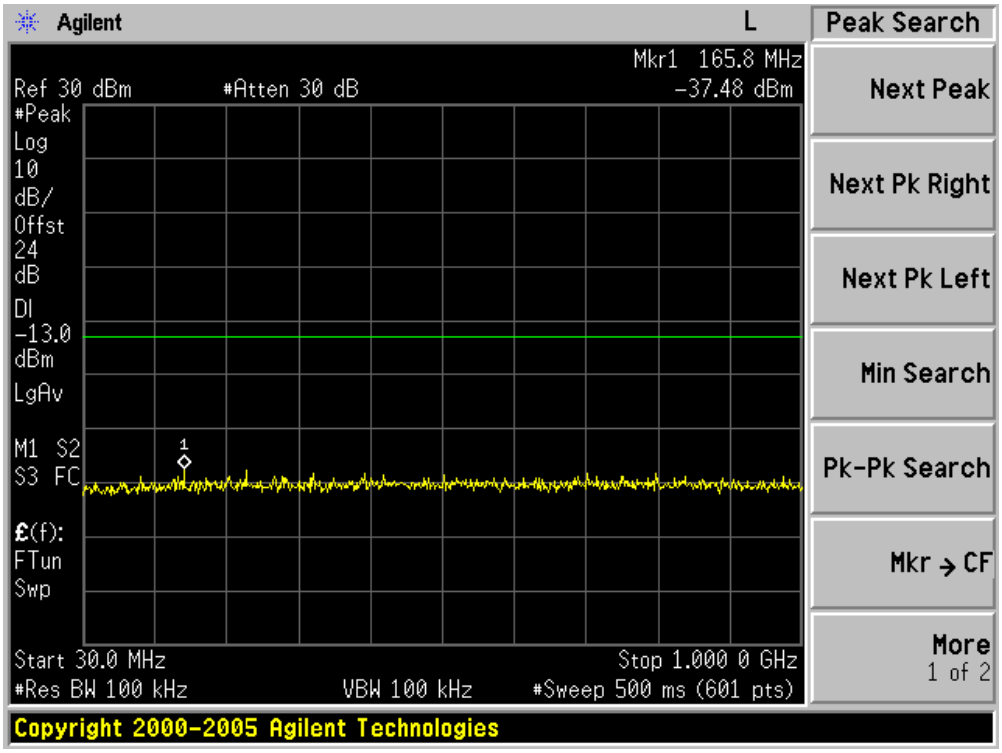


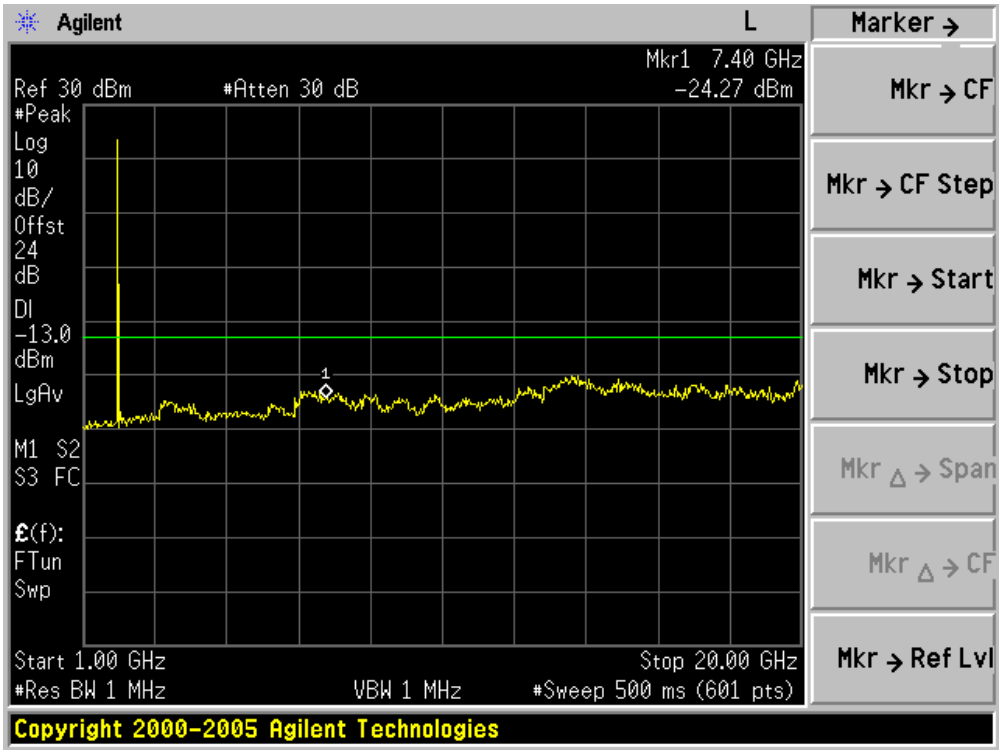
Test Mode: GSM 1900 CH 661





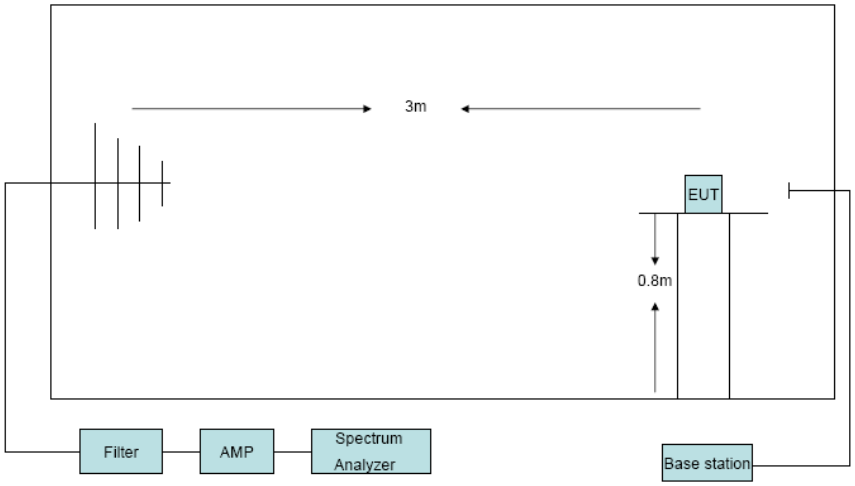
Test Mode: GSM 1900 CH 810





8. Radiated 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 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

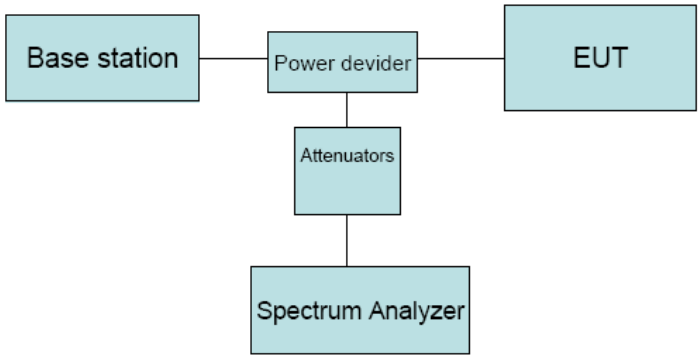
8.4. Test Result

EUT:GPS Vehicle Tracker M/N:TK310						
Power:DC 12V						
Test Date: 2010-01-05		Test site: RF Chamber		Tested by: TaTa_Chen		
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	-61.67	11.50	-52.32	-13	39.32
1648.4	V	-56.86	10.56	-48.45	-13	35.45
Test Mode： GSM 850 CH190						
1673.2	H	-64.22	10.94	-55.43	-13	42.43
2509.8	H	/	/	/	-13	/
1673.2	V	-62.07	10.90	-53.32	-13	40.32
2509.8	V	/	/	/	-13	/
Test mode: GSM 850 CH251						
1697.6	H	-62.95	11.67	-53.43	-13	40.43
2546.4	H	/	/	/	-13	/
1697.6	V	-58.30	11.13	-49.32	-13	36.32
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	-53.89	8.57	-45.32	-13	32.32
5550.6	H	/	/	/	-13	/
3700.4	V	-51.60	8.37	-43.23	-13	30.23
5550.6	V	/	/	/	-13	/
Test Mode： GSM 1900 CH661						
3760	H	-55.07	8.75	-46.32	-13	33.32
5640	H	/	/	/	-13	/
3760	V	-52.67	8.55	-44.12	-13	31.12
5640	V	/	/	/	-13	/
Test mode: GSM 1900 CH810						
3819.6	H	-56.28	8.94	-47.34	-13	34.34
5729.4	H	/	/	/	-13	/
3819.6	V	-54.38	8.72	-45.66	-13	32.66
5729.4	V	/	/	/	-13	/
Note: All the other emissions not recorded were too low to read, and deemed to comply with limit.						

9. Block Edge Compliance

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.

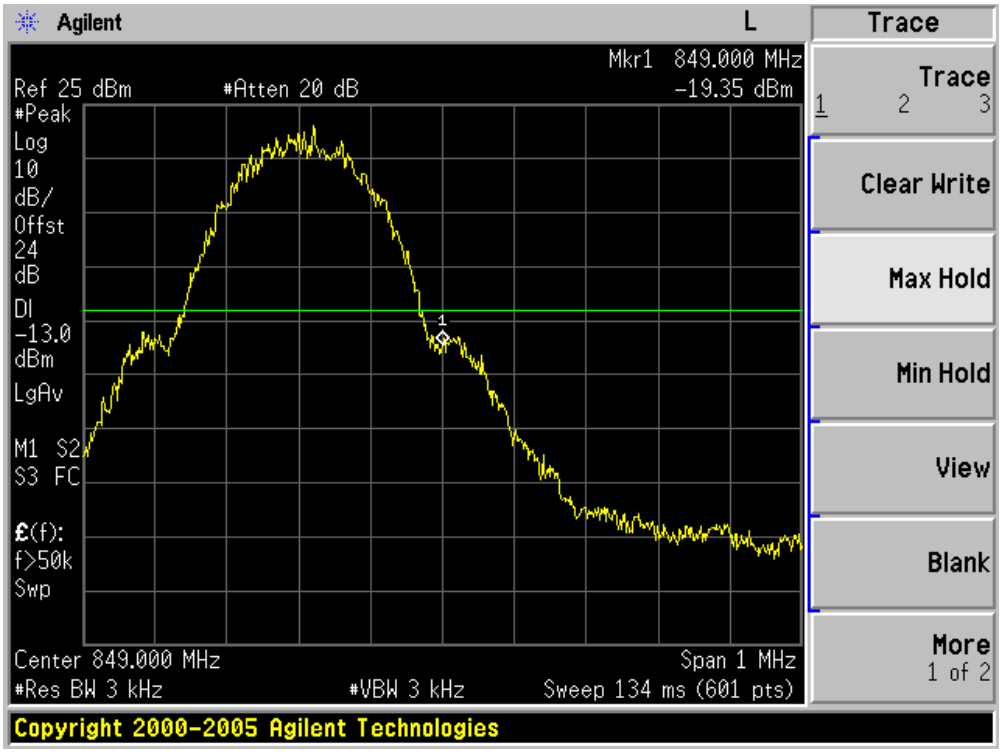
9.3. Test Procedure

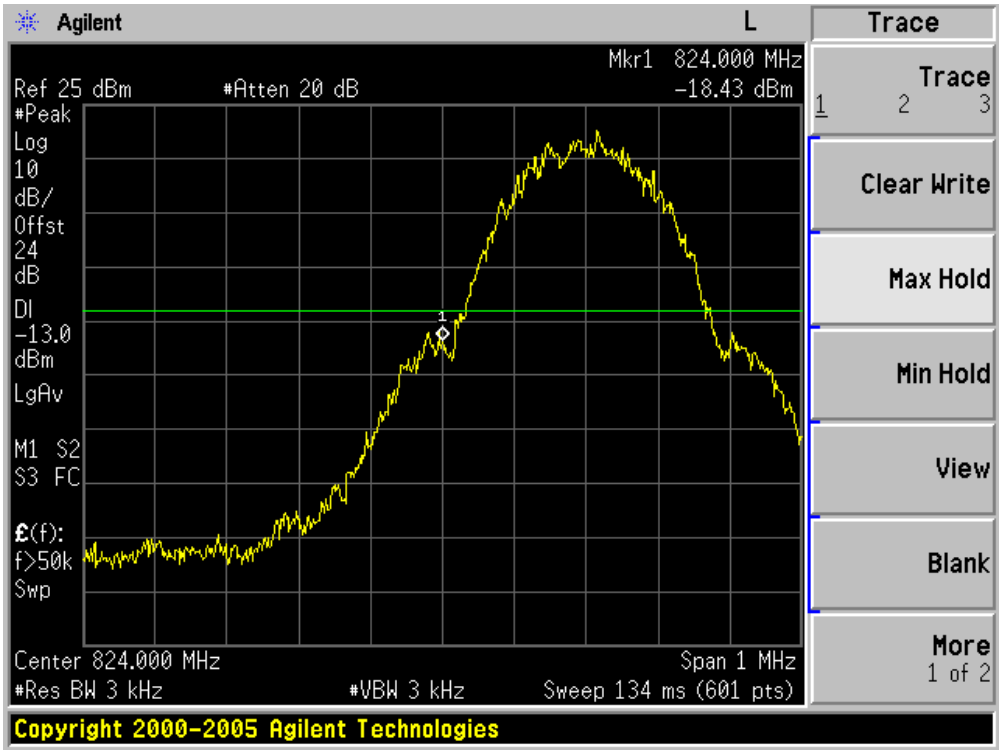
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured.

9.4. Test Result

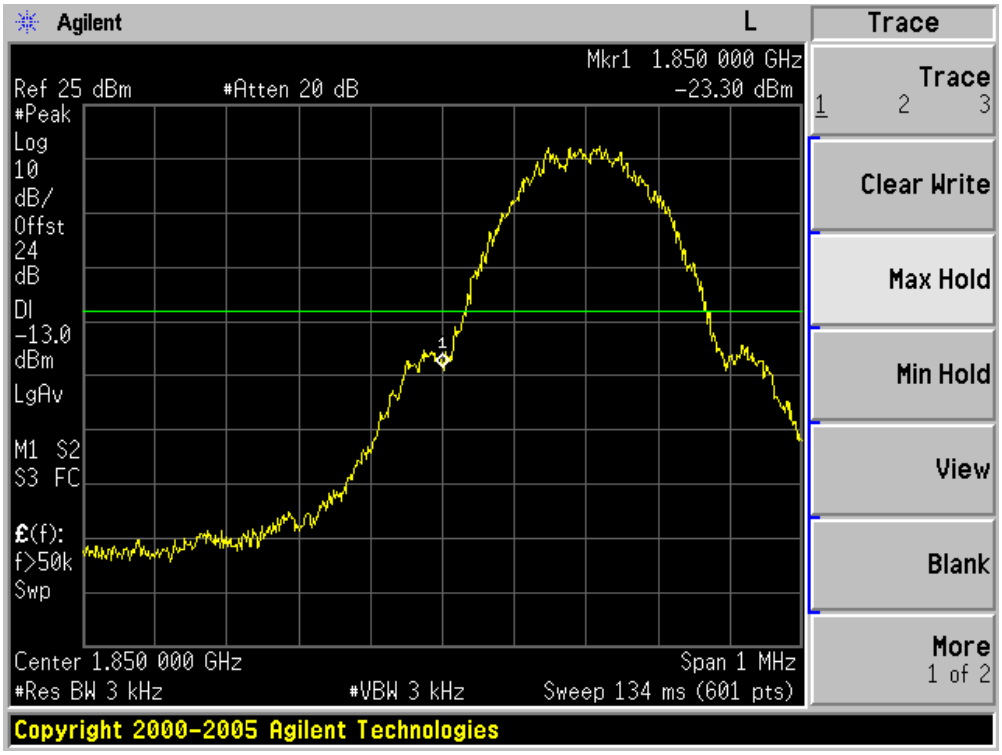
PASS

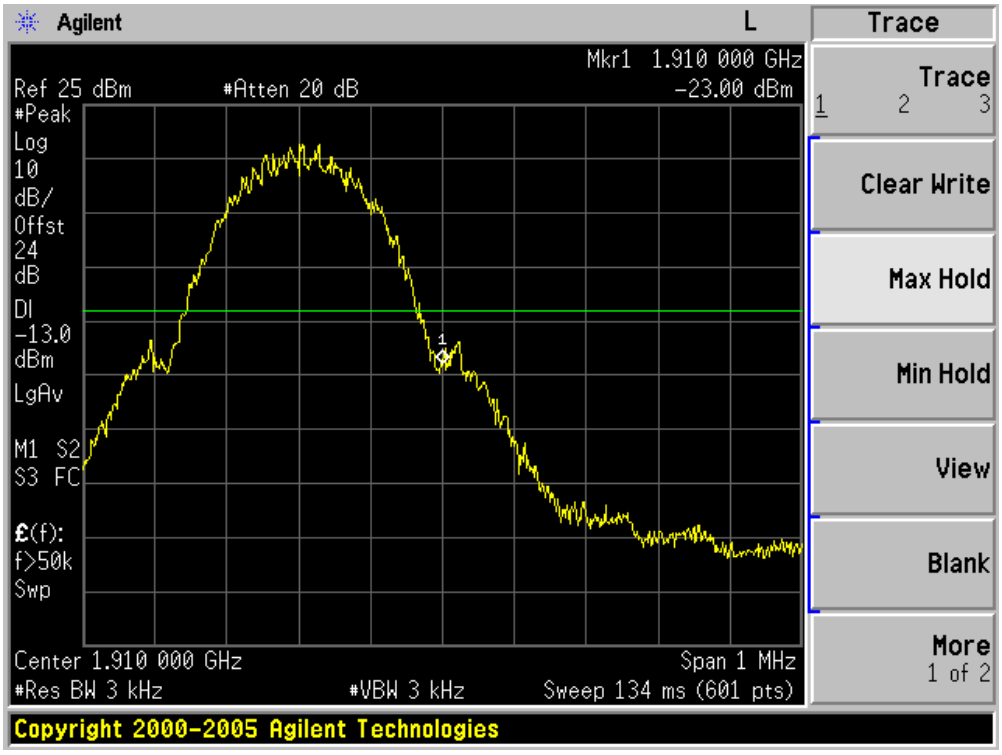
Test Mode: GSM 850





Test Mode: GSM 1900

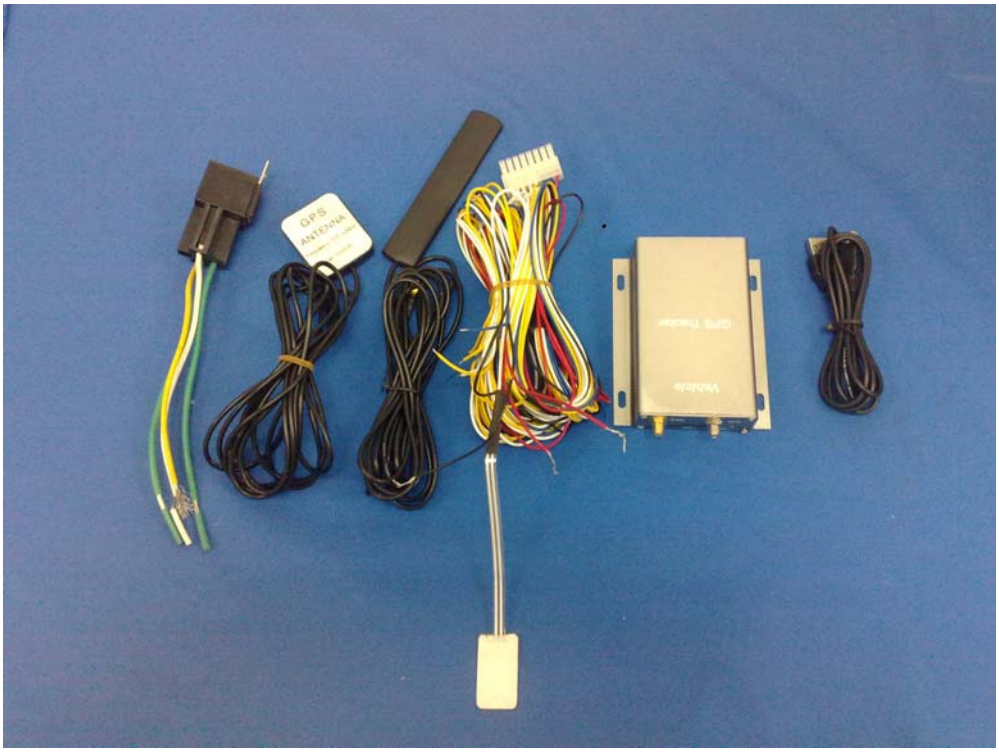


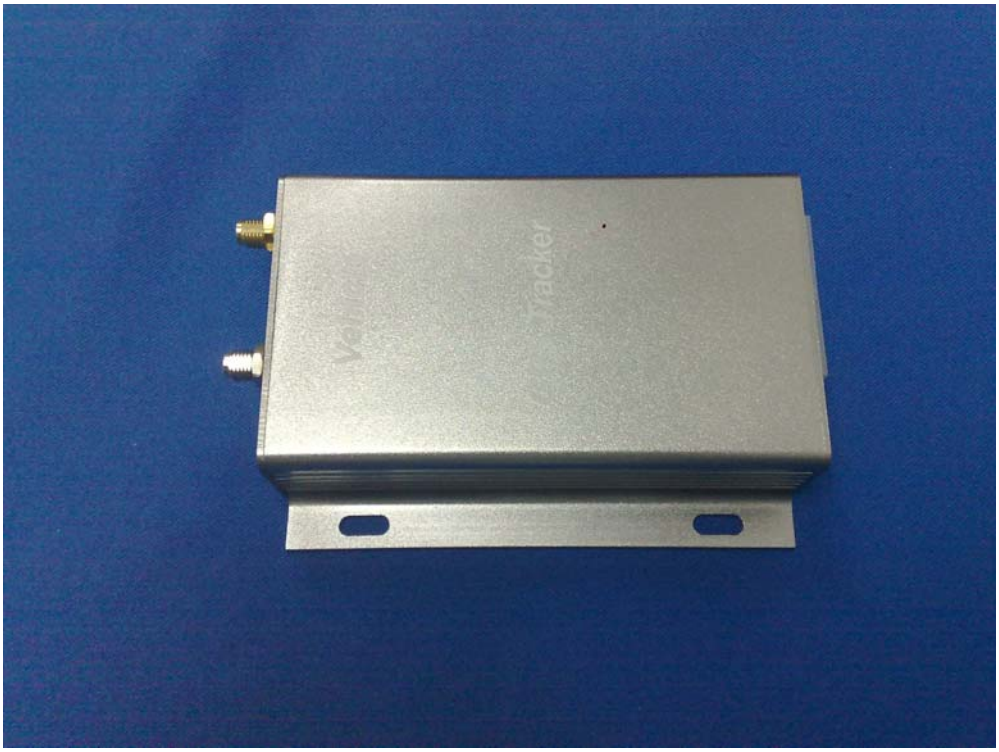


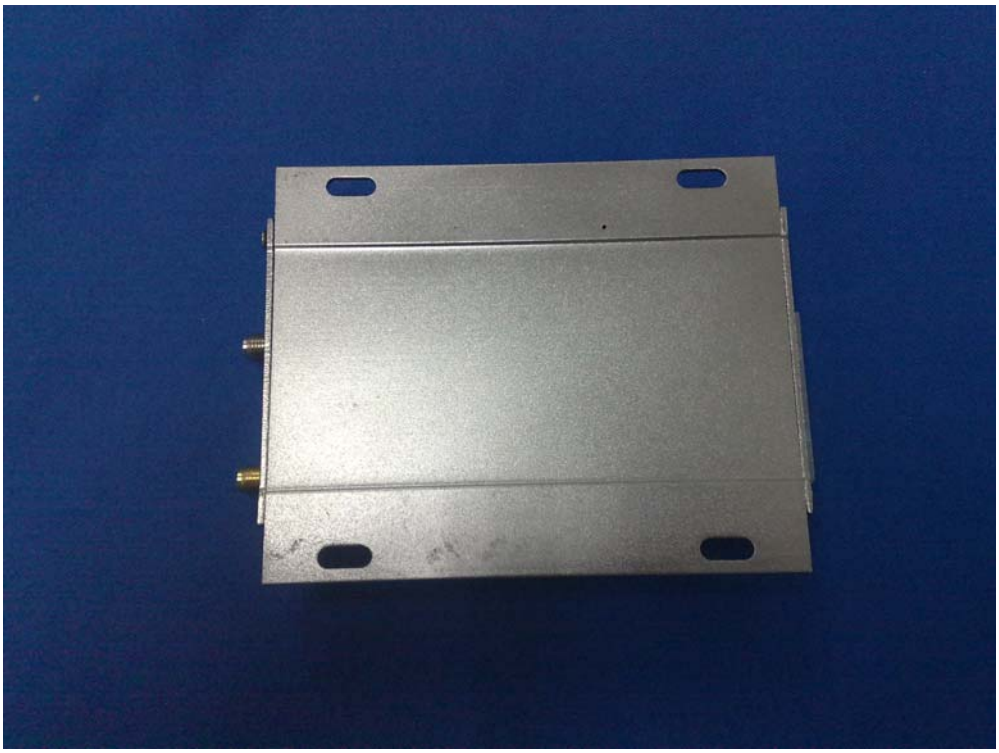
10. Testsetup photo


TERCHY

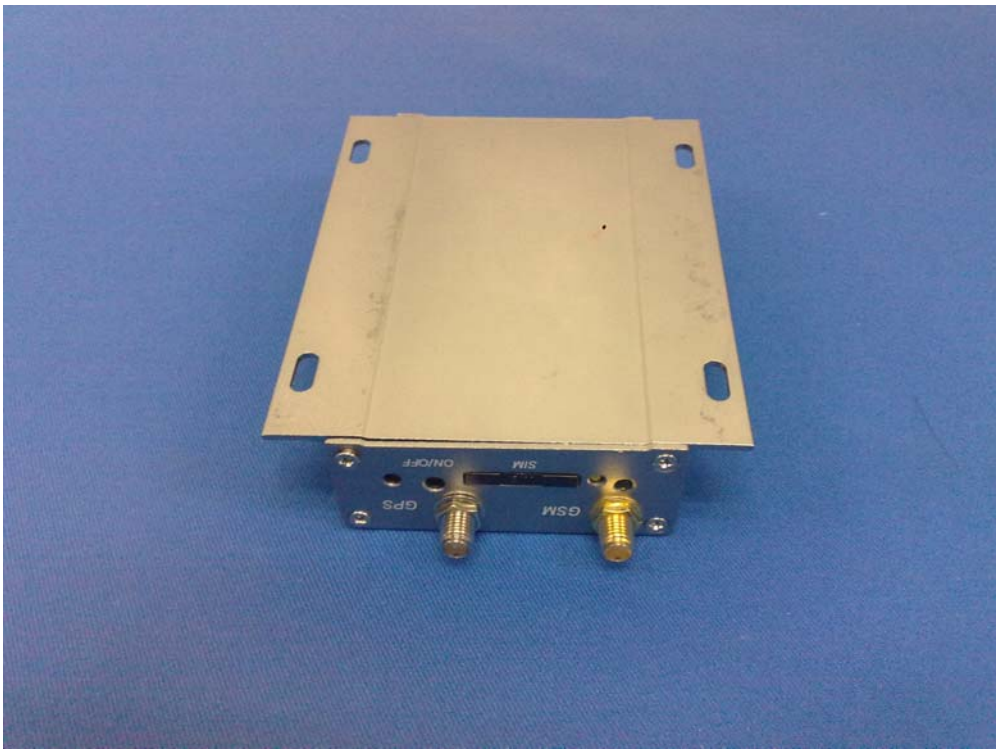
11. Photos of EUT








USB
Power GND AD 5 4 3 2 1
In
Out


ON/OFF
SIM
GPS
GSM


GPS Tracker
FHP Li-ion
3.7V 750mAH


SIM340DZ S2-10228-R0002
SN: MP0609450032903
IMEI: 011691000811839
FCC ID: UDV-0805152008007
CE0681


SIM340DZ S2-10228-R0002
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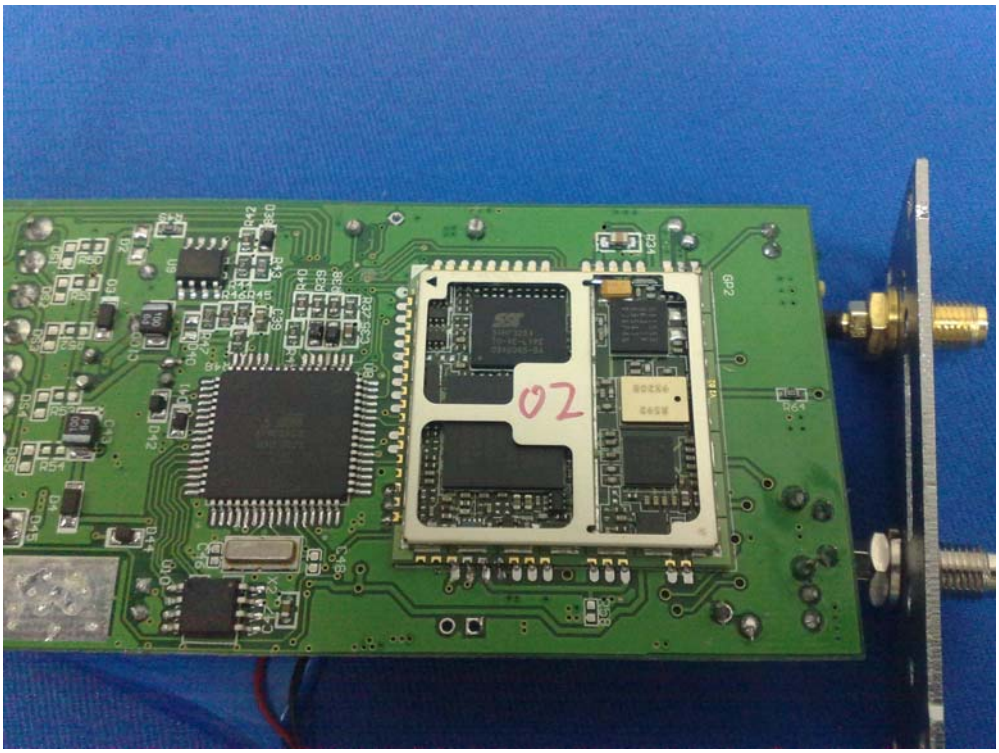
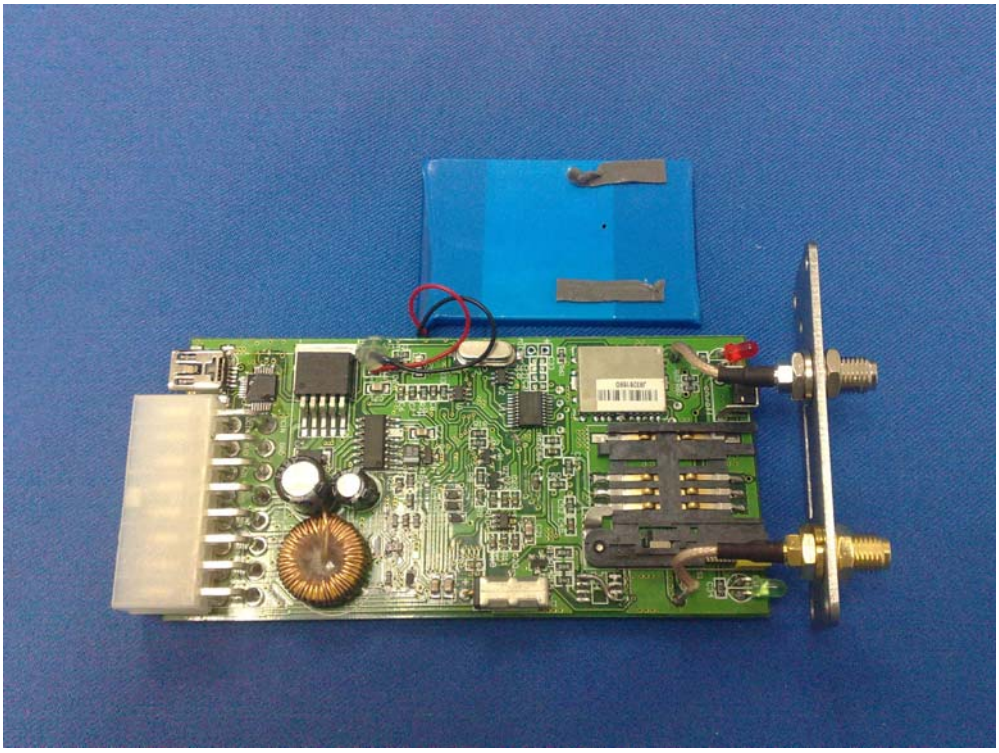
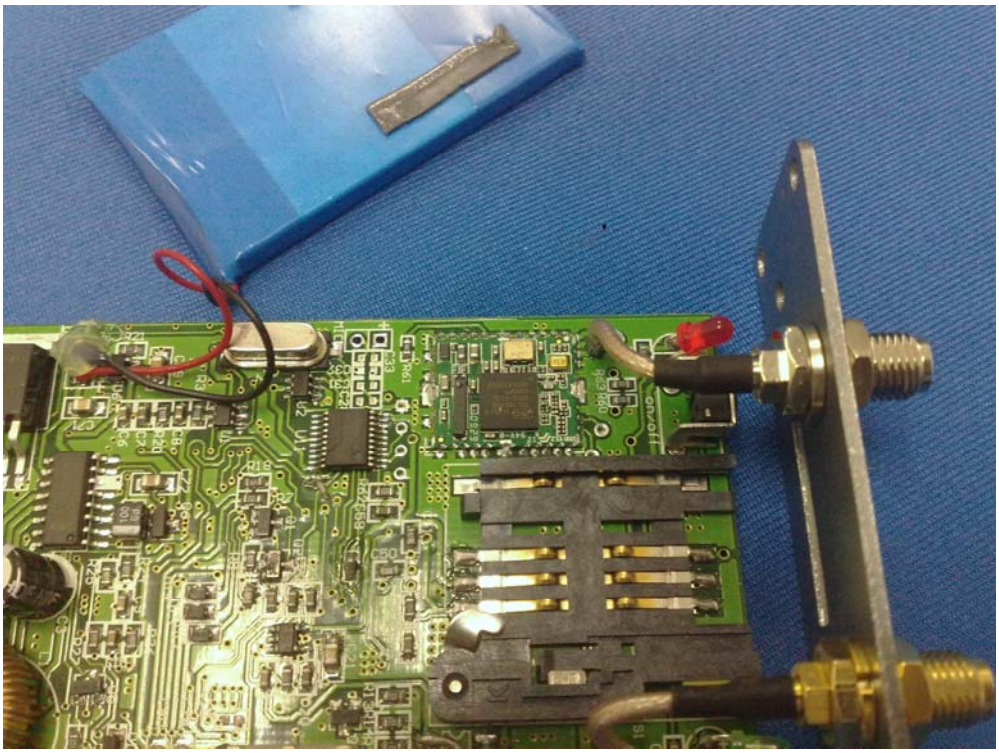
IMEI: 011691000811839
FCC ID: UDV-0805152008007
CE0681


02





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