

Ferrite for Switching Power Supplies

RM cores

RM series

Issue date: April 2011

- All specifications are subject to change without notice.
 - Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.
-

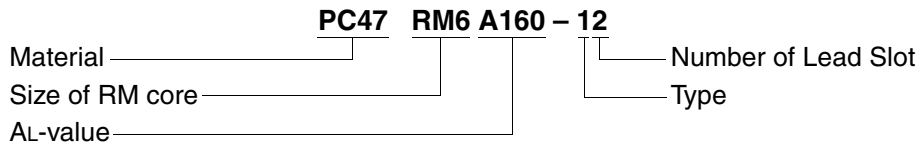
Ferrite for Switching Power Supplies

RM Series

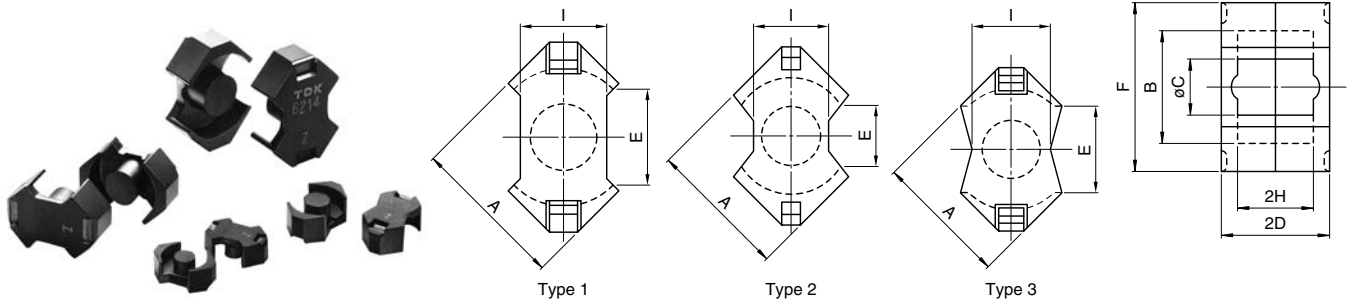
RM4 to RM14



Ordering Code System



RM CORES



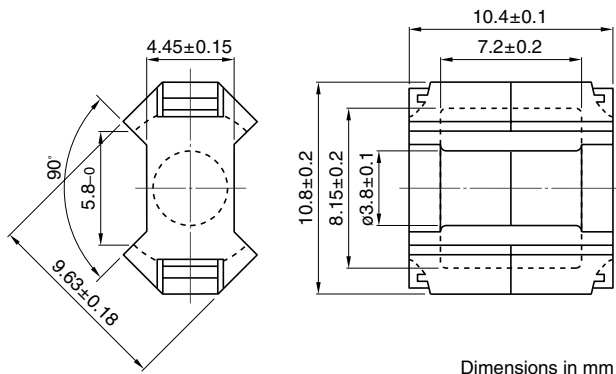
| Part No. | Type | Dimensions in mm | | | | | | | |
|--------------|------|------------------|------------|------------|----------|--------|------------|----------|------------|
| | | A | B | øC | 2D | E min. | F | 2H | I |
| PC47RM4Z-12 | 1 | 9.63±0.18 | 8.15±0.2 | 3.8±0.1 | 10.4±0.1 | 5.8 | 10.8±0.2 | 7.2±0.2 | 4.45±0.15 |
| PC47RM5Z-12 | 1 | 12.05±0.25 | 10.4±0.2 | 4.8±0.1 | 10.4±0.1 | 6.0 | 14.3±0.3 | 6.5±0.2 | 6.6±0.2 |
| PC47RM6Z-12 | 3 | 14.4±0.3 | 12.65±0.25 | 6.3±0.1 | 12.4±0.1 | 8.4 | 17.6±0.3 | 8.2±0.2 | 8.0±0.2 |
| PC47RM8Z-12 | 2 | 19.35±0.35 | 17.3±0.3 | 8.4±0.15 | 16.4±0.1 | 9.8 | 22.75±0.45 | 11.0±0.2 | 10.8±0.2 |
| PC47RM10Z-12 | 2 | 24.15±0.55 | 21.65±0.45 | 10.7±0.2 | 18.6±0.1 | 11.3 | 27.85±0.65 | 12.7±0.3 | 13.25±0.25 |
| PC47RM12Z-12 | 2 | 29.25±0.55 | 25.5±0.5 | 12.6±0.2 | 23.5±0.1 | 12.9 | 36.75±0.65 | 17.1±0.3 | 16.0±0.3 |
| PC47RM14Z-12 | 1 | 34.2±0.5 | 29.5±0.5 | 14.75±0.25 | 28.8±0.2 | 17.0 | 41.6±0.6 | 21.1±0.3 | 18.7±0.3 |

| Part No. | Effective parameter | | | | Electrical characteristics | | Core loss (W) max. 100kHz, 200mT, 100°C | Weight (g) |
|--------------|---------------------------------------|--------------------------------------|------------------------|--------------------------------------|--------------------------------|----------------------------|---|---------------|
| | C ₁ (mm ⁻¹) | A _e (mm ²) | ℓ _e (mm) | V _e (mm ³) | AL-value (nH/N ²)* | | | |
| | | | | | Without air gap | With air gap | | |
| PC47RM4Z-12 | 1.62 | 14.0 | 22.7 | 318 | 680 min. | 63±3% 100±3% 160±3% | 0.11 | 1.7 |
| PC47RM5Z-12 | 0.940 | 23.7 | 22.4 | 530 | 1250 min. | 63±3% 100±3% 160±3% | 0.17 | 3.0 |
| PC47RM6Z-12 | 0.781 | 36.6 | 28.6 | 1050 | 2450±25% | 100±3% 160±3% 250±3% | 0.38 | 5.5 |
| PC47RM8Z-12 | 0.594 | 64.0 | 38.0 | 2430 | 1950 min. | 100±3% 160±3% 250±3% | 0.91 | 13 |
| PC47RM10Z-12 | 0.450 | 98.0 | 44.0 | 4310 | 4850±25% | 160±3% 250±3% 400±3% | 1.70 | 23 |
| PC47RM12Z-12 | 0.406 | 140 | 56.9 | 7970 | 4150 min. | 160±3% 250±3% 400±3% | 3.00 | 42 |
| PC47RM14Z-12 | 0.393 | 178 | 70.0 | 12500 | 4600 min. | 160±3% 250±3% 400±3% | 4.60 | 70 |

* AL-value: 1kHz, 0.5mA, 100Ts

RM Series RM4 Cores

Based on JIS C 2516, IEC Publication 60431 and DIN 41980.



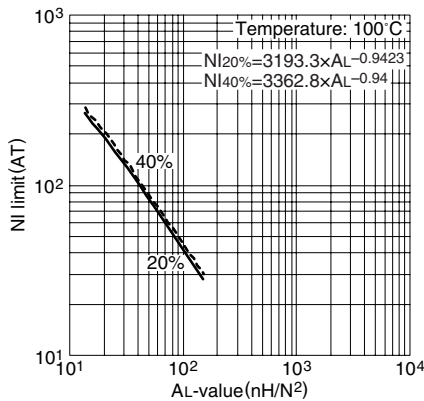
PARAMETER

| | | | |
|--|-----------------------|------------------|------|
| Core factor | C1 | mm ⁻¹ | 1.62 |
| Effective magnetic path length | ℓ_e | mm | 22.7 |
| Effective cross-sectional area | A_e | mm ² | 14.0 |
| Effective core volume | V_e | mm ³ | 318 |
| Cross-sectional center pole area | A_{cp} | mm ² | 11.3 |
| Minimum cross-sectional center pole area | $A_{cp \text{ min.}}$ | mm ² | 10.7 |
| Cross-sectional winding area of core | A_{cw} | mm ² | 15.6 |
| Weight (approx.) | | g | 1.7 |

| Part No. | AL-value (nH/N ²) | Core loss (W) at 100°C 100kHz, 200mT | Calculated output power (forward converter mode) |
|--------------------|--|---|---|
| PC47RM4Z-12 | 680 min. (1kHz, 0.5mA)* 1650 min. (100kHz, 200mT) | 0.11 max. | 8.4W (100kHz) |

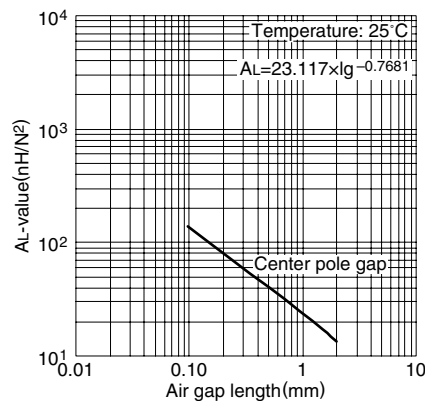
* Coil: ϕ 0.18 2UEW 100Ts

NI limit vs. AL-value for PC47RM4 gapped core (Typical)



Note: NI limit shows the point where the exciting current is 20% and 40% away from its extended linear part.

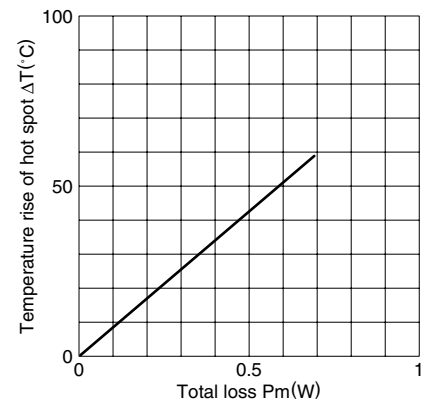
AL-value vs. Air gap length for PC47RM4 core (Typical)



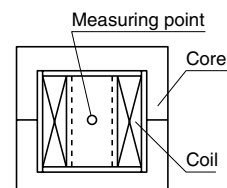
Measuring conditions

- Coil: ϕ 0.18 2UEW 100Ts
- Frequency: 1kHz
- Level: 0.5mA

Temperature rise vs. Total loss for RM4 core (Typical) (Ambient temperature: 25°C)

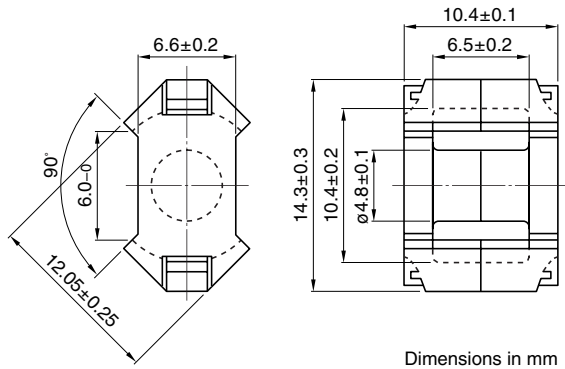


Note: The temperature rise is measured in the room whose temperature and humidity are fixed to 25°C and 45(%)RH, respectively. (approx. 400×300×300cm)



RM Series RM5 Cores

Based on JIS C 2516, IEC Publication 60431 and DIN 41980.



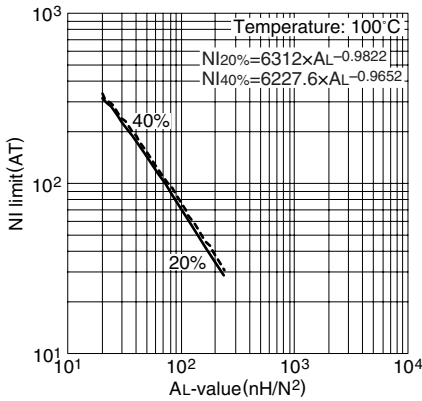
PARAMETER

| | | | |
|--|----------------------|------------------|-------|
| Core factor | C1 | mm ⁻¹ | 0.940 |
| Effective magnetic path length | ℓ _e | mm | 22.4 |
| Effective cross-sectional area | A _e | mm ² | 23.7 |
| Effective core volume | V _e | mm ³ | 530 |
| Cross-sectional center pole area | A _{cp} | mm ² | 18.1 |
| Minimum cross-sectional center pole area | A _{cp min.} | mm ² | 17.3 |
| Cross-sectional winding area of core | A _{cw} | mm ² | 18.2 |
| Weight (approx.) | | g | 3.0 |

| Part No. | AL-value (nH/N ²) | Core loss (W) at 100°C 100kHz, 200mT | Calculated output power (forward converter mode) |
|--------------------|---|---|---|
| PC47RM5Z-12 | 1250 min. (1kHz, 0.5mA)* 3340 min. (100kHz, 200mT) | 0.17 max. | 20.3W (100kHz) |

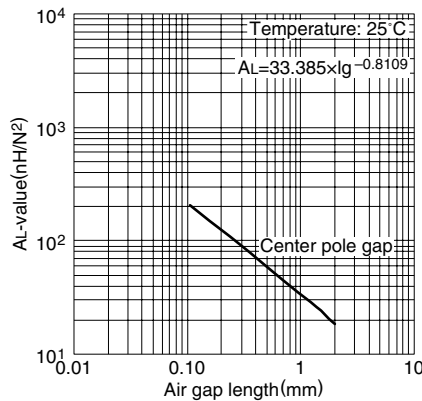
* Coil: ø0.2 2UEW 100Ts

NI limit vs. AL-value for PC47RM5 gapped core (Typical)



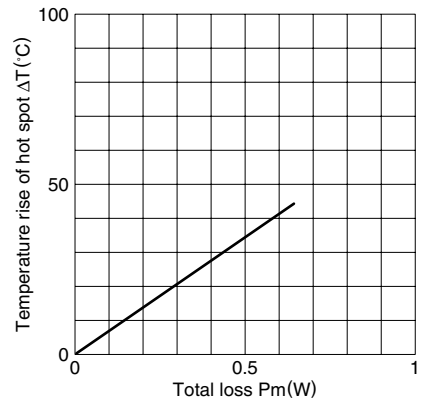
Note: NI limit shows the point where the exciting current is 20% and 40% away from its extended linear part.

AL-value vs. Air gap length for PC47RM5 core (Typical)

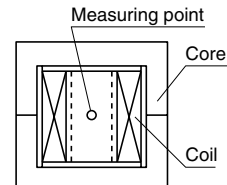


Measuring conditions • Coil: ø0.2 2UEW 100Ts
• Frequency: 1kHz
• Level: 0.5mA

Temperature rise vs. Total loss for RM5 core (Typical) (Ambient temperature: 25°C)

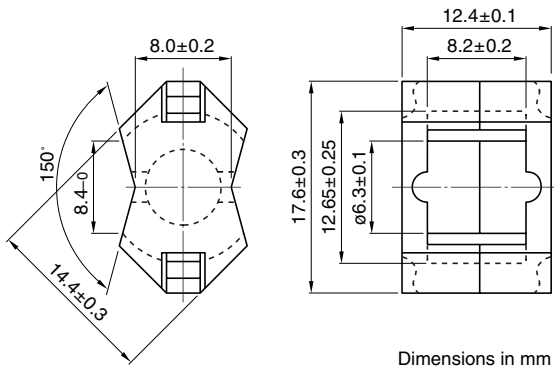


Note: The temperature rise is measured in the room whose temperature and humidity are fixed to 25°C and 45(%)RH, respectively. (approx. 400×300×300cm)



RM Series RM6 Cores

Based on JIS C 2516, IEC Publication 60431 and DIN 41980.



Dimensions in mm

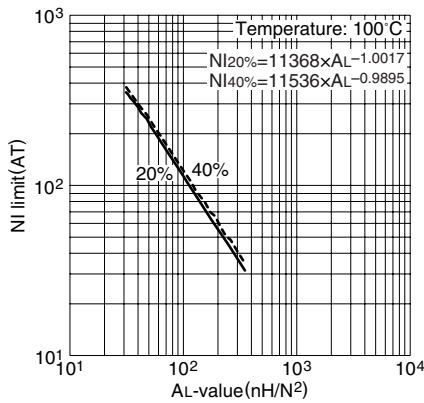
PARAMETER

| | | | |
|--|----------------------|------------------|-------|
| Core factor | C1 | mm ⁻¹ | 0.781 |
| Effective magnetic path length | ℓ _e | mm | 28.6 |
| Effective cross-sectional area | A _e | mm ² | 36.6 |
| Effective core volume | V _e | mm ³ | 1050 |
| Cross-sectional center pole area | A _{cp} | mm ² | 31.2 |
| Minimum cross-sectional center pole area | A _{cp min.} | mm ² | 30.2 |
| Cross-sectional winding area of core | A _{cw} | mm ² | 26.0 |
| Weight (approx.) | | g | 5.5 |

| Part No. | AL-value (nH/N ²) | Core loss (W) at 100°C 100kHz, 200mT | Calculated output power (forward converter mode) |
|--------------------|--|---|---|
| PC47RM6Z-12 | 2450±25% (1kHz, 0.5mA)* 4030 min. (100kHz, 200mT) | 0.38 max. | 36.2W (100kHz) |

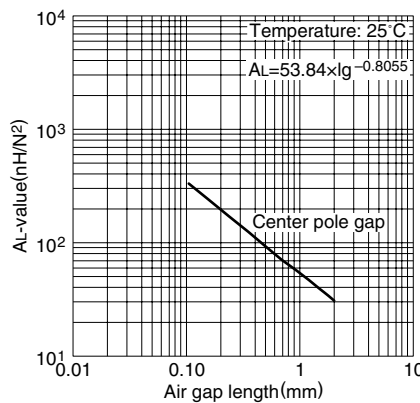
* Coil: ø0.26 2UEW 100Ts

NI limit vs. AL-value for PC47RM6 gapped core (Typical)



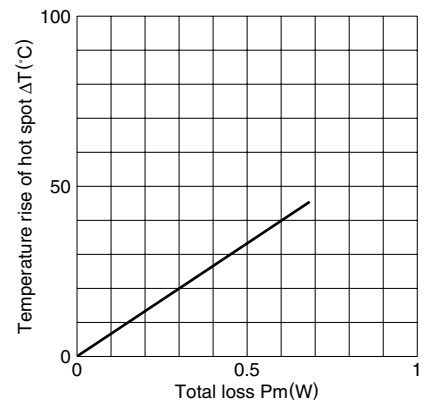
Note: NI limit shows the point where the exciting current is 20% and 40% away from its extended linear part.

AL-value vs. Air gap length for PC47RM6 core (Typical)

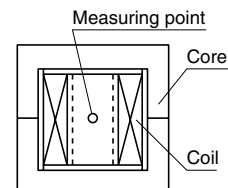


Measuring conditions • Coil: ø0.26 2UEW 100Ts
• Frequency: 1kHz
• Level: 0.5mA

Temperature rise vs. Total loss for RM6 core (Typical) (Ambient temperature: 25°C)

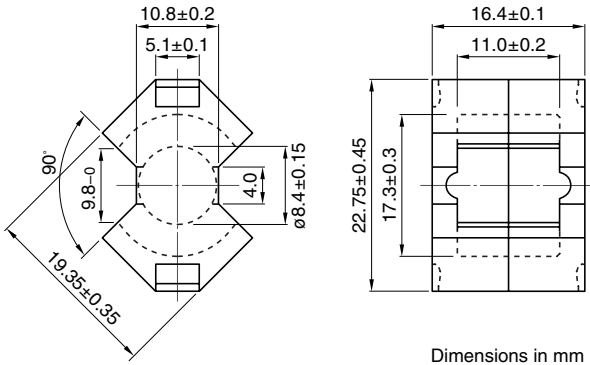


Note: The temperature rise is measured in the room whose temperature and humidity are fixed to 25°C and 45(%)RH, respectively. (approx. 400×300×300cm)



RM Series RM8 Cores

Based on JIS C 2516, IEC Publication 60431 and DIN 41980.



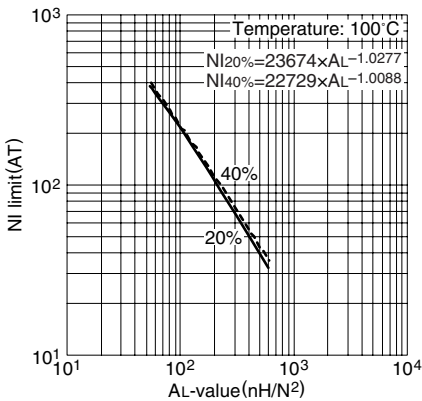
PARAMETER

| | | | |
|--|----------------------|------------------|-------|
| Core factor | C1 | mm ⁻¹ | 0.594 |
| Effective magnetic path length | ℓ _e | mm | 38.0 |
| Effective cross-sectional area | A _e | mm ² | 64.0 |
| Effective core volume | V _e | mm ³ | 2430 |
| Cross-sectional center pole area | A _{cp} | mm ² | 55.4 |
| Minimum cross-sectional center pole area | A _{cp min.} | mm ² | 53.5 |
| Cross-sectional winding area of core | A _{cw} | mm ² | 48.9 |
| Weight (approx.) | | g | 13 |

| Part No. | AL-value (nH/N ²) | Core loss (W) at 100°C 100kHz, 200mT | Calculated output power (forward converter mode) |
|--------------------|---|---|---|
| PC47RM8Z-12 | 1950 min. (1kHz, 0.5mA)* 5290 min. (100kHz, 200mT) | 0.91 max. | 92.4W (100kHz) |

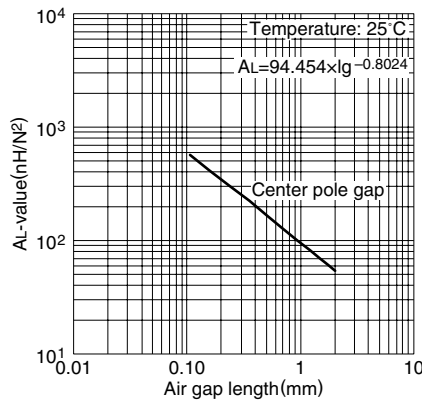
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value for PC47RM8 gapped core (Typical)



Note: NI limit shows the point where the exciting current is 20% and 40% away from its extended linear part.

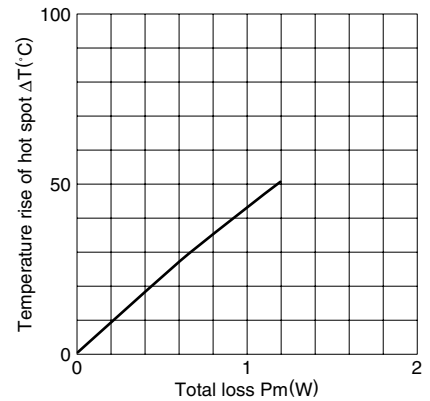
AL-value vs. Air gap length for PC47RM8 core (Typical)



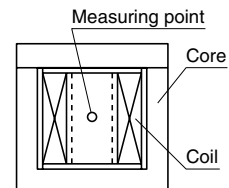
Measuring conditions

- Coil: ø0.4 2UEW 100Ts
- Frequency: 1kHz
- Level: 0.5mA

Temperature rise vs. Total loss for RM8 core (Typical) (Ambient temperature: 25°C)

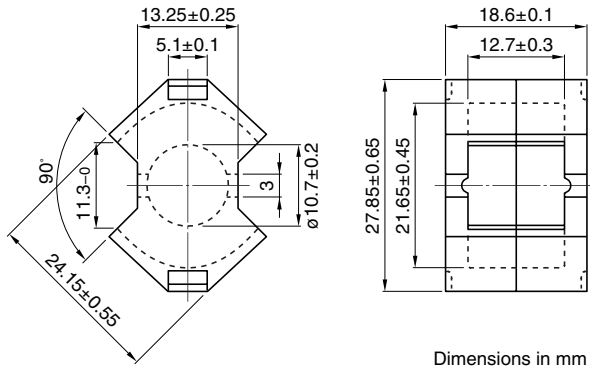


Note: The temperature rise is measured in the room whose temperature and humidity are fixed to 25°C and 45%RH, respectively. (approx. 400×300×300cm)



RM Series RM10 Cores

Based on JIS C 2516, IEC Publication 60431 and DIN 41980.



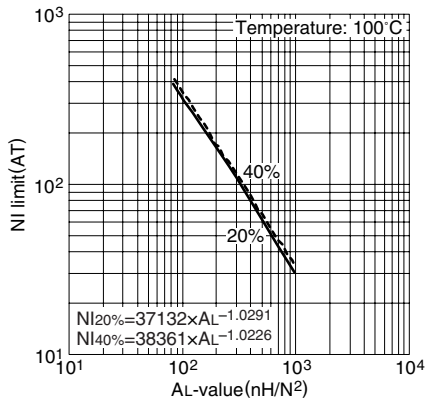
PARAMETER

| | | | |
|--|-----------------------|------------------|-------|
| Core factor | C1 | mm ⁻¹ | 0.450 |
| Effective magnetic path length | ℓ_e | mm | 44.0 |
| Effective cross-sectional area | A_e | mm ² | 98.0 |
| Effective core volume | V_e | mm ³ | 4310 |
| Cross-sectional center pole area | A_{cp} | mm ² | 89.9 |
| Minimum cross-sectional center pole area | $A_{cp \text{ min.}}$ | mm ² | 86.6 |
| Cross-sectional winding area of core | A_{cw} | mm ² | 69.5 |
| Weight (approx.) | | g | 23 |

| Part No. | AL-value (nH/N ²) | Core loss (W) at 100°C 100kHz, 200mT | Calculated output power (forward converter mode) |
|---------------------|--|---|---|
| PC47RM10Z-12 | 4850±25% (1kHz, 0.5mA)* 7000 min. (100kHz, 200mT) | 1.70 max. | 177.8W (100kHz) |

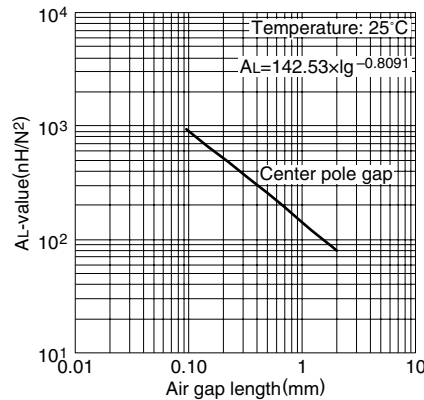
* Coil: $\phi 0.4$ 2UEW 100Ts

NI limit vs. AL-value for PC47RM10 gapped core (Typical)



Note: NI limit shows the point where the exciting current is 20% and 40% away from its extended linear part.

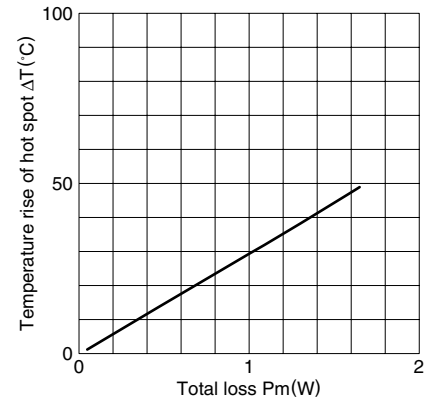
AL-value vs. Air gap length for PC47RM10 core (Typical)



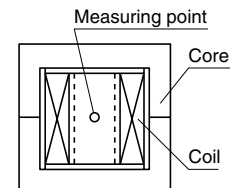
Measuring conditions

- Coil: $\phi 0.4$ 2UEW 100Ts
- Frequency: 1kHz
- Level: 0.5mA

Temperature rise vs. Total loss for RM10 core (Typical) (Ambient temperature: 25°C)

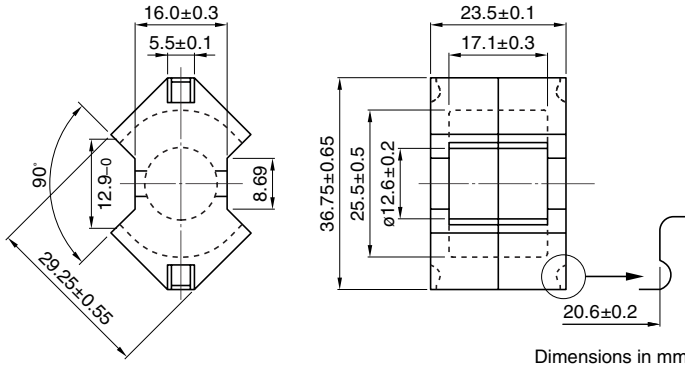


Note: The temperature rise is measured in the room whose temperature and humidity are fixed to 25°C and 45(%)RH, respectively. (approx. 400×300×300cm)



RM Series RM12 Cores

Based on JIS C 2516, IEC Publication 60431.



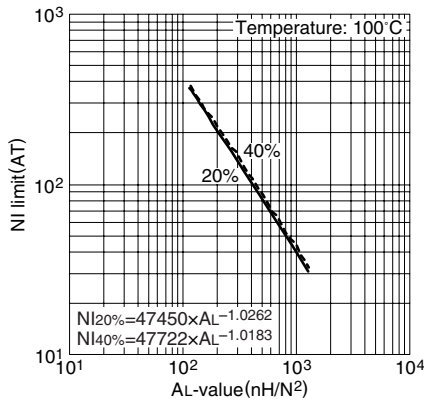
PARAMETER

| | | | |
|--|-----------------------|------------------|-------|
| Core factor | C1 | mm ⁻¹ | 0.406 |
| Effective magnetic path length | ℓ_e | mm | 56.9 |
| Effective cross-sectional area | A_e | mm ² | 140 |
| Effective core volume | V_e | mm ³ | 7960 |
| Cross-sectional center pole area | A_{cp} | mm ² | 125 |
| Minimum cross-sectional center pole area | $A_{cp \text{ min.}}$ | mm ² | 121 |
| Cross-sectional winding area of core | A_{cw} | mm ² | 110 |
| Weight (approx.) | | g | 42 |

| Part No. | AL-value (nH/N ²) | Core loss (W) at 100°C | Calculated output power |
|---------------------|---|------------------------|--------------------------|
| | | 100kHz, 200mT | (forward converter mode) |
| PC47RM12Z-12 | 4150 min. (1kHz, 0.5mA)* 9290 min. (100kHz, 200mT) | 3.00 max. | 466.2W (100kHz) |

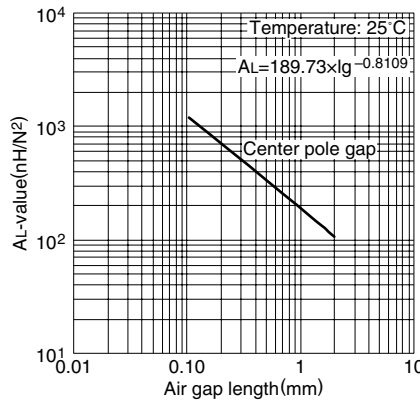
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value for PC47RM12 gapped core (Typical)



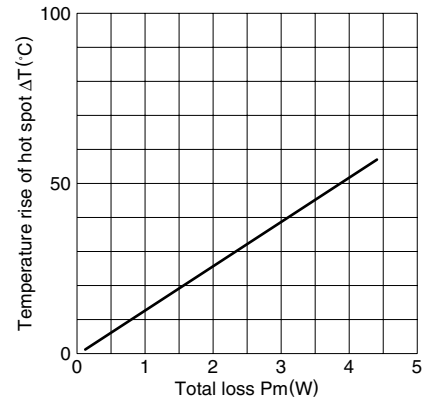
Note: NI limit shows the point where the exciting current is 20% and 40% away from its extended linear part.

AL-value vs. Air gap length for PC47RM12 core (Typical)

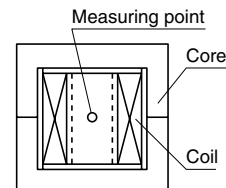


Measuring conditions • Coil: ø0.4 2UEW 100Ts
• Frequency: 1kHz
• Level: 0.5mA

Temperature rise vs. Total loss for RM12 core (Typical) (Ambient temperature: 25°C)

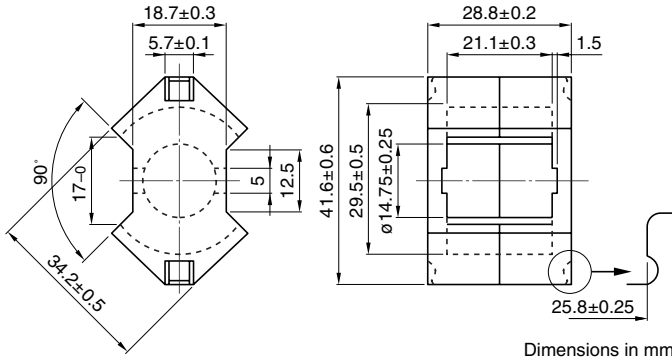


Note: The temperature rise is measured in the room whose temperature and humidity are fixed to 25°C and 45(%)RH, respectively. (approx. 400×300×300cm)



RM Series RM14 Cores

Based on JIS C 2516, IEC Publication 60431 and DIN 41980.



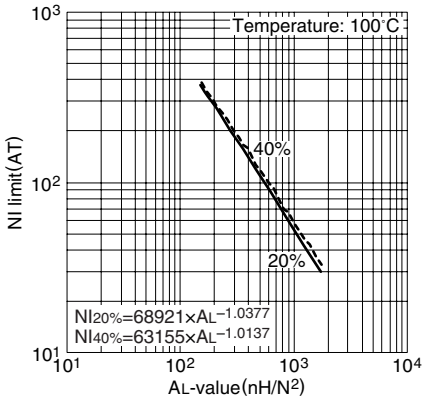
PARAMETER

| | | | |
|--|----------------------|------------------|-------|
| Core factor | C1 | mm ⁻¹ | 0.393 |
| Effective magnetic path length | ℓ _e | mm | 70.0 |
| Effective cross-sectional area | A _e | mm ² | 178 |
| Effective core volume | V _e | mm ³ | 12500 |
| Cross-sectional center pole area | A _{cp} | mm ² | 171 |
| Minimum cross-sectional center pole area | A _{cp min.} | mm ² | 165 |
| Cross-sectional winding area of core | A _{cw} | mm ² | 155 |
| Weight (approx.) | | g | 70 |

| Part No. | AL-value (nH/N ²) | Core loss (W) at 100°C 100kHz, 200mT | Calculated output power (forward converter mode) |
|---------------------|---|---|---|
| PC47RM14Z-12 | 4600 min. (1kHz, 0.5mA)* 9590 min. (100kHz, 200mT) | 4.60 max. | 462.6W (100kHz) |

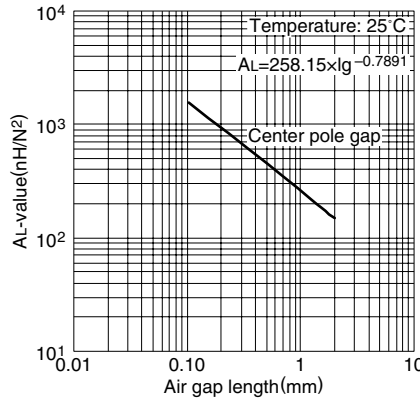
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value for PC47RM14 gapped core (Typical)



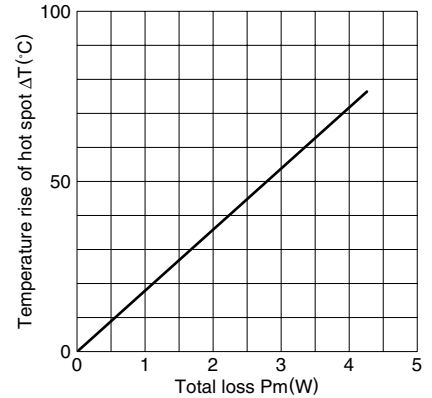
Note: NI limit shows the point where the exciting current is 20% and 40% away from its extended linear part.

AL-value vs. Air gap length for PC47RM14 core (Typical)



Measuring conditions • Coil: ø0.4 2UEW 100Ts
• Frequency: 1kHz
• Level: 0.5mA

Temperature rise vs. Total loss for RM14 core (Typical)
(Ambient temperature: 25°C)



Note: The temperature rise is measured in the room whose temperature and humidity are fixed to 25°C and 45(%)RH, respectively. (approx. 400×300×300cm)

