

# Chip Beads & Inductors

## Introduction

### Chip Components Guide

SAMWHA's CB□, CBA□, CM□, CD□ series of chip components consist of compact, high performance beads and inductors. Their innovative components and case structures mean low DC resistance and outstanding highfrequency characteristics. These series are designed for a variety of applications, facilitating component selection for individual circuit requirements.

### Products Guide

Product Name	Application	Material	Part Number	Impedance/ Inductance range	Dimensions
Chip Ferrite Beads	Signal Line (G)	General Frequency (A)	CB□GA□	10~4000Ω	1608 2012 3216
			CB□GK□	60~1000Ω	
	High Power Line (P)	Medium Frequency (K)	CB□GM□	5~1000Ω	
			CB□PA□	11~600Ω	
	Ultra High Power Line(U)	High Frequency (M)	CB□PM□	50~600Ω	
			CB□UM□	50~120Ω	
Chip Ferrite Beads Array	Signal Line	General Frequency (A)	CBA□GA□	30~1000Ω	3216
		Medium Frequency (K)	CBA□GK□	60~1000Ω	
		High Frequency (M)	CBA□GM□	30~1000Ω	
Chip Ferrite Inductors	Signal Line	Ferrite (F)	CM□F□	0.047~33μH	1608 2012
Chip Ceramic Inductors	Signal Line	Ceramic (C)	CD□C□	1.0~470nH	1005
					1608

# Chip Beads & Inductors

## Part Numbering

<u>CB</u>	<u>1608</u>	<u>G</u>	<u>A</u>	<u>102</u>	<u>T</u>	<u>CM</u>	<u>1608</u>	<u>F</u>	<u>R22</u>	<u>K</u>	<u>T</u>	
①	②	③	④	⑤	⑨	①	②	④	⑥	⑧	⑨	
<u>CBA</u>	<u>3216</u>	<u>G</u>	<u>A</u>	<u>102</u>	<u>N4</u>	<u>E</u>	<u>CD</u>	<u>1608</u>	<u>C</u>	<u>22N</u>	<u>J</u>	<u>T</u>
①	②	③	④	⑤	⑦	⑨	①	②	④	⑥	⑧	⑨

### ① Series

Mark	Product Name
CB	Chip Ferrite Beads
CBA	Chip Ferrite Beads Array
CM	Chip Ferrite Inductors
CD	Chip Ceramic Inductors

### ② Dimension

Mark	Dimension
1005	1.0mm × 0.5mm
1608	1.6mm × 0.8mm
2012	2.0mm × 1.25mm
3216	3.2mm × 1.6mm

### ③ Applications

Mark	Applications
G	Signal Line
P	High Power Line
U	Ultra High Power Line

### ④ Material

Mark	Material
A	General Frequency
K	Medium Frequency
M	High Frequency
F	Ferrite
C	Ceramic

### ⑤ Impedance

300 = 30Ω                      201 = 200Ω  
 601 = 600Ω                    102 = 1000Ω

### ⑥ Inductance

22N = 22nH                      3N3 = 3.3nH  
 2R2 = 2.2μH                    R22 = 0.22μH

### ⑦ Number of circuits

N4 = 4 array

### ⑧ Inductance Tolerance

Mark	Tolerance
G	±2%
J	±5%
K	±10%
M	±20%
N	±30%
C	±0.2nH
S	±0.3nH
D	±0.5nH

### ⑨ Packaging Code

Mark	Packaging
B	Bulk Pack
T	Tape & Reel Pack
E	Embossed Tape Pack

# Chip Ferrite Beads Array

## Features

1. Good reliability (Monolithic Structure)
2. High impedance characteristics
3. Flow/Reflow solder application

## Applications

1. Computer and its peripherals
2. CD-ROM, DVD, MD lines
3. I/O lines of notebook PCs, W/Ps
4. Digital TVs and VTRs

## Product Identifications

<b>CBA</b>	<b>3216</b>	<b>G</b>	<b>A</b>	<b>102</b>	<b>N4</b>	<b>E</b>
①	②	③	④	⑤	⑥	⑦

### ① Series Code

CBA : Chip Ferrite Beads Array

### ② Dimension Code

The first two digits : length(mm)  
The last two digits : width(mm)

### ③ Application Code

G : Signal line

### ④ Material Code

A : General frequency  
K : Medium frequency  
M : High frequency

### ⑤ Impedance Value Code

The first two digits are significant  
The last digit is the number of zeros following

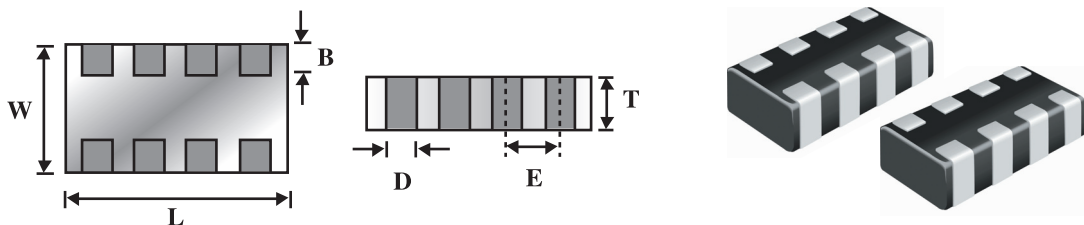
### ⑥ Number of circuits

N4 = 4 array

### ⑦ Packaging Code

T : Reed paper packaging  
E : Reed embossed tape packaging  
B : Bulk packaging

## Shape & Dimensions



(Unit:mm)

Model	L	W	T	B	D	E
CBA3216	3.2 ± 0.2	1.6 ± 0.2	0.9 ± 0.2	0.3 ± 0.2	0.4 ± 0.15	0.8 ± 0.1

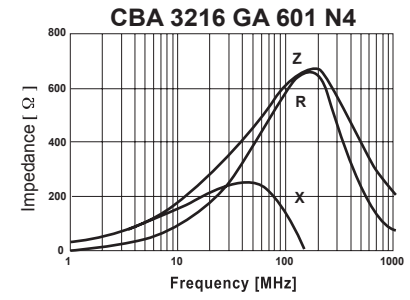
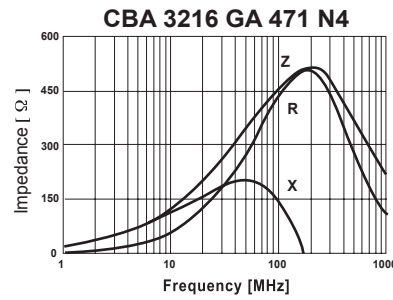
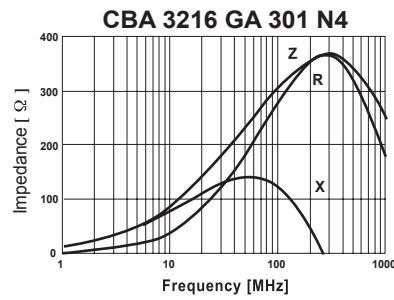
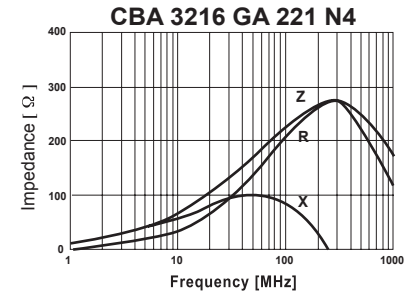
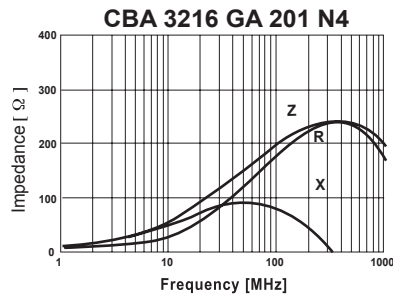
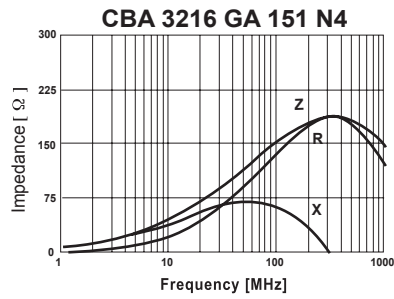
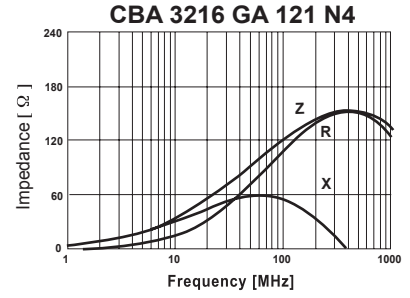
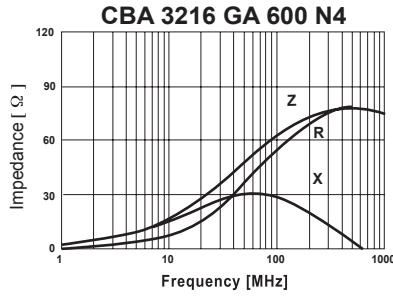
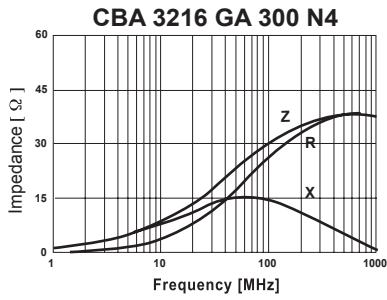
## Chip Ferrite Beads Array

### Specifications

Part No.	Impedance [Ω]	DC Resistance [Ω]max.	Rated Current (mA)max.	Test Frequency [MHz]
CB3216GA300N4	30 ± 25%	0.10	200	100
CB3216GA600N4	60 ± 25%	0.25	200	
CB3216GA121N4	120 ± 25%	0.30	300	
CB3216GA151N4	150 ± 25%	0.35	300	
CB3216GA201N4	200 ± 25%	0.35	200	
CB3216GA221N4	220 ± 25%	0.35	150	
CB3216GA301N4	300 ± 25%	0.40	100	
CB3216GA331N4	330 ± 25%	0.40	100	
CB3216GA471N4	470 ± 25%	0.45	100	
CB3216GA601N4	600 ± 25%	0.50	100	
CB3216GA102N4	1000 ± 25%	0.70	50	
CB3216GK600N4	60 ± 25%	0.25	400	
CB3216GK121N4	120 ± 25%	0.30	350	
CB3216GK151N4	150 ± 25%	0.35	250	
CB3216GK201N4	200 ± 25%	0.35	250	
CB3216GK221N4	220 ± 25%	0.35	250	
CB3216GK301N4	300 ± 25%	0.40	250	
CB3216GK471N4	470 ± 25%	0.50	200	
CB3216GK601N4	600 ± 25%	0.60	200	
CB3216GK102N4	1000 ± 25%	0.75	150	

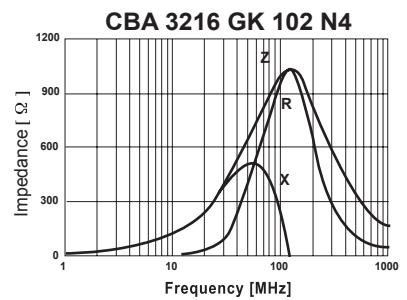
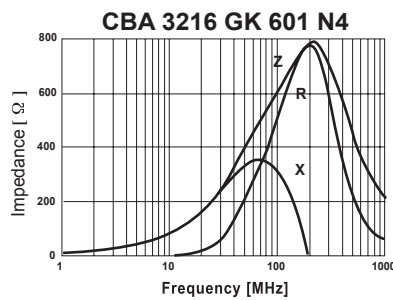
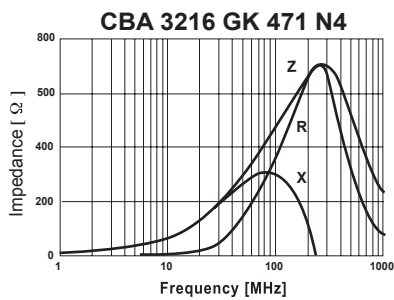
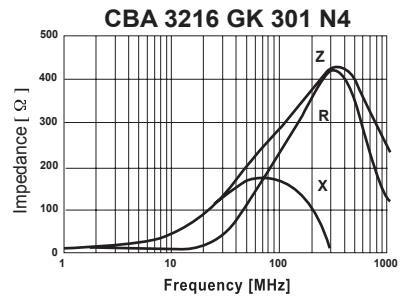
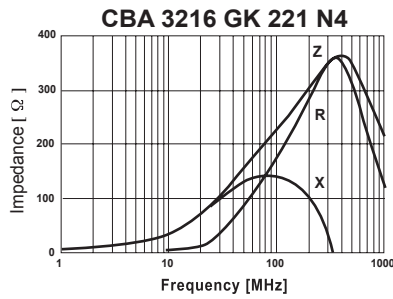
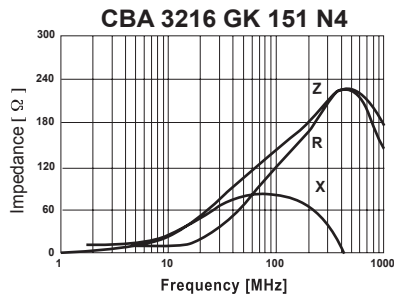
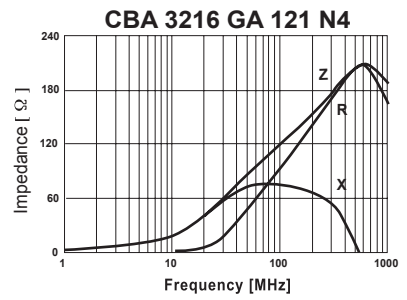
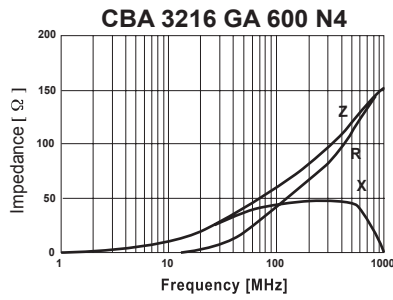
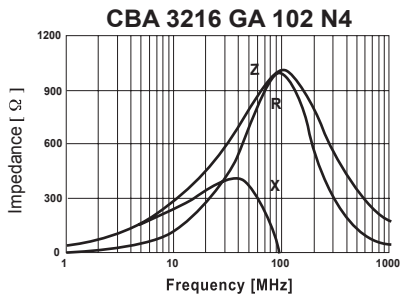
# Chip Ferrite Beads Array

## Electrical Characteristics



# Chip Ferrite Beads Array

## Electrical Characteristics



## Chip Ferrite Beads Array

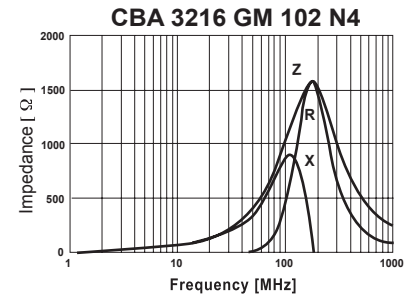
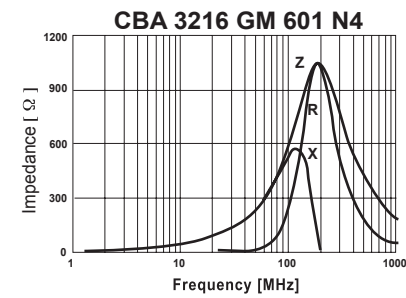
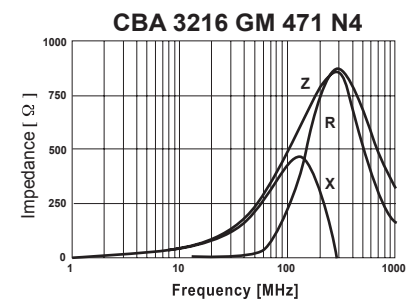
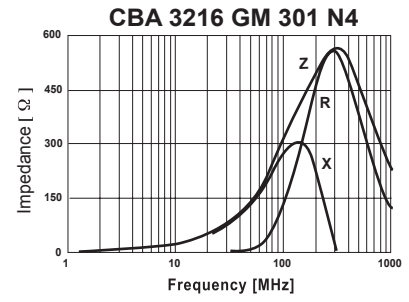
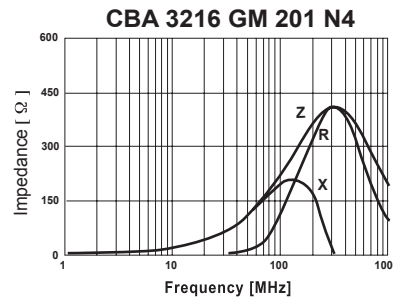
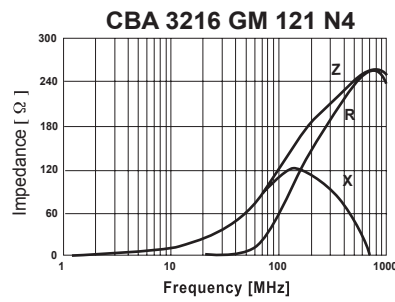
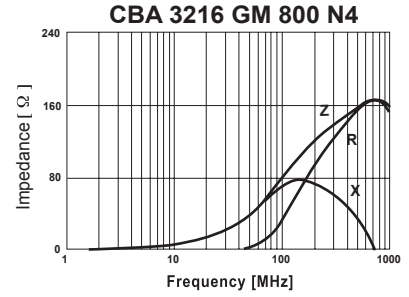
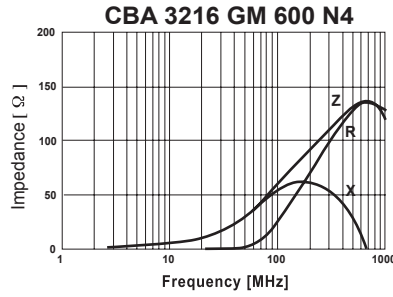
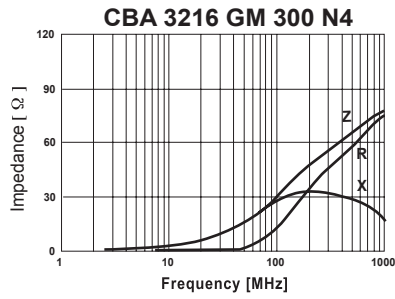
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### ■ Specifications

Part No.	Impedance [Ω]	DC Resistance [Ω]max.	Rated Current (mA)max.	Test Frequency [MHz]
CBA3216GM300N4	30 ± 25%	0.10	200	100
CBA3216GM600N4	60 ± 25%	0.12	200	
CBA3216GM800N4	80 ± 25%	0.15	150	
CBA3216GM121N4	120 ± 25%	0.20	100	
CBA3216GM201N4	200 ± 25%	0.30	100	
CBA3216GM301N4	300 ± 25%	0.45	100	
CBA3216GM471N4	470 ± 25%	0.45	100	
CBA3216GM601N4	600 ± 25%	0.50	100	
CBA3216GM102N4	1000 ± 25%	0.80	100	

# Chip Ferrite Beads Array


## Electrical Characteristics





## Reliability and Test Conditions

### ■ Chip Ferrite Beads Array

Item	Requirements	Test Conditions
Operating temperature range	-55℃ ~ +125℃ 0	-
Storage temperature range	40℃ max., 70%RH max.	at packing condition
Solderability	More than 90% of the terminal electrode shall be covered with new solder	Preheat temperature : 100~150℃ Preheat time : 60 sec. Solder temperature : 230 ± 10℃ Soldering time : 4 ± 1 sec.
Resistance to soldering heat	1. No damage such as cracks should be caused in chip element 2. More than 75% of the terminal electrode shall be covered with new solder 3. Impedance shall not change more than ± 30%	Preheat temperature : 100~150℃ Preheat time : 60 sec. Solder temperature : 270 ± 10℃ Soldering time : 10 ± 0.5 sec.
Reflow soldering	More than 50% of the terminal electrode shall be covered with new solder $ST \geq \frac{1}{2} CT$ 	Preheat temperature : 150℃ Preheat time : 60 sec. Solder temperature : 230 ± 10℃ Soldering time : 10 sec. max. (Reflow soldering profile)
High temperature resistance		Temperature : 85 ± 2℃ Time : 500 ± 12 hours Measurement at room ambient temperature after placing for 24 hours
High temperature load resistance	1. No mechanical damage 2. Impedance shall not change more than ± 30%	Temperature : 85 ± 2℃ Applied current : rated current Time : 1000 ± 12 hours Measurement at room ambient temperature after placing for 24 hours
Humidity resistance		Temperature : 40 ± 2℃ Humidity : 90 ± 2%RH Time : 500 ± 12 hours Measurement at room ambient temperature after placing for 24 hours

○ Chip Beads ● Chip Inductors

## Reliability and Test Conditions

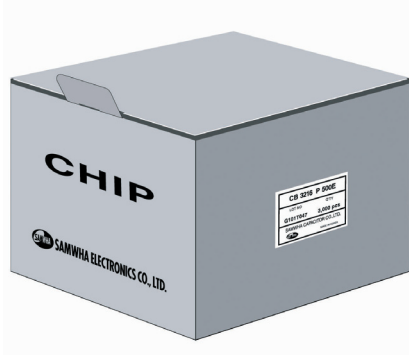
### Chip Ferrite Beads Array

Item	Requirements	Test Conditions	
Humidity load resistance	1. No mechanical damage 2. Impedance shall not change more than $\pm 30\%$	Temperature : $40 \pm 2^\circ\text{C}$ Humidity : $90 \pm 2\%$ RH Applied current : rated current Time : $500 \pm 12$ hours Measurement at room ambient temperature after placing for 24hours	
Low temperature resistance		Temperature : $-40 \pm 5^\circ\text{C}$ Time : $1000 \pm 12$ hours Measurement at room ambient temperature after placing for 24hours	
Thermal Shock		1. $-40 \pm 3^\circ\text{C}$ for 30 minutes 2. $85 \pm 3^\circ\text{C}$ for 30 minutes 3. repeat 100 cycle	
Vibration		Frequency : 10~55 Hz Amplitude : 1.5 mm Direction : X, T, Z Sweep time : 2 hours for each axis	
Drop		Drop 10 times on a concrete floor from a height of 100 cm	
Flexure strength	No mechanical damage		
	Type	4 Array	
	A [mm]	0.8	
	B [mm]	0.8	
	C [mm]	3.0	
	D [mm]	0.4	
W [kgf]	5.0		
Bending Strength	The terminal electrode shall be neither break off nor the chip damage		

○ Chip Beads   ● Chip Inductors

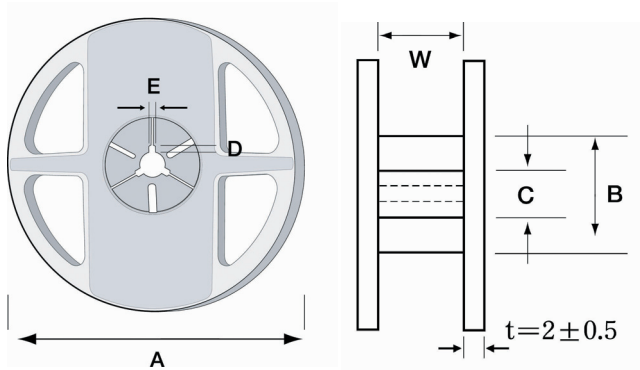
# Packaging

## Bulk packaging



Polybags / Box	Pcs / Polybag
5	1,000

## Reel packaging

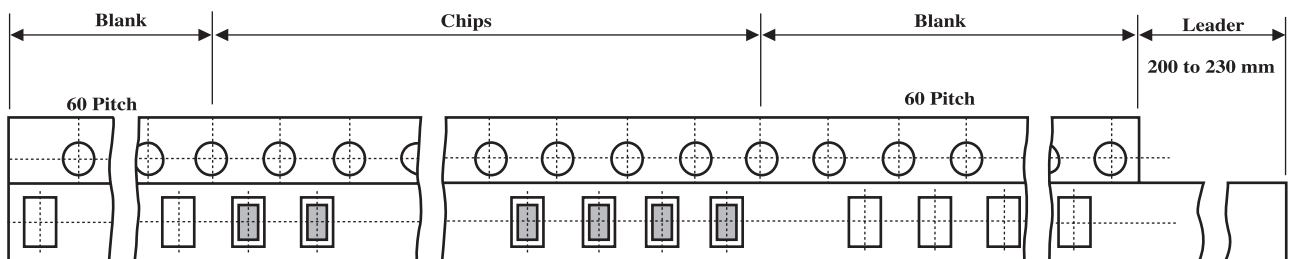


(Unit:mm)

A	B	C
$\phi 178 \pm 2$	$\phi 50 \text{min.}$	$\phi 13 \pm 0.5$
D	E	W
$4 \pm 0.8$	$2 \pm 0.2$	$9 \pm 1.5$

Type	1005	1608	2012		3216	Array
Q'TY(PCS)	10,000	4,000	(T)0.85 4,000	(T)1.25 3,000	3,000	3,000

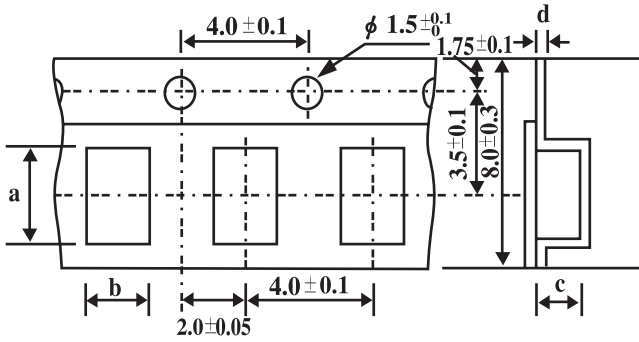
## Leader and Blank portion



# Packaging

## Taping Dimension

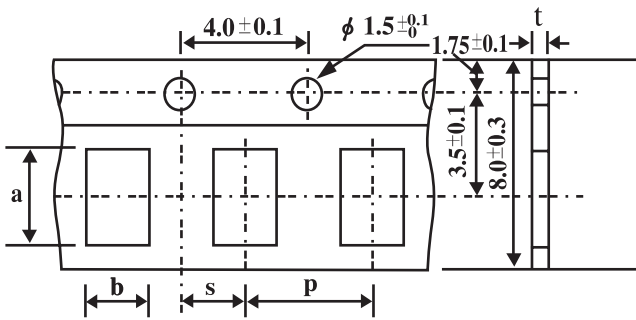
### · Embossing Tape



Unit : mm

Type	A	B	C	D
	±0.1	±0.1	±0.1	±0.1
1608	1.80	1.00	0.95	0.23
2012	2.25	1.45	1.00	0.23
3216	3.50	1.85	1.25	0.23

### · Paper Tape



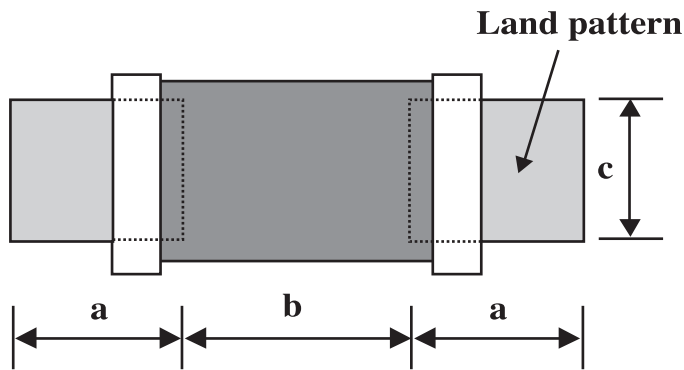
Unit : mm

Type	A	B	C	D	T
	±0.1	±0.1	±0.1	±0.05	(max)
1005	1.15	0.65	2.0	1.0	0.8
1608	1.80	1.00	4.0	2.0	1.1
2012	2.30	1.55	4.0	2.0	1.1

# Land Pattern Design

## Land Patten Design

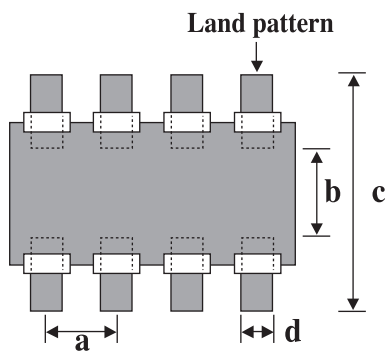
### Chip Ferrite Beads, Chip Ceramic/Ferrite Inductors



Unit : mm

Type	A	B	C
1005	0.7	0.4	0.5
1608	1.0	0.6	0.8
2012	1.0	1.0	1.0
3216	1.1	2.2	1.4

### Chip Ferrite Beads Array



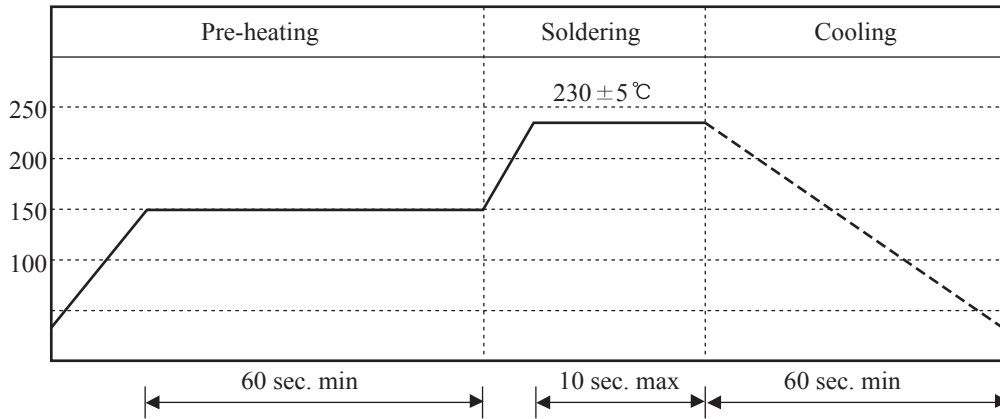
Unit : mm

Type	A	B	C	D
3216	0.8	0.8	3.0	0.4

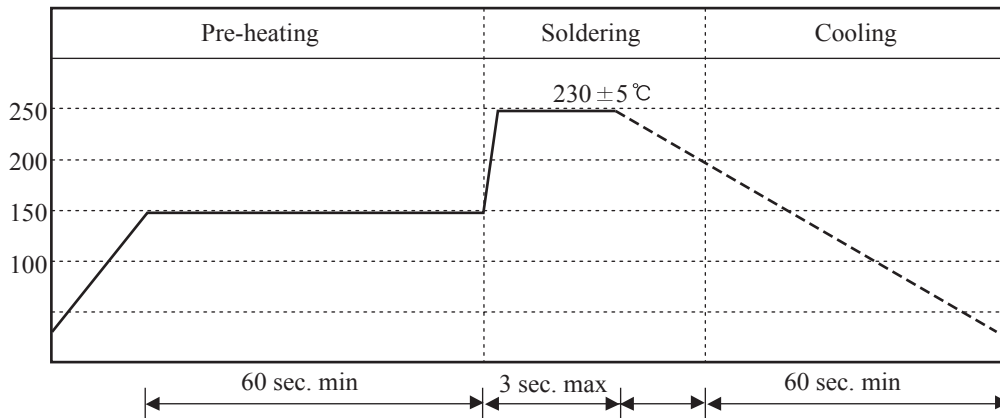
# Soldering Profile

## Soldering Profile

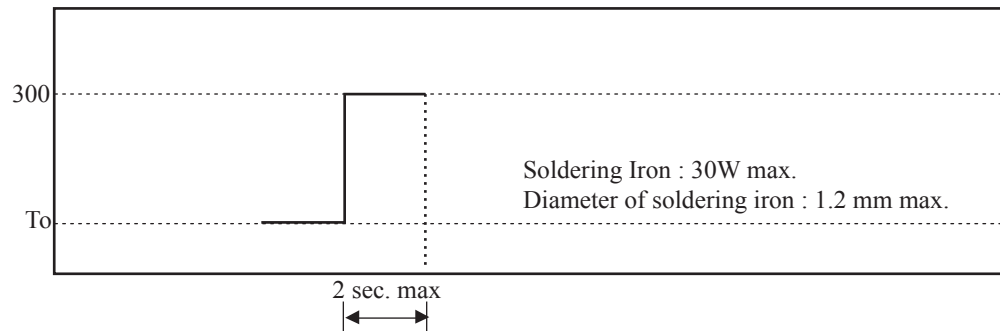
### Reflow Soldering



### Flow Soldering



### Flow Soldering



⚠ Specifications which provide more details for the proper and safe use described product are available upon request. All specifications are subject to change without notice.