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print

NANOCRYSTALLINE VITROPERM CORES IN PLASTIC CASING FOR COMMON MODE CHOKES

Common Mode Chokes with toroidal tape wound cores of VITROPERM® allow the effective attenuation of asymmetrical and conducted high frequency noise. The high permeability of the nanocrystalline core material achieves superior characteristics at low and middle frequencies, as well as in the high frequency range, when an optimized winding arrangement is chosen. In comparison to conventional ferrite, advantages over the entire frequency range are obtained. Further information is available in our application note → [EMC Products based on Nanocrystalline VITROPERM](#)

Our VITROPERM cores are available with different A_L -levels for many core sizes. Thus, saturation-resistant solutions are available for various fields of applications. If the common mode currents exceed the saturation currents (I_{cm}) of the cores or chokes, cores with higher saturation resistance must be used. High A_L values (high μ) are more suitable for typical single-phase applications with low unbalanced current (e.g. switched-mode power supplies), while cores with lower A_L values are often used in 3-phase applications with high unbalanced currents (e.g. frequency converters with long motor cables).

The plastic cases are suitable for direct winding and offer good mechanical protection of the nanocrystalline core material. This enables the best magnetic properties and highest permeability levels to be maintained. Additional winding protection is optional for heavy wire windings, where there may be a danger of core damage. The plastic materials comply with the standards UL94-V0 (UL file number: E41871), class B (130 °C) and UL94-V0 (UL file number E41938), class F (155 °C).

Epoxy coated designs are listed in the table → [Nanocrystalline VITROPERM cores with epoxy coating](#).

We recommend to examine the theoretical calculations experimentally. For testing purposes VAC offers a special sample kit consisting of selected cores → [Core Sample Kit VITROPERM](#).

The main areas of application are:

- _ EMC filters
- _ Switched-mode power supplies (SMPS), Power supplies
- _ Solar inverters
- _ Uninterruptible power supplies (UPS)
- _ Welding equipment
- _ Wind generators
- _ Frequency converters
- _ Inductive cooking

VAC-Product	nominal core dimensions	limiting dimensions (incl. case)			iron cross section	mean path length	weight	A_L nominal		saturation current I_{cm}^{**} , typical				
		D_a	D_i	H				A_{Fe}	l_{Fe}	m_{Fe}	10 kHz	100 kHz	10 kHz	100 kHz
											μH	A	A	A
	$d_a \times d_i \times h$	mm	mm	mm	cm^2	cm	g							
	mm x mm x mm	mm	mm	mm	cm^2	cm	g	μH		A				
T60006-L2009-W914	9.8 x 6.5 x 4.5	11.2	5.1	5.8	0.06	2.6	1.1	25.5	6.4	0.14	0.3			
T60006-L2012-W902	12 x 8 x 4.5	14.1	6.6	6.3	0.07	3.1	1.7	28.0	6.8	0.15	0.31			
T60006-L2012-W498	12.5 x 10 x 5	14.3	8.5	7.0	0.05	3.5	1.3	10.0	3.6	0.3	0.56			
T60006-L2014-V098	14.4 x 11.4 x 3.2	16.5	9.6	5.0	0.04	4.1	1.1	10.5	2.6	0.21	0.44			
T60006-L2015-W865	15 x 10 x 4.5	17.1	7.9	6.5	0.09	3.9	2.6	27.0	6.7	0.2	0.41			
T60006-L2016-W403								43.0	10.1	0.2	0.41			
T60006-L2016-W308	16 x 10 x 6	17.9	8,1	8.1	0.14	4.1	4.0	11.7	6.5	1.2	1.7			
T60006-L2016-V165								2.1	2.0	5.4	5.7			
T60006-L2017-W515	17.5 x 12.6 x 6	19.2	10.9	8.1	0.12	4.7	4.1	30.0	6.9	0.23	0.48			
T60006-L2019-V184	19 x 15 x 5	21.2	13.0	7.3	0.08	5.3	3.1	18.0	4.4	0.26	0.54			
T60006-L2019-W838	19 x 15 x 10	21.2	13.0	12.3	0.16	5.3	6.3	36.1	8.8	0.26	0.54			
T60006-L2020-W409	20 x 12.5 x 8	22.6	10.3	10.2	0.24	5.1	9.0	55.2	13.6	0.25	0.51			
T60006-L2020-W450								14.3	9.1	1.5	2.2			
T60006-L2025-W523	25 x 20 x 10	27.6	17.4	12.8	0.20	7.1	10.0	28.4	7.3	0.41	0.84			
T60006-L2025-W380								67.0	15.5	0.32	0.65			
T60006-L2025-W451	25 x 16 x 10	27.9	13.6	12.5	0.36	6.4	17.0	17.1	11.5	1.8	2.7			
T60006-L2025-W980								3.2	3.1	9.3	9.6			
T60006-L2030-W423								59.3	14.0	0.5	1.0			
T60006-L2030-W358	30 x 20 x 10	32.8	17.6	12.5	0.40	7.9	23.0	15.5	11.1	2.1	3.1			
T60006-L2030-W981								2.9	2.8	11.4	11.8			
T60006-L2030-W514								88.0	20.0	0.38	0.79			

T60006-L2030-V188	30 x 20 x 15	32.8	17.5	17.8	0.57	7.9	33.0	26.9	16.2	1.8	2.8	
T60006-L2030-V129								15.7	14.1	3.1	3.9	
T60006-L2040-W422								48.0	11.3	0.55	1.1	
T60006-L2040-V113								13.0	8.4	3.0	4.6	
T60006-L2040-W452	40 x 32 x 15	43.1	28.7	18.5	0.46	11.3	38.0	10.2	7.9	3.8	5.2	
T60006-L2040-W964								2.3	2.2	17.0	17.0	
T60006-L2040-W424								99.0	23.1	0.5	1.0	
T60006-L2040-W453								25.0	17.2	2.9	4.4	
T60006-L2045-V102	40 x 25 x 15	43.1	22.5	18.5	0.86	10.2	64.0	87.6	20.0	0.59	1.2	
T60006-L2045-V118								24.3	15.8	3.0	4.6	
T60006-L2045-V101								15.7	14.1	4.6	5.9	
T60006-L2050-W565								18.0	10.0	3.6	5.5	
T60006-L2050-W516	50 x 40 x 20	53.5	36.3	23.4	0.76	14.1	79.0	45.0	13.5	1.0	2.0	
T60006-L2050-V146			36.3					11.7	10.0	5.5	7.1	
T60006-L2050-V166			36.6					3.1	3.0	20.0	21.	
T60006-L2054-V172			87.0					19.9	0.72	1.5		
T60006-L2054-V178	54 x 40 x 20	57.5	37.7	24.1	1.06	14.8	115.0	24.0	15.7	3.7	5.8	
T60006-L2063-W517								161.0	59.0	17.5	1.2	2.5
T60006-L2063-V110								161.0	23.3	13.8	4.5	6.9
T60006-L2063-V144								161.0	15.1	13.5	6.9	8.9
T60006-L2063-W985	63 x 50 x 25	67.3	46.5	28.6	1.24	17.8		163.0	3.3	3.2	30.0	31.0
T60006-L2080-W531								342.0	35.0	24	5.5	8.4
T60006-L2080-V140								342.0	94.0	28.0	1.4	2.8
T60006-L2080-V091								347.0	9.6	9.2	26.0	28.0
T60006-L2090-W518	80 x 50 x 20	86.0	44.7	25.7	2.28	20.4		395.0	81.0	25.1	1.7	3.3
T60006-L2090-V173								400.0	32.5	21.1	5.9	9.1
T60006-L2090-W984								400.0	4.6	4.5	41.0	42.0
T60006-L2100-V081								379.0	14.6	13.1	11.0	14.0
T60006-L2100-V082	100 x 80 x 25	105.5	75.0	29.6	1.9	28.3	379.0	56.3	16.9	2.0	3.9	
T60006-L2102-W468								508.0	55.0	21.6	2.7	4.9
T60006-L2102-V080								508.0	19.1	17.2	11.0	14.0
T60006-L2102-W947								515.0	4.3	4.2	48.0	49.0
T60006-L2160-V066	160 x 130 x 25	166.9	123.9	30.5	2.74	45.6		917.0	13.0	11.7	18.0	23.0
T60006-L2160-V088					2.74			917.0	20.0	13.1	11.0	18.0
T60006-L2160-V074					2.74			917.0	28.0	14.0	8.5	14.0
T60006-L2160-W982					2.85			967.0	3.0	2.9	80.0	82.0

A_L = inductance for N = 1 (tolerance +45 % / -25 %)

I_{cm} : the listed saturation currents are guidelines, only. They are calculated for nominal core dimensions at room temperature and for approx. 70 % saturation flux density.

Further information can be found here:

General information

→ [Application note \(brochure\)](#)

RoHS information

Nanocrystalline Cores

→ [Epoxy coated designs](#)

→ [Core Sample Kit VITROPERM](#)

→ [Core stack assemblies](#)

Common Mode Chokes

→ [Chokes](#)

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