



TODA KOGYO CORP.

Flexible Ferrite Sheet

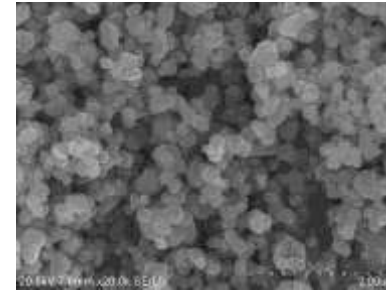
素材のチカラを未来のタカラに

戸田工業株式会社

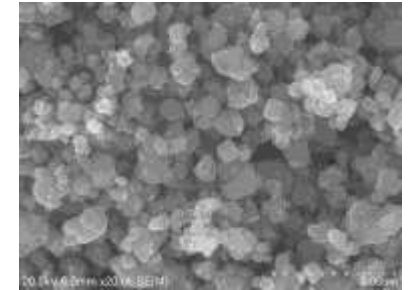
Flexible ferrite sheet is a sintered ferrite sheet cultivated with the technology of TODA KOGYO. For 200 years, TODA KOGYO has produced iron oxide powder, the main raw material of soft ferrite.

By using own synthesized soft ferrite powder, We take advantage of its characteristics and provide high quality Flexible ferrite sheet.

High purity iron oxide powder
(α -Fe₂O₃)



Soft ferrite powder



✓ **High μ' & Low μ''**

By designing suitable materials for the application, it realizes magnetic properties of higher magnetic permeability μ' and lower loss μ'' than the conventional sheet, and obtains excellent communication distance and charging efficiency.

✓ **High Flexibility**

By dividing the ferrite into several mm pieces in advance and giving flexibility, we provide a magnetic sheet that does not degrade the characteristics and has good handling during mounting.

✓ **Very Thin**

Because it possesses excellent magnetic properties, it can be thinned. This makes it ideal for wireless communication devices requiring lower profile, such as smartphones and compact communication devices.

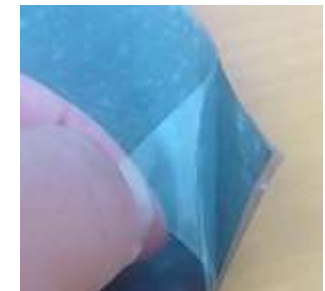
✓ **Application**

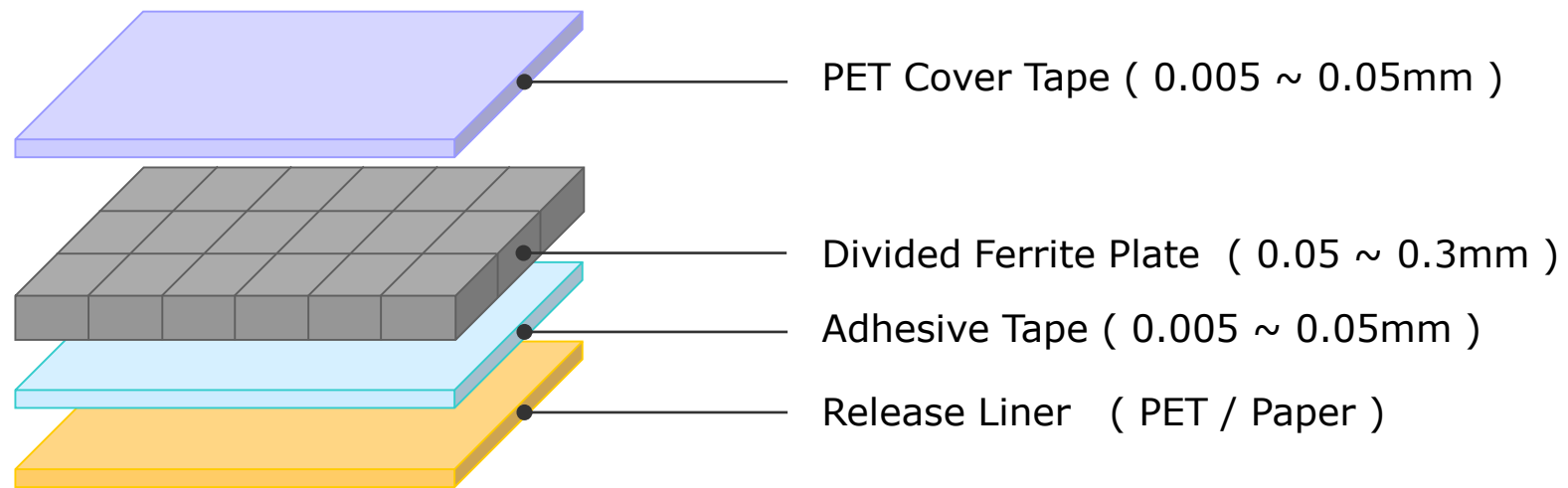
Near Field Communication (NFC), Wireless Power Supply (WPC, AirFuel Alliance)

High flexibility



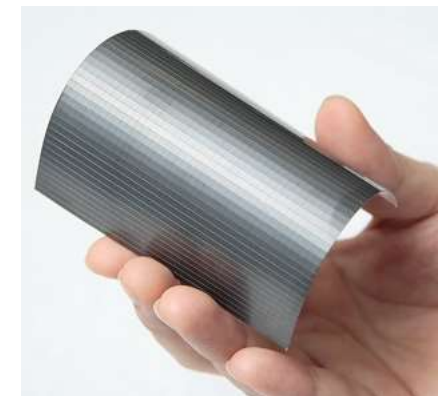
Very thin





Optional fabrication:

- ✓ Laminated with many kinds of film.
- ✓ Complicated shape.
- ✓ Adjustment to requested μ .
- ✓ Enable reflow soldering with heat-resistant tape.

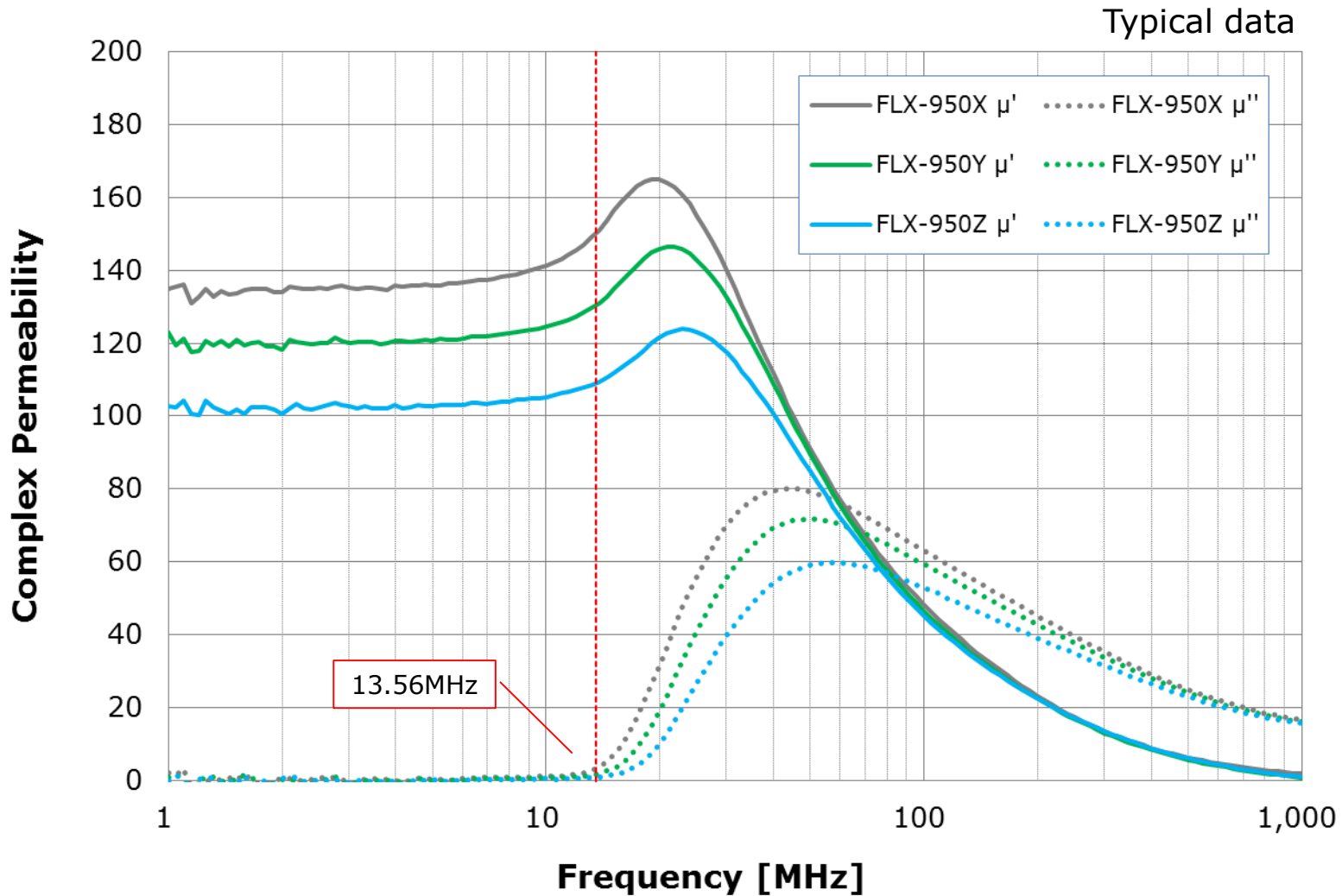


Typical property for Ferrite Sheet

For NFC at 13.56MHz

GRADE	FLX-950X	FLX-950Y	FLX-950Z
Material	Ni-Zn-Cu Ferrite	Ni-Zn-Cu Ferrite	Ni-Zn-Cu Ferrite
Max. Size (mm)	135X135	135X135	135X135
Thickness (mm)	0.05~0.30	0.05~0.30	0.05~0.30
μ' at 13.56MHz	150	130	110
μ'' at 13.56MHz	3	2	1
Environment	RoHS/Halogen free	RoHS/Halogen free	RoHS/Halogen free

Permeability vs Frequency For NFC at 13.56MHz



Typical property for Ferrite Sheet

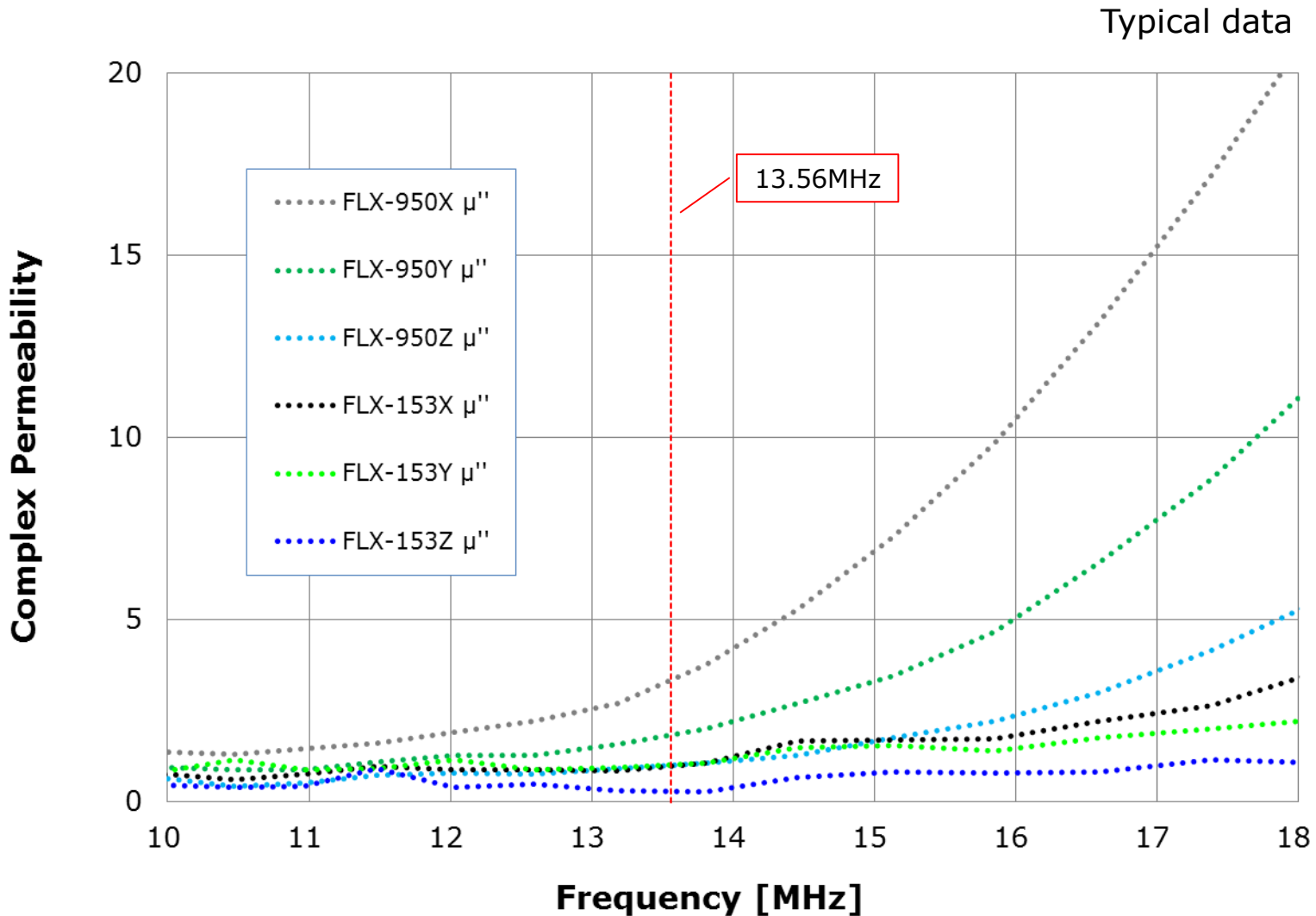
For NFC at 13.56MHz

GRADE	FLX-950X	FLX-950Y	FLX-950Z
Material	Ni-Zn-Cu Ferrite	Ni-Zn-Cu Ferrite	Ni-Zn-Cu Ferrite
Max. Size (mm)	135X135	135X135	135X135
Thickness (mm)	0.05~0.30	0.05~0.30	0.05~0.30
μ' at 13.56MHz	150	130	110
μ'' at 13.56MHz	3	2	1
Environment	RoHS/Halogen free	RoHS/Halogen free	RoHS/Halogen free

GRADE	FLX-153X	FLX-153Y	FLX-153Z
Material	Ni-Zn-Cu Ferrite	Ni-Zn-Cu Ferrite	Ni-Zn-Cu Ferrite
Max. Size (mm)	135X135	135X135	135X135
Thickness (mm)	0.05~0.10	0.05~0.10	0.05~0.15
μ' at 13.56MHz	150	130	110
μ'' at 13.56MHz	1.5	1	0.5
Environment	RoHS/Halogen free	RoHS/Halogen free	RoHS/Halogen free

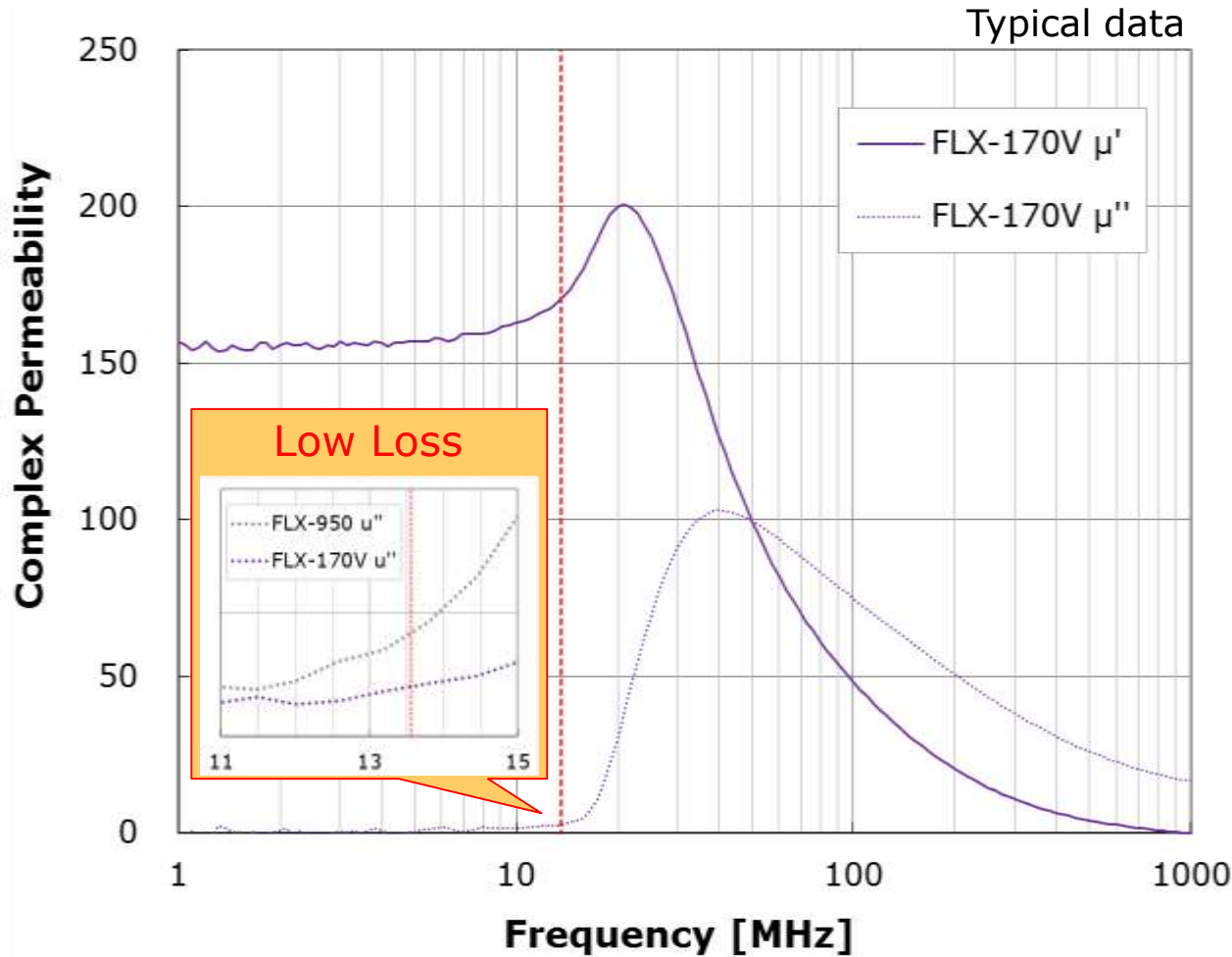
← Low loss type

Frequency Dependence of Permeability μ''



Typical property for Ferrite Sheet

For NFC at 13.56MHz
High μ' & Low Loss type



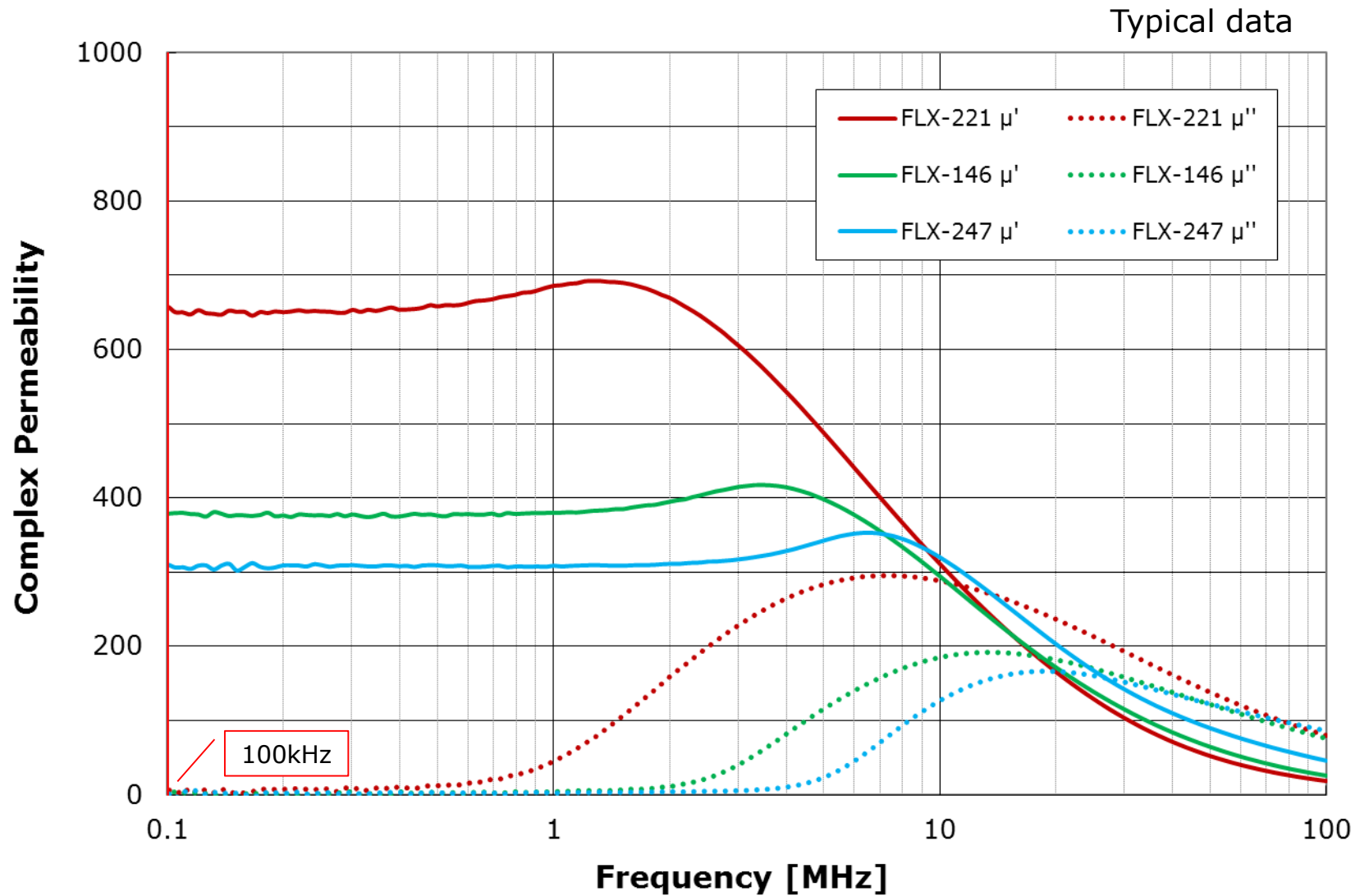
GRADE	FLX-170V
Material	Ni-Zn-Cu Ferrite
Max. Size (mm)	135X135
Thickness (mm)	0.05~0.30
μ' at 13.56MHz	170
μ'' at 13.56MHz	2.5
Environment	RoHS/Halogen free

Typical property for Ferrite Sheet

For WPC at 100kHz

GRADE	FLX-221	FLX-146	FLX-247
Material	Ni-Zn-Cu Ferrite	Ni-Zn-Cu Ferrite	Ni-Zn-Cu Ferrite
Max. Size (mm)	135X135	135X135	135X135
Thickness (mm)	0.05~0.30	0.05~0.30	0.05~0.30
μ' at 100kHz	660	380	310
Bm (mT)	252	256	307
Pcv (MW/m ³)	4	7	11
Environment	RoHS/Halogen free	RoHS/Halogen free	RoHS/Halogen free

Permeability vs Frequency For WPC at 100kHz



Typical property for Ferrite Sheet

For AirFuel at 6.78MHz

GRADE	FLX-202Q	FLX-160W	FLX-130X	FLX-130Z
Material	Ni-Zn-Cu Ferrite	Ni-Zn-Cu Ferrite	Ni-Zn-Cu Ferrite	Ni-Zn-Cu Ferrite
Max Size (mm)	135X135	135X135	135X135	135X135
Thickness (mm)	0.05~0.30	0.05~0.30	0.05~0.30	0.05~0.30
μ' at 6.78MHz	220	160	150	110
μ'' at 6.78MHz	3.0	1.0	1.0	0.5
Environment	RoHS / Halogen free	RoHS / Halogen free	RoHS / Halogen free	RoHS / Halogen free

Permeability vs Frequency For AirFuel at 6.78MHz

