

CUSTOMER: _____

日期 DATE: _____

纳入仕様书

SPECIFICATION

产品名称 PRODUCT NAME: 叠层片式铁氧体大电流电感

Multilayer Chip Ferrite Large Current Inductor

贵司料号 YOUR PART NO.: _____

敝司料号 OUR PART NO.: MGFL1608F Type

版本号 VERSION NO.: V1.2

接受 RECEPTION THE SPECIFICATION HAS BEEN ACCEPTED. 该纳入仕様书已被我司接受 日期: DATE: 公司: COMPANY:		
批准 CFMD	审核 CHKD	接收 RCVD

本纳入仕様书共 18 页

MANUFACTURING NAME

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目录 CATALOG

1	适用范围 Scope.....	4
2	品名构成 Product Identification.....	4
3	形状、尺寸和材料 Appearance, Dimensions and Material.....	4
4	测试条件 Testing Conditions.....	5
5	标称值 Rating.....	6
6	电气特性 Electrical Performance.....	7
7	信赖性试验 Reliable Performance.....	8
8	焊接条件 Recommended Soldering Conditions.....	10
9	清洗条件 Cleaning Conditions.....	12
10	包装 Packaging.....	13
11	装箱清单及标志 Packing documents and marking.....	15
12	保管 Storage.....	17
13	溴素系难燃剂的使用情况 Usage of Nonflammable Material.....	18
14	ODS 的使用情况 Usage of ODS.....	18
15	阻燃级别 Flammability Class.....	18
16	注意事项 Note.....	18

1 适用范围 Scope

本纳入仕様书适用于 MGFL 系列叠层片式铁氧体大电流电感。

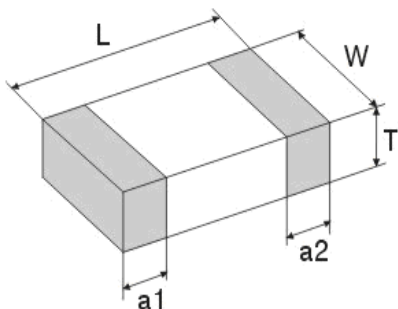
This specification applies to the MGFL series of multilayer chip ferrite Large Current inductors.

2 品名构成 Product Identification

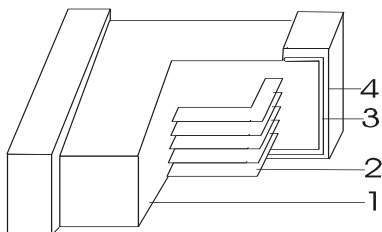
MGFL 1608 F 1R0 M T - LF
 ① ② ③ ④ ⑤ ⑥ ⑦

- ① 产品系列 Product Symbol
- ② 产品尺寸 Dimensions (见 3)
- ③ 基本材料代码 Material Code (铁氧体材料 F 等)
- ④ 电感量 Inductance Value (1R0: 1.0 μ H)
- ⑤ 允许容差 Inductance Tolerance (K: $\pm 10\%$; M: $\pm 20\%$; N: $\pm 30\%$)
- ⑥ 包装方式 (B: 散装; T: 盘装) Packaging Style (B:; Bulk; T: Tape & Reel)
- ⑦ 环保标识 Lead Free

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	1.60 \pm 0.15 [0.063 \pm 0.006]	0.80 \pm 0.15 [0.031 \pm 0.006]	0.80 \pm 0.15 [0.031 \pm 0.006]	0.30 \pm 0.20 [0.012 \pm 0.008]



	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 Japan
2	内导体 Internal Conductor	银 Ag	日本 Japan
3	端电极 Terminal Electrode	银 Ag	日本 Japan
4	端电极 Terminal Electrode	镍-锡 Ni-Sn	美国 USA

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>

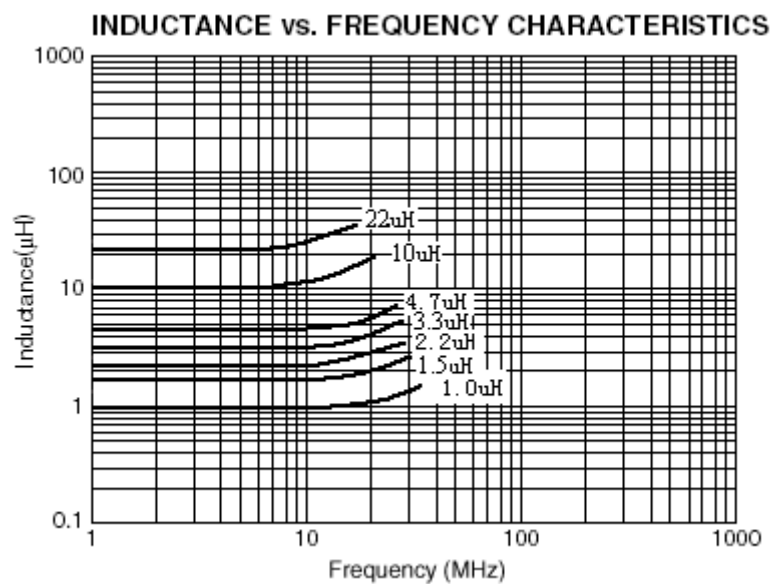
温度 Temperature : 20±2 °C
 湿度 Humidity : 60 to 75% RH
 大气压强 Atmospheric Pressure : 86 to 106 kPa

5 标称值 Rating

操作温度范围 Operating Temperature Range : -55 to +125°C

保存温度范围 Storage Temperature Range : -55 to +125°C

Customer Part No.	Microgate Part No.	Inductance (μH)	L Test Freq. (MHz)	SRF (MHz) min	RDC (Ω) ± 30%	IR* (mA) max
	MGFL1608F1R0MT-LF	1.0±20%	1	125	0.18	1000
	MGFL1608F1R5MT-LF	1.5±20%	1	109	0.22	800
	MGFL1608F2R2MT-LF	2.2±20%	1	90	0.30	700
	MGFL1608F3R3MT-LF	3.3±20%	1	70	0.40	600
	MGFL1608F4R7MT-LF	4.7±20%	1	50	0.50	500
	MGFL1608F100MT-LF	10±20%	1	33	0.60	400
	MGFL1608F150MT-LF	15±20%	1	20	0.90	220
	MGFL1608F220MT-LF	22±20%	1	15	1.00	200



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6 电气特性 Electrical Performance

6.1 电感量;Inductance;

按表 1 所列条件测量时，电感量应符合条款 5。

Inductance; 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
-----------------------------	--

6.3 额定电流 Rated current

IR*.基于产品温度上升的标准值:产品温度上升达到+40℃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 Impedance analyzer HP4291 or equivalent DC power HP6632 and Adapter HP16200
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6.4 焊接变化率 Variance after Soldering

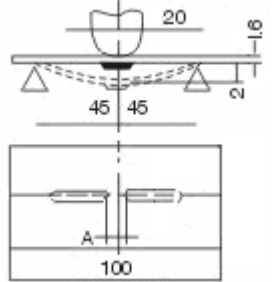
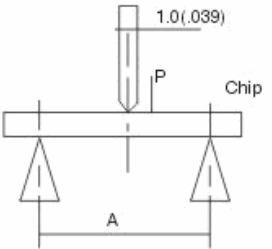
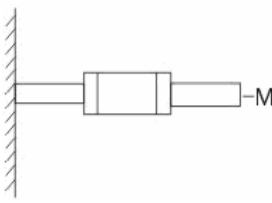
当经过焊接条件（255° C 浸锡 3.5 秒）后，电感量变化率：0.001μH ~ 10μH：±10%；
10μH ~ 220μH：±20%。

Inductance change shall be within 0.001μH ~ 10μH：±10%；10μH ~ 220μH：±20% and 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: 255°C+5°C/-0°C Flux 助焊剂: rosin 松香 Duration 浸渍时间: 3.5±0.5s						
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: 270°C+2°C/-0°C Flux 助焊剂: rosin 松香 Duration 浸渍时间: 10±0.5s						
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 inch) 当板弯曲挠度达 2mm 时: <table border="1" data-bbox="917 817 1181 918"> <thead> <tr> <th>Size</th> <th>A(mm)</th> </tr> </thead> <tbody> <tr> <td>1608</td> <td>0.7</td> </tr> </tbody> </table> 	Size	A(mm)	1608	0.7		
Size	A(mm)								
1608	0.7								
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" data-bbox="917 1198 1181 1299"> <thead> <tr> <th>Size</th> <th>A/mm</th> <th>P/N</th> </tr> </thead> <tbody> <tr> <td>1608</td> <td>1.0</td> <td>4.9</td> </tr> </tbody> </table> 	Size	A/mm	P/N	1608	1.0	4.9
Size	A/mm	P/N							
1608	1.0	4.9							
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" data-bbox="925 1590 1189 1713"> <thead> <tr> <th>Size</th> <th>Pull Strength</th> <th>Time (s)</th> </tr> </thead> <tbody> <tr> <td>1608</td> <td>5 N</td> <td>5±1</td> </tr> </tbody> </table> 	Size	Pull Strength	Time (s)	1608	5 N	5±1
Size	Pull Strength	Time (s)							
1608	5 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 焊接条件 Recommended Soldering Conditions

产品可用于波峰焊和回流焊

Product can be applied to flow and reflow soldering.

(1) 焊剂 Flux, Solder

- ① 使用松香助焊剂，禁止使用卤化物含量超过 0.2wt% 的强酸性助焊剂。

Use rosin-based flux. Don't use highly acidic flux with halide content exceeding 0.2wt% (chlorine conversion value).

- ② 使用纯锡焊料

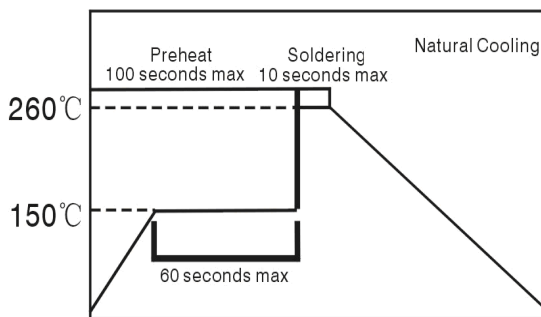
Use Sn solder.

(2) 波峰焊条件 Flow soldering conditions

- ① 预热时，产品表温与焊料温度的温差最大不允许超出 150℃，焊接完后冷却时，产品表温与溶剂温度之间的温差最大不允许超出 100℃。预热不足有可能引发产品表面裂纹，导致产品品质下降。

Pre-heating should be in such a way that the temperature difference between solder and product surface is limited to 150℃ max. Cooling into solvent after soldering also should be in such a way that temperature difference is limited to 100℃ max. Unwrought pre-heating may cause cracks on the product, resulting in the deterioration of products quality.

- ② 标准波峰焊曲线 Standard soldering profile.



预热 Pre-heating	150°C, 1 minute min
最高温度 Peak	260°C, 10 seconds max

(3) 回流焊条件 Reflow soldering conditions

Profile Feature	Lead-Free Assembly
Average Ramp-Up Rate (T _{max} to T _p)	3°C /second max.
Preheat - Temperature Min (T _{min}) - Temperature Max (T _{max}) - Time (t _{min} to t _{max}) min to t _{max})	150 °C 200 °C 60-180 seconds

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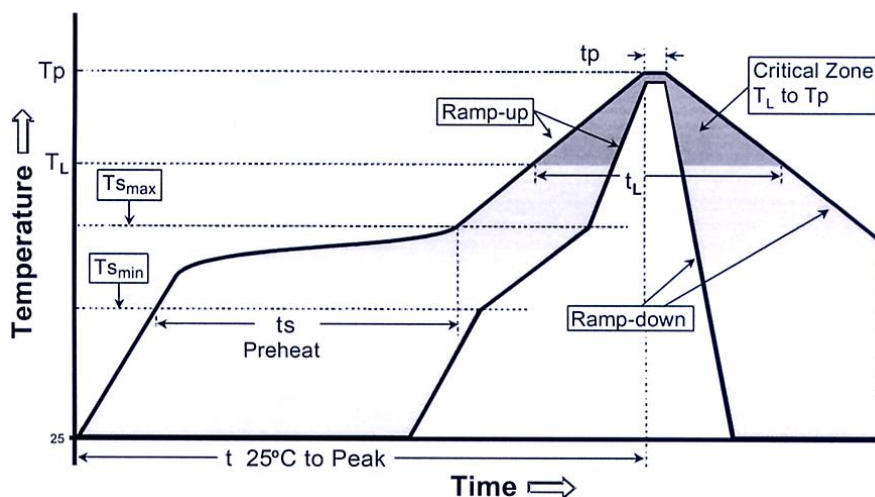
传真(Fax): 0755-28085605

邮编(Postcode): 518110

Profile Feature	Lead-Free Assembly
Time maintained above: - Temperature (TL) - Time (tL)	217 °C 60-150 seconds
Peak/Classification Temperature (Tp) Peak/Classification Time (Tp)	260 °C 3-4 seconds
Time within 5 °C of actual Peak Temperature (tp)	20-40 seconds
Ramp-Down Rate	6 °C/second max.
Time 25 °C to Peak Temperature	8 minutes max.

Note 1: All temperatures refer to topside of the package, measured on the package body surface.

标准回流焊曲线 Standard soldering profile



(4) 手工返工 Reworking with soldering iron

当使用电烙铁进行手工焊接时，以下条件必须严格遵守

The following conditions must be strictly followed when using a soldering iron.

预热 Pre-heating	150°C, 1 minute
尖端温度 Tip temperature	350°C max
输出功率 Soldering iron output	80w max
电烙铁头尖端尺寸 End of soldering iron	φ 1mm max
焊接时间 Soldering time	3 seconds max

