

File Number **19/31708796M1**



TEST REPORT

FCC/ICES Test Report

Petitioner's Reference: Lear Automotive (EEDS) Spain, SL

Customer Address : C\Fusters, 54-56, PO Box 23
43800 Valls (Spain)

Equipment: BODY CONTROL MODULE (BCM)

Brand:	LEAR	Model:	JV6T-14A073
S/N:	JV6T-14A073-JB 11LDH	Power Supply:	DC 12V (Car Battery)
FCC ID:	TTR-JV6T14A073		

Result: complies

It has been tested and complies the standard specifications Applicable / s
See specifications applied on page 9

Applicable Standards

Emission standard/s:

FCC 47 CFR Part 15 Subpart B -- Radio Frequency Devices (Unintentional Radiators)
RSS-Gen Issue 5 Amendment 1 - General Requirements for Compliance of Radio Apparatus
ICES-003 Issue 6-2016 -- Information Technology Equipment (Including Digital Apparatus) — Limits and Methods of Measurement

Date of issue: Bellaterra, December 4, 2019

M1: This report replaces and annuls the report with certificate number 19/31708796 dated 29-11-2019.

Modifications performed: Remove "DRAFT" watermark from the last two pages of the report

Fernando Rivas Fernández
Technical Responsible
Electrical and Electronics
LGAI Technological Center S.A.

The results refer only and exclusively to the sample, product or material delivered for testing in "Received Material" section above. The equipment has been tested under conditions stipulated by standard(s) quoted in this document.
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This is the first page of the document, which consists of **14** pages of which 11 are annexes.

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1. EQUIPMENT RECEIVED AND TESTED

Equipment: BODY CONTROL MODULE (BCM)

Brand:	LEAR	Model:	JV6T-14A073
S/N:	JV6T-14A073-JB 11LDH	Power Supply:	DC 12V (Car Battery)
SW version:	v12.9	HW Version:	HW8.2

**Highest
Operating
Frequency
Considered**

315MHz

EUT Features:

JV6T-14A073 is a BCM (Body Control Module) combining both smart electronic board and power board embedded in a single package enabling to control the main body electronic functionalities in a car. It also acts as a gateway between the different communication buses.

Bands used is 315 MHz (receiver only)

Test product reception:	2019-11-19
Test initial date:	2019-11-19
Test final date:	2019-11-20

1.1 Test configuration

Power Supply:	DC 12V (Car Battery)
Set-up:	Tabletop
Test exercise:	During tests: EUT working in test operational receiver mode at 315MHz
Equipment size:	250 x 180 x 30 mm

1.2 Auxiliary and control equipment

Panel of loads: special test fixture including real and/or simulated loads for all outputs, input switches and analog inputs

Key Fob: Special tooling containing the real vehicle key in order to check the RKE functionality

1.3 Input/output wires

The EUT has a special harness(Power supply, signal and communication) shorter than 3m

1.4 Modification performed

No modification was performed.

2. APPLICABLE STANDARDS

2.1. TEST APPLICABLE STANDARDS

Standard: FCC 47 CFR Part 15 Subpart B and ICES-003 issue 6 based on standards.

Basic standard: ANSI C63.4:2014

☒ Radio-frequency radiated emissions (30MHz -6000MHz)*

*Upper limit according to the fifth harmonic of the maximum internal frequency declared by the manufacturer

Basic standard: ANSI C63.4:2014

☐ Power line conducted emissions (0,15-30MHz)

Note: Test not applicable for vehicular devices

2.1.1. Acceptance criteria for the test

According to standard **FCC 47 CFR Part 15 Subpart B and ICES-003 Issue 6**

2.1.2. Test facilities ID

FCC Test Firm Registration Number: 507478

ISED Assigned Code: 5766A

CABID ES0002

2.1.3.Competences and Guarantees

LGAI Technological Center, S.A. is a testing laboratory accredited by the National Accreditation Body (ENAC -Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 9/LE 894

In order to assure the traceability to other national and international laboratories, Applus+ Laboratories has a calibration and maintenance program for its measurement equipment.

Applus+ Laboratories 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 Applus+ Laboratories at the time of performance of the test.

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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 Applus+ Laboratories and the Accreditation Bodies.

2.1.4.Test procedures

Radio-frequency radiated emissions:	C5401665
Power line conducted emissions:	C5401665

2.1.5. Measuring uncertainties

Radio-frequency radiated emissions:	± 4,3 dB
Power line conducted emissions:	± 2,1 dB

Expanded uncertainty measurement is obtained multiplying the typical uncertainty measurement with a coverage factor $k=2$, which corresponds to a confidence level of 95% for a normal distribution.

2.2. Used Equipment

RADIO-FREQUENCY RADIATED EMISSIONS					
EQUIPMENT	BRAND	MODEL	NUMBER	LAST CALIBRATION	NEXT CALIBRATION
SEMI ANECHOIC CHAMBER SAC2	EUROSHIELD	TC2	104563	04/07/2019	04/07/2020
EMI RECEIVER	R&S	ESW26	1042124	11/01/2019	11/01/2020
BILOG ANTENNA	SCHWARZBECK MESS- ELEKTRONIK	VULB 9162	1042229	24/04/2019	24/04/2020
ATTENUATOR 3dB	HUBER+SUHNER	6803.17.B	1042020	29/08/2019	29/08/2020
RF CABLE	HUBER+SUHNER	SF103/11N/16N/4 000MM	1041909	06/02/2019	06/02/2020
RF CABLE	HUBER+SUHNER	CLR67 NANA 10000 P01 FR	1042114	30/01/2019	30/01/2020
TEST SOFTWARE	RHODE & SCHWARZ	EMC32 v.10.50.00	1041158	--	--
MAST-TABLE CONTROLLER	COMTEST	4630 - 100	104369	--	--
HORN ANTENNA	EMCO	3115	05-ER-017	29/08/2019	29/08/2020
RF CABLE	HUBER+SUHNER	SUCOFLEX 100	1041627	22/03/2019	22/03/2020

3. RESULT

PRODUCT: Equipment: BODY CONTROL MODULE (BCM)			
Brand:	LEAR	Model:	JV6T-14A073
S/N:	JV6T-14A073-JB 11LDH	Power Supply:	DC 12V (Car Battery)
Class:	B	Type of device:	--
TESTING			RESULTS
Radio-frequency radiated emissions			Pass Note: 4
Power line conducted emissions			N/A
1: The measured results are above the upper limit, even considering the uncertainty interval.			
2: The measured results are above the specified limits, but within the uncertainty interval. It is therefore not possible to state compliance based on the 95% level of confidence. However, the results indicate that non-compliance is more probable than compliance			
3: The measured results are below the specified limits, but within the uncertainty interval. It is therefore not possible to state compliance based on the 95% level of confidence. However, the results indicate that compliance is more probable than non-compliance			
4: The measured results are within the limits, including the uncertainty interval.			

Service Quality Assurance

Applus+, guarantees that this work has been made in accordance with our Quality and Sustainability System, fulfilling the contractual conditions and legal norms.

Within our improvement program we would be grateful if you would send us any commentary that you consider opportune, to the person in charge who signs this document, or to the Quality Manager of Applus+, in the following e-mail address: satisfaccion.cliente@applus.com

4. ANNEXES

4.1. Test Results

4.1.1 Radiated Emissions

Test Procedures

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.4-2014

Up to 18GHz, the test distance is 3m.

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 30 MHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are conform to specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received.

Premeasurement

- The turntable rotates from 0° to 315° using 45° steps.
- The antenna is polarized vertical and horizontal.
- The antenna height changes from 1 m to 4 m.
- At each turntable position, antenna polarization and height the analyzer sweeps three times in peak to find the maximum of all emissions.

Final measurement

- The final measurement is performed for at least six highest peaks according to the requirements of the ANSI C63.4.
- Based on antenna and turntable positions at which the peak values are measured the software maximize the peaks by changing turntable position $\pm 45^\circ$ and antenna height between 1 and 4 m.
- The final measurement is done with quasi-peak detector (as described in ANSI C63.4) for 30MHz to 1GHz emissions test
- The final measurement is done in the position (turntable, EUT-table and antenna polarization) causing the highest emissions with Peak and RMS detector (as described in ANSI C63.4) for 1GHz to 18GHz test.
- Final levels, frequency, measuring time, bandwidth, antenna height, antenna polarization, turntable angle, correction factor, margin to the limit and limit are recorded. A plot with the graph of the premeasurement with marked maximum final results and the limit is stored.

$$FS = UR + CA + AF$$

(FS-field strength; UR-voltage at the receiver; CA-loss of the signal path; AF-antenna factor)

During the radiated emission test, the EMI receiver or the Spectrum Analyzer was set with the following configurations:

Frequency band (MHz)	Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	QP	120 kHz	300 kHz
Above 1000	Peak	1 MHz	1 MHz
	Average	1 MHz	10 Hz

Limits:

According to FCC Part 15.109(b):

Limits of Radiated Emission Measurement (Below 1000 MHz)

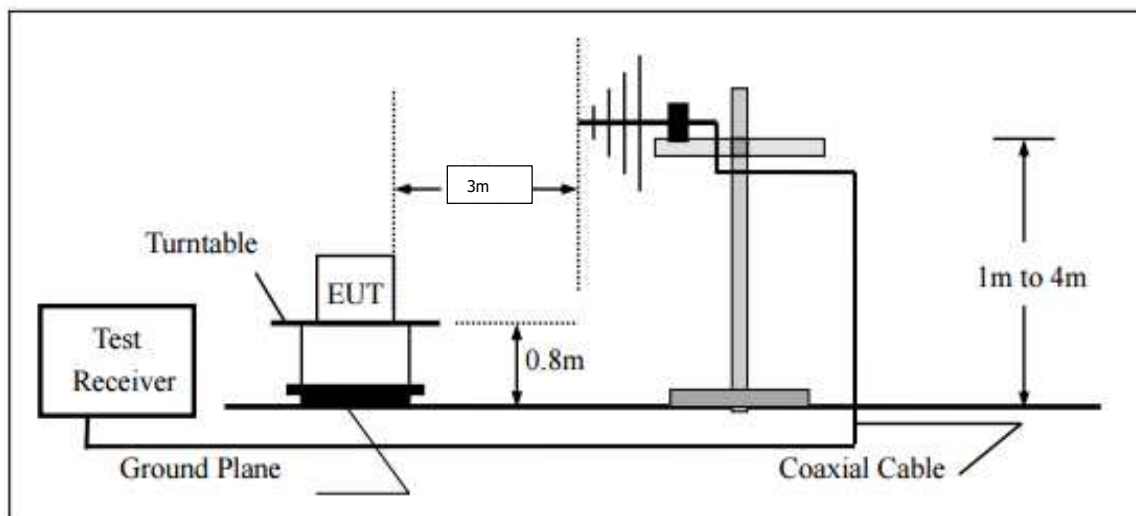
Frequency (MHz)	Class B (dBuV/m) (at 3m)
	QuasiPeak
30 – 88	39
88 – 216	44
216 – 960	46
960 – 1000	50

Limits of Radiated Emission Measurement (Above 1000 MHz)

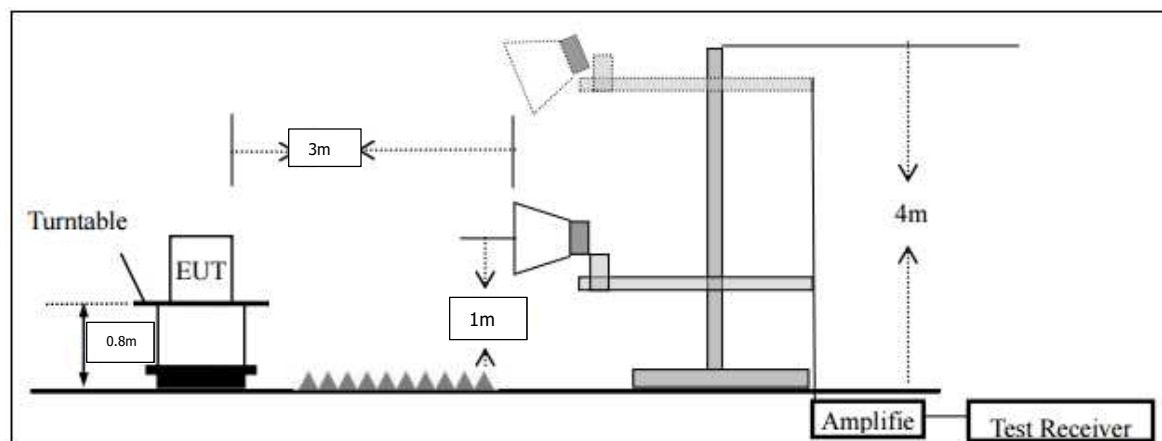
Frequency (MHz)	Class B (dBuV/m) (at 3m)	
	Peak	Average
Above 1000	74	54

Test Configuration

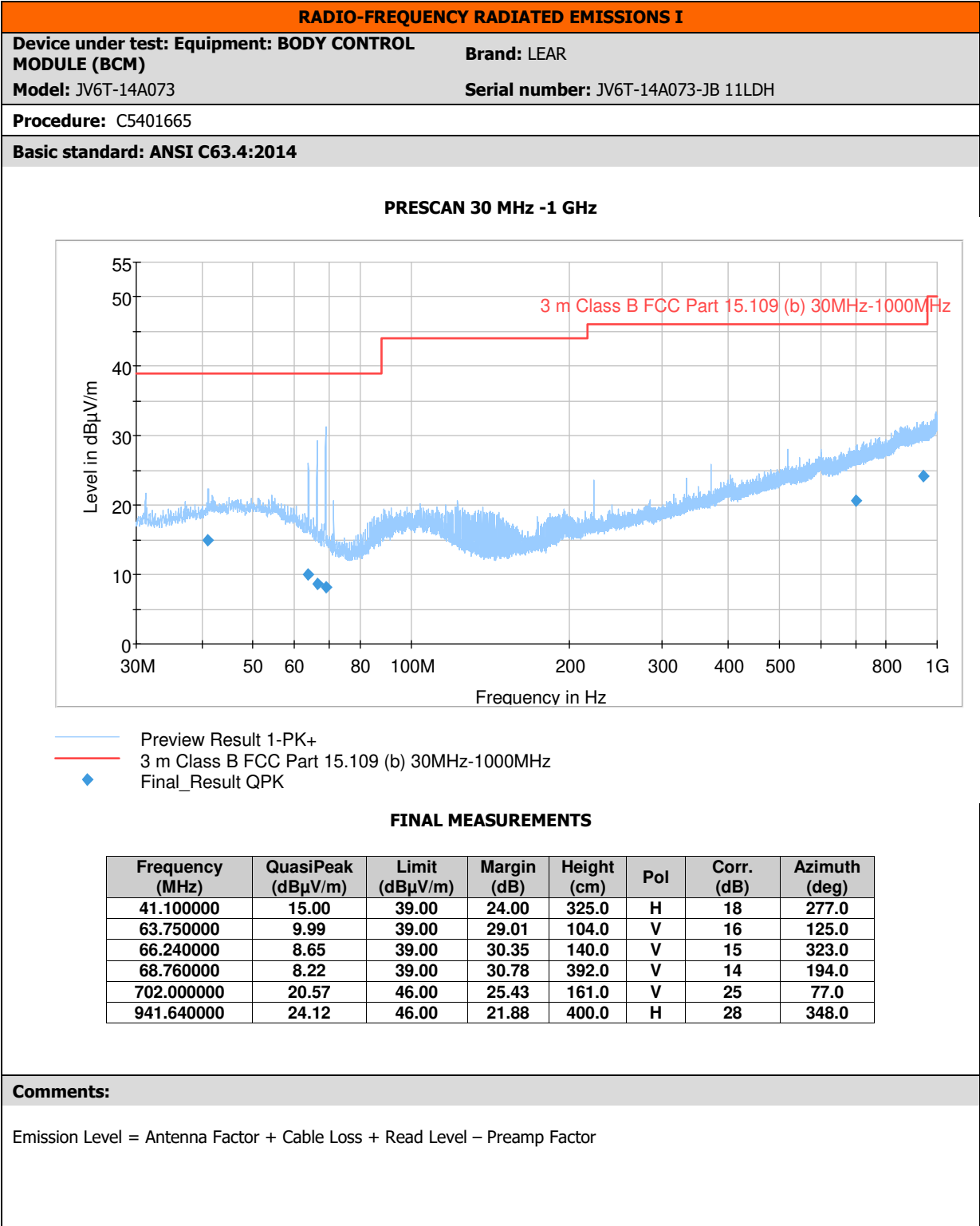
- For radiated emissions from 30MHz to 1000MHz:



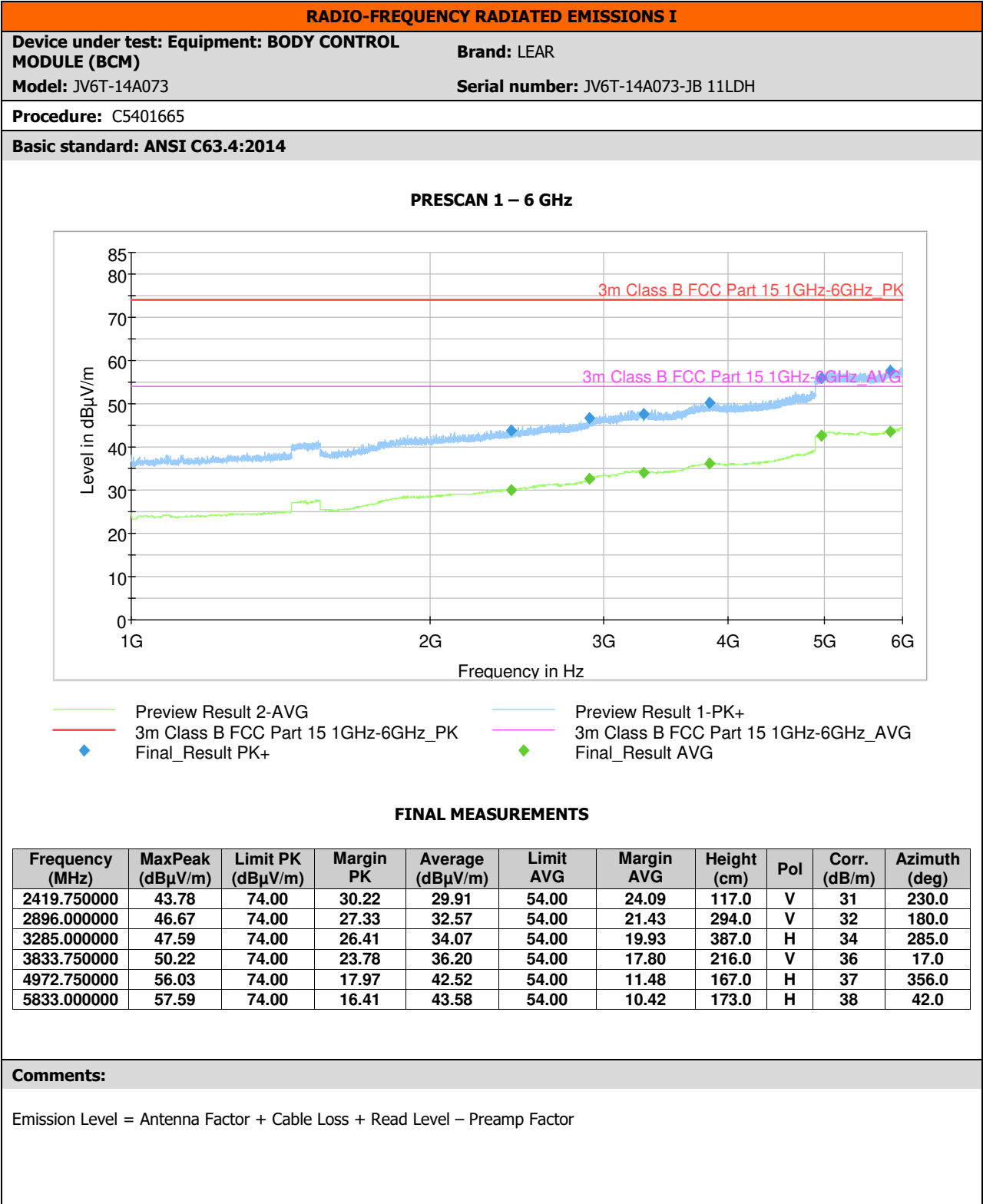
- For radiated emissions above 1000MHz up to 18GHz:



RADIO-FREQUENCY RADIATED EMISSIONS														
Device under test: Equipment: BODY CONTROL MODULE (BCM) Model: JV6T-14A073 Auxiliary equipment: Panel of loads: special test fixture including real and/or simulated loads for all outputs, input switches and analog inputs Key Fob: Special tooling containing the real vehicle key in order to check the RKE functionality DUT exercise: During tests: EUT working in test operational receiver mode at 315MHz		Brand: LEAR Serial number: JV6T-14A073-JB 11LDH Supply: DC 12V (Car Battery) Input/output cable: The EUT has a special harness(Power supply, signal and communication) shorter than 3m												
Technician: Jose M. Llauradó Test date: 2019-11-20 Measurement equipment: Receiver EMI R&S ESW26		Frequency range: 30MHz – 1 GHz Procedure: C5401665 Test Area: Semi-Anechoic chamber, SAC-2												
Basic standard: ANSI C63.4:2014														
<table border="1"> <tr> <td>Temperature:</td> <td>20.8</td> <td>°C</td> </tr> <tr> <td>Humidity:</td> <td>30.5</td> <td>%</td> </tr> <tr> <td>Atm. Pressure:</td> <td>993.1</td> <td>hPa</td> </tr> </table>						Temperature:	20.8	°C	Humidity:	30.5	%	Atm. Pressure:	993.1	hPa
Temperature:	20.8	°C												
Humidity:	30.5	%												
Atm. Pressure:	993.1	hPa												
EUT: Tabletop	Class B	Test Area SAC2	Distance 3m (30 MHz – 1 GHz)	PreScan 8 faces(45° step)	Evaluation Individual									
RESULTS: Pass														
Identification DUT: Device under test AUX: Auxiliary Devices SYS: DUT + AUX BB : Broad-band NB : Narrow-band QP: Quasi-peak		Emissions QP < Limit - I I=Uncertainty		Main emission source and type DUT, NB & BB										
Comments														



RADIO-FREQUENCY RADIATED EMISSIONS														
Device under test: Equipment: BODY CONTROL MODULE (BCM)		Brand: LEAR												
Model: JV6T-14A073		Serial number: JV6T-14A073-JB 11LDH												
Auxiliary equipment: Panel of loads: special test fixture including real and/or simulated loads for all outputs, input switches and analog inputs Key Fob: Special tooling containing the real vehicle key in order to check the RKE functionality		Supply: DC 12V (Car Battery)												
DUT exercise: During tests: EUT working in test operational receiver mode at 315MHz		Input/output cable: The EUT has a special harness(Power supply, signal and communication) shorter than 3m												
Technician: Jose M. Llauradó		Frequency range: 1 – 6 GHz												
Test date: 2019-11-20		Procedure: C5401665												
Measurement equipment: Receiver EMI R&S ESW26		Test Area: Semi-Anechoic chamber, SAC-2												
Basic standard: ANSI C63.4:2014														
<table border="1"> <tr> <td>Temperature:</td> <td>20.7</td> <td>°C</td> </tr> <tr> <td>Humidity:</td> <td>30.1</td> <td>%</td> </tr> <tr> <td>Atm. Pressure:</td> <td>992.8</td> <td>hPa</td> </tr> </table>						Temperature:	20.7	°C	Humidity:	30.1	%	Atm. Pressure:	992.8	hPa
Temperature:	20.7	°C												
Humidity:	30.1	%												
Atm. Pressure:	992.8	hPa												
EUT: Tabletop	Class B	Test Area SAC2	Distance 3m (1 – 6 GHz)	PreScan 8 faces(45° step)	Evaluation Individual									
RESULTS: Pass														
Identification		Emissions		Main emission source and type										
DUT: Device under test AUX: Auxiliary Devices SYS: DUT + AUX BB : Broad-band NB : Narrow-band PK: Peak, AVG: Average		Final PK and AVG < Limits - I I=Uncertainty		DUT, BB										
Comments														

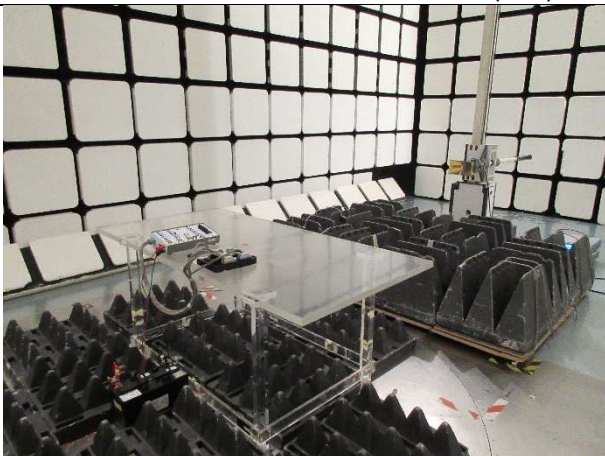


Test Setup Configuration

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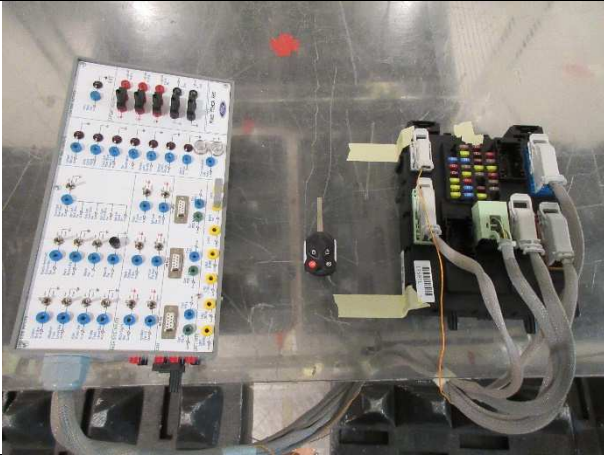
Radio-frequency radiated emissions 30MHz to 1GHz



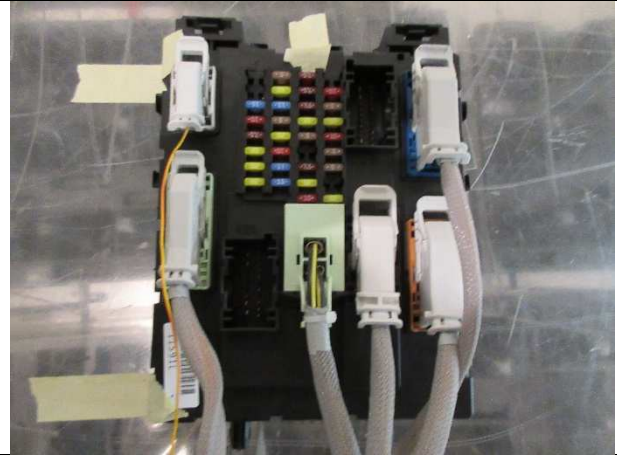
Radio-frequency radiated emissions 1GHz to 6GHz

Identification pictures

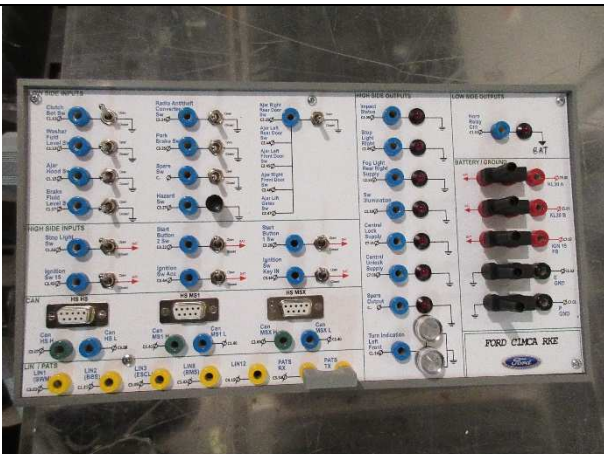
From file number: 19/31708796M1



Top view



BCM



Load panel



ID Label



Auxiliary KeyFob