ALLOY POWDER CORE SERIES INTRODUCTION

DMEGC alloy powder cores are made from insulated pretreatment alloy powders which have low losses at elevated temperature and have relatively stable inductance over temperature. DMEGC cores feature distributed air gaps which minimize fringing flux and makes them highly suited for applications such as switching regulator inductors, flyback transformers, and power factor correction (PFC) inductors.

DMEGC alloy powder cores are competitively priced against gapped ferrite E-cores and their distributed air gap eliminates EMI loss problems associated with ferrites. A selection of standard size Toriode core, DE CORE, DQ CORE, SMD cores is available along with the ability to produce custom dimensions and other geometries. DMEGC offers a range of permeabilities (14μ ~ 125μ) as well as with a variety of other soft magnetic materials such as Sendust (DS Series), Iron silicon (DF Series), High Flux (DH series) and MPP (DM Series). DMEGC Iron powder as a core material has been widely used in RF application for years. The distributed air gap properties inherent in iron powder cores make them extremely well suited for a variety of energy storage inductor applications. DMEGC Iron powder products, can be used in place of ferrite and iron-alloy laminations requiring a gap, which cover materials with permeabilities from 10 to 100 intended for frequencies ranging from line frequency to 5MHz.

SENDUST MATERIAL（DS SERIES）

DMEGC sendust is approximately 85% iron, 9% silicon and 6% aluminum. Like all powder core there is evenly distributed air gap inside the sendust core. Sendust cores have near zero magnetostriction which is benefit to eliminating audible frequency noise in filter inductors. Sendust powder has better ratio of performance versus price and low temperature rising performance in circuit due to its low core loss. It is possible that sendust powder core will offer a reduction in core size over powder iron cores in a similar application.

DS SENDUST POWDER CORE MATERIAL CHARACTERISTICS

1. Evenly distributed gaps in the core
2. Bs is up to 10000Gs.
3. Good DC Bias.
4. Low core loss, lower than High-Flux and IPC core.
5. Working temperature can be up to 200C and has not thermal aging problem.
6. Having negative temperature coefficient when work in more than 25C.
7. Permeability is from 14 to 125.

DS MATERIAL TYPICAL CHARACTERIESTICS

Characteristics	Unit	Parameter
Initial Permeability	--	26~125
Saturation Magnetic Flux Density	(Gs)	10000
Curie Temperature	(℃)	>400
(-40℃~125℃) Temperature Coefficient	10^{-6}/℃	300
Density	(g/cm^3)	5.6-6.8
Temperature Range	℃	-40~200

DS SENDUST POWDER CORE MAIN APPLICATIONS

1. PFC inductor.
2. On-line filter.
3. Switching regulator inductor
4. Flyback and Pulse transformer.
5. Solar inverter

DF Iron-Silicon Material（DF Series）

The 6.5 wt% Iron-Silicon material is a well known alloy and offers significant advantages, displaying excellent soft magnetic properties such as high saturation magnetization, near zero magnetostriction and higher resistivity. DMEGC DF series powder cores are manufactured from a complex composition of Iron-Silicon powdered particles, compacted into geometries such as toroid, block, E or U-core shapes. The powder metal compaction process produces a product with excellent core loss performance compared with the conventional silicon-iron tape wound core due to the distributed air gap feature.

DMEGC DF series powder cores have a typical 15,000 Gauss saturation flux density and core losses significantly lower than iron powder cores at high frequencies. The combination of high saturation flux density and high DC bias makes DF Iron-Silicon powder cores an ideal choice for higher power densities: where a low number of winding turns, low core loss and smaller size are required in today's power supply systems - especially in high energy storage applications.

The curie temperature of the DF Iron-Silicon powder material is over 500 ºC. High temperature operation of the cores does not significantly affect the magnetic properties. There are no organic binders within DMEGC DF series powder cores. They are, therefore, not subject to thermal aging when operated at elevated temperatures. DMEGC DF series powder cores can provide a 30% reduction in volume compared to Iron powder cores and are the best solution for large-current applications at a competitive price.

DF Series Powder Core Material Characteristics

1. Evenly distributed gaps in the core.
2. Bs is up to 15000Gs.
3. Excellent DC Bias.
4. Core Loss is lower than iron powder core
5. No subject to thermal aging and material can work in 200℃
6. Low cost and it can substitute IPC/Sendust /Hi-Flux core in some applications.
7. Permeability is from 14 to 125

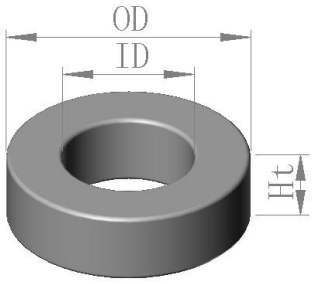
DF MATERIAL TYPICAL CHARACTERIESTICS

Characteristics	Unit	Parameter
Initial Permeability	--	26~125
Saturation Magnetic Flux Density	(Gs)	15000
Curie Temperature	(℃)	>400
(-40℃~125℃) Temperature Coefficient	10^{-6}/℃	400
ρ Density	(g/cm^3)	6.0~6.5
Temperature Range	℃	-40~200

DF SERIES POWDER CORE MAIN APPLICATIONS

1. Power inductor for big current circuit
2. PFC inductor
3. Switching regulator inductor
4. Buck inductor for VRM.
5. Smoothing choke for inverter
6. Solar inverter
7. UPS Power Supply

ALLOY POWDER CORE PART NUMBER DEFINATIONS



DS 270 125

DF

permeability

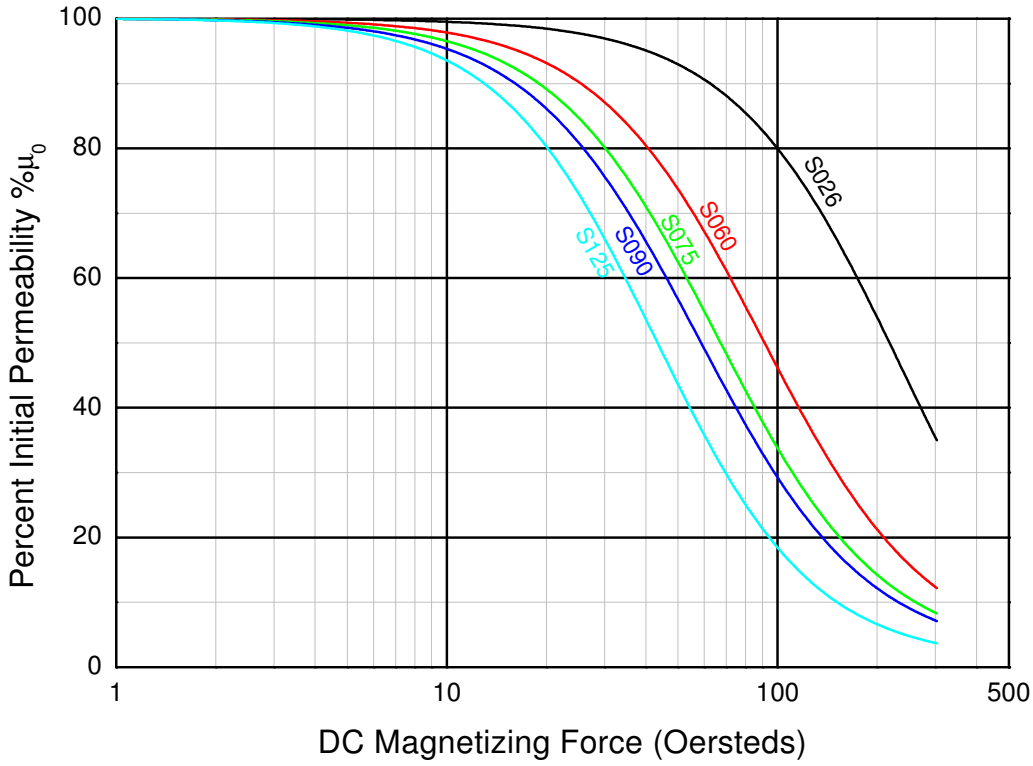
0.1 毫米 OD in 0.1mm

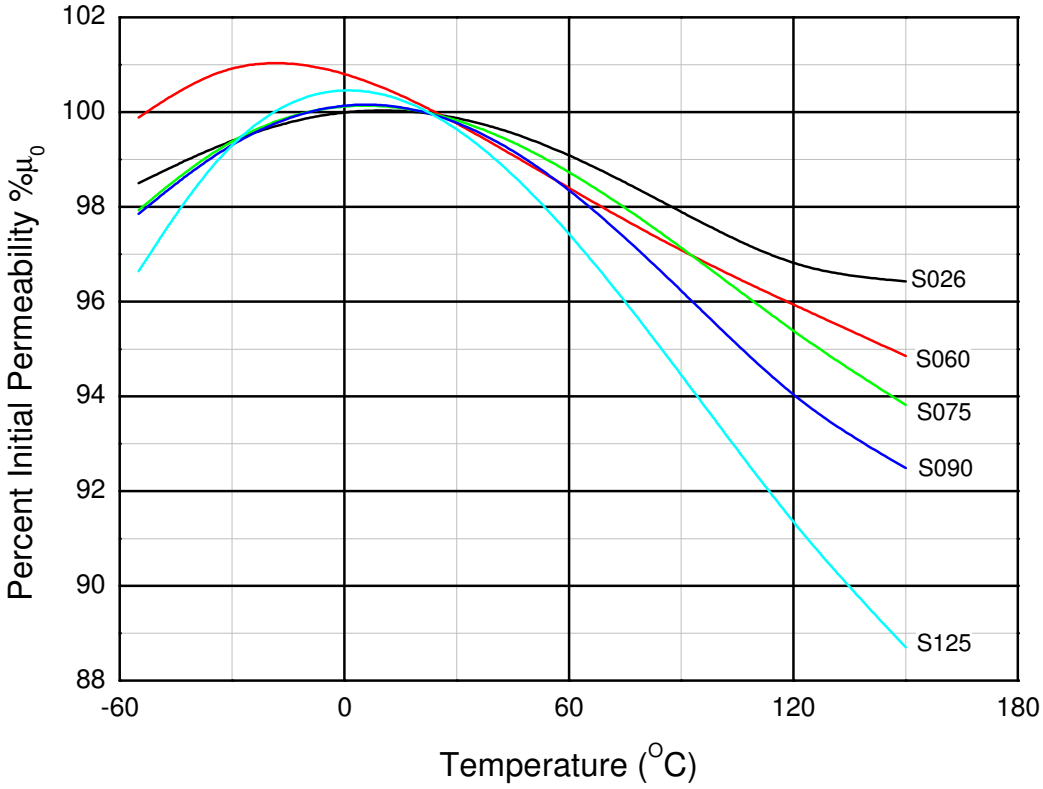
Material Mix.

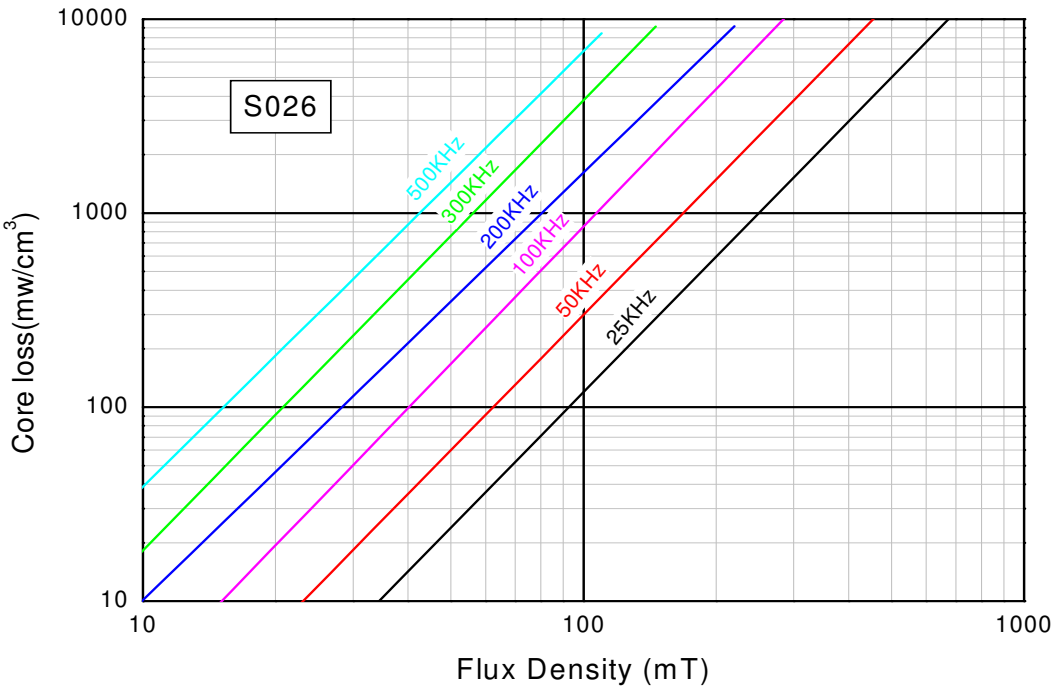
DS： Sendust

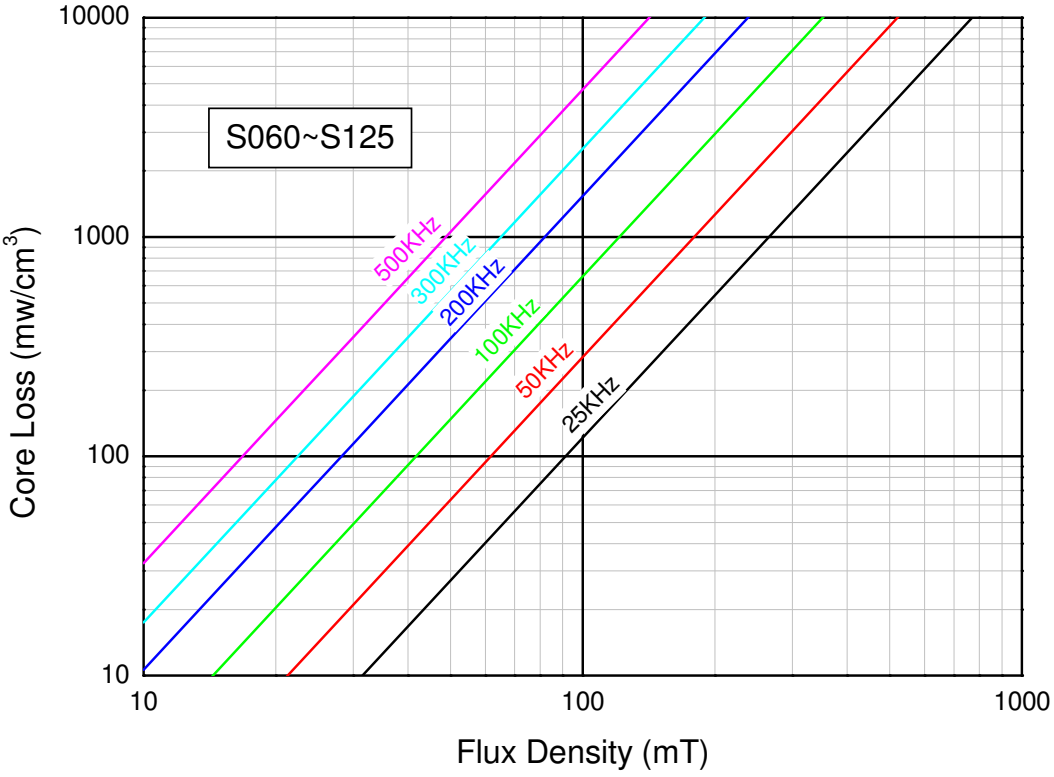
DF： Iron-Silicon

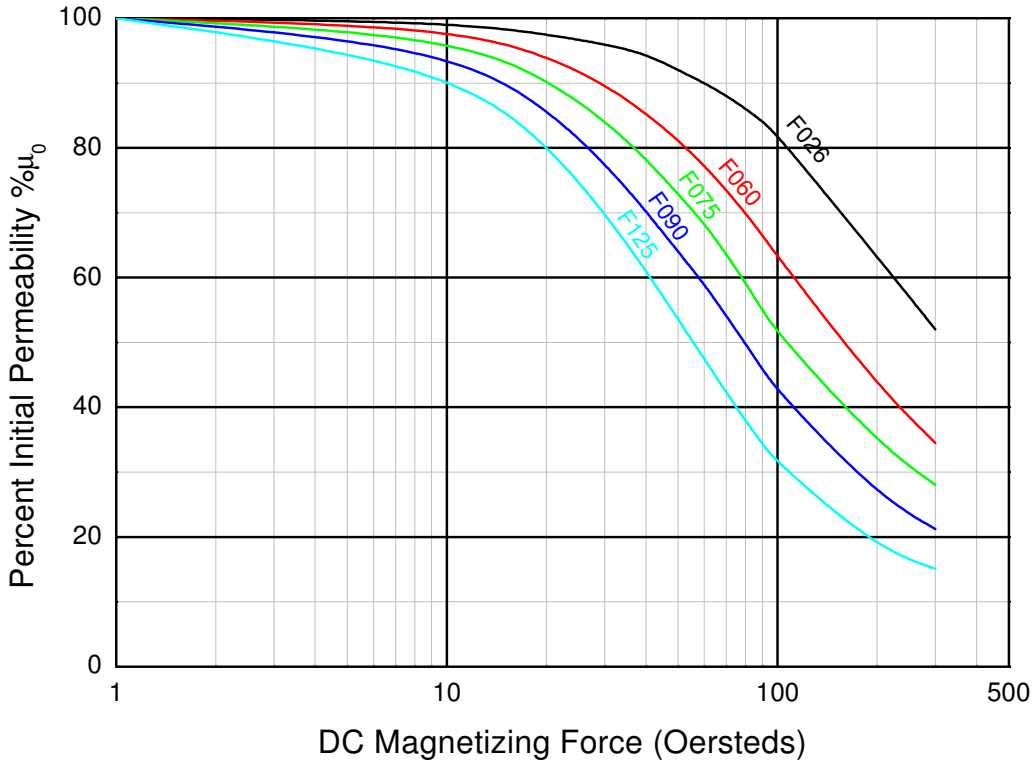
TYPICAL ELECTRICAL PERFORMANCE CURVES

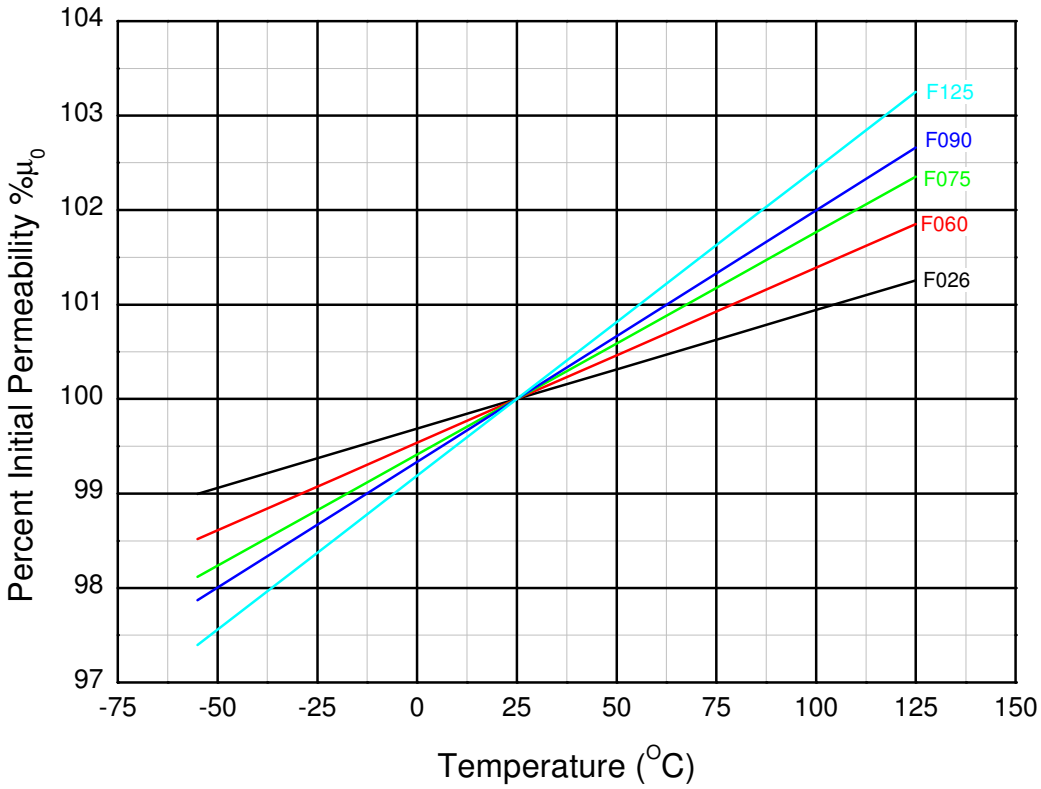


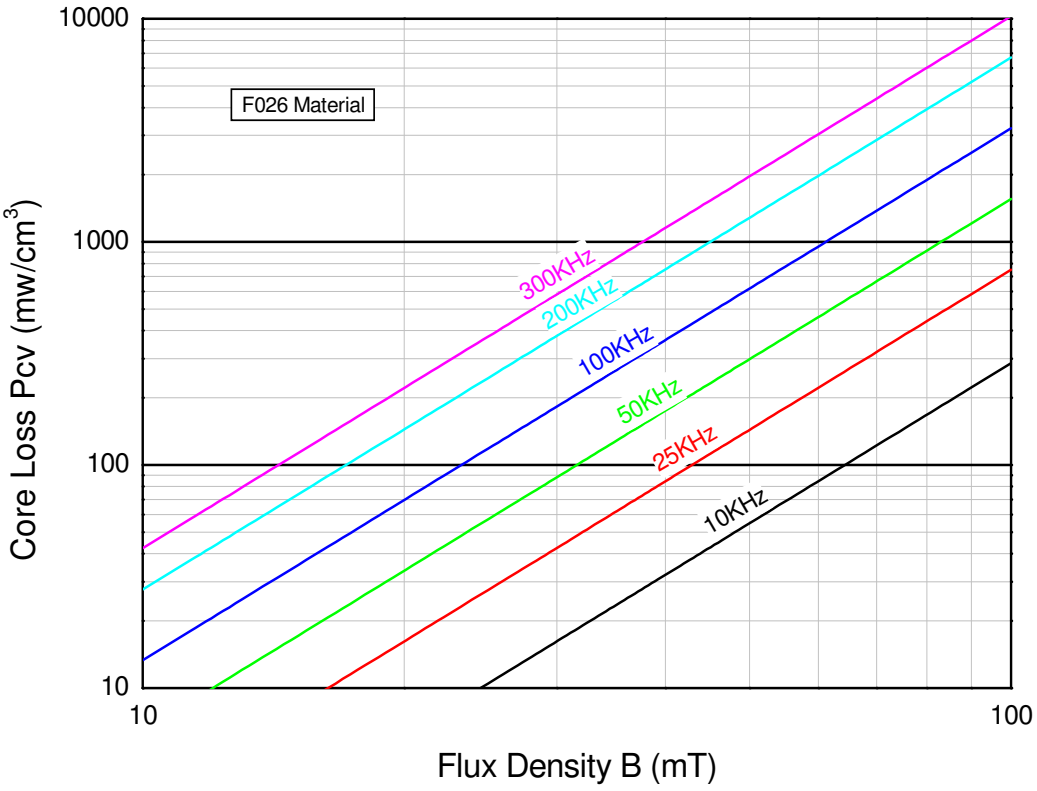

Percent Initial Permeability %μ0
102
100
98
96
94
92
90
88
-60
0
60
120
180
Temperature (°C)
S026
S060
S075
S090
S125

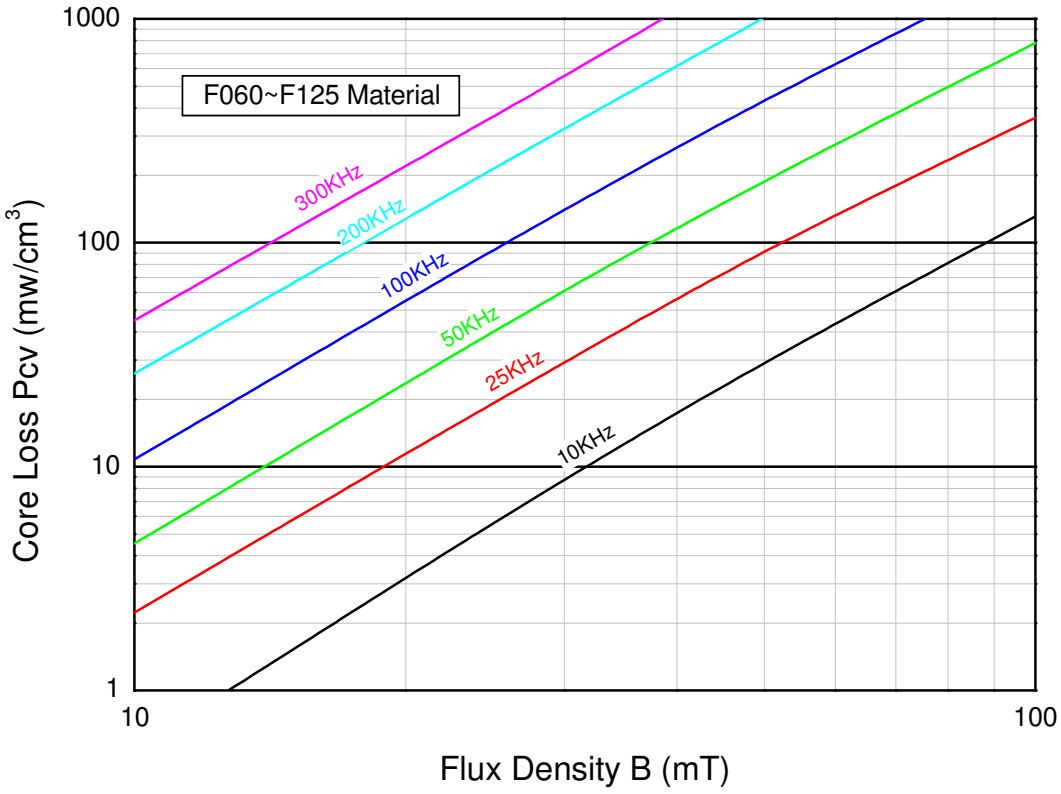

Core loss(mw/cm3)
10000
1000
100
10
10
100
1000
Flux Density (mT)
S026
500KHz
300KHz
200KHz
100KHz
50KHz
25KHz

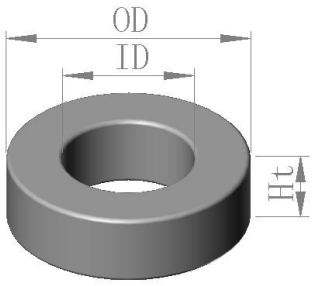

S060~S125
500KHz
300KHz
200KHz
100KHz
50KHz
25KHz
Core Loss (mw/cm3)
Flux Density (mT)
10000
1000
100
10
10
100
1000


F026
F060
F075
F090
F125
Percent Initial Permeability %μ0
DC Magnetizing Force (Oersteds)
100
80
60
40
20
0
1
10
100
500


104
103
102
101
100
99
98
97
-75
-50
-25
0
25
50
75
100
125
150
Percent Initial Permeability %μ0
Temperature (°C)
F125
F090
F075
F060
F026


10000
1000
100
10
10
100
F026 Material
Core Loss Pcv (mw/cm3)
Flux Density B (mT)
300KHz
200KHz
100KHz
50KHz
25KHz
10KHz


F060~F125 Material
300KHz
200KHz
100KHz
50KHz
25KHz
10KHz
1000
100
10
1
10
100
Core Loss Pcv (mw/cm3)
Flux Density B (mT)



DS /DF Series Powder cores phisical data

Customized sizes are welcome.

Part Number	Before coating			After coating			Ae	*Le*	Ve
	OD (mm)	ID (mm)	HT (mm)	ODmax (mm)	IDmin (mm)	HTmax (mm)	(cm^2)	(cm)	(cm^3)
DS/DF063XXX	6.35	2.79	2.79	6.99	2.79	3.43	0.0470	1.361	0.0640
DS/DF068XXX	6.86	3.96	5.08	7.50	3.46	5.72	0.0488	1.65	0.1196
DS/DF068XXXA	6.86	3.96	3.42	7.50	3.46	4.06	0.0725	1.65	0.0805
DS/DF078XXX	7.87	3.92	3.18	8.51	3.43	3.82	0.0615	1.787	0.1099
DS/DF097XXX	9.65	4.78	3.18	10.29	4.27	3.81	0.0752	2.18	0.1639
DS/DF102XXX	10.20	5.08	3.96	10.80	4.57	4.57	0.100	2.38	0.238
DS/DF103XXX	10.30	5.64	5.66	10.97	5.18	6.30	0.123	2.43	0.301
DS/DF112XXX	11.20	6.35	3.96	11.89	5.89	4.57	0.0906	2.69	0.244
DS/DF127XXX	12.70	7.62	4.75	13.50	7.00	5.45	0.1140	3.12	0.356
DS/DF127XXXB	12.70	7.62	6.35	13.50	7.00	7.15	0.1524	3.12	0.475
DS/DF146XXX	14.60	8.50	5.50	15.0	8.10	5.9	0.1587	3.54	0.562
DS/DF166XXX	16.60	10.20	6.35	17.40	9.50	7.10	0.1920	4.11	0.789
DS/DF173XXX	17.30	9.65	6.35	18.00	9.00	4.05	0.232	4.14	0.960
DS/DF203XXX	20.30	12.70	6.35	21.10	12.10	7.10	0.226	5.09	1.15
DS/DF229XXX	22.9	14.0	7.62	23.60	13.40	8.37	0.331	5.67	1.88
DS/DF236XXX	23.6	14.4	8.89	24.30	13.70	9.70	0.388	5.88	2.28
DS/DF270XXX	26.9	14.7	11.20	27.60	14.10	11.90	0.654	6.35	4.15
DS/DF270XXXA	26.9	14.7	7.92	27.60	14.10	8.62	0.462	6.35	2.94
DS/DF330XXX	33.0	19.9	10.7	33.80	19.30	10.70	0.672	8.15	5.48
DS/DF358XXX	35.8	22.4	10.5	36.71	21.50	11.26	0.678	8.98	6.09
DS/DF384XXX	38.4	21.5	8.26	39.40	20.86	9.02	0.657	9.38	6.16
DS/DF400XXX	39.9	24.1	14.5	40.70	23.30	15.38	1.072	9.84	10.5
DS/DF467XXX	46.7	24.1	18.0	47.64	23.32	18.92	1.990	10.74	21.37
DS/DF468XXX	46.7	28.7	15.2	47.64	27.92	16.12	1.340	11.63	15.58
DS/DF508XXX	50.8	31.8	13.3	51.80	30.80	14.40	1.251	12.73	15.93
DS/DF571XXX	57.2	26.4	15.2	58.00	25.60	16.00	2.29	12.5	28.62
DS/DF572XXX	57.2	35.6	14.0	58.0	34.74	14.86	1.444	14.30	20.65

DS /DF SERIES POWDER CORESINDUCTANCE FACTOR TABLE

Permeability	Sendust	Fe-Si	AL nH/N^2	OD (mm)	ID (mm)	HT (mm)
26	DS063026	DF0630026	10	6.35	2.79	2.79
60	DS063060	DF063060	24			
75	DS063075	DF063075	30			
90	DS063090	DF063090	36			
125	DS063125	DF063125	50			
26	DS068026	DF068026	14	6.86	3.96	5.08
60	DS068060	DF068060	33			
75	DS068075	DF068075	42			
90	DS068090	DF068090	50			
125	DS068125	DF068125	70			
26	DS068026A	DF068026A	10	6.86	3.96	3.42
60	DS068060A	DF068060A	22			
75	DS068075A	DF068075A	28			
90	DS068090A	DF068090A	34			
125	DS068125A	DF068125A	47			
26	DS078026	DF078026	12	7.87	3.96	3.18
60	DS078060	DF078060	25			
75	DS078075	DF078075	31			
90	DS078090	DF078090	37			
125	DS078125	DF078125	52			
26	DS097026	DF097026	12	9.65	4.78	3.18
60	DS097060	DF097060	25			
75	DS097075	DF097075	32			
90	DS097090	DF097090	38			
125	DS097125	DF097125	53			

pperuPerm	Sendust	Fe-Si	AL nH/N^2	OD (mm)	ID (mm)	HT (mm)
26	DS097026B	DF097026B	14	9.65	4.78	3.96
60	DS097060B	DF097060B	32			
75	DS097075B	DF097075B	40			
90	DS097090B	DF097090B	48			
125	DS097125B	DF097125B	66			
26	DS102026	DF102026	14	10.2	5.08	3.96
60	DS102060	DF102060	32			
75	DS102075	DF102075	40			
90	DS102090	DF102090	48			
125	DS102125	DF102125	66			
26	DS112026	DF112026	12	11.2	6.35	3.96
60	DS112060	DF112060	26			
75	DS112075	DF112075	32			
90	DS112090	DF112090	38			
125	DS112125	DF112125	53			
26	DS127026	DF127026	13	12.7	7.62	4.75
60	DS127060	DF127060	27			
75	DS127075	DF127075	34			
90	DS127090	DF127090	40			
125	DS127125	DF127125	56			
26	DS127026B	DF127026B	16	12.7	7.62	6.35
60	DS127060B	DF127060B	36			
75	DS127075B	DF127075B	45			
90	DS127090B	DF127090B	53			
125	DS127125B	DF127125B	76			

pperuPerm	Sendust	Fe-Si	AL nH/N^2	OD (mm)	ID (mm)	HT (mm)
26	DS166026	DF166026	16	16.6	10.2	6.35
60	DS166060	DF166060	35			
75	DS166075	DF166075	43			
90	DS166090	DF166090	52			
125	DS166125	DF166125	72			
26	DS173026	DF173026	20	17.3	9.65	6.35
60	DS173060	DF173060	43			
75	DS173075	DF173075	53			
90	DS173090	DF173090	64			
125	DS173125	DF173125	89			
26	DS203026	DF203026	14	20.3	12.7	6.35
60	DS203060	DF203060	32			
75	DS203075	DF203075	41			
90	DS203090	DF203090	49			
125	DS203125	DF203125	68			
26	DS229026	DF229026	19	22.9	14.0	7.62
60	DS229060	DF229060	43			
75	DS229075	DF229075	54			
90	DS229090	DF229090	65			
125	DS229125	DF229125	90			
26	DS236060	DF236060	22	23.6	14.4	8.89
60	DS236060	DF236060	51			
75	DS236075	DF236075	63			
90	DS236090	DF236090	76			
125	DS236125	DF236125	105			

pperuPerm	Sendust	Fe-Si	AL nH/N^2	OD (mm)	ID (mm)	HT (mm)
26	DS270026	DF270026	32	26.9	14.7	11.2
60	DS270060	DF270060	75			
75	DS270075	DF270075	94			
125	DS270125	DF270125	157			
90	DS270090	DF270090	113			
26	DS330026	DF330026	28	33.0	19.9	10.7
60	DS330060	DF330060	61			
75	DS330075	DF330075	76			
90	DS330090	DF330090	91			
125	DS330125	DF330125	127			
26	DS358026	DF358026	24	35.8	22.4	10.5
60	DS358060	DF358060	56			
75	DS358075	DF358075	70			
90	DS358090	DF358090	84			
125	DS358125	DF358125	117			
26	DS384026	DF384026	23	38.4	21.5	8.28
60	DS384060	DF384060	53			
75	DS384075	DF384075	66			
90	DS384090	DF384090	79			
125	DS384125	DF384125	110			
26	DS400026	DF400026	35	39.9	24.1	14.5
60	DS400060	DF400060	81			
75	DS400075	DF400075	101			
90	DS400090	DF400090	121			
125	DS400125	DF400125	168			

pperuPerm	Sendust	Fe-Si	AL nH/N^2	OD (mm)	ID (mm)	HT (mm)
26	DS467026	DF467026	59	46.7	24.1	18.0
60	DS467060	DF467060	135			
75	DS467075	DF467075	169			
90	DS467090	DF467090	202			
125	DS467125	DF467125	281			
26	DS468026	DF468026	37	46.7	28.7	15.2
60	DS468060	DF468060	86			
75	DS468075	DF468075	107			
90	DS468090	DF468090	128			
125	DS468125	DF468125	178			
26	DS508026	DF508026	32	50.8	31.8	13.5
60	DS508060	DF508060	73			
75	DS508075	DF508075	91			
90	DS508080	DF508080	109			
125	DS508125	DF508125	152			
26	DS571026	DF571026	65	57.2	35.6	15.2
60	DS571060	DF571060	138			
75	DS571075	DF571075	172			
90	DS571090	DF571090	207			
125	DS571125	DF571125	287			
26	DS572026	DF572026	33	57.2	35.6	14.0
60	DS572060	DF572060	75			
75	DS572075	DF572075	94			
90	DS572090	DF572090	112			
125	DS572125	DF572125	156			
26	DS740026	DF740026	89	74.1	45.8	35.0
60	DS740060	DF740060	206			
75	DS740075	DF740075	257			

SMD SERIES PRODUCT OF ALLOY POWDER CORE

There are two kinds of SMD alloy powders, Iron-Silicon and sendust. Sendust have lower core loss and Iron-Silicon have better DC bias. Sendust core loss is a half of Iron-Silicon material and one-third of iron powder core. But Sendust material is more expensive than Iron-Silicon and iron powder. Iron-Silicon material has more reasonable high ratio of performance versus price, and has not thermal aging problem. It can substituted iron SMD core in many field.

SMD GENERAL MATERIAL TYPES

Material No.	Material Name	Ref Permeability	Color
S40	Sendust	35	Black
S60	Sendust	60	Black
F30	DF	35	Black
F50	DF	55	Black

SMD Core Shapes

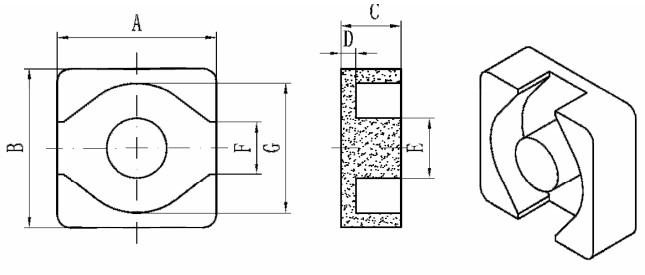


图 1

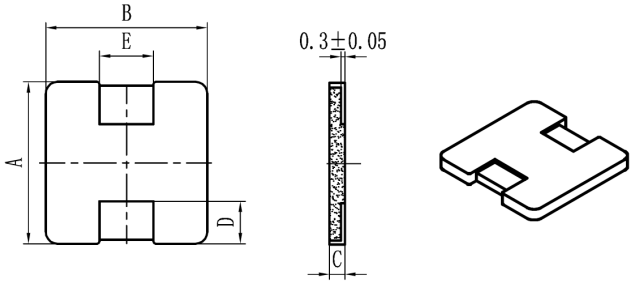


图 2

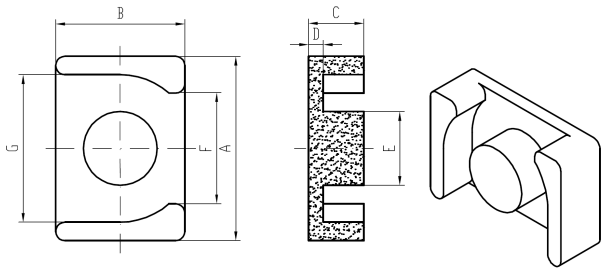


图 3

Figure 3

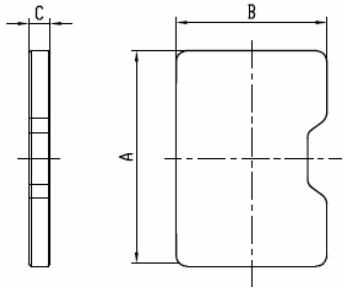


图 4

Figure 4

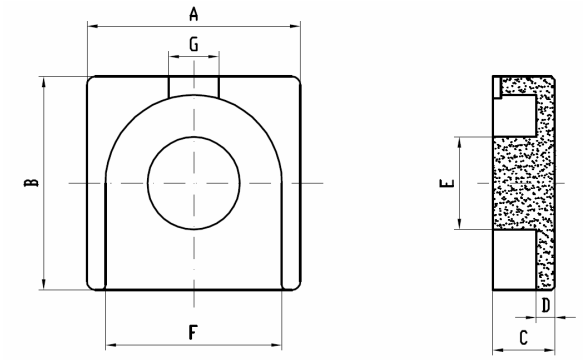


图 5

Figure 5

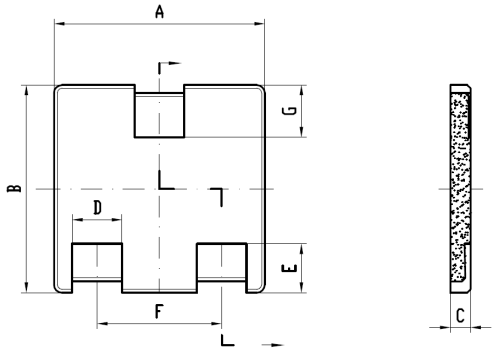


图 6

Figure 6

SMD Core Sizes

TYPE	Figure	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	A_L (nH/N^2)
DQ6.8	1	6.8	6.8	1.8~3.0	0.8	2.45	3.2	5.3	30~80
	2	6.8	6.8	0.9	1.6	3.2			
DQ10.0	1	10.0	10.0	2.0~5.5	1.0~1.2	3.8/4.0/4.2	4.0/4.2	8.2	40~100
	2	10.0	10.0	1.0~1.2	2.5	3.5~4.5			
DQC10	3	10.0	7.0	2.0~3.5	0.8~1.1	4.2	6.0	8.0	40~100
	4	10.0	7.0	0.8~1.2					
DQ12.7	1	12.7	12.7	2.5~7.5	1.0~1.5	4.8/5.2/5.5	4.2/4.8	10.4/10.	40~100
	2	12.7	12.7	1.0~1.5	3.3	4.2			
DQY12.7	5	12.7	12.7	3.0~5.0	1.0~1.5	5.5	10.5	3.0	40~100
	6	12.7	12.7	1.0~1.5	3.0	3.0	7.5	3.2	

Notes：

a) The height and the wall thickness can be adjusted in a certain range.

b) The typical outer dimension tolerance of DQ6.8 series is ±0.15mm.The typical outer dimension tolerance of DQ10 and DQC10 series is ±0.20mm .The typical outer dimension tolerance of DQ12.7 and DQ12.7Y series is ±0.25mm, please refer to the specific drawing for the details.

c) General inductance tolerance is ±15%

d) Please feel free to contact sample@dmegc.com.cn if you have any question

SMD SENDUST MATERIAL CHARACTERIESTICS

Characteristics	Unit	Parameter
Initial Permeability	--	35~75
Bs Saturation Magnetic Flux Density	(Gs)	10000
Curie Temperature	(℃)	>400
(-40℃~125℃) Temperature Coefficient	10-6/℃	300
Density	(g/cm3)	5.65
Temperature Range	℃	-55~200
Core Loss	MW/cm3	800@100kHz,100mT

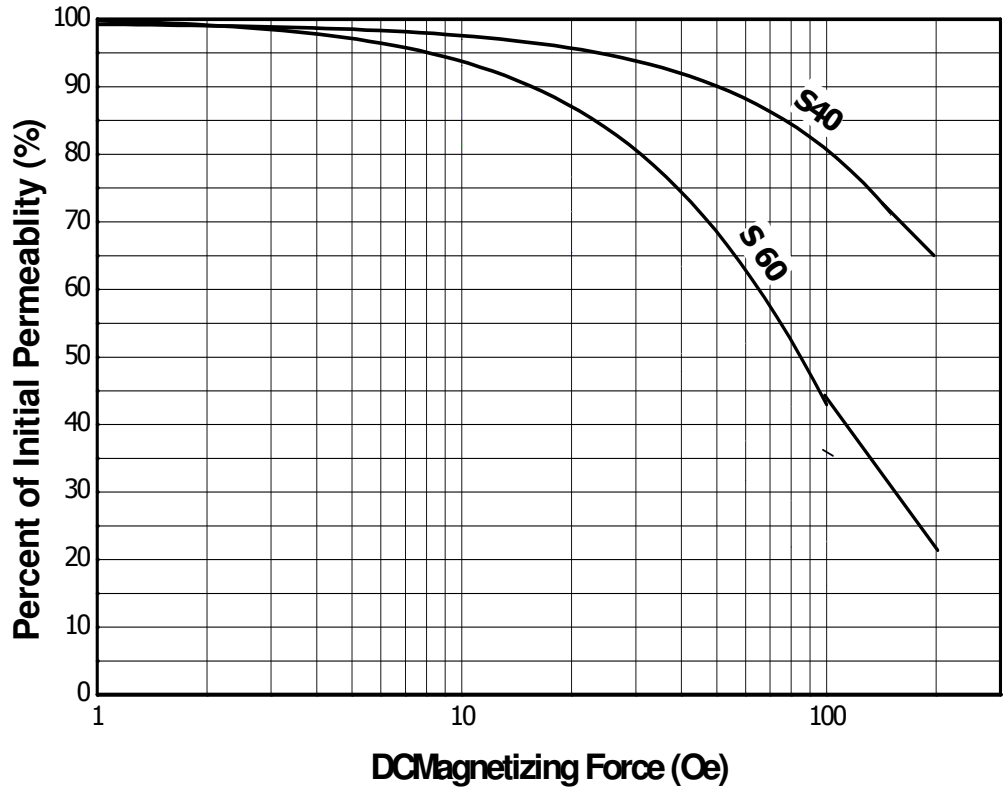
SMD SENDUST MATERIAL CHARACTERISTIC

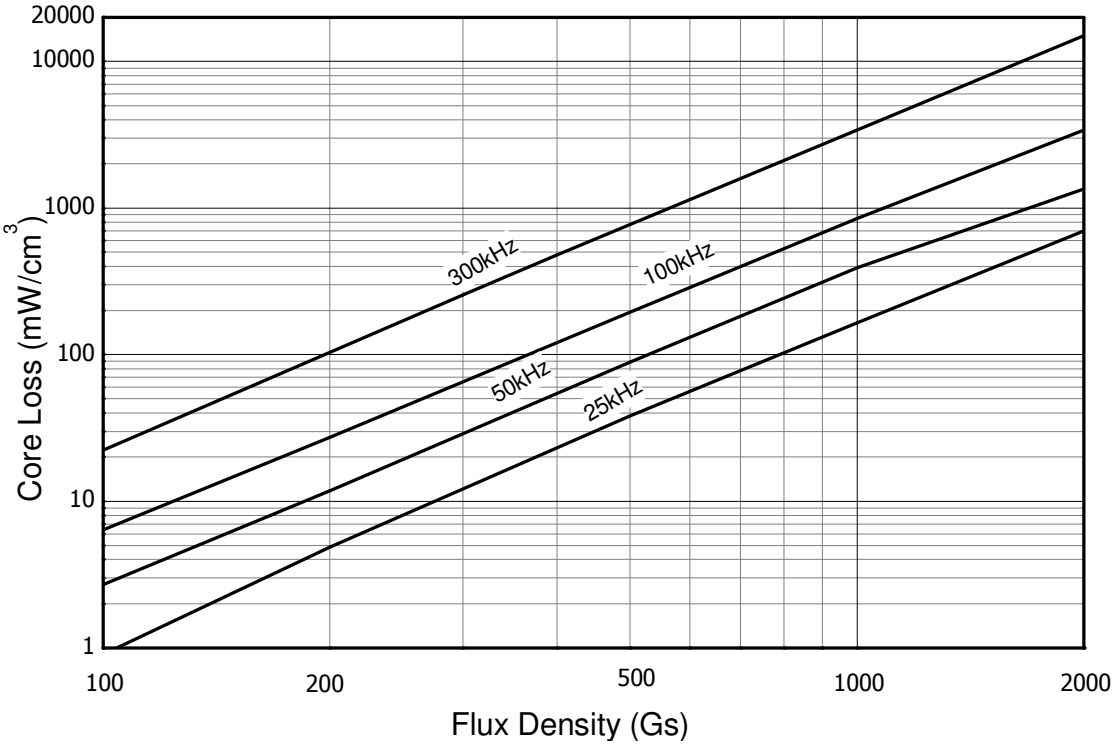
1) Good frequency characteristic, Operating frequency can be up to more than 500kHz.
2) Loss core loss. Lower than IPC and Hi-Flux. Low temperature rise in circuit.
3) Good DC bias which can be work in tens of current.
4) Working in high temperature and no thermal aging problem.
5) High storage energy stability,
6) Having negative temperature coefficient.

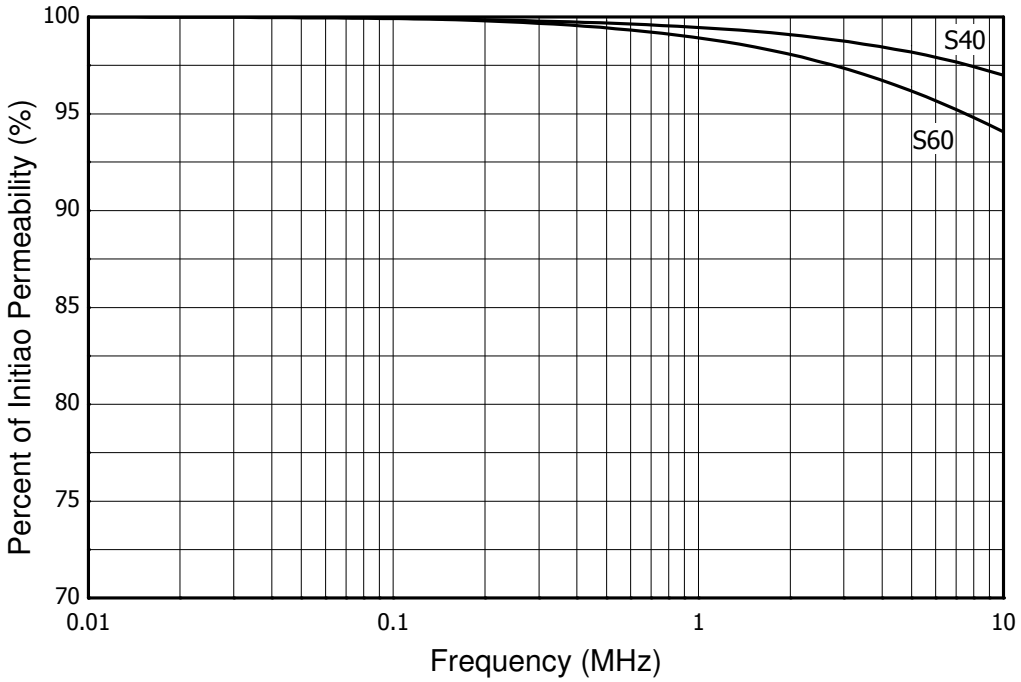
SENDUST POWDER CORE APPLICATIONS

1) Notebook / PDA/ LCD/ Car
2) DC/DC Converter in power system
3) low profile, high current powder supplier
4) portable electronic devices

SMD SENDUST ELECTRICAL PERFORMANCE CURVES







SMD IRON-SILICON DF MATERIAL CHARACTERISTICS

Characteristics	Unit	Parameter
Initial Permeability	--	26~75
Bs Saturation Magnetic Flux Density	(Gs)	15000
Curie Temperature	(℃)	>400
(-40℃~125℃) Temperature Coefficient	10-6/℃	500
Density	(g/cm3)	5.1
Temperature Range	℃	-55~200
Core Loss	MW/cm3	1500@50kHz,100mT

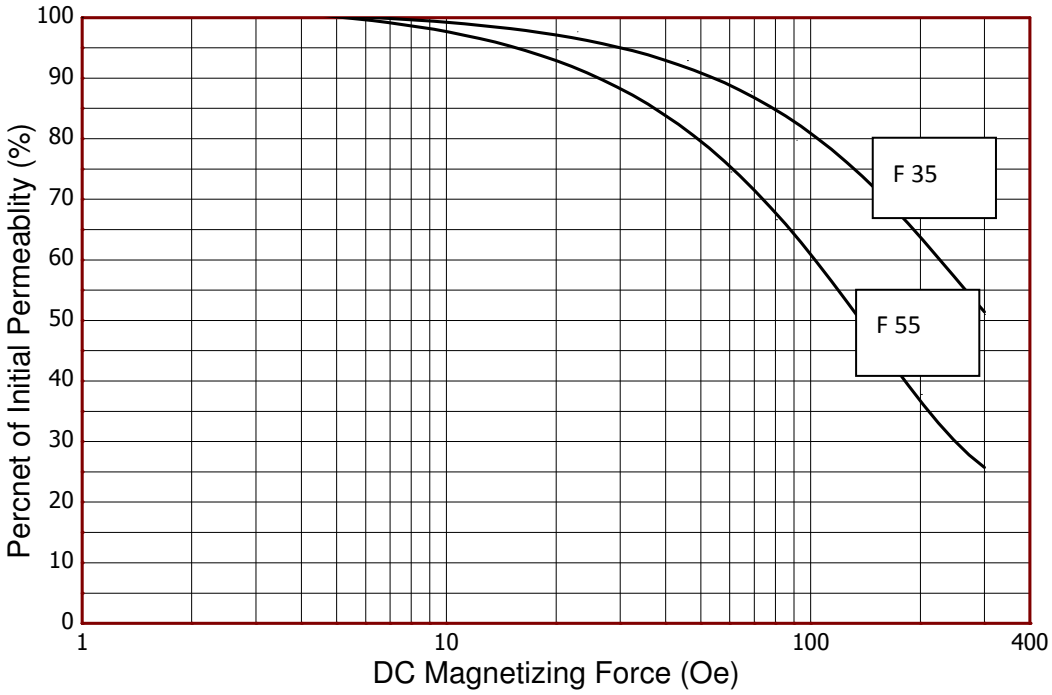
SMD DF Material Characteristic

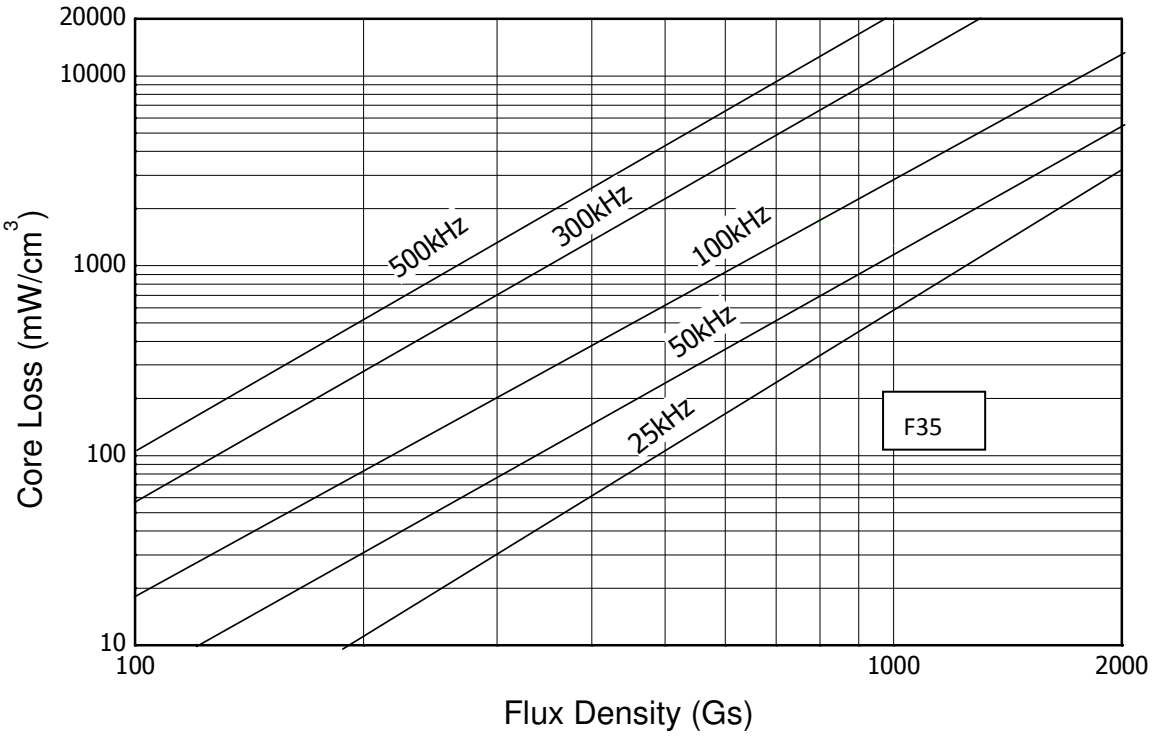
1. Good frequency characteristic, Operating frequency can be up to more than 500kHz.
2. Loss core loss and lower than iron powder core and higher than sendust core
3. Excellent DC Bias.
4. No thermal aging problem in operating temperature of 200℃

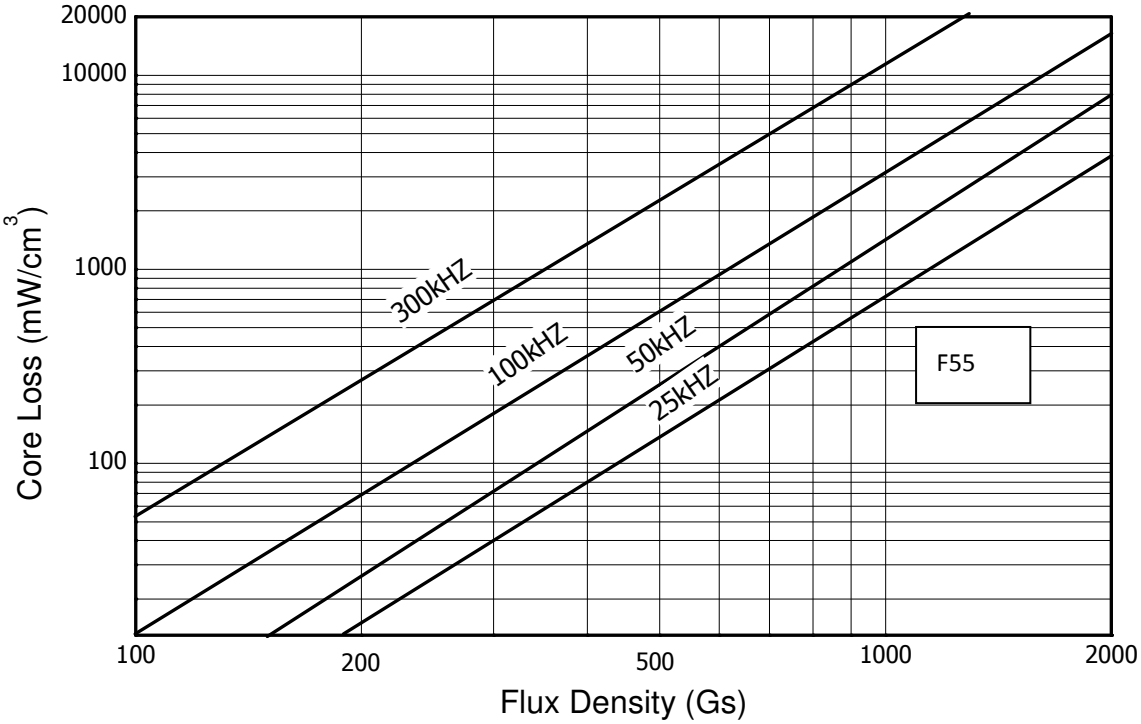
SMD DF Material applications

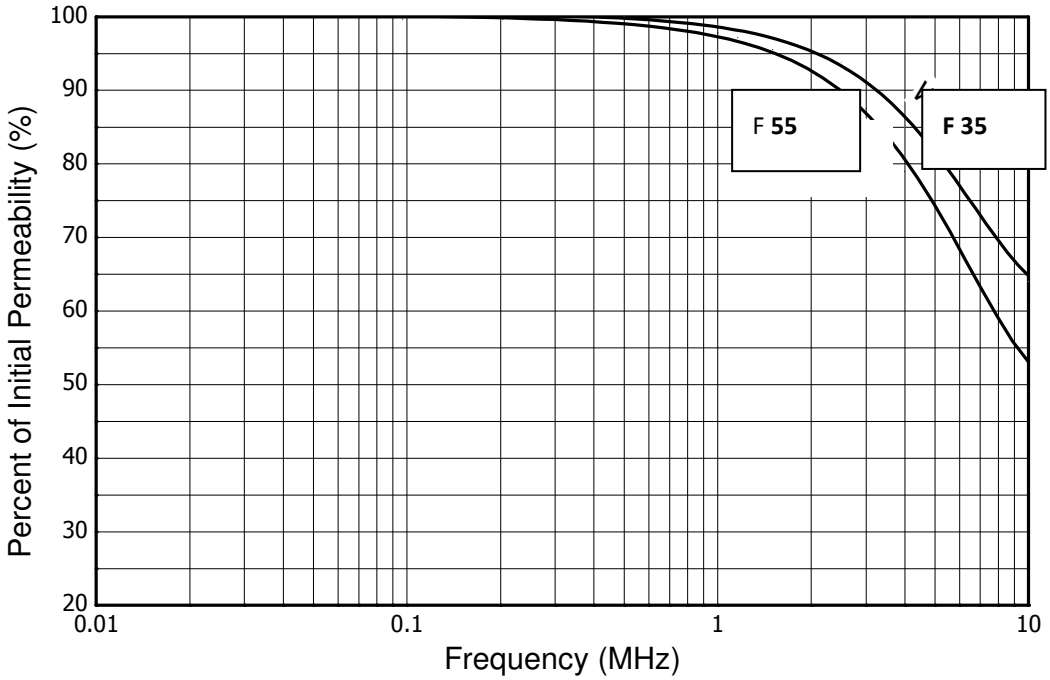
1. Inductor for low Profile and high current power supply.
2. DC/DC Converter
3. Buck inductor for VRM.

SMD DF material electrcial performance curves




20000
10000
1000
100
10
Core Loss (mW/cm3)
500kHz
300kHz
100kHz
50kHz
25kHz
F35
100
1000
2000
Flux Density (Gs)


20000
10000
1000
100
Core Loss (mW/cm3)
300kHZ
100kHZ
50kHZ
25kHZ
F55
100
200
500
1000
2000
Flux Density (Gs)


100
90
80
70
60
50
40
30
20
Percent of Initial Permeability (%)
0.01
0.1
1
10
Frequency (MHz)
F 55
F 35