

**Figure 3 (ER Type1)**

Part Number: 9578110502  
 Frequency Range: Dimensions  
 Description: 78 ER CORE SET  
 Application: Inductive Components  
 Where Used: Closed Magnetic Circuit  
 Part Type: Planar Cores  
 Generic Name: ER11

## Mechanical Specifications

Weight: 1.000 (g)

## Part Type Information

EE14/7, EE18/8, EE22/11, EE32/13, EE38/16, EE43/19, EE64/21, EI 14/5, EI 18/6, EI 22/7, EI 32/10, E 64/15, ER9.5, ER11, ER14.5

Planar EE cores, and Planar EI cores, with their low profile are suitable for board level installation allowing assembly without the need for plastic coilformers and can also allow windings integrated into multi-level PCBs. Planar ER cores with their low mass and low profile are suitable for Surface Mount installations in low power filter and transformer applications.

-Planar EE, ER, and EI core part number is for a set.

-Planar EE, ER and EI cores can be supplied with the center post gapped to a mechanical dimension, or supplied as sets gapped for an AL value.



## Mechanical Specifications

Dim	mm	mm tol	nominal inch	inch misc.
A	10.80	± 0.3	0.425	-
B	2.45	± 0.15	0.096	-
C	5.90	± 0.2	0.232	-
D	1.58	± 0.16	0.062	-
E	8.85	± 0.3	0.348	-
F	4.15	± 0.2	0.163	-
G	7.90	min	0.312	min
H	-	-	-	-
J	-	-	-	-
K	-	-	-	-

## Electrical Specifications

Typical Impedance ( $\Omega$ )	

Electrical Properties	
$A_L$ (nH)	1200 ±25%
$A_e$ (cm <sup>2</sup> )	0.12600
$\sum I/A$ (cm <sup>-1</sup> )	11.20
$l_e$ (cm)	1.40
$V_e$ (cm <sup>3</sup> )	0.17700
$A_{min}$ (cm <sup>2</sup> )	.103

### 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.

$\sum I/A$  - 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

## Land Patterns

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

## Winding Information

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

## Reel Information

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

## Package Size

Pkg Size
-
(-)

## Connector Plate

# Holes	# Rows
-	-



## Ferrite Material Constants

Specific Heat .....	0.25 cal/g/°C
Thermal Conductivity .....	10x10 <sup>-3</sup> cal/sec/cm/°C
Coefficient of Linear Expansion .....	8 - 10x10 <sup>-6</sup> /°C
Tensile Strength .....	4.9 kgf/mm <sup>2</sup>
Compressive Strength .....	42 kgf/mm <sup>2</sup>
Young's Modulus .....	15x10 <sup>3</sup> kgf/mm <sup>2</sup>
Hardness (Knoop) .....	650
Specific Gravity .....	≈ 4.7 g/cm <sup>3</sup>

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

See next page for further material specifications.



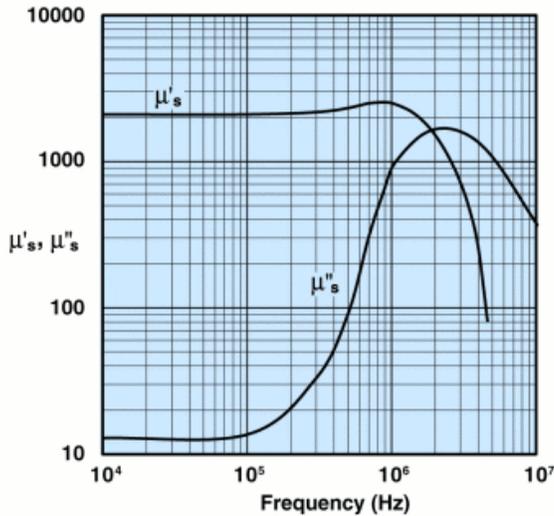
A MnZn ferrite specifically designed for power applications for frequencies up to 200 kHz.

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

**78 Material Characteristics:**

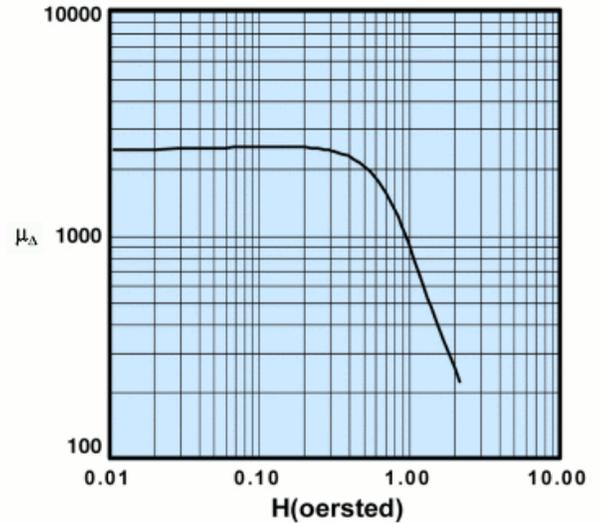
Property	Unit	Symbol	Value
Initial Permeability @ B < 10 gauss		$\mu_i$	2300
Flux Density @ Field Strength	gauss oersted	B H	4800 5
Residual Flux Density	gauss	$B_r$	1500
Coercive Force	oersted	$H_c$	0.20
Loss Factor @ Frequency	$10^{-6}$ MHz	$\tan \delta \mu_i$	4.5 0.1
Temperature Coefficient of Initial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

**Complex Permeability vs. Frequency**

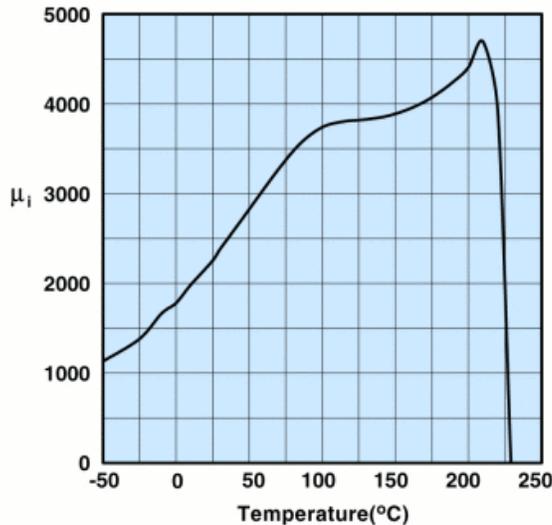


Measured on an 18/10/6mm toroid using the HP 4284A and the HP 4291A.

**Incremental Permeability vs. H**

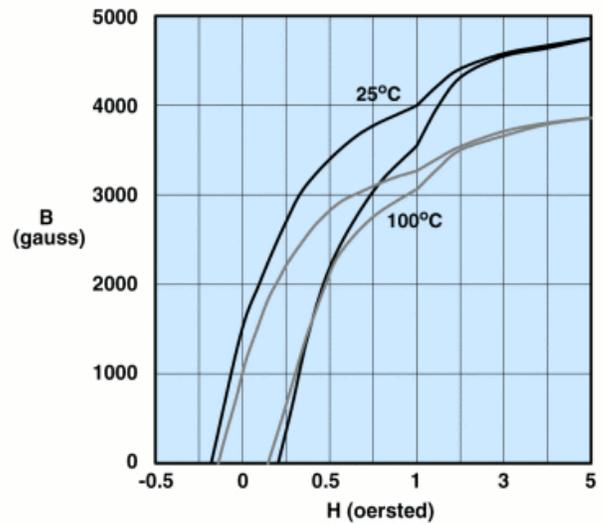


**Initial Permeability vs. Temperature**



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

**Hysteresis Loop**



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



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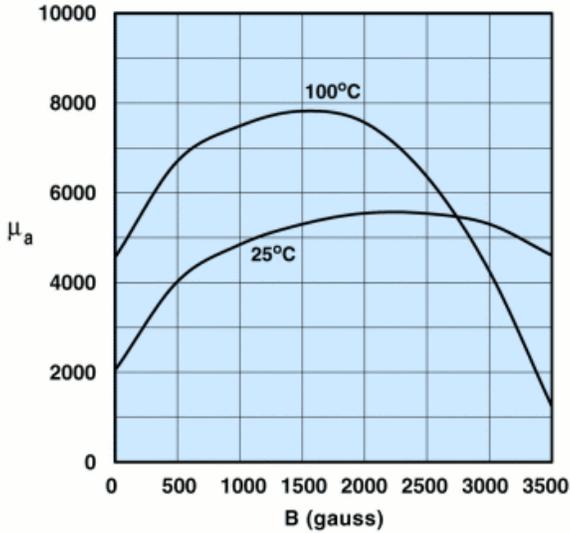
Ferrite Components for the Electronics Industry

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Fair-Rite Product's Catalog  
Part Data Sheet, 9578110502  
Printed: 2013-02-27

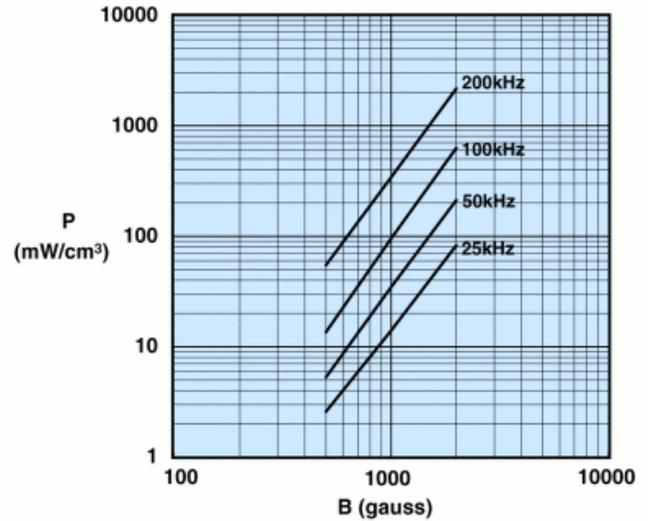


### Amplitude Permeability vs. Flux Density



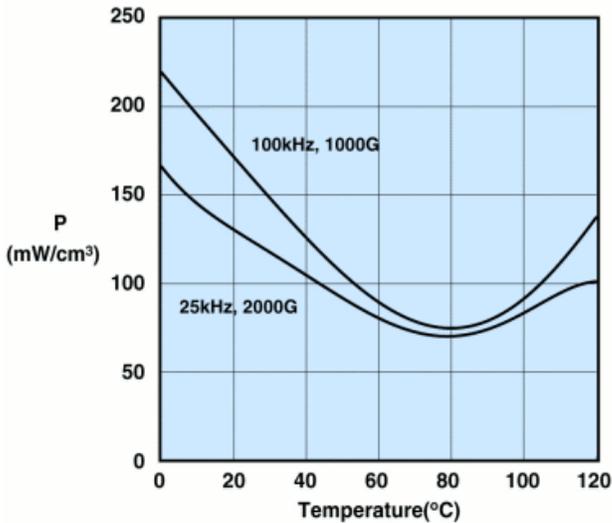
Measured on an 18/10/6mm toroid at 10kHz.

### Power Loss Density vs. Flux Density



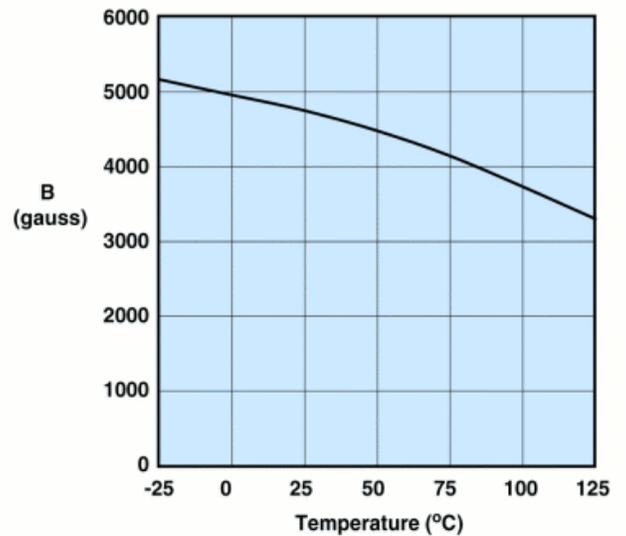
Measured on an 18/10/6mm toroid using the Clarke Hess 258 VAW at 100°C

### 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.