

# HCV1605

## High current power inductors



### 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

### 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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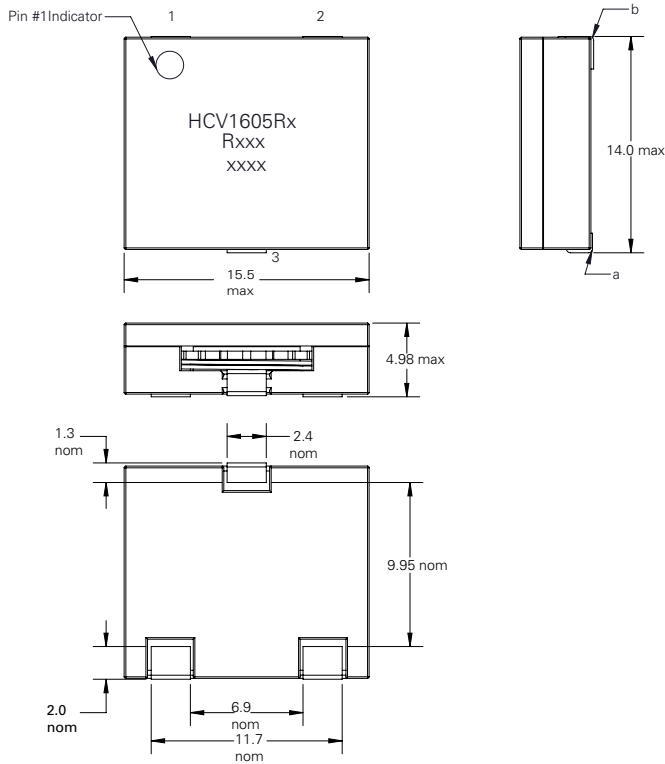
## Product specifications

Part Number <sup>7</sup>	OCL <sup>1</sup> ( $\mu$ H)	FLL <sup>2</sup> ( $\mu$ H) minimum	I <sub>rms</sub> <sup>3</sup> (A)	I <sub>sat</sub> <sup>14</sup> (A)	I <sub>sat</sub> <sup>25</sup> (A)	I <sub>sat</sub> <sup>36</sup> (A)	DCR (m $\Omega$ ) maximum @ +20 °C
HCV1605R1-R375-R	0.375 $\pm$ 6%	0.346	20	60	53	50	1.98
HCV1605R1-R500-R	0.500 $\pm$ 10%	0.441	20	45	40	37	1.98

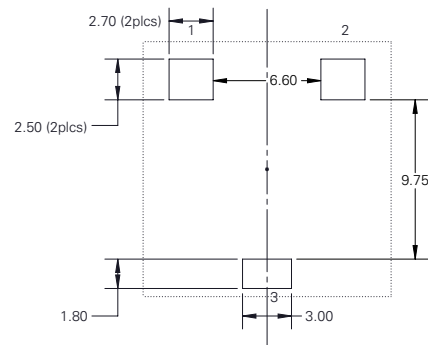
1. Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 0.1 Vrms, 0.0 Adc, +25 °C
2. Full Load Inductance (FLL) Test Parameters: 100 kHz, 0.1 Vrms, I<sub>sat</sub><sup>1</sup>, +25 °C
3. I<sub>rms</sub><sup>3</sup>: DC current for an approximate temperature rise of 40 °C without core loss. Derating 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<sub>sat</sub><sup>1</sup>: Peak current for approximately 2% rolloff @ +25 °C
5. I<sub>sat</sub><sup>2</sup>: Peak current for approximately 20% rolloff @ +100 °C
6. I<sub>sat</sub><sup>3</sup>: 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  $\mu$ H, R= decimal point,  
If no R is present last character equals number of zeros  
-R suffix = RoHS compliant

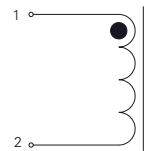
## Dimensions (mm)



## Recommended Pad Layout



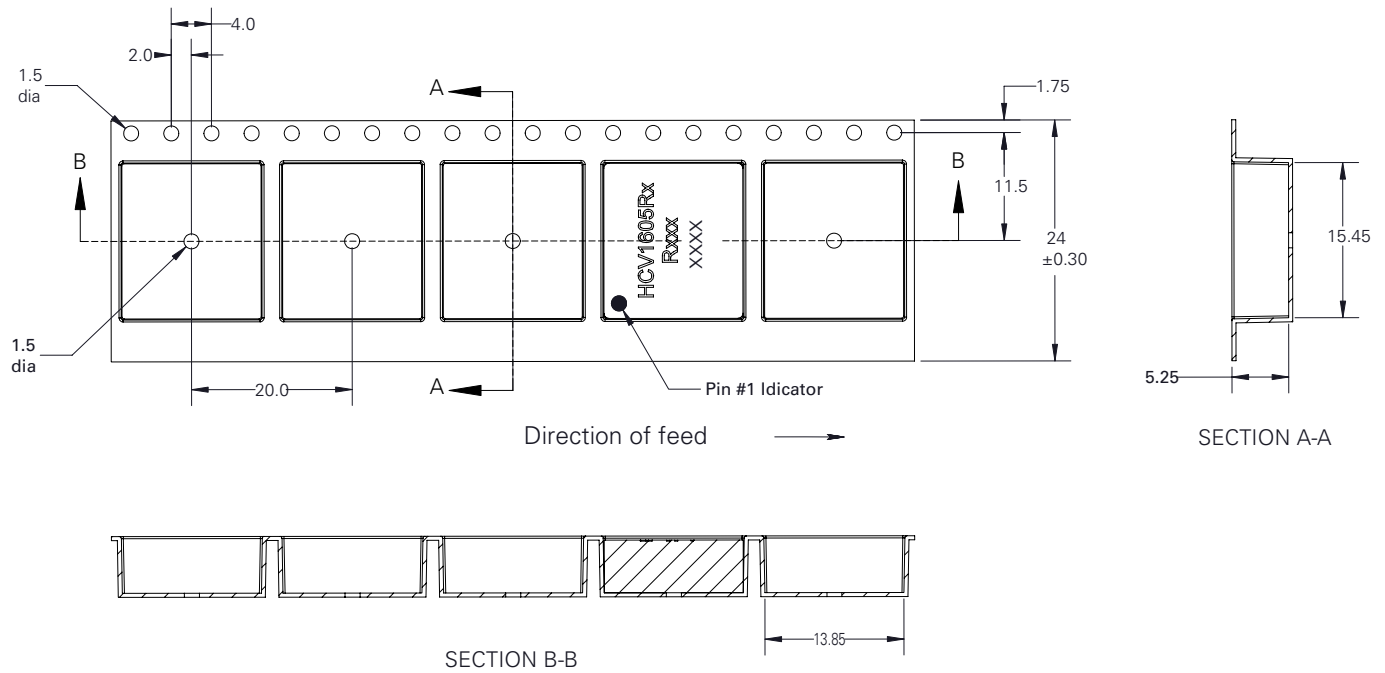
## Schematic



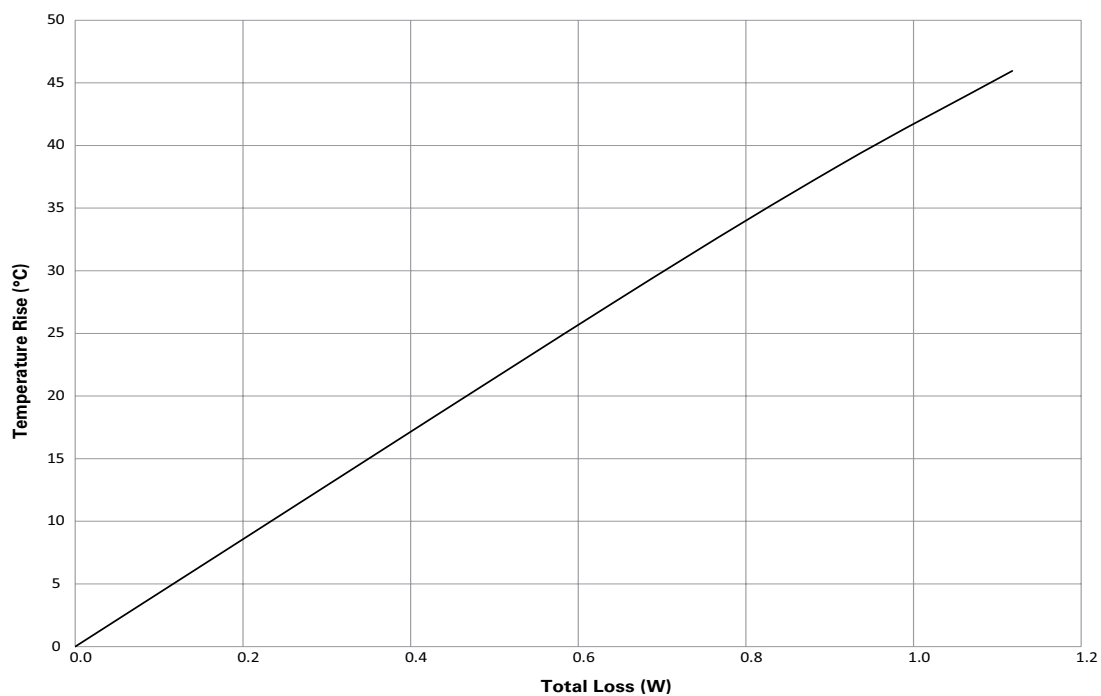
Part marking: HCV1605Rx-Rxxx, Rx= version indicator, Rxxx= inductance value in  $\mu$ H, R= decimal point, if no R is present last character equals number of zeros  
xxxx=lot code  
All soldering surface to be coplanar within 0.1 millimeters  
Tolerances are  $\pm$ 0.15 millimeters unless stated otherwise  
Pad layout tolerances are  $\pm$ 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)

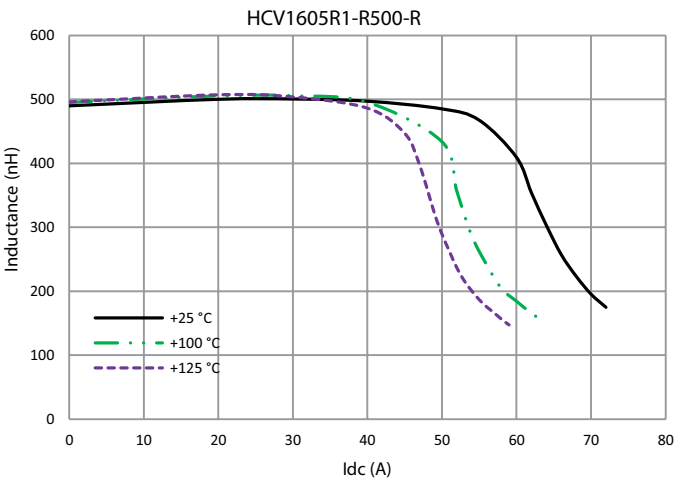
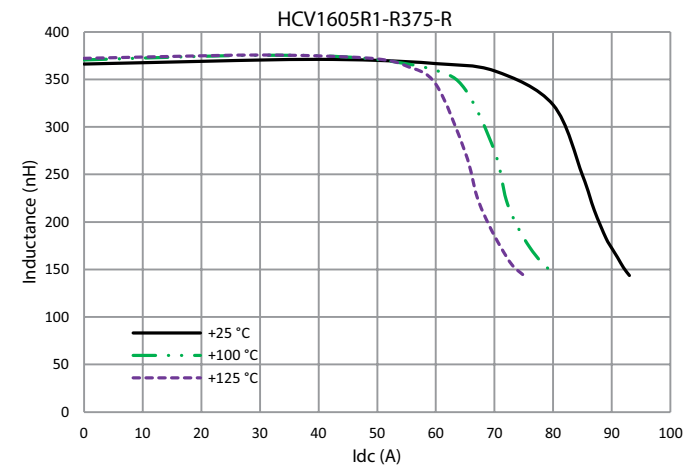
Supplied in tape and reel packaging , 500 parts per 13" diameter reel



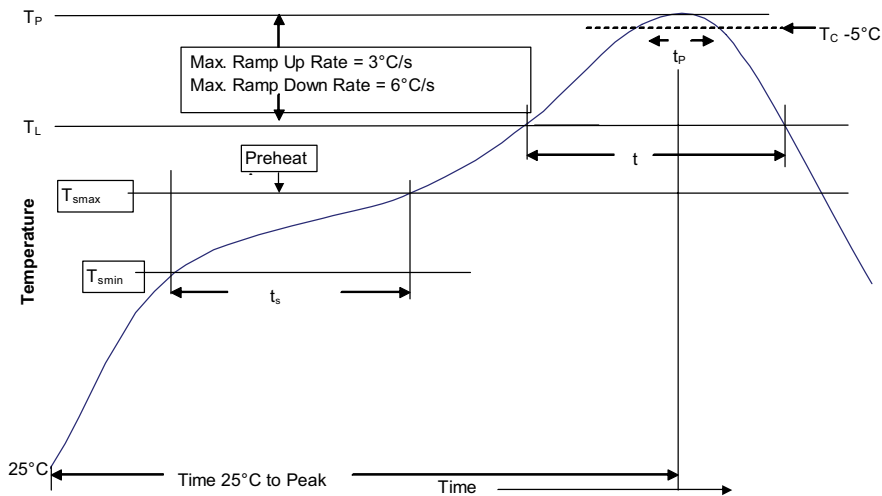
### Temperature rise vs. total loss



Inductance characteristics



## Solder reflow profile



**Table 1 - Standard SnPb Solder ( $T_C$ )**

Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥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 <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >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		
• 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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