

# 深圳市恒科翔电子科技有限公司

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## 产品规格承认书

## Product specification recognition

产品名称 PRODUCT NAME: 叠层片式铁氧体大电流电感

Multilayer Chip Ferrite Large Current Inductor

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## 1 适用范围 Scope

本纳入仕様书适用于 CIM 系列叠层片式铁氧体大电流电感。

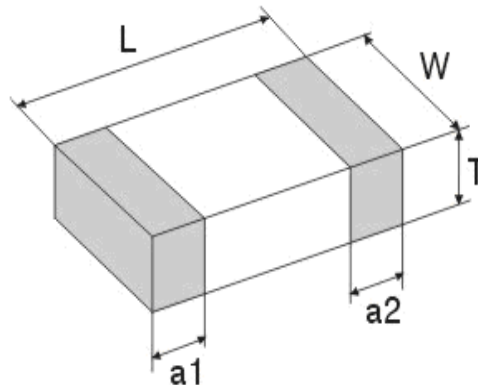
This specification applies to the CIM series of multilayer chip ferrite Large Current inductors

## 2 品名构成 Product Identification

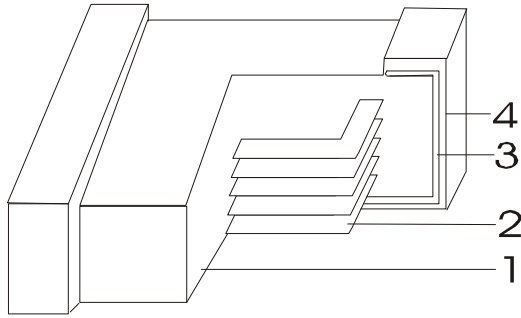
CIM    2012    H    4R7    M    T  
 ①        ②        ③        ④        ⑤        ⑥

- ① 产品系列 Product Symbol
- ② 产品尺寸 Dimensions (见 3)
- ③ 基本材料代码 Material Code
- ④ 电感量 Inductance Value (47N:0.047μH;R47:0.47μH;4R7:4.7μH;470:47μH;471:470μH)
- ⑤ 允许容差 Inductance Tolerance (M:±20%; N:±30%)
- ⑥ 包装方式 (B: 散装; T: 盘装) Packaging Style (B:; Bulk; T: Tape & Reel)

## 3 形状、尺寸和材料 Appearance, Dimensions and Material



Type 型号	Dimensions (mm) [inch]			
	L长	W宽	T高	a1, a2
1608 [0603]	1.6±0.15 [0.063±0.006]	0.8±0.15 [0.031±0.006]	0.8±0.15 [0.031±0.006]	0.3±0.2 [0.012±0.008]
2012 [0805]	2.00 (+0.30, -0.20) [0.079 (+0.012, -0.08) ]	1.25±0.20 [0.049±0.008]	0.85±0.20 [0.033±0.008]	0.50±0.30 [0.02±0.012]
2520 [1008]	2.50±0.20 [0.098±0.008]	2.0±0.20 [0.079±0.008]	0.9±0.20 [0.035±0.008]	0.50±0.30 [0.02±0.012]
3216 [1206]	3.2±0.20 [0.126±0.008]	1.6±0.20 [0.063±0.008]	1.10±0.30 [0.043±0.012]	0.50±0.30 [0.02±0.012]



	构成 Composition	材料 Material	供应商 Supplier
1	基本材料 Base Material	铁氧体(Ni-Cu-Zn 系列) Ferrite (Ni-Cu-Zn series)	日本/中国 Japan/China
2	内导体 Internal Conductor	银 Ag	日本/中国 Japan/China
3	端电极 Terminal Electrode	银 Ag	日本/中国 Japan/China
4	端电极 Terminal Electrode	镍-锡 Ni-Sn	美国/中国 USA/China

## 4 测试条件 Testing Conditions

除非另有规定，否则在以下条件下测试 <Unless otherwise specified>

温度 Temperature : Ordinary Temperature ( 5 to 35°C)

湿度 Humidity : Ordinary Humidity (25 to 85% RH)

当对测量结果有疑问时<In case of doubt>

温度 Temperature : 20±2°C

湿度 Humidity : 60 to 75% RH

大气压强 Atmospheric Pressure : 86 to 106 kPa

## 5 标称值 Rating

操作温度范围 Operating Temperature Range : -40to +125°C

## CIM1608Type

Part No. 型号	Inductance 电感量 ( $\mu$ H)	Test Freq. 测试频率 (MHz)	SRF (MHz) 自谐频率 min	RDC ( $\Omega$ ) 直流电阻 max	IR (mA) 额定电流 max	Thickness 厚度 mm [inch]
CIM1608H1R0MT	1.0 $\pm$ 20%	1	125	0.235	1000	0.8 $\pm$ 0.15 [0.031 $\pm$ 0.006]
CIM1608H1R5MT	1.5 $\pm$ 20%	1	109	0.286	800	
CIM1608H2R2MT	2.2 $\pm$ 20%	1	90	0.390	700	
CIM1608H3R3MT	3.3 $\pm$ 20%	1	70	0.520	600	
CIM1608H4R7MT	4.7 $\pm$ 20%	1	50	0.650	500	
CIM1608H100MT	10 $\pm$ 20%	1	33	0.8 $\pm$ 30%	400	

## CIM2012Type

Part No. 型号	Inductance 电感量 ( $\mu$ H)	Test Freq. 测试频率 (MHz)	SRF (MHz) 自谐频率 min	RDC ( $\Omega$ ) 直流电阻 max	IR (mA) 额 定电流 max	Thickness 厚度 mm [inch]
CIM2012H1R0MT	1.0 $\pm$ 20%	1	75	0.195	1400	0.85 $\pm$ 0.20 [0.033 $\pm$ 0.008]
CIM 2012H1R5MT	1.5 $\pm$ 20%	1	60	0.208	1300	
CIM 2012H2R2MT	2.2 $\pm$ 20%	1	50	0.260	1200	
CIM 2012H3R3MT	3.3 $\pm$ 20%	1	41	0.286	1100	
CIM 2012H4R7MT	4.7 $\pm$ 20%	1	35	0.325	1000	
CIM 2012H100MT	10 $\pm$ 20%	1	24	0.468	800	

## CIM2520Type

Part No. 型号	Inductance 电感量 ( $\mu$ H)	Test Freq. 测 试频率 (MHz)	SRF (MHz) 自 谐频率 min	RDC ( $\Omega$ ) 直流电阻 max	IR (mA) 额 定电流 max	Thickness 厚度 mm [inch]
CIM2520H4R7MT	4.7 $\pm$ 20%	1	30	0.247	1000	0.9 $\pm$ 0.20 [0.035 $\pm$ 0.008]
CIM2520H5R6MT	5.6 $\pm$ 20%	1	25	0.260	1000	
CIM2520H6R8MT	6.8 $\pm$ 20%	1	25	0.286	950	

## CIM3216Type

Part No. 型号	Inductance 电感量 ( $\mu$ H)	Test Freq. 测 试频率 (MHz)	SRF (MHz) 自 谐频率 min	RDC ( $\Omega$ ) 直流电阻 max	IR (mA) 额 定电流 max	Thickness 厚度 mm [inch]
CIM3216H1R0MT	1.0 $\pm$ 20%	1	90	0.130	1600	1.10 $\pm$ 0.30 [0.043 $\pm$ 0.012]
CIM3216H1R5MT	1.5 $\pm$ 20%	1	75	0.156	1500	
CIM3216H2R2MT	2.2 $\pm$ 20%	1	58	0.195	1300	
CIM3216H3R3MT	3.3 $\pm$ 20%	1	49	0.260	1200	
CIM3216H4R7MT	4.7 $\pm$ 20%	1	41	0.416	980	
CIM3216H100MT	10 $\pm$ 20%	1	28	0.650	670	
CIM3216H150MT	15 $\pm$ 20%	1	23	0.715	600	
CIM3216H220MT	22 $\pm$ 20%	1	19	0.780	500	

## 6 电气特性 Electrical Performance

### 6.1 电感量;Q 值 Inductance; Q factor

按表 1 所列条件测量时，电感量应符合条款 5。

Inductance; Q factor shall meet item 5 when measured on the condition of Table 1.

Table 1

测量设备 Measuring Equipment	阻抗分析仪 HP4291 或其他 Impedance analyzer HP4291 or equivalent
测量频率 Measuring Frequency	见条款 5 (see item 5)
测量信号 Measuring signal level	50mV

### 6.2 直流电阻 DC Resistance

按表 2 所列条件测量时，直流电阻应符合条款 5。

D.C Resistance shall meet item 5 when measured on the condition of Table 2.

Table 2

测量设备 Measuring Equipment	LCR 测量表 HP4263A 或其他 LCR Meter HP4263A or equivalent
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### 6.3 自谐频率 Self Resonant Frequency (S.R.F)

按表 3 所列条件测量时，自谐频率应符合条款 5。

S.R.F. shall meet item 5 when measured on the condition of Table 3.

Table 3

测量设备 Measuring Equipment	阻抗分析仪 HP4291 或其他 Impedance analyzer HP4291 or equivalent
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### 6.4 额定电流 Rated current

$I_r$  基于产品表面温度上升的标准值：产品表面温度达到+40°C时的电流值；

Rated current based on increasing product temperature: Current when temperature of the product reaches +40°C

Table 4

测量设备 Measuring Equipment	阻抗分析仪 HP4291 或其他 直流电源 HP6632 和适配器 HP16200 或其他 Impedance analyzer HP4291 or equivalent DC power HP6632 and Adapter HP16200 or equivalent
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### 6.5 焊接变化率 Variance after Soldering

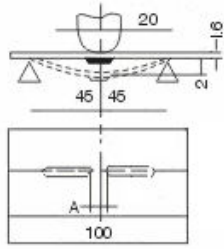
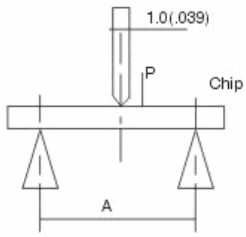
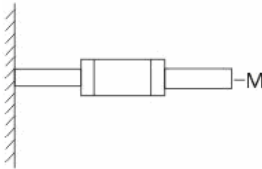
当经过焊接条件（255°C 浸锡 3.5 秒）后，电感量变化率 0.001  $\mu$  H~10  $\mu$  H:  $\pm$ 10%，10  $\mu$  H~220  $\mu$  H: 20%。

Inductance change shall be within 0.001  $\mu$  H~10  $\mu$  H:  $\pm$ 10%，10  $\mu$  H~220  $\mu$  H: 20%:  $\pm$ 10% when the inductor is dipped into solder for 3.5 seconds which is 255°C

Table 5

测量设备 Measuring Equipment	阻抗分析仪 HP4291 或其他；焊接炉 Impedance analyzer HP4291 or equivalent Solder furnace
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## 7 信赖性试验 Reliable Performance

NO.	Item 项目	Specifications 规范	Test Methods 测试方法															
1	Solder-Ability 可焊性	More than 90% of termination should be covered with new solder. 端电极焊锡覆盖率为 90%以上	Solder 焊锡: Sn 纯锡 Temperature 焊锡温度: 260°C ± 5 °C Flux 助焊剂: rosin 松香 Duration 浸渍时间: 4 ± 1s															
2	Leaching Resistance 耐焊性	More than 75% of termination Should be covered with new solder. 端电极焊锡覆盖率为 75%以上	Solder 焊锡: Sn 纯锡 Temperature 焊锡温度: 260°C ± 5 °C Flux 助焊剂: rosin 松香 Duration 浸渍时间: 10 ± 1s															
3	Bending Strength 弯曲试验	No mechanical damage should be noticed 不应见机械损伤	When the board curve to 2mm(0.079 inches) 当板弯曲挠度达 2mm 时: <table border="1"> <thead> <tr> <th>Size</th> <th>A(mm)</th> </tr> </thead> <tbody> <tr> <td>0603</td> <td>0.3</td> </tr> <tr> <td>1005</td> <td>0.5</td> </tr> <tr> <td>1608</td> <td>0.7</td> </tr> <tr> <td>2012</td> <td>1.0</td> </tr> </tbody> </table> 	Size	A(mm)	0603	0.3	1005	0.5	1608	0.7	2012	1.0					
Size	A(mm)																	
0603	0.3																	
1005	0.5																	
1608	0.7																	
2012	1.0																	
4	Body Strength 抗压强度	No mechanical damage should be noticed 不应见机械损伤	Applied specified pull strength in axial direction 在轴向上施加拉力如下: <table border="1"> <thead> <tr> <th>Size</th> <th>A/mm</th> <th>P/N</th> </tr> </thead> <tbody> <tr> <td>0603</td> <td>0.3</td> <td>4.9</td> </tr> <tr> <td>1005</td> <td>0.7</td> <td>4.9</td> </tr> <tr> <td>1608</td> <td>1.0</td> <td>4.9</td> </tr> <tr> <td>2012</td> <td>1.4</td> <td>9.8</td> </tr> </tbody> </table> 	Size	A/mm	P/N	0603	0.3	4.9	1005	0.7	4.9	1608	1.0	4.9	2012	1.4	9.8
Size	A/mm	P/N																
0603	0.3	4.9																
1005	0.7	4.9																
1608	1.0	4.9																
2012	1.4	9.8																
5	Terminal Strength 端头强度	The terminal and body should be no damage 端头和瓷体不应见损伤	Applied specified pull strength in axial 在轴向上施加拉力如下: <table border="1"> <thead> <tr> <th>Size</th> <th>Pull Strength</th> <th>Time (s)</th> </tr> </thead> <tbody> <tr> <td>0603</td> <td>2 N</td> <td>5±1</td> </tr> <tr> <td>1005</td> <td>3 N</td> <td>5±1</td> </tr> <tr> <td>1608</td> <td>5 N</td> <td>5±1</td> </tr> <tr> <td>2012</td> <td>10 N</td> <td>5±1</td> </tr> </tbody> </table> 	Size	Pull Strength	Time (s)	0603	2 N	5±1	1005	3 N	5±1	1608	5 N	5±1	2012	10 N	5±1
Size	Pull Strength	Time (s)																
0603	2 N	5±1																
1005	3 N	5±1																
1608	5 N	5±1																
2012	10 N	5±1																

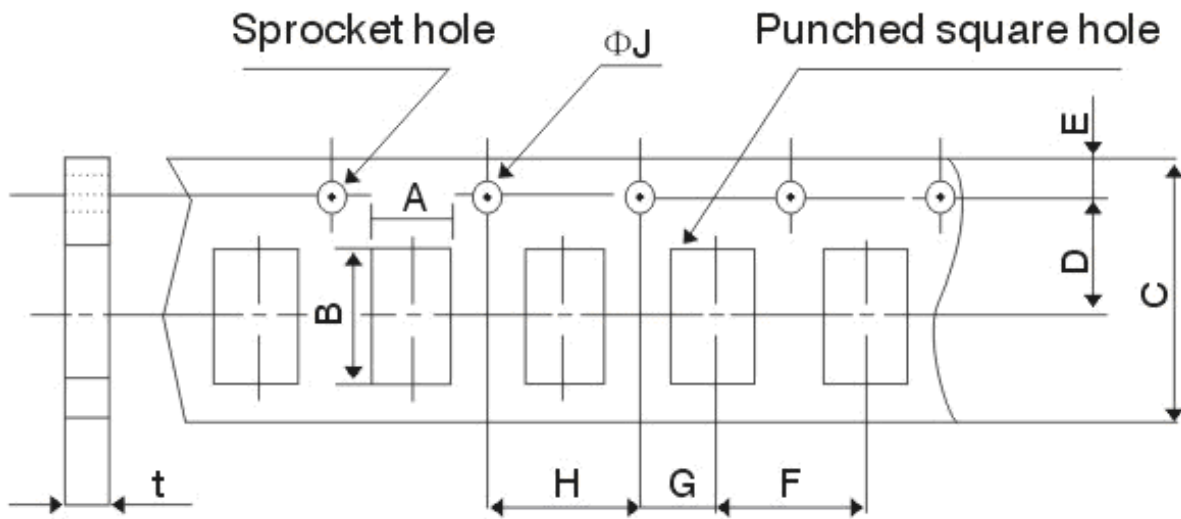
NO.	Item 项目	Specifications 规范	Test Methods 测试方法
6	Drop 跌落		Drop 10 times on a concrete floor from a height of 1m. 从距混凝土地面 1m 高度自由落下，重复 10 次
7	Vibration 振动		Frequency 频率: 10 to 55Hz Amplitude 振幅: 1.52mm Direction and time 方向及时间: X, Y and Z directions for 2 hours each.
8	Humidity resistance 耐潮湿		a. Test condition 试验条件 Temp. 温度: 60±2℃ Humidity 湿度: 90%~95% Test time 试验时间: 1000 h b. Measurement method 测量条件: The component should be stabilized at normal condition for 24 hours before test. 试验后常温常湿环境中放置 (24±2) 小时后测量
9	High temperature resistance 耐高温	1.No mechanical damage shall be noticed 外观无可见机械损伤 2. Inductance shall be within 电感量变化率: 0.001μH ~ 10μH: ±10% 10μH ~ 220μH: ±20%	a. Test condition 试验条件 Applied rated current 施加额定电流 Temp. 温度: 125±2℃ Test time 试验时间: 1000 h b. Measurement method 测量条件: The component should be stabilized at normal condition for 24 hours before test. 试验后常温常湿环境中放置 (24±2) 小时后测量
10	Low temperature resistance 耐低温		a. Test condition 试验条件 Temp. 温度: -55±2℃ Test time 试验时间: 1000 h b. Measurement method 测量条件: The component should be stabilized at normal condition for 24 hours before test. 试验后常温常湿环境中放置 (24±2) 小时后测量
11	Thermal shock 热冲击		a. Test condition 试验条件 1) Temp. 温度: -55℃, time 时间: 30±3min 2) Temp. 温度: +125℃, time 时间: 30±3min 100 cycles b. Measurement method 测量条件: The component should be stabilized at normal condition for 24 hours before test. 试验后常温常湿环境中放置 (24±2) 小时后测量



## 8 包装 Packaging

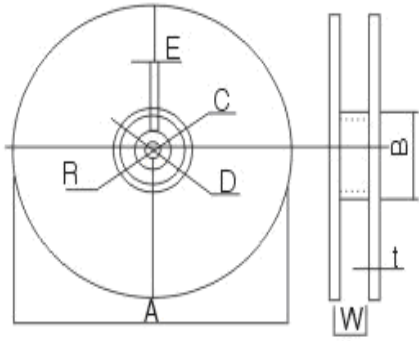
(1) 编带尺寸 Dimensions of Tape:

纸带/塑带 Paper / Embossed carrier tape:



Type	3216	2012	2520	1608
T*	0.85±0.2	0.85±0.2	0.9±0.2	0.8±0.15
TAPE	Paper carrier tape	Paper carrier tape	Embossed carrier tape	Paper carrier tape
A	1.8±0.1	1.5±0.1	2.3±0.10	1.05±0.10
B	3.48±0.1	2.35±0.1	2.80±0.10	1.85±0.10
C	8.0±0.3	8.0±0.3	8.0±0.30	8.0±0.3
D	3.5±0.05	3.5±0.05	3.5±0.05	3.5±0.05
E	1.75±0.1	1.75±0.1	1.75±0.1	1.75±0.1
F	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1
G	2.0±0.05	2.0±0.05	2.0±0.05	2.0±0.05
H	4.0±0.1	4.0±0.1	4.0±0.1	4.0±0.1
ΦJ	1.5±0.1	1.5±0.1	1.5±0.1	1.5±0.1
t(max)	0.95±0.05	0.95±0.05	1.1±0.05	0.95±0.05

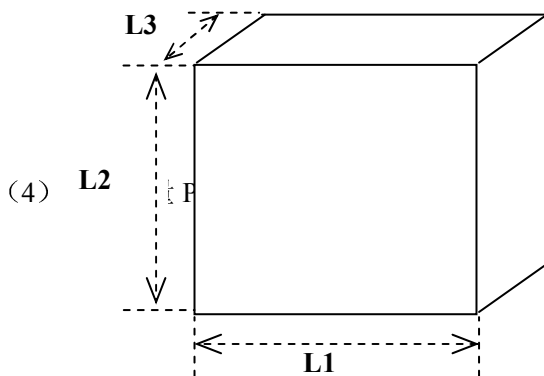
## (2) 带轮尺寸 Dimensions of Reel



A	178±2
B	60±2
C	13.0±0.5
D	21.0±0.8
E	2.0±0.5
W	10.0±1.0
t	1.1±0.3
R	1.0±0.25

Reel material: PS (Polystyrene)

## (3) 包装箱尺寸 Box and case dimensions



Type	L1	L2	L3
Box	185±3	192±3	63±3
Case	400±3	360±3	220±3

一盒五盘，一箱十盒

5

reels in a box, 10 boxes in a case.

型号 Type	产品厚度 Thickness(mm)	数量 Quantities(Pcs/Reel)	包装载带 (material)
1608	0.80±0.15	4000	纸带/塑带 Paper / Embossed carrier tape:
2012	0.85±0.20	3000/4000	纸带/塑带 Paper / Embossed carrier tape:
2520	0.90±0.20	3000	纸带/塑带 Paper / Embossed carrier tape:
3216	0.855±0.20	4000	纸带/塑带 Paper / Embossed carrier tape:

## 9 保管 Storage

### (1) 保管期限 Storage period

距恒科翔出厂检验时间六个月内，产品可以使用；若时间超出六个月，应检查焊接性能后方可使用。

Products which inspected in HUADE over 6 months ago should be examined and used, Solder ability should be checked if this period is exceeded.

### (2) 保管条件 Storage conditions

#### ① 存放货物的库房应满足以下条件

Products should be storage in the warehouse on the following conditions

温度 Temperature:  $\leq 40^{\circ}\text{C}$

湿度 Humidity :  $\leq 70\%$  relative humidity

不允许温、湿度有极剧变化。

No rapid change on temperature and humidity

#### ② 禁止将产品保管在腐蚀性物质中，例如硫磺、氯气或者酸，否则将引起端头氧化，导致降低焊接性。

Don't keep products in corrosive gases such as sulfur, chlorine gas or acid, or it may cause oxidization of electrode, resulting in poor solder ability.

#### ③ 为了避免受潮气、灰尘等物质的影响，产品应保管于货架上。

Products should be storage on the palette for the prevention of the influence from humidity, dust and so on.

#### ④ 产品保管在库房中时，应避免热冲击，振动以及直接光照等等。

Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.

#### ⑤ 产品应密封包装

Products should be storage under the airtight packaged condition.