SPECIFICATION FOR APPROVAL

MULTILAYER CHIP BEAD

- ☐ STANDARD TYPE CHIP BEAD
- ☐ MIDDLE CURRENT TYPE CHIP BEAD
- ☐ HIGH CURRENT TYPE CHIP BEAD
- ☐ ARRAY TYPE CHIP BEAD

CONTENTS

MULTILAYER CHIP BEAD

********** STANDARD TYPE CHIP BEAD **********

FEATURES

- Unlike conventional beads,these beads do not require wiring.
  Simply mounts them on to the PCB to eliminate the EMI/RFI.
- Specially designed for surface mounting equipment.
  available in various size which allows them to wide range of application and usage.
- Best designed and tested to offer high impedance for volume.

APPLICATIONS

- Prevention of high frequency EMI form computers, printers,
  VCRs, TVs, wireless telephone and other related equipment.

1. Product Identification

LB	1608	C	121	N	T	X
1-1	1-2	1-3	1-4	1-5	1-6	1-7

1-1. **LB** **UWA Standard Type Chip Bead** **(LBM : Middle Current Type)** **(LBH : High Current Type)**

1-2. **1608** **Size**

Code	EIA Code	Length * Width mm / (inch)
1005	0402	1.00 * 0.50 / (0.04 * 0.02)
1608	0603	1.60 * 0.80 / (0.06 * 0.03)
2012	0805	2.00 * 1.25 / (0.08 * 0.05)
3216	1206	3.20 * 1.60 / (0.12 * 0.06)
3225	1210	3.20 * 2.50 / (0.12 * 0.10)
4516	1806	4.50 * 1.60 / (0.18 * 0.06)
4532	1812	4.50 * 3.20 / (0.18 * 0.12)

1-3. **C** **Material**

Code	Description Of The Code
A	High Frequency – High Impedance , High R-X Cross Point
B	High Speed , Middle Frequency – Low Impedance , Low Impedance At 10 MHz
C	Normal Type , Low Frequency – High Impedance , High Impedance At 10 MHz
D	Low Frequency , Low R-X Cross Point

1-4. **121** **Impedance**

Code	Impedance (Ω)	Code	Impedance (Ω)
0R5	0.5	470	47
010	1	101	100
100	10	102	1000

1-5. **N** **Current**

Code	Description Of The Code	
N	**(LBM)**	Low Current I＜1 Ampere
	(LB)	Low Current I≦1 Ampere
P	**(LBH)** **High Current Type**	High Current 1≦I＜2 Ampere
Q		High Current 2≦I＜3Ampere
R		High Current 3≦I＜4 Ampere
S		High Current 4≦I＜5 Ampere
U		High Current 5≦I＜6 Ampere
V		High Current 6≦I＜7 Ampere

1-6. **T** **Packaging**

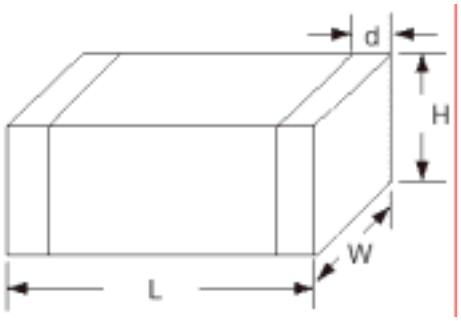
Code	Description Of The Code
T	7〃 Tape & Reel
D	13〃 Tape & Reel
B	Bulk

1-7. **X** **Material Option**

Code	Description Of The Code
	Sn – Pb Plating (Sn 90% , Pb 10%)
X	Pb – Free Plating (Sn 100%)

2. Dimension & Structure (Unit : mm)

Code	EIA Code	L	W	H	d
1005	0402	1.00±0.05	0.50±0.05	0.50±0.05	0.25±0.10
1608	0603	1.60±0.15	0.80±0.15	0.80±0.15	0.30±0.20
2012	0805	2.00±0.20	1.25±0.20	0.90±0.20	0.50±0.30
3216	1206	3.20±0.20	1.60±0.20	1.10±0.20	0.50±0.30
3225	1210	3.20±0.20	2.50±0.20	1.30±0.20	0.50±0.30
4516	1806	4.50±0.20	1.60±0.20	1.60±0.20	0.90±0.60
4532	1812	4.50±0.20	3.20±0.20	1.50±0.20	0.90±0.60



LB1005 , LB1608（0402 , 0603）Type

Part Number	Test Frequency (MHz)	Impedance (Ω)±25%	DC Resistance (Ω)Max.	Rated Curent (mA)Max.
LB1005□400□	100	40	0.3	300
LB1005□800□	100	80	0.4	200
LB1005□121□	100	120	0.5	200
LB1005□241□	100	240	0.5	200
LB1005□481□	100	480	0.8	100
LB1005□601□	100	600	1	100
LB1608□110□	100	11	0.05	500
LB1608□190□	100	19	0.08	500
LB1608□200□	100	20	0.1	400
LB1608□260□	100	26	0.1	400
LB1608□300□	100	30	0.1	400
LB1608□310□	100	31	0.1	400
LB1608□330□	100	33	0.1	400
LB1608□400□	100	40	0.1	400
LB1608□600□	100	60	0.2	300
LB1608□700□	100	70	0.2	300
LB1608□750□	100	75	0.2	300
LB1608□800□	100	80	0.2	300
LB1608□900□	100	90	0.3	250
LB1608□101□	100	100	0.3	250
LB1608□121□	100	120	0.3	250
LB1608□141□	100	140	0.3	250
LB1608□151□	100	150	0.3	250
LB1608□181□	100	180	0.3	250
LB1608□221□	100	220	0.3	250
LB1608□241□	100	240	0.3	250
LB1608□301□	100	300	0.35	230
LB1608□421□	100	420	0.4	210
LB1608□451□	100	450	0.4	210
LB1608□471□	100	470	0.4	210
LB1608□601□	100	600	0.45	210
LB1608□751□	100	750	0.7	200
LB1608□102□	100	1000	0.7	200
LB1608□152□	100	1500	0.8	100
LB1608□202□	100	2000	1.0	100
LB1608□222□	100	2200	1.2	100
LB1608□252□	100	2500	1.1	100
LB1608□272□	100	2700	1.3	50

5 Current
3 Material Code

*Other values are available upon customer's request.

3.Electrical Characteristic

LB2012（0805）Type

Part Number	Test Frequency (MHz)	Impedance (Ω)±25%	DC Resistance (Ω)Max.	Rated Curent (mA)Max.
LB2012□100□	100	10	0.1	600
LB2012□110□	100	11	0.1	600
LB2012□170□	100	17	0.1	600
LB2012□200□	100	20	0.1	600
LB2012□260□	100	26	0.1	600
LB2012□300□	100	30	0.1	600
LB2012□310□	100	31	0.1	600
LB2012□320□	100	32	0.1	600
LB2012□330□	100	33	0.1	600
LB2012□400□	100	40	0.1	600
LB2012□470□	100	47	0.1	600
LB2012□500□	100	50	0.1	600
LB2012□520□	100	52	0.1	600
LB2012□600□	100	60	0.1	600
LB2012□700□	100	70	0.2	400
LB2012□800□	100	80	0.2	400
LB2012□900□	100	90	0.2	400
LB2012□101□	100	100	0.2	400
LB2012□121□	100	120	0.2	400
LB2012□151□	100	150	0.3	200
LB2012□221□	100	220	0.3	200
LB2012□241□	100	240	0.3	200
LB2012□301□	100	300	0.3	200
LB2012□401□	100	400	0.3	200
LB2012□421□	100	420	0.3	200
LB2012□471□	100	470	0.3	200
LB2012□501□	100	500	0.3	200
LB2012□601□	100	600	0.3	200
LB2012□751□	100	750	0.4	200
LB2012□102□	100	1000	0.4	200
LB2012□152□	100	1500	0.6	200
LB2012□202□	100	2000	0.7	200
LB2012□222□	100	2200	0.75	150
LB2012□252□	100	2500	0.8	150
LB2012□272□	100	2700	1.5	100

(5) Current
(3) Material Code

*Other values are available upon customer's request.

LB3216（1206）Type

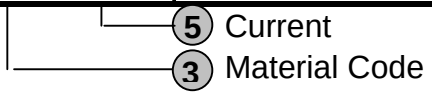
Part Number	Test Frequency (MHz)	Impedance (Ω)±25%	DC Resistance (Ω)Max.	Rated Curent (mA)Max.
LB3216□110□	100	11	0.05	600
LB3216□190□	100	19	0.1	600
LB3216□200□	100	20	0.1	600
LB3216□310□	100	31	0.1	600
LB3216□320□	100	32	0.1	600
LB3216□500□	100	50	0.1	600
LB3216□600□	100	60	0.1	600
LB3216□700□	100	70	0.1	600
LB3216□750□	100	75	0.1	600
LB3216□800□	100	80	0.2	400
LB3216□900□	100	90	0.2	400
LB3216□101□	100	100	0.2	400
LB3216□121□	100	120	0.2	300
LB3216□151□	100	150	0.3	300
LB3216□201□	100	200	0.3	300
LB3216□221□	100	220	0.3	300
LB3216□301□	100	300	0.4	300
LB3216□401□	100	400	0.4	200
LB3216□471□	100	470	0.4	200
LB3216□501□	100	500	0.45	200
LB3216□601□	100	600	0.5	200
LB3216□102□	100	1000	0.7	200
LB3216□122□	100	1200	0.7	200
LB3216□152□	100	1500	0.7	200
LB3216□202□	100	2000	0.7	200
LB3216□272□	100	2700	0.7	200

⑤ Current
③ Material Code

*Other values are available upon customer's request.

LBM1608 , LBM2012（0603 , 0805）Type

Part Number	Test Frequency (MHz)	Impedance (Ω)±25%	DC Resistance (Ω)Max.	Rated Curent (mA)Max.
LBM1608□110□	100	11	0.03	1000
LBM1608□190□	100	19	0.05	1000
LBM1608□300□	100	30	0.06	800
LBM1608□400□	100	40	0.06	800
LBM1608□600□	100	60	0.06	600
LBM1608□800□	100	80	0.1	600
LBM1608□121□	100	120	0.15	600
LBM1608□221□	100	220	0.18	400
LBM1608□301□	100	300	0.25	400
LBM1608□451□	100	450	0.3	400
LBM1608□601□	100	600	0.3	400
LBM1608□751□	100	750	0.45	300
LBM1608□102□	100	1000	0.45	300
LBM2012□070□	100	7	0.06	1000
LBM2012□090□	100	9	0.06	1000
LBM2012□110□	100	11	0.06	1000
LBM2012□170□	100	17	0.06	1000
LBM2012□320□	100	32	0.06	1000
LBM2012□600□	100	60	0.1	800
LBM2012□700□	100	70	0.1	800
LBM2012□800□	100	80	0.1	800
LBM2012□121□	100	120	0.15	600
LBM2012□151□	100	150	0.15	600
LBM2012□221□	100	220	0.18	600
LBM2012□301□	100	300	0.18	600
LBM2012□401□	100	400	0.18	600
LBM2012□501□	100	500	0.25	500
LBM2012□601□	100	600	0.25	500
LBM2012□751□	100	750	0.3	400
LBM2012□102□	100	1000	0.3	400
LBM2012□152□	100	1500	0.4	300
LBM2012□202□	100	2000	0.55	200



*Other values are available upon customer's request.

LBM3216 , LBM3225 , LBM4516 , LBM4532（1206 , 1210 , 1806 , 1812）Type

Part Number	Test Frequency (MHz)	Impedance (Ω)±25%	DC Resistance (Ω)Max.	Rated Curent (mA)Max.
LBM3216□190□	100	19	0.03	1000
LBM3216□260□	100	26	0.03	1000
LBM3216□320□	100	32	0.03	1000
LBM3216□500□	100	50	0.06	1000
LBM3216□600□	100	60	0.06	1000
LBM3216□700□	100	70	0.06	1000
LBM3216□900□	100	90	0.1	800
LBM3216□121□	100	120	0.1	800
LBM3216□151□	100	150	0.1	800
LBM3216□201□	100	200	0.15	600
LBM3216□401□	100	400	0.15	600
LBM3216□501□	100	500	0.15	600
LBM3216□601□	100	600	0.2	500
LBM3216□102□	100	1000	0.25	400
LBM3216□122□	100	1200	0.3	400
LBM3216□202□	100	2000	0.35	400
LBM3225□320□	100	32	0.1	1000
LBM3225□600□	100	60	0.1	1000
LBM3225□900□	100	90	0.1	1000
LBM4516□500□	100	50	0.1	1000
LBM4516□600□	100	60	0.1	1000
LBM4516□800□	100	80	0.1	1000
LBM4516□101□	100	100	0.18	1000
LBM4516□151□	100	150	0.18	1000
LBM4516□171□	100	171	0.18	1000
LBM4532□700□	100	70	0.18	1000
LBM4532□121□	100	120	0.18	1000

5 Current
3 Material Code

LBH1608 , LBH2012（0603 , 0805）Type

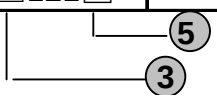
Part Number	Test Frequency (MHz)	Impedance (Ω)±25%	DC Resistance (Ω)Max.	Rated Curent (mA)Max.
LBH1608□110□	100	11	0.02	4000
LBH1608□250□	100	25	0.03	3000
LBH1608□400□	100	40	0.035	3000
LBH1608□600□	100	60	0.04	3000
LBH1608□121□	100	120	0.08	2500
LBH1608□301□	100	300	0.1	2000
LBH1608□501□	100	500	0.15	1500
LBH1608□601□	100	600	0.2	1000
LBH1608□102□	100	1000	0.25	800
LBH2012□110□	100	11	0.01	6000
LBH2012□170□	100	17	0.02	5000
LBH2012□220□	100	22	0.02	4000
LBH2012□300□	100	30	0.02	4000
LBH2012□310□	100	31	0.02	4000
LBH2012□400□	100	40	0.02	3000
LBH2012□500□	100	50	0.025	3000
LBH2012□600□	100	60	0.03	3000
LBH2012□700□	100	70	0.04	3000
LBH2012□750□	100	75	0.04	3000
LBH2012□800□	100	80	0.04	3000
LBH2012□900□	100	90	0.04	3000
LBH2012□101□	100	100	0.04	3000
LBH2012□121□	100	120	0.04	3000
LBH2012□151□	100	150	0.05	2500
LBH2012□201□	100	200	0.05	2500
LBH2012□221□	100	220	0.08	2000
LBH2012□301□	100	300	0.08	2000
LBH2012□331□	100	330	0.08	2000
LBH2012□401□	100	400	0.1	2000
LBH2012□601□	100	600	0.1	2000

5 Current
3 Material Code

*Other values are available upon customer's request.

LBH3216 , LBH3225 , LBH4516 , LBH4532（1206,1210,1806,1812）Type

Part Number	Test Frequency (MHz)	Impedance (Ω)±25%	DC Resistance (Ω)Max.	Rated Curent (mA)Max.
LBH3216□190□	100	19	0.015	6000
LBH3216□250□	100	25	0.015	5000
LBH3216□320□	100	32	0.015	4000
LBH3216□400□	100	40	0.02	4000
LBH3216□600□	100	60	0.02	4000
LBH3216□700□	100	70	0.025	3000
LBH3216□800□	100	80	0.025	3000
LBH3216□101□	100	100	0.03	2500
LBH3216□151□	100	150	0.04	2500
LBH3216□201□	100	200	0.05	2500
LBH3216□301□	100	300	0.06	2000
LBH3216□601□	100	600	0.1	2000
LBH3216□102□	100	1000	0.15	1500
LBH3216□122□	100	1200	0.2	1000
LBH3216□152□	100	1500	0.3	1000
LBH3225□400□	100	40	0.02	4000
LBH3225□600□	100	60	0.025	4000
LBH3225□800□	100	80	0.025	4000
LBH3225□900□	100	90	0.025	3000
LBH3225□121□	100	120	0.035	3000
LBH3225□151□	100	150	0.04	2000
LBH4516□500□	100	50	0.02	6000
LBH4516□600□	100	60	0.02	5000
LBH4516□800□	100	80	0.025	4000
LBH4516□151□	100	150	0.07	3000
LBH4532□700□	100	70	0.03	6000
LBH4532□121□	100	120	0.03	4000



*Other values are available upon customer's request.

MULTILAYER CHIP BEAD

********** ARRAY TYPE CHIP BEAD **********

FEATURES

- Reduction in required real estate(more than 50%)
- Reduced Cost,Space and Time for placement on PCB
- Reduction in number of solder joints
- Easier PCB design
- Simply mounts them on to the PCB to eliminate the EMI/RFI

APPLICATIONS

. Prevention of high frequency EMI form computers, printers,LCD MONITOR VCRs, TVs, wireless telephone and other related equipment.

1.Product Identification

LBA	6	B	241	N	T	X
1-1	1-2	1-3	1-4	1-5	1-6	1-7

1-1. **LBA** **UWA Array Type Chip Bead**

1-2. **6** **Size**

Code	EIA Code	Length * Width mm / (inch)
5	0805	2.00 * 1.25 / (0.08 * 0.05)
6	1206	3.20 * 1.60 / (0.12 * 0.06)

1-3. **B** **Material**

Code	Description Of The Code
A	High Frequency – High Impedance , High R-X Cross Point
B	High Speed , Middle Frequency – Low Impedance , Low Impedance At 10 MHz
C	Normal Type , Low Frequency – High Impedance , High Impedance At 10 MHz
D	Low Frequency , Low R-X Cross Point

1-4. **241** **Impedance**

Code	Impedance (Ω)	Code	Impedance (Ω)
0R5	0.5	470	47
010	1	101	100
100	10	102	1000

1-5. **N** **Current**

Code	Description Of The Code
N	Low Current I < 1 Ampere
P	High Current I = 1 Ampere

1-6. **T** **Packaging**

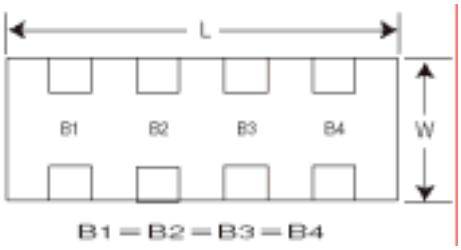
Code	Description Of The Code
T	7 ” Tape & Reel
D	13 ” Tape & Reel
B	Bulk

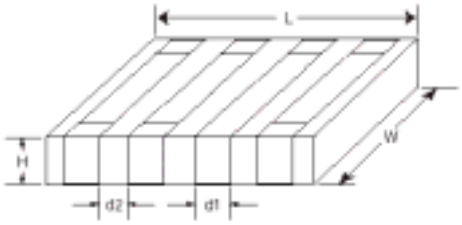
1-7. **X** **Material Option**

Code	Description Of The Code
	Sn – Pb Plating (Sn 90% , Pb 10%)
X	Pb – Free Plating (Sn 90% , Pb 10%)

2. Dimension & Structure (Unit : mm)

Code	EIA Code	L	W	H	d1	d2
5	0805	2.00±0.15	1.25±0.15	1.00 Max	0.25±0.10	0.25±0.10
6	1206	3.20±0.20	1.60±0.20	1.35 Max	0.40±0.20	0.40±0.20



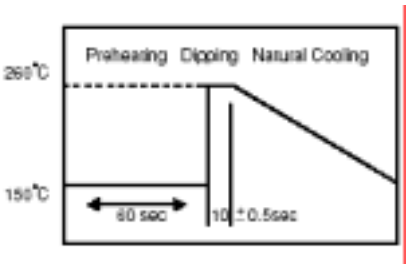
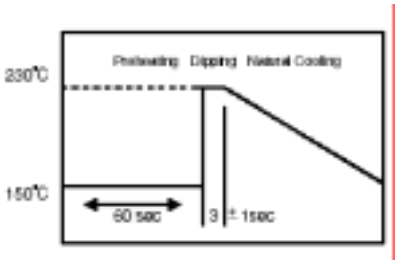
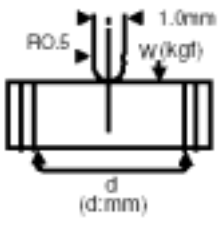


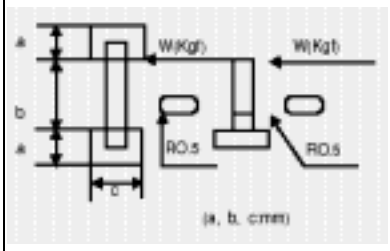
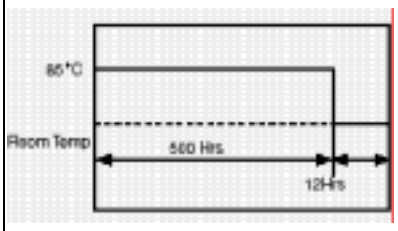
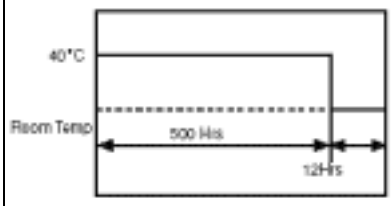
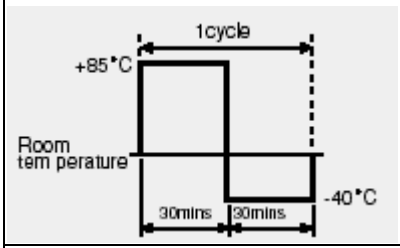
3.Electrical Characteristic

Part Number	Test (MHz)	Impedance (Ω)±25%	DC Resistance (Ω)Max	Rated Current (mA)Max
LBA6C300NT☐	100	30	0.4	350
LBA6C600NT☐	100	60	0.4	250
LBA6C121NT☐	100	120	0.8	150
LBA6C241NT☐	100	240	0.8	150
LBA6C301NT☐	100	300	0.8	150
LBA6C471NT☐	100	470	1	100
LBA6C601NT☐	100	600	1.5	100
LBA6C102NT☐	100	1000	1.7	50
LBA6B600NT☐	100	60	0.8	150
LBA6B121NT☐	100	120	0.8	150
LBA6B221NT☐	100	220	0.8	150
LBA6B241NT☐	100	240	0.8	150
LBA6B471NT☐	100	470	1	150
LBA6B601NT☐	100	600	1.5	100
LBA6B102NT☐	100	1000	1.5	100

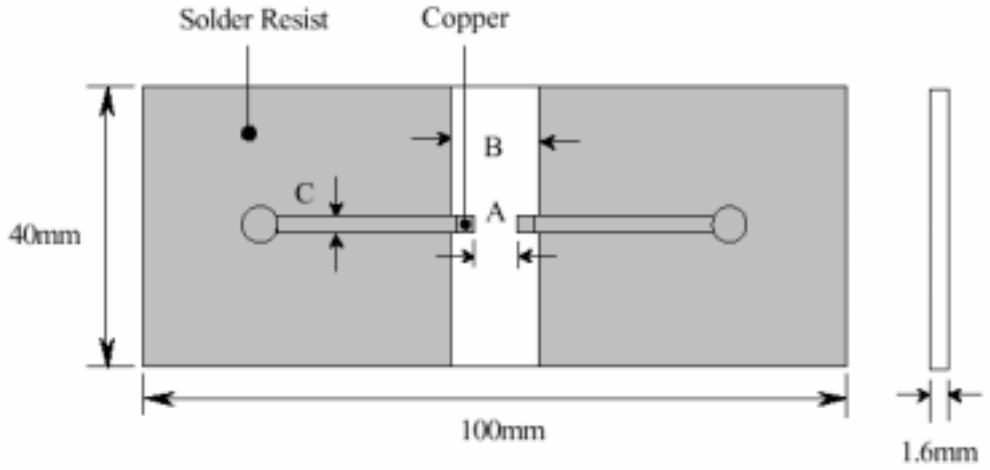
4.Reliability And Test Condition

Requirement : 1005 1608 2012 3216 4516 4532

Item	Specification	Test Conditions
(1)Operating Temp.Rang	-55℃ ~ + 125 ℃	
(2)Storage Temp. Range Humidity Range	-55℃ ~ + 125 ℃ 70% RH MAX	
(3)Resistance to Solder Heat 	The chip shall not be cracks. More than 75% of the terminal Electrode shall be covered with New solder . Impedance change : within±30%	Preheat Temp:150~180℃ Preheat Time:60sec Solder Temp:260±5℃ Dipping Time:10 ±1sec
(4)Solderability 	More than 75% of the terminal Electrode shall be covered with New solder .	Preheat Temp:150~180℃ Preheat Time:60sec Sn / Pb : Solder Temperature : 230 ± 5 °C Dip Time : 3 ± 1 sec. Solder : H63A Flux : RMA Type Preheat : At 80~120 °C For 10~30 sec. Pb Free : Solder Temperature : 250 ± 5 °C Dip Time : 3 ±1 sec. Solder : H63A Flux : RMA Type Preheat : At 80~120 °C For 10~30 sec. Hand Soldering : Solder Temperature : Sn/Pb 230 ~ 280 °C Pb Free 250 ~ 300°C Use a 20W Soldering Iron And The Soldering Irom Should Not Directly Touch Bead.
(5)Bending strength 	(1) The Ferrite shall not be Damaged by the force on the right . (2) Impedance change : within±30 %	Recommend Applied force :5N Duration : 10sec

Item	Specification	Test Conditions
(6)Flexure Strength 	(1) No mechanical damage shall Be noticed even when the board is bent 2mm(0.079inches) (2) Impedance change : within±30％	a b c LB100505 0.5 0.5 1.0 LB160808 0.8 0.8 1.3 LB201209 1.0 1.0 1.3 LB321611 1.3 1.5 3.0 LB322513 1.3 1.5 3.0 LB452616 1.5 3.6 3.0 LB453215 1.5 3.6 3.8 W(kgf) ＞500 g.f
(7)Heat Resistance (High Temp. Load) 	(1) No mechanical damage. (2) Impedance change : within±30％	Temperature :(85±2) ℃ Time : 500 hours Applied current :Rated Current base on specification
(8)Humidity Resistance 	(1)No mechanical damage. (2) Impedance change : within±30％	Temperature :(40±2) ℃ Humidity:90~95% RH Time : 500±12 hours Applied current :Rated Current base on specification
(9)Thermal Shock (Temperature Cycle) 	(1) No mechanical damage (2) Impedance change : within±30％	-40℃ ～+85℃ for 30 minutes each , 100 cycle …… Measurement : After placing For 24 hours
(10)Drop	(1) No mechanical damage (2) Impedance change : within±30％	Dropped 10 times on A concrete floor from A height of 91cm (35.827 inches)
(11)Vibration	(1) No mechanical damage. (2) Impedance change : within±30％	Frequency:10~55Hz Amplitude:1.52mm (0.060 inches) Direction and time :X,Y,Z Directions for 1 hs each

5. P.C. Board for Bending Strength Test

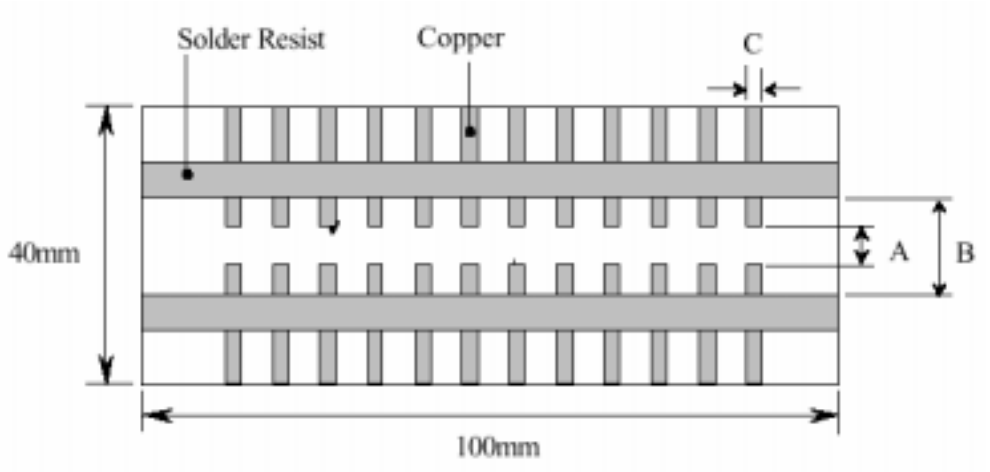


Unit : mm

Code	A	B	C
0201	0.2	1.0	0.3
0402	0.4	1.4	0.5
0603	1.0	3.0	1.0
0805	1.2	4.0	1.6
1206	2.2	5.0	2.0
1210	2.2	5.0	2.9
1808	3.5	7.0	2.5
1812	3.5	7.0	3.7
2220	4.5	8.0	5.6

Test Substrate
Material: Glass Epoxy Substrate Copper (Thickness : 0.035mm) Solder Resist

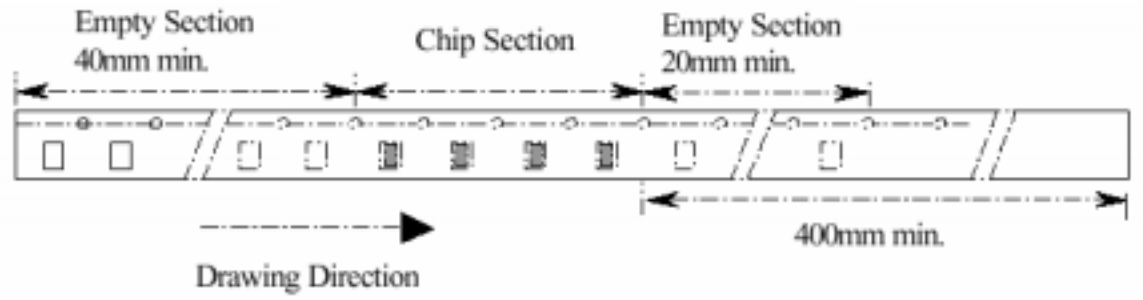
Test Substrate



(Unit: mm)

Code	A	B	C
0201	0.2	1.0	0.3
0402	0.4	1.4	0.5
0603	1.0	3.0	1.0
0805	1.2	4.0	1.6
1206	2.2	5.0	2.0
1210	2.2	5.0	2.9
1808	3.5	7.0	2.5
1812	3.5	7.0	3.7
2220	4.5	8.0	5.6

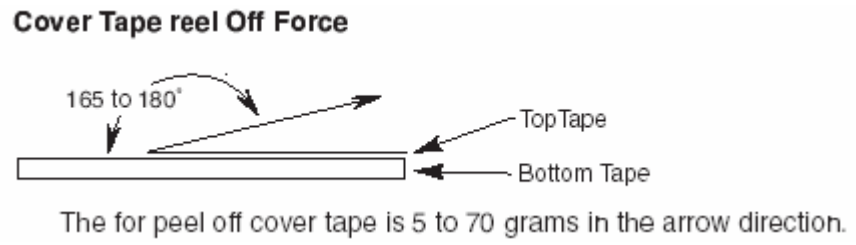
6. Packaging



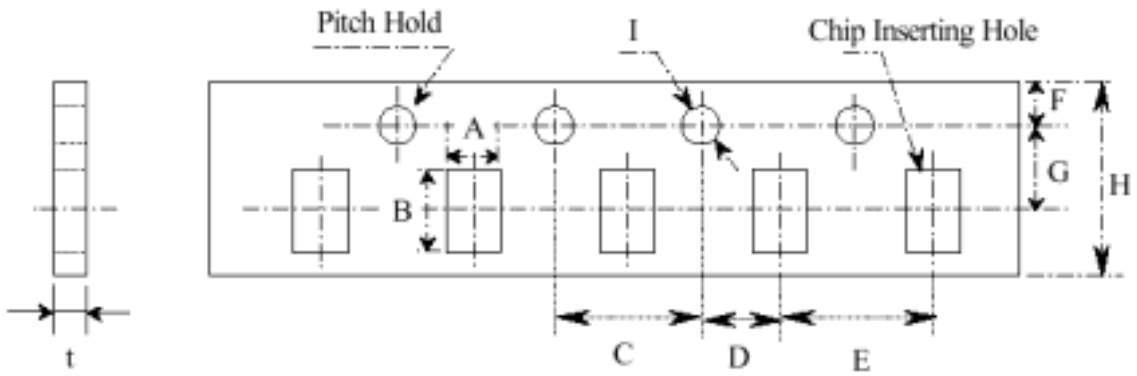
6-1.Material And Quantity

Size	EIA Code	Thickness (mm)	7〃Reel
1005	0402	T≦0.6	10K pcs / Reel
1608	0603	T≦0.95	4K pcs / Reel
2012	0805	T≦1.1	4K pcs / Reel
3216	1206	T≦1.3	3K pcs / Reel
		1.3＜T≦1.8	2K pcs / Reel
3225	1210	T≦1.5	2.5K pcs / Reel
4516	1806	T≦1.8	2K pcs / Reel
4532	1812	T≦1.7	1K pcs / Reel

6-2.Peel-Off Force : 5 g. f ≦ Peel-Off Force ≦ 70 g. f



6-3. Paper Tape

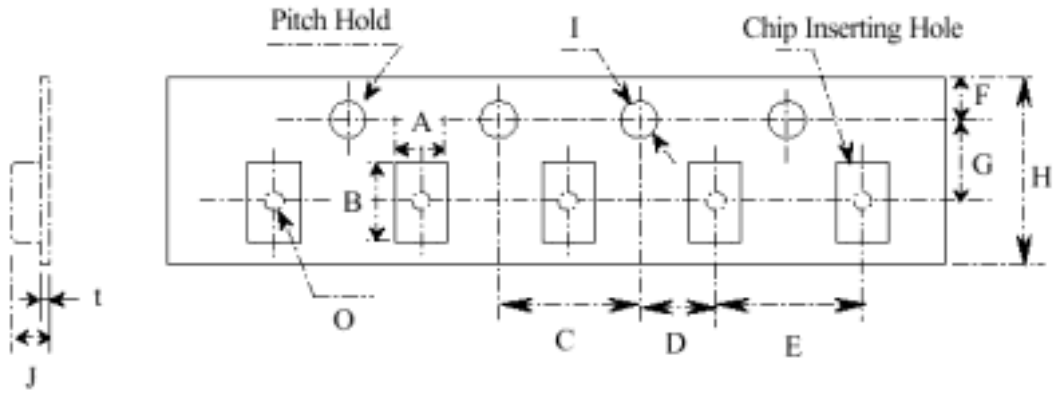


(Unit: mm)

Code	A	B	C	D	E
0402	0.61±0.10	1.2±0.1	2.0±0.1	1.0±0.05	2.0±0.1
0603	1.10±0.20	1.9±0.2	4.0±0.1	2.0±0.05	4.0±0.1
0805	1.50±0.20	2.3±0.2			

Code	F	G	H	I	t
0402	1.75±0.1	3.5±0.05	8.0±0.3	φ1.5+0.1/−0	0.70 Max
0603					0.95 Max
0805					1.05 Max

6-4. Plastic Tape



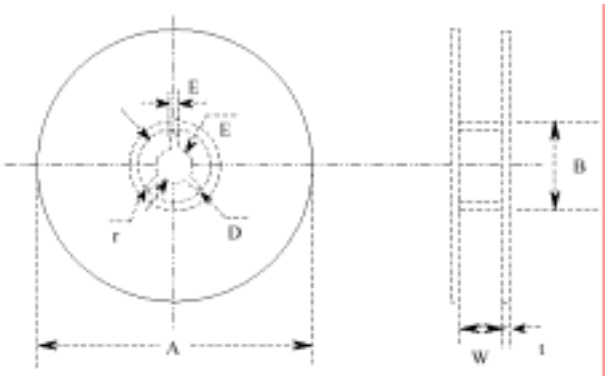
(Unit: mm)

Code	A	B	C	D	E	F
0805	1.5±0.2	2.3±0.2	4.0±0.1	2.0±0.05	4.0±0.1	1.75±0.1
1206	1.9±0.2	3.5±0.2				
1210	2.9±0.2	3.6±0.2				
1806	1.9±0.2	4.9±0.2			8.0±0.1	
1812	3.6±0.2	4.9±0.2				
2220	5.4±0.2	6.1±0.2				

Code	G	H	I	J	t	J
0805	3.5±0.05	8.0±0.3	φ1.5+0.1/−0	1.05 Max	0.3 max.	1.5 min.
1206				1.90 Max		
1210				1.65 Max		
1808	5.5±0.05	12.0+3/−0		1.90 Max		
1812				1.90 Max		

6-5. Reel Dimensions

Reel Material : Polystyrene



	7〃Reel	
Tape Size	8mm	12mm
A	178±2	
B	50±2	
C	13±0.5	
D	21±1	
E	2±0.5	
W	10±1.5	14±2
T	1.5±0.5	
r	1.0	

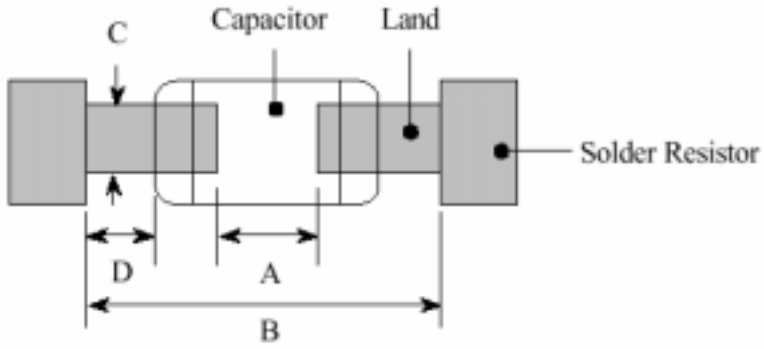
7. Precation Of Usage

7-1.Storage

Store the capacitors where the temperature and relative humidity don't exceed 40°C and 70°RH.

We recommend you use capacitors within 6 months from the manufactured date. In case of packaging, don't the last wrapped, polyethylene bag, till just before using. If it is opened, seal it as soon as possible or keep it in a desiccant with a desicantion agent.

7-2. Size and recommend land dimensions.



Unit : mm

Code	Chip Capacitor		Land			
	L	W	A	B	C	D
0201	0.60	0.30	0.2~0.3	0.9~1.1	0.2~0.3	0.1~0.3
0402	1.00	0.05	0.3~0.5	1.3~1.5	0.3~0.5	0.1~0.3
0603	1.60	0.80	0.6~0.8	1.9~2.1	0.6~0.8	0.2~0.5
0805	2.00	1.25	0.8~1.2	2.4~3.2	0.9~1.2	0.2~0.6
1206	3.20	1.60	1.8~2.5	3.8~4.8	1.2~1.6	0.3~0.8
1210	3.20	2.5	1.9~2.6	3.9~4.9	1.9~2.5	0.3~0.8
1808	4.50	2.00	2.4~3.4	5.4~6.0	1.7~2.0	0.5~1.3
1812	4.50	3.20	2.5~3.5	5.5~6.1	2.3~3.2	0.5~1.3
2220	5.70	5.00	2.7~4.2	6.7~8.3	3.5~5.0	0.5~1.3

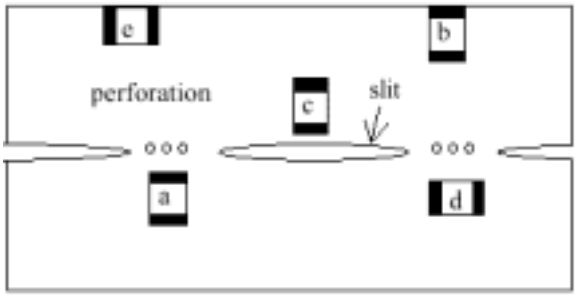
7-3..Mechanical strength varies according to location of chip capacitors the P.C. board.

Design layout of components on the PC board to minimize the stress imposed on the wrap or flexure of the board.

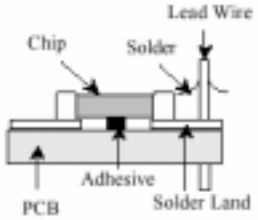
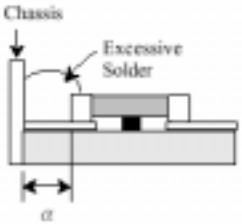
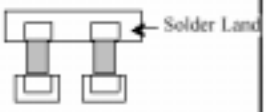
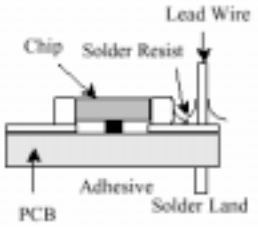
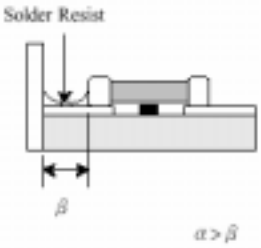
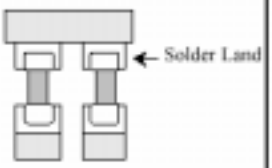
Component layout close to board break

Susceptibility to stress is in the order of : a>b>c d>e

:



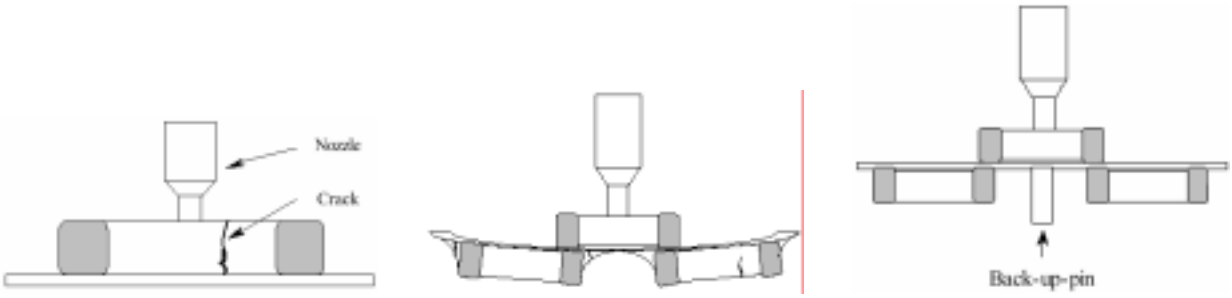
7-4.Layout Recommendation

Example	Use of Common Solder Land	Solder With Chassis	Use of Common Solder Land With Other SMD
Need to Avoid			
Recommendation			

7-5. Mounting

Crack is caused by impact load due to suction nozzle at the mounted.

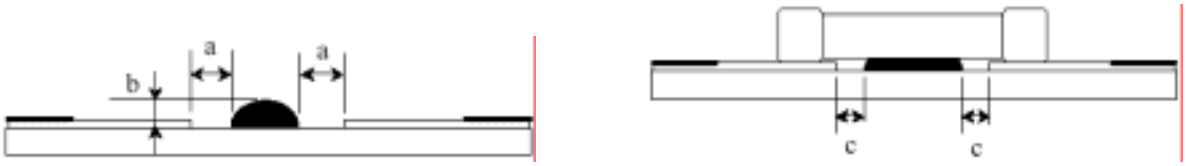
In mounting an element to board, If the low dead point is too low , excessive stress is applied to element. This will cause cracking. In this case, it is required to shift the low dead point of a suction nozzle to the upper surface of board so that warping of board is eliminated. Nozzle pressure is adjusted to 1N to 3N(static load)during mounting.



To Fix Board With Support Pin (OK)

If board is warped during mounting, crack or peeling of soldering will be caused. To avoid this, it is required to fix the board with back up pins or the like to avoid warping. Also, similar precautions are required when inserting a part with lead.

7-6. Amount of Adhesive



Example : 0805 & 1206 Size MLCC	
A	0.2mm (min)
B	70 ~ 100 uM
C	Do Not Touch The Solder Land

7-7.Soldering

7-7-1.Avoiding Thermal Shock

(a) preheat Condition

Carefully perform pre-heating so that the temperature difference (△T)between the solder and component surface should be in the follow range.

Soldering Method	3.2x1.6mm max.	3.2x1.6mm min.
Reflow method	△T≦190°C	△T≦190°C
Immersion method	△T≦150°C	△T≦100°C

(b) Colling Condition

Natural colling using air is recommended. If the chips ard dipped into a solvent for cleaning, the temperature difference (△T)must be less than 100°C

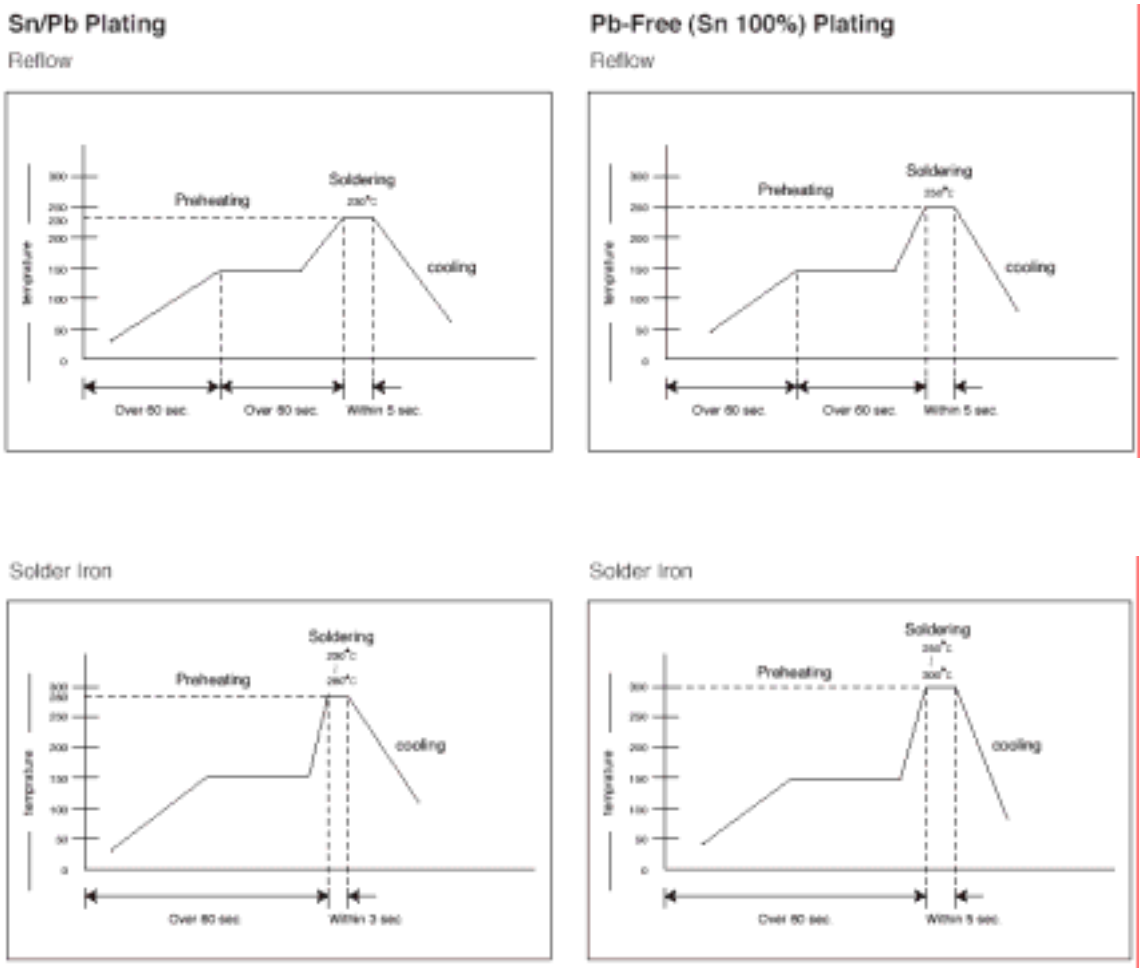
7-7-2. Recommend Soldering Profile By various Methods

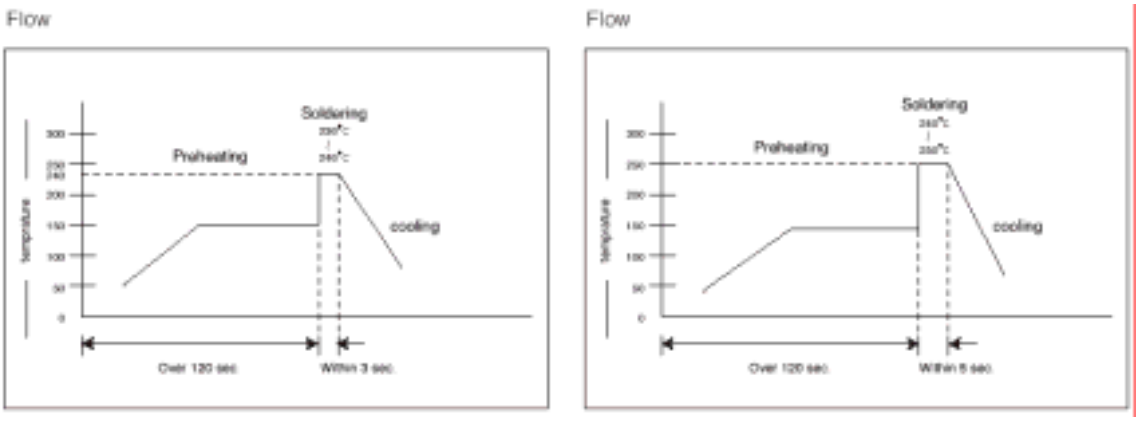
Infrared reflow soldering standard condition Iron/immersion soldering standard condition

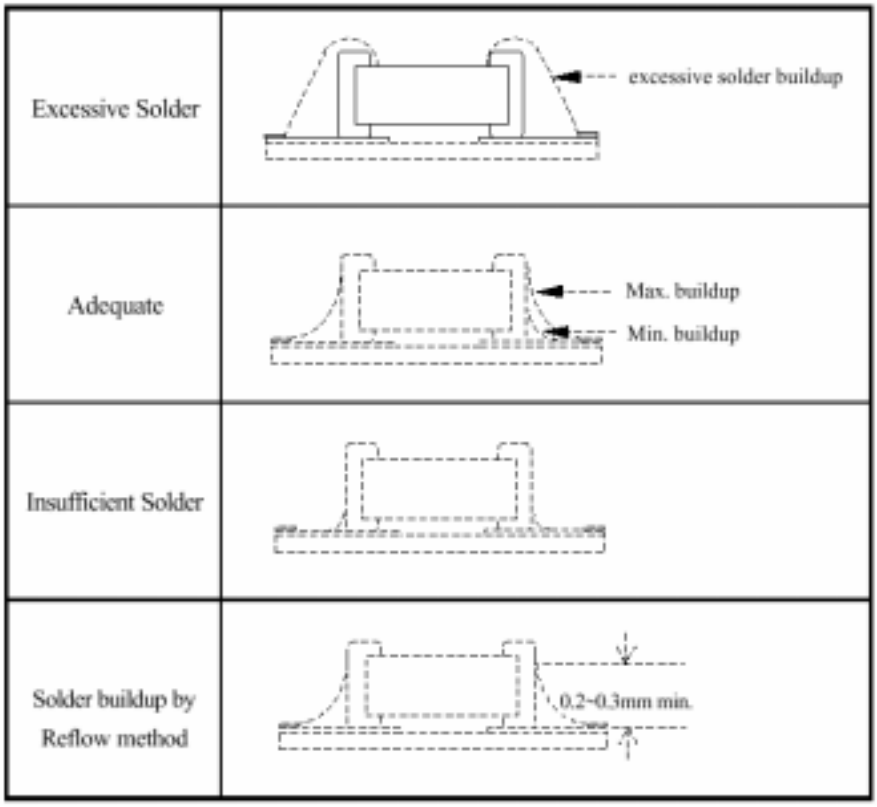
7-7-3. Amout of Solder

Excessive solder will induce higher tensile force in chip Bead when temperature change and it may result in chip cracking. In Sufficient solder may detach the Bead from the P.C. board.

Soldering recommendation :

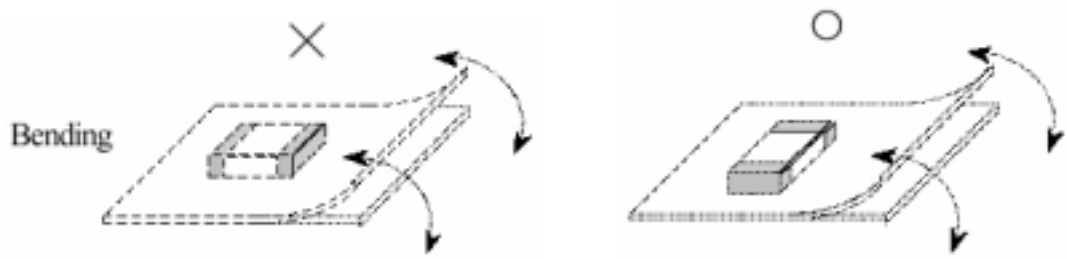




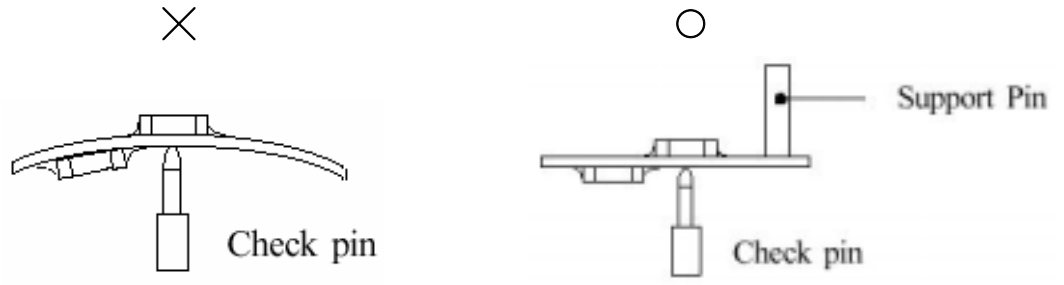


7-8.Caution : Handing after chip mounted

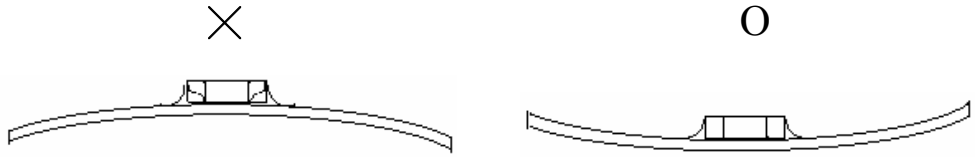
7-8-1. Please pay attention put the component lateral to the direction in which stress acts.



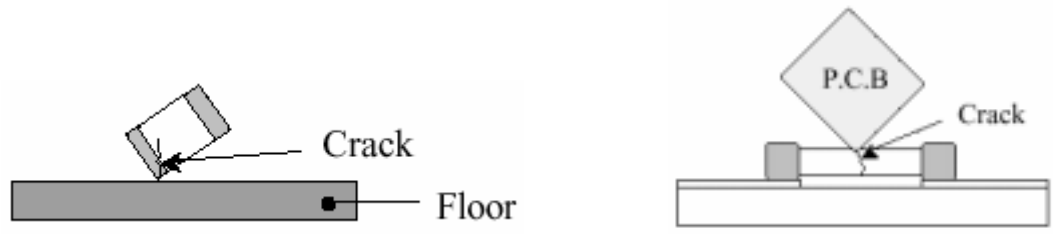
7-8-2. Crack Will be caused if board is warped due to excessive load by check pin.



7-8-3. Mechanical stress due to warping and torsion by dividing.
(a)Crack occurrence ratio will be increased by manual separation.
(b)Crack occurrence ratio will be increased by tensile force, rather than compressive force.



7-8-4. Handing to Loose Chip Bead
(a)IF dropped the chip capacitor may crack.
(b)Piling the P.C.board after mounting for storage or handling, the comer of the P.C. board may hit the chip Bead of another of board to cause crack.



(a) (b)