

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



## Chip Ferrite Beads Part Numbering

### Chip Ferrite Beads

(Part Number) 

|    |   |    |    |     |   |   |   |   |
|----|---|----|----|-----|---|---|---|---|
| BL | M | 18 | AG | 102 | S | N | 1 | D |
|----|---|----|----|-----|---|---|---|---|

#### ● Product ID

| Product ID |                    |
|------------|--------------------|
| BL         | Chip Ferrite Beads |

#### ● Type

| Code | Type            |
|------|-----------------|
| A    | Array Type      |
| M    | Monolithic Type |

#### ● Dimensions (L×W)

| Code | Dimensions (L×W) | EIA  |
|------|------------------|------|
| 03   | 0.6×0.3mm        | 0201 |
| 15   | 1.0×0.5mm        | 0402 |
| 18   | 1.6×0.8mm        | 0603 |
| 2A   | 2.0×1.0mm        | 0804 |
| 21   | 2.0×1.25mm       | 0805 |
| 31   | 3.2×1.6mm        | 1206 |
| 41   | 4.5×1.6mm        | 1806 |

#### ● Characteristics/Applications

| Code *1 | Characteristics/Applications                      | Series                                    |
|---------|---|---|
| AG      | for General Use                                   | BLM03/BLM15/BLM18/BLM21/BLM31/BLA2A/BLA31 |
| TG      |   | BLM18                                     |
| BA      | for High-speed Signal Lines                       | BLM18                                     |
| BB      |   | BLM15/BLM18/BLM21/BLA2A                   |
| BD      |   | BLM15/BLM18/BLM21/BLA2A/BLA31             |
| PG      | for Power Supplies                                | BLM15/BLM18/BLM21/BLM31/BLM41             |
| RK      | for Digital Interface                             | BLM18/BLM21                               |
| HG      | for GHz Band General Use                          | BLM15/BLM18                               |
| EG      | for GHz Band General Use (Low DC Resistance type) |   |
| HB      | for GHz Band High-speed Signal Line               | BLM18                                     |
| HD      |   | BLM15/BLM18                               |
| HK      | for GHz Band Digital Interface                    | BLM18                                     |
| GG      | for High-GHz Band General Use                     | BLM18                                     |

\*1 Frequency characteristics vary with each code.

#### ● Packaging

| Code | Packaging                    | Series                                 |
|------|------------------------------|--|
| K    | Plastic Taping (ø330mm Reel) | BLM31/BLM41/BLM21 *1                   |
| L    | Plastic Taping (ø190mm Reel) |  |
| B    | Bulk                         | All series                             |
| J    | Paper Taping (ø330mm Reel)   | BLM15/BLM18/BLM21*2 /BLA31             |
| D    | Paper Taping (ø190mm Reel)   | BLM03/BLM15/BLM18/BLM21*2 /BLA2A/BLA31 |
| C    | Bulk Case                    | BLM15/BLM18                            |

\*1 BLM21BD222SN1/BLM21BD272SN1 only.

\*2 Except BLM21BD222SN1/BLM21BD272SN1

#### ● 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.

#### ● Performance

Expressed by a letter.

Ex.)

| Code | Performance |
|------|-------------|
| S/T  | Sn Plating  |
| A    | Au Plating  |

#### ● Category

| Code | Category       |
|------|----------------|
| N    | Standard Type  |
| H    | For Automotive |

#### ● Number of Circuits

| Code | Number of Circuits |
|------|--------------------|
| 1    | 1 Circuit          |
| 4    | 4 Circuits         |

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

**muRata**

### Chip Ferrite Bead BLM Series

1

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

The chip ferrite bead BLM series comprises ferrite beads in the shape of a chip. This ferrite bead 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 0.6x0.3, 1.0x0.5, 1.6x0.8, 2.0x1.25, 3.2x1.6 and 4.5x1.6mm are cataloged. (The BLA series of array type chip ferrite beads is also cataloged.)

The nickel barrier structure of the external electrodes provides excellent solder heat resistance.

### ■ Features

The BLM series comprises the R series (for digital interface), the A series (for standard), the B series (for high speed signal), the P series (for large current), and the H/E/G series (for GHz range noise suppression).

#### 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 effective for digital signal waveform at low frequency range and can suppress the ringing.

#### 2. BLM□□A/T 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.

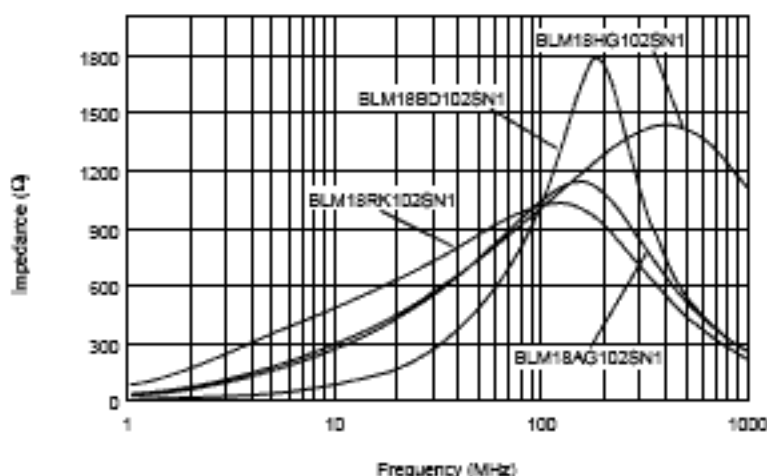
#### 4. BLM□□P series – For Large Current

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).

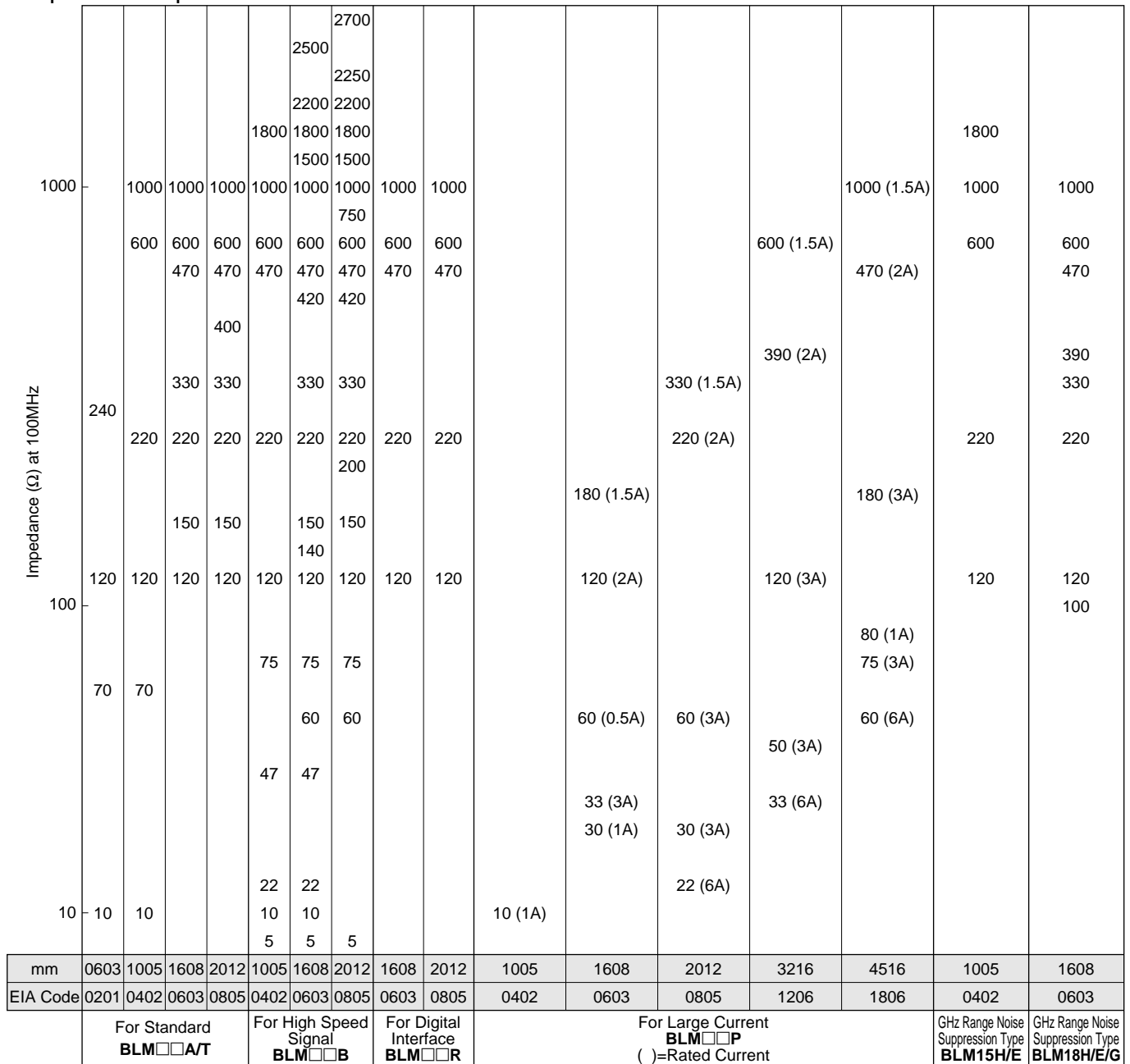
#### 5. BLM□□H/E/G series – For GHz Range Noise Suppression

The BLM□□H/E/G series has a modified internal electrode structure that minimizes stray capacitance and increases the effective frequency range.

[Impedance Characteristics]



## ■ Impedance Map



1

■BLM Series

| Size (EIA Code)                          | Type   | Part Number       | Impedance (Ω) |            | Rated Current (mA) |      |
|--|--|-------------------|---------------|------------|--------------------|------|
|  |  |                   | at 100MHz     | at 1GHz    |                    |      |
| 0201                                     | For Standard   | BLM03AG100SN1     | 10 (Typ.)     | -          | 500                |      |
|  |  | BLM03AG700SN1     | 70 (Typ.)     | -          | 200                |      |
|  |  | BLM03AG121SN1     | 120±25%       | -          | 200                |      |
|  |  | BLM03AG241SN1     | 240±25%       | -          | 100                |      |
| 0402                                     | For Standard   | BLM15AG100SN1     | 10 (Typ.)     | -          | 1000               |      |
|  |  | BLM15AG700SN1     | 70 (Typ.)     | -          | 500                |      |
|  |  | BLM15AG121SN1     | 120±25%       | -          | 300                |      |
|  |  | BLM15AG221SN1     | 220±25%       | -          |                    |      |
|  |  | BLM15AG601SN1     | 600±25%       | -          | 200                |      |
|  |  | BLM15AG102SN1     | 1000±25%      | -          | 200                |      |
|  |  | BLM15AG601AN1     | 600±25%       | 140 (Typ.) | 300                |      |
|  |  | BLM15AG102AN1     | 1000±25%      | 300 (Typ.) | 200                |      |
|  | For High Speed Signal<br>(Sharp impedance characteristics) | BLM15BB050SN1     | 5±25%         | -          | 300                |      |
|  |  | BLM15BB100SN1     | 10±25%        | -          |                    |      |
|  |  | BLM15BB220SN1     | 22±25%        | -          |                    |      |
|  |  | BLM15BB470SN1     | 47±25%        | -          |                    |      |
|  |  | BLM15BB750SN1     | 75±25%        | -          |                    |      |
|  |  | BLM15BB121SN1     | 120±25%       | -          | 200                |      |
|  |  | BLM15BB221SN1     | 220±25%       | -          |                    |      |
|  |  | BLM15BD750SN1     | 75±25%        | -          | 300                |      |
|  |  | BLM15BD121SN1     | 120±25%       | -          |                    |      |
|  |  | BLM15BD221SN1     | 220±25%       | -          |                    |      |
|  |  | For Large Current | BLM15BD471SN1 | 470±25%    | -                  | 200  |
|  |  |                   | BLM15BD601SN1 | 600±25%    | -                  |      |
|  | BLM15BD102SN1  |                   | 1000±25%      | -          | 100                |      |
|  | BLM15BD182SN1  |                   | 1800±25%      | -          | 100                |      |
|  | For Large Current  |                   | BLM15PG100SN1 | 10 (Typ.)  | -                  | 1000 |
|  | GHz Range  | For Standard      | BLM15HG601SN1 | 600±25%    | 1000±40%           | 300  |
| BLM15HG102SN1                            |  |                   | 1000±25%      | 1400±40%   | 250                |      |
| For High Speed Signal                    |  | BLM15HD601SN1     | 600±25%       | 1400±40%   | 300                |      |
|  |  | BLM15HD102SN1     | 1000±25%      | 2000±40%   | 250                |      |
| For Standard<br>(Low DC Resistance Type) |  | BLM15HD182SN1     | 1800±25%      | 2700±40%   | 200                |      |
|  |  | BLM15EG121SN1     | 120±25%       | 145 (Typ.) | 1500*              |      |
| 0603                                     | For Standard   | BLM15EG221SN1     | 220±25%       | 270 (Typ.) | 700*               |      |
|  |  | BLM18AG121SN1     | 120±25%       | -          | 200                |      |
|  |  | BLM18AG151SN1     | 150±25%       | -          |                    |      |
|  |  | BLM18AG221SN1     | 220±25%       | -          |                    |      |
|  |  | BLM18AG331SN1     | 330±25%       | -          |                    |      |
|  |  | BLM18AG471SN1     | 470±25%       | -          |                    |      |
|  |  | BLM18AG601SN1     | 600±25%       | -          |                    |      |
|  | For High Speed Signal<br>(Sharp impedance characteristics) | BLM18AG102SN1     | 1000±25%      | -          | 100                |      |
|  |  | 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        |                    |      |
| BLM18BA750SN1                            |  | 75±25%            | -             | 300        |                    |      |
| BLM18BB750SN1                            |  |                   | -             | 200        |                    |      |
| BLM18BA121SN1                            |  | 120±25%           | -             | 200        |                    |      |
| BLM18BB121SN1                            | -  |                   |               |            |                    |      |
| BLM18BD121SN1                            | -  |                   |               |            |                    |      |
| BLM18BB141SN1                            | 140±25%  |                   | -             |            |                    |      |

\* Please see P.58 "Derating of Rated Current".

Continued from the preceding page.

| Size (EIA Code)                          | Type   | Part Number           | Impedance (Ω) |             | Rated Current (mA) |     |
|--|--|-----------------------|---------------|-------------|--------------------|-----|
|  |  |                       | at 100MHz     | at 1GHz     |                    |     |
| 0603                                     | For High Speed Signal<br>(Sharp impedance characteristics) | BLM18BB151SN1         | 150±25%       | -           | 200                |     |
|  |  | BLM18BD151SN1         |               | -           |                    |     |
|  |  | BLM18BB221SN1         | 220±25%       | -           |                    |     |
|  |  | BLM18BD221SN1         |               | -           |                    |     |
|  |  | BLM18BB331SN1         | 330±25%       | -           |                    |     |
|  |  | BLM18BD331SN1         |               | -           |                    |     |
|  |  | BLM18BD421SN1         | 420±25%       | -           |                    |     |
|  |  | BLM18BB471SN1         | 470±25%       | -           |                    | 50  |
|  |  | BLM18BD471SN1         |               | -           |                    | 200 |
|  |  | BLM18BD601SN1         | 600±25%       | -           |                    | 200 |
|  |  | BLM18BD102SN1         | 1000±25%      | -           |                    | 100 |
|  |  | BLM18BD152SN1         | 1500±25%      | -           |                    | 50  |
|  |  | BLM18BD182SN1         | 1800±25%      | -           |                    |     |
|  |  | BLM18BD222SN1         | 2200±25%      | -           |                    |     |
|  |  | BLM18BD252SN1         | 2500±25%      | -           |                    |     |
|  | For Digital Interface                                      | BLM18RK121SN1         | 120±25%       | -           | 200                |     |
|  |  | BLM18RK221SN1         | 220±25%       | -           |                    |     |
|  |  | BLM18RK471SN1         | 470±25%       | -           |                    |     |
|  |  | BLM18RK601SN1         | 600±25%       | -           |                    |     |
|  |  | BLM18RK102SN1         | 1000±25%      | -           |                    |     |
|  | For Large Current  | BLM18PG300SN1         | 30 (Typ.)     | -           | 1000               |     |
|  |  | BLM18PG330SN1         | 33±25%        | -           | 3000*              |     |
|  |  | BLM18PG600SN1         | 60 (Typ.)     | -           | 500                |     |
|  |  | BLM18PG121SN1         | 120±25%       | -           | 2000*              |     |
|  |  | BLM18PG181SN1         | 180±25%       | -           | 1500*              |     |
|  | GHz Range  | For Standard          | BLM18HG471SN1 | 470±25%     | 600 (Typ.)         | 200 |
|  |  |                       | BLM18HG601SN1 | 600±25%     | 700 (Typ.)         |     |
|  |  |                       | BLM18HG102SN1 | 1000±25%    | 1000 (Typ.)        |     |
|  |  | For High Speed Signal | BLM18HB121SN1 | 120±25%     | 500±40%            | 200 |
|  |  |                       | BLM18HB221SN1 | 220±25%     | 1100±40%           | 100 |
|  |  |                       | BLM18HB331SN1 | 330±25%     | 1600±40%           | 50  |
|  |  |                       | BLM18HD471SN1 | 470±25%     | 1000 (Typ.)        | 100 |
|  |  |                       | BLM18HD601SN1 | 600±25%     | 1200 (Typ.)        |     |
| BLM18HD102SN1                            |  |                       | 1000±25%      | 1700 (Typ.) | 50                 |     |
| For Digital Interface                    |  | BLM18HK331SN1         | 330±25%       | 400±40%     | 200                |     |
|  |  | BLM18HK471SN1         | 470±25%       | 600±40%     |                    |     |
|  |  | BLM18HK601SN1         | 600±25%       | 700±40%     | 100                |     |
|  |  | BLM18HK102SN1         | 1000±25%      | 1200±40%    | 50                 |     |
| For Standard<br>(Low DC Resistance Type) |  | BLM18EG101TN1         | 100±25%       | 140 (Typ.)  | 2000*              |     |
|  |  | BLM18EG121SN1         | 120±25%       | 145 (Typ.)  | 2000*              |     |
|  |  | BLM18EG221TN1         | 220±25%       | 300 (Typ.)  | 1000               |     |
|  |  | BLM18EG331TN1         | 330±25%       | 450 (Typ.)  | 500                |     |
|  |  | BLM18EG391TN1         | 390±25%       | 520 (Typ.)  | 500                |     |
|  | BLM18EG471SN1  | 470±25%               | 550 (Typ.)    | 500         |                    |     |
|  | BLM18EG601SN1  | 600±25%               | 700 (Typ.)    | 500         |                    |     |
| BLM18GG471SN1                            | 470±25%  | 1800±30%              | 100           |             |                    |     |
| 0805                                     | For Standard   | BLM21AG121SN1         | 120±25%       | -           | 200                |     |
|  |  | BLM21AG151SN1         | 150±25%       | -           |                    |     |
|  |  | BLM21AG221SN1         | 220±25%       | -           |                    |     |
|  |  | BLM21AG331SN1         | 330±25%       | -           |                    |     |
|  |  | BLM21AG471SN1         | 470±25%       | -           |                    |     |
|  |  | BLM21AG601SN1         | 600±25%       | -           |                    |     |
|  |  | BLM21AG102SN1         | 1000±25%      | -           |                    |     |

\* Please see P.53 "Derating of Rated Current".

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| Size (inches) | Type   | Part Number    | Impedance ( $\Omega$ ) |         | Rated Current (mA) |
|---------------|--|----------------|------------------------|---------|--------------------|
|               |  |                | at 100MHz              | at 1GHz |                    |
| 0805          | For High Speed Signal<br>(Sharp impedance characteristics) | BLM21BB050SN1  | 5 $\pm$ 25%            | -       | 500                |
|               |  | BLM21BB600SN1  | 60 $\pm$ 25%           | -       | 200                |
|               |  | BLM21BB750SN1  | 75 $\pm$ 25%           | -       |                    |
|               |  | BLM21BB121SN1  | 120 $\pm$ 25%          | -       |                    |
|               |  | BLM21BD121SN1  |                        | -       |                    |
|               |  | BLM21BB151SN1  | 150 $\pm$ 25%          | -       |                    |
|               |  | BLM21BD151SN1  |                        | -       |                    |
|               |  | BLM21BB201SN1  | 200 $\pm$ 25%          | -       |                    |
|               |  | BLM21BB221SN1  | 220 $\pm$ 25%          | -       |                    |
|               |  | BLM21BD221SN1  |                        | -       |                    |
|               |  | BLM21BB331SN1  | 330 $\pm$ 25%          | -       |                    |
|               |  | BLM21BD331SN1  |                        | -       |                    |
|               |  | BLM21BD421SN1  | 420 $\pm$ 25%          | -       |                    |
|               |  | BLM21BB471SN1  | 470 $\pm$ 25%          | -       |                    |
|               |  | BLM21BD471SN1  |                        | -       |                    |
|               |  | BLM21BD601SN1  | 600 $\pm$ 25%          | -       |                    |
|               |  | BLM21BD751SN1  | 750 $\pm$ 25%          | -       |                    |
|               |  | BLM21BD102SN1  | 1000 $\pm$ 25%         | -       |                    |
|               |  | BLM21BD152SN1  | 1500 $\pm$ 25%         | -       |                    |
|               |  | BLM21BD182SN1  | 1800 $\pm$ 25%         | -       |                    |
|               | BLM21BD222SN1  | 2250 (Typ.)    | -                      |         |                    |
|               | BLM21BD222TN1  | 2200 $\pm$ 25% | -                      |         |                    |
|               | BLM21BD272SN1  | 2700 $\pm$ 25% | -                      |         |                    |
|               | For Digital Interface                                      | BLM21RK121SN1  | 120 $\pm$ 25%          | -       | 200                |
|               |  | BLM21RK221SN1  | 220 $\pm$ 25%          | -       |                    |
|               |  | BLM21RK471SN1  | 470 $\pm$ 25%          | -       |                    |
|               |  | BLM21RK601SN1  | 600 $\pm$ 25%          | -       |                    |
|               |  | BLM21RK102SN1  | 1000 $\pm$ 25%         | -       |                    |
|               | For Large Current  | BLM21PG220SN1  | 22 $\pm$ 25%           | -       | 6000*              |
|               |  | BLM21PG300SN1  | 30 (Typ.)              | -       | 3000*              |
|               |  | BLM21PG600SN1  | 60 $\pm$ 25%           | -       | 2000*              |
|               |  | BLM21PG331SN1  | 330 $\pm$ 25%          | -       | 1500*              |
| 1206          | For Large Current  | BLM31PG330SN1  | 33 $\pm$ 25%           | -       | 6000*              |
|               |  | BLM31PG500SN1  | 50 (Typ.)              | -       | 3000*              |
|               |  | BLM31PG121SN1  | 120 $\pm$ 25%          | -       |                    |
|               |  | BLM31PG391SN1  | 390 $\pm$ 25%          | -       | 2000*              |
|               |  | BLM31PG601SN1  | 600 $\pm$ 25%          | -       | 1500*              |
| 1806          | For Large Current  | BLM41PG600SN1  | 60 (Typ.)              | -       | 6000*              |
|               |  | BLM41PG750SN1  | 75 (Typ.)              | -       | 3000*              |
|               |  | BLM41PG181SN1  | 180 $\pm$ 25%          | -       | 3000*              |
|               |  | BLM41PG471SN1  | 470 $\pm$ 25%          | -       | 2000*              |
|               |  | BLM41PG102SN1  | 1000 $\pm$ 25%         | -       | 1500*              |

\* Please see P.53 "Derating of Rated Current".

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



## Chip Ferrite Beads BLM03/BLM15/BLM18/BLM21/BLM31/BLM41 Series

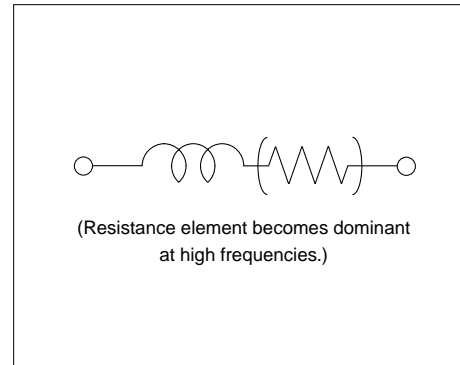
### ■ Features (BLM\_A Series)

The chip ferrite bead BLM series comprises ferrite beads in the shape of a chip. This ferrite bead generates a high impedance which at high frequency 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.

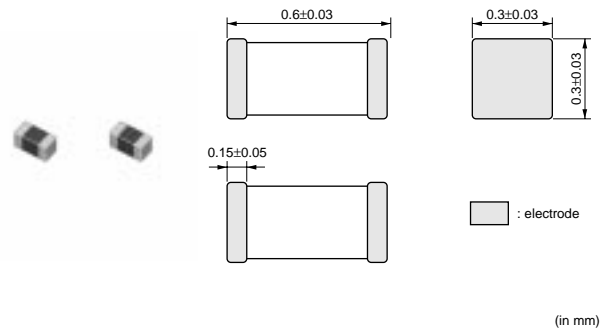
The nickel barrier structure of the external electrodes provides excellent solder heat resistance. BLM\_A series generates an impedance from the relatively low frequencies. Therefore BLM\_A series is effective in noise suppression in a wide frequency range (30MHz - several hundred MHz).

The small size of BLM03 series (0.6x0.3mm) is suitable for noise suppression in small equipment such as PA modules for cellular phones.

### ■ Equivalent Circuit

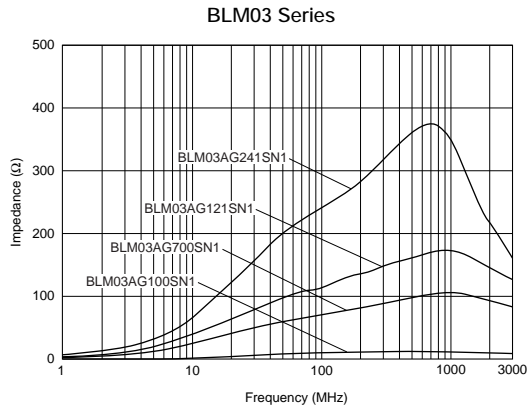


### BLM03A Series (0201 Size)

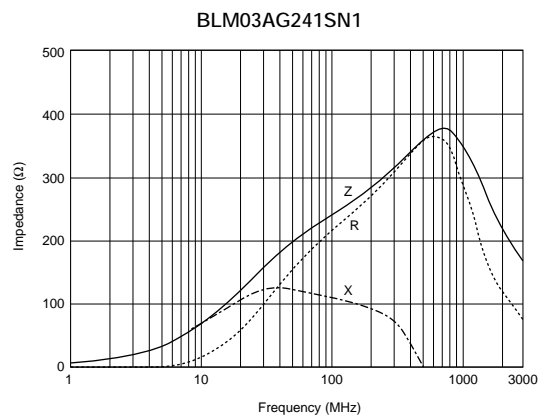
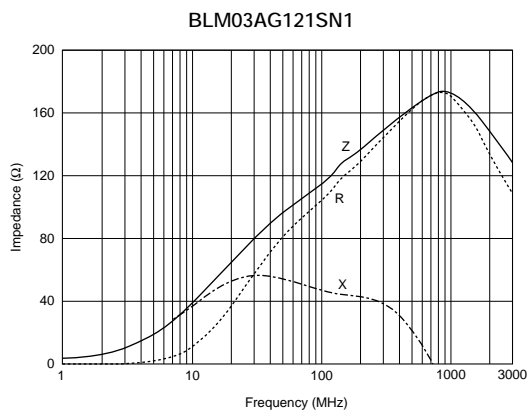
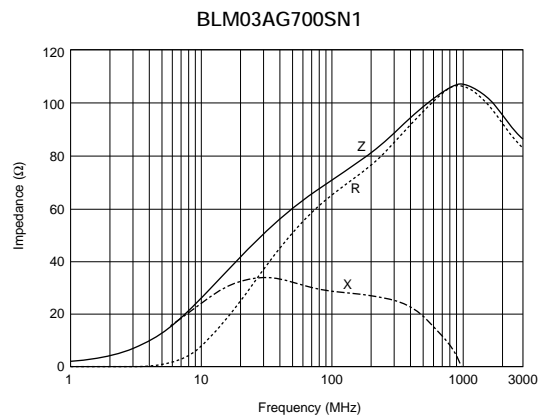
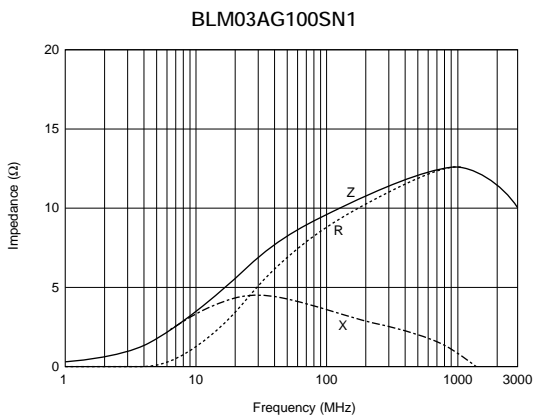


| Part Number   | Impedance<br>(at 100MHz/20°C)<br>(ohm) | Rated Current<br>(mA) | DC Resistance (max.)<br>(ohm) | Operating<br>Temperature Range<br>(°C) |
|---------------|--|-----------------------|-------------------------------|--|
| BLM03AG100SN1 | 10 (Typ.)                              | 500                   | 0.1                           | -55 to +125                            |
| BLM03AG700SN1 | 70 (Typ.)                              | 200                   | 0.5                           | -55 to +125                            |
| BLM03AG121SN1 | 120 ±25%                               | 200                   | 0.8                           | -55 to +125                            |
| BLM03AG241SN1 | 240 ±25%                               | 100                   | 1.0                           | -55 to +125                            |

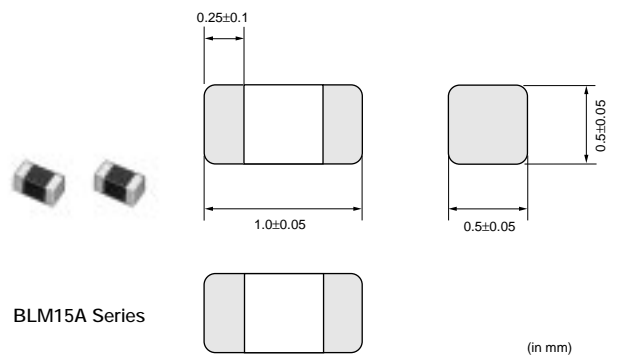
## ■ Impedance-Frequency (Typical)



## ■ Impedance-Frequency Characteristics



## BLM15A Series (0402 Size)

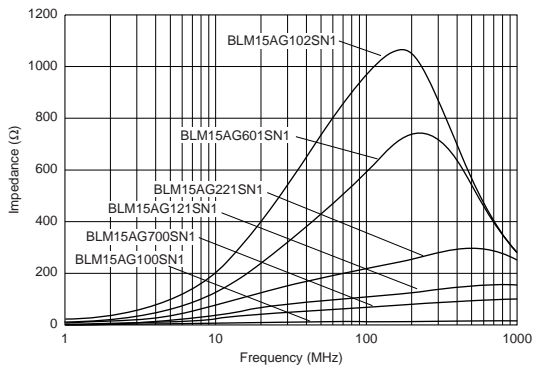




| Part Number          | Impedance (at 100MHz/20°C) (ohm) | Rated Current (mA) | DC Resistance (max.) (ohm) | Operating Temperature Range (°C) |
|----------------------|----------------------------------|--------------------|----------------------------|----------------------------------|
| <b>BLM15AG100SN1</b> | 10 (Typ.)                        | 1000               | 0.05                       | -55 to +125                      |
| <b>BLM15AG700SN1</b> | 70 (Typ.)                        | 500                | 0.15                       | -55 to +125                      |
| <b>BLM15AG121SN1</b> | 120 ±25%                         | 500                | 0.25                       | -55 to +125                      |
| <b>BLM15AG221SN1</b> | 220 ±25%                         | 300                | 0.35                       | -55 to +125                      |
| <b>BLM15AG601SN1</b> | 600 ±25%                         | 300                | 0.6                        | -55 to +125                      |
| <b>BLM15AG102SN1</b> | 1000 ±25%                        | 200                | 1.0                        | -55 to +125                      |

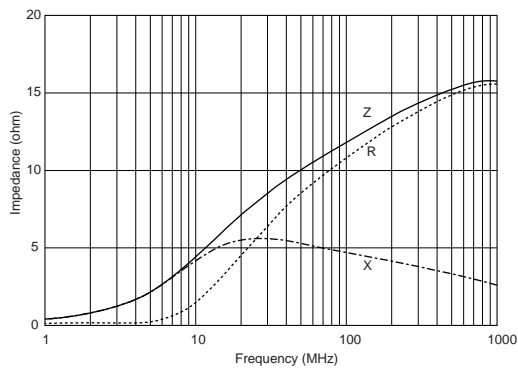
■ Impedance-Frequency (Typical)

BLM15A Series

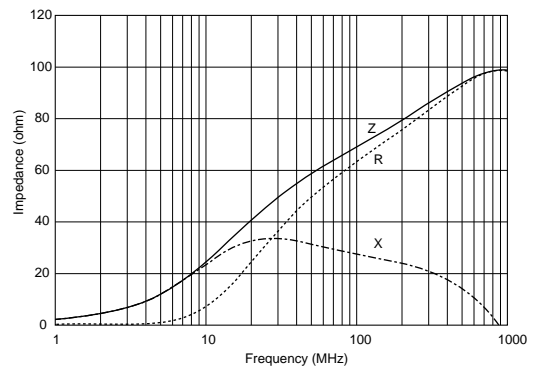


■ Impedance-Frequency Characteristics

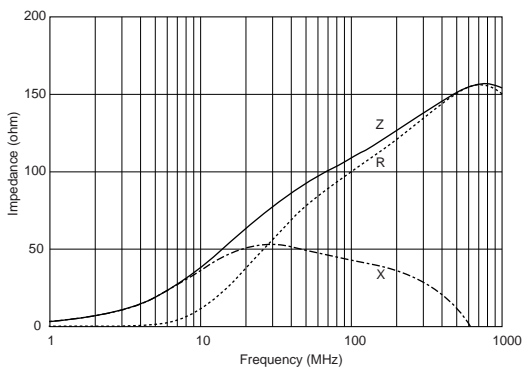
BLM15AG100SN1



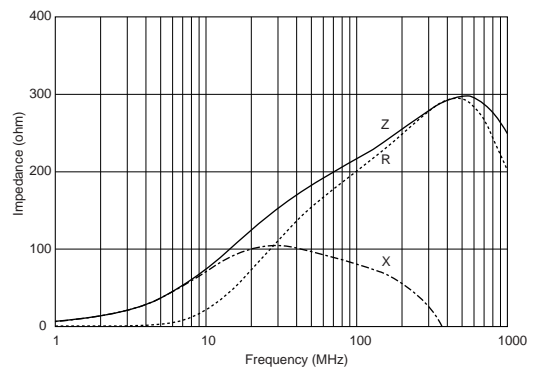
BLM15AG700SN1



BLM15AG121SN1



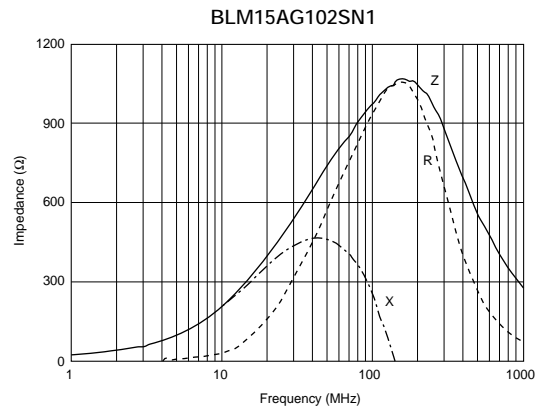
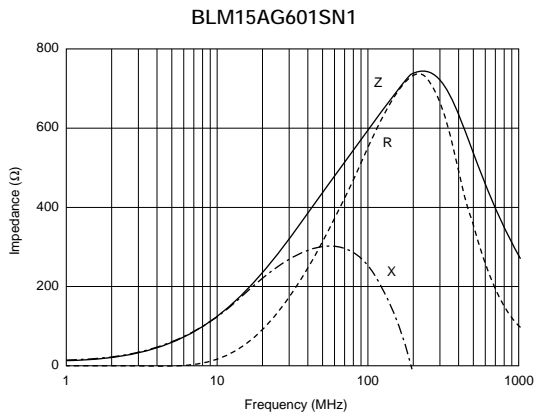
BLM15AG221SN1



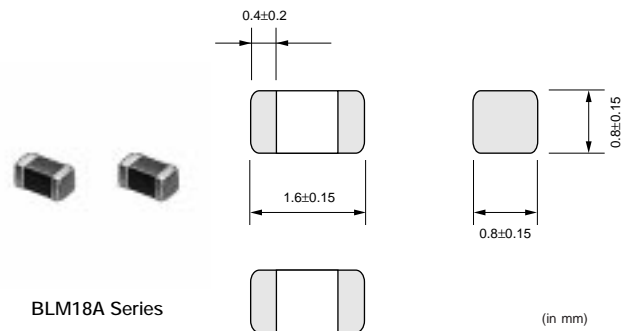
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### Impedance-Frequency Characteristics

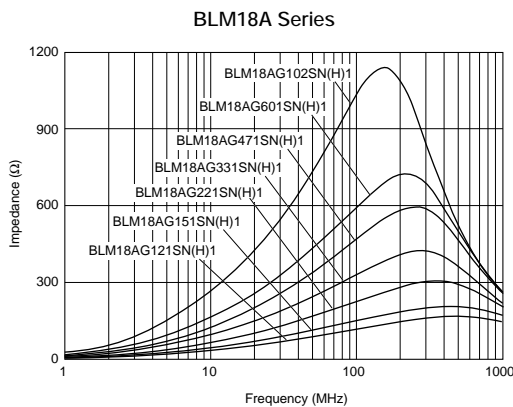


### BLM18A Series (0603 Size)

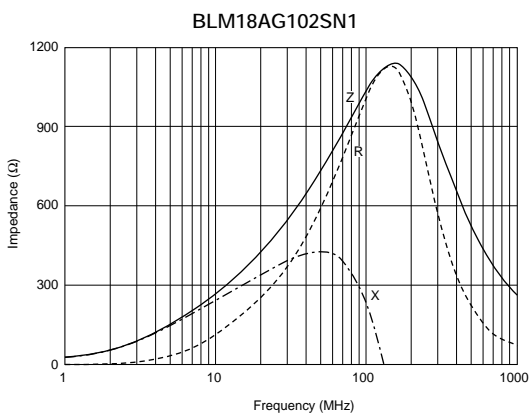
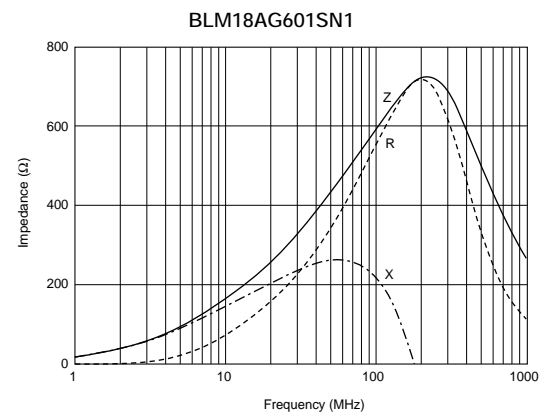
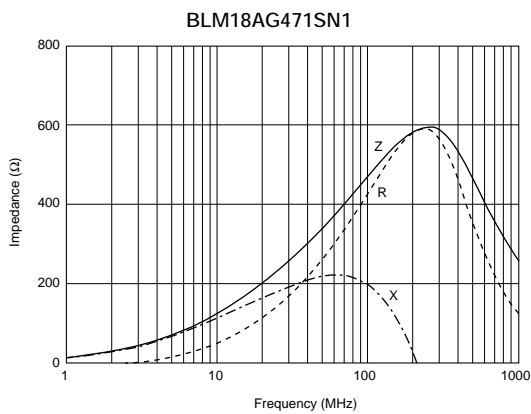
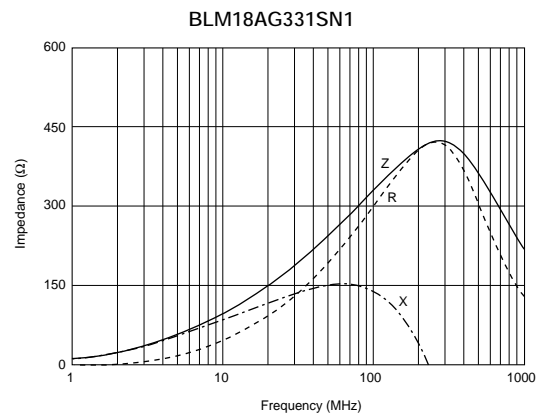
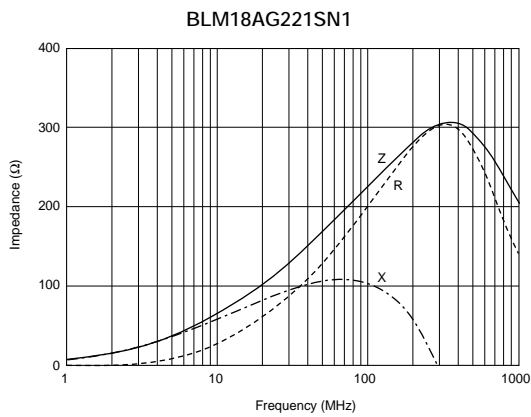
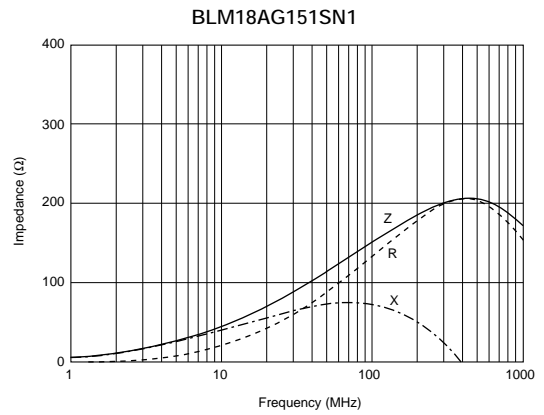
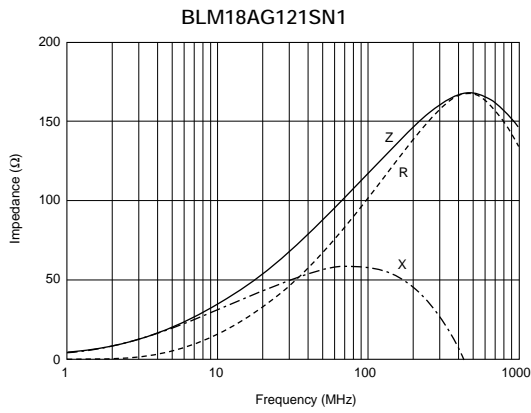


| Part Number   | Impedance (at 100MHz/20°C) (ohm) | Rated Current (mA) | DC Resistance (max.) (ohm) | Operating Temperature Range (°C) |
|---------------|----------------------------------|--------------------|----------------------------|----------------------------------|
| BLM18AG121SN1 | 120 ±25%                         | 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                      |

### Impedance-Frequency (Typical)

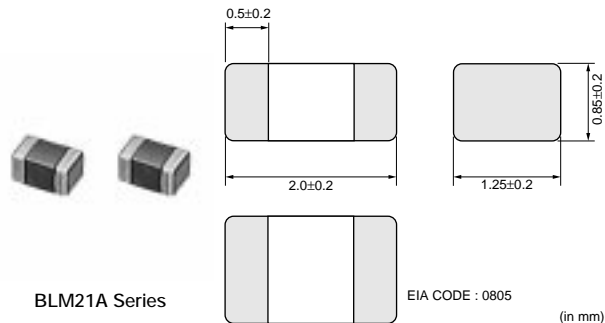


## ■ Impedance-Frequency Characteristics



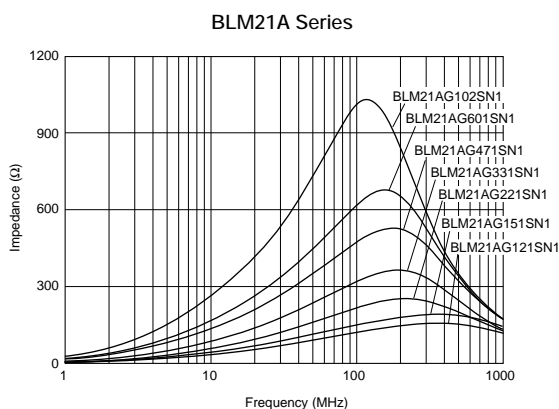
1

## BLM21A Series (0805 Size)

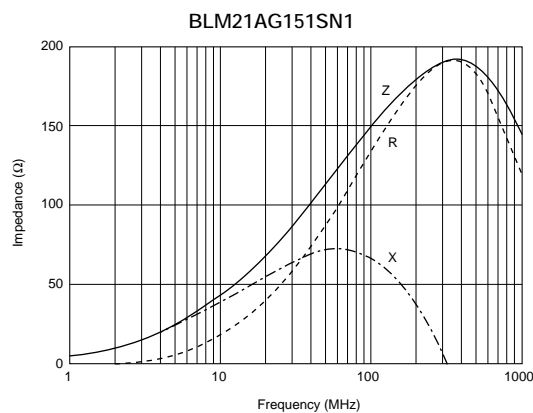
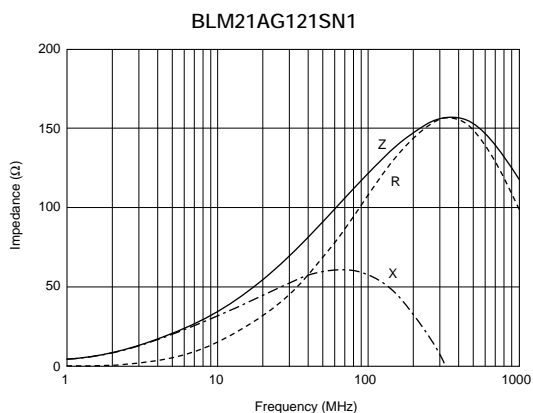


| Part Number   | Impedance<br>(at 100MHz/20°C)<br>(ohm) | Rated Current<br>(mA) | DC Resistance (max.)<br>(ohm) | Operating<br>Temperature Range<br>(°C) |
|---------------|--|-----------------------|-------------------------------|--|
| BLM21AG121SN1 | 120 ±25%                               | 200                   | 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                            |

### ■ Impedance-Frequency (Typical)



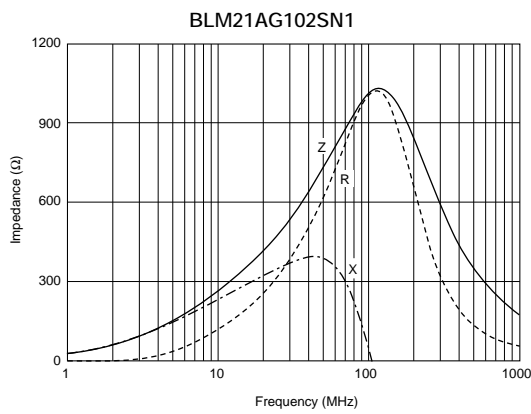
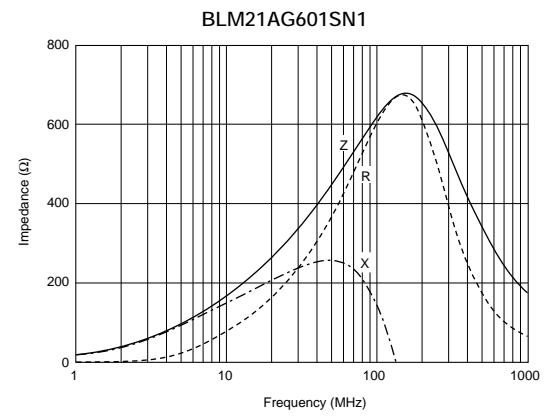
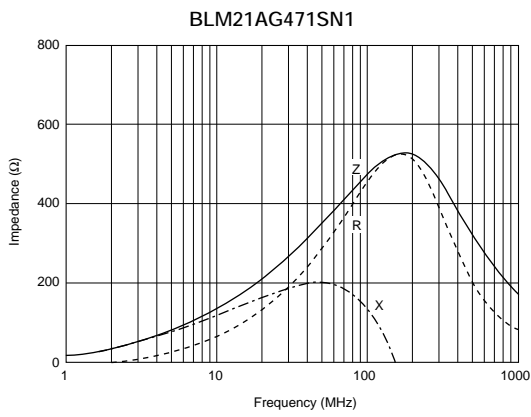
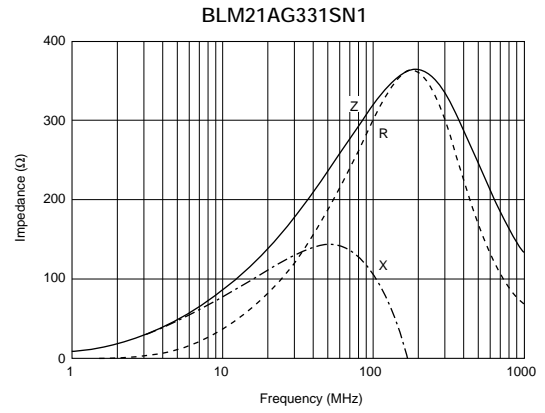
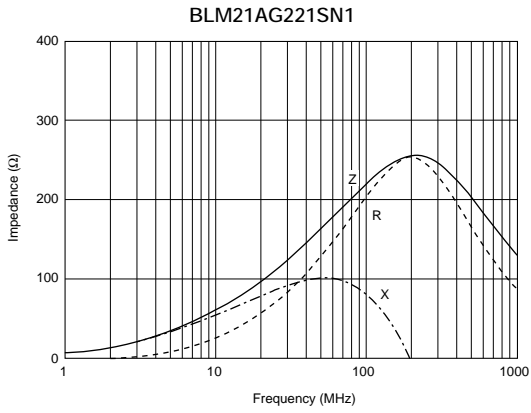
### ■ Impedance-Frequency Characteristics



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**Impedance-Frequency Characteristics**



1

## Chip EMI Suppression Filter Design Kits



### ●EKEMBL15C (Chip Ferrite Beads 0402 Size)

| No. | Part Number   | Quantity (pcs.) | Impedance typ.<br>(at 100MHz, 20 degree C) | Rated Current (mA) | DC Resistance (Ω) max. |
|-----|---------------|-----------------|--|--------------------|------------------------|
| 1   | BLM15AG100SN1 | 20              | 10Ω (Typ.)                                 | 1000               | 0.05                   |
| 2   | BLM15AG700SN1 | 20              | 70Ω (Typ.)                                 | 500                | 0.15                   |
| 3   | BLM15AG121SN1 | 20              | 120Ω±25%                                   | 500                | 0.25                   |
| 4   | BLM15AG221SN1 | 20              | 220Ω±25%                                   | 300                | 0.35                   |
| 5   | BLM15AG601SN1 | 20              | 600Ω±25%                                   | 300                | 0.60                   |
| 6   | BLM15AG102SN1 | 20              | 1000Ω±25%                                  | 200                | 1.00                   |
| 7   | BLM15BB050SN1 | 20              | 5Ω±25%                                     | 500                | 0.08                   |
| 8   | BLM15BB100SN1 | 20              | 10Ω±25%                                    | 300                | 0.10                   |
| 9   | BLM15BB220SN1 | 20              | 22Ω±25%                                    | 300                | 0.20                   |
| 10  | BLM15BB470SN1 | 20              | 47Ω±25%                                    | 300                | 0.35                   |
| 11  | BLM15BB750SN1 | 20              | 75Ω±25%                                    | 300                | 0.40                   |
| 12  | BLM15BB121SN1 | 20              | 120Ω±25%                                   | 300                | 0.55                   |
| 13  | BLM15BB221SN1 | 20              | 220Ω±25%                                   | 200                | 0.80                   |
| 14  | BLM15BD471SN1 | 20              | 470Ω±25%                                   | 200                | 0.60                   |
| 15  | BLM15BD601SN1 | 20              | 600Ω±25%                                   | 200                | 0.65                   |
| 16  | BLM15BD102SN1 | 20              | 1000Ω±25%                                  | 200                | 0.90                   |

### ●EKEMBL18A (Chip Ferrite Beads 0603 Size/ for Large-current P Type)

| No. | Part Number   | Quantity (pcs.) | Impedance typ.<br>(at 100MHz, 20 degree C) | Rated Current (mA) | DC Resistance (Ω) max. |
|-----|---------------|-----------------|--|--------------------|------------------------|
| 1   | BLM18AG121SN1 | 20              | 120Ω±25%                                   | 200                | 0.20                   |
| 2   | BLM18AG221SN1 | 20              | 220Ω±25%                                   | 200                | 0.30                   |
| 3   | BLM18AG471SN1 | 20              | 470Ω±25%                                   | 200                | 0.50                   |
| 4   | BLM18AG601SN1 | 20              | 600Ω±25%                                   | 200                | 0.50                   |
| 5   | BLM18AG102SN1 | 20              | 1000Ω±25%                                  | 100                | 0.70                   |
| 6   | BLM18BA050SN1 | 20              | 5Ω±25%                                     | 500                | 0.20                   |
| 7   | BLM18BA100SN1 | 20              | 10Ω±25%                                    | 500                | 0.25                   |
| 8   | BLM18BA220SN1 | 20              | 22Ω±25%                                    | 500                | 0.35                   |
| 9   | BLM18BA470SN1 | 20              | 47Ω±25%                                    | 300                | 0.55                   |
| 10  | BLM18BA750SN1 | 20              | 75Ω±25%                                    | 300                | 0.70                   |
| 11  | BLM18BA121SN1 | 20              | 120Ω±25%                                   | 200                | 0.90                   |
| 12  | BLM18BB100SN1 | 20              | 10Ω±25%                                    | 500                | 0.15                   |
| 13  | BLM18BB220SN1 | 20              | 22Ω±25%                                    | 500                | 0.25                   |
| 14  | BLM18BB470SN1 | 20              | 47Ω±25%                                    | 500                | 0.30                   |
| 15  | BLM18BB600SN1 | 20              | 60Ω±25%                                    | 200                | 0.35                   |
| 16  | BLM18BB121SN1 | 20              | 120Ω±25%                                   | 200                | 0.50                   |
| 17  | BLM18BB221SN1 | 20              | 220Ω±25%                                   | 200                | 0.65                   |
| 18  | BLM18BB471SN1 | 20              | 470Ω±25%                                   | 50                 | 1.00                   |
| 19  | BLM18BD121SN1 | 20              | 120Ω±25%                                   | 200                | 0.40                   |

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## Chip EMI Suppression Filter Design Kits

Continued from the preceding page.

| No. | Part Number   | Quantity (pcs.) | Impedance typ.<br>(at 100MHz, 20 degree C) | Rated Current (mA) | DC Resistance (Ω) max. |
|-----|---------------|-----------------|--|--------------------|------------------------|
| 20  | BLM18BD221SN1 | 20              | 220Ω±25%                                   | 200                | 0.45                   |
| 21  | BLM18BD471SN1 | 20              | 470Ω±25%                                   | 200                | 0.55                   |
| 22  | BLM18BD601SN1 | 20              | 600Ω±25%                                   | 200                | 0.65                   |
| 23  | BLM18BD102SN1 | 20              | 1000Ω±25%                                  | 100                | 0.85                   |
| 24  | BLM18BD182SN1 | 20              | 1800Ω±25%                                  | 50                 | 1.50                   |
| 25  | BLM18BD252SN1 | 20              | 2500Ω±25%                                  | 50                 | 1.50                   |
| 26  | BLM18HG471SN1 | 20              | 470Ω±25%                                   | 200                | 0.85                   |
| 27  | BLM18HG601SN1 | 20              | 600Ω±25%                                   | 200                | 1.00                   |
| 28  | BLM18HG102SN1 | 20              | 1000Ω±25%                                  | 100                | 1.60                   |
| 29  | BLM18HD471SN1 | 20              | 470Ω±25%                                   | 100                | 1.20                   |
| 30  | BLM18HD601SN1 | 20              | 600Ω±25%                                   | 100                | 1.50                   |
| 31  | BLM18HD102SN1 | 20              | 1000Ω±25%                                  | 50                 | 1.80                   |
| 32  | BLM18PG330SN1 | 20              | 33Ω±25%                                    | 3000               | 0.025                  |
| 33  | BLM18PG121SN1 | 20              | 120Ω±25%                                   | 2000               | 0.05                   |
| 34  | BLM18PG181SN1 | 20              | 180Ω±25%                                   | 1500               | 0.09                   |
| 35  | BLM21PG221SN1 | 20              | 220Ω (Typ.)                                | 2000               | 0.05                   |
| 36  | BLM21PG331SN1 | 20              | 330Ω (Typ.)                                | 1500               | 0.09                   |
| 37  | BLM31PG121SN1 | 20              | 120Ω (Typ.)                                | 3000               | 0.025                  |
| 38  | BLM31PG391SN1 | 20              | 390Ω (Typ.)                                | 2000               | 0.05                   |
| 39  | BLM31PG601SN1 | 20              | 600Ω (Typ.)                                | 1500               | 0.09                   |
| 40  | BLM41PG181SN1 | 20              | 180Ω (Typ.)                                | 3000               | 0.025                  |
| 41  | BLM41PG471SN1 | 20              | 470Ω (Typ.)                                | 2000               | 0.05                   |
| 42  | BLM41PG102SN1 | 20              | 1000Ω (Typ.)                               | 1500               | 0.09                   |
| 43  | BLM18RK121SN1 | 20              | 120Ω±25%                                   | 200                | 0.25                   |
| 44  | BLM18RK221SN1 | 20              | 220Ω±25%                                   | 200                | 0.3                    |
| 45  | BLM18RK471SN1 | 20              | 470Ω±25%                                   | 200                | 0.5                    |
| 46  | BLM18RK601SN1 | 20              | 600Ω±25%                                   | 200                | 0.6                    |
| 47  | BLM18RK102SN1 | 20              | 1000Ω±25%                                  | 200                | 0.8                    |
| 48  | BLM18HK471SN1 | 20              | 470Ω±25%                                   | 200                | 0.7                    |
| 49  | BLM18HK601SN1 | 20              | 600Ω±25%                                   | 100                | 0.9                    |
| 50  | BLM18HK102SN1 | 20              | 1000Ω±25%                                  | 50                 | 1.5                    |

●EKEMBL21B (Chip Ferrite Beads 0805 Size)

| No. | Part Number   | Quantity (pcs.) | Impedance typ.<br>(at 100MHz, 20 degree C) | Rated Current (mA) | DC Resistance (Ω) max. |
|-----|---------------|-----------------|--|--------------------|------------------------|
| 1   | BLM21AG121SN1 | 20              | 120Ω±25%                                   | 200                | 0.15                   |
| 2   | BLM21AG221SN1 | 20              | 220Ω±25%                                   | 200                | 0.20                   |
| 3   | BLM21AG471SN1 | 20              | 470Ω±25%                                   | 200                | 0.25                   |
| 4   | BLM21AG601SN1 | 20              | 600Ω±25%                                   | 200                | 0.30                   |
| 5   | BLM21AG102SN1 | 20              | 1000Ω±25%                                  | 200                | 0.45                   |
| 6   | BLM21BB600SN1 | 20              | 60Ω±25%                                    | 200                | 0.20                   |
| 7   | BLM21BB750SN1 | 20              | 75Ω±25%                                    | 200                | 0.25                   |
| 8   | BLM21BB121SN1 | 20              | 120Ω±25%                                   | 200                | 0.25                   |
| 9   | BLM21BB221SN1 | 20              | 220Ω±25%                                   | 200                | 0.35                   |
| 10  | BLM21BB471SN1 | 20              | 470Ω±25%                                   | 200                | 0.45                   |
| 11  | BLM21BD121SN1 | 20              | 120Ω±25%                                   | 200                | 0.25                   |
| 12  | BLM21BD221SN1 | 20              | 220Ω±25%                                   | 200                | 0.25                   |
| 13  | BLM21BD471SN1 | 20              | 470Ω±25%                                   | 200                | 0.35                   |
| 14  | BLM21BD601SN1 | 20              | 600Ω±25%                                   | 200                | 0.35                   |
| 15  | BLM21BD102SN1 | 20              | 1000Ω±25%                                  | 200                | 0.40                   |
| 16  | BLM21BD182SN1 | 20              | 1800Ω±25%                                  | 200                | 0.50                   |
| 17  | BLM21BD222SN1 | 20              | 2250Ω (Typ.)                               | 200                | 0.60                   |

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## Chip EMI Suppression Filter Design Kits

Continued from the preceding page.

| No. | Part Number          | Quantity (pcs.) | Impedance typ.<br>(at 100MHz, 20 degree C) | Rated Current (mA) | DC Resistance (Ω) max. |
|-----|----------------------|-----------------|--|--------------------|------------------------|
| 18  | <b>BLM21BD222TN1</b> | 20              | 2200Ω±25%                                  | 200                | 0.60                   |
| 19  | <b>BLM21BD272SN1</b> | 20              | 2700Ω±25%                                  | 200                | 0.80                   |

### ●EKEMFL18B (Chip EMIFIL LC Combined Type)

| No. | Part Number           | Quantity (pcs.) | Cut off Frequency | Rated Voltage | Rated Current | Insulation Resistance (MΩ min.) | DC Resistance max. |
|-----|-----------------------|-----------------|-------------------|---------------|---------------|---------------------------------|--------------------|
| 1   | <b>NFL18ST107X1C3</b> | 20              | 100MHz            | 16 V          | 100mA         | 1000                            | 4.5Ω               |
| 2   | <b>NFL18ST157X1C3</b> | 20              | 150MHz            | 16 V          | 100mA         | 1000                            | 4.0Ω               |
| 3   | <b>NFL18ST207X1C3</b> | 20              | 200MHz            | 16 V          | 150mA         | 1000                            | 3.5Ω               |
| 4   | <b>NFL18ST307X1C3</b> | 20              | 300MHz            | 16 V          | 200mA         | 1000                            | 1.8Ω               |
| 5   | <b>NFL18ST507X1C3</b> | 20              | 500MHz            | 16 V          | 200mA         | 1000                            | 1.5Ω               |
| 6   | <b>NFL18SP157X1A3</b> | 20              | 150MHz            | 10 V          | 100mA         | 1000                            | 3.0Ω               |
| 7   | <b>NFL18SP207X1A3</b> | 20              | 200MHz            | 10 V          | 100mA         | 1000                            | 3.0Ω               |
| 8   | <b>NFL18SP307X1A3</b> | 20              | 300MHz            | 10 V          | 100mA         | 1000                            | 3.0Ω               |
| 9   | <b>NFL18SP507X1A3</b> | 20              | 500MHz            | 10 V          | 100mA         | 1000                            | 2.0Ω               |
| 10  | <b>NFL21SP206X1C3</b> | 20              | 20MHz             | 16 V          | 100mA         | 1000                            | 8.5Ω               |
| 11  | <b>NFL21SP506X1C3</b> | 20              | 50MHz             | 16 V          | 150mA         | 1000                            | 3.5Ω               |
| 12  | <b>NFL21SP706X1C3</b> | 20              | 70MHz             | 16 V          | 150mA         | 1000                            | 3.0Ω               |
| 13  | <b>NFL21SP107X1C3</b> | 20              | 100MHz            | 16 V          | 200mA         | 1000                            | 2.0Ω               |
| 14  | <b>NFL21SP157X1C3</b> | 20              | 150MHz            | 16 V          | 200mA         | 1000                            | 2.0Ω               |
| 15  | <b>NFL21SP207X1C3</b> | 20              | 200MHz            | 16 V          | 250mA         | 1000                            | 1.5Ω               |
| 16  | <b>NFL21SP307X1C3</b> | 20              | 300MHz            | 16 V          | 300mA         | 1000                            | 1.2Ω               |
| 17  | <b>NFL21SP407X1C3</b> | 20              | 400MHz            | 16 V          | 300mA         | 1000                            | 1.2Ω               |
| 18  | <b>NFL21SP507X1C3</b> | 20              | 500MHz            | 16 V          | 300mA         | 1000                            | 1.2Ω               |

| No. | Part Number           | Quantity (pcs.) | Cut off Frequency | Attenuation (dB min.) |         |         |         |         |         |         |         |         |      | Rated Current | Rated Voltage |
|-----|-----------------------|-----------------|-------------------|-----------------------|---------|---------|---------|---------|---------|---------|---------|---------|------|---------------|---------------|
|     |                       |                 |                   | 10MHz                 | 20MHz   | 50MHz   | 100MHz  | 150MHz  | 200MHz  | 300MHz  | 400MHz  | 500MHz  | 1GHz |               |               |
| 19  | <b>NFW31SP106X1E4</b> | 20              | 10MHz             | 6dB max               | 5       | 25      | 25      | -       | 25      | -       | -       | 30      | 30   | 200mA         | 25V           |
| 20  | <b>NFW31SP206X1E4</b> | 20              | 20MHz             | -                     | 6dB max | 5       | 25      | -       | 25      | -       | -       | 30      | 30   | 200mA         | 25V           |
| 21  | <b>NFW31SP506X1E4</b> | 20              | 50MHz             | -                     | -       | 6dB max | 10      | -       | 30      | -       | -       | 30      | 30   | 200mA         | 25V           |
| 22  | <b>NFW31SP107X1E4</b> | 20              | 100MHz            | -                     | -       | -       | 6dB max | -       | 5       | -       | -       | 20      | 30   | 200mA         | 25V           |
| 23  | <b>NFW31SP157X1E4</b> | 20              | 150MHz            | -                     | -       | -       | -       | 6dB max | -       | 10      | 20      | 30      | 30   | 200mA         | 25V           |
| 24  | <b>NFW31SP207X1E4</b> | 20              | 200MHz            | -                     | -       | -       | -       | -       | 6dB max | -       | -       | 10      | 30   | 200mA         | 25V           |
| 25  | <b>NFW31SP307X1E4</b> | 20              | 300MHz            | -                     | -       | -       | -       | -       | -       | 6dB max | -       | 5       | 15   | 200mA         | 25V           |
| 26  | <b>NFW31SP407X1E4</b> | 20              | 400MHz            | -                     | -       | -       | -       | -       | -       | -       | 6dB max | -       | 10   | 200mA         | 25V           |
| 27  | <b>NFW31SP507X1E4</b> | 20              | 500MHz            | -                     | -       | -       | -       | -       | -       | -       | -       | 6dB max | 10   | 200mA         | 25V           |

### ●EKEMFA31B (Chip EMIFIL Capacitor Array Type/ Capacitor Type/ LC Combined Type)

| No. | Part Number           | Quantity (pcs.) | Capacitance | Rated Voltage | Rated Current | Insulation Resistance (MΩ min.) |
|-----|-----------------------|-----------------|-------------|---------------|---------------|---------------------------------|
| 1   | <b>NFA31CC220S1E4</b> | 20              | 22pF±20%    | 25 V          | 200mA         | 1000                            |
| 2   | <b>NFA31CC470S1E4</b> | 20              | 47pF±20%    | 25 V          | 200mA         | 1000                            |
| 3   | <b>NFA31CC101S1E4</b> | 20              | 100pF±20%   | 25 V          | 200mA         | 1000                            |
| 4   | <b>NFA31CC221S1E4</b> | 20              | 220pF±20%   | 25 V          | 200mA         | 1000                            |
| 5   | <b>NFA31CC471R1E4</b> | 20              | 470pF±20%   | 25 V          | 200mA         | 1000                            |
| 6   | <b>NFA31CC102R1E4</b> | 20              | 1000pF±20%  | 25 V          | 200mA         | 1000                            |
| 7   | <b>NFA31CC222R1E4</b> | 20              | 2200pF±20%  | 25 V          | 200mA         | 1000                            |
| 8   | <b>NFA31CC223R1C4</b> | 20              | 22000pF±20% | 16 V          | 200mA         | 1000                            |
| 9   | <b>NFA31GD1006R84</b> | 20              | 10pF±20%    | 6 V           | 50mA          | 1000                            |
| 10  | <b>NFA31GD1004704</b> | 20              | 10pF±20%    | 6 V           | 20mA          | 1000                            |
| 11  | <b>NFA31GD1001014</b> | 20              | 10pF±20%    | 6 V           | 15mA          | 1000                            |
| 12  | <b>NFA31GD4706R84</b> | 20              | 47pF±20%    | 6 V           | 50mA          | 1000                            |

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## Chip EMI Suppression Filter Design Kits

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### ●EKEMFA31B (Chip EMIFIL Capacitor Array Type/ Capacitor Type/ LC Combined Type)

| No. | Part Number           | Quantity (pcs.) | Capacitance | Rated Voltage | Rated Current | Insulation Resistance (MΩ min.) |
|-----|-----------------------|-----------------|-------------|---------------|---------------|---------------------------------|
| 13  | <b>NFA31GD4704704</b> | 20              | 47pF±20%    | 6 V           | 20mA          | 1000                            |
| 14  | <b>NFA31GD4701014</b> | 20              | 47pF±20%    | 6 V           | 15mA          | 1000                            |
| 15  | <b>NFA31GD1016R84</b> | 20              | 100pF±20%   | 6 V           | 50mA          | 1000                            |
| 16  | <b>NFA31GD1014704</b> | 20              | 100pF±20%   | 6 V           | 20mA          | 1000                            |
| 17  | <b>NFA31GD1011014</b> | 20              | 100pF±20%   | 6 V           | 15mA          | 1000                            |

### ●EKEMDL21D (Chip Common Mode Choke Coils)

| No. | Part Number          | Quantity (pcs.) | Common Mode Impedance typ. (at 100MHz, 20 degree C) | Rated Voltage | Rated Current | Insulation Resistance (MΩ min.) |
|-----|----------------------|-----------------|---|---------------|---------------|---------------------------------|
| 1   | <b>DLW21HN670SQ2</b> | 10              | 67Ω (Typ.)  | 50V           | 330mA         | 10                              |
| 2   | <b>DLW21HN900SQ2</b> | 10              | 90Ω (Typ.)  | 50V           | 330mA         | 10                              |
| 3   | <b>DLW21HN121SQ2</b> | 10              | 120Ω (Typ.)   | 50V           | 280mA         | 10                              |
| 4   | <b>DLW21HN181SQ2</b> | 10              | 180Ω (Typ.)   | 50V           | 250mA         | 10                              |
| 5   | <b>DLW21SN670SQ2</b> | 10              | 67Ω (Typ.)  | 50V           | 400mA         | 10                              |
| 6   | <b>DLW21SN900SQ2</b> | 10              | 90Ω (Typ.)  | 50V           | 330mA         | 10                              |
| 7   | <b>DLW21SN121SQ2</b> | 10              | 120Ω (Typ.)   | 50V           | 370mA         | 10                              |
| 8   | <b>DLW21SN181SQ2</b> | 10              | 180Ω (Typ.)   | 50V           | 330mA         | 10                              |
| 9   | <b>DLW21SN261SQ2</b> | 10              | 260Ω (Typ.)   | 50V           | 300mA         | 10                              |
| 10  | <b>DLW21SN371SQ2</b> | 10              | 370Ω (Typ.)   | 50V           | 280mA         | 10                              |
| 11  | <b>DLW31SN900SQ2</b> | 10              | 90Ω (Typ.)  | 50V           | 370mA         | 10                              |
| 12  | <b>DLW31SN161SQ2</b> | 10              | 160Ω (Typ.)   | 50V           | 340mA         | 10                              |
| 13  | <b>DLW31SN261SQ2</b> | 10              | 260Ω (Typ.)   | 50V           | 310mA         | 10                              |
| 14  | <b>DLW31SN601SQ2</b> | 10              | 600Ω (Typ.)   | 50V           | 260mA         | 10                              |
| 15  | <b>DLW31SN102SQ2</b> | 10              | 1000Ω (Typ.)  | 50V           | 230mA         | 10                              |
| 16  | <b>DLW31SN222SQ2</b> | 10              | 2200Ω (Typ.)  | 50V           | 200mA         | 10                              |
| 17  | <b>DLW5AHN402SQ2</b> | 5               | 4000Ω (Typ.)  | 50V           | 200mA         | 10                              |
| 18  | <b>DLW5BSN302SQ2</b> | 5               | 3000Ω (Typ.)  | 50V           | 500mA         | 10                              |
| 19  | <b>DLW5BSN152SQ2</b> | 5               | 1500Ω (Typ.)  | 50V           | 1000mA        | 10                              |
| 20  | <b>DLW5BSN102SQ2</b> | 5               | 1000Ω (Typ.)  | 50V           | 1500mA        | 10                              |
| 21  | <b>DLW5BSN351SQ2</b> | 5               | 350Ω (Typ.)   | 50V           | 2000mA        | 10                              |
| 22  | <b>DLW5BSN191SQ2</b> | 5               | 190Ω (Typ.)   | 50V           | 5000mA        | 10                              |
| 23  | <b>DLP11SN900SL2</b> | 10              | 90Ω (Typ.)  | 5V            | 160mA         | 100                             |
| 24  | <b>DLP11SN121SL2</b> | 10              | 120Ω (Typ.)   | 5V            | 140mA         | 100                             |
| 25  | <b>DLP11SN161SL2</b> | 10              | 160Ω (Typ.)   | 5V            | 120mA         | 100                             |
| 26  | <b>DLP11SN201SL2</b> | 10              | 200Ω (Typ.)   | 5V            | 130mA         | 100                             |
| 27  | <b>DLP31DN900ML4</b> | 10              | 90Ω±20%   | 10V           | 160mA         | 100                             |
| 28  | <b>DLP31DN131ML4</b> | 10              | 130Ω±20%  | 10V           | 120mA         | 100                             |
| 29  | <b>DLP31DN201ML4</b> | 10              | 200Ω±20%  | 10V           | 100mA         | 100                             |
| 30  | <b>DLP31DN321ML4</b> | 10              | 320Ω±20%  | 10V           | 80mA          | 100                             |
| 31  | <b>DLP31DN441ML4</b> | 10              | 440Ω±20%  | 10V           | 70mA          | 100                             |

### ●EKEMNFMPB

| No. | Part Number           | Quantity (pcs.) | Capacitance | Rated Voltage | Rated Current | Insulation Resistance (MΩ min.) |
|-----|-----------------------|-----------------|-------------|---------------|---------------|---------------------------------|
| 1   | <b>NFM18PC104R1C3</b> | 20              | 0.1μF±20%   | 16 V          | 2A            | 1000                            |
| 2   | <b>NFM18PC105R0J3</b> | 20              | 1μF±20%     | 6.3 V         | 2A            | 500                             |
| 3   | <b>NFM21PC104R1E3</b> | 20              | 0.1μF±20%   | 25 V          | 2A            | 1000                            |
| 4   | <b>NFM21PC224R1C3</b> | 20              | 0.22μF±20%  | 16 V          | 2A            | 1000                            |
| 5   | <b>NFM21PC474R1C3</b> | 20              | 0.47μF±20%  | 16 V          | 2A            | 1000                            |
| 6   | <b>NFM21PC105B1A3</b> | 20              | 1μF±20%     | 10 V          | 4A            | 500                             |

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## Chip EMI Suppression Filter Design Kits

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| No. | Part Number           | Quantity (pcs.) | Capacitance     | Rated Voltage | Rated Current | Insulation Resistance (MΩ min.) |
|-----|-----------------------|-----------------|-----------------|---------------|---------------|---------------------------------|
| 7   | <b>NFM21PC105B1C3</b> | 20              | 1μF±20%         | 16 V          | 4A            | 500                             |
| 8   | <b>NFE31PT152Z1E9</b> | 20              | 1500pF +50/-20% | 25 V          | 6A            | 1000                            |
| 9   | <b>NFE31PT222Z1E9</b> | 20              | 2200pF±50%      | 25 V          | 6A            | 1000                            |
| 10  | <b>NFE61PT102E1H9</b> | 20              | 1000pF +80/-20% | 50 V          | 2A            | 1000                            |
| 11  | <b>NFE61PT472C1H9</b> | 20              | 4700pF +80/-20% | 50 V          | 2A            | 1000                            |
| 12  | <b>NFM41PC204F1H3</b> | 20              | 0.2μF +80/-20%  | 50 V          | 2A            | 1000                            |
| 13  | <b>NFM41PC155B1E3</b> | 20              | 1.5μF±20%       | 25 V          | 6A            | 300                             |

### ●EKEMNFMCA

| No. | Part Number           | Quantity (pcs.) | Capacitance | Rated Voltage | Rated Current | Insulation Resistance (MΩ min.) |
|-----|-----------------------|-----------------|-------------|---------------|---------------|---------------------------------|
| 1   | <b>NFM18CC220U1C3</b> | 20              | 22pF±20%    | 16 V          | 400mA         | 1000                            |
| 2   | <b>NFM18CC470U1C3</b> | 20              | 47pF±20%    | 16 V          | 400mA         | 1000                            |
| 3   | <b>NFM18CC101R1C3</b> | 20              | 100pF±20%   | 16 V          | 500mA         | 1000                            |
| 4   | <b>NFM18CC221R1C3</b> | 20              | 220pF±20%   | 16 V          | 500mA         | 1000                            |
| 5   | <b>NFM18CC471R1C3</b> | 20              | 470pF±20%   | 16 V          | 500mA         | 1000                            |
| 6   | <b>NFM18CC102R1C3</b> | 20              | 1000pF±20%  | 16 V          | 600mA         | 1000                            |
| 7   | <b>NFM18CC222R1C3</b> | 20              | 2200pF±20%  | 16 V          | 700mA         | 1000                            |
| 8   | <b>NFM18CC223R1C3</b> | 20              | 22000pF±20% | 16 V          | 1000mA        | 1000                            |
| 9   | <b>NFM21CC220U1H3</b> | 20              | 22pF±20%    | 50 V          | 700mA         | 1000                            |
| 10  | <b>NFM21CC470U1H3</b> | 20              | 47pF±20%    | 50 V          | 700mA         | 1000                            |
| 11  | <b>NFM21CC101U1H3</b> | 20              | 100pF±20%   | 50 V          | 700mA         | 1000                            |
| 12  | <b>NFM21CC221R1H3</b> | 20              | 220pF±20%   | 50 V          | 700mA         | 1000                            |
| 13  | <b>NFM21CC471R1H3</b> | 20              | 470pF±20%   | 50 V          | 1000mA        | 1000                            |
| 14  | <b>NFM21CC102R1H3</b> | 20              | 1000pF±20%  | 50 V          | 1000mA        | 1000                            |
| 15  | <b>NFM21CC222R1H3</b> | 20              | 2200pF±20%  | 50 V          | 1000mA        | 1000                            |
| 16  | <b>NFM21CC223R1H3</b> | 20              | 22000pF±20% | 50 V          | 2000mA        | 1000                            |