

Toroids R $20.0 \times 10.0 \times 7.00$

Series/Type: B64290L0632
Date: July 2014

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Epoxy coating

R 20.0 \times 10.0 \times 7.00 (mm) R 0.787 \times 0.394 \times 0.276 (inch)

Dimensions

d _a (mm)	d _i (mm)	Height (mm)	d _a (inch)	d _i (inch)	Height (inch)	
20.0 ±0.4	10.0 ±0.25	7.00 ±0.3	0.787 ±0.016	0.394 ±0.010	0.276 ±0.012	uncoated 1)
21.2 max.	8.95 min.	8.1 max.	0.835 max.	0.352 min.	0.319 max.	coated

Characteristics and ordering codes

Mate-	A _L value	μ_{i}	Ordering code	Magneti	Magnetic characteristics			Approx.
rial		(approx.)		ΣI/A	l _e	A _e	V _e	weight
	nH			mm ⁻¹	mm	mm ²	mm ³	g
N87	2130 ±25%	2200	B64290L0632X087	1.30	43.55	33.63	1465	7.6
N30	4160 ±25%	4300	B64290L0632X830					
T35	5000 ±25%	5100	B64290L0632X035					
T65	5050 ±30%	5200	B64290L0632X065					
T37	6280 ±25%	6500	B64290L0632X037					
T38	9740 ±30%	10000	B64290L0632X038					

N87: P_V (200 mT, 100 kHz, 100 °C) < 0.95 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 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 chapter "Definitions", section 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 chapter "Definitions", section 8.2.

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.

Processing notes

- The start of the winding process should be soft. Else the flanges may be destroid.
- To strong winding forces may blast the flanges or squeeze the tube that the cores can no more be mount.
- To 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 oxyd of the tin bath or burned insulation of the wire. For detailed information see chapter "Processing notes", section 8.2.
- 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.



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
ΔB	Flux density deviation	Vs/m ² , mT
Â	Peak value of magnetic flux density	Vs/m ² , mT
ΔÂ	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	
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
Н	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	Α
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	
$tan \delta$	Loss factor	
$tan \; \delta_L$	Loss factor of coil	
$tan \ \delta_r$	(Residual) loss factor at $H \rightarrow 0$	
tan δ_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
$\alpha_{\mathbf{e}}$	Temperature coefficient of effective permeability	1/K
r	Relative permittivity	
Þ	Magnetic flux	Vs
1	Efficiency of a transformer	
lв	Hysteresis material constant	mT ⁻¹
li	Hysteresis core constant	$A^{-1}H^{-1/2}$
rs	Magnetostriction at saturation magnetization	
l	Relative complex permeability	
ι ₀	Magnetic field constant	Vs/Am
a	Relative amplitude permeability	
app	Relative apparent permeability	
^l e	Relative effective permeability	
İ	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	
r S	Relative real (inductive) component of $\overline{\mu}$ (for series components)	
″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
O	Angular frequency; $\omega = 2 \Pi f$	s ⁻¹

All dimensions are given in mm.





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