Ferrite Material

WPT Ferrite Tiles, FPL Series

Overview

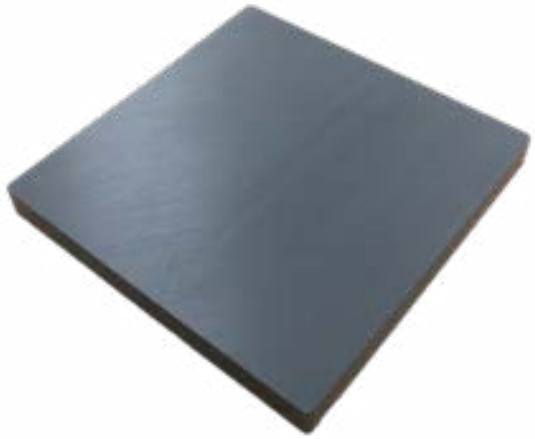
Ferrite material is used in tiles, plates, or pads in wireless power charging systems to increase system efficiency, by shielding and reflecting the magnetic field within the inductive transfer area. KEMET's ferrite tiles are designed with the latest proprietary ferrite material technology to offer the 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 – 11 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)



Ordering Information

FPL	100/	100/	4-	BH1T
Series	Length (mm)	Width (mm)	Thickness (mm)	Material
FPL	100	100	4 6 8 10 12	BH1T

Environmental Compliance

All KEMET ferrite tiles are RoHS compliant.

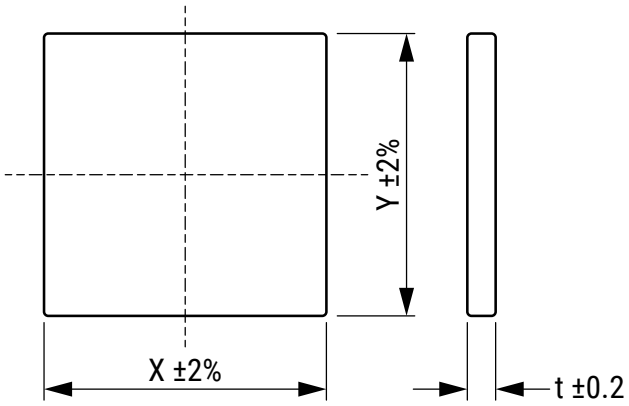
Material Characteristics

Item	Property	Conditions		Material Characteristics
Initial Permeability	ui	23°C		3000 ±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	7.2	11.0	BH1T	195
FPL100/100/6-BH1T					295
FPL100/100/8-BH1T					395
FPL100/100/10-BH1T					490
FPL100/100/12-BH1T					590

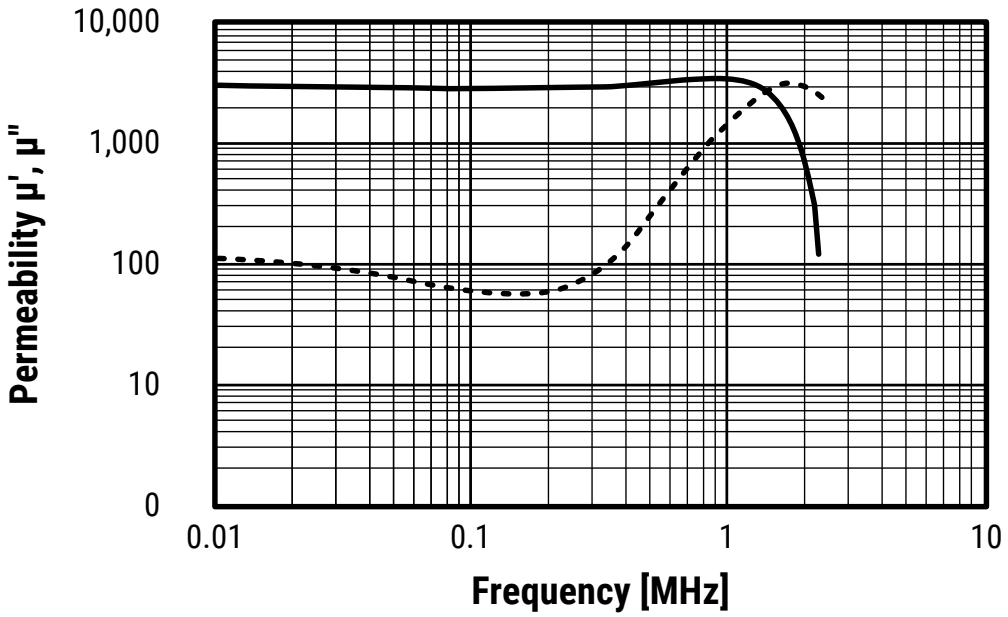
Dimensions – Millimeters



Part Number	Dimensions (mm)		
	X	Y	t
FPL100/100/4-BH1T	100	100	4
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

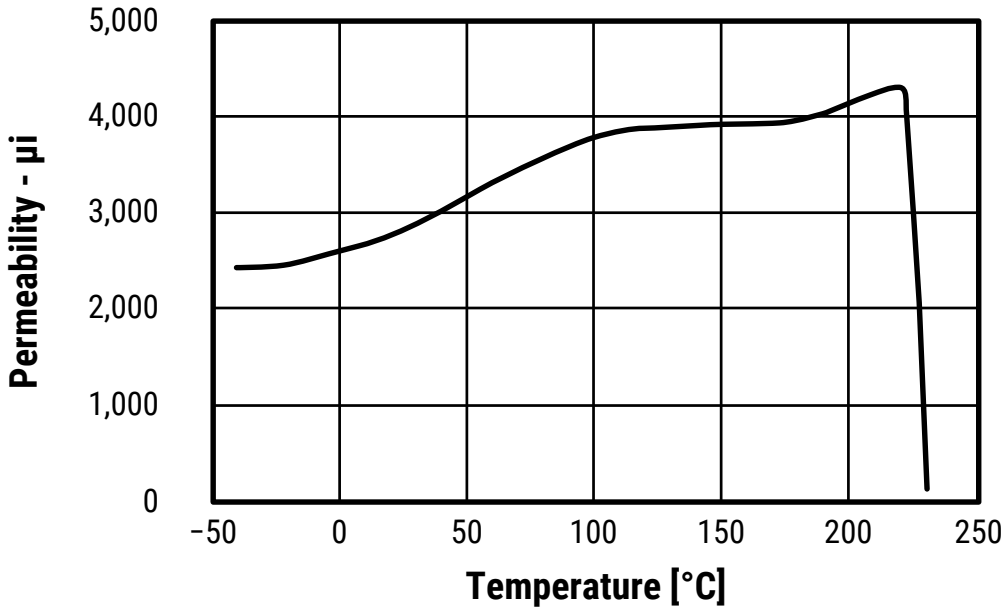
Frequency Characteristics

Permeability vs. Frequency

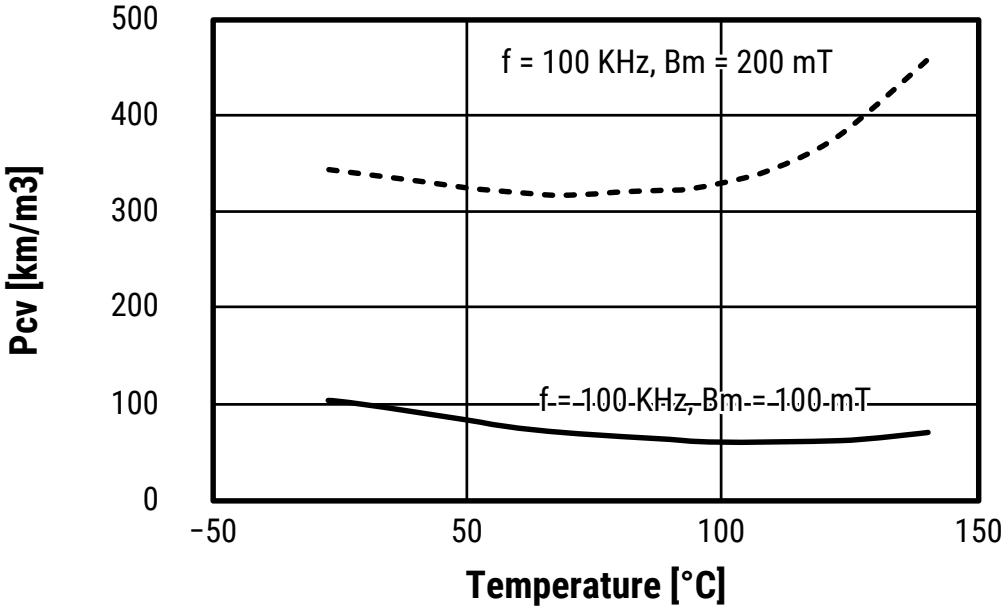


Frequency Characteristics cont.

Permeability vs. Temperature

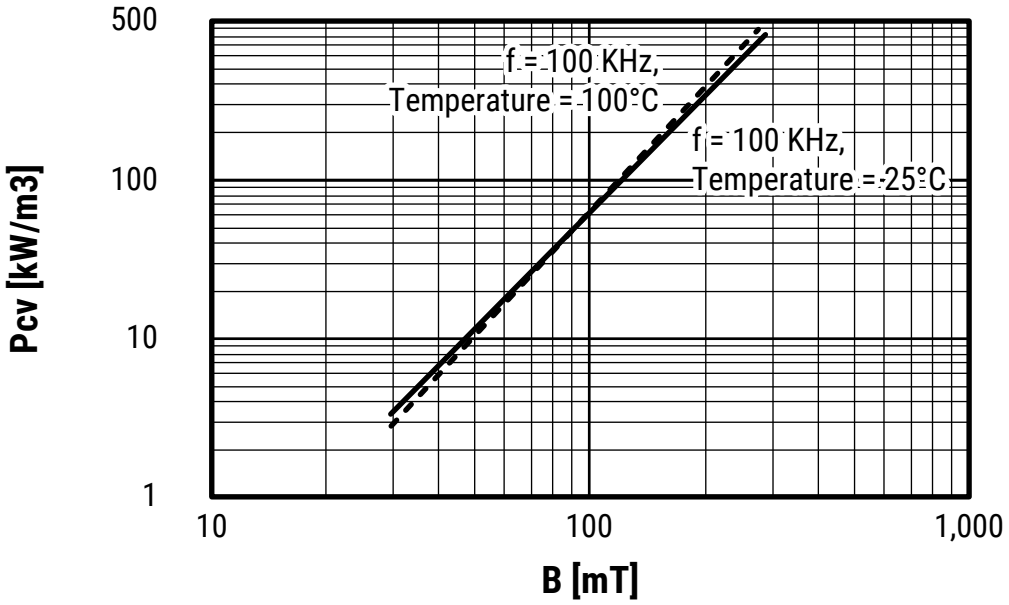


Power Loss vs. Temperature
(Several Frequency/Flux Density)

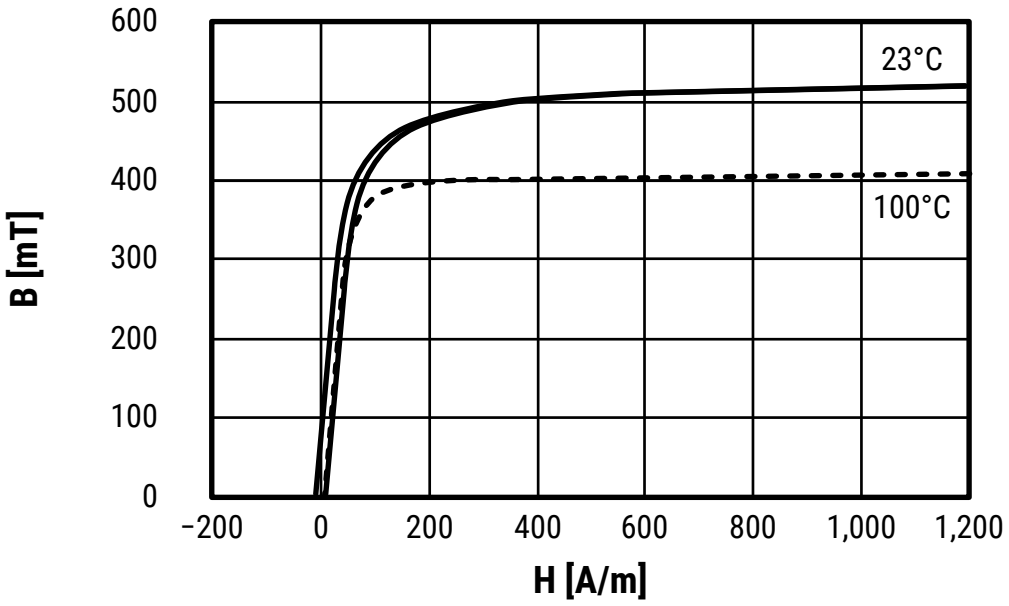


Frequency Characteristics cont.

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



B-H Loops



Packaging

Part Number	Packaging Type	Pieces per Box
FPL100/100/4-BH1T	Bulk	16
FPL100/100/6-BH1T	Bulk	16
FPL100/100/8-BH1T	Bulk	16
FPL100/100/10-BH1T	Bulk	12
FPL100/100/12-BH1T	Bulk	12

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.

For optimized solderability, ferrite tile stock should be used promptly, preferably within 2 years of receipt.

Export Control

For customers in Japan
For products which are controlled items subject to the “Foreign Exchange and Foreign Trade Law” of Japan, the export license specified by the law is required for export.

For customers outside Japan
Ferrite Cores products should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destructive weapons (nuclear weapons, chemical or biological weapons, or missiles), or any other weapons.

KEMET Electronics Corporation Sales Offices

For a complete list of our global sales offices, please visit www.kemet.com/sales.

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Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product–related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicted or that other measures may not be required.