承　认　书

SPECIFICATION FOR APPROVAL

客户名称：
CUSTOMER：

产品名称　叠层片式陶瓷电感
PARTNAME：　Multilayer Chip Ceramic Inductor
产品规格：　TCGL1005B 系列
SPECIFICATION：

承认书编号：
APPROVAL SHEET NO.：　DRAAW202A/0
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产 品 标 准 书 SPECIFICATIONFOR APPROVAL	编 号 Document No.
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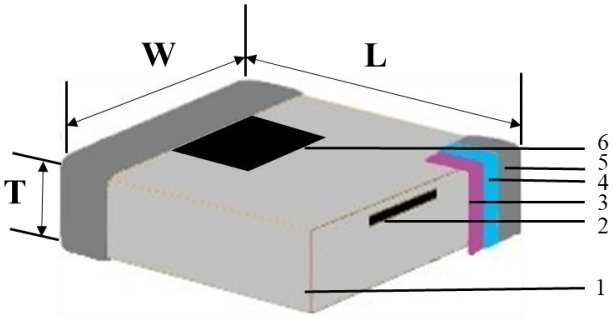
目录

1. 特性 Features

（1）高频电路使用的电感器
（2）封闭式的结构设计，具有高可靠性
（3）工作温度范围：-55~ +125℃
(1)Inductors used in high frequency circuits
(2)Closed structure design with high reliability
(3)Operating temperature range：-55~ +125℃

2.产品结构 Product Frame



序号 Number	名称 Name
1	陶瓷介质 Ceramic
2	内电极 Inner electrode
3	外电极 External electrode
4	镍层 Nickel coating
5	锡层 Tin coating
6	标记 Mark

3.产品规格型号命名规则 General Product Parts Numbering System

(例) (example)

TCGL 1005 B 10N J A T

系列名称
Product Name

尺寸
Chip Size
规格 Type=L×W
1005=1.00×0.50mm

产品类别
Product Code
B：不补偿
C：补偿
B: No compensation
C：Compensation

电感值
Inductance
1N5=1.5nH
10N=10nH
R10=100nH
R=decimal point
N=nH

电感容差
Inductance Tolerance
B=±0.1nH
C=±0.2nH
S=±0.3nH
H=±3%
J=±5%
K=±10%

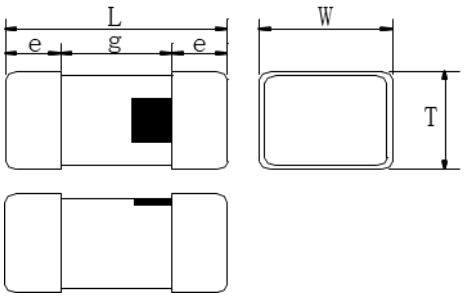
厚度
Thickness
A=0.50±0.05mm

包装形式
Packing
T: 编带
B: 袋式散装
T: Tape Carrier
B: Bulk Packing

4.产品尺寸 Dimensions

规格： 1005

Chip Size： 1005



规格 Type	L(mm)	W(mm)	T(mm)	e(mm)	g min(mm)
1005	1.00±0.05	0.50±0.05	0.50±0.05	0.25±0.10	0.4

5.型号一览 Part Numbers

5.1 特性规格表 Specifications

规格型号	L 值		Q 值	L/ Q 测定频率	典型 Q 值			自共振频率	直流电阻	额定电流
	标称值	容差								
Part Number	Nominal Value	Tolerance	Q Factor	L/ Q Test Freq.	Typical Q @ Freq.			Self-resonant Frequency	DC.Resistance	Rated Current
					100	800	1000			
—	(nH)	—	min.	(MHz)	(MHz)			(MHz)min.	(Ω)max.	(mA)
TCGL1005B0N6BAT	0.6	±0.1 nH	4	100	6	35	41	10000	0.10	800
TCGL1005B0N6CAT	0.6	±0.2 nH	4	100	6	35	41	10000	0.10	800
TCGL1005B0N6SAT	0.6	±0.3 nH	4	100	6	35	41	10000	0.10	800
TCGL1005B1N0BAT	1.0	±0.1 nH	8	100	11	34	36	10000	0.10	400
TCGL1005B1N0CAT	1.0	±0.2 nH	8	100	11	34	36	10000	0.10	400
TCGL1005B1N0SAT	1.0	±0.3 nH	8	100	11	34	36	10000	0.10	400
TCGL1005B1N1BAT	1.1	±0.1 nH	8	100	11	34	36	10000	0.10	400
TCGL1005B1N1CAT	1.1	±0.2 nH	8	100	11	34	36	10000	0.10	400
TCGL1005B1N1SAT	1.1	±0.3 nH	8	100	11	34	36	10000	0.10	400
TCGL1005B1N2BAT	1.2	±0.1 nH	8	100	11	34	36	10000	0.10	400
TCGL1005B1N2CAT	1.2	±0.2 nH	8	100	11	34	36	10000	0.10	400
TCGL1005B1N2SAT	1.2	±0.3 nH	8	100	11	34	36	10000	0.10	400
TCGL1005B1N3BAT	1.3	±0.1 nH	8	100	11	34	36	8000	0.10	400
TCGL1005B1N3CAT	1.3	±0.2 nH	8	100	11	34	36	8000	0.10	400
TCGL1005B1N3SAT	1.3	±0.3 nH	8	100	11	34	36	8000	0.10	400
TCGL1005B1N5BAT	1.5	±0.1 nH	8	100	11	34	36	6000	0.10	400
TCGL1005B1N5CAT	1.5	±0.2 nH	8	100	11	34	36	6000	0.10	400
TCGL1005B1N5SAT	1.5	±0.3 nH	8	100	11	34	36	6000	0.10	400
TCGL1005B1N6BAT	1.6	±0.1 nH	8	100	11	32	35	6000	0.12	300
TCGL1005B1N6CAT	1.6	±0.2 nH	8	100	11	32	35	6000	0.12	300
TCGL1005B1N6SAT	1.6	±0.3 nH	8	100	11	32	35	6000	0.12	300
TCGL1005B1N8BAT	1.8	±0.1 nH	8	100	11	30	34	6000	0.15	300

TCGL1005B1N8CAT	1.8	±0.2 nH	8	100	11	30	34	6000	0.15	300
TCGL1005B1N8SAT	1.8	±0.3 nH	8	100	11	30	34	6000	0.15	300
TCGL1005B2N0BAT	2.0	±0.1 nH	8	100	10	29	33	6000	0.20	300
TCGL1005B2N0CAT	2.0	±0.2 nH	8	100	10	29	33	6000	0.20	300
TCGL1005B2N0SAT	2.0	±0.3 nH	8	100	10	29	33	6000	0.20	300
TCGL1005B2N2BAT	2.2	±0.1 nH	8	100	10	29	33	6000	0.20	300
TCGL1005B2N2CAT	2.2	±0.2 nH	8	100	10	29	33	6000	0.20	300
TCGL1005B2N2SAT	2.2	±0.3 nH	8	100	10	29	33	6000	0.20	300
TCGL1005B2N4BAT	2.4	±0.1 nH	8	100	10	29	32	6000	0.20	300
TCGL1005B2N4CAT	2.4	±0.2 nH	8	100	10	29	32	6000	0.20	300
TCGL1005B2N4SAT	2.4	±0.3 nH	8	100	10	29	32	6000	0.20	300
TCGL1005B2N7BAT	2.7	±0.1 nH	8	100	10	29	32	6000	0.20	300
TCGL1005B2N7CAT	2.7	±0.2 nH	8	100	10	29	32	6000	0.20	300
TCGL1005B2N7SAT	2.7	±0.3 nH	8	100	10	29	32	6000	0.20	300
TCGL1005B3N0BAT	3.0	±0.1 nH	8	100	10	29	32	5500	0.20	300
TCGL1005B3N0CAT	3.0	±0.2 nH	8	100	10	29	32	5500	0.20	300
TCGL1005B3N0SAT	3.0	±0.3 nH	8	100	10	29	32	5500	0.20	300
TCGL1005B3N3BAT	3.3	±0.1 nH	8	100	10	29	32	5000	0.20	300
TCGL1005B3N3CAT	3.3	±0.2 nH	8	100	10	29	32	5000	0.20	300
TCGL1005B3N3SAT	3.3	±0.3 nH	8	100	10	29	32	5000	0.20	300
TCGL1005B3N6BAT	3.6	±0.1 nH	8	100	10	28	31	4000	0.20	300
TCGL1005B3N6CAT	3.6	±0.2 nH	8	100	10	28	31	4000	0.20	300
TCGL1005B3N6SAT	3.6	±0.3 nH	8	100	10	28	31	4000	0.20	300
TCGL1005B3N9BAT	3.9	±0.1 nH	8	100	10	28	31	4000	0.20	300
TCGL1005B3N9CAT	3.9	±0.2 nH	8	100	10	28	31	4000	0.20	300
TCGL1005B3N9SAT	3.9	±0.3 nH	8	100	10	28	31	4000	0.20	300
TCGL1005B4N3BAT	4.3	±0.1 nH	8	100	10	28	31	4000	0.20	300
TCGL1005B4N3CAT	4.3	±0.2 nH	8	100	10	28	31	4000	0.20	300
TCGL1005B4N3SAT	4.3	±0.3 nH	8	100	10	28	31	4000	0.20	300
TCGL1005B4N7BAT	4.7	±0.1 nH	8	100	10	28	31	4000	0.25	300
TCGL1005B4N7CAT	4.7	±0.2 nH	8	100	10	28	31	4000	0.25	300
TCGL1005B4N7SAT	4.7	±0.3 nH	8	100	10	28	31	4000	0.25	300
TCGL1005B5N1BAT	5.1	±0.1 nH	8	100	10	28	31	4000	0.30	300
TCGL1005B5N1CAT	5.1	±0.2 nH	8	100	10	28	31	4000	0.30	300
TCGL1005B5N1SAT	5.1	±0.3 nH	8	100	10	28	31	4000	0.30	300
TCGL1005B5N6BAT	5.6	±0.1 nH	8	100	10	28	31	4000	0.30	300
TCGL1005B5N6CAT	5.6	±0.2 nH	8	100	10	28	31	4000	0.30	300
TCGL1005B5N6SAT	5.6	±0.3 nH	8	100	10	28	31	4000	0.30	300
TCGL1005B6N2BAT	6.2	±0.1 nH	8	100	10	27	30	3900	0.30	300
TCGL1005B6N2CAT	6.2	±0.2 nH	8	100	10	27	30	3900	0.30	300
TCGL1005B6N2SAT	6.2	±0.3 nH	8	100	10	27	30	3900	0.30	300
TCGL1005B6N8HAT	6.8	±3%	8	100	10	27	30	3500	0.30	300
TCGL1005B6N8JAT	6.8	±5%	8	100	10	27	30	3500	0.30	300
TCGL1005B7N5HAT	7.5	±3%	8	100	10	27	30	3000	0.40	300

TCGL1005B7N5JAT	7.5	±5%	8	100	10	27	30	3000	0.40	300
TCGL1005B8N2HAT	8.2	±3%	8	100	10	27	30	3000	0.40	300
TCGL1005B8N2JAT	8.2	±5%	8	100	10	27	30	3000	0.40	300
TCGL1005B9N1HAT	9.1	±3%	8	100	10	27	30	3000	0.40	300
TCGL1005B9N1JAT	9.1	±5%	8	100	10	27	30	3000	0.40	300
TCGL1005B10NHAT	10	±3%	8	100	10	27	30	2500	0.40	300
TCGL1005B10NJAT	10	±5%	8	100	10	27	30	2500	0.40	300
TCGL1005B12NHAT	12	±3%	8	100	10	26	29	2500	0.50	300
TCGL1005B12NJAT	12	±5%	8	100	10	26	29	2500	0.50	300
TCGL1005B15NHAT	15	±3%	8	100	10	26	28	2200	0.55	300
TCGL1005B15NJAT	15	±5%	8	100	10	26	28	2200	0.55	300
TCGL1005B18NHAT	18	±3%	8	100	10	25	27	2000	0.60	300
TCGL1005B18NJAT	18	±5%	8	100	10	25	27	2000	0.60	300
TCGL1005B20NHAT	20	±3%	8	100	10	25	26	1900	0.60	300
TCGL1005B20NJAT	20	±5%	8	100	10	25	26	1900	0.60	300
TCGL1005B22NHAT	22	±3%	8	100	10	25	25	1700	0.70	300
TCGL1005B22NJAT	22	±5%	8	100	10	25	25	1700	0.70	300
TCGL1005B27NHAT	27	±3%	8	100	10	25	23	1600	0.80	300
TCGL1005B27NJAT	27	±5%	8	100	10	25	23	1600	0.80	300
TCGL1005B33NHAT	33	±3%	8	100	10	22	22	1300	0.90	200
TCGL1005B33NJAT	33	±5%	8	100	10	22	22	1300	0.90	200
TCGL1005B39NHAT	39	±3%	8	100	10	22	19	1200	1.00	200
TCGL1005B39NJAT	39	±5%	8	100	10	22	19	1200	1.00	200
TCGL1005B43NHAT	43	±3%	8	100	10	21	16	1100	1.10	200
TCGL1005B43NJAT	43	±5%	8	100	10	21	16	1100	1.10	200
TCGL1005B47NHAT	47	±3%	8	100	10	21	16	1000	1.20	200
TCGL1005B47NJAT	47	±5%	8	100	10	21	16	1000	1.20	200
TCGL1005B56NHAT	56	±3%	8	100	10	18	13	750	1.30	200
TCGL1005B56NJAT	56	±5%	8	100	10	18	13	750	1.30	200
TCGL1005B68NHAT	68	±3%	8	100	10	18	9	750	1.50	180
TCGL1005B68NJAT	68	±5%	8	100	10	18	9	750	1.50	180
TCGL1005B82NHAT	82	±3%	8	100	10	13	-	700	2.40	150
TCGL1005B82NJAT	82	±5%	8	100	10	13	-	700	2.40	150
TCGL1005BR10HAT	100	±3%	8	100	10	12	-	700	2.60	150
TCGL1005BR10JAT	100	±5%	8	100	10	12	-	700	2.60	150
TCGL1005BR12HAT	120	±3%	8	100	10	-	-	600	2.80	150
TCGL1005BR12JAT	120	±5%	8	100	10	-	-	600	2.80	150
TCGL1005BR15HAT	150	±3%	8	100	10	-	-	550	3.50	100
TCGL1005BR15JAT	150	±5%	8	100	10	-	-	550	3.50	100
TCGL1005BR18HAT	180	±3%	8	100	10	-	-	500	3.80	100
TCGL1005BR18JAT	180	±5%	8	100	10	-	-	500	3.80	100
TCGL1005BR22HAT	220	±3%	8	100	12	-	-	450	4.20	100
TCGL1005BR22JAT	220	±5%	8	100	12	-	-	450	4.20	100
TCGL1005BR27HAT	270	±3%	8	100	12	-	-	400	4.80	100

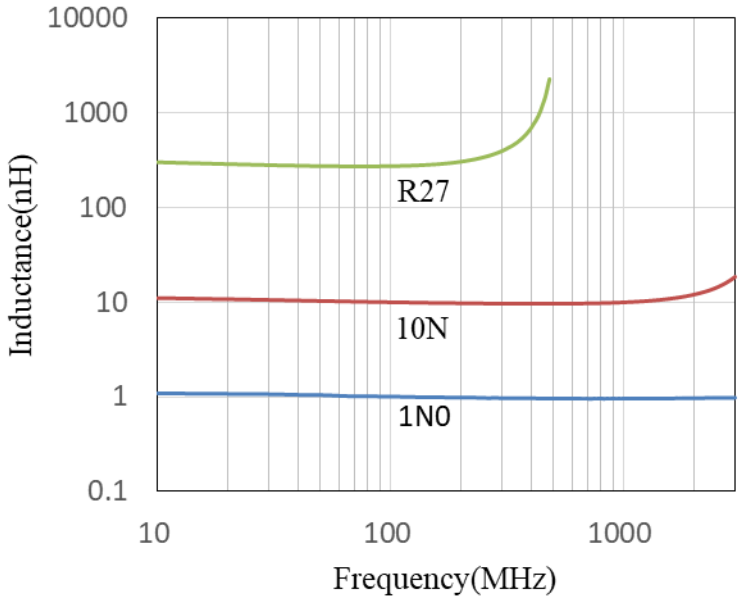
TCGL1005BR27JAT	270	±5%	8	100	12	-	-	400	4.80	100

备注：短路块的残留电感值=0.0 nH。

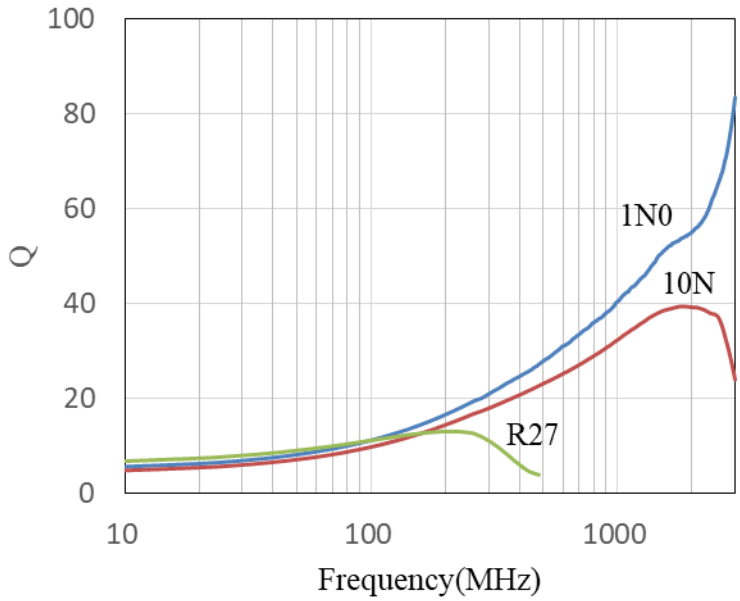
Note: Residual inductance of short chip=0.0 nH.

5.2 典型电性能特性 Typical Electrical Characteristics

5.2.1 L 值频率特性 Inductance vs. Frequency Characteristics



5.2.2 Q 值频率特性 Q vs. Frequency Characteristics



6.技术要求和测试条件 Specification and Test Condition

6.1 外观 Appearance

系列名称 Product Name	技术要求 Specification	测试条件 Testing Condition
TCGL	l≤1/8L,w≤1/8W,t≤1/8T （任意一项不符合，均判定不合格） l≤1/8L,w≤1/8W,t≤1/8T (None is acceptable，All judged unqualified)	目视检查 Visual inspection.

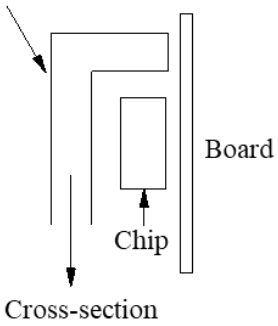
6.2 尺寸 Dimensions

系列名称 Product Name	技术要求 Specification	测试条件 Testing Condition
TCGL	在要求的范围内 Within the specified dimensions	使用游标卡尺 Using vernier caliper

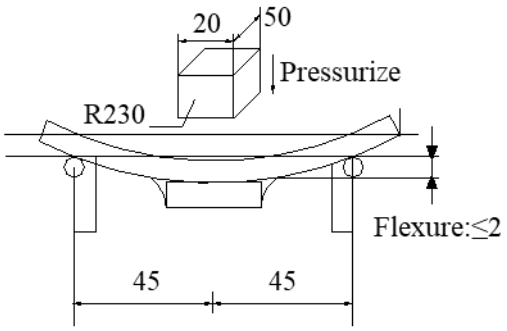
6.3 电性能 Electrical Performances

系列名称 Product Name	电性能 Electrical Performance	测试条件 Testing Condition
TCGL	L 值 Inductance	测试仪器：Keysight E4991A（夹具 Keysight 16197A）或同等级其它设备 Measuring equipment: Keysight E4991A （Measuring fixture: Keysight 16197A）or the equivalent 测试频率： 0.3~270nH : 100MHz 300~390nH : 50MHz Measuring frequency: 0.3~270nH : 100MHz 300~390nH : 50MHz
	Q 值 Q factor	
	直流电阻 DC.Resistance	测试仪器：Aglient 4338B 或同等级其它设备 Measuring equipment: Aglient 4338B or the equivalent
	自共振频率 Self-resonant frequency	测试仪器：Keysight N5230A\E4991A 或同等级其它设备 Measuring equipment: Keysight N5230A\E4991A or the equivalent
	额定电流 Rated current	测试仪器：Ans JS-155D 或同等级其它设备 Measuring equipment: Ans JS-155D or the equivalent

6.4 附着力 Adhesion

系列名称 Product Name	技术要求 Specification	测试条件 Testing Condition
TCGL	端电极无松动，也无其它不良现象 No removal of the terminations or other defect shall occur.	施加 5N 的压力，并保持 10(＋1)s The pressurizing force shall be 5N and the duration of application shall be 10(＋1)sec. 

6.5 抗弯曲 Resistance to Flexure

系列名称 Product Name	技术要求 Specification	测试条件 Testing Condition
TCGL	无明显可见损伤 No remarkable visual damage	1、测试板：玻璃纤维环氧树脂板（100mm*40mm*0.8mm） 2、弯曲量 ：2mm 3、施力速度：0.5mm/s 4、保持时间：30s Test substrate: glass-epoxy substrate（100mm*40mm*0.8mm） Deflection:2mm Pressurizing speed:0.5mm/s Holding time: 30s 

6.6 振动 Vibration

系列名称 Product Name	技术要求 Specification	测试条件 Testing Condition
TCGL	无明显可见损伤 L 值变化在±10%以内 No remarkable visual damage L change: within ±10%	振动频率：10~55~10Hz,振动周期 1min 振幅：1.5mm 测试时间：三个方向振动，每个方向振动 2h，共计 6h Oscillation frequency: 10 Hz to 55 Hz to 10 Hz, for approx. 1 min Total amplitude: 1.5 mm Test time: 3 directions perpendicular to each other, 2h for each direction (6 h in total)

6.7 可焊性 Solderability of Termination

系列名称 Product Name	技术要求 Specification	测试条件 Testing Condition
TCGL	端电极挂锡面积不小于 95%，针孔或粗糙面积小于 5% 95% min. coverage of both terminal electrodes and less than 5% have pin holes or rough spots.	助焊剂：浸入含有 25（wt）%的松香的乙醇助焊剂中 5-10s 预处理：高温 150±10℃，1-1.5min 焊接温度: 240±5℃ 浸入时间： 3±1 秒 两侧端电极完全浸入焊锡炉 Flux: immersed in ethanol solution with a rosin content of 25(wt)% for 5 s to 10 s Pre-heating: 150℃±10℃/1 min to 1.5 min Solder temperature: 240±5℃ Dipping time: 3±1 seconds. Completely soak both terminal electrodes in solder

6.8 耐焊接热 Resistance to Soldering Heat

系列名称 Product Name	技术要求 Specification	测试条件 Testing Condition
TCGL	无明显可见损伤 L 值变化在±10%以内 No remarkable visual damage L change: within ±10%	助焊剂：浸入含有 25（wt）%的松香的乙醇助焊剂中 5-10s 预处理：高温 150±10℃，1-2min 焊接温度：260±5℃ 浸入时间： 10±1 秒 后处理：试验后，在标准状态*下放置 24±2h Flux: immersed in ethanol solution with a rosin content of 25(wt)% for 5 s to 10 s Pre-heating: 150℃±10℃/1 min to 2 min Soldering temperature: 260±5℃ Dipping time: 10±1 seconds. Post-treatment: left at a room condition for 24 h±2 h

6.9 温度快速循环 Temperature Cycle

系列名称 Product Name	技术要求 Specification	测试条件 Testing Condition
TCGL	无明显可见损伤 L 值变化在±10%以内 Q 值变化在±20%以内 No remarkable visual damage L change: within ±10% Q change: within ±20%	按下列步骤进行 100 次循环： To perform 100 cycles of the stated environment

步骤 Step	温度 Temperature	时间 Time
1	-55℃（+0℃,-3℃）	30min
2	25℃	2~3 min
3	125℃（+3℃,-0℃）	30 min
4	25℃	2~3 min

后处理：试验后，在标准状态下放置 24±2h
Post-treatment: left at a room condition for 24 h±2 h

6.10 稳态湿热 Moisture Resistance （Steady state）

系列名称 Product Name	技术要求 Specification	测试条件 Testing Condition
TCGL	无明显可见损伤 L 值变化在±10%以内 Q 值变化在±20%以内 No remarkable visual damage L change: within ±10% Q change: within ±20%	测试温度： 40±2℃ 湿度： 90~95% RH 测试时间：1000h（+48h,-0h） 后处理：试验后，在标准状态下放置 24±2h Test temperature: 40±2℃ Humidity: 90~95% RH Testing time: 1000h（+48h,-0h） Post-treatment: left at a room condition for 24 h±2 h

6.11 耐湿负荷 Damp Heat with Load

系列名称 Product Name	技术要求 Specification	测试条件 Testing Condition
TCGL	无明显可见损伤 L 值变化在±10%以内 Q 值变化在±20%以内 No remarkable visual damage L change: within ±10% Q change: within ±20%	测试温度： 40±2℃ 湿度： 90~95% RH 负载电流：额定电流 测试时间：1000h（+48h,-0h） 后处理：试验后，在标准状态下放置 24±2h Test temperature: 40±2℃ Humidity: 90~95% RH Applied current: rated current Testing time: 1000h（+48h,-0h） Post-treatment: left at a room condition for 24 h±2 h

6.12 耐久性 Life Test

系列名称 Product Name	技术要求 Specification	测试条件 Testing Condition
TCGL	无明显可见损伤 L 值变化在±10%以内 Q 值变化在±20%以内 No remarkable visual damage L change: within ±10% Q change: within ±20%	测试温度： 125±2℃ 负载电流：额定电流 测试时间：1000h（+48h,-0h） 后处理：试验后，在标准状态下放置 24±2h Test temperature: 125±2℃ Applied current: rated current Testing time: 1000h（+48h,-0h） Post-treatment: left at a room condition for 24 h±2 h

备注：标准状态*为温度 15℃-35℃、相对湿度 25%-85%。测试结果如有疑问场合，以温度 20±2℃、相对湿度 60%-70%为测试状态。如无特殊指定要求，所有试验均在“标准状态”下实施。

7.产品包装 Packing

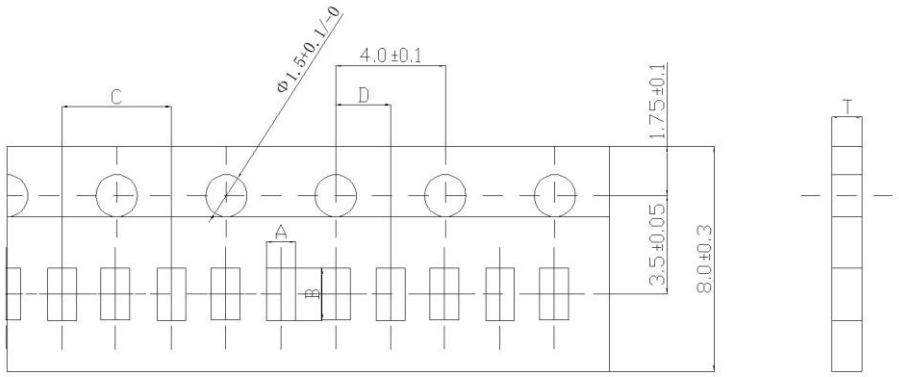
7.1 袋式散装 Bulk Packing

10,000 个/袋或按客户要求。Standard packing 10,000pcs/bag; others are according to customer request.

7.2 编带式包装 Tape Packing

规格 Type	尺寸 Size (mm)			编带数量(个/盘 pcs/reel)
	长度 L	宽度 W	厚度 T	纸带 Paper Tape
1005	1.00±0.05	0.50±0.05	0.50±0.05	10,000

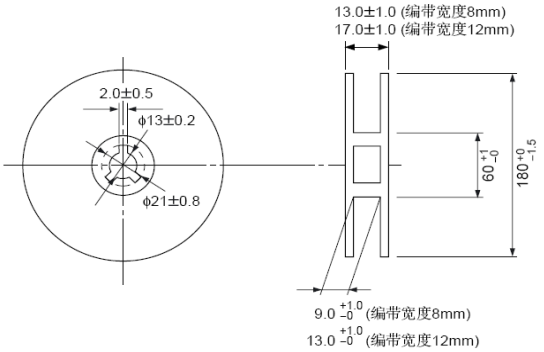
7.3 纸带尺寸 Dimensions of Packing Paper



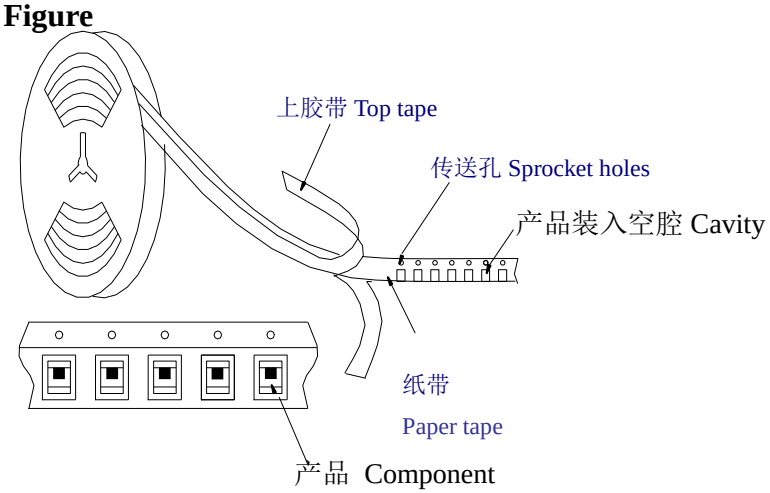
Type	A	B	C	D	T
1005	0.65±0.10	1.15±0.10	4.0±0.1	2.0±0.05	0.8max

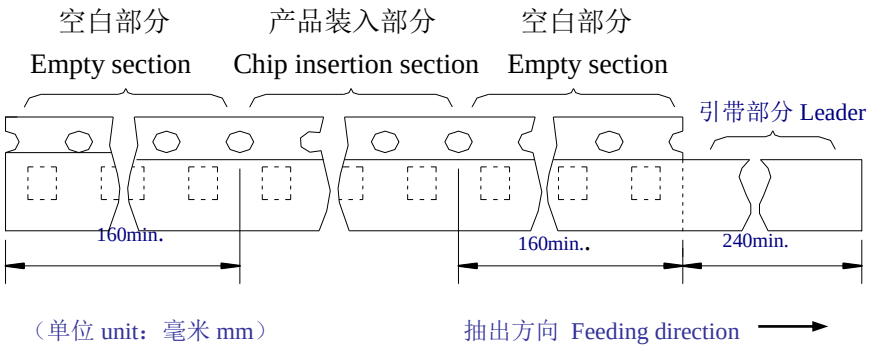
(单位 unit:毫米 mm)

7.4 编带盘尺寸 Dimensions of Reel



7.5 编带方式 Taping Figure



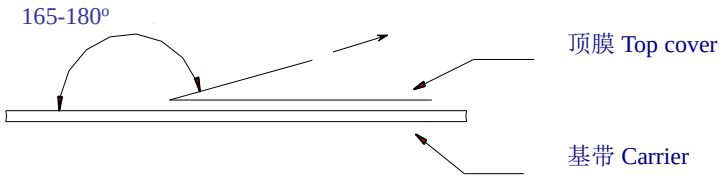


7.6 编带方法 Taping Method

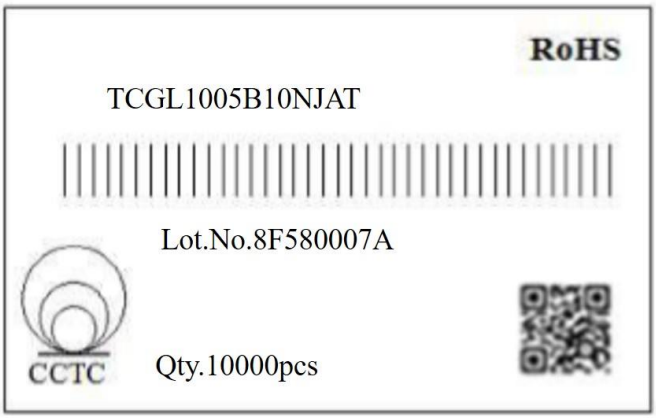
① 包装电感器的编带是顺时针卷绕的，由上往下的方向拉出编带时，传送孔处于编带的右侧。
② 在编带的前端，至少留出 5 个间距的引出带。
③ 在编带时，必须按下图留出引带部分或空白部分。
④ 在盘带的安装中的产品装错的数量每盘必须小于表示数量的 0.1%或 1 个为限，不连续发生错误。
⑤ 上胶带和下胶带不应超出编带的边缘，不能挡住传送孔。
⑥ 传送孔的累计误差为 10 个间距：±0.3 毫米以内。
⑦ 上胶带的剥离力矩应在 0.1 至 0.6 牛顿以内，其方向如下图所示。

① Tapes for inductors are wound clockwise. The sprocket holes are to the right as the tape is pulled toward the user.
② The top tape and base tape are not attached at the end of the tape for a minimum of 5 pitches.
③ Part of the leader and part of the empty tape shall be attached to the end of the tape as follows.

④ Missing inductors number within 0.1% of the number per reel or 1pc, whichever is greater, and are not continuous.
⑤ The top tape and bottom tape shall not protrude beyond the edges of the tape and shall not cover sprocket holes.
⑥ Cumulative tolerance of sprocket holes, 10 pitches: ±0.3mm.
⑦ Peeling off force: 0.1 to 0.6N in the direction shown down.



7.7 产品标签 Reel Label



（1）标签内容 The Contents of Label

TCGL	1005	B	10N	J	A	T
①	②	③	④	⑤	⑥	⑦

①常规叠层片式陶瓷电感代号 Code of General Multilayer Chip Ceramic Inductor
②尺寸 Chip size
③产品类别 Product Code
④电感值 Inductance
⑤电感容差 Inductance Tolerance
⑥厚度 Thickness
⑦包装 Packing

（2）产品批号 Lot.No.:8F580007A
（3）数量 Qty: 10000pcs
（4）RoHS:绿色物料 GREEN PARTS

7.8 外包装 Package

7.8.1 包装箱 Carton

（1）包装箱尺寸 Carton Size

L	W	H
41.0±3cm	38.5±3cm	20.2±3cm

（2）数量 Quantity

600Kpcs /箱 The Quantity: 600Kpcs /one carton
1 内包装盒=100,000PCS 1 Inner Box =100,000PCS
1 包装箱 =100,000PCS ×6 包装盒=600,000PCS 1 Carton =100,000PCS ×6Box=600,000PCS

RoHS 标识(根据客户要求张贴) RoHS Sign（According to customer request）

7.8.2 内包装盒 Inner Box

（1）包装盒尺寸 Size

L	W	H
18±1cm	18.5±1cm	11.8±1cm

（2）数量 Quantity

100Kpcs /盒 100Kpcs / Inner Box

1 盘=10000PCS 1 Reel=10,000PCS

1 包装盒=10,000PCS ×10 盘 =100,000PCS 1 Inner Box =10,000PCS ×10Reel =100,000PCS

8.MLCI 使用注意事项 Precautions on the Use of MLCI

8.1 电路板设计 PCB Design

8.1.1 电路板图案设计 Design of Land-patterns

下面图和表格给出了部分推荐的设计图案，可以防止安装时焊锡量过多。同时也给出了不正确的图案。

The following diagrams and tables show some examples recommended patterns to prevent excessive solder amounts (larger fillets which above the component end terminations)

Examples of improper pattern designs are also shown.

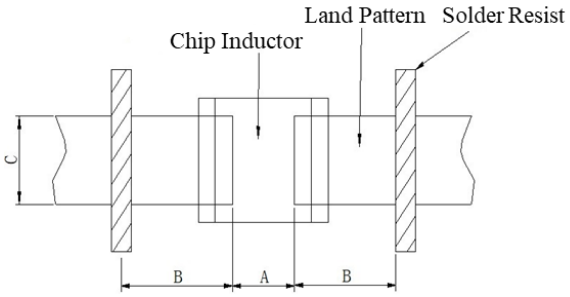
电路板设计推荐图案尺寸：

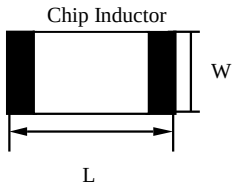
Recommended land dimensions for a typical chip inductor land patterns for PCBs

波峰焊接时推荐设计的尺寸 (单位: mm)：

Recommended land dimensions for wave-soldering (unit: mm)

规格 SIZE		1608	2125	3216
尺寸	L	1.6	2.0	3.2
	W	0.8	1.25	1.6
A		0.8~1.0	1.0~1.4	1.8~2.5
B		0.5~0.8	0.8~1.5	0.8~1.7
C		0.6~0.8	0.9~1.2	1.2~1.6





再流焊接时推荐设计的尺寸 (单位: mm)

Recommended land dimensions for reflow-soldering (unit: mm)

规格 SIZE		0603	1005
尺寸	L	0.60	1.00
	W	0.30	0.50

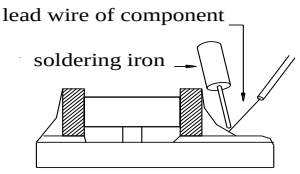
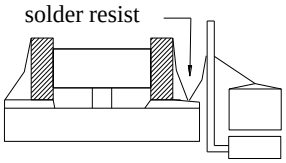
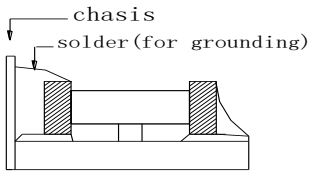
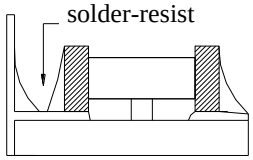
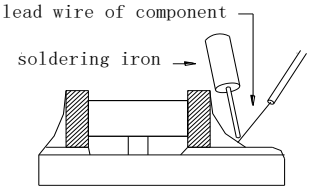
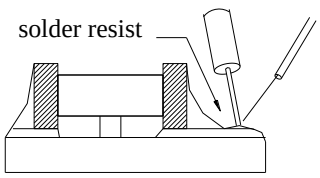
A	0.20~0.25	0.35~0.45
B	0.20~0.30	0.40~0.50
C	0.25~0.35	0.45~0.55

过量的焊锡会影响产品抵抗机械应力的能力，因此在设计图案时应引起注意。

Excess solder can affect the ability of chips to withstand mechanical stresses. Therefore, please take proper precautions when designing land-patterns.

在应用中一些焊接好与坏的情况：

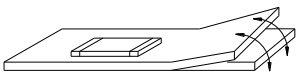
Examples of good and bad solder application:

项目 Item	不推荐结构 Not recommended	推荐结构 Recommended
片状元件和带引线的元件的混合焊接 Mixed mounting of SMD and leaded component		
靠近底座的焊接 Component placement close to the chassis		
在片状元件附近带引线元件的焊接 Hand-soldering of leaded components near mounted components		

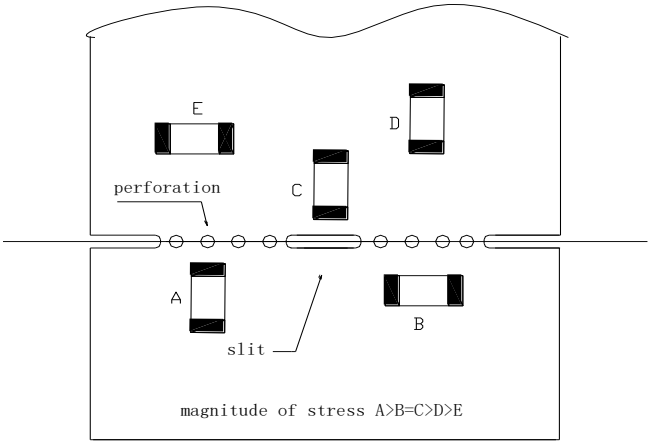
8.1.2 图案结构 Pattern Configurations

下面是电感器安装好与坏的例子。选择贴装位置，应尽可能减小电路板在弯曲时受到的机械应力。

The following are examples of good and bad inductor layout, SMD inductors should be located to minimize any possible mechanical stresses from board warp or deflection.

	不推荐结构 Not recommended	推荐结构 Recommended
电路板弯曲 Deflection of the board		

对于电路板分拨的电感器，在分拨时受到的机械应力大小与电感器的安装有关。下面推荐了一些好的设计。To layout the inductors for the breakaway PC board, it should be noted that the amount of mechanical stresses given depending on inductor layout. The example below shows recommendations for better design.



在沿着分拨线分拨电路板时，对产品施加的机械应力与使用的方法关系很大。分折电路板时片状元件受到的疲劳按照如下顺序增大：分折、剪切、V 型槽、穿孔。因此，贴装时应该考虑电路板的分拨过程。

When breaking PC boards along their perforations, the amount lf mechanical stress on the inductors can vary according to the method used. The following methods are listed in order from least stressful to most stressful: push-back, silt, -grooving, and perforation. Thus, any ideal SMD inductor layout must also consider the PCB splitting procedure.

8.2 自动贴装注意事项 Considerations for Automatic Placement

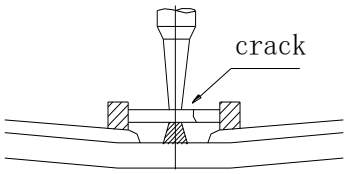
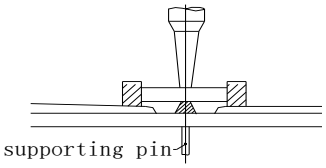
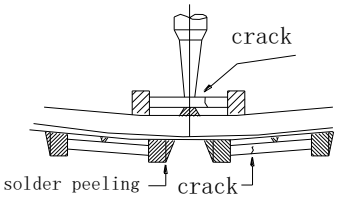
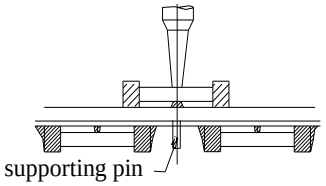
8.2.1 贴装机的调整 Adjustment of Mounting Machine

（1）产品在电路板贴装时，不应该受到过大的冲击。

（2）必须定期对吸头和定位爪进行检查、维修和更换

(1)Excessive impact load should not be imposed on the inductors when mounting the PC boards.

(2)The maintenance and inspection of the mounters should be conducted periodically.

	不推荐结构 Not recommended	推荐结构 Recommended
单面贴装 Single-sided mounting		
双面贴装 Double-sided mounting		

8.3 推荐焊接曲线 Recommended Soldering Profile

8.3.1 说明 Explanation

（1）产品推荐使用回流焊接工艺；

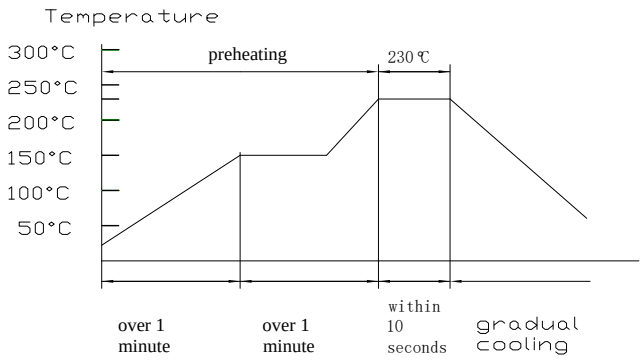
（2）大尺寸产品适用于回流焊接工艺

(1) Reflow soldering is recommended;

(2) Reflow soldering is suitable for bigger size MLCI

8.3.2 锡铅焊接曲线 Recommended Sn&Pb Soldering Profile

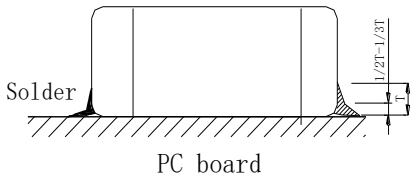
（1）回流焊 Reflow Soldering



注意 Caution

①. 理想状况的焊锡高度为电感器厚度的 1/2 ~1/3，如下图所示：

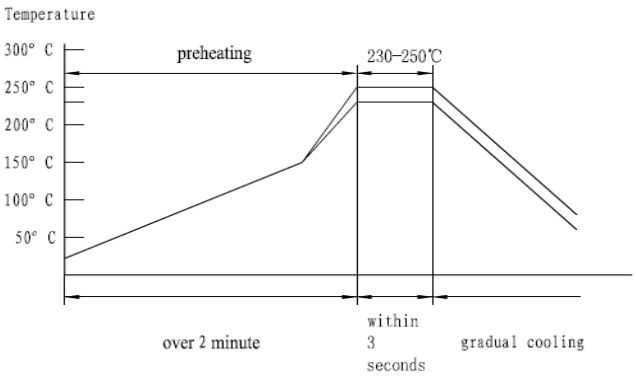
①.The ideal condition is to have solder mass (fillet) controlled to 1/2 to 1/3of the thickness of the inductor, as shown below:



②. 过长的焊接时间会影响端头的可焊性，焊接时间尽可能保持与推荐时间一致。

②. Because excessive dwell times can detrimentally affect solder ability, soldering duration should be kept as close to recommended times as possible.

（2）波峰焊 Wave Solder Profile



注意 Caution

①.确保电感器充分预热。

②.产品预热和焊接温度差不超过 100~130℃。

③.焊接后尽可能慢速冷却。

①.Make sure the inductors are preheated sufficiently.

②.The temperature difference between the inductor and melted solder should not be greater than 100 to 130℃.

③.Cooling after soldering should be gradual as possible.

（3）手工焊接 Hand Soldering

预热 Preheat	烙铁头温度 Tip temperature of soldering iron	烙铁头直径 Tip diameter of soldering iron	焊接时间 Soldering time	锡膏量 Solder mass	限制条件 Restrictive condition
△≤130℃	≤350℃	建议 1mm Suggest 1mm	≤5s	≤1/2 芯片厚度 ≤1/2 the thickness of inductor	请勿使用烙铁头直接接触电感产品 The soldering iron should not directly touch the inductor.

注意 Caution

①.用尖端最大直径 1.0mm 功率 20W 的焊接烙铁。

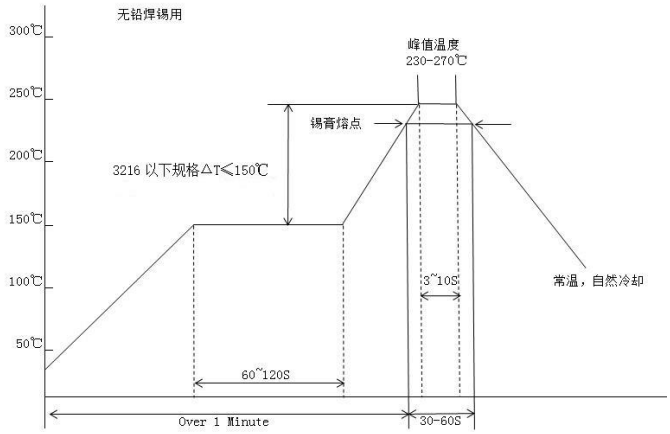
②.焊接烙铁不要直接接触产品。

①.Use a 20w soldering iron with a maximum tip diameter of 1.0mm.

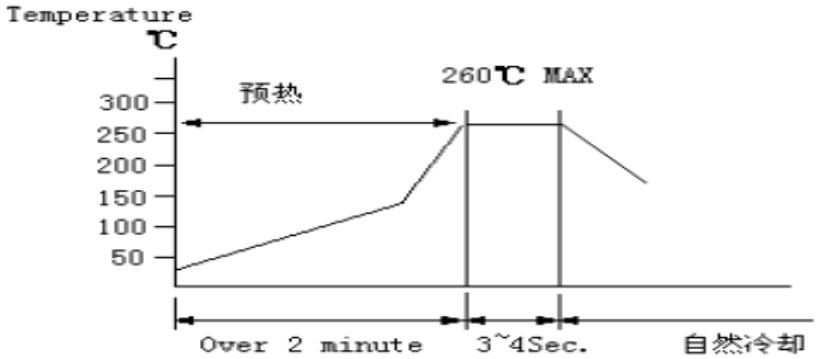
②.The soldering iron should not directly touch the inductor.

（4）无铅焊接曲线 Recommended Pb-Free Soldering Profile

回流焊接 Reflow solder



波峰焊接 Wave solder profile



8.4 分拨电路板 Handling of Substrate

（1）在电感器或其它贴装后，必须注意因电路板弯曲或变形带来的应力。

（2）分拨电路板时必须使用专用的夹具，不可以用手拨断。

(1) When splitting the PC board after mounting inductors and other components, care is required so as not to give any stresses of deflection or twisting to the board.

(2) Board separation should not be done manually, but by using the appropriate devices.

8.5 保存 Storage

（1）在下列环境中保存产品：温度 5~40℃；湿度 ≤70% RH。
（2）产品自生产之日保存期为一年，产品使用之前请勿拆开编带。
（3）编带拆开后，产品应在三个月内使用。

(1) Keep the storage environment conditions as following: Temperature: 5~40℃; Humidity: ≤70% RH.
(2) Don't open the tape until the parts are to be used, and store them within one year since the date printed on the reel.
(3) Use the chips within 3 months after the tape is opened.

8.6 环保申明 Environmental Declaration

（1）我司所有 MLCI 产品均符合 RoHS 2.0 标准。
（2）我司所有 MLCI 产品均符合最新的 REACH 法规要求。
（3）我司所有 MLCI 产品均符合 HF 要求。

(1) All MLCI products of our company comply with RoHS 2.0.
(2) All MLCI products of our company comply with the latest REACH regulations.
(3) All MLCI products of our company comply with HF requirements.