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

Pb HALOGEN HF FREE RoHS

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.

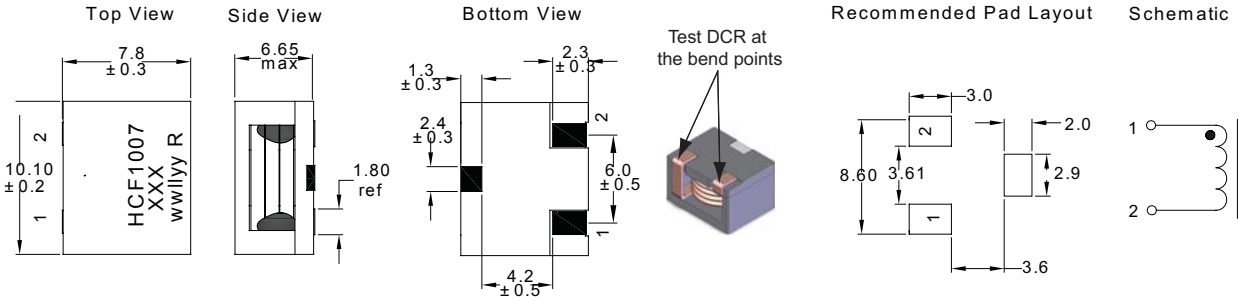
4 $I_{sat}1$: Peak current for approximately 20% rolloff at +25 °C.

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

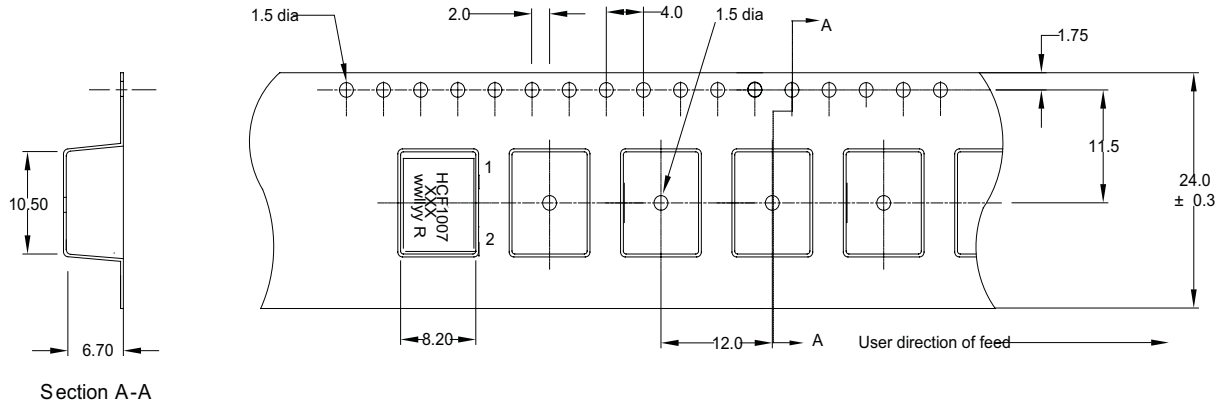
Dimensions- mm



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

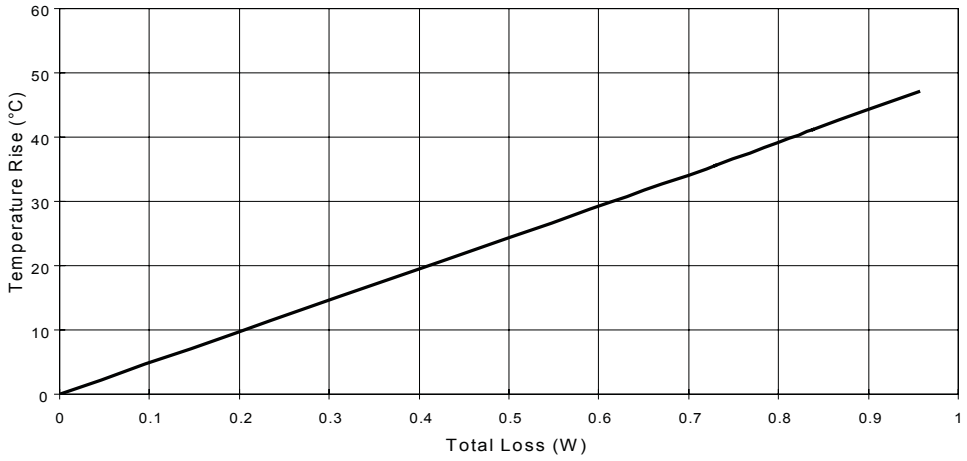
Do not route traces or vias underneath the inductor

Packaging information - mm

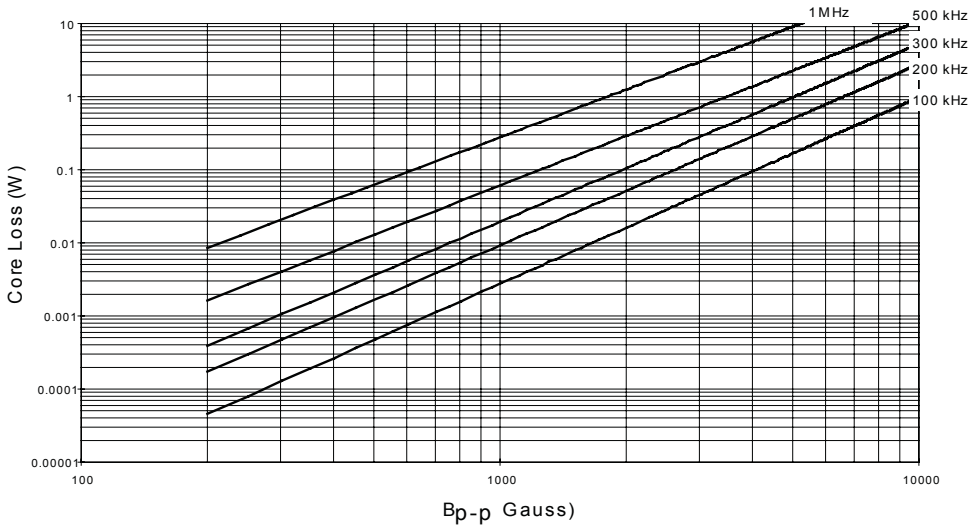


Supplied in tape-and-reel packaging, 700 parts per reel, 13" diameter reel.

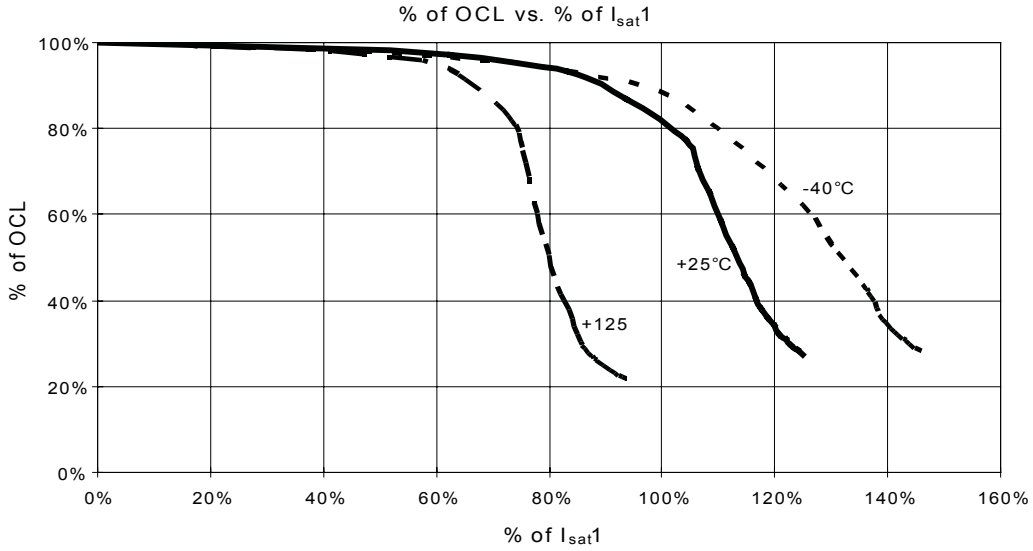
Temperature rise vs total loss



Core loss vs Bp-p



Inductance characteristics



Solder Reflow Profile

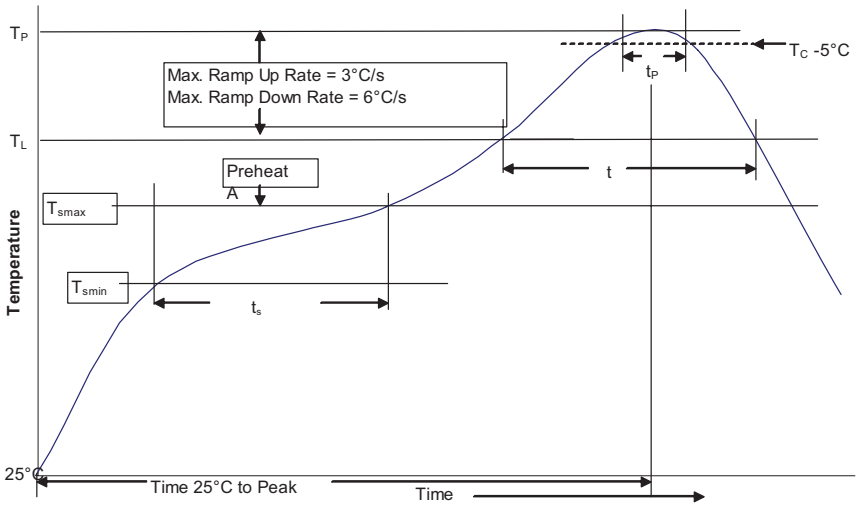


Table 1 - Standard SnPb Solder (T_C)

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 (T_L) 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.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin.

Eaton
Electronics Division
1000 Eaton Boulevard
Cleveland, OH 44122
United States
www.eaton.com/electronics

© 2017 Eaton
All Rights Reserved
Printed in USA
Publication No. 4361 BU-SB10928
July 2017

Eaton is a registered trademark.

All other trademarks are property of their respective owners.

Powering Business Worldwide