

HC3

High current power inductors



Product description

- Compact footprint
- Designed for high density, high current/low voltage applications
- Foil technology that adds higher reliability factor over the traditional magnet wire used for higher frequency circuit designs
- Inductance range from 0.50uH to 6.52uH
- Current range from 30 to 120 Amps
- Ferrite core material

Applications

- Distributed power systems DC-DC converters
- General-purpose low voltage supplies
- Computer systems
- Servers
- Point of Load (POL) converters
- Industrial Equipment

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.

Packaging

- Supplied in bulk packaging, 24 parts per tray



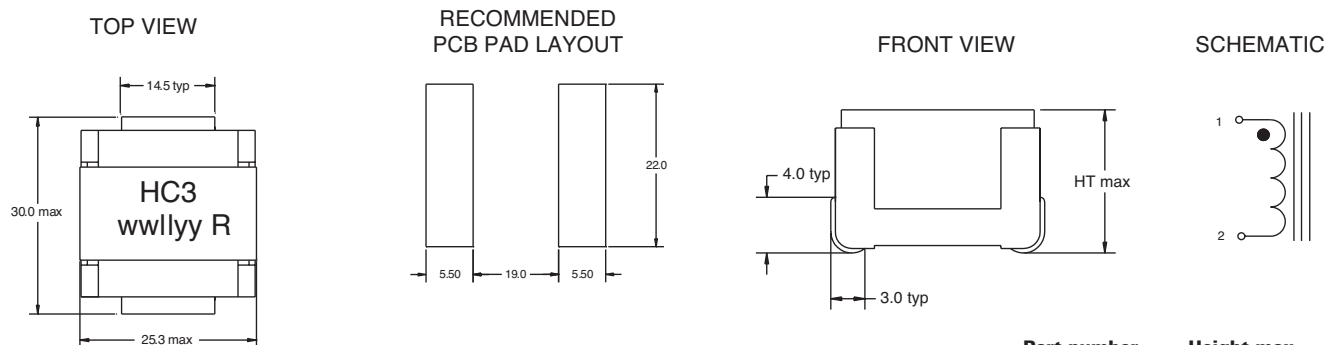
Product specifications

| Part number ⁵ | OCL ¹ (μH) ±20% | I _{rms} ² (amps) | I _{sat} ³ (amps) | DCR (mΩ) maximum @ 20°C | Volt-μsec ⁴ (V-μs) ref. |
|--------------------------|----------------------------|--------------------------------------|--------------------------------------|-------------------------|------------------------------------|
| HC3-R50-R | 0.50 | 78.00 | 120 | 0.42 | 17.33 |
| HC3-1R0-R | 1.05 | 78.00 | 78 | 0.42 | 17.33 |
| HC3-2R2-R | 2.05 | 55.50 | 60 | 0.70 | 26.01 |
| HC3-3R3-R | 3.63 | 42.45 | 46 | 1.20 | 34.65 |
| HC3-4R7-R | 4.98 | 33.80 | 38 | 2.17 | 43.30 |
| HC3-5R6-R | 5.68 | 33.80 | 34.5 | 2.17 | 43.30 |
| HC3-6R0-R | 6.52 | 33.80 | 30.0 | 2.17 | 43.30 |

- OCL (Open Circuit Inductance) Test parameters: 300kHz, .25Vrms, 0.0ADC & Isat.
- DC current for approximately ΔT of 40°C without core loss De-rating is necessary for AC currents. PCB layout, trace thickness and width, air flow and proximity of other heat generating components will affect temperature rise. It is recommended that the temperature of the part not exceed 125°C under worst case conditions verified in the end application.

- Peak current for approximately 30% rolloff (@20°C).
- Applied Volt-Time product (V-μs) across the inductor. This value represents the applied V-μs at 300kHz necessary to generate a core loss equal to 10% of the total losses for a 40°C temperature rise.
- Part number definition - HC3-xxx-R:
HC3 = Product code and size
-xxx = Inductance value R = Decimal point (if no "R" is present, last character equals number of zeros)
-R Suffix = RoHS compliant

Dimensions—mm

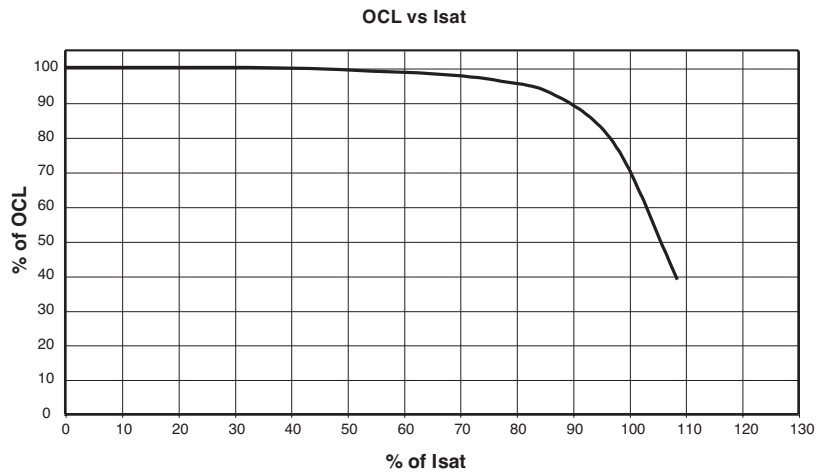


wwllyy = Date code R = Revision level

Do not route traces or vias underneath inductor

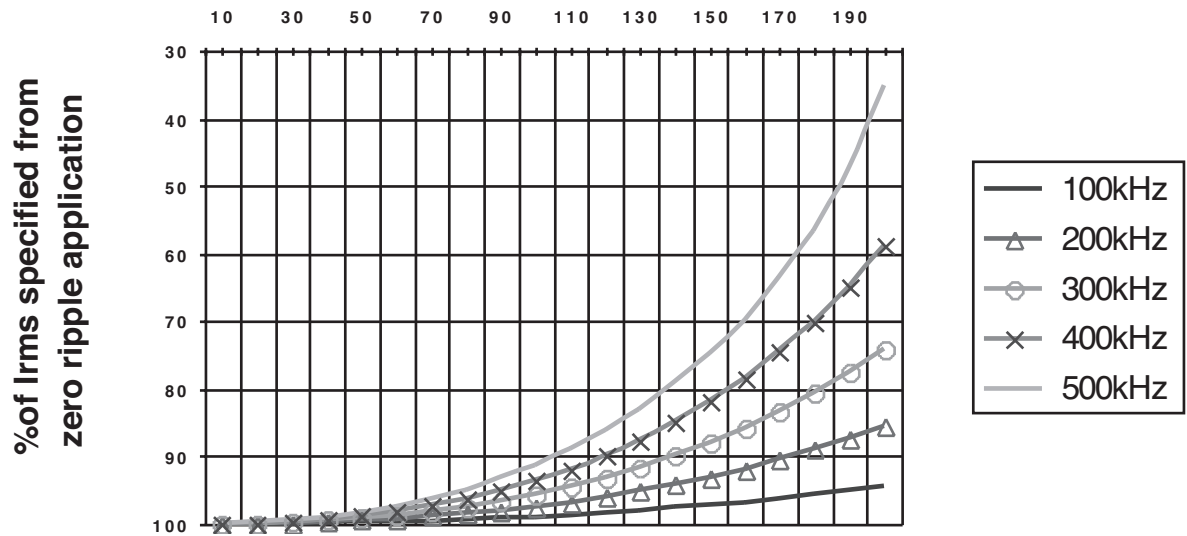
| Part number | Height max |
|-------------|------------|
| HC3-R50-R | 18.0 |
| HC3-1R0-R | 17.5 |
| HC3-2R2-R | 17.5 |
| HC3-3R3-R | 17.5 |
| HC3-4R7-R | 17.5 |
| HC3-5R6-R | 17.5 |
| HC3-6R0-R | 17.5 |

Inductance characteristics



Core loss

Irms DERATING WITH CORE LOSS for HC3
% Applied Volt-u Seconds



Solder reflow profile

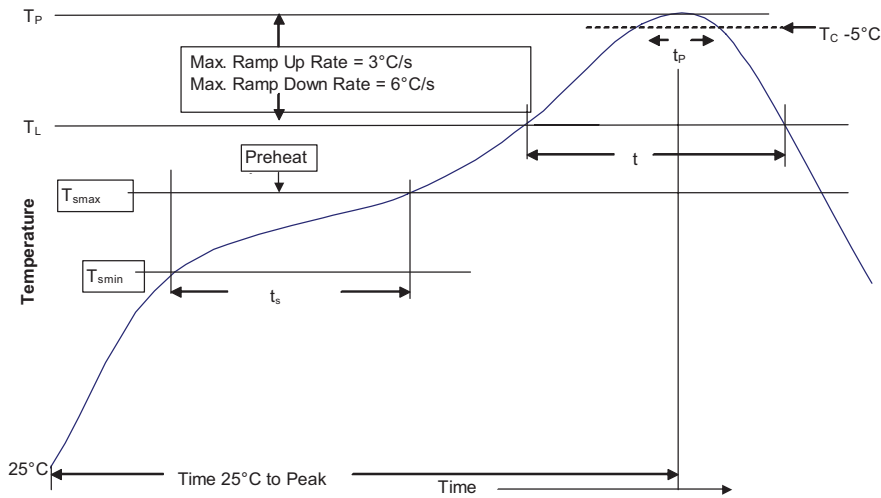


Table 1 - Standard SnPb Solder (T_C)

| 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 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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