

## Product Specifications

| Part Number <sup>6</sup> | OCL <sup>1</sup><br>( $\mu\text{H}$ ) $\pm 20\%$ | FLL <sup>2</sup> ( $\mu\text{H}$ )<br>minimum | $I_{\text{rms}}^3$<br>(A) | $I_{\text{sat}}^4$<br>(A) | DCR (m $\Omega$ )<br>typical @ +20 °C | DCR (m $\Omega$ )<br>maximum @ +20 °C | K-factor <sup>5</sup> |
|--------------------------|--------------------------------------------------|-----------------------------------------------|---------------------------|---------------------------|---------------------------------------|---------------------------------------|-----------------------|
| 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           | 6.8                                              | 4.1                                           | 4.5                       | 8.0                       | 54                                    | 60                                    | 151                   |
| HCM0703- 8R2-R           | 8.2                                              | 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 $\pm$ 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<sub>max</sub>, 0.0 Adc, +25 °C.

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

3. I<sub>DC</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 20% rolloff at +25 °C.

5. K-factor: Used to determine B<sub>pp</sub> for core loss (see graph). B<sub>p</sub> = K \* L \*  $\Delta I$ . B<sub>pp</sub>: (Gauss), K: (K-factor from table), L: (Inductance in  $\mu\text{H}$ ),  $\Delta I$  (Peak to peak ripple current in Amps).

6. Part Number Definition: HCM0703-xxx-R

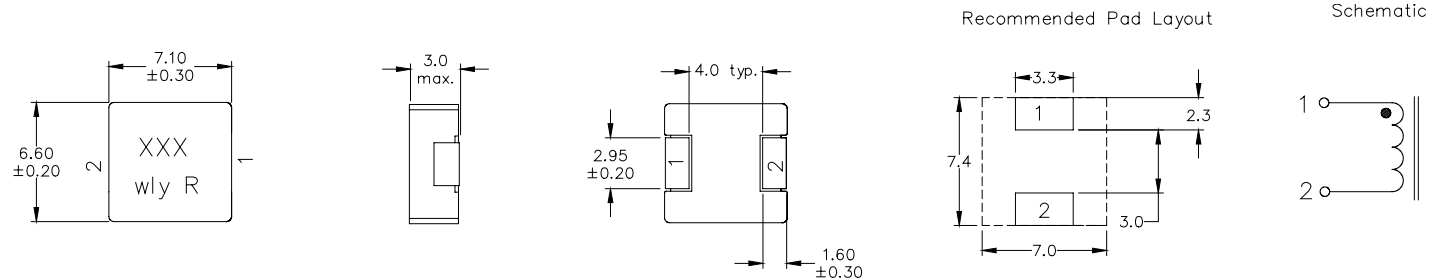
HCM0703 = Product code and size

-xxx= Inductance value in  $\mu\text{H}$ , 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

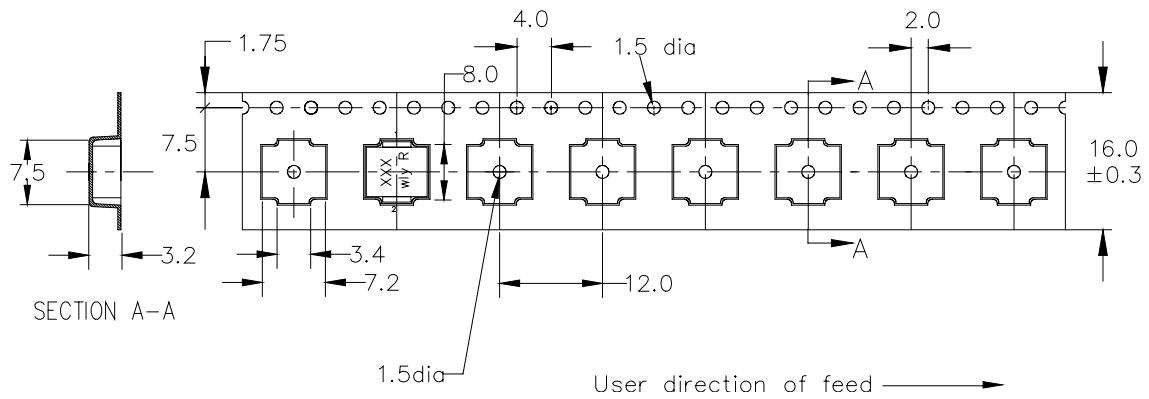
All soldering surfaces to be coplanar within 0.10 millimeters

Tolerances are  $\pm 0.3$  millimeters unless stated otherwise

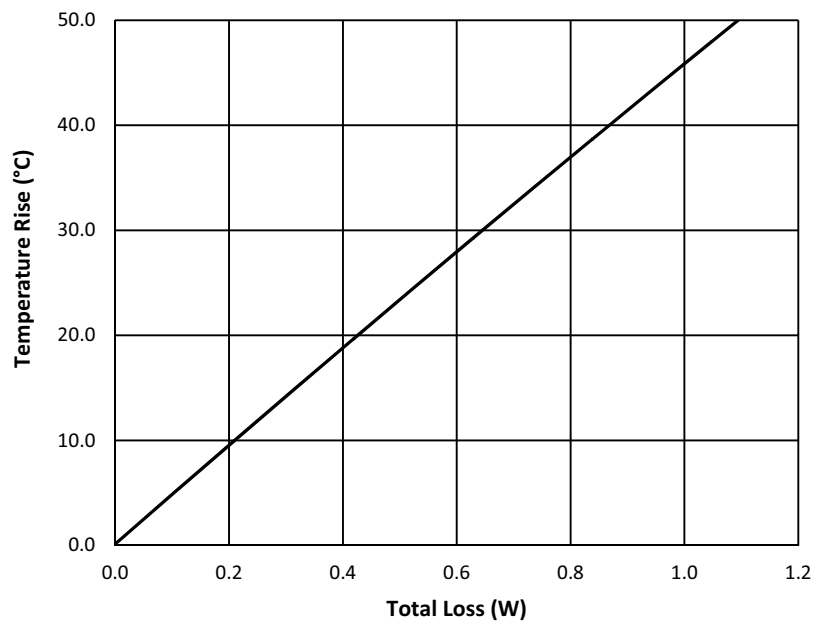
Color: Grey

### Packaging information (mm)

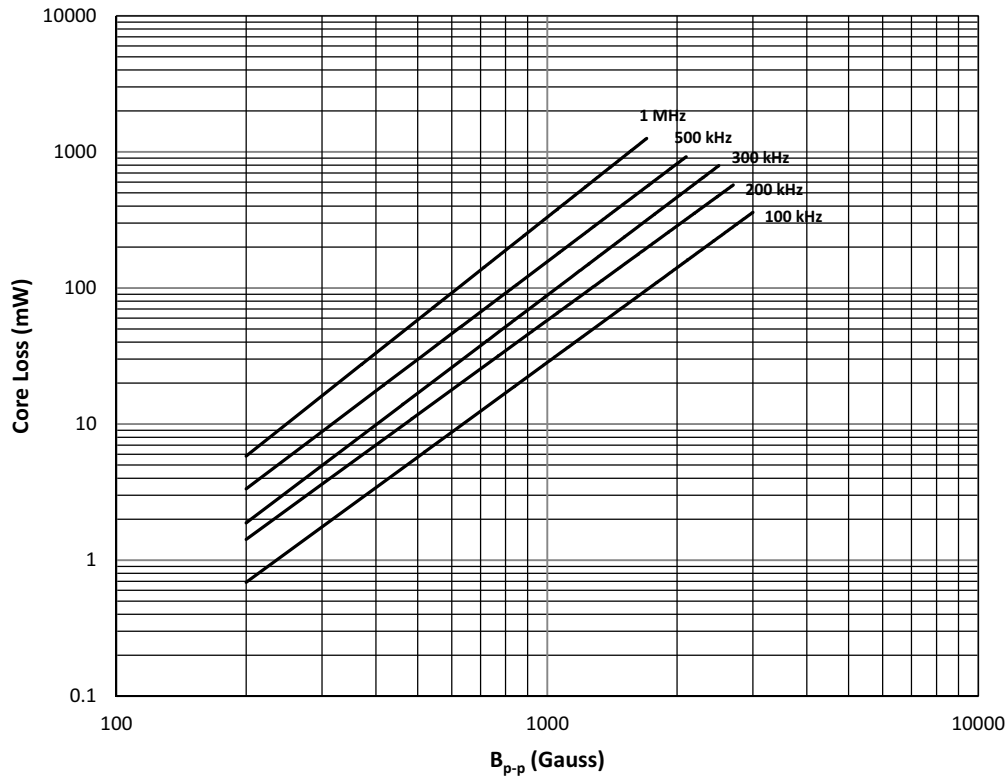
Supplied in tape and reel packaging, 1500 parts per 13" diameter reel.



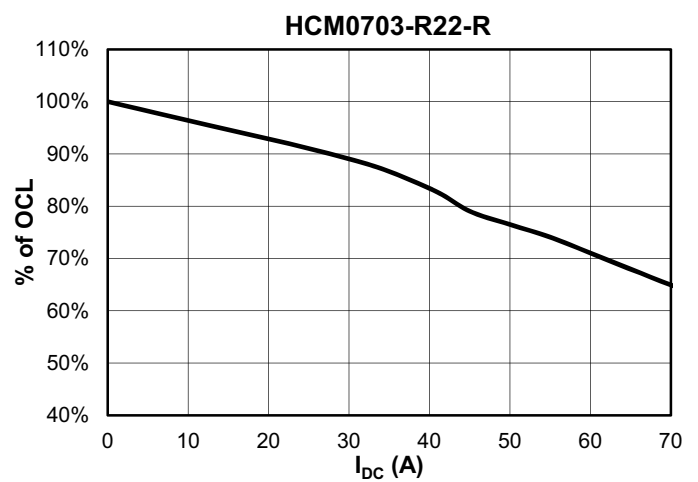
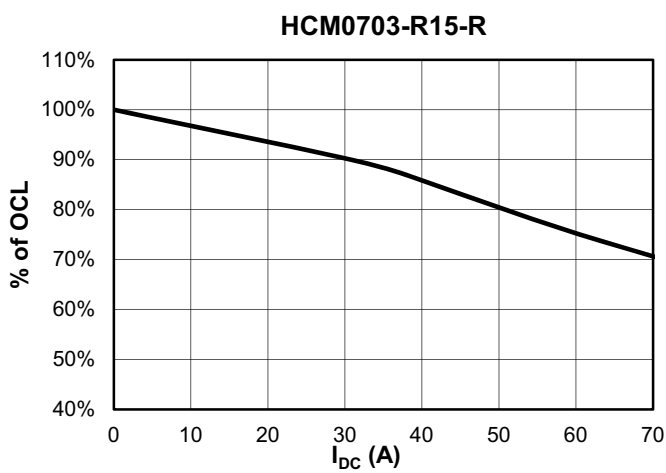
### Temperature rise vs. total loss



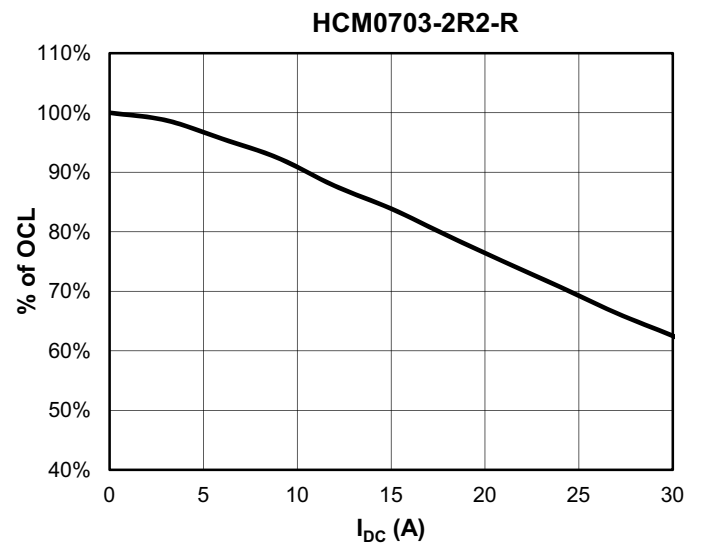
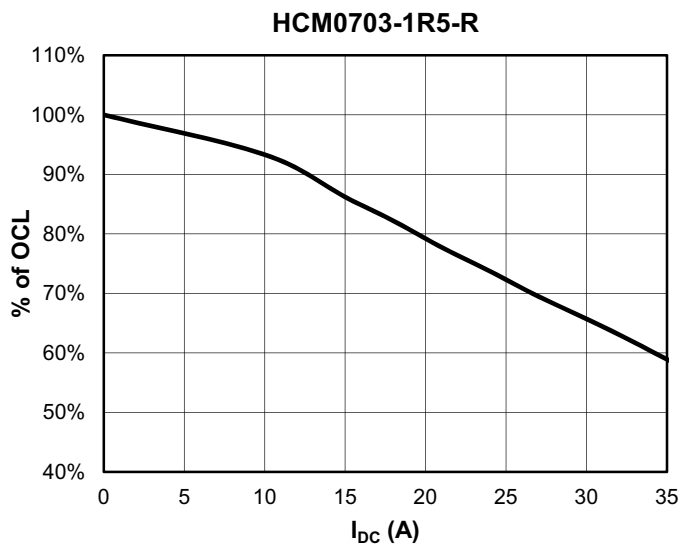
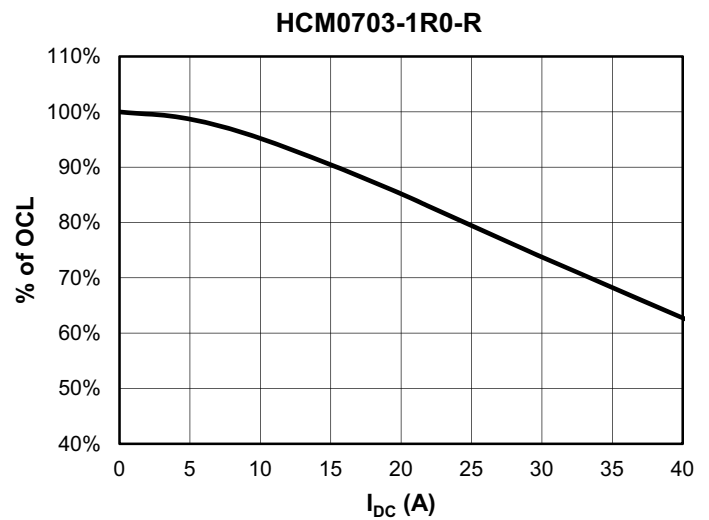
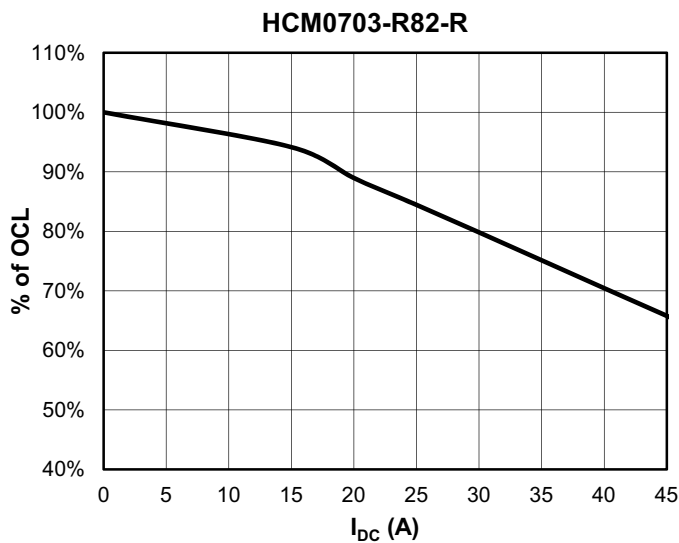
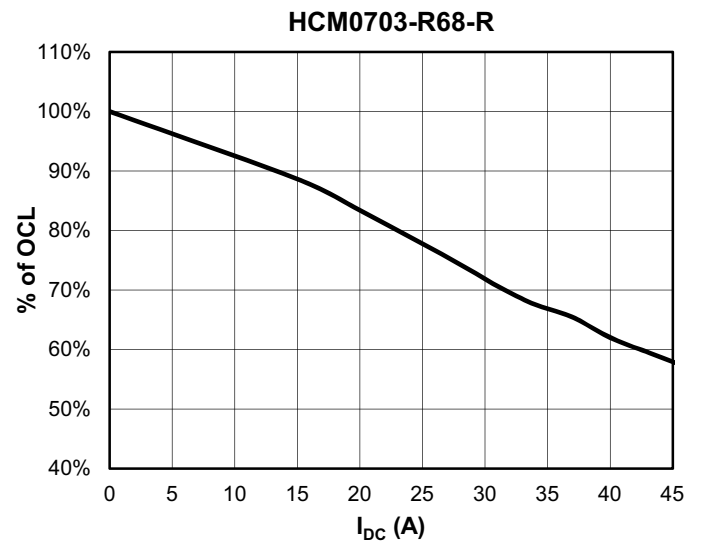
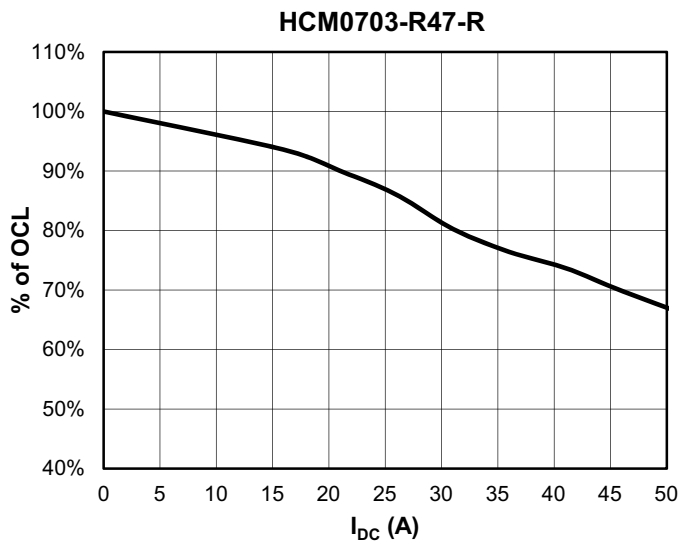
### Core loss vs. $B_{p-p}$



### Inductance characteristics

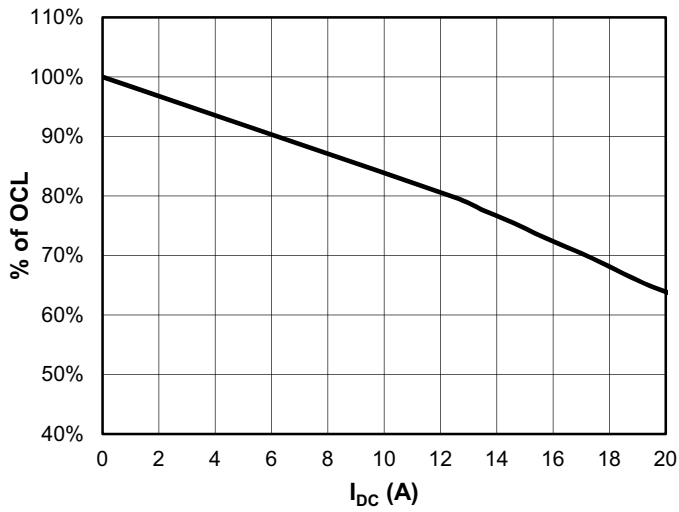


Inductance characteristics

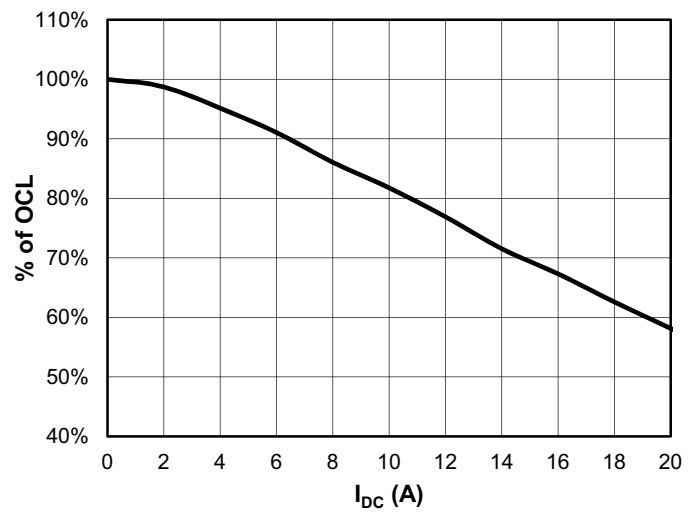


Inductance characteristics

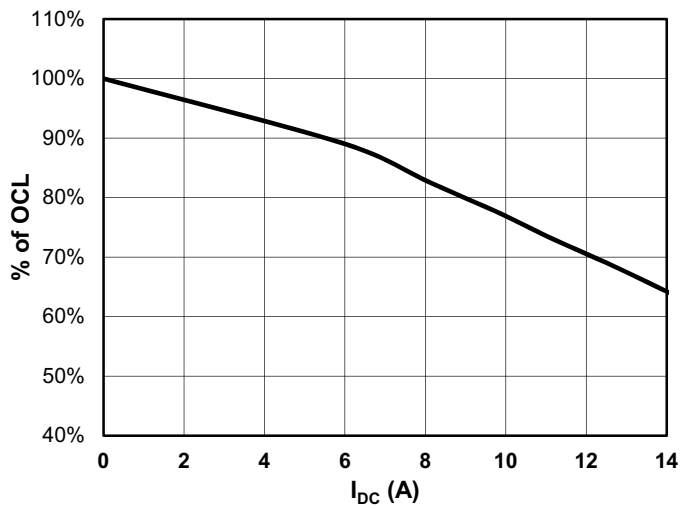
HCM0703-3R3-R



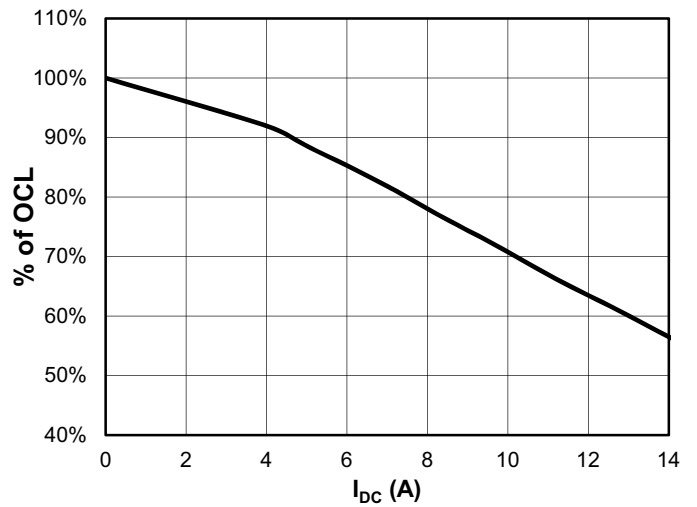
HCM0703-4R7-R



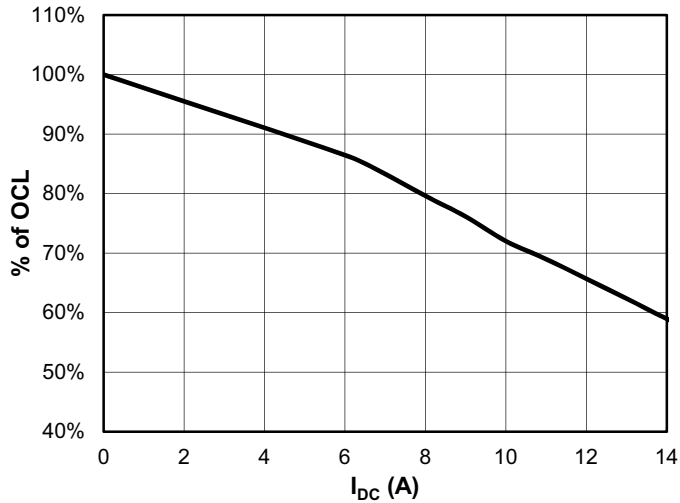
HCM0703-6R8-R



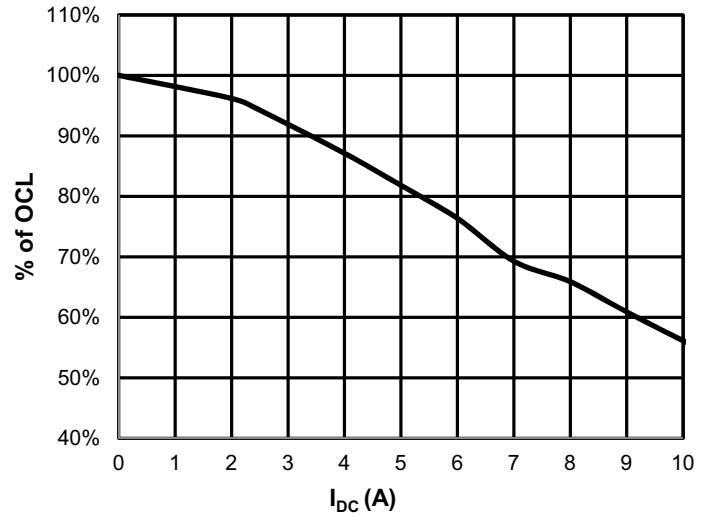
HCM0703-8R2-R



HCM0703-100-R

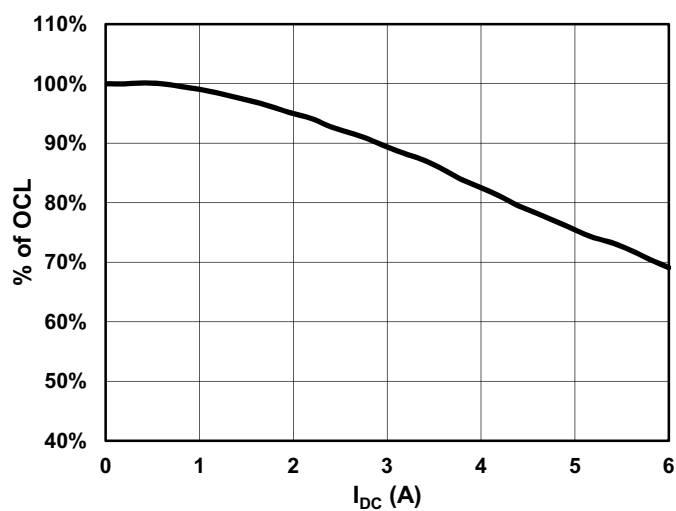


HCM0703-150-R

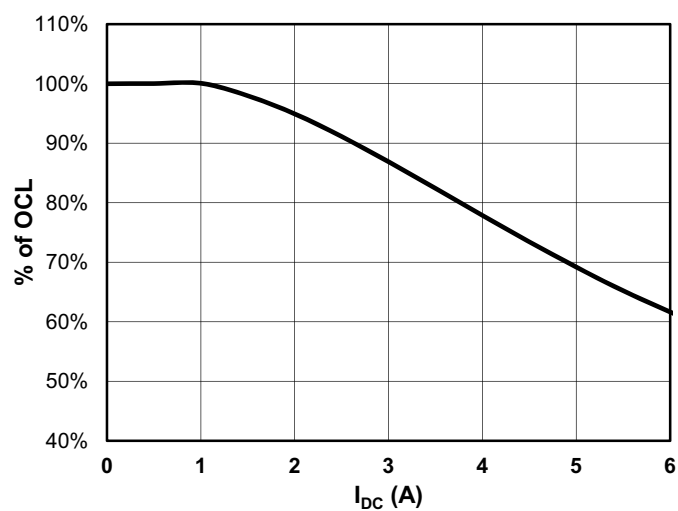


Inductance characteristics

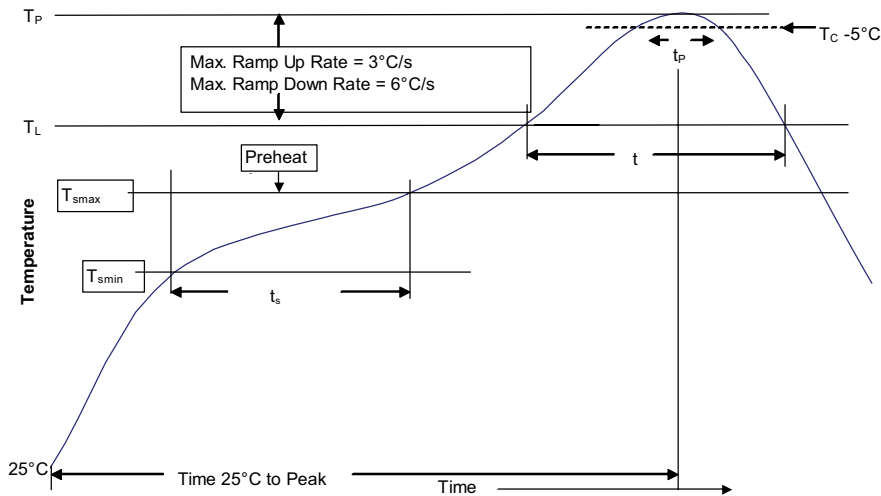
HCM0703-220-R



HCM0703-330-R



## Solder reflow profile



**Table 1 - Standard SnPb Solder ( $T_C$ )**

| Package Thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> ≥350 |
|-------------------|-----------------------------|-----------------------------|
| <2.5 mm)          | 235 °C                      | 220 °C                      |
| ≥2.5 mm           | 220 °C                      | 220 °C                      |

**Table 2 - Lead (Pb) Free Solder ( $T_C$ )**

| Package Thickness | Volume mm <sup>3</sup> <350 | Volume mm <sup>3</sup> 350 - 2000 | Volume mm <sup>3</sup> >2000 |
|-------------------|-----------------------------|-----------------------------------|------------------------------|
| <1.6 mm           | 260 °C                      | 260 °C                            | 260 °C                       |
| 1.6 – 2.5 mm      | 260 °C                      | 250 °C                            | 245 °C                       |
| >2.5 mm           | 250 °C                      | 245 °C                            | 245 °C                       |

## Reference JEDEC J-STD-020

| 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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