

## 承认书

## SPECIFICATION FOR APPROVAL

客户名称:

Customer Name: \_\_\_\_\_

(请填写贵司全名)

客户品名:

Customer Part No.: \_\_\_\_\_

(请填写客户物料编码)

大立品名:

DALI Part No.: \_\_\_\_\_

(请填写大立品名)

大立规格书编号:

Specification No.: \_\_\_\_\_

Spec-CMLF Series Rev.02

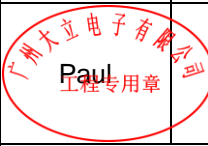
变更履历/Revised record:

Rev.	Effective Date	Changed Contents	Change Reasons	Approved By
01	2012-09-01	New released		Paul
02	2019-01-01	Format update		Paul

客户承认栏 (请签名盖章并签署日期后回传)

Customer's Approval Chop: 客户承认盖章:
Approved By: 承认人:
Approved Date: 承认日期:

广州大立电子有限公司

Confirmed	Checked	Prepared
 Paul	Amy	Steven
Date: 2019-01-01		

Add: 广州市南沙区进港大道

Tel: 020-39075998 Fax: 020-39075978

Type: CMLF1005,1608,2012,2012A,3216,3216A      Operation Temperature : -40~+85°C(Includes temperature when the coil is heated)

### Feature/特长

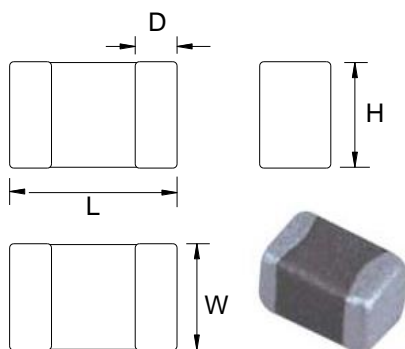
- Monolithic inorganic material construction(Ferrite)
- Excellent solderability and heat resistance.
- High reliability.
- RoHS compliant.
- 无机材料构造(铁氧体)。
- 良好的可焊性、耐热性。
- 高可靠性。
- RoHS指定对应。

### Application/用途

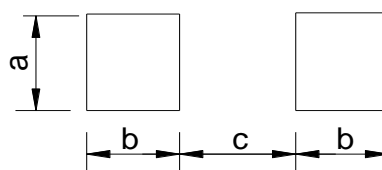
For Cellular platform DC-DC converter circuit, Portable AV equipment, Memex(computer Type),etc.

移动设备用DC-DC转换器电路, 便携式AV设备, 信息机器(电脑)等适用。

### Dimensions/外形图(Unit: mm)



### Recommended Land Pattern/推荐贴装尺寸



Type	L	W	H	D	a(Ref.)	b(Ref.)	c(Ref.)	Packaging (pcs/reel)
CMLF1005 [0402]	1.0 ±0.15	0.5 ±0.15	0.5 ±0.15	0.25 ±0.15	0.6	0.8	0.5	10000
CMLF1608 [0603]	1.6 ±0.2	0.8 ±0.2	0.8 ±0.2	0.3 ±0.2	0.8	1.0	0.6	4000
CMLF2012 [0805]	2.0 ±0.2	1.25 ±0.2	0.85 ±0.2	0.5 ±0.3	1.2	1.0	1.0	4000
CMLF2012A [0805]	2.0 ±0.2	1.25 ±0.2	1.25 ±0.2	0.5 ±0.3	1.2	1.0	1.0	2000
CMLF3216 [1206]	3.2 ±0.2	1.6 ±0.2	0.85 ±0.2	0.5 ±0.3	1.6	1.1	2.2	4000
CMLF3216A [1206]	3.2 ±0.2	1.6 ±0.2	1.10 ±0.2	0.5 ±0.3	1.6	1.1	2.2	3000

### Product Identification/品名注释

C M L F 1608 - 47N J C  
(1) (2) (3) (4) (5) (6) (7) (8)

(1) SMD/表面安装制品

(2) Multilayer chip/叠层片式

(3) Inductors/电感

(4) Ferrite/铁氧体

(5) Dimension symbol/尺寸表示:

1608=1.6 x 0.8 mm (L x W)

(6) Inductance value/电感值:

47N=47nH, R10=100nH, 1R0=1.0μH, 100=10μH

(7) Tolerance/公差: M=±20%, L=±15%, K=±10%

(8) Packing Style/包装形态: C=Carrier taping/编带包装

**CMLF1005 Electrical Characteristics**

Part Number	Inductance (μH)	Inductance tolerance	Q min.	Test Frequency (L,Q)	DCR max. (Ω)	Rated Current (mA)	SRF min. (MHz)	Thickness (mm)
CMLF1005-R22KC	0.22	K	10	25MHZ,60mV	1.2	25	110	0.5 ±0.15
CMLF1005-1R0KC	1.0	K	20	10MHZ,60mV	1.4	15	40	0.5 ±0.15
CMLF1005-1R8KC	1.8	K	20	10MHZ,60mV	1.5	15	30	0.5 ±0.15
CMLF1005-2R2KC	2.2	K	20	10MHZ,60mV	1.7	10	28	0.5 ±0.15

• Tolerance: M=±20%, L=±15%, K=±10%.

• Test equipments: Inductance Q : HP4291A+16193A, or equivalent; SRF: HP8720C, or equivalent; DCR: YOKOGAWA TYPE7561, or equivalent.

• Rated current: The DC current at which the temperature rise is  $\Delta t=40^{\circ}\text{C}$  max.( $T_a=25^{\circ}\text{C}$ )

• All test data is referenced to 25°C ambient.

## CMLF1608 Electrical Characteristics

Part Number	Inductance (μH)	Inductance tolerance	Q min.	Test Frequency (MHz)	DCR max. (Ω)	Rated Current (mA)	SRF min. (MHz)	Thickness (mm)
CMLF1608-47NKC	0.047	K	10	50	0.30	50	260	0.8 ±0.15
CMLF1608-68NKC	0.068	K	10	50	0.30	50	250	0.8 ±0.15
CMLF1608-82NKC	0.082	K	10	50	0.30	50	245	0.8 ±0.15
CMLF1608-R10KC	0.10	K	15	25	0.50	50	240	0.8 ±0.15
CMLF1608-R12KC	0.12	K	15	25	0.50	50	205	0.8 ±0.15
CMLF1608-R15KC	0.15	K	15	25	0.60	50	180	0.8 ±0.15
CMLF1608-R18KC	0.18	K	15	25	0.60	50	165	0.8 ±0.15
CMLF1608-R22KC	0.22	K	15	25	0.80	50	150	0.8 ±0.15
CMLF1608-R27KC	0.27	K	15	25	0.80	50	136	0.8 ±0.15
CMLF1608-R33KC	0.33	K	15	25	0.85	35	125	0.8 ±0.15
CMLF1608-R39KC	0.39	K	15	25	1.00	35	110	0.8 ±0.15
CMLF1608-R47KC	0.47	K	15	25	1.35	35	105	0.8 ±0.15
CMLF1608-R56KC	0.56	K	15	25	1.55	35	95	0.8 ±0.15
CMLF1608-R68KC	0.68	K	15	25	1.70	35	80	0.8 ±0.15
CMLF1608-R82KC	0.82	K	15	25	2.10	35	75	0.8 ±0.15
CMLF1608-1R0KC	1.0	K	30	10	0.60	25	70	0.8 ±0.15
CMLF1608-1R2KC	1.2	K	30	10	0.80	25	60	0.8 ±0.15
CMLF1608-1R5KC	1.5	K	30	10	0.80	25	55	0.8 ±0.15
CMLF1608-1R8KC	1.8	K	30	10	0.95	25	50	0.8 ±0.15
CMLF1608-2R2KC	2.2	K	30	10	1.15	15	45	0.8 ±0.15
CMLF1608-2R7KC	2.7	K	30	10	1.35	15	40	0.8 ±0.15
CMLF1608-3R3KC	3.3	K	30	10	1.55	15	38	0.8 ±0.15
CMLF1608-3R9KC	3.9	K	30	10	1.70	15	36	0.8 ±0.15
CMLF1608-4R7KC	4.7	K	30	10	2.10	15	33	0.8 ±0.15
CMLF1608-5R6KC	5.6	K	30	10	1.55	15	22	0.8 ±0.15
CMLF1608-6R8KC	6.8	K	30	10	1.70	15	20	0.8 ±0.15
CMLF1608-8R2KC	8.2	K	30	10	2.10	15	18	0.8 ±0.15
CMLF1608-100KC	10	K	30	2	2.55	15	17	0.8 ±0.15
CMLF1608-120KC	12	K	30	2	2.75	15	15	0.8 ±0.15
CMLF1608-150KC	15	K	30	2	1.70	15	14	0.8 ±0.15
CMLF1608-180KC	18	K	30	2	1.85	15	13	0.8 ±0.15

• Tolerance: M=±20%, L=±15%, K=±10%.

• Test equipments: Inductance Q : HP4291A+16193A, or equivalent; SRF: HP8720C, or equivalent; DCR: YOKOGAWA TYPE7561, or equivalent.

• Rated current: The DC current at which the temperature rise is  $\Delta t=40^{\circ}\text{C}$  max.( $T_a=25^{\circ}\text{C}$ )

• All test data is referenced to 25°C ambient.

## CMLF2012/CMLF2012A Electrical Characteristics

Part Number	Inductance (μH)	Inductance tolerance	Q min.	Test Frequency (MHz)	DCR max. (Ω)	Rated Current (mA)	SRF min. (MHz)	Thickness (mm)
CMLF2012-47NKC	0.047	K	15	50	0.20	300	320	0.85 ±0.2
CMLF2012-68NKC	0.068	K	15	50	0.20	300	280	0.85 ±0.2
CMLF2012-82NKC	0.082	K	15	50	0.20	300	255	0.85 ±0.2
CMLF2012-R10KC	0.10	K	20	25	0.30	250	235	0.85 ±0.2
CMLF2012-R12KC	0.12	K	20	25	0.30	250	220	0.85 ±0.2
CMLF2012-R15KC	0.15	K	20	25	0.40	250	200	0.85 ±0.2
CMLF2012-R18KC	0.18	K	20	25	0.40	250	185	0.85 ±0.2
CMLF2012-R22KC	0.22	K	20	25	0.50	250	170	0.85 ±0.2
CMLF2012-R27KC	0.27	K	20	25	0.50	250	150	0.85 ±0.2
CMLF2012-R33KC	0.33	K	20	25	0.55	250	145	0.85 ±0.2
CMLF2012-R39KC	0.39	K	25	25	0.65	200	135	0.85 ±0.2
CMLF2012-1R0KC	1.0	K	45	10	0.40	50	75	0.85 ±0.2
CMLF2012-1R2KC	1.2	K	45	10	0.50	50	65	0.85 ±0.2
CMLF2012-1R5KC	1.5	K	45	10	0.50	50	60	0.85 ±0.2
CMLF2012-1R8KC	1.8	K	45	10	0.60	50	55	0.85 ±0.2
CMLF2012-2R2KC	2.2	K	45	10	0.65	30	50	0.85 ±0.2
CMLF2012A-R47KC	0.47	K	25	25	0.65	200	125	1.25 ±0.2
CMLF2012A-R56KC	0.56	K	25	25	0.75	150	115	1.25 ±0.2
CMLF2012A-R68KC	0.68	K	25	25	0.80	150	105	1.25 ±0.2
CMLF2012A-R82KC	0.82	K	25	10	1.00	150	100	1.25 ±0.2
CMLF2012A-2R7KC	2.7	K	45	10	0.75	30	45	1.25 ±0.2
CMLF2012A-3R3KC	3.3	K	45	10	0.80	30	41	1.25 ±0.2
CMLF2012A-3R9KC	3.9	K	45	10	0.90	30	38	1.25 ±0.2
CMLF2012A-4R7KC	4.7	K	45	10	1.00	30	35	1.25 ±0.2
CMLF2012A-5R6KC	5.6	K	45	4	1.00	15	32	1.25 ±0.2
CMLF2012A-6R8KC	6.8	K	45	4	1.00	15	29	1.25 ±0.2
CMLF2012A-8R2KC	8.2	K	45	4	1.10	15	26	1.25 ±0.2
CMLF2012A-100KC	10	K	45	2	1.15	15	24	1.25 ±0.2
CMLF2012A-120KC	12	K	45	2	1.25	15	22	1.25 ±0.2
CMLF2012A-150KC	15	K	30	1	0.80	5	19	1.25 ±0.2
CMLF2012A-180KC	18	K	30	1	0.90	5	18	1.25 ±0.2
CMLF2012A-220KC	22	K	30	1	1.10	5	16	1.25 ±0.2
CMLF2012A-270KC	27	K	30	1	1.15	5	14	1.25 ±0.2
CMLF2012A-330KC	33	K	30	0.4	1.25	5	13	1.25 ±0.2

• Tolerance: M=±20%, L=±15%, K=±10%.

• Test equipments: Inductance Q : HP4291A+16193A, or equivalent; SRF: HP8720C, or equivalent; DCR: YOKOGAWA TYPE7561, or equivalent.

• Rated current: The DC current at which the temperature rise is  $\Delta t=40^{\circ}\text{C}$  max.( $T_a=25^{\circ}\text{C}$ )

• All test data is referenced to 25°C ambient.

## CMLF3216/CMLF3216A Electrical Characteristics

Part Number	Inductance (μH)	Inductance tolerance	Q min.	Test Frequency (MHz)	DCR max. (Ω)	Rated Current (mA)	SRF min. (MHz)	Thickness (mm)
CMLF3216-47NLC	0.047	L	20	50	0.15	300	320	0.85 ±0.2
CMLF3216-68NLC	0.068	L	20	50	0.25	300	280	0.85 ±0.2
CMLF3216-R10LC	0.10	L	20	25	0.25	250	235	0.85 ±0.2
CMLF3216-R12LC	0.12	L	20	25	0.3	250	220	0.85 ±0.2
CMLF3216-R15LC	0.15	L	20	25	0.3	250	200	0.85 ±0.2
CMLF3216-R18LC	0.18	L	20	25	0.4	250	185	0.85 ±0.2
CMLF3216-R22LC	0.22	L	20	25	0.4	250	170	0.85 ±0.2
CMLF3216-R27LC	0.27	L	20	25	0.5	250	150	0.85 ±0.2
CMLF3216-R33LC	0.33	L	20	25	0.5	250	145	0.85 ±0.2
CMLF3216-R39LC	0.39	L	25	25	0.5	200	135	0.85 ±0.2
CMLF3216-R47LC	0.47	L	25	25	0.6	200	125	0.85 ±0.2
CMLF3216-R56LC	0.56	L	25	25	0.7	150	115	0.85 ±0.2
CMLF3216-R68LC	0.68	L	25	25	0.8	150	105	0.85 ±0.2
CMLF3216-R82LC	0.82	L	25	25	0.9	150	100	0.85 ±0.2
CMLF3216-1R0KC	1.0	K	45	10	0.4	100	75	0.85 ±0.2
CMLF3216-1R2KC	1.2	K	45	10	0.5	100	65	0.85 ±0.2
CMLF3216-1R5KC	1.5	K	45	10	0.5	50	60	0.85 ±0.2
CMLF3216-1R8KC	1.8	K	45	10	0.5	50	55	0.85 ±0.2
CMLF3216-2R2KC	2.2	K	45	10	0.6	50	50	0.85 ±0.2
CMLF3216-2R7KC	2.7	K	45	10	0.6	50	45	0.85 ±0.2
CMLF3216-3R3KC	3.3	K	45	10	0.7	50	41	0.85 ±0.2
CMLF3216-3R9KC	3.9	K	45	10	0.8	50	38	0.85 ±0.2
CMLF3216-4R7KC	4.7	K	45	10	0.9	50	35	0.85 ±0.2
CMLF3216-5R6KC	5.6	K	50	4	0.7	25	32	0.85 ±0.2
CMLF3216-6R8KC	6.8	K	50	4	0.8	25	29	0.85 ±0.2
CMLF3216-8R2KC	8.2	K	50	4	0.9	25	26	0.85 ±0.2
CMLF3216-100KC	10	K	50	2	1.0	25	24	0.85 ±0.2
CMLF3216-120KC	12	K	50	2	1.05	15	22	0.85 ±0.2
CMLF3216-150KC	15	K	35	1	0.7	5	19	0.85 ±0.2
CMLF3216-180KC	18	K	35	1	0.7	5	18	0.85 ±0.2
CMLF3216-220KC	22	K	35	1	0.9	5	16	0.85 ±0.2
CMLF3216-270KC	27	K	35	1	0.9	5	14	0.85 ±0.2
CMLF3216-330KC	33	K	35	0.4	1.05	5	13	0.85 ±0.2
CMLF3216A-390KC	39	K	40	2	3.0	5	11	1.10 ±0.2
CMLF3216A-470KC	47	K	40	2	3.4	5	10	1.10 ±0.2

• Tolerance: M=±20%, L=±15%, K=±10%.

• Test equipments: Inductance Q : HP4291A+16193A, or equivalent; SRF: HP8720C, or equivalent; DCR: YOKOGAWA TYPE7561, or equivalent.

• Rated current: The DC current at which the temperature rise is  $\Delta t=40^{\circ}\text{C}$  max.( $T_a=25^{\circ}\text{C}$ )

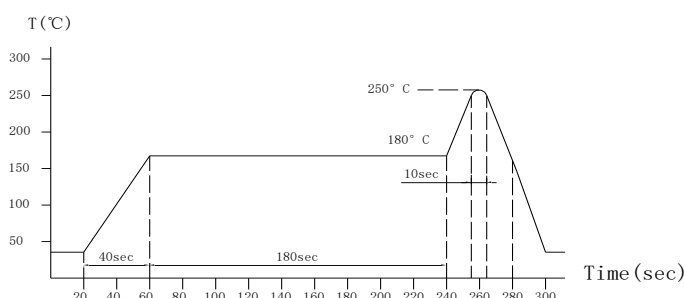
• All test data is referenced to 25°C ambient.

## General Characteristics/一般特性

Operation Temperature Range /使用温度范围	-40~+85°C(Includes temperature when the coil is heated) / -40~+85°C(包含线圈自身发热)
Storage Conditions /保存条件(产品安装基板前)	To maintain the solderability of terminal electrodes: / 为了保持电极的可焊性, 请按以下保存条件存储: 1. Temperature and humidity conditions: 5~40°C and 30~70% RH; / 温度、湿度条件: 5~40°C、相对湿度 30~70%; 2. Recommended products should be used within 6 months form the time of delivery; / 产品应在交货后 6 个月内使用; 3. The products Should be stored in the complete package provided by the supplier; The packaging material should be kept where no chlorine or sulfur exists in the air; The packaging should be placed on the shelf. / 产品须存储在供方提供的完整的包装内; 产品包装应存放在空气中不含氯或硫的地方; 产品包装应放在货架上。
Transport Attentions /搬运注意事项	1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils; / 1. 产品搬运时应小心处理, 避免因出汗和皮肤油渍而造成损坏或污染; 2. The use of tweezers or vacuum pick up is strongly recommended for individual components; / 2. 强烈建议对单个部件使用镊子或真空吸嘴; 3. Bulk handling should ensure that abrasion and mechanical shock are minimized. / 3. 散货搬运应确保磨损和机械冲击最小化。
External Appearance/外观	On visual inspection, the coil has no external defects. / 目视检查时, 外观没有明显的缺陷。
Solderability Test/可焊性测试	The terminal shall be at least 90% covered with solder. Test condition: after fluxing, inductor shall be dipped in a melted solder bath at 245 ±5°C for 5 Sec. / 电极应至少覆盖 90% 的焊料。测试条件: 电极涂上助焊剂后在 245±5°C 的熔化焊槽中浸泡 5 秒。
Humidity Characteristics /耐湿度特性	Inductance deviation within ±10%, after 96 hours in 90~95% relative humidity at 40±2°C and 1 hour drying under normal condition. / 温度在 40±2°C, 相对湿度在 90~95% 条件下存放 96 小时后取出, 用布擦干, 然后在常温常湿中放置 1 小时, 电感值变化率±10% 以内。
Thermal shock test /冷热冲击特性	Inductance deviation within ±10%, after 20 cycles of -40°C for 30 minutes, +85°C for 30 minutes. Characteristics are measured after the ambient air exposure of 1 hour. / -40°C 放置 30 分钟后转换为 +85°C 放置 30 分钟, 20 次循环, 然后在常温常湿中放置 1 小时, 电感值变化率±10% 以内。
High temperature storage test /高温保存测试	Inductance deviation within ±10%, after 96 hours in +85°C±2°C characteristics are measured after ambient are exposure of 1 hour. / +85°C±2°C 放置 96 小时, 然后在常温常湿中放置 1 小时, 电感值变化率±10% 以内。
Low temperature storage test /低温保存测试	Inductance deviation within ±10%, after 96 hours in -40°C±2°C characteristics are measured after ambient are exposure of 1 hour. / -40°C±2°C 放置 96 小时, 然后在常温常湿中放置 1 小时, 电感值变化率±10% 以内。

## Recommended Reflow Conditions (Lead-free)

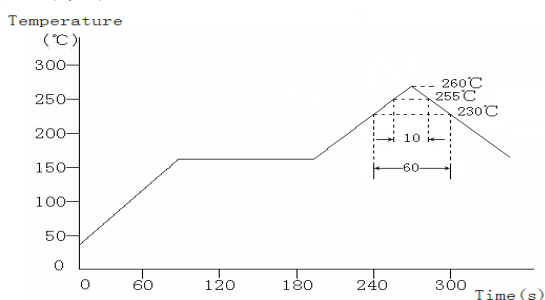
## /推荐回流焊条件(无铅)



The reflow condition recommended above is according to the machine used by our company. Big differences will arise as a result of the type of machine, reflow conditions, method, used etc. Hence, before setting up your reflow conditions, please confirm with the above. / 上面推荐的回流焊试验条件是根据本公司的回流焊设备测试结果得到。不同的试验设备、试验条件和试验方法及试

## Reflow Soldering Heat Endurance

## /回流焊耐热



No mechanical and electrical defects are found after testing based on the above profile and keeping under the conditions of room temperature and humidity for 2 hours. / 在该条件下进行回流焊, 常温常湿条件下放置 2 个小时后, 无机械、电气特性缺陷发生。

Twice reflow test is acceptable with the test interval remaining 1 hour under the normal conditions. / 在常温常湿条件下, 间隔 1 小时可进行两次回流焊。The reflow test profile may vary with the testing