Ferrites and accessories

Packing

Date: October 2022

Packing

Survey of packing modes

Ferrite cores

	Type	Packing	Para.	Page
RM cores	RM 4 … RM 10 RM 12, RM 14	Blister tape Standard tray	3.2 2.2.1	8 5
PQ cores	PQ 16 … PQ 65 PQ 26 … PQ 32	Standard tray Cardbord tray on request	2.2.1 2.5	5 6
PM cores	PM 50/39 … PM 114/93	Standard tray	2.2.1	5
P cores	All P cores P 9 × 5 … P 22 × 13 PCH 4.6	Standard tray Blister tape on request Vacuum bag	2.2.1 3.2	5 8
P core halves	7.35 × 3.6 … 150 × 30	Standard tray	2.2.1	5
EP cores	EP 5 … EP 20, EPX 9/9 EPX 7/9, EPX 10, EPO 13 EP 11	Standard tray Blister tape on request Cardbord tray with vacuum bag	2.2.1 3.2 2.6	5 8 6
E cores	E 5 … E 10 E 5 and E 6.3 Core length 12.6 … 36 mm Core length > 36 mm E 47	Standard tray Blister tape on request Block packing Standard tray Skin packing	2.2.1 3.3 2.2.2 2.2.1 3.6	5 8 5 5 12
ELP cores	All ELP cores ELP 43, I 43	Standard tray Skin packing	2.2.1 3.6	5 12
ER cores	All ER cores ER 32 ER 14.5	Standard tray (blister tape on request) Skin packing Cardbord tray with vacuum bag	2.2.1 3.2 3.6 2.6	5 8 12 6
EQ cores ETD cores EFD cores EV cores		Standard tray	2.2.1	5
U and I cores	I 126 I 18.4 I 10	Cardboard tray Vacuum bag Blister tape	2.5 3.2	6 8
Toroids (ring cores)	Packing depends on size and version (coated/uncoated)	Standard tray Box Bag Skin packing	2.2.1 2.3.2 2.3.1	5 6 6
Double-aperture cores		Bag	2.3.1	6

Packing

Accessories

Coil formers	Polystyrene boards, carton boxes, bags and blister trays	2.4	6
Mounting assemblies	Boxes	2.3.2	6
Clamps	Bags (individual clamps)	2.3.1	6
Insulating washers	Bags (individual washers), boxes	2.3.1	6
Insulating washers	Packed on reels	2.3.2	6

We can supply the packaging according to customer requirement.

Please read *Cautions and warnings* and
Important notes at the end of this document.

3 10/22

Packing

1 General information

Our product packaging modes ensure maximum protection against damage during transportation. Moreover, our packing materials are selected with environmental considerations in mind. They are marked with the appropriate recycling symbols.

Because of the large variety of types and sizes, we use five basic kinds of packing, which are described in points 2 and 3 below:

- Blister tape
- Tray
- Container
- Reel
- Magazine

The packing units are based on the following system:

1.1 Packing unit (PU)

Usually, a packing unit is a collection of a number of basic packages. The size of the packing unit is stated for the particular components in their data sheets. When ordering, please state complete packing units if possible. We reserve the right to round the ordered quantity accordingly.

1.2 Dispatch unit

A number of packing units are combined to form a dispatch unit. Standard dispatch units for large quantities are a Europallet or pallet carton. For small quantities, folding corrugated cardboard boxes are used in standard sizes. In the case of small quantities a dispatch unit may also include packages with other components.

1.3 Barcode label

On the product packing label (standard label) we include bar-code information in addition to plain text. In addition to benefits relating to the internal flow of goods, this provides above all a more rapid and error-free means of identification checking for the customer.

Please read *Cautions and warnings* and
Important notes at the end of this document.

4 10/22

2 Modes of packing

2.1 Blister tape

Blister packing was specially devised for handling by automatic systems but has also proved to be very good for conventional handling, especially where small quantities are concerned. See point 3.2 for a detailed description and a list of the core types that can be supplied in this type of packing.

2.2 Tray (pallet)

2.2.1 Standard tray

The polystyrene tray (basic package) is the standard packing for most types of core. The area of 200 mm × 300 mm corresponds to the module dimensions of DIN 55 510 and is based on the area of the 800 mm × 1200 mm Europallet. Depending on the overall height of the trays and the numbers contained, several trays will be stacked to form a packing unit and provided with a corrugated cardboard cover. For the protection of the cores the entire stack is also shrink-wrapped in polyethylene film.
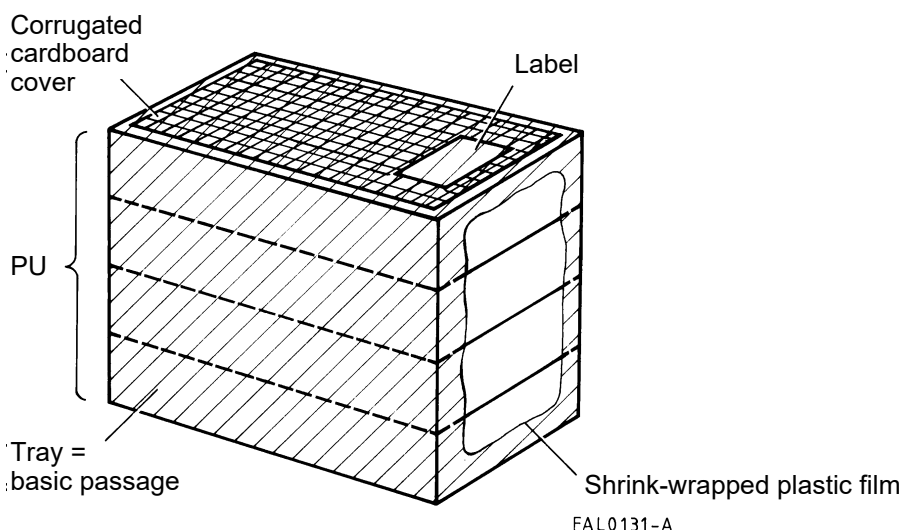
Each core is enclosed in a separate compartment. When P cores and similar types are packed in sets, the halves of the core pairs are packed so that their pole faces are opposite one another. As a rule their association is identified by markings in the polystyrene (recessed webs, thinner webs). In the case of P 3.3 × 2.6 and P 4.6 × 4.1 cores the halves of a set are not located in a single tray but in different trays of a packing unit.

2.2.2 Block packing

For E and U core we prefer block packing in trays with the dimensions 200 mm × 300 mm. The symmetry, position, length and spacing of the blocks are always the same. The height of the tray is dependent on the size of the core. For the makeup of a packing unit see point 2.2.1.

Block packing can be supplied in boxes of corrugated cardboard (special packing unit!) on request.

Block packing permits highly rationalized handling and is designed for automatic processing.

Packing unit for standard or block packing

FAL0131–A

Please read *Cautions and warnings* and
Important notes at the end of this document.

5   10/22

2.3 Container

2.3.1 Bag

Small ferrite parts are packed in flat polyethylene vacuum bags. The number per bag depends on the volume of the parts. Generally four bags in a corrugated cardboard box form a packing unit.

Small accessories (clamps, pinless and SMD coil formers) are also packed in this way. The size of the bag depends on the volume of the parts (packing unit).

2.3.2 Boxes

Coated ring cores of medium size are packed in cardboard boxes with cardboard or polyethylene foam inlays. The number per box depends on the volume of the cores.

Accessories (large mounting assemblies, clamps, washers packed on reels etc.) are packed in boxes of cardboard or corrugated cardboard.

2.4 Packing for coil formers

For coil formers we use different packing types depending on size, pin type and packing equipment. So we use polystyrene boards for some PTH coil formers like RM types. For most of the other PTH coil formers and some SMD coil formers we use cardboard boxes as bulk packaging. Coil formers without pins are mainly packed in plastic bags. For some SMD coil formers we also use blister tray packaging.
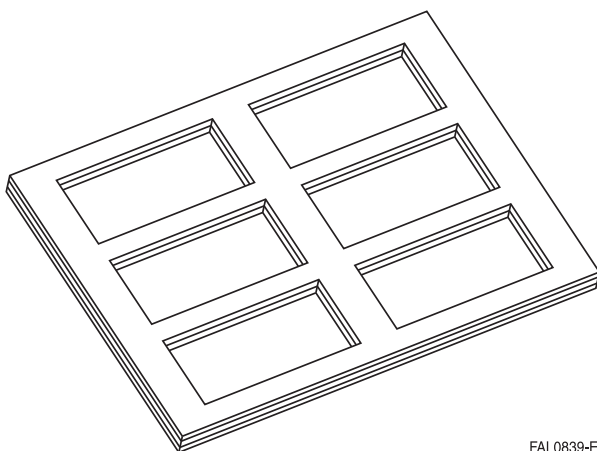
2.5 Cardboard tray

Cardboard trays are a new ecological packing system, stacked in a cardboard box or in a plastic bag.

Advantages:
– Environmentally friendly solution with easy-to-recycle materials.
– Good removing cores from tray.

Packing unit for cardboard trays

FAL0839-E

2.6 Cardboard tray with vacuum bag

There is used a cardboard tray without slots for individual cores. The tray with cores is placed in vacuum bag, which protects the cores during a transport. The package is suitable for smaller cores that are not too high. The cores are not oriented on the tray.

Please read *Cautions and warnings* and
Important notes at the end of this document.

6 10/22

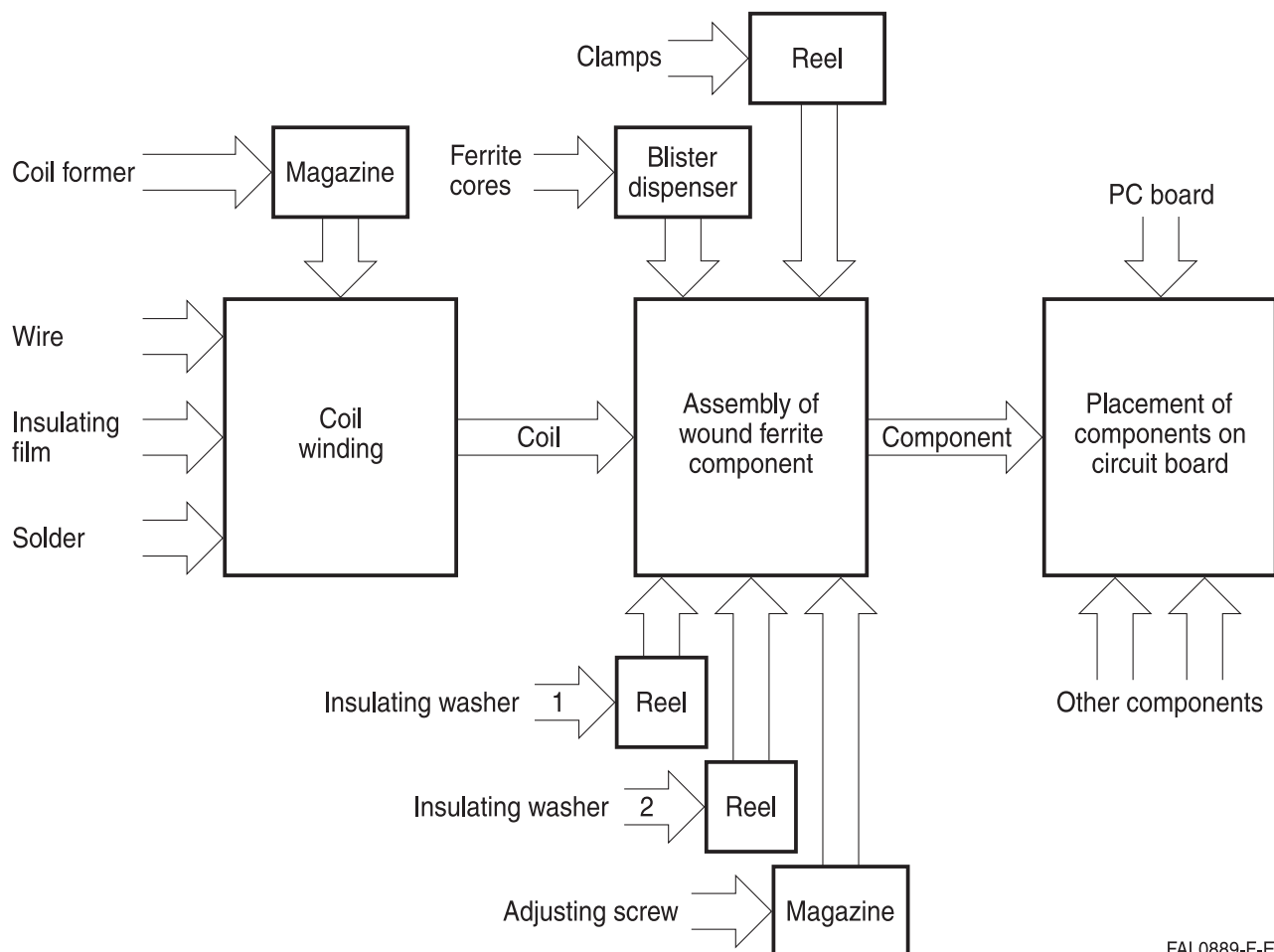## 3 Delivery modes for automatic processing

3.1 General information on inductor production

The inductor parts described in the following can be handled by automatic manufacturing systems. In addition to automatic winding machines – which can be combined with wrapping, fluxing and soldering stations – flexible, high-performance automatic assembly lines are available. Design and packing of the individual parts (ferrite cores, coil formers, clamps, insulating washers and adjusting screws) have been optimized for automatic processing and permit easy feeding to the various stations of production lines.

We supply RM cores up to RM 10 (P and EP cores on request) blister-taped in dispenser boxes. By inserting a plate-shaped resilient insulating washer between core and coil former, gluing can be dispensed with.

We also provide consulting services with examples of implementations to customers planning to introduce automatic production lines.

Production sequence

FAL0889-F-E

Please read *Cautions and warnings* and
Important notes at the end of this document.

7 10/22

3.2 Cores in blister tape (strips)

The cores are packed in sets ready for assembly, i.e. a stamped core with the base upwards and an unstamped core (possibly with a threaded sleeve) with the pole face upwards. The blister tapes have a hole at one end for orientation purposes (see also illustration). The tapes are sealed with a paper cover. Looking at a tape with the hole on the left and the paper cover on top, then after removing the paper cover the stamped cores will be in the upper row and the unstamped cores of the sets in the lower row.

1) Depends on core height
2) Thickness incl. cover tape

FAL0882-S-E
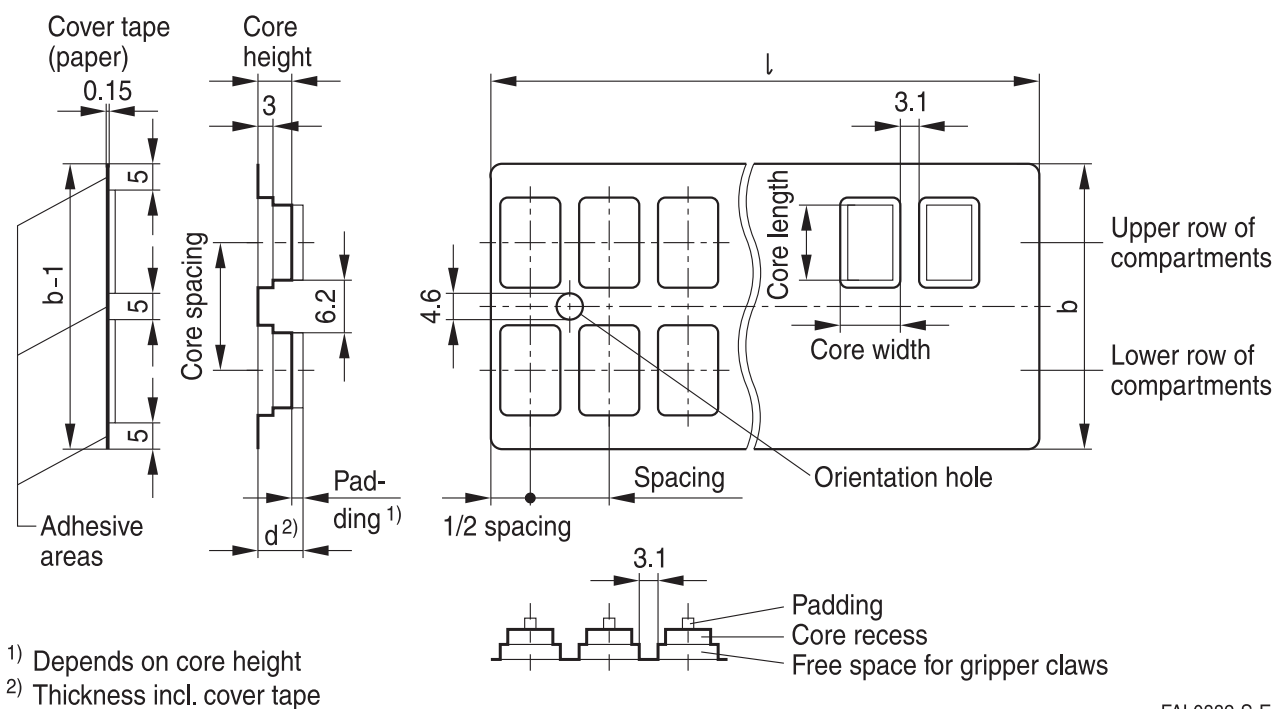
The blister compartments always comprise the following function spaces: a free space for the gripper claws, the recess in which the core rests and the padding.

The free space enables the cores to be removed by mechanical grippers. On the reverse side of the blister, these free spaces lead to a regular grid arrangement with a spacing of 6.2 mm and 3.1 mm. The blisters should be guided and stopped at these intervals. A hanging arrangement is to be preferred, because this avoids problems arising in case the blister height or padding thickness varies.

The core recess centers the core in the blister compartment.

The padding serves as protection during transport and as spacing to achieve correct filling of the dispenser pack. The shape and position of the padding may vary, depending on the production method used. All padding dimensions given must therefore be considered to be subject to change at any time.

Several blister tapes are combined in a box with a perforated tear-off cover (dispenser pack) to form a packing unit. The tapes are packed so that the orientation hole appears in the dispenser opening. The box is shrink-wrapped in polyethylene film.

Please read *Cautions and warnings* and
Important notes at the end of this document.

8   10/22

Packing

The following table lists the core types which are available in blister tape:
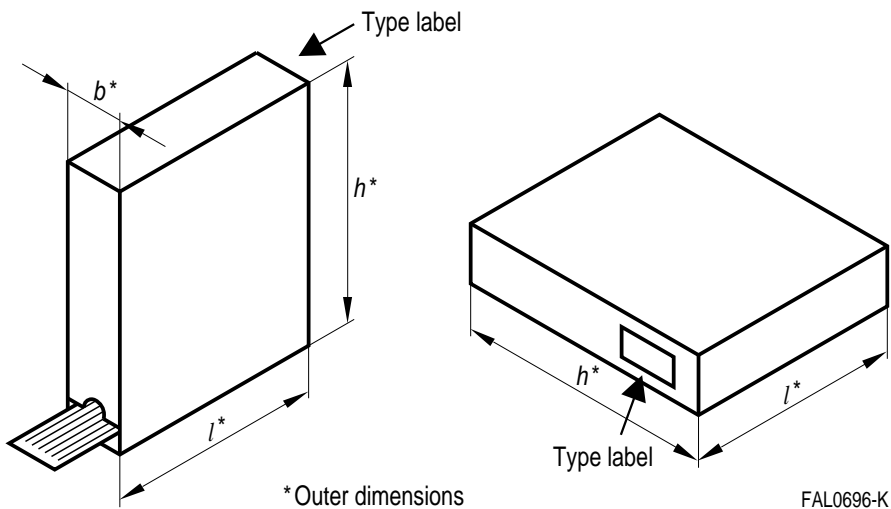
| Type	Dimensions of blister tape l × b × d mm	Spacing mm	Spacing upper/ lower row mm	Dimensions of dispenser pack l × b × h mm	Sets/ tape	Tapes/ box	Sets/ box	Approx. net weight g
RM cores								
RM 4	340 × 60 × 6.6	17.0	27.5	349 × 63 × 203	20	30	600	1000
RM 4 LP	340 × 60 × 5.0	17.0	27.5	349 × 63 × 203	20	40	800	
RM 5	340 × 60 × 8.0	17.0	27.5	349 × 63 × 203	20	25	500	1550
RM 6	340 × 60 × 8.0	17.0	27.5	349 × 63 × 203	20	25	500	2550
R 6	340 × 60 × 8.0	17.0	27.5	349 × 63 × 203	20	25	500	2550
RM 7	295 × 82 × 9.4	29.5	38.5	301 × 85 × 240	10	25	400	1925
RM 8	295 × 82 × 11.8	29.5	38.5	301 × 85 × 240	10	20	200	2600
RM 10	295 × 82 × 11.8	29.5	38.5	301 × 85 × 240	10	20	200	4600
RM 10 LP	295 × 82 × 9.4	29.5	38.5	301 × 85 × 240	10	25	250	
EP cores (on request)								
EP 7	340 × 60 × 5.0	17.0	27.5	349 × 63 × 203	20	40	800	1260
EP 10	340 × 60 × 8.0	17.0	27.5	349 × 63 × 203	20	25	500	1375
EP 13	340 × 60 × 8.0	17.0	27.5	349 × 63 × 203	20	25	500	2550
EP 17	295 × 82 × 11.8	29.5	38.5	301 × 85 × 240	10	20	200	2220
EP 20	295 × 82 × 11.8	29.5	38.5	301 × 85 × 240	10	20	200	5640
P cores (on request)								
P 9 × 5	340 × 60 × 4.0	17.0	27.5	349 × 63 × 203	20	50	1000	800
P 11 × 7	340 × 60 × 4.0	17.0	27.5	349 × 63 × 203	20	50	1000	1700
P 14 × 8	295 × 82 × 5.9	29.5	38.5	301 × 85 × 240	10	40	400	1280
P 18 × 11	295 × 82 × 9.4	29.5	38.5	301 × 85 × 240	10	25	250	1500
P 22 × 13	295 × 82 × 9.4	29.5	38.5	301 × 85 × 240	10	25	250	3250

For ordering codes refer to the individual data sheets.

Dimensions are nominal; tolerances given in design drawings.

Please read *Cautions and warnings* and
Important notes at the end of this document.

9   10/22

3.3 Dispenser pack

* Outer dimensions   FAL0696-K

To open a blister tape manually, peel back the paper cover tape smoothly but not too quickly, along the axis of the tape as shown in the following illustration.
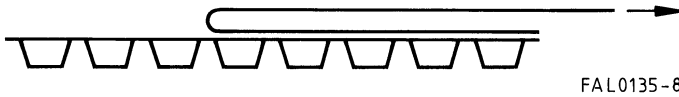

FAL0135–8

When opening a blister tape automatically, it is advisable not to completely remove the paper cover. Rather, the cover paper should be divided up by means of 4 longitudinal cuts so that the mating surfaces remain on the blister (cf. blister tape illustration). The paper strips produced above the two rows of compartments can then be easily lifted. This avoids malfunctions resulting from fluctuations in the adhesive properties of the paper sealing tape.

Please read *Cautions and warnings* and
Important notes at the end of this document.

10   10/22

3.4   Cores in blister tape (reeled)

Small and low profile cores can also be supplied taped an reeled as per IEC 60286-3, optionally in conductive or non-conductive tapes. The cores are oriented for automatic feeding. The tapes are sealed with a transparent cover tape and wound on 330-mm polystyrol reels. Each reel is identified with a barcode label and a release label.
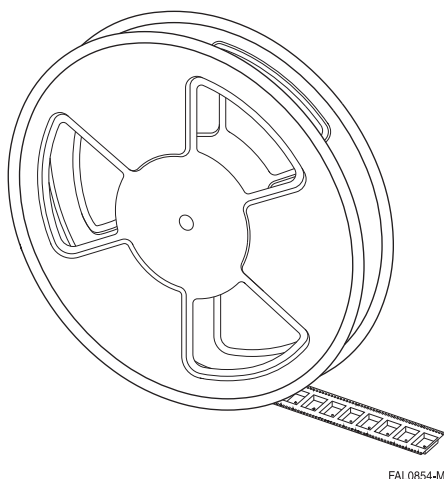
FAL0854-M

The following table lists the core types which are available in tape on reel.

Type	Width of blister tape (reeled) mm	Reel diameter	Pieces / Blister tape	Pieces / cardboard box
ELP cores				
ELP 18/4/10	32	"13"	1000	2000
ELP 22/6/16	32	"13"	325	650
ER cores				
ER 11/2.5/6	24	"13"	1800	3600
ER 14.5/3/7	24	"13"	1400	2800
ER 18/3/10	32	"13"	1000	2000
ER 23/5/13	44	"13"	800	1600
I cores				
I 22/2.5/16	44	"13"	325	650
I 22/2/13	44	"13"	1600	3200

Please read *Cautions and warnings* and
Important notes at the end of this document.

11   10/22

3.5 Skin packing

Skin packing is a new and very compact packing method.

Several cores are placed on a cardboard pallet and sealed in GLTE film by heat shrinking. The various pallets are then stacked in a cardboard box.

Cores

Cardboard pallet

GLTE film

FAL0697-T

Cardboard cover

Cardboard box

FAL0677-E
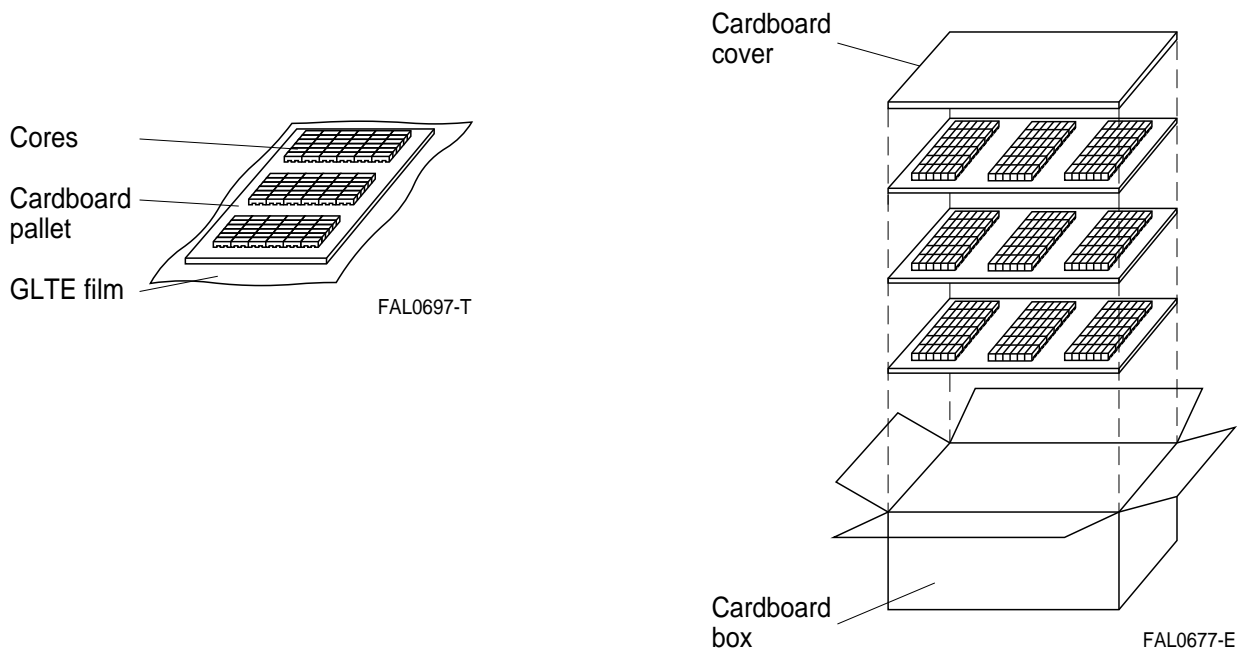
Advantages

- Environmentally friendly solution with easy-to-recycle materials
- Suitable for all cores larger than E 30
- Good protection of mating surface
- Film can be peeled back very easily
- Code numbers printed on cores can be read through transparent film

Please read *Cautions and warnings* and
Important notes at the end of this document.

12 10/22

Mechanical stress and mounting

Ferrite cores have to meet mechanical requirements during assembling and for a growing number of applications. Since ferrites are ceramic materials one has to be aware of the special behavior under mechanical load.

As valid for any ceramic material, ferrite cores are brittle and sensitive to any shock, fast temperature changing or tensile load. Especially high cooling rates under ultrasonic cleaning and high static or cyclic loads can cause cracks or failure of the ferrite cores.

For detailed information see data book, chapter *"General - Definitions, 8.1"*.

Effects of core combination on A_L value

Stresses in the core affect not only the mechanical but also the magnetic properties. It is apparent that the initial permeability is dependent on the stress state of the core. The higher the stresses are in the core, the lower is the value for the initial permeability. Thus the embedding medium should have the greatest possible elasticity.

For detailed information see data book, chapter *"General - Definitions, 8.1"*.

Heating up

Ferrites can run hot during operation at higher flux densities and higher frequencies.

NiZn-materials

The magnetic properties of NiZn-materials can change irreversible in high magnetic fields.

Ferrite Accessories

Our ferrite accessories have been designed and evaluated only in combination with our ferrite cores. We explicitly point out that our ferrite accessories or our ferrite cores may not be compatible with those of other manufacturers. Any such combination requires prior testing by the customer and will be at the customer's own risk.

We assume no warranty or reliability for the combination of our ferrite accessories with cores and other accessories from any other manufacturer.

Processing remarks

The start of the winding process should be soft. Else the flanges may be destroyed.

– Too strong winding forces may blast the flanges or squeeze the tube that the cores can not be mounted any more.
– Too long soldering time at high temperature (>300 °C) may effect coplanarity or pin arrangement.
– Not following the processing notes for soldering of the J-leg terminals may cause solderability problems at the transformer because of pollution with Sn oxide of the tin bath or burned insulation of the wire. For detailed information see chapter *"Processing notes"*, section 2.2.
– The dimensions of the hole arrangement have fixed values and should be understood as a recommendation for drilling the printed circuit board. For dimensioning the pins, the group of holes can only be seen under certain conditions, as they fit into the given hole arrangement. To avoid problems when mounting the transformer, the manufacturing tolerances for positioning the customers' drilling process must be considered by increasing the hole diameter.

Please read *Cautions and warnings* and
Important notes at the end of this document.

13 10/22

Display of ordering codes for TDK Electronics products

The ordering code for one and the same product can be represented differently in data sheets, data books, other publications, on the company website or in order-related documents such as shipping notes, order confirmations and product labels. **The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products**. Detailed information can be found on the Internet under www.tdk-electronics.tdk.com/orderingcodes.

Please read *Cautions and warnings* and
Important notes at the end of this document.

14 10/22

Symbol	Meaning	Unit
A	Cross section of coil	mm^2
A_e	Effective magnetic cross section	mm^2
A_L	Inductance factor; $A_L = L/N^2$	nH
A_{L1}	Minimum inductance at defined high saturation ($\triangleq \mu_a$)	nH
A_{min}	Minimum core cross section	mm^2
A_N	Winding cross section	mm^2
A_R	Resistance factor; $A_R = R_{Cu}/N^2$	$\mu\Omega = 10^{-6}\,\Omega$
B	RMS value of magnetic flux density	Vs/m^2, mT
ΔB	Flux density deviation	Vs/m^2, mT
$\hat{B}$	Peak value of magnetic flux density	Vs/m^2, mT
$\Delta\hat{B}$	Peak value of flux density deviation	Vs/m^2, mT
B_{DC}	DC magnetic flux density	Vs/m^2, mT
B_R	Remanent flux density	Vs/m^2, mT
B_S	Saturation magnetization	Vs/m^2, mT
C_0	Winding capacitance	F = As/V
CDF	Core distortion factor	$mm^{-4.5}$
DF	Relative disaccommodation coefficient $DF = d/\mu_i$	
d	Disaccommodation coefficient	
E_a	Activation energy	J
f	Frequency	s^{-1}, Hz
f_{cutoff}	Cut-off frequency	s^{-1}, Hz
f_{max}	Upper frequency limit	s^{-1}, Hz
f_{min}	Lower frequency limit	s^{-1}, Hz
f_r	Resonance frequency	s^{-1}, Hz
f_{Cu}	Copper filling factor	
g	Air gap	mm
H	RMS value of magnetic field strength	A/m
$\hat{H}$	Peak value of magnetic field strength	A/m
H_{DC}	DC field strength	A/m
H_c	Coercive field strength	A/m
h	Hysteresis coefficient of material	10^{-6} cm/A
h/μ_i^2	Relative hysteresis coefficient	10^{-6} cm/A
I	RMS value of current	A
I_{DC}	Direct current	A
$\hat{I}$	Peak value of current	A
J	Polarization	Vs/m^2
k	Boltzmann constant	J/K
k_3	Third harmonic distortion	
k_{3c}	Circuit third harmonic distortion	
L	Inductance	H = Vs/A

Please read *Cautions and warnings* and
Important notes at the end of this document.

15 10/22

Symbol	Meaning	Unit
$\Delta L/L$	Relative inductance change	H
L_0	Inductance of coil without core	H
L_H	Main inductance	H
L_p	Parallel inductance	H
L_{rev}	Reversible inductance	H
L_s	Series inductance	H
l_e	Effective magnetic path length	mm
l_N	Average length of turn	mm
N	Number of turns	
P_{Cu}	Copper (winding) losses	W
P_{trans}	Transferrable power	W
P_V	Relative core losses	mW/g
PF	Performance factor	
Q	Quality factor ($Q = \omega L/R_s = 1/\tan \delta_L$)	
R	Resistance	Ω
R_{Cu}	Copper (winding) resistance ($f = 0$)	Ω
R_h	Hysteresis loss resistance of a core	Ω
ΔR_h	R_h change	Ω
R_i	Internal resistance	Ω
R_p	Parallel loss resistance of a core	Ω
R_s	Series loss resistance of a core	Ω
R_{th}	Thermal resistance	K/W
R_V	Effective loss resistance of a core	Ω
s	Total air gap	mm
T	Temperature	°C
ΔT	Temperature difference	K
T_C	Curie temperature	°C
t	Time	s
t_v	Pulse duty factor	
$\tan \delta$	Loss factor	
$\tan \delta_L$	Loss factor of coil	
$\tan \delta_r$	(Residual) loss factor at $H \rightarrow 0$	
$\tan \delta_e$	Relative loss factor	
$\tan \delta_h$	Hysteresis loss factor	
$\tan \delta/\mu_i$	Relative loss factor of material at $H \rightarrow 0$	
U	RMS value of voltage	V
$\hat{U}$	Peak value of voltage	V
V_e	Effective magnetic volume	mm^3
Z	Complex impedance	Ω
Z_n	Normalized impedance $\lvert Z \rvert_n = \lvert Z \rvert /N^2 \times \varepsilon \,(l_e/A_e)$	Ω/mm

Please read *Cautions and warnings* and
Important notes at the end of this document.

16 10/22

Symbol	Meaning	Unit
α	Temperature coefficient (TK)	1/K
α_F	Relative temperature coefficient of material	1/K
α_e	Temperature coefficient of effective permeability	1/K
ε_r	Relative permittivity	
Φ	Magnetic flux	Vs
η	Efficiency of a transformer	
η_B	Hysteresis material constant	mT^{-1}
η_i	Hysteresis core constant	$A^{-1}H^{-1/2}$
λ_s	Magnetostriction at saturation magnetization	
μ	Relative complex permeability	
μ_0	Magnetic field constant	Vs/Am
μ_a	Relative amplitude permeability	
μ_{app}	Relative apparent permeability	
μ_e	Relative effective permeability	
μ_i	Relative initial permeability	
$\mu_p{}'$	Relative real (inductive) component of $\overline{\mu}$ (for parallel components)	
$\mu_p{}''$	Relative imaginary (loss) component of $\overline{\mu}$ (for parallel components)	
μ_r	Relative permeability	
μ_{rev}	Relative reversible permeability	
$\mu_s{}'$	Relative real (inductive) component of $\overline{\mu}$ (for series components)	
$\mu_s{}''$	Relative imaginary (loss) component of $\overline{\mu}$ (for series components)	
μ_{tot}	Relative total permeability	
	derived from the static magnetization curve	
ρ	Resistivity	Ωm^{-1}
$\Sigma l/A$	Magnetic form factor	mm^{-1}
τ_{Cu}	DC time constant $\tau_{Cu} = L/R_{Cu} = A_L/A_R$	s
ω	Angular frequency; $\omega = 2\,\Pi f$	s^{-1}

All dimensions are given in mm.

SMD   Surface-mount device

Please read *Cautions and warnings* and
Important notes at the end of this document.

17 10/22

Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application.** As a rule, we are either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether a product with the properties described in the product specification is suitable for use in a particular customer application.

2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified.** In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.

3. **The warnings, cautions and product-specific notes must be observed**.

4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet (www.tdk-electronics.tdk.com/material). Should you have any more detailed questions, please contact our sales offices.

5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order.
We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available. The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

6. Unless otherwise agreed in individual contracts, **all orders are subject to our General Terms and Conditions of Supply**.

Please read *Cautions and warnings* and
Important notes at the end of this document.

18 10/22

7. **Our manufacturing sites serving the automotive business apply the IATF 16949 standard**. The IATF certifications confirm our compliance with requirements regarding the quality management system in the automotive industry. Referring to customer requirements and customer specific requirements ("CSR") TDK always has and will continue to have the policy of respecting individual agreements. Even if IATF 16949 may appear to support the acceptance of unilateral requirements, we hereby like to emphasize that **only requirements mutually agreed upon can and will be implemented in our Quality Management System.** For clarification purposes we like to point out that obligations from IATF 16949 shall only become legally binding if individually agreed upon.

8. The trade names EPCOS, CarXield, CeraCharge, CeraDiode, CeraLink, CeraPad, CeraPlas, CSMP,   CTVS, DeltaCap, DigiSiMic, ExoCore, FilterCap, FormFit, InsuGate, LeaXield, MiniBlue, MiniCell, MKD, MKK, ModCap, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, PowerHap, PQSine, PQvar, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, ThermoFuse, WindCap, XieldCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at www.tdk-electronics.tdk.com/trademarks.

Release 2022-07

Please read *Cautions and warnings* and
Important notes at the end of this document.

19 10/22