

EVALUATION REPORT ***for Certification***

Applicant: Summit Technology
130, Digital-ro, Namsung Plaza suite 611,
Geumcheon-gu, Seoul, South Korea
Attn: Mr. Yong-seong Park / Senior Director

Date of Issue: Mar. 04, 2026
Order Number: GETEC-C1-26-055
Test Report Number: GETEC-E3-26-018
Test Site: GUMI UNIVERSITY EMC CENTER
CAB Designation Number: KR0033

RESPONSIBLE PARTY	: Universal Remote Control, Inc
ADDRESS	: 500 Mamaroneck Ave, Suite 502, Harrison, NEW YORK
CONTACT PERSON	: Lars Granoe / Vice President of Product Development

Rule Part(s)	: FCC Part 15 Subpart C-Intentional Radiator § 15.247
Test Method	: ANSI C63.10 (2020)
Equipment Class	: Digital Transmission System(DTS)
EUT Type	: Total Control
Type of Authority	: Certification
Model Name	: MRA-DUO

This equipment has been shown to be in compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10 (2020)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the vest of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested by, 

Eun-Young Park, Associate Engineer
GUMI UNIVERSITY EMC CENTER

Reviewed by, 

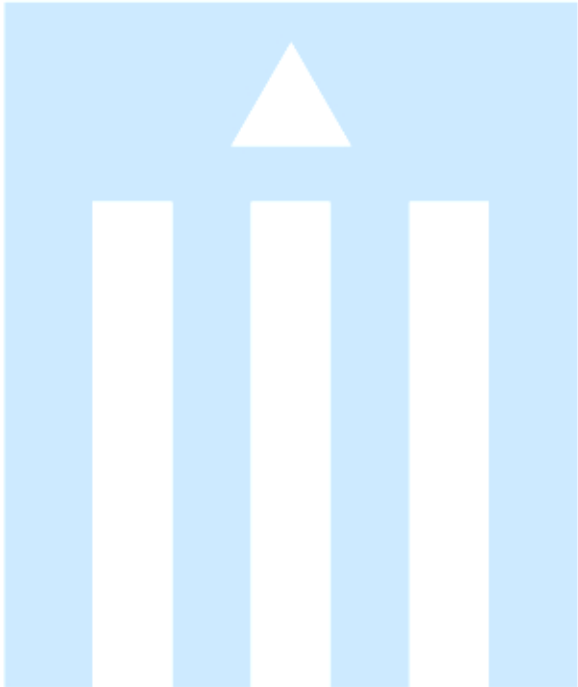
Hyun Kim, Technical Manager
GUMI UNIVERSITY EMC CENTER



Version

Test Report No.	Date	Description
GETEC-E3-26-018	Mar. 04, 2026	- First Approval Report

※ This test report is not related to the accredited test result by ISO/IEC 17025 and KOLAS





CONTENTS

1. GENERAL INFORMATION	4
2. INTRODUCTION	5
3. PRODUCT INFORMATION	6
3.1 DESCRIPTION OF EUT.....	6
3.2 DEFINITION OF MODELS	6
3.3 SUPPORT EQUIPMENT / CABLES USED	7
3.4 MODIFICATION ITEM(S).....	7
4. ANTENNA REQUIREMENT - §15.203	8
4.1 DESCRIPTION OF ANTENNA.....	8
5. DESCRIPTION OF TESTS.....	8
5.1 TEST CONDITION.....	8
6. REFERENCES STANDARDS	8
7. SUMMARY OF TEST RESULTS	9
8. AC POWER LINE CONDUCTED EMISSION	10
8.1 OPERATING ENVIRONMENT	11
8.2 TEST SET-UP	11
8.3 MEASUREMENT UNCERTAINTY.....	11
8.4 LIMIT	12
8.5 TEST EQUIPMENT USED.....	12
8.6 TEST DATA FOR CONDUCTED EMISSION	12
8.7 TEST RESULT	13
9. RADIATED SPURIOUS EMISSION	16
9.1 OPERATING ENVIRONMENT.....	17
9.2 TEST SET-UP.....	17
9.3 MEASUREMENT UNCERTAINTY	17
9.4 LIMIT	18
9.5 TEST EQUIPMENT USED.....	18
9.6 TEST DATA FOR RADIATED SPURIOUS EMISSION.....	19
10. SAMPLE CALCULATIONS.....	22
10.1 EXAMPLE 1 :	22
10.2 EXAMPLE 2 :	22
11. RECOMMENDATION & CONCLUSION	23
APPENDIX A – ATTESTATION STATEMENT	
APPENDIX B – BLOCK DIAGRAM	
APPENDIX C – SCHEMATIC DIAGRAM	
APPENDIX D – TEST SETUP PHOTOGRAPH	
APPENDIX E – USER’S MANUAL	
APPENDIX F – OPERATIONAL DESCRIPTION	
APPENDIX G – RF EXPOSURE EVALUATION	



Scope: Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and / or unintentional radiators for compliance with technical rules and regulations of the Federal Communications Commission.

1. General Information

Applicant: Summit Technology

Applicant Address: 130, Digital-ro, Namsung Plaza suite 611, Geumcheon-gu, Seoul, South Korea

Manufacturer: Summit Technology

Manufacturer Address: 130, Digital-ro, Namsung Plaza suite 611, Geumcheon-gu, Seoul, South Korea

Contact Person: Mr. Yong-seong Park / Senior Director

Telephone Number: +82-2-6929-3161

- **FCC ID.** 2AT6QMRADUO
- **Equipment Class** Digital Transmission System (DTS)
- **EUT Type** Total Control
- **Model Name** MRA-DUO
- **Rule Part(s)** FCC Part 15 Subpart C-Intentional Radiator § 15.247
- **Test Method** ANSI C63.10 (2020)
- **Type of Authority** Certification
- **Test Procedure(s)** ANSI C63.10 (2020), KDB558074 D01 DTS Meas Guidance v05r02
- **Dates of Test** Feb. 19, 2026 ~ Mar. 03, 2026
- **Place of Test**
GUMI UNIVERSITY EMC CENTER
37 Yaeun-ro, Gumi-si, Gyeongsangbuk-do, 39213, Republic of Korea
(FCC Test firm Registration No.: 269701)
(ISED Test Site Registration No.: 7620A)
- **Test Report Number** GETEC-E3-26-018
- **Dates of Issue** Mar. 04, 2026



2. Introduction

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Nose Emissions From Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2014) was used in determining radiated and conducted emissions emanating from **Summit Technology Total Controller (Model name: MRA-DUO)**

These measurement tests were conducted at **GUMI UNIVERSITY EMC CENTER**.

The site address is 37 Yaeun-ro, Gumi-si, Gyeongsangbuk-do, 39213, South Korea

This test site is one of the highest point of Gumi 1 college at about 200 kilometers away from Seoul city and 40 kilometers away from Daejeon city. It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures. The detailed description of the measurement facility was found to be in compliance with the requirements of §2.948 according to ANSI C63.10 (2020)

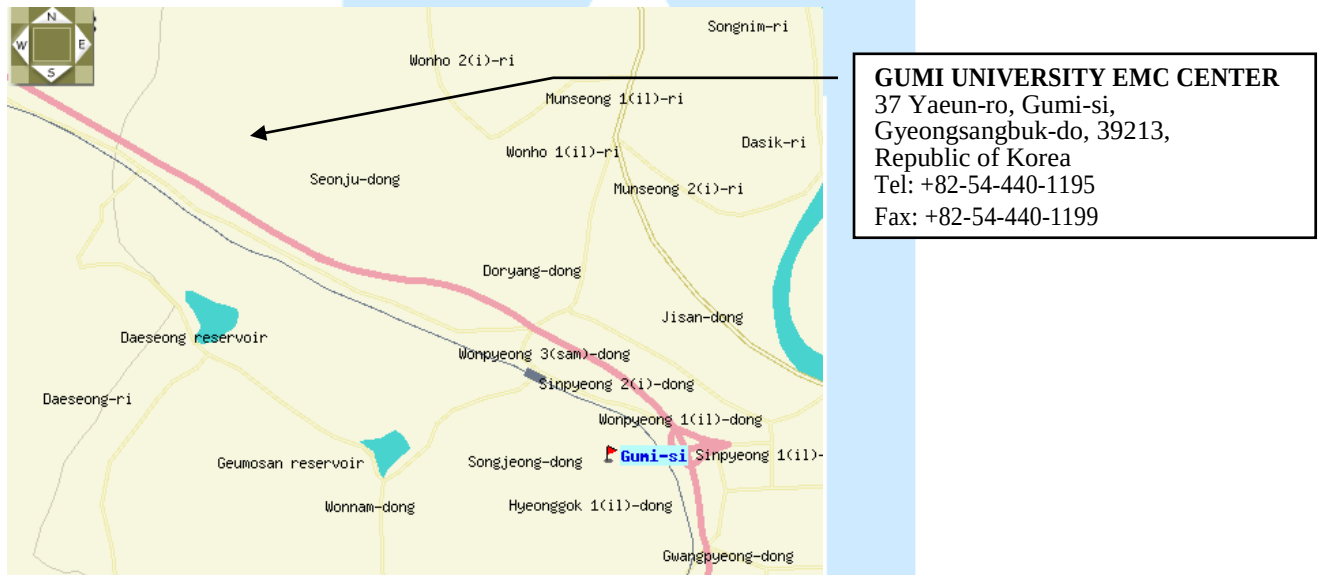


Fig 1. The map above shows the Gumi University in vicinity area.



3. Product Information

3.1 Description of EUT

The Equipment under Test (EUT) is the **Summit Technology Total Control (Model Name: MRA-DUO)**
FCC ID.: 2AT6QMRADUO

- Equipment	: Total Control
- Model Name	: MRA-DUO
- Serial Number	: Proto type
- Electrical Rating	: DC 12.0 V / 1.0 A
- Channel Separations	: 2 MHz
- Type of Modulation	: GFSK
- Type of Technique	: Bluetooth LE
- Frequency Range	: 2 402 MHz ~ 2 480 MHz
- Number of Channel	: 40
- RF Output Power	: 8 dBm
- Type of Chain	: One
- Antenna specification	: Manufacturer: Summit Technology Antenna type : FPC Antenna Peak Gain : 2.25 dBi

3.2 Definition of models

-None.



3.3 Support Equipment / Cables used

3.3.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID.
Notebook computer	Samsung Electronics Co., Ltd.	NT500R3W	S/N: 0Q2V91JJ100096T FCC ID.: -

3.3.2 System configuration

Description	Manufacturer	Model Name	S/N & FCC ID.
AC/DC adapter ¹⁾	URC	MLF-A00121201000U0075	S/N: - FCC ID.: -

1) Input: AC(100-240)V, (50-60)Hz, 0.4A / Output: DC 12V, 1 A

3.3.3 Used Cable(s)

Cable Name	Condition		Description
	In(I/O port)	Out(I/O port)	
DC power	EUT	AC/DC adapter	1.80 m Unshielded with a ferrite core

3.4 Modification Item(s)

-. None



4. Antenna Requirement - §15.203

An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the applicant can be used with the device. The use of permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with this requirement.

4.1 Description of Antenna

The **Summit Technology. Total Control.** comply with the requirement of §15.203 with a built-in PCB pattern antenna permanently attached to the transmitter.

5. Description of tests

5.1 Test Condition

The EUT was installed, arranged and operated in a manner that is most representative of equipment as typically used.

The measurements were carried out while varying operating modes and cable positions within typically arrangement to determine maximum emission level.

The representative and worst test mode(s) were noted in the test report.

- Test Voltage / Frequency: 12 V / DC
- Operating condition during the test(s) :
 - Continuous RF transmitting mode with maximum RF output power.
 - Operating channel frequency and modulation technology
 - Enabling Bluetooth functionality on Realtek modules and ESP32 modules

Mode	Available channel	Frequency	Type of Modulation
Bluetooth LE	0~39	2 402 ~ 2 480 MHz	GFSK

- EUT set condition (Test Software)
Realtek module

Test Software	RTL_RF Test Tool
Test Software version	V1.0.2.5

ESP32 module

Test Software	ESP RF Test Tool
Test Software version	V4.7

6. References Standards

- FCC Part 15 (2009) Subpart C-Intentional Radiator §15.247
- ANSI C 63.10 (2020): American National Standard for Testing Unlicensed Wireless Devices
- KDB 558074 D01 DTS meas Guidance v05r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247



7. SUMMARY OF TEST RESULTS

FCC Part Section(s)	Test Description	Test Result
§15.247(a)(2)	6 dB Bandwidth	N/A ¹⁾
§15.247(b)(3)	Conducted Maximum Peak Output Power	N/A ¹⁾
§15.247(e)	Power Spectral Density	N/A ¹⁾
§15.247(d)	Conducted Out of Band Emission Emissions	N/A ¹⁾
§15.207(a)	AC Power line Conducted Emissions	Pass
§15.205, 15.209	Radiated Spurious Emissions	Pass

Note)

- 1) The EUT has changed non-transmitter parts. Therefore the test was not applicable.



8. AC Power line Conducted emission

-Test Description

The Line conducted emission test facility is inside a 4 m × 8 m × 2.5 m shielded enclosure. (Test firm Registration Number: 269701)

The EUT was placed on a non-conducting 1.0 m by 1.5 m table, which is 0.8 m in height and 0.4 m away from the vertical wall of the shielded enclosure.

The EUT is powered from the Rohde & Schwarz LISN and the support equipment is powered from the Rohde & Schwarz LISN. Powers to the LISN are filtered by high-current high insertion loss power line filter.

Sufficient time for EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.

The RF output of the LISN was connected to the EMI test receiver.

Exploratory measurements were conducted to identify the highest emission by operating the EUT in a range of typical modes of operation, cable positions, system configuration and arrangement.

Based on exploratory measurements, the final measurements were conducted at the worst test conditions.

Exploratory measurements were scanned using Peak mode of EMI Test receiver from 150 kHz to 30 MHz with 20 ms sweep time. The final measurements were measured with Quasi-Peak and Average mode.

The bandwidth of EMI Test Receiver was set to 9 kHz. Interface cables were connected to the available interface ports of the test unit. Excess cable lengths were bundled at center with 30 cm ~ 40 cm.

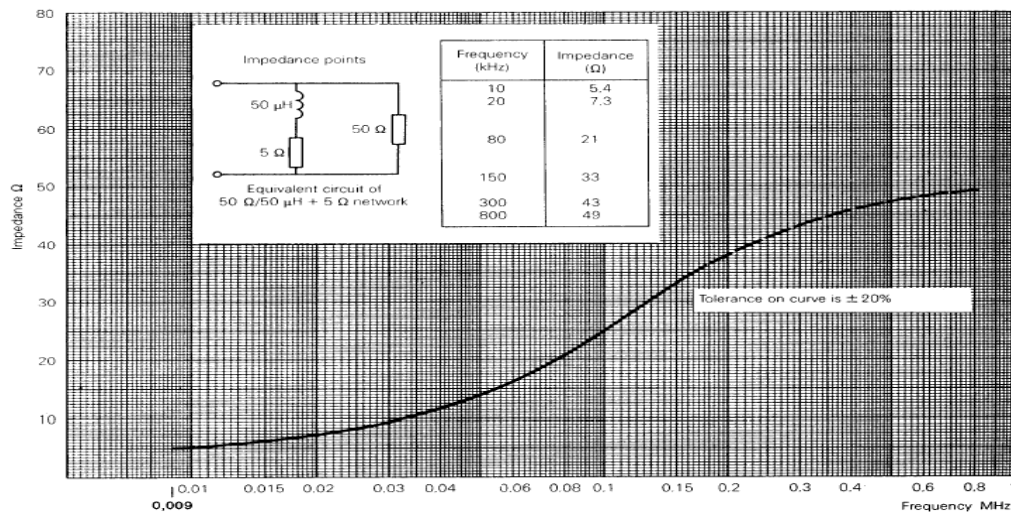


Fig 2. Impedance of LISN



8.1 Operating Environment

Temperature : 23.9 °C
Relative Humidity : 28.1 % R.H.

8.2 Test Set-up

The conducted emission measurements were performed in the shielded room.

The EUT was placed on wooden table, 0.8 m heights above the floor, 0.4 m from the reference ground plane (GRP) wall and 0.8 m from AMN & ISN.

AMN is bonded on horizontal reference ground plane.

The ground plane, which was electrically bonded to the shield room, ground system and all power lines entering the shield room, were filtered.

8.3 Measurement Uncertainty

The measurement uncertainty was calculated in accordance with ISO “Guide to the expression of uncertainty in measurement.”

The measurement uncertainty was given with a confidence of 95 %.

Test Items	Uncertainty	Remark
Conducted emission (9 kHz ~ 150 kHz)	3.70 dB	Confidence level of approximately 95 % ($k = 2$)
Conducted emission (150 kHz ~ 30 MHz)	3.29 dB	Confidence level of approximately 95 % ($k = 2$)



8.4 Limit

RFI Conducted	FCC Limit(dBμV/m) Class B	
Freq. Range	Quasi-Peak	Average
150 kHz ~ 0.5 MHz	66 ~ 56*	56 ~ 46*
0.5 MHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50
*Limits decreases linearly with the logarithm of frequency.		

8.5 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Calibration
■- ESCI	Rohde & Schwarz	EMI test receiver	100237	Apr. 03, 2025
■- ESH2-Z5	Rohde & Schwarz	LISN	829991/009	Apr. 03, 2025
□- ENV216	Rohde & Schwarz	LISN	100173	Apr. 04, 2025
■- EMC 32	Rohde & Schwarz	Testing Software	VER8.53.0	N/A
■- RG400	RF & Connector Technology	Shield Room Cable#1	N/A	May 21, 2025

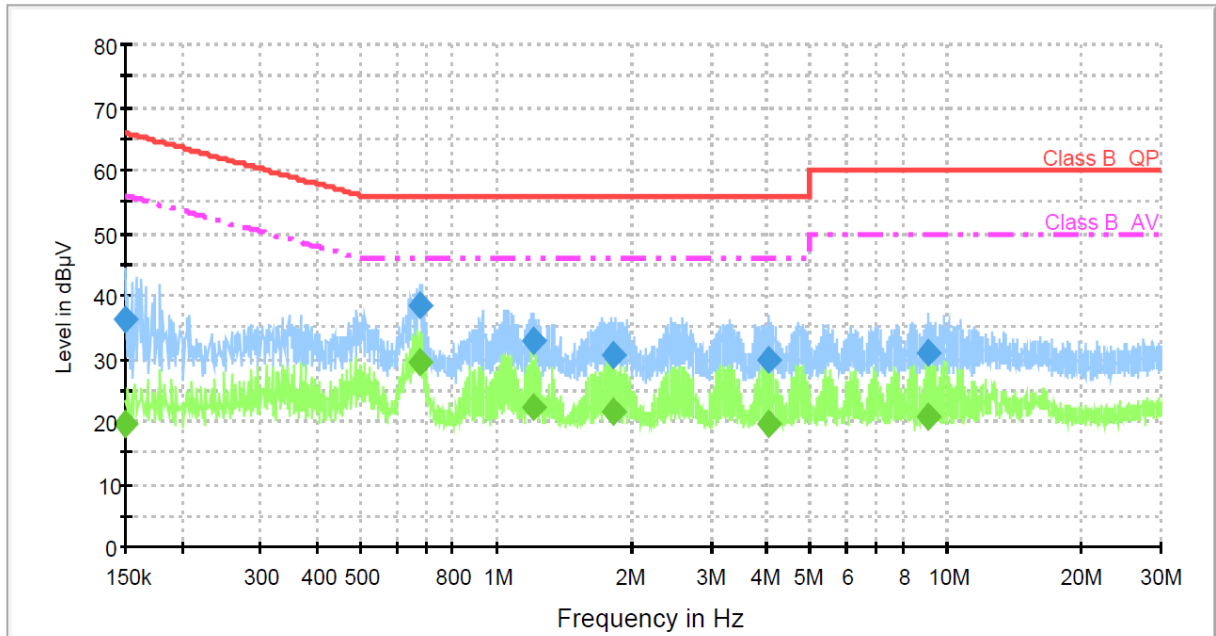
8.6 Test data for Conducted Emission

- Test Date : Mar. 03, 2026
- Reference Standard : Part 15 Subpart C, Sec. 15.207
- Test Procedure(s) : ANSI C63.4 (2017)
- Operating Condition : RF transmitting mode (Low: 2 402 MHz, Middle: 2 440 MHz, High: 2 480 MHz)
- Frequency rage : 0.15 MHz to 30 MHz
- Power Source : AC 120 V / 60 Hz
- Comment : -



8.7 Test Result

AC Power Line Conducted emission (2 402 MHz)



Class B_QP Class B_AV Preview Result 1-PK+ Preview Result 2-AVG Final Result 1-QPK Final Result 2-CAV

Final Result 1

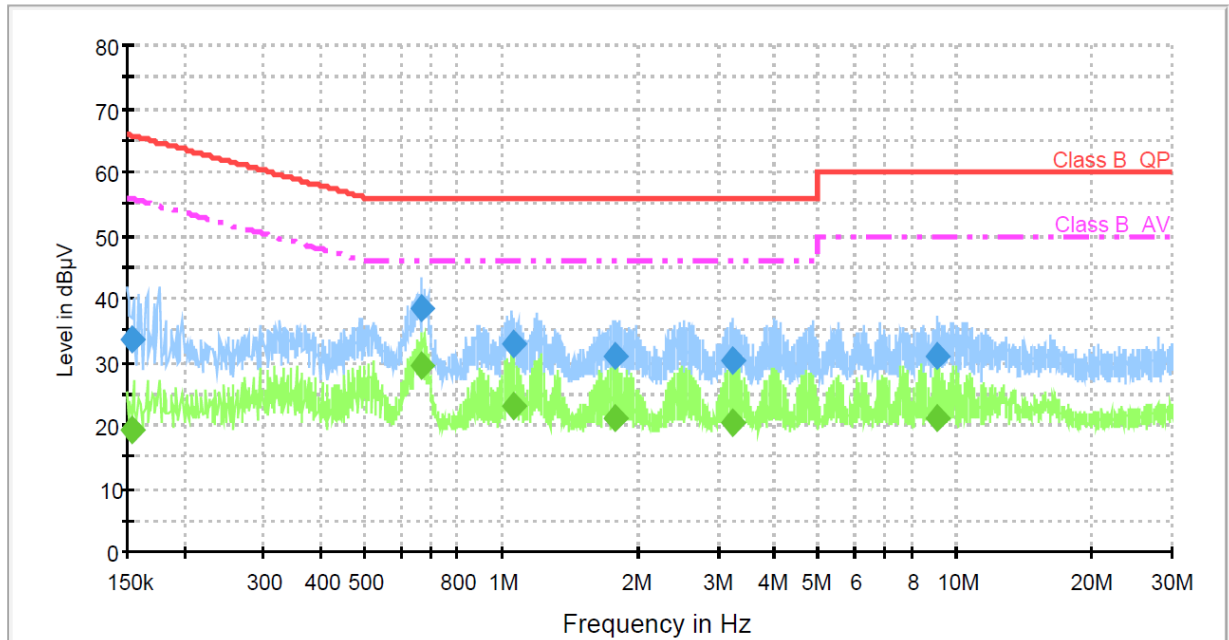
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	36.1	1000.0	9.000	FLO	L1	10.2	29.90	66.00	
0.674938	38.4	1000.0	9.000	FLO	L1	10.2	17.60	56.00	
1.208675	32.7	1000.0	9.000	FLO	L1	10.3	23.30	56.00	
1.815300	30.7	1000.0	9.000	FLO	L1	10.3	25.30	56.00	
4.027625	29.8	1000.0	9.000	FLO	L1	10.4	26.20	56.00	
9.165250	31.1	1000.0	9.000	FLO	L1	10.5	28.90	60.00	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	19.6	1000.0	9.000	FLO	L1	10.2	36.40	56.00	
0.674938	29.4	1000.0	9.000	FLO	L1	10.2	16.60	46.00	
1.208675	22.4	1000.0	9.000	FLO	L1	10.3	23.60	46.00	
1.815300	21.7	1000.0	9.000	FLO	L1	10.3	24.30	46.00	
4.027625	19.8	1000.0	9.000	FLO	L1	10.4	26.20	46.00	
9.165250	20.8	1000.0	9.000	FLO	L1	10.5	29.20	50.00	



AC Power Line Conducted emission (2 440 MHz)



Class B_QP Class B_AV Preview Result 1-PK+ Preview Result 2-AVG Final Result 1-QPK Final Result 2-CAV

Final Result 1

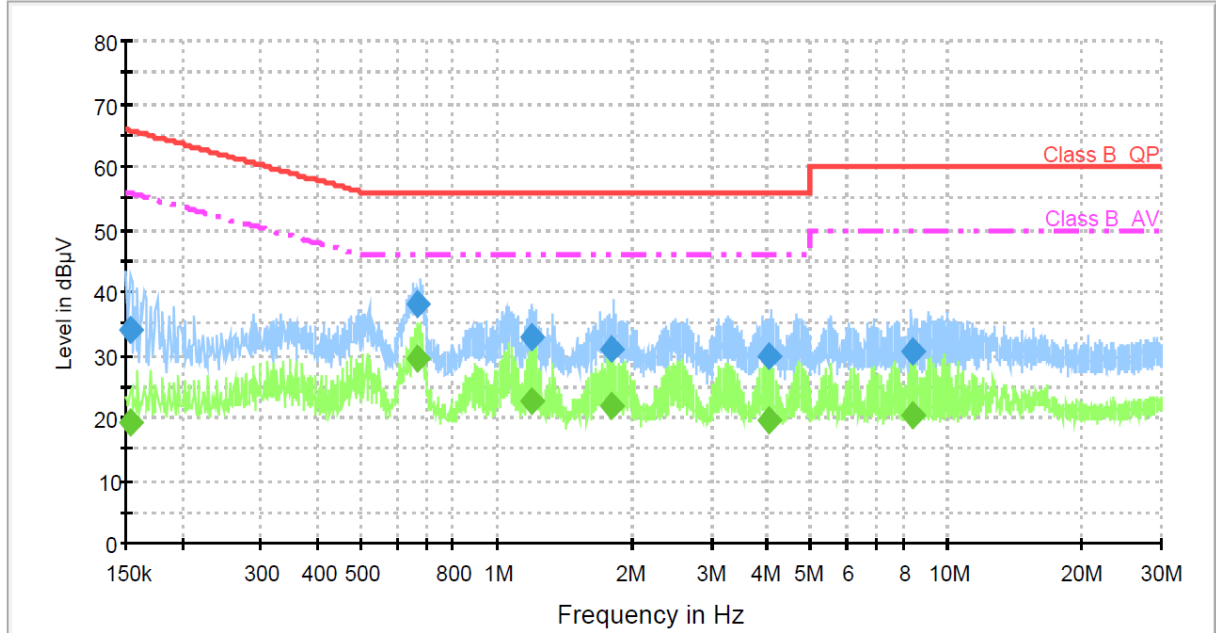
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.154175	33.8	1000.0	9.000	FLO	L1	10.2	32.00	65.80	
0.671662	38.5	1000.0	9.000	FLO	L1	10.2	17.50	56.00	
1.063662	32.9	1000.0	9.000	FLO	L1	10.3	23.10	56.00	
1.787888	31.1	1000.0	9.000	FLO	L1	10.3	24.90	56.00	
3.232338	30.1	1000.0	9.000	FLO	L1	10.3	25.90	56.00	
9.097000	30.9	1000.0	9.000	FLO	L1	10.5	29.10	60.00	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.154175	19.4	1000.0	9.000	FLO	L1	10.2	36.40	55.80	
0.671662	29.5	1000.0	9.000	FLO	L1	10.2	16.50	46.00	
1.063662	23.2	1000.0	9.000	FLO	L1	10.3	22.80	46.00	
1.787888	21.1	1000.0	9.000	FLO	L1	10.3	24.90	46.00	
3.232338	20.4	1000.0	9.000	FLO	L1	10.3	25.60	46.00	
9.097000	21.0	1000.0	9.000	FLO	L1	10.5	29.00	50.00	



AC Power Line Conducted emission (2 480 MHz)



Class B_QP Class B_AV Preview Result 1-PK+
Preview Result 2-AVG Final Result 1-QPK Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.154000	33.9	1000.0	9.000	FLO	L1	10.2	31.80	65.80	
0.666938	38.3	1000.0	9.000	FLO	L1	10.2	17.70	56.00	
1.201162	32.7	1000.0	9.000	FLO	L1	10.3	23.30	56.00	
1.809238	30.8	1000.0	9.000	FLO	L1	10.3	25.20	56.00	
4.052962	29.7	1000.0	9.000	FLO	L1	10.3	26.30	56.00	
8.373750	30.4	1000.0	9.000	FLO	L1	10.5	29.60	60.00	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.154000	19.2	1000.0	9.000	FLO	L1	10.2	36.60	55.80	
0.666938	29.5	1000.0	9.000	FLO	L1	10.2	16.50	46.00	
1.201162	22.7	1000.0	9.000	FLO	L1	10.3	23.30	46.00	
1.809238	21.7	1000.0	9.000	FLO	L1	10.3	24.30	46.00	
4.052962	19.7	1000.0	9.000	FLO	L1	10.3	26.30	46.00	
8.373750	20.6	1000.0	9.000	FLO	L1	10.5	29.40	50.00	



9. Radiated Spurious Emission

Exploratory Radiated measurements were conducted at the 3m semi anechoic chamber in order to identify the highest emission by operating the EUT in a range of typical modes of operation, cable positions, system configuration and arrangement.

Based on exploratory measurements, the final measurements were conducted at the worst test conditions.

Final measurements of below 1GHz were made at 3m or 10 m Chamber that complies with CISPR 16/ANSI C63.10. Above 1GHz final measurements were conducted at the 3m Chamber only.

For measurements above 1GHz, the bottom side of 3m chamber was installed with absorbers in order to meet SVSWR Limit.

Exploratory measurements were scanned using Peak mode of EMI Test receiver and final measurements were measured with Quasi-Peak mode (Below 1GHz) and Peak & Average mode (Above 1GHz).

The measurements were performed by rotating the EUT 360° and adjusting the receive antenna height from 1.0 m to 4.0 m. All frequencies were investigated in both horizontal and vertical antenna polarity.

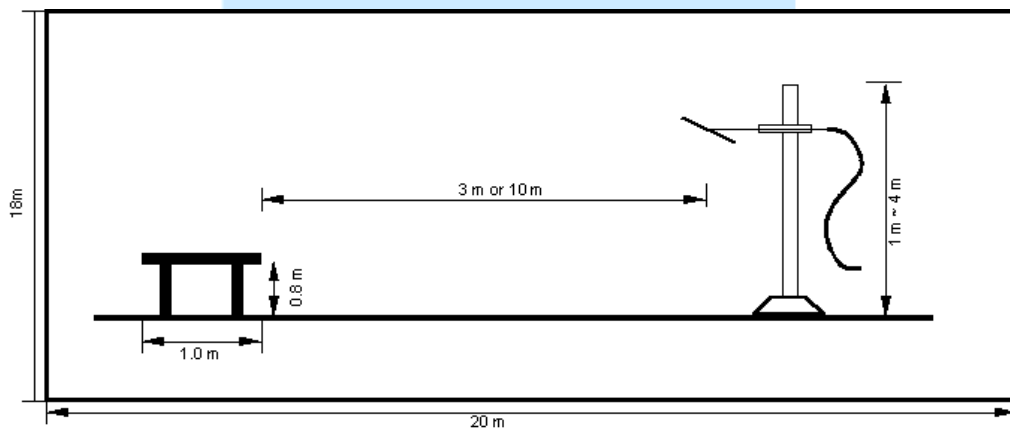


Fig 3. Dimensions of test site (Below 1GHz)

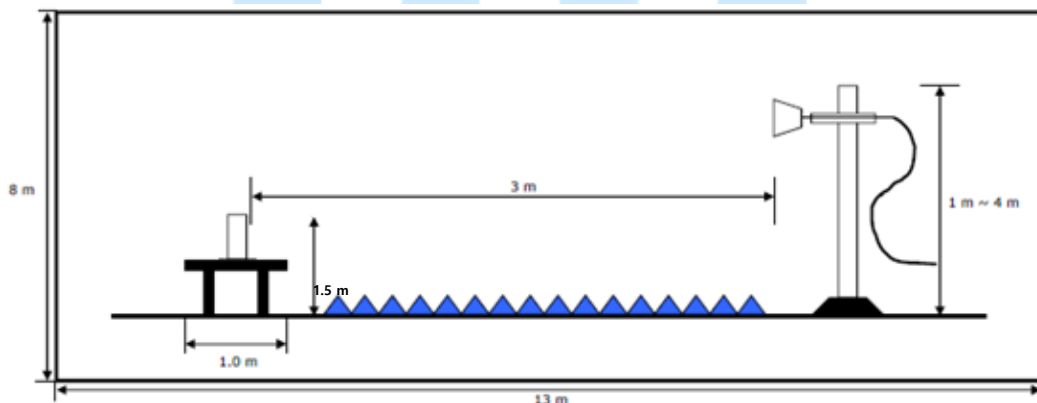


Fig 4. Dimensions of test site (Above 1GHz)



9.1 Operating environment

Temperature : 15.0 °C
Relative humidity : 18.8 % R.H.

9.2 Test set-up

A preliminary and final measurement was at 3 m anechoic chamber.

The EUT was placed on a non-conducting table.

For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane.

For emission measurements above 1 GHz, the table height is 1.5 m above the reference ground plane.

The turntable with EUT was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels.

This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

9.3 Measurement uncertainty

The measurement uncertainty was calculated in accordance with ISO “Guide to the expression of uncertainty in measurement”.

The measurement uncertainty was given with a confidence of 95 %.

Test items(Anechoic Chamber)	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	4.90 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	4.79 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	6.23 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	5.16 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (1 000 MHz ~ 6 000 MHz, 3 m, V/H)	4.56 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (6 000 MHz ~ 18 000 MHz, 3 m, V/H)	4.88 dB	Confidence level of approximately 95 % ($k = 2$)
Radiated emission (18 000 MHz ~ 26 000 MHz, 3 m, V/H)	5.13 dB	Confidence level of approximately 95 % ($k = 2$)

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2.

The listed uncertainties are the worst case uncertainty for the entire range of measurement. please note that the uncertainty values are provided for informational purposes only are not used in determining the PASS/FAIL results



9.4 Limit

20 dB in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2 400/F (kHz)	300
0.490 ~ 1.705	2 400/F (kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

9.5 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Calibration
■ - ESW44	Rohde & Schwarz	EMI Test Receiver	103354	Apr. 02, 2025
■ - HFH2-Z2	Rohde & Schwarz	Loop Antenna	100041	Apr. 15, 2025
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3193	Apr. 19, 2025
■ - HF907	ETS LINDGREN	Horn Antenna	103197	Feb. 05, 2025
■ - BBHA9170	Schwarzbeck	Horn Antenna	766	Apr. 08, 2025
■ - MCU066	matur GmbH	Position Controller	1390306	N/A
■ - TT2.5SI	matur GmbH	Turntable	1390307	N/A
■ - CO3000	Innco system GmbH	Position Controller	CO3000/1804/4	N/A
			2760218/P	
■ - MA4640-XP-ET	Innco system GmbH	Antenna Mast	5580916	N/A
■ - 310N	Sonoma Instrument	Amplifier	187164	Apr. 02, 2025
■ - TK-PA18H	TESTEK	Low Noise Amplifier	220107-L	Apr. 03, 2025
■ - TK-PA1840H	TESTEK	Amplifier	170007-L	Apr. 08, 2025
■ - WHKX3.0/18G-10SS	WAINWRIGHT INSTRUMENTS	High pass filter	SN31	Apr. 02, 2025
■ - SUCOFLEX 104	Huber+Suhner, Inc.	RF coaxial cable	271057/4	May 21, 2025
■ - SUCOFLEX 103	Huber+Suhner, Inc.	RF coaxial cable	MY112/3	May 21, 2025
■ - EMC 32	Rohde & Schwarz	Testing Software	VER10.50.10	N/A
■ - SUCOFLEX 106	Huber+Suhner	Chamber C Cable#1	N/A	May 21, 2025
■ - SUCOFLEX 106	Huber+Suhner	Chamber C Cable#2	N/A	May 21, 2025
■ - J12J102248-00-3	JUNFLON	Chamber C Cable#3	N/A	May 21, 2025
■ - SUCOFLEX 106	Huber+Suhner	Chamber C Cable#4	N/A	May 21, 2025
■ - SUCOFLEX 106	Huber+Suhner	Chamber C Cable#5	N/A	May 21, 2025
■ - 13A26	SENSORVIEW	Chamber C Cable#6	N/A	May 21, 2025
■ - SUCOFLEX 106	Huber+Suhner	Chamber C Cable#7	N/A	May 21, 2025



9.6 Test data for Radiated Spurious Emission

- Test Date : Feb. 19 ~ 23, 2026
- Reference Standard : Part 15 Subpart C, Sec. 15.247(d)
- Measuring Distance : 3 m
- Resolution Bandwidth : 200 Hz, 9 kHz(Below 30 MHz) / 120 kHz(30 MHz ~ 1GHz) / 1 MHz(Above 1GHz)
- Detector mode : Quasi Peak detector mode / Peak detector mode / Average detector mode
- Power Source : AC 120 V / 60 Hz
- Note : Through three orthogonal axes were investigated and the worst case is report

* ESP32 BT

Radiated Spurious Emission (9 kHz to 30 MHz): 2 402 MHz

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas.Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
N/A									

Radiated Spurious Emission (9 kHz to 30 MHz): 2 440 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas.Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
N/A									

Radiated Spurious Emission (9 kHz to 30 MHz): 2 480 MHz

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas.Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
N/A									

Radiated Spurious Emission (30 MHz to 1 000 MHz): 2 402 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas.Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
56.46	32.88	40.00	7.12	1000.00	120.00	100.0	V	272.0	-17.7
749.99	38.81	46.02	7.21	1000.00	120.00	110.0	H	324.0	-4.3

Radiated Spurious Emission (30 MHz to 1 000 MHz): 2 440 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas.Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
57.88	32.98	40.00	7.02	1000.00	120.00	107.0	V	257.0	-17.8

Radiated Spurious Emission (30 MHz to 1 000 MHz): 2 480 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas.Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
57.88	33.10	40.00	6.90	1000.00	120.00	100.0	V	254.0	-17.8



Radiated Spurious Emission (1 GHz to 26 GHz): 2 402 MHz

Frequency [MHz]	Pol.	Frequency Component	Reading [dBuV]	Transducer Factor [dB]	DCCF	Test Result [dBuV/m]	Limits [dBuV/m]	Margin [dB]	Detector Type
17 742.80	V	Harmonics	39.06	23.40	-	62.46	74.00	11.54	PK
17 742.80	V	Harmonics	25.83	23.40	-10.46	38.77	54.00	15.23	AV

Radiated Spurious Emission (1 GHz to 26 GHz): 2 440 MHz

Frequency [MHz]	Pol.	Frequency Component	Reading [dBuV]	Transducer Factor [dB]	DCCF	Test Result [dBuV/m]	Limits [dBuV/m]	Margin [dB]	Detector Type
17 791.40	V	Harmonics	38.72	22.90	-	61.62	74.00	12.38	PK
17 791.40	V	Harmonics	25.97	22.90	-10.46	38.41	54.00	15.59	AV

Radiated Spurious Emission (1 GHz to 26 GHz): 2 480 MHz

Frequency [MHz]	Pol.	Frequency Component	Reading [dBuV]	Transducer Factor [dB]	DCCF	Test Result [dBuV/m]	Limits [dBuV/m]	Margin [dB]	Detector Type
17 765.90	H	Harmonics	39.02	23.20	-	62.22	74.00	11.78	PK
17 765.90	H	Harmonics	25.95	23.20	-10.46	38.69	54.00	15.31	AV

Note:

If the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

Peak Test Result = Peak Reading + Transducer Factor

Average Test Result = Average Reading + Transducer Factor

Where, Transducer Factor = Cable loss + Preamplifier gain + Antenna factor



*** Realtek BT + ESP32 BT**

Radiated Spurious Emission (30 MHz to 1 000 MHz): 2 402 MHz

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas.Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
34.46	33.16	40.00	6.84	1000.00	120.00	107.0	V	214.0	-18.8
39.07	37.20	40.00	2.80	1000.00	120.00	100.0	V	238.0	-18.4
41.23	34.64	40.00	5.36	1000.00	120.00	107.0	V	211.0	-18.3
749.99	41.57	46.02	4.45	1000.00	120.00	111.0	H	182.0	-4.3

Radiated Spurious Emission (1 GHz to 26 GHz): 2 402 MHz

Frequency [MHz]	Pol.	Frequency Component	Reading [dBuV]	Transducer Factor [dB]	DCCF	Test Result [dBuV/m]	Limits [dBuV/m]	Margin [dB]	Detector Type
17 789.00	H	Harmonics	39.28	22.90	-	62.18	74.00	11.82	PK
17 789.00	H	Harmonics	25.95	22.90	-10.46	38.39	54.00	15.61	AV

Note:

If the maximized peak measured value complies with the average limit, then it is unnecessary to perform an average measurement.

Peak Test Result = Peak Reading + Transducer Factor

Average Test Result = Average Reading + Transducer Factor

Where, Transducer Factor = Cable loss + Preamplifier gain + Antenna factor



10. Sample Calculations

$$\begin{aligned} \text{dB}\mu\text{V} &= 20 \text{ Log}_{10}(\mu\text{V}/\text{m}) \\ \text{dB}\mu\text{V} &= \text{dBm} + 107 \\ \mu\text{V} &= 10^{(\text{dB}\mu\text{V}/20)} \end{aligned}$$

10.1 Example 1 :

■ 20.3 MHz

Class B Limit = 250 μV = 48 dB μV
Reading = 39.2 dB μV
10 ^(39.2dB μV /20) = 91.2 μV
Margin = 48 dB μV - 39.2 dB μV
= 8.8 dB

10.2 Example 2 :

■ 66.7 MHz

Class B Limit = 100 $\mu\text{V}/\text{m}$ = 40.0 dB $\mu\text{V}/\text{m}$
Reading = 31.0 dB μV
Antenna Factor + Cable Loss = 5.8 dB
Total = 36.8 dB $\mu\text{V}/\text{m}$
Margin = 40.0 dB $\mu\text{V}/\text{m}$ – 36.8 dB $\mu\text{V}/\text{m}$
= 3.2 dB



11. Recommendation & Conclusion

The data collected shows that the **Summit Technology Total Control (Model Name: MRA-DUO)** complies with §15.247 of the FCC Rules.

- The end -

