ECE TYPE-APPROVAL CERTIFICATE

E24

Communication Concerning:[2] Approval granted
~~Approval extended~~
~~Approval refused~~
~~Approval withdrawn~~
~~Production definitively discontinued~~

Of a type of ~~vehicle~~/component/~~separate technical unit~~[2] with regard to Regulation No. 10.
Of a type of electrical/electronic sub-assembly[2] with regard to Regulation No.10.

Approval No: ***E24*10R06/02*4448*00***

Reason for extension:		*-N/A*
1.	Make (trade name of manufacturer):	inhand
2.	Type and general commercial description:	***VG710*** *InVehicle Gateway*
	Variant(s):	*N/A*
3.	Means of identification of type, if marked on the ~~vehicle~~/ component/separate technical unit[2]:	***Approval mark***
3.1	Location of that marking:	***Stuck on the enclosure, See Drawings of the ESA***
4.	Category of vehicle:	*N/A*
5.	Name and address of manufacturer:	***Beijing InHand Networks Technology Co., Ltd. Room 501, 5th floor, building 3, No.18 Yard, Ziyue Road, Chaoyang District, Beijing, China 100102***
6.	In the case of components and separate technical units, location and method of affixing of the approval mark:	***Stuck on the enclosure, See Drawings of the ESA.***
7.	Address(es) of assembly plant(s):	***Inhand Jiaxing Communication Technology Co., Ltd. 318 Ruifeng Street, Gaozhao Street, Xiuzhou District, Jiaxing City, Zhejiang Province, China***

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

Approval No: ***E24*10R06/02*4448*00***

8.	Additional information (where applicable):	***See appendix below***
9.	Technical service responsible for carrying out the tests:	***CETOC Technical Service srl Via della Bufalotta, 374, 00139 Roma***
10.	Date of test report:	***14.02.2023***
11.	Number of test report:	***CN-112-17-58-COM22-05368-IR***
12.	Remarks (if any):	***See Appendix below***
13.	Place:	***Dublin***
14.	Date:	***16th February, 2023***
15.	Signature:	

NATIONAL STANDARDS AUTHORITY OF IRELAND
NSAI Certification
TRANSPORT DEPARTMENT

16. The index to the information package lodged with the approval authority, which may be obtained on Request, is attached.

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1. Distinguishing number of the country which issued/extended/refused or withdrawn approval. (see Regulation, provisions on approval).
2. Strike out what does not apply.

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Approval No: ***E24*10R06/02*4448*00***

Appendix

To type-approval communication concerning the type approval
of an electrical/electronic sub-assembly under Regulation No.10.

1.	Additional information	
1.1.	Electrical system rated voltage:	***DC 12/24V, negative ground***
1.2.	This ESA can be used on any vehicle type with the following restrictions:	***See manufacturer's specifications.***
1.2.1	Installation conditions, if any:	***See manufacturer's specifications.***
1.3.	This ESA can only be used on the following vehicle types:	***N/A***
1.3.1	Installation conditions, if any:	***N/A***
1.4.	The specific test method(s) used and the frequency ranges covered to determine immunity were:	***Bulk Current Injection Method:*** *Frequency: (20 – 400 MHz)* ***Free Field Immunity Test:*** *Frequency: (400 – 2000 MHz)*
1.5.	Laboratory accredited to ISO 17025 and recognized by the Approval Authority responsible for carrying out the tests:	***CETOC Technical Service srl***
2.	Remarks:	***N/A***

Appendix to type-approval communication concerning the
type approval of a vehicle under Regulation No.10.

1.	Additional information	
2.	Electrical system rated voltage:	***N/A***
3.	Type of bodywork:	***N/A***
4.	List of electronic systems installed in the tested vehicle(s) not limited to the items in the information document:	***N/A***
4.1.	Vehicle equipped with 24 GHz short-range radar equipment (yes/no/optional)[2]:	***N/A***
5.	Laboratory accredited to ISO 17025 and recognized by the Approval Authority responsible for carrying out the tests:	***N/A***
6.	Remarks:	***N/A***

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

Approval No: ***E24*10R06/02*4448*00***

Index to the Information Package

Date of issue:	***16th February, 2023***
Date of latest amendment:	***N/A***
Reason for extension/revision:	***N/A***

1. Additional conditions, and advisory notes on legal alternatives.

2. Test report(s)

- numbers(s):	***CN-112-17-58-COM22-05368-IR***
- date of issue:	***14.02.2023***
- date of latest amendment:	***N/A***

3. Information document

- number(s):	***VG710-00***
- date of issue:	***26.12.2022***
- date of latest amendment:	***N/A***
Documentation:	***44 pages***

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

Approval No: ***E24*10R06/02*4448*00***

Appendix: **Additional conditions, and advisory notes on legal alternatives**

A: Additional conditions:

1. The attached technical report, with any of its attachments, forms part of this Type Approval certificate.
2. Each device from series production shall be to the measurements specified in the attached drawings, and shall be manufactured only from the materials specified in the Approval documents.
3. Changes in the type are permitted only with the explicit permission of NSAI. Breaches of this requirement will lead to a withdrawal of the Type Approval, and in addition may be subject to criminal prosecution.
4. At regular intervals, any tests or associated checks prescribed by the applicable legislation to verify continued conformity with the approved type shall be carried out. The manufacturer shall demonstrate compliance with this by submitting to NSAI evidence of adequate arrangements and documented control plans for each type approved.
5. Any set of samples or test pieces showing evidence of non-conformity shall give rise to further sampling and testing and all steps shall be taken to restore conformity of production.
6. This Type Approval will expire when it is surrendered by the holder, or withdrawn by NSAI, or when the approved type no longer conforms to legal requirements. The recall of the Type Approval can be issued by NSAI when the conditions required for the issuing or continuation of the Type Approval are no longer current, or when the Approval holder is in breach of the duties attached to the Type Approval, or when it is established that the approved type no longer meets the requirements of traffic safety.
7. Changes in the company name, address or manufacturing site, as well as in any of the sales or other agents specified in the issuing of the approval must immediately be notified to NSAI.
8. The duties imposed by the issuing of this certificate are not transferable. The legal protection of third parties is not affected by this certificate.
9. When the manufacture or sale of the system, component or separate technical unit has not been started within one year of the date of issue of this certificate, then NSAI is to be informed. This requirement also applies when the manufacture or sale has been halted for more than one year, or when it ought to have been halted for more than one year. The initial commencement of manufacture or sale, or the resumption of manufacture or sale, shall then be notified to NSAI within one month of commencement or resumption.

B: Legal Options:

Any objection to the requirements set out in this certificate shall be made within one month of the date of issue. The objection shall be made, in writing, to NSAI in Dublin.

NSAI, 1 Swift Square, Northwood, Santry, Dublin 9, Ireland. Telephone: (+353+1) 807 3800, Facsimile: 01-807 3844

CETOC TS

CETOC Technical Service srl
Via della Bufalotta, 374,
00139 Roma

Electromagnetic Compatibility – ESA

0. Legislation:

0.1. Requirements according to : UNECE Regulation 10.06 to Supplement 2

1. General

1.1. Reason for Inspection Report : New approval /~~Extension of approval / Test report only / COP~~

1.2. Manufacturer's Representative(s) : No attendance

1.3. CETOC TS Representative(s) : Nancy Han

1.4. Location of Test : GuangZhou ShunTai Quality Technical Service Co., Ltd.
Room 206A, 2F, 4# Plant, No.63 Punan Road, Huangpu District, Guangzhou, China, 510760

1.5. Data of test : 04/01/2023

2. Manufacturer Details

2.1. Make :

2.2. Type : VG710

2.3. Variant/Version : NA

2.4. Commercial Name : InVehicle Gateway

2.5. Category : Component

2.6. Name and Address of manufacturer : Beijing InHand Networks Technology Co., Ltd.
Room 501, 5th floor , building 3, No.18 Yard, Ziyue Road, Chaoyang District, Beijing, China 100102

3. Conclusion:

3.1. Final conclusion of the inspection: The above mentioned type was tested in accordance with the above mentioned legislation and was found to comply in all respects. This Inspection report relates only to the items tested.

Signature:		Nancy Han	
Name:	:	Nancy Han	Massimo Peraboni
Position:	:	Type Approval Engineer	Tech. Mgr.
Place and date:	:	Guangzhou, 02/02/2023	Roma, 14/02/2023

4. List of annexes:

Annex Nr.	Page Nr.		Subject
Annex I	2	:	Appendix 1 - Test report history
Annex II	2	:	Appendix 2 – General specification
Annex III	4	:	Appendix 3 – Inspection results
Annex IV	12	:	Appendix 4 – Test results

APPENDIX 1 - TEST REPORT HISTORY

List this report and previous reports, with extension details.

Inspection Report Number	Reason for Extension	Date of Issue
CN-112-17-58-COM22-05368-IR	N/A	14/02/2023

APPENDIX 2 – GENERAL SPECIFICATION

1. Worst Case Rationale : Single specification

2. Significant Interpretations, Alternative Test Methods, New Technologies : N/A

3. Summary of test results

3.1. Applicability :

	PASS	FAIL	N/A
Radiated Emissions:	☒	☐	☐
Radiated Immunity:	☒	☐	☐
BCI Immunity:	☒	☐	☐
Free Field Immunity:	☒	☐	☐
150 mm Stripline Immunity:	☐	☐	☒
800 mm Stripline Immunity:	☐	☐	☒
Transient Testing:	☒	☐	☐

4. Component Specification

Component Part Number:	VG710

5. Facility and Equipment Checks

5.1. Calibration certificates checked and valid, recorded in the following table : Conform

5.2 All instruments are equipped with identification label : Yes

5.3 Calibration certificates are complete of calibration-chain with detailed information regarding primary used. : Yes

5.4. Is the anechoic/semi-anechoic chamber correctly set up in all its electrical/mechanical parts to ensure the validity of the measurements? : Yes

Equipment	Serial / Certificate No.	Calibration due*
ALSE ROOM	CN 2GB22052344006-0006	26/05/2025
EMI receiver	CN J202206020680A-0007	06/07/2023
L.I.S.N.	CN J202206020680A-0015	06/07/2023
L.I.S.N.	CN J202206020680A-0016	06/07/2023
Biconical antenna	CN J202206020680-02-0005	31/07/2023
Log-periodic antenna	CN J202206020680-04-0001	28/08/2023
Supply Voltage Change Simulator	CN J202206020680A-0001	06/07/2023
Load dump wave simulator	CN J202206020680A-0002	06/07/2023
Transient pulse disturbance simulator	CN J202206020680A-0003	06/07/2023
Current Injection Clamp	CN J202206020680A-0012	06/07/2023
Digital phosphor oscilloscope	CN 1GA22042037623-0002	21/04/2023

**Specify calibrated date + (interval) or calibration due date.*

APPENDIX 3 – INSPECTION RESULTS

		PASS	FAIL	N/A
	Radiated Emissions			
CISPR25, 4.5.	Measuring equipment complies with CISPR 16-1-4 (2010).	☒	☐	☐
	Test Location			
Ann 7, 3.1. *Ann 7, 3.3.*	Test performed in: - A.L.S.E (Absorber-lined Shielded Enclosure)* - ~~O.A.T.S (Open Area Test Site)*~~ **Strikethrough, as appropriate.*	☒	☐	☐
Ann 7, 3.3.	O.A.T.S level is a clear area, free from electromagnetic reflecting surfaces, within a circle of 15 m minimum radius.	☐	☐	☒
Ann 7, 3.3.	Measuring equipment is outside 15 m minimum radius circle.	☐	☐	☒
Ann 7, 3.4.	Ambient noise is at least 6 dB below reference limits, in either case.	☒	☐	☐
	Test Arrangements			
CISPR25, 4.4.2.	EUT and antenna are more than 2 m from the walls and ceiling, and 1 m from the nearest absorber material.	☒	☐	☐
CISPR25, 6.1.1.	Ground plane is 900 ± 50 mm high and made from 0.5 mm thick copper, brass or galvanised steel.	☒	☐	☐
CISPR25, 6.1.1.	Ground plane is at least 2,000 mm length x 1,000 mm width.	☒	☐	☐
CISPR25, 6.4.2.3.	ESA and harness are supported at 50 ± 5 mm above the ground plane on low relative permittivity material.	☒	☐	☐
CISPR25, 6.4.2.3.	Face of the ESA is within 200 mm ± 10 mm from the edge of the ground plane.	☒	☐	☐
CISPR25, 6.4.2.4.	Length of test harness, parallel to the front of the ground plane, is 1,500 ± 75 mm and does not exceed 2,000 mm.	☒	☐	☐
CISPR25, 6.4.2.4.	Long segment of test harness is located parallel to the edge of the ground plane, facing the antenna at a distance of 100 ± 10 mm from the edge.	☒	☐	☐
CISPR25, 6.1.2.	Power supply is Artificial Network (AN) rated at 5 Ω/50 µH.	☒	☐	☐
CISPR25, 6.1.2.	EUT is: - Remotely grounded (vehicle power return line longer than 200 mm): two artificial networks are required, one for the positive supply line and one for the power return line* - ~~Locally grounded (vehicle power return line 200 mm or shorter): one artificial network is required for the positive supply*~~ **Strikethrough, as appropriate.*			
CISPR25, 6.1.2.	Case of the ESA is: - ~~Grounded, simulating actual vehicle configuration*~~ - Not grounded, simulating actual vehicle configuration* **Strikethrough, as appropriate.*	☒	☐	☐
CISPR25, 6.1.2.	AN is electrically bonded to the ground plane.	☒	☐	☐

	Antenna			
CISPR25, 6.4.2.6.	Height of the phase centre is 100 ± 10 mm above the ground plane.	☒	☐	☐
CISPR25, 6.4.2.6.	No part of any antenna radiating element is closer than 250 mm to the floor.	☒	☐	☐
CISPR25, 6.4.2.6.	Radiating elements of the measuring antenna are not closer than 1,000 mm to any absorber material, except that used on the floor, and are not closer than 2,000 mm to the walls or ceiling of the shielded enclosure.	☒	☐	☐
CISPR25, 6.4.2.6.	Phase centre (for biconical) or tip (for log-periodic) is 1,000 ± 50 mm from the harness.	☒	☐	☐
CISPR25, 6.4.2.6.	Antenna calibrated for this distance to correct measuring point (phase centre or tip).	☒	☐	☐
CISPR25, 6.4.2.6.	Phase centre of the antenna is in line with the centre of the longitudinal part of the wiring harness.	☒	☐	☐
Ann 7, Ann 8, 4.3.	Pre-test sweep supplied to show compliance throughout frequency range 30 to 1,000 MHz.	☒	☐	☐
Ann 7, Ann 8, 4.3.	Test frequencies chosen from pre-test data.	☒	☐	☐
	Narrowband Test Results			
Ann 8, 2.	Operational mode of ESA: Normal operation	☒	☐	☐
Ann 8, 4.2.	Detector used and bandwidth: Average, 120kHz	☒	☐	☐
6.6.2.	ESA meets narrowband emissions limits, with both vertical and horizontal polarisations.	☒	☐	☐
	Broadband Test Results			
Ann 7, 2.	Operational mode of ESA: Normal operation	☒	☐	☐
Ann 7, 4.2.	Detector used and bandwidth: Quasi peak, 120kHz	☒	☐	☐
6.5.2.	ESA meets broadband emissions limits, with both vertical and horizontal polarisations.	☒	☐	☐
	Radiated Immunity			
	Test Method(s) used and Frequency Range(s)			
ISO11452-4	BCI frequency range between 20 and 400 MHz:	☒	☐	☐
ISO11452-2	Free field frequency range between 400 and 2,000 MHz:	☒	☐	☐
ISO11452-3	TEM cell frequency range between 20 and 200 MHz:	☐	☐	☒
ISO11452-5	150 mm stripline frequency range between 20 and 400 MHz:	☐	☐	☒
ISO11452-5	800 mm stripline frequency range between 20 and 2,000 MHz:	☐	☐	☒

Maximum frequency step sizes do not exceed:

Frequency Band (MHz)	Linear Steps (MHz)	Log Steps (%)	Actual Steps Used
20 - 200	5	5	5%
200 - 400	10	5	5%
400 - 1000	20	2	2%
1000 - 2000	40	2	2%

Test Arrangements (General)

Ann 9, 2.2.	Operational mode of ESA: Normal operation	☒	☐	☐
Ann 9, 2.3.	Extraneous equipment in place during calibration.	☒	☐	☐
Ann 9, 2.4.	Test equipment used is the same as for calibration.	☒	☐	☐
Ann 9, 2.5.	Loads and actuators are as realistic as possible.	☒	☐	☐
Ann 9, 2.5.	Case of ESA is: - ~~Grounded, simulating actual vehicle configuration*~~ - Not grounded, simulating actual vehicle configuration* **Strikethrough, as appropriate.*	☒	☐	☐
Ann 9, 3.1.	Test frequency range is 20 to 2,000 MHz.	☒	☐	☐
Ann 9, 3.1.	Test signal is R.F. sine wave amplitude, modulated by a 1 kHz sine wave at a modulation depth of 0.8 ± 0.04, in the 20 - 800 MHz band and pulse modulation (time on 577 µs, period 4,600 µs) in the 800 – 2,000 MHz band.	☒	☐	☐
6.8.2.1.	Pre-test sweep supplied to show compliance throughout frequency range 20 to 2,000 MHz.	☒	☐	☐
Ann 9, 3.2.	Test frequencies chosen from pre-test data.	☒	☐	☐
6.8.2.2.	No degradation of immunity related functions during the tests.	☒	☐	☐

BCI Immunity

ISO11452-4, 5.	Shielded area used: Yes	☒	☐	☐
ISO11452-4, 8.3.2.1.	Forward power used to achieve specified current.	☒	☐	☐

Installation of ESA under Test

Ann 9, 4.3.2.	Current probe located 150 ± 10 mm from ESA connectors.	☒	☐	☐
Ann 9, 4.3.2.	ESA installed: - ~~In a vehicle, as per ISO 11451-4*~~ - On a ground plane, as per ISO 11452-4* **Strikethrough, as appropriate.*	☒	☐	☐
ISO11452-4, 7.1.	Ground plane is made from at least 0.5 mm thick copper, brass or galvanised steel.	☒	☐	☐
ISO11452-4, 7.1.	Minimum width of the ground plane is 1,000 mm and the minimum length is 1,500 mm, or length of the entire underneath of equipment plus 200 mm, whichever is greater.	☒	☐	☐

ISO11452-4, 7.1.	Height of the ground plane is 900 ± 100 mm.	☒	☐	☐
ISO11452-4, 7.1.	Ground plane is bonded to the shielded enclosure, with the straps at a distance no greater than 300 mm apart.	☒	☐	☐
ISO11452-4, 7.2.	- ESA remotely grounded (vehicle power return line longer than 200 mm): two artificial networks are required, one for the positive supply line and one for the power return line)* - ~~ESA locally grounded (vehicle power return line 200 mm or shorter): one artificial network is required, for the positive supply~~* **Strikethrough, as appropriate.*			
ISO11452-4, 7.2.	Power supply is Artificial Network (AN) rated at 50 Ω/5 µH.	☒	☐	☐
ISO11452-4, 7.3.	ESA and harness supported 50 ± 5 mm above ground plane, on low relative permittivity material.	☒	☐	☐
ISO11452-4, 7.3.	Face of the ESA within 100 mm from the edge of the ground plane.	☒	☐	☐
ISO11452-4, 7.3.	Distance of at least 500 mm between ESA and any metal parts, such as the walls of the shielded enclosure (exception is ground plane).	☒	☐	☐
ISO11452-4, 7.4.	Length of test harness is 1,700 + 300 mm, unless specified.	☒	☐	☐
	BCI Test Results			
6.8.2.1.	No malfunction at 60 mA or below.	☒	☐	☐
	Free Field Immunity			
ISO11452-2, 8.3.1.	Test field defined by: - Forward power* - ~~Another parameter, directly related~~* **Strikethrough, as appropriate.*	☒	☐	☐
ISO11452-2, 8.3.2.	Antenna is at a distance of 1,000 ± 10 mm from the reference point.	☒	☐	☐
ISO11452-2, 8.3.2.	Reference point is 150 ± 10 mm above the ground plane.	☒	☐	☐
ISO11452-2, 8.3.2.	Reference point is 100 ± 10mm from the edge of the ground plane.	☒	☐	☐
ISO11452-2, 8.3.2.	For frequencies from 80 - 1,000 MHz, the reference point is in the centre of the harness.	☒	☐	☐
ISO11452-2, 8.3.2.	For frequencies from 1,000 - 2,000 MHz, the reference point is in line with the ESA.	☒	☐	☐
	Test Arrangements			
ISO11452-2, 7.1.	Ground plane is made from at least 0.5 mm thick copper, brass or galvanised steel.	☒	☐	☐
ISO11452-2, 7.1.	Minimum width of the ground plane is 1,000 mm and the minimum length is 2,000 mm.	☒	☐	☐
ISO11452-2, 7.1.	Height of the ground plane is 900 ± 100 mm.	☒	☐	☐

ISO11452-2, 7.1.	Bonding straps are at a distance no greater than 300 mm apart.	☒	☐	☐
ISO11452-2, 7.2.	Power supply is Artificial Network (AN) rated at 50 Ω/5 µH.	☒	☐	☐
ISO11452-2, 7.2.	- ESA remotely grounded (vehicle power return line longer than 200 mm): two artificial networks are required, one for the positive supply line and one for the power return line)* - ~~ESA locally grounded (vehicle power return line 200 mm or shorter): one artificial network is required, for the positive supply~~* **Strikethrough, as appropriate.*			
ISO11452-2, 7.3.	AN mounted directly on the ground plane and cases bonded to the ground plane.	☒	☐	☐
ISO11452-2, 7.3.	ESA and harness supported 50 ± 5 mm above table, on low relative permittivity material.	☒	☐	☐
ISO11452-2, 7.3.	Face of the ESA located 200 ± 10 mm from the edge of the ground plane.	☒	☐	☐
ISO11452-2, 7.4.	Test harness parallel to the front edge of the ground plane.	☒	☐	☐
ISO11452-2, 7.4.	Total length of harness does not exceed 2,000 mm.	☒	☐	☐
ISO11452-2, 7.4.	Actual wiring harness length: N/A m or	☐	☐	☒
	Length is 1,500 ± 75 mm between ECU and AN.	☒	☐	☐
ISO11452-2, 7.4.	Harness is at a distance of 100 ± 10 mm from the edge of the ground plane.	☒	☐	☐
ISO11452-2, Fig 1	Front face of ESA is at least 1.0 m from all other conductive structures.	☒	☐	☐
ISO11452-2, Fig 1	ESA harness is at least 2.0 m forward from the chamber wall.	☒	☐	☐
	Antenna Type(s) and Frequency Range(s)			
Ann 9, 4.1.2.	Antenna is vertically polarised.	☒	☐	☐
ISO11452-2, 7.6.	Antenna is in the same position as the calibration.	☒	☐	☐
ISO11452-2, 7.6.	Phase centre is 100 ± 10 mm above the ground plane.	☒	☐	☐
ISO11452-2, 7.6.	Antenna elements are no closer than 250 mm to the floor of the facility, no closer than 0.5 m to any radio absorbent material, and no closer than 1.5 m to the wall of the facility.	☒	☐	☐
ISO11452-2, 7.6.	Distance between wiring harness and antenna is 1,000 mm ± 10 mm, measured from the phase-centre of the biconical antenna, or the nearest part of the log-periodic and horn antennas.	☒	☐	☐
Ann 9, 3.1.	Test signal modulation is: - AM, 1 kHz modulation, 80 % depth in 20 - 800 MHz frequency range; - PM, ton 577 µs, period 4,600 µs in 800 - 2,000 MHz frequency range.	☒	☐	☐
	Free Field Immunity Test Results			
6.8.2.	No malfunction at 30 V/m or below.	☒	☐	☐
	150 mm Stripline Immunity			
ISO11452-5, 5.3.1.	Stripline housed in a shielded room.	☐	☐	☒

ISO11452-5, 6.2.2.	Test field defined by: - Forward power* - Another parameter, directly related* **Strikethrough, as appropriate.*	☐	☐	☒	
ISO11452-5, 6.2.3.	Field probe in the centre of stripline.				
	Installation of ESA under Test				
ISO11452-5, 5.3.1.	ESA is 200 + 20 - 0 mm from the edge of the active conductor.	☐	☐	☒	
ISO11452-5, 5.3.1.	Peripherals are a minimum of 200 mm from the edge of the active conductor.	☐	☐	☒	
ISO11452-5, 5.3.1.	Harness supported 50 mm above the ground plane and is placed in the centre of the stripline.	☐	☐	☒	
ISO11452-5, 5.3.1.	Actual wiring harness length: N/A m or Minimum length under stripline is 1,000 mm.	☐ ☐	☐ ☐	☒ ☒	
ISO11452-5, 5.3.1.	All wires in the harness are terminated or open, according to the vehicle application.	☐	☐	☒	
ISO11452-5, 5.3.1.	Device and peripherals connected to the ground plane, as specified by the vehicle installation.	☐	☐	☒	
ISO11452-5, 5.3.1.	Power supply is Artificial Network (AN) rated at 50 Ω/5 µH.	☐	☐	☒	
ISO11452-5, 5.3.1.	- ESA remotely grounded (vehicle power return line longer than 200 mm): two artificial networks are required, one for the positive supply line and one for the power return line)* - ~~ESA locally grounded (vehicle power return line 200 mm or shorter): one artificial network is required, for the positive supply*~~ **Strikethrough, as appropriate.*				
	150 mm Stripline Test Results				
6.8.2.	No malfunction at 50 V/m or below.	☐	☐	☒	
	800 mm Stripline Immunity				
Ann 9, 4.5.2.1.	Stripline housed in a screened room.	☐	☐	☒	
Ann 9, 4.5.2.1.	Stripline positioned a minimum of 2,000 mm from the walls or metallic enclosure.	☐	☐	☒	
Ann 9, 4.5.2.1.	Stripline placed on non-conducting supports at least 400 mm above the floor.	☐	☐	☒	
Ann 9, 4.5.2.2.	Field probe positioned within the central one-third of the longitudinal, vertical and transverse dimensions of the space between the parallel plates, with the system under test absent.	☐	☐	☒	
Ann 9, 4.5.2.2.	Test field defined by: - Forward power* - Another parameter, directly related* **Strikethrough, as appropriate.*	☐	☐	☒	

Installation of ESA under Test

Ann 9, 4.5.2.3.	ESA is within the central one-third of the stripline.	☐	☐	☒
Ann 9, 4.5.2.3.	ESA is supported on non-conducting material.	☐	☐	☒
Ann 9, 4.5.2.4.	Wiring loom is arranged as per Appendix 1, Figure 3.	☐	☐	☒
Ann 9, 4.5.2.4.	Associated equipment is a minimum of 1,000 mm from stripline.	☐	☐	☒

800 mm Stripline Test Results

Frequency Suggested (MHz)	Frequency (MHz)	Forward Power		Output Level		Field Strength (V/m)
		Cal. (w)	Test (w)	Cal. (dBm)	Test (dBm)	
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A

6.8.2.	No malfunction at 12.5 V/m or below.	☐	☐	☒

Transient Testing

	Case of ESA is: - ~~Grounded, simulating actual vehicle configuration*~~ - Not grounded, simulating actual vehicle configuration* **Strikethrough, as appropriate.*	☒	☐	☐

Transient Immunity

6.9.1.	Test set up according to ISO 7637-2 (second edition 2004 and Amd.1:2008).	☒	☐	☐
Ann 10, 2.	Supply lines and other lines, which may be connected to supply lines, are tested.	☒	☐	☐
	Test voltage and time parameters are within allowed envelopes.	☒	☐	☐
	Test pulses and duration according to the following:	☒	☐	☐

Test Pulse	Immunity Test Level	Functional Status for Systems		Test Duration
		Related to Immunity-related Functions	Not Related to Immunity-related Functions	
1	III	C	D	5000 pulses
2a	III	B	D	5000 pulses
2b	III	C	D	10 pulses
3a	III	A	D	1 hour
3b	III	A	D	1 hour
4	III	B *(for ESA, which must be operational during engine start, or C, for other ESA)*	D	1 pulse

	ESA operational after the tests, according to the above classification.	☒	☐	☐

Emission of Conducted Disturbances

6.9.1.	Test set up according to ISO 7637-2.	☒	☐	☐
Ann 10, 3.	Supply lines and other lines, which may be connected to supply lines, are tested.	☒	☐	☐
	Slow pulses and fast pulses tested on both powering up and powering down.	☒	☐	☐

Polarity of Pulse Amplitude	Maximum Allowed Pulse Amplitude	
	Vehicles with 12 V systems	Vehicles with 24 V system
Positive	+ 75 V	+ 150 V
Negative	- 100 V	- 450 V

Remarks

None

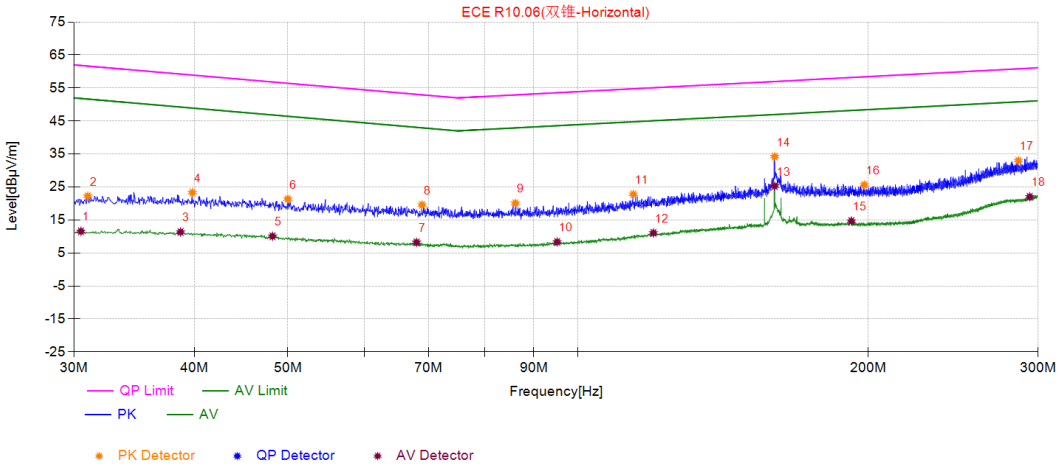
Note: CETOC TS apply measurement uncertainty to calibrated items but not test results.

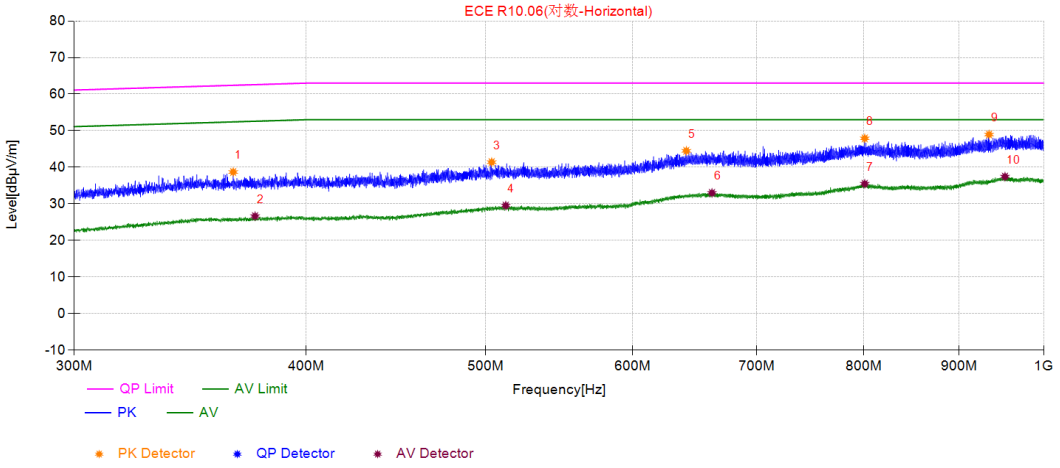
APPENDIX 4 – TEST RESULTS

APPENDIX 4.1 Radiated Emissions

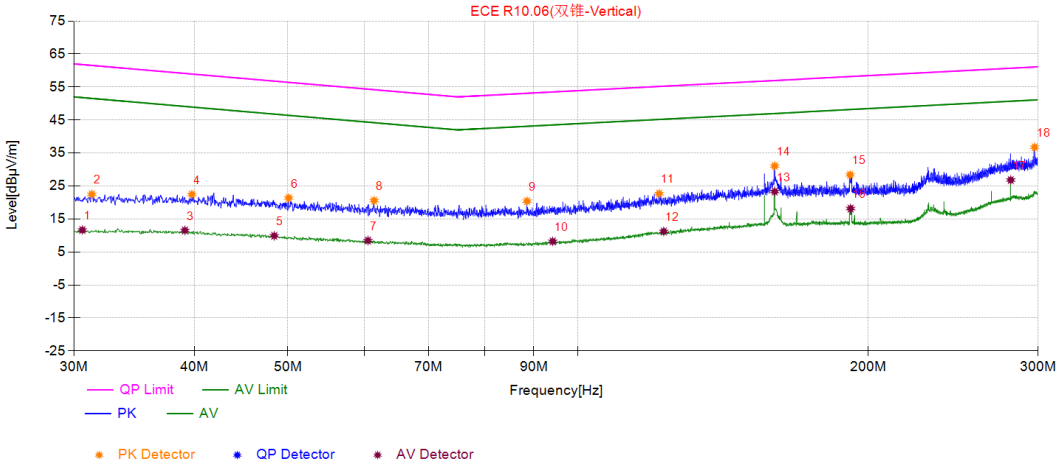
Vehicles with 12V systems

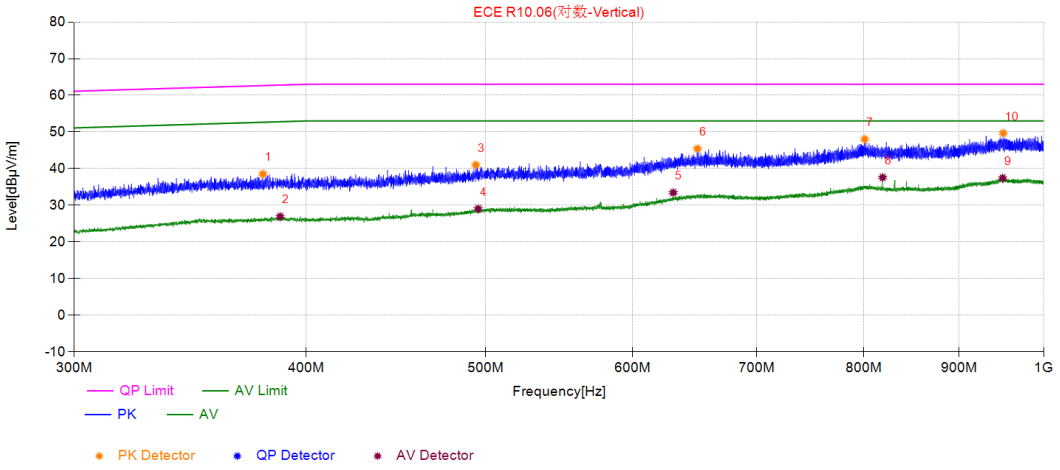
Horizontal Polarisation
30MHz to 1GHz





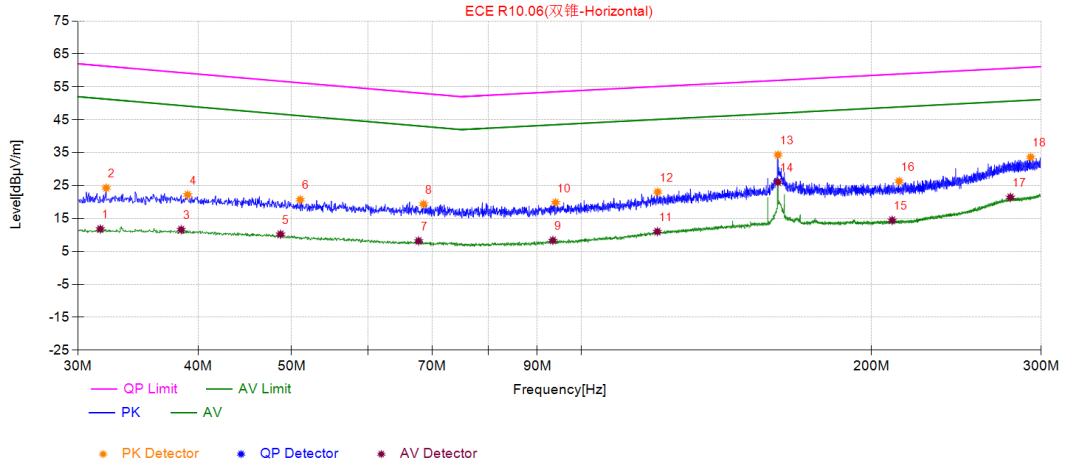
Vertical Polarisation
30MHz to 1GHz

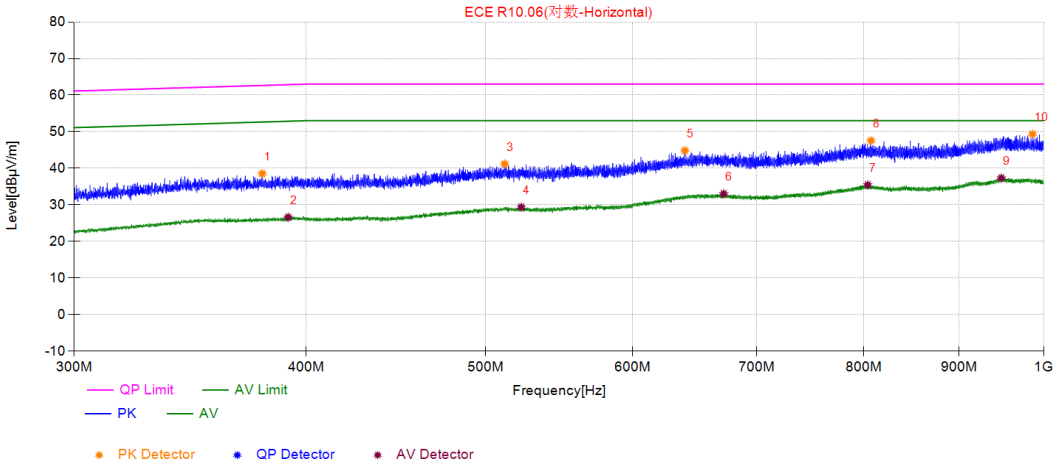




Vehicles with 24V systems

Horizontal Polarisation
30MHz to 1GHz





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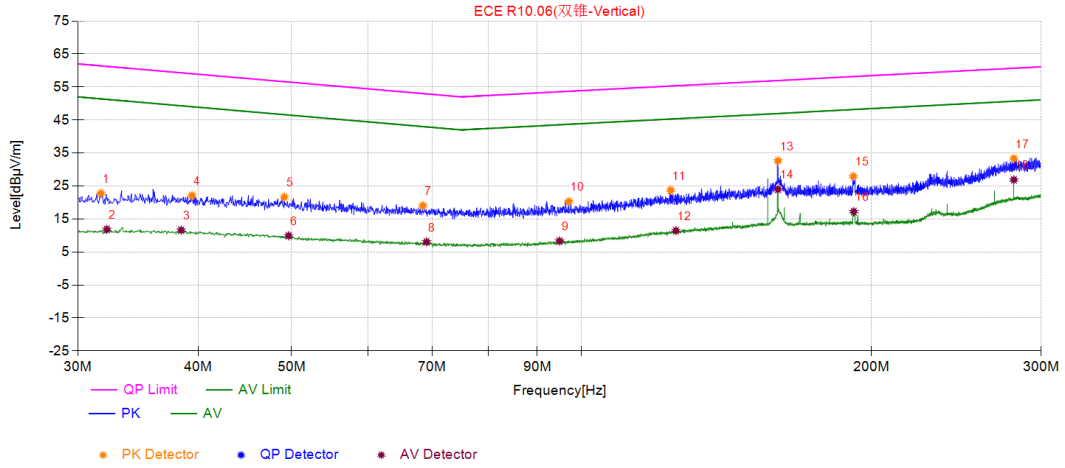
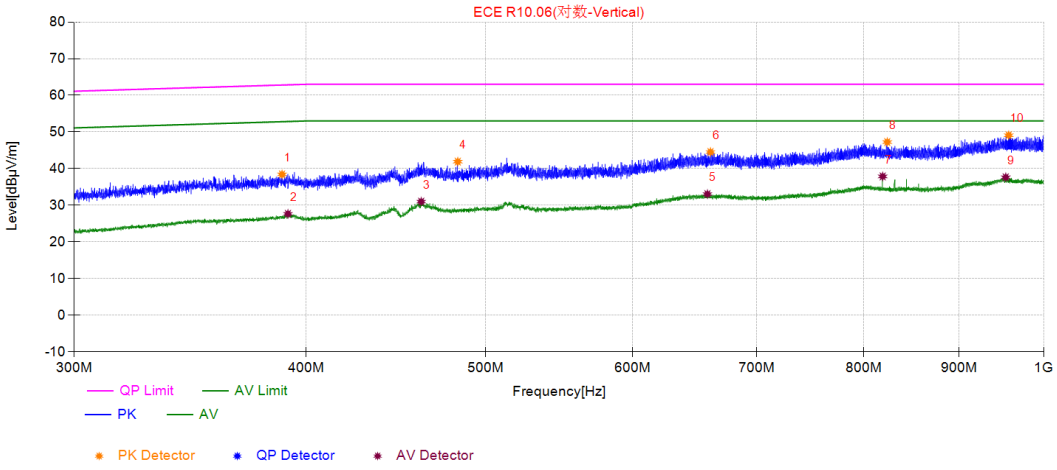
Via della Bufalotta, 374,
00139 Roma

Vertical Polarisation
30MHz to 1GHz





APPENDIX 4.2 Radiated Immunity

Frequency (MHz)	Level (V/m)	Modulation	Polarity	Accept Status	Test Result	
					Vehicles with 12V systems	Vehicles with 24V systems
400-800	30	AM (1kHz,80%)	V	I	A	A
800-1000	30	PM	V	I	A	A
1000-2000	30	PM	V	I	A	A

APPENDIX 4.3 BCI Immunity

Frequency (MHz)	Level (mA)	Modulation	Injection place	Test Result	
				Vehicles with 12V systems	Vehicles with 24V systems
20-400	60	AM (1kHz,80%)	150mm	A	A

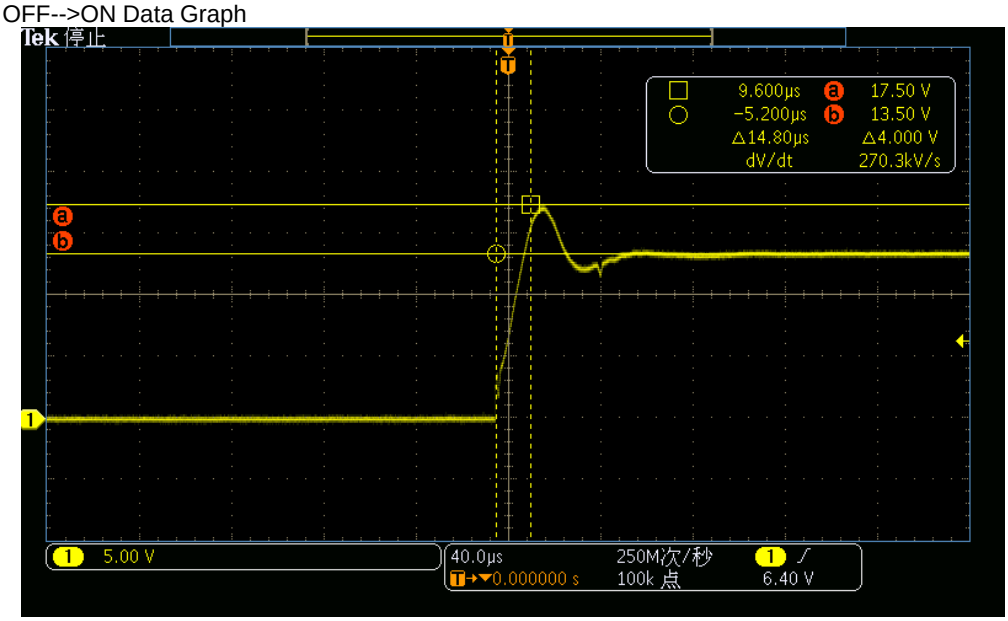
APPENDIX 4.4 Transient Immunity

Test Pulse	Immunity Test Level	Functional Status for Systems		Test results	
		Related to Immunity-related Functions	~~Not Related to Immunity-related Functions~~	Vehicles with 12V systems	Vehicles with 24V systems
1	III	C	~~D~~	C	C
2a	III	B	~~D~~	A	A
2b	III	C	~~D~~	C	C
3a	III	A	~~D~~	A	A
3b	III	A	~~D~~	A	A
4	III	C	~~D~~	A	A

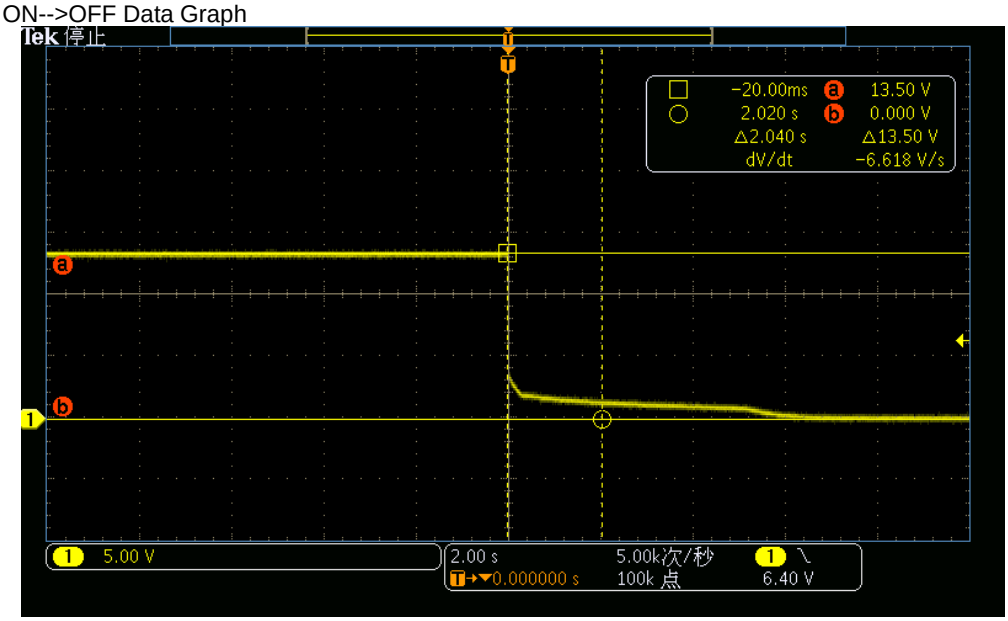
APPENDIX 4.5 Emission of Conducted Disturbances

Vehicles with 12 V systems

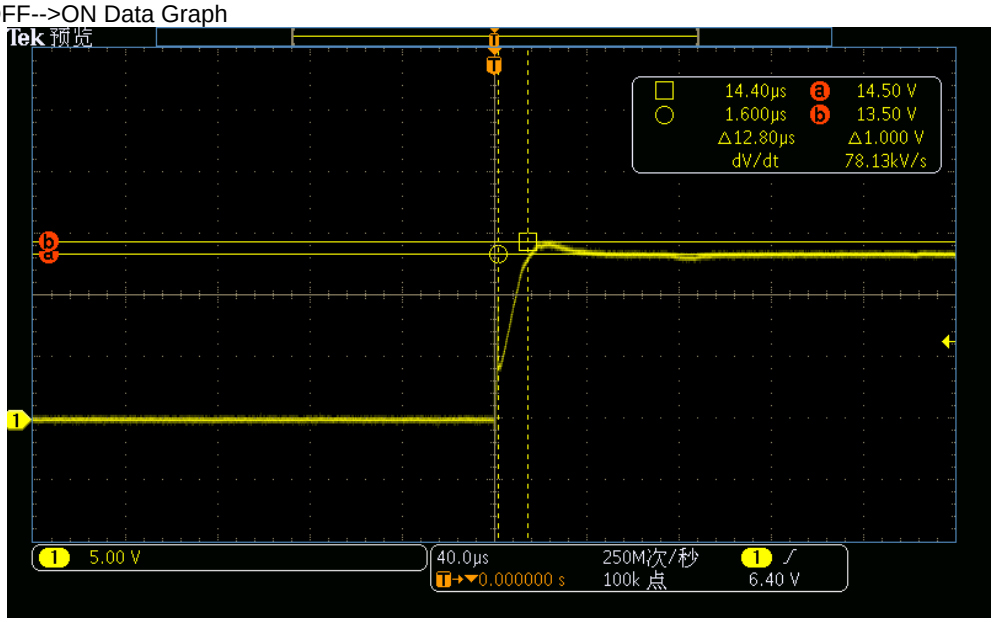
Slow Pulse: OFF-->ON Data Graph



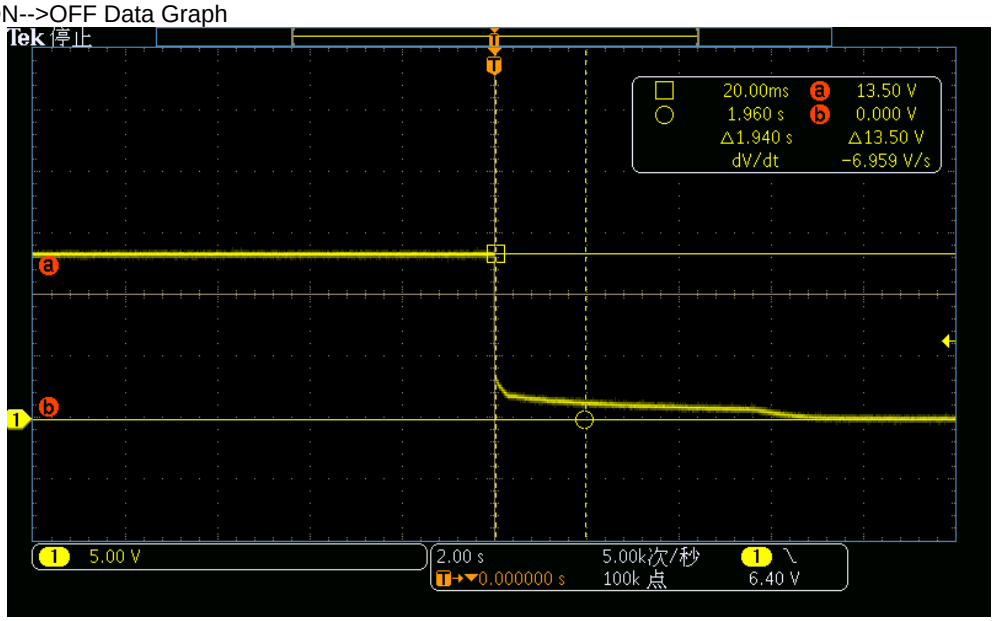
Slow Pulse: ON-->OFF Data Graph



Fast Pulse: OFF-->ON Data Graph

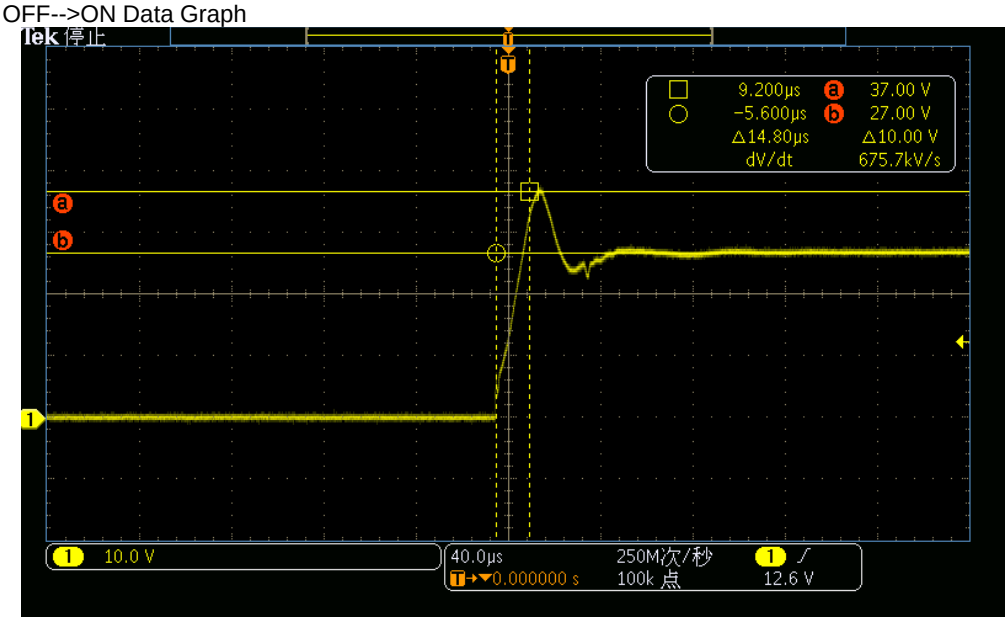


Fast Pulse: ON-->OFF Data Graph

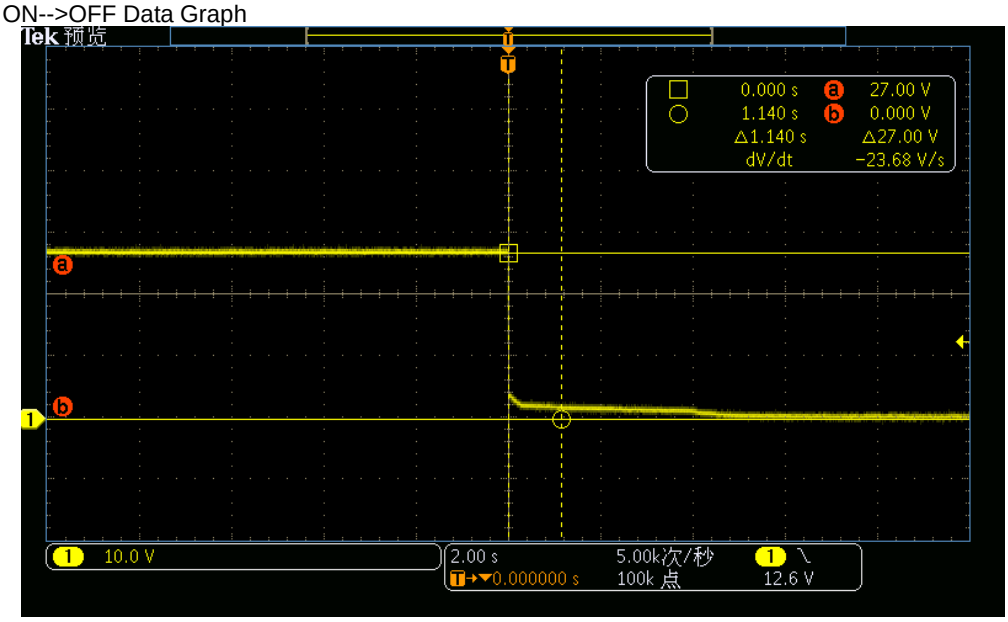


Vehicles with 24 V systems

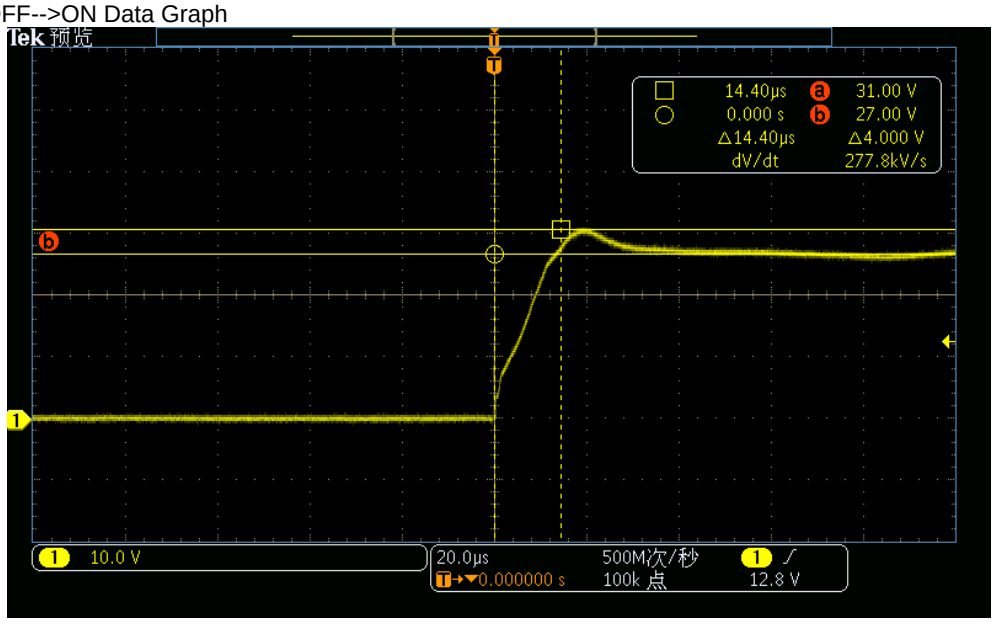
Slow Pulse: OFF-->ON Data Graph



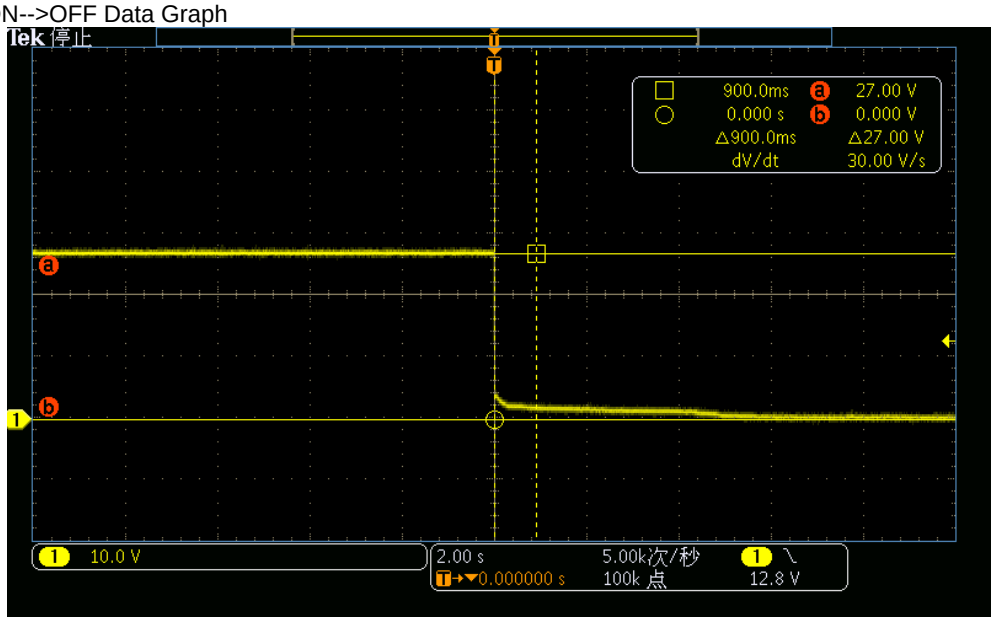
Slow Pulse: ON-->OFF Data Graph



Fast Pulse: OFF-->ON Data Graph



Fast Pulse: ON-->OFF Data Graph



Information document no. VG710-00 relating to type-approval of an electronic subassembly with respect to electromagnetic compatibility (ECE Regulation 10.06 to Supplement 2)

Type	:	VG710
Manufacturer	:	Beijing Inhand Networks Technology Co., Ltd.
Date	:	2022/12/26

INDEX

GENERAL

1. Make (trade name of manufacturer):

2. Type: **VG710**

   General commercial description(s):
   InVehicle Gateway

3. Means of identification of type, if marked on the component/separate technical unit (1):
   Approval mark

3.1 Location of that marking:
Stuck on the enclosure, See Drawings of the ESA

4. Name and address of manufacturer:
   Beijing InHand Networks Technology Co., Ltd.
   Room 501, 5th floor, building 3, No.18 Yard, Ziyue Road, Chaoyang District, Beijing, China 100102

   Name and address of authorised representative, if any:**N/A**

5. In the case of components and separate technical units, location and method of affixing of the approval mark:
   Stuck on the enclosure, See Drawings of the ESA.

6. Address(es) of assembly plant(s):
   Inhand Jiaxing Communication Technology Co., Ltd.
   318 Ruifeng Street, Gaozhao Street, Xiuzhou District, Jiaxing City, Zhejiang Province, China

7. This ESA shall be approved as a component/~~STU~~[2].

8. Any restrictions of use and conditions for fitting:
   N/A

9. Electrical system rated voltage:
   DC 12/24V, ~~positive~~/negative[2] ground.

   Appendix 1: Description of the ESA chosen to represent the type (electronic block diagram and list of main component constituting the ESA (e.g. make and type of microprocessor, crystal, etc.).
   See electronic block diagram and list of main component constituting the ESA for details.

Appendix 2: Relevant test report(s) supplied by the manufacturer from a test laboratory accredited to ISO 17025 and recognized by the Type Approval Authority for the purpose of drawing up the type approval certificate.
N/A

Only applicable for charging systems: **N/A**

10. Charger:
N/A

11. Charging current:
N/A

12. Maximal nominal current (in each mode if necessary) :
N/A

13. Nominal charging voltage:
N/A

14. Basic ESA interface functions:
N/A

15. Minimum R_{sce} value (see paragraph 7.11. of this Regulation):
N/A

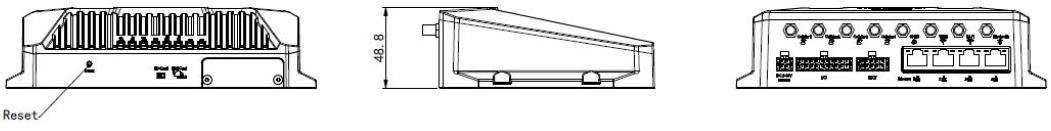
1. If the means of identification of type contains characters not relevant to describe the component or separate technical unit types covered by this information document, such characters shall be represented in the documentation by the symbol "?" (e.g. ABC??123??).

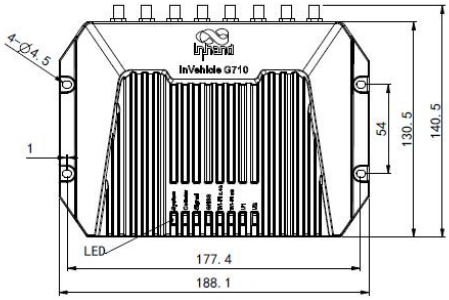
2. Delete where not applicable.

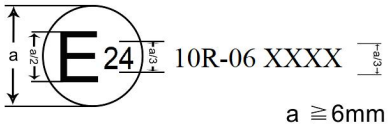
Information document no.	: VG710-00
Manufacturer	: Beijing Inhand Networks Technology Co., Ltd.
Regulation	: R10.06 to Supplement 2

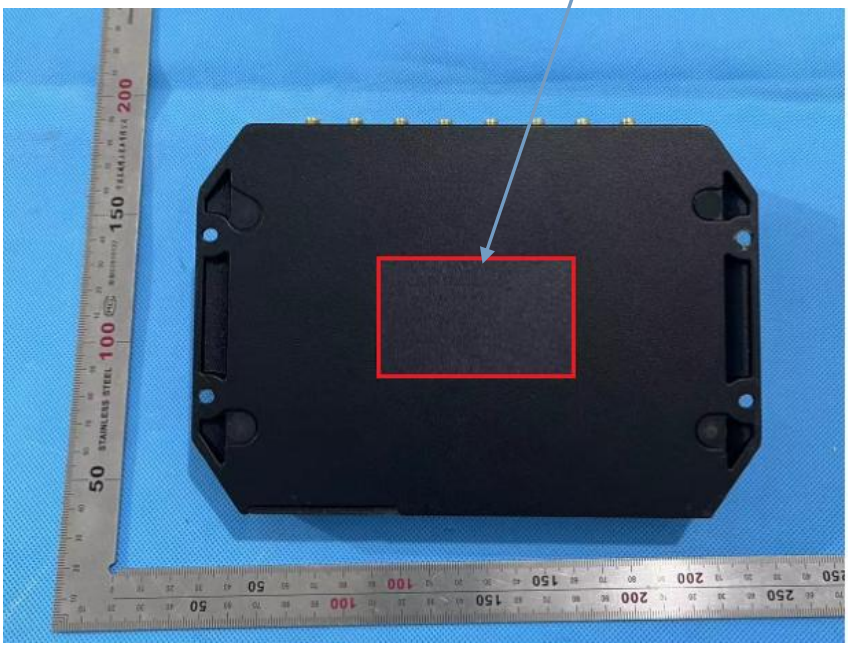
Drawings of the ESA

Location of the ECE approval mark



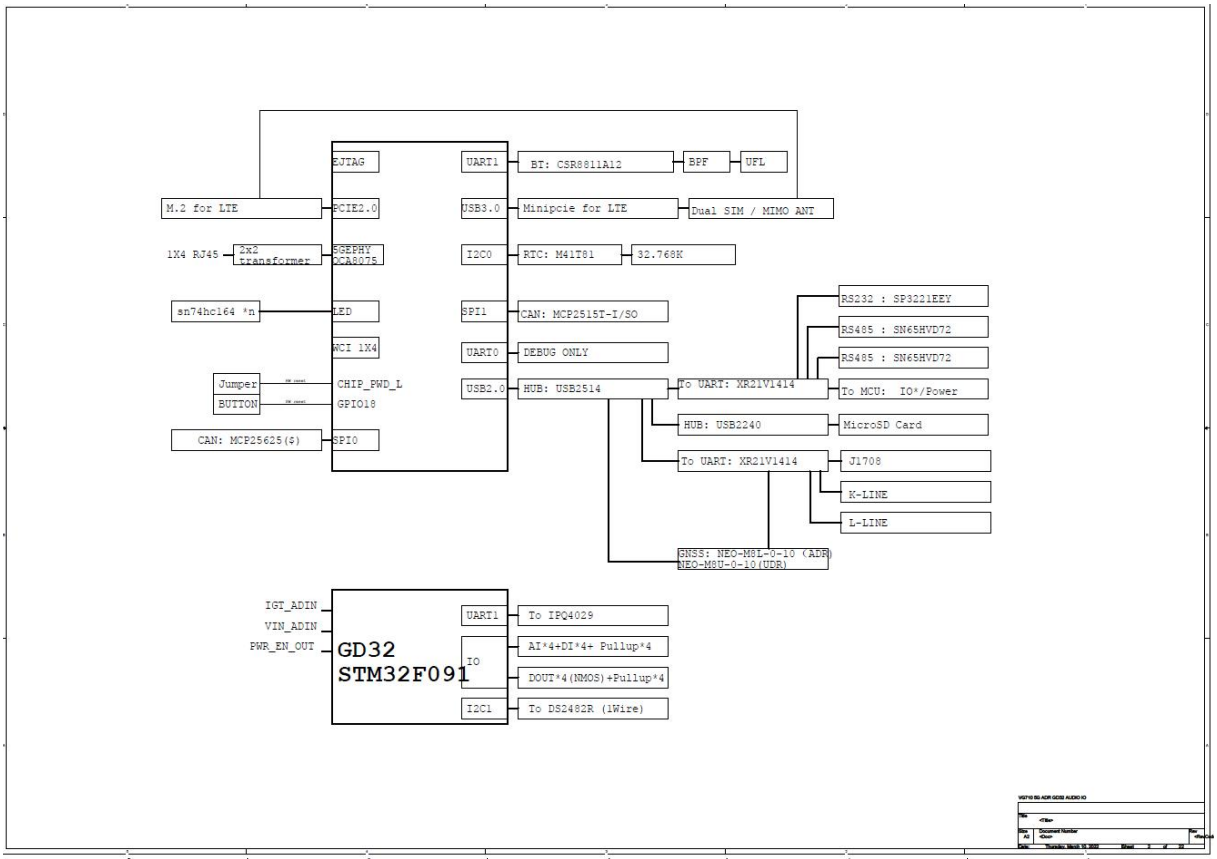


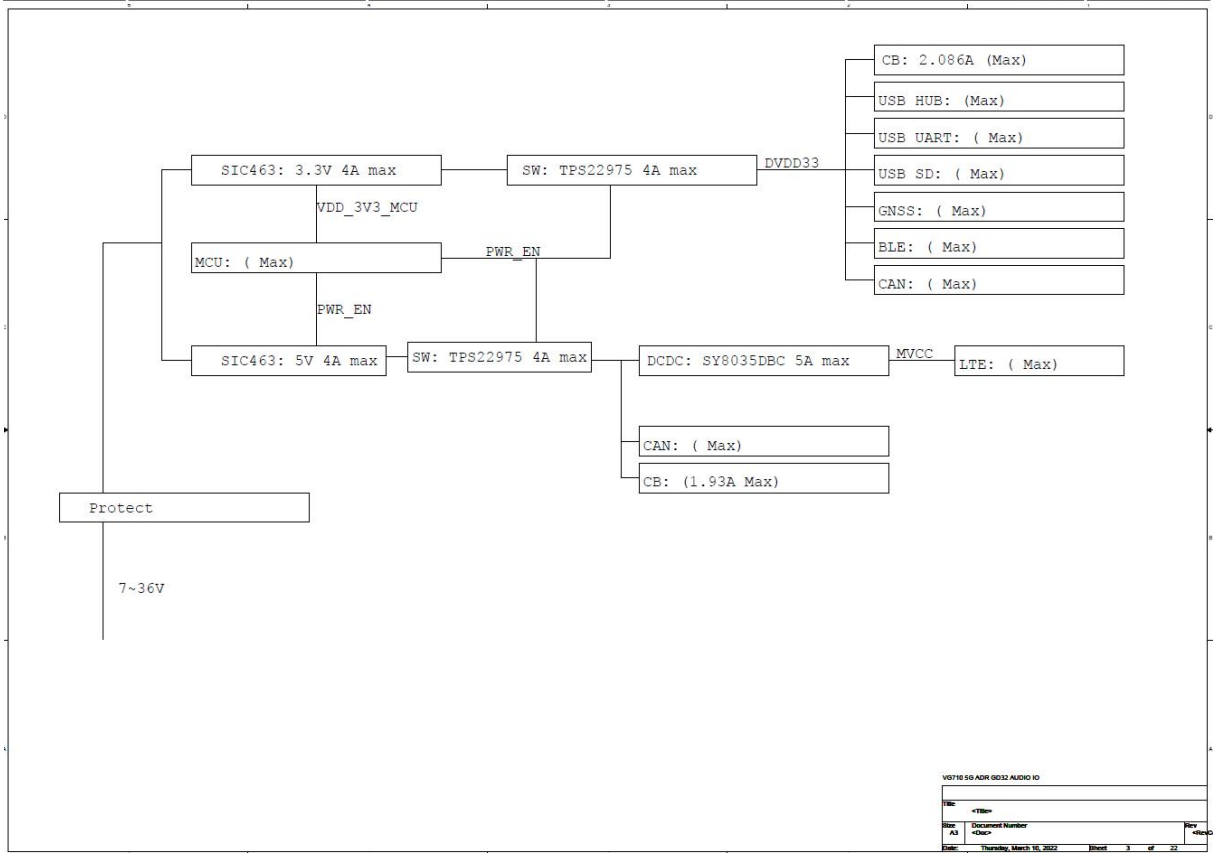




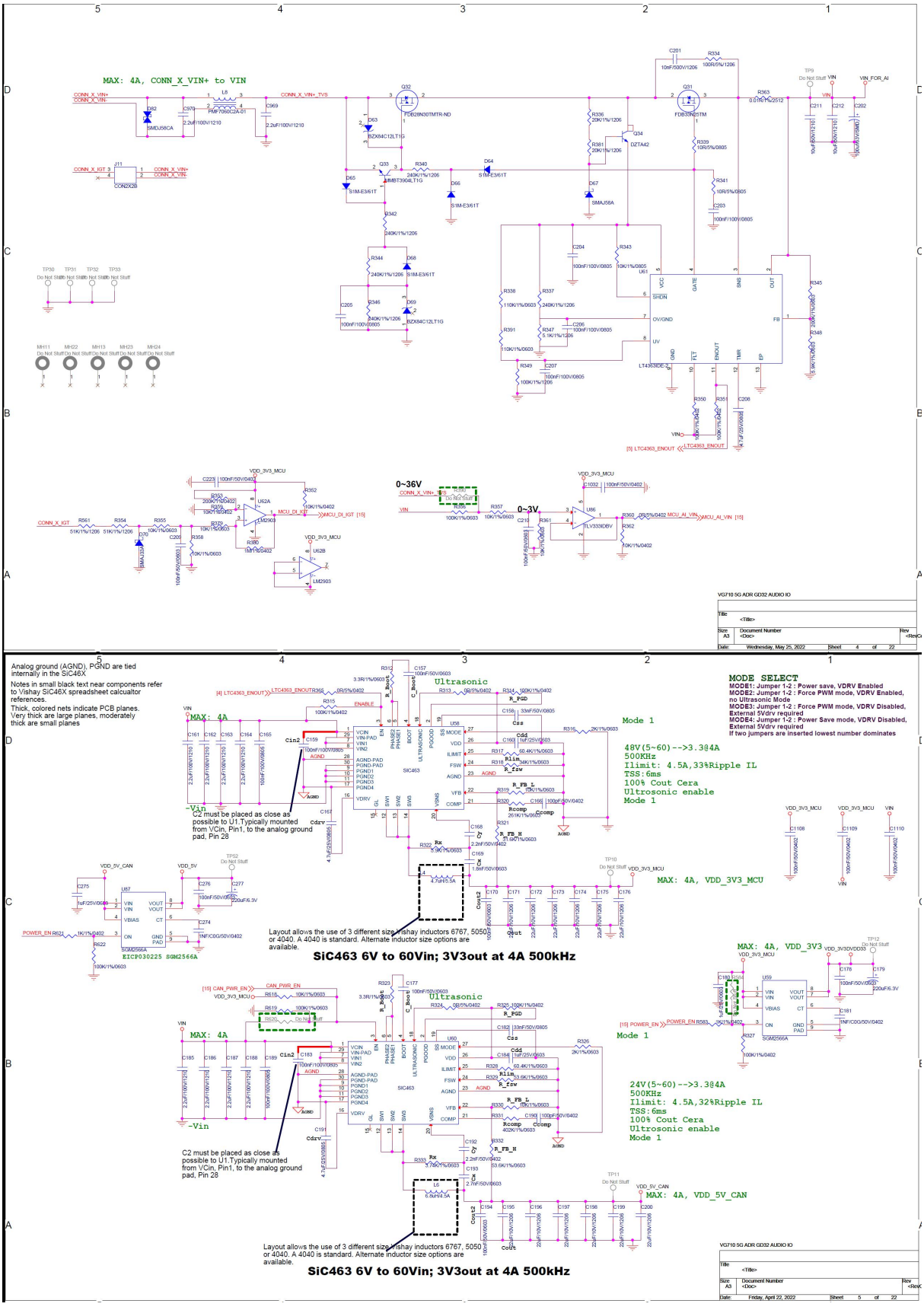
Description of Accessories	Manufacturer	Model number	Description	Remark
5G antenna	SHENZHEN GUYANG COMMUNICATION TECHNOLOGY CO.,LTD.	GY-XDK-OCL2-B2JG24.1	5G Sucker antenna	Length:200cm
WiFi antenna	SHENZHEN GUYANG COMMUNICATION TECHNOLOGY CO.,LTD.	GY-BCF-BCL2-GJ	WiFi antenna	Length:200cm
GPS antenna	SHENZHEN GUYANG COMMUNICATION TECHNOLOGY CO.,LTD.	GY-GDN-BCL2-AJ	GPS antenna	Length:200cm
WiFi antenna	2J Antennas, s.r.o.	2J55 02P	2.4/5.0/6.0 GHz ISM Adhesive Mount	Length:300cm
5G antenna	2J Antennas, s.r.o.	2J6984 BGFa	5GNR MIMO and GPS/GLONASS Screw Mount	Length:480cm
Wall Mount Bracket	2J Antennas, s.r.o.	2JB03Ha	Wall Mount Bracket	L*W*H:104*90*30mm
Power cord	Naitong Electronics	NA	NA	Length:300cm

Electronic Block Diagram





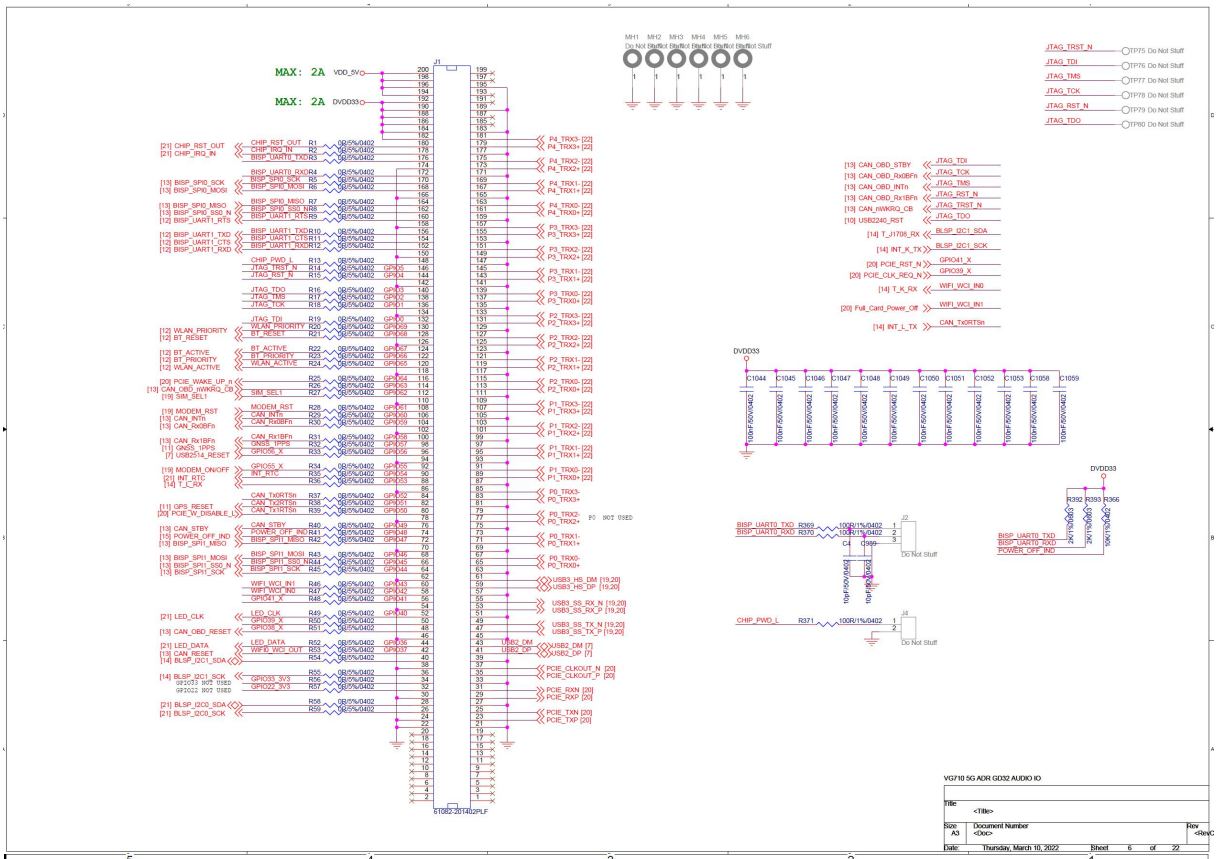
Information document no.	: VG710-00
Manufacturer	: Beijing Inhand Networks Technology Co., Ltd.
Regulation	: R10.06 to Supplement 2

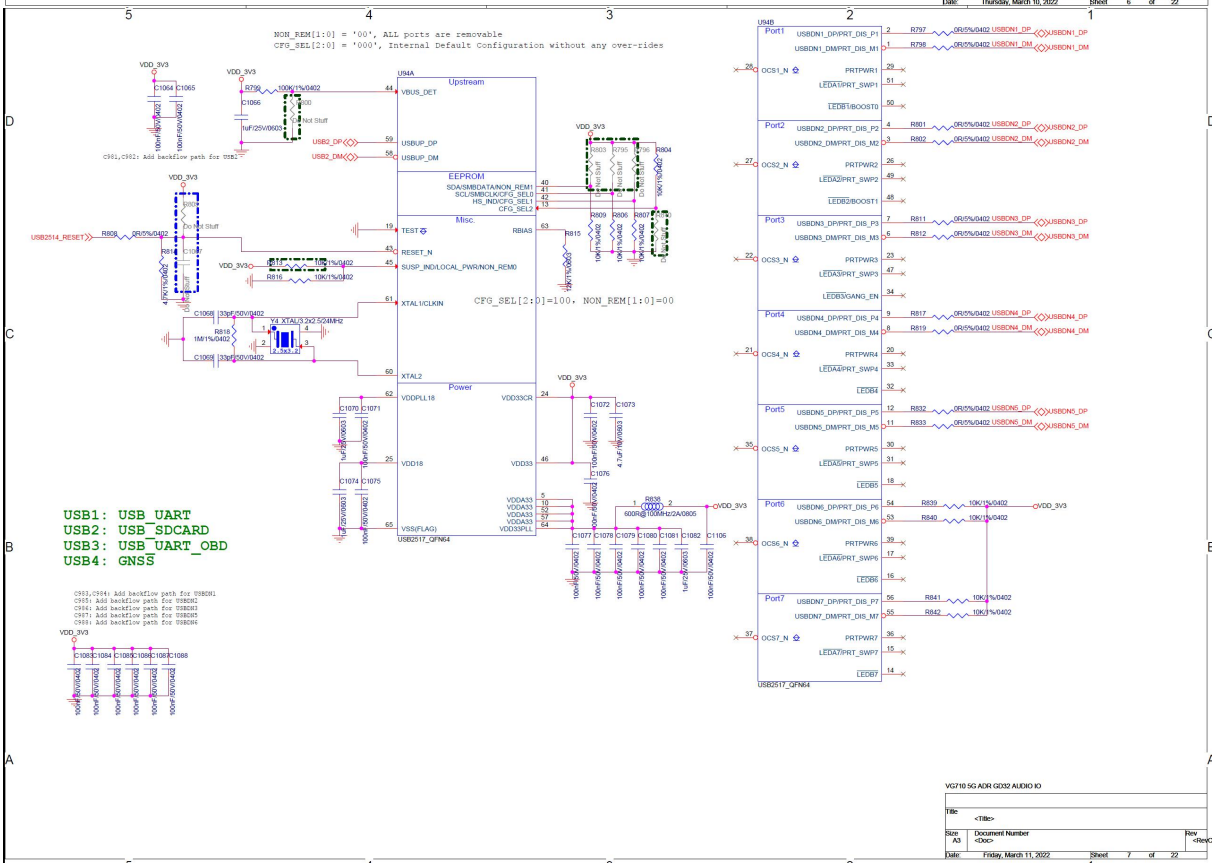


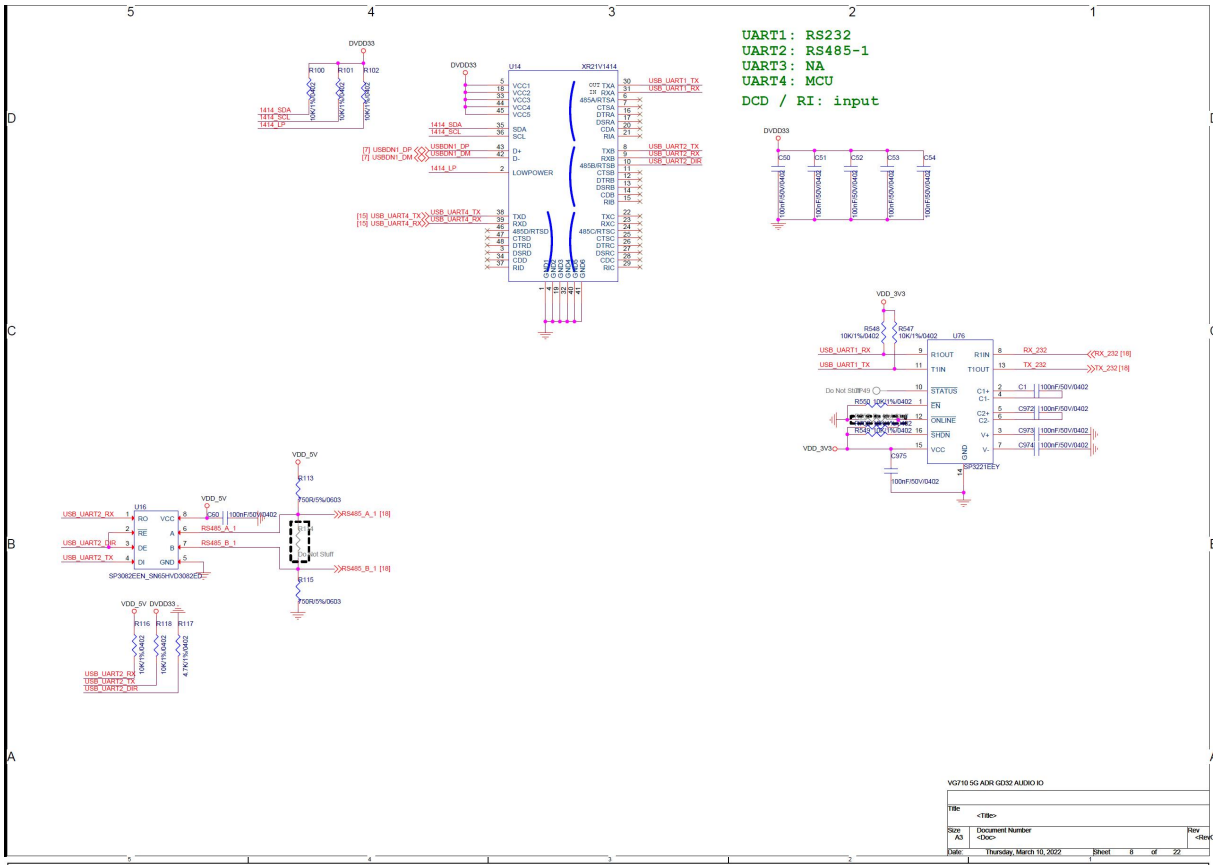
Information document no. : VG710-00

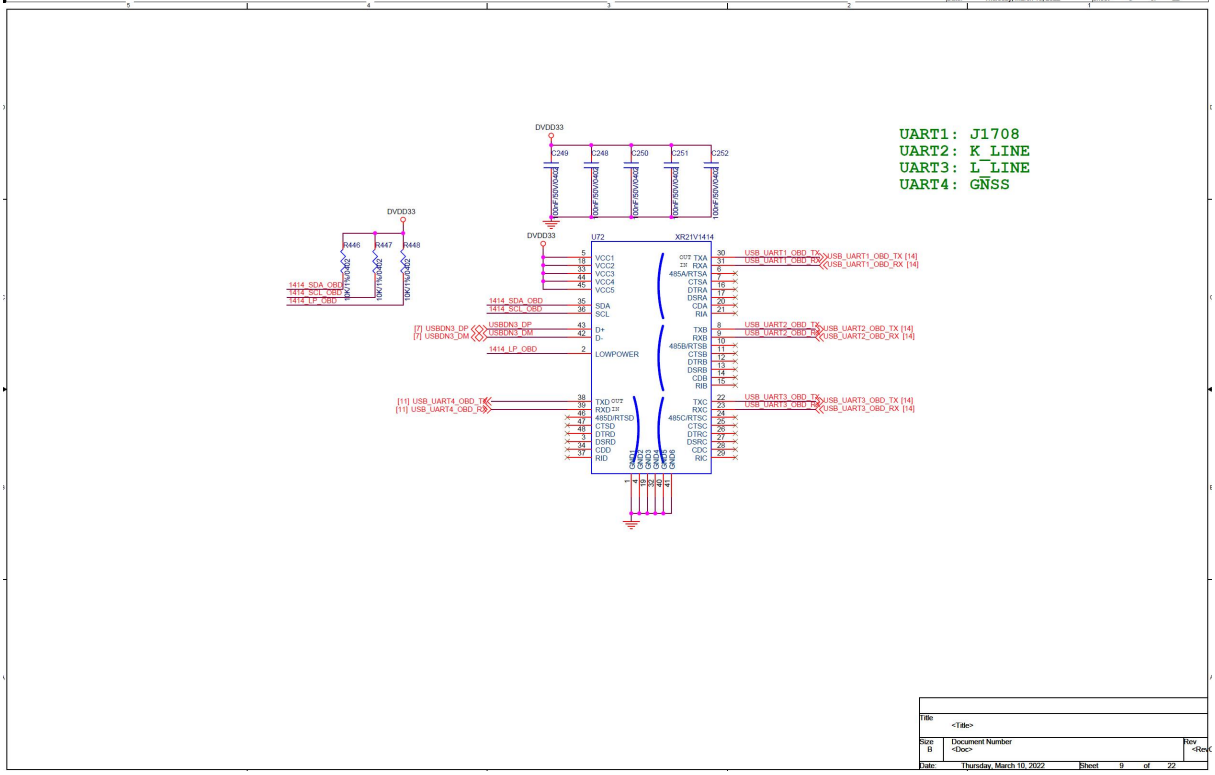
Manufacturer : Beijing Inhand Networks Technology Co., Ltd.

Regulation : R10.06 to Supplement 2

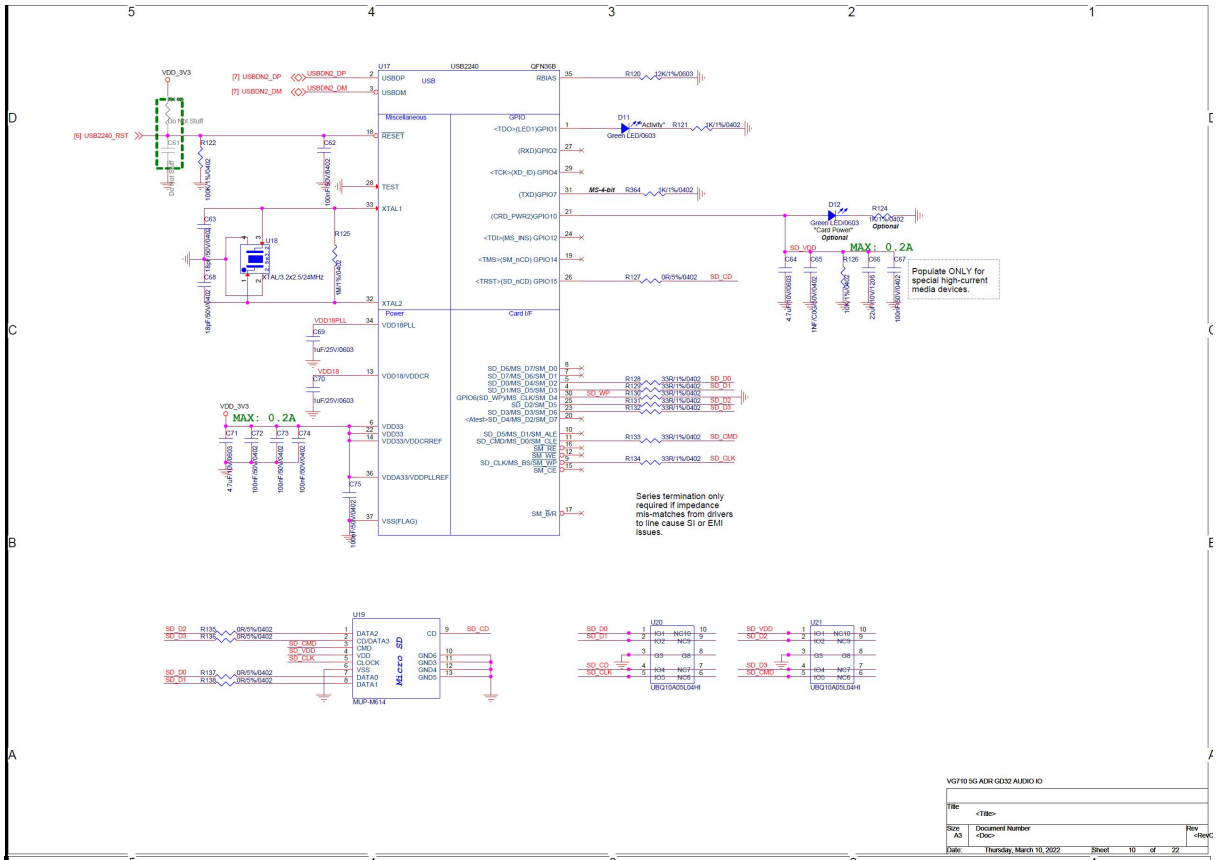


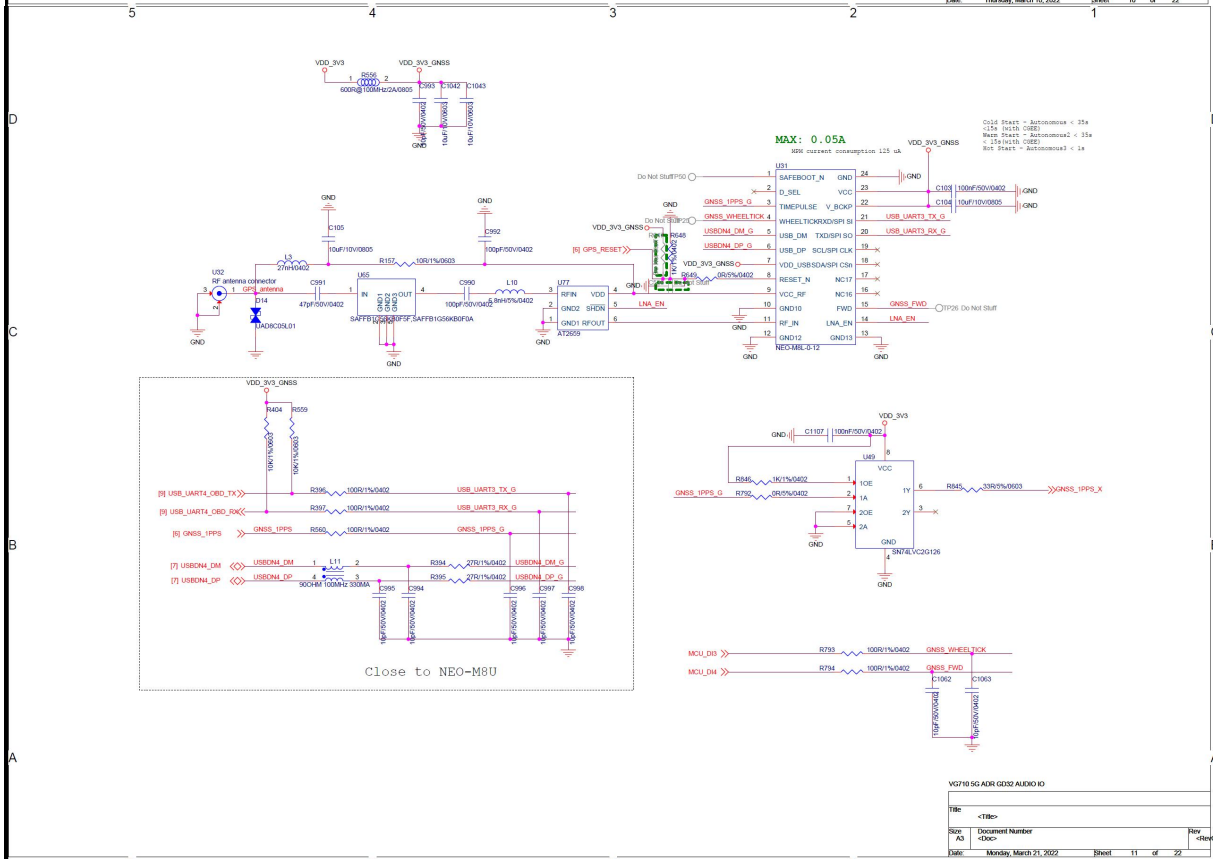



UART1: RS232
UART2: RS485-1
UART3: NA
UART4: MCU
DCD / RI: input
VG710 5G ADR GD32 AUDIO IO
Thursday, March 10, 2022
Sheet 8 of 22

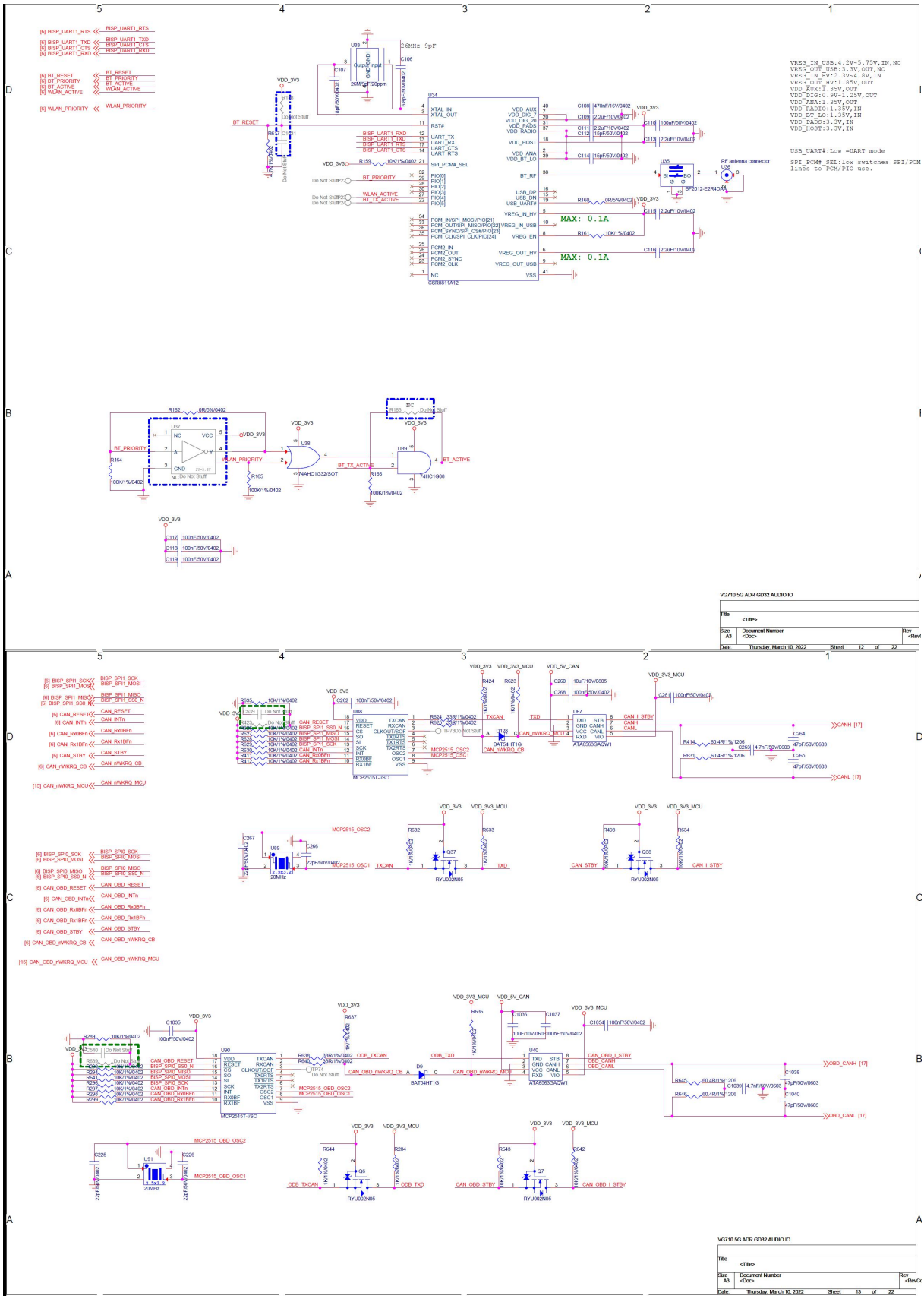

UART1: J1708
UART2: K_LINE
UART3: L_LINE
UART4: GNSS
Thursday, March 10, 2022
Sheet 9 of 22

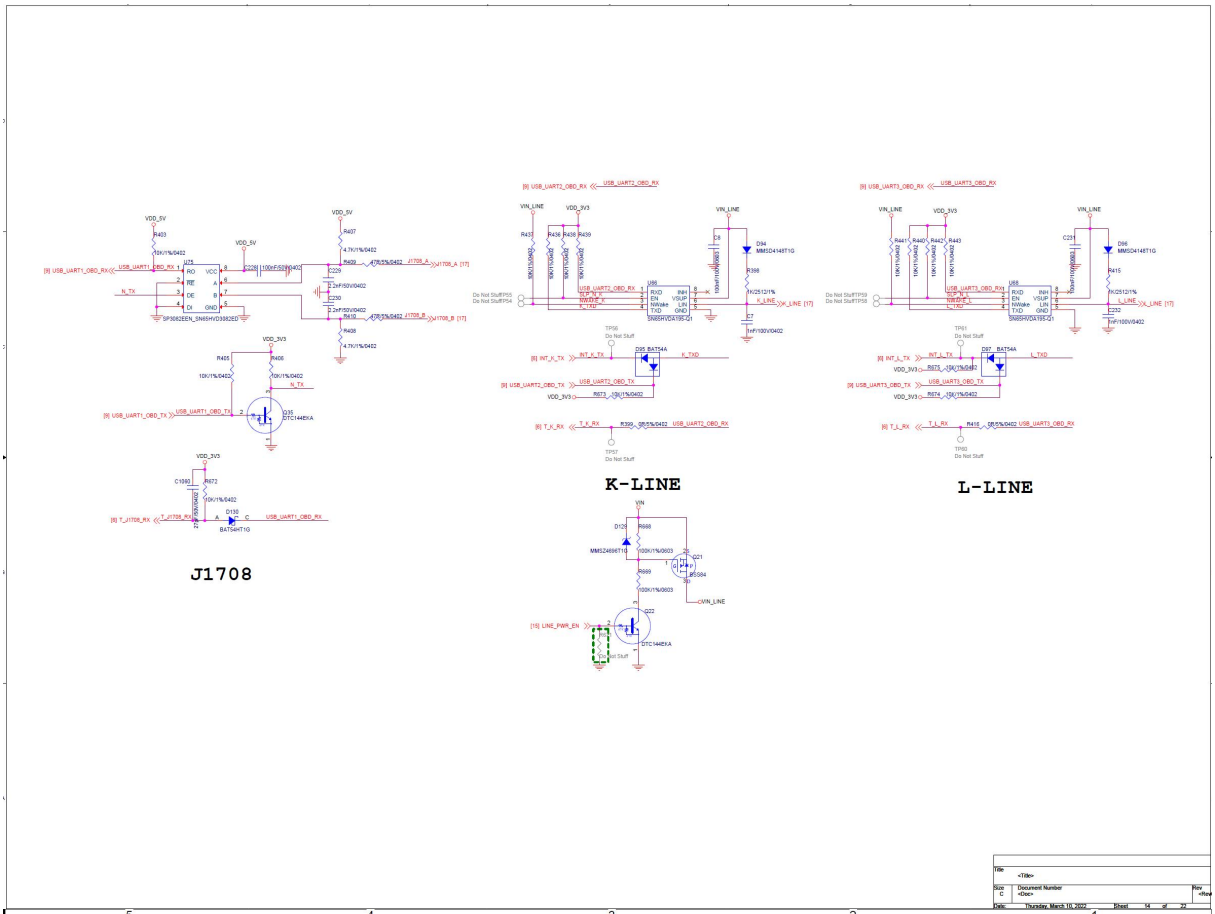
Information document no.	: VG710-00
Manufacturer	: Beijing Inhand Networks Technology Co., Ltd.
Regulation	: R10.06 to Supplement 2

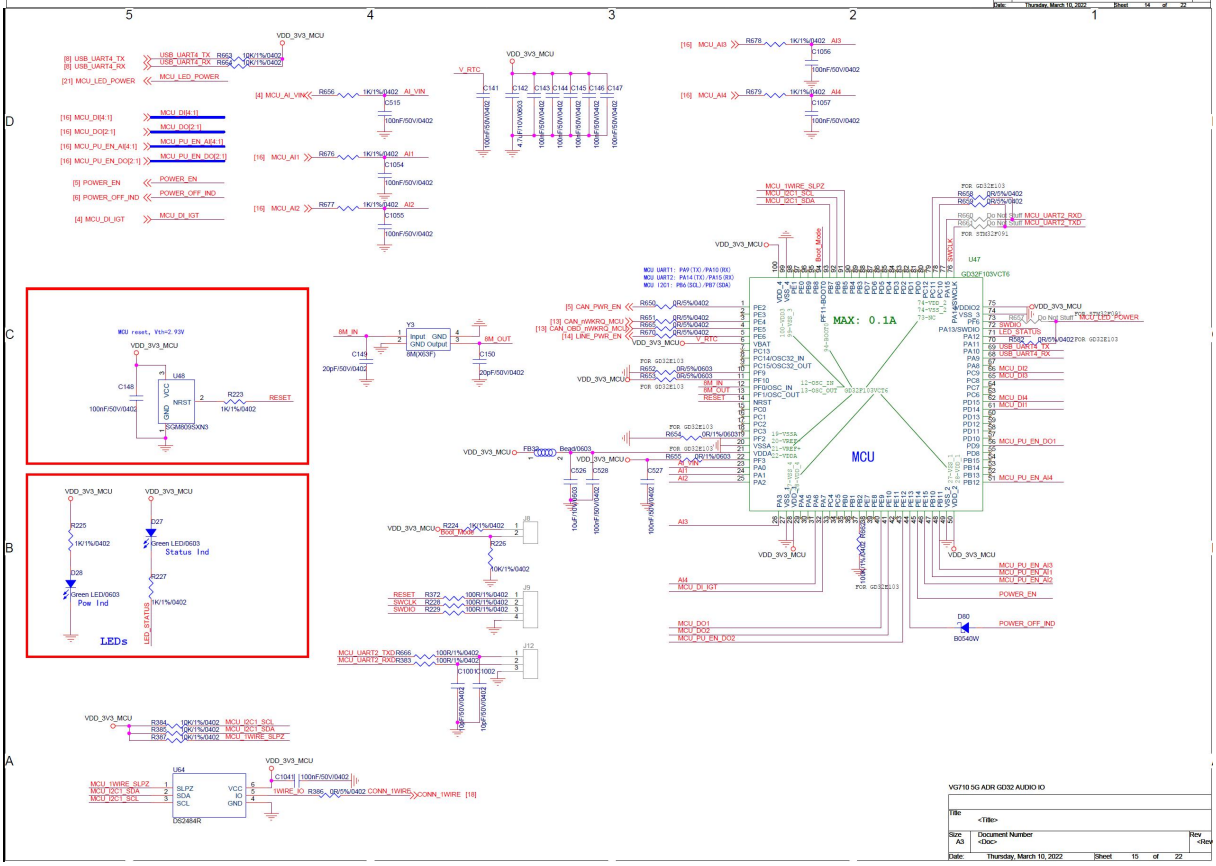




Information document no.	: VG710-00
Manufacturer	: Beijing Inhand Networks Technology Co., Ltd.
Regulation	: R10.06 to Supplement 2



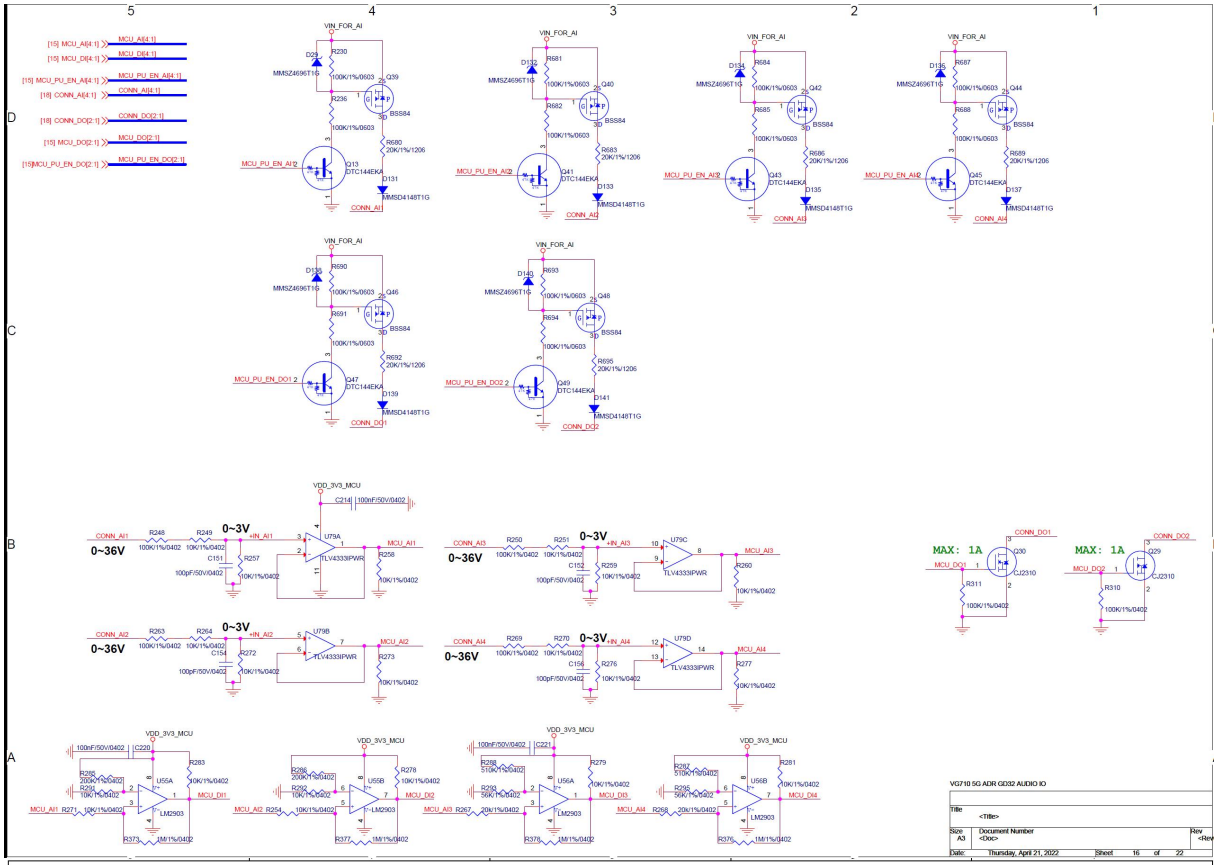

K-LINE
L-LINE
J1708

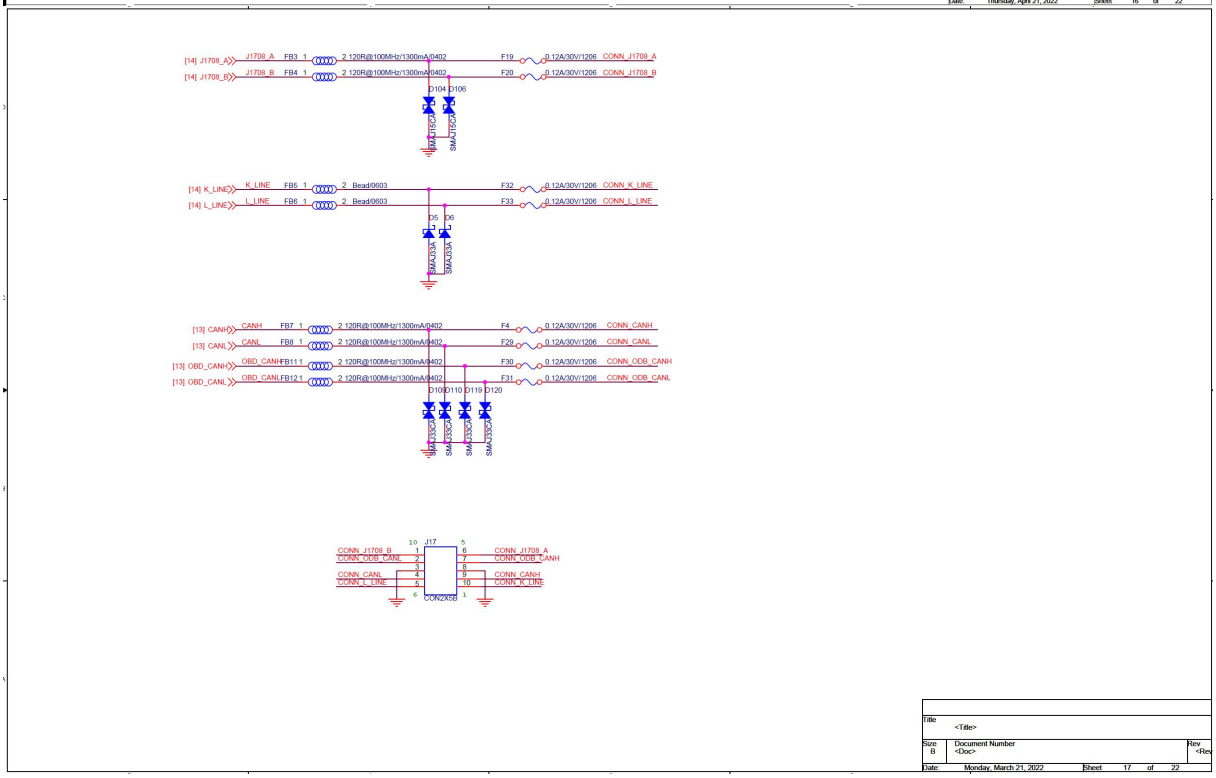

MAX: 0.1A
MCU
LEDs
Status Ind
Pow Ind

Information document no. : VG710-00

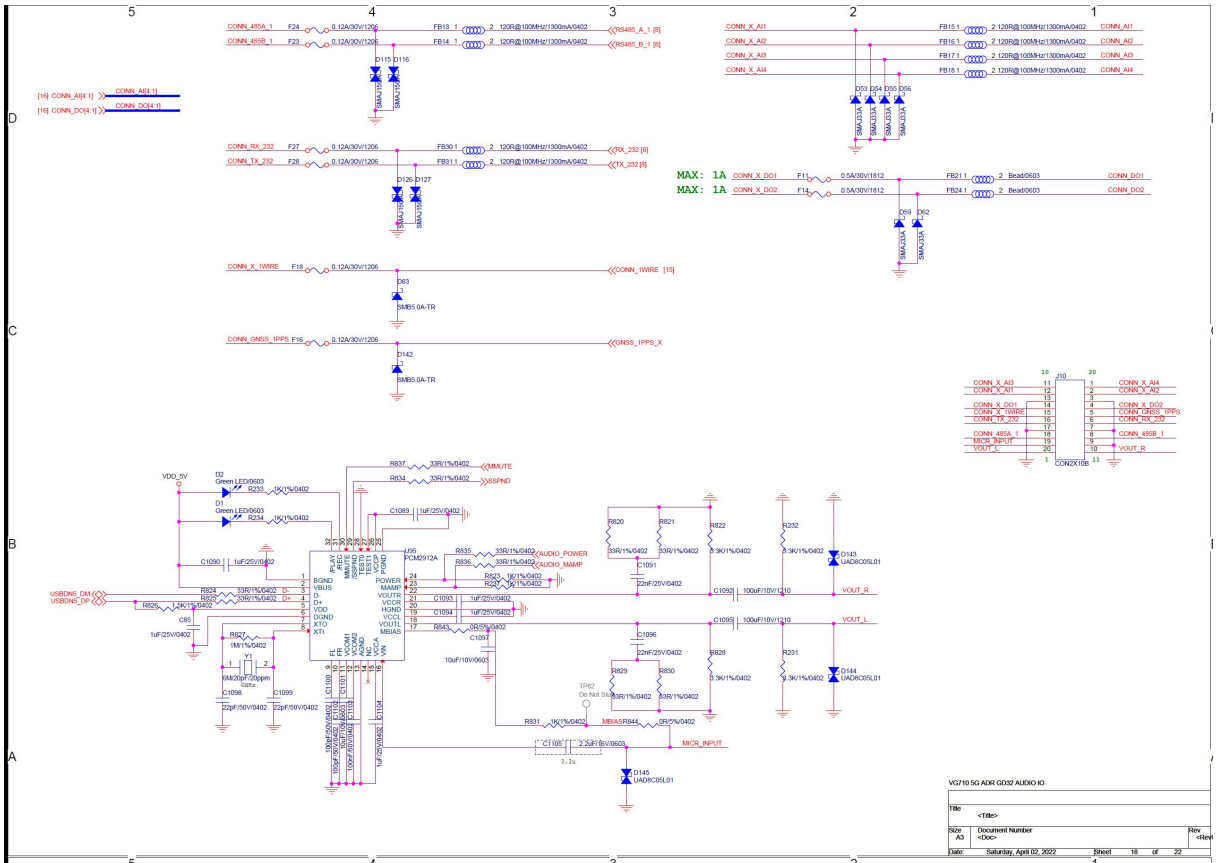
Manufacturer : Beijing Inhand Networks Technology Co., Ltd.

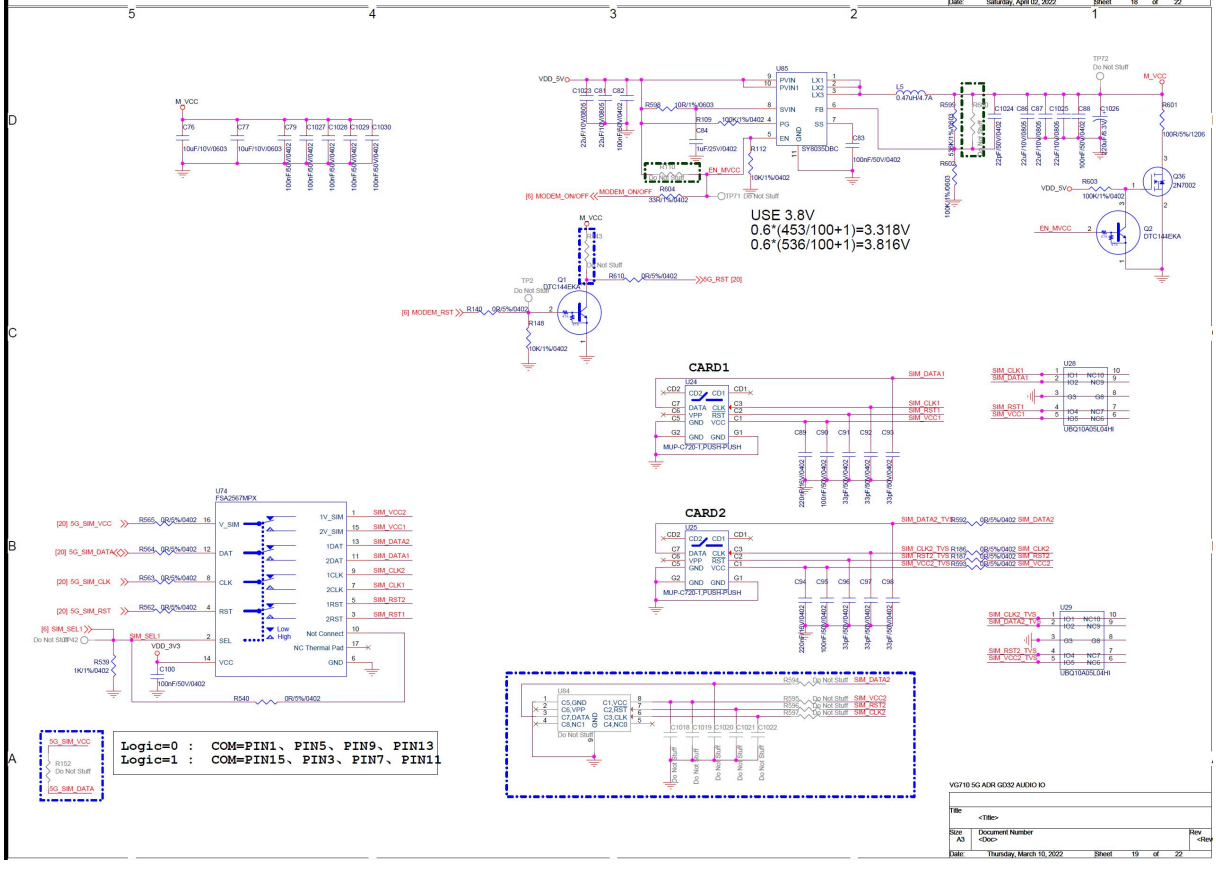
Regulation : R10.06 to Supplement 2





Information document no.	: VG710-00
Manufacturer	: Beijing Inhand Networks Technology Co., Ltd.
Regulation	: R10.06 to Supplement 2

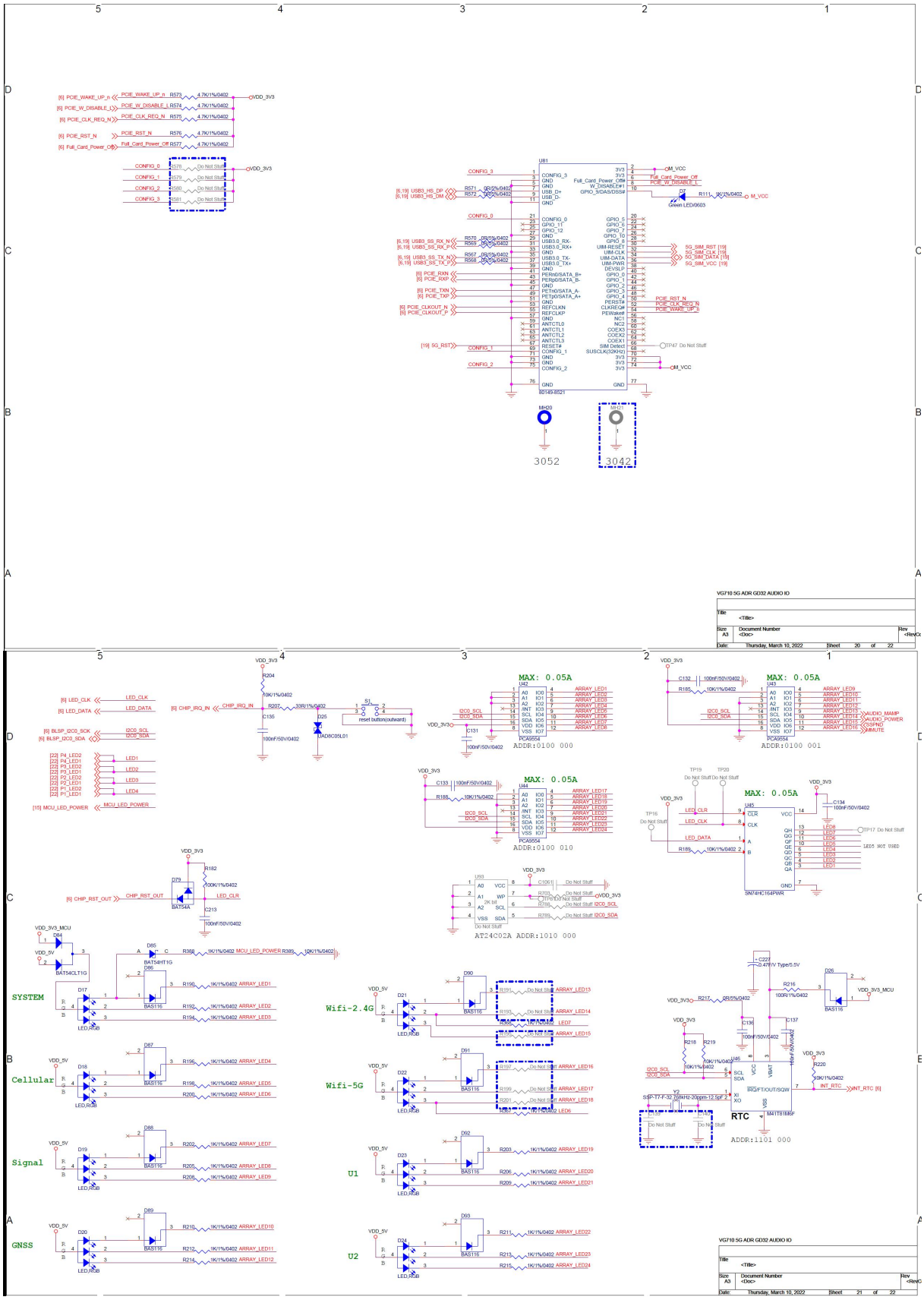




Information document no. : VG710-00

Manufacturer : Beijing Inhand Networks Technology Co., Ltd.

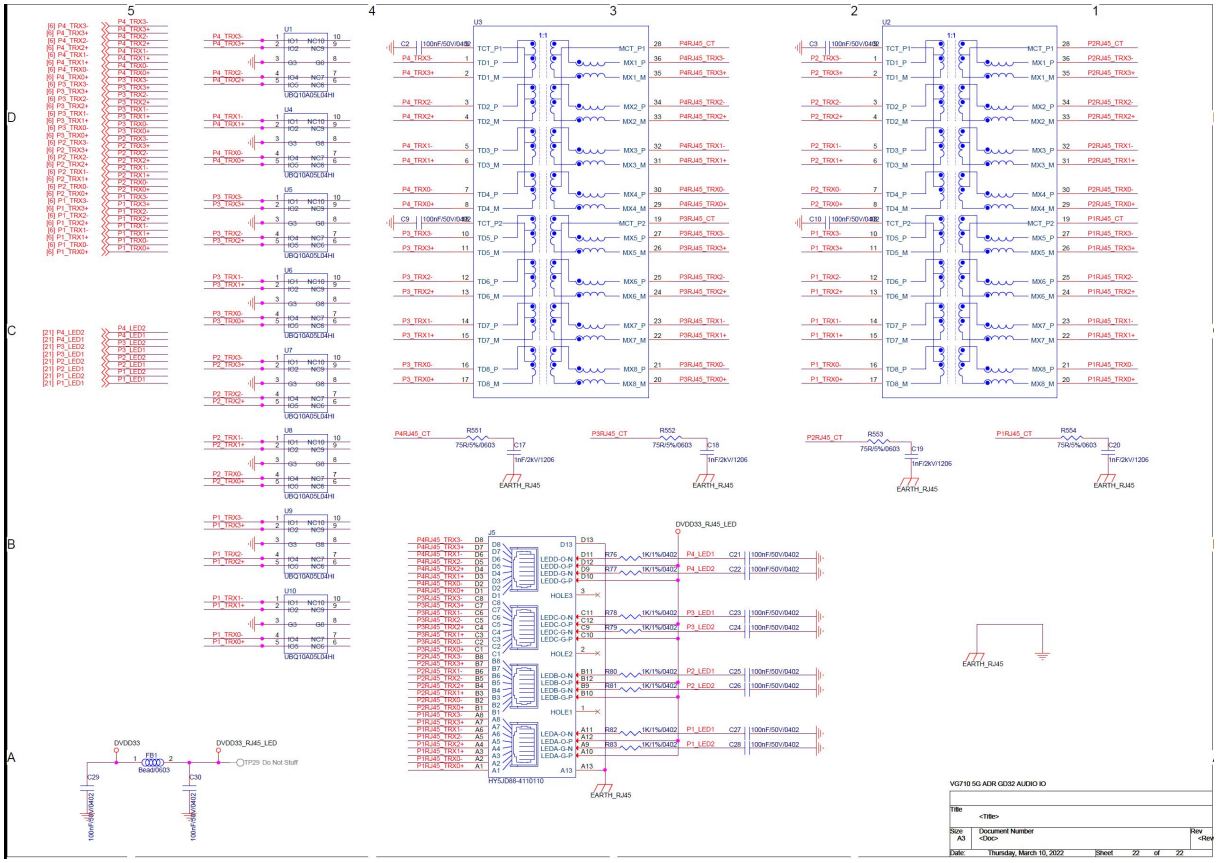
Regulation : R10.06 to Supplement 2



Information document no. : VG710-00

Manufacturer : Beijing Inhand Networks Technology Co., Ltd.

Regulation : R10.06 to Supplement 2



List of main component constituting the ESA

EPCB240006			VG710_P_CB_V12	1	VG710_P_CB_V12, unleaded FR4, 4layer，103.12x84.71mm =87.35 square centimetre
ASHD000011	SH2	SH26_VG710_2G	SH26_VG710_2G	1	VG710 2G Inner frame of shield cover
ASHD000013	SH1	SH23_VG710_5G	SH23_VG710_5G	1	VG710 5G Inner frame of shield cover
ECAP050012	C88 C240 C353 C395	c0603	10pF/50V/0603	4	10pF/50V/0603
ECAP050059	C273 C308 C309 C341 C649 C650 C652 C653 C654	C0603	2.2uF/16V/0603	9	2.2uF/16V/0603
ECAP050074	C970 C973	C0402	220pF/50V/0402	2	220pF/50V/0402
ECAP050131	C118 C300 C323 C324 C333 C336 C355 C357 C361 C368 C377 C498 C535 C573 C611	C0201	10nF/16V/0201	15	10nF/16V/0201
ECAP050137	C13 C278 C291 C345 C371 C373 C959 C960	C0603	4.7uF/6.3V/0603	8	4.7uF/6.3V/0603
ECAP050138	C14 C16 C123 C125 C443 C444 C550 C551 C588 C589 C974 C975	C0603	10uF/10V/0603	12	10uF/10V/0603
ECAP050139	C193 C272	C0603	22uF/6.3V/0603	2	22uF/6.3V/0603
ECAP050169	C969 C972	C0402	22nF/25V/0402	2	22nF/25V/0402
ECAP050178	C968 C971	C0402	1uF/6.3V/0402	2	1uF/6.3V/0402
ECAP050200	C11 C82 C302 C304 C317 C362 C369 C376 C378 C383 C549 C587	C0201	1nF/25V/0201	12	1nF/25V/0201
ECAP050205	C183 C184 C190 C246 C262 C263 C292 C310 C356 C364 C389 C410 C411 C422 C423 C429 C432 C453 C466 C469 C471 C546 C584	C0805	22uF/10V/0805	23	22uF/10V/0805
ECAP050208	C313 C365 C472 C509	C0402	2.2uF/10V/0402	4	2.2uF/10V/0402
ECAP050209	C12 C85 C93 C187 C197 C211 C218 C220 C228 C244 C256 C265 C287 C394 C441 C958	C0402	1uF/25V/0402	16	1uF/25V/0402
ECAP050213	C505 C545 C581 R482 R504	C0201	0.2pF/50V/0201	5	0.2pF/50V/0201
ECAP050214	C576 C578 C582 C616 C636 C637	C0201	0.3pF/50V/0201	6	0.3pF/50V/0201
ECAP050215	C574 C579 C583 C614 C615 C617 C619 C621	C0201	0.5pF/25V/0201	8	0.5pF/25V/0201
ECAP050216	C618	C0201	1.2pF/50V/0201	1	1.2pF/50V/0201
ECAP050217	R505	C0201	1.3pF/25V/0201	1	1.3pF/25V/0201
ECAP050218	C503 C507 C541 C543 C560 C599 C623 C624 R511	C0201	2.2pF/25V/0201	9	2.2pF/25V/0201
ECAP050219	C488 C525	C0201	2.4pF/25V/0201	2	2.4pF/25V/0201
ECAP050220	C489 C526	C0201	2pF/25V/0201	2	2pF/25V/0201
ECAP050221	C10 C15 C17 C22 C201 C204 C210 C213 C217 C225 C226 C229 C232 C234 C241 C252 C253 C258 C435 C437 C440 C442 C445 C447 C448 C450 C452 C566 C605 C949	C0201	4.7pF/25V/0201	30	4.7pF/25V/0201
ECAP050222	C235 C237	C0201	4pF/25V/0201	2	4pF/25V/0201
ECAP050223	C950	C0201	5pF/25V/0201	1	5pF/25V/0201
ECAP050224	C33 C64 C482 C521 C568 C604	C0201	8.2pF/25V/0201	6	8.2pF/25V/0201
ECAP050225	C23 C52 C81 C301 C316 C370 C379 C387 C476 C478 C484 C491 C493 C494 C502 C504 C513 C516 C520 C529 C530 C531 C536 C540 C554 C556 C559 C561 C565 C575 C577 C592 C593 C596 C597 C601 C612 C613 R143 R167 R512	C0201	10pF/50V/0201	41	10pF/50V/0201
ECAP050226	C483 C519 C948	C0201	15pF/50V/0201	3	15pF/50V/0201
ECAP050227	C480 C517	C0201	100pF/50V/0201	2	100pF/50V/0201
ECAP050228	C3 C4 C9 C18 C19 C20 C21 C31 C37 C75 C76 C77 C78 C83 C84 C91 C96 C98 C102 C105 C108 C111 C112 C113 C114 C119 C185 C188 C189 C192 C194 C195 C196 C198 C199 C200 C202 C203 C205 C206 C207 C208 C209 C212 C214 C219 C222 C223 C224 C238 C239 C243 C247 C248 C249 C251 C254 C255 C257 C259 C260 C264 C266 C267 C268 C269 C270 C271 C274 C275 C276 C277 C279 C280 C281 C283 C284 C285 C286 C288 C289 C294 C295 C296 C297 C298 C299 C303 C305 C306 C307 C311 C314 C315 C318 C319 C320 C321 C322 C325 C326 C327 C328 C329 C330 C331 C332 C334 C335 C337 C338 C339 C342 C346 C347 C348 C349 C350 C351 C352 C354 C359 C360 C363 C366 C367 C374 C382 C391 C413 C419 C424 C425 C428 C433 C436 C446 C449 C467 C470 C473 C475 C479 C510 C512 C515 C547 C555 C585 C590 C606 C607 C610 C634 C635 C955 C956 C957 C962	C0201	100nF/10V/0201	159	100nF/10V/0201
ECAP050229	C434 C474 C511	C0402	4.7uF/10V/0402	3	4.7uF/10V/0402
ECAP050235	C963 C964 C965 C966 C967	C0402	3.3nF/50V/0402	5	3.3nF/50V/0402
ECON010034	J43	61083_201	61083-201402PLF	1	61083-201402PLF
ECON060030	J26 J27 J28 J30 J44 J46	UFLR-MINIPCI	RF antenna connector	6	RF antenna connector
ECON090060	X1 X3 X5 X7	P1201Y	P1201Y	4	P1201Y
EICP000070	U8	583PGA709X709B256_PROTO	IPQ-4029-1	1	IPQ-4029-1-583MSP-MT-00-0
EICP010050	U6	bga169_0p5_12x16	8GB eMMC5.1 Ind	1	SDINBDG4-8G-I
EICP010069	U15	96pga557x321b315	8Gb DDR3L(x16) IND	1	MT41K512M16VRN-107IT:P,AS4C512M16D3LB-12BIN
EICP020088	U4	109PSM358X358N197	QCA-8075-1	1	QCA-8075-1-108DRQFN-MT-01-0
EICP030134	U14	SOT23-5	SPX3819M5-L	1	SPX3819M5-L/TR
EICP030162	U13 U16 U18 U24	SOT583	MP1612	4	MP1612GTL
EICP030163	U19	SOT583	MP1613	1	MP1613GTL
EICP040056	U46	TSSOP-20	LSF0108	1	LSF0108PWR
EICP070013	U47 U48	SOCAF50P080X160X60-6N	DPX165950DT-8048A1	2	DPX165950DT-8048A1
EICP070018	AR3 AR4	21PSM159X159N197	RFPA5542	2	RFPA5542SB,RFPA5542SQ,RFPA5542SR,RFPA5542TR13
EICP070019	AR1 AR2	17PCC128X128N	SE2623L-R	2	SE2623L-R
EICP070020	U26 U28	7PSM67X67N197V1	BGU7224	2	BGU7224

EICP070021	U30 U32	7PSM67X67N197V1	BGU7258	2	BGU7258
EICP070022	FL5 FL6 FL12 FL14	5PSM59X47N	BPF 2400-2500MHz	4	DEA142450BT-3024A1
EICP070023	FL3 FL7	3PSM67X35NV1	BPF 4900-5950MHz	2	RFBPF1608060K68Q1C
EICP070024	S3 S5 S7 S9	7PSM63X63N197V1	SKY13370-374LF	4	SKY13370-374LF
EICP070025	U5 U7 U29 U31	4PSM27X21N	TFSC06054125-2120A1	4	TFSC06054125-2120A1
EICP080001	U49	MSOP-8	TMP431ADGKT	1	TMP431ADGKT
EIND000063	L31 L33 L36 L37 L39	INDS2_CYN_PS125201BQ	1uH/3A	5	1uH/3A
EIND000074	L66	MHCC04	4.7uH/2.2A	1	4.7uH/2.2A
EIND020012	L42 L45	2P0201R_POLV1	0.7nH/800mA/0201	2	0.7nH/800mA/0201
EIND020013	L40 L47 L49 L52	2P0201R_POLV1	0.8nH/800mA/0201	4	0.8nH/800mA/0201
EIND020014	L54 L59	2P0201R_POLV1	1nH/750mA/0201	2	1nH/750mA/0201
EIND020015	L55 L56 L57 L58 L60 L61 L62 L63	2P0201R_POLV1	1.2nH/750mA/0201	8	1.2nH/750mA/0201
EIND020016	R441 R517	2P0201R_POLV1	1.5nH/600mA/0201	2	1.5nH/600mA/0201
EIND020017	L43 L46 L50 L53	2P0201R_POLV1	1.7nH/600mA/0201	4	1.7nH/600mA/0201
EIND050017	R112 R296 R313 R332 R339	2P0201R	1000R@100MHz/100mA/0201	5	1000R@100MHz/100mA/0201
EIND050018	E6	2P0201R	470R@100MHz/175mA/0201	1	470R@100MHz/175mA/0201
EIND050019	E1 E5	2P0402R	120R@100MHz/1300mA/0402	2	120R@100MHz/1300mA/0402
EIND050020	R214 R224 R254 R266 R352 R353 R400 R404 R429 R430 R432	2P0805R	600R@100MHz/2A/0805	11	600R@100MHz/2A/0805
ERES040153	R362 R373	R0603	84.5K/1%/0603	2	84.5K/1%/0603
ERES040213	E7 E8 E9 E10 R77 R300 R305	r0402	0R/5%/0402	7	0R/5%/0402
ERES040274	R1 R63 R64 R87 R92 R114 R183 R184 R237 R245 R246 R255 R263	R0402	4.7K/1%/0402	13	4.7K/1%/0402
ERES040276	R308 R334 R351 R533 R534	R0402	10K/1%/0402	5	10K/1%/0402
ERES040283	R16 R17 R18 R20 R23 R290 R291 R341 R347 R349 R350 R359 R513 R514	R0402	100K/1%/0402	14	100K/1%/0402
ERES040341	R4 R285 R434	R0402	200K/1%/0402	3	200K/1%/0402
ERES040355	R342	R0603	127K/1%/0603	1	127K/1%/0603
ERES040385	R289 R435	R0603	27K/1%/0603	2	27K/1%/0603
ERES040473	R36	R0201	100K/1%/0201	1	100K/1%/0201
ERES040474	R436 R451	R0201	10R/1%/0201	2	10R/1%/0201
ERES040475	R120	R0201	100R/1%/0201	1	100R/1%/0201
ERES040479	R83 R103 R479 R501	R0201	49.9R/1%/0201	4	49.9R/1%/0201
ERES040480	R27 R117 R118 R123 R127 R130 R131 R133 R135 R136 R139 R141 R144 R147 R149 R151 R153 R154 R155 R156 R158 R159 R162	R0201	60.4R/1%/0201	23	60.4R/1%/0201
ERES040481	R280 R282 R294 R303 R306 R321 R322 R439 R453	R0201	1K/1%/0201	9	1K/1%/0201
ERES040482	R19 R21 R22 R25 R41 R42 R43 R44 R45 R46 R116 R520 R521	R0201	10K/1%/0201	13	10K/1%/0201
ERES040483	R315 R320 R437 R450 R526 R527	R0201	150R/1%/0201	6	150R/1%/0201
ERES040484	R393	R0201	1.5K/1%/0201	1	1.5K/1%/0201
ERES040485	R316	R0201	240R/1%/0201	1	240R/1%/0201
ERES040486	R14	R0201	2.4K/1%/0201	1	2.4K/1%/0201
ERES040488	R86	R0201	5.9K/1%/0201	1	5.9K/1%/0201
ERES040489	R35 R37 R38 R93 R107 R122 R168 R180 R230 R264 R267 R268 R271 R275 R278 R295 R297 R299 R301 R310 R314 R324 R335 R337 R391 R413 R414 R415 R416 R424 R425 R426 R427 R442 R443 R444 R445 R448 R449 R456 R457 R458 R459 R462 R463 R464 R465 R466 R467 R473 R474 R475 R481 R483 R486 R487 R488 R489 R495 R496 R497 R503 R509 R510 R518 R519	R0201	0R/5%/0201	66	0R/5%/0201
ERES040490	L44 L51 R284 R307 R522	R0201	5.6R/5%/0201	5	5.6R/5%/0201
ERES040491	R478 R500	R0201	18R/5%/0201	2	18R/5%/0201
ERES040492	R24 R26 R71	R0201	22R/5%/0201	3	22R/5%/0201
ERES040493	C570 C571 C608 C609	R0201	300R/5%/0201	4	300R/5%/0201
ERES040494	R319 R525	R0201	39R/5%/0201	2	39R/5%/0201
ERES040495	R2 R3 R5 R6 R7 R8 R9 R10 R11 R12 R142 R166 R172 R174 R344 R387 R395 R396	R0201	4.7K/5%/0201	18	4.7K/5%/0201
ERES040496	R281 R286 R523 R524	R0201	820R/5%/0201	4	820R/5%/0201
ERES040497	C506 C508 C542 C544	R0201	910/5%/0201	4	910/5%/0201
ERES040509	R312 R318	0402_CC	20k/1%/0402	2	20k/1%/0402
ERES040518	R528 R529 R530 R531 R532	R0402	1.3R/5%/0402	5	1.3R/5%/0402
ERES040559	R293	R0201	750/1%/0201	1	750R/0201/1%; 750R SMT resistance，0201，accuracy 1%.
EXTL010044	Y2	4PSM85X69N	48MHz/10pF/10ppm	1	48MHz/10pF/10ppm
SCAB000213				2	Ipex（φ2.0mm）to Ipex（φ2.0mm）ntenna feeder, line length 50 mm, diameter 1.13 mm

Part_Number	Part Reference	PCB Footprint	Value	Quantity	Description
EPCB240031			VG710_5G_P_MB_V1.1	1	VG710_5G_P_MB_V1.1, unleaded，FR4, 4 layer，120*156MM = 187.2cm2,M.2 5G module，double CAN，double 485，with voice。
APSS030043	MH20	MTGP620H422	5.56-4.09-M3.0-8.03L-SN-SMD	1	5.56/4.09 × M3.0 × 8.03L-SN-SMD， spec： M3.0 × 6.5，material quality：1215 free-cutting steel (lead free)，Height on board 6.5mm， Total height 8.03mm。The surface is tinned and wrapped with tape.
ECAP000024	C202	cap10-10-smb	100uf/63V/SMD	1	100uf/63V/SMD；Tolerance：63V， Temperature：-55℃~+105℃；Description：100μF/63V
ECAP020014	C179 C277 C1026	STC7343	220uF/6.3V	3	220uF ±20%/6.3V(6TPE220MI)
ECAP050002	C17 C18 C19 C20	C1206	1nF/2kV/1206	4	1nF/2kV/±10%/X7R/1206；
ECAP050007	C193	c0603	2.7nF/50V/0603	1	2.7nF/50V/±10%/X7R/0603；
ECAP050009	C157 C170 C177 C178 C194 C209 C210 C276	c0603	100nF/50V/0603	8	100nF/50V/±10%/X7R/0603；
ECAP050010	C69 C70 C160 C180 C184 C275 C1066 C1070 C1074 C1082	C0603	1uF/25V/0603	10	1uF/25V/±10%/X5R/0603；
ECAP050017	C264 C265 C1038 C1040	c0603	47pF/50V/0603	4	47pF/50V/±5%/C0G/0603；
ECAP050056	C211 C212	C1210	10uF/50V/1210	2	10uF/50V/±20%/X5R/1210；
ECAP050059	C1105	C0603	2.2uF/16V/0603	1	2.2uF/16V/±10%/X5R/0603；
ECAP050060	C167 C191 C208	C0805	4.7uF/25V/0805	3	4.7uF/25V/±10%/X7R/0805；
ECAP050063	C4 C989 C993 C994 C995 C996 C997 C998 C1001 C1002 C1062 C1063	C0402	10pF/50V/0402	12	10pF/50V/5%/C0G/0402；
ECAP050064	C151 C152 C154 C156 C166 C190 C990 C992 C1100 C1102	C0402	100pF/50V/0402	10	100pF/50V/±5%/C0G/0402；
ECAP050073	C106	C0402	6.8pF/50V/0402	1	6.8pF/50V/±0.1pF/C0G/0402；
ECAP050076	C149 C150	C0402	20pF/50V/0402	2	20pF/50V/±5%/C0G/0402；
ECAP050084	C161 C162 C163 C164 C185 C186 C187 C188 C969 C970	C1210	2.2uF/100V/1210	10	2.2uF/100V/±10%/X7R/1210
ECAP050093	C112 C114	C0402	15pF/50V/0402	2	15pF/50V/±5%/C0G/0402；
ECAP050106	C168 C192 C229 C230	C0402	2.2nF/50V/0402	4	2.2nF/50V/±10%/X7R/0402；
ECAP050108	C1060	C0402	27pF/50V/0402	1	27pF/50V/±5%/C0G/0402；
ECAP050123	C159 C165 C183 C189 C203 C204 C205 C206 C207	C0805	100nF/100V/0805	9	100nF/100V/±10%/X7R/0805；
ECAP050129	C63 C68 C107	C0402	18pF/50V/0402	3	18pF/50V/±5%/C0G/0402；
ECAP050130	C169	C0603	1.8nF/50V/0603	1	1.8nF/50V/±10%/X7R/0603；
ECAP050134	C225 C226 C266 C267 C1024 C1098 C1099	C0402	22pF/50V/0402	7	22pF/50V/±5%/C0G/0402；
ECAP050136	C64 C71 C142 C1073	C0603	4.7uF/10V/0603	4	4.7uF/10V/±10%/X5R/0603；
ECAP050138	C76 C77 C526 C1036 C1042 C1043 C1097 C1101	C0603	10uF/10V/0603	8	10uF/10V/±10%/X5R/0603；
ECAP050144	C1092 C1095	C1210	100uF/10V/1210	2	100uF/10V/±20%/X5R/1210；
ECAP050146	C108	C0402	470nF/16V/0402	1	470nF/16V/±10%/X5R/0402；
ECAP050148	C65 C181 C274	C0402	1NF/C0G/50V/0402	3	1nF/50V/±5%/C0G/0402；
ECAP050149	C991	C0402	47pF/50V/0402	1	47pF/50V/±5%/C0G/0402；
ECAP050150	C1 C2 C3 C9 C10 C21 C22 C23 C24 C25 C26 C27 C28 C29 C30 C50 C51 C52 C53 C54 C60 C62 C67 C72 C73 C74 C75 C79 C82 C83 C88 C90 C95 C100 C103 C110 C117 C118 C119 C131 C132 C133 C134 C135 C136 C137 C141 C143 C144 C145 C146 C147 C148 C213 C214 C220 C221 C223 C228 C248 C249 C250 C251 C252 C261 C262 C268 C515 C527 C528 C972 C973 C974 C975 C1027 C1028 C1029 C1030 C1032 C1034 C1035 C1037 C1041 C1044 C1045 C1046 C1047 C1048 C1049 C1050 C1051 C1052 C1053 C1054 C1055 C1056 C1057 C1058 C1059 C1064 C1065 C1071 C1072 C1075 C1076 C1077 C1078 C1079 C1080 C1081 C1083 C1084 C1085 C1086 C1087 C1088 C1103	C0402	100nF/50V/0402	122	100nF/50V/±10%/X7R/0402；
ECAP050151	C89 C94	C0402	220nF/16V/0402	2	220nF/16V/±10%/X7R/0402
ECAP050169	C1091 C1096	C0402	22nF/25V/0402	2	22nF/25V/±10%/X7R/0402；
ECAP050171	C263 C1039	C0603	4.7nF/50V/0603	2	4.7nF/50V/±10%/X7R/0603；
ECAP050176	C104 C105 C260	C0805	10uF/10V/0805	3	10uF/10V/±10%/X7R/0805；
ECAP050177	C66 C171 C172 C173 C174 C175 C176 C195 C196 C197 C198 C199 C200	C1206	22uF/10V/1206	13	22uF/10V/±10%/X7R/1206；
ECAP050193	C91 C92 C93 C96 C97 C98 C1068 C1069	C0402	33pF/50V/0402	8	33pF/50V/±5%/C0G/0402；
ECAP050204	C158 C182	C0805	33nF/50V/0805	2	33nF/50V/±5%/C0G/0805；
ECAP050205	C81 C86 C87 C1023 C1025	C0805	22uF/10V/0805	5	22uF/10V/±20%/X5R/0805；
ECAP050208	C109 C111 C113 C115 C116	C0402	2.2uF/10V/0402	5	2.2uF/10V/±10%/X6S/0402；
ECAP050209	C84 C85 C1089 C1090 C1093 C1094 C1104	C0402	1uF/25V/0402	7	1uF/25V/±10%/X5R/0402；
ECAP050230	C201	C1206	10nF/500V/1206	1	10nF/500V/±10%/X7R/1206；
ECAP050242	C8 C231	C0603	100nF/100V/0603	2	100nF/100V/±10%/X7R/0603；
ECAP050248	C7 C232	C0402	1nF/100V/0402	2	1nF/100V/0402
ECAP060009	C227	SCAP-V	0.47F/V Type/5.5V	1	0.47F/V Type/5.5V；0.47F/5.5V/V Type，SC，-25~70°C
ECON000020	J11	molex_4304504	CON2X2B	1	2x2 plug in 90°C，Power connector，3mm spacing；
ECON000021	J10	molex_4304520	CON2X10B	1	2X10 plug in 90°C，Power connector，3mm spacing；
ECON000043	J17	j-43045-8ww_24wa-2x5	CON2X5B	1	2X5 plug in 90°C，Power connector，3mm spacing

ECON010033	J1	61082_201	61082-201402PLF	1	61082-201402PLF， High-speed connector， 200P， 0.8mm， RCPT， Height 5mm；
ECON060030	U32 U36	UFLR-MINIPCI	RF antenna connector	2	RF connector; Surface sticker, diameter 2.0mm, height 1.25mm. Transmission speed up to 6GHz
ECON070056	J5	1x4rj45_no_bc13	HY5JD88-4110110	1	1x4 RJ45, shield without shrapnel, left yellow and right green with light, no rear foot, and the inside is completely sealed with plastic;
ECON090044	U19	sdcard-mup-m614	MUP-M614	1	mup-m614,Micro SD,H1.8 8pin；
ECON090078	U81	m2_keyb_c85h_3042-3052	80149-8521	1	80149-8521，M.2 Connector， 0.5mm pitch， Total height 8.5mm，Slot height 6.6mm。
ECON090092	U24 U25	SIM-MUP-C720-1	MUP-C720-1,PUSH-PUSH	2	MUP-C720-1 6P，PUSH-PUSH，operation temperature -40 °C~85°C；
EDIO000018	D63 D69	SOT23	BZX84C12LT1G	2	BZX84C12LT1G 12V zener voltage regulator，SOT23，-55 °C to 150°C .； 12V zener voltage regulator，SOT23，-55°C to150°C 。
EDIO000019	D84	SOT23	BAT54CLT1G	1	BAT54CLT1G ； DIODE SCH DUAL CC 200MA 30V SOT23
EDIO000020	D9 D85 D128 D130	SOD323_AC	BAT54HT1G	4	BAT54HT1G；DIODE SCH 30V 200MA -- SOD323
EDIO000026	D80	SOD-123	B0540W	1	B0540W；
EDIO000027	D79 D95 D97	sot23	BAT54A	3	BAT54A-7-F；
EDIO010008	D1 D2 D7 D11 D12 D27 D28	LED0603	Green LED/0603	7	LED 0603；
EDIO010072	D17 D18 D19 D20 D21 D22 D23 D24	SOL4P145_270X350X210L75N	LED,RGB	8	LED，RGB，67-23/R6GHBHC-B05/2T，
EDIO020008	D94 D96 D131 D133 D135 D137 D139 D141	D1206	MMSD4148T1G	8	MMSD4148T1G；
EDIO020017	D64 D65 D66 D68	SMA_DO214AC_C2A1	S1M-E3/61T	4	S1M-E3/61T；S1M-E3/61T
EDIO030002	D29 D129 D132 D134 D136 D138 D140	SOD-123	MMSZ4696T1G	7	MMSZ4696T1G，Zener voltage 9.1V，0.5W；
EDIO040001	D26 D86 D87 D88 D89 D90 D91 D92 D93	SOT23	BAS116	9	BAS116-7-F；BAS116-7-F，SOT23，reverse voltage 60V，reverse leakage current 5nA@75V，forward current 512mA，forward current Forward current 1V@10mA，
EFET000008	Q21 Q39 Q40 Q42 Q44 Q46 Q48	SOT23	BSS84	7	BSS84（Not certified）；Vds<=-50V Id<=-130mA Rdson<=10Ohms Ptot<=250mW
EFET010002	Q36	SOT23	2N7002	1	2N7002,60V,N-channel,SOT23,；SOT23,-40°C ~ +85 °C,VDS≤60V,ID≤300mA,RDSON≤5R,Ptot≤0.83W
EFET010013	Q6 Q7 Q37 Q38	SOT323_3	RYU002N05	4	RYU002N05 N-MOS；RYU002N05,withstand voltage50V，persistent Current 200mA。
EFET010015	Q31	d2pak	FDB33N25TM	1	FDB33N25TM，withstand voltage250V，On-resistance0.077R@10V，Maximum current33A，D2PAK；
EFET010016	Q29 Q30	SOT23	CJ2310	2	CJ2310,NMOS,60V,ID=3A；
EFET010017	Q32	d2pak	FDB28N30TMTR-ND	1	FDB28N30TMTR-ND，withstand voltage300V，On-resistance0.129R@10V，Maximum current28A，D2PAK；
EICP000101	U47	LQFP100	GD32F103VCT6	1	GD32F103VCT6,ARM 32bits MCU,LQFP100；256Kbytes Flash，48Kbytes SRAM，CAN,16bit timers,ADC,DAC,2.6-3.6V，–40 to +85 °C，
EICP020039	U16 U75	soic_8	SP3082EEN_SN65HVD3082ED	2	RS485 half-duplex chip
EICP020047	U42 U43 U44	TSSOP-16	PCA9554	3	PCA9554、TCA9554，8-bit I2C expansion I/O chip
EICP020051	U94	QFP_9X9-64	USB2517	1	USB2517I-JZX：Industrial grade USB2.0 Hi-speed Hub,Low Power, MTT, 7 port,QFN64。
EICP020078	U14 U72	TQFP48	XR21V1414	2	XR21V1414IM48-F,USB2.0 to serial port，UART data rates up to 12 Mbps,FIFO,TQFP48；XR21V1414IM48-F,USB to serial port，UART data rates up to 12 Mbps,FIFO
EICP020089	U17	QFN37P50_600X600X90L62X24T410	USB2244	1	USB2244I-AEZG-06-TR,SD/MMC card Reader,USB2.0 to SD/MMC,MS Flash Media Controllers,HS-SD,SDHC,QFN36；USB2244I-AEZG-06-TR,SD/MMC card Reader,I temp, 35MB/s,USB2.0 to SD/MMC,MS Flash Media Controllers,HS-SD,SDHC
EICP020099	U64	SOT23_6L	DS2484R	1	DS2484R+T,1-Wire Master,I2C-to-1-Wire；
EICP020101	U76	TSSOP16	SP3221EEY	1	SP3221EEY,3.0V to 5.5V，Single RS232transceiver，Auto on-line；SP3221EEY,3.0V to 5.5V，Single RS232transceiver，Auto on-line，tssop16，-40~85°C，
EICP020104	U66 U68	soic_8	SN65HVDA195-Q1	2	LIN and Most ECL Physical Interface,Compliant and Conforms to SAEJ2602,Speed up to 20-kbps；LIN and Most ECL Physical Interface,Compliant and Conforms to SAEJ2602,Speed up to 20-kbps,SOIC8,–40~125°C
EICP020129	U40 U67	SOIC8	ATA6563GAQW1	2	ATA6563GAQW1,High-speed CAN transceiver with Standby mode,VCC=5V,VIO=3.3V/5V,SOIC4
EICP020133	U88 U90	soic127p1155x750x265-18	MCP2515T-I/SO	2	MCP2515T-I/SO,Stand-Alone CAN Controller with SPI Interface,SOIC18,-40°C~85°C
EICP020151	U95	tqfp32p80_700x700x1201120x50	PCM2912A	1	PCM2912A
EICP030167	U58 U60	vishay_mlp55-271	SIC463	2	4.5~60V，4A；

EICP030168	U61	SON13P50_400X300X80L40X25T330X170	LT4363IDE-2	1	LT4363IDE-2#TRPBF，4~80V；
EICP030225	U59 U87	SON9P50_200X200X80L30X25T160X90	SGM2566A	2	SGM2566A, load switch, 6A, slow start adjustable, and can be exchanged with TPS22975.
EICP030227	U85	dfn3x3-10	SY8035DBC	1	SY8035DBC，efficient 5.5V，5A,1MHz Synchronous step-down converter，2.7~5.5V，-40~85℃；
EICP040018	U38	SOT23-5	74AHC1G32/SOT	1	74AHC1G32/SOT(or gate)；-40~85℃，ESD protection :HBM JESD22-A114E 2kv,input voltage=3.3v,input current=1ua, Icc=10ua,Ci=10pf, maximum transmission delay<=13.0ns.
EICP040024	U39	SOT23-5	74HC1G08	1	74HC1G08；single AND door；Gate delay 7ns；Operating Voltage 2.0V-6.0V，power waste 200mW；SOT753，-40℃ ~ +125℃
EICP040049	U49	ssop65p315x290x130-8	SN74LVC2G126	1	SN74LVC2G126DCTR；IC BUF DUAL TS 1.65-5.5V SSOP8
EICP040069	U45	tssop14	SN74HC164PWR	1	SN74HC164PWR,8-Bit Parallel-Out Serial Shift Registers；
EICP040080	U74	WQFN16_3X3_0_5P	FSA2567MPX	1	FSA2567MPX
EICP050006	U46	SOIC_8	M41T81M6F	1	M41T81M6F；
EICP050010	U48	SOT23	SGM809SXN3	1	SGM809-SXN3；
EICP060004	U55 U56 U62	SOP8	LM2903	3	LM2903M；input:2V~36,+/-1V~+/-18V,25nA,1mV,-40~105
EICP060037	U86	SOT23-5	TLV333IDBV	1	TLV333IDBV；TLVx333 2μV VOS、0.02μV/°C、17μA、CMOS operational amplifier, zero drift series
EICP060042	U79	tssop65p510x450x120-14	TLV4333IPWR	1	TLV4333IPWR；TLVx333 2μV VOS、0.02μV/°C、17μA、CMOS operational amplifier, zero drift series
EICP070010	U35	BPF2012	BF2012-E2R4DAA	1	BF2012-E2R4DAA.2.4G-2.5G BPF，Insertion Loss 2.8dB,，VSWR=2.0；
EICP070016	U65	SMD5	SAFFB1G56KB0F5F,SAFFB1G56KB0F0A	1	SAW Single Filter；
EICP070026	U34	QFN41P50_600X600X90L40X25T462	CSR8811A12	1	CSR8811A12,BLUETOOTH V4.1；IC,RF BLUETOOTH V4.1 QFN INDUSTRIAL ROHS
EICP070031	U77	dfn50p150x100x80-6	AT2659	1	AT2659;GNSS LNA;1.5V~3.6V;NF:0.71dB;Operating Frequency:1550MHz ~ 1615MHz;
EIND000066	L5	ind_sph2520	0.47uH/4.7A	1	0.47uH/4.7A；0.47uH/4.7A,-40~125℃
EIND000075	L4	INDM730X680X300L160X300N	4.7uH/5.5A	1	4.7uH+/-20%，Rdc maximum 22mΩ，Isat 6.5A，Irms 5.5A，max operation temperature125℃
EIND000076	L6	INDM730X680X300L160X300N	6.8uH/4.5A	1	6.8uH+/-20%，Rdc maximum38.5mΩ，Isat maximum6.0A，Irms4.5A，withstand voltage 30VDC，6.8*7.3*2.8，maximum operation temperature125℃
EIND040004	L11	ind4_choke_0805	90OHM 100MHz 330MA	1	DLW21HN900SQ2L 90OHM@100MHz；IND CHK 90 OHM@100MHZ 330MA 25% 0805
EIND040006	L8	PMF7060	PMF7060C2A-01	1	PMF7060C2A-01；PMF7060C2A-01,Rated voltage 100V，Rated current 5A
EIND050001	FB1 FB5 FB6 FB21 FB24 FB32	l0603	Bead/0603	6	magnetic bead/0603；
EIND050019	FB3 FB4 FB7 FB8 FB11 FB12 FB13 FB14 FB15 FB16 FB17 FB18 FB30 FB31	2P0402R	120R@100MHz/1300mA/0402	14	120R@100MHz/1300mA/0402/0.09R；
EIND050020	R556 R838	2P0805R	600R@100MHz/2A/0805	2	600R@100MHz/2A/0805/0.1R；
EIND080001	L3	L0402	27nH/0402	1	27nH/0402；
EIND080005	L10	L0402	6.8nH/5%/0402	1	6.8nH/5%/0402(Not certified)；6.8nH/5%/0402
EMOD000052	U31	24-pin_stamp_holes	NEO-M8L-0-12	1	NEO-M8L-0-12，GNSS module，ADR，16*12.2；
ERES040001	R652 R653	R0603	0R/5%/0603	2	0R/5%/0603/max50mohm/100mW/+155°C/1A/Derate0.8A；
ERES040014	R845	R0603	33R/5%/0603	1	33R/5%/0603/TCR100ppm/100mW/+155°C /1.8V/Derate1.4V；0603 5% 33R
ERES040024	R322 R348	R0603	5.9K/1%/0603	2	5.9K/1%/0603/TCR100ppm/100mW/+155°C /24.3V/Derate18.8V；
ERES040033	R345	R0603	200K/1%/0603	1	200K/1%/0603/TCR100ppm/100mW/+155°C /50V/Derate37.5V；
ERES040036	R320	R0603	261K/1%/0603	1	261K/1%/0603/TCR100ppm/100mW/+155°C /50V/Derate37.5V；
ERES040038	R551 R552 R553 R554	R0603	75R/5%/0603	4	75R/5%/0603/TCR100ppm/100mW/+155°C /2.7V/Derate2.1V；0603 5% 75R
ERES040044	R120 R815	R0603	12K/1%/0603	2	12K/1%/0603/TCR100ppm/100mW/+155°C /34.6V/Derate26.8V；
ERES040048	R113 R115	R0603	750R/5%/0603	2	750R/5%/0603/TCR100ppm/100mW/+155°C /8.7V/Derate6.7V；
ERES040078	R157 R598	R0603	10R/1%/0603	2	10R/0603/1%；
ERES040088	R230 R236 R356 R602 R619 R622 R668 R669 R681 R682 R684 R685 R687 R688 R690 R691 R693 R694	R0603	100K/1%/0603	18	100K/1%/0603/TCR100ppm/100mW/+155°C /50V/Derate37.5V；
ERES040089	R319 R330 R355 R357 R358 R361 R379 R404 R559	R0603	10K/1%/0603	9	10K/0603/1%；
ERES040101	R316 R326 R392 R393	R0603	2K/1%/0603	4	2K/0603/1%；
ERES040150	R318	R0603	34K/1%/0603	1	34K/1%/0603；
ERES040154	R338 R391	R0603	110K/1%/0603	2	110K/1%/0603；

ERES040200	R293 R295	R0402	56K/1%/0402	2	56K/0402/1%；56K SMT resistance，0402，accuracy 1%
ERES040207	R363	R2512	0.01R/1%/2512	1	0.01R/1%/1W/2512；
ERES040212	R216 R228 R229 R369 R370 R371 R372 R383 R396 R397 R560 R666 R793 R794	R0402	100R/1%/0402	14	100R/0402/1%；100R/0402/1%，maximum power 1/16W，operating voltage maximum50V，Temperature drift 100ppm/°C，operation temperature-55～125°C
ERES040213	R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 R16 R17 R18 R19 R20 R21 R22 R23 R24 R25 R26 R27 R28 R29 R30 R31 R32 R33 R34 R35 R36 R37 R38 R39 R40 R41 R42 R43 R44 R45 R46 R47 R48 R49 R50 R51 R52 R53 R54 R55 R56 R57 R58 R59 R127 R135 R136 R137 R138 R140 R160 R162 R186 R187 R217 R313 R324 R360 R365 R386 R399 R416 R540 R562 R563 R564 R565 R567 R568 R569 R570 R571 R572 R582 R592 R593 R610 R649 R650 R651 R658 R659 R665 R670 R792 R797 R798 R801 R802 R808 R811 R812 R817 R819 R832 R833 R843 R844	r0402	0R/5%/0402	113	0R/5%/0402；
ERES040226	R654 R655	R0603	0R/1%/0603	2	0R/1%/0603；
ERES040229	R334 R601	R1206	100R/5%/1206	2	100R/1206/5%；
ERES040237	R599	R0603	536K/1%/0603	1	536k/1%/0603；
ERES040240	R128 R129 R130 R131 R132 R133 R134 R207 R604 R624 R625 R638 R640 R820 R821 R824 R825 R829 R830 R834 R835 R836 R837	R0402	33R/1%/0402	23	33R/1%/0402；33R/1%/0402,表贴resistance,-55~125°C。
ERES040251	R321	R0603	31.6K/1%/0603	1	31.6k/1%/0603；
ERES040257	R333	R0603	3.74K/1%/0603	1	3.74K/1%/0603；
ERES040260	R317 R328	R0603	60.4K/1%/0603	2	60.4K/1%/0603；
ERES040263	R409 R410	R0402	47R/5%/0402	2	47R,LF,5%/0402；
ERES040269	R826	R0402	1.5K/1%/0402	1	1.5K/1%/0402；
ERES040271	R76 R77 R78 R79 R80 R81 R82 R83 R111 R121 R124 R190 R192 R194 R196 R198 R200 R202 R203 R205 R206 R208 R209 R210 R211 R212 R213 R214 R215 R223 R224 R225 R227 R233 R234 R237 R284 R364 R367 R368 R388 R424 R539 R583 R621 R623 R632 R633 R636 R637 R644 R648 R656 R676 R677 R678 R679 R823 R831 R846	R0402	1K/1%/0402	60	1K/1%/0402；
ERES040274	R117 R407 R408 R573 R574 R575 R576 R577 R617 R814	R0402	4.7K/1%/0402	10	4.7K/1%/0402；
ERES040276	R100 R101 R102 R112 R116 R118 R126 R148 R159 R161 R185 R188 R189 R204 R218 R219 R220 R226 R249 R251 R254 R257 R258 R259 R260 R264 R270 R271 R272 R273 R276 R277 R278 R279 R281 R283 R289 R290 R291 R292 R294 R296 R297 R298 R299 R352 R359 R362 R366 R384 R385 R387 R389 R403 R405 R406 R411 R412 R436 R437 R438 R439 R440 R441 R442 R443 R446 R447 R448 R498 R547 R548 R549 R550 R626 R627 R628 R629 R630 R634 R635 R641 R642 R643 R663 R664 R672 R673 R674 R675 R702 R804 R806 R807 R809 R813 R816 R839 R840 R841 R843	R0402	10K/1%/0402	101	10K/1%/0402；
ERES040283	R109 R122 R164 R165 R166 R182 R248 R250 R263 R269 R310 R311 R314 R315 R325 R327 R350 R351 R603 R662 R799	R0402	100K/1%/0402	21	100K/1%/0402；
ERES040321	R331	R0603	402K/1%/0603	1	402K/1%/0603；
ERES040328	R312 R323	R0603	3.3R/1%/0603	2	3.3R/1%/0603；
ERES040341	R285 R286 R353	R0402	200K/1%/0402	3	200K/0402/1%；
ERES040347	R329 R332	R0603	53.6K/1%/0603	2	53.6K/1%/R0603；
ERES040360	R394 R395	R0402	27R/1%/0402	2	27R/0402/1%（RK73H1E270RF-MR）；27R/0402/1%
ERES040371	R125 R373 R376 R377 R378 R380 R818 R827	R0402	1M/1%/0402	8	1M/1%/0402；
ERES040380	R339 R341	R0805	10R/5%/0805	2	10R/5%/0805；
ERES040390	R231 R232 R822 R828	RESC1005_IS0402Q	3.3K/1%/0402	4	3.3K/1%/0402,63mW,50V；
ERES040420	R343	R0805	10K/1%/0805	1	10K/0805/1%；10KΩ；0805；±1%；thick film;(RoHS)；temperature coefficient：±100ppm/°C；operation temperature -55°C ~ 155°C
ERES040423	R414 R631 R645 R646	R1206	60.4R/1%/1206	4	60.4/1206/1%；60.4Ω；1206；±1%；thick film;(RoHS)；temperature coefficient：±100ppm/°C；operation temperature -55°C ~ 155°C
ERES040438	R349	R1206	100K/1%/1206	1	100K/1206/1%；100KΩ；1206；±1%；thick film;(RoHS)；temperature coefficient：±100ppm/°C；operation temperature -55°C ~ 155°C
ERES040498	R337 R340 R342 R344 R346	R1206	240K/1%/1206	5	240K/1%/1206；
ERES040499	R347	R1206	5.1K/1%/1206	1	5.1K/1%/1206；
ERES040500	R336 R381 R680 R683 R686 R689 R692 R695	R1206	20K/1%/1206	8	20K/1%/1206；
ERES040509	R267 R268	0402_CC	20k/1%/0402	2	20k/1%/0402；RES MF 20k 1/16W 1% 0402
ERES040531	R398 R415	R2512	1K/2512/1%	2	1K/2512/1%
ERES040534	R618	R0603	10K/1%/0603	1	10K/1%/0603/Vehicle gauge level
ERES040555	R354 R561	R1206	51K/1%/1206	2	51K/1%/1206
ERES040578	R287 R288	R0402	510K/1%/0402	2	510K/1%/0402
ESEP000016	D83 D142	smb	SMB5.0A-TR	2	SMBJ5.0A-TR；
ESEP000061	D67	SMA_DO214AC_C2A1	SMAJ58A	1	SMAJ58A；
ESEP000063	D14 D25 D143 D144 D145	SODFLN90X60X55L25X50N	UAD8C05L01	5	ESD protection TVS，5V，ESD level 4，0.4pF，SOD882，；
ESEP000065	U1 U4 U5 U6 U7 U8 U9 U10 U20 U21 U28 U29	SON10P50_245X100X65L36X20	UBQ10A05L04HI	12	UBQ10A05L04HI；UBQ10A05L04HI，4-way high-speed 5V signal static protection，0.6pF，15V@4A@8/20us，ESD20KV，DFN10-2510

ESEP000079	D5 D6 D53 D54 D55 D56 D59 D62 D70	SMA_DO214AC_C2A1	SMAJ33A	9	SMAJ33A,400W,53.3V@7.5A；
ESEP000084	D82	SMDJ	SMDJ58CA	1	SMDJ58CA；clamping voltage 58V-TVS
ESEP000090	D109 D110 D119 D120	SMA_DO214AC_C2A1	SMAJ33CA	4	SMAJ33CA,400W,53.3V@7.5A
ESEP000096	D104 D106 D115 D116 D126 D127	SMA_DO214AC_C2A1	SMAJ15CA	6	SMAJ15CA,400W,24.4V@16.4A
ESEP020028	F11 F14	MFU1812	0.5A/30V/1812	2	PTC RESETBL 30V 0.5A 1812；
ESEP020031	F4 F16 F18 F19 F20 F23 F24 F27 F28 F29 F30 F31 F32 F33	MFU1206	0.12A/30V/1206	14	PTC RESETBL 30V 0.12A 1206；
ESWT000005	S1	switch_4legs	reset button(outward)	1	reset button
ETFR050012	U2 U3	DIP480W40P178L3250 H1160Q36	LG2P109NM	2	Double-port gigabit network transformer, industrial grade; Double-port gigabit network transformer, industrial grade, 32.5 * 8.5 * 11.6
ETSR000007	Q1 Q2 Q13 Q22 Q35 Q41 Q43 Q45 Q47 Q49	SOT95P280X110-3	DTC144EKA	10	DTC144EKA；VIN=-10V~40V，VI(off)<0.5V@VCC=5V&IO=100uA，VI(on)>3V@Vo=0.3V&IO=2mA ,input current<0.18m A@Vi=5V，output current<0.5u A@Vcc=50V，Vi=0V，transmission speed：250MHz@Vce=10V，Ie=-5m A
ETSR000014	Q33	SOT23	MMBT3904LT1G	1	MMBT3904LT1G；TRAN NPN GEN 200MA 40V SOT-23
ETSR000022	Q34	sot223	DZTA42	1	DZTA42，PNP,SOT223,300V Withstand voltage；
EXTL010005	Y3	X63F	8M(X63F)	1	X63F-G20SSA-8M Crystal；
EXTL010022	U33	Y2520SA	26M/9pF/20ppm	1	26M，9pF，20ppm,XYBCCLNANF；26M，9pF，20ppm，
EXTL010024	U18 Y4	CRYSTAL32X25	XTAL/3.2x2.5/24 MHz	2	Passive crystal, X32F/3225 series, 24MHz, load capacitance 18PF, frequency deviation:+/- 20ppm, frequency temperature stability:+/- 20ppm;
EXTL010031	Y2	SSP-T7-F	SSP-T7-F-32.768kHz-20ppm-12.5pF	1	SSP-T7-F-32.768kHz-20ppm-12.5pF；
EXTL010033	U89 U91	CRYSTAL32X25	20MHz	2	XTAL，3.2X2.5，20MHZ，CL=16PF，10ppm；
EXTL010057	Y1	CRYSTAL_SMD2	6M/20pF/20ppm	1	XJHCCLNANF-6MHz，6.00MHz/20ppm/20pf，±20ppm，operation temperature -40--85°C
SSIM240001				1	VG710-5G terminal waterproof cover