SUNSTAR 商斯达实业集团是集研发、生产、工程、销售、代理经销 、技术咨询、信息服务等为一体的高科技企业，是专业高科技电子产品生产厂家，是具有10 多年历史的专业电子元器件供应商，是中国最早和最大的仓储式连锁规模经营大型综合电子零部件代理分销商之一,是一家专业代理和分銷世界各大品牌IC 芯片和電子元器件的连锁经营綜合性国际公司，专业经营进口、国产名厂名牌电子元件，型号、种类齐全。在香港、北京、深圳、上海、西安、成都等全国主要电子市场设有直属分公司和产品展示展销窗口门市部专卖店及代理分销商,已在全国范围内建成强大统一的供货和代理分销网络。 我们专业代理经销、开发生产电子元器件、集成电路、传感器、微波光电元器件、工控机/DOC/DOM 电子盘、专用电路、单片机开发、MCU/DSP/ARM/FPGA 软件硬件、二极管、三极管、模块等，是您可靠的一站式现货配套供应商、方案提供商、部件功能模块开发配套商。商斯达实业公司拥有庞大的资料库，有数位毕业于著名高校——有中国电子工业摇篮之称的西安电子科技大学（西军电）并长期从事国防尖端科技研究的高级工程师为您精挑细选、量身订做各种高科技电子元器件，并解决各种技术问题。

微波光电部专业研制、代理经销高频、微波、光纤、光电元器件、组件、部件、模块、整机；电磁兼容元器件、材料、设备；微波CAD、EDA 软件、开发测试仿真工具；微波、光纤仪器仪表。欢迎国外高科技微波、光纤厂商将优秀产品介绍到中国、共同开拓市场。长期大量现货专业批发高频、微波、卫星、光纤、电视、CATV 器件：晶振、VCO、连接器、PIN 开关、变容二极管、开关二极管、低噪晶体管、功率电阻及电容、放大器、功率管、MMIC、混频器、耦合器、功分器、振荡器、合成器、衰减器、滤波器、隔离器、环行器、移相器、调制解调器；光电子元器件和组件：红外发射管、红外接收管、光电开关、光敏管、发光二极管和发光二极管组件、半导体激光二极管和激光器组件、光电探测器和光接收组件、光发射接收模块、光纤激光器和光放大器、光调制器、光开关、DWDM 用光发射和接收器件、用户接入系统光光收发器件与模块、光纤连接器、光纤跳线/尾纤、光衰减器、光纤适 配器、光隔离器、光耦合器、光环行器、光复用器/转换器；无线收发芯片和模组、蓝牙芯片和模组。

更多产品请看本公司产品专用销售网站：欢迎索取免费详细资料、设计指南和光盘；产品凡多，未能尽录，欢迎来电查询

商斯达中国传感器科技信息网：http://www.sensor-ic.com/

商斯达工控安防网：http://www.pc-ps.net/

商斯达电子元器件网：http://www.sunstare.com/

商斯达微波光电产品网:HTTP://www.rfoe.net/

商斯达消费电子产品网://www.icasic.com/

商斯达实业科技产品网://www.sunstars.cn/ 微波元器件销售热线：

地址：深圳市福田区福华路福庆街鸿图大厦1602 室

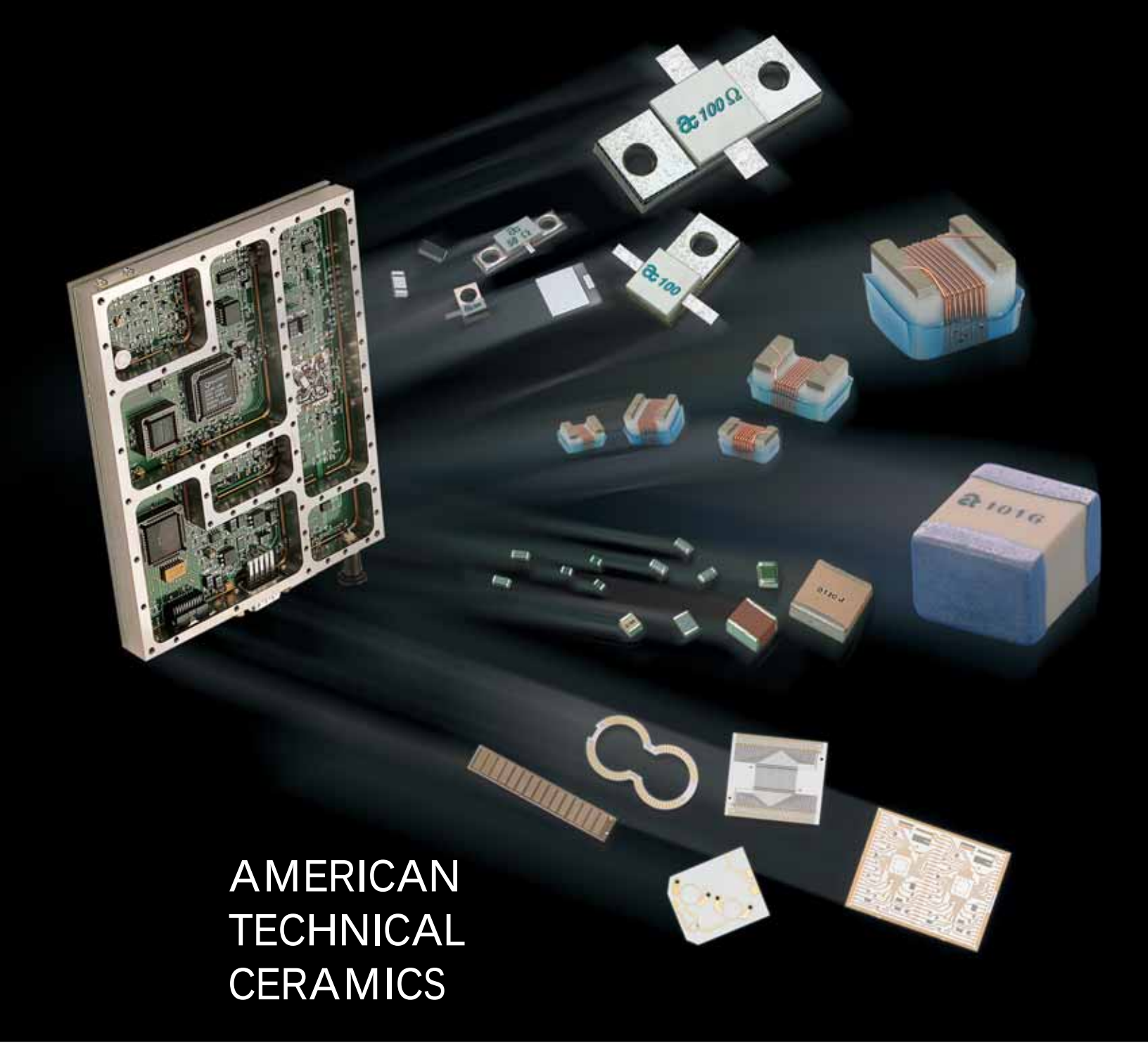
电话：0755-82884100 83397033 83396822 83398585

传真：0755-83376182 （0）13823648918 MSN: SUNS8888@hotmail.com

邮编：518033 E-mail:szss20@163.com QQ: 195847376

深圳赛格展销部：深圳华强北路赛格电子市场2583 号 电话：0755-83665529

技术支持: 0755-83394033 13501568376



AMERICAN
TECHNICAL
CERAMICS

QUICK REFERENCE

PRODUCT SELECTION GUIDE

THE ENGINEERS' CHOICE®

RoHS Compliant

ISO 9001
REGISTERED COMPANY

Corporate Profile

American Technical Ceramics Corp. (ATC) provides component and custom integrated packaging solutions for the RF, microwave and telecommunications industries. For over forty years we have been "The Engineer's Choice®".

ATC designs, develops, manufactures and markets Multilayer Capacitors, Single Layer Capacitors, Resistor Products, Inductors and Custom Thin Film Products for RF, microwave and millimeter-wave applications. Our products are primarily used in: wireless communications infrastructure, fiber optics, medical electronics, semiconductor manufacturing equipment, defense, aerospace, and satellite communications markets.

▲ *ATC's Jacksonville Facility occupies approximately 100,000 sq. ft.*

◀ *ATC's New York Facility occupies approximately 90,000 sq. ft.*

As part of our globalization initiative ATC has a wholly-owned subsidiary for European Direct Sales, Applications Support and Distribution, located in Kungens Kurva, Sweden. The Company's wholly-owned subsidiary offering Technical Support for Asia is located in Shenzhen, P.R. China. ATC also has local offices in Holzkirchen, Germany and Guildford, England.

RLC Products

- Multilayer Ceramic Capacitors
- Capacitor Assemblies for Power Applications
- Single Layer Ceramic Capacitors
- Resistor Products
- Inductor Products

Process and Packaging

- Thin Film Custom Products: metalization and patterned substrates for a broad range of hybrid circuit requirements

Markets Served

- Wireless / Telecom Base Stations
- Semiconductor Manufacturing Equipment
- Medical Diagnostic Equipment
- Sattelite Systems
- Public Safety Radio
- Avionic Systems
- Military and Aerospace
- Commerical Broadcast Transmitters
- Fiber Optic Communications
- Automotive Electronics

Facilities

- Huntington Station, New York – Sales, Applications Support, Manufacturing and Distribution Center
- Kungens Kurva, Sweden – European Operations and Distribution Center
- Jacksonville, Florida – Advanced Technology Center, Manufacturing Facility

ATC's Quick Reference Product Selection Guide is designed to help you navigate through our products and services. The following parameters, included in ATC's complete catalog, are highlights of each Product Series:

- Full electrical and mechanical specifications
- ESR, FSR, Q and TCC Performance Curves
- Power Handling Data
- Design Software
- Application Notes
- Thin Film Overview

Download complete pdf data sheets at
www.atceramics.com

ATC's website includes a complete listing of technical articles in pdf format, as well as new product updates and design support software. As an added convenience, ATC Multilayer Capacitor Kits and Inductor Design Kits may be purchased online.

NOTE: Contact ATC's Applications Engineers for further technical information at (+1-631) 622-4700.
To receive a full catalog, contact any ATC representative or call the factory.

A M E R I C A N T E C H N I C A L C E R A M I C S

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ATC Asia
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ATC PRODUCTS BY FREQUENCY RANGE

▶ Frequency Range 1: Up to 30 MHz

Typical Applications	Capacitor Products	Power Capacitor Assemblies	Resistive Products	Inductor Products
Low Frequency Communication Systems, Switch Mode Power Supplies, AM Broadcast, Semiconductor Fabrication, HF Amplifiers, Medical (MRI)	▶ ATC 100 Series Porcelain MLCs ▶ ATC 700 Series NPO Porcelain and Ceramic MLCs ▶ ATC 200 Series BX Ceramic MLCs ▶ ATC 900 Series X7R Ceramic RF Power MLCs ▶ ATC 520 / 530 / 545 Series / 550 Series ▶ General Purpose ▶ CDR / QPL Approved MIL-PRF-55681 ▶ COTS	▶ Extended Capacitance Assemblies ▶ Extended Voltage & Current Assemblies ▶ Matched Sets ▶ Voltage Dividers	▶ Resistors ▶ Terminations: SMT, Chip Leaded & Flanged ▶ Attenuators ▶ Non-Magnetic Series CR, LR, FR	▶ WL Chip Inductors - EIA Sizes 0402 0603 0805 1008 1206

▶ Frequency Range 2: >30 MHz to 800 MHz

Typical Applications	Capacitor Products	Power Capacitor Assemblies	Resistive Products	Inductor Products
Medical (MRI), Aircraft, Marine, Public Safety, Military	▶ ATC 100 Series Porcelain MLCs ▶ ATC 700 Series NPO Porcelain and Ceramic MLCs ▶ ATC 800 Series NPO Ceramic MLCs ▶ ATC 200 Series BX Ceramic MLCs ▶ ATC 900 Series X7R Ceramic RF Power MLCs ▶ ATC 520 / 530 / 545 Series / 550 Series ▶ General Purpose ▶ CDR / QPL Approved MIL-PRF-55681 ▶ COTS	▶ Extended Capacitance Assemblies ▶ Extended Voltage & Current Assemblies ▶ Matched Sets ▶ Voltage Dividers	▶ Resistors ▶ Terminations: SMT Chip Leaded & Flanged ▶ Attenuators ▶ Non-Magnetic Series CR, LR, FR	▶ WL Chip Inductors - EIA Sizes 0402 0603 0805 1008 1206

▶ Frequency Range 3: >800 MHz to 3.5 GHz

Typical Applications	Capacitor Products	Advanced Substrate Packaging	Resistive Products	Inductor Products
Wireless Infrastructure (Cellular / PCS / DCS / GPS / MMDS), Bluetooth, Wireless LAN (802.11)	▶ ATC 100 Series Porcelain MLCs ▶ ATC 700 Series NPO Porcelain and Ceramic MLCs ▶ ATC 600 Series ▶ ATC 800 Series NPO Ceramic MLCs ▶ ATC 200 Series BX Ceramic MLCs ▶ SLC ▶ ATC 500 / 520 / 530 / 545 Series / 550 Series ▶ General Purpose ▶ CDR / QPL Approved MIL-PRF-55681 ▶ COTS	▶ ATC // AVX Thin Film Technologies	▶ Resistors ▶ Terminations: SMT Chip Leaded & Flanged ▶ Attenuators ▶ Non-Magnetic Series CR, LR, FR	▶ WL Chip Inductors - EIA Sizes 0402 0603 0805 1008 1206

▶ Frequency Range 4: >3.5 GHz to 100 GHz

Typical Applications	Capacitor Products	Advanced Substrate Packaging	Resistive Products	Inductor Products
Satellite Communications, LMDS, Radar, High Speed Data	▶ ATC 100 Series Porcelain MLCs ▶ ATC 700 Series NPO Porcelain and Ceramic MLCs ▶ ATC 600 Series ▶ ATC 800 Series NPO Ceramic MLCs ▶ SLC ▶ ATC 500 / 520 / 530 / 545 Series / 550 Series ▶ CDR / QPL Approved MIL-PRF-55681 ▶ COTS	▶ ATC // AVX Thin Film Technologies	▶ Resistors ▶ Terminations: SMT, Chip Leaded & Flanged ▶ Attenuators ▶ Non-Magnetic Series CR, LR, FR	▶ WL Chip Inductors - EIA Sizes 0402 0603 0805 1008 1206

▶ Frequency Range 1: Up to 30 MHz

RESISTORS *(page 10)*

ATC HIGH POWER RF RESISTIVE PRODUCTS

ATC's complete line of high power resistive products are designed and manufactured in our ISO-9001 registered facility. These products are manufactured with non-toxic, cost effective, aluminum nitride based substrates and qualified to Mil-PRF-55342, MIL-STD 202, and ANSI /J-STD-002 specifications.

ATC high power resistive products are suitable for many wireless and satellite communication applications including GSM, PCS, W-CDMA, 3G, WCS, ISM and Wireless LAN. Other applications include medical, industrial, military and aerospace. Typical circuit applications are splitter-combiner networks, power amplifiers, synthesizers, MRI coils, isolators and circulators.

DC and RF Specifications:

- Resistance value: 50Ω and 100Ω standard (10Ω to 200Ω available)
- Terminations: Typical VSWR from 1.05:1 to 1.20:1
- Resistors: Low parasitic capacitance (See catalog)
- Temperature Coefficient of Resistance (TCR) <150ppm/ °C typical
- Operating temperature range: -55°C to +150°C

Mechanical Specifications:

- Substrate – Aluminum Nitride; Resistive Film – Tantalum Nitride; Terminals – Silver
- Flangeless and Flanged tabs – 100% silver leads; Covers – Alumina
- Copper flanges – Nickel or Silver plated
- **Lead-Free, RoHS compliant**

Non-magnetic products available

ATC RESISTOR SERIES

ATC CR Chip Resistors
- Power handling: 5 watts to 250 watts

ATC CS and CW Surface Mount Resistors
- Power handling: 2 watts to 40 watts

ATC LR Leaded Chip Resistors
- Power handling: 30 watts to 250 watts

ATC FR Flanged Resistors
- Power handling: 15 watts to 250 watts

ATC TERMINATION SERIES

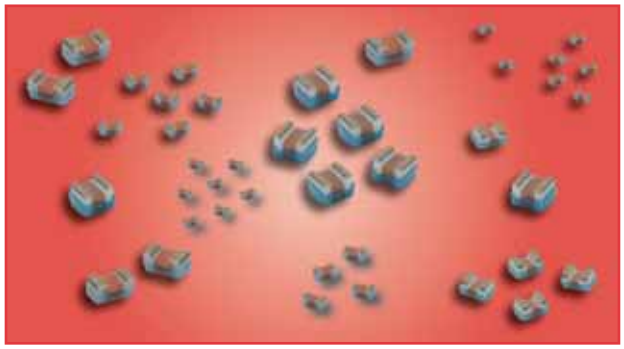
ATC CT Series Chip Terminations
- Power handling: 5 watts to 225 watts

ATC CZ Series Surface Mount Terminations
- Power handling: 10 watts to 40 watts

ATC LT Series Leaded Terminations
- Power handling: 12 watts to 225 watts

ATC FT Series Flanged Terminations
- Power handling: 15 watts to 225 watts

INDUCTORS *(page 11)*



ATC WL SERIES INDUCTOR PRODUCTS

ATC introduces its new family of RF surface mount inductor components, intended to complement its high frequency ultra low ESR capacitor products. The WL Series wire wound chip inductor products have been designed to provide excellent performance at competitive prices.

This Series includes the most widely used traditional EIA case sizes – 0402, 0603, 0805, 1008, and 1206. With an inductance range of 1 nH to 15,000 nH, these products have an operating temperature of -40°C to +125°C and a temperature coefficient of inductance (TCL) of +25 to +125 ppm/°C typical from -40°C to +125°C.

The WL inductor product line is intended for RF and microwave applications and features high self-resonant frequencies (SRF), high Q, and low DC resistance. These products are manufactured on a rugged core made of high quality ceramic material that exhibits high Q at high operating frequencies.

The WL Series is especially attractive for all 800 MHz to 3.4 GHz wireless applications where cost and performance are major factors. These applications include but are not limited to: cellular base stations, broadband wireless services, point-to-point and point-to-multipoint radio as well as other RF and microwave telecommunications systems.

All WL Series inductor products are supplied in tape and reel (2000 to 4000 parts per reel depending on case size) as standard, making them ideal for automated pick and place manufacturing applications. The terminations consist of a barrier layer with a lead-free tin-plated finish that exhibits excellent solderability for trouble-free attachments.

ATC WL (size = 0402)
- Inductance Range: 1.0 nH @ 250 MHz to 56 nH @ 250 MHz
- Tolerances: J (±5%), K (±10%)

ATC WL (size = 0603)
- Inductance Range: 1.6 nH @ 250 MHz to 390 nH @ 100 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

ATC WL (size = 0805)
- Inductance Range: 3.3 nH @ 250 MHz to 2700 nH @ 25 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

ATC WL (size = 1008)
- Inductance Range: 4.7 nH @ 50 MHz to 15,000 nH @ 7.9 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

ATC WL (size = 1206)
- Inductance Range: 6.8 nH @ 100 MHz to 1200 nH @ 35 MHz
- Tolerances: J (±5%), K (±10%)

ATC MILLIMETER-WAVE / BROADBAND / ULTRA-BROADBAND SURFACE MOUNT CAPACITORS

ATC 520 L Series Broadband Capacitors
- 160 KHz to 16 GHz, 10 nF

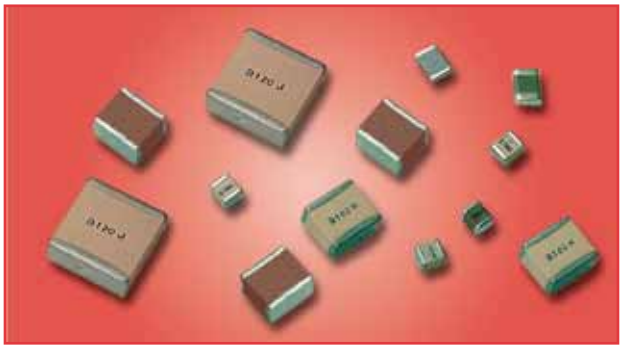
ATC 530 L Series Broadband Capacitors
- 16 KHz to 18 GHz, 100 nF

ATC 545 L Series UBC™ Ultra-Broadband Capacitors
- 16 KHz to 40+ GHz, 100 nF

ATC 550 L Series UBC™ Ultra-Broadband Capacitors
- 16 KHz to 40+ GHz, 100 nF

▶ Frequency Range 1: Up to 30 MHz

CAPACITORS *(page 12, 13,14)*



ATC 100 SERIES PORCELAIN SUPERCHIP® MLCS

These capacitors feature High Q, low ESR / ESL, ultra-stable performance, low noise, high self-resonance and established reliability (QPL.).

Non-magnetic products available
RoHS compliant terminations are standard.
Refer to data sheets for other styles.

ATC 100 B (size = .110" x .110")
- Capacitance Range 0.1 pF to 1000 pF
- Available with encapsulation option for leaded styles only

ATC 100 C (size = .250" x .250")
- Capacitance Range 1 pF to 2700 pF
- High RF Current/Voltage

ATC 100 E (size = .380" x .380")
- Capacitance Range 1 pF to 5100 pF
- High RF Power
- Extended WVDC up to 7200 VDC
- High RF Current/Voltage
- High Reliability

ATC 700 SERIES NPO PORCELAIN AND CERAMIC MLCS

This series features low ESR / ESL, low noise, ultra-stable NPO performance, high self-resonance and rugged construction. They meet established reliability standards. These capacitors are available with encapsulation option for leaded styles only.

ATC 700 B (size = .110" x .110") Capacitance Range 0.1 pF to 5100 pF

ATC 700 C (size = .250" x .250") Capacitance Range 1 pF to 2700 pF

ATC 700 E (size = .380" x .380") Capacitance Range 1 pF to 2200 pF

ATC 200 SERIES BX CERAMIC MLCS

This series features low ESR / ESL, rugged construction and high reliability.

ATC 200 A (size = .055" x .055")
- Capacitance Range 510 pF to 0.01 µF

ATC 200 B (size = .110" x .110")
- Capacitance Range 5000 pF to 0.1 µF
- Available with encapsulation option for leaded styles only

ATC 900 SERIES X7R CERAMIC RF POWER MLCS

This series features low ESR/ESL, rugged construction, a mid-K, X7R dielectric, and high reliability.

ATC 900 C (size = .250" x .250")
- Capacitance Range 0.01 µF to 1 µF
- Available with encapsulation option for leaded styles only

ATC GENERAL PURPOSE MLC CAPACITORS FOR SURFACE MOUNT APPLICATIONS

ATC provides low cost general purpose capacitors which are not intended for precision designs but are suitable for many applications including DC blocking, coupling, bypassing, and filtering. Available in standard EIA case sizes.

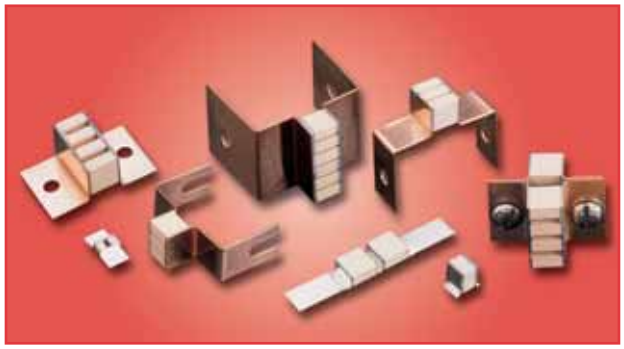
ATC MILITARY (CDR) PRODUCTS

ATC is a QPL approved supplier for MIL-PRF-55681/4 and /5 fixed, multilayer, unencapsulated, monolithic porcelain and ceramic dielectric capacitors.

ATC COTS (COMMERCIAL OFF THE SHELF) PRODUCTS

Cost-effective upscreening of standard products for enhanced reliability applications.

POWER CAPACITOR ASSEMBLIES *(page 15)*



ATC POWER CAPACITOR ASSEMBLIES

ATC power capacitor assemblies are manufactured to customer specifications using ATC's proven standard products. Benefits include:

Reduced Assembly Steps / Handling Costs: Combinations of capacitors pre-packaged in manageable mechanical configurations for customer specific "drop-in" applications.

Enhanced Reliability: Overall elements and assemblies are 100% pre-tested to customer's electrical requirements: – Capacitance – Q – IR – DWV (to 10kV max). Elements are 100% ESR tested.

Reduced Purchasing Logistics: Reduced inventory requirements in matched assemblies. This eliminates excess, wasted parts.

Reduced Technical Labor: Alleviate need for engineering and technician resources in selecting electrically matched elements.

Guaranteed Performance: ATC guarantees electrical / mechanical performance on an assembly level every time.

Achieve Non-Standard Values and Ultra-Tight Tolerances: ATC will "mix and match" values from our extensive inventory via computer matching programs to achieve any capacitor value specified by the designer.

Non-magnetic products available

ATC Parallel Assemblies: Extended capacitance

Standard Designs	B Case	C Case	E Case
No. of caps	2	2 - 6	2 - 8
Lead Type	L Bracket	L Bracket	L Bracket
Lead Material	Silver	Silver	Silver or Copper
Lead Thickness	.004 or .010 (0.10 or 0.25)*	.004 or .010 (0.10 or 0.25)*	.010 or .020 (0.25 or 0.51)*
Lead Length (max.)	0.5 (12.7)*	0.75 (19.1)*	2.0 (50.8)*
No. of holes (max.)	None	1 per lead	1 per lead
Mtg. Configuration	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical
Capacitor Spacer (typ.)	.050 or .070 (1.27 or 1.78)*	.050 or .070 (1.27 or 1.78)*	.090 (2.29)*

**inches (mm)*

ATC Series Assemblies: Extended voltage

Standard Designs	C Case	E Case
No. of caps	2 - 3	2 - 3
Lead Type	L Bracket	L Bracket
Lead Material	Silver	Silver
Lead Thickness	.010*	.010*
Lead Length (max.)	0.75 (19.1)*	1.0 (25.4)*
No. of holes (max.)	1 per lead	1 per lead
Mtg. Configuration	Horizontal	Horizontal
Capacitor Spacer (typ.)	.050 (1.27)*	.050 (1.27)*

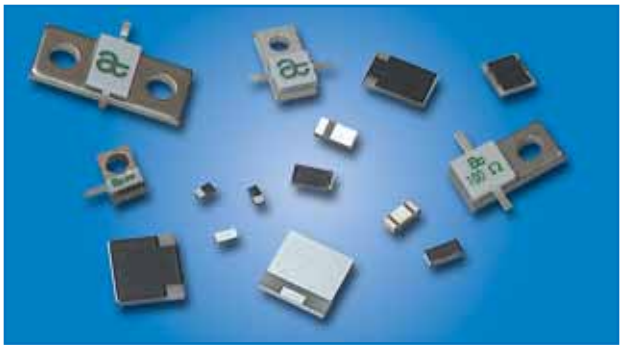
**inches (mm)*

Matched Sets: Series or Parallel configurations for non-standard values or very close tolerance capacitance values.

Voltage Dividers: based on capacitive reactance, provided to customers' specific capacitance ratio.

▶ Frequency Range 2: >30 MHz to 800 MHz

RESISTORS *(page 10)*



ATC HIGH POWER RF RESISTIVE PRODUCTS

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DC and RF Specifications:

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- Resistors: Low parasitic capacitance (See catalog)
- Temperature Coefficient of Resistance (TCR) <150ppm/ °C typical
- Operating temperature range: -55°C to +150°C

Mechanical Specifications:

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- Flangeless and Flanged tabs – 100% silver leads; Covers – Alumina
- Copper flanges – Nickel or Silver plated
- **Lead-Free, RoHS compliant**

Non-magnetic products available

ATC RESISTOR SERIES

ATC CR Chip Resistors
- Power handling: 5 watts to 250 watts

ATC CS and CW Surface Mount Resistors
- Power handling: 2 watts to 40 watts

ATC LR Leaded Chip Resistors
- Power handling: 30 watts to 250 watts

ATC FR Flanged Resistors
- Power handling: 15 watts to 250 watts

ATC TERMINATION SERIES

ATC CT Series Chip Terminations
- Power handling: 5 watts to 225 watts

ATC CZ Series Surface Mount Terminations
- Power handling: 10 watts to 40 watts

ATC LT Series Leaded Terminations
- Power handling: 12 watts to 225 watts

ATC FT Series Flanged Terminations
- Power handling: 15 watts to 225 watts

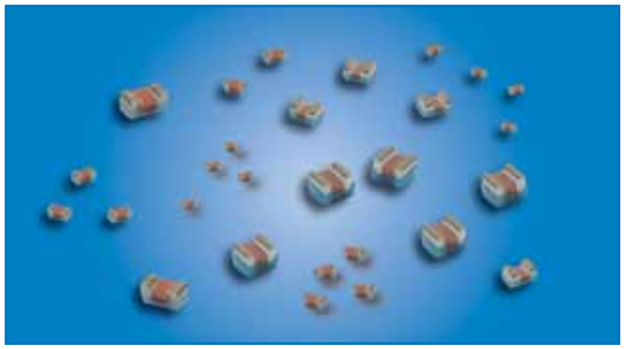
ATC ATTENUATOR SERIES

ATC CA Series Chip Attenuators
- Power handling: up to 100 watts

ATC LA Series Leaded Attenuators
- Power handling: up to 100 watts

ATC FA Series Flanged Attenuators
- Power handling: up to 100 watts

INDUCTORS *(page 11)*



ATC WL SERIES INDUCTOR PRODUCTS

ATC introduces its new family of RF surface mount inductor components, intended to complement its high frequency ultra low ESR capacitors products. The WL Series wire wound chip inductor products have been designed to provide excellent performance at competitive prices.

This Series includes the most widely used traditional EIA case sizes – 0402, 0603, 0805, 1008, and 1206. With an inductance range of 1 nH to 15,000 nH, these products have an operating temperature of -40°C to +125°C and a temperature coefficient of inductance (TCL) of +25 to +125 ppm/°C typical from -40°C to +125°C.

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ATC WL (size = 0402)
- Inductance Range: 1.0 nH @ 250 MHz to 56 nH @ 250 MHz
- Tolerances: J (±5%), K (±10%)

ATC WL (size = 0603)
- Inductance Range: 1.6 nH @ 250 MHz to 390 nH @ 100 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

ATC WL (size = 0805)
- Inductance Range: 3.3 nH @ 250 MHz to 2700 nH @ 25 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

ATC WL (size = 1008)
- Inductance Range: 4.7 nH @ 50 MHz to 15,000 nH @ 7.9 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

ATC WL (size = 1206)
- Inductance Range: 6.8 nH @ 100 MHz to 1200 nH @ 35 MHz
- Tolerances: J (±5%), K (±10%)

ATC MILLIMETER-WAVE / BROADBAND / ULTRA-BROADBAND SURFACE MOUNT CAPACITORS

ATC 520 L Series Broadband Capacitors
- 160 KHz to 16 GHz, 10 nF

ATC 530 L Series Broadband Capacitors
- 16 KHz to 18 GHz, 100 nF

ATC 545 L Series UBC™ Ultra-Broadband Capacitors
- 16 KHz to 40+ GHz, 100 nF

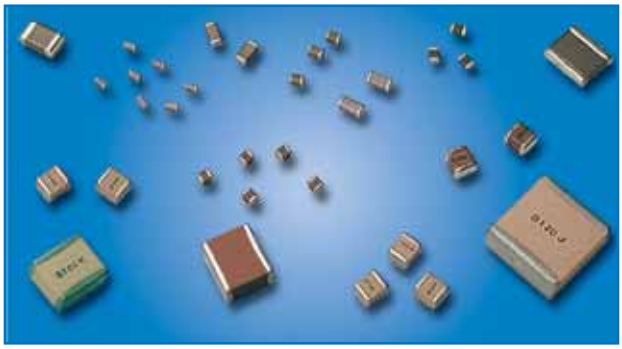
ATC 550 L Series UBC™ Ultra-Broadband Capacitors
- 16 KHz to 40+ GHz, 100 nF

ATC GENERAL PURPOSE MLC SURFACE MOUNT CAPACITORS

Low cost general purpose capacitors, not intended for precision designs but suitable for many applications including DC blocking, coupling, bypassing, and filtering. This offering consists of a variety of dielectric types from the most stable NPO to high K versions for maximum capacitance. Available in standard EIA case sizes.

▶ Frequency Range 2: >30 MHz to 800 MHz

CAPACITORS *(page 12, 13,14)*



ATC 100 SERIES PORCELAIN SUPERCHIP® MLCS

These capacitors feature High Q, low ESR / ESL and ultra-stable performance. They are available with an encapsulation option as noted below.

Non-magnetic products available
RoHS compliant terminations are standard.
Refer to data sheets for other styles.

ATC 100 B (size = .110" x .110")
- Capacitance Range 0.1 pF to 1000 pF
- Available with encapsulation option for leaded styles only

ATC 100 C (size = .250" x .250")
- Capacitance Range 1 pF to 2700 pF
- High RF Current/Voltage

ATC 100 E (size = .380" x .380")
- Capacitance Range 1 pF to 5100 pF
- High RF Power
- Extended WVDC up to 7200 VDC
- High RF Current/Voltage
- High Reliability

ATC 700 SERIES NPO PORCELAIN AND CERAMIC MLCS

This series features low ESR / ESL, low noise, ultra-stable NPO performance, high self-resonance and rugged construction. They meet established reliability standards. These capacitors are available with encapsulation option for leaded styles only.

ATC 700 B (size = .110" x .110") Capacitance Range 0.1 pF to 5100 pF

ATC 700 C (size = .250" x .250") Capacitance Range 1 pF to 2700 pF

ATC 700 E (size = .380" x .380") Capacitance Range 1 pF to 2200 pF

ATC 800 SERIES NPO CERAMIC HIGH RF POWER MLCS

Advantages of these MLCs include optimized form factor, lowest ESR at wireless frequencies, highest self resonance and superior thermal performance.

ATC 800 A (size = .055" x .055")
- Capacitance Range 0.1 pF to 100 pF

ATC 800 B (size = .110" x .110")
- Capacitance Range 0.1 pF to 1000 pF

ATC 800 R (size = .070" x .090")
- Capacitance Range 1 pF to 100 pF

ATC 200 SERIES BX CERAMIC MLCS

This series features low ESR / ESL, rugged construction and high reliability.

ATC 200 A (size = .055" x .055")
- Capacitance Range 510 pF to 0.01 µF

ATC 200 B (size = .110" x .110")
- Capacitance Range 5000 pF to 0.1 µF
- Available with encapsulation option for leaded styles only

ATC 900 SERIES X7R CERAMIC RF POWER MLCS

Features low ESR/ESL, rugged construction, a mid-K, X7R dielectric, and high reliability.

ATC 900 C (size = .250" x .250")
- Capacitance Range 0.01 µF to 1 µF
- Available with encapsulation option for leaded styles only

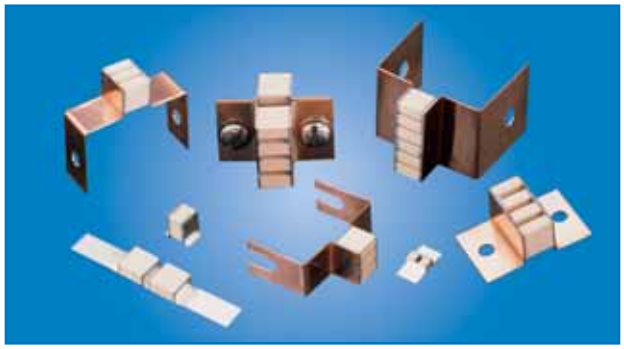
ATC MILITARY (CDR) PRODUCTS

ATC is a QPL approved supplier for MIL-PRF-55681/4 and /5 fixed, multilayer, unencapsulated, monolithic porcelain and ceramic dielectric capacitors.

ATC COTS (COMMERCIAL OFF THE SHELF) PRODUCTS

Cost-effective upscreening of standard products for enhanced reliability applications.

POWER CAPACITOR ASSEMBLIES *(page 15)*



ATC POWER CAPACITOR ASSEMBLIES

ATC power capacitor assemblies are manufactured to customer specifications using ATC's proven standard products. Benefits include:

Reduced Assembly Steps / Handling Costs: Combinations of capacitors pre-packaged in manageable mechanical configurations for customer specific "drop-in" applications.

Enhanced Reliability: Overall elements and assemblies are 100% pre-tested to customer's electrical requirements: – Capacitance – Q – IR – DWV (to 10kV max). Elements are 100% ESR tested.

Reduced Purchasing Logistics: Reduced inventory requirements in matched assemblies. This eliminates excess, wasted parts.

Reduced Technical Labor: Alleviate need for engineering and technician resources in selecting electrically matched elements.

Guaranteed Performance: ATC guarantees electrical / mechanical performance on an assembly level every time.

Achieve Non-Standard Values and Ultra-Tight Tolerances: ATC will "mix and match" values from our extensive inventory via computer matching programs to achieve any capacitor value specified by the designer.

Non-magnetic products available

ATC Parallel Assemblies: Extended capacitance

Standard Designs	B Case	C Case	E Case
No. of caps	2	2 - 6	2 - 8
Lead Type	L Bracket	L Bracket	L Bracket
Lead Material	Silver	Silver	Silver or Copper
Lead Thickness	.004 or .010 (0.10 or 0.25)*	.004 or .010 (0.10 or 0.25)*	.010 or .020 (0.25 or 0.51)*
Lead Length (max.)	0.5 (12.7)*	0.75 (19.1)*	2.0 (50.8)*
No. of holes (max.)	None	1 per lead	1 per lead
Mtg. Configuration	Horizontal/Vertical	Horizontal/Vertical	Horizontal/Vertical
Capacitor Spacer (typ.)	.050 or .070 (1.27 or 1.78)*	.050 or .070 (1.27 or 1.78)*	.090 (2.29)*

**inches (mm)*

ATC Series Assemblies: Extended voltage

Standard Designs	C Case	E Case
No. of caps	2 - 3	2 - 3
Lead Type	L Bracket	L Bracket
Lead Material	Silver	Silver
Lead Thickness	.010*	.010*
Lead Length (max.)	0.75 (19.1)*	1.0 (25.4)*
No. of holes (max.)	1 per lead	1 per lead
Mtg. Configuration	Horizontal	Horizontal
Capacitor Spacer (typ.)	.050 (1.27)*	.050 (1.27)*

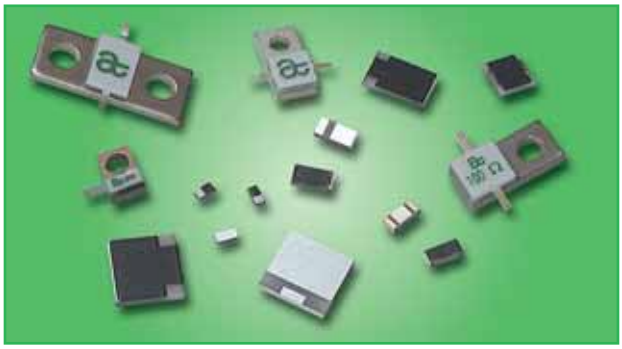
**inches (mm)*

Matched Sets: Series or Parallel configurations for non-standard values or very close tolerance capacitance values.

Voltage Dividers: based on capacitive reactance, provided to customers' specific capacitance ratio.

▶ Frequency Range 3: >800 MHz to 3.5 GHz

RESISTORS *(page 10)*



ATC HIGH POWER RF RESISTIVE PRODUCTS

ATC's complete line of high power resistive products are designed and manufactured in our ISO-9001 registered facility. These products are manufactured with non-toxic, cost effective, aluminum nitride base substrates and qualified to Mil-PRF-55342, MIL-STD 202, and ANSI /J-STD-002 specifications.

ATC high power resistive products are suitable for many wireless and satellite communication applications including GSM, PCS, W-CDMA, 3G, WCS, ISM and Wireless LAN. Other applications include medical, industrial, military and aerospace. Typical circuit applications are splitter-combiner networks, power amplifiers, synthesizers, MRI coils, isolators and circulators.

DC and RF Specifications:

- Resistance value: 50Ω and 100Ω standard (10Ω to 200Ω available)
- Terminations: Typical VSWR from 1.05:1 to 1.20:1
- Resistors: Low parasitic capacitance (See catalog)
- Temperature Coefficient of Resistance (TCR) <150ppm/ °C typical
- Operating temperature range: -55°C to +150°C

Mechanical Specifications:

- Substrate – Aluminum Nitride; Resistive Film – Tantalum Nitride; Terminals – Silver
- Flangeless and Flanged tabs – 100% silver leads; Covers – Alumina
- Copper flanges – Nickel or Silver plated
- **Lead-Free, RoHS compliant**

Non-magnetic products available

ATC RESISTOR SERIES

ATC CR Chip Resistors
- Power handling: 5 watts to 250 watts

ATC CS and CW Surface Mount Resistors
- Power handling: 2 watts to 40 watts

ATC LR Leaded Chip Resistors
- Power handling: 30 watts to 250 watts

ATC FR Flanged Resistors
- Power handling: 15 watts to 250 watts

ATC TERMINATION SERIES

ATC CT Series Chip Terminations
- Power handling: 5 watts to 225 watts

ATC CZ Series Surface Mount Terminations
- Power handling: 10 watts to 40 watts

ATC LT Series Leaded Terminations
- Power handling: 12 watts to 225 watts

ATC FT Series Flanged Terminations
- Power handling: 15 watts to 225 watts

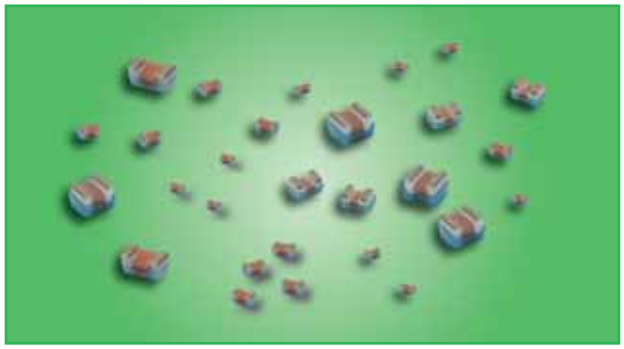
ATC ATTENUATOR SERIES

ATC CA Series Chip Attenuators
- Power handling: up to 100 watts

ATC LA Series Leaded Attenuators
- Power handling: up to 100 watts

ATC FA Series Flanged Attenuators
- Power handling: up to 100 watts

INDUCTORS *(page 11)*



ATC WL SERIES INDUCTOR PRODUCTS

ATC introduces its new family of RF surface mount inductor components, intended to complement its high frequency ultra low ESR capacitor products. The WL Series wire wound chip inductor products have been designed to provide excellent performance at competitive prices.

This Series includes the most widely used traditional EIA case sizes – 0402, 0603, 0805, 1008, and 1206. With an inductance range of 1 nH to 15,000 nH, these products have an operating temperature of -40°C to +125°C and a temperature coefficient of inductance (TCL) of +25 to +125 ppm/°C typical from -40°C to +125°C.

The WL inductor product line is intended for RF and microwave applications and features high self-resonant frequencies (SRF), high Q, and low DC resistance. These products are manufactured on a rugged core made of high quality ceramic material that exhibits high Q at high operating frequencies.

The WL Series is especially attractive for all 800 MHz to 3.4 GHz wireless applications where cost and performance are major factors. These applications include but are not limited to: cellular base stations, broadband wireless services, point-to-point and point-to-multipoint radio as well as other RF and microwave telecommunications systems.

ATC WL (size = 0402)
- Inductance Range: 1.0 nH @ 250 MHz to 56 nH @ 250 MHz
- Tolerances: J (±5%), K (±10%)

ATC WL (size = 0603)
- Inductance Range: 1.6 nH @ 250 MHz to 390 nH @ 100 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

ATC WL (size = 0805)
- Inductance Range: 3.3 nH @ 250 MHz to 2700 nH @ 25 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

ATC WL (size = 1008)
- Inductance Range: 4.7 nH @ 50 MHz to 15,000 nH @ 7.9 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

ATC WL (size = 1206)
- Inductance Range: 6.8 nH @ 100 MHz to 1200 nH @ 35 MHz
- Tolerances: J (±5%), K (±10%)

ATC MILLIMETER-WAVE / BROADBAND / ULTRA-BROADBAND SURFACE MOUNT CAPACITORS

ATC 500 S Series Millimeter-Wave Capacitors
- Low insertion loss and ultra-high self resonance surface mount millimeter-wave capacitors

ATC 520 L Series Broadband Multilayer Capacitors
- 160 KHz to 16 GHz, 10 nF

ATC 530 L Series Broadband Multilayer Capacitors
- 16 KHz to 18 GHz, 100 nF

ATC 545 L Series UBC™ Ultra-Broadband Multilayer Capacitors
- 16 KHz to 40+ GHz, 100 nF

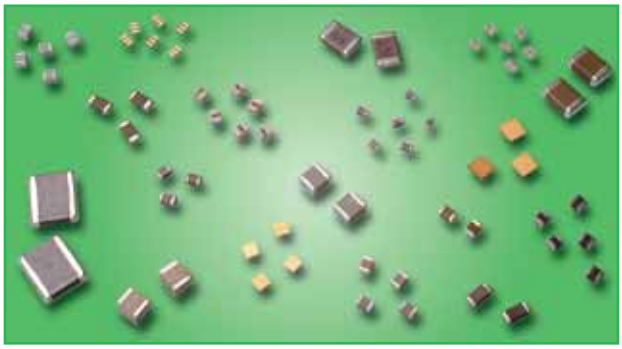
ATC 550 L Series UBC™ Ultra-Broadband Multilayer Capacitors
- 16 KHz to 40+ GHz, 100 nF

ATC GENERAL PURPOSE MLC SURFACE MOUNT CAPACITORS

Low cost general purpose capacitors, not intended for precision designs but suitable for many applications including DC blocking, coupling, bypassing, and filtering. This offering consists of a variety of dielectric types from the most stable NPO to high K versions for maximum capacitance. Available in standard EIA case sizes.

▶ Frequency Range 3: >800 MHz to 3.5 GHz

CAPACITORS *(page 12, 13, 14)*



ATC 100 SERIES PORCELAIN SUPERCHIP® MLCS

These capacitors feature High Q, low ESR / ESL, ultra-stable performance, low noise, high self-resonance and established reliability (QPL.).

Non-magnetic products available
RoHS compliant terminations are standard.
Refer to data sheets for other styles.

ATC 100 A (size = .055" x .055")
- Capacitance Range 0.1 pF to 100 pF

ATC 100 B (size = .110" x .110")
- Capacitance Range 0.1 pF to 1000 pF
- Available with encapsulation option for leaded styles only

ATC 700 SERIES NPO PORCELAIN AND CERAMIC MLCS

This series features low ESR / ESL, low noise, ultra-stable NPO performance, high self-resonance and rugged construction. They meet established reliability standards.

ATC 700 A (size = .055" X .055")
- Capacitance Range 0.1 pF to 1000 pF

ATC 700 B (size =.110" X .110")
- Capacitance Range 0.1 pF to 5100 pF
- Available with encapsulation option for leaded styles only

ATC 600 SERIES ULTRA-LOW ESR HIGH Q MICROWAVE CAPACITORS

Feature ultra-low ESR and high self-resonance. Environmentally safe terminations meet or exceed MIL-PRF-55681. Operating temperature is -55°C to +125°C

ATC 600 L (size = 0402)
- Capacitance Range 0.1 pF to 27 pF
- Voltage Rating: 200 WVDC

ATC 600 S (size = 0603)
- Capacitance Range 0.1 pF to 100 pF
- Voltage Rating: 250 WVDC

ATC 600 F (size = 0805)
- Capacitance Range 0.1 pF to 240 pF
- Voltage Rating: 250 WVDC

ATC 800 SERIES NPO CERAMIC HIGH RF POWER MLCS

Advantages of these MLCs include optimized form factor, lowest ESR at wireless frequencies, highest self resonance and superior thermal performance.

ATC 800 A (size = .055" x .055")
- Capacitance Range 0.1 pF to 100 pF

ATC 800 B (size = .110" x .110")
- Capacitance Range 0.1 pF to 1000 pF

ATC 800 R (size = .070" x .090")
- Capacitance Range 1 pF to 100 pF

ATC SINGLE LAYER CAPACITORS

For applications with operating frequencies up to 100 GHz Capacitance range 0.04 pF to 10,000 pF, case sizes from 10 mils to 90 mils. "Design your own" option (custom sizes.)

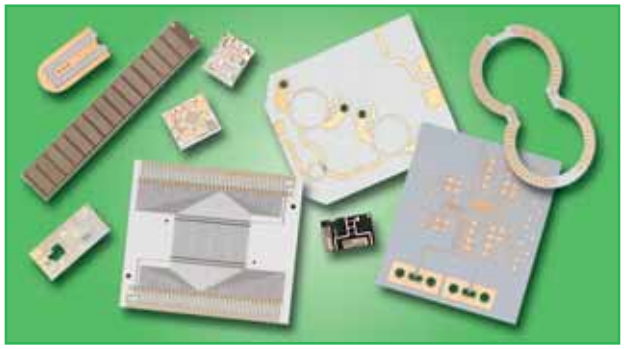
ATC MILITARY (CDR) PRODUCTS

ATC is a QPL approved supplier for MIL-PRF-55681/4 and /5 fixed, multilayer, unencapsulated, monolithic porcelain and ceramic dielectric capacitors.

ATC COTS (COMMERCIAL OFF THE SHELF) PRODUCTS

Cost-effective upscreening of standard products for enhanced reliability applications.

THIN FILM *(page 16, 17)*



ATC // AVX THIN FILM TECHNOLOGIES

Combined Capabilities

- Design: Modeling (HFSS), simulation (Genesys) and CAD (Tanner)
- Substrates: 1 inch square to 6 inch round (150 mm) wafers
- Typical materials: Alumina, Aluminum Nitride, Beryllium Oxide, Silicon, (N, P, and N+), Quartz, Glass, Glass-Ceramic, Sapphire, Ferrites and Titanates
- Metalizations:
  - Sputtered: Al, Au, Cr, Cu, Ni(V), Pd, Pt, TaN, Ti and TiW
  - Plated: Electrolytic Cu, Ni, Au; Electroless Cu, Au
- Resistors: High Ohmic SiCr and TaN resistors in laser trimmable designs
- Capacitors: Si02, SiON and BCB dielectrics in laser trimmable designs
- Inductors: Multilevel and multiturn copper and gold inductors
- Routing: True Air Bridges and Dielectric Crossovers
- Passivation Materials: SiON, Si_3N_4, BCB and polyimide
- Vias: Sputtered, enhanced plated, filled and castellations
- I/Os: BGA, LGA, edge wrap, through via and wire or ribbon bond
- Machining:
  - CO2 cutting, drilling, and scribing
  - Diamond-saw dicing
  - Back grinding and polishing
- Assembly:
  - High precision 0201 or larger pick and place
  - Attachment via wire or ribbon bonding, BGA, LGA or surface mount reflow
  - Encapsulation
- Testing:
  - MIL-STD-105D level II sampling
  - MIL-STD-883 100% visual inspection
  - Capacitance, insulation resistance and resistivity
  - RF testing to 40 GHz

Primary Markets and Applications

- Military, Aerospace and Space:
  - RF and Microwave filters
  - Precision resistors
  - MOS capacitors
  - Circulators, Splitters
  - Specialized modules
- Medical and Instrumentation:
  - Precision resistor networks and arrays
  - In-circuit trimmed designs
  - Telemetry filters
  - Miniature circuits and assemblies
- Broadband infrastructure:
  - Laser diode mounts and heat sinks
  - Optoelectronic converters
  - RF and DC fan-outs
- Instrumentation:
  - Ultra-precision reference capacitors and resistors
- Solar:
  - Interposers and heat sinks

▶ Frequency Range 4: >3.5 GHz to 100 GHz

RESISTORS *(page 10)*

ATC HIGH POWER RF RESISTIVE PRODUCTS

ATC's complete line of high power resistive products are designed and manufactured in our ISO-9001 registered facility. These products are manufactured with non-toxic, cost effective, aluminum nitride base substrates and qualified to Mil-PRF-55342, MIL-STD 202, and ANSI /J-STD-002 specifications.

ATC high power resistive products are suitable for many wireless and satellite communication applications including GSM, PCS, W-CDMA, 3G, WCS, ISM and Wireless LAN. Other aplications include medical, industrial, military and aerospace applications. Typical circuit applications are splitter-combiner networks, power amplifiers, synthesizers, MRI coils, isolators and circulators.

DC and RF Specifications:

- Resistance value: 50Ω and 100Ω standard (10Ω to 200Ω available)
- Terminations: Typical VSWR from 1.05:1 to 1.20:1
- Resistors: Low parasitic capacitance (See catalog)
- Temperature Coefficient of Resistance (TCR) <150ppm/ °C typical
- Operating temperature range: -55°C to +150°C

Mechanical Specifications:

- Substrate – Aluminum Nitride; Resistive Film – Tantalum Nitride; Terminals – Silver
- Flangeless and Flanged tabs – 100% silver leads; Covers – Alumina
- Copper flanges – Nickel or Silver plated
- **Lead-Free, RoHS compliant**

Non-magnetic products available

ATC RESISTOR SERIES

ATC CR Chip Resistors
- Power handling: 5 watts to 250 watts

ATC CS and CW Surface Mount Resistors
- Power handling: 2 watts to 40 watts

ATC LR Leaded Chip Resistors
- Power handling: 30 watts to 250 watts

ATC FR Flanged Resistors
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ATC TERMINATION SERIES

ATC CT Series Chip Terminations
- Power handling: 5 watts to 225 watts

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- Power handling: up to 100 watts

ATC LA Series Leaded Attenuators
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- Power handling: up to 100 watts

INDUCTORS *(page 11)*

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The WL inductor product line is intended for RF and microwave applications and features high self-resonant frequencies (SRF), high Q, and low DC resistance. These products are manufactured on a rugged core made of high quality ceramic material that exhibits high Q at high operating frequencies.

The WL Series is especially attractive for all 800 MHz to 3.4 GHz wireless applications where cost and performance are major factors. These applications include but are not limited to: cellular base stations, broadband wireless services, point-to-point and point-to-multipoint radio as well as other RF and microwave telecommunications systems.

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- Inductance Range: 1.0 nH @ 250 MHz to 56 nH @ 250 MHz
- Tolerances: J (±5%), K (±10%)

ATC WL (size = 0603)
- Inductance Range: 1.6 nH @ 250 MHz to 390 nH @ 100 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

ATC WL (size = 0805)
- Inductance Range: 3.3 nH @ 250 MHz to 2700 nH @ 25 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

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- Inductance Range: 4.7 nH @ 50 MHz to 15,000 nH @ 7.9 MHz
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- Inductance Range: 6.8 nH @ 100 MHz to 1200 nH @ 35 MHz
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- 16 KHz to 40+ GHz, 100 nF

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▶ Frequency Range 4: >3.5 GHz to 100 GHz

CAPACITORS *(page 12, 13, 14)*

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ATC 600 L (size = 0402)

- Capacitance Range 0.1 pF to 27 pF

ATC 600 S (size = 0603)

- Capacitance Range 0.1 pF to 100 pF
- Voltage Rating: 250 WVDC

ATC 600 F (size = 0805)

- Capacitance Range 0.1 pF to 240 pF
- Voltage Rating: 250 WVDC

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- Capacitance Range 0.1 pF to 100 pF

ATC 800 B (size = .110" x .110")

- Capacitance Range 0.1 pF to 1000 pF

ATC 800 R (size = .070" x .090")

- Capacitance Range 1 pF to 100 pF

ATC SINGLE LAYER CAPACITORS

For applications with operating frequencies up to 100 GHz Capacitance range 0.03 pF to 6200 pF, case sizes from 10 mils to 90 mils. "Design your own" option (custom sizes.)

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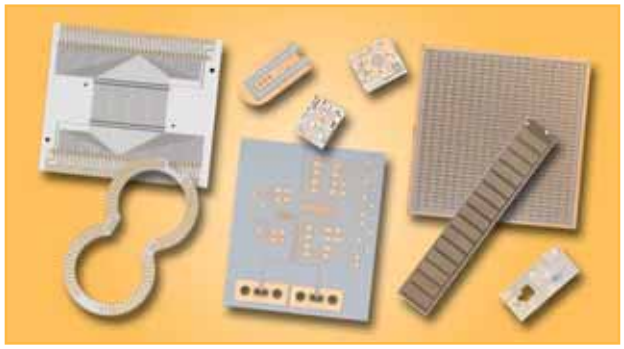
THIN FILM *(PAGE 16, 17)*



ATC // AVX THIN FILM TECHNOLOGIES

Combined Capabilities

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- Substrates: 1 inch square to 6 inch round (150 mm) wafers
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- Metalizations:
  - Sputtered: Al, Au, Cr, Cu, Ni(V), Pd, Pt, TaN, Ti and TiW
  - Plated: Electrolytic Cu, Ni, Au; Electroless Cu, Au
- Resistors: High Ohmic SiCr and TaN resistors in laser trimmable designs
- Capacitors: Si02, SiON and BCB dielectrics in laser trimmable designs
- Inductors: Multilevel and multiturn copper and gold inductors
- Routing: True Air Bridges and Dielectric Crossovers
- Passivation Materials: SiON, Si_3N_4, BCB and polyimide
- Vias: Sputtered, enhanced plated, filled and castellations
- I/Os: BGA, LGA, edge wrap, through via and wire or ribbon bond
- Machining:
  - CO2 cutting, drilling, and scribing
  - Diamond-saw dicing
  - Back grinding and polishing
- Assembly:
  - High precision 0201 or larger pick and place
  - Attachment via wire or ribbon bonding, BGA, LGA or surface mount reflow
  - Encapsulation
- Testing:
  - MIL-STD-105D level II sampling
  - MIL-STD-883 100% visual inspection
  - Capacitance, insulation resistance and resistivity
  - RF testing to 40 GHz

Primary Markets and Applications

- Military, Aerospace and Space:
  - RF and Microwave filters
  - Precision resistors
  - MOS capacitors
  - Circulators, Splitters
  - Specialized modules
- Medical and Instrumentation:
  - Precision resistor networks and arrays
  - In-circuit trimmed designs
  - Telemetry filters
  - Miniature circuits and assemblies
- Broadband infrastructure:
  - Laser diode mounts and heat sinks
  - Optoelectronic converters
  - RF and DC fan-outs
- Instrumentation:
  - Ultra-precision reference capacitors and resistors
- Solar:
  - Interposers and heat sinks

ATC High Power RF Resistive Products

ATC's complete line of high powered resistive products are designed and manufactured in our ISO-9001 facility using non-toxic, cost effective, Aluminum Nitride base substrates. All products are manufactured and qualified to Mil-PRF-55342, MIL-STD 202, and ANSI /J-STD-002 specifications. Leaded and flanged devices are available. Non-Magnetic styles are available in CR, LR and FR Series. Please consult factory.

ATC High powered resistive products are used in all wireless & satellite communication applications. Communication bands include GSM, PCS, W-CDMA, 3G, WCS, ISM Wireless LAN. They are also used in medical, industrial, military and aerospace applications. Typical applications include splitter/combiner networks, power amplifiers, feed forward amplifiers, RF Generators, MRI devices, isolators & circulators.

DC and RF Specifications:

- Resistance value: 50 Ω and 100 Ω standard (10 Ω to 200 Ω available)
- Terminations: Typical VSWR (Voltage Standard Wave Ratio) 1.05:1 to 1.20:1
- Resistors: Low parasitic capacitance
- Temperature Coefficient of Resistance TCR Typical <150 ppm/°C
- Operating temperature range: -55° to +150°C
- Frequency Range: DC to 18 GHz

Mechanical Specifications:

- Substrate – Aluminum Nitride
- Resistive Film – Tantalum Nitride
- Terminals – Silver
- Flangeless and Flanged tabs–100% silver leads Covers – Alumina
- Copper flanges – Nickel or Silver plated
- **Lead-Free, RoHS compliant**

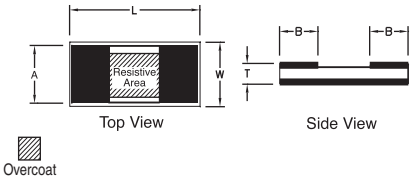
Visit ATC's website for Leaded and Flanged devices.

Order Resistive Product Design Kits Online at www.atceramics.com

ATC CR Chip Resistors

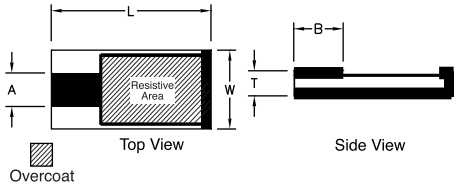
ATC Part Number*	W ±.010	L ±.010	T ±.005	A ±.005	B (Typ.)	Capacitance (pF)	Power Max (Watts)
CR11005TxxxxJ	.050	.100	.025	.045	.020	.75	5
CR11206TxxxxJ	.060	.120	.025	.055	.020	.90	15
CR12010TxxxxJ	.100	.200	.040	.090	.020	1.0	30
CR12525TxxxxJ	.245	.245	.040	.130	.020	2.0	60
CR12525TxxxxJ01	.245	.245	.040	.130	.020	2.0	100
CR13725TxxxxJ	.250	.375	.040	.198	.025	4.15	150
CR13737TxxxxJ	.370	.370	.040	.330	.025	6.0	250

*xxxx denotes Ohm value



ATC CT Chip Terminations

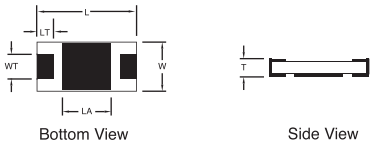
ATC Part Number	W ±.010	L ±.010	T ±.005	A ±.010	B (Typ.)	Frequency Range (GHz)	VSWR (Typ.)	Power Max (W)
CT11020T0050J	.200	.100	.025	.034	.020	DC to 18.0	1.25:1	20
CT12010T0050J	.100	.200	.040	.050	.020	DC to 4.0	1.20:1	30
CT12525T0050J	.245	.245	.040	.090	.020	DC to 4.0	1.15:1	60
CT12525T0050J01	.245	.245	.040	.050	.020	DC to 2.5	1.15:1	100
CT12525T0050J02	.245	.245	.040	.090	.020	DC to 4.0	1.20:1	100
CT12335T0050J	.350	.230	.040	.100	.020	DC to 4.0	1.15:1	100
CT13725T0050J	.250	.375	.040	.090	.025	DC to 4.0	1.20:1	125
CT13725T0050J01	.250	.375	.040	.050	.025	DC to 1.1	1.20:1	150
CT13725T0050J02	.250	.375	.040	.090	.025	DC to 4.0	1.25:1	150
CT13737T0050J	.370	.370	.040	.120	.025	DC to 2.0	1.25:1	150
CT13737T0050J01	.370	.370	.040	.130	.025	DC to 1.0	1.20:1	250
CT13737T0050J02	.370	.370	.040	.120	.025	DC to 2.0	1.25:1	250



ATC CS Surface Mount Chip Resistors

ATC Part Number*	W ±.010	L ±.010	T ±.005	WT ±.005	LT ±.005	LA ±.005	Capacitance (pF)	Power Max (Watts)
CS12010TxxxxG	.100	.200	.040	.090	.030	.095	.95 pF	10
CS12525TxxxxG	.245	.245	.040	.120	.040	.110	1.85 pF	20
CS13725TxxxxG	.250	.375	.040	.120	.050	.195	3.0 pF	30
CS13737TxxxxG	.370	.370	.040	.360	.050	.195	3.5 pF	40

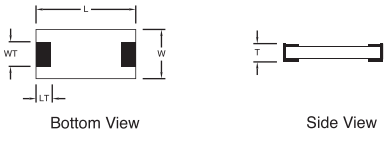
*xxxx denotes Ohm value



ATC CW Surface Mount Chip Resistors

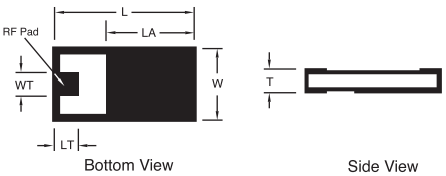
ATC Part Number*	W ±.010	L ±.010	T ±.005	WT ±.005	LT ±.005	Power Max (Watts)
CW12010TxxxxG	.100	.200	.040	.090	.030	4
CW12525TxxxxG	.245	.245	.040	.120	.040	6
CW13725TxxxxG	.250	.375	.040	.120	.050	8
CW13737TxxxxG	.370	.370	.040	.360	.050	10

*xxxx denotes Ohm value



ATC CZ Surface Mount Chip Terminations

ATC Part Number	W ±.010	L ±.010	T ±.005	LT ±.005	WT ±.005	LA ±.005	Frequency Range (GHz)	VSWR (Typ.)	Power Max (W)
CZ12010T0050G	.100	.200	.040	.040	.090	.115	DC to 3.0	1.20:1	10
CZ12010T0050G02	.100	.200	.040	.020	.090	.140	DC to 3.0	1.20:1	10
CZ12525T0050G	.245	.245	.040	.030	.125	.170	DC to 4.0	1.25:1	20
CZ13725T0050G	.250	.375	.040	.050	.125	.260	DC to 2.2	1.20:1	30
CZ13737T0050G	.370	.370	.040	.050	.125	.275	DC to 3.0	1.25:1	40



ATC WL Series
Wire Wound Chip Inductors

ATC's family of RF surface mount inductor components is intended to complement their high frequency ultra-low ESR capacitor products. The WL Series wire wound chip inductor products have been designed to provide excellent performance at competitive prices.

This Series includes the most widely used traditional EIA case sizes – 0402, 0603, 0805, 1008 and 1206. With an inductance range of 1 nH to 15,000 nH, these products have an operating temperature of -40°C to +125°C and a temperature coefficient of inductance (TCL) of +25 to +125 ppm/°C typical from -40°C to +125°C.

The WL inductor product line is intended for RF and microwave applications and features high self-resonant frequencies (SRF), high Q, and low DC resistance. These products are manufactured on a rugged core made of high quality ceramic material that exhibits high Q at high operating frequencies.

The WL Series is especially attractive for all 800 MHz to 3.4 GHz wireless applications where cost and performance are major factors. These applications include but are not limited to: cellular base stations, broadband wireless services, point-to-point and point-to-multipoint radio as well as other RF and microwave telecommunications systems.

All WL Series inductor products are supplied in tape and reel (2000 to 4000 parts per reel depending on case size) as standard, making them ideal for automated pick and place manufacturing applications. The terminations consist of a barrier layer with a lead-free, tin-plated finish that exhibits excellent solderability for trouble-free attachments.

Inductor Product Overview

Case Size Code	Inductance Value (nH)	Tolerance Code	Q min.	SRF (MHz) typ.	RDC (Ohms) max.	IDC (mA) max.
0402	1.0 @ 250 MHz	K	16	>6000	0.045	1360
	10 @ 250 MHz	G, J, K	21	3900	0.195	480
	68 @ 250 MHz	G, J, K	22	1620	1.120	100
0603	1.6 @ 250 MHz	J, K	16	12,500	0.040	700
	22 @ 250 MHz	G, J, K	38	3000	0.190	700
	470 @ 100 MHz	G, J, K	23	600	3600	80
0805	2.7 @ 250 MHz	J, K	80 @ 1500	7900	0.060	800
	100 @ 150 MHz	G, J, K	65 @ 500	1200	0.460	400
	4700 @ 7.9 MHz	G, J, K	15 @ 7.9	40	6.400	90
1008	5.6 @ 50 MHz	J, K	50 @ 1500	4000	0.15	1000
	330 @ 25 MHz	G, J, K	45 @ 100	570	1.05	450
	15000 @ 2.52 MHz	G, J, K	15 @ 7.96	15	11.5	120

Visit our website for individual values and specifications.

Order Inductor Design Kits Online at www.atceramics.com

ATC Multilayer High Q RF Capacitors

ATC 100 Series Porcelain Superchip® Multilayer Capacitors have been the industry standard for over 35 years, featuring one of the highest Qs in the industry, rugged porcelain construction, TCC of ±90 ppm / °C, and solderable SMT chip and leaded style terminations. **RoHS compliant terminations are standard. Refer to data sheets for other styles.** Order Design Kits online at www.atceramics.com

ATC Series	Case Size Footprint in. (mm)	Cap Value Range (pF)*	Working Voltage WVDC (volts) max.	Dielelectric Material	TCC -55°/+125°C (ppm/°C)	
100A	.055 x .055 (1.40 x 1.40)	0.1 to 100	250	Porcelain (P90)	+90 ± 20	
100B	.110 x .110 (2.79 x 2.79)	0.1 to 1000	1500	Porcelain (P90)	+90 ± 20	
100C	.230 x .250 (5.84 x 6.35)	1 to 2700	2500	Porcelain (P90)	+90 ± 30	
100E	.380 x .380 (9.65 x 9.65)	1 to 5100	7200	Porcelain (P90)	+90 ± 30	
700A	.055 x .055 (1.40 x 1.40)	0.1 to 1000	250	Porcelain and Ceramic (NPO)	0 ± 30	
700B	.110 x .110 (2.79 x 2.79)	0.1 to 5100	1500	Porcelain and Ceramic (NPO)	0 ± 30	
700C	.230 x .250 (5.84 x 6.35)	1 to 2700	2500	Porcelain (NPO)	0 ± 30	
700E	.380 x .380 (9.65 x 9.65)	1 to 2200	7200	Porcelain (NPO)	0 ± 30	
600L	.040 x .020 (1.02 x .51)	0.1 to 27	200	Ultra-Low ESR, High Q (NPO)	0 ± 30	
600S	.063 x .032 (1.60 x .81)	0.1 to 100	250	Ultra-Low ESR, High Q (NPO)	0 ± 30	
600F	.079 x .049 (2.00 x 1.25)	0.1 to 240	250	Ultra-Low ESR, High Q (NPO)	0 ± 30	
800A	.055 x .055 (1.40 x 1.40)	0.1 to 100	250	NPO Ceramic	0 ± 30	
800B	.110 x .110 (2.79 x 2.79)	0.1 to 1000	500	NPO Ceramic	0 ± 30	
800R	.070 x .090 (1.78 x 2.29)	1 to 100	500	NPO Ceramic	0 ± 30	
200A	.055 x .055 (1.40 x 1.40)	510 to 10,000	50	BX Ceramic	±15%	
200B	.110 x .110 (2.79 x 2.79)	5000 to 100,000	50	BX Ceramic	±15%	
900C	.230 x .250 (5.84 x 6.35)	.01 µF to 1 µF	300	X7R Ceramic	±15%	

ATC Series	Typical ESR (Ohms) Cap (pF)					Series Resonance (MHz)
	Cap (pF)	30 MHz	150 MHz	500 MHz	1000 MHz	
100A	1	–	0.170	0.280	0.390	9110
	10	–	0.067	0.119	0.168	3020
	100	–	0.028	0.051	0.072	1000
100B	10	–	0.047	0.082	0.115	2030
	100	–	0.033	0.060	0.085	680
	1000	–	0.015	0.027	–	230
100C	10	0.072	0.139	0.251	0.355	1457
	100	0.026	0.057	0.103	–	475
	1000	0.010	0.023	–	–	155
	2700	0.007	0.016	–	–	95
100E	10	0.076	0.147	0.266	0.376	1110
	100	0.030	0.065	0.119	–	365
	1000	0.018	0.040	–	–	120
	5100	0.010	0.022	–	–	55
700A	1	–	0.186	0.308	0.429	9110
	10	–	0.073	0.130	0.184	3020
	100	–	0.031	0.056	0.080	1000
	1000	–	0.035	0.064	–	330
700B	10	–	0.051	0.090	0.126	1840
	100	–	0.036	0.066	0.093	620
	1000	–	0.038	0.069	–	210
	5100	0.011	0.025	–	–	100
700C	10	0.072	0.139	0.251	0.355	1457
	100	0.026	0.057	0.103	–	475
	1000	0.010	0.023	–	–	155
	2700	0.007	0.016	–	–	95
700E	10	0.076	0.147	0.266	0.376	1110
	100	0.030	0.065	0.119	–	365
	1000	0.018	0.040	0.073	–	120
	2200	0.014	0.030	0.055	–	82
600L	1	–		0.074	0.074	11,310
	10	–		0.054	0.072	4230
	27	–		0.063	0.086	2780
600S	1	–	–	0.120	0.117	10,500
	10	–	–	0.058	0.070	5150
	100	–	0.034	0.043	0.070	1200
600F	1	–	–	0.070	0.084	9050
	10	–	–	0.062	0.078	3910
	100	–	–	0.055	0.078	2010
	240	–	–	–	–	–
800A	1	–	0.072	0.078	0.081	10,000
	10	–	0.040	0.048	0.064	4000
	100	–	0.032	0.048	0.071	1200
800B	10	–	0.038	0.047	0.064	5300
	100	–	0.027	0.041	0.060	2000
	1000	–	0.024	0.051	–	700
800R	1	–	–	.057	.055	10,800
	10	–	.032	.032	.048	3600
	100	–	.026	.032	.044	1500
200A	510	1.010	2.238	–	–	341
	1000	0.553	1.226	–	–	247
	10,000	0.071	0.157	–	–	82
200B	5000	0.202	0,450	–	–	89
	10,000	0.133	0.296	–	–	63
	100,000	0.033	–	–	–	20
900C	10,000	0.059	–	–	–	50
	100,000	0.034	–	–	–	16
	1 µF	0.020	–	–	–	5

ATC's products are supported by fully certified in-house RF and QA Labs with test capability from DC to Millimeter-wave Frequencies

Standard Electrical Testing:

- ► Capacitors: Capacitance, Dissipation Factor, Dielectric Withstanding Voltage, Insulation Resistance
- ► Inductors: Inductance, Q, SRF, RDC, IDC
- ► Resistors: Resistance, RF Power, VSWR, Shunt Capacitance

Hi-Reliability Testing (MIL-PRF-55681, MIL-PRF-123) and COTS Upscreening Program:

- ► Full Burn In and Life Test Capability
- ► Electrical, Environmental and Mechanical (MIL-STD-202, MIL-STD-883)

Specialized RF Power Testing:

- ► High RF Power: CW and pulsed
- ► Thermal Characterization
- ► High RF Voltage: Corona, Internal and external breakdown, Partial discharge
- ► Specialized test fixtures designed in-house to support a full range of customer requirements

Frequency Range: 2 MHz to 1 GHz

POPULAR TEST FREQUENCIES:	APPLICATIONS:
13.56 MHz	Semiconductor Manufacturing
64 MHz	1.5 Tesla MRI Systems
128 MHz	3 Tesla MRI Systems
1 GHz	Telecommunications & Cellular Systems
ISM	Unlicensed Wireless Devices

Small Signal RF Testing:

- ► Equivalent Series Resistance (ESR) from 10 MHz to 2 GHz
- ► Impedance vs. Frequency: 1 MHz to 1.8 GHz
- ► S-Parameters: Four-receiver architecture, full two-port TRL calibration to 40 GHz

Design Support For Capacitor, Inductor, & Resistive Products:

- ► Comprehensive electrical, mechanical and environmental data available
- ► S-Parameters
- ► Tech-Select™ RF Design Software
- ► Applications Support Team of Experienced RF Engineers

ATC Single Layer Capacitor Products

ATC's extensive line of Single Layer Capacitor (SLC) products offers solutions to the most demanding microwave and millimeter wave requirements. Broadband applications with operating frequencies up to 100 GHz are achievable with ATC's SLC products.

- Capacitance Range: 0.04 to 10,000 pF
- Wide selection of dielectrics with K's of 14 to 25,000
- Ultra-high Q
- Up to 100 WVDC rating
- Standard case sizes from 10 mils.
- "Design Your Own" option
- Manufacturing facilities certified to ISO 9001
- Custom Design Kits available online at www.atceramics.com

	Dielectric Code	Dielectric Const. (K)	TCC (-55°C to +125°C)	Cap. Range (pF)	Max. DF @ 1 MHz (%)	Q
Stable K Dielectrics	A	14	+90 ±30 PPM/°C	0.04 to 5.6	0.01	11,000 @ 6.4 GHz
	BB	31	0 ±30 PPM/°C	0.06 to 13	0.15	950 @ 4.5 GHz
	CA	60	0 ±30 PPM/°C	0.1 to 27	0.15	770@ 5 GHz

	Dielectric Code	Dielectric Const. (K)	TCC (-55°C to +125°C)	Cap. Range (pF)	Max. DF (%)*		Q @ Freq.
					@1 MHz	@1 KHz	
Mid-K Dielectrics	CC	130	-750 ±220 PPM/°C	0.3 to 56	0.15	–	2310 @ 5 GHz
	DA	165	-1500 ±500 PPM/°C	0.4 to 68	0.25	–	500 @ 1.8 GHz
	DB	200	±7.5% max. change (non-linear)	0.5 to 82	0.25	–	29 @ 5 GHz
	HC	420	-2000 ±500 PPM/°C	1.1 to 180	0.7	0.3	–
	EA	650	-4700 ±1500 PPM/°C	1.5 to 270	0.3	0.3	–

	Dielectric Code	Dielectric Const. (K)	TCC (-55°C to +125°C)	Cap. Range (pF)	Max. DF (%)*	
					@ 1 MHz	@ 1 KHz
High-K Dielectrics	EC	650	±10% max. change (non-linear)	1.5 to 270	1.5	1.5
	J	1100	+5% to -15% max. change (non-linear)	2.4 to 470	2.5	2.0
	F	2000	±15% max. change (non-linear)	4.3 to 820	2.5	2.0
	GA	4000	±15%	10 to 1800	3.0	2.0

	Dielectric Code	Dielectric Const. (K)	TCC (+10°C to +85°C)	Cap. Range (pF)	Max. DF (%)*	
					@ 1 MHz	@ 1 KHz
Ultra High-K Dielectrics	G	6000	±10% to -75% max. change (non-linear)	13 to 2400	2.5	2.0
	K	9000	0% to -92% max. change (non-linear)	20 to 3300	4.0	2.0
	L	16,000	0/-92%	33 to 6200	3.5	2.0

*Capacitance and DF are measured at 1MHz for capacitance values ≤ 1,000 pF and 1 KHz for capacitance values > 1,000 pF.

ATC 500 S, 530 L, 520 L, 545 L, 550L Broadband SMT Capacitors

RoHS Compliant

Best Broadband and Ultra-Broadband Options for Reliability and Widest Frequency Coverage.

Attributes

- SMT Broadband Devices
- Optoelectronics
- Low Insertion Loss
- High speed data
- Flat Frequency Response
- Sonet
- One Piece Construction
- Broadband Wireless Communications
- Orientation Insensitive
- Microwave/Millimeter-Wave
- Tape and Reel, Surface Mountable
- Rugged Ceramic Construction
- RoHS Compliant
- Unit-to-Unit Performance Repeatability

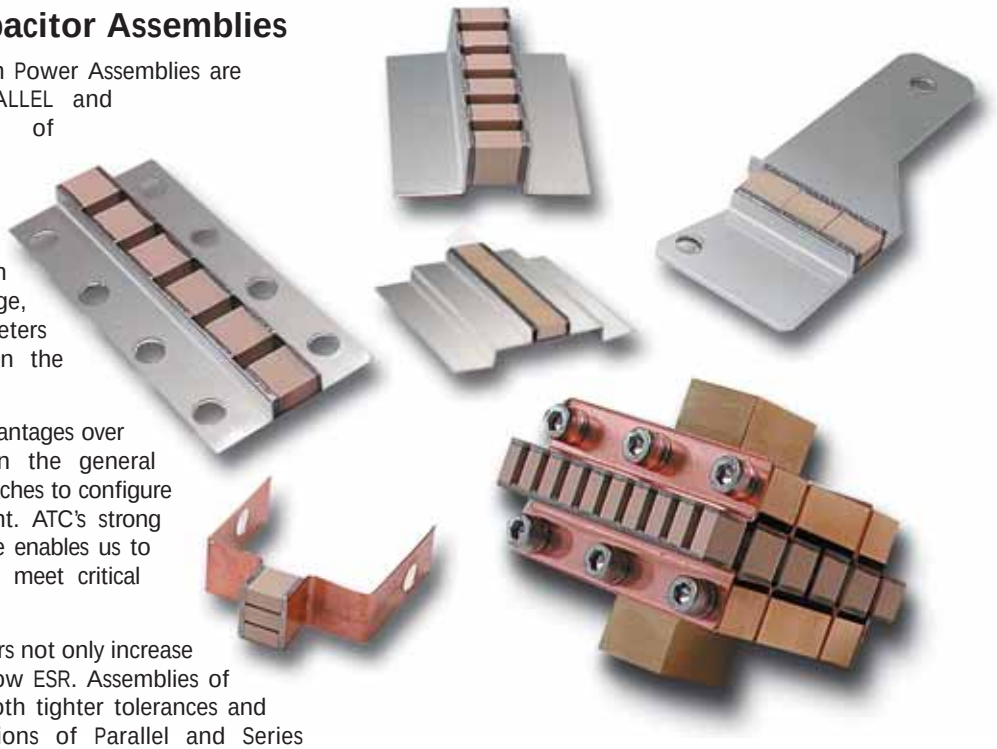
Applications/Markets

- Optoelectronics
- High speed data
- Sonet
- Broadband Wireless Communications
- Microwave/Millimeter-Wave

ATC Series	Frequency Response	Insertion Loss	Capacitance	Voltage Ratings	Termination Options
 500	1 GHz to 40 GHz	1 dB typ.	0.1 pF to 10 pF	100 V	Gold
 520	160 KHz to 16 GHz	1 dB max.	10 mF	16 V	RoHS compatible
 530	16 KHz to 18 GHz	1 dB max.	100 mF	16 V	RoHS compatible
 545	16 KHz to 40+ GHz	< 0.5 dB	100 mF	16 V	RoHS/Tin-Lead/Gold
 550	16 KHz to 40+ GHz	< 0.5 dB	100 mF	16 V	RoHS/Tin/Gold

ATC Power Capacitor Assemblies

ATC standard & custom Power Assemblies are fabricated from PARALLEL and SERIES combinations of industry-respected ATC catalog products. Customer requirements are addressed by a variety of computer matching and assembly techniques which have en-abled ATC to extend voltage, current, ESR, Q, and tolerance parameters beyond what is normally available in the industry.



ATC Power Assemblies offer distinct advantages over purchasing standard components "in the general ballpark" and trying "hit & miss" approaches to configure & match these in a circuit environment. ATC's strong tradition of quality and customer service enables us to work closely with design engineers to meet critical specifications.

Assemblies of parallel grouped capacitors not only increase the capacitance but will exhibit ultra-low ESR. Assemblies of series grouped capacitors will allow both tighter tolerances and higher working voltages. Combinations of Parallel and Series assemblies can realize an increase in both capacitance and voltage rating. Assemblies can be composed of multiple capacitors in horizontal, vertical or multi-level mounting configurations.

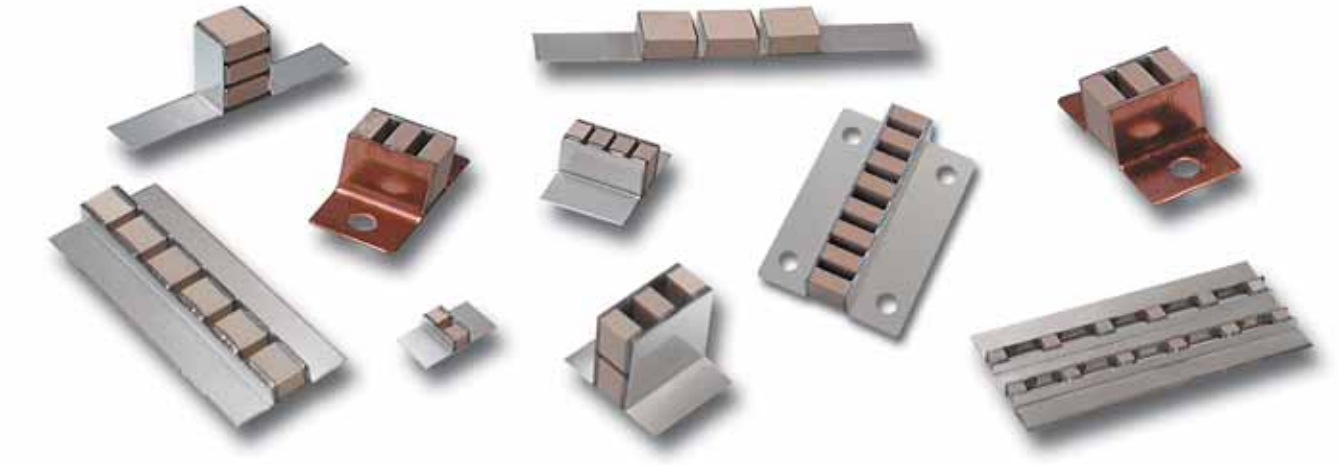
MATCHED SETS: SERIES OR PARALLEL CONFIGURATIONS
For customers requiring non-standard values or very close tolerance capacitance values, ATC can select a set of capacitors (2 or more) to achieve the desired results. Available tolerances appear in table at right.

VOLTAGE DIVIDERS: Voltage dividers based on capacitive reactance can be provided to customers' specific capacitance ratio. Ratios can be provided within 1.0%.

Series	Capacitance Range	Tolerance
100A/700A	1 pF to 6.2 pF 6.8 pF to 1000 pF	0.1 pF 0.5%
100B/700B	0.1 pF to 6.2 pF 6.8 pF to 5100 pF	0.1 pF 0.5%
100C	1 pF to 2700 pF	0.5%
100E	1 pF to 5100 pF	0.5%

ASSEMBLIES ARE DESIGNED TO MEET CUSTOMER NEEDS. ATC OFFERS THE FOLLOWING OPTIONS:

- Lead designs to customer specifications
- Non-magnetic assemblies for MRI applications
- Coatings to enhance high voltage operation
- Marking: Assemblies can be marked with ATC or customer part numbers
- Special Test Options (enhanced screening) for high reliability requirements: (a) Accelerated Life Testing and Voltage Conditioning: Individual parts are tested for 100 hours at elevated voltages and at 125° C. (b) Burn-in at elevated temperatures and voltages to insure reliability



ATC // AVX Thin Film Technologies

Engineered Thin Film Solutions

ATC // AVX is pleased to introduce the combined resources of ATC's Jacksonville, Florida and AVX's Myrtle Beach, South Carolina Thin Film product groups. This allows us to offer a wide range of custom hybrid circuits along with thin film resistors, capacitors, inductors, as well as lumped element and distributed filters, integrated passives, modules, heat sinks, and other unique thin film microelectronic solutions.

Design, Fabrication, Assembly, and RF Testing Services

Jacksonville Thin Film Products

Since 1993, ATC Thin Film Products, located in Jacksonville, FL, has been supplying a broad spectrum of high reliability metalized hybrid circuits. Designers can select from a wide variety of substrate materials, as well as vias, crossovers and bridges. Whether built to print or designed to a performance specification, the experienced engineering staff is available to assist in optimizing your product. In addition, two-sided assembly and RF testing to 40 GHz are value-added services. AS-9100 certification ensures conformance with existing military and aerospace requirements.

Myrtle Beach Thin Film Products

AVX Thin Film operations, located in Myrtle Beach, SC, offers an array of thin film passives including net-worked resistors, capacitors, inductors, along with integrated passive LC and RC filters and modules. Six inch (150 mm) wafer technology offers the designer build-to-print or custom designs based on 3D HFSS modeling from 500 MHz to 40 GHz. These products will meet the most demanding requirements of circuit miniaturizations, tolerance and signal integrity applications that involve a wide frequency spectrum from MHz to GHz.

Combined Capabilities

- Design: Modeling (HFSS), simulation (Genesys) and CAD (Tanner)
- Substrates: 1 inch square to 6 inch round (150 mm) wafers
- Typical materials: Alumina, Aluminum Nitride, Beryllium Oxide, Silicon, (N, P, and N+), Quartz, Glass, Glass-Ceramic, Sapphire, Ferrites and Titanates
- Metalizations:
  - Sputtered: Al, Au, Cr, Cu, Ni(V), Pd, Pt, TaN, Ti and TiW
  - Plated: Electrolytic Cu, Ni, Au; Electroless Cu, Au
- Resistors: High Ohmic SiCr and TaN resistors in laser trimmable designs
- Capacitors: Si02, SiON and BCB dielectrics in laser trimmable designs
- Inductors: Multilevel and multiturn copper and gold inductors
- Routing: True Air Bridges and Dielectric Crossovers
- Passivation Materials: SiON, Si_3N_4, BCB and polyimide
- Vias: Sputtered, enhanced plated, filled and castellations
- I/Os: BGA, LGA, edge wrap, through via and wire or ribbon bond
- Machining:
  - CO2 cutting, drilling, and scribing
  - Diamond-saw dicing
  - Back grinding and polishing
- Assembly:
  - High precision 0201 or larger pick and place
  - Attachment via wire or ribbon bonding, BGA, LGA or surface mount reflow
  - Encapsulation

- Testing:
  - MIL-STD-105D level II sampling
  - MIL-STD-883 100% visual inspection
  - Capacitance, insulation resistance and resistivity
  - RF testing to 40 GHz

Primary Markets and Applications

- Military, Aerospace and Space:
  - RF and Microwave filters
  - Precision resistors
  - MOS capacitors
  - Circulators, Splitters
  - Specialized modules
- Medical and Instrumentation:
  - Precision resistor networks and arrays
  - In-circuit trimmed designs
  - Telemetry filters
  - Miniature circuits and assemblies
- Broadband infrastructure:
  - Laser diode mounts and heat sinks
  - Optoelectronic converters
  - RF and DC fan-outs
- Instrumentation:
  - Ultra-precision reference capacitors and resistors
- Solar:
  - Interposers and heat sinks

Typical Substrate Properties

Properties Nominal	Al_2O_3 99.6%	Al_2O_3 96.0%	Fused Silica	BeO 99.5%	AiN	Glass Boro-silicate	Glass Ceramic	P-Silicon Boron Dopped	N++-Silicon Arsenic Dopped	FZ-Silicon Arsenic Dopped
Thickness Range (mil)	4-50	10-50	4-25	10-60	10-60	20	20	2-25	4-25	4-25
As Fired (Surface finish)	3µ''	No	No	6µ''	No	10 Å	NA			
Lapped (Surfance finish) µ''	<20	No	No	<20	<20	NA				
Polished (Surfance finish) µ''	<2	<4	<1	<3	<3	<.04	<0.6	<.04		
Dielectric Constant @ 10 GHz	9.8	9.6	3.8	6.6	8.7	5.1	NA			
Loss Tangent @ 10 GHz	0.0002	0.0002	0.0001	0.0003	0.001	0.003	NA			
CTE (PPM/°C)	6.7	8.2	0.5	7.5	4.5	3.2	11.5	2.6		
Thermal Conductivity (W/mK)	25.5	24.7	1.38	280	170	1.16	2.7	150		
Volume Resistivity (ohm-cm)	10^{14}	10^{14}	10^{14}	10^{14}	10^{13}	10^{13}	10^{13}	15	0.002	10^{4}
Dielectric Strength (KV/mm)	8.7	8.3	100	14	>10	NA				

Sputtered and Electroplated Materials

Materials	Sputtered	Comment
Al	150-40000 Å	AlSi (<1%) and AlCu (2%) available, Typical 2000 – 15000
Au	1000-65000 Å	Typical 3000 – 10000
Cr	150-5000 Å	Typical 600
Cu	2000-65000 Å	NA
LSCO	300-1200 Å	Typical 600
Ni(V)	500-10000 Å	NA
Pd	500-5000 Å	NA
Pt	1000-4000 Å	Typical 2500
TaN	300-1500 Å	Barrier Layer
Ti	500-5000 Å	Typical 600
TiW	300-1500 Å	Typical 500
Plated Material	**Electrolytic µm and (µin)**	**Electroless µm and (µin)**
Au	0.5 – 50 (20-2000)	1-10 (40-400)
Cu	5 – 150 (200-6000)	2-4 (80-160)
Ni	1.25 – 5 (50-200)	NA

Resistor Technology

Thin Film Resistors	SiCr	TaN	NiCr
Process	High Ohmic, High Voltage, Ultra-stable	High process temperature (no diffusion); Resistance to harsh environment	Low TCR
Typical Sheet Resistivity (ohm/sq)	300-1300	10-200	5-200
TCR (ppm/°C -25 to 125°C))	±50; 0 to -150	-100 to -150	0 to 100
Stability (Change after 1000 hours @ 125°C)	0.2%	0.2%	0.2%
Maximum Stabilization Temperature (°C)	500	450	350
Recommended Device Environment	Ambient Atmosphere	Ambient Atmosphere	Ambient with Passivation or Inert Atmosphere
Maximum Device Processing Temperature	Up to 1 hr. @ 400 °C	Up to 1/2 hr. @ 350 °C	Up to 1/2 hr. @ 260 °C
Tolerance (the greater of)	0.05% or 0.1 Ω	0.05% or 0.1 Ω	0.05% or 0.1 Ω

Capacitor Materials

Material	SiON	SiO_2	BCB	PI
pF/mm² Typical	55	35	25	30
Range	1-500 pF	1-500 pF	1-50 pF	0.5-10 pF
Trimmable	Yes	No	Yes	No
Tolerance; *NOTE: value dependent*	≥ 0.5%; or ≥ 0.05 pF	≥ 0.5%; or ≥ 0.05 pF	≥ 0.5%; or ≥ 0.05 pF	20%
Stability	±60 ppm/°C	±30 ppm/°C	±42 ppm/°C	±100 ppm/°C
Rated Voltage	≤ 100	≤ 100	≤ 25	≤ 25
BDV (v/µm)	600	1000	300	200
DF	≤ 0.1%	≤ 0.1%	≤ 0.1%	≤ 0.2%
Performance	K 5.8; TCC 60	K 4.0; TCC 30	K 2.7; TCC 42	K 3.3; TCC

NEW! ATC 100 A/B and 700 A/B MLCs Extended Voltage Ratings to 1500 WVDC

ATC now offers 100A/B Porcelain Superchips® and 700A/B Porcelain and NPO Multilayer Capacitors with extended voltage ratings, providing the widest range of capacitance values with extended voltage ratings available

100A / 700A

Capacitance Range	Standard WVDC	Extended WVDC
0.1 to 56 pF	150 WVDC	250 WVDC
62 to 100 pF	150 WVDC	200 WVDC

100B/ 700B

Capacitance Range	Standard WVDC	Extended WVDC
0.1 to 47 pF	500 WVDC	1500 WVDC
51 to 100 pF	500 WVDC	1000 WVDC
110 to 200 pF	300 WVDC	1000 WVDC

NEW! ATC 800 Series High RF Power Multilayer Capacitors

- Optimized Form Factor
- Lowest ESR @ Wireless Frequencies
- Highest Self Resonance
- Rugged, Reliable NPO Dielectric
- High RF Power Applications
- Superior Thermal Performance
- Ideal for Large and Small Signal Applications
- Available with non-magnetic terminations

800 SERIES Case A	Capacitance Range	Electrical Specifications
• .055'' x .055'' (1.4 mm x 1.4 mm)	• 0.1 pF to 100 pF	• Voltage Rating: Up to 250 WVDC • IR: 10^5 MΩ @ 25°C • TCC: 0 ±30 PPM/°C
800 SERIES Case B	**Capacitance Range**	**Electrical Specifications**
• .110'' x .110'' (2.79 mm x 2.79 mm)	• 0.1 pF to 1000 pF	• Voltage Rating: Up to 500 WVDC • IR: 10^5 MΩ @ 25°C • TCC: 0 ±30 PPM/°C
800 SERIES Case R	**Capacitance Range**	**Electrical Specifications**
• .070'' x .090'' (1.79 mm x 2.29 mm)	• 1 pF to 100 pF	• Voltage Rating: Up to 500 WVDC • IR: 10^5 MΩ @ 25°C • TCC: 0 ±30 PPM/°C

ATC 500 S, 530 L, 520 L, 545 L, 550L Broadband SMT Capacitors

Your best broadband and ultra-broadband options for reliability.

- Widest Frequency Coverage
- SMT Broadband Capacitors
- Ultra-Low Insertion Loss
- Flat Frequency Response
- One Piece Construction
- Orientation insensitive*
- Tape & Reel, Surface Mountable
- Rugged Ceramic Construction
- RoHS Compliant
- Unit to Unit Performance Repeatability

ATC Series	Operating Frequency	Insertion Loss	Capacitance	Voltage Rating (WVDC)	Termination Options
500 S	1 GHz to 40 GHZ	1db max.	0.1 pF to 10 pF	0.1 to 4.7 pF: 100 V 5.1 to 10 pF: 50 V	Platinum/Gold
520 L	160 KHz to 16 GHZ	1db max.	10 nF	16 V	Tin
530 L	16 KHz to 18 GHZ	1db max.	100 nF	16 V	Tin
545 L	16 KHz to 40+ GHZ	<0.5db	100 nF	16 V	Tin, Solder, Gold
550 L	16 KHz to 40+ GHZ	<0.5db	100 nF	16 V	Tin, Gold

ATC 600 Series Ultra-Low ESR, NPO, EIA MLCs

Excellent for RF and Microwave Transmit and Receive Wireless Applications

- Lowest ESR in Class
- Higher power handling capability
- Highest voltage rating in class for greater design margin
- High Self Resonance
- Reduces thermal noise (KTB) and improves signal to noiseratio (SNR) in receiver applications
- Improves PA reliability by operating cooler
- Wireless / Telecom Base Stations
- Satellite Systems
- Wireless Communications
- Microwave Communications Systems
- WiMAX
- Approved Supplier to DSCC Drawings
- Available with non-magnetic terminations

*Horizontal Mount for 500 S

SUNSTAR 商斯达实业集团是集研发、生产、工程、销售、代理经销 、技术咨询、信息服务等为一体的高科技企业，是专业高科技电子产品生产厂家，是具有10 多年历史的专业电子元器件供应商，是中国最早和最大的仓储式连锁规模经营大型综合电子零部件代理分销商之一,是一家专业代理和分銷世界各大品牌IC 芯片和電子元器件的连锁经营綜合性国际公司，专业经营进口、国产名厂名牌电子元件，型号、种类齐全。在香港、北京、深圳、上海、西安、成都等全国主要电子市场设有直属分公司和产品展示展销窗口门市部专卖店及代理分销商,已在全国范围内建成强大统一的供货和代理分销网络。 我们专业代理经销、开发生产电子元器件、集成电路、传感器、微波光电元器件、工控机/DOC/DOM 电子盘、专用电路、单片机开发、MCU/DSP/ARM/FPGA 软件硬件、二极管、三极管、模块等，是您可靠的一站式现货配套供应商、方案提供商、部件功能模块开发配套商。商斯达实业公司拥有庞大的资料库，有数位毕业于著名高校——有中国电子工业摇篮之称的西安电子科技大学（西军电）并长期从事国防尖端科技研究的高级工程师为您精挑细选、量身订做各种高科技电子元器件，并解决各种技术问题。

微波光电部专业研制、代理经销高频、微波、光纤、光电元器件、组件、部件、模块、整机；电磁兼容元器件、材料、设备；微波CAD、EDA 软件、开发测试仿真工具；微波、光纤仪器仪表。欢迎国外高科技微波、光纤厂商将优秀产品介绍到中国、共同开拓市场。长期大量现货专业批发高频、微波、卫星、光纤、电视、CATV 器件：晶振、VCO、连接器、PIN 开关、变容二极管、开关二极管、低噪晶体管、功率电阻及电容、放大器、功率管、MMIC、混频器、耦合器、功分器、振荡器、合成器、衰减器、滤波器、隔离器、环行器、移相器、调制解调器；光电子元器件和组件：红外发射管、红外接收管、光电开关、光敏管、发光二极管和发光二极管组件、半导体激光二极管和激光器组件、光电探测器和光接收组件、光发射接收模块、光纤激光器和光放大器、光调制器、光开关、DWDM 用光发射和接收器件、用户接入系统光光收发器件与模块、光纤连接器、光纤跳线/尾纤、光衰减器、光纤适 配器、光隔离器、光耦合器、光环行器、光复用器/转换器；无线收发芯片和模组、蓝牙芯片和模组。

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