

Toroids (ring cores) $R 18.4 \times 5.90 \times 5.90$

Series/Type: B64290L0697

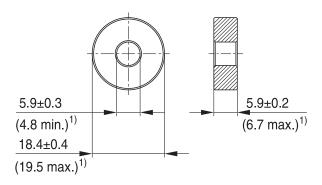
Date: May 2023

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Epoxy coating

R $18.4 \times 5.90 \times 5.90$ (mm) R $0.724 \times 0.232 \times 0.232$ (inch)



1) With coating

FUS0238-P-E

Dimensions

d _a (mm)	d _i (mm)	Height (mm)	d _a (inch)	d _i (inch)	Height (inch)	
18.4 ±0.4	5.9 ±0.3	5.90 ±0.2	0.724 ±0.016	0.232 ±0.012	0.232 ±0.008	uncoated1)
19.5 max.	4.8 min.	6.7 max.	0.768 max.	0.189 min.	0.264 max.	coated

Characteristics and ordering codes

Mate-	A _L value	μ_{i}	Ordering code	Magneti	c charact	eristics		Approx.
rial		(approx.)		ΣΙ/Α	l _e	A _e	V _e	weight
	nH			mm ^{−1}	mm	mm ²	mm ³	g
N87	2950 ±25%	2200	B64290L0697X087	0.94	31.03	33.14	1029	6.9
N30	5770 ±25%	4300	B64290L0697X830					
T65	6680 ±30%	5000	B64290L0697X065					
T35	8020 ±25%	6000	B64290L0697X035					
T37	8690 ±25%	6500	B64290L0697X037					
T38	13400 ±30%	10000	B64290L0697X038					

N87: P_V (200 mT, 100 kHz, 100 °C) < 0.82 W/core

¹⁾ On request.



Cautions and warnings

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 A₁ 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 oxyde 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.

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Cautions and warnings

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.



Symbols and terms

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; $A_R = R_{Cu}/N^2$	$\mu\Omega = 10^{-6} \Omega$
В	RMS value of magnetic flux density	Vs/m ² , mT
ΔΒ	Flux density deviation	Vs/m ² , mT
Ê	Peak value of magnetic flux density	Vs/m ² , mT
Δ Ŝ	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/μ_i	
d	Disaccommodation coefficient	
Ea	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
Ĥ	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
1	RMS value of current	Α
I _{DC}	Direct current	Α
Î	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



Symbols and terms

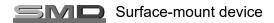
Symbol	Meaning	Unit
ΔL/L	Relative inductance change	Н
L_0	Inductance of coil without core	Н
L _H	Main inductance	Н
L_p	Parallel inductance	Н
L _{rev}	Reversible inductance	Н
L _s	Series inductance	Н
l _e	Effective magnetic path length	mm
I _N	Average length of turn	mm
N	Number of turns	
P_{Cu}	Copper (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 δ_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^r	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
Т	Temperature	°C
ΔT	Temperature difference	K
T_{C}	Curie temperature	°C
t	Time	s
t_{v}	Pulse duty factor	
tan δ	Loss factor	
tan δ_I	Loss factor of coil	
$tan \delta_r$	(Residual) loss factor at H \rightarrow 0	
$tan \delta_e$	Relative loss factor	
tan δ_h	Hysteresis loss factor	
tan δ/μ _i	Relative loss factor of material at H \rightarrow 0	
U	RMS value of voltage	V
Û	Peak value of voltage	V
V _e	Effective magnetic volume	mm ³
Z	Complex impedance	Ω
Z_n	Normalized impedance $ Z _n = Z / N^2 \times \varepsilon (I_e / A_e)$	Ω/mm



Symbols and terms

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
r	Relative permittivity	
Þ	Magnetic flux	Vs
1	Efficiency of a transformer	
В	Hysteresis material constant	mT-1
li	Hysteresis core constant	$A^{-1}H^{-1/2}$
'S	Magnetostriction at saturation magnetization	
,	Relative complex permeability	
0	Magnetic field constant	Vs/Am
a	Relative amplitude permeability	
app	Relative apparent permeability	
е	Relative effective permeability	
i	Relative initial permeability	
p'	Relative real (inductive) component of $\overline{\mu}$ (for parallel components)	
p"	Relative imaginary (loss) component of $\overline{\mu}$ (for parallel components)	
r	Relative permeability	
rev	Relative reversible permeability	
s'	Relative real (inductive) component of $\overline{\mu}$ (for series components)	
s S	Relative imaginary (loss) component of $\overline{\mu}$ (for series components)	
tot	Relative total permeability	
	derived from the static magnetization curve	
	Resistivity	Ω m $^{-1}$
I/A	Magnetic form factor	mm ⁻¹
Cu	DC time constant $\tau_{Cu} = L/R_{Cu} = A_L/A_R$	s
)	Angular frequency; ω = 2 Π f	s ⁻¹

All dimensions are given in mm.





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

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Important notes

- 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, 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