HCM0703

High current power inductors

Description

- High current carrying capacity
- Low core losses
- Magnetically shielded, low EMI
- Frequency range up to 5 MHz
- Inductance range from 0.15 µH to 33 µH
- Current range from 1.8 A to 52 A
- 7.4 mm x 6.8 mm footprint surface mount package in a 3.0 mm height
- Iron powder core material
- Halogen free, lead free, RoHS compliant

Applications

- Voltage Regulator Module (VRM)
- Multi-phase regulators
- Point-of-loadmodules
- Desktop and server VRMs and EVRDs
- Base station equipment
- Laptop and 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 plus self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

Pb HALOGEN HF FREE RoHS

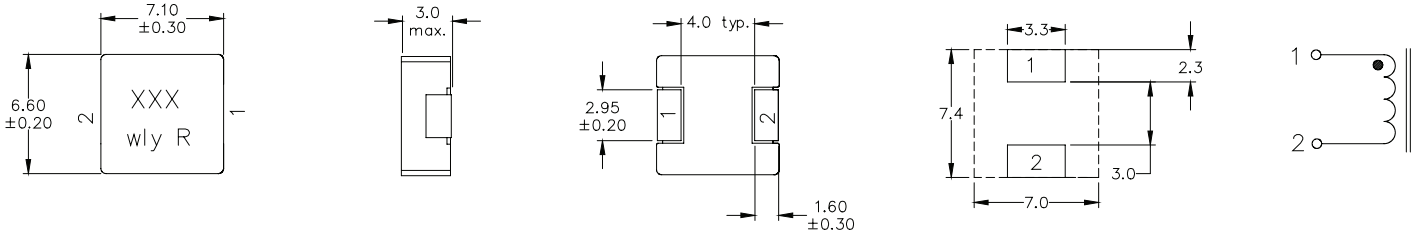
Powering Business Worldwide

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]
HCM0703-R15-R	0.15	0.09	26	52	1.9	2.5	1044
HCM0703-R22-R	0.22	0.13	23	40	2.5	2.8	986
HCM0703-R47-R	0.47	0.28	17.5	26	4.0	4.2	580
HCM0703-R68-R	0.68	0.41	15.5	25	5.0	5.5	455
HCM0703-R82-R	0.82	0.49	13	24	6.7	8.0	439
HCM0703- 1R0-R	1.0	0.60	11	22	9.0	10	374
HCM0703- 1R5-R	1.5	0.90	9.0	18	14	15	366
HCM0703- 2R2-R	2.2	1.3	8.0	14	18	20	281
HCM0703- 3R3-R	3.3	2.0	6.0	13.5	28	30	252
HCM0703- 4R7-R	4.7	2.8	5.5	10	37	40	210
HCM0703- 6R8-R	7	4.1	4.5	8.0	54	60	151
HCM0703- 8R2-R	8	4.9	4.0	7.5	64	68	142
HCM0703- 100-R	10	6.0	3.2	7.0	71	78	132
HCM0703- 150-R	14.9±15%	10.1	2.2	5.0	113	127	105
HCM0703- 220-R	22	14.1	2.3	3.0	135	149	83
HCM0703- 330-R	33	19.8	1.8	2.2	220	242	76

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_{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: HCM0703-xxx-R
   HCM0703 = 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

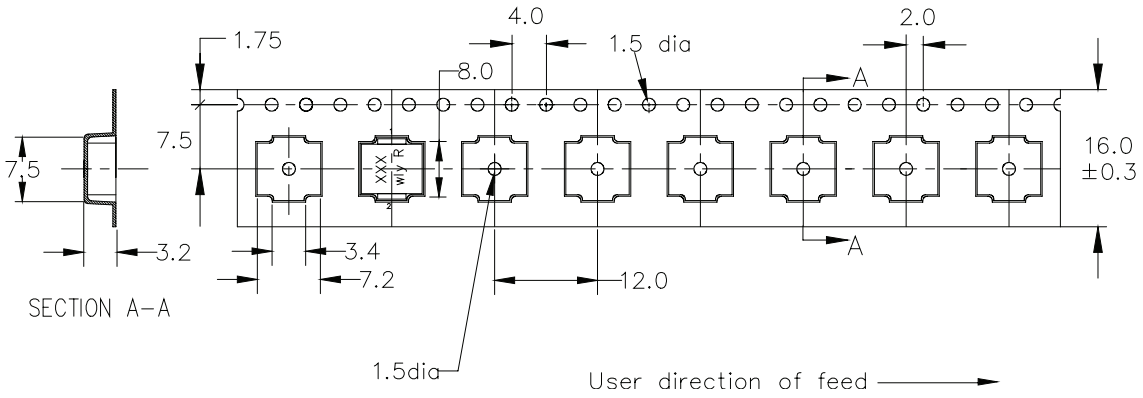
Dimensions (mm)



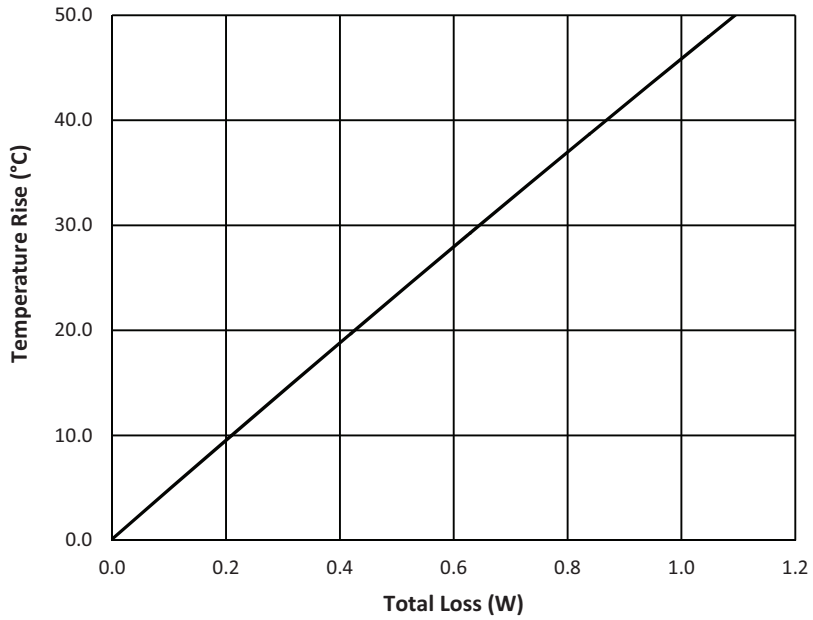
Part marking: XXX=Inductance value in uH, R= decimal point. If no R is present then last character equals number of zeros.
wly=date code, R=revision level
All soldering surfaces to be coplanar within 0.10 millimeters
Tolerances are ±0.3 millimeters unless stated otherwise
Color: Grey

Packaging information (mm)

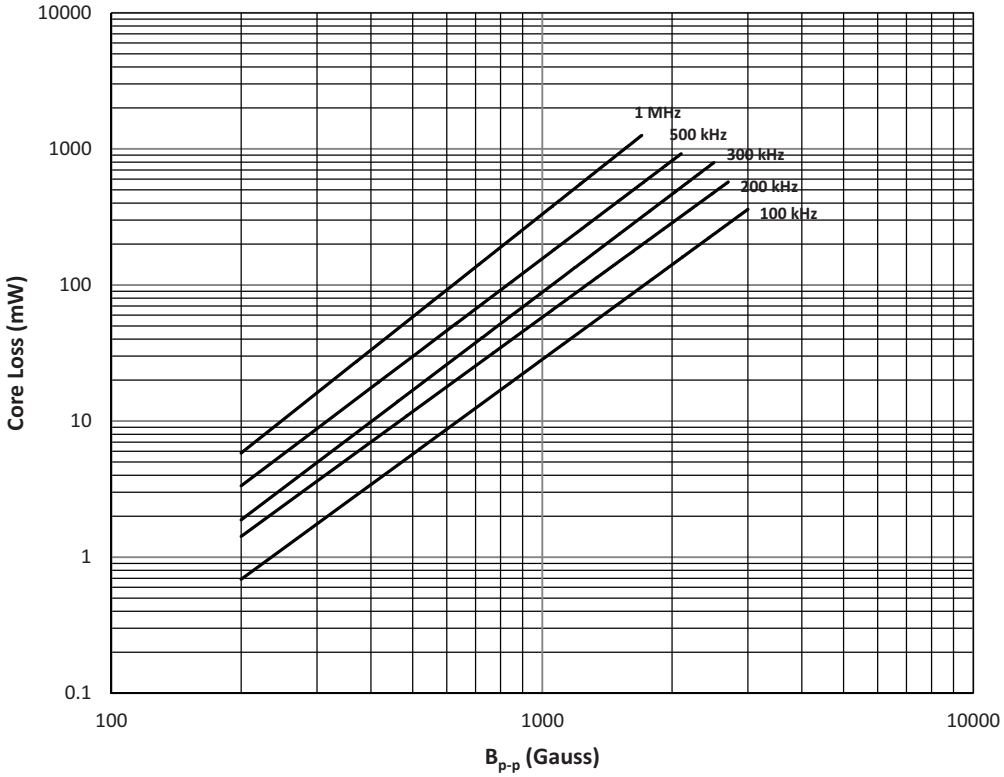
Supplied in tape and reel packaging, 1500 parts per 13" diameter reel.



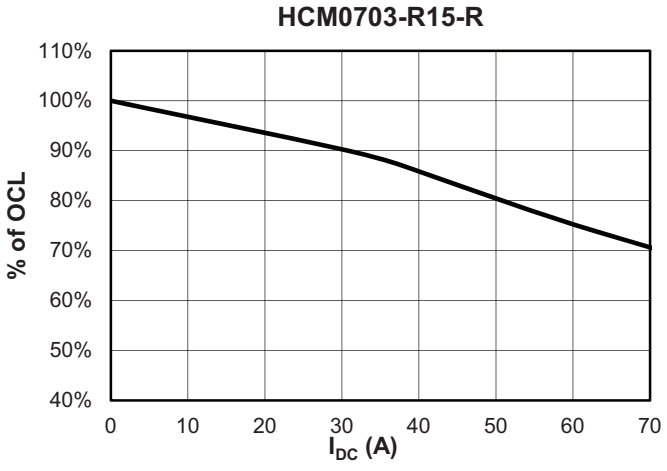
Temperature rise vs. total loss

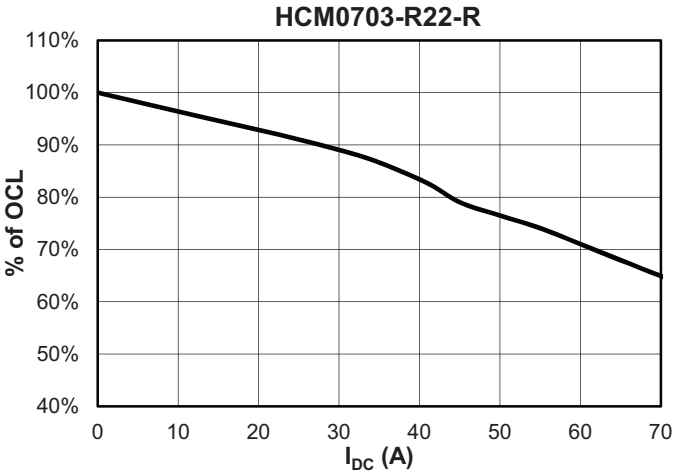


Core loss vs. B_{p-p}

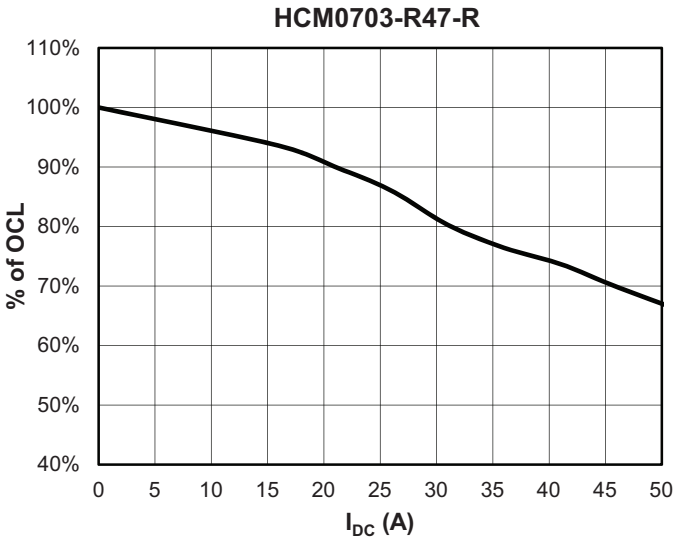


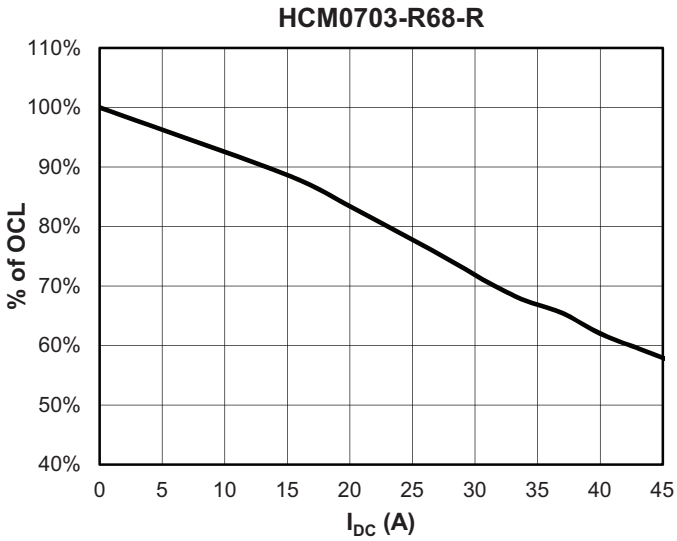
Inductance characteristics

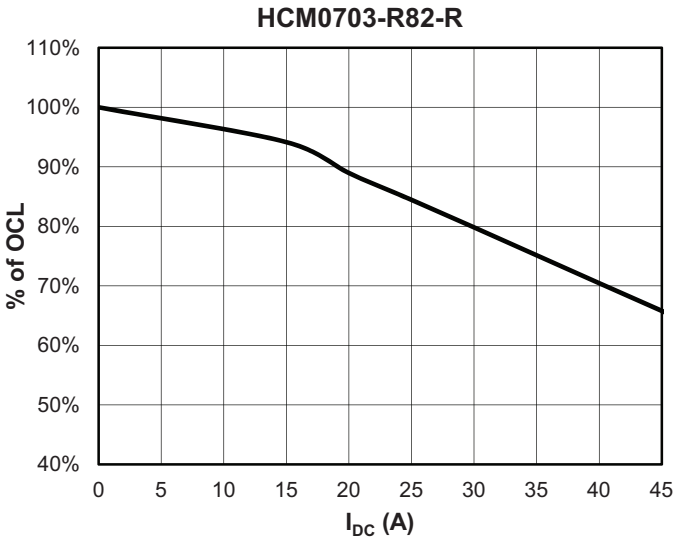


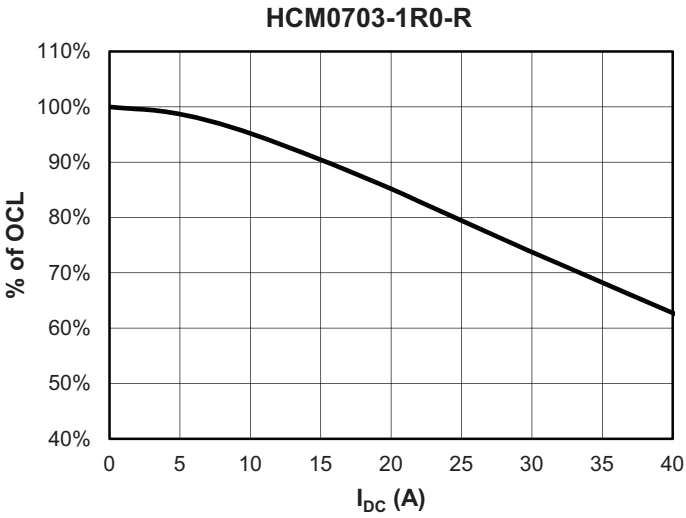


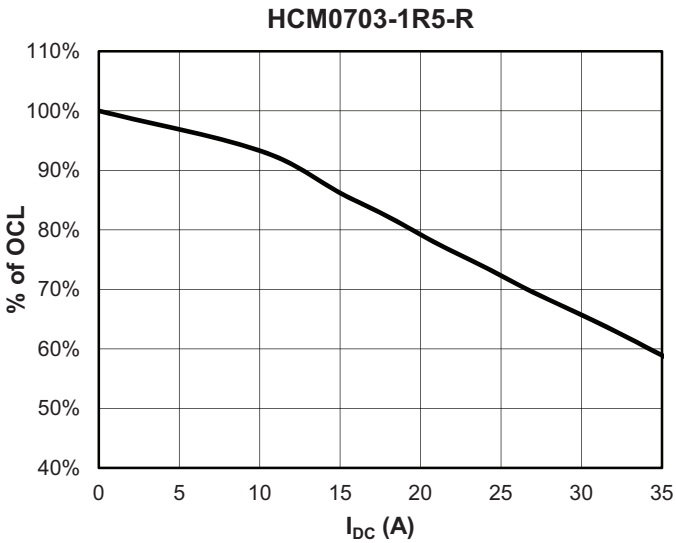
Inductance characteristics

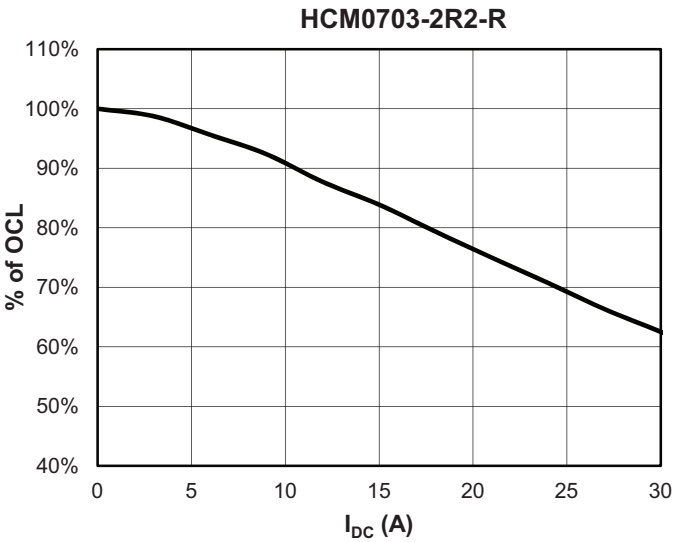






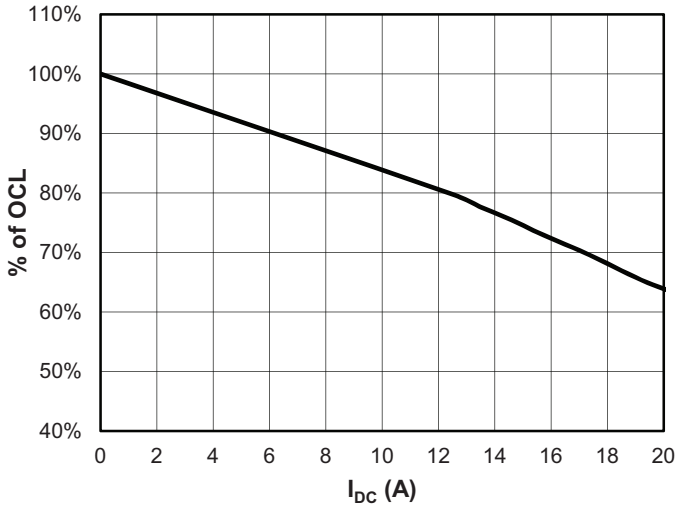




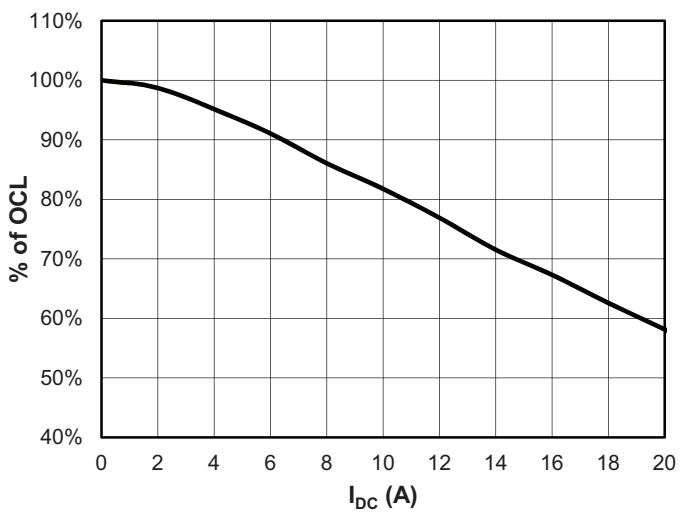


Inductance characteristics

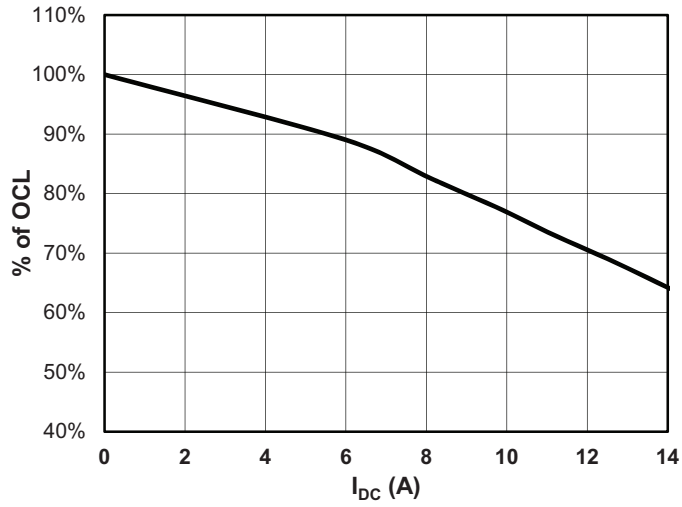
HCM0703-3R3-R



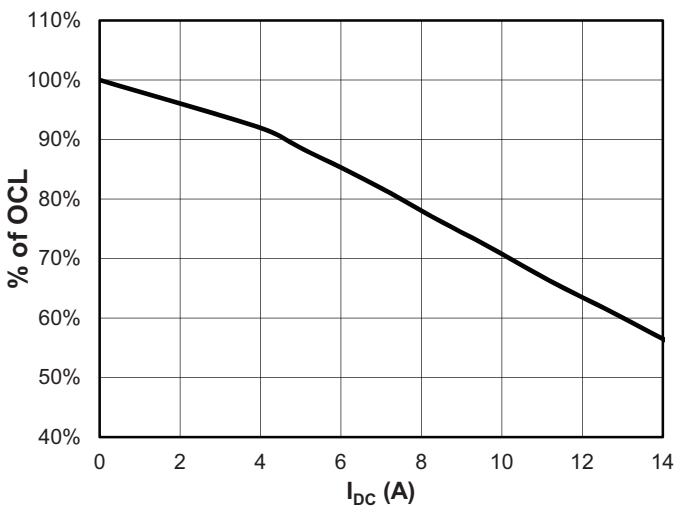
HCM0703-4R7-R



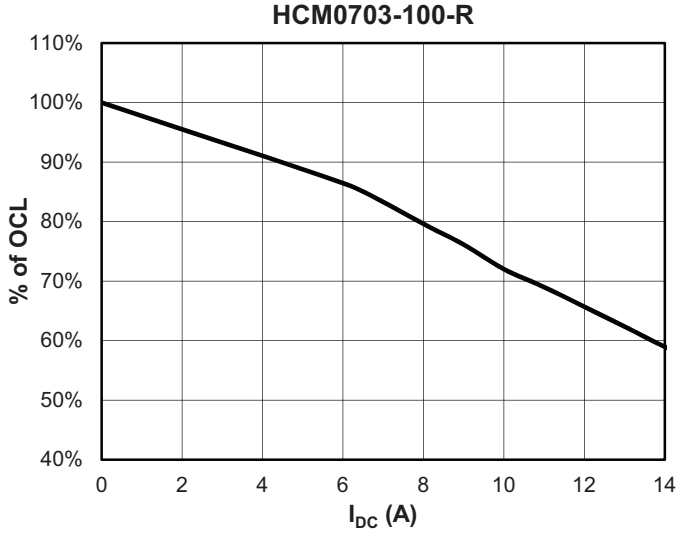
HCM0703-6R8-R



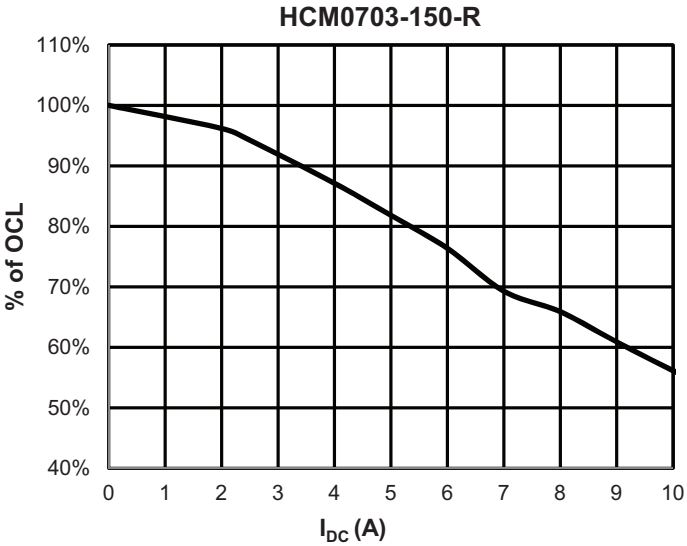
HCM0703-8R2-R



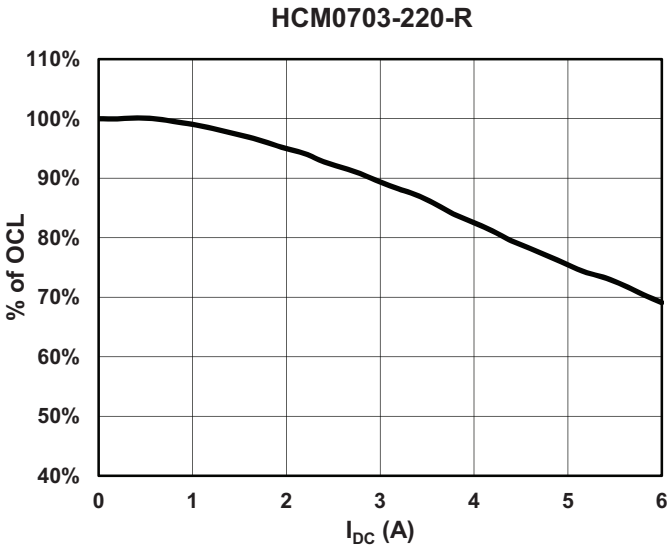
HCM0703-100-R

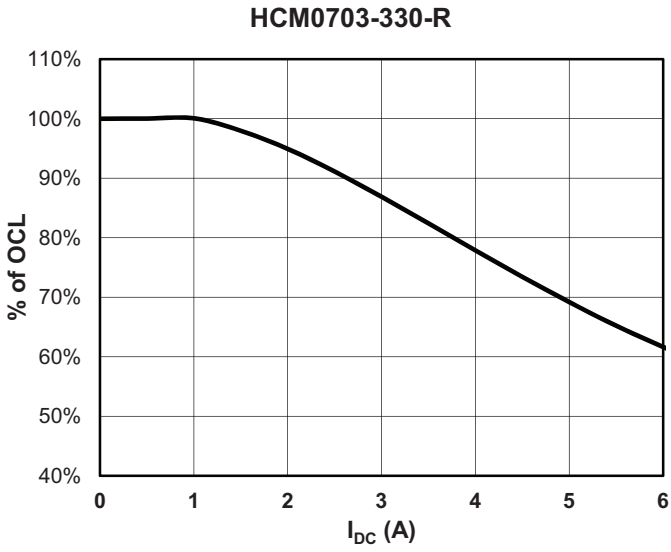


HCM0703-150-R



Inductance characteristics





Solder reflow profile

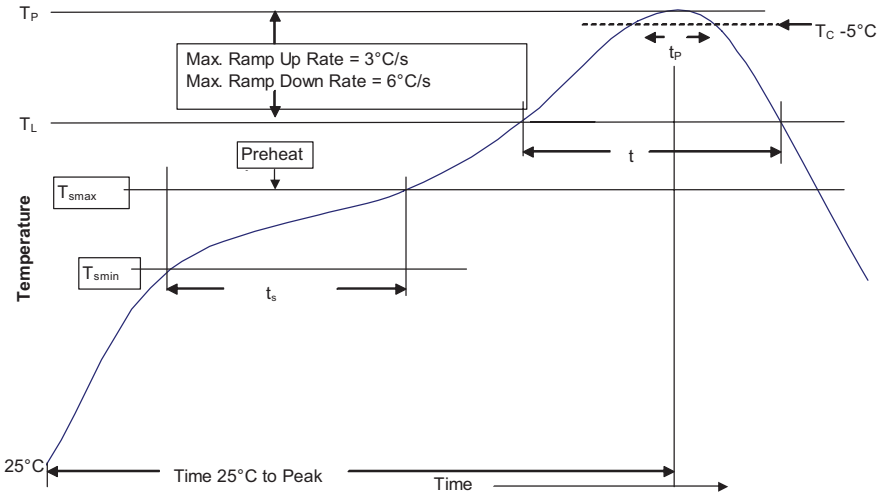


Table 1 - Standard SnPb Solder (T_C)

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 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
>2.5mm	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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