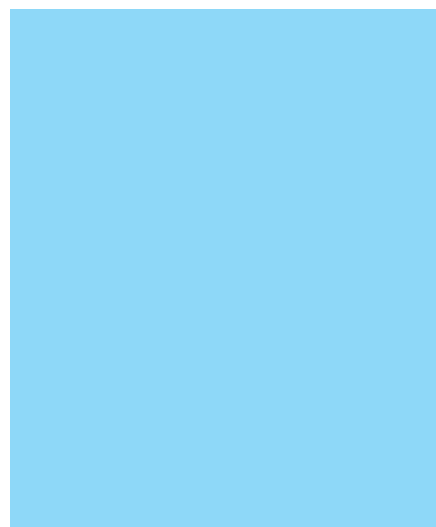


Ceramic Multilayer Chip Inductor



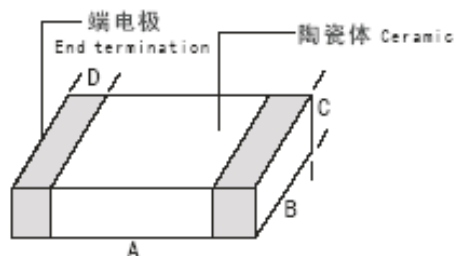
FEATURES

- Lamina ceramic allows high SRF;
- Small size;
- High-Q, stable inductance;
- Operating temperature: -30°C — $+85^{\circ}\text{C}$

特征

- 氧化铝陶瓷，适合高的自谐振频率；
- 尺寸大小；
- 在高频下Q值高，电感值稳定；
- 使用温度： -30°C — $+85^{\circ}\text{C}$

■ APPEARANCE AND DIMENSION (外观与尺寸)



Code (类型)	Dimension (尺寸) (mm)			
	A	B	C	D
0402	1.0 ± 0.15	0.5 ± 0.15	0.5 ± 0.15	0.25 ± 0.1
0603	1.6 ± 0.15	0.8 ± 0.15	0.8 ± 0.15	0.3 ± 0.2
0805	2.0 ± 0.2	1.25 ± 0.2	1.0 ± 0.2	0.020 ± 0.006

■ PART NUMBERING (型号命名方式)

- Product symbol (产品代码)

<u>KHF</u> ①	<u>0603</u> ②	<u>H</u> ③	<u>1R0</u> ④	<u>K</u> ⑤	<u>A</u> ⑥
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- ① Product Code (产品代号)

- ② Dimension (规格尺寸)

Code (类型)	Dimension (尺寸) (mm)			
	A	B	C	D
0402	1.0 ± 0.15	0.5 ± 0.15	0.5 ± 0.15	0.25 ± 0.1
0603	1.6 ± 0.15	0.8 ± 0.15	0.8 ± 0.15	0.3 ± 0.2
0805	2.0 ± 0.2	1.25 ± 0.2	1.0 ± 0.2	0.020 ± 0.006

- ③ Material Code (材料代码)

- ④ Nominal Inductance (标称电感量 (nH))

Symbol	3N3	10N	R10	1R0	100
Inductance	3.3nH	10nH	100nH	1□H	10□H

- ⑤ Tolerance (误差)

Symbol	S	D	J	K
Tolerance	± 0.3nH	± 0.5nH	± 5%	± 10%

- ⑥ Packaging Style (包装方式)

T = Bulk (散装)

A = Tape Reel(编带盘装)

■ STANDARD RATINGS (标准参数值)

● KHF1005 Series (0402系列)

Part No.	L (nH)	Tolerance	Q Min	L、Q test Freq. (MHz)	Q (Typical)- F(MHz)			SRF		DCR Max (\square)	I _r Max (mA)
					100	800	1800	MIN (MHz)	Typ. (MHz)		
KHF1005H1N0*T	1.0	± 0.3nH	8	100	10	34	55	10000	>13000	0.1	300
KHF1005H1N2*T	1.2		8	100	10	34	52	10000	>13000	0.1	300
KHF1005H1N5*T	1.5		8	100	10	34	52	>6000	>13000	0.12	300
KHF1005H1N8*T	1.8		8	100	10	30	50	>6000	12000	0.12	300
KHF1005H2N2*T	2.2		8	100	9	29	48	>6000	11000	0.16	300
KHF1005H2N7*T	2.7		8	100	9	28	48	>6000	11000	0.17	300
KHF1005H3N3*T	3.3		8	100	9	28	48	>6000	10000	0.19	300
KHF1005H3N9*T	3.9		8	100	9	28	47	>6000	9000	0.22	300
KHF1005H4N7*T	4.7		8	100	9	28	48	>6000	8000	0.24	300
KHF1005H5N6*T	5.6	± 0.5nH	8	100	9	27	45	5500	6000	0.27	300
KHF1005H6N8*T	6.8		8	100	9	28	46	5000	6000	0.32	250
KHF1005H8N2*T	8.2		8	100	9	30	45	4000	5000	0.37	250
KHF1005H10N*T	10	± 5% or ± 10%	8	100	9	29	40	3600	4900	0.12	250
KHF1005H12N*T	12		8	100	10	27	38	3400	4600	0.47	250
KHF1005H15N*T	15		8	100	10	28	36	3000	4000	0.5	250
KHF1005H18N*T	18		8	100	10	26	27	2500	3600	0.55	250
KHF1005H22N*T	22		8	100	10	28	25	2000	3400	0.6	200
KHF1005H27N*T	27		8	100	10	27	21	1800	2800	0.7	200
KHF1005H33N*T	33		8	100	10	25	15	1600	2600	0.8	200
KHF1005H39N*T	39		8	100	10	24	8	1500	2400	0.9	150
KHF1005H47N*T	47		8	100	10	23	6	1300	2100	1.0	150
KHF1005H56N*T	56		8	100	10	21	-	1200	1900	1.0	150
KHF1005H68N*T	68		8	100	10	19	-	1100	1600	1.2	150
KHF1005H82N*T	82		8	100	9	16	-	1000	1300	1.3	100
KHF1005HR10*T	100		8	100	9	10	-	900	1100	1.5	100
KHF1005HR12*T	120		8	100	9	8	-	800	1000	1.6	100

● KHF1608 Series (0603系列)

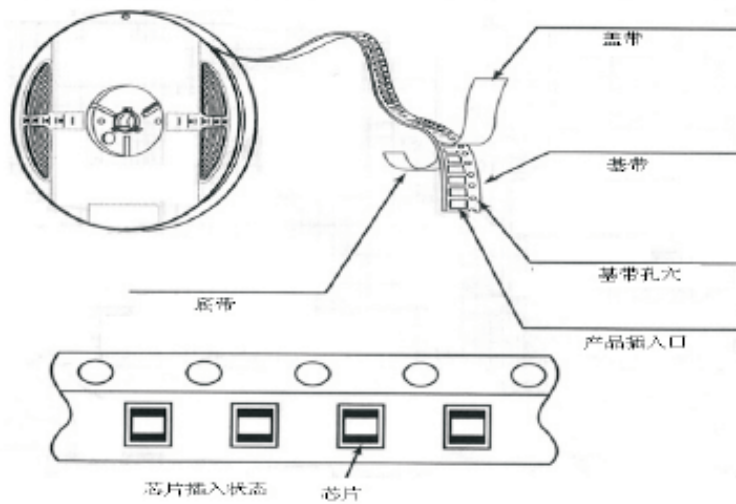
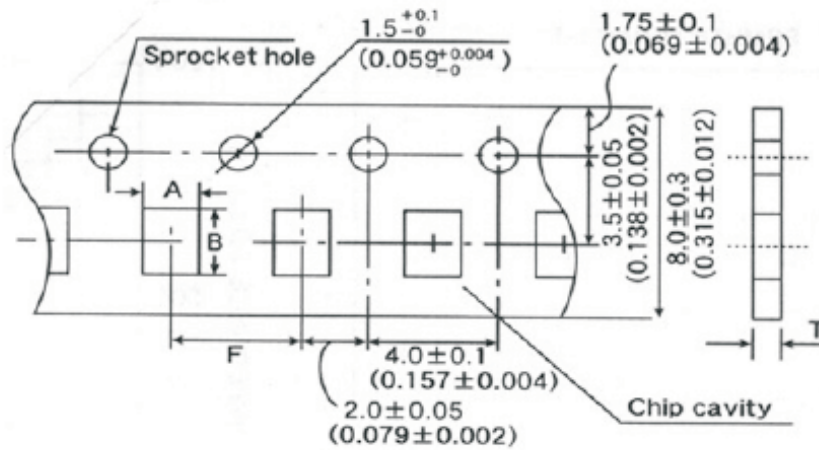
Part No.	L (nH)	Tolerance	Q Min	L、Q test Freq. (MHz)	Q (Typical)-F(MHz)			SRF		DCR Max (□)	I _r Max (mA)
					100	800	1800	MIN (MHz)	Typ. (MHz)		
KHF1608H1N0*T	1.0	± 0.3nH	8	100	13	70	126	10000	>13000	0.05	500
KHF1608H1N2*T	1.2		8	100	13	70	113	10000	>13000	0.05	500
KHF1608H1N5*T	1.5		8	100	13	47	110	10000	>13000	0.10	500
KHF1608H1N8*T	1.8		8	100	13	37	107	6000	>13000	0.10	500
KHF1608H2N2*T	2.2		8	100	13	37	106	6000	>13000	0.10	500
KHF1608H2N7*T	2.7		10	100	13	41	88	6000	12000	0.10	500
KHF1608H3N3*T	3.3		10	100	14	42	80	6000	11000	0.12	500
KHF1608H3N9*T	3.9		10	100	14	42	75	6000	10000	0.14	500
KHF1608H4N7*T	4.7		10	100	12	42	70	6000	9000	0.16	500
KHF1608H5N6*T	5.6	± 0.5nH	10	100	12	42	70	6000	8000	0.18	500
KHF1608H6N8*T	6.8		10	100	12	43	70	5500	6500	0.22	500
KHF1608H8N2*T	8.2		10	100	13	44	74	4500	5500	0.24	500
KHF1608H10N*T	10	± 5% or ± 10%	12	100	14	43	61	3500	4700	0.26	300
KHF1608H12N*T	12		12	100	14	45	60	3000	4200	0.28	300
KHF1608H15N*T	15		12	100	14	46	52	2800	4100	0.32	300
KHF1608H18N*T	18		12	100	13	44	33	2500	3500	0.35	300
KHF1608H22N*T	22		12	100	14	44	28	2000	3200	0.40	300
KHF1608H27N*T	27		12	100	15	45	20	2000	2900	0.45	300
KHF1608H33N*T	33		12	100	15	46	20	1800	2700	0.55	300
KHF1608H39N*T	39		12	100	15	44	18	1600	2400	0.60	300
KHF1608H47N*T	47		12	100	16	35	12	1400	2100	0.70	300
KHF1608H56N*T	56		12	100	17	34	-	1300	2000	0.75	300
KHF1608H68N*T	68		12	100	16	30	-	1300	1900	0.85	300
KHF1608H82N*T	82		12	100	15	27	-	1100	1700	0.95	300
KHF1608HR10*T	100		12	100	15	16	-	1000	1500	1.10	300
KHF1608HR12*T	120		8	50	15	-	-	900	1300	1.20	300
KHF1608HR15*T	150		8	50	15	-	-	800	1300	1.20	300
KHF1608HR18*T	180		8	50	17	-	-	600	1200	1.30	300
KHF1608HR22*T	220		8	50	17	-	-	600	1100	1.50	300
KHF1608HR27*T	270		8	50	17	-	-	500	900	1.60	300

● KHF2012 Series (0805系列)

Part No.	L (nH)	Tolerance	Q Min	L、Q test Freq. (MHz)	Q (Typical)-F (MHz)			SRF		DCR Max (□)	I _r Max (mA)
					100	800	1800	MIN (MHz)	Typ. (MHz)		
KHF2012H1N5*T	1.5	± 0.3nH	10	100	21	61	100	>6000	>6000	0.10	500
KHF2012H1N8*T	1.8		10	100	20	55	92	>6000	>6000	0.10	500
KHF2012H2N2*T	2.2		10	100	20	53	90	>6000	>6000	0.10	500
KHF2012H2N7*T	2.7		12	100	18	56	92	>6000	>6000	0.10	500
KHF2012H3N3*T	3.3		12	100	18	54	83	>6000	>6000	0.13	500
KHF2012H3N9*T	3.9		12	100	18	54	90	>6000	>6000	0.15	500
KHF2012H4N7*T	4.7		12	100	18	55	68	5500	>6000	0.20	500
KHF2012H5N6*T	5.6	± 0.5nH	15	100	18	60	68	4500	5800	0.23	500
KHF2012H6N8*T	6.8		15	100	18	63	68	3500	5000	0.25	500
KHF2012H8N2*T	8.2		15	100	20	63	70	3000	4000	0.28	500
KHF2012H10N*T	10	± 5% or ± 10%	15	100	21	60	70	2800	3800	0.30	500
KHF2012H12N*T	12		15	100	20	60	70	2600	3800	0.35	500
KHF2012H15N*T	15		15	100	20	63	50	2500	3600	0.40	500
KHF2012H18N*T	18		15	100	22	63	46	2200	3000	0.45	300
KHF2012H22N*T	22		18	100	19	60	29	2000	3000	0.50	300
KHF2012H27N*T	27		18	100	19	58	18	1700	2400	0.55	300
KHF2012H33N*T	33		18	100	19	55	10	1500	2100	0.60	300
KHF2012H39N*T	39		18	100	19	47	6	1300	1900	0.65	300
KHF2012H47N*T	47		18	100	23	43	-	1000	1600	0.70	300
KHF2012H56N*T	56		18	100	19	39	-	900	1500	0.75	300
KHF2012H68N*T	68		18	100	19	30	-	900	1500	0.80	300
KHF2012H82N*T	82		18	100	19	-	-	800	1400	0.90	300
KHF2012HR10*T	100		18	100	19	-	-	800	1300	0.90	300
KHF2012HR12*T	120		13	50	19	-	-	700	1200	0.95	300
KHF2012HR15*T	150		13	50	19	-	-	700	1100	1.20	300
KHF2012HR18*T	180		13	50	19	-	-	500	800	1.30	300
KHF2012HR22*T	220		12	50	20	-	-	400	700	1.50	300
KHF2012HR27*T	270		12	50	20	-	-	400	600	1.80	300
KHF2012HR33*T	330		12	50	16	-	-	300	360	2.50	300
KHF2012HR39*T	390		12	50	16	-	-	300	420	2.00	300
KHF2012HR47*T	470	12	50	16	-	-	200	270	2.00	300	

■ PACKAGING (包装)

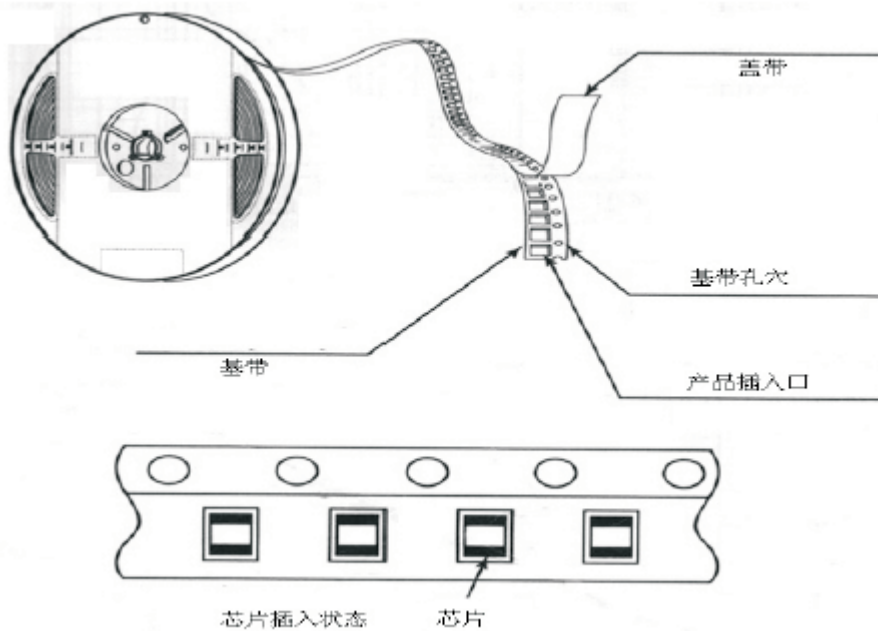
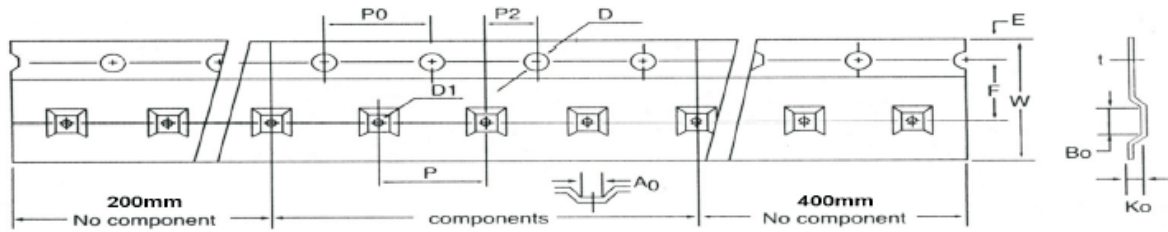
● PAPER TAPING (纸带)



Unit: mm

Size	晶片插入部尺寸		插入晶片间距	纸带厚度
	A	B		
0402	0.65 ± 0.1	1.15 ± 0.1	2.0 ± 0.05	0.8max
0603	1.0 ± 0.2	1.8 ± 0.2	4.0 ± 0.1	1.1max
0805	1.5 ± 0.2	2.3 ± 0.2	4.0 ± 0.1	1.1max

● EMBOSSED TAPING (胶带)

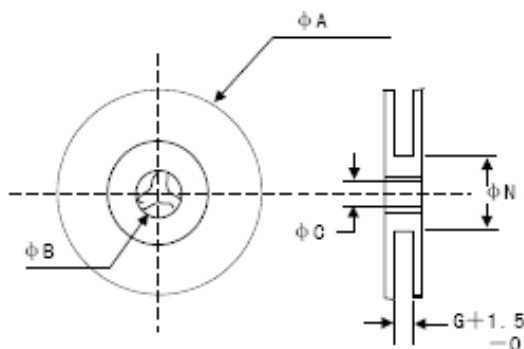


Unit: mm

Size	W	P	E	F	D	D1	P ₀	P ₂	A ₀	B ₀	t
0805	8.1 ± 0.2	4.0 ± 0.1	1.75 ± 0.1	3.5 ± 0.1	1.55 ± 0.05	1.5min	4.0 ± 0.1	2.0 ± 0.05	1.52 ± 0.1	2.41 ± 0.1	0.23 ± 0.1

● REEL DIMENSION (卷盘尺寸)

Unit: mm (单位: mm)



□A	□B	□C	□N	G
178 ± 2.0	22.0 ± 2.0	12.5 ± 1.5	67 ± 2.0	8

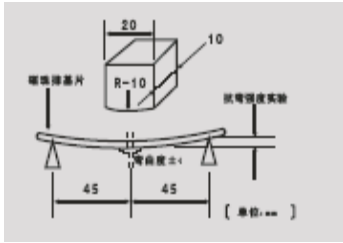
● PACKING QUANTITY (包装数量)

Size (尺寸)	Package Style & Quantity (包装形式和数量) Unit: pcs		
	PT (纸带卷盘)	ET (胶带卷盘)	BP (塑料袋散装)
0402	10,000		5,000
0603	4,000		5,000
0805	4,000	2,000/3,000	5,000

■ RELIABILITY TEST DATA (可靠性测试数据)

Type (序号)	Item (项目)	Specified Value (详细说明)		Test Methods (测试方法)
1	Operating temperature range (工作温度范围)	-40 to +125°C	-40 to +85°C	
2	Storage temperature range (贮存温度范围)	-40 to +125°C	-40 to +85°C	
3	Rated current (额定电流)	100 to 600mA (max)		恒流源型号: 33010D
4	Inductance (感量)	1.0 to 5.6nH ± 0.3nH 6.8 to 470nH ± 5% or ± 10%		Measuring frequency: 50 to 100MHz Measuring equipment: HP4291A、HP4286A、HP4287A Measuring jig: 16192A or 16196A、16196B 测试频率: 50~100MHz 测试仪器: HP4291A、HP4286A、HP4287A 测试夹具: 16192A或16196A、16196B
5	Q Value (Q值)	8 to 15 (min)		Measuring frequency: 50 to 100MHz Measuring equipment: HP4291A、HP4286A、HP4287A Measuring jig: 16192A or 16196A、16196B 测试频率: 50~100MHz 测试仪器: HP4291A、HP4286A、HP4287A 测试夹具: 16192A或16196A、16196B
6	DC resistance (直流电阻)	0.05 to 3.50Ω (max)		Measuring equipment: HP4338B (测试仪器中: HP4338B)
7	Self-Resonant frequency (自谐振频率)	200 to 10000MHz (min)		Measuring equipment: HP4291A Measuring jig: 16192A or 16196A、16196B 测试仪器: HP4291A 测试夹具: 16192A 或 16196A、16196B

Type (序号)	Item (项目)	Specified Value (详细说明)	Test Methods (测试方法)
8	Solderability (可焊)	At least 90% of terminal electrodes covered by new solder (至少有90%的端电极被焊料覆盖。)	Solder temperature: $230 \pm 5^{\circ}\text{C}$ Duration: $4 \pm 1\text{s}$ Preheating temperature: 120 to 150°C Preheating time: 60s Flux: immersion into methanol solution with colophony for 3 to 5 sec. Immersion speed: 25mm/sec 焊锡温充: $230 \pm 5^{\circ}\text{C}$ 浸锡时间: $4 \pm 1\text{s}$ 预热温度: 120 至 150°C 预热时间: 60秒 浸入松香助焊剂3至5秒 浸入速度: 25mm/sec
9	Resistance to soldering (耐焊)	Appearance: No significant abnormality. At least 75% of terminal electrode is covered by new solder. Inductance change: within $\pm 10\%$ Q Value change: within $\pm 20\%$ (外观: 没有严重变形。 至少有75%的端电极被焊料覆盖。 感量变化率小于 $\pm 10\%$ 。 Q值变化率小于 $\pm 20\%$ 。)	Solder temperature: $260 \pm 5^{\circ}\text{C}$ Duration: $10 \pm 1\text{s}$ Preheating temperature: 120 to 150°C Preheating time: 60s Flux: immersion into methanol solution with colophony for 3 to 5 sec. Immersion speed: 25mm/sec (焊锡温度: $260 \pm 5^{\circ}\text{C}$ 浸锡时间: $10 \pm 0.5\text{s}$ 预热温度: 120 至 150°C 预热时间: 60秒 浸入松香助焊剂3至5秒 浸入速度: 25mm/sec
10	Thermal shock (热冲击)	Appearance: No significant abnormality. Inductance change: within $\pm 10\%$ Q Value change: within $\pm 20\%$ (外观: 没有严重变形。 感量变化率小于 $\pm 10\%$ 。 Q值变化率小于 $\pm 20\%$ 。)	High frequency inductors (1608、2012) series: Conditions for 1 cycle Step 1: -40°C , 60min Step 2: $+85^{\circ}\text{C}$, 60min High frequency inductors (1005) series: Conditions for 1 cycle Step 1: -40°C , 60min Step 2: $+125^{\circ}\text{C}$, 60min Number of cycles: 100 (甚高频电感1608、2012系列: 以下为一个循环: 第一步: -40°C , 60分钟 第二步: 85°C , 60分钟 甚高频电感1005系列: 以下为一个循环: 第一步: -40°C , 60分钟 第二步: 125°C , 60分钟 循环次数: 100次

Type (序号)	Item (项目)	Specified Value (详细说明)	Test Methods (测试方法)
11	Loading at high temperature (耐高温)	Appearance: No significant abnormality. Inductance change: within $\pm 10\%$ Q Value change: within $\pm 20\%$ (外观: 没有严重变形。 感量变化率小于 $\pm 10\%$ 。 Q值变化率小于 $\pm 20\%$ 。)	Temperature: $125 \pm 2^\circ\text{C}$ (1608、2012 series) $85 \pm 2^\circ\text{C}$ (1005 series) Duration: 500(-0,+24)hrs Applied current: Rated current (试验温度: $125 \pm 2^\circ\text{C}$ (1608、2012 系列) $85 \pm 2^\circ\text{C}$ (1005系列) 试验时间: 500 (-0, +24) 小时 施加额定电流。
12	Loading under Damp Heat (耐湿负荷)	Appearance: No significant abnormality. Inductance change: within $\pm 10\%$ Q Value change: within $\pm 20\%$ (外观: 没有严重变形。 感量变化率小于 $\pm 10\%$ 。 Q值变化率小于 $\pm 20\%$ 。)	Temperature: $40 \pm 2^\circ\text{C}$ Humidity: 90 to 95%RH Duration: 500(-0,+24)hrs Applied current: Rated current (试验温度: $40 \pm 2^\circ\text{C}$ 试验时间: 500 (-0, +24) 小时 相对湿度: 90%至95% 施加额定电流。
13	Vibration (振动)	Appearance: No significant abnormality. Inductance change: within $\pm 10\%$ Q Value change: within $\pm 20\%$ (外观: 没有严重变形。 感量变化率小于 $\pm 10\%$ 。 Q值变化率小于 $\pm 20\%$ 。)	Amplitude: 1.5mm Directions: 2hrs each in XYZ direction Frequency range: 10 to 55 to 10Hz (min) (振幅: 1.5mm X,Y,Z方向 各2小时 频率范围: 10~55~ 10Hz(min))
14	Adhesion of electrode (端电极附着力)	No separation or indication of electrode. (没有脱帽或拉断现象。)	Applied force: 5N Duration: 10s (施加压力: 5N 试验时间: 10秒)
15	Resistance to flexure of substrate (抗弯强度)	No mechanical damage. (没有机械损伤。)	Warp: 2mm Testing board: Glass epoxy-resin substrate Thickness: 8mm (弯曲度: 2mm 测试板: 玻璃环氧树脂基板 厚度: 0.8mm) 

Note: When there are questions concerning, measurement shall be made after 24 ± 2 hrs of recovery under the standard condition.

(注: 以上要求测试电性能的, 在标准条件下放置 24 ± 2 小时后测试。)