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 ⁷	OCL¹ (µH)	FLL² (µH) minimum	I_ms ³ (A)	l _{sat} 1 ⁴ (A)	I _{sat} 2 ⁵ (A)	I _{sat} 3 ⁶ (A)	DCR (mΩ) 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

14.0 max

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, Isat1, +25 °C

3. I_{ms}: 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___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

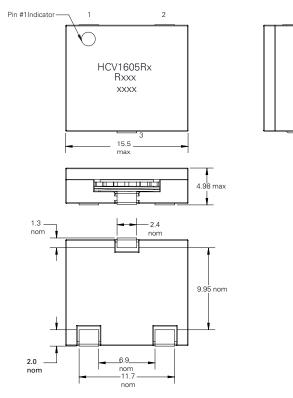
Rx= Version indicator

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)



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

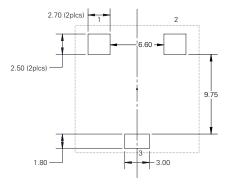
Pin 3 is for mounting stability. No connection.

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

Recommended Pad Layout



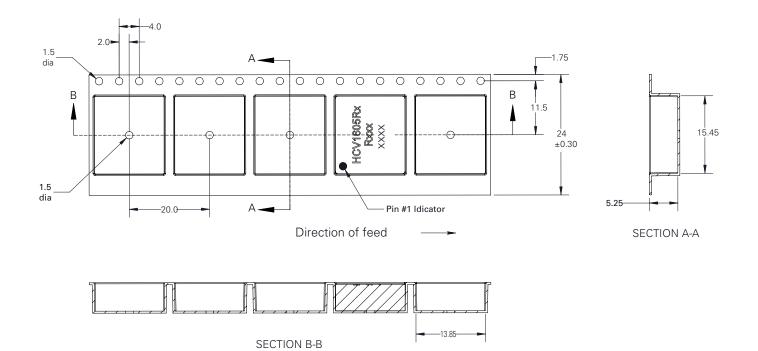
Schematic



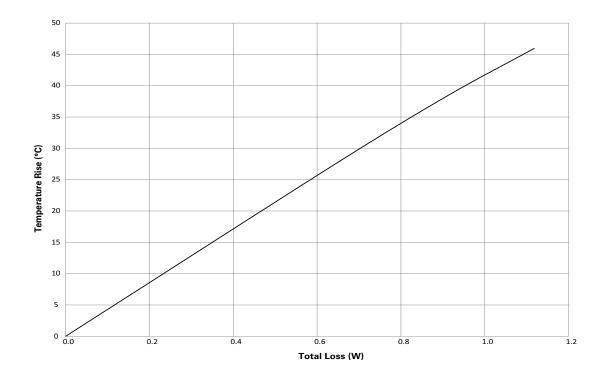
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Packaging information (mm)

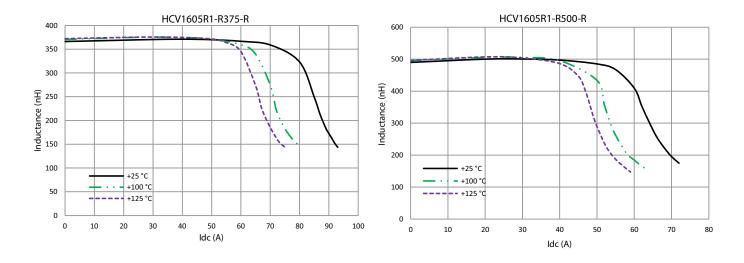
Supplied in tape and reel packaging , 500 parts per 13" diameter reel



Temperature rise vs. total loss



Inductance characteristics



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Solder reflow profile

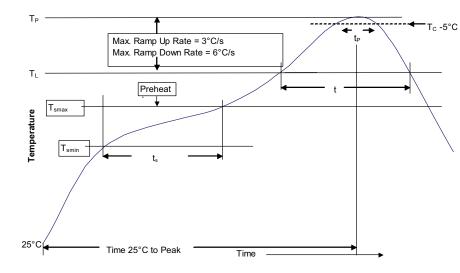


Table 1 - Standard SnPb Solder (T_c)

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 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 • Temperature min. (T _{smin})	100 °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 (TL) Time at liquidous (tL)	183 °C 60-150 Seconds	217 °C 60-150 Seconds	
Peak package body temperature (Tp)*	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 (Tp to Tsmax)	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 (Tp) 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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