

HC8LP

Low profile, high current power inductors



Applications

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

Product description

- Low profile surface mount inductors designed for higher speed switch mode applications requiring low voltage, and high current
- Design utilizes high temperature powder iron material with a non-organic binder to eliminate thermal aging
- Inductance range from 0.17 μ H to 47.9 μ H
- Current range from 1.7 to 56 Amps
- Frequency range 1kHz to 500kHz

Environmental data

- Storage temperature range (component): -40°C to +155°C
- Operating temperature range: -40°C to +155°C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant



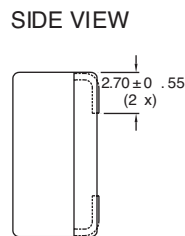
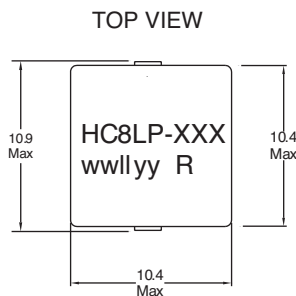
Product specifications

Part number ⁶	OCL ¹ (μH) ±20%	I _{rms} ² (amps)	I _{sat} ³ (amps) 15% rolloff	I _{sat} ⁴ (amps) 30% rolloff	DCR (mΩ) maximum @ 20°C	Volt-μSec ⁵ (V-μs)
HC8LP-R15-R	0.170	29.0	31	56	1.40	7.8
HC8LP-R39-R	0.430	20.2	19	34	2.80	4.7
HC8LP-R75-R	0.830	15.6	13.5	24	4.70	3.4
HC8LP-1R2-R	1.35	12.4	10.1	18.7	7.50	2.6
HC8LP-1R9-R	1.92	10.1	8.7	15.5	11.5	4.1
HC8LP-2R6-R	2.67	8.3	7.4	13.1	17.1	4.8
HC8LP-3R5-R	3.56	6.9	6.4	11.4	24.5	5.6
HC8LP-4R5-R	4.57	6.5	5.6	10.0	27.6	6.3
HC8LP-5R6-R	5.71	5.5	5.1	9.0	38.9	7.1
HC8LP-6R9-R	6.98	5.2	4.6	8.1	42.8	7.8
HC8LP-8R2-R	8.37	4.5	4.2	7.4	58.0	8.6
HC8LP-100-R	9.90	4.3	6.8	3.8	62.9	9.3
HC8LP-150-R	15.2	3.4	3.1	5.5	99.4	11.6
HC8LP-220-R	21.7	2.8	2.6	4.6	149	13.7
HC8LP-330-R	32.1	2.3	2.1	3.8	224	16.8
HC8LP-470-R	47.9	1.8	1.7	3.1	344	20.3

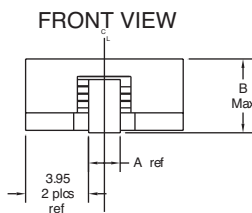
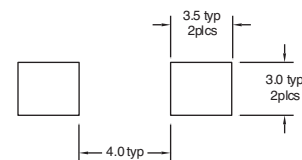
1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 1.0Vrms, 0.0Adc, @ +25°C
2. Irms: DC current for an approximate DT of 40°C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part not exceed 155°C under worst case operating conditions verified in the end application.
3. Peak current for approximately 15% rolloff @+20°C
4. Peak current for approximately 30% rolloff @+20°C
5. Applied Volt-Time product (V-μs) across the inductor. This value represents the applied V-μs at operating frequency necessary to generate additional core loss which contributes to the 40°C temperature rise. De-rating of the I_{rms} is required to prevent excessive temperature rise. The 100% V-us rating is equivalent to a ripple current Ip-p of 20% of Isat (30% rolloff option).

6. Part number definition: HC8LP-XXX-R
HC8LP = Product code and size
XXX = Inductance value in uH. R = Decimal point. If no R is present then last character equals number of zeros
-R suffix indicates RoHS compliant

Dimensions—mm

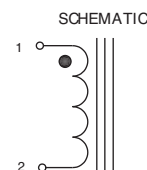


RECOMMENDED PAD LAYOUT



FRONT VIEW
Dimensional Table

PN	A ref mm	B max mm
R15	2.1	3.5
R39	2.1	3.5
R75	2.1	3.5
1R2	2.1	3.3
1R9 thru 470	2.7	3.5



Part marking: HC8LP= (Product code and size)-xxx=(inductance value in uH, R= decimal point. If no R is present then last character equals number of zeros. wwlyy=date code, R=revision level)

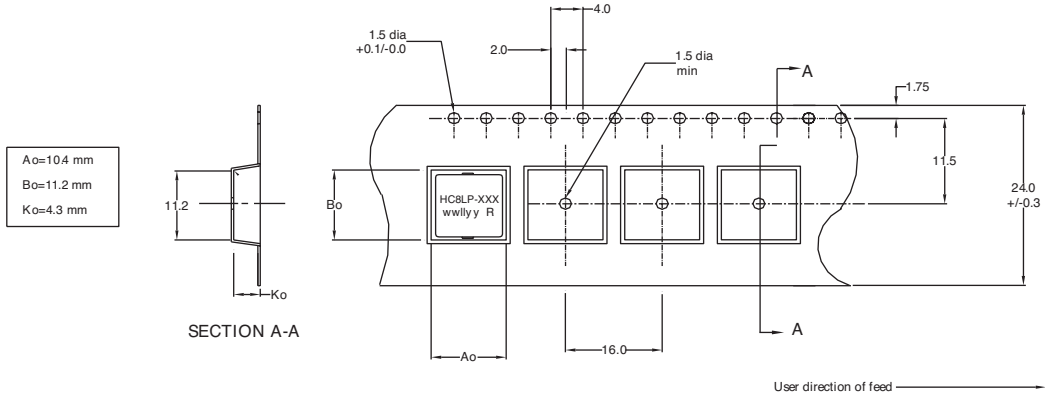
Tolerances are ±0.2 millimeters unless stated otherwise

All soldering surfaces to be coplanar within 0.1 millimeters

Do not route traces or vias underneath the inductor

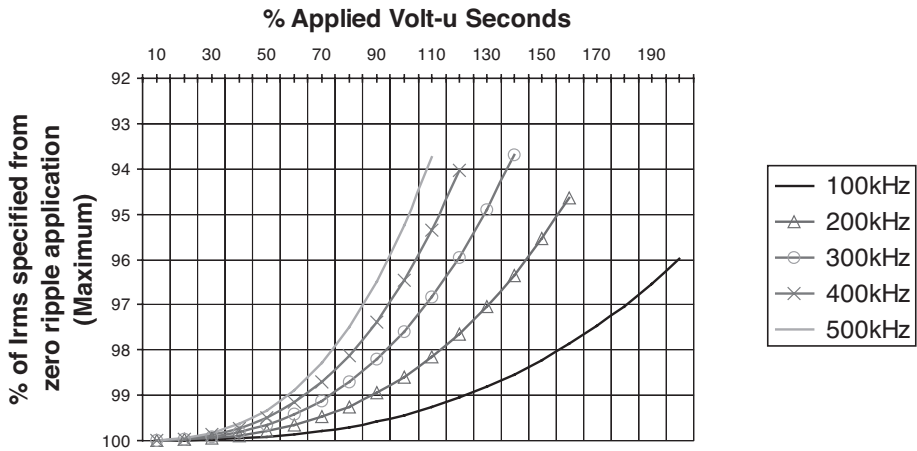
Packaging information-mm

Supplied in tape and reel packaging, 800 parts per reel



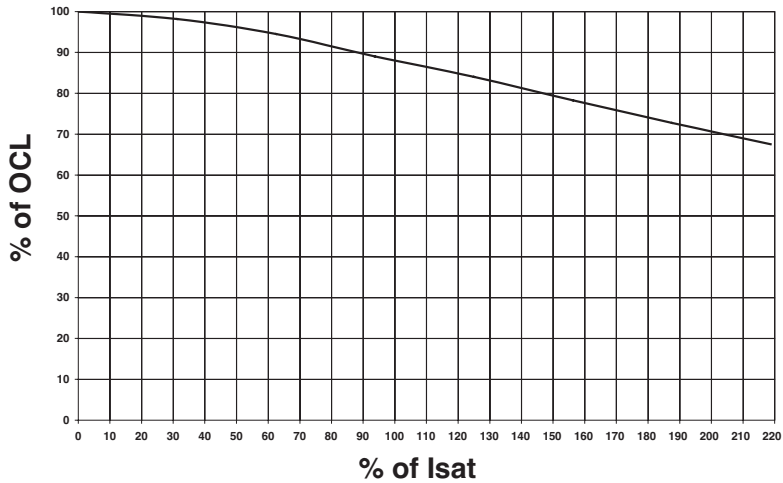
Core loss

Irms DERATING WITH CORE LOSS



Rolloff

OCL vs Isat



Solder reflow profile

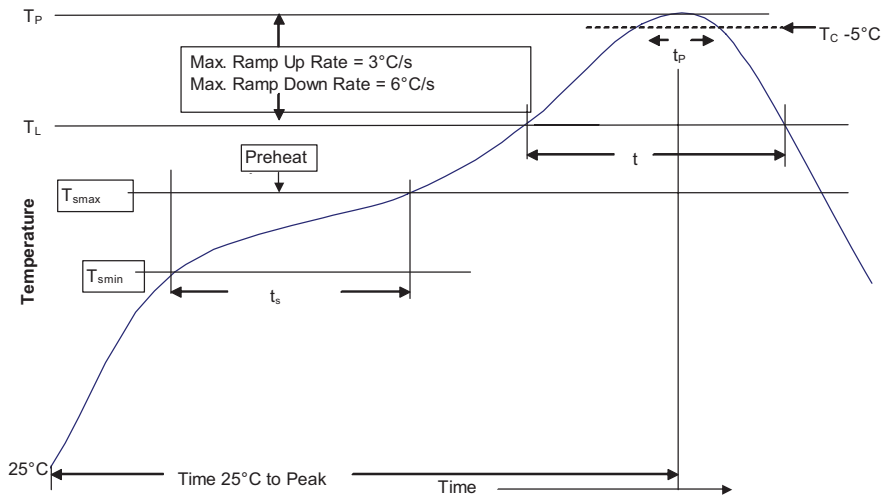


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume mm ³ <350	Volume mm ³ ≥350
<2.5mm)	235°C	220°C
≥2.5mm	220°C	220°C

Table 2 - Lead (Pb) Free Solder (T_C)

Package Thickness	Volume mm ³ <350	Volume mm ³ 350 - 2000	Volume 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 JEDEC 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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Printed in USA
Publication No. 4120
October 2015