

TEST REPORT

Application No.: SZCR2110023550AT
Applicant: Qorvo International Pte. Ltd.
Address of Applicant: 1 Changi Business Park Avenue 1, # 04-01, Singapore
Manufacturer: Qorvo International Pte. Ltd.
Address of Manufacturer: 1 Changi Business Park Avenue 1, # 04-01, Singapore
Factory: Victory Concept
Address of Factory: Building A, No 18 Shuiyuan Industrial District, Ruhu Town, Huizhou City, 516021, Guangdong

Equipment Under Test (EUT):
EUT Name: UWB Transceiver module
Model No.: DWM3001C
Trade Mark: Qorvo
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2021-11-01
Date of Test: 2021-11-11 to 2021-11-19
Date of Issue: 2021-12-02

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager



Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-12-02		Original

Authorized for issue by:			
		Calvin Weng	
		Calvin Weng/Project Engineer	
		Eric Fu	
		Eric Fu/Reviewer	



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2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (30MHz-1GHz)		ANSI C63.4:2014	Class B	Pass



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4 General Information

4.1 Details of E.U.T.

Power supply:	For RF Module: DC3.3V from debug board For Debug Board: DC5V from PC USB port
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4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Laptop	Lenovo	L480	REF. No.SEA18C01F
Mouse	Lenovo	M-U0025-O	REF. No.:SEA24A01
Router	NETGEAR	DGN2200	REF. No.SEA22A00

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at Mains Terminals (150kHz-30MHz)	± 2.9dB
Radiated Emissions (30MHz-1GHz)	± 5.5dB

Remark:

The U_{lab} (lab Uncertainty) is less than $U_{CISPR/ETSI}$ (CISPR/ETSI Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• **VCCI (Member No. 1937)**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



5 Equipment List

Conducted Emissions at Mains Terminals (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2019-06-13	2022-06-12
EMI Test Receiver	Rohde&Schwarz	ESCI	SEM004-02	2021-03-24	2022-03-23
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2021-07-09	2022-07-08
LISN	Rohde&Schwarz	ENV216	SEM007-01	2021-09-23	2022-09-22
LISN	ETS-LINDGREN	3816/2	SEM007-02	2021-03-24	2022-03-25

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-07-19	2023-07-18
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2021-10-21	2022-10-20
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2021-09-17	2023-09-16
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2021-03-24	2022-03-23
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2021-07-09	2022-07-08

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2021-09-14	2022-09-13
Humidity/ Temperature Indicator	Anymetre	TH101B	SEM002-09	2021-09-14	2022-09-13
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2021-03-30	2022-03-29



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6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement: 47 CFR Part 15, Subpart B
 Test Method: ANSI C63.4:2014

Limit:

0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

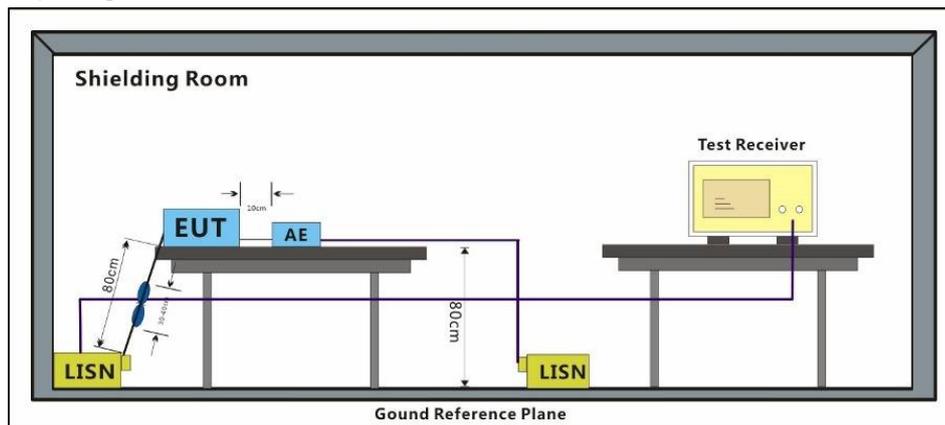
6.1.1 E.U.T. Operation

Operating Environment:
 Temperature: 24.2 °C Humidity: 48.5 % RH Atmospheric Pressure: 1020 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	Normal working

6.1.3 Test Setup Diagram



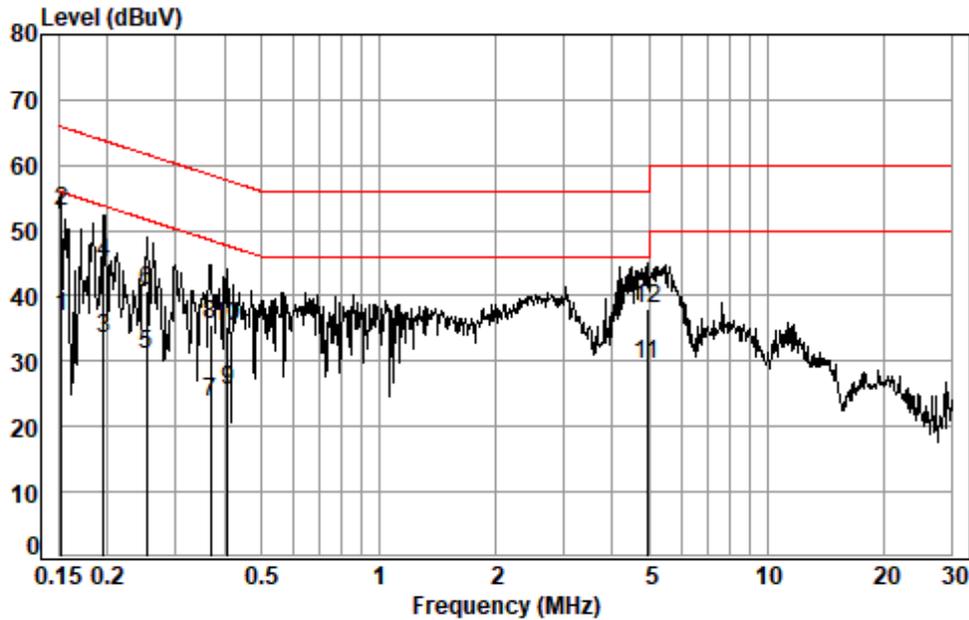
6.1.4 Measurement Procedure and Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

Remark: Level= Read Level+ Cable Loss+ LISN Factor



Test Mode: 04; Line: Live line



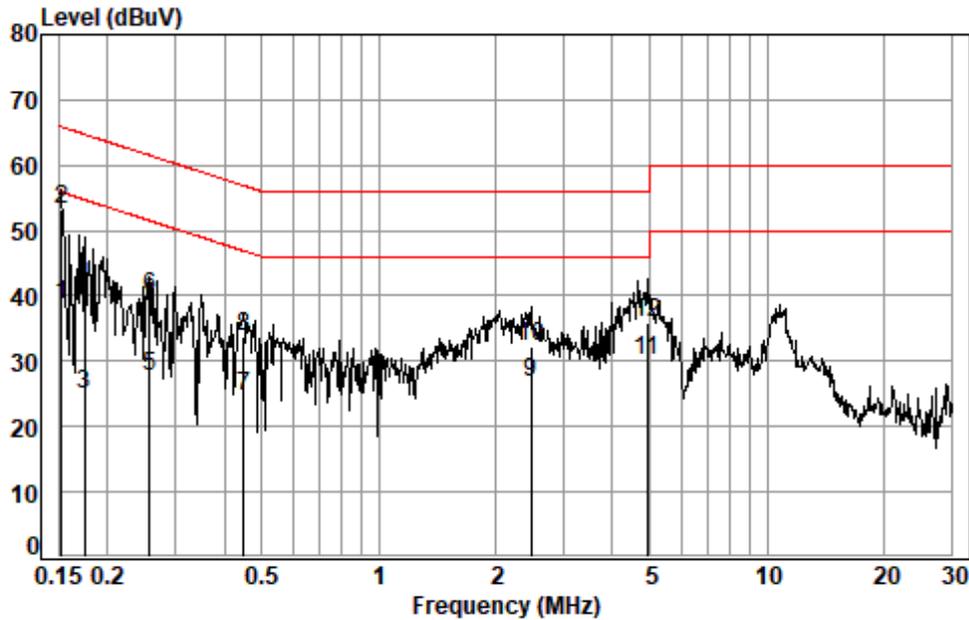
Site : Shielding Room
Condition: Line
Job No. : 23550AT
Test mode: 04

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1524	0.12	9.65	27.10	36.87	55.87	-19.00	Average
2	0.1524	0.12	9.65	43.20	52.97	65.87	-12.90	QP
3	0.1955	0.13	9.65	23.67	33.45	53.80	-20.35	Average
4	0.1955	0.13	9.65	35.34	45.12	63.80	-18.68	QP
5	0.2521	0.14	9.64	21.38	31.16	51.69	-20.53	Average
6	0.2521	0.14	9.64	31.08	40.86	61.69	-20.83	QP
7	0.3692	0.16	9.62	13.91	23.69	48.52	-24.83	Average
8	0.3692	0.16	9.62	25.80	35.58	58.52	-22.94	QP
9	0.4083	0.16	9.63	15.88	25.67	47.68	-22.01	Average
10	0.4083	0.16	9.63	25.35	35.14	57.68	-22.54	QP
11	4.9257	0.20	9.70	19.62	29.52	46.00	-16.48	Average
12	4.9257	0.20	9.70	28.17	38.07	56.00	-17.93	QP



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Test Mode: 04; Line: Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 23550AT
Test mode: 04

	Freq	Cable Loss	LISN Factor	Read Level	Limit Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1524	0.12	9.70	28.87	38.69	55.87	-17.18	Average
2	0.1524	0.12	9.70	43.34	53.16	65.87	-12.71	QP
3	0.1749	0.12	9.70	15.22	25.04	54.72	-29.68	Average
4	0.1749	0.12	9.70	31.45	41.27	64.72	-23.45	QP
5	0.2575	0.14	9.68	17.92	27.74	51.51	-23.77	Average
6	0.2575	0.14	9.68	29.95	39.77	61.51	-21.74	QP
7	0.4492	0.17	9.69	14.73	24.59	46.89	-22.30	Average
8	0.4492	0.17	9.69	23.80	33.66	56.89	-23.23	QP
9	2.4736	0.20	9.73	16.78	26.71	46.00	-19.29	Average
10	2.4736	0.20	9.73	22.31	32.24	56.00	-23.76	QP
11	4.9257	0.20	9.77	20.06	30.03	46.00	-15.97	Average
12	4.9257	0.20	9.77	25.87	35.84	56.00	-20.16	QP



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6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: 47 CFR Part 15, Subpart B

Test Method: ANSI C63.4:2014

Measurement Distance: 3m

Limit:

FREQUENCY (MHz)	dB μ V/m (At 10m)	dB μ V/m (At 3m)
	Class B	Class B
30MHz -88MHz	29.5	40.0
88MHz-216MHz	33.1	43.5
216MHz-960MHz	35.6	46.0
960MHz-1000MHz	43.5	54.0

Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C

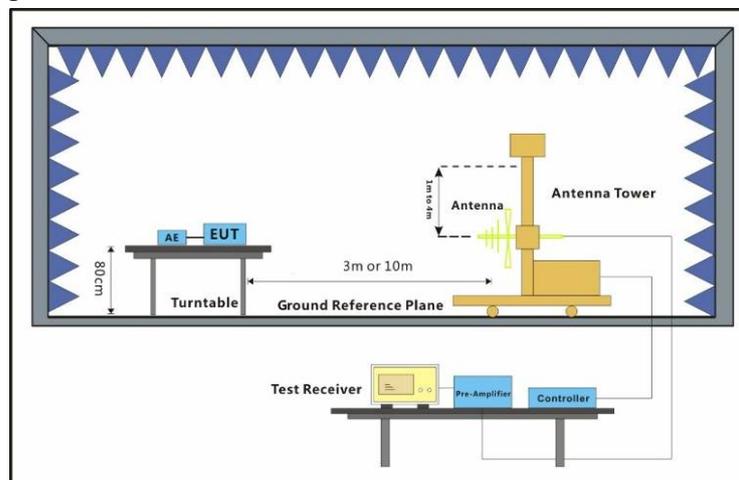
Humidity: 62.4 % RH

Atmospheric Pressure: 1020 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	Normal working

6.2.3 Test Setup Diagram



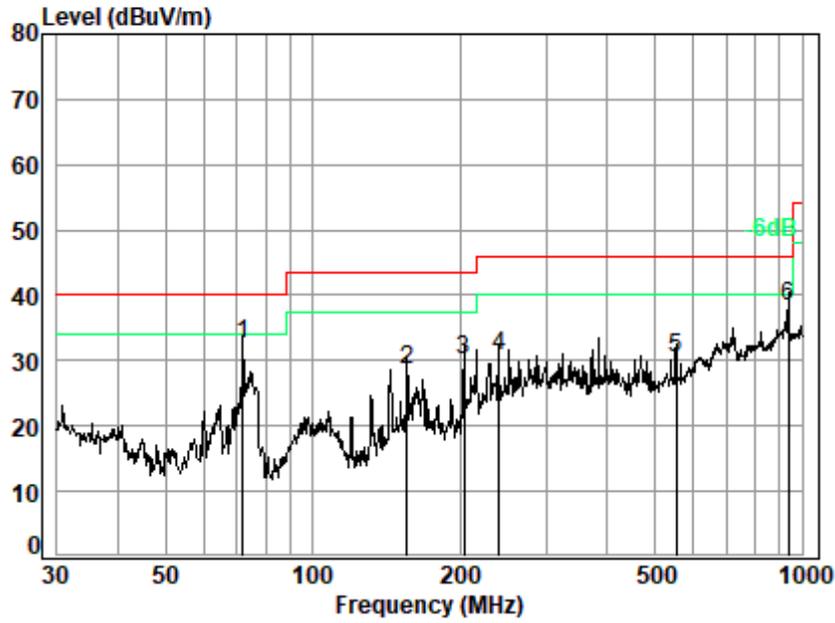
6.2.4 Measurement Procedure and Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



Test Mode: 04; Polarity: Horizontal



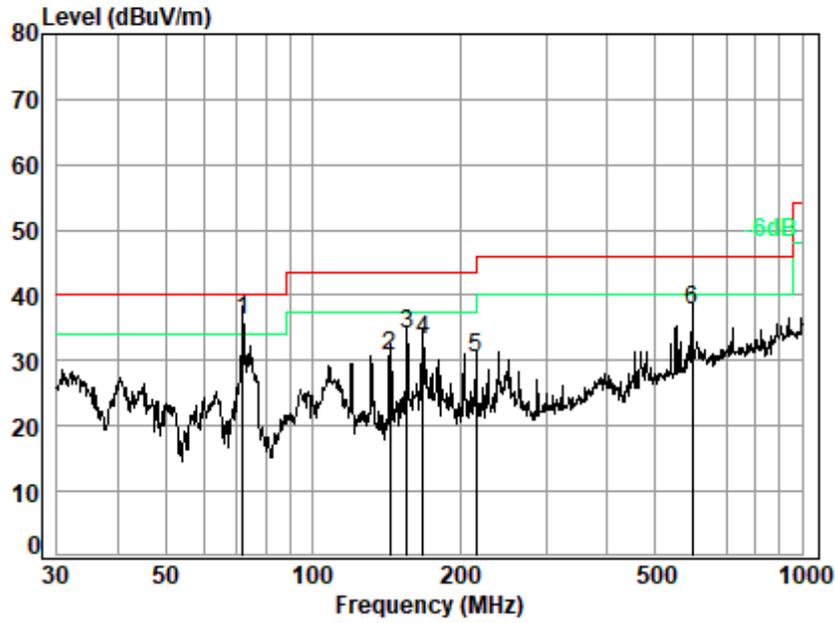
Site : chamber
Condition: 3m HORIZONTAL
Job No. : 23550AT
Test Mode: 04

	Ant	Cable	Preamp	Read	Limit	Over				
	Freq	Factor	Loss	Factor	Level	Level	Line	Limit		
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	q	71.83	10.41	1.24	27.43	48.42	32.64	40.00	-7.36	QP
2		155.91	13.50	1.96	27.12	40.12	28.46	43.50	-15.04	QP
3		204.24	14.82	2.11	26.94	40.12	30.11	43.50	-13.39	QP
4		239.99	17.80	2.14	26.84	37.57	30.67	46.00	-15.33	QP
5		552.88	23.95	2.66	27.76	31.63	30.48	46.00	-15.52	QP
6		938.83	28.66	3.92	26.78	32.53	38.33	46.00	-7.67	QP



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Test Mode: 04; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : 23550AT
Test Mode: 04

	Ant	Cable	Preamp	Read	Limit	Over				
	Freq	Factor	Loss	Factor	Level	Level	Line	Limit		
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB		
1	q	71.83	10.41	1.24	27.43	51.98	36.20	40.00	-3.80	QP
2		143.83	12.40	1.91	27.17	43.45	30.59	43.50	-12.91	QP
3		155.91	13.50	1.96	27.12	45.77	34.11	43.50	-9.39	QP
4		167.82	14.03	2.00	27.07	44.14	33.10	43.50	-10.40	QP
5		216.02	15.65	2.12	26.91	39.55	30.41	46.00	-15.59	QP
6		597.22	25.13	2.70	27.89	37.66	37.60	46.00	-8.40	QP

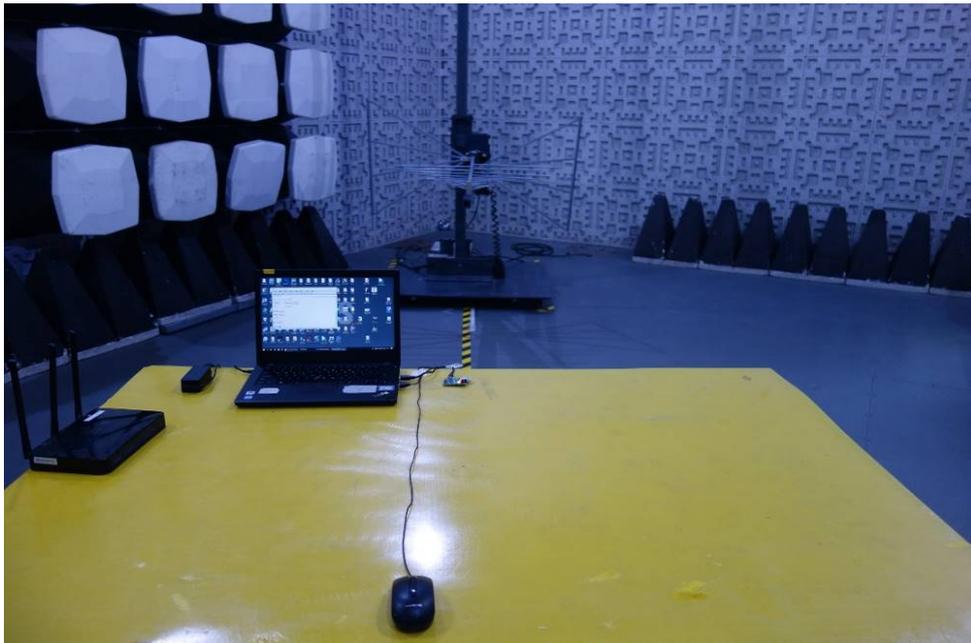


7 Test Setup Photo

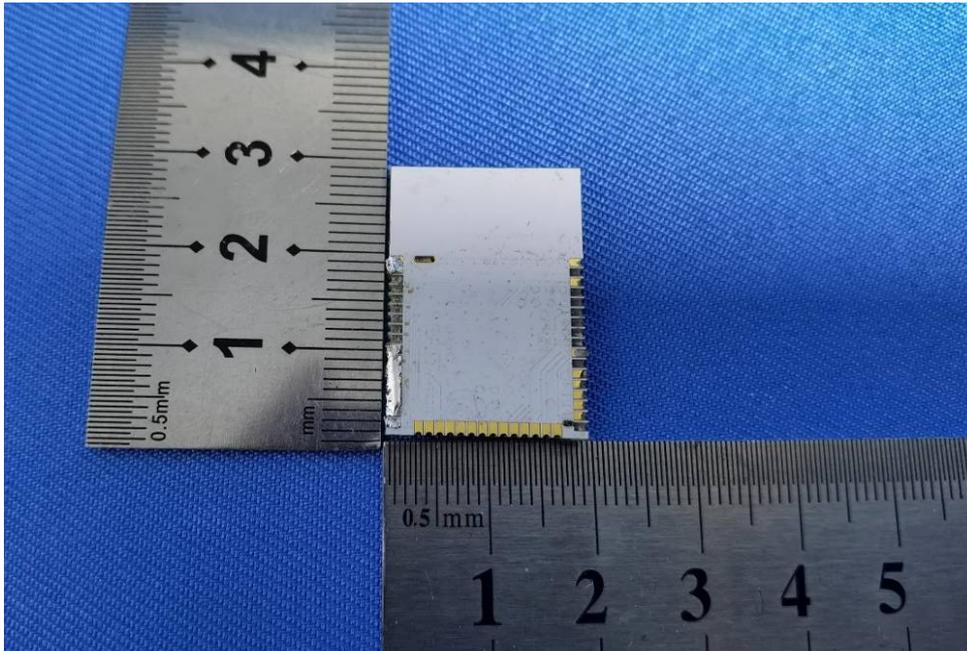
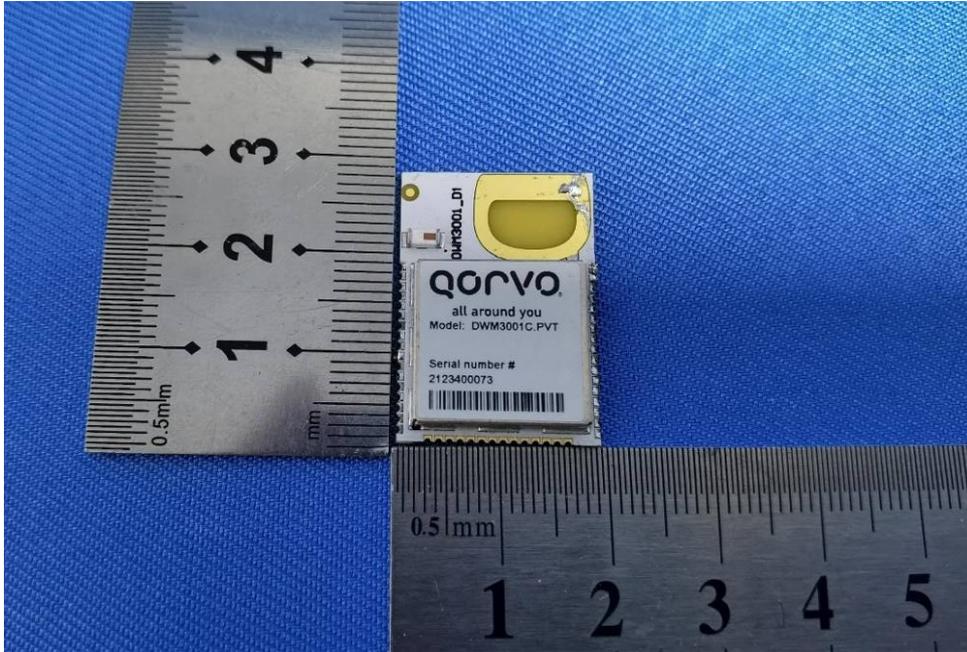
Conducted Emissions at Mains Terminals (150kHz-30MHz)

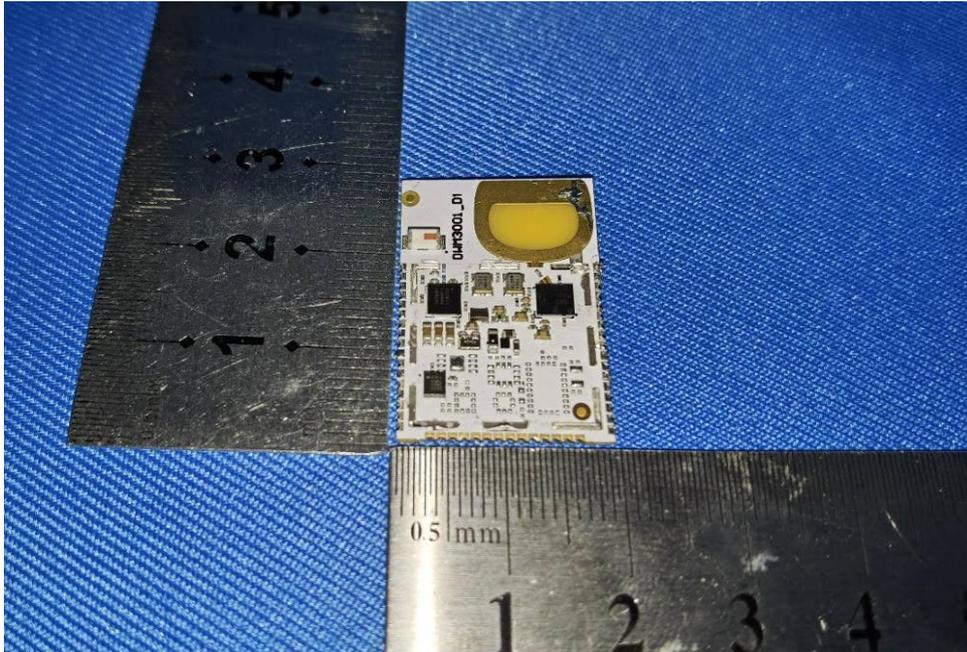


Radiated Emissions (30MHz-1GHz)



8 EUT Constructional Details (EUT Photos)





- End of the Report -

