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## T12-2

### Features

Applies to high Q below 40 MHz, for utilization of band transformer range within 200-400 MHz

| Electrical Specifications |                   |           |        |      |
|---------------------------|-------------------|-----------|--------|------|
| Item                      | Unit/Symbol       | Condition | Value  | Tol. |
| A <sub>L</sub>            | nH/N <sup>2</sup> | Typ.      | 2.0    | ± 5% |
| L <sub>e</sub>            | cm                | N/A       | 0.75   | Typ. |
| A <sub>e</sub>            | cm <sup>2</sup>   | N/A       | 0.010  | Typ. |
| V <sub>e</sub>            | cm <sup>3</sup>   | N/A       | 0.0077 | Typ. |
| Material Density          | g/cm <sup>3</sup> | N/A       | 5.0    | Typ. |
| Permeability              | μ <sub>0</sub>    | N/A       | 10     | ± 5% |
| Temperature Stability     | +ppm/°C           | N/A       | 95     | Typ. |

| Resonant Circuit (---) and Broadband Frequency Range (+++) |             |          |            |             |             |          |           |            |             |             |                 |
|--|-------------|----------|------------|-------------|-------------|----------|-----------|------------|-------------|-------------|-----------------|
| Mix  | Range (MHz) | 2-50 KHz | 50-250 KHz | 250-500 KHz | 500KHz-2MHz | 2-10 MHz | 10-40 MHz | 40-150 MHz | 150-250 MHz | 250-500 MHz | 500 MHz to 1GHz |
| 42   | 0.3-80      | -----    |            |             |             |          |           |            |             |             |                 |
| 3  | 0.02-1      | -----    |            |             |             |          |           |            |             |             |                 |
| 8  | 0.02-1      | -----    |            |             |             | +++++    |           |            |             |             |                 |
| 1  | 0.15-3      |          | -----      |             |             |          |           |            | +++++       |             |                 |
| 15   | 0.15-3      |          | -----      |             |             |          |           |            |             |             |                 |
| 2  | 0.25-10     |          | -----      |             |             |          |           |            |             |             |                 |
| 7  | 1-25        |          |            | -----       |             |          |           |            |             |             |                 |
| 4  | 3-40        |          |            |             | -----       |          |           |            |             |             |                 |
| 6  | 3-40        |          |            |             |             | -----    |           |            | +++++       |             |                 |
| 10   | 15-100      |          |            |             |             |          | -----     |            |             | +++++       |                 |
| 17   | 20-200      |          |            |             |             |          |           | -----      |             |             |                 |
| 12   | 30-250      |          |            |             |             |          |           |            |             |             |                 |
| 0  | 50-350      |          |            |             |             |          |           |            |             |             | +++++           |

| 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)          | 0.125 | 0.005 | 3.18 | 0.13 |
| A (Inner Diameter)          | 0.062 | 0.005 | 1.57 | 0.13 |
| H (Height)                  | 0.050 | 0.005 | 1.27 | 0.13 |
| Weight 0.04 g               |       |       |      |      |

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

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

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

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

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)

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

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

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

| CODE IDENT        | MFG. P/N  | DESCRIPTION   | ITEM NO.  |
|-------------------|-----------|---|---|
| <b>PARTS LIST</b> |           |   |   |
| 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 | <b>TITLE: Iron Powder Core: Material Mix 2<br/>           (Carbonyl E), Red/Clear</b> |   |
| CHECKED           | JL 3/7/13 |   |   |
| ENGR.             | JL 3/7/13 |   |   |
| APPR.             | JL 3/7/13 |   |   |
| SIZE DWG. NO.     |           | T12-2   | REV   |
| SCALE             |           |   | N/A   |
|                   |           | SHEET   | 1 OF 1  |