

Coiltronics HCM0503 Series

High current power inductors



Product description

- High current carrying capacity
- Low core losses
- Magnetically shielded, low EMI
- Frequency range up to 1MHz
- Inductance range from 0.20 μ H to 15 μ H
- Current range from 2.1A to 22.2A
- 5.5 x 5.3mm footprint surface mount package in a 3mm height
- Powder Iron core material
- Halogen free, lead free, RoHS compliant

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



The Coiltronics brand of magnetics (formerly of the Bussmann Division of Cooper Industries) is now part of Eaton's Electrical Group, Electronics Division.

Coiltronics is now part of Eaton
Same great products plus even more.

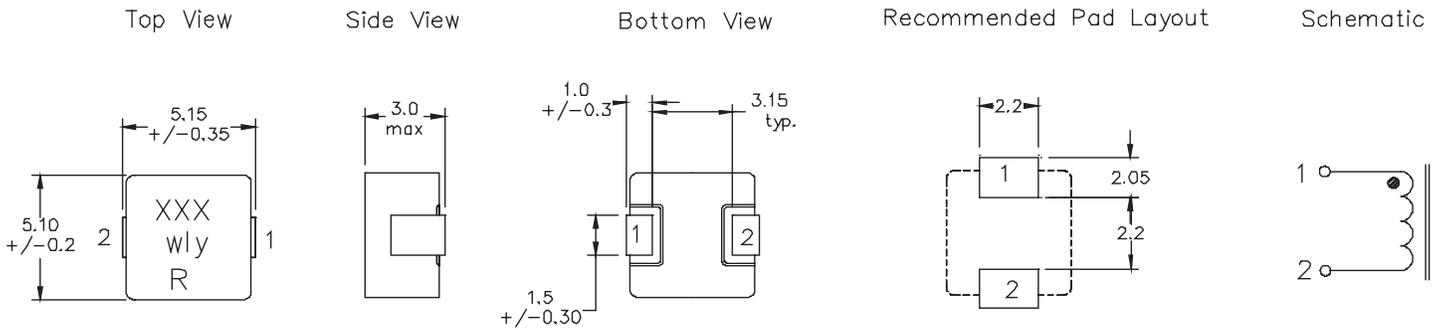
Product specifications

Part Number ⁶	OCL ¹ (μH) $\pm 20\%$	FLL min. ² (μH)	I_{rms} ³ (Amps)	I_{sat} ⁴ (Amps)	DCR (m Ω) @ 20°C (Typ.)	DCR (m Ω) @ 20°C (Max.)	K-factor ⁵
HCM0503-R20-R	0.20	0.128	22.2	21.0	2.10	2.31	1764
HCM0503-R35-R	0.35	0.224	16.6	14.9	3.90	4.29	1259
HCM0503-R47-R	0.47	0.300	12.0	11.5	6.50	7.15	820
HCM0503-R75-R	0.75	0.480	11.3	9.7	8.50	9.35	801
HCM0503-1R0-R	1.00	0.640	10.1	8.5	10.4	11.4	588
HCM0503-1R5-R	1.50	0.960	7.5	7.0	17.1	18.5	393
HCM0503-2R2-R	2.20	1.40	6.8	6.5	22.5	25.0	325
HCM0503-3R3-R	3.30	2.10	5.5	6.0	36.4	40.4	273
HCM0503-4R7-R	4.70	3.00	4.5	5.5	54.0	60.0	226
HCM0503-5R6-R	5.60	3.60	4.3	3.5	63.0	70.6	206
HCM0503-100-R	10.0	6.40	2.8	2.3	122	132	158
HCM0503-150-R	15.0	9.60	2.4	2.1	138	166	127

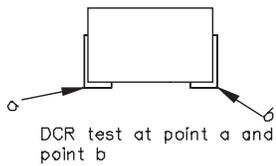
1. Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.25V_{rms}, 0.0Adc, +25°C.
2. Full Load Inductance (FLL) Test Parameters: 100kHz, 0.25V_{rms}, I_{sat} @ +25°C.
3. I_{rms} : DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB 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 20% rolloff at +25°C.
5. K-factor: Used to determine $B_{\text{p-p}}$ for core loss (see graph). $B_{\text{p-p}} = K * L * \Delta I$.
 $B_{\text{p-p}}$: (Gauss), K: (K-factor from table), L: (Inductance in μH), ΔI (Peak to peak ripple current in amps).
6. Part Number Definition: HCM0503-yyy-R
 - HCM0503 = Product code and size
 - yyy= Inductance value in μH , R = decimal point,
 if no R is present then third character = number of zeros.
 - "-R" suffix = RoHS compliant

Dimensions - mm

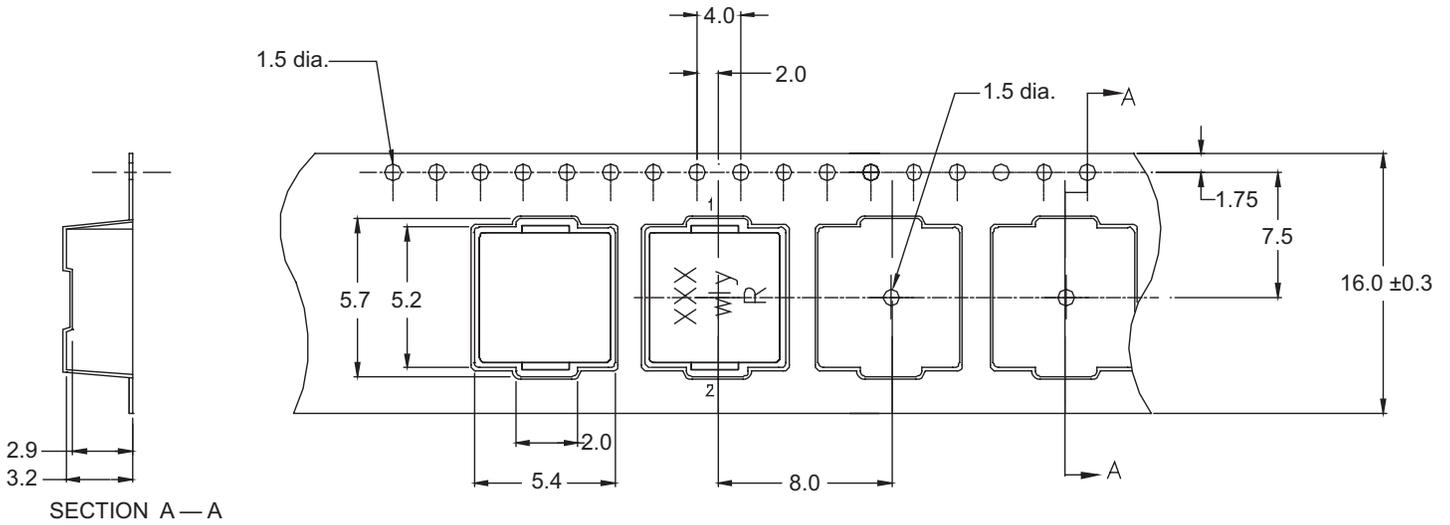


Front View



Part marking: xxx= Inductance value in uH, R= decimal point, If no R is present then last digit is # of zeroes
wly= Date code, R= Revision level
All soldering surfaces to be coplanar within 0.10 millimeters
Tolerances are +/- 0.2 millimeters unless stated otherwise
Color: Grey

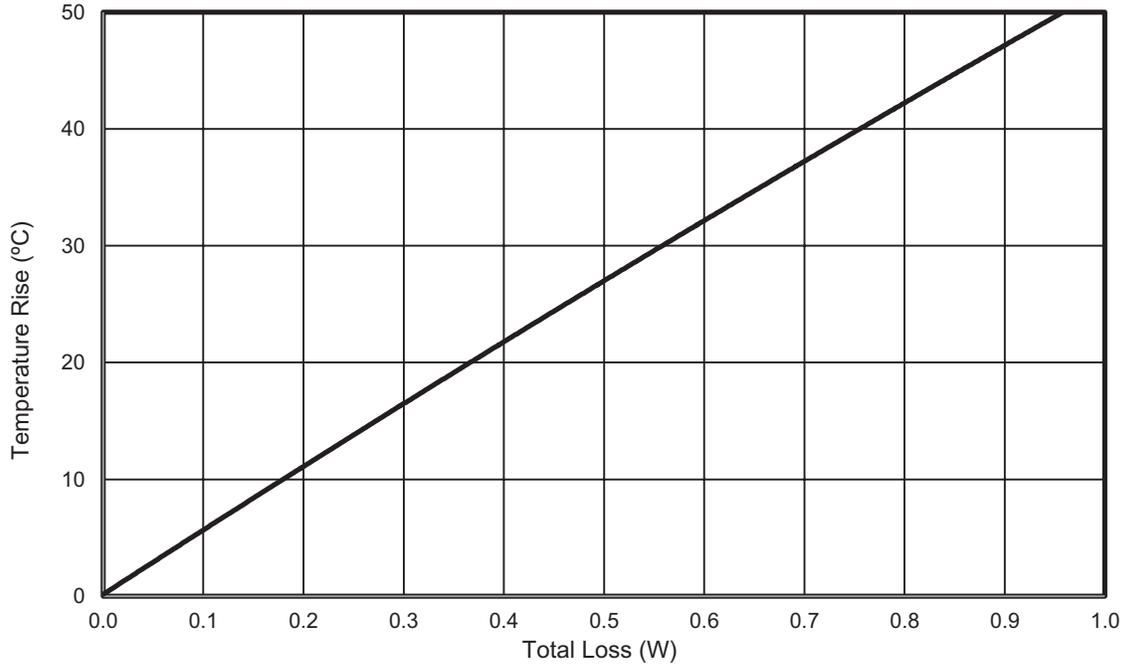
Packaging information - mm



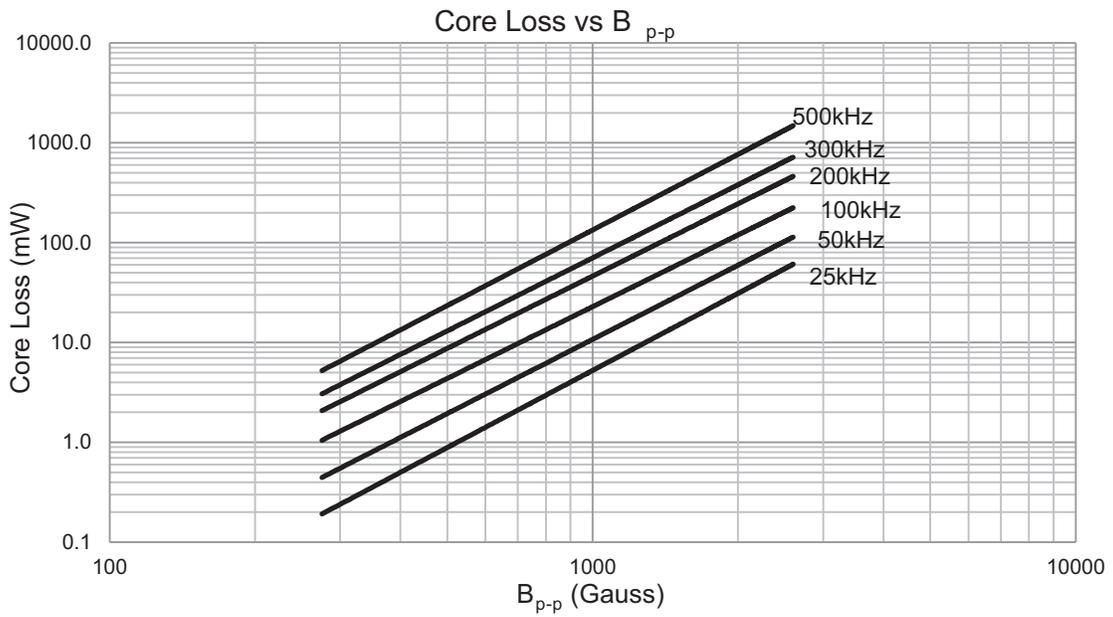
Supplied in tape and reel packaging, 2000 parts per 13" diameter reel.

User direction of feed →

Temperature rise vs. total loss

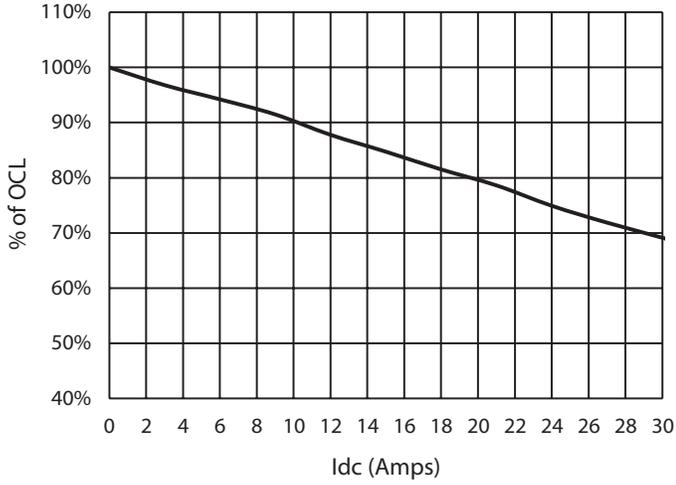


Core loss

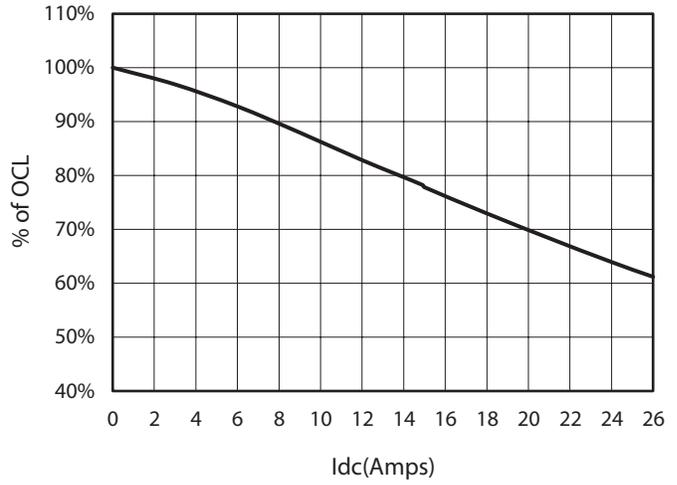


Inductance characteristics

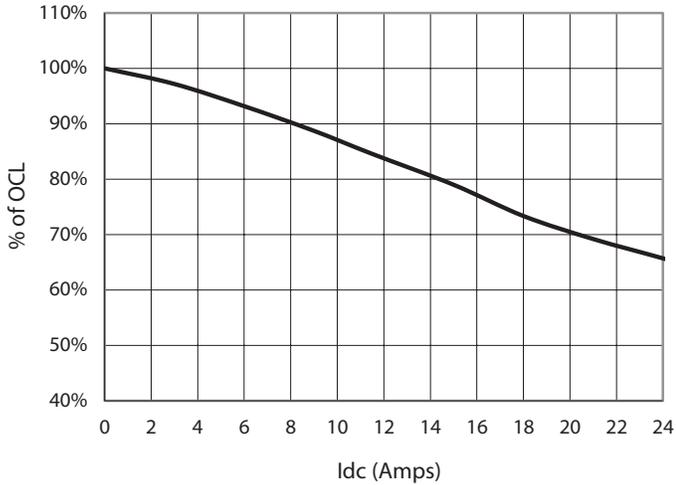
HCM0503-R20-R



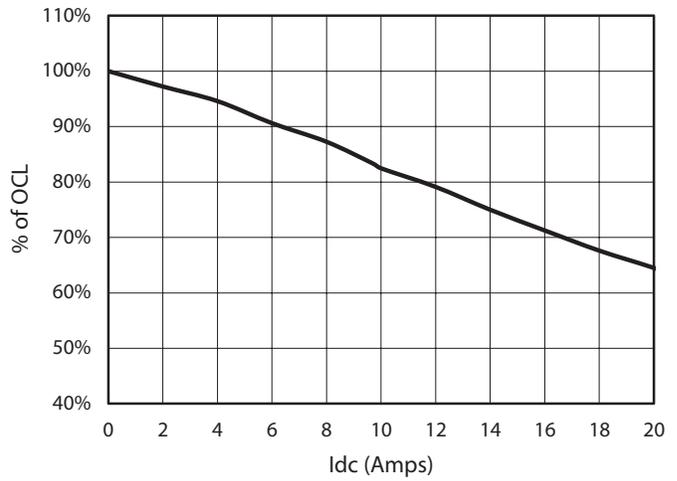
HCM0503-R35-R



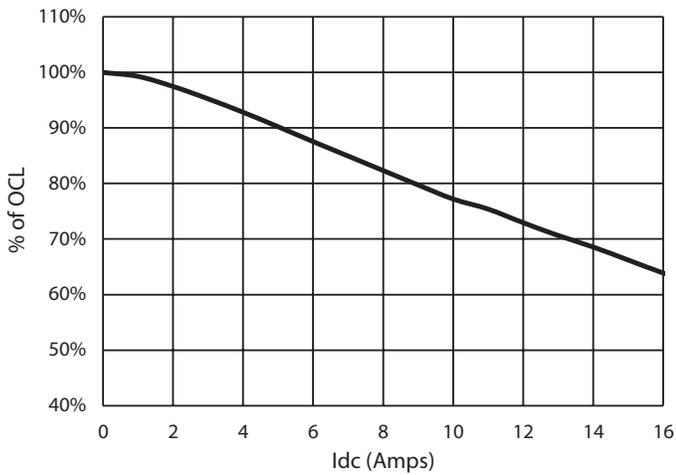
HCM0503-R47-R



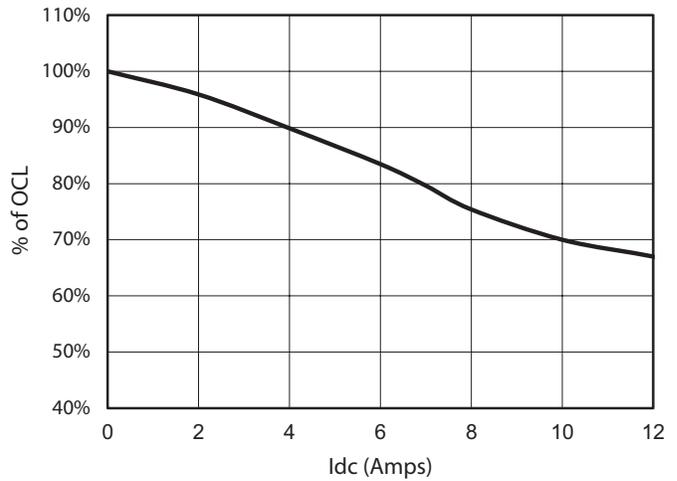
HCM0503-R75-R



HCM0503-1R0-R

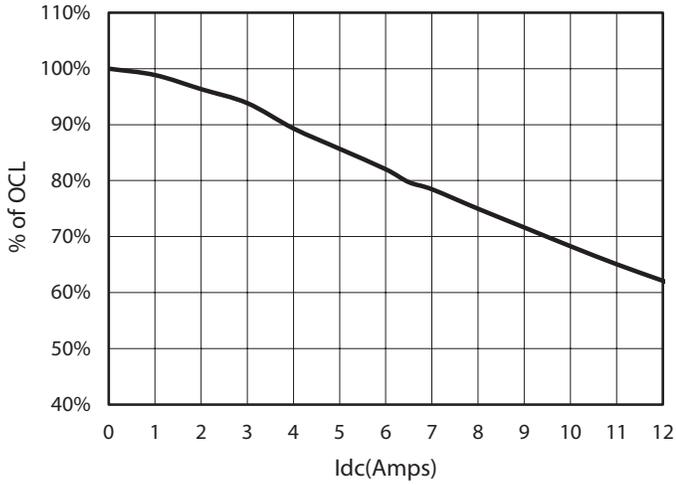


HCM0503-1R5-R

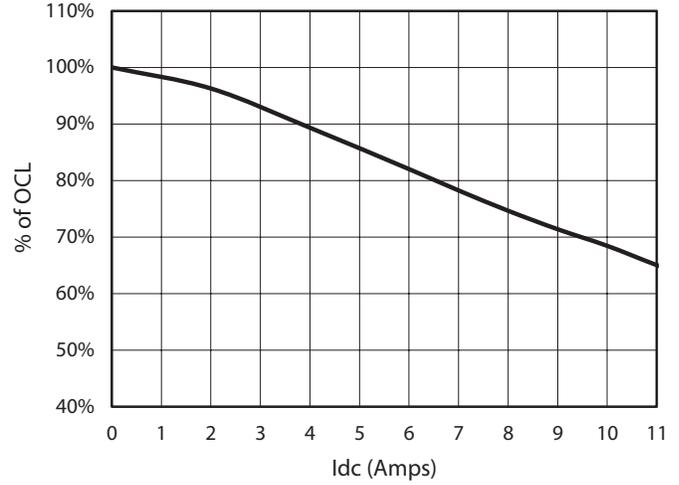


Inductance characteristics

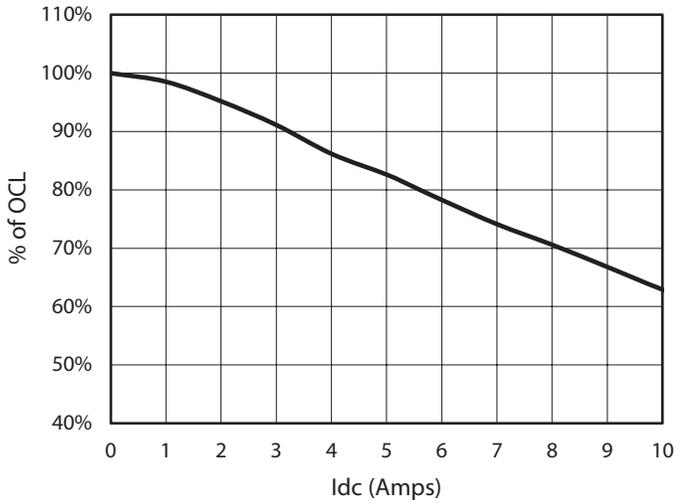
HCM0503-2R2-R



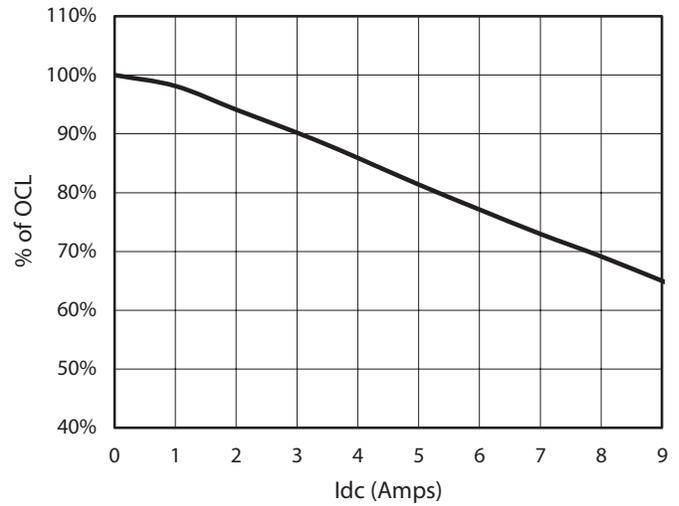
HCM0503-3R3-R



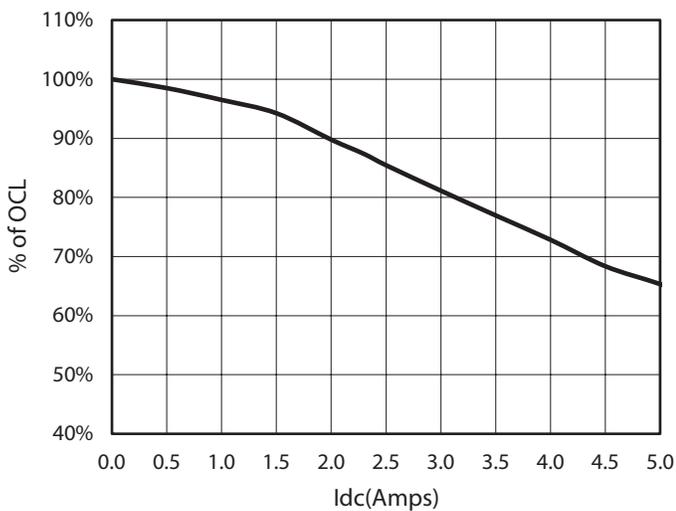
HCM0503-4R7-R



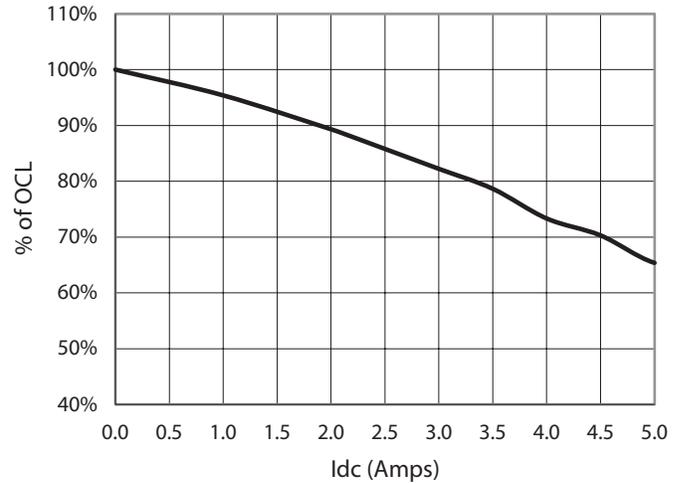
HCM0503-5R6-R



HCM0503-100-R



HCM0503-150-R



Solder reflow profile

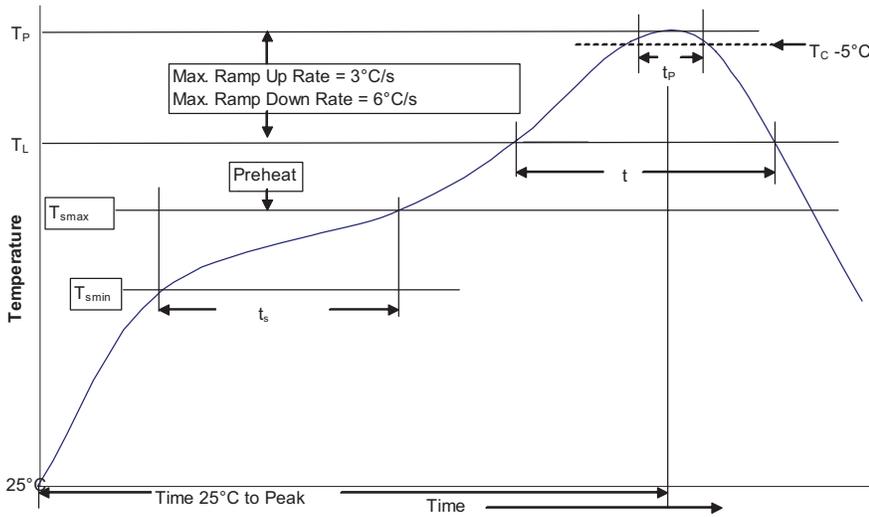


Table 1 - Standard SnPb Solder (T_C)

Package Thickness	Volume ≤ 350 mm ³	Volume ≥ 350 mm ³
<2.5mm	235°C	220°C
≥ 2.5 mm	220°C	220°C

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

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

Reference JDEC J-STD-020D

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak	<ul style="list-style-type: none"> Temperature min. (T_{smin}) Temperature max. (T_{smax}) Time (T_{smin} to T_{smax}) (t_s) 	<ul style="list-style-type: none"> 150°C 200°C 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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