

# HCP0805

## High current power inductors



### Product description

- High current carrying capacity
- Magnetically shielded, low EMI
- Frequency range up to 2MHz
- Inductance range from 0.40uH to 2.2uH
- Current range from 10 to 32 amps
- 7.9 x 7.6 mm footprint surface mount package in a 5.0mm height
- Iron powder core material
- Halogen free, lead free, RoHS compliant

### Applications

- Multi-phase regulators
- Voltage Regulator Modules (VRMs)
- Distributed power systems DC-DC converters
- Desktop and server VRMs and EVRDs
- Point-of-Load (POL) modules
- Field Programmable Gate Array (FPGA) DC-DC converters
- Battery power systems
- High current power supplies
- Data networking and storage systems

### 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-020D compliant

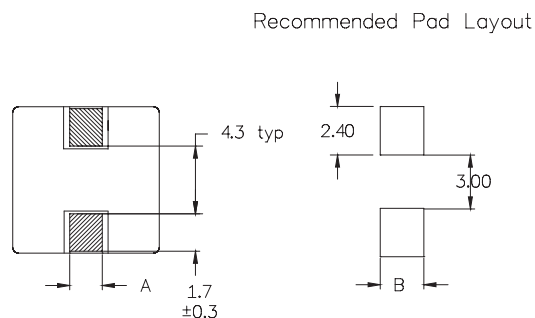
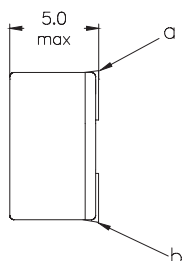
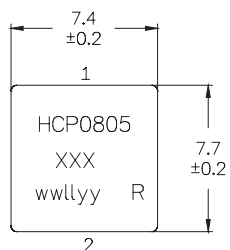


**Product specifications**

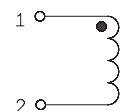
Part Number <sup>6</sup>	OCL <sup>1</sup> (uH) ±20%	FLL <sup>2</sup> (uH) minimum	I <sub>rms</sub> <sup>3</sup> (amps)	I <sub>sat</sub> <sup>4</sup> (amps)	DCR (mΩ) ±6.0% @ 20°C	K-factor <sup>5</sup>
HCP0805-R40-R	0.40	0.26	20	32	3.1	376
HCP0805-R68-R	0.68	0.44	17.5	25	4.5	292
HCP0805-1R0-R	1.0	0.64	14.5	22	5.8	239
HCP0805-1R5-R	1.5	0.96	13.3	18	6.8	202
HCP0805-2R2-R	2.2	1.41	10	14	11.2	175

- Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.1Vrms, 0.0Adc @ +25°C
- Full Load Inductance (FLL) Test Parameters: 100kHz, 0.10Vrms, @ Isat, @ +25°C
- 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.
- I<sub>sat</sub>: Peak current for approximately 20% rolloff @ +25°C
- 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).
- Part number definition: HCP0805-xxx-R  
HCP0805 = Product code and size  
XXX = Inductance value in uH, R = decimal point,  
If no R is present then last character equals number of zeroes  
-R suffix indicates RoHS compliant

**Dimensions (mm)**



Schematic

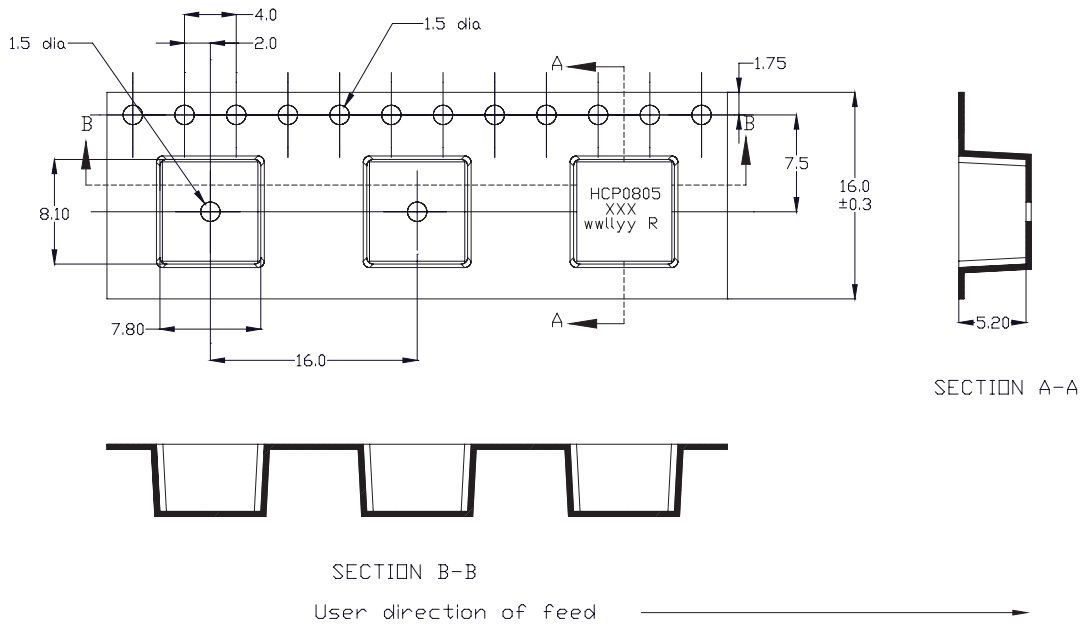


Part marking:HCP0805, XXX= Inductance value in uH, R=decimal point,  
If no R is present then last character equals number of zeros  
wwllly = date code, R = revision level  
Tolerances are ±0.25 millimeters unless stated otherwise  
PCB tolerances are ±0.1 millimeters unless stated otherwise  
DCR measured from point "a" to point "b"  
Do not route traces or vias underneath the inductor

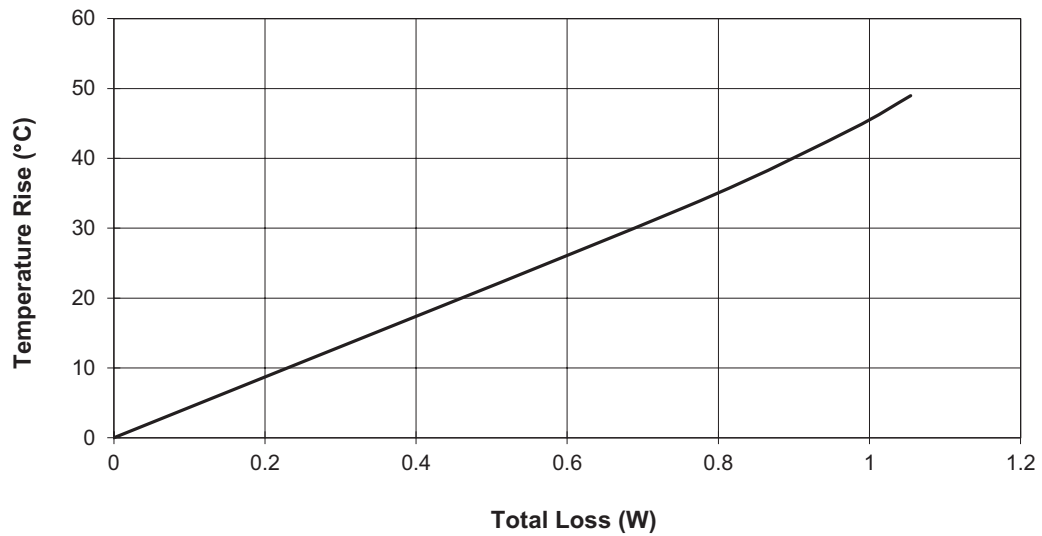
Part Number	Dimensions	
	A (mm)	B (mm)
HCP0805-R40-R	1.3 ±0.2	1.70
HCP0805-R68-R	1.1 ±0.2	1.50
HCP0805-1R0-R	1.1 ±0.2	1.50
HCP0805-1R5-R	1.1 ±0.2	1.50
HCP0805-2R2-R	0.8 ±0.2	1.20

**Packaging information (mm)**

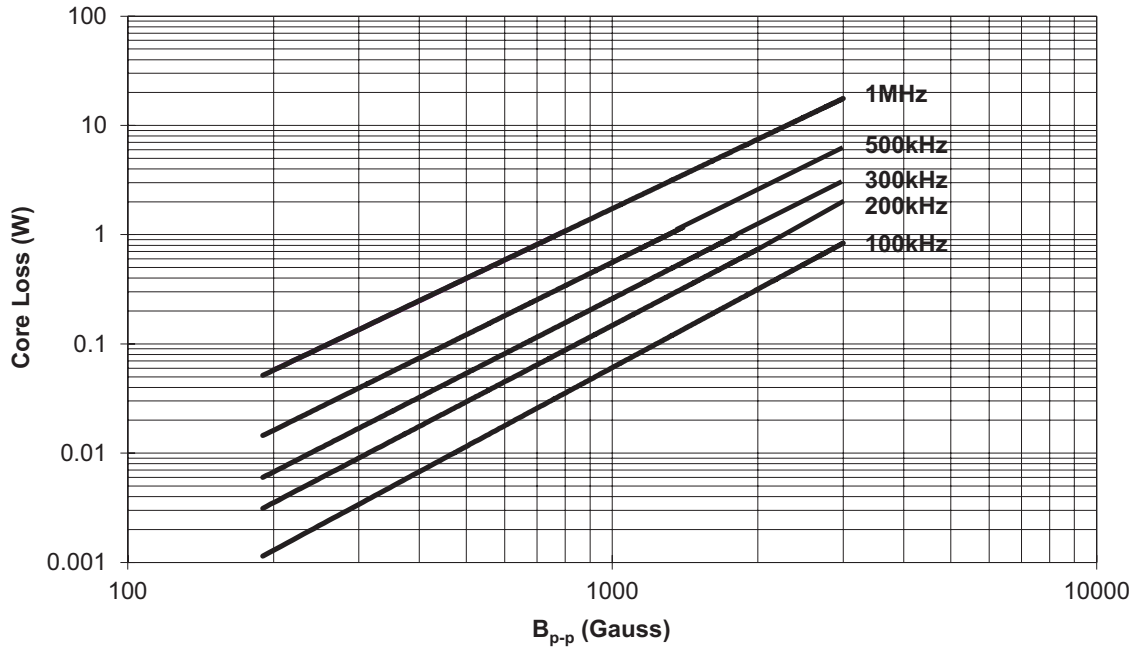
Supplied in tape and reel packaging, 700 parts per 13" diameter reel.



**Temperature rise vs. total loss**

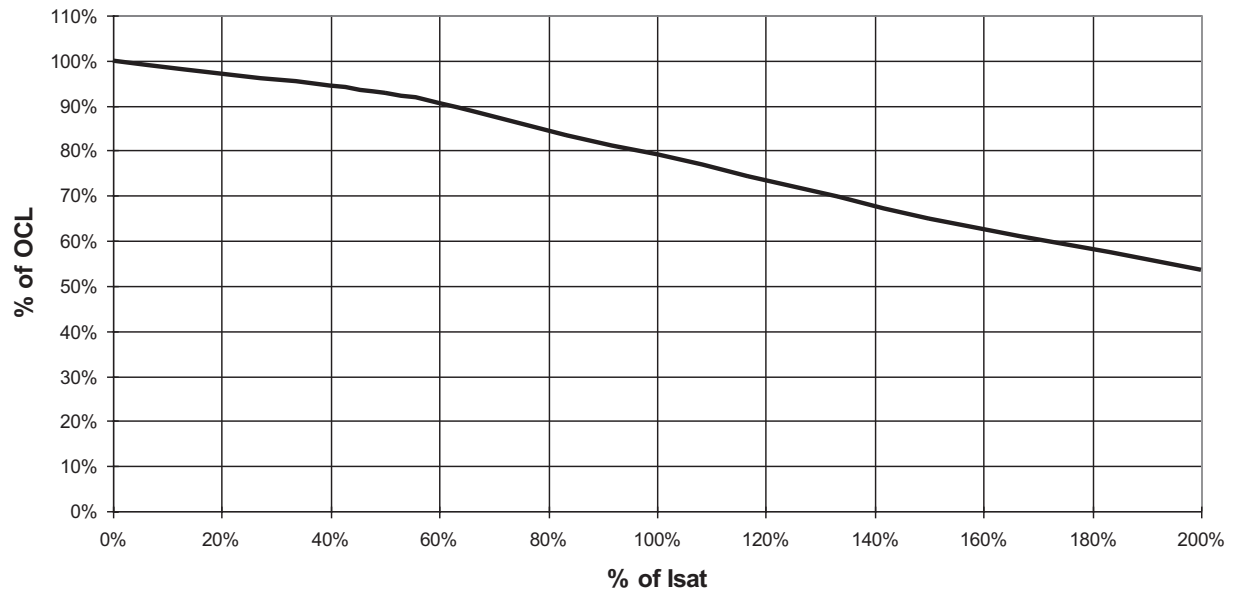


Core loss vs  $B_{p-p}$



Inductance characteristics

% of OCL vs. % of Isat



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
$\geq$ 2.5mm	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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