

# DATA SHEET

## **RM12/I**

**RM, RM/I, RM/ILP cores and accessories**

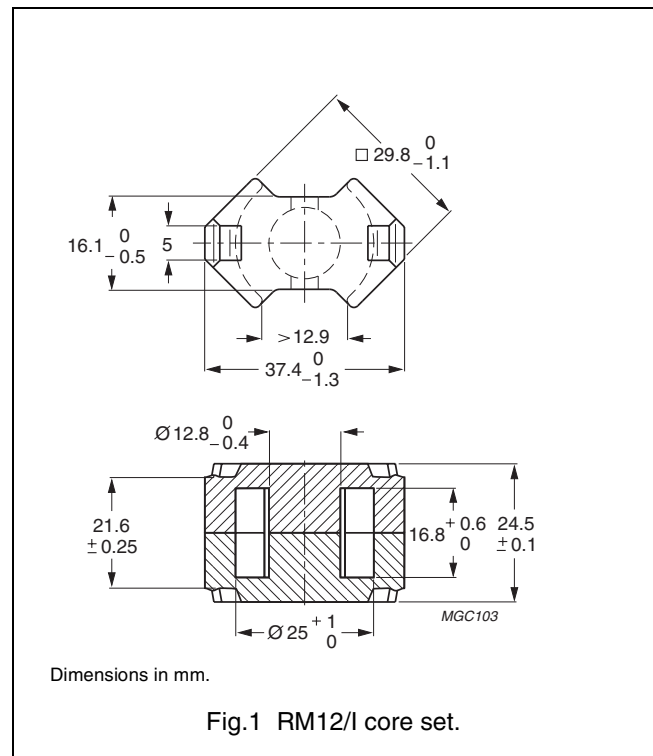
Supersedes data of September 2004

2008 Sep 01

**CORE SETS**

**Effective core parameters**

| SYMBOL        | PARAMETER        | VALUE | UNIT             |
|---------------|------------------|-------|------------------|
| $\Sigma(l/A)$ | core factor (C1) | 0.388 | mm <sup>-1</sup> |
| $V_e$         | effective volume | 8340  | mm <sup>3</sup>  |
| $l_e$         | effective length | 56.6  | mm               |
| $A_e$         | effective area   | 146   | mm <sup>2</sup>  |
| $A_{min}$     | minimum area     | 125   | mm <sup>2</sup>  |
| m             | mass of set      | ≈ 46  | g                |



**Core sets for general purpose transformers and power applications**

Clamping force for  $A_L$  measurements, 70 ±20 N.

| GRADE    | $A_L$<br>(nH) | $\mu_e$ | AIR GAP<br>( $\mu\text{m}$ ) | TYPE NUMBER      |
|----------|---------------|---------|------------------------------|------------------|
| 3C90     | 160 ±3%       | ≈ 49    | ≈ 1570                       | RM12/I-3C90-A160 |
|          | 250 ±3%       | ≈ 77    | ≈ 900                        | RM12/I-3C90-A250 |
|          | 315 ±5%       | ≈ 97    | ≈ 680                        | RM12/I-3C90-A315 |
|          | 400 ±5%       | ≈ 123   | ≈ 510                        | RM12/I-3C90-A400 |
|          | 630 ±5%       | ≈ 194   | ≈ 300                        | RM12/I-3C90-A630 |
|          | 5600 ±25%     | ≈ 1730  | ≈ 0                          | RM12/I-3C90      |
| 3C94     | 160 ±3%       | ≈ 49    | ≈ 1570                       | RM12/I-3C94-A160 |
|          | 250 ±3%       | ≈ 77    | ≈ 900                        | RM12/I-3C94-A250 |
|          | 315 ±5%       | ≈ 97    | ≈ 680                        | RM12/I-3C94-A315 |
|          | 400 ±5%       | ≈ 123   | ≈ 510                        | RM12/I-3C94-A400 |
|          | 630 ±5%       | ≈ 194   | ≈ 300                        | RM12/I-3C94-A630 |
|          | 5600 ±25%     | ≈ 1730  | ≈ 0                          | RM12/I-3C94      |
| 3C95 des | 6790 ±25%     | ≈ 2095  | ≈ 0                          | RM12/I-3C95      |
| 3C96 des | 5050 ±25%     | ≈ 1560  | ≈ 0                          | RM12/I-3C96      |

## RM, RM/I, RM/ILP cores and accessories

RM12/I

| GRADE | $A_L$<br>(nH)  | $\mu_e$        | AIR GAP<br>( $\mu\text{m}$ ) | TYPE NUMBER     |
|-------|----------------|----------------|------------------------------|-----------------|
| 3F3   | 160 $\pm$ 3%   | $\approx$ 49   | $\approx$ 1570               | RM12/I-3F3-A160 |
|       | 250 $\pm$ 3%   | $\approx$ 77   | $\approx$ 900                | RM12/I-3F3-A250 |
|       | 315 $\pm$ 5%   | $\approx$ 97   | $\approx$ 680                | RM12/I-3F3-A315 |
|       | 400 $\pm$ 5%   | $\approx$ 123  | $\approx$ 510                | RM12/I-3F3-A400 |
|       | 630 $\pm$ 5%   | $\approx$ 194  | $\approx$ 300                | RM12/I-3F3-A630 |
|       | 5050 $\pm$ 25% | $\approx$ 1560 | $\approx$ 0                  | RM12/I-3F3      |

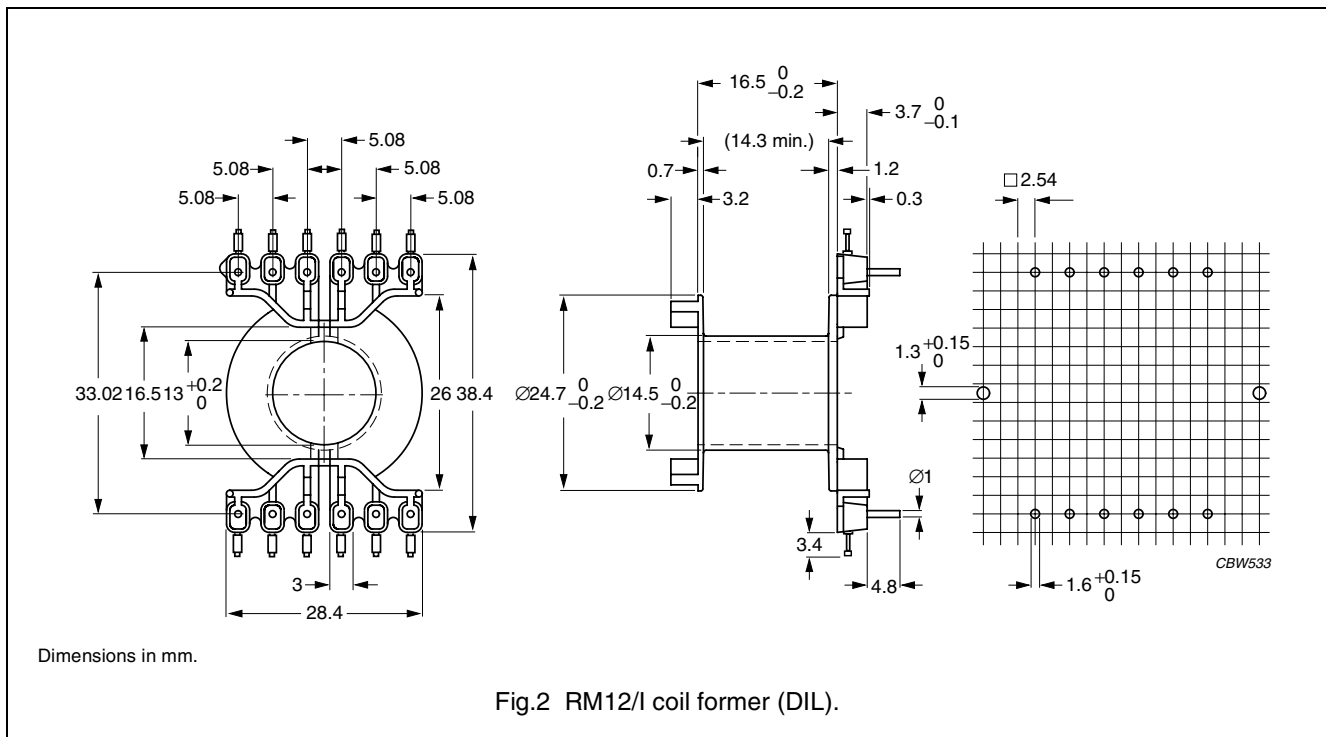
## Properties of core sets under power conditions

| 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 = 25 °C | f = 100 kHz;<br>B = 200 mT;<br>T = 100 °C | f = 400 kHz;<br>B = 50 mT;<br>T = 100 °C | f = 500 kHz;<br>B = 50 mT;<br>T = 100 °C |
| 3C90  | $\geq$ 315                                | $\leq$ 1.0                               | $\leq$ 1.1                                | –  | –   | –  | –  |
| 3C94  | $\geq$ 315                                | –  | $\leq$ 0.8                                | –  | $\leq$ 4.5                                | –  | –  |
| 3C95  | $\geq$ 315                                | –  | –   | $\leq$ 4.92                              | $\leq$ 4.67                               | –  | –  |
| 3C96  | $\geq$ 340                                | –  | $\leq$ 0.6                                | –  | $\leq$ 3.6                                | $\leq$ 1.5                               | $\leq$ 3.0                               |
| 3F3   | $\geq$ 315                                | –  | $\leq$ 0.92                               | –  | –   | $\leq$ 1.6                               | –  |

**COIL FORMER**

**General data**

| PARAMETER                     | SPECIFICATION  |
|-------------------------------|--|
| Coil former material          | polybutyleneterephthalate (PBT), glass-reinforced, flame retardant in accordance with UL 94V-0; UL file number E45329(R) |
| Pin material                  | copper-tin alloy (CuSn), tin (Sn) plated   |
| Maximum operating temperature | 155 °C, "IEC 60085", class F   |
| Resistance to soldering heat  | "IEC 60068-2-20", Part 2, Test Tb, method 1B, 350 °C, 3.5 s  |
| Solderability                 | "IEC 60068-2-20", Part 2, Test Ta, method 1  |



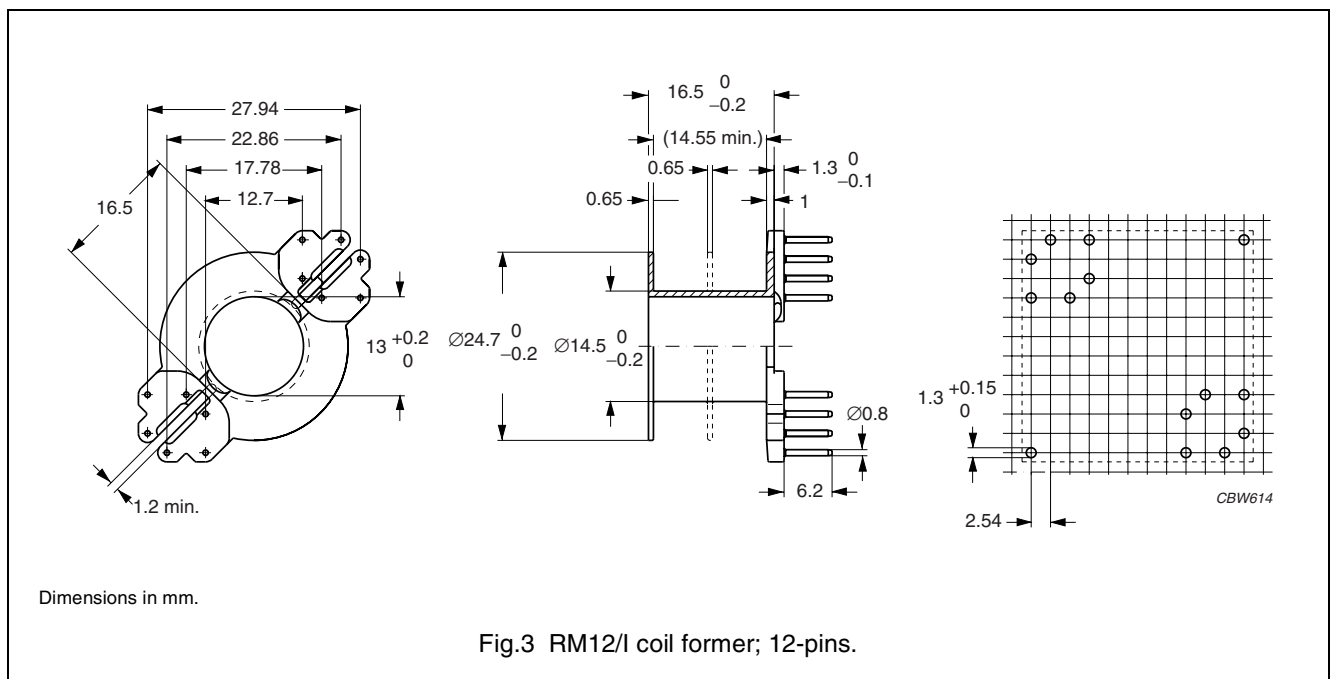
**Winding data and area product for RM12/I coil former (DIL)**

| NUMBER OF SECTIONS | AVERAGE LENGTH OF TURN (mm) | WINDING AREA (mm <sup>2</sup> ) | WINDING WIDTH (mm) | AREA PRODUCT Ae x Aw (mm <sup>4</sup> ) | TYPE NUMBER        |
|--------------------|-----------------------------|---------------------------------|--------------------|---|--------------------|
| 1                  | 61                          | 75.0                            | 14.3               | 10950                                   | CPV-RM12/I-1S-12PD |

**COIL FORMERS**

**General data**

| PARAMETER                     | SPECIFICATION   |
|-------------------------------|---|
| Coil former material          | phenolformaldehyde (PF), glass reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E167521(M) |
| Pin material                  | copper-tin alloy (CuSn), tin (Sn) plated  |
| Maximum operating temperature | 180 °C, "IEC 60085", class H  |
| Resistance to soldering heat  | "IEC 60068-2-20", Part 2, Test Tb, method 1B, 350 °C, 3.5 s   |
| Solderability                 | "IEC 60068-2-20", Part 2, Test Ta, method 1: 235 °C, 2 s  |



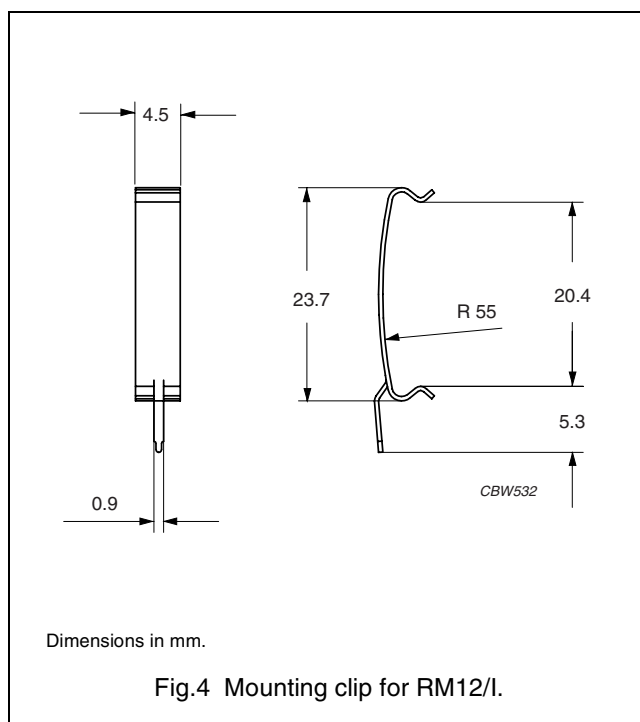
**Winding data and area product for RM12/I coil former with 12-pins**

| 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                  | 72.0                            | 14.4                       | 61                          | 10500                                   | CSV-RM12-1S-12P |

**MOUNTING PARTS**

**General data**

| ITEM           | SPECIFICATION                                  |
|----------------|--|
| Clamping force | ≈ 35 N   |
| Clip material  | stainless steel                                |
| Clip plating   | tin (Sn)                                       |
| Solderability  | "IEC 60068-2-20",<br>Part 2, Test Ta, method 1 |
| Type number    | CLI/P-RM12/I                                   |






**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. |

**DISCLAIMER**

**Life support applications** — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Ferroxcube customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Ferroxcube for any damages resulting from such application.

**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.         |