

# TOKIN

## NEW PRODUCTS

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English

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Vol.  
**08**



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# Polymer Tantalum Chip Capacitor *NeoCapacitor*<sup>TM</sup>



## Features

- Low ESR / High permissible ripple current
- Industry leading lineup using cutting-edge powder technology
- No reduction in capacitance due to DC bias
- High level of safety

## Applications

- Notebook PC
- Tablet PC
- Smart Phone
- TV
- Security Camera
- HDD / SSD
- Digital Camera
- Server
- Base Station

## Product Lineup

| Voltage<br>Capacitance | 2.5V       | 4V            | 6.3V              | 10V               | 16V     | 20V | 25V     | 35V |
|------------------------|------------|---------------|-------------------|-------------------|---------|-----|---------|-----|
| 3.3μF                  |            |               |                   | A                 | A       |     |         |     |
| 4.7μF                  |            |               |                   | A                 | B2      |     |         |     |
| 6.8μF                  |            |               | A                 | A, B2             | B2      |     | B3, B2  | B3★ |
| 10μF                   |            | A             | P2, A             | P2, A, B2         | B2      |     | B15     |     |
| 15μF                   |            |               | A, B2             | A, B2             | B2      |     | B3★, B2 |     |
| 22μF                   |            | B2            | A, B3, B2         | P2, A3, A, B3, B2 |         | B2  | B2★     |     |
| 33μF                   |            | A             | A, B3, B2         | A3, A, B3, B2     | B3★, B2 | B2  | V, D    |     |
| 47μF                   |            | A, B3         | P2, A3, A, B3, B2 | A3, A, B3, B2     | V, D    | V15 |         |     |
| 68μF                   |            | A             | B3, B2            | V, D              | V, D    |     |         |     |
| 100μF                  | A, B3      | A3, A, B3, B2 | A3, A, B3, B2     | B2                | V       |     |         |     |
| 150μF                  |            | B2            | B3★, B15, B2      | V, D              | D       |     |         |     |
| 220μF                  | A, B3★, B2 | B2            | B2                | V, D              |         |     |         |     |
| 330μF                  | B2         | V, D          | V, D              |                   |         |     |         |     |
| 470μF                  | V          | D             | V, D              |                   |         |     |         |     |
| 680μF                  | D          | D             |                   |                   |         |     |         |     |
| 1000μF                 | D          |               |                   |                   |         |     |         |     |

★ : New

| シリーズ名      | ケースコード | 寸法 [mm]                  |
|------------|--------|--------------------------|
| G/PS       | P2     | 2.0±0.1×1.25±0.1×0.9±0.1 |
| F/PS       | A3     | 3.2±0.2×1.6±0.2×0.9±0.1  |
| PS/L       | A      | 3.2±0.2×1.6±0.2×1.6±0.2  |
| PS/L, F/PS | B3     | 3.5±0.2×2.8±0.2×1.1±0.1  |
| PS/L       | B15    | 3.5±0.2×2.8±0.2×1.4±0.1  |
| PS/L       | B2     | 3.5±0.2×2.8±0.2×1.9±0.1  |
| PS/K       | V15    | 7.3±0.3×4.3±0.3×1.4±0.1  |
| PS/K       | V      | 7.3±0.3×4.3±0.3×1.9±0.1  |
| PS/K       | D      | 7.3±0.3×4.3±0.3×2.8±0.3  |



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# 125°C Rated Polymer Tantalum Chip Capacitor

## NeoCapacitor™ PS/H Series



Highly reliable products optimized for industrial and communication devices which require reliability in high-temperature environments.

### Features

- Operation temperature range : -55°C~+125°C
- Achieve low ESR/high ripple current tolerance using conductive polymers

### Applications

- Server
- Base Station
- Communication Equipment
- LED Lighting
- Industrial Robot



### Product Lineup

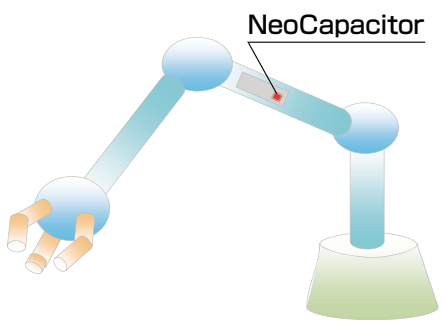
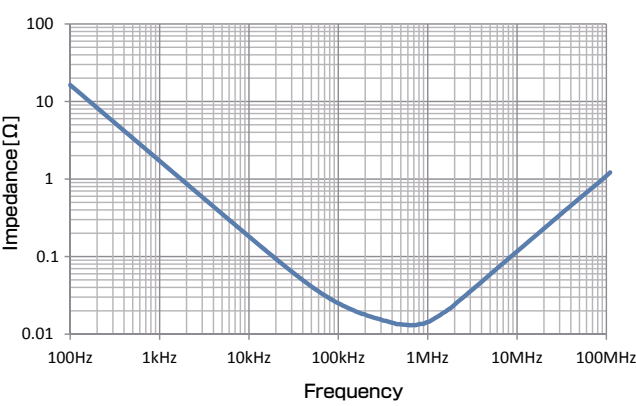
| Voltage/Capacitance | 2.5V | 6.3V | 10V | 16V  | 25V  | 35V  |
|---------------------|------|------|-----|------|------|------|
| 3.3μF               |      |      |     |      |      | (B2) |
| 4.7μF               |      |      |     |      | (B2) |      |
| 22μF                |      |      |     | (B2) |      |      |
| 33μF                |      |      |     | (B2) |      |      |
| 47μF                |      |      | B2  |      |      |      |
| 100μF               |      | B2   |     |      |      |      |
| 150μF               |      | (B2) |     |      |      |      |
| 220μF               | (B2) | (B2) |     |      |      |      |
| 330μF               | (B2) |      |     |      |      |      |

| Series | Case code | Dimension [mm]          |
|--------|-----------|-------------------------|
| PS/H   | B2        | 3.5±0.2×2.8±0.2×1.9±0.1 |

( ): Under development

### Frequency Characteristics

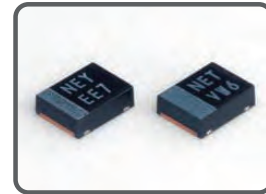
PSHB20J107M070 (B2/6.3V/100μF)



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# Face Down Package Polymer Chip Capacitor NeoCapacitor™ F/PS Series



**A high reliability product suitable for lower profile and smaller motherboard footprint of notebook PCs pursuing high mobility.**

## Features

- Industry leading low profile and high capacity
- No reduction in capacitance due to DC bias
- No acoustic noise
- High level of safety

## Applications

- Notebook PC
- Tablet PC
- HDD/SSD
- IoT Equipment

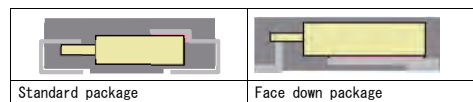
## Product Lineup

| Voltage \ Capacitance | 2.5V | 6.3V | 10V  | 16V     | 25V  | 35V |
|-----------------------|------|------|------|---------|------|-----|
| 6.8μF                 |      |      |      |         |      | B3  |
| 10μF                  |      |      |      |         | (A2) |     |
| 15μF                  |      |      |      |         | B3   |     |
| 22μF                  |      |      | A3   |         |      |     |
| 33μF                  |      |      | A3   | (A3)    |      |     |
| 47μF                  |      | A3   | A3   | (B3,A2) |      |     |
| 68μF                  |      |      | (B3) |         |      |     |
| 100μF                 |      | A3   |      |         |      |     |
| 150μF                 |      | (A2) |      |         |      |     |
| 220μF                 |      | (B3) |      |         |      |     |
| 330μF                 | (B3) |      |      |         |      |     |

| Series | Case code | Dimension [mm]          |
|--------|-----------|-------------------------|
| F/PS   | A3        | 3.2±0.2×1.6±0.2×0.9±0.1 |
| F/PS   | A2        | 3.2±0.2×1.6±0.2×1.1±0.1 |
| F/PS   | B3        | 3.5±0.2×2.8±0.2×1.1±0.1 |

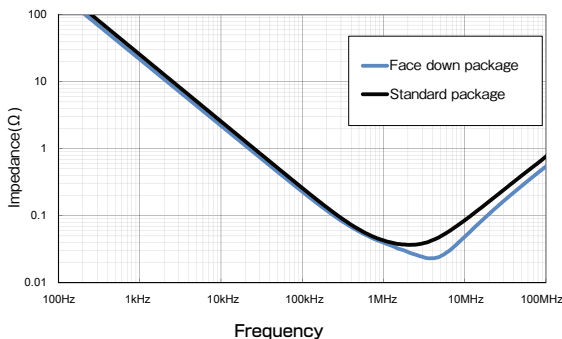
( ): Under development

## Construction



## Frequency Characteristics

Standard package : PSLB31E685M (B3/25V/6.8μF)  
Face down package : FPSB31V685M (B3/35V/6.8μF)



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# Axial Lead Type Aluminium Electrolytic Capacitor

## Features

Optimal for applications which require high-reliability, long lifetime.

- High temperature(150°C, Rated voltage, 2,000hours, PEG226 Series)
- High vibration resistance(20G)
- High permissible ripple current(Max.28Arms)
- AEC Q200 Compliant, produced in a ISO/TS 16949 certified factory

## Series development

| Series                   | PEG225   | PEG226  |
|--------------------------|--|---|
| Diameter<br>Length       | 16–20mm<br>26.5–42.5mm   | 16–20mm<br>26.5–42.5mm  |
| Features                 | +150°C Reduce voltage 2,000hours<br>High CV<br>High permissible ripple current<br>(Max. 28Arms)<br>High vibration resistance | +150°C Reduce voltage 2,000hours<br>High permissible ripple current<br>(Max. 28Arms)<br>High vibration resistance |
| Capacitance range        | 470–6300 μF  | 250–4700 μF   |
| Rated voltage            | 25–63VDC   | 25–63VDC  |
| operating<br>temperature | –40~+125°C<br>(+125~+150°C: Reduce voltage)  | –40~+150°C  |

## Applications

### Automotive

- Cooling fan
- Water cooling pump
- Power steering
- Electric motorcycle/Electric scooter/EV
- Alternator
- Braking system
- Injection
- Valve control
- Idling stop
- Supercharger
- Active suspension

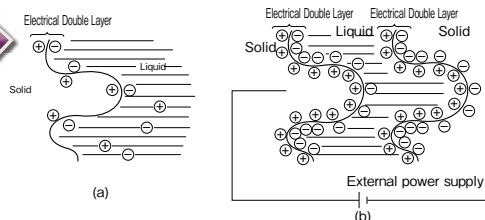


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# SuperCapacitor

The SuperCapacitor is a capacitor that employs the electric double layer principle to achieve an extremely large capacitance. It is ideal for backups requiring long life and high reliability.

## Principle of Electrical Double Layer



$$C = \epsilon \epsilon_0 (4\pi \delta)^{-1} dS$$

$\epsilon$  : Dielectric constant of electrolyte  
 $\delta$  : Distance from the electrode surface to the center of ion, which corresponds to a thickness of the electric double layer  
 $S$  : Surface area of the electrode interface

## Features

- There is no limit for charge/discharge cycles. In principle, it has an unlimited cycle life.
- Since no chemical charge is involved, unlike a battery, quick charging and discharging is possible. Full charge is possible within a few seconds.
- General failure mode of SuperCapacitor is open circuit.
- Lineup matching various mounting form is available. Surface mounting and automatic mounting (self-alone mold type) can be applied.
- We guarantee a wide operating temperature range. High reliability type : -40 to 85°C
- RoHS Compliant

## Applications and Markets

Since the TOKIN SuperCapacitor displays high structural reliability in humid environments and failure mode occurs in open circuits, they are widely used for data and clock backup, and other applications requiring high reliability, such as in infrastructure, traffic, automobiles, etc.

## Lineup

| • $\mu$ A order applications          |                             |                                   |  |
|---------------------------------------|-----------------------------|-----------------------------------|--|
| <b>FR</b><br>5.5V                     | <b>FGR</b><br>5.5V          | High temperature guarantee (85°C) | <b>FM</b><br>FMR type<br>5.5V                    |
| <b>FG</b><br>3.5 V to 5.5V            | <b>FGH</b><br>3.5 V to 5.5V |                                   | Automatic assembly type<br>3.6V-High reliability |
|                                       |                             | Low profile                       | <b>FMR 0V type</b><br>3.6V-85°C                  |
|                                       |                             |                                   | <b>FCS</b><br>3.5 V to 5.5V                      |
| • mA order applications               |                             |                                   |  |
| <b>FT</b><br>5.5V                     | <b>FS</b><br>5.5 V to 12V   |                                   | <b>FMS</b><br>5.5V                               |
| Compact<br>High temperature type 85°C |                             |                                   | SMD type<br>Adoption of high reliability molding |



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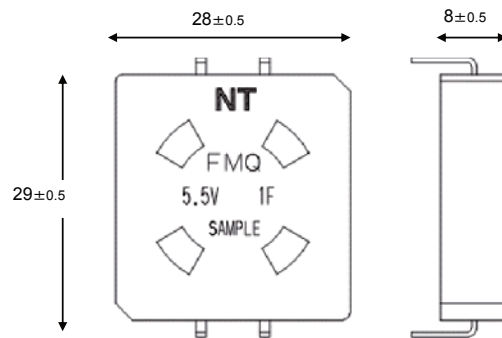
# SuperCapacitor FMQ Series (Resin molded, Low ESR Type)

## Features

- ☆Low ESR
  - Most suitable for peak assisting, and backup for clock
- ☆High reliability
  - Reliability is maintained even in high temperature and high humidity environment
    - : 85°C-85%RH-5.5V, 500h guaranteed
  - World's first capacitor usable at high temperature environment of +105°C
    - : 105°C-5.5V, 500h (actual value)



## Dimensions



## Specifications

| Rated voltage [Vdc] | ESR [ $\Omega$ ] | Nominal capacitance (Discharge system) [F] | Current at 30min. [mA] |
|---------------------|------------------|--|------------------------|
| 5.5                 | 1.0              | 1.0+80/-20%                                | 1.5                    |

※Category temperature: -40 ~ +105°C



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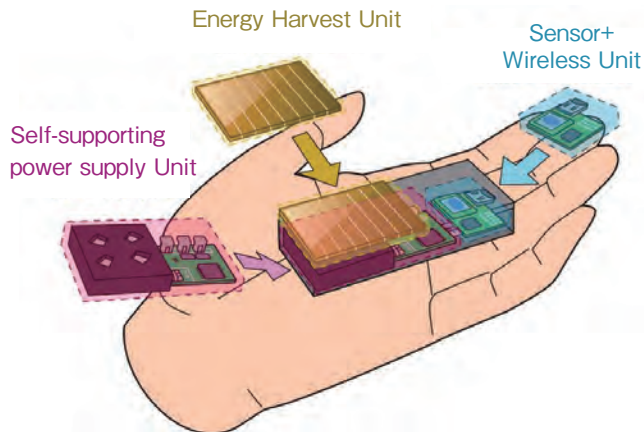


# Micro Energy Harvesting - MEH

## Merit of MEH: Maintenance free/self-supporting power supply

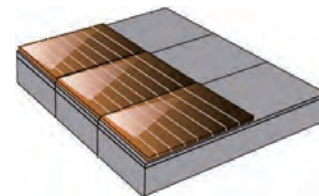
### Merit 1 · Compact and High Convenience

- Module is compact, palm-sized.
- Each unit is replaceable to cartridge type.



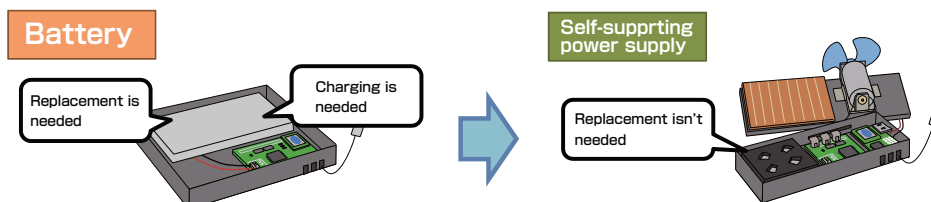
### Merit 2 · Possible Expansion of the Storage Capacity

- MEH module with built-in SuperCapacitor can be easily consolidated, it is possible to expand the capacity of the storage according to the application.



### Merit 3 · Unnecessary Battery Replacement

- Build maintenance free power supply by using several energy harvesting sources and SuperCapacitor that is without deterioration in charge/discharge cycle.



# Metal Composite Inductors for Automotive application



## Features

- Operating temperature range: **-40°C to +150°C**  
 (Include self temperature rise)
- AEC-Q200
- High reliability products (Automotive Market)
- Shielded construction, Large current, Low DCR
- Pb-free, RoHS Compliant

## Applications

- Inductor for ECU (Automotive)  
 (EPS, LED Head Light, SRS)

## Product line up

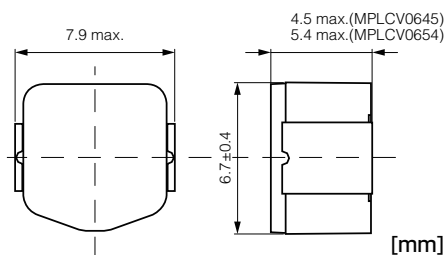
| Series        | Inductance ( $\mu$ H )<br>At 100kHz, 1mA | I <sub>rms</sub> *1<br>( A ) | I <sub>sat</sub> *2<br>( A ) |
|---------------|--|------------------------------|------------------------------|
| MPLCV0645L100 | 10±20%                                   | 4.0                          | 6.5                          |
| MPLCV0654L4R7 | 4.7±20%                                  | 6.3                          | 10.5                         |
| MPLCV0654L330 | 33±20%                                   | 2.6                          | 4.0                          |
| MPLCV0654L470 | 47±20%                                   | 2.1                          | 3.0                          |
| MPLCV1054L100 | 10±20%                                   | 7.1                          | 12.0                         |
| MPLCV1054L220 | 22±20%                                   | 5.5                          | 7.0                          |

\*1 40°C rise at rated current. \*2 Inductance drop 30%.

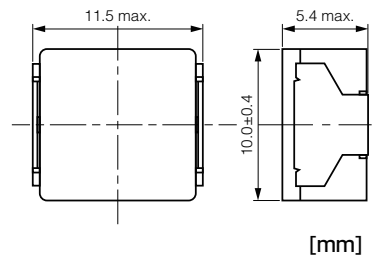
● Operating temperature range : -40°C to +150°C (Include self temperature rise), AEC-Q200

## Dimensions

- MPLCV0645 Series
- MPLCV0654 Series



- MPLCV1054 Series



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Custom Product

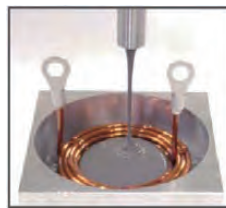
# Metal Composite Reactors

## Features

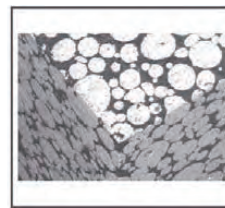
- Integrally molded reactor by inject molding of our original technology
- Superior design flexibility by inject molding method
- Leakage flux is small due to have a distributed gap
- Excellent heat dissipation efficiency by integral molding
- Able to support a high-frequency (50kHz or less)

## Applications

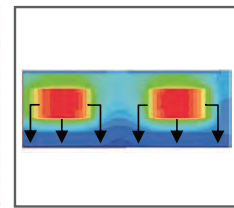
- Inverter for HEV/PHEV
- Power conditioner



【Injection process】



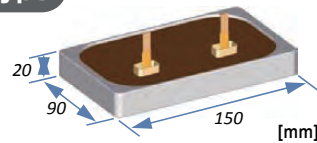
【Cross-section of core】



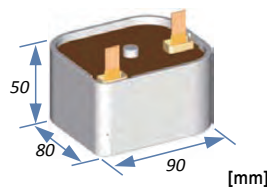
【Thermal analysis】  
 Example; heat radiation to the bottom

## Specification example

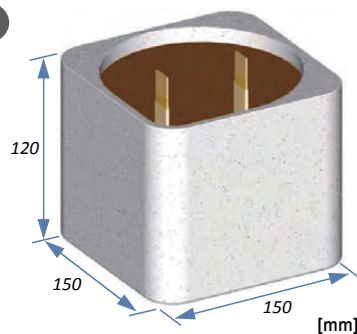
### Low height type



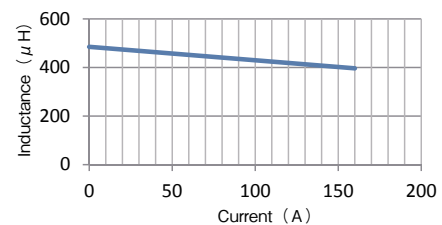
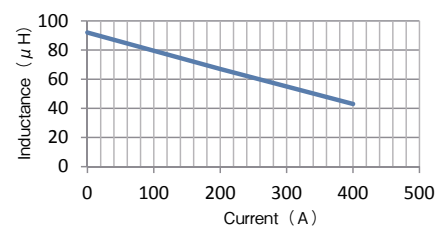
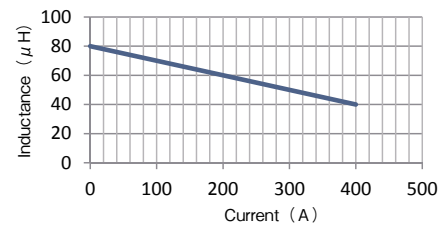
### Standard type



### Large size



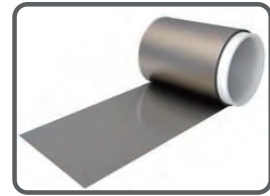
## Characteristics (typ.)



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# UL94 V-0 Flame Retardant type Flex Suppressor®



## Features

- Lowered impact to the environment, Halogen free
- UL94 V-0
- EFA :  $\mu$ 60 permeability, Roll acceptable, **Red phosphorus free**
- FF1 :  $\mu$ 100 permeability, **Supports Roll up to 0.3mm, AEC-Q200**
- EFF4:  $\mu$ 140 permeability, **AEC-Q200**

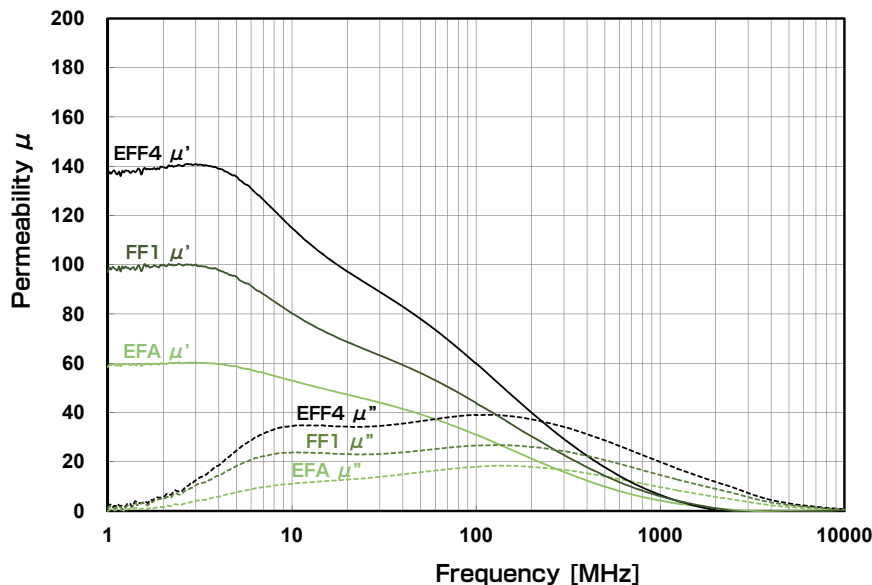
## Applications

- Noise radiation suppression, Internal interference suppression
- Anti-ESD measure for electric devices.

## Specifications

| Features                                | Red phosphorus free type                            | NEW<br>Roll type | NEW<br>High $\mu$ type |
|---|---|------------------|------------------------|
| Type                                    | EFA   | FF1              | EFF4                   |
| Effective frequency                     | Up to 10GHz   |                  |                        |
| Operating temperature (°C)              | -40 to +105   |                  |                        |
| Thickness (mm)                          | 0.05/0.1/0.2/0.3                                    |                  | 0.1/0.2/0.3/0.5        |
| Standard dimensions (mm)                | 240×240 / Roll acceptable                           |                  | 240×240                |
| Specific gravity                        | 3.1 (typ.)  |                  | 3.7 (typ.)             |
| Approved standard                       | UL94 V-0 (UL File No.E176124)                       |                  |                        |
| Environment                             | RoHS compliant, Halogen free / PVC free / Lead free |                  |                        |
|   | Red phosphorus free                                 | -                |                        |
| Relative magnetic permeability(at 3MHz) | 60(typ.)  | 100(typ.)        | 140(typ.)              |

## Permeability characteristics



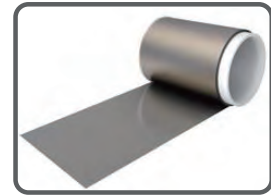
\*Above data are not guaranteed values.



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# High Magnetic Permeability type Flex Suppressor<sup>®</sup>



## Features

- Lowered impact to the environment, Halogen free
- Red phosphorus free
- UL94 HB
- FX5 :  $\mu$  150 permeability, Roll acceptable
- EFX6 :  $\mu$  160 permeability

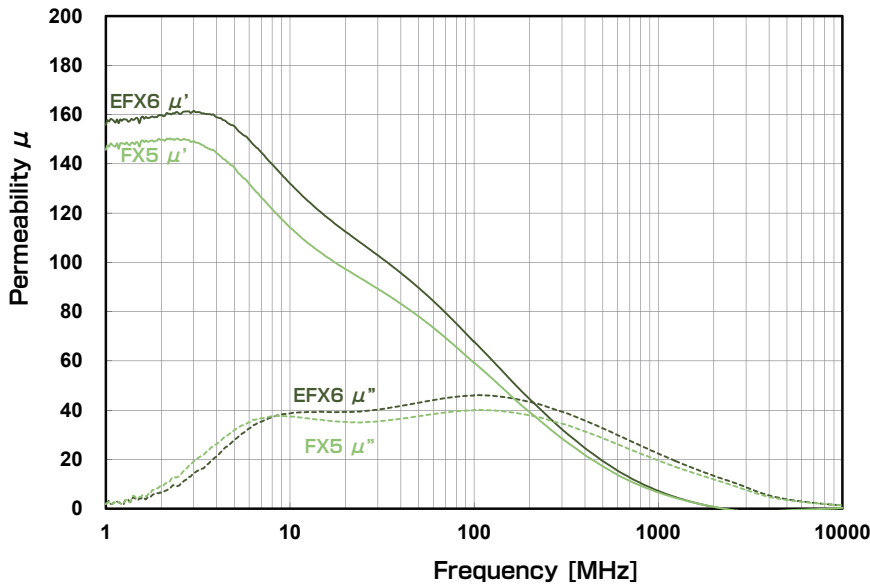
## Applications

- Noise radiation suppression, Internal interference suppression
- Anti-ESD measure for electric devices.

## Specifications

| Features                                | Ultra thin, Roll type <span style="color:red">NEW</span>                   | High $\mu$ type <span style="color:red">NEW</span> |
|---|--|--|
| Type                                    | FX5  | EFX6   |
| Effective frequency                     | Up to 10GHz  |  |
| Operating temperature (C)               | -40 to +105  |  |
| Thickness (mm)                          | 0.025/0.05/0.075   | 0.1/0.2/0.3  |
| Standard dimensions (mm)                | 240x240 / Roll acceptable  | 240x240  |
| Specific gravity                        | 3.3(typ.)  | 3.8(typ.)  |
| Approved standard                       | UL94 HB (UL File No.E176124)   |  |
| Environment                             | RoHS compliant, Halogen free / PVC free / Lead free<br>Red phosphorus free |  |
| Relative magnetic permeability(at 3MHz) | 150(typ.)  | 160(typ.)  |

## Permeability characteristics



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# GHz band High Performance type Flex Suppressor<sup>®</sup>



## Features

- Lowered impact to the environment, Halogen free
- Red phosphorus free
- UL94 HB
- FG1 : Roll acceptable
- EFG2 : Excellent suppression of high frequency noise

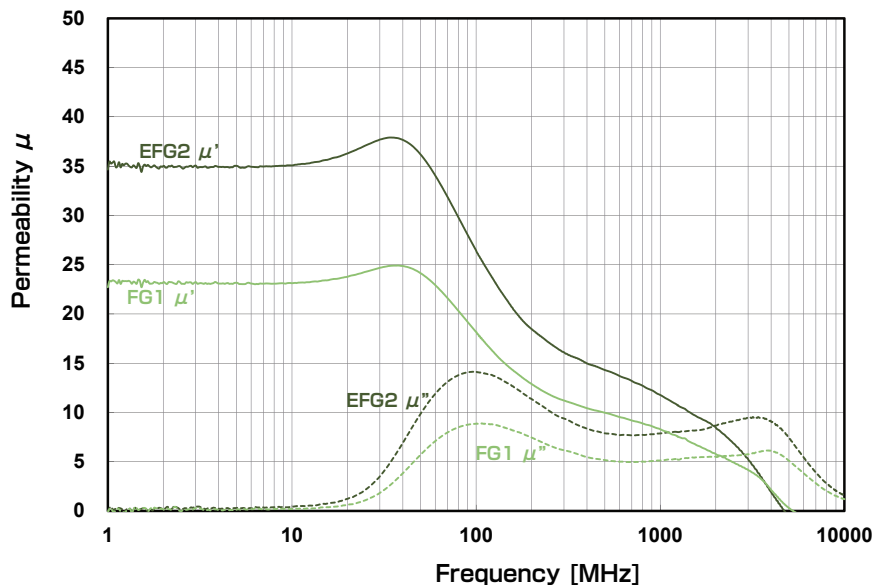
## Applications

- Measures for the desense LTE, Wi-Fi, GPS, etc.

## Specifications

| Features                                 | Ultra thin, Roll type <span style="color:red">NEW</span>                   | High performance type <span style="color:red">NEW</span> |
|--|--|--|
| Type                                     | FG1  | EFG2   |
| Effective frequency                      | 1GHz to 10GHz  |  |
| Operating temperature (°C)               | -40 to +105  |  |
| Thickness (mm)                           | 0.025/0.05/0.075   | 0.1/0.2/0.3  |
| Standard dimensions (mm)                 | 240x240 / Roll acceptable  | 240x240  |
| Specific gravity                         | 3.1 (typ.)   | 3.9 (typ.)   |
| Approved standard                        | UL94 HB (UL File No.E176124)   |  |
| Environment                              | RoHS compliant, Halogen free / PVC free / Lead free<br>Red phosphorus free |  |
| Relative magnetic permeability (at 3MHz) | 25 (typ.)  | 35 (typ.)  |

## Permeability characteristics



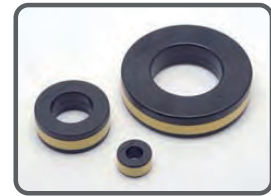
\*Above data are not guaranteed values.



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# Nanocrystal EMI Core ESD-R-H-NC Series



## Features

- Suppresses radiation and conduction noise in wide frequency range
- Ring type: Correspondence from small diameter to large diameter
- Operating temperature range:  $-40^{\circ}\text{C}\sim+120^{\circ}\text{C}$
- Frame retardant: UL94 V-0

## Dimensions

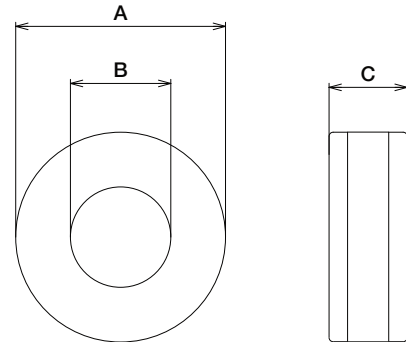
※Custom design available

| Model                | Dimensions (mm) |       |      |
|----------------------|-----------------|-------|------|
|                      | A               | B     | C    |
| ESD-R-291216H-NC23   | 29.0            | 12.7  | 16.0 |
| ESD-R-341616H-NC23   | 34.0            | 16.5  | 16.0 |
| ESD-R-421617H-NC23   | 42.0            | 16.7  | 17.0 |
| ESD-R-512936H-NC23   | 51.0            | 29.5  | 36.0 |
| ESD-R-512419H-NC23   | 51.0            | 24.4  | 19.0 |
| ESD-R-613325H-NC23   | 61.0            | 33.2  | 25.0 |
| ESD-R-854626H-NC23   | 85.0            | 46.0  | 26.0 |
| ESD-R-1105826H-NC23  | 110.0           | 58.5  | 26.0 |
| ESD-R-1469637H-NC23  | 146.0           | 96.0  | 37.0 |
| ESD-R-20515636H-NC23 | 205.0           | 156.0 | 36.0 |

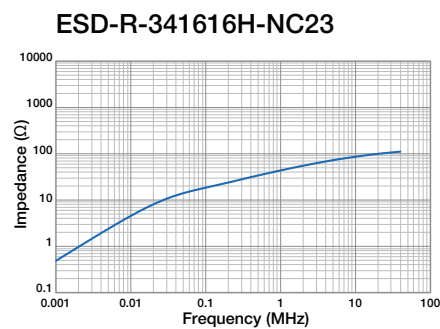
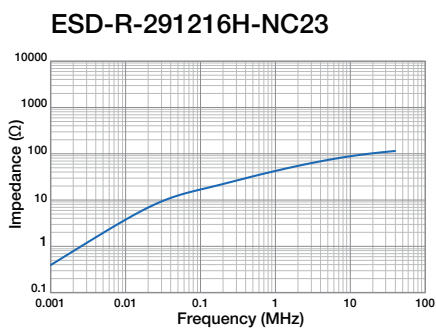
※ This series still in the development stage. Changes may be made at the start of mass production.  
 ※ The series with a base is also under development. Please contact TOKIN for details.

## Applications

- General purpose inverters
- Air conditioners
- Multifunction printers for business use
- Industrial equipments



## Impedance Characteristics (Typ. value)

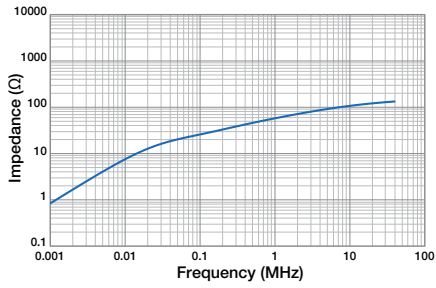


※This product is under development and design might be changed.

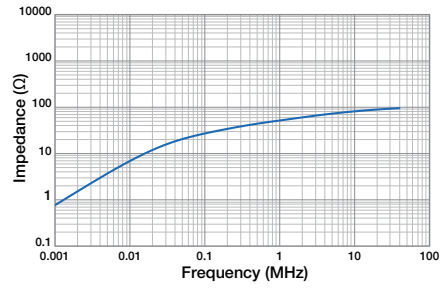


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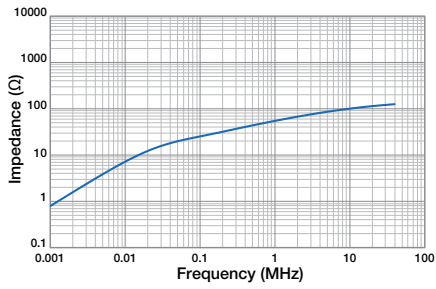
**ESD-R-421617H-NC23**



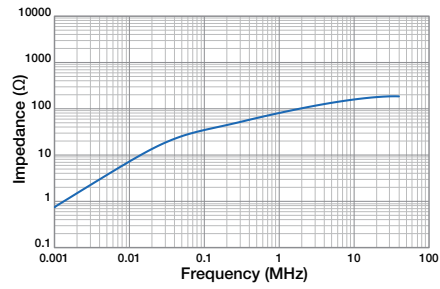
**ESD-R-512936H-NC23**



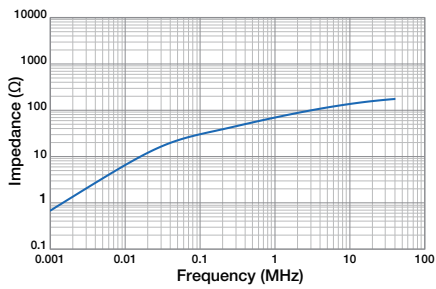
**ESD-R-512419H-NC23**



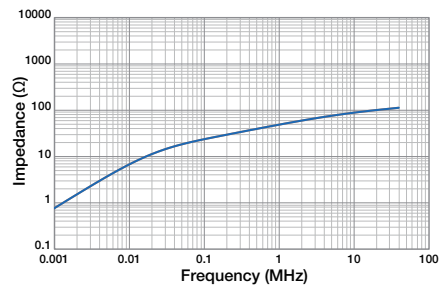
**ESD-R-613325H-NC23**



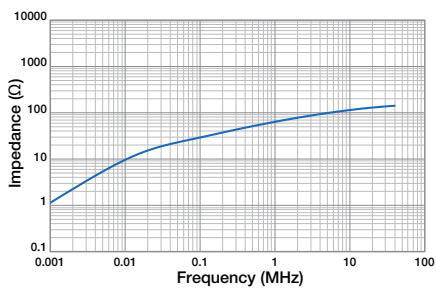
**ESD-R-854626H-NC23**



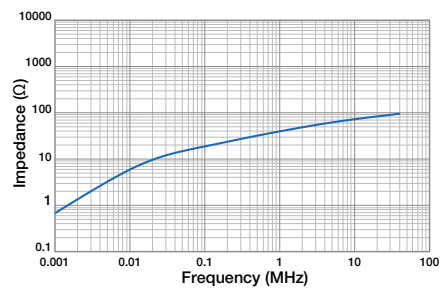
**ESD-R-1105826H-NC23**



**ESD-R-1469637H-NC23**



**ESD-R-20515636H-NC23**



※This product is under development and design might be changed.



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Custom  
Product

# Three-phase SCF Series

## Features

- High current series (up to 60A)
- Rated voltage 500V correspondence
- Operating temperature ~120°C, UL94 V-0
- Metal-based magnetic materials are employed

## Applications

- Air conditioner
- Power conditioner
- Industrial equipment with inverter

## Specification

| Part number                 | Core size | Rated current (A) | Inductance (mH) Min. | DC resistance (mΩ/line) Max. | Input and output terminal                                    |
|-----------------------------|-----------|-------------------|----------------------|------------------------------|--|
| SCF38B - 250 - S2R3A004J/JH | FR38      | 25                | 0.4                  | 1.8                          | on-board mount   |
| SCF47B - 300 - S1R7C010J/JH | FR47      | 30                | 1.0                  | 2.5                          | on-board mount   |
| SCF56B - 400 - S2R3A035J/JH | FR56      | 40                | 3.5                  | 4.5                          | on-board mount   |
| 3 Phase 4 line SCF Series   | FR38~68   | 15/20/30/60       | 0.4~4.0              | 0.3~6.0                      | on-board mount<br>terminal connecting<br>board assembly type |

## Dimensions

**3 Phase SCF (vertical)**



**3 Phase SCF (horizontal)**



**3 Phase 4 line SCF (on-board mount)**



**3 Phase 4 line SCF (terminal connecting)**



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# NEW SSHB10HS Series



## Features

- Hybrid coil capable of simultaneously suppressing common and normal noises with one coil
- Unique core molding technology and materials development realizes quiet operation and excellent superimposition characteristics at high temperature
- Class B (130°C) support

## Applications

- LED lighting
- AV equipment
- OA equipment
- Power supply

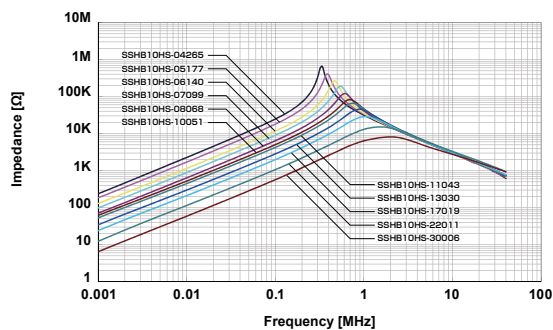
## Specification

※ Custom design available

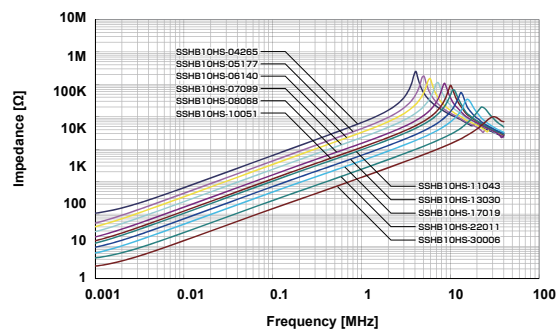
| Part number    | Rated current (A) | Inductance [common] (mH)Min. | Inductance [normal] (μH)Typ. | Wire size (mmφ) | DC resistance(Ω/line) Typ. |
|----------------|-------------------|------------------------------|------------------------------|-----------------|----------------------------|
| SSHB10HS-04265 | 0.4               | 26.5                         | 949                          | 0.20            | 2.269                      |
| SSHB10HS-05177 | 0.5               | 17.7                         | 635                          | 0.23            | 1.436                      |
| SSHB10HS-06140 | 0.6               | 14.0                         | 502                          | 0.25            | 1.087                      |
| SSHB10HS-07099 | 0.7               | 9.9                          | 353                          | 0.28            | 1.736                      |
| SSHB10HS-08068 | 0.8               | 6.8                          | 243                          | 0.30            | 0.519                      |
| SSHB10HS-10051 | 1.0               | 5.1                          | 185                          | 0.32            | 0.404                      |
| SSHB10HS-11043 | 1.1               | 4.3                          | 154                          | 0.35            | 0.313                      |
| SSHB10HS-13030 | 1.3               | 3.0                          | 108                          | 0.37            | 0.232                      |
| SSHB10HS-17019 | 1.7               | 1.9                          | 71                           | 0.40            | 0.157                      |
| SSHB10HS-22011 | 2.2               | 1.1                          | 41                           | 0.45            | 0.094                      |
| SSHB10HS-30006 | 3.0               | 0.6                          | 23                           | 0.50            | 0.059                      |

## Impedance Characteristics

### Common mode



### Normal mode



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# NEW SSHB21HS Series



## Features

- Hybrid coil capable of simultaneously suppressing common and normal noises with one coil
- Unique core molding technology and materials development realizes quiet operation and excellent superimposition characteristics at high temperature
- Class B (130°C) support

## Applications

- LED lighting
- AV equipment
- OA equipment
- Power supply

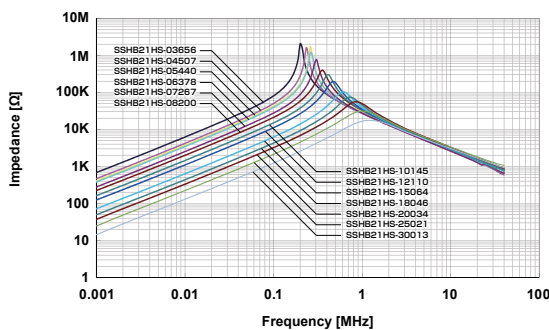
## Specification

※ Custom design available

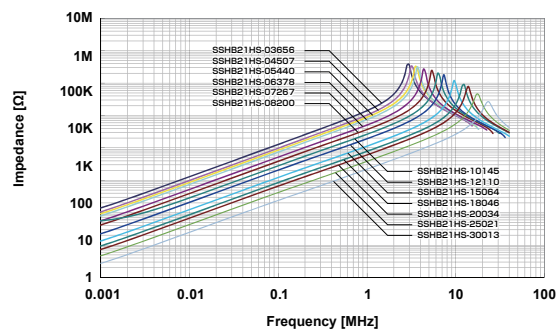
| Part number    | Rated current (A) | Inductance [common] (mH)Min. | Inductance [normal] (μH)Typ. | Wire size (mm φ) | DC resistance (Ω/line) Typ. |
|----------------|-------------------|------------------------------|------------------------------|------------------|-----------------------------|
| SSHB21HS-03656 | 0.3               | 65.6                         | 1819                         | 0.20             | 2.609                       |
| SSHB21HS-04507 | 0.4               | 50.7                         | 1407                         | 0.23             | 1.820                       |
| SSHB21HS-05440 | 0.5               | 44.0                         | 1221                         | 0.23             | 1.695                       |
| SSHB21HS-06378 | 0.6               | 37.8                         | 1048                         | 0.25             | 1.328                       |
| SSHB21HS-07267 | 0.7               | 26.7                         | 742                          | 0.28             | 0.902                       |
| SSHB21HS-08200 | 0.8               | 20.0                         | 559                          | 0.30             | 0.672                       |
| SSHB21HS-10145 | 1.0               | 14.5                         | 402                          | 0.32             | 0.501                       |
| SSHB21HS-12110 | 1.2               | 11.0                         | 305                          | 0.35             | 0.364                       |
| SSHB21HS-15064 | 1.5               | 6.4                          | 178                          | 0.37             | 0.241                       |
| SSHB21HS-18046 | 1.8               | 4.6                          | 128                          | 0.40             | 0.178                       |
| SSHB21HS-20034 | 2.0               | 3.4                          | 95                           | 0.45             | 0.130                       |
| SSHB21HS-25021 | 2.5               | 2.1                          | 59                           | 0.50             | 0.079                       |
| SSHB21HS-30013 | 3.0               | 1.3                          | 38                           | 0.55             | 0.051                       |

## Impedance Characteristics

### Common mode



### Normal mode

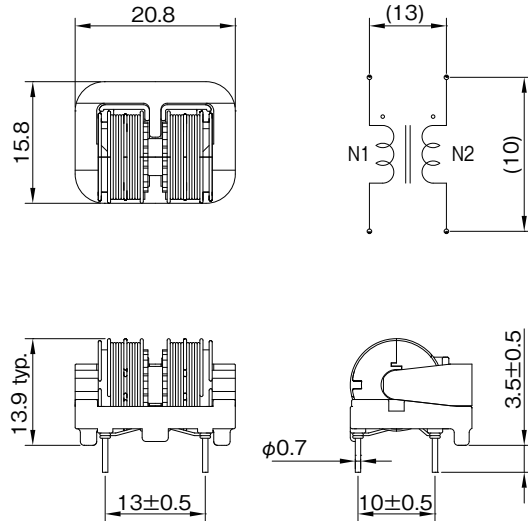


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**NEW**

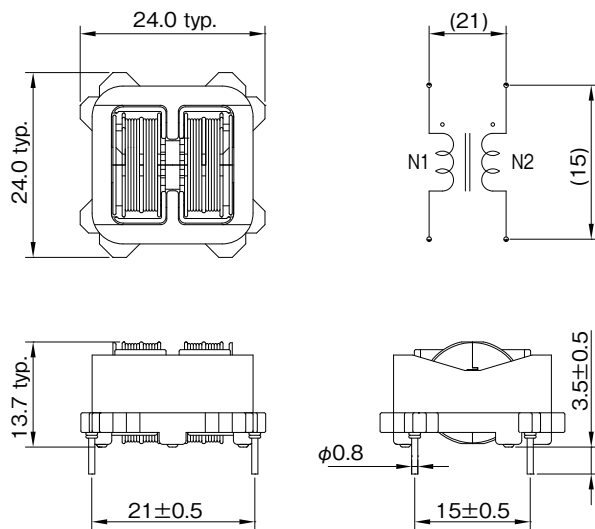
# SSHB Series Shapes and Dimensions

**SSHB10HS**



[mm]

**SSHB21HS**



[mm]



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# NEW SSRH24NV Series



## Features

Using high magnetic permeability material S18H optimized core and structure

- Downsized(30% less volume than SS28V Series)
- Expanded current range  
(SS28V Series: up to 2.5A → New product: up to 5A)
- Realized high performance, low Rdc(Compared to SS28V Series, Inductance: 2 times or more, Rdc: 3% or greater reduction)
- Non-split bobbin design for ultra-high impedance characteristics

## Applications

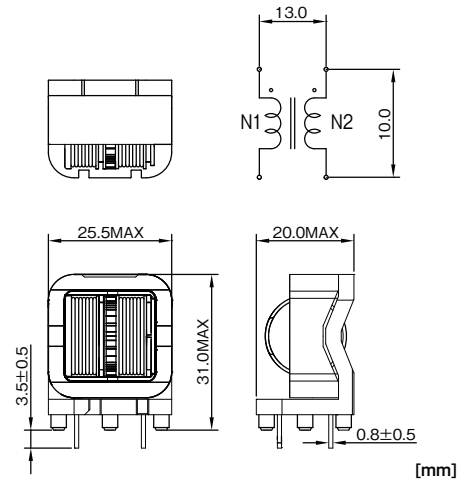
- AV equipment
- OA equipment
- Digital appliance
- Power supply

## Specification

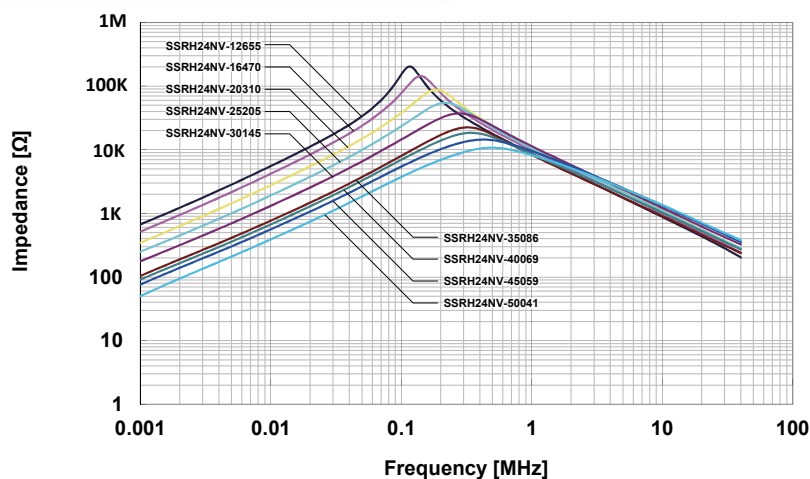
※Custom design available

| Part number    | Rated current (A) | Inductance (mH) Min. | DC resistance (Ω/line) Max. | Temperature rise (K) Max. |
|----------------|-------------------|----------------------|-----------------------------|---------------------------|
| SSRH24NV-12655 | 1.2               | 65.5                 | 0.475                       | 65                        |
| SSRH24NV-16470 | 1.6               | 47                   | 0.327                       | 65                        |
| SSRH24NV-20310 | 2.0               | 31                   | 0.214                       | 65                        |
| SSRH24NV-25205 | 2.5               | 20.5                 | 0.145                       | 65                        |
| SSRH24NV-30145 | 3.0               | 14.5                 | 0.102                       | 65                        |
| SSRH24NV-35086 | 3.5               | 8.6                  | 0.078                       | 65                        |
| SSRH24NV-40069 | 4.0               | 6.9                  | 0.057                       | 65                        |
| SSRH24NV-45059 | 4.5               | 5.9                  | 0.048                       | 65                        |
| SSRH24NV-50041 | 5.0               | 4.1                  | 0.035                       | 65                        |

## Dimensions



## Impedance Characteristics



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# NEW SSRH24NVS Series



## Features

- Using high magnetic permeability material S18H optimized core and structure
- Downsized(30% less volume than SS28V Series)
  - Expanded current range  
(SS28V Series: up to 2.5A → New product: up to 5A)
  - Realized high performance, low Rdc(Compared to SS28V Series, Inductance: 1.6 times or more, Rdc: 20% or greater reduction)
  - Split bobbin design for wideband impedance characteristics

## Applications

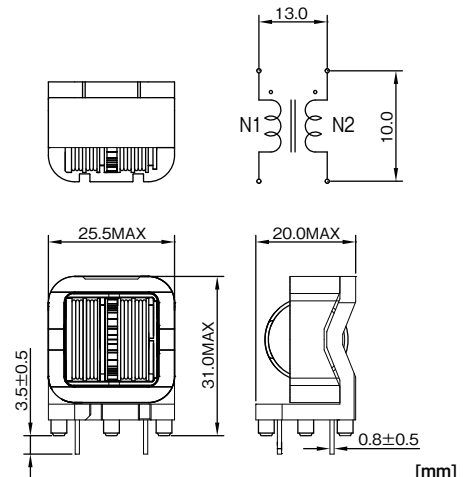
- AV equipment
- OA equipment
- Digital appliance
- Power supply

## Specification

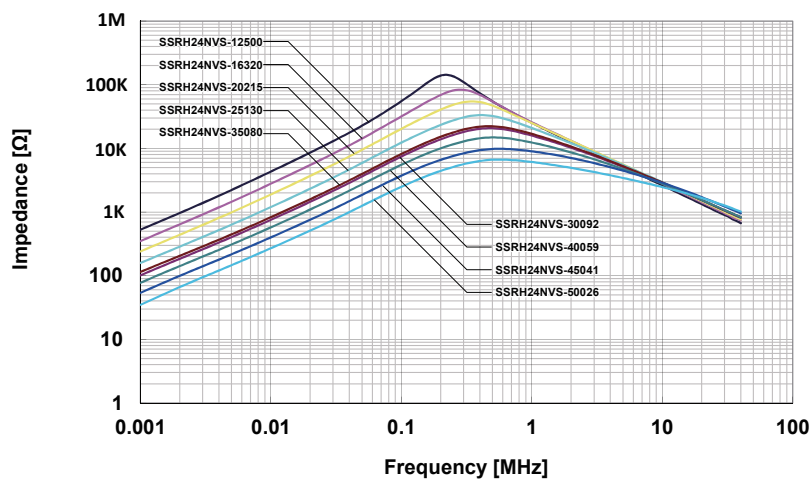
※ Custom design available

| Part number     | Rated current (A) | Inductance (mH) Min. | DC resistance (Ω/line) Max. | Temperature rise (K) Max. |
|-----------------|-------------------|----------------------|-----------------------------|---------------------------|
| SSRH24NVS-12500 | 1.2               | 50                   | 0.430                       | 65                        |
| SSRH24NVS-16320 | 1.6               | 32                   | 0.265                       | 65                        |
| SSRH24NVS-20215 | 2.0               | 21.5                 | 0.177                       | 65                        |
| SSRH24NVS-25130 | 2.5               | 13                   | 0.111                       | 65                        |
| SSRH24NVS-30092 | 3.0               | 9.2                  | 0.079                       | 65                        |
| SSRH24NVS-35080 | 3.5               | 8                    | 0.074                       | 65                        |
| SSRH24NVS-40059 | 4.0               | 5.9                  | 0.055                       | 65                        |
| SSRH24NVS-45041 | 4.5               | 4.1                  | 0.041                       | 65                        |
| SSRH24NVS-50026 | 5.0               | 2.6                  | 0.027                       | 65                        |

## Dimensions



## Impedance Characteristics



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Under development

# SSRH30NH Series



## Features

- Using high magnetic permeability material S18H optimized core and structure  
High inductance characteristics as toroid core (equivalent to SC type)
- High current series (up to  $\phi 1.3$ , up to 10A)

## Applications

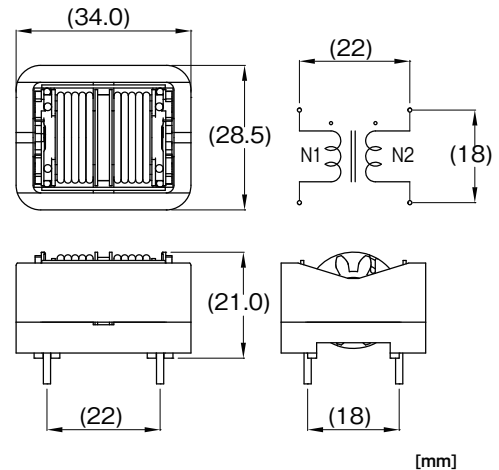
- AV equipment
- OA equipment
- Digital appliance
- Power supply

## Specification

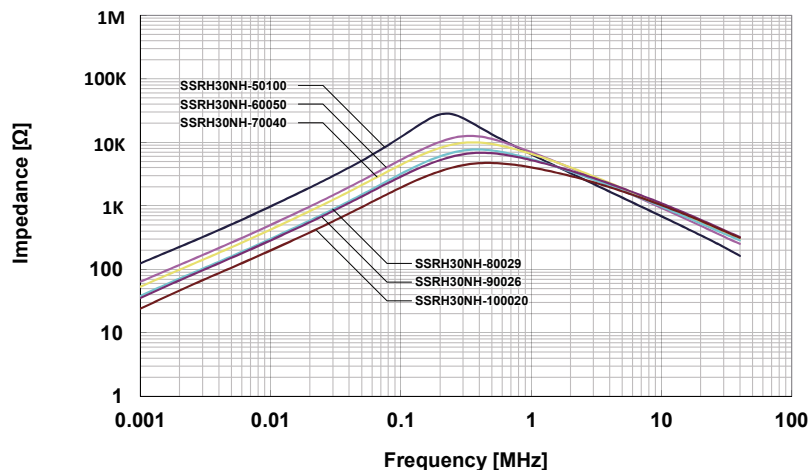
※ Custom design available

| Part number     | Rated current (A) | Inductance (mH) Min. | DC resistance ( $\Omega$ /line) Max. | Wire size (mm $\phi$ ) |
|-----------------|-------------------|----------------------|--------------------------------------|------------------------|
| SSRH30NH-50100  | 5                 | 10                   | 0.053                                | 0.85                   |
| SSRH30NH-60050  | 6                 | 5.0                  | 0.028                                | 0.95                   |
| SSRH30NH-70040  | 7                 | 4.0                  | 0.023                                | 1.0                    |
| SSRH30NH-80029  | 8                 | 2.9                  | 0.0165                               | 1.1                    |
| SSRH30NH-90026  | 9                 | 2.6                  | 0.0135                               | 1.2                    |
| SSRH30NH-100020 | 10                | 2.0                  | 0.010                                | 1.3                    |

## Dimensions



## Impedance Characteristics



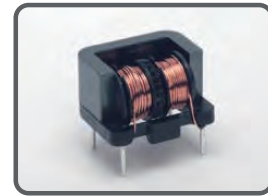
※ This product is under development and design might be changed.



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# NEW SSRH7H-M Series



## Features

- Smallest-in-industry gear common choke for low current applications
- High performance and reduced size through use of high magnetic permeability material S18H and optimization of the core shape and product structure (Compared to SU10VFC Series, Inductance: 1.6 times or more, Volume: 35% less)
- Non-split bobbin design for ultra-high impedance characteristics

## Applications

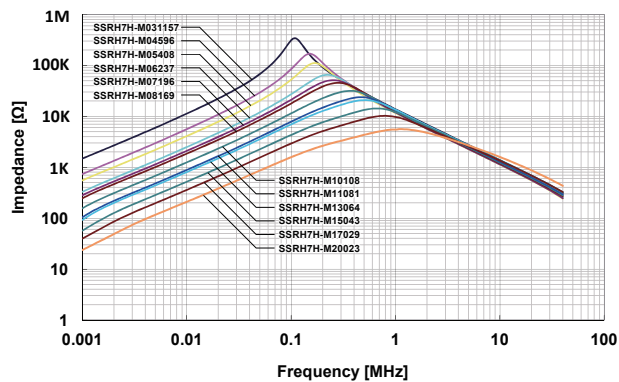
- AV equipment
- OA equipment
- Digital appliance
- Compact power supply

## Specification

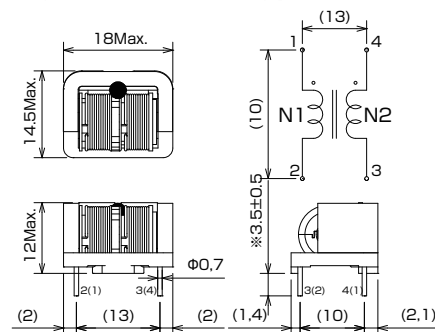
※ Custom design available

| Model          | Rated current (A) | Inductance (mH) Min. | DC resistance (Ω/line) Max. | Wire size (mm φ) | Temperature rise Max. |
|----------------|-------------------|----------------------|-----------------------------|------------------|-----------------------|
| SSRH7H-M031157 | 0.3               | 115.7                | 3.57                        | 0.16             | 55                    |
| SSRH7H-M04596  | 0.4               | 59.6                 | 2.02                        | 0.18             | 55                    |
| SSRH7H-M05408  | 0.5               | 40.8                 | 1.36                        | 0.20             | 55                    |
| SSRH7H-M06237  | 0.6               | 23.7                 | 0.78                        | 0.23             | 55                    |
| SSRH7H-M07196  | 0.7               | 19.6                 | 0.71                        | 0.23             | 55                    |
| SSRH7H-M08169  | 0.8               | 16.9                 | 0.56                        | 0.25             | 55                    |
| SSRH7H-M10108  | 1.0               | 10.8                 | 0.36                        | 0.28             | 55                    |
| SSRH7H-M11081  | 1.1               | 8.1                  | 0.27                        | 0.30             | 55                    |
| SSRH7H-M13064  | 1.3               | 6.4                  | 0.21                        | 0.32             | 55                    |
| SSRH7H-M15043  | 1.5               | 4.3                  | 0.14                        | 0.35             | 55                    |
| SSRH7H-M17029  | 1.7               | 2.9                  | 0.12                        | 0.35             | 55                    |
| SSRH7H-M20016  | 2.0               | 1.6                  | 0.09                        | 0.35             | 55                    |

## Impedance Characteristics



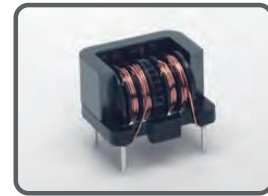
## Dimensions



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# NEW SSRH7HS-M Series



## Features

- Smallest-in-industry gear common choke for low current applications
- High performance and reduced size through use of high magnetic permeability material S18H and optimization of the core shape and product structure (Compared to SU10VFC Series, Inductance: 1.3 times or more, Volume: 35% less)
- Split bobbin design for wideband impedance characteristics

## Applications

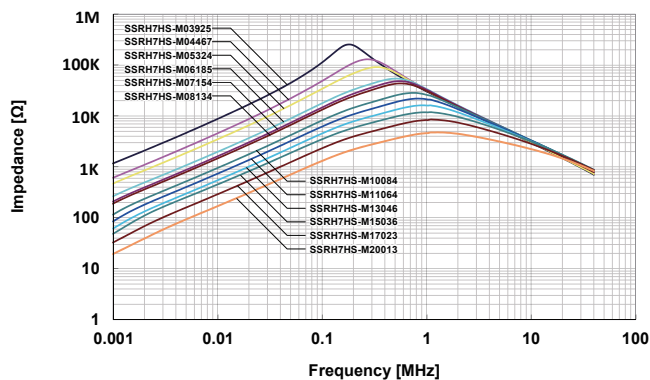
- AV equipment
- OA equipment
- Digital appliance
- Compact power supply

## Specification

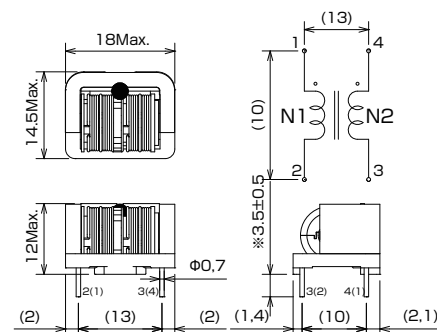
※ Custom design available

| Model          | Rated current (A) | Inductance (mH) Min. | DC resistance (Ω/line) Max. | Wire size (mm φ) | Temperature rise Max. |
|----------------|-------------------|----------------------|-----------------------------|------------------|-----------------------|
| SSRH7HS-M03925 | 0.3               | 92.5                 | 3.18                        | 0.16             | 50                    |
| SSRH7HS-M04467 | 0.4               | 46.7                 | 1.79                        | 0.18             | 50                    |
| SSRH7HS-M05324 | 0.5               | 32.4                 | 1.21                        | 0.20             | 50                    |
| SSRH7HS-M06185 | 0.6               | 18.5                 | 0.69                        | 0.23             | 50                    |
| SSRH7HS-M07154 | 0.7               | 15.4                 | 0.63                        | 0.23             | 50                    |
| SSRH7HS-M08134 | 0.8               | 13.4                 | 0.50                        | 0.25             | 50                    |
| SSRH7HS-M10084 | 1.0               | 8.4                  | 0.32                        | 0.28             | 50                    |
| SSRH7HS-M11064 | 1.1               | 6.4                  | 0.24                        | 0.30             | 50                    |
| SSRH7HS-M13046 | 1.3               | 4.6                  | 0.18                        | 0.32             | 50                    |
| SSRH7HS-M15036 | 1.5               | 3.6                  | 0.13                        | 0.35             | 50                    |
| SSRH7HS-M17023 | 1.7               | 2.3                  | 0.1                         | 0.35             | 50                    |
| SSRH7HS-M20013 | 2.0               | 1.3                  | 0.08                        | 0.35             | 50                    |

## Impedance Characteristics



## Dimensions



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# Current Sensor (Clamp CT: C/CT-1216)



Sensors based on proprietary materials that contribute to energy saving.

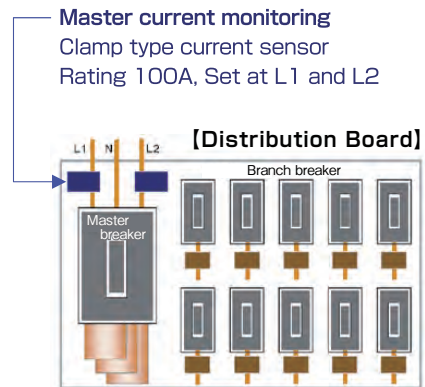
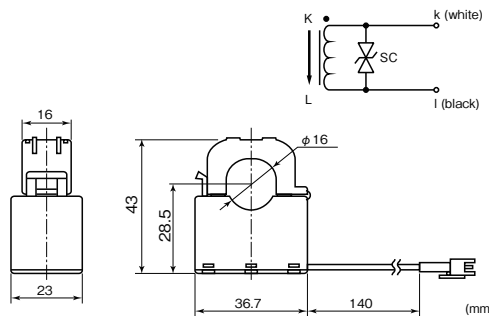
## Features

- New design structure . Improved ratio error characteristics(50% reduction from existing model)
- Flat temperature characteristics by original core material
- Compact & Slim design
- Noncombustible

## Applications

- xEMS Measurements (Power monitoring)
- Power conditioners, Inverter units
- Distribution boards
- Power monitoring system

## Dimensions



## Specifications

| Items                   | Unit | STD      | Condition                     |
|-------------------------|------|----------|-------------------------------|
| Rated primary current   | Arms | 120      | 50Hz/60Hz                     |
| Applied current         | Arms | 0.1~120  | 50Hz/60Hz                     |
| Output voltage          | mV   | 1000±20  | Io=50A RL=60Ω f=50Hz          |
| Ratio of current trans. | -    | 3000 : 1 | -                             |
| Output protection       | Vp   | 7.5      | -                             |
| Ratio error             | %    | ±1.0     |                               |
| Phase angle             | °    | ≤1       |                               |
| Insulation resistance   | MΩ   | ≥100     | DC500V                        |
| Operating temperature   | °C   | -20~+60  | 80%RH or less No condensation |
| Storage temperature     | °C   | -20~+75  | 80%RH or less No condensation |



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# Thermal Sensor (TRS<sup>®</sup> Series & OHD<sup>™</sup> Series)

Temperature sensing switches composed of a magnet, reed switch and original temperature-sensing soft ferromagnetic substance called Thermorite<sup>™</sup>. It has simple circuit design, high reliability and excellent temperature accuracy.

## Features

- High reliability (Long product lifetime)
- Excellent temperature accuracy ( $\pm 2.5^{\circ}\text{C}$ ,  $\pm 5.0^{\circ}\text{C}$ )
- Wide range of operating temperature available
- Excellent environmental resistance
- Approved several safety standard

## Applications

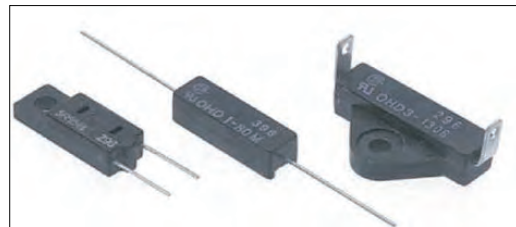
- Thermal reed switch (TRS<sup>®</sup>)
  - Temperature detection of electric appliances
  - Overheat monitoring, temperature control of heater unit
- Thermal guard (OHD<sup>™</sup>)
  - OA equipment and other electric appliances
  - Atmospheric temperature detection of room heater, hot water heater and other general equipment

## Appearance

TRS<sup>®</sup> Series



OHD<sup>™</sup> Series



## Sensing temperature range

|                         | -50°C | 0°C   | 50°C   | 100°C                                      | 150°C | 200°C |  |
|-------------------------|-------|-------|--|--|-------|-------|--|
| TRS <sup>®</sup> Series |       | -10°C | Sensing accuracy $\pm 2.5^{\circ}\text{C} / \pm 5.0^{\circ}\text{C}$ |  | 130°C |       | ※ Sensing temperature range is different in product series |
| OHD <sup>™</sup> Series |       |       | 30°C   | Sensing accuracy $\pm 5.0^{\circ}\text{C}$ |       | 130°C | ※ Break type<br>※ Make type<br>(OHD5R has only break type) |



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# Pyroelectric Infrared Sensor (PL Series)

## Unobtrusive sensors that contribute to set designs

Pyroelectric Infrared Sensor using Pyroelectric effect of ceramic can detect even slight infrared energy from human body. By leveraging our proprietary technologies, we also propose new solutions such as detection through resin or glass and lens-less solutions, in addition to supporting lensed solutions.

### Features(Bulk sensor)

- Lens-less also possible
- Capable of detecting through resin or glass (no hole required)
- SMD type (Reflow soldering)
- Wide field of view ( $\pm 60$ deg)
- Low current consumption driving (a few  $\mu A$ )
- Excellent high frequency electric wave resistance
- Compact & Low profile (5.0x4.8x1.7mm)

### Applications

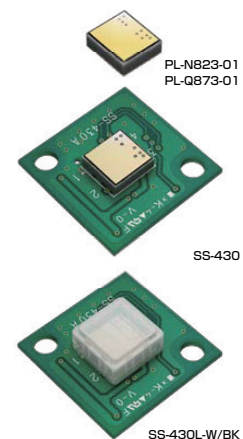
- Human sensor
- Housing equipment (Lighting, Toilet)
- Home appliance
- Kitchen appliance
- Contactless switch

Greater convenience  
 Saving energy  
 Improved design



### Lineup

|                         | Detection distance(general guide)                                  |  |   |
|-------------------------|--|--|---|
|                         | Glass/Permeable resin<br>~20cm                                     | ~2m  | ~5m   |
| Bulk                    | Sensor : PL-N823-01<br>Lens : Not needed                           |  | <b>Under development</b><br>Sensor : PL-Q873-01<br>Lens : PL-001L-W/BK  |
| Standard module         | —  | <b>Under development</b><br>SS-430                             | <b>Under development</b><br>SS-430L-W/BK  |
| High-sensitivity module | <b>Under development</b><br>SS-431                                 | —  | —   |
| Notes                   | [Cover material choices]<br>• Glass t3.2mm<br>• ABS t2.0mm<br>etc. | [Limited cover material]<br>• High-density polyethylene (HDPE) | [Cover material not needed]<br>• Lens eliminates need for cover<br>• HDPE, if cover is to be used for design purposes |



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# Vibration Sensor



Measure minute vibration in wide bandwidth and monitoring inside condition of equipment.

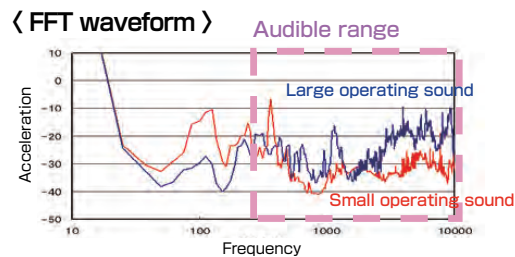
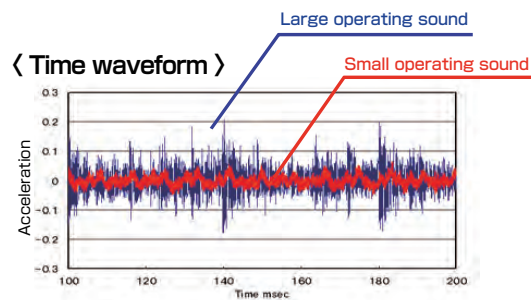
## Feature

- High sensitivity (20mV/m/s<sup>2</sup>)
- Wide bandwidth sensing (10Hz~15kHz) with reasonable price
- Original product design brings high conversion efficiency

## Application example <Pump vibration>



Measure two different operating sound of pumps



(VS-BVSeries)

## Specifications

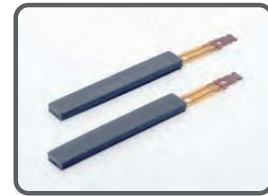
|                          |                          |                     |
|--------------------------|--------------------------|---------------------|
| Dimension without cable  | [mm]                     | 11.5x8.5x2.9 (typ.) |
| Weight without cable     | [g]                      | 0.9(typ.)           |
| Drive voltage            | [Vcc]                    | 3.3V/0.3mA          |
| Sensitivity              | [mV/(m/s <sup>2</sup> )] | 20 (typ.)           |
| Offset voltage           | [V]                      | 1/2xVcc             |
| Frequency range          | [Hz]                     | 10~15000[3dB]       |
| Min. detect acceleration | [m/s <sup>2</sup> ]      | 0.003               |
| Max. detect acceleration | [m/s <sup>2</sup> ]      | 50                  |

※ Acceleration 1m/s<sup>2</sup> = 0.1G = 100Gal



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# Piezo Receiver / Speaker

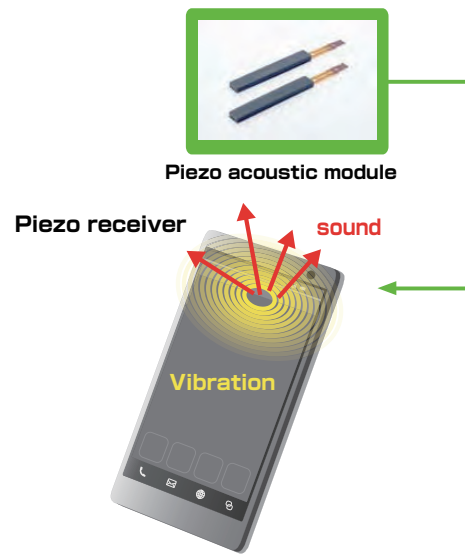


<New Type>Generates both Sound and Vibration from chassis at the same time

## Features

- Sound comes from panel surface
- Easy to hear in noisy surrounding
- No sound hole
- Easy for waterproof and dust -proofing design
- Design flexibility

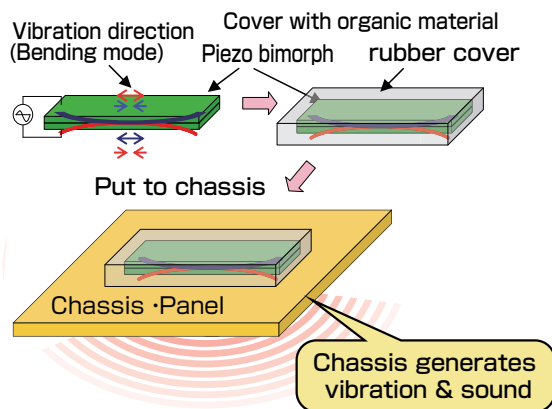
## Application example



## Operation principle

Piezo bimorph

Piezo acoustic module



Conventional (Electromagnetic) Receiver

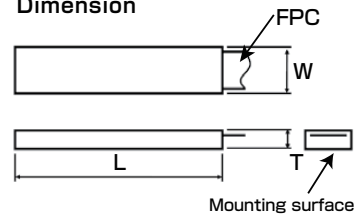
- Narrow hearing area
- Sound hole is necessary



## Specifications

|   | Item           | Specification | Note                         |
|---|----------------|---------------|------------------------------|
| 1 | Input Voltage  | 20Vp-p        | _____                        |
| 2 | Capacitance    | 960nF         | at 1kHz-1Vrms                |
| 3 | Dimension      | 26Lx4Wx1.7T   | (mm)                         |
| 4 | Weight         | 0.8g          | Including standard FPC       |
| 5 | Sound Pressure | 106±3dB(1kHz) | Original measuring condition |

Dimension



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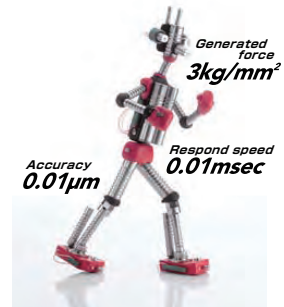
# Multilayer Piezoelectric Actuators

Contributing to the realization of devices with higher speed, higher accuracy, higher power generation, reduced size, and lower power consumption.

## Applications

- Valve control (MFC/proportional control valve)
- Probe control
- High speed focusing, 3D image acquisition
- Optical fiber/laser optical axis adjustment
- Interferometer mirror adjustment
- Correction of mirror angle displacement
- Pixel shifting for the image sensor
- Precise stage positioning
- Nanoimprint positioning
- Clamping (wire bonder)
- Dispensing equipment (ink jet/dispenser)
- Excitation/damping equipment
- Various tests (pressure, fatigue, wear, etc.)
- Various machining (precise centering, precise feeding)

Bring Fine, Quick and Power by Piezo technology

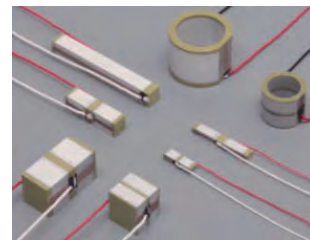


## Resin coated type

We are enhancing our lineup from large displacement products to large power generating products.

|           | Displacement (µm) at 150Vdc | Generated force (N) | Operating temperature |
|-----------|-----------------------------|---------------------|-----------------------|
| AE Series | 4.6~42.0                    | 200~20,000          | -25°C~+85°C           |

- Ring shape, ultra compact actuator and other custom design are available. Please contact us for further details.



## Metal case type

High reliability by metal encapsulate

|            | Displacement (µm) at 150Vdc | Generated force (N) | Operating temperature |
|------------|-----------------------------|---------------------|-----------------------|
| ASB Series | 17~84                       | 200~3,000           | -25°C~+85°C           |
| ASL Series | 19~77                       | 800                 | -40°C~+150°C          |
| AHB Series | 55~240                      | 800~3,600           | -25°C~+85°C           |

- Two flange types available for installation
- \* For detail specification, please refer to the catalogue of multilayer piezoelectric actuator



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# Piezoelectric Ceramics

Contributing to the electronics industry through in-house developed high performance piezoelectric ceramics and application technologies.

## Standard Ceramic Material

(Main material characteristics)

| Characteristics                   | N6 | N61 | N85 | N10 | N17 | N21 |
|-----------------------------------|----|-----|-----|-----|-----|-----|
| Dielectric constant               | L  | L   | M   | H   | H   | M   |
| Electromechanical coupling factor | M  | M   | H   | H   | H   | H   |
| Piezoelectric d constant          | L  | L   | L   | H   | H   | M   |
| Piezoelectric g constant          | M  | M   | M   | L   | L   | H   |
| Mechanical Quality Factor         | M  | M   | H   | L   | L   | L   |
| Curie Temperature                 | H  | H   | M   | L   | M   | H   |



- Characteristic Value: H = High, M = Medium, L = Low
- Other materials are available. Please contact us for details.

## Applications

| Piezoelectric Ceramic Function | Application Field   |
|--------------------------------|---|
| Acoustic & Ultrasonic          | Sonar, Fish Finder, Medical Application, Flow Meter, Actuator for Camera, Measurement equipment |
| Piezoelectric Effect           | Shock, Vibration, Pressure, Motion and Acceleration Sensors, Energy Harvest                     |
| Pyroelectric Effect            | Motion Sensor (Human Detection)   |
| Inverse Piezoelectric Effect   | Pump, Valve, Haptic device, Knitting machine, Positioner, DSC Dust reduction                    |

## Product Lineup

- Custom Piezoelectric Elements
- Langevin Bolt-on Transducers
- Ultrasonic Cleaning Elements
- Piezoelectric Bimorphs
- Molded Waterproof Transducers
- High Frequency Transducers
- Aerial Microphone Transducers
- Sonar Transducers



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## Precautions



- The names of the products and the specifications in this catalog are subject to change without notice for the sake of improvement. The manufacturer also reserves the right to discontinue any of these products. At the time of delivery, please ask for specification sheets to check the contents before use.
- Descriptions in this catalog regarding product characteristics and quality are based solely on discrete components. When using these components, be sure to check the specifications with the component in question mounted on the products.
- The manufacturer's warranty will not cover any disadvantage or damage caused by improper use of the products, deviating from the characteristics, specifications, or conditions for use described in this catalog.
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Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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