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

Product features

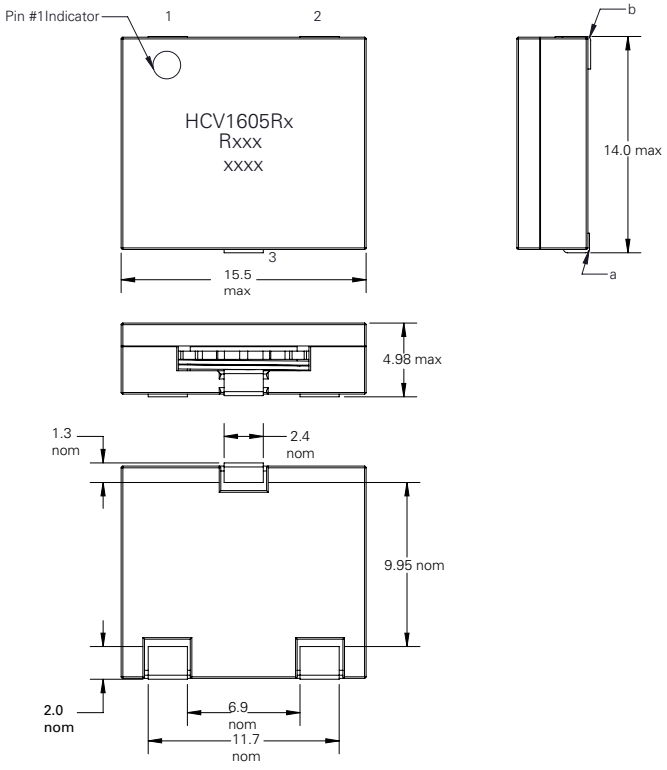
- Flat-wire construction
- Low DCR, high efficiency
- Secure 3 terminal mounting
- 15.5 mm x 14 mm footprint surface mount package in a 4.98 mm height
- Ferrite core material
- Moisture Sensitivity Level: 1

Product specifications

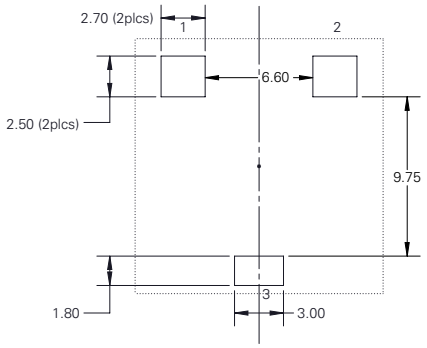
Part Number[7]	OCL[1] (µH)	FLL[2] (µH) minimum	I_{rms}[3] (A)	$I_{sat}1$[4] (A)	$I_{sat}2$[5] (A)	$I_{sat}3$[6] (A)	DCR (mΩ) maximum @ +20 °C
HCV1605R1-R375-R	0.375 ±6%	0.346	20	60	53	50	1.98
HCV1605R1-R500-R	0.500 ±10%	0.441	20	45	40	37	1.98

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 µH, R= decimal point,
   If no R is present last character equals number of zeros
   -R suffix = RoHS compliant

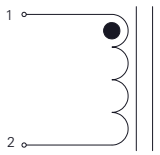
Dimensions (mm)



Recommended Pad Layout



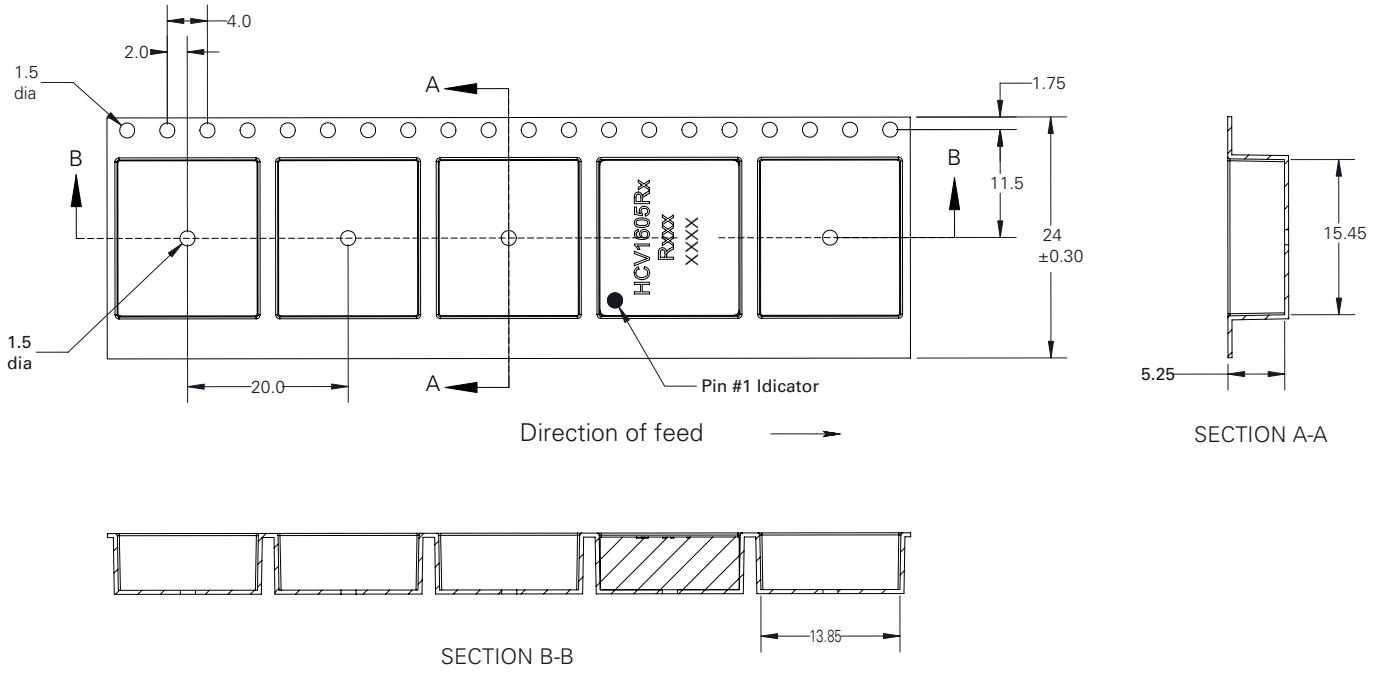
Schematic



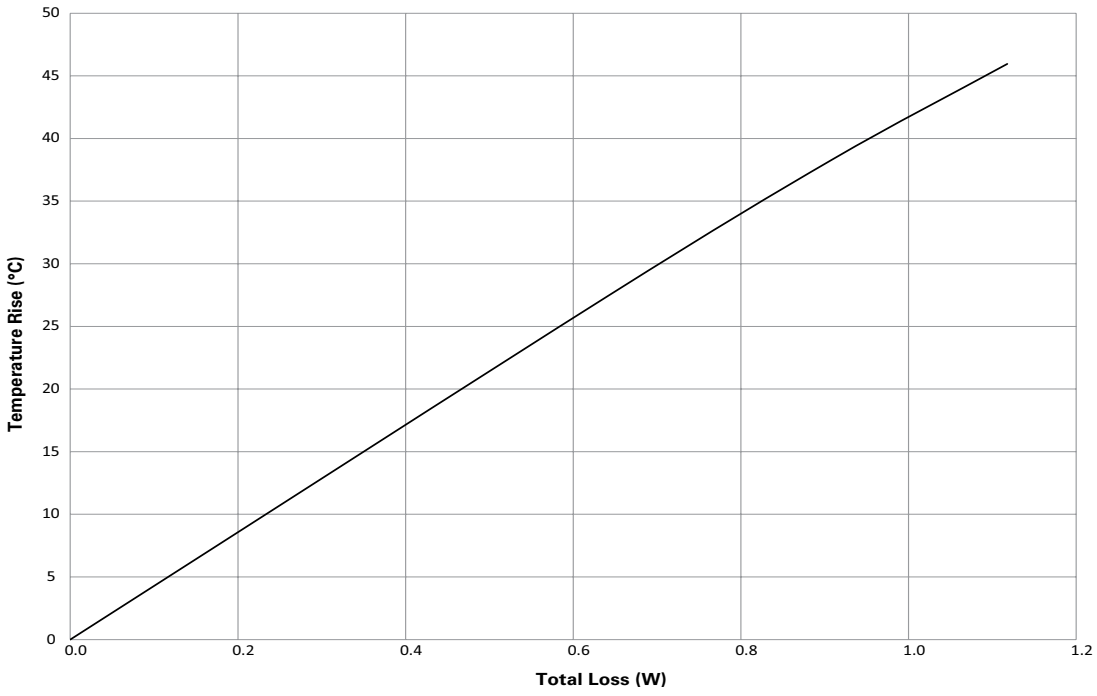
Part marking: HCV1605Rx-Rxxx, Rx= version indicator, Rxxx= inductance value in uH, R= decimal point, if no R is present last character equals number of zeros
xxxx=lot code
All soldering surface to be coplanar within 0.1 millimeters
Tolerances are ±0.15 millimeters unless stated otherwise
Pad layout tolerances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

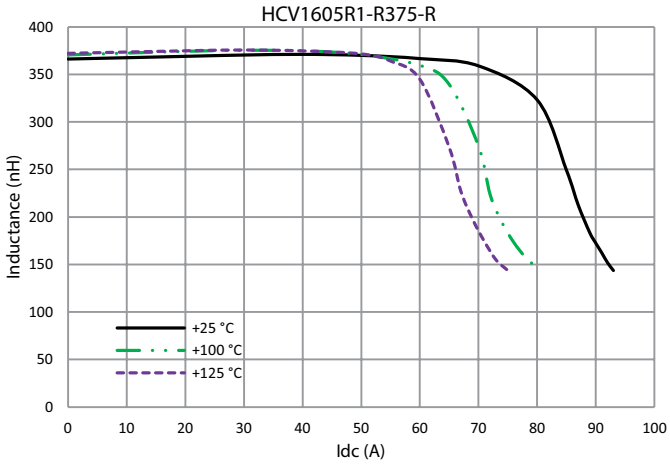
Supplied in tape and reel packaging , 500 parts per 13" diameter reel

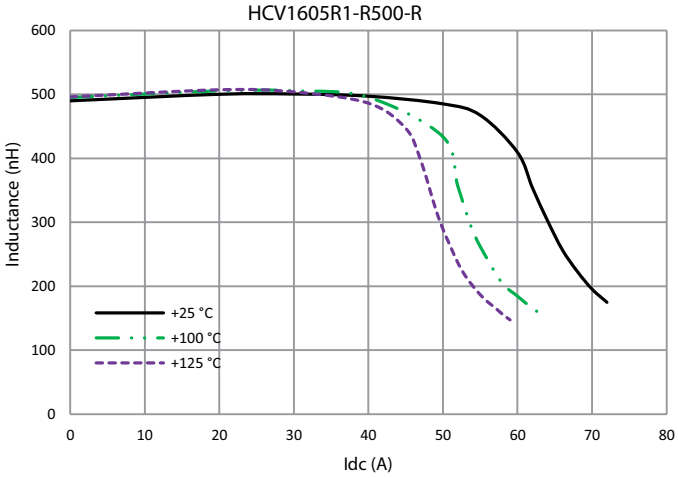


Temperature rise vs. total loss



Inductance characteristics





Solder reflow profile

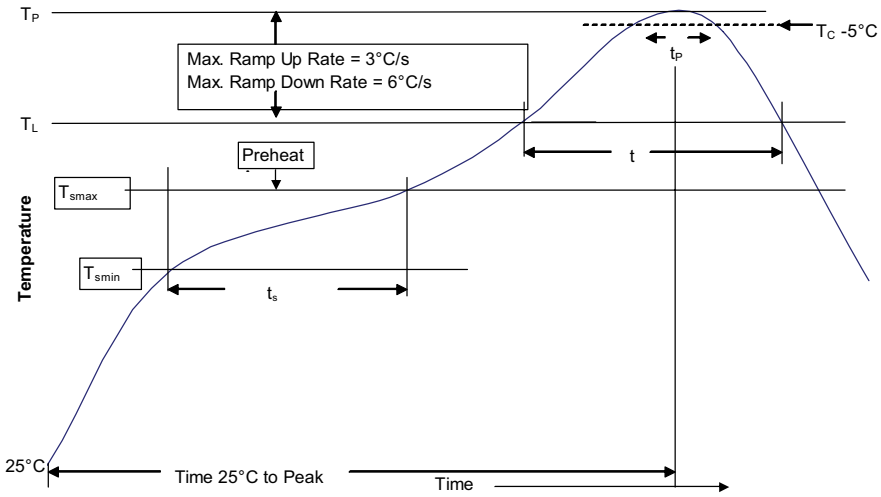


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume 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	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) Time at liquidous (t_L)		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 (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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