



FCC LISTED, REGISTRATION
NUMBER: 2764.01

ISED LISTED REGISTRATION
NUMBER: 23595-1

Test report No:
3735ERM.004

Test report

**FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-20 Edition)
&
ICES-003 ISSUE 7 – October (2020)**

(*) Identification of item tested	Automotive Rear Seat Entertainment LCD Display mounted on the ceiling
(*) Trademark	Innolux
(*) Model and /or type reference tested	Padi 31.3
Other identification of the product	FCC ID: 2AQPW-DD313IA-01A IC ID: 27960-DD313IA01A
(*) Features	Bluetooth Classic
Manufacturer	CARUX TECHNOLOGY INC. No. 12, Building B, Nanke 8th Road, Shanhua District, Tainan City, 74144
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-20 Edition) ICES-003 ISSUE 7 – October (2020)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager
Date of issue	09-16-2022
Report template No	FDT08_23 (*) "Data provided by the client"

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Competences and guarantees

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

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

DEKRA Certification Inc. 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 Certification at the time of performance of the test.

DEKRA Certification Inc. 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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Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Certification internal document PODT000.

	Frequency (MHz)	U (k=2)	Units
Radiated emission	30 - 1000	5.94	dB
	1000-18000	5.89	dB

Data provided by the client

Automotive Rear Seat Entertainment LCD Display mounted on the ceiling.

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

Usage of samples

Samples used for test have been selected by **The Client**.

Sample S/01 is composed of the following elements, accessories and auxiliary equipment:

Id	Control Number	Description	Manufacturer/Model	Serial N°	Date of Reception	Application
S/01	3735/01	Automotive Rear Seat Entertainment LCD Display	Innolux / Padi 31.3	0611211109	2022-08-15	Element Under Test
S/01	3735/10	Padi Power DC Cable	-	-	2022-08-15	Accessory
S/01	3735/16	AC/DC Adapter	TT Electronics / SW3477D	-	2022-08-15	Accessory
S/01	3735/26	USB 3.0A female to USB-C 3.1 male - Adapter	ALLTEQ	-	2022-08-15	Accessory
S/01	3735/30	Pendrive	ScanDisk / SDCZ48-016G	-	2022-08-15	Accessory
S/01	3735/32	Gigabit Ethernet Adapter	StarTech / USB31000S	211001000649	2022-08-15	Accessory
S/01	3735/34	UTP RJ45 to RJ45 Ethernet cable - 2m	Cat5e	-	2022-08-15	Accessory
S/01	1302	Automotive Ethernet Adapter	Rad Moon	12813	-	Auxiliary
S/01	Dekra 46	Broad-Reach (100Base-T1) to OABR cable	-	-	-	Auxiliary
S/01	Dekra 02	Laptop	DELL / Latitude 5470	9T12LT2	-	Auxiliary

Sample S/01 was used for the following test(s): Radiated emission test indicated in appendix A.

Test sample description

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

Ports..... :	Port name and description		Cable								
			Specified length [m]	Attached during test	Shielded	Coupled to patient					
	USB-C		2	☒	☒	☐					
	HDMI		2	☒	☒	☐					
	Headphone jacks		2	☒	☒	☐					
	OABR		2	☒	☒	☐					
	Power Supply		2	☒	☐	☐					
Supplementary information to the ports..... :	No Data Provided										
Rated power supply	Voltage and Frequency		Reference poles								
			L1	L2	L3	N PE					
	☐	AC:	☐	☐	☐	☐					
	☐	AC:	☐	☐	☐	☐					
	☒	DC: 13 Vdc									
	☐	DC:									
Rated Power	110 Watts										
Clock frequencies.....	No Data Provided										
Other parameters	No Data Provided										
Software version	12										
Hardware version	12										
Dimensions in cm (W x H x D)	82.5 X 26 X 4.6										
Mounting position	☐	Table top equipment									
	☒	Wall/Ceiling mounted equipment									
	☐	Floor standing equipment									
	☐	Hand-held equipment									
	☐	Other:									

Modules/parts.....:	Module/parts of test item	Type	Manufacturer
	Padi 31.3, GDD313IA0010S	China	CarUX
Accessories (not part of the test item)	Description	Type	Manufacturer
	No Data Provided		
Documents as provided by the applicant.....:	Description	File name	Issue date
	Declaration Equipment Data	FDT30_18 Declaration Equipment Data_Signed	09/13/2022
Copy of marking plate:			
			

Identification of the client

Innolux Europe BV
Stationsstraat 39G, 6411NK, Heerlen
Netherlands

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	08-11-2022
Date (finish)	08-11-2022

Document history

Report number	Date	Description
3735ERM.004	09-16-2022	First release

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. = 860 mbar Max. = 1060 mbar

In the semi-anechoic 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. = 860 mbar Max. = 1060 mbar

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. = 860 mbar Max. = 1060 mbar

Remarks and comments

1. The tests have been performed by the technical personnel: Nasir Khan and Koji Nishimoto.

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Summary

Emission Test			
Report Section	Requirement – Test case	Verdict	Remark
A.1	Radiated emission test (30 MHz – 1000 MHz)	P	N/A
A.1	Radiated emission test (1 GHz – 18 GHz)	P	N/A
-	Radiated emission test (18 GHz – 26 GHz)	N/A	Refer 1
-	Conducted emission test (150 kHz to 30 MHz)	N/A	Refer 2
<u>Supplementary information and remarks:</u> 1) According with the requirements of FCC Rules and Regulations, title 47, Chapter I, Subchapter A, Part 15, Subpart A, §15.33 Frequency range of radiated measurements, (b) for unintentional radiators, (1) due to The Highest frequency generated or used in the device above 1000MHz, The Upper frequency of measurement range is up to 5th harmonic of the highest frequency or 40GHz, whichever is lower. 2) According with the requirements of FCC Rules and Regulations, title 47, Chapter I, Subchapter A, Part 15, Subpart B, §15.107 Conducted limits, (d) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation, and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provision for, the use of battery chargers which permit operating while charging, AC adaptors or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.			

List of equipment used during the test

Radiated Emission Equipment

Control Number	Description	Manufacturer	Model	Last Calibration	Next Calibration
981	RF pre-amplifier 1-18 GHz	Bonn Elektronik	BLMA 0118-2A	2020/11	2022/11
1010	ESR7 EMI Test Receiver	Rohde & Schwarz	ESR7	2020/10	2022/10
1014	FSV40 Signal Analyzer 40GHz	Rohde & Schwarz	FSV40	2021/05	2023/05
1057	3116C Double-Ridged Waveguide Horn Antennas	ETS Lindgren	3116C	2020/06	2023/06
1065	Biconical log Antenna	ETS Lindgren	3142E	2020/08	2023/08
1108	Ethernet SNMP Thermometer- CR Room	HW Group	HWg-STE Plain	2020/09	2022/09
1111	Ethernet SNMP Thermometer- SAC	HW Group	HWg-STE Plain	2020/09	2022/09
1179	Semi-Anechoic Chamber	Frankonia	SAC 3plus 'L'	N/A	N/A
1217	Frankonia Transparent Test Table 1	Frankonia	FFT-Square	N/A	N/A
1314	Wireless measurement software EMC 32	Rohde & Schwarz	-	N/A	N/A

Appendix A: Test results

Appendix A Content

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A.1. RADIATED EMISSION ELECTROMAGNETIC FIELD.....13

DESCRIPTION OF THE OPERATION MODES

The operation modes described in this paragraph represent functionalities of the sample under test.

The following operation modes of the samples were used during the test executions:

OPERATION MODE	DESCRIPTION
OM#01*	DUT ON. Power supply 13 Vdc. • BT in IDLE mode.

* Worst case observed

A.1. RADIATED EMISSION ELECTROMAGNETIC FIELD

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-20 Edition), Secs. 15.109 & ICES-003 Issue 7 – October (2020)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-20 Edition), Secs. 15.109 & ICES-003 Issue 7 – October (2020); ANSI C63.4 (2014)

Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, in the frequency range 30 MHz to 40 GHz for class B equipment, according with the requirements of:

FCC Rules and Regulations 47 CFR Part 15, Subpart B, Secs. 15.109 (a) (10-01-20 Edition).

Frequency range (MHz)	QP Limit for 3 m	
	($\mu\text{V/m}$)	(dB $\mu\text{V/m}$)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46
Above 960	500	54

Frequency range (MHz)	AVG Limit for 3 m		PK Limit for 3 m (1)
	($\mu\text{V/m}$)	(dB $\mu\text{V/m}$)	(dB $\mu\text{V/m}$)
Above 1000	500	54	74

- (1) Frequencies above 1 GHz, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test, as per §15.35(b)

ICES-003 Issue 7, Secs 3.2.2, table 2 & 4 (October 2020).

Frequency range (MHz)	QP Limit for 3 m	
	($\mu\text{V/m}$)	(dB $\mu\text{V/m}$)
30 to 88	100	40
88 to 216	150	43.5
216 to 230	200	46
230 to 960	224	47
Above 960	500	54

Frequency range (MHz)	AVG Limit for 3 m		PK Limit for 3 m (1)
	($\mu\text{V/m}$)	(dB $\mu\text{V/m}$)	(dB $\mu\text{V/m}$)
Above 1000	500	54	74

TEST SETUP

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 3 m for the frequency range 30-1000 MHz (Bilog antenna) and 1-18 GHz (Double ridge horn antenna).

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

TEST SETUP (CONT.)

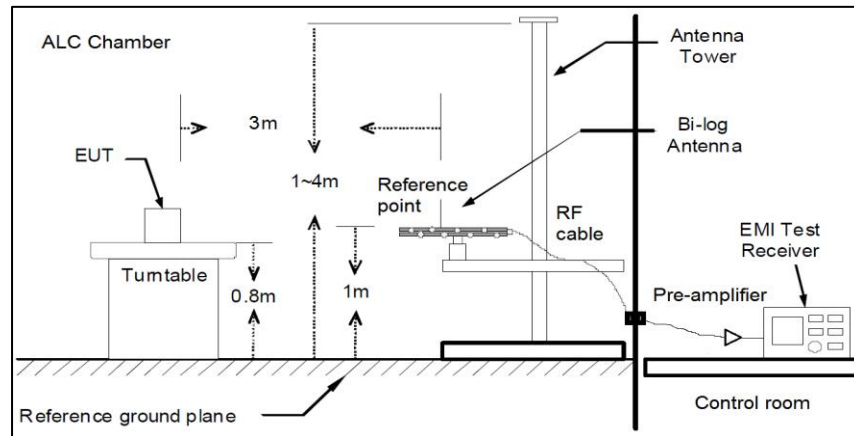


Fig A1: Generic setup for measurements from 30 to 1000 MHz

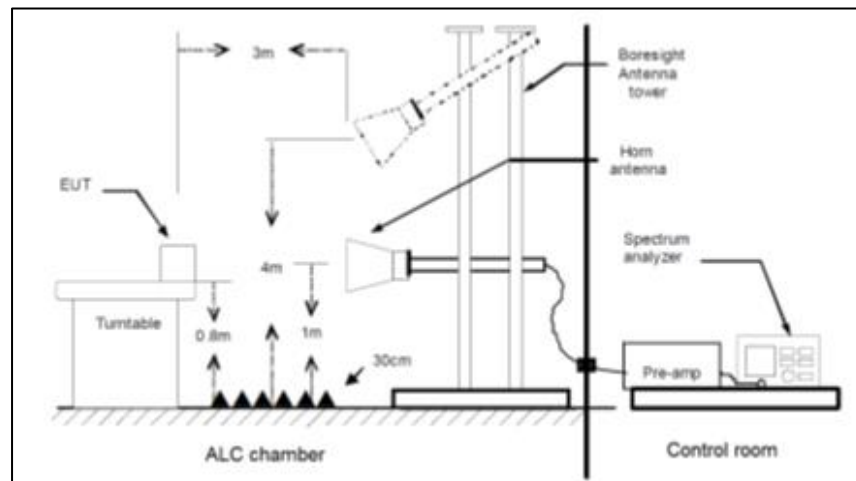


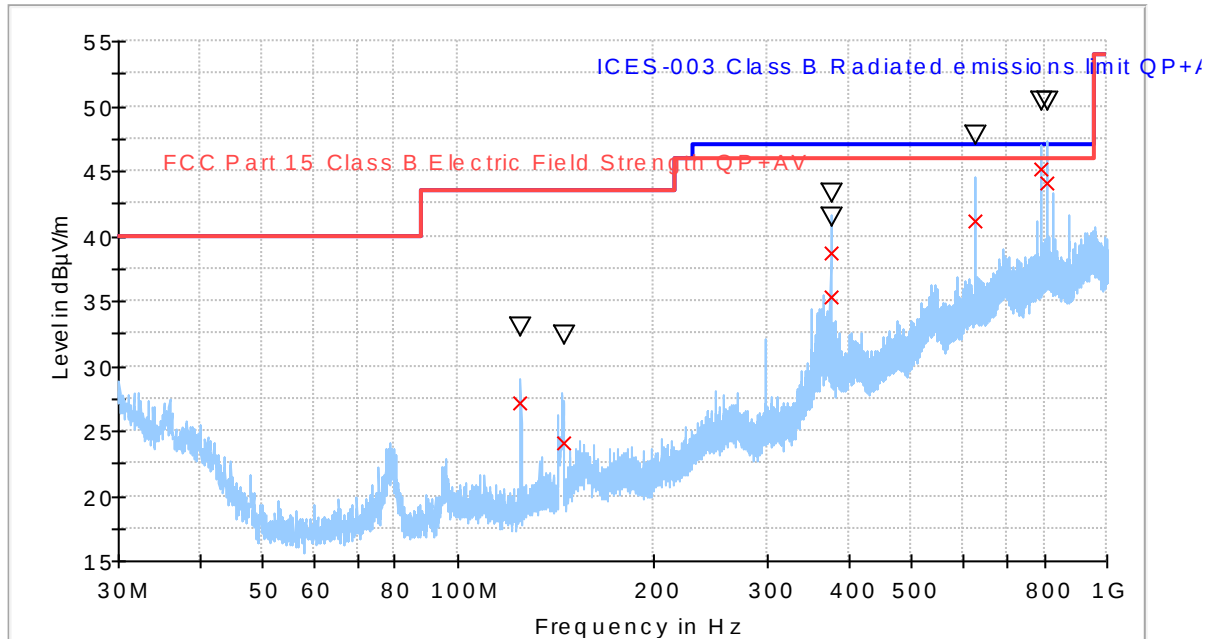
Fig A2: Generic setup for measurements from 1 to 18 GHz

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	OM#01
TEST RESULTS:	CRmmnnxx: CR: Radiation Condition, mm: Sample number, nn: Operation mode, xx: Frequency Range

CRmmnnxx	Description	Result
CR0101LR	Range: 30 - 1000 MHz Horizontal and Vertical Polarization	P
CR0101HR	Range: 1 - 18 GHz Horizontal and Vertical Polarization	P

TEST RESULTS (Cont.):

CR0101LR

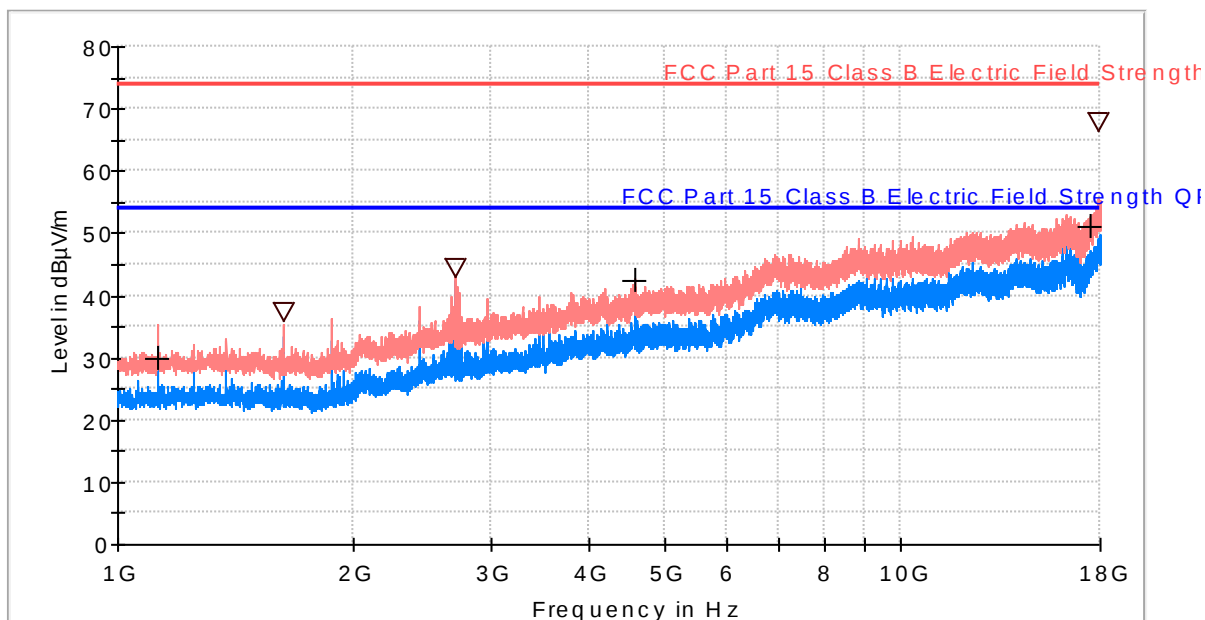


- ICES-003 Class B Radiated emissions limit QP+V
- Preview Result 1-PK+
- FCC Part 15 Class B Electric Field Strength QP+AV
- x Final_Result QPK
- v Final_Result PK+

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
125.013000	27.23	33.06	43.50	16.27	100.0	V	-8.0
145.322000	24.08	32.31	43.50	19.42	212.0	H	133.0
374.990500	38.72	43.33	46.00	7.28	197.0	V	169.0
375.000500	35.35	41.49	46.00	10.65	171.0	V	144.0
624.998000	41.19	47.71	46.00	4.81	114.0	V	-168.0
794.116000	45.09	50.32	46.00	0.91	149.0	V	180.0
810.024000	44.06	50.33	46.00	1.94	136.0	V	-16.0

TEST RESULTS (Cont.):

CR0101HR



- Preview Result 2-AVG
- Preview Result 1-PK+
- FCC Part 15 Class B Electric Field Strength PK
- FCC Part 15 Class B Electric Field Strength QP+AV
- ▽ Final_Result PK+
- + Final_Result AVG

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
1125.000000	---	29.96	53.90	23.95	171.0	V	11.0
1625.200000	37.34	---	73.90	36.56	192.0	V	15.0
2700.300000	44.32	---	73.90	29.58	209.0	V	9.0
4590.200000	---	42.53	53.90	11.37	155.0	V	-158.0
17443.800000	---	51.12	53.90	2.78	250.0	V	36.0
17895.200000	67.66	---	73.90	6.24	131.0	H	-149.0