

HCPT1309

High current power inductors



Product features

- 13.2 mm x 13.2 mm x 9.0 mm through hole package
- Iron powder core material
- Inductance range from 0.20 μ H to 3.3 μ H
- Current range from 90.0 A to 11.4 A
- Frequency range up to 1 MHz

Applications

- Next generation processors
- High current DC-DC converters
- VRM, multi-phase buck regulator
- Desktop computers
- Video game power

Environmental Data

- Storage temperature range (Component): -40 °C to +105 °C
- Operating temperature range: -40 °C to +105 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant



Product Specifications

Part Number	OCL (1) nominal +/- 20% (μH)	I _{rms} (2) (A)	Isat (A) (3) Peak 20%rolloff @ +20 °C	Isat (A) (4) Peak 30%rolloff @+20 °C	DCR (mΩ) nom @+20 °C	K-factor (5)
HCPT1309-R20-R	0.20	43.1	72.2	90.0	0.426	154.1
HCPT1309-R47-R	0.49	34.0	43.3	55.0	0.624	92.4
HCPT1309-1R0-R	0.96	19.4	30.9	40.0	1.90	66.0
HCPT1309-1R5-R	1.59	13.7	24.1	30.6	3.82	51.4
HCPT1309-2R2-R	2.27	12.5	19.7	25.0	4.10	42.0
HCPT1309-3R3-R	3.31	11.4	16.7	21.0	4.80	35.6

(1) OCL: Open Circuit Inductance test parameters: 100 kHz, 0.1 V_{rms}, 0.0 Adc.

(2) I_{rms}: DC current for an approximate ΔT 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 +105 °C under worst case operating conditions verified in the end application.

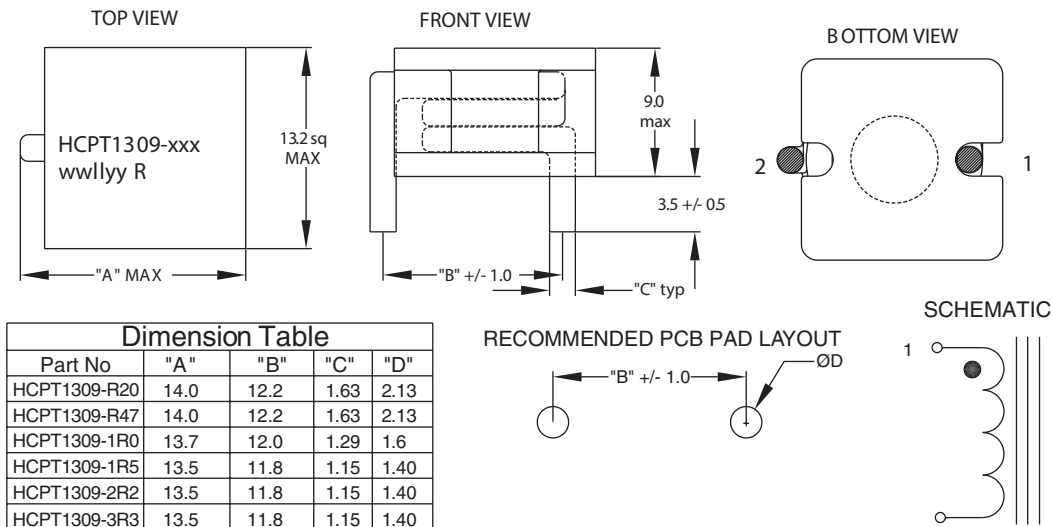
(3) Isat Amperes peak for approximately 20% rolloff (@ +20 °C)

(4) Isat Amperes peak for approximately 30% rolloff (@ +20 °C)

(5) K-factor: Used to determine B p-p for core loss (see graph).

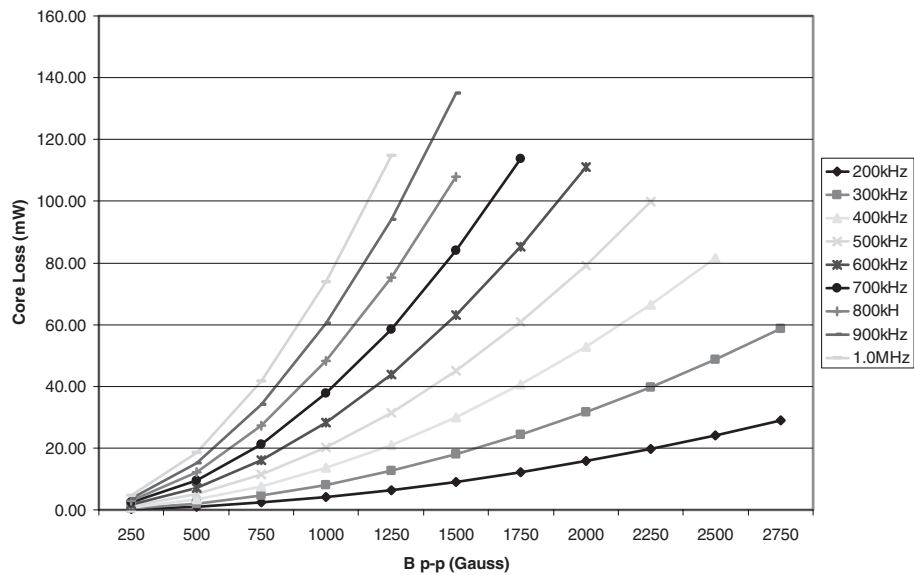
B p-p = K*L*ΔI, B p-p: (Gauss), K: (K factor from table), L: (Inductance in μH),
ΔI(Peak to peak ripple current in Amps).

Dimensions (mm)



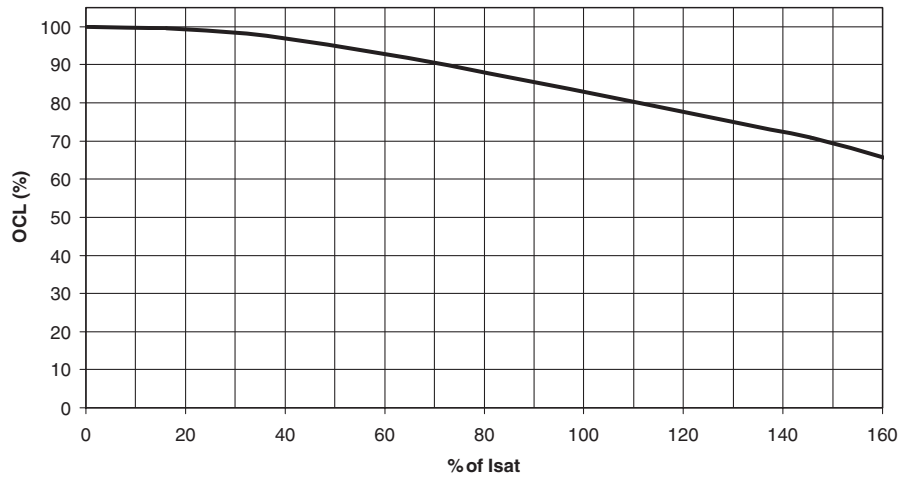
Do not route traces or vias underneath the inductor

Core loss vs. B_{p-p}



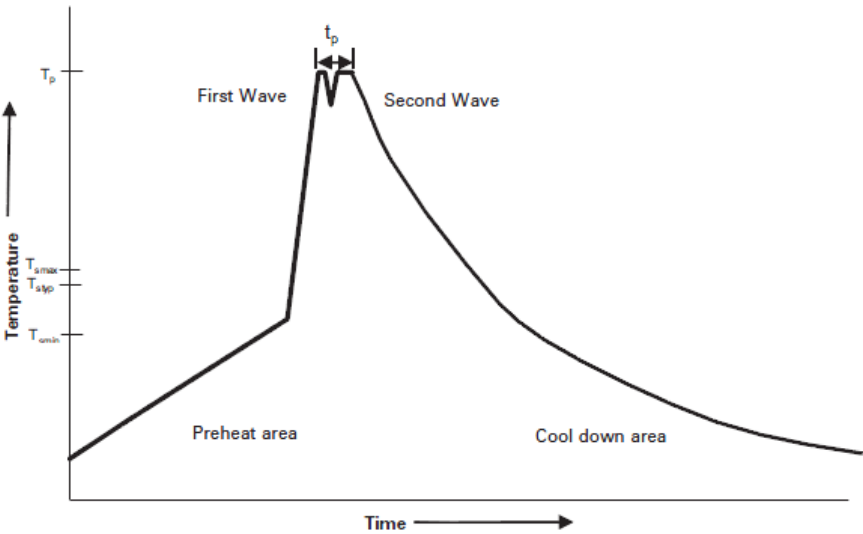
Inductance characteristics

OCL vs Isat



Wave solder profile- Through-hole components

Reflow soldering not recommended



Reference EN 61760-1:2006

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat		
• Temperature min. (T_{smin})	100°C	100°C
• Temperature typ. (T_{styp})	120°C	120°C
• Temperature max. (T_{smax})	130°C	130°C
• Time (T_{smin} to T_{smax}) (t_s)	70 seconds	70 seconds
Δ preheat to max Temperature	150°C max.	150°C max.
Peak temperature (T_p)*	235°C – 260°C	250°C – 260°C
Time at peak temperature (t_p)	10 seconds max 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate	~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~5 K/s max
Time 25°C to 25°C	4 minutes	4 minutes

Manual solder

350°C, 4-5 seconds. (by soldering iron), generally manual, hand soldering is not recommended.

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. 4139
July 2017



Eaton is a registered trademark.
All other trademarks are property
of their respective owners.