SEMICONDUCTOR NOISE PROTECTION CHOKE

PRODUCT SUMMARY

Description

NB / NK series are now available to reduce to reduce the spike noise in switch–mode power supplies such as persona / industrial, UPS, Telecomm / Network SMPS. This type of noise caused by rapid change in current and / or voltage.

In continuous mode converters, the output rectifiers have forward current flowing through them just prior to an instant voltage reversal across their terminals. This causes a sizeable spike of reverse current to flow through the diode. This spike usually flows through the power switch at its turn–on transition due to the reverse recovery of the output rectifier and / or catch diode. This added switch at its turn–on transition due to the reverse recovery of the output rectifier and / or catch diode. This added switching loss can be much more than the conduction loss of the power switching loss can be much more than the conduction loss of the power switch if the input voltage of the supply is high. One method to reduce this phenomenon is to add a NB / NK series Bead / Spike Killer cores in series with the output rectifier or the catch diode.

NB / NK series semiconductor noise suppression cores are a choke whose core exhibits a very square hysteresis curve, so called Z–shape B–H loop, as exhibited by Co–based amorphous alloy. Chokes made with this core material have very high permeability and quickly enter saturation, but do pass through a period of linear inductance behavior.

Feature

- Low loss which improve the efficiency of a switch–mode power supplies
- High inductance when the current crosses zero
- Very low saturated inductance
- Reduction of ripple noise and ringing
- Simplifies design of noise suppression circuit

Application

- Softening the reverse recovery phenomena in noise suppression
- Protection diode from being broken by spike voltage
- Ringing suppression in switch–mode power supplies
- Limit semiconductor rectifier revers recovery current in continuous mode converter
- Motor controller circuit used for MOSFET and / or bipolar transistor, BJT
- Ringing protection in MOSFET
- Time delay function for MOSFET gate trigger
- Bettery charger for switch–mode power supplies
- Spike noise protection for MOSFET bridge circuit
- Battery charger for switch–mode power supplies
- AC adapter for switch–mode power supplies

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STANDARD CORE DIMENSIONS & SPECIFICATIONS

NB Series Bead

Part No.	Finished Core(mm) ①			L_{eff} ②	A_{eff} ③	$2Ø_m$ ④	A_L ⑤	Insulating cover
	OD	ID	HT	(mm)	(mm^2)	(μWb)	(μH)	
NB–03A–N	4.0	1.6	4.5	7.7	1.2	0.9	3.0	blue class resin
NB–03S–N	4.0	1.6	6.0	7.7	1.8	1.3	5.0	
NB–04S–N	5.0	1.6	6.0	9.1	3.6	2.7	9.0	
NB–04B–N	5.0	1.6	7.5	9.1	4.8	3.6	12.0	
NB–045A–N	6.5	2.4	6.0	13.3	0.6	0.6	0.86	

Notes:
1) The finished core dimensions shows a limiting ones.
2) Nominal values of magnetic path length.
3) Nominal values of cross–section area.
4) Minimum value at 50kHz, 80A/m, RT(~25℃).
5) Normalized inductance, Minimum value at kHz with the oscillation voltage of 1V, RT(~25℃).
6) Minimum value at 50kHz with the oscillating voltage of 1V, 1 tune, RT(~25℃).

NK Series Spike Killer

Part No.	Finished Core(mm) ①			L_{eff} ②	A_{eff} ③	V_{eff} ④	W_a ⑤	A_L ⑥	$2Ø_m$ ⑦ (μWb)
	OD	ID	HT	(mm)	(mm^2)	(mm^3)	(mm^2)	(μH)	
NK–09S–N	10.7	5.5	6.3	25.0	3.5	88	24	1.8	3.9
NK–10S–N	11.9	5.8	6.3	27.0	4.7	129	26	2.2	5.3
NK–12A–N	14.0	6.6	4.8	31.0	4.7	147	34	1.9	5.2
NK–12S–N	14.0	6.6	6.3	31.0	7.0	221	34	2.8	7.9
NK–14S–N	15.9	6.8	6.5	34.3	10.0	350	36	3.7	11.2
NK–15A–N	16.7	10.5	6.3	42.2	5.3	223	87	1.6	5.9
NK–15S–N	16.9	8.6	6.5	38.7	8.8	345	59	2.8	9.8
NK–18S–N	19.8	10.4	6.4	46.5	10.5	496	85	2.8	11.8
NK–21S–N	22.8	12.4	6.3	54.2	12.3	675	121	2.8	13.8

Note:
1) The finished core dimensions shows a nominal ones. Please consult sales department for tolerance.
2) Nominal values of magnetic path length.
3) Nominal values of cross–section area.
4) Nominal values of volume.
5) Nominal values of window area.
6) Normalized inductance, Minimum value at kHz with the oscillation voltage of 1V, RT(~25℃).
7) Total flux with its tolerances of ± 15%. All values are measured at 50kHz, 80A/m, RT(~25℃).

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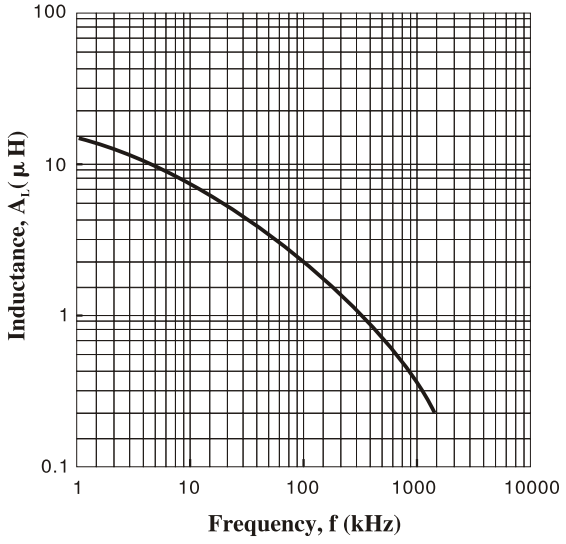
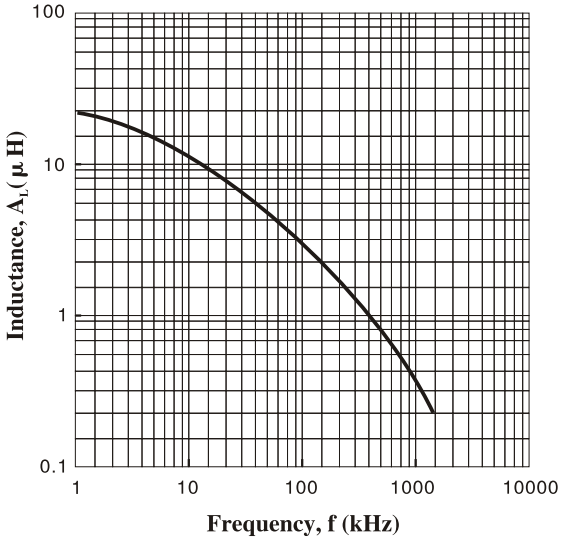
TYPICAL MAGNETIC CHARACTERISTICS

Typical frequency dependency of inductance, $A_L(f)$

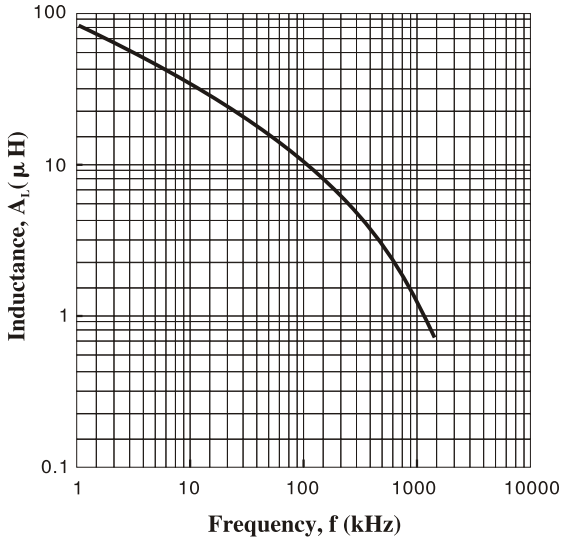
NB–03A–N



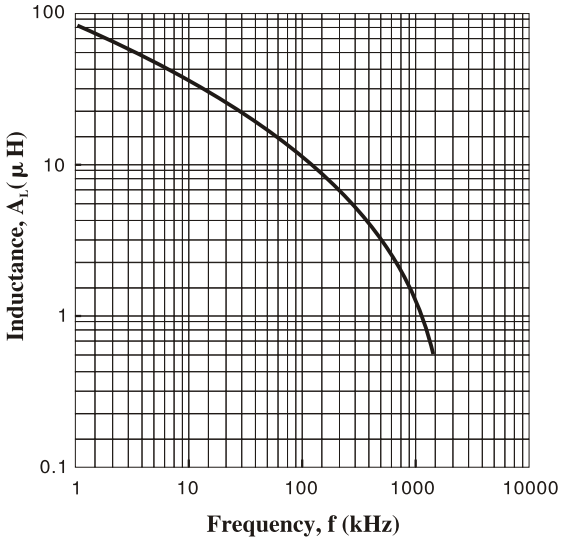
NB–03S–N



NB–04B–N



NB–04S–N



* The frequency characteristics are measured using 1 turn at room temperature, ~25℃

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