

## Chip Bead Cores

Type: **EXCCL**  
**EXCML**  
**EXC3B**



Discontinued

### ■ Features

- Effective noise suppression for power lines and high speed signal lines
- Easy pattern layout on PC Board
- RoHS compliant

Type: EXCCL, EXCML

- Low DC Resistance 3 to 8 mΩ typical: Rated current (3 and 4 Amperes) (type: EXCML)
- Low impedance

Type: EXC3B

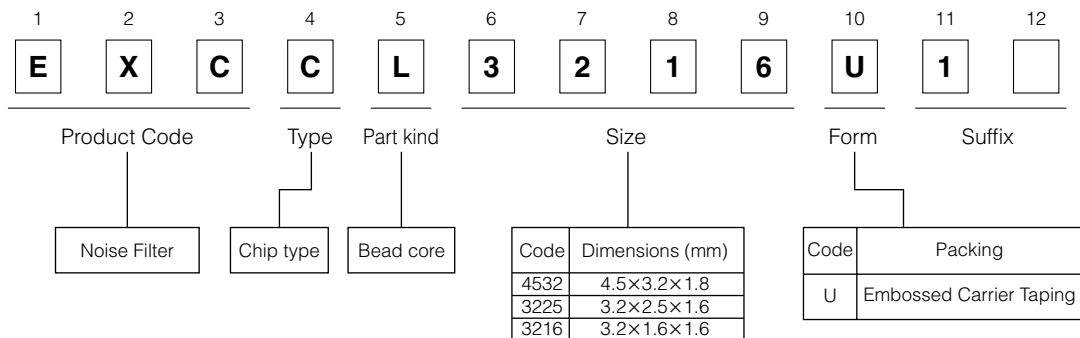
- High impedance for high speed signal line noise
- Increased attenuation
- 60 Ω-1 A, 120 Ω-0.5 A are achieved by using 1608 size (type: EXC3BP)

### ■ Recommended Applications

- Digital equipment such as PCs, word processors, printers, HDD, PCC, CD-ROMs, DVD-ROMs.
- Digital audio and video equipment such as VCRs, DVC, CD Players, DVD Players.
- AC adapters, and switching power supplies.
- Electronic musical instruments, and other digital equipment.

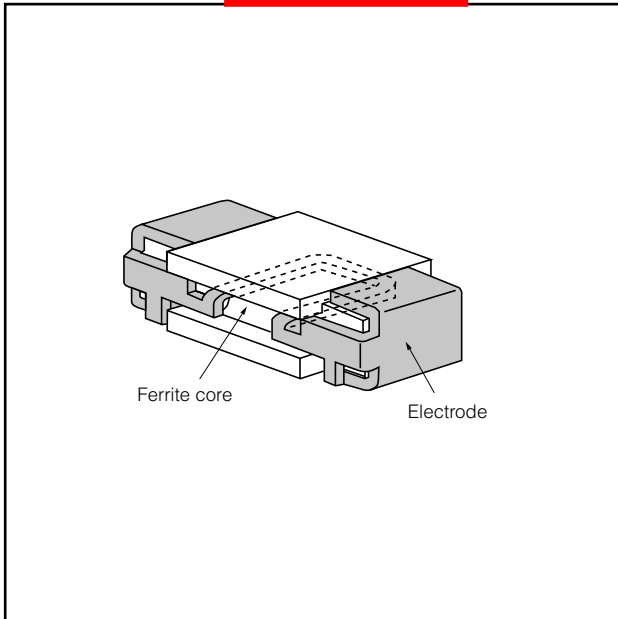
### ■ Type: EXCCL

#### ● Explanation of Part Numbers

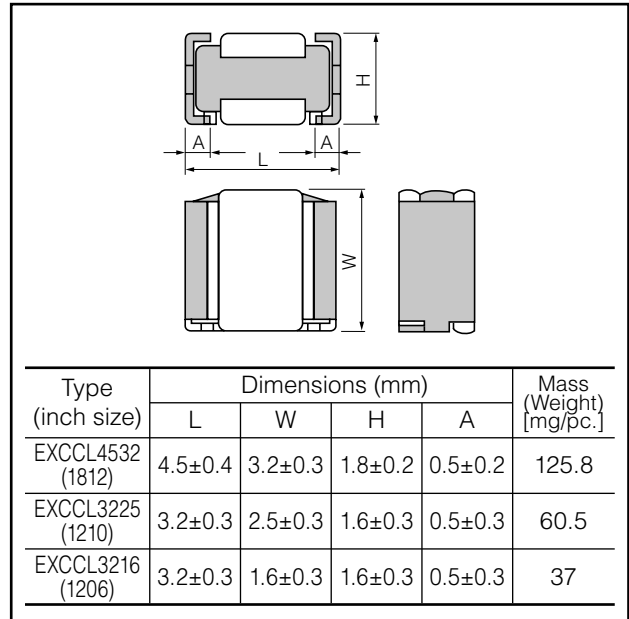


### Construction

**Discontinued**

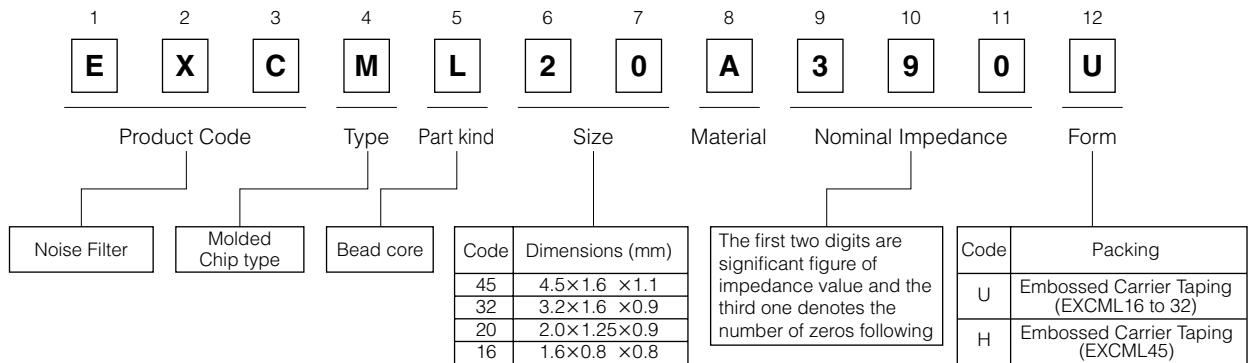


### Dimensions in mm (not to scale)

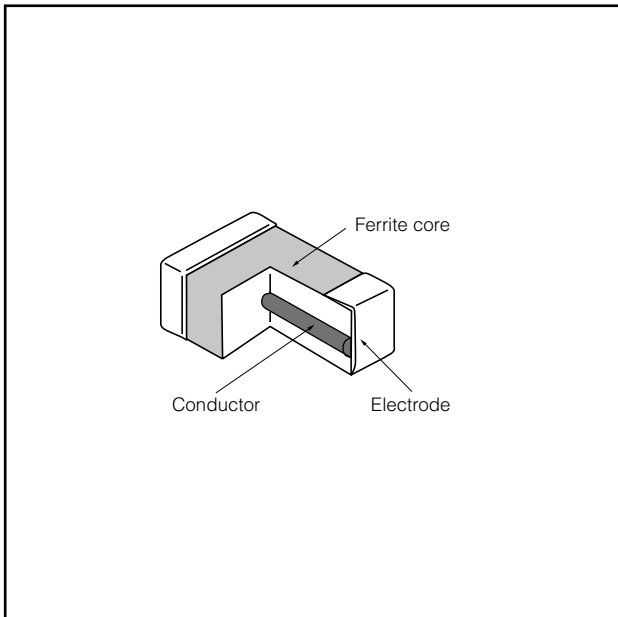


### Type: EXCML

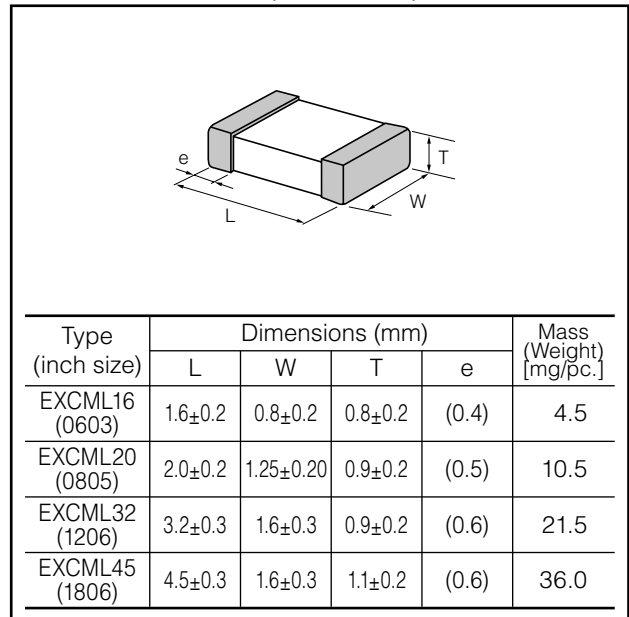
#### Explanation of Part Numbers



### Construction



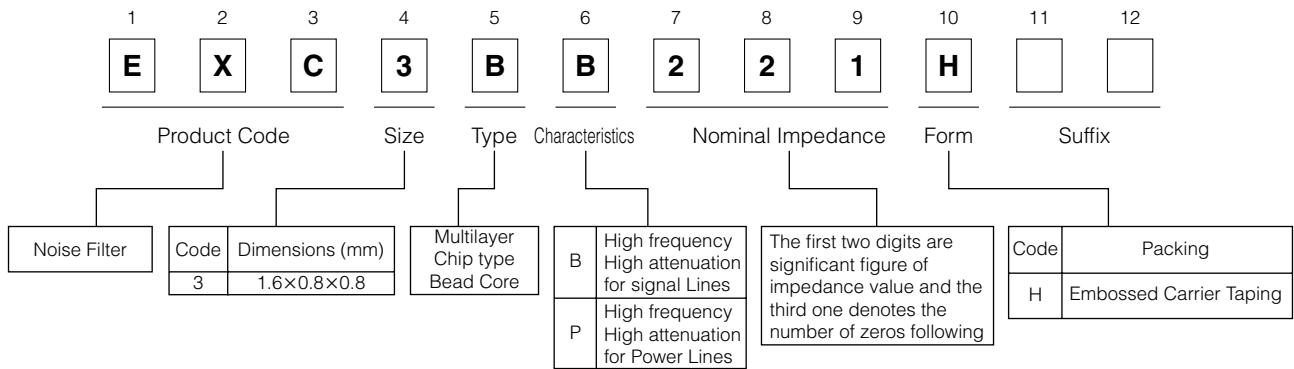
### Dimensions in mm (not to scale)



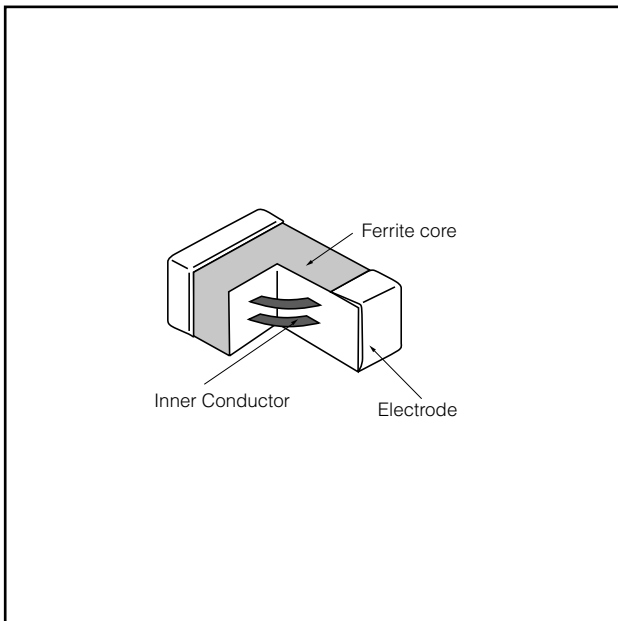
■ Type: EXC3B

Discontinued

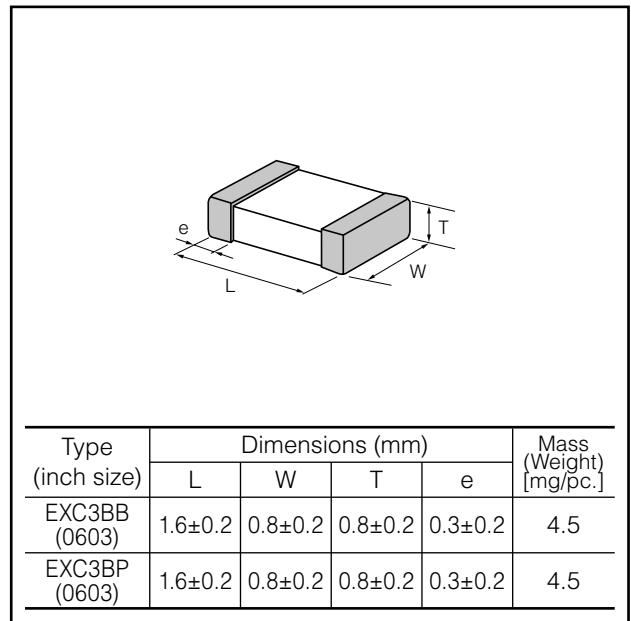
● Explanation of Part Numbers



■ Construction



■ Dimensions in mm (not to scale)



■ Ratings

| Type | Part Number  | Impedance      |         | Rated Current<br>(mA DC) | DC Resistance<br>(Ω) max. |
|------|--------------|----------------|---------|--------------------------|---------------------------|
|      |              | (Ω) at 100 MHz | tol.(%) |                          |                           |
| 4532 | EXCCL4532U1  | 115            | ±25     | 2000                     | 0.1                       |
| 3225 | EXCCL3225U1  | 45             |         | 2000                     | 0.05                      |
| 3216 | EXCCL3216U1  | 25             |         | 2000                     | 0.05                      |
| 4516 | EXCML45A910H | 91             |         | 3000                     | 0.016                     |
| 3216 | EXCML32A680U | 68             |         | 3000                     | 0.012                     |
| 2012 | EXCML20A390U | 39             |         | 4000                     | 0.008                     |
| 1608 | EXCML16A270U | 27             |         | 4000                     | 0.006                     |
| 1608 | EXC3BP600H   | 60             |         | 1000                     | 0.07                      |
|      | EXC3BP121H   | 120            |         | 500                      | 0.1                       |
|      | EXC3BB221H   | 220            |         | 200                      | 0.3                       |
|      | EXC3BB601H   | 600            | 100     | 0.8                      |                           |
|      | EXC3BB102H   | 1000           | 50      | 1                        |                           |

● Category Temperature Range -25 °C to +85 °C

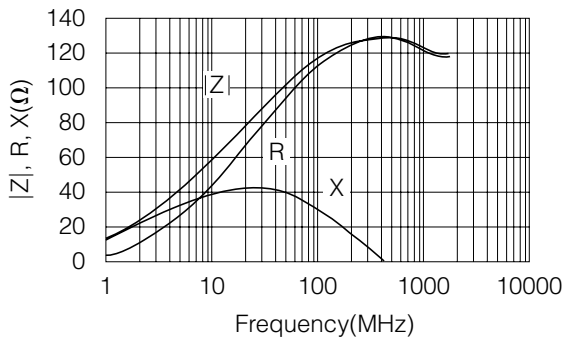
■ Impedance Characteristics (Reference Data)

Measured by HP4291A

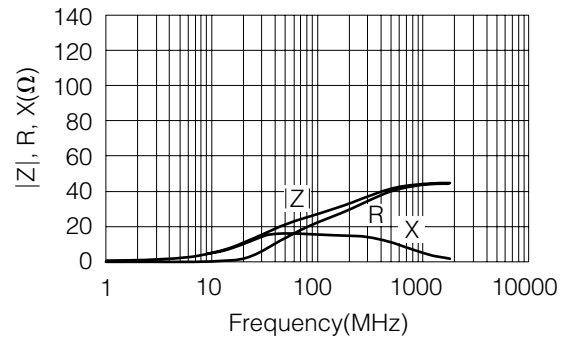
|Z| : Impedance    R : Resistance    X : Reactance

Discontinued

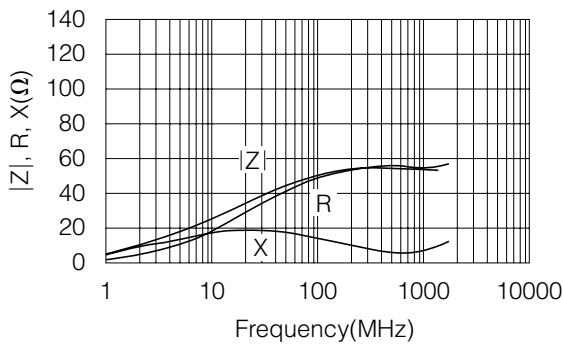
●EXCCL4532U1 (4532)



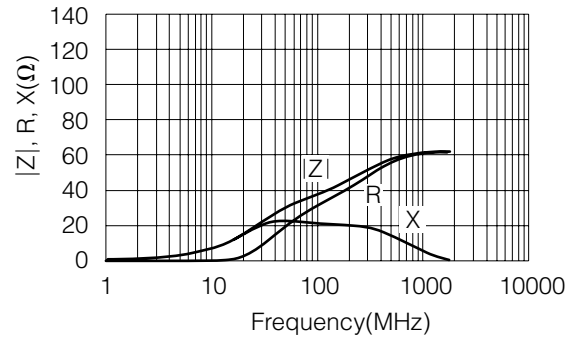
●EXCML16A270U (1608)



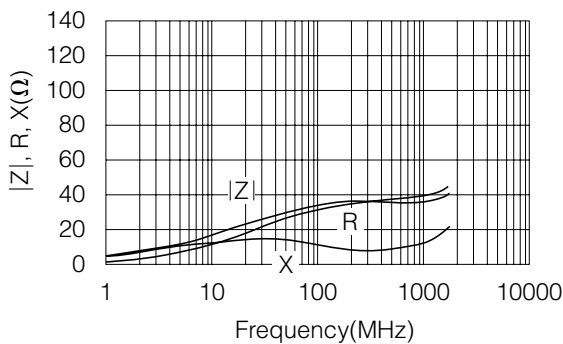
●EXCCL3225U1 (3225)



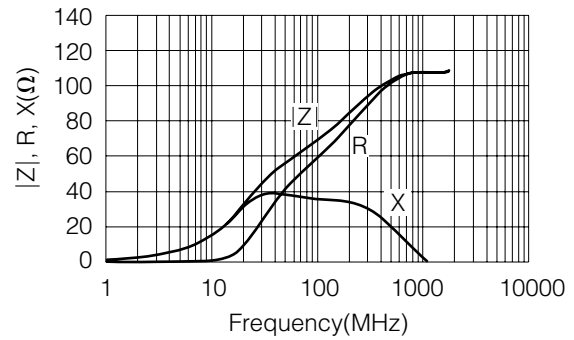
●EXCML20A390U (2012)



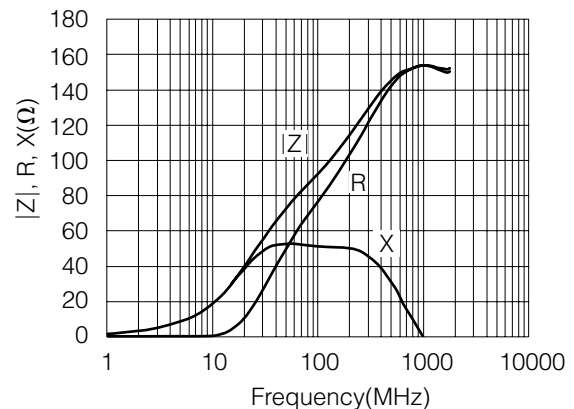
●EXCCL3216U1 (3216)



●EXCML32A680U (3216)



●EXCML45A910H (4516)



■ Impedance Characteristics (Reference Data)

Measured by HP4291A

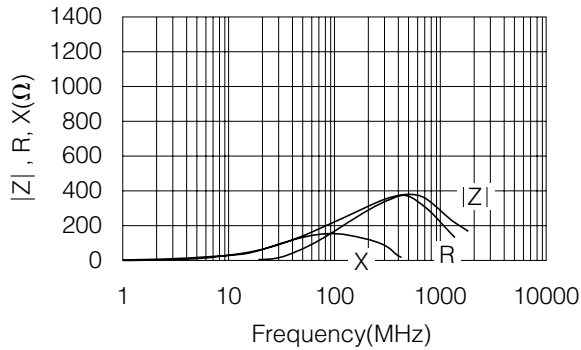
Discontinued

|Z| : Impedance

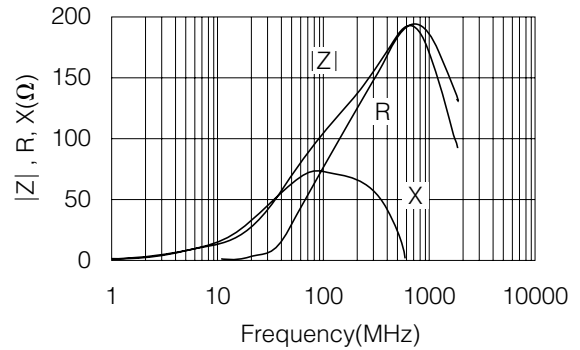
R : Resistance

X : Reactance

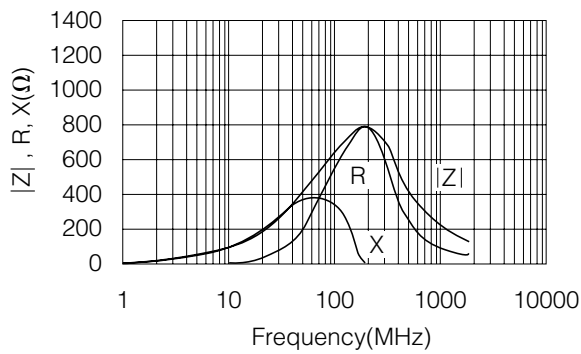
●EXC3BB221H (1608)



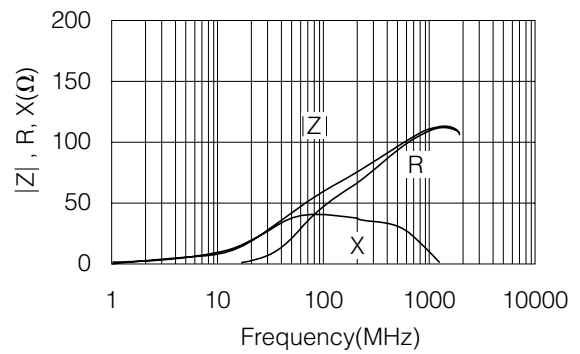
●EXC3BP121H (1608)



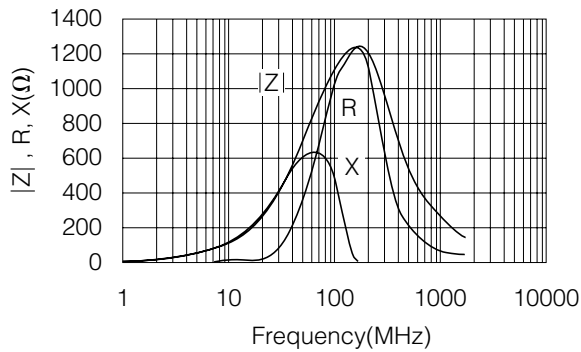
●EXC3BB601H (1608)



●EXC3BP600H (1608)



●EXC3BB102H (1608)



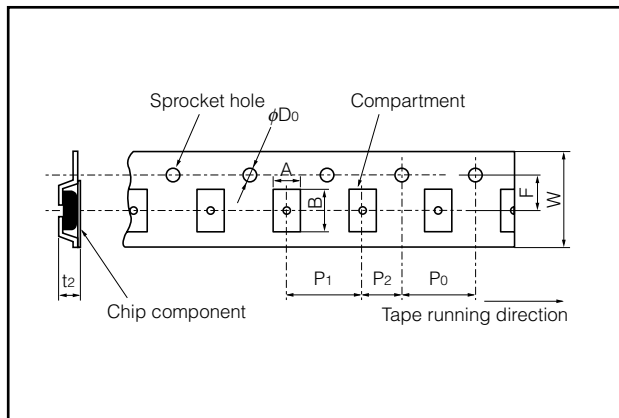
### ■ Packaging Methods (Taping)

- Standard Quantity

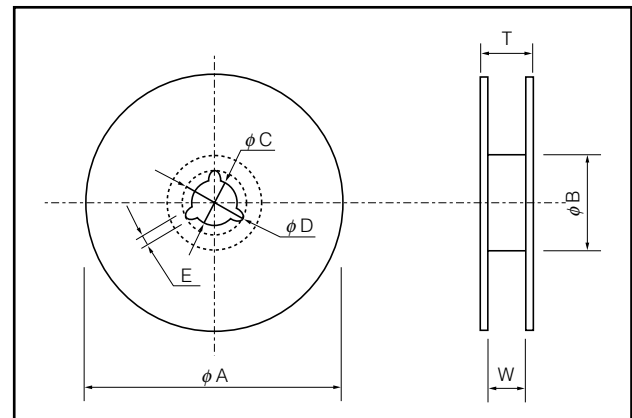
Discontinued

| Part Number  | Kind of Taping          | Pitch (P <sub>1</sub> ) | Quantity       |
|--------------|-------------------------|-------------------------|----------------|
| EXCCL4532U1  | Embossed Carrier Taping | 8 mm                    | 1000 pcs./reel |
| EXCCL3225U1  |                         | 4 mm                    | 2000 pcs./reel |
| EXCCL3216U1  |                         |                         | 3000 pcs./reel |
| EXCML45A910H |                         |                         |                |
| EXCML32A680U |                         |                         | 4000 pcs./reel |
| EXCML20A390U |                         |                         |                |
| EXCML16A270U |                         |                         |                |
| EXC3B□□□□H   |                         |                         |                |

### ● Embossed Carrier Taping



### ● Taping Reel



### Embossed Carrier Dimensions (mm)

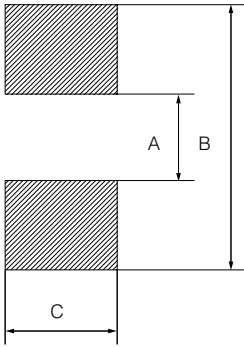
| Part Number  | A       | B       | W        | F       | P <sub>1</sub> | P <sub>2</sub> | P <sub>0</sub> | $\phi D_0$ | t <sub>2</sub> |
|--------------|---------|---------|----------|---------|----------------|----------------|----------------|------------|----------------|
| EXCCL4532U1  | 3.6±0.2 | 4.9±0.2 | 12.0±0.2 | 5.5±0.1 | 8.0±0.1        |                |                |            | 2.4 max.       |
| EXCCL3225U1  | 2.9±0.2 | 3.6±0.2 | 8.0±0.2  | 3.5±0.1 |                |                |                |            |                |
| EXCCL3216U1  | 2.0±0.2 | 3.6±0.2 | 12.0±0.2 | 5.5±0.1 | 4.0±0.1        | 2.0±0.1        | 4.0±0.1        | 1.5±0.1    | 1.8 max.       |
| EXCML45A910H | 1.9±0.2 | 4.8±0.2 |          |         |                |                |                |            |                |
| EXCML32A680U | 1.9±0.2 | 3.5±0.2 | 8.0±0.2  | 3.5±0.1 |                |                |                |            | 1.6 max.       |
| EXCML20A390U | 1.5±0.2 | 2.3±0.2 |          |         |                |                |                |            |                |
| EXCML16A270U | 1.0±0.2 | 1.8±0.2 |          |         |                |                |                |            |                |
| EXC3B□□□□H   | 1.0±0.1 | 1.8±0.1 |          |         |                |                |                |            |                |

### Standard Reel Dimensions (mm)

| Part Number  | $\phi A$                           | $\phi B$ | $\phi C$ | $\phi D$ | E       | W        | T         |
|--------------|------------------------------------|----------|----------|----------|---------|----------|-----------|
| EXCCL4532U1  | 180.0 <sup>0</sup> <sub>-3.0</sub> | 60.0±1.0 | 13.0±0.5 | 21.0±0.8 | 2.0±0.5 | 13.0±0.3 | 16.5 max. |
| EXCCL3225U1  |                                    |          |          |          |         | 9.0±0.3  | 13 max.   |
| EXCCL3216U1  |                                    |          |          |          |         | 13.0±0.3 | 16.5 max. |
| EXCML45A910H |                                    |          |          |          |         | 9.0±0.3  | 13 max.   |
| EXCML32A680U |                                    |          |          |          |         |          |           |
| EXCML20A390U |                                    |          |          |          |         |          |           |
| EXCML16A270U |                                    |          |          |          |         |          |           |
| EXC3B□□□□H   |                                    |          |          |          |         |          |           |

Recommended Land Pattern Dimensions in mm (not to scale)

**Discontinued**

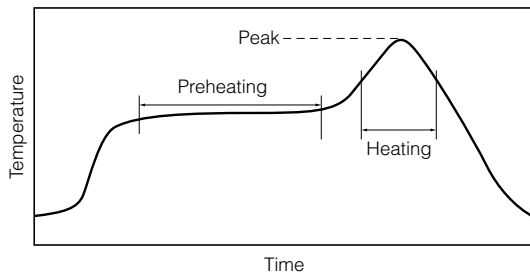


| Part Number  | A          | B          | C          |
|--------------|------------|------------|------------|
| EXCCL4532U1  | 3          | 5.4        | 2.8        |
| EXCCL3225U1  | 1.7        | 4.1        | 2.1        |
| EXCCL3216U1  | 1.7        | 4.1        | 1.2        |
| EXCML45A910H | 2.6 to 3   | 5.5 to 6.5 | 1.2 to 1.6 |
| EXCML32A680U | 1.6 to 2   | 4 to 5     | 1.2 to 1.6 |
| EXCML20A390U | 0.8 to 1.2 | 3 to 4     | 1 to 1.2   |
| EXCML16A270U | 0.6 to 1   | 2 to 3     | 0.8 to 1   |
| EXC3B□□□□H   | 0.8 to 1   | 2 to 2.6   | 0.8 to 1   |

Recommended Soldering Conditions

Recommendations and precautions are described below.

- Recommended soldering conditions for reflow
  - Reflow soldering shall be performed a maximum of two times.
  - Please contact us for additional information when used in conditions other than those specified.
  - Please measure the temperature of the terminals and study every kind of solder and printed circuit board for solderability before actual use.



For soldering (Example : Sn-37Pb)

|              | Temperature      | Time          |
|--------------|------------------|---------------|
| Preheating   | 140 °C to 160 °C | 60 s to 120 s |
| Main heating | Above 200 °C     | 30 s to 40 s  |
| Peak         | 235 ± 10 °C      | max. 10 s     |

For lead-free soldering (Example : Sn/3Ag/0.5Cu)

|              | Temperature      | Time          |
|--------------|------------------|---------------|
| Preheating   | 150 °C to 170 °C | 60 s to 120 s |
| Main heating | Above 230 °C     | 30 s to 40 s  |
| Peak         | max. 260 °C      | max. 10 s     |

- Flow soldering
  - Flow soldering may cause this product to come off because the adhesiveness of the product element is low. Please consult our sales representative in advance about flow soldering.

<Repair with hand soldering>

- Preheat with a blast of hot air or similar method. Use a soldering iron with a tip temperature of 350 °C or less. Solder each electrode for 3 seconds or less.
- Never touch this product with the tip of a soldering iron.

**⚠ Safety Precautions**

The following are precautions for individual products. Please also refer to the common precautions for Noise Suppression Device shown on this catalog.

1. Use rosin-based flux or halogen-free flux.
2. For cleaning, use an alcohol-based cleaning agent. Before using any other type, consult with our sales person in advance.
3. Do not apply shock to Chip Bead Cores (hereafter called the bead cores) or pinch them with a hard tool (e.g. pliers and tweezers). Otherwise, their bodies may be chipped, affecting their performance.  
Excessive mechanical stress may damage the bead cores. Handle with care.
4. Store the bead cores in a location with a temperature ranging from -5 °C to +40 °C and a relative humidity of 40 % to 60 %, where there are no rapid changes in temperature or humidity.
5. Use the bead cores within a year (EXC3B Type: within half a year) after the date of the outgoing inspection indicated on the packages.