



Product Lines—Electronic Components

CAPACITORS

- **Aluminum Electrolytic**—A complete line of electrolytic capacitors including the standard miniature axial and radial and a wide variety of other styles for special applications. These include Subminiature Radial, Low E.S.R. (high ripple current), Standard Series "D" Non Polar, Series "P" Non Polar (for crossover networks), and Low Leakage. The Low Leakage Series includes the standard miniature and the low profile, axial or radial. High voltage-axial or radial and lug terminal styles are also available. Packaged either in bulk, or tape and reel (radial or axial taping).
- **Plastic Film**—Available as a radial lead epoxy dipped construction or epoxy filled preformed plastic box, as well as the axial wrap and fill style. Produced in a wide variety of plastic film dielectrics either metallized or film & foil (extended foil): polyester (mylar), polypropylene, polycarbonate, or polystyrene. Refer to the individual specifications for the best choice in the required application. Packaged either in bulk or tape and reel (radial or axial taping).
- **Ceramic Disc**—The BRELDISC standard ceramic disc capacitor is available in many styles and configurations. Both Class I (temperature dependent) and Class II (temperature stable) temperature characteristics are produced, as well as the Class III (Barrier type) style for low voltage circuitry. Packaged either in bulk or radial tape and reel.
- **Ceramic Monolithic Multilayer**—Available in a conformally coated, radial or axial lead, as well as the chip style. A variety of temperature coefficients and sizes assures a complete selection for every application. Available in bulk packing or tape and reel. (Axial, radial, paper or plastic magazine embossed taping.) Ceramic chip capacitors are available in sizes 0403 to 2225. Temperature coefficients of NPO (COG), X7R and Z5U with voltages from 25VDC to 2000VDC.

RESISTORS

- **Carbon and Metal Film**—Our complete line of standard carbon and metal film resistors with power dissipations from 1/8 Watt to 2 Watt. A variety of tolerances and temperature coefficients gives the designer the ability to pick the exact part for their application. Refer to the product specifications for complete details. Packaging in either bulk, tape/box (ammo pack) or tape and reel. Avisert or Panasert radial taping is also available in most sizes.
- **Wirewound and Metal-Oxide Film (MOF)**—These products are designed to meet the most stringent commercial specifications for high power applications. The wirewound is inductively wound around a ceramic core and then cement encased for maximum protection. Wirewound resistors also available conformally coated. The MOF is a vapor-deposited film with a flameproof coating, ensuring the highest reliability in any application. Packaged in bulk or tape and reel.
- **Thick Film Chips and Networks**—General application chip resistors in sizes 0603, 0805 and 1206. Tolerance = $\pm 1\%$ or $\pm 5\%$, and TC = 100 to 300 ppm. Chip resistors also available in sizes 0202 to 2512 with tolerances as tight as $\pm 0.25\%$ and TC as low as 50ppm. Resistance ranges from 0.10 Ω to 1 Gig Ω . Nickel barrier passivated. Paper or plastic magazine embossed taping.

SEMICONDUCTOR PRODUCTS

- **Rectifier and LED's**—Small signal, rectifier, zener, high-voltage diodes, as well as Schottky Barrier, Varistors, Transient Voltage Suppressors and Bridge Rectifiers. Surface Mounted or leaded in both axial, and radial tape/reel to satisfy any requirement. Light Emitting Diodes (LED) and LED display devices are also available.
- **Transistors**—A large variety in TO-92 and Surface Mount SOT-23 package. Bulk, tape/box (ammo pack) and tape/reel.

POTENTIOMETERS

- **Rotary, Silde, and Trimmer**—This complete line of variable resistors is designed to satisfy the majority of today's commercial equipment application needs. Common uses are as volume, tone and balance controls, and a variety of low power dissipation DC controller circuitry. A full choice of shaft styles, lengths and design configurations.

CRYSTAL PRODUCTS

- **Crystals and Oscillators**—VCXO, TCXO, Dual-Output, Trimode, CMOS, TTL; Crystal Filters, Crystals to ± 10 ppm.

ADDITIONAL PRODUCTS

- **Switches**—DIP, Slide, Rocker, Toggle. Available in Miniature and Sub-Miniature Sizes.
- **Jacks and Plugs**—DC Power, Earphone, Phono, DIN, Headphone Jacks, Stereo/Mono Plugs, DC Power Plugs.
- **Cables and Connectors**—Line Cords, Computer Cables, RS-232, Centronics, Edge Card Connectors.

MANUFACTURERS REPRESENTATIVE

AB ELECTRONIC LTD.—Potentiometers: Plastic, Cermet and Wirewound variable resistor products. Supplying a broad line of components designed to meet the most critical laboratory and industrial applications including climatic and harsh environment condition protection, custom designs, precision voltage dividing, etc.

SRT Resistor Technology—Thin and Thickfilm Resistive Products: The world's leading producer of micro and subminiature film resistors, including all types of miniature trimmers, chip resistors, chip resistor networks, and a leading supplier to industry of custom hybrid electronic circuits. We can design, prototype, and commercially produce any hybrid circuit utilizing thin or thickfilm technology. Especially suited for sensors, hearing aids and other similar devices.

AUTHORIZED DISTRIBUTOR



Capacitor/Resistor Products

- **Aluminum Electrolytic** – Standard, Subminiature, Low Leakage, Non-Polar, Low ESR (Axial or Radial)
- **Plastic Film** – Polyester, Polypropylene, Polystyrene, Polycarbonate (Dipped, Encased, Axial-Wrap & Fill)
- **Ceramic** – Single Layer-Axial/Radial; Multilayer-Chip (Surface Mount – 0402 to 1812), Epoxy Dip (Thru Hole)
- **Resistors** – Carbon Film (1/8W-2W) $\pm 2\%$, $\pm 5\%$; Metal Film (1/8W-2W) $\pm 0.1\%$, $\pm 0.25\%$, $\pm 0.5\%$, $\pm 1\%$ (25, 50, 100 ppm); Metal Oxide Film; Power: Wirewound-Cement Encased or Tubular-Epoxy Coated
- **Chip Resistors and Thick Film Resistor Networks** – Size=0402 to 2512, Tol= $\pm 1\%$, $\pm 2\%$, $\pm 5\%$, TC=100-200ppm; SIP Network – 5 to 12 Pins
- **Potentiometers** – Rotary, Slide, Trimmer, Conductive Plastic, Custom Design – Multi-Section, Switched
- **Crystal Products** – Crystals, Oscillators – VCXO, TCXO, Dual-Output, Trimode, CMOS, TTL; Crystal Filters
- **Switches** – DIP, Slide, Rocker, Toggle – Miniature Sizes
- **Jacks and Plugs** – DC Power, Earphone, Phono, DIN, Headphone Jacks, Stereo/Mono Plugs, DC Power Plugs
- **Cables and Connectors** – Line Cords, Computer Cables, RS-232, Centronics, Edge Card Connectors
- **Semiconductor Products** – Diodes, Rectifier, Small Signal, Zener, Schottky & Rectifier Bridges

Specialized Products

LCR-Capacitors, Vogt AG – Stamped Metal Products, AB Electronic, Lairton Semiconductors, Potentiometers

BREL International Components

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SRT Resistor Technology

- **Microminiature Leaded Film Resistors and Leaded Chip Resistors (the World's Smallest)** – RKL-2, 50mW, Cylindrical, D=0.8mm x L=2.2mm LMR, 125 to 350mW, Chip Resistor Substrate Size=0504, 0805 or 1206 with Wire Leads
- **Thin Film Chip Resistors** – Tol= $\pm 0.05\%$ to 1%, TC=5-25ppm, Silicon or Ceramic Substrate
- **Thin Film Networks** – Tol= $\pm 0.02\%$ to 1%, TC=5-25ppm, Custom Design, Surface Mount/Leaded
- **Thick Film Chip Resistors** – Size=0202 to 2512, Range=0.10 Ω to 100G Ω , Trimming Style Available
- **Thick Film Networks** – Custom Circuit Design, Flexible Layout, Low Tracking TCR, Surface Mount/Leaded
- **Miniature SMT Coils** – Size=0603 to 1206 Range=1.8nH to 1200nH Tol= $\pm 5\%$ to $\pm 20\%$
- **Temperature Sensor Chips** – Size=0402-1206, Range=1R00 Ω to 10K0 Ω Tol= $\pm 0.5\%$ to 20% TC=+1500ppm to +4000ppm
- **Precision Pressure Sensors in Thinfilm** – Measuring Range= 10bar to 2000bar Bridge Resistance=10K Ω $\pm 15\%$ TC= ± 50 ppm/K
- **Thinfilm Substrates for Flip Chip Technique** – SnPb Bumps, Bump Height= 40NM to 50NM Combines Flip Chip Technique, US and TS-Wire Bonding Technique, and SMD Solder Technique in One Circuit

Capacitor Products

- **Ceramic Monolithic Chip Capacitors** – Size 0402-2225, Palladium/Silver or Nickel Barrier/Solder Coat Termination
- **Tantalum Capacitors** – Radial, Axial, Molded Case SMD, Hermetically Sealed Case

BREL Precision Components

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Conversion Table (mm - inches)

mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
0.5	0.01968	17.5	0.68897	34.5	1.35826	51.5	2.02755	68.5	2.69685	85.5	3.36614
1.0	0.03937	18.0	0.70866	35.0	1.37795	52.0	2.04724	69.0	2.71653	86.0	3.38582
1.5	0.05905	18.5	0.72834	35.5	1.39763	52.5	2.06692	69.5	2.73622	86.5	3.40551
2.0	0.07874	19.0	0.74803	36.0	1.41732	53.0	2.08661	70.0	2.75590	87.0	3.42519
2.5	0.09842	19.5	0.76771	36.5	1.43700	53.5	2.10629	70.5	2.77559	87.5	3.44488
3.0	0.11811	20.0	0.78740	37.0	1.45669	54.0	2.12598	71.0	2.79527	88.0	3.46456
3.5	0.13779	20.5	0.80708	37.5	1.47637	54.5	2.14566	71.5	2.81496	88.5	3.48425
4.0	0.15748	21.0	0.82677	38.0	1.49606	55.0	2.16535	72.0	2.83464	89.0	3.50393
4.5	0.17716	21.5	0.84645	38.5	1.51574	55.5	2.18503	72.5	2.85433	89.5	3.52362
5.0	0.19685	22.0	0.86614	39.0	1.53543	56.0	2.20472	73.0	2.87401	90.0	3.54330
5.5	0.21653	22.5	0.88582	39.5	1.55511	56.5	2.22440	73.5	2.89370	90.5	3.56299
6.0	0.23622	23.0	0.90551	40.0	1.57480	57.0	2.24409	74.0	2.91338	91.0	3.58267
6.5	0.25590	23.5	0.92519	40.5	1.59448	57.5	2.26377	74.5	2.93307	91.5	3.60236
7.0	0.27559	24.0	0.94488	41.0	1.61417	58.0	2.28346	75.0	2.95275	92.0	3.62204
7.5	0.29527	24.5	0.96456	41.5	1.63385	58.5	2.30314	75.5	2.97244	92.5	3.64173
8.0	0.31496	25.0	0.98425	42.0	1.65354	59.0	2.32283	76.0	2.99212	93.0	3.66141
8.5	0.33464	25.5	1.00393	42.5	1.67322	59.5	2.34251	76.5	3.01181	93.5	3.68110
9.0	0.35433	26.0	1.02362	43.0	1.69291	60.0	2.36220	77.0	3.03149	94.0	3.70078
9.5	0.37401	26.5	1.04330	43.5	1.71259	60.5	2.38188	77.5	3.05118	94.5	3.72047
10.0	0.39370	27.0	1.06299	44.0	1.73228	61.0	2.40157	78.0	3.07086	95.0	3.74015
10.5	0.41338	27.5	1.08267	44.5	1.75196	61.5	2.42125	78.5	3.09055	95.5	3.75984
11.0	0.43307	28.0	1.10236	45.0	1.77165	62.0	2.44094	79.0	3.11023	96.0	3.77952
11.5	0.45275	28.5	1.12204	45.5	1.79133	62.5	2.46062	79.5	3.12992	96.5	3.79921
12.0	0.47244	29.0	1.14173	46.0	1.81102	63.0	2.48031	80.0	3.14960	97.0	3.81889
12.5	0.49212	29.5	1.16141	46.5	1.83070	63.5	2.49999	80.5	3.16929	97.5	3.83858
13.0	0.51181	30.0	1.18110	47.0	1.85039	64.0	2.51968	81.0	3.18897	98.0	3.85826
13.5	0.53149	30.5	1.20078	47.5	1.87007	64.5	2.53937	81.5	3.20866	98.5	3.87795
14.0	0.55118	31.0	1.22047	48.0	1.88976	65.0	2.55905	82.0	3.22834	99.0	3.89763
14.5	0.57086	31.5	1.24015	48.5	1.90944	65.5	2.57874	82.5	3.24803	99.5	3.91732
15.0	0.59055	32.0	1.25984	49.0	1.92913	66.0	2.59842	83.0	3.26771	100.0	3.93700
15.5	0.61023	32.5	1.27952	49.5	1.94881	66.5	2.61811	83.5	3.28740		
16.0	0.62992	33.0	1.29921	50.0	1.96850	67.0	2.63779	84.0	3.30708		
16.5	0.64960	33.5	1.31889	50.5	1.98818	67.5	2.65748	84.5	3.32677		
17.0	0.66929	34.0	1.33858	51.0	2.00787	68.0	2.67716	85.0	3.34645		