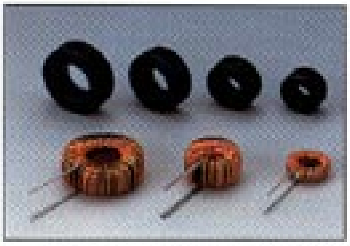
"CY" CHOKE COILS

"CY"Choke coils, made from iron-based amorphous magnetic alloys, are useful for smoothing output currents. "CY" Choke Coil are an amorphous alloy gap core. Due to the composition and the amorphous nature of the alloys used in these components, they have a higher flux density than ferrites and are less lossy than silicon steel.



1. Features

Miniaturization

Due to the higher flux density of amorphous alloys, the coil can be about half the size of a ferrite core of the same specifications.

Low Loss

The alloy composition and amorphous nature lead to lower losses than in silicon steel or iron powder choke coils.

Suitability

Based on the above, amorphous choke coils are suitable when:
1)The size of a ferrite choke coil is too large
2)The temperature rise in silicon steel or iron powder choke coil is too great

2. CY Choke Applications

- DC-DC Converters
- Switched mode power supplies
- Inverter circuits

3. Characteristics (Typical Value)

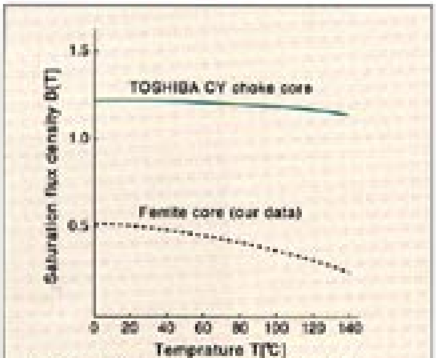


Fig 3-1 Temprature Characteristics

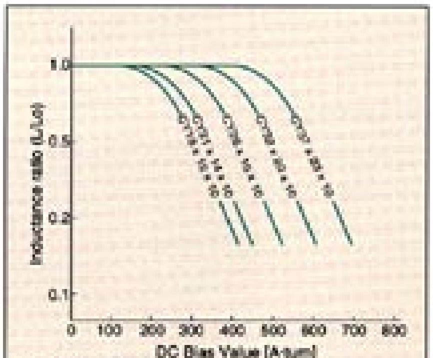


Fig 3-2 DC Bias Characteristics

4. Typical Application

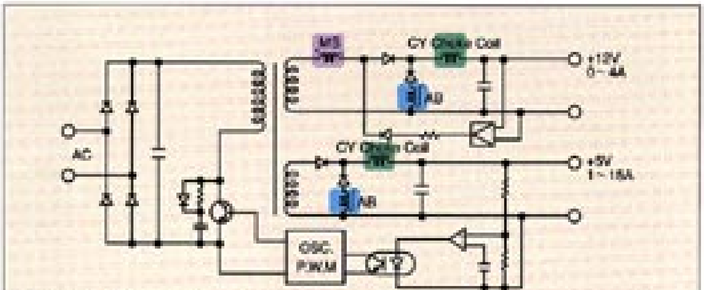


Fig 4-1 Typical Circuit

Caution : Iron amorphous alloy has comparatively high magnetostriction, and ringing may be generated at audio frequency

5. Standard Specifications

"CY" Choke Cores

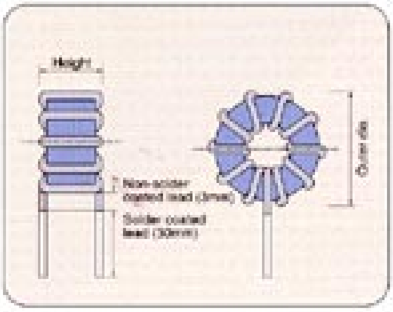
Type No.	Finished dimensions[mm]			Initial *1 AL value AL [μH]	DC bias value DCB [A-turn]	Winding *2 Area Aw [mm²]	Handling *2 power HPc [μH-A²]	Insulating cover
	Outer dia.	Inner dia.	Height					
CY18 x 12 x 10	21.5max	9.0min	13.0max	0.110	220min	63.6	3407	Resin casing
CY21 x 14 x 10	24.5max	11.0min	13.0max	0.112	250min	95.0	4480	
CY26 x 16 x 10	29.5max	13.0min	13.0max	0.131	320min	132.7	8585	
CY32 x 20 x 10	35.5max	17.0min	13.0max	0.118	410min	227.0	12695	
CY37 x 23 x 10	40.5max	20.0min	13.0max	0.129	450min	314.2	16718	

*1 : Tolerance ±25%
*2 : Reference Value

"CY" Choke Coils

Type No.	Rating		Wire diameter (mm)	Standard number of turns (turn)	Max. dimensions	
	Current (A)	Inductance (μH)			Outer dia.(mm)	Height (mm)
CY18 x 12 x 10A	3	400	0.8	62	26	20
CY26 x 16 x 10A	3	1000	0.8	92	35	20
CY18 x 12 x 10B	5	150	1.0	38	26	20
CY26 x 16 x 10B	5	300	1.0	50	35	20
CY37 x 23 x 10B	5	500	1.0	65	46	20
CY18 x 12 x 10C	8	60	0.9 x 2	24	26	20
CY26 x 16 x 10C	8	150	0.9 x 2	36	35	20
CY37 x 23 x 10C	8	250	1.9 x 2	46	46	20
CY18 x 12 x 10D	10	40	1.0 x 2	20	26	20
CY26 x 16 x 10D	10	100	1.0 x 2	29	35	20
CY37 x 23 x 10D	10	160	1.0 x 2	37	46	20
CY26 x 16 x 10E	15	40	1.0 x 3	19	37	22
CY37 x 23 x 10E	15	70	1.0 x 3	25	48	22
CY26 x 16 x 10F	20	25	1.0 x 4	15	37	22
CY37 x 23 x 10F	20	40	1.0 x 4	19	48	22

Appearance and dimensions



Inductance tolerance: ±25%,
Winding wire type 1UEW
Note:Standard number of turns could vary with inductance. The above figures are for reference only.

6. How to select the proper Choke Coil for a Given Circuit

For a given circuit:

L : Inductance[μH]
I : Current[A]

The condition for a choke coil to be effective in the circuit is:

$HP \geq \{L \times I^2\}$ [μH·A²] .... (1)

where:

HP : Required Handling Power f the choke coil

So, to select the proper choke coil for a given circuit

a)Calculate the right hand side of equation(1)
b)Compare to the table listing the properties of particular Choke Coils
c)Select the smallest sized coil which satisfies Equation(1)

Once the proper coil has been selected, the diameter of the winding wire and the number of turns in the winding can be determaind.

The diameter of the wire, d, is calculated based upon:

$d \geq \{0.43 \times \sqrt{I}\}$ [mm] .... (2)

The number of turns, N, is calcalated from:

$N \geq \sqrt{L \div AL}$ [turn] .... (3)

where:

N is an integer
AL=Initial Inductance for a particular coil