

Test report No:
 NIE: 72370REM.001A2

Test report

**FCC Rules and Regulations CFR 47, Part 15, Subpart B
 (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)**

(*) Identification of item tested	CIVIC Central In-Vehicle Infotainment Computer
(*) Trademark	Bosch
(*) Model and /or type reference	MBCI2LS4PN1
Other identification of the product	FCC ID: 2AUXS-MBCI2LS4PN1 IC: 25847-MBCI2LS4PN1
(*) Features	HW version: D1.1 SW version: E23.3 AM/FM/DAB/SIRIUS, GNSS, 2.4/5GHz WLAN, Bluetooth 5.1, Video/Audio etc
Applicant	Robert Bosch GmbH Robert-Bosch-Strasse 200, 31139 Hildesheim Germany
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López Martín EMC Consumer & RF Lab. Manager
Date of issue	2022-11-02
Report template No	FDT08_24 (* "Data provided by the client")



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Acronyms

Acronym ID	Acronym Description
Code	EMC Test Code
Freq Rng	Frequency Range
MP	Measurement Point
OM	Operation Mode
S/	Sample
V	Verdict

Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification S.A.U. is an FCC-recognized accredited testing laboratory with the appropriate scope of accreditation that covers the performed tests in this report, FCC designation number ES0004.

DEKRA Testing and Certification S.A.U. is an ISED recognized accredited testing laboratory, CABid: ES1909, with the appropriate scope of accreditation that covers the performed tests in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification S.A.U. at the time of performance of the test.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification S.A.U. internal document PODT000.

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 1000 MHz is $I = \pm 4,9$ dB for quasi-peak measurements, $I = \pm 4,6$ dB for peak measurements ($k = 2$)

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 1000 MHz to 26 GHz is $I = \pm 2,6$ dB for peaks and average measurements ($k = 2$)

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested" and "Derived model not tested").
2. The tested model is: MBCI2LS4PN1. It consists of a CIVIC Central In-Vehicle Infotainment Computer, including WLAN/ Bluetooth, GPS, AM/FM/DAB receiver.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial N°	Date of Reception	Application
S/01	72370_13.1	Connecting cable	--	--	2022-05-17	Auxiliary Element
S/01	72370_179.1	Vehicle Infotainment Computer	MBCI2LS4PN1	0006024	2022-05-26	Element Under Test
S/01	72370_181.1	Termination Box	--	--	2022-05-26	Auxiliary Element
S/01	72370_19.1	USB Cable	--	--	2022-05-17	Auxiliary Element
S/01	72370_20.1	USB Adapter	--	--	2022-05-17	Auxiliary Element
S/01	72370_41.1	FAKRA to SMA cable	--	--	2022-05-17	Auxiliary Element
S/01	72370_6.1	Harness	--	--	2022-05-17	Auxiliary Element
S/01	72370_62.1	FAKRA 4n1 cable	--	--	2022-05-17	Auxiliary Element
S/01	72370_64.1	FAKRA 4n1 cable	--	--	2022-05-17	Auxiliary Element
S/01	72370_68.1	FAKRA to SMA cable	--	--	2022-05-17	Auxiliary Element
S/01	72370_69.1	FAKRA to SMA cable	--	--	2022-05-17	Auxiliary Element
S/01	72370_86.1	DC Block	--	--	2022-05-17	Auxiliary Element
S/01	72370_87.1	DC Block	--	--	2022-05-17	Auxiliary Element

Notes referenced to samples during the project.

Test sample description

Test Sample description (compulsory information for EMC and RF testing services)

Ports..... :	Port name and description	Cable					
		Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾		
	Main Connector	2m	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Most Connector	2m	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	Fakra Quad Connector AM/FM/DAB Fakra Single Connector GPS	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	Fakra Quad Connector WLAN/BT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Supplementary information to the ports..... :	.....					
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	DC: 9-16V nominal 12 VDC by vehicle battery					
<input type="checkbox"/>	DC:						
Rated Power .....	.....					
Clock frequencies..... :	.....					
Other parameters .....	.....					
Software version	E23.3						
Hardware version	D1.1						
Dimensions in cm (W x H x D) .....	.....					
Mounting position	<input type="checkbox"/>	Table top equipment					

	<input type="checkbox"/>	Wall/Ceiling mounted equipment		
	<input type="checkbox"/>	Floor standing equipment		
	<input type="checkbox"/>	Hand-held equipment		
	<input checked="" type="checkbox"/>	Other: Cluster in the car		
Modules/parts.....:	Module/parts of test item		Type	Manufacturer

Accessories (not part of the test item)	Description		Type	Manufacturer
	Antennas		.....	.....
	HUD		.....	.....
	SA2 Panel		.....	.....
	Cameras		.....	.....

Documents as provided by the applicant.....:	Description		File name	Issue date

⁽³⁾ Only for Medical Equipment

Identification of the client

Robert Bosch GmbH
Robert-Bosch-Strasse 200, 31139 Hildesheim Germany

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2022-05-30
Date (finish)	2022-05-30

Document history

Report number	Date	Description
72370REM.001	2022-10-18	First release
72370REM.001A1	2022-10-20	Second release. Modification of Hardware Version of sample tested. This modification of test report cancels and replaces the test report 72370REM.001.
72370REM.001A2	2022-11-02	Second release. Modification due to missing info regarding MME mode. This modification of test report cancels and replaces the test report 72370REM.001A1.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860mbar Max. = 1060mbar

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860mbar Max. = 1060mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860mbar Max. = 1060mbar

Remarks and comments

The tests have been performed by the technical personnel: Antonio Ruiz Sánchez.

Testing verdicts

Fail	F
Inconclusive	I
Not applicable	N/A
Not measured	N/M
Pass	P
Partial Passed	P*

List of equipment used during the test

Control No.	Equipment	Model	Manufacturer	Next Calibration
2942	EMI TEST RECEIVER 20Hz-40GHz	ESU40	ROHDE AND SCHWARZ	2023-11-22
8866	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2023-09-21
6132	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2023-05-09
6126	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2023-05-04
4612	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK MESS-ELEKTRONIK	2024-07-13
4656	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2024-09-29
3541	HYBRID BILOG ANTENNA 30MHz-6GHz	JB6	SUNOL SCIENCES CORPORATION	2024-11-15
5641	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2024-09-15
6193	PRE-AMPLIFIER G>48dB 18-40GHz	JS44-18004000-33-8P	NARDA	2022-03-24
8788	PREAMPLIFIER 30dB 500MHz-18GHz	BBV 9718 C	SCHWARZBECK	2022-06-07

Summary

Test Specification.	Requirement – Test case	Verdict	Remark
FCC CFR 47, Part 15, Subpart B (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)	RE Radiated emission. Electromagnetic field measure	Pass	---
	CE Conducted emission	N/A	(1)
Supplementary information and remarks:			
(1) This test is not applicable because EUT is powered in DC			

Appendix A: Test results

Appendix A content

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Description of the operation modes

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. Every operation mode takes a failure criteria for the immunity test that they were applying to it and a monitoring to guarantee performance of the same ones.

The operation modes used by the samples to which the present report refers, are shown in the following table:

Id	Description
OM/01	EUT ON. Bluetooth, Wifi 2.4GHz and Wifi 5GHz OFF. GNSS awaiting valid position. FM mode 98MHz tuned. Power supply: 12 Vdc

Test standards version applied

The product standards and test standards applied for each test cases are shown in the following table:

Product Test Standard	Test standard	Requirement – Test case
FCC CFR 47, Part 15, Subpart B (10-1-21 Edition) & ICES-003 Issue 7 (October 2020)	ANSI C63.4 (2014)	RE Radiated emission.
	ANSI C63.4 (2014)	CE Continuous conducted emission

Test Cases Details

RE Radiated emission. Electromagnetic field measure

Limits of interference Class B

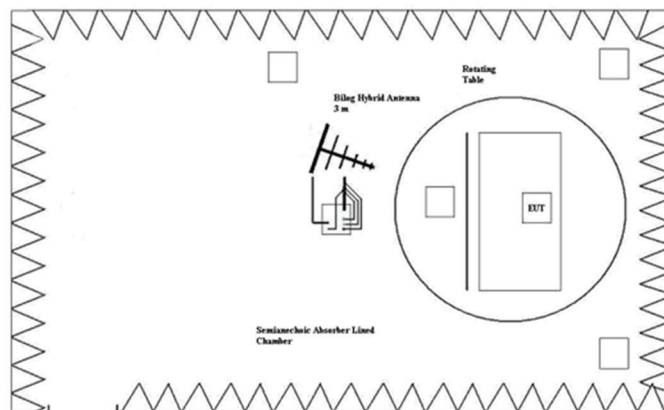
The applied limit for radiated emissions, 3 m distance, according to the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-21 Edition), Secs. 15.109 & ICES-003 Issue 7 (October 2020)

Frequency range (MHz)	FCC Part 15B		ICES-003 Issue 7		FCC Part 15B & ICES-003 Issue 7	
	QP Limit for 3 m		QP Limit for 3 m		PK Limit for 3 m	AVG Limit for 3 m
	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)
30 to 88	100	40	100	40	---	---
88 to 216	150	43.5	150	43.5	---	---
216 to 230	200	46	200	46	---	---
230 to 960	200	46	224	47	---	---
960 to 1000	500	54	500	54	---	---
Above 1000	---	---	---	---	74	54

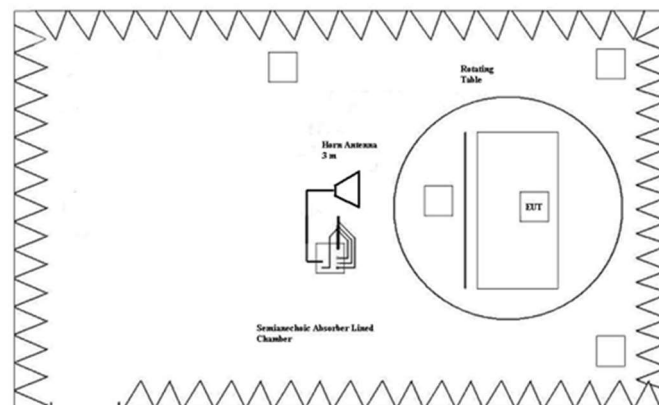
NOTE: FCC QP and AVG limits are in concordance with RSS-Gen Issue 5 (March 2019), Secs. 7.1 and 7.3.

Limits according to FCC Part 15B, are equal or more stringent than those of ICES-003 Issue 7.

Setup for measurements



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

Results

S/	OM	Code	Freq Rng (MHz)	V
01	OM/01	RE0101LR	[30, 1000]	P
01	OM/01	RE0101HR1	[1000, 17000]	P
01	OM/01	RE0101HR2	[17000, 26000]	P

Verdict

Pass

Attachments

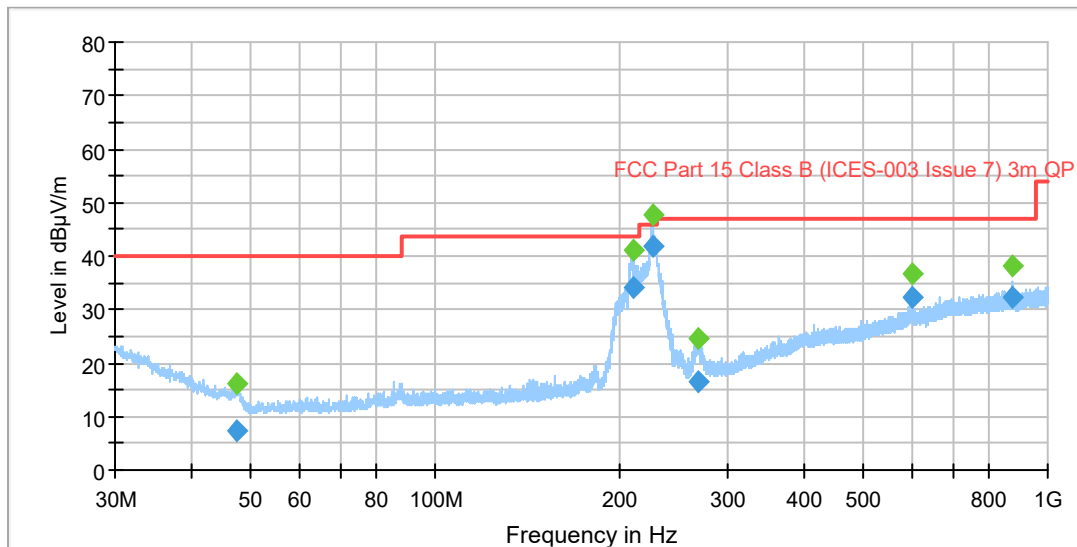
EMC Test Code = RE0101LR, Frequency Range MHz = [30, 1000]

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Bluetooth, Wifi 2.4GHz and Wifi 5GHz OFF. GNSS awaiting valid position. FM mode 98MHz tuned. Power supply: 12 Vdc

Images:

Full Spectrum



◆ Preview Result 1-PK+ Final_Result QPK
 — FCC Part 15 Class B (ICES-003 Issue 7) 3m Q
◆ Final_Result PK+

Tables:

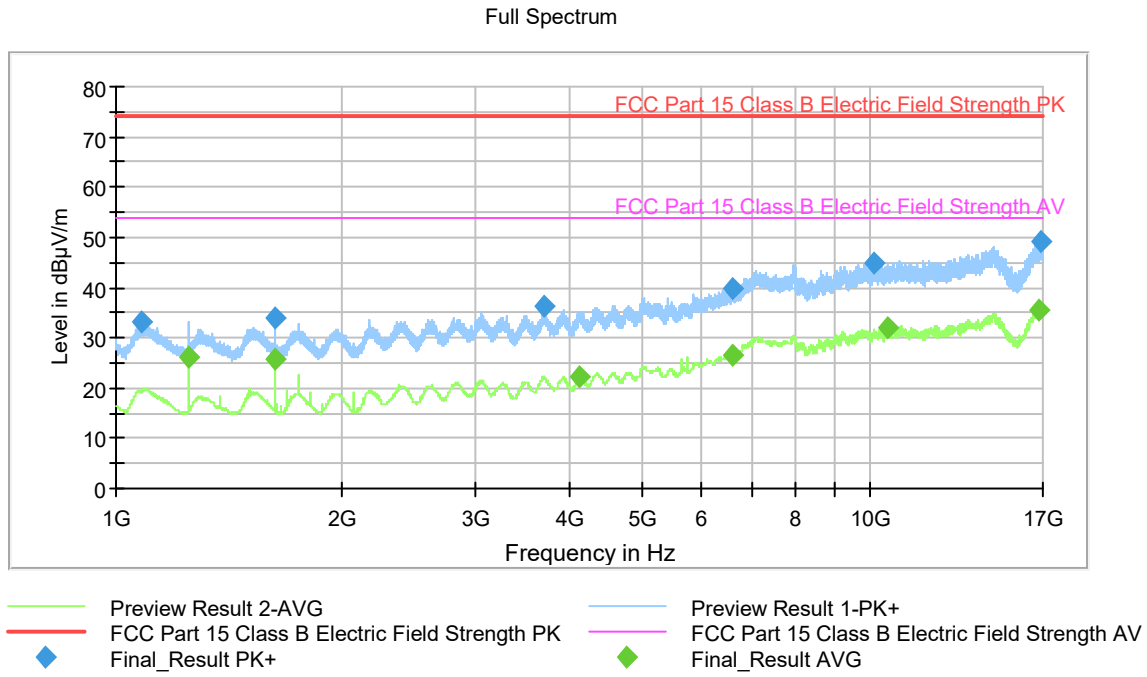
Frequency(MHz)	QuasiPeak(dBµV/m)	MaxPeak(dBµV/m)	Limit(dBµV/m)	Margin(dB)	Height(cm)	Pol	Azimuth(deg)
47.363000	7.38	---	40.00	32.62	100.0	V	7.0
47.363000	---	16.24	---	---	100.0	V	7.0
210.117000	---	40.97	---	---	115.0	V	172.0
210.117000	34.20	---	43.52	9.32	115.0	V	172.0
226.299000	---	47.61	---	---	125.0	H	-146.0
226.299000	41.93	---	46.00	4.07	125.0	H	-146.0
268.936000	---	24.47	---	---	207.0	V	-53.0
268.936000	16.64	---	47.00	30.36	207.0	V	-53.0
600.025000	32.19	---	47.00	14.81	222.0	V	59.0
600.025000	---	36.58	---	---	222.0	V	59.0
875.022000	32.29	---	47.00	14.71	166.0	V	0.0
875.022000	---	38.23	---	---	166.0	V	0.0

EMC Test Code = RE0101HR1, Frequency Range MHz = [1000, 17000]

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Bluetooth, Wifi 2.4GHz and Wifi 5GHz OFF. GNSS awaiting valid position. FM mode 98MHz tuned. Power supply: 12 Vdc

Images:



Tables:

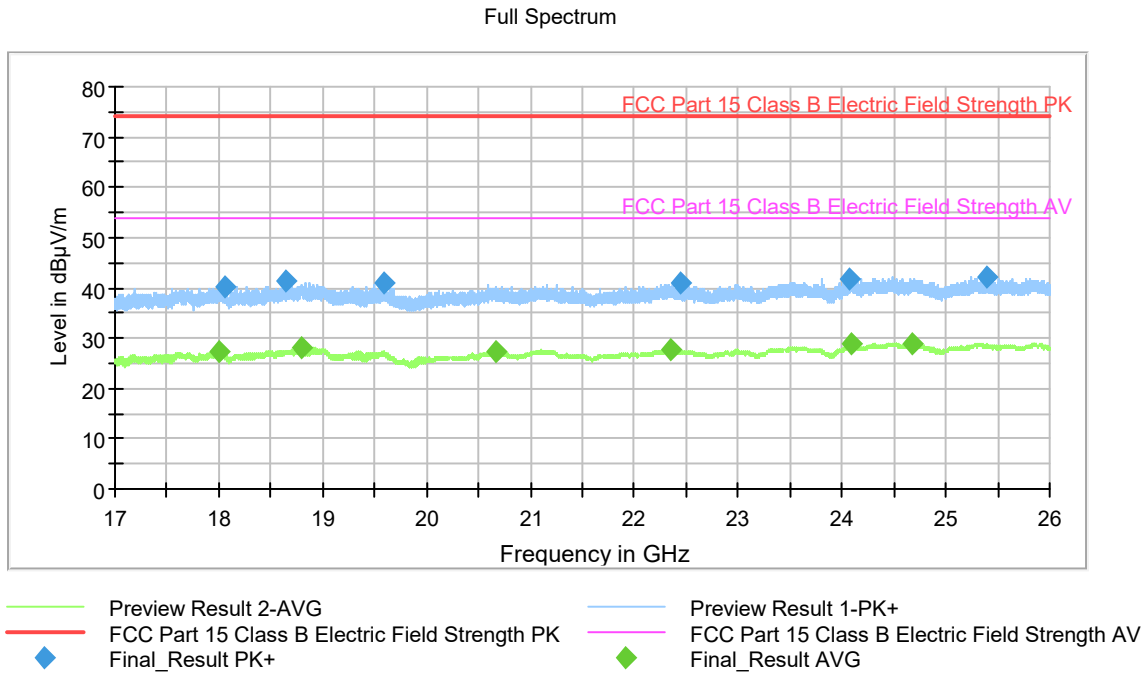
Frequency(MHz)	MaxPeak(dBµV/m)	Average(dBµV/m)	Limit(dBµV/m)	Margin(dB)
1084.250000	33.25	---	73.97	40.72
1250.000000	---	26.12	53.97	27.85
1625.000000	34.10	---	73.97	39.87
1625.000000	---	25.63	53.97	28.34
3704.250000	36.36	---	73.97	37.61
4121.500000	---	22.25	53.97	31.72
6585.250000	39.85	---	73.97	34.12
6595.250000	---	26.71	53.97	27.26
10139.500000	44.94	---	73.97	29.03
10559.750000	---	31.96	53.97	22.01
16781.000000	---	35.70	53.97	18.27
16933.750000	49.30	---	73.97	24.67

EMC Test Code = RE0101HR2, Frequency Range MHz = [17000, 26000]

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Bluetooth, Wifi 2.4GHz and Wifi 5GHz OFF. GNSS awaiting valid position. FM mode 98MHz tuned. Power supply: 12 Vdc

Images:



Tables:

Frequency(MHz)	MaxPeak(dBµV/m)	Average(dBµV/m)	Limit(dBµV/m)	Margin(dB)
18001.500000	---	27.31	53.97	26.66
18064.500000	40.18	---	73.97	33.79
18648.250000	41.24	---	73.97	32.73
18805.500000	---	28.26	53.97	25.71
19591.000000	40.97	---	73.97	33.00
20666.500000	---	27.44	53.97	26.53
22358.500000	---	27.62	53.97	26.35
22436.500000	41.07	---	73.97	32.90
24076.000000	41.89	---	73.97	32.08
24098.750000	---	28.95	53.97	25.02
24668.250000	---	28.88	53.97	25.09
25390.250000	42.22	---	73.97	31.75