



# Hermetic Flat Pack Thin Film Resistor, Surface Mount Network



Product may not  
be to scale

## FEATURES

- Military/aerospace
- Hermetically sealed
- Material categorization:  
for definitions of compliance please see  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



RoHS\*  
Available

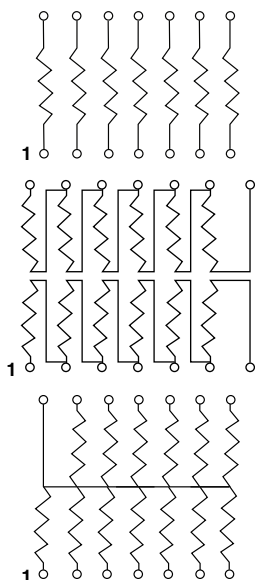
HALOGEN  
FREE

## Note

\* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

Vishay Dale Thin Film offers a broad line of precision resistor networks in hermetic Flat-Packs for surface mount requirements in military, space or other harsh environmental applications. These networks provide the long-term stability necessary to insure continuous specification and performance over the 20 years to 30 years life required for space applications. The fabrication of these devices is performed under tight procedural and environmental controls to insure conformance to all 883C level H or K requirements. Custom configurations, values and tolerance combinations are available with fast turnaround.

## SCHEMATICS



FP200

|                     |                                |
|---------------------|--------------------------------|
| Number of Resistors | 7, 8                           |
| Number of Leads     | 14, 16                         |
| Type Connection     | Isolated                       |
| Values Available    | 500 $\Omega$ to 100 k $\Omega$ |

FP201

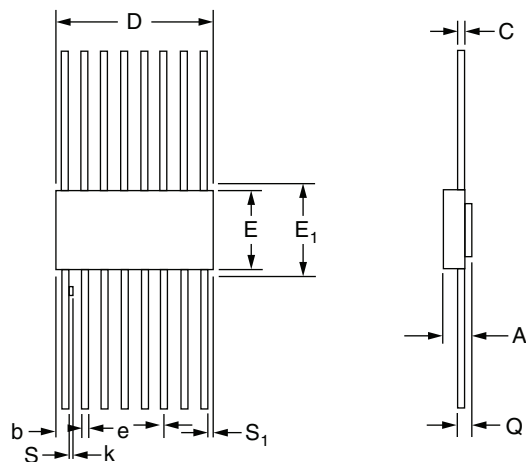
|                     |                                |
|---------------------|--------------------------------|
| Number of Resistors | 12, 14                         |
| Number of Leads     | 14, 16                         |
| Type Connection     | Series                         |
| Values Available    | 500 $\Omega$ to 100 k $\Omega$ |

FP202

|                     |                                |
|---------------------|--------------------------------|
| Number of Resistors | 13, 15                         |
| Number of Leads     | 14, 16                         |
| Type Connection     | Common                         |
| Values Available    | 500 $\Omega$ to 100 k $\Omega$ |

## STANDARD ELECTRICAL SPECIFICATIONS

| TEST                           | SPECIFICATIONS                                     | CONDITIONS                 |
|--------------------------------|----------------------------------------------------|----------------------------|
| Material                       | Passivated nichrome                                | -                          |
| Pin/Lead Number                | 14, 16                                             | -                          |
| Resistance Range               | 10 $\Omega$ to 1 M $\Omega$ (total)                | -                          |
| TCR: Absolute                  | $\pm 10$ ppm/ $^{\circ}$ C to 50 ppm/ $^{\circ}$ C | -                          |
| TCR: Tracking                  | $\pm 5$ ppm/ $^{\circ}$ C (standard)               | -                          |
| Tolerance: Absolute            | $\pm 0.05$ % to $\pm 1$ %                          | -                          |
| Tolerance: Ratio               | $\pm 0.01$ % to $\pm 0.1$ %                        | -                          |
| Power Rating: Resistor         | 100 mW                                             | -                          |
| Power Rating: Package          | 800 mW                                             | 70 $^{\circ}$ C            |
| Stability: Absolute            | $\Delta R \pm 0.05$ %                              | 2000 h at +70 $^{\circ}$ C |
| Stability: Ratio               | $\Delta R \pm 0.015$ %                             | 2000 h at +70 $^{\circ}$ C |
| Voltage Coefficient            | -                                                  | -                          |
| Working Voltage                | 100 V max. not to exceed $\sqrt{P \times R}$       | -                          |
| Operating Temperature Range    | -55 $^{\circ}$ C to +125 $^{\circ}$ C              | -                          |
| Storage Temperature Range      | -55 $^{\circ}$ C to +150 $^{\circ}$ C              | -                          |
| Noise                          | -                                                  | -                          |
| Thermal EMF                    | -                                                  | -                          |
| Shelf Life Stability: Absolute | $\Delta R \pm 0.01$ %                              | 1 year at +25 $^{\circ}$ C |
| Shelf Life Stability: Ratio    | $\Delta R \pm 0.002$ %                             | 1 year at +25 $^{\circ}$ C |

**DIMENSIONS** in inches (millimeters)**FLAT-PAK FP200**

| DIMENSION      | 14 LEAD      |              | 16 LEAD      |               |
|----------------|--------------|--------------|--------------|---------------|
|                | MINIMUM      | MAXIMUM      | MINIMUM      | MAXIMUM       |
| A              | 0.086 (2.18) | 0.106 (2.69) | 0.045 (1.14) | 0.115 (2.92)  |
| b              | 0.015 (0.38) | 0.019 (0.48) | 0.015 (0.38) | 0.019 (0.48)  |
| C              | 0.004 (0.10) | 0.007 (0.18) | 0.003 (0.08) | 0.009 (0.23)  |
| D              | 0.373 (9.47) | 0.383 (9.73) | -            | 0.440 (11.18) |
| e              | 0.047 (1.19) | 0.053 (1.35) | 0.050 (1.27) | BSC           |
| E              | 0.250 (6.35) | 0.260 (6.60) | 0.245 (6.22) | 0.285 (7.24)  |
| E <sub>1</sub> | -            | 0.290 (7.37) | -            | 0.315 (8.00)  |
| E <sub>2</sub> | 0.158 (4.01) | 0.172 (4.37) | 0.130 (3.30) | -             |
| E <sub>3</sub> | 0.030 (0.76) | -            | 0.030 (0.76) | -             |
| L              | -            | -            | 0.250 (6.35) | 0.370 (9.40)  |
| Q              | 0.026 (0.66) | -            | 0.26 (0.66)  | 0.045 (1.14)  |
| S              | -            | 0.045 (1.14) | -            | 0.045 (1.14)  |
| S <sub>1</sub> | 0.005 (0.13) | -            | 0.005 (0.13) | -             |
| k              | -            | -            | 0.008 (0.20) | 0.015 (0.38)  |

**GLOBAL PART NUMBER INFORMATION****New Global Part Numbering: FP2001681001BFBCW**

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| F | P | 2 | 0 | 0 | 1 | 6 | 8 | 1 | 0 | 0 | 1 | B | F | B | C | W |   |
| F | P | 2 | 0 | 2 | 1 | 6 | 1 | 3 | 1 | 0 | 0 | 1 | B | F | B | C | W |

| GLOBAL MODEL | CASE SIZE | NUMBER OF RESISTORS (1 or 2 digits) | OHMIC VALUE                                                                                                                                                                                          | ABSOLUTE TOLERANCE                                                                                         | RATIO TOLERANCE                                                                                                  | ABSOLUTE TCR                                                      | RATIO TCR                                                                                  | PACKAGING                                |
|--------------|-----------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------|
| FP200        | 14<br>16  | 7<br>8                              | The first 3 digits are significant figures and the last digit specifies the number of zeros to follow. "R" designates the decimal point.<br>Example:<br>10R0 = 10 Ω<br>1000 = 100 Ω<br>1001 = 1000 Ω | A = 0.05 %<br>B = 0.1 %<br>C = 0.2 %<br>D = 0.5 %<br>F = 1 %<br>G = 2 %<br>J = 5 %<br>K = 10 %<br>M = 20 % | B = 0.01 %<br>C = 0.025 %<br>D = 0.05 %<br>F = 0.1 %<br>H = 0.25 %<br>J = 0.5 %<br>K = 1 %<br>X = Not applicable | A = 10 ppm/°C<br>B = 25 ppm/°C<br>D = 50 ppm/°C<br>E = 100 ppm/°C | C = 2 ppm <sup>(1)</sup><br>D = 3 ppm <sup>(1)</sup><br>F = 5 ppm<br>G = 10 ppm<br>X = N/A | W = Carrier packaging, 100 min., 1 mult. |
| FP201        | 14<br>16  | 12<br>14                            |                                                                                                                                                                                                      |                                                                                                            |                                                                                                                  |                                                                   |                                                                                            |                                          |
| FP202        | 14<br>16  | 13<br>16                            |                                                                                                                                                                                                      |                                                                                                            |                                                                                                                  |                                                                   |                                                                                            |                                          |

**Historical Part Number example: FP2001681002BFBC (for reference purposes only)**

|       |                 |                     |            |                    |                 |              |           |
|-------|-----------------|---------------------|------------|--------------------|-----------------|--------------|-----------|
| FP200 | 16              | 8                   | 1002       | B                  | F               | B            | C         |
| MODEL | NUMBER OF LEADS | NUMBER OF RESISTORS | RESISTANCE | ABSOLUTE TOLERANCE | RATIO TOLERANCE | ABSOLUTE TCR | RATIO TCR |

**Note**<sup>(1)</sup> Value dependent



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