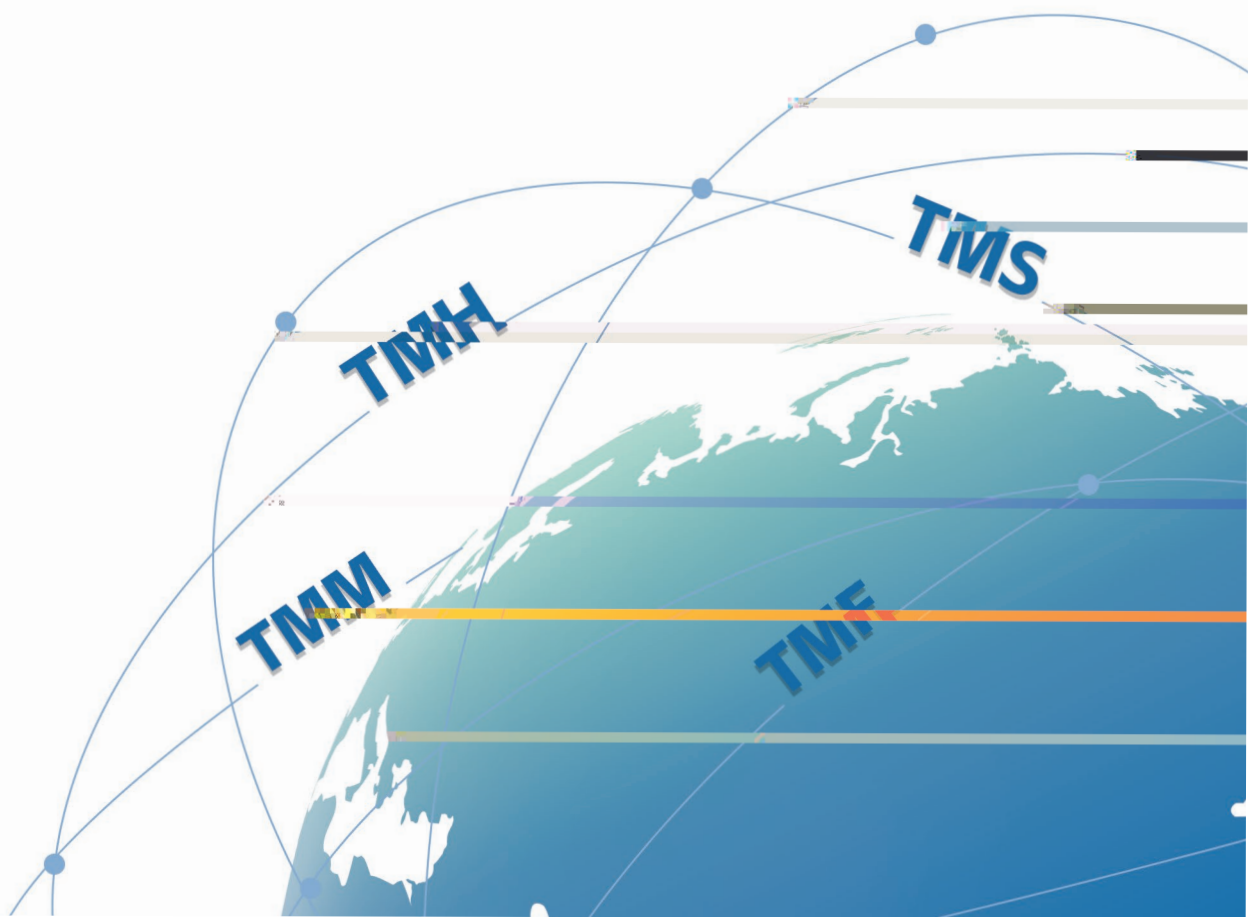


MAGNETIC POWDER CORES

金属磁粉心

TMS HOLDING CO., LTD.



Introduction

(:600330) 1984 2001

2009

5G

Founded in 1984 and listed on the Shanghai Stock Exchange in 2001 (Stock Code: 600330), TDG Holding Co., Ltd is a high-tech enterprise in China and has a number of subsidiaries. TDG has formed four major business segments: electronic materials, electronic module, green energy and smart equipment, the business covers the entire industrial chain of electronic information materials.

TDG has been researching and developing magnetic powder cores since 2009, and owns magnetic powder cores industrial bases in Haining, Zhejiang and Lu'an, Anhui. TDG has developed and can mass produce Fe-Si-Al , Fe-Si, Fe-Ni, Fe-Ni-Mo and composite powder cores, the products are widely used in the field of electronic technology, such as new energy vehicles, PV and energy storage, 5G communication, data centers, servers, smart homes, medical care and consumer electronics.



The company's products are widely used in Solar inverter, energy storage, new energy vehicles, DC Charging station, uninterruptible power supply, communication server, high-efficiency switching power supply, high-end household appliances and other fields.

Material

[illegible]

/Material:

TMS SERIES

1.05T

Al-Si-Fe

High saturation flux density (1.05T)

Low loss characteristics

Low magnetostriction

Good temperature & frequency stability

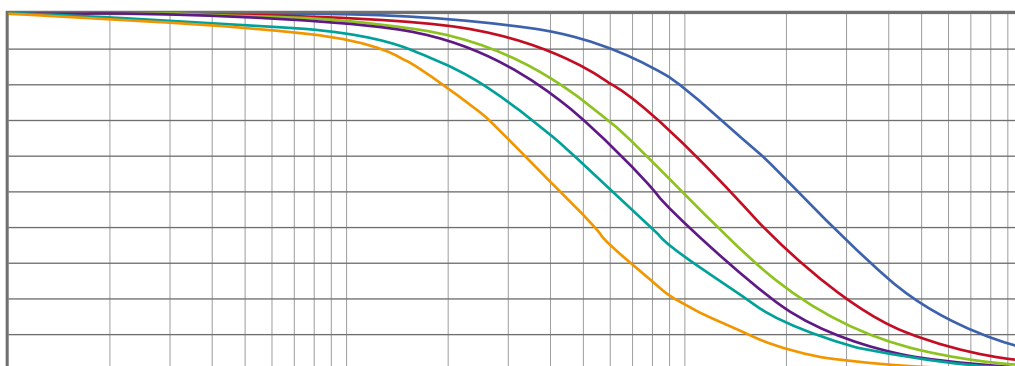
PC

Power adapter

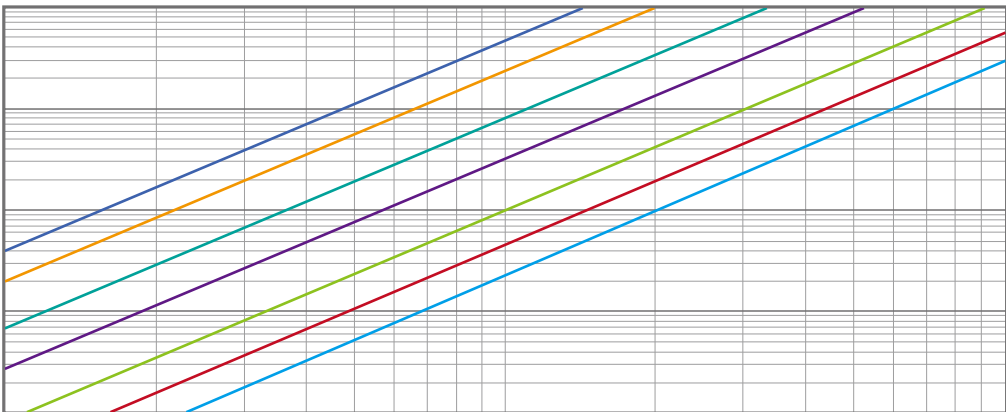
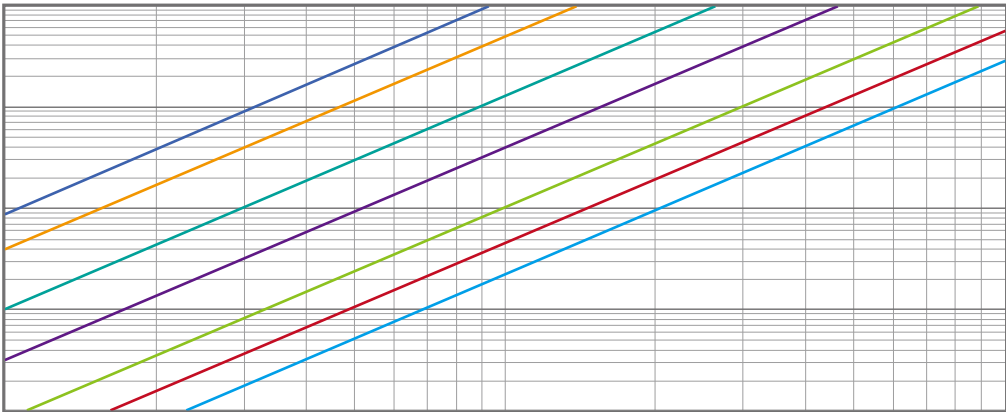
Boost choke for PV inverter

PC power supply

1.1



1.2



/Material:

TMSA SERIES

0.95T

High saturation flux density (1.0T)

Ultra-low core loss

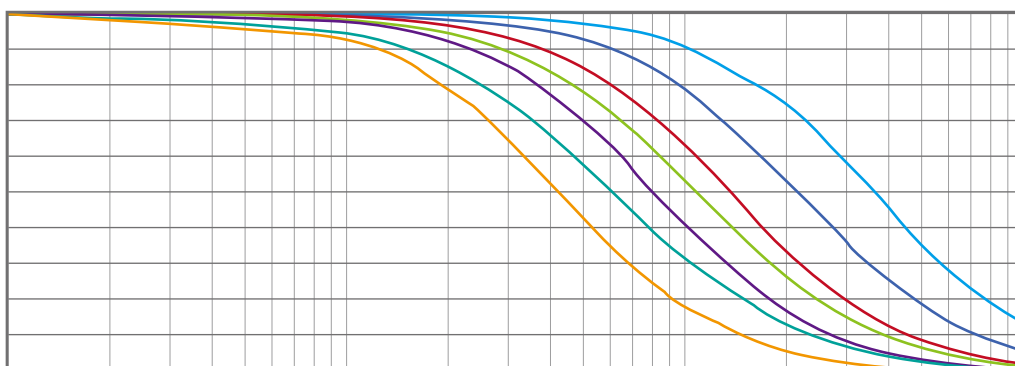
Low magnetostriction

Good temperature & frequency stability

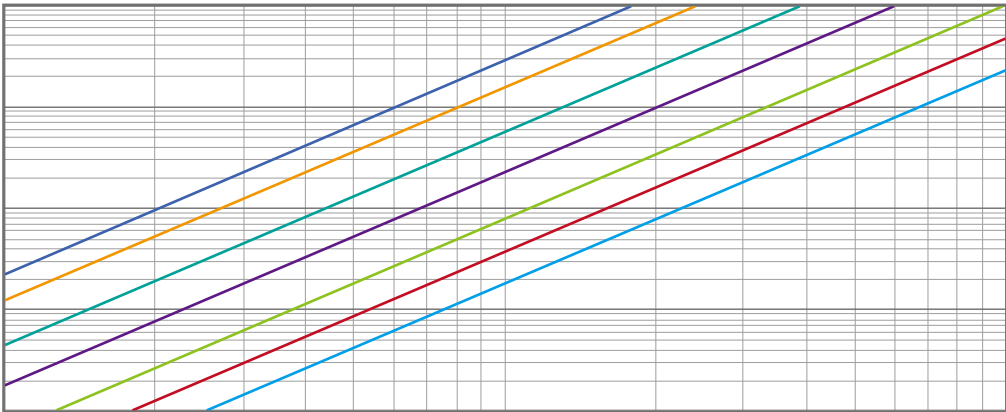
PFC 150kHz
50-200kHz

Resonant inductor 150kHz
PFC inductor 50-200kHz
Flyback transformer
Buck inductor

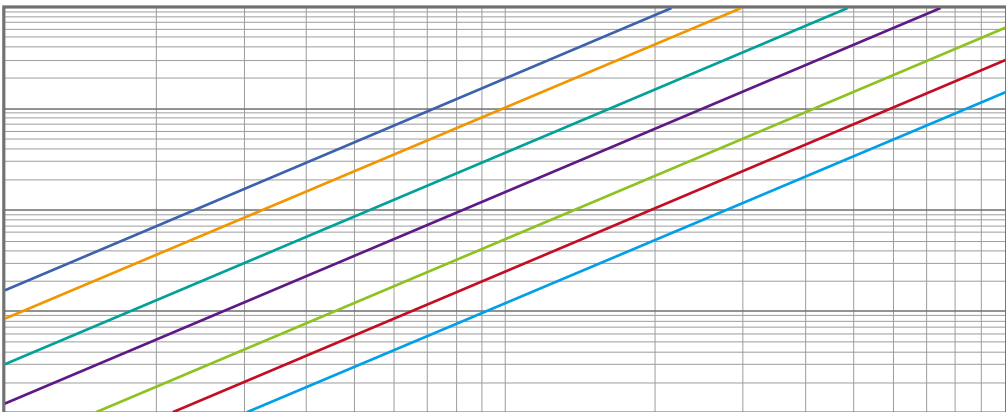
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1.2



• ————— •



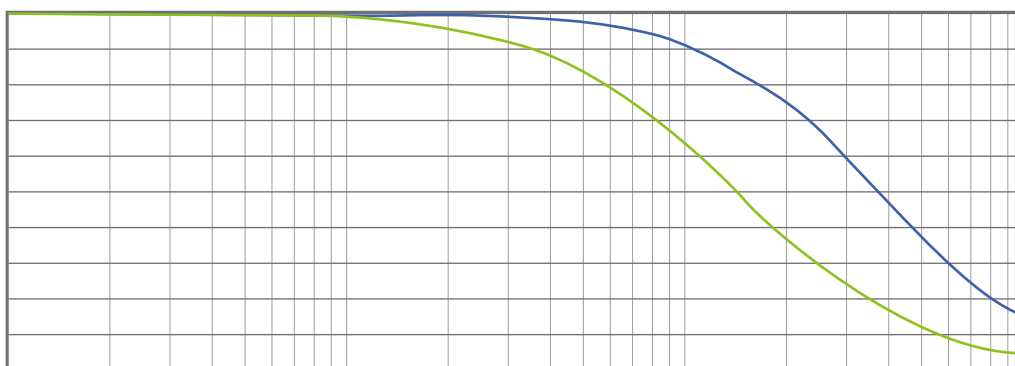
/Material:

TMSB SERIES

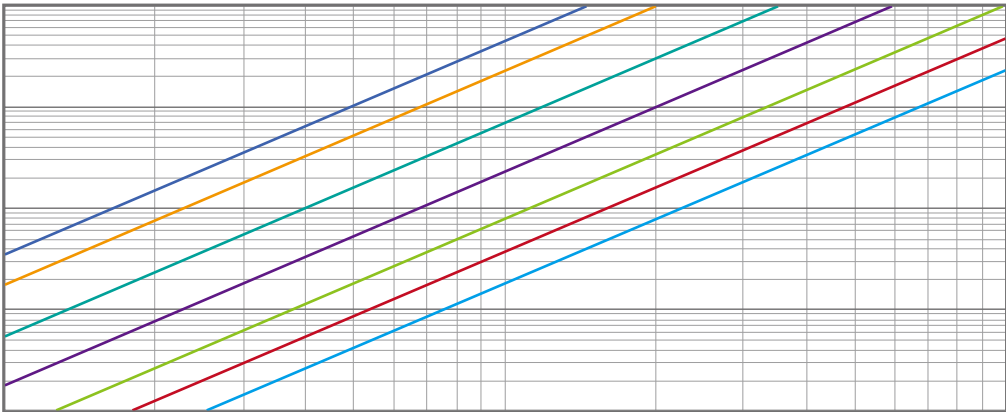
Excellent DC Bias performance
Lower loss
Excellent temperature & frequency stability

PV inverter
Energy storage system
Server power supply
DC charging module

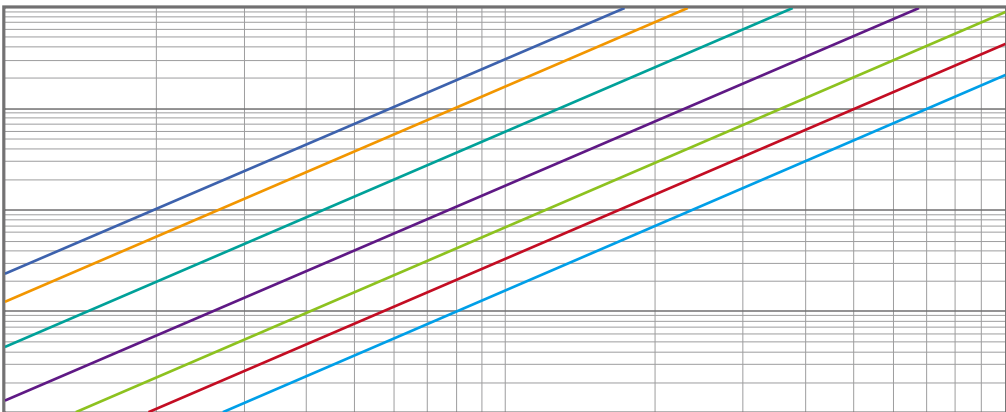
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1.2



• ————— •



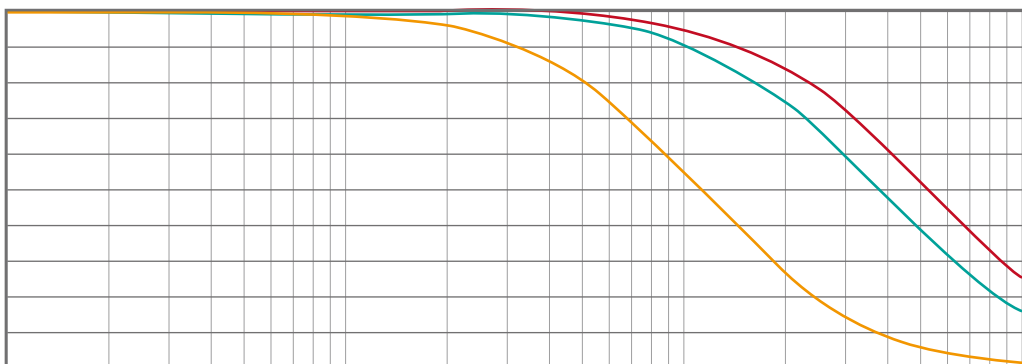
/Material:

TMSG SERIES

Ultra-low core loss
High saturation flux density
Near zero magnetostriction
Excellent temperature & frequency stability

High frequency Inductor
Resonant inductor
Chip Inductor

1.1



/Material:

TMF SERIES

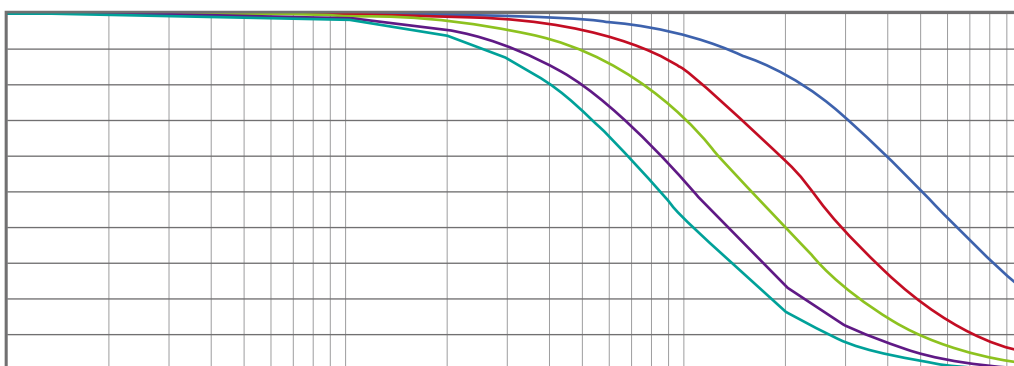
1.6T

Distributed air gap
Very high saturation flux density (1.6T)
High DC bias performance
Low magnetostriction
Good temperature & frequency stability

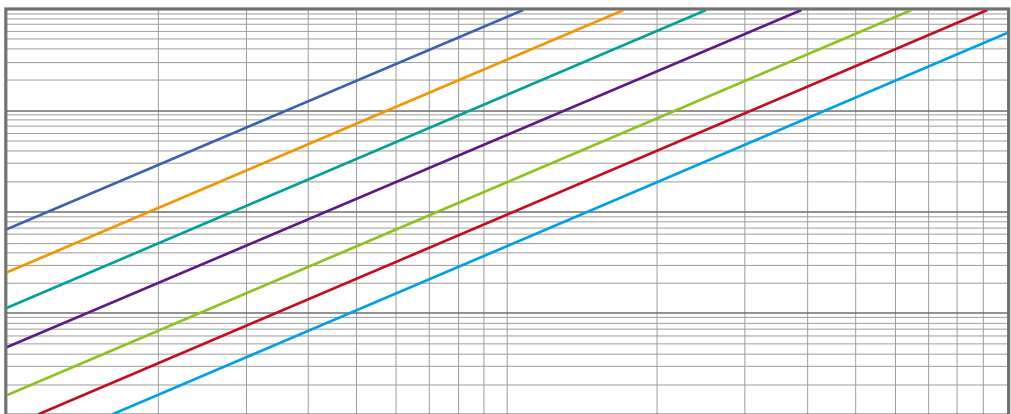
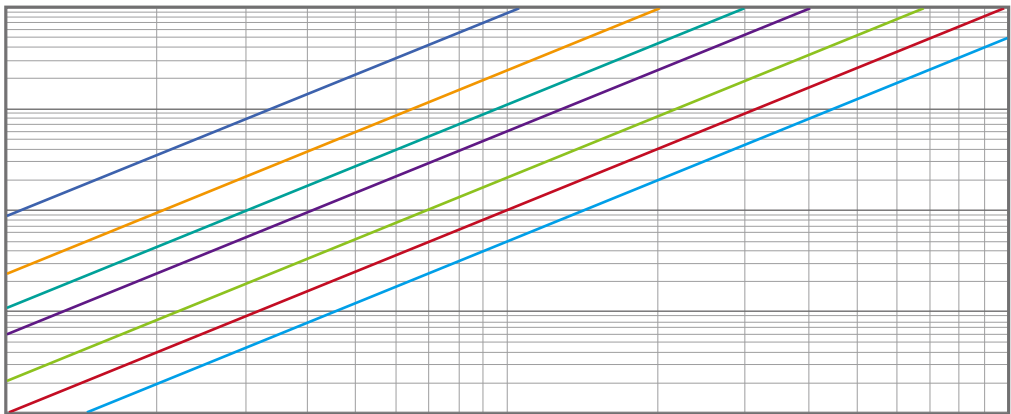
UPS

PV Inverter
General industrial power supply
UPS power supply
DC charging station

1.1



1.2



/Material:

TMFA SERIES

1.5T

- High saturation flux density (1.5T)
- High DC bias performance
- Low magnetostriction
- Good temperature & frequency stability
- The loss is 30% lower than TMF

TMF 30%

- PV Inverter
- New energy vehicle
- General industrial power supply
- DC charging pile

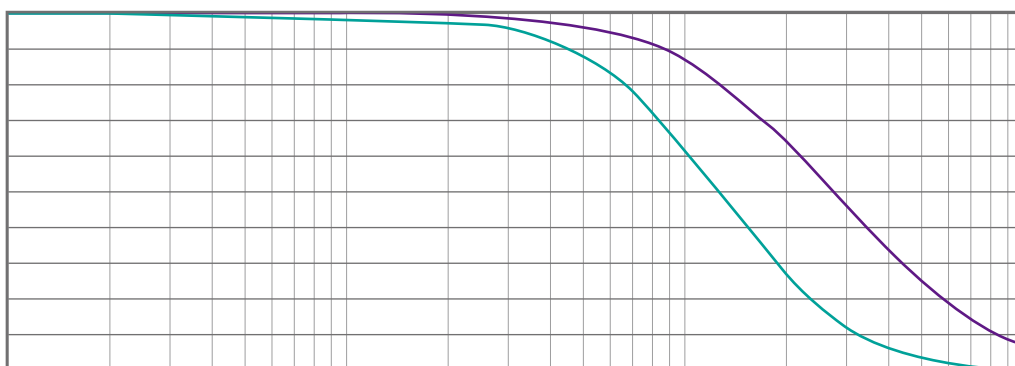
/Material: **TMFB SERIES**

1.2T

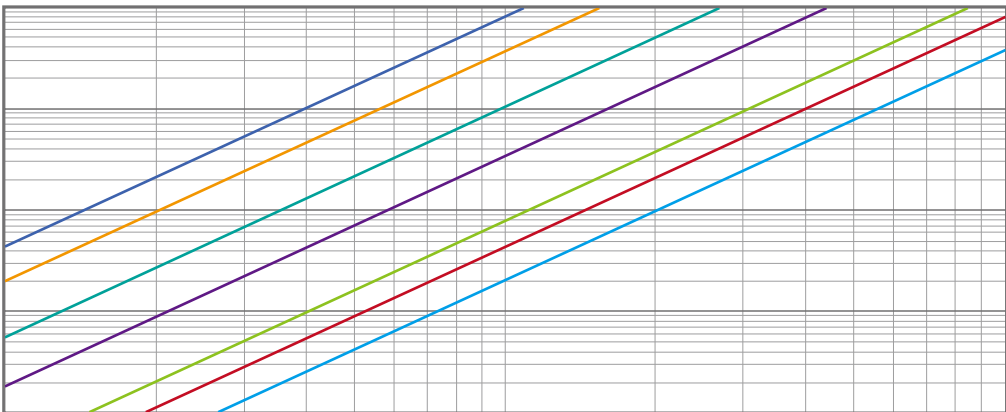
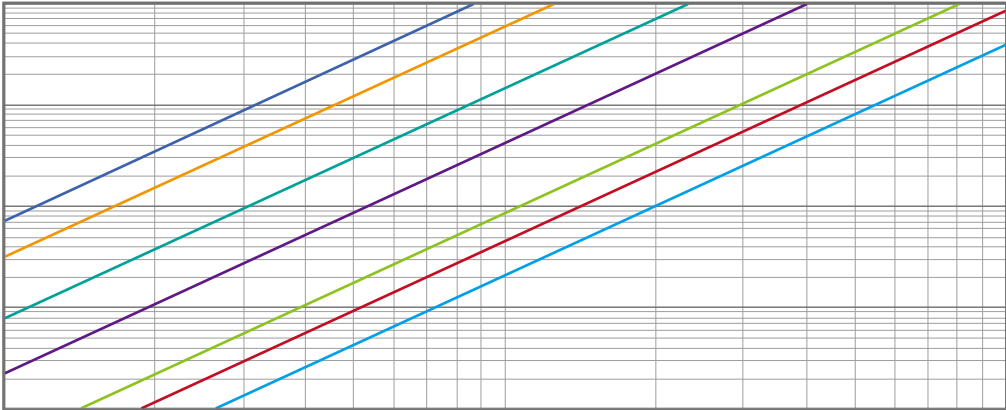
Very high saturation flux density (1.2T)
 Low core loss
 Low magnetostriction
 Good temperature & frequency stability

UPS
 PV Inverter
 New energy vehicle
 Server power supply
 DC charging pile

1.1



1.2



/Material:

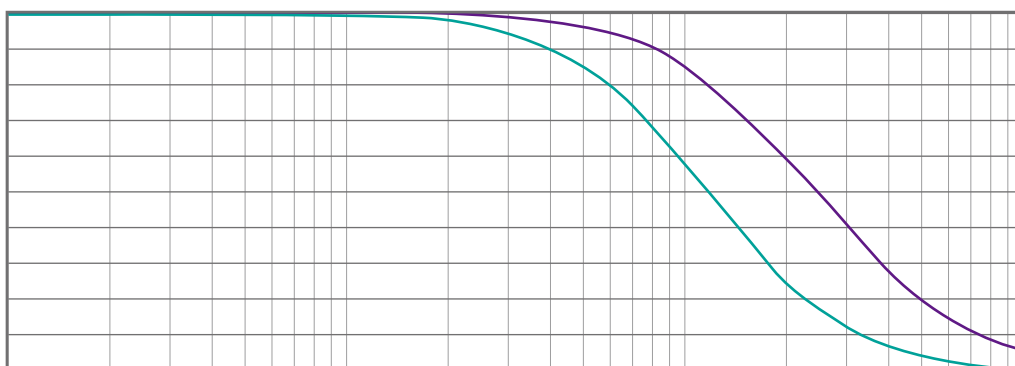
TMFC SERIES

1.1T

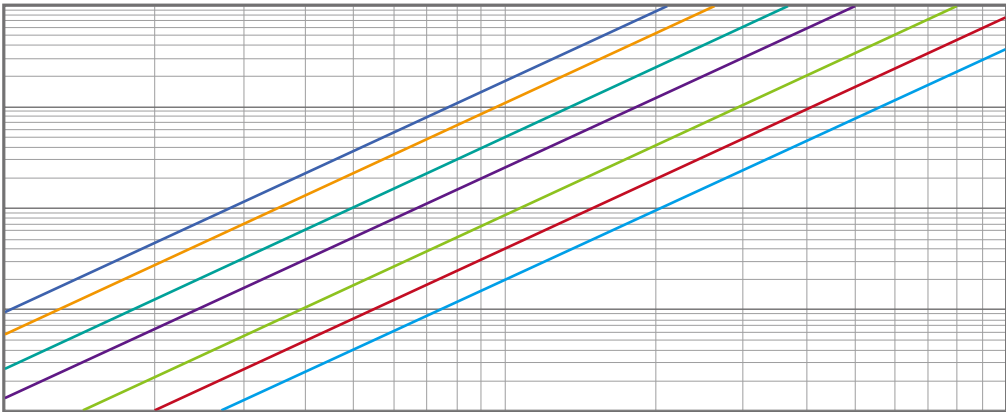
Distributed air gap
Very high saturation flux density (1.1T)
Low core loss
Low magnetostriction
Good temperature & frequency stability

UPS
PV Inverter
New energy vehicle
Server power supply

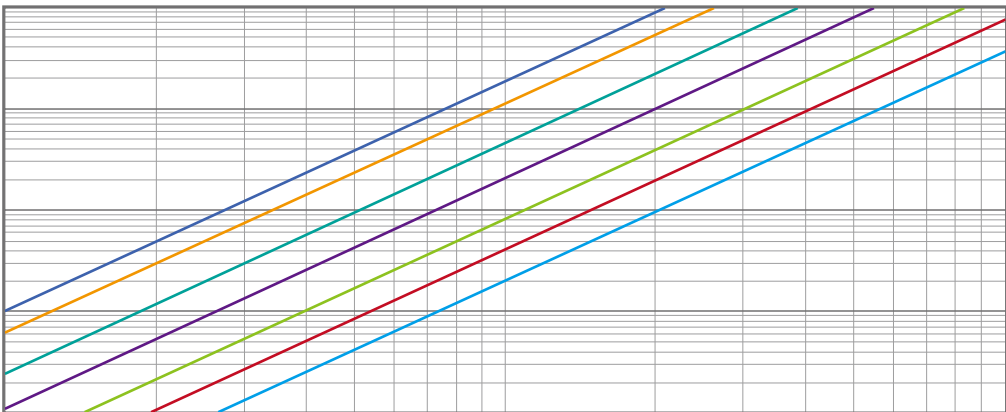
1.1



1.2



• ————— •



/Material:

TMH SERIES

1.5T

Very high saturation flux density (1.5T)

Low core loss

Excellent DC bias performance

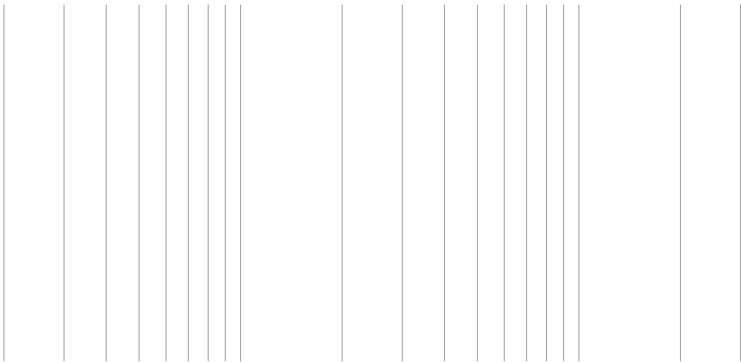
Good temperature & frequency stability

Industrial power supply

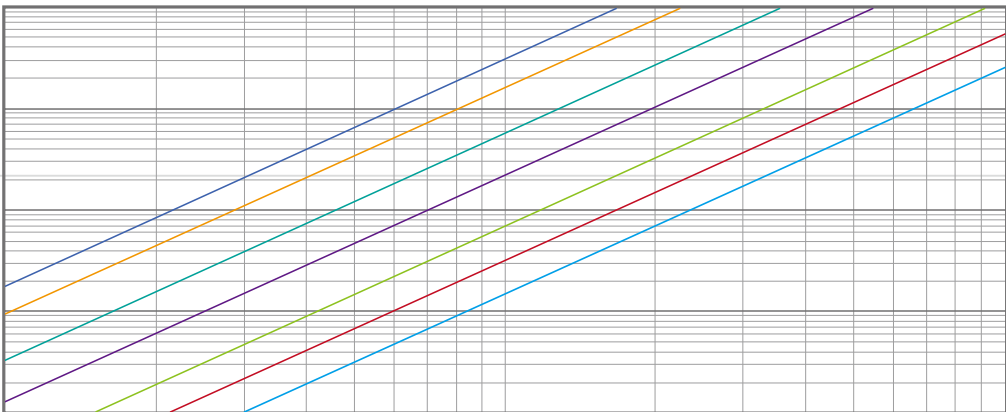
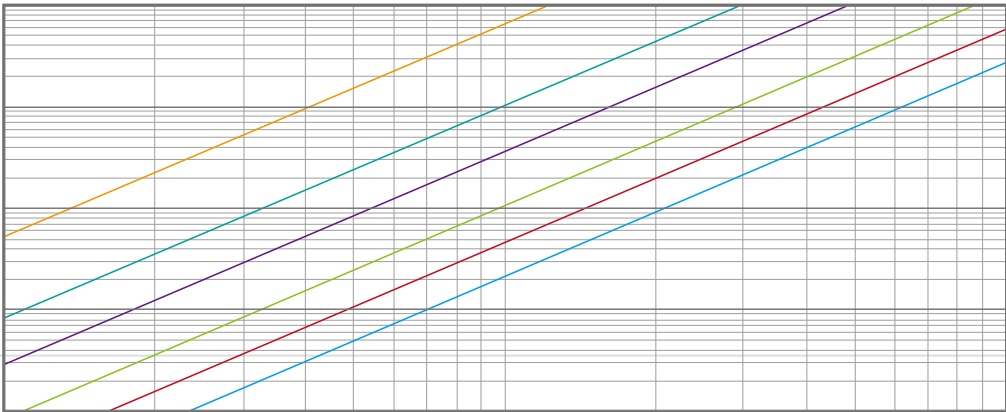
Communication power supply

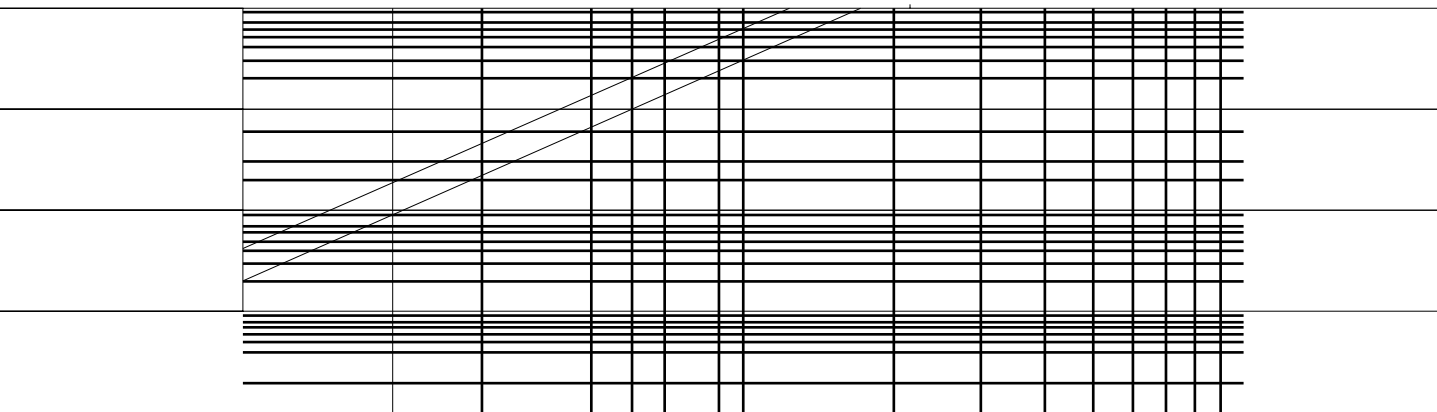
New energy vehicle

Server power supply



1.2





/Material:

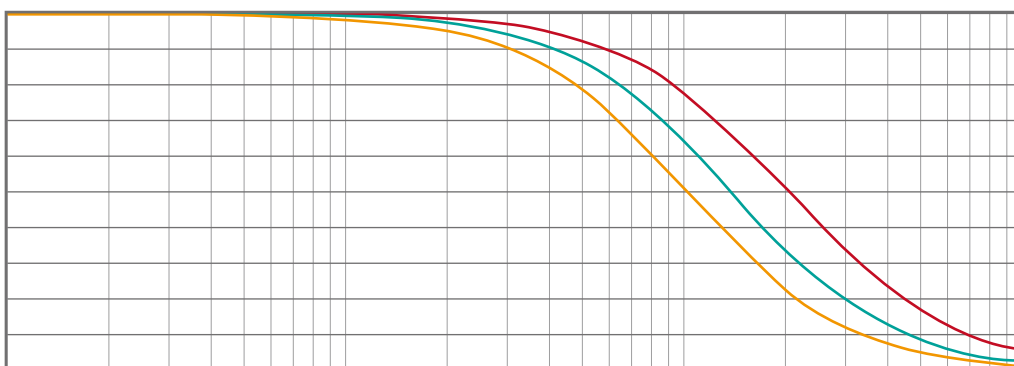
TMHA SERIES

1.2T

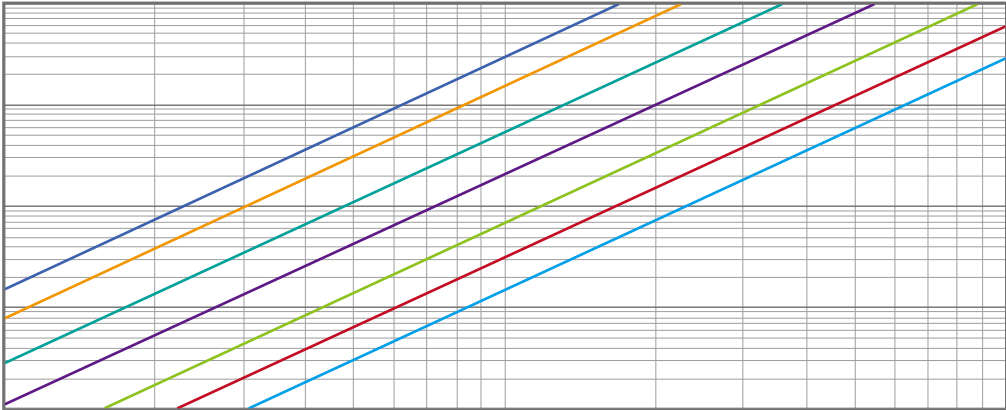
Distributed air gap
Very high saturation flux density (1.2T)
Low core loss
Excellent DC bias performance
Good temperature & frequency stability

Industrial power supply
Communication power supply
New energy vehicle
Server power supply
Chip inductor

1.1



1.2



/Material:

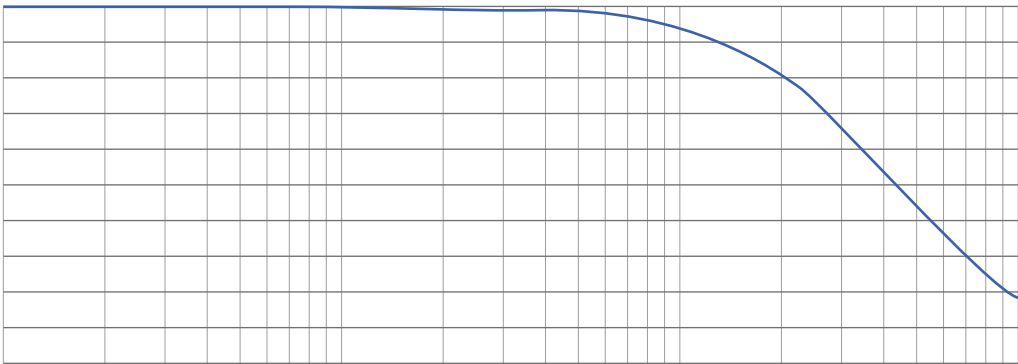
TMHB SERIES

1.3T

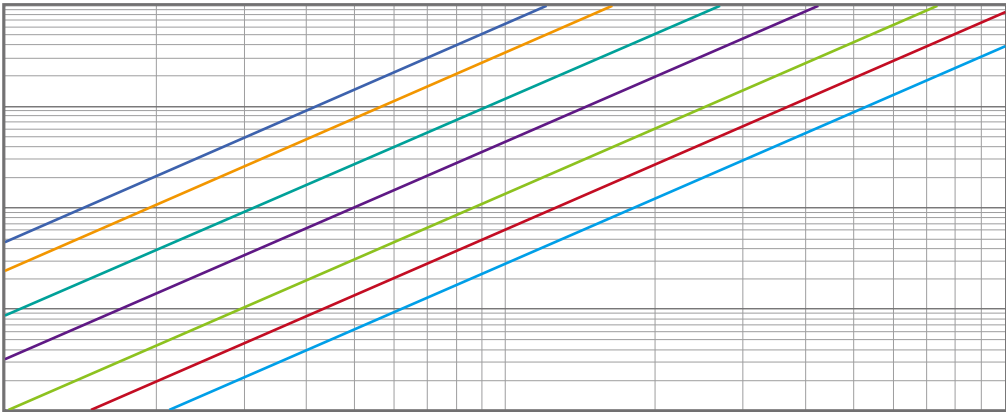
- Distributed air gap
- Very high saturation flux density (1.3T)
- Excellent DC bias performance
- Low magnetostriction
- Good temperature & frequency stability

- Industrial power supply
- Communication power supply
- New energy vehicle
- Server power supply

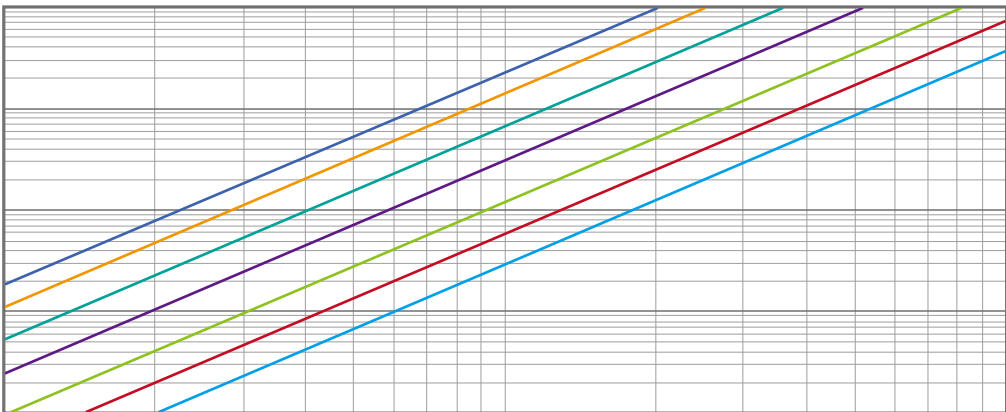
1.1



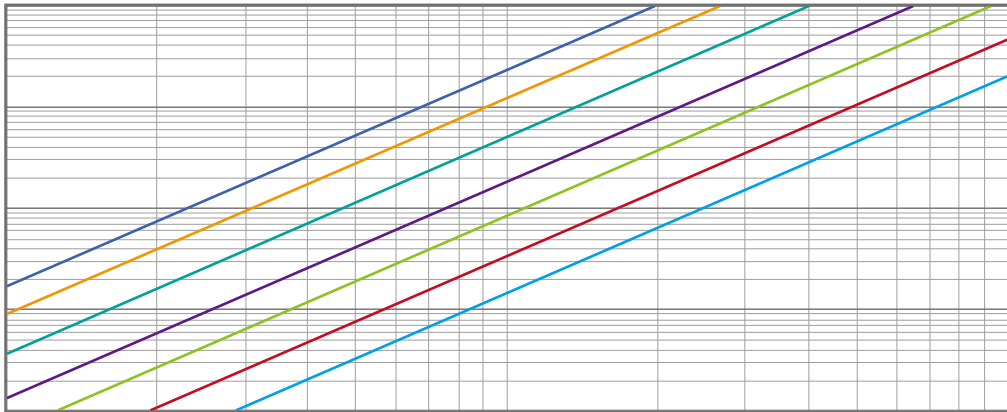
1.2



• ————— •



1.2



/Material:

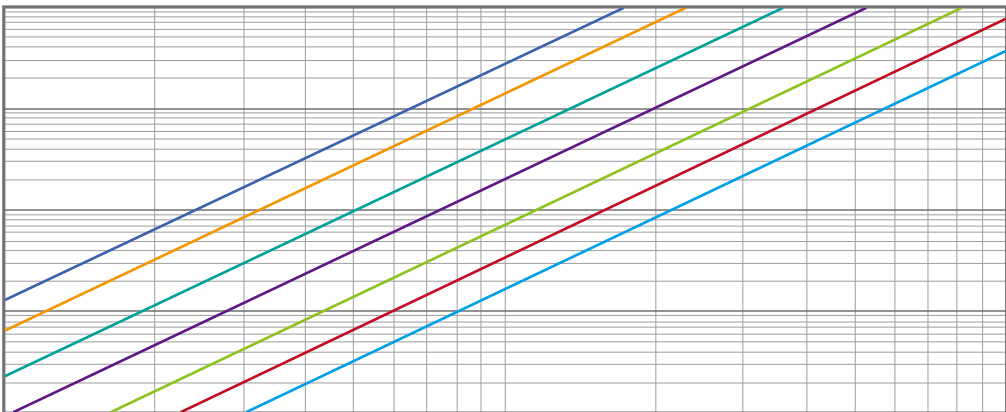
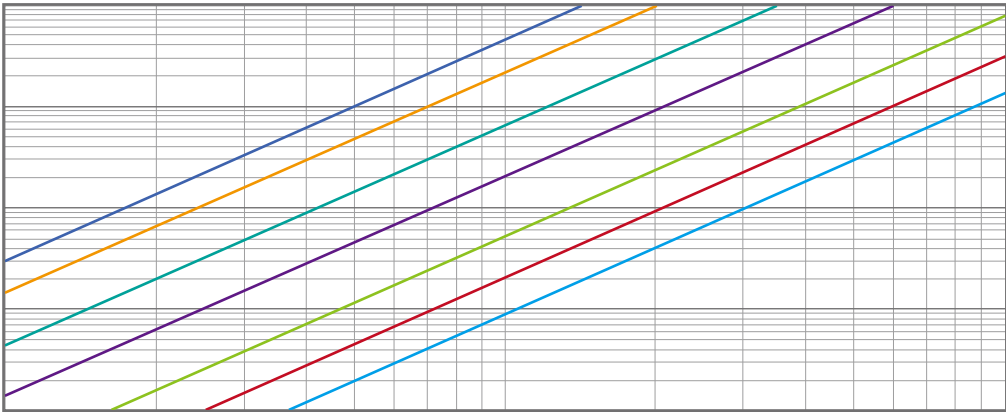
TMM SERIES

0.75T

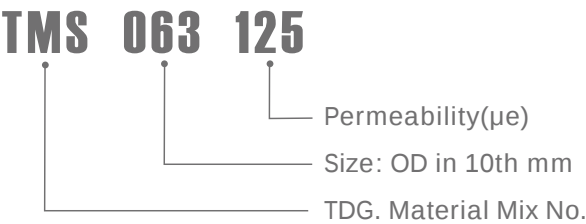
- Distributed air gap
- High saturation flux density (0.75T)
- Very low core loss
- Low magnetostriction
- Good temperature & frequency stability

- High efficiency server power supply
- Communication power supply

1.2



OD6.35mm × ID2.79mm × Ht2.79mm

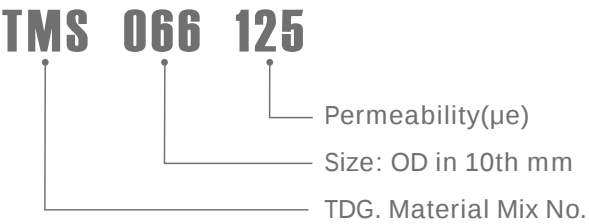


Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	13.61 mm	4.7 mm ²	64 mm ³	4.12 mm ²
B.S.	0.536 in	0.007 in ²	0.004 in ³	0.006 in ²

			24		
TMF			24		
			24		

OD6.60mm × ID2.67mm × Ht2.54mm



Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	13.63 mm	4.76 mm ²	64.9 mm ³	4.10 mm ²
B.S.	0.537 in	0.007 in ²	0.004 in ³	0.006 in ²

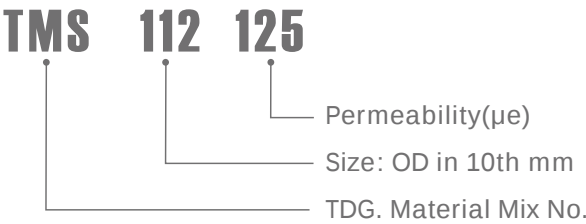
TMF					
			32		







OD11.2mm × ID6.35mm × Ht3.96mm



Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

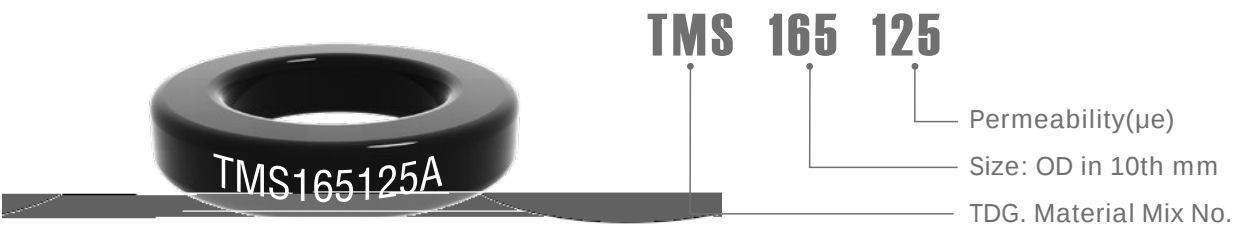
Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	26.90 mm	9.06 mm ²	243.70 mm ³	27.30 mm ²
B.S.	1.080 in	0.014 in ²	0.015 in ³	0.0423 in ²

			38		
TMF					
			32		
			38		



	Magnetic Path Length		Cross Section Area	Core Volume	Window Area
	Le		Ae	V	W
SI	31.20 mm		10.90 mm ²	360.52 mm ³	38.30 mm ²
L	2	1.220 in τ	0.018 in ²	0.022 in ³	0.059 in ²

OD16.5mm × ID10.2mm × Ht6.35mm

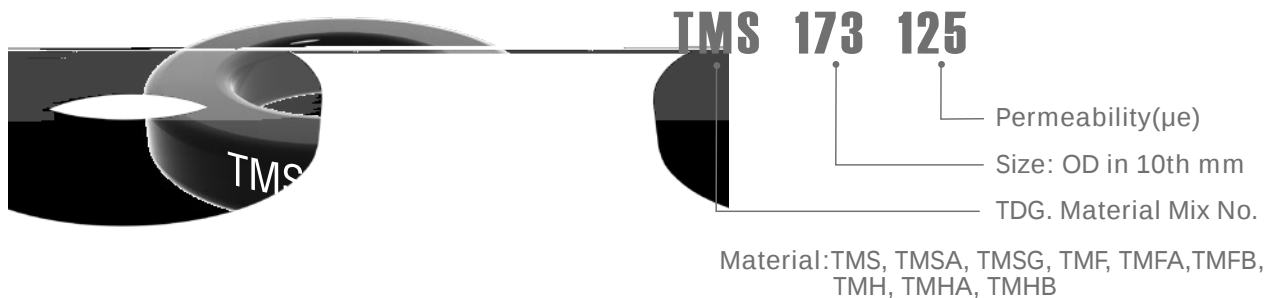


Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	41.10 mm	19.20 mm ²	789.00 mm ³	71.30 mm ²
B.S.	1.619 in	0.030 in ²	0.048 in ³	0.111 in ²

			72		
TMF					
			23		
			43		
			72		

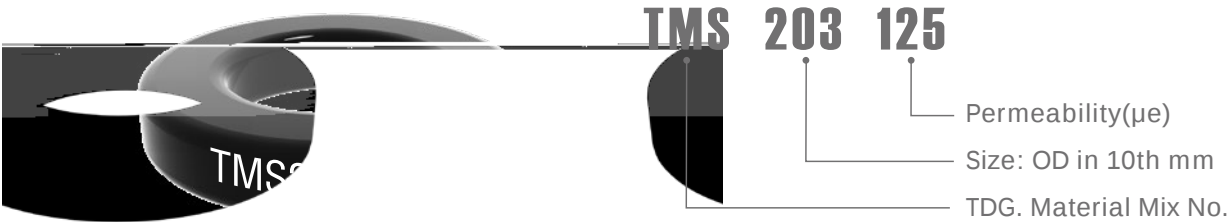
OD17.3mm × ID9.65mm × Ht6.35mm



Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	41.40 mm	23.20 mm ²	960.00 mm ³	57.60 mm ²
B.S.	1.63 in	0.0306 in ²	0.059 in ³	0.089 in ²

			43		
TMF			28		
			43		
			43		

OD20.3mm × ID12.7mm × Ht6.35mm

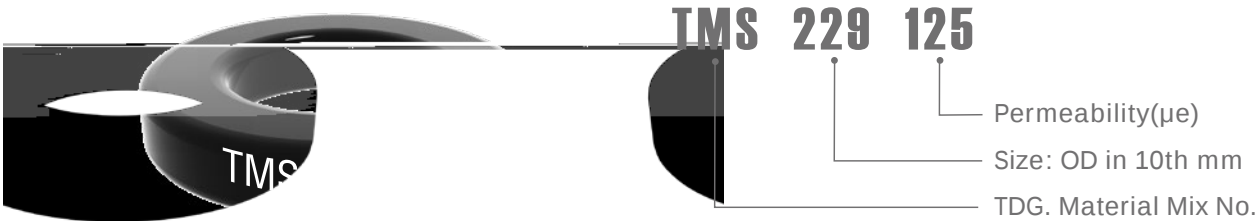


Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	50.90 mm	22.58 mm ²	1150.00 mm ³	114.00 mm ²
B.S.	2.01 in	0.035 in ²	0.070 in ³	0.177 in ²

			32		
TMF			32		
			32		

OD22.9mm × ID14.0mm × Ht7.62mm

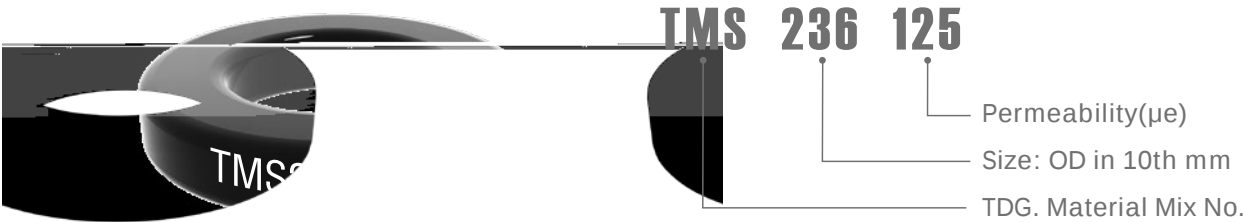


Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	56.70 mm	33.10 mm ²	1868.00 mm ³	141.00 mm ²
B.S.	2.23 in	0.051 in ²	0.114 in ³	0.218 in ²

			43		
TMF			43		
			43		

OD23.6mm × ID14.4mm × Ht8.89mm

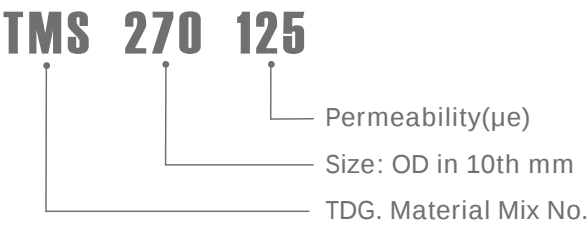


Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	58.80 mm	38.80 mm ²	2280.00 mm ³	149.00 mm ²
B.S.	2.32 in	0.061 in ²	0.142 in ³	0.231 in ²

			22		
TMF			22		
			34		

OD27.0mm × ID14.7mm × Ht11.2m

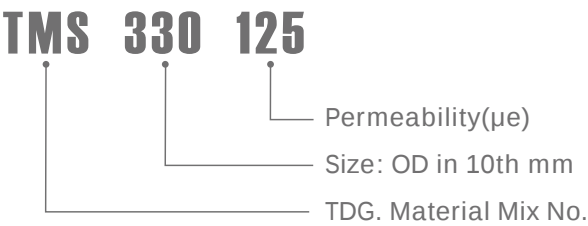


Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	63.50 mm	65.40 mm ²	4150.00 mm ³	156.00 mm ²
B.S.	2.50 in	0.101 in ²	0.254 in ³	0.242 in ²

			32		
TMF			32		

OD33.0mm × ID19.9mm × Ht10.7mm

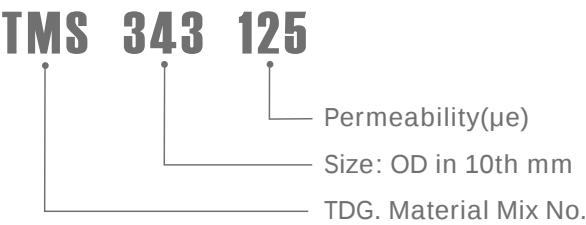


Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	81.50 mm	67.10 mm ²	5473.00 mm ³	293.00 mm ²
B.S.	3.21 in	0.104 in ²	0.334 in ³	0.454 in ²

			28		
TMF			28		

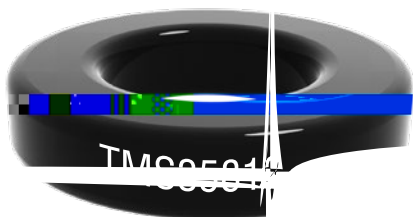
OD34.3mm × ID23.4mm × Ht8.89mm



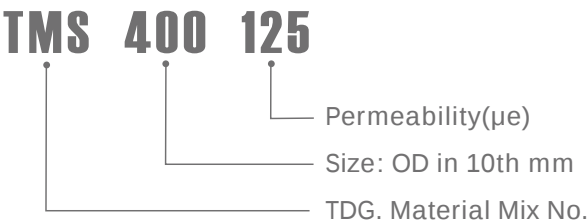
Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	89.50 mm	45.40 mm ²	4060.00 mm ³	401.00 mm ²
B.S.	3.530 in	0.070 in ²	0.249 in ³	0.622 in ²

			38		
TMF			38		
			47		
			38		



OD39.9mm × ID24.1mm × Ht14.5mm



Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	98.40 mm	107.20 mm ²	10569.66 mm ³	427.00 mm ²
B.S.	3.880 in	0.166 in ²	0.645 in ³	0.662 in ²

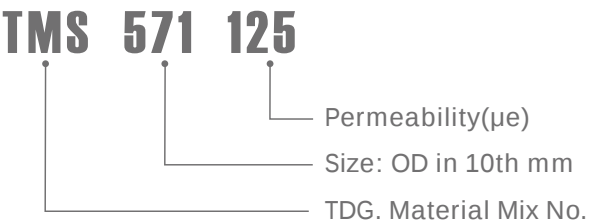
TMF					







OD57.2mm × ID26.4mm × Ht15.2mm

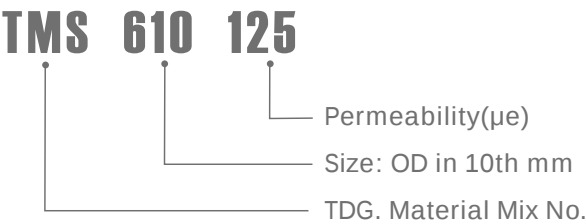


Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	125.00 mm	229.00 mm²	28677.00 mm³	514.00 mm²
B.S.	4.930 in	0.355 in²	1.750 in³	0.796 in²

			287		
TMF					
			287		

OD62.0mm × ID32.6mm × Ht25.0mm

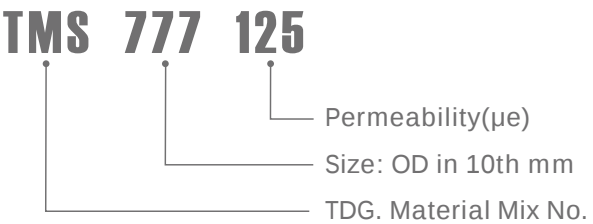


Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	143.70 mm	367.50 mm²	52810.00 mm³	772.50 mm²
B.S.	5.660 in	0.570 in²	3.223 in³	1.198 in²

			83		
			288		
TMF			83		
			288		

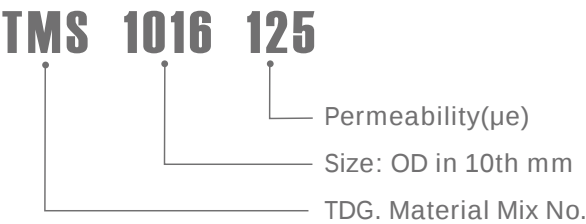
OD77.8mm × ID49.2mm × Ht12.7mm



Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	200.00 mm	177.00 mm ²	34700.00 mm ³	1799.00 mm ²
B.S.	7.720 in	0.274 in ²	2.118 in ³	2.788in ²

OD101.6mm × ID57.2mm × Ht16.5mm



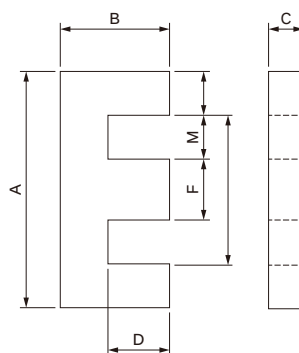
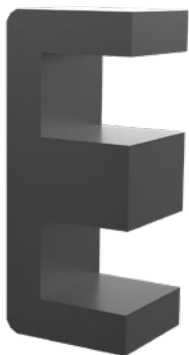
Material:TMS, TMSA, TMSG, TMF, TMFA,TMFB, TMH, TMHA, TMHB

Parameter	Magnetic Path Length	Cross Section Area	Core Volume	Window Area
	Le	Ae	V	W
SI	242.71.00 mm	352.30 mm ²	84495.00 mm ³	2441.13 mm ²
B.S.	9.555 in	0.546 in ²	5.217 in ³	4.818in ²

			228		
TMF					
			228		

EE

EE CORE



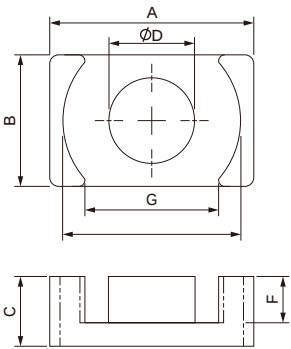
TMS 18 08 E - 090

Material Code _____ Permeability _____
Size(mm) A _____ E type Core _____
Size(mm) B _____

[illegible]

EQ

EQ CORE



TMF060 - EQ 26.5 / 19.5 / 7.5

Material

EQ type Core

Size(mm) A

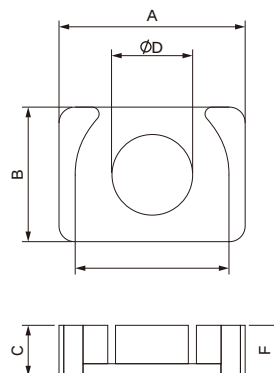
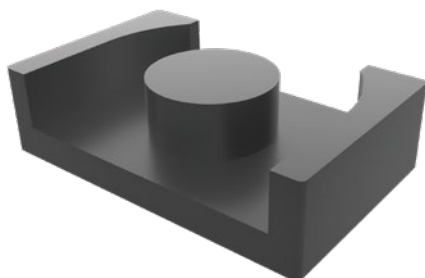
Size(mm) C

Size(mm) B

										3)			
	A	B	C	D		F	G						
											72		
	32	22									83		
	32	22											
					32								
		28										87	
		32			44						77		

ER

ER CORE



TMF060 - ER 50.6 / 32.0 / 13.5

Material

EQ type Core

Size(mm) A

- Size(mm) C

- Size(mm) B

[illegible]

AR

AR CORE

TMF060 - AR 13.5 / 5

Material

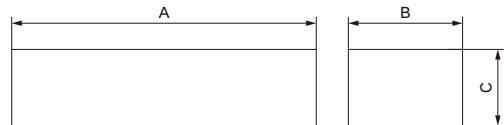
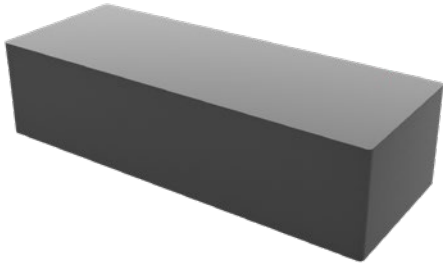
- Size(mm) B

AR type Core

Size(mm) A

[illegible][illegible]

BLOCK CORE



TMS 50 30 15 B 060

Material _____ Permeability _____

Size(mm) A _____ Block Core _____

Size(mm) B _____ Size(mm) C _____

[illegible]

► Effective Permeability

μ_e	Effective Permeability
B	Flux Density Gauss
H	Magnetizing Force Oe

► Inductance and Inductance Factor

L	Inductance H
μ_e	Effective Permeability
N	Inductance Coefficient
A_L	Inductance Coefficient
A_e	Effective Area cm^2
l_e	Effective length cm

$$A_L = \frac{L}{N^2}$$

► Magnetization Field

H	Magnetizing force Oersteds
N	Turn
I	Current A
l_e	Effective length cm

► R Winding DC Resistance

l	Length of per turn cm/Ts
r	Line resistivity $10^{-3} \Omega \cdot \text{in}^{-1}$
N	Turn

► Quality Factor

Q	Quality factor
L	Inductance(H)
ω	Angular velocity $2\pi f(\text{Hz})$
R_{dc}	Winding resistivity(Ω)
R_{ac}	Hysteresis losses resistivity(Ω)
R_{cd}	Dielectric loss resistivity(Ω)

$$Q = \frac{\omega L}{R_{dc} + R_{ac} + R_{cd}}$$

► Magnetic Flux Density

$B_{\max}$	Max flux density (Gauss)
E_{rms}	Max volt (Volts)
N	Turn
A_e	Effective area (cm ²)
f	Frequency (Hz)

$$B_{\max} = \frac{E_{\text{rms}} 10^8}{4.44 f A_e N}$$

► Magnetic Core Loss

a=	Hysteresis losses coefficient
c=	Surplus losses coefficient
e=	Eddy-current losses coefficient
f	Frequency Hz
$B_{\max}$	Max flux density Gauss
L	Inductance H
μ_e	Effective Permeability

$$\frac{R_{ac}}{\mu_e L} = a B_{\max} f + c f + e f^2$$

Under high frequency conditions, eddy current loss is the main loss.
Hysteresis loss is the main loss at low frequency.

RAW MATERIAL TEST



icp-oes



X fluorescence analyzer

PERFORMANCE TEST



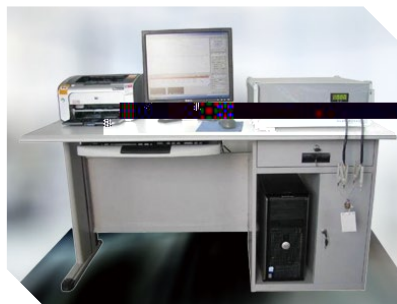
B-H analyzer



HP 4284A precision LCR tester



Network/spectrum/impedance analyzer



MATS Soft magnetic DC Tester

PERFORMANCE TEST

High-low
Temperature
Test Chamber



Metallographic
Microscope



High and low
temperature test box



Electric Vibrator



High and low temperature
alternating test box





TDC

MAGNETIC POWDER CORES 2024 2024

