

Table 3.1. SURVEY OF SOME FERRITE GRADES

CLASS	MnZn ferrites					APPLICATION
	I	II	III	IV	V	
	<i>Initial permeability</i>	800-4000	500-1000	3000-20 000	2000-5000	> 1000
<i>Main applications</i>	L.f. resonant circuits	M.f. resonant circuits, antennas	Low-power wide-band & pulse transformers, e.m.i. supprsn.	Power & high-flux density applications, e.m.i. supprsn.	Wide-band & pulse transformers	
<i>Approx. frequency range</i>	< 0.2 MHz	0.1-2 MHz	1.f.-200 MHz	0.01-1 MHz	1-300 MHz	
<i>Manufacturer, country and brand name</i>						
<b>WESTERN EUROPE</b>						
1 Kaschke (FRG) <i>Kamafer</i>	K2005	K300 K600 K700	K4000 K6000 K10000	K2002 K2004 K2006		
2 Krupp (FRG) <i>Hyperox</i>	DIS2 DIS3 DIS4	DIS5	DI DISI DISII	C2 C21 C23 C24		
3 Neosid (UK)	P10 P11 P12		F9 F10	F4 F5 F3 F6 FP4a FP5a		
4 Phillips Components (The Netherlands) <i>Ferroxcube</i>	3B 3B7 3H1 3H3 A5 <sup>M</sup>	3D3 3D35	3E1 3E2 3E4 3E5 3H2	3C2 <sup>Y</sup> 2A2 <sup>Y</sup> 3C6 3C8 3C85 3F3 3B8 A9 <sup>M</sup>		
5 SEI Magnetic Components (UK)	Q3 Q7	S1	Q5 P T3 T4 T6	L2		
6 Siemens (FRG) <i>Siferrit</i>	N22 N28 N48	M33	N26 N30 T35 T38	N41 N27 N47 N67		
7 Thomson CSF (France) <i>Ferrinox</i>	T10 T14 T13	B10 T31	T22 T4 T6 T4A T6A	T22 B50 B51 B52 B30 <sup>Y</sup> B31 <sup>Y</sup>		
8 Vogt Electronic (FRG) <i>Ferrocavit</i>	FI311 FI323	FI262 FI291	FI340 FI360	FI323 FI322 FI311		
<b>EASTERN EUROPE</b>						
9 Ei Feriti (Yugoslavia)	M42 M58	M31	M42 M48 M56 M51 M52	M46 M48 M32 <sup>Y</sup>		
10 EMO Elektromodule (Hungary) <i>Maferit Niferrit</i>	M1 M2 M2F M2F-A M4-A	M05F-A	M2 M3 M4 M4-A M5 M6	M2T M2TN M2TN-A M2TN-B		
11 Iskra (Yugoslavia) <i>Elvefer</i>	1G 6G 8G 11G 14G 16G 26G	10G	8G 9G 19G 22G 12G 25G	5G 15G 25G 35G		
12 Kombinat VEB (GDR)	M163 M183 M150	M143	M195	M194 M196		
13 Polfer (Poland) <i>Ferroxyl</i>	F-1001 F-1501 F-2001 F-2002	F-605	F-1501 F-2001 F-2004 F-3001 F-3002 F-6001	F-1502 F-2004 F-3002 F-807 F-803 <sup>Y</sup> F-804 <sup>Y</sup>		
14 Pramet (Czechoslovakia) <i>Fonox</i>	H23	H6 H7	H22	H11 H20 H21		
<b>USA</b>						
15 Allen-Bradley <i>Ferramic</i>	BBR7400 BBR7500 BBR7600 BBR7700 BBR7800 BBR7950		BBR7400 BBR7500 BBR7600 BBR7700 BBR7800	IR8000 IR8100 IR8200 IR8500 IR8600 IR8700 05 06		

## CLASSIFICATION

<i>NiZn Ferrites</i>						<i>MnZn or NiZn</i>
<i>VI</i>	<i>VII</i>	<i>VIII</i>	<i>IX</i>	<i>X</i>	<i>XI</i>	<i>XII</i>
500-1000	150-500	70-150	35-70	12-35	< 12	-
H.f. wide-band & pulse transformers, antennas, e.m.i. supprsn.	Antennas, h.f. power transformers, e.m.i. supprsn.	Resonant circuits, antennas, h.f. power transformers, e.m.i. supprsn.	Resonant circuits, e.m.i. supprsn.	Resonant circuits, e.m.i. supprsn.	Resonant circuits, e.m.i. supprsn.	Dedicated e.m.i. suppression, special applications
5-300 MHz	0.5-5 MHz	2-20 MHz	10-40 MHz	20-60 MHz	> 30	-
K650	K250	K150 K80	K50 K40	K14	K10	
E2	E4	E5*		E7*		
F13	F14	F16	F25*	F28* F29*	F27*	F8
4A4 B1 <sup>M</sup>	4B1	4C6	4D1	4E1		3H2 3S1 4S2
	K4	K6 K10	K7	K8		
		K1		K12	U60 U17*	N22
H10	H20	H30 H32	H50 H52	H60 H62		T4A T6A
Fi292 Fi293	Fi221 Fi222	Fi212	Fi150	Fi130	Fi110 Fi091	
N32	N31	N23	N22	N25 N21	F11	
	N300 N200	N100	N50	N20	N10	
IC	2C 3C	3F 1F	2F	1E 2E		
	M360	M340 M343		M330 M321	M320	
	F-302 F-201	F-81 F-82		U-31*	U-11* U-6	
	N2	N1 N08P	N05	N02	N01 N01P	
H	G	Q1	Q2	Q3		AR9100 AR9700

Table 3.1—contd

						APPLICATION
<i>MnZn ferrites</i>						
CLASS	I	II	III	IV	V	
<i>Initial permeability</i>	800–4000	500–1000	3000–20 000	2000–5000	> 1000	
<i>Main applications</i>	L.f. resonant circuits	M.f. resonant circuits, antennas	Low-power wide-band & pulse transformers, e.m.i. supprsn.	Power & high-flux density applications, e.m.i. supprsn.	Wide-band & pulse transformers	
<i>Approx. frequency range</i>	<0.2 MHz	0.1–2 MHz	1.f.–200 MHz	0.01–1 MHz	1–300 MHz	
<i>Manufacturer, country and brand name</i>						
<i>USA (contd)</i>						
16 Ceramic Magnetics	<b>MN30</b>		<b>MN60 MN100</b>	<b>MN80 MN60LL MN67 MN8CX</b>	<b>CMD5005 CMD6</b>	
17 Fair-rite		33	73 75	77 83 <sup>1</sup>		
18 Ferronics			<b>B</b>			
19 Ferroxcube Div. of AmpereX	<b>3B9 3B7</b>	<b>3D3</b>	<b>3E2A 3E5</b>	<b>3C6A 3C8 3C85 3F3</b>	<b>4A6</b>	
20 Krystinel	K18	K16 KE1	K82 KT6 KS6 KT7 KTA	KB2 KB3 K72	KF1	
21 National Magnetics Group		R P				
22 Magnetics Div. of Spang & Co.	D G V	A	D G J W H	F P		
23 D. M. Steward	33		35 40	33		
<i>JAPAN</i>						
24 Nippon Ferrite			GP-5 GP-7 GP-9 GP-11 6Q-5C	SB-5F SB-5HK SB-5L SB-5LK SB-5S SB-7 SB-7C SB-7E SB-7H SB-9C SB-9H SB-5M <sup>Y</sup>	DL-3 DL-2 DL-8C T-314 RL-5A	
25 Sumitomo Ceraxcube	3B2 3B4 3B4A 3B6 3F3 3F4 3F5		3E1 3E1A 3E1B	3F5 3F5B 3F6	4T1	
26 TDK	H6A H6A3 H6B H6H3 H6K H6Z	H6F	H5A H5B H5B2 H5C2 H5D H5E HP3000 HP4000 HP5000 NF H1B H1D	H7A H7B H7C1 H7C2 H7C4		
27 Tokin	1801F 1000SFP 2001F 2002F 2101F 2300F	801F 1000SFP	4000H 5000H 700H 12001H	2500B 2500B2 2500B3 3100B 5000B	2000L	
28 Tomita	2B3 2B4		2C2 2C3 2E4 2E1 2D1 2D3	2E6 2E7 2E4	3A9	

*Notes*

Where a material code number is printed in bold type, some property or properties of that material are presented in the graphical data in Figures 3.1–3.25.

\* These materials have properties induced by special heat treatment during manufacture; irreversible changes in properties will be caused if the material is subjected to strong magnetic fields.

## CLASSIFICATION

NiZn Ferrites						MnZn or NiZn
VI	VII	VIII	IX	X	XI	XII
500-1000	150-500	70-150	35-70	12-35	<12	-
H.f. wide-band & pulse transformers, antennas, e.m.i. supprsn.	Antennas, h.f. power transformers, e.m.i. supprsn.	Resonant circuits, antennas, h.f. power transformers, e.m.i. supprsn.	Resonant circuits, e.m.i. supprsn.	Resonant circuits, e.m.i. supprsn.	Resonant circuits, e.m.i. supprsn.	Dedicated e.m.i. suppression, special applications
CN20	C2025	C2050	C2075	N40		
	64*	61* 65*	63* 67*	68*		43 73
J	F	K*	P*			
4A	4B	4C4				
K52	KA1 KD1	K01 KU8	K21	K31 KU1		KV1
H		M	M2	M3		
28		18 21	16	15		
DL-7C CL-81 DB-3T DL-6C TH-55	L-82 QL-400 SM-30C DL-5C L-81 KP-4B DM-1N DM-8 QM-051 DL-4C DM-7 DM-6 DM-1	KQ-1 KP-2S KP-3S QM-201 SM-2C SV-5B	DV-6 DV-2A DV-2C SV-1 SV-1D KP-3M VH-50 DV-1A DV-1S DV-1N SV-1AC SV-2C	RM-1K RM-2K SV-2D RV-6 RV-5 SV-3C SV-5D RV-4 SV-3A SV-3H VH-200	RV-2 RV-3 SF-7 SH-6L	
FS1				SMC-2		
	K5	K6A		K7A K8		NF1 NF2 NF3 NF4 NF5
601L 700L	400L 250L	150L 100L	50L 40L	20L	10L	
3A 3A4 3A6	3A3 3D2 3H2 4A 4A2 4A3 4A5 D3 D4A D5A D7E D8E D9E D11A D12A D13A D14A F3 F3L 4B4 4D 4D4 4D8 4H2 4C	DF4A 4D7 5B 5B3 5H2 6D8 6H3	DF7P DF11R DF10 6A 6D2 6D3 6D7	6B2 6B3 7A5 7A6 7B2 7B5 7B5E 7D1	7A3 7B4 7C 7D2 7D3 7D4 7D5C 7D5E 7D6 7D7	

(I) This material has a substantially rectangular hysteresis loop and is intended for use in saturating transformers and chokes.

(M) These materials are discontinued Mullard grades but are retained in this table (under the Philips Components name) because useful properties appear in the following graphical data.

(Y) Materials intended mainly for TV deflection yokes.