

Evaluation Report

Client: Souyi Japan Co., Ltd.
10F Takigen Bldg., 1-24-4 Nishi-Gotanda Shinagawa-ku Tokyo 141-0031 Japan

Test Item: SOUYI Electromagnetic Wave Absortion Case

Identification: SY-007A

Receipt No.: PT0214032859-1

Date of Receipt: 2013-01-16

Testing Laboratory: TÜV Rheinland Japan Ltd. – Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku, Yokohama 224-0021, Japan

Test Specification:

[Radio]

Radiated Spurious Emission Comparison with and without EUT at particular frequencies by customer's request

EN 300 328 V1.7.1 as reference

Prepared by



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1. General Remarks

1.1 Test Report Purpose

The purpose of this test report is to show how the radiated power change of the reference radio source with the EUT. The methodology of the testing, test setup and representation were confirmed by customer.

1.2 Complementary Materials

There is no attachment to this test report.

2. Test Sites

2.1 Test Facilities

TÜV Rheinland Japan Ltd. – Global Technology Assessment Center
4-25-2 Kita-Yamata, Tsuzuki-ku, Yokohama 224-0021, Japan

This test site is in accordance with CISPR 16 for measurement of radio interference.

The test facility is accredited by VLAC (member of ILAC) under number VLAC-017 according to ISO/IEC 17025:2005.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Model Name	Serial Number	Equipment ID	Calibrated until
For Transmitter and Receiver Radiated Spurious Emission (below 40GHz)					
Receiver spectrum analyzer	Rohde & Schwarz	ESU 26	100070	-	2014-01
Signal Generator (1GHz - 40GHz)	Rohde & Schwarz	SMR40	100498	RF-0074	2013-07
Trilog Antenna, 25-1000MHz (RX)	Schwarzbeck	VULB9168	0245	RF-0019	2013-03
3dB Attenuator	Hewlett Packard	8491A 3 dB	34742	RF-0286	2013-06
Low Noise Pre-Amplifier, 9kHz-1GHz	TSJ	MLA-10K01-B01-35	1336163	RF-0275	2013-07
Horn Antenna, 1-8GHz (RX)	Schwarzbeck	BBHA9120B	419	RF-0050	2013-05
Microwave Pre-Amplifier, 1-8GHz	Toyo Corporation	TPA0108-40	0634	RF-0052	2013-05
Band Reject Filter, 1-8GHz	Nitsuki	NF-49BT	027	RF-0131	2013-05
Comb Generator	Com-Power Corporation	CG-515	291074	RF-0030	-

Conformance of the used measurement and test equipment with the requirements of ISO/IEC 17025:2005 has been confirmed before testing.

2.3 Measurement Uncertainty

Table 2: Emission Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Radiated Emission – Full Anechoic Chamber	25MHz - 1GHz	±4.8dB
	> 1GHz	±3.3dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT (Equipment Under Test) is SY-007A Electromagnetic Wave Absorption Case.

Customer declares that the EUT is the case for smartphone, absorbing electromagnetic waves almost by 90% in 360-degree radius. It absorbs a wide band of electromagnetic waves from 850MHz to 2.2GHz used by mobile phones, ranging in length from UHF to microwave.

Photograph 1: EUT's logo



3.2 Noise Generating and Noise Suppressing Parts

Customer declares that the EUT is the case for smartphone, absorbing electromagnetic waves almost by 90% in 360-degree radius. It absorbs a wide band of electromagnetic waves from 850MHz to 2.2GHz used by mobile phones, ranging in length from UHF to microwave.

3.3 Submitted Documents

None.

4. Test Set-up and Operation Modes

4.1 Test Methodology

Radio: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Operation Modes

Testing was performed at the frequency 850MHz, 1500MHz, 2000MHz and 2500MHz.

The basic operation modes used for testing are:

- A. Reference radio source transmits (TX mode), at 850MHz.
- B. Reference radio source transmits (TX mode), at 1500MHz.
- C. Reference radio source transmits (TX mode), at 2000MHz.
- D. Reference radio source transmits (TX mode), at 2500MHz.

4.3 Physical Configuration for Testing

The EUT was tested on a stand-alone basis and the test system was configured in a typical fashion (as a customer would normally use it).

For more details, refer to section: Photographs of the Test Set-Up.

4.4 Test Software

No special test software was used to operate the EUT.

4.5 Special Accessories and Auxiliary Equipment

There is no special accessories and auxiliary equipment tested together with the EUT.

4.6 Countermeasures to achieve EMC Compliance

No additional measures were employed to achieve compliance.

5. Test Results RADIO

5.1 Spurious Emissions

Date of testing:	2013-01-16
Ambient temperature:	20°C
Relative humidity:	32%
Atmospheric pressure:	1012hPa
Reference Standard:	EN 300 328 V1.7.1, clause 5.7.5
Spot Frequency:	850, 1500, 2000, 2500MHz
Measurement distance:	3m
Kind of test site:	Full Anechoic Chamber
Supply voltage during testing:	Not Applicable
Test mode applied:	A, B, C, D
Note:	

The level of spurious emissions was measured as their effective radiated power when radiated by the antenna, cabinet and structure of the reference signal generator (Comb Generator).

The EUT was placed at 2cm to the antenna of the signal generator on a styrene foam table in a full anechoic chamber. The power of spurious emissions produced by the reference signal generator was measured by a test antenna connected to a spectrum analyzer for vertical polarizations of the test antenna. The level of the spurious emission was compared with and without the EUT, which is shown in the following plots.

The measurements were performed with a spectrum analyzer using a peak detector with a resolution bandwidth of 100kHz below 1GHz and 1MHz above 1GHz measurement.

Summary:

Frequency, MHz	Reference level, dBm	Maximum change in level, dB
850	-55.83	-11.88
1500	-59.69	-10.26
2000	-77.38	-9.23
2500	-79.37	-9.42

Figure 1: The relative value for Transmitter Radiated Spurious Emissions, Mode A (850MHz)
Shield Gain

Axis: X-Y
Polarization: Vertical
Frequency: 2cm EUT (850 MHz)

Peak gain: -3.75 dB
at angle: 8°
MIN gain: -11.88 dB
at angle: 165°

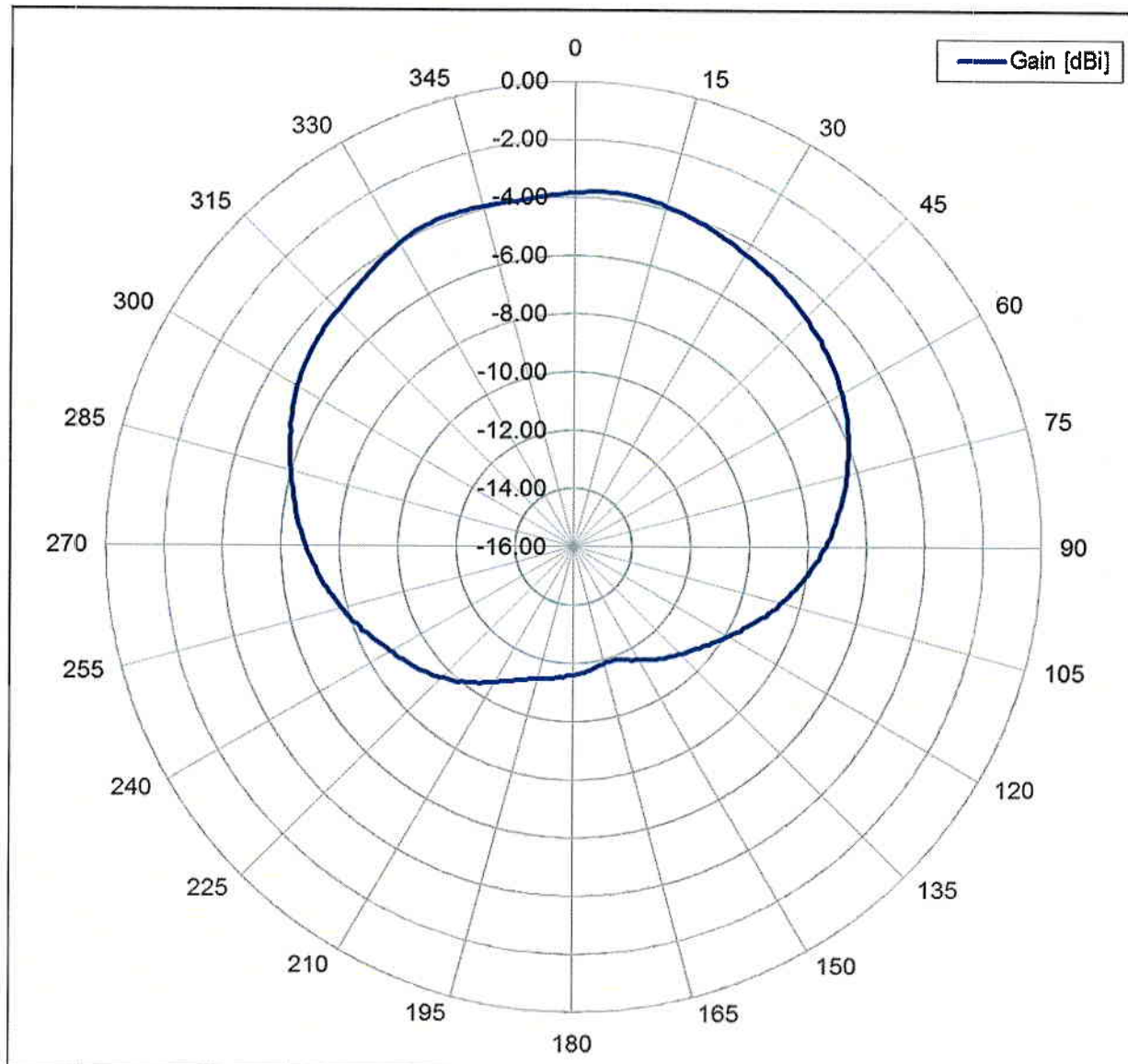


Figure 2: The relative value for Transmitter Radiated Spurious Emissions, Mode B (1500MHz)
Shield Gain

Axis:	X-Y	Peak gain:	-0.59 dB
Polarization:	Vertical	at angle:	9°
Frequency:	2cm (1500 MHz)	MIN gain:	-10.26 dB
		at angle:	102°

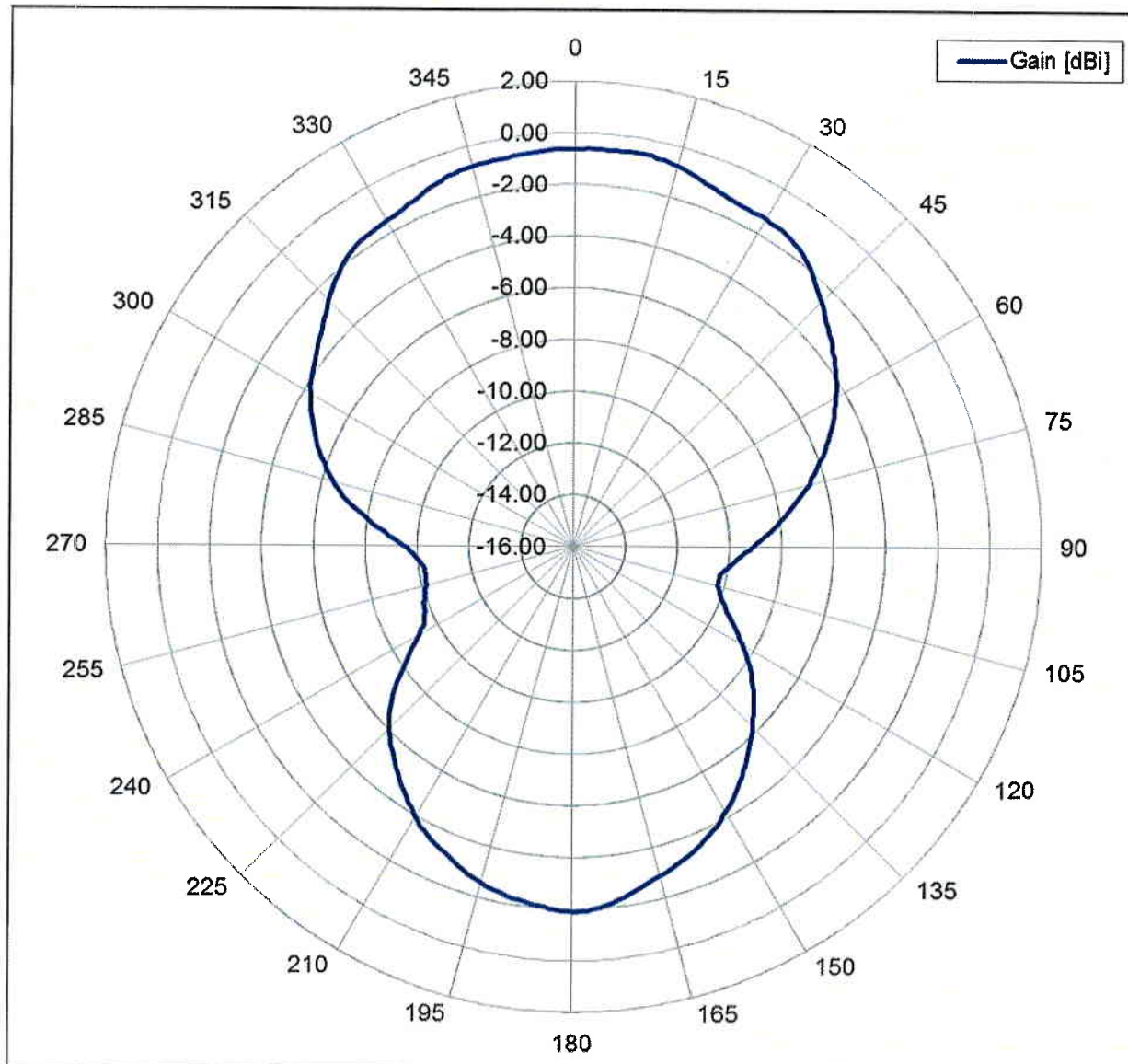


Figure 3: The relative value for Transmitter Radiated Spurious Emissions, Mode C (2000MHz)

Shield Gain

Axis: X-Y
Polarization: Vertical
Frequency: 2cm (2000 MHz)

Peak gain: 2.03 dB
at angle: 188°
MIN gain: -9.23 dB
at angle: 295°

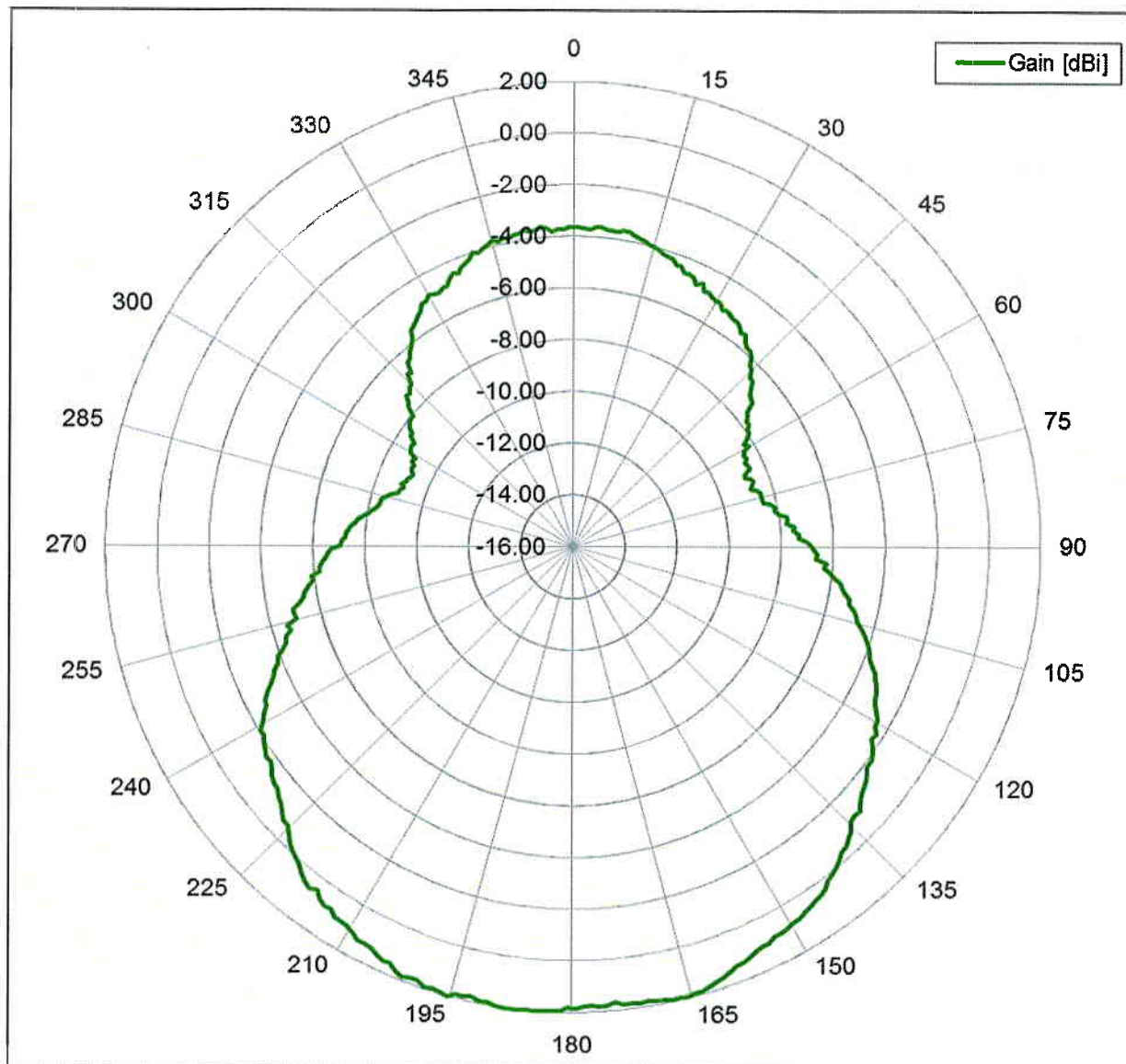
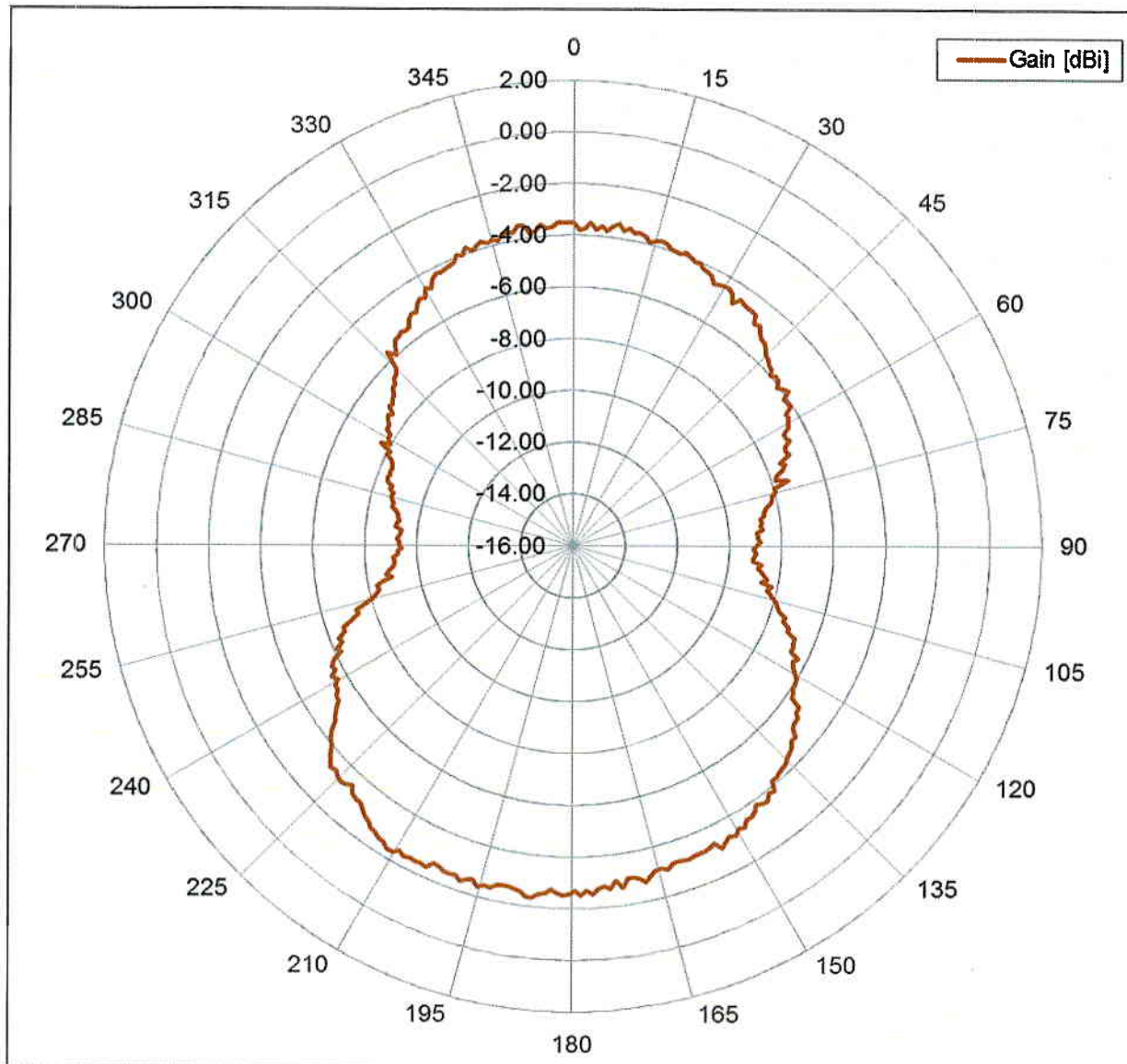


Figure 4: The relative value for Transmitter Radiated Spurious Emissions, Mode D (2500MHz)

Shield Gain

Axis: X-Y
 Polarization: Vertical
 Frequency: 2cm (2500 MHz)

Peak gain: -2.30 dB
 at angle: 212°
 MIN gain: -9.42 dB
 at angle: 270°



6. Photographs of the Test Setup

Photograph 2: EUT Configuration, Front View



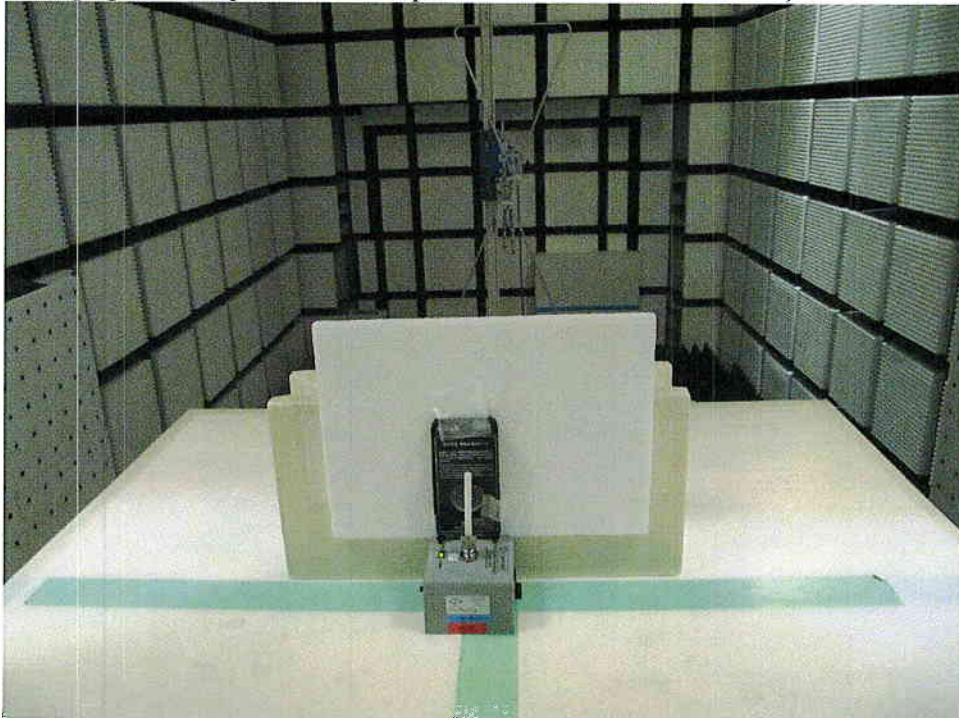
Photograph 3: EUT Configuration, Rear View



Photograph 4: EUT Configuration, Rear View (Case and Magnetic Cover)



Photograph 5: Set-up for Radiated Spurious Emissions of Transmitter, MHz



Photograph 6: Set-up for Radiated Spurious Emissions of Transmitter, GHz



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