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 µH to 3.3 µH
- 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

RoHS

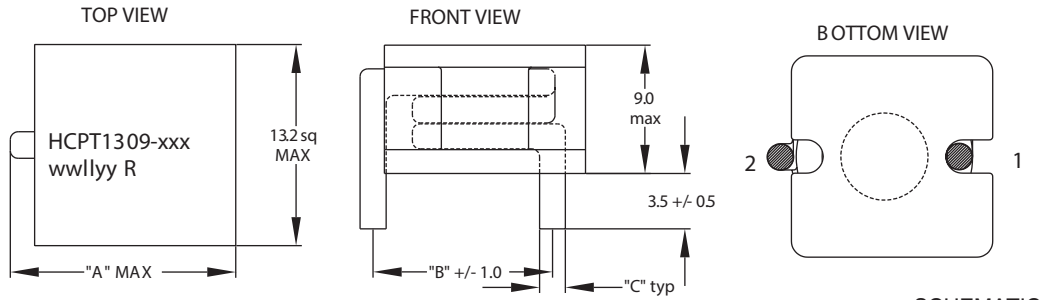
Powering Business Worldwide

Product Specifications

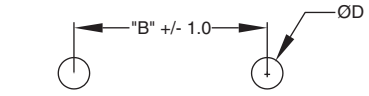
Part Number	OCL (1) nominal +/- 20% (µH)	Irms (2) (A)	Isat (A) (3) Peak 20%rolloff @ +20 °C	Isat (A) (4) Peak 30%rolloff @+20 °C	DCR (mΩ) nom @+20 °C	K-factor (5)
HCPT1309-R20-R	0.20	43.1	72.2	90.0	0.426	154.1
HCPT1309-R47-R	0.49	34.0	43.3	55.0	0.624	92.4
HCPT1309-1R0-R	0.96	19.4	30.9	40.0	1.90	66.0
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

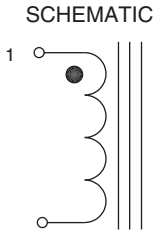
(1) OCL: Open Circuit Inductance test parameters: 100 kHz, 0.1 Vrms, 0.0 Adc.
(2) Irms: DC current for an approximate ΔT of 40 °C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the 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 uH), Δ(Peak to peak ripple current in Amps).

Dimensions (mm)



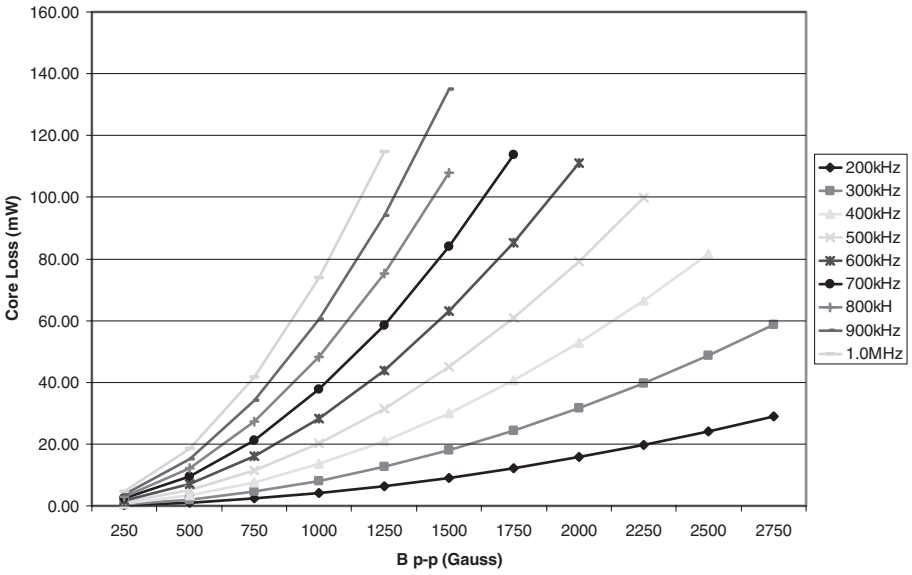
Dimension Table				
Part No	"A"	"B"	"C"	"D"
HCPT1309-R20	14.0	12.2	1.63	2.13
HCPT1309-R47	14.0	12.2	1.63	2.13
HCPT1309-1R0	13.7	12.0	1.29	1.6
HCPT1309-1R5	13.5	11.8	1.15	1.40
HCPT1309-2R2	13.5	11.8	1.15	1.40
HCPT1309-3R3	13.5	11.8	1.15	1.40



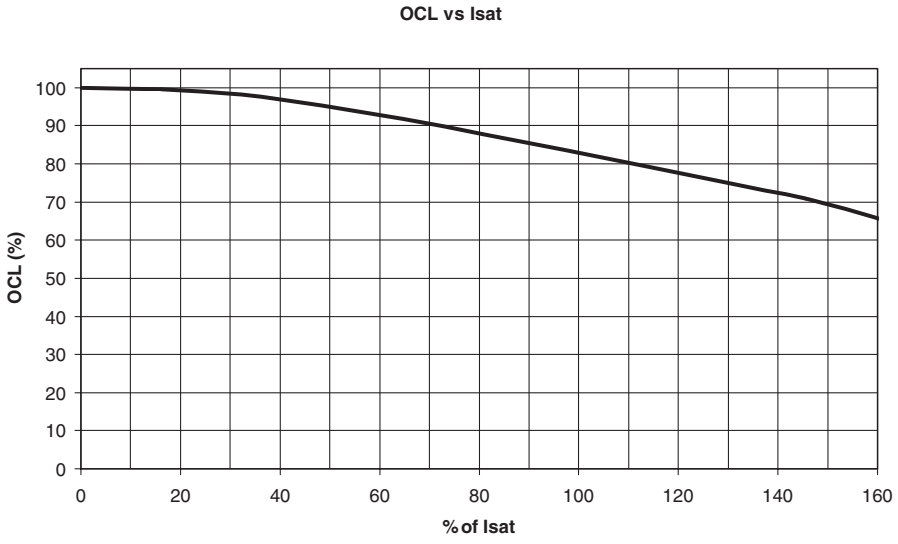


Do not route traces or vias underneath the inductor

Core loss vs. B_{p-p}

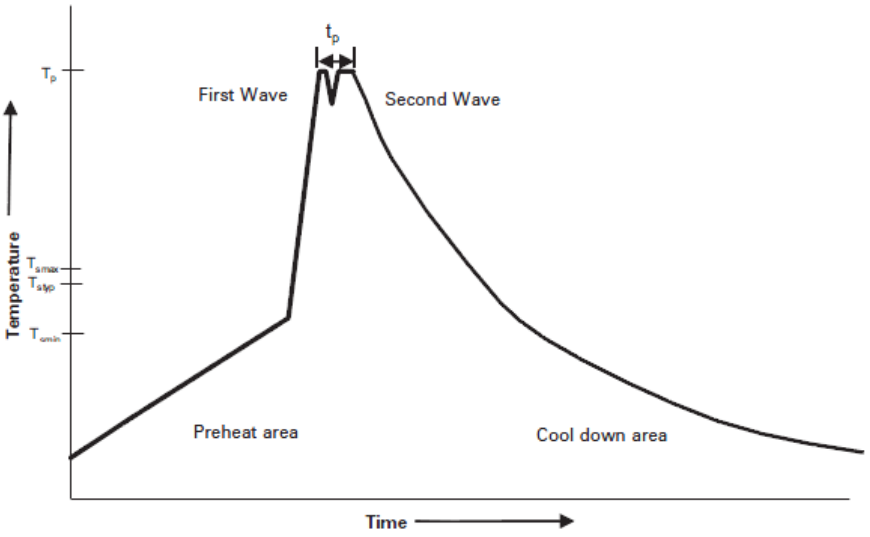


Inductance characteristics



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 Temeperature		150°C max.	150°C max.
Peak temperature (Tp)*		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.

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