



Mn-Zn Ferrite

Material Characteristics

Ferrite for Switching Power Supplies

Ferrite for Telecommunication

Large Size Ferrite for High Power



REMINDERS FOR USING THESE PRODUCTS

Please be sure to read this manual thoroughly before using the products.

The products Listed on this catalog are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.

The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.

When using the products for specific purposes, please first make confirmations in areas such as safety, reliability, and quality.

Please understand that we are not in a position to be held responsible for any damage or the like caused by any use exceeding the range or conditions of this specification sheet or by any use in the specific applications.

- | | |
|---|--|
| (1) Aerospace/Aviation equipment | (8) Public information-processing equipment |
| (2) Transportation equipment (electric trains, ships, etc.) | (9) Military equipment |
| (3) Medical equipment | (10) Electric heating apparatus, burning equipment |
| (4) Power-generation control equipment | (11) Disaster prevention/crime prevention equipment |
| (5) Atomic energy-related equipment | (12) Safety equipment |
| (6) Seabed equipment | (13) Other applications that are not considered general-purpose applications |
| (7) Transportation control equipment | |

When using this product in general-purpose standard applications, you are kindly requested to take into consideration securing protection circuit/equipment or providing backup circuits, etc to ensure higher safety.

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Ferrite for Switching Power Supplies

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Ferrite for Telecommunication

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Large Size Ferrite for High Power

| | |
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Mn-Zn Material List of Ferrite for Switching Power Supplies

MATERIAL CHARACTERISTICS

| Material | Initial permeability μ_i | Core loss volume density (Core loss)* P _{cv} (kW/m ³) B=200mT 100kHz sine wave | | | | Saturation magnetic flux density* B _s (mT) H=1194A/m | | | | Remanent flux density* B _r (mT) H=1194A/m | | | | Coercive force* H _c (A/m) H=1194A/m | | | | Curie temperature T _c (°C) | Density* d _b (kg/m ³) ×10 ³ | Electrical resistivity* ρ _v (Ω • m) |
|----------|---------------------------------|--|------|-------|-------|--|------|-------|-------|---|------|-------|-------|---|------|-------|-------|---|--|--|
| | | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | | | |
| PC47 | 2500±25% | 600 | 400 | 250 | 360 | 530 | 480 | 420 | 390 | 180 | 100 | 60 | 60 | 13 | 9 | 6 | 7 | >230 | 4.9 | 4 |
| PC90 | 2200±25% | 680 | 470 | 320 | 460 | 540 | 500 | 450 | 420 | 170 | 95 | 60 | 65 | 13 | 9 | 6.5 | 7 | >250 | 4.9 | 4 |
| PC95 | 3300±25% | 350 | | 290 | 350 | 530 | 480 | 410 | 380 | 85 | 70 | 60 | 55 | 9.5 | 7.5 | 6.5 | 6 | >215 | 4.9 | 6 |

* Typ.

| Material | Initial permeability μ_i | Relative loss factor tanδ/ μ_i ×10 ⁻⁶ | Saturation magnetic flux density* B _s (mT) H=1194A/m 25°C | Remanent flux density* B _r (mT) H=1194A/m 25°C | Coercive force* H _c (A/m) H=1194A/m 25°C | Curie temperature T _c (°C) | Density* d _b (kg/m ³) ×10 ³ | Electrical resistivity* ρ _v (Ω • m) |
|----------|-------------------------------------|--|--|---|---|---|--|--|
| | | | | | | | | |
| HS72 | 7500±25% (2000min. at 500kHz) | 30(100kHz) | 410 | 80 | 6 | >130 | 4.9 | 0.2 |
| HS10 | 10000±25% | 30(100kHz) | 380 | 120 | 5 | >120 | 4.9 | 0.2 |
| HS12 | 12000±25% (at 150kHz) | 20(100kHz) | 430 | 80 | 6 | >130 | 4.9 | 0.5 |

* Typ.

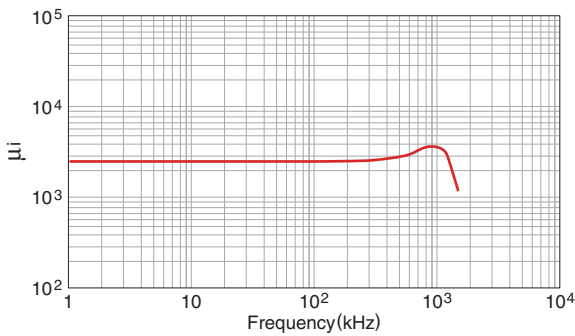
Mn-Zn Ferrite for Switching Power Supplies Material List of PC47

■ MATERIAL CHARACTERISTICS

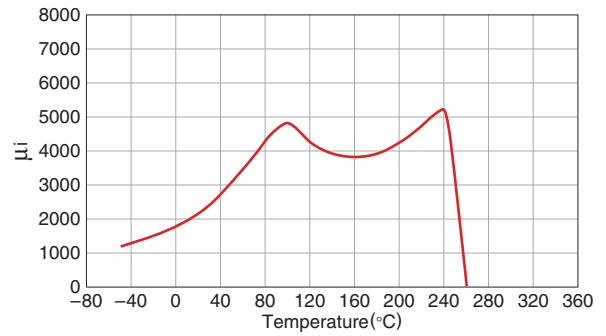
| Initial permeability μ_i | Core loss volume density (Core loss)* P _{cv} (kW/m ³) B=200mT 100kHz sine wave | | | | Saturation magnetic flux density* B _s (mT) H=1194A/m | | | | Remanent flux density* B _r (mT) H=1194A/m | | | | Coercive force* H _c (A/m) H=1194A/m | | | | Curie temperature T _c (°C) | Density* d _b (kg/m ³) ×10 ³ | Electrical resistivity* ρ _v (Ω·m) |
|---------------------------------|---|------|-------|-------|--|------|-------|-------|---|------|-------|-------|---|------|-------|-------|---|--|--|
| | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | >230 | 4.9 | 4 |
| 2500±25% | 600 | 400 | 250 | 360 | 530 | 480 | 420 | 390 | 180 | 100 | 60 | 60 | 13 | 9 | 6 | 7 | | | |

* Typ.

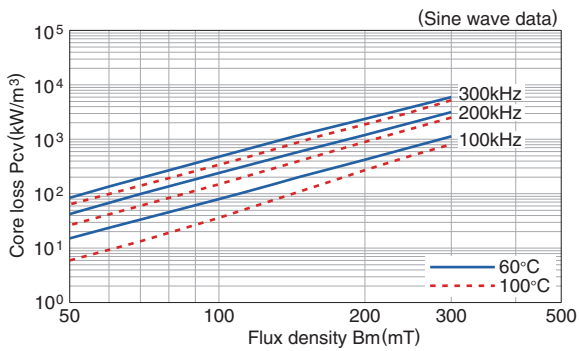
□ μ_i frequency characteristics(Typ.)



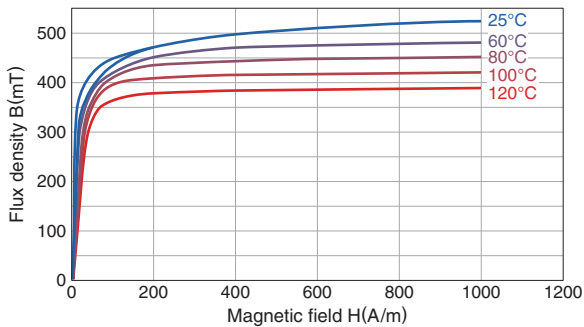
□ μ_i temperature characteristics(Typ.)



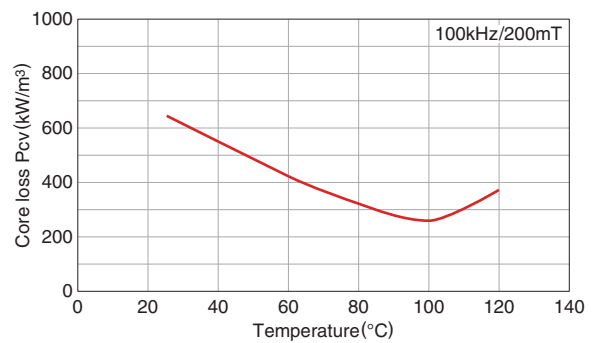
□ Core Loss(Typ.)



□ B-H temperature characteristics(Typ.)



□ Temperature Dependence of Core Loss(Typ.)



• All specifications are subject to change without notice.

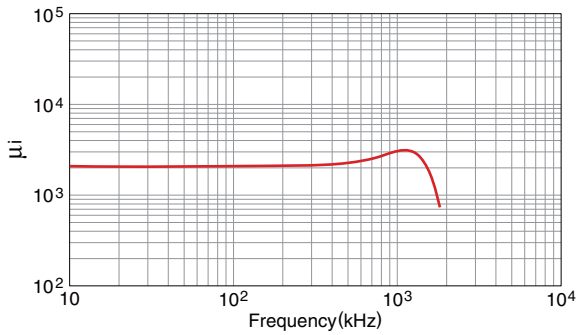
Mn-Zn Ferrite for Switching Power Supplies Material List of PC90

MATERIAL CHARACTERISTICS

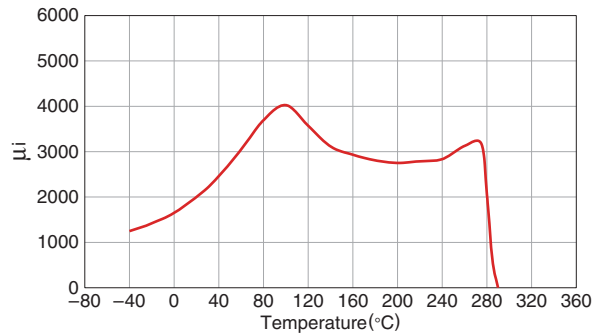
| Initial permeability μ_i | Core loss volume density (Core loss)* Pcv (kW/m ³) B=200mT 100kHz sine wave | | | | Saturation magnetic flux density* Bs (mT) H=1194A/m | | | | Remanent flux density* Br (mT) H=1194A/m | | | | Coercive force* Hc (A/m) H=1194A/m | | | | Curie temperature Tc (°C) | Density* db (kg/m ³) ×10 ³ | Electrical resistivity* ρ_v ($\Omega \cdot m$) |
|---------------------------------|---|------|-------|-------|--|------|-------|-------|---|------|-------|-------|---|------|-------|-------|---------------------------------|--|---|
| | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | | | |
| 2200±25% | 680 | 470 | 320 | 460 | 540 | 500 | 450 | 420 | 170 | 95 | 60 | 65 | 13 | 9 | 6.5 | 7 | >250 | 4.9 | 4 |

* Typ.

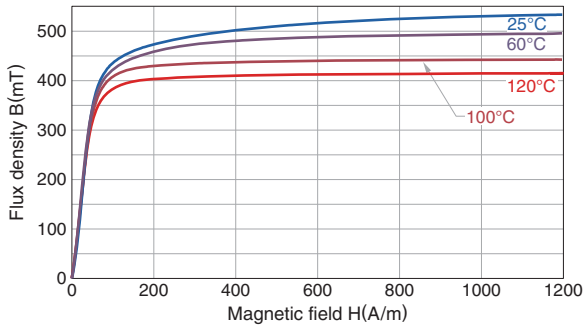
□ μ_i frequency characteristics(Typ.)



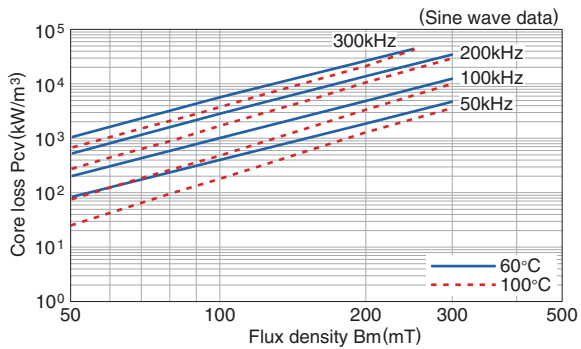
□ μ_i temperature characteristics(Typ.)



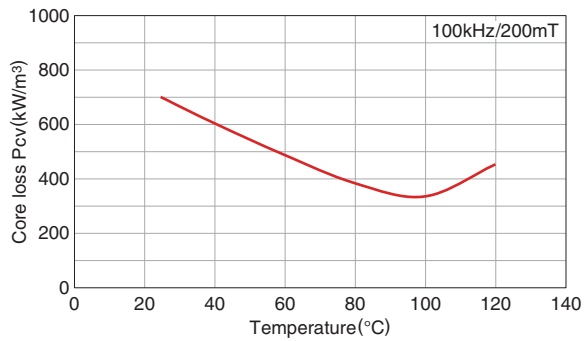
□ B-H temperature characteristics(Typ.)



□ Core Loss(Typ.)



□ Temperature Dependence of Core Loss(Typ.)



• All specifications are subject to change without notice.

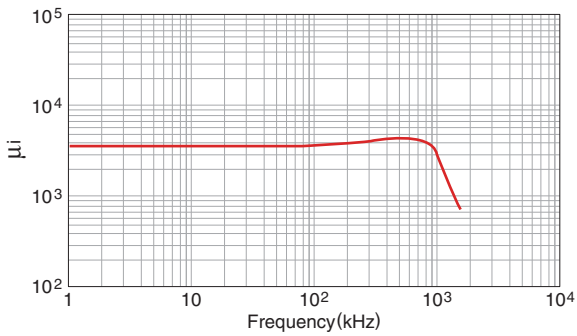
Mn-Zn Ferrite for Switching Power Supplies Material List of PC95

MATERIAL CHARACTERISTICS

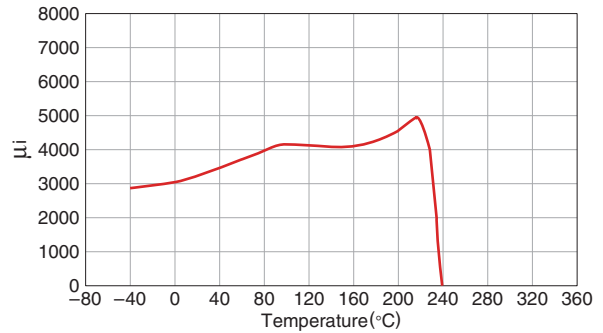
| Initial permeability μ_i | Core loss volume density (Core loss)* Pcv (kW/m ³) B=200mT 100kHz sine wave | | | | Saturation magnetic flux density* Bs (mT) H=1194A/m | | | | Remanent flux density* Br (mT) H=1194A/m | | | | Coercive force* Hc (A/m) H=1194A/m | | | | Curie temperature Tc (°C) | Density* db (kg/m ³) ×10 ³ | Electrical resistivity* ρ_v (Ω·m) |
|---------------------------------|---|------|-------|-------|--|------|-------|-------|---|------|-------|-------|---|------|-------|-------|---------------------------------|--|--|
| | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | 25°C | 60°C | 100°C | 120°C | | | |
| 3300±25% | 350 | | 290 | 350 | 530 | 480 | 410 | 380 | 85 | 70 | 60 | 55 | 9.5 | 7.5 | 6.5 | 6 | >215 | 4.9 | 6 |

* Typ.

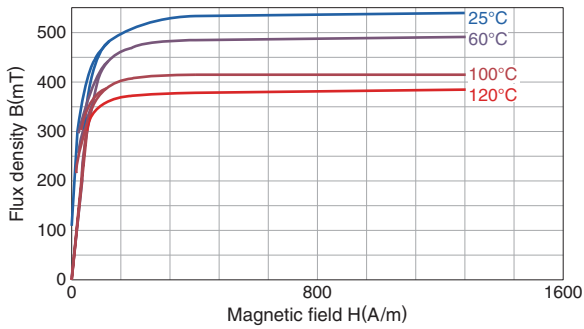
□ μ_i frequency characteristics(Typ.)



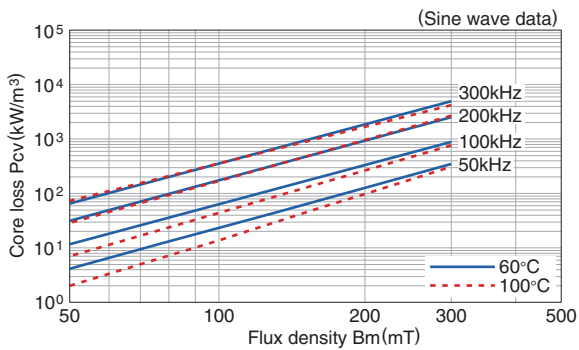
□ μ_i temperature characteristics(Typ.)



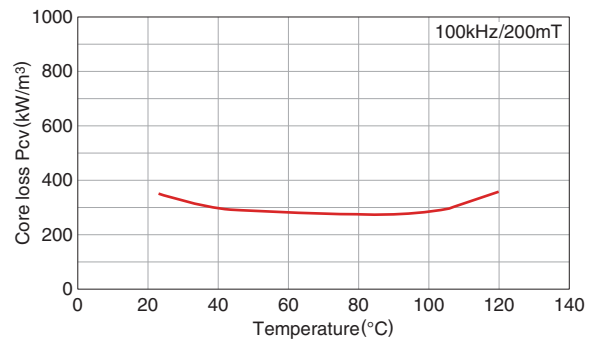
□ B-H temperature characteristics(Typ.)



□ Core Loss(Typ.)



□ Temperature Dependence of Core Loss(Typ.)



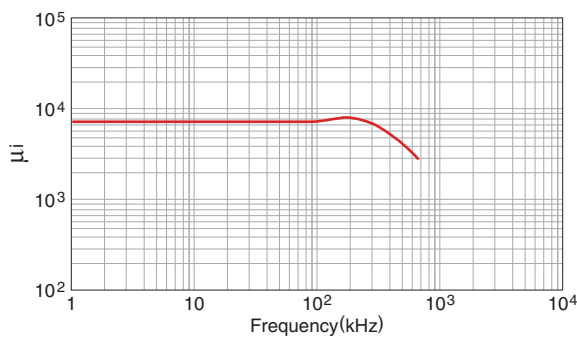
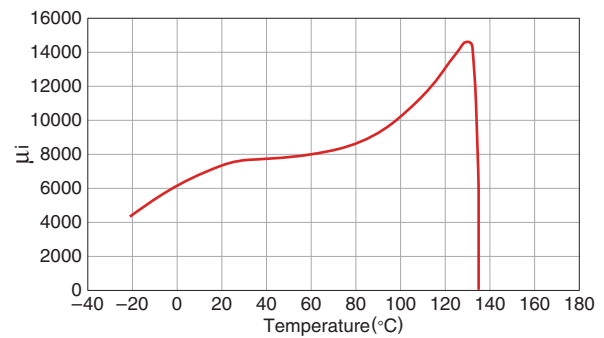
• All specifications are subject to change without notice.

Mn-Zn Ferrite for Switching Power Supplies **Material List of HS72**

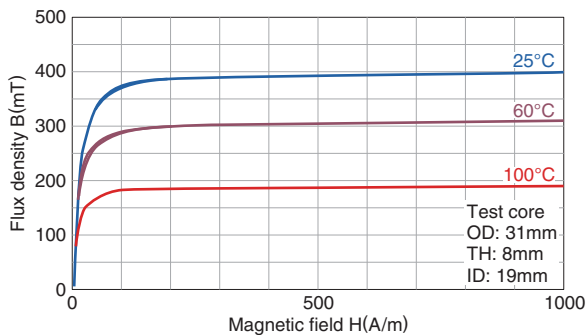
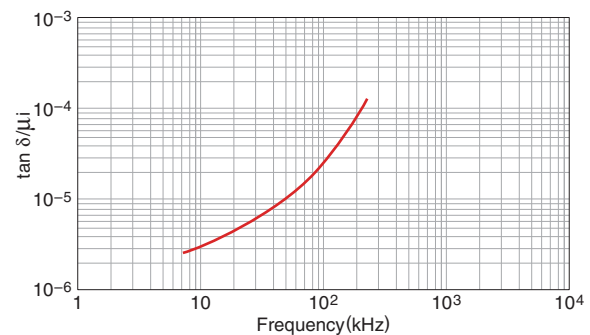
■ MATERIAL CHARACTERISTICS

| Initial permeability μ_i | Relative loss factor $\tan\delta/\mu_i$ $\times 10^{-6}$ | Saturation magnetic flux density* B_s (mT) H=1194A/m 25°C | Remanent flux density* B_r (mT) H=1194A/m 25°C | Coercive force* H_c (A/m) H=1194A/m 25°C | Curie temperature T_c (°C) | Density* d_b (kg/m ³) $\times 10^3$ | Electrical resistivity* ρ_v ($\Omega \cdot m$) |
|-------------------------------------|--|---|--|--|------------------------------------|--|---|
| 7500±25% (2000min. at 500kHz) | 30(100kHz) | 410 | 80 | 6 | >130 | 4.9 | 0.2 |

* Typ.

□ μ_i frequency characteristics(Typ.)□ μ_i temperature characteristics(Typ.)

□ B-H temperature characteristics(Typ.)

□ $\tan\delta/\mu_i$ frequency characteristics(Typ.)

• All specifications are subject to change without notice.

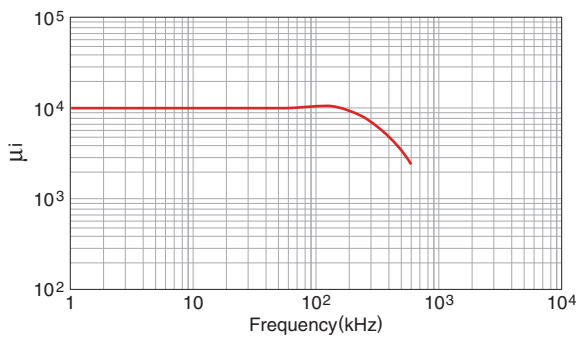
Mn-Zn Ferrite for Switching Power Supplies Material List of HS10

■ MATERIAL CHARACTERISTICS

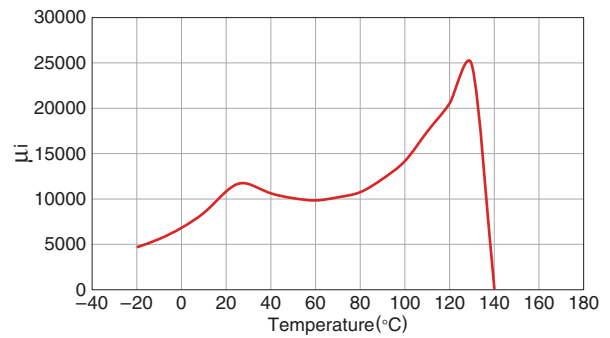
| Initial permeability μ_i | Relative loss factor $\tan\delta/\mu_i$ $\times 10^{-6}$ | Saturation magnetic flux density* Bs (mT) H=1194A/m 25°C | Remanent flux density* Br (mT) H=1194A/m 25°C | Coercive force* Hc (A/m) H=1194A/m 25°C | Curie temperature Tc (°C) | Density* db (kg/m ³) $\times 10^3$ | Electrical resistivity* ρ_v ($\Omega \cdot m$) |
|---------------------------------|--|--|---|---|---------------------------------|---|---|
| 10000±25% | 30(100kHz) | 380 | 120 | 5 | >120 | 4.9 | 0.2 |

* Typ.

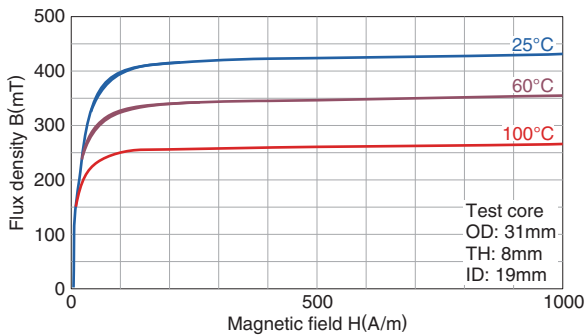
□ μ_i frequency characteristics(Typ.)



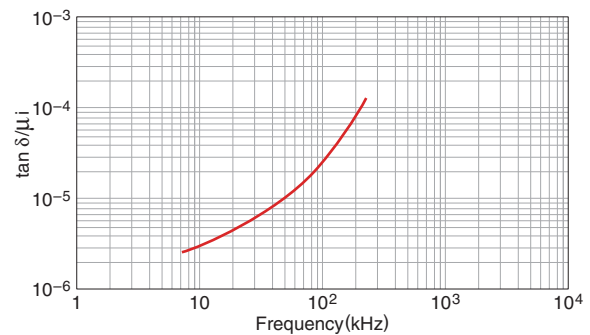
□ μ_i temperature characteristics(Typ.)



□ B-H temperature characteristics(Typ.)



□ $\tan\delta/\mu_i$ frequency characteristics(Typ.)



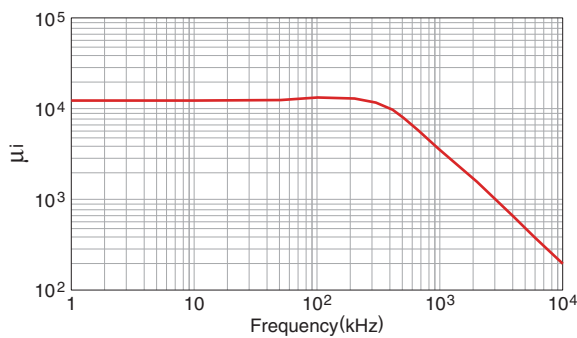
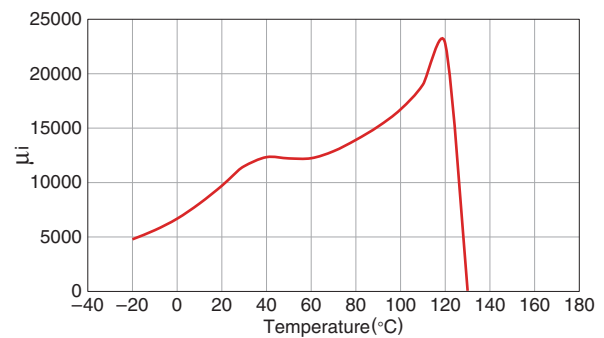
• All specifications are subject to change without notice.

Mn-Zn Ferrite for Switching Power Supplies **Material List of HS12**

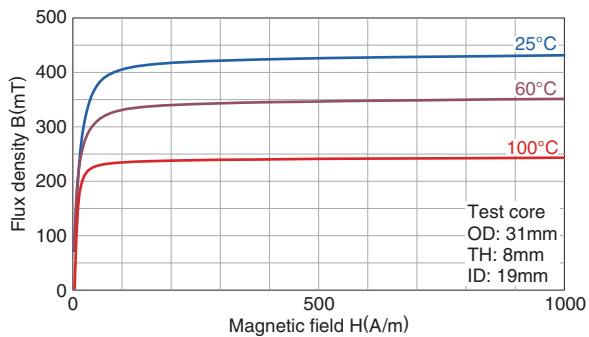
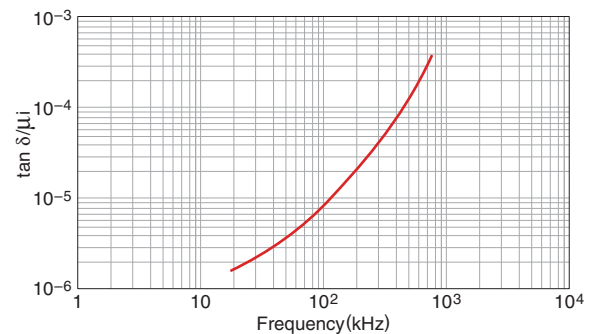
■ MATERIAL CHARACTERISTICS

| Initial permeability μ_i | Relative loss factor $\tan\delta/\mu_i$ $\times 10^{-6}$ | Saturation magnetic flux density* B_s (mT) H=1194A/m 25°C | Remanent flux density* B_r (mT) H=1194A/m 25°C | Coercive force* H_c (A/m) H=1194A/m 25°C | Curie temperature T_c (°C) | Density* d_b (kg/m ³) $\times 10^3$ | Electrical resistivity* ρ_v ($\Omega \cdot m$) |
|---------------------------------|--|---|--|--|------------------------------------|--|---|
| 12000±25% (at 150kHz) | 20(100kHz) | 430 | 80 | 6 | >130 | 4.9 | 0.5 |

* Typ.

□ μ_i frequency characteristics(Typ.)□ μ_i temperature characteristics(Typ.)

□ B-H temperature characteristics(Typ.)

□ $\tan\delta/\mu_i$ frequency characteristics(Typ.)

• All specifications are subject to change without notice.

Mn-Zn Material List of Ferrite Core for Telecommunication

MATERIAL CHARACTERISTICS

| Material | Initial permeability μ_i | Relative loss factor $\tan\delta/\mu_i$ $\times 10^{-6}$ | Temperature factor of initial permeability $\alpha_{\mu ir}$ $\times 10^{-6}$ -30 to +20°C 0 to 20°C 20 to 70°C | Saturation magnetic flux density* B_s (mT) H=1194A/m 25°C | Remanent flux density* B_r (mT) H=1194A/m 25°C | Coercive force* H_c (A/m) H=1194A/m 25°C | Curie temperature T_c (°C) | Hysteresis material constant ηB $\frac{10^{-6}}{mT}$ | Disaccommodation factor DF $\times 10^{-6}$ | Density* db (kg/m ³) $\times 10^3$ | Electrical resistivity* ρ_v ($\Omega \cdot m$) |
|----------|-------------------------------------|--|--|--|---|---|---|--|--|--|---|
| H5A | 3300 ^{+40%} _{-0%} | <2.5(10kHz) <10(100kHz) | -0.5 to 2.0 — -0.5 to 2.0 | 410 | 100 | 8.0 | >130 | <0.8 | <3 | 4.8 | 1 |
| H5B2 | 7500±25% | <6.5(10kHz) | 0 to 1.8 — 0 to 1.8 | 420 | 40 | 5.6 | >130 | <1.0 | <3 | 4.9 | 0.1 |
| H5C2 | 10000±30% | <7.0(10kHz) | -0.5 to 1.5 — -0.5 to 1.5 | 400 | 90 | 7.2 | >120 | <1.4 | <2 | 4.9 | 0.15 |
| H5C3 | 15000±30% | <7.0(10kHz) | -0.5 to 1.5 — -0.5 to 1.5 | 360 | 105 | 4.4 | >105 | <0.5 | <2 | 4.95 | 0.15 |
| HP5 | 5000±20% | <3.5 | — ±12.5% ±12.5% | 400 | 65 | 7.2 | >140 | <0.4 | <3 | 4.8 | 0.15 |
| DNW45 | 4200±25% | <3.5 | — — — | 450 | 50 | 6.5 | >150 | <0.8 | <3 | 4.85 | 0.65 |

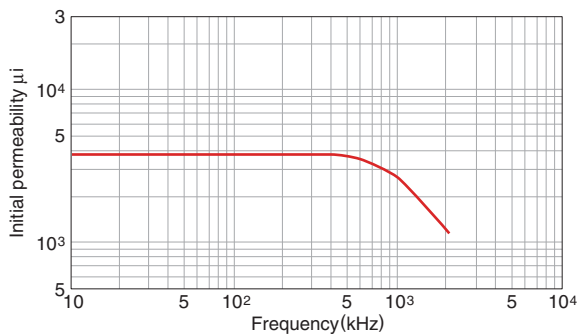
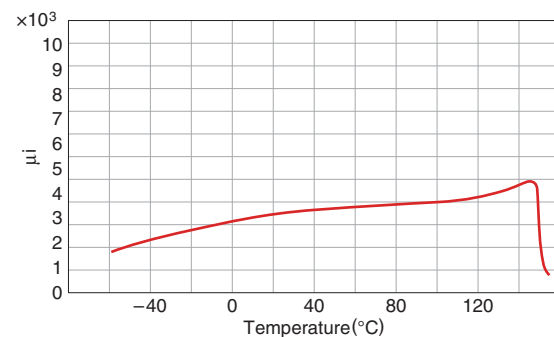
* Typ.

Mn-Zn Ferrite for Telecommunication **Material List of H5A**

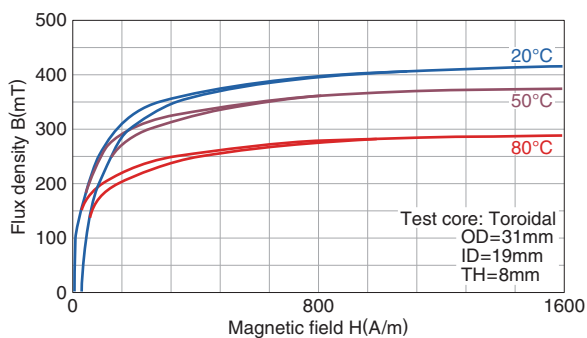
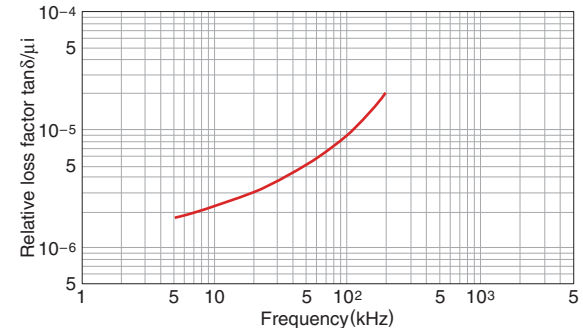
■ MATERIAL CHARACTERISTICS

| Initial permeability | Relative loss factor | Temperature factor of initial permeability | Saturation magnetic flux density* | Remanent flux density* | Coercive force* | Curie temperature | Hysteresis material constant | Disaccommodation factor | Density* | Electrical resistivity* |
|----------------------|----------------------------|--|------------------------------------|------------------------------------|-------------------------------------|-------------------|---|-------------------------|---|---|
| μ_i | $\tan\delta/\mu_i$ | $\alpha_{\mu i r}$ | B_s (mT) H=1194A/m 25°C | B_r (mT) H=1194A/m 25°C | H_c (A/m) H=1194A/m 25°C | T_c (°C) | ηB $\frac{10^{-6}}{\text{mT}}$ | DF $\times 10^{-6}$ | db (kg/m ³) $\times 10^3$ | ρ_V ($\Omega \cdot \text{m}$) |
| 3300 +40% -0% | <2.5(10kHz) <10(100kHz) | -0.5 to 2.0 — -0.5 to 2.0 | 410 | 100 | 8.0 | >130 | <0.8 | <3 | 4.8 | 1 |

* Typ.

□ μ_i frequency characteristics(Typ.)□ μ_i temperature characteristics(Typ.)

□ B-H temperature characteristics(Typ.)

□ $\tan\delta/\mu_i$ frequency characteristics(Typ.)

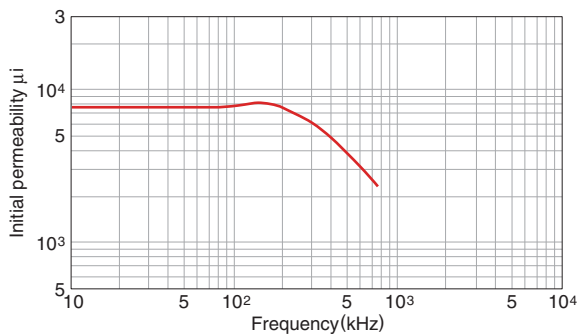
• All specifications are subject to change without notice.

Mn-Zn Ferrite for Telecommunication **Material List of H5B2**

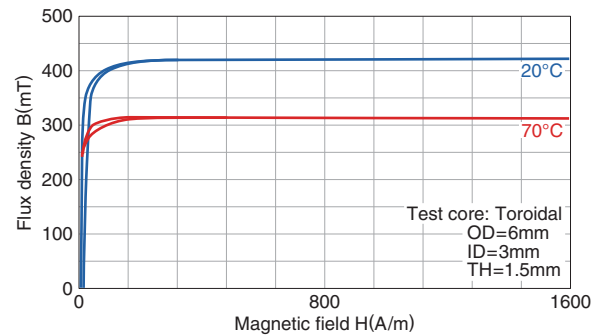
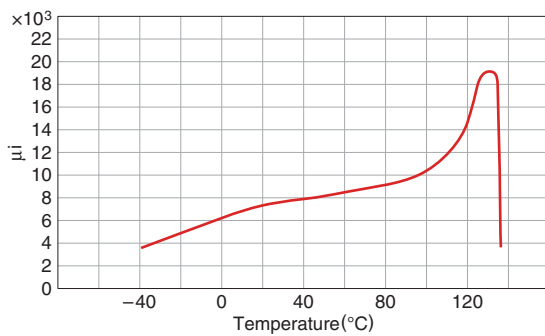
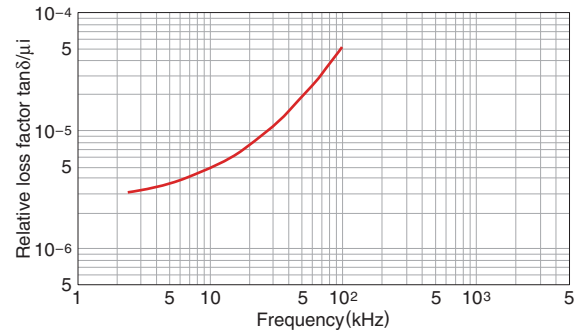
■ MATERIAL CHARACTERISTICS

| Initial permeability | Relative loss factor | Temperature factor of initial permeability | Saturation magnetic flux density* | Remanent flux density* | Coercive force* | Curie temperature | Hysteresis material constant | Disaccommodation factor | Density* | Electrical resistivity* |
|----------------------|----------------------|--|------------------------------------|------------------------------------|-------------------------------------|-------------------|---|-------------------------|---|---|
| μ_i | $\tan\delta/\mu_i$ | $\alpha_{\mu ir}$ | B_s (mT) H=1194A/m 25°C | B_r (mT) H=1194A/m 25°C | H_c (A/m) H=1194A/m 25°C | T_c (°C) | ηB $\frac{10^{-6}}{\text{mT}}$ | DF $\times 10^{-6}$ | db (kg/m ³) $\times 10^3$ | ρv ($\Omega \cdot \text{m}$) |
| 7500±25% | <6.5(10kHz) | 0 to 1.8 — 0 to 1.8 | 420 | 40 | 5.6 | >130 | <1.0 | <3 | 4.9 | 0.1 |

* Typ.

□ μ_i frequency characteristics(Typ.)

□ B-H temperature characteristics(Typ.)

□ μ_i temperature characteristics(Typ.)□ $\tan\delta/\mu_i$ frequency characteristics(Typ.)

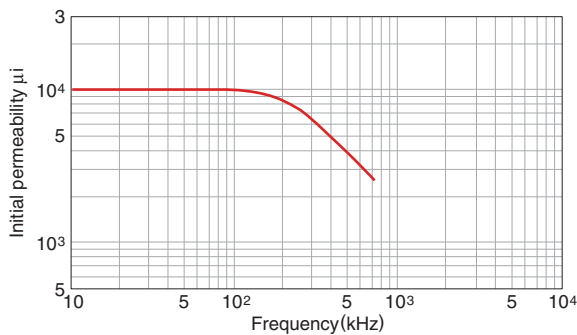
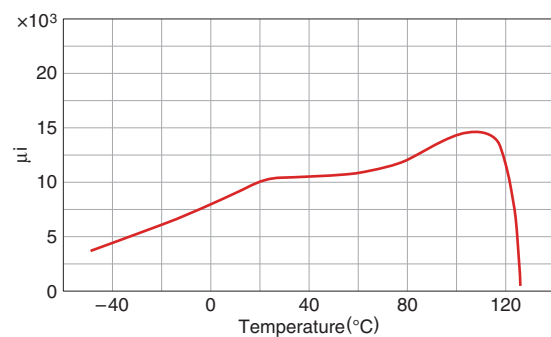
• All specifications are subject to change without notice.

Mn-Zn Ferrite for Telecommunication **Material List of H5C2**

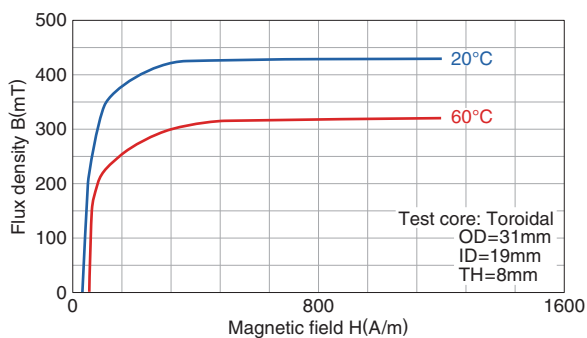
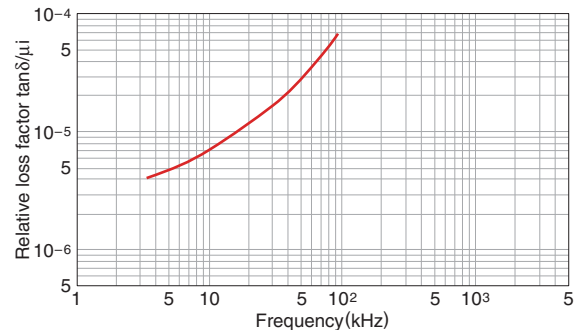
■ MATERIAL CHARACTERISTICS

| Initial permeability | Relative loss factor | Temperature factor of initial permeability | Saturation magnetic flux density* | Remanent flux density* | Coercive force* | Curie temperature | Hysteresis material constant | Disaccommodation factor | Density* | Electrical resistivity* |
|----------------------|----------------------|--|------------------------------------|------------------------------------|-------------------------------------|-------------------|---|-------------------------|--|---|
| μ_i | $\tan\delta/\mu_i$ | $\alpha_{\mu i r}$ | B_s (mT) H=1194A/m 25°C | B_r (mT) H=1194A/m 25°C | H_c (A/m) H=1194A/m 25°C | T_c (°C) | ηB $\frac{10^{-6}}{\text{mT}}$ | DF | d_b (kg/m ³) $\times 10^3$ | ρ_V ($\Omega \cdot \text{m}$) |
| 10000±30% | <7.0(10kHz) | -0.5 to 1.5 — -0.5 to 1.5 | 400 | 90 | 7.2 | >120 | <1.4 | <2 | 4.9 | 0.15 |

* Typ.

□ μ_i frequency characteristics(Typ.)□ μ_i temperature characteristics(Typ.)

□ B-H temperature characteristics(Typ.)

□ $\tan\delta/\mu_i$ frequency characteristics(Typ.)

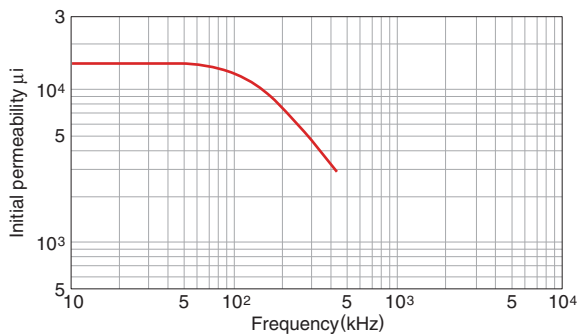
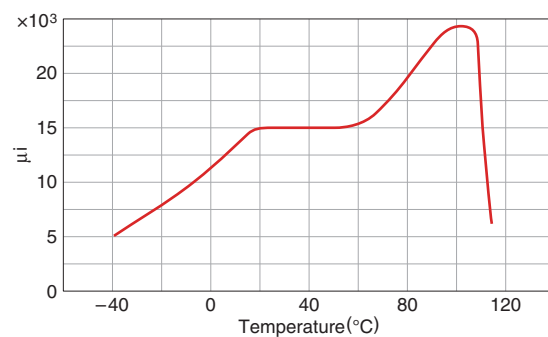
• All specifications are subject to change without notice.

Mn-Zn Ferrite for Telecommunication **Material List of H5C3**

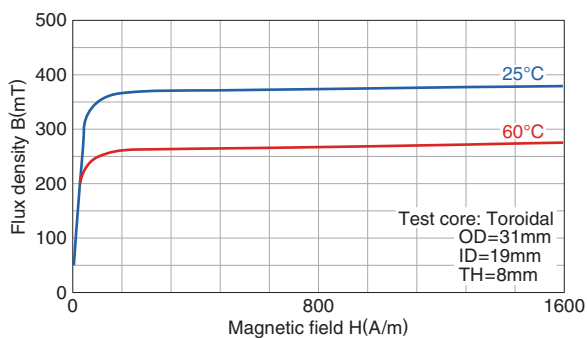
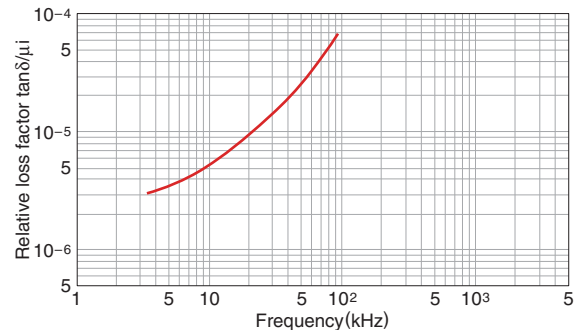
■ MATERIAL CHARACTERISTICS

| Initial permeability | Relative loss factor | Temperature factor of initial permeability | Saturation magnetic flux density* | Remanent flux density* | Coercive force* | Curie temperature | Hysteresis material constant | Disaccommodation factor | Density* | Electrical resistivity* |
|----------------------|----------------------|---|------------------------------------|------------------------------------|-------------------------------------|-------------------|----------------------------------|-------------------------|--|----------------------------------|
| μ_i | $\tan\delta/\mu_i$ | $\alpha_{\mu ir}$ | B_s (mT) H=1194A/m 25°C | B_r (mT) H=1194A/m 25°C | H_c (A/m) H=1194A/m 25°C | T_c (°C) | ηB $\frac{10^{-6}}{mT}$ | DF $\times 10^{-6}$ | d_b (kg/m ³) $\times 10^3$ | ρ_V ($\Omega \cdot m$) |
| 15000±30% | <7.0(10kHz) | $\times 10^{-6}$ -30 to +20°C 0 to 20°C 20 to 70°C | 360 | 105 | 4.4 | >105 | <0.5 | <2 | 4.95 | 0.15 |

* Typ.

□ μ_i frequency characteristics(Typ.)□ μ_i temperature characteristics(Typ.)

□ B-H temperature characteristics(Typ.)

□ $\tan\delta/\mu_i$ frequency characteristics(Typ.)

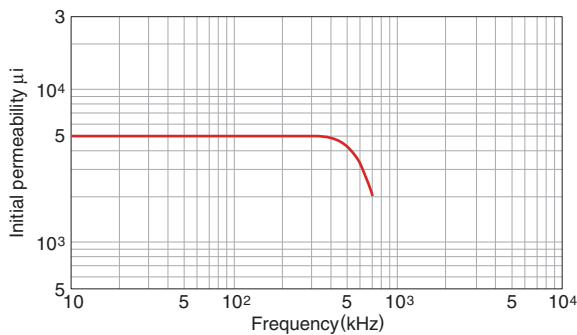
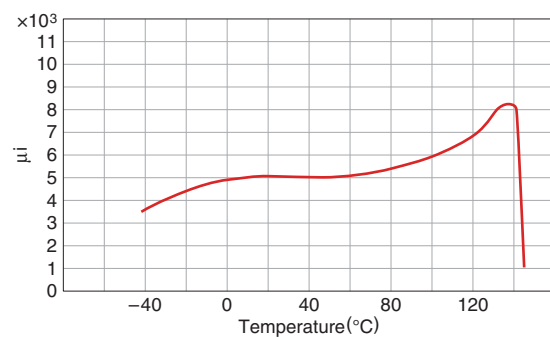
• All specifications are subject to change without notice.

Mn-Zn Ferrite for Telecommunication **Material List of HP5**

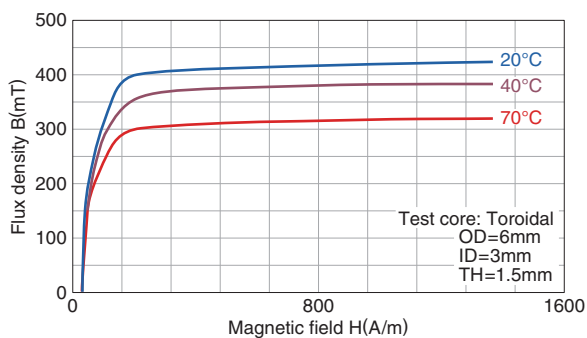
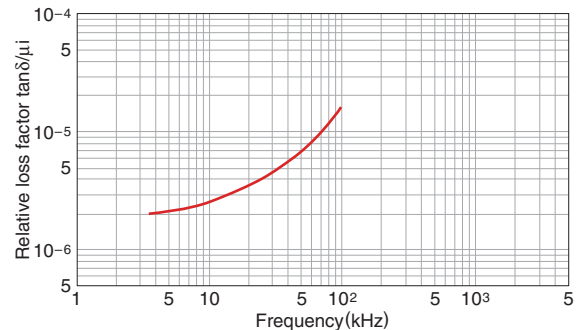
■ MATERIAL CHARACTERISTICS

| Initial permeability | Relative loss factor | Temperature factor of initial permeability | Saturation magnetic flux density* | Remanent flux density* | Coercive force* | Curie temperature | Hysteresis material constant | Disaccommodation factor | Density* | Electrical resistivity* |
|----------------------|----------------------|--|------------------------------------|------------------------------------|-------------------------------------|-------------------|---|-------------------------|--|---|
| μ_i | $\tan\delta/\mu_i$ | $\alpha_{\mu i r}$ | B_s (mT) H=1194A/m 25°C | B_r (mT) H=1194A/m 25°C | H_c (A/m) H=1194A/m 25°C | T_c (°C) | ηB $\frac{10^{-6}}{\text{mT}}$ | DF | d_b (kg/m ³) $\times 10^3$ | ρ_v ($\Omega \cdot \text{m}$) |
| 5000±20% | <3.5 | — ±12.5% ±12.5% | 400 | 65 | 7.2 | >140 | <0.4 | <3 | 4.8 | 0.15 |

* Typ.

□ μ_i frequency characteristics(Typ.)□ μ_i temperature characteristics(Typ.)

□ B-H temperature characteristics(Typ.)

□ $\tan\delta/\mu_i$ frequency characteristics(Typ.)

• All specifications are subject to change without notice.

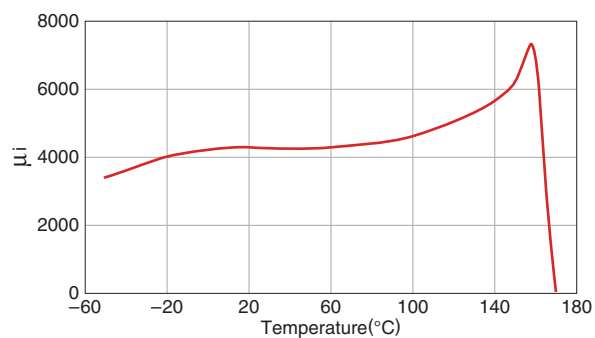
Mn-Zn Ferrite for Telecommunication Material List of DNW45

■ MATERIAL CHARACTERISTICS

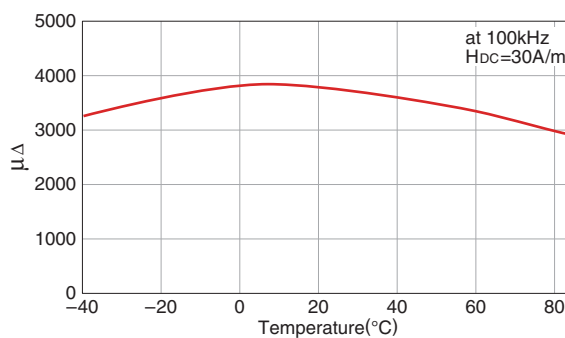
| Initial permeability | Relative loss factor | Temperature factor of initial permeability | Saturation magnetic flux density* | Remanent flux density* | Coercive force* | Curie temperature | Hysteresis material constant | Disaccommodation factor | Density* | Electrical resistivity* |
|----------------------|----------------------|--|---|---|--|------------------------------|--------------------------------------|-----------------------------------|--|----------------------------------|
| μ_i | $\tan\delta/\mu_i$ | $\alpha_{\mu ir}$ | B_s (mT) H=1194A/m 25°C | B_r (mT) H=1194A/m 25°C | H_c (A/m) H=1194A/m 25°C | T_c (°C) | ηB $\frac{10^{-6}}{mT}$ | DF $\times 10^{-6}$ | db (kg/m ³) $\times 10^3$ | ρ_V ($\Omega \cdot m$) |
| 4200±25% | <3.5 | — — — | 450 | 50 | 6.5 | >150 | <0.8 | <3 | 4.85 | 0.65 |

* Typ.

□ μ_i temperature characteristics(Typ.)



□ μ_Δ temperature characteristics(Typ.)



• All specifications are subject to change without notice.

Mn-Zn Material List of Large Size Ferrite for High Power

MATERIAL CHARACTERISTICS

| Material | Initial permeability μ_i 23°C | Curie temperature T_c (°C) | Saturation magnetic flux density B_s (mT) H=1194A/m | | Remanent flux density B_r (mT) H=1194A/m | Coercive force H_c (A/m) H=1194A/m | Core loss | | | Electrical resistivity ρ ($\Omega \cdot m$) | Approximate density d_{app} (kg/m ³) $\times 10^3$ | Thermal expansion coefficient α (1/K) $\times 10^{-6}$ | Thermal conductivity κ (W/mK) | Specific heat C_p (J/kg · K) | Bending strength δb_3 (N/m ²) $\times 10^7$ | Young's modulus E (N/m ²) $\times 10^{11}$ | Magnetostriction λ_s $\times 10^{-6}$ |
|----------|---|------------------------------------|--|-------|---|---|-----------|------|---------------|--|---|--|--|--------------------------------------|--|---|---|
| | | | 23°C | 100°C | | | 23°C | 23°C | 25kHz 90°C | | | | | | | | |
| PE22 | 1800 | >200 | 510 | 410 | 140 | 16 | 79 | 80 | 520 | 3.0 | 4.8 | 12 | 5 | 600 | 9 | 1.2 | -0.6 |
| PC40 | 2300 | >200 | 500 | 380 | 125 | 15 | 64 | 70 | 420 | 6.5 | 4.8 | 12 | 5 | 600 | 9 | 1.2 | -0.6 |
| PE90 | 2200 | >250 | 530 | 430 | 170 | 13 | 60 | 68 | 400 | 6.0 | 4.9 | 12 | 5 | 600 | 9 | 1.2 | -0.6 |

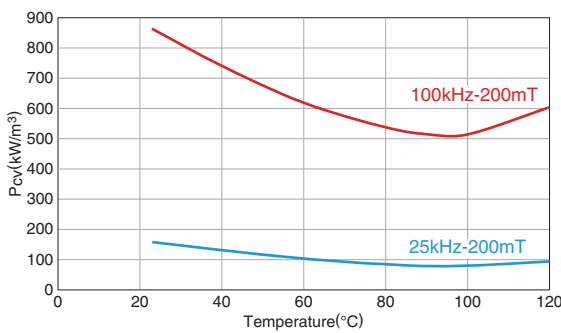
• All specifications are subject to change without notice.

Mn-Zn Large Size Ferrite for High Power Material List of PE22

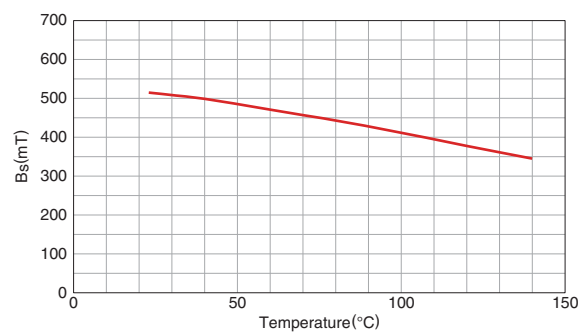
■ MATERIAL CHARACTERISTICS

| Initial permeability μ_i | Curie temperature T_c (°C) | Saturation magnetic flux density B_s (mT) H=1194A/m | | Remanent flux density B_r (mT) H=1194A/m | Coercive force H_c (A/m) H=1194A/m | Core loss | | | Electrical resistivity ρ ($\Omega \cdot m$) | Approximate density d_{app} (kg/m^3) $\times 10^3$ | Thermal expansion coefficient α (1/K) $\times 10^{-6}$ | Thermal conductivity κ (W/mK) | Specific heat C_p (J/kg · K) | Bending strength δb_3 (N/m ²) $\times 10^7$ | Young's modulus E (N/m ²) $\times 10^{11}$ | Magnetostriiction λ_s $\times 10^{-6}$ |
|---------------------------------|------------------------------------|--|-------|---|---|-----------|-------|------|--|---|--|--|--------------------------------------|--|---|--|
| | | 23°C | 100°C | | | 23°C | 25kHz | 90°C | | | | | | | | |
| 1800 | >200 | 510 | 410 | 140 | 16 | 79 | 80 | 520 | 3.0 | 4.8 | 12 | 5 | 600 | 9 | 1.2 | -0.6 |

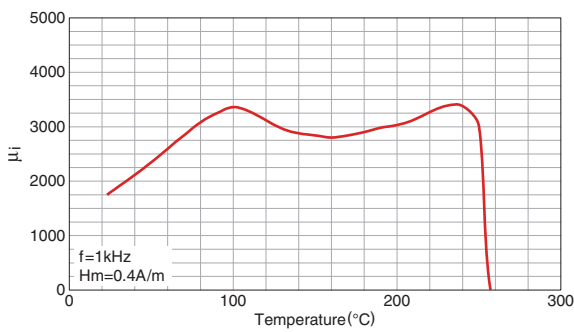
□ Core loss vs. temperature characteristics(Typ.)



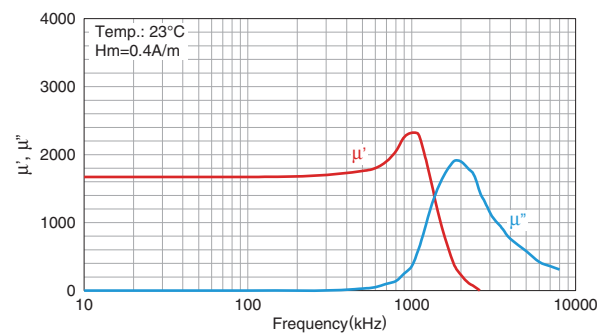
□ Saturation magnetic flux density vs. temperature characteristics(Typ.)



□ Initial magnetic permeability vs. temperature characteristics(Typ.)



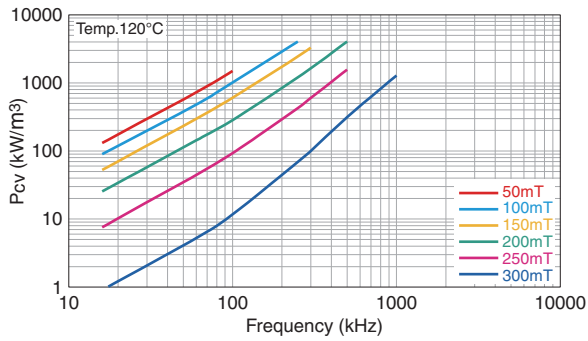
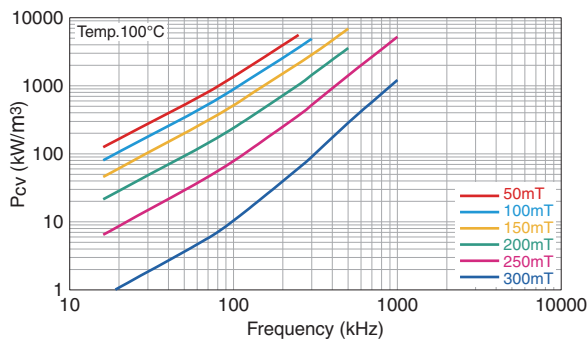
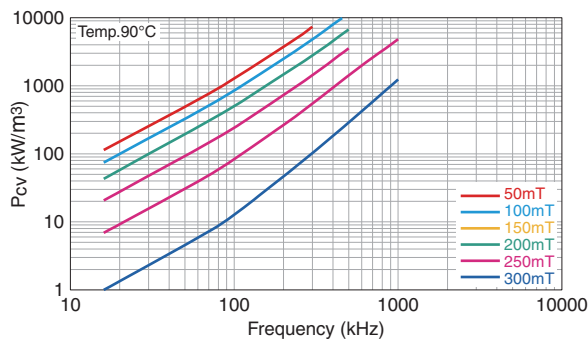
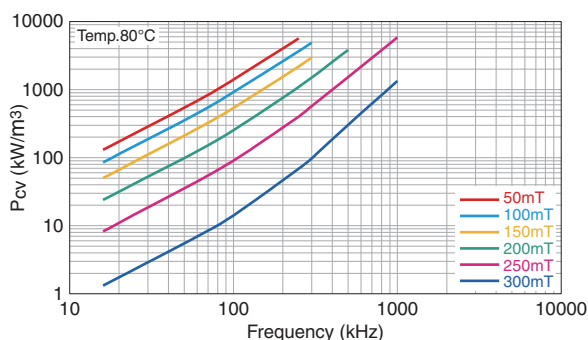
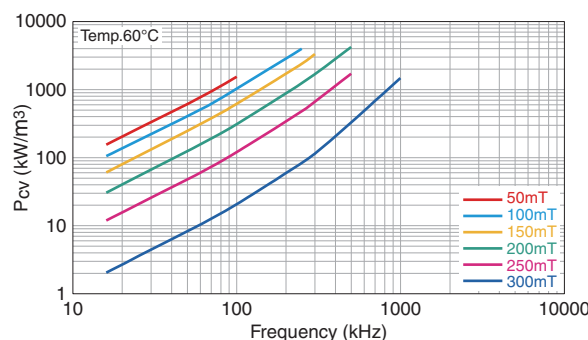
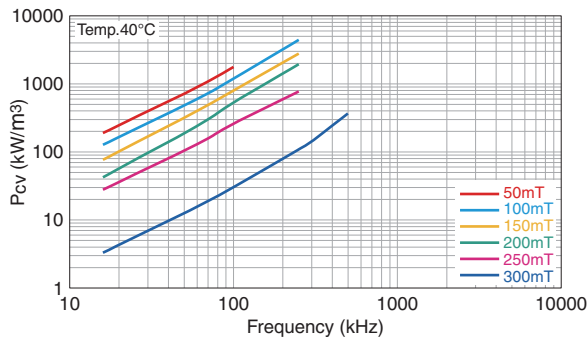
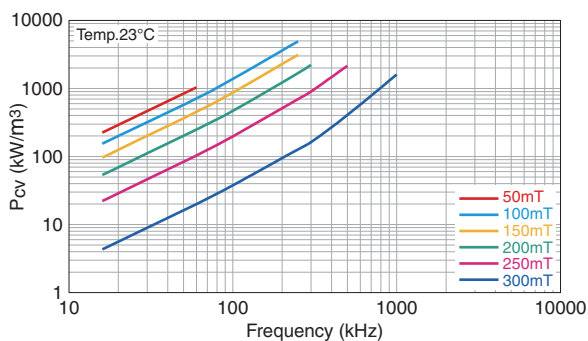
□ Magnetic permeability vs. frequency characteristics(Typ.)



• All specifications are subject to change without notice.

Mn-Zn Large Size Ferrite for High Power Material List of PE22

Core loss vs. temperature characteristics



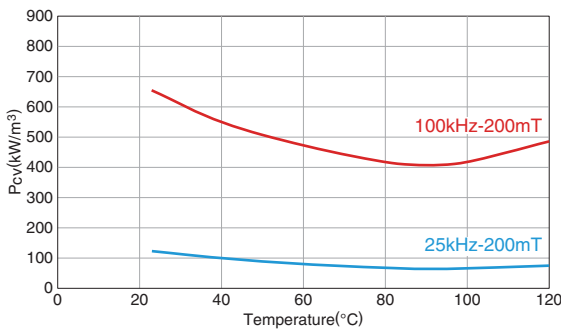
• All specifications are subject to change without notice.

Mn-Zn Large Size Ferrite for High Power Material List of PC40

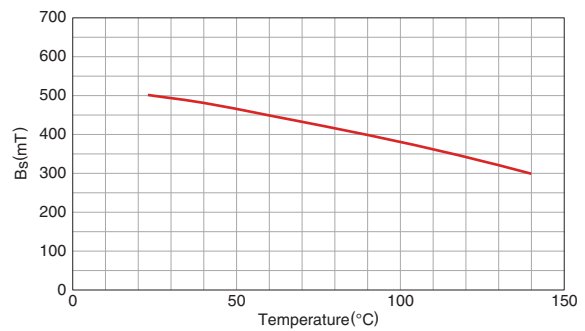
■ MATERIAL CHARACTERISTICS

| Initial permeability μ_i | Curie temperature T_c (°C) | Saturation magnetic flux density B_s (mT) H=1194A/m | | Remanent flux density B_r (mT) H=1194A/m | Coercive force H_c (A/m) H=1194A/m | Core loss P_{cv} (kW/m ³) B=200mT | | | Electrical resistivity ρ ($\Omega \cdot m$) | Approximate density d_{app} (kg/m ³) $\times 10^3$ | Thermal expansion coefficient α (1/K) $\times 10^{-6}$ | Thermal conductivity κ (W/mK) | Specific heat C_p (J/kg · K) | Bending strength δb_3 (N/m ²) $\times 10^7$ | Young's modulus E (N/m ²) $\times 10^{11}$ | Magnetostriction λ_s $\times 10^{-6}$ |
|---------------------------------|------------------------------------|--|-------|---|---|--|-------|------|--|---|--|--|--------------------------------------|--|---|---|
| | | 23°C | 100°C | | | 23°C | 25kHz | 90°C | | | | | | | | |
| 2300 | >200 | 500 | 380 | 125 | 15 | 64 | 70 | 420 | 6.5 | 4.8 | 12 | 5 | 600 | 9 | 1.2 | -0.6 |

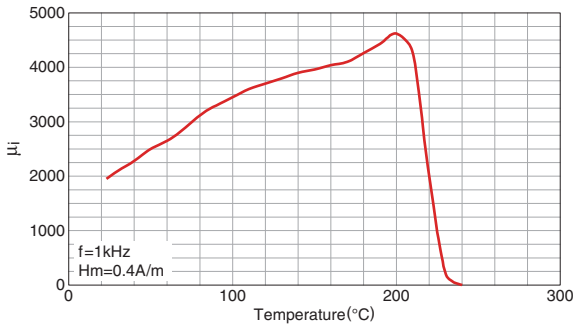
□ Core loss vs. temperature characteristics(Typ.)



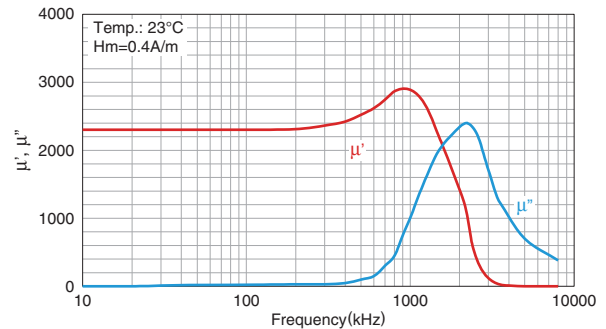
□ Saturation magnetic flux density vs. temperature characteristics(Typ.)



□ Initial magnetic permeability vs. temperature characteristics(Typ.)



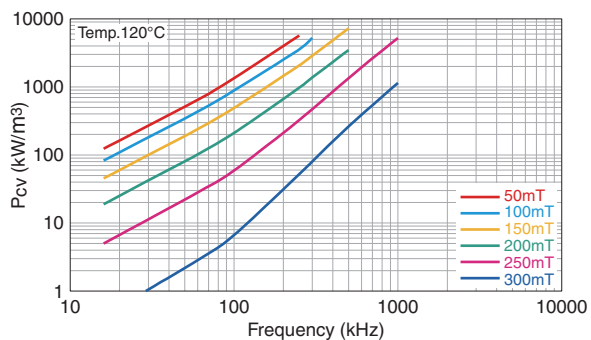
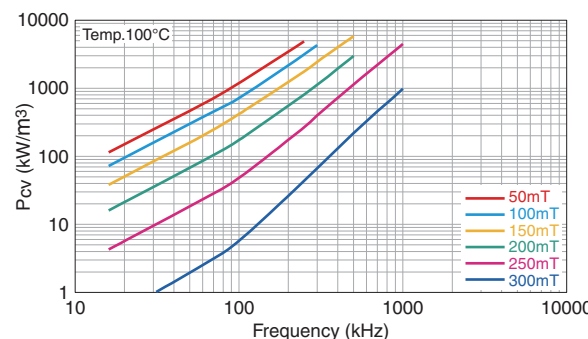
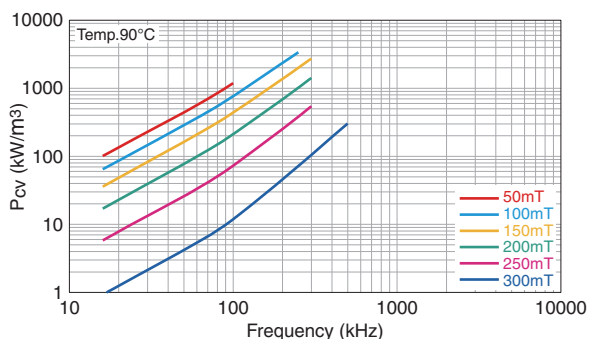
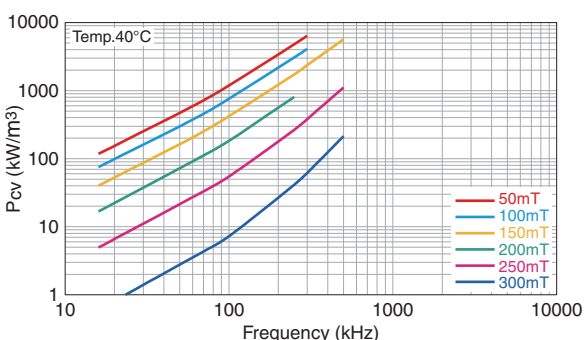
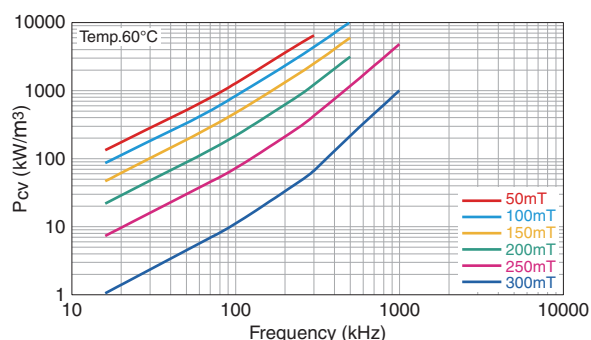
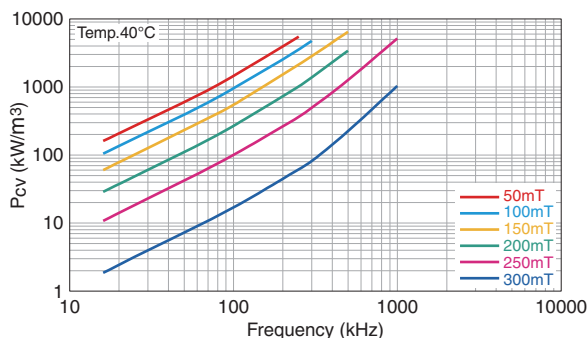
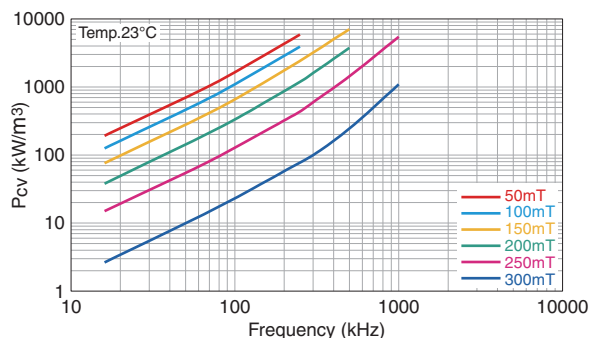
□ Magnetic permeability vs. frequency characteristics(Typ.)



• All specifications are subject to change without notice.

Mn-Zn Large Size Ferrite for High Power **Material List of PC40**

Core loss vs. temperature characteristics



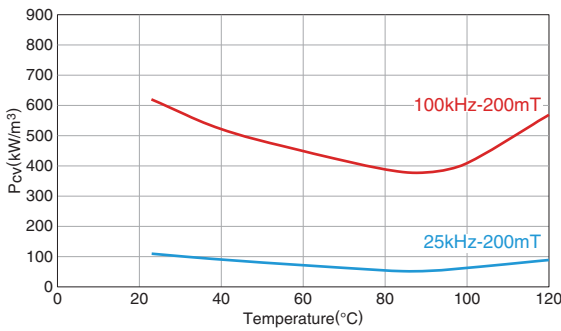
• All specifications are subject to change without notice.

Mn-Zn Large Size Ferrite for High Power Material List of PE90

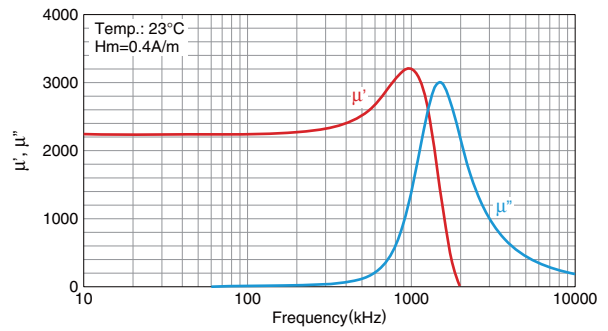
MATERIAL CHARACTERISTICS

| Initial permeability μ_i | Curie temperature T_c (°C) | Saturation magnetic flux density B_s (mT) H=1194A/m | | Remanent flux density B_r (mT) H=1194A/m | Coercive force H_c (A/m) H=1194A/m | Core loss | | | Electrical resistivity ρ ($\Omega \cdot m$) | Approximate density d_{app} (kg/m ³) $\times 10^3$ | Thermal expansion coefficient α (1/K) $\times 10^{-6}$ | Thermal conductivity κ (W/mK) | Specific heat C_p (J/kg · K) | Bending strength δb_3 (N/m ²) $\times 10^7$ | Young's modulus E (N/m ²) $\times 10^{11}$ | Magnetostriction λ_s $\times 10^{-6}$ |
|---------------------------------|------------------------------------|--|-------|---|---|-----------|-------|------|--|---|--|--|--------------------------------------|--|---|---|
| | | 23°C | 100°C | | | 23°C | 25kHz | 90°C | | | | | | | | |
| 2200 | >250 | 530 | 430 | 170 | 13 | 60 | 68 | 400 | 6.0 | 4.9 | 12 | 5 | 600 | 9 | 1.2 | -0.6 |

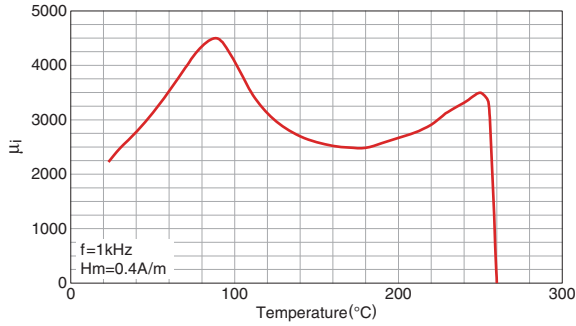
Core loss vs. temperature characteristics(Typ.)



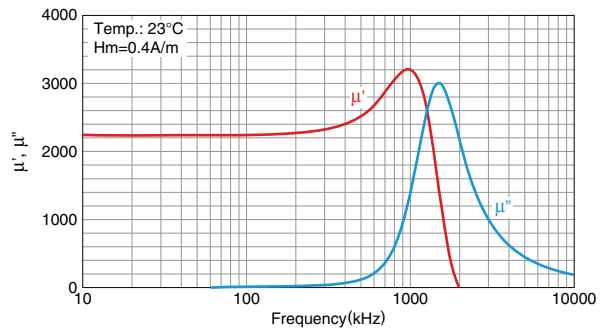
Saturation magnetic flux density vs. temperature characteristics(Typ.)



Initial magnetic permeability vs. temperature characteristics(Typ.)



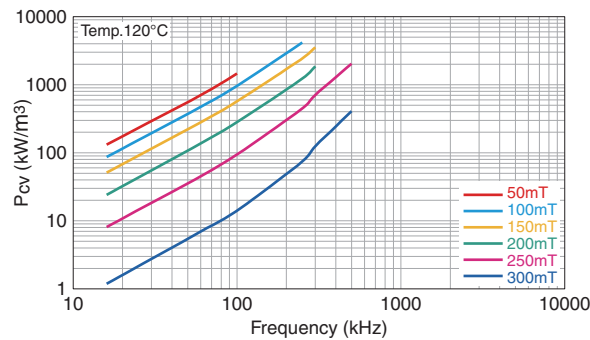
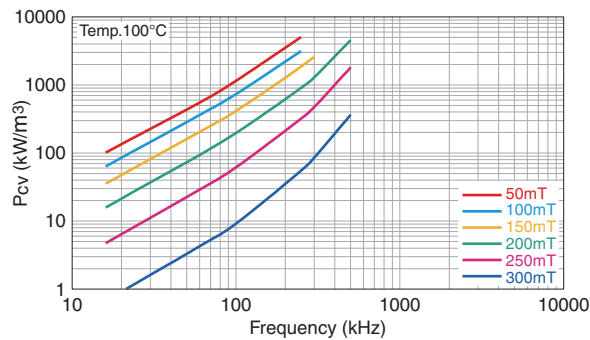
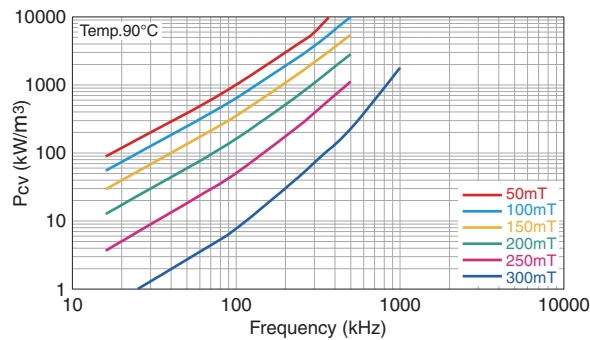
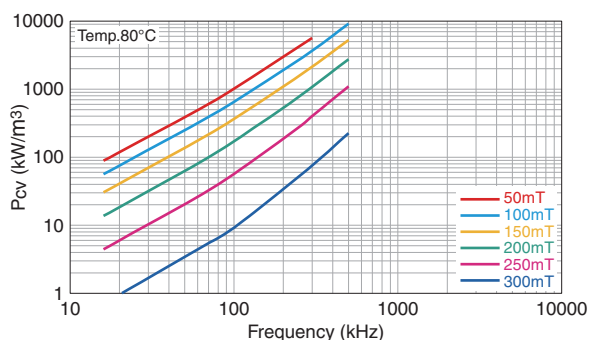
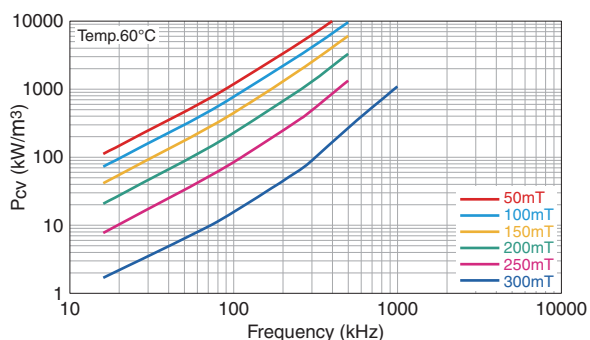
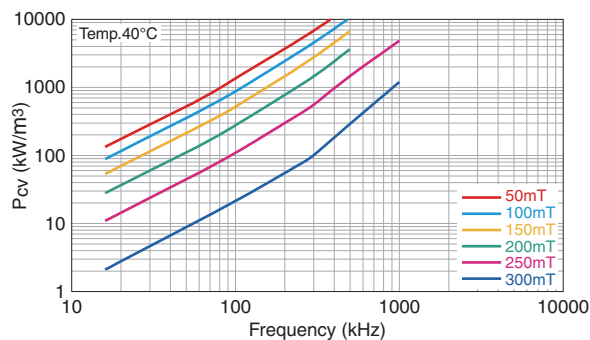
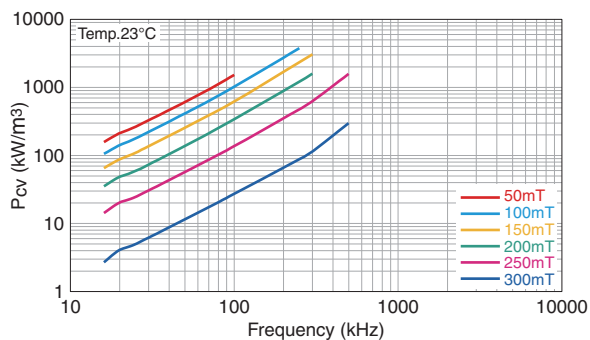
Magnetic permeability vs. frequency characteristics(Typ.)



• All specifications are subject to change without notice.

Mn-Zn Large Size Ferrite for High Power Material List of PE90

Core loss vs. temperature characteristics



• All specifications are subject to change without notice.