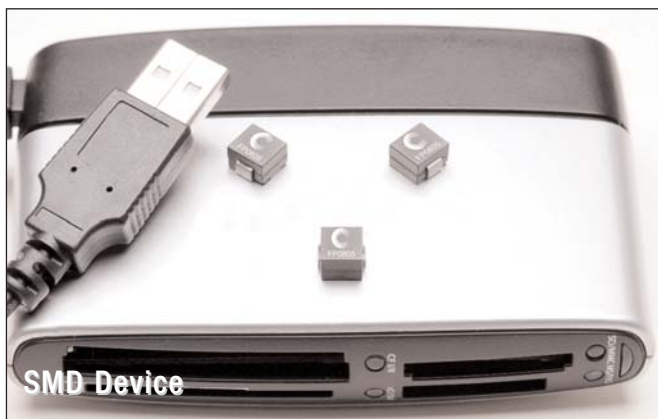


# High Current, High Frequency, Low-Profile Power Inductors

## FLAT-PAC™ FP0805 Series



### Description

- Halogen free
- 125°C maximum total temperature operation
- 7.5 x 7.6 x 5mm surface mount package
- Ferrite core material
- High current carrying capacity, Low core losses
- Controlled DCR tolerance for sensing circuits
- Inductance range from 32nH to 200nH
- Current range from 20 to 110 Amps
- Frequency range up to 2MHz
- RoHS compliant

### Applications

- Multi-phase regulators
- Voltage Regulator Module (VRM)
- Point-of-load modules
- Desktop and server VRM's and EVRD's
- Data networking and storage systems
- Notebook regulators
- Graphics cards and battery power systems
- DCR sensing

RoHS  
2002/95/EC

### Environmental Data

- Storage temperature range: -40°C to +125°C
- Operating temperature range: -40°C to +125°C (Range is application specific)
- Solder reflow temperature: J-STD-020D compliant

### Packaging

- Supplied in tape and reel packaging, 950 parts per reel, 13 inch diameter reel.

### Product Specifications

| Part Number <sup>7</sup> | OCL <sup>1</sup> ± 10% (nH) | FLL <sup>2</sup> Min. (nH) | I <sub>rms</sub> <sup>3</sup> (Amps) | I <sub>sat</sub> <sup>1,4</sup> @ 25°C (Amps) | I <sub>sat</sub> <sup>2,5</sup> @ 125°C (Amps) | DCR (mΩ) @ 20°C | K-factor <sup>6</sup> |
|--------------------------|-----------------------------|----------------------------|--------------------------------------|-----------------------------------------------|------------------------------------------------|-----------------|-----------------------|
| FP0805R1-R03-R           | 32                          | 23                         | 65                                   | 110                                           | 95                                             | 0.17 ± 17%      | 823.6                 |
| FP0805R1-R06-R           | 58                          | 42                         |                                      | 83                                            | 61                                             |                 | 823.6                 |
| FP0805R1-R07-R           | 72                          | 52                         |                                      | 67                                            | 49                                             |                 | 823.6                 |
| FP0805R1-R10-R           | 100                         | 72                         |                                      | 50                                            | 35                                             |                 | 823.6                 |
| FP0805R1-R20-R           | 200                         | 144                        |                                      | 20                                            | 16                                             |                 | 823.6                 |

1 Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10V<sub>rms</sub>, 0.0Adc

2 Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V<sub>rms</sub>, I<sub>sat</sub><sup>1</sup>

3 I<sub>rms</sub>: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB pad layout, trace thickness and width, air-flow and proximity of other heat generating components will affect the temperature rise. It is recommended the part temperature not exceed 125°C under worst case operating conditions verified in the end application.

4 I<sub>sat</sub><sup>1</sup>: Peak current for approximately 20% rolloff at +25°C.

5 I<sub>sat</sub><sup>2</sup>: Peak current for approximately 20% rolloff at +125°C.

6 K-factor: Used to determine B<sub>p-p</sub> for core loss (see graph). B<sub>p-p</sub> = K \* L \* ΔI \* 10<sup>-3</sup>, B<sub>p-p</sub>: (Gauss), K: (K-factor from table), L: (inductance in nH), ΔI (peak-to-peak ripple current in amps).

7 Part Number Definition: FP0805Rx-Rxx-R

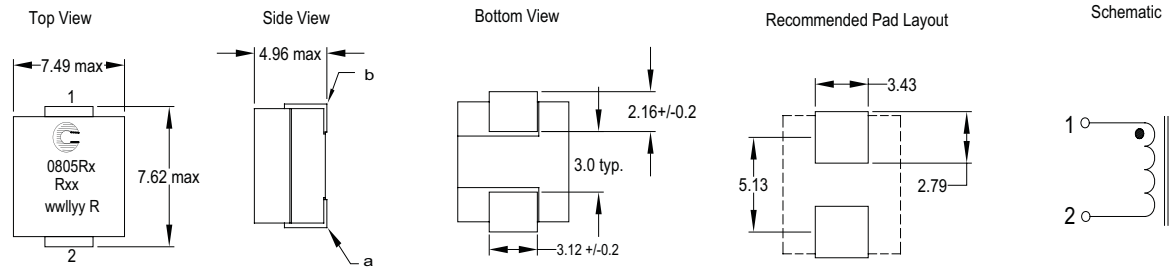
• FP0805 = Product code and size

• Rxx= Inductance value in μH, R = decimal point

• Rx is the DCR indicator

• "-R" suffix = RoHS compliant

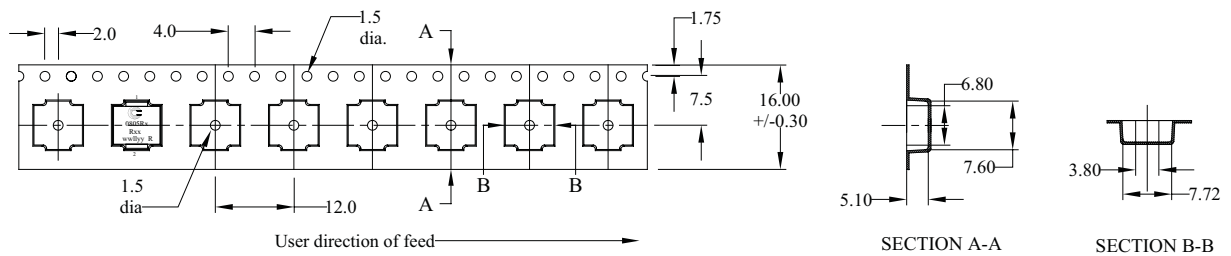
## Dimensions - mm



The nominal DCR is measured from point "a" to point "b."

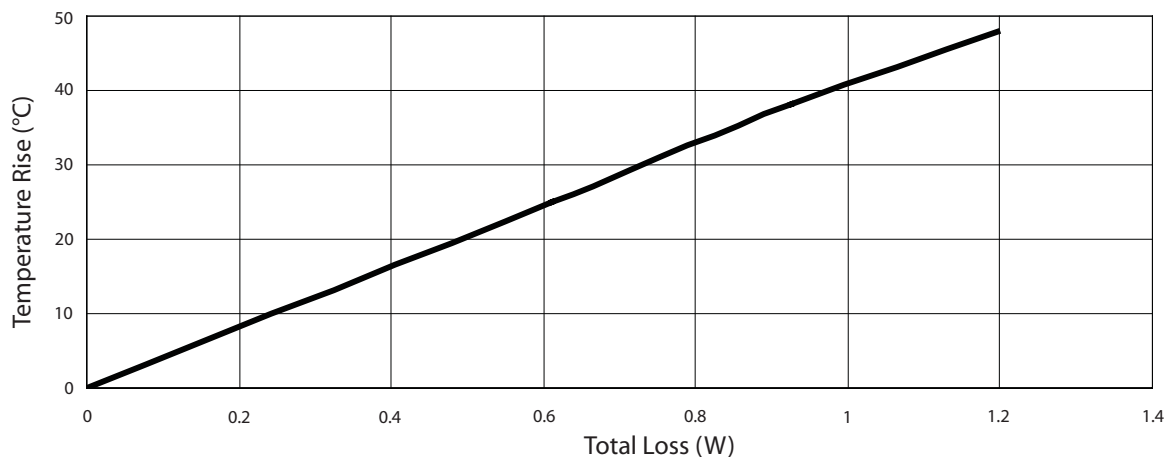
Part Marking: Coiltronics Logo    0805Rx (Rx = DCR Indicator)    Rxx = Inductance value in  $\mu\text{H}$ . (R = Decimal point)    wwlyy = Date code    R = Revision level

## Packaging Information - mm

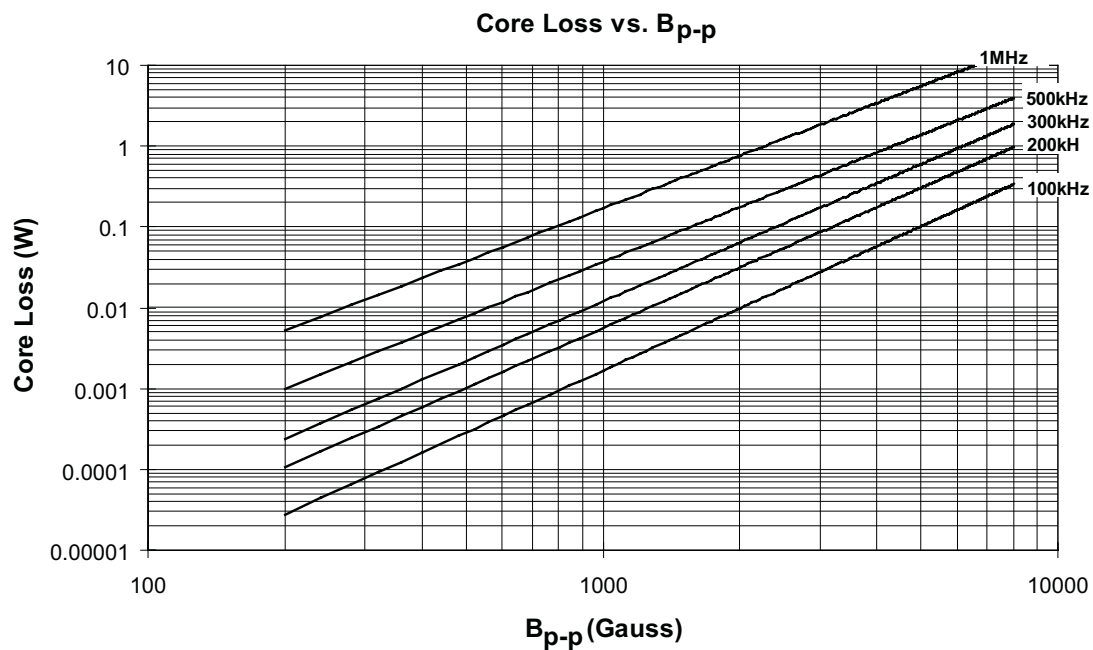


Supplied in tape-and-reel packaging, 950 parts per reel, 13" diameter reel.

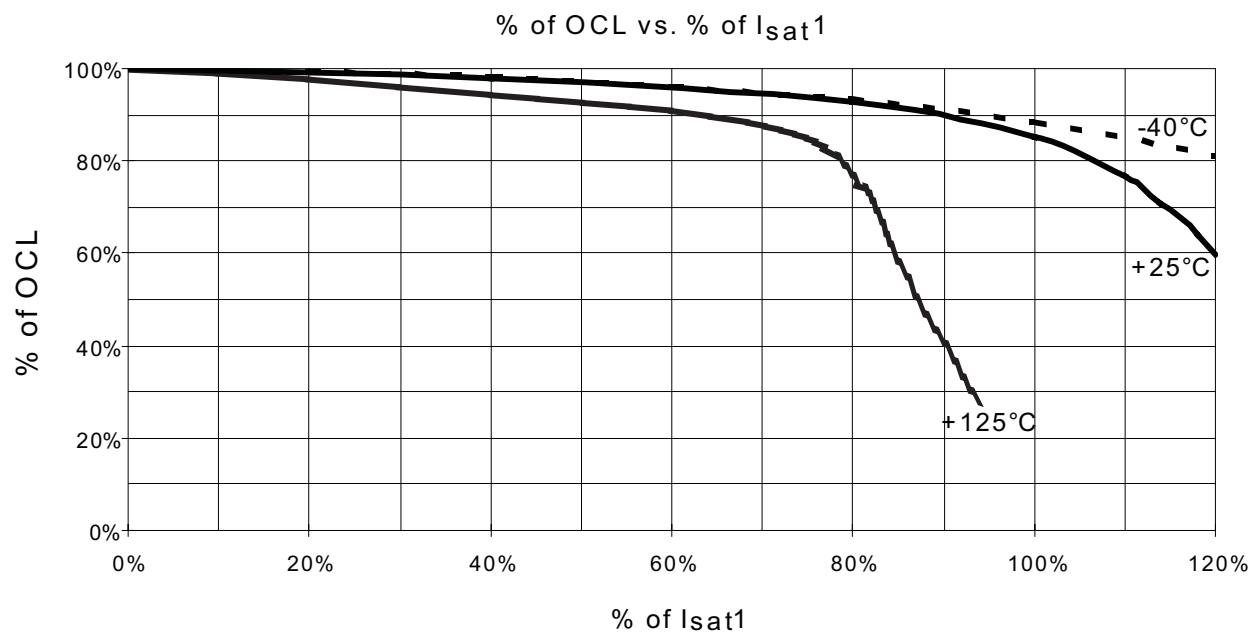
## Temperature Rise vs.Total Loss



## Core Loss



## Inductance Characteristics



## Solder Reflow Profile

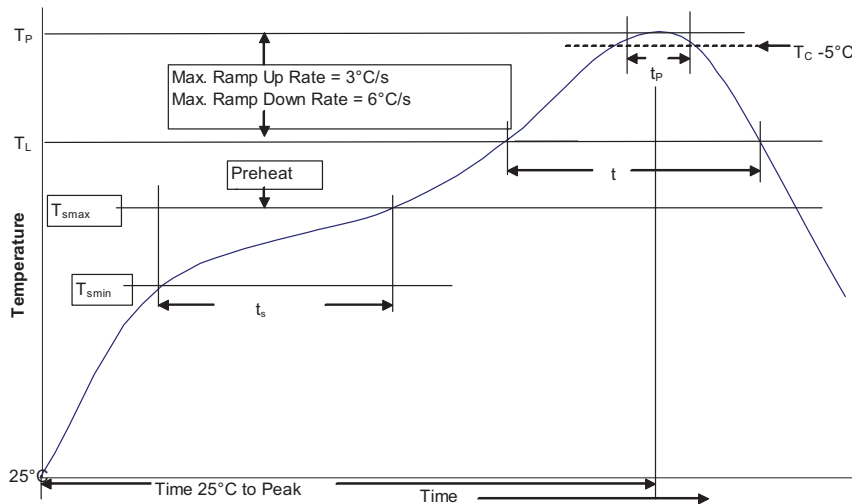


Table 1 - Standard SnPb Solder ( $T_c$ )

| Package Thickness | Volume $mm^3$ <350 | Volume $mm^3$ >350 |
|-------------------|--------------------|--------------------|
| <2.5mm            | 235°C              | 220°C              |
| ≥2.5mm            | 220°C              | 220°C              |

Table 2 - Lead (Pb) Free Solder ( $T_c$ )

| Package Thickness | Volume $mm^3$ <350 | Volume $mm^3$ 350 - 2000 | Volume $mm^3$ >2000 |
|-------------------|--------------------|--------------------------|---------------------|
| <1.6mm            | 260°C              | 260°C                    | 260°C               |
| 1.6 - 2.5mm       | 260°C              | 250°C                    | 245°C               |
| >2.5mm            | 250°C              | 245°C                    | 245°C               |

## Reference JDEC J-STD-020D

| Profile Feature                                                                    | Standard SnPb Solder | Lead (Pb) Free Solder |
|------------------------------------------------------------------------------------|----------------------|-----------------------|
| Preheat and Soak                                                                   |                      |                       |
| • Temperature min. ( $T_{smin}$ )                                                  | 100°C                | 150°C                 |
| • Temperature max. ( $T_{smax}$ )                                                  | 150°C                | 200°C                 |
| • Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )                                      | 60-120 Seconds       | 60-120 Seconds        |
| Average ramp up rate $T_{smax}$ to $T_p$                                           | 3°C/ Second Max.     | 3°C/ Second Max.      |
| Liquidous temperature ( $T_L$ )                                                    | 183°C                | 217°C                 |
| Time at liquidous ( $t_L$ )                                                        | 60-150 Seconds       | 60-150 Seconds        |
| Peak package body temperature ( $T_p$ )*                                           | Table 1              | Table 2               |
| Time ( $t_p$ )** within 5 °C of the specified classification temperature ( $T_c$ ) | 20 Seconds**         | 30 Seconds**          |
| Average ramp-down rate ( $T_p$ to $T_{smax}$ )                                     | 6°C/ Second Max.     | 6°C/ Second Max.      |
| Time 25°C to Peak Temperature                                                      | 6 Minutes Max.       | 8 Minutes Max.        |

\* Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

\*\* Tolerance for time at peak profile temperature ( $t_p$ ) is defined as a supplier minimum and a user maximum.

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