# DATA SHEET

# RM6S/ILP
RM cores and accessories

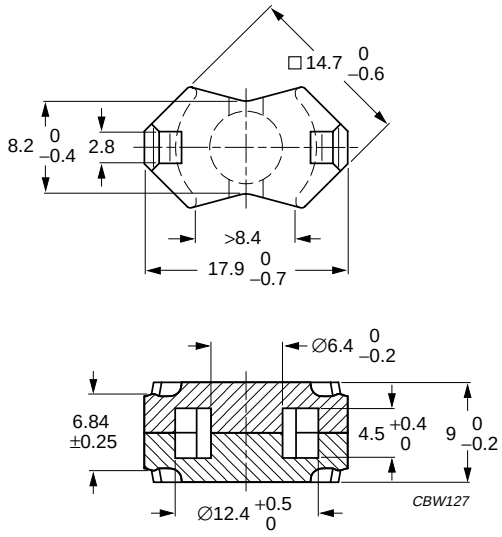
Supersedes data of February 2002 2004 Sep 01

FERROXCUBE
A YAGEO COMPANY

## CORE SETS

### Effective core parameters

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| Σ(l/A) | core factor (C1) | 0.580 | $mm^{-1}$ |
| $V_e$ | effective volume | 820 | $mm^3$ |
| $l_e$ | effective length | 21.8 | mm |
| $A_e$ | effective area | 37.5 | $mm^2$ |
| $A_{min}$ | minimum area | 31.2 | $mm^2$ |
| m | mass of set | ≈ 4.4 | g |




Dimensions in mm.

Fig.1 RM6S/ILP core set.

### Core sets for filter applications

Clamping force for $A_L$ measurements, 20 ±10 N.

| GRADE | $A_L$ (nH) | $\mu_e$ | AIR GAP (μm) | TYPE NUMBER |
|---|---|---|---|---|
| 3B46 des | 4000 ± 25 % | ≈ 1850 | ≈0 | RM6S/ILP-3B46 |
| 3D3 | 160 ±3% | ≈74 | ≈310 | RM6S/ILP-3D3-A160 |
| | 250 ±5% | ≈116 | ≈180 | RM6S/ILP-3D3-A250 |
| | 315 ±5% | ≈146 | ≈130 | RM6S/ILP-3D3-A315 |
| | 1350 ±25% | ≈625 | ≈0 | RM6S/ILP-3D3 |
| 3H3 | 315 ±3% | ≈146 | ≈150 | RM6S/ILP-3H3-A315 |
| | 400 ±5% | ≈185 | ≈120 | RM6S/ILP-3H3-A400 |
| | 630 ±8% | ≈291 | ≈70 | RM6S/ILP-3H3-A630 |
| | 2900 ±25% | ≈1340 | ≈0 | RM6S/ILP-3H3 |

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

Clamping force for $A_L$ measurements, 20 ±10 N.

| GRADE | $A_L$ (nH) | $\mu_e$ | AIR GAP (μm) | TYPE NUMBER |
|---|---|---|---|---|
| 3C90 | 3175 ±25% | ≈1470 | ≈0 | RM6S/ILP-3C90 |
| 3C94 | 3175 ±25% | ≈1470 | ≈0 | RM6S/ILP-3C94 |
| 3C96 des | 2900 ±25% | ≈1340 | ≈0 | RM6S/ILP-3C96 |
| 3F3 | 2700 ±25% | ≈1250 | ≈0 | RM6S/ILP-3F3 |

| GRADE | $A_L$ (nH) | $\mu_e$ | AIR GAP ($\mu$m) | TYPE NUMBER |
|---|---|---|---|---|
| 3F35 prot | 2200 ±25% | ≈1020 | ≈0 | RM6S/ILP-3F35 |
| 3F4 des | 1600 ±25% | ≈740 | ≈0 | RM6S/ILP-3F4 |
| 3F45 prot | 1600 ±25% | ≈740 | ≈0 | RM6S/ILP-3F45 |

**Core sets of high permeability grades**

Clamping force for $A_L$ measurements, 20 ±10 N.

| GRADE | $A_L$ (nH) | $\mu_e$ | AIR GAP ($\mu$m) | TYPE NUMBER |
|---|---|---|---|---|
| 3E5 | 10500 +40/–30% | ≈ 4860 | ≈ 0 | RM6S/ILP-3E5 |
| 3E6 | 13000 +40/–30% | ≈ 6010 | ≈ 0 | RM6S/ILP-3E6 |

**Properties of core sets under power conditions**

| GRADE | B (mT) at | CORE LOSS (W) at | | | |
|---|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.10 | ≤ 0.11 | – | – |
| 3C94 | ≥320 | – | ≤ 0.08 | ≤ 0.45 | – |
| 3C96 | ≥340 | – | ≤ 0.06 | ≤ 0.35 | ≤ 0.15 |
| 3F3 | ≥300 | – | ≤ 0.10 | – | ≤ 0.15 |
| 3F35 | ≥300 | – | – | – | ≤ 0.08 |
| 3F4 | ≥250 | – | – | – | – |

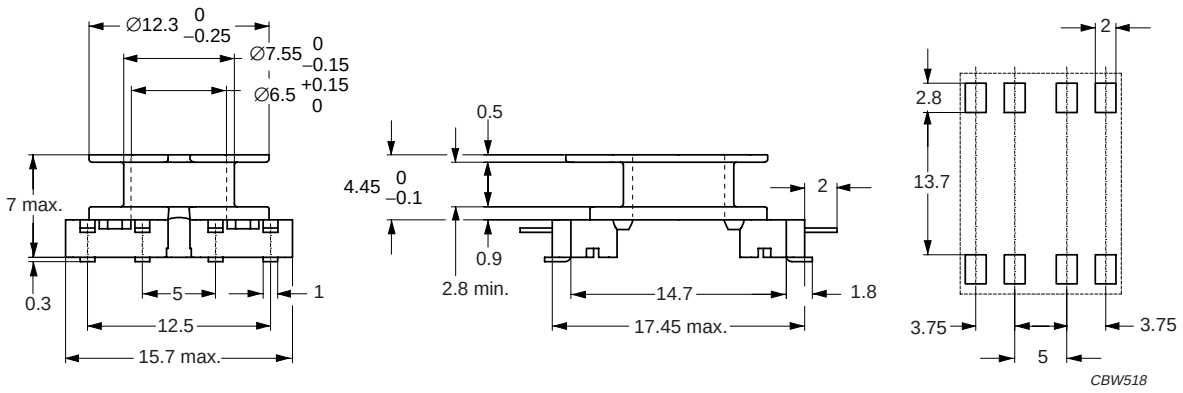
**Properties of core sets under power conditions (continued)**

| GRADE | B (mT) at | CORE LOSS (W) at | | | | |
|---|---|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 500 kHz; $\hat{B}$ = 50 mT; T = 100 °C | f = 500 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 1 MHz; $\hat{B}$ = 30 mT; T = 100 °C | f = 1 MHz; $\hat{B}$ = 50 mT; T = 100 °C | f = 3 MHz; $\hat{B}$ = 10 mT; T = 100 °C |
| 3C90 | ≥320 | – | – | – | – | – |
| 3C94 | ≥320 | – | – | – | – | – |
| 3C96 | ≥340 | ≤ 0.3 | – | – | – | – |
| 3F3 | ≥300 | – | – | – | – | – |
| 3F35 | ≥300 | ≤ 0.15 | ≤ 1.0 | – | – | – |
| 3F4 | ≥250 | – | – | ≤ 0.25 | – | ≤ 0.4 |
| 3F45 | ≥250 | – | – | ≤ 0.17 | ≤ 0.4 | ≤ 0.3 |

## COIL FORMERS

### General data

| PARAMETER | DESCRIPTION |
|---|---|
| Coil former material | phenolformaldehyde (PF), glass-reinforced, flame retardant in accordance with *"UL 94V-0"*; UL file number E41429 (M) |
| Solder pad material | copper-tin alloy (CuSn), tin-lead alloy (SnPb) plated, transition to lead-free (Sn) ongoing |
| 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 |




Dimensions in mm.

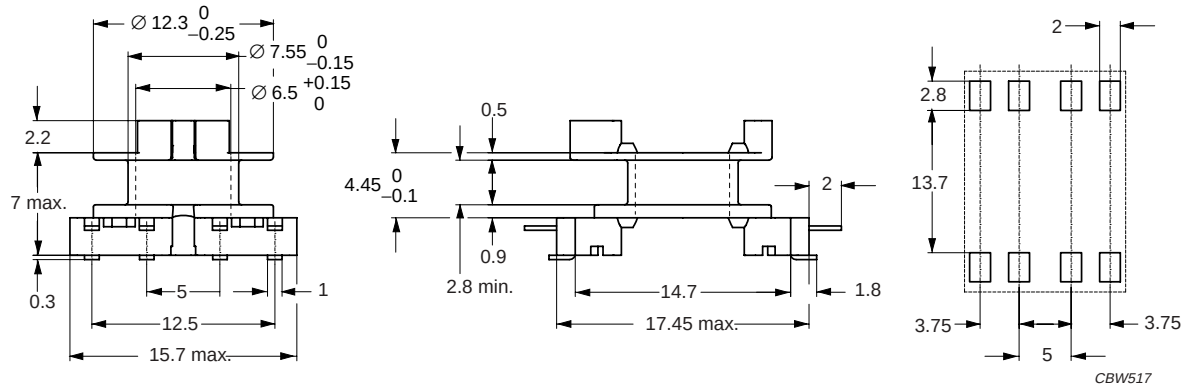
Fig.2 SMD coil former for RM6S/ILP.

### Winding data for RM6S/ILP coil former (SMD)

| NUMBER OF SECTIONS | NUMBER OF SOLDER PADS | WINDING AREA ($mm^2$) | WINDING WIDTH (mm) | AVERAGE LENGTH OF TURN (mm) | TYPE NUMBER |
|---|---|---|---|---|---|
| 1 | 8 | 6.3 | 2.85 | 31.0 | CSVS-RM6S/LP-1S-8P |

**General data (continued)**

| PARAMETER | DESCRIPTION |
|---|---|
| Coil former material | phenolformaldehyde (PF), glass-reinforced, flame retardant in accordance with *"UL 94V-0"*; UL file number E41429 (M) |
| Solder pad material | copper-tin alloy (CuSn), tin-lead alloy (SnPb) plated, transition to lead-free (Sn) ongoing |
| 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 |




Dimensions in mm.

Fig.3 SMD coil former for RM6S/ILP.

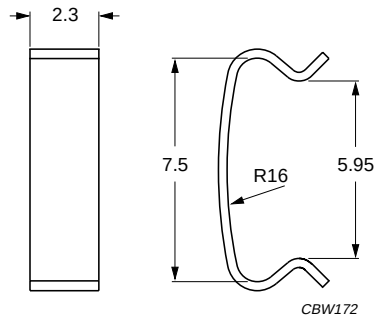
**Winding data for RM6S/ILP coil former (SMD)**

| NUMBER OF SECTIONS | NUMBER OF SOLDER PADS | WINDING AREA ($mm^2$) | WINDING WIDTH (mm) | AVERAGE LENGTH OF TURN (mm) | TYPE NUMBER |
|---|---|---|---|---|---|
| 1 | 8 | 6.4 | 2.85 | 31.4 | CSVS-RM6S/LP-1S-8P-B |

## MOUNTING PARTS

### General data

| ITEM | SPECIFICATION |
|---|---|
| Clamping force | ≈10 N |
| Clip material | stainless steel (CrNi) |
| Type number | CLI-RM6/ILP |




Dimensions in mm.

Fig.4 Mounting clip for RM6/ILP.

**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 |
|---|---|---|
| **Prototype** | prot | 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. |
| **Design-in** | des | These products are recommended for new designs. |
| **Preferred** | | These products are recommended for use in current designs and are available via our sales channels. |
| **Support** | sup | These products are **not** recommended for new designs and may not be available through all of our sales channels. Customers are advised to check for availability. |