COILTRONICS®

High Current, High Frequency, Power Inductors

HCP0805 Series



SMD Device

RoHS 2002/95/EC

Applications:

- Voltage Regulator Module (VRM)
- Multi-phase regulators
- Desktop and servers
- Base station equipment
- Notebook regulators
- Data networking and storage systems
- Point-of-load modules
- Battery power systems
- DCR sensing

Environmental Data:

- Storage temperature range: -40°C to +125°C
- Operating temperature range: -40°C to +125°C (Range is application specific)
- Solder reflow temperature: J-STD-020D compliant

Packaging:

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

Description:

- Halogen free
- 125°C maximum total temperature operation
- 7.6 x 7.9 x 5.0mm surface mount package
- Powder iron core material
- Magnetically shielded, low EMI
- High current carrying capacity, Low core losses
- Controlled DCR tolerance for sensing circuits
- Inductance range from 0.40µH to 2.2µH
- Current range from 10.0 to 32 amps
- Frequency range up to 2MHz
- RoHS compliant

Product Specifications

Part Number[6]	OCL[1] ± 20% (µH)	FLL[2] Min. (µH)	I_{rms}[3] (Amps)	I_{sat}[4] @ 25°C (Amps)	DCR (mΩ) @ 20°C	K-factor[5]
HCP0805-R40-R	0.40	0.26	20	32	3.1 ±6.0%	376.0
HCP0805-R68-R	0.68	0.44	17.5	25	4.5 ±6.0%	292.0
HCP0805-1R0-R	1.00	0.64	14.5	22	5.8 ±6.0%	239.0
HCP0805-1R5-R	1.50	0.96	13.3	18	6.8 ±6.0%	202.0
HCP0805-2R2-R	2.20	1.41	10	14	11.2 ±6.0%	175.0

1 Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10V_{rms}, 0.0Adc

2 Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1V_{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 pad layout, trace thickness and width, air-flow and proximity of other heat generating components will affect the temperature rise. It is recommended the part temperature not exceed 125°C under worst case operating conditions verified in the end application.

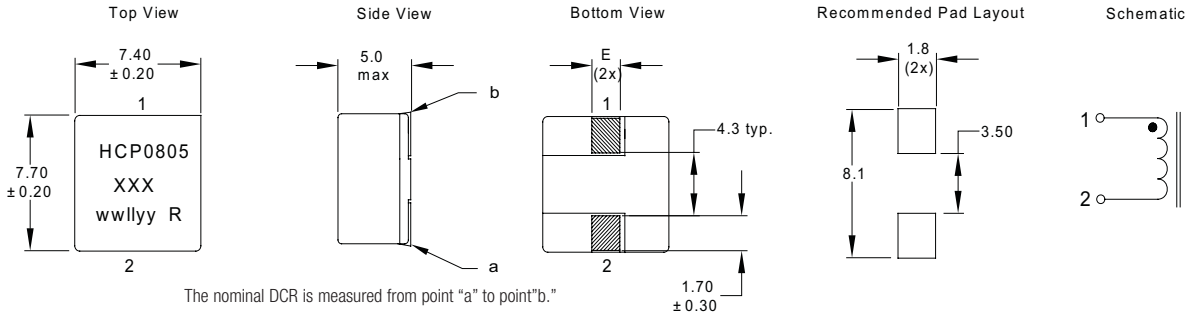
4 I_{sat}: Peak current for approximately 20% rolloff at +25°C.

5 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).

6 Part Number Definition: HCP0805-xxx-R
- HCP0805 = 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

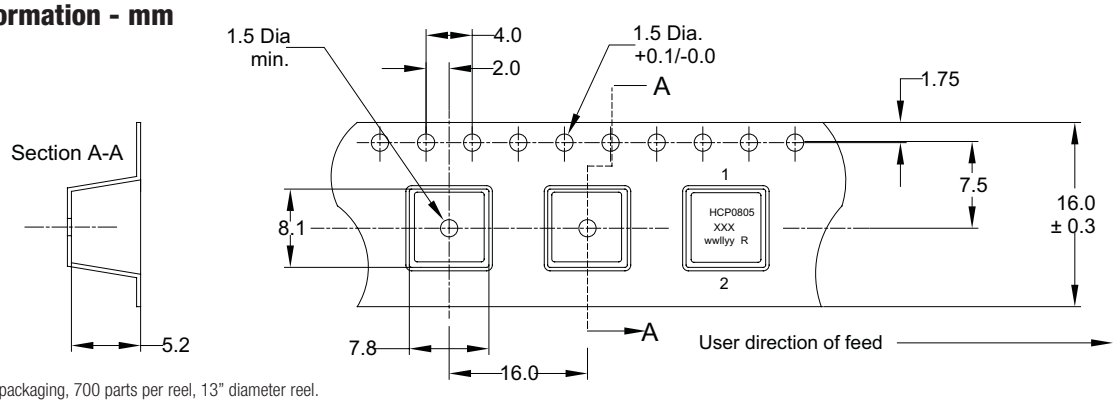
Part No.	Pin width E (mm)
HCP0805-R40-R	1.3 ±0.2
HCP0805-R68-R	1.1 ±0.2
HCP0805-1R0-R	1.1 ±0.2
HCP0805-1R5-R	1.1 ±0.2
HCP0805-2R2-R	0.8 ±0.2



The nominal DCR is measured from point "a" to point"b."

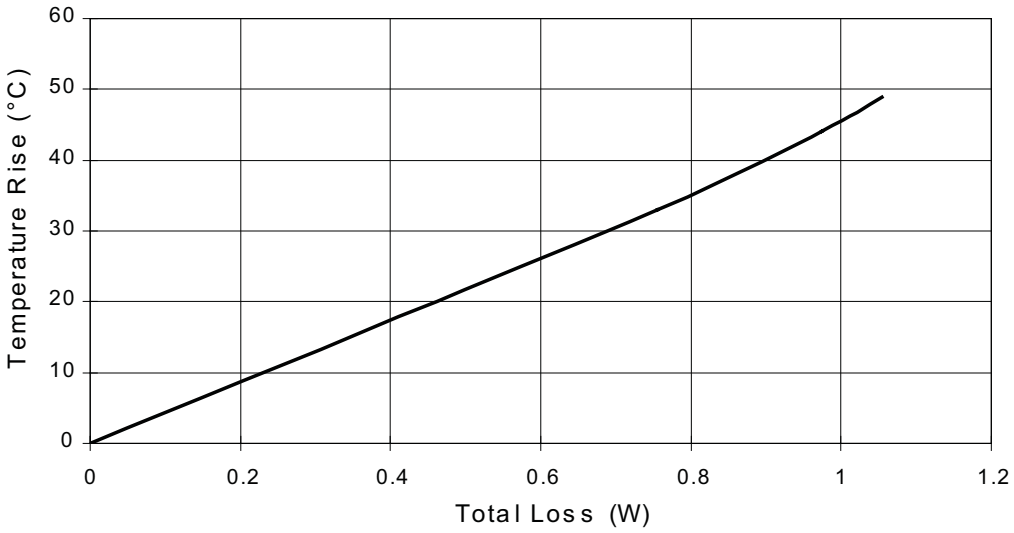
Part Marking: HCP0805 xxx = Inductance value in µH. (R = Decimal point). If no "R" is present, then last character is # 0f zeros wwllyy = Date code R = Revision level

Packaging Information - mm

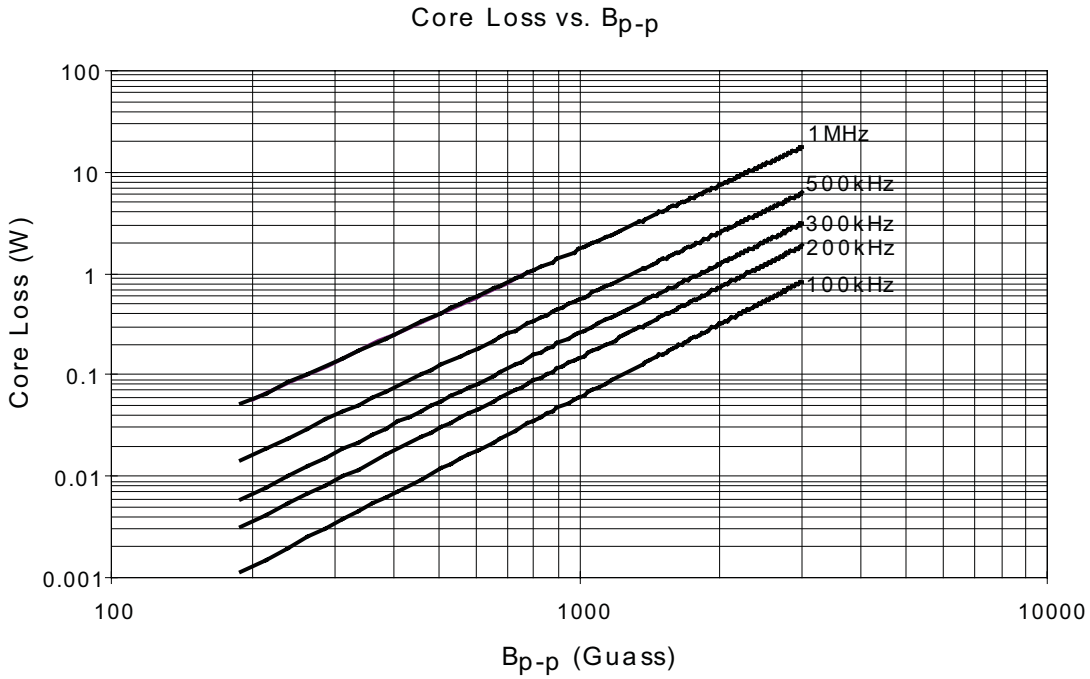


Supplied in tape-and-reel packaging, 700 parts per reel, 13" diameter reel.

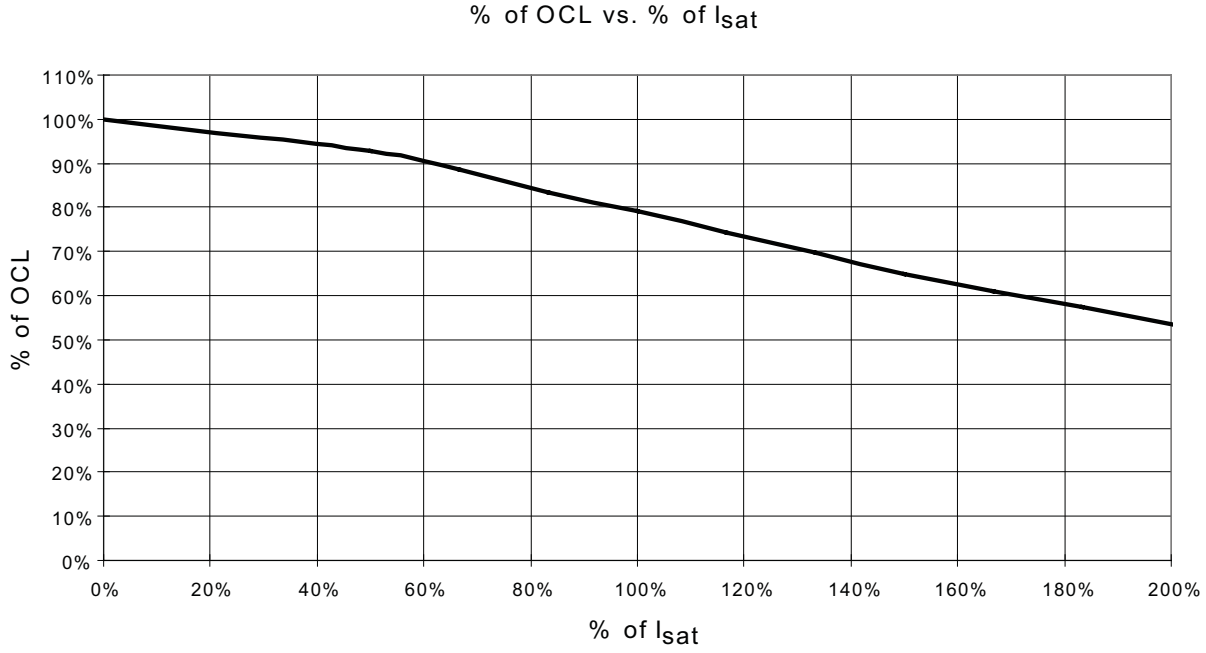
Temperature Rise vs.Total Loss



Core Loss



Inductance Characteristics



Solder Reflow Profile

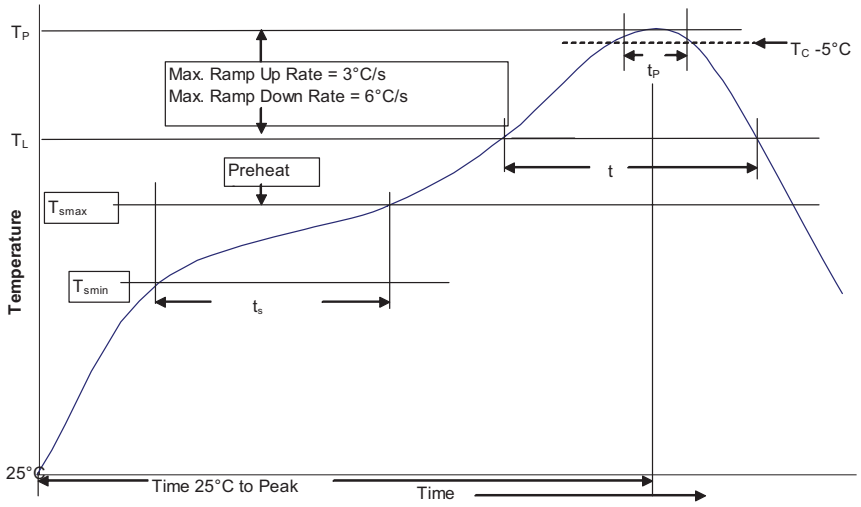


Table 1 - Standard SnPb Solder (T_C)

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-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) 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.

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