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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.

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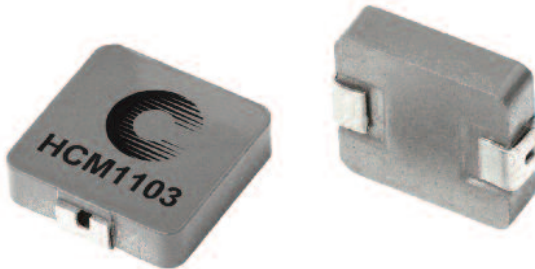
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# High Current, High Frequency Power Inductors

## 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 <sup>6</sup>	OCL <sup>1</sup> ±20% (µH)	FLL min. <sup>2</sup> (µH)	I <sub>rms</sub> <sup>3</sup> (Amps)	I <sub>sat</sub> <sup>4</sup> @ 25°C (Amps)	DCR (mΩ) @ 20°C Typical	DCR (mΩ) @ 20°C Maximum	K-Factor <sup>5</sup>
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<sub>rms</sub>, 0.0Adc @ 25°C

2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.25V<sub>rms</sub>, I<sub>sat</sub> @ 25°C.

3. I<sub>rms</sub>: 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<sub>sat</sub>: Peak current for approximately 30% rolloff at +25°C

5. K-factor: Used to determine B<sub>p-p</sub> for core loss (see graph).

B<sub>p-p</sub> = K \* L \* ΔI. B<sub>p-p</sub>:(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

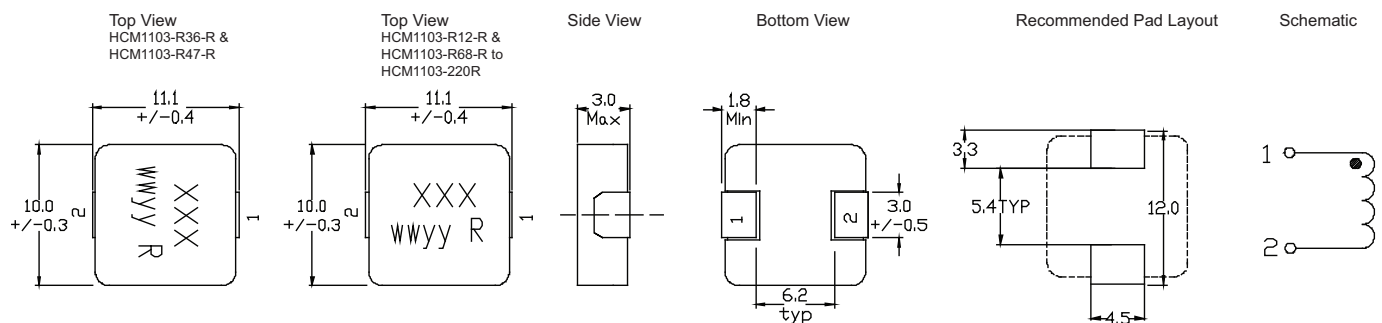
HCM1103 = Product code and size

xxx= Inductance value in µH, R = decimal point,

if no R is present then third character = number of zeros.

-R suffix = RoHS compliant

### Dimensions - mm



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

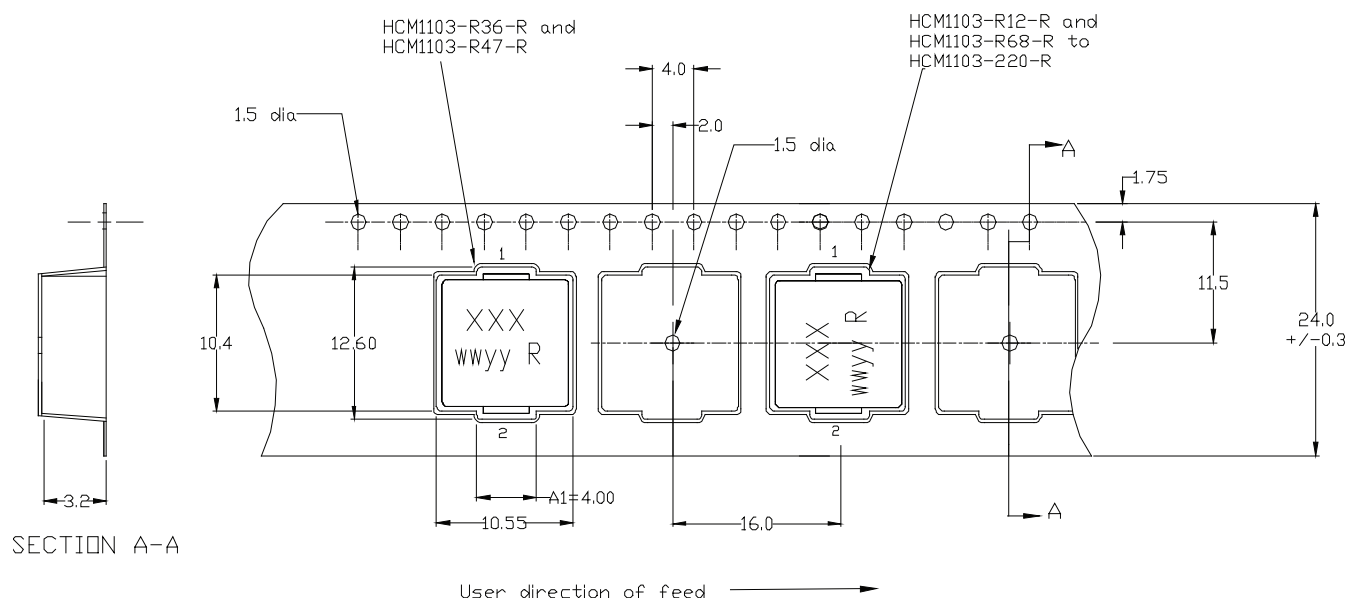
All soldering surfaces to be coplanar within 0.10 millimeters.

Tolerances are  $\pm 0.3$  millimeters unless stated otherwise.

HCM1103-R36-R and HCM1103-R47-R Color: Black

HCM1103-R12-R and HCM1103-R68-R to HCM1103-

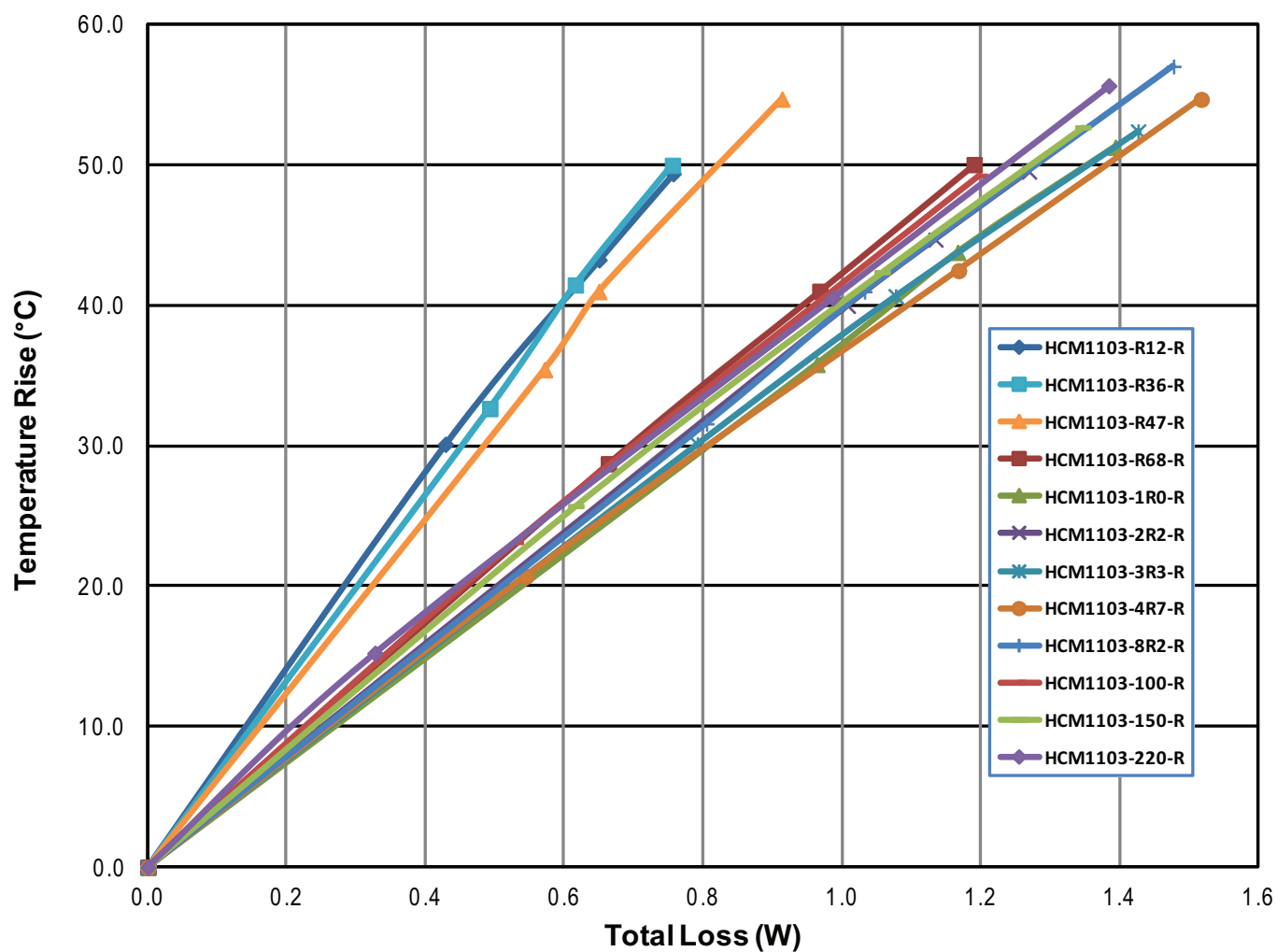
### Packaging Information - mm



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

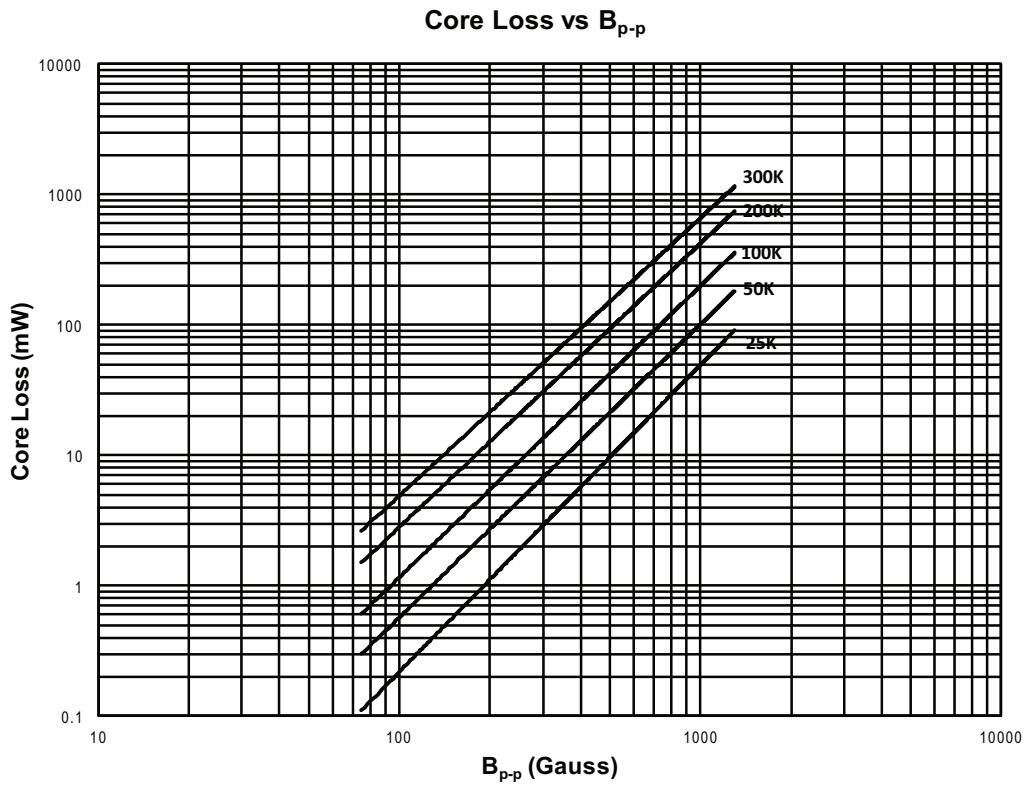


## Temperature Rise vs. Total Loss

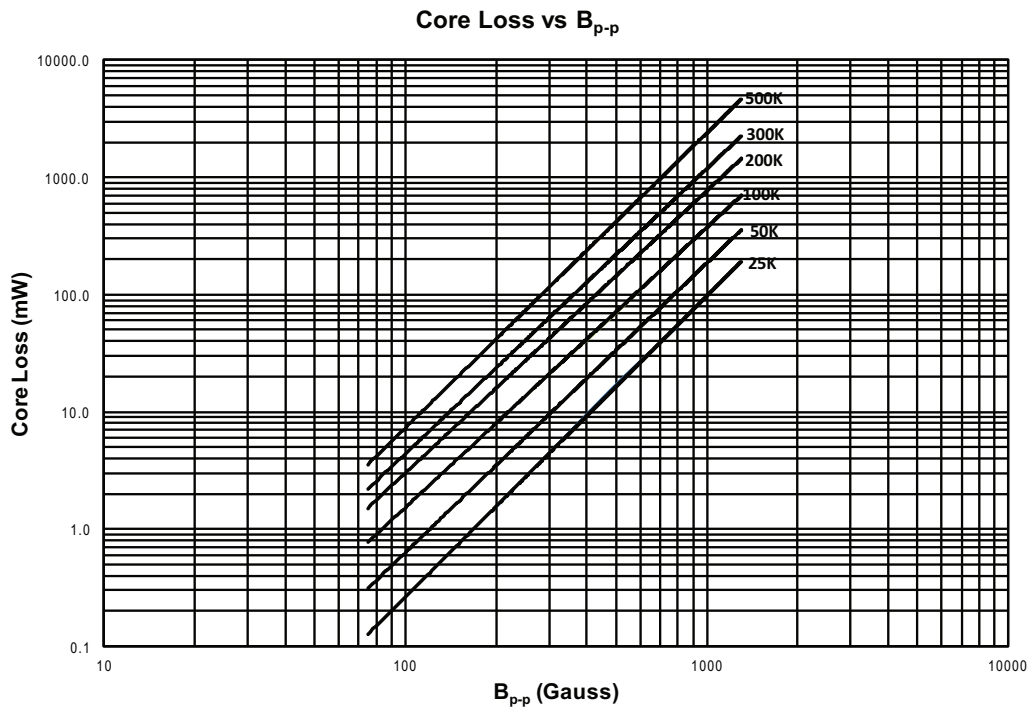


## Core Loss

HCM1103-; R36-R and R47-R

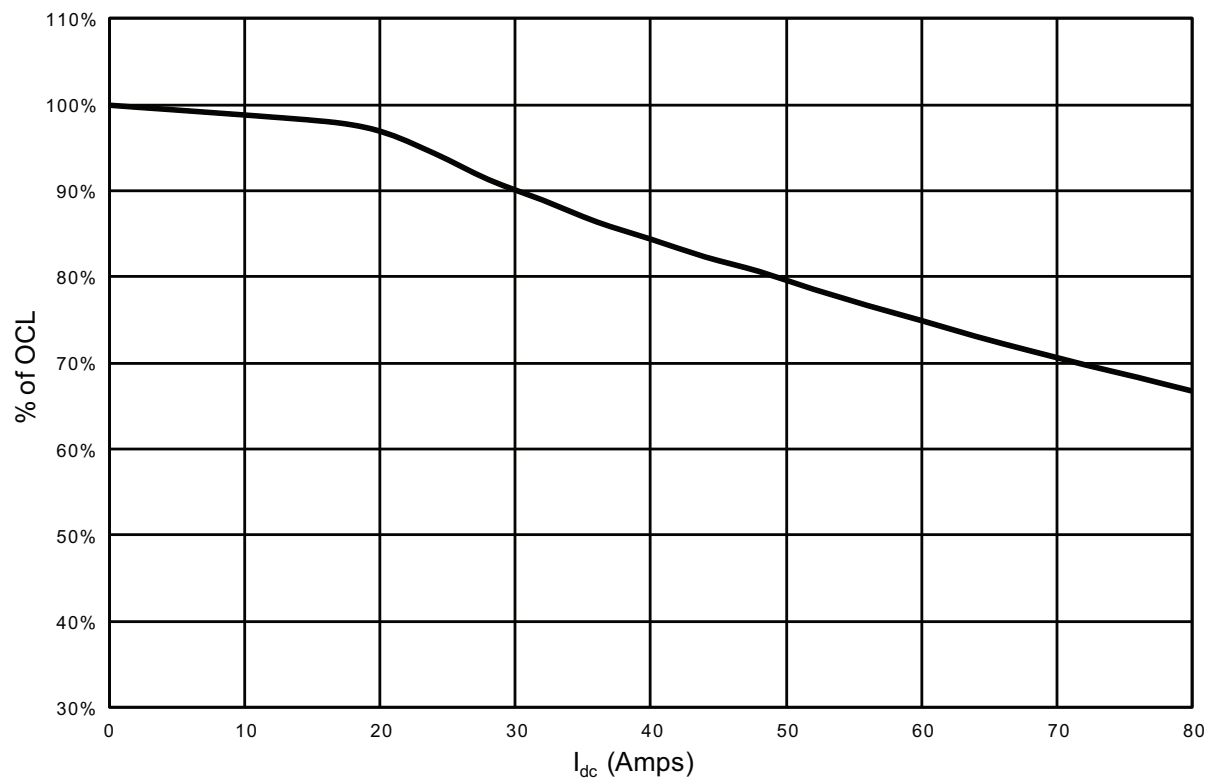


HCM1103-; R12-R, R68-R through 220-R

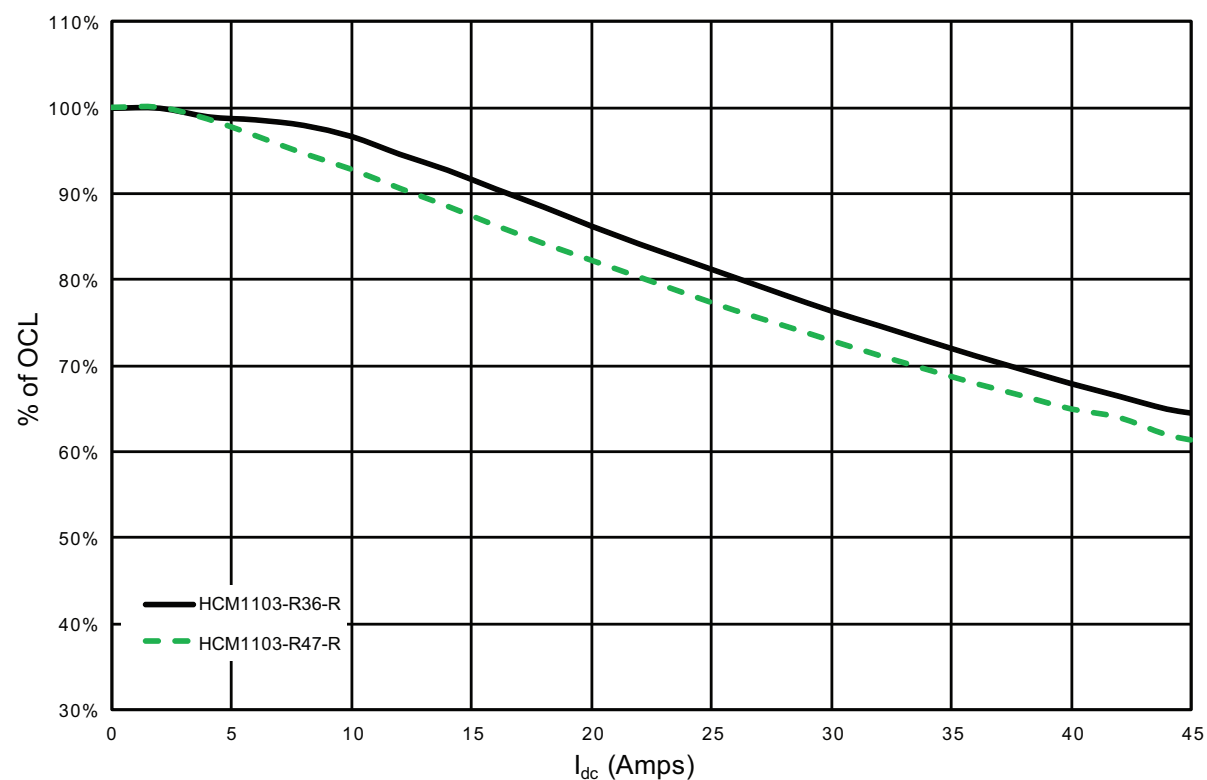


## Inductance Characteristics

HCM1103- R12-R

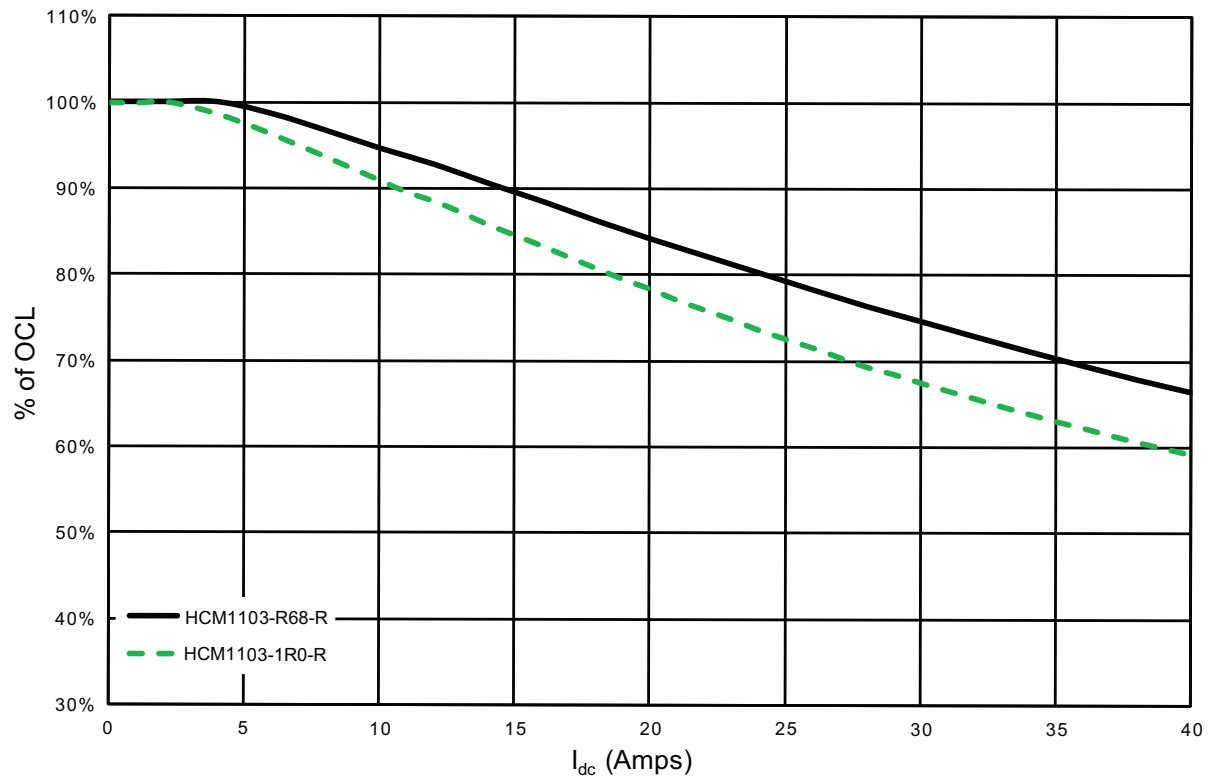


HCM1103-; R36-R, R47-R

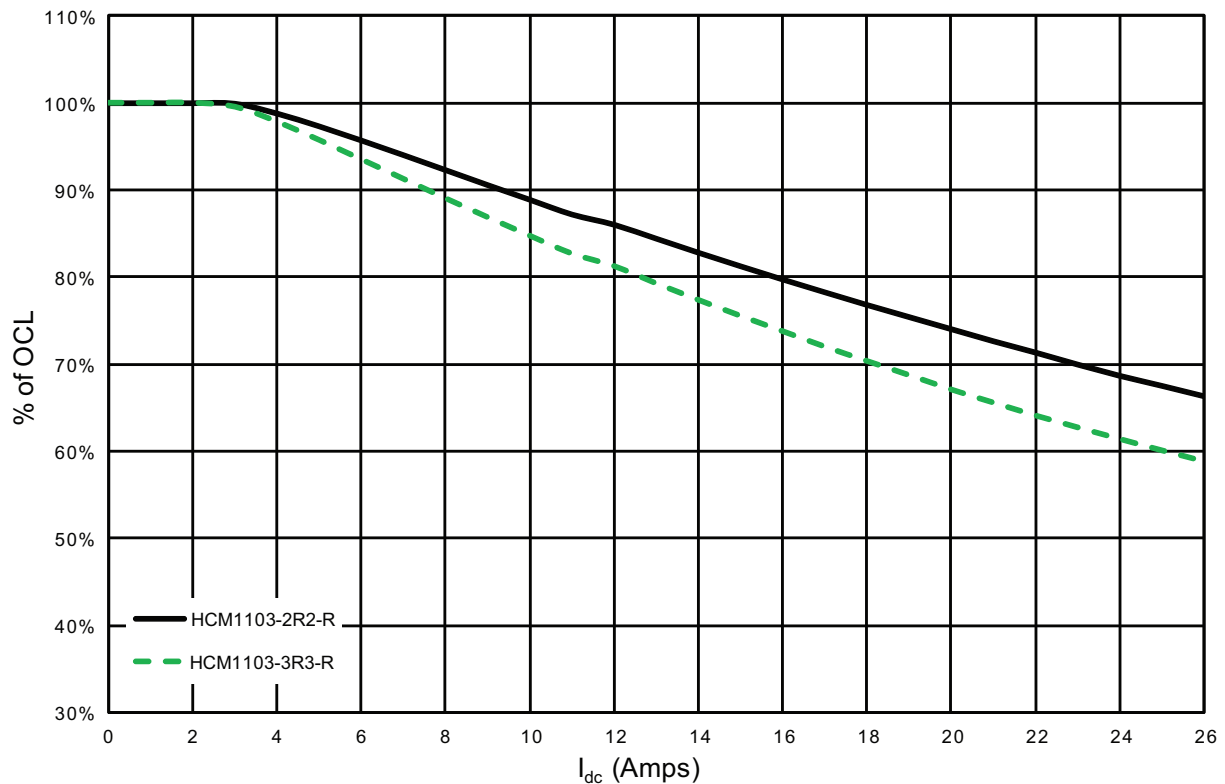


## Inductance Characteristics

HCM1103-; R68-R, 1R0-R

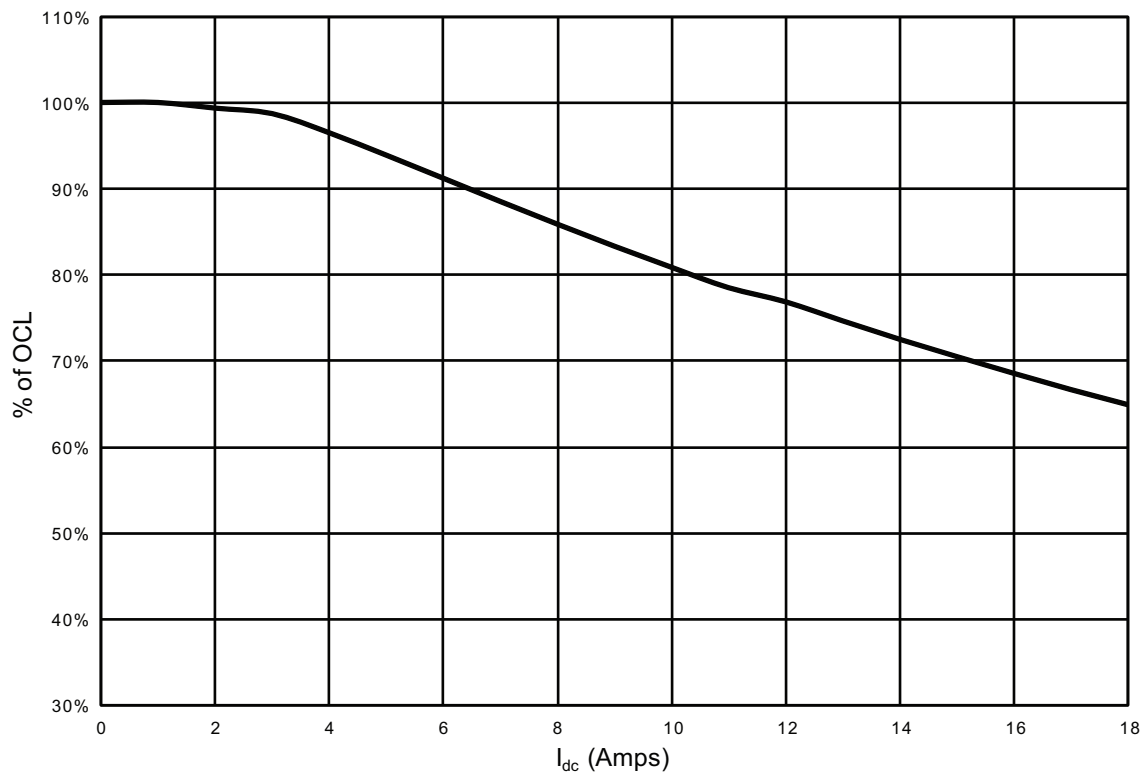


HCM1103-; 2R2-R, 3R3-R

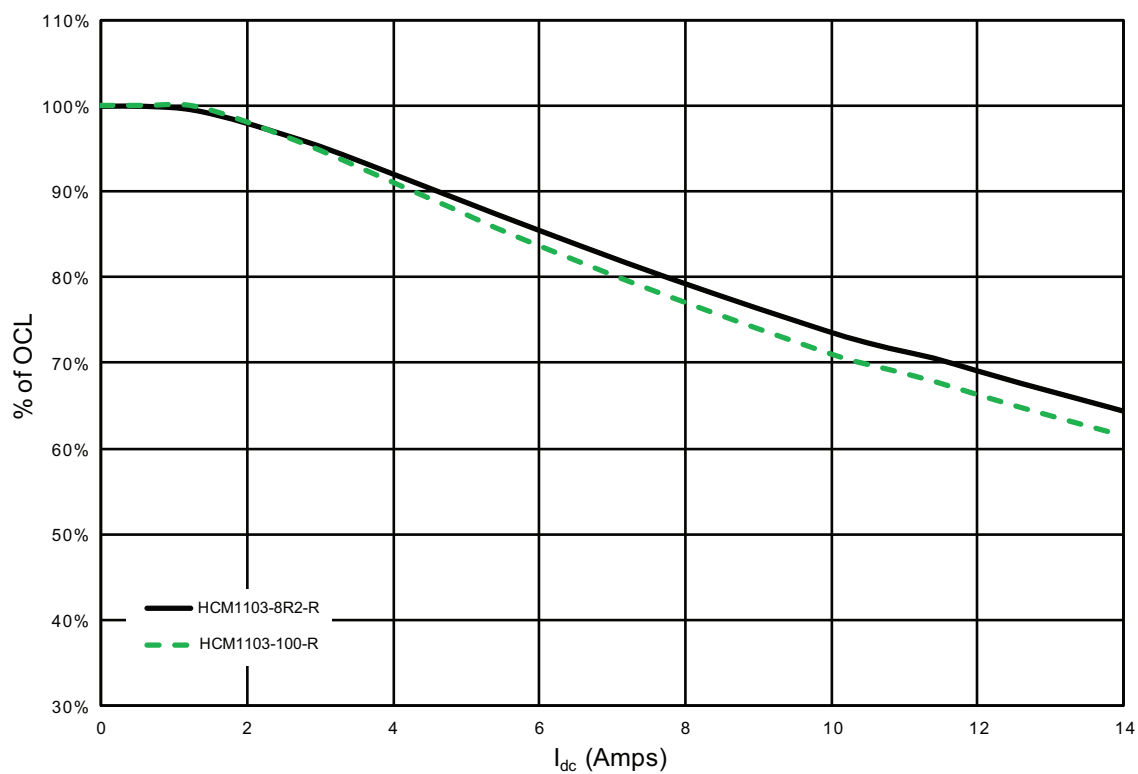


## Inductance Characteristics

HCM1103-4R7-R



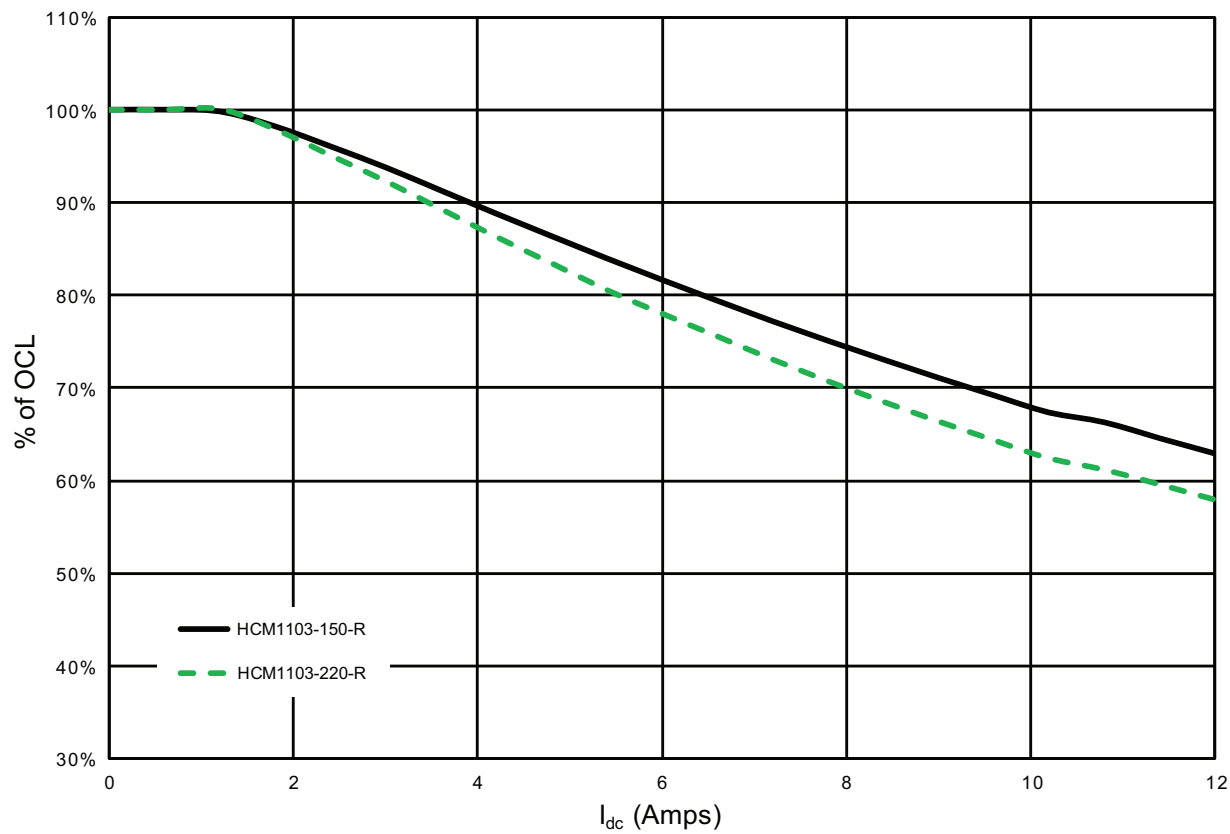
HCM1103-; 8R2-R, 100-R





**Inductance Characteristics**

HCM1103-;150-R, 220-R



## Solder Reflow Profile

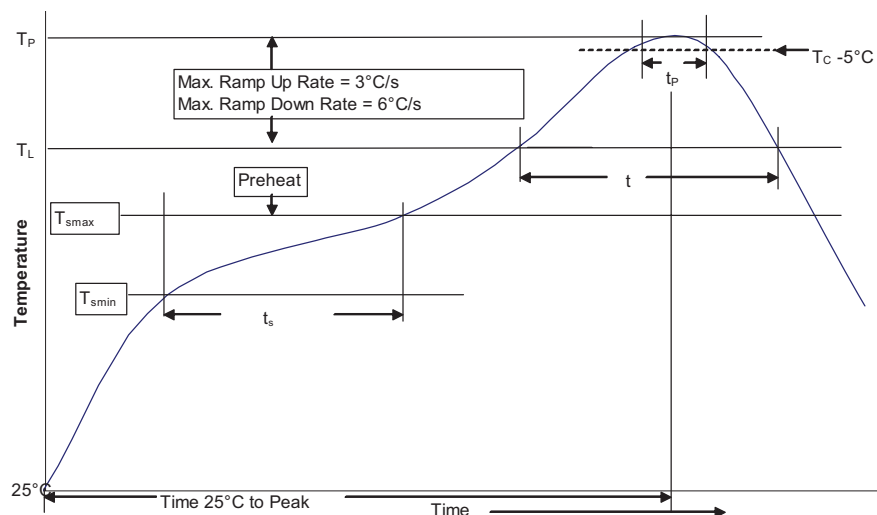


Table 1 - Standard SnPb Solder ( $T_c$ )

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ $\geq 350$
<2.5mm	235°C	220°C
$\geq 2.5\text{mm}$	220°C	220°C

Table 2 - Lead (Pb) Free Solder ( $T_c$ )

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350 - 2000	Volume $\text{mm}^3$ >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 ( $T_L$ )	183°C	217°C
Time at liquidous ( $t_L$ )	60-150 Seconds	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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