Report on RF Attenuation Testing of:

Qi-Technologies GmbH
EMF Modulation Unit, Model: Qi-Shield

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

Add value.
Inspire trust.

COMMERCIAL-IN-CONFIDENCE

Document Number: 75946649-01 | Issue: 01

SIGNATURE			
AJ Lawson.			
NAME	**JOB TITLE**	**RESPONSIBLE FOR**	**ISSUE DATE**
Andy Lawson	Senior Engineer	Authorised Signatory	04 September 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 the RF Attenuation level that utilising it provided to no specific specification or accreditation.

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 2

1.1 Report Modification Record 2
1.2 Introduction 2
1.3 Brief Summary of Results 3
1.4 Declaration of Build Status 4
1.5 Product Information 6
1.6 EUT Modification Record 7
1.7 Test Location 8

2 Test Details 9

2.1 Radiated Attenuation Measurements 9

3 Measurement Uncertainty 16

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.

Issue	Description of Change	Date of Issue
1	First Issue	04 September 2019

Table 1

1.2 Introduction

Applicant	Qi-Technologies GmbH
Manufacturer	Qi-Technologies GmbH
Model Number(s)	Qi-Shield
Serial Number(s)	S19 01 01 11
Hardware Version(s)	January 2019
Software Version(s)	Not Applicable
Number of Samples Tested	1
Test Specification/Issue/Date	Not Applicable
Order Number Date	Signed QAF's 25-July-2019
Date of Receipt of EUT	06-August-2019
Start of Test	09-August-2019
Finish of Test	09-August-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	Radiated Attenuation Measurements of Qi-Shield	N/A	

Table 2

1.4 Declaration of Build Status

MAIN EUT			
MANUFACTURING DESCRIPTION	EMF Modulation Unit		
MANUFACTURER	Qi-Technologies		
MODEL NAME/NUMBER	Qi Shield		
PART NUMBER			
SERIAL NUMBER	S19 01 01 11		
HARDWARE VERSION	January 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 of Qi-Technologies GmbH
Date 06/08/2019

1.5 Product Information

1.5.1 Technical Description

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

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: S19 01 01 11			
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		
Radiated Attenuation Measurements	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, Clause Not Applicable

2.1.2 Equipment Under Test and Modification State

Qi-Shield, S/N: S19 01 01 11 – Modification State 0

2.1.3 Date of Test

09-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 calibration was carried out across the frequency band, 2419.0 MHz to 2468.4 MHz, using a sine wave narrowband signal (without device) using a small (relative to product size) source antenna.

A Field Probe 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.

The Qi-Shield was placed in the two positions shown on the diagram and the V/m readings measured.

Distance between Qi-Shield and recipient (empfänger) 1.5 m
Distance between Position 1 (red) and sender 15 cm
Distance between Position 2 (blue) and sender 30 cm
Distance between Position 1 (red) and recipient 1.5 m
Distance between Position 2 (blue) and recipient 1.5 m
Placement height of the receiver/sender 80 cm

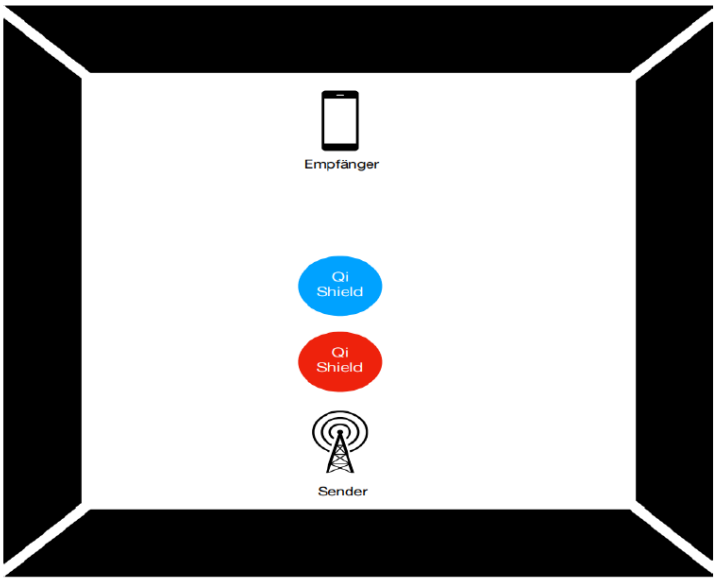

Figure 3 – Test Setup

2.1.5 Environmental Conditions

Ambient Temperature	20.0 °C
Relative Humidity	46.0 %

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.

The figure shown below is of the calibrated level and the field strength measured at each of the test positions from the Test Method.

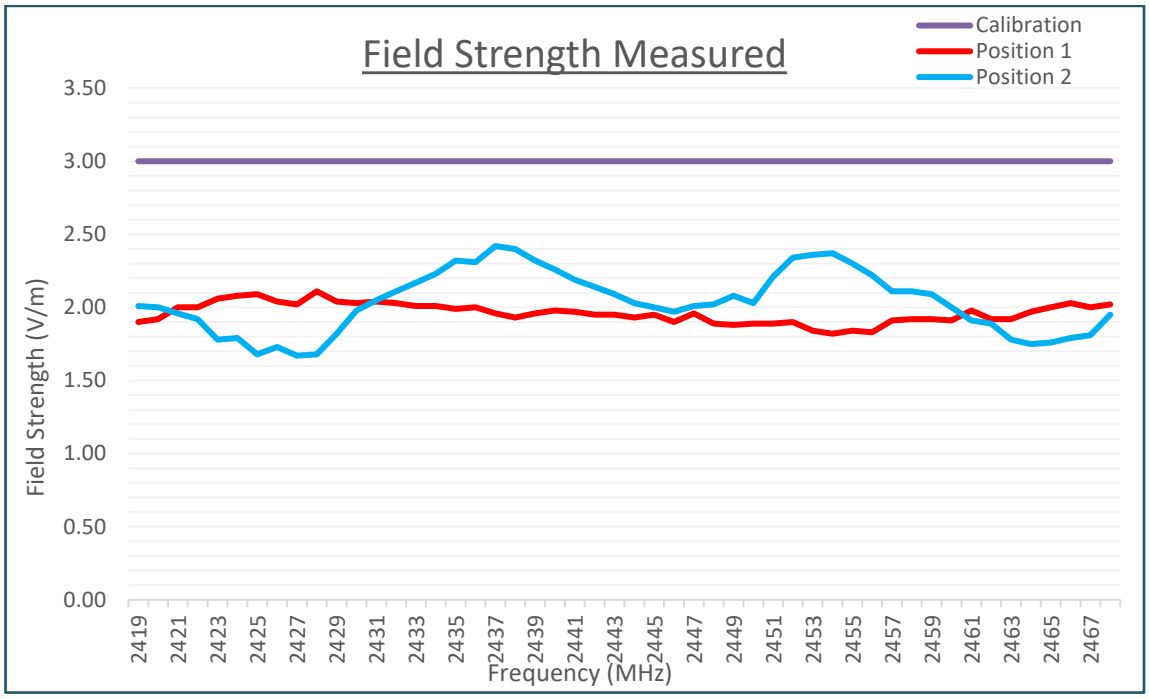

Figure 4 – Field Strength

The figure shown below is of the calculated attenuation achieved at each of the test positions from section 2 and 3 of the Test Method.

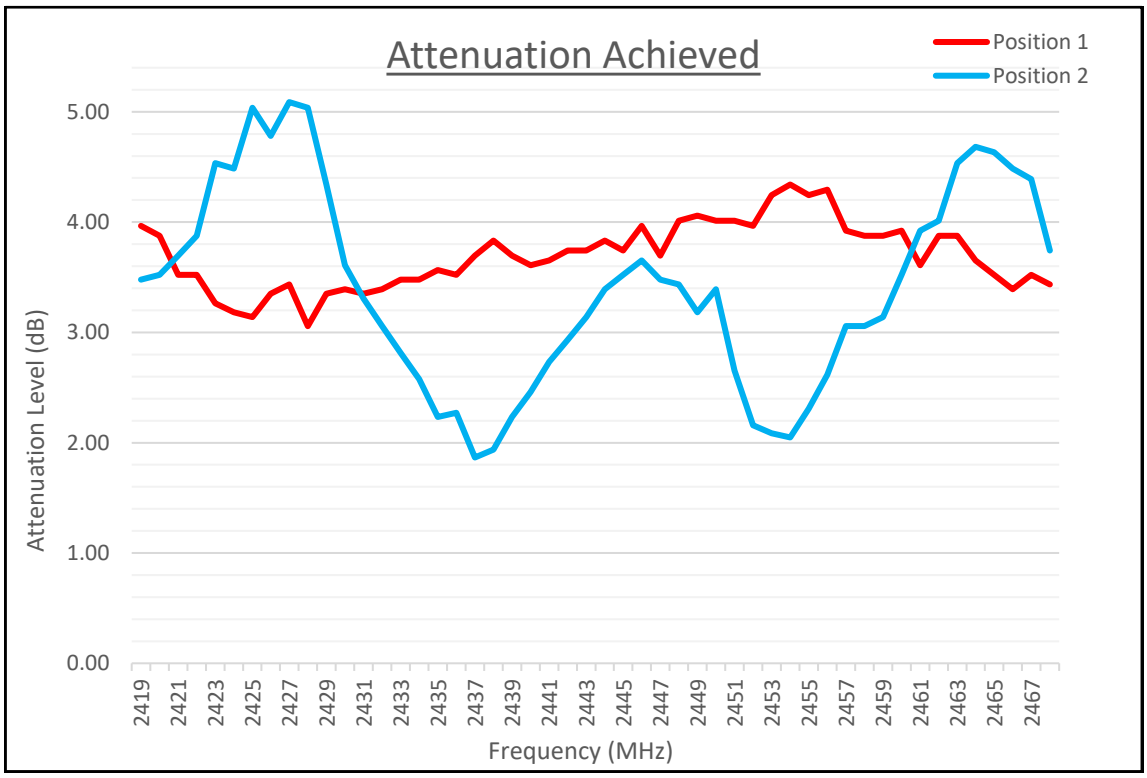

Figure 5 – Attenuation Achieved

The table below is the conversion to W/m^2 of the difference in field strength in each test positions of the measured field in section 2 and 3 of the Test Method.

Frequency (MHz)	Test Position 1		Test Position 2	
	Field Strength Difference (V/m)	(W/m^2)	Field Strength Difference (V/m)	(W/m^2)
2419	1.10	0.00321	0.99	0.0026
2420	1.08	0.003094	1.00	0.002653
2421	1.00	0.002653	1.04	0.002869
2422	1.00	0.002653	1.08	0.003094
2423	0.94	0.002344	1.22	0.003948
2424	0.92	0.002245	1.21	0.003884
2425	0.91	0.002197	1.32	0.004622
2426	0.96	0.002445	1.27	0.004278
2427	0.98	0.002547	1.33	0.004692
2428	0.89	0.002101	1.32	0.004622
2429	0.96	0.002445	1.18	0.003693
2430	0.97	0.002496	1.02	0.00276
2431	0.96	0.002445	0.95	0.002394
2432	0.97	0.002496	0.89	0.002101
2433	0.99	0.0026	0.83	0.001827
2434	0.99	0.0026	0.77	0.001573
2435	1.01	0.002706	0.68	0.001227
2436	1.00	0.002653	0.69	0.001263
2437	1.04	0.002869	0.58	0.000892
2438	1.07	0.003037	0.60	0.000955
2439	1.04	0.002869	0.68	0.001227
2440	1.02	0.00276	0.74	0.001453
2441	1.03	0.002814	0.81	0.00174
2442	1.05	0.002924	0.86	0.001962
2443	1.05	0.002924	0.91	0.002197
2444	1.07	0.003037	0.97	0.002496
2445	1.05	0.002924	1.00	0.002653
2446	1.10	0.00321	1.03	0.002814
2447	1.04	0.002869	0.99	0.0026
2448	1.11	0.003268	0.98	0.002547
2449	1.12	0.003327	0.92	0.002245
2450	1.11	0.003268	0.97	0.002496
2451	1.11	0.003268	0.79	0.001655
2452	1.10	0.00321	0.66	0.001155
2453	1.16	0.003569	0.64	0.001086
2454	1.18	0.003693	0.63	0.001053

Frequency (MHz)	Test Position 1		Test Position 2	
	Field Strength Difference (V/m)	(W/m^2)	Field Strength Difference (V/m)	(W/m^2)
2455	1.16	0.003569	0.70	0.0013
2456	1.17	0.003631	0.78	0.001614
2457	1.09	0.003151	0.89	0.002101
2458	1.08	0.003094	0.89	0.002101
2459	1.08	0.003094	0.91	0.002197
2460	1.09	0.003151	1.00	0.002653
2461	1.02	0.00276	1.09	0.003151
2462	1.08	0.003094	1.11	0.003268
2463	1.08	0.003094	1.22	0.003948
2464	1.03	0.002814	1.25	0.004145
2465	1.00	0.002653	1.24	0.004079
2466	0.97	0.002496	1.21	0.003884
2467	1.00	0.002653	1.19	0.003756
2468	0.98	0.002547	1.05	0.002924

Table 6

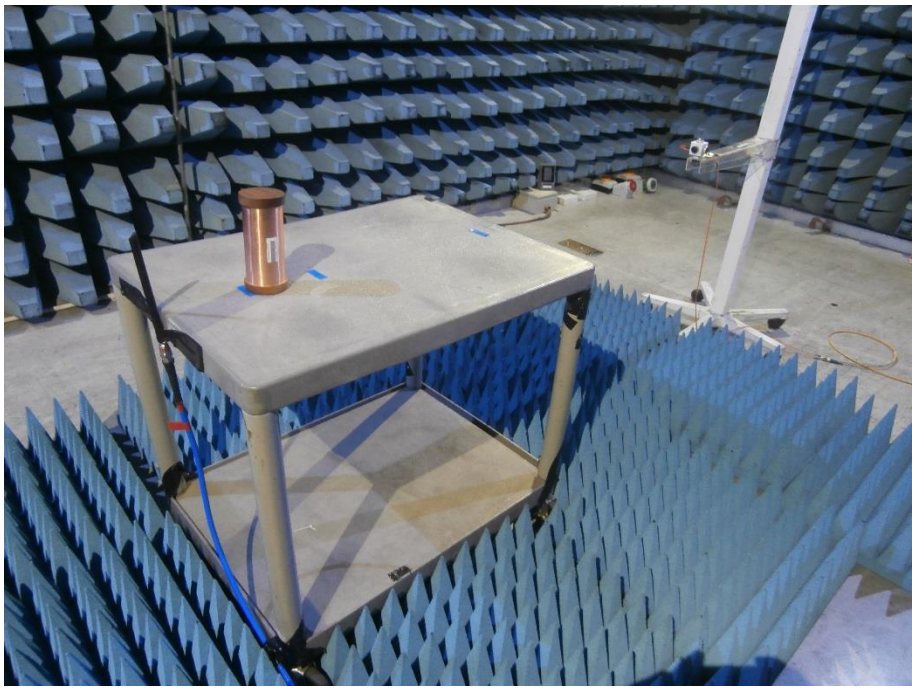

Figure 6 - Position 1

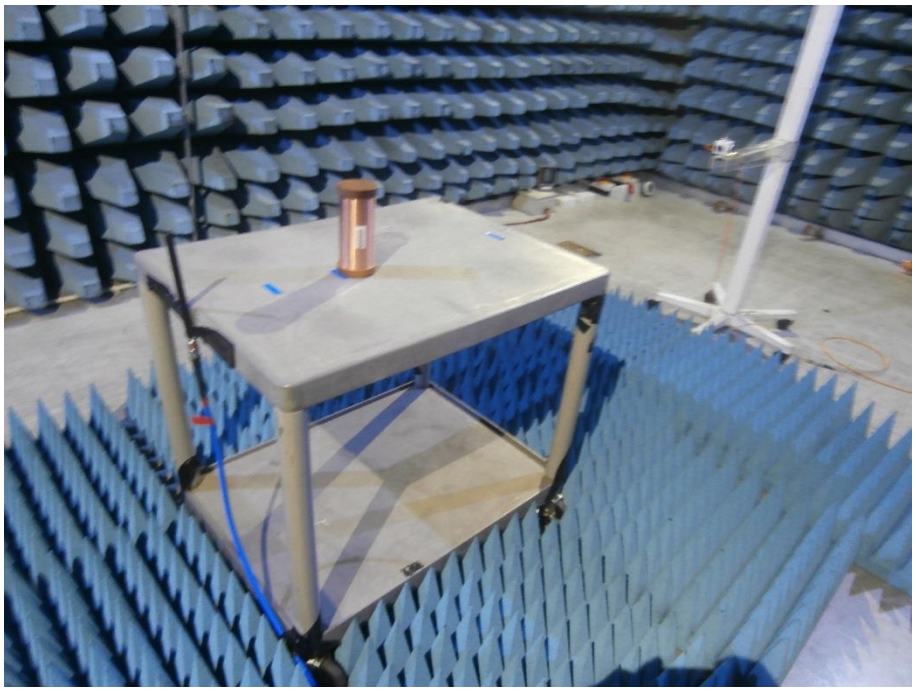

Figure 7 - Position 2

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
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
Laser Powered Electric Field Sensor	Dare Development	RadiSense VI - CTR1001A	2148	-	TU

Table 7

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 8

All measurement uncertainties have been calculated in accordance with CISPR guidelines.