

HCV1605

High current power inductors



Applications

- Compatible with Picor® Cool-Power® ZVS Buck and Buck-Boost Regulator Families

Environmental data

- Storage temperature range (Component): -55 °C to +125 °C
- Operating temperature range: -55 °C to +125 °C (ambient plus self-temperature rise)
- Solder reflow temperature: J-STD-020 (latest revision) compliant
- Halogen free, lead free, RoHS compliant



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Product features

- Flat-wire construction
- Low DCR, high efficiency
- Secure 3 terminal mounting
- 15.5 mm x 14 mm footprint surface mount package in a 4.98 mm height
- Ferrite core material
- Moisture Sensitivity Level: 1

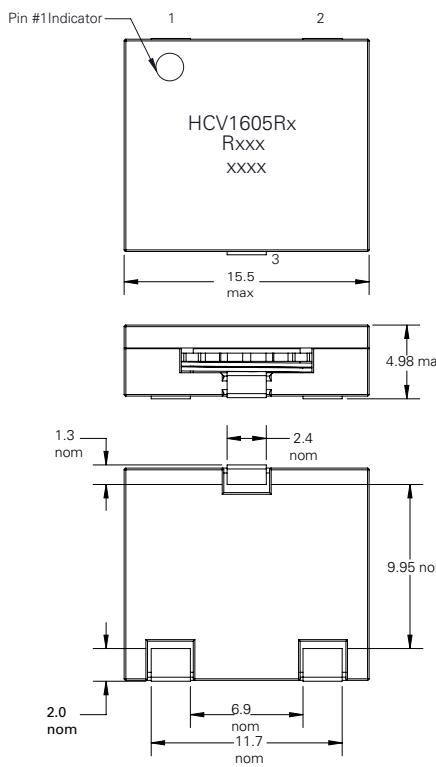
Product specifications

Part Number ⁷	OCL ¹ (μ H)	FLL ² (μ H) minimum	I _{rms} ³ (A)	I _{sat} ¹ ⁴ (A)	I _{sat} ² ⁵ (A)	I _{sat} ³ ⁶ (A)	DCR (m Ω) maximum @ +20 °C
HCV1605R1-R375-R	0.375 ±6%	0.346	20	60	53	50	1.98
HCV1605R1-R500-R	0.500 ±10%	0.441	20	45	40	37	1.98

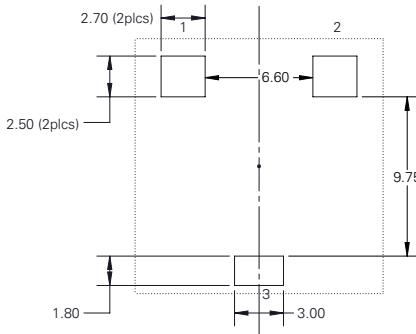
1. Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 0.1 Vrms, 0.0 Adc, +25 °C
2. Full Load Inductance (FLL) Test Parameters: 100 kHz, 0.1 Vrms, I _{sat}¹, +25 °C
3. I _{rms}: DC current for an approximate temperature rise of 40 °C without core loss. Derating is necessary for AC currents. PCB layout, 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.

4. I _{sat}¹: Peak current for approximately 2% rolloff @ +25 °C
5. I _{sat}²: Peak current for approximately 20% rolloff @ +100 °C
6. I _{sat}³: Peak current for approximately 20% rolloff @ +125 °C
7. Part Number Definition: HCV1605Rx-Rxxx-R
HCV1605= Product code and size
Rx= Version indicator
Rxxx= Inductance value in μ H, R= decimal point,
If no R is present last character equals number of zeros
-R suffix = RoHS compliant

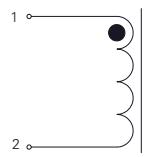
Dimensions (mm)



Recommended Pad Layout



Schematic



Part marking: HCV1605Rx-Rxxx, Rx= version indicator, Rxxx= inductance value in uH, R= decimal point, if no R is present last character equals number of zeros

xxxx=lot code

All soldering surface to be coplanar within 0.1 millimeters

Tolerances are ±0.15 millimeters unless stated otherwise

Pad layout tolerances are ±0.1 millimeters unless stated otherwise

Pin 3 is for mounting stability. No connection.

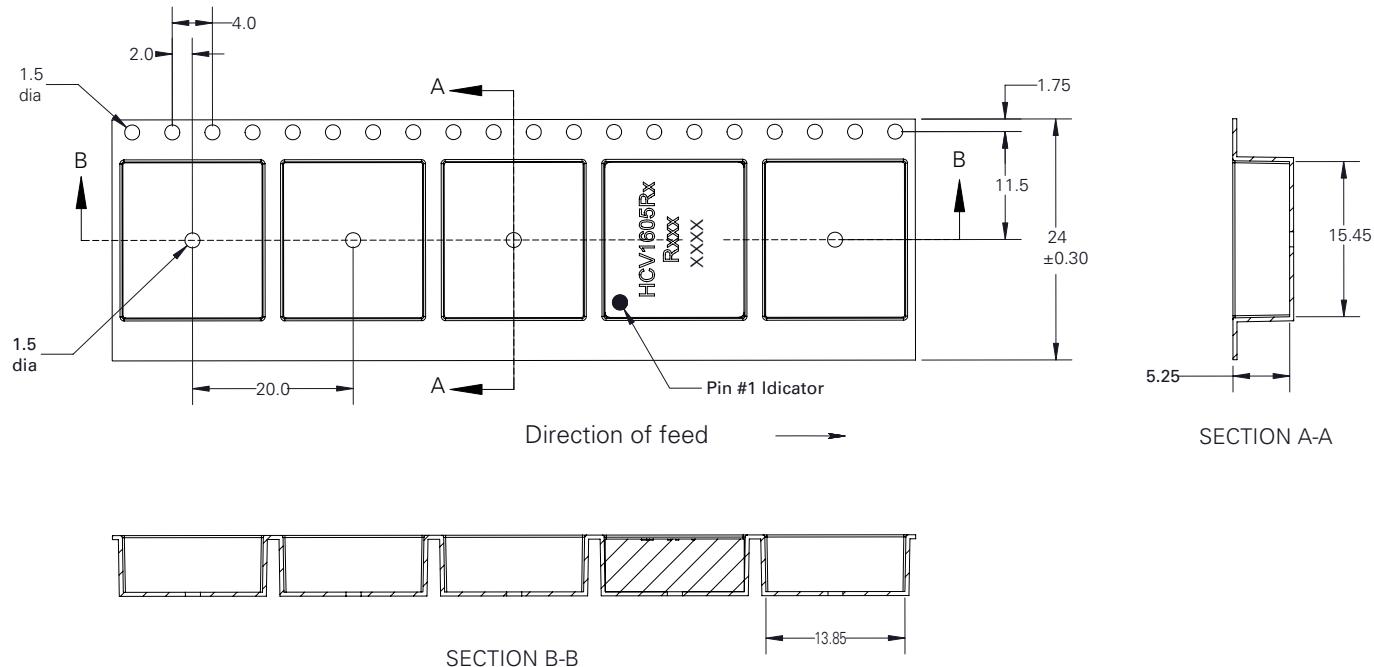
Terminal: Pins (1,2) - Copper, Pin (3) - Bronze

Terminal finish: Pins (1,2) Tin-silver-copper, Pin (3) Copper-nickel-gold

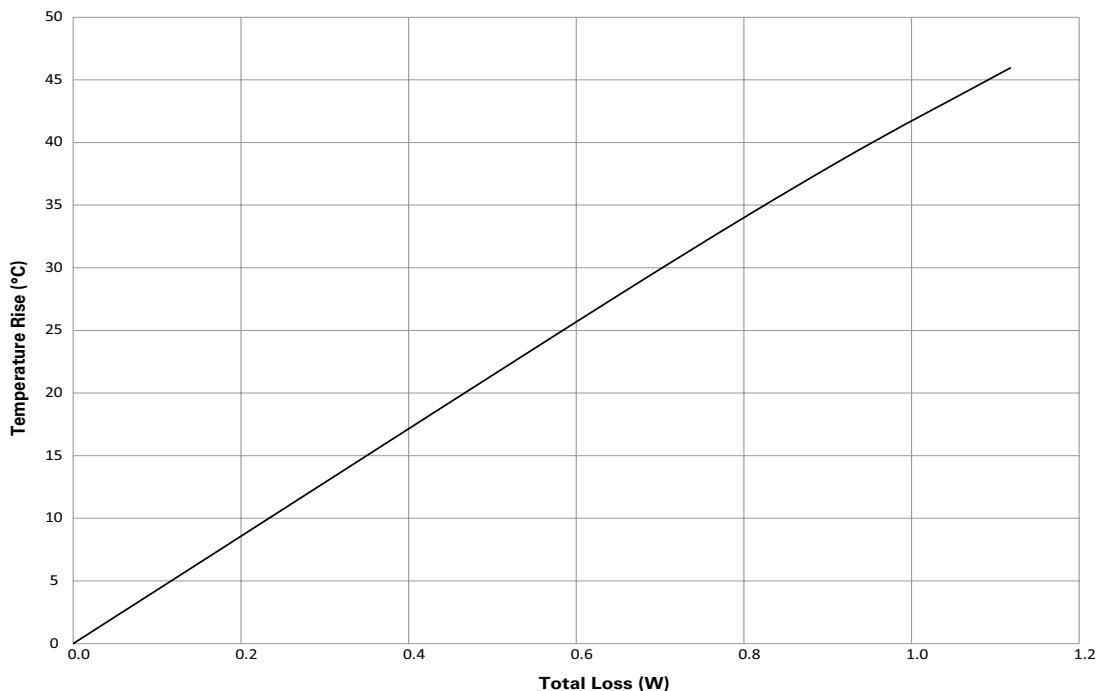
Do not route traces or vias underneath the inductor

Packaging information (mm)

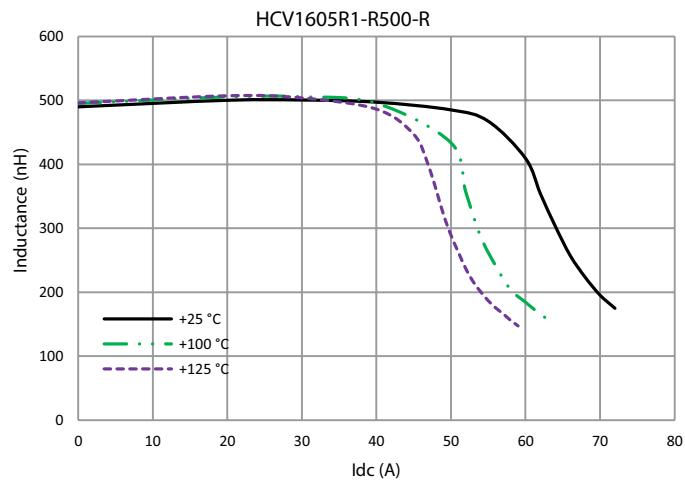
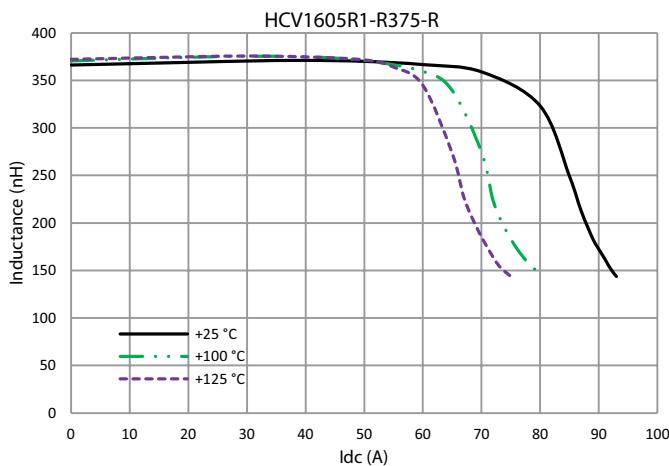
Supplied in tape and reel packaging , 500 parts per 13" diameter reel



Temperature rise vs. total loss



Inductance characteristics



Solder reflow profile

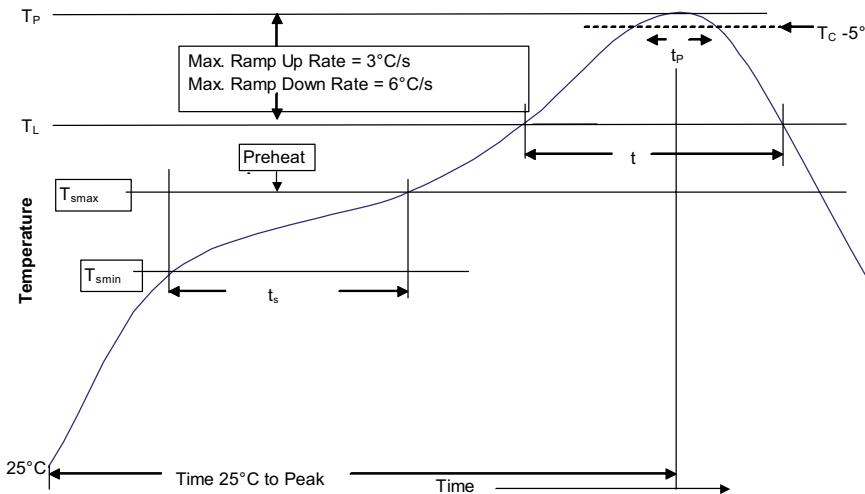


Table 1 - Standard SnPb Solder (T_c)

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-020

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak	<ul style="list-style-type: none"> Temperature min. (T_{smin}) Temperature max. (T_{smax}) Time (T_{smin} to T_{smax}) (t_s) 	100 °C 150 °C 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. 10828 BU-MC18060
August 2018

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