Prüfbericht-Nr.: *Test report no.*:	**CN25615P 002**	**Auftrags-Nr.:** *Order no.*:	168516757	Seite 1 von 25 *Page 1 of 25*
Kunden-Referenz-Nr.: *Client reference no.*:	N/A	**Auftragsdatum:** *Order date:*	2024-12-03	
Auftraggeber: *Client*:	Aptiv Electronics (Suzhou) Co., Ltd. No. 123, Changyang Street, Suzhou Industrial Park, Suzhou, China			
Prüfgegenstand: *Test item*:	DHU2.5_A (Digital Cockpit Head Unit)			
Bezeichnung / Typ-Nr.: *Identification / Type no.*:	DHU2.5_A			
Auftrags-Inhalt: *Order content*:	Test Report			
Prüfgrundlage: *Test specification*:	CFR Title 47 FCC Part 15: Subpart C Section 15.247			

Wareneingangsdatum: *Date of sample receipt*:	2024-12-20	Please refer to Photo Document
Prüfmuster-Nr.: *Test sample no:*	A003881754-001~018	
Prüfzeitraum: *Testing period*:	2025-01-14 - 2025-01-20	
Ort der Prüfung: *Place of testing*:	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüfergebnis*: *Test result**:	Pass	

geprüft von: tested by:	X Jonathan Li Signed by: Jonathan Li	**genehmigt von:** *authorized by*:	X Bell Hu Signed by: Bell Hu
Datum: *Date:* 2025-02-10		**Ausstellungsdatum:** *Issue date:* 2025-02-10	
Stellung / Position:	Sachverständige(r)/Expert	**Stellung** / Position:	Sachverständige(r)/Expert

Sonstiges / *Other*: FCC ID: 2AX7A-DHU2-5-A

This report is for Bluetooth dual mode (Module AH20C).

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery*: Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. *The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
2	Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben. Informationen zur Verifizierung der Authentizität unserer Dokumente erhalten Sie auf folgender Webseite: go.tuv.com/digital-signature *As contractually agreed, this document has been signed digitally only. TUV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TUV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged. For information on verifying the authenticity of our documents, please visit the following website: go.tuv.com/digital-signature*
3	Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt. *Test clauses with remark of * are subcontracted to qualified subcontractors and descripted under the respective test clause in the report.* *Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.*
4	Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnisen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezueglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019. *The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.*

Test Summary

5.1.1 ANTENNA REQUIREMENT
RESULT: Pass

5.1.2 MAXIMUM PEAK CONDUCTED OUTPUT POWER
RESULT: Pass

5.1.3 CONDUCTED POWER SPECTRAL DENSITY
RESULT: Pass

5.1.4 6DB BANDWIDTH
RESULT: Pass

5.1.5 99% BANDWIDTH
RESULT: Pass

5.1.6 20DB BANDWIDTH
RESULT: Pass

5.1.7 CARRIER FREQUENCY SEPARATION
RESULT: Pass

5.1.8 NUMBER OF HOPPING FREQUENCY
RESULT: Pass

5.1.9 TIME OF OCCUPANCY
RESULT: Pass

5.1.10 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHZ BANDWIDTH
RESULT: Pass

5.1.11 RADIATED SPURIOUS EMISSION
RESULT: Pass

Contents

1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results of Bluetooth BR & EDR

Appendix B: Test Results of Bluetooth LE

Appendix C: Photographs of the Test Set-up

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.
2-3F, 101 & 102, No.2, Nuclear Power Industrial Park, Fuming Community, Fucheng Street, Longhua District, Shenzhen 518000, People's Republic of China

FCC Accreditation Designation No.: 694916

ISED wireless device testing laboratory: 25069

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing (SRD-Tonscend)					
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. Date**	**Cal. until**
EXA Signal Analyzer, Multi-touch	Keysight	N9010B	MY60241175	2024-09-26	2025-09-25
MXG X-Series RF Vector Signal Generator	Keysight	N5182B	MY61250137	2024-09-26	2025-09-25
EXG X-Series Microwave Analog Signal Generator	Keysight	N5173B	MY61250141	2024-09-26	2025-09-25
DC power supply	Keysight	E3642A	MY61276100	2024-09-26	2025-09-25
Power Control Unit	Tonscend	JS0806-4ADC	N/A	2024-09-26	2025-09-25
Automation Control Unit	Tonscend	JS0806-2	21C8060396	2024-09-26	2025-09-25
Test Software	Tonscend	JS1120-3	N/A	N/A	N/A
Control PC	Lenovo	TianYi510S-071MB	YLX23JMF	N/A	N/A
Shielding Room	Albatross	SR1	APC17151-SR1	2024-09-14	2027-09-13
Unwanted Emission Testing (TS9975)					
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Cal. Date**	**Cal. until**
EMI Test Receiver	R&S	ESR 7	102021	2024-09-29	2025-09-28
Signal Analyzer	R&S	FSV 40	101439	2024-09-29	2025-09-28
System Controller Interface	R&S	SCI-100	S10010038	N/A	N/A
Filterbank	R&S	Wlan	100759	2024-09-29	2025-09-28
OSP	R&S	OSP 120	102040	N/A	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2024-09-29	2025-09-28
Amplifier	R&S	SCU-18F	180070	2024-09-29	2025-09-28
Amplifier	R&S	SCU40A	100475	2024-09-29	2025-09-28
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2024-09-28	2025-09-27

Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2024-09-28	2025-09-27
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2024-09-28	2025-09-27
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2024-09-28	2025-09-27
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-09-14	2027-09-13

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Table 2: Measurement Uncertainty

Parameter	Uncertainty
RF output power, conducted	± 0.99 dB
Occupied Channel Bandwidth	± 2.08 %
RF power density, conducted	± 0.99 dB
Unwanted Emissions, conducted	± 0.89 dB
All emissions, radiated	± 4.17 dB

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B & C of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at 2-3F, 101 & 102, No.2, Nuclear Power Industrial Park, Fuming Community, Fucheng Street, Longhua District, Shenzhen 518000, People's Republic of China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is an Intelligent cockpit domain controller which supports Bluetooth dual mode, 2.4GHz Wi-Fi, 5GHz Wi-Fi and FM/DAB wireless technologies.
The EUT has a BT module AH20C and a BT/WIFI module AF66T.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Information of EUT	**Value**
Kind of Equipment:	DHU2.5_A (Digital Cockpit Head Unit)
Type Designation:	DHU2.5_A
FCC ID:	2AX7A-DHU2-5-A
Operating Voltage:	DC 9~16V
Testing Voltage:	DC 12V
Operating Temperature Range:	-40 °C ~ +85 °C
Technical Specification of Bluetooth dual mode (Module AH20C)	
Operating Frequency:	2402 MHz to 2480 MHz
Type of Modulation:	GFSK, π/4-DQPSK, 8DPSK
Channel Number:	BR & EDR mode:79 channels, Low Energy mode:40 channels
Channel Separation:	BR & EDR mode:1MHz, Low Energy mode:2MHz
Data Rate:	BR & EDR mode: 1Mbps, 2Mbps, 3Mbps Low Energy mode: 1Mbps
Antenna Type:	Integral Antenna
Antenna Gain:	0.79dBi Max. (Provided by the Client)

Note: The correctness of all data provided by customer in the test report is ensured and responsible of the customer. Any misjudgment of the test results caused by the use of incorrect data provided by customer shall be borne by the customer.

Table 4: RF Channel and Frequency of Bluetooth BR & EDR

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
0	**2402.00**	20	2422.00	40	2442.00	60	2462.00
1	2403.00	21	2423.00	41	2443.00	61	2463.00
2	2404.00	22	2424.00	42	2444.00	62	2464.00
3	2405.00	23	2425.00	43	2445.00	63	2465.00
4	2406.00	24	2426.00	44	2446.00	64	2466.00
5	2407.00	25	2427.00	45	2447.00	65	2467.00
6	2408.00	26	2428.00	46	2448.00	66	2468.00
7	2409.00	27	2429.00	47	2449.00	67	2469.00
8	2410.00	28	2430.00	48	2450.00	68	2470.00
9	2411.00	29	2431.00	49	2451.00	69	2471.00
10	2412.00	30	2432.00	50	2452.00	70	2472.00
11	2413.00	31	2433.00	51	2453.00	71	2473.00
12	2414.00	32	2434.00	52	2454.00	72	2474.00
13	2415.00	33	2435.00	53	2455.00	73	2475.00
14	2416.00	34	2436.00	54	2456.00	74	2476.00
15	2417.00	35	2437.00	55	2457.00	75	2477.00
16	2418.00	36	2438.00	56	2458.00	76	2478.00
17	2419.00	37	2439.00	57	2459.00	77	2479.00
18	2420.00	38	2440.00	58	2460.00	78	**2480.00**
19	2421.00	39	**2441.00**	59	2461.00		

Test frequencies are lowest channel: 2402 MHz, middle channel: 2441 MHz and highest channel: 2480 MHz for Bluetooth BR & EDR

Table 5: RF Channel and Frequency of Bluetooth LE

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
0	**2402**	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	**19**	**2440**	29	2460	**39**	**2480**

Test frequencies are lowest channel: 2402 MHz, middle channel: 2440 MHz and highest channel: 2480 MHz for Bluetooth LE

3.3 Independent Operation Modes

The basic operation modes are:

A. On, Bluetooth transmitting mode (BR & EDR mode)
    1) Low Channel
    2) Middle Channel
    3) High Channel

B. On, Bluetooth transmitting mode (Bluetooth LE mode)
    1) Low Channel
    2) Middle Channel
    3) High Channel

C. On, Transmitting on Hopping channel

D. On, Co-location mode (Module AF666T with AH20C)

E. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Application Form
- ID Label and Location Info
- User Manual
- Operation Description

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all tests were performed on model *DHU2.5_A* in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 6: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
DC power Supply	Topward	3303D	809332	0-30 Volts, 0-3 Amps
Laptop	Lenovo	T480	PF-16A6N8	N/A

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

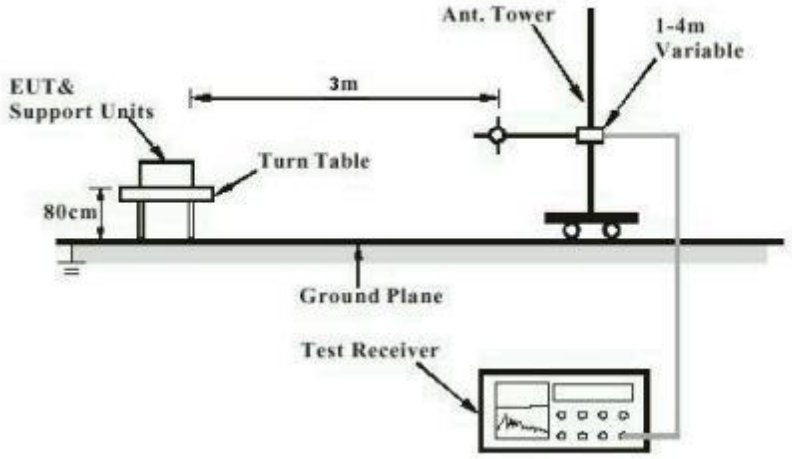


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

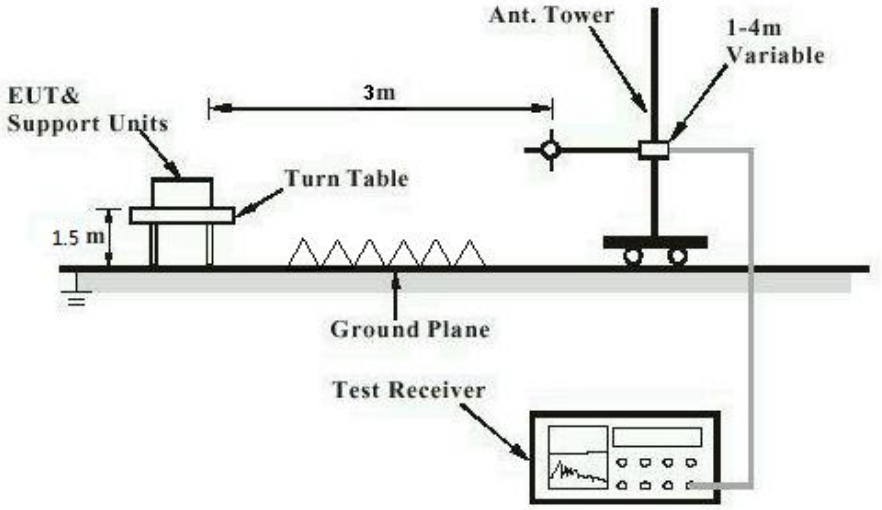
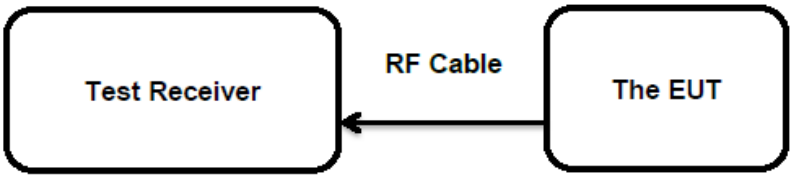


Diagram of Measurement Configuration for Conducted Transmitter Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Pass**

Test Specification

Test standard : FCC Part 15.247(b)(4) and Part 15.203

According to the manufacturer declared, the EUT has an Integral Antenna, the directional gain of antenna is 0.79dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement.

Therefore, the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

5.1.2 Maximum Peak Conducted Output Power

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(b)(1)&(3)
Basic standard	:	ANSI C63.10: 2013
Limits	:	FHSS < 0.125 Watts, DSSS < 1.0 Watts (Maximum Conducted Peak Power)
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2025-01-14
Input voltage	:	DC 12V
Operation mode	:	A, B
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	45 %
Atmospheric pressure	:	101 kPa

For details refer to following test result.

Table 7: Test Result of Maximum Peak Conducted Output Power, BR & EDR

Test Mode	Test Channel (MHz)	Measured Peak Power		Limit (W)
		(dBm)	(W)	
GFSK (BR)	2402.0	7.15	0.0052	< 0.125
	2441.0	7.51	0.0056	
	2480.0	7.10	0.0051	
8DPSK (EDR)	2402.0	5.66	0.0037	
	2441.0	6.00	0.0040	
	2480.0	5.59	0.0036	
Maximum Measured Value		**7.51**	**0.0056**	

Table 8: Test Result of Maximum Peak Conducted Output Power, Bluetooth LE

Test Mode	Data Rate	Test Channel (MHz)	Measured Peak Power		Limit (W)
			(dBm)	(W)	
Bluetooth LE	1 Mbps	2402	6.74	0.0047	< 1.0
		2440	7.04	0.0051	
		2480	6.66	0.0046	
Max. Measured Value			**7.04**	**0.0051**	

Note:
1) The cable loss is taken into account in results.
2) Antenna gain(G): 0.79dBi

5.1.3 Conducted Power Spectral Density

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(e)
Basic standard	:	ANSI C63.10: 2013
Limits	:	< 8 dBm / 3kHz
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2025-01-14
Input voltage	:	DC 12V
Operation mode	:	B
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	45 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

5.1.4 6dB Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(a)(2)
Basic standard	:	ANSI C63.10: 2013
Limits	:	> 500 kHz
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2025-01-14
Input voltage	:	DC 12V
Operation mode	:	B
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	45 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix B.

5.1.5 99% Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(a)
Basic standard	:	ANSI C63.10: 2013
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2025-01-14
Input voltage	:	DC 12V
Operation mode	:	A, B
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	45 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix A & B.

5.1.6 20dB Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(a)(1)
Basic standard	:	ANSI C63.10: 2013
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2025-01-14
Input voltage	:	DC 12V
Operation mode	:	A
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	45 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix A.

5.1.7 Carrier Frequency Separation

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(a)(1)
Basic standard	:	ANSI C63.10: 2013
Limits	:	≥ 25kHz or 2/3 of 20dB bandwidth, whichever is greater
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2025-01-14
Input voltage	:	DC 12V
Operation mode	:	C
Ambient temperature	:	25 ℃
Relative humidity	:	45 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix A.

5.1.8 Number of Hopping Frequency

RESULT: **Pass**

Test Specification

Test standard	:	FCC part 15.247(a)(1)(iii)
Basic standard	:	ANSI C63.10: 2013
Limits	:	≥ 15 non-overlapping channels
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2025-01-14
Input voltage	:	DC 12V
Operation mode	:	C
Ambient temperature	:	25 ℃
Relative humidity	:	45 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix A.

5.1.9 Time of Occupancy

RESULT: **Pass**

Test Specification

Test standard	:	FCC part 15.247(a)(1)(iii)
Basic standard	:	ANSI C63.10: 2013
Limits	:	< 0.4s
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2025-01-14
Input voltage	:	DC 12V
Operation mode	:	C
Ambient temperature	:	25 ℃
Relative humidity	:	45 %
Atmospheric pressure	:	101 kPa

For the measurement records, refer to the appendix A.

5.1.10 Conducted Spurious Emissions Measured in 100 kHz Bandwidth

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d)
Basic standard	:	ANSI C63.10: 2013
Limits	:	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, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2025-01-14
Input voltage	:	DC 12V
Operation mode	:	A, B, C
Test channel	:	Low / Middle / High
Ambient temperature	:	25 ℃
Relative humidity	:	45 %
Atmospheric pressure	:	101 kPa

Test results of 100kHz Bandwidth of Frequency Band Edge by Conducted method refer to test plots, and compliance is achieved as well.

For the measurement records, refer to the appendix A & B.

5.1.11 Radiated Spurious Emission

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.247(d) & FCC Part 15.205
Basic standard	:	ANSI C63.10: 2013
Limits	:	Refer to 15.209(a) of FCC part 15.247(d)
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2025-01-18 to 2025-01-20
Input voltage	:	DC 12V
Operation mode	:	A, B, D
Test channel	:	Low / Middle / High
Ambient temperature	:	Refer to test result
Relative humidity	:	Refer to test result
Atmospheric pressure	:	101 kPa

Remark:
Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix A & B.

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix C.

7 List of Tables

Appendix A: Test Results of Bluetooth BR & EDR

Appendix A.1: Test Results of 20dB Bandwidth

Test Result

TestMode	Antenna	Channel	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.972	2401.526	2402.498	---	PASS
		2441	0.912	2440.562	2441.474	---	PASS
		2480	0.858	2479.556	2480.414	---	PASS
3DH5	Ant1	2402	1.332	2401.346	2402.678	---	PASS
		2441	1.341	2440.340	2441.681	---	PASS
		2480	1.338	2479.340	2480.678	---	PASS

Test Graphs

DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480

Appendix A.2: Test Results of 99% Bandwidth

Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	0.87800	2401.5795	2402.4575	---	PASS
		2441	0.88612	2440.5726	2441.4587	---	PASS
		2480	0.87870	2479.5696	2480.4483	---	PASS
3DH5	Ant1	2402	1.2226	2401.3974	2402.6200	---	PASS
		2441	1.2194	2440.3975	2441.6169	---	PASS
		2480	1.2236	2479.3925	2480.6161	---	PASS

Test Graphs

DH5_Ant1_2402

DH5_Ant1_2441

DH5_Ant1_2480

3DH5_Ant1_2402

3DH5_Ant1_2441

3DH5_Ant1_2480

Appendix A.3: Test Results of Carrier Frequency Separation

Test Result

TestMode	Antenna	Channel	Result[MHz]	Limit[MHz]	Verdict
DH5	Ant1	Hop	1.12	≥0.972	PASS
3DH5	Ant1	Hop	1.02	≥0.894	PASS

Test Graphs

DH5_Ant1_Hop

3DH5_Ant1_Hop

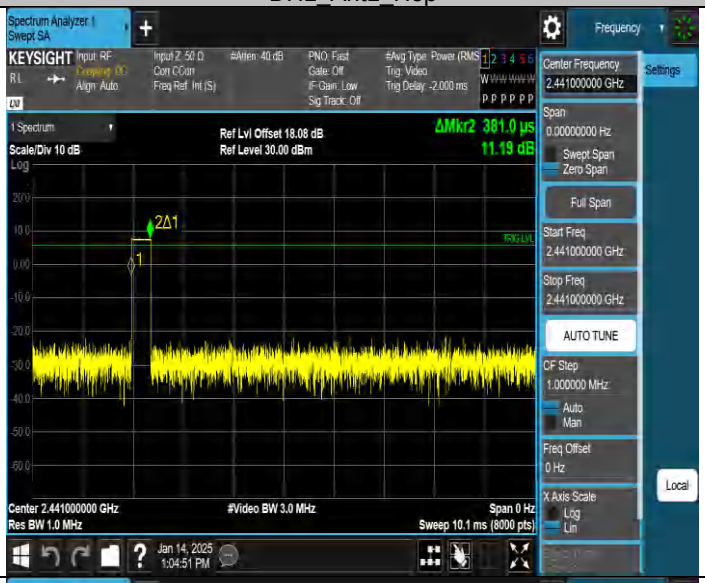
Appendix A.4: Test Results of Time of Occupancy

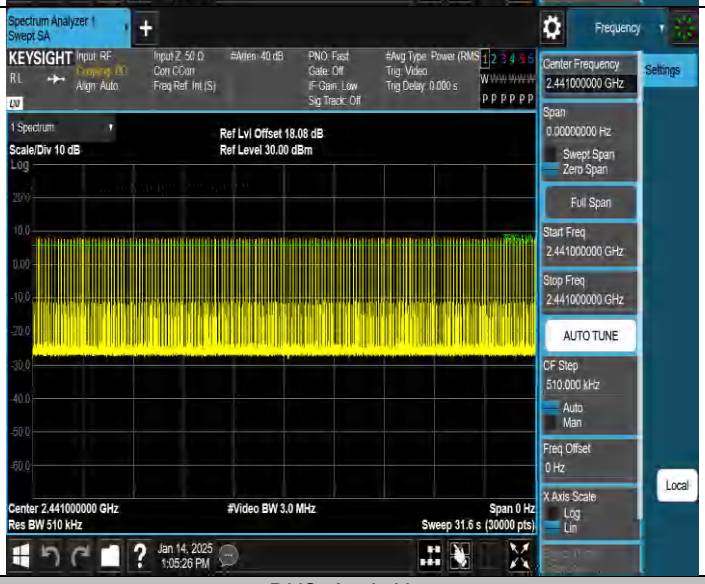
Test Result

TestMode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.381	319	0.122	≤0.4	PASS
DH3	Ant1	Hop	1.637	155	0.254	≤0.4	PASS
DH5	Ant1	Hop	2.885	110	0.317	≤0.4	PASS
3DH1	Ant1	Hop	0.388	318	0.123	≤0.4	PASS
3DH3	Ant1	Hop	1.639	158	0.259	≤0.4	PASS
3DH5	Ant1	Hop	2.888	103	0.297	≤0.4	PASS

Test Graphs

DH1_Ant1_Hop

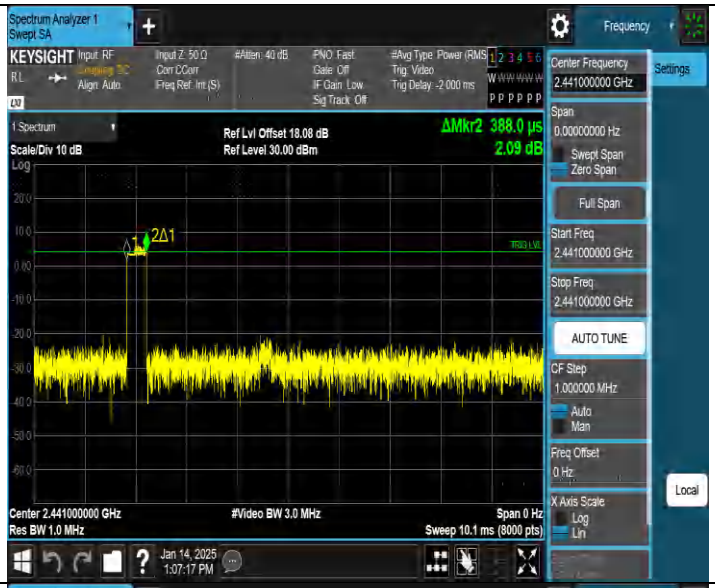




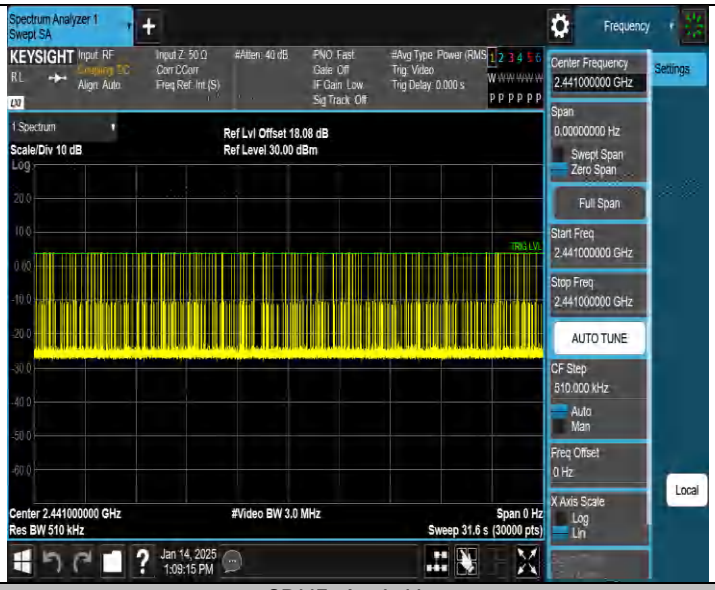
DH3_Ant1_Hop

DH5_Ant1_Hop

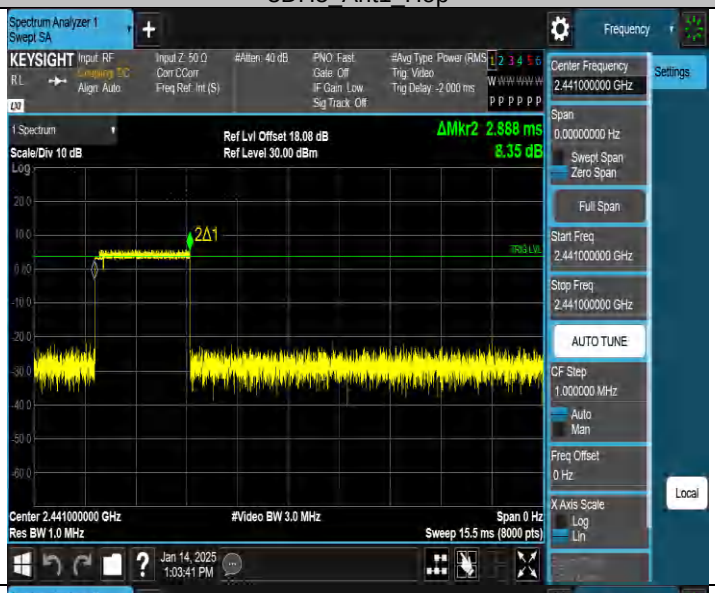
3DH1_Ant1_Hop

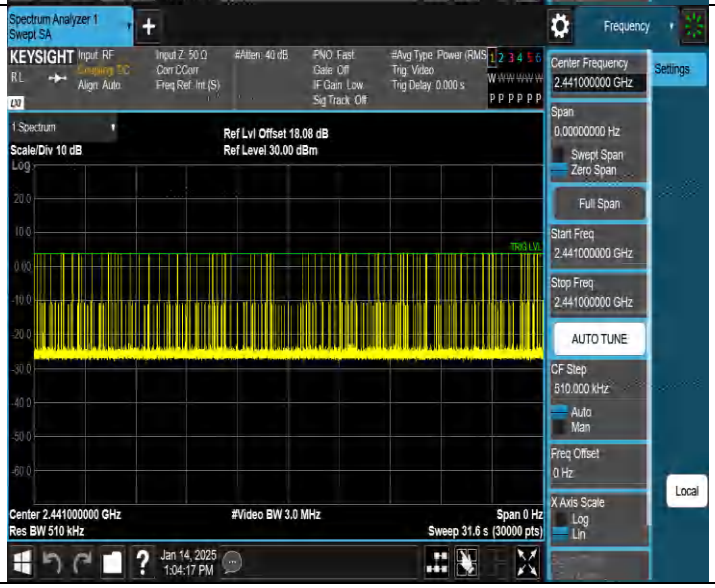


3DH3_Ant1_Hop



3DH5_Ant1_Hop





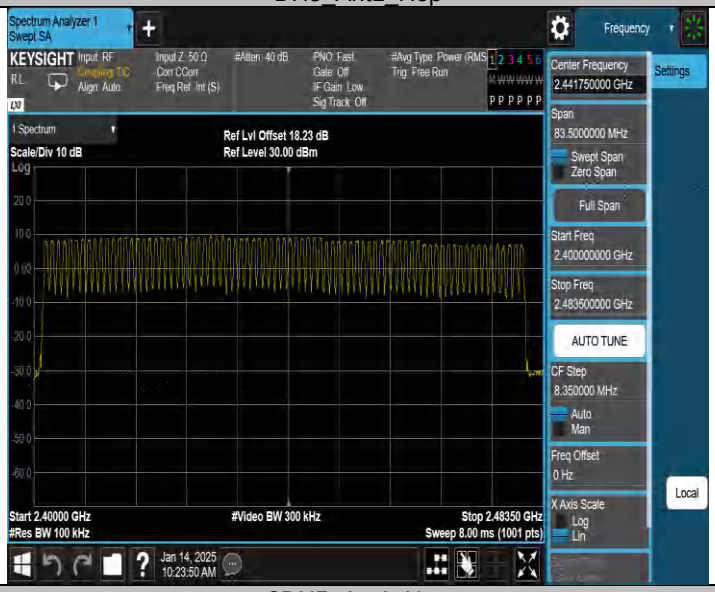
Appendix A.5: Test Results of Number of Hopping Frequency

Test Result

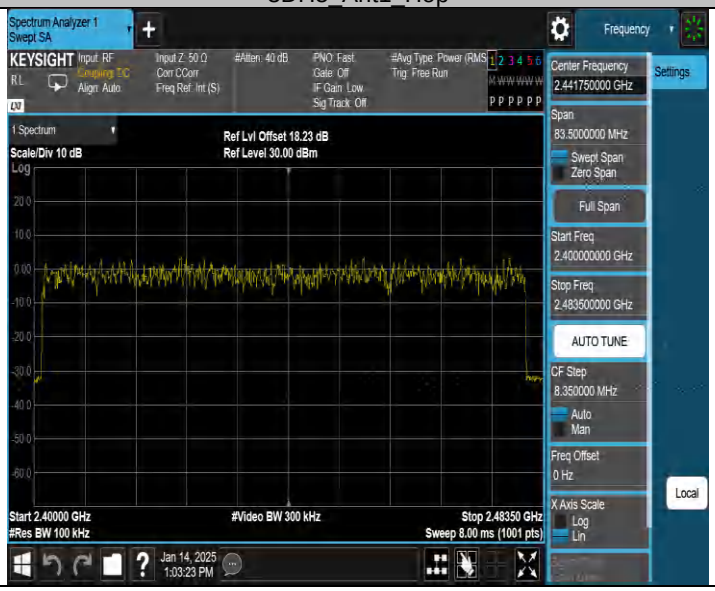
TestMode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥15	PASS
3DH5	Ant1	Hop	79	≥15	PASS

Test Graphs

DH5_Ant1_Hop



3DH5_Ant1_Hop



Appendix A.6: Test Results of Band Edge Measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	8.13	-42.77	≤-11.87	PASS
		High	2480	6.65	-42.94	≤-13.35	PASS
3DH5	Ant1	Low	2402	4.13	-44.04	≤-15.87	PASS
		High	2480	2.65	-43.65	≤-17.35	PASS
DH5	Ant1	Hopping	2402	6.97	-42.98	≤-13.83	PASS
		Hopping	2480	6.09	-45.80	≤-13.91	PASS
3DH5	Ant1	Hopping	2402	1.58	-45.17	≤-18.42	PASS
		Hopping	2480	1.58	-44.30	≤-18.42	PASS

Test Graphs

DH5_Ant1_Low_2402

DH5_Ant1_High_2480

3DH5_Ant1_Low_2402

3DH5_Ant1_High_2480

DH5_Ant1_Hopping_2402

DH5_Ant1_Hopping_2480

3DH5_Ant1_Hopping_2402

3DH5_Ant1_Hopping_2480

Appendix A.7: Test Results of Conducted Spurious Emission

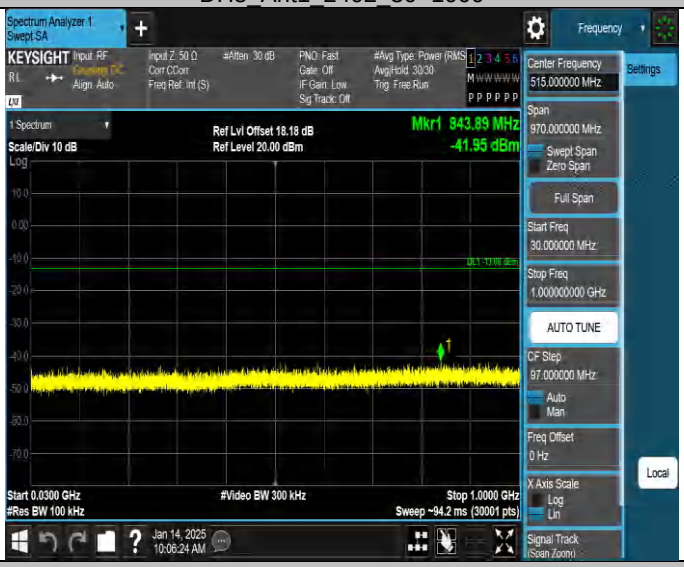
Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	2402	Reference	6.92	6.92	---	PASS
			30~1000	6.92	-41.95	≤-13.08	PASS
			1000~26500	6.92	-32.33	≤-13.08	PASS
		2441	Reference	7.86	7.86	---	PASS
			30~1000	7.86	-41.76	≤-12.14	PASS
			1000~26500	7.86	-31.26	≤-12.14	PASS
		2480	Reference	5.66	5.66	---	PASS
			30~1000	5.66	-42.17	≤-14.34	PASS
			1000~26500	5.66	-33.41	≤-14.34	PASS
3DH5	Ant1	2402	Reference	2.00	2.00	---	PASS
			30~1000	2.00	-41.56	≤-18	PASS
			1000~26500	2.00	-32.98	≤-18	PASS
		2441	Reference	3.59	3.59	---	PASS
			30~1000	3.59	-41.3	≤-16.41	PASS
			1000~26500	3.59	-32.95	≤-16.41	PASS
		2480	Reference	1.07	1.07	---	PASS
			30~1000	1.07	-41.31	≤-18.93	PASS
			1000~26500	1.07	-32.79	≤-18.93	PASS

Test Graphs

DH5_Ant1_2402_0~Reference

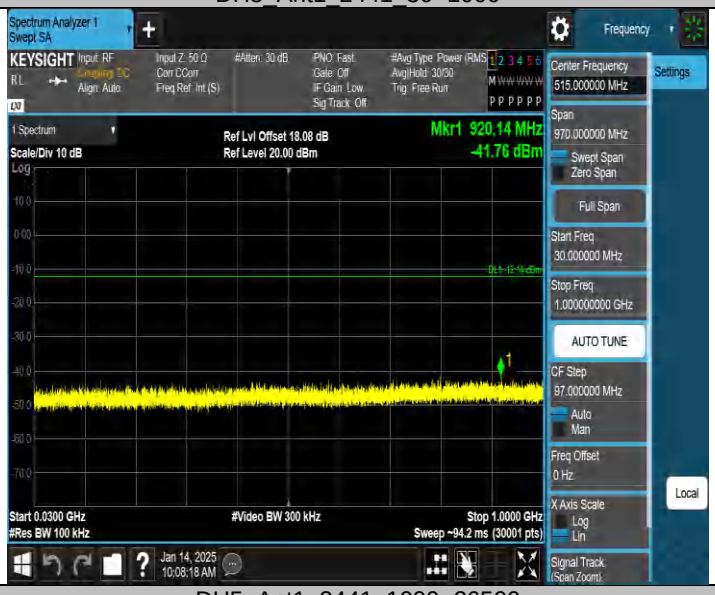
DH5_Ant1_2402_30~1000



DH5_Ant1_2402_1000~26500

DH5_Ant1_2441_0~Reference

DH5_Ant1_2441_30~1000



DH5_Ant1_2441_1000~26500

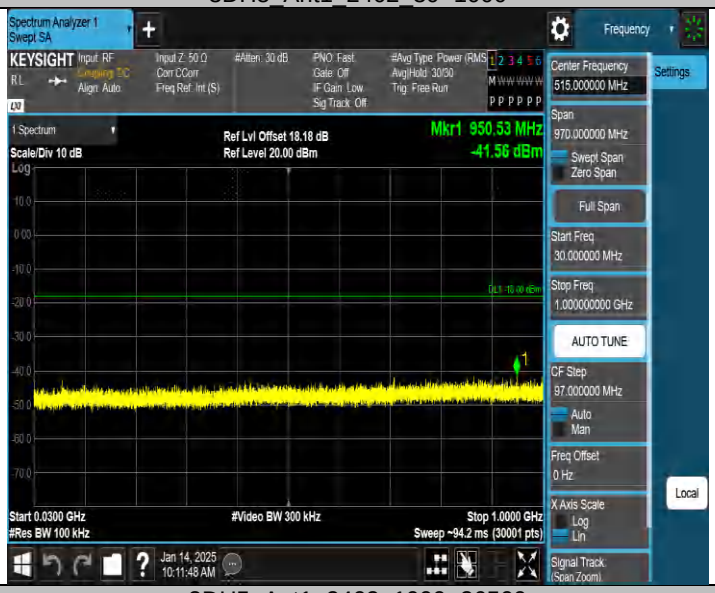
DH5_Ant1_2480_0~Reference

DH5_Ant1_2480_30~1000

DH5_Ant1_2480_1000~26500

3DH5_Ant1_2402_0~Reference

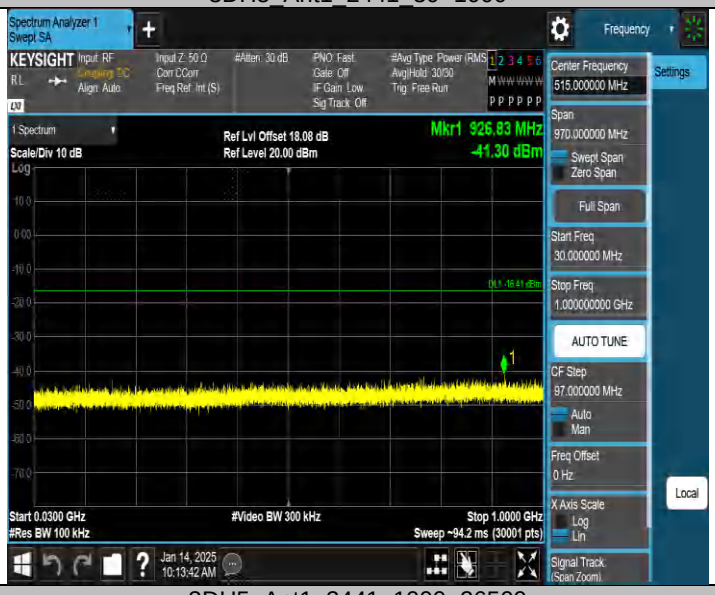
3DH5_Ant1_2402_30~1000



3DH5_Ant1_2402_1000~26500

3DH5_Ant1_2441_0~Reference

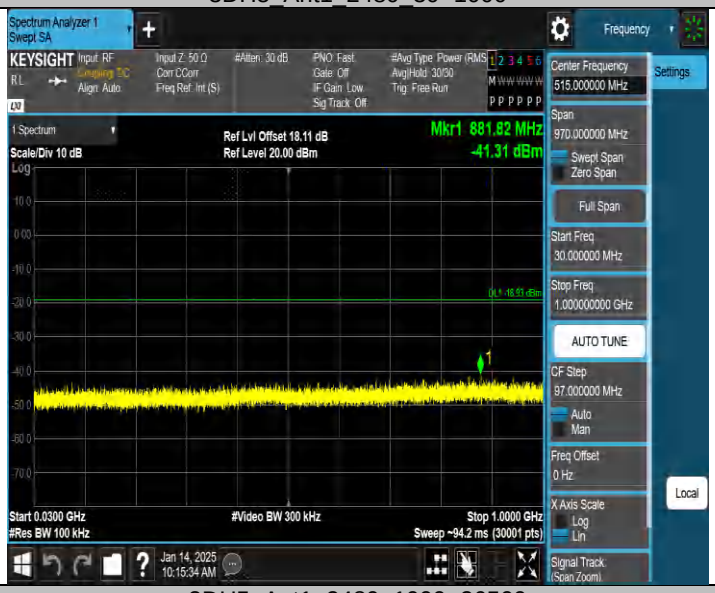
3DH5_Ant1_2441_30~1000



3DH5_Ant1_2441_1000~26500

3DH5_Ant1_2480_0~Reference

3DH5_Ant1_2480_30~1000



3DH5_Ant1_2480_1000~26500

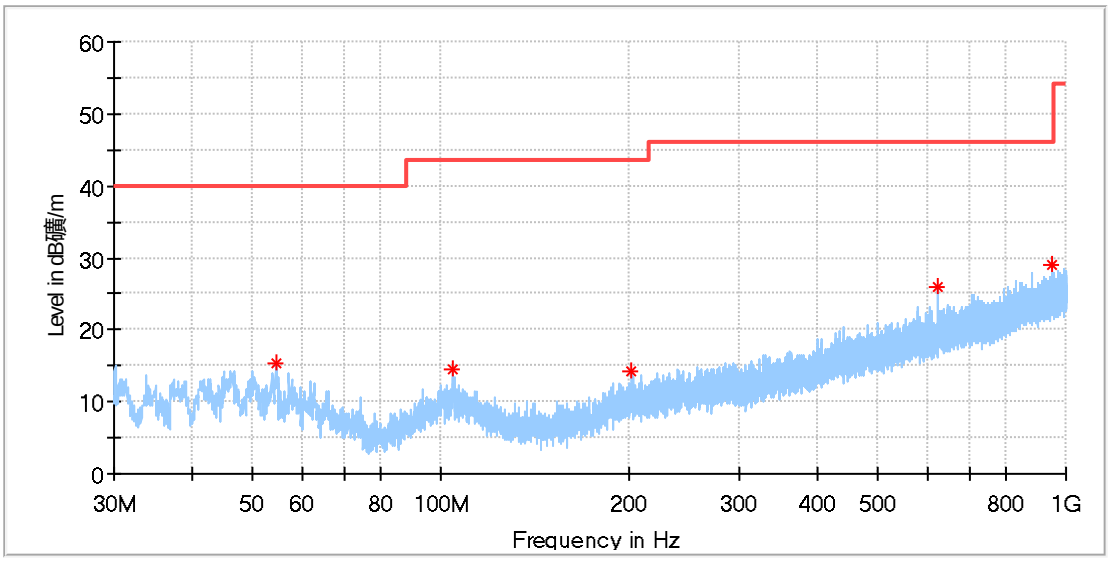
Appendix A.8: Test Results of Radiated Spurious Emissions

Note:
1) This testing was carried out on different modulations, but only the worst case was presented in this report.
2) Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

30 MHz - 1GHz

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

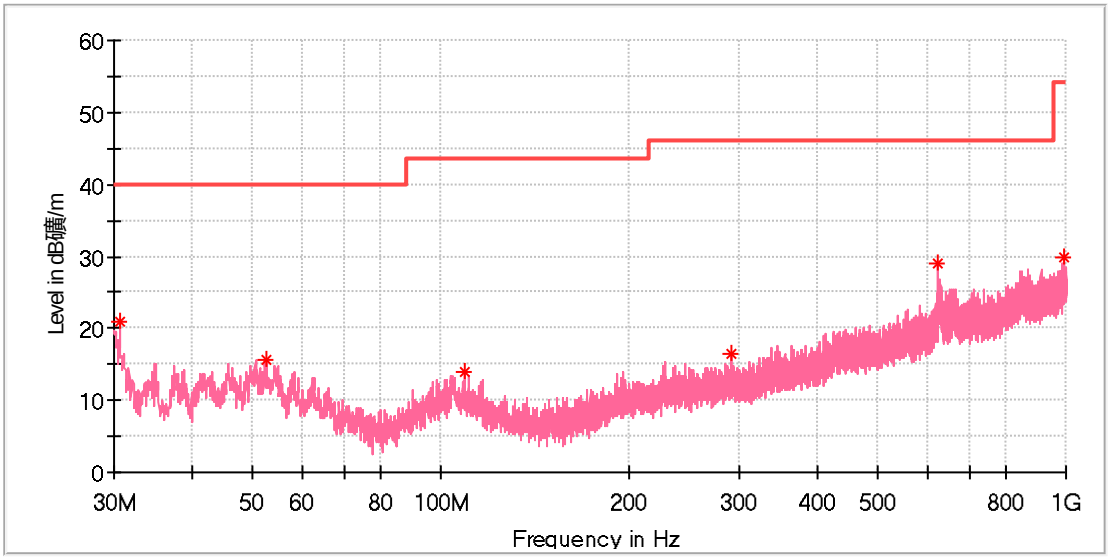
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
54.399231	15.27	40.00	24.73	100.0	H	95.0	-18.5
104.428846	14.44	43.50	29.06	100.0	H	74.0	-18.9
202.249615	14.14	43.50	29.36	100.0	H	4.0	-19.0
625.020385	25.99	46.00	20.01	100.0	H	250.0	-9.2
949.075000	28.99	46.00	17.01	100.0	H	95.0	-4.3

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.634231	20.81	40.00	19.19	100.0	V	204.0	-22.9
52.645769	15.57	40.00	24.43	100.0	V	58.0	-18.5
109.465385	13.85	43.50	29.65	100.0	V	131.0	-19.2
291.228462	16.53	46.00	29.47	100.0	V	104.0	-16.5
625.020385	28.97	46.00	17.03	100.0	V	204.0	-9.2
993.135385	29.79	54.00	24.21	100.0	V	167.0	-3.6

Final_Result

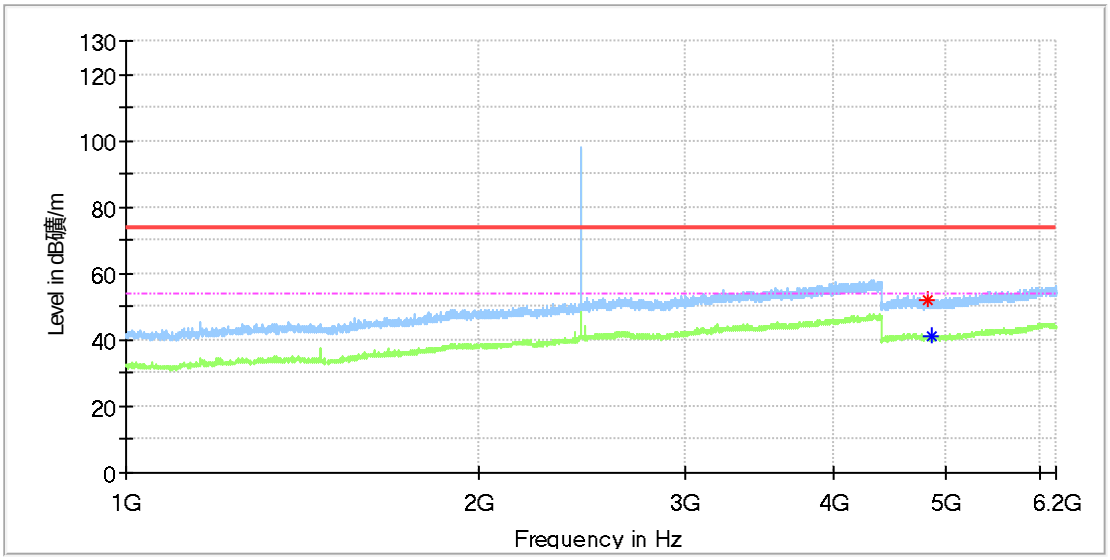
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

1GHz - 18GHz

Note: The highest waveform in the figure is Bluetooth Fundamental.

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

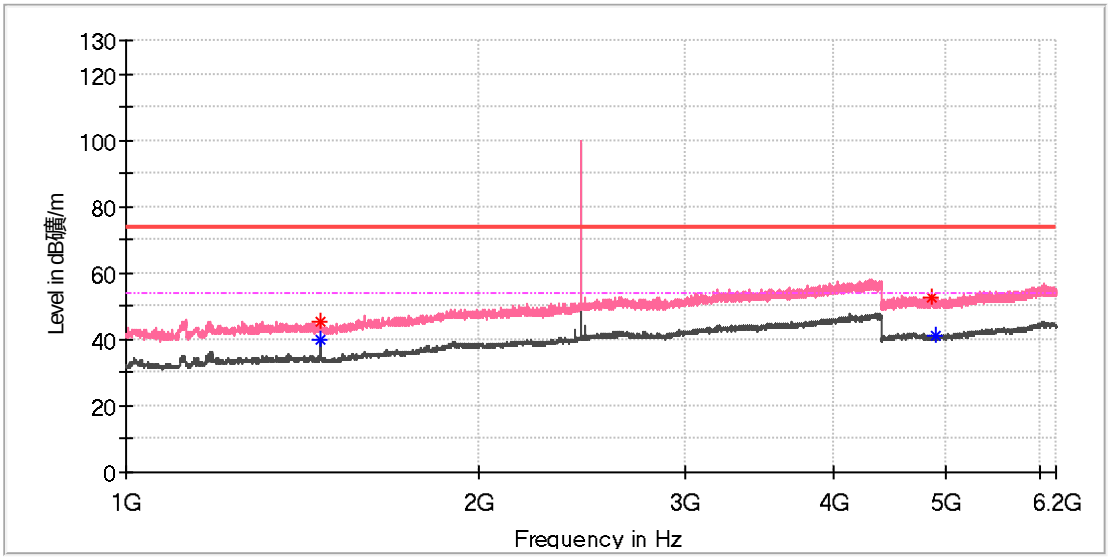
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4813.000000	52.26	---	74.00	21.74	150.0	H	4.0	13.3
4860.000000	---	40.91	54.00	13.09	150.0	H	4.0	13.3

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

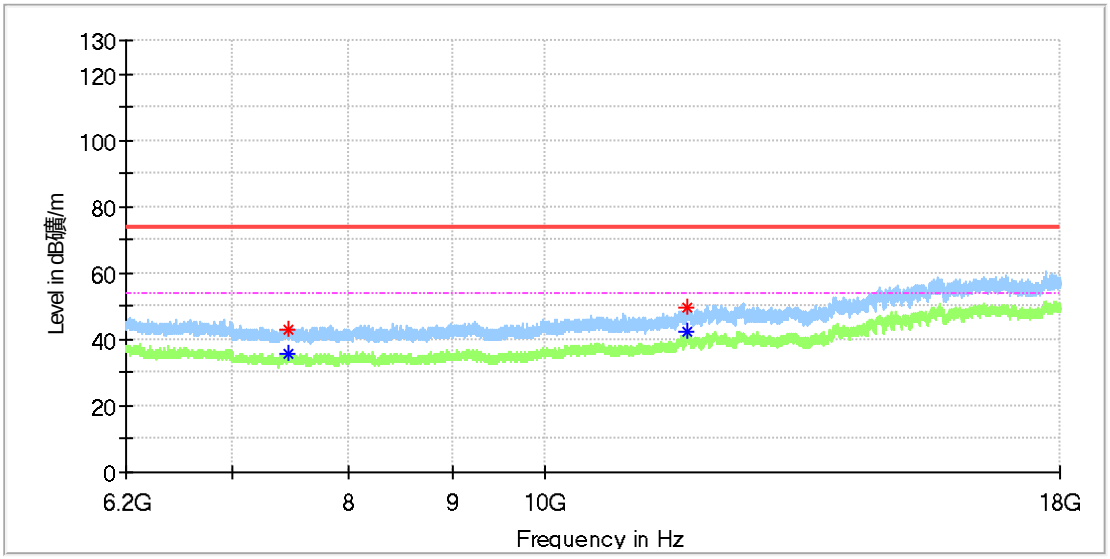
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1464.000000	45.41	---	74.00	28.59	150.0	V	240.0	2.6
1464.500000	---	39.81	54.00	14.19	150.0	V	233.0	2.6
4862.500000	52.67	---	74.00	21.33	150.0	V	66.0	13.3
4903.500000	---	41.24	54.00	12.76	150.0	V	2.0	13.3

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

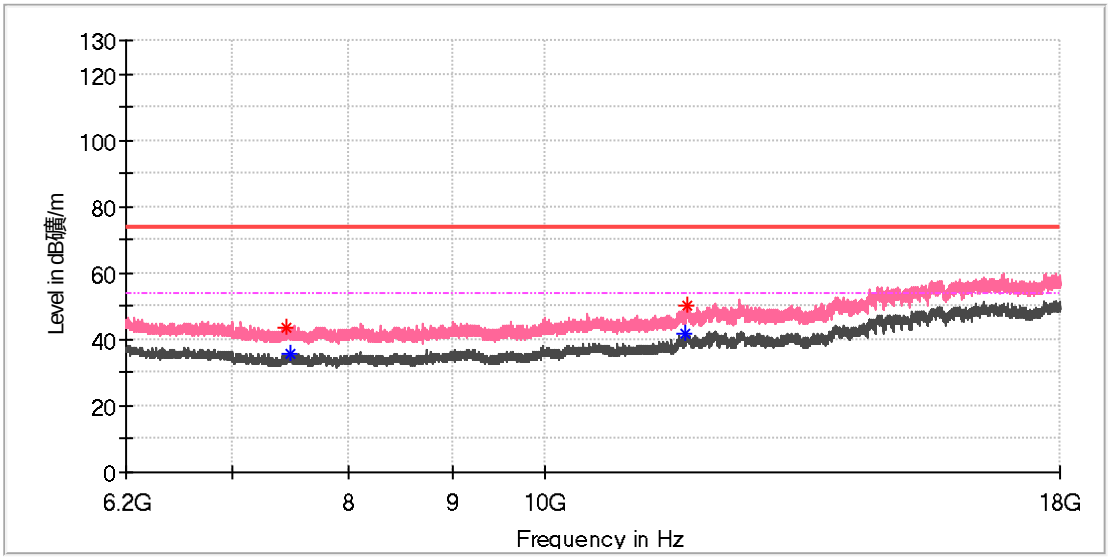
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7463.091667	---	35.52	54.00	18.48	150.0	H	258.0	8.6
7467.516667	43.19	---	74.00	30.81	150.0	H	357.0	8.6
11750.916667	49.68	---	74.00	24.32	150.0	H	236.0	15.5
11752.391667	---	42.31	54.00	11.69	150.0	H	347.0	15.5

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BR_DH5_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7441.950000	43.73	---	74.00	30.27	150.0	V	24.0	8.4
7487.183333	---	35.53	54.00	18.47	150.0	V	103.0	8.7
11740.100000	---	41.51	54.00	12.49	150.0	V	0.0	14.9
11762.716667	50.41	---	74.00	23.59	150.0	V	222.0	15.4

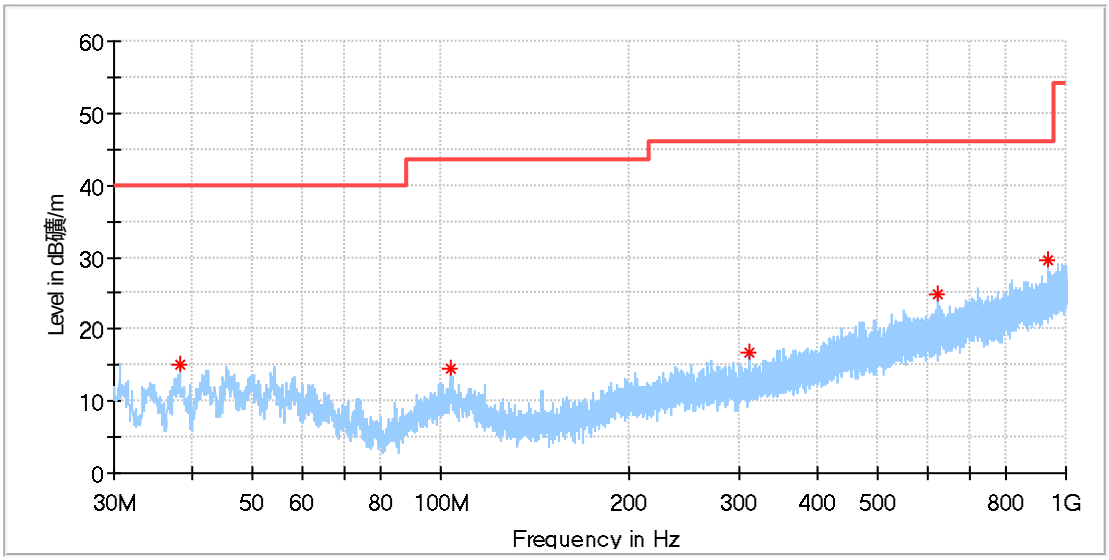
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

30 MHz - 1GHz for Co-location

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BT+WIFI 5G
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

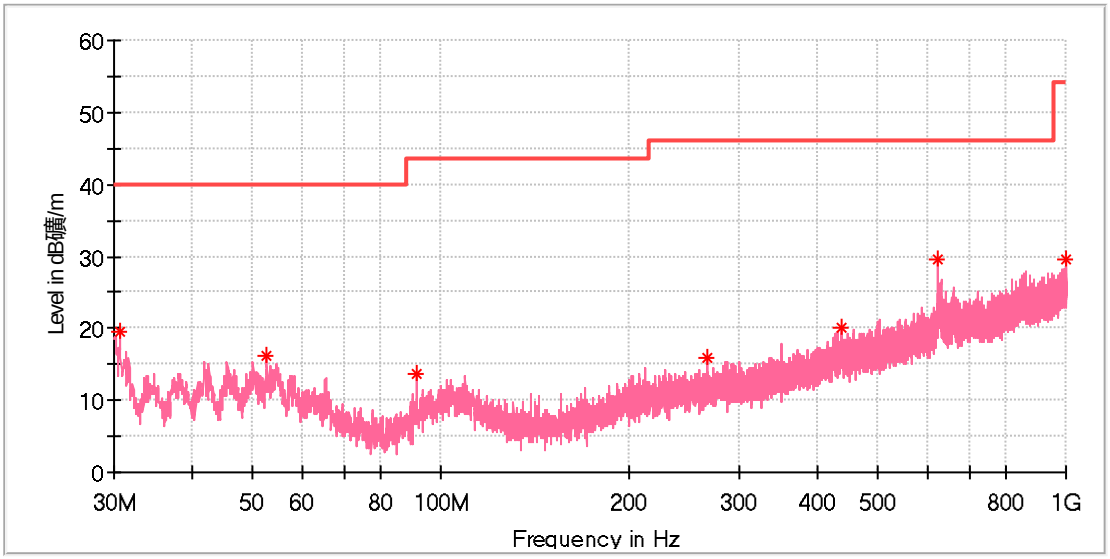
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
38.245000	15.10	40.00	24.90	100.0	H	22.0	-20.7
103.458846	14.46	43.50	29.04	100.0	H	32.0	-19.0
312.493846	16.87	46.00	29.13	100.0	H	175.0	-15.9
624.983077	24.77	46.00	21.23	100.0	H	254.0	-9.2
937.546923	29.56	46.00	16.44	100.0	H	77.0	-4.4

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BT+WIFI 5G
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.671539	19.41	40.00	20.59	100.0	V	244.0	-22.9
52.720385	16.23	40.00	23.77	100.0	V	12.0	-18.5
91.669615	13.75	43.50	29.75	100.0	V	58.0	-20.7
267.388846	16.03	46.00	29.97	100.0	V	126.0	-17.0
436.840385	19.99	46.00	26.01	100.0	V	103.0	-13.0
625.020385	29.51	46.00	16.49	100.0	V	201.0	-9.2
996.978077	29.55	54.00	24.45	100.0	V	289.0	-3.5

Final_Result

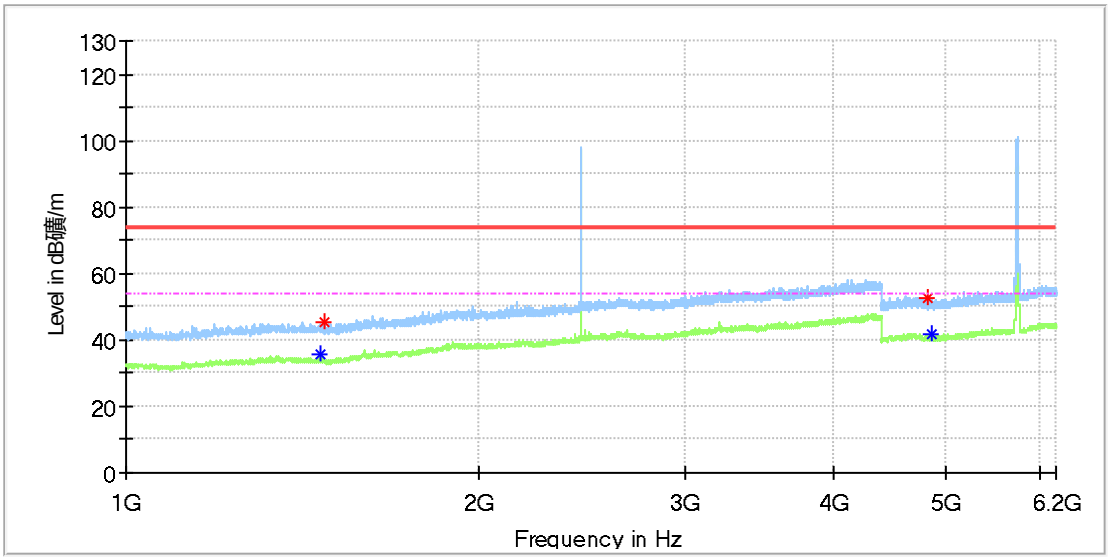
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

1GHz - 18GHz for Co-location

Note: The highest waveform in the figure is Bluetooth / Wi-Fi Fundamental.

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BT+WIFI 5G
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

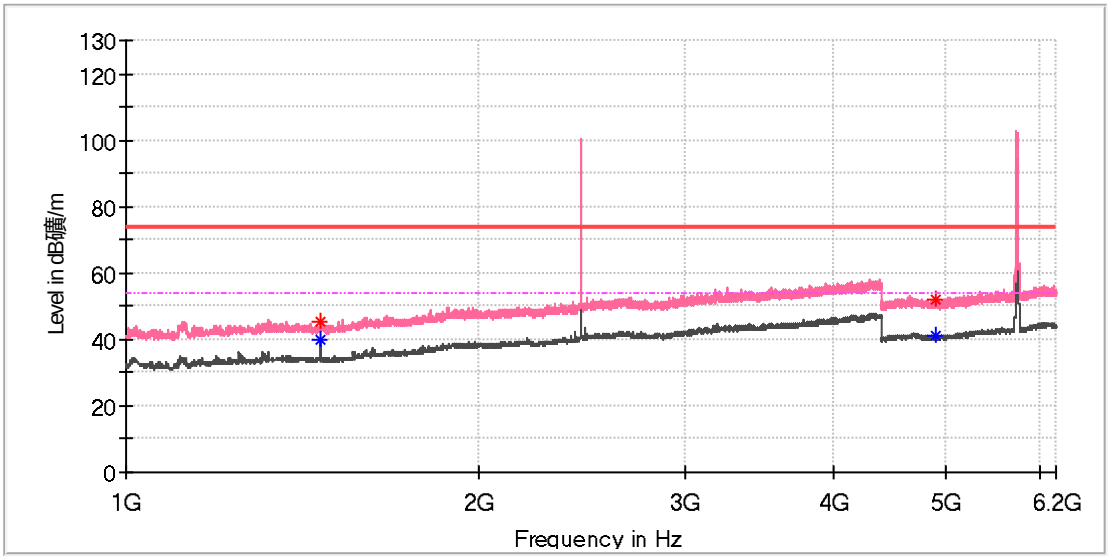
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1464.000000	---	35.71	54.00	18.29	150.0	H	341.0	2.6
1475.000000	45.15	---	74.00	28.85	150.0	H	327.0	2.5
4823.500000	52.57	---	74.00	21.43	150.0	H	224.0	13.3
4862.000000	---	41.42	54.00	12.58	150.0	H	121.0	13.3

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BT+WIFI 5G
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

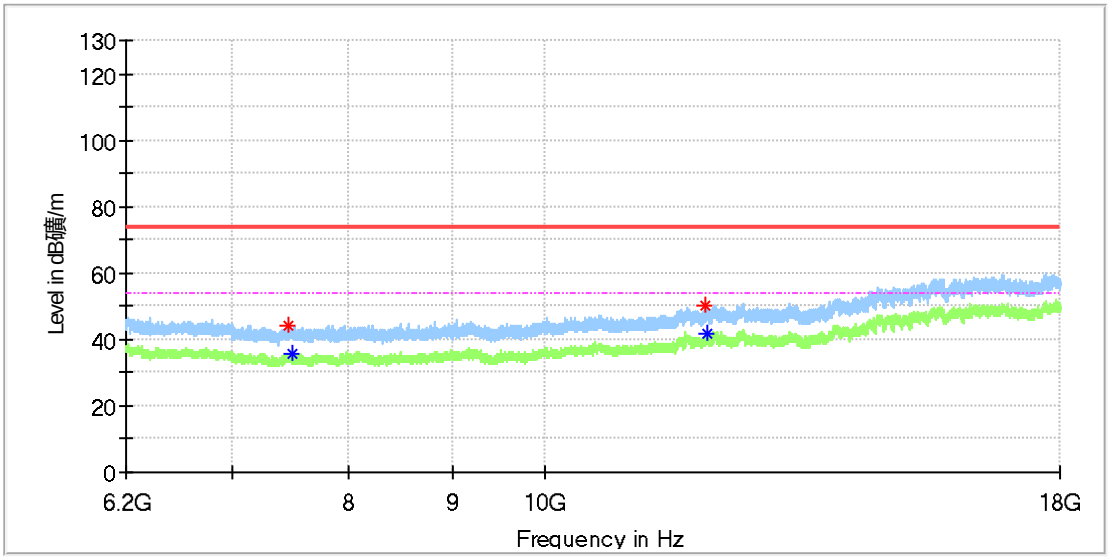
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1464.000000	45.42	---	74.00	28.58	150.0	V	229.0	2.6
1464.500000	---	39.63	54.00	14.37	150.0	V	222.0	2.6
4892.000000	51.73	---	74.00	22.27	150.0	V	18.0	13.3
4904.000000	---	41.12	54.00	12.88	150.0	V	251.0	13.3

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BT+WIFI 5G
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

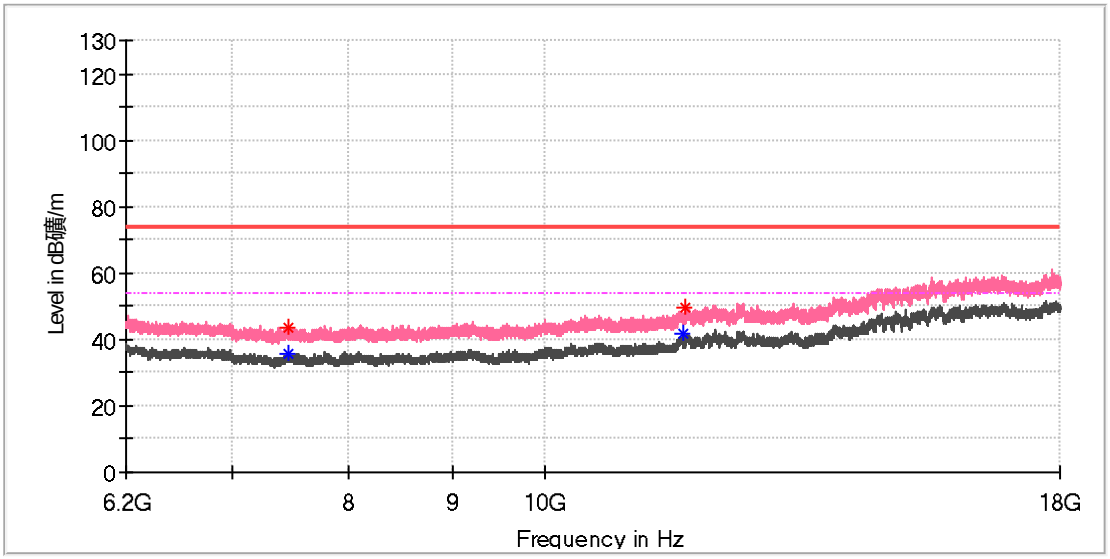
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7469.975000	43.89	---	74.00	30.11	150.0	H	285.0	8.6
7499.475000	---	35.84	54.00	18.16	150.0	H	351.0	8.7
12016.416667	49.95	---	74.00	24.05	150.0	H	351.0	15.6
12048.866667	---	41.87	54.00	12.13	150.0	H	109.0	16.4

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BT+WIFI 5G
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7456.208333	---	35.71	54.00	18.29	150.0	V	167.0	8.5
7468.500000	43.58	---	74.00	30.42	150.0	V	188.0	8.6
11703.225000	---	42.00	54.00	12.00	150.0	V	343.0	14.9
11748.950000	49.41	---	74.00	24.59	150.0	V	177.0	15.5

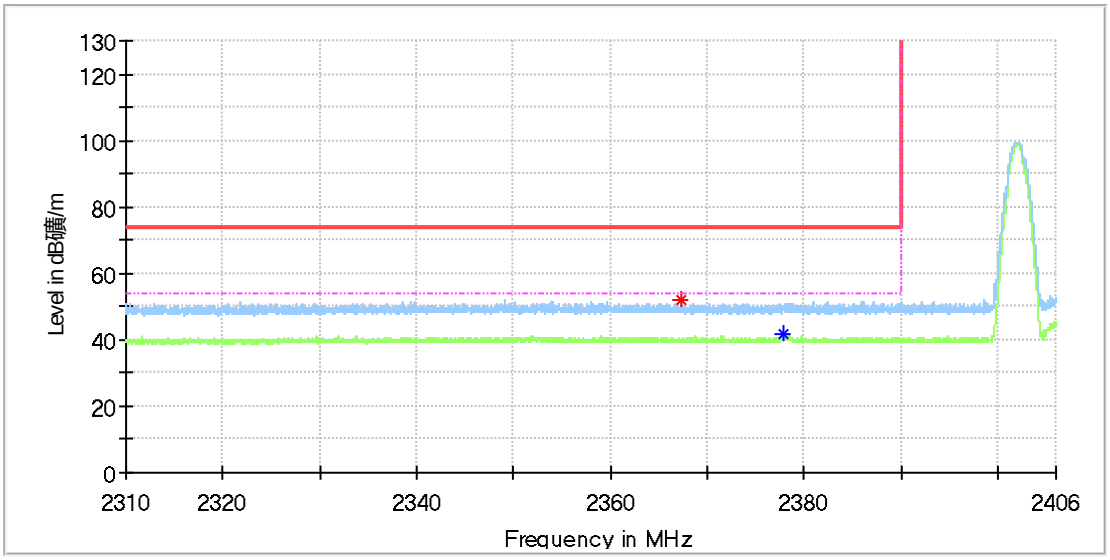
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

Appendix A.9: Test Results of Radiated Emissions in Restricted Bands

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

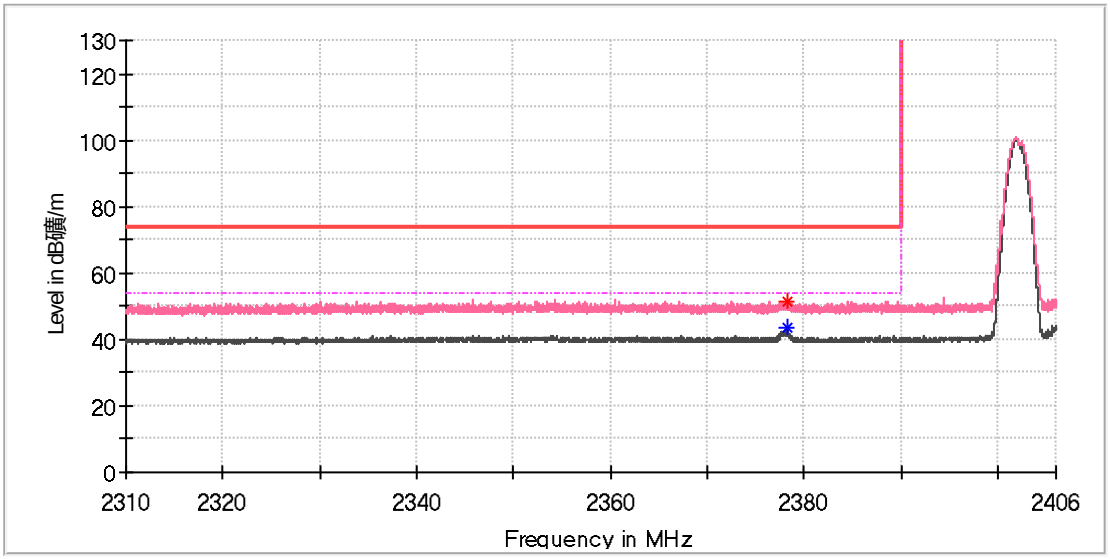
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2367.247059	52.13	---	74.00	21.87	150.0	H	0.0	8.5
2377.920000	---	41.98	54.00	12.02	150.0	H	286.0	8.5

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BR_DH5_Low channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

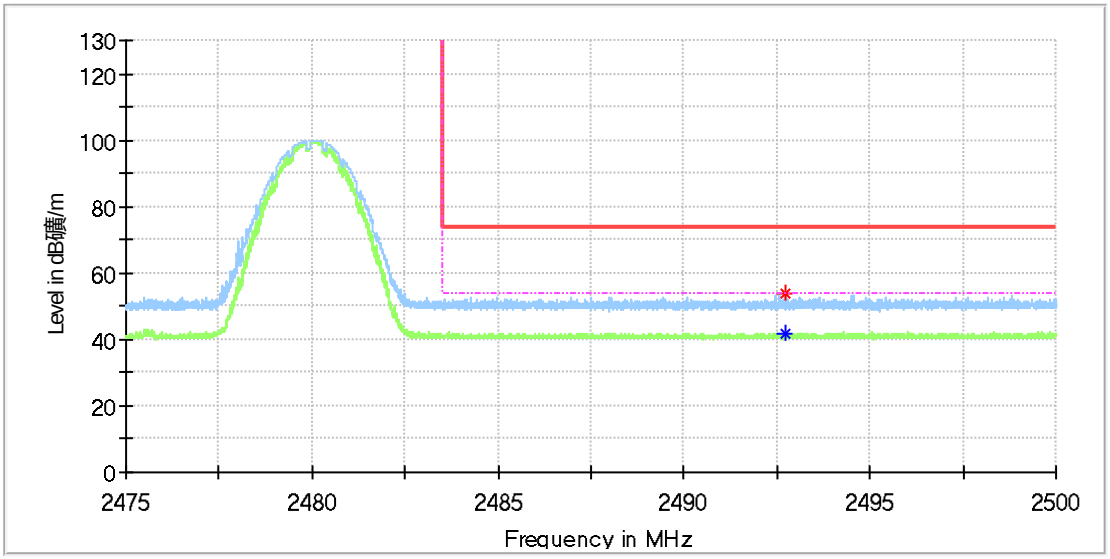
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2378.216471	---	43.34	54.00	10.66	150.0	V	217.0	8.5
2378.258824	51.19	---	74.00	22.81	150.0	V	342.0	8.5

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BR_DH5_High channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

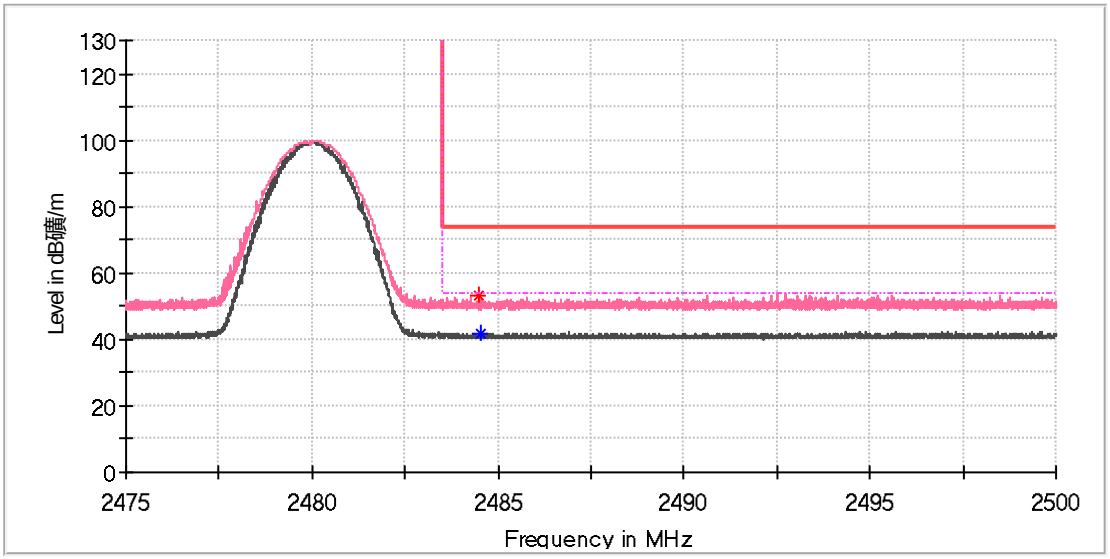
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2492.713235	---	41.97	54.00	12.03	150.0	H	223.0	9.0
2492.713235	53.88	---	74.00	20.12	150.0	H	223.0	9.0

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BR_DH5_High channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2484.477941	53.36	---	74.00	20.64	150.0	V	81.0	9.0
2484.555147	---	41.75	54.00	12.25	150.0	V	206.0	9.0

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

Appendix B: Test Results of Bluetooth LE

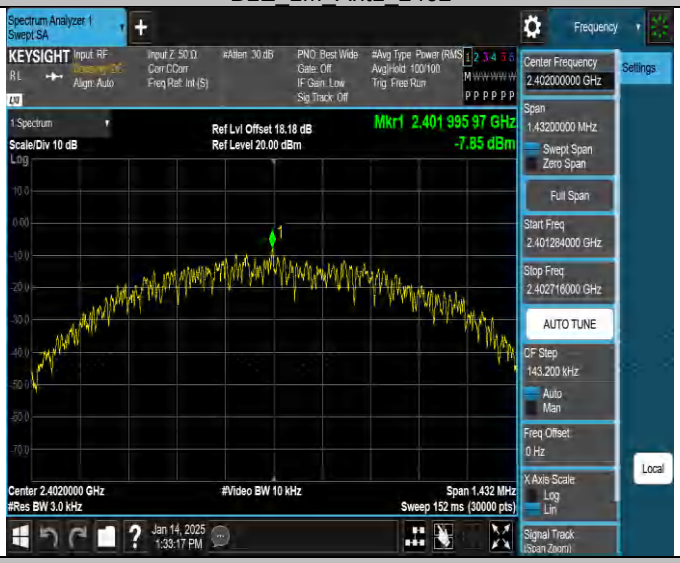
Appendix B.1: Test Results of Conducted Power Spectral Density

Test Result

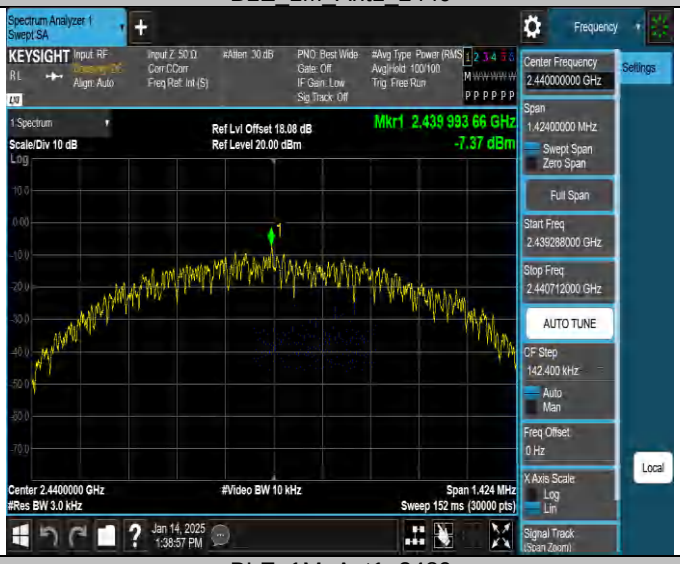
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-7.85	≤8.00	PASS
		2440	-7.37	≤8.00	PASS
		2480	-7.86	≤8.00	PASS

Test Graphs

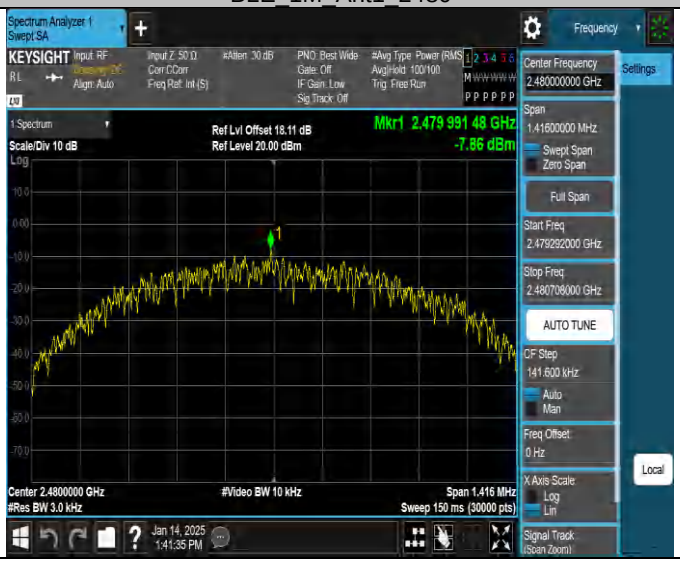
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480



Appendix B.2: Test Results of 6dB Bandwidth

Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.716	2401.652	2402.368	0.5	PASS
		2440	0.712	2439.656	2440.368	0.5	PASS
		2480	0.708	2479.660	2480.368	0.5	PASS

Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

Appendix B.3: Test Results of 99% Bandwidth

Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.0737	2401.4918	2402.5655	---	PASS
		2440	1.0780	2439.4865	2440.5645	---	PASS
		2480	1.0679	2479.4856	2480.5535	---	PASS

Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

Appendix B.4: Test Results of Band Edge Measurements

Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	5.44	-44.57	≤-14.56	PASS
		High	2480	5.22	-43.64	≤-14.78	PASS

Test Graphs

BLE_1M_Ant1_Low_2402

BLE_1M_Ant1_High_2480

Appendix B.5: Test Results of Conducted Spurious Emission

Test Result

TestMode	Antenna	Channel	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	5.37	5.37	---	PASS
			30~1000	5.37	-42.04	≤-14.63	PASS
			1000~26500	5.37	-33.35	≤-14.63	PASS
		2440	Reference	5.65	5.65	---	PASS
			30~1000	5.65	-42.14	≤-14.35	PASS
			1000~26500	5.65	-33.04	≤-14.35	PASS
		2480	Reference	5.22	5.22	---	PASS
			30~1000	5.22	-42.2	≤-14.78	PASS
			1000~26500	5.22	-32.79	≤-14.78	PASS

Test Graphs

BLE_1M_Ant1_2402_0~Reference

BLE_1M_Ant1_2402_30~1000

BLE_1M_Ant1_2402_1000~26500

BLE_1M_Ant1_2440_0~Reference

BLE_1M_Ant1_2440_30~1000

BLE_1M_Ant1_2440_1000~26500


BLE_1M_Ant1_2480_0~Reference

BLE_1M_Ant1_2480_30~1000

BLE_1M_Ant1_2480_1000~26500

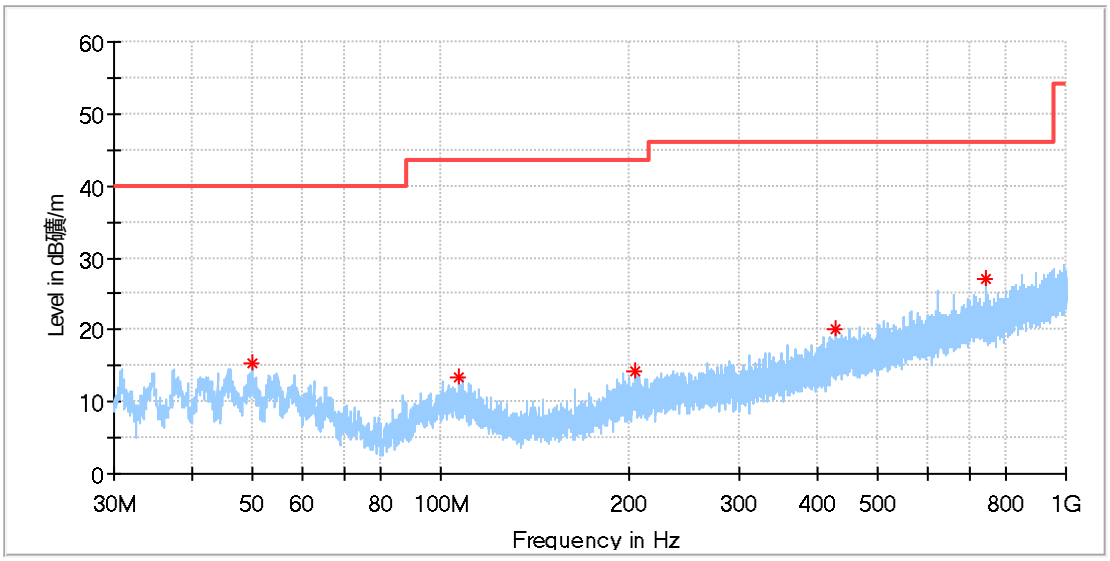
Appendix B.6: Test Results of Radiated Spurious Emissions

Note:
1) This testing was carried out on different modulations, but only the worst case was presented in this report.
2) Testing was carried out within frequency range 9kHz to the tenth harmonics. The measurement results below 30MHz and 18GHz - 26.5GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported.

30 MHz - 1GHz

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

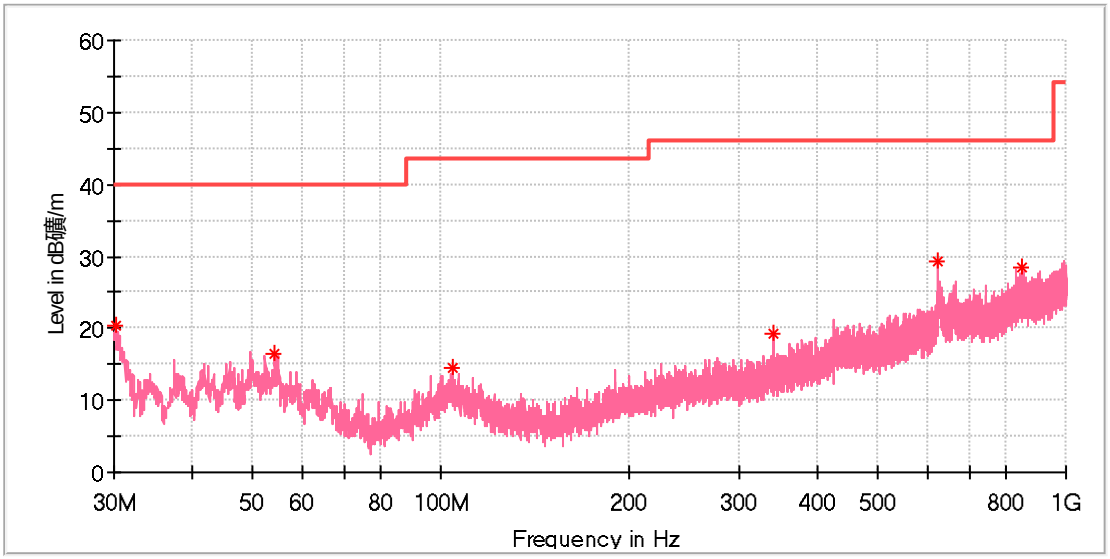
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
49.885000	15.37	40.00	24.63	100.0	H	235.0	-18.4
106.704615	13.35	43.50	30.15	100.0	H	22.0	-19.0
205.122308	14.34	43.50	29.16	100.0	H	308.0	-19.0
426.841923	20.23	46.00	25.77	100.0	H	139.0	-13.2
742.502308	26.95	46.00	19.05	100.0	H	291.0	-7.2

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
30.149231	20.24	40.00	19.76	100.0	V	0.0	-23.0
54.212692	16.55	40.00	23.45	100.0	V	256.0	-18.5
104.727308	14.50	43.50	29.00	100.0	V	144.0	-18.9
339.616539	19.27	46.00	26.73	100.0	V	0.0	-15.1
625.020385	29.26	46.00	16.74	100.0	V	207.0	-9.2
850.731923	28.49	46.00	17.51	100.0	V	160.0	-5.4

Final_Result

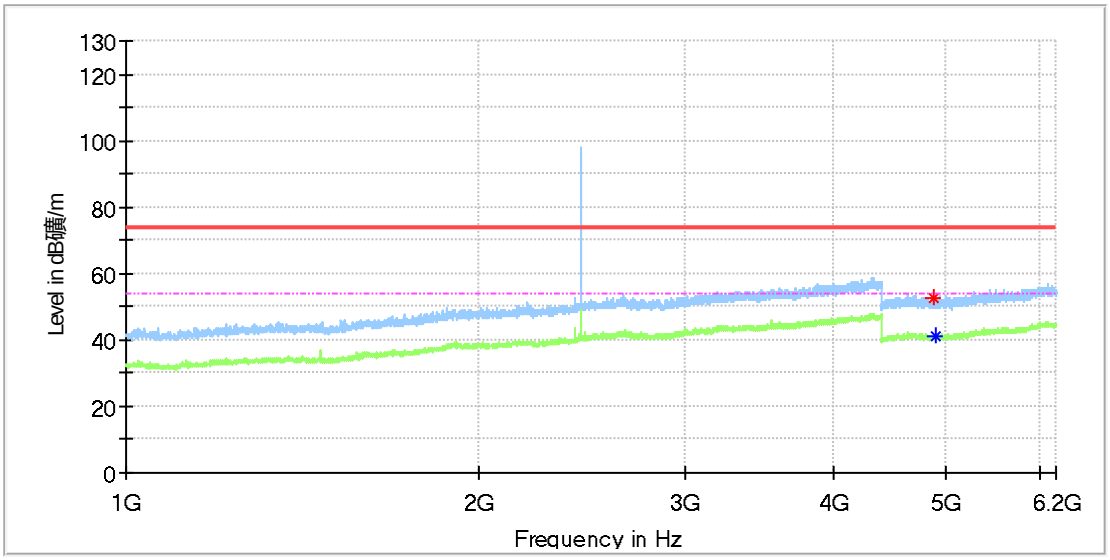
Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

1GHz - 18GHz

Note: The highest waveform in the figure is Bluetooth Fundamental.

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

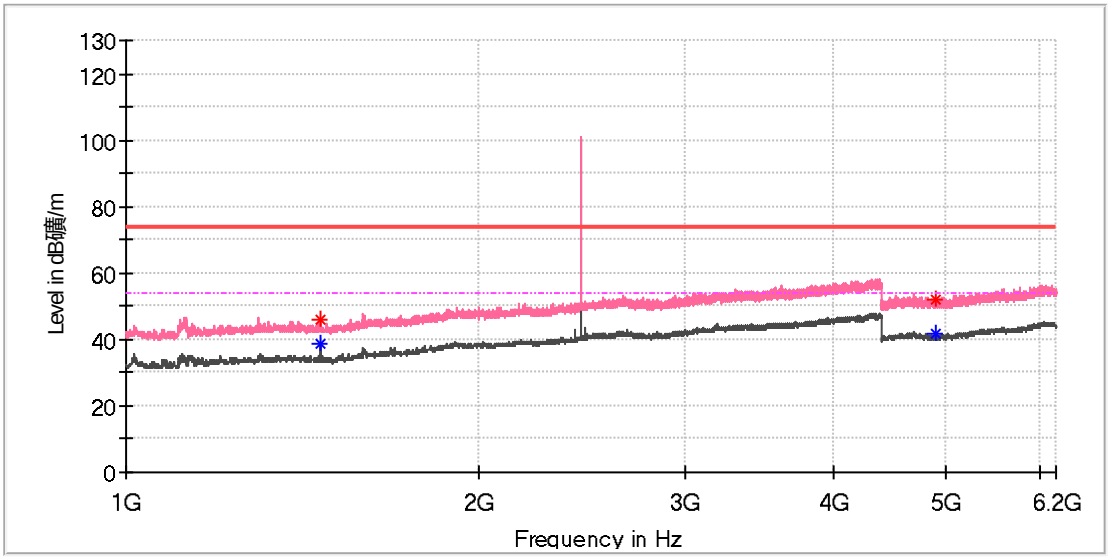
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4873.000000	52.67	---	74.00	21.33	150.0	H	1.0	13.3
4899.000000	---	41.26	54.00	12.74	150.0	H	1.0	13.3

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

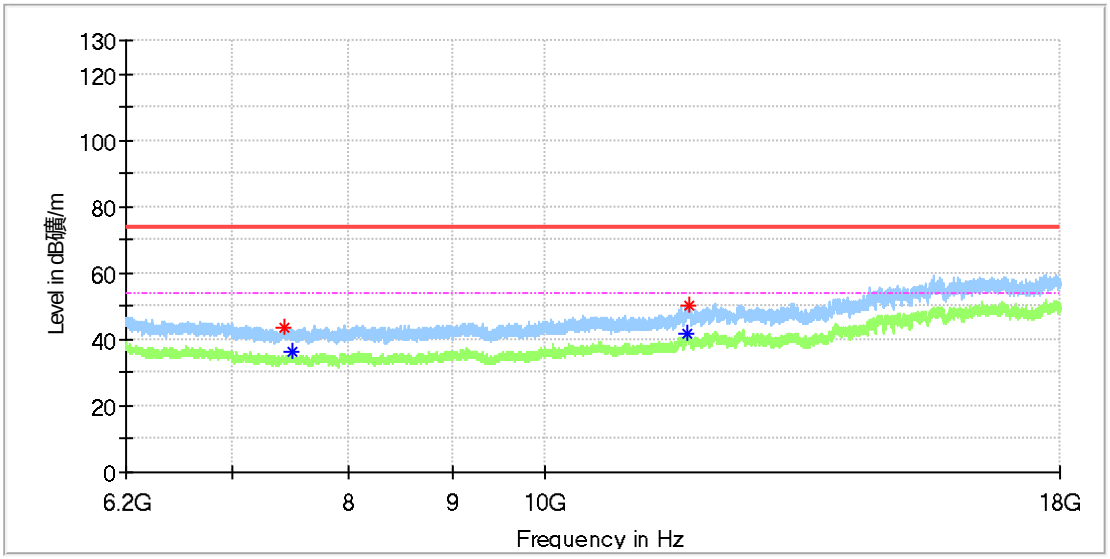
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1464.000000	45.69	---	74.00	28.31	150.0	V	210.0	2.6
1464.000000	---	38.42	54.00	15.58	150.0	V	210.0	2.6
4897.000000	51.99	---	74.00	22.01	150.0	V	2.0	13.3
4905.000000	---	41.83	54.00	12.17	150.0	V	18.0	13.3

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

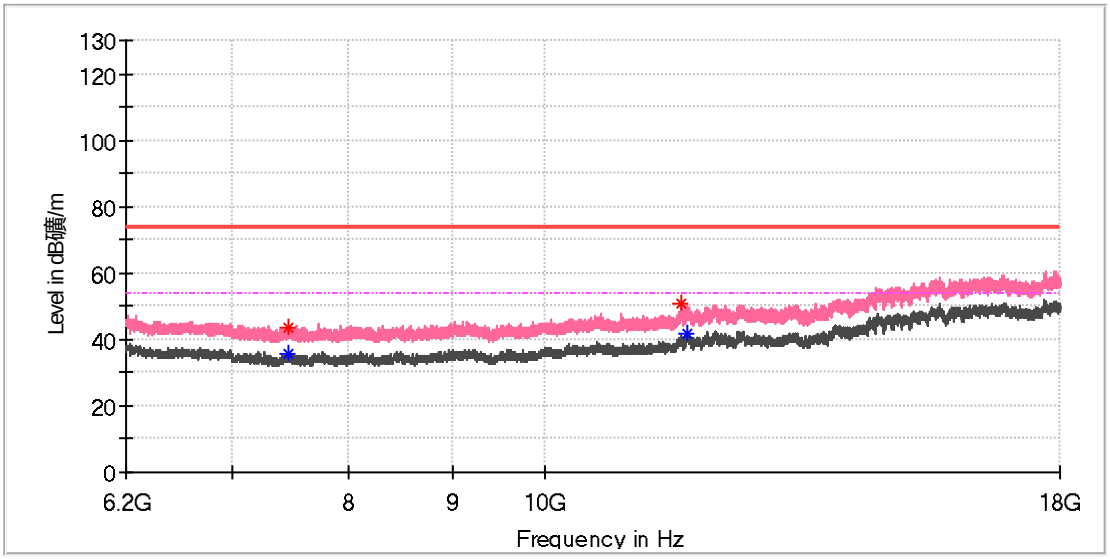
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7429.166667	43.42	---	74.00	30.58	150.0	H	315.0	8.4
7489.641667	---	36.08	54.00	17.92	150.0	H	357.0	8.7
11751.408333	---	41.59	54.00	12.41	150.0	H	210.0	15.5
11790.741667	50.27	---	74.00	23.73	150.0	H	357.0	15.0

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BLE 1M_Mid channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
7462.108333	43.63	---	74.00	30.37	150.0	V	19.0	8.6
7462.108333	---	35.87	54.00	18.13	150.0	V	19.0	8.6
11671.266667	50.52	---	74.00	23.48	150.0	V	131.0	15.0
11766.158333	---	41.62	54.00	12.38	150.0	V	75.0	15.3

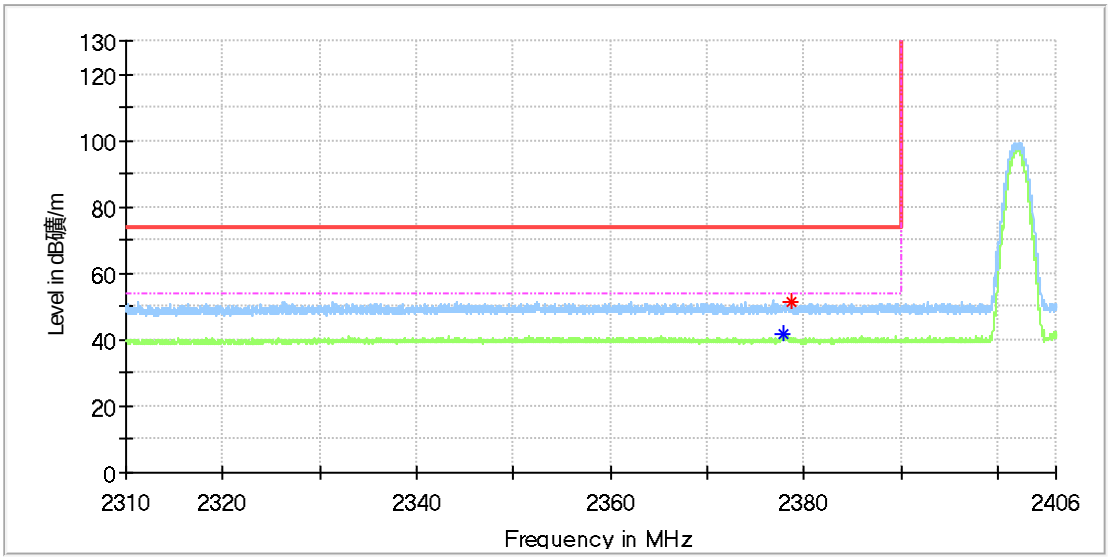
Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

Appendix B.7: Test Results of Radiated Emissions in Restricted Bands

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

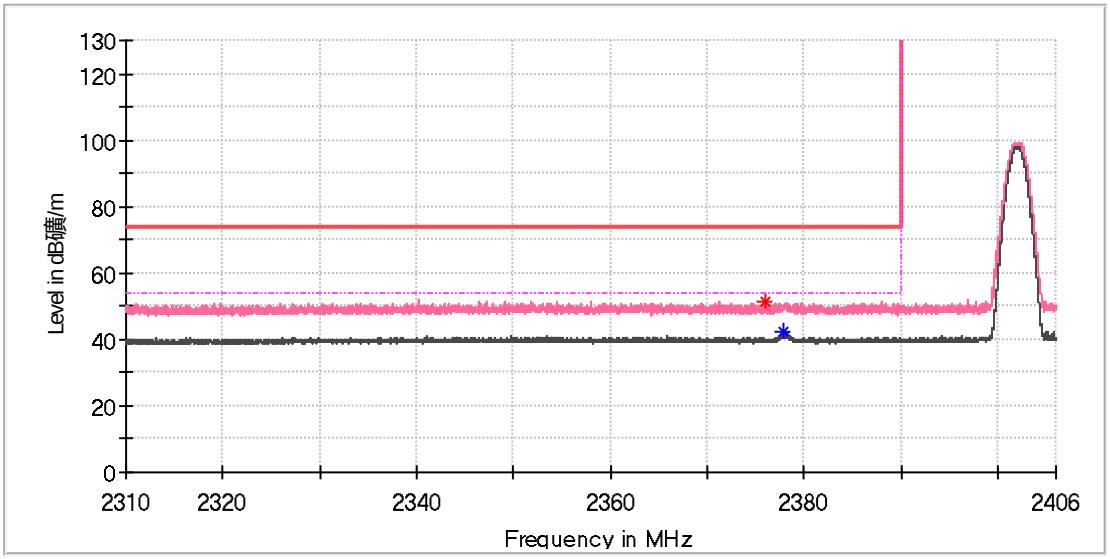
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2377.905882	---	41.97	54.00	12.03	150.0	H	269.0	8.5
2378.696471	51.70	---	74.00	22.30	150.0	H	143.0	8.5

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BLE 1M_Low channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

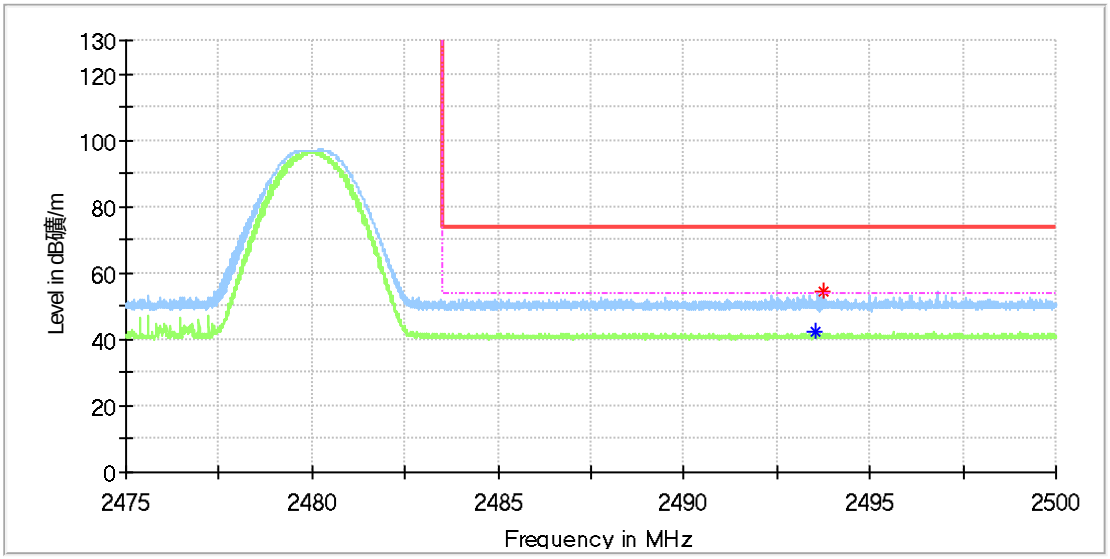
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2376.042353	51.11	---	74.00	22.89	150.0	V	44.0	8.5
2377.807059	---	42.21	54.00	11.79	150.0	V	226.0	8.5

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

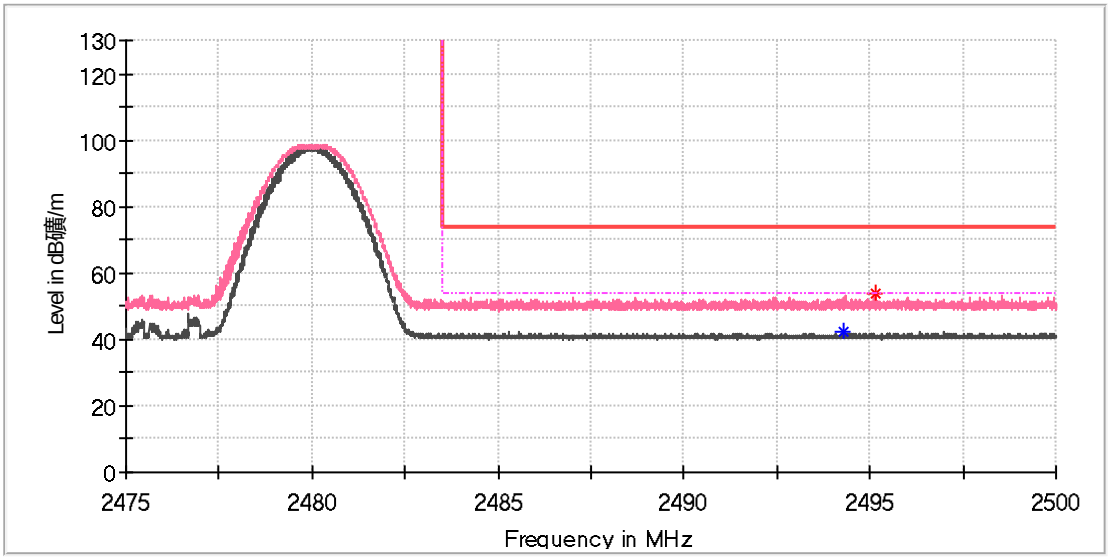
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2493.555147	---	42.58	54.00	11.42	150.0	H	4.0	9.0
2493.727941	54.19	---	74.00	19.81	150.0	H	252.0	9.0

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---

EUT Information

EUT Name:	Digital Cockpit Head Unit
Model:	DHU2.5_A
Test Mode:	BLE 1M_High channel
Order No/Sample No:	168516757/A003881754-002
Test Voltage:	DC 12V From DC Source
Remark:	Temp 23 Humi:53%
Test Standard:	FCC 15.247
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2494.272059	---	42.38	54.00	11.62	150.0	V	168.0	9.0
2495.132353	54.09	---	74.00	19.91	150.0	V	47.0	9.0

Final_Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
---	---	---	---	---		---	---