

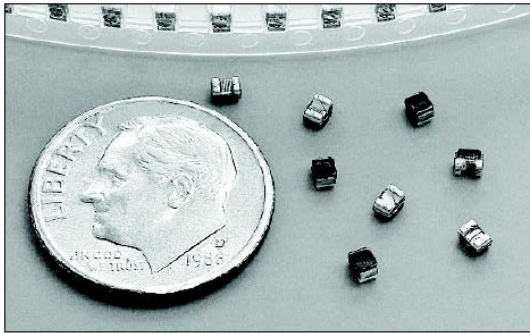
*Network PBU*







## **RF Chip Inductors**

*Wire-Wound-0603 Series*

# Wire Wound RF Chip Inductors

0603CD Series



-  Wire wound ceramic core construction
-  High Q values
-  High self resonant frequency
-  Temperature Range -40°C to +125°C
-  Industry 0603 (1608) size and surface mount land pattern
-  100% Tin Solder Termination

Electrical Specifications @ 25°C - Operating Temperature Range -40°C to +125°C

| Part Number<br>Tolerance +/-2% | Part Number<br>Tolerance +/-5% | Inductance1<br>(nH) | Q 2<br>(MIN) | SRF 3<br>(MHz MIN) | RDC 4<br>(Ω MAX) | IDC 5<br>(mA MAX) |
|--------------------------------|--------------------------------|---------------------|--------------|--------------------|------------------|-------------------|
| N/A                            | PE-0603CD010JTT                | 1.7 @ 250MHz        | 16 @ 250MHz  | >6000              | 0.050            | 700               |
| N/A                            | PE-0603CD1N8JTT                | 1.8 @ 250MHz        | 16 @ 250MHz  | >6000              | 0.045            | 700               |
| N/A                            | PE-0603CD2N2JTT                | 2.2 @ 250MHz        | 18 @ 250MHz  | >6000              | 0.011            | 700               |
| PE-0603CD3N3GTT                | PE-0603CD3N3JTT                | 3.3 @ 250MHz        | 35 @ 250MHz  | >6000              | 0.045            | 700               |
| PE-0603CD3N6GTT                | PE-0603CD3N6JTT                | 3.6 @ 250MHz        | 20 @ 250MHz  | >6000              | 0.070            | 700               |
| PE-0603CD030GTT                | PE-0603CD030JTT                | 3.9 @ 250MHz        | 20 @ 250MHz  | >6000              | 0.080            | 700               |
| PE-0603CD4N3GTT                | PE-0603CD4N3JTT                | 4.3 @ 250MHz        | 20 @ 250MHz  | >6000              | 0.102            | 700               |
| PE-0603CD040GTT                | PE-0603CD040JTT                | 4.55 @ 250MHz       | 20 @ 250MHz  | 5800               | 0.106            | 700               |
| PE-0603CD4N7GTT                | PE-0603CD4N7JTT                | 4.7 @ 250MHz        | 20 @ 250MHz  | 5800               | 0.116            | 700               |
| PE-0603CD5N1GTT                | PE-0603CD5N1JTT                | 5.1 @ 250MHz        | 20 @ 250MHz  | 2700               | 0.108            | 700               |
| PE-0603CD5N6GTT                | PE-0603CD5N6JTT                | 5.6 @ 250MHz        | 25 @ 250MHz  | 5500               | 0.108            | 700               |
| PE-0603CD6N2GTT                | PE-0603CD6N2JTT                | 6.2 @ 250MHz        | 25 @ 250MHz  | 5800               | 0.110            | 700               |
| PE-0603CD060GTT                | PE-0603CD060JTT                | 6.68 @ 250MHz       | 25 @ 250MHz  | 5800               | 0.110            | 700               |
| PE-0603CD6N8GTT                | PE-0603CD6N8JTT                | 6.8 @ 250MHz        | 27 @ 250MHz  | 5800               | 0.110            | 700               |
| PE-0603CD7N5GTT                | PE-0603CD7N5JTT                | 7.5 @ 250MHz        | 28 @ 250MHz  | 4800               | 0.150            | 700               |
| PE-0603CD080GTT                | PE-0603CD080JTT                | 8.2 @ 250MHz        | 30 @ 250MHz  | 4600               | 0.120            | 700               |
| PE-0603CD8N7GTT                | PE-0603CD8N7JTT                | 8.7 @ 250MHz        | 28 @ 250MHz  | 4600               | 0.109            | 700               |
| PE-0603CD9N5GTT                | PE-0603CD9N5JTT                | 9.5 @ 250MHz        | 28 @ 250MHz  | 5400               | 0.135            | 700               |
| PE-0603CD100GTT                | PE-0603CD100JTT                | 10.0 @ 250MHz       | 30 @ 250MHz  | 4800               | 0.130            | 700               |
| PE-0603CD110GTT                | PE-0603CD110JTT                | 11.0 @ 250MHz       | 30 @ 250MHz  | 4000               | 0.086            | 700               |
| PE-0603CD120GTT                | PE-0603CD120JTT                | 12.0 @ 250MHz       | 50 @ 250MHz  | 4000               | 0.130            | 700               |
| PE-0603CD130GTT                | PE-0603CD130JTT                | 13.0 @ 250MHz       | 45 @ 250MHz  | 3600               | 0.106            | 700               |
| PE-0603CD150GTT                | PE-0603CD150JTT                | 15.0 @ 250MHz       | 45 @ 250MHz  | 4000               | 0.170            | 700               |
| PE-0603CD160GTT                | PE-0603CD160JTT                | 16.0 @ 250MHz       | 45 @ 250MHz  | 3300               | 0.170            | 700               |
| PE-0603CD180GTT                | PE-0603CD180JTT                | 18.0 @ 250MHz       | 35 @ 250MHz  | 3100               | 0.170            | 700               |

# Wire Wound RF Chip Inductors

0603CD Series

## Electrical Specifications @ 25°C - Operating Temperature Range -40°C to +125°C (continued)

| Part Number <sup>6</sup><br>Tolerance +/-2% | Part Number <sup>6</sup><br>Tolerance +/-5% | Inductance <sup>1</sup><br>(nH) | Q <sup>2</sup><br>(MIN) | SRF <sup>3</sup><br>(MHz MIN) | RDC <sup>4</sup><br>(Ω MAX) | IDC <sup>5</sup><br>(mA MAX) |
|---|---|---------------------------------|-------------------------|-------------------------------|-----------------------------|------------------------------|
| PE-0603CD220GTT                             | PE-0603CD220JTT                             | 22.0 @ 250MHz                   | 35 @ 250MHz             | 3000                          | 0.19                        | 700                          |
| PE-0603CD270GTT                             | PE-0603CD270JTT                             | 27.0 @ 250MHz                   | 35 @ 250MHz             | 2800                          | 0.22                        | 600                          |
| PE-0603CD300GTT                             | PE-0603CD300JTT                             | 30.0 @ 250MHz                   | 37 @ 250MHz             | 2250                          | 0.44                        | 600                          |
| PE-0603CD330GTT                             | PE-0603CD330JTT                             | 33.0 @ 250MHz                   | 35 @ 250MHz             | 2300                          | 0.22                        | 600                          |
| PE-0603CD360GTT                             | PE-0603CD360JTT                             | 36.0 @ 250MHz                   | 37 @ 250MHz             | 2080                          | 0.25                        | 600                          |
| PE-0603CD390GTT                             | PE-0603CD390JTT                             | 39.0 @ 250MHz                   | 35 @ 250MHz             | 2200                          | 0.25                        | 600                          |
| PE-0603CD430GTT                             | PE-0603CD430JTT                             | 43.0 @ 250MHz                   | 35 @ 200MHz             | 2000                          | 0.28                        | 600                          |
| PE-0603CD470GTT                             | PE-0603CD470JTT                             | 47.0 @ 250MHz                   | 35 @ 100MHz             | 2000                          | 0.28                        | 600                          |
| PE-0603CD560GTT                             | PE-0603CD560JTT                             | 56.0 @ 250MHz                   | 35 @ 200MHz             | 1900                          | 0.31                        | 600                          |
| PE-0603CD680GTT                             | PE-0603CD680JTT                             | 68.0 @ 250MHz                   | 35 @ 200MHz             | 1700                          | 0.34                        | 600                          |
| PE-0603CD720GTT                             | PE-0603CD720JTT                             | 72.0 @ 250MHz                   | 34 @ 150MHz             | 1700                          | 0.49                        | 400                          |
| PE-0603CD820GTT                             | PE-0603CD820JTT                             | 82.0 @ 250MHz                   | 34 @ 150MHz             | 1700                          | 0.54                        | 400                          |
| PE-0603CD101GTT                             | PE-0603CD101JTT                             | 98.5 @ 250MHz                   | 34 @ 150MHz             | 1400                          | 0.58                        | 400                          |
| PE-0603CDR10GTT                             | PE-0603CDR10JTT                             | 100 @ 250MHz                    | 34 @ 150MHz             | 1400                          | 0.58                        | 400                          |
| PE-0603CD111GTT                             | PE-0603CD111JTT                             | 110 @ 250MHz                    | 33 @ 150MHz             | 1300                          | 0.61                        | 300                          |
| PE-0603CD121GTT                             | PE-0603CD121JTT                             | 120 @ 250MHz                    | 32 @ 150MHz             | 1300                          | 0.65                        | 300                          |
| PE-0603CD151GTT                             | PE-0603CD151JTT                             | 150 @ 250MHz                    | 28 @ 150MHz             | 990                           | 0.92                        | 280                          |
| PE-0603CD181GTT                             | PE-0603CD181JTT                             | 180 @ 250MHz                    | 25 @ 100MHz             | 990                           | 1.25                        | 240                          |
| PE-0603CD201GTT                             | PE-0603CD201JTT                             | 200 @ 250MHz                    | 25 @ 100MHz             | 900                           | 1.98                        | 240                          |
| PE-0603CD221GTT                             | PE-0603CD221JTT                             | 220 @ 250MHz                    | 25 @ 100MHz             | 900                           | 1.90                        | 200                          |
| PE-0603CD271GTT                             | PE-0603CD271JTT                             | 270 @ 250MHz                    | 24 @ 100MHz             | 860                           | 2.30                        | 170                          |
| PE-0603CD331GTT                             | PE-0603CD331JTT                             | 330 @ 250MHz                    | 22 @ 100MHz             | 500                           | 2.30                        | 150                          |
| PE-0603CD391GTT                             | PE-0603CD391JTT                             | 390 @ 250MHz                    | 20 @ 100MHz             | 350                           | 2.90                        | 130                          |

### Notes:

1. Inductance measured using a HP4286A RF Impedance Analyzer. (Please note that inductance information is not stamped on part, because of the extremely small size).
2. Q measured using a HP4291A RF Impedance Analyzer with a HP16193A Test Fixture.
3. SRF measured using a HP8753C Network Analyzer.
4. RDC measured using a Valhalla Scientific model 4100 ATC Digital Ohmmeter.
5. Based on a 15°C maximum temperature rise  
- see also specific application note on operation temperature
6. Check ordered tolerance band carefully:  
To order a +/-2% tolerance band the ordering code ends with "GTT"  
while any +/-5% tolerance band ends with "JTT" .

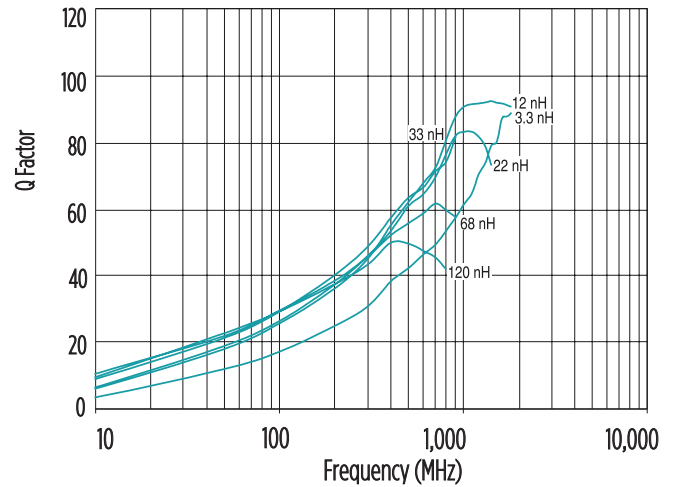
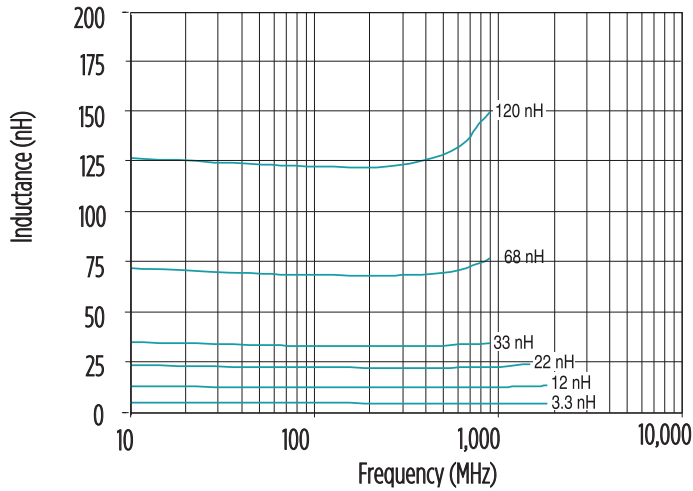
### Specific Application note on operational temperature:

1. Operating Temperature range -40°C to +125°C includes a +40°C self rise above +85°C ambient.
2. Part temperature should not exceed +125°C under worst case conditions

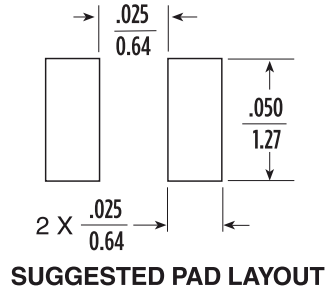
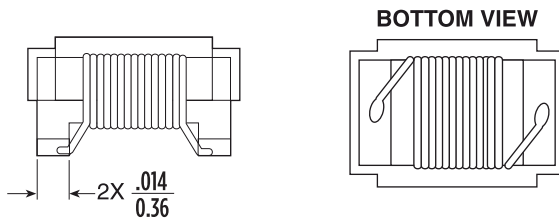
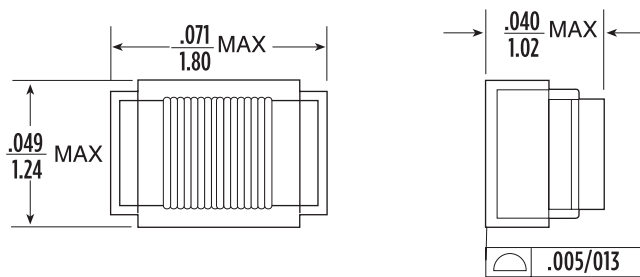
Circuit design, variability and hot spot, component placement, PWB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end applications

## Typical Inductance vs Frequency

## Typical Q vs Frequency



## Mechanical



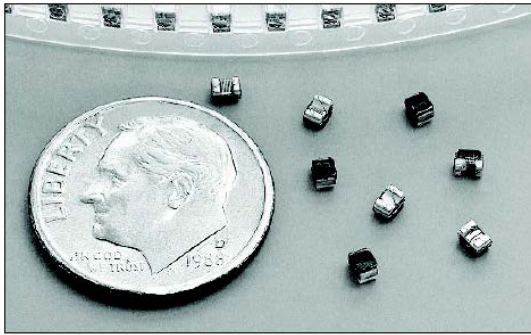
Weight: .....0.008 grams

Dimensions:  $\frac{\text{Inches}}{\text{mm}}$

Unless otherwise specified,  
all tolerances are  $\pm \frac{0.10}{0.25}$

# Wire Wound RF Chip Inductors

0603FT Series



- ④ Wire wound ferrite core construction
- ④ High Impedance Values for suppression
- ④ High self resonant frequency
- ④ Temperature Range -40°C to +125°C
- ④ Industry standard 0603 (1608) size and surface mount land pattern
- ④ 100% Tin Solder Termination

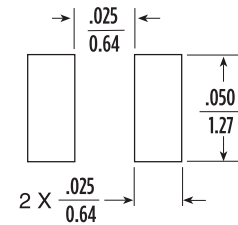
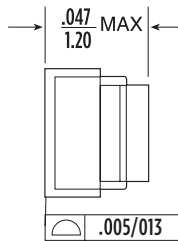
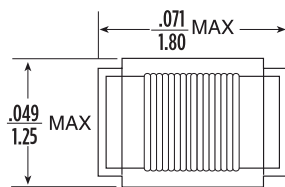
### Electrical Specifications @ 25°C - Operating Temperature Range -40°C to +125°C

| Part Number <sup>6</sup><br>Tolerance +/-10% | Inductance <sup>1</sup><br>(uH) | Typical<br>Impedance | SRF <sup>3</sup><br>(MHz MIN) | RDC <sup>4</sup><br>(Ω MAX) | IDC <sup>5</sup><br>(mA MAX) |
|--|---------------------------------|----------------------|-------------------------------|-----------------------------|------------------------------|
| PE-0603FT470KTT                              | 0.047 @ 7.9MHz                  | 20 @ 100MHz          | 1370                          | 0.11                        | 850                          |
| PE-0603FT101KTT                              | 0.100 @ 7.9MHz                  | 50 @ 100MHz          | 1370                          | 0.11                        | 850                          |
| PE-0603FT221KTT                              | 0.220 @ 7.9MHz                  | 100 @ 100MHz         | 850                           | 0.20                        | 650                          |
| PE-0603FT471KTT                              | 0.470 @ 7.9MHz                  | 300 @ 100MHz         | 670                           | 0.37                        | 470                          |
| PE-0603FT681KTT                              | 0.680 @ 7.9MHz                  | 800 @ 100MHz         | 520                           | 0.77                        | 310                          |
| PE-0603FT102KTT                              | 1.00 @ 7.9MHz                   | 1000 @ 100MHz        | 410                           | 0.94                        | 280                          |
| PE-0603FT272KTT                              | 2.70 @ 7.9MHz                   | 600 @ 25MHz          | 70                            | 1.60                        | 210                          |
| PE-0603FT682KTT                              | 6.80 @ 7.9MHz                   | 1000 @ 25MHz         | 40                            | 4.00                        | 130                          |
| PE-0603FT822KTT                              | 8.20 @ 2.5MHz                   | 600 @ 25MHz          | 40                            | 4.50                        | 110                          |
| PE-0603FT103KTT                              | 10.0 @ 2.5MHz                   | 800 @ 10MHz          | 30                            | 5.00                        | 100                          |
| PE-0603FT153KTT                              | 15.0 @ 2.5MHz                   | 1000 @ 10MHz         | 20                            | 9.50                        | 90                           |
| PE-0603FT223KTT                              | 22.0 @ 2.5MHz                   | 2500 @ 10MHz         | 20                            | 11.40                       | 70                           |

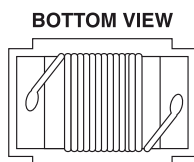
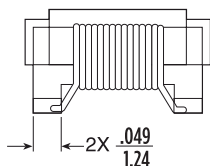
**Notes:**

- Inductance measured using a HP4286A RF Impedance Analyzer. (Please note that inductance information is not stamped on part, because of the extremely small size).
- Q measured using a HP4291A RF Impedance Analyzer with a HP16193A Test Fixture.
- SRF measured using a HP8753C Network Analyzer.
- RDC measured using a Valhalla Scientific model 4100 ATC Digital Ohmmeter.
- Based on a 15°C maximum temperature rise.

## Mechanical



**SUGGESTED PAD LAYOUT**

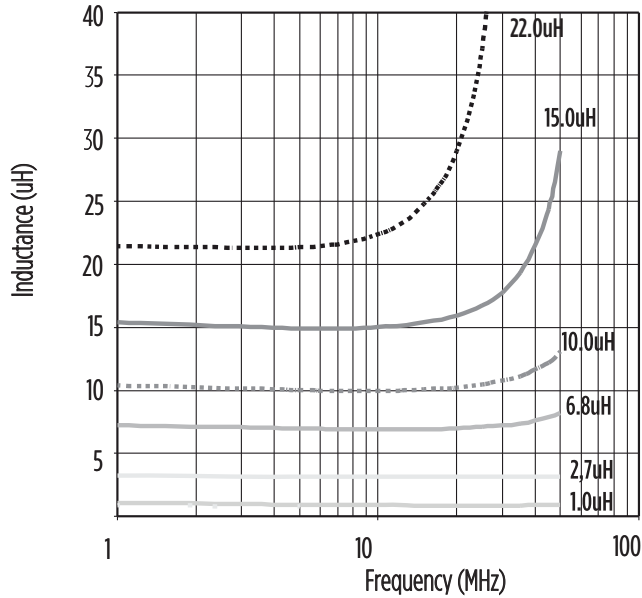


**Weight:** .....0.008 grams

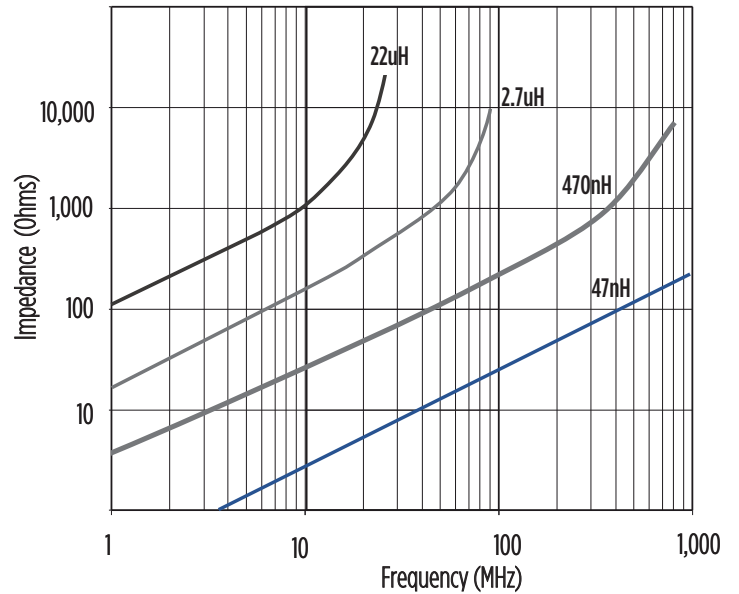
**Dimensions:** Inches  
mm

Unless otherwise specified,  
all tolerances are ± 0.10  
0,25

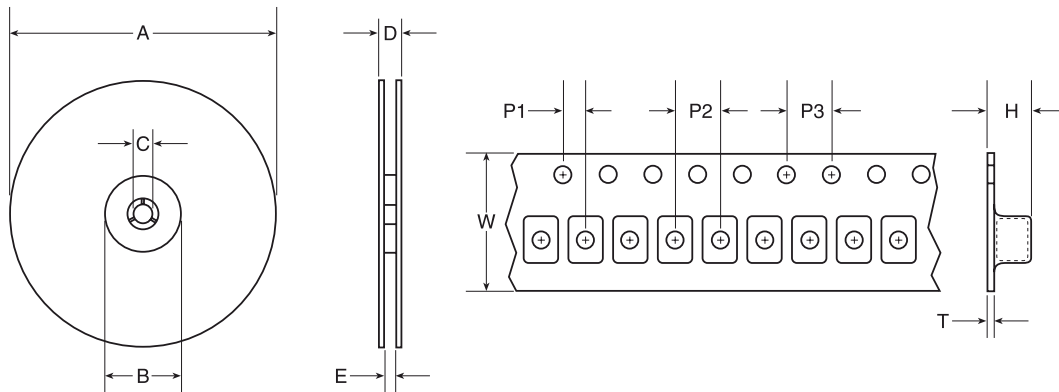
## Typical Inductance vs Frequency



## Typical Impedance vs Frequency



## Tape and Reel Specifications



Packing Moisture Level = MSL 1 - Storage Temperature - 40oC to +125oC

| Series | Parts per Reel | Reels Dimensions (mm) |    |    |      |     | Tape Dimensions (mm) |    |    |    |     |     |
|--------|----------------|-----------------------|----|----|------|-----|----------------------|----|----|----|-----|-----|
|        |                | A                     | B  | C  | D    | E   | W                    | P1 | P2 | P3 | H   | T   |
| 0603CD | 2000           | 178                   | 50 | 13 | 14.4 | 8.4 | 8                    | 2  | 4  | 4  | 2.1 | 0.3 |
| 0603FT |                |                       |    |    |      |     |                      |    |    |    |     |     |

**Notes:**  
 P1, P2 and P3 are same for all chip inductor series. Keeping the same dimensions for guide hole and pocket pitch (P1), pocket pitch (P2), guide hole pitch (P3) and tape width (8mm) for all series, enables the packaging machine to maintain the same settings while changing models. The only difference between the series are the parts per reel which contributes to a different length of tapes/reel per model.

# Wire Wound RF Chip Inductors

## PERFORMANCE TESTING

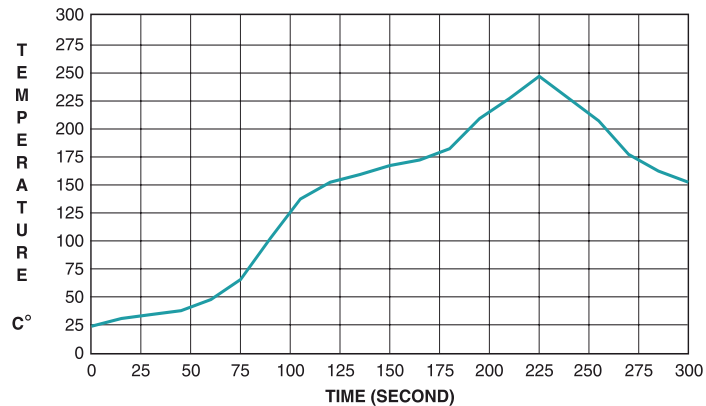
### Electrical Testing

|   |   |  |
|---|---|--|
| Storage and Operating Temperature Range:<br>-40°C to +125°C | Inductors are subjected to the extremes for 48 hours.<br>Then tested at 25°C                            | There shall be no deformation or change in appearance<br>Inductance shall not change by more than ±5%<br>Q values shall not change by more than ±10% |
| Thermal:<br>-40°C to +85°C                                  | Inductors are subjected to 30 cycles for 30 minutes at each extreme.<br>Then tested at 25°C             |  |
| Moisture Resistance 240 Hours at 70°C                       | Inductors are subjected to 10 cycles of 24 hours at 90 to 95% relative humidity<br>Then tested at 24°C  |  |
| Operating Life  | Inductors are subjected to 1000 hours at 85°C with 85% Relative Humidity with the rated current applied | There shall be no Damaged, Open or Shorted Windings  |

### Electrical Testing

|                    |  |  |
|--------------------|--|--|
| Temperature Range: | Inductors are subjected to the following:<br>Use a solder pot at 260°C, with RMA Flux. Each termination is immersed in 63Sn/37Pb molten solder for 4 to 6 seconds. | There shall be no deformation or change in appearance<br>Inductance shall not change by more than ±5%<br>Q values shall not change by more than ±10% |
|--------------------|--|--|

Recommended Solder Heat Resistance Profile



### Physical Specifications

|                     |   |  |
|---------------------|---|--|
| Vibration (Random)  | Samplers are subjected to random vibrations as per NAVMAT P9492   | There shall be no deformation or change in appearance<br>Inductance shall not change by more than ±5%<br>Q values shall not change by more than ±10% |
| Mechanical Shock    | Inductors are subjected to one half sine wave pulse (8700 g's for 0.3ms) in each directional axis for a total of 18 shocks                  |  |
| Moisture Resistance | Reflow Inductors on to test pads using 63Sn/37 Pb solder paste<br>(IR Reflow profile = 200 oC for 30 seconds or peak 235 oC for 20 seconds) | Pulse Jack<br>The inductors shall withstand a minimum force of 1000 g's in any direction using a dynamometer force guage                             |

### For More Information:


Americas - [prodinfonetworkamericas@pulseelectronics.com](mailto:prodinfonetworkamericas@pulseelectronics.com) | Europe - [comms-Apps-Europe@pulseelectronics.com](mailto:comms-Apps-Europe@pulseelectronics.com) | Asia - [prodinfonetworkapac@pulseelectronics.com](mailto:prodinfonetworkapac@pulseelectronics.com)

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