Ferrite Material

WPT Ferrite Tiles, FPL Series

Overview

Ferrite material is used in tiles, plates, or pads in wireless power charging systems to increase system efficiency, by shielding and reflecting the magnetic field within the inductive transfer area. KEMET's ferrite tiles are designed with the latest proprietary ferrite material technology to offer the highest charging efficiency.

Applications

- Automotive Wireless Power Transfer (WPT)
- Industrial Wireless Power Transfer (WPT)

Benefits

- Increased efficiency in high power WPT systems from 3.7 – 30.0 kW
- High operating frequency range up to 1 MHz
- Operating temperature range from −40°C to +125°C
- Low temperature rise with high magnetic flux density
- Available in various geometric sizes on request
- AEC–Q200 qualified (stress test)

FPL100

FPL150

FPL240

Ordering Information

FPL	100/	100/	4-		BH1T
Series	Length (mm)	Width (mm)	Thickness (mm)		Material
FPL	100 150 240	60 100	4 5 6 8	10 12 16 20	BH1T

Environmental Compliance

All KEMET Ferrite Tiles are RoHS and REACH Compliant.

Material Characteristics

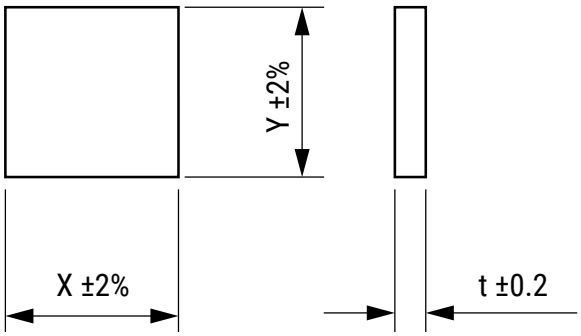
Item	Property	Conditions		Material Characteristics
Initial Permeability	ui	23°C		3,000 ±25%
Core Loss	Pcv	100 kHz 200 mT	23°C	345 KW/m3
			80°C	320 KW/m3
			100°C	330 KW/m3
			120°C	370 KW/m3
Curie Temperature	Tc			220°C
Effective Saturation Magnetic Flux Density	Bms	1,200 A/m	23°C	520 mT
			100°C	410 mT
Effective Saturation Coercive Force	Hc	23°C		8.5 A/m
Density	d			4,900 kg/m3

Table 1 – Ratings & Part Number Reference

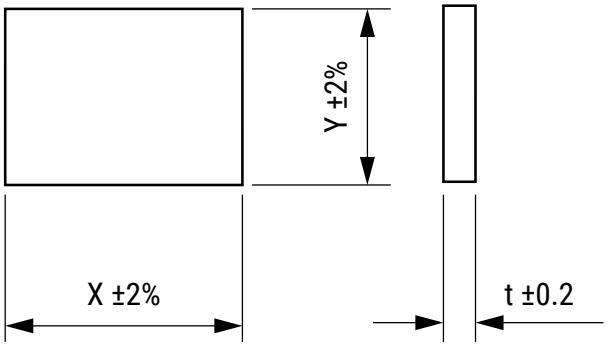
Part Number	Power (kW) Reference	Material	Weight (g)
FPL100/100/4-BH1T	3.7	BH1T	195
FPL100/100/5-BH1T			245
FPL100/100/6-BH1T	7.2		295
FPL100/100/8-BH1T			395
FPL100/100/10-BH1T	11.0		490
FPL100/100/12-BH1T			590
FPL100/100/16-BH1T	30.0		800
FPL100/100/20-BH1T			1,000
FPL150/100/5-BH1T	3.7		390
FPL150/100/8-BH1T	7.2		620
FPL150/100/10-BH1T	11.0		760
FPL150/100/12-BH1T			930
FPL150/100/16-BH1T	30.0		1,230
FPL150/100/20-BH1T			1,540
FPL240/60/5-BH1T	3.7		380
FPL240/60/8-BH1T	7.2		600
FPL240/60/10-BH1T	11.0		750
FPL240/60/12-BH1T			900
FPL240/60/16-BH1T	30.0		1,190
FPL240/60/20-BH1T			1,490

Dimensions – Millimeters

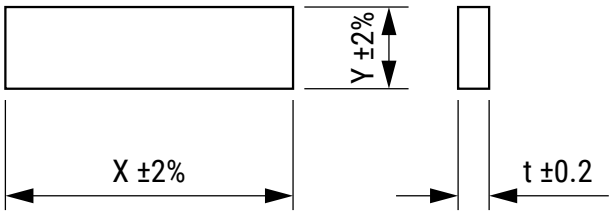
FPL100



FPL150



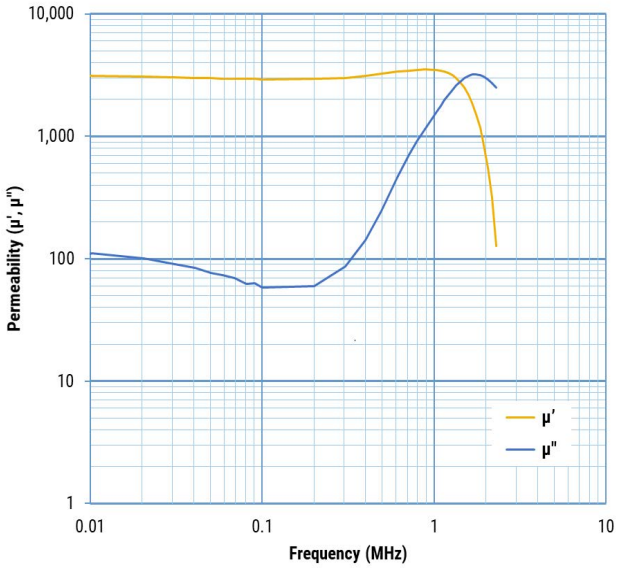
FPL240



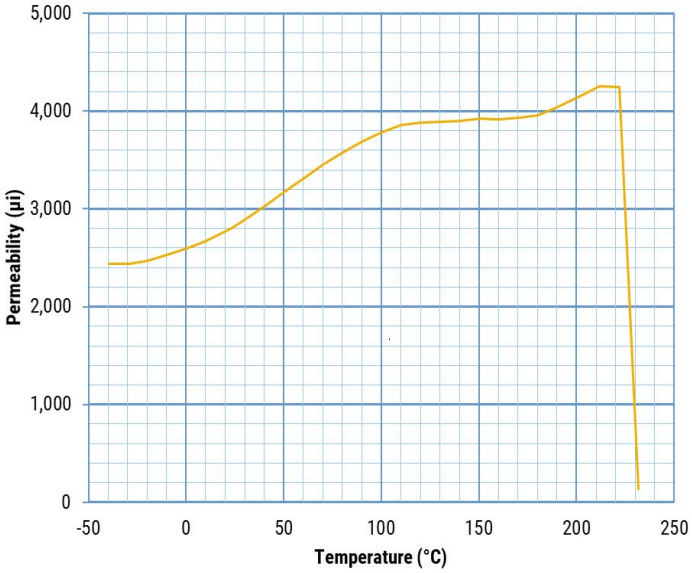
Part Number	Dimensions (mm)		
	X	Y	t
FPL100/100/4-BH1T	100	100	4
FPL100/100/5-BH1T	100	100	5
FPL100/100/6-BH1T	100	100	6
FPL100/100/8-BH1T	100	100	8
FPL100/100/10-BH1T	100	100	10
FPL100/100/12-BH1T	100	100	12
FPL100/100/16-BH1T	100	100	16
FPL100/100/20-BH1T	100	100	20
FPL150/100/5-BH1T	152	102	5
FPL150/100/8-BH1T	152	102	8
FPL150/100/10-BH1T	152	102	10
FPL150/100/12-BH1T	152	102	12
FPL150/100/16-BH1T	152	102	16
FPL150/100/20-BH1T	152	102	20
FPL240/60/5-BH1T	240	60	5
FPL240/60/8-BH1T	240	60	8
FPL240/60/10-BH1T	240	60	10
FPL240/60/12-BH1T	240	60	12
FPL240/60/16-BH1T	240	60	16
FPL240/60/20-BH1T	240	60	20

Frequency Characteristics

Permeability vs. Frequency

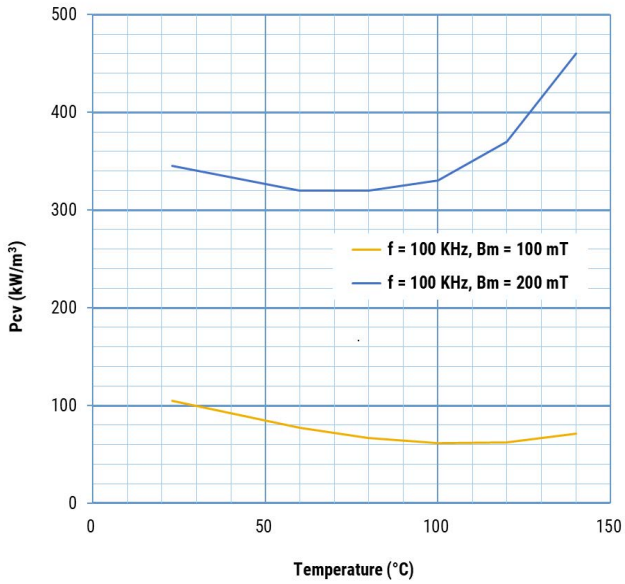


Permeability vs. Temperature

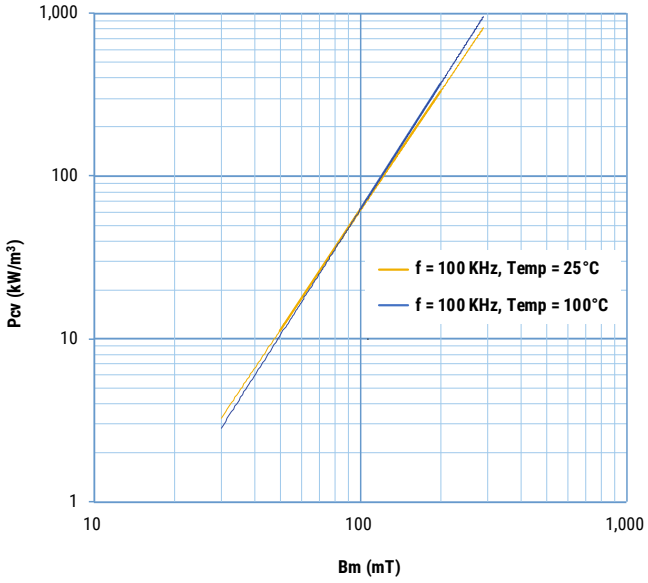


Frequency Characteristics cont.

Power Loss vs. Temperature (Several Frequency/Flux Density)

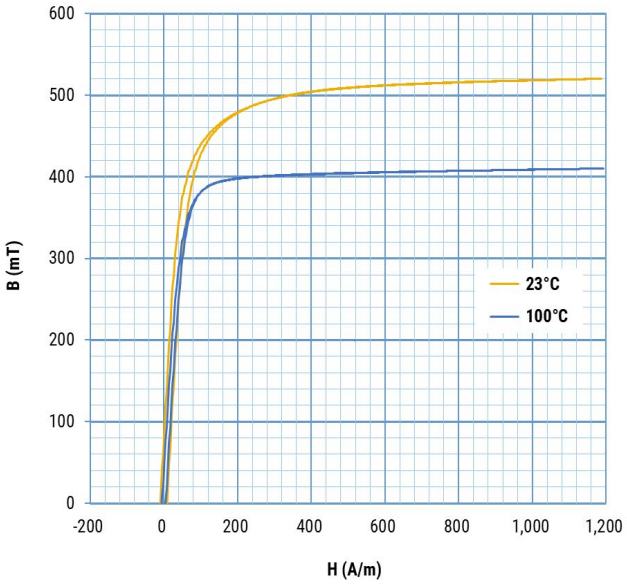


Power Loss vs. Flux Density (Several Frequency/Temperature)



Frequency Characteristics cont.

B-H Loops



Packaging

Part Number	Packaging Type	Pieces per Box
FPL100/100/4-BH1T	Tray	14
FPL100/100/5-BH1T		
FPL100/100/6-BH1T		
FPL100/100/8-BH1T		12
FPL100/100/10-BH1T		
FPL100/100/12-BH1T		4
FPL100/100/16-BH1T		
FPL100/100/20-BH1T		
FPL150/100/5-BH1T		8
FPL150/100/8-BH1T		
FPL150/100/10-BH1T		
FPL150/100/12-BH1T		4
FPL150/100/16-BH1T		
FPL150/100/20-BH1T		
FPL240/60/5-BH1T		8
FPL240/60/8-BH1T		
FPL240/60/10-BH1T		
FPL240/60/12-BH1T		4
FPL240/60/16-BH1T		
FPL240/60/20-BH1T		

Handling Precautions

Sinter Material
Make sure to handle it carefully as it has low tolerance for impact (e.g., being knocked over or dropped), which may cause it to break or chip. Using it while being unaware it is broken will result in degradation of its properties and in heat release. In addition, chipped fragments may provoke injuries or get in the eyes, if not protected.

Magnetic Material
Due to its magnetic substance, if in the vicinity of a strong magnet, the ferrite core will be attracted to it with great acceleration, and it might be destroyed by the impact. Be cautious, as a finger, or the like, might also be crushed between the two.

The ground surface of the ferrite tile has sharp edges, as bevel would decrease the performance. In addition, there may be a minute amount of burr. Careless handling may lead to injury.

- Do not apply force to the ferrite tile beyond the prescribed amount to avoid chipping or breaking the core.
- Do not allow the ferrite tile and jigs or two tiles to collide or it may destroy the cores.
- When securing the ferrite tile, do not apply stress beyond the necessary amount.
  Falling to observe this may break or chip the core, reducing its properties.
- Do not expose the ferrite tile to rapid temperature extremes. Thermal shocks may break or chip the core, reducing its properties. Temperature fluctuations should also be minimized to avoid condensation on the parts.
- Some ferrite tiles are heavy. Limit the height when stacking the packing boxes to avoid having them fall over. When moving or transporting the packing boxes, take precautions to prevent injury or backache.
- Care should be taken to isolate it from vibration when transporting.
- The ferrite material should not be placed in the mouth. Make sure to keep it away from young children.

Ferrite tiles should be stored in normal working environments. Avoid exposure to rapid temperature changes, high humidity, corrosive atmospheres, dust and humidity.

KEMET recommends that maximum storage temperature not exceed 40°C and maximum storage humidity not exceed 70% relative humidity and atmospheres should be free of chlorine and sulfur bearing compounds. Avoid also storage near strong magnetic fields as this might magnetize the product and affect its specified properties.

Ferrite tile stock should be used promptly, preferably within 2 years of receipt.

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