

ISED CABid: ES1909

Test report No:  
**NIE: 70923REM.004**

## Test report

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

|                                           |                                                                                                                                                     |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| (*) Identification of item tested         | RF Tag that is attached to objects and localises them using radio broadcasts                                                                        |
| (*) Trademark                             | Inpixon Asset Tag                                                                                                                                   |
| (*) Model and /or type reference          | PN01ASSTG                                                                                                                                           |
| Other identification of the product       | ---                                                                                                                                                 |
| (*) Features                              | FCC ID: SIFASSETTAG<br>IC: 7654A-ASSETG<br>HW version: 67292-NAT-V3b<br>SW version: ASSET_TAG_ver1.0.0-4<br>Features: Chirp 2.4g Rx/Tx RF Front End |
| Manufacturer                              | Nanotron Technologies GmbH<br>Alt Moabit 60a, 10555 Berlin, Germany                                                                                 |
| Test method requested, standard           | FCC Rules and Regulations CFR 47, Part 15, Subpart B<br>(10-1-20 Edition) & ICES-003 Issue 7 (October 2020)                                         |
| Summary                                   | IN COMPLIANCE                                                                                                                                       |
| Approved by (name / position & signature) | José Manuel Gómez<br>Industrial & Automotive<br>EMC Lab. Manager                                                                                    |
| Date of issue                             | 2022-10-05                                                                                                                                          |
| Report template No                        | FDT08_24<br>(*) "Data provided by the client"                                                                                                       |



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## Acronyms

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

## Competences and guarantees

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

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

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

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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.

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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

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1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
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## Uncertainty

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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 6000 MHz is  $I = \pm 4,7$  dB for quasi-peak measurements,  $I = \pm 4,3$  dB for peak and average measurements ( $k = 2$ ).

## Data provided by the client

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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")

The sample consists of a RF Tag that is attached to objects and localises them using radio broadcasts. Long lived Radio Tag for asset tracking.

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

# Usage of samples

Samples under test have been selected by: The client.

| Id   | Control Number | Description         | Model     | Serial N°    | Date of Reception | Application        |
|------|----------------|---------------------|-----------|--------------|-------------------|--------------------|
| S/01 | 70293B_18.1    | USB cable           | --        | --           | 2021-10-29        | Element Under Test |
|      | 70923_3.1      | Module (assetTAG)   | PN01ASSTG | 180B5202B75F | 2022-05-03        | Element Under Test |
|      | 70923_4.1      | Battery compartment | --        | --           | 2022-05-03        | Element Under Test |

Notes referenced to samples during the project.

## Test sample description

|                                               |                                                                                       |                                                         |                          |                      |              |                                   |     |
|-----------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------|--------------------------|----------------------|--------------|-----------------------------------|-----|
| Ports..... :                                  | Port name and description                                                             |                                                         | Cable                    |                      |              |                                   |     |
|                                               |                                                                                       |                                                         | Specified max length [m] | Attached during test | Shielded     | Coupled to patient <sup>(3)</sup> |     |
|                                               | .....                                                                                 | .....                                                   | [ ]                      | [ ]                  | [ ]          |                                   |     |
| Supplementary information to the ports..... : | There are no ports to connect to, the device is powered by a battery and is wireless. |                                                         |                          |                      |              |                                   |     |
| Rated power supply .....                      | Voltage and Frequency                                                                 |                                                         | Reference poles          |                      |              |                                   |     |
|                                               |                                                                                       |                                                         | L1                       | L2                   | L3           | N                                 | PE  |
|                                               | [ ]                                                                                   | AC: .....                                               | [ ]                      | [ ]                  | [ ]          | [ ]                               | [ ] |
|                                               | [X]                                                                                   | DC: 4.5v                                                |                          |                      |              |                                   |     |
| Rated Power .....                             | 0.2 W at peak power output and transmission                                           |                                                         |                          |                      |              |                                   |     |
| Clock frequencies.....                        | 32 MHz, 32.768 kHz                                                                    |                                                         |                          |                      |              |                                   |     |
| Other parameters .....                        | .....                                                                                 |                                                         |                          |                      |              |                                   |     |
| Software version .....                        | ASSET_TAG_ver1.0.0-4                                                                  |                                                         |                          |                      |              |                                   |     |
| Hardware version .....                        | 67292-NAT-V3b                                                                         |                                                         |                          |                      |              |                                   |     |
| Dimensions in cm (W x H x D) .....            | 88x48x26                                                                              |                                                         |                          |                      |              |                                   |     |
| Mounting position .....                       | [ ]                                                                                   | Table top equipment                                     |                          |                      |              |                                   |     |
|                                               | [ ]                                                                                   | Wall/Ceiling mounted equipment                          |                          |                      |              |                                   |     |
|                                               | [ ]                                                                                   | Floor standing equipment                                |                          |                      |              |                                   |     |
|                                               | [ ]                                                                                   | Hand-held equipment                                     |                          |                      |              |                                   |     |
|                                               | [X]                                                                                   | Other: Attached to objects suited for long term storage |                          |                      |              |                                   |     |
| 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   |                                   |     |
|                                               | User Guide                                                                            |                                                         | .....                    |                      | .....        |                                   |     |
|                                               | Schematic and PCB Layout                                                              |                                                         | .....                    |                      | .....        |                                   |     |
|                                               | Battery/PCB certificates                                                              |                                                         | .....                    |                      | .....        |                                   |     |
|                                               | Housing Documentation                                                                 |                                                         | .....                    |                      | .....        |                                   |     |

## Identification of the client

Nanotron Technologies GmbH  
Alt Moabit 60a, 10555 Berlin, Germany

## Testing period and place

|               |                                        |
|---------------|----------------------------------------|
| Test Location | DEKRA Testing and Certification S.A.U. |
| Date (start)  | 2022-05-11                             |
| Date (finish) | 2022-05-11                             |

## Document history

| Report number | Date       | Description   |
|---------------|------------|---------------|
| 70923REM.004  | 2022-10-05 | First release |

## Environmental conditions

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

|                          |                                   |
|--------------------------|-----------------------------------|
| <b>Temperature</b>       | Min. = 15 °C<br>Max. = 35 °C      |
| <b>Relative humidity</b> | Min. = 30 %<br>Max. = 75 %        |
| <b>Air pressure</b>      | Min. = 860mbar<br>Max. = 1060mbar |

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

|                          |                                   |
|--------------------------|-----------------------------------|
| <b>Temperature</b>       | Min. = 15 °C<br>Max. = 35 °C      |
| <b>Relative humidity</b> | Min. = 30 %<br>Max. = 75 %        |
| <b>Air pressure</b>      | Min. = 860mbar<br>Max. = 1060mbar |

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

|                          |                                   |
|--------------------------|-----------------------------------|
| <b>Temperature</b>       | Min. = 15 °C<br>Max. = 35 °C      |
| <b>Relative humidity</b> | Min. = 30 %<br>Max. = 60 %        |
| <b>Air pressure</b>      | Min. = 860mbar<br>Max. = 1060mbar |



## Remarks and comments

The tests have been performed by the technical personnel: Victoria Olmedo Villalba.

## Testing verdicts

|                |     |
|----------------|-----|
| Not applicable | N/A |
| Partial Passed | P*  |

## List of equipment used during the test

| Control No. | Equipment                           | Model      | Manufacturer                | Next Calibration |
|-------------|-------------------------------------|------------|-----------------------------|------------------|
| 7817        | EMI TEST RECEIVER 2Hz-44GHz         | ESW44      | ROHDE AND SCHWARZ           | 2023-12-30       |
| 7763        | HORN ANTENNA 1-18GHz                | BBHA 9120D | SCHWARZBECK MESS-ELEKTRONIK | 2022-11-15       |
| 7769        | PREAMPLIFIER 30dB 500MHz-18GHz      | BBV 9718 C | SCHWARZBECK                 | 2023-03-25       |
| 8130        | SEMIANECHOIC ABSORBER LINED CHAMBER | P29419     | ALBATROSS                   | --               |
| 8134        | SHIELDED ROOM                       | P29419     | ALBATROSS PROJECTS GMBH     | --               |
| 4848        | SOFTWARE FOR EMC/RF TESTING         | EMC32      | ROHDE AND SCHWARZ           | --               |
| 7826        | ULTRALOG ANTENNA 30MHz-6GHz         | HL562E_UPG | ROHDE AND SCHWARZ           | 2022-10-15       |

# Summary

| Test Specification.                                                                                                        | Requirement – Test case                                | Verdict | Remark |
|----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------|--------|
| FCC Rules and Regulations CFR 47,<br>Part 15, Subpart B (10-1-20 Edition) &<br>ICES-003 Issue 7 (October 2020)             | RE Radiated emission.<br>Electromagnetic field measure | Pass    |        |
|                                                                                                                            | CE Continuous conducted<br>emission                    | N/A     | (1)    |
| <u>Supplementary information and remarks:</u><br>(1) The device does not contain an AC port where this test is applicable. |                                                        |         |        |

## Appendix A: Test results

# Appendix A content

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## Description of the operation modes

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

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

| Id    | Description                                                                            |
|-------|----------------------------------------------------------------------------------------|
| OM/01 | EUT ON. Proprietary radio in idle mode. Power supply: 4.5Vdc. Internal battery (AAAx3) |

## Test standards version applied

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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<br>(10-1-20 Edition) & ICES-003 Issue 7<br>(October 2020) | ANSI C63.4 (2014) | RE Radiated emission.   |

## Test Cases Details

### FCC 47 CFR Part 15B

RE Radiated emission. Electromagnetic field measure

#### Limits of interference Class B

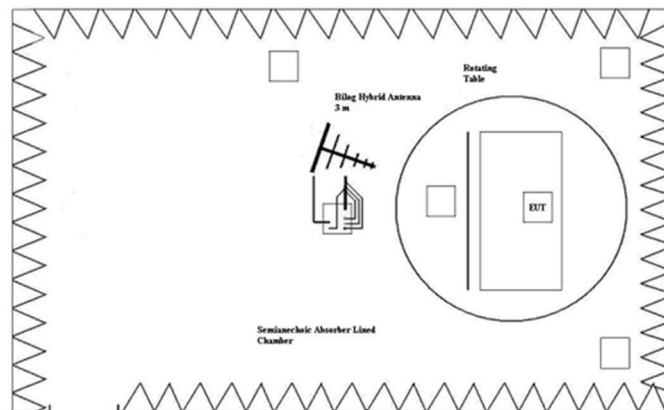
The applied limit for radiated emissions, 3 m distance, according to the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-19 Edition), Secs. 15.109 & ICES-003 Issue 7 (October 2020)

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

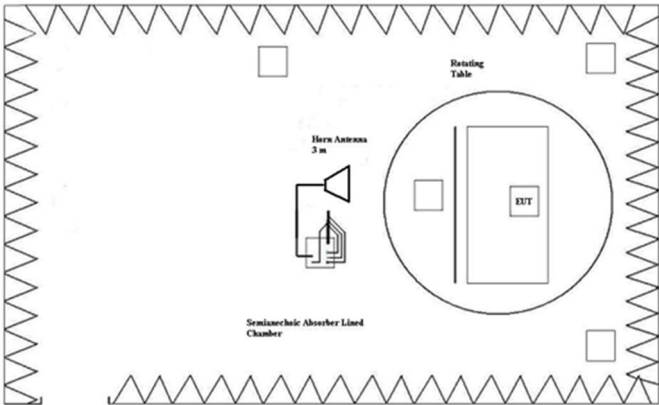
**NOTE: FCC QP and AVG limits are in concordance with RSS-Gen Issue 5 (March 2019), Secs. 7.1 and 7.3.**

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

#### Setup for measurements



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

Results

| S/ | OM    | Code     | Freq Rng (MHz) | V |
|----|-------|----------|----------------|---|
| 01 | OM/01 | RE0101LR | [30, 1000]     | P |
| 01 | OM/01 | RE0101HR | [1000, 12750]  | P |

Verdict

Pass



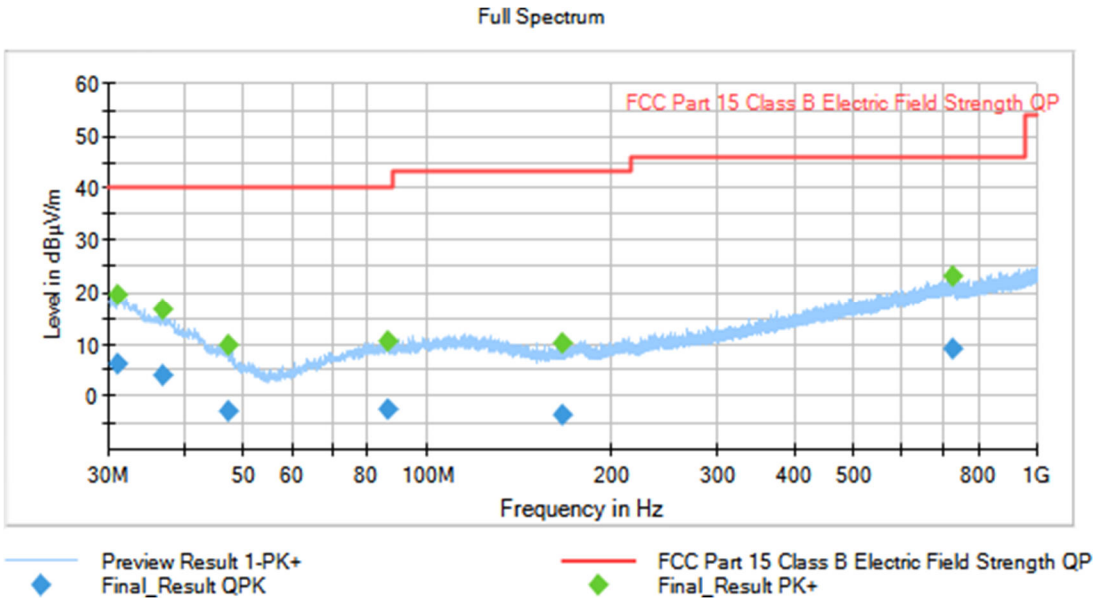
Attachments

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

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Proprietary radio in idle mode. Power supply: Internal battery (AAAx3)

Images:



Tables:

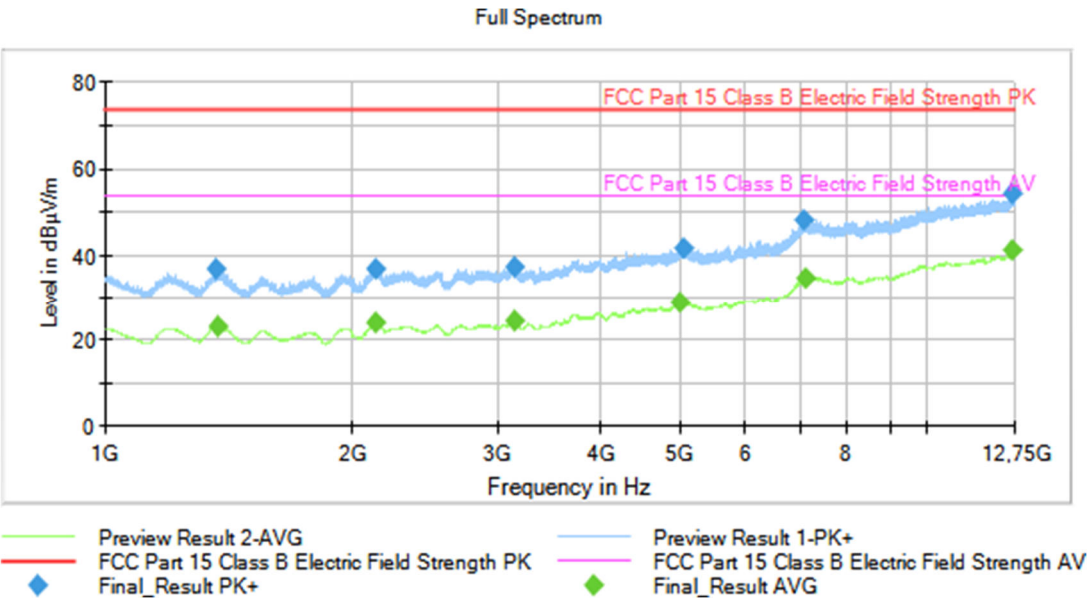
| Frequency(MHz) | QuasiPeak(dBµV/m) | MaxPeak(dBµV/m) | Limit(dBµV/m) | Margin(dB) | Height(cm) | Pol | Azimuth(deg) |
|----------------|-------------------|-----------------|---------------|------------|------------|-----|--------------|
| 31.022000      | ---               | 19.73           | ---           | ---        | 292.0      | H   | 260.0        |
| 31.022000      | 6.09              | ---             | 40.00         | 33.91      | 292.0      | H   | 260.0        |
| 36.903000      | ---               | 16.72           | ---           | ---        | 151.0      | H   | 224.0        |
| 36.903000      | 4.17              | ---             | 40.00         | 35.83      | 151.0      | H   | 224.0        |
| 47.347000      | ---               | 9.91            | ---           | ---        | 388.0      | V   | 260.0        |
| 47.347000      | -2.74             | ---             | 40.00         | 42.74      | 388.0      | V   | 260.0        |
| 86.251000      | -2.50             | ---             | 40.00         | 42.50      | 348.0      | V   | 174.0        |
| 86.251000      | ---               | 10.71           | ---           | ---        | 348.0      | V   | 174.0        |
| 166.312000     | ---               | 10.04           | ---           | ---        | 390.0      | V   | 214.0        |
| 166.312000     | -3.41             | ---             | 43.52         | 46.93      | 390.0      | V   | 214.0        |
| 727.575000     | 9.16              | ---             | 46.00         | 36.84      | 154.0      | V   | 6.0          |
| 727.575000     | ---               | 23.08           | ---           | ---        | 154.0      | V   | 6.0          |

EMC Test Code = RE0101HR, Frequency Range MHz = [1000, 12750]

Sample ID: S/01

Operation Mode: OM/01. EUT ON. Proprietary radio in idle mode. Power supply: Internal battery (AAAx3)

Images:



Tables:

| Frequency(MHz) | MaxPeak(dBµV/m) | Average(dBµV/m) | Limit(dBµV/m) | Margin(dB) |
|----------------|-----------------|-----------------|---------------|------------|
| 1374.000000    | 36.80           | ---             | 73.97         | 37.17      |
| 1374.000000    | ---             | 23.21           | 53.97         | 30.76      |
| 2130.000000    | 36.92           | ---             | 73.97         | 37.05      |
| 2130.000000    | ---             | 24.03           | 53.97         | 29.94      |
| 3148.800000    | ---             | 24.32           | 53.97         | 29.65      |
| 3148.000000    | 37.37           | ---             | 73.97         | 36.60      |
| 5004.800000    | ---             | 28.77           | 53.97         | 25.20      |
| 5004.800000    | 41.73           | ---             | 73.97         | 32.24      |
| 7099.600000    | 48.19           | ---             | 73.97         | 25.78      |
| 7099.600000    | ---             | 34.71           | 53.97         | 19.26      |
| 12700.800000   | ---             | 41.04           | 53.97         | 12.93      |
| 12700.800000   | 54.04           | ---             | 73.97         | 19.93      |