ISO/IEC JTC1/SC17 2009-09-07
Cards and personal identification

ISO/IEC JTC1/SC17 N 3740 **WG8 N 1586**

DOCUMENT TYPE: Notification of Ballot

TITLE: Notification of ballot - ISO/IEC PDAM 10373-6:2001 - Identification cards - Test methods - Part 6: Proximity cards – Amd 8: Additional PICC classes

BACKWARD POINTER: N 3680, N 3681

SOURCE: SECRETARIAT ISO/IEC JTC1/SC17

STATUS: Amendment to test standard ISO/IEC 10373-6 for additional PICC classes to reflect amendments contained in N 3680 and N 3681.

ACTION ID: Vote

WORK ITEM: To be advised

DUE DATE: 2009-11-26

DISTRIBUTION: P and L-Members of ISO/IEC JTC1/SC17
JTC1 Secretariat
ISO/IEC ITTF

MEDIUM: SERVER

NO. OF PAGES: 12

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ISO/IEC JTC 1/SC 17/WG 8 N 1551 R1

Date: 2009-07-09

ISO/IEC 10373-6:2001/PDAM 8

ISO/IEC JTC 1/SC 17/WG 8

Secretariat: DIN

Identification cards — Test methods — Part 6: Proximity cards

AMENDMENT 8
Additional PICC classes

Cartes d'identification — Méthodes d'essai — Partie 6: Cartes de proximité

AMENDEMENT 2
Classes additionnelles de PICC

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Document type: International Standard
Document subtype: Amendment
Document stage: (20) Preparatory
Document language: E

O:\STANDARD\SC17\Work In Progress\WG8\10373 amd 8\wg8n1569_Text_of_CD10373-6_AM9(classes)V6.doc STD Version 2.1c2

Foreword

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Amendment 9 to ISO/IEC 10373-6:2001 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and personal identification*.

Identification cards — Test methods — Part 6: Proximity cards

AMENDMENT 8:
Additional PICC classes

Page 3 of ISO/IEC CD 10373-6.2:2009, 3.2

Add the following definition:

CCF Coupling Compensation Factor

Page 15 of ISO/IEC CD 10373-6.2:2009, 7.1

Add the following paragraph and table:

"Tests shall be performed using Reference PICCs 1, 2 and 3 and optionally other Reference PICCs corresponding to the optional classes supported by the PCD as defined in Table 3."

Table 3 — Classes parameters

Class	Reference PICC	V_{load}	$R2_{min}$	$R2_{max}$	Sense coils	CCF
1	1	6 V	870 Ω	1070 Ω	Sense coils 1	1
2	2	6 V	1430 Ω	1750 Ω	Sense coils 1	1
3	3	6 V	1600 Ω	1950 Ω	Sense coils 2	0,7
4	4	4,5 V	800 Ω	970 Ω	Sense coils 2	0,7
5	5	4,5 V	1000 Ω	1230 Ω	Sense coils 2	0,7

Page 16 of ISO/IEC CD 10373-6.2:2009, Clause 7.1.1

Add the following paragraph:

"The maximum and minimum field strength values to be used with each Reference PICC are given in ISO/IEC 14443-2:2001/PDAM 4, Table 1."

Page 16 of ISO/IEC CD 10373-6.2:2009, Clause 7.1.1.2

Replace "3 V" with "V_{load} as defined in Table 3" in steps c) and d) of the procedure for H_{min}.

Replace "400" with "$R2_{min}$" in the procedure for H_{min} warning.

Replace "500 Ω" with "$R2_{max}$ as defined in Table 3" in the procedure for H_{min} warning.

N/A

Page 16 of ISO/IEC CD 10373-6.2:2009, Clause 7.1.1.3

The test report shall confirm the operating volume in which the d.c. voltage measured at CON3 for R2 or variable load resistor adjusted to H_{min} and H_{max} field strength fulfils the requirements defined in steps d) of the two procedures of 7.1.1.2.

Page 16 of ISO/IEC CD 10373-6.2:2009, Clause 7

Delete 7.1.2 and its subclauses

Page 17 of ISO/IEC CD 10373-6.2:2009, Clause 7

Delete 7.1.3 and its subclauses

Page 19 of ISO/IEC CD 10373-6.2:2009, Clause 7.2.1.2

Add the following sentence at the end of the first paragraph starting with "Step 1":

"Depending on the PICC class, select the relevant sense coils as defined in Table 3."

Page 20 of ISO/IEC CD 10373-6.2:2009, Clause 7.2.1.2

Add the following words at the beginning of the sentence starting with “The resulting peak amplitudes”:

“Once multiplied by the coupling compensation factor CCF as defined in Table 3, “

Page 22 of ISO/IEC CD 10373-6.2:2009, Clause 7.2.4

Replace 7.2.4 and its subclauses with the following:

7.2.4 PICC maximum loading effect

7.2.4.1 Purpose

This test is used to measure the PICC loading effect.

7.2.4.2 Test procedure

Depending on the PICC class, select:

— the relevant H_{min} as defined in ISO/IEC 14443-2:2001/PDAM 4, Table 2;

— the relevant Reference PICC as defined in Table 3 and its reference voltage V_{load}.

The PICC loading effect at H_{min} shall be measured using the Test PCD assembly. It shall not exceed the loading effect of the selected Reference PICC tuned to 13,56 MHz and calibrated to obtain V_{load} at CON3 at H_{min}. The procedure of this substitution method is as follows.

a) Tune the selected Reference PICC to 13,56 MHz as described in 5.4.3.

b) Calibrate the Test PCD assembly to produce the H_{min} operating condition on the calibration coil.

c) Place the Reference PICC into the DUT position on the Test PCD assembly. Switch the jumper J1 to position 'b' and adjust R2 to obtain a d.c. voltage of V_{load} measured at connector CON3. Alternatively, jumper J1 may be set to position 'c' and the applied voltage on CON2 is adjusted to obtain a d.c. voltage of V_{load} at connector CON3. In both cases, the operating field condition shall be verified by monitoring the voltage on the calibration coil.

WARNING — R2 value should be between $R2_{min}$ and $R2_{max}$ as defined in Table 3. Check this range at least once before using the alternative method.

d) Remove the Reference PICC.

e) Place the PICC under test into the DUT position on the Test PCD assembly.

f) Measure the field strength H_C monitored by the calibration coil.

The field strength H_C shall be greater than H_{min}.

7.2.4.3 Test report

The test report shall give the value H_C.

Page 33 of ISO/IEC CD 10373-6.2:2009, Annex C

Add following sub clause headline directly after C.1:

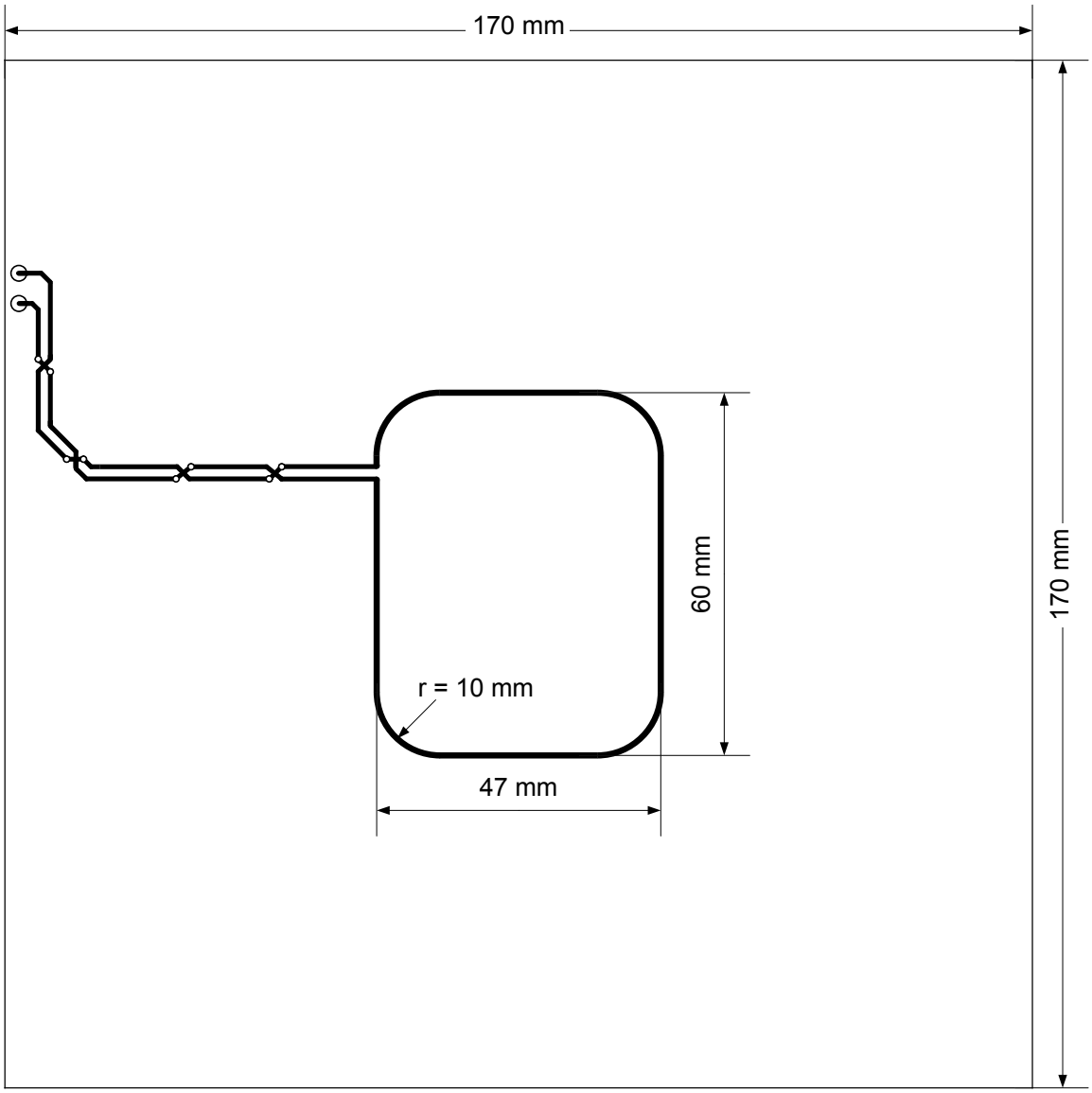
C.1.1 Sense coil 1 layout

Page 33 of ISO/IEC CD 10373-6.2:2009, Annex C

Add following sub clause after Figure C.1 and renumber figures in annex C:

N/A

C.1.2 Sense coil 2 layout



Dimensions in millimeters (Drawings are not to scale).
The sense coil track width is 0,5 mm with relative tolerance ± 20 % (except for through-plated holes). Size of the coils refers to the outer dimensions.
Printed circuit board (PCB): FR4 material, thickness 1,6 mm, double sided with 35 µm copper.

NOTE Such printed circuit boards are available from various commercial sources.

Figure C.2 — Layout for sense coils 2 (a and b)

Page 35 of ISO/IEC CD 10373-6.2:2009, Annex D

Change the title to "Reference PICCs".

Page 35 of ISO/IEC CD 10373-6.2:2009, Annex D

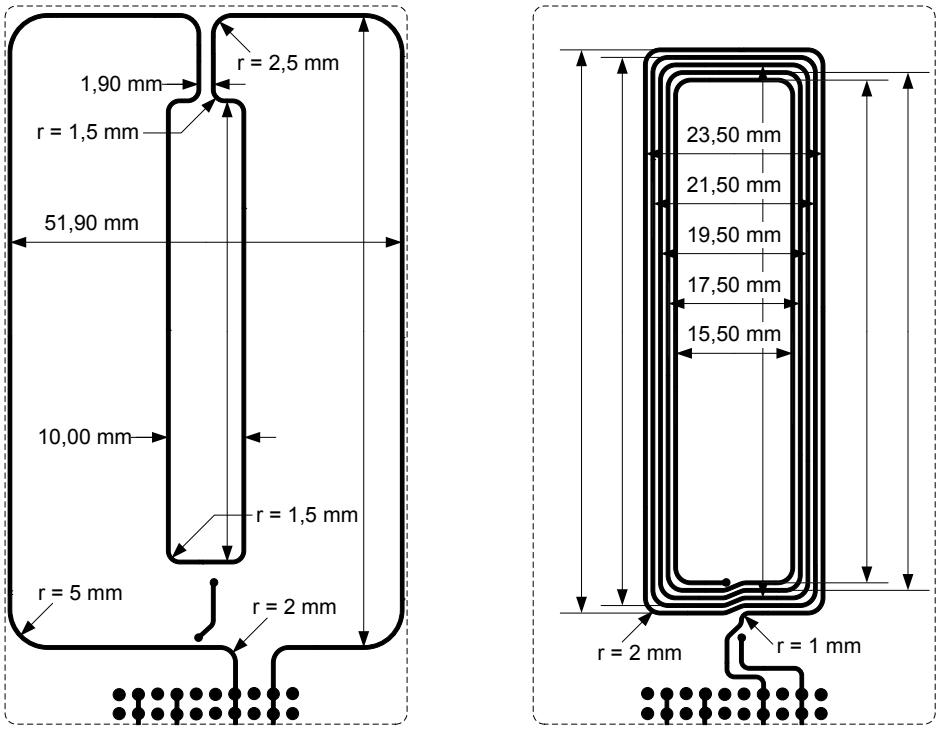
Change the subclause title to:

"D.1 Reference PICC 1 circuit diagram"

Page 35 of ISO/IEC CD 10373-6.2:2009, Annex D

Add following sub clauses at the end of D.1:

D.2 Reference PICC 2 circuit diagram



(View from front, Pick up coil) (View from back, Main coil)

Figure D.2 — Antenna layout

Dimensions in millimeters to track center (drawings are not to scale).

Main coil dimensions: 75 mm x 24 mm (outer dimensions).

The Pick up coil and the Main coil shall be concentric.

The two coils track width and spacing shall be 0,5 mm with a relative tolerance of ± 20 %.

Printed circuit board (PCB): FR4 material, thickness 0,76 mm with a relative tolerance of ± 10 %, double sided with 35 µm copper.

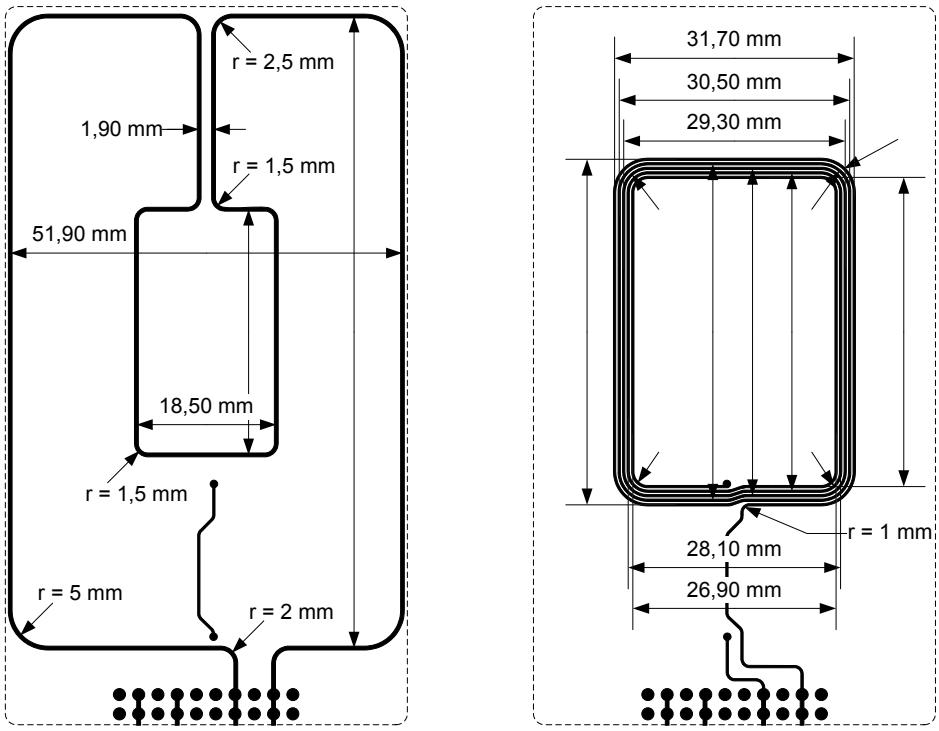
NOTE 1 At 13,56 MHz the inductance of the Main coil L1 is 2,4 µH ± 10 % and the resistance is 1,9 Ω ± 10 %.

NOTE 2 At 13,56 MHz the inductance of the Pick up coil L2 is 417 nH ± 10 % and the approximate resistance is 0,8 Ω ± 10 %.

61,00 mm

83,60 mm

D.3 Reference PICC 3 circuit diagram



(View from front, Pick up coil) (View from back, Main coil)

Figure D.3 — Antenna layout

Dimensions in millimeters to track center (drawings are not to scale).

Main coil dimensions: 46 mm x 32 mm (outer dimensions).

The Pick up coil and the Main coil shall be concentric.

The Pick up coil track width shall be 0,5 mm with a relative tolerance of ± 20 %.

32,50 mm

83,60 mm

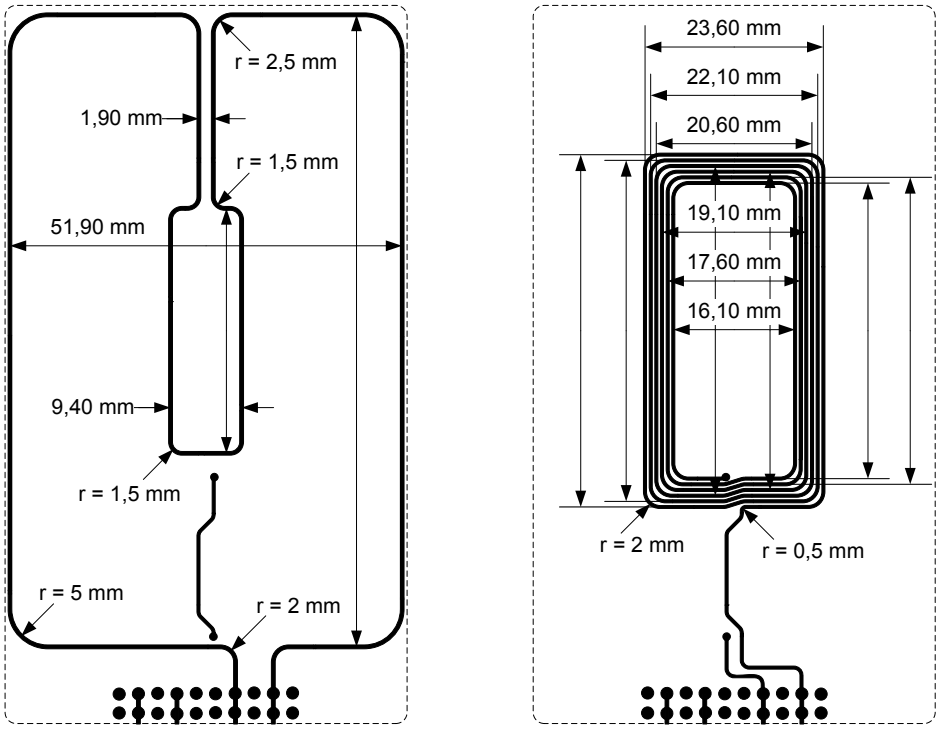
The Main coil track width and spacing shall be 0,3 mm with a relative tolerance of ± 20 %.

Printed circuit board (PCB): FR4 material, thickness 0,76 mm with a relative tolerance of ± 10 %, double sided with 35 µm copper.

NOTE 1 At 13,56 MHz the inductance of the Main coil L1 is 2,39 µH ± 10 % and the resistance is 2,18 Ω ± 10 %.

NOTE 2 At 13,56 MHz the inductance of the Pick up coil L2 is 405 nH ± 10 % and the approximate resistance is 0,76 Ω ± 10 %.

D.4 Reference PICC 4 circuit diagram



(View from front, Pick up coil) (View from back, Main coil)

Figure D.4 — Antenna layout

Dimensions in millimeters to track center (drawings are not to scale).

Main coil dimensions: 47 mm x 24 mm (outer dimensions).

The Pick up coil and the Main coil shall be concentric.

The Pick up coil track width shall be 0,5 mm with a relative tolerance of ± 20 %.

32,40 mm

83,60 mm

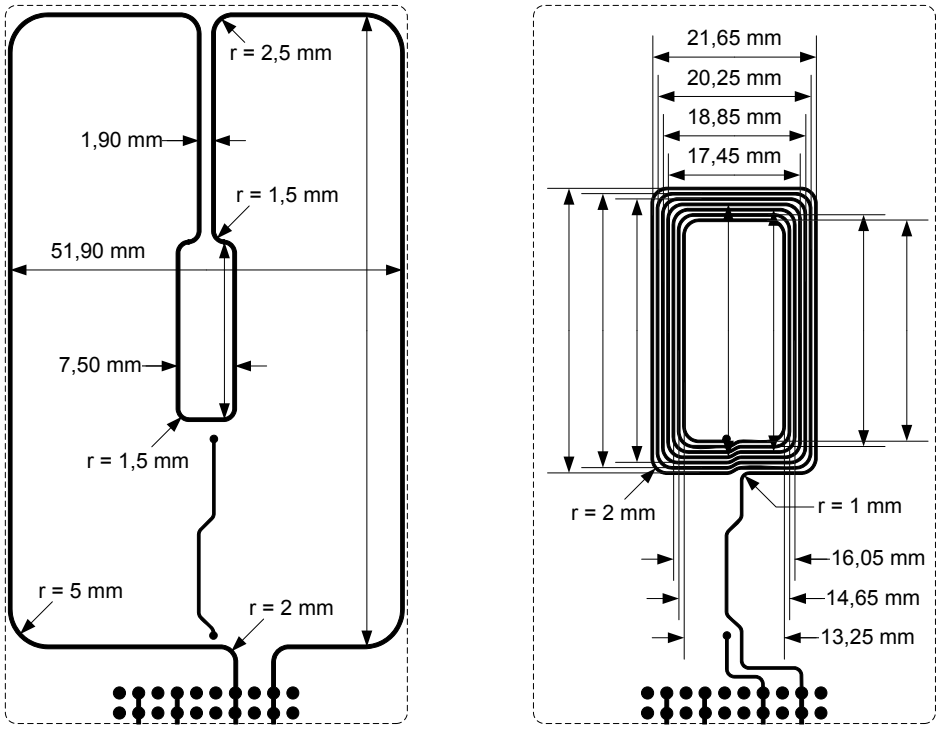
The Main coil track width shall be 0,4 mm and the spacing shall be 0,35 mm with a relative tolerance of ± 20 %.

Printed circuit board (PCB): FR4 material, thickness 0,76 mm with a relative tolerance of ± 10 %, double sided with 35 µm copper.

NOTE 1 At 13,56 MHz the inductance of the Main coil L1 is 2,3 µH ± 10 % and the resistance is 1,8 Ω ± 10 %.

NOTE 2 At 13,56 MHz the inductance of the Pick up coil L2 is 390 nH ± 10 % and the approximate resistance is 0,7 Ω ± 10 %.

D.5 Reference PICC 5 circuit diagram



(View from front, Pick up coil) (View from back, Main coil)

Figure D.5 — Antenna layout

Dimensions in millimeters to track center (drawings are not to scale).

Main coil dimensions: 38 mm x 22 mm (outer dimensions).

The Pick up coil and the Main coil shall be concentric.

The Pick up coil track width shall be 0,5 mm with a relative tolerance of ± 20 %.

23,50 mm

83,60 mm

The Main coil track width and spacing shall be 0,35 mm with a relative tolerance of ± 20 %.

Printed circuit board (PCB): FR4 material, thickness 0,76 mm with a relative tolerance of ± 10 %, double sided with 35 µm copper.

NOTE 1 At 13,56 MHz the inductance of the Main coil L1 is 2,4 µH ± 10 % and the resistance is 1,9 Ω ± 10 %.

NOTE 2 At 13,56 MHz the inductance of the Pick up coil L2 is 380 nH ± 10 % and the approximate resistance is 0,7 Ω ± 10 %.