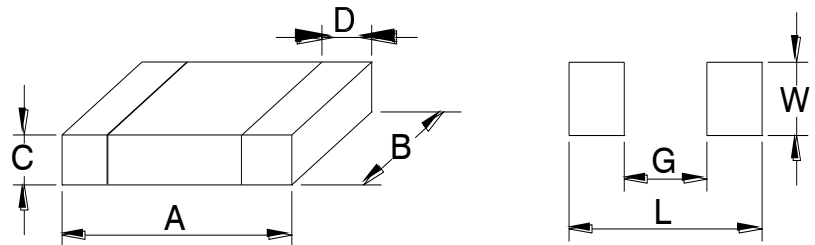


ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS



FEATURES

- High density packaging requires less space and best value for EMI noise suppression effect.
- Excellent in physical properties, such as terminal strength, flexure strength, soldering resistance and solderability.
- Impedance generated from low frequency to cover a wide frequency range.
- Available in multiple material types to suit various applications, such as digital interfaces, general signal, high-speed or power lines.
- AEC-Q200 version available up on request.

Physical Dimensions

Type	A	B	C	D
100505	1.0 ± 0.1 (0.040 ± 0.004)	0.5 ± 0.1 (0.020 ± 0.004)	0.5 ± 0.1 (0.020 ± 0.004)	0.25 ± 0.15 (0.01 ± 0.006)
160808	1.6 ± 0.2 (0.063 ± 0.008)	0.8 ± 0.2 (0.031 ± 0.008)	0.8 ± 0.2 (0.031 ± 0.008)	0.3 ± 0.2 (0.012 ± 0.008)
201209	2.0 ± 0.2 (0.079 ± 0.008)	1.2 ± 0.2 (0.047 ± 0.008)	0.9 ± 0.2 (0.035 ± 0.008)	0.5 ± 0.3 (0.020 ± 0.012)
321611	3.2 ± 0.2 (0.126 ± 0.008)	1.6 ± 0.2 (0.063 ± 0.008)	1.1 ± 0.2 (0.042 ± 0.008)	0.5 ± 0.3 (0.020 ± 0.012)
321616	3.2 ± 0.2 (0.126 ± 0.008)	1.6 ± 0.2 (0.063 ± 0.008)	1.6 ± 0.2 (0.063 ± 0.008)	0.5 ± 0.3 (0.020 ± 0.012)
322513	3.2 ± 0.2 (0.126 ± 0.008)	2.5 ± 0.2 (0.098 ± 0.008)	1.3 ± 0.2 (0.051 ± 0.008)	0.5 ± 0.3 (0.020 ± 0.012)
451616	4.5 ± 0.2 (0.177 ± 0.008)	1.6 ± 0.2 (0.063 ± 0.008)	1.6 ± 0.2 (0.063 ± 0.008)	0.5 ± 0.3 (0.020 ± 0.012)
453215	4.5 ± 0.2 (0.177 ± 0.008)	3.2 ± 0.2 (0.126 ± 0.008)	1.5 ± 0.2 (0.059 ± 0.008)	0.5 ± 0.3 (0.020 ± 0.012)

Inductor

Unit: mm (in)

ORDERING CODE

ECB 160808 Z 121 T
(1) (2) (3) (4) (5)

- (1) Series Name
- (2) Dimensions Code
Length x Width x Height
- (3) Material Code
G, U, Z, B, L
- (4) Impedance Code
3-digit IEC
- (5) Package Code
T

Land Patterns for Reflow Soldering

Type	L	W	G
100505	2.20 (0.086)	0.70 (0.028)	0.40 (0.016)
160808	2.80 (0.110)	1.00 (0.039)	0.60 (0.024)
201209	3.20 (0.126)	1.50 (0.059)	0.60 (0.024)
321611	4.40 (0.173)	1.80 (0.071)	1.20 (0.047)
321616	4.40 (0.173)	1.80 (0.071)	1.20 (0.047)
322513	4.40 (0.173)	2.70 (0.106)	1.20 (0.047)
451616	5.80 (0.228)	1.80 (0.071)	2.00 (0.079)
453215	5.80 (0.228)	3.40 (0.134)	2.00 (0.079)

Unit: mm (in)

ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

Electrical Characteristics

- Impedance Measured at: 100 MHz / 100mV
- Test Conditions: 30°C Max., 70% RH
- Operating Temperature: -55°C to 125°C
- Storage Temperature: 40°C Max., 70% RH
- Moisture Sensitivity Level: 1

Part Number	Impedance (Ω) @100MHz $\pm 25\%$	DC Resistance (Ω) Maximum	Rated Current (mA) Maximum
ECB100505G100	10	0.05	500
ECB100505G300	30	0.3	500
ECB100505G600	60	0.4	200
ECB100505G750	75	0.5	200
ECB100505G121	120	0.5	200
ECB100505G221	220	0.7	100
ECB100505G301	300	0.8	100
ECB100505G471	470	1.0	100
ECB100505G601	600	1.0	100
ECB100505G102	1000	1.3	100
ECB100505G152	1500	1.5	50
ECB100505U100	10	0.05	500
ECB100505U300	30	0.3	500
ECB100505U470	47	0.4	200
ECB100505U600	60	0.4	200
ECB100505U750	75	0.5	200
ECB100505U121	120	0.5	200
ECB100505U221	220	0.7	100
ECB100505U301	300	0.8	100
ECB100505U471	470	0.9	100
ECB100505U601	600	1.0	100
ECB100505U102	1000	1.3	100
ECB100505Z300	30	0.3	500
ECB100505Z600	60	0.4	200
ECB100505Z800	80	0.5	200
ECB100505Z121	120	0.5	200
ECB100505Z221	220	0.7	100
ECB100505Z301	300	0.8	100
ECB100505Z471	470	0.9	100
ECB100505Z601	600	1.0	100

Part Number	Impedance (Ω) @100MHz $\pm 25\%$	DC Resistance (Ω) Maximum	Rated Current (mA) Maximum
ECB160808B100	10	0.25	500
ECB160808B300	30	0.25	500
ECB160808B470	47	0.3	300
ECB160808B600	60	0.3	300
ECB160808B750	75	0.3	200
ECB160808B121	120	0.3	200
ECB160808B221	220	0.4	200
ECB160808B301	300	0.45	200
ECB160808B471	470	0.65	200
ECB160808B601	600	0.65	200
ECB160808G100	10	0.2	400
ECB160808G310	31	0.2	400

ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

Part Number	Impedance (Ω) @100MHz $\pm 25\%$	DC Resistance (Ω) Maximum	Rated Current (mA) Maximum
ECB160808G470	47	0.3	300
ECB160808G600	60	0.2	300
ECB160808G750	75	0.2	300
ECB160808G121	120	0.2	200
ECB160808G221	220	0.2	200
ECB160808G301	300	0.35	200
ECB160808G471	470	0.45	200
ECB160808G601	600	0.45	200
ECB160808G102	1000	0.6	100
ECB160808G152	1500	0.7	50
ECB160808G202	2000	0.8	50
ECB160808G252	2500	1	50
ECB160808G272	2700	1.2	50
ECB160808U100	10	0.2	400
ECB160808U300	30	0.2	400
ECB160808U470	47	0.2	300
ECB160808U600	60	0.2	300
ECB160808U800	80	0.2	300
ECB160808U121	120	0.2	200
ECB160808U221	220	0.2	200
ECB160808U301	300	0.35	200
ECB160808U471	470	0.45	200
ECB160808U601	600	0.45	200
ECB160808U102	1000	0.6	100
ECB160808Z300	30	0.2	400
ECB160808Z600	60	0.2	300
ECB160808Z800	80	0.2	300
ECB160808Z121	120	0.2	300
ECB160808Z221	220	0.2	200
ECB160808Z301	300	0.35	200
ECB160808Z601	600	0.45	200
ECB160808Z102	1000	0.6	100

Part Number	Impedance (Ω) @100MHz $\pm 25\%$	DC Resistance (Ω) Maximum	Rated Current (mA) Maximum
ECB201209B070	7	0.15	600
ECB201209B300	30	0.15	400
ECB201209B600	60	0.2	300
ECB201209B121	120	0.25	200
ECB201209B221	220	0.35	200
ECB201209B301	300	0.4	200
ECB201209B601	600	0.5	200
ECB201209B102	1000	0.6	200
ECB201209G070	7	0.15	600
ECB201209-G300	30	0.15	400
ECB201209G600	60	0.15	300

ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

Part Number	Impedance (Ω) @100MHz $\pm 25\%$	DC Resistance (Ω) Maximum	Rated Current (mA) Maximum
ECB201209G800	80	0.15	300
ECB201209G121	120	0.25	300
ECB201209G221	220	0.3	200
ECB201209G301	300	0.3	200
ECB201209G601	600	0.35	200
ECB201209G102	1000	0.45	200
ECB201209G152	1500	0.45	200
ECB201209G202	2000	0.6	200
ECB201209G222	2200	0.6	200
ECB201209G252	2500	0.6	200
ECB201209G272	2700	0.8	200
ECB201209U100	10	0.15	600
ECB201209U110	11	0.15	600
ECB201209U300	30	0.15	400
ECB201209U600	60	0.15	300
ECB201209U800	80	0.15	300
ECB201209U121	120	0.25	300
ECB201209U221	220	0.3	200
ECB201209U301	300	0.3	200
ECB201209U601	600	0.35	200
ECB201209U102	1000	0.45	200
ECB201209Z300	30	0.15	400
ECB201209Z600	60	0.15	300
ECB201209Z800	80	0.15	300
ECB201209Z121	120	0.25	300
ECB201209Z221	220	0.3	200
ECB201209Z301	300	0.3	200
ECB201209Z601	600	0.35	200
ECB201209Z102	1000	0.45	200

Part Number	Impedance (Ω) @100MHz $\pm 25\%$	DC Resistance (Ω) Maximum	Rated Current (mA) Maximum
ECB321611B190	19	0.1	600
ECB321611G600	60	0.3	400
ECB321611G800	80	0.3	300
ECB321611G221	220	0.3	300
ECB321611G301	300	0.3	300
ECB321611G601	600	0.3	200
ECB321611G102	1000	0.45	100
ECB321611G152	1500 Ω at 50MHz	0.55	100
ECB321611G202	2000 Ω at 30MHz	0.6	100
ECB321611U260	26	0.2	500
ECB321611U310	31	0.2	500
ECB321611U500	50	0.3	400
ECB321611U700	70	0.3	300
ECB321611U800	80	0.3	300

ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

Part Number	Impedance (Ω) @100MHz $\pm 25\%$	DC Resistance (Ω) Maximum	Rated Current (mA) Maximum
ECB321611U121	120	0.3	300
ECB321611U221	220	0.3	300
ECB321611U301	300	0.3	300
ECB321611U601	600	0.3	200
ECB321611U102	1000	0.45	100
ECB321611U122	1200 Ω at 50MHz	0.5	100
ECB321611U152	1500 Ω at 50MHz	0.5	100
ECB321611U202	2000 Ω at 30MHz	0.6	100
ECB321611Z260	26	0.2	500
ECB321611Z310	31	0.2	500
ECB321611Z600	60	0.3	400
ECB321611Z800	80	0.3	300
ECB321611Z121	120	0.3	300
ECB321611Z301	300	0.3	300
ECB321611Z601	600	0.3	200
ECB321611Z122	1200 Ω at 50MHz	0.5	100
ECB321611Z202	2000 Ω at 30MHz	0.6	100

Part Number	Impedance (Ω) @100MHz $\pm 25\%$	DC Resistance (Ω) Maximum	Rated Current (mA) Maximum
ECB322513U300	30	0.3	400
ECB322513U330	33	0.3	400
ECB322513U520	52	0.3	400
ECB322513U600	60	0.3	400
ECB322513U121	120	0.3	400

Part Number	Impedance (Ω) @100MHz $\pm 25\%$	DC Resistance (Ω) Maximum	Rated Current (mA) Maximum
ECB451616U600	60	0.3	400
ECB451616U800	80	0.1	500
ECB451616U101	100	0.3	500
ECB451616U121	120	0.3	300
ECB451616U181	180	0.3	300

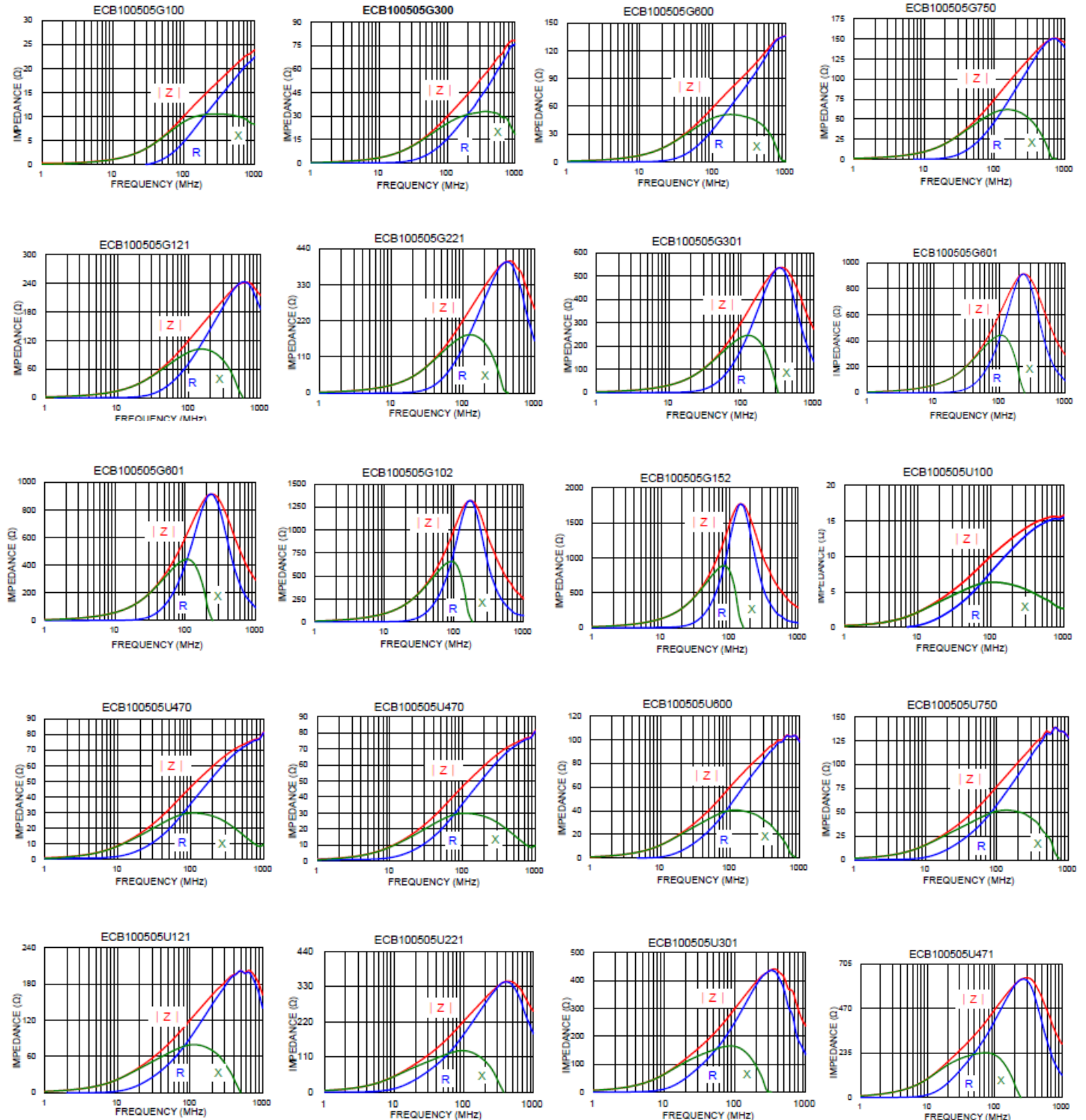
Part Number	Impedance (Ω) @100MHz $\pm 25\%$	DC Resistance (Ω) Maximum	Rated Current (mA) Maximum
ECB453215U700	70	0.3	300
ECB453215U800	80	0.3	300
ECB453215U121	120	0.3	300

ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

Typical Impedance Charts (100505)

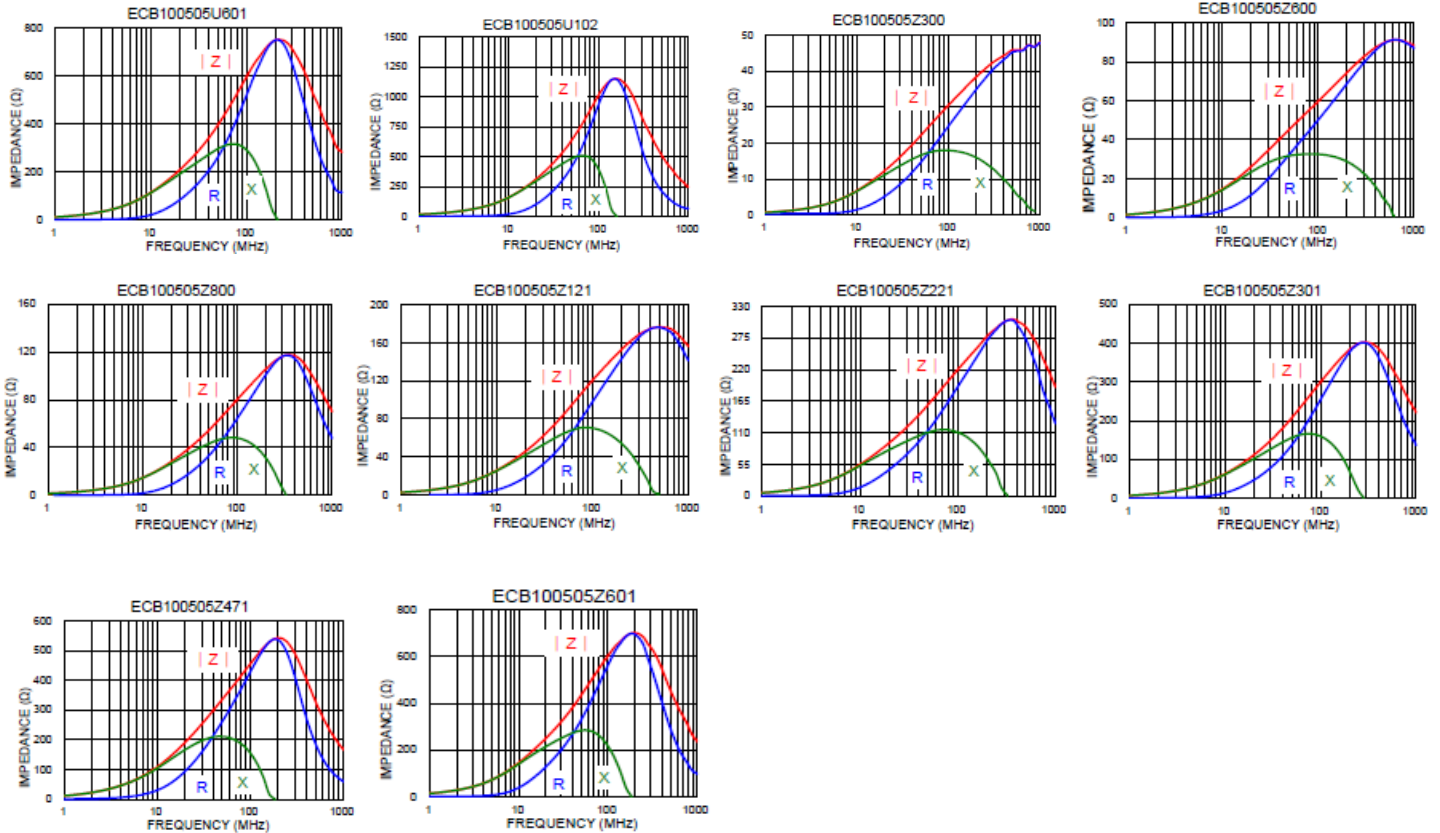


ECB Series

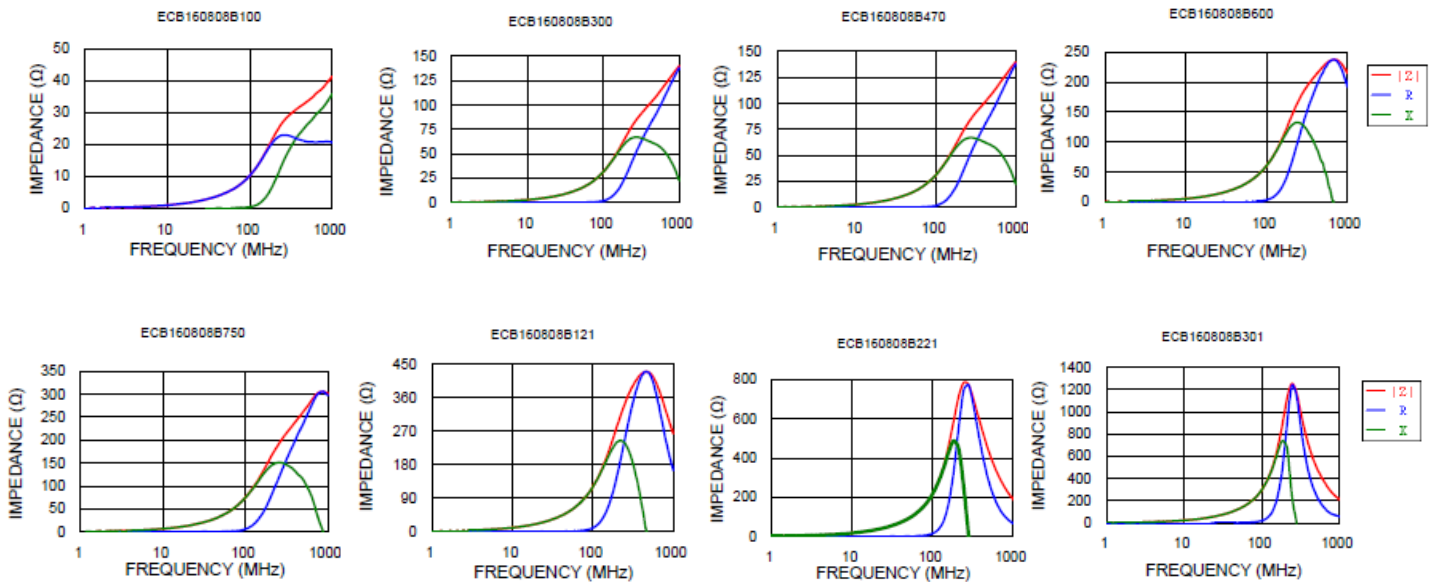
Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

Typical Impedance Charts



Typical Impedance Charts (160808)

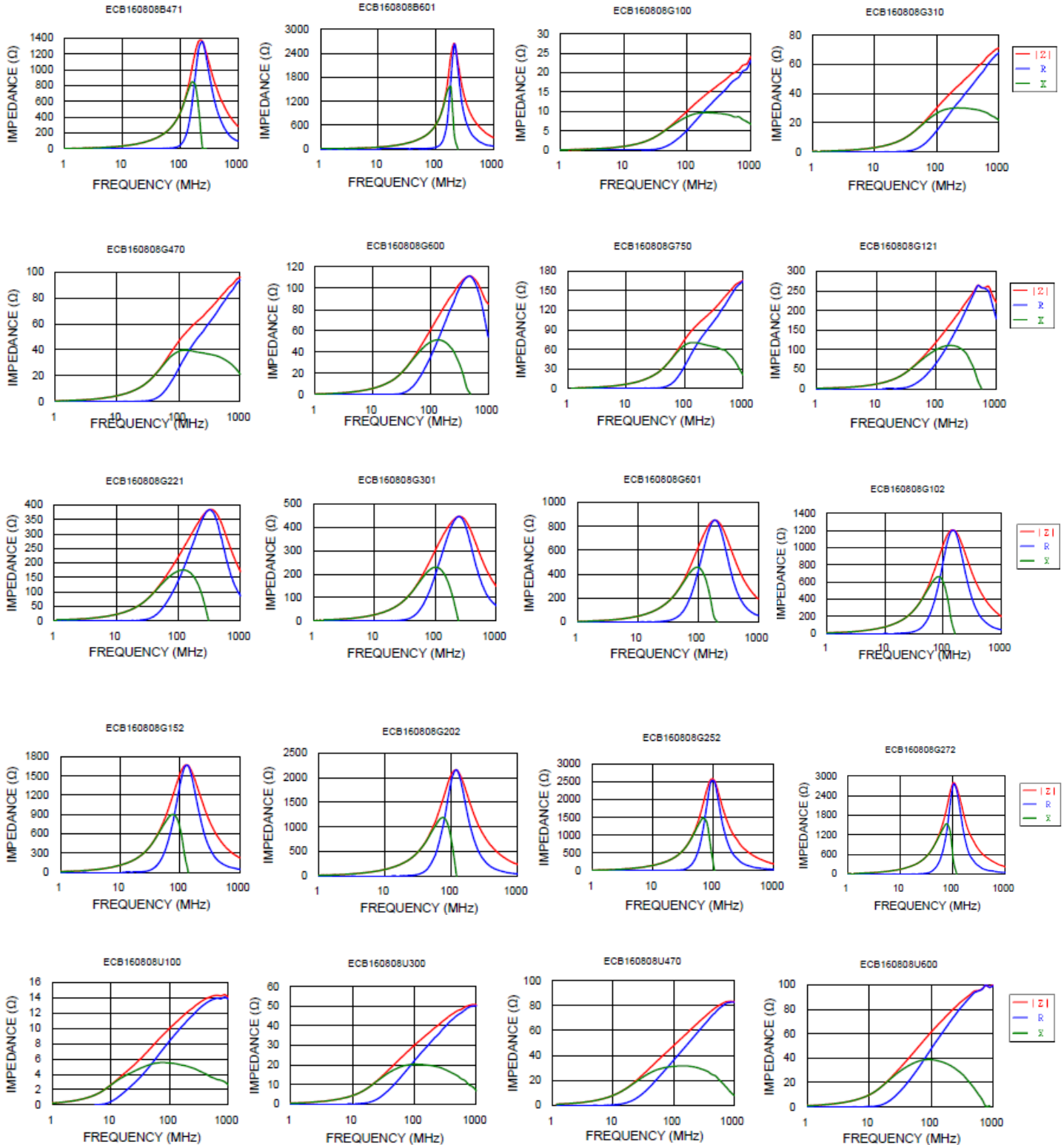


ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

Typical Impedance Charts (160808)

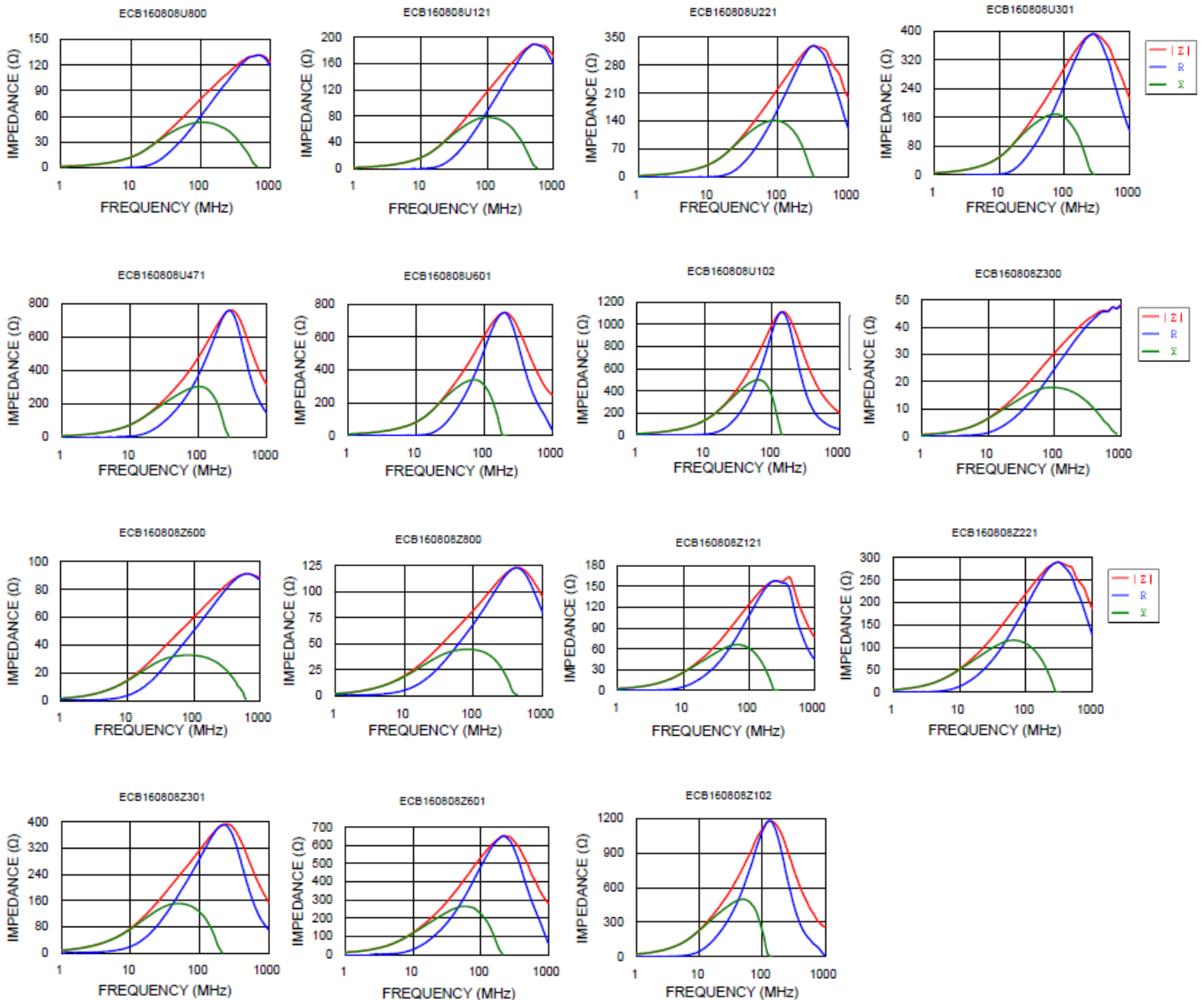


ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

Typical Impedance Charts (160808)

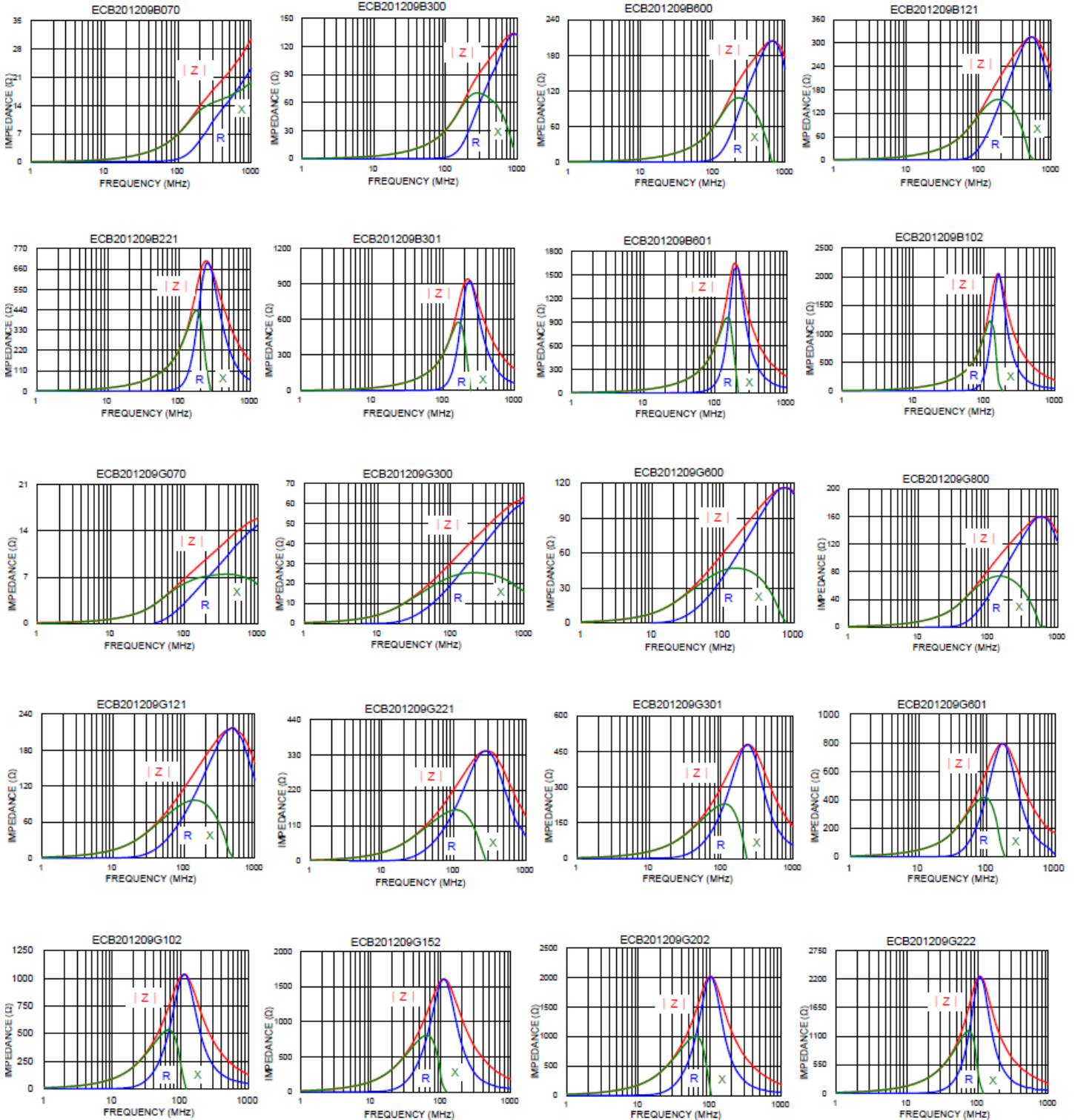


ECB Series

Multilayer Ferrite Chip Beads

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COMPONENTS

Typical Impedance Charts (201209)

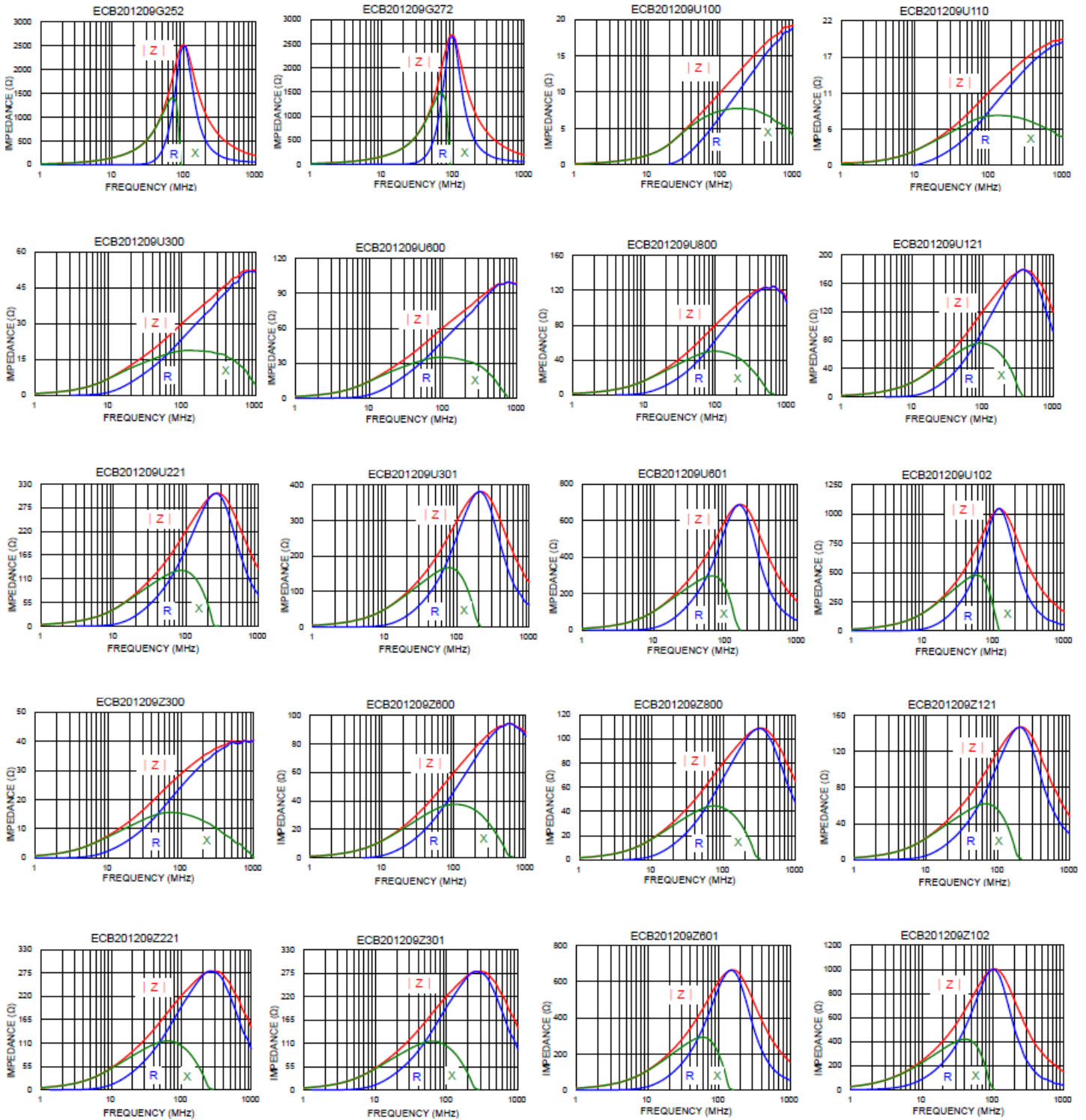


ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

Typical Impedance Charts (201209)

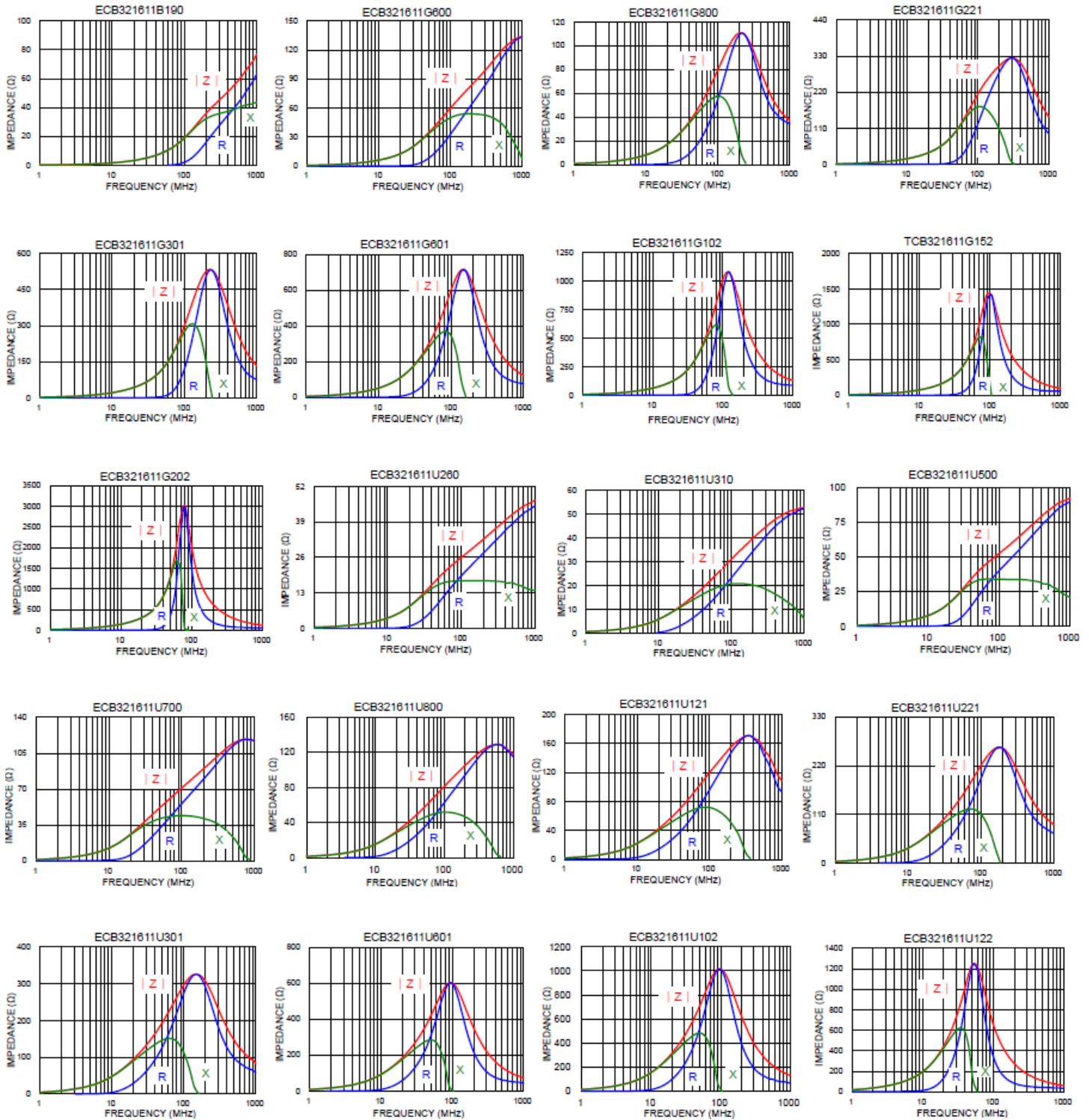


ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

Typical Impedance Charts (321611)

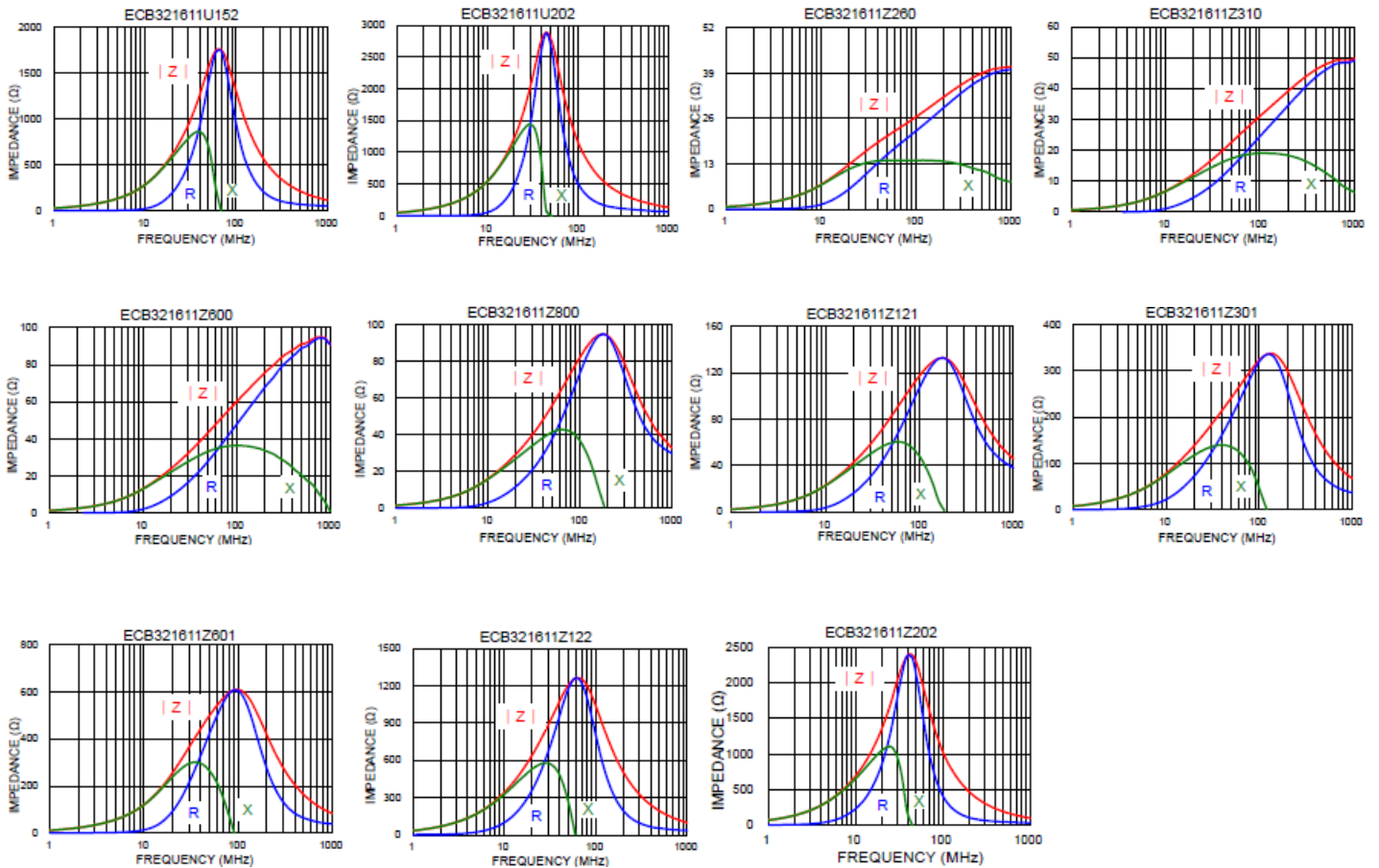


ECB Series

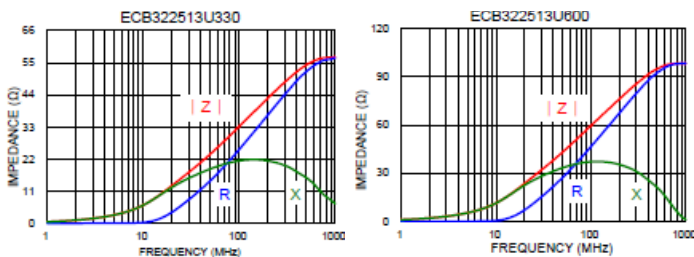
Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

Typical Impedance Charts (321611)



Typical Impedance Charts (322513)

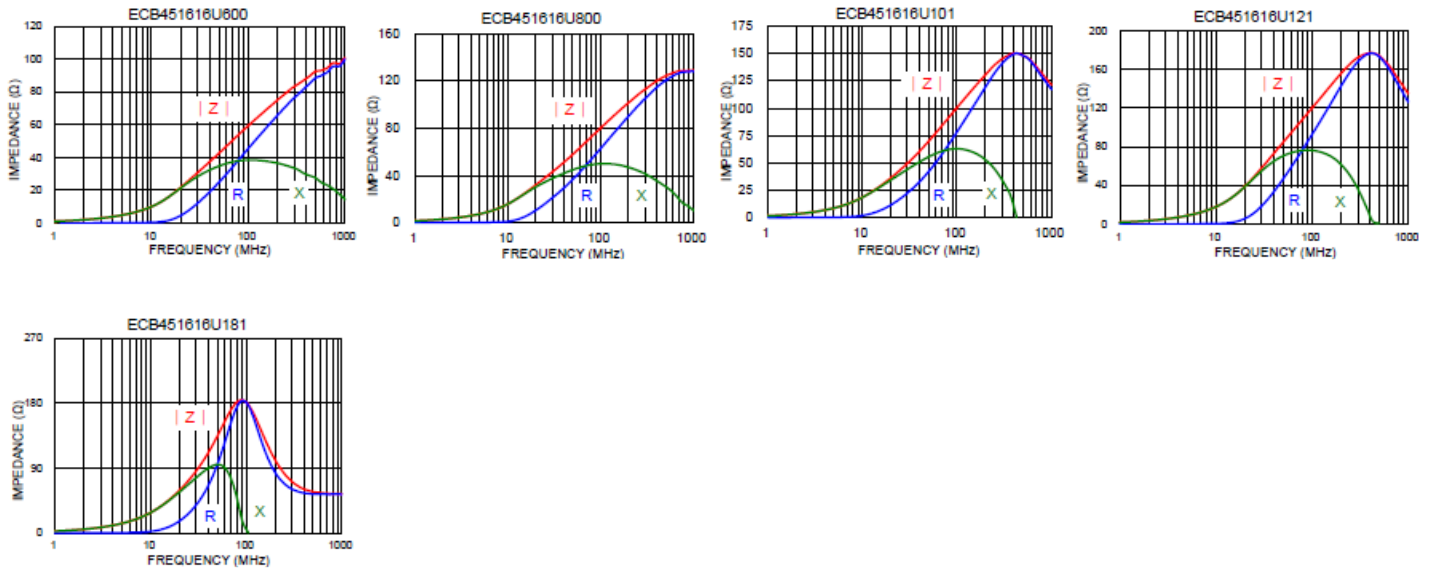


ECB Series

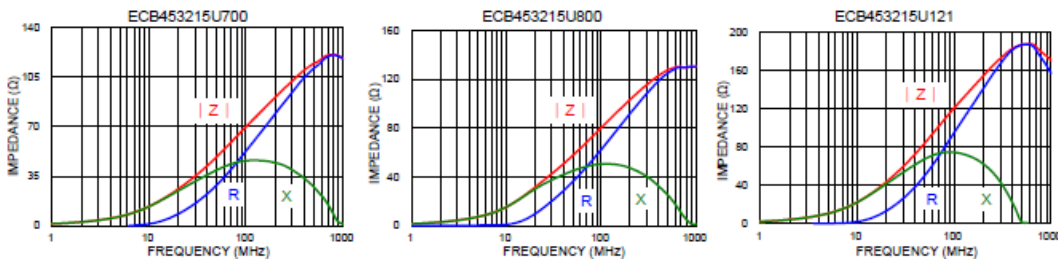
Multilayer Ferrite Chip Beads

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COMPONENTS

Typical Impedance Charts (451616)



Typical Impedance Charts (453215)

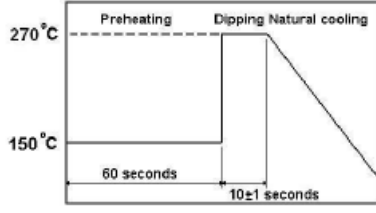
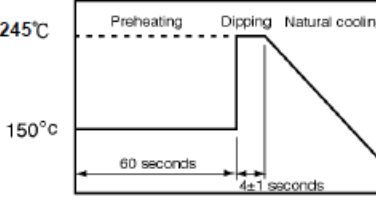
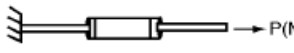


ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

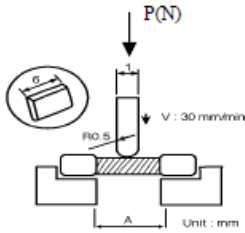
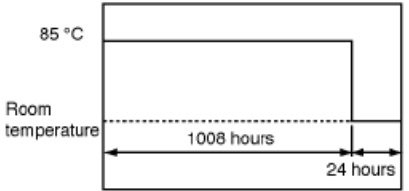
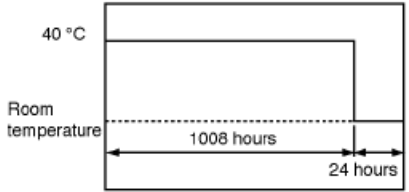
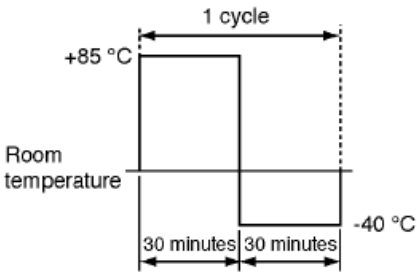
Reliability Tests

Test Item	Performance	Test Condition																							
Operation Temperature Range	-55°C to 125°C																								
Storage Temperature and Humidity Range	40°C Max., 70% RH Max.																								
Soldering Heat Resistance	The chip shall not crack. More than 75% of the terminal electrode shall be covered with new solder.	Preheat: 150°C, 60 seconds. Solder Temperature: 270±5°C Flux: Rosin Dip Time: 10±1 second 																							
Solderability	More than 90% of the terminal electrode shall be covered with new solder.	Preheat: 150°C, 60 seconds. Solder Temperature: 245±5°C Flux: Rosin Dip Time: 4±1 seconds 																							
Terminal Strength	The terminal electrode and body shall not be damaged by the forces applied. 	<table border="1"> <thead> <tr> <th>Type</th> <th>P (kgf)</th> <th>Time (s)</th> </tr> </thead> <tbody> <tr> <td>100505</td> <td>0.3</td> <td rowspan="8">30±5</td> </tr> <tr> <td>160808</td> <td>0.5</td> </tr> <tr> <td>201209</td> <td>0.6</td> </tr> <tr> <td>201212</td> <td>0.8</td> </tr> <tr> <td>321611</td> <td>1.0</td> </tr> <tr> <td>322513</td> <td>1.0</td> </tr> <tr> <td>451616</td> <td>1.0</td> </tr> <tr> <td>453215</td> <td>1.5</td> </tr> <tr> <td>3216*4</td> <td>0.5</td> <td></td> </tr> </tbody> </table>	Type	P (kgf)	Time (s)	100505	0.3	30±5	160808	0.5	201209	0.6	201212	0.8	321611	1.0	322513	1.0	451616	1.0	453215	1.5	3216*4	0.5	
Type	P (kgf)	Time (s)																							
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201209	0.6																								
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322513	1.0																								
451616	1.0																								
453215	1.5																								
3216*4	0.5																								

ECB Series

Multilayer Ferrite Chip Beads

Reliability Tests

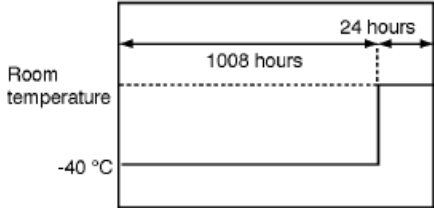
<p>Bending Strength</p>	<p>The body shall not be damaged by the forces applied.</p> 	<table border="1" data-bbox="1156 499 1477 760"> <thead> <tr> <th>Type</th> <th>A(mm)</th> <th>P(kgf)</th> </tr> </thead> <tbody> <tr> <td>100505</td> <td>-</td> <td>-</td> </tr> <tr> <td>160808</td> <td>1.0</td> <td>0.5</td> </tr> <tr> <td>201209</td> <td>1.4</td> <td>1.0</td> </tr> <tr> <td>201212</td> <td>1.4</td> <td>1.2</td> </tr> <tr> <td>321611</td> <td>2.0</td> <td>2.0</td> </tr> <tr> <td>322513</td> <td>2.0</td> <td>2.5</td> </tr> <tr> <td>451616</td> <td>2.5</td> <td>2.5</td> </tr> <tr> <td>453215</td> <td>2.7</td> <td>2.5</td> </tr> </tbody> </table>	Type	A(mm)	P(kgf)	100505	-	-	160808	1.0	0.5	201209	1.4	1.0	201212	1.4	1.2	321611	2.0	2.0	322513	2.0	2.5	451616	2.5	2.5	453215	2.7	2.5
Type	A(mm)	P(kgf)																											
100505	-	-																											
160808	1.0	0.5																											
201209	1.4	1.0																											
201212	1.4	1.2																											
321611	2.0	2.0																											
322513	2.0	2.5																											
451616	2.5	2.5																											
453215	2.7	2.5																											
<p>High Temperature Resistance</p>	<p>Appearance: Body shall not be damaged. Impedance: Within $\pm 20\%$ of the initial value.</p>	<p>Temperature: $85 \pm 2^\circ\text{C}$ Testing Time: 1008 ± 12 hours Measurement: After placing for 24 hours min.</p> 																											
<p>Humidity Resistance</p>	<p>Appearance: Body shall not be damaged. Impedance: Within $\pm 20\%$ of the initial value.</p>	<p>Humidity: 90 to 95% RH Temperature: $40 \pm 2^\circ\text{C}$ Testing Time: 1008 ± 12 hours Measurement: After placing for 24 hours min.</p> 																											
<p>Thermal Shock</p>	<p>Appearance: Cracking, chipping or any other defects or any other defects harmful to the characteristics shall not be allowed. Impedance: Within $\pm 20\%$ of the initial value.</p>	<p>Temperature: -40°C, 85°C, kept stabilized for 30 minutes each Cycle: 100 cycles Measurement: After placing for 24 hours min.</p> 																											

ECB Series

Multilayer Ferrite Chip Beads

TRIGON
COMPONENTS

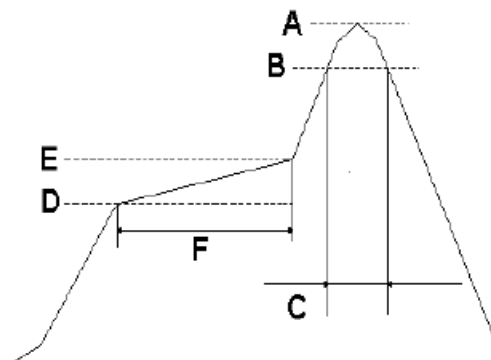
Reliability Tests

<p>Low Temperature Storage Life Test</p>	<p>Appearance: Cracking, chipping, or any other defects harmful to the characteristics shall not be allowed. Impedance: Within $\pm 20\%$ of the initial value.</p>	<p>Temperature: $-40 \pm 2^\circ\text{C}$ Testing Time: 1008 ± 12 hours. Measurement: After placing for 24 hours min.</p> 
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Recommended Soldering Conditions

(REFLOW TEMPERATURE PROFILE) **Lead-Free**

A	$260 \pm 5^\circ\text{C}$
B	$230 \pm 5^\circ\text{C}$
C	$30 \pm 10 \text{ sec}$
D	150°C
E	180°C
F	$90 \pm 30 \text{ sec}$

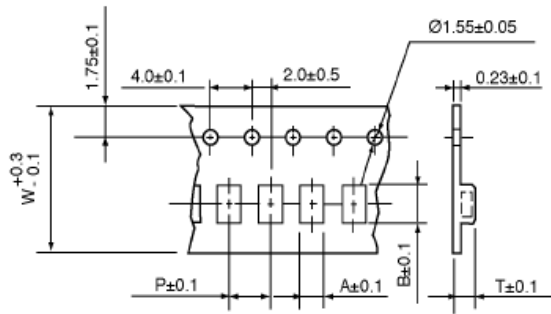


ECB Series

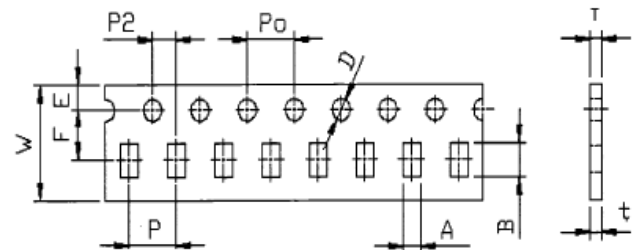
Multilayer Ferrite Chip Beads

Packing Information

Polystyrene Tape Carrier:



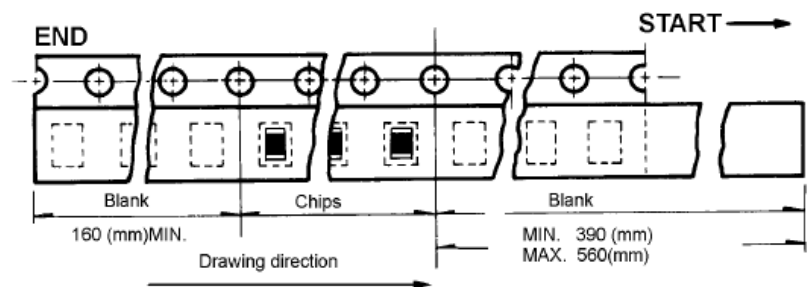
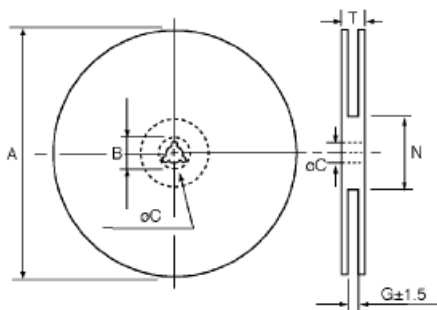
Paper Tape Carrier:



Type	A	B	W	P	T	Chips /Reel
100505	0.62	1.12	8	2	0.6	10,000
160808	1.1	1.9	8	4	0.95	4,000
201209	1.5	2.3	8	4	0.95	4,000

Type	A	B	W	P	T	Chips /Reel
160808	1.01	1.8	8	4	1.02	4,000
201209	1.42	3.25	8	4	1.04	4,000
201212	1.5	2.35	8	4	1.45	2,000
321611	1.88	3.5	8	4	1.27	3,000
322513	2.77	3.42	8	4	1.55	2,000
451616	1.93	4.95	12	4	1.93	2,000
453215	3.66	4.95	12	8	1.85	1,000

Reel Dimensions:



Type	W=8mm	W=12mm
A	178±2	178±2
B	21.0±0.8	21.0±0.8
C	13.0±0.8	13.0±0.8
G	10.0	14.0
N	75.0	75.0
T	12.5	16.5

Dimensions in mm.