



FERRITE COMPONENTS FOR TV & VCR USE



An integrated maker of ferrites and ferrite products, FDK has developed many ferrite materials, and produces a wide selection of ferrite cores and core products. This catalog specifically introduces FDK deflection yoke cores, flyback transformer cores, and rotary transformers.

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FDK CORPORATION

FERRITE CORES FOR DEFLECTION YOKE

The growing demand for a greater image clarity and definition in television images has made necessary an improvement in ferrite cores for deflection yoke. With the advances in the ferrite technology, FDK has developed H44V ferrite materials with lower core loss than H44F. H44V material supplements the existing H44 and H44F widely used in many types of televisions. FDK also has introduced DS1 ferrite materials suitable for high quality picture displays with high horizontal scanning frequency.

Although this catalog presents standard FDK ferrites and ferrite products, only FDK can design and produce any type of customized core on a made-to-order basis, and welcomes inquiries for custom-design cores.



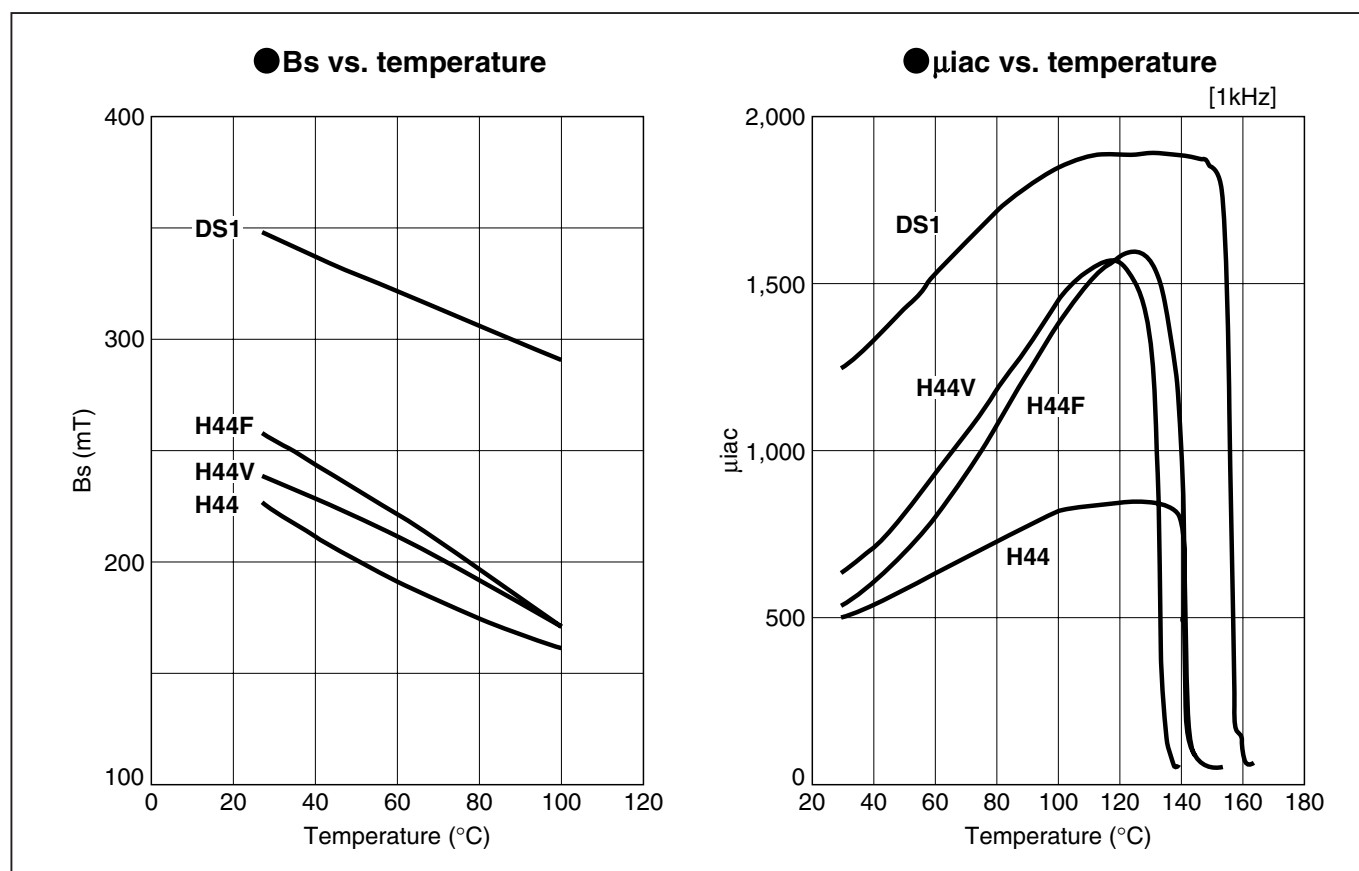
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Standard material characteristics of ferrite cores for deflection yoke

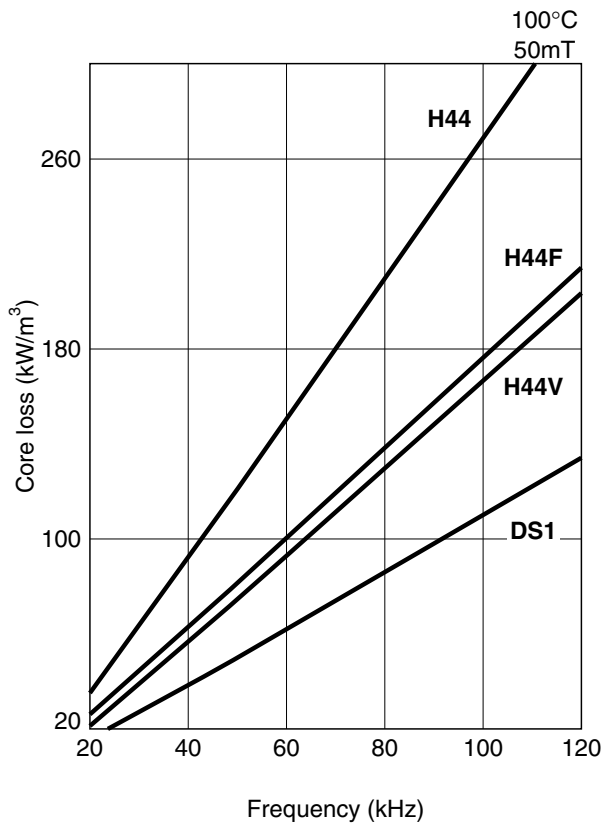
Property	Symbol	Condition	Unit	H44	H44F	H44V	DS1
AC initial permeability	μ_{iac}	0.1MHz	—	350	400	450	1000
Saturation magnetic flux density	Bs	23°C	mT	230	260	240	350
		60°C		190	220	210	320
		100°C		160	170	170	290
Residual magnetic flux density	Br	23°C	mT	160	190	180	190
Coercivity	Hc	23°C	A/m	40	24	20	24
Relative loss factor	$\tan\delta/\mu$	0.1MHz	$\times 10^{-6}$	<50	<120	<120	<20
Core loss 25kHz 100mT	Pc	23°C	kW/m ³	420	230	60	45
		60°C		380	170	45	35
		100°C		430	170	40	25
Core loss 100kHz 100mT	Pc	23°C	kW/m ³	1500	1000	220	180
		60°C		1470	850	180	130
		100°C		1640	860	170	110
Curie temperature	Tc	—	°C	>150	>150	>135	>150
Resistivity	ρ	—	$\Omega \cdot m$	10^5	10^5	10^5	10^2
Apparent density	d	—	kg/m ³ $\times 10^3$	4.5	4.6	4.6	4.8

Note: 1. The above values were obtained from FR25 ϕ /15 ϕ /5 toroidal cores.

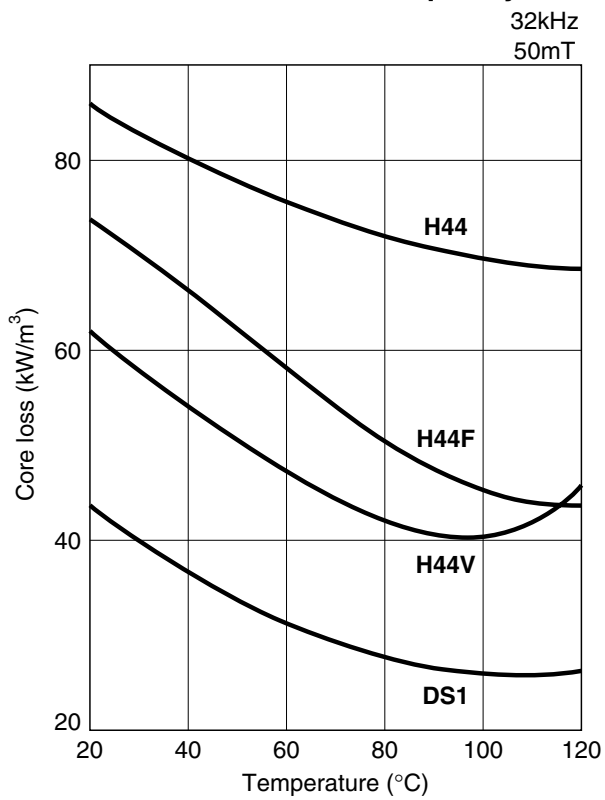
2. The values were obtained at 23 \pm 2°C unless otherwise specified.



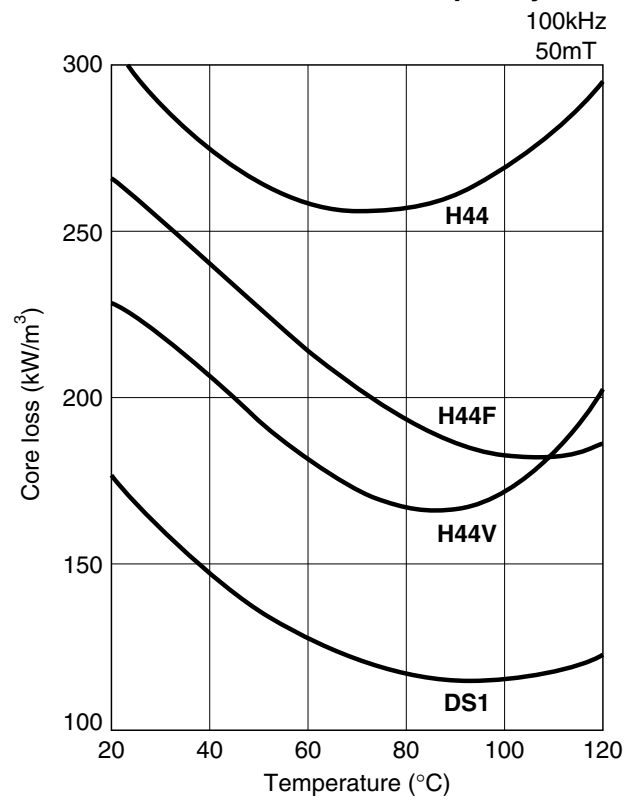
● Core loss vs. frequency



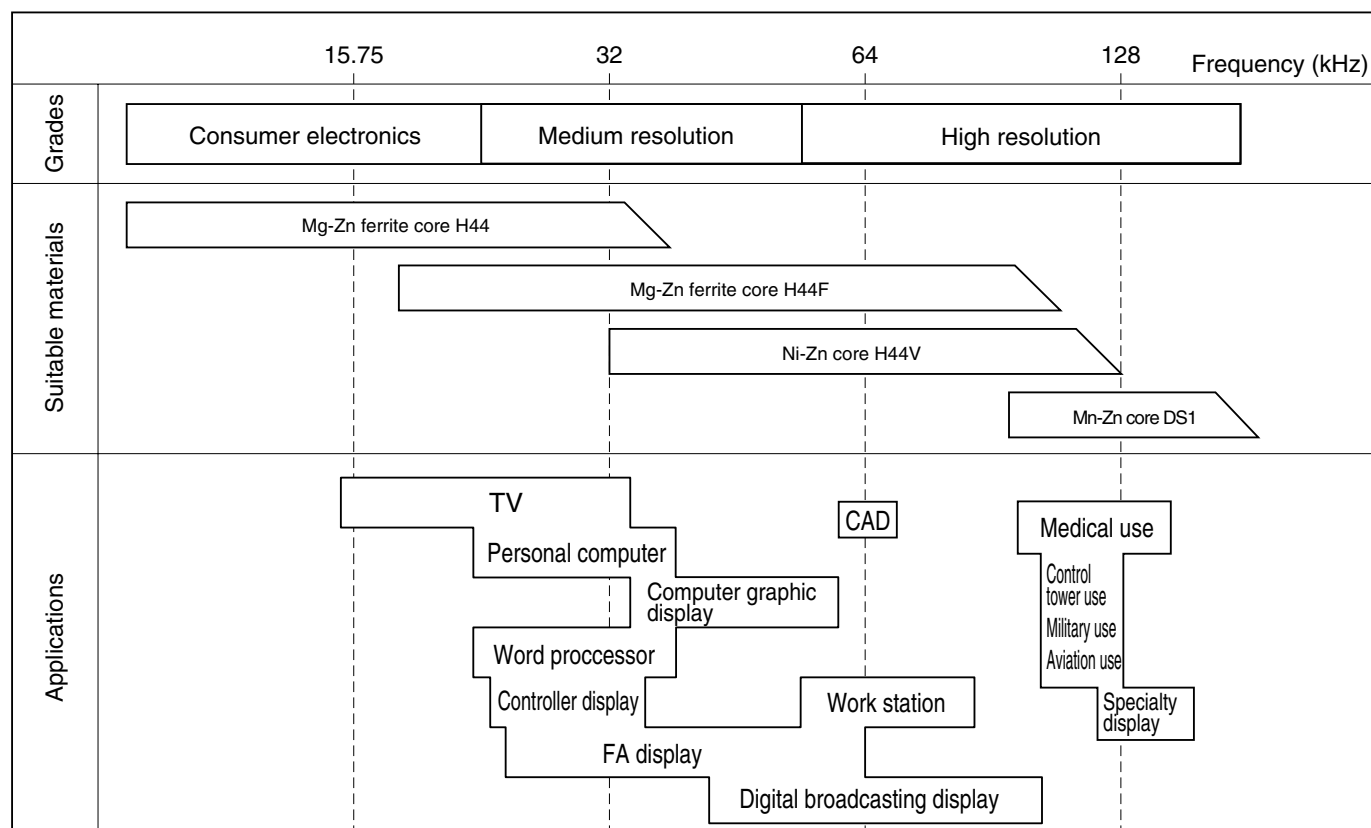
● Core loss vs. frequency



● Core loss vs. frequency



■ Ferrite materials for deflection yoke according to frequency



■ Shape selection according to application

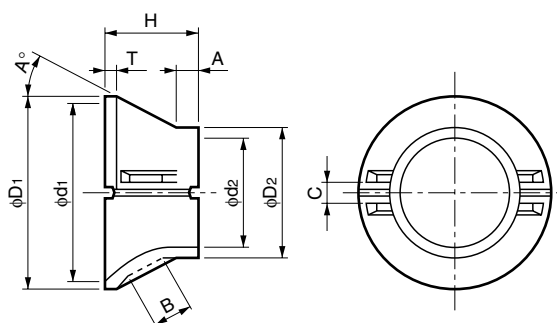
Screen size	Television	Display
10	<div> DY4037MA DY4137CV DY4232A </div> <div> DY4037MC DY4228AM DY4640L </div>	<div> DY3839B DY4349TG DY4648BA </div> <div> DY4646AB DY4646BV DY4650B </div>
20	<div> DY4032A DY4034A DY4336AN DY4743L </div> <div> DY4033A DY4334A DY4741AT DY4846M </div>	<div> DY4951GB DY4748TG DY4949GH </div>
30	<div> DY5139CD DY5047C DY5042A DY5245A DY5645A </div> <div> DY5139AV DY5039AB DY5145A DY5439MA DY5647L </div>	

■ Dimensions of ferrite cores for deflection yoke

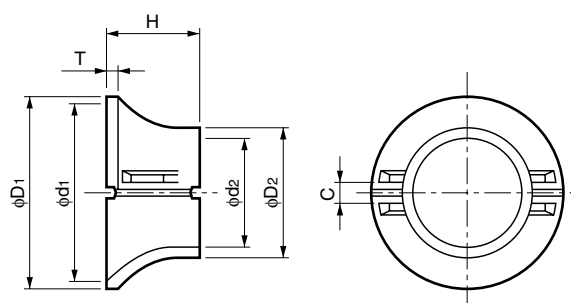
● For television

Shape code	Type	Dimensions (mm)									
		ϕD_1	ϕd_1	ϕD_2	ϕd_2	H	T	A	A°	B	C
DY4032AT	A	72.5±0.8	68.00	56.0 ±0.6	39.5 ±0.5	32.0 ±0.4	7.0	—	30.0	9.0	12.0±0.2
DY4033A	A	72.5±0.8	68.00	56.0 ±0.6	39.5 ±0.5	33.0 ±0.4	7.0	—	30.0	—	12.0±0.2
DY4034A	A	75.0±0.8	71.00	56.0 ±0.6	40.0 ±0.4	34.0 ±0.4	9.0	—	30.0	—	12.0±0.2
DY4036A	B	77.0±0.8	72.58	52.0 ±0.6	40.0 ±0.4	36.5 ±0.5	7.0	—	—	—	12.0±0.2
DY4037MA	B	74.0±0.8	69.69	52.5 ±0.6	40.4 ±0.4	37.0 ±0.4	5.0	—	—	—	12.0±0.2
DY4037MC	B	74.0±0.8	69.69	52.0 ±0.6	40.0 ±0.4	37.0 ±0.5	7.0	—	—	—	12.0±0.2
DY4133C	B	74.0±0.8	69.69	52.0 ±0.6	41.0 ±0.4	33.0 ±0.4	7.0	—	—	—	12.0±0.2
DY4137CV	B	74.0±0.8	69.69	53.0 ±0.6	41.0 ±0.4	37.0 ±0.4	7.0	—	—	—	12.0±0.2
DY4228AM	A	72.5±0.8	68.40	56.0 ±0.6	42.0 ±0.4	28.0 ±0.4	7.0	—	30.0	—	12.0±0.2
DY4232A	A	72.5±0.8	68.40	56.0 ±0.6	42.0 ±0.5	32.0 ±0.5	7.0	—	30.0	—	12.0±0.2
DY4334A	A	89.0±0.9	82.66	58.0 ±0.6	43.3 ±0.5	34.0 ±0.5	5.0	—	36.4	—	12.0±0.2
DY4336AN	A	73.7±0.8	69.73	56.0 ±0.6	43.37±0.4	35.5 ±0.4	5.0	—	29.0	—	12.0±0.2
DY4640L	A	89.8±1.0	81.86	59.8 ±1.0	46.0 ±0.5	40.0 ±0.5	5.0	—	30.0	—	12.0±0.2
DY4735A	A	84.8±0.9	78.50	62.0 ±0.6	47.2 ±0.5	35.0 ±0.5	4.0	—	30.3	—	12.0±0.2
DY4741AT	A	89.0±0.9	84.00	60.0 ±0.6	46.5 ±0.5	40.5 ±0.5	5.0	—	30.0	13.0	12.0±0.2
DY4743L	A	89.8±1.2	81.80	59.8 ±1.0	46.8 ±0.5	42.5 ±0.5	5.0	—	29.0	—	12.0±0.2
DY4842A	A	89.0±1.0	84.00	60.0 ±1.0	48.0 ±0.5	42.0 ±0.5	5.0	—	28.0	—	12.0±0.2
DY4846M	B	90.0±1.2	84.84	61.0 ±0.6	48.2 ±0.5	46.0 ±0.5	5.5	—	—	—	12.0±0.2
DY4945A	A	124.0±1.3	116.19	64.0 ±0.7	49.0 ±0.5	44.5 ±0.5	5.0	—	44.5	—	12.0±0.2
DY4948A	A	124.0±1.3	116.19	65.0 ±0.7	49.0 ±0.5	47.7 ±0.5	5.0	—	40.1	—	12.0±0.2
DY5039AB	A	110.0±1.1	103.64	62.5 ±0.6	50.48±0.4	49.0 ±0.4	5.0	—	41.5	13.0	12.0±0.2
DY5041B	A	108.0±1.3	104.00	65.4 ±1.0	50.4 ±0.5	41.2 ±0.5	4.5	—	41.5	—	12.0±0.2
DY5042A	A	106.0±1.0	100.85	64.0 ±0.6	50.0 ±0.5	42.0 ±0.4	5.0	—	38.5	13.0	12.0±0.2
DY5043C	B	114.0±1.1	109.60	67.0 ±0.7	50.0 ±0.5	43.0 ±0.5	5.0	—	—	—	12.0±0.2
DY5047C	B	119.0±1.2	114.60	66.0 ±0.7	50.0 ±0.5	47.0 ±0.5	5.0	—	—	—	12.0±0.2
DY5139AV	B	102.3±1.0	94.16	64.26±0.6	50.52±0.5	38.95 ^{+0.3} _{-0.5}	5.5	—	—	—	12.0±0.2
DY5139CC	B	109.0±1.1	104.70	66.0 ±0.7	51.0 ±0.5	39.0 ±0.4	5.0	—	—	—	12.0±0.2
DY5139CD	B	108.0±1.1	102.70	70.0 ±0.7	51.0 ±0.5	39.0 ±0.4	6.0	—	—	—	12.0±0.2
DY5145A	A	112.0±1.0	105.36	65.0 ±0.66	51.0 ±0.52	44.5 ±0.5	4.8	—	40.0	—	12.0±0.2
DY5245A	A	114.0±1.0	107.65	65.88±0.66	51.88±0.52	44.5 ±0.5	4.8	—	40.0	—	12.0±0.2
DY5439MA	A	108.0±1.0	104.00	70.0 ±0.8	54.0 ±0.5	39.0 ±0.5	6.0	—	42.0	—	12.0±0.2
DY5445A	A	114.0±1.2	109.65	72.0 ±0.8	53.88±0.6	44.5 ±0.5	5.5	—	40.0	—	12.0±0.2
DY5645A	A	118.0±1.2	114.10	75.0 ±0.8	56.4 ±0.6	44.5 ±0.5	5.5	—	40.0	—	12.0±0.2
DY5647L	A	124.0±1.4	116.18	72.0 ±0.7	56.0 ±0.6	47.0 ±0.5	6.0	—	39.0	—	12.0±0.2

● Type A

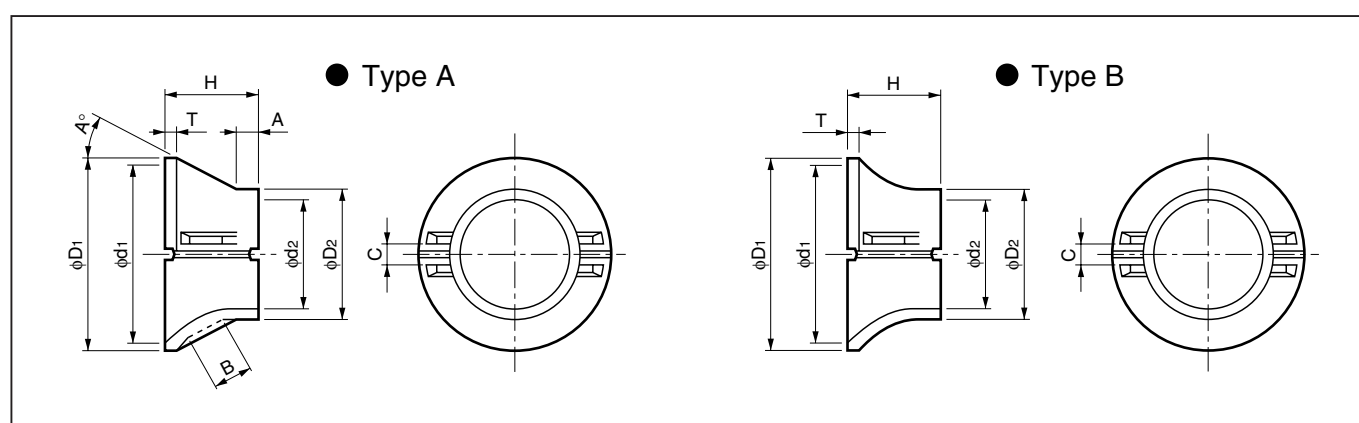


● Type B



● For display

Shape code	Type	Dimensions (mm)									
		ϕD_1	ϕd_1	ϕD_2	ϕd_2	H	T	A	A°	B	C
DY3839B	A	69.0 ± 0.7	64.63	51.0 ± 0.6	37.61 ± 0.4	39.0 ± 0.4	5.0	—	22.0	11.5	12.0 ± 0.2
DY3935A	A	71.0 ± 0.7	66.85	55.1 ± 0.6	39.2 ± 0.4	35.0 ± 0.5	5.0	—	17.0	10.0	12.0 ± 0.2
DY3938GA	A	71.5 ± 0.7	67.38	53.0 ± 0.6	39.52 ± 0.2	38.0 ± 0.4	5.0	—	22.0	12.0	12.0 ± 0.2
DY3939A	A	71.0 ± 0.7	66.85	55.1 ± 0.6	39.2 ± 0.4	39.0 ± 0.5	5.0	—	17.0	10.0	12.0 ± 0.2
DY3940B	A	70.0 ± 0.8	65.88	53.0 ± 0.6	39.2 ± 0.4	40.0 ± 0.4	5.0	—	22.0	10.5	12.0 ± 0.2
DY4349TG	A	88.9 ± 0.2	81.89	55.0 ± 0.6	43.0 ± 0.2	49.0 ± 0.2	5.0	—	32.0	—	—
DY4447GV	A	87.2 ± 0.9	79.19	60.0 ± 0.6	43.57 ± 0.2	46.5 ± 0.4	6.12	11.5	—	—	12.0 ± 0.2
DY4449GV	A	87.2 ± 0.9	79.19	60.0 ± 0.6	43.57 ± 0.2	48.5 ± 0.4	6.12	13.5	—	—	12.0 ± 0.2
DY4450TG	A	91.0 ± 0.2	84.45	57.0 ± 0.6	44.0 ± 0.2	49.5 ± 0.2	4.0	—	34.0	—	—
DY4545GV	A	85.2 ± 1.0	76.36	59.0 ± 0.6	45.0 ± 0.2	45.0 ± 0.3	5.0	—	27.0	—	12.0 ± 0.2
DY4546B	A	90.0 ± 0.9	80.80	60.0 ± 0.6	45.26 ± 0.5	46.0 ± 0.5	5.0	—	31.0	10.5	12.0 ± 0.2
DY4549TG	A	89.0 ± 0.8	80.60	58.0 ± 0.6	45.0 ± 0.2	49.0 ± 0.3	5.0	—	31.0	—	—
DY4551GH	A	88.2 ± 0.8	82.20	60.5 ± 0.6	45.02 ± 0.2	50.5 ± 0.3	5.0	—	26.0	11.5	12.0 ± 0.2
DY4645TG	A	88.1 ± 0.2	81.10	63.0 ± 0.5	46.0 ± 0.15	44.5 ± 0.2	5.0	—	25.7	—	—
DY4646AB	A	85.0 ± 1.0	77.36	60.0 ± 0.7	46.27 ± 0.46	46.0 ± 0.5	5.0	9.0	—	16.5	12.0 ± 0.2
DY4646BA	A	85.0 ± 1.0	76.26	57.6 ± 0.7	45.84 ± 0.5	45.6 ± 0.4	(5.0)	—	26.0	12.5	12.0 ± 0.2
DY4646BV	A	88.0 ± 0.9	79.78	59.84 ± 0.6	45.98 ± 0.46	46.0 ± 0.5	5.0	—	26.0	12.0	12.0 ± 0.2
DY4648BA	A	90.0 ± 0.9	82.62	60.0 ± 0.6	46.0 ± 0.46	48.0 ± 0.5	5.0	—	31.0	10.0	12.0 ± 0.2
DY4648GB	A	84.14 ± 0.9	78.14	61.0 ± 0.6	46.0 ± 0.2	48.0 ± 0.3	5.0	—	24.0	12.0	12.0 ± 0.2
DY4650B	A	88.0 ± 0.9	79.78	59.84 ± 0.6	45.84 ± 0.46	50.0 ± 0.5	5.0	—	26.0	12.0	12.0 ± 0.2
DY4650GA	A	88.0 ± 0.9	79.78	59.84 ± 0.6	45.84 ± 0.23	49.8 ± 0.2	5.0	—	26.0	12.0	12.0 ± 0.2
DY4748TG	A	92.0 ± 0.2	86.54	61.2 ± 0.6	47.2 ± 0.2	48.0 ± 0.2	6.5	—	30.0	—	—
DY4852TG	A	94.0 ± 0.8	88.82	60.25 ± 0.5	48.25 ± 0.2	51.8 ± 0.2	4.3	—	31.0	—	—
DY4949GH	A	96.0 ± 1.0	90.55	62.0 ± 0.6	49.65 ± 0.2	48.6 ± 0.2	5.0	—	28.5	16.0	12.0 ± 0.2
DY4951GB	A	98.0 ± 1.0	90.67	66.4 ± 0.7	49.2 $\begin{smallmatrix} +0.4 \\ -0 \end{smallmatrix}$	51.0 $\begin{smallmatrix} +0.2 \\ -0.8 \end{smallmatrix}$	7.0	—	30.0	15.0	12.0 ± 0.2
DY5248T	B	92.0 ± 1.2	86.295	63.8 ± 0.8	51.85 ± 0.42	48.0 ± 0.5	6.0	—	—	—	—

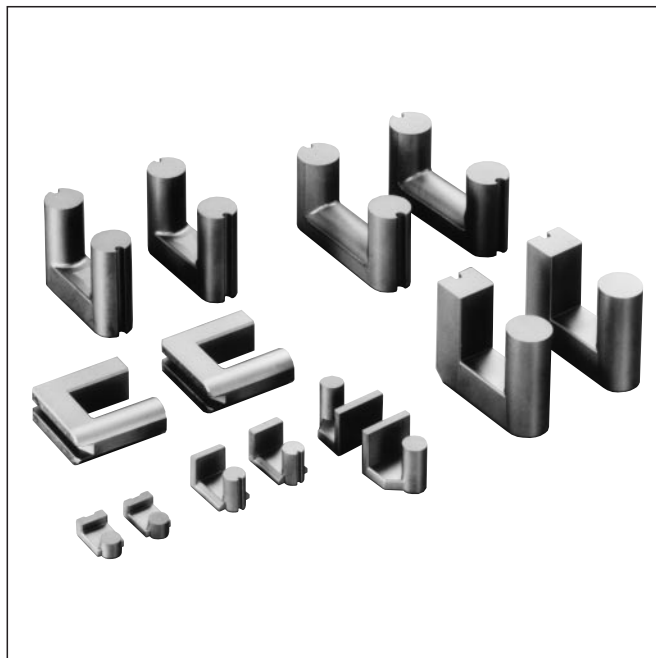


FERRITE CORES FOR FLYBACK TRANSFORMER

5H20 ferrite materials have been best-seller for television flyback transformer cores for many years.

5H30 ferrite materials have been used for display flyback transformer cores and characterized as smaller core loss than 5H20.

Besides, FDK had begun the sale of flyback transformer cores using the brand-new 5H40 ferrite materials with a remarkably reduced core loss enable the development of high-resolution displays.



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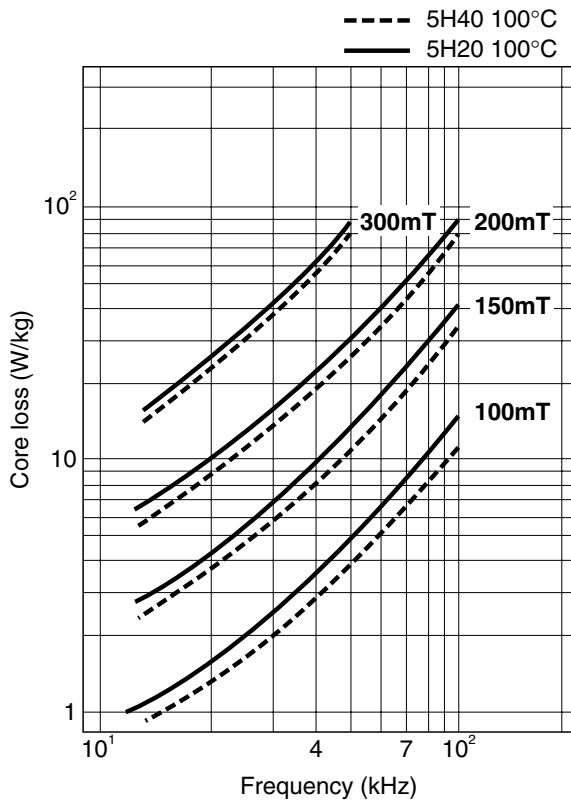
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■ Standard material characteristics of ferrite cores for flyback transformer

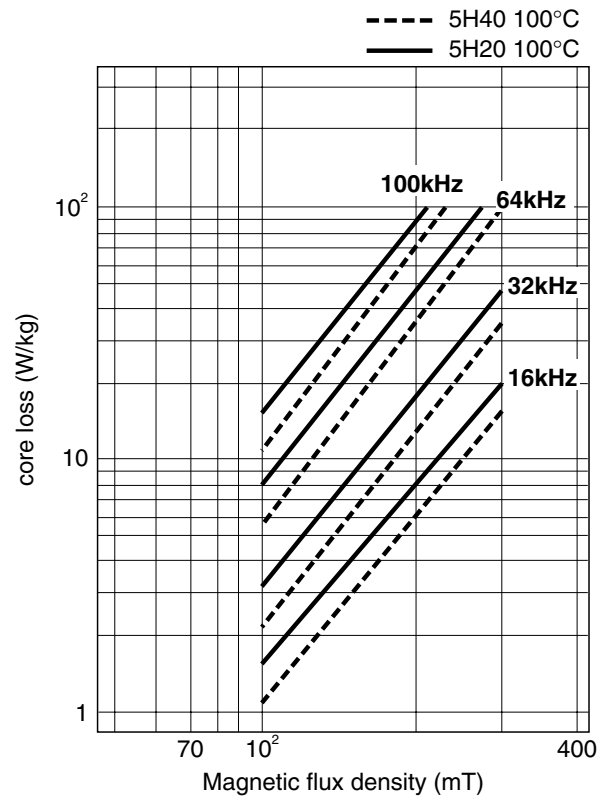
Property	Symbol		Condition	Unit	5H20	5H30	5H40
AC initial permeability	μiac		0.1MHz	—	1800	2300	2200
Saturation magnetic flux density	Bs (800A/m)		23°C	mT	520	500	500
			100°C		420	400	400
Residual magnetic flux density	Br		23°C	mT	150	130	130
Corecivity	Hc		23°C	A/m	13	13	13
Relative loss factor	tanδ/μiac		0.1MHz	×10 ⁻⁶	<5	<5	<5
Core loss	150mT	16kHz	80°C	W/kg	3.9	3.5	2.9
			100°C		3.5	3.3	2.7
	200mT	32kHz	80°C	W/kg	19	18	15
			100°C		17	16	13
		50kHz	80°C	W/kg	36	33	27
			100°C		32	29	24
		100kHz	80°C	W/kg	95	88	72
			100°C		90	85	70
Temperature coefficient	αμr		20~80°C	×10 ⁻⁶	8	6	6
Curie temperature	Tc		—	°C	>200	>200	>200
Resistivity	ρ		—	Ω·m	3	3	3
Apparent density	d		—	kg/m³×10³	4.8	4.8	4.8

Note: 1. The above values were obtained from FR25 ϕ /15 ϕ /5 toroidal cores.
 2. The room temperature was 23 \pm 2°C in the table unless otherwise specified.

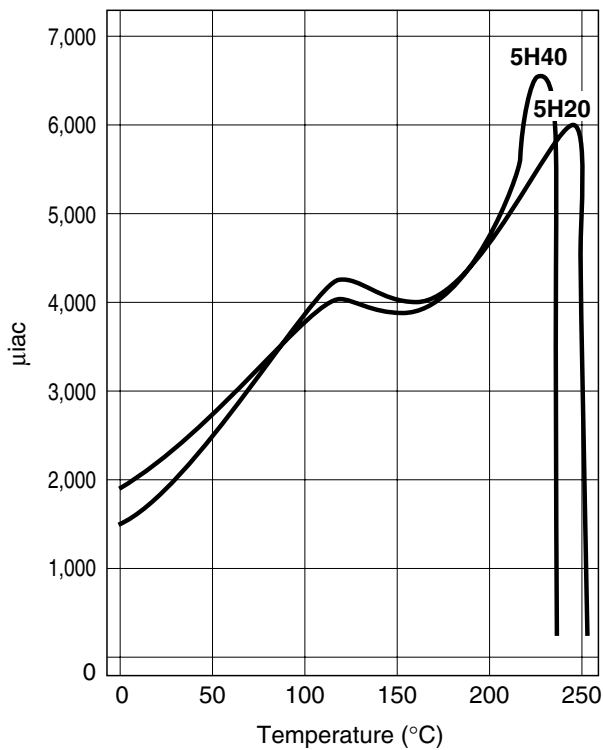
● Core loss vs. frequency



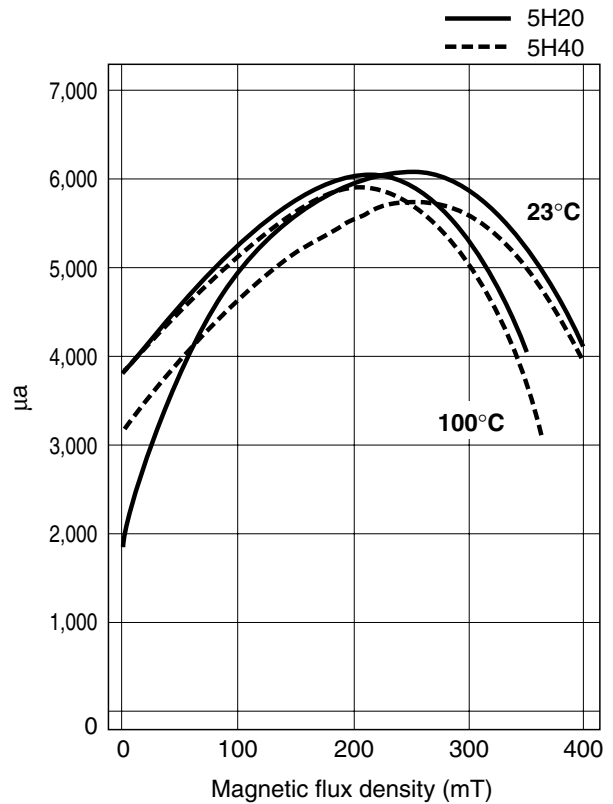
● Core loss vs. magnetic flux density

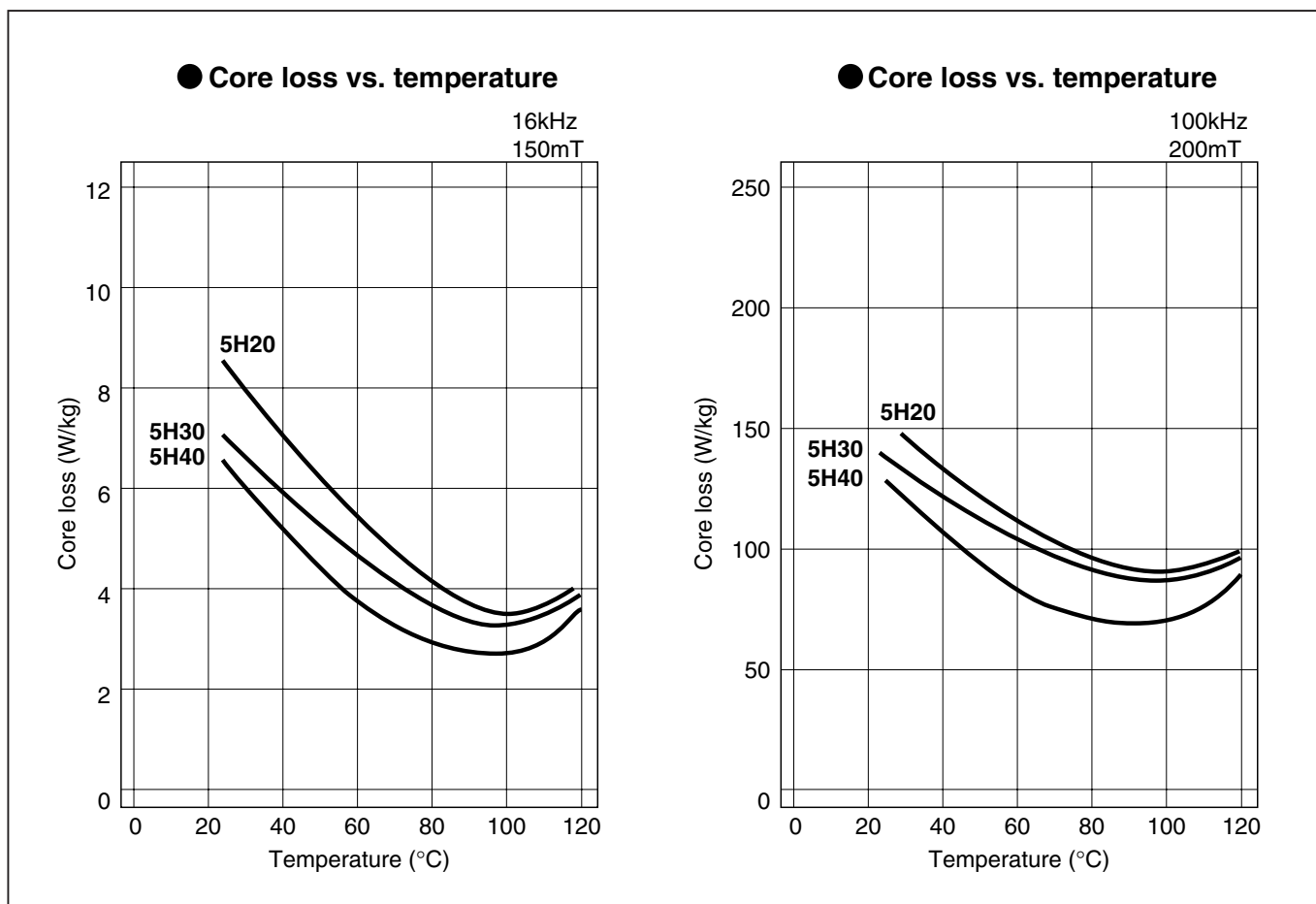


● μ_{iac} vs. temperature

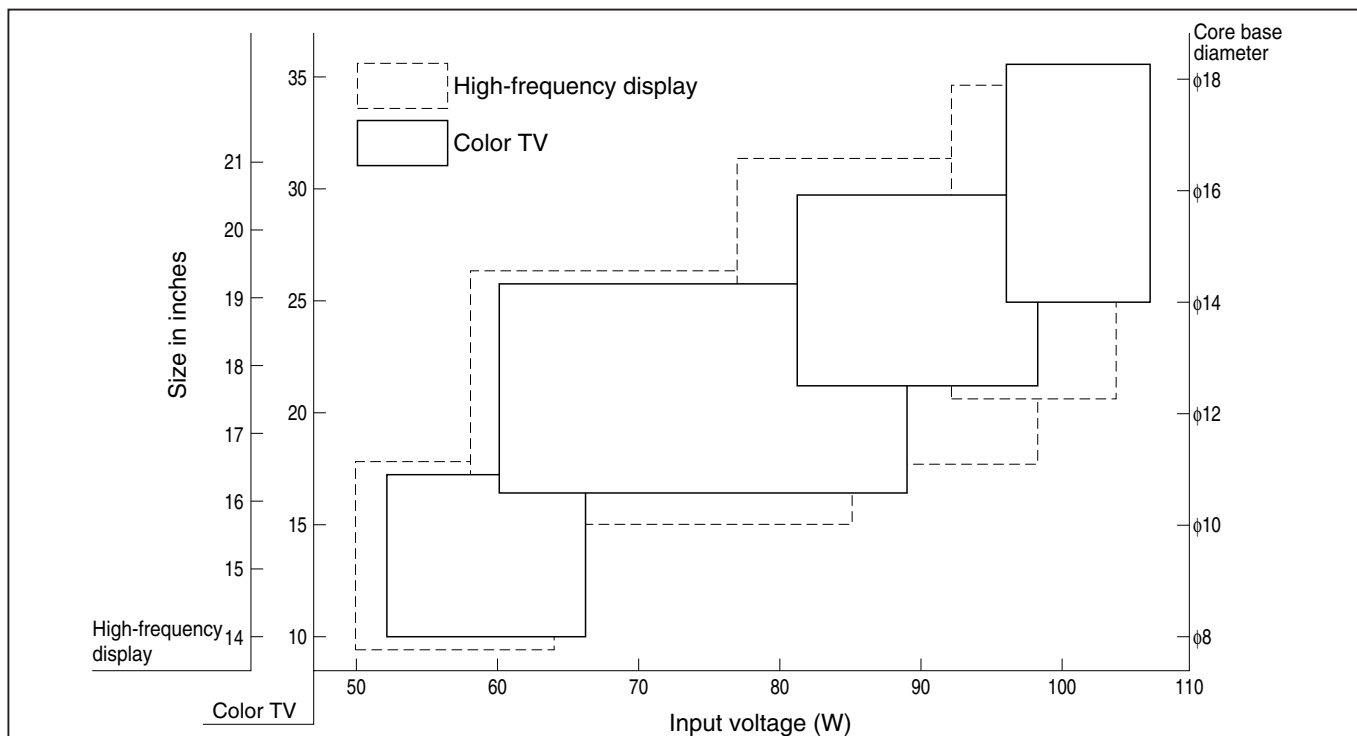


● μ_a vs. magnetic flux density



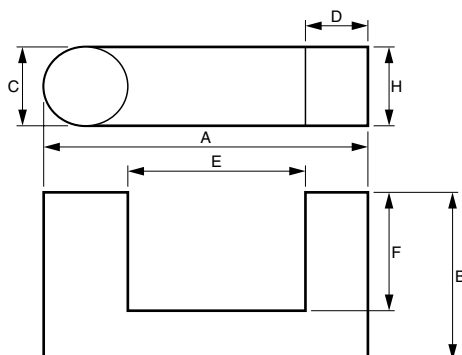


■ Comparison of screen size and core shape



■ Dimensions of ferrite cores for flyback transformer

● RU type

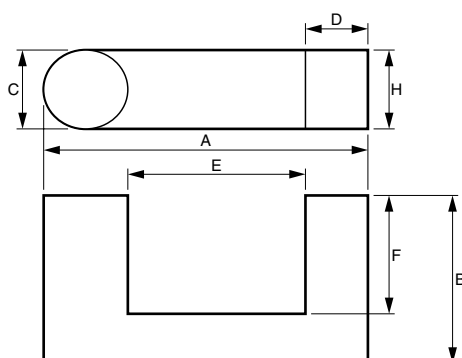


Shape code	Dimensions (mm)						
	A	B	C	D nom.	E min.	F	H
RU1116A	11.20±0.2	8.05±0.1	4.00±0.1	2.50	4.50	5.50±0.2	5.00±0.2
RU1728A	16.60±0.4	13.60±0.3	6.00±0.2	3.00	7.30	10.65±0.15	10.00±0.3
RU2027A	20.30±0.5	13.60±0.5	8.00±0.3	5.00	7.00	8.60±0.3	10.00±0.3
RU2953A	28.70±0.5	26.50±0.2	8.60±0.2	6.80	12.80	19.30±0.2	8.60±0.2
RU-26	25.65±0.4	9.70±0.3	9.50±0.3	3.90	11.75	5.70±0.3	17.80±0.3
RU2749A	27.30±0.4	24.50±0.3	10.00±0.2	7.10	9.80	17.30±0.3	10.00±0.2
RU-30DB	30.50±0.5	31.35±0.2	10.00±0.2	8.15	11.70	22.85±0.25	10.00±0.2
RU3060B	30.40±0.5	30.00±0.25	10.00±0.25	8.15	11.70	21.60±0.25	10.00±0.2
RU3054A	30.40±0.5	27.00±0.3	10.00±0.3	8.15	11.75	18.60±0.3	10.30±0.3
RU3659A	35.50±0.5	29.30±0.3	11.00±0.3	9.00	15.20	20.30±0.3	11.00±0.3
RU3561A	34.50±0.5	30.30±0.3	11.00±0.3	8.70	14.30	21.30±0.3	11.00±0.3
RU3261A	31.50±0.4	30.50±0.3	11.00±0.3	7.50	12.60	20.50±0.3	11.00±0.3
RU3258B	32.00±0.4	29.00±0.3	11.40±0.3	8.20	12.00	19.20±0.3	11.40±0.3
RU3762B	37.10±0.5	30.80±0.3	11.50±0.3	10.25	14.85	21.00±0.3	11.50±0.3
RU3465A	34.30±0.5	32.30±0.3	12.00±0.25	8.00	14.00	23.30±0.25	12.00±0.25
RU3654A	36.10±0.5	27.20±0.3	12.00±0.3	9.30	14.30	17.70±0.3	12.00±0.3
RU4068A	39.75±0.5	34.00±0.25	12.00±0.3	9.00	18.25	25.00±0.25	12.00±0.3
RU3770A	37.00±0.6	34.95±0.3	12.00±0.3	8.40	16.00	24.55±0.3	12.00±0.3
RU3763D	36.60±0.5	31.50±0.3	12.00±0.3	9.90	14.20	21.70±0.3	12.00±0.3
RU3662A	36.20±0.5	30.90±0.3	12.00±0.3	9.40	14.30	21.50±0.3	12.00±0.3
RU3568A	35.00±0.5	33.80±0.3	12.50±0.3	8.50	13.50	23.80±0.3	12.50±0.3
RU-36NL	36.15±0.5	24.60±0.3	12.50±0.3	8.00	15.15	16.60±0.3	12.50±0.3
RU3754B	37.00±0.5	27.00±0.3	12.50±0.3	7.85	16.15	18.60±0.3	12.50±0.3
RU-36HM	35.25±0.5	34.30±0.5	12.70±0.2	9.30	13.20	24.00±0.5	12.70±0.2
RU3560C	35.05±0.5	30.30±0.3	12.70±0.3	9.30	13.05	20.00±0.3	12.70±0.3
RU3661A	35.80±0.5	30.50±0.3	13.00±0.25	10.50	12.00	20.00±0.25	13.00±0.25
RU3563A	35.40±0.5	31.50±0.3	13.00±0.25	10.00	11.90	21.50±0.2	13.00±0.3
RU3763SU	37.00±0.4	31.50±0.3	13.00±0.25	8.50	15.00	21.50±0.25	13.00±0.25
RU4263C	42.05±0.5	31.50±0.3	13.00±0.3	10.70	17.85	20.80±0.3	13.00±0.3
RU3461A	33.50±0.4	30.50±0.3	13.00±0.3	8.50	11.60	20.50±0.3	13.00±0.3
RU-35DA	35.40±0.5	27.50±0.3	13.00±0.3	10.00	11.90	17.50±0.3	13.00±0.3
RU4266A	41.85±0.5	32.60±0.3	13.00±0.3	10.70	17.65	21.90±0.3	13.00±0.3
RU3762A	36.90±0.5	31.10±0.3	13.00±0.3	10.20	13.20	20.90±0.3	13.00±0.3
RU3764B	37.30±0.5	31.80±0.3	13.00±0.3	9.70	14.10	22.10±0.3	13.00±0.3
RU3877A	38.30±0.5	38.90±0.3	13.00±0.3	10.70	14.10	28.40±0.3	13.00±0.3
RU3868C	38.00±0.5	34.20±0.3	13.00±0.3	10.70	13.80	23.50±0.3	13.00±0.3
RU3671A	35.85±0.5	35.55±0.25	13.50±0.3	8.90	12.95	25.40±0.25	13.50±0.3
RU4266C	42.35±0.5	33.00±0.3	14.00±0.3	11.10	16.65	21.50±0.3	14.00±0.3
RU3663A	36.40±0.5	31.50±0.3	14.00±0.3	10.10	11.80	21.40±0.3	14.00±0.3
RU4072A	40.00±0.5	36.10±0.3	14.00±0.3	11.50	14.10	24.30±0.3	14.00±0.3
RU4382A	43.00±0.5	41.00±0.3	14.00±0.3	11.50	17.00	30.00±0.3	14.00±0.3
RU4270A	42.35±0.6	35.00±0.3	14.00±0.3	11.10	16.65	23.50±0.3	14.00±0.3

● RU type

Shape code	Core constant			Core weight (g/set)
	Ae (mm ²)	le (mm)	Ve (mm ³)	
RU1116A	12.30	40.6	499	2.50
RU1728A	28.20	69.0	1950	10.00
RU2027A	49.50	67.1	3320	17.30
RU2953A	58.20	128.8	7500	36.70
RU-26	70.00	62.2	4350	22.90
RU2749A	70.40	113.8	8010	40.40
RU-30DB	78.50	143.5	11300	54.60
RU3060B	77.00	138.3	10600	52.00
RU3054A	81.10	126.3	10240	50.90
RU3659A	92.90	142.3	13220	65.70
RU3561A	95.15	144.4	13740	69.70
RU3261A	89.46	136.7	12230	63.40
RU3258B	89.40	131.0	11700	61.20
RU3762B	106.00	147.0	15580	78.90
RU3465A	104.60	150.9	15780	79.50
RU3654A	108.00	131.9	14250	71.40
RU4068A	104.80	167.7	17570	87.60
RU3770A	108.90	162.7	17720	90.90
RU3763D	112.40	148.8	16730	80.00
RU3662A	111.70	147.2	16440	92.60
RU3568A	112.00	154.3	17300	87.00
RU-36NL	100.00	124.8	12500	63.70
RU3754B	104.00	135.6	14200	73.00
RU-36HM	120.00	151.6	18700	93.60
RU3560C	120.00	138.9	16670	84.00
RU3661A	130.50	138.9	18130	92.00
RU3563A	128.00	145.0	18560	92.90
RU3763SU	118.20	148.2	17520	91.70
RU4263C	133.00	156.1	20800	102.00
RU3461A	116.20	137.2	15900	84.00
RU-35DA	128.00	129.0	16500	83.40
RU4266A	132.00	159.3	21000	107.00
RU3762A	133.00	145.2	19300	97.00
RU3764B	119.00	150.0	17900	90.00
RU3877A	132.00	177.9	23500	116.00
RU3868C	132.00	158.0	20900	103.00
RU3671A	126.00	161.1	20300	102.00
RU4266C	155.10	158.3	24550	121.90
RU3663A	140.80	144.5	20350	103.00
RU4072A	156.00	162.7	25400	126.00
RU4382A	150.00	192.0	28800	141.00
RU4270A	155.00	166.3	25800	128.00

● RU type



RU-42MS	42.75±0.5	31.50±0.3	14.00±0.3	11.50	16.75	20.00±0.3	14.00±0.3
RU-40C	40.00±0.5	30.20±0.3	14.00±0.3	11.50	14.10	18.40±0.3	14.00±0.3
RU3866Z	38.50±0.5	32.80±0.3	14.00±0.3	10.50	13.50	21.70±0.3	14.00±0.3
RU3864B	37.50±0.5	32.10±0.5	14.00±0.3	10.50	12.70	21.30±0.3	14.00±0.2
RU4168A	40.80±0.5	34.00±0.3	14.50±0.3	12.20	13.80	22.00±0.3	14.50±0.3
RU-40DA	40.05±0.5	31.10±0.3	14.50±0.3	11.50	13.55	20.10±0.3	14.50±0.3
RU3763E	36.75±0.4	31.50±0.3	14.50±0.3	9.50	12.40	20.50±0.3	14.50±0.3
RU4280A	42.30±0.5	40.40±0.3	15.00±0.3	11.80	15.00	28.40±0.3	15.00±0.3
RU4058A	39.80±0.5	29.20±0.3	15.00±0.3	11.50	12.80	17.70±0.3	15.00±0.3
RU4676A	46.00±0.8	38.00±0.3	15.00±0.3	12.00	18.50	26.00±0.3	15.00±0.3
RU4279A	42.00±0.5	39.45±0.3	15.00±0.3	11.00	15.50	27.45±0.3	15.00±0.3
RU4375B	42.80±0.5	37.55±0.3	15.00±0.3	11.80	15.50	25.55±0.3	15.00±0.3
RU4066A	40.00±0.5	33.00±0.3	15.00±0.3	11.50	13.20	21.50±0.3	15.00±0.3
RU-41E	41.60±0.5	37.00±0.3	15.00±0.3	11.80	14.30	25.00±0.3	15.00±0.3
RU4173A	41.50±0.5	36.50±0.3	15.00±0.3	11.50	14.50	25.00±0.3	15.00±0.3
RU4174A	40.70±0.5	36.80±0.3	15.00±0.3	8.70	16.50	27.50±0.3	16.50±0.3
RU4067C	40.25±0.5	33.60±0.3	15.00±0.3	10.40	14.35	24.00±0.3	15.00±0.3
RU4567B	44.50±0.5	33.25±0.3	15.00±0.3	11.50	17.60	21.60±0.3	15.00±0.3
RU-46MA	46.00±0.6	36.65±0.3	15.00±0.3	12.00	18.40	24.55±0.3	15.00±0.3
RU4573A	45.40±0.5	36.50±0.3	15.00±0.3	11.40	18.40	25.10±0.3	15.00±0.3
RU-42G	42.40±0.5	36.00±0.3	15.50±0.3	12.50	13.90	23.20±0.3	15.50±0.3
RU4570A	44.50±0.5	35.00±0.3	16.00±0.3	12.00	16.00	22.80±0.3	16.00±0.3
RU-49A	48.50±0.6	38.30±0.3	16.00±0.3	13.00	18.90	25.00±0.3	16.00±0.3
RU4373A	43.20±0.5	36.60±0.3	16.00±0.3	12.00	14.40	24.60±0.3	16.00±0.3
RU4370A	43.10±0.5	35.10±0.3	16.50±0.3	12.50	13.70	24.00±0.3	16.50±0.3
RU4776A	46.55±0.5	38.00±0.3	16.50±0.3	12.80	16.80	25.00±0.3	16.50±0.3
RU4582A	45.60±0.5	41.00±0.3	16.50±0.3	12.80	15.90	28.00±0.3	16.50±0.3
RU-43D	43.40±0.5	38.00±0.3	16.50±0.3	12.80	13.70	25.00±0.3	16.50±0.3
RU4478A	44.15±0.5	38.75±0.3	16.50±0.3	11.40	15.75	27.50±0.3	16.50±0.3
RU4569A	45.10±0.5	34.70±0.3	16.70±0.3	13.10	14.80	21.60±0.3	16.70±0.3
RU4677A	45.85±0.5	38.55±0.3	16.70±0.3	13.80	14.80	24.55±0.3	16.70±0.3
RU-51MS	50.70±0.65	38.55±0.3	16.70±0.3	13.80	19.55	24.55±0.3	16.70±0.3
RU4676C	45.50±0.6	38.20±0.3	17.00±0.3	13.00	14.90	25.20±0.3	17.00±0.3
RU-46D	46.30±0.5	38.00±0.3	17.00±0.3	13.30	15.50	25.00±0.3	25.00±0.3
RU4661A	45.60±0.5	30.50±0.3	17.50±0.3	13.00	14.60	17.50±0.3	17.50±0.3
RU4879A	48.40±0.6	39.30±0.3	18.00±0.3	14.50	15.50	24.50±0.3	18.00±0.3

● RU type

RU-42MS	154.00	152.6	23500	119.00
RU-40C	156.00	140.3	21900	109.00
RU3866Z	146.00	151.2	22100	110.00
RU3864B	143.00	146.6	21000	105.00
RU4168A	164.00	156.2	25600	127.00
RU-40DA	159.00	146.1	23200	116.00
RU3763E	148.10	142.7	21130	109.10
RU4280A	172.00	184.4	31700	158.00
RU4058A	172.50	136.2	23490	120.00
RU4676A	170.00	181.9	30900	152.00
RU4279A	168.00	180.9	30400	152.00
RU4375B	172.90	174.0	30090	149.70
RU4066A	132.00	159.3	21000	128.00
RU-41E	173.00	169.5	29300	147.00
RU4173A	172.00	168.9	29100	137.00
RU4174A	155.00	175.9	27300	138.00
RU4067C	167.90	161.0	27030	133.50
RU4567B	165.00	161.2	26600	135.00
RU-46MA	172.00	175.6	30200	150.00
RU4573A	173.00	177.0	30600	152.00
RU-42G	190.00	163.7	31100	153.00
RU4570A	188.00	165.0	31000	156.00
RU-49A	196.00	195.2	38300	181.00
RU4373A	188.00	169.3	31800	161.00
RU4370A	199.70	164.3	32810	164.70
RU4776A	205.00	177.8	36400	181.00
RU4582A	206.00	187.9	38700	193.00
RU-43D	207.00	171.5	35500	178.00
RU4478A	194.00	181.4	35200	175.00
RU4569A	216.00	159.5	34500	175.00
RU4677A	219.00	174.5	38200	188.00
RU-51MS	219.00	184.0	40300	198.00
RU4676C	222.00	175.7	39000	198.00
RU-46D	217.00	176.0	38200	191.00
RU4661A	223.00	145.0	32340	161.00
RU4879A	260.00	178.5	46400	225.00

ROTARY TRANSFORMERS

In VCRs, high-frequency video signals are recorded on, and replayed from a magnetic tape by a high-speed revolving drum equipped with a magnetic head. The rotary transformer is fitted onto this revolving drum to transmit the high-frequency signals without distortion from the rotor to the stator. The use of rotary transformers is now extending to DAT (digital audio tape), DVC (digital video camera) and D-VHS.



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■ Standard characteristics and product list of FDK rotary transformers

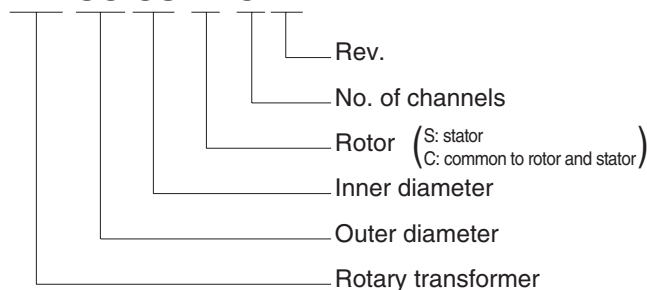
- Taking full advantage of its long experience as an integrated ferrite maker, FDK selects only the most suitable ferrite materials for rotary transformers.
- FDK rotary transformers incorporate cores with an outstanding dimensional precision backed by sophisticated processing and production technologies. FDK's high quality rotary transformers are mass-produced in overseas factories.
- Upon the request of customers, FDK promptly designs and produces test sample products.
- * FDK's product development and design services for customers are aided by a supercomputer simulation system to ensure that the exact needs of each customer are fully met.

Applications	Specification	No. of channels	Model type
Console VCR	Standard	2CH	RTA2525R/S-2A type
	Standard	4CH	RTA2929R/S-4A type
	Hi-Fi	6CH	RTA3636R/S-6A type
	S-VHS	7CH	RTA4040R/S-7A type
	Standard D-VHS	8CH	RTA5656R/S-8A type
Camcorder VCR	NORMAL	5CH	RTA3838R/S-5A type
	DVC	2CH	RTA1818R/S-2A type
DAT	DDS	4CH	RTA2626R/S-4A type

■ Naming of rotary transformer models

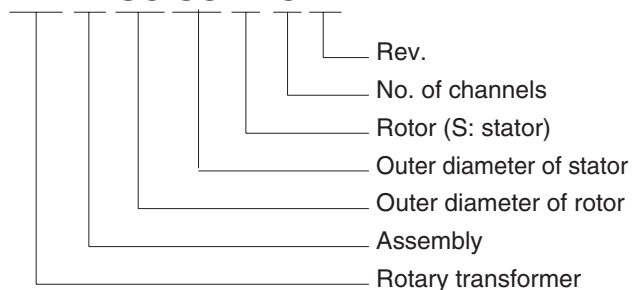
● Naming of core models

RT 36 08 R-6 A



● Naming of assembled models

RT A 36 36 R-6 A



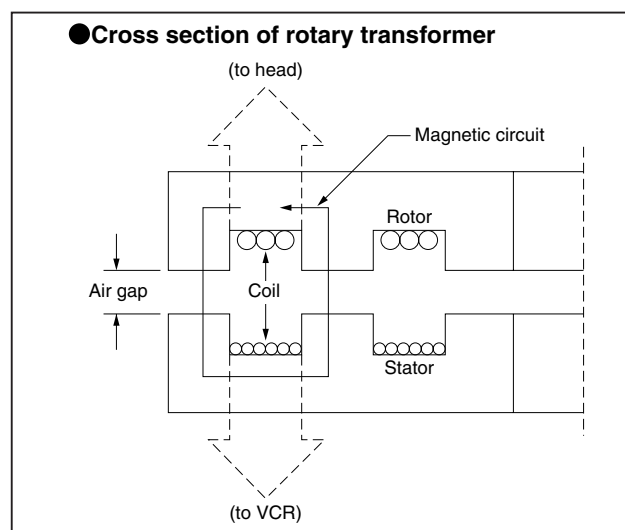
Standard materials for rotary transformer ferrite cores

Characteristic		Unit	L52H	L52R	L52S	L52M
Initial permeability	μ_{iac}	—	500	690	1200	1900
Coercivity	Hc	A/m	24	32	32	16
AC temperature coefficient	$\alpha_{\mu r}$	$\times 10^{-6}$	3~10	3~10	4~12	3~8
Resistivity	ρ	$\Omega \cdot \text{cm}$	$>10^8$	$>10^8$	$>10^8$	$>10^8$
Saturation magnetic flux density	Bs	mT	280	310	310	300
Residual magnetic flux density	Br	mT	130	110	160	120
Curie temperature	Tc	°C	>130	>130	>130	>110
Range frequency	f	Hz	1K~10M	1K~10M	1K~10M	1K~10M

Working mechanism of rotary transformers

Rotary transformers are designed to transmit electric signals from a rotating body to a fixed body, or from a fixed body to a rotating body. In this regards, (a) it is not possible to use lead wires to transmit electric signals between a rotating and a fixed body; (b) although theoretically possible, if a spring and brush used in motors are applied to this task, noise problems will arise due to the very weak signals and a very high MHz-level frequency involved.

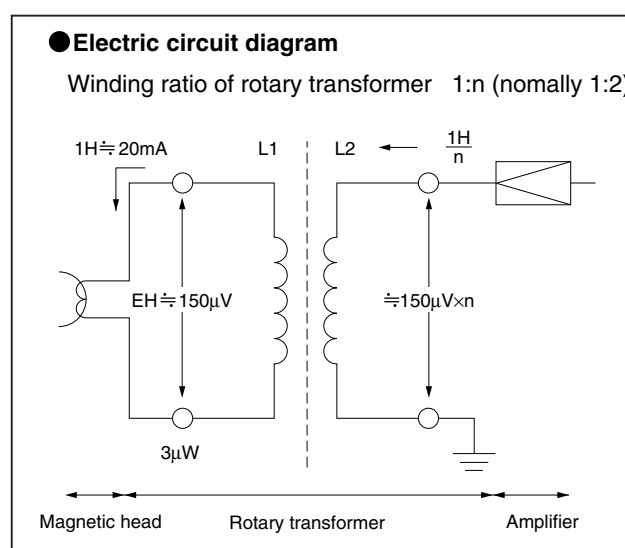
Consequently, a rotary transformer was created, which could transmit magnetic fields generated between a rotor and a stator, through a ferrite material (see righthand diagram). In this diagram, the performance of the magnetic circuit depends almost totally on the precision of the air gap. In conventional VCRs, the air gap is set between 30 μm and 50 μm .



Electric circuits of rotary transformers

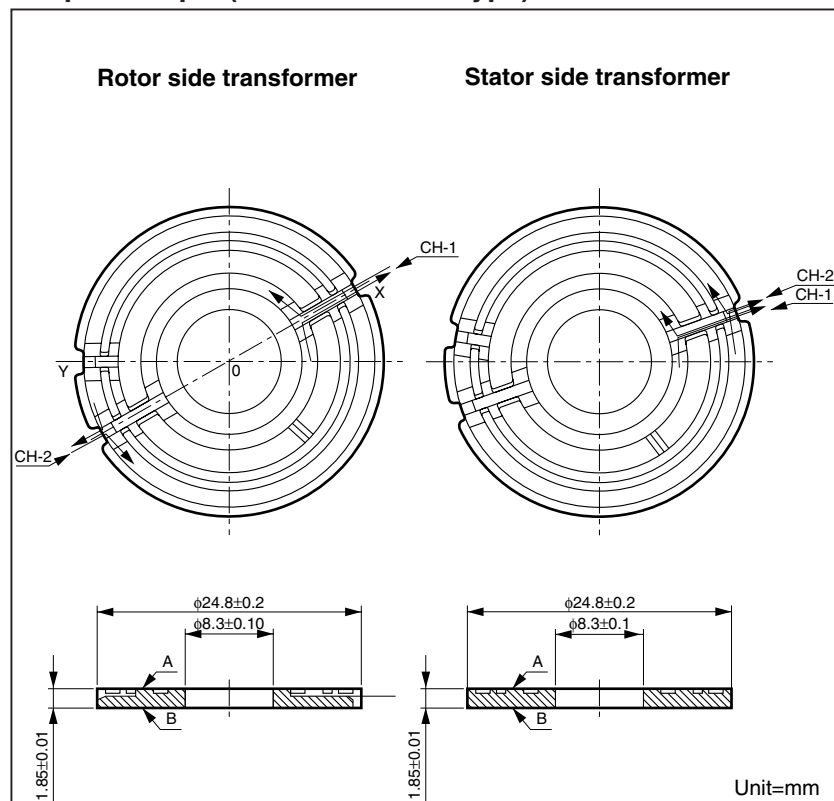
The righthand diagram shows the electric circuit of a revolving magnetic head drum for VCRs, and each VCR incorporates as many electric circuits of this type as needed to match the number of television channels. These electric circuits have the following characteristics:

- ① If the coupling coefficient is 1, the power on the rotor side and the power on the stator side are considered equal.
- ② The ratio of the voltages applied to the both ends of the rotary transformer is identical to the winding ratio.
- ③ The values shown in the righthand diagram were measured when the VCR was in the recording mode. The values would be even smaller for the replay mode.
- ④ The voltage, current and power values shown in the right-hand diagram vary somewhat, depending on the frequencies and models of rotary transformers involved.



■ 2-channel rotary transformers for console VCR

Shape example (RTA2525R/S-2A type)



These are standard rotary transformers for 2-channel video recording and replay.

Features

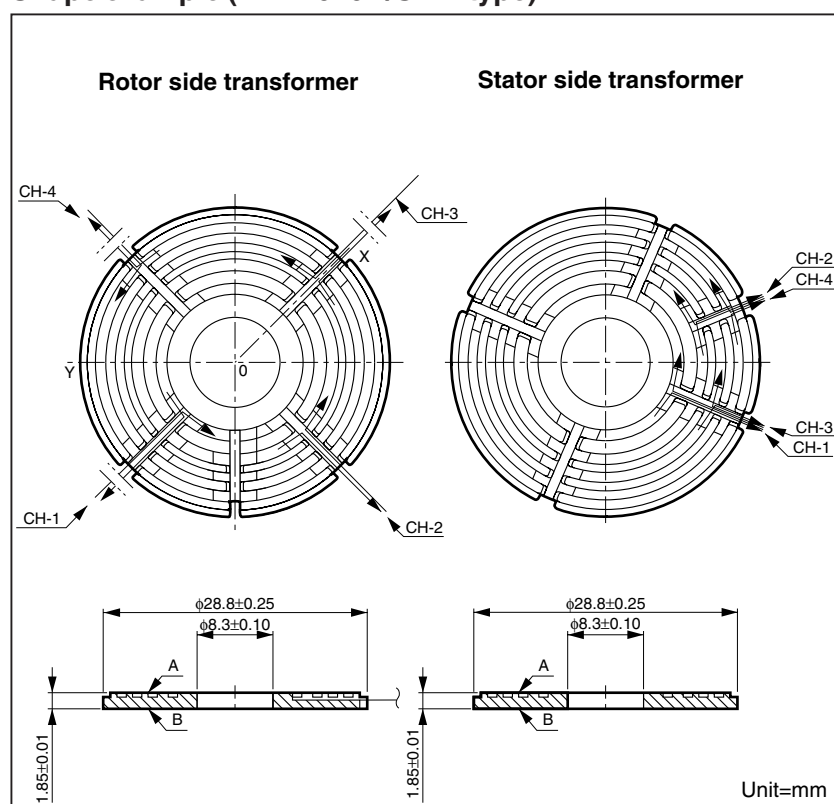
- A high quality and a low price made possible by advanced technologies.

Characteristics

Channel	Combinational inductance	Leakage inductance	Coupling coefficient	Note
1	60 μ H	2.1 μ H	0.98	gap=38 μ m f=1.0MHz
2	63 μ H	3.2 μ H	0.97	

■ 4-channel rotary transformers for console VCR

Shape example (RTA 2929R/S-4A type)



These are standard rotary transformers for 4-channel video recording and replay.

Features

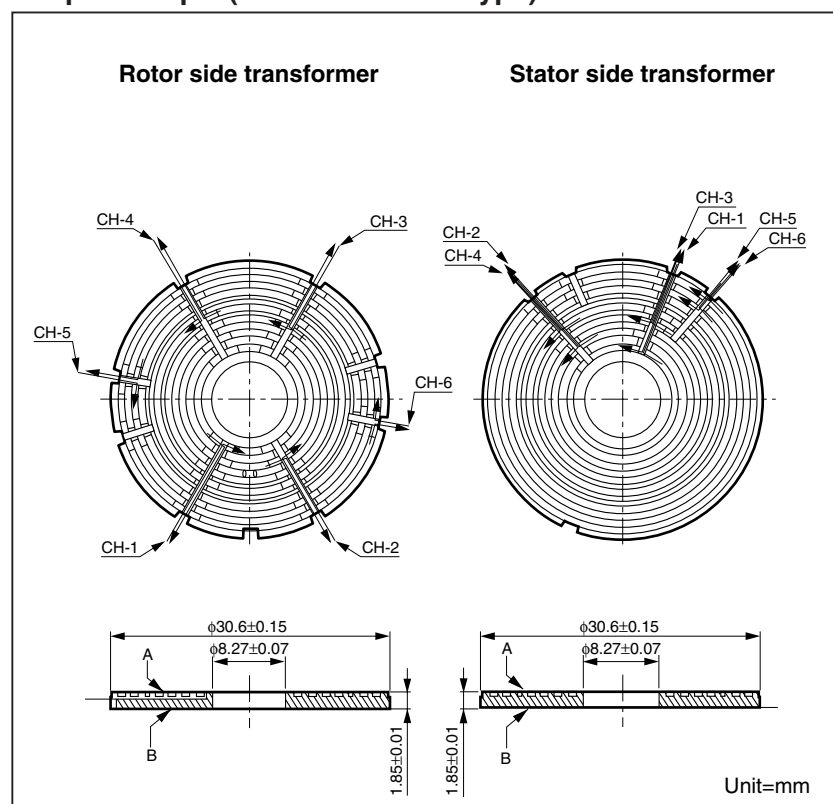
- Stable characteristics ensured by the use of high-quality ferrites.

Characteristics

Channel	Combinational inductance	Leakage inductance	Coupling coefficient	Note
1	27 μ H	1.8 μ H	0.96	gap=38 μ m f=1.0MHz
2	27 μ H	2.2 μ H	0.96	
3	27 μ H	2.5 μ H	0.95	
4	27 μ H	2.7 μ H	0.95	

■ 6-channel rotary transformers for console VCR (Hi-Fi)

Shape example (RTA 3131R/S-6A type)



Features

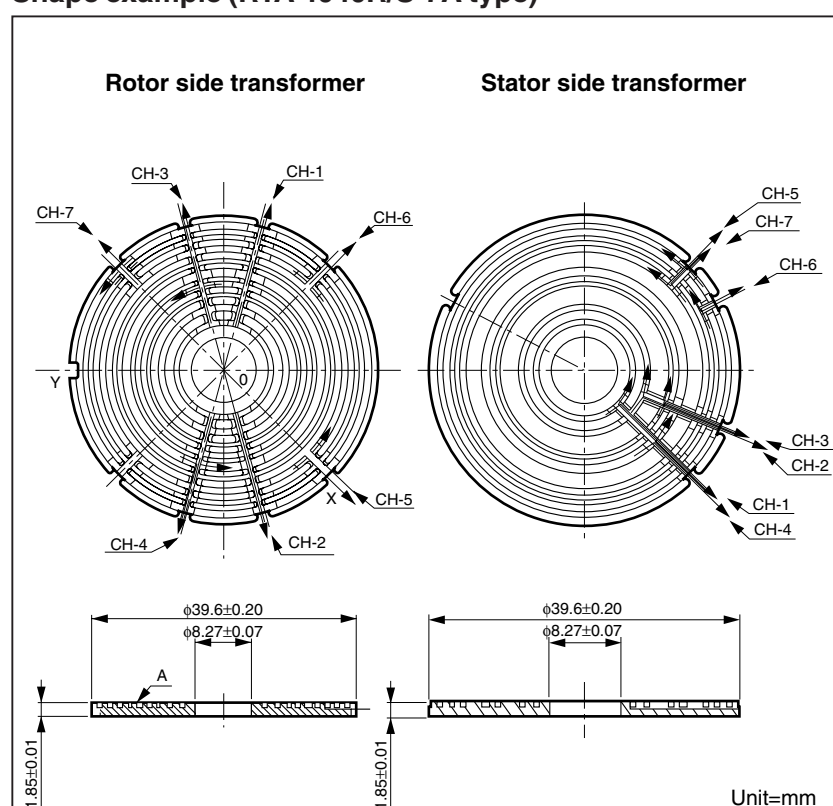
- A stable signal transmission throughout a low to high (several KHz to several MHz) frequency range due to the use of high-quality ferrites.

Characteristics

Channel	Combinational inductance	Leakage inductance	Coupling coefficient	Note
1	21 μ H	1.8 μ H	0.96	gap=30 μ m f=1.0MHz
2	21 μ H	2.0 μ H	0.95	
3	21 μ H	2.2 μ H	0.95	
4	21 μ H	2.4 μ H	0.94	
5	31 μ H	3.3 μ H	0.95	
6	31 μ H	3.3 μ H	0.95	

■ 7-channel rotary transformers for console VCR (S-VHS)

Shape example (RTA 4040R/S-7A type)



Features

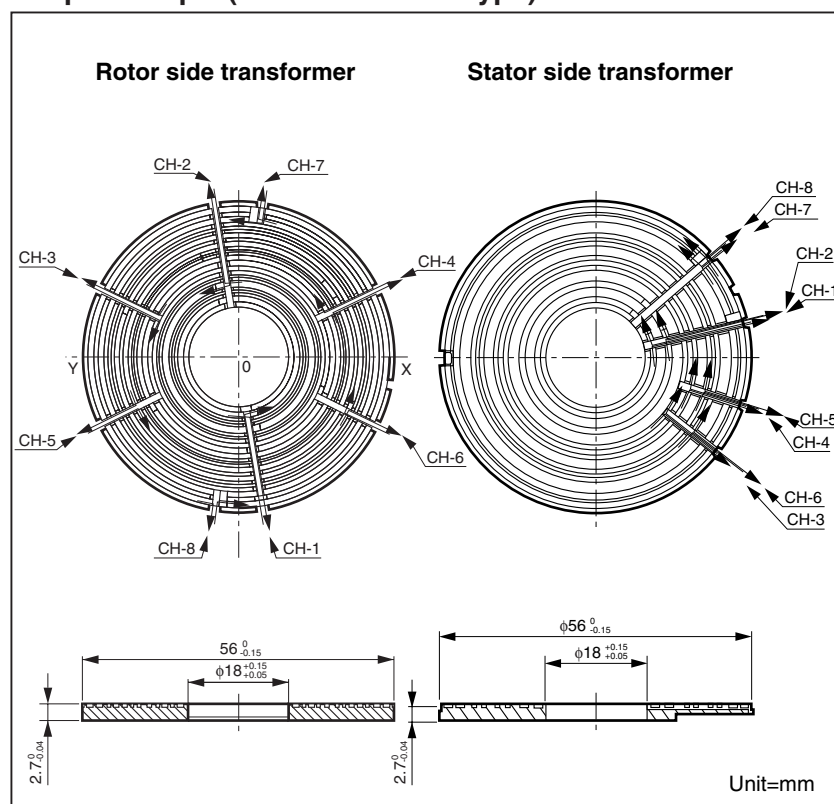
- Improved characteristics obtained by the use of a high-performance ferrite with a high permeability and a low loss.
- Self-resonance frequency raised to near the 10 MHz level.

Characteristics

Channel	Combinational inductance	Leakage inductance	Coupling coefficient	Note
1	23 μ H	3.1 μ H	0.93	gap=38 μ m f=1.0MHz
2	23 μ H	3.1 μ H	0.93	
3	23 μ H	3.1 μ H	0.93	
4	23 μ H	3.1 μ H	0.93	
5	40 μ H	5.0 μ H	0.93	
6	5 μ H	0.9 μ H	0.90	
7	40 μ H	5.0 μ H	0.93	

8-channel rotary transformers for console VCR (D-VHS)

Shape example (RTA 5656R/S-8A type)



Features

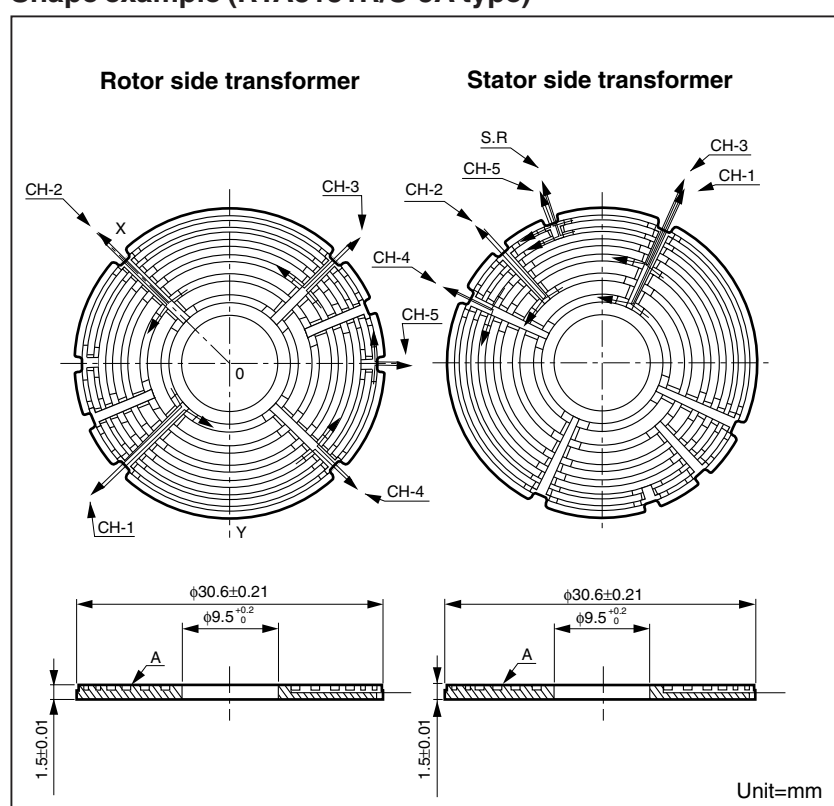
- Stable transmission characteristics achieved in the low to high range (several kHz to several MHz) by using high-quality ferrites.
- Dimensional accuracy enhanced by applying advanced processing techniques.
- Minimized inter-channel variation of characteristics.

Characteristics

Channel	Combinational inductance	Leakage inductance	Coupling coefficient	Note
1	24μH	2.5μH	0.94	gap=50μm f=1.0MHz
2	24μH	2.5μH	0.94	
3	31μH	4.0μH	0.93	
4	31μH	4.0μH	0.93	
5	31μH	4.0μH	0.93	
6	31μH	4.0μH	0.93	
7	45μH	4.5μH	0.95	
8	45μH	4.5μH	0.95	

Disk-Shaped 5-channel rotary transformers for camcorder VCR (VHS-C)

Shape example (RTA3131R/S-5A type)



Features

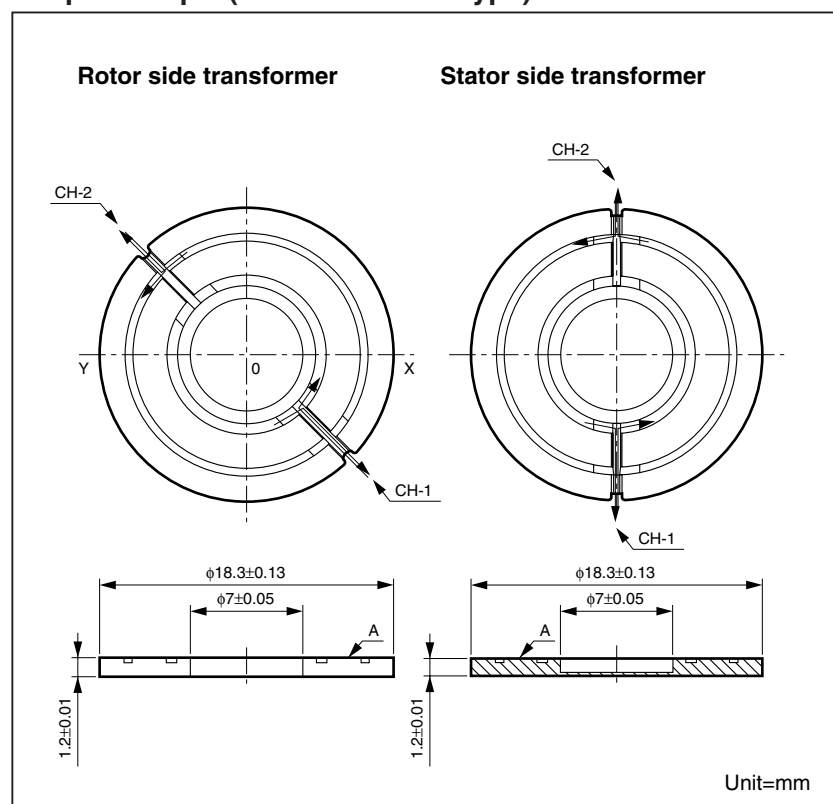
- Use of strongly magnetic ferrite materials suitable for high-precision grinding work to carve channel grooves.
- Suitable for compact, lightweight camcorders.

Characteristics

Channel	Combinational inductance	Leakage inductance	Coupling coefficient	Note
1	27μH	2.3μH	0.96	gap=30μm f=1.0MHz
2	29μH	2.6μH	0.95	
3	29μH	2.6μH	0.95	
4	27μH	2.9μH	0.94	
5	3.5μH	0.6μH	0.91	

■ 2-channel rotary transformers for DVC

Shape example (RTA1818R/S-2A type)



Features

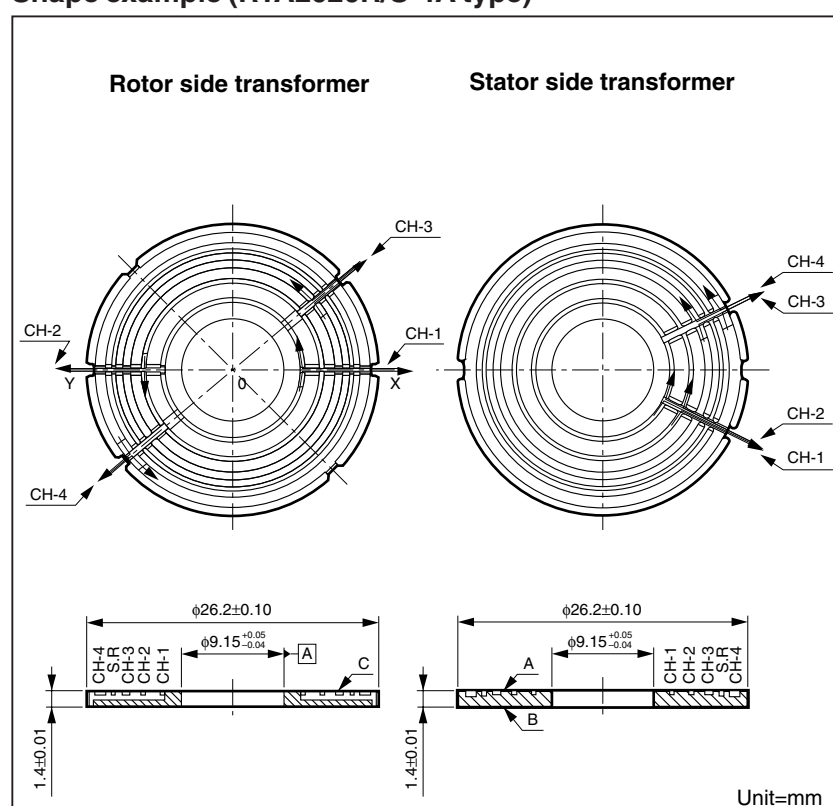
- High performance and quality achieved by using low-loss, high-permeability and high-resistivity ferrites.
- High-precision, lightweight and compact transformers to match DVC.

Characteristics

Channel	Combinational inductance	Leakage inductance	Coupling coefficient	Note
1	4.5μH	0.3μH	0.97	gap=30μm f=1.0MHz
2	4.5μH	0.3μH	0.97	

■ 4-channel rotary transformers for DAT

Shape example (RTA2626R/S-4A type)



Features

- A high performance and a high quality obtained by the use of low-loss, high-permeability and high-resistivity ferrite materials.
- Light, compact rotary transformers with precision dimensions matching the delicate shapes of R-DAT recorders.



FDK CORPORATION

Electronics sales Div.

5-36-11, Shinbashi, Minato-ku, Tokyo 105-8677, Japan (Hamagomu Bldg.)
TEL: (81)-3-5473-4683 FAX: (81)-3-3431-9436

U.S.A. FDK AMERICA, INC. CORPORATE OFFICE

2270 North First Street, San Jose, California 95131-2022, U.S.A.
TEL: (1)-408-432-8331 FAX: (1)-408-435-7478

FDK AMERICA, INC. BOSTON OFFICE

411 Waverly Oaks Road, Suite 324, Waltham,
Massachusetts 02452-8437, U.S.A.
TEL: (1)-781-899-7700 FAX: (1)-781-899-7701

FDK AMERICA, INC. SAN DIEGO OFFICE

6540 Lusk Blvd Suite C274 San Diego,
California 92121-2766, U.S.A.
TEL: (1)-858-558-8368 FAX: (1)-858-558-6005

Europe FDK ELECTRONICS GMBH

Heerdter Lohweg 89, 40549 Düsseldorf, Germany
TEL: (49)-211-591574 FAX: (49)-211-593549

FDK ELECTRONICS UK LIMITED

Suite 4C Celect House 12A Fairbairn Road,
Kirkton North Livingston EH54 6TS,
Scotland, United Kingdom
TEL: (44)-1506-467981 FAX: (44)-1506-467982

Asia FDK HONG KONG LTD.

Unit 18, 15/F., Chevalier Commercial Centre, 8 Wang Hoi Road,
Kowloon Bay, Hong Kong
TEL: (852)-27999773 FAX: (852)-27554635

FDK SINGAPORE PTE., LTD.

4, Leng Kee Road, #06-07/08 SiS Building, Singapore. 159088,
Republic of Singapore
TEL: (65)-472-2328 FAX: (65)-472-5761