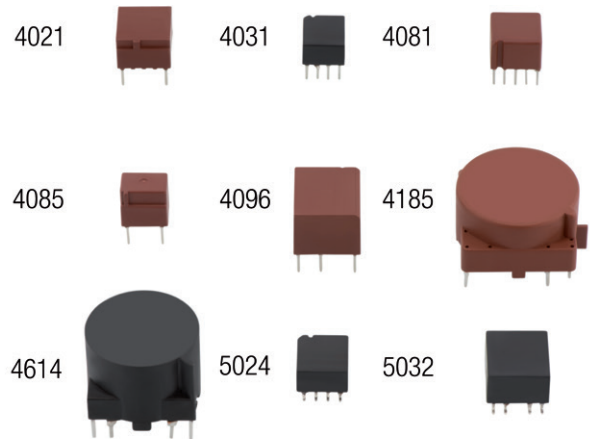


ISOLATION TRANSFORMERS FOR NARROWBAND PLC SYSTEMS

INDUSTRIAL APPLICATIONS

MAIN FEATURES

- Excellent transmission characteristics
- High mains current capability, low THD
- Matching with all leading IC (modulation methods FSK, DCSK and OFDM)
- Compliant with all PLC standards (HomePlug, CENELEC ...)
- Compact designs in THT and SMT housings
- Insulation according to IEC 60950, UL 1950 and IEC 61558

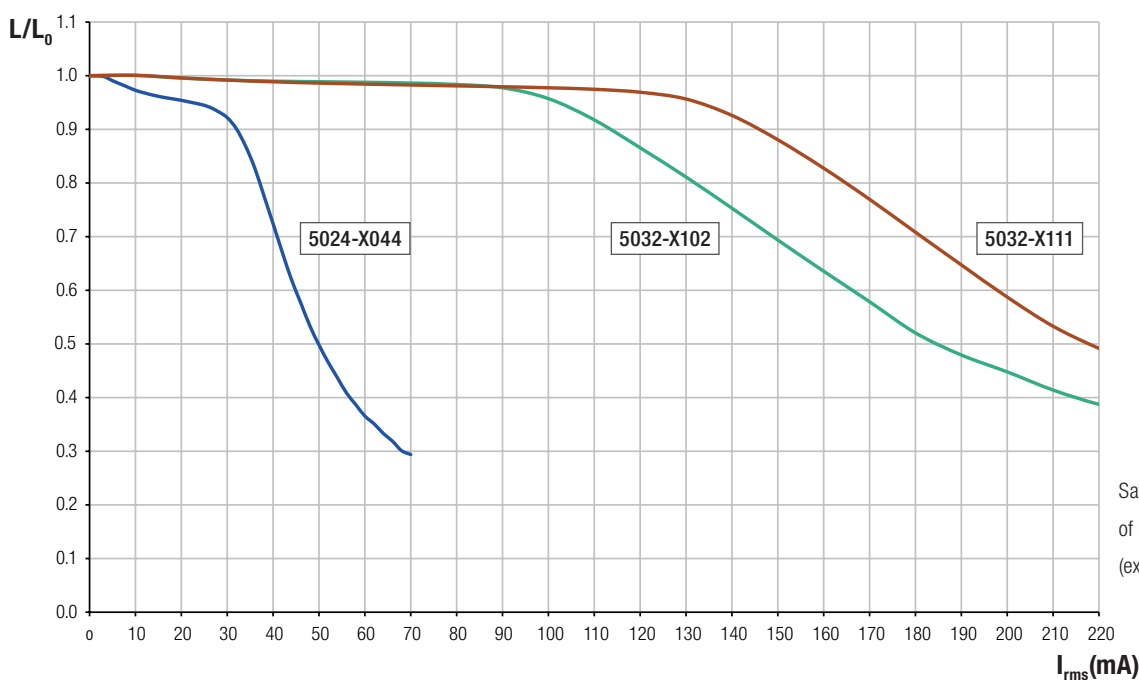


DESCRIPTION

Power line communication (PLC) is a type of communication technology that enables the use of existing wiring infrastructure to transfer data and information over power lines. PLC is one of the favored technologies for reliable, cost-effective and high-performance communication networking technology in multiple domains.

For narrowband PLC systems where the operating frequency may be up to 500kHz isolation transformers based on amorphous VITROVAC® or nanocrystalline VITROPERM® offer excellent transmission characteristics, high robustness against EMC interferences and safe galvanic insulation.

MAINS CURRENT CAPABILITY



ADVANCED MATERIALS – THE KEY TO PROGRESS



MAGNETIC AND ELECTRICAL PROPERTIES

Part number	n	I _{rms} mA	L _m mH	L _s μH	C _k pF	R _{Cu} Ohm	U _{is,rms} V	U _{p,rms} kV	extra feature
-------------	---	------------------------	----------------------	----------------------	----------------------	------------------------	--------------------------	--------------------------	---------------

Operational Isolation

THT Design

4021-X142	1.68:1	50	0.43	6	17	0.17	100	1.5	compact flat
---------------------------	--------	----	------	---	----	------	-----	-----	--------------

SMT Design

5024-X097	1.68:1	50	0.43	6	17	0.17	100	1.5	ultra-compact
5032-X104	1:1	90	0.5	6.6	15	0.09	100	1.0	compact
5032-X111	2:1	130	0.3	5.8	7	0.17	300	3.0	compact

IEC 60950

THT Design

4021-X144	1.37:1	120	0.43	1	35	0.22	450	5.1	compact flat
4021-X145	1.7:1	130	0.34	1	30	0.20	450	5.1	compact flat
4021-X146	1:1	100	0.68	1	35	0.26	450	5.1	compact flat
4081-X004	1:1	30	1.4	0.8	25	0.20	400	4.0	ultra-compact flat
4081-X007	2:1	35	0.9	0.3	25	0.11	250	5.5	ultra-compact flat
4081-X008	1.36:1	32	1.2	0.4	25	0.13	250	5.5	ultra-compact flat
4085-X004	1:1	30	1.4	0.8	25	0.20	300	4.0	ultra-compact upright
4096-X046	1:1	30	1.3	1	12	0.15	500	6.0	standard
4185-X047	1:1	50	1.4	0.8	15	0.20	400	10.0	high voltage
4614-X010	1:1.2	250	0.44	0.9	60	0.02	450	5.1	high current

SMT Design

5024-X044*)	1:1	30	1.4	0.3	25	0.20	250	5.5	ultra-compact
5024-X078	1:1	15	2.5	0.9	50	0.30	250	3.0	ultra-compact
5024-X079	2:1	30	1.4	0.5	50	0.12	400	3.0	ultra-compact
5024-X090	1:1.2	35	0.88	0.4	30	0.10	400	3.0	ultra-compact
5024-X092**)	1:1.2	100	0.7	1	40	0.50	400	4.0	ultra-compact
5024-X099**)	1:1.2	100	0.7	1	40	0.50	400	3.0	ultra-compact
5024-X100	1:4.4	30	1.56	1	25	0.15	400	3.0	ultra-compact
5032-X102	1:1.2	100	0.7	1	30	0.23	450	5.1	compact
5032-X114	1:1.15:1.62	120	0.54	1	30	0.22	450	5.1	compact

*) UL 1950 certified

**) extended performance in the low frequency range

IEC 61558

THT Design

4031-X009	2:1	5	1.0	0.17	17	0.08	300	4.2	compact cubic
4096-X047	1:1	-	1.3	10	5	0.20	500	6.0	standard

TRANSFORMER SELECTION

The transformers have been designed to be compatible with PLC chipsets of various IC manufacturers. Depending on individual operating and/or mounting conditions a preselection may be made.

Part number	Atmel	Cypress	Enverv	Maxim	ON Semi	Renesas	STM	TI	Yitran	Others
T60403-K...	ATPL230A ATPL250A	CY8C56** CY8C58**	EV80*0	MAX2990 MAX2991	AMIS 49587 NCN 49597 NCN 49599	M16C/6S	ST7538 ST7540 ST7570 ST7580 ST7590 STComet	F28PLC83 F28PLC35	IT800	various

Operational Isolation

THT Design

4021-X142										X
---------------------------	--	--	--	--	--	--	--	--	--	---

SMT Design

5024-X097										X
5032-X104										X
5032-X111					X					

IEC 60950

THT Design

4021-X144										X
4021-X145										X
4021-X146										X
4081-X004	X	X				X				
4081-X007										X
4081-X008										X
4085-X004	X	X				X				
4096-X046				X						
4185-X047	X	X				X				
4614-X010			X				X			

SMT Design

5024-X044*)	X	X				X				
5024-X078										X
5024-X079										X
5024-X090			X			X			X	
5024-X092**)						X	X		X	
5024-X099**)						X	X		X	
5024-X100	X									
5032-X102			X			X	X		X	
5032-X114								X		

*) UL 1950 certified

**) extended performance in the low frequency range

IEC 61558

THT Design

4031-X009					X					
4096-X047				X						

ISOLATION TRANSFORMERS FOR NARROWBAND PLC SYSTEMS

INDUSTRIAL APPLICATIONS

KEY

n	=	turns ratio (bold : mains side winding)	R_{Cu}	=	DC resistance of mains side winding (typical value)
I_{rms}	=	max mains current (50/60Hz; related to mains side winding)	$U_{is,rms}$	=	insulation voltage, effective value between mains side winding and IC side winding(s) (identical to 'working voltage')
L_m	=	inductance of mains side winding (minimum value)	$U_{p,rms}$	=	test voltage, effective value at 50 Hz between mains side winding and IC side winding(s)
L_s	=	leakage inductance of mains side winding with IC side winding(s) shorted (typical value)	THT	=	Through Hole Technology
C_k	=	coupling capacitance between mains side winding and IC side winding(s) (typical value)	SMT	=	Surface-Mounting Technology

NOTES

A part of above listed isolation transformers are built according to IEC 60950 for "Safety of Information technology equipment" or IEC 61558 "Safety of power transformers, power supplies, reactors and similar products". They all feature reinforced insulation. The classification to overvoltage category, pollution degree and insulation material group may be taken from the data sheet.

The data sheets can be downloaded from VAC's homepage.

Design modifications are possible upon request.

POSSIBLE APPLICATIONS

- Smart Grid
- Automated Meter Infrastructure (AMI)
- Indoor Networking / Home Automation
- Remote monitoring & control



Published by VACUUMSCHMELZE GmbH & Co. KG

© VACUUMSCHMELZE GmbH & Co. KG 2015. All rights reserved.

® is a registered trademark of VACUUMSCHMELZE GmbH & Co. KG