

Part Number: 8978101021
 Frequency Range: Dimensions
 Description: 78 EFD CORE
 Application: Inductive Components
 Where Used: Closed Magnetic Circuit
 Part Type: EFD Cores
 Generic Name: EFD10

Mechanical Specifications

Weight: .900 (g) per Set

Part Type Information

EFD10, EFD12, EFD15, EFD20, EFD25, EFD30

EFD (Economical Flat Design) cores have been designed to maximize volume in a low profile geometry. EFD cores allow maximum throughput power density with reasonably low mass for board level installation.

-EFD cores can be supplied with the centerpost 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.

Mechanical Specifications

Dim	mm	mm tol	nominal inch	inch misc.
A	10.50	± 0.3	0.413	-
B	5.20	± 0.15	0.205	-
C	2.70	± 0.2	0.106	-
D	3.75	± 0.15	0.148	-
E	7.65	± 0.3	0.301	-
F	4.55	± 0.2	0.179	-
G	-	-	-	-
H	-	-	-	-
J	-	-	-	-
K	1.45	± 0.1	0.057	-

Electrical Specifications

Typical Impedance (Ω)	

Electrical Properties	
A_L (nH)	530 ±25%
A_e (cm ²)	0.07200
$\Sigma I/A$ (cm ⁻¹)	32.70
I_e (cm)	2.36
V_e (cm ³)	0.17100
A_{min} (cm ²)	.066

Land Patterns

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

Winding Information

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

$\Sigma I/A$ - 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

I_e - Effective Path Length

V_e - Effective Core Volume

NI - Value of dc Ampere-turns



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.



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	2×10^2

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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Fair-Rite Products Corp. PO Box J, One Commercial Row, Wallkill, NY 12589-0288
Phone: (888) 324-7748 www.fair-rite.com

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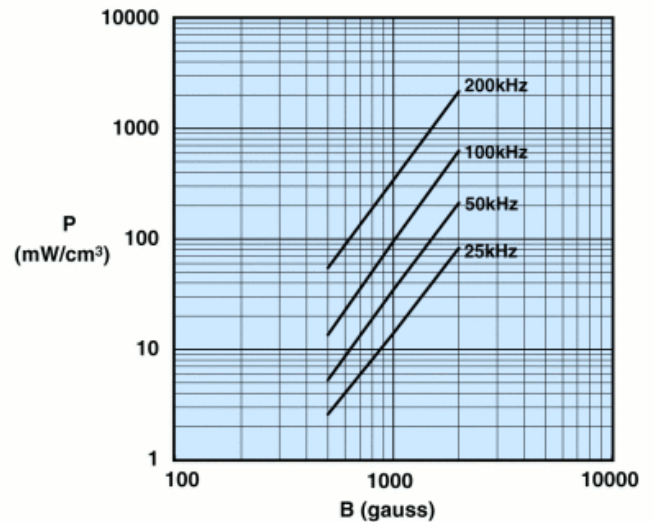
RoHS
Material
Declaration

Amplitude Permeability vs. Flux Density



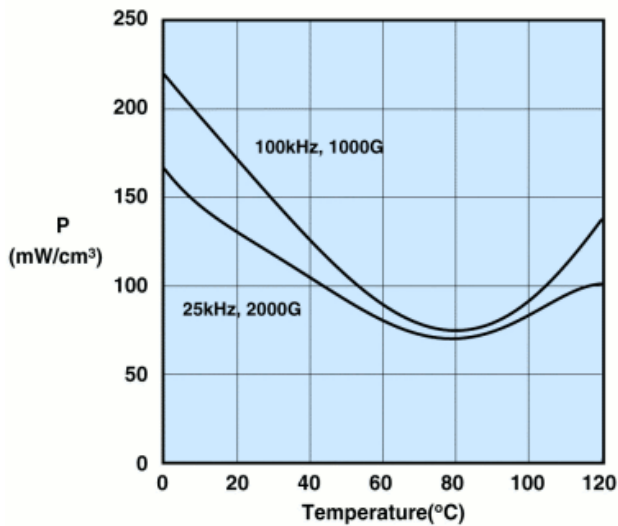
Measured on an 18/10/6mm toroid at 10kHz.

Power Loss Density vs. Flux Density



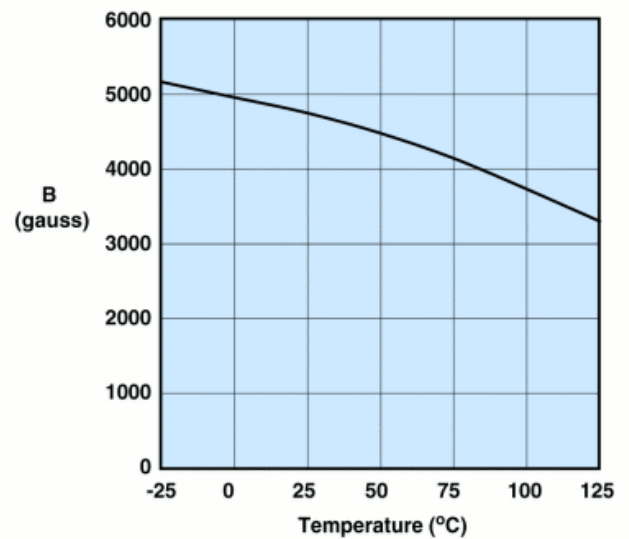
Measured on an 18/10/6mm toroid using the
Clarke Hess 258 VAW at 100°C

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.