

# HCV1707

## High current power inductors



### Product features

- Flat-wire construction
- Low DCR, high efficiency
- Secure 3 terminal mounting
- 17.8 mm x 14.35 mm footprint surface mount package in a 6.9 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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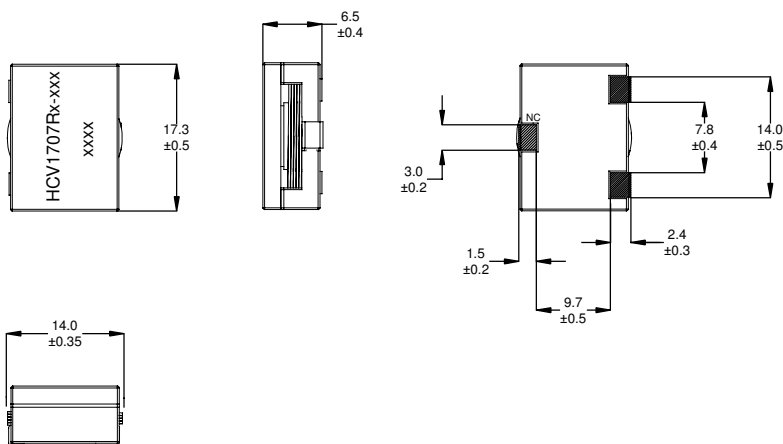
Product specifications

Part Number <sup>7</sup>	OCL <sup>1</sup> ( $\mu$ H) $\pm 10\%$	FLL <sup>2</sup> ( $\mu$ H) minimum	I <sub>rms</sub> <sup>3</sup> (A)	I <sub>sat</sub> <sup>1</sup> <sup>4</sup> (A)	I <sub>sat</sub> <sup>2</sup> <sup>5</sup> (A)	I <sub>sat</sub> <sup>3</sup> <sup>6</sup> (A)	DCR (m $\Omega$ ) $\pm 10\%$ @ +20 °C
HCV1707R1-R48-R	0.48	0.42	32	55	68	47	1.7

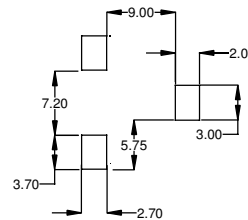
- Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 0.1 Vrms, 0.0 Adc, +25 °C
- Full Load Inductance (FLL) Test Parameters: 100 kHz, 0.1 Vrms, I<sub>sat</sub><sup>1</sup>, +25 °C
- I<sub>rms</sub><sup>3</sup>: DC current for an approximate temperature rise of 40 °C without core loss. Derating is 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.

- I<sub>sat</sub><sup>1</sup>: Peak current for approximately 2% rolloff @ +25 °C
- I<sub>sat</sub><sup>2</sup>: Peak current for approximately 2% rolloff @ -55 °C
- I<sub>sat</sub><sup>3</sup>: Peak current for approximately 2% rolloff @ +125 °C
- Part Number Definition: HCV1707Rx-Rxxx-R  
HCV1707= Product code and size  
Rx= Version indicator  
Rxx= Inductance value in  $\mu$ H, R= decimal point,  
If no R is present last character equals number of zeros  
-R suffix = RoHS compliant

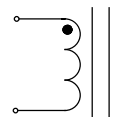
Dimensions (mm)



Recommended Pad Layout



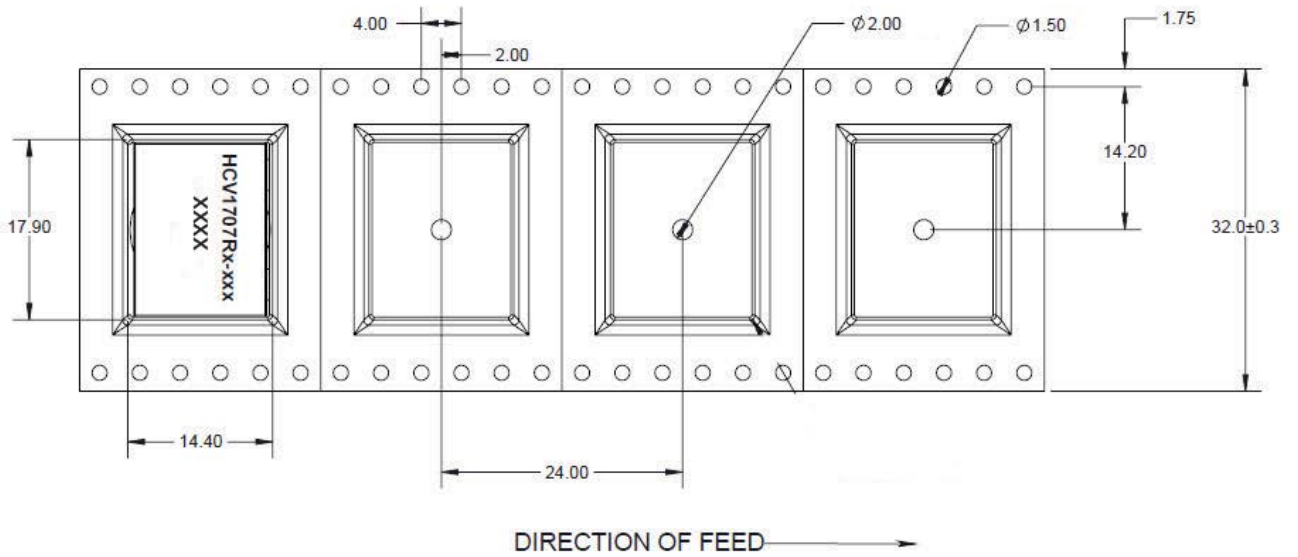
Schematic



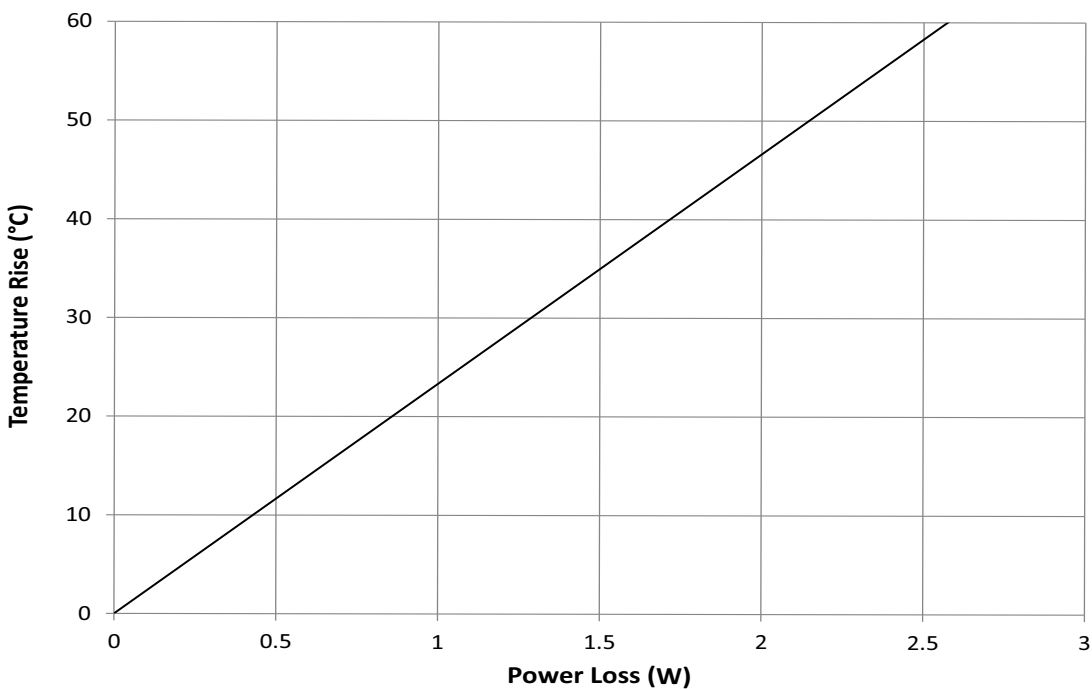
Part marking: HCV1707Rx-Rxx, Rxx= inductance value in uH, R= decimal point, if no R is present last character equals number of zeros  
xxxx=lot code  
All soldering surface to be coplanar within 0.1 millimeters  
Tolerances are  $\pm 0.15$  millimeters unless stated otherwise  
Pad layout tolerances are  $\pm 0.1$  millimeters unless stated otherwise  
Pin NC is for mounting stability. No connection.  
Do not route traces or vias underneath the inductor

**Packaging information (mm)**

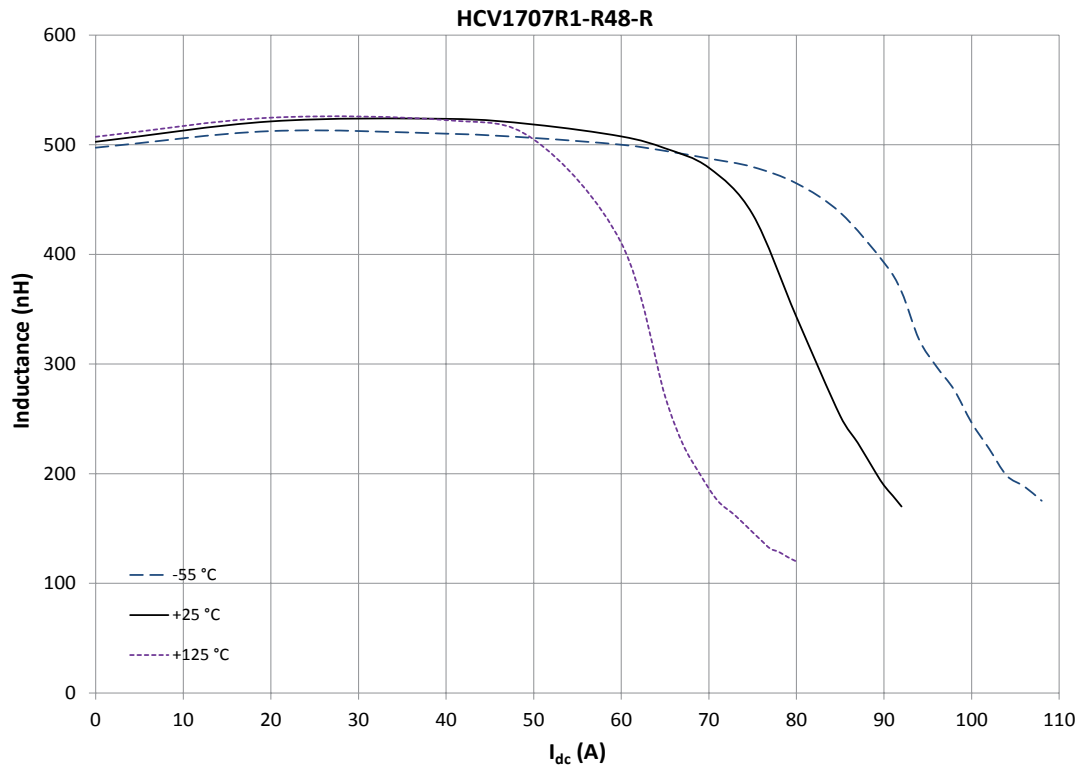
Supplied in tape and reel packaging , 350 parts per 13" diameter reel



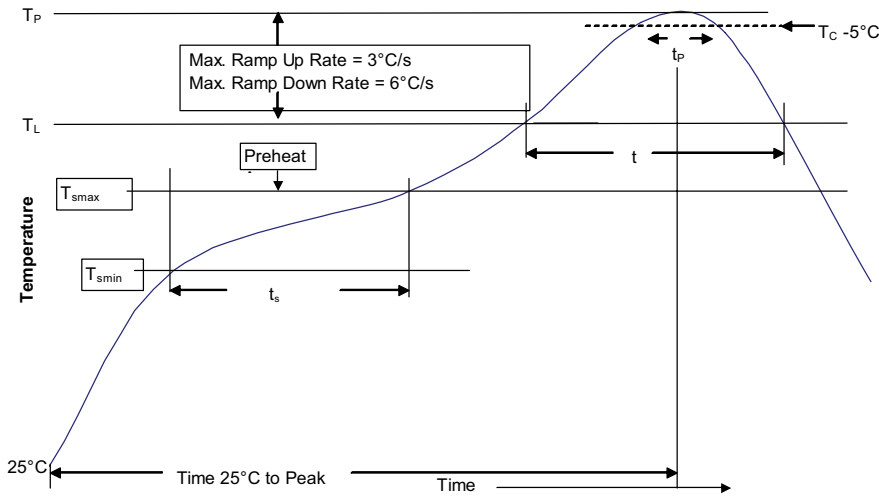
**Temperature rise vs. total loss**



Inductance characteristics



**Solder reflow profile**



**Table 1 - Standard SnPb Solder (T<sub>C</sub>)**

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<sub>C</sub>)**

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 <sub>smin</sub> )	100 °C	150 °C
• Temperature max. (T <sub>smax</sub> )	150 °C	200 °C
• Time (T <sub>smin</sub> to T <sub>smax</sub> ) (t <sub>s</sub> )	60-120 Seconds	60-120 Seconds
Average ramp up rate T <sub>smax</sub> to T <sub>p</sub>	3°C/ Second Max.	3 °C/ Second Max.
Liquidous temperature (T <sub>L</sub> )	183 °C	217 °C
Time at liquidous (t <sub>L</sub> )	60-150 Seconds	60-150 Seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )** within 5 °C of the specified classification temperature (T <sub>C</sub> )	20 Seconds**	30 Seconds**
Average ramp-down rate (T <sub>p</sub> to T <sub>smax</sub> )	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<sub>p</sub>) is defined as a supplier minimum and a user maximum.  
\*\* Tolerance for time at peak profile temperature (t<sub>p</sub>) is defined as a supplier minimum and a user maximum.

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