

## Wirewound Resistors, Industrial Power, Silicone Coated, Fixed Edgewound Tubular


**FEATURES**

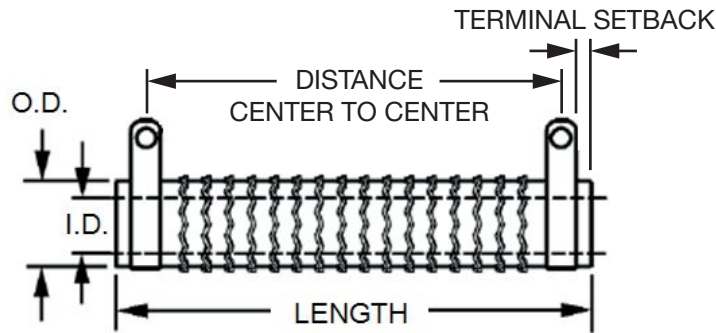
- High temperature silicone coating
- Complete welded construction
- Excellent stability in operation (< 3 % change in resistance)
- Material categorization:  
for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



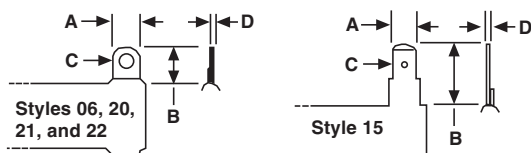
**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

| STANDARD ELECTRICAL SPECIFICATIONS |                  |                                                     |                                           |                                            |                          |
|------------------------------------|------------------|-----------------------------------------------------|-------------------------------------------|--------------------------------------------|--------------------------|
| GLOBAL MODEL                       | HISTORICAL MODEL | POWER RATING<br>$P_{25\text{ }^\circ\text{C}}$<br>W | RESISTANCE RANGE<br>$\Omega$<br>$\pm 5\%$ | RESISTANCE RANGE<br>$\Omega$<br>$\pm 10\%$ | WEIGHT<br>(typical)<br>g |
| FSE0050                            | FSE-50           | 50                                                  | 1.0 to 3.8                                | 1.0 to 3.8                                 | 18                       |
| FSE0090                            | FSE-90           | 90                                                  | 0.10 to 5.7                               | 0.10 to 5.7                                | 36                       |
| FSE0100                            | FSE-100          | 100                                                 | 1.0 to 6.1                                | 0.15 to 6.1                                | 41                       |
| FSE0110                            | FSE-110          | 110                                                 | 1.0 to 7.4                                | 0.20 to 7.4                                | 49                       |
| FSE0120                            | FSE-120          | 120                                                 | 1.0 to 8.6                                | 0.1 to 8.6                                 | 54                       |
| FSE0155                            | FSE-155          | 155                                                 | 1.0 to 12.5                               | 0.1 to 12.5                                | 129                      |
| FSE0240                            | FSE-240          | 240                                                 | 1.0 to 18                                 | 0.1 to 18                                  | 186                      |
| FSE0300                            | FSE-300          | 300                                                 | 1.0 to 25                                 | 0.15 to 25                                 | 236                      |
| FSE0375                            | FSE-375          | 375                                                 | 1.0 to 32                                 | 0.20 to 32                                 | 286                      |
| FSE0420                            | FSE-420          | 420                                                 | 1.0 to 35.8                               | 0.25 to 35.8                               | 320                      |
| FSE0500                            | FSE-500          | 500                                                 | 1.0 to 46.2                               | 0.30 to 46.2                               | 381                      |
| FSE0750                            | FSE-750          | 750                                                 | 1.0 to 81.3                               | 0.35 to 81.3                               | 654                      |
| FSE1000                            | FSE-1000         | 1000                                                | 1.0 to 101.6                              | 0.40 to 101.6                              | 817                      |
| FSE1500                            | FSE-1500         | 1500                                                | 1.0 to 135.5                              | 0.15 to 135.5                              | 1090                     |

| GLOBAL PART NUMBER INFORMATION                                                                                                                                       |                                                               |                              |                                                  |           |                                               |                                              |                                                                                                                                               |   |   |   |   |   |   |   |   |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------|--------------------------------------------------|-----------|-----------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|--|--|
| Global Part Numbering example: <b>FSE050021E15R0JE</b> (visit <a href="http://www.vishay.net">www.vishay.net</a> Vishay Dale parts numbering manual for all options) |                                                               |                              |                                                  |           |                                               |                                              |                                                                                                                                               |   |   |   |   |   |   |   |   |  |  |
| F                                                                                                                                                                    | S                                                             | E                            | 0                                                | 5         | 0                                             | 0                                            | 2                                                                                                                                             | 1 | E | 1 | 5 | R | 0 | J | E |  |  |
| GLOBAL MODEL<br>(7 digits)                                                                                                                                           | TERMINAL DESIGNATION<br>(2 digits)                            | TERMINAL FINISH<br>(1 digit) | VALUE<br>(4 digits)                              |           | TOLERANCE<br>(1 digit)                        | PACKAGING CODE<br>(1 digit)                  | SPECIAL<br>(up to 2 digits)                                                                                                                   |   |   |   |   |   |   |   |   |  |  |
| (See Standard Electrical Specifications Global Model column for options)                                                                                             | <b>06</b><br><b>15</b><br><b>20</b><br><b>21</b><br><b>22</b> | <b>E</b> = Lead (Pb)-free    | <b>R</b> = Decimal<br><b>1R50</b> = 1.5 $\Omega$ |           | <b>J</b> = $\pm 5\%$<br><b>K</b> = $\pm 10\%$ | <b>E</b> = Lead (Pb)-free cell and bulk pack | (Dash number) From <b>1</b> to <b>99</b> as applicable<br><b>91</b> = 100 style BKT<br><b>92</b> = 200 style BKT<br><b>93</b> = 300 style BKT |   |   |   |   |   |   |   |   |  |  |
| Historical Part Number example: <b>FSE-500-15-5 %</b>                                                                                                                |                                                               |                              |                                                  |           |                                               |                                              |                                                                                                                                               |   |   |   |   |   |   |   |   |  |  |
| FSE-500                                                                                                                                                              |                                                               | 15 $\Omega$                  |                                                  | 5 %       |                                               |                                              |                                                                                                                                               |   |   |   |   |   |   |   |   |  |  |
| HISTORICAL MODEL                                                                                                                                                     |                                                               | RESISTANCE VALUE             |                                                  | TOLERANCE |                                               | SPECIAL                                      |                                                                                                                                               |   |   |   |   |   |   |   |   |  |  |

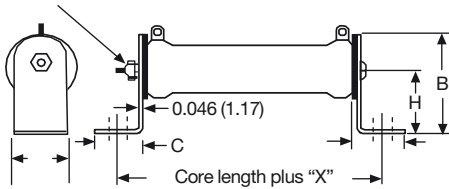
**DIMENSIONS** in inches [millimeters]


| MODEL   | CORE DIMENSIONS               |                             |                             | TERMINAL SETBACK | DISTANCE CENTER TO CENTER (REF.) | TERMINAL DESIGNATION |                          |
|---------|-------------------------------|-----------------------------|-----------------------------|------------------|----------------------------------|----------------------|--------------------------|
|         | LENGTH<br>± 0.062<br>[± 1.57] | O.D.<br>± 0.031<br>[± 0.79] | I.D.<br>± 0.031<br>[± 0.79] |                  |                                  | STANDARD             | OPTIONAL (QUICK CONNECT) |
| FSE0050 | 2.000<br>[50.8]               | 0.750<br>[19.05]            | 0.500<br>[12.70]            | 0.094<br>[2.39]  | 1.562<br>[39.67]                 | 06                   | 15                       |
| FSE0090 | 4.000<br>[101.6]              | 0.563<br>[14.30]            | 0.313<br>[7.95]             | 0.094<br>[2.39]  | 3.562<br>[90.47]                 | 06                   | 15                       |
| FSE0100 | 3.500<br>[88.90]              | 0.750<br>[19.05]            | 0.500<br>[12.70]            | 0.079<br>[2.01]  | 3.092<br>[78.54]                 | 06                   | 15                       |
| FSE0110 | 4.000<br>[101.6]              | 0.750<br>[19.05]            | 0.500<br>[12.70]            | 0.125<br>[3.18]  | 3.500<br>[88.90]                 | 06                   | 15                       |
| FSE0120 | 4.500<br>[114.3]              | 0.750<br>[19.05]            | 0.547<br>[13.89]            | 0.125<br>[3.18]  | 4.000<br>[101.60]                | 06                   | 15                       |
| FSE0155 | 4.500<br>[114.3]              | 1.125<br>[28.58]            | 0.750<br>[19.05]            | 0.282<br>[7.16]  | 3.311<br>[84.10]                 | 20                   | 15                       |
| FSE0240 | 6.500<br>[165.1]              | 1.125<br>[28.58]            | 0.750<br>[19.05]            | 0.250<br>[6.35]  | 5.561<br>[141.25]                | 20                   | 15                       |
| FSE0300 | 8.500<br>[215.9]              | 1.125<br>[28.58]            | 0.750<br>[19.05]            | 0.267<br>[6.78]  | 7.591<br>[192.81]                | 20                   | 15                       |
| FSE0375 | 10.500<br>[266.7]             | 1.125<br>[28.58]            | 0.750<br>[19.05]            | 0.266<br>[6.76]  | 9.591<br>[243.61]                | 20                   | 15                       |
| FSE0420 | 11.750<br>[288.9]             | 1.125<br>[28.58]            | 0.750<br>[19.05]            | 0.266<br>[6.76]  | 10.843<br>[275.41]               | 20                   | 15                       |
| FSE0500 | 10.500<br>[266.7]             | 1.625<br>[41.275]           | 1.125<br>[28.58]            | 0.266<br>[6.76]  | 9.468<br>[240.49]                | 21                   | -                        |
| FSE0750 | 12.000<br>[304.8]             | 2.500<br>[63.50]            | 1.750<br>[44.45]            | 0.508<br>[12.90] | 10.484<br>[266.29]               | 22                   | -                        |
| FSE1000 | 15.000<br>[381.0]             | 2.500<br>[63.50]            | 1.750<br>[44.45]            | 0.508<br>[12.90] | 13.484<br>[342.49]               | 22                   | -                        |
| FSE1500 | 20.000<br>[508.0]             | 2.500<br>[63.50]            | 1.750<br>[44.45]            | 0.508<br>[12.90] | 18.484<br>[469.49]               | 22                   | -                        |

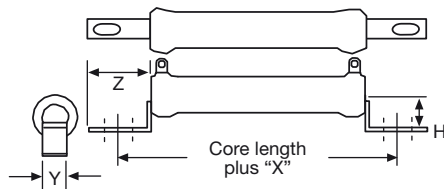
**TERMINAL DIMENSIONS** in inches [millimeters]


| DIMENSIONS        | TERMINAL STYLE   |                  |                   |                  |                  |
|-------------------|------------------|------------------|-------------------|------------------|------------------|
|                   | 06               | 15               | 20                | 21               | 22               |
| A                 | 0.250<br>[6.35]  | 0.250<br>[6.35]  | 0.375<br>[9.53]   | 0.500<br>[12.70] | 0.500<br>[12.70] |
| B                 | 0.500<br>[12.70] | 0.594<br>[15.08] | 0.5625<br>[14.28] | 0.625<br>[15.87] | 0.925<br>[23.49] |
| C (HOLE DIAMETER) | 0.173<br>[4.39]  | 0.065<br>[1.65]  | 0.204<br>[5.18]   | 0.264<br>[6.70]  | 0.264<br>[6.70]  |
| D                 | 0.020<br>[0.51]  | 0.031<br>[0.79]  | 0.032<br>[0.812]  | 0.025<br>[0.64]  | 0.025<br>[0.64]  |

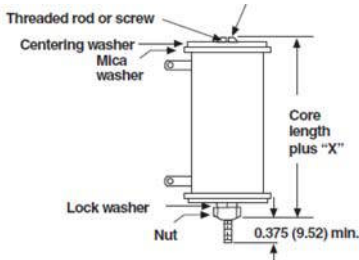
**MOUNTING HARDWARE FOR AVT PRODUCTS** - Dimensions in inches [millimeters]

**91 = 100 Style Horizontal 1 High Bracket**


| BRACKET TYPE | X                | Y                | Z                | H                | MOUNTING SLOT                   | C                | B                |
|--------------|------------------|------------------|------------------|------------------|---------------------------------|------------------|------------------|
| 102          | 1.063<br>[26.99] | 0.750<br>[19.05] | 0.859<br>[21.83] | 1.250<br>[31.75] | 0.219 x 0.438<br>[5.56 x 11.11] | 0.750<br>[19.05] | 1.750<br>[44.75] |
| 103          | 1.063<br>[26.99] | 1.250<br>[31.75] | 1.000<br>[25.40] | 1.500<br>[38.10] | 0.281 x 0.563<br>[7.14 x 14.29] | 0.927<br>[23.55] | 2.125<br>[53.98] |
| 104          | 1.952<br>[49.58] | 2.500<br>[63.50] | 1.478<br>[37.54] | 3.000<br>[76.20] | open slot x<br>0.406<br>[10.31] | 1.375<br>[34.93] | 4.25<br>[107.25] |

**92 = 200 Style Push-In Bracket**


| BRACKET TYPE | X                | H                | Y                | Z                | HOLE (DIA.)                    |
|--------------|------------------|------------------|------------------|------------------|--------------------------------|
| 204          | 0.700<br>[17.78] | 0.578<br>[14.68] | 0.250<br>[6.35]  | 0.500<br>[12.70] | 0.156<br>[3.96]                |
| 206          | 0.846<br>[21.49] | 0.800<br>[20.62] | 0.375<br>[9.53]  | 0.600<br>[15.24] | 0.343 x 0.213<br>[8.71 x 5.46] |
| 207          | 0.700<br>[17.78] | 1.125<br>[28.58] | 0.500<br>[12.70] | 0.687<br>[17.45] | 0.250 x 0.188<br>[6.35 x 4.78] |

**93 = 300 Style Thru-Bolt Bracket**


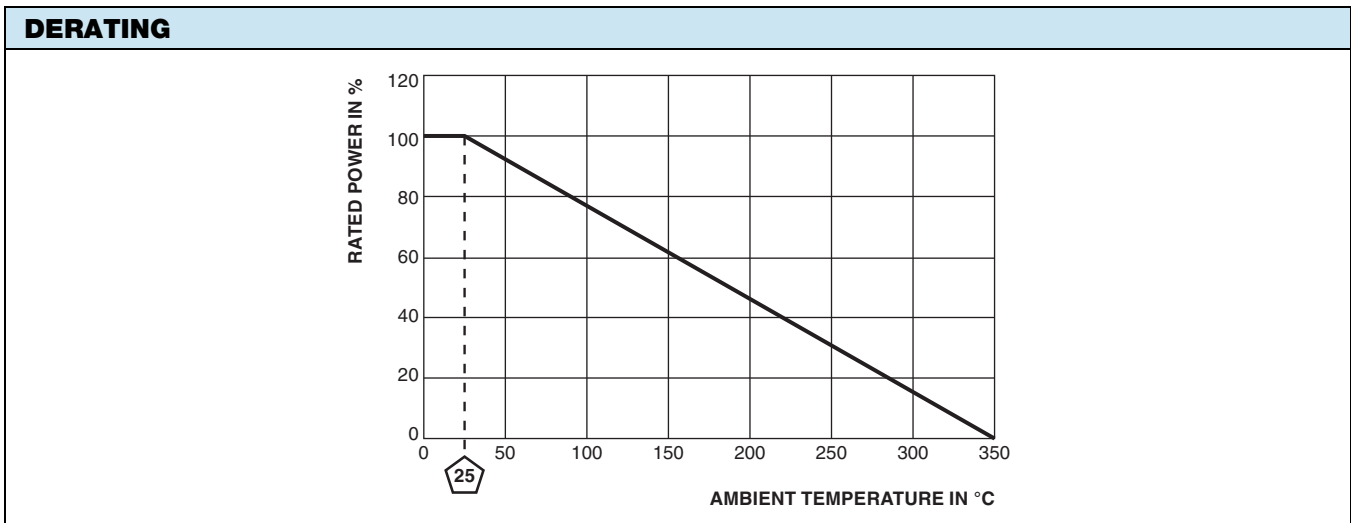
| BRACKET TYPE | X (APPROXIMATE) | THREAD |
|--------------|-----------------|--------|
| 302          | 0.271 [6.88]    | 10-32  |
| 303          | 0.463 [11.76]   | 1/4-20 |

| MOUNTING HARDWARE |                                          |                                |                                  |
|-------------------|------------------------------------------|--------------------------------|----------------------------------|
| GLOBAL MODEL      | AVAILABLE BRACKET TYPES BY MODEL         |                                |                                  |
|                   | 91 = 100 STYLE HORIZONTAL 1 HIGH BRACKET | 92 = 200 STYLE PUSH-IN BRACKET | 93 = 300 STYLE THRU-BOLT BRACKET |
| FSE0050           | 102                                      | 206                            | 302                              |
| FSE0090           | 102                                      | 204                            | 302                              |
| FSE0100           | 102                                      | 206                            | 302                              |
| FSE0110           | 102                                      | 206                            | 302                              |
| FSE0120           | 102                                      | 206                            | 302                              |
| FSE0155           | 103                                      | 207                            | 302                              |
| FSE0240           | 103                                      | 207                            | 302                              |
| FSE0300           | 103                                      | 207                            | 303                              |
| FSE0375           | 103                                      | 207                            | 303                              |
| FSE0420           | 103                                      | 207                            | 303                              |
| FSE0500           | 103                                      | -                              | 302                              |
| FSE0750           | 104                                      | -                              | 302                              |
| FSE1000           | 104                                      | -                              | 302                              |
| FSE1500           | 104                                      | -                              | 303                              |



| TECHNICAL SPECIFICATIONS               |                   |                                                                                         |
|----------------------------------------|-------------------|-----------------------------------------------------------------------------------------|
| PARAMETER                              | UNIT              | RESISTOR CHARACTERISTICS                                                                |
| Power Rating                           | W                 | 50 to 1500                                                                              |
| Resistance Range                       | $\Omega$          | 0.10 to 135.5                                                                           |
| Resistance Tolerance                   | %                 | 10                                                                                      |
| Temperature Coefficient                | ppm/ $^{\circ}$ C | $\pm 260$ for 20 $\Omega$ and above, $\pm 400$ for 1 $\Omega$ to 19.99 $\Omega$         |
| Operating Temperature                  | $^{\circ}$ C      | -55 $^{\circ}$ C to 350 $^{\circ}$ C                                                    |
| Temperature Rise                       | $^{\circ}$ C      | 325 $^{\circ}$ C above an ambient of 25 $^{\circ}$ C                                    |
| Maximum Altitude                       | f.a.s.l.          | 10 000                                                                                  |
| Short-Term Overload                    | -                 | 10x rated power for 5 s                                                                 |
| Surge Windings                         | -                 | Available                                                                               |
| Maximum Working Voltage                | -                 | $(P \times R)^{0.5}$                                                                    |
| Insulation Resistance                  | $\Omega$          | 1M                                                                                      |
| Dielectric Voltage                     | V <sub>RMS</sub>  | 1000 V <sub>AC</sub>                                                                    |
| Creepage                               | -                 | Varies by wattage, see "Terminal Setback" in Dimensions table                           |
| Terminal Sleeves                       | -                 | n/a                                                                                     |
| Inductance                             | $\mu$ H           | Varies by wattage and resistance                                                        |
| Non-Inductive Winding                  | -                 | n/a                                                                                     |
| Terminal Strength                      | lb                | 10 lbs                                                                                  |
| Electrical or Mechanical Customization | -                 | Contact factory: <a href="mailto:ww2dresistors@vishay.com">ww2dresistors@vishay.com</a> |

| MATERIAL SPECIFICATIONS |                                                                           |
|-------------------------|---------------------------------------------------------------------------|
| Element                 | Copper-nickel alloy or nickel-chrome alloy, depending on resistance value |
| Core                    | Cordierite, steatite                                                      |
| Coating                 | Special high temperature silicone                                         |
| Standard Terminals      | Tinned alloy 42                                                           |
| Optional Terminals      | Alloy 42                                                                  |
| Terminal Bands          | Alloy 42                                                                  |
| Part Marking            | HEI, model, wattage, value, tolerance, date code                          |





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**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.**



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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;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- 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.);

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- 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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