

Test report No:
77617REM.007

Test report

**FCC Rules and Regulations CFR 47, Part 15, Subpart B
(10-1-23 Edition) & ICES-003 Issue 7 (October 2020)**

(*) Identification of item tested	Telematic control unit with wireless technologies, used in automotive industry.
(*) Trademark	VW AG
(*) Model and /or type reference	TKCMOD12N00W
(*) Derived model not tested	TKCMOD11000W
Other identification of the product	FCC ID: T8GCONMODMQB IC: 6434A-CONMODMQB
(*) Features	GSM, UMTS, LTE, 5G, Bluetooth EDR, BT Low-Energy, Wi-Fi, GNSS receiver HW version: X07 SW version: Q113
Manufacturer	HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH Becker-Goering-Str. 16 76307, Karlsbad, GERMANY
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-23 Edition) & ICES-003 Issue 7 (October 2020)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez EMC Consumer & RF Lab. Manager
Date of issue	2025-02-05
Report template No	FDT08_25 (*) "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.

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.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
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 1 GHz to 26 GHz is $I = \pm 2,6$ dB for peak 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").
2. The sample consists of a Telematics control unit with wireless technologies, used in automotive, equipped with one modem, OEM. This unit was designed for automotive usage and contains the following features: GSM, UMTS, LTE, 5G, GNSS, Wifi (a, b, g, n, ac,ax) and Bluetooth EDR.
3. Derived model not tested. These models have been declared by the supplier of the sample as being the same as the model under test.

HARMAN Becker Automotive Systems GmbH

Becker-Goering-Str. 16
76307 Karlsbad, Germany



Date: January 28th, 2025

To whom it may concern,

We,

HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
Becker-Goering-Str. 16; 76307 Karlsbad, Germany,

Hereby declare that the products listed below:

Type of equipment: Telematic control unit with wireless technologies used in automotive industry.
Brand name: VW AG
Model names: TKCMOD12N00W and TKCMOD11000W

are part of the same family and all the models are equal. The model TKCMOD12N00W is the most populated variant, and it is the one that has been tested. The model TKCMOD11000W is the same as TKCMOD12N00W but it has a different name because has the cellular module disabled (although is installed in the device).

The rest of interfaces (BT, WiFi, GNSS) are equal in all the variants.

In the table below you can find the different names based on the specific country target:

Country	Product Name	AUDI Part number	Variant	GNSS	Bluetooth WLAN	NAD (Activated)	WLAN P
NAR (online variant)	TKCMOD12N00W	57N.035.741	V160	x	x	x	-
Rest of the world (offline variant)	TKCMOD11000W	571.035.741	V333	x	x	-	-

As mentioned above, TKCMOD12N00W is the variant that has been tested and results are applicable to the rest of the variants.

Sincerely,

i.v. 

By: Iulian-George Stoica
Title: Customer Lead Certification
E-mail: iulian.stoica@harman.com
Telephone: +40799 306 699

Company: Harman Becker Automotive Systems GmbH

i.v. 

By: Alin Banica
Title: Regulatory Product Compliance Expert
E-mail: AlinLucian.Banica@harman.com

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. The laboratory is not responsible for such information and it is not covered by accreditation.

Usage of samples

Samples undergoing test have been selected by: The client.

Id	Control Number	Description	Model	Serial N°	Date Reception	of Application
S/01	77617B_247.1	Telematic control unit	TKCMOD12N00W	V16039R220900008	2024-09-16	Element Under Test
S/01	77617B_242	Automotive setup	ICC/CONMOD	D06-01	2024-06-12	Auxiliary element

Notes referenced to samples during the project.

Id	Note
S/01	Sample used for testing.

Test sample description

Ports..... :	Port name and description		Cable				
			Specified max length [m]	Attached during test	Shielded	Coupled to patient ⁽³⁾	
	RF connector – code			[]	[X]	[]	
	RF connector – code			[X]	[X]	[]	
	RF connector – code			[X]	[]	[]	
--							
Supplementary information to the ports..... :							
Rated power supply	Voltage and Frequency			Reference poles			
				L1	L2	L3	N
	[]	AC:	[]	[]	[]	[]	[]
	[X]	DC: 12V car battery (4.8 VDC inside of TCU)					
Rated Power	12V DC						
Clock frequencies.....	--						
Other parameters	See Technical description						
Software version	Q113						
Hardware version	X07						
Dimensions in cm (W x H x D)	--						
Mounting position	[]	Table top equipment					
	[]	Wall/Ceiling mounted equipment					
	[]	Floor standing equipment					
	[]	Hand-held equipment					
	[X]	Other: automotive telematics control unit					
Modules/parts.....	Module/parts of test item			Type		Manufacturer	
	--						
Accessories (not part of the test item)	Description			Type		Manufacturer	
	--						
Documents as provided by the applicant.....	Description			File name		Issue date	
	--						

⁽³⁾ Only for Medical Equipment

Identification of the client

HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
Becker-Goering-Str. 16
76307, Karlsbad, GERMANY

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2024-09-25
Date (finish)	2024-09-25

Document history

Report number	Date	Description
77617REM.007	2025-02-05	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. = 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: Fernando Chito Solis and Miguel Manuel López Guzmán.

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
06064	SEMIANECHOIC ABSORBER LINED CHAMBER	SAC-3	FRANKONIA	N/A
06329	SHIELDED ROOM	--	FRANKONIA	N/A
06132	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2025-04-09
06126	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2025-04-04
03541	HYBRID BILOG ANTENNA 30MHz-6GHz	JB6	SUNOL SCIENCES CORPORATION	2024-11-15
08866	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2026-06-12
06496	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK	2026-12-01
09360	PRE-AMPLIFIER G>40dB 1-18 GHz	BLMA 0118-1M	BONN ELEKTRONIK	2025-08-05
04657	HORN ANTENNA 18-40GHz	BBHA 9170	SCHWARZBECK	2026-06-12
08856	PRE-AMPLIFIER G>30dB 17-40GHz	BLMA 1840-4A	BONN ELEKTRONIK	2025-02-27
04848	SOFTWARE FOR EMC/RF TESTING	EMC32	ROHDE AND SCHWARZ	N/A

Summary

Test Specification	Requirement – Test case	Verdict	Remark
FCC CFR 47, Part 15, Subpart B (10-1-23 Edition) & ICES-003 Issue 7 (October 2020)	RE Radiated emission. Electromagnetic field measure	P	(1)
	CE Continuous conducted emission	N/A	(2)
<u>Supplementary information and remarks:</u> (1) Test required only to the 5th harmonics of the maximum internal work frequency in the EUT. (2) According to the standard, 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.
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. WiFi 2.4GHz, WiFi 5GHz and Bluetooth LE and Bluetooth EDR OFF. Cellular searching network. GNSS module pending to receive satellites signals. Power supply: 12Vdc

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 (10-1-23 Edition) & ICES-003 Issue 7 (October 2020)	ANSI C63.4 (2014)	RE Radiated emission.

Test Cases Details

RE Radiated emission. Electromagnetic field measure

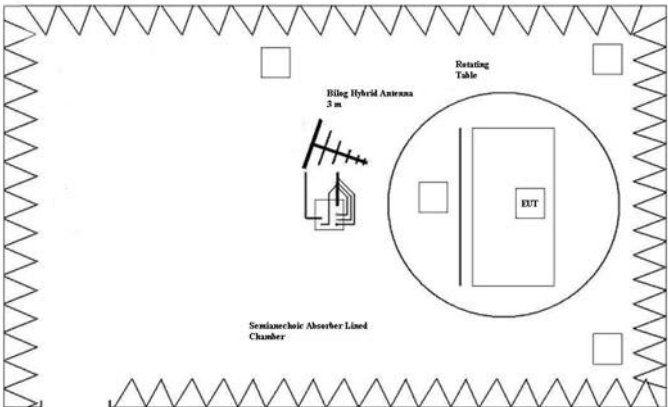
Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, according to the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-23 Edition), Secs. 15.109 & ICES-003 Issue 7 (October 2020)

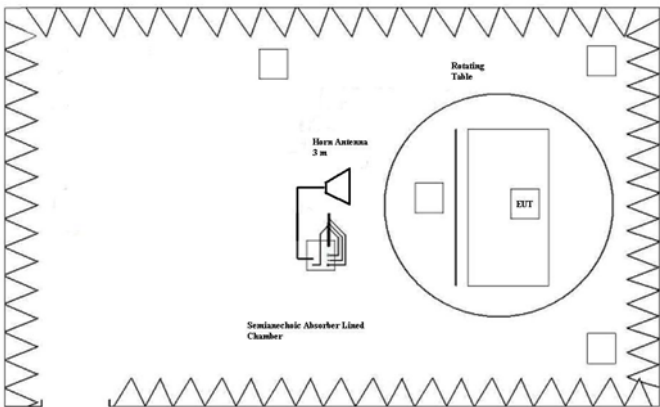
Frequency range (MHz)	FCC Part 15B		ICES-003 Issue 7		FCC Part 15B & ICES-003 Issue 7	
	QP Limit for 3 m		QP Limit for 3 m		PK Limit for 3 m	AVG Limit for 3 m
	(μ V/m)	(dB μ V/m)	(μ V/m)	(dB μ V/m)	(dB μ V/m)	(dB μ V/m)
30 to 88	100	40	100	40	---	---
88 to 216	150	43.5	150	43.5	---	---
216 to 230	200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

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

Passed

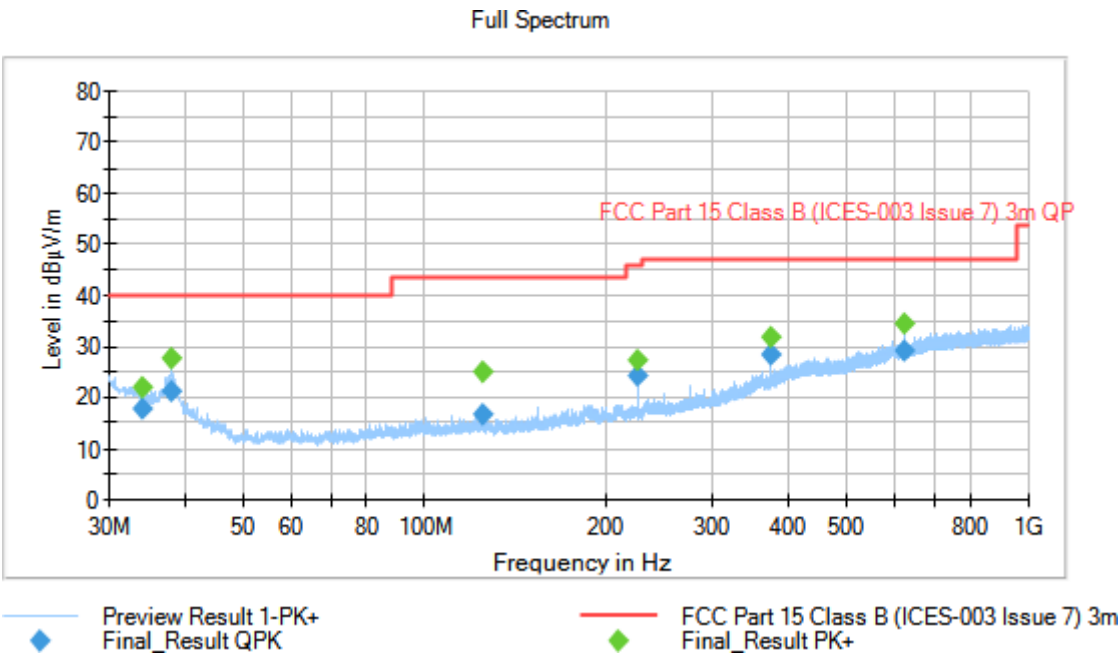
Attachments

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

Sample ID: S/01

Operation Mode: OM/01

Images:



Tables:

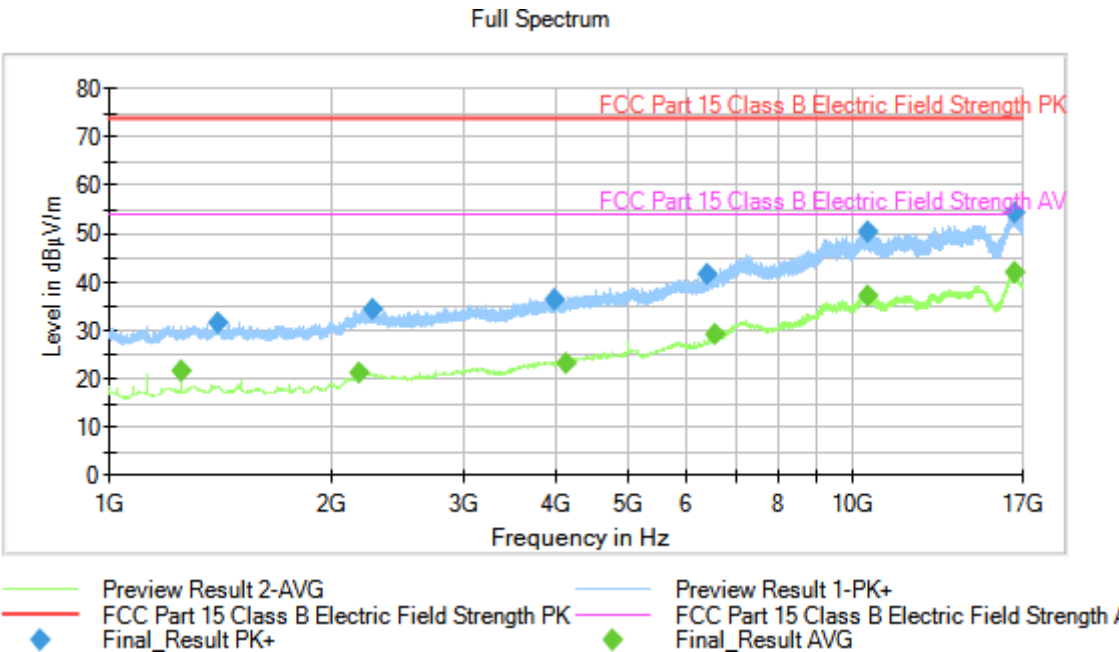
Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
34.008000	---	21.81	---	---	230.0	V	-17.0
34.008000	17.94	---	40.00	27.06	230.0	V	-17.0
38.043000	---	27.81	---	---	114.0	V	-126.0
38.043000	21.24	---	40.00	18.76	114.0	V	-126.0
125.025000	16.53	---	43.52	26.99	100.0	V	132.0
125.025000	---	24.97	---	---	100.0	V	132.0
225.005000	24.08	---	46.00	21.92	138.0	H	-20.0
225.005000	---	27.42	---	---	138.0	H	-20.0
374.988000	28.62	---	47.00	18.38	135.0	V	106.0
374.988000	---	32.01	---	---	135.0	V	106.0
625.015000	29.13	---	47.00	17.87	124.0	H	-71.0
625.015000	---	34.39	---	---	124.0	H	-71.0

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

Sample ID: S/01

Operation Mode: OM/01

Images:



Tables:

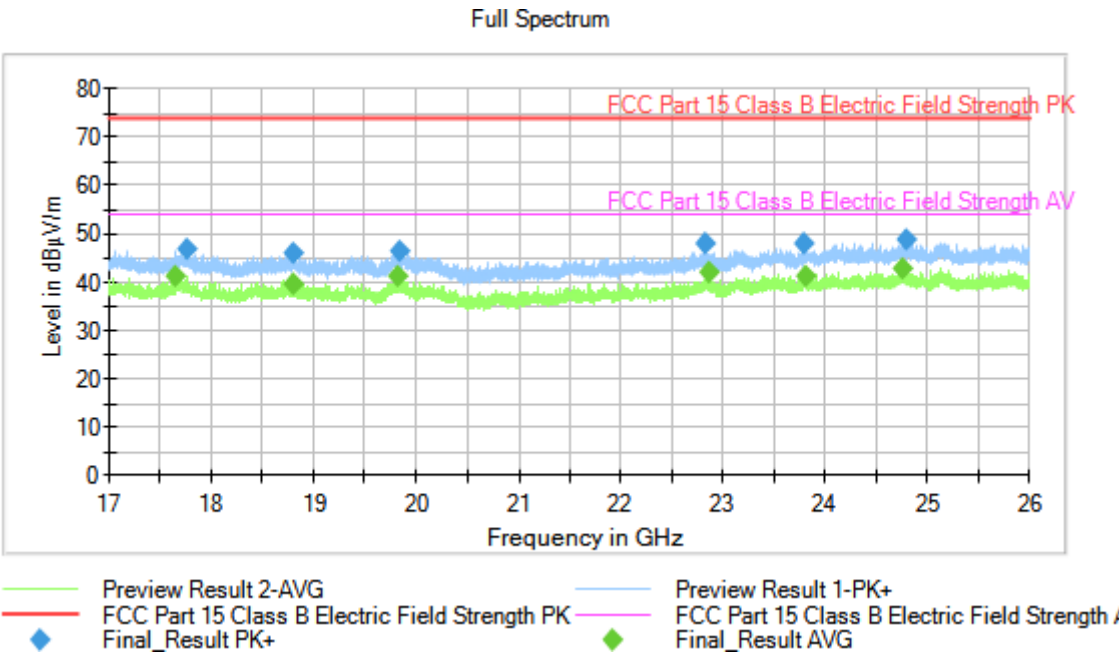
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol
1250.000000	---	21.60	53.97	32.37	V
1400.500000	31.63	---	73.97	42.34	H
2175.000000	---	21.09	53.97	32.88	V
2268.250000	34.22	---	73.97	39.75	H
3974.000000	36.51	---	73.97	37.46	V
4118.750000	---	23.38	53.97	30.59	V
6381.500000	41.70	---	73.97	32.27	V
6564.000000	---	29.05	53.97	24.92	V
10500.000000	---	37.15	53.97	16.82	H
10517.250000	50.37	---	73.97	23.60	H
16580.250000	---	41.88	53.97	12.09	V
16593.750000	54.53	---	73.97	19.44	H

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

Sample ID: S/01

Operation Mode: OM/01

Images:



Tables:

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Pol
17640.406250	---	41.04	53.97	12.93	V
17747.500000	46.64	---	73.97	27.33	V
18789.687500	---	39.78	53.97	14.19	H
18796.875000	46.13	---	73.97	27.84	V
19826.125000	---	41.05	53.97	12.92	V
19841.218750	46.54	---	73.97	27.43	V
22830.500000	47.93	---	73.97	26.04	H
22862.125000	---	41.97	53.97	12.00	V
23794.343750	48.00	---	73.97	25.97	H
23808.718750	---	41.32	53.97	12.65	V
24751.000000	---	42.86	53.97	11.11	H
24799.156250	48.71	---	73.97	25.26	V