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Eaton (formerly Cooper Bussmann)
HCM1104-R20-R

For any questions, you can email us directly:
sales@integrated-circuit.com

Technical Data 4370

Effective November 2014
Supersedes March 2012

Coiltronics HCM1104 Series

High current power inductors

Product description

- High current carrying capacity
- Low core losses
- Magnetically shielded, low EMI
- Frequency range up to 5MHz
- Inductance range from 0.20µH to 10µH
- Current range from 7.5A to 45A
- 11.5x10.3mm footprint surface mount package in a 4.0mm 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

Pb HALOGEN HF FREE RoHS

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.

Powering Business Worldwide

Product specifications

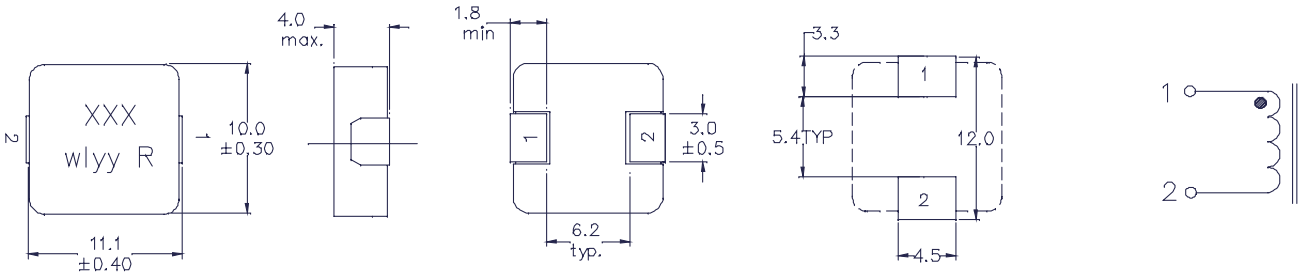
Part Number[7]	OCL[1] (µH) ± 20%	FLL[2] Min. (µH)	I_{rms}[3] (amps)	I_{sat}[4, 5] @25°C (amps)	DCR (mΩ) @ 20°C typical	DCR (mΩ) @ 20°C maximum	K-factor[6]
HCM1104-R20-R	0.20	0.13	32	45	0.63	0.72	411
HCM1104-R36-R	0.36	0.23	30	42	1.04	1.20	269
HCM1104-R45-R	0.45	0.29	29	36	1.07	1.23	219
HCM1104-R56-R	0.56	0.36	25	32	1.56	1.80	230
HCM1104-R90-R	0.90	0.58	22	28	2.17	2.50	236
HCM1104-1R0-R	1.0	0.56	18	28	3.00	3.30	378
HCM1104-1R5-R	1.5	0.84	16	32	3.80	4.20	310
HCM1104-2R2-R	2.2	1.23	12	18	6.00	7.00	253
HCM1104-3R3-R	3.3	1.85	10	16	10.8	11.8	220
HCM1104-4R7-R	4.7	2.63	8.5	15	17.0	20.0	175
HCM1104-100-R	10	5.60	7.5	8.5	27.0	30.0	116

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- HCM1104-R20-R to HCM1104-R90-R.
5. I_{sat}: Peak current for approximately 30% rolloff at +25°C- HCM1104-1R0-R to HCM 1104-100-R.
6. 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).
7. Part Number Definition: HCM1104-yyy-R
   - HCM1104 = 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

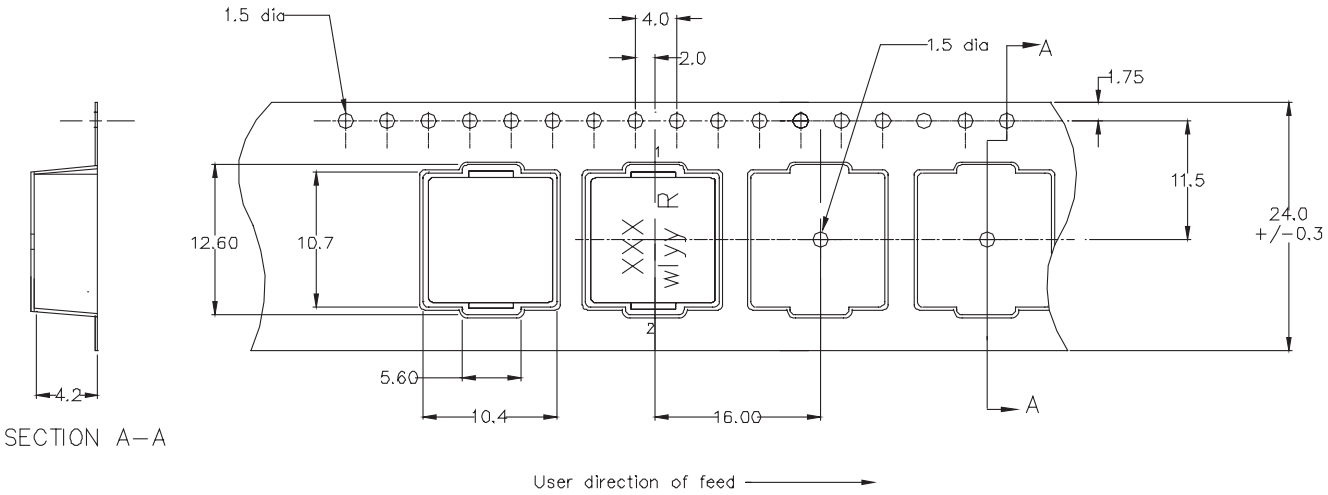
Recommended pad layout

Schematic



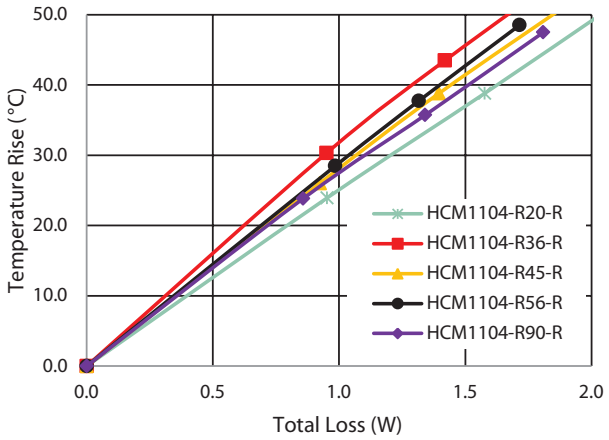
Part marking: xxx = inductance value in µH, R = decimal point, if no R is present, third character = number of zeros, wlyy = date code, R = revision level
All soldering surfaces to be coplaner within 0.10 millimeters
Tolerances are ±0.3 millimeters unless stated otherwise
Color: Grey

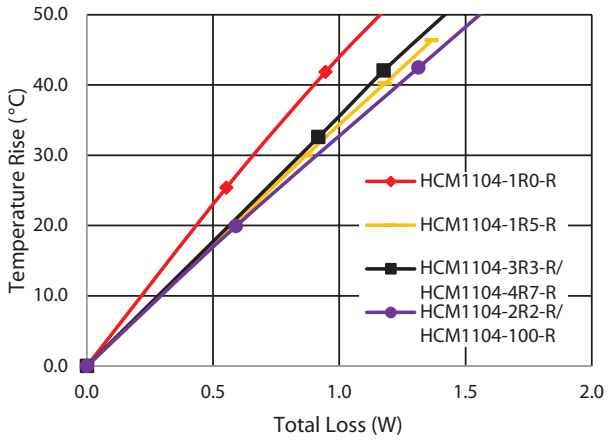
Packaging information - mm



Supplied in tape and reel packaging, 850 parts per 13” diameter reel.

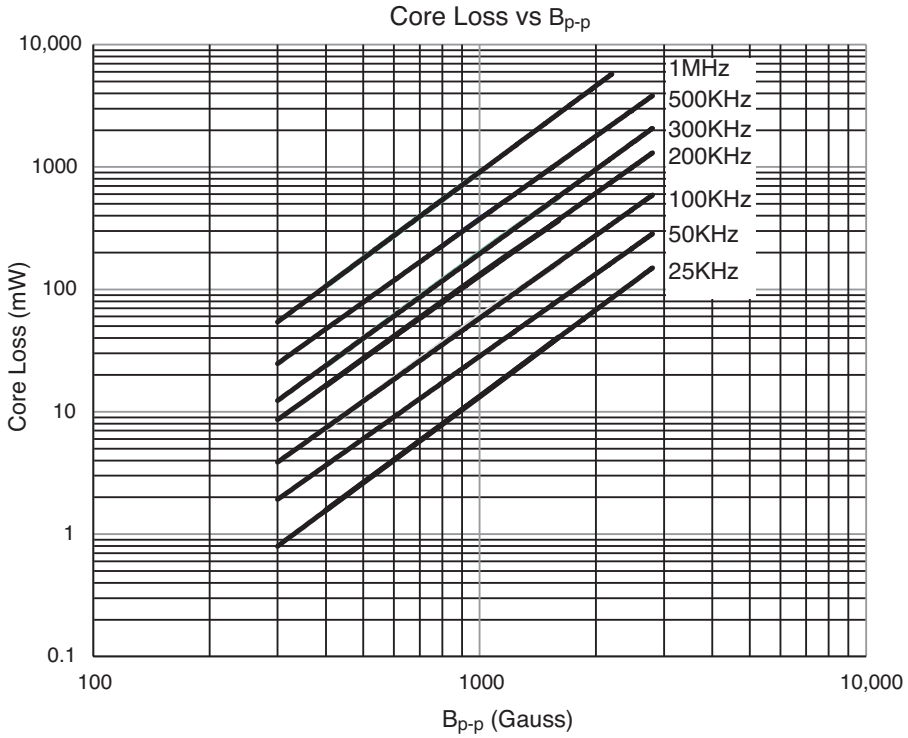
Temperature rise vs. total loss



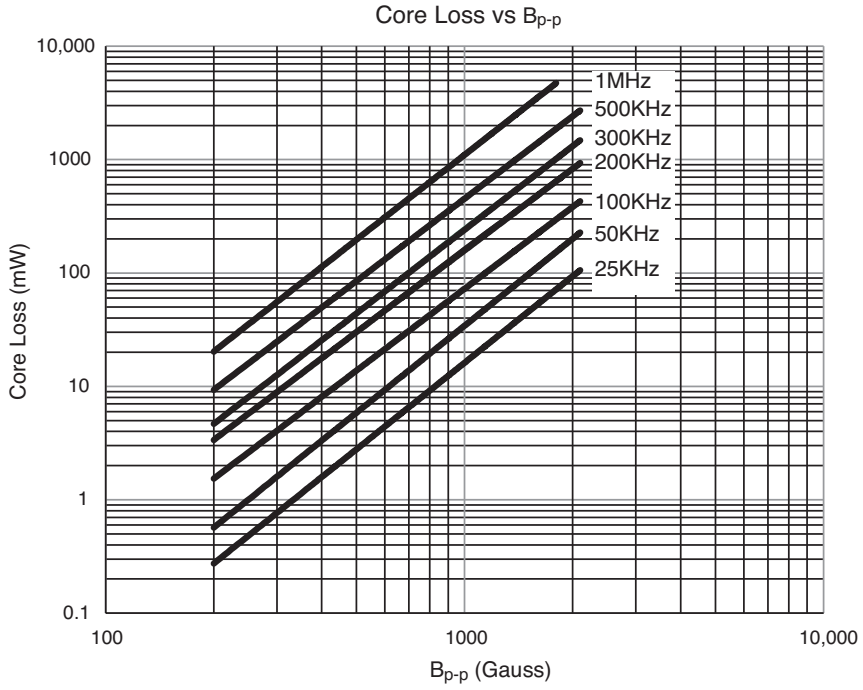


Core loss

HCM1104-R20-R to HCM1104-R90-R

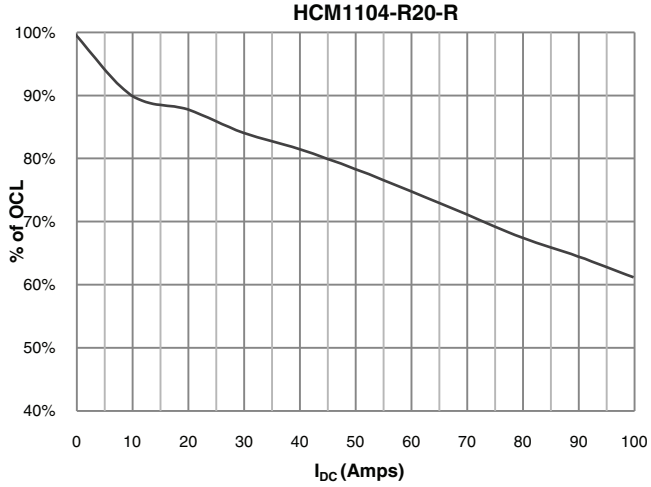


HCM1104-1R0-R to HCM1104-100-R

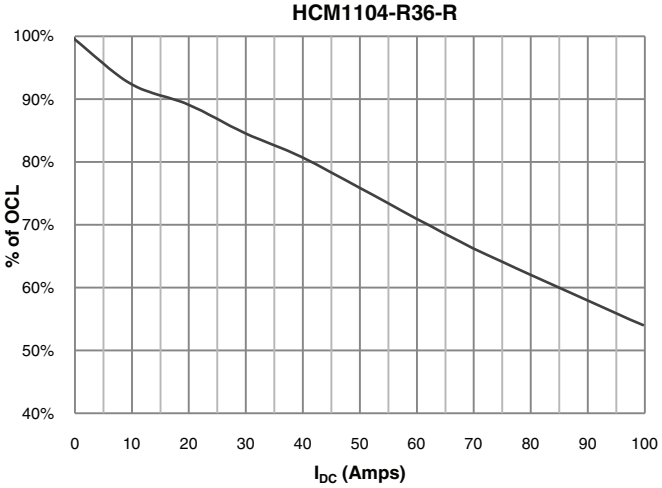


Inductance characteristics

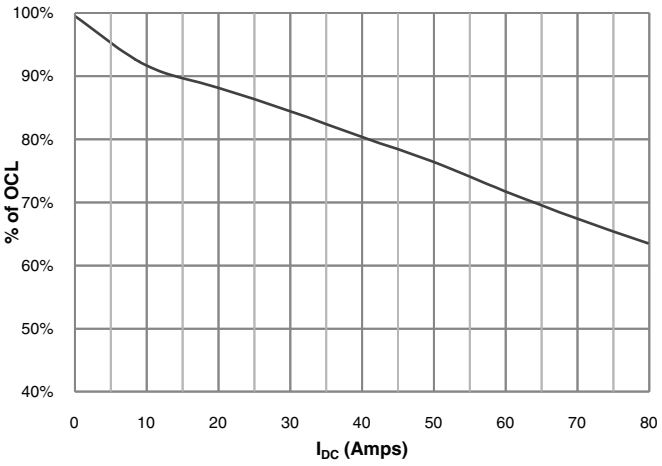
HCM1104-R20-R



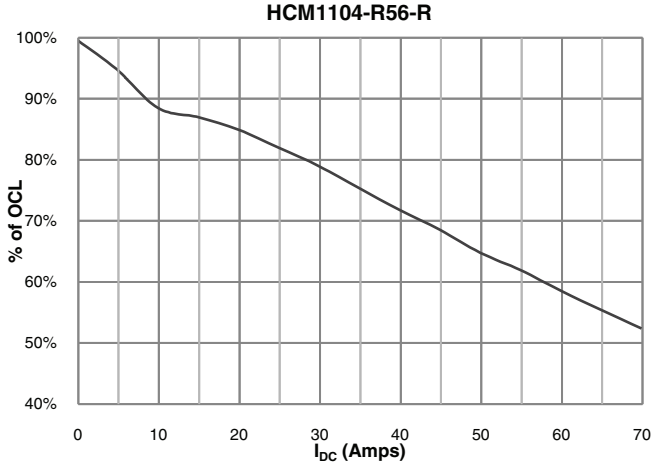
HCM1104-R36-R



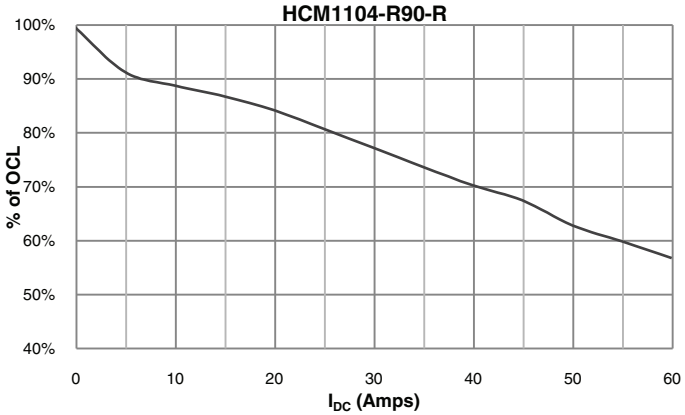
HCM1104-R45-R



HCM1104-R56-R

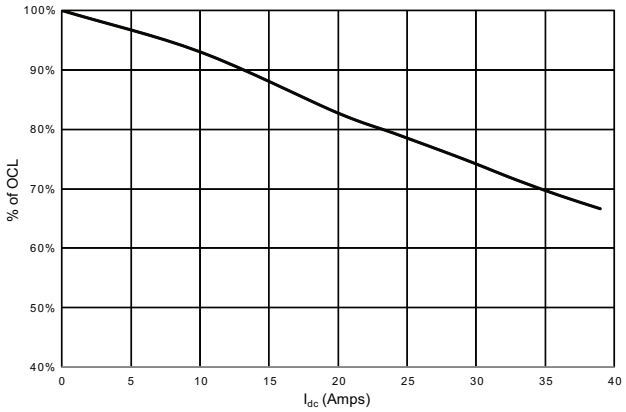


HCM1104-R90-R

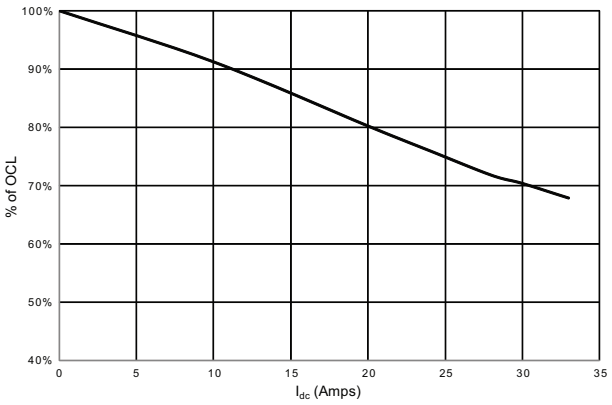


Inductance characteristics

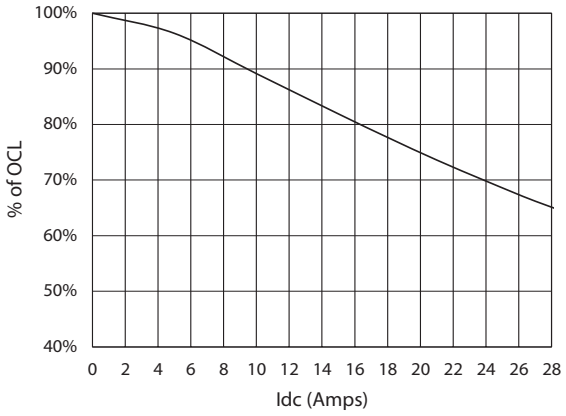
HCM1104-1R0-R



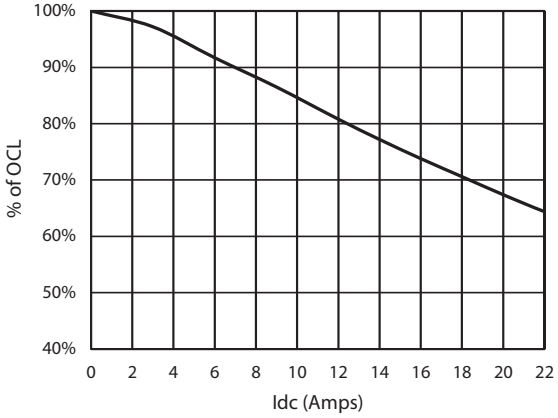
HCM1104-1R5-R



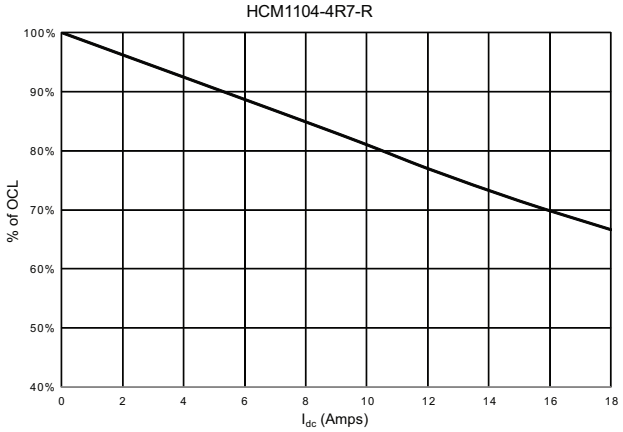
HCM1104-2R2-R



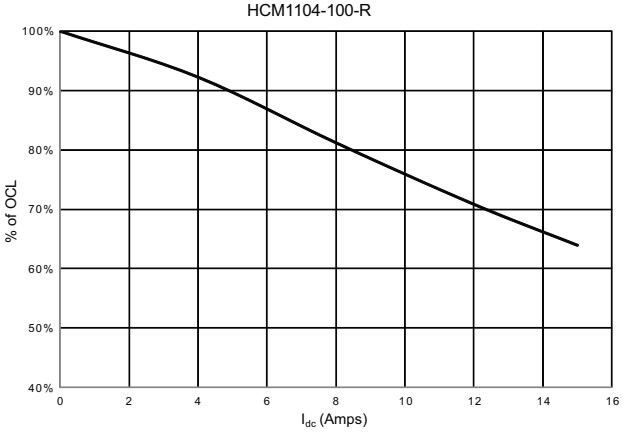
HCM1104-3R3-R



HCM1104-4R7-R



HCM1104-100-R



Solder reflow profile

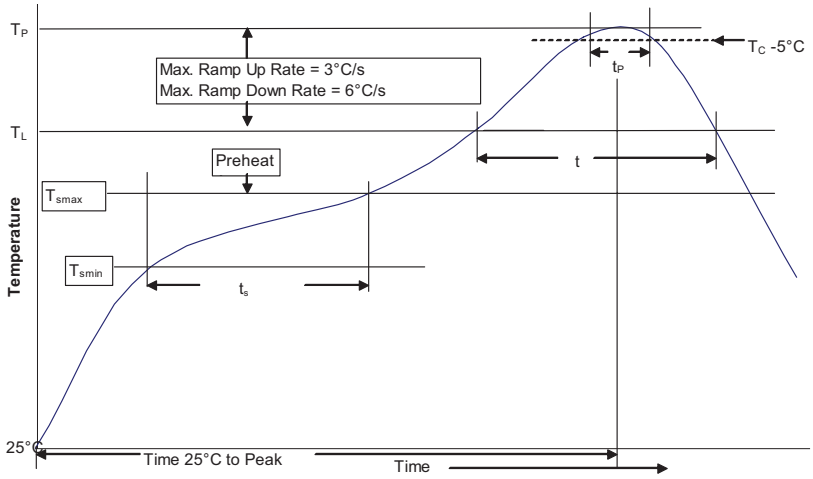


Table 1 - Standard SnPb Solder (T_C)

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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