

# 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

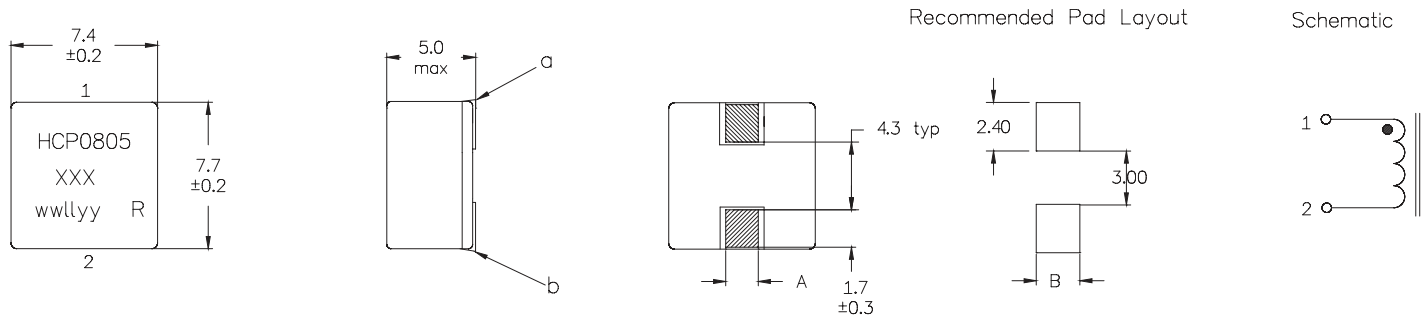


**Product specifications**

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)**

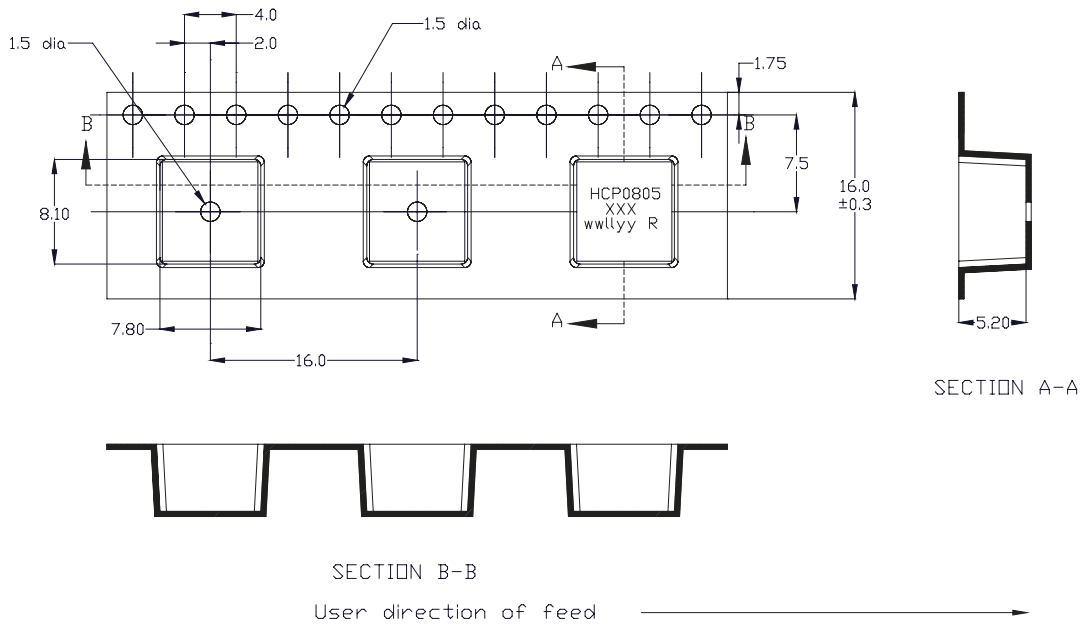


Part marking:HCP0805, XXX= Inductance value in uH, R=decimal point,  
If no R is present then last character equals number of zeros  
wwllly = date code, R = revision level  
Tolerances are ±0.25 millimeters unless stated otherwise  
PCB tolerances are ±0.1 millimeters unless stated otherwise  
DCR measured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

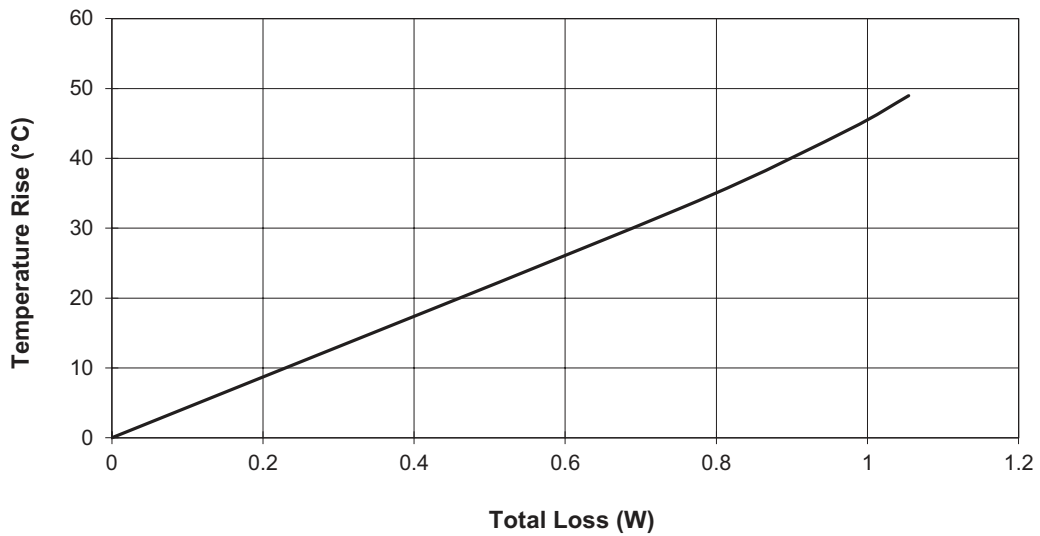
Part Number	Dimensions	
	A (mm)	B (mm)
HCP0805-R40-R	1.3 ±0.2	1.70
HCP0805-R68-R	1.1 ±0.2	1.50
HCP0805-1R0-R	1.1 ±0.2	1.50
HCP0805-1R5-R	1.1 ±0.2	1.50
HCP0805-2R2-R	0.8 ±0.2	1.20

**Packaging information (mm)**

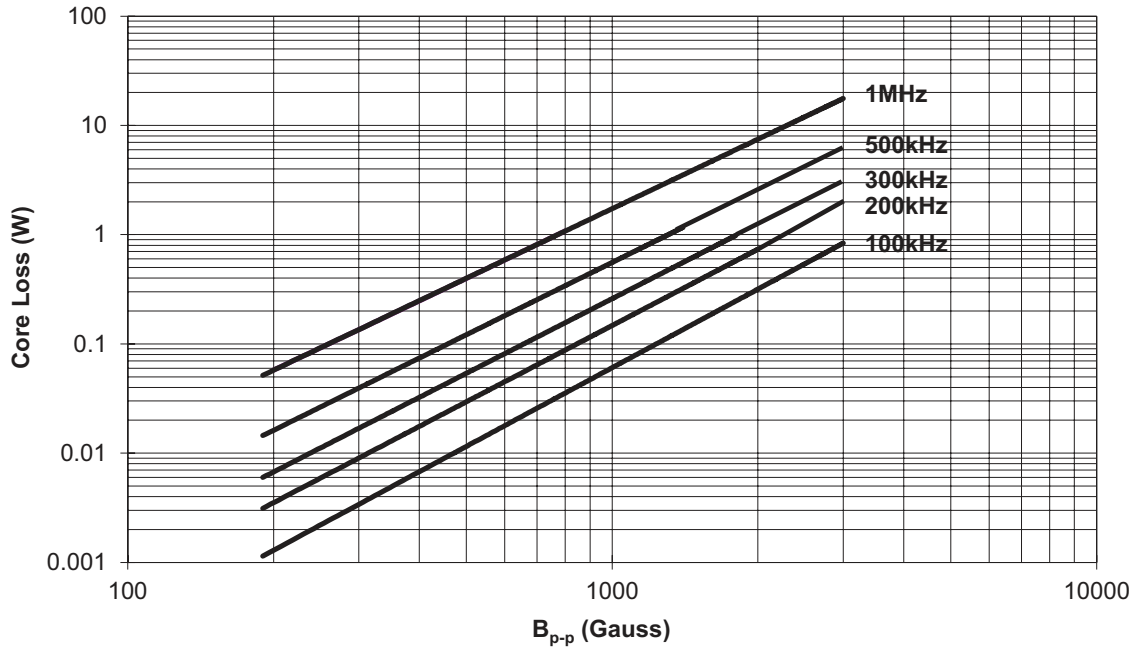
Supplied in tape and reel packaging, 700 parts per 13" diameter reel.



**Temperature rise vs. total loss**

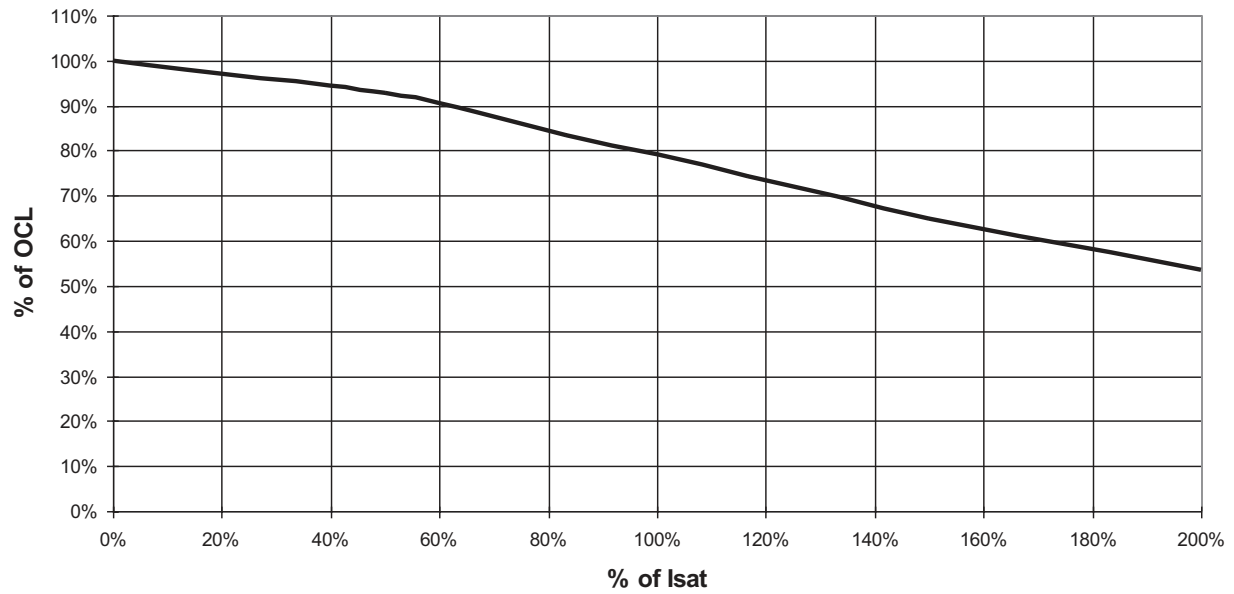


Core loss vs  $B_{p-p}$

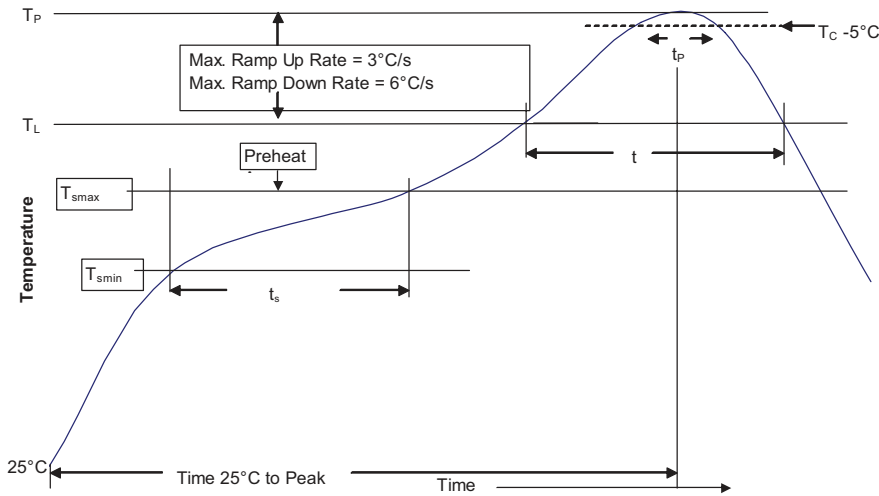


Inductance characteristics

% 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.

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

© 2016 Eaton  
 All Rights Reserved  
 Printed in USA  
 Publication 4349 BU-MC16003  
 January 2016



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