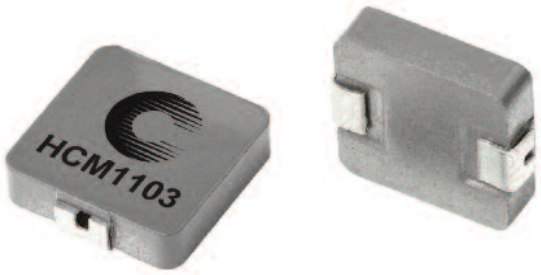
COILTRONICS®

High Current, High Frequency Power Inductors

HCM1103 Series



Description

- Halogen free, lead free, RoHS compliant
- 125°C maximum total temperature operation
- 11.5 x 10.3 x 3.0mm maximum surface mount package
- Powder Iron core material
- Magnetically shielded, low EMI
- High current carrying capacity, low core losses
- Inductance range from 0.12µH to 22.0µH
- Current range from 3.0 to 75 amps

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: -55°C to +125 °C
- Operating temperature range: -55°C to +125°C (ambient + self-temperature rise)
- Solder reflow temperature: J-STD-020D compliant

Packaging

- Supplied in tape-and reel packaging, 1000 parts per 13" diameter reel

Product Specifications

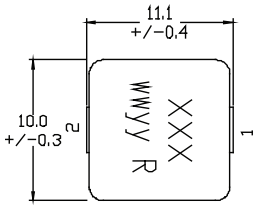
Part Number[6]	OCL[1] ±20% (µH)	FLL min.[2] (µH)	I_{rms}[3] (Amps)	I_{sat}[4] @ 25°C (Amps)	DCR (mΩ) @ 20°C Typical	DCR (mΩ) @ 20°C Maximum	K-Factor[5]
HCM1103-R12-R	0.12	0.07	30	75	0.55	0.61	1200
HCM1103-R36-R	0.36	0.26	23	28	1.10	1.30	711
HCM1103-R47-R	0.47	0.33	20	26	1.50	2.00	515
HCM1103-R68-R	0.68	0.38	21	23	2.90	3.40	510
HCM1103-1R0-R	1.0	0.56	15	21	5.50	6.00	377
HCM1103-2R2-R	2.2	1.2	13	16	8.40	9.00	264
HCM1103-3R3-R	3.3	1.9	9.0	14	14.5	16.0	230
HCM1103-4R7-R	4.7	2.6	7.0	13	20.5	22.5	205
HCM1103-8R2-R	8.2	4.6	5.0	8.5	35.0	38.5	153
HCM1103-100-R	10.0	5.6	5.0	7.5	40.0	44.0	141
HCM1103-150-R	15.0	8.4	4.0	6.0	59.0	65.0	114
HCM1103-220-R	22.0	12.3	3.0	5.0	90.0	99.0	91

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 30% rolloff at +25°C
5. K-factor: Used to determine B_{p-p} for core loss (see graph).
   B_{p-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: HCM1103-xxx-R
   HCM1103 = Product code and size
   xxx= Inductance value in µH, R = decimal point,
   if no R is present then third character = number of zeros.
   -R suffix = RoHS compliant

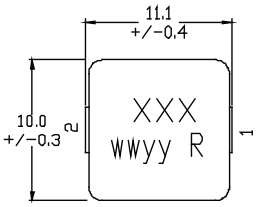
COOPER Bussmann

Dimensions - mm

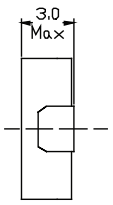
Top View
HCM1103-R36-R &
HCM1103-R47-R



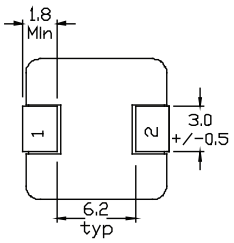
Top View
HCM1103-R12-R &
HCM1103-R68-R to
HCM1103-220R



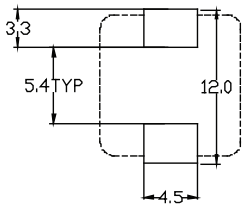
Side View



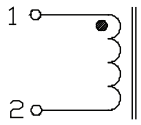
Bottom View



Recommended Pad Layout

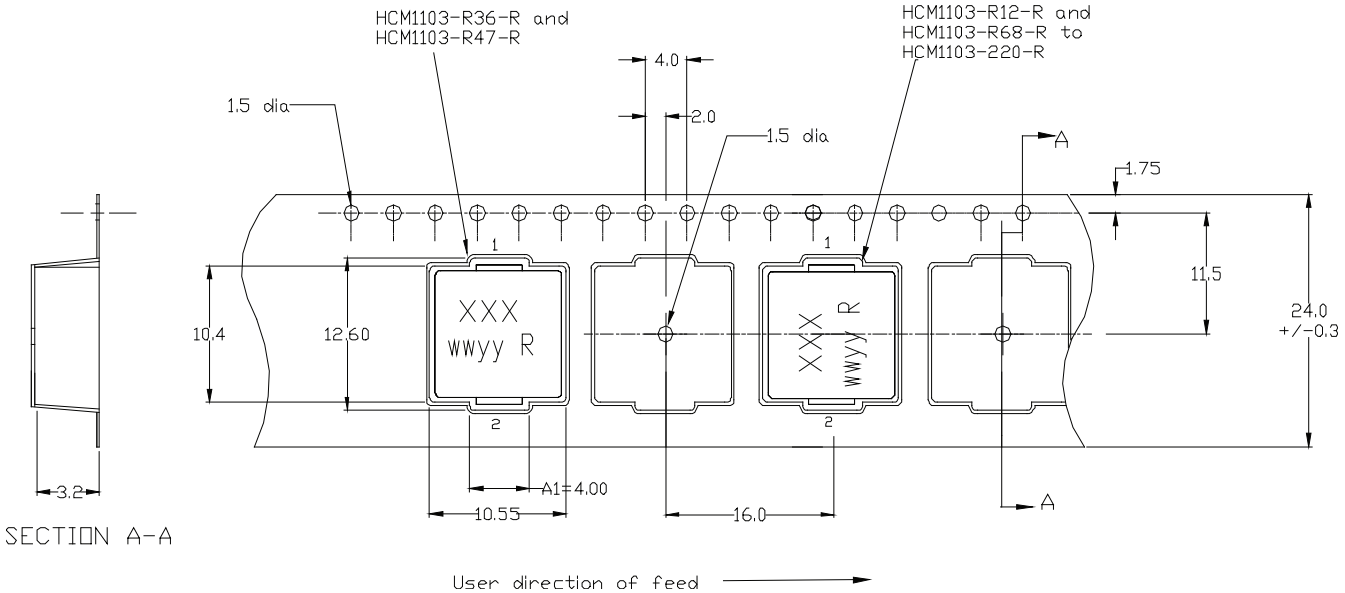


Schematic



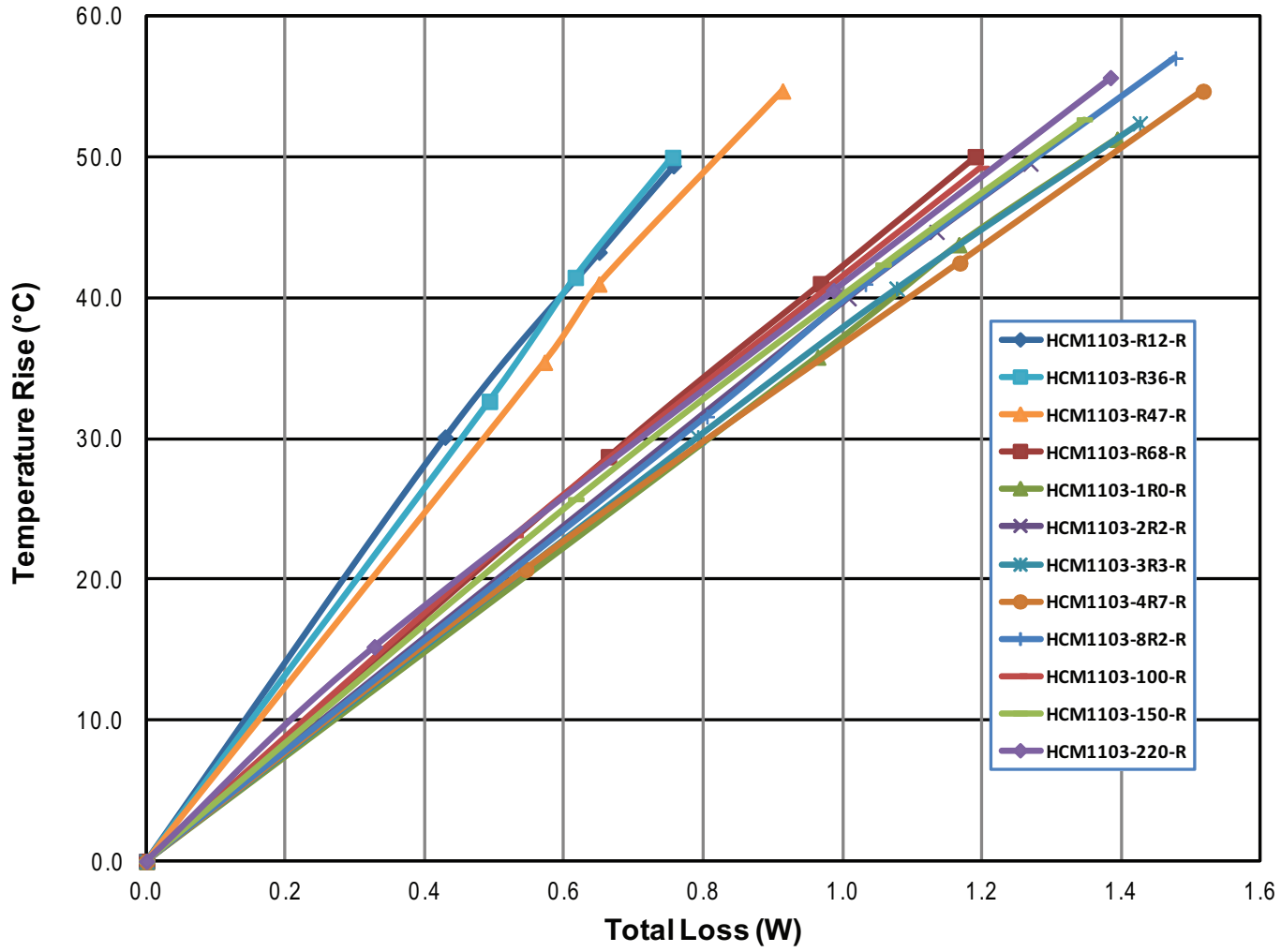
Part Marking: xxx = Inductance value in uH, R = decimal point, if no R is present then third character = # of zeros.
wwyy = (Date code), R = Revision Level
All soldering surfaces to be coplanar within 0.10 millimeters.
Tolerances are ±0.3 millimeters unless stated otherwise.
HCM1103-R36-R and HCM1103-R47-R Color: Black
HCM1103-R12-R and HCM1103-R68-R to HCM1103-220-R Color : Top Grey

Packaging Information - mm



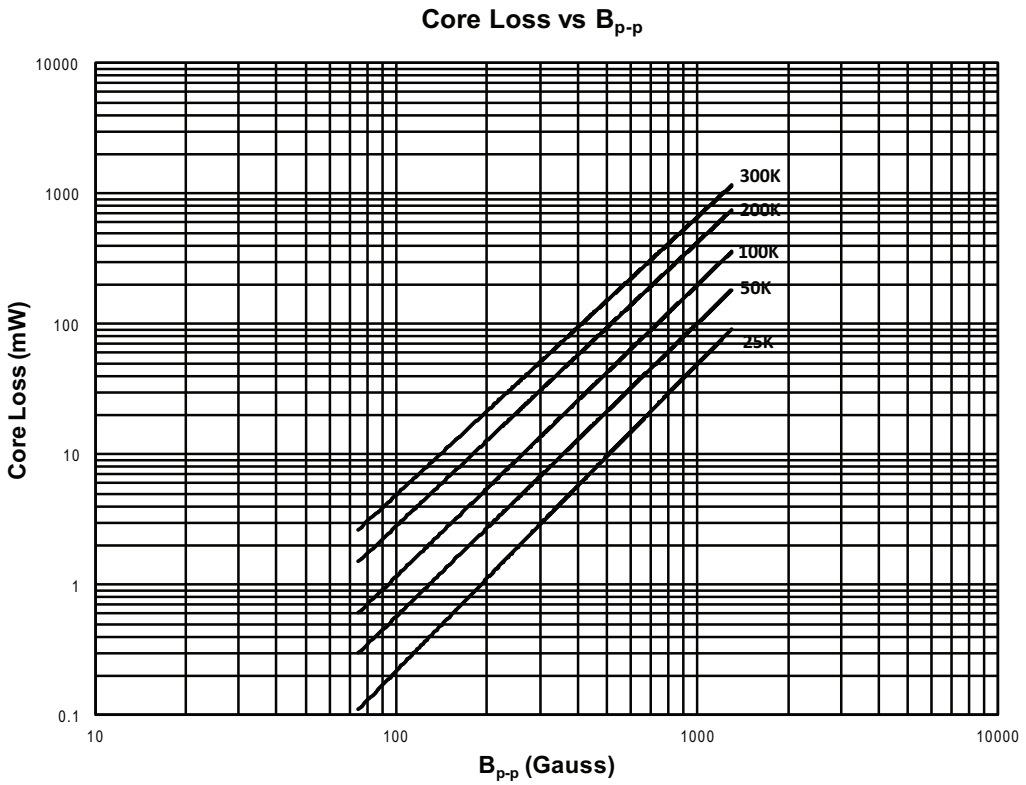
1000 Pieces supplied in tape and reel packaging, on a 13” diameter reel.

Temperature Rise vs. Total Loss

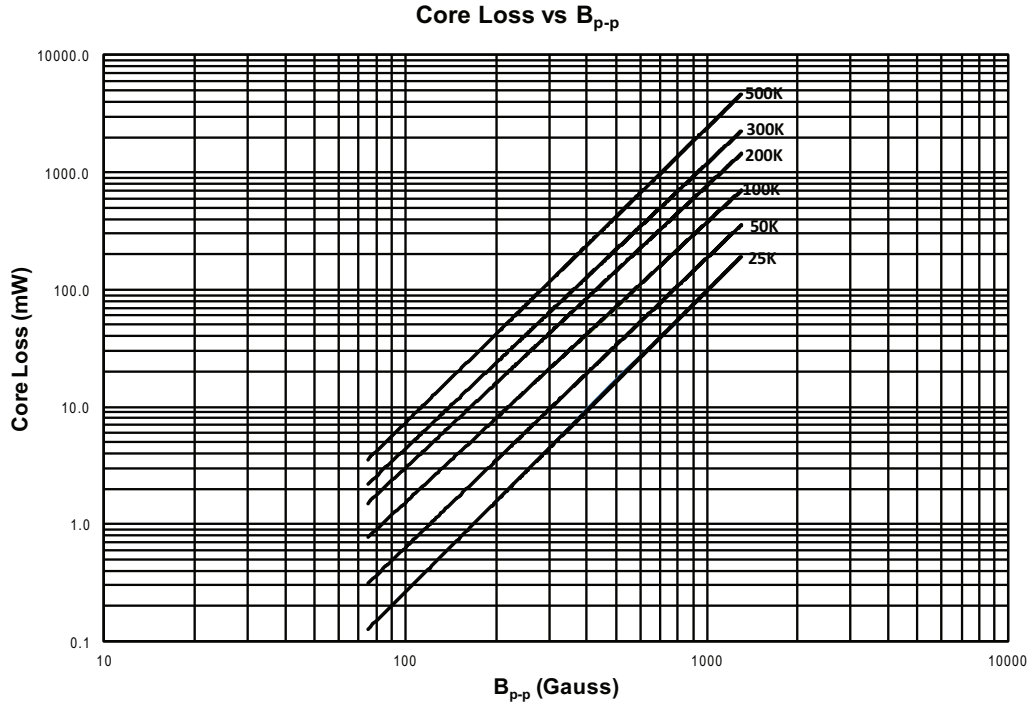


Core Loss

HCM1103-; R36-R and R47-R

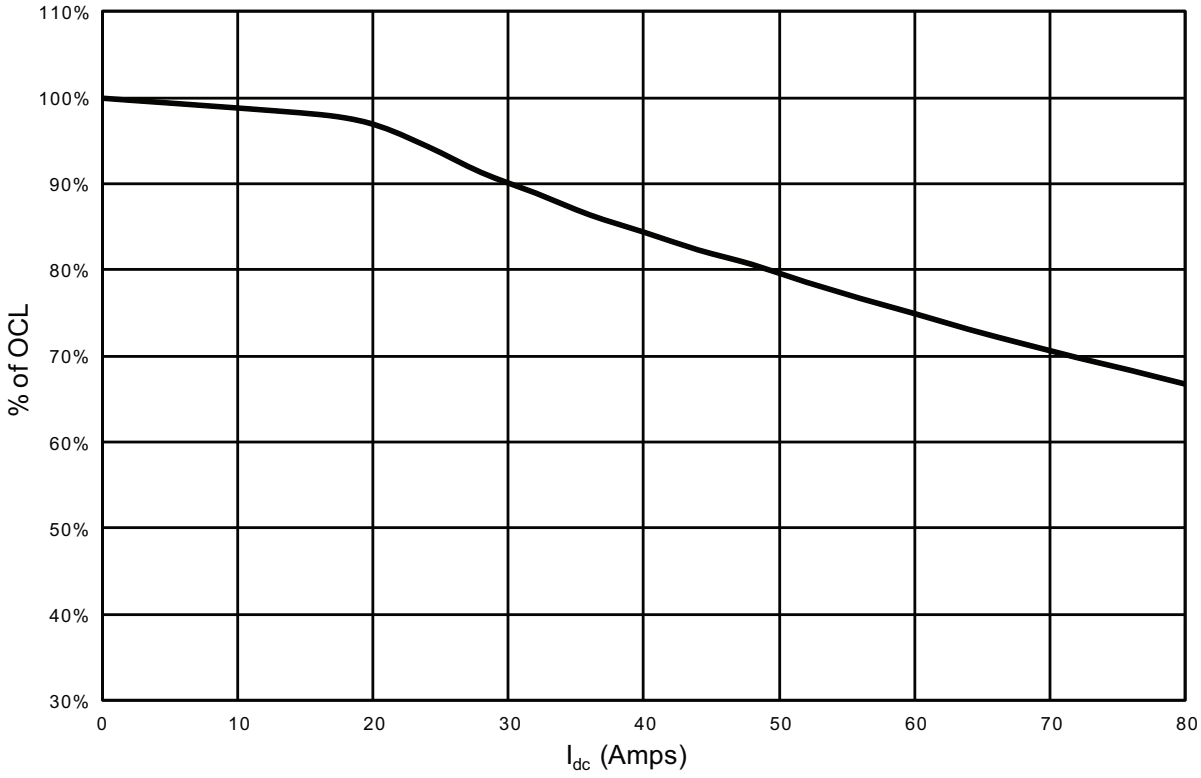


HCM1103-; R12-R, R68-R through 220-R

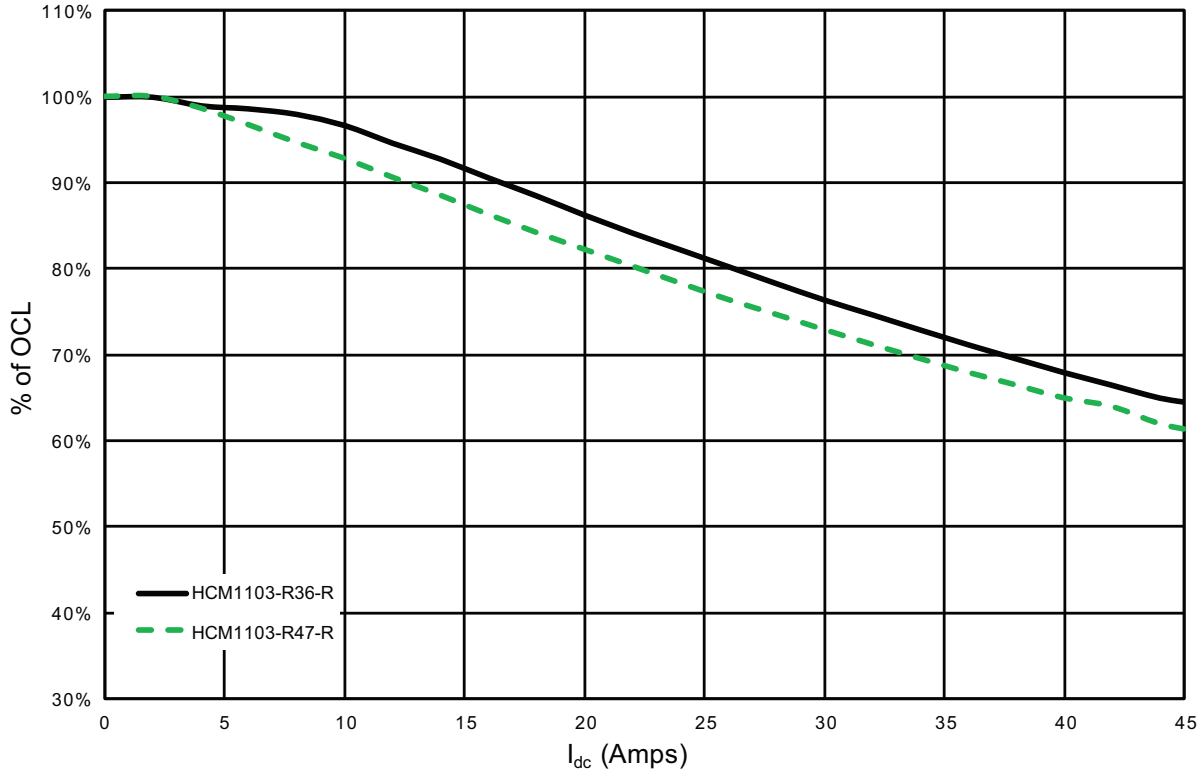


Inductance Characteristics

HCM1103- R12-R

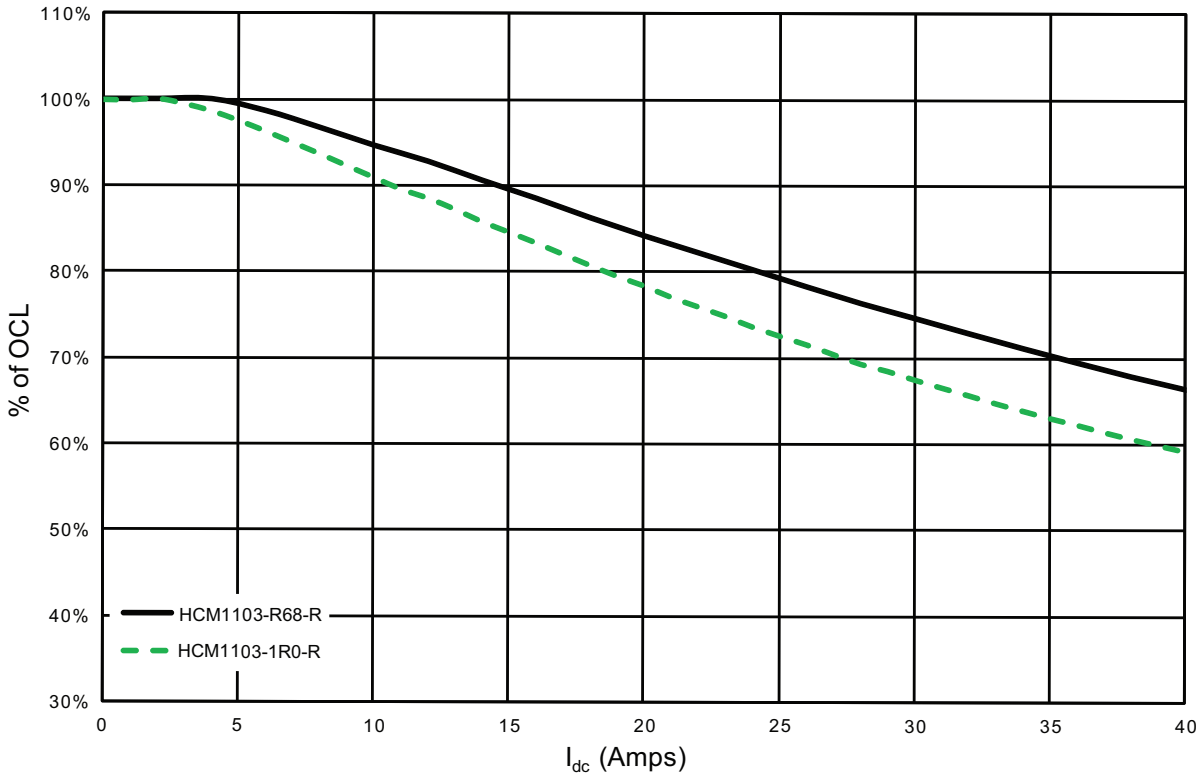


HCM1103-; R36-R, R47-R

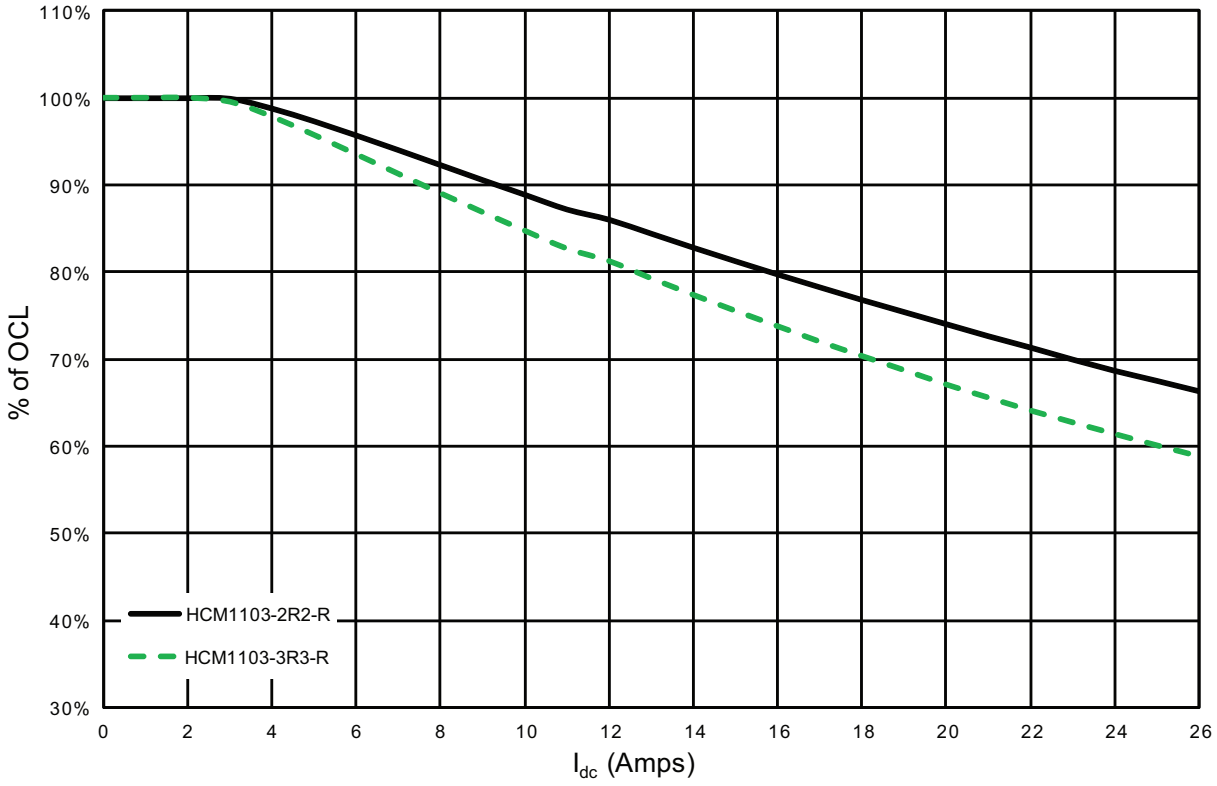


Inductance Characteristics

HCM1103-; R68-R, 1R0-R

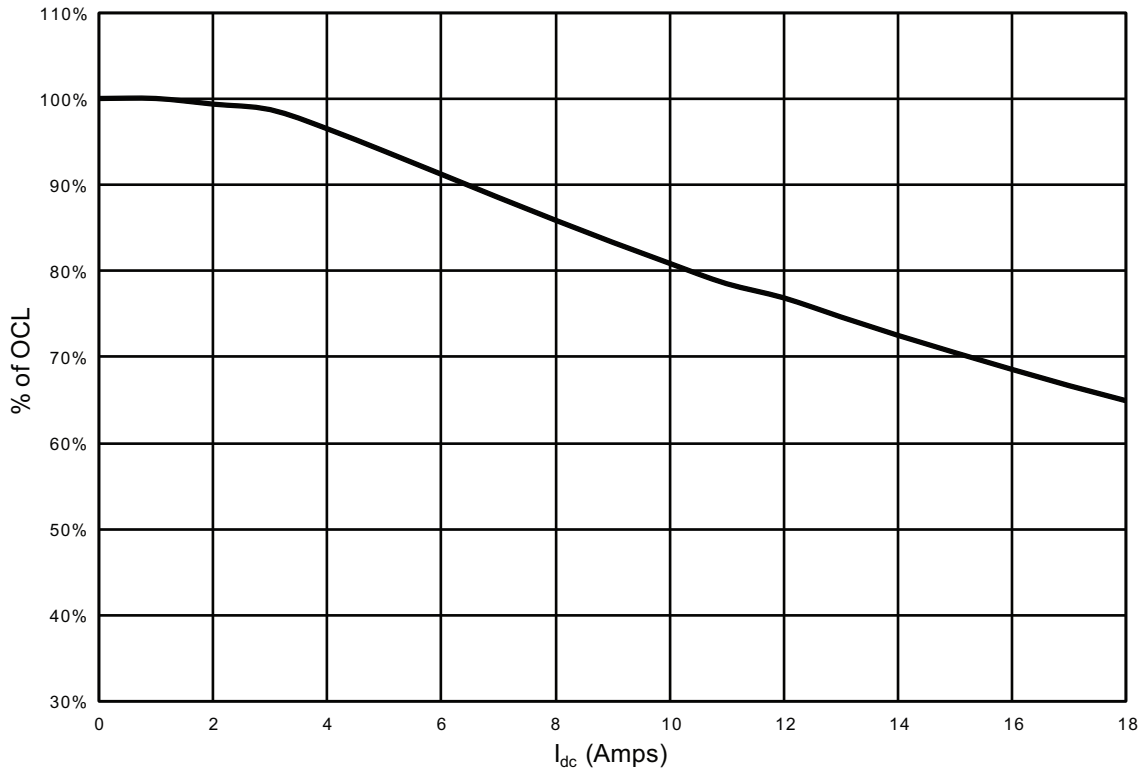


HCM1103-; 2R2-R, 3R3-R

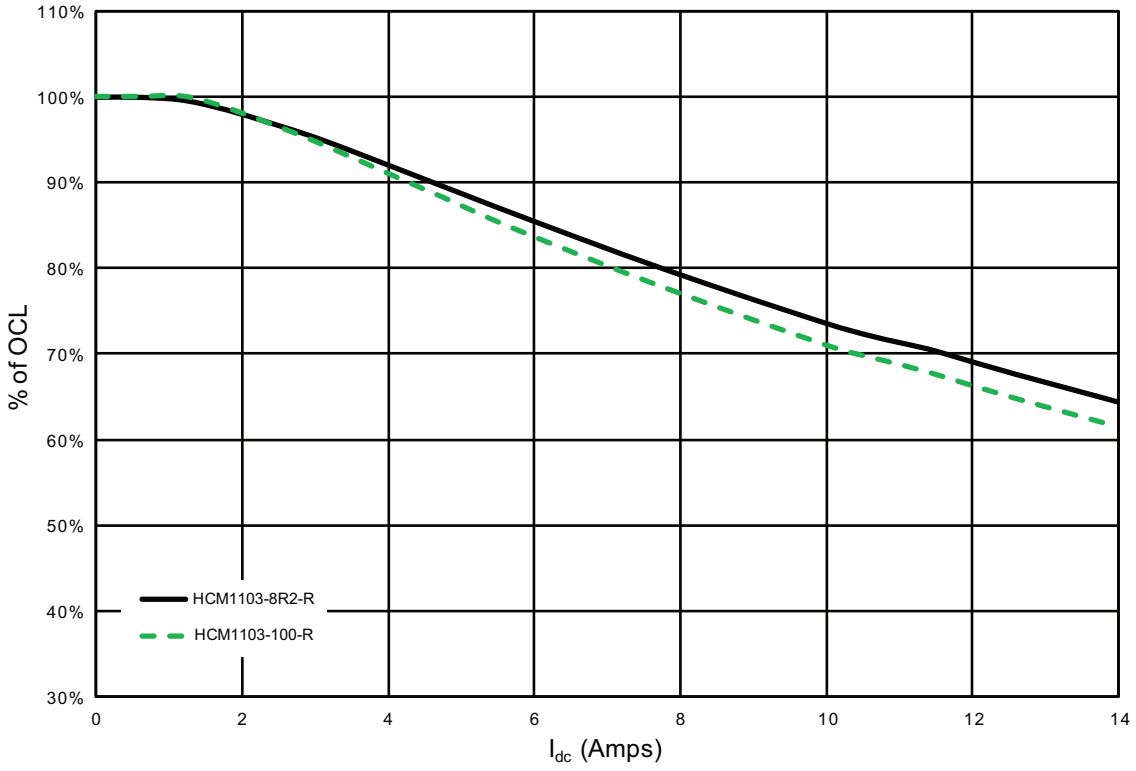


Inductance Characteristics

HCM1103-4R7-R

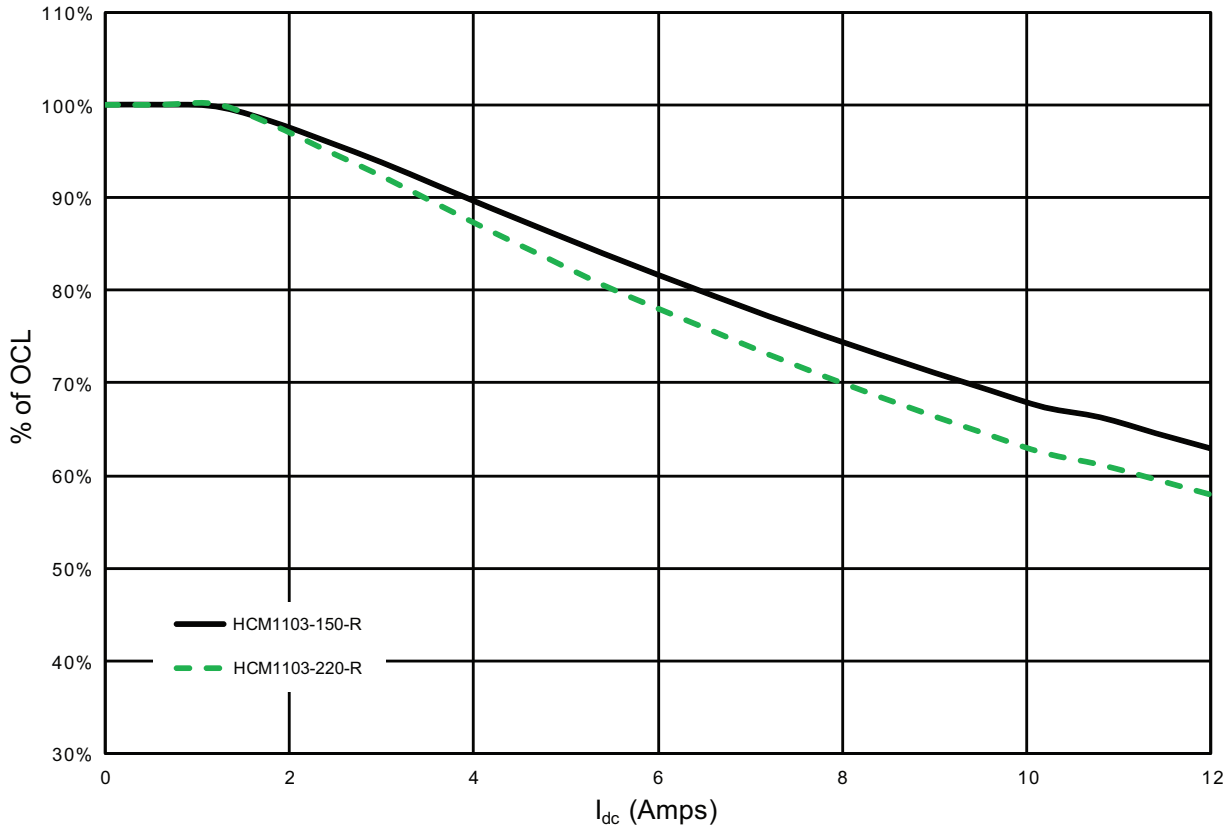


HCM1103-; 8R2-R, 100-R



Inductance Characteristics

HCM1103-;150-R, 220-R



Solder Reflow Profile

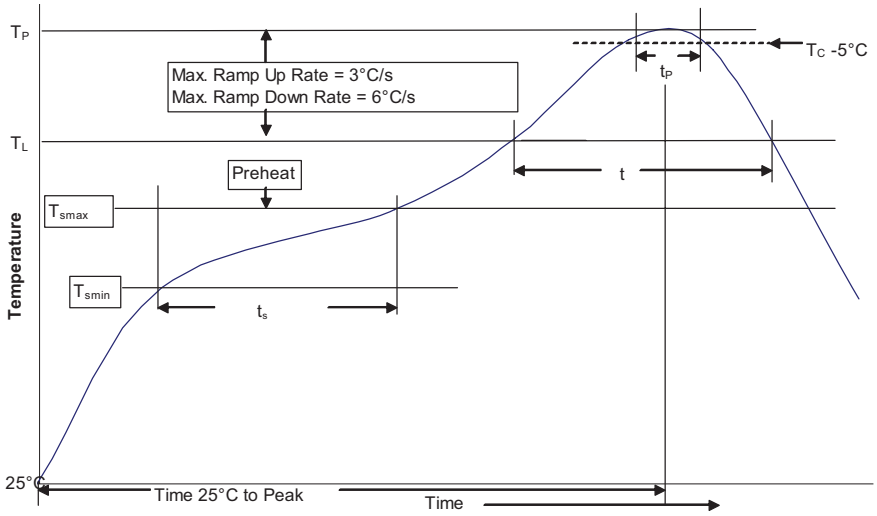


Table 1 - Standard SnPb Solder (T_C)

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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