



# RF TEST REPORT

<b>Applicant</b>	Shanghai Simcom Ltd.
<b>FCC ID</b>	UDV-201710
<b>Product</b>	LTE-FDD/HSPA MODULE
<b>Brand</b>	SIMCOM
<b>Model</b>	SIM7600A-H
<b>Report No.</b>	RXA1711-0374RF01
<b>Issue Date</b>	November 24, 2017

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 2 (2017)/ FCC CFR 47 Part 22H (2017)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Performed by: Jiangpeng Lan

Approved by: Kai Xu

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### Summary of measurement results

No.	Test Type	Clause in FCC rules	Verdict
1	RF power output	2.1046	PASS
2	Radiates Spurious Emission	2.1053 / 22.917 (a)	PASS
Date of Testing: November 14, 2017~ November 18, 2017			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard.			



## 1. Test Laboratory

### 1.1. Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.

### 1.2. Test facility

#### **CNAS (accreditation number: L2264)**

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

#### **FCC (Designation number: CN1179, Test Firm Registration Number: 446626)**

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

#### **IC (recognition number is 8510A)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

#### **VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)**

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

#### **A2LA (Certificate Number: 3857.01)**

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



### 1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.  
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong  
City: Shanghai  
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## 2. General Description of Equipment under Test

### Client Information

Applicant	Shanghai Simcom Ltd.
Applicant address	SIM Technology Building.,No.633, Jinzhong Rd,Changning District, Shanghai, P.R.China
Manufacturer	Shanghai Simcom Ltd.
Manufacturer address	SIM Technology Building.,No.633, Jinzhong Rd,Changning District, Shanghai, P.R.China

### General Information

EUT Description			
Model	SIM7600A-H		
IMEI	861475030055604		
Hardware Version	V1.02		
Software Version	B02V01		
Power Supply	External Power Supply		
Antenna Type	External Antenna		
Test Mode(s)	WCDMA Band V		
Test Modulation	QPSK		
WCDMA Release	R8		
LTE Release	R10		
Rated Power Supply Voltage	3.8V		
Extreme Voltage	Minimum: 3.4V    Maximum: 4.2V		
Operating Frequency Range(s)	Band	Tx (MHz)	Rx (MHz)
	WCDMA Band V	824 ~ 849	869 ~ 894
Note: The information of the EUT is declared by the manufacturer.			



### **3. Applied Standards**

According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC CFR47 Part 2 (2017)**

**FCC CFR 47 Part 22H (2017)**

**ANSI/TIA-603-D (2010)**

**KDB 971168 D01 Power Meas License Digital Systems v03**

## 4. Test Configuration

Radiated measurements are performed by rotating the EUT in three different orthogonal test planes. EUT stand-up position (Z axis), lie-down position (X, Y axis). Receiver antenna polarization (horizontal and vertical), the worst emission was found in position (X axis, horizontal polarization) and the worst case was recorded.

SIM7600A-H (FCC ID: UDV-201710) is a variant model of SIM7500A (FCC ID: UDV-201606).

Test items tested see the table below.

	Test items	Modes/Modulation
		WCDMA Band V
Conducted Test cases	RF power output	RMC HSDPA/HSUPA DC-HSDPA
Radiated Test cases	Radiates Spurious Emission	RMC



## 5. Test Case Results

### 5.1. RF Power Output

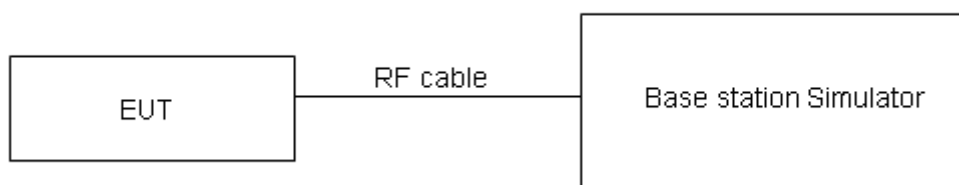
#### Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

#### Methods of Measurement

During the process of the testing, The EUT is controlled by the Base Station Simulator to ensure max power transmission and proper modulation.

#### Test Setup



The loss between RF output port of the EUT and the input port of the tester has been taken into consideration.

#### Limits

No specific RF power output requirements in part 2.1046.

#### Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 2$ ,  $U = 0.4$  dB.

**Test Results**

WCDMA Band V		Conducted Power(dBm)		
		Channel 4132	Channel 4183	Channel 4233
		826.4(MHz)	836.6(MHz)	846.6(MHz)
RMC		24.01	24.05	24.11
HSDPA	Sub - Test 1	22.76	22.78	22.82
	Sub - Test 2	22.97	22.93	23.03
	Sub - Test 3	22.54	22.50	22.52
	Sub - Test 4	22.51	22.47	22.58
HSUPA	Sub - Test 1	23.01	22.96	23.07
	Sub - Test 2	22.51	22.50	22.56
	Sub - Test 3	23.02	22.95	23.00
	Sub - Test 4	22.98	22.97	23.04
	Sub - Test 5	23.02	22.97	23.00
DC-HSDPA	Sub - Test 1	22.78	22.76	22.87
	Sub - Test 2	22.93	22.94	23.06
	Sub - Test 3	22.56	22.53	22.55
	Sub - Test 4	22.55	22.42	22.54

## 5.2. Radiates Spurious Emission

### Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

### Method of Measurement

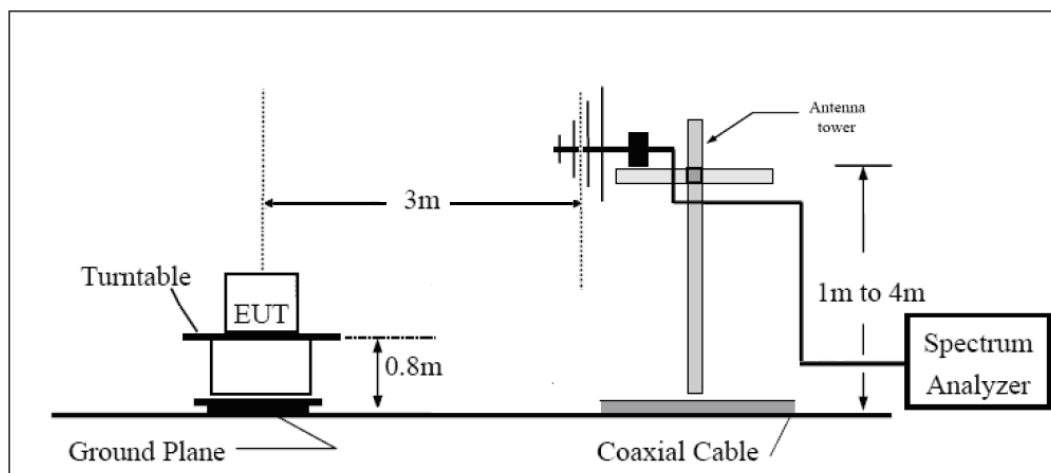
1. The testing follows FCC KDB 971168 v02r02 Section 5.8 and ANSI/TIA-603-D-2010.
2. The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).
3. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
4. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz for above 1GHz and RBW=100kHz, VBW=300kHz for 30MHz to 1GHz, And the maximum value of the receiver should be recorded as (Pr).
5. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjust the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
6. A amplifier should be connected to the Signal Source output port. And the cable should be connect between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
7. The measurement results are obtained as described below:  

$$\text{Power(EIRP)} = \text{PMea} - \text{PAg} - \text{Pcl} + \text{Ga}$$
The measurement results are amend as described below:  

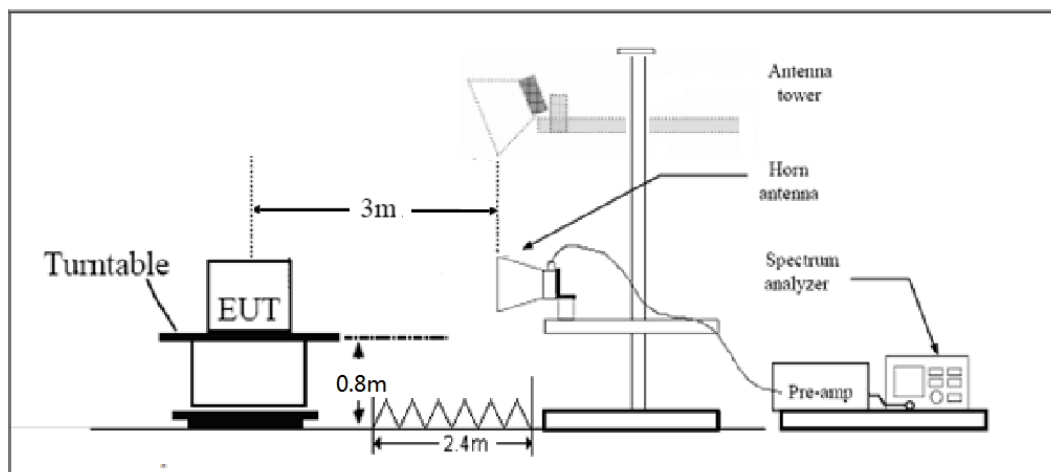
$$\text{Power(EIRP)} = \text{PMea} - \text{Pcl} + \text{Ga}$$
8. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $\text{ERP} = \text{EIRP} - 2.15\text{dBi}$ .

## Test setup

30MHz~~~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

## Limits

Rule Part 22.917(a) specifies that “The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.”

Limit	-13 dBm
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## Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor  $k = 1.96$ ,  $U = 3.55$  dB.

**Test Result**

## WCDMA Band V CH-Low

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1655.1	-51.20	2	10.15	Horizontal	-45.20	-13.00	32.20	45
3	2481.2	-47.19	2.51	11.35	Horizontal	-40.50	-13.00	27.50	225
4	3305.6	-49.40	4.2	10.85	Horizontal	-44.90	-13.00	31.90	225
5	4132.0	-53.40	5.2	11.35	Horizontal	-49.40	-13.00	36.40	45
6	4958.4	-50.50	5.5	11.95	Horizontal	-46.20	-13.00	33.20	225
7	5784.8	-50.80	5.7	13.55	Horizontal	-45.10	-13.00	32.10	270
8	6611.2	-49.60	6.3	13.75	Horizontal	-44.30	-13.00	31.30	90
9	7437.6	-46.50	6.8	13.85	Horizontal	-41.60	-13.00	28.60	225
10	8264.0	-46.10	6.9	14.25	Horizontal	-40.90	-13.00	27.90	315

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2.The worst emission was found in the antenna is Horizontal position.

## WCDMA Band V CH-Middle

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1673.2	-53.30	2	10.75	Horizontal	-46.70	-13.00	33.70	180
3	2509.8	-53.39	2.51	11.05	Horizontal	-47.00	-13.00	34.00	270
4	3346.4	-51.10	4.2	11.15	Horizontal	-46.30	-13.00	33.30	180
5	4183.0	-52.50	5.2	11.15	Horizontal	-48.70	-13.00	35.70	45
6	5019.6	-50.30	5.5	11.95	Horizontal	-46.00	-13.00	33.00	180
7	5856.2	-51.00	5.7	13.55	Horizontal	-45.30	-13.00	32.30	315
8	6692.8	-49.30	6.3	13.75	Horizontal	-44.00	-13.00	31.00	225
9	7529.4	-46.60	6.8	13.85	Horizontal	-41.70	-13.00	28.70	45
10	8366.0	-47.70	6.9	14.25	Horizontal	-42.50	-13.00	29.50	180

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2.The worst emission was found in the antenna is Horizontal position.



## WCDMA Band V CH-High

Harmonic	Frequency (MHz)	SG (dBm)	Cable Loss (dB)	Gain (dBi)	Antenna Polarization	ERP Level (dBm)	Limit (dBm)	Margin (dB)	Azimuth (deg)
2	1693.2	-46.80	2	10.15	Horizontal	-40.80	-13.00	27.80	90
3	2539.8	-48.29	2.51	11.05	Horizontal	-41.90	-13.00	28.90	90
4	3386.4	-48.40	4.2	11.15	Horizontal	-43.60	-13.00	30.60	270
5	4233.0	-52.20	5.2	11.15	Horizontal	-48.40	-13.00	35.40	315
6	5079.6	-50.70	5.5	11.95	Horizontal	-46.40	-13.00	33.40	90
7	5926.2	-51.30	5.7	13.55	Horizontal	-45.60	-13.00	32.60	180
8	6772.8	-50.20	6.3	13.75	Horizontal	-44.90	-13.00	31.90	135
9	7619.4	-49.50	6.8	13.85	Horizontal	-44.60	-13.00	31.60	135
10	8466.0	-48.30	6.9	14.25	Horizontal	-43.10	-13.00	30.10	225

Note: 1.The other Spurious RF Radiated emissions level is no more than noise floor.

2.The worst emission was found in the antenna is Horizontal position.



## 6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Universal Radio Communication Tester	Agilent	E5515C	MY48367192	2017-05-20	2018-05-19
Signal Analyzer	R&S	FSV30	100815	2016-12-16	2017-12-15
Trilog Antenna	SCHWARZBECK	VUBL 9163	9163-201	2014-12-06	2017-12-05
Horn Antenna	R&S	HF907	100126	2014-12-06	2017-12-05

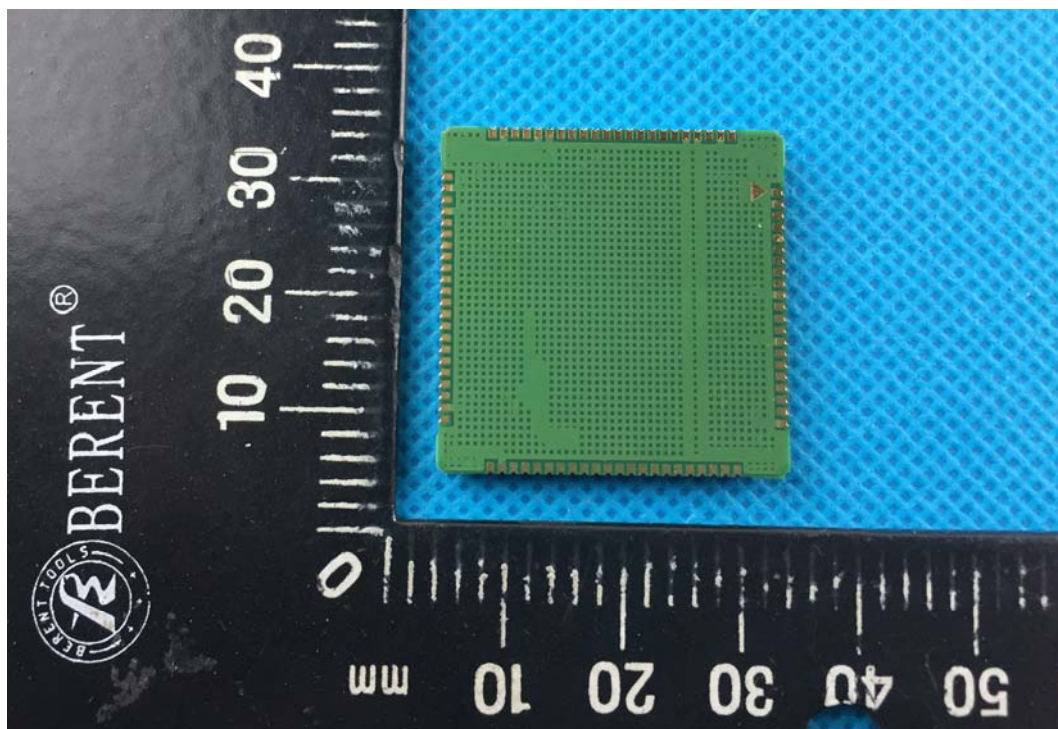
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## ANNEX A: EUT Appearance and Test Setup

### A.1 EUT Appearance



Front Side



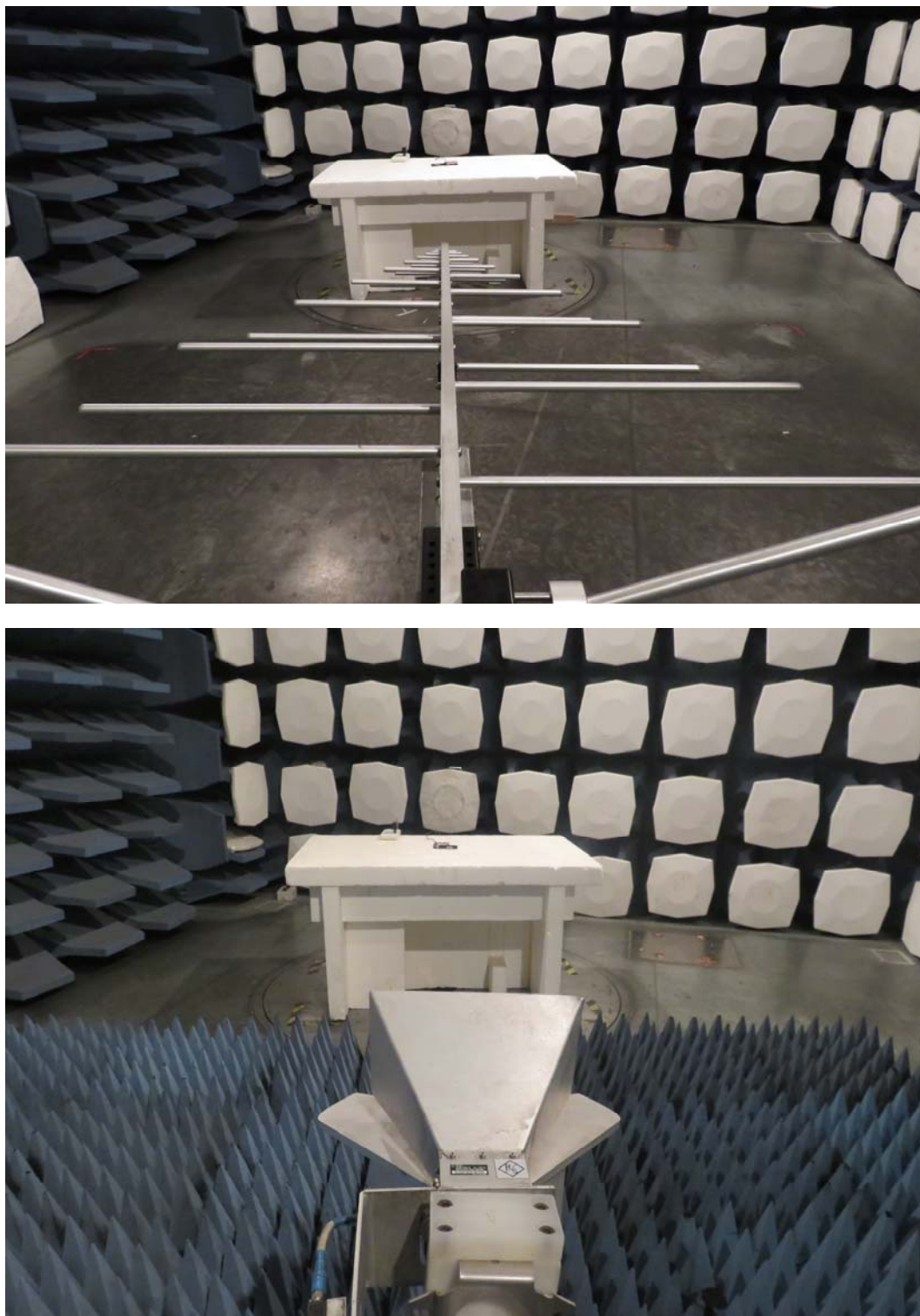
Back Side

a: EUT

Picture 1 EUT and Accessory



## A.2 Test Setup



Picture 2: Radiated Spurious Emissions Test setup