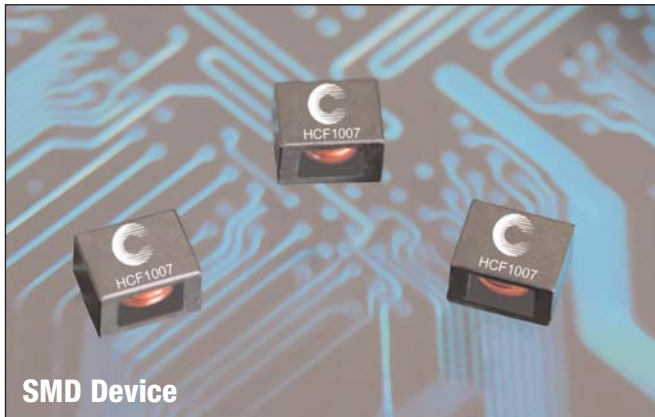


# High Current, High Frequency, Power Inductors

## HCF1007 Series



### Description

- Halogen free
- 125°C maximum total temperature operation
- 10.3 x 8.1 x 6.65mm surface mount package
- Ferrite core material
- Secure 3 terminal mounting
- High current carrying capacity, low core losses
- Controlled DCR tolerance for sensing circuits
- Inductance range from 0.3μH to 10.0μH
- Current range from 5.3 to 48 Amps
- Frequency range up to 1MHz
- RoHS compliant

### Applications

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

### Environmental Data

- Storage temperature range: -40°C to +125°C
- Operating temperature range: -40°C to +125°C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

### Packaging

- Supplied in tape and reel packaging, 700 parts per 13" diameter reel

### Product Specifications

Part Number <sup>7</sup>	OCL <sup>1</sup> μH ± 20%	FLL <sup>2</sup> Min (μH)	I <sub>rms</sub> <sup>3</sup> Amps	I <sub>sat</sub> <sup>14</sup> Amps @25°C	I <sub>sat</sub> <sup>25</sup> Amps @125°C	DCR mΩ @20°C	K-factor <sup>6</sup>
HCF1007-R30-R	0.30	0.21	30	48	35	0.90±10%	279.9
HCF1007-R42-R	0.42	0.30	26	45	36	1.30±7%	186.6
HCF1007-R56-R	0.56	0.40	26	36	28	1.30±7%	186.6
HCF1007-R68-R	0.68	0.49	26	29	23	1.30±7%	186.6
HCF1007-1R0-R	1.0	0.72	16	26	21	2.65±6%	139.9
HCF1007-1R5-R	1.5	1.08	13	22	17	4.15±6%	112.0
HCF1007-2R2-R	2.2	1.57	10.7	18	14	6.35±6%	93.30
HCF1007-3R3-R	3.3	2.37	10	14.5	11	7.50±6%	79.97
HCF1007-4R7-R	4.7	3.38	9.4	12	8.9	8.65±6%	69.97
HCF1007-5R6-R	5.6	4.03	9.4	9.4	7.5	8.65±6%	69.97
HCF1007-6R8-R	6.8	4.90	9.4	7.8	6.1	8.65±6%	69.97
HCF1007-100-R	10.0	7.20	9.4	5.3	4.2	8.65±6%	69.97

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 layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part 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.

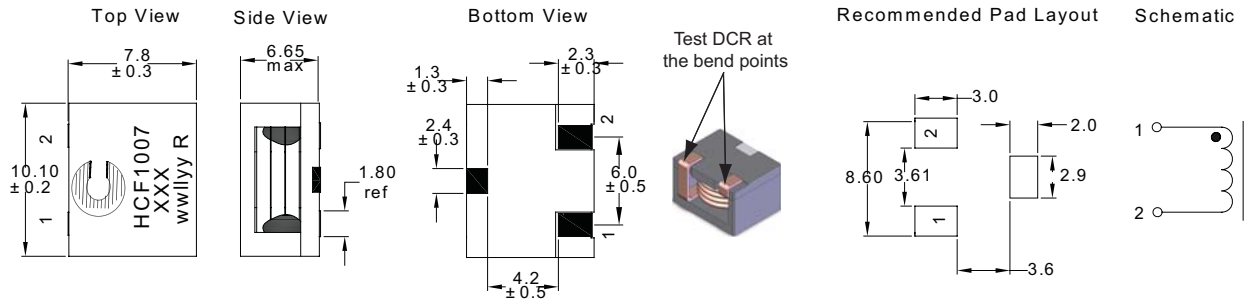
5 I<sub>sat</sub><sup>2</sup>: Peak current for approximately 20% rolloff at +125°C.

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

7 Part Number Definition:HCF1007-xxx-R

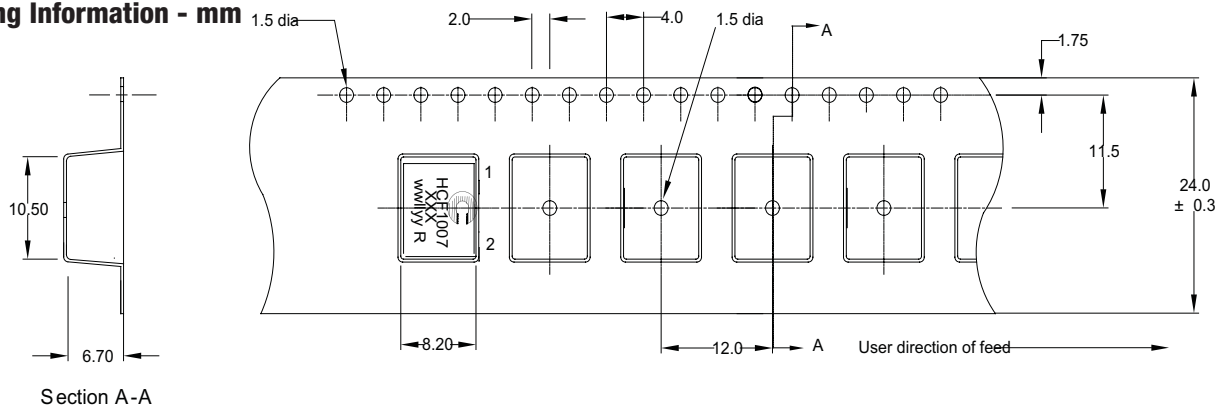
- HCF1007 = Product code and size
- xxx= Inductance value in μH, R = decimal point.
- If no "R" is present then third character =# of zeros
- -R suffix = RoHS compliant

### Dimensions - mm



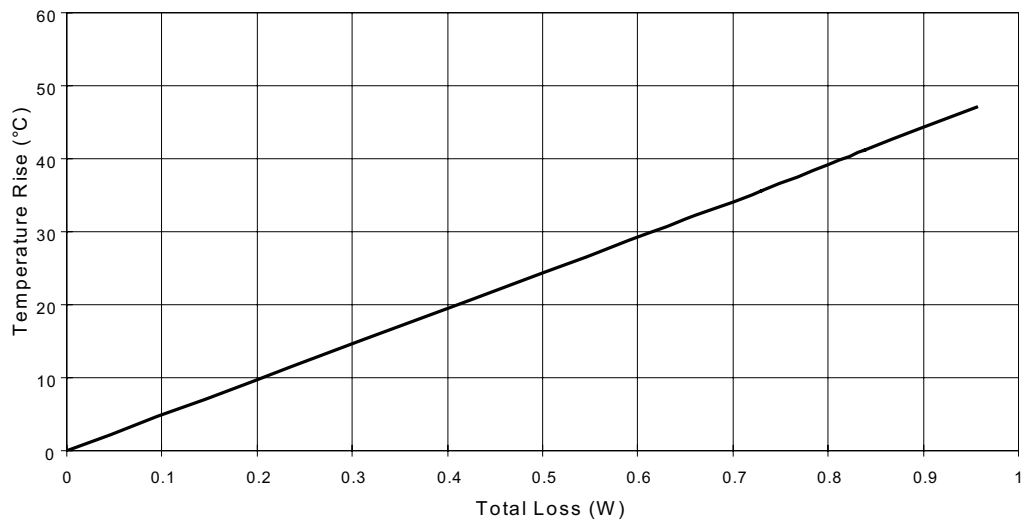
Part Marking: Coiltronics logo HCF1007 xxx = Inductance value in  $\mu\text{H}$ . (R = Decimal point). If no "R" is present, then last character is # of zeros wvllly = Date code R = Revision level

### Packaging Information - mm



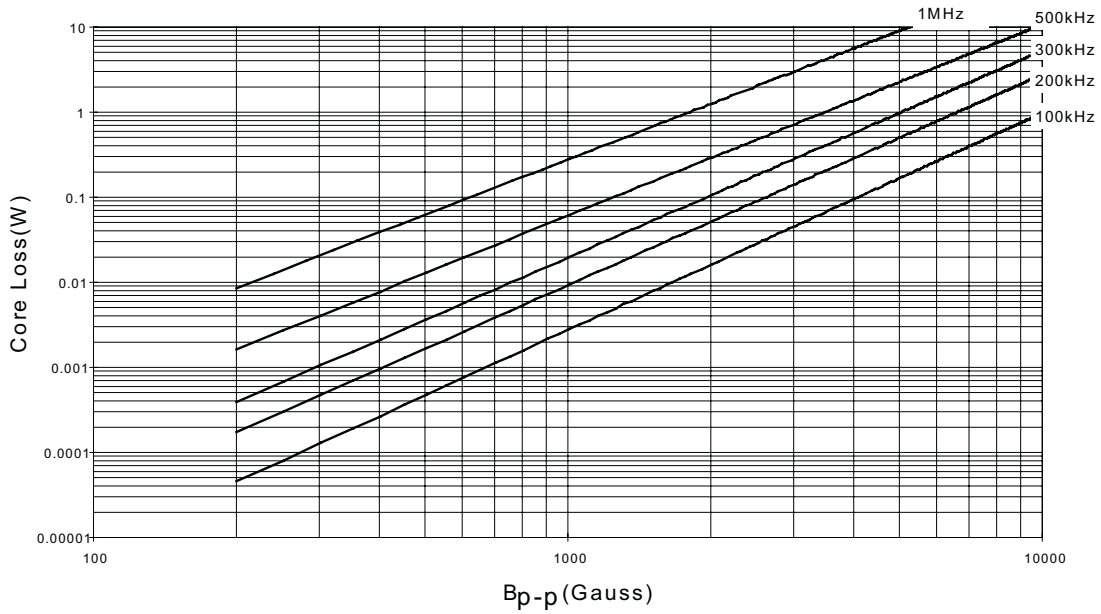
Supplied in tape-and-reel packaging, 700 parts per reel, 13" diameter reel.

### Temperature Rise vs. Total Loss



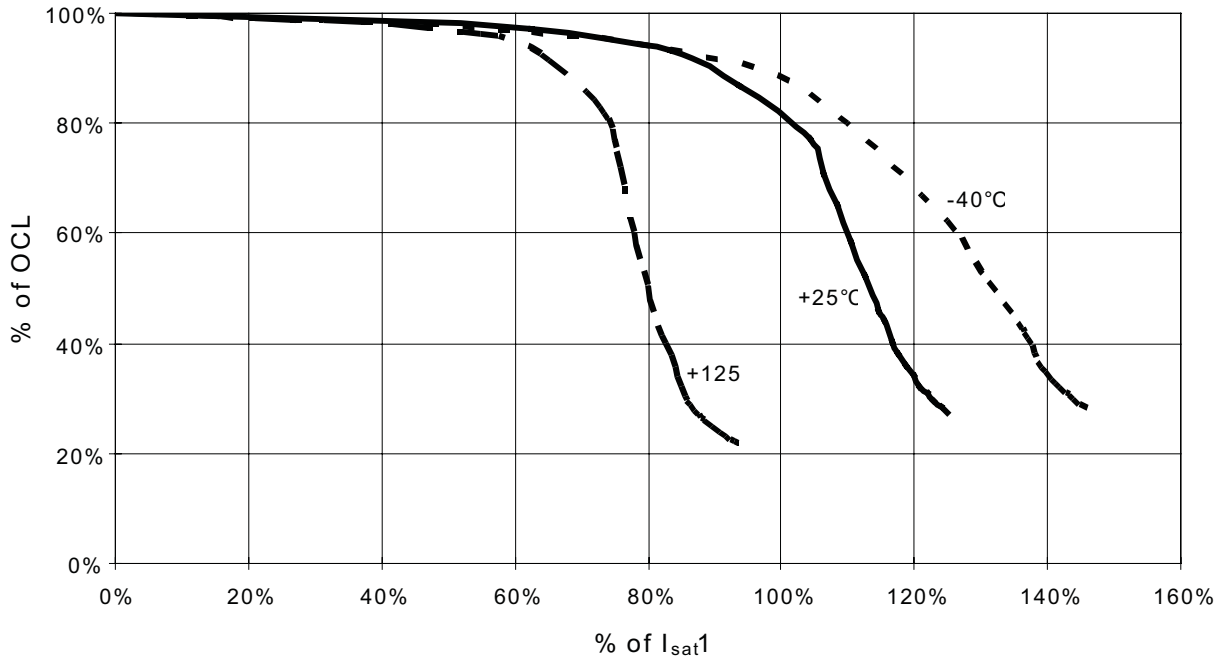
### Core Loss

Core Loss vs.  $B_{p-p}$



### Inductance Characteristics

% of OCL vs. % of  $I_{sat1}$



## Solder Reflow Profile

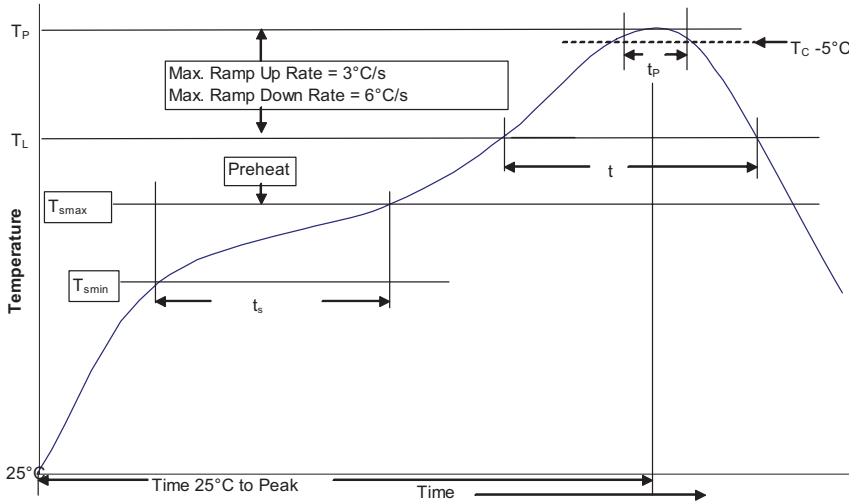


Table 1 - Standard SnPb Solder ( $T_c$ )

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ $\geq 350$
<2.5mm	235°C	220°C
$\geq 2.5\text{mm}$	220°C	220°C

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

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350 - 2000	Volume $\text{mm}^3$ >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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