Effective July 2017
Supersedes September 2010

HCF1007

High frequency, high current power inductors

Product features

- 10.3 x 8.1 x 6.65 mm surface mount package
- Ferrite core material
- Secure 3 terminal mounting
- High current carrying capacity, low core losses
- Tight DCR tolerance for sensing circuits
- Inductance range from 0.3 µH to 10.0 µH
- Current range from 5.3 A to 48 A
- Frequency range up to 1 MHz

Applications

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

Environmental data

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

Powering Business Worldwide

Product specifications

Part Number[7]	OCL[1] µH ± 20%	FLL[2] Min (µH)	I_{rms}[3] (A)	$I_{sat}1$[4] (A) @ +25 °C	$I_{sat}2$[5] (A) @1+25 °C	DCR mΩ @+20 °C	K-factor[6]
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: 100 kHz, 0.10 V_{rms}, 0.0 Adc

2 Full Load Inductance (FLL) Test Parameters: 100 kHz, 0.1 V_{rms}, $I_{sat}1$

3 I_{rms}: 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 $I_{sat}1$: Peak current for approximately 20% rolloff at +25 °C.

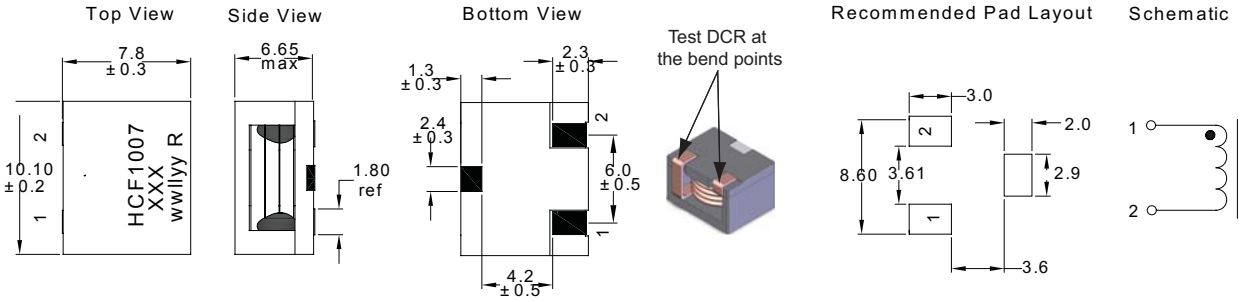
5 $I_{sat}2$: Peak current for approximately 20% rolloff at +125 °C.

6 K-factor: Used to determine B_{p-p} for core loss (see graph). $B_{p-p} = K * L * \Delta I$. B_{p-p}:(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

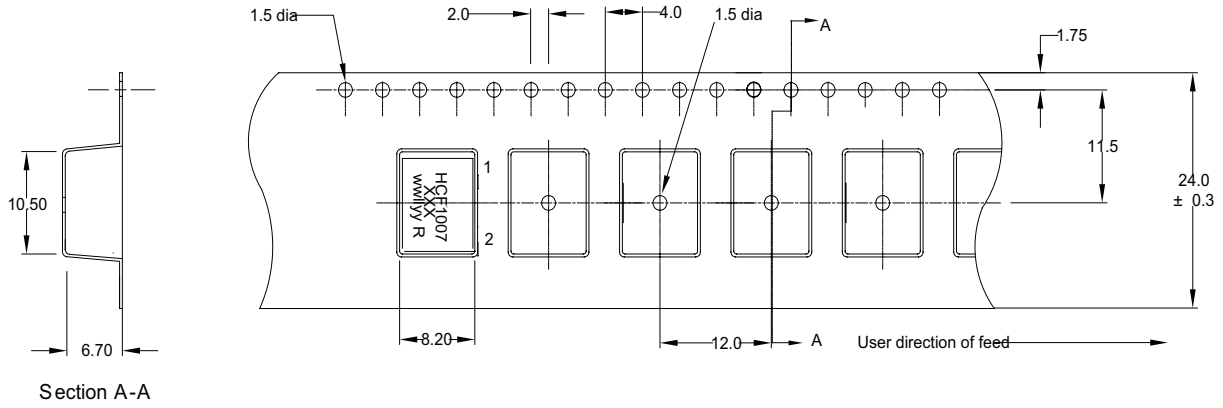
Dimensions- mm



Part Marking: HCF1007 xxx = Inductance value in µH. (R = Decimal point). If no "R" is present, then last character is # of zeros yyllww = Date code R = Revision level

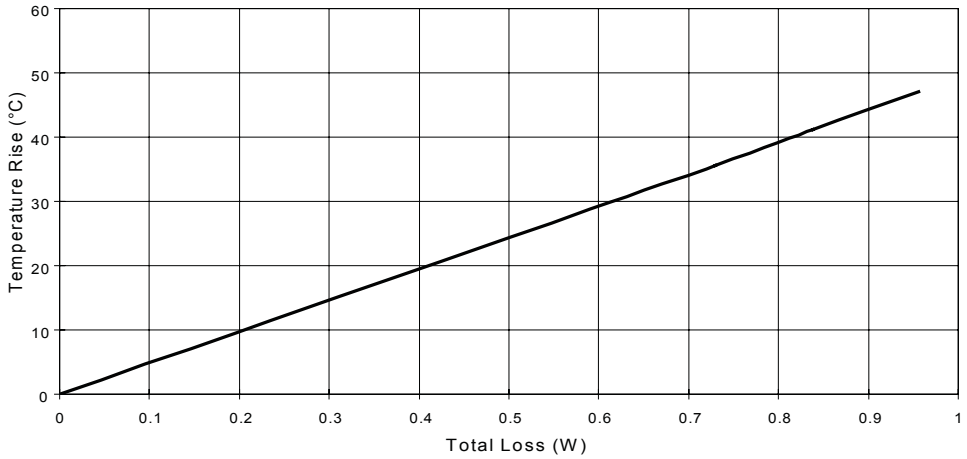
Do not route traces or vias underneath the inductor

Packaging information - mm

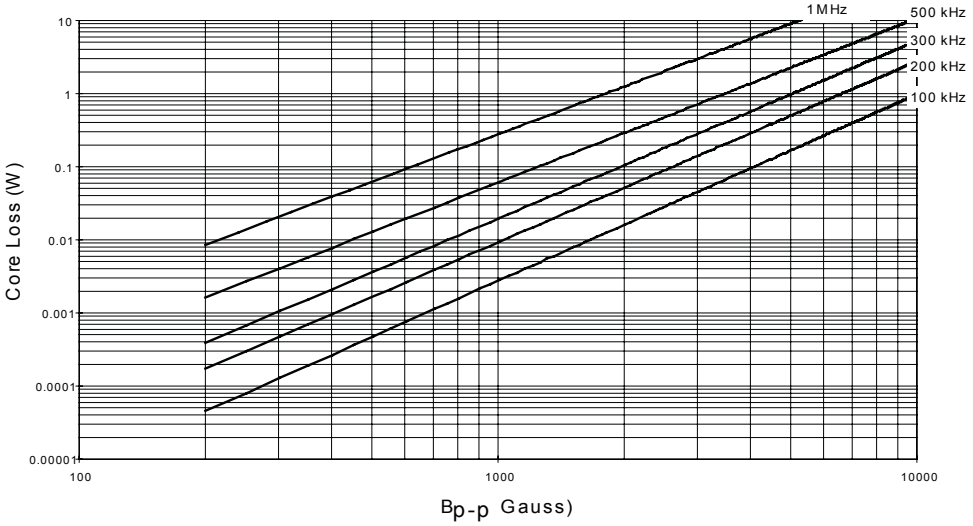


Supplied in tape-and-reel packaging, 700 parts per reel, 13" diameter reel.

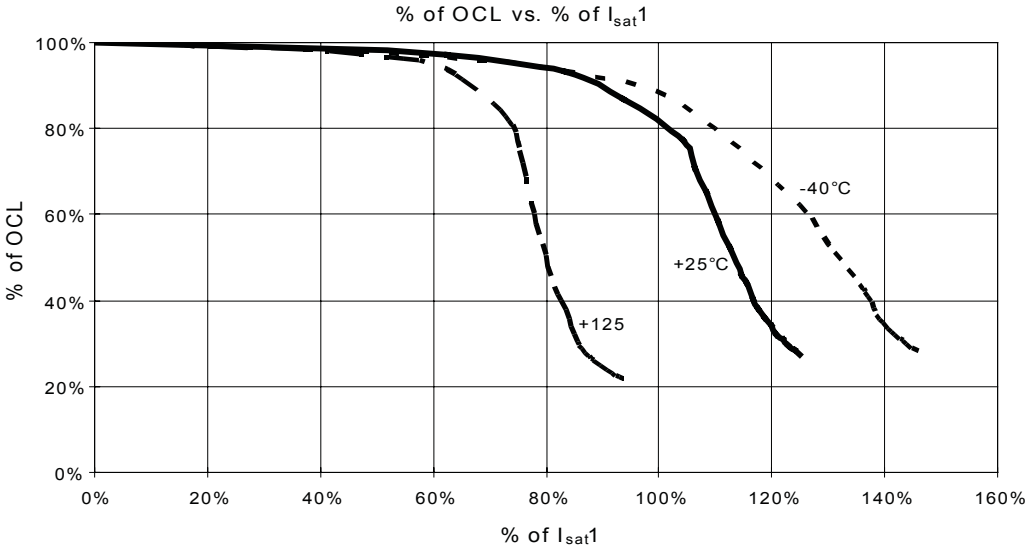
Temperature rise vs total loss



Core loss vs Bp-p



Inductance characteristics



Solder Reflow Profile

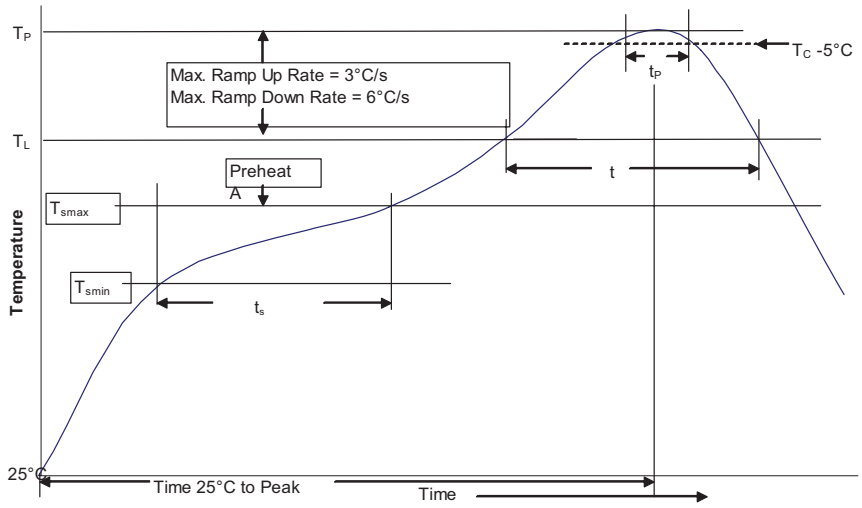


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume mm³ <350	Volume mm³ ≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

Table 2 - Lead (Pb) Free Solder (T_C)

Package Thickness	Volume mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >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-020

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 (TL) Time at liquidous (t_L)		183°C 60-150 Seconds	217°C 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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