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!

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HCMA0503

Automotive grade
High current power inductors

Description

- AEC-Q200 Grade 3 qualified
- High current carrying capacity
- Low core losses
- Magnetically shielded, low EMI
- Frequency range up to 1 MHz
- Inductance range from 0.2 µH to 22 µH
- Current range from 1.9 A to 22 A
- 5.5 mm x 5.3 mm footprint surface mount package in a 3.0 mm height
- Iron powder 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
  - 77 GHz radar systems
  - Basic and smart surround, and rear and front view camera
  - Adaptive cruise control (ACC)
  - Automatic parking control
  - Collision avoidance system
  - Car black box system
- Infotainment and cluster electronics
  - Active noise cancellation (ANC)
  - Audio subsystem: head unit and trunk amp - Digital instrument cluster
  - In-vehicle infotainment (IVI) and navigation
- Chassis and safety electronics
  - Airbag control unit

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

EATON
Powering Business Worldwide

Product Specifications

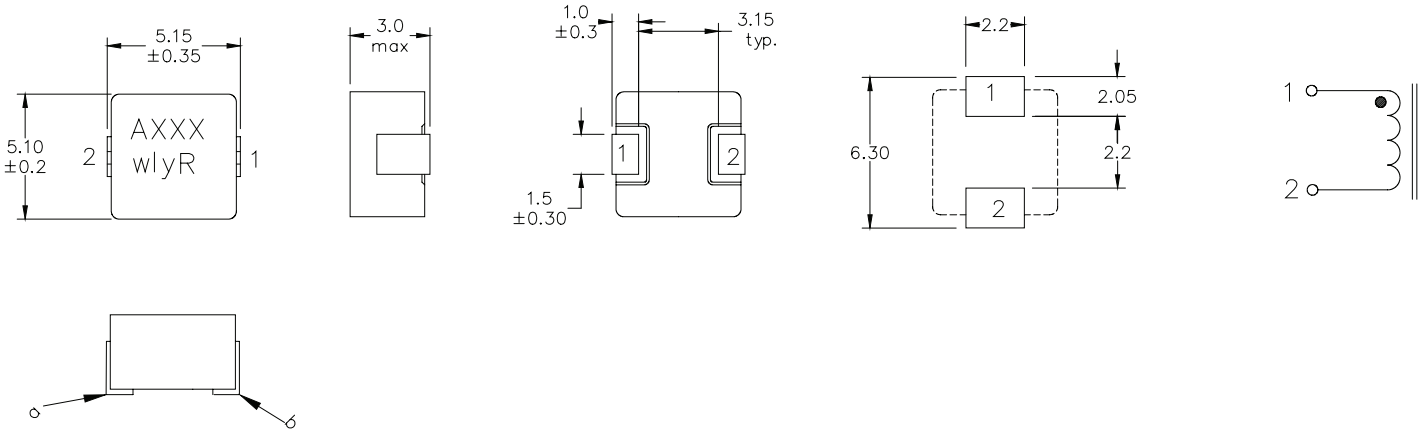
Part Number[6]	OCL[1] (µH) ± 20%	FLL[2] (µH) minimum	I_{rms}[3] (A)	I_{sat}[4] (A)	DCR (mΩ) typical @ 20°C	DCR (mΩ) maximum @ 20°C	K-factor[5]
HCMA0503-R20-R	0.20	0.13	22.2	21.0	2.1	2.31	1764
HCMA0503-R35-R	0.35	0.22	16.6	14.9	3.9	4.29	1259
HCMA0503-R47-R	0.47	0.30	12.0	11.5	6.5	7.15	820
HCMA0503-R75-R	0.75	0.48	11.3	9.7	8.5	9.35	801
HCMA0503-1R0-R	1.0	0.64	10.1	8.5	10.4	11.4	588
HCMA0503-1R5-R	1.5	0.96	7.5	7.0	17.1	18.5	393
HCMA0503-2R2-R	2.2	1.4	6.8	6.5	22.5	25	325
HCMA0503-3R3-R	3.3	2.1	5.5	6.0	36.4	40.4	273
HCMA0503-4R7-R	4.7	3.0	4.5	5.5	54	60	226
HCMA0503-5R6-R	5.6	3.6	4.25	3.5	63	70.6	206
HCMA0503-6R8-R	6.8	4.4	2.60	3.8	91	99	172
HCMA0503-100-R	10	6.4	2.75	2.3	122	132	158
HCMA0503-150-R	15	9.6	2.4	2.1	138	166	127
HCMA0503-220-R	22	14	1.9	1.9	260	270	106

1. Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 0.25 Vrms, 0.0 Adc, +25 °C
2. Full Load Inductance (FLL) Test Parameters: 100 kHz, 0.25 Vrms, Isat, +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}: Peak current for approximately 20% 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: HCMA0503-xxx-R
   HCMA0503 = 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)

Recommended Pad Layout

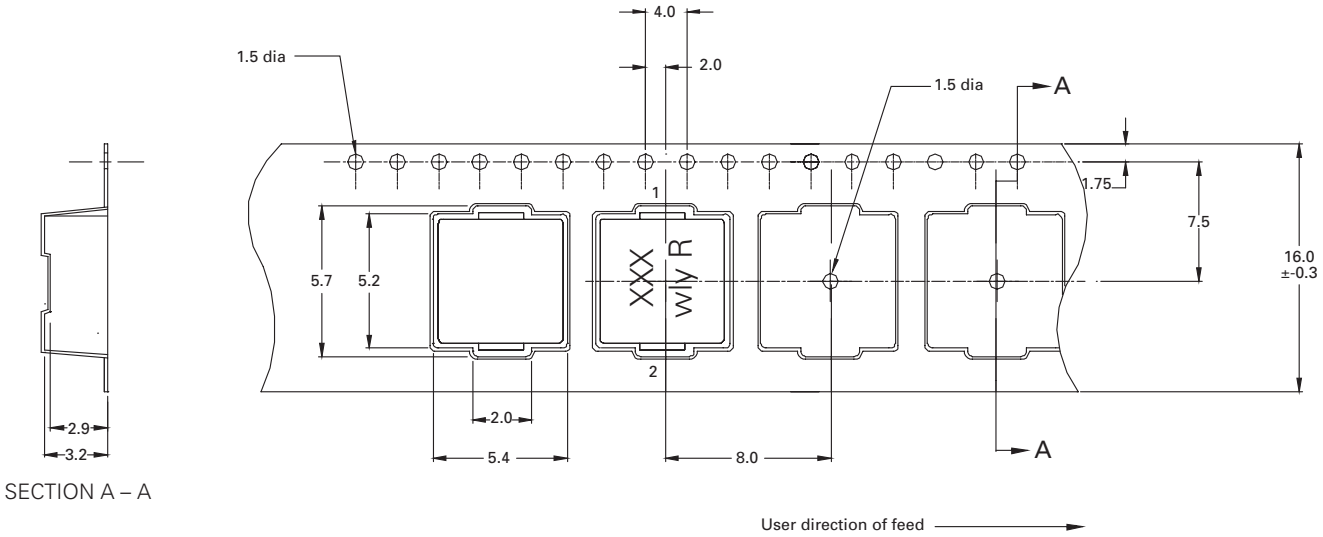
Schematic



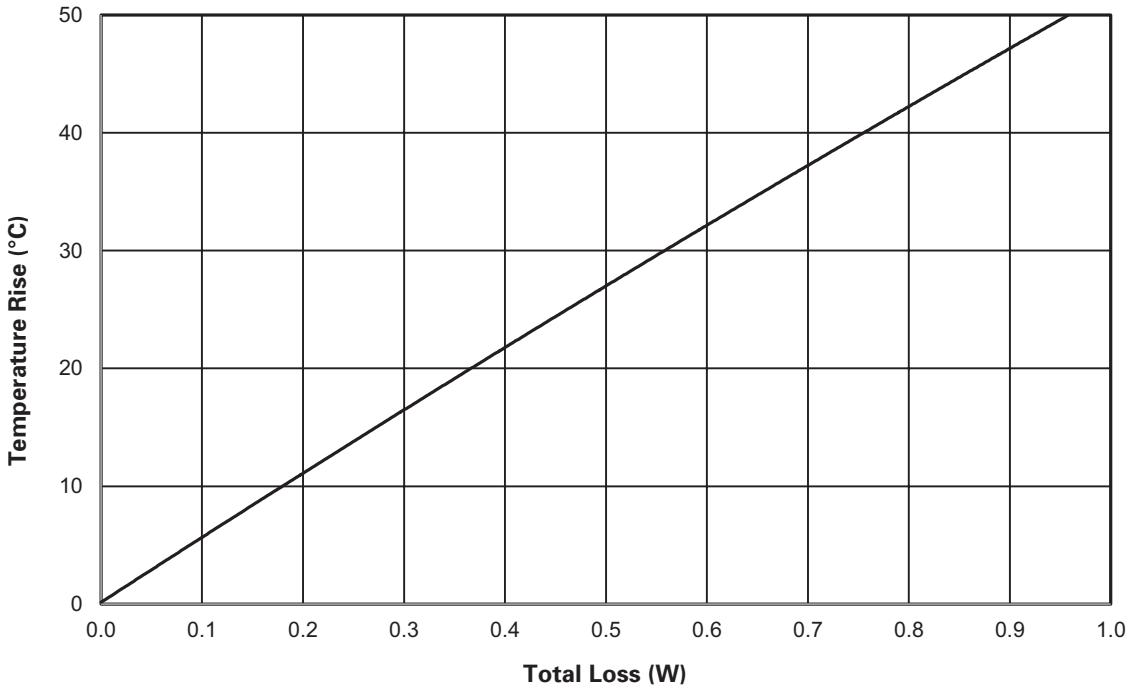
Part marking: AXXX A=automotive, XXX=inductance value in uH, R= decimal point. If no R is present then last character equals number of zeros. wly=date code, R=revision level
All soldering surfaces to be coplanar within 0.10 millimeters
Tolerances are ±0.2 millimeters unless stated otherwise
DCR measured from point "a" to point "b"
Color: Grey
Do not route traces or vias underneath the inductor

Packaging information (mm)

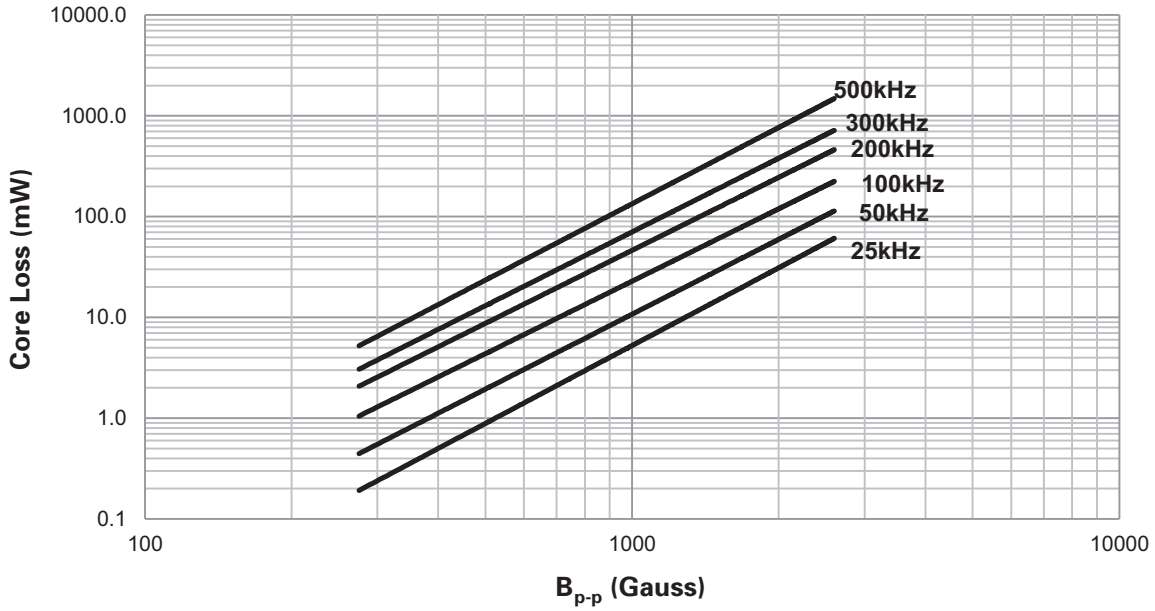
Supplied in tape and reel packaging, 2,000 parts per 13" diameter reel



Temperature rise vs. total loss

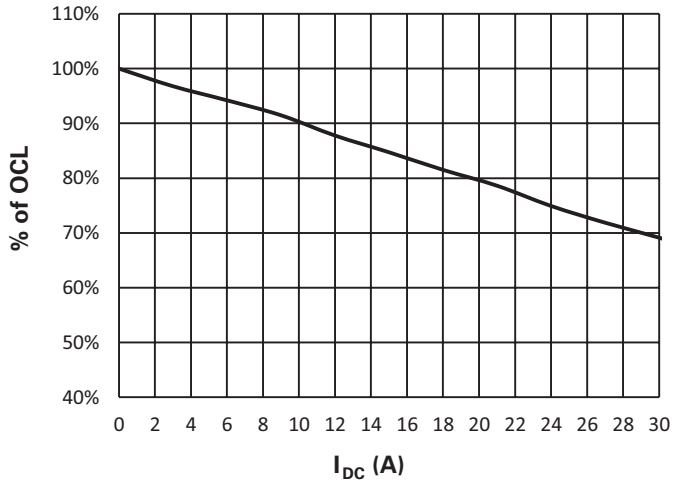


Core loss vs. B_{p-p}

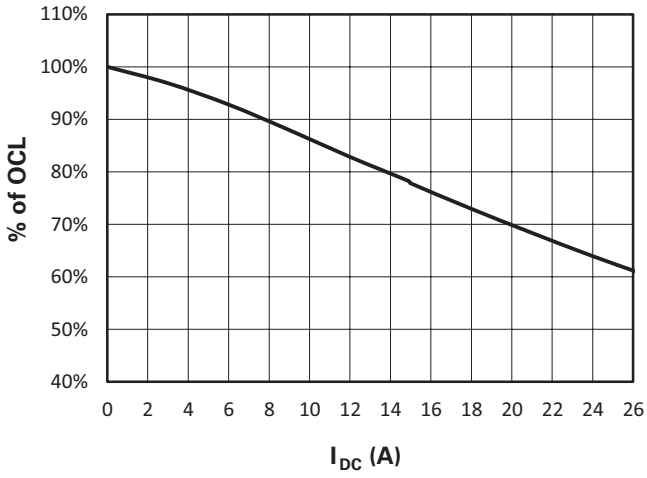


Inductance characteristics

HCMA0503-R20-R

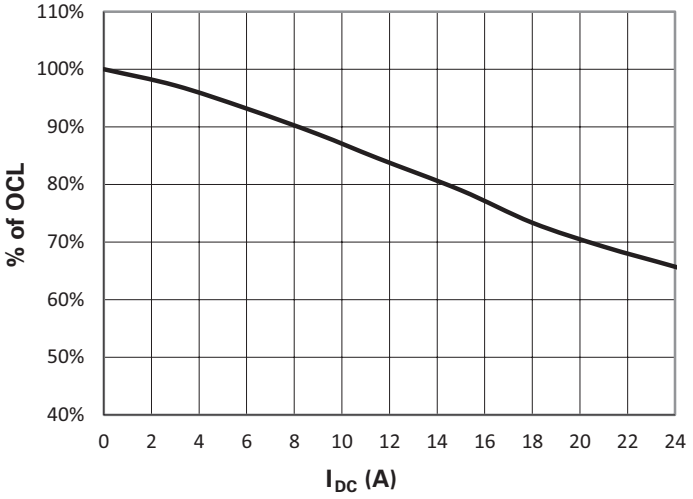


HCMA0503-R35-R

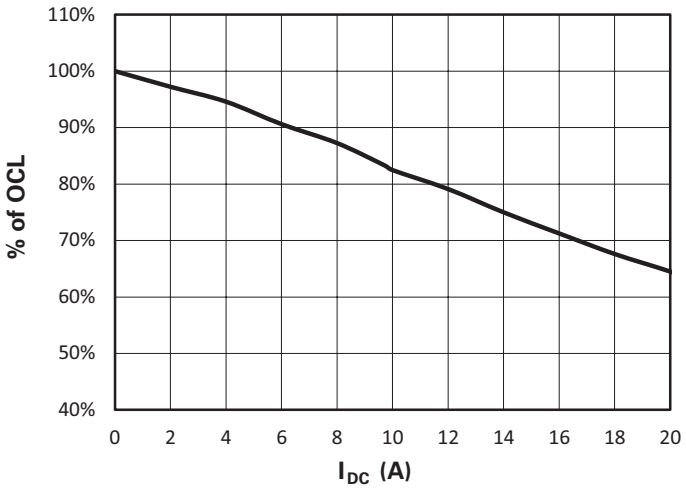


Inductance characteristics

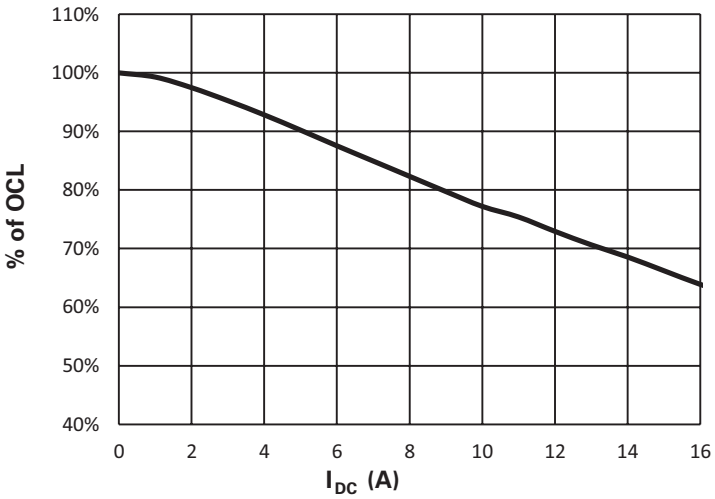
HCMA0503-R47-R



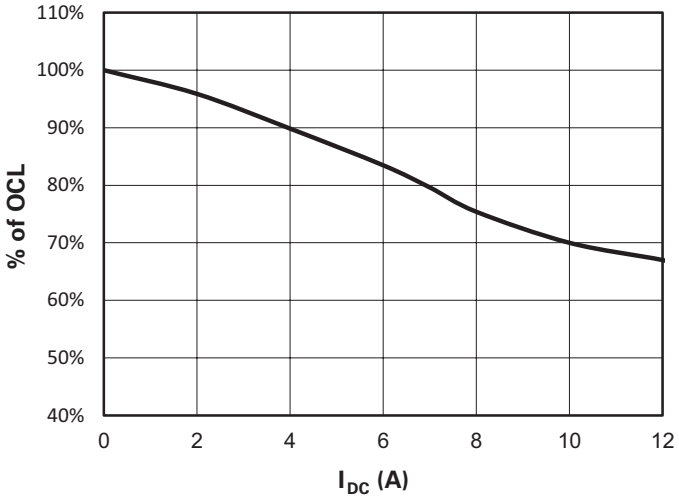
HCMA0503-R75-R



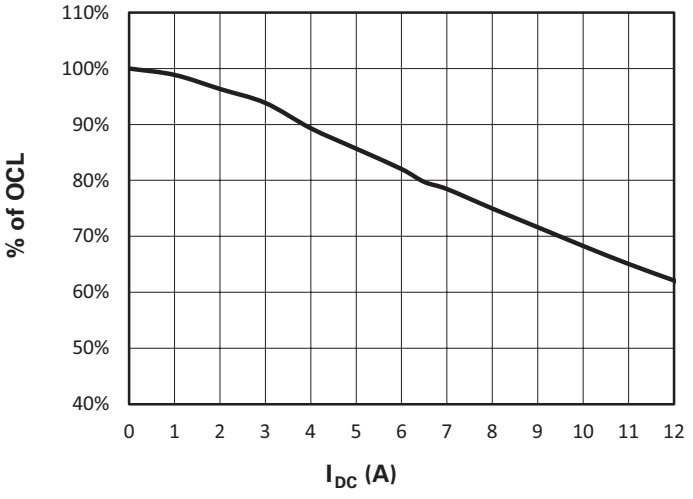
HCMA0503-1R0-R



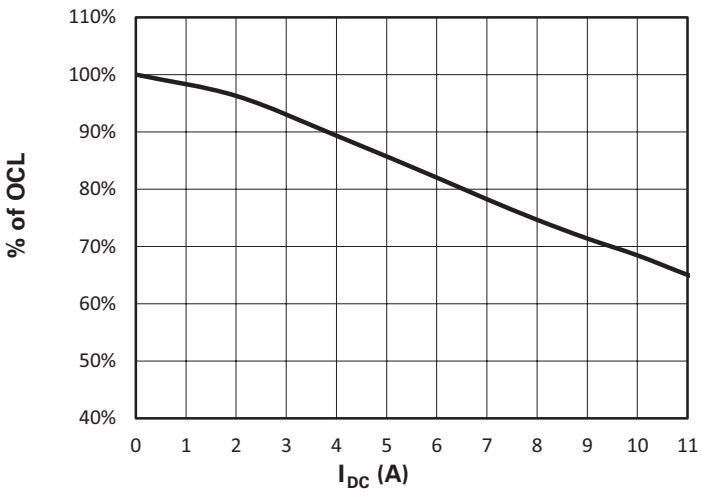
HCMA0503-1R5-R



HCMA0503-2R2-R

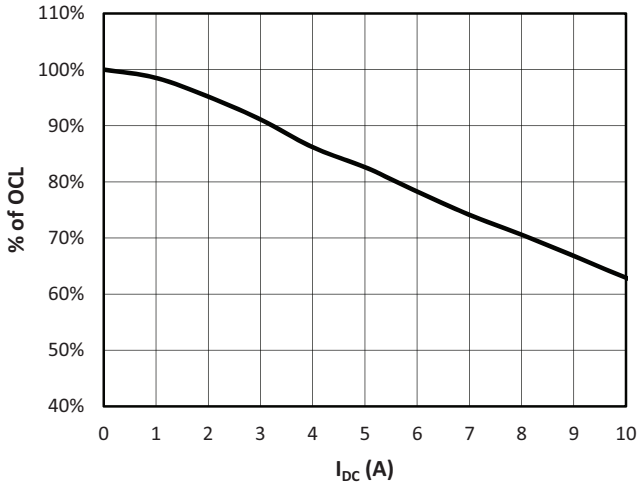


HCMA0503-3R3-R

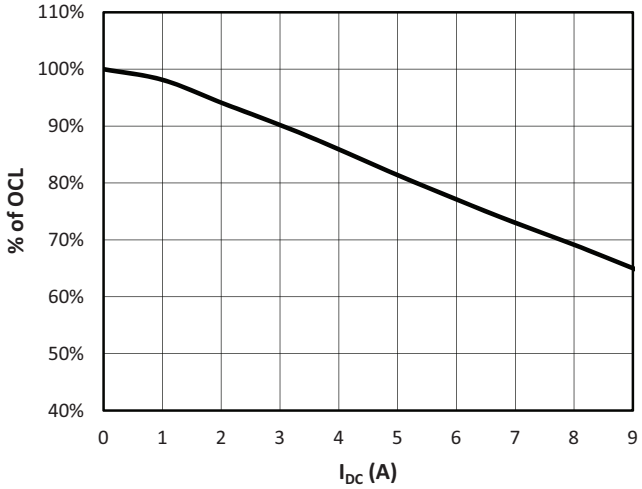


Inductance characteristics

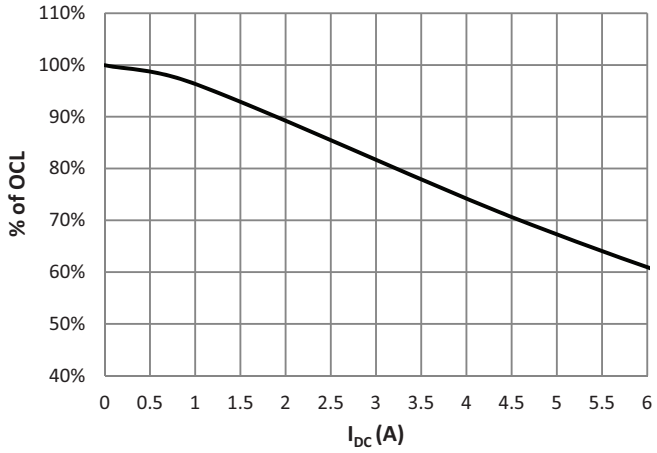
HCMA0503-4R7-R



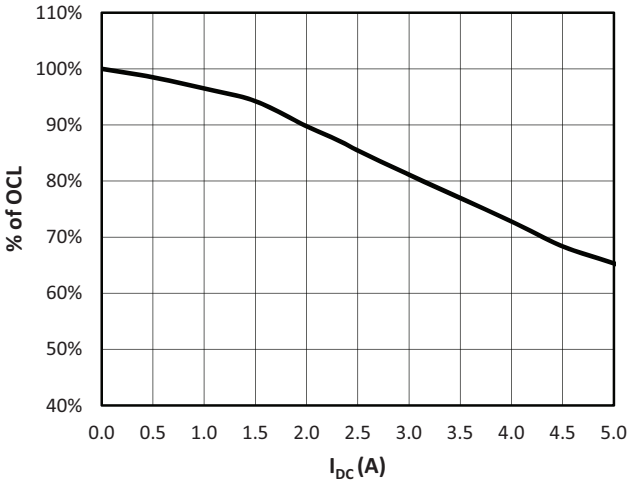
HCMA0503-5R6-R



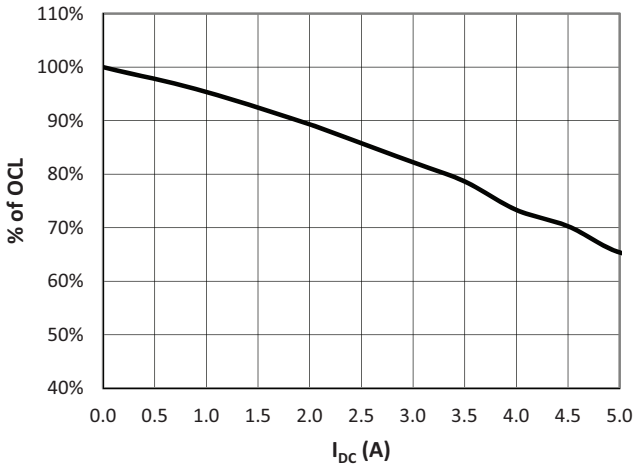
HCMA0503-6R8-R



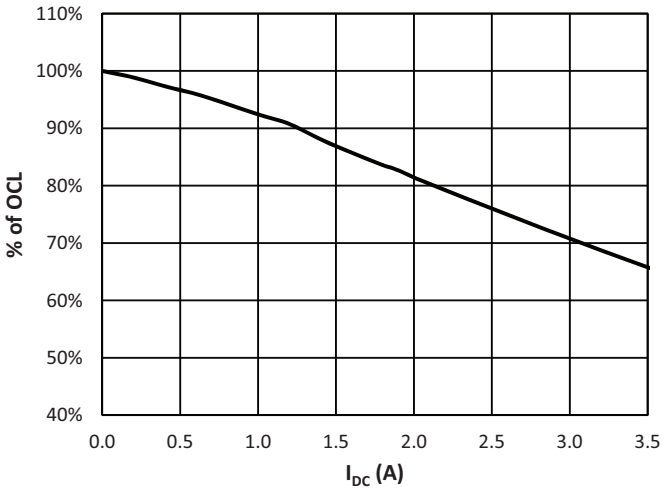
HCMA0503-100-R



HCMA0503-150-R



HCMA0503-220-R



Solder reflow profile

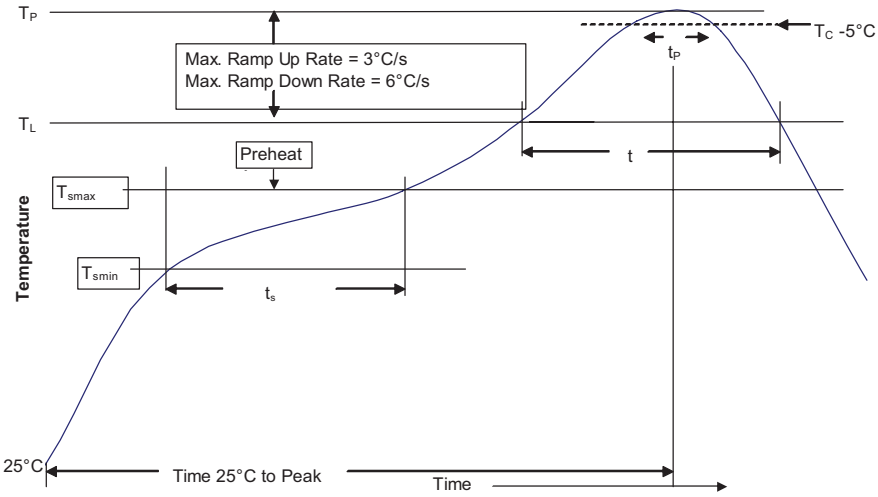


Table 1 - Standard SnPb Solder (T_C)

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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Printed in USA
Publication No. 10248 BU-SB15268
June 2016

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