

Coiltronics HCM1707 Series

High current power inductors



Product description

- High current carrying capacity
- Magnetically shielded, low EMI
- Frequency range up to 1MHz
- Inductance range from 1.5 μ H to 68.0 μ H
- Current range from 5.2 to 40.0 amps
- 17.5x17.2mm footprint surface mount package in a 7.0mm height
- Powder iron core material
- Halogen free, lead free, RoHS compliant

Applications

- Voltage Regulator Module (VRM)
- Multi-phase regulators
- Point-of-load modules
- Desktop and server VRMs and EVRDs
- Data networking and storage systems
- Base station equipment
- Battery power systems

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



Powering Business Worldwide



The Coiltronics brand of magnetics (formerly of the Bussmann Division of Cooper Industries) is now part of Eaton's Electrical Group, Electronics Division.

Coiltronics is now part of Eaton
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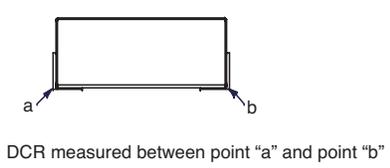
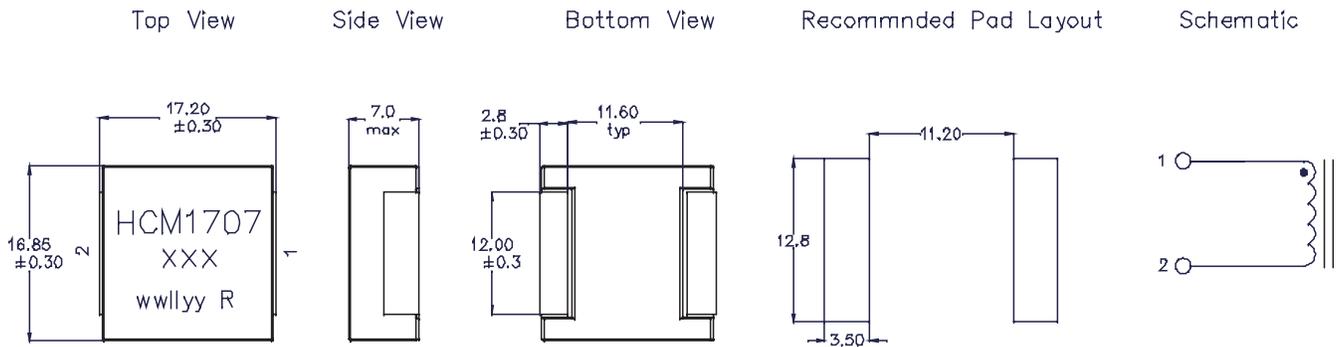
Product specifications

Part Number ⁶	OCL ¹ ±20% (μH)	FLL min. ² (μH)	I _{rms} ³ (amps)	I _{sat} ⁴ (amps)	DCR (mΩ) @ 20°C (typical)	DCR (mΩ) @ 20°C (maximum)	K-factor ⁵
HCM1707-1R5-R	1.5	0.96	40	40	1.85	2.15	124
HCM1707-2R2-R	2.2	1.41	37	34	2.15	2.50	103
HCM1707-4R7-R	4.7	3.01	27	24	4.12	4.72	76
HCM1707-6R8-R	6.8	4.35	20	22	6.55	7.55	60
HCM1707-8R2-R	8.2	5.25	16	20	8.10	8.70	55
HCM1707-100-R	10	6.40	14	18	9.30	10	47
HCM1707-150-R	15	9.60	12	13	14.5	15.5	43
HCM1707-220-R	22	14.1	9.5	11	21	23	37
HCM1707-330-R	33	21.1	9.0	10	35	37	28
HCM1707-470-R	47	30.1	6.8	7.5	41	47	25
HCM1707-680-R	68	43.5	5.2	6.5	74	85	20

- Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.25V_{rms}, 0.0A_{dc}, +25°C.
- Full Load Inductance (FLL): Test parameters: 100kHz, 0.25V_{rms}, I_{sat}, +25°C.
- 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.
- I_{sat}: Peak current for approximately 20% rolloff at +25°C.

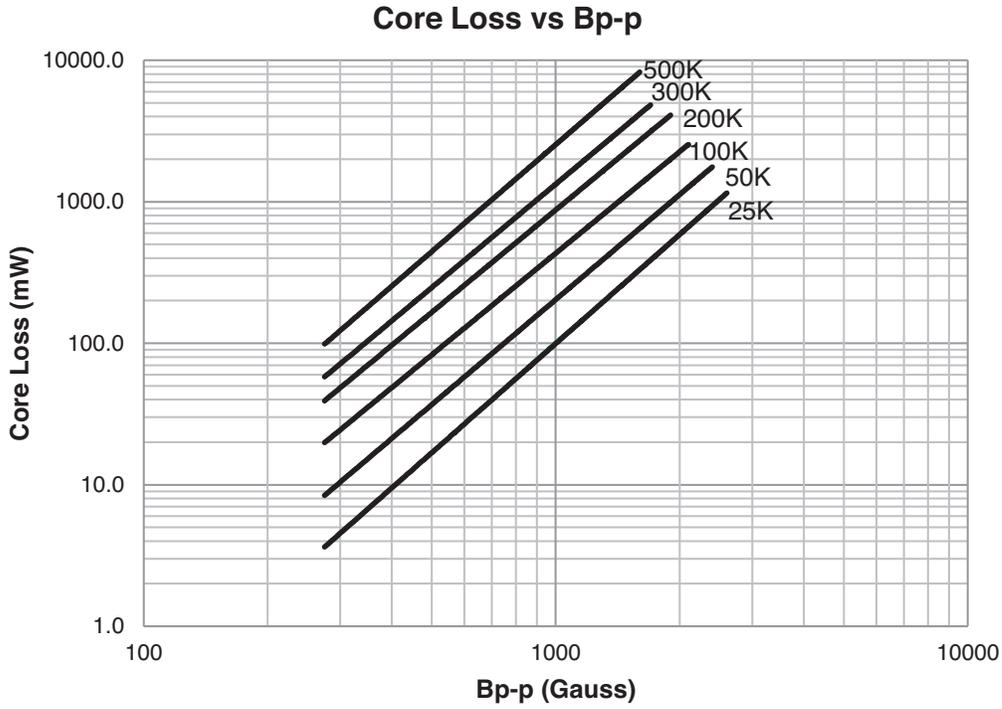
- K-factor: Used to determine B_{pp} for core loss (see graph). B_{pp} = K * L * ΔI. B_{pp}:(Gauss), K: (K-factor from table), L: (Inductance in μH), ΔI (Peak to peak ripple current in amps).
- Part Number Definition: HCM1707-yyy-R
 - HCM1707 = Product code and size
 - yyy= Inductance value in uH, R = decimal point,
 if no R is present then third character = number of zeros.
 - "-R" suffix = RoHS compliant

Dimensions - mm



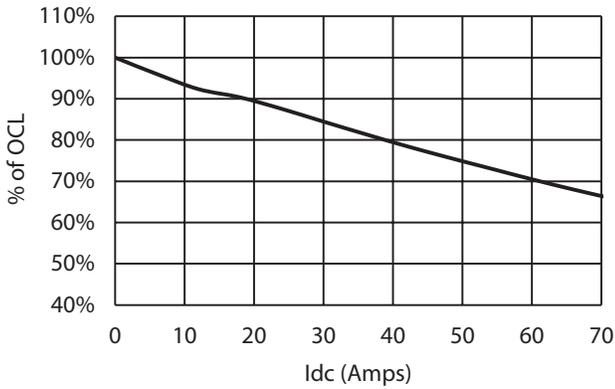
All soldering surfaces coplanar within 0.10 millimeters.
 Part marking: HCM1707; XXX = initial inductance in μH, R = decimal point;
 if no R is present, last digit equals number of zeros.
 wllly = date code, R = revision level
 Color: Grey.

Core loss

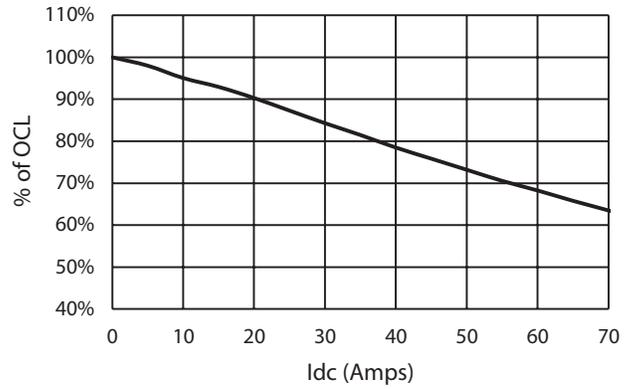


Inductance characteristics

HCM1707-1R5-R

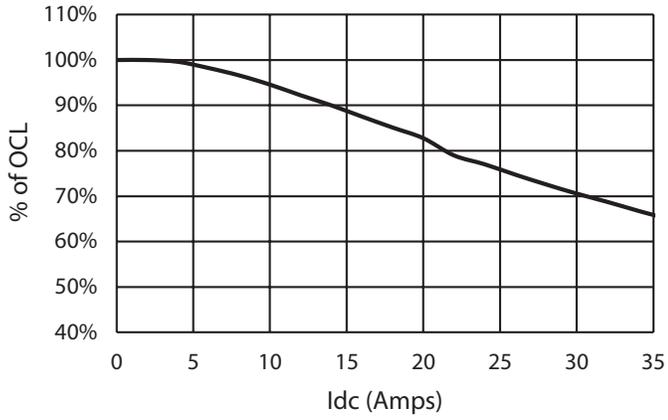


HCM1707-2R2-R

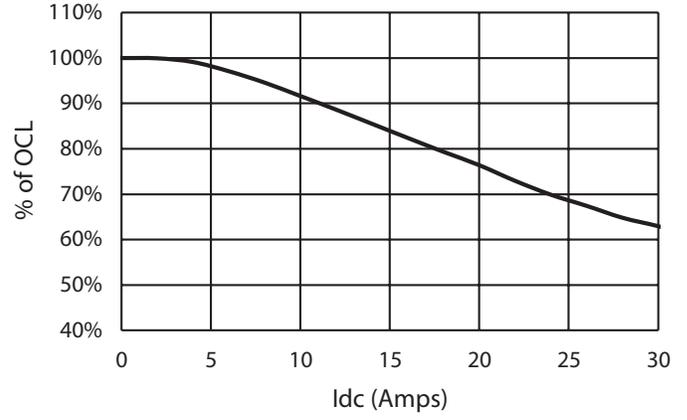


Inductance characteristics

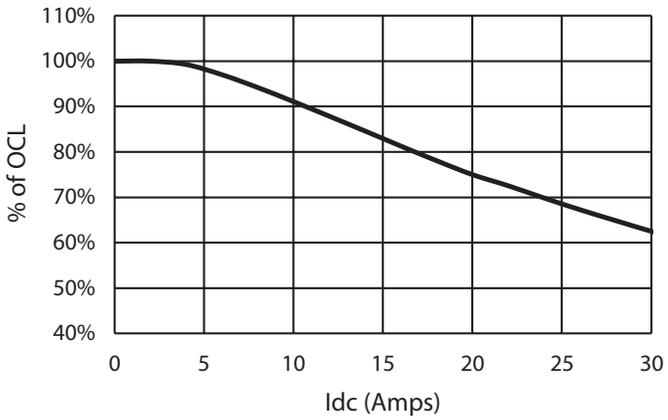
HCM1707-4R7-R



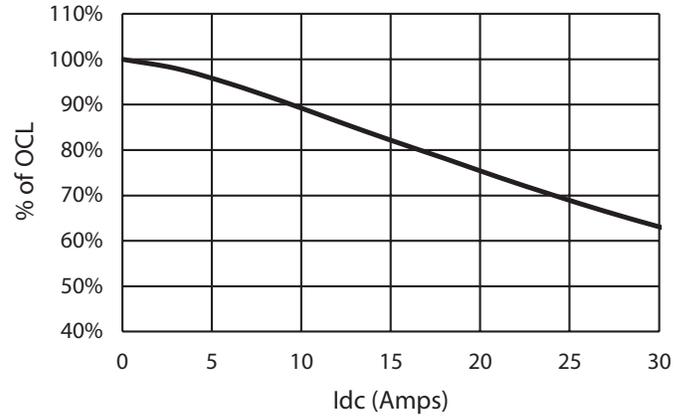
HCM1707-6R8-R



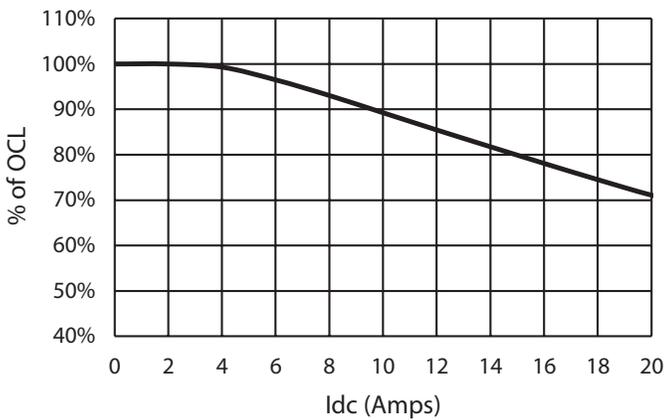
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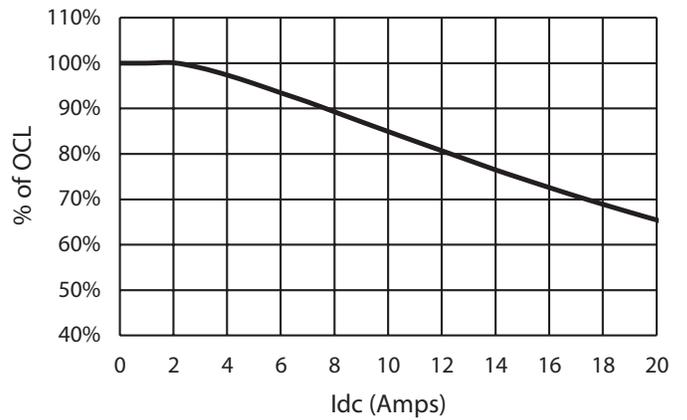
HCM1707-100-R



HCM1707-150-R

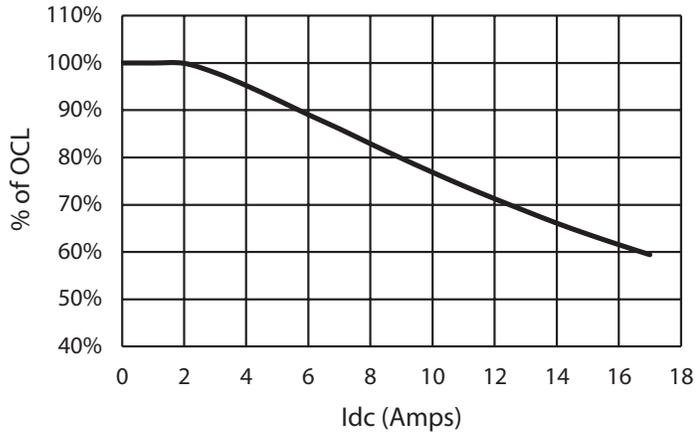


HCM1707-220-R

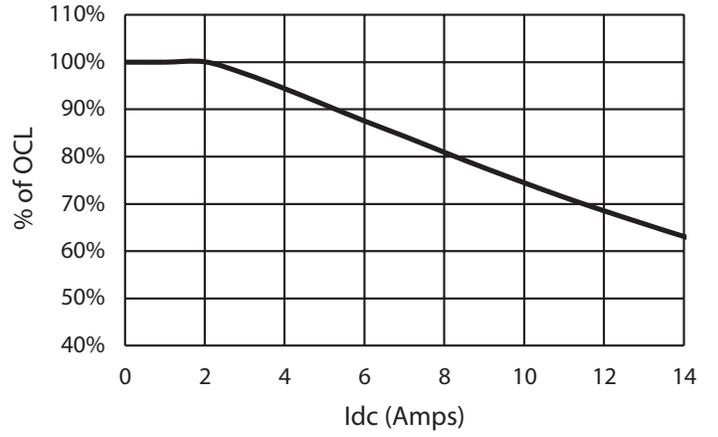


Inductance characteristics

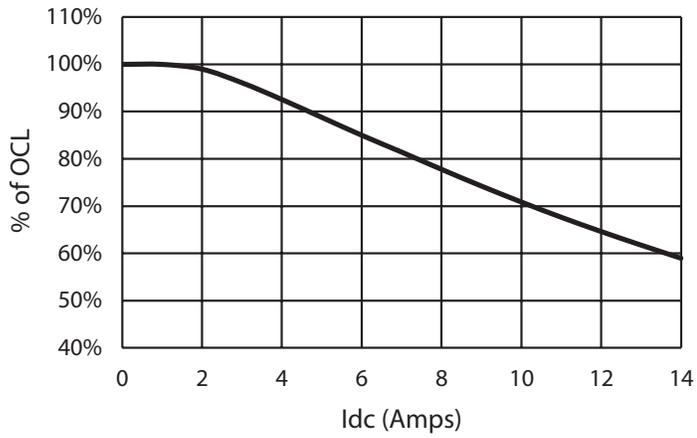
HCM1707-330-R



HCM1707-470-R



HCM1707-680-R



Solder reflow profile

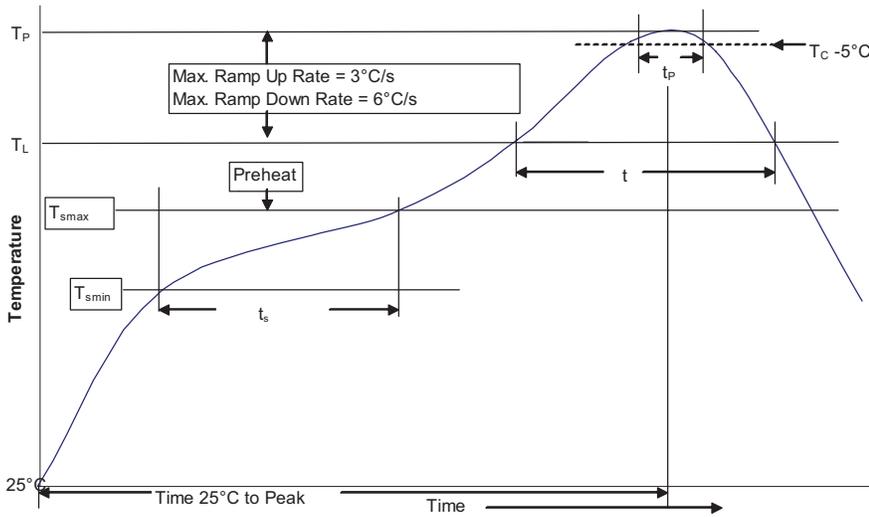


Table 1 - Standard SnPb Solder (T_c)

Package Thickness	Volume mm^3 <350	Volume mm^3 ≥ 350
<2.5mm	235°C	220°C
$\geq 2.5\text{mm}$	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
$>2.5\text{mm}$	250°C	245°C	245°C

Reference JDEC J-STD-020D

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak	<ul style="list-style-type: none"> Temperature min. (T_{smin}) Temperature max. (T_{smax}) Time (T_{smin} to T_{smax}) (t_s) 	<ul style="list-style-type: none"> 150°C 200°C 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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