

Gapped Cores

How To Order

Part Number



Gap Code

The letter indicates the type of gap and a three-digit number defines the value.

CODE	MEANING	EXAMPLE
A_ _ _	A_L (if <1000)	DF42311 A275 ($A_L=275$)
X_ _ _	A_L if 1000 or greater (add 1000 to code)	OP44721 X250 ($A_L=1250$)
F_ _ _	A_L if <100, non-integer (divide code by 10)	OR42510 F807 ($A_L=80.7$)
G_ _ _	Depth of Grind in mils (1000 ^{ths} of an inch)	OF44317 G079 (Gap=0.079")
M_ _ _	Depth of Grind , mm (divide code by 10)	OF43019 M015 (Gap=1.5 mm)

A_L is inductance factor, mH/1000 Turns, or nH/T².

Either the A_L or the depth of grind (not both) is controlled during production of gapped cores.

See the chart on pages 14-15 for tolerances.

Gap-to-Gap vs Ungapped-to-Gap Core Sets

"Gap-to-gap combination" means the gap is symmetrical. Half of the total gap is removed from each piece.

"Ungapped-to-gap combination" means an asymmetrical gap; the entire gap is taken from one piece, and the other piece is ungapped.

For an E-core gapped to an A_L value when mated with the standard I-core, add "EI" to the end of the part number.

Gapping for A_L

In most applications, defining the gap with the A_L results in inductors with the least variation. Electrical measurement is inherently more precise, and compensation is made for variability in material permeability and core geometry.

When specifying and ordering E cores (including EC, EFD, EER, ETD, and Planar E cores) gapped to an A_L , it is important to note which cores are produced in gap-to-gap combination, because two gapped pieces are assembled to achieve the A_L . Alternatively, for E cores provided ungapped-to-gap, an ungapped piece must be used with a gapped piece to achieve the A_L . Pot, RS, DS, RM, PQ, and EP cores are sold as sets whether the combination is gap-to-gap or ungapped-to-gap.

A_L testing and limits are calculated to three significant digits, based on the normal value. For example, $A_L=99\pm3\%$ is interpreted as 96.0 Minimum, 99.0 Nominal, and 102.0 Maximum.

Magnetics tests gapped A_L values with full bobbins, usually 100 turns, or 250 turns for deep gaps. The drive level is low (5 Gauss) and the frequency is set low enough to avoid resonance effects. Measured inductance in an application may vary significantly from the theoretical value due to low turns, low bobbin fill, leakage effects, resonance effects, or elevated drive levels.

It is important for the users to verify the correlation between the test of the core and the specific test being applied to the inductor or transformer. Planar E cores, Planar RM, and Planar PQ cores are especially susceptible to correlation discrepancies.

Gapping for Depth of Grind

For parts ordered in pieces (E and I cores), the depth of grind is given for each piece.

For parts ordered in sets, the depth of grind is given as a total for the set, and may be ungapped-to-gap core pieces, or gap-to-gap. To make an ungapped-to-gap set, use one piece of each. For example, use OR41808G050 with OR41808EC for an asymmetrical gap of 0.050 ± 0.001 ". For the same gap, but symmetric, use two pieces of OR41808G025.

For deep gaps, however, better consistency often results when the depth of grind is specified. In such cases, variation in the finished inductor is dominated by the variation in the windings, especially if the number of turns is low.