东磁 MnZn 铁氧体材料主要应用

Application Area	Frequency Range	Material	Main Features	μi 25℃	Bs 25℃	Bs 100℃	Pcv 25℃	Pcv 100℃	Tc(℃)
Medium frequency Transformers Power inductors Chokes	<0.5MHz	DMR24	High Bs	2000	540 mT	460 mT	800 kW/m^3	445 kW/m^3	>280
	<0.2MHz	DMR28	High Bs	1600	600 mT	490 mT	1250 kW/m3	1350 kW/m3	>280
	<0.5MHz	DMR91	High Bs and low loss	2000	550 mT	460 mT	700 kW/m^3	300 kW/m^3	>280
	<0.3MHz	DMR40	Low loss	2300	510 mT	390 mT	600 kW/m^3	410 kW/m^3	>215
	<0.4MHz	DMR44	Low loss	2400	510 mT	400 mT	600 kW/m^3	300 kW/m^3	>215
	<0.4MHz	DMR47	Low loss	2500	530 mT	420 mT	600 kW/m^3	280 kW/m^3	>230
	<0.4MHz	DMR95	Low loss and wide Temp.	3300	530 mT	410 mT	350 kW/m^3	320 kW/m^3	>215
	<0.4MHz	DMR95L	Low loss and wide Temp.	3300	530 mT	410 mT	320 kW/m^3	290 kW/m^3	>215
	<0.4MHz	DMR95B	Low loss & wide Temp. &High Bs	3300	540 mT	450 mT	350 kW/m^3	300 kW/m^3	>230
	<0.4MHz	DMR96	Low loss with wide temperature range	3300	540 mT	430mT	290 kW/m3	280 kW/m3	>215
	<0.6MHz	DMR96A	Low loss with wide temperature range	3500	540 mT	430mT	290 kW/m3	280 kW/m3	>215
High frequency transformers Power inductors Chokes	0.5-1MHz	DMR50	Low loss at high frequency	1400	470 mT	380 mT	*130 kW/m^3	*80 kW/m^3	>240
	1-2MHz	DMR51	Low loss at high frequency	900	500 mT	410 mT	**80 kW/m^3	**80 kW/m^3	>290
	2-4MHz	DMR52	Low loss at high frequency	600	500 mT	430 mT	***30 kW/m^3	***100 kW/m^3	>220
	1-3MHz	DMR51W	Low loss at high frequency	900	500 mT	430 mT	**40 kW/m^3	**40kw/m^3	>280
High Q inductors	<0.1MHz	DMR70	High Q material for filter inductor	2300	420 mT	310 mT			>170
ISDN transformers XDSL transformers LAN transformers	<0.5MHz	DMR71	High Bs for telecommunication	3800	550 mT	435 mT			>255
	<0.5MHz	DMR73	Wide temperature range (-40~85℃) with super DC bias	4200	470 mT				>160
Broadband transformers Pulse transformers Delay lines	<0.5MHz	R4k		4300	450 mT				>150
	<0.3MHz	R5k		5000	430 mT				>140
	<0.2MHz	R7k		7000	420 mT				>125
	<0.2MHz	R10k		10000	400 mT				>120
	<0.3MHz	R10kZ		10000	>400mT				>120
	<0.1MHz	R12k		12000	380 mT				>110
	<0.1MHz	R15k		15000	360 mT				>110

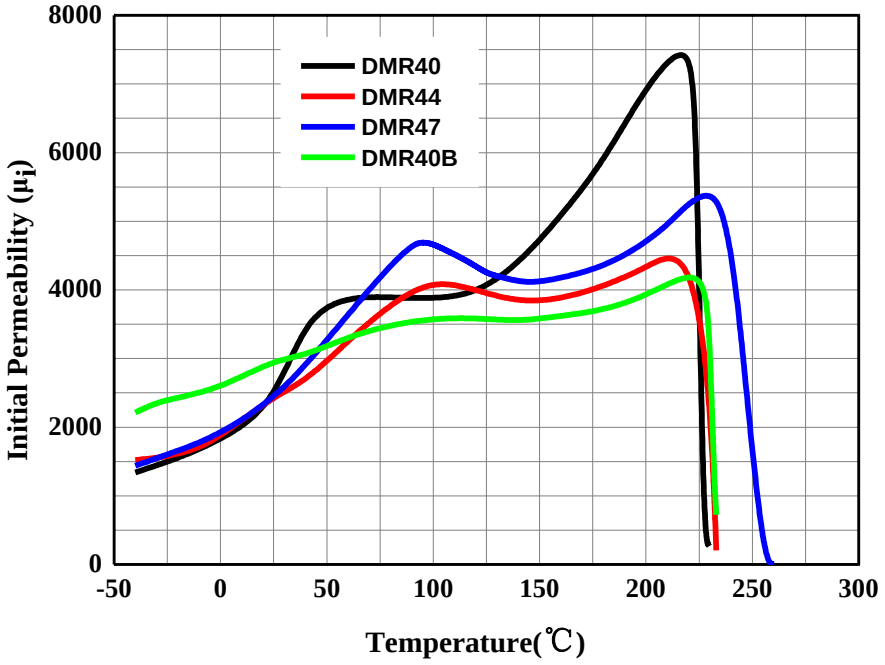
Notes:

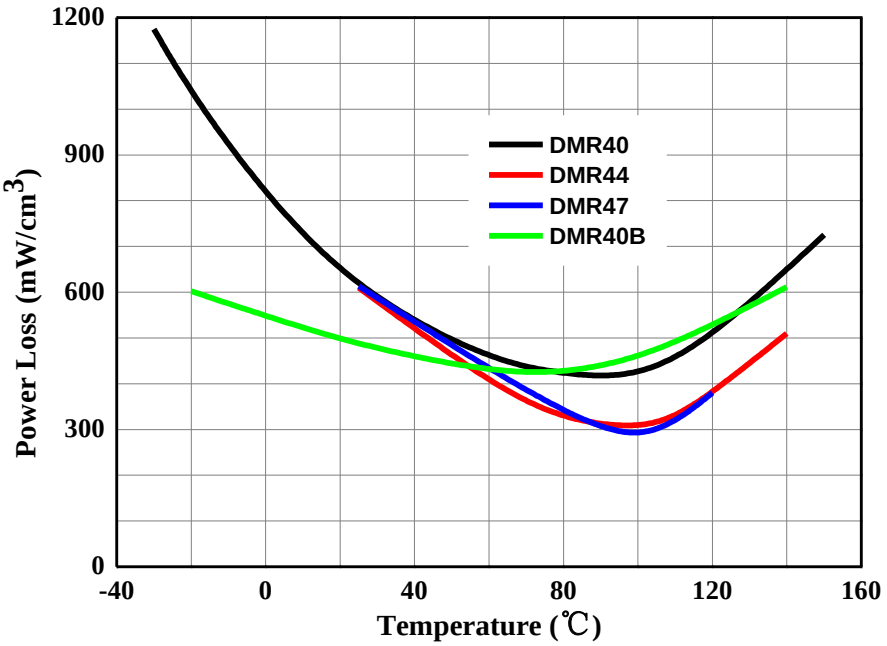
*** testing condition: 500kHz/50mT; ** testing condition: 1MHz/30mT; *** testing condition: 3MHz/10mT; **** testing condition: 400kHz/50mT.**

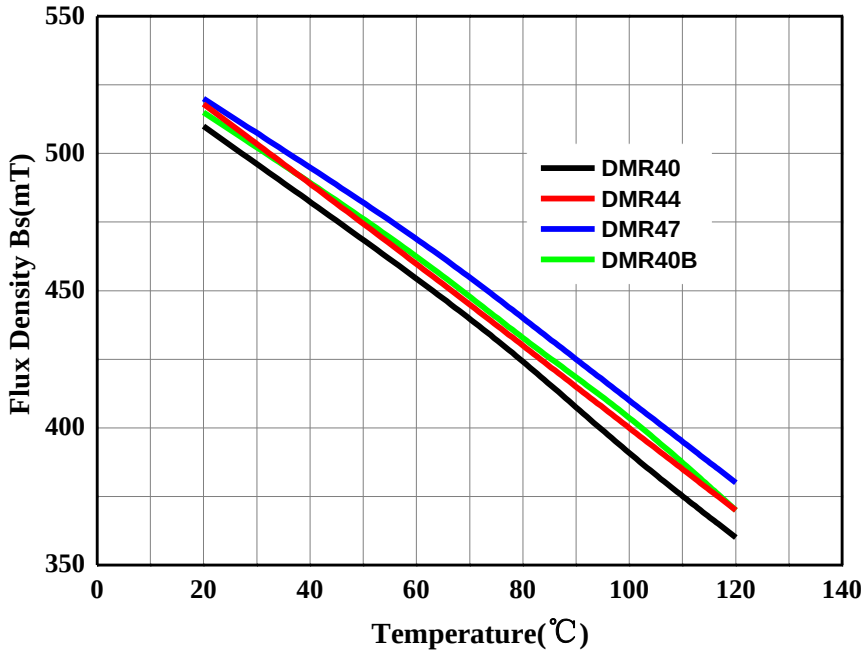
低损耗 MnZn 铁氧体材料

Parameter		Unit	DMR40	DMR44	DMR47	DMR40B
Initial permeability	25℃		2300±25%	2400±25%	2500±25%	3000±25%
Saturation magnetic Flux density (*f*=50Hz H=1194A/m)	25℃	mT	510	510	520	520
	100℃	mT	390	400	410	400
Residual magnetic fulx density	25℃	mT	95	110	160	120
	100℃	mT	55	60	50	95
Coercive Force	25℃	A/m	14	15	10	12
	100℃	A/m	9	6	6	10
Core loss 100kHz/200mT	25℃	mW/cm^3	600	600	600	90**
	60℃	mW/cm^3	450	400	400	75**
	100℃	mW/cm^3	410	300	280	75**
	120℃	mW/cm^3	500	380	380	95**
Curie temperature		℃	＞215	＞215	＞250	＞225
Density		g/cm^3	4.8	4.8	4.8	4.8

** At 25 kHz/200mT



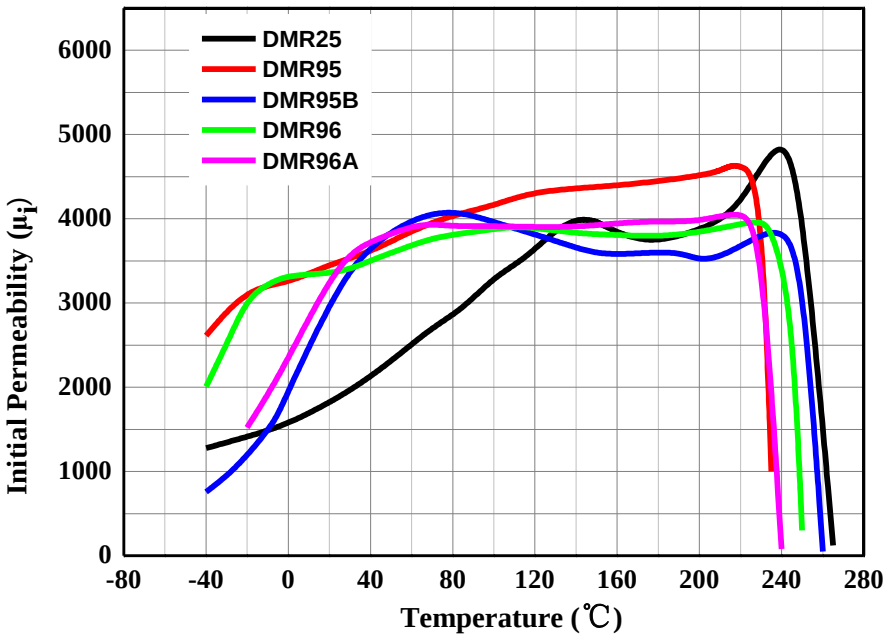

1200
900
600
300
0
-40
0
40
80
120
160
Power Loss (mW/cm3)
Temperature (℃)
DMR40
DMR44
DMR47
DMR40B

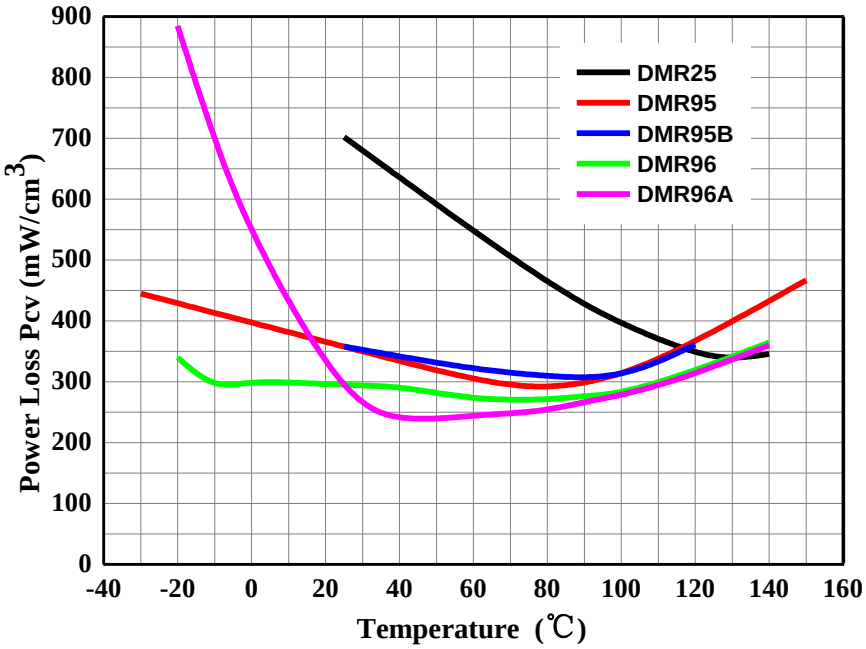

550
500
450
400
350
0
20
40
60
80
100
120
140
Flux Density Bs(mT)
Temperature(℃)
DMR40
DMR44
DMR47
DMR40B

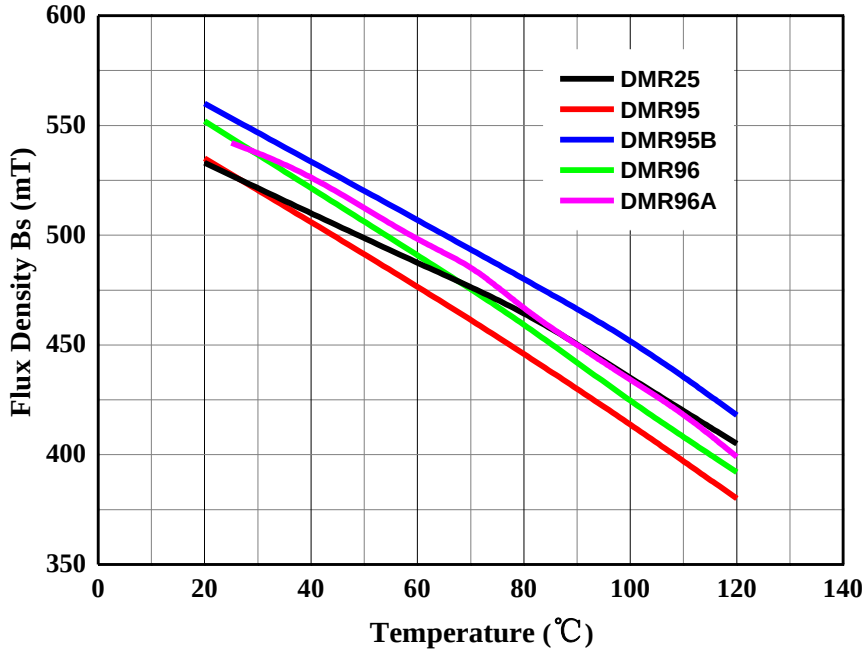
宽温低损耗 MnZn 铁氧体材料

Parameter		Unit	DMR25	DMR95	DMR95L	DMR95B	DMR96	DMR96A
Initial permeability	25℃		1800±25%	3300±25%	3300±25%	3300±25%	3300±25%	3500±25%
Saturation magnetic Flux density（*f*=50Hz H=1194A/m)	25℃	mT	520	530	530	540	535	540
	100℃	mT	430	410	410	450	430	430
Residual magnetic fulx density	25℃	mT	200	85	85	75	90	90
	100℃	mT	90	55	55	50	70	70
Coercive Force	25℃	A/m	16	9	9	10	10	10
	100℃	A/m	10	9	9	8	9	9
Core loss 100kHz/200mT	-20℃	mW/cm^3	-	-	-	-	360	-
	0℃	mW/cm^3	-	-	360	-	320	-
	25℃	mW/cm^3	700	350	320	350	290	270*
	60℃	mW/cm^3	-	-		-	270	260*
	80℃	mW/cm^3	450	280		-	270	260*
	100℃	mW/cm^3	400	310	290	300	280	270*
	120℃	mW/cm^3	350	350	350	360	320	300*
	140℃	mW/cm^3	350	-		-	370	-
Curie temperature		℃	＞240	＞215	＞215	＞230	＞215	>215
Density		g/cm^3	4.9	4.9	4.9	4.9	4.9	4.8

* At 300kHz/100mT

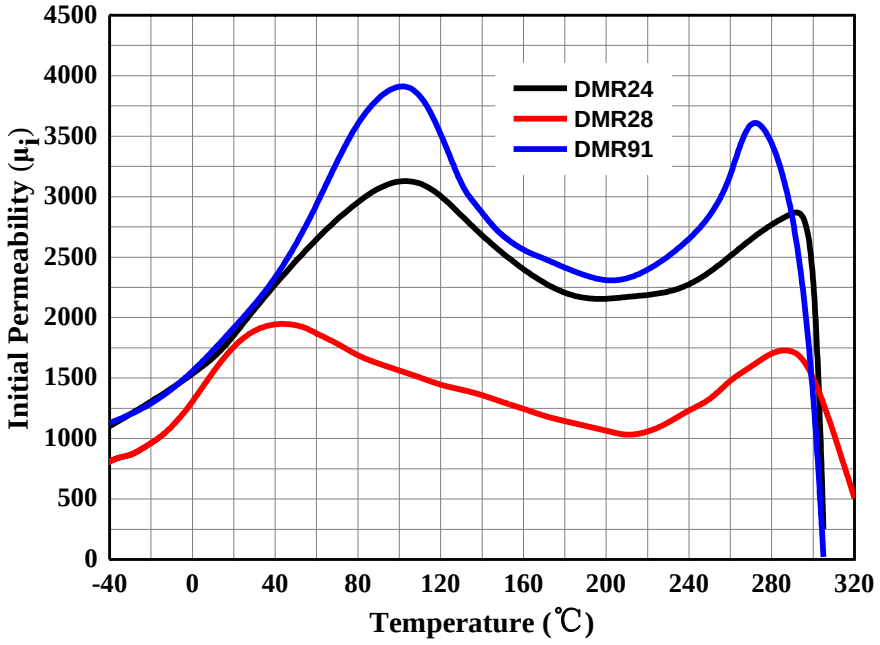


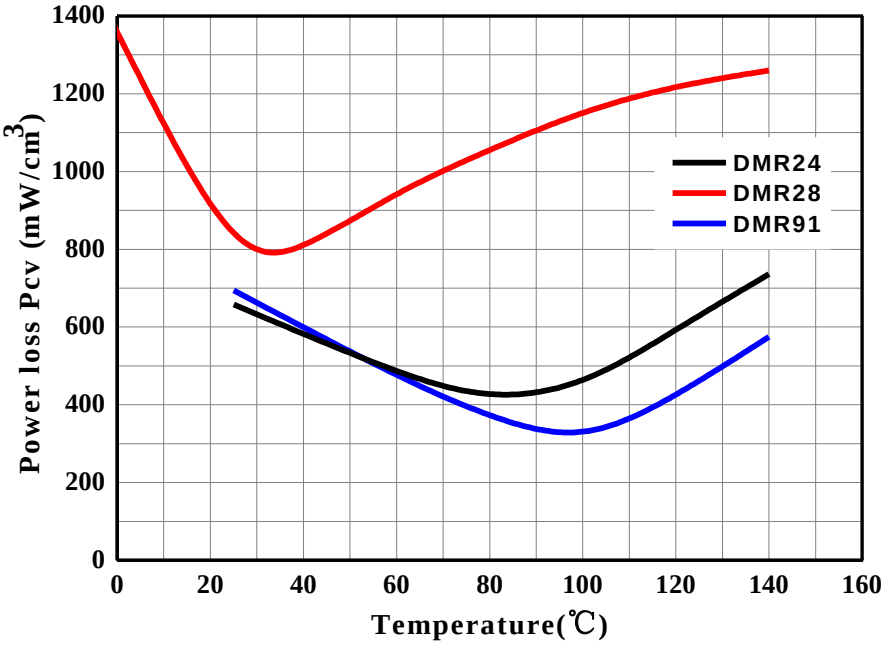

900
800
700
600
500
400
300
200
100
0
Power Loss Pcv (mW/cm3)
-40
-20
0
20
40
60
80
100
120
140
160
Temperature (℃)
DMR25
DMR95
DMR95B
DMR96
DMR96A

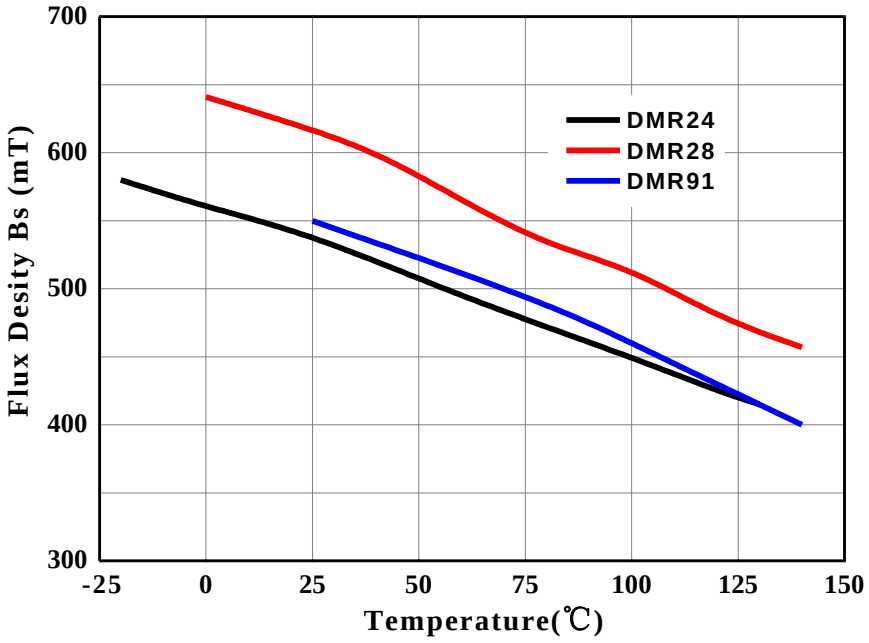

600
550
500
450
400
350
Flux Density Bs (mT)
0
20
40
60
80
100
120
140
Temperature (℃)
DMR25
DMR95
DMR95B
DMR96
DMR96A

高饱和磁通密度 MnZn 铁氧体材料

Material			DMR24	DMR28	DMR91
Initial permeability	μ_i	25℃	2000±25%	2000±25%	2000±20%
Saturation magnetic flux density	Bs(mT) （1194A/m)	25℃	540	600	540
		100℃	460	490	460
Remanence	Br(mT)	25℃	180	150	200
		100℃	65	250	62
Coercive force	Hc(A/m)	25℃	13	19	11
		100℃	11	18	4.2
core loss	Pcv (mw/cm^3) （100kHz/200mT）	25℃	750	780	700
		60℃	/	940	470
		100℃	445	1140	300
		120℃	/	1210	420
Curie temperature	Tc(℃)		>280	≥300	≥290
Resistivity	ρ(Ω·m)		8		6
Density	d(g/cm^3)		4.9	＞4.9	4.9

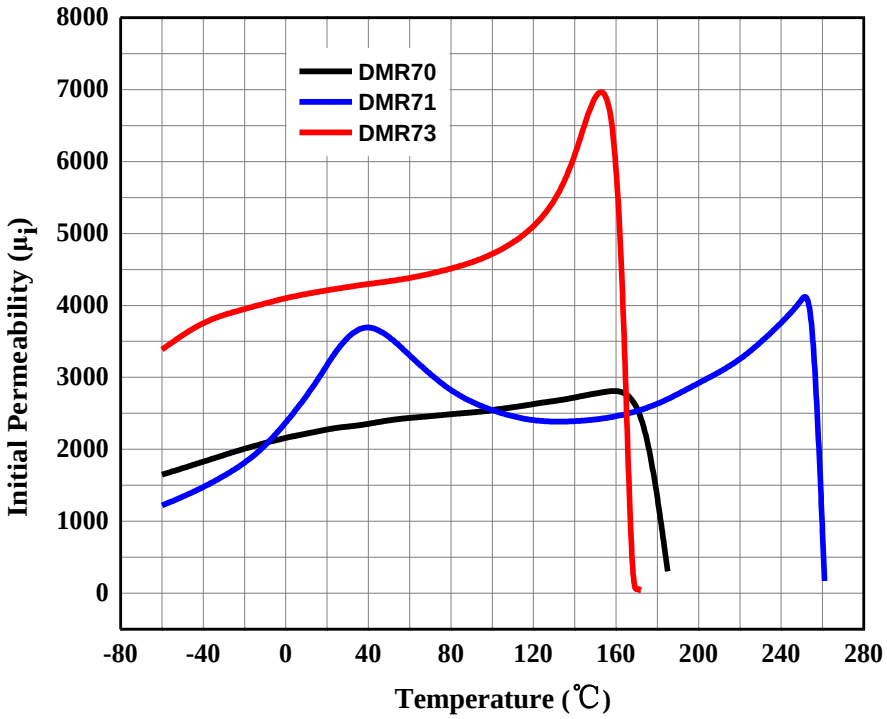


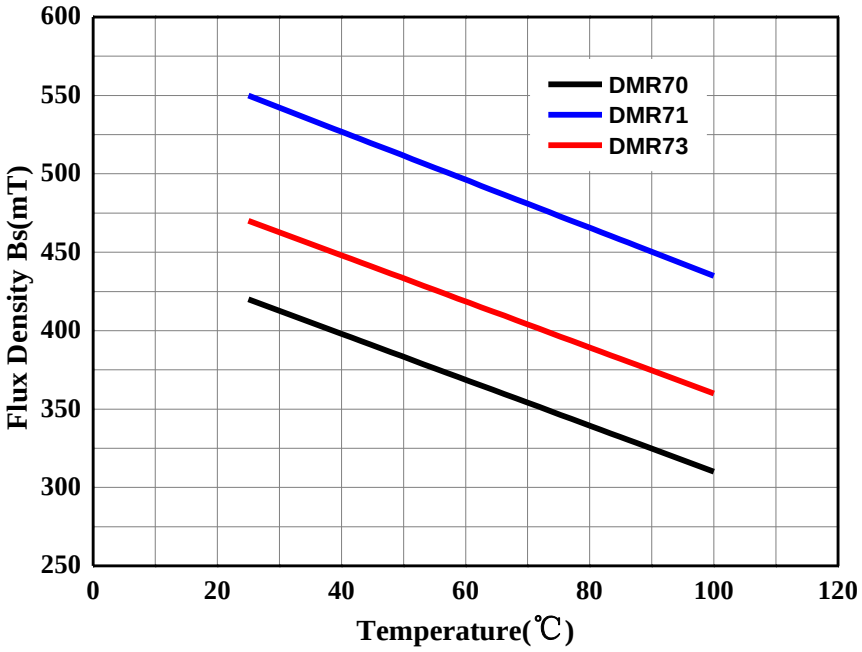

1400
1200
1000
800
600
400
200
0
Power loss Pcv (mW/cm3)
0
20
40
60
80
100
120
140
160
Temperature(℃)
DMR24
DMR28
DMR91


700
600
500
400
300
Flux Desity Bs (mT)
-25
0
25
50
75
100
125
150
Temperature(℃)
DMR24
DMR28
DMR91

高 μ_i 高 Q MnZn 铁氧体材料

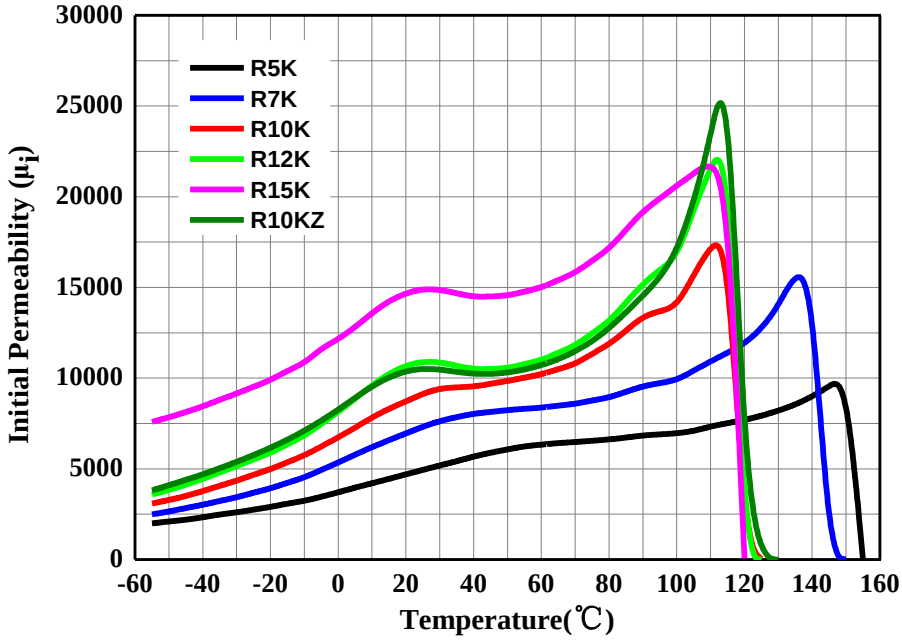
Parameter 项目	Symbol 符号	Unit 单位	DMR70	DMR71	DMR73
Initial permeability 初始磁导率(T=25℃)	μ_i		2300±25%	3800±25%	4200±25%
Saturation magnetic Flux density 饱和磁感应强度 (H=1194A/m,f=50Hz)	Bs(25℃)	mT	420	550	470
	Bs(100℃)		310	435	
Residual magnetic flux density 剩磁	Br(25℃)	mT	60	120	45
	Br(100℃)		50	180	
Relative loss factor 比损耗因子	10 kHz	$\times10^{-6}$	＜4	≈1	＜3.5
	100 kHz	$\times10^{-6}$	＜6	≈2	＜10
Curie temperature 居里温度	Tc	℃	>170	＞255	>160
Density(typical values) 密度		kg/m^3	4.8×10^3	4.85×10^3	4.9×10^3
Relative temperature coefficient 比温度系数	α_μ	$\times10^{-6}$/℃	0.3~1.3 (5℃~25℃)	≈4.44 (5℃~25℃)	——
			0.3~1.3 (25℃~55℃)	≈-2.22 (25℃~55℃)	
Hysteresis material constant 比磁滞损耗系数	η_B	10^{-6}/mT	＜0.4	＜0.3	——

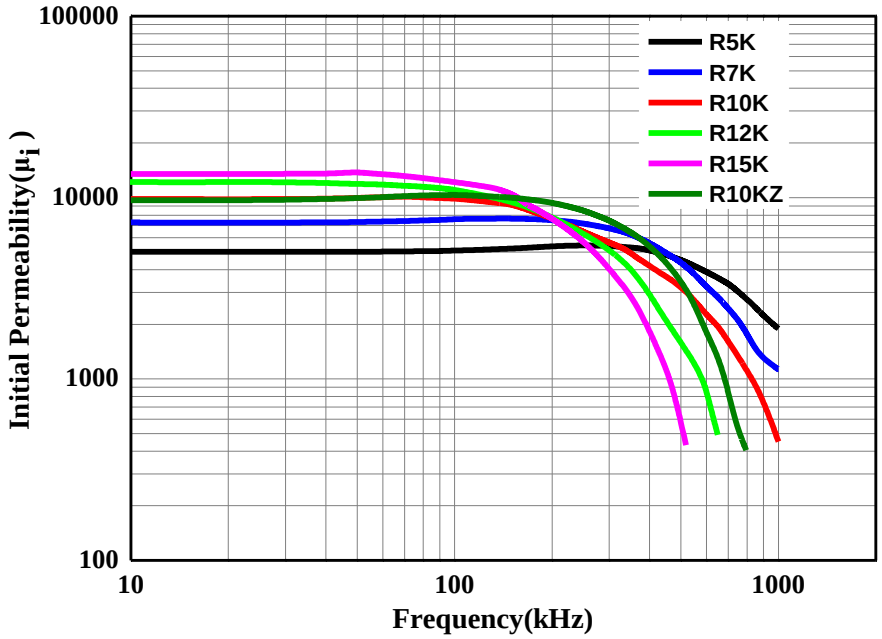

DMR70
DMR71
DMR73
Initial Permeability (μi)
8000
7000
6000
5000
4000
3000
2000
1000
0
-80
-40
0
40
80
120
160
200
240
280
Temperature (℃)


DMR70
DMR71
DMR73
Flux Density Bs(mT)
600
550
500
450
400
350
300
250
0
20
40
60
80
100
120
Temperature(℃)

高磁导率 MnZn 铁氧体材料

Parameter 项目		R5K	R7K	R10K	R10KZ	R12K	R15K
ui Initial permeability	10kHz B < 0.25mT 25℃	5000±25%	7000±25%	10000±30%	10000±30% (10kHz) >9000 (200kHz)	12000±30%	15000±30%
tanδ/ui 10^{-6} Relative loss factor	B＜0.25mT 25℃	< 15.0 (100KHz)	< 30.0 (100KHz)	< 7.0 (10KHz)	< 7.0 (10KHz)	< 7.0 (10KHz)	< 7.0 (10KHz)
Bs(mT) Saturation flux density	50Hz 1194A/m 25℃	430	420	400	380	380	360
Br(mT) Residual flux density		140	110	100	60	100	100
Hc(A/m) Coercive force		8	7	6.5	5	6	5
$\alpha_{\mu r}$(1/℃ 10^{-6}) Relative temperature coefficient	20℃~60℃	-0.5~2.0	-0.5~2.0	-0.5~2.0	-0.5~1.5	-0.5~2.0	-0.5~2.0
η_B(/mT) Hysteresis material constant	10kHz 1.5~3mT 25℃	< $1.0*10^{-6}$	< $1.2*10^{-6}$	< $1.4*10^{-6}$	< $0.2*10^{-6}$	< $1.5*10^{-6}$	< $2.0*10^{-6}$
Tc(℃) Curie temperature		≥140	≥125	≥120	≥120	≥110	≥120
d(g/cm^3) Density		4.85	4.9	4.9	4.9	4.9	4.9

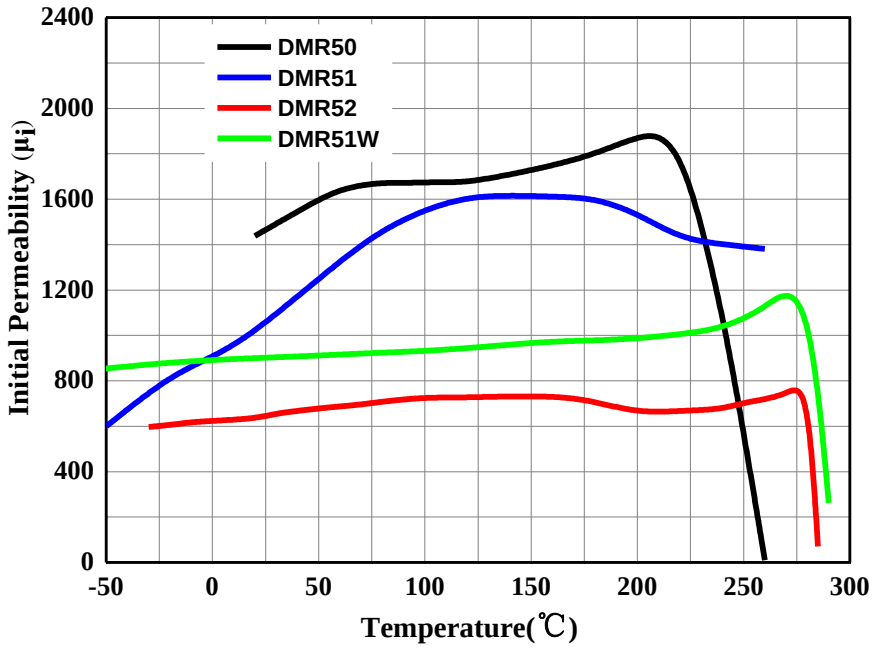

30000
25000
20000
15000
10000
5000
0
Initial Permeability (μi)
R5K
R7K
R10K
R12K
R15K
R10KZ
-60
-40
-20
0
20
40
60
80
100
120
140
160
Temperature(℃)

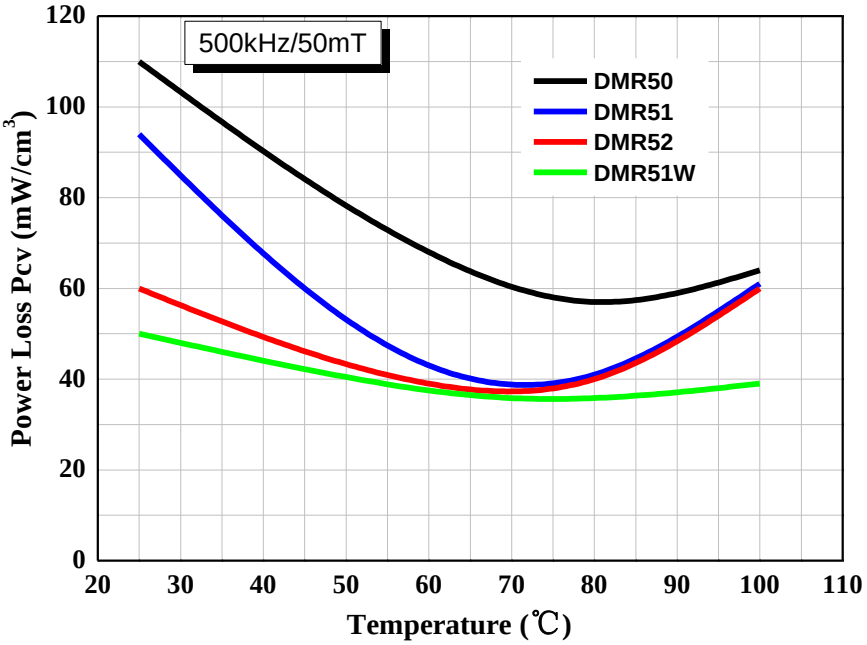

100000
10000
1000
100
Initial Permeability(μi)
R5K
R7K
R10K
R12K
R15K
R10KZ
10
100
1000
Frequency(kHz)

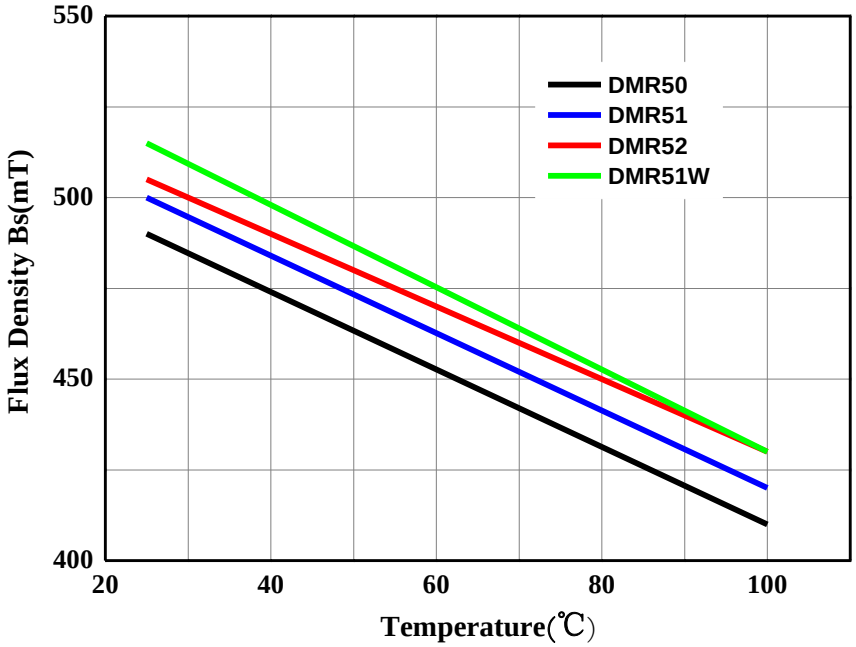
高频低损耗 MnZn 铁氧体材料

特性 Characteristics		DMR50	DMR51	DMR52	DMR51W
初始磁导率 μ_i Initial Permeability		1400±25%	900±25%	600±25%	900±25%
饱和磁通密度 Bs (mT) Saturation Magnetic Flux Density (H=1194A/m)	25℃	470	500	500	500
	100℃	380	410	430	430
剩磁 Br (mT) Remanent Flux Density	25℃	140	150	150	150
	100℃	98	90	90	90
矫顽力 Hc (A/m) Coercive Force	25℃	37	45	55	45
	100℃	27	38	45	38
功率损耗 Pcv (mW/cm^3) Core Loss	25℃	*130			**150
	60℃	*80			**140
	100℃	*80	**300	***900	**140
居里温度 Tc (℃) Curie Temperature		>240	>280	>280	>280
密度 d (g/cm^3) Density		4.7	4.7	4.7	4.7

注：功率损耗测试条件：*500kHz/50mT　　**1MHz/50mT　*** 3MHz/30mT




500kHz/50mT
DMR50
DMR51
DMR52
DMR51W
Power Loss Pcv (mW/cm3)
120
100
80
60
40
20
0
20
30
40
50
60
70
80
90
100
110
Temperature (℃)


DMR50
DMR51
DMR52
DMR51W
Flux Density Bs(mT)
550
500
450
400
20
40
60
80
100
Temperature(℃)