



## HEALTH TEST REPORT

For

Descartes System Group Inc

Inventory control beacon tag

Test Model: BIN001-1

Prepared for : Descartes System Group Inc  
Address : 105 Trafalgar Street, Floor 2 Floor 2, Nelson, New Zealand

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.  
Address : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

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Date of receipt of test sample : March 31, 2025  
Number of tested samples : 2  
Sample No. : A03275107-1, A03275107-2  
Serial number : Prototype  
Date of Test : March 31, 2025 ~ April 10, 2025  
Date of Report : April 11, 2025



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**HEALTHTEST REPORT**  
**EN IEC 62311:2020**

Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)

**Report Reference No..... : LCSA03275107EE**

Date of Issue..... : April 11, 2025

**Testing Laboratory Name..... : Shenzhen LCS Compliance Testing Laboratory Ltd.**

Address..... : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Testing Location/Procedure..... : Full application of Harmonised standards ■  
Partial application of Harmonised standards□  
Other standard testing method□**Applicant's Name..... : Descartes System Group Inc**

Address..... : 105 Trafalgar Street, Floor 2 Floor 2, Nelson, New Zealand

**Test Specification**

Standard..... : EN IEC 62311:2020

Test Report Form No..... : TRF-4-E-156 A/0

TRF Originator..... : Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF..... : Dated 2011-03

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**Test Item Description..... : Inventory control beacon tag**

Trade Mark..... : N/A

Test Model..... : BIN001-1

Ratings ..... : DC 3V By CR2477 Button Battery

**Result..... : PASS****Compiled by:**

Kevin Huang/Administrator

**Supervised by:**

Jack Liu/ Technique principal

**Approved by:**

Gavin Liang/ Manager



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## HEALTH--TEST REPORT

**Test Report No. : LCSA03275107EE**April 11, 2025  
Date of issue

Test Model..... : BIN001-1

EUT..... : Inventory control beacon tag

**Applicant..... : Descartes System Group Inc**

Address..... : 105 Trafalgar Street, Floor 2 Floor 2, Nelson, New Zealand

Telephone..... : /

Fax..... : /

**Manufacturer..... : Descartes System Group Inc**

Address..... : 105 Trafalgar Street, Floor 2 Floor 2, Nelson, New Zealand

Telephone..... : /

Fax..... : /

**Factory..... : Descartes System Group Inc**

Address..... : 105 Trafalgar Street, Floor 2 Floor 2, Nelson, New Zealand

Telephone..... : /

Fax..... : /

**Test Result****PASS**

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



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### Revision History

Report Version	Issue Date	Revision Content	Revised By
000	April 11, 2025	Initial Issue	---





## 1. GENERAL INFORMATION

### 1.1. Product Description for Equipment Under Test (EUT)

EUT	: Inventory control beacon tag
Test Model	: BIN001-1
Ratings	: DC 3V By CR2477 Button Battery
Hardware Version	: BIN001-1
Software Version	: /
Bluetooth	:
Frequency Range	: 2402MHz~2480MHz
Channel Number	: 40 channels for Bluetooth V5.0 (BT LE/BT 2LE)
Channel Spacing	: 2MHz for Bluetooth V5.0 (BT LE/BT 2LE)
Modulation Type	: GFSK for Bluetooth V5.0 (BT LE/BT 2LE)
Bluetooth Version	: V5.0
Antenna Description	: Internal Antenna , 3.2dBi(Max)
NFC	:
Frequency Range	: 13.56MHz
Modulation Type	: ASK
Antenna Description	: PCB Antenna, 0dBi(Max.)





## 1.2. Objective

According to its specifications, the EUT must comply with the requirements of the following standards:

EN IEC 62311:2020—Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)

## 1.3. Test Methodology

All measurements contained in this report were conducted with EN IEC 62311:2020.

## 1.4. Facilities

All measurement facilities used to collect the measurement data are located at Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 32.

## 1.5. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate
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## 1.6. External I/O

I/O Port Description	Quantity	Cable
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### 1.7. Equipment

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### 1.8. Laboratory Accreditations And Listings

#### Site Description

EMC Lab. : NVLAP Accreditation Code is 600167-0.  
FCC Designation Number is CN5024.  
CAB identifier is CN0071.  
CNAS Registration Number is L4595.

Name of Firm : Shenzhen LCS Compliance Testing Laboratory Ltd.

Site Location : Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China



### 1.9. Measurement Uncertainty(95% confidence levels, k=2)

Test Item	Uncertainty
Radio Frequency	$0.9 \times 10^{-4}$
Total RF Power, Conducted	1.0 dB
RF Power Density, Conducted	1.8 dB
Spurious Emissions, Conducted	1.8 dB
All Emissions, Radiated	3.1 dB
Temperature	0.5°C
Humidity	1 %
DC And Low Frequency Voltages	1 %







## 2.HUMAN EXPOSURE TO THE ELECTROMAGNETIC FIELDS

### 2.1 Basic Restrictions Reference levels

Council Recommendation 1999/519/EC Annex III

Basic restrictions for electric, magnetic and electromagnetic fields (0Hz to 300GHz)

Frequency range	Magnetic flux density (mT)	Current density (Ma/m <sup>2</sup> ) (rms)	Whole body average SAR (W/kg)	Localised SAR (head and trunk) (W/kg)	Localised SAR (limbs) (W/kg)	Power density (W/m <sup>2</sup> )
0Hz	40	-	-	-	-	-
>0-1Hz	-	8	-	-	-	-
1-4Hz	-	8/f	-	-	-	-
4-1000Hz	-	2	-	-	-	-
1000Hz-100kHz	-	f/500	-	-	-	-
100kHz-10MHz	-	f/500	0.08	2	4	-
10MHz-10GHz	-	-	0.08	2	4	-
10-300GHz	-	-	-	-	-	10

Note:

1. f is the frequency in Hz.
2. The basic restriction on the current density is intended to protect against acute exposure effects on central nervous system tissues in the head and trunk of the body and includes a safety factor. The basic restrictions for ELF fields are based on established adverse effects on the central nervous system. Such acute effects are essentially instantaneous and there is no scientific justification to modify the basic restrictions for exposure of short duration. However, since the basic restriction refers to adverse effects on the central nervous system, this basic restriction may permit higher current densities in body tissues other than the central nervous system under the same exposure conditions.
3. Because of electrical inhomogeneity of the body, current densities should be averaged over a cross section of 1cm<sup>2</sup> perpendicular to the current direction.
4. For frequencies up to 100 kHz, peak current density values can be obtained by multiplying the rms value by  $\sqrt{2}$ (=1.414). For pulses of duration  $t_p$  the equivalent frequency to apply in the basic restrictions should be calculated as  $f=1/(2t_p)$
5. For frequencies up to 100kHz and for pulsed magnetic fields, the maximum current density associated with the pulses can be calculated from the rise/fall times and the maximum rate of change of magnetic flux density. The induced current density can then be compared with the appropriate basic restriction.
6. All SAR values are to be averaged over any six-minute period.
7. Localised SAR averaging mass is any 10g of contiguous tissue; the maximum SAR so obtained should be the value used for the estimation of exposure. These 10g of tissue are intended to be a mass of contiguous tissue with nearly homogeneous electrical properties. In specifying a contiguous mass of tissue, it is recognised that this concept can be used in computational dosimetry but may present difficulties for direct physical measurements. A



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simple geometry such as cubic tissue mass can be used provided that the calculated dosimetric quantities have conservation values relative to the exposure guidelines.

8. For pulses of duration  $t_p$  the equivalent frequency to apply in the basic restrictions should be calculated as  $f = 1/(2t_p)$ . Additionally, for pulsed exposures, in the frequency range 0,3 to 10GHz and for localised exposure of the head, in order to limit and avoid auditory effects caused by thermoelastic expansion, an additional basic restriction is recommended. This is that SA should not exceed 2mJ kg<sup>-1</sup> averaged over 10g of tissue.

## 2.2 Reference Levels

Council Recommendation 1999/519/EC Annex III

Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density Seq (W/m <sup>2</sup> )
0-1Hz	-	$3,2 \times 10^4$	$4 \times 10^4$	-
1-8Hz	1000	$3,2 \times 10^4 / f^2$	$4 \times 10^4 / f^2$	-
8-25Hz	1000	$4000 / f$	$5000 / f$	-
0.025Hz-0,8kHz	$250 / f$	$4 / f$	$5 / f^{6,25}$	-
0,8-3kHz	$250 / f$	5	6,25	-
3-150kHz	87	5	6,25	-
0,15-1MHz	87	$0.73 / f$	$0.92 / f$	-
1-10MHz	$87 / f^{1/2}$	$0.73 / f$	$0.92 / f$	-
10-400MHz	28	0.073	0.092	2
400-2000MHz	$1,375 f^{1/2}$	$0,0037 f^{1/2}$	$0,0046 f^{1/2}$	$f / 200$
2-300GHz	61	0,16	0,20	10

Note:

1. As indicated in the frequency range column.
2. For frequencies between 100kHz and 10GHz, Seq, E2, H2 and B2 are to be averaged over any six-minute period.
3. For frequencies exceeding 10GHz, Seq, E2, H2 and B2 are to be averaged over any 68/.1.05-minute period (.in GHz).
4. No E-field value is provided for frequencies <1Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 20kV/m. Spark discharges causing stress or annoyance should be avoided.



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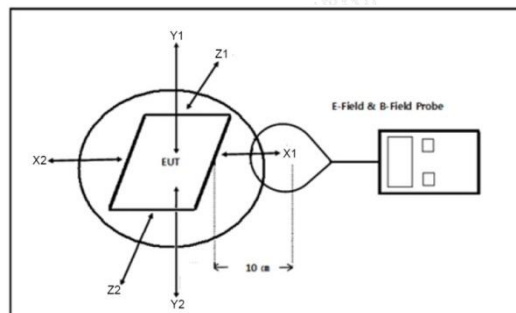
### 3. RF EXPOSURE EVALUATION

#### 3.1. Test Equipment

The following test equipments are used during the power line conducted measurement:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
1	Exposure Level Tester	Narda	ELT-400	N-0713	2024-11-11	2025-11-10
2	B-Field Probe	Narda	ELT-400	M-1154	2024-10-08	2025-10-07

#### 3.2. Block Diagram of Test Setup



\*Note:

Position A: Back Side of the EUT

Position B: Left Side of the EUT

Position C: Front Side of the EUT

Position D: Right Side of the EUT

Position E: Top Side of the EUT

Position F: Bottom Side of the EUT

#### 3.3. Test Results

##### H-field Strength Test Result:

Test condition: NFC mode

Frequency Range(MHz)	Probe Position Hx1 (A/m)	Probe Position Hx2 (A/m)	Probe Position Hy1 (A/m)	Probe Position Hy2 (A/m)	Probe Position Hz1 (A/m)	Probe Position Hz2 (A/m)	ResultH (A/m)	Limit (A/m)
13.56	0.04	0.04	0.04	0.04	0.03	0.03	0.064	0.073

$$H = \sqrt{H_x^2 + H_y^2 + H_z^2} = \sqrt{0.04^2 + 0.04^2 + 0.03^2} \text{ A/m} = 0.064 \text{ A/m}$$

Note: All test modes have been tested and only record the worst result.

-----THE END OF REPORT-----



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