

HCMA1707

Automotive grade High current power inductors



Product features

- AEC-Q200 qualified
- High current carrying capacity
- Magnetically shielded, low EMI
- Frequency range up to 1 MHz
- Inductance range from 1.5 μ H to 68 μ H
- Current range from 5.2 A to 40 A
- 17.5 mm x 17.2 mm footprint surface mount package in a 7.0 mm height
- Iron powder core material

Applications

- Body electronics
 - Central body control module
 - 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)
 - Anti-Lock Braking System (ABS)

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



Product Specifications

Part Number ⁶	OCL ¹ ±20% (μH)	FLL min. ² (μH)	I _{rms} ³ (A)	I _{sat} ⁴ (A)	DCR (mΩ) @ +20 °C (typical)	DCR (mΩ) @ +20 °C (maximum)	K-factor ⁵
HCMA1707-1R5-R	1.5	0.96	40	40	1.85	2.15	124
HCMA1707-2R2-R	2.2	1.41	37	34	2.15	2.50	103
HCMA1707-4R7-R	4.7	3.01	27	24	4.12	4.72	76
HCMA1707-6R8-R	6.8	4.35	20	22	6.55	7.55	60
HCMA1707-8R2-R	8.2	5.25	16	20	8.10	8.70	55
HCMA1707-100-R	10	6.40	14	18	9.30	10	47
HCMA1707-150-R	15	9.60	12	13	14.5	15.5	43
HCMA1707-220-R	22	14.1	9.5	11	21	23	37
HCMA1707-330-R	33	21.1	9.0	10	35	37	28
HCMA1707-470-R	47	30.1	6.8	7.5	41	47	25
HCMA1707-680-R	68	43.5	5.2	6.5	74	85	20

1. Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 0.25 V_{rms}, 0.0 Adc, +25 °C.

2. Full Load Inductance (FLL): Test parameters: 100 kHz, 0.25 V_{rms}, I_{sat}, +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.

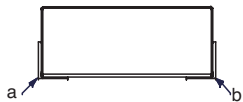
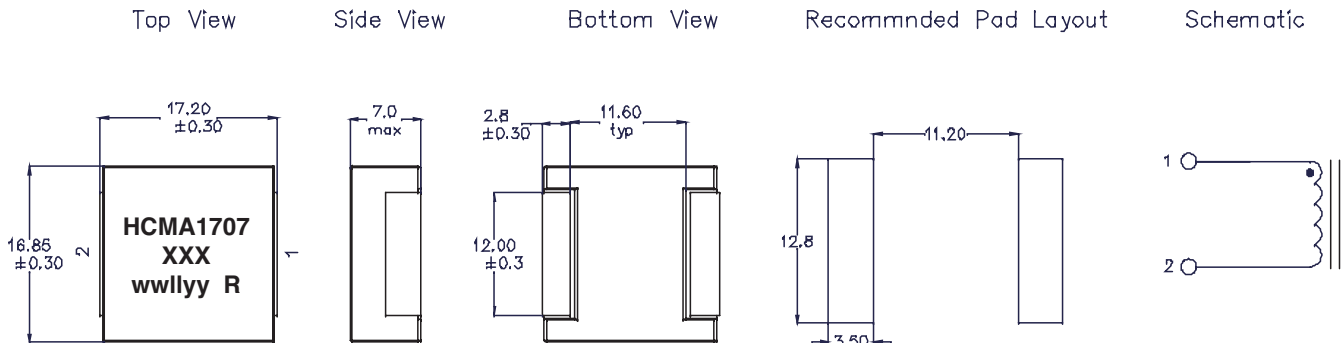
4. I_{sat}: Peak current for approximately 20% rolloff at +25 °C.

5. 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).

6. Part Number Definition: HCMA1707-yyy-R

- HCMA1707 = 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)



DCR measured between point "a" and point "b"

All soldering surfaces coplanar within 0.10 millimeters.
Part marking: HCMA1707; A = Automotive grade, XXX = initial inductance in μH, R = decimal point; if no R is present, last digit equals number of zeros.
wwlyy = date code, R = revision level
Color: Grey
Do not route traces or vias underneath the inductor

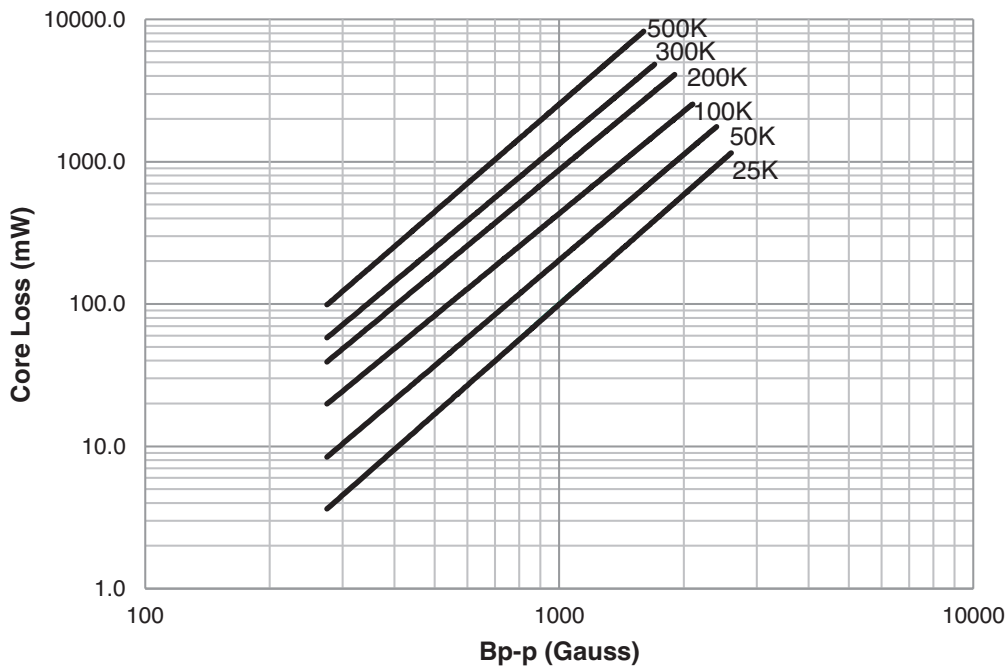
Supplied in tape and reel packaging , 350 parts per 13" diameter reel



A line graph showing the relationship between Total Loss (W) on the x-axis and Temperature Rise (°C) on the y-axis. The x-axis ranges from 0.0 to 2.5 with major grid lines every 0.5 units. The y-axis ranges from 0 to 50 with major grid lines every 10 units. A straight line starts at the origin (0,0) and passes through points (0.5, 10), (1.0, 20), (1.5, 30), (2.0, 40), and (2.5, 50).

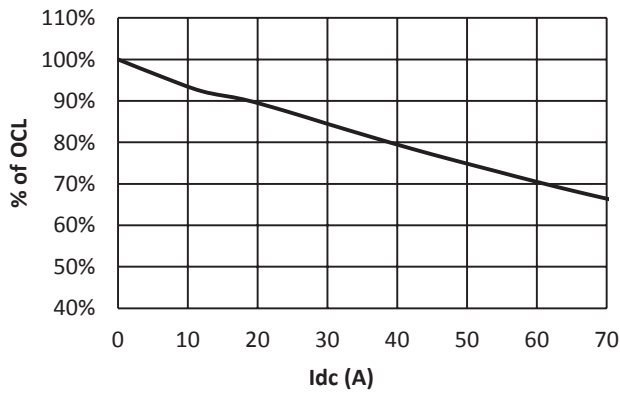
Total Loss (W)	Temperature Rise (°C)
0.0	0
0.5	10
1.0	20
1.5	30
2.0	40
2.5	50

Core loss vs. B_{p-p}

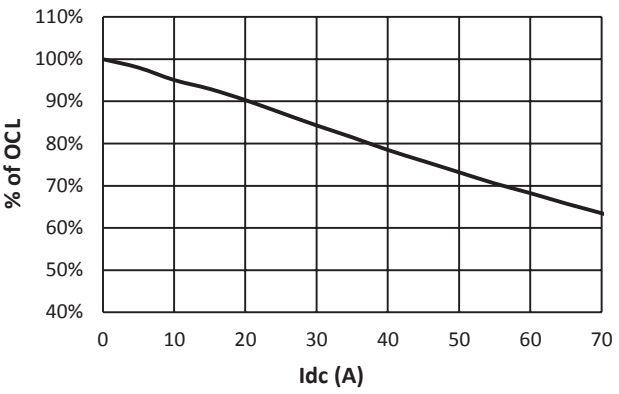


Inductance characteristics

HCMA1707 -1R5-R

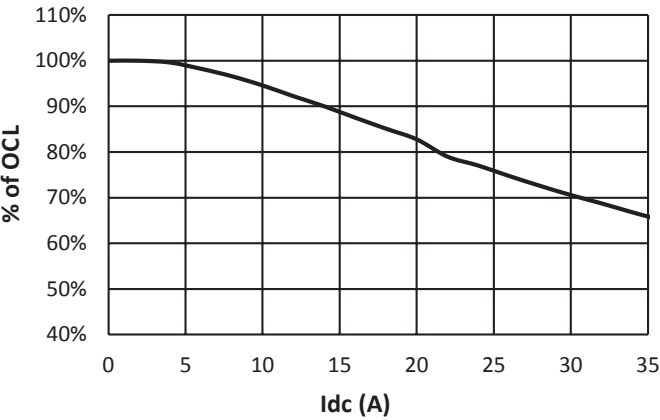


HCMA1707 -2R2-R

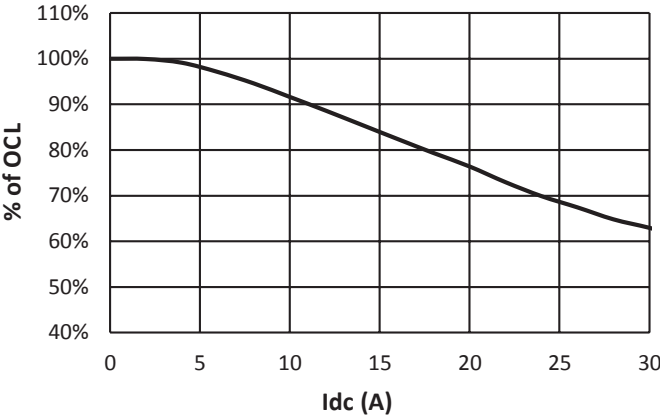


Inductance characteristics

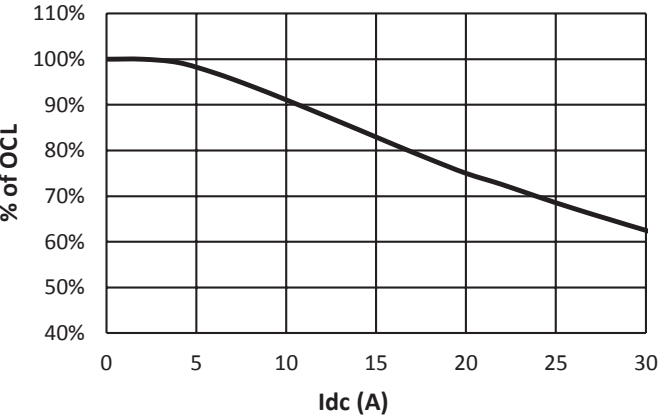
HCMA1707 -4R7-R



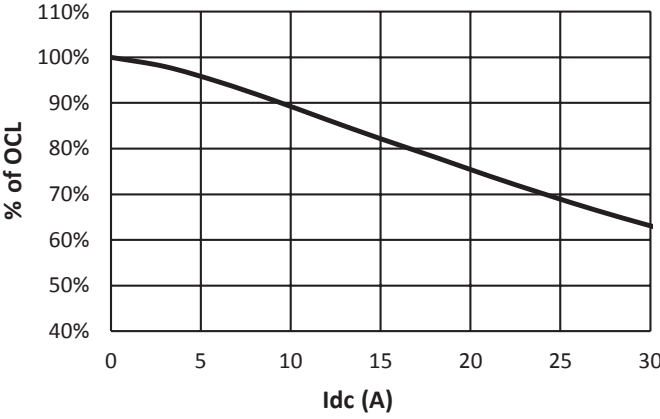
HCMA1707 -6R8-R



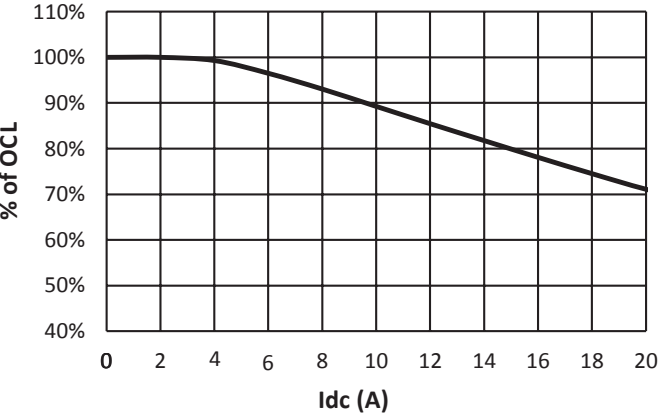
HCMA1707 -8R2-R



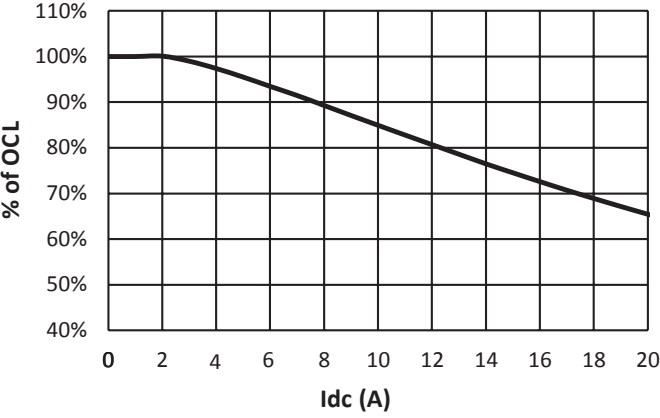
HCMA1707 -100-R



HCMA1707 -150-R

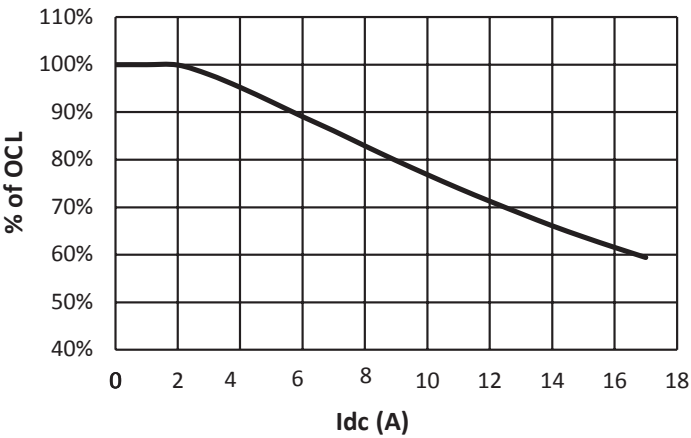


HCMA1707 -220-R

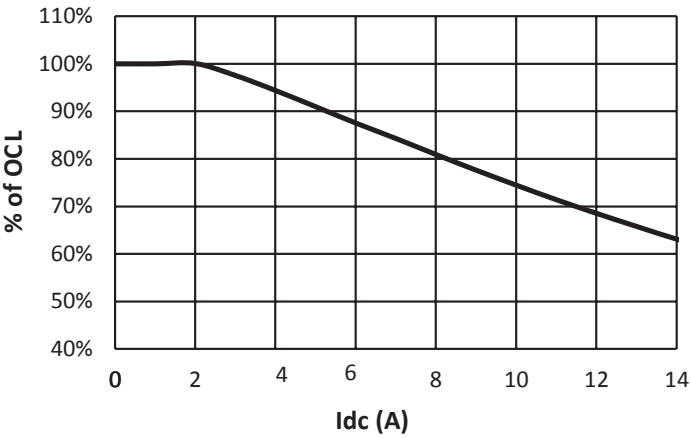


Inductance characteristics

HCMA1707-330-R



HCMA1707-470-R



HCMA1707-680-R

