Report on EMC Testing of:

Qi-Technologies GmbH
EMF Modulation Unit, Model: Qi-Home Cell

Prepared for: Qi-Technologies GmbH
Bahnhofstrasse 16
02625 Bautzen
Germany
02625
UNITED KINGDOM

Add value.
Inspire trust.

COMMERCIAL-IN-CONFIDENCE

Document Number: 79547152-01 | Issue: 01

SIGNATURE			
			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Andy Lawson	Senior Engineer	Authorised Signatory	05 December 2019

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

EXECUTIVE SUMMARY
A sample of this product was tested for pre-compliance for the tests detailed in section 1.3.

TÜV SÜD
is a trading name of TUV SUD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TUV SUD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuv-sud.co.uk

TÜV SÜD
Octagon House
Concorde Way
Fareham
Hampshire PO15 5RL
United Kingdom

Contents

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

The report will be a factual results-based test report and will only re-produce test results. We will not give any opinions in the test results in regard to the effectiveness of the device in a real world situation.

Issue	Description of Change	Date of Issue
1	First Issue	05 December 2019

Table 1

1.2 Introduction

Applicant	Qi-Technologies GmbH
Manufacturer	Qi-Technologies GmbH
Model Number(s)	Qi-Home Cell
Serial Number(s)	HCZ19-06-02-17
Hardware Version(s)	February 2019
Software Version(s)	Not Applicable
Number of Samples Tested	1
Test Specification/Issue/Date	Not Applicable
Order Number Date	91403399 04-October-2019
Date of Receipt of EUT	22-October-2019
Start of Test	24-October-2019
Finish of Test	25-October-2019
Name of Engineer(s)	Colin McKean

1.3 Brief Summary of Results

A brief summary of the tests carried out for pre-compliance are shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: Standalone				
2.1	Not Applicable	Shielding Effectiveness Testing of Qi-Home Cell	N/A	

Table 2

1.4 Declaration of Build Status

MAIN EUT			
MANUFACTURING DESCRIPTION	EMF Modulation Unit		
MANUFACTURER	Qi-Technologies		
MODEL NAME/NUMBER	Qi-Home Cell		
PART NUMBER			
SERIAL NUMBER	HCZ 19 02 06 17		
HARDWARE VERSION	February 2019		
SOFTWARE VERSION	n/a		
PSU VOLTAGE/FREQUENCY/CURRENT	n/a		
HIGHEST INTERNALLY GENERATED / USED FREQUENCY	5.0 GHz		
FCC ID (if applicable)			
INDUSTRY CANADA ID (if applicable)			
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	EMF modulation unit interacts with ambient EM environment		
COUNTRY OF ORIGIN	Germany		
RF CHARACTERISTICS (if applicable)			
TRANSMITTER FREQUENCY OPERATING RANGE (MHz)	824,0 – 849,0 MHz; 876,0 – 915,0 MHz; 1710,0 – 1910,0 MHz; 2,400 –2,485 MHz; 5725 – 5875 MHz		
RECEIVER FREQUENCY OPERATING RANGE (MHz)	824,0 – 849,0 MHz; 876,0 – 915,0 MHz; 1710,0 – 1910,0 MHz; 2,400 –2,485 MHz; 5725 – 5875 MHz		
INTERMEDIATE FREQUENCIES			
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	300KGXW, 22M0G1D, 16M5D1D, 33M1D1D		
MODULATION TYPES: (i.e. GMSK, QPSK)	GSM 850, 900, 1800, 1900, 802.11		
OUTPUT POWER (W or dBm)	~ 1 W		
SEPARATE BATTERY/POWER SUPPLY (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
PART NUMBER			
PSU VOLTAGE/FREQUENCY/CURRENT			
COUNTRY OF ORIGIN			
MODULES (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
POWER			
FCC ID			
INDUSTRY CANADA ID			
EMISSION DESIGNATOR			

DHSS/FHSS/COMBINED OR OTHER			
COUNTRY OF ORIGIN			
ANCILLARIES (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
PART NUMBER			
SERIAL NUMBER			
COUNTRY OF ORIGIN			

I hereby declare that the information supplied is correct and complete.

Name: Hagen Thiers
Position held: CEO
Date 03/10/2019

1.5 Product Information

1.5.1 Technical Description

The Equipment Under Test (EUT) was a Qi Technologies GmbH, Model: Qi-Home cell.

The primary function of the EUT is a portable device that gives a level of protection against non-ionising radiation.

A full description and detailed product specification details are available from the manufacturer.

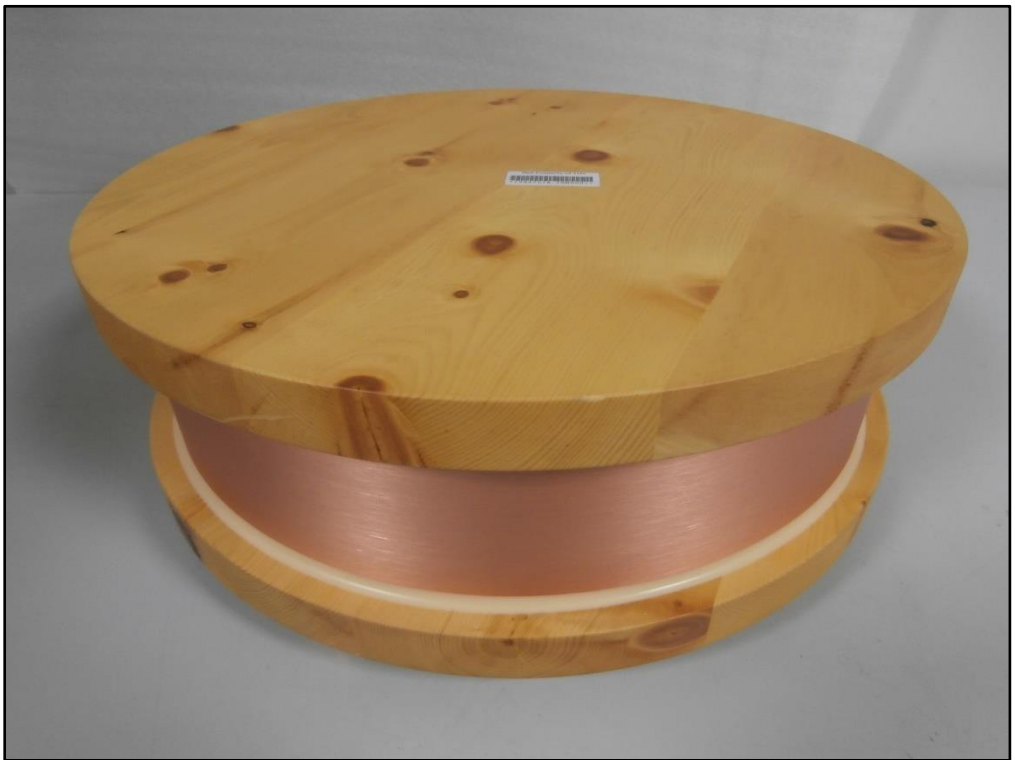

Figure 1 – Front Face

Figure 2 – Top Face

1.5.2 Test Configuration

Configuration	Description
Standalone	The EUT was a standalone unpowered device placed on a non-conductive table in a semi-anechoic chamber.

Table 3

1.6 EUT Modification Record

The table below details modifications made to the EUT during the test programme.

The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: HCZ19-06-02-17			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 4

1.7 Test Location

TÜV SÜD conducted the following pre-compliance tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: Standalone		
Shielding Effectiveness Testing	Colin McKean	Not Accredited

Table 5

Office Address:
Octagon House
Concorde Way
Segensworth North
Fareham
Hampshire
PO15 5RL
United Kingdom

2 Test Details

2.1 Radiated Attenuation Measurements

2.1.1 Specification Reference

Not Applicable

2.1.2 Equipment Under Test and Modification State

Qi-Home Cell, S/N: HCZ19-06-02-17 – Modification State 0

2.1.3 Date of Test

24-August and 25-August-2019

2.1.4 Test Method

The equipment under test was placed on a 0.8 m high non-conductive table in a semi anechoic chamber with Radar Absorbent Material (RAM) placed on the chamber floor between the RF Source and Rx antenna to minimise reflections from the chamber floor.

The chamber details are:

Internal Dimensions: Length = 6.0m, Width = 3.3m, Height = 4.3m
Access Door: Width = 1.8m, Height = 2.02m
Construction: Modular Steel
RAM: Fully lined with Anechoic material with the exception of the floor which is lined with ferrite tiles.

A receive antenna was placed in the line of sight to the source antenna and signal generator measuring the incident field in V/m at distances shown below in figure 3.

A calibration was carried out across different frequency bands as shown in the table 6 below, using a sine wave narrowband signal (without device) using a small (relative to product size) source antenna.

Frequency Band	Frequency Range (MHz)
GSM-850	824.2 to 893.8
GSM-900	880 to 960
DCS-1800	1710.2 to 1879.8
PCS-1900	1850.2 to 1989.8

Table 6

The Qi-Home Cell was placed in position 1 as shown in figure 3 below and the V/m readings measured.

Graphs were produced showing the measured difference in field strength with the EUT in position 1 and the attenuation achieved for each of the frequency bands.

Table numbers 7 to 10 are converted measurements of the measured difference in V/m to W/m^2

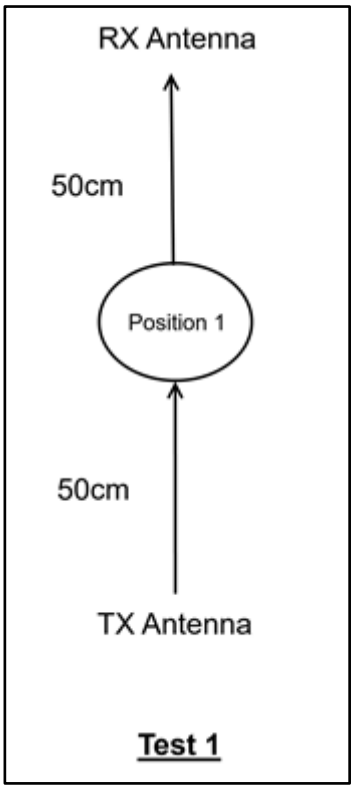

Figure 3 – Test Setup

2.1.5 Environmental Conditions

Ambient Temperature	21.0 °C
Relative Humidity	52.0 %

2.1.6 Test Results

Results for Configuration and Mode: Standalone

Performance assessment of the EUT made during this test: Declaration.

Detailed results are shown below.

Guide to test results:

- Figures 4, 6, 8 and 10 show a field strength comparison between the EUT not present and the EUT present.
- Figures 5, 7, 9, and 11 show the difference between EUT present and EUT not present in dBs of attenuation.

GSM-850 Results

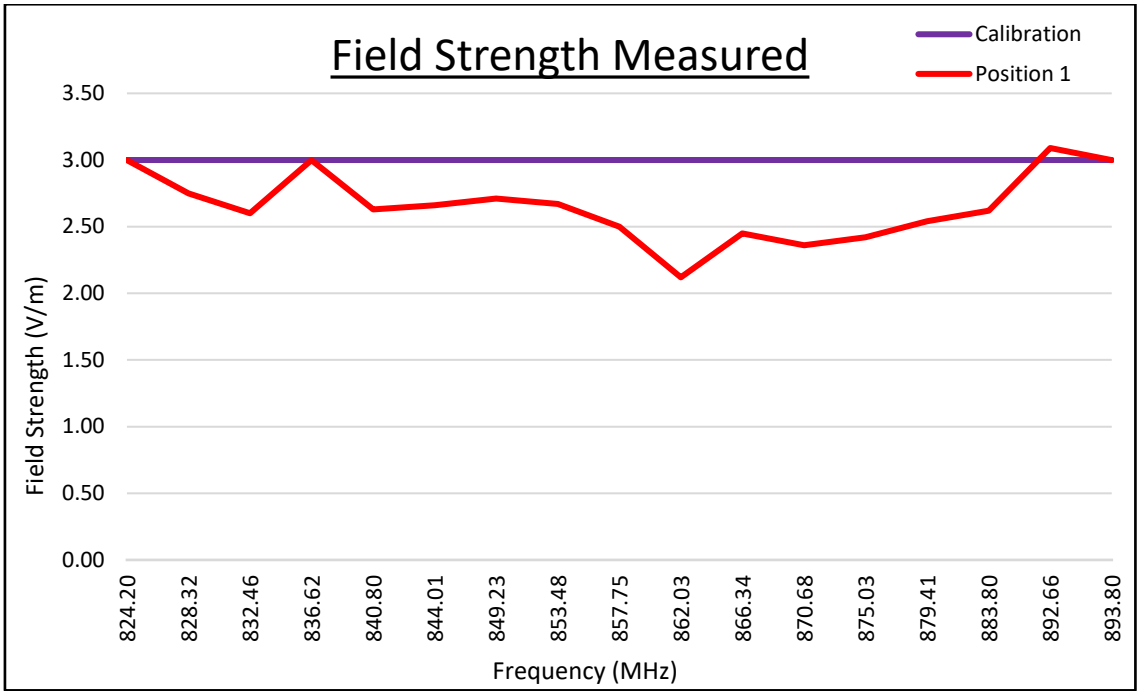

Figure 4 – Field Strength

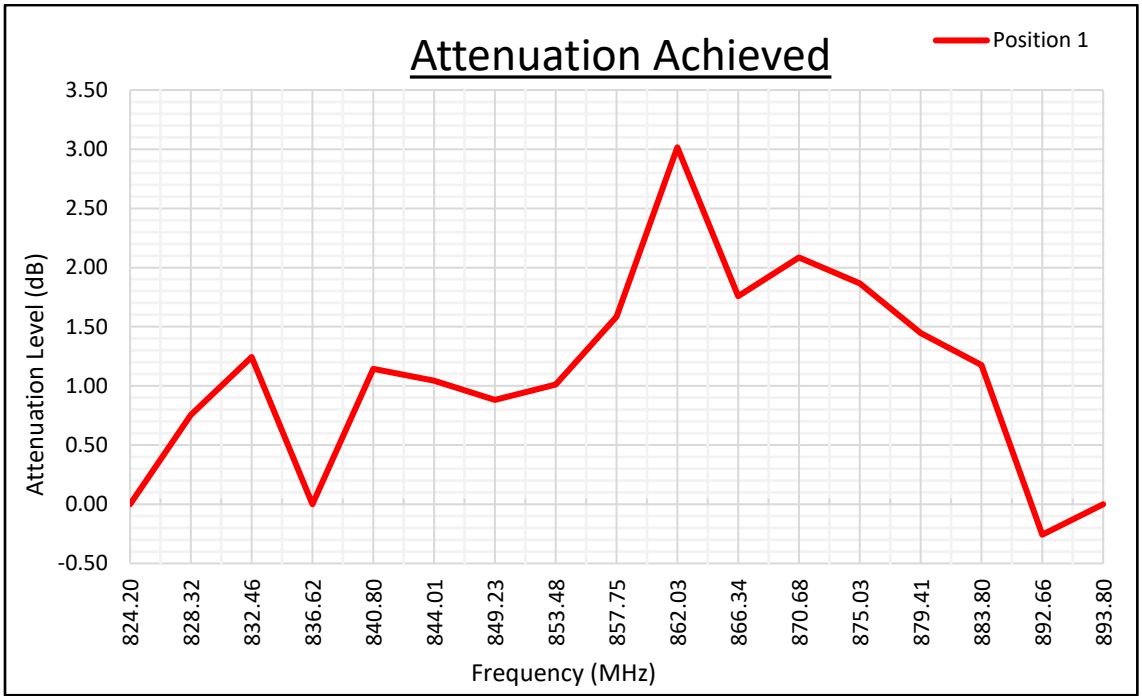

Figure 5 – Attenuation Achieved

GSM-900 Results

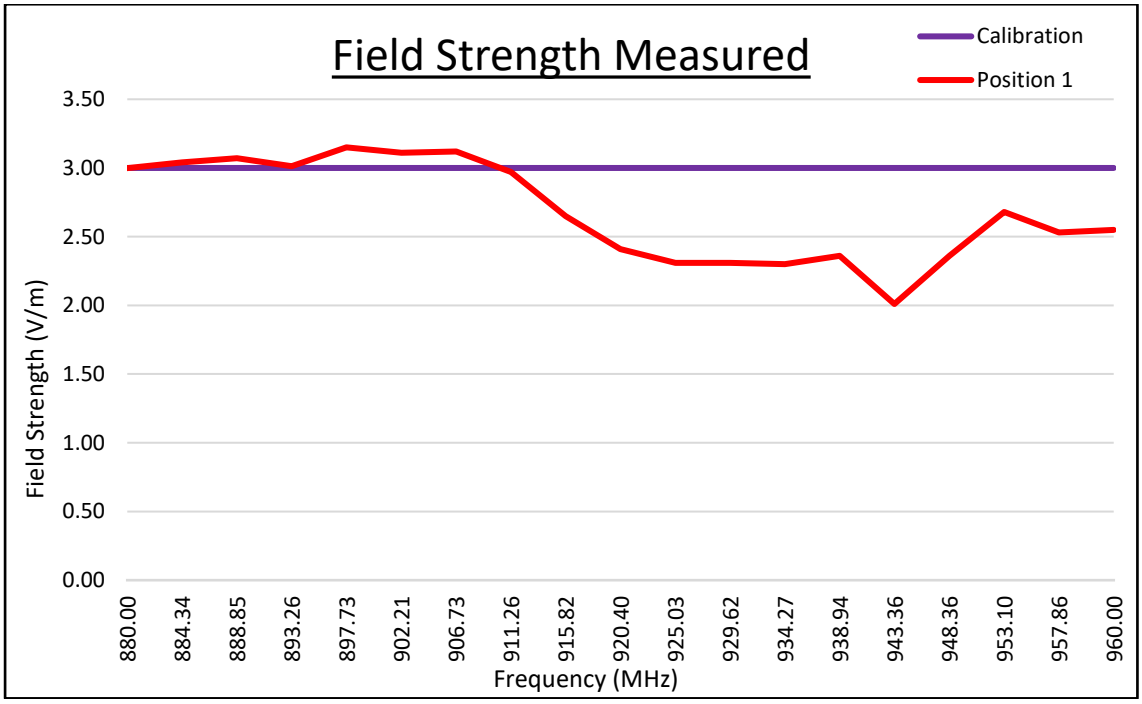

Figure 6 – Field Strength

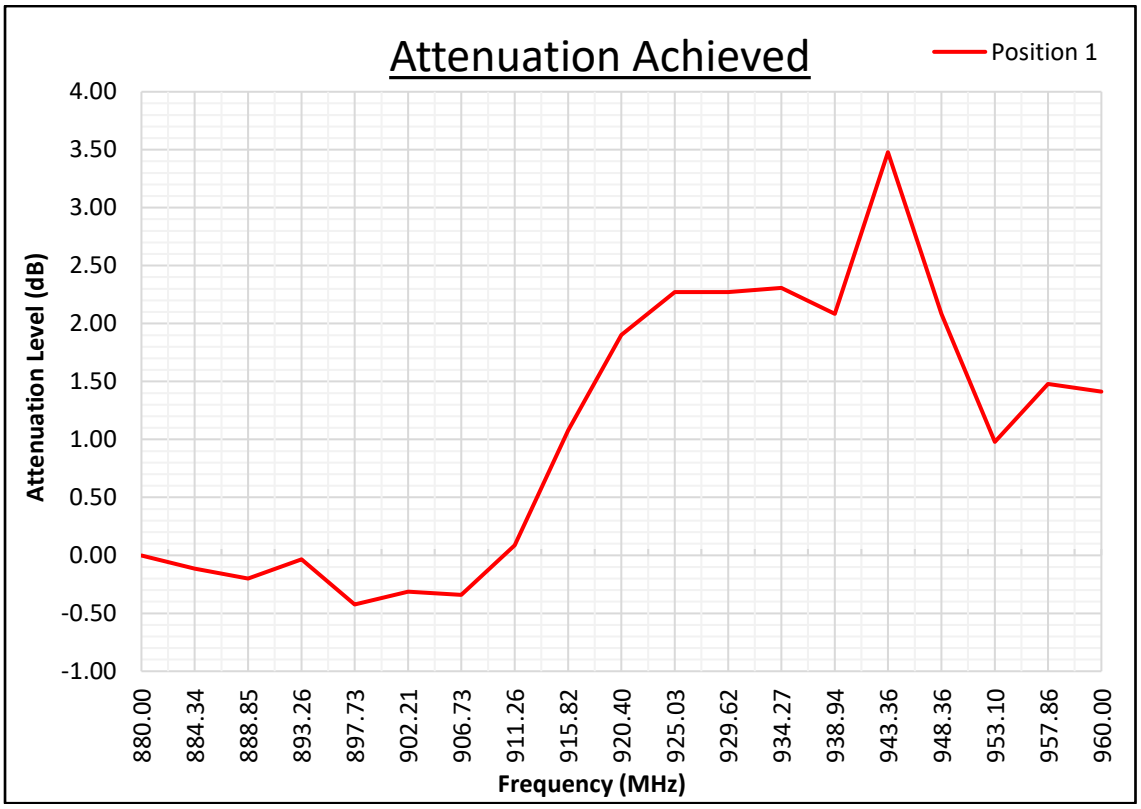

Figure 7 – Attenuation Achieved

DSC-1800 Results

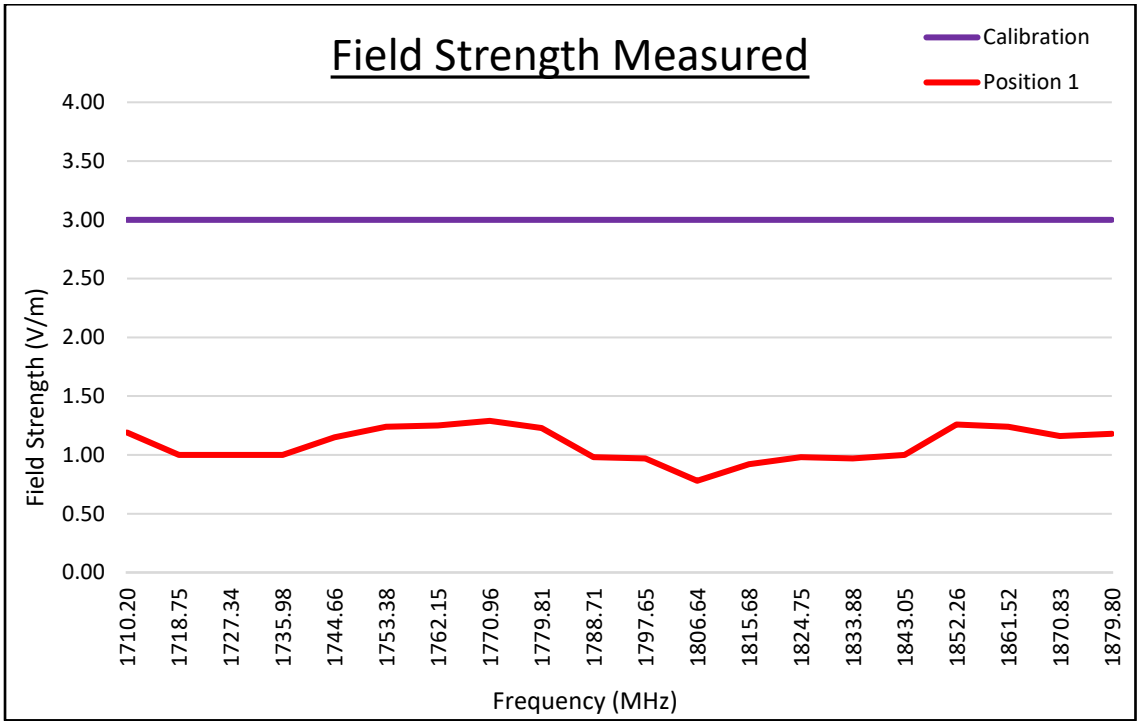

Figure 8 – Field Strength

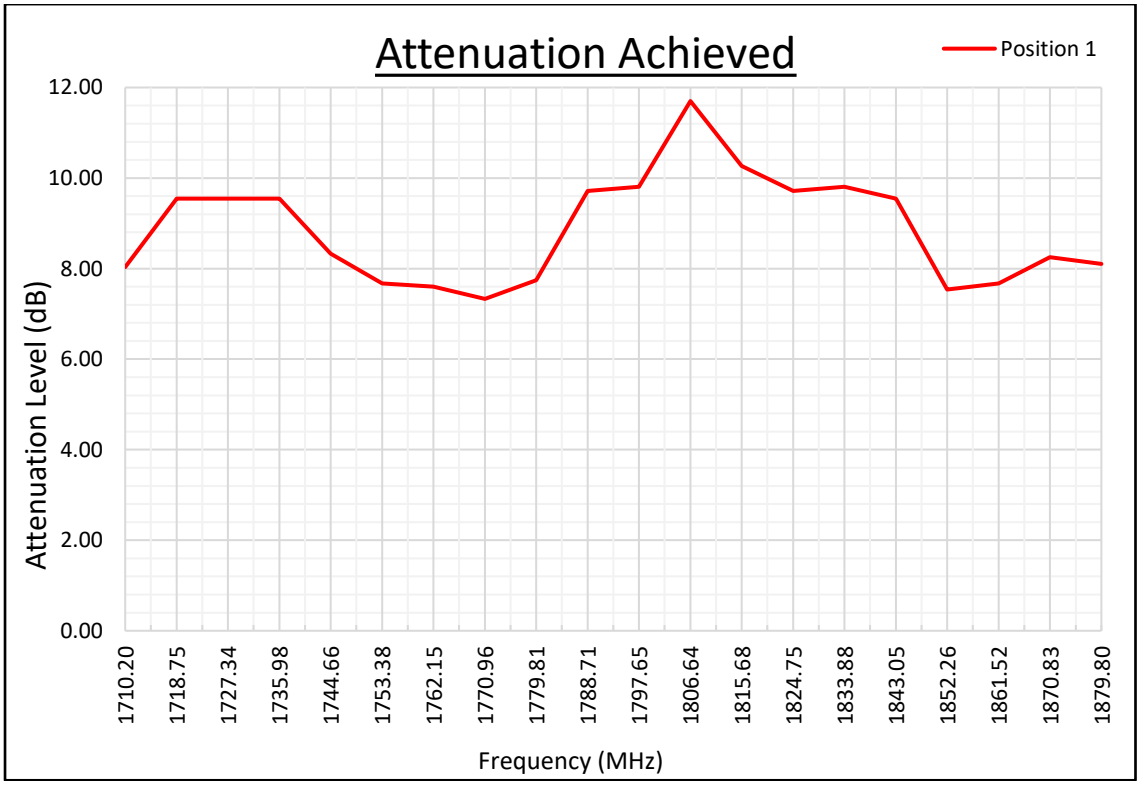

Figure 9 – Attenuation Achieved

DSC-1900 Results

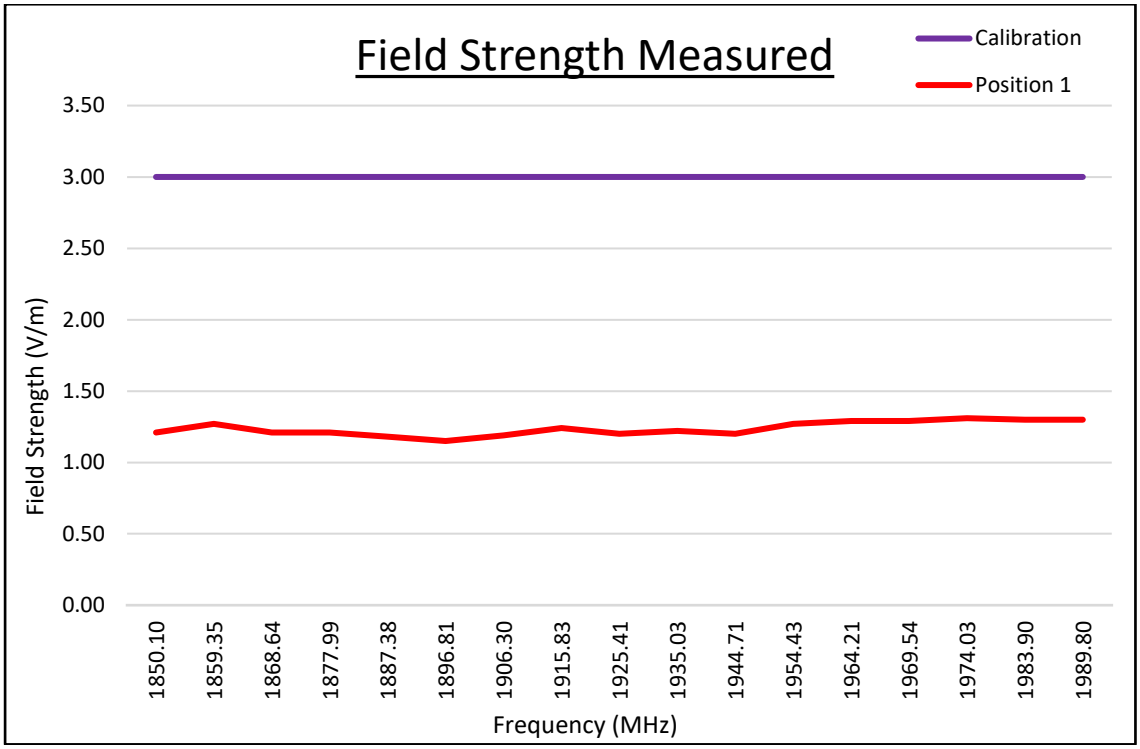

Figure 10 – Field Strength

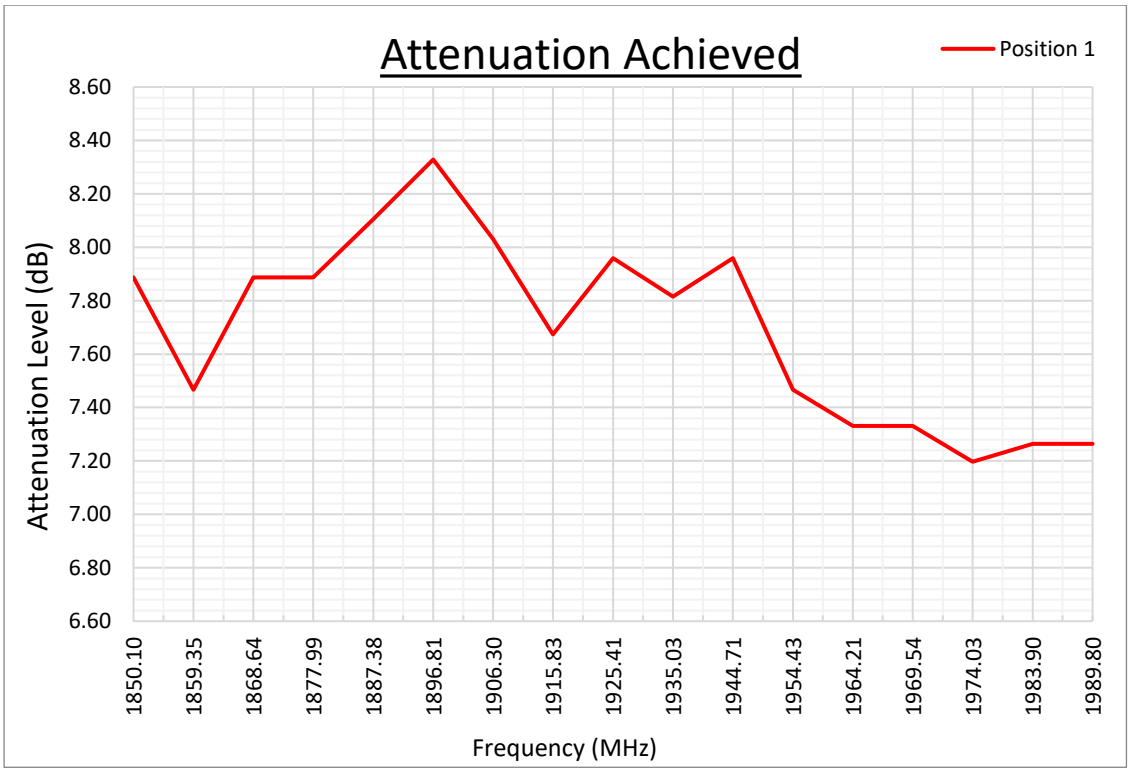

Figure 11 – Attenuation Achieved

The tables below detail the field strength difference with the EUT in place and includes a conversion to W/m^2 of this difference.

GSM-850

Frequency (MHz)	Test Position 1	
	Field Strength Difference (V/m)	(W/m^2)
824.20	0.00	0.00000
828.32	-0.25	0.00017 Reduction in exposure
832.46	-0.40	0.00042 Reduction in exposure
836.62	0.00	0.00000
840.80	-0.37	0.00036 Reduction in exposure
844.01	-0.34	0.00031 Reduction in exposure
849.23	-0.29	0.00022 Reduction in exposure
853.48	-0.33	0.00029 Reduction in exposure
857.75	-0.50	0.00066 Reduction in exposure
862.03	-0.88	0.00205 Reduction in exposure
866.34	-0.55	0.00080 Reduction in exposure
870.68	-0.64	0.00109 Reduction in exposure
875.03	-0.58	0.00089 Reduction in exposure
879.41	-0.46	0.00056 Reduction in exposure
883.80	-0.38	0.00038 Reduction in exposure
892.66	0.09	0.00002 Increase in exposure
893.80	0.00	0.00000

Table 7

GSM-950

Frequency (MHz)	Test Position 1	
	Field Strength Difference (V/m)	(W/m^2)
880.00	0.00	0.00000
884.34	0.04	0.00000
888.85	0.07	0.00001 Increase in exposure
893.26	0.01	0.00000
897.73	0.15	0.00006 Increase in exposure
902.21	0.11	0.00003 Increase in exposure
906.73	0.12	0.00004 Increase in exposure
911.26	-0.03	0.00000 Reduction in exposure
915.82	-0.35	0.00032 Reduction in exposure
920.40	-0.59	0.00092 Reduction in exposure
925.03	-0.69	0.00126 Reduction in exposure
929.62	-0.69	0.00126 Reduction in exposure
934.27	-0.70	0.00130 Reduction in exposure
938.94	-0.64	0.00109 Reduction in exposure
943.36	-0.99	0.00260 Reduction in exposure
948.36	-0.64	0.00109 Reduction in exposure
953.10	-0.32	0.00027 Reduction in exposure
957.86	-0.47	0.00059 Reduction in exposure
960.00	-0.45	0.00054 Reduction in exposure

Table 8

DSC1800

Frequency (MHz)	Test Position 1	
	Field Strength Difference (V/m)	(W/m^2)
1710.20	-1.81	0.00869 Reduction in exposure
1718.75	-2.00	0.01061 Reduction in exposure
1727.34	-2.00	0.01061 Reduction in exposure
1735.98	-2.00	0.01061 Reduction in exposure
1744.66	-1.85	0.00908 Reduction in exposure
1753.38	-1.76	0.00822 Reduction in exposure
1762.15	-1.75	0.00812 Reduction in exposure
1770.96	-1.71	0.00776 Reduction in exposure
1779.81	-1.77	0.00831 Reduction in exposure
1788.71	-2.02	0.01082 Reduction in exposure
1797.65	-2.03	0.01093 Reduction in exposure
1806.64	-2.22	0.01307 Reduction in exposure
1815.68	-2.08	0.01148 Reduction in exposure
1824.75	-2.02	0.01082 Reduction in exposure
1833.88	-2.03	0.01093 Reduction in exposure
1843.05	-2.00	0.01061 Reduction in exposure
1852.26	-1.74	0.00803 Reduction in exposure
1861.52	-1.76	0.00822 Reduction in exposure
1870.83	-1.84	0.00898 Reduction in exposure
1879.80	-1.82	0.00879 Reduction in exposure

Table 9

DSC1900

Frequency (MHz)	Test Position 1	
	Field Strength Difference (V/m)	(W/m^2)
1850.10	-1.79	0.00850 Reduction in exposure
1859.35	-1.73	0.00794 Reduction in exposure
1868.64	-1.79	0.00850 Reduction in exposure
1877.99	-1.79	0.00850 Reduction in exposure
1887.38	-1.82	0.00879 Reduction in exposure
1896.81	-1.85	0.00908 Reduction in exposure
1906.30	-1.81	0.00869 Reduction in exposure
1915.83	-1.76	0.00822 Reduction in exposure
1925.41	-1.80	0.00859 Reduction in exposure
1935.03	-1.78	0.00840 Reduction in exposure
1944.71	-1.80	0.00859 Reduction in exposure
1954.43	-1.73	0.00794 Reduction in exposure
1964.21	-1.71	0.00776 Reduction in exposure
1969.54	-1.71	0.00776 Reduction in exposure
1974.03	-1.69	0.00758 Reduction in exposure
1983.90	-1.70	0.00767 Reduction in exposure
1989.80	-1.70	0.00767 Reduction in exposure

Table 10

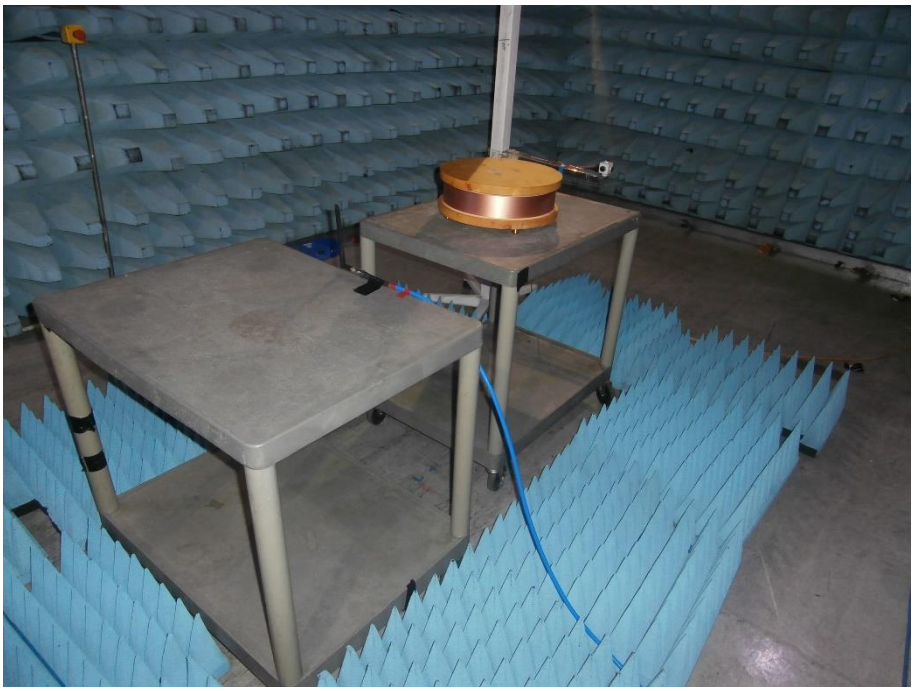

Figure 12 - Position 1

2.1.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 2.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna (Double Ridge Guide, 1 GHz to 18 GHz)	EMCO	3115	235	-	TU
Screened Room (2)	Rainford	EMC Chamber 2	1542	-	TU
Signal Generator, 9kHz to 6GHz	Rohde & Schwarz	SMB 100A	3499	12	11-Jun-2020
Power Meter	Rohde & Schwarz	NRVD	1391	-	TU
Power Sensor (10MHz to 18GHz)	Rohde & Schwarz	NRV-Z1	2899	-	TU
CW TWT (1-2.5GHz)	Thorn	PTC6341	2069	-	TU
Amplifier (250W, 80MHz - 1GHz)	Amp Research	250W1000A	3029	-	TU
Laser Powered Electric Field Sensor	Dare Development	RadiSense VI - CTR1001A	2148	-	TU
Cable	Teledyne	PR90-088-2MTR	5196	12	06-Oct-2020
5 Meter Cable	Teledyne	PR90-088-5MTR	5205	12	06-Oct-2020

Table 11

TU - Traceability Unscheduled

3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Radiated Attenuation Measurements. (Measurement of uncertainty for Radiated Immunity provided as test setup is the same.)	±2.0 dB

Table 12

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2007, clause 4.4.3 and 4.5.1.