CE EMC

TEST REPORT

of

GSM/GPRS 850/900/1800/1900 Module

Model Name: SIM340
Trade Name: SIMCOM
Report No.: SH08040007E01

prepared for

SHANGHAI SIMCOM LIMITED
SIM Technology Building, 700 Yishan Rd., Shanghai 200233

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1. TEST CERTIFICATION

Equipment under Test:	GSM/GPRS 850/900/1800/1900 Module
Trade Name:	SIMCOM
Model Name:	SIM340
Applicant:	SHANGHAI SIMCOM LIMITED
	SIM Technology Building, 700 Yishan Rd., Shanghai 200233
Manufacturer:	SHANGHAI SIMCOM LIMITED
	SIM Technology Building, 700 Yishan Rd., Shanghai 200233
Test Standards:	ETSI EN 301 489-1
	ETSI EN 301 489-7
EUT Received Date:	April 21, 2008
Test Date(s):	April 22, 2008 - April 25, 2008
Test Result:	PASS

*** We Hereby Certify That:**

The equipment under test was tested by Shenzhen Electronic Product Quality Testing Center Morlab Laboratory. The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the requirement of related European Commission's standards.

The test results of this report only apply for the tested sample equipment identified above. The test report shall be invalid without all the signatures of the test engineer, the reviewer and the approver.

Tested by: Lou QinChao Dated: 2008.4.30

Lou QinChao

Reviewed by: Zhang Jun 2008.4.30.

Zhang Jun

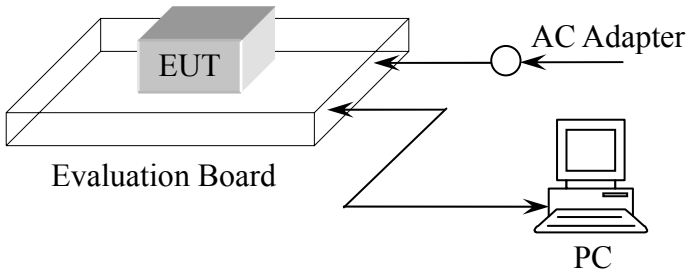
Approved by: Su Feng Dated: 2008.4.30

Su Feng

2. GENERAL INFORMATION

2.1 EUT Description

EUT Type.....:	GSM/GPRS 850/900/1800/1900 Module
Model Name .....:	SIM340
Serial No.....:	(n.a., marked #1 by test site)
Hardware Version .....:	V7.03
Software Version .....:	TTPCom 10.0
Modulation Type.....:	GMSK
Accessory Equipment 1……:	Evaluation Band
	Model Name: (n.a.)
	Trade Name: (n.a.)
	Manufacturer: (supplied by applicant)
	Serial No.: (n.a., marked #1 by test site)
Accessory Equipment 2…….:	AC Adapter
	Model Name: DSA-0131F-06EU12
	Brand Name: DEEVAN
	Serial No.: (n.a. marked #1 by test site)
	Rated Input: ~ 100-240V, 0.3A,50/60Hz
	Rated Output: ⎓ 6V, 2A
	Manufacturer: DEEVAN ELECTRONICS(JIAXING) CO,.LTD
	Wire Length: 183cm
Test Sample Sketch.....:	The EUT (Module) is positioned on the Evaluation Board (Ancillary Equipments 1) which is powered by AC Adapter (Ancillary Equipments 2). The EUT (Module) can not work without the Evaluation Board together with the AC Adapter. (see the figure below)



During the tests, a special program, supplied by applicant, installed in a Personal Computer (PC) is employed to control the Test Sample to work appropriately through their serial ports.

Note 1: The EUT is a GSM/GPRS Module which supports GSM 850MHz, 900MHz, 1800MHz, 1900MHz bands, and GSM 900MHz and DCS 1800MHz bands are tested in this report.

Note 2: During the tests in this report, a Personal Computer is employed to control the EUT to work appropriately through their serial port.

Note 3: The test results in this report are ONLY for the configuration of "EUT (Module) + Ancillary Equipments 1 + Ancillary Equipments 2" as listed above. The EUT (Module) is considered a component which will be installed into final equipment; the final equipment must be re-confirmed that it still meets EMC directives.

Note 4: Please refer to 0 for the photographs of the EUT. For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

2.2 Test Standards and Results

The objective of the report is to perform testing according to following standards for CE marking:

No.	Identity	Document Title
1	ETSI EN 301 489-7 V1.3.1 (2005-11)	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)
2	ETSI EN 301 489-1 V1.6.1 (2005-09)	Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

Test detailed items required and results are listed as below (the latest versions of basic standards are applied):

No.	Base Standard	Test Type	Result
Emission (EN 301 489-1 Clause 7.1)			
1	EN 55022	Radiated Emission	PASS
2	EN 55022	Conducted Emission, DC Ports	(n.a.)
3	EN 55022	Conducted Emission, AC Ports	(n.a.)
4	EN 55022	Conducted Emission, Telecom Ports	(n.a.)
5	EN 61000-3-2	Harmonic Current Emissions	(n.a.)
6	EN 61000-3-3	Voltage Fluctuations & Flicker	(n.a.)
Immunity (EN 301 489-1 Clause 7.2)			
7	EN 61000-4-2	Electrostatic Discharge Immunity	PASS
8	EN 61000-4-3	Radiated RF Electromagnetic Field Immunity	PASS
9	EN 61000-4-4	Electrical Fast Transient/Burst Immunity	(n.a.)
10	ISO 7637-1, -2	Transients and Surges, DC Ports	(n.a.)
11	EN 61000-4-5	Surge Immunity, AC Ports, Telecom Ports	(n.a.)
12	EN 61000-4-6	Immunity to Conducted Disturbances Induced by RF Fields	(n.a.)
13	EN 61000-4-11	Voltage Dips and Short Interruptions Immunity	(n.a.)

2.3 Test Equipments Used

Description	Manufacturer	Model	Serial No.
Receiver	Rohde&Schwarz	ESCI3	100666
LISN	Rohde&Schwarz	ENV216	812744
System Simulator	Rohde&Schwarz	CMU200	105571
Test Antenna - Bi-Log	Rohde&Schwarz	HL562	100385
Anechoic Chamber	Albatross	9m*6m*6m	(n.a.)
ESD Test System	EM TEST	DITO	V0747103152
Signal Generator	Rohde&Schwarz	SML03	103476
Power Amplifier	BONN	BLWA0830-160/100 /40D	076810

Note 1: Equipments listed above have been calibrated and are in the period of validation.

2.4 Facilities and Accreditations

2.4.1 Facilities

Shenzhen Electronic Product Quality Testing Center Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

All measurement facilities used to collect the measurement data are located at Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen 518055 CHINA.

2.4.2 Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	35 - 60
Atmospheric Pressure (kPa):	86-106

2.4.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.

Uncertainty of Conducted Emission:	±1.8dB
Uncertainty of Radiated Emission:	±3.2dB

3. EMISSION TESTS

3.1 EUT Setup and Operating Conditions

The EUT (Module) is positioned on the Evaluation Board (Ancillary Equipments 1) which is powered by AC Adapter (Ancillary Equipments 2); the AC Adapter is powered by 230VAC, 50Hz mains supply.

During the tests, a Personal Computer supplied by test site is employed to communicate with the EUT through their serial ports to control the EUT. The EUT operates at GSM 900MHz band and works at the maximum output power i.e. Power Control Level (PCL) = 5, Power Class = 4; the operating channel number is set to middle ARFCN 65. A call is established between the EUT and the System Simulator.

3.2 Radiated Disturbance

3.2.1 Limits of Radiated Disturbance

Frequency range (MHz)	Quasi-Peak Limit (dBμV/m)
30 - 230	40
230 - 1000	47

NOTE:

a) The limit is applicable to Class B ITE at 3m measurement distance.

b) The lower limit shall apply at the transition frequency.

c) Additional provisions may be required for cases where interference occurs.

3.2.2 Test Procedure

1. The test is performed in a 3m Semi-Anechoic Chamber; the antenna factor. The EUT is placed on a 0.8m high insulating Turn Table, and keeps 3m away from the Test Antenna, which is mounted on a variable-height antenna master tower.

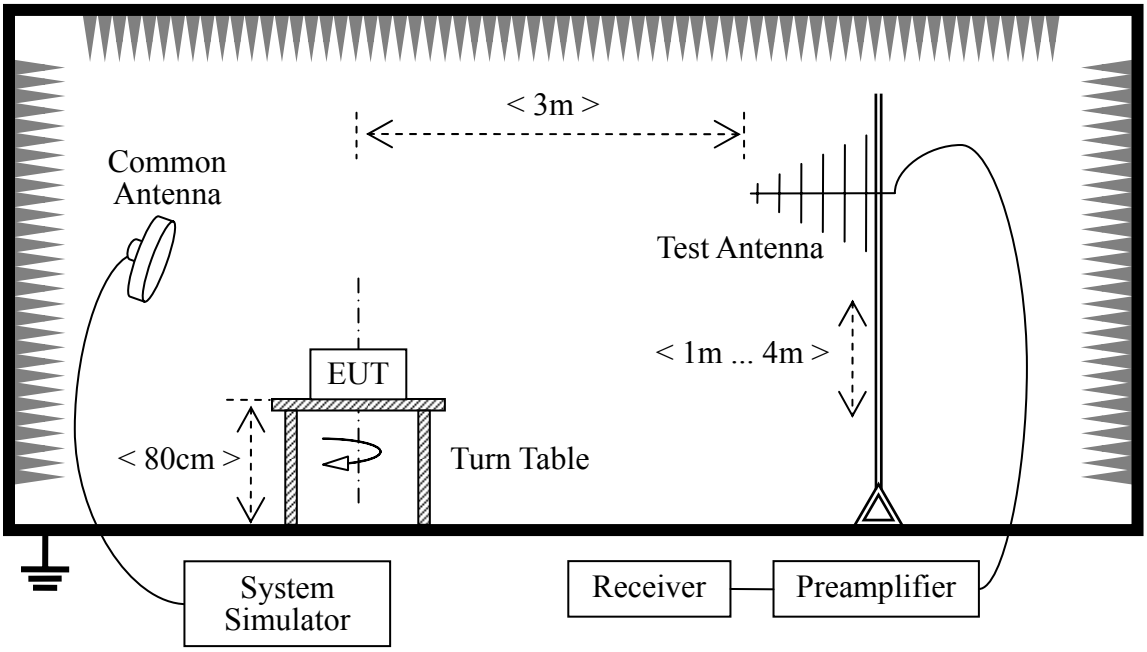
2. For each suspected emission, the EUT is arranged to its worst case and then the Test Antenna is tuned to the heights from 1 to 4m and the Turn Table is tuned from 0 to 360 degrees to find the maximum reading.

3. The Test Antenna is a bi-log one, and its height is varied from 1 to 4m above the ground to determine the maximum value of the field strength. Both the vertical and the horizontal polarizations of the Test Antenna are considered to perform the tests.

4. The maximum radiated emission is searched using PK, QP and AV detectors; the emission levels more than the limits, and that have narrow margins from the limits will be re-measured with AV and QP detectors.

3.2.3 Test Setup

Please refer to 0 for the photographs of the Test Configuration.



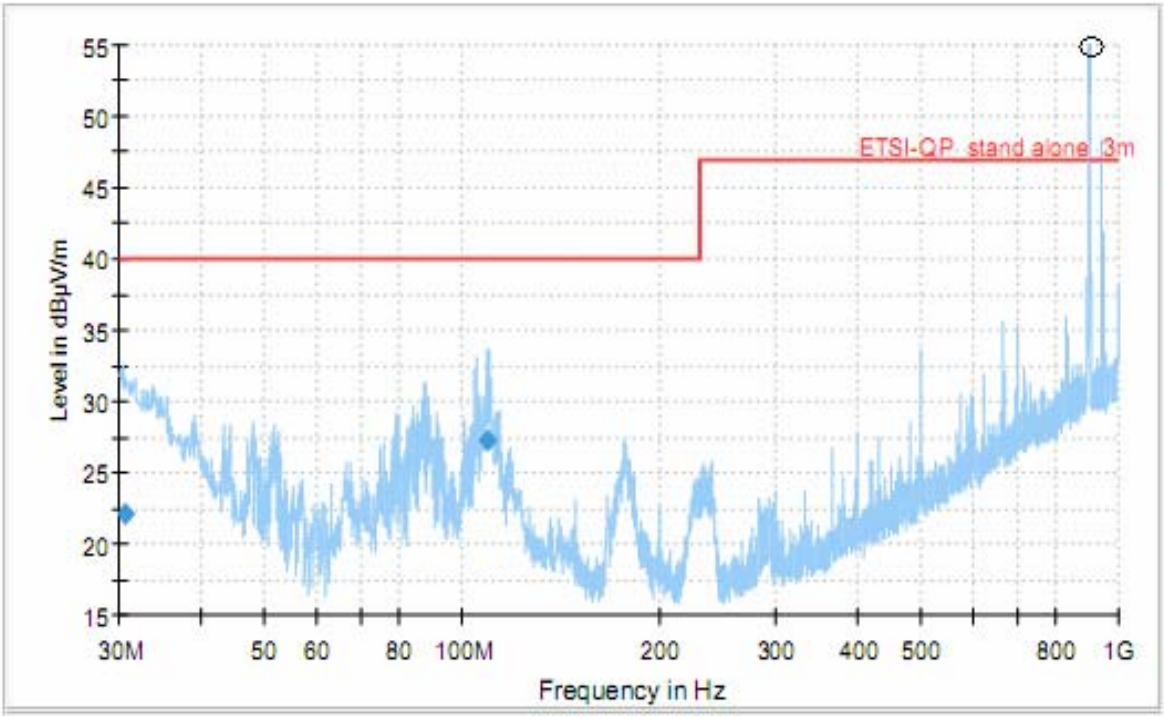
3.2.4 Test Result

A. Test Verdict Recorded for Suspicious Points:

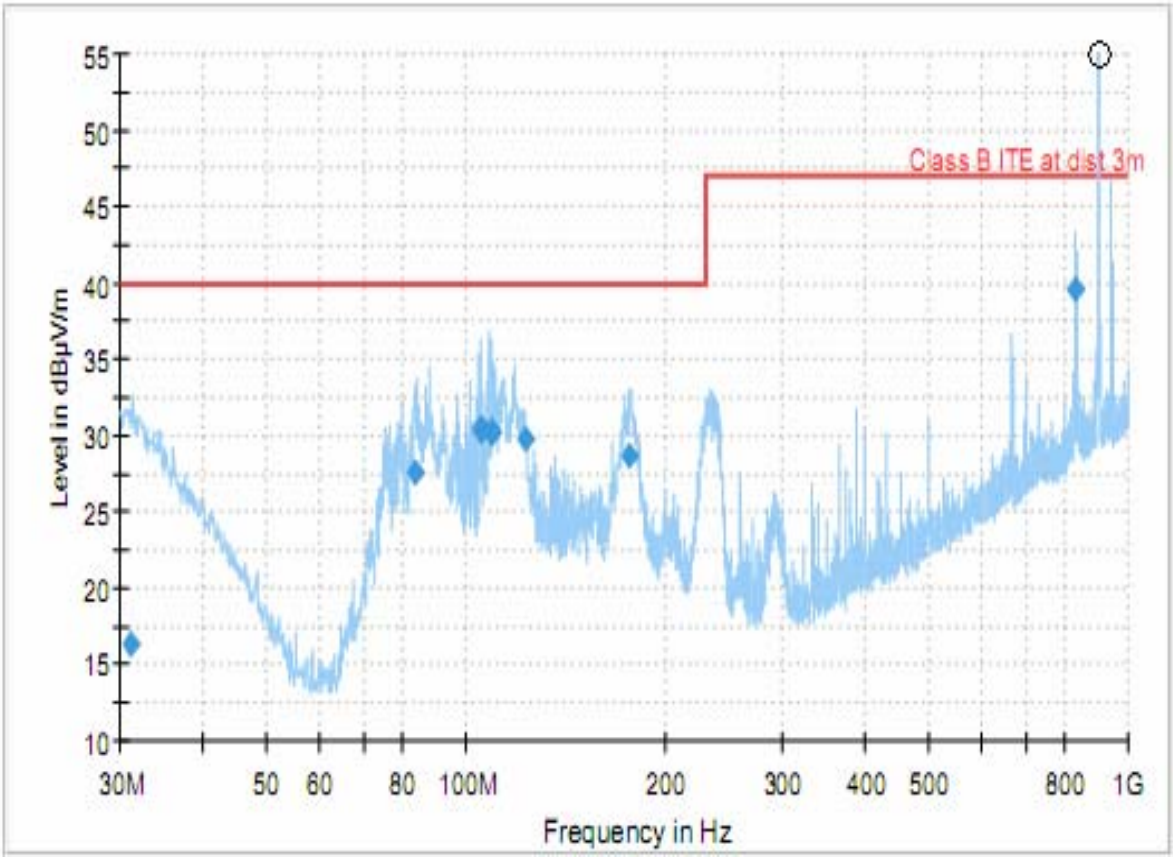
No.	@Frequency (MHz)	Emission Level (dBμV/m)			Quasi-Peak Limit (dBμV/m)	Result
		PK	QP	Antenna Polarization		
1	30.663	32.5	22.2	Vertical	40	PASS
2	109.150	33.7	27.2	Vertical	40	PASS
3	31.082	31.2	16.3	Horizontal	40	PASS
4	83.768	31.9	27.7	Horizontal	40	PASS
5	105.211	33.0	30.4	Horizontal	40	PASS
6	105.513	33.1	30.5	Horizontal	40	PASS
8	109.275	33.4	30.2	Horizontal	40	PASS
9	109.470	32.4	30.3	Horizontal	40	PASS
10	122.571	30.8	29.7	Horizontal	40	PASS
	177.078	31.8	28.6	Horizontal	40	PASS
	831.918	42.8	39.6	Horizontal	47	PASS

B. Test Plot:

Note: Following is the plots for emission measurement; please note that spikes at near 900MHz with should be ignored because they are MS and SS carrier frequency.



(Plot A: Test Antenna Vertical)



(Plot B: Test Antenna Horizontal)

4. IMMUNITY TESTS

4.1 EUT Operation and Performance Criteria

4.1.1 EUT Setup and Operating Conditions

The EUT is directly powered by 230VAC, 50Hz mains supply using a power line made by test site.

During the tests, a Personal Computer supplied by test site is employed to communicate with the EUT through their serial ports to control the EUT.

Each immunity test is performed with the EUT operating at Traffic Mode and Idle Mode of GSM 900MHz and DCS 1800MHz bands according to the standard.

A. Traffic Mode:

A call is established between the EUT and the System Simulator. The EUT operates at the maximum output power and middle ARFCN:

GSM 900MHz

Power Control Level (PCL) = 5, Power Class = 4; the operating channel number = 65.

DCS 1800MHz

Power Control Level (PCL) = 0, Power Class = 4; the operating channel number = 700.

B. Idle Mode:

The EUT is synchronized to the BCCH, listening to the CCCH and able to response to paging message. Periodic location updating is disabled.

4.1.2 Performance Criteria

A. General Performance Criteria:

Type	Description
Criterion A	The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
Criterion B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
Criterion C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

B. Performance Criteria for CT and CR:

Refer to EN 301 489-7 subclasses 6.3 and 6.5 for the performance criteria for Continuous phenomena applied to Transmitter (CT) and Receiver (CR).

Traffic Mode

A call is established at the start of the test, and maintained during the test. During the test, the RXQUAL of the downlink shall not exceed 3, measured during each individual exposure in the test sequence. Both the uplink speech output level and the downlink speech output level shall be at least 35dB less than the previously recorded reference levels, when measured through an audio band Pass filter of width 200Hz, centered on 1kHz (audio breakthrough check). At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained.

Idle Mode

The transmitter shall not unintentionally operate during the test.

C. Performance Criteria for TT and TR:

Refer to EN 301 489-7 subclasses 6.4 and 6.6 for the performance criteria for Transient phenomena applied to Transmitter (TT) and Receiver (TR).

Traffic Mode

A call is established at the start of the test. At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link. At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.

Idle Mode

The transmitter shall not unintentionally operate during the test.

4.2 Electrostatic Discharge Immunity

4.2.1 Test Specification

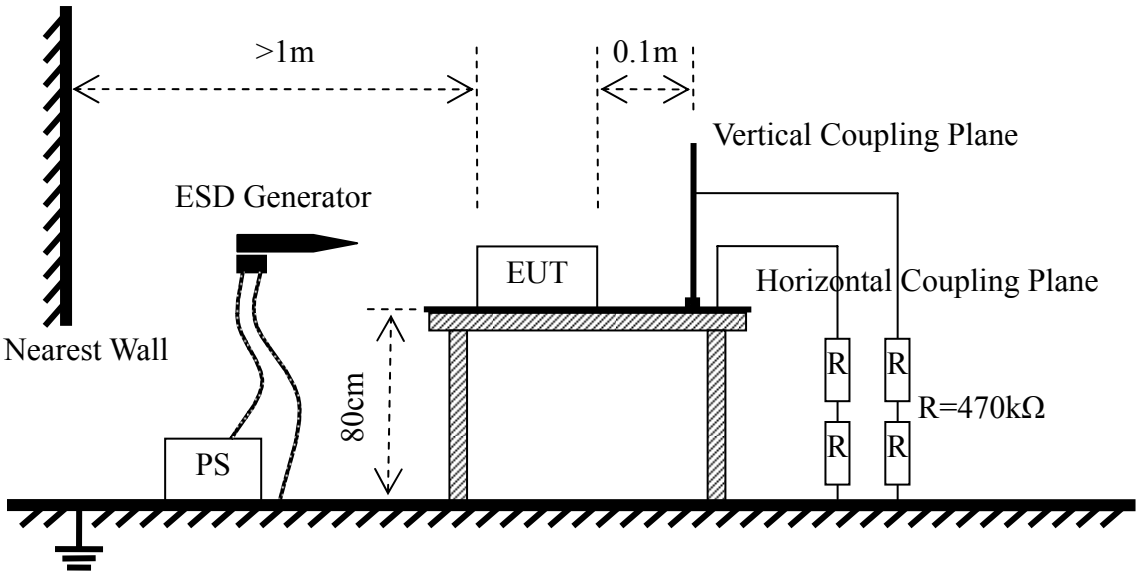
Specification	Value
Basic Standard	IEC 61000-4-2
Discharge Impedance	330Ohm / 150pF
Discharge Voltage	Air Discharge: 8kV; Contact Discharge: 4kV
Polarity	Positive / Negative
Number of Discharge	Minimum 20 times at each test point
Discharge Mode	Single discharge
Discharge Period	1 second minimum

4.2.2 Test Procedure

1. Electrostatic discharges are applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
2. The test is performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
3. The time interval between two successive single discharges is at least 1 second.
4. The ESD generator is held perpendicularly to the surface to which the discharge is applied and the return cable is at least 0.2 meters from the EUT.
5. Contact discharges are applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
6. Air discharges are applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator is removed from the EUT and re-triggered for a new single discharge. The test is repeated until all discharges were completed.
7. At least ten single discharges (in the most sensitive polarity) are applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator is positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.
8. At least ten single discharges (in the most sensitive polarity) are applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m*0.5m) is placed vertically to and 0.1 meters from the EUT.

4.2.3 Test Setup

Please refer to 0 for the photographs of the Test Configuration.



4.2.4 Test Result

The EUT performance complies with the performance criteria for TT and TR.

Test Points	Discharge Level (kV)	Discharge Mode	Verdict
I/O Port Metal Enclosure	±2, ±4	Contact	PASS
HCP	±2, ±4	Contact	PASS
VCP	±2, ±4	Contact	PASS
AC Adapter	±2, ±4, ±8	Air	PASS

4.3 Radiated Radio Frequency Electromagnetic Field Immunity

4.3.1 Test Specification

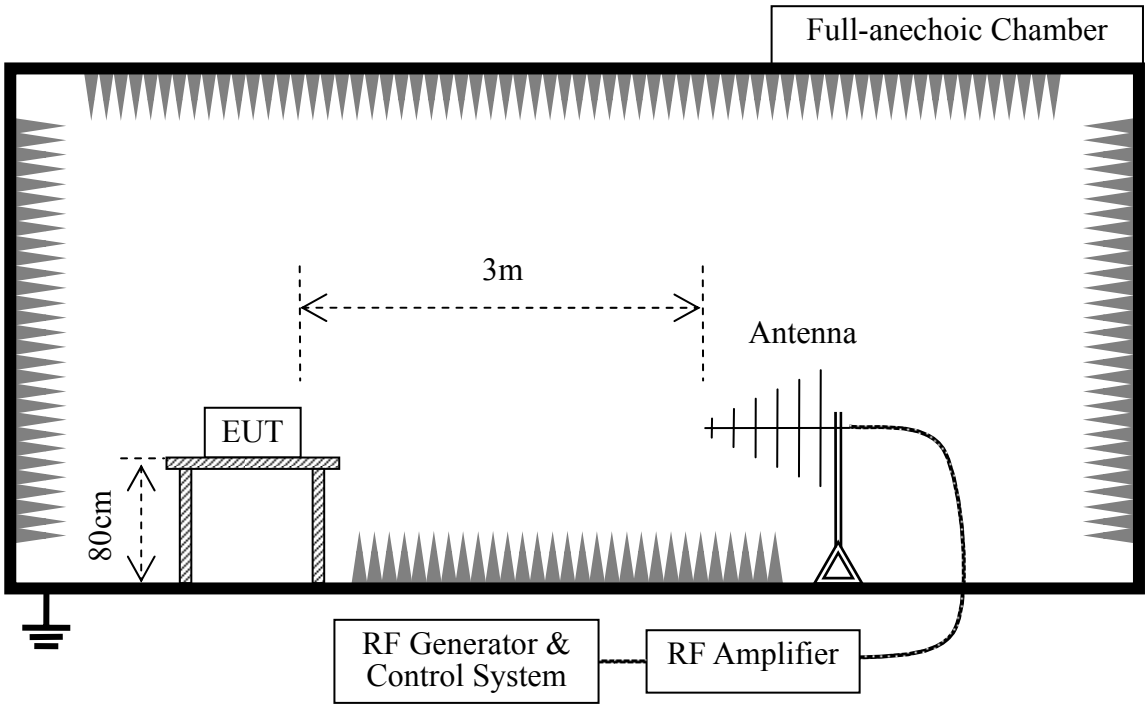
Specification	Value
Basic Standard	IEC 61000-4-3
Frequency Range	80MHz - 1000MHz, 14000MHz - 2000MHz
Field Strength	3V/m
Modulation	1kHz sine wave, 80%, AM modulation
Frequency Step	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance	3m
Antenna Height	1.5m
Dwell Time	3 seconds

4.3.2 Test Procedure

1. The testing is performed in a fully anechoic chamber. The transmit antenna is located at a distance of 3 meters from the EUT.
2. The test signal is 80% amplitude modulated with a 1 kHz sine wave.
3. The frequency range is swept from 80MHz to 1000MHz and 1400MHz to 2000MHz with the exception of the exclusion band for transmitters, receivers and duplex transceivers. The rate of sweep does not exceed 1.5*10-3 decade/s. Where the frequency range is swept incrementally, the step size is 1% of fundamental.
4. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
5. The field strength level is 3V/m.
6. The test is performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.3.3 Test Setup

Please refer to 0 for the photographs of the Test Configuration.



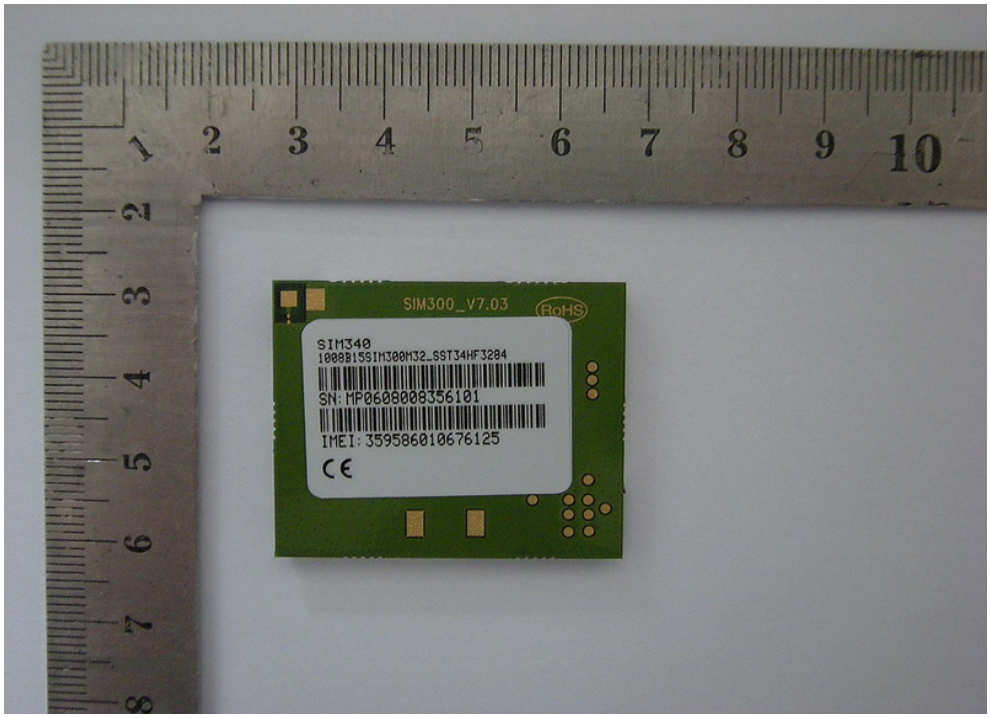
4.3.4 Test Result

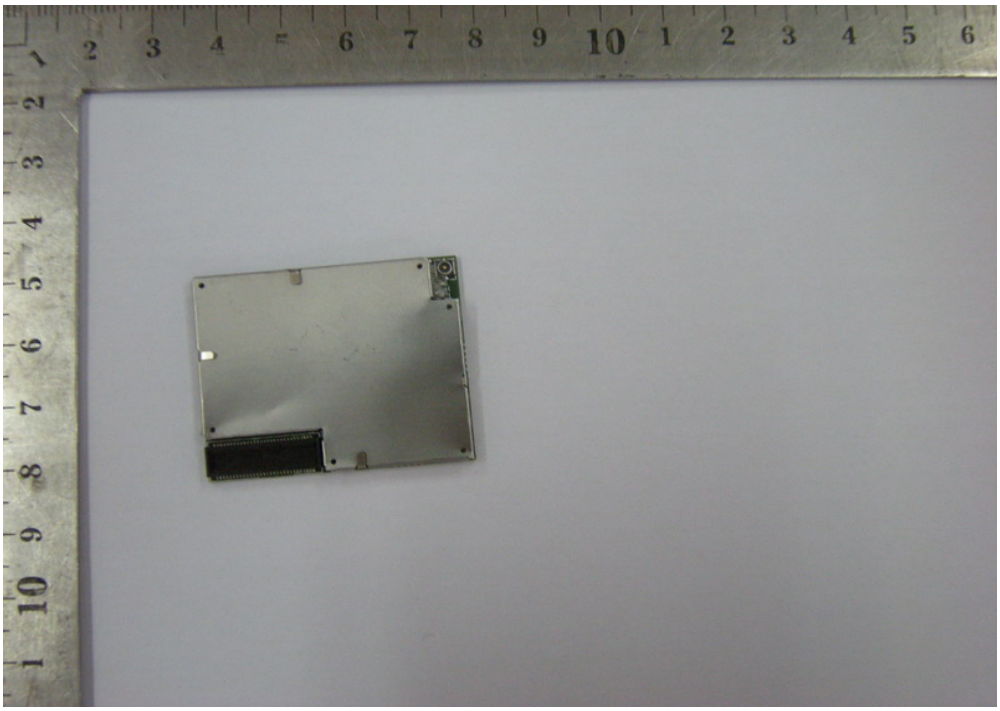
The EUT performance complies with the performance criteria for CT and CR.

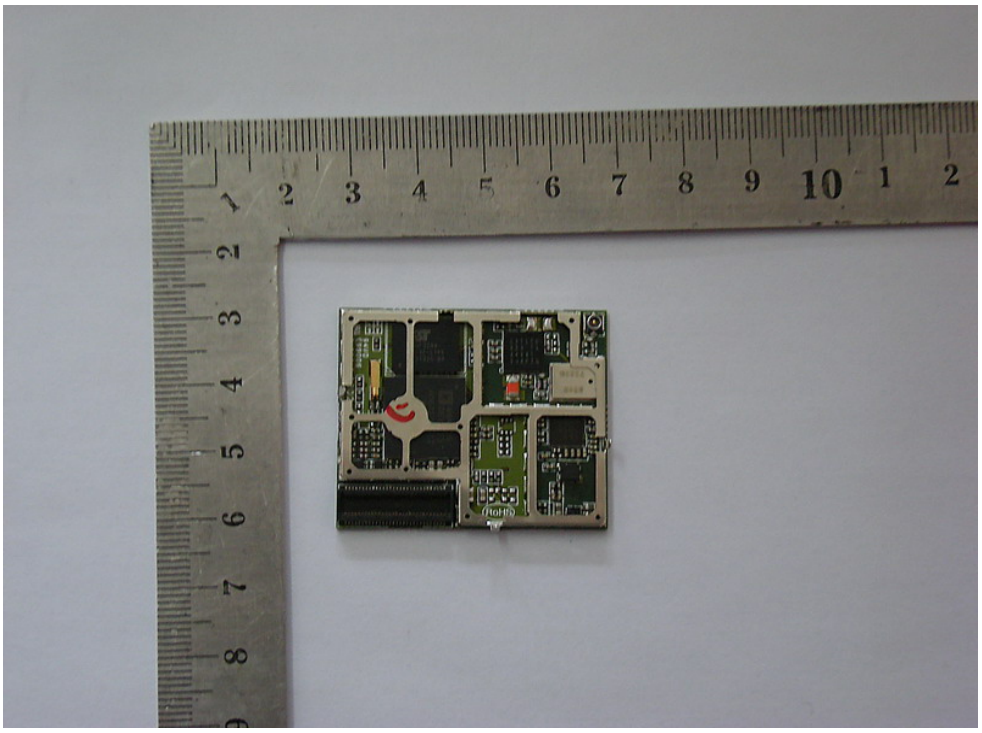
EUT Operating Mode	Antenna Polarity	Frequency (MHz)	Field Strength (V/m)	Verdict
GSM 900MHz Traffic	Vertical	80 - 1000, 1400 - 2000	3	PASS
	Horizontal	80 - 1000, 1400 - 2000	3	PASS
GSM 900MHz Idle	Vertical	80 - 1000, 1400 - 2000	3	PASS
	Horizontal	80 - 1000, 1400 - 2000	3	PASS
DCS 1800MHz Traffic	Vertical	80 - 1000, 1400 - 2000	3	PASS
	Horizontal	80 - 1000, 1400 - 2000	3	PASS
DCS 1800MHz Idle	Vertical	80 - 1000, 1400 - 2000	3	PASS
	Horizontal	80 - 1000, 1400 - 2000	3	PASS

Photos of the EUT

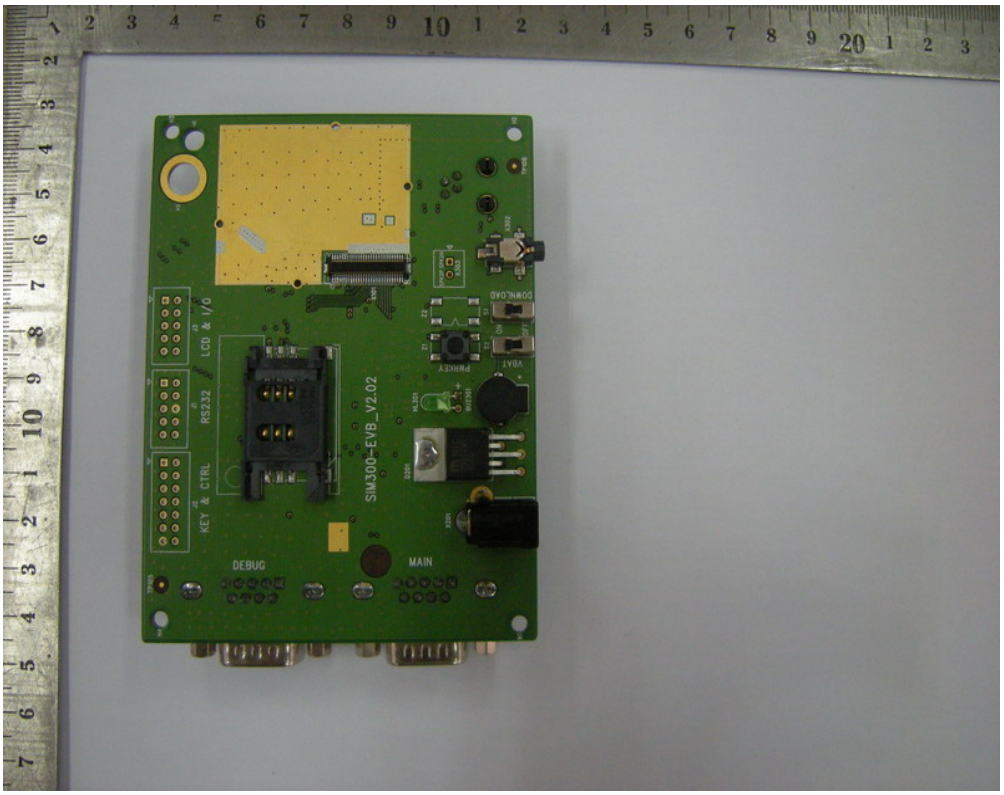
1. Appearance of the EUT:

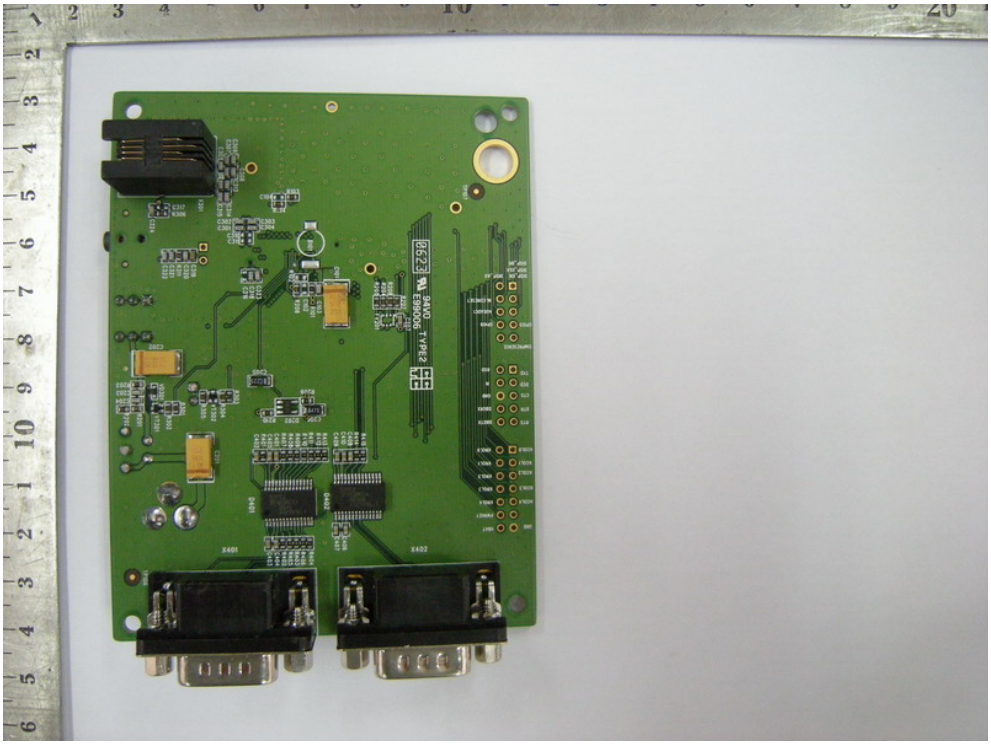


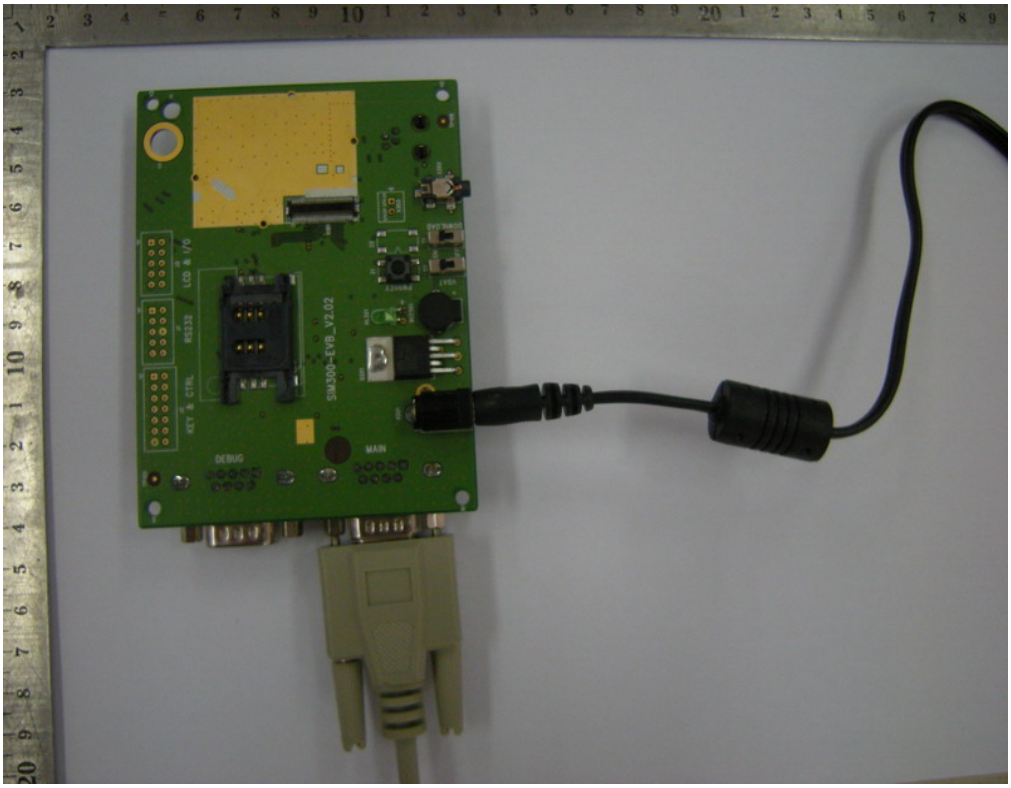


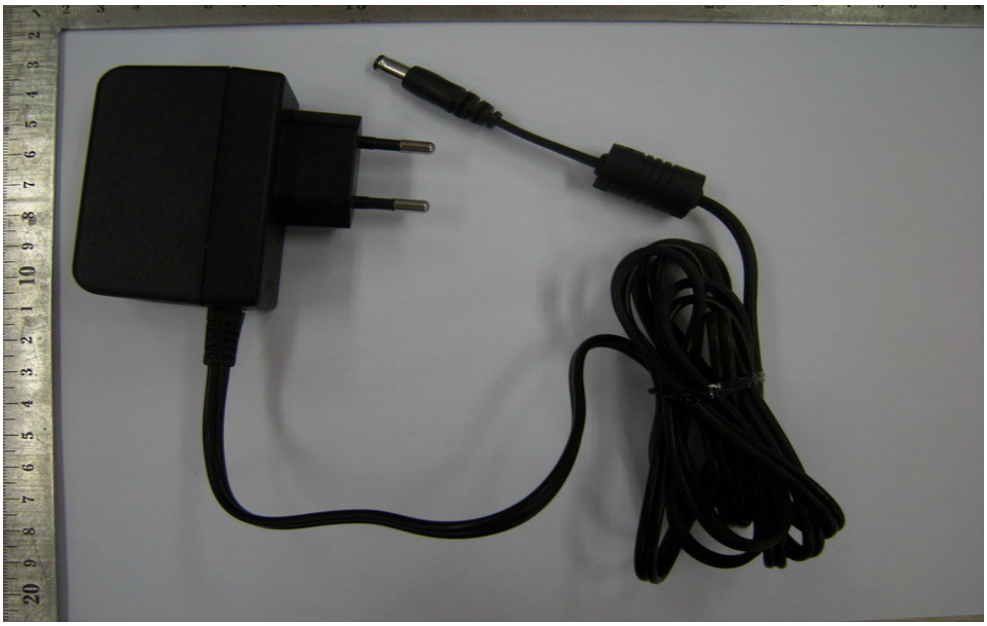


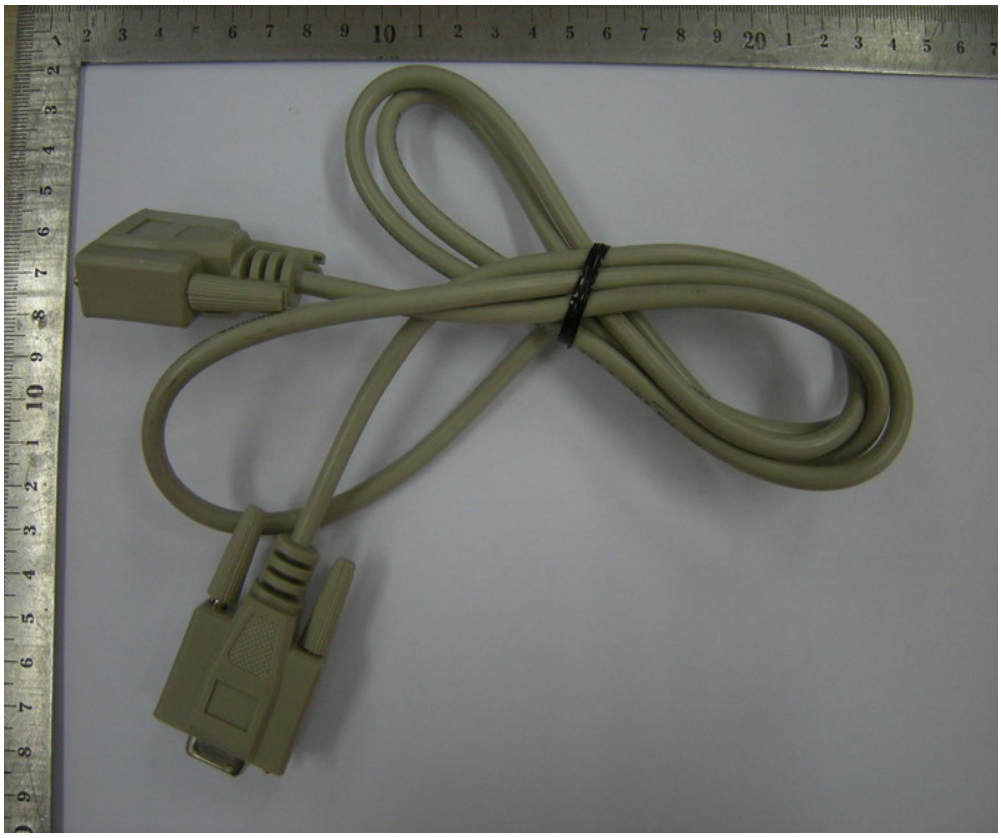
2. Accessory Equipment:





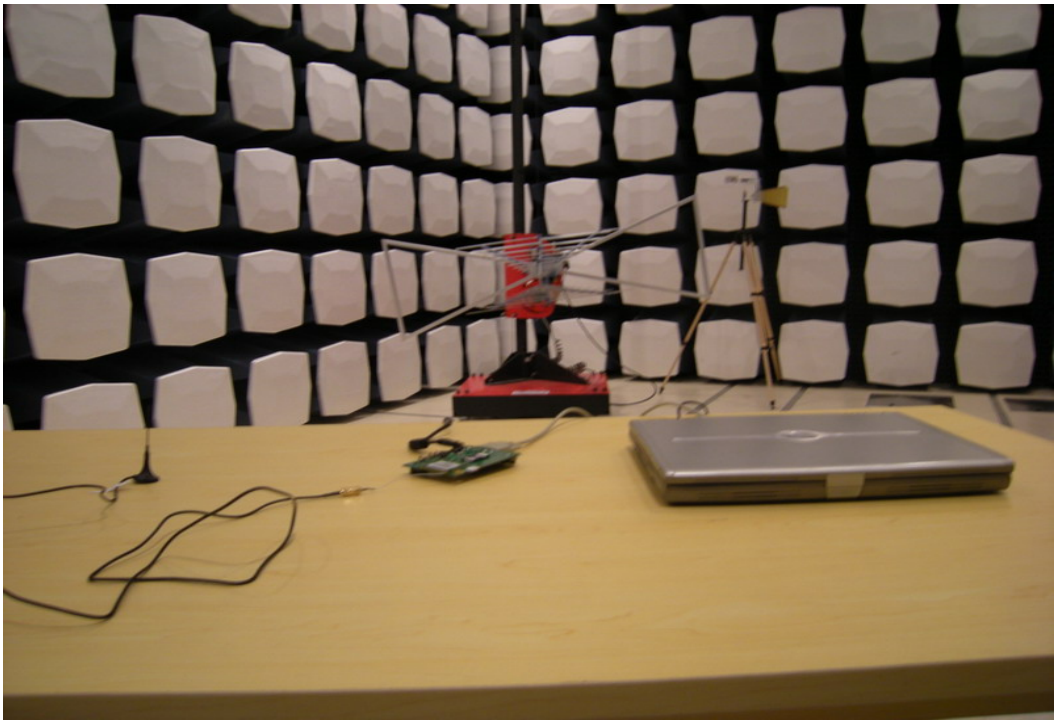




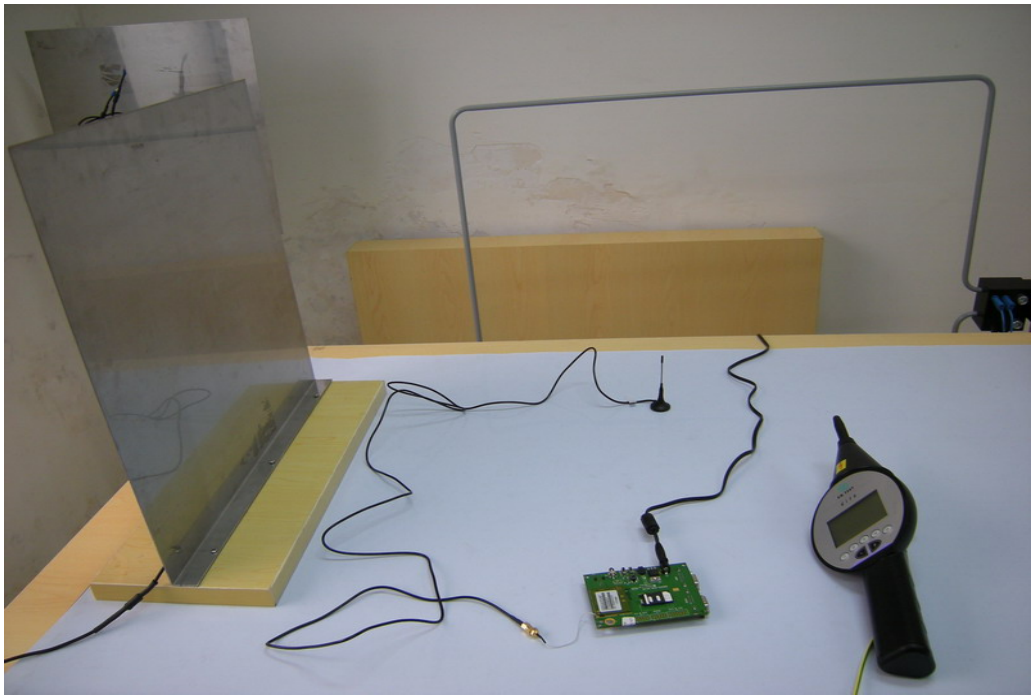


Photos of Test Setup

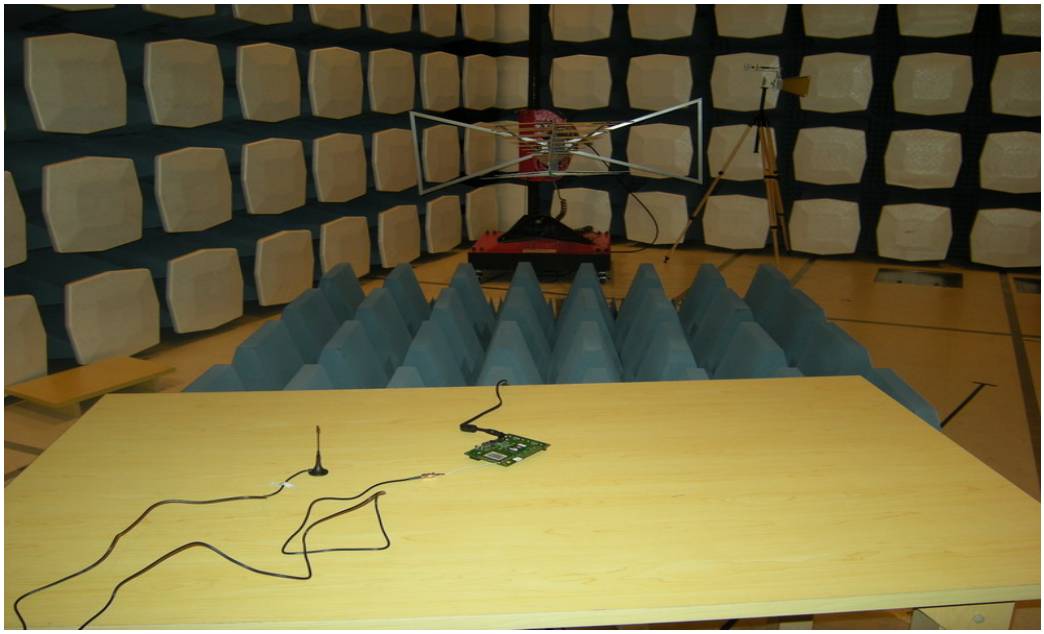
1. Radiated Field Strength Measurement



2. Electrostatic Discharge Immunity Test



3. Radiated, Radio Frequency Electromagnetic Field Immunity Test



** END OF REPORT **