

Report on the Radio Testing of:

VR MOTION TRACKERS

Model(s): AXIS

– NODES (AN-001)

– USB DONGLE (AD-001)

In accordance with

47 CFR FCC Part 15C



PSB Singapore

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Inspire trust.

Prepared for:

Refract Technologies Pte Ltd
71 Ayer Rajah Crescent
#04-12/14, Singapore 139951

COMMERCIAL-IN-CONFIDENCE

Document Number: 7191295520-EEC22/05 | Issue: 01
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RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Approved By	Foo Kai Maun	23 Nov 2022	
Prepared By	Quek Keng Huat	22 Nov 2022	

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

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with the mentioned standard(s).



LA-2007-0380-A LA-2007-0386-C
LA-2007-0381-F LA-2010-0464-D
LA-2007-0382-B LA-2018-0702-B
LA-2007-0383-G LA-2018-0703-G
LA-2007-0384-G LA-2020-0747-L
LA-2007-0385-E

The results reported herein have been performed in accordance with the terms of accreditation under the Singapore Accreditation Council. Inspections/Calibrations/Tests marked "Not SAC-SINGLAS Accredited" in this Report are not included in the SAC-SINGLAS Accreditation Schedule for our inspection body/laboratory.

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Contents

1	Report Summary	3
1.1	Report Modification Record	3
1.2	Introduction	4
1.3	Brief Summary of Results	5
1.4	Product Information	7
1.5	Deviations from the Standard	8
1.6	EUT Modification Record	8
1.7	Test Location(s)	8
1.8	Test Facilities Registrations	9
1.9	Supporting Equipment.....	10
2	Test Details	11
2.1	Radiated Emissions (Spurious Emissions Inclusive Restricted Bands Requirement).....	11
2.2	Band Edge Compliance (Radiated).....	16
3	Photographs	21
4	Test Equipment	33
5	Measurement Uncertainty	34
6	Annex A – FCC Label and Position	35
	End of the Test Report	37



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	23 Nov 2022





1.2 Introduction

Applicant	:	Refract Technologies Pte Ltd 71 Ayer Rajah Crescent #04-12/14 Singapore 139951
Manufacturer	:	Same as applicant
Factory	:	Same as applicant
Model Number(s)	:	AXIS – Nodes (AN-001) & USB Dongle (AD-001)
Serial Number(s)	:	Nil
Number of Samples Tested	:	1
Test Sample(s) Condition	:	Good
Quotation Reference	:	5695710
Test Specification/Issue/Date	:	FCC 47 CFR Part 15C
Test Sample(s) Received Date	:	26 Oct 2022
Start of Test	:	10 Nov 2022
Finish of Test	:	12 Nov 2022



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with specifications as shown below.

Specification Clause	Test Description	Result	Comments/Base Standard
47 CFR FCC Part 15			
15.107(a), 15.207	Conducted Emissions	Not Applicable *See Note 3	ANSI C63.4: 2014 ANSI C63.10: 2013 KDB 558074 D01 DTS Measurement Guidance V05R02: 2018
15.109(a), 15.205, 15.209	Radiated Emissions (Spurious Emissions Inclusive Restricted Bands Requirement)	Pass	ANSI C63.4: 2014 ANSI C63.10: 2013 KDB 558074 D01 DTS Measurement Guidance V05R02: 2019
15.247(a)(2)	Spectrum Bandwidth (6dB Bandwidth Measurement)	Not Tested *See Note 6	ANSI C63.10: 2013 KDB 558074 D01 DTS Measurement Guidance V05R02: 2019
15.247(b)(3)	Maximum Peak Power	Not Tested *See Note 6	ANSI C63.10: 2013 KDB 558074 D01 DTS Measurement Guidance V05R02: 2019
15.247(d)	RF Conducted Spurious Emissions (Non-Restricted Bands)	Not Tested *See Note 6	ANSI C63.10: 2013 KDB 558074 D01 DTS Measurement Guidance V05R02: 2019
15.247(d)	RF Conducted Spurious Emissions (Restricted Bands)	Not Tested *See Note 6	ANSI C63.10: 2013 KDB 558074 D01 DTS Measurement Guidance V05R02: 2019
15.247(d)	Band Edge Compliance (Conducted)	Not Tested *See Note 6	ANSI C63.10: 2013 KDB 558074 D01 DTS Measurement Guidance V05R02: 2019
15.247(d)	Band Edge Compliance (Radiated)	Pass	ANSI C63.10: 2013 KDB 558074 D01 DTS Measurement Guidance V05R02: 2019
15.247(e)	Peak Power Spectral Density	Not Tested *See Note 6	ANSI C63.10: 2013 KDB 558074 D01 DTS Measurement Guidance V05R02: 2019
15.35(c)	Duty Cycle Factor Computation	Not Applicable *See Note 4	ANSI C63.10: 2013 KDB 558074 D01 DTS Measurement Guidance V05R02: 2019
2.1091	Maximum Permissible Exposure	Not Tested *See Note 7	

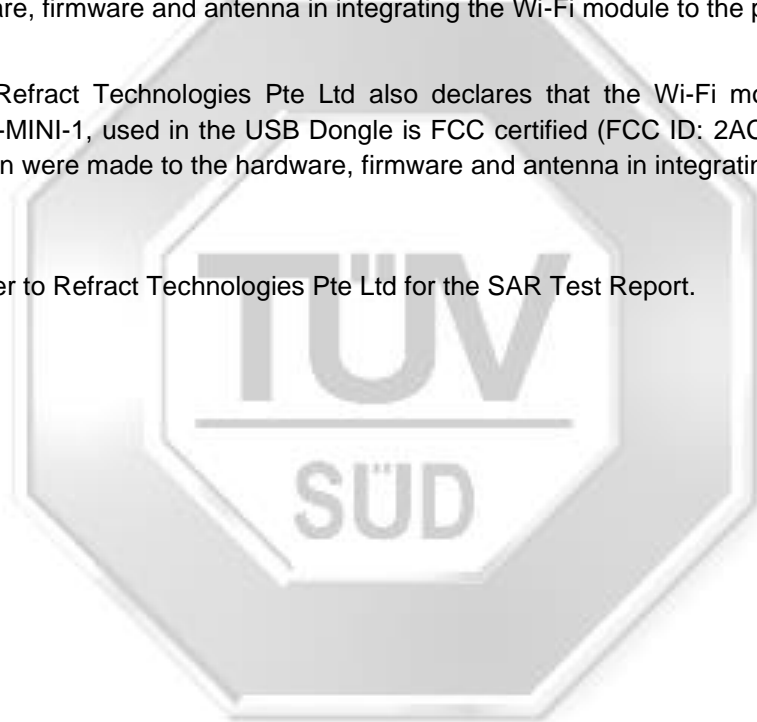


Notes

1. All the measurements in section 15.247 were done based on conducted measurements except Band Edge Compliance (Radiated) test.
2. The EUT is a Class B device when in non-transmitting state and meets the 47 CFR FCC Part15B Class B requirements.
3. The Equipment Under Test (EUT) is a battery-operated device and contains no provision for public utility connections.
4. The EUT was operated in continuous transmission, ie 100% duty cycle.
5. The EUT was tested using fully charged batteries with DC voltage of 3.7V.
6. Refract Technologies Pte Ltd declares that the Wi-Fi module, Espressif Systems ESP32-C3-MINI-1, used in the Node is FCC certified (FCC ID: 2AC7Z-ESPC3MINI1) and no modification were made to the hardware, firmware and antenna in integrating the Wi-Fi module to the product.

Similarly, Refract Technologies Pte Ltd also declares that the Wi-Fi module, Espressif Systems ESP32-S3-MINI-1, used in the USB Dongle is FCC certified (FCC ID: 2AC7Z-ESPS3MINI1) and no modification were made to the hardware, firmware and antenna in integrating the Wi-Fi module to the product.

7. Please refer to Refract Technologies Pte Ltd for the SAR Test Report.





1.4 Product Information

1.4.1 Technical Description

Description	:	The Equipment Under Test(s) (EUT(s)) is a VR MONTION TRACKERS . It Comprise of i. 9x Nodes ii. 1x Dongle iii. 1x Charging dock iv. 1x Charging brick
Microprocessor	:	Nodes – ESP32-C3-MINI-1 USB Dongle – ESP32-S3-MINI-1
Operating Frequency	:	Wi-Fi IEEE 802.11 b/g/n 2.412GHz – 2.462GHz
Clock / Oscillator Frequency	:	40MHz
Modulation	:	i. Wi-Fi IEEE 802.11b - Direct Sequence Spread Spectrum (DSSS) ii. Wi-Fi IEEE 802.11g/n - Orthogonal Frequency-Division Multiplexing (OFDM)
Antenna Gain	:	3.96dBi
Port / Connectors	:	1 x DC Inlet
Rated Power	:	Input 5Vdc / 7.0A
Accessories	:	Nil

1.4.2 Test Configuration and Modes of Operation

Mode(s)	Description
---------	-------------



Mode(s)	Description								
Maximum RF power transmission	<p>The EUT was exercised in the mode, transmitting at lower, middle and upper channels as shown below one at a time with all supported modulation schemes were evaluated. For Band Edge Compliance, only lower and upper channels were evaluated.</p> <table border="1" data-bbox="603 481 1469 683"> <thead> <tr> <th data-bbox="603 481 1034 526">Transmit Channel</th> <th data-bbox="1040 481 1469 526">Frequency (GHz)</th> </tr> </thead> <tbody> <tr> <td data-bbox="603 535 1034 580">Channel 1 (Lower Channel)</td> <td data-bbox="1040 535 1469 580">2.412</td> </tr> <tr> <td data-bbox="603 589 1034 633">Channel 6 (Middle Channel)</td> <td data-bbox="1040 589 1469 633">2.437</td> </tr> <tr> <td data-bbox="603 642 1034 687">Channel 11 (Upper Channel)</td> <td data-bbox="1040 642 1469 687">2.462</td> </tr> </tbody> </table>	Transmit Channel	Frequency (GHz)	Channel 1 (Lower Channel)	2.412	Channel 6 (Middle Channel)	2.437	Channel 11 (Upper Channel)	2.462
Transmit Channel	Frequency (GHz)								
Channel 1 (Lower Channel)	2.412								
Channel 6 (Middle Channel)	2.437								
Channel 11 (Upper Channel)	2.462								

1.5 Deviations from the Standard

Nil.

1.6 EUT Modification Record

No modifications were made.

1.7 Test Location(s)

TÜV SÜD PSB Pte Ltd
 Electrical & Electronics Centre (EEC), Product Services,
 15 International Business Park
 TÜV SÜD @ IBP
 Singapore 609937





1.8 Test Facilities Registrations

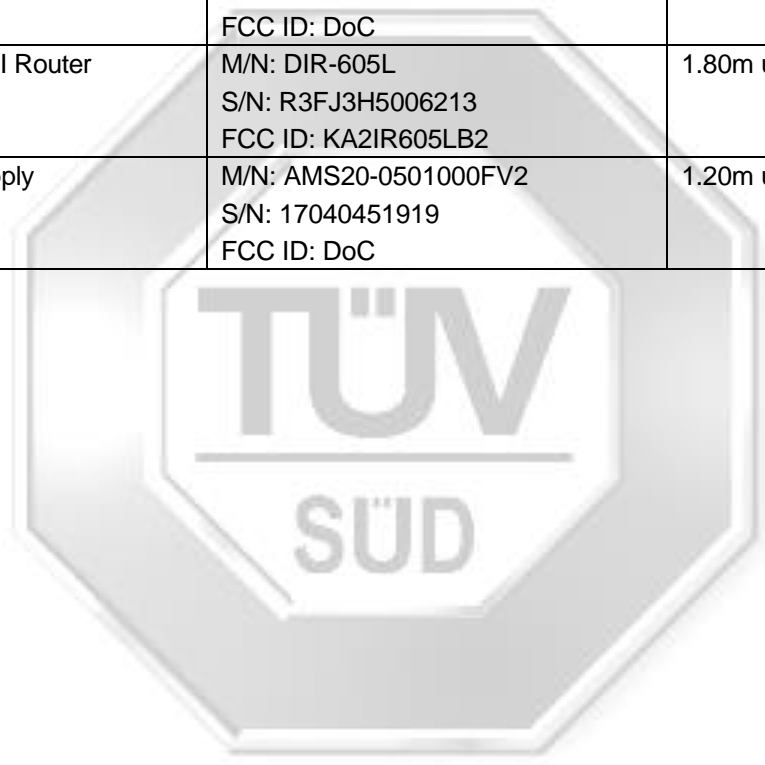
Requirements	Registration Numbers
FCC	994109 (Test Firm Registration Number) SG0002 (Designation Number)
ISED	SGAP01 (CAB Identifier) 2932N-1 (10m Semi-Anechoic Chamber)
VCCI	R-13324 (10m ANC), G-10203 (10mANC) R-20151 (3m RF Chamber - Lab 7), G-20149 (3m RF Chamber - Lab 7) C-14933 (C.E @ CEIBP) T-12403 (Telecom Ports @ CEIBP)
BSMI	SL2-IS-E-6001R [<i>CNS-13803 (ISM Equipment)</i>] SL2-IN-E-6001R [<i>CNS-13438 (IT Equipment)</i>] SL2-R1/R2-E-6001R [<i>CNS-13439 (Broadcast Receivers)</i>] SL2-A1-E-6001R [<i>CNS-13783-1 (Household Appliances)</i>] SL2-L1-E-6001R [<i>CNS-14115 (Lighting Equipment)</i>]
SABS	SABS/A-LAB/0030/2018
ASCA	TL-86





1.9 Supporting Equipment

Equipment Description (Including Brand Name)	Model, Serial & FCC ID Number	Cable Description (List Length, Type & Purpose)
Intel® NUC Mini PC	M/N: NUC6i7KYK S/N: 1801929357864 FCC ID: PD98260D2	
Delta Electronics, INC AC/DC Adapter (Intel® NUC Mini PC)	M/N: ADP-65JH BB S/N: 69WW55701DK FCC ID: DoC	1.80m unshielded power cable
Lenovo ThinkVision® T24i-10	M/N: C18238FT0 S/N: 1S61CEMAR2WWVNA4MB3R FCC ID: DoC	1.80m unshielded power cable
D-Link N300 WI-FI Router	M/N: DIR-605L S/N: R3FJ3H5006213 FCC ID: KA2IR605LB2	1.80m unshielded power cable
D-Link Power Supply	M/N: AMS20-0501000FV2 S/N: 17040451919 FCC ID: DoC	1.20m unshielded power cable





2 Test Details

2.1 Radiated Emissions (Spurious Emissions Inclusive Restricted Bands Requirement)

2.1.1 Test Limits

Frequency Range (MHz)	Quasi-Peak Limit Values (dBµV/m)
0.009 - 0.490 *	20 log [2400 / F (kHz)] @ 300m
0.490 - 1.705	20 log [24000 / F (kHz)] @ 30m
1.705 - 30.0	30.0 @ 30m
30 – 88	40.0 @ 3m
88 – 216	43.5 @ 3m
216 – 960	46.0 @ 3m
Above 960 *	54.0 @ 3m

* For frequency bands 9kHz – 90kHz, 110kHz – 490kHz and above 1GHz, average detector was used. A peak limit of 20dB above the average limit does apply.

Restricted Bands

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
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	Above 38.6
13.36 - 13.41			



2.1.2 Test Setup

- 2.1.2.1 The EUT and supporting equipment were set up in accordance with the requirements of the standard as shown in the setup photos.
- 2.1.2.2 The filtered power supply for the EUT and supporting equipment were tapped from the appropriate power sockets located on the turntable.
- 2.1.2.3 The relevant broadband antenna was set at the required test distance away from the EUT and supporting equipment boundary.

2.1.3 Test Method

- 2.1.3.1 The EUT was switched on and allowed to warm up to its normal operating condition.
- 2.1.3.2 A prescan was carried out to pick the worst emission frequencies from the EUT. For EUT which is a portable device, the prescan was carried out by rotating the EUT through three orthogonal axes to determine which altitude and equipment arrangement produces such emissions.
- 2.1.3.3 The test was carried out at the selected frequency points obtained from the pre-scan. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
 - a. Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
 - b. The EUT was then rotated to the direction that gave the maximum emission.
 - c. Finally, the antenna height was adjusted to the height that gave the maximum emission
- 2.1.3.4 A Quasi-peak measurement was made for that frequency point if it was less than or equal to 1GHz. For frequency point in range of 9kHz – 90kHz, 110kHz – 490kHz and above 1GHz, both Peak and Average measurements were carried out.
- 2.1.3.5 The measurements were repeated for the next frequency point, until all selected frequency points were measured.
- 2.1.3.6 The frequency range covered was from the lowest radio frequency signal generated from the EUT, without going below 9kHz to 10th harmonics of the EUT fundamental frequency, using the loop antenna for frequency below 30MHz, Bi-log antenna for frequencies from 30MHz up to 1GHz, and the Horn antenna above 1GHz.

Sample Calculation Example

At 300 MHz

Q-P limit = 46.0 dB μ V/m

Log-periodic antenna factor & cable loss at 300 MHz = 18.5 dB
Q-P reading obtained directly from EMI Receiver = 40.0 dB μ V/m
(Calibrated level including antenna factors & cable losses)

Therefore, Q-P margin = 46.0 - 40.0 = 6.0

i.e. 6.0 dB below Q-P limit



2.2.5 Test Results

Test Input Power	Battery Operated	Temperature	24°C
Test Distance	10m (<30MHz) 3m (≥30MHz – 25GHz)	Relative Humidity	60%
Mode	Data Transmission	Atmospheric Pressure	1030mbar
		Tested By	Derrick Ng, Nazrulhizat
		Test Date	10, 11 Nov 2022

Spurious Emissions ranging from 9kHz – 30MHz (for 9kHz – 90kHz, 110kHz – 490kHz) *See Note 4 & 5

Freq (GHz)	Peak Value (dBμV/m)	Peak Limit (dBμV/m)	Peak Margin (dB)	AV Value (dBμV/m)	AV Limit (dBμV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
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Spurious Emissions ranging from 9kHz – 30MHz *See Note 4 & 5

Frequency (MHz)	Q-P Value (dBμV/m)	Q-P Limit (dBμV/m)	Q-P Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Channel
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Spurious Emissions ranging from 30MHz – 1GHz

Frequency (MHz)	Q-P Value (dBμV/m)	Q-P Limit (dBμV/m)	Q-P Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Channel (Worst)
49.1850	12.5	40.0	27.5	359	33	V	1
319.9920	22.4	46.0	23.6	100	82	H	1
519.9950	22.0	46.0	24.0	170	75	H	1
600.6960	18.0	46.0	28.0	224	166	H	1
789.3330	20.6	46.0	25.4	400	176	V	1
959.9480	25.9	46.0	20.1	148	114	H	1



Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
1.5752	37.1	74.0	36.9	30.6	54.0	23.4	175	307	V	1
3.2159	41.1	74.0	32.9	28.3	54.0	25.7	111	237	V	1
3.7611	44.7	74.0	29.3	30.9	54.0	23.1	203	230	V	1
4.8241	66.3	74.0	7.7	48.8	54.0	5.2	111	177	V	1
7.2370	54.2	74.0	19.8	37.6	54.0	16.4	170	38	H	1
9.6480	54.0	74.0	20.0	39.5	54.0	14.5	100	1	V	1

Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
4.8739	61.7	74.0	12.3	45.9	54.0	8.1	138	173	V	6
7.3102	53.7	74.0	20.3	34.8	54.0	19.2	127	202	V	6
9.7480	59.1	74.0	14.9	43.1	54.0	10.9	138	199	V	6
10.6878	53.2	74.0	20.8	39.4	54.0	14.6	246	183	H	6
12.7457	49.2	74.0	24.8	35.2	54.0	18.8	291	53	V	6
14.5236	53.3	74.0	20.7	39.5	54.0	14.5	165	236	V	6

Spurious Emissions above 1GHz – 25GHz

Freq (GHz)	Peak Value (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)	AV Value (dBµV/m)	AV Limit (dBµV/m)	AV Margin (dB)	Height (cm)	Azimuth (Degrees)	Pol (H/V)	Ch
1.5748	48.8	74.0	25.2	34.0	54.0	20.0	154	40	V	11
4.9239	57.9	74.0	16.1	43.9	54.0	10.1	100	186	V	11
7.3871	47.5	74.0	26.5	32.3	54.0	21.7	105	172	V	11
9.8479	56.9	74.0	17.1	40.4	54.0	13.6	127	204	V	11
10.7004	53.4	74.0	20.6	39.7	54.0	14.3	300	220	V	11
14.4927	53.5	74.0	20.5	39.8	54.0	14.2	154	276	V	11



Notes

1.	All possible modes of operation were investigated. Only the worst case emissions measured, using the correct CISPR detectors, are reported. All other emissions were relatively insignificant.
2.	A "positive margin" indicates a PASS as it refers to the margin present below the limit line at the particular frequency. Conversely, a "negative margin" indicates a FAIL.
3.	EMI receiver Resolution Bandwidth (RBW) and Video Bandwidth (VBW) settings: <u>9kHz – 150kHz</u> RBW: 200Hz VBW: 1kHz <u>150kHz – 30MHz</u> RBW: 9kHz VBW: 30kHz <u>30MHz - 1GHz</u> RBW: 120kHz VBW: 1MHz <u>>1GHz</u> RBW: 1MHz VBW: 3MHz
4.	"--" indicates no emissions were found and shows compliance to the limits
5.	The measurement was done at 10m. The measured results were extrapolated to the specified test limits as specified in § 15.209 (a) based on 40dB/decade.
6.	Quasi-peak measurement was used for frequency measurement up to 1GHz. Average and peak measurements were used for emissions above 1GHz. The average measurement was done by averaging over a complete cycle of the pulse train, including the blanking interval as the pulse train duration does not exceed 0.1 second.
7.	The upper frequency of radiated emission investigations was according to requirements stated in Section 15.33 (a) for intentional radiators & Section 15.33 (b) for unintentional radiators.
8.	The channel in the table refers to the transmit channel of the EUT.

2.2 Band Edge Compliance (Radiated)

2.2.1 Test Limits

The EUT shows compliance to the requirements of this section, which states in any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator (EUT) is operating, the radio frequency power that is produced by the EUT shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands shall comply to the radiated emission limits specified in 15.209.

2.2.2 Test Setup

2.2.2.1 The EUT and supporting equipment were set up as shown in the setup photo.

2.2.2.2 The power supply for the EUT was connected to a filtered mains.

2.2.2.3 The resolution bandwidth (RBW) and the video bandwidth (VBW) of the spectrum analyser were respectively set to 100kHz and 300kHz to show compliance of spurious at band edges are at least 20dB below the carriers. For restricted band spurious at band edges, peak and average measurement plots were taken using the following setting:

- a. Peak Plot:
RBW = 1MHz, VBW = 3RBW
- b. Average Plot
RBW = 1MHz, VBW = 10Hz

2.2.2.4 All other supporting equipment were powered separately from another filtered mains.

2.2.3 Test Method

2.2.3.1 The EUT was switched on and allowed to warm up to its normal operating condition. The EUT was then configured to operate in the test mode.

2.2.3.2 The frequency span of the spectrum analyser was set to wide enough to capture the lower band edge of the transmission band, 2.400GHz and any spurious emissions at the band edge.

2.2.3.3 The spectrum analyser was set to max hold to capture any spurious emissions within the span. The signal capturing was continuous until no further spurious emissions were detected.

2.2.3.4 The measurements were repeated if the EUT supports more than one modulation and data rate.

2.2.3.5 The measurements were repeated with the frequency span of the spectrum analyser was set to wide enough to capture the upper band edge frequency of the transmission band, 2.4835GHz and the any spurious emissions at the band-edge.



2.2.4 Test Results

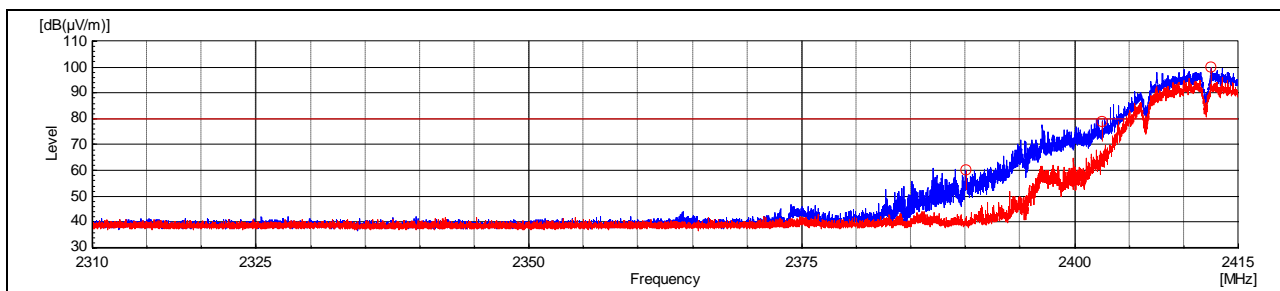
Test Input Power	Battery Operated	Temperature	24°C
Attached Plots	1 – 6	Relative Humidity	60%
		Atmospheric Pressure	1030mbar
		Tested By	Derrick Ng, Nazrulhizat
		Test Date	12 Nov 2022

No significant signal was found and they were below the specified limit.

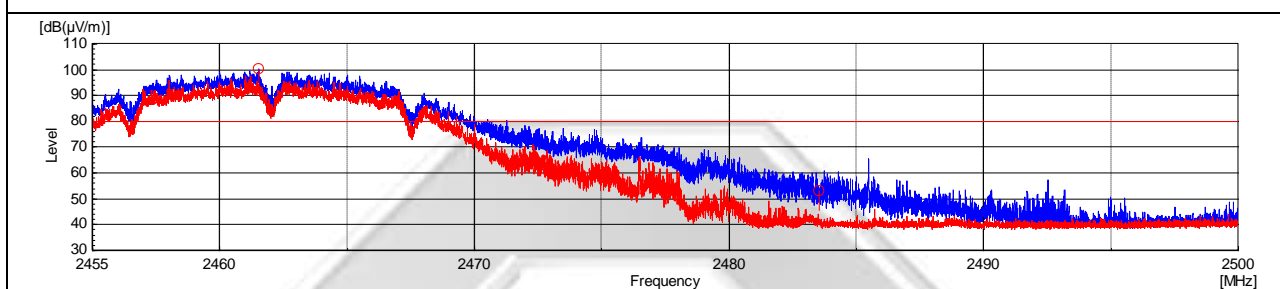




Band Edge Compliance (Radiated) Plots (20dB Delta from Carrier at Band Edge)



Plot 1 – Lower Band Edge at 2.4000GHz

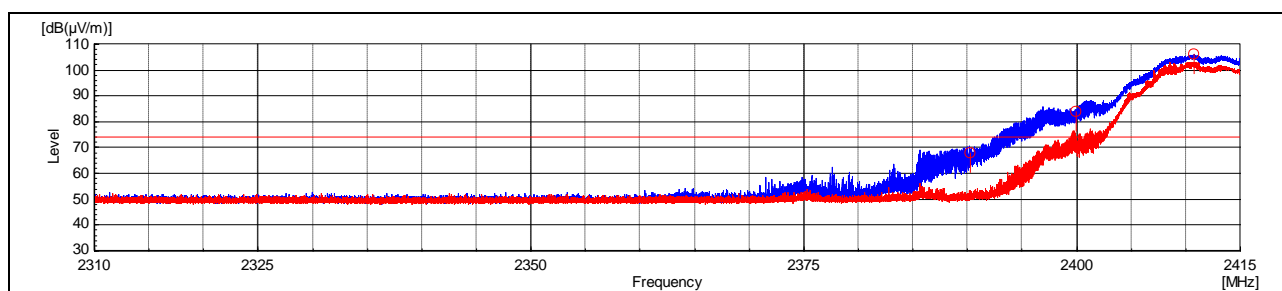


Plot 2 – Upper Band Edge at 2.4835GHz

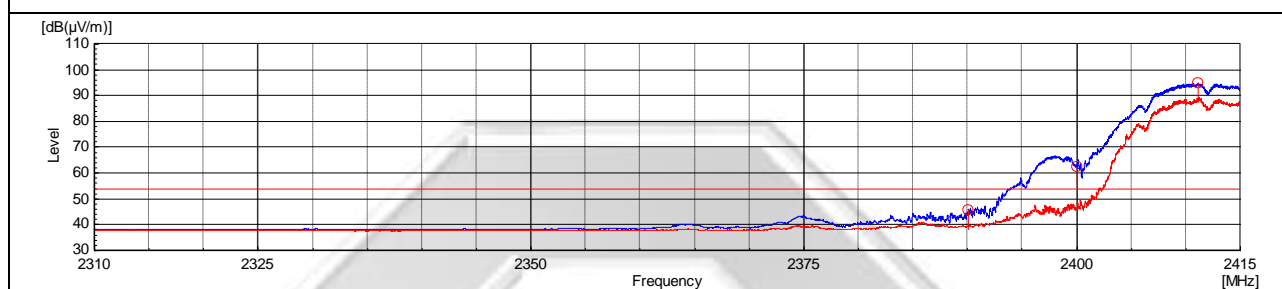




Band Edge Compliance (Radiated) Plots (Restricted Band)



Plot 3 – Peak Plot at Lower Band Edge at 2.4000GHz

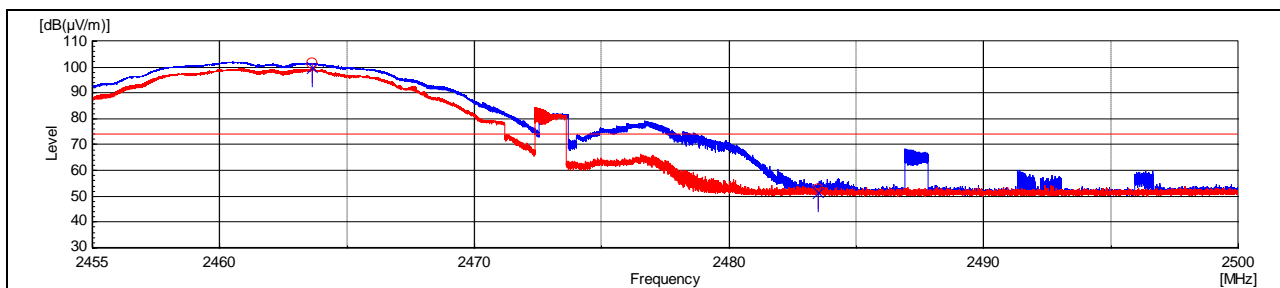


Plot 4 – Average Plot at Lower Band Edge at 2.4000GHz

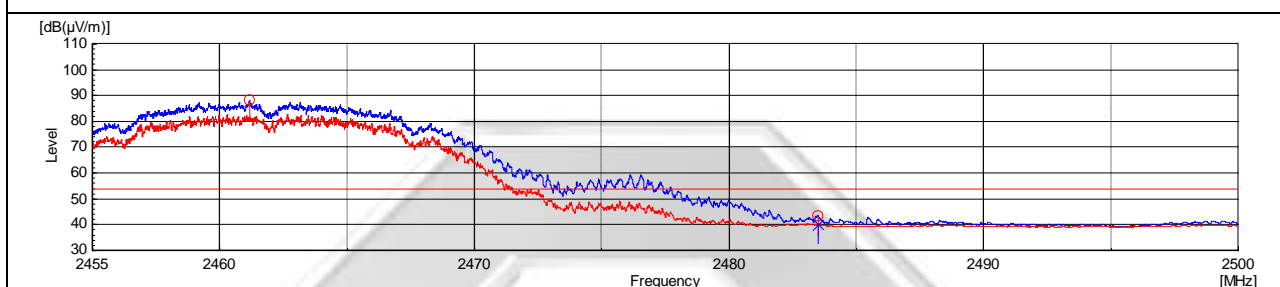




Band Edge Compliance (Radiated) Plots (Restricted Band)



Plot 5 – Peak Plot at Upper Band Edge at 2.4835GHz

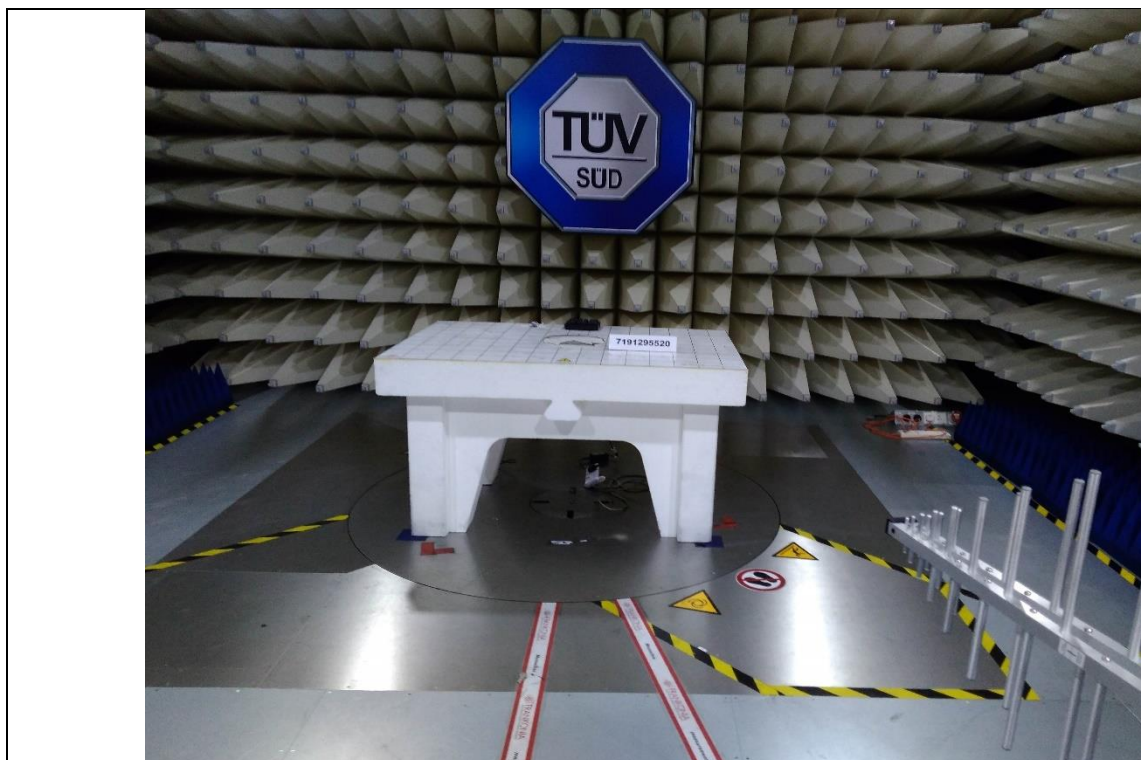


Plot 6 – Average Plot at Upper Band Edge at 2.4835GHz

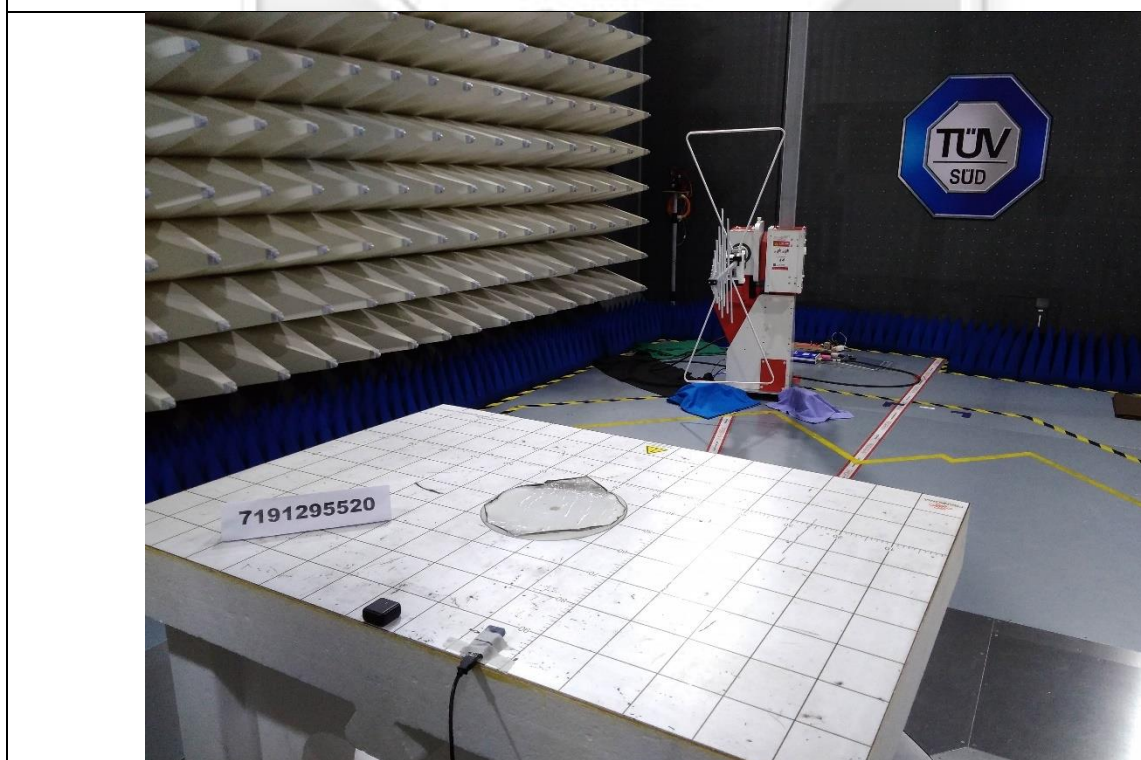


3 Photographs

TEST SETUP (30MHz to 1GHz)

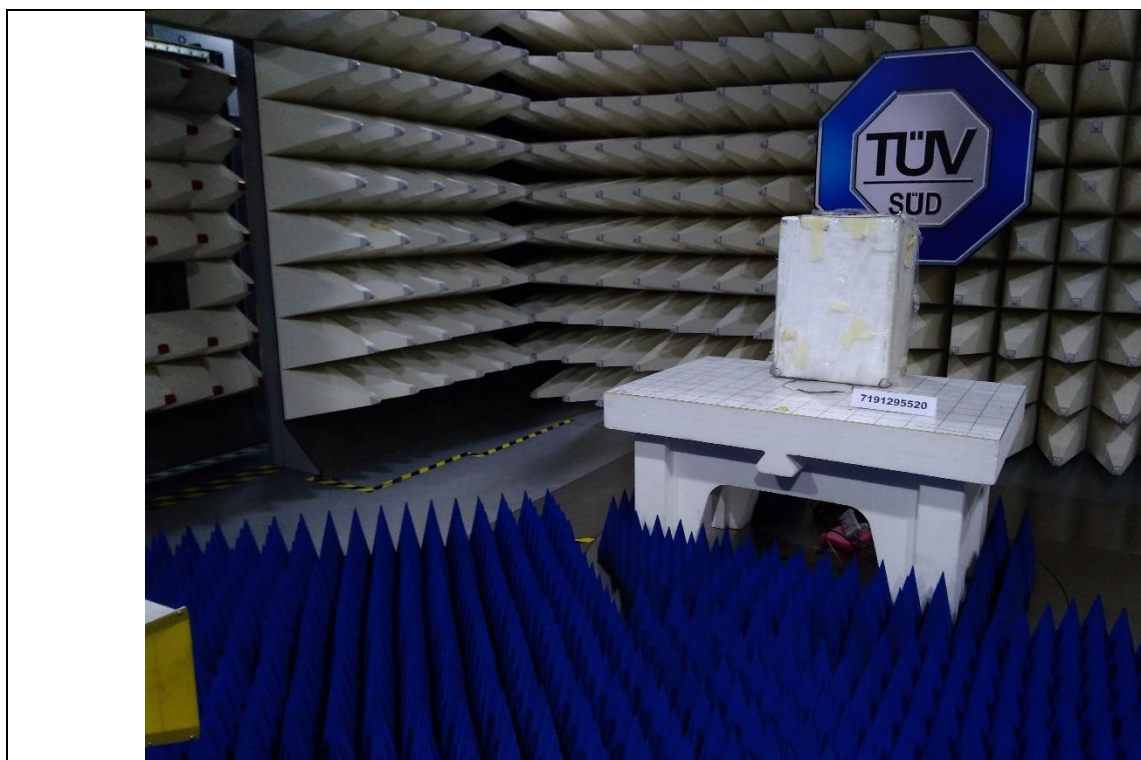


Radiated Emissions (Spurious Emissions Inclusive Restricted Bands Requirement) Test Setup (Front View)

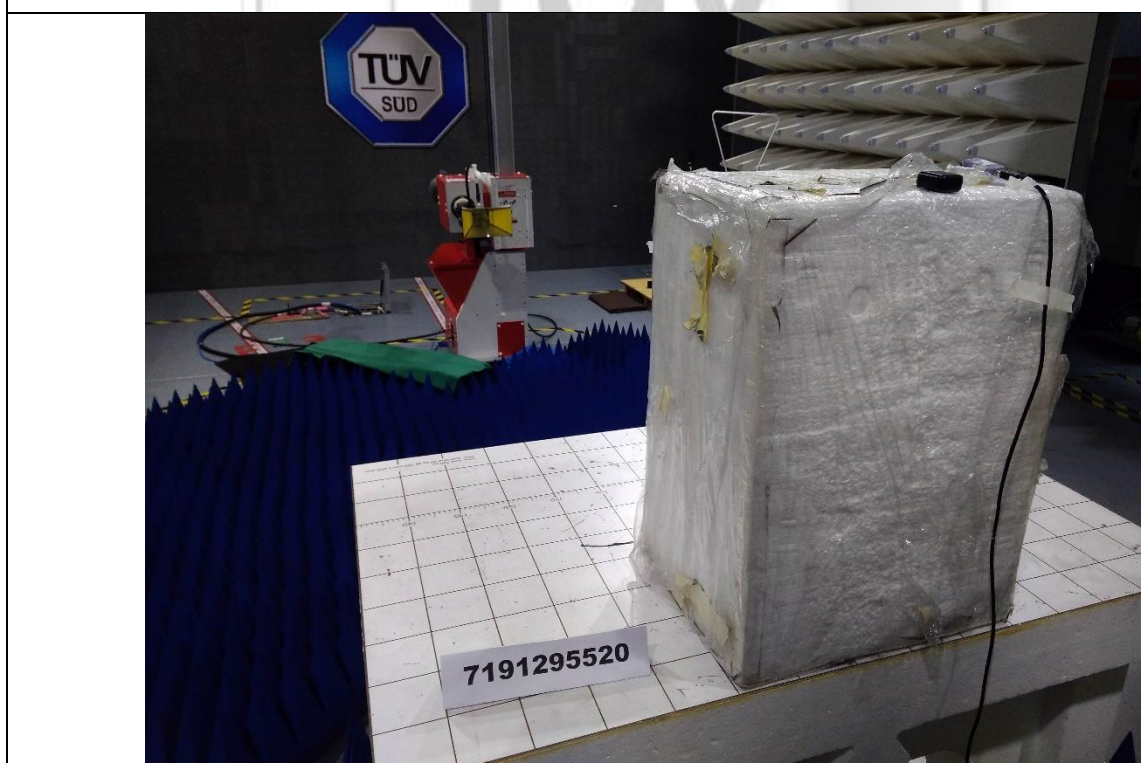


Radiated Emissions (Spurious Emissions Inclusive Restricted Bands Requirement) Test Setup (Rear View)

TEST SETUP (Above 1GHz)

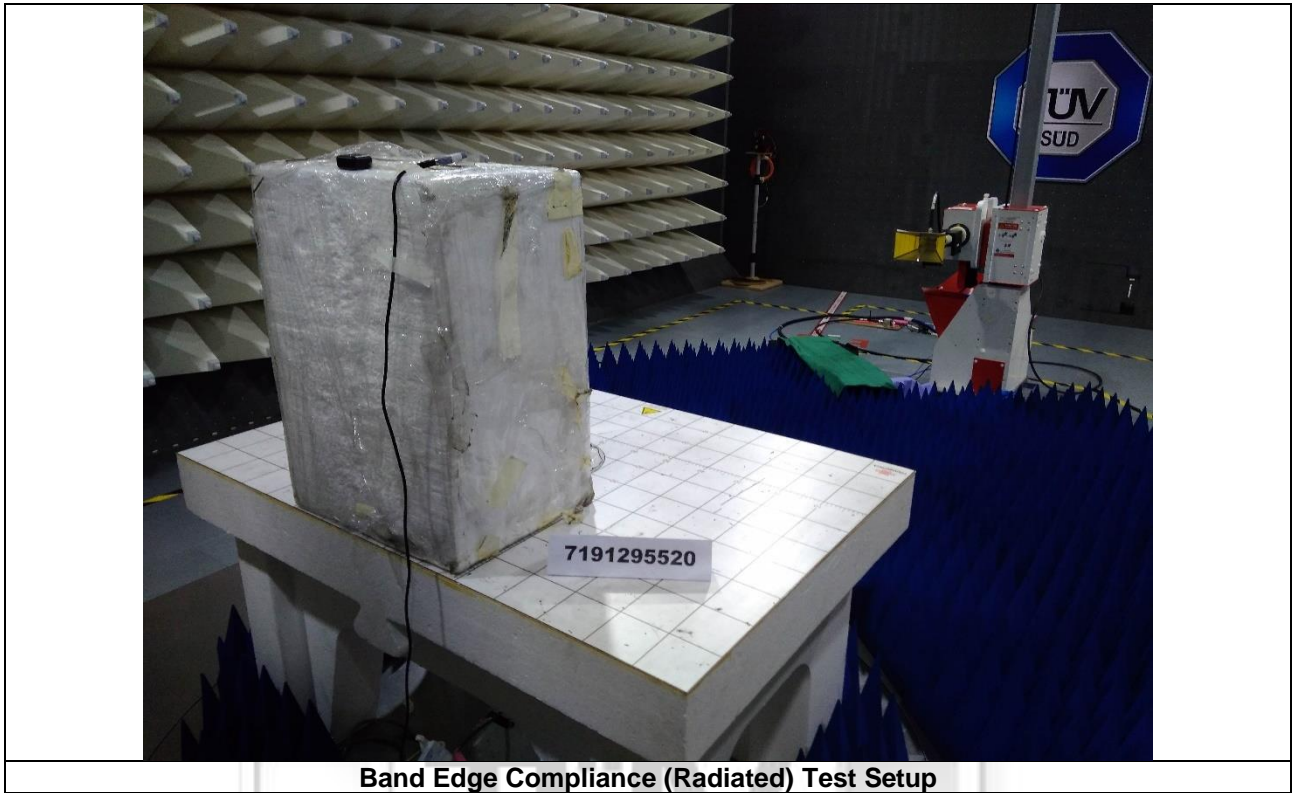


Radiated Emissions (Spurious Emissions Inclusive Restricted Bands Requirement) Test Setup (Front View)



Radiated Emissions (Spurious Emissions Inclusive Restricted Bands Requirement) Test Setup (Rear View)

TEST SETUP



EUT PHOTOGRAPHS



View 1



View 2

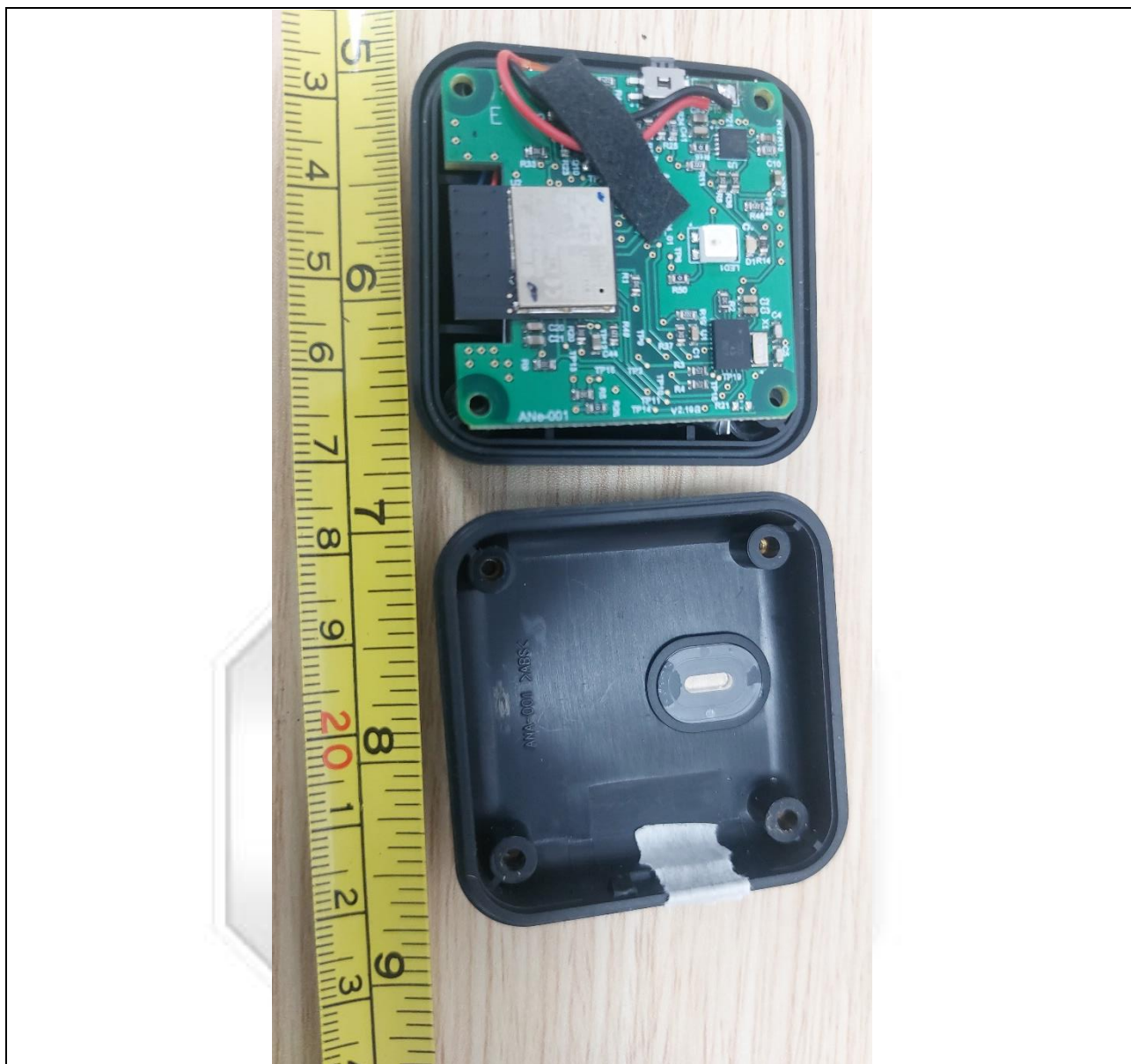
EUT PHOTOGRAPHS



View 3



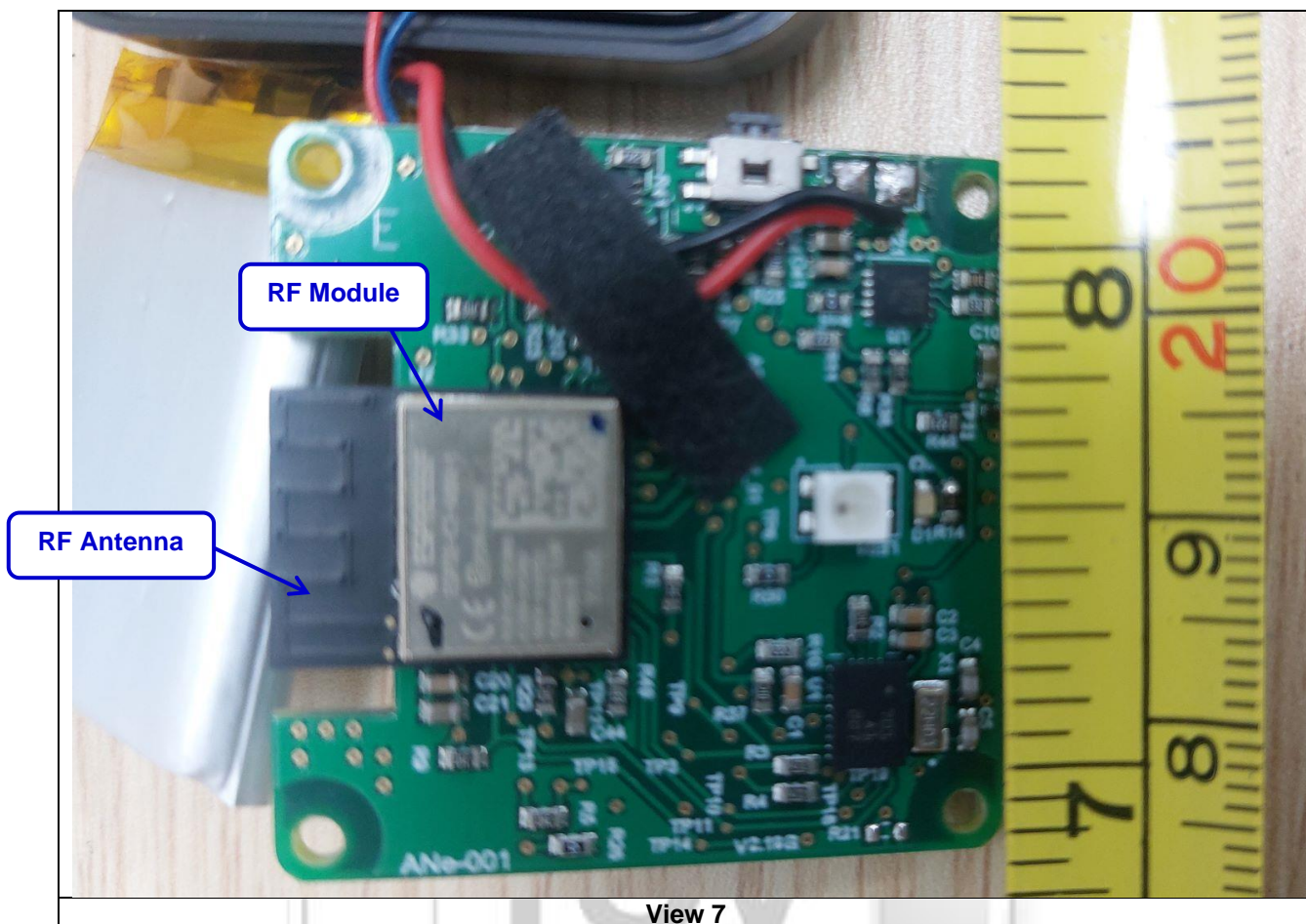
View 4



View 5



View 6

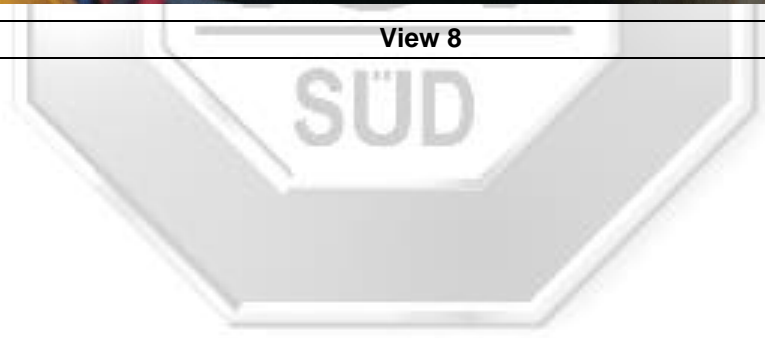


View 7



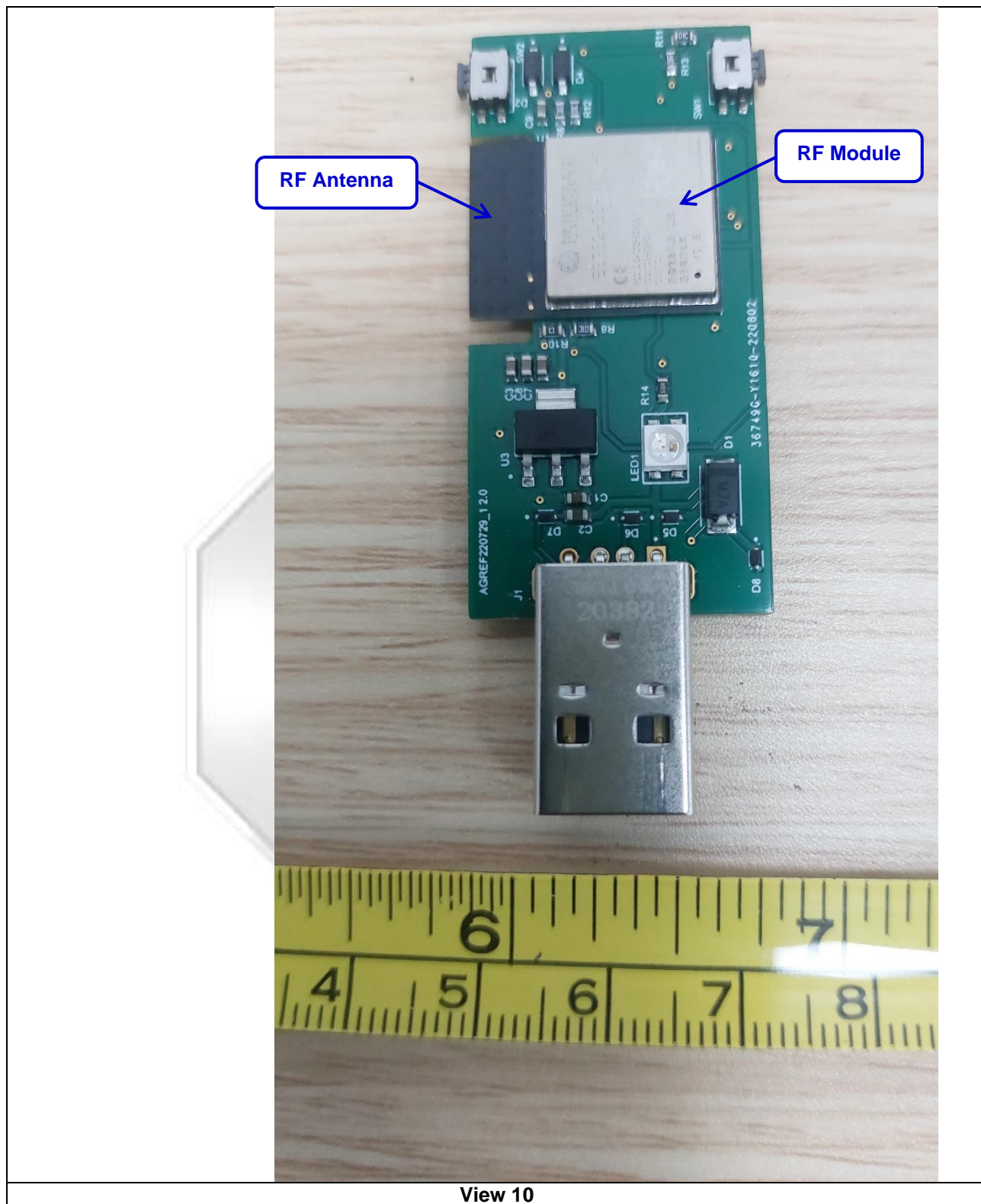


View 8





View 9





View 11



4 Test Equipment

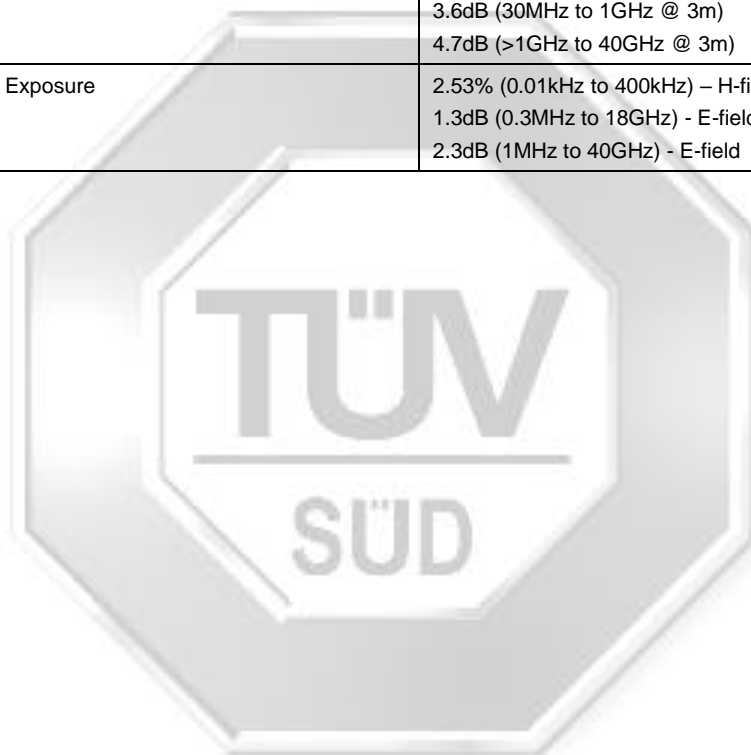
Instrument	Model	S/No	Cal Due Date
<i>Radiated Emissions (Spurious Emissions Inclusive Restricted Bands Requirement)</i>			
R&S EMI Test Receiver (1Hz - 44GHz)	ESW44	101661	07 Oct 2023
Com-Power Preamplifier (1MHz - 1GHz)	PAM-103	441162	16 Feb 2023
Schwarzbeck Hybrid Antenna (30MHz – 1GHz)	VULB9168	1430	06 Apr 2023
R&S Preamplifier (1GHz -18GHz)	SCU18	102191	12 Jan 2023
Electro-Metrics Horn Antenna (1GHz - 18GHz)	EM-6961	6553	16 Mar 2023
HP Preamplifier (1GHz - 26.5GHz)	8449B	3008A1078	01 Jun 2023
ETS Horn Antenna (18GHz - 40GHz)	3116	0004-2474	08 Oct 2023
Micro-tronics Bandstop Filter (2.4GHz)	BRM50701-02	007	13 Aug 2023
<i>Band Edge Compliance (Radiated)</i>			
R&S EMI Test Receiver (1Hz - 44GHz)	ESW44	101661	07 Oct 2023
R&S Preamplifier (1GHz -18GHz)	SCU18	102191	12 Jan 2023
Electro-Metrics Horn Antenna (1GHz - 18GHz)	EM-6961	6553	16 Mar 2023
<i>Maximum Permissible Exposure</i>			
Wavecontrol EM Field Meter	SMP2	21SN1744	03 Nov 2023
Wavecontrol Isotropic EM Field Probe (300kHz – 18GHz)	WPF18	21WP090498	03 Nov 2023



5 Measurement Uncertainty

All measured results are traceable to the SI units. The uncertainty of the measurement is at a confidence level of approximately 95%, with a coverage factor of 2.

Test Name	Measurement Uncertainty
Conducted Emissions at Mains Terminals	1.1dB (9kHz to 30MHz)
Radiated Emissions	<u>10m Anechoic Chamber (Lab 4)</u> 2.2dB (9kHz to 30MHz @ 10m) 3.1dB (30MHz to 1GHz @ 10m) 3.7dB (30MHz to 1GHz @ 3m) 4.7dB (>1GHz to 40GHz @ 3m) <u>3m RF Chamber (Lab7)</u> 3.6dB (30MHz to 1GHz @ 3m) 4.7dB (>1GHz to 40GHz @ 3m)
Maximum Permissible Exposure	2.53% (0.01kHz to 400kHz) – H-field 1.3dB (0.3MHz to 18GHz) - E-field 2.3dB (1MHz to 40GHz) - E-field



6 Annex A – FCC Label and Position

Labelling requirements per Section 2.925 & 15.19

The label shown will be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.





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Effective 26 January 2021



