HCM1307

High current power inductors



Applications

- Multi-phase regulators
- Voltage Regulator Modules (VRMs)
- Distributed power systems DC-DC converters
- Desktop and server VRMs and EVRDs
- Point-of-Load (POL) modules
- Field Programmable Gate Array (FPGA) DC-DC converters
- Battery power systems
- High current power supplies
- Data networking and storage systems

Description

- High current carrying capacity
- Low core losses
- Magnetically shielded, low EMI
- Frequency range up to 1MHz
- Inductance range from 0.47µH to 3.3µH
- Current range from 15 to 63 amps
- 14.2 x 13.0mm footprint surface mount package in a 6.5mm height
- Iron powder core material
- Halogen free, lead free, RoHS compliant

Environmental Data

- Storage temperature range (Component): -55°C to +125°C
- Operating temperature range: -55°C to +125°C (ambient + self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

Pb HALOGEN HF FREE RoHS

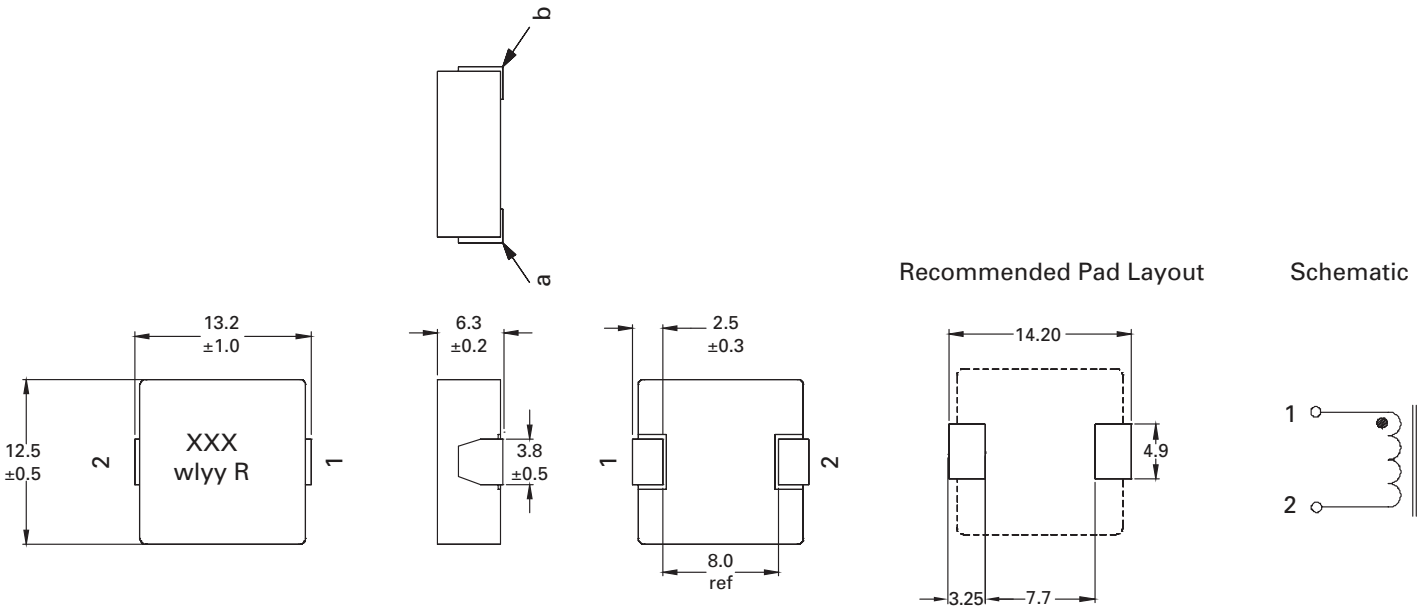
Powering Business Worldwide

Product Specifications

Part Number[6]	OCL[1] (µH) ±20%	FLL[2] (µH) minimum	I_{rms}[3] (amps)	I_{sat}[4] (amps)	DCR (mΩ) typical @ +20°C	DCR (mΩ) maximum @ +20°C	K-factor[5]
HCM1307-R47-R	0.47	0.26	38	63	1.0	1.2	192
HCM1307-1R0-R	1.0	0.56	29	49	1.7	2.0	111
HCM1307-3R3-R	3.3	1.85	15	40	4.3	4.5	88

1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 1.0Vrms, 0.0Adc, @ +25°C
2. Full Load Inductance (FLL) Test Parameters: 100kHz, 1.0Vrms, @ I_{sat}, @ +25ºC
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}: Peak current for approximately 30% rolloff @ +25°C
5. K-factor: Used to determine B_{p-p} for core loss (see graph). Bp-p = K * L * ΔI. B_{p-p}: (Gauss), K: (K-factor from table), L: (Inductance in µH), ΔI (Peak to peak ripple current in Amps).
6. Part Number Definition: HCM1307-xxx-R
   HCM1307 = Product code and size
   xxx= inductance value in µH, R= decimal point ,
   If no R is present then last character equals number of zeros
   -R suffix = RoHS compliant

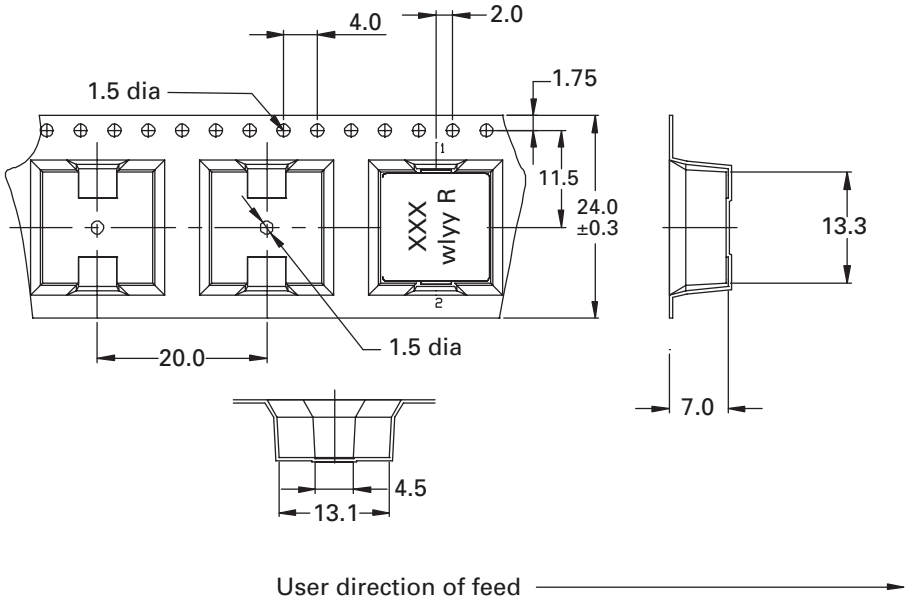
Dimensions (mm)



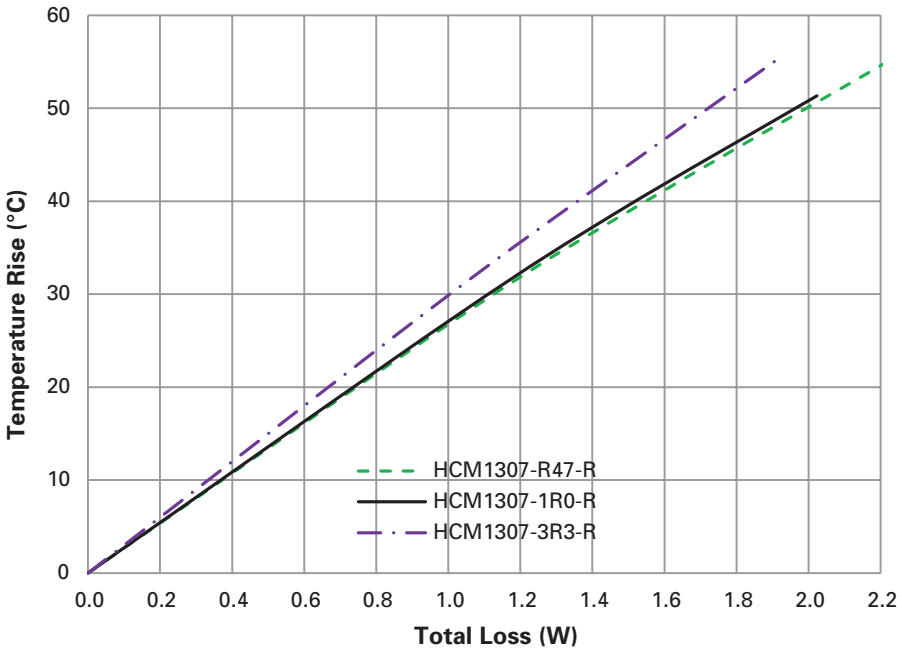
Part marking: XXX=Inductance value in uH, R= decimal point. If no R is present then last character equals number of zeros.
wlyy=date code, R=revision level
All soldering surfaces to be coplanar within 0.10 millimeters
Tolerances are ±0.3 millimeters unless stated otherwise
Color: Grey
Do not route traces or vias underneath the inductor

Packaging information (mm)

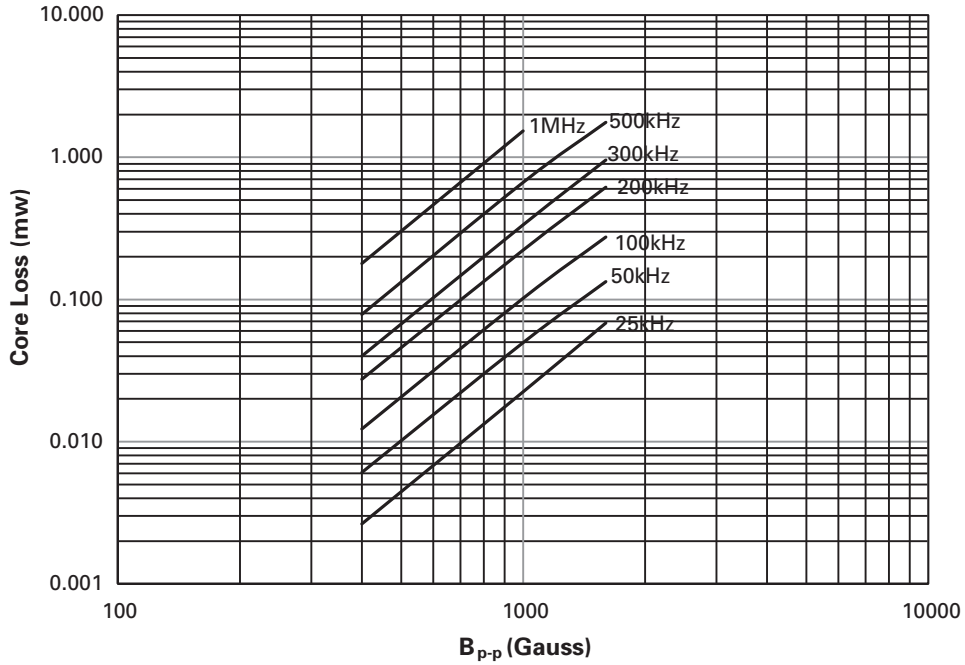
Supplied in tape and reel packaging, 400 parts per 13" diameter reel



Temperature rise vs. total loss

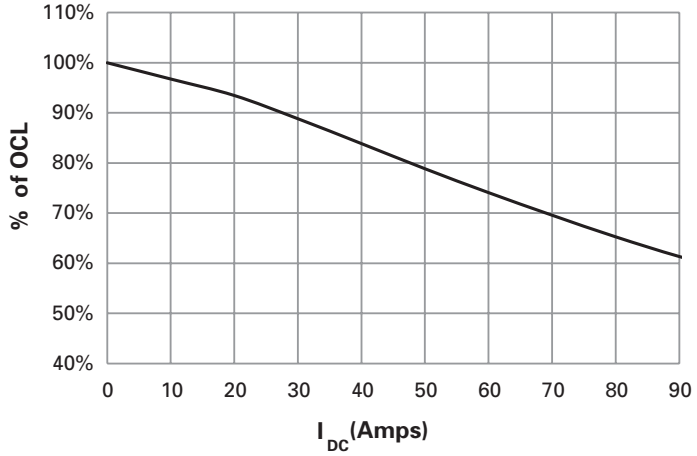


Core loss vs. B_{p-p}

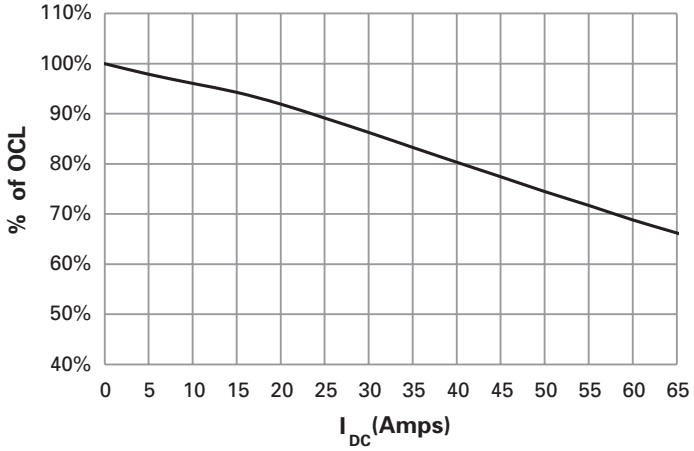


Inductance characteristics

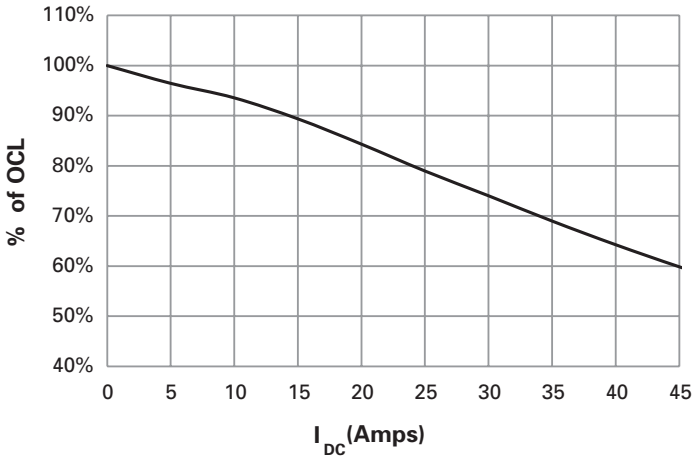
HCM1307-R47-R



HCM1307-1R0-R



HCM1307-3R3-R



Solder reflow profile

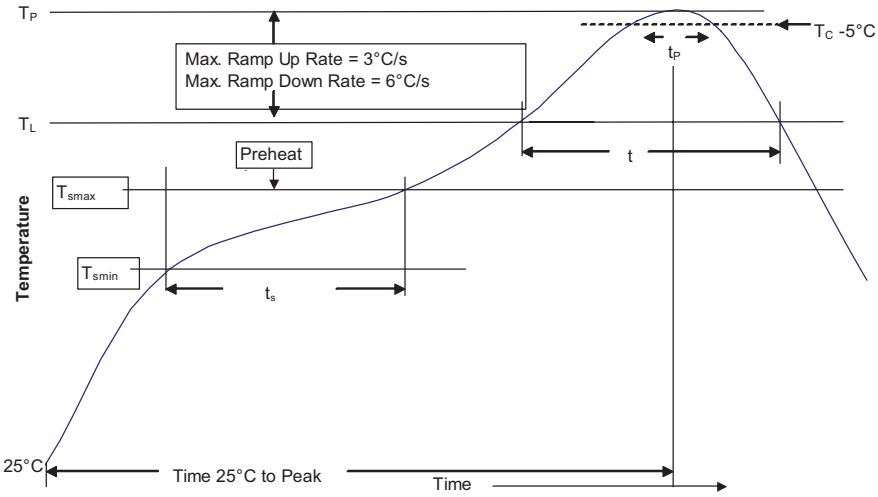


Table 1 - Standard SnPb Solder (T_C)

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 mm³ <350	Volume mm³ 350 - 2000	Volume mm³ >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-020D

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 (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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