

# On-Board Type (DC) EMI Suppression Filters(EMIFIL®)

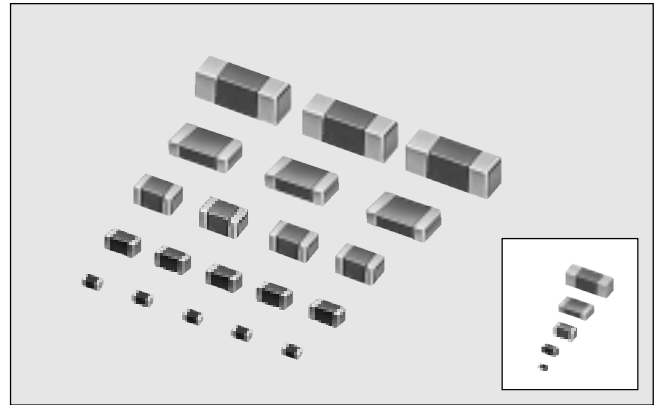
## Chip Ferrite Bead BLM Series

# Essential for Noise Suppression in High Speed Signal Lines and DC Power Lines

The chip ferrite bead BLM series comprises ferrite bead inductors in the shape of a chip. This inductor generates a high impedance which at high frequencies mainly consists of a resistance element. The BLM series is effective in circuits without stable ground lines because the BLM series does not need a connection to ground.

Chip sizes of 1.0×0.5, 1.6×0.8, 2.0×1.25, 3.2×1.6 and 4.5×1.6mm are cataloged. (The BLA series of array type chip ferrite bead is also cataloged.)

The nickel barrier structure of the external electrodes provides excellent solder heat resistance. Both flow and reflow soldering methods can be employed.



### ■Features

The BLM series comprises, the R series (for digital interface), the A series (for standard), the B series (for high speed signal), and the P series (for large current).

#### 1. BLM□□R series-For Digital Interface

The BLM-R series can be used in Digital Interface. Resistance of BLM-R series especially grows in the lower frequency range. Therefore BLM-R series is less effect for digital signal waveform at low frequency range and can suppress the ringing.

#### 2. BLM□□A series-For Standard

The BLM-A series generates an impedance from the relatively low frequencies. Therefore the BLM-A series is effective in noise suppression in the wide frequency range (30MHz-Several hundred MHz).

#### 3. BLM□□B series-For High Speed Signal

The BLM-B series can minimize attenuation of the signal waveform due to its sharp impedance characteristics. Various impedances are available to match signal frequency

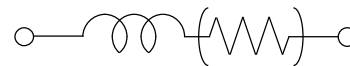
#### 4. BLM□□P series-For Large Current

The BLM-P series can be used in high current circuits due to its low DC resistance. It can match power lines to a maximum of 6A DC (BLM41P).

### ■Difference between A Series, B Series and R Series

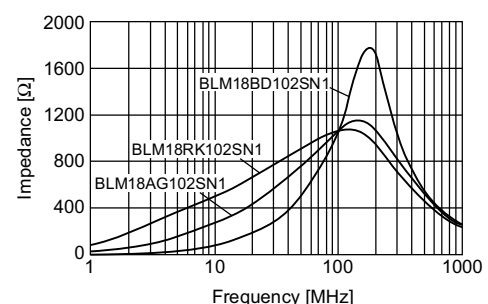
The BLM□□B series has sharp impedance characteristics and it does not affect the signal frequency. The BLM□□R series has resistance especially growing in the lower frequency range. Therefore it can suppress the ringing effectively.

### ■Equivalent Circuit Diagram



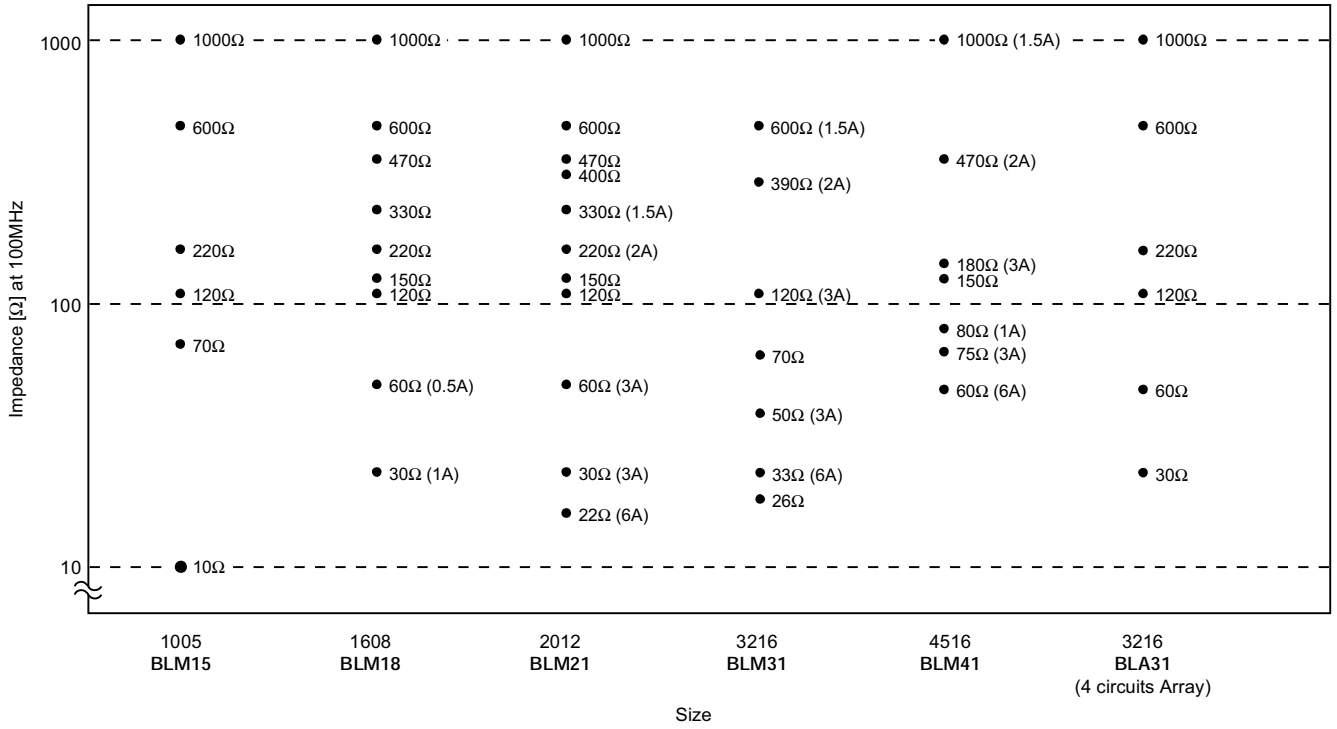
(Resistance element becomes dominant at high frequencies.)

[Impedance Characteristics]

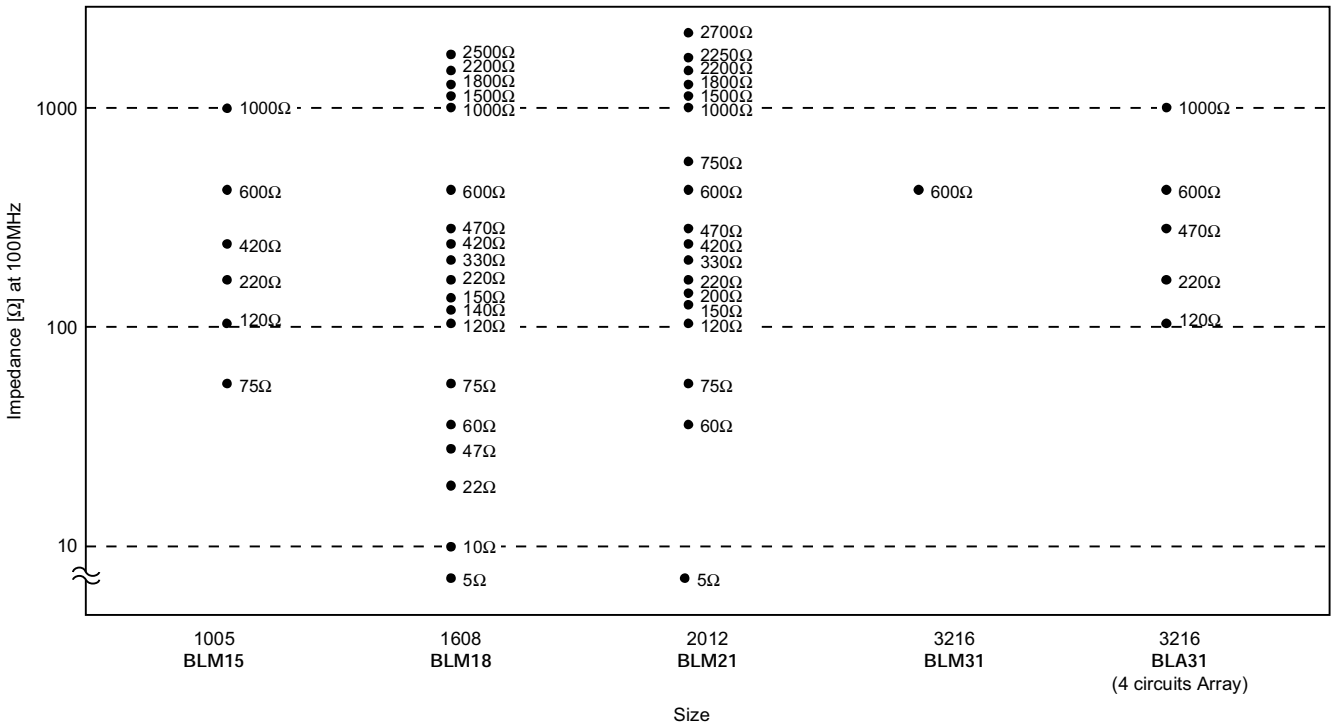


■ Selection Guide

● BLM□□A series-Standard / BLM□□R series-For Digital Interface / BLM□□P series-For Large Current




● BLM□□B series-For High Speed Signal



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## ■BLM Series


Type	Size(mm)	Part Number	Impedance ( $\Omega$ ) at 100MHz	Rated Current (mA)
BLM□□R Series -For Digital Interface	1.6×0.8	BLM18RK121SN1	120±25%	200
		BLM18RK221SN1	220±25%	
		BLM18RK471SN1	470±25%	
		BLM18RK601SN1	600±25%	
		BLM18RK102SN1	1000±25%	
	2.0×1.25	BLM21RK121SN1	120±25%	
		BLM21RK221SN1	220±25%	
		BLM21RK471SN1	470±25%	
		BLM21RK601SN1	600±25%	
		BLM21RK102SN1	1000±25%	
BLM□□A Series -For Standard	1.0×0.5	BLM15AG100PN1	10 (Typ.)	500
		BLM15AG700PN1	70 (Typ.)	200
		BLM15AG121PN1	120 (Typ.)	100
		BLM15AG221PN1	220±25%	
		BLM15AG601PN1	600±25%	50
		BLM15AG102PN1	1000±25%	
	1.6×0.8	BLM18AG121SN1	120±25%	200
		BLM18AG151SN1	150±25%	
		BLM18AG221SN1	220±25%	
		BLM18AG331SN1	330±25%	
		BLM18AG471SN1	470±25%	
		BLM18AG601SN1	600±25%	
	2.0×1.25	BLM18AG102SN1	1000±25%	200
		BLM21AG121SN1	120±25%	
		BLM21AG151SN1	150±25%	
		BLM21AG221SN1	220±25%	
		BLM21AG331SN1	330±25%	
		BLM21AJ401SN1	400±25%	
		BLM21AG471SN1	470±25%	
		BLM21AG601SN1	600±25%	
3.2×1.6	BLM21AJ601SN1	1000±25%	200	
	BLM21AG102SN1			
	BLM21AJ102SN1			
4.5×1.6	BLM31AJ260SN1	26±25%	500	
	BLM31AF700SN1	70±25%	200	
	BLM31AJ601SN1	600±25%	200	
BLM□□B Series -For High Speed Signal (Sharp impedance characteristic)	1.0×0.5	BLM41AF800SN1	80±25%	500
		BLM41AF151SN1	150±25%	200
		BLM15BB750PN1	75±25%	100
		BLM15BB121PN1	120±25%	
		BLM15BB221PN1	220±25%	
		BLM15BD421PN1	420±25%	
	BLM15BD601PN1	600±25%		
	BLM15BD102PN1	1000±25%		
	1.6×0.8	BLM18BA050SN1	5±25%	500
		BLM18BB050SN1		700
		BLM18BA100SN1	10±25%	500
		BLM18BB100SN1		
		BLM18BA220SN1	22±25%	300
		BLM18BB220SN1		
BLM18BA470SN1		47±25%	500	
BLM18BB470SN1				
BLM18BB600SN1		60±25%	200	
BLM18BB750SN1		75±25%	300	
BLM18BA750SN1				
BLM18BA121SN1	120±25%	200		
BLM18BB121SN1				


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Type	Size(mm)	Part Number	Impedance (Ω) at 100MHz	Rated Current (mA)	
BLM□□B Series -For High Speed Signal (Sharp impedance characteristic)	1.6×0.8	BLM18BD121SN1	120±25%	200	
		BLM18BB141SN1	140±25%		
		BLM18BB151SN1	150±25%		
		BLM18BD151SN1			
		BLM18BB221SN1	220±25%		
		BLM18BD221SN1			
		BLM18BB331SN1	330±25%		
		BLM18BD331SN1			
		BLM18BD421SN1	420±25%		
		BLM18BB471SN1	470±25%		50
		BLM18BD471SN1			200
		BLM18BD601SN1	600±25%		100
		BLM18BD102SN1	1000±25%		
		BLM18BD152SN1	1500±25%		50
		BLM18BD182SN1	1800±25%		
		BLM18BD222SN1	2200±25%		
BLM18BD252SN1	2500±25%				
BLM□□B Series -For High Frequency (Sharp impedance characteristic)	2.0×1.25	BLM21BB050SN1	5±25%	500	
		BLM21BB600SN1	60±25%	200	
		BLM21BB750SN1	75±25%		
		BLM21BB121SN1	120±25%		
		BLM21BD121SN1			
		BLM21BB151SN1	150±25%		
		BLM21BD151SN1			
		BLM21BB201SN1	200±25%		
		BLM21BB221SN1	220±25%		
		BLM21BD221SN1			
		BLM21BB331SN1	330±25%		
		BLM21BD331SN1			
		BLM21BD421SN1	420±25%		
		BLM21BB471SN1	470±25%		
		BLM21BD471SN1			
		BLM21BD601SN1	600±25%		
		BLM21BD751SN1	750±25%		
		BLM21BD102SN1	1000±25%		
		BLM21BD152SN1	1500±25%		
	BLM21BD182SN1	1800±25%			
BLM21BD222SN1*	2250 (Typ.)				
BLM21BD222TN1	2200±25%				
BLM21BD272SN1	2700±25%				
	3.2×1.6	BLM31BE601FN1	600±25%	300	

\* Impedance±25% guarantee type is also available. Please contact for further details.

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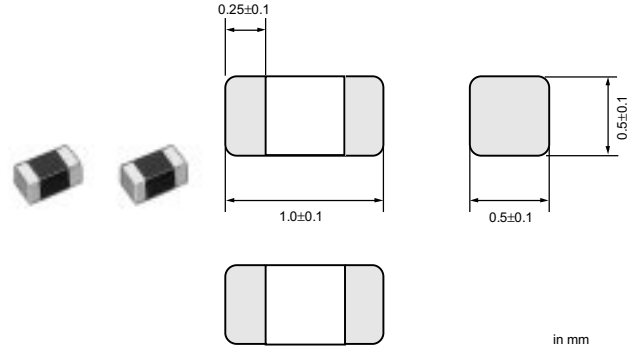
Type	Size(mm)	Part Number	Impedance ( $\Omega$ ) at 100MHz	Rated Current (mA)	
BLM□□P Series* -For Large Current	1.6×0.8	BLM18PG300SN1	30 (Typ.)	1000	
		BLM18PG600SN1	60 (Typ.)	500	
	2.0×1.25	BLM21PG220SN1	22 (Typ.)	6000	
		BLM21PG300SN1	30 (Typ.)	3000	
		BLM21PG600SN1	60 (Typ.)		
		BLM21PG221SN1	220 (Typ.)	2000	
		BLM21PG331SN1	330 (Typ.)	1500	
	3.2×1.6	BLM31PG330SN1	33 (Typ.)	6000	
		BLM31PG500SN1	50 (Typ.)	3000	
		BLM31PG121SN1	120 (Typ.)		
		BLM31PG391SN1	390 (Typ.)	2000	
	4.5×1.6	BLM31PG601SN1	600 (Typ.)	1500	
		BLM41PG600SN1	60 (Typ.)	6000	
		BLM41PG750SN1	75 (Typ.)	3000	
		BLM41PF800SN1	80 (Typ.)	1000	
		BLM41PG181SN1	180 (Typ.)	3000	
		BLM41PG471SN1	470 (Typ.)	2000	
	BLM□□H□ Series For GHz Range Noise Suppression	BLM□□HG Series -For Standard	1.6×0.8	BLM18HG471SN1	470±25%
BLM18HG601SN1				600±25%	
BLM18HG102SN1				1000±25%	
BLM□□HD Series -For High Speed Signal		BLM18HD471SN1		470±25%	100
		BLM18HD601SN1		600±25%	
		BLM18HD102SN1		1000±25%	
BLM□□HK Series -For Digital Interface		BLM18HK331SN1		330±25%	200
		BLM18HK471SN1		470±25%	
		BLM18HK601SN1		600±25%	100
		BLM18HK102SN1		1000±25%	50

# On-Board Type (DC) EMI Suppression Filters(EMIFIL®)



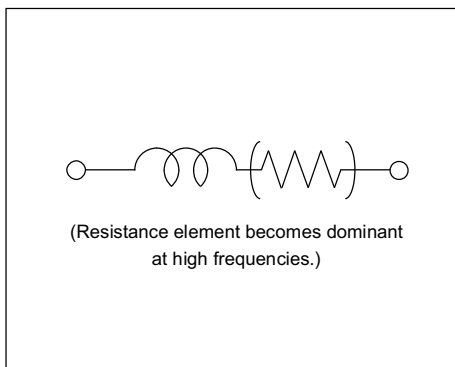
## Chip Ferrite Beads BLM15/BLM18/BLM21/BLM31/BLM41 Series

### BLM15 Series(1005 Size)

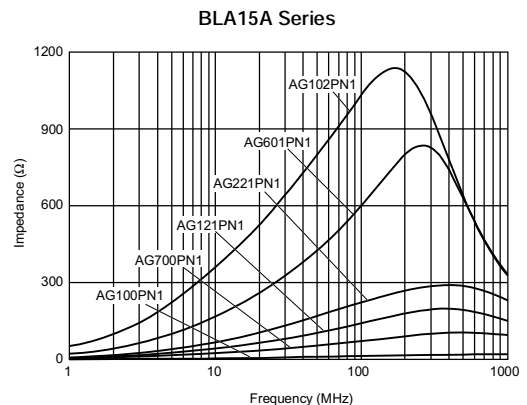


Part Number	Impedance (at 100MHz) (ohm)	Rated Current (mA)	DC Resistance(max.) (ohm)	Operating Temperature Range (°C)
BLM15AG100PN1	10 (Typ.)	500	0.05	-55 to 125
BLM15AG700PN1	70 (Typ.)	200	0.40	-55 to 125
BLM15AG121PN1	120 (Typ.)	200	0.50	-55 to 125
BLM15AG221PN1	220 ±25%	100	0.70	-55 to 125
BLM15AG601PN1	600 ±25%	50	1.10	-55 to 125
BLM15AG102PN1	1000 ±25%	50	1.50	-55 to 125
BLM15BB750PN1	75 ±25%	100	0.80	-55 to 125
BLM15BB121PN1	120 ±25%	50	1.10	-55 to 125
BLM15BB221PN1	220 ±25%	50	1.40	-55 to 125
BLM15BD421PN1	420 ±25%	50	1.30	-55 to 125
BLM15BD601PN1	600 ±25%	50	1.50	-55 to 125
BLM15BD102PN1	1000 ±25%	50	1.30	-55 to 125


### Equivalent Circuit



### Impedance-Frequency (Typical)



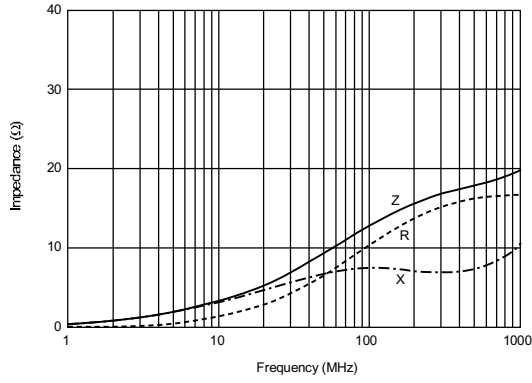
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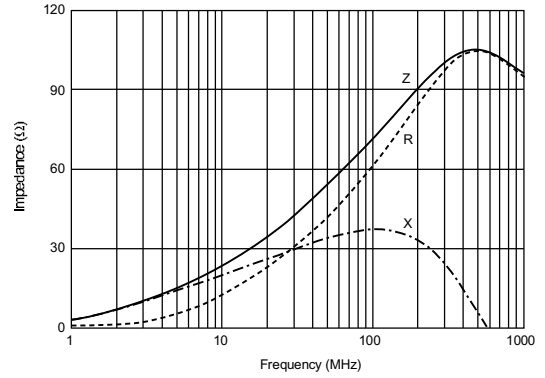
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**Impedance-Frequency Characteristics**

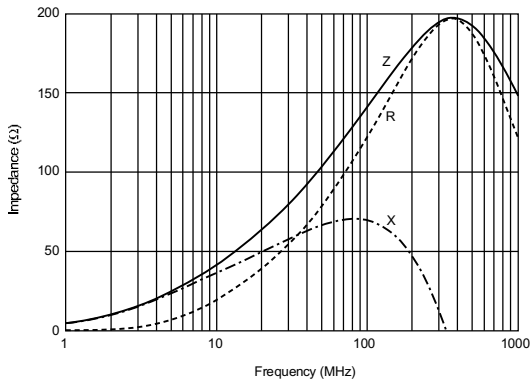
**BLM15AG100PN1**



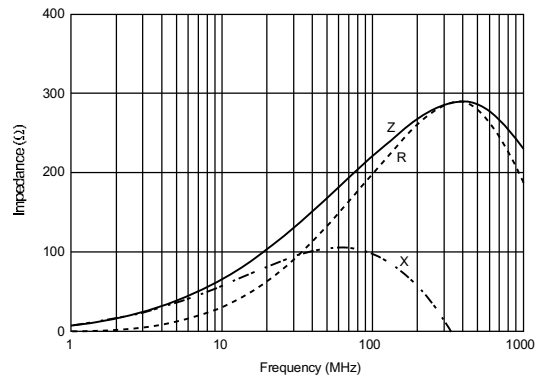
**BLM15AG700PN1**



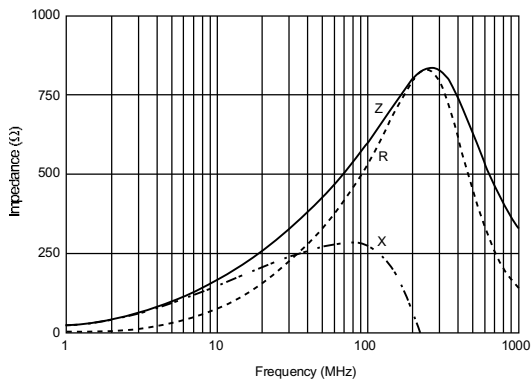
**BLM15AG121PN1**



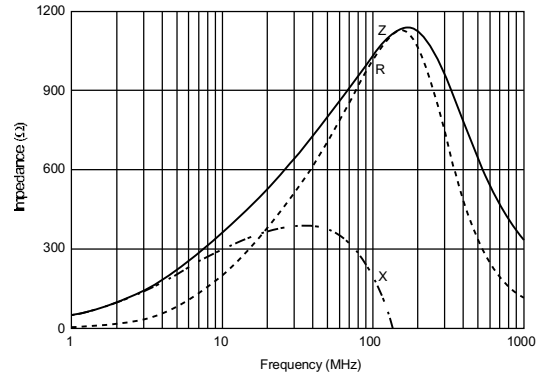
**BLM15AG221PN1**



**BLM15AG601PN1**

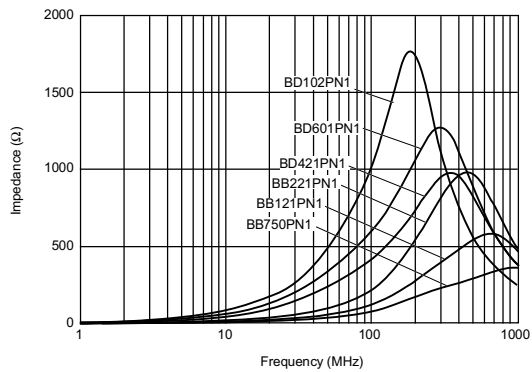


**BLM15AG102PN1**



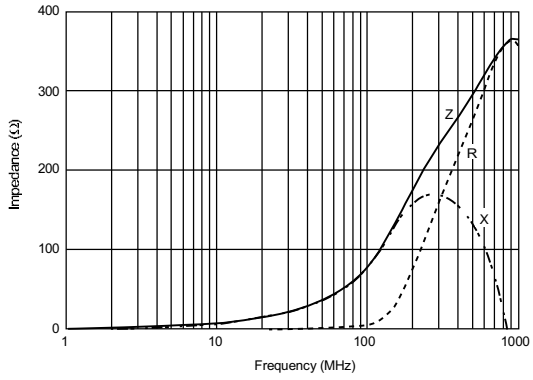
**Impedance-Frequency (Typical)**

**BLA15B Series**

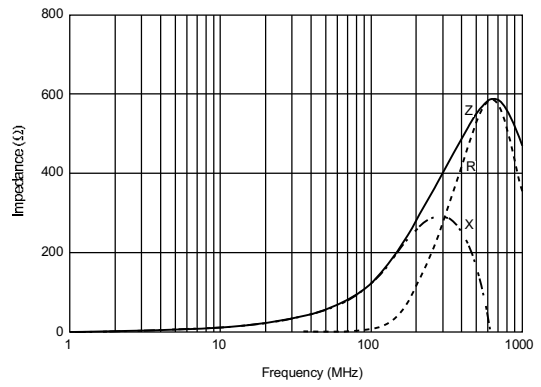


### ■ Impedance-Frequency Characteristics

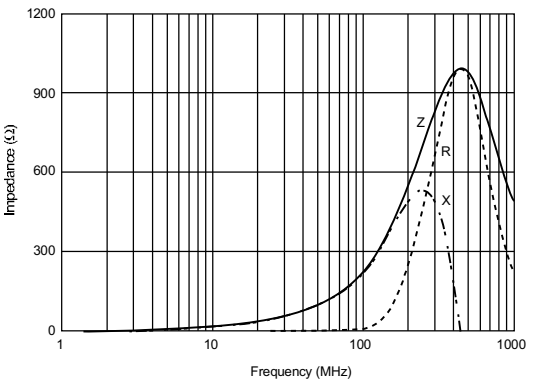
BLM15BB750PN1



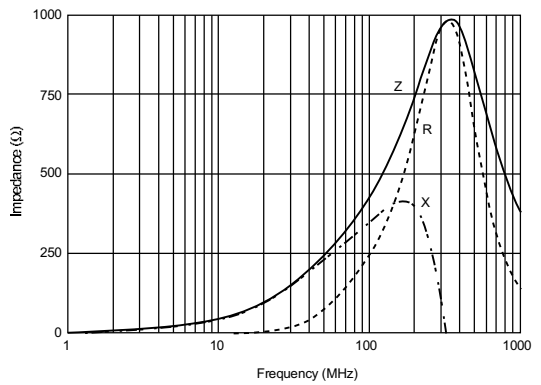
BLM15BB121PN1



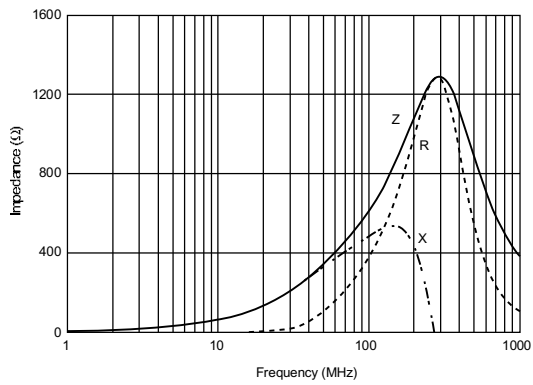
BLM15BB221PN1



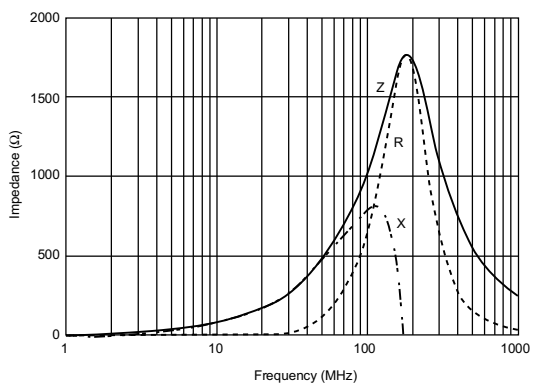
BLM15BD421PN1



BLM15BD601PN1

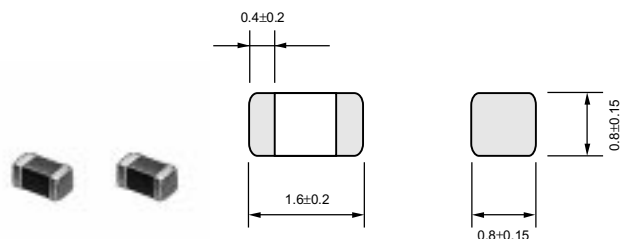


BLM15BD102PN1





## BLM18 Series(1608 Size)



in mm

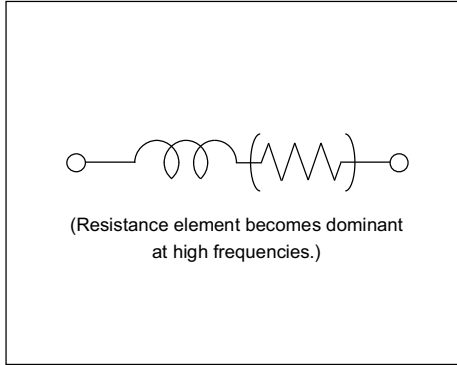
Part Number	Impedance (at 100MHz) (ohm)	Rated Current (mA)	DC Resistance(max.) (ohm)	Operating Temperature Range (°C)
BLM18AG121SN1	120 ±25%	200	0.20	-55 to 125
BLM18AG151SN1	150 ±25%	200	0.25	-55 to 125
BLM18AG221SN1	220 ±25%	200	0.30	-55 to 125
BLM18AG331SN1	330 ±25%	200	0.45	-55 to 125
BLM18AG471SN1	470 ±25%	200	0.50	-55 to 125
BLM18AG601SN1	600 ±25%	200	0.50	-55 to 125
BLM18AG102SN1	1000 ±25%	100	0.70	-55 to 125
BLM18BA050SN1	5 ±25%	500	0.20	-55 to 125
BLM18BA100SN1	10 ±25%	500	0.25	-55 to 125
BLM18BA220SN1	22 ±25%	500	0.35	-55 to 125
BLM18BA470SN1	47 ±25%	300	0.55	-55 to 125
BLM18BA750SN1	75 ±25%	300	0.70	-55 to 125
BLM18BA121SN1	120 ±25%	200	0.90	-55 to 125
BLM18BB050SN1	5 ±25%	700	0.10	-55 to 125
BLM18BB100SN1	10 ±25%	500	0.15	-55 to 125
BLM18BB220SN1	22 ±25%	500	0.25	-55 to 125
BLM18BB470SN1	47 ±25%	500	0.30	-55 to 125
BLM18BB600SN1	60 ±25%	200	0.35	-55 to 125
BLM18BB750SN1	75 ±25%	200	0.35	-55 to 125
BLM18BB121SN1	120 ±25%	200	0.50	-55 to 125
BLM18BB141SN1	140 ±25%	200	0.55	-55 to 125
BLM18BB151SN1	150 ±25%	200	0.55	-55 to 125
BLM18BB221SN1	220 ±25%	200	0.65	-55 to 125
BLM18BB331SN1	330 ±25%	200	0.75	-55 to 125
BLM18BB471SN1	470 ±25%	50	1.00	-55 to 125
BLM18BD121SN1	120 ±25%	200	0.40	-55 to 125
BLM18BD151SN1	150 ±25%	200	0.40	-55 to 125
BLM18BD221SN1	220 ±25%	200	0.45	-55 to 125
BLM18BD331SN1	330 ±25%	200	0.5	-55 to 125
BLM18BD421SN1	420 ±25%	200	0.55	-55 to 125
BLM18BD471SN1	470 ±25%	200	0.55	-55 to 125
BLM18BD601SN1	600 ±25%	200	0.65	-55 to 125
BLM18BD102SN1	1000 ±25%	100	0.85	-55 to 125
BLM18BD152SN1	1500 ±25%	50	1.20	-55 to 125
BLM18BD182SN1	1800 ±25%	50	1.50	-55 to 125
BLM18BD222SN1	2200 ±25%	50	1.50	-55 to 125
BLM18BD252SN1	2500 ±25%	50	1.50	-55 to 125
BLM18PG300SN1	30 (Typ.)	1000	0.05	-55 to 125
BLM18PG600SN1	60 (Typ.)	500	0.10	-55 to 125
BLM18RK121SN1	120 ±25%	200	0.25	-55 to 125
BLM18RK221SN1	220 ±25%	200	0.30	-55 to 125
BLM18RK471SN1	470 ±25%	200	0.50	-55 to 125

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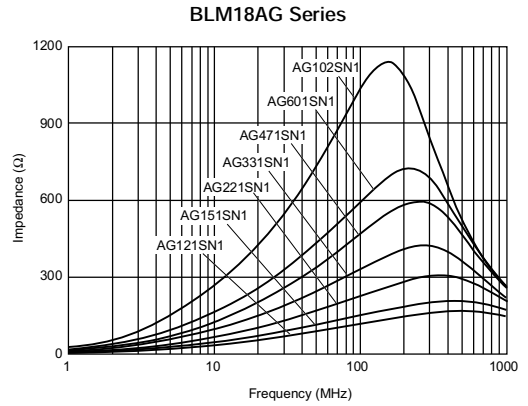
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Part Number	Impedance (at 100MHz) (ohm)	Rated Current (mA)	DC Resistance(max.) (ohm)	Operating Temperature Range (°C)
<b>BLM18RK601SN1</b>	600 ±25%	200	0.60	-55 to 125
<b>BLM18RK102SN1</b>	1000 ±25%	100	0.80	-55 to 125

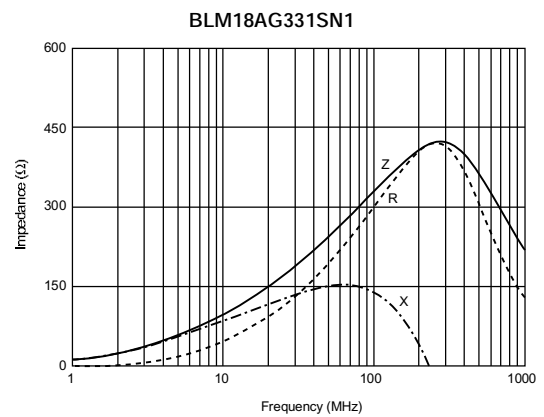
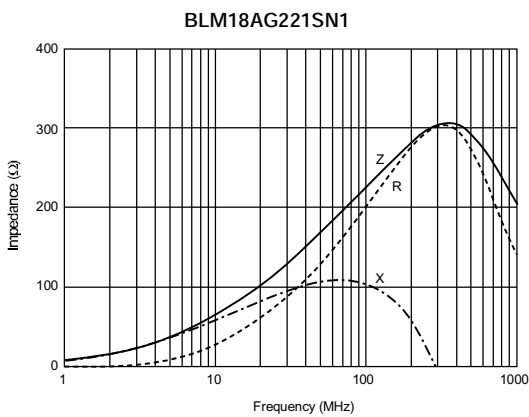
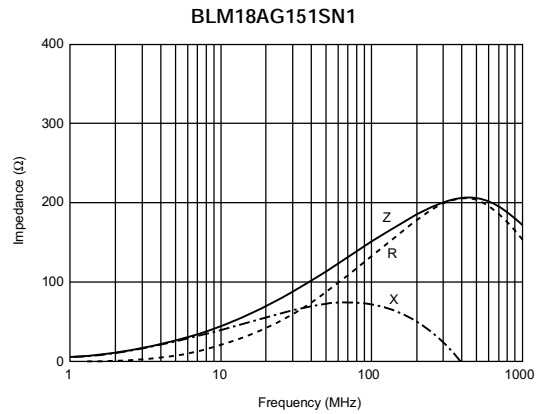
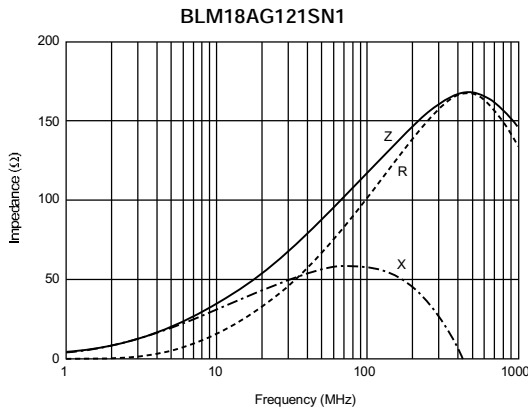
■ Equivalent Circuit



■ Impedance-Frequency (Typical)



■ Impedance-Frequency Characteristics



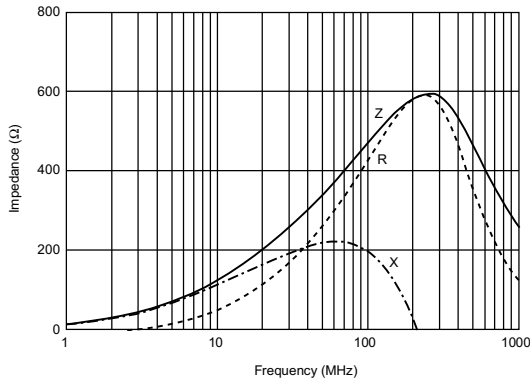
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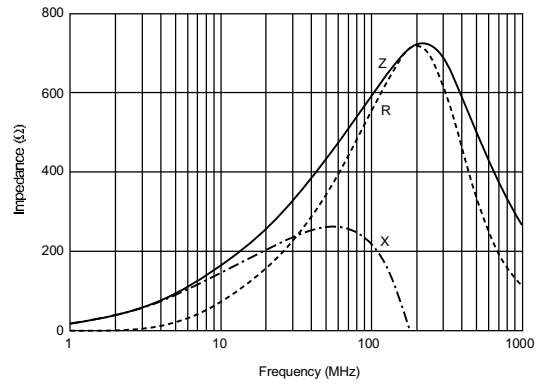
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**Impedance-Frequency Characteristics**

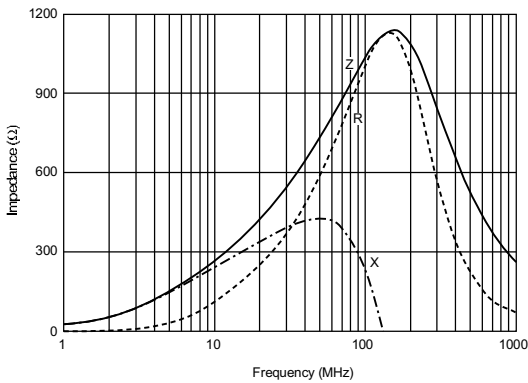
**BLM18AG471SN1**



**BLM18AG601SN1**

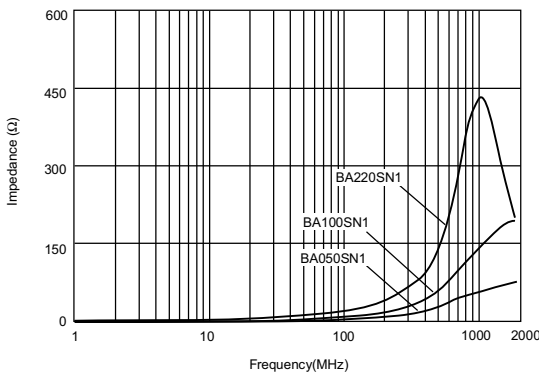


**BLM18AG102SN1**

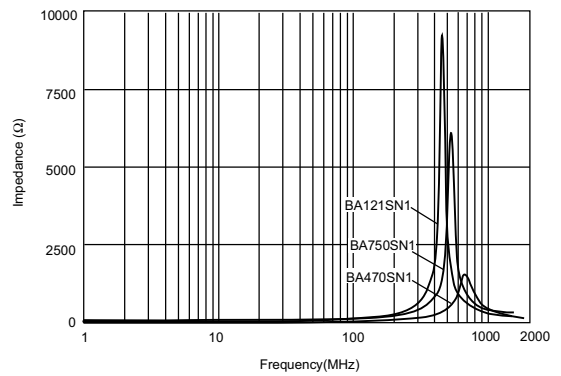


**Impedance-Frequency (Typical)**

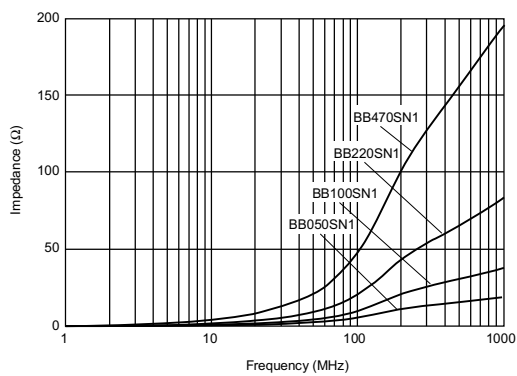
**BLM18BA\_SN1(5-22ohm)**



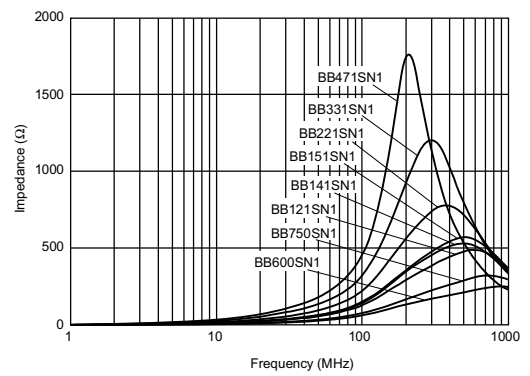
**BLM18BA\_SN1(47-120ohm)**



**BLM18BB\_SN1(5-47ohm)**



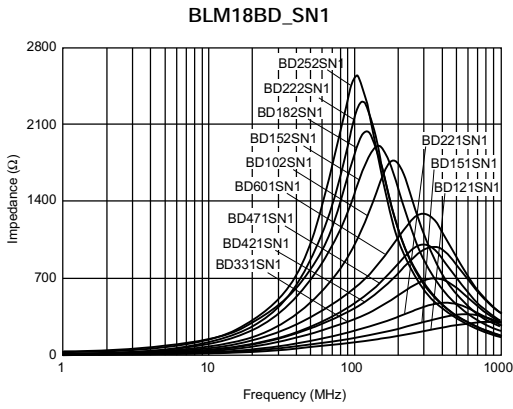
**BLM18BB\_SN1(60-470ohm)**



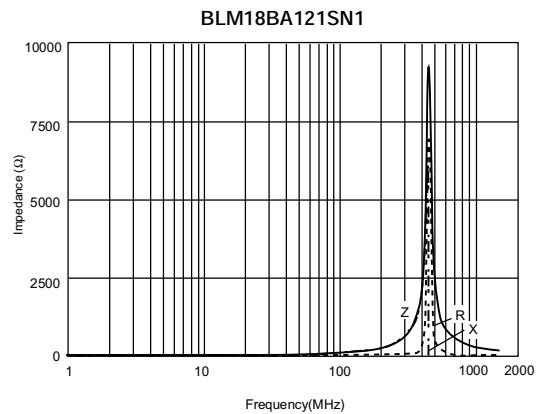
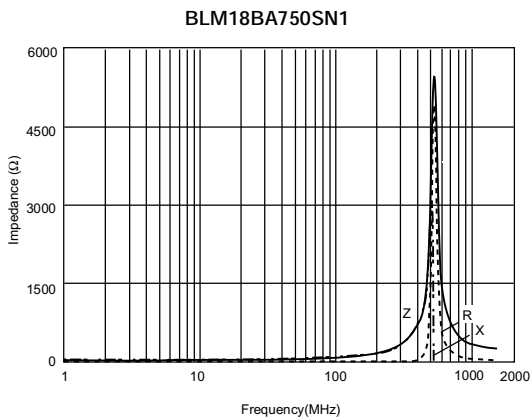
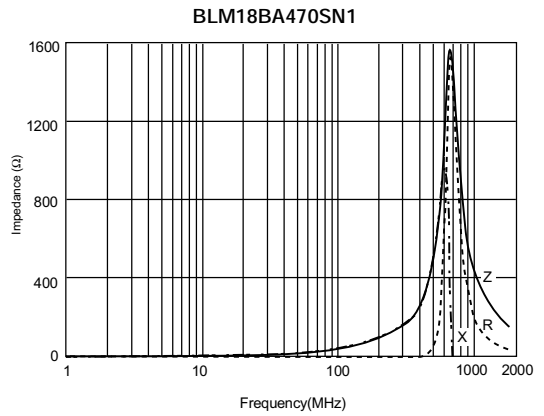
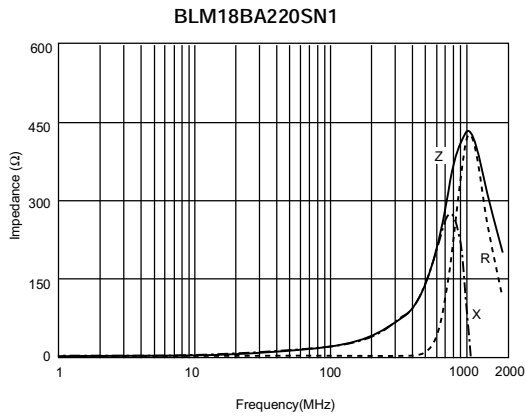
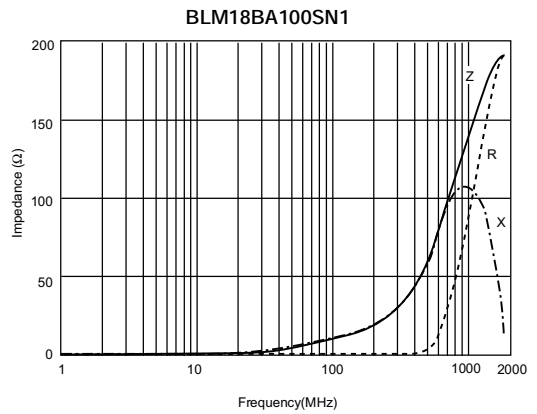
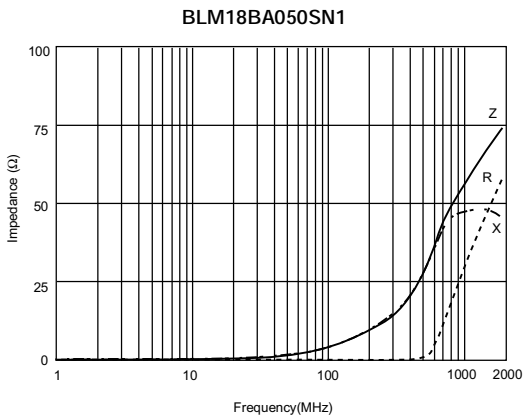
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**Impedance-Frequency (Typical)**



**Impedance-Frequency Characteristics**

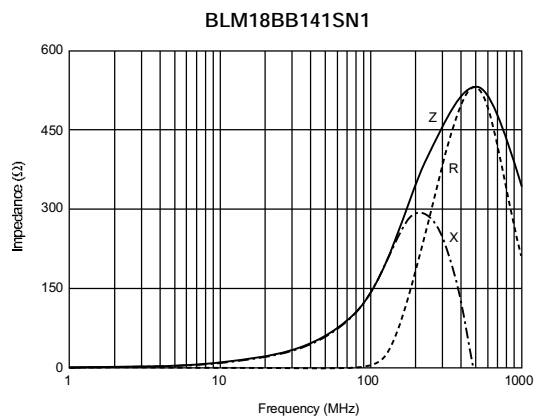
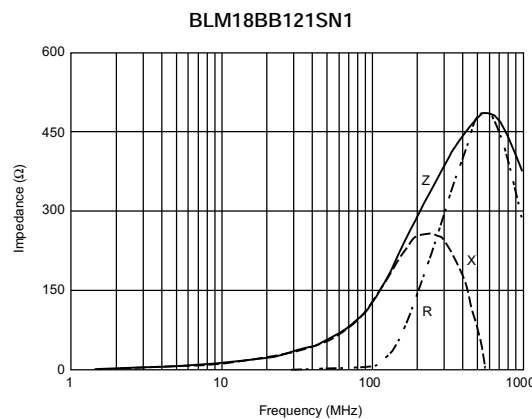
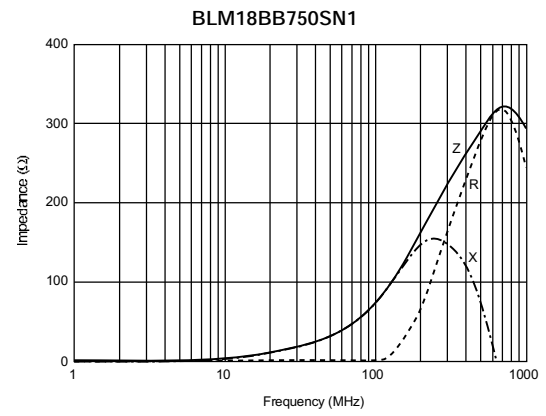
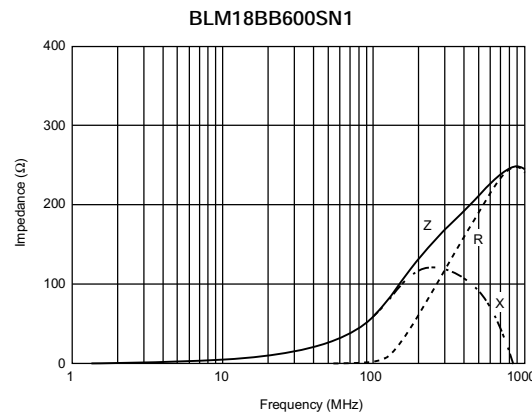
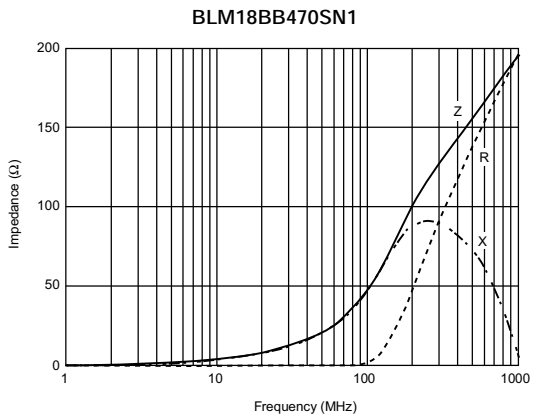
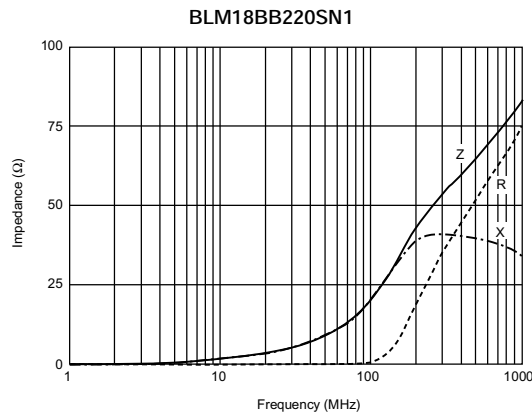
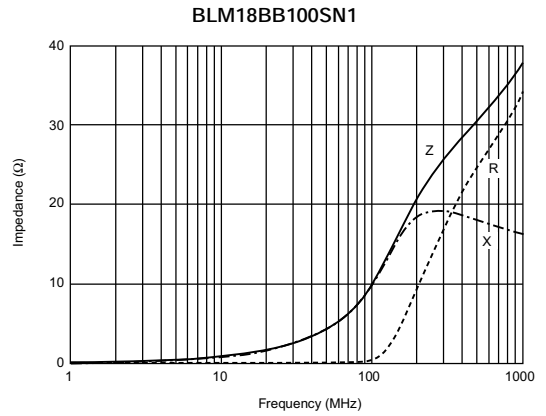
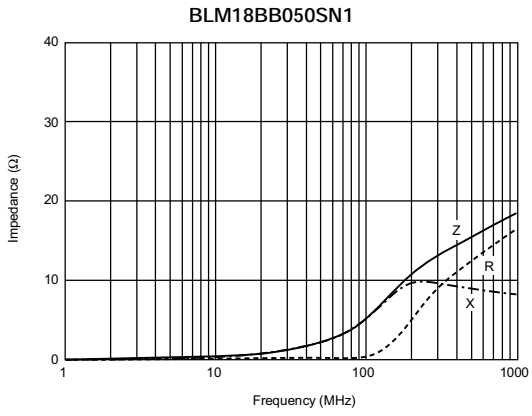



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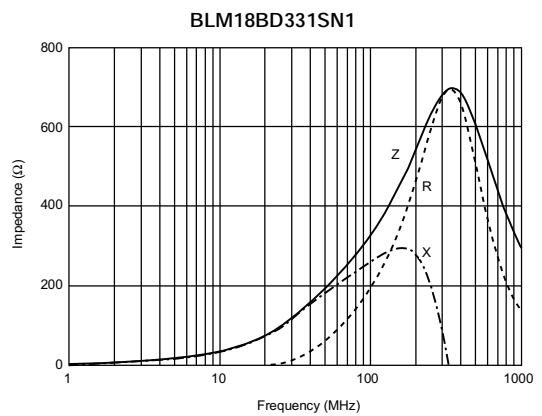
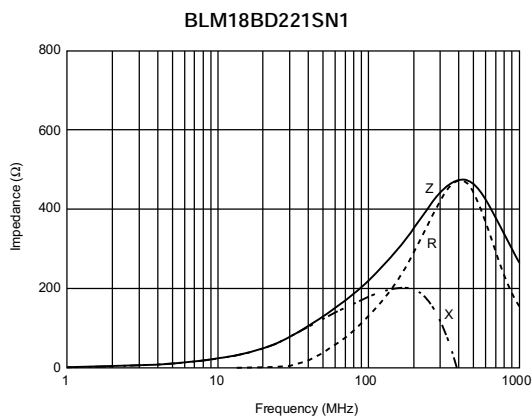
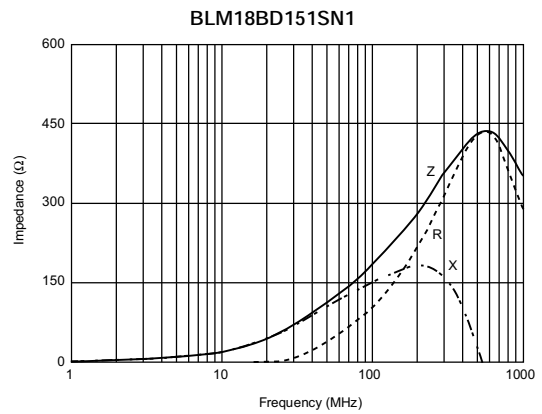
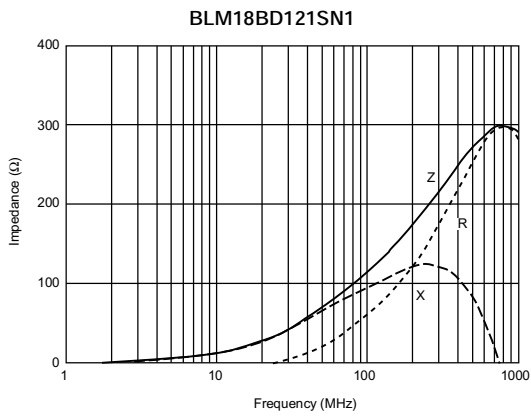
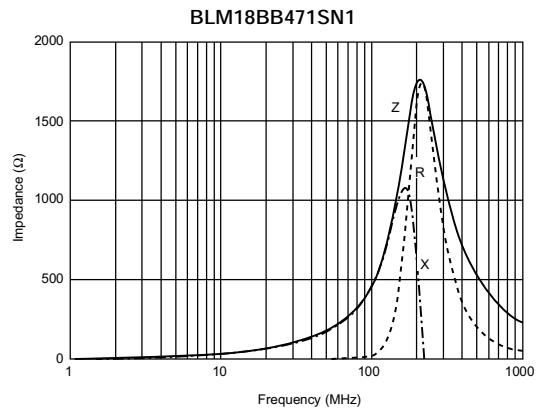
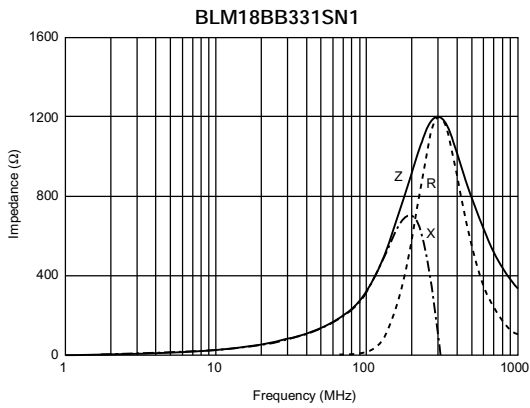
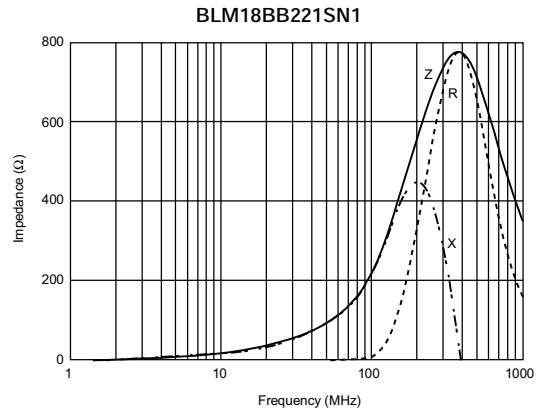
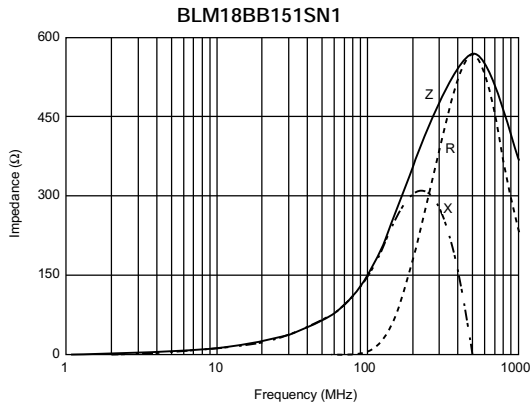
### Impedance-Frequency Characteristics




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**Impedance-Frequency Characteristics**

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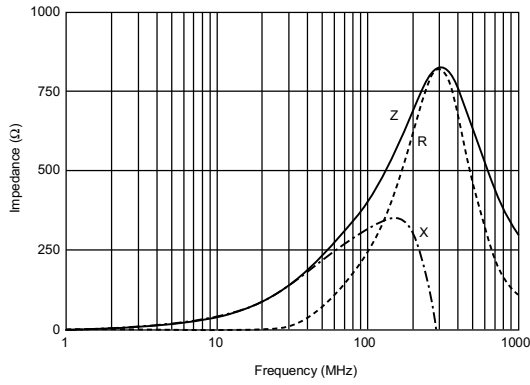
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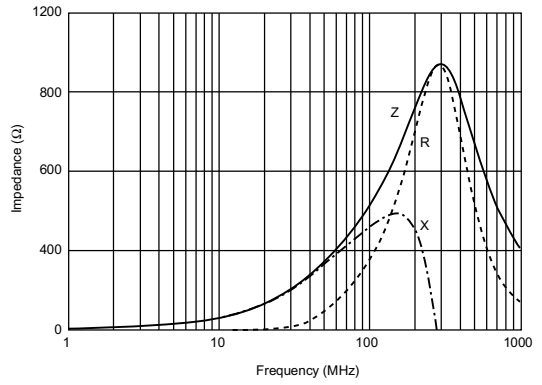
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**Impedance-Frequency Characteristics**

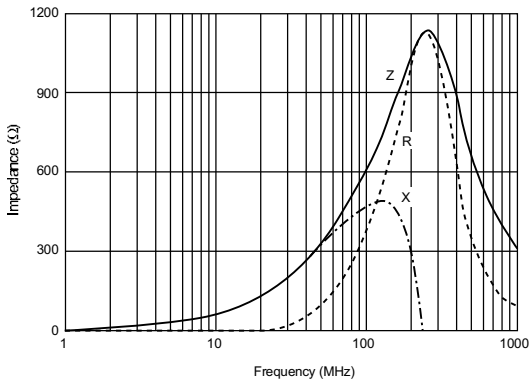
**BLM18BD421SN1**



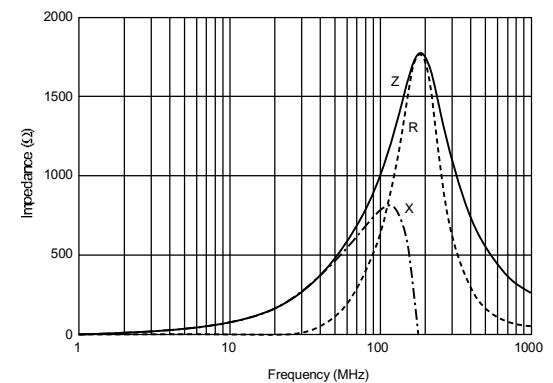
**BLM18BD471SN1**



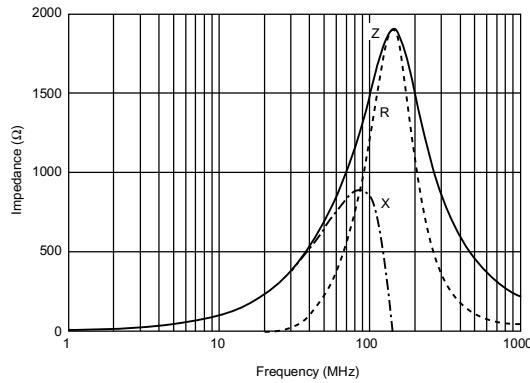
**BLM18BD601SN1**



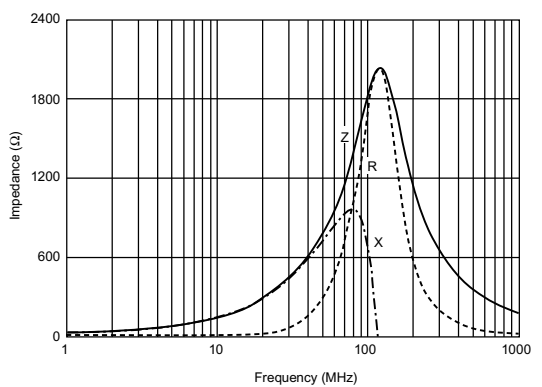
**BLM18BD102SN1**



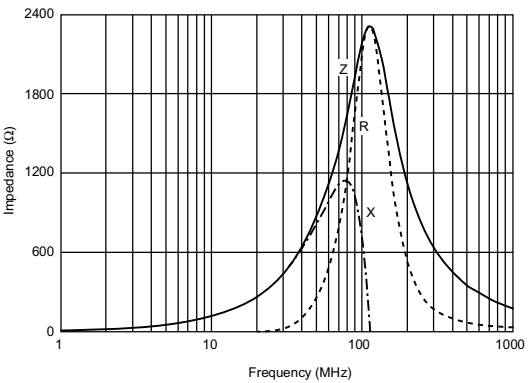
**BLM18BD152SN1**



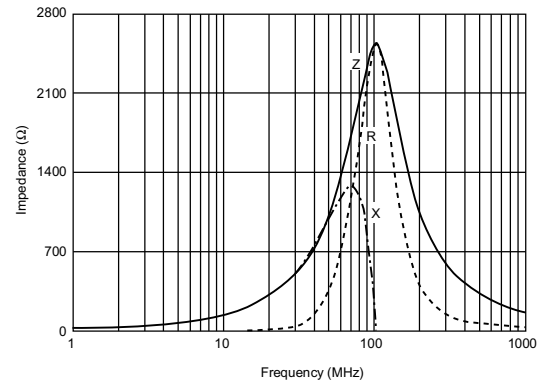
**BLM18BD182SN1**



**BLM18BD222SN1**

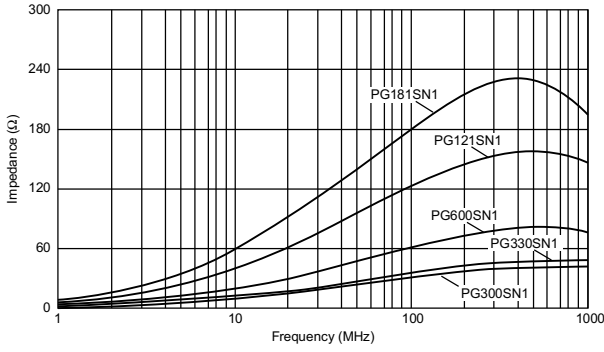


**BLM18BD252SN1**



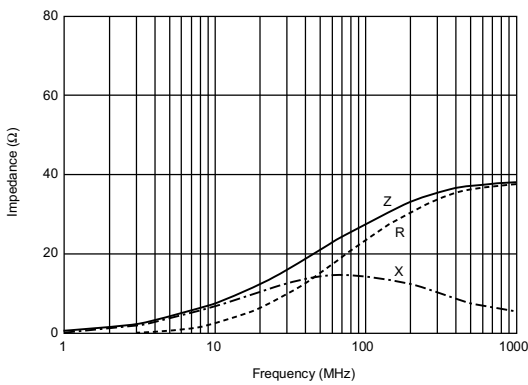
■ Impedance-Frequency (Typical)

BLM18P Series

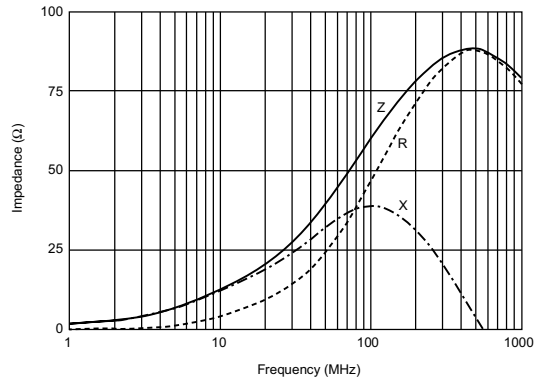


■ Impedance-Frequency Characteristics

BLM18PG300SN1

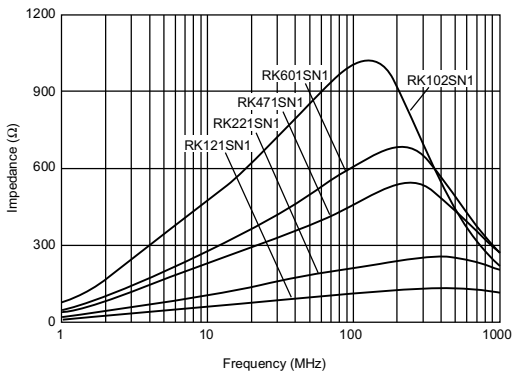


BLM18PG600SN1



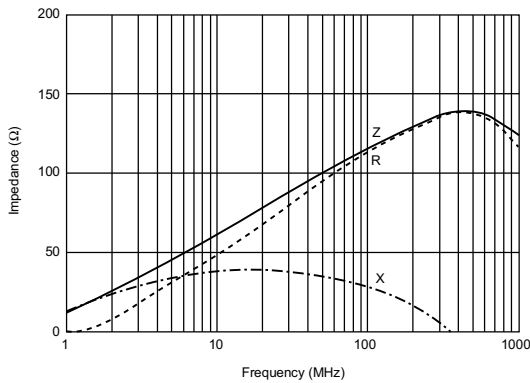
■ Impedance-Frequency (Typical)

BLM18R Series

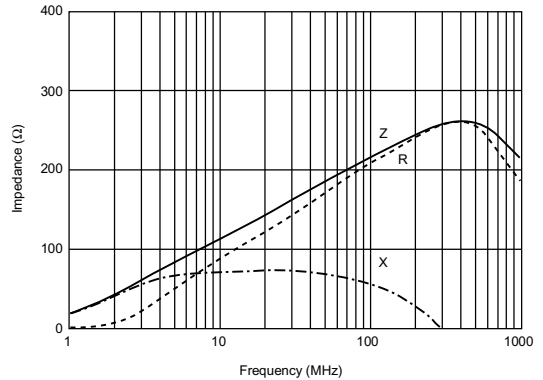


■ Impedance-Frequency Characteristics

BLM18RK121SN1



BLM18RK221SN1



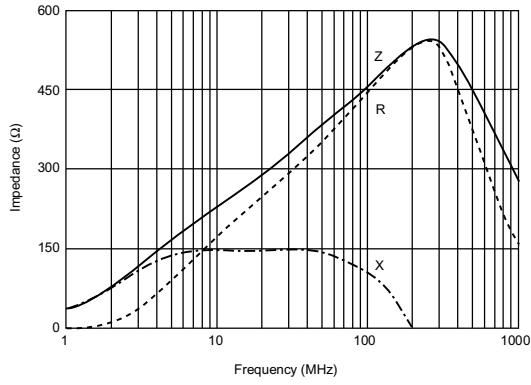


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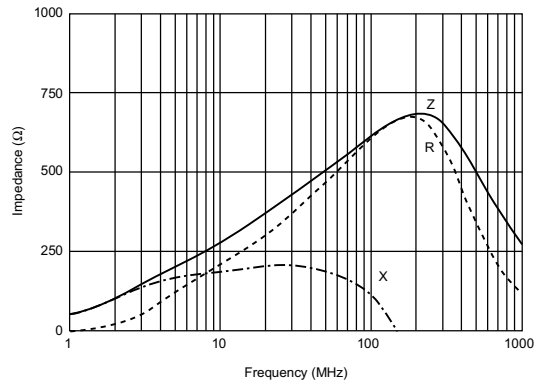
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### Impedance-Frequency Characteristics

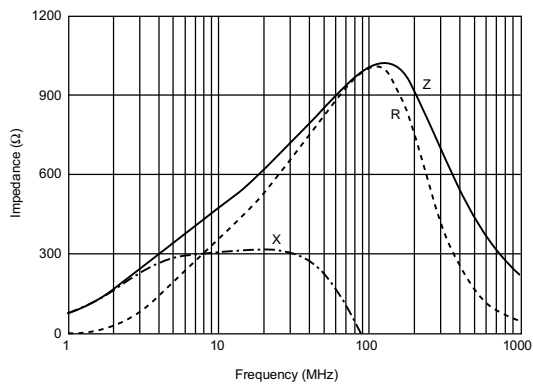
BLM18RK471SN1



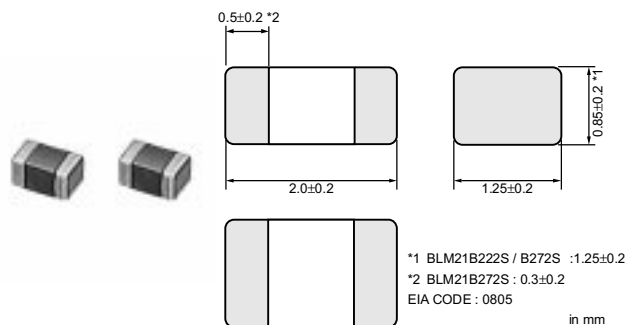
BLM18RK601SN1



BLM18RK102SN1



**BLM21 Series(2012 Size)**



Part Number	Impedance (at 100MHz) (ohm)	Rated Current (mA)	DC Resistance(max.) (ohm)	Operating Temperature Range (°C)
BLM21AG121SN1	120 ±25%	200	0.15	-55 to 125
BLM21AG151SN1	150 ±25%	200	0.15	-55 to 125
BLM21AG221SN1	220 ±25%	200	0.20	-55 to 125
BLM21AG331SN1	330 ±25%	200	0.25	-55 to 125
BLM21AG471SN1	470 ±25%	200	0.25	-55 to 125
BLM21AG601SN1	600 ±25%	200	0.30	-55 to 125
BLM21AG102SN1	1000 ±25%	200	0.45	-55 to 125
BLM21AH102SN1	1000 ±25%	200	0.45	-55 to 85
BLM21AJ401SN1	400 ±25%	200	0.85	-55 to 125
BLM21AJ601SN1	600 ±25%	200	1.10	-55 to 125
BLM21BB050SN1	5 ±25%	500	0.07	-55 to 125
BLM21BB600SN1	60 ±25%	200	0.20	-55 to 125
BLM21BB750SN1	75 ±25%	200	0.25	-55 to 125
BLM21BB121SN1	120 ±25%	200	0.25	-55 to 125
BLM21BB151SN1	150 ±25%	200	0.25	-55 to 125
BLM21BB201SN1	200 ±25%	200	0.35	-55 to 125
BLM21BB221SN1	220 ±25%	200	0.35	-55 to 125
BLM21BB331SN1	330 ±25%	200	0.40	-55 to 125
BLM21BB471SN1	470 ±25%	200	0.45	-55 to 125
BLM21BD121SN1	120 ±25%	200	0.25	-55 to 125
BLM21BD151SN1	150 ±25%	200	0.25	-55 to 125
BLM21BD221SN1	220 ±25%	200	0.25	-55 to 125
BLM21BD331SN1	330 ±25%	200	0.30	-55 to 125
BLM21BD421SN1	420 ±25%	200	0.30	-55 to 125
BLM21BD471SN1	470 ±25%	200	0.35	-55 to 125
BLM21BD601SN1	600 ±25%	200	0.35	-55 to 125
BLM21BD751SN1	750 ±25%	200	0.40	-55 to 125
BLM21BD102SN1	1000 ±25%	200	0.40	-55 to 125
BLM21BD152SN1	1500 ±25%	200	0.45	-55 to 125
BLM21BD182SN1	1800 ±25%	200	0.50	-55 to 125
BLM21BD222TN1	2200 ±25%	200	0.60	-55 to 125
BLM21BD222SN1	2250 (Typ.)	200	0.60	-55 to 125
BLM21BD272SN1	2700 ±25%	200	0.80	-55 to 125
BLM21PG220SN1	22 (Typ.)	6000	0.01	-55 to 125
BLM21PG300SN1	30 (Typ.)	3000	0.015	-55 to 125
BLM21PG600SN1	60 (Typ.)	3000	0.025	-55 to 125
BLM21PG221SN1	220 (Typ.)	2000	0.050	-55 to 125
BLM21PG331SN1	330 (Typ.)	1500	0.09	-55 to 125
BLM21RK121SN1	120 ±25%	200	0.15	-55 to 125
BLM21RK221SN1	220 ±25%	200	0.20	-55 to 125
BLM21RK471SN1	470 ±25%	200	0.25	-55 to 125
BLM21RK601SN1	600 ±25%	200	0.30	-55 to 125

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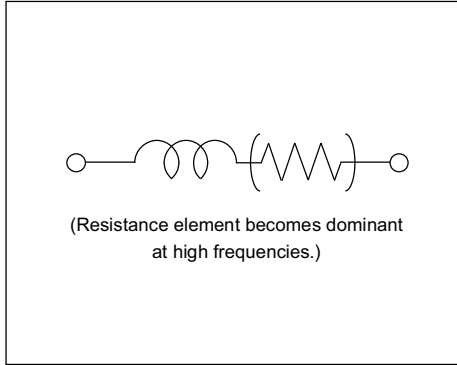
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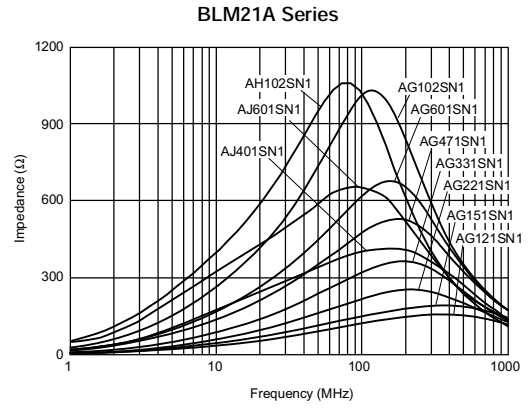
Part Number	Impedance (at 100MHz) (ohm)	Rated Current (mA)	DC Resistance(max.) (ohm)	Operating Temperature Range (°C)
<b>BLM21RK102SN1</b>	1000 ±25%	200	0.50	-55 to 125

BLM21P series require derating above 85°C ambient. Please contact us for details.

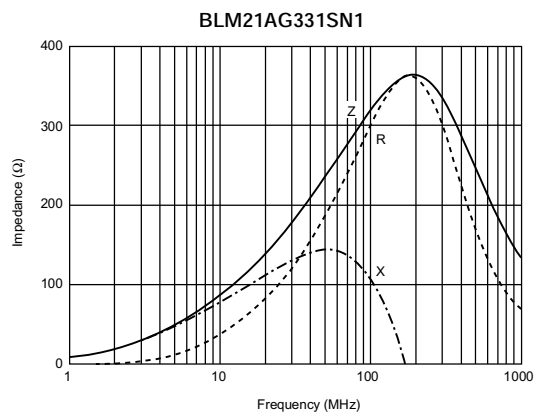
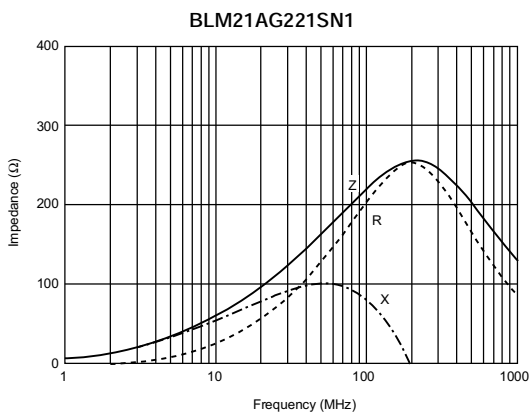
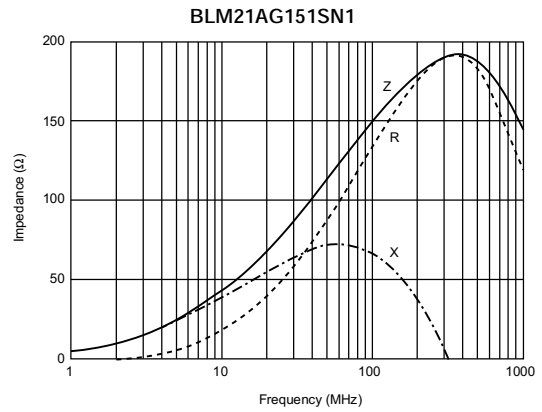
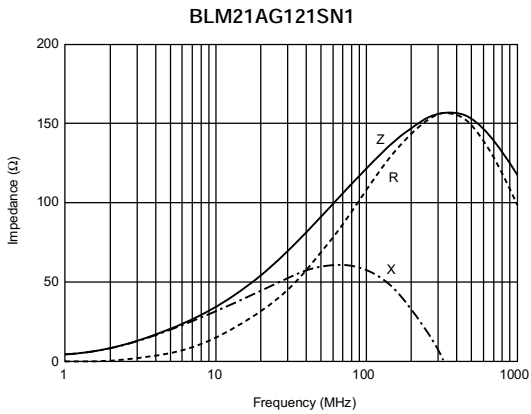
■ Equivalent Circuit




■ Impedance-Frequency (Typical)



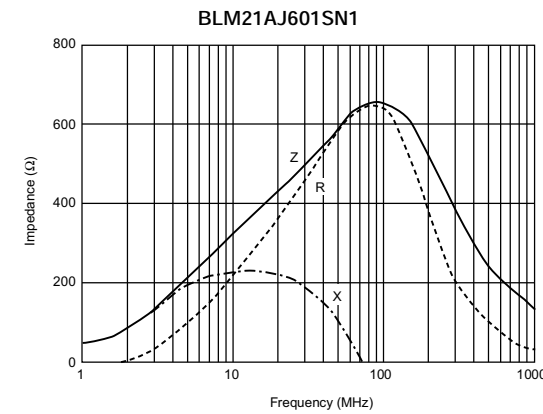
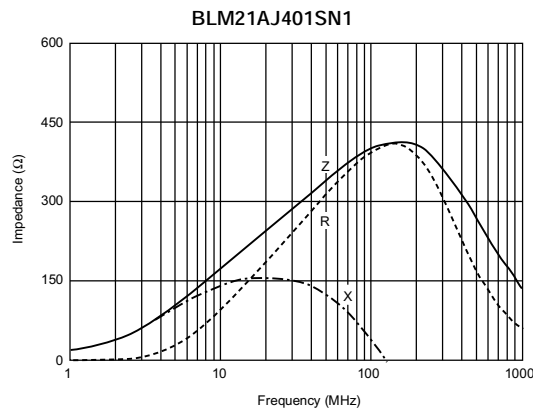
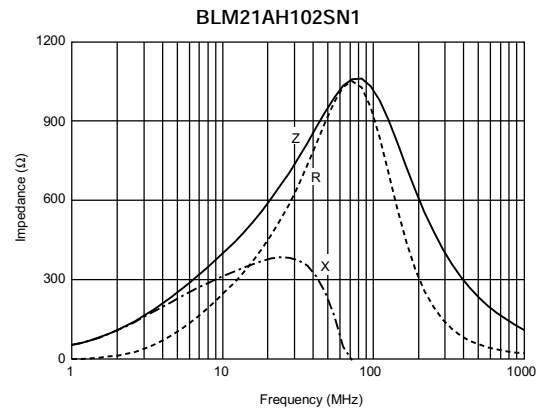
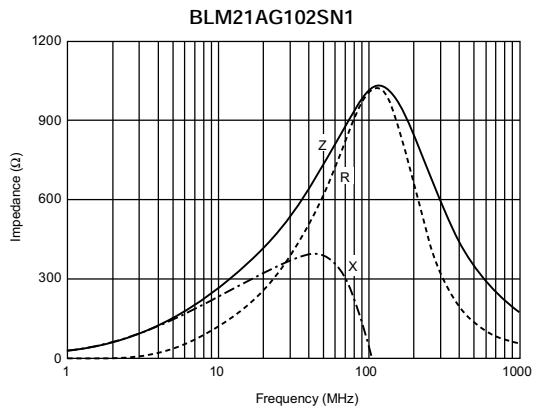
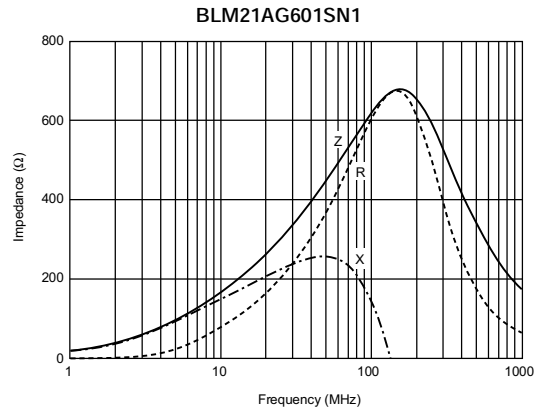
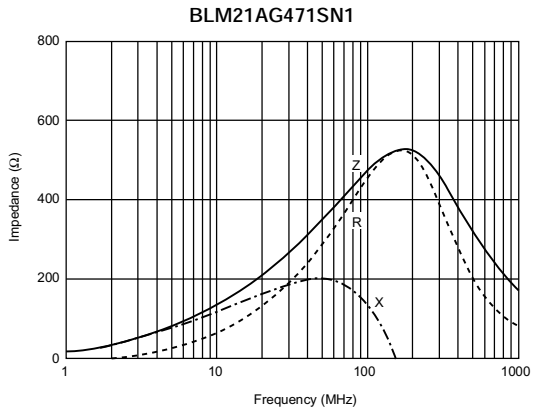
■ Impedance-Frequency Characteristics



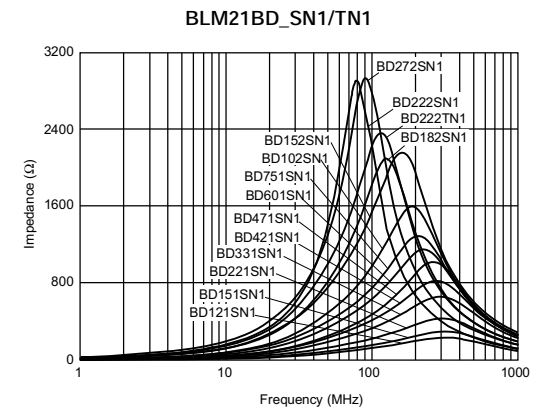
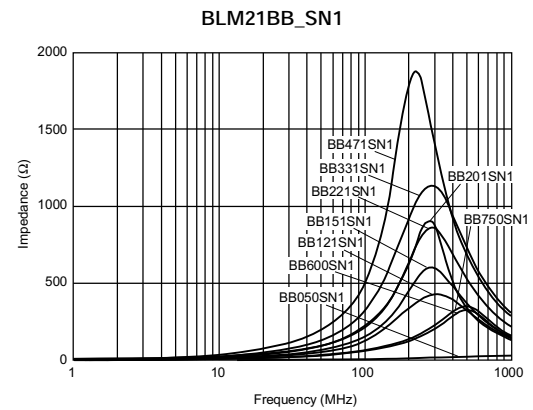
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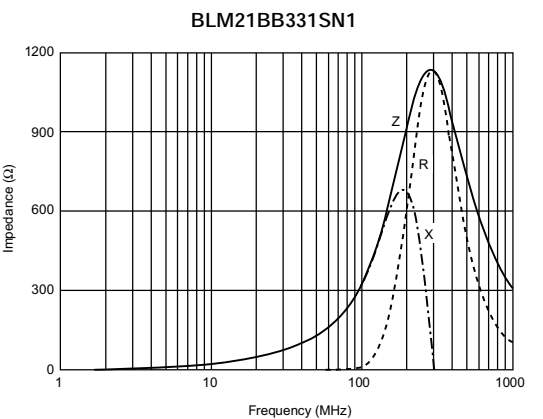
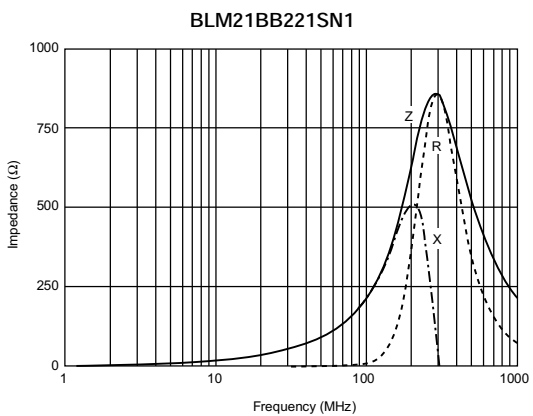
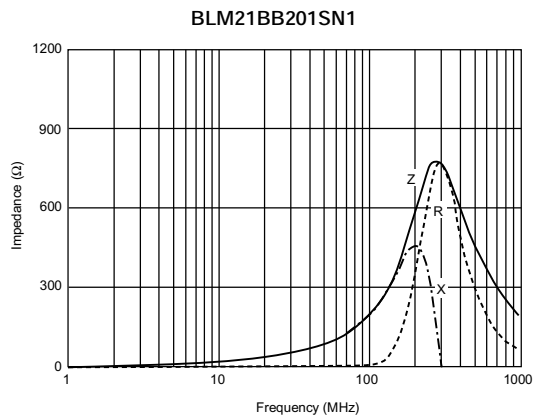
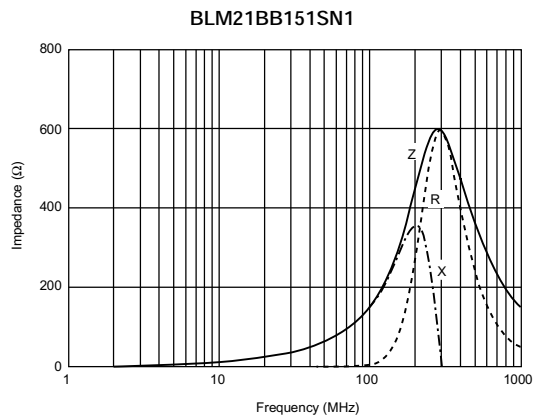
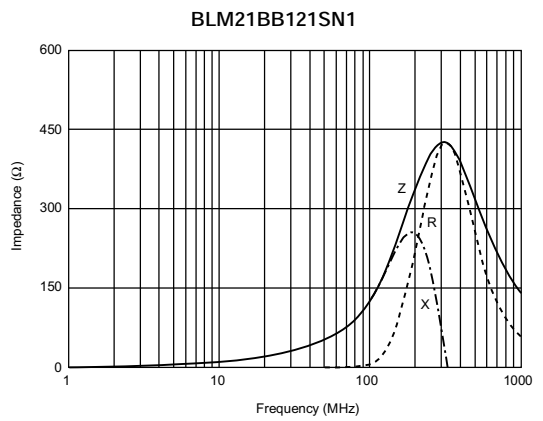
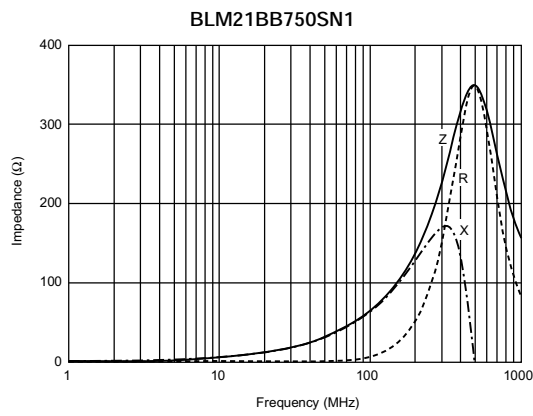
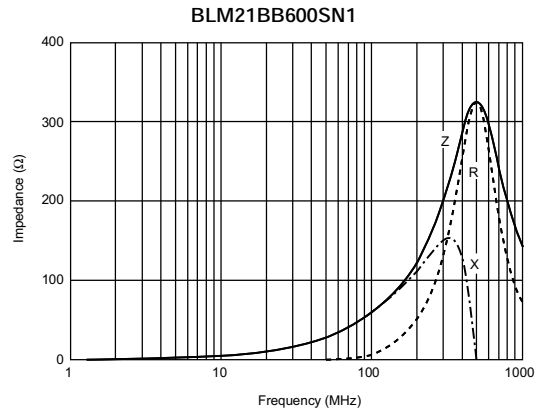
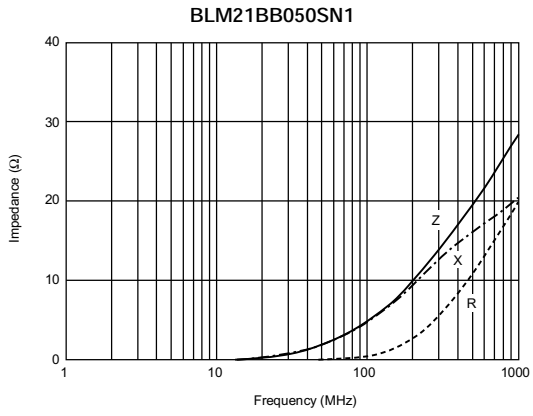
■ Impedance-Frequency Characteristics



■ Impedance-Frequency (Typical)



■ Impedance-Frequency Characteristics



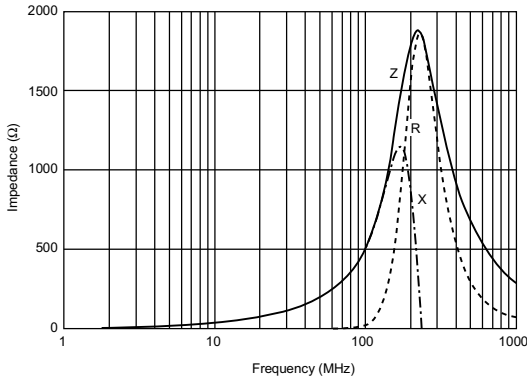
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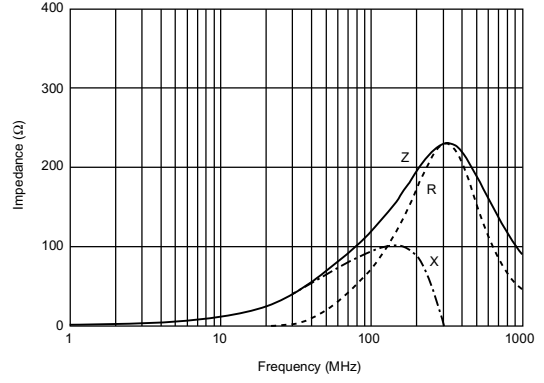
### Impedance-Frequency Characteristics

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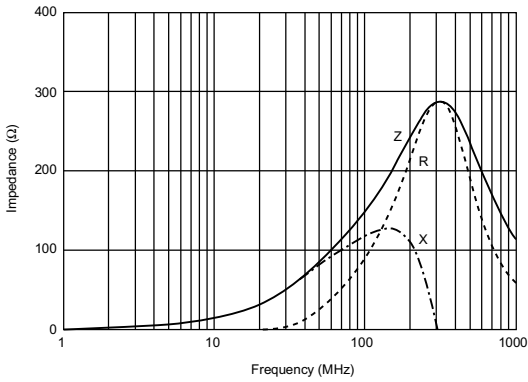
BLM21BB471SN1



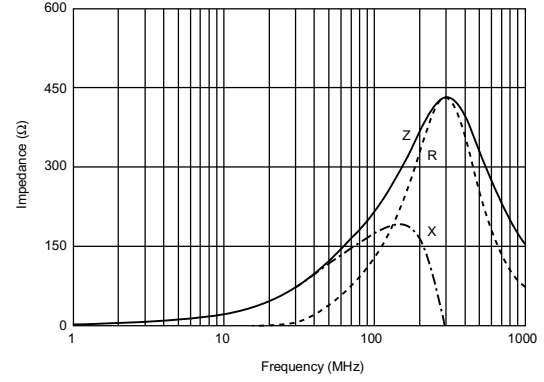
BLM21BD121SN1



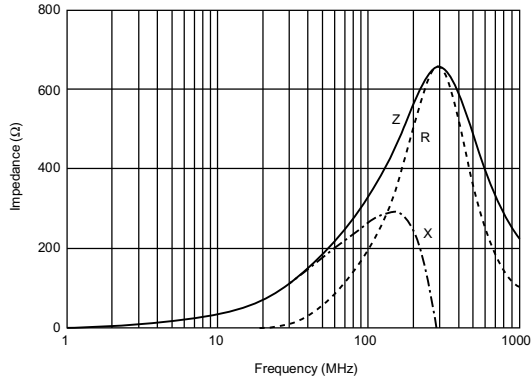
BLM21BD151SN1



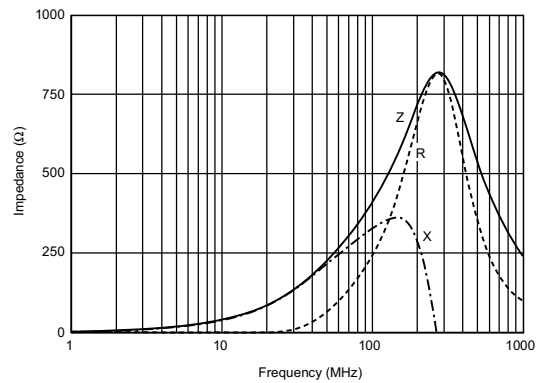
BLM21BD221SN1



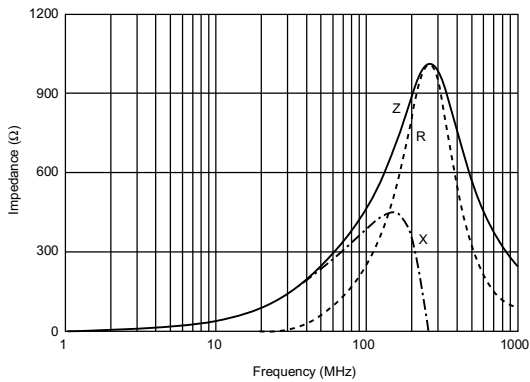
BLM21BD331SN1



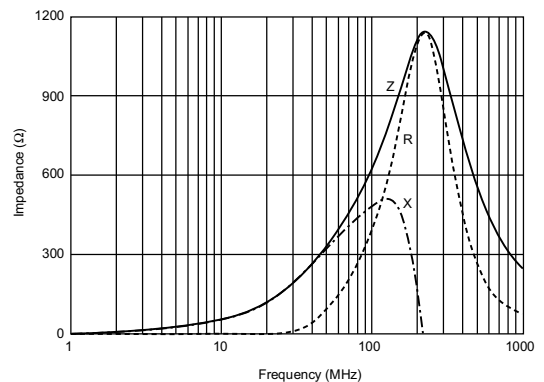
BLM21BD421SN1



BLM21BD471SN1



BLM21BD601SN1



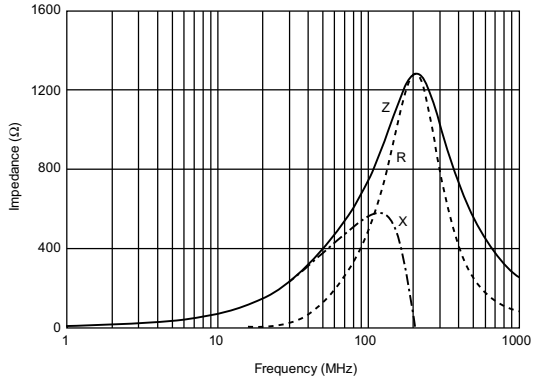
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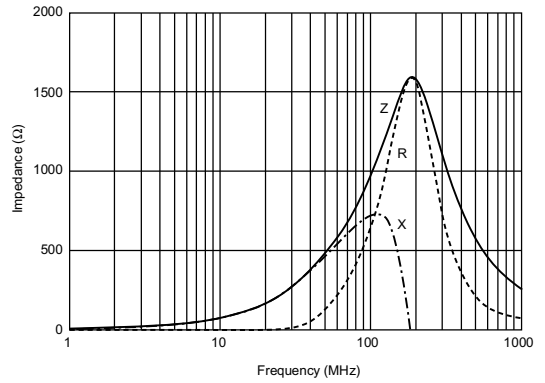
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### Impedance-Frequency Characteristics

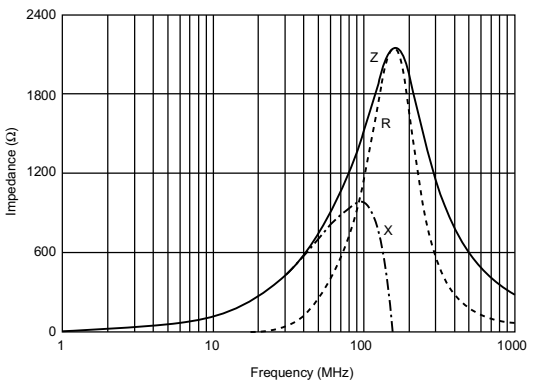
BLM21BD751SN1



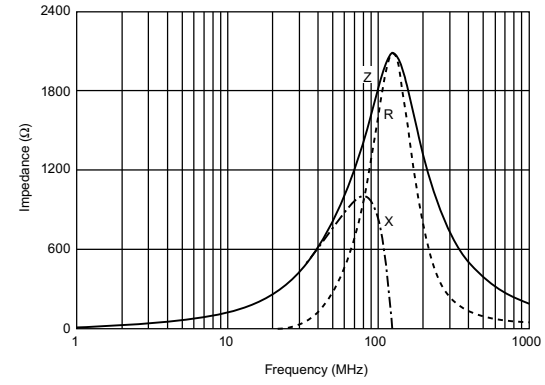
BLM21BD102SN1



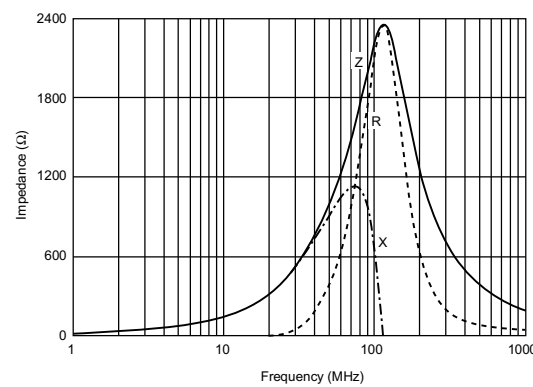
BLM21BD152SN1



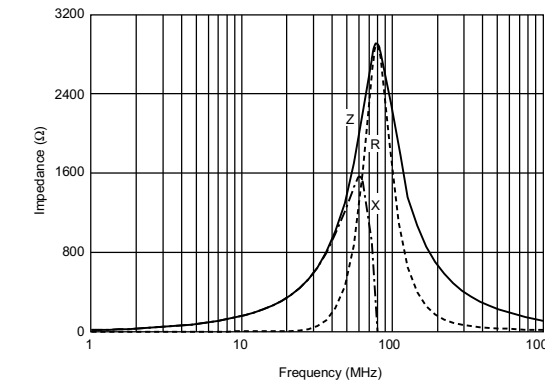
BLM21BD182SN1



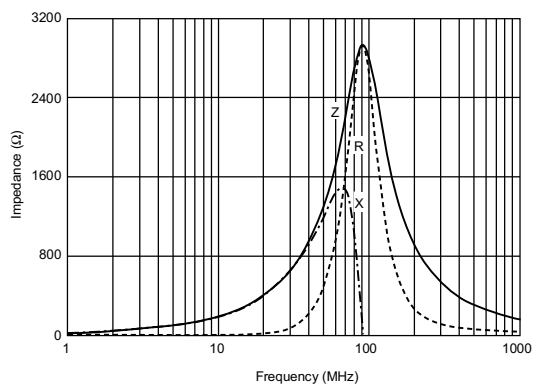
BLM21BD222TN1



BLM21BD222SN1

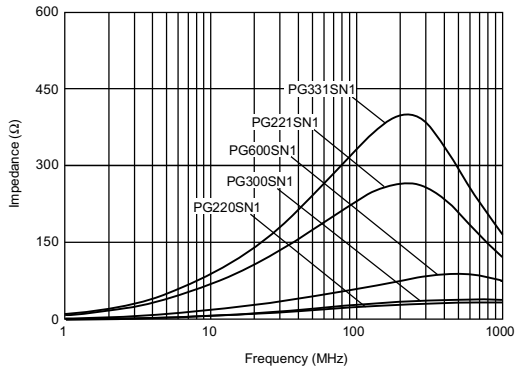


BLM21BD272SN1



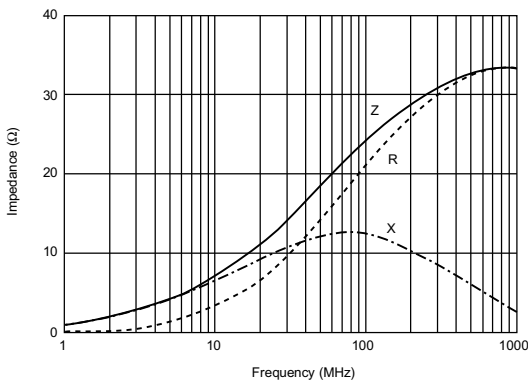
■ Impedance-Frequency (Typical)

BLM21P Series

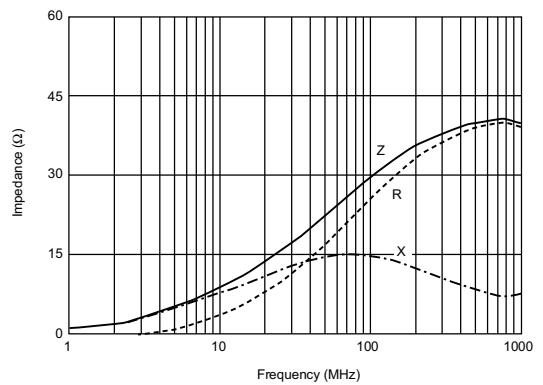


■ Impedance-Frequency Characteristics

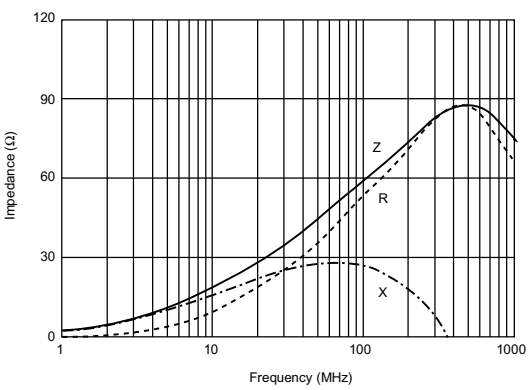
BLM21PG220SN1



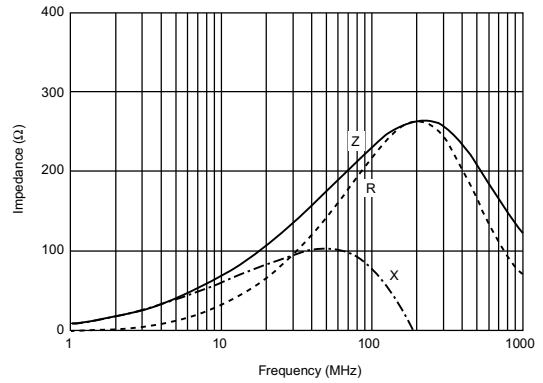
BLM21PG300SN1



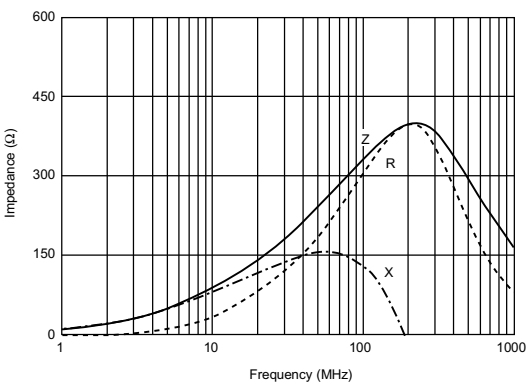
BLM21PG600SN1



BLM21PG221SN1



BLM21PG331SN1

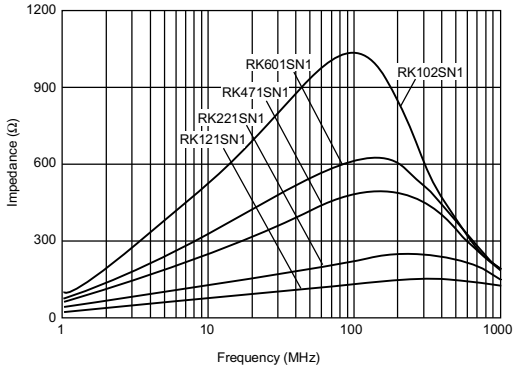




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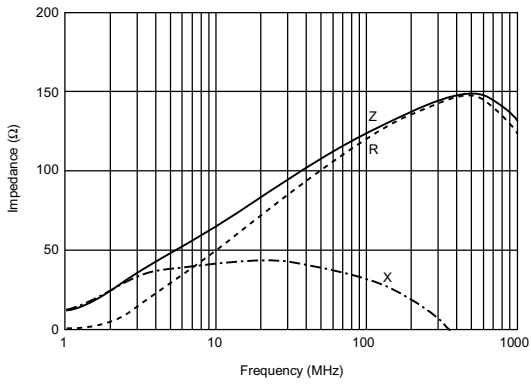
■ Impedance-Frequency (Typical)

BLM21R Series

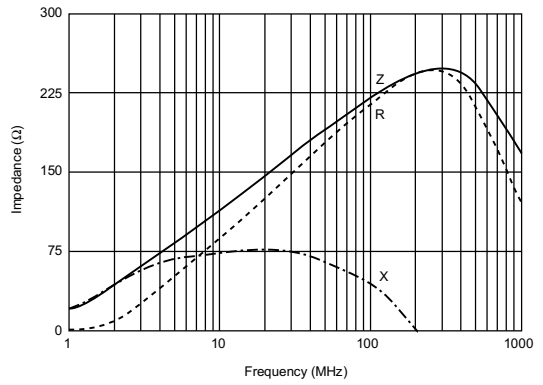


■ Impedance-Frequency Characteristics

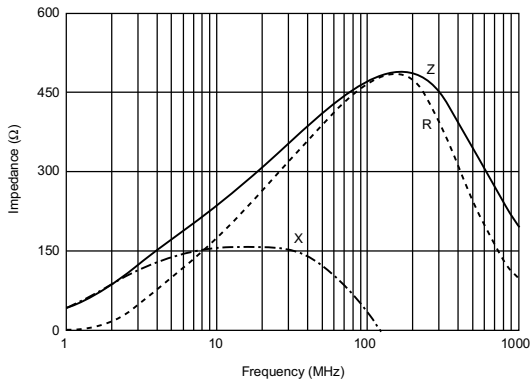
BLM21RK121SN1



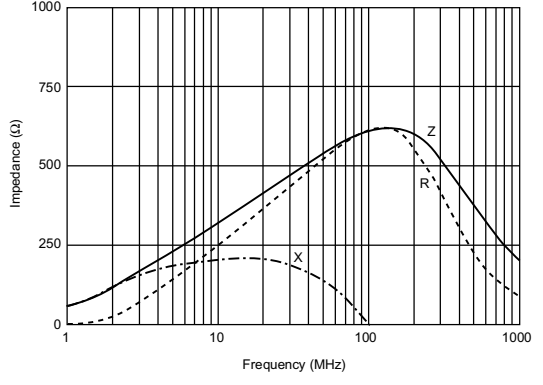
BLM21RK221SN1



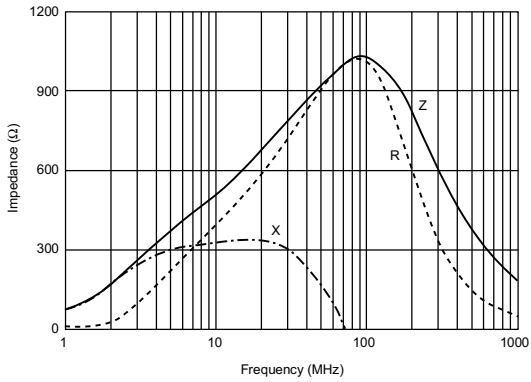
BLM21RK471SN1



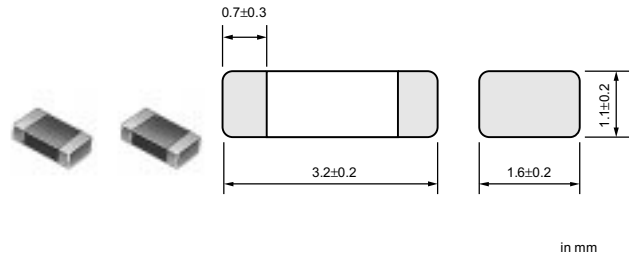
BLM21RK601SN1



BLM21RK102SN1



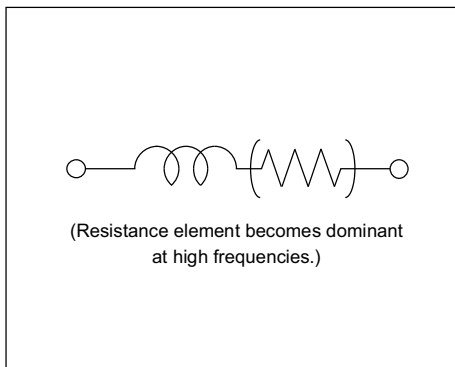
**BLM31 Series(3216 Size)**



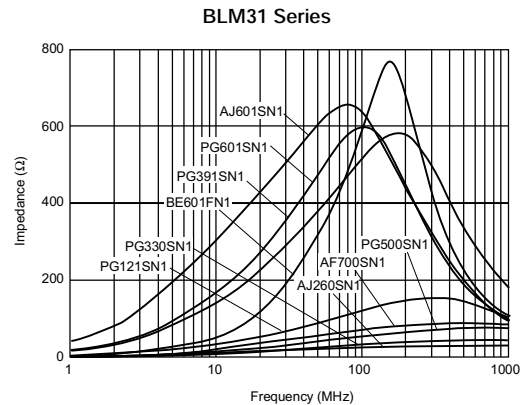
Part Number	Impedance (at 100MHz) (ohm)	Rated Current (mA)	DC Resistance(max.) (ohm)	Operating Temperature Range (°C)
BLM31AF700SN1	70 ±25%	200	0.15	-55 to 125
BLM31AJ260SN1	26 ±25%	500	0.05	-55 to 125
BLM31AJ601SN1	600 ±25%	200	0.90	-55 to 125
BLM31BE601FN1	600 ±25%	300	0.35	-55 to 125
BLM31PG330SN1	33 (Typ.)	6000	0.01	-55 to 125
BLM31PG500SN1	50 (Typ.)	3000	0.025	-55 to 125
BLM31PG121SN1	120 (Typ.)	3000	0.025	-55 to 125
BLM31PG391SN1	390 (Typ.)	2000	0.05	-55 to 125
BLM31PG601SN1	600 (Typ.)	1500	0.09	-55 to 125

BLM31P series require derating above 85°C ambient. Please contact us for details.

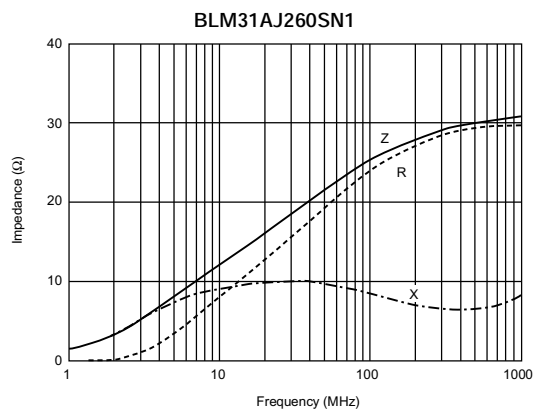
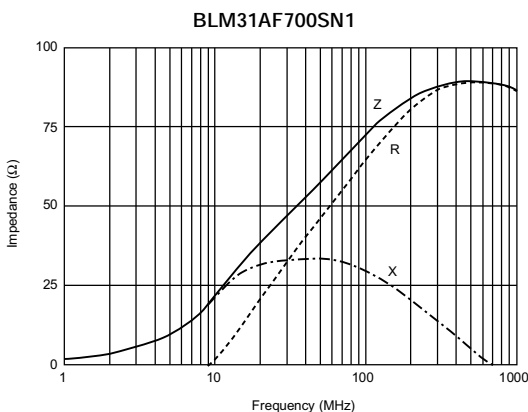
■ Equivalent Circuit




■ Impedance-Frequency (Typical)



■ Impedance-Frequency Characteristics

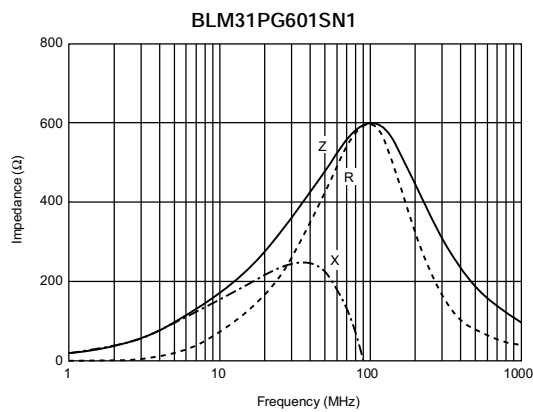
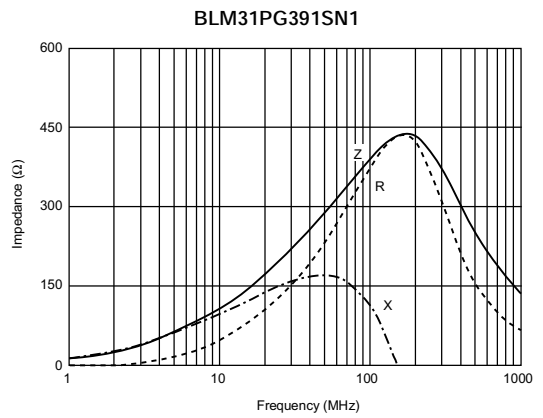
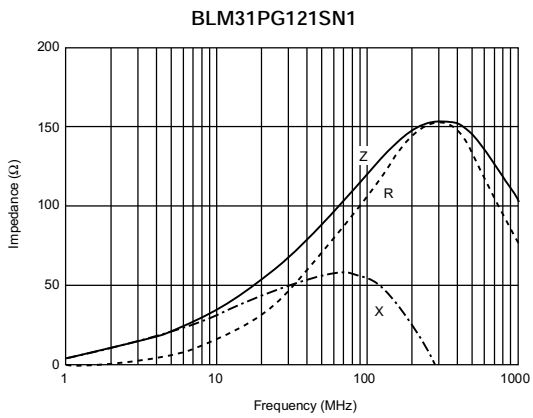
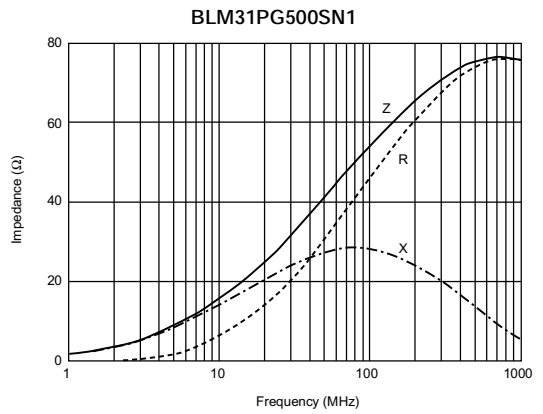
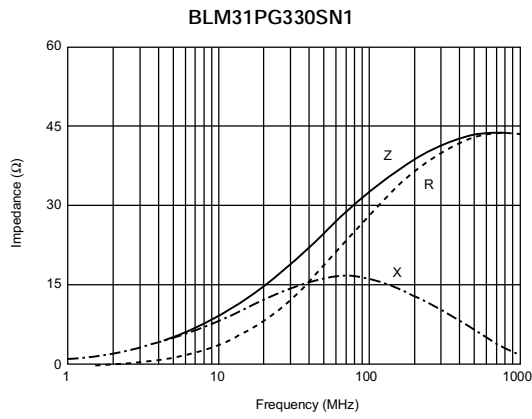
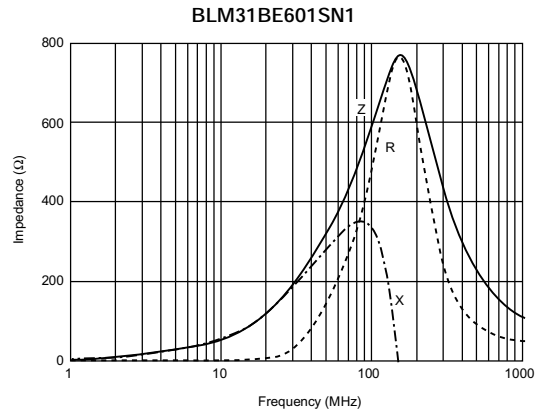
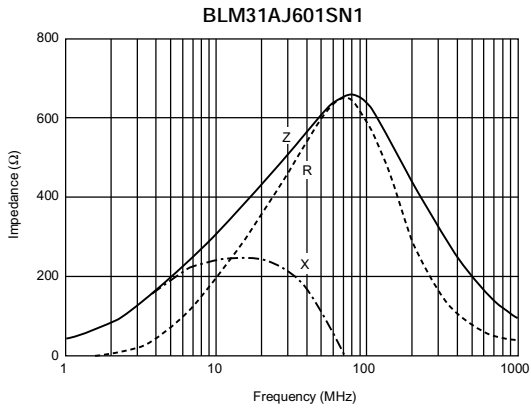


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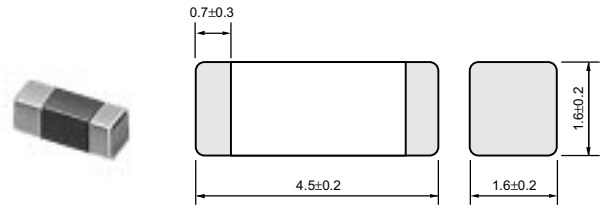
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**Impedance-Frequency Characteristics**



**BLM41 Series(4516 Size)**

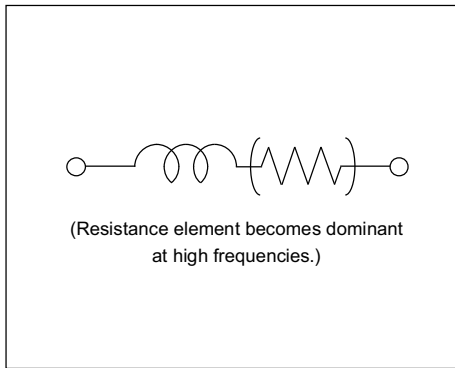


in mm

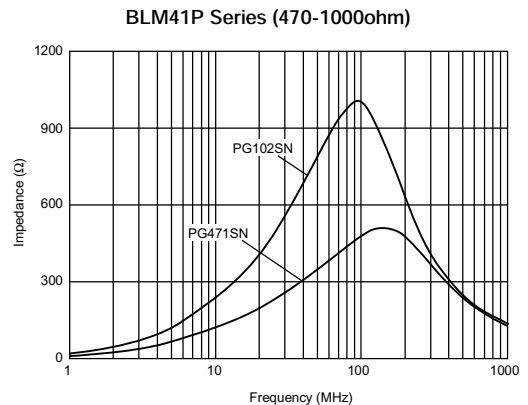
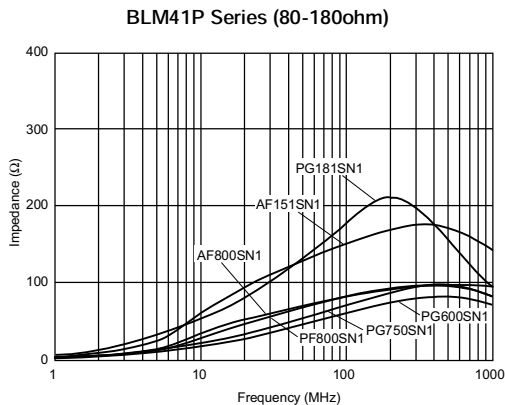
Part Number	Impedance (at 100MHz) (ohm)	Rated Current (mA)	DC Resistance(max.) (ohm)	Operating Temperature Range (°C)
<b>BLM41AF800SN1</b>	80 ±25%	500	0.10	-55 to 125
<b>BLM41AF151SN1</b>	150 ±25%	200	0.50	-55 to 125
<b>BLM41PF800SN1</b>	80 (Typ.)	1000	0.10	-55 to 125
<b>BLM41PG600SN1</b>	60 (Typ.)	6000	0.01	-55 to 125
<b>BLM41PG750SN1</b>	75 (Typ.)	3000	0.025	-55 to 125
<b>BLM41PG181SN1</b>	180 (Typ.)	3000	0.025	-55 to 125
<b>BLM41PG471SN1</b>	470 (Typ.)	2000	0.05	-55 to 125
<b>BLM41PG102SN1</b>	1000 (Typ.)	1500	0.09	-55 to 125

BLM41P series require derating above 85°C ambient. Please contact us for details.

■ Equivalent Circuit

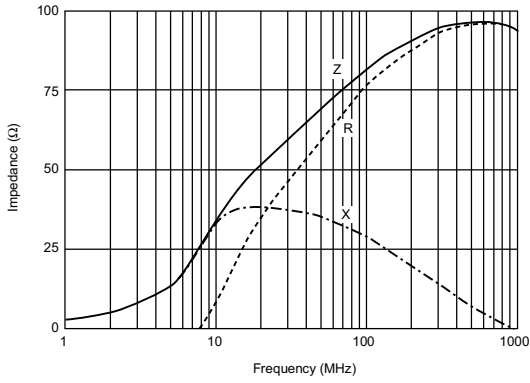


■ Impedance-Frequency (Typical)

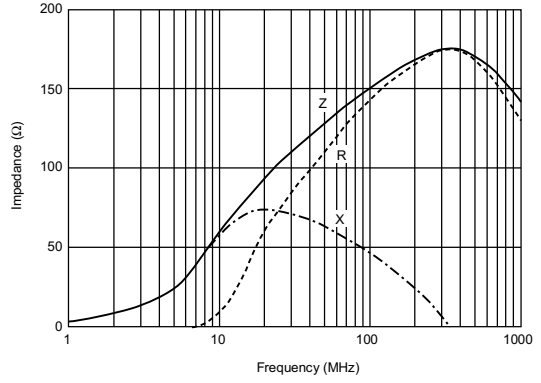


### ■ Impedance-Frequency Characteristics

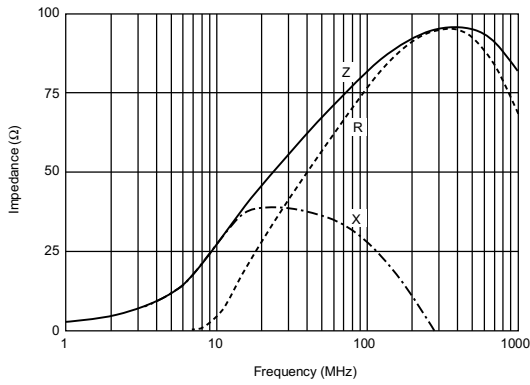
BLM41AF800SN1



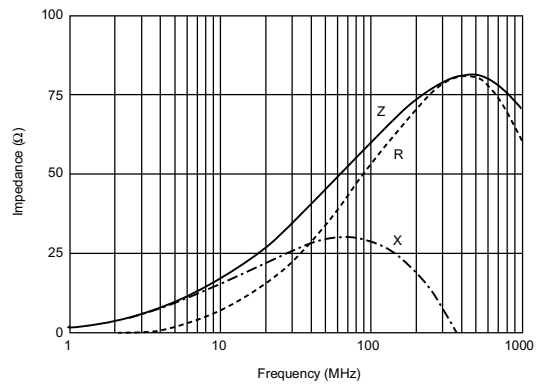
BLM41AF151SN1



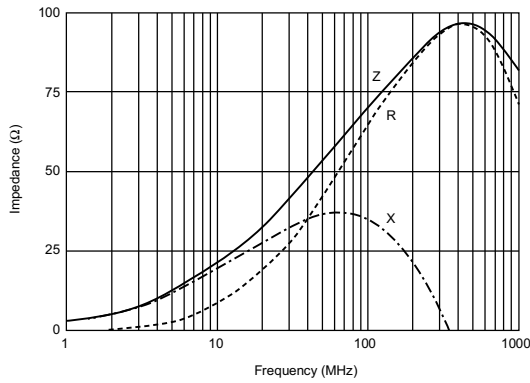
BLM41PF800SN1



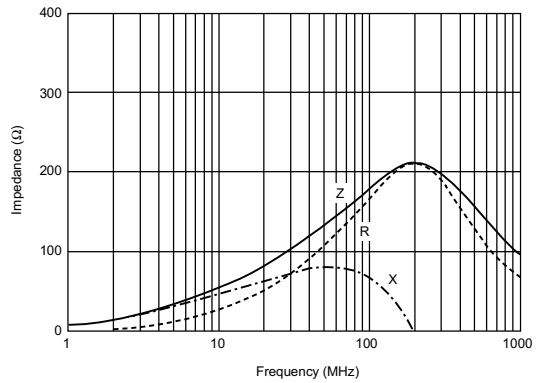
BLM41PG600SN1



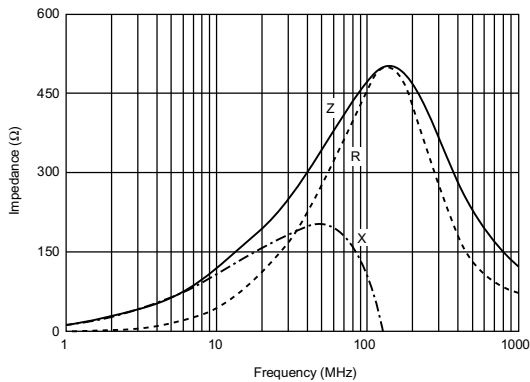
BLM41PG750SN1



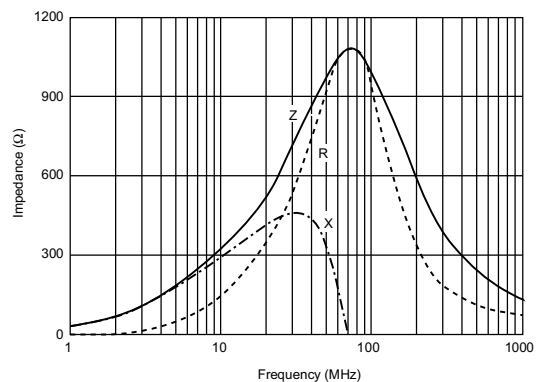
BLM41PG181SN1




BLM41PG471SN1



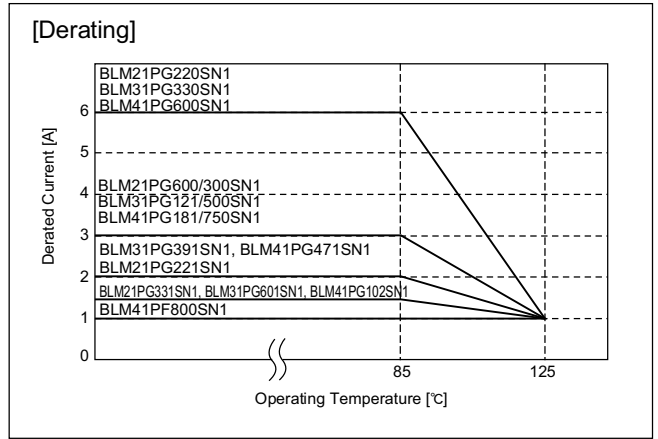
BLM41PG102SN1



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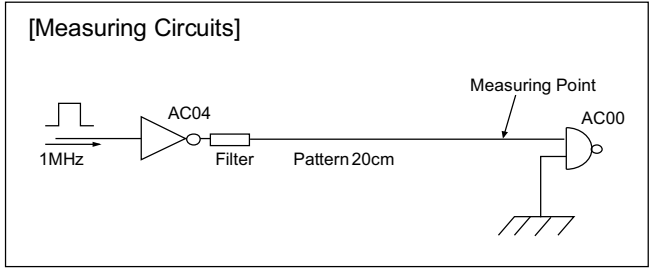
**Notice (Rating)**

When the BLM□□P series is for Large-current used in operating temperatures exceeding + 85°C, derating of current is necessary. Please apply the derating curve shown below according to the operating temperature.



# 1 Noise Suppression Effect of BLM\_R Series

## Waveform Distortion Suppressing Performance of BLM□□R Series



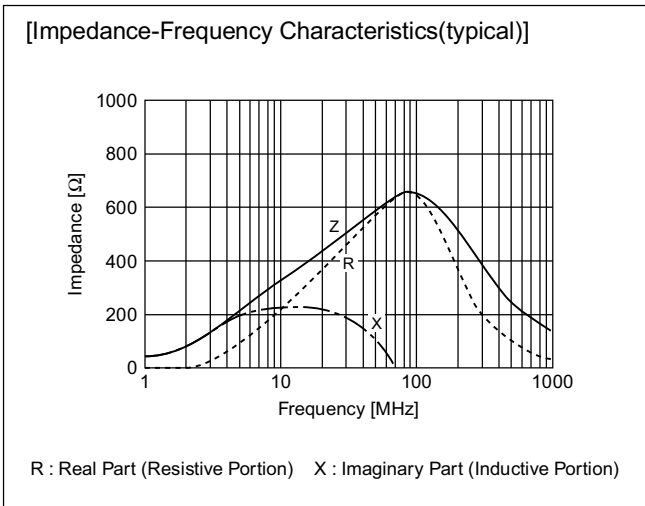
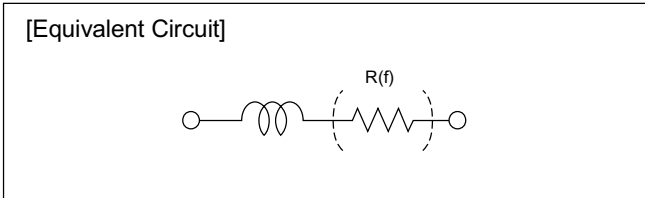
Type of Filter	EMI Suppression Effect / Description		
<p>Initial (No filter)</p>	<p>Signal waveform (100nsec/div, 2V/div)</p>	<p>Expand (10nsec/div, 2V/div)</p>	<p>Spectrum</p> <p>Level [dB <math>\mu</math>V]</p> <p>Frequency [MHz]</p> <p>Ringing is caused on the signal waveform Such ringing contains several hundred MHz harmonic components and generates noise.</p>
<p>Resister (47<math>\Omega</math>) is used</p>	<p>Signal waveform (100nsec/div, 2V/div)</p>	<p>Expand (10nsec/div, 2V/div)</p>	<p>Spectrum</p> <p>Level [dB <math>\mu</math>V]</p> <p>Frequency [MHz]</p> <p>Comparing initial waveform, ringing is suppressed a little. However there still remains high level waveform distortion.</p>
<p>BLM18RK221SN1 (220<math>\Omega</math> at 100MHz) is used</p>	<p>Signal waveform (100nsec/div, 2V/div)</p>	<p>Expand (10nsec/div, 2V/div)</p>	<p>Spectrum</p> <p>Level [dB <math>\mu</math>V]</p> <p>Frequency [MHz]</p> <p>BLM18R has excellent performance for noise suppression and waveform distortion suppression. BLM18R suppresses drastically not only spectrum level in more than 100MHz range but waveform distortion.</p>

## Outlines of EMI Suppression Filter (EMIFIL<sup>®</sup>) for DC Line

- Chip Ferrite Bead
- Ferrite Bead Inductor

<p>Chip Ferrite Bead .....P.24–65</p> <div style="text-align: center; margin-top: 20px;"> <p>BLM15    BLM18    BLM21</p> <p>BLM31    BLM41</p> <p>BLA31</p> </div>	<p>Ferrite Bead Inductor .....P.129–130</p> <div style="text-align: center; margin-top: 20px;"> <p>BL01            BL02RN1R3J2B    BL02RN2R3J2B</p> <p>BL02RN1        BL02RN2R1M2B    BL03RN2R1M1B</p> </div>
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- Inductor type EMI suppression filters are effective for frequencies ranging from a few MHz to a few GHz. Inductor type filters are widely used as a low noise countermeasure, as well as a universal noise suppression component.
- The inductor type EMIFIL<sup>®</sup> produce a micro inductance in the low frequency range. At high frequencies, however, the resistive component of the inductor produces the primary impedance. When inserted in series in the noise producing circuit, the resistive impedance of the inductor prevents noise propagation.





● **Part Numbering** (The structure of the "Global Part Numbers" that have been adopted since June 2001 and the meaning of each code are described herein.)  
 If you have any questions about details, inquire at your usual Murata sales office or distributor.

**Chip EMIFIL® Inductor Type**

(Global Part Number) 

BL	M	18	AG	102	S	N	1	D
①	②	③	④	⑤	⑥	⑦	⑧	⑨

① Product ID

Product ID	
<b>BL</b>	Chip Ferrite Beads

② Type

Code	Type
<b>A</b>	Array Type
<b>M</b>	Monolithic Type
<b>D</b>	Monoblock Type

③ Dimension (L×W)

Code	Dimension (L×W)	EIA
<b>15</b>	1.00×0.50mm	0402
<b>18</b>	1.60×0.80mm	0603
<b>21</b>	2.00×1.25mm	0805
<b>31</b>	3.20×1.60mm	1206
<b>32</b>	3.20×2.50mm	1210
<b>41</b>	4.50×1.60mm	1806

④ Characteristics

Code	Characteristics
<b>A</b> □ *1	for General Use
<b>B</b> □ *2	for High-speed Signal Lines
<b>P</b> □ *3	for Power Supplies
<b>RK</b>	for Digital Interface
<b>HG</b>	for GHz Band General Use
<b>HD</b>	for GHz Band High-speed Signal Line

\*1 For standard type, □ is expressed by "G".

\*2 □ is expressed by "A", "B" or "D".

\*3 □ is expressed by "G", "M", "B", "F".

⑤ Impedance

Expressed by three figures. The unit is in ohm (Ω). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures.

⑥ Performance

Expressed by an alphabet.

Ex.)

Code	Performance
<b>S</b>	Sn Plating

⑦ Category

Code	Category
<b>N</b>	Standard Type
<b>H</b>	for Automotive Electronics

⑧ Numbers of Circuit

Code	Numbers of Circuit
<b>1</b>	1Circuit
<b>4</b>	4Circuit
<b>6</b>	6Circuit
<b>8</b>	8Circuit

⑨ Packaging

Code	Packaging
<b>K</b>	Plastic Taping (ø330mm Reel)
<b>L</b>	Plastic Taping (ø180mm Reel)
<b>B</b>	Bulk
<b>J</b>	Paper Taping (ø330mm Reel)
<b>D</b>	Paper Taping (ø180mm Reel)
<b>C</b>	Bulk Case

# BLM Series Notice (Soldering and Mounting)

## 1. Standard Land Pattern Dimensions

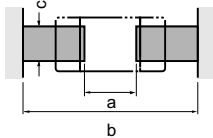
Do not apply narrower pattern than listed above to BLM\_P.

Narrow pattern can cause excessive heat or open circuit.

### BLM Series

(Except BLM21P/31P/41P)

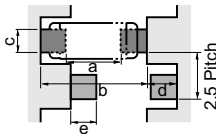
Land Pattern  
Solder Resist



Type	Size (mm)				
	L	W	a	b	c
*BLM15 (Reflow)	1.0	0.5	0.4	1.2-1.4	0.5
BLM18 (Flow)	1.6	0.8	0.7	2.2-2.6	0.7
BLM18 (Reflow)	1.6	0.8	0.7	1.8-2.0	0.7
BLM21	2.0	1.25	1.2	3.0-4.0	1.0
BLM31	3.2	1.6	2.0	4.2-5.2	1.2
BLM41	4.5	1.6	3.0	5.5-6.5	1.2

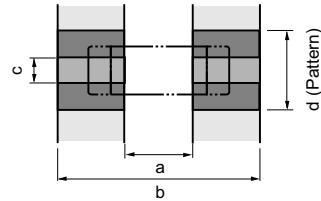
\*BLM15 is specially adapted for reflow soldering.

### Flow Mounting in High Density for BLM31/41



Type	Size (mm)				
	a	b	c	d	e
BLM31	2.0	4.2-5.2	1.2	1.3	1.35
BLM41	3.0	5.5-6.5	1.2	1.8	1.5

### BLM21P/31P/41P



Type	Rated Current (A)	Size (mm)			Land pad thickness and Dimension d		
		a	b	c	18μm	35μm	70μm
BLM21PG331SN1	1.5				1.0	1.0	1.00
BLM21PG221SN1	2				1.2	1.0	1.00
BLM21PG300SN1	3	1.2	3.0-4.0	1.0	2.4	1.2	1.00
BLM21PG600SN1							
BLM21PG220SN1					6	6.4	3.3
BLM31PG330SN1	6						
BLM31PG500SN1	3	2.0	4.5-5.2	1.2	2.4	1.2	1.20
BLM31PG121SN1							
BLM31PG391SN1					2		
BLM31PG601SN1	1.5						
BLM41PF800SN1	1				1.2	1.2	1.20
BLM41PG102SN1	1.5						
BLM41PG471SN1	2	3.0	5.5-6.5	1.2			
BLM41PG750SN1	3				2.4	1.2	1.20
BLM41PG181SN1							
BLM41PG600SN1	6				6.4	3.3	1.65


## 2. Solder Paste Printing and Adhesive Application

When reflow soldering the chip EMI suppression filter, the printing must be conducted in accordance with the following cream solder printing conditions. If too much solder is applied, the chip will prone to be damaged by mechanical and thermal stress from the PCB and may crack. In contrast, if too little solder is applied, there is the potential that the termination strength will be insufficient, creating the potential for detachment. Standard land dimensions should be used for resist and copper foil patterns.

When flow soldering the EMI suppression filter, apply the adhesive in accordance with the following conditions. If too much adhesive is applied, then it may overflow into the land or termination areas and yield poor solderability. In contrast, if insufficient adhesive is applied, or if the adhesive is not sufficiently hardened, then the chip may become detached during flow soldering process.

Continued on the following page.

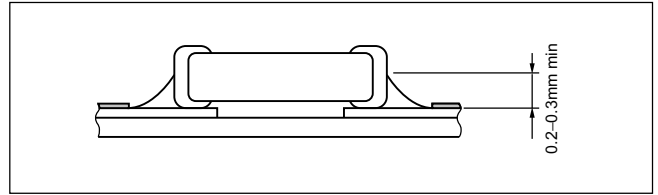
## BLM Series Notice (Soldering and Mounting)

 Continued from the preceding page.

### (1) Solder Paste Printing

BLM Series

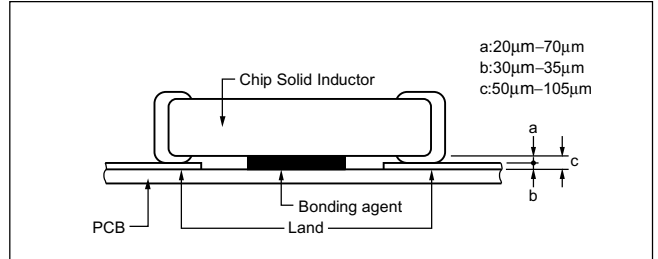
- Ensure that solder is applied smoothly to a minimum height of 0.2mm to 0.3mm at the end surface of the part.
- Coat the solder paste a thickness of 100μm to 200μm.



### (2) Adhesive Application

BLM Series

- Coating amount is illustrated in the following diagram.



## 3. Standard Soldering Conditions

### (1) SOLDERING METHODS

- Use flow and reflow soldering methods only.
- Use standard soldering conditions when soldering chip EMI suppression filters.
- In cases where several different parts are soldered, each having different soldering conditions, use those conditions requiring the least heat and minimum time.
- Ensure that solder is applied smoothly to a minimum height of 0.2mm to 0.3mm at the end surface of the part.
- Coat the solder paste a thickness of 100μm to 200μm.

### (2) SOLDERING TEMPERATURE AND TIME

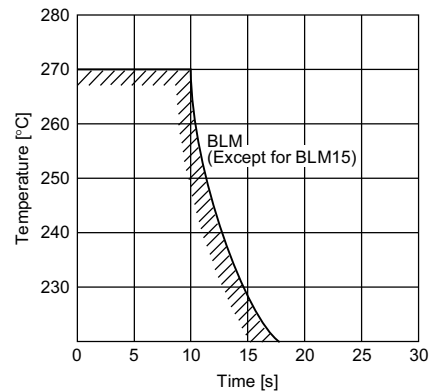
To prevent external electrode solder leaching and performance deterioration, solder within the temperature and time combinations illustrated by the slanted lines in the following graphs. If soldering is repeated, please note that the allowed time is the accumulated time.

Solder : H60A H63A solder(JIS Z 3238)

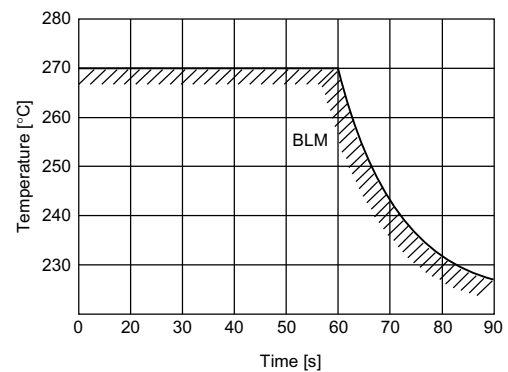
Flux :


- Use Rosin-based flux(when using RA type solder, clean products sufficiently to avoid residual flux).
- Do not use strong acidic flux(with chlorine content exceeding 0.20wt%)
- Do not use water-soluble flux.

Allowable Flow Soldering Temperature and Time




Allowable Reflow Soldering Temperature and Time



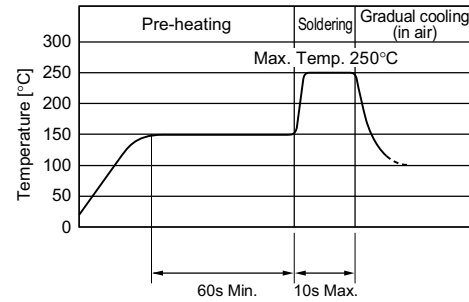
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## BLM Series Notice (Soldering and Mounting)

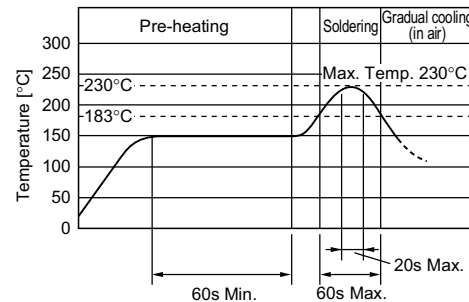
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### (3) SOLDERING CONDITIONS

#### Flow Solder



#### Reflow Solder



### (4) REWORKING WITH SOLDER IRON

The following conditions must be strictly followed when using a soldering iron.

- Pre-heating : 150°C 60 second Min.
- Soldering iron power output : 30W Max.
- Temperature of soldering iron tip : 280°C Max.
- Soldering time : 10 second Max.

Do not allow the tip of the soldering iron directly to contact the chip.

For additional methods of reworking with soldering iron, please contact Murata engineering.

### 4. Cleaning

Following conditions should be observed when cleaning chip EMI filter.

- (1) Cleaning Temperature : 60degree C max. (40degree C max. for CFC alternatives and alcohol cleaning agents)
- (2) Ultrasonic
  - Output : 20W/liter max.
  - Duration : 5 minutes max.
  - Frequency : 28kHz to 40kHz
- (3) Cleaning agent

The following list of cleaning agents have been tested on the individual components. Evaluation of final assembly should be completed prior to production.

- a) CFC alternatives and alcohol cleaning agents
  - Isopropyl alcohol (IPA)
  - HCFC-225

- b) Aqueous cleaning agent

- Surface active agent (Clean Thru 750H)
- Hydrocarbon (Techno Cleaner 335)
- High grade alcohol (Pine Alpha ST-100S)
- Alkaline saponifier ( Aqua Cleaner 240 -cleaner should be diluted within 20% using deionized water.)

- (4) Ensure that flux residue is completely removed.

Component should be thoroughly dried after aqueous agent has been removed with deionized water.

- (5) Some products may become slightly whitened.

However, product performance or usage is not affected. For additional cleaning methods, please contact Murata engineering.