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## T68-40

### Features

Good results of general power conversion and line filter administration.  
 Applicable (at <50kHz) for Power Factor Correction Chokes, DC Chokes and lower Et/N.  
 Also applies for 60 Hz differential-mode EMI Line Chokes, and light dimmer chokes.

#### Electrical Specifications

| Item                        | Unit/Symbol                                | Condition                                   | Value    | Tol.  |
|-----------------------------|--|---|----------|-------|
| A <sub>L</sub>              | nH/N <sup>2</sup>                          | AC flux density of 10 gauss (1 mT) @ 10 kHz | 35.0     | ± 10% |
| L <sub>e</sub>              | cm   | N/A   | 4.23     | Typ.  |
| A <sub>e</sub>              | cm <sup>2</sup>                            | N/A   | 0.179    | Typ.  |
| V <sub>e</sub>              | cm <sup>3</sup>                            | N/A   | 0.759    | Typ.  |
| Density                     | g/cm <sup>3</sup>                          | N/A   | 6.9      | Typ.  |
| Permeability                | μ <sub>0</sub>                             | N/A   | 60       | ± 10% |
| Permeability with DC BIAS   | %μ <sub>0</sub> , μ <sub>0</sub> effective | HDC = 50 Oersted                            | 62, 37.2 | Typ.  |
| Temp. Coef. of Permeability | +ppm/°C                                    | N/A   | 950      | Typ.  |
| Coef. of Lin. Expansion     | +ppm/°C                                    | N/A   | 11       | Typ.  |
| Thermal Conductivity        | mW/cm-°C                                   | N/A   | 36       | Typ.  |

| REVISION HISTORY |     |                    |             |        |     |        |
|------------------|-----|--------------------|-------------|--------|-----|--------|
| REV              | ECN | DESCRIPTION        | SIGN & DATE |        |     |        |
|                  |     |                    | BY          | DATE   | AP. | DATE   |
| A                |     | Production release | EO          | 3/7/13 | JL  | 3/7/13 |
|                  |     |                    |             |        |     |        |



| Case Dimensional Tolerances |        |       |       |      |
|-----------------------------|--------|-------|-------|------|
|                             | in     | tol.  | mm    | tol. |
| B (Outer Diameter)          | 0.690  | 0.020 | 17.50 | 0.51 |
| A (Inner Diameter)          | 0.370  | 0.020 | 9.40  | 0.51 |
| H (Height)                  | 0.190  | 0.020 | 4.83  | 0.51 |
| Weight                      | 5.24 g |       |       |      |

$$\text{Temperature Rise } \Delta T(^{\circ}\text{C}) = \left[ \frac{\text{Total Power Dissipation (milliwatts)}}{\text{Surface Area (cm}^2\text{)}} \right]^{0.833}$$

$$\text{Required turns} = \left[ \frac{\text{desired L (nH)}}{A_L \left( \frac{\text{nH}}{\text{N}^2} \right)} \right]^{\frac{1}{2}}$$

$$\text{Peak AC Flux Density: } B_{pk} = \frac{E_{avg} 10^8}{4ANf}$$

$$\text{Magnetizing Force: } H = \frac{0.4\pi NI}{\ell}$$

L = inductance  
 nH = nanohenries  
 H = oersteds (Oe)  
 N = Number of turns  
 I = Current (amperes)  
 ℓ = Mean Magnetic Path (cm)  
 A = Cross-sectional area (cm<sup>2</sup>)  
 f = frequency (hertz)  
 B<sub>pk</sub> = Gauss (G)

**For additional detail, specifications and charts see:**

[http://www.bytemark.com/products/IPCores\\_index.html](http://www.bytemark.com/products/IPCores_index.html)

| Core Loss in mW/cm <sup>3</sup> (extrapolated data from high frequency testing) |         |         |        |        |        |        |
|---|---------|---------|--------|--------|--------|--------|
| Frequency   | 60 Hz   | 1kHz    | 10kHz  | 50kHz  | 100kHz | 500kHz |
| Condition   | @ 5000G | @ 1500G | @ 500G | @ 225G | @ 140G | @ 50G  |
| Value   | 29      | 62      | 93     | 130    | 127    | 223    |

UNLESS OTHERWISE SPECIFIED  
 DIMENSIONING AND TOLERANCE PER ANSI Y14.5M  
 ALL DIMENSIONS ARE IN INCHES AND [MILLIMETERS].  
 TOLERANCE INCHES:  
 .XXX=±.005 .XX=±.015 <math>\angle=±0^{\circ}30'</math>  
 TOLERANCE METRICS:  
 .XXX=±.127 .XX=±.38 <math>\angle=±0^{\circ}30'</math>  
 ANGLE PROJECTION   
 DO NOT SCALE DRAWING

| CODE IDENT | MFG. P/N  | DESCRIPTION   | ITEM NO.  |
|------------|-----------|---|---|
| PARTS LIST |           |   |   |
| AUTOCAD    | X         | www.coilws.com<br>www.cwsbytemark.com   | CWSBYTEMARK<br>353 West Grove Ave. Orange, CA.<br>92865 |
| SOLIDWORKS |           |   |   |
| DRAWN      | EO 3/7/13 | TITLE: Iron Powder Core Material Mix 40,<br>Green/Yellow<br><br>SIZE DWG. NO. T68-40<br>SCALE N/A |   |
| CHECKED    | JL 3/7/13 |   |   |
| ENGR.      | JL 3/7/13 |   |   |
| APPR.      | JL 3/7/13 |   |   |
|            |           | REV   | A   |
|            |           | SHEET   | 1 OF 1  |