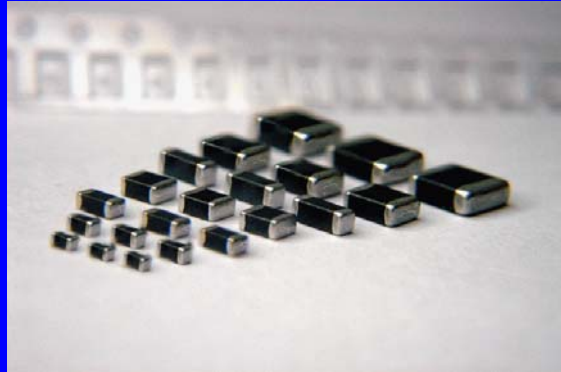


GANGES TECHNOLOGY

**Ferrite Chip Bead
For High Current
Applications**



HCB Series

High Current Chip Bead

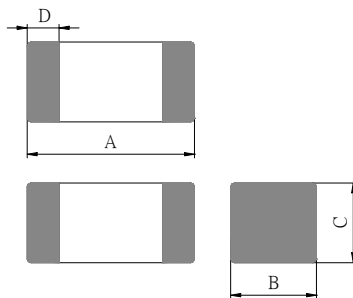
HCB/HPB Series

1. Features

HCB/HPB□□□□-series for Large Current Application

The HCB/HPB series can be used in high current circuits due to its low DC resistance. It can match power lines to maximum of 6A DC.

2. Dimension



Chip size				
Size	A(mm)	B(mm)	C(mm)	D(mm)
1608	1.6±0.15	0.80±0.15	0.80±0.15	0.30±0.2
2012	2.0±0.20	1.25±0.20	0.85±0.20	0.50±0.3
3216	3.2±0.20	1.60±0.20	1.10±0.20	0.50±0.3
3225	3.2±0.20	2.50±0.20	1.30±0.20	0.50±0.3
4516	4.5±0.20	1.60±0.20	1.60±0.20	0.50±0.3
4532	4.5±0.20	3.20±0.20	1.50±0.20	0.50±0.3
5750	5.7±0.2	5.0±0.3	1.8±0.2	0.5±0.3

3. Part Numbering



A: Series

B: Dimension L x W

C: Material

D: Impedance 301=300Ω, 300=30Ω

E: Packaging T=Taping and Reel, B=Bulk(Bags)

F: Rated Current 10=1000mA=1A

4. Specification

Customer Part Number	YOSONIC Part Number	Impedance (Ohm)	Test Frequency (MHz)	Rated Current (mA) max.	DCR (Ohm) max.	Reference
	HCB1608K-300T30	30±25%	100	3000	0.04	For Large Current
	HCB1608K-800T30	80±25%	100	3000	0.04	
	HCB1608K-121T20	120±25%	100	2000	0.10	
	HCB1608K-151T20	150±25%	100	2000	0.10	
	HCB1608K-221T20	220±25%	100	2000	0.10	
	HCB1608K-301T10	300±25%	100	1000	0.20	
	HCB1608K-471T10	470±25%	100	1000	0.20	
	HCB1608K-601T10	600±25%	100	1000	0.20	
	HCB2012K-300T30	30±25%	100	3000	0.04	
	HCB2012K-800T30	80±25%	100	3000	0.04	
	HCB2012K-121T20	120±25%	100	2000	0.10	
	HCB2012K-151T20	150±25%	100	2000	0.10	

Customer Part Number	YOSONIC Part Number	Impedance (Ohm)	Test Frequency (MHz)	Rated Current (mA) max.	DCR (Ohm) max.	Reference
	HCB2012K-221T20	220±25%	100	2000	0.10	For Large Current
	HCB2012K-301T10	300±25%	100	1000	0.20	
	HCB2012K-471T10	470±25%	100	1000	0.20	
	HCB2012K-601T10	600±25%	100	1000	0.20	
	HPB2012Z-300T50	30±25%	100	5000	0.01	
	HPB2012Z-101T40	100±25%	100	4000	0.02	
	HPB2012Z-221T30	220±25%	100	3000	0.04	
	HPB2012Z-331T25	330±25%	100	2500	0.05	
	HPB2012Z-471T20	470±25%	100	2000	0.08	
	HPB2012Z-601T15	600±25%	100	1500	0.10	
	HCB3216K-300T30	30 ±25%	100	3000	0.04	
	HCB3216K-500T30	50 ±25%	100	3000	0.04	
	HCB3216K-800T30	80 ±25%	100	3000	0.04	
	HCB3216K-121T20	120 ±25%	100	2000	0.10	
	HCB3216K-151T20	150 ±25%	100	2000	0.10	
	HCB3216K-301T10	300 ±25%	100	1000	0.20	
	HCB3216K-471T10	470 ±25%	100	1000	0.20	
	HCB3216K-501T30	500 ±25%	100	3000	0.04	
	HCB3216K-601T20	600 ±25%	100	2000	0.10	
	HCB3225K-600T40	60 ±25%	100	4000	0.03	
	HCB3225K-900T20	90 ±25%	100	2000	0.10	
	HCB3225K-151T50	150 ±25%	100	5000	0.02	
	HCB3225K-201T40	200 ±25%	100	4000	0.03	
	HCB4516K-600T60	60 ±25%	100	6000	0.01	
	HCB4516K-800T30	80 ±25%	100	3000	0.04	
	HCB4516C-102T15	1000 ±25%	100	1500	0.15	
	HCB4532K-800T60	80 ±25%	100	6000	0.01	
	HCB4532K-131T30	130 ±25%	100	3000	0.04	
	HCB4532K-151T50	150 ±25%	100	5000	0.02	
	HCB4532H-681T40	680±25%	100	4000	0.03	
	HCB4532H-132T30	1300 ±25%	60	3000	0.06	
	HCB4532M-132T30	1300 ±25%	100	3000	0.06	
	HCB5750V-101T60	100 ±25%	100	6000	0.01	
	HCB5750V-151T30	150 ±25%	100	3000	0.04	
	HCB5750V-181T30	180 ±25%	100	3000	0.04	
	HCB5750H-601T30	600 ±25%	100	3000	0.04	

5. Reliability and Test Condition

Item	Performance	Test Condition
Operating Temperature	-55~+125℃	
Storage temperature and humidity range	-55~+125℃ 70%RH (max)	
Impedance	Refer to standard electrical characteristics list	HP4291A, HP4287A+16092A
DC Resistance		HP4338B
Rated Current	1000~6000mA (HCB), 1500~5000mA (HPB)	P3.
Item	Performance	Test Condition

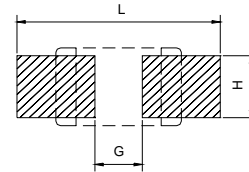
Temperature Rise Test	30°C max. (Δt)	1. Applied the allowed DC current. 2. Temperature measured by digital surface thermometer.																								
Solder heat Resistance	Appearance: No significant abnormality. Impedance change: Within $\pm 30\%$.	Preheat:150°C,60sec. Solder : H63A Solder temperature:260 \pm 5°C Flux: rosin Dip time:10 \pm 0.5sec.																								
Solderability	More than 90% of the terminal electrode should be covered with solder.	Preheat:150°C,60sec. Solder : H63A Solder temperature:230 \pm 5°C Flux: rosin Dip time:4 \pm 1sec.																								
Terminal strength	The terminal electrode and the dielectric must not be damaged by the forces applied on the right conditions.	For HCB HPB: <table border="1"> <thead> <tr> <th>Size</th> <th>Force (Kfg)</th> <th>Time(sec)</th> </tr> </thead> <tbody> <tr> <td>1608</td> <td>0.5</td> <td></td> </tr> <tr> <td>2012</td> <td>0.6</td> <td></td> </tr> <tr> <td>3216</td> <td>1.0</td> <td>>25</td> </tr> <tr> <td>3225</td> <td>1.0</td> <td></td> </tr> <tr> <td>4516</td> <td>1.0</td> <td></td> </tr> <tr> <td>4532</td> <td>1.5</td> <td></td> </tr> <tr> <td>5750</td> <td>2.0</td> <td></td> </tr> </tbody> </table>	Size	Force (Kfg)	Time(sec)	1608	0.5		2012	0.6		3216	1.0	>25	3225	1.0		4516	1.0		4532	1.5		5750	2.0	
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4516	1.0																									
4532	1.5																									
5750	2.0																									
Flexure strength	The terminal electrode and the dielectric must not be damaged by the forces applied on the right conditions.	Solder a chip on a test substrate, bend the substrate by 2mm (0.079in)and return.																								
Bending Strength	The ferrite should not be damaged by Forces applied on the right condition.	<table border="1"> <thead> <tr> <th>Series name</th> <th>mm(inches)</th> <th>P-Kgf</th> </tr> </thead> <tbody> <tr> <td>1608</td> <td>0.80(0.033)</td> <td>0.3</td> </tr> <tr> <td>2012</td> <td>0.14(0.055)</td> <td>1.0</td> </tr> <tr> <td>3216</td> <td>2.00(0.079)</td> <td>2.5</td> </tr> <tr> <td>3225</td> <td>2.00(0.079)</td> <td>2.5</td> </tr> <tr> <td>4516</td> <td>2.70(0.106)</td> <td>2.5</td> </tr> <tr> <td>4532</td> <td>2.70(0.106)</td> <td>2.5</td> </tr> </tbody> </table>	Series name	mm(inches)	P-Kgf	1608	0.80(0.033)	0.3	2012	0.14(0.055)	1.0	3216	2.00(0.079)	2.5	3225	2.00(0.079)	2.5	4516	2.70(0.106)	2.5	4532	2.70(0.106)	2.5			
Series name	mm(inches)	P-Kgf																								
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4532	2.70(0.106)	2.5																								
Loading at High Temperature	Appearance: no damage. Impedance: within \pm 30%of initial value.	Temperature:125 \pm 5°C. Applied current:rated current. Duration:500 \pm 12hrs. Measured at room temperature after placing for 2 to 3hrs.																								
Loading under Damp Heat	Appearance: no damage. Impedance: within \pm 30%of initial value.	Humidity:90-95%RH. Temperature:40 \pm 2°C. Applied current: rated current. Duration:500 \pm 12hrs. Measured at room temperature after placing for 2 to 3hrs.																								
Item	Performance	Test Condition																								

Thermal shock	Appearance: no damage. Impedance: within±30%of initial value.	Phase	Temperature(°C)	Time(min)	For HCB HPB Condition for 1 cycle Step1:-55±2°C 30±3 min. Step2:Room temperature 10 to15 min. Step3:+125±5°C 30±3 min. Step4: Room temperature 10 to15 min. Number of cycles:5 Measured at room temperature after placing for 2 to 3 hrs.
		1	-55±2°C	30±3	
Low temperature storage test	Appearance: no damage. Impedance: within±30%of initial value.	2	Room Temp.	10~15	Temperature:-55±2°C. Applied current:rated current. Duration:500±12hrs. Measured at room temperature after placing for 2 to 3hrs.
		3	+125±5°C	30±3	
Random Vibration Test	Appearance: Cracking, shipping and any other defects harmful to the characteristics should not be allowed. Impedance: Within±30% of initial value.	4	Room Temp.	10~15	Frequency: 10-55-10Hz for 1 min. Amplitude: 1.52mm Directions and times: X, Y, Z directions for 2 hours. A period of 2 hours in each of 3 mutually perpendicular directions (Total 6 hours).
		Measured:5 times			
Drop	Drop 10 times on a concrete floor from a height of 75cm				a: No mechanical damage b: Impedance change: ±30%

6. Soldering and Mounting

6-1. Recommended PC Board Pattern

Chip size						Land Patterns For Reflow Soldering		
Series	Type	A(mm)	B(mm)	C(mm)	D(mm)	L(mm)	G(mm)	H(mm)
HCB/HPB	1608	1.6±0.15	0.80±0.15	0.80±0.15	0.30±0.2	2.60	0.60	0.80
	2012	2.0±0.20	1.25±0.20	0.85±0.20	0.50±0.3	3.00	1.00	1.00
	3216	3.2±0.20	1.60±0.20	1.10±0.20	0.50±0.3	4.40	2.20	1.40
	3225	3.2±0.20	2.50±0.20	1.30±0.20	0.50±0.3	4.40	2.20	3.40
	4516	4.5±0.20	1.60±0.20	1.60±0.20	0.50±0.3	5.70	2.70	1.40
	4532	4.5±0.20	3.20±0.20	1.50±0.20	0.50±0.3	5.90	2.57	4.22



PC board should be designed so that products are not sufficient under mechanical stress as warping the board.
Products shall be positioned in the sideway direction against the mechanical stress to prevent failure.

6-2. Soldering

Mildly activated rosin fluxes are preferred. The minimum amount of solder can lead to damage from the stresses caused by the difference in coefficients of expansion between solder, chip and substrate. YOSONIC terminations are suitable for all wave and re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

6-2.1 Solder re-flow:

Recommended temperature profiles for re-flow soldering in Figure 1.

6-2.2 Solder Wave:

Wave soldering is perhaps the most rigorous of surface mount soldering processes due to the steep rise in temperature seen by the circuit when immersed in the molten solder wave, typical at 240°C. Due to the risk of thermal damage to products, wave soldering of large size products is discouraged. Recommended temperature profile for wave soldering is shown in Figure 2.

6-2.3 Soldering Iron(Figure 3):

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

- Preheat circuit and products to 150°C
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 280°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 3 sec.

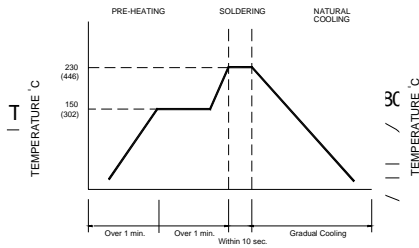


Figure 1. Re-flow Soldering

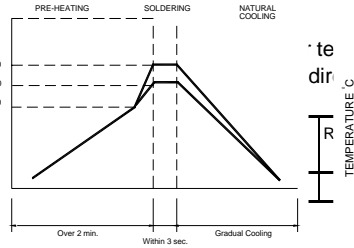


Figure 2. Wave Soldering

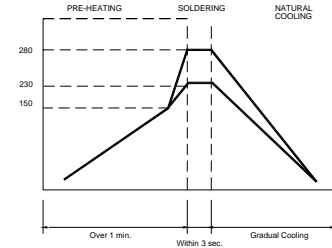
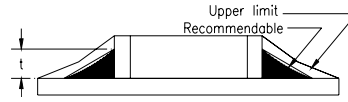


Figure 3. Hand Soldering

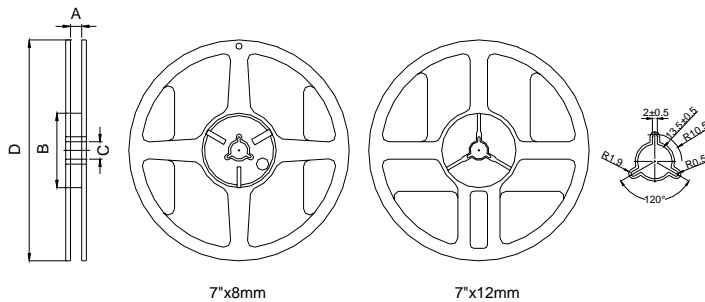
6-2.4 Solder Volume:

Accordingly Increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceeded as shown in right side:



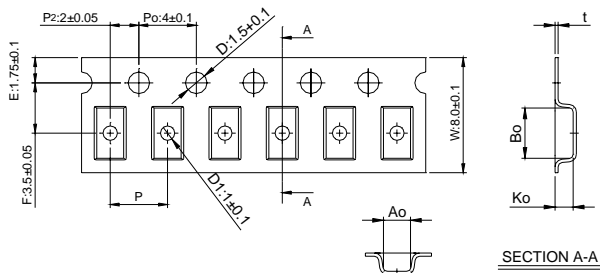
7. Packaging Information

7-1. Reel Dimension



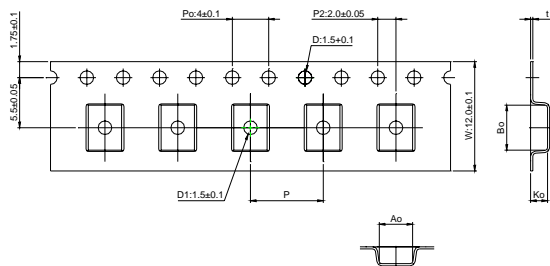
Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	9.0±0.5	60±2	13.5±0.5	178±2
7"x12mm	13.5±0.5	60±2	13.5±0.5	178±2

7-2.1 Tape Dimension / 8mm



Series	size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
HCB	160808	1.80±0.10	1.01±0.10	1.02±0.10	4.0±0.1	0.22±0.05
HCB,HPB	201209	2.25±0.10	1.42±0.10	1.04±0.10	4.0±0.1	0.22±0.05
HCB	321611	3.50±0.10	1.88±0.10	1.27±0.10	4.0±0.1	0.22±0.05
HCB	322513	3.42±0.10	2.77±0.10	1.55±0.10	4.0±0.1	0.22±0.05

7-2.2 Tape Dimension / 12mm



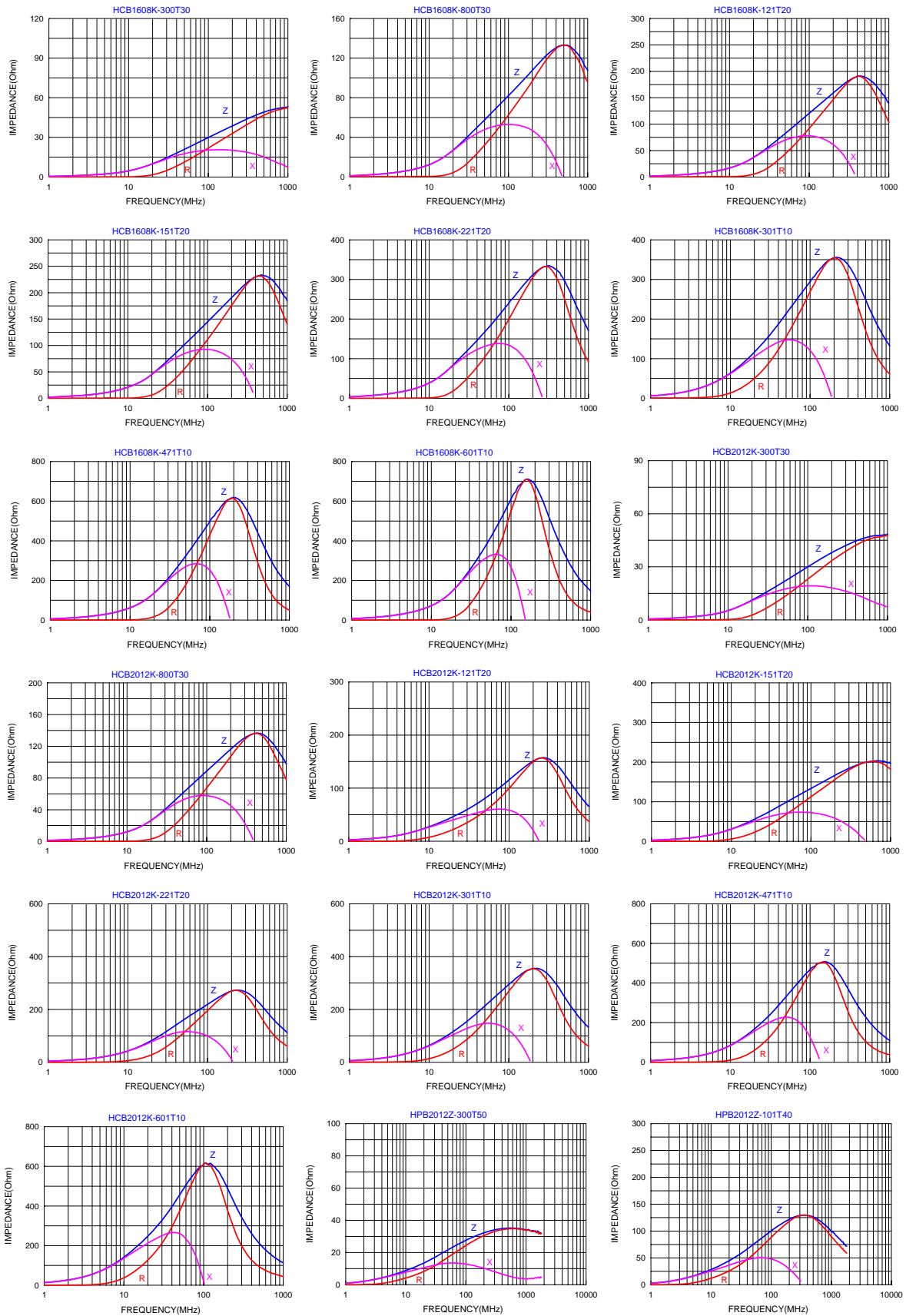
Series	Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
HCB	451616	4.95±0.1	1.93±0.1	1.93±0.1	4.0±0.1	0.24±0.05
HCB	453215	4.95±0.1	3.66±0.1	1.85±0.1	8.0±0.1	0.24±0.05
HCB	575018	6.10±0.1	5.40±0.1	2.00±0.1	8.0±0.1	0.30

7-3. Packaging Quantity

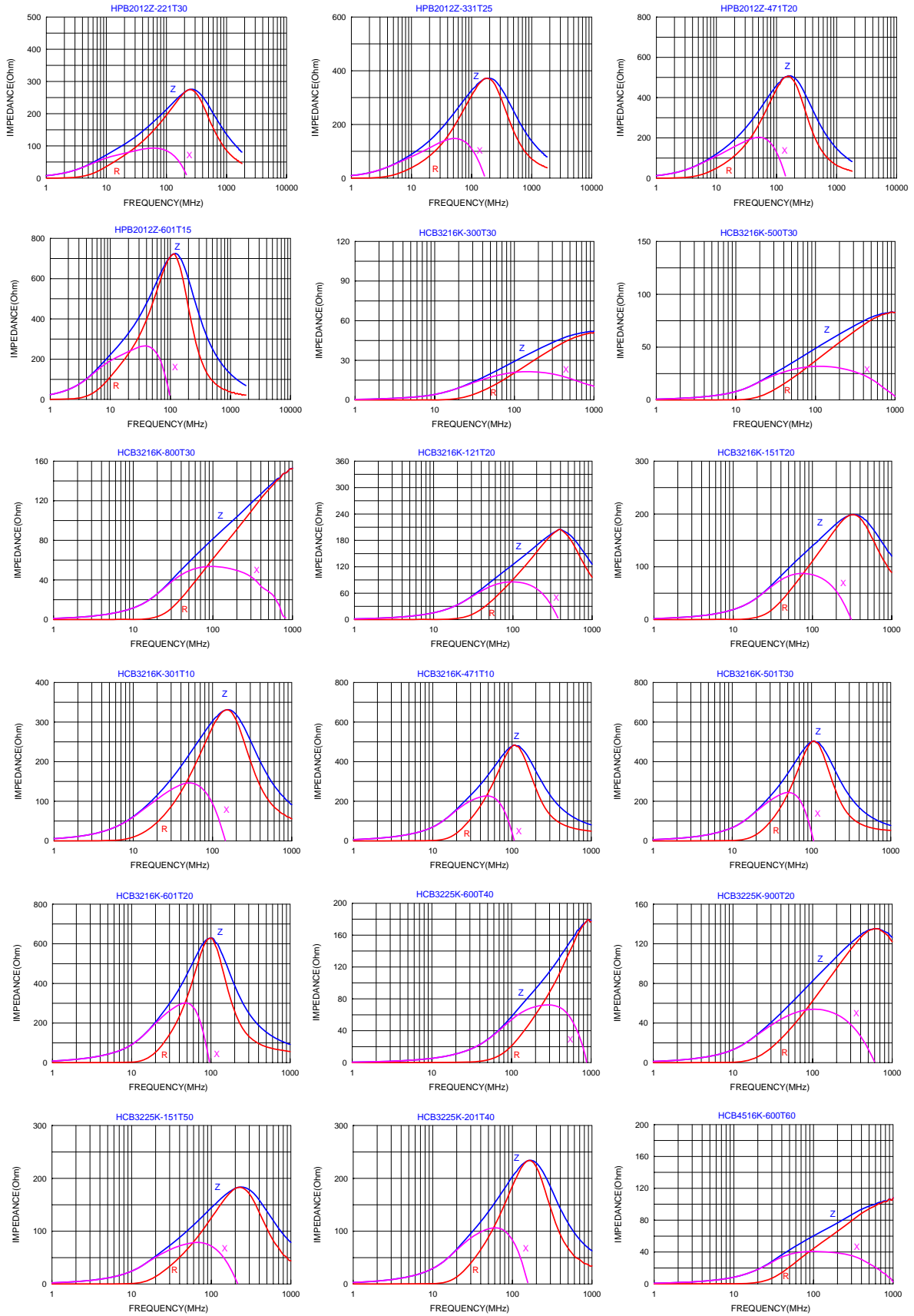
Chip size	575018	453215	451616	322513	321611	201209	160808
Chip / Reel	1000	1000	2000	2500	3000	4000	4000
Inner box	4000	4000	8000	12500	15000	20000	20000
Middle box	20000	20000	40000	62500	75000	100000	100000
Carton	40000	40000	80000	125000	150000	200000	200000
Bulk (Bags)	4000	12000	20000	30000	50000	150000	200000

7-4. Tearing Off Force

Typical Impedance v.s. Frequency Curve



Typical Impedance v.s. Frequency Curve



Typical Impedance v.s. Frequency Curve

