

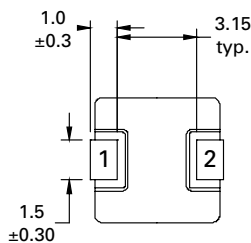
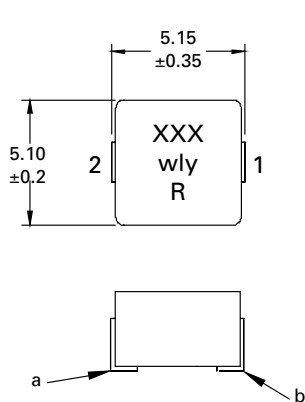
Product Specifications

Part Number <sup>6</sup>	OCL <sup>1</sup> ( $\mu\text{H}$ ) $\pm 20\%$	FLL <sup>2</sup> ( $\mu\text{H}$ ) minimum	$I_{\text{rms}}^3$ (A)	$I_{\text{sat}}^4$ (A)	DCR (m $\Omega$ ) typical @ +20 °C	DCR (m $\Omega$ ) maximum @ +20 °C	K-factor <sup>5</sup>
HCM0503-R20-R	0.20	0.13	22.2	21.0	2	2.3	1764
HCM0503-R35-R	0.35	0.22	16.6	14.9	4	4.3	1259
HCM0503-R47-R	0.47	0.30	12.0	11.5	6	7.2	820
HCM0503-R75-R	0.75	0.48	11.3	9.7	8	9.4	801
HCM0503-1R0-R	1.0	0.64	10.1	8.5	10	12	588
HCM0503-1R5-R	1.5	0.96	7.5	7.0	17	19	393
HCM0503-2R2-R	2.2	1.4	6.8	6.5	23	25	325
HCM0503-3R3-R	3.3	2.1	5.5	6.0	36	41	273
HCM0503-4R7-R	4.7	3.0	4.5	5.5	54	60	226
HCM0503-5R6-R	5.6	3.6	4.3	3.5	63	71	206
HCM0503-100-R	10	6.4	2.8	2.3	122	132	158
HCM0503-150-R	15	9.6	2.4	2.1	138	166	127
HCM0503-220-R	22	14	1.9	1.9	260	270	106

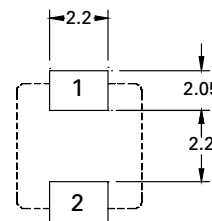
- Open Circuit Inductance (OCL) Test Parameters: 100 kHz, 0.25 Vrms, 0.0 Adc, @ +25 °C
- Full Load Inductance (FLL) Test Parameters: 100 kHz, 0.25 Vrms, @  $I_{\text{sat}}$  @ +25 °C
- $I_{\text{rms}}$ : DC current for an approximate temperature rise of 40 °C without core loss. Derating is necessary 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.

- $I_{\text{sat}}$ : Peak current for approximately 20% rolloff @ +25 °C
- K-factor: Used to determine  $B_{\text{pp}}$  for core loss (see graph).  $B_{\text{p-p}} = K * L * \Delta I$ .  $B_{\text{pp}}$ : (Gauss), K: (K-factor from table), L: (Inductance in  $\mu\text{H}$ ),  $\Delta I$  (Peak to peak ripple current in Amps).
- Part Number Definition: HCM0503-xxx-R  
 HCM0503 = 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

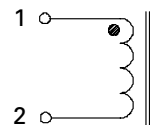
Dimensions (mm)



Recommended Pad Layout



Schematic



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 0.1 millimeters

Tolerances are ±0.2 millimeters unless stated otherwise

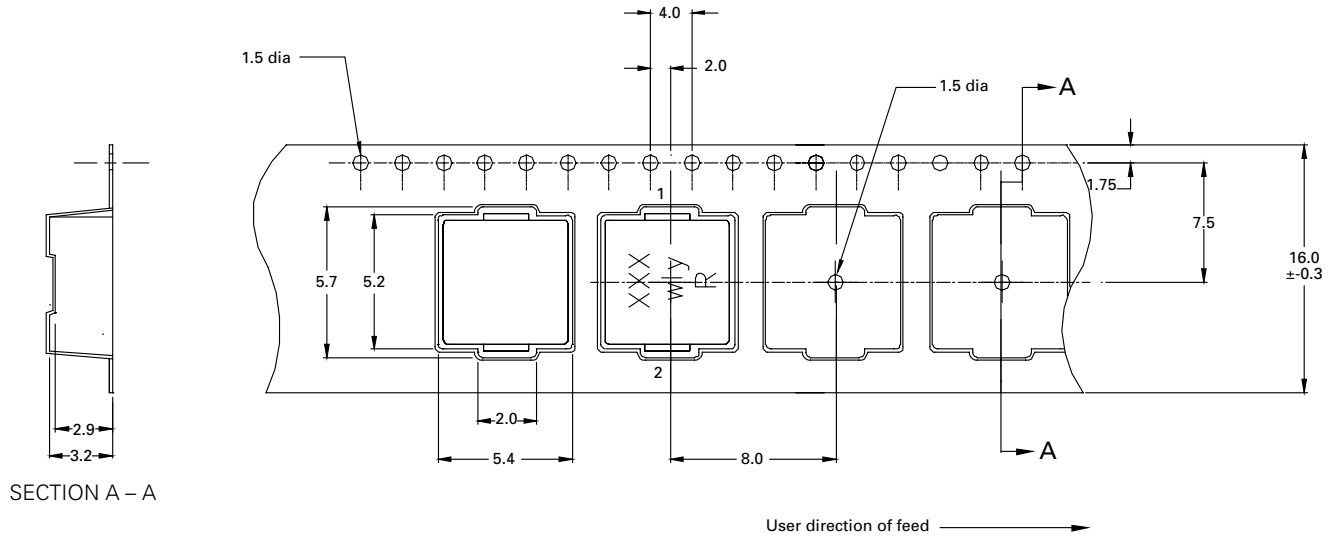
DCR measured from point "a" to point "b"

Color: Grey

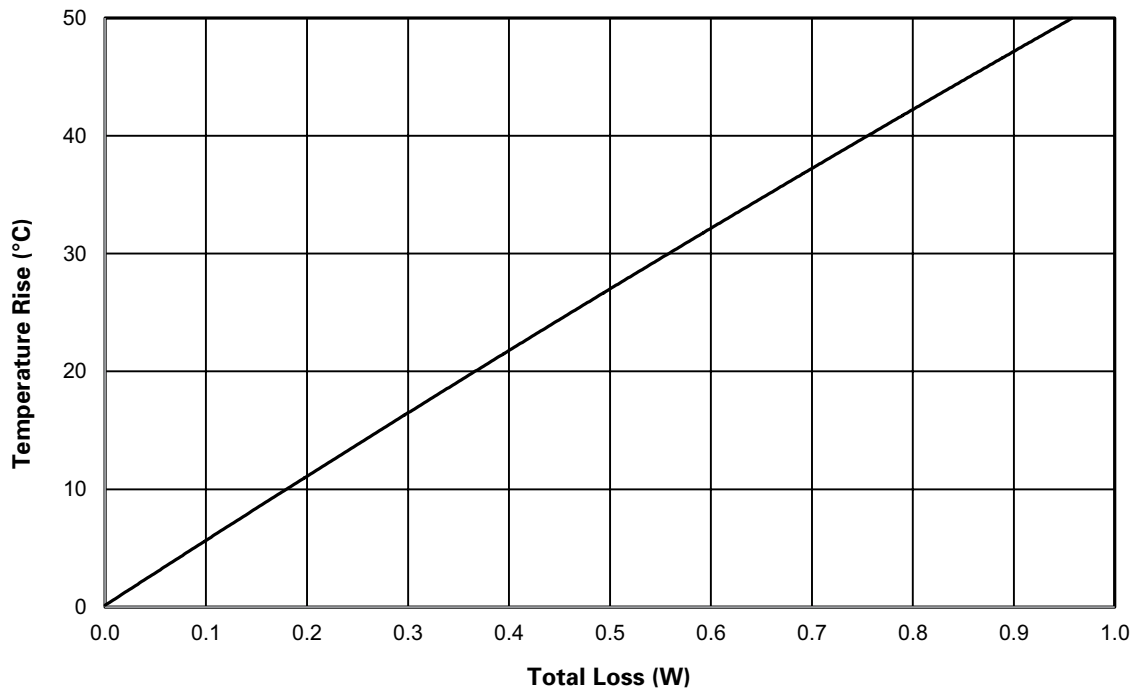
Do not route traces or vias underneath the inductor

**Packaging information (mm)**

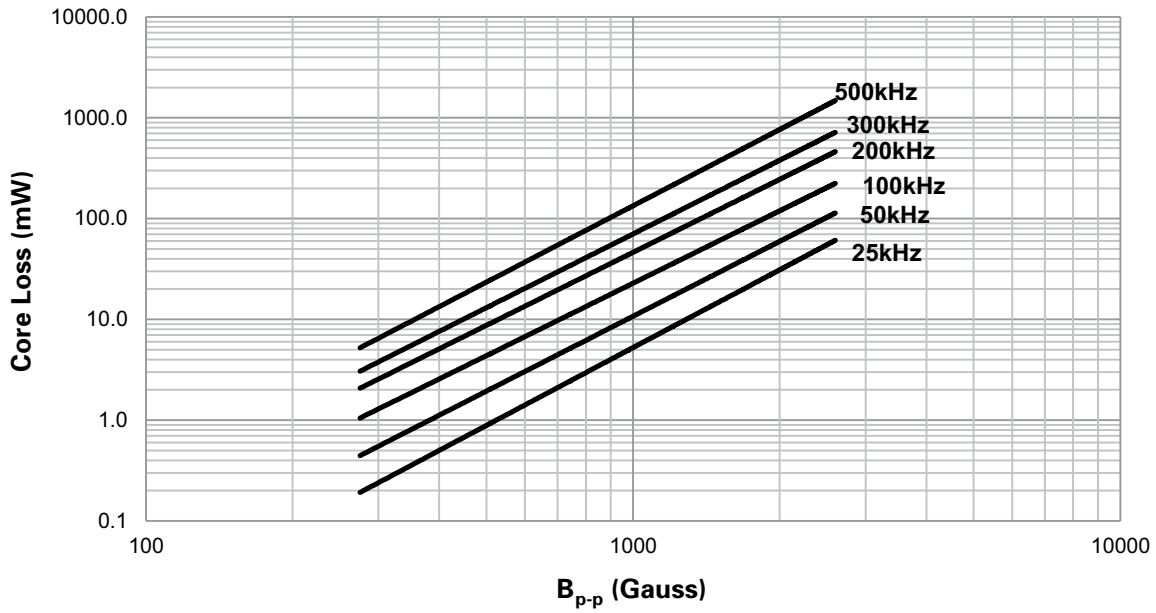
Supplied in tape and reel packaging, 2,000 parts per 13" diameter reel



**Temperature rise vs. total loss**

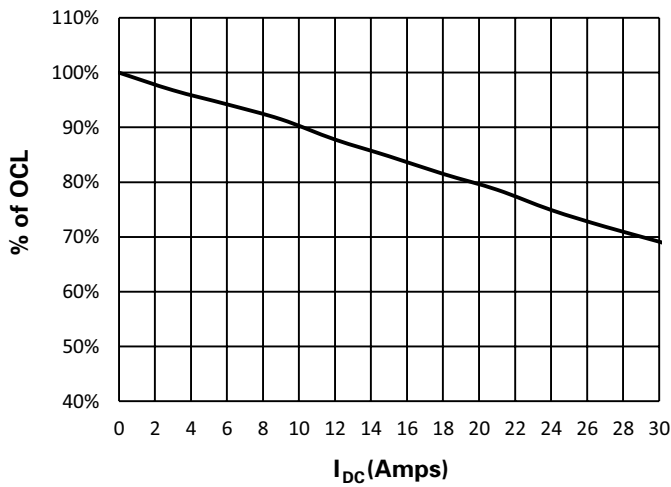


Core loss vs.  $B_{p-p}$

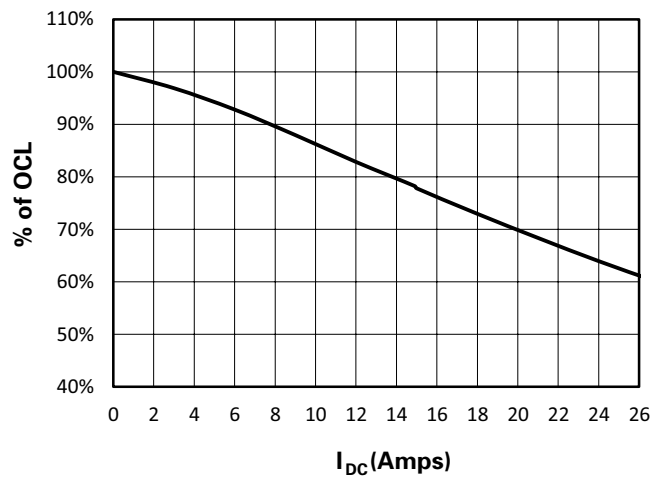


Inductance characteristics

HCM0503-R20-R

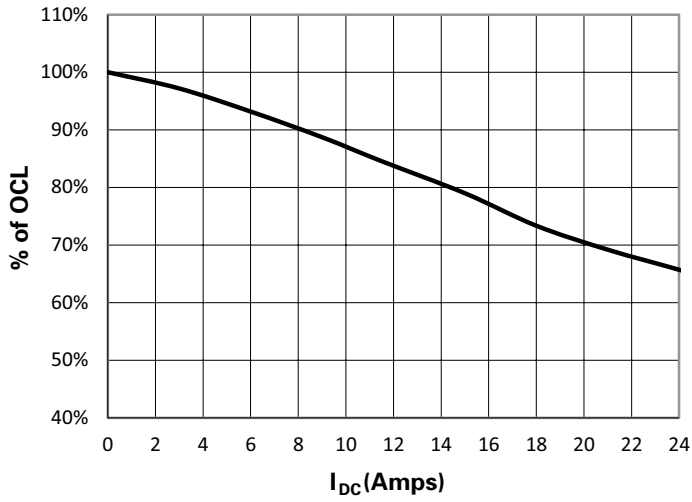


HCM0503-R35-R

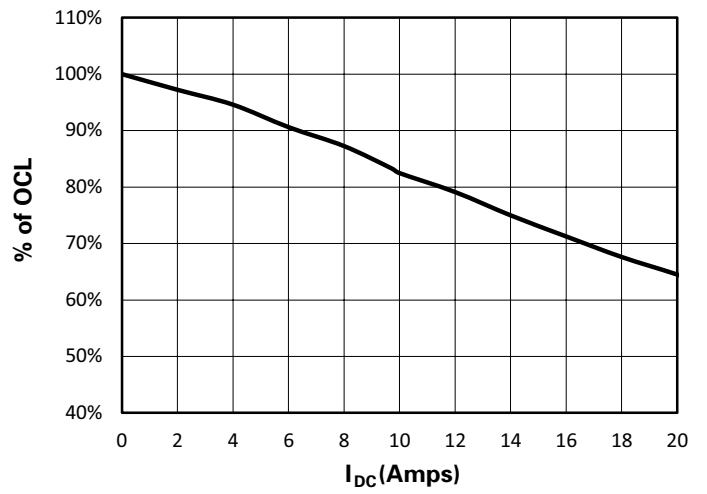


Inductance characteristics

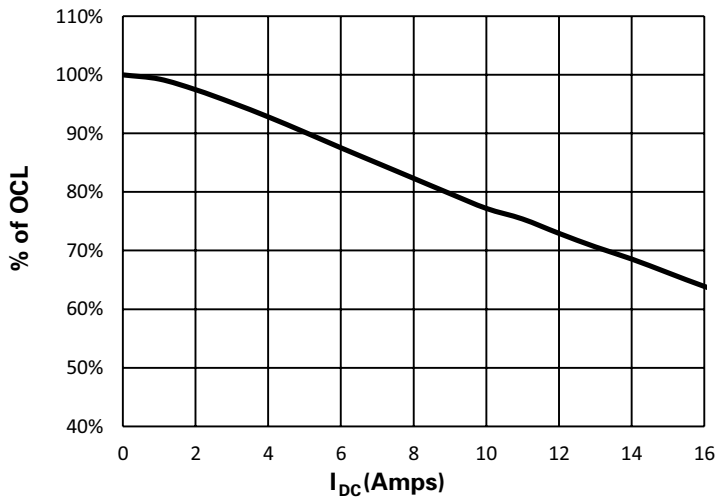
HCM0503-R47-R



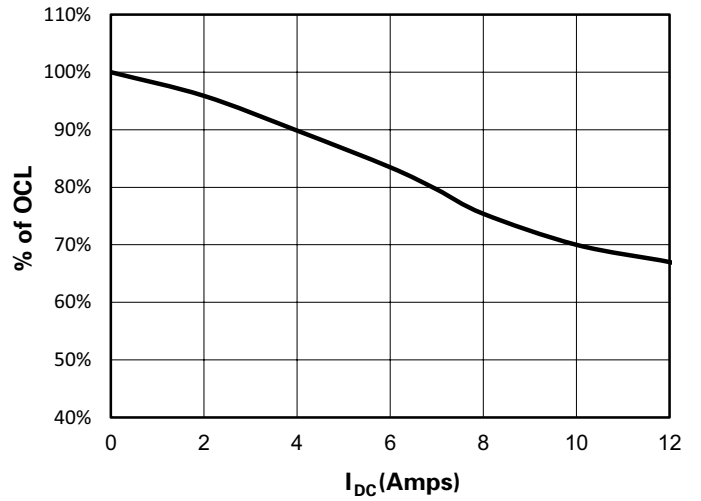
HCM0503-R75-R



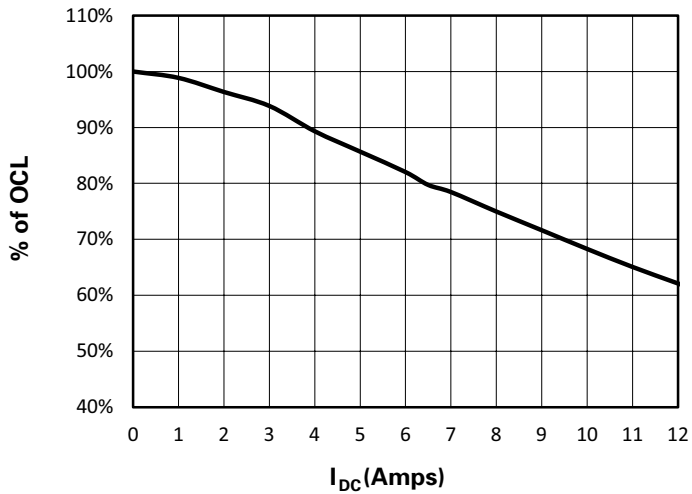
HCM0503-1R0-R



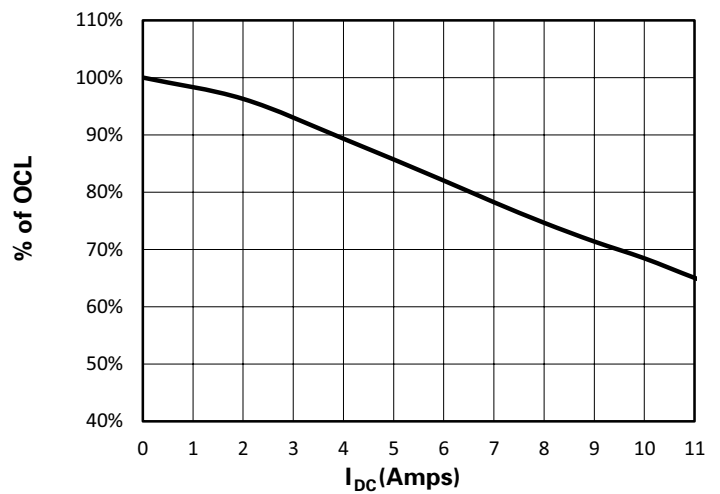
HCM0503-1R5-R



HCM0503-2R2-R

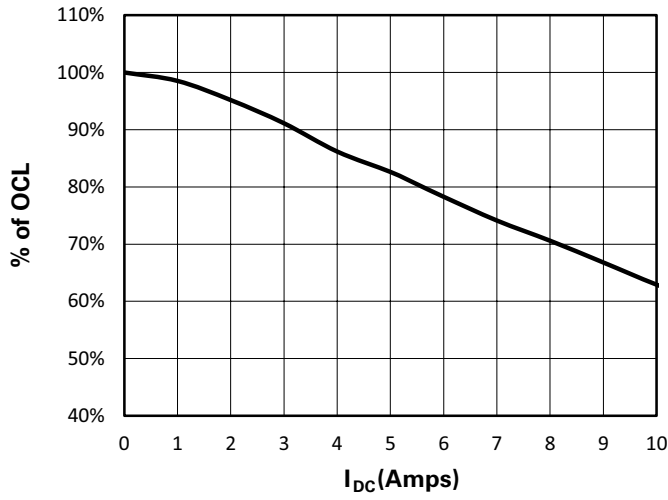


HCM0503-3R3-R

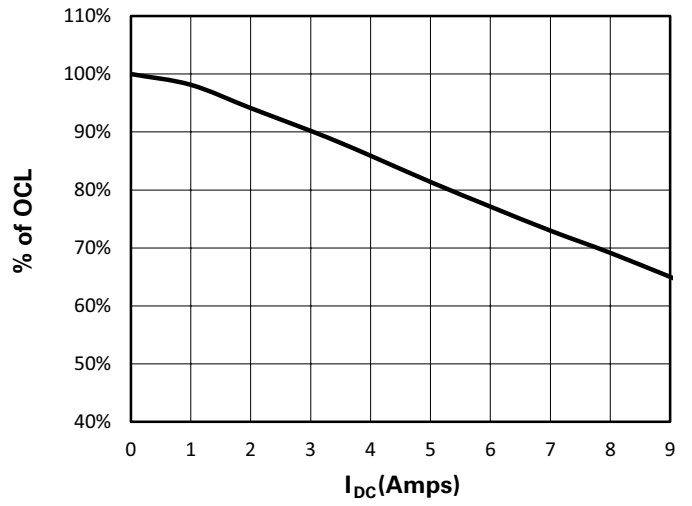


Inductance characteristics

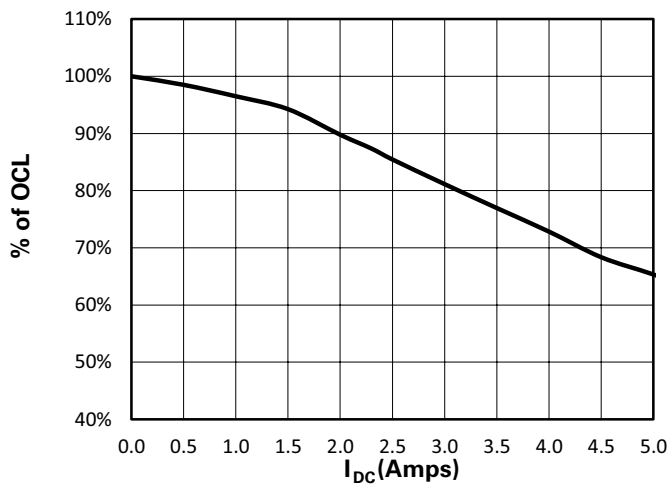
HCM0503-4R7-R



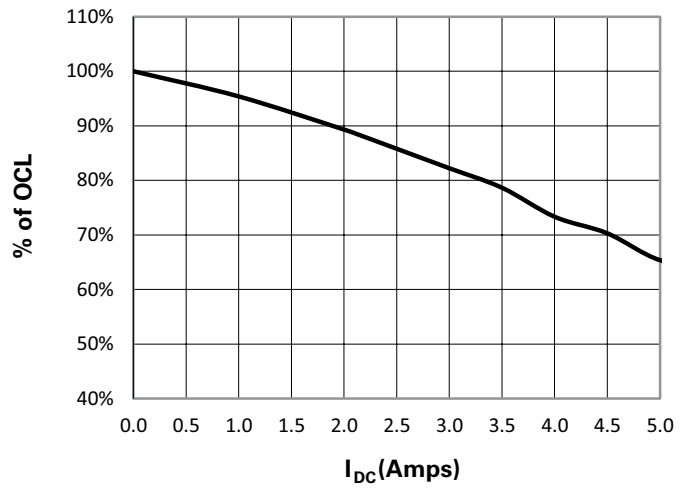
HCM0503-5R6-R



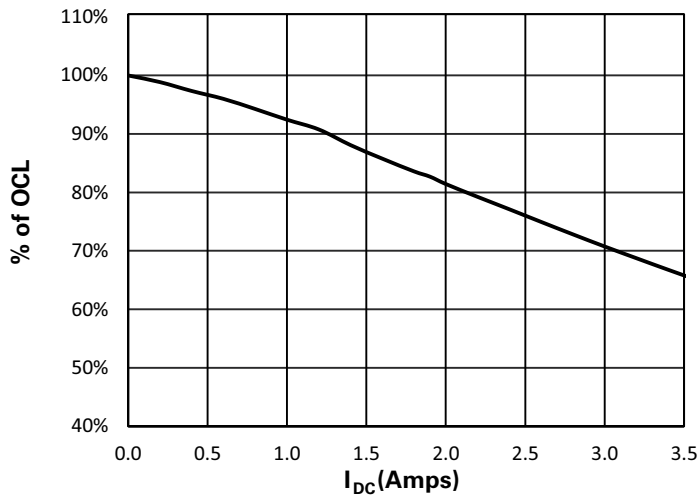
HCM0503-100-R



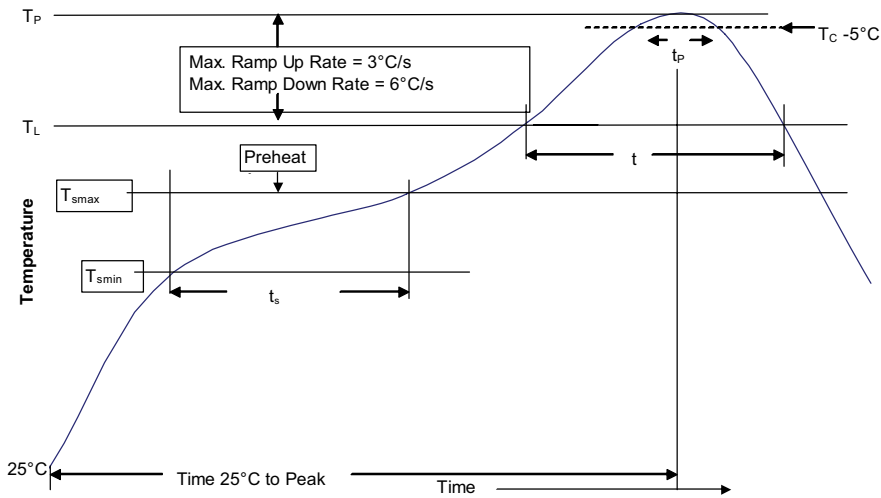
HCM0503-150-R



HCM0503-220-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
<2.5mm)	235°C	220°C
≥2.5mm	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
<1.6mm	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 JEDEC J-STD-020**

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak	<ul style="list-style-type: none"> <li>Temperature min. (<math>T_{smin}</math>)</li> <li>Temperature max. (<math>T_{smax}</math>)</li> <li>Time (<math>T_{smin}</math> to <math>T_{smax}</math>) (<math>t_s</math>)</li> </ul>	<ul style="list-style-type: none"> <li>100°C</li> <li>150°C</li> <li>60-120 Seconds</li> </ul>
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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 Printed in USA  
 Publication No. 4430 BU-SB15267  
 June 2015

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