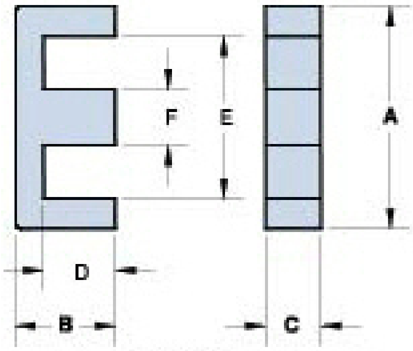
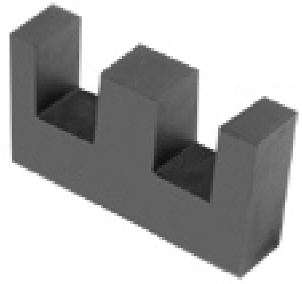
Fair-Rite Products Corp.
Your Signal Solution®
Ferrite Components for the Electronics Industry
Fair-Rite Products Corp. PO Box J,One Commercial Row, Wallkill, NY 12589-0288
Phone: (888) 324-7748 www.fair-rite.com

Fair-Rite Product's Catalog
Part Data Sheet, 9478114002
Printed: 2013-07-03





Part Number:	9478114002
Frequency Range:	Dimensions
Description:	78 E CORE
Application:	Inductive Components
Where Used:	Closed Magnetic Circuit
Part Type:	E Cores
Generic Name:	E42/15

Mechanical Specifications

Weight: 88.000 (g) per Set

Part Type Information

EF12.6, EF16, E 187, EF20, EF25, EF32, E33/13, E 375, E42/15, E42/20, E55/21, E65/27

The E core geometry offers an economical design approach for inductive applications in a variety of power designs.

-E cores can be supplied with the center post gapped to a mechanical dimension or an AL value.

-AL value is measured at 1 kHz, B < 10 gauss.

-Weight indicated is per pair or set.

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Mechanical Specifications

Dim	mm	mm tol	nominal inch	inch misc.
A	42.00	±0.7	1.654	-
B	21.20	±0.3	0.835	-
C	14.90	±0.3	0.587	-
D	15.15	±0.3	0.596	-
E	29.50	min	1.161	min
F	11.90	±0.3	0.469	-
G	-	-	-	-
H	-	-	-	-
J	-	-	-	-
K	-	-	-	-

Electrical Specifications

Typical Impedance (Ω)	

Electrical Properties	
A_L (nH)	4300 ±25%
Ae(cm^2)	1.77000
Σl/A(cm^{-1})	5.53
l_e (cm)	9.79
V_e (cm^3)	17.30000
A_{min} (cm^2)	1.740

Land Patterns

V	W ref	X	Y	Z
- -	- -	- -	- -	- -

Winding Information

Turns Tested	Wire Size	1st Wire Length	2nd Wire Length
-	-	-	-

Reel Information

Tape Width mm	Pitch mm	Parts 7 " Reel	Parts 13 " Reel	Parts 14 " Reel
-	-	-	-	-

Package Size

Pkg Size
- (-)

Connector Plate

# Holes	# Rows
-	-

Legend
+ Test frequency
Preferred parts, the suggested choice for new designs,have shorter lead times and are more readily available.
The column H(Oe) gives for each bead the calculated dc bias field in oersted for 1 turn and 1 ampere direct current. The actual dc H field in the application is this value of H times the actual NI (ampere-turn) product. For the effect of the dc bias on the impedance of the bead material, see figures 18-23 in the application note How to choose Ferrite Components for EMI Suppression.
A ½ turn is defined as a single pass through a hole.

Σl/A - Core Constant
A_e: Effective Cross-Sectional Area
A_L - Inductance Factor $(\frac{L}{N^2})$
N/AWG - Number of Turns/Wire Size for Test Coil
l_e: Effective Path Length
V_e: Effective Core Volume
NI - Value of dc Ampere-turns

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Ferrite Material Constants

Specific Heat	0.25 cal/g/°C
Thermal Conductivity	**3.5 - 4.5 mW/cm** - °C
Coefficient of Linear Expansion	8 - $10x10^{-6}$/°C
Tensile Strength	4.9 kgf/mm^2
Compressive Strength	42 kgf/mm^2
Young's Modulus	$15x10^3$ kgf/mm^2
Hardness (Knoop)	650
Specific Gravity	≈ 4.7 g/cm^3

The above quoted properties are typical for Fair-Rite MnZn and NiZn ferrites.

See next page for further material specifications.

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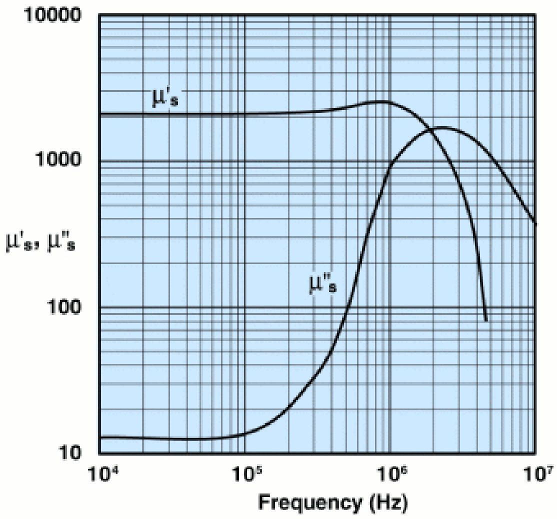
A MnZn ferrite specifically designed for power applications for frequencies up to 200 kHz.

RFID rods, toroids, U cores, and E&I cores are all available in 78 material.

78 Material Characteristics:

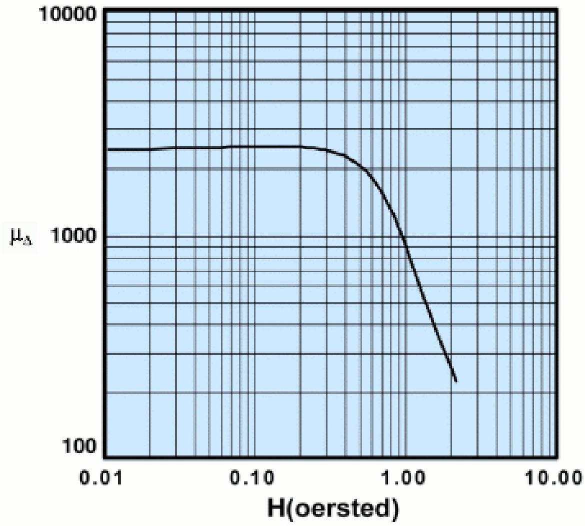
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		μ_i	2300
Flux Density @ Field Strength	gauss oersted	B H	4800 5
Residual Flux Density	gauss	B_r	1500
Coercive Force	oersted	H_c	0.20
Loss Factor @ Frequency	10^{-6} MHz	$\tan\delta/\mu_i$	4.5 0.1
Temperature Coefficient of Initial Permeability (20 -70°C)	%/°C		1.0
Curie Temperature	°C	T_c	>200
Resistivity	Ω cm	ρ	$2x10^2$

Complex Permeability vs. Frequency

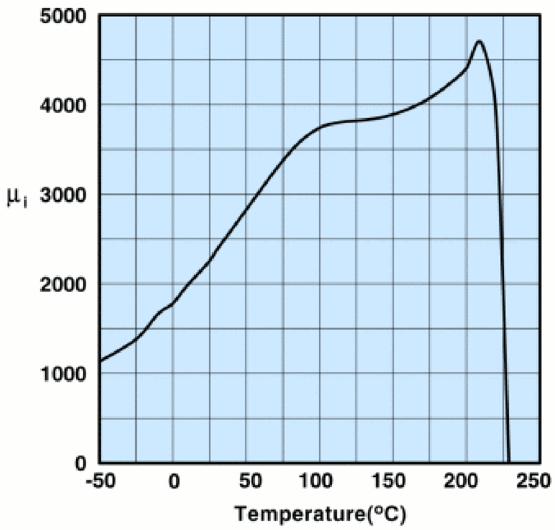


Measured on an 18/10/6mm toroid using the HP 4284A and the HP 4291A.

Incremental Permeability vs. H

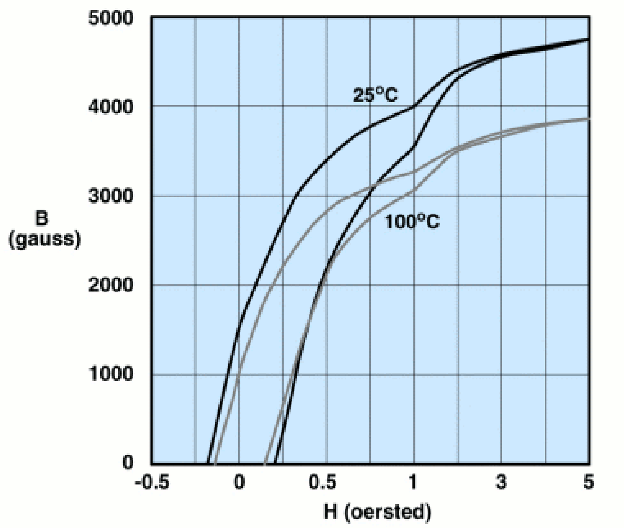


Initial Permeability vs. Temperature



Measured on an 18/10/6mm toroid at 100kHz.

Hysteresis Loop



Measured on an 18/10/6mm toroid at 10kHz.

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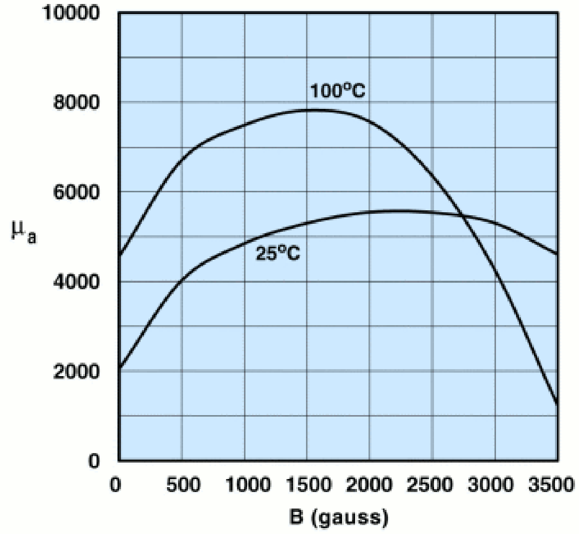
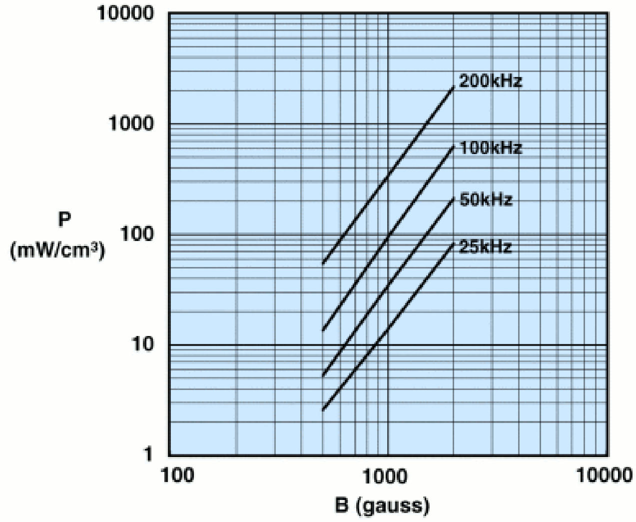
Amplitude Permeability vs. Flux Density



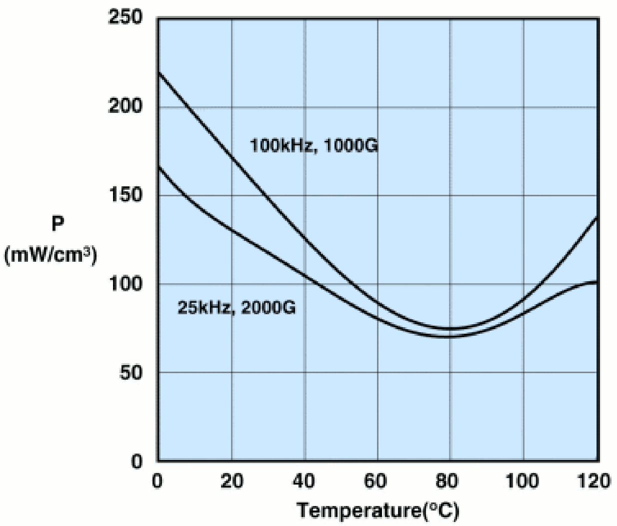
Measured on an 18/10/6mm toroid at 10kHz.

Power Loss Density vs. Flux Density



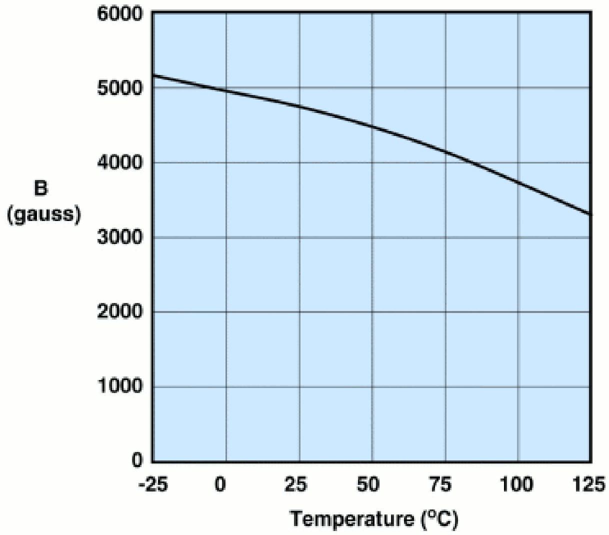
Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW at 100°C

Power Loss Density vs. Temperature



Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW.

Flux Density vs. Temperature



Measured on an 18/10/6 mm toroid at 10kHz and H=5 oersted.