

APPLICATION CERTIFICATION FCC Part 15C

On Behalf of
SPEQ GmbHRemote control
Model No.: SP-11

FCC ID: 2ASRSSP106

Prepared for
Address: SPEQ GmbH
: Tannbachstraße 10-73635 Steinenberg, GermanyPrepared by
Address: Shenzhen Accurate Technology Co., Ltd.
: 1/F., Building A, Changyuan New Material Port, Science
& Industry Park, Nanshan District, Shenzhen, Guangdong,
P.R. ChinaTel: (0755) 26503290
Fax: (0755) 26503396Report Number
Date of Test
Date of Report: ATE20190377
: March 15-March 19, 2019
: March 22, 2019

TABLE OF CONTENTS

Description	Page
Test Report Certification	
1. GENERAL INFORMATION	4
1.1. Description of Device (EUT).....	4
1.2. Special Accessory and Auxiliary Equipment	4
1.3. Description of Test Facility	5
1.4. Measurement Uncertainty.....	5
2. MEASURING DEVICE AND TEST EQUIPMENT	6
3. OPERATION OF EUT DURING TESTING	7
3.1. Operating Mode.....	7
3.2. Configuration and peripherals	7
4. TEST PROCEDURES AND RESULTS	8
5. 20DB BANDWIDTH TEST.....	9
5.1. Block Diagram of Test Setup.....	9
5.2. The Requirement For Section 15.215(c).....	9
5.3. Operating Condition of EUT	9
5.4. Test Procedure	9
5.5. Test Results.....	10
6. BAND EDGE COMPLIANCE TEST	12
6.1. Block Diagram of Test Setup.....	12
6.2. The Requirement For Section 15.249.....	12
6.3. EUT Configuration on Measurement	12
6.4. Operating Condition of EUT	13
6.5. Test Procedure	13
6.6. Test Results.....	13
7. RADIATED SPURIOUS EMISSION TEST	18
7.1. Block Diagram of Test Setup.....	18
7.2. The Limit For Section 15.249.....	19
7.3. Restricted bands of operation	20
7.4. Configuration of EUT on Measurement	20
7.5. Operating Condition of EUT	21
7.6. Test Procedure	21
7.7. Data Sample.....	22
7.8. Test Results.....	22
8. AC POWER LINE CONDUCTED EMISSION TEST	50
8.1. Block Diagram of Test Setup.....	50
8.2. Test System Setup.....	50
8.3. Test Limits	51
8.4. Configuration of EUT on Measurement	51
8.5. Operating Condition of EUT	51
8.6. Test Procedure	51
8.7. Data Sample.....	52
8.8. Test Results.....	52
9. ANTENNA REQUIREMENT	55
9.1. The Requirement	55
9.2. Antenna Construction	55

Test Report Certification

Applicant : SPEQ GmbH
Address : Tannbachstraße 10-73635 Steinenberg, Germany

Factory : ZhaoQing Bohan Sports Co.,ltd
Address : Da Wang Industrial Zhaoqing, Gunagdong Province Guangdong, 526238, China

Product : Remote control

Model No. : SP-11

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.249
ANSI C63.10: 2013

The EUT was tested according to FCC 47CFR 15.249 for compliance to FCC 47CFR 15.249 requirements

The device described above is tested by Shenzhen Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.249 limits. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test :
Date of Report :

March 15-March 19, 2019

March 22, 2019

Prepared by :



Approved & Authorized Signer :

(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : Remote control

Model Number : SP-11

Frequency Range : 2407MHz, 2455MHz, 2477MHz

Number of Channels : 3

Modulation mode : GFSK

Antenna Gain : 0dBi

Antenna type : PCB Layout Antenna

Power Supply : DC 3.7V

Trade Mark : Crivit

1.2. Special Accessory and Auxiliary Equipment

N/A

1.3. Description of Test Facility

EMC Lab	: Recognition of accreditation by Federal Communications Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358
	Listed by Innovation, Science and Economic Development Canada (ISED) The Registration Number is 5077A-2
	Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193
	Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Name of Firm	: Shenzhen Accurate Technology Co., Ltd.
Site Location	: 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

1.4. Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty = 3.08dB, k=2
(9kHz-30MHz)

Radiated emission expanded uncertainty = 4.42dB, k=2
(30MHz-1000MHz)

Radiated emission expanded uncertainty = 4.06dB, k=2
(Above 1GHz)

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Cal. Interval
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 05, 2019	One Year
EMI Test Receiver	Rohde&Schwarz	ESR	101817	Jan. 05, 2019	One Year
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 05, 2019	One Year
Pre-Amplifier	Rohde&Schwarz	CBLU118354 0-01	3791	Jan. 05, 2019	One Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 05, 2019	One Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 05, 2019	One Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 05, 2019	One Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 05, 2019	One Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 05, 2019	One Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18 G-10SS	N/A	Jan. 05, 2019	One Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 05, 2019	One Year
Conducted Emission Measurement Software: ES-K1 V1.71					
Radiated Emission Measurement Software: EZ_EMC V1.1.4.2					

3. OPERATION OF EUT DURING TESTING

3.1. Operating Mode

The mode is used: **Transmitting mode**

Low Channel: 2407MHz

Middle Channel: 2445MHz

High Channel: 2477MHz

3.2. Configuration and peripherals

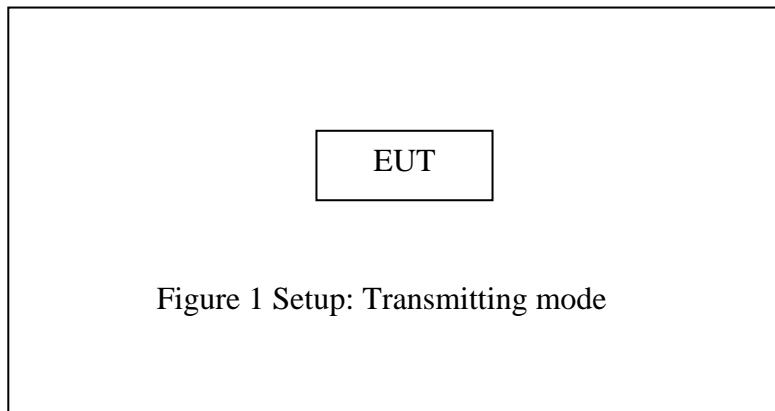


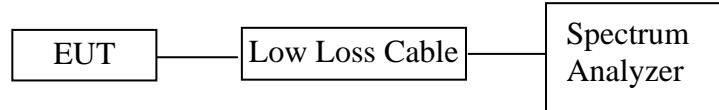
Figure 1 Setup: Transmitting mode

4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.215(c)	20dB Bandwidth	Compliant
Section 15.249(d)	Band Edge Compliance Test	Compliant
Section 15.205(a), Section 15.209(a), Section 15.249, Section 15.35	Radiated Spurious Emission Test	Compliant
Section 15.207	AC Power Line Conducted Emission Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. 20DB BANDWIDTH TEST

5.1. Block Diagram of Test Setup



5.2. The Requirement For Section 15.215(c)

Must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.3. Operating Condition of EUT

5.3.1. Setup the EUT and simulator as shown as Section 5.1.

5.3.2. Turn on the power of all equipment.

5.3.3. Let the EUT work in TX modes measure it. The transmit frequency are 2407, 2445, 2477MHz.

5.4. Test Procedure

5.4.1. Place the EUT on the table and set it in transmitting mode.

5.4.2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

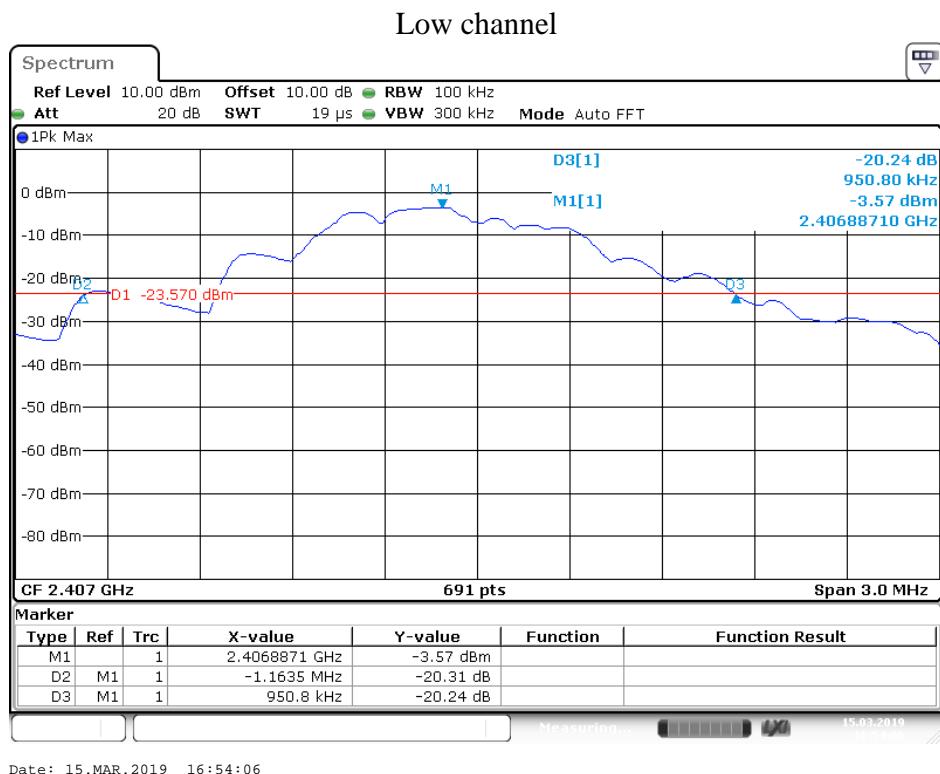
5.4.3. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz, Detector function=peak, Trace=max hold, Sweep=auto.

5.4.4. Set the measured low, middle and high frequency and test 20dB bandwidth with spectrum analyzer.

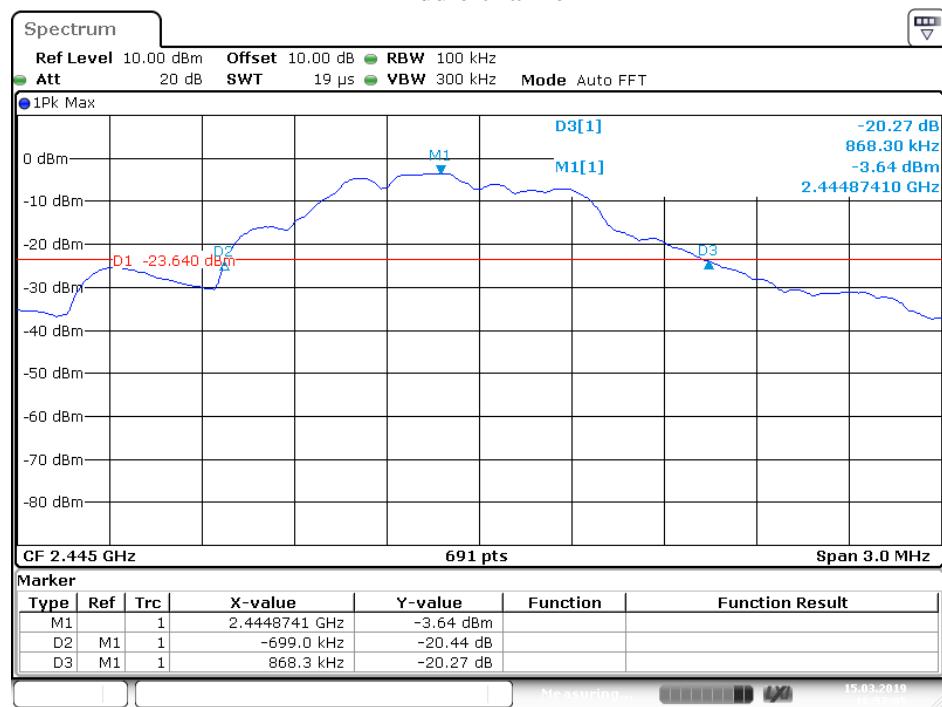
5.5. Test Results

Channel	Frequency (MHz)	20 dB Bandwidth (MHz)
Low	2407	2.114
Middle	2445	1.567
High	2477	1.455

The spectrum analyzer plots are attached as below.

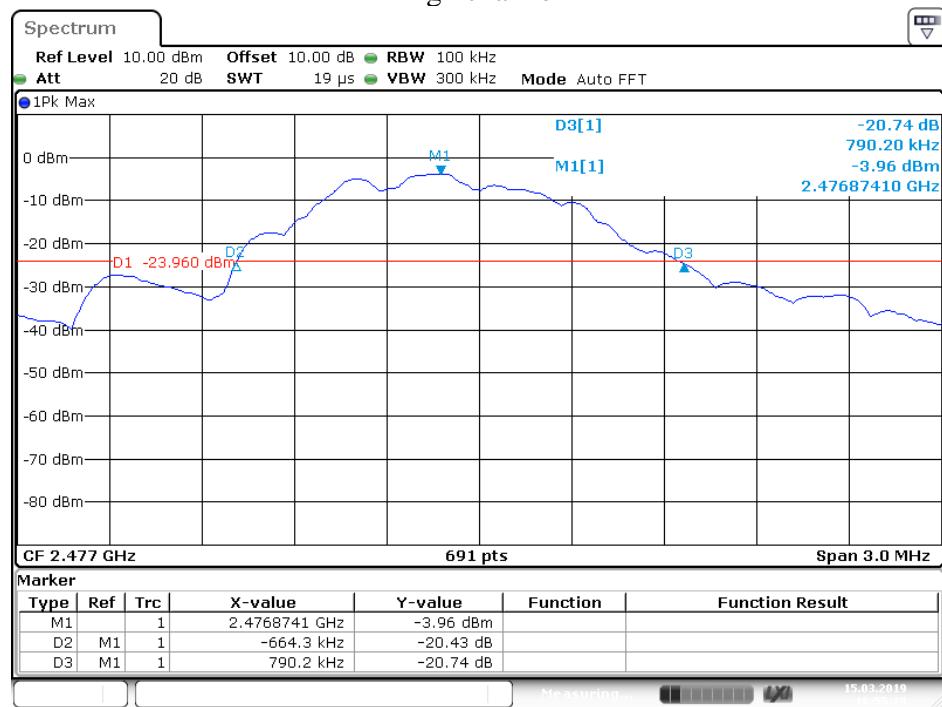


Middle channel



Date: 15.MAR.2019 16:57:06

High channel

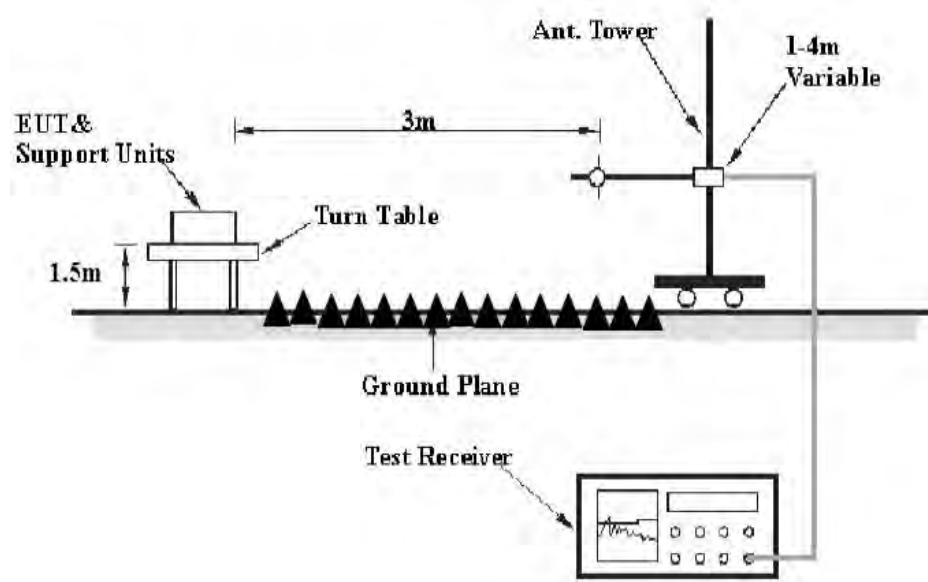


Date: 15.MAR.2019 16:55:29

6. BAND EDGE COMPLIANCE TEST

6.1. Block Diagram of Test Setup

(C) Radiated Emission Test Set-Up. Frequency above 1GHz



6.2. The Requirement For Section 15.249

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

6.3. EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX modes measure it. The transmit frequency are 2407, 2477MHz.

6.5. Test Procedure

Radiate Band Edge:

6.5.1. The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.

6.5.2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.

6.5.3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

6.5.4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

RBW=1MHz, VBW=1MHz

6.5.5. The band edges was measured and recorded.

6.6. Test Results

Pass.

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

3. Display the measurement of peak values.

4. The average measurement was not performed when peak measured data under the limit of average detection.

The spectrum analyzer plots are attached as below.



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #639

Polarization: Horizontal

Standard: FCC (Band Edge)

Power Source: DC 3.7V

Test item: Radiation Test

Date: 19/03/18/

Temp.(C)/Hum.(%) 23 C / 48 %

Time:

EUT: Smart Helmet

Engineer Signature: WADE

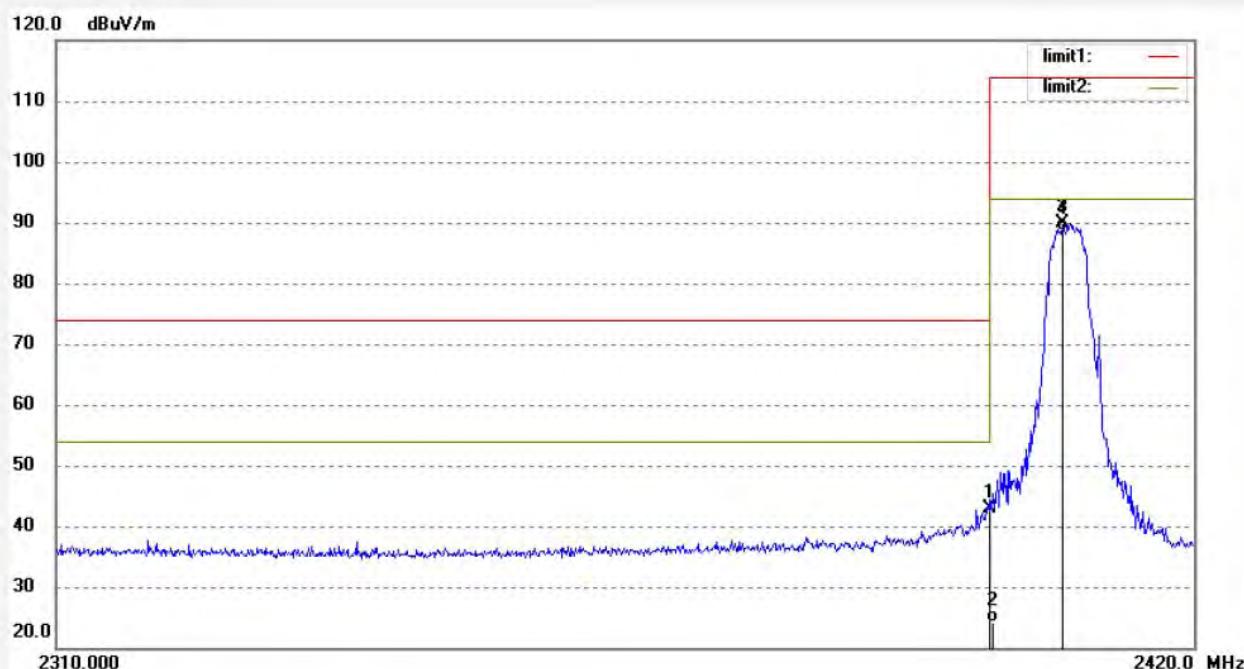
Mode: TX 2407MHz

Distance: 3m

Model: SP-106

Manufacturer: SPEQ GmbH

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2400.000	42.10	0.88	42.98	74.00	-31.02	peak			
2	2400.000	23.32	0.88	24.20	54.00	-29.80	AVG			
3	2407.000	89.02	0.91	89.93	114.00	-24.07	peak			
4	2407.000	87.72	0.91	88.63	94.00	-5.37	AVG			



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #638

Polarization: Vertical

Standard: FCC (Band Edge)

Power Source: DC 3.7V

Test item: Radiation Test

Date: 19/03/18/

Temp.(C)/Hum.(%) 23 C / 48 %

Time:

EUT: Smart Helmet

Engineer Signature: WADE

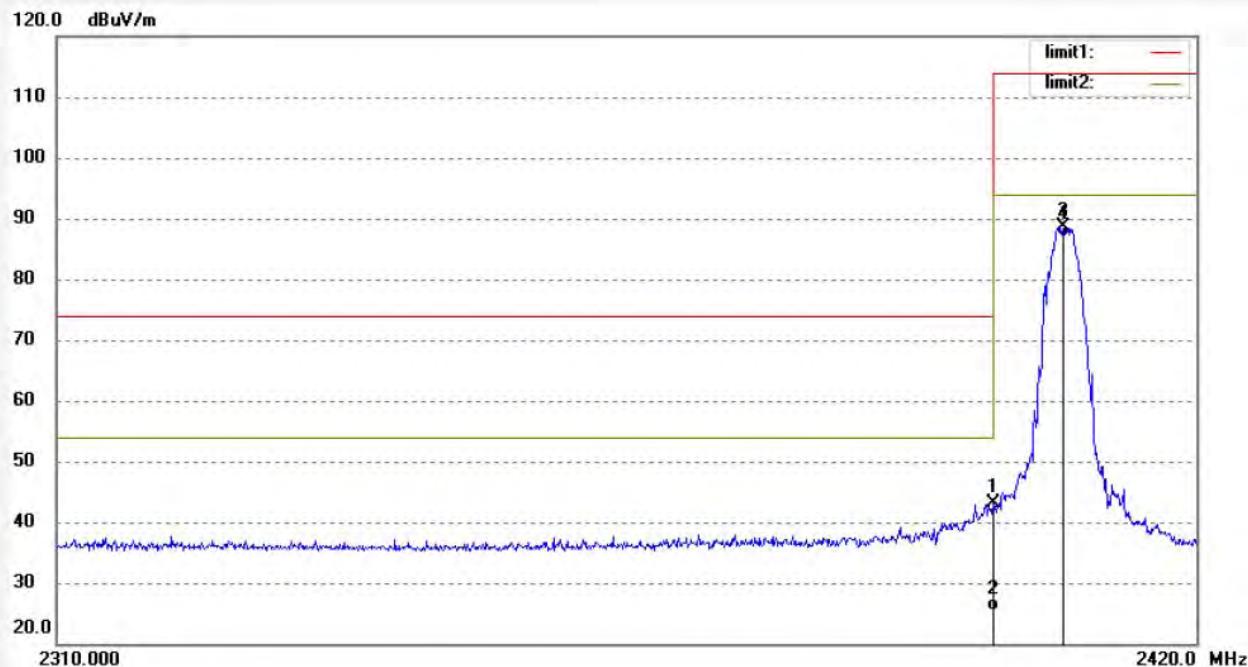
Mode: TX 2407MHz

Distance: 3m

Model: SP-106

Manufacturer: SPEQ GmbH

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2400.000	42.16	0.88	43.04	74.00	-30.96	peak			
2	2400.000	24.54	0.88	25.42	54.00	-28.58	AVG			
3	2407.000	87.63	0.91	88.54	114.00	-25.46	peak			
4	2407.000	86.33	0.91	87.24	94.00	-6.76	AVG			



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #644

Polarization: Horizontal

Standard: FCC (Band Edge)

Power Source: DC 3.7V

Test item: Radiation Test

Date: 19/03/18/

Temp.(C)/Hum.(%) 23 C / 48 %

Time:

EUT: Smart Helmet

Engineer Signature: WADE

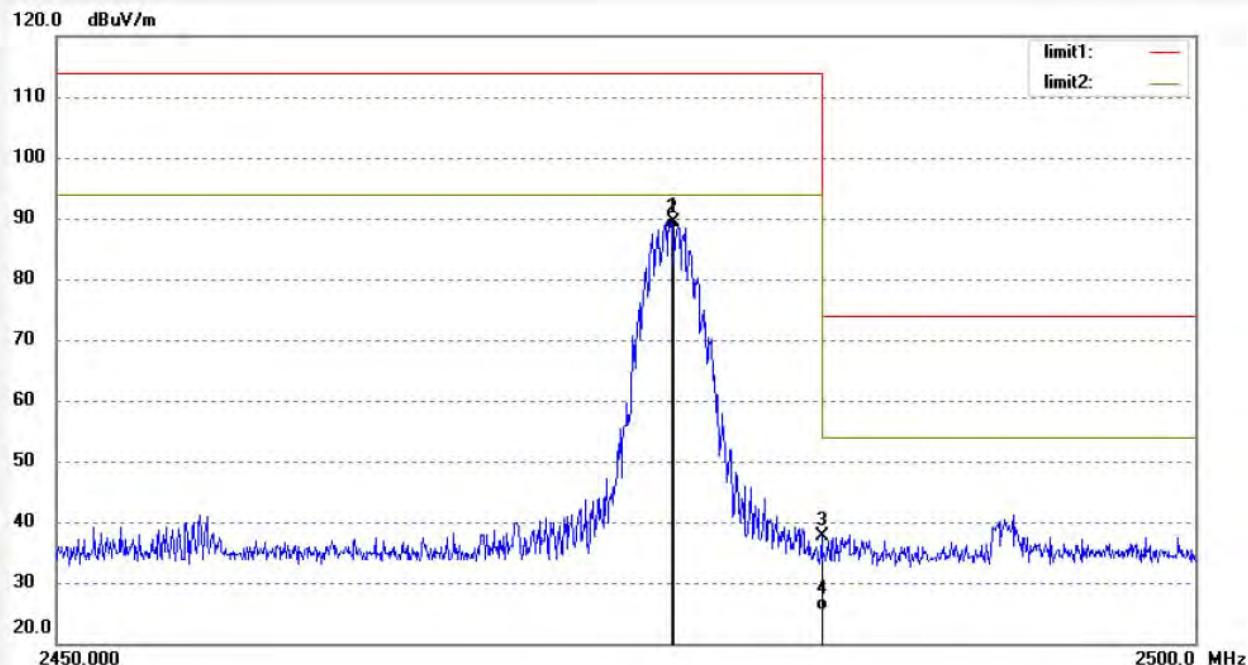
Mode: TX 2477MHz

Distance: 3m

Model: SP-106

Manufacturer: SPEQ GmbH

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2477.000	88.39	1.09	89.48	114.00	-24.52	peak			
2	2477.000	87.09	1.09	88.18	94.00	-5.82	AVG			
3	2483.500	36.60	1.10	37.70	74.00	-36.30	peak			
4	2483.500	24.25	1.10	25.35	54.00	-28.65	AVG			

Job No.: LGW2019 #645

Polarization: Vertical

Standard: FCC (Band Edge)

Power Source: DC 3.7V

Test item: Radiation Test

Date: 19/03/18/

Temp.(C)/Hum.(%) 23 C / 48 %

Time:

EUT: Smart Helmet

Engineer Signature: WADE

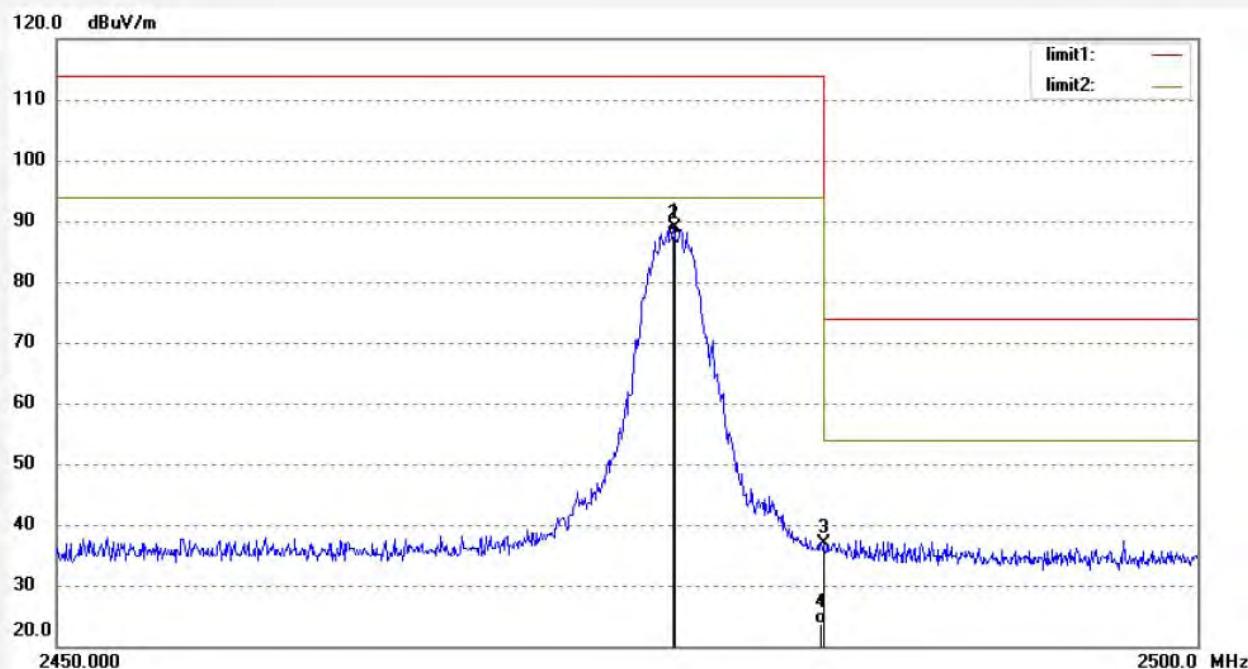
Mode: TX 2477MHz

Distance: 3m

Model: SP-106

Manufacturer: SPEQ GmbH

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2477.000	87.75	1.09	88.84	114.00	-25.16	peak			
2	2477.000	86.45	1.09	87.54	94.00	-6.46	AVG			
3	2483.500	35.81	1.10	36.91	74.00	-37.09	peak			
4	2483.500	22.47	1.10	23.57	54.00	-30.43	AVG			

7. RADIATED SPURIOUS EMISSION TEST

7.1. Block Diagram of Test Setup

7.1.1. Block diagram of connection between the EUT and peripherals

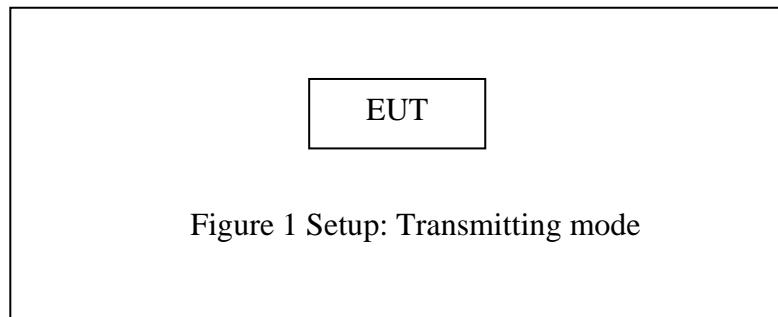
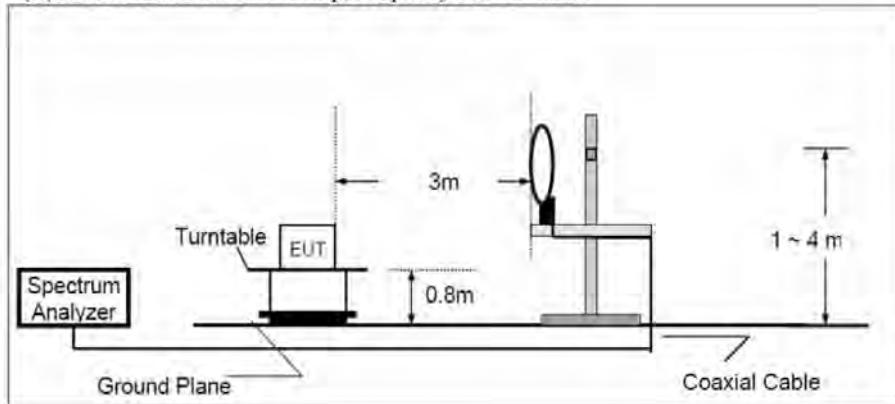


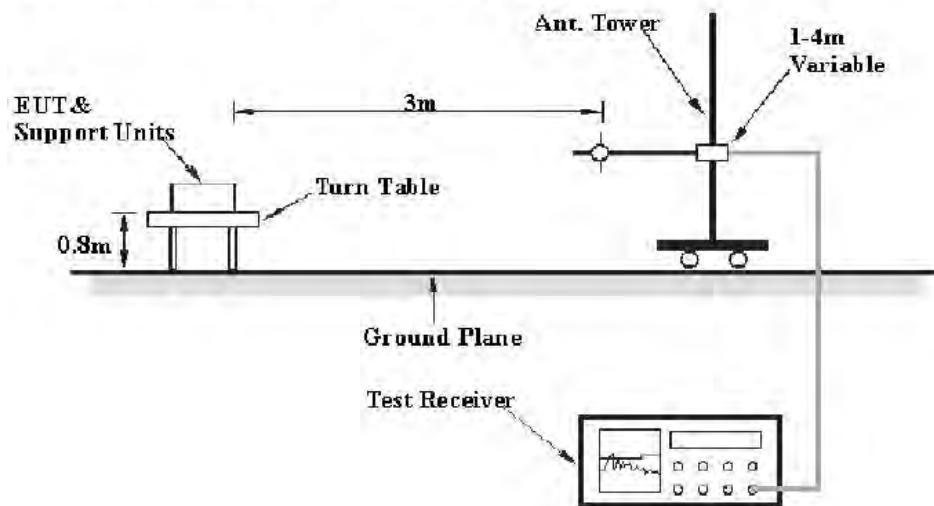
Figure 1 Setup: Transmitting mode

7.1.2. Semi-Anechoic Chamber Test Setup Diagram

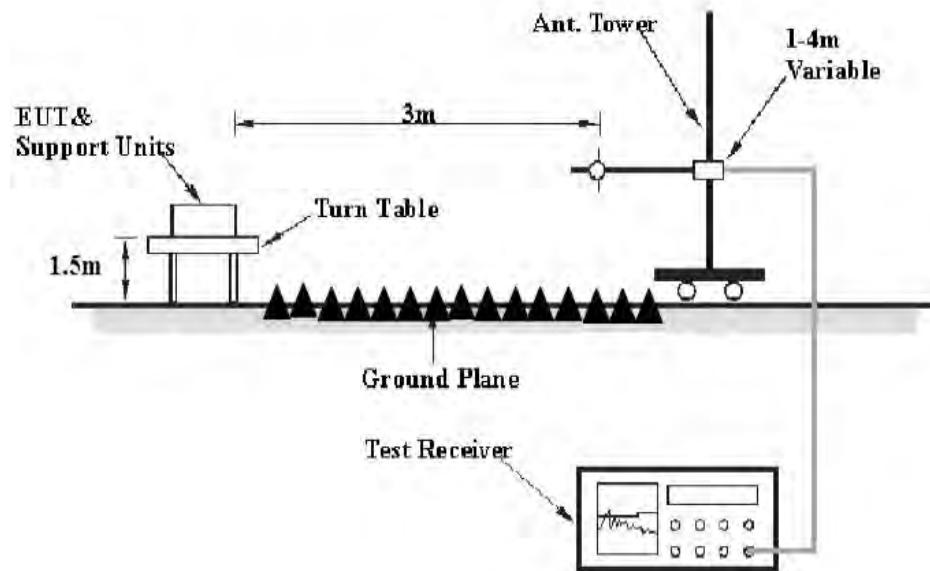
(A) Radiated Emission Test Set-Up, Frequency below 30MHz



(B) Radiated Emission Test Set-Up, Frequency 30MHz-1GHz



(C) Radiated Emission Test Set-Up, Frequency above 1GHz



7.2. The Limit For Section 15.249

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph A8.4(4), the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

7.3. Restricted bands of operation

7.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

¹Until February 1, 1999, this restricted band shall be 0.490-0.510

²Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

7.4.Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.5. Operating Condition of EUT

7.5.1. Setup the EUT and simulator as shown as Section 7.1.

7.5.2. Turn on the power of all equipment.

7.5.3. Let the EUT work in TX modes and measure it. The transmit frequency are 2407, 2445, 2477MHz.

7.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8m(Below 1GHz) and 1.5m(above 1GHz) high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated emission measurement. This EUT was tested in 3 orthogonal positions and the worst case position data was reported.

The bandwidth of test receiver is set at 9 kHz in below 30MHz. and set at 120 kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The frequency range from 9 kHz to 26.5GHz is checked.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

RBW (120 kHz), VBW (300 kHz) for QP detector below 1GHz

Peak detector above 1GHz

RBW (1 MHz), VBW (3MHz) for Peak measurement

RBW (1 MHz), VBW (10Hz) for AV measurement

7.7. Data Sample

Frequency (MHz)	Reading (dB μ V)	Factor (dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Remark
X.XX	48.69	-13.35	35.34	46	-10.66	QP

Frequency(MHz) = Emission frequency in MHz

Reading(dB μ V) = Uncorrected Analyzer/Receiver reading

Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain

Result(dB μ V/m) = Reading(dB μ V) + Factor(dB/m)

Limit (dB μ V/m) = Limit stated in standard

Margin (dB) = Result(dB μ V/m) - Limit (dB μ V/m)

QP = Quasi-peak Reading

Calculation Formula:

Margin(dB) = Result (dB μ V/m)–Limit(dB μ V/m)

Result(dB μ V/m)= Reading(dB μ V)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

7.8. Test Results

Pass.

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. *: Denotes restricted band of operation.

3. The EUT is tested radiation emission in three axes. The worst emissions are reported in all channels.

The spectrum analyzer plots are attached as below.

9KHz to 30MHz Test data

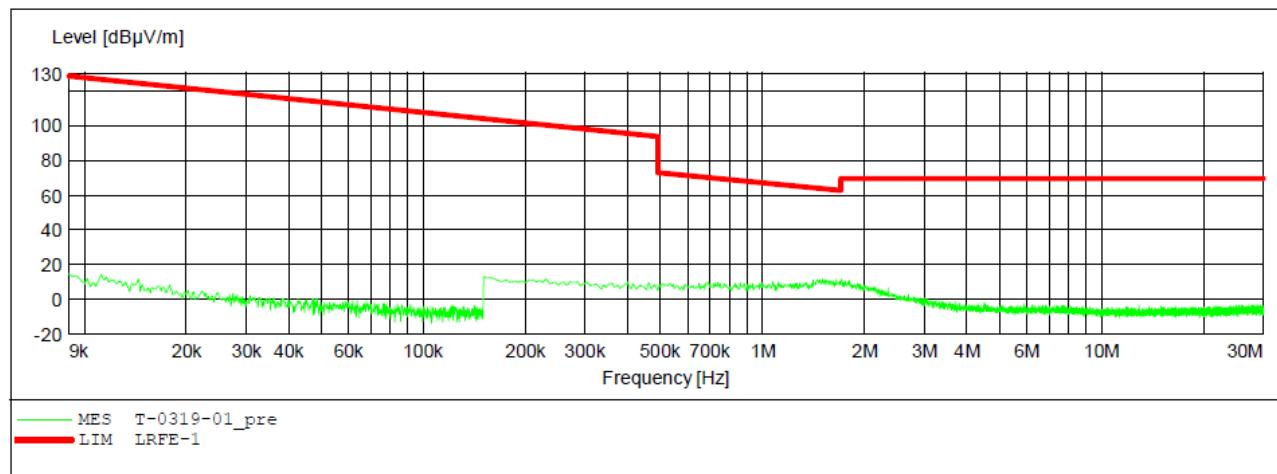
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3M Radiated

EUT: Smart Helmet M/N:SP-106
Manufacturer: SPEQ GmbH
Operating Condition: TX 2407MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: DC 3.7V
Comment: X
Start of Test: 2019-3-19 /

SCAN TABLE: "LFRE Fin"

Short Description:			- SUB_STD_VTERM2 1.70			
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



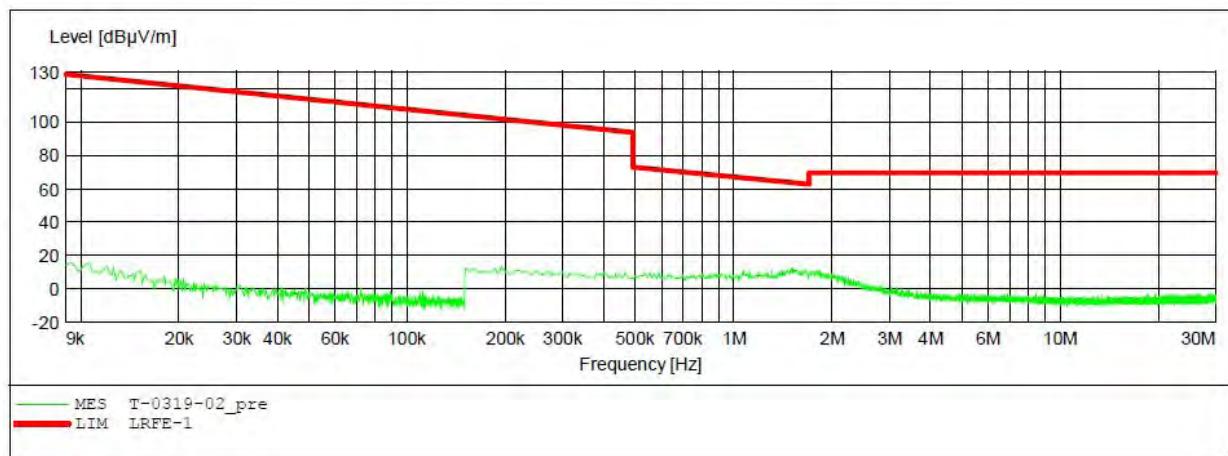
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3M Radiated

EUT: Smart Helmet M/N:SP-106
Manufacturer: SPEQ GmbH
Operating Condition: TX 2407MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: DC 3.7V
Comment: Y
Start of Test: 2019-3-19 /

SCAN TABLE: "LFRE Fin"

Short Description:		- SUB_STD_VTERM2 1.70				
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



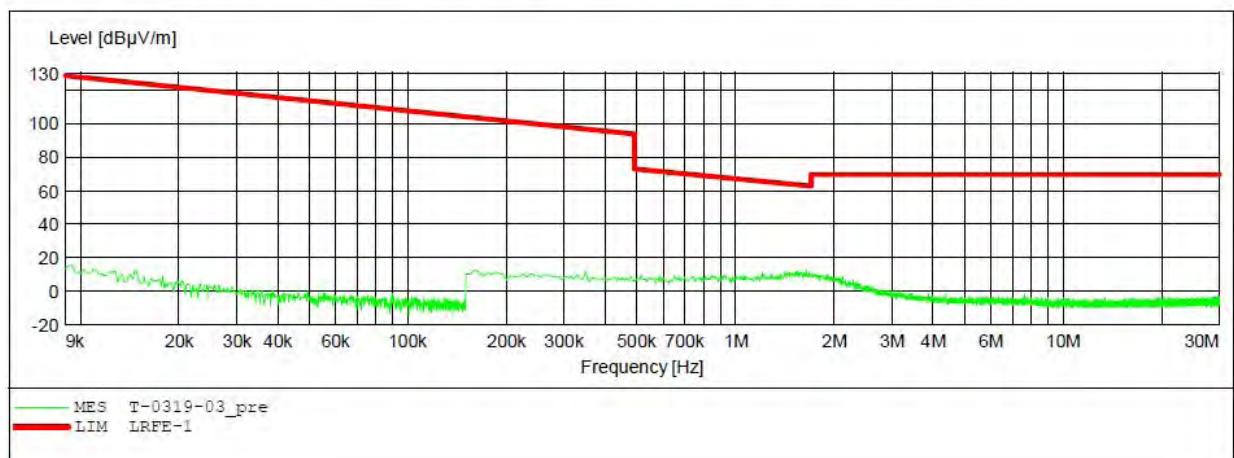
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3M Radiated

EUT: Smart Helmet M/N:SP-106
Manufacturer: SPEQ GmbH
Operating Condition: TX 2407MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: DC 3.7V
Comment: Z
Start of Test: 2019-3-19 /

SCAN TABLE: "LFRE Fin"

Short Description:		- SUB_STD_VTERM2 1.70		
Start	Stop	Step	Detector	Meas.
Frequency	Frequency	Width		Time
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s
				IF Bandw.
				200 Hz 1516M
				9 kHz 1516M



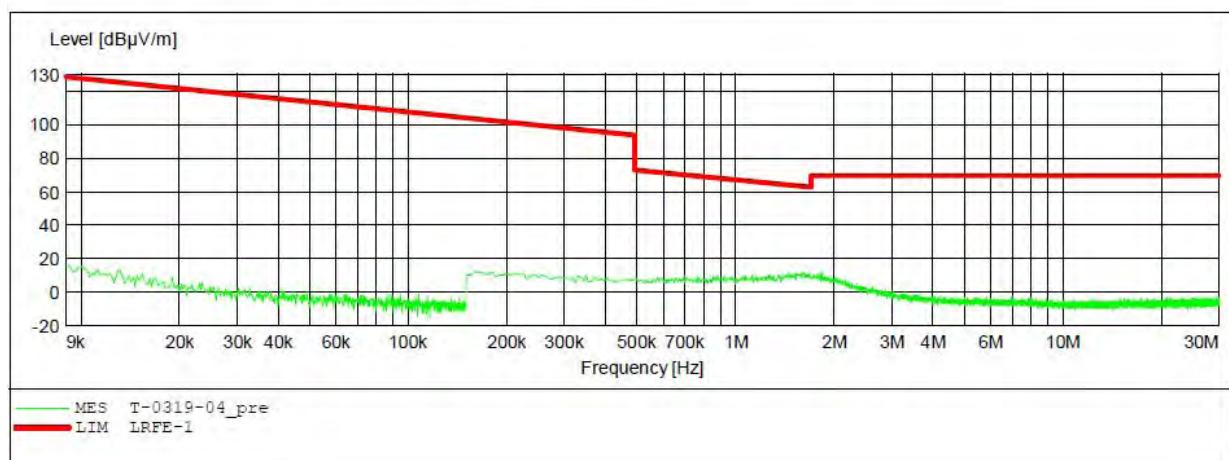
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3M Radiated

EUT: Smart Helmet M/N:SP-106
Manufacturer: SPEQ GmbH
Operating Condition: TX 2445MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: DC 3.7V
Comment: X
Start of Test: 2019-3-19 /

SCAN TABLE: "LFRE Fin"

Short Description:		- SUB_STD_VTERM2 1.70				
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



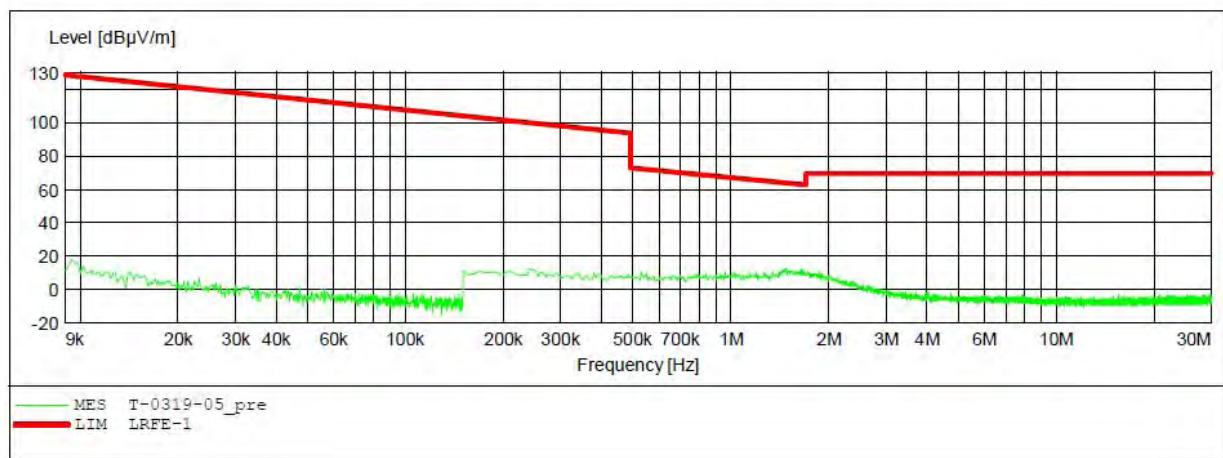
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3M Radiated

EUT: Smart Helmet M/N:SP-106
Manufacturer: SPEQ GmbH
Operating Condition: TX 2445MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: DC 3.7V
Comment: Y
Start of Test: 2019-3-19 /

SCAN TABLE: "LFRE Fin"

Short Description:		- SUB_STD_VTERM2 1.70				
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



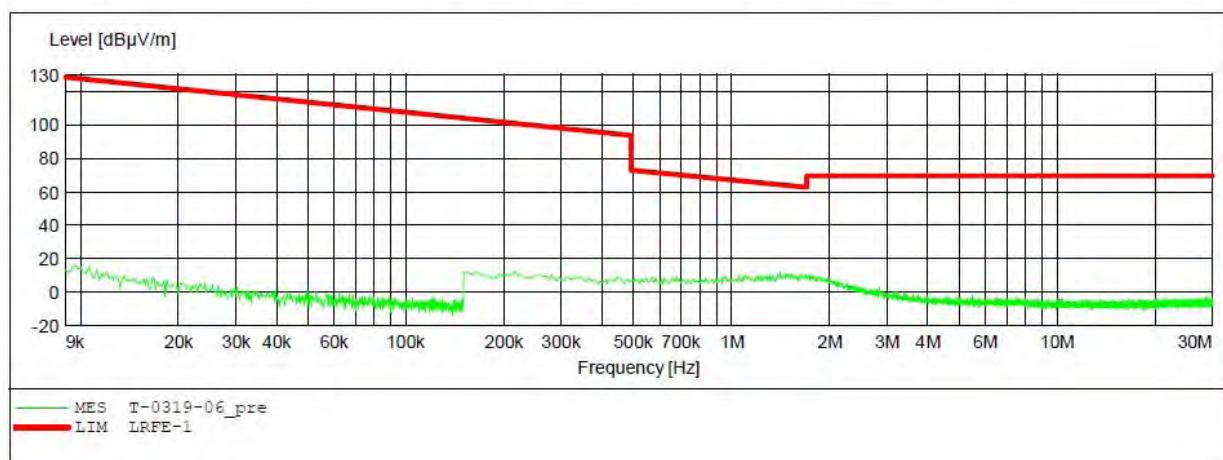
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3M Radiated

EUT: Smart Helmet M/N:SP-106
Manufacturer: SPEQ GmbH
Operating Condition: TX 2445MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: DC 3.7V
Comment: Z
Start of Test: 2019-3-19 /

SCAN TABLE: "LFRE Fin"

Short Description:		- SUB_STD_VTERM2 1.70				
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



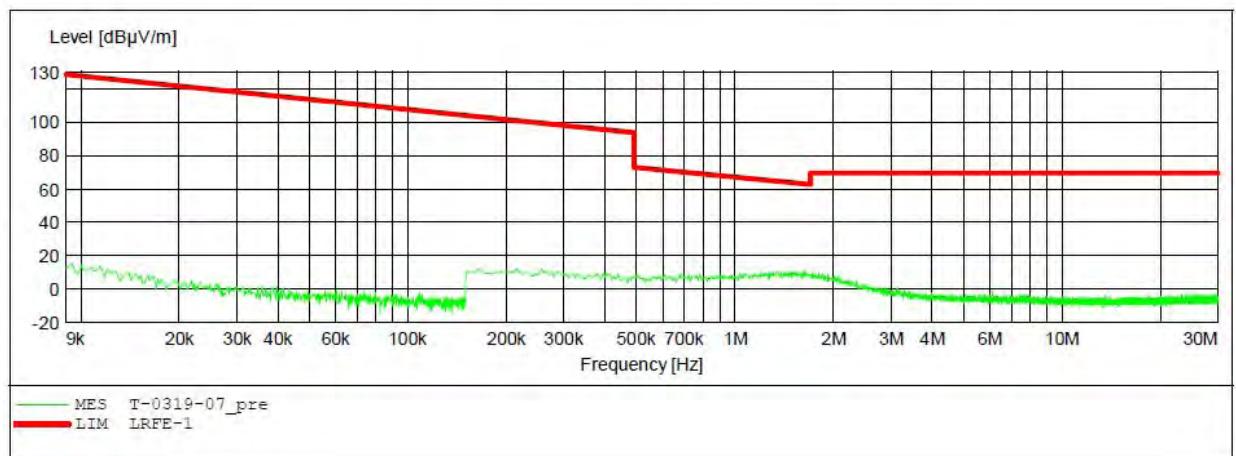
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3M Radiated

EUT: Smart Helmet M/N:SP-106
Manufacturer: SPEQ GmbH
Operating Condition: TX 2477MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: DC 3.7V
Comment: X
Start of Test: 2019-3-19 /

SCAN TABLE: "LFRE Fin"

Short Description:		_SUB_STD_VTERM2 1.70				
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M



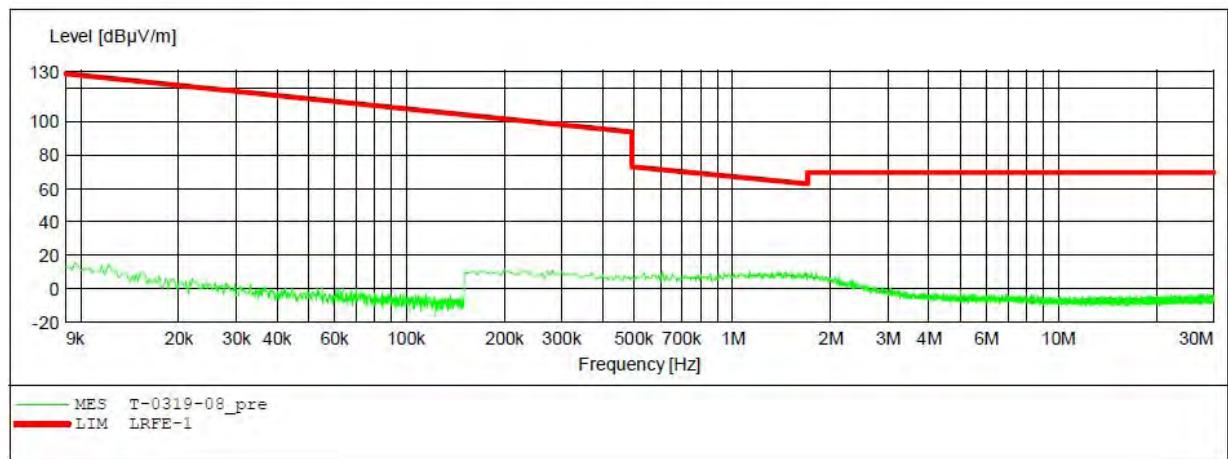
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3M Radiated

EUT: Smart Helmet M/N:SP-106
Manufacturer: SPEQ GmbH
Operating Condition: TX 2477MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: DC 3.7V
Comment: Y
Start of Test: 2019-3-19 /

SCAN TABLE: "LFRE Fin"

Short Description:		_SUB_STD_VTERM2 1.70		
Start	Stop	Step	Detector	Meas.
Frequency	Frequency	Width		Time
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s
				200 Hz
				Bandw.
				9 kHz
				1516M



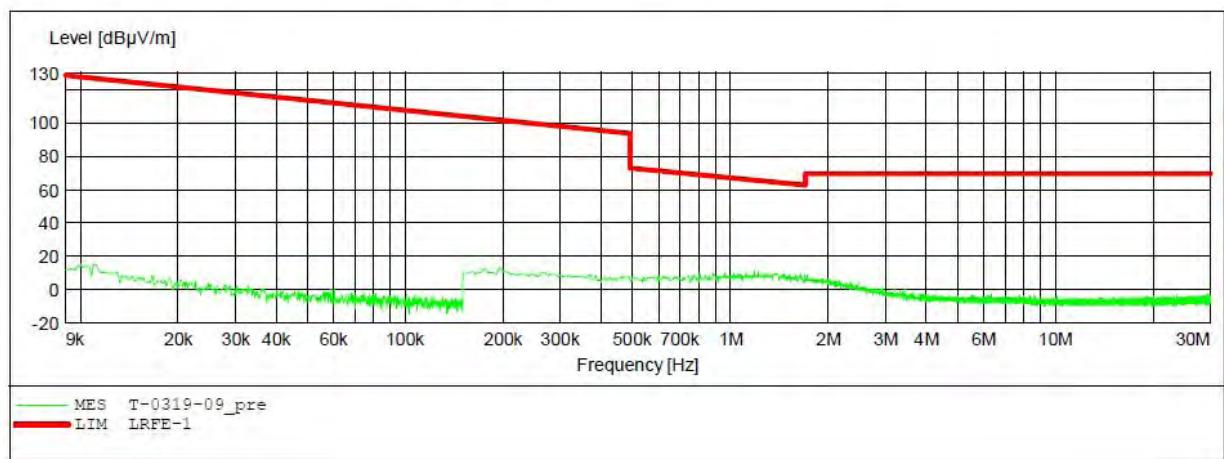
ACCURATE TECHNOLOGY CO., LTD

FCC Part 15C 3M Radiated

EUT: Smart Helmet M/N:SP-106
Manufacturer: SPEQ GmbH
Operating Condition: TX 2477MHz
Test Site: 2# Chamber
Operator: WADE
Test Specification: DC 3.7V
Comment: Z
Start of Test: 2019-3-19 /

SCAN TABLE: "LFRE Fin"

Short Description:			SUB STD VTERM2 1.70			
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak	1.0 s	200 Hz	1516M
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak	1.0 s	9 kHz	1516M





30MHz to 1GHz Test data
ACCURATE TECHNOLOGY CO., LTD.

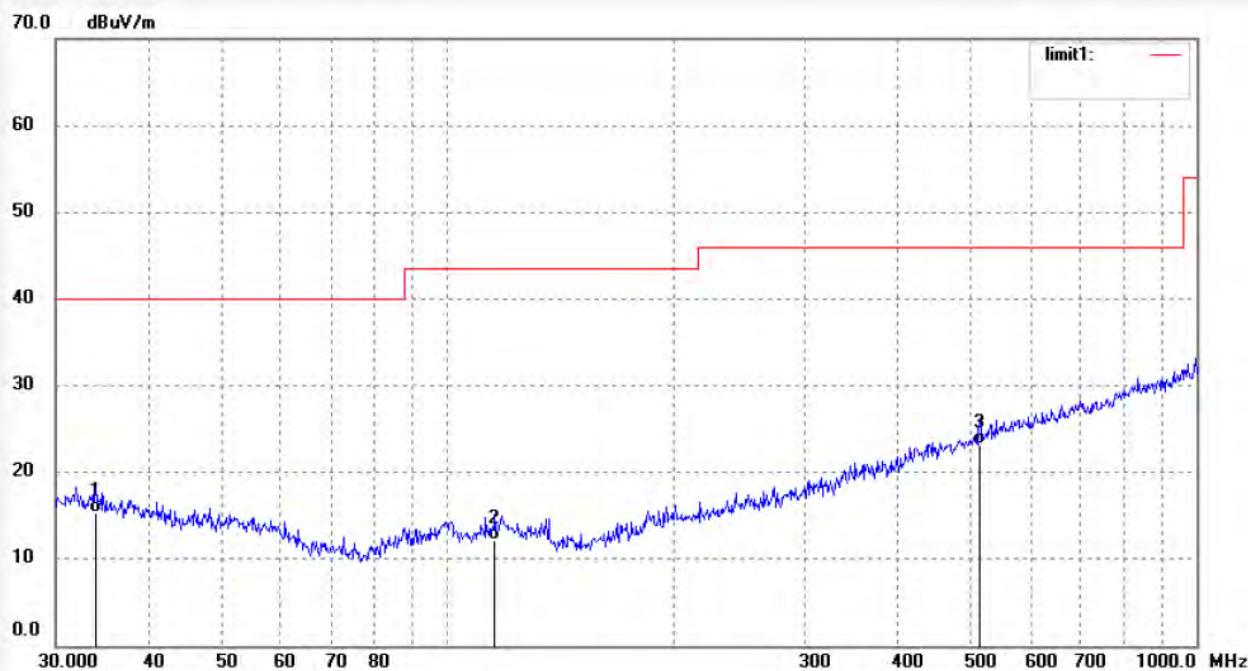
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
 Tel:+86-0755-26503290
 Fax:+86-0755-26503396

Job No.: LGW2019 #652
 Standard: FCC Part 15C 3M Radiated
 Test item: Radiation Test
 Temp.(C)/Hum.(%) 23 C / 48 %
 EUT: Smart Helmet
 Mode: TX 2407MHz
 Model: SP-106
 Manufacturer: SPEQ GmbH

Polarization: Horizontal
 Power Source: DC 3.7V
 Date: 19/03/18/
 Time:
 Engineer Signature: WADE
 Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	33.9174	25.68	-10.31	15.37	40.00	-24.63	QP			
2	115.7256	25.19	-13.06	12.13	43.50	-31.37	QP			
3	513.6331	27.26	-4.01	23.25	46.00	-22.75	QP			



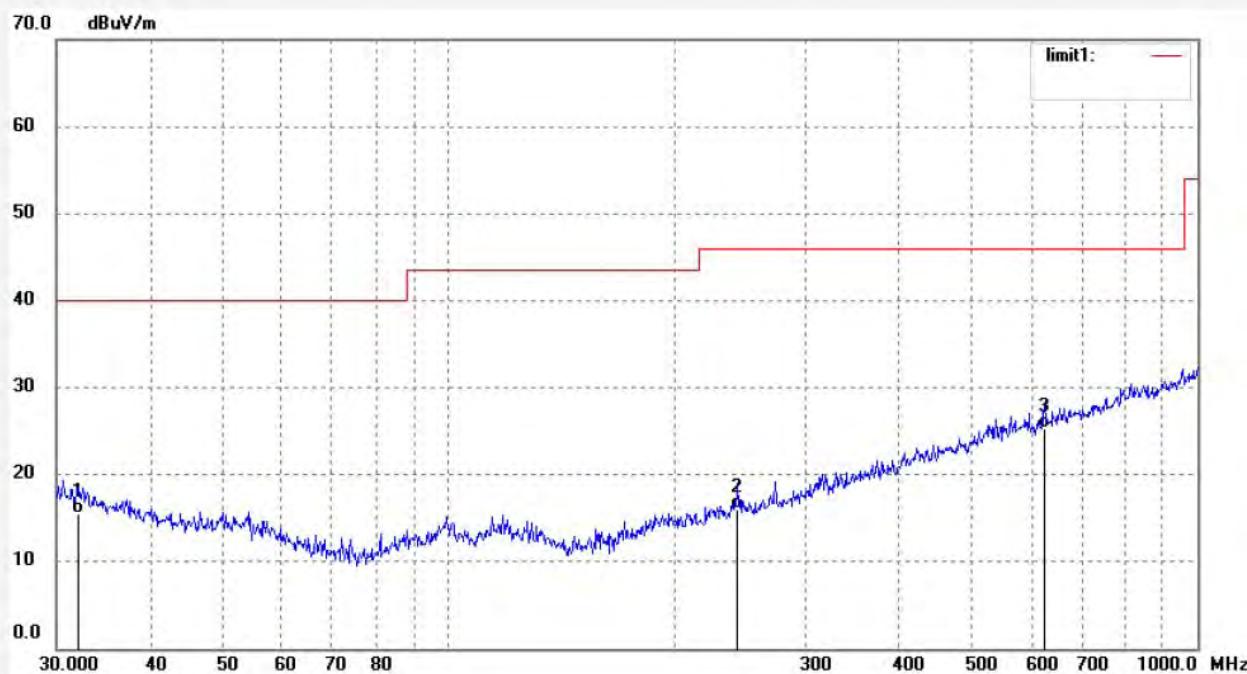
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #653	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/03/18/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Smart Helmet	Engineer Signature: WADE
Mode: TX 2407MHz	Distance: 3m
Model: SP-106	
Manufacturer: SPEQ GmbH	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	32.0667	25.11	-9.54	15.57	40.00	-24.43	QP			
2	243.3771	26.62	-10.60	16.02	46.00	-29.98	QP			
3	625.0779	27.24	-2.00	25.24	46.00	-20.76	QP			



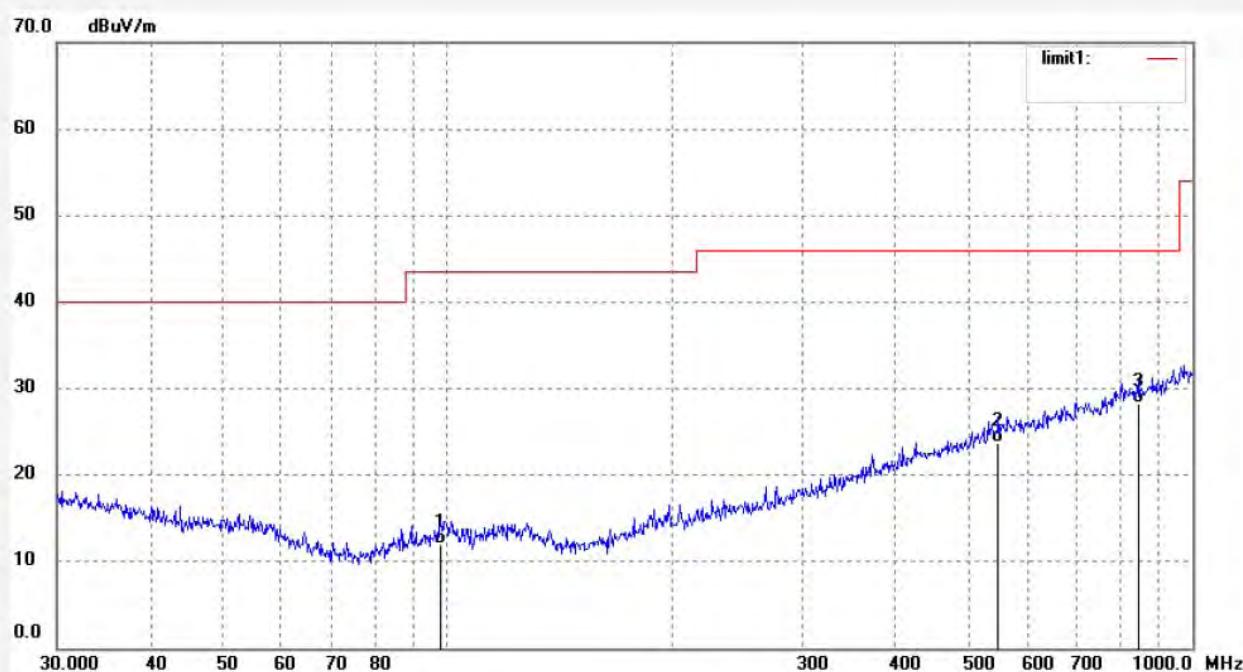
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.:	LGW2019 #655	Polarization:	Horizontal
Standard:	FCC Part 15C 3M Radiated	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	19/03/18/
Temp.(C)/Hum.(%)	23 C / 48 %	Time:	
EUT:	Smart Helmet	Engineer Signature:	WADE
Mode:	TX 2445MHz	Distance:	3m
Model:	SP-106		
Manufacturer:	SPEQ GmbH		

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	98.1419	25.62	-13.68	11.94	43.50	-31.56	QP			
2	549.0193	26.86	-3.11	23.75	46.00	-22.25	QP			
3	845.0878	26.65	1.53	28.18	46.00	-17.82	QP			



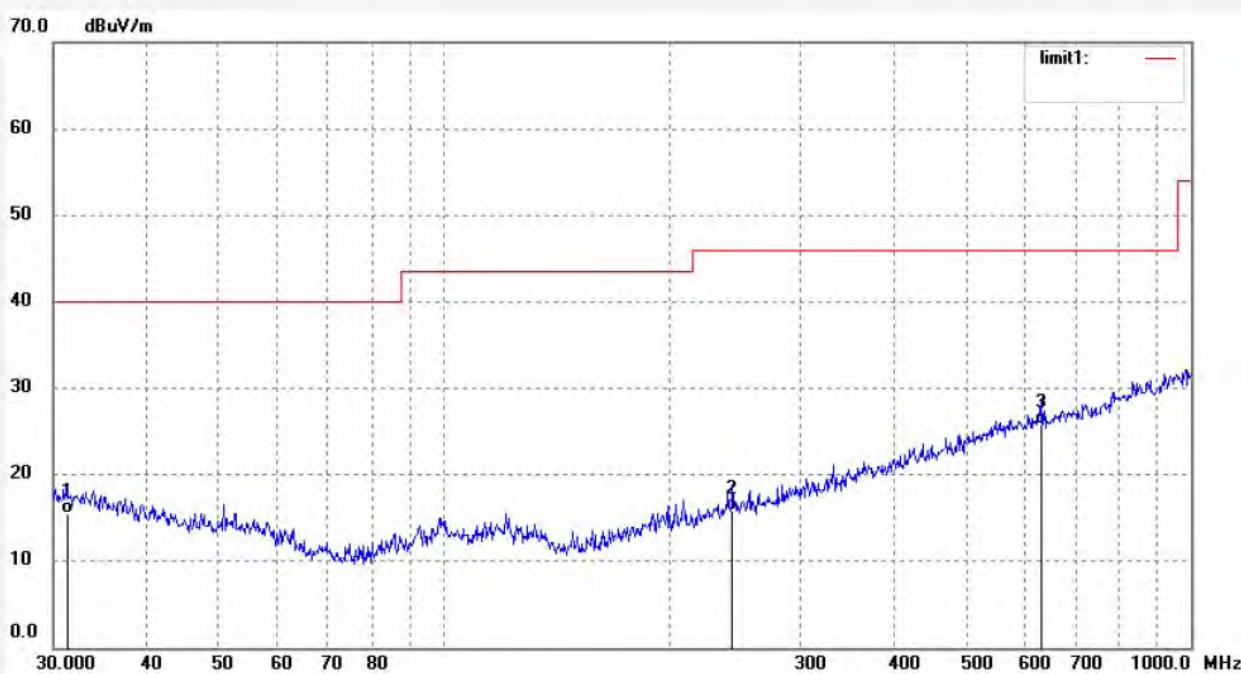
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #654	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/03/18/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Smart Helmet	Engineer Signature: WADE
Mode: TX 2445MHz	Distance: 3m
Model: SP-106	
Manufacturer: SPEQ GmbH	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	31.2893	24.87	-9.31	15.56	40.00	-24.44	QP			
2	243.3771	26.44	-10.60	15.84	46.00	-30.16	QP			
3	629.4772	27.72	-1.97	25.75	46.00	-20.25	QP			



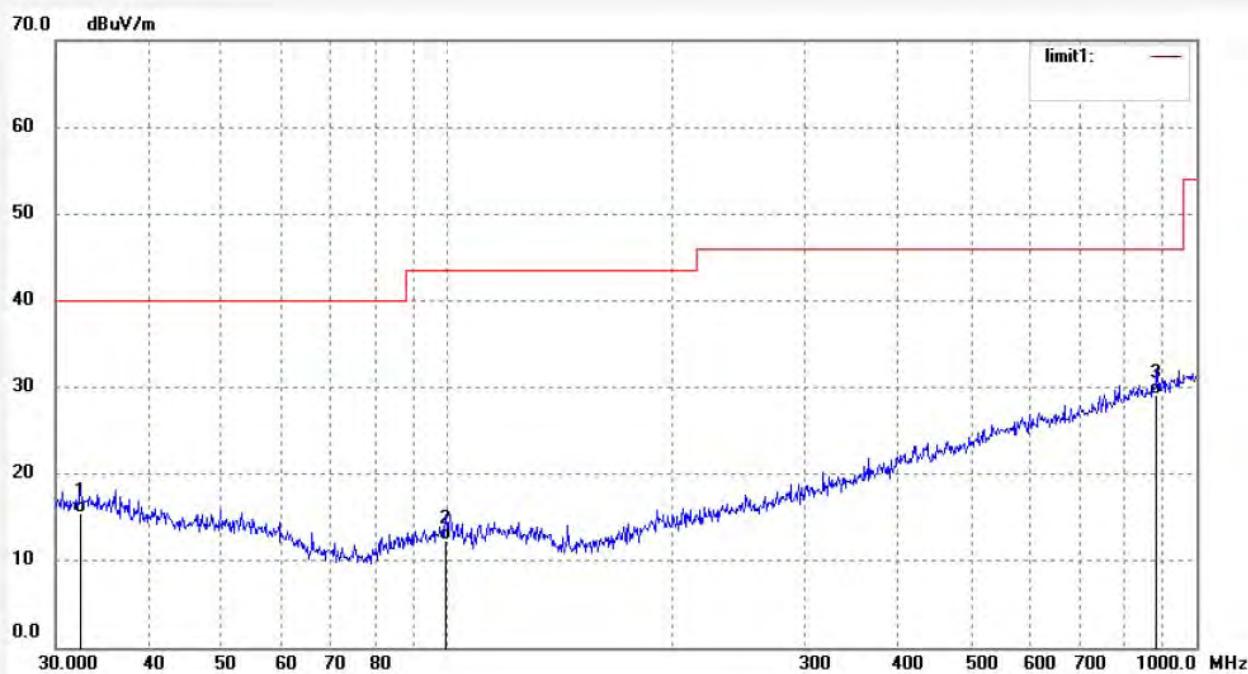
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #656	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/03/18/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Smart Helmet	Engineer Signature: WADE
Mode: TX 2477MHz	Distance: 3m
Model: SP-106	
Manufacturer: SPEQ GmbH	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	32.4059	25.66	-10.17	15.49	40.00	-24.51	QP			
2	99.5279	25.61	-13.21	12.40	43.50	-31.10	QP			
3	884.5027	27.04	2.08	29.12	46.00	-16.88	QP			



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #657

Polarization: Vertical

Standard: FCC Part 15C 3M Radiated

Power Source: DC 3.7V

Test item: Radiation Test

Date: 19/03/18/

Temp.(C)/Hum.(%) 23 C / 48 %

Time:

EUT: Smart Helmet

Engineer Signature: WADE

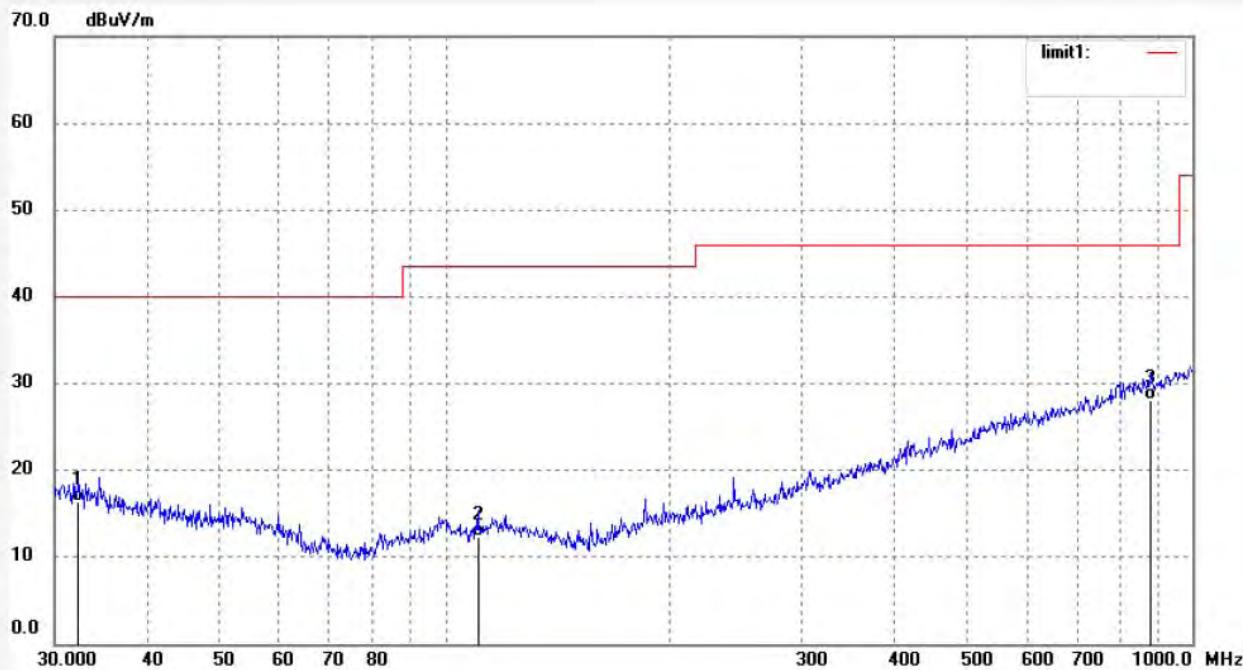
Mode: TX 2477MHz

Distance: 3m

Model: SP-106

Manufacturer: SPEQ GmbH

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	32.2924	25.97	-9.61	16.36	40.00	-23.64	QP			
2	110.5687	26.08	-13.72	12.36	43.50	-31.14	QP			
3	878.3214	26.15	2.00	28.15	46.00	-17.85	QP			



1GHz to 18GHz Test data
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg.A,Changyuan New Material Port Keyuan Rd,
 Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
 Tel:+86-0755-26503290
 Fax:+86-0755-26503396

Job No.: LGW2019 #636

Polarization: Horizontal

Standard: FCC Part 15C 3M Radiated

Power Source: DC 3.7V

Test item: Radiation Test

Date: 19/03/18/

Temp.(C)/Hum.(%) 23 C / 48 %

Time:

EUT: Smart Helmet

Engineer Signature: WADE

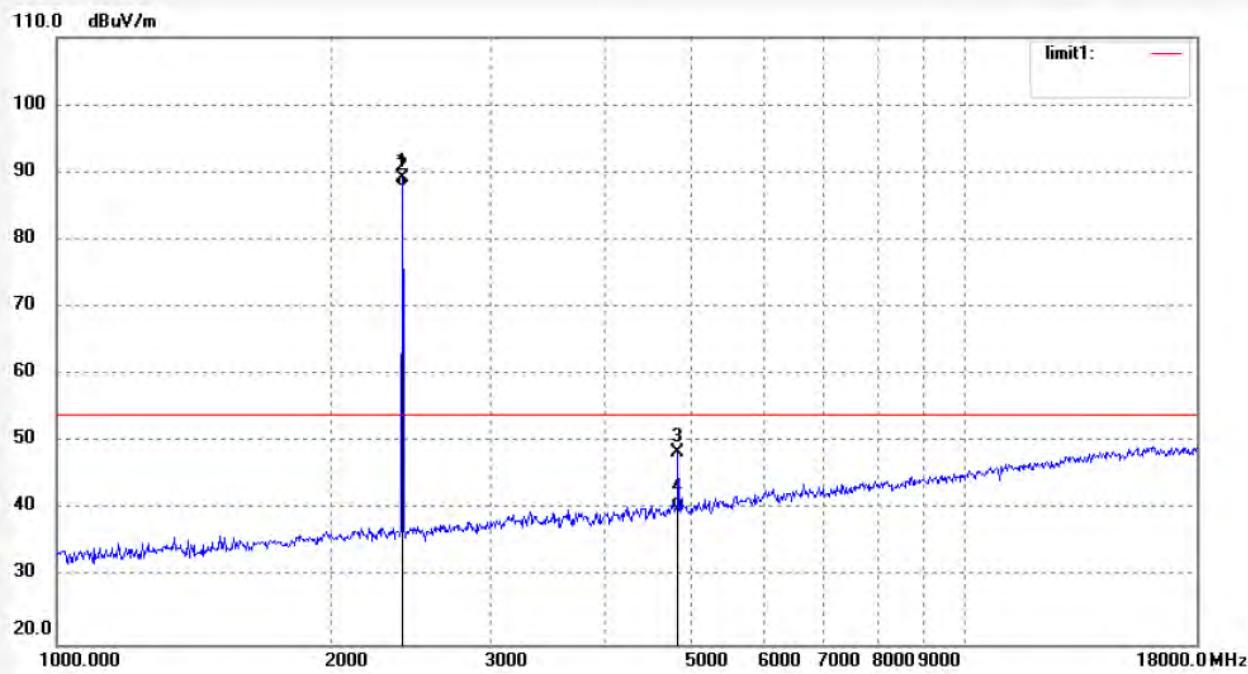
Mode: TX 2407MHz

Distance: 3m

Model: SP-106

Manufacturer: SPEQ GmbH

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2407.000	88.17	0.91	89.08	114.00	-24.92	peak			
2	2407.000	86.87	0.91	87.78	94.00	-6.22	AVG			
3	4814.026	40.92	7.49	48.41	74.00	-25.59	peak			
4	4814.026	32.76	7.49	40.25	54.00	-13.75	AVG			



ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #637

Polarization: Vertical

Standard: FCC Part 15C 3M Radiated

Power Source: DC 3.7V

Test item: Radiation Test

Date: 19/03/18/

Temp.(C)/Hum.(%) 23 C / 48 %

Time:

EUT: Smart Helmet

Engineer Signature: WADE

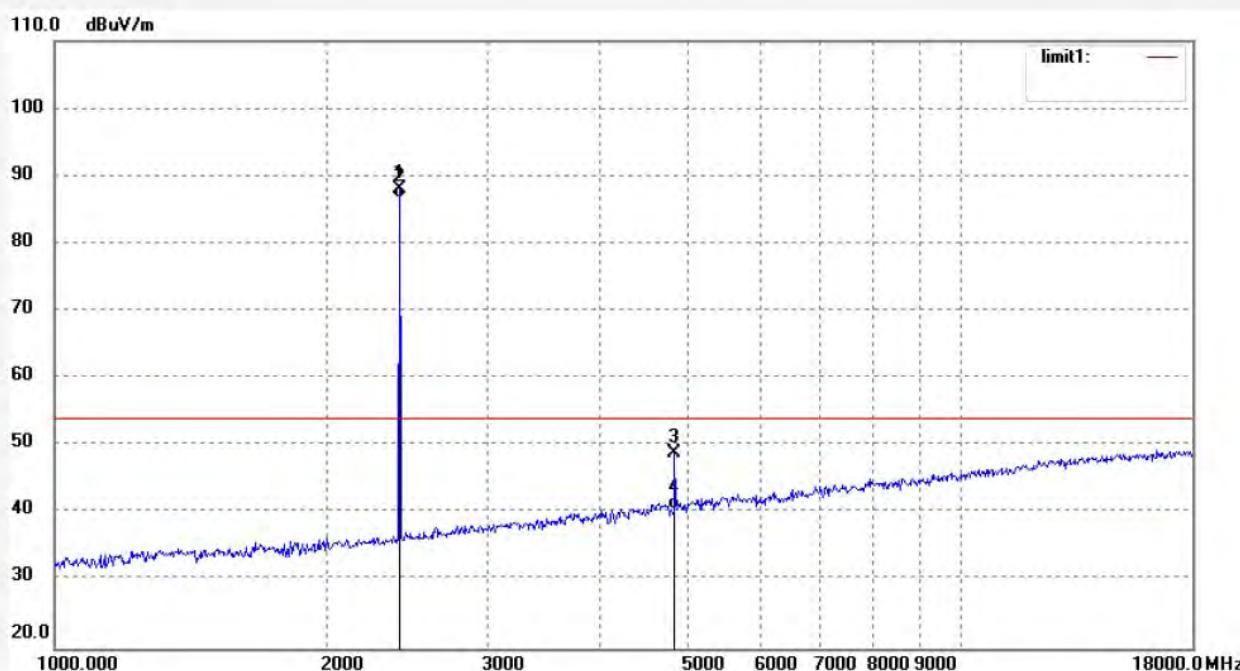
Mode: TX 2407MHz

Distance: 3m

Model: SP-106

Manufacturer: SPEQ GmbH

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2407.000	87.16	0.91	88.07	114.00	-25.93	peak			
2	2407.000	85.86	0.91	86.77	94.00	-7.23	AVG			
3	4814.028	41.46	7.49	48.95	74.00	-25.05	peak			
4	4814.028	33.18	7.49	40.67	54.00	-13.33	AVG			



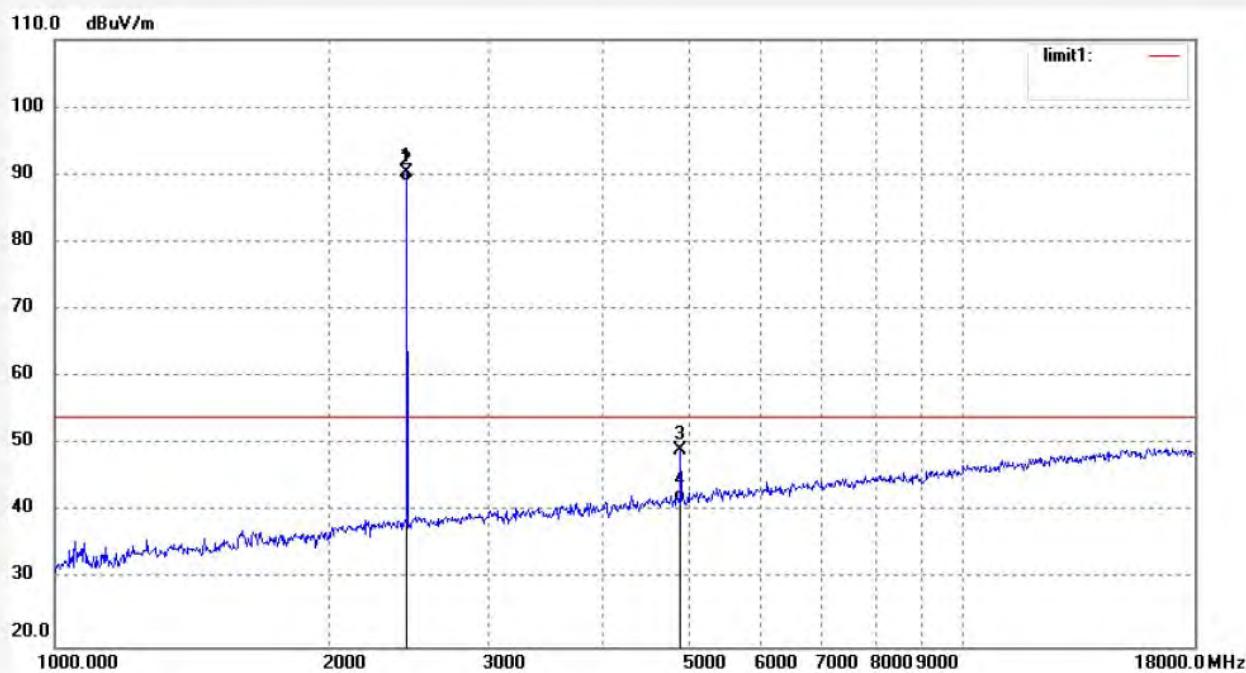
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #640	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/03/18/
Temp. (C)/Hum.(%) 23 C / 48 %	Time:
EUT: Smart Helmet	Engineer Signature: WADE
Mode: TX 2445MHz	Distance: 3m
Model: SP-106	
Manufacturer: SPEQ GmbH	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2445.000	89.19	1.07	90.26	114.00	-23.74	peak			
2	2445.000	87.99	1.07	89.06	94.00	-4.94	AVG			
3	4890.032	40.96	8.18	49.14	74.00	-24.86	peak			
4	4890.032	33.38	8.18	41.56	54.00	-12.44	AVG			



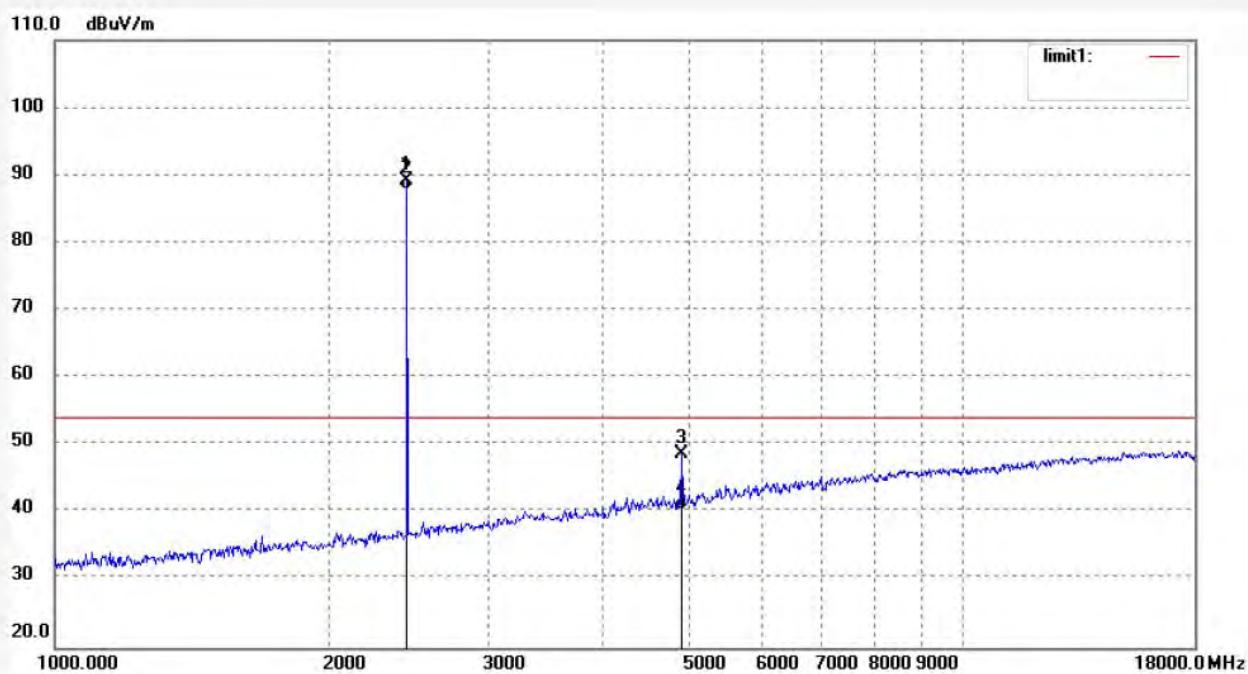
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #641	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/03/18/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Smart Helmet	Engineer Signature: WADE
Mode: TX 2445MHz	Distance: 3m
Model: SP-106	
Manufacturer: SPEQ GmbH	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2445.000	88.05	1.07	89.12	114.00	-24.88	peak			
2	2445.000	86.85	1.07	87.92	94.00	-6.08	AVG			
3	4890.031	40.57	8.18	48.75	74.00	-25.25	peak			
4	4890.031	32.19	8.18	40.37	54.00	-13.63	AVG			



ACCURATE TECHNOLOGY CO., LTD.

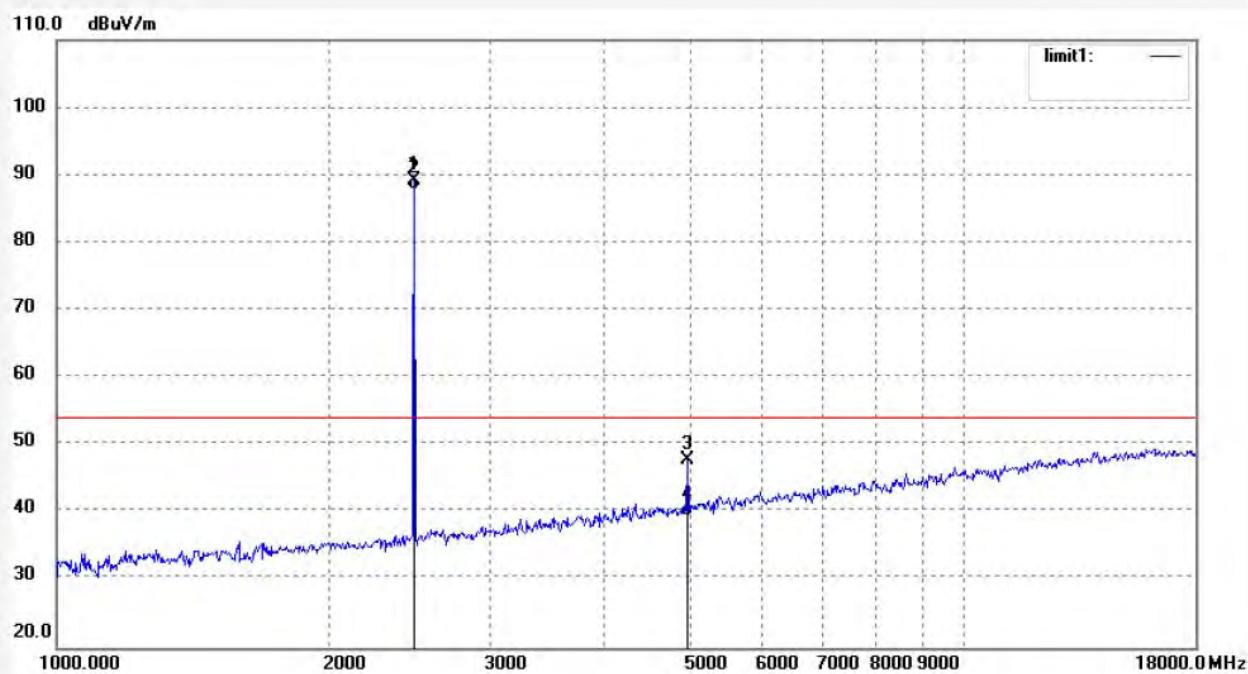
F1,Bldg.A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #643
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Smart Helmet
Mode: TX 2477MHz
Model: SP-106
Manufacturer: SPEQ GmbH

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/03/18/
Time:
Engineer Signature: WADE
Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2477.000	88.16	1.09	89.25	114.00	-24.75	peak			
2	2477.000	86.86	1.09	87.95	94.00	-6.05	AVG			
3	4954.033	39.19	8.56	47.75	74.00	-26.25	peak			
4	4954.033	30.89	8.56	39.45	54.00	-14.55	AVG			



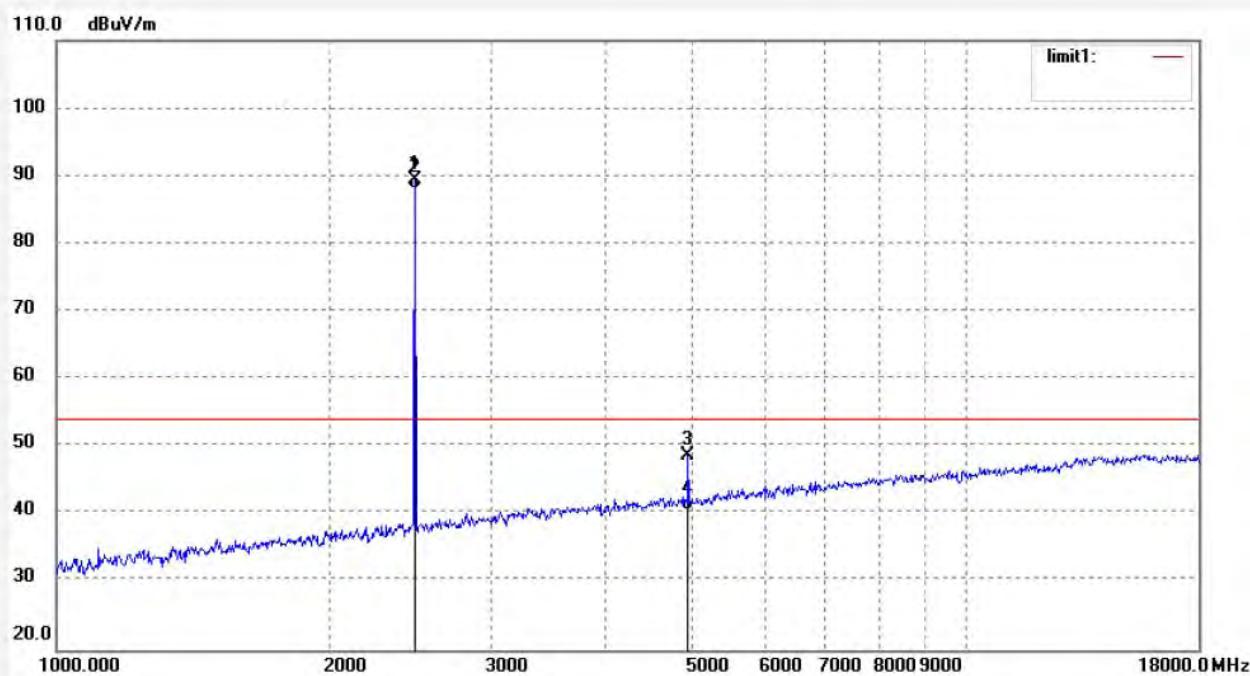
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #642	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/03/18/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Smart Helmet	Engineer Signature: WADE
Mode: TX 2477MHz	Distance: 3m
Model: SP-106	
Manufacturer: SPEQ GmbH	

Note:



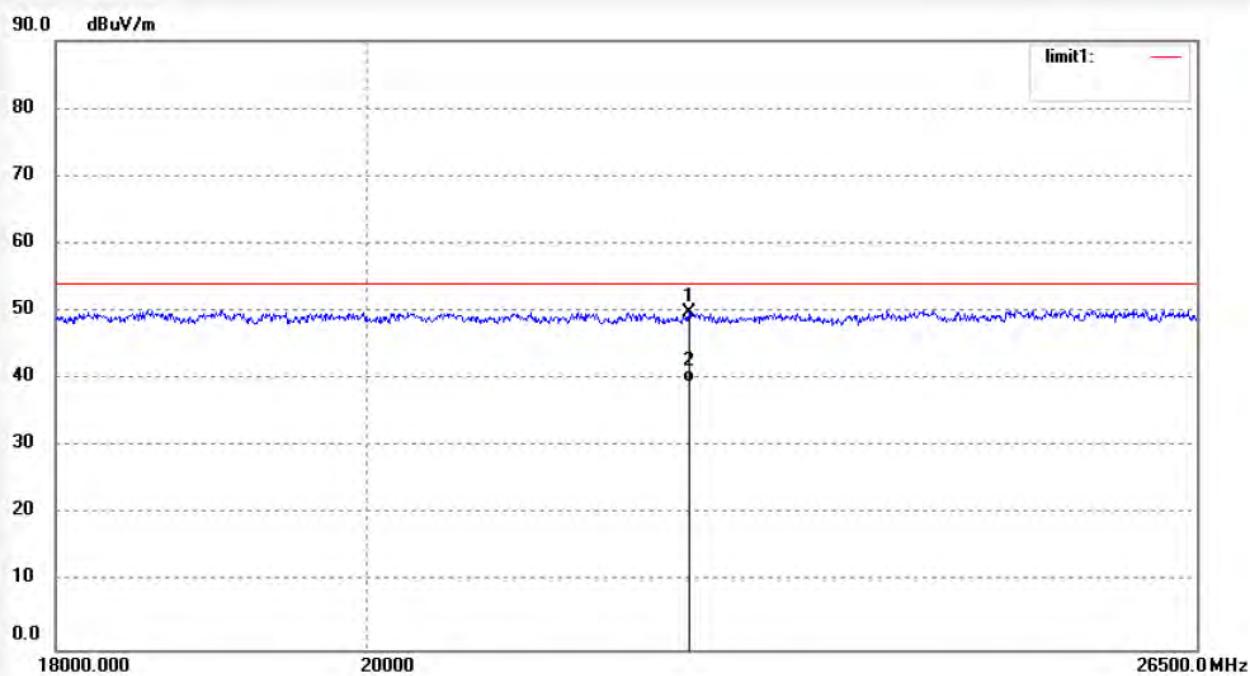
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2477.000	88.26	1.09	89.35	114.00	-24.65	peak			
2	2477.000	86.96	1.09	88.05	94.00	-5.95	AVG			
3	4954.029	40.13	8.56	48.69	74.00	-25.31	peak			
4	4954.029	32.03	8.56	40.59	54.00	-13.41	AVG			

18GHz to 26.5GHz Test data
ACCURATE TECHNOLOGY CO., LTD.F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.ChinaSite: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #647
 Standard: FCC Part 15C 3M Radiated
 Test item: Radiation Test
 Temp.(C)/Hum.(%) 23 C / 48 %
 EUT: Smart Helmet
 Mode: TX 2407MHz
 Model: SP-106
 Manufacturer: SPEQ GmbH

Polarization: Horizontal
 Power Source: DC 3.7V
 Date: 19/03/18/
 Time:
 Engineer Signature: WADE
 Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22309.905	10.06	39.67	49.73	74.00	-24.27	peak			
2	22309.905	-0.22	39.67	39.45	54.00	-14.55	AVG			



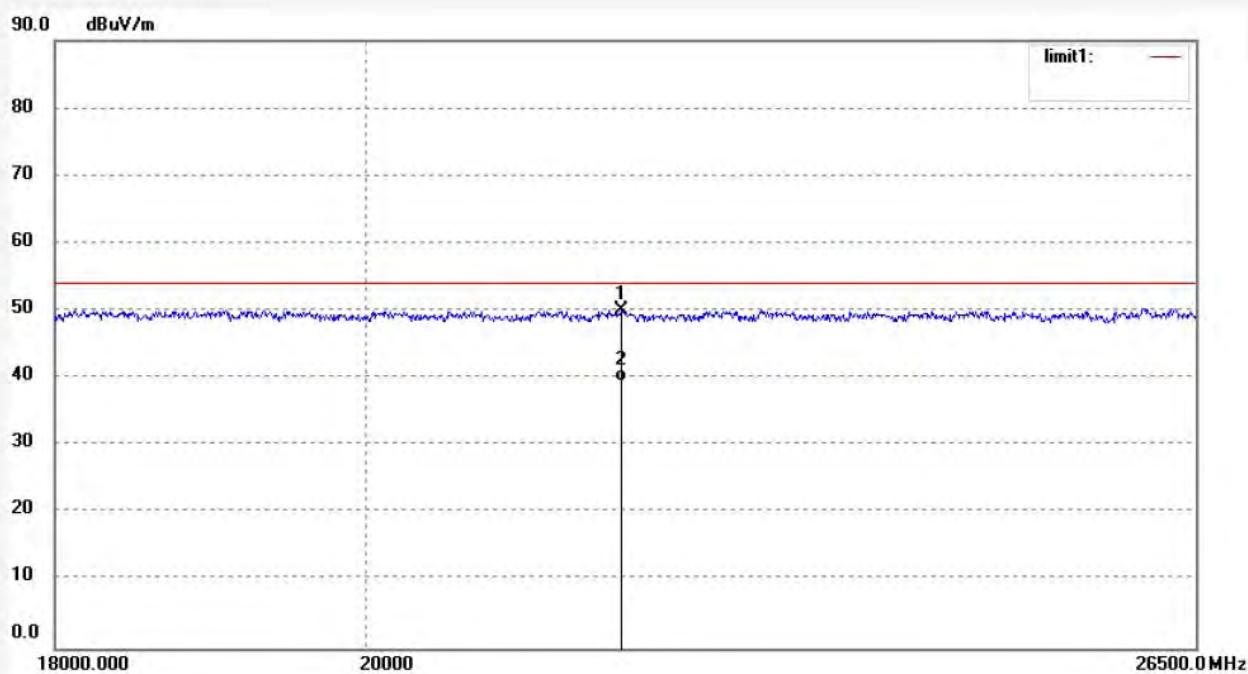
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #646	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/03/18/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Smart Helmet	Engineer Signature: WADE
Mode: TX 2407MHz	Distance: 3m
Model: SP-106	
Manufacturer: SPEQ GmbH	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21806.567	10.73	39.24	49.97	74.00	-24.03	peak			
2	21806.567	0.17	39.24	39.41	54.00	-14.59	AVG			



ACCURATE TECHNOLOGY CO., LTD.

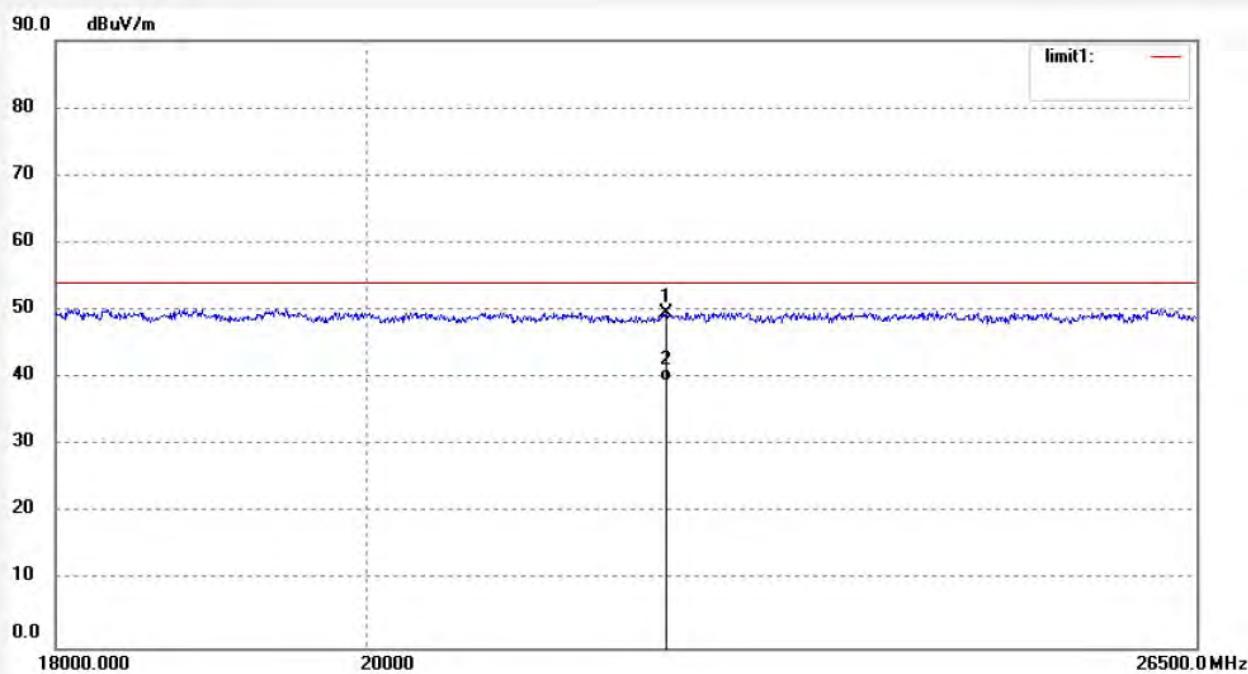
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #648
Standard: FCC Part 15C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: Smart Helmet
Mode: TX 2445MHz
Model: SP-106
Manufacturer: SPEQ GmbH

Polarization: Horizontal
Power Source: DC 3.7V
Date: 19/03/18/
Time:
Engineer Signature: WADE
Distance: 3m

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	22137.994	10.06	39.52	49.58	74.00	-24.42	peak			
2	22137.994	-0.07	39.52	39.45	54.00	-14.55	AVG			



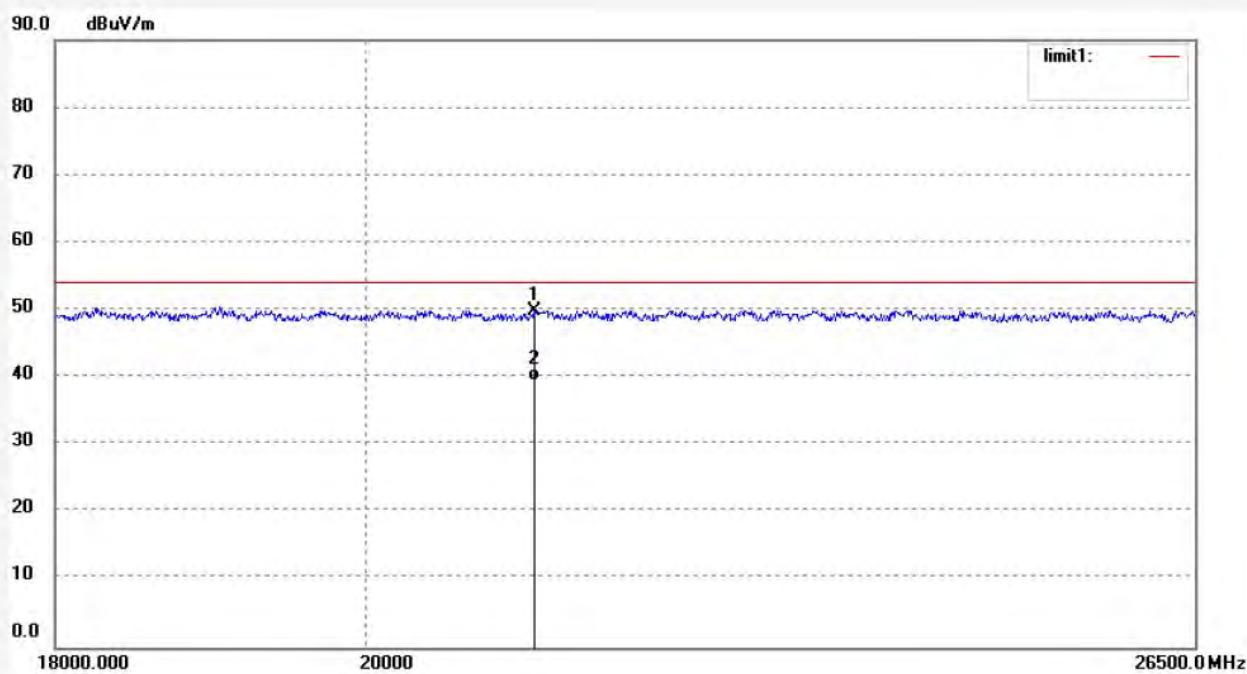
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.:	LGW2019 #649	Polarization:	Vertical
Standard:	FCC Part 15C 3M Radiated	Power Source:	DC 3.7V
Test item:	Radiation Test	Date:	19/03/18/
Temp.(C)/Hum.(%)	23 C / 48 %	Time:	
EUT:	Smart Helmet	Engineer Signature:	WADE
Mode:	TX 2445MHz	Distance:	3m
Model:	SP-106		
Manufacturer:	SPEQ GmbH		

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21174.898	10.56	39.36	49.92	74.00	-24.08	peak			
2	21174.898	0.10	39.36	39.46	54.00	-14.54	AVG			



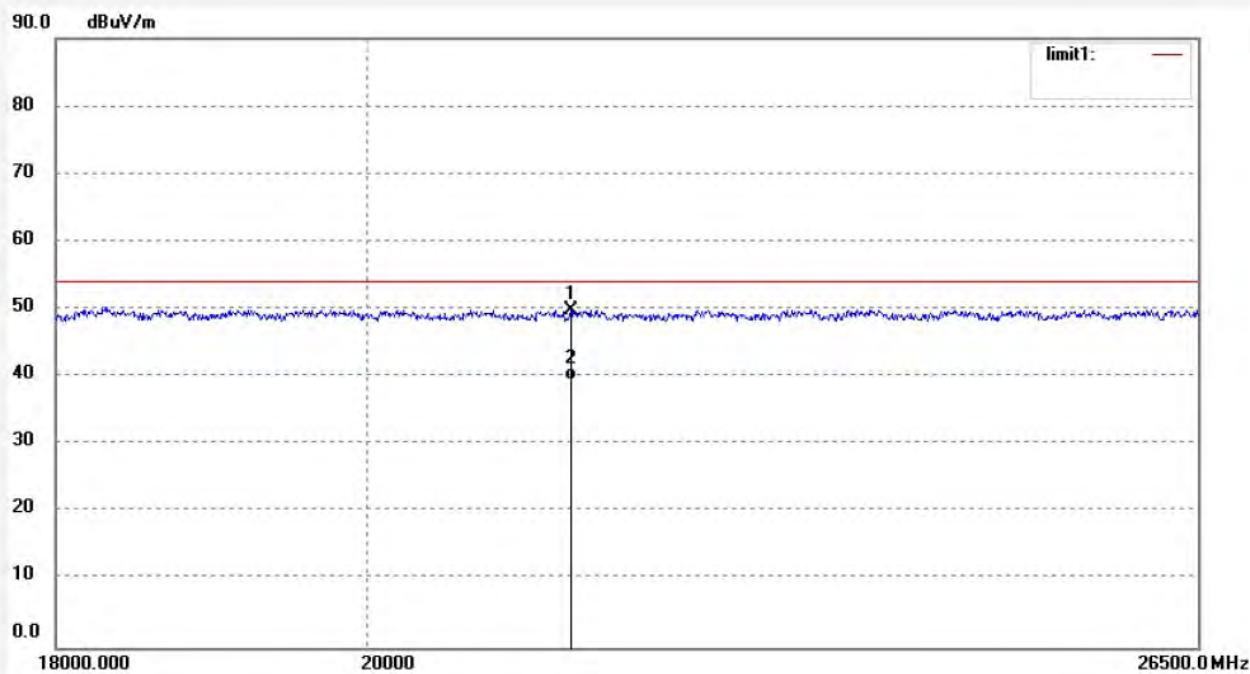
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #651	Polarization: Horizontal
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/03/18/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Smart Helmet	Engineer Signature: WADE
Mode: TX 2477MHz	Distance: 3m
Model: SP-106	
Manufacturer: SPEQ GmbH	

Note:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	21430.312	11.26	38.50	49.76	74.00	-24.24	peak			
2	21430.312	0.95	38.50	39.45	54.00	-14.55	AVG			



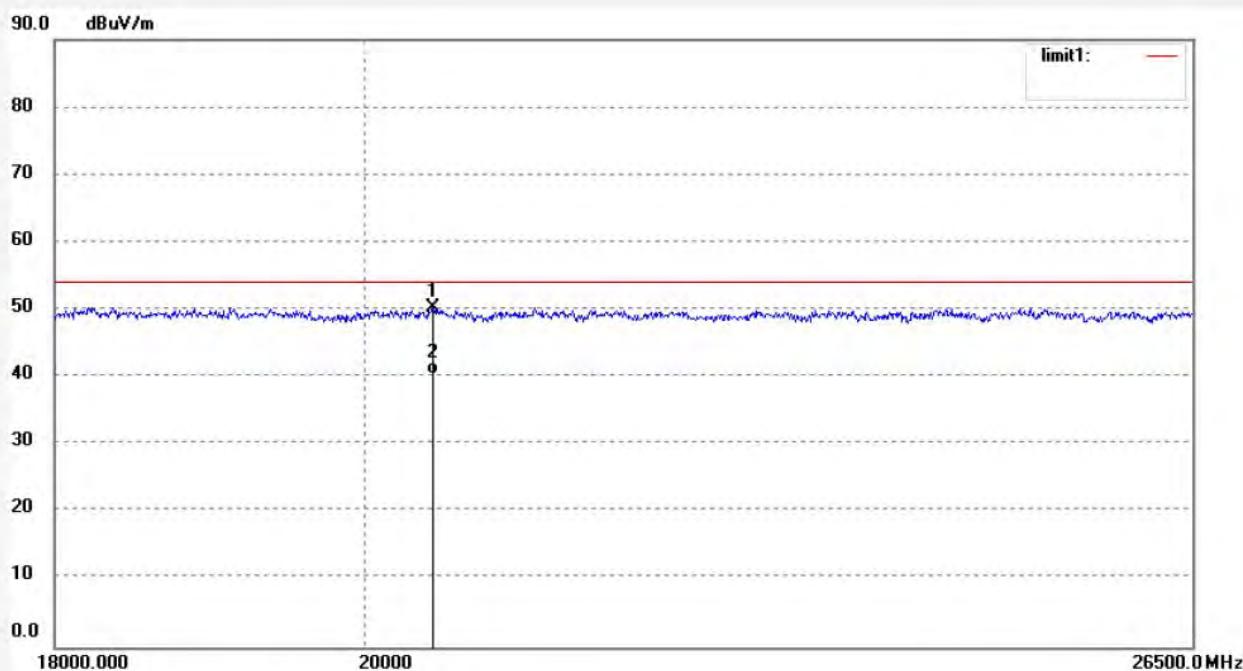
ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: LGW2019 #650	Polarization: Vertical
Standard: FCC Part 15C 3M Radiated	Power Source: DC 3.7V
Test item: Radiation Test	Date: 19/03/18/
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: Smart Helmet	Engineer Signature: WADE
Mode: TX 2477MHz	Distance: 3m
Model: SP-106	
Manufacturer: SPEQ GmbH	

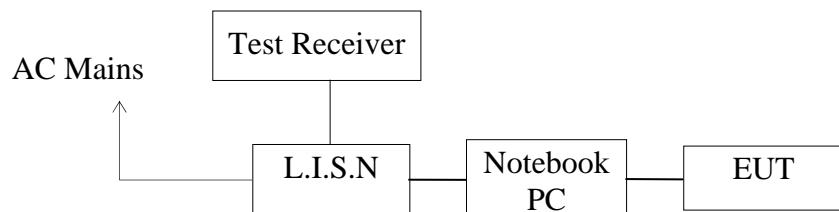
Note:



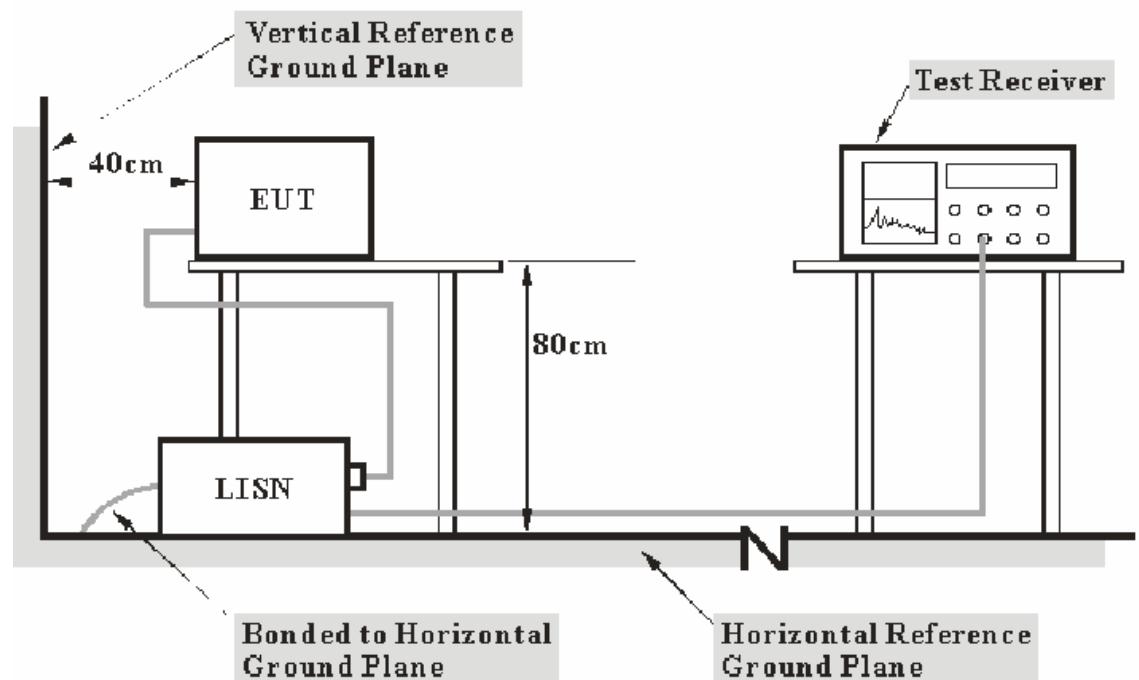
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	20466.315	11.95	38.31	50.26	74.00	-23.74	peak			
2	20466.315	2.06	38.31	40.37	54.00	-13.63	AVG			

8. AC POWER LINE CONDUCTED EMISSION TEST

8.1. Block Diagram of Test Setup



8.2. Test System Setup



Note:

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

8.3. Test Limits

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0

NOTE1: The lower limit shall apply at the transition frequencies.
NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

8.4. Configuration of EUT on Measurement

The equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

8.5. Operating Condition of EUT

8.5.1. Setup the EUT and simulator as shown as Section 8.1.

8.5.2. Turn on the power of all equipment.

8.5.3. Let the EUT work in test mode and measure it.

8.6. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

8.7.Data Sample

Frequency (MHz)	Transducer value (dB)	QuasiPeak Level (dB μ V)	Average Level (dB μ V)	QuasiPeak Limit (dB μ V)	Average Limit (dB μ V)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	10.5	51.1	34.2	56.0	46.0	4.9	11.8	Pass

Frequency(MHz) = Emission frequency in MHz

Transducer value(dB) = Insertion loss of LISN + Cable Loss

Level(dB μ V) = Quasi-peak Reading/Average Reading + Transducer value

Limit (dB μ V) = Limit stated in standard

Calculation Formula:

Margin = Limit (dB μ V) - Level (dB μ V)

8.8.Test Results

Pass.

The frequency range from 150kHz to 30MHz is checked.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

Emissions attenuated more than 20 dB below the permissible value are not reported.

All data was recorded in the Quasi-peak and average detection mode.

The spectral diagrams are attached as below.

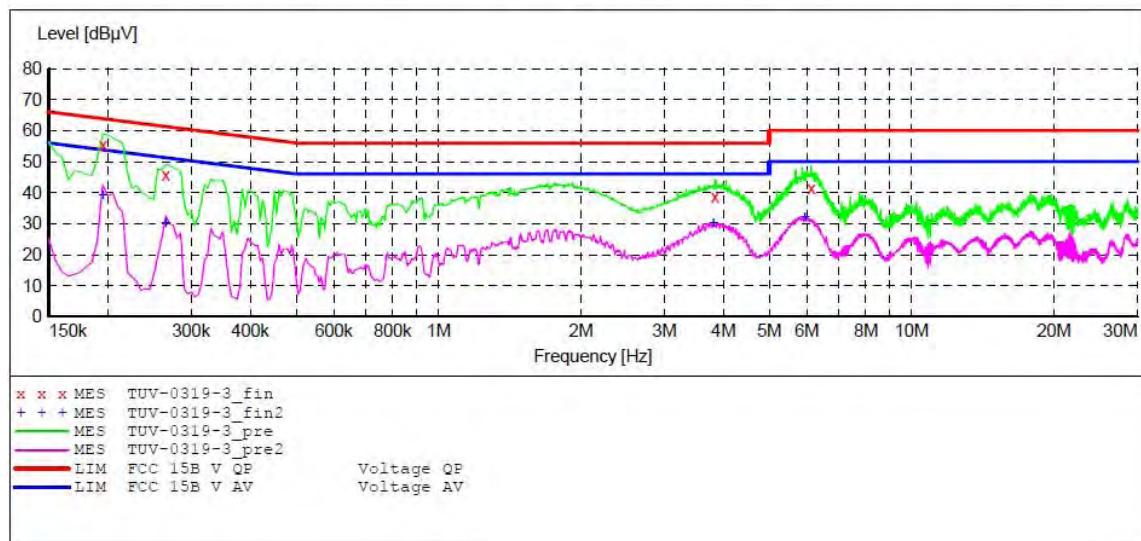
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 C

EUT: Smart Helmet M/N:SP-106
 Manufacturer: SPEQ GmbH
 Operating Condition: Communication
 Test Site: 1#Shielding Room
 Operator: WADE
 Test Specification: L 120V/60Hz
 Comment: Mains Port
 Start of Test: 3/19/2019 /

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70
 Start Stop Step Detector Meas. IF Transducer
 Frequency Frequency Width Time Bandw.
 9.0 kHz 150.0 kHz 100.0 Hz QuasiPeak 1.0 s 200 Hz NSLK8126 2008
 Average
 150.0 kHz 30.0 MHz 5.0 kHz QuasiPeak 1.0 s 9 kHz NSLK8126 2008
 Average



MEASUREMENT RESULT: "TUV-0319-3_fin"

3/19/2019

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.195000	55.50	10.5	64	8.3	QP	L1	GND
0.265000	45.80	10.6	61	15.5	QP	L1	GND
3.840000	38.70	11.1	56	17.3	QP	L1	GND
6.130000	41.30	11.2	60	18.7	QP	L1	GND

MEASUREMENT RESULT: "TUV-0319-3_fin2"

3/19/2019

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.195000	38.90	10.5	54	14.9	AV	L1	GND
0.265000	30.00	10.6	51	21.3	AV	L1	GND
3.810000	29.90	11.1	46	16.1	AV	L1	GND
5.950000	31.90	11.2	50	18.1	AV	L1	GND

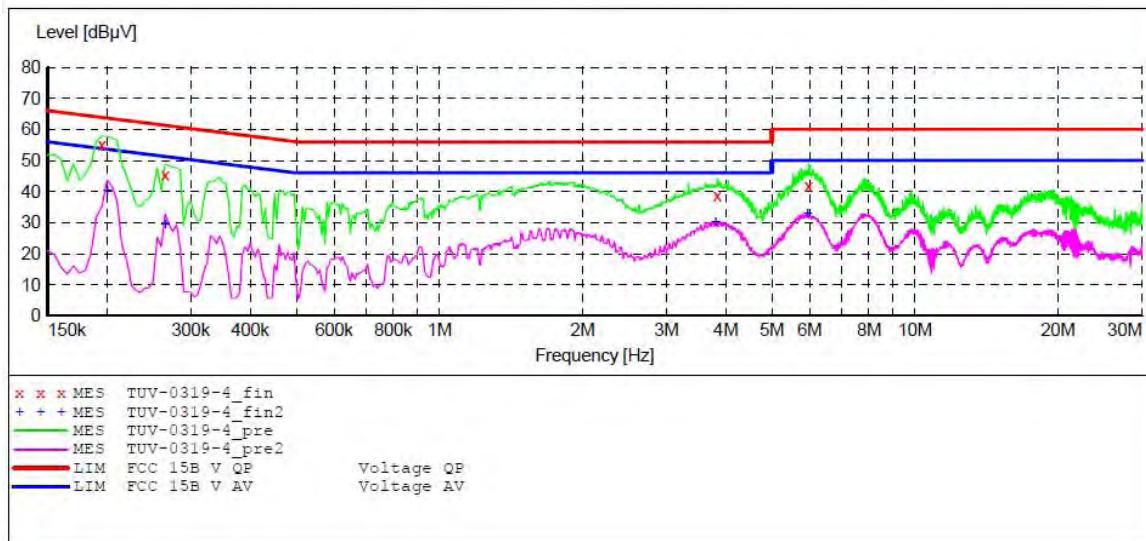
ACCURATE TECHNOLOGY CO., LTD

CONDUCTED EMISSION STANDARD FCC PART 15 C

EUT: Smart Helmet M/N:SP-106
 Manufacturer: SPEQ GmbH
 Operating Condition: Communication
 Test Site: 1#Shielding Room
 Operator: WADE
 Test Specification: N 120V/60Hz
 Comment: Mains Port
 Start of Test: 3/19/2019 /

SCAN TABLE: "V 9K-30MHz fin"

Short Description:		-SUB_STD_VTERM2 1.70		Detector	Meas.	IF	Transducer
Start Frequency	Stop Frequency	Step Width	Time				
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak 1.0 s	200 Hz	NSLK8126	2008	
			Average				
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak 1.0 s	9 kHz	NSLK8126	2008	
			Average				



MEASUREMENT RESULT: "TUV-0319-4_fin"

3/19/2019

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.195000	54.90	10.5	64	8.9	QP	N	GND
0.265000	45.30	10.6	61	16.0	QP	N	GND
3.840000	38.80	11.1	56	17.2	QP	N	GND
5.970000	41.80	11.2	60	18.2	QP	N	GND

MEASUREMENT RESULT: "TUV-0319-4_fin2"

3/19/2019

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.200000	40.10	10.5	54	13.5	AV	N	GND
0.265000	29.40	10.6	51	21.9	AV	N	GND
3.810000	30.00	11.1	46	16.0	AV	N	GND
5.950000	32.80	11.2	50	17.2	AV	N	GND

9. ANTENNA REQUIREMENT

9.1. The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

9.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 0dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.

***** End of Test Report *****