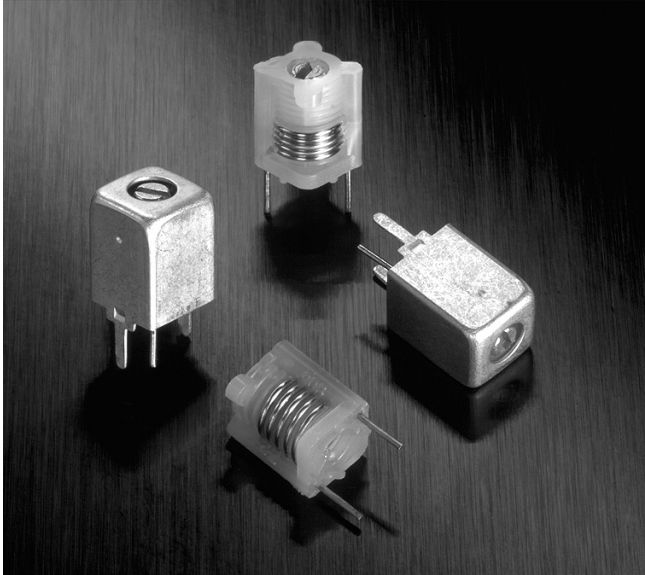




# 5 mm Tunable Inductor-164, 165 Series



- These tunables offer the compactness of a 5 mm coil and the low drift reliability of an insert molded coil.
- Inductance values from 9 to over 280 nH
- Optional plated brass cans provide integral shielding.
- Can be ordered without cores for use as fixed inductors.

**Designer's Kit M305** contains 2 each of all parts

**Core material** Aluminum, 0.187" (4.75 mm) long.

**Terminations** Leads: RoHS compliant tin-silver over copper. Other terminations available at additional cost. Shield can tabs: Tin-silver over nickel over brass

**Weight**

164 series unshielded: 0.16 – 0.31 g; with shield can: 0.45 – 0.60 g  
165 series unshielded: 0.15 – 0.25 g; with shield can: 0.43 – 0.54 g

**Ambient temperature** –40°C to +85°C

**Storage temperature** Component: –40°C to +85°C.

Packaging tubes: –40°C to +80°C

**Resistance to soldering heat:** Wave solder only. Recommended maximum board surface temperature of 168°C (334°F) for no more than three seconds. Pre-heating is recommended to minimize time over the solder nozzle.

**Moisture Sensitivity Level (MSL)** 1 (unlimited floor life at <30°C / 85% relative humidity)

**Failures in Time (FIT) / Mean Time Between Failures (MTBF)**

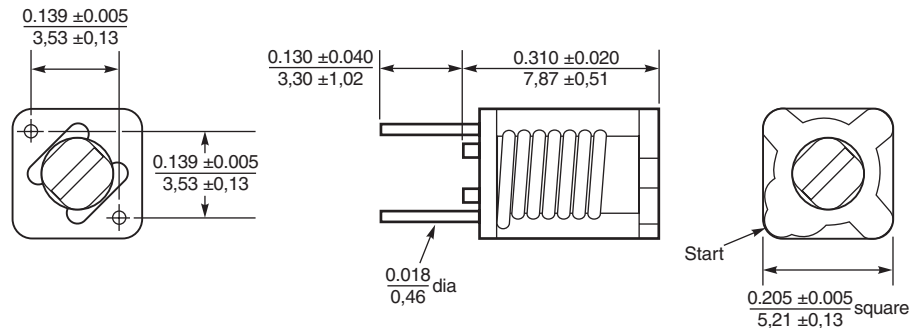
Two per billion hours / 1/2 billion hours, calculated per Telcordia SR-332

**Packaging** 50 parts per tube

**PCB washing** Tested with pure water or alcohol only. For other solvents, see Doc787\_PCB\_Washing.pdf.

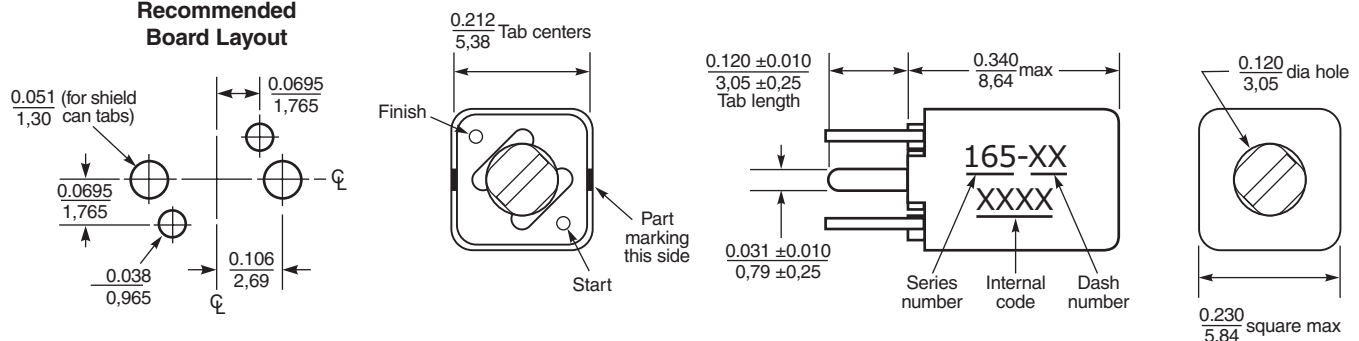
**TRITUNER** 3 TOOLS IN 1  
**TUNING WRENCH** SEE INDEX

## Unshielded Styles



## Shielded Styles

**Recommended Board Layout**





# 5 mm Tunable Inductor–Unshielded

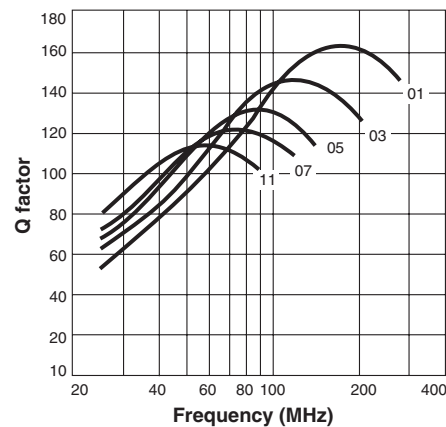
| Part number <sup>1</sup> | Color  | Turns  | No core             |                    | at L max <sup>3</sup> |                    | at L min <sup>4</sup> |                    | Freq (MHz) | No core SRF min (MHz) | Irms <sup>6</sup> (A) |
|--------------------------|--------|--------|---------------------|--------------------|-----------------------|--------------------|-----------------------|--------------------|------------|-----------------------|-----------------------|
|                          |        |        | L (nH) <sup>2</sup> | Q min <sup>5</sup> | L (nH) <sup>2</sup>   | Q min <sup>5</sup> | L (nH) <sup>2</sup>   | Q min <sup>5</sup> |            |                       |                       |
| 164-01A06L               | Brown  | 1 1/2  | 19                  | 145                | 19                    | 145                | 16                    | 112                | 150        | 2000                  | 7.2                   |
| 164-02A06L               | Red    | 2 1/2  | 34                  | 138                | 34                    | 138                | 26                    | 96                 | 150        | 1260                  | 5.1                   |
| 164-03A06L               | Orange | 3 1/2  | 55                  | 130                | 55                    | 130                | 38                    | 79                 | 150        | 960                   | 4.4                   |
| 164-04A06L               | Yellow | 4 1/2  | 77                  | 119                | 77                    | 119                | 52                    | 72                 | 150        | 850                   | 3.7                   |
| 164-05A06L               | Green  | 5 1/2  | 101                 | 108                | 99                    | 86                 | 65                    | 64                 | 150        | 770                   | 3.6                   |
| 164-06A06L               | Blue   | 6 1/2  | 128                 | 107                | 126                   | 75                 | 83                    | 60                 | 100        | 730                   | 3.3                   |
| 164-07A06L               | Violet | 7 1/2  | 156                 | 106                | 150                   | 68                 | 97                    | 57                 | 100        | 640                   | 3.1                   |
| 164-08A06L               | Gray   | 8 1/2  | 183                 | 100                | 178                   | 62                 | 112                   | 53                 | 100        | 570                   | 2.9                   |
| 164-09A06L               | White  | 9 1/2  | 216                 | 100                | 190                   | 62                 | 131                   | 53                 | 100        | 540                   | 2.7                   |
| 164-10A06L               | Black  | 10 1/2 | 248                 | 92                 | 223                   | 55                 | 148                   | 51                 | 100        | 490                   | 2.5                   |
| 164-11A06L               | Brown  | 11 1/2 | 281                 | 92                 | 246                   | 55                 | 170                   | 51                 | 100        | 360                   | 2.3                   |
| 165-00A06L               | Black  | 1 1/2  | 9                   | 147                | 9                     | 147                | 9                     | 131                | 150        | 6000                  | 8.1                   |
| 165-01A06L               | Brown  | 1 1/2  | 18                  | 145                | 18                    | 145                | 15                    | 112                | 150        | 2850                  | 6.5                   |
| 165-02A06L               | Red    | 2 1/2  | 32                  | 143                | 32                    | 143                | 25                    | 92                 | 150        | 1860                  | 4.9                   |
| 165-03A06L               | Orange | 3 1/2  | 48                  | 138                | 45                    | 135                | 33                    | 84                 | 150        | 1410                  | 4.2                   |
| 165-04A06L               | Yellow | 4 1/2  | 64                  | 133                | 60                    | 114                | 43                    | 76                 | 150        | 1130                  | 3.8                   |
| 165-05A06L               | Green  | 5 1/2  | 83                  | 125                | 78                    | 110                | 54                    | 73                 | 150        | 820                   | 3.6                   |
| 165-06A06L               | Blue   | 6 1/2  | 103                 | 120                | 90                    | 94                 | 68                    | 70                 | 150        | 800                   | 3.4                   |
| 165-07A06L               | Violet | 7 1/2  | 122                 | 115                | 105                   | 92                 | 79                    | 69                 | 150        | 770                   | 3.1                   |

## Notes:

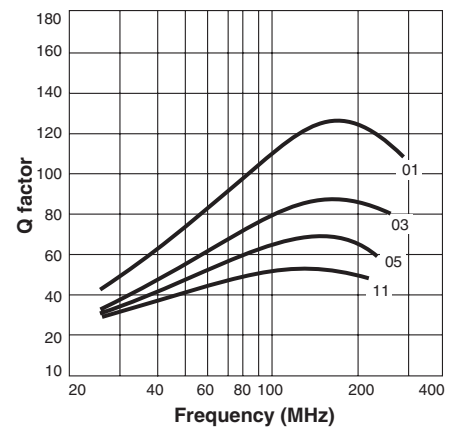
- To order fixed inductance parts without cores, eliminate the "A06", e.g. 164-01.
- Inductance measured on Agilent/HP 4286A Impedance Analyzer with 16092A Spring Clip Fixture.
- L max measured with core halfway out top of form.
- L min measured with core centered in winding.
- Q measured on Agilent/HP 4286A with 16092A fixture, direct connect to Agilent/HP 4342A Q-Meter and Meguro MQ-171 Q-Meter with 0.5" bus bars.
- Current that causes a 15°C rise above 25°C ambient.
- Electrical specifications 25°C.

## Typical Q vs Frequency

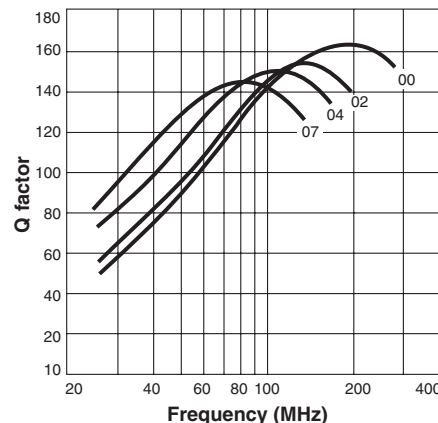
### 164 Series No Core



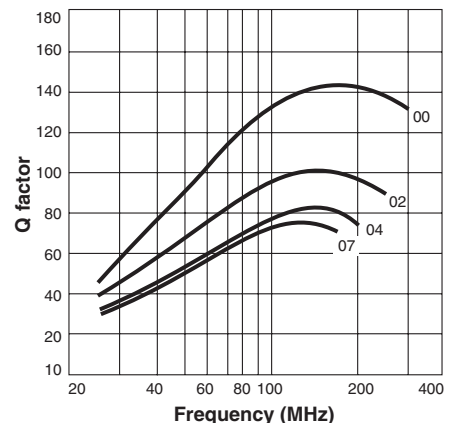
### 164 Series Al Core



### 165 Series No Core



### 165 Series Al Core



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# 5 mm Tunable Inductor–Shielded

**TRITUNER** 3 TOOLS IN 1  
SEE INDEX  
**TUNING WRENCH**

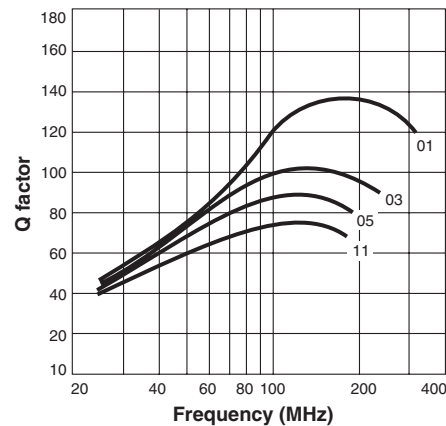
| Part number <sup>1</sup> | Color  | Turns  | No core             |                    | at L max <sup>3</sup> |                    | at L min <sup>4</sup> |                    | Freq (MHz) | No core SRF min (MHz) | Irms <sup>6</sup> (A) |
|--------------------------|--------|--------|---------------------|--------------------|-----------------------|--------------------|-----------------------|--------------------|------------|-----------------------|-----------------------|
|                          |        |        | L (nH) <sup>2</sup> | Q min <sup>5</sup> | L (nH) <sup>2</sup>   | Q min <sup>5</sup> | L (nH) <sup>2</sup>   | Q min <sup>5</sup> |            |                       |                       |
| 164-01A06SL              | Brown  | 1 1/2  | 16                  | 124                | 16                    | 124                | 14                    | 106                | 150        | 2100                  | 7.2                   |
| 164-02A06SL              | Red    | 2 1/2  | 27                  | 108                | 27                    | 108                | 22                    | 89                 | 150        | 1300                  | 5.1                   |
| 164-03A06SL              | Orange | 3 1/2  | 41                  | 92                 | 41                    | 92                 | 32                    | 72                 | 150        | 1100                  | 4.4                   |
| 164-04A06SL              | Yellow | 4 1/2  | 56                  | 86                 | 56                    | 84                 | 43                    | 66                 | 150        | 940                   | 3.7                   |
| 164-05A06SL              | Green  | 5 1/2  | 71                  | 80                 | 71                    | 79                 | 53                    | 60                 | 150        | 980                   | 3.6                   |
| 164-06A06SL              | Blue   | 6 1/2  | 88                  | 79                 | 80                    | 77                 | 65                    | 59                 | 150        | 800                   | 3.3                   |
| 164-07A06SL              | Violet | 7 1/2  | 105                 | 75                 | 101                   | 70                 | 76                    | 54                 | 100        | 750                   | 3.1                   |
| 164-08A06SL              | Gray   | 8 1/2  | 122                 | 74                 | 117                   | 64                 | 87                    | 54                 | 100        | 580                   | 2.9                   |
| 164-09A06SL              | White  | 9 1/2  | 141                 | 71                 | 134                   | 62                 | 100                   | 53                 | 100        | 550                   | 2.7                   |
| 164-10A06SL              | Black  | 10 1/2 | 160                 | 69                 | 150                   | 60                 | 113                   | 51                 | 100        | 490                   | 2.5                   |
| 164-11A06SL              | Brown  | 11 1/2 | 179                 | 69                 | 164                   | 60                 | 127                   | 51                 | 100        | 400                   | 2.3                   |
| 165-00A06SL              | Black  | 1 1/2  | 9                   | 138                | 9                     | 138                | 9                     | 121                | 150        | 6000                  | 8.1                   |
| 165-01A06SL              | Brown  | 1 1/2  | 16                  | 124                | 16                    | 124                | 14                    | 104                | 150        | 2570                  | 6.5                   |
| 165-02A06SL              | Red    | 2 1/2  | 25                  | 110                | 25                    | 110                | 21                    | 87                 | 150        | 1670                  | 4.9                   |
| 165-03A06SL              | Orange | 3 1/2  | 35                  | 104                | 33                    | 102                | 28                    | 78                 | 150        | 1230                  | 4.2                   |
| 165-04A06SL              | Yellow | 4 1/2  | 46                  | 97                 | 41                    | 90                 | 35                    | 69                 | 150        | 1150                  | 3.8                   |
| 165-05A06SL              | Green  | 5 1/2  | 57                  | 92                 | 50                    | 82                 | 43                    | 67                 | 150        | 820                   | 3.6                   |
| 165-06A06SL              | Blue   | 6 1/2  | 68                  | 86                 | 59                    | 75                 | 52                    | 65                 | 150        | 800                   | 3.4                   |
| 165-07A06SL              | Violet | 7 1/2  | 80                  | 85                 | 70                    | 74                 | 60                    | 64                 | 150        | 770                   | 3.1                   |

## Notes:

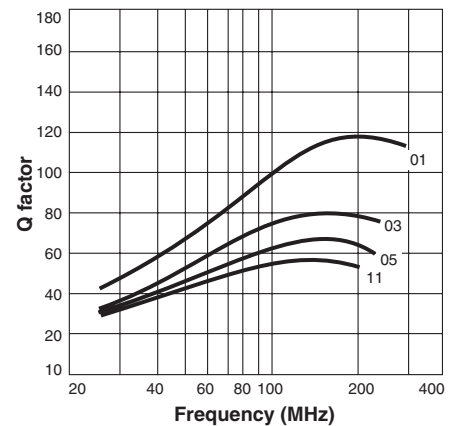
- To order fixed inductance parts without cores, eliminate the "A06", e.g. 164-01S.
- Inductance measured on Agilent/HP 4286A Impedance Analyzer with 16092A Spring Clip Fixture.
- L max measured with core halfway out top of form.
- L min measured with core centered in winding.
- Q measured on Agilent/HP 4286A with 16092A fixture, direct connect to Agilent/HP 4342A Q-Meter and Meguro MQ-171 Q-Meter with 0.5" bus bars.
- Current that causes a 15°C rise above 25°C ambient.
- Electrical specifications 25°C.

## Typical Q vs Frequency

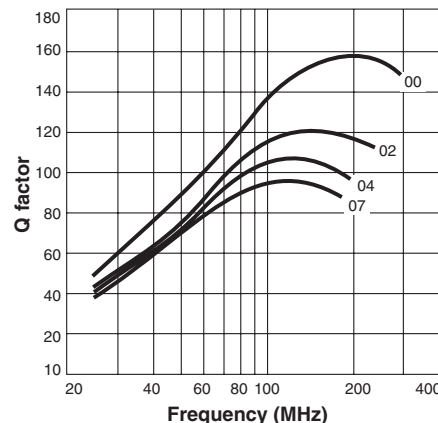
### 164 Series No Core



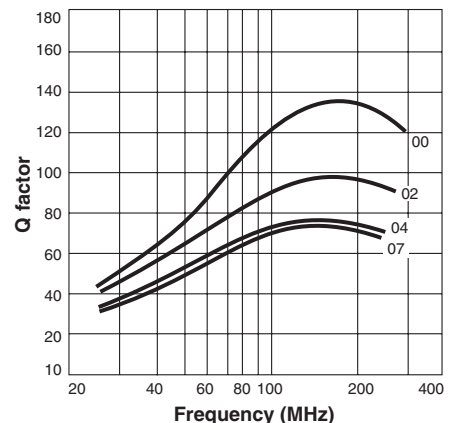
### 164 Series Al Core



### 165 Series No Core



### 165 Series Al Core



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