



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

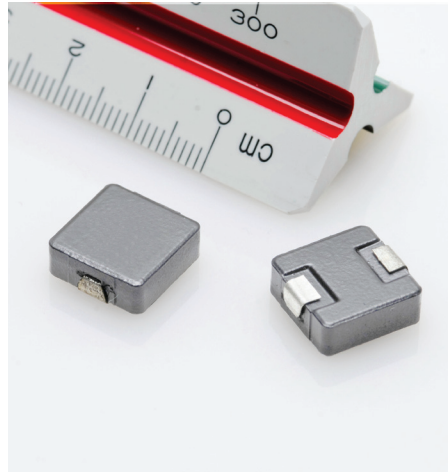
Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



# Coiltronics HCMA1305 Series

## Automotive grade High current power inductors



### Product description

- Automotive grade 3 qualified
- High current carrying capacity, low core losses
- Magnetically shielded, low EMI
- Frequency range up to 5MHz
- Inductance range from 0.10 $\mu$ H to 33 $\mu$ H
- Current range from 5.2A to 118A
- 13.8x12.5mm footprint surface mount package in a 5.0mm height
- Powder iron core material
- Halogen free, lead free, RoHS compliant

### Applications

- Body electronics
  - Central body control module
  - Vehicle access control system
  - Headlamps, tail lamps and interior lighting
  - Heating Ventilation and Air Conditioning controllers (HVAC)
  - Doors, window lift and seat control
- Advanced driver assistance systems
  - Adaptive cruise control (ACC)
  - Automatic parking control
  - Collision avoidance system
  - Car black box system
- Infotainment and cluster electronics
  - Audio subsystem: head unit and trunk amp
  - Digital instrument cluster
  - In-Vehicle Infotainment (IVI) and navigation
- Chassis and safety electronics
  - Airbag control unit
  - Electronic Stability Control system (ESC)
  - Electric parking brake
  - Electronic Power Steering (EPS)

### 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



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**  
**Same great products plus even more.**

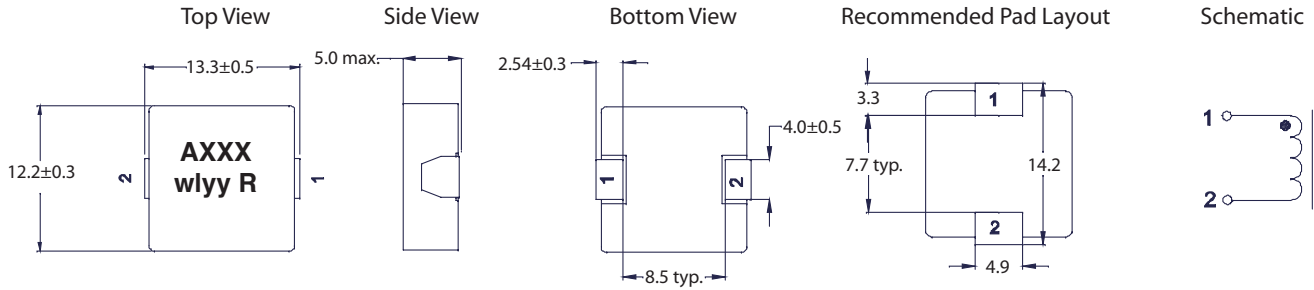
**Product specifications**

Part Number <sup>6</sup>	OCL <sup>1</sup> ( $\mu\text{H}$ ) $\pm$ 20%	FLL <sup>2</sup> Min. ( $\mu\text{H}$ )	$I_{\text{rms}}^3$ (amps)	$I_{\text{sat}}^4$ (amps)	DCR (m $\Omega$ ) @ 20°C $\pm$ nominal	DCR (m $\Omega$ ) @ 20°C maximum	K-factor <sup>5</sup>
HCMA1305-R10-R	0.10	0.064	55	118	0.52	0.59	848
HCMA1305-R22-R	0.22	0.14	51	110	0.63	0.72	843
HCMA1305-R33-R	0.33	0.21	42	80	0.80	0.92	506
HCMA1305-R47-R	0.47	0.30	38	65	0.80	0.92	506
HCMA1305-R56-R	0.56	0.36	36	55	1.15	1.33	500
HCMA1305-R68-R	0.68	0.44	34	54	1.15	1.33	500
HCMA1305-R82-R	0.82	0.52	31	53	1.40	1.61	358
HCMA1305-1R0-R	1.00	0.64	29	50	2.10	2.42	275
HCMA1305-1R5-R	1.50	0.96	23	48	2.75	3.16	225
HCMA1305-1R8-R	1.80	1.15	21	40	4.00	4.60	216
HCMA1305-2R2-R	2.20	1.41	20	32	4.60	5.29	191
HCMA1305-3R3-R	3.30	2.11	15	32	7.70	9.20	170
HCMA1305-4R7-R	4.70	3.01	12	27	11.0	12.7	161
HCMA1305-5R6-R	5.60	3.58	11.5	22	12.0	13.8	142
HCMA1305-6R8-R	6.80	4.35	11	21	13.0	15.0	129
HCMA1305-7R8-R	7.80	4.99	10	18.5	16.8	19.4	117
HCMA1305-8R2-R	8.20	5.25	9.5	18	17.5	20.1	117
HCMA1305-100-R	10.0	6.40	9.0	16	19.0	21.9	90
HCMA1305-150-R	15.0	9.60	7.7	13	29.0	33.4	74
HCMA1305-220-R	22.0	14.1	6.2	10	45.0	51.8	63
HCMA1305-330-R	33.0	21.1	5.2	8	74.5	85.5	48

- Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.25V<sub>rms</sub>, 0.0A<sub>dc</sub>, +25°C.
- Full Load Inductance (FLL) Test Parameters: 100kHz, 0.25V<sub>rms</sub>,  $I_{\text{sat}}$  @ +25°C.
- $I_{\text{rms}}$ : 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.

- $I_{\text{sat}}$ : Peak current for approximately 20% rolloff at +25°C.
- K-factor: Used to determine  $B_{\text{p-p}}$  for core loss (see graph).  $B_{\text{p-p}} = K * L * \Delta I$ .  
 $B_{\text{p-p}}$ : (Gauss), K: (K-factor from table), L: (Inductance in  $\mu\text{H}$ ),  $\Delta I$  (Peak to peak ripple current in amps).
- Part Number Definition: HCMA1305-yyy-R  
- HCMA1305 = Product code and size  
- yyy= Inductance value in  $\mu\text{H}$ , R = decimal point,  
if no R is present then third character = number of zeros.  
- "-R" suffix = RoHS compliant

**Dimensions - mm**



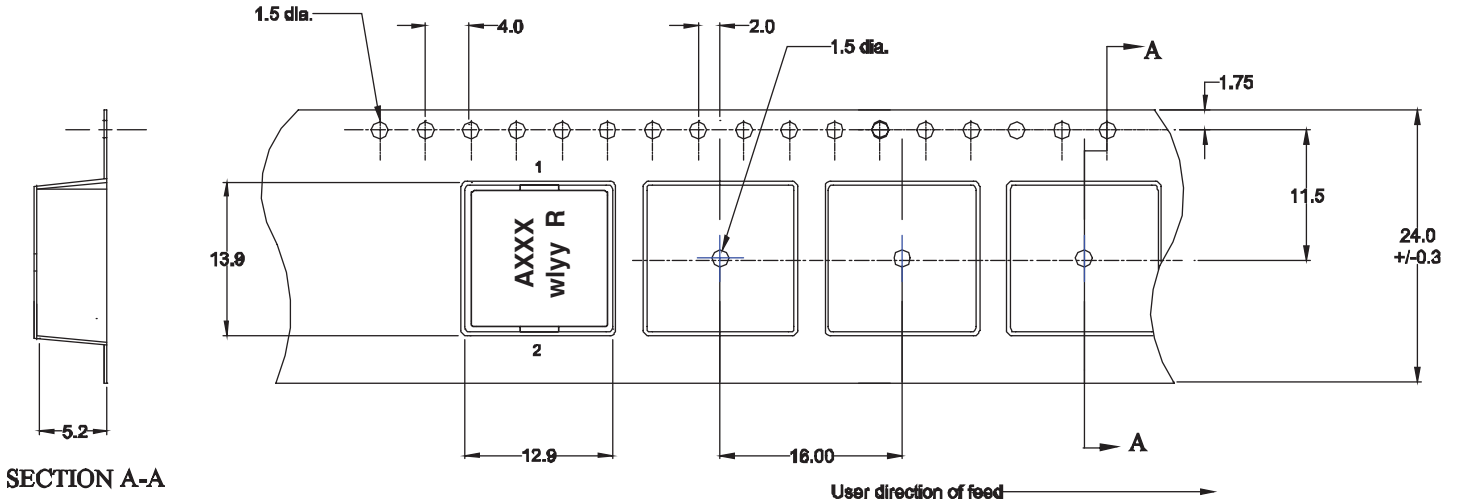
Part Marking: A = Automotive grade, xxx = Inductance value in  $\mu\text{H}$ , R = decimal point, if no R is present, third character = number of zeros, wlyy = (Date Code), R = (Revision Level)

All soldering surfaces to be coplanar within 0.10 millimeters.

Tolerances are  $\pm 0.3$  millimeters unless stated otherwise.

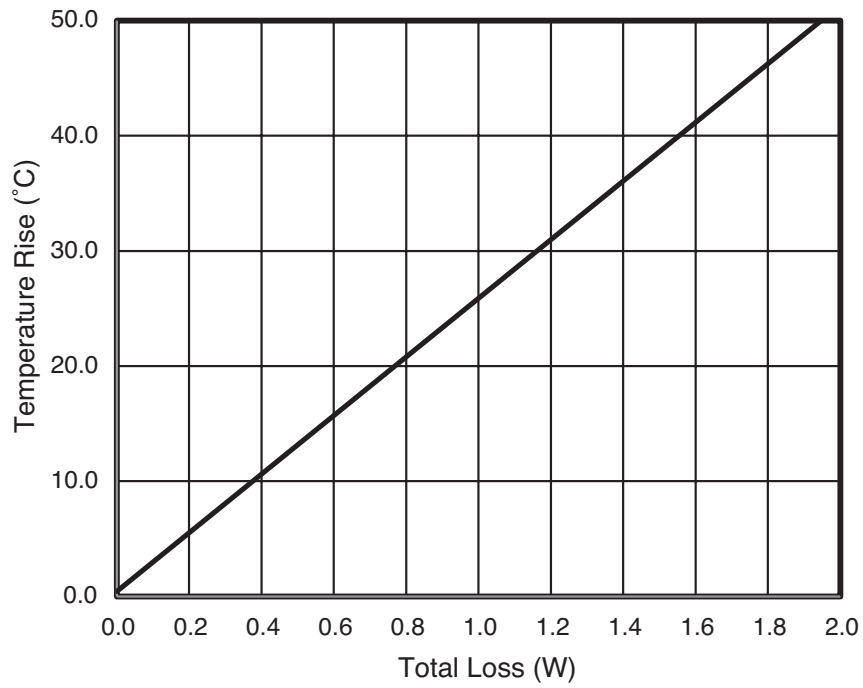
Color: Grey.

**Packaging information - mm**

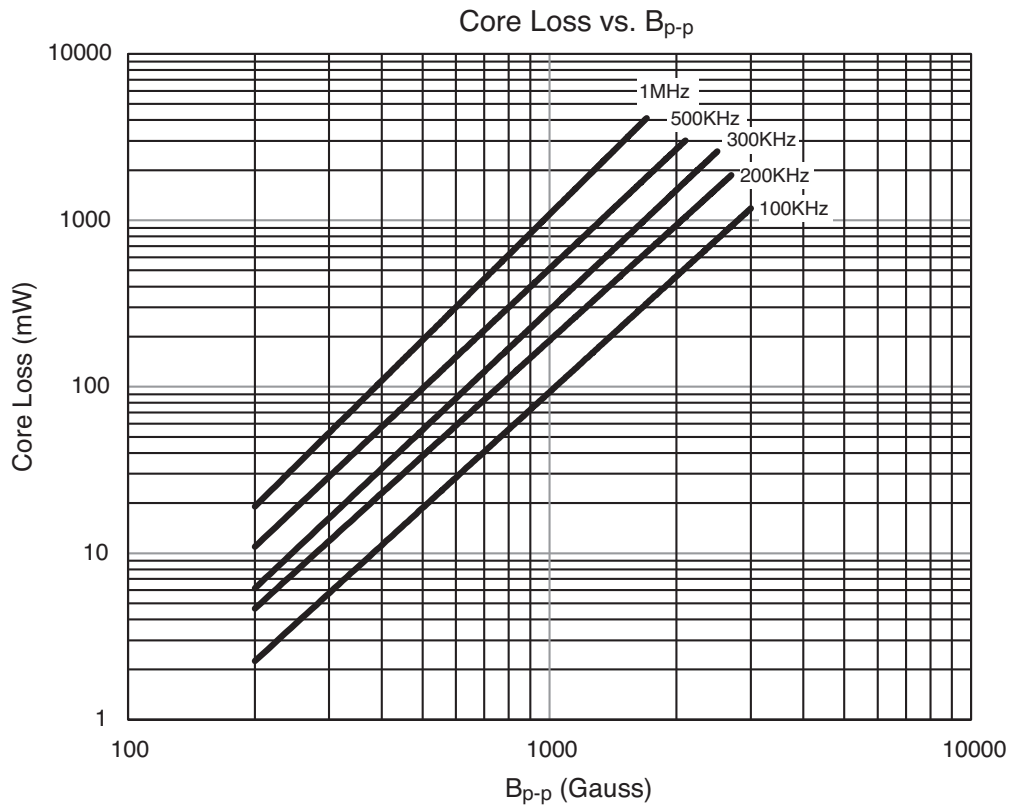


Supplied in tape and reel packaging, 400 parts per 13" diameter reel.

Temperature rise vs. total loss

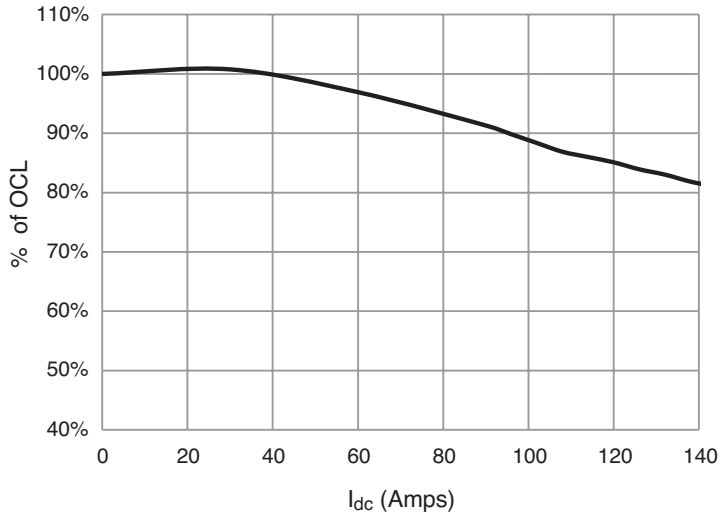


Core loss

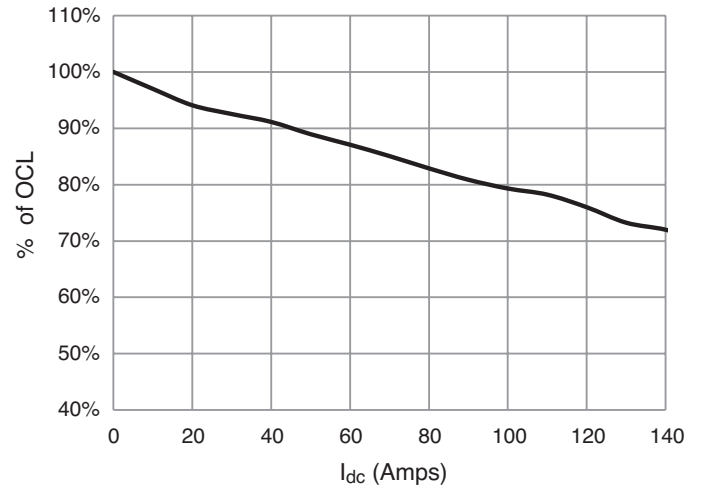


Inductance characteristics

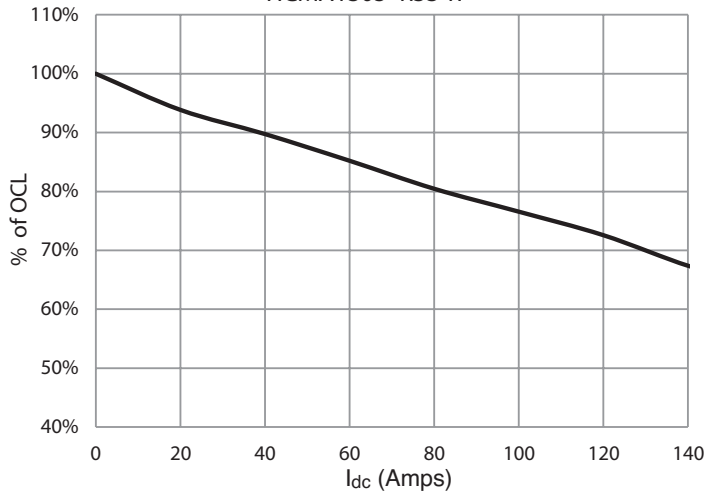
HCMA1305-R10-R



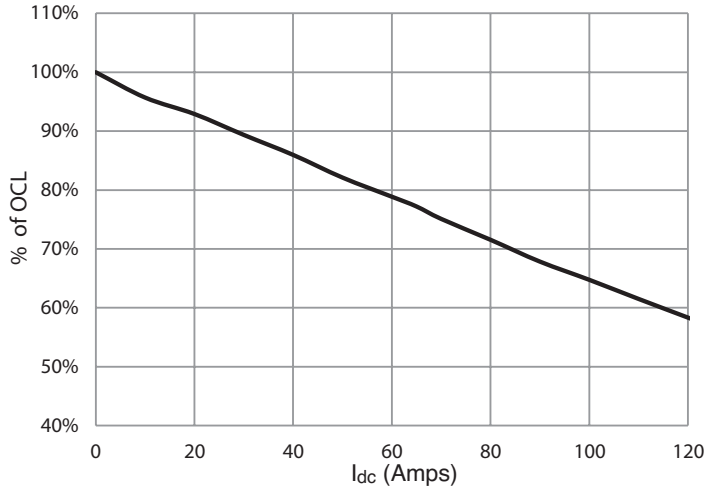
HCMA1305-R22-R



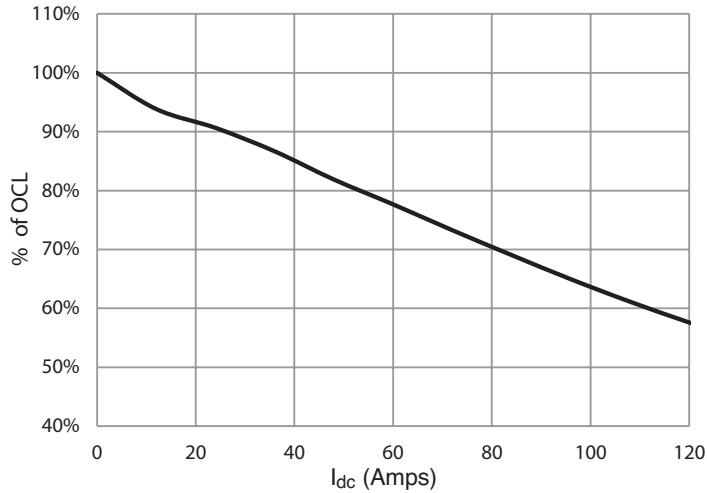
HCMA1305-R33-R



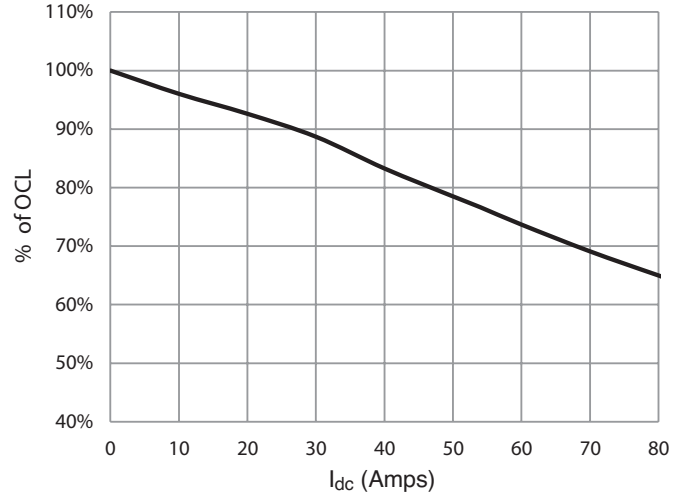
HCMA1305-R47-R



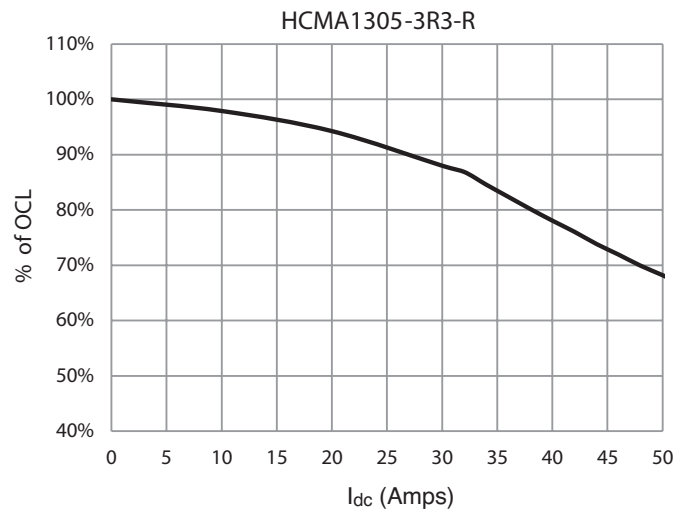
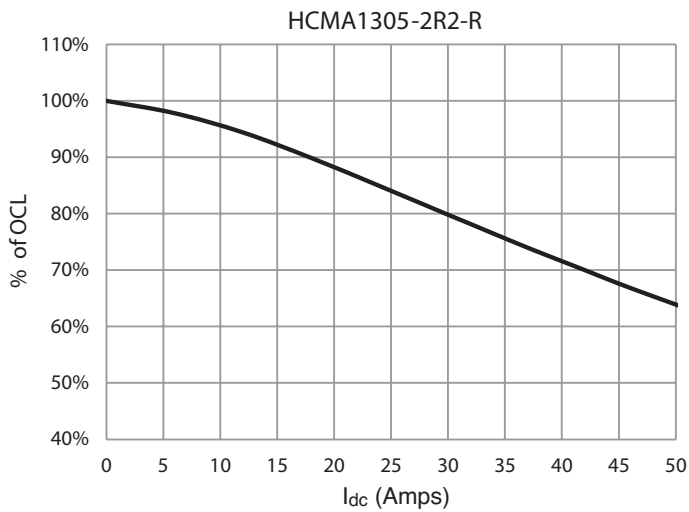
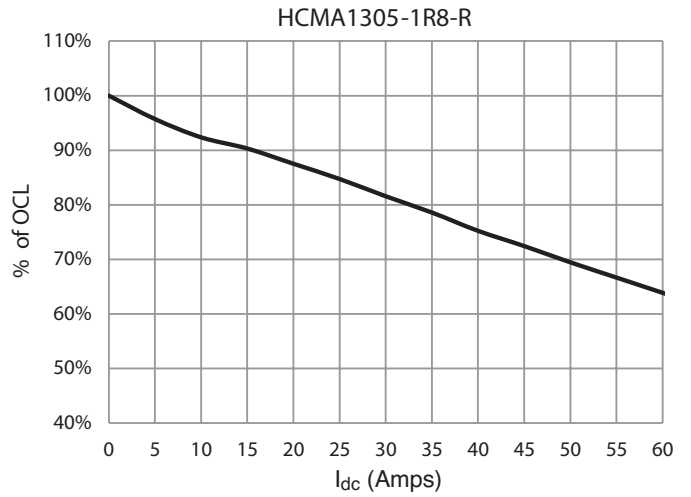
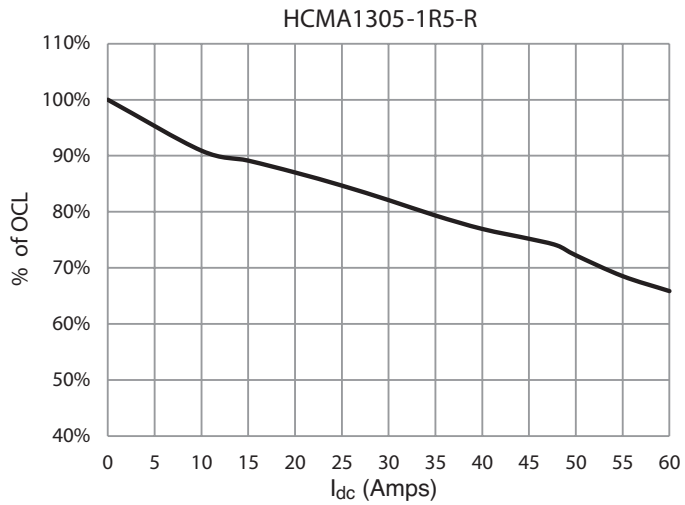
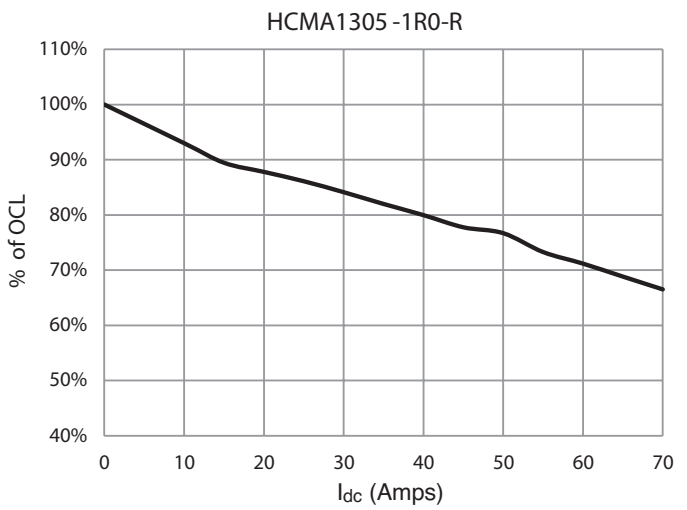
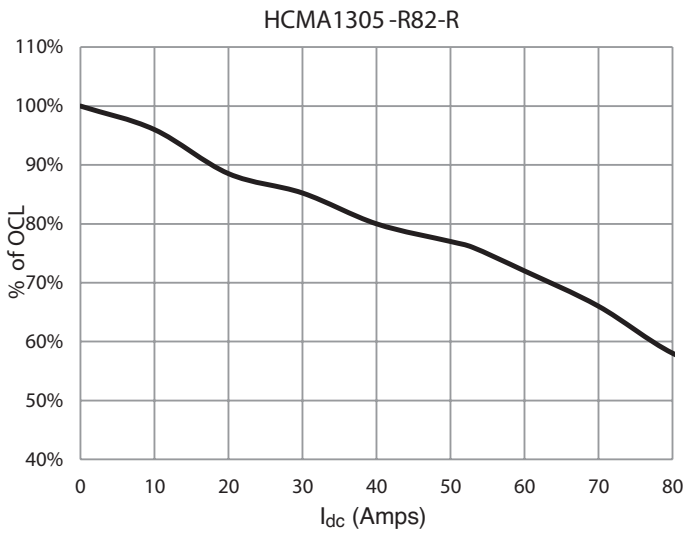
HCMA1305-R56-R



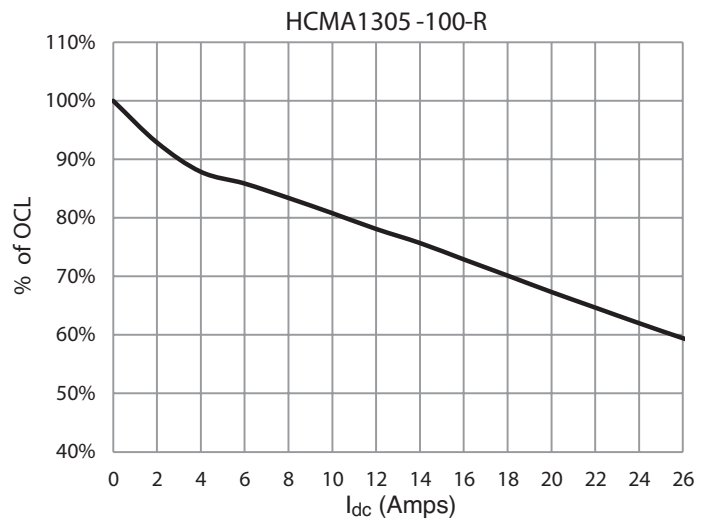
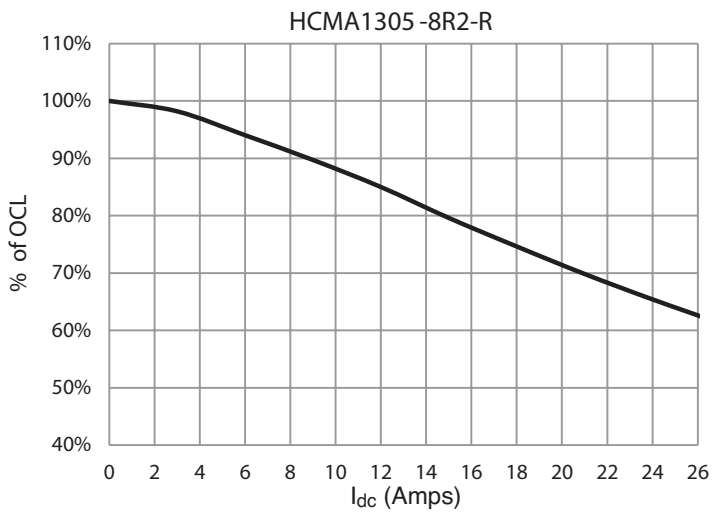
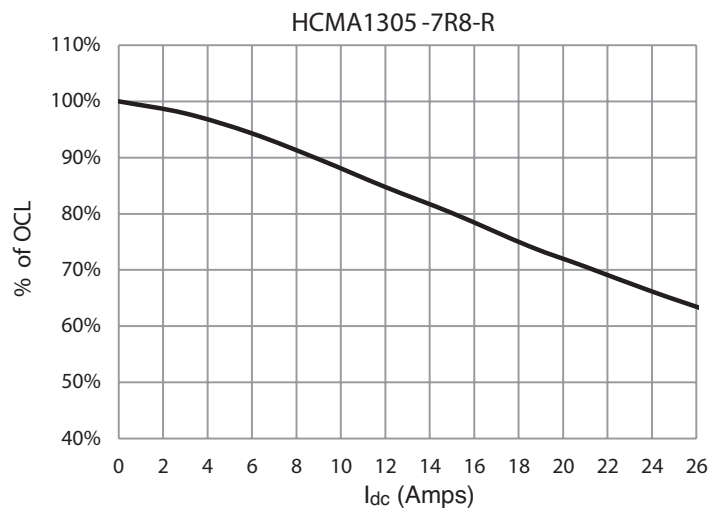
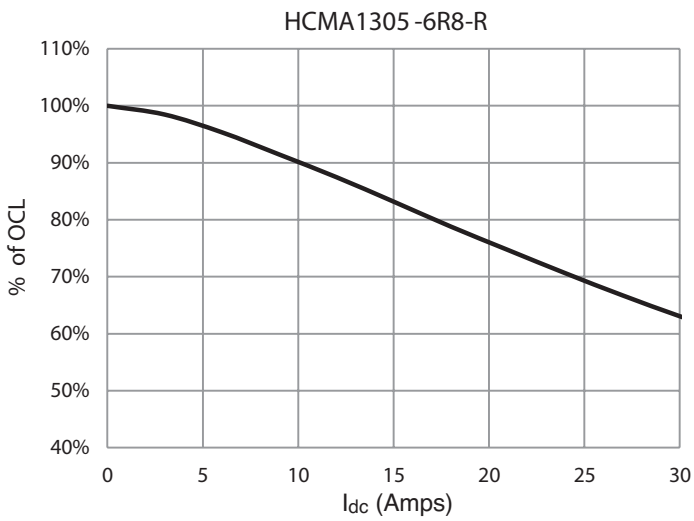
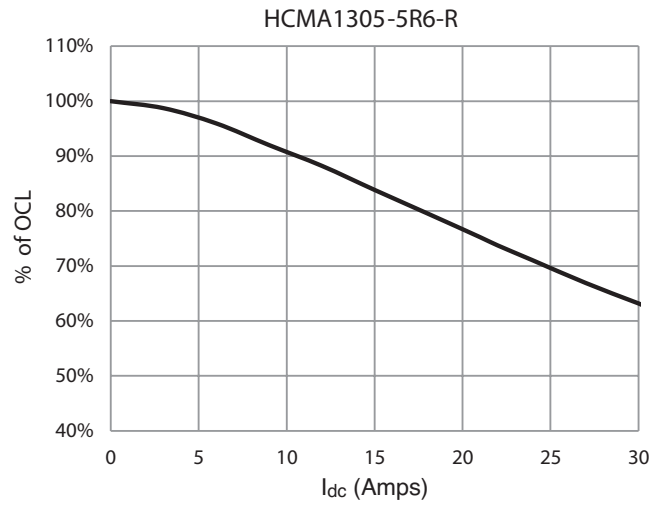
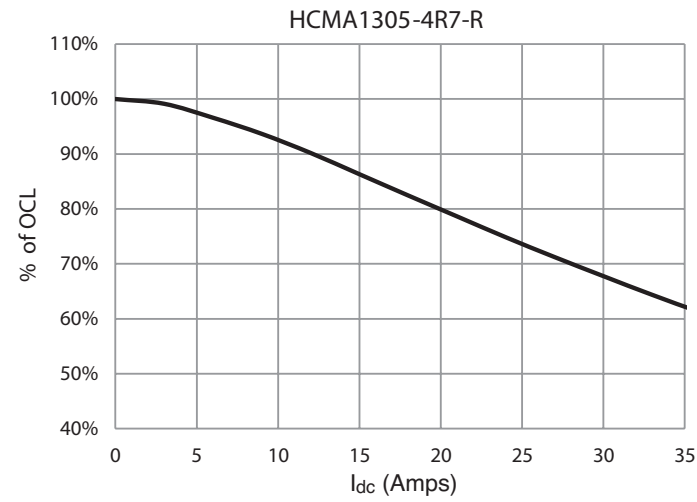
HCMA1305-R68-R



**Inductance characteristics**

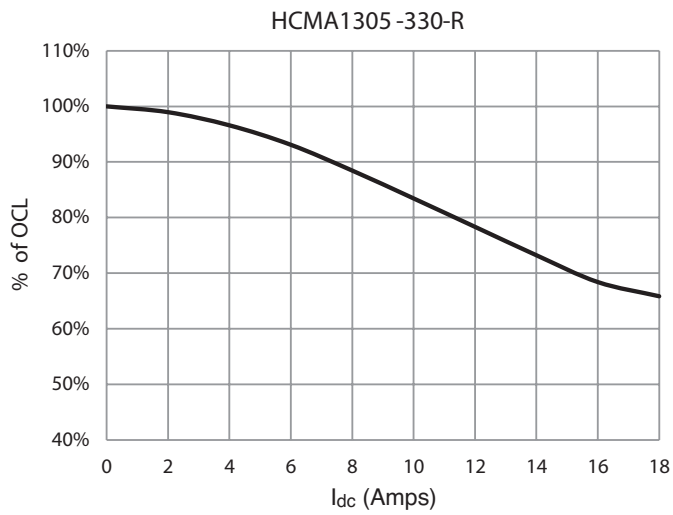
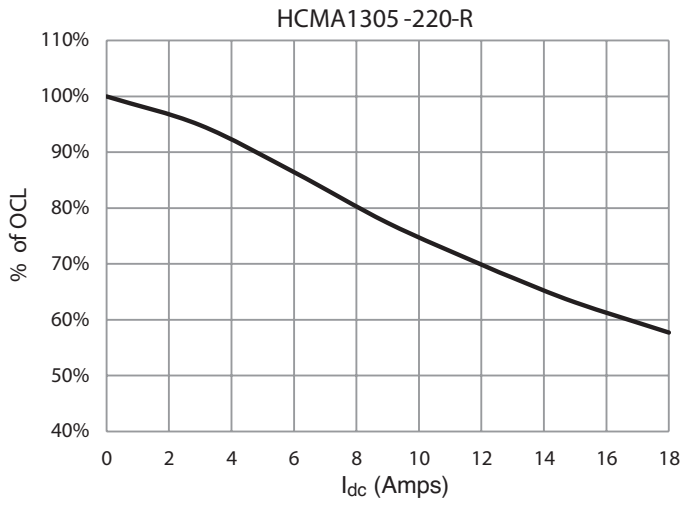
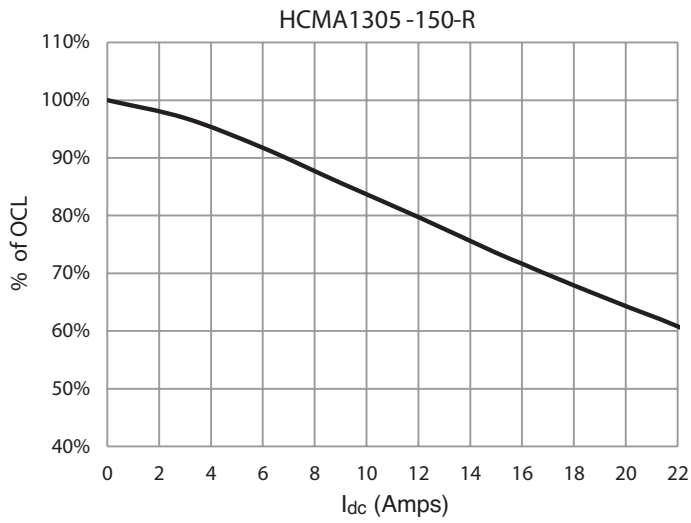


**Inductance characteristics**

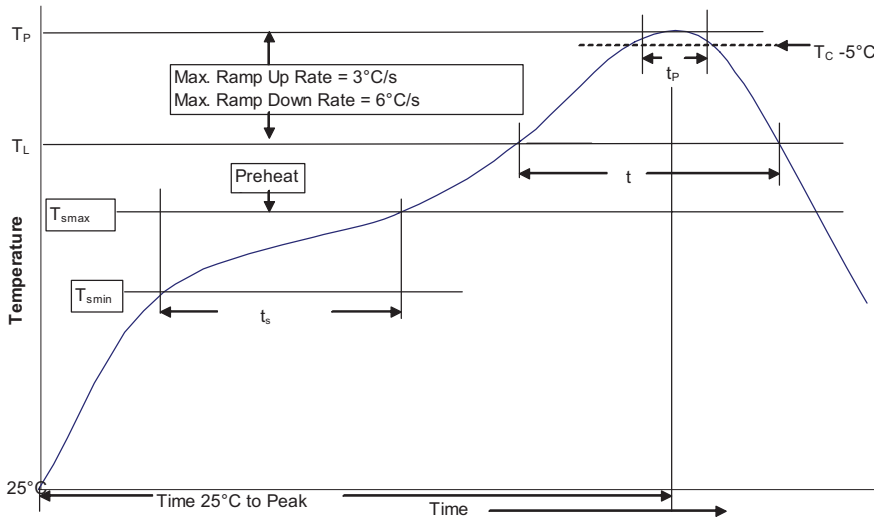




**Inductance characteristics**



**Solder reflow profile**



**Table 1 - Standard SnPb Solder ( $T_c$ )**

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ $\geq 350$
<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 $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350 - 2000	Volume $\text{mm}^3$ >2000
<1.6mm	260°C	260°C	260°C
1.6 – 2.5mm	260°C	250°C	245°C
$\geq 2.5\text{mm}$	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"> <li>Temperature min. (<math>T_{psmin}</math>)</li> <li>Temperature max. (<math>T_{psmax}</math>)</li> <li>Time (<math>T_{psmin}</math> to <math>T_{psmax}</math>) (<math>t_{ps}</math>)</li> </ul>	<ul style="list-style-type: none"> <li>150°C</li> <li>200°C</li> <li>60-120 Seconds</li> </ul>
Average ramp up rate $T_{psmax}$ 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 $T_{psmax}$ )	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.

**North America**

Eaton's Electrical Group  
Electronics Division  
1225 Broken Sound Parkway NW  
Suite F  
Boca Raton, FL 33487-3533  
Tel: 1-561-998-4100  
Fax: 1-561-241-6640  
Toll Free: 1-888-414-2645

Eaton's Electrical Group  
Electronics Division  
P.O. Box 14460  
St. Louis, MO 63178-4460  
Tel: 1-636-394-2877  
Fax: 1-636-527-1607

**Europe**

Eaton's Electrical Group  
Electronics Division  
Burton-on-the-Wolds  
Leicestershire, LE 12 5th UK  
Phone: +44 (0) 1509 882 600  
Fax: +44 (0) 1509 882 786

Eaton's Electrical Group  
Electronics Division  
Avda Santa Eulalia, 290  
Terrassa, Barcelona 08223 Spain  
Phone: +34-93-736-2813  
Fax: +34-93-783-5055

**Asia Pacific**

Eaton's Electrical Group  
Electronics Division  
No.2, #06-01  
Serangoon North Avenue 5  
Singapore 554911  
Tel: +65 6645 9888  
Fax: +65 6728 3155

The only controlled copy of this Data Sheet is the electronic read-only version located on the Bussmann Network Drive. All other copies of this document are by definition uncontrolled. This bulletin is intended to clearly present comprehensive product data and provide technical information that will help the end user with design applications. Bussmann reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Bussmann also reserves the right to change or update, without notice, any technical information contained in this bulletin. Once a product has been selected, it should be tested by the user in all possible applications.

Life Support Policy: Bussmann does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

**Eaton's Electrical Group  
Electronics Division**  
114 Old State Road  
Ellisville, MO 63021  
United States  
www.eaton.com/elx

© 2014 Eaton  
All Rights Reserved  
Publication No. 10277 – BU-SB14567  
August 2014



Powering Business Worldwide

Eaton is a registered trademark.

All other trademarks are property of their respective owners.

www.eaton.com/elx