

# DATA SHEET

**P11/7**

**P cores and accessories**

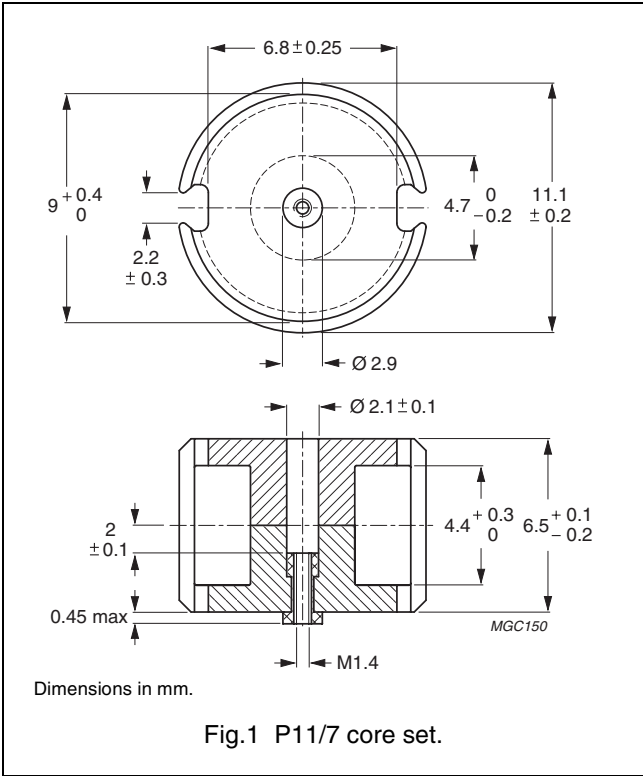
Supersedes data of September 2004

2008 Sep 01

CORE SETS

Effective core parameters

| SYMBOL        | PARAMETER        | VALUE         | UNIT             |
|---------------|------------------|---------------|------------------|
| $\Sigma(l/A)$ | core factor (C1) | 0.956         | $\text{mm}^{-1}$ |
| $V_e$         | effective volume | 251           | $\text{mm}^3$    |
| $l_e$         | effective length | 15.5          | mm               |
| $A_e$         | effective area   | 16.2          | $\text{mm}^2$    |
| $A_{\min}$    | minimum area     | 13.2          | $\text{mm}^2$    |
| m             | mass of set      | $\approx 1.8$ | g                |



Core sets for filter applications

Clamping force for  $A_L$  measurements,  $35 \pm 10$  N.

| GRADE              | $A_L$<br>(nH)   | $\mu_e$        | TOTAL AIR GAP<br>( $\mu\text{m}$ ) | TYPE NUMBER<br>(WITH NUT) | TYPE NUMBER<br>(WITHOUT NUT) |
|--------------------|-----------------|----------------|------------------------------------|---------------------------|------------------------------|
| 3D3 <sup>sup</sup> | $16 \pm 3\%$    | $\approx 12$   | $\approx 2210$                     | P11/7-3D3-E16/N           | P11/7-3D3-E16                |
|                    | $25 \pm 3\%$    | $\approx 19$   | $\approx 1280$                     | P11/7-3D3-E25/N           | P11/7-3D3-E25                |
|                    | $40 \pm 3\%$    | $\approx 31$   | $\approx 710$                      | P11/7-3D3-E40/N           | P11/7-3D3-E40                |
|                    | $63 \pm 3\%$    | $\approx 48$   | $\approx 400$                      | P11/7-3D3-E63/N           | P11/7-3D3-E63                |
|                    | $100 \pm 3\%$   | $\approx 76$   | $\approx 220$                      | P11/7-3D3-A100/N          | P11/7-3D3-A100               |
|                    | $800 \pm 25\%$  | $\approx 610$  | $\approx 0$                        | —                         | P11/7-3D3                    |
| 3H3 <sup>sup</sup> | $160 \pm 3\%$   | $\approx 122$  | $\approx 140$                      | P11/7-3H3-A160/N          | P11/7-3H3-A160               |
|                    | $250 \pm 3\%$   | $\approx 190$  | $\approx 80$                       | P11/7-3H3-A250/N          | P11/7-3H3-A250               |
|                    | $1650 \pm 25\%$ | $\approx 1260$ | $\approx 0$                        | —                         | P11/7-3H3                    |

## P cores and accessories

P11/7

## Core sets for general purpose transformers and power applications

Clamping force for  $A_L$  measurements,  $35 \pm 10$  N.

| GRADE                   | $A_L$<br>(nH)   | $\mu_e$        | AIR GAP<br>( $\mu\text{m}$ ) | TYPE NUMBER     |
|-------------------------|-----------------|----------------|------------------------------|-----------------|
| 3C81                    | $100 \pm 3\%$   | $\approx 76$   | $\approx 240$                | P11/7-3C81-A100 |
|                         | $160 \pm 3\%$   | $\approx 122$  | $\approx 140$                | P11/7-3C81-A160 |
|                         | $250 \pm 3\%$   | $\approx 190$  | $\approx 85$                 | P11/7-3C81-A250 |
|                         | $2050 \pm 25\%$ | $\approx 1560$ | $\approx 0$                  | P11/7-3C81      |
| 3C91 <small>des</small> | $2050 \pm 25\%$ | $\approx 1560$ | $\approx 0$                  | P11/7-3C91      |
| 3F3                     | $100 \pm 3\%$   | $\approx 76$   | $\approx 240$                | P11/7-3F3-A100  |
|                         | $160 \pm 3\%$   | $\approx 122$  | $\approx 140$                | P11/7-3F3-A160  |
|                         | $250 \pm 5\%$   | $\approx 190$  | $\approx 80$                 | P11/7-3F3-A250  |
|                         | $1650 \pm 25\%$ | $\approx 1260$ | $\approx 0$                  | P11/7-3F3       |

## Core sets of high permeability grades

Clamping force for  $A_L$  measurements,  $35 \pm 10$  N.

| GRADE | $A_L$<br>(nH)   | $\mu_e$        | AIR GAP<br>( $\mu\text{m}$ ) | TYPE NUMBER |
|-------|-----------------|----------------|------------------------------|-------------|
| 3E27  | $3400 \pm 25\%$ | $\approx 2600$ | $\approx 0$                  | P11/7-3E27  |

## Properties of core sets under power conditions

| GRADE | B (mT) at                                 | CORE LOSS (W) at                         |                                           |                                           |                                          |
|-------|-------------------------------------------|------------------------------------------|-------------------------------------------|-------------------------------------------|------------------------------------------|
|       | H = 250 A/m;<br>f = 25 kHz;<br>T = 100 °C | f = 25 kHz;<br>B = 200 mT;<br>T = 100 °C | f = 100 kHz;<br>B = 100 mT;<br>T = 100 °C | f = 100 kHz;<br>B = 200 mT;<br>T = 100 °C | f = 400 kHz;<br>B = 50 mT;<br>T = 100 °C |
| 3C81  | $\geq 320$                                | $\leq 0.05$                              | —                                         | —                                         | —                                        |
| 3C91  | $\geq 315$                                | —                                        | $\leq 0.015^{(1)}$                        | $\leq 0.12^{(1)}$                         | —                                        |
| 3F3   | $\geq 315$                                | —                                        | $\leq 0.03$                               | —                                         | $\leq 0.05$                              |

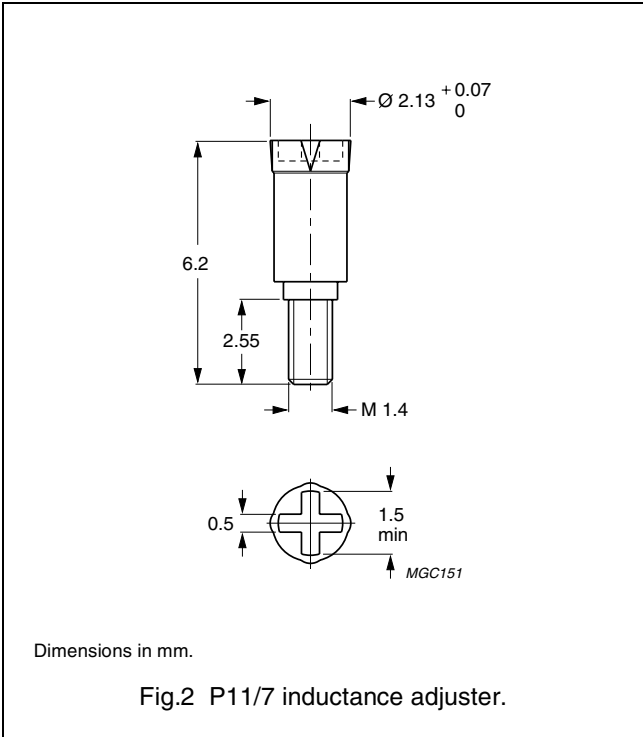
## Note

1. Measured at 60 °C.

INDUCTANCE ADJUSTERS

General data

| PARAMETER                     | SPECIFICATION                              |
|-------------------------------|--------------------------------------------|
| Material of head and thread   | polypropylene (PP), glass fibre reinforced |
| Maximum operating temperature | 125 °C                                     |



Inductance adjuster selection chart <sup>sup up</sup> (applies to all types)

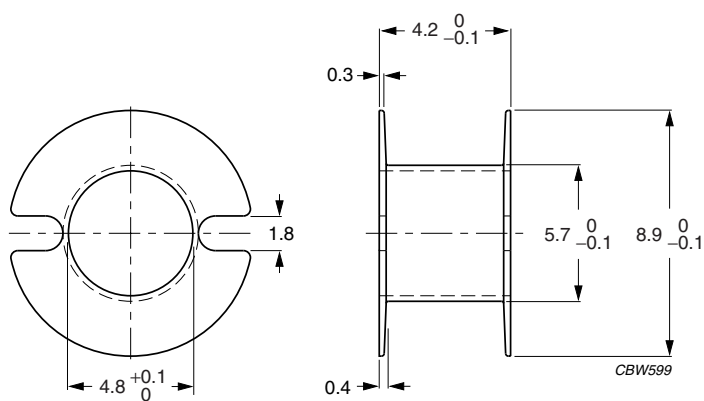
| GRADE | A <sub>L</sub><br>(nH) | TYPES FOR LOW<br>ADJUSTMENT | ΔL/L <sup>(1)</sup> | TYPES FOR MEDIUM<br>ADJUSTMENT | ΔL/L <sup>(1)</sup> | TYPES FOR HIGH<br>ADJUSTMENT | ΔL/L <sup>(1)</sup> |
|-------|------------------------|-----------------------------|---------------------|--------------------------------|---------------------|------------------------------|---------------------|
| 3H3   | 100                    | —                           | —                   | ADJ-P9/P11-YELLOW              | 13                  | ADJ-P9/P11-BROWN             | 24                  |
|       | 160                    | ADJ-P9/P11-YELLOW           | 8                   | ADJ-P9/P11-BROWN               | 15                  | ADJ-P9/P11-GREY              | 22                  |
|       | 250                    | ADJ-P9/P11-BROWN            | 9                   | ADJ-P9/P11-GREY                | 14                  | —                            | —                   |
| 3D3   | 16                     | —                           | —                   | ADJ-P9/P11-YELLOW              | 19                  | —                            | —                   |
|       | 25                     | —                           | —                   | —                              | —                   | ADJ-P9/P11-YELLOW            | 30                  |
|       | 40                     | —                           | —                   | —                              | —                   | ADJ-P9/P11-YELLOW            | 24                  |
|       | 63                     | —                           | —                   | ADJ-P9/P11-YELLOW              | 18                  | —                            | —                   |
|       | 100                    | —                           | —                   | ADJ-P9/P11-YELLOW              | 11                  | —                            | —                   |

Note

1. Maximum adjustment range.

**COIL FORMERS****General data CP-P11/7-1S coil former**

| PARAMETER                     | SPECIFICATION                                                                                                               |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Coil former material          | polybutyleneterephthalate (PBT), glass reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E45329 (R) |
| Maximum operating temperature | 155 °C, "IEC 60085", class F                                                                                                |



Dimensions in mm.

Fig.3 Coil former: CP-P11/7-1S.

**Winding data and area product for CP-P11/7-1S coil former**

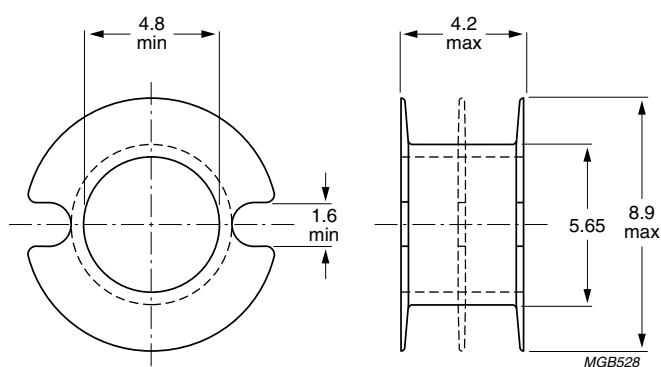
| NUMBER OF SECTIONS | WINDING AREA (mm <sup>2</sup> ) | MINIMUM WINDING WIDTH (mm) | AVERAGE LENGTH OF TURN (mm) | AREA PRODUCT Ae x Aw (mm <sup>4</sup> ) | TYPE NUMBER |
|--------------------|---------------------------------|----------------------------|-----------------------------|-----------------------------------------|-------------|
| 1                  | 4.8                             | 3.1                        | 22.6                        | 77.8                                    | CP-P11/7-1S |

## P cores and accessories

P11/7

## General data for CP-P11/7-A coil former

| PARAMETER                     | SPECIFICATION                                                                                           |
|-------------------------------|---------------------------------------------------------------------------------------------------------|
| Coil former material          | acetal (POM), glass reinforced, flame retardant in accordance with "UL 94-HB"; UL file number E66288(R) |
| Maximum operating temperature | 105 °C                                                                                                  |



Dimensions in mm.

Fig.4 Coil former: CP-P11/7-A.

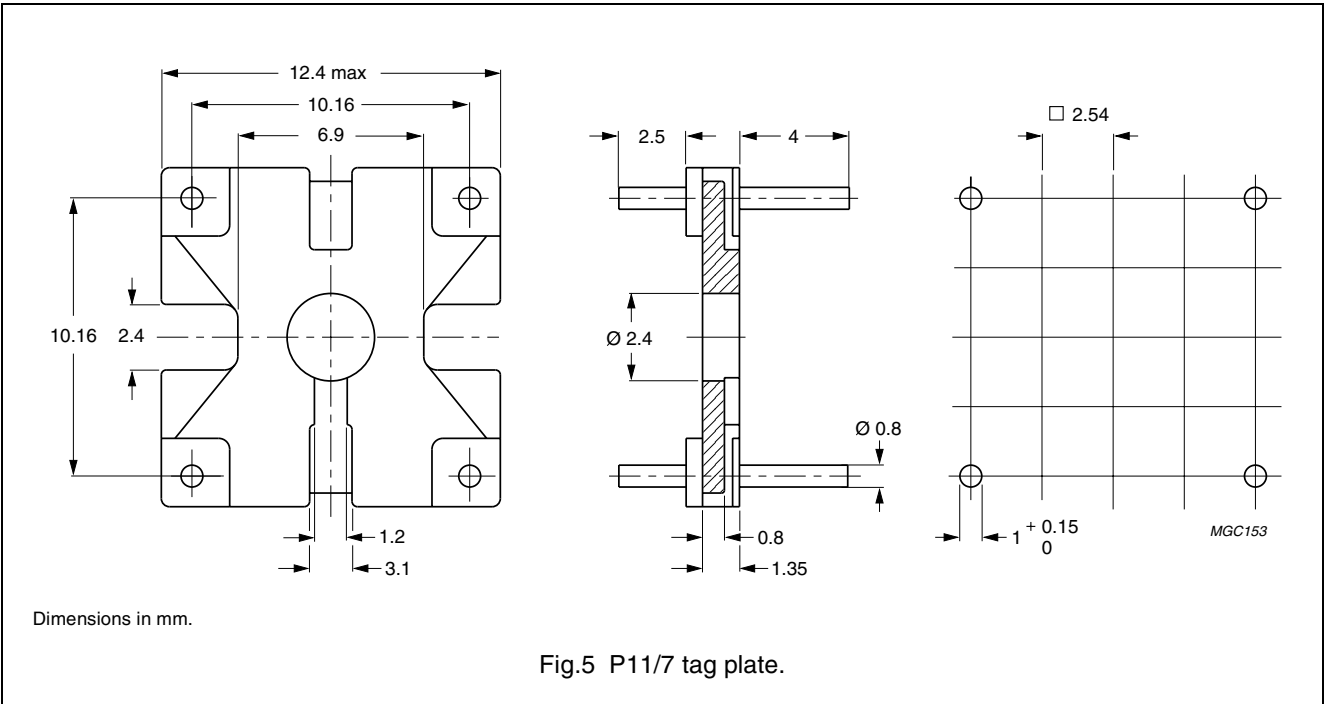
## Winding data and area product for CP-P11/7-A coil former

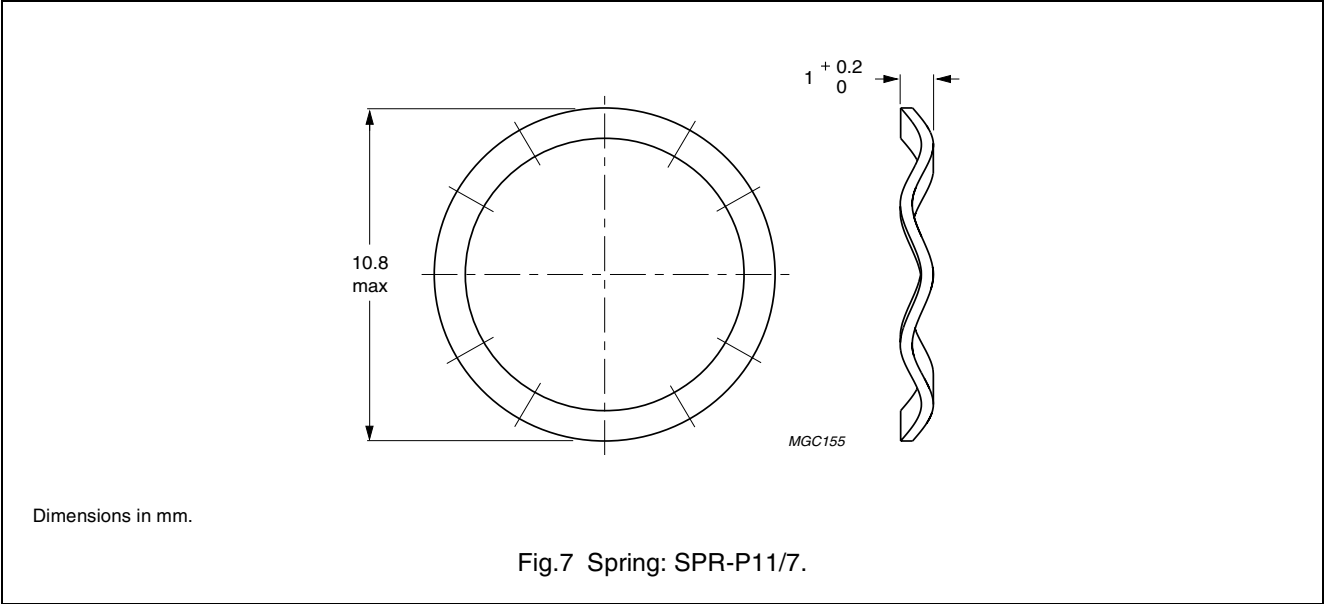
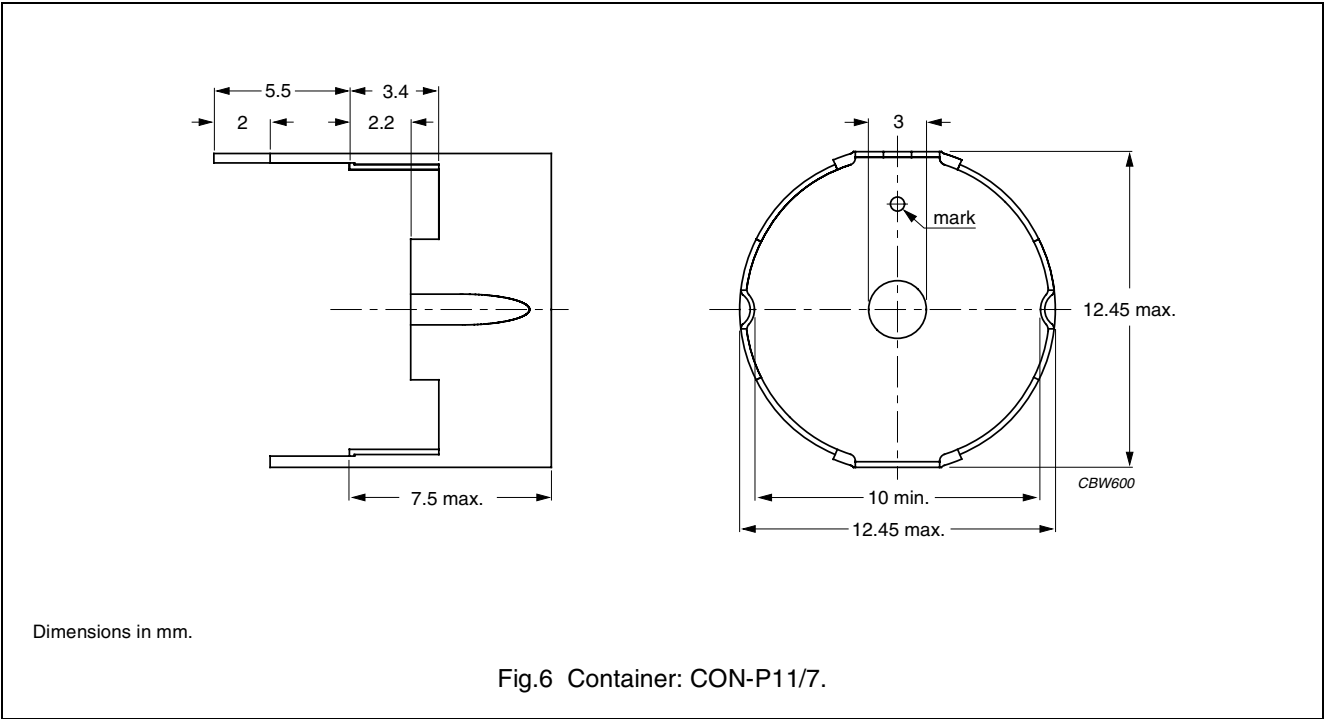
| NUMBER OF SECTIONS | MINIMUM WINDING AREA (mm <sup>2</sup> ) | NOMINAL WINDING WIDTH (mm) | AVERAGE LENGTH OF TURN (mm) | AREA PRODUCT Ae x Aw (mm <sup>4</sup> ) | TYPE NUMBER   |
|--------------------|-----------------------------------------|----------------------------|-----------------------------|-----------------------------------------|---------------|
| 1                  | 4.77                                    | 3.42                       | 22.7                        | 77.3                                    | CP-P11/7-1S-A |
| 2                  | 2 × 2.00                                | 2 × 1.52                   | 22.7                        | 2 x 32.4                                | CP-P11/7-2S-A |
| 3                  | 3 × 1.16                                | 3 × 0.91                   | 22.7                        | 3 x 18.8                                | CP-P11/7-3S-A |

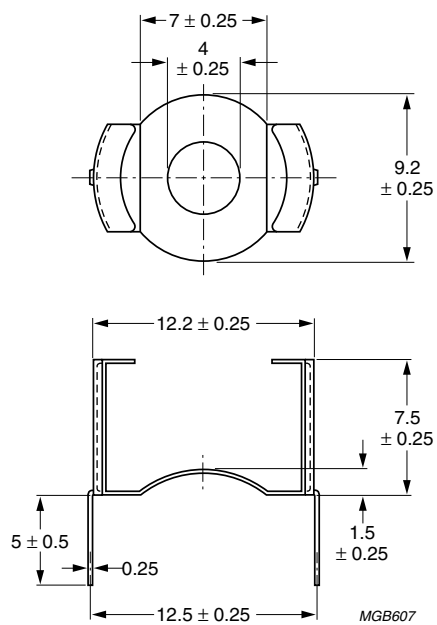
MOUNTING PARTS

General data

| ITEM      | REMARKS                                                                                                        | FIGURE | TYPE NUMBER  |
|-----------|----------------------------------------------------------------------------------------------------------------|--------|--------------|
| Tag plate | material: phenolformaldehyde (PF), glass reinforced                                                            | 5      | TGP-P11/7-C  |
|           | flame retardant: in accordance with "UL 94V-0";<br>file number E41429                                          |        |              |
|           | maximum operating temperature: 180 °C, "IEC 60085", class H                                                    |        |              |
|           | pins : copper-tin alloy (CuSn), tin (Sn) plated                                                                |        |              |
|           | resistance to soldering heat in accordance with "IEC 60068-2-20",<br>Part 2, Test Tb, method 1B: 350 °C, 3.5 s |        |              |
|           | solderability in accordance with "IEC 60068-2-20", Part 2, Test Ta,<br>method 1: 235 °C, 2 s                   |        |              |
| Container | copper-zinc alloy (CuZn), tin (Sn) plated                                                                      | 6      | CON-P11/7    |
|           | earth pins: presoldered                                                                                        |        |              |
| Spring    | CrNi-steel                                                                                                     | 7      | SPR-P11/7    |
|           | spring force: ≈35 N when mounted                                                                               |        |              |
| Clamp     | spring steel, tin-plated                                                                                       | 7      | CLM/TP-P11/7 |







Dimensions in mm.

Fig.7 Clamp: CLM/TP-P11/7.

## P cores and accessories

P11/7

## DATA SHEET STATUS DEFINITIONS

| DATA SHEET STATUS         | PRODUCT STATUS | DEFINITIONS                                                                                                                                                                              |
|---------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preliminary specification | Development    | This data sheet contains preliminary data. Ferroxcube reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.     |
| Product specification     | Production     | This data sheet contains final specifications. Ferroxcube reserves the right to make changes at any time without notice in order to improve design and supply the best possible product. |

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## PRODUCT STATUS DEFINITIONS

| STATUS           | INDICATION                                                                          | DEFINITION                                                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Prototype</b> |  | These are products that have been made as development samples for the purposes of technical evaluation only. The data for these types is provisional and is subject to change. |
| <b>Design-in</b> |  | These products are recommended for new designs.                                                                                                                                |
| <b>Preferred</b> |                                                                                     | These products are recommended for use in current designs and are available via our sales channels.                                                                            |
| <b>Support</b>   |  | These products are <b>not</b> recommended for new designs and may not be available through all of our sales channels. Customers are advised to check for availability.         |