# Military- and Space-Qualified Passive Components Selector Guide

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VISHAY INTERTECHNOLOGY, INC.

www.vishay.com

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Introduction

Vishay’s line of high-reliability products reflects a long-term commitment to our military and aerospace customers. As one of the largest suppliers of military components, we continually strive to meet the changing application requirements of the defense market by developing new products and manufacturing technologies on an ongoing basis.

Vishay has one of the broadest lines of military-qualified resistors, capacitors, and inductors in the industry, and our high-reliability devices can be found in nearly every existing military and aerospace program, including aircraft, satellites, missiles, weapons, ground vehicles, and ships. Our precision potentiometers have been used for over 20 years in three different missile programs and are also used in passenger jets.

Able to meet the most demanding application specifications, our high-reliability products are qualified to the relevant CECC, EN, ESCC, or MIL specifications. For example, our high-reliability inductors are qualified to MIL-T-27E, MIL-C-15305E, and MIL-C-39010D specifications. Our high-reliability resistive components are qualified to ESCC 4001/022, MIL-PRF-39007, MIL-PRF-39009, MIL-PRF-39017, MIL-PRF 55182, MIL-PRF-55342, MIL-PRF-83401, and many other high-reliability specifications. Our high-reliability capacitors are qualified to MIL-PRF-39003, MIL-PRF-39006, MIL-PRF-55365, MIL-PRF-123, and MIL-PRF-55681.

In addition to standard military-grade products, Vishay is equipped to design and produce custom components to meet any design and reliability demands. Our MLCC capacitor group offers products to source-controlled specifications with customer specific requirements such as capacitance tolerances. Our custom magnetic group produces many custom inductors and transformers for applications as diverse as missile systems and ground-based communications systems. And our resistor groups produce many resistive products designed to meet various military source-controlled drawings.

Every component Vishay provides to the military and aerospace markets is backed by the comprehensive testing and failure analysis capabilities of our own technical staff, who are experts in understanding and meeting the requirements of the military environment. Our technical expertise, our knowledge of the military and aerospace industries, our broad product offering, and our ability to work long-term are all part of Vishay’s ongoing commitment to meeting the changing requirements of our most reliability-conscious customers, today and in the future.
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<td>M 55342/1 through /12 D55342/7</td>
<td>10 Ω to 3 MΩ</td>
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<td>PTN</td>
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<td>• DSCC listed • Moisture-resistant wrap-around chip resistors • Low TCR (25 ppm/°C) • Tight tolerance (0.1 %)</td>
<td>94012, 94013, 94014, 94015, 94016, 94017, 94018, 94019, 94025, 94026, 04008, 04009</td>
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<td>L1206</td>
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<td>• DSCC listed • Low ohmic values • Power rating 250 mW at + 70 °C</td>
<td>02008</td>
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<tr>
<td>M1206</td>
<td></td>
<td>• DSCC listed • Ohmic values 10 Ω – 10 MΩ • Power rating 250 mW at + 70 °C</td>
<td>02008</td>
<td>10 Ω to 10 MΩ</td>
<td>200 and 400 ppm/°C</td>
<td>250 mW</td>
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<td>PFR</td>
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<td>• R failure rate chip resistor • 0603 / 0805 / 1206 / 2010 • Very low TCR: 10 ppm/°C, 25 ppm/°C • Tight tolerances of 0.05 % and 0.1 % • ESA qualification ongoing</td>
<td>ESCC 4001/023 Variants 09 to 12</td>
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<td>• High reliability chip resistor • 0603 / 0805 / 1206 / 2010 • Very low TCR: 5 ppm/°C, 10 ppm/°C, 25 ppm/°C • Very tight tolerance: 0.01 % to 0.1 % • ESA-qualified</td>
<td>ESCC 4001/023 Variants 01 to 08</td>
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<td>• High reliability chip arrays • Very low TCR: 10 ppm/°C absolute / 3 ppm/°C ratio • Tight tolerance: 0.1 % absolute / 0.05 % ratio • 3 sizes 100/135/182 • 2 to 8 resistors • ESA-qualified • Custom network qualified (CNW)</td>
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<td>RV</td>
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<td>• In lot tracking to 5 ppm/°C • Tolerance 0.1 % to 5 % • 0603 / 0805 / 1206 • Stability 0.05 % at Pn 1000 hours</td>
<td>CECC 40401-010</td>
<td>100 R to 1 MΩ depending on size</td>
<td>10 and 25 ppm/°C</td>
<td>125 mW to 330 mW</td>
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<td>Component</td>
<td>Series/Part Number</td>
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<td>Power Rating</td>
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<td><strong>Axial Lede Thin Film Resistors</strong></td>
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<td>Axial leaded thin film resistors</td>
<td>CECC 40101-806</td>
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<td>50 ppm/K / ± 1 %; 15 ppm/K / ± 0.1 %;</td>
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<td>MBB/SMA 0207 VG06</td>
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<td>MBE/SMA 0414 VG06</td>
<td>Assessment level EZ, Version E: Established reliability, failure rate level E7</td>
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<td>50 ppm/K / ± 1 %; 15 ppm/K / ± 0.1 %;</td>
<td>1.0 W</td>
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<td><strong>Thin Film MELF Resistors</strong></td>
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<td>Thin film MELF resistors</td>
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<td>15, 25, and 50 ppm/K;</td>
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<td>MMU 0102 VG03</td>
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<td>50 ppm/K / ± 1 %; 15 ppm/K / ± 0.1 %;</td>
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<td>MMA 0204 VG03</td>
<td>Assessment level EZ, Version E: established reliability, failure rate level E6</td>
<td></td>
<td>1.0 Ω to 5.11 MΩ; 0 Ω</td>
<td>50 ppm/K / ± 1 %; 15 ppm/K / ± 0.1 %;</td>
<td>0.25 W; 3.0 A</td>
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<td>MMB 0207 VG03</td>
<td>Series include zero-ohm jumpers</td>
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<td>1.0 Ω to 10.0 MΩ; 75.0 Ω to 499 kΩ; 0 Ω</td>
<td>50 ppm/K / ± 1 %; 15 ppm/K / ± 0.1 %;</td>
<td>0.4 W; 5.0 A</td>
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<td>Approval registered at IECQ</td>
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<td>10.0 Ω to 2.21 MΩ; 75.0 Ω to 100 kΩ</td>
<td>50 ppm/K / ± 1 %; 15 ppm/K / ± 0.1 %;</td>
<td>0.25 W</td>
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<td>SMM0204 EN803 E8</td>
<td>Thin film MELF resistors</td>
<td>CECC 140401-803</td>
<td>10.0 Ω to 2.21 MΩ; 75.0 Ω to 100 kΩ</td>
<td>50 ppm/K / ± 1 %; 15 ppm/K / ± 0.1 %;</td>
<td>0.25 W</td>
</tr>
<tr>
<td>Component</td>
<td>Series/Part Number</td>
<td>Features/Benefits</td>
<td>Qualification</td>
<td>Qualified Value Range</td>
<td>TCR</td>
<td>Power Rating</td>
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<tr>
<td>Thin Film MELF Resistors</td>
<td>MMU 0102 Professional Precision</td>
<td>• Thin film MELF resistors • Tolerances 0.1 % , 0.25 %, 0.5 %, and 1 % • Professional and precision specifications • Series include zero-ohm jumpers • Assessment level EZ, Version A • Approval registered at IECQ</td>
<td>CECC / EN 140401-803</td>
<td>0.22 Ω to 2.21 MΩ; 0 Ω</td>
<td>15, 25, and 50 ppm/K; —</td>
<td>0.2 W; 2.0 A</td>
</tr>
<tr>
<td>MMA 0204 Professional Precision</td>
<td>MMU 0204 Professional Precision</td>
<td>• Thin film MELF resistors • Tolerances 0.1 %, 0.25 %, 0.5 %, and 1 % • Professional and precision specifications • Series include zero-ohm jumpers • Assessment level EZ, Version A • Approval registered at IECQ</td>
<td>CECC / EN 140401-803</td>
<td>0.22 Ω to 10.0 MΩ; 0 Ω</td>
<td>15, 25, and 50 ppm/K; —</td>
<td>0.25 W; 3.0 A</td>
</tr>
<tr>
<td>MMA 0207 Professional Precision</td>
<td>MMU 0207 Professional Precision</td>
<td>• Thin film MELF resistors • Tolerances 0.1 %, 0.25 %, 0.5 %, and 1 % • Professional and precision specifications • Series include zero-ohm jumpers • Assessment level EZ, Version A • Approval registered at IECQ</td>
<td>CECC / EN 140401-803</td>
<td>0.22 Ω to 15.0 MΩ; 0 Ω</td>
<td>15, 25, and 50 ppm/K; —</td>
<td>0.4 W; 5.0 A</td>
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<tr>
<td>MMA 0204 HT</td>
<td>MMU 0204 HT</td>
<td>• Thin film MELF resistors • Tolerance 0.5 % and 1 % • Extended temperature range • Professional specifications • Assessment level EZ, Version A • Approval registered at IECQ</td>
<td>CECC / EN 140401-803</td>
<td>47 Ω to 100 kΩ</td>
<td>25 and 50 ppm/K</td>
<td>0.5 W</td>
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<tr>
<td>UMA 0204</td>
<td>MMU 0204 HT</td>
<td>• Thin film MELF resistors • Tolerance 0.1 % and 0.25 % • High precision specifications • Assessment level EZ, Version A • Approval registered at IECQ</td>
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<td>22.0 Ω to 332 kΩ</td>
<td>10 ppm/K</td>
<td>0.25 W</td>
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<tr>
<td>SMM0204 EN803 E0</td>
<td>MMU 0204 HT</td>
<td>• Thin film MELF resistors • Tolerances 0.1 %, 0.25 %, 0.5 %, and 1 % • Professional specifications • Assessment level EZ, Version A • Approval registered at IECQ</td>
<td>CECC / EN 140401-803</td>
<td>1.0 Ω to 2.2 MΩ</td>
<td>15, 25, and 50 ppm/K</td>
<td>0.25 W</td>
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<tr>
<td>OMM0204 EN803 E0</td>
<td>MMU 0204 HT</td>
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<td>CECC / EN 140401-803</td>
<td>0 Ω</td>
<td>—</td>
<td>2.0 A</td>
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<td>Thin Film Chip Resistors</td>
<td>TNPS 0603 ESCC</td>
<td>• Thin film chip resistors • Tolerances 0.1 %, 0.5 %, and 1 % • Product listed in the EPPL • Approval listed in the ESCC QPL</td>
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<td>10.0 Ω to 221 kΩ</td>
<td>15, 25, and 50 ppm/K</td>
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<tr>
<td>TNPS 0805 ESCC</td>
<td>TNPS 0805 ESCC</td>
<td>• Thin film chip resistors • Tolerances 0.1 %, 0.5 %, and 1 % • Product listed in the EPPL • Approval listed in the ESCC QPL</td>
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<td>10.0 Ω to 422 kΩ</td>
<td>15, 25, and 50 ppm/K</td>
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<td>TNPS 1206 ESCC</td>
<td>TNPS 1206 ESCC</td>
<td>• Thin film chip resistors • Tolerances 0.1 %, 0.5 %, and 1 % • Product listed in the EPPL • Approval listed in the ESCC QPL</td>
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<td>MCS 0402 VG01</td>
<td>TNPS 0603 ESCC</td>
<td>• Thin film chip resistors • Tolerance 0.1 % and 1 % • 50 ppm/K / ± 1 %; E96 values; 15 ppm/K / ± 0.1 %; E120 values • Series include zero-ohm jumpers • Assessment level EZ, Version A: established reliability, failure rate level E6 • Approval registered at IECQ</td>
<td>CECC / EN 140401-801</td>
<td>100 Ω to 100 kΩ; 100 Ω to 33.2 kΩ; 0 Ω</td>
<td>50 ppm/K / ± 1 %; 15 ppm/K / ± 0.1 %; —</td>
<td>0.063 W; 0.63 A</td>
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<tr>
<td>MCT 0603 VG01</td>
<td>TNPS 0805 ESCC</td>
<td>• Thin film chip resistors • Tolerance 0.1 % and 1 % • 50 ppm/K / ± 1 %; E96 values; 15 ppm/K / ± 0.1 %; E120 values • Series include zero-ohm jumpers • Assessment level EZ, Version A: established reliability, failure rate level E6 • Approval registered at IECQ</td>
<td>CECC / EN 140401-801</td>
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<td>50 ppm/K / ± 1 %; 15 ppm/K / ± 0.1 %; —</td>
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<td>MCU 0805 VG01</td>
<td>TNPS 1206 ESCC</td>
<td>• Thin film chip resistors • Tolerance 0.1 % and 1 % • 50 ppm/K / ± 1 %; E96 values; 15 ppm/K / ± 0.1 %; E120 values • Series include zero-ohm jumpers • Assessment level EZ, Version A: established reliability, failure rate level E6 • Approval registered at IECQ</td>
<td>CECC / EN 140401-801</td>
<td>1.0 Ω to 1.0 MΩ; 100 Ω to 33.2 kΩ; 0 Ω</td>
<td>50 ppm/K / ± 1 %; 15 ppm/K / ± 0.1 %; —</td>
<td>0.125 W; 1.5 A</td>
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<td>MCA 1206 VG01</td>
<td>TNPS 0603 ESCC</td>
<td>• Thin film chip resistors • Tolerance 0.1 % and 1 % • 50 ppm/K / ± 1 %; E96 values; 15 ppm/K / ± 0.1 %; E120 values • Series include zero-ohm jumpers • Assessment level EZ, Version A: established reliability, failure rate level E6 • Approval registered at IECQ</td>
<td>CECC / EN 140401-801</td>
<td>1.0 Ω to 10 MΩ; 43 Ω to 332 kΩ; 0 Ω</td>
<td>50 ppm/K / ± 1 %; 15 ppm/K / ± 0.1 %; —</td>
<td>0.25 W; 2.0 A</td>
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## Component Series/part Number

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<td>MCS 0402 Professional Precision</td>
<td>• Thin film chip resistors</td>
<td>CECC / EN 140401-801</td>
<td>10.0 Ω to 1.0 MΩ; 0 Ω</td>
<td>10, 15, 25, and 50 ppm/K</td>
<td>0.063 W; 0.63 A</td>
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<td>MCT 0603 Professional Precision</td>
<td>• Professional and precision specifications</td>
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<td>10.0 Ω to 1.0 MΩ; 0 Ω</td>
<td>10, 15, 25, and 50 ppm/K</td>
<td>0.1 W; 1.0 A</td>
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<td>MCU 0805 Professional Precision</td>
<td>• Assessment level EZ, Version A</td>
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<td>10.0 Ω to 1.0 MΩ; 0 Ω</td>
<td>10, 15, 25, and 50 ppm/K</td>
<td>0.125 W; 1.5 A</td>
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<td>MCA 1206 Professional Precision</td>
<td>• Series include zero-ohm jumpers</td>
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<td>10.0 Ω to 1.0 MΩ; 0 Ω</td>
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<td>47 Ω to 47 kΩ; 0 Ω</td>
<td>15, 25, and 50 ppm/K; –</td>
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<td>• Professional and precision specifications</td>
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<td>47 Ω to 100 kΩ; 0 Ω</td>
<td>15, 25, and 50 ppm/K; –</td>
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<td>MCU 0805 AT Professional Precision</td>
<td>• Series include zero Ohm jumpers</td>
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<td>47 Ω to 100 kΩ; 0 Ω</td>
<td>15, 25, and 50 ppm/K; –</td>
<td>0.2 W; 1.5 A</td>
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<td>MCA 1206 AT Professional Precision</td>
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<td>47 Ω to 100 kΩ; 0 Ω</td>
<td>15, 25, and 50 ppm/K; –</td>
<td>0.4 W; 2 A</td>
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<td>• Thick film chip resistor</td>
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<td>1 R to 10 M</td>
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<td>• Axial leaded wirewound resistors with vitreous coating</td>
<td>CECC 40 201-801</td>
<td>0.10 Ω to 10 kΩ</td>
<td>+ 180 ppm/K / ±5 % + 180 ppm/K / ±2 %</td>
<td>3.0 W</td>
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<td>• Tolerance ±5 %: E12 values;</td>
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<td>0.10 Ω to 39 kΩ</td>
<td>+ 180 ppm/K / ±5 % + 180 ppm/K / ±2 %</td>
<td>5.5 W</td>
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<td>• Tolerance ±2 %: E24 values</td>
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<td>0.10 Ω to 22 kΩ</td>
<td>+ 180 ppm/K / ±5 % + 180 ppm/K / ±2 %</td>
<td>10.0 W</td>
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<td>0.15 Ω to 68 kΩ</td>
<td>+ 180 ppm/K / ±5 % + 180 ppm/K / ±2 %</td>
<td>3.0 W</td>
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<td>FDK</td>
<td>• Approval registered at IECQ</td>
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<td>0.15 Ω to 33 kΩ</td>
<td>+ 180 ppm/K / ±5 % + 180 ppm/K / ±2 %</td>
<td>5.5 W</td>
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<td>• E: established reliability, failure rate level E7</td>
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<td>0.15 Ω to 68 kΩ</td>
<td>+ 180 ppm/K / ±5 % + 180 ppm/K / ±2 %</td>
<td>10.0 W</td>
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<tr>
<td><strong>Fixed Linear Resistors</strong></td>
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</tr>
</tbody>
</table>
| CMF07 | (Military type RL07) | • Axial film resistor  
• Military qualified  
• Multiple body sizes  
• Monthly acceptance testing  
• 100 % screen tested  
• Traceability of materials and processes  
• Low noise  
• Excellent high-frequency characteristics | MIL-PRF-22684/1 | 51 Ω to 150 kΩ | 200 ppm/°C | 0.25 W |
| CMF20 | (Military type RL20) | | MIL-PRF-22684/2 | 4.3 Ω to 470 kΩ | 200 ppm/°C | 0.50 W |
| CMF50 | (Military type RN50) | | MIL-R-10509/8 | 10 Ω to 100 kΩ | 25, 50, and 100 ppm/°C | 0.05 W |
| CMF55 | (Military type RN55) | | MIL-R-10509/7 | 10 Ω to 301 kΩ | | 0.10 W to 0.125 W |
| CMF60 | (Military type RN60) | | MIL-R-10509/1 | 10 Ω to 1 MΩ | | 0.125 W to 0.25 W |
| CMF65 | (Military type RN65) | | MIL-R-10509/2 | 10 Ω to 2 MΩ | | 0.25 W to 0.50 W |
| CMF70 | (Military type RN70) | | MIL-R-10509/3 | 10 Ω to 2.49 MΩ | | 0.50 W to 1 W |
| DFM14 | (Military type RZ030) | • Thick film flat pack resistor networks  
• Military qualified  
• Multiple schematics and pin counts  
• Monthly acceptance testing  
• 100 % screen tested per Group A  
• Traceability of materials and processes | MIL-PRF-83401/03 | 10 Ω to 1 MΩ | 100 and 300 ppm/°C | 0.015 W/element to 0.050 W/element |
| **Military dFM14** | | | | | | |
| ERC50 | (Military type RNC50, RNR50) | • Axial film resistor  
• Established reliability military qualified (verified failure rates)  
• Multiple body sizes  
• Monthly acceptance testing  
• 100 % tested per Group A  
• Traceability of materials and processes  
• Low noise  
• Excellent high frequency characteristics  
• Customs available, per source control drawings | MIL-PRF-55182/7 | 10 Ω to 796 kΩ | 25, 50, and 100 ppm/°C | 0.05 W to 0.10 W |
| ERC55 | (Military type RNC55, RNR55) | | MIL-PRF-55182/1 | 10 Ω to 2 MΩ | 25, 50, and 100 ppm/°C | 0.10 W to 0.125 W |
| ERC60 | (Military type RNC60, RNR60) | | MIL-PRF-55182/3 | 10 Ω to 2 MΩ | 25, 50, and 100 ppm/°C | 0.125 W to 0.25 W |
| ERC65 | (Military type RNC65, RNR65) | | MIL-PRF-55182/5 | 10 Ω to 3.01 MΩ | 25, 50, and 100 ppm/°C | 0.25 W to 0.50 W |
| ERC70 | (Military type RNC70, RNR70) | | MIL-PRF-55182/6 | 10 Ω to 3.01 MΩ | 25, 50, and 100 ppm/°C | 0.50 W to 0.75 W |
| ERH | (Military type RER60, RER65, RER70, RER75) | • Chassis mounted  
• Wirewound  
• Precision  
• Established reliability  
• Power resistor | MIL-PRF-39009/1 | 0.1 Ω to 39.2 kΩ | ± 100 for 0.1 Ω to 0.99 Ω; ± 50 for 1 Ω to 19.9 Ω; ± 20 for 20 Ω and above | 5 W, 10 W, 20 W and 30 W |
| ENH | (Military type RER40, RER45, RER50, RER55) | | MIL-PRF-39009/2 | 1.0 Ω to 6.04 kΩ | ± 50 for 1 Ω to 19.9 Ω; ± 20 for 20 Ω and above | 5 W, 10 W, 20 W, and 30 W |
## Fixed Linear Resistors

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<tr>
<th>Component</th>
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<th>Power Rating</th>
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</thead>
<tbody>
<tr>
<td><strong>ERL05</strong> (Military type RLR05)</td>
<td>• Axial film resistor &lt;br&gt;• Established reliability military qualified (verified failure rates) &lt;br&gt;• Multiple body sizes &lt;br&gt;• Monthly acceptance testing &lt;br&gt;• 100% tested per Group A &lt;br&gt;• Traceability of materials and processes &lt;br&gt;• Low noise &lt;br&gt;• Excellent high frequency characteristics</td>
<td>MIL-PRF-39017/5</td>
<td>4.7 Ω to 1 MΩ</td>
<td>100 ppm/°C</td>
<td>0.125 W</td>
<td></td>
</tr>
<tr>
<td><strong>ERL07</strong> (Military type RLR07)</td>
<td>• Axial film resistor &lt;br&gt;• Established reliability military qualified (verified failure rates) &lt;br&gt;• Multiple body sizes &lt;br&gt;• Monthly acceptance testing &lt;br&gt;• 100% tested per Group A &lt;br&gt;• Traceability of materials and processes &lt;br&gt;• Low noise &lt;br&gt;• Excellent high frequency characteristics &lt;br&gt;• Customs available, per source control drawings</td>
<td>MIL-PRF-39017/1</td>
<td>1 Ω to 10 MΩ</td>
<td>100 ppm/°C</td>
<td>0.25 W</td>
<td></td>
</tr>
<tr>
<td><strong>ERL20</strong> (Military type RLR20)</td>
<td>• Axial film resistor &lt;br&gt;• Established reliability military qualified (verified failure rates) &lt;br&gt;• Multiple body sizes &lt;br&gt;• Monthly acceptance testing &lt;br&gt;• 100% tested per Group A &lt;br&gt;• Traceability of materials and processes &lt;br&gt;• Low noise &lt;br&gt;• Excellent high frequency characteristics &lt;br&gt;• Customs available, per source control drawings</td>
<td>MIL-PRF-39017/2</td>
<td>4.3 Ω to 3.01 MΩ</td>
<td>100 ppm/°C</td>
<td>0.50 W</td>
<td></td>
</tr>
<tr>
<td><strong>ERL32</strong> (Military type RLR32)</td>
<td>• Axial film resistor &lt;br&gt;• Established reliability military qualified (verified failure rates) &lt;br&gt;• Multiple body sizes &lt;br&gt;• Monthly acceptance testing &lt;br&gt;• 100% tested per Group A &lt;br&gt;• Traceability of materials and processes &lt;br&gt;• Low noise &lt;br&gt;• Excellent high frequency characteristics &lt;br&gt;• Customs available, per source control drawings</td>
<td>MIL-PRF-39017/3</td>
<td>1 Ω to 2.7 MΩ</td>
<td>100 ppm/°C</td>
<td>1 W</td>
<td></td>
</tr>
<tr>
<td><strong>ERL</strong> (dS/C Drawings)</td>
<td>• Axial film resistor &lt;br&gt;• Established reliability military qualified (verified failure rates) &lt;br&gt;• Multiple body sizes &lt;br&gt;• Low noise &lt;br&gt;• Excellent high frequency characteristics &lt;br&gt;• Customs available, per source control drawings</td>
<td>MIL-PRF-39017/9</td>
<td>0.1 Ω to 22 MΩ</td>
<td>100 and 200 ppm/°C</td>
<td>2 W</td>
<td></td>
</tr>
<tr>
<td><strong>ECL</strong> (Military type RWR73)</td>
<td>• Axial-leaded &lt;br&gt;• Wirewound &lt;br&gt;• Precision &lt;br&gt;• Established reliability &lt;br&gt;• Power resistor</td>
<td>MIL-PRF-39007/5</td>
<td>0.1 Ω to 12.1 kΩ</td>
<td>± 650 for 0.1 Ω to 0.499 Ω; ± 400 for 0.505 Ω to 1 Ω; ± 50 for 1.1 Ω to 10 Ω; ± 20 for 10 Ω and above</td>
<td>2 W</td>
<td></td>
</tr>
<tr>
<td><strong>ECL</strong> (Military type RWR74)</td>
<td>• Axial-leaded &lt;br&gt;• Wirewound &lt;br&gt;• Precision &lt;br&gt;• Established reliability &lt;br&gt;• Power resistor</td>
<td>MIL-PRF-39007/6</td>
<td>0.1 Ω to 12.1 kΩ</td>
<td>± 650 for 0.1 Ω to 0.499 Ω; ± 400 for 0.505 Ω to 1 Ω; ± 50 for 1.1 Ω to 10 Ω; ± 20 for 10 Ω and above</td>
<td>5 W</td>
<td></td>
</tr>
<tr>
<td><strong>ECL</strong> (Military type RWR78)</td>
<td>• Axial-leaded &lt;br&gt;• Wirewound &lt;br&gt;• Precision &lt;br&gt;• Established reliability &lt;br&gt;• Power resistor</td>
<td>MIL-PRF-39007/7</td>
<td>0.1 Ω to 39.2 kΩ</td>
<td>± 650 for 0.1 Ω to 0.499 Ω; ± 400 for 0.505 Ω to 1 Ω; ± 50 for 1.1 Ω to 10 Ω; ± 20 for 10 Ω and above</td>
<td>10 W</td>
<td></td>
</tr>
<tr>
<td><strong>ECL</strong> (Military type RWR80)</td>
<td>• Axial-leaded &lt;br&gt;• Wirewound &lt;br&gt;• Precision &lt;br&gt;• Established reliability &lt;br&gt;• Power resistor</td>
<td>MIL-PRF-39007/8</td>
<td>0.1 Ω to 3.16 kΩ</td>
<td>± 650 for 0.1 Ω to 0.499 Ω; ± 400 for 0.505 Ω to 1 Ω; ± 50 for 1.1 Ω to 10 Ω; ± 20 for 10 Ω and above</td>
<td>2 W</td>
<td></td>
</tr>
<tr>
<td><strong>FRJ50</strong></td>
<td>• Axial film resistor &lt;br&gt;• Zero-ohm jumper</td>
<td>MIL-PRF-39007/9</td>
<td>0.1 Ω to 1 kΩ</td>
<td>± 650 for 0.1 Ω to 0.499 Ω; ± 400 for 0.505 Ω to 1 Ω; ± 50 for 1.1 Ω to 10 Ω; ± 20 for 10 Ω and above</td>
<td>1 W</td>
<td></td>
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<tr>
<td><strong>FRJ50</strong></td>
<td>• Axial film resistor &lt;br&gt;• Zero-ohm jumper</td>
<td>MIL-PRF-39007/10</td>
<td>0.1 Ω to 12.4 kΩ</td>
<td>± 650 for 0.1 Ω to 0.499 Ω; ± 400 for 0.505 Ω to 1 Ω; ± 50 for 1.1 Ω to 10 Ω; ± 20 for 10 Ω and above</td>
<td>7 W</td>
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<tr>
<td><strong>FRJ50</strong></td>
<td>• Axial film resistor &lt;br&gt;• Zero-ohm jumper</td>
<td>MIL-PRF-39007/11</td>
<td>0.1 Ω to 4.12 kΩ</td>
<td>± 650 for 0.1 Ω to 0.499 Ω; ± 400 for 0.505 Ω to 1 Ω; ± 50 for 1.1 Ω to 10 Ω; ± 20 for 10 Ω and above</td>
<td>3 W</td>
<td></td>
</tr>
<tr>
<td><strong>FRJ50</strong></td>
<td>• Axial film resistor &lt;br&gt;• Zero-ohm jumper</td>
<td>MIL-PRF-39007/12</td>
<td>0.1 Ω to 1.3 kΩ</td>
<td>± 650 for 0.1 Ω to 0.499 Ω; ± 400 for 0.505 Ω to 1 Ω; ± 50 for 1.1 Ω to 10 Ω; ± 20 for 10 Ω and above</td>
<td>1.5 W</td>
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</tbody>
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Resistors

MiLiTAry ANd AErOSpACE

PRoduC t Sheet

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www.vishay.com
## Fixed Linear Resistors

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</tr>
</thead>
</table>
| LVR03     | (Military type RLV30) | • Axial-leaded  
• Low ohmic value  
• Power resistor | MIL-PRF-49465/6 | 0.01 Ω to 0.2 Ω | ± 350 for 0.01 Ω to 0.0249 Ω; ± 200 for 0.025 Ω to 0.0499 Ω; ± 125 for 0.05 Ω to 0.0749 Ω; ± 75 for 0.075 Ω to 0.099 Ω; ± 50 for 0.1 Ω and above | 3 W |
| LVR05     | (Military type RLV31) | MIL-PRF-49465/7 | 0.01 Ω to 0.3 Ω | ± 250 for 0.01 Ω to 0.0249 Ω; ± 150 for 0.025 Ω to 0.0499 Ω; ± 100 for 0.05 Ω to 0.0749 Ω; ± 75 for 0.075 Ω to 0.099 Ω; ± 50 for 0.1 Ω and above | 5 W |
| MDM14     | (Military type RZ010) | • Thick film DIP resistor networks  
• Military qualified  
• Multiple schematics and pin counts  
• Monthly acceptance testing  
• 100 % screen tested per Group A  
• Traceability of materials and processes  
• Rugged molded body | MIL-PRF-83401/01 | 10 Ω to 1 MΩ | 100 and 300 ppm/°C | 0.05 W/element to 0.20 W/element |
| MDM16     | (Military type RZ020) | MIL-PRF-83401/02 | 10 Ω to 1 MΩ | 100 and 300 ppm/°C | 0.05 W/element to 0.20 W/element |
| MSM06C    | (Military type RZ040) | • Thick film SIP resistor networks  
• Military qualified  
• Multiple schematics and pin counts  
• Monthly acceptance testing  
• 100 % screen tested per Group A  
• Traceability of materials and processes  
• Rugged molded body | MIL-PRF-83401/04 | 10 Ω to 1 MΩ | 100 and 300 ppm/°C | 0.10 W/element to 0.20 W/element |
<p>| MSM08C    | (Military type RZ050) | MIL-PRF-83401/05 | 10 Ω to 1 MΩ | 100 and 300 ppm/°C | 0.10 W/element to 0.20 W/element |
| MSM10C    | (Military type RZ060) | MIL-PRF-83401/06 | 10 Ω to 1 MΩ | 100 and 300 ppm/°C | 0.10 W/element to 0.20 W/element |
| MSM06A    | (Military type RZ070) | MIL-PRF-83401/07 | 10 Ω to 1 MΩ | 100 and 300 ppm/°C | 0.07 W/element to 0.12 W/element |
| MSM08A    | (Military type RZ080) | MIL-PRF-83401/08 | 10 Ω to 1 MΩ | 100 and 300 ppm/°C | 0.07 W/element to 0.12 W/element |
| MSM10A    | (Military type RZ090) | MIL-PRF-83401/09 | 10 Ω to 1 MΩ | 100 and 300 ppm/°C | 0.07 W/element to 0.12 W/element |
| MSM06A-S1 and S2 | (Military type RZ180) | MIL-PRF-83401/18 | per slash sheet | 100 and 300 ppm/°C | 0.10 W/element |
| MSM08A-S1 through S12 | (Military type RZ190) | MIL-PRF-83401/19 | per slash sheet | 100 and 300 ppm/°C | 0.10 W/element |
| MSM10A-S2, -S3 and -S4 | (Military type RZ240) | MIL-PRF-83401/24 | 10 Ω to 1 MΩ | 100 and 300 ppm/°C | 0.07 W/element to 0.12 W/element |</p>
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</tr>
</thead>
</table>
| Fixed Linear Resistors | PTF56              | • Axial film resistor  
• Ultra precision  
• Multiple body sizes  
• 100 % screen tested  
• Traceability of materials and processes  
• Very low noise  
• Excellent high-frequency characteristics  
• Ultra high stability  
• Extremely low TC of R and resistance tolerance | 89088         | 10 Ω to 500 kΩ  
5 ppm/°C | 0.1 W          |
|                   | PtF56 (DSCC drawing) |                                                                                                                                                  |               |                           |             |              |
|                   | RCWPM0550          | • Thick film chip resistor  
• Established reliability military qualified (verified failure rates)  
• Multiple case sizes  
• Monthly acceptance testing  
• 100 % screen tested per Group A  
• Traceability of materials and processes | MIL-PRF-55342/02 | 5.6 Ω to 1 MΩ  
100 and 300 ppm/°C | 0.055 W       |
|                   | (Military type RM0505) |                                                                                                                                            |               |                           |             |              |
|                   | RCWPM5100          |                                                                                                                                                | MIL-PRF-55342/03 | 5.6 Ω to 1 MΩ  
100 and 300 ppm/°C | 0.10 W        |
|                   | (Military type RM1005) |                                                                                                                                            |               |                           |             |              |
|                   | RCWPM5150          |                                                                                                                                                | MIL-PRF-55342/04 | 5.6 Ω to 4.75 MΩ  
100 and 300 ppm/°C | 0.15 W        |
|                   | (Military type RM1505) |                                                                                                                                            |               |                           |             |              |
|                   | RCWPM7225          |                                                                                                                                                  | MIL-PRF-55342/05 | 5.6 Ω to 15 MΩ  
100 and 300 ppm/°C | 0.225 W       |
|                   | (Military type RM2208) |                                                                                                                                            |               |                           |             |              |
|                   | RCWPM0575          |                                                                                                                                                  | MIL-PRF-55342/06 | 5.6 Ω to 1 MΩ  
100 and 300 ppm/°C | 0.10 W        |
|                   | (Military type RM0705) |                                                                                                                                            |               |                           |             |              |
|                   | RCWPM1206          |                                                                                                                                                  | MIL-PRF-55342/07 | 5.6 Ω to 5.6 MΩ  
100 and 300 ppm/°C | 0.25 W        |
|                   | (Military type RM1206) |                                                                                                                                            |               |                           |             |              |
|                   | RCWPM2010          |                                                                                                                                                  | MIL-PRF-55342/08 | 5.6 Ω to 15 MΩ  
100 and 300 ppm/°C | 0.80 W        |
|                   | (Military type RM2010) |                                                                                                                                            |               |                           |             |              |
|                   | RCWPM2512          |                                                                                                                                                  | MIL-PRF-55342/09 | 5.6 Ω to 15 MΩ  
100 and 300 ppm/°C | 1 W           |
|                   | (Military type RM2512) |                                                                                                                                            |               |                           |             |              |
|                   | RCWPM1100          |                                                                                                                                                  | MIL-PRF-55342/10 | 5.6 Ω to 5.6 MΩ  
100 and 300 ppm/°C | 0.50 W        |
|                   | (Military type RM1100) |                                                                                                                                            |               |                           |             |              |
|                   | RCWPM0402          |                                                                                                                                                  | MIL-PRF-55342/11 | 5.6 Ω to 1 MΩ  
100 and 300 ppm/°C | 0.04 W        |
|                   | (Military type RM0402) |                                                                                                                                            |               |                           |             |              |
|                   | RCWPM0603          |                                                                                                                                                  | MIL-PRF-55342/12 | 5.6 Ω to 1 MΩ  
100 and 300 ppm/°C | 0.07 W        |
<p>|                   | (Military type RM0603) |                                                                                                                                            |               |                           |             |              |</p>
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</table>
| Fixed Linear Resistors | RCWPM  
(DS MCC  drawings)                | • Thick film chip resistor  
• Zero-ohm jumper  
• Multiple case sizes               | 03002, 03013, 03014, 03015, 03016, 87011, 90047, 90048, 90049, 90092, 94011 | 0 Ω            | N/A                   | N/A               |              |
| RH / NH  
(Military type RE60, RE65, RE70, RE75) | Chassis mounted  
• Wirewound precision  
• Power resistor               | MIL-PRF-18546/1  
| MIL-PRF-18546/2                 | 0.1 Ω to 39.2 kΩ  
± 100 for 0.1 Ω to 0.99 Ω  
± 50 for 1 Ω to 19.9 Ω  
± 20 for 10 Ω and above       | 5 W, 10 W, 20 W and 30 W |
| HDN55  
(Military Type RNR55, RNN55) | Axial film resistor  
• Established reliability military qualified (verified failure rates)  
• Multiple body sizes  
• Monthly acceptance testing  
• 100 % tested per Group A  
• Traceability of materials and processes  
• Low noise  
• Hermetic glass enclosure is impervious to harmful environment               | MIL-PRF-55182/1  
| MIL-PRF-55182/2  
| MIL-PRF-55182/3  
| MIL-PRF-55182/5  
| MIL-PRF-55182/6  
| MIL-PRF-55182/10                 | 10 Ω to 1.21 MΩ  
25 and 50 ppm/°C       | 0.10 W to 1.25 W |
| HDN60  
(Military Type RNR60, RNN60) | MIL-PRF-55182/1  
| MIL-PRF-55182/2  
| MIL-PRF-55182/3  
| MIL-PRF-55182/5  
| MIL-PRF-55182/6  
| MIL-PRF-55182/10                 | 24.9 Ω to 4.99 MΩ  
25 and 50 ppm/°C       | 0.25 W to 0.50 W |
| HDN70  
(Military Type RNR70, RNN70) | MIL-PRF-55182/1  
| MIL-PRF-55182/2  
| MIL-PRF-55182/3  
| MIL-PRF-55182/5  
| MIL-PRF-55182/6  
| MIL-PRF-55182/10                 | 49.9 Ω to 1.21 MΩ  
25 ppm/°C       | 1 W to 2 W |
| HDN75  
(Military Type RNR70, RNN75) | MIL-PRF-55182/4  
| MIL-PRF-55182/5  
| MIL-PRF-55182/6  
| MIL-PRF-55182/10                 | 0.1 Ω to 20 kΩ  
± 650 for 0.1 Ω to 0.498 Ω  
± 400 Ω for 0.499 Ω to 0.999 Ω  
± 50 for 1 Ω to 9.9 Ω  
± 30 for 10 Ω to 19.9 Ω  
± 20 for 20 Ω and above       | 3 W, 6.5 W and 11 W |
| RS  
(Military type RW67, RW68, RW69) | MIL-PRF-55182/4  
| MIL-PRF-55182/5  
| MIL-PRF-55182/6  
| MIL-PRF-55182/10                 | 0.1 Ω to 20 kΩ  
± 650 for 0.1 Ω to 0.498 Ω  
± 400 Ω for 0.499 Ω to 0.999 Ω  
± 50 for 1 Ω to 9.9 Ω  
± 30 for 10 Ω to 19.9 Ω  
± 20 for 20 Ω and above       | 1 W to 3 W, 5 W and 10 W |
| RS / G  
(Military type RW70, RW74, RW78, RW79) | MIL-PRF-55182/4  
| MIL-PRF-55182/5  
| MIL-PRF-55182/6  
| MIL-PRF-55182/10                 | 0.1 Ω to 20 kΩ  
± 650 for 0.1 Ω to 0.498 Ω  
± 400 Ω for 0.499 Ω to 0.999 Ω  
± 50 for 1 Ω to 9.9 Ω  
± 30 for 10 Ω to 19.9 Ω  
± 20 for 20 Ω and above       | 1 W and 2 W |
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</tr>
</thead>
</table>
| Fixed Linear Resistors | SOMC (DSCC drawings) | • Thick film SMD DIP resistor networks  
• Multiple schematics and pin counts  
• Rugged molded body | 87012, 87013 | 10 Ω to 2.2 MΩ | 100 and 300 ppm/°C | 0.08 W/element to 0.16 W/element |
| SPR1005 (Military type RLV10) |  | • Axial-leded  
• Low-ohmic value  
• Power resistor | MIL-PRF-49465/1 | 0.01 Ω to 0.5 Ω | ± 150 for 0.01 Ω to 0.0249 Ω; ± 125 for 0.025 Ω to 0.0499 Ω; ± 100 for 0.05 Ω to 0.0749 Ω; ± 50 for 0.075 Ω to 0.099 Ω; ± 50 for 0.1 Ω and above | 5 W |
| WSC0001 - 15 (93706) |  | • Surface mount, 1 W, power resistor | 93076 | 0.1 Ω to 2.77 kΩ | ± 90 for 0.1 Ω to 0.99 Ω; ± 50 for 1.0 Ω to 9.9 Ω; ± 20 for 10.0 Ω and above | 1 W |
| WSC0002 - 15 (93077) |  | • Surface mount, 2 W, power resistor | 93077 | 0.1 Ω to 10.4 kΩ |  | 2 W |
| WSC01/2 - 15 (93075) |  | • Surface mount, 1/2 W, power resistor | 93075 | 0.1 Ω to 4.99 Ω |  | 0.5 W |
| WSL2512 (Military type VLV2512) |  | • Metal strip  
• Low-ohmic value  
• Power surface mount resistor | A-A-55534/08 | 0.005 Ω to 0.1 Ω | 400 ppm/°C | 1 W |
<p>| WSL2010 (Military type VLV2010) |  |  | A-A-55534/07 | 0.007 Ω to 0.5 Ω |  | 0.5 W |
| WSL1206 (Military type VLV1206) |  |  | A-A-55534/02 | 0.007 Ω to 0.5 Ω |  | 0.25 W |
| WSR2 (Military type VLV2) |  |  | A-A-55534/09 | 0.005 Ω to 1.0 Ω | 110 ppm/°C | 2 W |</p>
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<th>Component</th>
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<th>Qualification</th>
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</thead>
</table>
| MLCC Specialty Product Line | M123A10 | • 0805 case size  
• Space-level reliability  
• Proven BP and BX dielectrics in NME construction  
• Multiple termination finishes available | MIL-PRF-123 | 1 pF to 18 000 pF | 50 V to 100 V |
| | M123A11 | • 1210 case size  
• Space-level reliability  
• Proven BP and BX dielectrics in NME construction  
• Multiple termination finishes available | MIL-PRF-123 | 300 pF to 100 000 pF | 50 V to 100 V |
| | M123A12 | • 1808 case size  
• Space-level reliability  
• Proven BP and BX dielectrics in NME construction  
• Multiple termination finishes available | MIL-PRF-123 | 300 pF to 100 000 pF | 50 V to 100 V |
| | M123A13 | • 2225 case size  
• Space-level reliability  
• Proven BP and BX dielectrics in NME construction  
• Multiple termination finishes available | MIL-PRF-123 | 1100 pF to 470 000 pF | 50 V to 100 V |
| | M123A21 | • 1206 case size  
• Space-level reliability  
• Proven BP and BX dielectrics in NME construction  
• Multiple termination finishes available | MIL-PRF-123 | 1 pF to 39 000 pF | 50 V to 100 V |
| | M123A22 | • 1812 case size  
• Space-level reliability  
• Proven BP and BX dielectrics in NME construction  
• Multiple termination finishes available | MIL-PRF-123 | 100 pF to 56 000 pF | 50 V to 100 V |
| | M123A23 | • 1825 case size  
• Space-level reliability  
• Proven BP and BX dielectrics in NME construction  
• Multiple termination finishes available | MIL-PRF-123 | 3600 pF to 470 000 pF | 50 V to 100 V |
| CdR01 | | • Standard capacitance  
• 0805 case size  
• Established reliability  
• Tin/lead “Z” code and solder coat “U” code terminations available | MIL-PRF-55681/1 | 10 pF to 4700 pF | 50 V to 100 V |
| CdR02 | | • Standard capacitance  
• 1805 case size  
• Established reliability  
• Tin/lead “Z” code and solder coat “U” code terminations available | MIL-PRF-55681/1 | 220 pF to 22 000 pF | 50 V to 100 V |
| CdR03 | | • Standard capacitance  
• 1808 case size  
• Established reliability  
• Tin/lead “Z” code and solder coat “U” code terminations available | MIL-PRF-55681/1 | 330 pF to 68 000 pF | 50 V to 100 V |
| CdR04 | | • Standard capacitance  
• 1812 case size  
• Established reliability  
• Tin/lead “Z” code and solder coat “U” code terminations available | MIL-PRF-55681/1 | 1200 pF to 180 000 pF | 50 V to 100 V |
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<td>MLCC</td>
<td>CDR06</td>
<td>• Standard capacitance • 2225 case size • Established reliability • Tin/lead “Z” code and solder coat “U” code terminations available</td>
<td>MIL-PRF-55681/3</td>
<td>390 000 pF to 470 000 pF</td>
<td>50 V</td>
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<td>CDR31</td>
<td>• Standard capacitance • 0805 case size • Established reliability • Tin/lead “Z” code and solder coat “U” code terminations available</td>
<td>MIL-PRF-55681/7</td>
<td>1.0 pF to 18 000 pF</td>
<td>50 V to 100 V</td>
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<td>CDR32</td>
<td>• Standard capacitance • 1206 case size • Established reliability • Tin/lead “Z” code and solder coat “U” code terminations available</td>
<td>MIL-PRF-55681/8</td>
<td>1.0 pF to 39 000 pF</td>
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<td>CDR33</td>
<td>• Standard capacitance • 1210 case size • Established reliability • Tin/lead “Z” code and solder coat “U” code terminations available</td>
<td>MIL-PRF-55681/9</td>
<td>1000 pF to 100 000 pF</td>
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<td>CDR34</td>
<td>• Standard capacitance • 1812 case size • Multilayer ceramic chip capacitors • Established reliability • Tin/lead “Z” code and solder coat “U” code terminations available</td>
<td>MIL-PRF-55681/10</td>
<td>2200 pF to 180 000 pF</td>
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<td></td>
<td>CDR35</td>
<td>• Standard capacitance • 1825 case size • Established reliability • Tin/lead “Z” code and solder coat “U” code terminations available</td>
<td>MIL-PRF-55681/11</td>
<td>4700 pF to 470 000 pF</td>
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<tr>
<td>DSCC 03028</td>
<td></td>
<td>• Standard capacitance • Smaller case size (0603) • Screened per DSCC drawing • Tin/lead “Z” code terminations available</td>
<td>DSCC 03028</td>
<td>1 pF to 100 000 pF</td>
<td>6.3 V to 100 V</td>
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<tr>
<td>DSCC 03029</td>
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<td>• Standard capacitance • Smaller case size (0402) • Multilayer ceramic chip capacitors • Screened per DSCC drawing • Tin/lead “Z” code terminations available</td>
<td>DSCC 03029</td>
<td>1 pF to 10 000 pF</td>
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<tr>
<td>DSCC 05001</td>
<td></td>
<td>• High frequency applications • Maximum DF of 0.05 % • Case size 0805 • Tin/lead “Z” code terminations available</td>
<td>DSCC 05001</td>
<td>1 pF to 100 pF</td>
<td>50 V to 250 V</td>
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<tr>
<td>DSCC 05002</td>
<td></td>
<td>• High frequency applications • Maximum DF of 0.05 % • Case size 0603 • Tin/lead “Z” code terminations available</td>
<td>DSCC 05002</td>
<td>1 pF to 100 pF</td>
<td></td>
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<tr>
<td>DSCC 05003</td>
<td></td>
<td>• High frequency applications • Maximum DF of 0.05 % • Case size 0402 • Tin/lead “Z” code terminations available</td>
<td>DSCC 05003</td>
<td>1 pF to 27 pF</td>
<td>50 V to 100 V</td>
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<th>Qualification</th>
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<tr>
<td><strong>MLCC Specialty Product Line</strong></td>
<td><strong>DSCC 05006</strong></td>
<td>• Extended capacitance&lt;br&gt;• Standard CDR case size (0805)&lt;br&gt;• Screened per DSCC drawing&lt;br&gt;• Tin/lead “Z” code and solder coat&lt;br&gt;• “U” code terminations available</td>
<td>DSCC 05006</td>
<td>1 pF to 220 000 pF</td>
<td>10 V to 200 V</td>
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<tr>
<td><strong>DSCC 05007</strong></td>
<td></td>
<td>• Extended capacitance&lt;br&gt;• Standard CDR case size (1206)&lt;br&gt;• Screened per DSCC drawing&lt;br&gt;• Tin/lead “Z” code and solder coat&lt;br&gt;• “U” code terminations available</td>
<td>DSCC 05007</td>
<td>1 pF to 470 000 pF</td>
<td>16 V to 200 V</td>
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<tr>
<td><strong>VJ HiRel COG (NP0)</strong></td>
<td></td>
<td>• Extended capacitance, case sizes 0402 to 2225&lt;br&gt;• Hi-rel screened to MIL-PRF-55681 Group A and C guidelines&lt;br&gt;• Tin/lead terminations available</td>
<td>HI REL COTS</td>
<td>1 pF to 39 000 pF</td>
<td>10 V to 600 V</td>
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<tr>
<td><strong>VJ HiRel X7R / X5R</strong></td>
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<td>• Extended capacitance&lt;br&gt;• Case sizes 0402 to 3640&lt;br&gt;• Hi-rel screened to MIL-PRF-55681 Group A and C guidelines&lt;br&gt;• Tin/lead terminations available</td>
<td>HI REL COTS</td>
<td>100 pF to 6.8 µF</td>
<td>6.3 V to 500 V</td>
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<tr>
<td><strong>Tantalum Capacitors</strong></td>
<td><strong>CWR06</strong></td>
<td>• Standard capacitance range&lt;br&gt;• Conformal case&lt;br&gt;• Tantalum chip capacitor&lt;br&gt;• Established reliability&lt;br&gt;• Gold or tin/lead terminations available</td>
<td>MIL-PRF-55363/4</td>
<td>0.10 µF to 100 µF</td>
<td>4 V to 50 V</td>
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<tr>
<td><strong>CWR16</strong></td>
<td></td>
<td>• Extended capacitance range&lt;br&gt;• Conformal case&lt;br&gt;• Tantalum chip capacitor,&lt;br&gt;• Established reliability&lt;br&gt;• Gold or tin/lead terminations available</td>
<td>MIL-PRF-55365/13</td>
<td>0.33 µF to 330 µF</td>
<td>4 V to 35 V</td>
</tr>
<tr>
<td><strong>DSCC 02002</strong></td>
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<td>• Vishay 195D series&lt;br&gt;• Standard capacitance range&lt;br&gt;• Conformal coated&lt;br&gt;• Tantalum chip capacitor&lt;br&gt;• Hi-rel screened&lt;br&gt;• Tin/lead terminations available</td>
<td>DSCC 02002</td>
<td>10 µF to 150 µF</td>
<td>10 V to 40 V</td>
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<td>Component</td>
<td>Serial/Part Number</td>
<td>Features/Benefits/Qualifications</td>
<td>Qualification</td>
<td>Qualified Value Range</td>
<td>Voltage Range</td>
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</table>
| Tantalum Capacitors| T95                | • Extended capacitance  
• Conformal case  
• Tantalum chip capacitor  
• Hi-rel screened  
• Tin/lead terminations available | HI REL COTS   | 0.10 µF to 680 µF         | 4 V to 50 V    |
| Capacitors         |                    | • Standard capacitance range  
• Molded case  
• Tantalum chip capacitor  
• Established reliability  
• Tin/lead terminations | MIL-PRF-55365/8 | 0.10 µF to 100 µF         |               |
| DSCC 95158         |                    | • Vishay 593D series  
• Low ESR  
• Standard capacitance range  
• Molded case  
• Tantalum chip capacitor  
• Hi-rel screened  
• Tin/lead terminations available | DSCC 95158    | 4.7 µF to 220 µF          |               |
| T83                |                    | • Extended capacitance  
• Molded case  
• Tantalum chip capacitor  
• Hi-rel screened  
• Tin/lead terminations available | HI REL COTS   | 0.10 µF to 330 µF         |               |
| CSR13              |                    | • Standard capacitance range  
• Metal case  
• Hermetically sealed  
• Axial-leaded  
• Solid tantalum capacitor  
• Tin/lead terminations | MIL-PRF-39003/01 | 0.056 µF to 330 µF        | 6 V to 100 V  |
| CSR23              |                    | • Extended capacitance range  
• Metal case  
• Hermetically sealed  
• Axial-leaded  
• Solid tantalum capacitor  
• Tin/lead terminations | MIL-PRF-39003/03 | 1.2 µF to 1000 µF         | 6 V to 50 V   |
| T97                |                    | • Ultra-low ESR  
• Robust dual anode design  
• Extended capacitance  
• Conformal case  
• Tantalum chip capacitor  
• Hi-rel screened  
• Tin/lead terminations available | HI REL COTS   | 22 µF to 1500 µF          | 4 V to 50 V   |
| CSR21              |                    | • Standard capacitance range  
• Low ESR  
• Metal case  
• Hermetically sealed  
• Axial-leaded  
• Solid tantalum capacitor  
• Tin/lead terminations | MIL-PRF-39003/09 | 5.6 µF to 330 µF          | 6 V to 50 V   |
| CLR65              |                    | • Standard capacitance range  
• Silver case, hermetically sealed, axial-leaded  
• Wet tantalum capacitor  
• Established reliability  
• Tin/lead terminations | MIL-PRF-39006/09 | 1.7 µF to 1200 µF         | 6 V to 125 V  |
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<th>Component</th>
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<th>Qualification</th>
<th>Qualified Value Range</th>
<th>Voltage Range</th>
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<tr>
<td>Tantalum Capacitors</td>
<td>CLR69</td>
<td>• Extended capacitance range&lt;br&gt;• Silver case, hermetically sealed, axial-leaded&lt;br&gt;• Wet tantalum capacitor&lt;br&gt;• Established reliability&lt;br&gt;• Tin/lead terminations</td>
<td>MIL-PRF-39006/21</td>
<td>6.8 µF to 2200 µF</td>
<td>6 V to 125 V</td>
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<td>M39006/22 or CLR79</td>
<td>• Standard capacitance range&lt;br&gt;• Tantalum case, hermetically sealed, axial-leaded&lt;br&gt;• Wet tantalum capacitor&lt;br&gt;• Established reliability&lt;br&gt;• Tin/lead terminations</td>
<td>MIL-PRF-39006/22</td>
<td>1.7 µF to 1200 µF</td>
<td></td>
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<td></td>
<td>M39006/25 or CLR81</td>
<td>• Extended capacitance range&lt;br&gt;• Tantalum case, hermetically sealed, axial-leaded&lt;br&gt;• Wet tantalum capacitor&lt;br&gt;• Established reliability&lt;br&gt;• Tin/lead terminations</td>
<td>MIL-PRF-39006/25</td>
<td>6.8 µF to 2200 µF</td>
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<tr>
<td></td>
<td>M39006/30 or CLR90</td>
<td>• Low ESR&lt;br&gt;• Standard capacitance range&lt;br&gt;• Tantalum case, hermetically sealed, axial-leaded&lt;br&gt;• Wet tantalum capacitor&lt;br&gt;• Established reliability&lt;br&gt;• Tin/lead terminations</td>
<td>MIL-PRF-39006/30</td>
<td>1.7 µF to 1200 µF</td>
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<td>M39006/31 or CLR91</td>
<td>• Low ESR&lt;br&gt;• Standard capacitance range&lt;br&gt;• Tantalum case, hermetically sealed, axial-leaded&lt;br&gt;• Wet tantalum capacitor&lt;br&gt;• Established reliability&lt;br&gt;• Tin/lead terminations</td>
<td>MIL-PRF-39006/31</td>
<td>6.8 µF to 2200 µF</td>
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<td>DSCC 06013</td>
<td>• Space level screened, CLR79, MIL approved&lt;br&gt;• Standard capacitance range&lt;br&gt;• Tantalum case, hermetically sealed, axial-leaded&lt;br&gt;• Wet tantalum capacitor&lt;br&gt;• Established reliability&lt;br&gt;• Tin/lead terminations</td>
<td>DSCC 06013</td>
<td>1.7 µF to 1200 µF</td>
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<td>DSCC 06014</td>
<td>• Space level screened, CLR81, MIL approved&lt;br&gt;• Extended capacitance range&lt;br&gt;• Tantalum case, hermetically sealed, axial-leaded&lt;br&gt;• Wet tantalum capacitor&lt;br&gt;• Established reliability&lt;br&gt;• Tin/lead terminations</td>
<td>DSCC 06014</td>
<td>6.8 µF to 2200 µF</td>
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<td>Component</td>
<td>Serial/Part Number</td>
<td>Features/Benefits/Qualifications</td>
<td>Qualification</td>
<td>Qualified Value Range</td>
<td>Voltage Range</td>
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| Tantalum Capacitors | DSCC 06015        | • Space level screened, CLR90, MIL approved  
• Standard capacitance range  
• Tantalum case, hermetically sealed, axial-leaded  
• Wet tantalum capacitor  
• Established reliability  
• Tin/lead terminations | DSCC 06015 | 1.7 µF to 1200 µF | 6 V to 125 V |
|               | DSCC 06016        | • Space level screened, CLR91, MIL approved  
• Low ESR  
• Extended capacitance range  
• Tantalum case, hermetically sealed, axial-leaded  
• Wet tantalum capacitor  
• Established reliability  
• Tin/lead terminations | DSCC 06016 | 6.8 µF to 2200 µF | |
| ST            |                    | • Ultra extended capacitance range  
• Tantalum case, hermetically sealed, axial-leaded  
• Wet tantalum capacitor  
• Tin/lead terminations | HI REL COTS | 10 µF to 1800 µF | 25 V to 125 V |
| DSCC 93026    |                    | • Super extended capacitance range  
• Tantalum case, hermetically sealed, axial-leaded  
• Wet tantalum capacitor  
• Hi-rel screened  
• Tin/lead terminations | DSCC 93026 | 10 µF to 1800 µF | |
| STA           |                    | • Ultra extended capacitance range  
• Tantalum case, hermetically sealed, axial-leaded  
• Wet tantalum capacitor  
• Tin/lead terminations | HI REL COTS | 150 µF to 4700 µF | 6 V to 15 V |
| STE           |                    | • Ultra extended capacitance range  
• Tantalum case, hermetically sealed, axial-leaded  
• Wet tantalum capacitor, tin/lead terminations |                  | 750 µF to 6000 µF | 16 V to 75 V |
| DSCC 04033    |                    | • MIL-DTL-3965 styles  
• CL13, CL16, CL19  
• Metal case, hermetically sealed, axial and solder lug configurations  
• Wet tantalum capacitor  
• Tin/lead terminations | DSCC 04033 | 2 µF to 1300 µF | 8 V to 630 V |
| DSCC 04021    |                    | • MIL-DTL-3965 styles  
• CL55  
• Metal case, hermetically sealed, solder lug configurations,  
• Wet tantalum capacitor array  
• Tin/lead terminations | DSCC 04021 | 70 µF to 2400 µF | 15 V to 150 V |
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<th>Component</th>
<th>Serial/Part Number</th>
<th>Features/Benefits</th>
<th>Qualification</th>
<th>Qualified Value Range</th>
<th>Rated DC Current</th>
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</table>
| Magnetics/Inductors | MS21426 | • Type LT  
• Molded  
• Shielded  
• Miniature  
• Tin/lead axial leads  
• IMS-2 series | MIL-PRF-15305 -14 to -37 | 1.2 µH to 100 µH | 51 mA to 247 mA |
| | MS75087 | • Type LT  
• Molded  
• Shielded  
• IMS-2 series | MIL-PRF-15305 -1 to -12 | 0.10 µH to 0.82 µH | 370 mA to 1790 mA |
| | MS75088 | • Tin/lead axial leads  
• IMS-5 series | MIL-PRF-15305 -1 to -14 | 1.0 µH to 12 µH | 200 mA to 1070 mA |
| | MS75083 | • Type LT  
• Molded  
• Tin/lead axial leads  
• IM-2 series | MIL-PRF-15305 -1 to -13 | 0.10 µH to 1.0 µH | 385 mA to 1350 mA |
| | MS75084 | • Tin/lead axial leads  
• IMS-5 series | MIL-PRF-15305 -1 to -17 | 1.2 µH to 27 µH | 135 mA to 590 mA |
| | MS75085 | • Type LT  
• Molded  
• Tin/lead axial leads  
• IM-2 series | MIL-PRF-15305 -1 to -19 | 33 µH to 1000 µH | 28 mA to 130 mA |
| | MS18130 | • Type LT  
• Molded  
• Tin/lead axial leads  
• IM-4 Series | MIL-PRF-15305 -1 to -16 | 0.15 µH to 4.7 µH | 260 mA to 2450 mA |
| | MS14046 | • Type LT  
• Molded  
• Tin/lead axial leads  
• IM-4 Series | MIL-PRF-15305 -1 to -10 | 5.6 µH to 33 µH | 165 mA to 495 mA |
| | MS90538 | • Type LT  
• Molded  
• Tin/lead axial leads  
• IM-6 Series | MIL-PRF-15305 -1 to -21 | 36 µH to 240 µH | 101 mA to 180 mA |
| | MS75101 | • Type LT  
• Molded  
• Tin/lead axial leads  
• IM-6 Series | MIL-PRF-15305 -1 to -12 | 3.3 µH to 27 µH | 205 mA to 990 mA |
SEMICONDUCTORS

**MOSFETs Segment**

- Low-Voltage TrenchFET® Power MOSFETs
- Medium-Voltage Power MOSFETs
- High-Voltage Planar MOSFETs
- High-Voltage Superjunction MOSFETs
- Automotive-Grade MOSFETs

**ICs**

- VRPower® DrMOS Integrated Power Stages
- Power Management and Power Control ICs
- Smart Load Switches
- Analog Switches and Multiplexers

**Diodes Segment**

- Rectifiers
  - Schottky Rectifiers
  - Ultra-Fast Recovery Rectifiers
  - Standard and Fast Recovery Rectifiers
  - High-Power Rectifiers/Diodes
  - Bridge Rectifiers
- Small-Signal Diodes
  - Schottky and Switching Diodes
  - Zener Diodes
  - RF PIN Diodes

**Optoelectronic Components Segment**

- Infrared Emitters and Detectors
- Optical Sensors
  - Proximity
  - Ambient light
  - Light Index (RGBW, UV, IR)
  - Humidity
  - Quadrant Sensors
  - Transmissive
  - Reflective
- Infrared Remote Control Receivers

**Optocouplers**

- Phototransistor, Photodarlington
  - Linear
  - Phototriac
  - High-Speed
  - IGBT and MOSFET Driver

**Passive Components**

**Resistors and Inductors Segment**

- Film Resistors
  - Metal Film Resistors
  - Thin Film Resistors
  - Thick Film Resistors
  - Power Thick Film Resistors
  - Metal Oxide Film Resistors
  - Carbon Film Resistors
- Wirewound Resistors
  - Vitreous, Cemented, and Housed Resistors
  - Braking and Neutral Grounding Resistors
  - Custom Load Banks
- Power Metal Strip® Resistors
- Battery Management Shunts
- Crowbar and Steel Blade Resistors
- Thermo Fuses
- Chip Fuses
- Pyrotechnic Initiators / Igniters

**Variable Resistors**

- Cermet Variable Resistors
- Wirewound Variable Resistors
- Conductive Plastic Variable Resistors
- Contactless Potentiometers
- Hall Effect Position Sensors
- Precision Magnetic Encoders

**Networks/Arrays**

- Non-Linear Resistors
- NTC Thermistors
- PTC Thermistors
- Thin Film RTDs
- Varistors

**Magnetics**

- Inductors
- Wireless Charging Coils
- Planar Devices
- Transformers
- Custom Magnetics

**Connectors**

**Capacitors Segment**

- Tantalum Capacitors
  - Molded Chip Tantalum Capacitors
  - Molded Chip Polymer Tantalum Capacitors
  - Coated Chip Tantalum Capacitors
  - Solid Through-Hole Tantalum Capacitors
  - Wet Tantalum Capacitors
- Ceramic Capacitors
  - Multilayer Chip Capacitors
  - Disc Capacitors
  - Multilayer Chip RF Capacitors
  - Chip Antennas
  - Thin Film Capacitors
- Film Capacitors
- Power Capacitors
- Heavy-Current Capacitors
- Aluminum Electrolytic Capacitors
- ENYCAP™ Energy Storage Capacitors