

CUT-CORES FOR HIGH POWER APPLICATIONS

PRODUCT SUMMARY

Description RC Series Cut cores are the ideal solutions for implementing energy chokes in several types of SMPS topologies even in high frequency ranges and high power ranges.

Significant component size reduction and / or increased power throughput is achieved using RC Series Amorphous Cut cores. RC Series Amorphous Cut cores made by iron based thin amorphous ribbon with high saturation level of 1.5T. with this high saturation level, RC Series Amorphous Cut cores enable up to 50% reduction in volume for typical applications compared more conventional materials like ferrite, sendust, iron powder and silicon steel. The thin ribbon reduces the unwanted eddy current losses at high frequencies. SHINHOM new technology on Cut core manufacturing ensures lower magnetic reversal losses than ever before.

RC Series amorphous Cut cores are being used in a growing number of high frequency power applications.

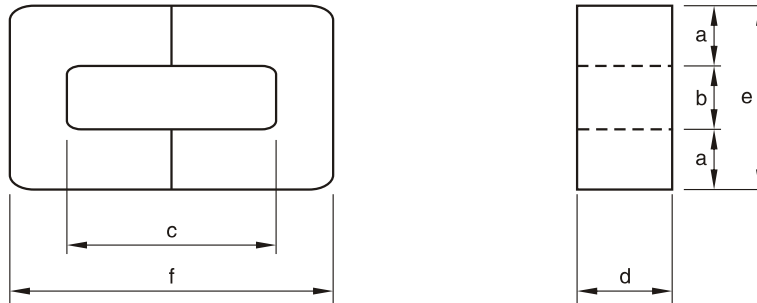
SHINHOM will offer a fully designed solutions and a customer oriented solutions with a free design service whenever you need it.

- Feature**
- Low eddy current losses
 - Low hysteresis losses
 - High efficiency
 - Low temperature rise
 - High saturation flux density $B_{\text{saturation}}=1.56\text{T}$
 - UL94V-0 compliant
 - UL Temp class F compliant

- Application**
- PFC chokes for power supplies
 - Output chokes for power supplies
 - PFC choke for UPS system
 - Harmonic choke for UPS system
 - PFC choke for home appliance & industrial air conditioning
 - Inverter choke for high power supplies
 - X-ray power supplies
 - Choke for induction furnaces
 - Choke for weight / efficiency sensitive applications in high speed rail car power supplies
 - Choke for induction furnaces

CUT-CORES FOR HIGH APPLICATIONS

STANDARD CORE DIMENSIONS & SPECIFICATIONS

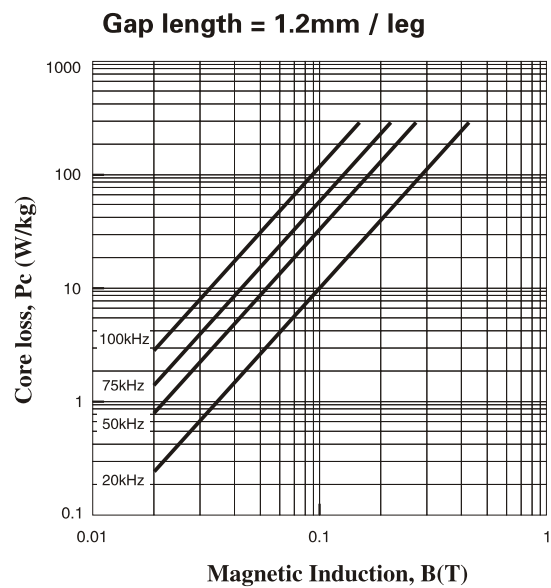
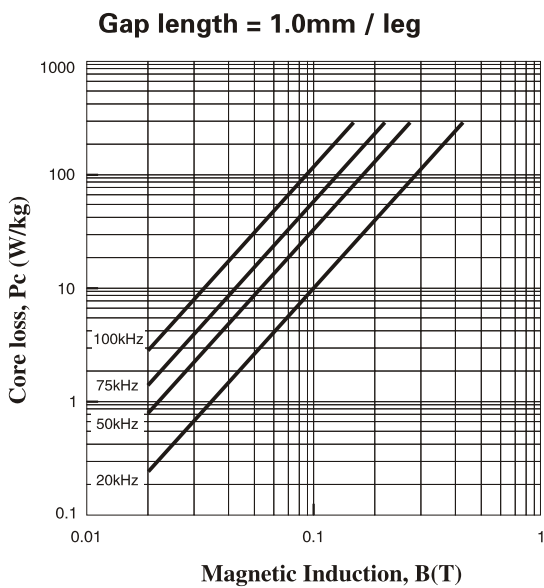
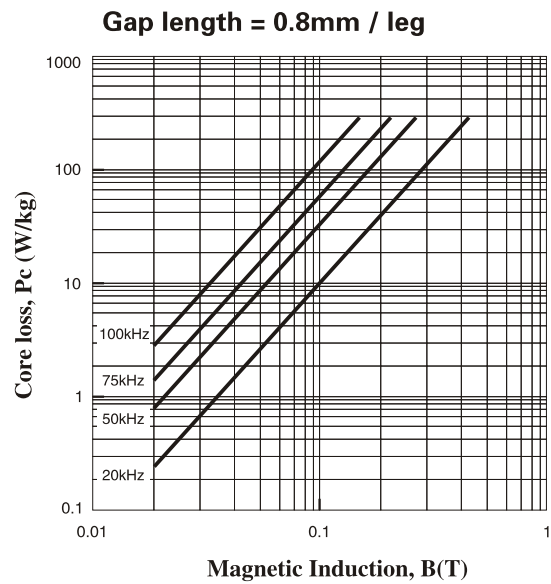
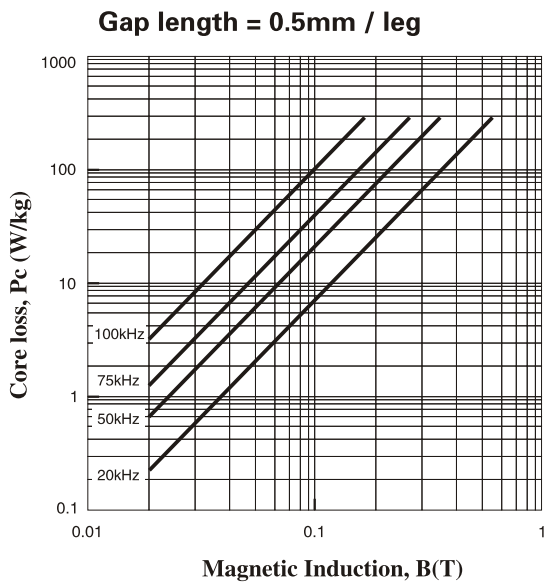


| Part Number | a | b | c | d | e | f | Mass | L_m (cm) | A_c (cm^2) | V_e (cm^3) | W_A (cm^2) | $W_A A_c$ (cm^4) |
|-------------|-----|-----|-----|----|------|-----|------|------------|------------------|------------------|------------------|----------------------|
| RC-4 | 9 | 10 | 33 | 15 | 29 | 51 | 95 | 11.5 | 1.0 | 13.20 | 3.4 | 3.5 |
| RC-6.3 | 10 | 11 | 33 | 20 | 31 | 53 | 150 | 13.1 | 1.6 | 20.86 | 3.6 | 5.8 |
| RC-6.3B | 9.9 | 9.7 | 33 | 20 | 29.5 | 53 | 145 | 12.9 | 1.6 | 20.61 | 3.2 | 5.1 |
| RC-8 | 11 | 13 | 30 | 20 | 35 | 52 | 170 | 13.2 | 1.8 | 23.64 | 3.9 | 7.0 |
| RC-10 | 11 | 13 | 40 | 20 | 35 | 62 | 200 | 15.4 | 1.8 | 27.82 | 5.2 | 9.4 |
| RC-16A | 11 | 13 | 40 | 25 | 35 | 62 | 250 | 15.1 | 2.3 | 34.77 | 5.2 | 12.0 |
| RC-16B | 11 | 13 | 50 | 25 | 35 | 72 | 280 | 16.9 | 2.3 | 38.94 | 6.5 | 15.0 |
| RC-20 | 11 | 13 | 50 | 30 | 35 | 72 | 340 | 17.5 | 2.7 | 47.29 | 6.5 | 17.6 |
| RC-25 | 13 | 15 | 56 | 25 | 41 | 82 | 380 | 19.6 | 2.7 | 52.85 | 8.4 | 22.7 |
| RC-32 | 13 | 15 | 56 | 30 | 41 | 82 | 460 | 20.0 | 3.2 | 63.89 | 8.4 | 26.9 |
| RC-40 | 13 | 15 | 56 | 35 | 41 | 82 | 530 | 19.9 | 3.7 | 73.71 | 8.4 | 31.1 |
| RC-50 | 16 | 20 | 70 | 25 | 52 | 102 | 590 | 24.9 | 3.3 | 82.06 | 14.0 | 46.2 |
| RC-63 | 16 | 20 | 70 | 30 | 52 | 102 | 710 | 25.3 | 3.9 | 98.75 | 14.0 | 54.6 |
| RC-80 | 16 | 20 | 70 | 40 | 52 | 102 | 950 | 25.4 | 5.2 | 132.13 | 14.0 | 72.8 |
| RC-100 | 16 | 20 | 70 | 45 | 52 | 102 | 1060 | 25.0 | 5.9 | 147.43 | 14.0 | 52.6 |
| RC-125 | 19 | 25 | 83 | 35 | 63 | 121 | 1170 | 30.2 | 5.4 | 162.73 | 20.8 | 112.1 |
| RC-160 | 19 | 25 | 83 | 40 | 63 | 121 | 1330 | 28.5 | 6.5 | 184.98 | 20.8 | 135.2 |
| RC-200 | 19 | 25 | 83 | 50 | 63 | 121 | 1670 | 29.8 | 7.8 | 232.27 | 20.8 | 162.2 |
| RC-250 | 19 | 25 | 90 | 60 | 63 | 128 | 2100 | 31.4 | 9.3 | 292.07 | 22.5 | 209.3 |
| RC-320 | 22 | 35 | 85 | 50 | 79 | 129 | 2170 | 32.5 | 9.0 | 301.81 | 29.8 | 267.8 |
| RC-500 | 25 | 40 | 85 | 55 | 90 | 135 | 2900 | 35.6 | 11.3 | 403.34 | 34.0 | 384.2 |
| RC-630 | 25 | 40 | 85 | 70 | 90 | 135 | 3670 | 35.6 | 14.3 | 510.43 | 34.0 | 486.2 |
| RC-800A | 25 | 40 | 85 | 85 | 90 | 135 | 4450 | 35.6 | 17.4 | 618.92 | 34.0 | 591.6 |
| RC-800B | 30 | 40 | 95 | 85 | 100 | 155 | 5930 | 39.3 | 21.0 | 824.76 | 38.0 | 798.0 |
| RC-1000 | 33 | 40 | 105 | 85 | 106 | 171 | 7060 | 42.7 | 23.0 | 981.92 | 42.0 | 966.0 |

All mechanical dimensions shows a nominal ones. Please consult sales department for tolerances.

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TYPICAL HYSTERESIS LOSS WITH GAP SIZE, $P_c(f, \mu)$

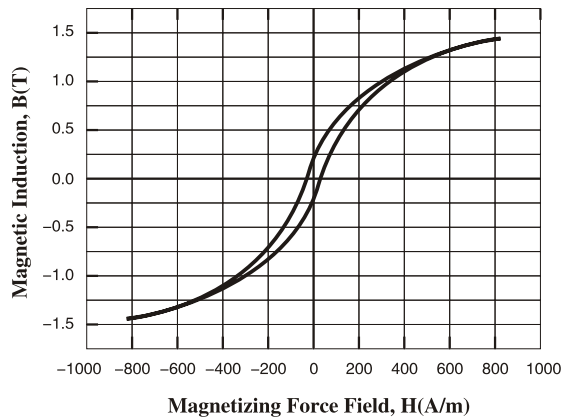


* Hysteresis losses are measured at room temperature, $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$

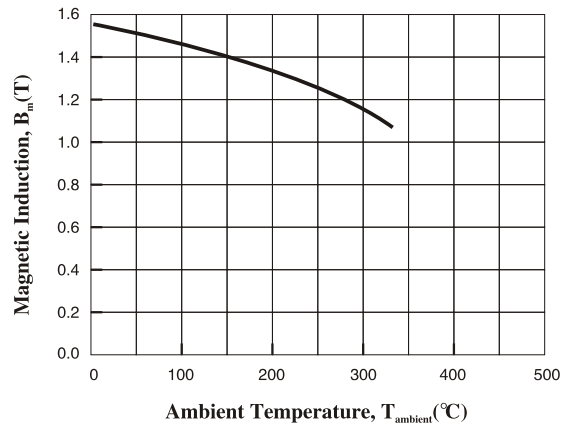
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TYPICAL MAGNETIC & ELECTRIC CHARACTERISTICS

Typical hysteresis loop shape

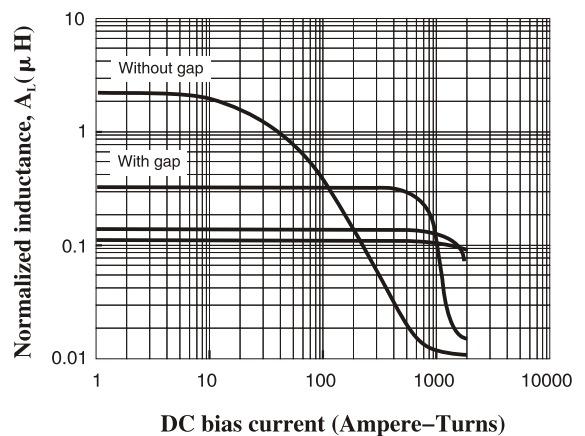
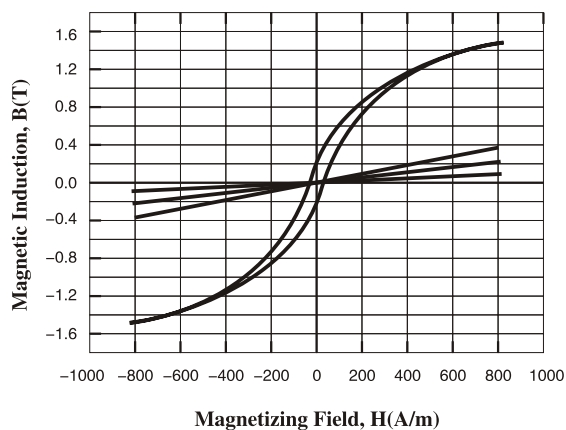


Temperature behavior of $B_m(T)$



* Without gap after cutting

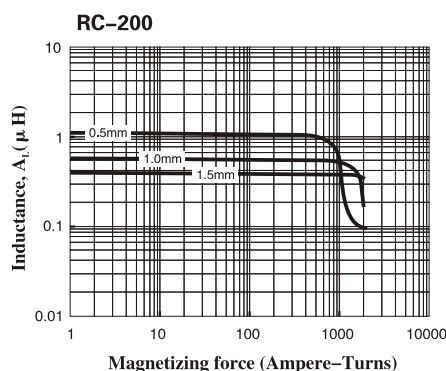
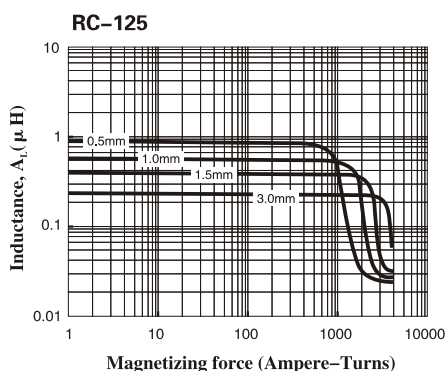
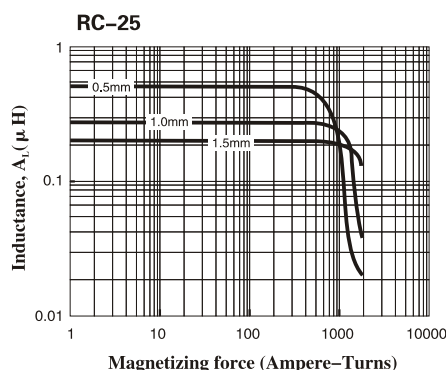
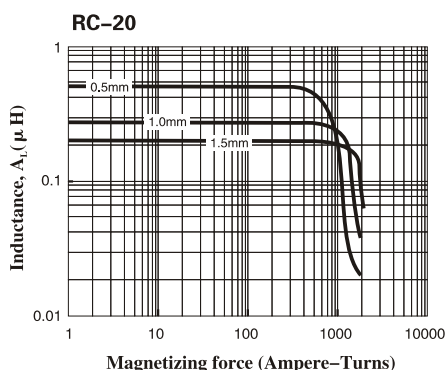
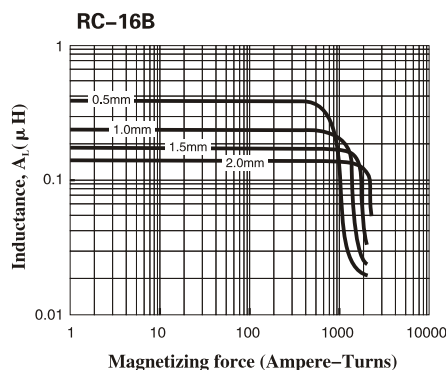
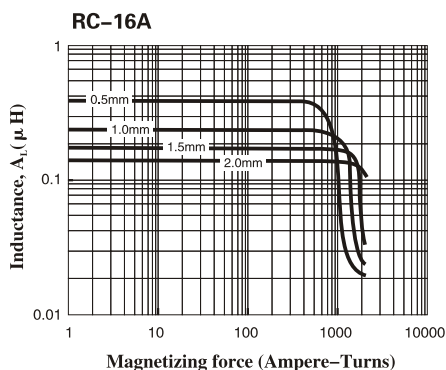
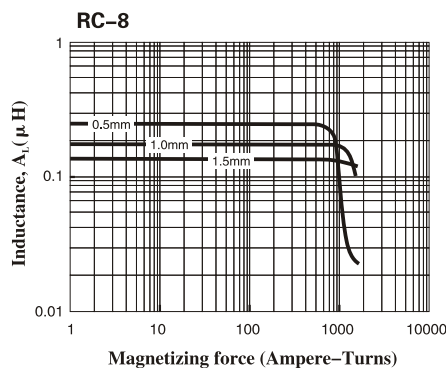
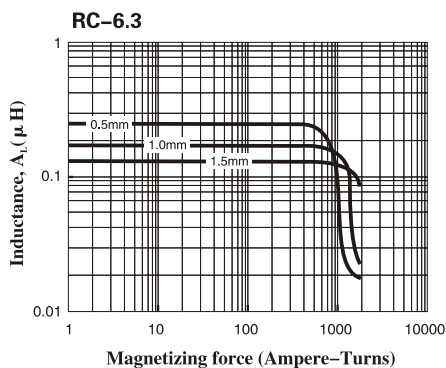
Typical hysteresis loop and it's corresponding DC Bias characteristics with gap



* These comparison shows a typical relations between B-H loop shaps and superimposed inductance behavior with gap
 * The DC bias properties depends on cross-section area, magnetic path length and wound structures of each Cut-cores.

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TYPICAL DC BIAS CHARACTERISTICS WITH GAP SIZE@10kHz



* Gap size(mm): total air gap size with both air gaps.