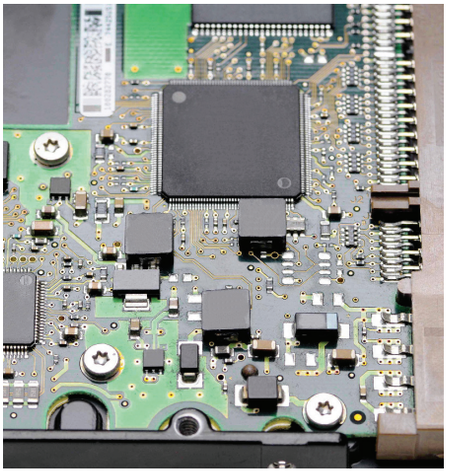
Technical Data 4085

Effective December 2014
Supersedes September, 2010

Coiltronics HCM0703 Series

High current power inductors



Product description

- High current carrying capacity
- Low core losses
- Magnetically shielded, low EMI
- Frequency range up to 5MHz
- Inductance range from 0.15µH to 33µH
- Current range from 1.8A to 52A
- 7.4x7.0mm footprint surface mount package in a 3.0mm 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
- Base station equipment
- Notebook regulators
- Battery power systems
- Graphics cards
- Data networking and storage 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

Pb HALOGEN HF FREE RoHS

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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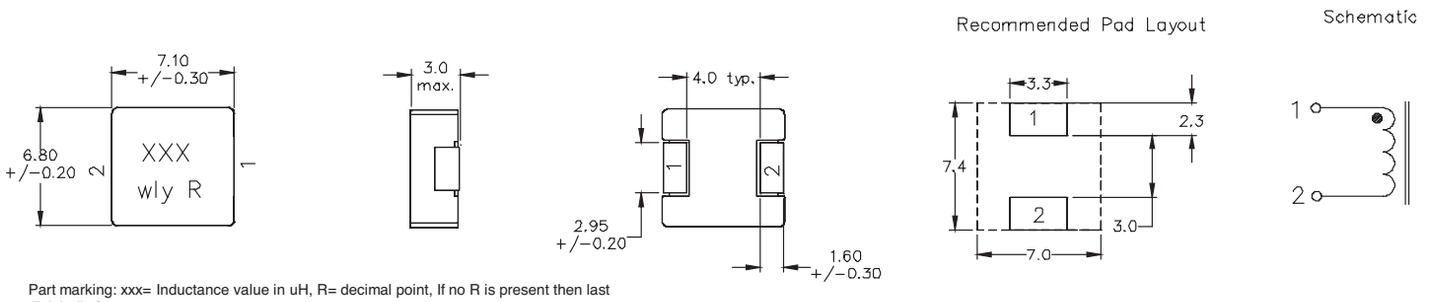
Powering Business Worldwide

Product specifications

Part Number[6]	OCL[1] (µH) ±20%	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]
HCM0703-R15-R	0.15	0.09	26.0	52.0	1.90	2.50	1044
HCM0703-R22-R	0.22	0.13	23.0	40.0	2.50	2.80	986
HCM0703-R47-R	0.47	0.28	17.5	26.0	4.00	4.20	580
HCM0703-R68-R	0.68	0.41	15.5	25.0	5.00	5.50	455
HCM0703-R82-R	0.82	0.49	13.0	24.0	6.70	8.00	439
HCM0703-1R0-R	1.00	0.60	11.0	22.0	9.00	10.0	374
HCM0703-1R5-R	1.50	0.90	9.00	18.0	14.0	15.0	366
HCM0703-2R2-R	2.20	1.32	8.00	14.0	18.0	20.0	281
HCM0703-3R3-R	3.30	1.98	6.00	13.5	28.0	30.0	252
HCM0703-4R7-R	4.70	2.82	5.50	10.0	37.0	40.0	210
HCM0703-6R8-R	6.80	4.08	4.50	8.00	54.0	60.0	151
HCM0703-8R2-R	8.20	4.92	4.00	7.50	64.0	68.0	142
HCM0703-100-R	10.0	6.00	3.20	7.00	70.5	77.6	132
HCM0703-220-R	22.0	14.1	2.30	3.00	135.3	148.8	83
HCM0703-330-R	33.0	19.8	1.80	2.20	220	242	76

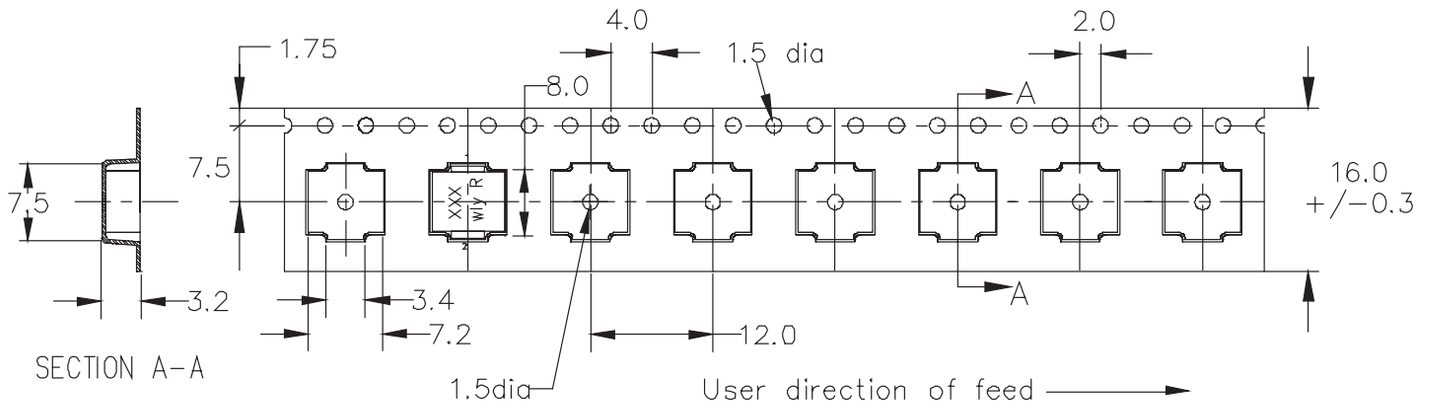
1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.25V_{rms}, 0.0Adc, +25°C.
2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.25V_{rms}, I_{sat}, @ +25°C.
3. I_{rms}: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB 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_{p-p} for core loss (see graph). $B_{p-p} = K * L * \Delta I$. 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: HCM0703-yyy-R
   - HCM0703 = Product code and size
   - yyy= Inductance value in µH, R = decimal point, if no R is present then third character = number of zeros.
   - "-R" suffix = RoHS compliant

Dimensions - mm



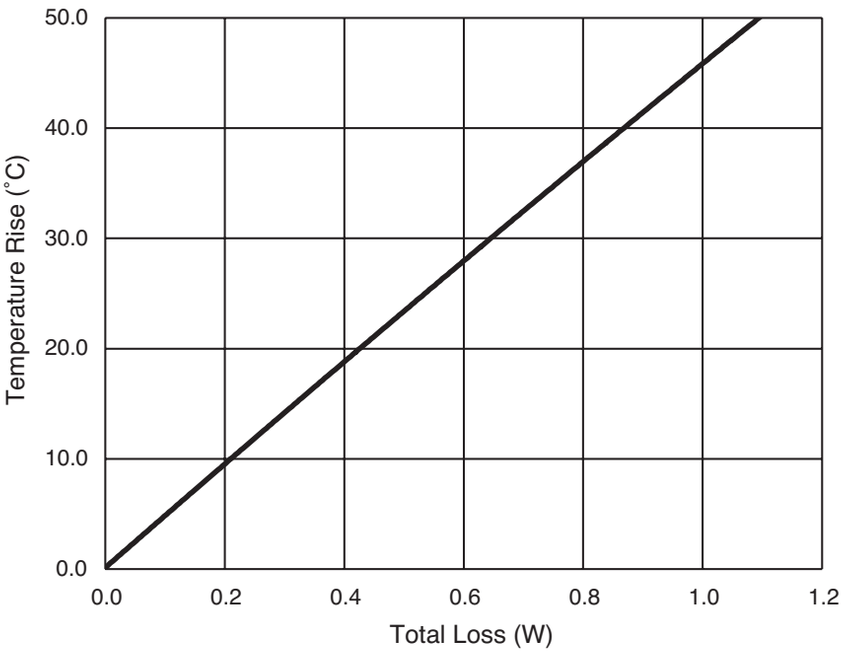
Part marking: xxx= Inductance value in uH, R= decimal point, If no R is present then last digit is # of zeroes
wly= Date code, R= Revision level
All soldering surfaces to be coplanar within 0.10 millimeters
Tolerances are ±0.3 millimeters unless stated otherwise.
Color: Grey

Packaging information - mm

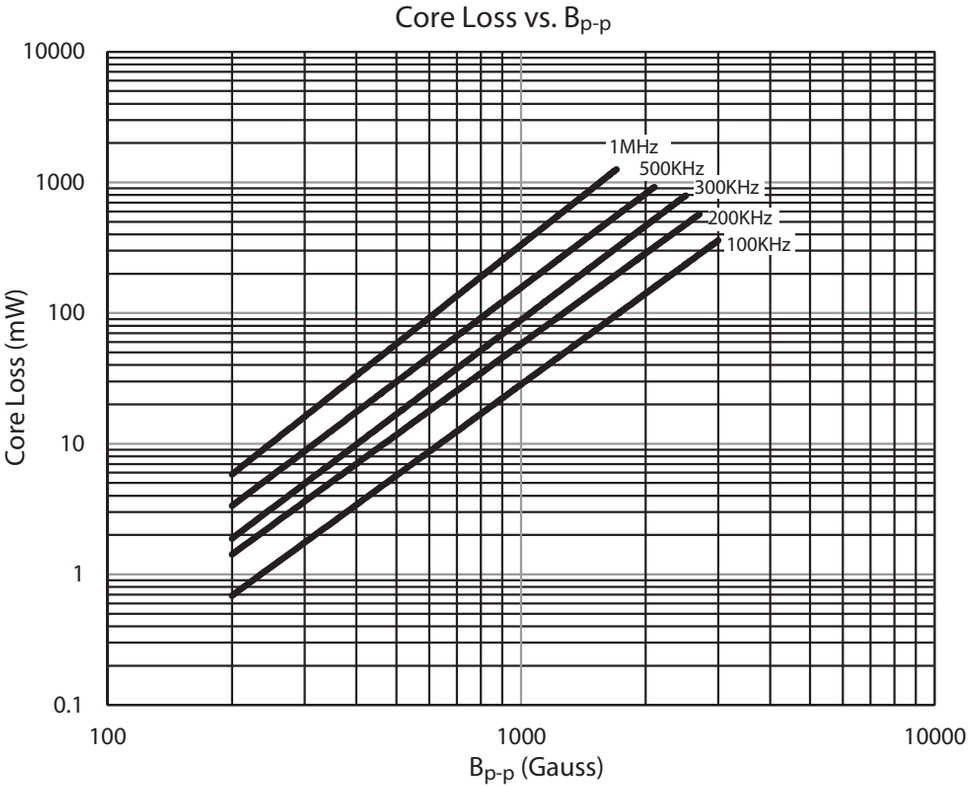


Supplied in tape and reel packaging, 1500 parts per 13” diameter reel.

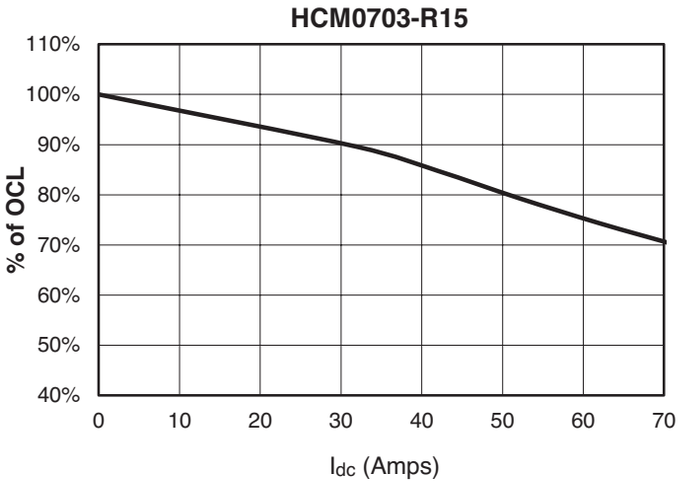
Temperature rise vs. total loss

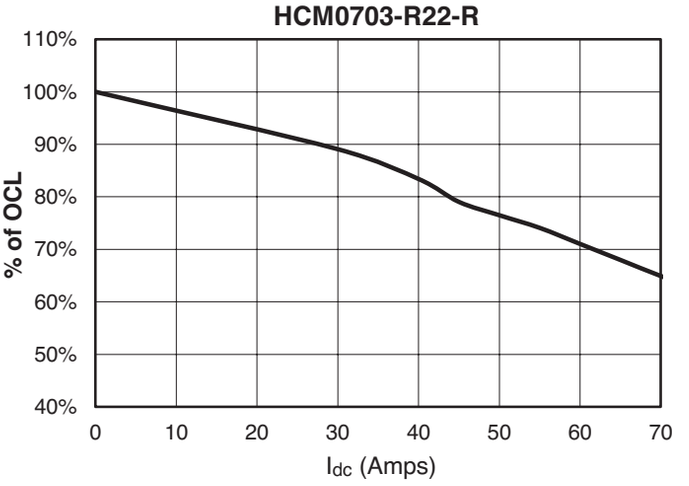


Core loss



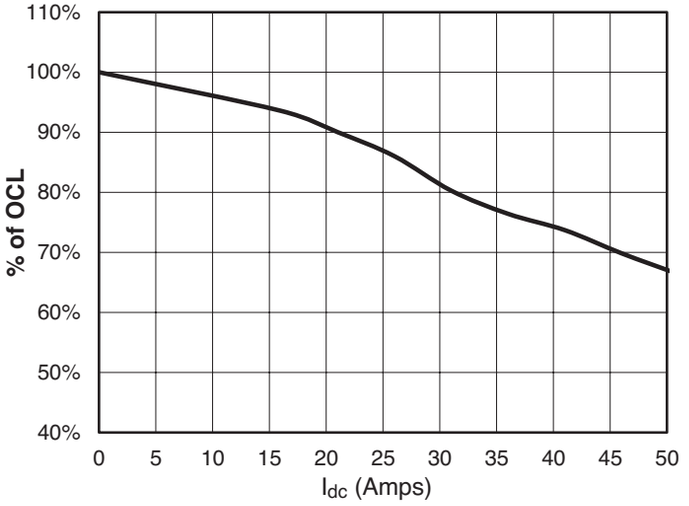
Inductance characteristics



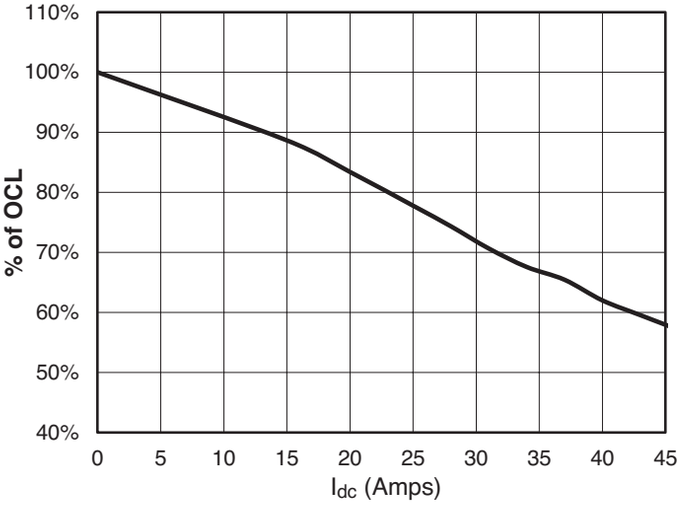


Inductance characteristics

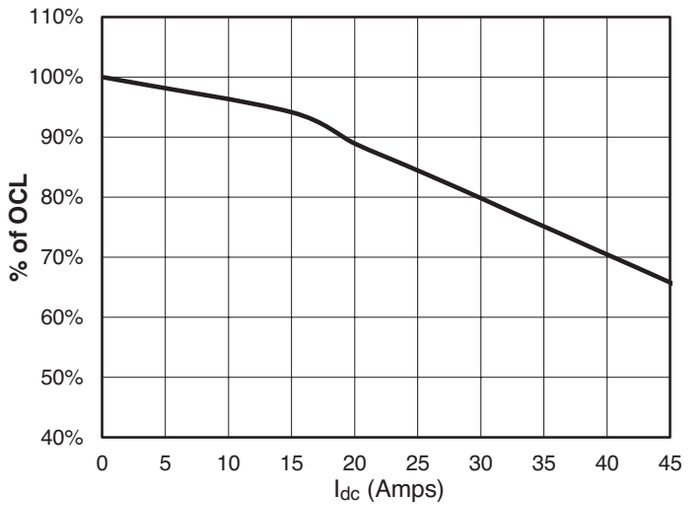
HCM0703-R47-R



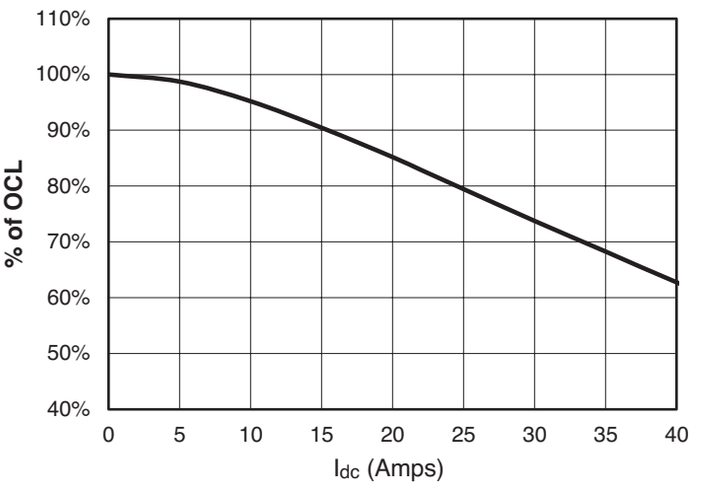
HCM0703-R68-R



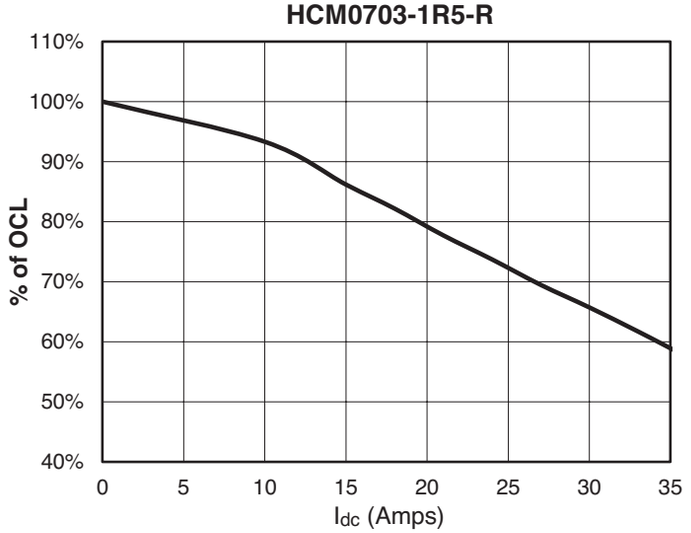
HCM0703-R82-R



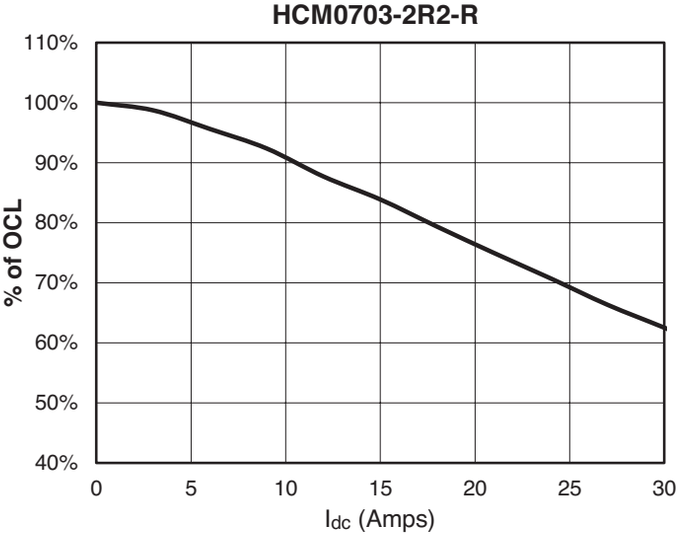
HCM0703-1R0-R



HCM0703-1R5-R

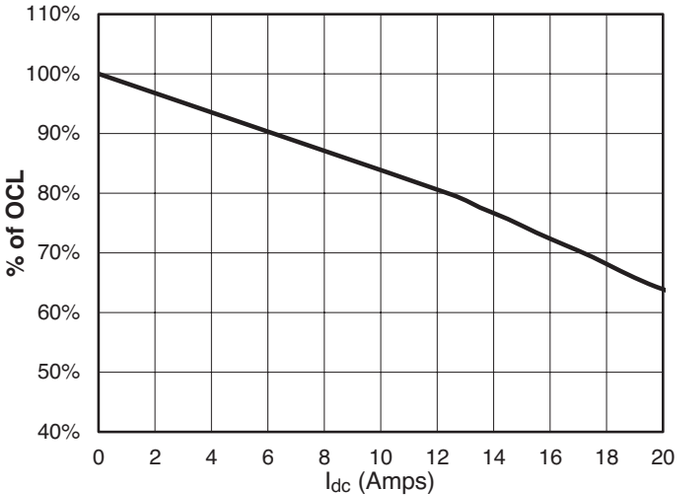


HCM0703-2R2-R



Inductance characteristics

HCM0703-3R3-R



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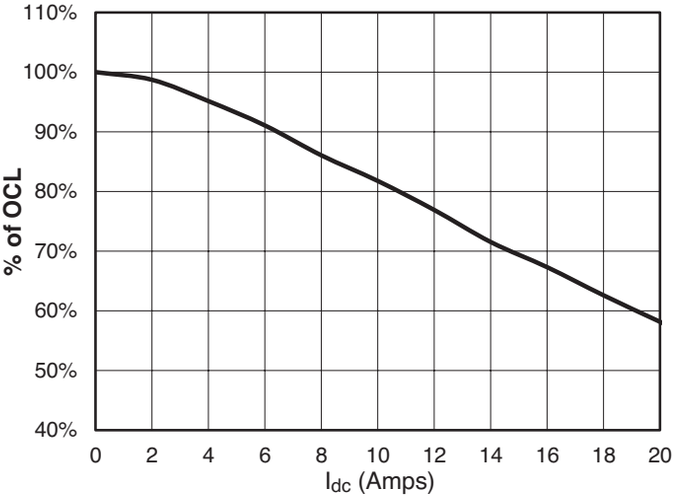
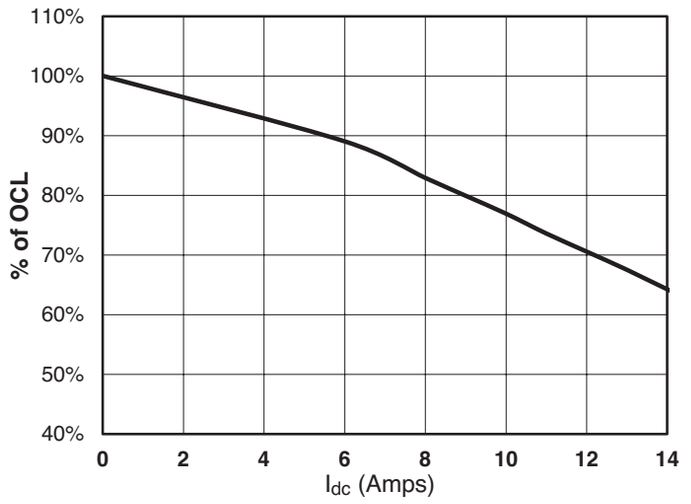
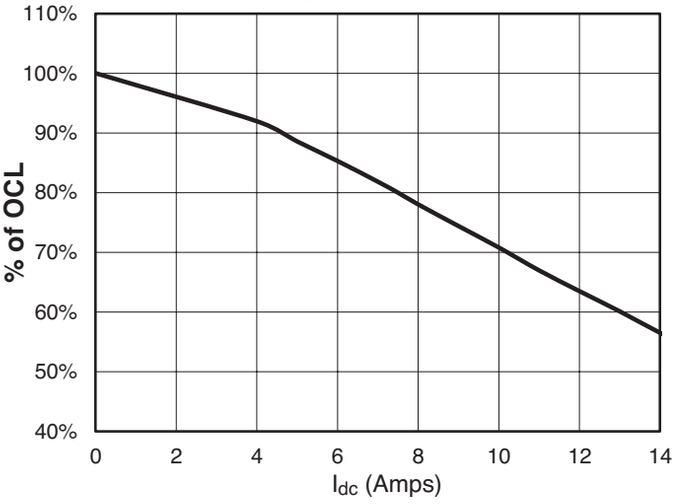


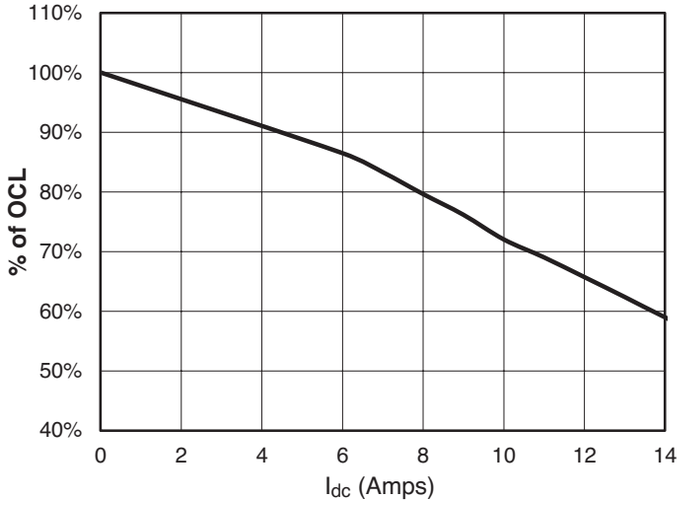
HCM0703-6R8-R



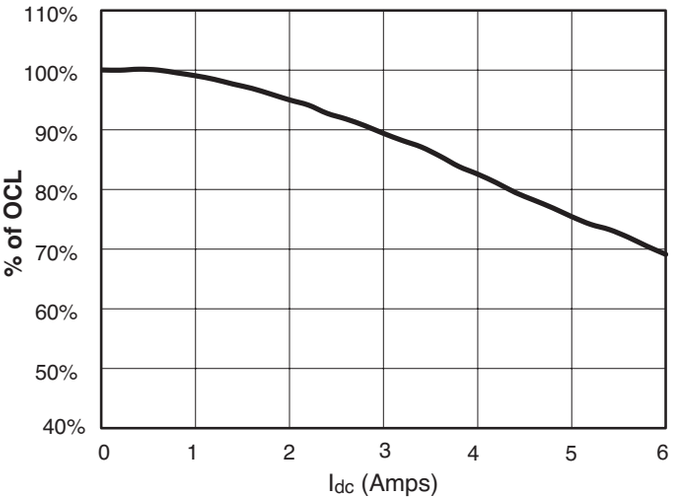
HCM0703-8R2-R



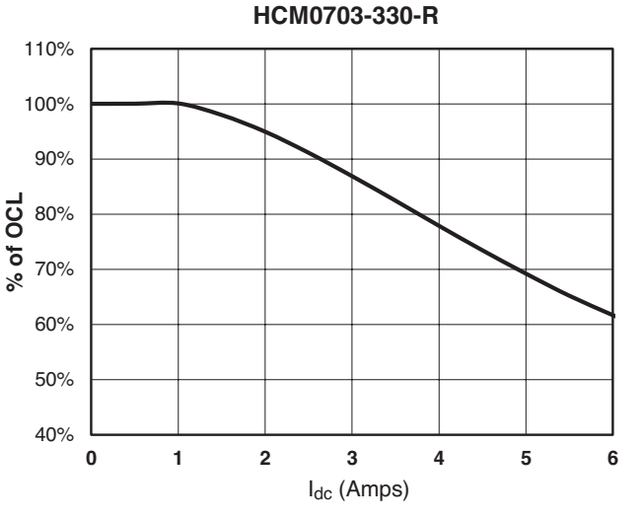
HCM0703-100-R



HCM0703-220-R



Inductance characteristics



Solder reflow profile

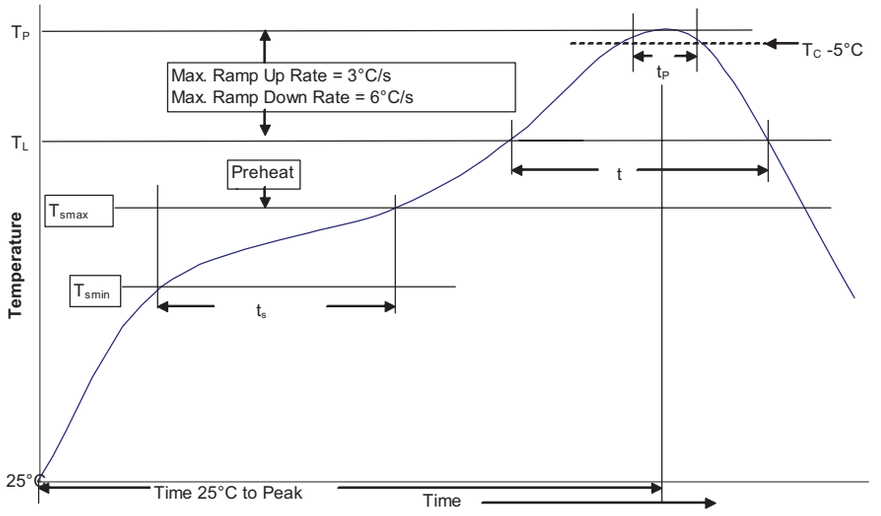


Table 1 - Standard SnPb Solder (T_C)

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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