有关敝司产品的注意事项

请务必在使用敝司产品之前阅读。

⚠ 注 意

- 本产品目录所记载的内容为2016年10月之内容。因改良等原因，可能会不经预告而变更记载内容，所以请务必在使用前先确认最新的产品信息。未按照本产品目录所记载的内容或交货规格说明书使用敝司产品的，即便其致使使用设备发生损害、瑕疵等时，敝司也不承担任何责任，敬请悉知。

- 就规格相关的详细内容，敝司备有交货规格说明书，详情请向敝司咨询。

- 使用敝司产品时，请务必事先安装到设备之后，在实际使用的环境下进行评估和确认。

- 本产品目录所中记载的产品可使用于一般电子设备 [音像设备、办公自动化设备、家电产品、办公设备、信息/通讯设备 (手机、电脑等)] 。因此，若考虑将本产品目录所记载的产品使用于可能会直接危及生命或身体的设备 [运输用设备 (汽车驱动控制设备、火车控制设备、船舶控制设备等) 、交通信号设备、防灾设备、医疗用器械、高公共性信息通信设备 (电话交换机以及电话、无线、广播电视等基站)] 等时，请务必事先向敝司咨询。

  另外，请勿将敝司产品使用于对安全性和可靠性要求较高的设备 (航天设备、航空设备、原子能控制设备、海底设备、军事设备等) 。

  且即便属于一般电子设备，使用于对安全性和可靠性要求较高的设备、电路上时，敝司建议进行充分的安全评估，并根据需要，在设计时追加保护电路等。

  未经敝司的事先书面同意，把本产品目录中记载的产品使用于前述需要向敝司咨询的设备或敝司禁止使用的设备，从而给客户或第三方造成的损害的，敝司不承担任何责任，敬请悉知。

- 因使用敝司产品，发生第三方的知识产权等权利相关问题的，敝司不承担责任。另外，并不代表授予这些权利的实施权，敬请悉知。

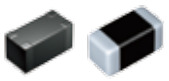
- 除非书面合同中另有规定，敝司产品的保证范围仅限于交付的敝司产品单品，并且就敝司产品的故障或瑕疵所导致的损害，敝司不承担任何责任，敬请悉知。

- 本产品目录所记载的内容适用于从敝司营业所、销售子公司、销售代理店 (即“正规销售渠道”) 购买的敝司产品，并不适用于从上述以外的渠道购买的敝司产品，敬请悉知。

- 出口相关注意事项

  本产品目录所记载的部分产品在出口时须事先确认《外汇和对外贸易法》以及美国出口管理的相关法规，并办理相关手续。如有不明之处，请向敝司咨询。

绕线型片状电感器(LB 系列)



回流焊

■型号标示法

※使用温度范围: -40～+105℃ (包含产品本身发热)

L	B	△	△	2	0	1	2	T	1	0	0	M	△	△	△	△
①		②		③				④	⑤			⑥	⑦	⑧		

△＝空格

①类型

代码	类型
LB	绕线型片状电感器

②特性

代码	特性
△△	标准品
△C	大电流
△R	低Rdc
MF	低损耗

③尺寸 (L × W)

代码	外型 (inch)	尺寸 (L×W) [mm]
1608	1608(0603)	1.6×0.8
2012	2012(0805)	2.0×1.25
2016	2016(0806)	2.0×1.6
2518	2518(1007)	2.5×1.8
3218	3218(1207)	3.2×1.8
3225	3225(1210)	3.2×2.5

④包装

代码	包装
T	卷盘带装

⑤标称电感值

代码 (例)	标称电感值 [μH]
1R0	1.0
100	10
101	100

※R=小数点

⑥电感量公差

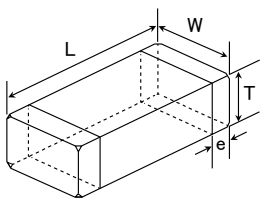
代码	电感量公差
K	±10%
M	±20%

⑦个别规格

代码	个别规格
△	标准品
R	低Rdc 品

⑧本公司管理记号

■标准外型尺寸 / 标准数量

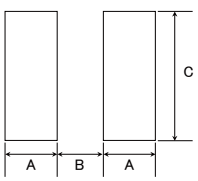


推荐焊盘图案

实装上的注意

·请确认实装状态后使用。

·本产品焊法限定为回流焊法。



Type	A	B	C
1608	0.55	0.7	0.9
MF1608	0.55	0.7	1.0
2012	0.60	1.0	1.45
2016	0.60	1.0	1.8
2518	0.60	1.5	2.0
3218	0.85	1.7	2.0
3225	0.85	1.7	2.7

单位: mm

Type	L	W	T	e	标准数量[pcs] 纸带	标准数量[pcs] 压纹带
LB 1608	1.6±0.1 (0.063±0.004)	0.8±0.1 (0.031±0.004)	0.8±0.1 (0.031±0.004)	0.35±0.15 (0.014±0.006)	4000	—
LBMF1608	1.6±0.2 (0.063±0.008)	0.8±0.2 (0.031±0.008)	0.8±0.2 (0.031±0.008)	0.45±0.15 (0.016±0.006)	—	3000
LB 2012 LB C2012 LB R2012	2.0±0.2 (0.079±0.008)	1.25±0.2 (0.049±0.008)	1.25±0.2 (0.049±0.008)	0.5±0.2 (0.020±0.008)	—	3000
LB 2016 LB C2016	2.0±0.2 (0.079±0.008)	1.6±0.2 (0.063±0.008)	1.6±0.2 (0.063±0.008)	0.5±0.2 (0.020±0.008)	—	2000
LB 2518 LB C2518 LB R2518	2.5±0.2 (0.098±0.008)	1.8±0.2 (0.071±0.008)	1.8±0.2 (0.071±0.008)	0.5±0.2 (0.020±0.008)	—	2000
LB 3218	3.2±0.2 (0.126±0.008)	1.8±0.2 (0.071±0.008)	1.8±0.2 (0.071±0.008)	0.6±0.2 (0.024±0.008)	—	2000
LB C3225	3.2±0.2 (0.126±0.008)	2.5±0.2 (0.098±0.008)	2.5±0.2 (0.098±0.008)	0.6±0.3 (0.024±0.012)	—	1000

单位: mm (inch)

■型号一览

●1608(0603)型

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LB 1608T1R0M	RoHS	1.0	±20%	100	0.17	160	7.96
LB 1608T2R2M	RoHS	2.2	±20%	80	0.33	115	7.96
LB 1608T4R7M	RoHS	4.7	±20%	45	0.55	70	7.96
LB 1608T8R2M	RoHS	8.2	±20%	32	0.70	60	2.52
LB 1608T100M	RoHS	10	±20%	32	0.70	60	2.52

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LBMF1608T1R0M	RoHS	1.0	±20%	100	0.09	230	7.96
LBMF1608T2R2M	RoHS	2.2	±20%	80	0.17	160	7.96
LBMF1608T3R3M	RoHS	3.3	±20%	60	0.22	130	7.96
LBMF1608T4R7M	RoHS	4.7	±20%	45	0.24	110	7.96
LBMF1608T100□	RoHS	10	±10%, ±20%	32	0.36	80	2.52
LBMF1608T220□	RoHS	22	±10%, ±20%	16	1.0	50	2.52
LBMF1608T470□	RoHS	47	±10%, ±20%	11	2.5	35	2.52

●2012(0805)型

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LB 2012T1R0M	RoHS	1.0	±20%	100	0.15	405	7.96
LB 2012T2R2M	RoHS	2.2	±20%	80	0.23	260	7.96
LB 2012T3R3M	RoHS	3.3	±20%	55	0.30	235	7.96
LB 2012T4R7M	RoHS	4.7	±20%	45	0.40	190	7.96
LB 2012T6R8M	RoHS	6.8	±20%	38	0.47	135	7.96
LB 2012T100□	RoHS	10	±10%, ±20%	32	0.70	120	2.52
LB 2012T100□R	RoHS	10	±10%, ±20%	32	0.50	120	2.52
LB 2012T150□	RoHS	15	±10%, ±20%	28	1.3	100	2.52
LB 2012T220□	RoHS	22	±10%, ±20%	16	1.7	80	2.52
LB 2012T470□	RoHS	47	±10%, ±20%	11	3.7	60	2.52
LB 2012T680□	RoHS	68	±10%, ±20%	10	6.0	50	2.52
LB 2012T101□	RoHS	100	±10%, ±20%	8	7.0	45	0.796

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LB C2012T1R0M	RoHS	1.0	±20%	100	0.19	620	7.96
LB C2012T2R2M	RoHS	2.2	±20%	70	0.33	430	7.96
LB C2012T4R7M	RoHS	4.7	±20%	45	0.50	295	7.96
LB C2012T100□	RoHS	10	±10%, ±20%	40	1.2	200	2.52
LB C2012T220□	RoHS	22	±10%, ±20%	16	3.7	130	2.52
LB C2012T470□	RoHS	47	±10%, ±20%	11	5.8	90	2.52

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LB R2012T1R0M	RoHS	1.0	±20%	100	0.07	400	7.96
LB R2012T2R2M	RoHS	2.2	±20%	80	0.13	260	7.96
LB R2012T4R7M	RoHS	4.7	±20%	45	0.24	200	7.96
LB R2012T100□	RoHS	10	±10%, ±20%	32	0.36	150	2.52
LB R2012T220□	RoHS	22	±10%, ±20%	16	1.0	100	2.52
LB R2012T470□	RoHS	47	±10%, ±20%	11	1.7	75	2.52
LB R2012T101□	RoHS	100	±10%, ±20%	8	4.0	50	0.796

●2016(0806)型

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LB 2016T1R0M	RoHS	1.0	±20%	100	0.09	490	7.96
LB 2016T1R5M	RoHS	1.5	±20%	80	0.11	380	7.96
LB 2016T2R2M	RoHS	2.2	±20%	70	0.13	375	7.96
LB 2016T3R3M	RoHS	3.3	±20%	55	0.20	285	7.96
LB 2016T4R7M	RoHS	4.7	±20%	45	0.25	225	7.96
LB 2016T6R8M	RoHS	6.8	±20%	38	0.35	200	7.96
LB 2016T100□	RoHS	10	±10%, ±20%	32	0.50	155	2.52
LB 2016T150□	RoHS	15	±10%, ±20%	28	0.70	130	2.52
LB 2016T220□	RoHS	22	±10%, ±20%	16	1.0	105	2.52
LB 2016T330□	RoHS	33	±10%, ±20%	14	1.7	85	2.52
LB 2016T470□	RoHS	47	±10%, ±20%	11	2.4	70	2.52
LB 2016T680□	RoHS	68	±10%, ±20%	10	3.0	55	2.52
LB 2016T101□	RoHS	100	±10%, ±20%	8	4.5	40	0.796

(注) 型号中的[]中标有电感值代码 (M或K) 。

LB/LBC系列

※) 额定电流: 直流叠加导致的电感降低在10%以内、以及温度上升20℃以内都满足的最大直流电流值。

LBR系列

※) 额定电流: 直流叠加导致的电感降低在20%以内、以及温度上升20℃以内都满足的最大直流电流值。

▶由于篇幅有限，本产品目录中只记载了有代表性的产品规格，若考虑使用弊司产品时，请确认交货规格说明书中的详细规格。
另外，有关各产品的详细信息(特性图、可靠性信息、使用时的注意事项等)，请参阅弊司网站(http://www.ty-top.com/)。

■型号一览

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LB C2016T1R0M	RoHS	1.0	±20%	100	0.10	690	7.96
LB C2016T1R5M	RoHS	1.5	±20%	80	0.15	600	7.96
LB C2016T2R2M	RoHS	2.2	±20%	70	0.20	520	7.96
LB C2016T3R3M	RoHS	3.3	±20%	55	0.27	410	7.96
LB C2016T4R7M	RoHS	4.7	±20%	45	0.37	355	7.96
LB C2016T6R8M	RoHS	6.8	±20%	38	0.59	290	7.96
LB C2016T100□	RoHS	10	±10%, ±20%	32	0.82	245	2.52
LB C2016T150□	RoHS	15	±10%, ±20%	28	1.2	200	2.52
LB C2016T220□	RoHS	22	±10%, ±20%	16	1.8	165	2.52
LB C2016T330□	RoHS	33	±10%, ±20%	14	2.8	135	2.52
LB C2016T470□	RoHS	47	±10%, ±20%	11	4.3	110	2.52
LB C2016T680□	RoHS	68	±10%, ±20%	10	7.0	95	2.52
LB C2016T101□	RoHS	100	±10%, ±20%	8	8.0	75	0.796

●2518(1007)型

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LB 2518T1R0M	RoHS	1.0	±20%	100	0.06	665	7.96
LB 2518T1R5M	RoHS	1.5	±20%	80	0.07	405	7.96
LB 2518T2R2M	RoHS	2.2	±20%	68	0.09	340	7.96
LB 2518T3R3M	RoHS	3.3	±20%	54	0.11	280	7.96
LB 2518T4R7M	RoHS	4.7	±20%	46	0.13	240	7.96
LB 2518T4R7MR	RoHS	4.7	±20%	46	0.10	235	7.96
LB 2518T6R8M	RoHS	6.8	±20%	38	0.15	195	7.96
LB 2518T100□	RoHS	10	±10%, ±20%	30	0.25	165	2.52
LB 2518T150□	RoHS	15	±10%, ±20%	23	0.32	145	2.52
LB 2518T220□	RoHS	22	±10%, ±20%	19	0.50	115	2.52
LB 2518T330□	RoHS	33	±10%, ±20%	15	0.70	95	2.52
LB 2518T470□	RoHS	47	±10%, ±20%	12	0.95	85	2.52
LB 2518T680□	RoHS	68	±10%, ±20%	9.5	1.5	70	2.52
LB 2518T101□	RoHS	100	±10%, ±20%	9.0	2.1	60	0.796
LB 2518T151□	RoHS	150	±10%, ±20%	7.0	3.2	45	0.796
LB 2518T221□	RoHS	220	±10%, ±20%	5.5	4.5	40	0.796
LB 2518T331□	RoHS	330	±10%, ±20%	4.5	7.0	30	0.796
LB 2518T471□	RoHS	470	±10%, ±20%	3.5	10	25	0.796
LB 2518T681□	RoHS	680	±10%, ±20%	3.0	17	20	0.796
LB 2518T102□	RoHS	1000	±10%, ±20%	2.4	24	15	0.252

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LB C2518T1R0M	RoHS	1.0	±20%	100	0.08	775	7.96
LB C2518T1R0MR	RoHS	1.0	±20%	100	0.07	890	7.96
LB C2518T1R5M	RoHS	1.5	±20%	80	0.11	730	7.96
LB C2518T2R2M	RoHS	2.2	±20%	68	0.13	630	7.96
LB C2518T3R3M	RoHS	3.3	±20%	54	0.16	560	7.96
LB C2518T4R7M	RoHS	4.7	±20%	41	0.20	510	7.96
LB C2518T6R8M	RoHS	6.8	±20%	38	0.30	420	7.96
LB C2518T100□	RoHS	10	±10%, ±20%	30	0.36	375	2.52
LB C2518T150□	RoHS	15	±10%, ±20%	23	0.65	285	2.52
LB C2518T220□	RoHS	22	±10%, ±20%	19	0.77	250	2.52
LB C2518T330□	RoHS	33	±10%, ±20%	15	1.5	185	2.52
LB C2518T470□	RoHS	47	±10%, ±20%	12	1.9	165	2.52
LB C2518T680□	RoHS	68	±10%, ±20%	9.5	2.8	140	2.52
LB C2518T101□	RoHS	100	±10%, ±20%	9.0	3.7	125	0.796
LB C2518T151□	RoHS	150	±10%, ±20%	7.0	6.1	95	0.796
LB C2518T221□	RoHS	220	±10%, ±20%	5.5	8.4	80	0.796
LB C2518T331□	RoHS	330	±10%, ±20%	4.5	12.3	65	0.796
LB C2518T471□	RoHS	470	±10%, ±20%	3.5	22	50	0.796
LB C2518T681□	RoHS	680	±10%, ±20%	3.0	28	45	0.796

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LB R2518T1R0M	RoHS	1.0	±20%	100	0.045	960	7.96
LB R2518T2R2M	RoHS	2.2	±20%	68	0.07	480	7.96
LB R2518T4R7M	RoHS	4.7	±20%	45	0.10	345	7.96
LB R2518T100□	RoHS	10	±10%, ±20%	30	0.19	235	2.52
LB R2518T220□	RoHS	22	±10%, ±20%	19	0.44	175	2.52
LB R2518T470□	RoHS	47	±10%, ±20%	11	0.84	120	2.52
LB R2518T101□	RoHS	100	±10%, ±20%	9	1.89	80	0.796

(注)型号中的[]中标有电感值代码 (M或K) 。

LB/LBC系列

※) 额定电流: 直流叠加导致的电感降低在10%以内、以及温度上升20℃以内都满足的最大直流电流值。

LBR系列

※) 额定电流: 直流叠加导致的电感降低在20%以内、以及温度上升20℃以内都满足的最大直流电流值。

▶由于篇幅有限，本产品目录中只记载了有代表性的产品规格，若考虑使用弊司产品时，请确认交货规格说明书中的详细规格。
另外，有关各产品的详细信息(特性图、可靠性信息、使用时的注意事项等)，请参阅弊司网站(http://www.ty-top.com/)。

■型号一览

●3218(1207)型

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LB 3218T1R0M	RoHS	1.0	±20%	100	0.06	1,075	7.96
LB 3218T1R5M	RoHS	1.5	±20%	80	0.07	860	7.96
LB 3218T2R2M	RoHS	2.2	±20%	68	0.09	775	7.96
LB 3218T3R3M	RoHS	3.3	±20%	54	0.11	560	7.96
LB 3218T4R7M	RoHS	4.7	±20%	41	0.13	550	7.96
LB 3218T6R8M	RoHS	6.8	±20%	40	0.17	380	7.96
LB 3218T100□	RoHS	10	±10%, ±20%	30	0.25	340	2.52
LB 3218T150□	RoHS	15	±10%, ±20%	25	0.32	300	2.52
LB 3218T220□	RoHS	22	±10%, ±20%	19	0.49	255	2.52
LB 3218T330□	RoHS	33	±10%, ±20%	15	0.75	215	2.52
LB 3218T470□	RoHS	47	±10%, ±20%	12	0.92	205	2.52
LB 3218T680□	RoHS	68	±10%, ±20%	11	1.49	145	2.52
LB 3218T101□	RoHS	100	±10%, ±20%	8.0	2.4	140	0.796
LB 3218T151□	RoHS	150	±10%, ±20%	7.0	3.2	105	0.796
LB 3218T221□	RoHS	220	±10%, ±20%	5.0	5.4	80	0.796
LB 3218T331□	RoHS	330	±10%, ±20%	4.0	7.0	65	0.796
LB 3218T471□	RoHS	470	±10%, ±20%	3.5	14	54	0.796
LB 3218T681□	RoHS	680	±10%, ±20%	3.0	17	45	0.796
LB 3218T102□	RoHS	1000	±10%, ±20%	2.4	27	39	0.252

●3225(1210)型

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LB C3225T1R0MR	RoHS	1.0	±20%	250	0.055	1,100	0.1
LB C3225T1R5MR	RoHS	1.5	±20%	220	0.060	1,000	0.1
LB C3225T2R2MR	RoHS	2.2	±20%	190	0.080	930	0.1
LB C3225T3R3MR	RoHS	3.3	±20%	160	0.095	820	0.1
LB C3225T4R7MR	RoHS	4.7	±20%	70	0.100	680	0.1
LB C3225T6R8MR	RoHS	6.8	±20%	50	0.120	620	0.1
LB C3225T100□R	RoHS	10	±10%, ±20%	23	0.133	540	0.1
LB C3225T150□R	RoHS	15	±10%, ±20%	20	0.195	420	0.1
LB C3225T220□R	RoHS	22	±10%, ±20%	17	0.27	330	0.1
LB C3225T330□R	RoHS	33	±10%, ±20%	13	0.41	300	0.1
LB C3225T470□R	RoHS	47	±10%, ±20%	10	0.67	220	0.1
LB C3225T680□R	RoHS	68	±10%, ±20%	8	1.0	190	0.1
LB C3225T101□R	RoHS	100	±10%, ±20%	6	1.4	150	0.1

(注)型号中的[]中标有电感值代码 (M或K) 。

LB/LBC系列

※) 额定电流: 直流叠加导致的电感降低在10%以内、以及温度上升20℃以内都满足的最大直流电流值。

▶由于篇幅有限，本产品目录中只记载了有代表性的产品规格，若考虑使用弊司产品时，请确认交货规格说明书中的详细规格。
另外，有关各产品的详细信息(特性图、可靠性信息、使用时的注意事项等)，请参阅弊司网站(http://www.ty-top.com/)。

信号用绕线型片状电感器(LB 系列 M 型)

回流焊

■型号标示法

※使用温度范围: -40～+105℃ (包含产品本身发热)

L	B	M	2	0	1	6	T	1	0	0	J	△
①			②				③	④			⑤	⑥

△＝空格

①类型

代码	类型
LBM	信号用绕线型片状电感器

②尺寸 (L × W)

代码	尺寸 (L×W) [mm]
2016	2.0×1.6

③包装

代码	包装
T	卷盘带装

④标称电感值

代码 (例)	标称电感值 [μH]
R12	0.12
1R0	1.0
100	10
101	100

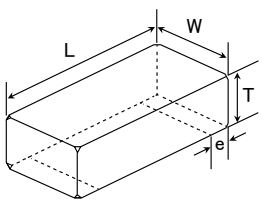
※R＝小数点

⑤电感量公差

代码	电感量公差
J	±5%

⑥本公司管理记号

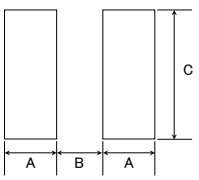
■标准外型尺寸 / 标准数量



推荐焊盘图案
实装上的注意
・请确认实装状态后使用。
・本产品焊法限定为回流焊法。

Type	A	B	C
LBM2016	0.6	1.0	1.8

单位: mm



Type	L	W	T	e	标准数量[pcs]	
					纸带	压纹带
LBM2016	2.0±0.2 (0.08±0.008)	1.6±0.2 (0.063±0.008)	1.6±0.2 (0.063±0.008)	0.5±0.2 (0.02±0.008)	—	2000

单位: mm (inch)

●LBM2016 型

型号	EHS	标称电感值 [μH]	电感量公差	Q值 (min.)	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]
LBM 2016TR12J	RoHS	0.12	±5%	30	600	0.13	610	25.2
LBM 2016TR15J	RoHS	0.15	±5%	30	550	0.15	570	25.2
LBM 2016TR18J	RoHS	0.18	±5%	30	500	0.15	560	25.2
LBM 2016TR22J	RoHS	0.22	±5%	30	450	0.20	520	25.2
LBM 2016TR27J	RoHS	0.27	±5%	30	425	0.21	510	25.2
LBM 2016TR33J	RoHS	0.33	±5%	30	400	0.21	490	25.2
LBM 2016TR39J	RoHS	0.39	±5%	30	375	0.26	440	25.2
LBM 2016TR47J	RoHS	0.47	±5%	30	350	0.26	430	25.2
LBM 2016TR56J	RoHS	0.56	±5%	30	300	0.29	410	25.2
LBM 2016TR68J	RoHS	0.68	±5%	30	270	0.32	400	25.2
LBM 2016TR82J	RoHS	0.82	±5%	30	250	0.34	390	25.2
LBM 2016T1R0J	RoHS	1.0	±5%	30	220	0.38	385	7.96
LBM 2016T1R2J	RoHS	1.2	±5%	30	180	0.41	370	7.96
LBM 2016T1R5J	RoHS	1.5	±5%	30	135	0.47	350	7.96
LBM 2016T1R8J	RoHS	1.8	±5%	30	100	0.48	345	7.96
LBM 2016T2R2J	RoHS	2.2	±5%	30	75	0.54	340	7.96
LBM 2016T2R7J	RoHS	2.7	±5%	30	55	0.59	310	7.96
LBM 2016T3R3J	RoHS	3.3	±5%	30	48	0.68	290	7.96
LBM 2016T3R9J	RoHS	3.9	±5%	30	43	0.74	275	7.96
LBM 2016T4R7J	RoHS	4.7	±5%	30	40	0.78	270	7.96
LBM 2016T5R6J	RoHS	5.6	±5%	25	36	0.88	255	7.96
LBM 2016T6R8J	RoHS	6.8	±5%	25	33	0.97	240	7.96
LBM 2016T8R2J	RoHS	8.2	±5%	25	30	1.1	225	7.96
LBM 2016T100J	RoHS	10	±5%	25	27	1.2	215	2.52
LBM 2016T120J	RoHS	12	±5%	25	23	1.4	200	2.52
LBM 2016T150J	RoHS	15	±5%	25	20	1.5	190	2.52
LBM 2016T180J	RoHS	18	±5%	25	18	2.5	150	2.52
LBM 2016T220J	RoHS	22	±5%	25	17	2.8	140	2.52
LBM 2016T270J	RoHS	27	±5%	25	16	3.2	130	2.52
LBM 2016T330J	RoHS	33	±5%	25	15	3.6	125	2.52
LBM 2016T390J	RoHS	39	±5%	20	14	3.9	120	2.52
LBM 2016T470J	RoHS	47	±5%	20	13	4.1	115	2.52
LBM 2016T560J	RoHS	56	±5%	20	12	5.9	95	2.52
LBM 2016T680J	RoHS	68	±5%	20	11	7.0	90	2.52
LBM 2016T820J	RoHS	82	±5%	20	10	7.7	85	2.52
LBM 2016T101J	RoHS	100	±5%	15	9.0	8.0	80	0.796
LBM 2016T151J	RoHS	150	±5%	15	6.5	13.5	69	0.796
LBM 2016T181J	RoHS	180	±5%	15	6.0	15	67	0.796
LBM 2016T221J	RoHS	220	±5%	15	5.5	18	65	0.796

※) 额定电流: 直流叠加导致的电感降低在10%以内、以及温度上升22℃以内都满足的最大直流电流值。

WIRE-WOUND CHIP INDUCTORS (LB SERIES),
WIRE-WOUND CHIP POWER INDUCTORS (CB SERIES),
WIRE-WOUND CHIP INDUCTORS FOR SIGNAL LINES (LB SERIES M TYPE)

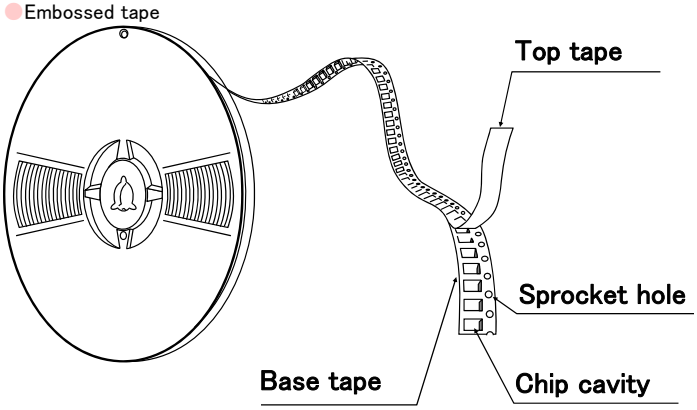
■PACKAGING

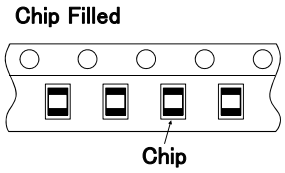
①Minimum Quantity

Type	Standard Quantity [pcs]	
	Paper Tape	Embossed Tape
LB C3225 CB C3225	—	1000
LB 3218	—	2000
LB R2518 LB C2518 LB 2518 CB 2518 CB C2518	—	2000
LBM2016 LB C2016 LB 2016 CB 2016 CB C2016	—	2000
LB 2012 LB C2012 LB R2012 CB 2012 CB C2012	—	3000
CB L2012	4000	—
LB 1608	4000	—
LBMF1608 CBMF1608	—	3000

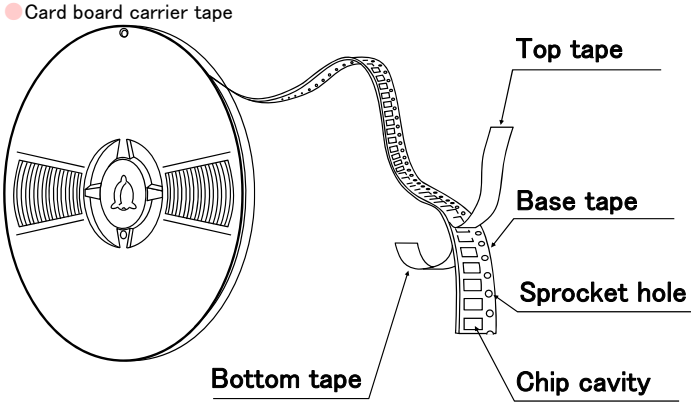
②Tape material

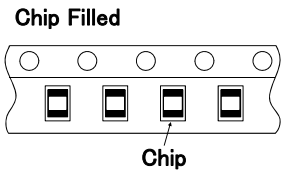
●Embossed tape





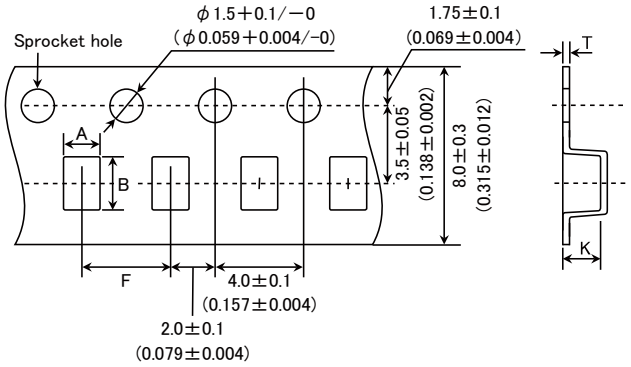
●Card board carrier tape





③Taping Dimensions

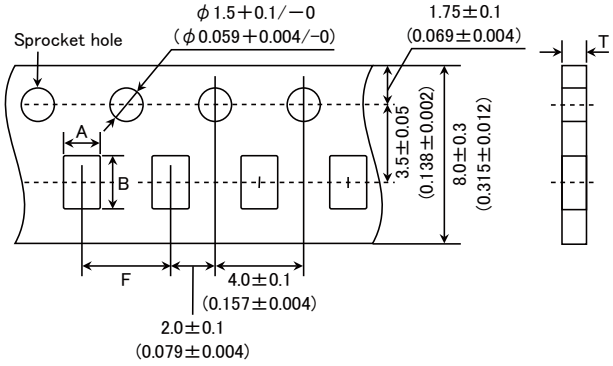
Embossed Tape (0.315 inches wide)



Type	Chip cavity		Insertion pitch	Tape thickness	
	A	B	F	T	K
LBM2016	1.75±0.1 (0.069±0.004)	2.1±0.1 (0.083±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	1.9max. (0.075max.)
LB C3225 CB C3225	2.8±0.1 (0.110±0.004)	3.5±0.1 (0.138±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	4.0max. (0.157max.)
LB 3218	2.1±0.1 (0.083±0.004)	3.5±0.1 (0.138±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	2.2max. (0.087max.)
LB 2518 CB 2518 LB C2518 CB C2518 LB R2518	2.15±0.1 (0.085±0.004)	2.7±0.1 (0.106±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	2.2max. (0.087max.)
LB 2016 CB 2016 LB C2016 CB C2016	1.75±0.1 (0.069±0.004)	2.1±0.1 (0.083±0.004)	4.0±0.1 (0.157±0.004)	0.3±0.05 (0.012±0.002)	1.9max. (0.075max.)
LB 2012 CB 2012 LB C2012 CB C2012 LB R2012	1.45±0.1 (0.057±0.004)	2.25±0.1 (0.089±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.010±0.002)	1.45max. (0.057max.)
LBMF1608 CBMF1608	1.1±0.1 (0.043±0.004)	1.9±0.1 (0.075±0.004)	4.0±0.1 (0.157±0.004)	0.25±0.05 (0.010±0.002)	1.2max. (0.047max.)

Unit : mm (inch)

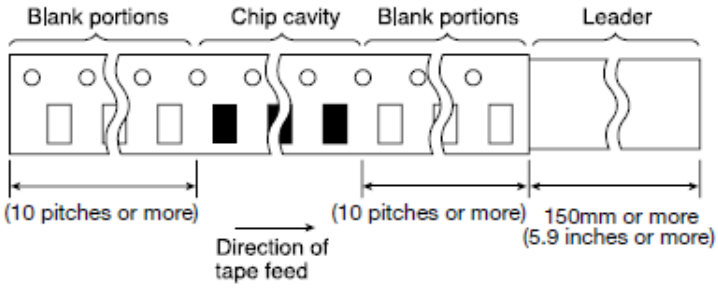
Card board carrier tape (0.315 inches wide)



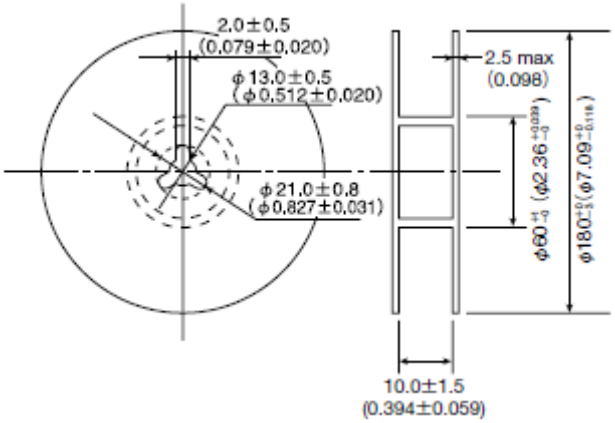
Type	Chip cavity		Insertion pitch	Tape thickness
	A	B	F	T
CB L2012	1.55±0.1 (0.061±0.004)	2.3±0.1 (0.091±0.004)	4.0±0.1 (0.157±0.004)	1.1max. (0.043max.)
LB 1608	1.0±0.1 (0.039±0.004)	1.8±0.1 (0.071±0.004)	4.0±0.1 (0.157±0.004)	1.1max. (0.043max.)

Unit : mm (inch)

④Leader and Blank Portion

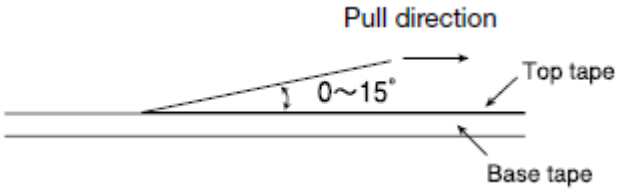


⑤Reel Size



⑥Top Tape Strength

The top tape requires a peel-off force 0.2 to 0.7N in the direction of the arrow as illustrated below.



WIRE-WOUND CHIP INDUCTORS (LB SERIES),
WIRE-WOUND CHIP POWER INDUCTORS (CB SERIES),
WIRE-WOUND CHIP INDUCTORS FOR SIGNAL LINES (LB SERIES M TYPE)

■RELIABILITY DATA

1.Operating temperature Range		
Specified Value	LB, LBC, LBR, LBMF Series	−40～＋105℃(Including self-generated heat)
	CB, CBC, CBL, CBMF Series	
	LBM Series	

2. Storage Temperature Range(after soldering)		
Specified Value	LB, LBC, LBR, LBMF Series	−40～＋85℃
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	LB, CB Series: Please refer the term of "7. storage conditions" in precautions.	

3.Rated Current		
Specified Value	LB, LBC, LBR, LBMF Series	Within the specified tolerance
	CB, CBC, CBL, CBMF Series	
	LBM Series	

4.Inductance		
Specified Value	LB, LBC, LBR, LBMF Series	Within the specified tolerance
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	LB・LBC・LBR・CB・CBC・CBL・LBMF・CBMF・LBM Series Measuring equipment :LCR Mater(HP4285A or its equivalent) Measuring frequency : Specified frequency	

5.Q		
Specified Value	LB, LBC, LBR, LBMF Series	—
	CB, CBC, CBL, CBMF Series	
	LBM Series	Within the specified tolerance
Test Methods and Remarks	LBM Series Measuring equipment : LCR Mater(HP4285A or its equivalent) Measuring frequency : Specified frequency	

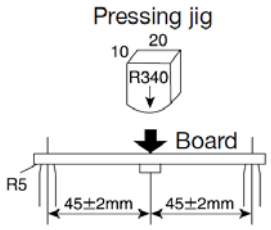
6.DC Resisitance		
Specified Value	LB, LBC, LBR, LBMF Series	Within the specified tolerance
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	Measuring equipment : DC Ohmmeter (HIOKI 3227 or its equivalent)	

7.Self-Resonant Frequency		
Specified Value	LB, LBC, LBR, LBMF Series	Within the specified tolerance
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	Measuring equipment : Impedance analyzer (HP4291A or its equivalent)	

8.Temperature Characteristic

Specified Value	LBM2016				Inductance change : Within±5%
	LB1608	LB2012	LBR2012	CB2012	Inductance change : Within±20%
	CBL2012	LB2016	CB2016	LB2518	
	LBR2518	CB2518	LBC3225	CBC3225	
	LBMF1608	CBMF1608	LBC2016	CBC2016	Inductance change : Within±25%
	LBC2518	CBC2518	LB3218		
	LBC2012	CBC2012			Inductance change : Within±35%
Test Methods and Remarks	Based on the inductance at 20℃ and Measured at the ambient of －40℃～＋85℃.				

9.Rasistance to Flexure of Substrate

Specified Value	LB, LBC, LBR, LBMF Series	No damage.
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	Warp : 2mm(LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF Series) Test substrate : Glass epoxy-resin substrate Thickness : 0.8mm(LB1608・LBMF1608・CBMF1608) : 1.0mm(Others) 	

10.Body Strength

Specified Value	LB, LBC, LBR, LBMF Series	No damage.
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	LB・LBC・LBR・CB・CBC・CBL・LBM Applied force : 10N Duration : 10sec. LB1608・LBMF1608・CBMF1608 Applied force : 5N Duration : 10sec.	

11.Adhesion of terminal electrode

Specified Value	LB, LBC, LBR, LBMF Series	No abnormality.
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF Applied force : 10N to X and Y directions Duration : 5 sec. Test substrate : Printed board LB1608・CBMF1608・LBMF1608 Applied force : 5N to X and Y directions Duration : 5 sec. Test substrate : Printed board	

12.Resistance to vibration

Specified Value	LB, LBC, LBR, LBMF Series	Inductance change : Within±10% No significant abnormality in appearance.
	CB, CBC, CBL, CBMF Series	
	LBM Series	Inductance change : Within±5% No significant abnormality in appearance.
Test Methods and Remarks	LB・LBR・LBC・CB・CBC・CBL・LBM・LBMF・CBMF: The given sample is soldered to the board and then it is tested depending on the conditions of the following table.	

Vibration Frequency	10～55Hz	
Total Amplitude	1.5mm (May not exceed acceleration 196m/s2)	
Sweeping Method	10Hz to 55Hz to 10Hz for 1min.	
Time	X	For 2 hours on each X, Y, and Z axis.
	Y	
	Z	

Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.

13.Drop test

Specified Value	LB, LBC, LBR, LBMF Series	—
	CB, CBC, CBL, CBMF Series	
	LBM Series	

14.Solderability

Specified Value	LB, LBC, LBR, LBMF Series	At least 90% of surface of terminal electrode is covered by new
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF: Solder temperature : 245±5℃ Duration : 5±0.5sec Flux : Methanol solution with 25% of colophony	

15.Resistance to soldering

Specified Value	LB, LBC, LBR, LBMF Series	Inductance change : Within±10%
	CB, CBC, CBL, CBMF Series	
	LBM Series	Inductance change : Within±5%
Test Methods and Remarks	LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF: 3 times of reflow oven at 230℃ MIN for 40sec. with peak temperature at 260 ℃ for 5sec. Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.	

16.Resisitance to solvent

Specified Value	LB, LBC, LBR, LBMF Series	—
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	Solvent temperature : Room temperature Type of solvent : Isopropyl alcohol Cleaning conditions : 90s. Immersion and cleaning.	

17.Thermal shock

Specified Value	LB, LBC, LBR, LBMF Series	Inductance change : Within±10% No significant abnormality in appearance.
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	LB・LBC・LBR・CB・CBC・CBL・LBM・LBMF・CBMF: The given sample is soldered to the board and then its Inductance is measured after 100cycles of the following conditions.	

Conditions of 1 cycle		
Step	Temperature (℃)	Duration (min)
1	−40±3	30±3
2	Room temperature	Within 3
3	+85±2	30±3
4	Room temperature	Within 3

Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.

18.Damp heat life test		
Specified Value	LB, LBC, LBR, LBMF Series	Inductance change : Within±10% No significant abnormality in appearance.
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	Temperature : 60±2℃ Humidity : 90～95%RH Duration : 1000 hrs Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.	

19.Loading under damp heat life test		
Specified Value	LB, LBC, LBR, LBMF Series	Inductance change : Within±10% No significant abnormality in appearance.
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	Temperature : 60±2℃ Humidity : 90～95%RH Duration : 1000 hrs Applied current : Rated current Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.	

20.High temperature life test		
Specified Value	LB, LBC, LBR, LBMF Series	—
	CB, CBC, CBL, CBMF Series	Inductance change : Within±10% No significant abnormality in appearance.
	LBM Series	
Test Methods and Remarks	Temperature : 85±2℃ Duration : 1000 hrs Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.	

21.Loading at high temperature life test		
Specified Value	LB, LBC, LBR, LBMF Series	Inductance change : Within±10% (LBC3225 Series : Within±20%) No significant abnormality in appearance.
	CB, CBC, CBL, CBMF Series	—
	LBM Series	
Test Methods and Remarks	Temperature : 85±2℃ Duration : 1000 hrs Applied current : Rated current Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.	

22.Low temperature life test		
Specified Value	LB, LBC, LBR, LBMF Series	Inductance change : Within±10% No significant abnormality in appearance.
	CB, CBC, CBL, CBMF Series	
	LBM Series	
Test Methods and Remarks	Temperature : −40±2℃ Duration : 1000 hrs Recovery : At least 2 hrs of recovery under the standard condition after the test, followed by the measurement within 48 hrs.	

23.Standard condition		
Specified Value	LB, LBC, LBR, LBMF Series	Standard test conditions Unless specified, Ambient temperature is 20±15℃ and the Relative humidity is 65±20%. If there is any doubt about the test results, further measurement shall be had within the following limits: Ambient Temperature: 20±2℃ Relative humidity: 65±5% Inductance value is based on our standard measurement systems.
	CB, CBC, CBL, CBMF Series	
	LBM Series	

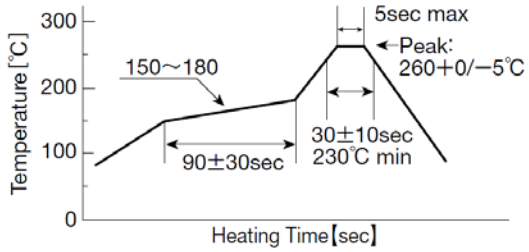
WIRE-WOUND CHIP INDUCTORS (LB SERIES),
WIRE-WOUND CHIP POWER INDUCTORS (CB SERIES),
WIRE-WOUND CHIP INDUCTORS FOR SIGNAL LINES (LB SERIES M TYPE)

■PRECAUTIONS

1. Circuit Design	
Precautions	◆Operating environment 1. The products described in this specification are intended for use in general electronic equipment, (office supply equipment, telecommunications systems, measuring equipment, and household equipment). They are not intended for use in mission-critical equipment or systems requiring special quality and high reliability (traffic systems, safety equipment, aerospace systems, nuclear control systems and medical equipment including life-support systems,) where product failure might result in loss of life, injury or damage. For such uses, contact TAIYO YUDEN Sales Department in advance.

2. PCB Design	
Precautions	◆Land pattern design 1. Please contact any of our offices for a land pattern, and refer to a recommended land pattern of a right figure or specifications.
Technical considerations	PRECAUTIONS 【Recommended Land Patterns】 Surface Mounting ・ Mounting and soldering conditions should be checked beforehand. ・ Applicable soldering process to those products is reflow soldering only.

3. Considerations for automatic placement	
Precautions	◆Adjustment of mounting machine 1. Excessive impact load should not be imposed on the products when mounting onto the PC boards. 2. Mounting and soldering conditions should be checked beforehand.
Technical considerations	1. When installing products, care should be taken not to apply distortion stress as it may deform the products.

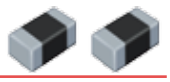
4. Soldering	
Precautions	◆Reflow soldering(LB and CB Types) 1. For reflow soldering with either leaded or lead-free solder, the profile specified in "point for controlling" is recommended. ◆Recommended conditions for using a soldering iron 1. Put the soldering iron on the land-pattern. Soldering iron's temperature – Below 350℃ Duration-3 seconds or less. The soldering iron should not come in contact with inductor directly.
Technical considerations	◆Reflow soldering(LB and CB Types) 1. Reflow profile  ◆Recommended conditions for using a soldering iron 1. Components can be damaged by excessive heat where soldering conditions exceed the specified range.

5. Cleaning	
Precautions	◆Cleaning conditions Washing by supersonic waves shall be avoided.
Technical considerations	◆Cleaning conditions If washed by supersonic waves, the products might be broken.

6. Handling	
Precautions	◆Handling 1. Keep the inductors away from all magnets and magnetic objects. ◆Breakaway PC boards (splitting along perforations) 1. When splitting the PC board after mounting inductors, care should be taken 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. ◆Mechanical considerations 1. Please do not give the inductors any excessive mechanical shocks.
Technical considerations	◆Handling 1. There is a case that a characteristic varies with magnetic influence. ◆Breakaway PC boards (splitting along perforations) 1. Planning pattern configurations and the position of products should be carefully performed to minimize stress. ◆Mechanical considerations 1. There is a case to be damaged by a mechanical shock.

7. Storage conditions	
Precautions	◆Storage 1. To maintain the solderability of terminal electrodes and to keep the packing material in good condition, temperature and humidity in the storage area should be controlled. ・ Recommended conditions Ambient temperature : 0～40℃ / Humidity : Below 70% RH The ambient temperature must be kept below 30℃ even under ideal storage conditions, solderability of products electrodes may decrease as time passes. For this reason, Should be used within 6 months from the time of delivery.
Technical considerations	◆Storage 1. Under a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place.

多层片状电感器(LK 系列)



波峰焊※ 回流焊

※LK1005除外

■型号标示法

※使用温度范围: -40～+85℃

L	K	△	1	6	0	8	△	R	1	0	M	—	T	△
①			②					③			④	⑤		⑥

△＝空格

①类型

代码	类型
LK△	多层片状电感器

②尺寸 (L×W)

代码	外型 (inch)	尺寸 (L×W) [mm]
1005	1005(0402)	1.0×0.5
1608	1608(0603)	1.6×0.8
2125	2125(0805)	2.0×1.25

③标称电感值

代码 (例)	标称电感值 [μH]
47N	0.047
R10	0.1
1R0	1.0
100	10

※R＝小数点

※N＝nH 的小数点

④电感量公差

代码	电感量公差
K	±10%
M	±20%

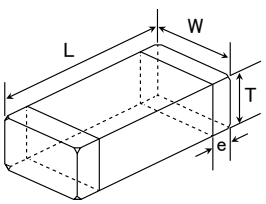
⑤包装

代码	包装
—T	卷盘带装

⑥本公司管理记号

代码	本公司管理记号
△	标准品

■标准外型尺寸 / 标准数量



Type	L	W	T	e	标准数量[pcs]	
					纸带	压纹带
LK 1005 (0402)	1.00±0.05 (0.039±0.002)	0.50±0.05 (0.020±0.002)	0.50±0.05 (0.020±0.002)	0.25±0.10 (0.010±0.004)	10000	—
LK 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)	4000	—
LK 2125 (0805)	2.0+0.3/−0.1 (0.079+0.012/−0.004)	1.25±0.2 (0.049±0.008)	0.85±0.2 (0.033±0.008)	0.5±0.3 (0.020±0.012)	4000	—
	2.0+0.3/−0.1 (0.079+0.012/−0.004)	1.25±0.2 (0.049±0.008)	1.25±0.2 (0.049±0.008)	0.5±0.3 (0.020±0.012)	—	2000

单位: mm (inch)

●LK1005

型号	EHS	标称电感值 [μH]	电感量公差	Q值 (min.)	自共振频率 [MHz] (min.)	直流电阻 [Ω] (max.)	额定电流 [mA] (max.)	测试频率 [MHz]	厚度 [mm]
LK 1005 R12□-T	RoHS	0.12	±10%, ±20%	10	180	0.59	25	25	0.50 ±0.05
LK 1005 R15□-T	RoHS	0.15	±10%, ±20%	10	165	0.63	25	25	0.50 ±0.05
LK 1005 R18□-T	RoHS	0.18	±10%, ±20%	10	150	0.76	25	25	0.50 ±0.05
LK 1005 R22□-T	RoHS	0.22	±10%, ±20%	10	135	0.79	25	25	0.50 ±0.05
LK 1005 R27□-T	RoHS	0.27	±10%, ±20%	10	120	0.91	25	25	0.50 ±0.05
LK 1005 R33□-T	RoHS	0.33	±10%, ±20%	10	105	1.05	25	25	0.50 ±0.05
LK 1005 R39□-T	RoHS	0.39	±10%, ±20%	20	85	0.41	20	10	0.50 ±0.05
LK 1005 R47□-T	RoHS	0.47	±10%, ±20%	20	80	0.42	20	10	0.50 ±0.05
LK 1005 R56□-T	RoHS	0.56	±10%, ±20%	20	75	0.47	20	10	0.50 ±0.05
LK 1005 R68□-T	RoHS	0.68	±10%, ±20%	20	70	0.55	20	10	0.50 ±0.05
LK 1005 R82□-T	RoHS	0.82	±10%, ±20%	20	65	0.59	20	10	0.50 ±0.05
LK 1005 1R0□-T	RoHS	1.0	±10%, ±20%	20	60	0.64	20	10	0.50 ±0.05
LK 1005 1R2□-T	RoHS	1.2	±10%, ±20%	20	55	0.79	20	10	0.50 ±0.05
LK 1005 1R5□-T	RoHS	1.5	±10%, ±20%	20	50	0.95	20	10	0.50 ±0.05
LK 1005 1R8□-T	RoHS	1.8	±10%, ±20%	20	45	1.16	20	10	0.50 ±0.05
LK 1005 2R2□-T	RoHS	2.2	±10%, ±20%	20	40	1.15	20	10	0.50 ±0.05

※型号中的[]中标有电感值公差。

●LK1608

型号	EHS	标称电感值 [μH]	电感量公差	Q值 (min.)	自共振频率 [MHz] (min.)	直流电阻 [Ω] (max.)	额定电流 [mA] (max.)	测试频率 [MHz]	厚度 [mm]
LK 1608 47NM-T	RoHS	0.047	±20%	10	260	0.20	150	50	0.80 ±0.15
LK 1608 68NM-T	RoHS	0.068	±20%	10	250	0.30	150	50	0.80 ±0.15
LK 1608 82NM-T	RoHS	0.082	±20%	10	245	0.30	150	50	0.80 ±0.15
LK 1608 R10□-T	RoHS	0.10	±10%, ±20%	15	240	0.35	150	25	0.80 ±0.15
LK 1608 R12□-T	RoHS	0.12	±10%, ±20%	15	205	0.40	150	25	0.80 ±0.15
LK 1608 R15□-T	RoHS	0.15	±10%, ±20%	15	180	0.45	150	25	0.80 ±0.15
LK 1608 R18□-T	RoHS	0.18	±10%, ±20%	15	165	0.50	100	25	0.80 ±0.15
LK 1608 R22□-T	RoHS	0.22	±10%, ±20%	15	150	0.55	100	25	0.80 ±0.15
LK 1608 R27□-T	RoHS	0.27	±10%, ±20%	15	136	0.80	100	25	0.80 ±0.15
LK 1608 R33□-T	RoHS	0.33	±10%, ±20%	15	125	0.75	80	25	0.80 ±0.15
LK 1608 R39□-T	RoHS	0.39	±10%, ±20%	15	110	0.85	80	25	0.80 ±0.15
LK 1608 R47□-T	RoHS	0.47	±10%, ±20%	15	105	0.95	80	25	0.80 ±0.15
LK 1608 R56□-T	RoHS	0.56	±10%, ±20%	15	95	1.05	80	25	0.80 ±0.15
LK 1608 R68□-T	RoHS	0.68	±10%, ±20%	15	80	1.25	40	25	0.80 ±0.15
LK 1608 R82□-T	RoHS	0.82	±10%, ±20%	15	75	1.40	40	25	0.80 ±0.15
LK 1608 1R0□-T	RoHS	1.0	±10%, ±20%	35	70	0.60	40	10	0.80 ±0.15
LK 1608 1R2□-T	RoHS	1.2	±10%, ±20%	35	60	0.65	40	10	0.80 ±0.15
LK 1608 1R5□-T	RoHS	1.5	±10%, ±20%	35	55	0.70	40	10	0.80 ±0.15
LK 1608 1R8□-T	RoHS	1.8	±10%, ±20%	35	50	0.95	40	10	0.80 ±0.15
LK 1608 2R2□-T	RoHS	2.2	±10%, ±20%	35	45	1.00	30	10	0.80 ±0.15
LK 1608 2R7□-T	RoHS	2.7	±10%, ±20%	35	40	1.15	30	10	0.80 ±0.15
LK 1608 3R3□-T	RoHS	3.3	±10%, ±20%	35	38	1.30	30	10	0.80 ±0.15
LK 1608 3R9□-T	RoHS	3.9	±10%, ±20%	35	36	1.50	30	10	0.80 ±0.15
LK 1608 4R7□-T	RoHS	4.7	±10%, ±20%	35	33	1.60	30	10	0.80 ±0.15
LK 1608 5R6□-T	RoHS	5.6	±10%, ±20%	35	22	1.10	10	4	0.80 ±0.15
LK 1608 6R8□-T	RoHS	6.8	±10%, ±20%	35	20	1.30	10	4	0.80 ±0.15
LK 1608 8R2□-T	RoHS	8.2	±10%, ±20%	35	18	1.50	10	4	0.80 ±0.15
LK 1608 100□-T	RoHS	10	±10%, ±20%	35	17	1.70	10	2	0.80 ±0.15
LK 1608 120□-T	RoHS	12	±10%, ±20%	35	15	1.80	10	2	0.80 ±0.15
LK 1608 150M-T	RoHS	15	±20%	20	14	1.50	1	1	0.80 ±0.15
LK 1608 180M-T	RoHS	18	±20%	20	13	1.60	1	1	0.80 ±0.15
LK 1608 220M-T	RoHS	22	±20%	20	11	1.70	1	1	0.80 ±0.15
LK 1608 270M-T	RoHS	27	±20%	20	10	1.80	1	1	0.80 ±0.15
LK 1608 330M-T	RoHS	33	±20%	20	9	2.20	1	1	0.80 ±0.15

※型号中的[]中标有电感值公差。

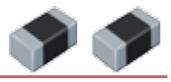
●LK2125

型号	EHS	标称电感值 [μH]	电感量公差	Q值 (min.)	自共振频率 [MHz] (min.)	直流电阻 [Ω] (max.)	额定电流 [mA] (max.)	测试频率 [MHz]	厚度 [mm]
LK 2125 47NM-T	RoHS	0.047	±20%	15	320	0.10	300	50	0.85 ±0.2
LK 2125 68NM-T	RoHS	0.068	±20%	15	280	0.15	300	50	0.85 ±0.2
LK 2125 82NM-T	RoHS	0.082	±20%	15	255	0.20	300	50	0.85 ±0.2
LK 2125 R10□-T	RoHS	0.10	±10%, ±20%	20	235	0.15	270	25	0.85 ±0.2
LK 2125 R12□-T	RoHS	0.12	±10%, ±20%	20	220	0.20	270	25	0.85 ±0.2
LK 2125 R15□-T	RoHS	0.15	±10%, ±20%	20	200	0.20	270	25	0.85 ±0.2
LK 2125 R18□-T	RoHS	0.18	±10%, ±20%	20	185	0.25	270	25	0.85 ±0.2
LK 2125 R22□-T	RoHS	0.22	±10%, ±20%	20	170	0.30	250	25	0.85 ±0.2
LK 2125 R27□-T	RoHS	0.27	±10%, ±20%	20	150	0.35	250	25	0.85 ±0.2
LK 2125 R33□-T	RoHS	0.33	±10%, ±20%	20	145	0.40	250	25	0.85 ±0.2
LK 2125 R39□-T	RoHS	0.39	±10%, ±20%	25	135	0.45	200	25	0.85 ±0.2
LK 2125 R47□-T	RoHS	0.47	±10%, ±20%	25	125	0.50	200	25	1.25 ±0.2
LK 2125 R56□-T	RoHS	0.56	±10%, ±20%	25	115	0.55	150	25	1.25 ±0.2
LK 2125 R68□-T	RoHS	0.68	±10%, ±20%	25	105	0.60	150	25	1.25 ±0.2
LK 2125 R82□-T	RoHS	0.82	±10%, ±20%	25	100	0.65	150	25	1.25 ±0.2
LK 2125 1R0□-T	RoHS	1.0	±10%, ±20%	45	75	0.30	80	10	0.85 ±0.2
LK 2125 1R2□-T	RoHS	1.2	±10%, ±20%	45	65	0.35	80	10	0.85 ±0.2
LK 2125 1R5□-T	RoHS	1.5	±10%, ±20%	45	60	0.40	80	10	0.85 ±0.2
LK 2125 1R8□-T	RoHS	1.8	±10%, ±20%	45	55	0.45	80	10	0.85 ±0.2
LK 2125 2R2□-T	RoHS	2.2	±10%, ±20%	45	50	0.50	50	10	0.85 ±0.2
LK 2125 2R7□-T	RoHS	2.7	±10%, ±20%	45	45	0.55	50	10	1.25 ±0.2
LK 2125 3R3□-T	RoHS	3.3	±10%, ±20%	45	41	0.60	50	10	1.25 ±0.2
LK 2125 3R9□-T	RoHS	3.9	±10%, ±20%	45	38	0.70	30	10	1.25 ±0.2
LK 2125 4R7□-T	RoHS	4.7	±10%, ±20%	45	35	0.70	30	10	1.25 ±0.2
LK 2125 5R6□-T	RoHS	5.6	±10%, ±20%	50	32	0.60	15	4	1.25 ±0.2
LK 2125 6R8□-T	RoHS	6.8	±10%, ±20%	50	29	0.70	15	4	1.25 ±0.2
LK 2125 8R2□-T	RoHS	8.2	±10%, ±20%	50	26	0.70	15	4	1.25 ±0.2
LK 2125 100□-T	RoHS	10	±10%, ±20%	50	24	0.80	15	2	1.25 ±0.2
LK 2125 120□-T	RoHS	12	±10%, ±20%	50	22	0.90	15	2	1.25 ±0.2
LK 2125 150M-T	RoHS	15	±20%	30	19	0.70	5	1	1.25 ±0.2
LK 2125 180M-T	RoHS	18	±20%	30	18	0.80	5	1	1.25 ±0.2
LK 2125 220M-T	RoHS	22	±20%	30	16	0.90	5	1	1.25 ±0.2
LK 2125 270M-T	RoHS	27	±20%	30	14	1.00	5	1	1.25 ±0.2
LK 2125 330M-T	RoHS	33	±20%	30	13	1.10	5	0.4	1.25 ±0.2

※型号中的[]中标有电感值公差。

▶由于篇幅有限，本产品目录中只记载了有代表性的产品规格，若考虑使用弊司产品时，请确认交货规格说明书中的详细规格。
另外，有关各产品的详细信息(特性图、可靠性信息、使用时的注意事项等)，请参阅弊司网站(http://www.ty-top.com/)。

多层片状电感器(CK 系列／CK 系列 S 型)



波峰焊　回流焊

■型号标示法　　※使用温度范围: -40～+85℃

C	K	△	2	1	2	5	△	1	R	0	M	—	T	△
①			②					③			④	⑤		⑥

△＝空格

①类型

代码	类型
CK△	多层片状电感器
CKS	

②尺寸 (L×W)

代码	外型 (inch)	尺寸 (L×W) [mm]
1608	1608(0603)	1.6×0.8
2125	2125(0805)	2.0×1.25

③标称电感值

代码 (例)	标称电感值 [μH]
1R0	1.0
100	10

※R＝小数点

④电感量公差

代码	电感量公差
M	±20%

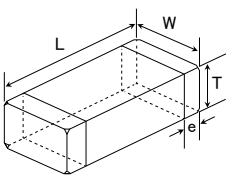
⑤包装

代码	包装
—T	卷盘带装

⑥本公司管理记号

代码	本公司管理记号
△	标准品

■标准外型尺寸 / 标准数量



Type	L	W	T	e	标准数量 [pcs] 纸带	标准数量 [pcs] 压纹带
CK 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)	4000	—
CK 2125 CKS2125 (0805)	2.0+0.3/−0.1 (0.079+0.012/−0.004)	1.25±0.2 (0.049±0.008)	0.85±0.2 (0.033±0.008)	0.5±0.3 (0.020±0.012)	4000	—
	2.0+0.3/−0.1 (0.079+0.012/−0.004)	1.25±0.2 (0.049±0.008)	1.25±0.2 (0.049±0.008)	0.5±0.3 (0.020±0.012)	—	2000

单位: mm (inch)

■型号一览

●CK1608

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (±30%)	额定电流 [mA] (max.)	测试频率 [MHz]	厚度 [mm]
CK 1608 4R7M-T	RoHS	4.7	±20%	25	0.45	60	4	0.80 ±0.15
CK 1608 100M-T	RoHS	10.0	±20%	17	0.85	50	2	0.80 ±0.15

●CK2125

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (max.)	直流电阻 [Ω] (typ.)	额定电流 [mA] (max.)	测试频率 [MHz]	厚度 [mm]
CK 2125 R10M-T	RoHS	0.10	±20%	235	0.16	0.08	500	25	0.85 ±0.2
CK 2125 R15M-T	RoHS	0.15	±20%	200	0.20	0.13	500	25	0.85 ±0.2
CK 2125 R22M-T	RoHS	0.22	±20%	170	0.23	0.16	400	25	0.85 ±0.2
CK 2125 R33M-T	RoHS	0.33	±20%	145	0.28	0.21	400	25	0.85 ±0.2
CK 2125 R47M-T	RoHS	0.47	±20%	125	0.32	0.25	400	25	1.25 ±0.2
CK 2125 R68M-T	RoHS	0.68	±20%	105	0.45	0.35	300	25	1.25 ±0.2
CK 2125 1R0M-T	RoHS	1.0	±20%	75	0.26	0.19	220	10	0.85 ±0.2
CK 2125 1R5M-T	RoHS	1.5	±20%	60	0.28	0.23	170	10	0.85 ±0.2
CK 2125 2R2M-T	RoHS	2.2	±20%	50	0.35	0.26	150	10	0.85 ±0.2
CK 2125 3R3M-T	RoHS	3.3	±20%	41	0.43	0.38	130	10	1.25 ±0.2
CK 2125 4R7M-T	RoHS	4.7	±20%	35	0.48	0.44	120	10	1.25 ±0.2
CK 2125 6R8M-T	RoHS	6.8	±20%	29	0.52	0.39	70	4	1.25 ±0.2
CK 2125 100M-T	RoHS	10.0	±20%	24	0.65	0.55	60	2	1.25 ±0.2

●CKS2125

型号	EHS	标称电感值 [μH]	电感量公差	自共振频率 [MHz] (min.)	直流电阻 [Ω] (max.)	直流电阻 [Ω] (typ.)	额定电流 [mA] (max.)	测试频率 [MHz]	厚度 [mm]
CKS2125 1R0M-T	RoHS	1.0	±20%	75	0.12	0.09	280	10	0.85 ±0.2
CKS2125 2R2M-T	RoHS	2.2	±20%	50	0.19	0.15	170	10	0.85 ±0.2
CKS2125 4R7M-T	RoHS	4.7	±20%	35	0.30	0.25	130	10	1.25 ±0.2
CKS2125 100M-T	RoHS	10.0	±20%	24	0.52	0.40	110	2	1.25 ±0.2

▶由于篇幅有限，本产品目录中只记载了有代表性的产品规格，若考虑使用弊司产品时，请确认交货规格说明书中的详细规格。
另外，有关各产品的详细信息(特性图、可靠性信息、使用时的注意事项等)，请参阅弊司网站(http://www.ty-top.com/)。

Multilayer chip inductors
Multilayer chip inductors for high frequency, Multilayer chip bead inductors
Multilayer common mode choke coils (MC series F type)
Metal Multilayer Chip Power Inductors (MCOIL™ MC series)

■PACKAGING

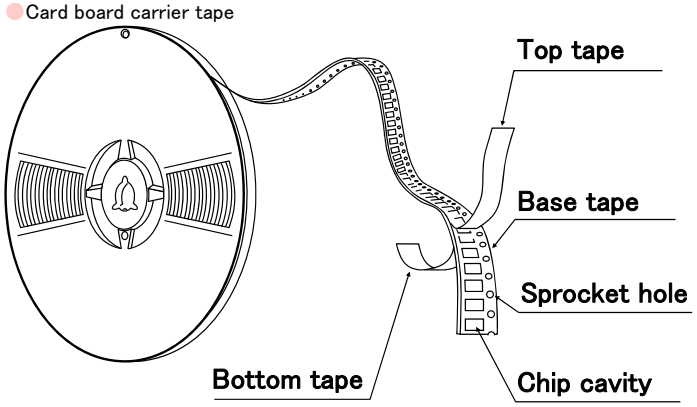
①Minimum Quantity

●Tape & Reel Packaging

Type	Thickness mm (inch)	Standard Quantity [pcs]	
		Paper Tape	Embossed Tape
CK1608 (0603)	0.8 (0.031)	4000	—
CK2125 (0805)	0.85 (0.033)	4000	—
	1.25 (0.049)	—	2000
CKS2125 (0805)	0.85 (0.033)	4000	—
	1.25 (0.049)	—	2000
CKP1608 (0603)	0.8 (0.031)	4000	—
CKP2012 (0805)	0.9 (0.035)	—	3000
CKP2016 (0806)	0.9 (0.035)	—	3000
CKP2520 (1008)	0.7 (0.028)	—	3000
	0.9 (0.035)	—	3000
	1.1 (0.043)	—	2000
NM2012 (0805)	0.9 (0.035)	—	3000
NM2520 (1008)	0.9 (0.035)	—	3000
	1.1 (0.043)	—	2000
LK1005 (0402)	0.5 (0.020)	10000	—
LK1608 (0603)	0.8 (0.031)	4000	—
LK2125 (0805)	0.85 (0.033)	4000	—
	1.25 (0.049)	—	2000
HK0603 (0201)	0.3 (0.012)	15000	—
HK1005 (0402)	0.5 (0.020)	10000	—
HK1608 (0603)	0.8 (0.031)	4000	—
HK2125 (0805)	0.85 (0.033)	—	4000
	1.0 (0.039)	—	3000
HKQ0402 (01005)	0.2 (0.008)	20000	40000
HKQ0603W (0201)	0.3 (0.012)	15000	—
HKQ0603C (0201)	0.3 (0.012)	15000	—
HKQ0603S (0201)	0.3 (0.012)	15000	—
HKQ0603U (0201)	0.3 (0.012)	15000	—
AQ105 (0402)	0.5 (0.020)	10000	—
BK0402 (01005)	0.2 (0.008)	20000	—
BK0603 (0201)	0.3 (0.012)	15000	—
BK1005 (0402)	0.5 (0.020)	10000	—
BKH0603 (0201)	0.3 (0.012)	15000	—
BKH1005 (0402)	0.5 (0.020)	10000	—
BK1608 (0603)	0.8 (0.031)	4000	—
BK2125 (0805)	0.85 (0.033)	4000	—
	1.25 (0.049)	—	2000
BK2010 (0804)	0.45 (0.018)	4000	—
BK3216 (1206)	0.8 (0.031)	—	4000
BKP0402 (01005)	0.2 (0.008)	20000	—
BKP0603 (0201)	0.3 (0.012)	15000	—
BKP1005 (0402)	0.5 (0.020)	10000	—
BKP1608 (0603)	0.8 (0.031)	4000	—
BKP2125 (0805)	0.85 (0.033)	4000	—
MCF0605 (0202)	0.3 (0.012)	15000	—
MCF0806 (0302)	0.4 (0.016)	—	10000
MCF1210 (0504)	0.55 (0.022)	—	5000
MCF2010 (0804)	0.45 (0.018)	—	4000
MCFK1608 (0603)	0.6 (0.024)	4000	—
MCFE1608 (0603)	0.65 (0.026)	4000	—
MCHK2012 (0806)	0.8 (0.031)	4000	—
MCKK2012 (0805)	1.0 (0.039)	–	3000

②Taping material

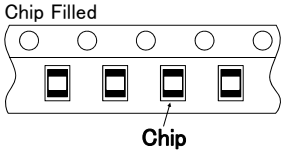
Card board carrier tape



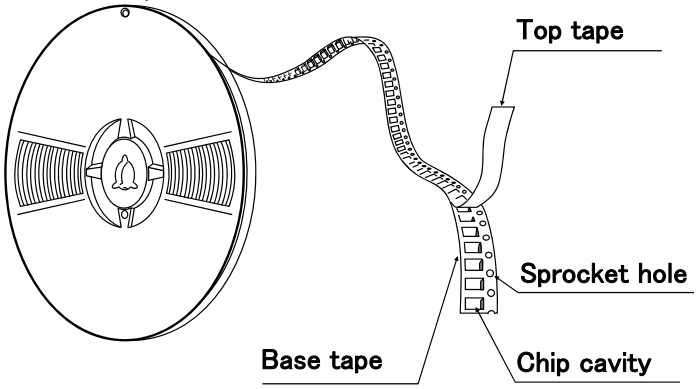
CK	1608
CKP	1608
CK	2125
CKS	2125
LK	1005
LK	1608
LK	2125
HK	0603
HK	1005
HK	1608
HKQ	0402
HKQ	0603
AQ	105

BK	0402
BK	0603
BK	1005
BK	1608
BK	2125
BK	2010
BKP	0402
BKP	0603
BKP	1005
BKP	1608
BKP	2125
BKH	0603
BKH	1005
MCF	0605
MC	1608
MC	2012

Chip Filled



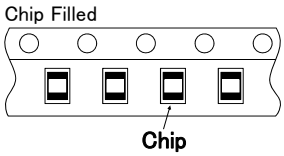
Embossed Tape



CK	2125
CKS	2125
CKP	2012
CKP	2016
CKP	2520
NM	2012
NM	2520
LK	2125
HKQ	0402
HK	2125

BK	2125
BK	3216
MCF	0806
MCF	1210
MCF	2010
MC	2012

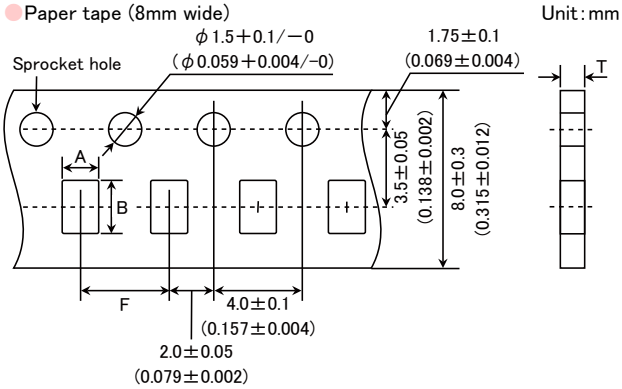
Chip Filled



③Taping Dimensions

Paper tape (8mm wide)

Unit : mm (inch)

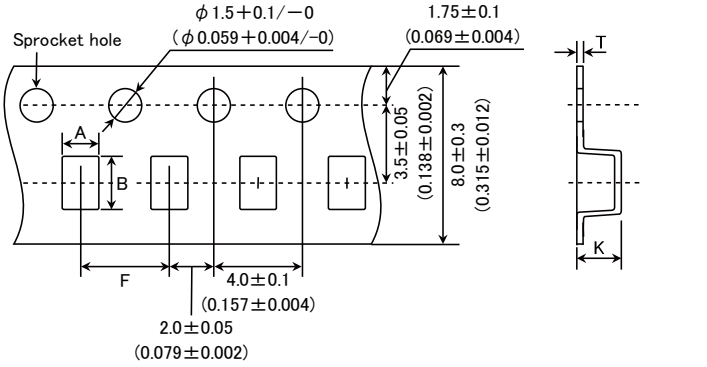


Type	Thickness mm(inch)	Chip cavity		Insertion Pitch	Tape Thickness
		A	B	F	T
CK1608(0603)	0.8 (0.031)	1.0±0.2 (0.039±0.008)	1.8±0.2 (0.071±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.043max)
CK2125(0805)	0.85(0.033)	1.5±0.2 (0.059±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.043max)
CKS2125(0805)	0.85(0.033)	1.5±0.2 (0.059±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.043max)
CKP1608(0603)	0.8 (0.031)	1.0±0.2 (0.039±0.008)	1.8±0.2 (0.071±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.043max)
LK1005(0402)	0.5 (0.020)	0.65±0.1 (0.026±0.004)	1.15±0.1 (0.045±0.004)	2.0±0.05 (0.079±0.002)	0.8max (0.031max)
LK1608(0603)	0.8 (0.031)	1.0±0.2 (0.039±0.008)	1.8±0.2 (0.071±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.043max)
LK2125(0805)	0.85(0.033)	1.5±0.2 (0.059±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.043max)
HK0603(0201)	0.3 (0.012)	0.40±0.06 (0.016±0.002)	0.70±0.06 (0.028±0.002)	2.0±0.05 (0.079±0.002)	0.45max (0.018max)
HK1005(0402)	0.5 (0.020)	0.65±0.1 (0.026±0.004)	1.15±0.1 (0.045±0.004)	2.0±0.05 (0.079±0.002)	0.8max (0.031max)
HK1608(0603)	0.8 (0.031)	1.0±0.2 (0.039±0.008)	1.8±0.2 (0.071±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.043max)
HKQ0402(01005)	0.2 (0.008)	0.25±0.04 (0.010±0.002)	0.45±0.04 (0.018±0.002)	2.0±0.05 (0.079±0.002)	0.36max (0.014max)
HKQ0603W(0201)	0.3 (0.012)	0.40±0.06 (0.016±0.002)	0.70±0.06 (0.028±0.002)	2.0±0.05 (0.079±0.002)	0.45max (0.018max)
HKQ0603C(0201)	0.3 (0.012)	0.40±0.06 (0.016±0.002)	0.70±0.06 (0.028±0.002)	2.0±0.05 (0.079±0.002)	0.45max (0.018max)
HKQ0603S(0201)	0.3 (0.012)	0.40±0.06 (0.016±0.002)	0.70±0.06 (0.028±0.002)	2.0±0.05 (0.079±0.002)	0.45max (0.018max)
HKQ0603U(0201)	0.3 (0.012)	0.40±0.06 (0.016±0.002)	0.70±0.06 (0.028±0.002)	2.0±0.05 (0.079±0.002)	0.45max (0.018max)
AQ105(0402)	0.5 (0.020)	0.75±0.1 (0.030±0.004)	1.15±0.1 (0.045±0.004)	2.0±0.05 (0.079±0.002)	0.8max (0.031max)
BK0402(01005)	0.2 (0.008)	0.25±0.04 (0.010±0.002)	0.45±0.04 (0.018±0.002)	2.0±0.05 (0.079±0.002)	0.36max (0.014max)
BK0603(0201)	0.3 (0.012)	0.40±0.06 (0.016±0.002)	0.70±0.06 (0.028±0.002)	2.0±0.05 (0.079±0.002)	0.45max (0.018max)
BK1005(0402)	0.5 (0.020)	0.65±0.1 (0.026±0.004)	1.15±0.1 (0.045±0.004)	2.0±0.05 (0.079±0.002)	0.8max (0.031max)
BK1608(0603)	0.8 (0.031)	1.0±0.2 (0.039±0.008)	1.8±0.2 (0.071±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.043max)
BK2125(0805)	0.85(0.033)	1.5±0.2 (0.059±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.043max)
BK2010(0804)	0.45(0.018)	1.2±0.1 (0.047±0.004)	2.17±0.1 (0.085±0.004)	4.0±0.1 (0.157±0.004)	0.8max (0.031max)
BKP0402(01005)	0.2 (0.008)	0.25±0.04 (0.010±0.002)	0.45±0.04 (0.018±0.002)	2.0±0.05 (0.079±0.002)	0.36max (0.014max)
BKP0603(0201)	0.3 (0.012)	0.40±0.06 (0.016±0.002)	0.70±0.06 (0.028±0.002)	2.0±0.05 (0.079±0.002)	0.45max (0.018max)
BKP1005(0402)	0.5 (0.020)	0.65±0.1 (0.026±0.004)	1.15±0.1 (0.045±0.004)	2.0±0.05 (0.079±0.002)	0.8max (0.031max)
BKP1608(0603)	0.8 (0.031)	1.0±0.2 (0.039±0.008)	1.8±0.2 (0.071±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.043max)
BKP2125(0805)	0.85(0.033)	1.5±0.2 (0.059±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	1.1max (0.043max)
BKH0603(0201)	0.3 (0.012)	0.40±0.06 (0.016±0.002)	0.70±0.06 (0.028±0.002)	2.0±0.05 (0.079±0.002)	0.45max (0.018max)
BKH1005(0402)	0.5 (0.020)	0.65±0.1 (0.026±0.004)	1.15±0.1 (0.045±0.004)	2.0±0.05 (0.079±0.002)	0.8max (0.031max)
MCF0605(0202)	0.3 (0.012)	0.62±0.03 (0.024±0.001)	0.77±0.03 (0.030±0.001)	2.0±0.05 (0.079±0.002)	0.45max (0.018max)
MCFK1608(0603)	0.6 (0.024)	1.1±0.05 (0.043±0.002)	1.9±0.05 (0.075±0.002)	4.0±0.1 (0.157±0.004)	0.72max (0.028max)
MCFE1608(0603)	0.65(0.026)	1.1±0.05 (0.043±0.002)	1.9±0.05 (0.075±0.002)	4.0±0.1 (0.157±0.004)	0.9max (0.035max)
MCHK2012(0805)	0.8 (0.031)	1.55±0.2 (0.061±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	0.9max (0.035max)

Unit : mm(inch)

● Embossed Tape (8mm wide)

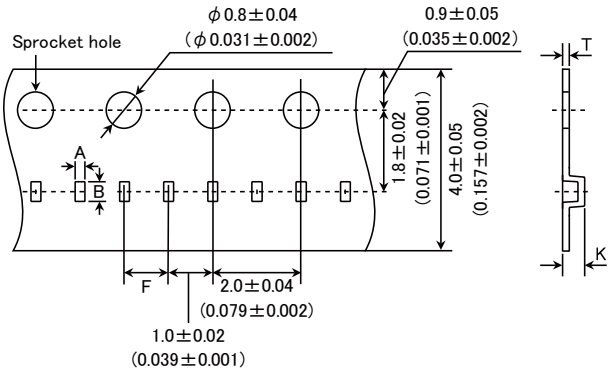
Unit : mm (inch)



Type	Thickness mm (inch)	Chip cavity		Insertion Pitch	Tape Thickness	
		A	B	F	K	T
CK2125 (0805)	1.25 (0.049)	1.5±0.2 (0.059±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	2.0 (0.079)	0.3 (0.012)
CKS2125 (0805)	1.25 (0.049)	1.5±0.2 (0.059±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	2.0 (0.079)	0.3 (0.012)
CKP2012 (0805)	0.9 (0.035)	1.55±0.2 (0.061±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	1.3 (0.051)	0.3 (0.012)
CKP2016 (0806)	0.9 (0.035)	1.8±0.1 (0.071±0.004)	2.2±0.1 (0.087±0.004)	4.0±0.1 (0.157±0.004)	1.3 (0.051)	0.25 (0.01)
CKP2520 (1008)	0.7 (0.028)	2.3±0.1 (0.091±0.004)	2.8±0.1 (0.110±0.004)	4.0±0.1 (0.157±0.004)	1.4 (0.055)	0.3 (0.012)
	0.9 (0.035)				1.4 (0.055)	
	1.1 (0.043)				1.7 (0.067)	
NM2012 (0805)	0.9 (0.035)	1.55±0.2 (0.061±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	1.3 (0.051)	0.3 (0.012)
NM2520 (1008)	0.9 (0.035)	2.3±0.1 (0.091±0.004)	2.8±0.1 (0.110±0.004)	4.0±0.1 (0.157±0.004)	1.4 (0.055)	0.3 (0.012)
	1.1 (0.043)				1.7 (0.067)	
LK2125 (0805)	1.25 (0.049)	1.5±0.2 (0.059±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	2.0 (0.079)	0.3 (0.012)
HK2125 (0805)	0.85 (0.033)	1.5±0.2 (0.059±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	1.5 (0.059)	0.3 (0.012)
	1.0 (0.039)				2.0 (0.079)	
BK2125 (0805)	1.25 (0.049)	1.5±0.2 (0.059±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	2.0 (0.079)	0.3 (0.012)
BK3216 (1206)	0.8 (0.031)	1.9±0.1 (0.075±0.004)	3.5±0.1 (0.138±0.004)	4.0±0.1 (0.157±0.004)	1.4 (0.055)	0.3 (0.012)
MCF0806 (0302)	0.4 (0.016)	0.75±0.05 (0.030±0.002)	0.95±0.05 (0.037±0.002)	2.0±0.05 (0.079±0.002)	0.55 (0.022)	0.3 (0.012)
MCF1210 (0504)	0.55 (0.022)	1.15±0.05 (0.045±0.002)	1.40±0.05 (0.055±0.002)	4.0±0.1 (0.157±0.004)	0.65 (0.026)	0.3 (0.012)
MCF2010 (0804)	0.45 (0.018)	1.1±0.1 (0.043±0.004)	2.3±0.1 (0.091±0.004)	4.0±0.1 (0.157±0.004)	0.85 (0.033)	0.3 (0.012)
MCKK2012 (0805)	1.0 (0.039)	1.55±0.2 (0.061±0.008)	2.3±0.2 (0.091±0.008)	4.0±0.1 (0.157±0.004)	1.3 (0.051)	0.25 (0.010)

Unit : mm (inch)

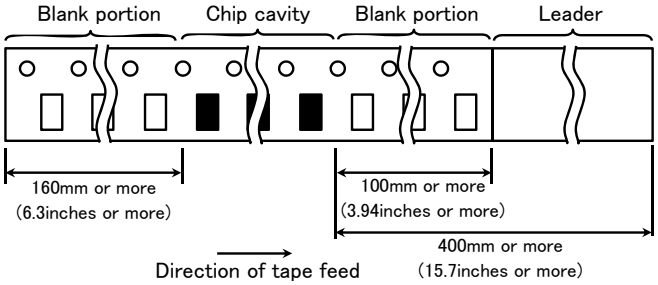
Embossed Tape (4mm wide)　　Unit : mm (inch)



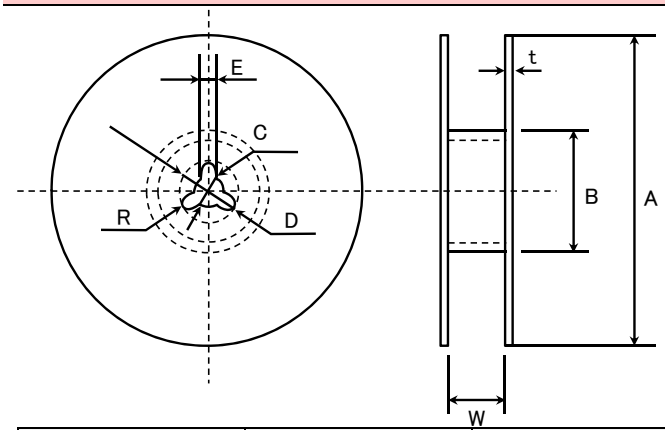
Type	Thickness mm (inch)	Chip cavity		Insertion Pitch	Tape Thickness	
		A	B	F	K	T
HKQ0402 (01005)	0.2 (0.008)	0.23	0.43	1.0±0.02	0.5max.	0.25max.

Unit : mm

④LEADER AND BLANK PORTION



⑤Reel Size



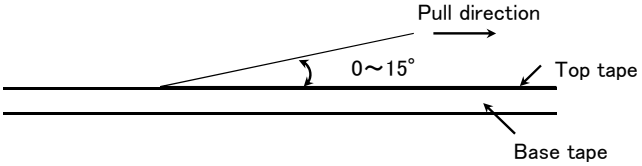
A	B	C	D	E	R
φ178±2.0	φ50 or more	φ13.0±0.2	φ21.0±0.8	2.0±0.5	1.0

	t	W
4mm width tape	1.5max.	5±1.0
8mm width tape	2.5max.	10±1.5

(Unit : mm)

⑥Top tape strength

The top tape requires a peel-off force of 0.1～0.7N in the direction of the arrow as illustrated below.



Multilayer chip inductors
Multilayer chip inductors for high frequency, Multilayer chip bead inductors
Multilayer common mode choke coils(MC series F type)
Metal Multilayer Chip Power Inductors (MCOIL™ MC series)

■RELIABILITY DATA

1. Operating Temperature Range			
Specified Value	BK0402		−55～＋125℃
	BK0603		
	BK1005		
	BKH0603		
	BKH1005		
	BK1608		
	BK2125		
	ARRAY	BK2010	
		BK3216	
	BKP0402		−55～＋85℃
	BKP0603		
	BKP1005		
	BKP1608		
	BKP2125		
	MCF 0605		−40～＋85℃
	MCF 0806		
	MCF 1210		
	MCF 2010		
	CK1608		−40～＋85℃
	CK2125		
	CKS2125		
	CKP1608		
	CKP2012		
	CKP2016		
	CKP2520		
	NM2012		
	NM2520		
	LK1005		
	LK1608		
	LK2125		
	HKQ0402		−55～＋125℃
	HK0603		
	HK1005		
	HK1608		−40～＋85℃
	HK2125		
	HKQ0603W/HKQ0603C/HKQ0603S/ HKQ0603U/		−55～＋125℃
	AQ105		
	MCFK1608		
	MCFE1608		−40～＋125℃(Including self-generated heat)
	MCHK2012		
	MCKK2012		

2. Storage Temperature Range			
Specified Value	BK0402		−55～＋125℃
	BK0603		
	BK1005		
	BKH0603		
	BKH1005		
	BK1608		
	BK2125		
	ARRAY	BK2010	
		BK3216	
	BKP0402		−55～＋85℃
	BKP0603		
	BKP1005		
	BKP1608		
	BKP2125		
	MCF 0605		−40～＋85℃
	MCF 0806		
	MCF 1210		
	MCF 2010		
	CK1608		−40～＋85℃
	CK2125		
	CKS2125		
	CKP1608		
	CKP2012		
	CKP2016		
	CKP2520		
	NM2012		
	NM2520		
	LK1005		
	LK1608		
	LK2125		
	HKQ0402		−55～＋125℃
	HK0603		
	HK1005		
	HK1608		−40～＋85℃
	HK2125		
	HKQ0603W/HKQ0603C/HKQ0603S/ HKQ0603U/		−55～＋125℃
	AQ105		
	MCFK1608		
	MCFE1608		−40～＋85℃
	MCHK2012		
	MCKK2012		

3. Rated Current			
Specified Value	BK0402		150～750mA DC
	BK0603		100～500mA DC
	BK1005		120～1000mA DC
	BKH0603		115～450mA DC
	BKH1005		200～300mA DC
	BK1608		150～1500mA DC
	BK2125		200～1200mA DC
	ARRAY	BK2010	100mA DC
		BK3216	100～200mA DC
	BKP0402		0.55～1.1A DC
	BKP0603		0.8～1.8A DC
	BKP1005		0.8～2.4A DC
	BKP1608		1.0～3.0A DC
	BKP2125		1.5～4.0A DC
	MCF 0605		0.05A DC
	MCF 0806		0.1～0.13A DC
	MCF 1210		0.1～0.15A DC
	MCF 2010		0.1A DC
	CK1608		50～60mA DC
	CK2125		60～500mA DC
	CKS2125		110～280mA DC
	CKP1608		0.35～0.9A DC
	CKP2012		0.7～1.7A DC
	CKP2016		0.9～1.6A DC
	CKP2520		1.1～1.8A DC
	NM2012		1.0～1.2A DC
	NM2520		0.9～1.2A DC
	LK1005		20～25mA DC
	LK1608		1～150mA DC
	LK2125		5～300mA DC
	HK0603		60～470mA DC
	HK1005		110～300mA DC (−55～+125℃) 200～900mA DC (−55～+85℃)
	HK1608		150～300mA DC
	HK2125		300mA DC
	HKQ0402		100～500mA DC
	HKQ0603W		100～850mA DC
	HKQ0603C		160～850mA DC
	HKQ0603S		130～600mA DC
	HKQ0603U		190～900mA DC
	AQ105		280～710mA DC
	MCFK1608		Idc1 : 1900～2300mA DC, Idc2 : 1600～2100mA DC
	MCFE1608		Idc1 : 1400～2600mA DC, Idc2 : 800～1500mA DC
	MCHK2012		Idc1 : 3210～4320mA DC, Idc2 : 3240～3600mA DC
	MCKK2012		Idc1 : 4500～6200mA DC, Idc2 : 3100～4000mA DC

Definition of rated current:

・In the CK, CKS and BK Series, the rated current is the value of current at which the temperature of the element is increased within 20℃.

・In the BK Series P type, CK Series P type, NM Series, the rated current is the value of current at which the temperature of the element is increased within 40℃.

・In the LK, HK, HKQ0603, and AQ Series, the rated current is either the DC value at which the initial L value is decreased within 5% with the application of DC bias, or the value of current at which the temperature of the element is increased within 20℃.

・In the HKQ0402(～9N1), the rated current is either the DC value at which the initial L value is decreased within 5% with the application of DC bias, or the value of current at which the temperature of the element is increased within 20℃.

・In the HKQ0402(10N～), the rated current is either the DC value at which the initial L value is decreased within 5% with the application of DC bias, or the value of current at which the temperature of the element is increased within 25℃.

・In the MC Series, Idc1 is the DC value at which the initial L value is decreased within 30% and Idc2 is the DC value at which the temperature of element is increased within 40℃ by the application of DC bias. (at 20℃)

4. Impedance			
Specified Value	BK0402		10～330Ω ±5Ω(10Ω), ±25%(Other)
	BK0603		10～1200Ω ±25%
	BK1005		10～1800Ω ±25%
	BKH0603		25～1500Ω ±25%
	BKH1005		600～1800Ω ±25%
	BK1608		22～2500Ω ±25%
	BK2125		15～2500Ω ±25%
	ARRAY	BK2010	5～1000Ω ±25%
		BK3216	60～1000Ω ±25%
	BKP0402		10～33Ω ±5Ω(10Ω)、±25%(Other)
	BKP0603		10～120Ω ±5Ω(10Ω), ±25%(Other)
	BKP1005		10～330Ω ±5Ω(EM100), ±25%(Other)
	BKP1608		33～470Ω ±25%
	BKP2125		33～330Ω ±25%
	MCF 0605		12～90Ω ±5Ω(12Ω), ±20%(35Ω), ±25%(Other)
	MCF 0806		12～90Ω ±5Ω(12Ω), ±20%(Other)
	MCF 1210		40～90Ω ±20%(2H900),±25%(Other)
	MCF 2010		90Ω ±25%
	CK1608		–
	CK2125		
	CKS2125		
	CKP1608		
	CKP2012		
	CKP2016		
	CKP2520		
	NM2012		
	NM2520		
	LK1005		
	LK1608		
	LK2125		
	HKQ0402		
	HK0603		
	HK1005		
	HK1608		
	HK2125		
	HKQ0603W/HKQ0603C/HKQ0603S/ HKQ0603U		
	AQ105		
	MCFK1608		
	MCFE1608		
	MCHK2012		
	MCKK2012		

Test Methods and Remarks	BK0402Series, BKP0402Series Measuring frequency : 100±1MHz Measuring equipment : E4991A(or its equivalent) Measuring jig : 16197A(or its equivalent) BK0603Series, BKP0603Series Measuring frequency : 100±1MHz Measuring equipment : 4291A(or its equivalent) Measuring jig : 16193A(or its equivalent) BK1005Series, BKP1005Series ,BKH1005Series Measuring frequency : 100±1MHz Measuring equipment : 4291A(or its equivalent) Measuring jig : 16192A(or its equivalent), 16193A(or its equivalent) BK1608・2125Series, BKP1608・2125Series Measuring frequency : 100±1MHz Measuring equipment : 4291A(or its equivalent), 4195A(or its equivalent) Measuring jig : 16092A(or its equivalent) or 16192A(or its equivalent)/HW BK2010・3216Series, MCF Series Measuring frequency : 100±1MHz Measuring equipment : 4291A(or its equivalent), 4195A(or its equivalent) Measuring jig : 16192A(or its equivalent)

5. Inductance

Specified Value	BK0402		—
	BK0603		
	BK1005		
	BKH0603		
	BKH1005		
	BK1608		
	BK2125		
	ARRAY	BK2010	
		BK3216	
	BKP0402		
	BKP0603		
	BKP1005		
	BKP1608		
	BKP2125		
	MCF 0605		
	MCF 0806		
	MCF 1210		
	MCF 2010		
	CK1608		4.7～10.0 μH: ±20%
	CK2125		0.1～10.0 μH: ±20%
	CKS2125		1.0～10.0 μH: ±20%
	CKP1608		0.33～2.2 μH: ±20%
	CKP2012		0.47～4.7 μH: ±20%
	CKP2016		0.47～4.7 μH: ±20%
	CKP2520		0.47～4.7 μH: ±20%
	NM2012		0.82～1.0 μH: ±20%
	NM2520		1.0～2.2 μH: ±20%
	LK1005		0.12～2.2 μH: ±10 or 20%
	LK1608		0.047～33.0 μH: ±20%　0.10～12.0 μH: ±10%
	LK2125		0.047～33.0 μH: ±20%　0.10～12.0 μH: ±10%
	HK0603		1.0～6.2nH: ±0.3nH　6.8～100nH: ±5%
	HK1005		1.0～6.2nH: ±0.3nH　6.8～270nH: ±5%
	HK1608		1.0～5.6nH: ±0.3nH　6.8～470nH: ±5%
	HK2125		1.5～5.6nH: ±0.3nH　6.8～470nH: ±5%
	HKQ0402		0.5～3.9nH: ±0.1 or 0.2 or 0.3nH　4.3～5.6nH: ±0.3nH or 3% or 5% 6.2～47nH: ±3 or 5%
	HKQ0603W		0.6～3.9nH: ±0.1 or 0.2 or 0.3nH　4.3～6.2nH: ±0.2 or 0.3nH or 3 or 5% 6.8～30nH: ±3 or 5%　33～100nH: ±5%
	HKQ0603C		0.6～3.9nH: ±0.1 or 0.2 or 0.3nH　4.3～6.2nH: ±0.2 or 0.3nH　6.8～22nH: ±3 or 5%
	HKQ0603S		0.6～6.2nH: ±0.2 or 0.3nH　6.8～22nH: ±3 or 5%
	HKQ0603U		0.6～4.2nH: ±0.1 or 0.2 or 0.3nH　4.3～6.5nH: ±0.2 or 0.3nH　6.8～22nH: ±3 or 5%
	AQ105		1.0～6.2nH: ±0.3nH　6.8～15nH: ±5%
	MCFK1608		0.24～0.47H: ±20%
	MCFE1608		0.24～1.0 μH: ±20%
	MCHK2012		0.24～0.47H: ±20%
	MCKK2012		0.24～0.47H: ±20%

Test Methods and Remarks

CK、LK、CKP、NM、MC Series

- Measuring frequency : 2～4MHz(CK1608)
- Measuring frequency : 2～25MHz(CK2125)
- Measuring frequency : 2～10MHz(CKS2125)
- Measuring frequency : 10～25MHz(LK1005)
- Measuring frequency : 1～50MHz(LK1608)
- Measuring frequency : 0.4～50MHz(LK2125)
- Measuring frequency : 1MHz(CKP1608・CKP2012・CKP2016・CKP2520・NM2012・NM2520・MCFK1608・MCFE1608・MCHK2012・MCKK2012)
- Measuring equipment /jig :・4194A＋16085B＋16092A(or its equivalent)　・4195A＋41951＋16092A(or its equivalent)
  ・4294A＋16192A(or its equivalent)　・4291A＋16193A(or its equivalent)/LK1005
  ・4285A＋42841A＋42842C＋42851－61100(or its equivalent)/CKP1608・CKP2012・CKP2016・CKP2520・NM2012・NM2520・MCFK1608・MCFE1608・MCHK2012・MCKK2012
- Measuring current :・1mA rms(0.047～4.7 μH)
  ・0.1mA rms(5.6～33 μH)

HK、HKQ、AQ Series

- Measuring frequency : 100MHz(HK0603・HK1005・AQ105)
- Measuring frequency : 50/100MHz(HK1608・HK2125)
- Measuring frequency : 500MHz(HKQ0603C・HKQ0603S・HKQ0603U)
- Measuring frequency : 300/500MHz(HKQ0603W)
- Measuring frequency : 100/500MHz(HKQ0402)
- Measuring equipment /jig :・4291A＋16197A(or its equivalent)/HK0603・AQ105
  ・4291A＋16193A(or its equivalent)/HK1005
  ・E4991A＋16197A(or its equivalent)/HKQ0603S・HKQ0603U・HKQ0603W・HKQ0603C
  ・4291A＋16092A ＋ in-house made jig(or its equivalent)/HK1608・HK2125
  ・E4991A＋16196D(or its equivalent)/HKQ0402

6. Q		
Specified Value	BK0402	—
	BK0603	
	BK1005	
	BKH0603	
	BKH1005	
	BK1608	
	BK2125	
	ARRAY BK2010	
	ARRAY BK3216	
	BKP0402	
	BKP0603	
	BKP1005	
	BKP1608	
	BKP2125	
	MCF 0605	
	MCF 0806	
	MCF 1210	
	MCF 2010	
	CK1608	—
	CK2125	
	CKS2125	
	CKP1608	
	CKP2012	
	CKP2016	
	CKP2520	
	NM2012	
	NM2520	
	LK1005	10～20 min.
	LK1608	10～35 min.
	LK2125	15～50 min.
	HK0603	4～5 min.
	HK1005	8 min.
	HK1608	8～12 min.
	HK2125	10～18 min.
	HKQ0402	3～8 min.
	HKQ0603W	6～15 min.
	HKQ0603C	14～15 min.
	HKQ0603S	10～13 min.
	HKQ0603U	14 min.
	AQ105	8 min.
	MCFK1608	—
	MCFE1608	
	MCHK2012	
	MCKK2012	
Test Methods and Remarks	LK Series Measuring frequency : 10～25MHz(LK1005) Measuring frequency : 1～50MHz(LK1608) Measuring frequency : 0.4～50MHz(LK2125) Measuring equipment /jig :・4194A＋16085B＋16092A(or its equivalent) ・4195A＋41951＋16092A(or its equivalent) ・4294A＋16192A(or its equivalent) ・4291A＋16193A(or its equivalent)/LK1005 Measuring current ・1mA rms(0.047～4.7 μH) ・0.1mA rms(5.6～33 μH) HK、HKQ、AQ Series Measuring frequency : 100MHz(HK0603・HK1005・AQ105) Measuring frequency : 50/100MHz(HK1608・HK2125) Measuring frequency : 500MHz(HKQ0603C・HKQ0603S・HKQ0603U) Measuring frequency : 300/500MHz(HKQ0603W) Measuring frequency : 100/500MHz(HKQ0402) Measuring equipment /jig :・4291A＋16197A(or its equivalent)/HK0603・AQ105 ・4291A＋16193A(or its equivalent)/HK1005 ・E4991A＋16197A(or its equivalent)/HKQ0603S・HKQ0603U・HKQ0603W・HKQ0603C ・4291A＋16092A ＋ in-house made jig(or its equivalent)/HK1608, HK2125 ・E4991A＋16196D(or its equivalent)HKQ0402	

7. DC Resistance			
Specified Value	BK0402		0.07～1.2Ω max.
	BK0603		0.065～1.50Ω max.
	BK1005		0.03～0.90Ω max.
	BKH0603		0.26～3.20Ω max.
	BKH1005		0.85～2.00Ω max.
	BK1608		0.05～1.10Ω max.
	BK2125		0.05～0.75Ω max.
	ARRAY	BK2010	0.10～0.90Ω max.
		BK3216	0.15～0.80Ω max.
	BKP0402		0.05～0.15Ω max.
	BKP0603		0.030～0.180Ω max.
	BKP1005		0.0273～0.220Ω max.
	BKP1608		0.025～0.18Ω max.
	BKP2125		0.020～0.075Ω max.
	MCF 0605		2.5～6.5Ω max
	MCF 0806		2.5～5.0Ω max.
	MCF 1210		2.5～4.5Ω max.
	MCF 2010		4.5Ω max.
	CK1608		0.45～0.85Ω(±30%)
	CK2125		0.16～0.65Ω max.
	CKS2125		0.12～0.52Ω max.
	CKP1608		0.15～0.35Ω max.
	CKP2012		0.08～0.28Ω max.
	CKP2016		0.075～0.20Ω max
	CKP2520		0.05～0.16Ω max.
	NM2012		0.10～0.15Ω max.
	NM2520		0.11～0.22Ω max.
	LK1005		0.41～1.16Ω max.
	LK1608		0.2～2.2Ω max.
	LK2125		0.1～1.1Ω max.
	HK0603		0.11～3.74Ω max.
	HK1005		0.08～4.8Ω max.
	HK1608		0.05～2.6Ω max.
	HK2125		0.10～1.5Ω max.
	HKQ0402		0.08～5.0Ω max.
	HKQ0603W		0.07～4.1Ω max.
	HKQ0603C		0.07～1.6Ω max.
	HKQ0603S		0.06～1.29Ω max.
	HKQ0603U		0.06～1.29Ω max.
	AQ105		0.07～0.45Ω max.
	MCFK1608		0.050～0.085Ω max.
	MCFE1608		0.100～0.340Ω max.
	MCHK2012		0.024～0.036Ω max.
	MCKK2012		0.025～0.039Ω max.
Test Methods and Remarks	Measuring equipment：VOAC-7412, VOAC-7512, VOAC-7521 (made by Iwasaki Tsushinki), HIOKI3227 (or its equivalent)		

8. Self Resonance Frequency (SRF)			
Specified Value	BK0402		—
	BK0603		
	BK1005		
	BKH0603		
	BKH1005		
	BK1608		
	BK2125		
	ARRAY	BK2010	
		BK3216	
	BKP0402		
	BKP0603		
	BKP1005		
	BKP1608		
	BKP2125		
	MCF 0605		
	MCF 0806		
	MCF 1210		
	MCF 2010		
	CK1608		17～25MHz min.
	CK2125		24～235MHz min.
	CKS2125		24～75MHz min.
	CKP1608		—
	CKP2012		
	CKP2016		
	CKP2520		
	NM2012		
	NM2520		
	LK1005		40～180MHz min.
	LK1608		9～260MHz min.
	LK2125		13～320MHz min.
	HK0603		900～10000MHz min.
	HK1005		400～10000MHz min.
	HK1608		300～10000MHz min.
	HK2125		200～4000MHz min.
	HKQ0402		1200～10000MHz min.
	HKQ0603W		800～10000MHz min.
	HKQ0603C		2500～10000MHz min.
	HKQ0603S		1900～10000MHz min.
	HKQ0603U		1900～10000MHz min.
	AQ105		2300～10000MHz min.
	MCFK1608		—
	MCFE1608		
	MCHK2012		
	MCKK2012		
Test Methods and Remarks	LK、CK Series : Measuring equipment : 4195A (or its equivalent) Measuring jig : 41951＋16092A (or its equivalent) HK、HKQ、AQ Series : Measuring equipment : 8719C (or its equivalent)・8753D (or its equivalent)/HK2125		

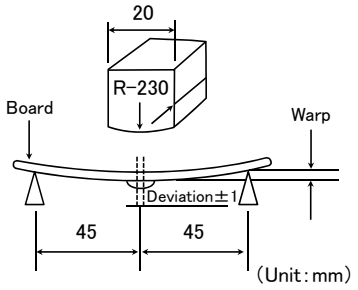
9. Temperature Characteristic			
Specified Value	BK0402		—
	BK0603		
	BK1005		
	BKH0603		
	BKH1005		
	BK1608		
	BK2125		
	ARRAY	BK2010	
		BK3216	
	BKP0402		
	BKP0603		
	BKP1005		
	BKP1608		
	BKP2125		
	MCF 0605		
	MCF 0806		
	MCF 1210		
	MCF 2010		
	CK1608		
	CK2125		
	CKS2125		
	CKP1608		
	CKP2012		
	CKP2016		
	CKP2520		
	NM2012		
	NM2520		
	LK1005		
	LK1608		
	LK2125		
	HK0603		Inductance change : Within ±10%
	HK1005		
	HK1608		
	HK2125		
	HKQ0402		
	HKQ0603W		
	HKQ0603C		
	HKQ0603S		
	HKQ0603U		
	AQ105		
	MCFK1608		
	MCFE1608		
	MCHK2012		
	MCKK2012		
Test Methods and Remarks	HK、HKQ、AQ Series: Temperature range : −30～+85℃ Reference temperature : +20℃		
	MC Series: Temperature range : −40～+85℃ Reference temperature : +20℃		

10. Resistance to Flexure of Substrate

Specified Value	BK0402		No mechanical damage.
	BK0603		
	BK1005		
	BKH0603		
	BKH1005		
	BK1608		
	BK2125		
	ARRAY	BK2010	
		BK3216	
	BKP0402		
	BKP0603		
	BKP1005		
	BKP1608		
	BKP2125		
	MCF 0605		
	MCF 0806		
	MCF 1210		
	MCF 2010		
	CK1608		
	CK2125		
	CKS2125		
	CKP1608		
	CKP2012		
	CKP2016		
	CKP2520		
	NM2012		
	NM2520		
	LK1005		
	LK1608		
	LK2125		
	HK0603		
	HK1005		
	HK1608		
	HK2125		
	HKQ0402		
	HKQ0603W		
	HKQ0603C		
	HKQ0603S		
	HKQ0603U		
	AQ105		
	MCFK1608		
	MCFE1608		
	MCHK2012		
	MCKK2012		

Test Methods and Remarks

Warp : 2mm(BK Series without 0402size、BKP、BKH1005、CK、CKS、CKP、LK、HK、HKQ0603S、HKQ0603U、AQ Series、MCF1210、MC Series)
: 1mm(BK0402、BKP0402、BKH0603、HKQ0402、HKQ0603W、HKQ0603C Series、MCF Series without 1210 size,)
Testing board : glass epoxy-resin substrate
Thickness : 0.8mm



11. Solderability		
Specified Value	BK0402	At least 75% of terminal electrode is covered by new solder.
	BK0603	
	BK1005	
	BKH0603	
	BKH1005	
	BK1608	
	BK2125	
	ARRAY: BK2010	
	ARRAY: BK3216	
	BKP0402	
	BKP0603	
	BKP1005	
	BKP1608	
	BKP2125	
	MCF 0605	
	MCF 0806	
	MCF 1210	
	MCF 2010	
	CK1608	
	CK2125	
	CKS2125	
	CKP1608	
	CKP2012	
	CKP2016	
	CKP2520	
	NM2012	
	NM2520	
	LK1005	
	LK1608	
	LK2125	
	HK0603	
	HK1005	
	HK1608	
	HK2125	
	HKQ0402	
	HKQ0603W	
	HKQ0603C	
	HKQ0603S	
	HKQ0603U	
	AQ105	
	MCFK1608	
	MCFE1608	
	MCHK2012	
	MCKK2012	
Test Methods and Remarks	Solder temperature :230±5℃ (JIS Z 3282 H60A or H63A) Solder temperature :245±3℃ (Sn/3.0Ag/0.5Cu) Duration :4±1 sec.	

12. Resistance to Soldering			
Specified Value	BK0402		Appearance : No significant abnormality Impedance change : Within ±30%
	BK0603		
	BK1005		
	BKH0603		
	BKH1005		
	BK1608		
	BK2125		
	ARRAY	BK2010	
		BK3216	
	BKP0402		
	BKP0603		
	BKP1005		
	BKP1608		
	BKP2125		
	MCF 0605		Appearance : No significant abnormality Impedance change : Within ±20%
	MCF 0806		
	MCF 1210		
	MCF 2010		
	CK1608		No mechanical damage. Remaining terminal electrode : 70% min Inductance change R10～4R7 : Within ±10% 6R8～100 : Within ±15% CKS2125 : Within ±20% CKP1608、CKP2012、CKP2016、CKP2520、NM2012、NM2520 : Within ±30%
	CK2125		
	CKS2125		
	CKP1608		
	CKP2012		
	CKP2016		
	CKP2520		
	NM2012		
	NM2520		
	LK1005		No mechanical damage. Remaining terminal electrode : 70% min. Inductance change : Within ±15%
	LK1608		No mechanical damage. Remaining terminal electrode : 70% min. Inductance change 47N～4R7 : Within ±10% 5R6～330 : Within ±15%
	LK2125		
	HK0603		No mechanical damage. Remaining terminal electrode : 70% min. Inductance change : Within ±5%
	HK1005		
	HK1608		
	HK2125		
	HKQ0402		
	HKQ0603W		
	HKQ0603C		
	HKQ0603S		
	HKQ0603U		
	AQ105		
	MCFK1608		No mechanical damage. Remaining terminal electrode : 70% min. Inductance change : Within ±10%
	MCFE1608		
	MCHK2012		
	MCKK2012		
Test Methods and Remarks	Solder temperature	: 260±5℃	
	Duration	: 10±0.5 sec.	
	Preheating temperature	: 150 to 180℃	
	Preheating time	: 3 min.	
	Flux	: Immersion into methanol solution with colophony for 3 to 5 sec.	
	Recovery	: 2 to 3 hrs of recovery under the standard condition after the test. (See Note 1)	
(Note 1) When there are questions concerning measurement result ; measurement shall be made after 48±2 hrs of recovery under the standard condition.			

13. Thermal Shock

Specified Value	BK0402		Appearance：No significant abnormality Impedance change： Within ±30%
	BK0603		
	BK1005		
	BKH0603		
	BKH1005		
	BK1608		
	BK2125		
	ARRAY	BK2010	
		BK3216	
	BKP0402		
	BKP0603		
	BKP1005		
	BKP1608		
	BKP2125		
	MCF 0605		Appearance：No significant abnormality Impedance change： Within ±20%
	MCF 0806		
	MCF 1210		
	MCF 2010		
	CK1608		No mechanical damage. Inductance change：Within ±20% Q change：Within ±30%
	CK2125		
	CKS2125		Inductance change：Within ±20% (CKS2125)
	CKP1608		No mechanical damage. Inductance change： Within ±30%
	CKP2012		
	CKP2016		
	CKP2520		
	NM2012		
	NM2520		
	LK1005		No mechanical damage. Inductance change： Within ±10% Q change： Within ±30%
	LK1608		
	LK2125		
	HK0603		No mechanical damage. Inductance change： Within ±10% Q change： Within ±20%
	HK1005		
	HK1608		
	HK2125		
	HKQ0402		
	HKQ0603W		
	HKQ0603C		
	HKQ0603S		
	HKQ0603U		
	AQ105		
	MCFK1608		Appearance：No significant abnormality Inductance change： Within ±10%
	MCFE1608		
	MCHK2012		
	MCKK2012		

Test Methods and Remarks

Conditions for 1 cycle

Step	temperature(℃)	time(min.)
1	Minimum operating temperature +0/−3	30±3
2	Room temperature	2～3
3	Maximum operating temperature +3/−0	30±3
4	Room temperature	2～3

Number of cycles：5

Recovery：2 to 3 hrs of recovery under the standard condition after the test.(See Note 1)

(Note 1) When there are questions concerning measurement result；measurement shall be made after 48±2 hrs of recovery under the standard condition.

14. Damp Heat(Steady state)			
Specified Value	BK0402		Appearance:No significant abnormality Impedance change: Within ±30%
	BK0603		
	BK1005		
	BKH0603		
	BKH1005		
	BK1608		
	BK2125		
	ARRAY	BK2010	
		BK3216	
	BKP0402		
	BKP0603		
	BKP1005		
	BKP1608		
	BKP2125		
	MCF 0605		Appearance:No significant abnormality Impedance change: Within ±20%
	MCF 0806		
	MCF 1210		
	MCF 2010		
	CK1608		No mechanical damage. Inductance change: Within ±20% Q change: Within ±30%
	CK2125		
	CKS2125		Inductance change: Within ±20%
	CKP1608		No mechanical damage. Inductance change: Within ±30%
	CKP2012		
	CKP2016		
	CKP2520		
	NM2012		
	NM2520		
	LK1005		No mechanical damage. Inductance change: Within ±10% Q change: Within ±30%
	LK1608		
	LK2125		No mechanical damage. Inductance change: Within ±20% Q change: Within ±30%
	HK0603		No mechanical damage. Inductance change: Within ±10% Q change: Within ±20%
	HK1005		
	HK1608		
	HK2125		
	HKQ0402		
	HKQ0603W		
	HKQ0603C		
	HKQ0603S		
	HKQ0603U		
	AQ105		
	MCFK1608		Appearance:No significant abnormality Inductance change: Within ±10%
	MCFE1608		
	MCHK2012		
	MCKK2012		
Test Methods and Remarks	BK、BKP、BKH Series、MCF Series: Temperature :40±2℃ Humidity :90 to 95%RH Duration :500+24/−0 hrs Recovery :2 to 3 hrs of recovery under the standard condition after the removal from test chamber.(See Note 1) LK、CK、CKS、CKP、NM、HK、HKQ、AQ、MC Series: Temperature :40±2℃(LK、CK、CKS、CKP Series) :60±2℃(HK、HKQ、AQ、MC Series) Humidity :90 to 95%RH Duration :500±12 hrs Recovery :2 to 3 hrs of recovery under the standard condition after the removal from test chamber.(See Note 1)		

(Note 1) When there are questions concerning measurement result;measurement shall be made after 48±2 hrs of recovery under the standard condition.

15. Loading under Damp Heat			
Specified Value	BK0402		Appearance：No significant abnormality Impedance change： Within ±30%
	BK0603		
	BK1005		
	BKH0603		
	BKH1005		
	BK1608		
	BK2125		
	ARRAY	BK2010	
		BK3216	
	BKP0402		
	BKP0603		
	BKP1005		
	BKP1608		
	BKP2125		
	CK1608		No mechanical damage. Inductance change： Within ±20% Q change： Within ±30%
	CK2125		
	CKS2125		No mechanical damage. Inductance change： Within ±20%
	CKP1608		No mechanical damage. Inductance change： Within ±30%
	CKP2012		
	CKP2016		
	CKP2520		
	NM2012		
	NM2520		
	LK1005		No mechanical damage. Inductance change： Within ±10% Q change： Within ±30%
	LK1608		No mechanical damage. Inductance change： 0.047～12.0 μH： Within ±10% 15.0～33.0 μH： Within ±15% Q change： Within ±30%
	LK2125		No mechanical damage. Inductance change： Within ±20% Q change： Within ±30%
	HK0603		No mechanical damage. Inductance change： Within ±10% Q change： Within ±20%
	HK1005		
	HK1608		
	HK2125		
	HKQ0402		
	HKQ0603W		
	HKQ0603C		
	HKQ0603S		
	HKQ0603U		
	AQ105		
	MCFK1608※		Appearance：No significant abnormality Inductance change： Within ±10%
	MCFE1608※		
	MCHK2012※		
	MCKK2012※		
Test Methods and Remarks	BK、BKP、BKH Series： Temperature ：40±2℃ Humidity ：90 to 95%RH Applied current ：Rated current Duration ：500＋24／－0 hrs Recovery ：2 to 3 hrs of recovery under the standard condition after the removal from test chamber.(See Note 1) LK、CK、CKS、CKP、NM、HK、HKQ、AQ、MC Series： Temperature ：40±2℃(LK、CK、CKS、CKP、NM Series) ：60±2℃(HK、HKQ、AQ、MC Series) Humidity ：90 to 95%RH Applied current ：Rated current ※MC series ; Idc2max Duration ：500±12 hrs Recovery ：2 to 3 hrs of recovery under the standard condition after the removal from test chamber.(See Note 1)		

Note on standard condition: "standard condition" referred to herein is defined as follows:
5 to 35℃ of temperature, 45 to 85% relative humidity, and 86 to 106kPa of air pressure.
When there are questions concerning measurement results:
In order to provide correlation data, the test shall be conducted under condition of 20±2℃ of temperature, 60 to 70% relative humidity, and 86 to 106kPa of air pressure.
Unless otherwise specified, all the tests are conducted under the "standard condition."
(Note 1) Measurement shall be made after 48±2 hrs of recovery under the standard condition.

16. Loading at High Temperature			
Specified Value	BK0402		Appearance：No significant abnormality Impedance change： Within ±30%
	BK0603		
	BK1005		
	BKH0603		
	BKH1005		
	BK1608		
	BK2125		
	ARRAY	BK2010	
		BK3216	
	BKP0402		
	BKP0603		
	BKP1005		
	BKP1608		
	BKP2125		
	MCF 0605		Appearance：No significant abnormality Impedance change： Within ±20%
	MCF 0806		
	MCF 1210		
	MCF 2010		
	CK1608		No mechanical damage. Inductance change： Within ±20% Q change： Within ±30%
	CK2125		
	CKS2125		No mechanical damage. Inductance change： Within ±20%
	CKP1608		No mechanical damage. Inductance change： Within ±30%
	CKP2012		
	CKP2016		
	CKP2520		
	NM2012		
	NM2520		
	LK1005		No mechanical damage. Inductance change： Within ±10% Q change： Within ±30%
	LK1608		No mechanical damage. Inductance change： 0.047～12.0 μH： Within ±10% 15.0～33.0 μH： Within ±15% Q change： Within ±30%
	LK2125		No mechanical damage. Inductance change： Within ±20% Q change： Within ±30%
	HK0603		No mechanical damage. Inductance change： Within ±10% Q change： Within ±20%
	HK1005		
	HK1608		
	HK2125		
	HKQ0402		
	HKQ0603W		
	HKQ0603C		
	HKQ0603S		
	HKQ0603U		
	AQ105		
	MCFK1608※		Appearance：No significant abnormality Inductance change： Within ±10%
	MCFE1608※		
	MCHK2012※		
	MCKK2012※		
Test Methods and Remarks	BK、BKH、BKP Series、MCF Series： Temperature ：125±3℃(BK、BKH Series) ：85±3℃(BKP、MCF Series) Applied current ：Rated current Duration ：500＋24/－0 hrs Recovery ：2 to 3 hrs of recovery under the standard condition after the removal from test chamber. (See Note 1) LK、CK、CKS、CKP、NM、HKQ、AQ、MC Series： Temperature ：85±2℃(LK、CK、CKS、CKP、NM、MC Series) ：85±2℃(HK1608, 2125) ：85±2℃(HK1005, AQ105 operating temperature range－55～＋85℃) ：125±2℃(HKQ0402, HK0603, HK1005, HKQ0603S, HKQ0603U, HKQ0603W, HKQ0603C, AQ105 operating temperature range－55～＋125℃) Applied current ：Rated current ※MC series ; Idc2max Duration ：500±12 hrs Recovery ：2 to 3 hrs of recovery under the standard condition after the test.(See Note 1)		

Note on standard condition: "standard condition" referred to herein is defined as follows:
5 to 35℃ of temperature, 45 to 85% relative humidity, and 86 to 106kPa of air pressure.
When there are questions concerning measurement results:
In order to provide correlation data, the test shall be conducted under condition of 20±2℃ of temperature, 60 to 70% relative humidity, and 86 to 106kPa of air pressure. Unless otherwise specified, all the tests are conducted under the "standard condition."
(Note 1) Measurement shall be made after 48±2 hrs of recovery under the standard condition.

Precautions on the use of Multilayer chip inductors
Multilayer chip inductors for high frequency, Multilayer chip bead inductors
Multilayer common mode choke coils (MC series F type)
Metal Multilayer Chip Power Inductors (MCOIL™ MC series)

■PRECAUTIONS

1. Circuit Design

Precautions

◆Verification of operating environment, electrical rating and performance

1. A malfunction in medical equipment, spacecraft, nuclear reactors, etc. may cause serious harm to human life or have severe social ramifications.
   As such, any inductors to be used in such equipment may require higher safety and/or reliability considerations and should be clearly differentiated from components used in general purpose applications.

◆Operating Current (Verification of Rated current)

1. The operating current including inrush current for inductors must always be lower than their rated values.
2. Do not apply current in excess of the rated value because the inductance may be reduced due to the magnetic saturation effect.

2. PCB Design

Precautions

◆Pattern configurations (Design of Land-patterns)

1. When inductors are mounted on a PCB, the size of land patterns and the amount of solder used (size of fillet) can directly affect inductor performance.
   Therefore, the following items must be carefully considered in the design of solder land patterns:
   (1) The amount of solder applied can affect the ability of chips to withstand mechanical stresses which may lead to breaking or cracking. Therefore, when designing land-patterns it is necessary to consider the appropriate size and configuration of the solder pads which in turn determines the amount of solder necessary to form the fillets.
   (2) When more than one part is jointly soldered onto the same land or pad, the pad must be designed so that each component's soldering point is separated by solder-resist.
   (3) The larger size of land patterns and amount of solder, the smaller Q value after mounting on PCB. It makes higher the Q value to design land patterns smaller than terminal electrode of chips.

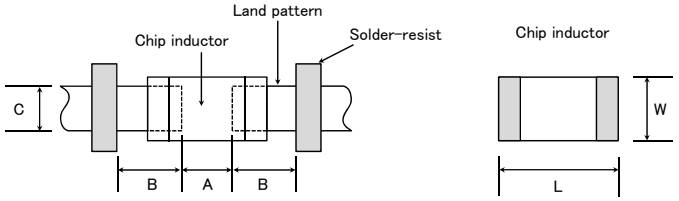
◆Pattern configurations (Inductor layout on panelized[breakaway] PC boards)

1. After inductors have been mounted on the boards, chips can be subjected to mechanical stresses in subsequent manufacturing processes (PCB cutting, board inspection, mounting of additional parts, assembly into the chassis, wave soldering the reflow soldered boards etc.) For this reason, planning pattern configurations and the position of SMD inductors should be carefully performed to minimize stress.

Technical considerations

◆Pattern configurations (Design of Land-patterns)

1. The following diagrams and tables show some examples of recommended patterns to prevent excessive solder amounts (larger fillets which extend above the component end terminations). Examples of improper pattern designs are also shown.
   (1) Recommended land dimensions for a typical chip inductor land patterns for PCBs



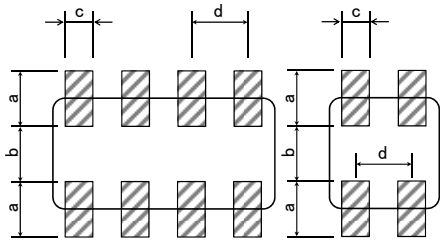
Recommended land dimensions for wave-soldering (Unit: mm)

Type		1608	2012	2125	2016	2520	3216
Size	L	1.6	2.0	2.0	2.0	2.5	3.2
	W	0.8	1.25	1.25	1.6	2.0	1.6
A		0.8～1.0	1.0～1.4	1.0～1.4	1.0～1.4	1.0～1.4	1.8～2.5
B		0.5～0.8	0.8～1.5	0.8～1.5	0.8～1.5	0.6～1.0	0.8～1.7
C		0.6～0.8	0.9～1.2	0.9～1.2	1.3～1.6	1.6～2.0	1.2～1.6

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

Type		0402	0603	1005	105	1608	2012	2125	2016	2520	3216
Size	L	0.4	0.6	1.0	1.0	1.6	2.0	2.0	2.0	2.5	3.2
	W	0.2	0.3	0.5	0.6	0.8	1.25	1.25	1.6	2.0	1.6
A		0.15～0.25	0.20～0.30	0.45～0.55	0.50～0.55	0.8～1.0	0.8～1.2	0.8～1.2	0.8～1.2	1.0～1.4	1.8～2.5
B		0.10～0.20	0.20～0.30	0.40～0.50	0.30～0.40	0.6～0.8	0.8～1.2	0.8～1.2	0.8～1.2	0.6～1.0	0.6～1.5
C		0.15～0.30	0.25～0.40	0.45～0.55	0.60～0.70	0.6～0.8	0.9～1.6	0.9～1.6	1.2～2.0	1.8～2.2	1.2～2.0

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

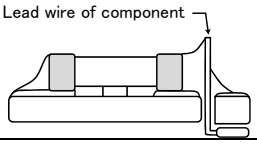
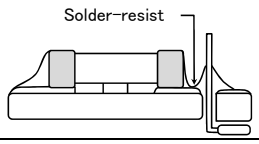
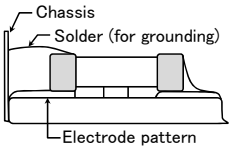
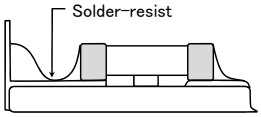
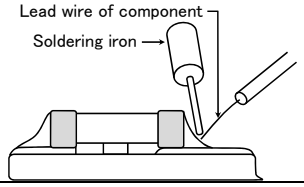
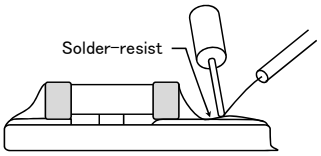
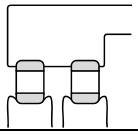
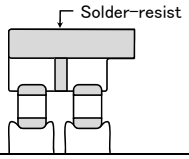


Recommended land dimension for Reflow-soldering

Type		3216	2010	1210	0806	0605
Size	L	3.2	2.0	1.25	0.85	0.65
	W	1.6	1.0	1.0	0.65	0.50
a		0.7～0.9	0.5～0.6	0.45～0.55	0.25～0.35	0.27～0.33
b		0.8～1.0	0.5～0.6	0.7～0.8	0.25～0.35	0.17～0.23
c		0.4～0.5	0.2～0.3	0.25～0.35	0.25～0.35	0.20～0.26
d		0.8	0.5	0.55	0.5	0.4

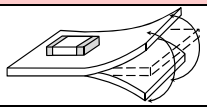
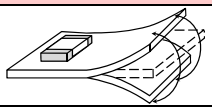
(Unit : mm)

((2) Examples of good and bad solder application

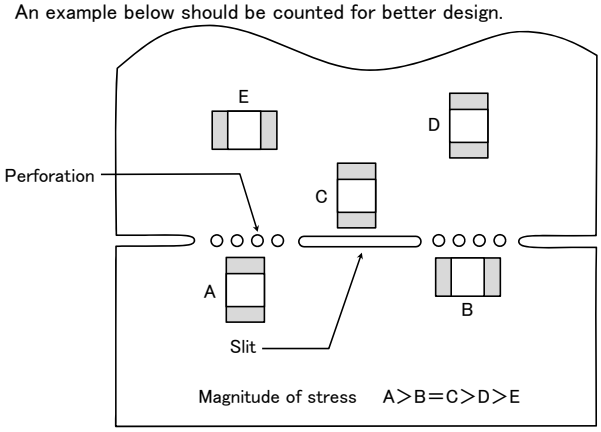
Item	Not recommended	Recommended
Mixed mounting of SMD and leaded components		
Component placement close to the chassis		
Hand-soldering of leaded components near mounted components		
Horizontal component placement		

◆Pattern configurations (Inductor layout on panelized[breakaway] PC boards)

1-1. 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.

Item	Not recommended	Recommended
Deflection of the board		 Position the component at a right angle to the direction of the mechanical stresses that are anticipated.

1-2. To layout the inductors for the breakaway PC board, it should be noted that the amount of mechanical stresses given will vary depending on inductor layout.
An example below should be counted for better design.



1-3. When breaking PC boards along their perforations, the amount of 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, slit, V-grooving, and perforation. Thus, any ideal SMD inductor layout must also consider the PCB splitting procedure.

3. Considerations for automatic placement

Precautions

◆Adjustment of mounting machine

1. Excessive impact load should not be imposed on the inductors when mounting onto the PC boards.
2. The maintenance and inspection of the mounter should be conducted periodically.

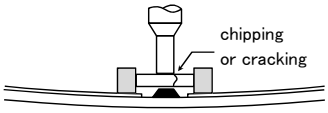
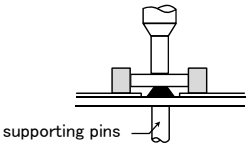
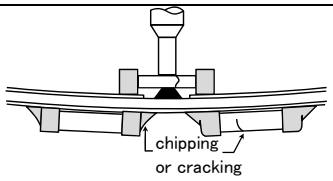
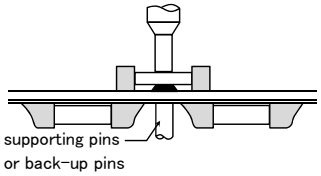
◆Selection of Adhesives

1. Mounting inductors with adhesives in preliminary assembly, before the soldering stage, may lead to degraded inductor characteristics unless the following factors are appropriately checked; the size of land patterns, type of adhesive, amount applied, hardening temperature and hardening period. Therefore, it is imperative to consult the manufacturer of the adhesives on proper usage and amounts of adhesive to use.

Technical considerations

◆Adjustment of mounting machine

1. If the lower limit of the pick-up nozzle is low, too much force may be imposed on the inductors, causing damage. To avoid this, the following points should be considered before lowering the pick-up nozzle:
   (1) The lower limit of the pick-up nozzle should be adjusted to the surface level of the PC board after correcting for deflection of the board.
   (2) The pick-up pressure should be adjusted between 1 and 3N static loads.
   (3) To reduce the amount of deflection of the board caused by impact of the pick-up nozzle, supporting pins or back-up pins should be used under the PC board. The following diagrams show some typical examples of good pick-up nozzle placement:

Item	Improper method	Proper method
Single-sided mounting		
Double-sided mounting		

2. As the alignment pin wears out, adjustment of the nozzle height can cause chipping or cracking of the inductors because of mechanical impact on the inductors. To avoid this, the monitoring of the width between the alignment pin in the stopped position, and maintenance, inspection and replacement of the pin should be conducted periodically.

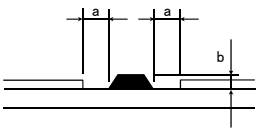
◆Selection of Adhesives

1. Some adhesives may cause reduced insulation resistance. The difference between the shrinkage percentage of the adhesive and that of the inductors may result in stresses on the inductors and lead to cracking. Moreover, too little or too much adhesive applied to the board may adversely affect component placement, so the following precautions should be noted in the application of adhesives.
   (1) Required adhesive characteristics
      a. The adhesive should be strong enough to hold parts on the board during the mounting & solder process.
      b. The adhesive should have sufficient strength at high temperatures.
      c. The adhesive should have good coating and thickness consistency.
      d. The adhesive should be used during its prescribed shelf life.
      e. The adhesive should harden rapidly.
      f. The adhesive must not be contaminated.
      g. The adhesive should have excellent insulation characteristics.
      h. The adhesive should not be toxic and have no emission of toxic gasses.
   (2) When using adhesives to mount inductors on a PCB, inappropriate amounts of adhesive on the board may adversely affect component placement. Too little adhesive may cause the inductors to fall off the board during the solder process. Too much adhesive may cause defective soldering due excessive flow of adhesive on to the land or solder pad.

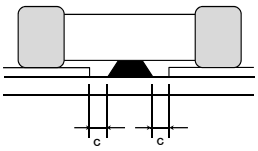
[Recommended conditions]

Figure	0805 case sizes as examples
a	0.3mm min
b	100～120 μm
c	Area with no adhesive

Amount of adhesives



After inductors are bonded



4. Soldering

Precautions

◆Selection of Flux

1. Since flux may have a significant effect on the performance of inductors, it is necessary to verify the following conditions prior to use;
   (1) Flux used should be with less than or equal to 0.1 wt% (Chlorine conversion method) of halogenated content. Flux having a strong acidity content should not be applied.
   (2) When soldering inductors on the board, the amount of flux applied should be controlled at the optimum level.
   (3) When using water-soluble flux, special care should be taken to properly clean the boards.

◆Soldering

1. Temperature, time, amount of solder, etc. are specified in accordance with the following recommended conditions, and please contact us about peak temperature when you use lead-free paste.

Technical considerations

◆Selection of Flux

1-1. When too much halogenated substance (Chlorine, etc.) content is used to activate the flux, or highly acidic flux is used, an excessive amount of residue after soldering may lead to corrosion of the terminal electrodes or degradation of insulation resistance on the surface of the Inductor.

1-2. Flux is used to increase solderability in flow soldering, but if too much is applied, a large amount of flux gas may be emitted and may detrimentally affect solderability. To minimize the amount of flux applied, it is recommended to use a flux-bubbling system.

1-3. Since the residue of water-soluble flux is easily dissolved by water content in the air, the residue on the surface of Inductor in high humidity conditions may cause a degradation of insulation resistance and therefore affect the reliability of the components. The cleaning methods and the capability of the machines used should also be considered carefully when selecting water-soluble flux.

◆Soldering

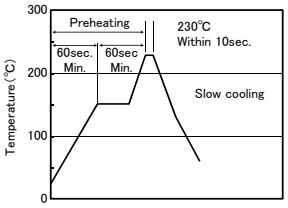
1-1. Preheating when soldering

Heating: Chip inductor components should be preheated to within 100 to 130℃ of the soldering. Cooling: The temperature difference between the components and cleaning process should not be greater than 100℃.

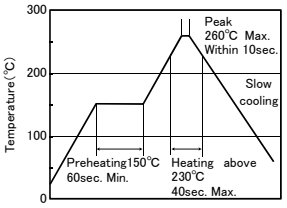
Chip inductors are susceptible to thermal shock when exposed to rapid or concentrated heating or rapid cooling. Therefore, the soldering process must be conducted with a great care so as to prevent malfunction of the components due to excessive thermal shock.

[Reflow soldering]

【Recommended conditions for eutectic soldering】



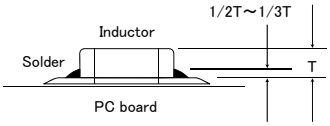
【Recommended condition for Pb-free soldering】



※Ceramic chip components should be preheated to within 100 to 130℃ of the soldering.
※Assured to be reflow soldering for 2 times.
※MC series; Peak 230℃(eutectic soldering)、260℃(Pb-free soldering)max within 5sec.

Caution

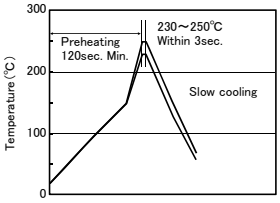
1. The ideal condition is to have solder mass (fillet) controlled to 1/2 to 1/3 of the thickness of the inductor, as shown below:



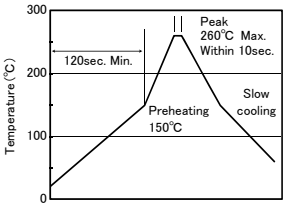
2. Because excessive dwell times can detrimentally affect solderability, soldering duration should be kept as close to recommended times as possible.

[Wave soldering]

【Recommended conditions for eutectic soldering】



【Recommended condition for Pb-free soldering】



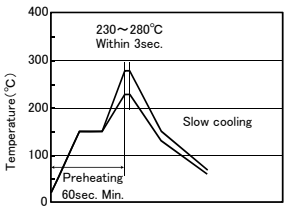
※Ceramic chip components should be preheated to within 100 to 130℃ of the soldering.
※Assured to be wave soldering for 1 time.
※Except for reflow soldering type.

Caution

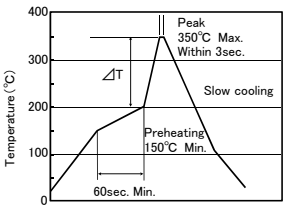
1. Make sure the inductors are preheated sufficiently.
2. The temperature difference between the inductor and melted solder should not be greater than 100 to 130℃.
3. Cooling after soldering should be as gradual as possible.
4. Wave soldering must not be applied to the inductors designated as for reflow soldering only.

[Hand soldering]

【Recommended conditions for eutectic soldering



【Recommended condition for Pb-free soldering】



(※⊿T≦190℃(3216Type max), ⊿T≦130℃(3225 Type min)
※It is recommended to use 20W soldering iron and the tip is 1φ or less.
※The soldering iron should not directly touch the components.
※Assured to be soldering iron for 1 time.
Note: The above profiles are the maximum allowable soldering condition, therefore these profiles are not always recommended.

	Caution 1. Use a 20W soldering iron with a maximum tip diameter of 1.0 mm. 2. The soldering iron should not directly touch the inductor.

5. Cleaning	
Precautions	◆Cleaning conditions 1. When cleaning the PC board after the Inductors are all mounted, select the appropriate cleaning solution according to the type of flux used and purpose of the cleaning(e.g. to remove soldering flux or other materials from the production process.) 2. Cleaning conditions should be determined after verifying, through a test run, that the cleaning process does not affect the inductor's characteristics.
Technical considerations	◆Cleaning conditions 1. The use of inappropriate solutions can cause foreign substances such as flux residue to adhere to the inductor, resulting in a degradation of the inductor's electrical properties(especially insulation resistance). 2. Inappropriate cleaning conditions(insufficient or excessive cleaning)may detrimentally affect the performance of the inductors. (1) Excessive cleaning a. In the case of ultrasonic cleaning, too much power output can cause excessive vibration of the PC board which may lead to the cracking of the inductor or the soldered portion, or decrease the terminal electrodes' strength. Thus the following conditions should be carefully checked; Ultrasonic output Below 20W/ℓ Ultrasonic frequency Below 40kHz Ultrasonic washing period 5 min. or less

6. Post cleaning processes	
Precautions	◆Application of resin coatings, moldings, etc. to the PCB and components. 1. With some type of resins a decomposition gas or chemical reaction vapor may remain inside the resin during the hardening period or while left under normal storage conditions resulting in the deterioration of the inductor's performance. 2. When a resin's hardening temperature is higher than the inductor's operating temperature, the stresses generated by the excess heat may lead to inductor damage or destruction. 3. Stress caused by a resin's temperature generated expansion and contraction may damage inductors. The use of such resins, molding materials etc. is not recommended.

7. Handling	
Precautions	◆Breakaway PC boards(splitting along perforations) 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. ◆General handling precautions 1. Always wear static control bands to protect against ESD. 2. Keep the inductors away from all magnets and magnetic objects. 3. Use non-magnetic tweezers when handling inductors. 4. Any devices used with the inductors(soldering irons, measuring instruments) should be properly grounded. 5. Keep bare hands and metal products(i.e., metal desk)away from chip electrodes or conductive areas that lead to chip electrodes. 6. Keep inductors away from items that generate magnetic fields such as speakers or coils. ◆Mechanical considerations 1. Be careful not to subject the inductors to excessive mechanical shocks. (1) If inductors are dropped on the floor or a hard surface they should not be used. (2) When handling the mounted boards, be careful that the mounted components do not come in contact with or bump against other boards or components.

8. Storage conditions	
Precautions	◆Storage 1. To maintain the solderability of terminal electrodes and to keep the packaging material in good condition, care must be taken to control temperature and humidity in the storage area. Humidity should especially be kept as low as possible. Recommended conditions Ambient temperature Below 30℃ Humidity Below 70% RH The ambient temperature must be kept below 40℃. Even under ideal storage conditions inductor electrode solderability decreases as time passes, so inductors should be used within 6 months from the time of delivery. *The packaging material should be kept where no chlorine or sulfur exists in the air.
Technical considerations	◆Storage 1. If the parts are stocked in a high temperature and humidity environment, problems such as reduced solderability caused by oxidation of terminal electrodes and deterioration of taping/packaging materials may take place. For this reason, components should be used within 6 months from the time of delivery. If exceeding the above period, please check solderability before using the inductors.