

AMERICAN  
TECHNICAL  
CERAMICS

**QUICK  
REFERENCE**

# PRODUCT SELECTION GUIDE



 **THE  
ENGINEERS'  
CHOICE®**



**ISO 9001  
REGISTERED  
COMPANY**

**Corporate Profile**

ATC designs, develops, manufactures and markets Multilayer Capacitors, Single Layer Capacitors, Resistive Products, Inductors and Custom Thin Film Products for RF, microwave and millimeter-wave applications. Our products are primarily focused on the wireless communications infrastructure, fiber optic, medical electronics, semiconductor manufacturing equipment, defense, aerospace, and satellite communications markets. For over fifty years, ATC's family of superior component and custom integrated packaging solutions has been represented by **THE ENGINEERS' CHOICE®** brand.

Customer interface is administered by our own personnel and independent sales representatives. American Technical Ceramics is headquartered in Huntington Station, New York and has an Advanced Technology Center in Jacksonville, Florida. This is the center of excellence for our traditional product lines and the development and manufacturing facilities for Thin Film and Resistive Products.

American Technical Ceramics' Sales and Customer Service Center, serving Europe, Africa and the Middle East, is located in the Czech Republic. ATC has Regional Sales Offices in Surrey, England and Hallbergmoos, Germany. The Company's wholly-owned subsidiary offering Sales and Technical Support for Asia is located in Shenzhen, P.R. China.

American Technical Ceramics is a wholly-owned subsidiary of AVX Corp. The common stock of AVX is listed on the New York Stock Exchange (symbol "AVX").



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



ATC's New York Facility occupies approximately 75,000 sq. ft.

**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 Communications Infrastructure
- 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
- Jacksonville, Florida – Advanced Technology Center, Manufacturing Facility

Download complete pdf data sheets at [www.atceramics.com](http://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.

# QUICK REFERENCE PRODUCT SELECTION GUIDE

## 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)	<ul style="list-style-type: none"> <li>▶ 100 Series Porcelain MLCs</li> <li>▶ 700 Series NPO Porcelain and Ceramic MLCs</li> <li>▶ 800 Series NPO Ceramic MLCs</li> <li>▶ 200 Series BX Ceramic MLCs</li> <li>▶ 900 Series X7R Ceramic RF Power MLCs</li> <li>▶ 520, 530 Series Broadband SMT Capacitors</li> <li>▶ General Purpose Capacitors</li> <li>▶ HP Series Capacitors</li> <li>▶ CDR / QPL Approved MIL-PRF-55681</li> <li>▶ COTS Hi-Rel Upscreening</li> </ul>	<ul style="list-style-type: none"> <li>▶ Extended Capacitance Assemblies</li> <li>▶ Extended Voltage &amp; Current Assemblies</li> <li>▶ Matched Sets</li> <li>▶ Voltage Dividers</li> <li>▶ Transmitter Capacitor Equivalents</li> </ul>	<ul style="list-style-type: none"> <li>▶ Resistors</li> <li>▶ Terminations: SMT, Chip Leaded &amp; Flanged</li> <li>▶ Attenuators</li> <li>▶ Non-Magnetic Series CR1, LR1, FR1</li> <li>▶ 504 L Series Ultra-Broadband Resistors</li> </ul>	<ul style="list-style-type: none"> <li>▶ WL Chip Inductors - EIA Sizes 0402 0603 0805 1008 1206</li> <li>▶ 506 WLC Series Ultra-Broadband Inductors</li> <li>▶ 506 WLS Series Ultra-Broadband SMT Inductors</li> </ul>
		<b>Thin Film Technologies</b>		
		<ul style="list-style-type: none"> <li>▶ LPF Series High Performance Low Pass Filter</li> </ul>		

▶ 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	<ul style="list-style-type: none"> <li>▶ 100 Series Porcelain MLCs</li> <li>▶ 700 Series NPO Porcelain and Ceramic MLCs</li> <li>▶ 600 Series Ultra-Low ESR</li> <li>▶ 800 Series NPO Ceramic MLCs</li> <li>▶ 400 Series Precision Tolerance Capacitors</li> <li>▶ 200 Series BX Ceramic MLCs</li> <li>▶ 900 Series X7R Ceramic RF Power MLCs</li> <li>▶ 520, 530 Series Broadband SMT Capacitors</li> <li>▶ General Purpose Capacitors</li> <li>▶ HP Series Capacitors</li> <li>▶ CDR / QPL Approved MIL-PRF-55681</li> <li>▶ COTS Hi Rel Upscreening</li> </ul>	<ul style="list-style-type: none"> <li>▶ Extended Capacitance Assemblies</li> <li>▶ Extended Voltage &amp; Current Assemblies</li> <li>▶ Matched Sets</li> <li>▶ Voltage Dividers</li> <li>▶ Transmitter Capacitor Equivalents</li> </ul>	<ul style="list-style-type: none"> <li>▶ Resistors</li> <li>▶ Terminations: SMT Chip Leaded &amp; Flanged</li> <li>▶ Attenuators</li> <li>▶ Non-Magnetic Series CR1, LR1, FR1</li> <li>▶ 504 L Series Ultra-Broadband Resistors</li> </ul>	<ul style="list-style-type: none"> <li>▶ WL Chip Inductors - EIA Sizes 0402 0603 0805 1008 1206</li> <li>▶ 506 WLC Series Ultra-Broadband Inductors</li> <li>▶ 506 WLS Series Ultra-Broadband SMT Inductors</li> </ul>
		<b>Thin Film Technologies</b>		
		<ul style="list-style-type: none"> <li>▶ LPF Series High Performance Low Pass Filter</li> </ul>		

**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 PRODUCTS BY FREQUENCY RANGE**

<b>► Frequency Range 3: &gt;800 MHz to 3.5 GHz</b>				
<b>Typical Applications</b>	<b>Capacitor Products</b>	<b>Thin Film Technologies</b>	<b>Resistive Products</b>	<b>Inductor Products</b>
<p>Wireless Infrastructure (Cellular / PCS / DCS / GPS / MMDS), Bluetooth, Wireless LAN (802.11)</p>	<ul style="list-style-type: none"> <li>▶ 100 Series Porcelain MLCs</li> <li>▶ 700 Series NPO Porcelain and Ceramic MLCs</li> <li>▶ 600 Series Ultra-Low ESR</li> <li>▶ 800 Series NPO Ceramic MLCs</li> <li>▶ 400 Series Precision Tolerance Capacitors</li> <li>▶ Single Layer Capacitors</li> <li>▶ 500 Series Millimeter Wave SMT</li> <li>▶ 520, 530 Series Broadband SMT Capacitors</li> <li>▶ General Purpose Capacitors</li> <li>▶ HP Series Capacitors</li> <li>▶ CDR / QPL Approved MIL-PRF-55681</li> <li>▶ COTS Hi-Rel Upscreening</li> </ul>	<ul style="list-style-type: none"> <li>▶ MOS Single Layer Capacitors</li> <li>▶ 504 L Series Ultra-Broadband Resistors</li> <li>▶ LPF Series High Performance Low Pass Filter</li> </ul>	<ul style="list-style-type: none"> <li>▶ Resistors</li> <li>▶ Terminations: SMT Chip Leaded &amp; Flanged</li> <li>▶ Attenuators</li> <li>▶ Non-Magnetic Series CR1, LR1, FR1</li> <li>▶ 504 L Series Ultra-Broadband Resistors</li> </ul>	<ul style="list-style-type: none"> <li>▶ WL Chip Inductors - EIA Sizes 0402 0603 0805 1008 1206</li> <li>▶ 506 WLC Series Ultra-Broadband Inductors</li> <li>▶ 506 WLS Series Ultra-Broadband SMT Inductors</li> </ul>

<b>► Frequency Range 4: &gt;3.5 GHz to 100 GHz</b>				
<b>Typical Applications</b>	<b>Capacitor Products</b>	<b>Thin Film Technologies</b>	<b>Resistive Products</b>	<b>Inductor Products</b>
<p>Satellite Communications, LMDS, Radar, High Speed Data</p>	<ul style="list-style-type: none"> <li>▶ 100 Series Porcelain MLCs</li> <li>▶ 700 Series NPO Porcelain and Ceramic MLCs</li> <li>▶ 600 Series</li> <li>▶ 800 Series NPO Ceramic MLCs</li> <li>▶ 400 Series Precision Tolerance Capacitors</li> <li>▶ 500 Series Millimeter Wave SMT</li> <li>▶ 520, 530 Series Broadband SMT Capacitors</li> <li>▶ Single Layer Capacitors</li> <li>▶ HP Series Capacitors</li> <li>▶ CDR / QPL Approved MIL-PRF-55681</li> <li>▶ COTS Hi-Rel Upscreening</li> </ul>	<ul style="list-style-type: none"> <li>▶ MOS Single Layer Capacitors</li> <li>▶ 504 L Series Ultra-Broadband Resistors</li> <li>▶ LPF Series High Performance Low Pass Filter</li> </ul>	<ul style="list-style-type: none"> <li>▶ Resistors</li> <li>▶ Terminations: SMT, Chip Leaded &amp; Flanged</li> <li>▶ Attenuators</li> <li>▶ Non-Magnetic Series CR1, LR1, FR1</li> <li>▶ 504 L Series Ultra-Broadband Resistors</li> </ul>	<ul style="list-style-type: none"> <li>▶ WL Chip Inductors - EIA Sizes 0402 0603 0805 1008 1206</li> <li>▶ 506 WLC Series Ultra-Broadband Inductors</li> <li>▶ 506 WLS Series Ultra-Broadband SMT Inductors</li> </ul>

## ► Frequency Range 1: Up to 30 MHz

### CAPACITORS



#### 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

##### 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 C (size = .250" x .250")

- Capacitance Range 2.2 pF to 3000 pF

##### ATC 800 E (size = .380" x .380")

- Capacitance Range 3.3 pF to 5100 pF

##### ATC 800 H (size = .720" x .740")

- Capacitance Range 100 pF to 20,000 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  $\mu$ F

##### ATC 200 B (size = .110" x .110")

- Capacitance Range 5000 pF to 0.1  $\mu$ F

#### 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  $\mu$ F to 1  $\mu$ F
- Available with encapsulation option for leaded styles only

#### ATC 520 AND 530 SERIES BROADBAND SMT CAPACITORS

##### ATC 520 L (size = 0402)

- 160 KHz to 16 GHz, 10 nF

##### ATC 530 Z (size = 0201)

- 16 KHz to 20 GHz, 100 nF

##### ATC 530 L (size = 0402)

- 16 KHz to 18 GHz, 100 nF

#### ATC GENERAL PURPOSE MLC SURFACE MOUNT CAPACTORS

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 0402, 0603, 0805, 1206, 1210, 1812 and 2225.

#### ATC HP SERIES HIGH PERFORMANCE CAPACITORS

ATC offers the new HP Series high performance family of MLC NPO ceramic capacitors. Built in a rugged ceramic SMT package, these products deliver high performance at the right price. The HP series is available in four popular EIA case sizes and is suitable for tuning, DC blocking, coupling and bypassing over the full range of wireless frequencies. All HP Series products are RoHS compliant.

- Case Size 0402: 0.2 to 30 pF, 50 WVDC
- Case Size 0603: 0.2 pF to 120 pF, up to 250 WVDC
- Case Size 0805: 1.0 pF to 160 pF, 250 WVDC
- Case Size 1210: 1.0 pF to 1000 pF, up to 500 WVD

#### ATC MILITARY (CDR) / QPL APPROVED PRODUCTS

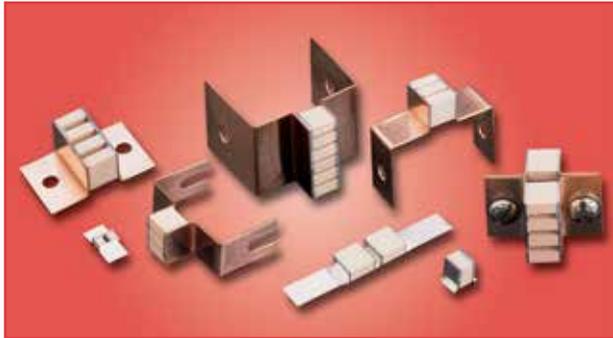
ATC is a QPL approved supplier for MIL-PRF-55681/4 and /5 fixed, multilayer, unencapsulated, monolithic porcelain and ceramic dielectric capacitors.

#### ATC COTS HIGH-REL UPSCREENING

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

► Frequency Range 1: Up to 30 MHz

**POWER CAPACITOR ASSEMBLIES**



**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.

**ATC TRANSMITTER CAPACITOR ASSEMBLIES**

ATC Transmitter Capacitor Assemblies offer a cost effective alternative to large and costly fixed vacuum capacitors, doorknobs and transmitter capacitors. ATC assemblies are ideal for the most demanding applications requiring high RF power at low frequencies. They are constructed with the finest materials and are engineered to provide the most reliable performance in the most demanding applications.

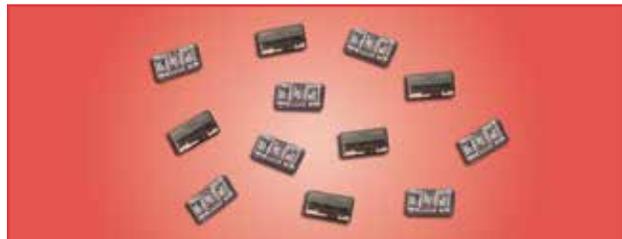
ATC's Transmitter Capacitor Assembly products are ideal for use in Plasma Generators and matching networks used in Semiconductor Manufacturing equipment, AM Broadcast Transmitters, RF Induction Heating, High Power HF amplifiers and many others.

**Attributes:**

- Capacitance Values up to 1200 pF
- High RF Power Handling Capability
- Current Handling Capability up to 156 Amps RMS @ 13.56 MHz
- 7200 Rated WVDC
- Ideal for applications between 400 KHz to 30 MHz
- Rugged Porcelain Construction for superior dielectric strength
- Heavy Cu leads (0.020") with punched holes
- Highest breakdown voltage
- NPO and P90 ultra stable dielectrics
- Available in tight tolerances

**Applications:**

- High RF Power Matching Networks
- High RF Power Tuning Circuits
- Antenna Tuning
- High RF Power Output Filter Networks



**ATC LPF SERIES HIGH PERFORMANCE LOW PASS FILTERS**

The HP LPF Series offers superb high frequency performance in low profile EIA style packages. This Series offers sharp cut-off response, excellent stopband rejection, low passband insertion loss with 50 ohm input and output impedance characteristics.

**ATC 0805**

- LPF0805HP2900L, Passband: 0 to 2900 MHz

**ATC 1206**

- LPF1206HP0512L, Passband: 0 to 512 MHz
- LPF1206HP0700L, Passband: 0 to 700 MHz

## ► Frequency Range 1: Up to 30 MHz

### INDUCTORS



#### ATC WL SERIES INDUCTOR PRODUCTS

ATC's family of RF surface mount inductors is intended to compliment its high frequency ultra-low ESR capacitor products. The WL Series is constructed with a rugged high quality ceramic core and is available in traditional EIA case sizes, 0402, 0603, 0805, 1008 and 1206, with a range extending from 1 nH to 15,000 nH.

The WL Series is intended for RF and microwave applications and features high self-resonance, high Q, low DC resistance and stable temperature coefficient of inductance. These products are especially attractive for all 800 MHz to 3.4 GHz wireless applications, providing the best balance between cost and performance.

#### ATC WL (size = 0402)

- Inductance Range: 1.0 nH @ 250 MHz to 120 nH @ 250 MHz
- Tolerances: G ( $\pm 2\%$ ), J ( $\pm 5\%$ ), K ( $\pm 10\%$ )

#### ATC WL (size = 0603)

- Inductance Range: 1.6 nH @ 250 MHz to 470 nH @ 100 MHz
- Tolerances: G ( $\pm 2\%$ ), J ( $\pm 5\%$ ), K ( $\pm 10\%$ )

#### ATC WL (size = 0805)

- Inductance Range: 2.7 nH @ 250 MHz to 4700 nH @ 7.9 MHz
- Tolerances: G ( $\pm 2\%$ ), J ( $\pm 5\%$ ), K ( $\pm 10\%$ )

#### ATC WL (size = 1008)

- Inductance Range: 4.7 nH @ 50 MHz to 15,000 nH @ 2.52 MHz
- Tolerances: G ( $\pm 2\%$ ), J ( $\pm 5\%$ ), K ( $\pm 10\%$ )

#### ATC WL (size = 1206)

- Inductance Range: 6.8 nH @ 100 MHz to 1200 nH @ 35 MHz
- Tolerances: G ( $\pm 2\%$ ), J ( $\pm 5\%$ ), K ( $\pm 10\%$ )

#### ATC 506 WLC SERIES ULTRA-BROADBAND INDUCTOR

ATC's new 506WLC Series High Frequency Ultra-Broadband Inductor (UBL) is a unique component that provides low insertion loss and an excellent match over multiple octaves of frequency spectrum.

The 506WLC is ideal for ultra-broadband DC decoupling networks and bias tee applications in optical communication systems and equipment using high-speed digital logic.

#### ATC 506WLC2R0KG250B

- Inductance: 2.0  $\mu$ H typ.
- Operating Frequency Range: 2.3 MHz to 40 GHz
- Rated DC Current: 250 mA

#### ATC 506 WLS SERIES ULTRA-BROADBAND SMT INDUCTORS

ATC's new 506WLS Series High Frequency Ultra-Broadband Inductor (UBL) is a unique component that provides low insertion loss and an excellent match over multiple octaves of frequency spectrum.

The 506WLS is ideal for ultra-broadband DC decoupling networks and bias tee applications in optical communication systems and equipment using high-speed digital logic.

#### ATC 506WLSM0R47KT815T

- Inductance: 0.47  $\mu$ H typ.
- Operating Frequency Range: 9.5 MHz to 40+ GHz
- Rated DC Current: 815 mA

#### ATC 506WLSM0R70KT619T

- Inductance: 0.7  $\mu$ H typ.
- Operating Frequency Range: 5.6 MHz to 40+ GHz
- Rated DC Current: 619 mA

#### ATC 506WLSM1R10KT438T

- Inductance: 1.1  $\mu$ H typ.
- Operating Frequency Range: 3.3 MHz to 40+ GHz
- Rated DC Current: 438mA

#### ATC 506WLSM2R00KT277T

- Inductance: 2.0  $\mu$ H typ.
- Operating Frequency Range: 2.1 MHz to 40+ GHz
- Rated DC Current: 277 mA

#### ATC 506WLSM3R80KT182T

- Inductance: 3.8  $\mu$ H typ.
- Operating Frequency Range: 1.1 MHz to 40+ GHz
- Rated DC Current: 182 mA

#### ATC 506WLSN1R47KT694T

- Inductance: 1.47  $\mu$ H typ.
- Operating Frequency Range: 2.8 MHz to 40+ GHz
- Rated DC Current: 694 mA

#### ATC 506WLSN2R00KT494T

- Inductance: 2.0  $\mu$ H typ.
- Operating Frequency Range: 1.6 MHz to 40+ GHz
- Rated DC Current: 494 mA

#### ATC 506WLSN3R30KT350T

- Inductance: 3.3  $\mu$ H typ.
- Operating Frequency Range: 1.3 MHz to 40+ GHz
- Rated DC Current: 350 mA

#### ATC 506WLSN6R00KT236T

- Inductance: 6.0  $\mu$ H typ.
- Operating Frequency Range: 700 KHz to 40+ GHz
- Rated DC Current: 236 mA

#### ATC 506WLSN10R7KT150T

- Inductance: 10.7  $\mu$ H typ.
- Operating Frequency Range: 400 KHz to 40+ GHz
- Rated DC Current: 150 mA

► Frequency Range 1: Up to 30 MHz

**RESISTORS**



**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 are designed to meet 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 and BeO Free**

**Non-magnetic products available**

**ATC HIGH POWER ATTENUATOR SERIES**

**ATC LA1 Series Leaded Attenuators**

- Power handling: up to 100 watts

**ATC FA1 Series Flanged Attenuators**

- Power handling: up to 100 watts

**ATC RF/MICROWAVE ATTENUATORS**

**ATC AT Series 0603 RF/Microwave Attenuators**

- Thin Film Design
- Power Rating: 1 watt

**ATC HIGH POWER RESISTOR SERIES**

**ATC CS1 and CW Surface Mount Resistors**

- Power handling: 4 watts to 40 watts

**ATC CR1 Chip Resistors**

- Power handling: 5 watts to 250 watts

**ATC LR1 Leaded Chip Resistors**

- Power handling: 30 watts to 250 watts

**ATC FR1 Flanged Resistors**

- Power handling: 15 watts to 250 watts

**ATC HIGH POWER TERMINATION SERIES**

**ATC CZ1 Series Surface Mount Terminations**

- Power handling: 10 watts to 40 watts

**ATC CT1 Series Chip Terminations**

- Power handling: 20 watts to 250 watts

**ATC LT1 Series Leaded Terminations**

- Power handling: 20 watts to 2250 watts

**ATC FT1 Series Flanged Terminations**

- Power handling: 20 watts to 250 watts

**ATC JUMPERS**

- Substrate Material: Aluminum Nitride
- Terminals: Silver
- Operating Temp Range: -55 to +150°C
- Reliability: MIL-PRF-55342
- Lead-Free, RoHS Compliant

**ATC 504 L SERIES ULTRA-BROADBAND RESISTORS**

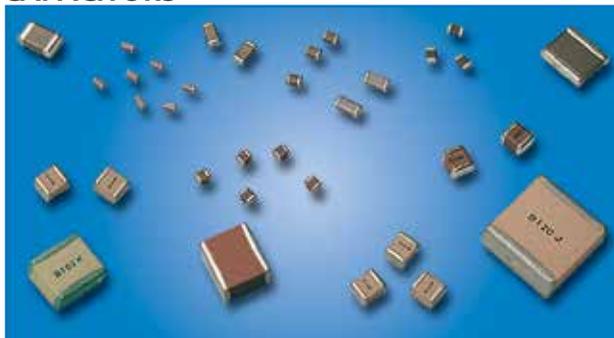
The 504L Series next generation of surface mount Ultra-Broadband Resistors was designed with our proprietary Glass Sandwich Flexitem® Technology, (GSFT). The Flexitem® is a surface mountable automotive qualified termination that adds an extra margin against damage due to flexure during installation.

The 504L Series has been designed with high quality selected materials that yield excellent performance. This product is ideal for use in Optical Transceiver Modules or any application requiring excellent ultra-broadband performance.

- Standard Resistance Values (Ω): 25Ω, 50Ω, 100Ω, 200Ω
- Frequency Range: DC to 20 GHz
- EIA 0402 Case Size
- Power Rating: 125 mW
- Operating Temperature: -40°C to +125°C
- 100% Laser Trimming for Tight Tolerances
- RoHS Compliant

## ► Frequency Range 2: >30 MHz to 800 MHz

### CAPACITORS



#### 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

##### 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 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 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 wire-less frequencies, highest self resonance and superior thermal performance.

##### ATC 800 C (size = .250" x .250")

- Capacitance Range 2.2 pF to 3000 pF

##### ATC 800 E (size = .380" x .380")

- Capacitance Range 3.3 pF to 5100 pF

##### ATC 800 H (size = .720" x .740")

- Capacitance Range 100 pF to 20,000 pF

#### ATC 400 SERIES PRECISION TOLERANCE CAPACITORS

##### ATC 400 L (size = 0402)

- Capacitance Range 0.1 pF to 68 pF
- Voltage Rating: 200 WVDC

##### ATC 400 S (size = 0603)

- Capacitance Range 0.1 pF to 68 pF
- Voltage Rating: 200 WVDC

#### 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  $\mu$ F

##### ATC 200 B (size = .110" x .110")

- Capacitance Range 5000 pF to 0.1  $\mu$ F

#### 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  $\mu$ F to 1  $\mu$ F
- Available with encapsulation option for leaded styles only

#### ATC 520 AND 530 SERIES BROADBAND SMT CAPACITORS

##### ATC 520 L (size = 0402)

- 160 KHz to 16 GHz, 10 nF

##### ATC 530 Z (size = 0201)

- 16 KHz to 20 GHz, 100 nF

##### ATC 530 L (size = 0402)

- 16 KHz to 18 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 0402, 0603, 0805, 1206, 1210, 1812 and 2225.

#### ATC HP SERIES HIGH PERFORMANCE CAPACITORS

ATC offers the new HP Series high performance family of MLC NPO ceramic capacitors. Built in a rugged ceramic SMT package, these products deliver high performance at the right price. The HP series is available in four popular EIA case sizes and is suitable for tuning, DC blocking, coupling and bypassing over the full range of wireless frequencies. All HP Series products are RoHS compliant.

- Case Size 0402: 0.2 to 30 pF, 50 WVDC

- Case Size 0603: 0.2 pF to 120 pF, up to 250 WVDC

- Case Size 0805: 1.0 pF to 160 pF, 250 WVDC

- Case Size 1210: 1.0 pF to 1000 pF, up to 500 WVDC

#### ATC MILITARY (CDR) / QPL APPROVED PRODUCTS

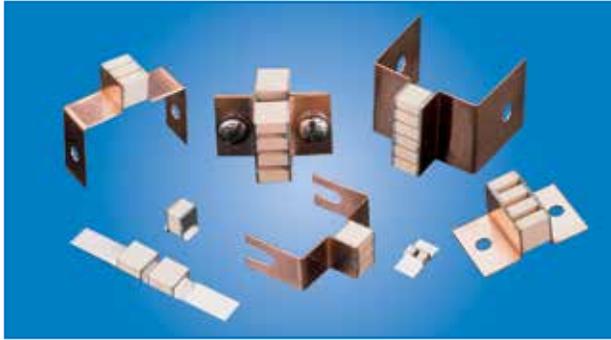
ATC is a QPL approved supplier for MIL-PRF-55681/4 and /5 fixed, multilayer, unencapsulated, monolithic porcelain and ceramic dielectric capacitors.

#### ATC COTS HIGH-REL UPSCREENING

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

► Frequency Range 2: >30 MHz to 800 MHz

**POWER CAPACITOR ASSEMBLIES**



**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.

**ATC TRANSMITTER CAPACITOR ASSEMBLIES**

ATC Transmitter Capacitor Assemblies offer a cost effective alternative to large and costly fixed vacuum capacitors, doorknobs and transmitter capacitors. ATC assemblies are ideal for the most demanding applications requiring high RF power at low frequencies. They are constructed with the finest materials and are engineered to provide the most reliable performance in the most demanding applications.

ATC's Transmitter Capacitor Assembly products are ideal for use in Plasma Generators and matching networks used in Semiconductor Manufacturing equipment, AM Broadcast Transmitters, RF Induction Heating, High Power HF amplifiers and many others.

**Attributes:**

- Capacitance Values up to 1200 pF
- High RF Power Handling Capability
- Current Handling Capability up to 156 Amps RMS @ 13.56 MHz
- 7200 Rated WVDC
- Ideal for applications between 400 KHz to 30 MHz
- Rugged Porcelain Construction for superior dielectric strength
- Heavy Cu leads (0.020") with punched holes
- Highest breakdown voltage
- NPO and P90 ultra stable dielectrics
- Available in tight tolerances

**Applications:**

- High RF Power Matching Networks
- High RF Power Tuning Circuits
- Antenna Tuning
- High RF Power Output Filter Networks



**ATC LPF SERIES HIGH PERFORMANCE LOW PASS FILTERS**

The HP LPF Series offers superb high frequency performance in low profile EIA style packages. This Series offers sharp cut-off response, excellent stopband rejection, low passband insertion loss with 50 ohm input and output impedance characteristics.

**ATC 0805**

- LPF0805HP2900L, Passband: 0 to 2900 MHz

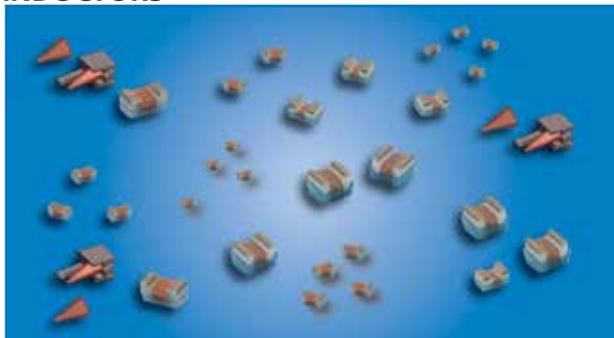
**ATC 1206**

- LPF1206HP0512L, Passband: 0 to 512 MHz
- LPF1206HP0700L, Passband: 0 to 700 MHz

Frequency Range 2:  
>30 MHz to 800 MHz

## ► Frequency Range 2: >30 MHz to 800 MHz

### INDUCTORS



#### ATC WL SERIES INDUCTOR PRODUCTS

ATC's family of RF surface mount inductors is intended to compliment its high frequency ultra-low ESR capacitor products. The WL Series is constructed with a rugged high quality ceramic core and is available in traditional EIA case sizes, 0402, 0603, 0805, 1008 and 1206, with a range extending from 1 nH to 15,000 nH.

The WL Series is intended for RF and microwave applications and features high self-resonance, high Q, low DC resistance and stable temperature coefficient of inductance. These products are especially attractive for all 800 MHz to 3.4 GHz wireless applications, providing the best balance between cost and performance.

#### ATC WL (size = 0402)

- Inductance Range: 1.0 nH @ 250 MHz to 120 nH @ 250 MHz
- Tolerances: G ( $\pm 2\%$ ), J ( $\pm 5\%$ ), K ( $\pm 10\%$ )

#### ATC WL (size = 0603)

- Inductance Range: 1.6 nH @ 250 MHz to 470 nH @ 100 MHz
- Tolerances: G ( $\pm 2\%$ ), J ( $\pm 5\%$ ), K ( $\pm 10\%$ )

#### ATC WL (size = 0805)

- Inductance Range: 2.7 nH @ 250 MHz to 4700 nH @ 7.9 MHz
- Tolerances: G ( $\pm 2\%$ ), J ( $\pm 5\%$ ), K ( $\pm 10\%$ )

#### ATC WL (size = 1008)

- Inductance Range: 4.7 nH @ 50 MHz to 15,000 nH @ 2.52 MHz
- Tolerances: G ( $\pm 2\%$ ), J ( $\pm 5\%$ ), K ( $\pm 10\%$ )

#### ATC WL (size = 1206)

- Inductance Range: 6.8 nH @ 100 MHz to 1200 nH @ 35 MHz
- Tolerances: G ( $\pm 2\%$ ), J ( $\pm 5\%$ ), K ( $\pm 10\%$ )

#### ATC 506 WLC SERIES ULTRA-BROADBAND INDUCTOR

ATC's new 506WLC Series High Frequency Ultra-Broadband Inductor (UBL) is a unique component that provides low insertion loss and an excellent match over multiple octaves of frequency spectrum.

The 506WLC is ideal for ultra-broadband DC decoupling networks and bias tee applications in optical communication systems and equipment using high-speed digital logic.

#### ATC 506WLC2R0KG250B

- Inductance: 2.0  $\mu$ H typ.
- Operating Frequency Range: 2.3 MHz to 40 GHz
- Rated DC Current: 250 mA

#### ATC 506 WLS SERIES ULTRA-BROADBAND SMT INDUCTORS

ATC's new 506WLS Series High Frequency Ultra-Broadband Inductor (UBL) is a unique component that provides low insertion loss and an excellent match over multiple octaves of frequency spectrum.

The 506WLS is ideal for ultra-broadband DC decoupling networks and bias tee applications in optical communication systems and equipment using high-speed digital logic.

#### ATC 506WLSM0R47KT815T

- Inductance: 0.47  $\mu$ H typ.
- Operating Frequency Range: 9.5 MHz to 40+ GHz
- Rated DC Current: 815 mA

#### ATC 506WLSM0R70KT619T

- Inductance: 0.7  $\mu$ H typ.
- Operating Frequency Range: 5.6 MHz to 40+ GHz
- Rated DC Current: 619 mA

#### ATC 506WLSM1R10KT438T

- Inductance: 1.1  $\mu$ H typ.
- Operating Frequency Range: 3.3 MHz to 40+ GHz
- Rated DC Current: 438mA

#### ATC 506WLSM2R00KT277T

- Inductance: 2.0  $\mu$ H typ.
- Operating Frequency Range: 2.1 MHz to 40+ GHz
- Rated DC Current: 277 mA

#### ATC 506WLSM3R80KT182T

- Inductance: 3.8  $\mu$ H typ.
- Operating Frequency Range: 1.1 MHz to 40+ GHz
- Rated DC Current: 182 mA

#### ATC 506WLSN1R47KT694T

- Inductance: 1.47  $\mu$ H typ.
- Operating Frequency Range: 2.8 MHz to 40+ GHz
- Rated DC Current: 694 mA

#### ATC 506WLSN2R00KT494T

- Inductance: 2.0  $\mu$ H typ.
- Operating Frequency Range: 1.6 MHz to 40+ GHz
- Rated DC Current: 494 mA

#### ATC 506WLSN3R30KT350T

- Inductance: 3.3  $\mu$ H typ.
- Operating Frequency Range: 1.3 MHz to 40+ GHz
- Rated DC Current: 350 mA

#### ATC 506WLSN6R00KT236T

- Inductance: 6.0  $\mu$ H typ.
- Operating Frequency Range: 700 KHz to 40+ GHz
- Rated DC Current: 236 mA

#### ATC 506WLSN10R7KT150T

- Inductance: 10.7  $\mu$ H typ.
- Operating Frequency Range: 400 KHz to 40+ GHz
- Rated DC Current: 150 mA

► **Frequency Range 2: >30 MHz to 800 MHz**

**RESISTORS**



**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 are designed to meet 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 and BeO Free**

**Non-magnetic products available**

**ATC HIGH POWER ATTENUATOR SERIES**

**ATC LA1 Series Leaded Attenuators**

- Power handling: up to 100 watts

**ATC FA1 Series Flanged Attenuators**

- Power handling: up to 100 watts

**ATC RF/MICROWAVE ATTENUATORS**

**ATC AT Series 0603 RF/Microwave Attenuators**

- Thin Film Design
- Power Rating: 1 watt

**ATC HIGH POWER RESISTOR SERIES**

**ATC CS1 and CW Surface Mount Resistors**

- Power handling: 4 watts to 40 watts

**ATC CR1 Chip Resistors**

- Power handling: 5 watts to 250 watts

**ATC LR1 Leaded Chip Resistors**

- Power handling: 30 watts to 250 watts

**ATC FR1 Flanged Resistors**

- Power handling: 15 watts to 250 watts

**ATC HIGH POWER TERMINATION SERIES**

**ATC CZ1 Series Surface Mount Terminations**

- Power handling: 10 watts to 40 watts

**ATC CT1 Series Chip Terminations**

- Power handling: 20 watts to 250 watts

**ATC LT1 Series Leaded Terminations**

- Power handling: 20 watts to 250 watts

**ATC FT1 Series Flanged Terminations**

- Power handling: 20 watts to 250 watts

**ATC JUMPERS**

- Substrate Material: Aluminum Nitride
- Terminals: Silver
- Operating Temp Range: -55 to +150°C
- Reliability: MIL-PRF-55342
- Lead-Free, RoHS Compliant

**ATC 504 L SERIES ULTRA-BROADBAND RESISTORS**

The 504L Series next generation of surface mount Ultra-Broadband Resistors was designed with our proprietary Glass Sandwich Flexitem® Technology, (GSFT). The Flexitem® is a surface mountable automotive qualified termination that adds an extra margin against damage due to flexure during installation.

The 504L Series has been designed with high quality selected materials that yield excellent performance. This product is ideal for use in Optical Transceiver Modules or any application requiring excellent ultra-broadband performance.

- Standard Resistance Values (Ω): 25Ω, 50Ω, 100Ω, 200Ω
- Frequency Range: DC to 20 GHz
- EIA 0402 Case Size
- Power Rating: 125 mW
- Operating Temperature: -40°C to +125°C
- 100% Laser Trimming for Tight Tolerances
- RoHS Compliant

## ► Frequency Range 3: >800 MHz to 3.5 GHz

### CAPACITORS



#### 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

#### 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

#### 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 400 SERIES PRECISION TOLERANCE CAPACITORS

##### ATC 400 W (size = 01005)

- Capacitance Range 0.05 pF to 2.4 pF
- Voltage Rating: 16 WVDC

##### ATC 400 Z (size = 0201)

- Capacitance Range 0.1 pF to 22 pF
- Voltage Rating: 100 WVDC

##### ATC 400 L (size = 0402)

- Capacitance Range 0.1 pF to 68 pF
- Voltage Rating: 200 WVDC

##### ATC 400 S (size = 0603)

- Capacitance Range 0.1 pF to 68 pF
- Voltage Rating: 200 WVDC

#### 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 500 S SERIES MILLIMETER-WAVE SMT CAPACITORS

- Low insertion loss and ultra-high self resonance surface mount millimeter-wave capacitors

#### ATC 520 AND 530 SERIES BROADBAND SMT CAPACITORS

##### ATC 520 L (size = 0402)

- 160 KHz to 16 GHz, 10 nF

##### ATC 530 Z (size = 0201)

- 16 KHz to 20 GHz, 100 nF

##### ATC 530 L (size = 0402)

- 16 KHz to 18 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 0402, 0603, 0805, 1206, 1210, 1812 and 2225.

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- Case Size 0402: 0.2 to 30 pF, 50 WVDC
- Case Size 0603: 0.2 pF to 120 pF, up to 250 WVDC
- Case Size 0805: 1.0 pF to 160 pF, 250 WVDC
- Case Size 1210: 1.0 pF to 1000 pF, up to 500 WVD

#### ATC MILITARY (CDR) / QPL APPROVED PRODUCTS

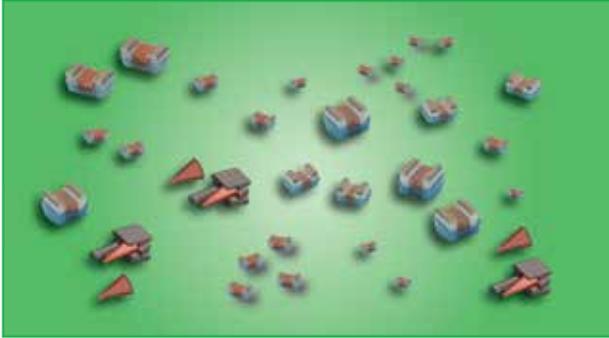
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#### ATC COTS HIGH-REL UPSCREENING

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

► Frequency Range 3: >800 MHz to 3.5 GHz

**INDUCTORS**



**ATC WL SERIES INDUCTOR PRODUCTS**

ATC's family of RF surface mount inductors is intended to compliment its high frequency ultra-low ESR capacitor products. The WL Series is constructed with a rugged high quality ceramic core and is available in traditional EIA case sizes, 0402, 0603, 0805, 1008 and 1206, with a range extending from 1 nH to 15,000 nH.

The WL Series is intended for RF and microwave applications and features high self-resonance, high Q, low DC resistance and stable temperature coefficient of inductance. These products are especially attractive for all 800 MHz to 3.4 GHz wireless applications, providing the best balance between cost and performance.

**ATC WL (size = 0402)**

- Inductance Range: 1.0 nH @ 250 MHz to 120 nH @ 250 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

**ATC WL (size = 0603)**

- Inductance Range: 1.6 nH @ 250 MHz to 470 nH @ 100 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

**ATC WL (size = 0805)**

- Inductance Range: 2.7 nH @ 250 MHz to 4700 nH @ 7.9 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

**ATC WL (size = 1008)**

- Inductance Range: 4.7 nH @ 50 MHz to 15,000 nH @ 2.52 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: G (±2%), J (±5%), K (±10%)

**ATC 506 WLC SERIES ULTRA-BROADBAND INDUCTOR**

ATC's new 506WLC Series High Frequency Ultra-Broadband Inductor (UBL) is a unique component that provides low insertion loss and an excellent match over multiple octaves of frequency spectrum.

The 506WLC is ideal for ultra-broadband DC decoupling networks and bias tee applications in optical communication systems and equipment using high-speed digital logic.

**ATC 506WLC2R0KG250B**

- Inductance: 2.0 µH typ.
- Operating Frequency Range: 2.3 MHz to 40 GHz
- Rated DC Current: 250 mA

**ATC 506 WLS SERIES ULTRA-BROADBAND SMT INDUCTORS**

ATC's new 506WLS Series High Frequency Ultra-Broadband Inductor (UBL) is a unique component that provides low insertion loss and an excellent match over multiple octaves of frequency spectrum.

The 506WLS is ideal for ultra-broadband DC decoupling networks and bias tee applications in optical communication systems and equipment using high-speed digital logic.

**ATC 506WLSM0R47KT815T**

- Inductance: 0.47 µH typ.
- Operating Frequency Range: 9.5 MHz to 40+ GHz
- Rated DC Current: 815 mA

**ATC 506WLSM0R70KT619T**

- Inductance: 0.7 µH typ.
- Operating Frequency Range: 5.6 MHz to 40+ GHz
- Rated DC Current: 619 mA

**ATC 506WLSM1R10KT438T**

- Inductance: 1.1 µH typ.
- Operating Frequency Range: 3.3 MHz to 40+ GHz
- Rated DC Current: 438mA

**ATC 506WLSM2R00KT277T**

- Inductance: 2.0 µH typ.
- Operating Frequency Range: 2.1 MHz to 40+ GHz
- Rated DC Current: 277 mA

**ATC 506WLSM3R80KT182T**

- Inductance: 3.8 µH typ.
- Operating Frequency Range: 1.1 MHz to 40+ GHz
- Rated DC Current: 182 mA

**ATC 506WLSN1R47KT694T**

- Inductance: 1.47 µH typ.
- Operating Frequency Range: 2.8 MHz to 40+ GHz
- Rated DC Current: 694 mA

**ATC 506WLSN2R00KT494T**

- Inductance: 2.0 µH typ.
- Operating Frequency Range: 1.6 MHz to 40+ GHz
- Rated DC Current: 494 mA

**ATC 506WLSN3R30KT350T**

- Inductance: 3.3 µH typ.
- Operating Frequency Range: 1.3 MHz to 40+ GHz
- Rated DC Current: 350 mA

**ATC 506WLSN6R00KT236T**

- Inductance: 6.0 µH typ.
- Operating Frequency Range: 700 KHz to 40+ GHz
- Rated DC Current: 236 mA

**ATC 506WLSN10R7KT150T**

- Inductance: 10.7 µH typ.
- Operating Frequency Range: 400 KHz to 40+ GHz
- Rated DC Current: 150 mA

Frequency Range 3:  
>800 MHz to 3.5 GHz

## ► Frequency Range 3: >800 MHz to 3.5 GHz

### RESISTORS



#### 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 are designed to meet 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 and BeO Free**

#### **Non-magnetic products available**

#### ATC HIGH POWER ATTENUATOR SERIES

##### ATC LA1 Series Leaded Attenuators

- Power handling: up to 100 watts

##### ATC FA1 Series Flanged Attenuators

- Power handling: up to 100 watts

#### ATC RF/MICROWAVE ATTENUATORS

##### ATC AT Series 0603 RF/Microwave Attenuators

- Thin Film Design
- Power Rating: 1 watt

#### ATC HIGH POWER RESISTOR SERIES

##### ATC CS1 and CW Surface Mount Resistors

- Power handling: 4 watts to 40 watts

##### ATC CR1 Chip Resistors

- Power handling: 5 watts to 250 watts

##### ATC LR1 Leaded Chip Resistors

- Power handling: 30 watts to 250 watts

##### ATC FR1 Flanged Resistors

- Power handling: 15 watts to 250 watts

#### ATC HIGH POWER TERMINATION SERIES

##### ATC CZ1 Series Surface Mount Terminations

- Power handling: 10 watts to 40 watts

##### ATC CT1 Series Chip Terminations

- Power handling: 20 watts to 250 watts

##### ATC LT1 Series Leaded Terminations

- Power handling: 20 watts to 250 watts

##### ATC FT1 Series Flanged Terminations

- Power handling: 20 watts to 250 watts

#### ATC JUMPERS

- Substrate Material: Aluminum Nitride
- Terminals: Silver
- Operating Temp Range: -55 to +150°C
- Reliability: MIL-PRF-55342
- Lead-Free, RoHS Compliant

#### ATC 504 L SERIES ULTRA-BROADBAND RESISTORS

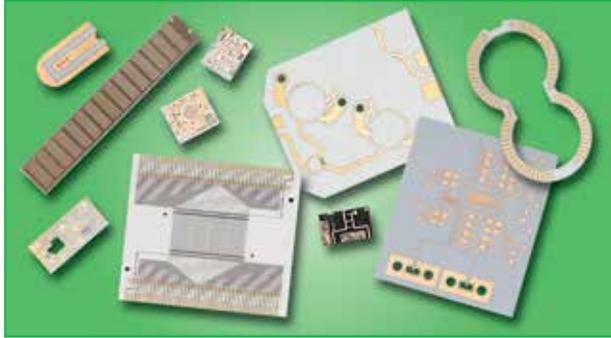
The 504L Series next generation of surface mount Ultra-Broadband Resistors was designed with our proprietary Glass Sandwich Flexitem® Technology, (GSFT). The Flexitem® is a surface mountable automotive qualified termination that adds an extra margin against damage due to flexure during installation.

The 504L Series has been designed with high quality selected materials that yield excellent performance. This product is ideal for use in Optical Transceiver Modules or any application requiring excellent ultra-broadband performance.

- Standard Resistance Values (Ω): 25Ω, 50Ω, 100Ω, 200Ω
- Frequency Range: DC to 20 GHz
- EIA 0402 Case Size
- Power Rating: 125 mW
- Operating Temperature: -40°C to +125°C
- 100% Laser Trimming for Tight Tolerances
- RoHS Compliant

► Frequency Range 3: >800 MHz to 3.5 GHz

**THIN FILM**



**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), 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: SiO<sub>2</sub>, 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<sub>3</sub>N<sub>4</sub>, BCB and polyimide
- Vias: Sputtered, enhanced plated, filled and castellations
- I/Os: BGA, LGA, edge wrap, through via and wire or ribbon bond
- Machining:
  - CO<sub>2</sub> 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

**MOS SINGLE LAYER CAPACITORS**

ATC//AVX Thin Film Technologies offers semi-custom thin film Metal Oxide Semiconductor (MOS) Single Layer Capacitors suitable for RF/ microwave and millimeter-wave applications. The silicon oxide dielectric is fabricated with high temperature processing resulting in excellent uniformity and stability.

ATC//AVX Thin Film Technologies' unique processing and materials sets result in MOS capacitors with high Q, excellent temperature stability, high dielectric strength, high insulation resistance and low ESR. A wide range of termination metallizations are available to facilitate epoxy, solder die attach, thermosonic and ultrasonic bonding and gold or aluminum wire bonding. Custom applications and designs are welcome. Consult factory for additional information

**Typical Electrical Specifications**

Material	MOS (SiO <sub>2</sub> )
pF/mm <sup>2</sup> Typical	85 @ 50V rated
TCC	±30 ppm/°C
Rated Voltage	≤100
Peak Voltage at +25°C	1.5 x Rated
D	≤0.1%

**ATC 504 L SERIES ULTRA-BROADBAND RESISTORS**

The 504L Series next generation of surface mount Ultra-Broadband Resistors was designed with our proprietary Glass Sandwich Flexitem® Technology, (GSFT). The Flexitem® is a surface mountable automotive qualified termination that adds an extra margin against damage due to flexure during installation.

The 504L Series has been designed with high quality selected materials that yield excellent performance. This product is ideal for use in Optical Transceiver Modules or any application requiring excellent ultra-broadband performance.

- Standard Resistance Values (Ω): 25Ω, 50Ω, 100Ω, 200Ω
- Frequency Range: DC to 20 GHz
- EIA 0402 Case Size
- Power Rating: 125 mW
- Operating Temperature: -40°C to +125°C
- 100% Laser Trimming for Tight Tolerances
- RoHS Compliant



**ATC LPF SERIES HIGH PERFORMANCE LOW PASS FILTERS**

The HP LPF Series offers superb high frequency performance in low profile EIA style packages. This Series offers sharp cut-off response, excellent stopband rejection, low passband insertion loss with 50 ohm input and output impedance characteristics.

**ATC 0805**

- LPF0805HP2900L, Passband: 0 to 2900 MHz

**ATC 1206**

- LPF1206HP0512L, Passband: 0 to 512 MHz
- LPF1206HP0700L, Passband: 0 to 700 MHz

## ► Frequency Range 4: >3.5 GHz to 100 GHz

### CAPACITORS



#### 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 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 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 400 SERIES PRECISION TOLERANCE CAPACITORS

##### ATC 400 W (size = 01005)

- Capacitance Range 0.05 pF to 2.4 pF
- Voltage Rating: 16 WVDC

##### ATC 400 Z (size = 0201)

- Capacitance Range 0.1 pF to 22 pF
- Voltage Rating: 100 WVDC

##### ATC 400 L (size = 0402)

- Capacitance Range 0.1 pF to 68 pF
- Voltage Rating: 200 WVDC

##### ATC 400 S (size = 0603)

- Capacitance Range 0.1 pF to 68 pF
- Voltage Rating: 200 WVDC

#### 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 500 S SERIES MILLIMETER-WAVE SMT CAPACITORS

- Low insertion loss and ultra-high self resonance surface mount millimeter-wave capacitors

#### ATC 520 AND 530 SERIES BROADBAND SMT CAPACITORS

##### ATC 520 L (size = 0402)

- 160 KHz to 16 GHz, 10 nF

##### ATC 530 Z (size = 0201)

- 16 KHz to 20 GHz, 100 nF

##### ATC 530 L (size = 0402)

- 16 KHz to 18 GHz, 100 nF

#### ATC HP SERIES HIGH PERFORMANCE CAPACITORS

ATC offers the new HP Series high performance family of MLC NPO ceramic capacitors. Built in a rugged ceramic SMT package, these products deliver high performance at the right price. The HP series is available in four popular EIA case sizes and is suitable for tuning, DC blocking, coupling and bypassing over the full range of wireless frequencies. All HP Series products are RoHS compliant.

- Case Size 0402: 0.2 to 30 pF, 50 WVDC
- Case Size 0603: 0.2 pF to 120 pF, up to 250 WVDC
- Case Size 0805: 1.0 pF to 160 pF, 250 WVDC
- Case Size 1210: 1.0 pF to 1000 pF, up to 500 WVD

#### ATC MILITARY (CDR) / QPL APPROVED 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 HIGH-REL UPSCREENING

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

► Frequency Range 4: >3.5 GHz to 100 GHz

**INDUCTORS**



**ATC WL SERIES INDUCTOR PRODUCTS**

ATC's family of RF surface mount inductors is intended to compliment its high frequency ultra-low ESR capacitor products. The WL Series is constructed with a rugged high quality ceramic core and is available in traditional EIA case sizes, 0402, 0603, 0805, 1008 and 1206, with a range extending from 1 nH to 15,000 nH.

The WL Series is intended for RF and microwave applications and features high self-resonance, high Q, low DC resistance and stable temperature coefficient of inductance. These products are especially attractive for all 800 MHz to 3.4 GHz wireless applications, providing the best balance between cost and performance.

**ATC WL (size = 0402)**

- Inductance Range: 1.0 nH @ 250 MHz to 120 nH @ 250 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

**ATC WL (size = 0603)**

- Inductance Range: 1.6 nH @ 250 MHz to 470 nH @ 100 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

**ATC WL (size = 0805)**

- Inductance Range: 2.7 nH @ 250 MHz to 4700 nH @ 7.9 MHz
- Tolerances: G (±2%), J (±5%), K (±10%)

**ATC WL (size = 1008)**

- Inductance Range: 4.7 nH @ 50 MHz to 15,000 nH @ 2.52 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: G (±2%), J (±5%), K (±10%)

**ATC 506 WLC SERIES ULTRA-BROADBAND INDUCTOR**

ATC's new 506WLC Series High Frequency Ultra-Broadband Inductor (UBL) is a unique component that provides low insertion loss and an excellent match over multiple octaves of frequency spectrum.

The 506WLC is ideal for ultra-broadband DC decoupling networks and bias tee applications in optical communication systems and equipment using high-speed digital logic.

**ATC 506WLC2R0KG250B**

- Inductance: 2.0 µH typ.
- Operating Frequency Range: 2.3 MHz to 40 GHz
- Rated DC Current: 250 mA

**ATC 506 WLS SERIES ULTRA-BROADBAND SMT INDUCTORS**

ATC's new 506WLS Series High Frequency Ultra-Broadband Inductor (UBL) is a unique component that provides low insertion loss and an excellent match over multiple octaves of frequency spectrum.

The 506WLS is ideal for ultra-broadband DC decoupling networks and bias tee applications in optical communication systems and equipment using high-speed digital logic.

**ATC 506WLSM0R47KT815T**

- Inductance: 0.47 µH typ.
- Operating Frequency Range: 9.5 MHz to 40+ GHz
- Rated DC Current: 815 mA

**ATC 506WLSM0R70KT619T**

- Inductance: 0.7 µH typ.
- Operating Frequency Range: 5.6 MHz to 40+ GHz
- Rated DC Current: 619 mA

**ATC 506WLSM1R10KT438T**

- Inductance: 1.1 µH typ.
- Operating Frequency Range: 3.3 MHz to 40+ GHz
- Rated DC Current: 438mA

**ATC 506WLSM2R00KT277T**

- Inductance: 2.0 µH typ.
- Operating Frequency Range: 2.1 MHz to 40+ GHz
- Rated DC Current: 277 mA

**ATC 506WLSM3R80KT182T**

- Inductance: 3.8 µH typ.
- Operating Frequency Range: 1.1 MHz to 40+ GHz
- Rated DC Current: 182 mA

**ATC 506WLSN1R47KT694T**

- Inductance: 1.47 µH typ.
- Operating Frequency Range: 2.8 MHz to 40+ GHz
- Rated DC Current: 694 mA

**ATC 506WLSN2R00KT494T**

- Inductance: 2.0 µH typ.
- Operating Frequency Range: 1.6 MHz to 40+ GHz
- Rated DC Current: 494 mA

**ATC 506WLSN3R30KT350T**

- Inductance: 3.3 µH typ.
- Operating Frequency Range: 1.3 MHz to 40+ GHz
- Rated DC Current: 350 mA

**ATC 506WLSN6R00KT236T**

- Inductance: 6.0 µH typ.
- Operating Frequency Range: 700 KHz to 40+ GHz
- Rated DC Current: 236 mA

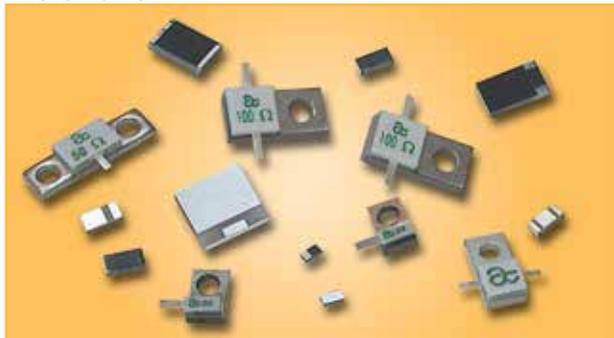
**ATC 506WLSN10R7KT150T**

- Inductance: 10.7 µH typ.
- Operating Frequency Range: 400 KHz to 40+ GHz
- Rated DC Current: 150 mA

Frequency Range 4:  
>3.5 GHz to 100 GHz

## ► Frequency Range 4: >3.5 GHz to 100 GHz

### RESISTORS



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- Resistors: Low parasitic capacitance (See catalog)
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#### Mechanical Specifications:

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- **Lead-Free, RoHS compliant and BeO Free**

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#### ATC HIGH POWER ATTENUATOR SERIES

##### ATC LA1 Series Leaded Attenuators

- Power handling: up to 100 watts

##### ATC FA1 Series Flanged Attenuators

- Power handling: up to 100 watts

#### ATC RF/MICROWAVE ATTENUATORS

##### ATC AT Series 0603 RF/Microwave Attenuators

- Thin Film Design
- Power Rating: 1 watt

#### ATC HIGH POWER RESISTOR SERIES

##### ATC CS1 and CW Surface Mount Resistors

- Power handling: 4 watts to 40 watts

##### ATC CR1 Chip Resistors

- Power handling: 5 watts to 250 watts

##### ATC LR1 Leaded Chip Resistors

- Power handling: 30 watts to 250 watts

##### ATC FR1 Flanged Resistors

- Power handling: 25 watts to 250 watts

#### ATC HIGH POWER TERMINATION SERIES

##### ATC CZ1 Series Surface Mount Terminations

- Power handling: 10 watts to 40 watts

##### ATC CT1 Series Chip Terminations

- Power handling: 20 watts to 250 watts

##### ATC LT1 Series Leaded Terminations

- Power handling: 20 watts to 250 watts

##### ATC FT1 Series Flanged Terminations

- Power handling: 20 watts to 250 watts

#### ATC JUMPERS

- Substrate Material: Aluminum Nitride
- Terminals: Silver
- Operating Temp Range: -55 to +150°C
- Reliability: MIL-PRF-55342
- Lead-Free, RoHS Compliant

#### ATC 504 L SERIES ULTRA-BROADBAND RESISTORS

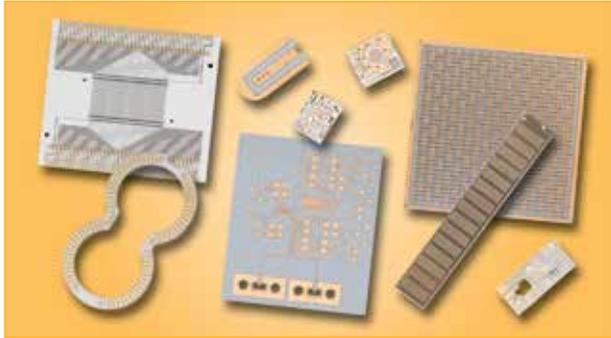
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- EIA 0402 Case Size
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► Frequency Range 4: >3.5 GHz to 100 GHz

**THIN FILM**



**THIN FILM TECHNOLOGIES**

**Combined Capabilities**

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  - Encapsulation
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  - 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
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  - Specialized modules
- Medical and Instrumentation:
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  - In-circuit trimmed designs
  - Telemetry filters
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- Broadband infrastructure:
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**Typical Electrical Specifications**

Material	MOS (SiO <sub>2</sub> )
pF/mm <sup>2</sup> Typical	85 @ 50V rated
TCC	±30 ppm/°C
Rated Voltage	≤100
Peak Voltage at +25°C	1.5 x Rated
D	≤0.1%

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- Frequency Range: DC to 20 GHz
- EIA 0402 Case Size
- Power Rating: 125 mW
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- RoHS Compliant



**ATC LPF SERIES HIGH PERFORMANCE LOW PASS FILTERS**

The HP LPF Series offers superb high frequency performance in low profile EIA style packages. This Series offers sharp cut-off response, excellent stopband rejection, low passband insertion loss with 50 ohm input and output impedance characteristics.

**ATC 0805**

- LPF0805HP2900L, Passband: 0 to 2900 MHz

**ATC 1206**

- LPF1206HP0512L, Passband: 0 to 512 MHz
- LPF1206HP0700L, Passband: 0 to 700 MHz



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### DC and RF Specifications:

- Resistance value: 50Ω and 100Ω standard (10Ω to 200Ω 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**
- **BeO Free**

Visit ATC's website for Leaded and Flanged devices.

Order Resistive Product Design Kits Online at [www.atceramics.com](http://www.atceramics.com)

## High Power Resistive Products Overview

ATC High Power RF Resistive Products	Sizes/Flange Options	Power	Capacitance/VSWR
LA1 High Power Leaded Chip Attenuators	3740	150w	Attenuation: 1 dB thru 30 dB
FA1 High Power Flange Mount Attenuators	2 hole	150w	Attenuation:1 dB thru 30 dB
CS1 Series Surface Mount Chip Resistors	2010 thru 3737	10w thru 40w	.95pf thru 3.5pf
CW1 Series Surface Mount Chip Resistors	2010 thru 3737	4w thru 10w	.95pf thru 3.5pf
CR1 Series Chip Resistors	1005 thru 3737	5w thru 250w	.75pf thru 6pf
LR1 Series Leaded Chip Resistors	2010 thru 3737	30w thru 250w	1.0pf thru 6pf
FR1 Series Flange Resistors	1 hole, 2 hole	20w thru 250w	1.0pf thru 6.5pf
CZ1 Series Surface Mount Chip Terminations Freq. range DC-4 GHz	2010 thru 3737	10w thru 40w	1.20:1 thru 1.25:1
CT1 Series Chip Terminations Freq. range DC-18 GHz	1020 thru 3737	20w thru 250w	1.15:1 thru 1.25:1
LT1 Series Leaded Chip Terminations Freq range DC-18GHz	1020 thru 3737	20w thru 250w	1.15:1 thru 1.25:1
FT1 Series Flange Terminations Freq. range DC-18GHz	1 hole, 2 hole	20w thru 250w	1.10:1 thru 1.30:1

## ATC AT Series 0603 RF/Microwave Attenuators

ATC's AT Series RF / Microwave SMT Attenuators are constructed with Aluminum Nitride (AlN) and are available in a standard EIA 0603 case size. These devices are suitable for a wide range of RF / Microwave applications in Telecommunications, Satellite Communications, Cellular Base Stations, Microwave Radio, ISM, Military / Aerospace and Test and Measurement instrumentation.

The AT Series provides virtually flat loss over a broad frequency spectrum and is ideal where low noise and low parasitic capacitance is required. Thin film metallization provides stable characteristics over temperature and time. Its balanced Pi design provides even current distribution and accurate attenuation characteristics from DC to 20 GHz. designed to meet a wide range of RF and microwave large and small signal level applications, the AT Series is ideal for impedance matching, input padding, signal level tuning, and many other critical RF / Microwave applications. This Series is rated highest power in class and is suitable for microstrip and CPW applications.

Various magnetic and non-magnetic terminations are available providing a range of attachment options such as eutectic die-bonding, conductive epoxies, and soldering. The AT Series is fully compatible with high speed automated pick-and-place processing. Consult factory for other case sizes.

### Features:

- Thin Film Design
- Characterized to 20 GHz
- Power Rating: 1 watt
- Flatness:  $\pm 0.5$  dB
- CPW and Microstrip Applications
- EIA 0603 SMT footprint
- AlN construction
- Balanced Pi design
- Non-Magnetic
- RoHS Compliant

### Applications:

- Impedance Matching
- Input Signal Padding
- Signal Level Tuning
- Signal Conditioning



## ATC 504 L Series UBR™ Ultra-Broadband Resistors

The 504L Series next generation of surface mount Ultra-Broadband Resistors. This product was designed with our proprietary Glass Sandwich Flexitem® Technology, (GSFT). The Flexitem® is a surface mountable automotive qualified termination that adds an extra margin against damage due to flexure during installation.

The 504L Series has been designed with high quality selected materials that yield excellent performance. This product is ideal for use in Optical Transceiver Modules or any application requiring excellent ultra-broadband performance.

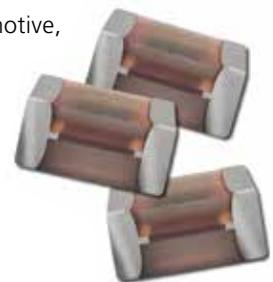
These devices are suitable for a wide range of RF/Microwave applications in Opto-electronics, Automotive, Telecom, Broadband Jamming for EW, and Satellite Communications.

### Features:

- Standard Resistance Values ( $\Omega$ ): 25 $\Omega$ , 50 $\Omega$ , 100 $\Omega$ , 200  $\Omega$
- Frequency Range: DC to 20 GHz
- EIA 0402 Case Size
- Power Rating: 125 mW
- Operating Temperature: -40°C to +125°C
- 100% Laser Trimming for Tight Tolerances
- RoHS Compliant

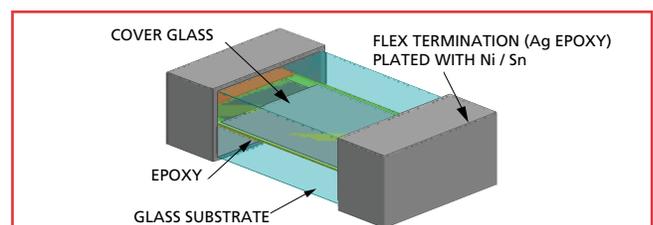
### Applications:

- Optical Transceiver Modules
- Broadband Receive
- TOSA / ROSA
- Wideband Test Equipment
- Low Noise Amplifier
- MMIC Amplifiers



## Specifications

Resistor	Detail
Outline	EIA 0402
Package	Glass wafer sandwich
Resistance Value Range	From 25 $\Omega$ to 400 $\Omega$
Termination	Flexitem® (Ag/Epoxy), NiSn plated
Power Rating	125 mW
Operating Temperature Range	-40°C to +125°C
Tolerance	1%
Cold Storage	-65°C





## 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	J, K	16	>6000	0.045	1360
	10 @ 250 MHz	G, J, K	21	3900	0.195	480
	100 @ 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](http://www.atceramics.com)

**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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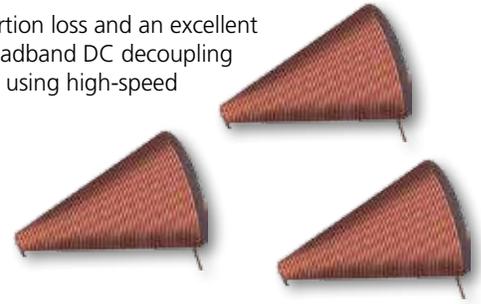
### 506 WLC Ultra-Broadband Inductor

The ATC 506WLC High Frequency Ultra-Broadband Inductor (UBL)\* provides low insertion loss and an excellent match over multiple octaves of frequency spectrum. The 506WLC is ideal for ultra broadband DC decoupling networks and bias tee applications in optical communications systems and equipment using high-speed digital logic.

\*patent pending

**Features:**

- Ultra-Broadband Performance
- Ultra-Low Insertion Loss
- Flat Frequency Response
- Excellent Return Loss Through 40+ GHz
- Operating Temperature Range: - 55° C to + 125 ° C
- Unit-to-Unit Performance Repeatability
- Rugged Powdered Iron Core
- Gold Plated Leads



Part Number, max	Inductance (µH)	Operating Frequency Range*	Insertion Loss**	Return Loss**	DC Resistance	Current Handling (DC max.)***
ATC 506WLC2R0KG250B	2.0 typ.	2.3 MHz* to 40 GHz	0.5 dB typ.	17 dB typ.	1.45 Ω typ. @ 10 mA	250 mA dc

\*Lower -3 dB roll-off frequency \*\*Shunt Mounted \*\*\*Current for 100 °C temperature rise

### ATC 506 WLS Ultra-Broadband SMT Inductors

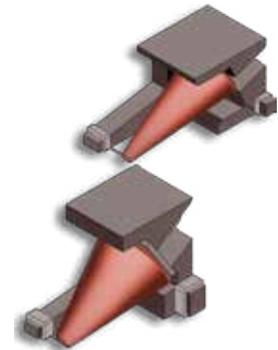
The ATC 506WLS Series High Frequency Ultra-Broadband Inductor (UBL) is a unique component that provides low insertion loss and an excellent match over multiple octaves of frequency spectrum. The 506WLS is ideal for ultra-broadband DC decoupling networks and bias tee applications in optical communications systems and equipment using high-speed digital logic.

**Features:**

- Operating Frequency: 400 KHz (-3 dB roll-off frequency) through 40+ GHz, typ.
- Operating Temperature Range: - 55° C to + 125 ° C
- Lead-Free, RoHS Compliant Terminations

**Advantages:**

- Flat Frequency Response
- Excellent Return Loss Through 40+ GHz
- Unit-to-Unit Performance Repeatability
- Rugged Powdered Iron Core



Part Number	Inductance (µH)	Operating Frequency Range*	Insertion Loss** typ.	Return Loss** typ.	DC Resistance Ω typ.	Current Handling (DC max.)***
ATC 506WLSM0R47KT815T	0.47	9.5 MHz to 40+ GHz	< 0.5 dB	> 20 dB	0.19	815 mA
ATC 506WLSM0R70KT619T	0.7	5.6 MHz to 40+ GHz	< 0.5 dB	> 20 dB	0.32	619 mA
ATC 506WLSM1R10KT438T	1.1	3.3 MHz to 40+ GHz	< 0.6 dB	> 22 dB	0.64	438 mA
ATC 506WLSM2R00KT277T	2.0	2.1 MHz to 40+ GHz	< 0.4 dB	> 20 dB	1.60	277 mA
ATC 506WLSM3R80KT182T	3.8	1.1 MHz to 40+ GHz	< 0.4 dB	> 25 dB	3.70	182 mA
ATC 506WLSN1R47KT694T	1.47	2.8 MHz to 40+ GHz	< 0.4 dB	> 17 dB	0.33	694 mA
ATC 506WLSN2R00KT494T	2.0	1.6 MHz to 40+ GHz	< 0.5 dB	> 17 dB	0.65	494 mA
ATC 506WLSN3R30KT350T	3.3	1.3 MHz to 40+ GHz	< 0.5 dB	> 17 dB	1.29	350 mA
ATC 506WLSN6R00KT236T	6.0	700 KHz to 40+ GHz	< 0.4 dB	> 18 dB	2.85	236 mA
ATC 506WLSN10R7KT150T	10.7	400 KHz to 40+ GHz	< 0.4 dB	> 17 dB	7.10	150 mA

\*Lower -3 dB roll-off frequency \*\*Shunt Mounted \*\*\*Current for 100 °C temperature rise

## ATC Multilayer High Q RF Capacitors

ATC Series	Case Size Footprint in. (mm)	Cap Value Range (pF)*	Working Voltage WVDC (volts) max.	Dielectric 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	.250 x .250 (6.35 x 6.35)	1 to 2700	3600	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	.250 x .250 (6.35 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
800C	.250 x .250 (6.35 x 6.35)	2.2 to 3000	3600	NPO Ceramic	0 ± 30
800E	.380 x .380 (9.65 x 9.65)	3.3 to 5100	7200	NPO Ceramic	0 ± 30
800H	.720 x .740 (18.29 x 18.80)	100 to 20,000	8000	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%

**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 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
800C	10	0.058	0.042	–	–	–
	39	0.030	0.023	–	–	–
	2700	0.007	0.015	–	–	–
800E	10	0.063	0.053	–	–	–
	47	0.018	0.026	–	–	–
800H	430	0.022	0.048	–	–	396
	1000	0.027	0.053	–	–	265
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](http://www.atceramics.com)



Stable K Dielectrics	Dielectric Code	Dielectric Const. (K)	TCC (-55°C to +125°C)	Cap. Range (pF)	Max. DF @ 1 MHz (%)		Q
	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

Mid-K Dielectrics	Dielectric Code	Dielectric Const. (K)	TCC (-55°C to +125°C)	Cap. Range (pF)	Max. DF (%)*		Q @ Freq.
					@1 MHz	@1 KHz	
	CC	130	-750 ±220 PPM/°C	0.3 to 56	0.15	–	2310 @ 5
	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	–

High-K Dielectrics	Dielectric Code	Dielectric Const. (K)	TCC (-55°C to +125°C)	Cap. Range (pF)	Max. DF (%)*	
					@ 1 MHz	@ 1 KHz
	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

Ultra High-K Dielectrics	Dielectric Code	Dielectric Const. (K)	TCC (+10°C to +85°C)	Cap. Range (pF)	Max. DF (%)*	
					@ 1 MHz	@ 1 KHz
	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

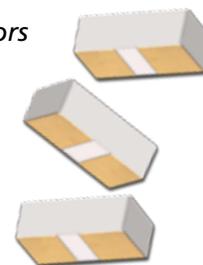
Max-K Dielectrics	Dielectric Code	Dielectric Const. (K)	TCC (-55°C to +125°C)	Cap. Range (pF)	Max. DF (%)*	
					@ 1 MHz	@ 1 KHz
	M	25,000 typ.	±15%	150 to 10,000	–	2.5

\*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 Series Millimeter-Wave SMT Capacitors

*Low insertion loss and ultra-high self-resonance surface mount millimeter-wave capacitors*

ATC's 500 Series (BMC) Broadband Microwave Capacitor is a unique, patented component which greatly exceeds both multilayer and single layer capacitor performance. It delivers extremely low insertion loss with ultra-high self resonance performance, in a rugged, laser-marked package compatible with automatic SMT manufacturing.



### Attributes

- EIA 0603 Case Size
- Low Insertion Loss
- Ultra High Self Resonance
- Surface Mountable
- Rugged Construction

### Functional Applications

- Broadband
- Bypass
- Coupling
- Feedback
- Impedance Matching
- DC Blocking
- Tuning

ATC Series	Cap Value Range (pF)*	Working Voltage WVDC (volts)	TCC -55° to 125°C (ppm/°C)	Typical Resonance			IR@ 25°C (Megohms)	Case size Footprint Inches (mm)
				Cap (pF)	Series	Parallel		
500	0.1 to 10 pF	100 WVDC (0.1 pF to 4.7 pF) 50 WVDC (5.1 pF to 10 pF)	0±30 for C ≤2.2pF 0±60 for C ≥2.4 pF	0.1 1 10	28 GHz 15 GHz 7.8 GHz	40 GHz 32 GHz 20 GHz	10 <sup>5</sup>	.060 x .030 (1.52 x 0.762)

## ATC 520 L, 530Z and 530 L Broadband SMT Capacitors

*Best Broadband Options for Reliability and Widest Frequency Coverage.*

The 520 L Series, 530 Z Series and 530 L Series Multilayer Broadband Capacitors provide low insertion loss performance over multiple octaves of frequency spectrum. These capacitors are compatible with high speed automated pick and place SMT manufacturing.

The 520 L, 530 Z and 530 L are ideal for broadband DC blocking, coupling, bypassing, and feedback applications in optical communications systems and equipment using high-speed digital logic.



### Attributes

- Low Loss X7R and X5R Dielectrics
- Broadband Performance
- Flat Frequency Response
- Excellent Return Loss
- Unit-to-Unit Performance Repeatability
- Rugged Ceramic Construction
- Solderable SMT Terminations
- RoHS Compliant Terminations

ATC Series	EIA Size	Frequency Response	Insertion Loss	Capacitance	Voltage Ratings	Termination Options
520 L	0402	160 KHz to 16 GHz	1 dB max.	10 nF	16 WVDC	RoHS compatible
530 Z	0201	16 KHz to 20 GHz	0.4 dB typ.	100 nF	10 WVDC	RoHS compatible
530 L	0402	16 KHz to 18 GHz	1 dB max.	100 nF	16 WVDC	RoHS compatible



## ATC Power Capacitor Assemblies

ATC offers leaded Power Capacitor Assemblies that extend the capacitance, voltage and current

parameters of our standard multilayer ceramic capacitor product line.

ATC standard & custom Power Capacitor 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 enabled ATC

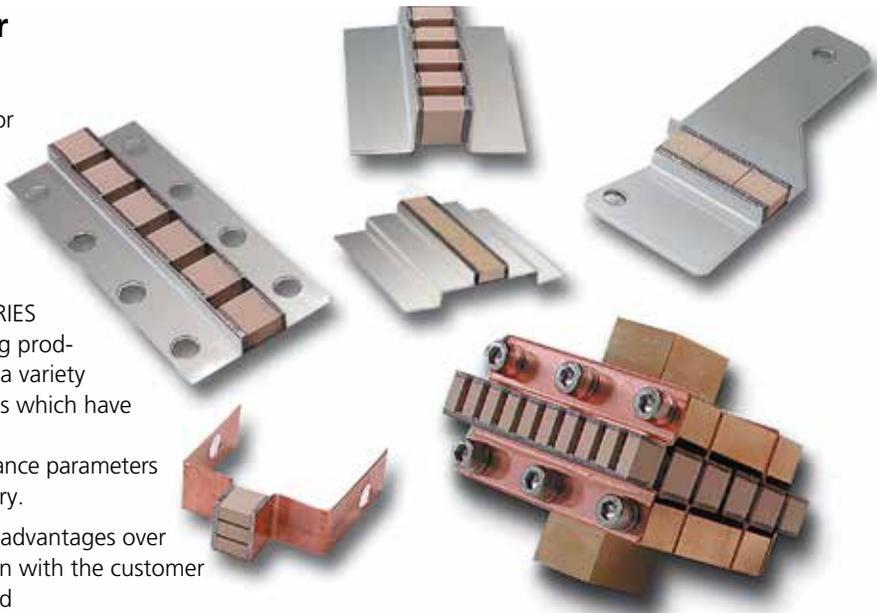
to extend voltage, current, lower ESR, and tolerance parameters beyond what is normally available in the industry.

ATC Power Capacitor Assemblies offer distinct advantages over purchasing standard components. Collaboration with the customer design engineer results in a precisely engineered solution to their exact requirements.

### 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%

### PERFORMANCE ADVANTAGES

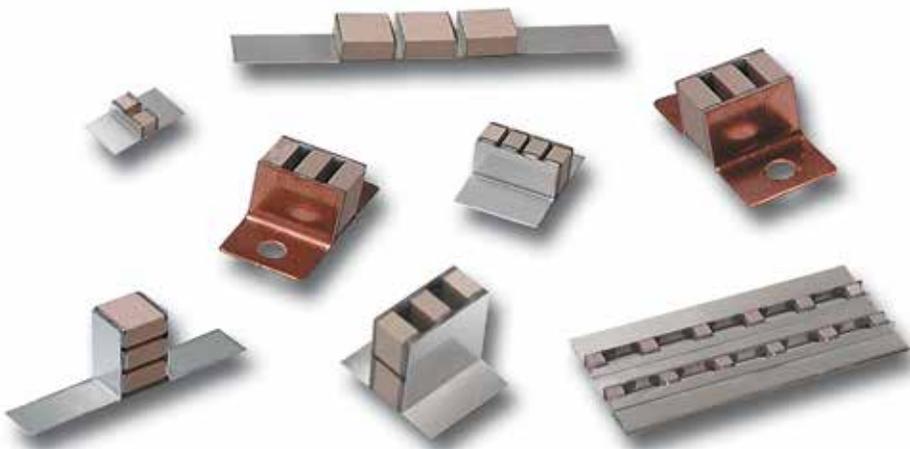
- High operating voltage
- High operating current
- Extended capacitance
- Tighter tolerances
- High reliability
- High Q
- Ultra-low ESR

### TYPICAL APPLICATIONS

- HF/RF Power Amplifiers
- Semiconductor Manufacturing Equipment
- Medical Electronics (MRI)
- Broadcast Transmitters
- Antenna Matching Networks
- Inductive Heating
- Ultra-low ESR

### ATTRIBUTES

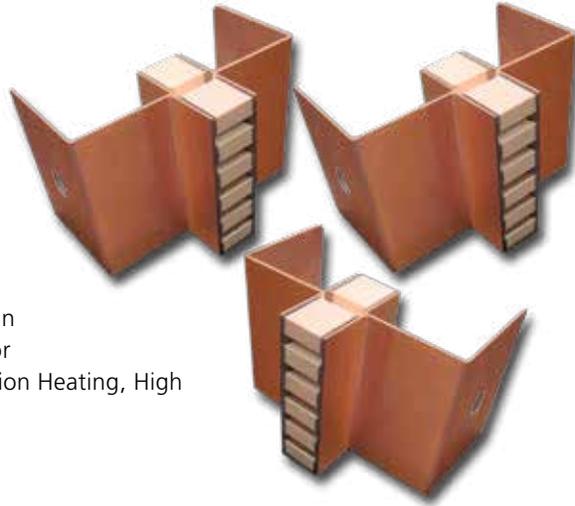
- Reduced Assembly Steps/ Handling Costs
- Enhanced Reliability
- Reduced Purchasing Logistics
- Reduced Technical Labor
- Guaranteed Performance
- Achieve Non-Standard Values and Ultra-Tight Tolerances



## ATC Transmitter Capacitor Assemblies

ATC Transmitter Capacitor Assemblies offer a cost effective alternative to large and costly fixed vacuum capacitors, door-knobs and transmitter capacitors. ATC assemblies are ideal for the most demanding applications requiring high RF power at low frequencies. They are constructed with the finest materials and are engineered to provide the most reliable performance in the most demanding applications.

ATC's Transmitter Capacitor Assembly products are ideal for use in Plasma Generators and matching networks used in Semiconductor Manufacturing equipment, AM Broadcast Transmitters, RF Induction Heating, High Power HF amplifiers and many others.



### ATTRIBUTES:

- Capacitance Values up to 1200 pF
- High RF Power Handling Capability
- Current Handling Capability up to 156 Amps RMS @ 13.56 MHz
- 7200 Rated WVDC
- Ideal for applications between 400 KHz to 30 MHz
- Rugged Porcelain Construction for superior dielectric strength
- Heavy Cu leads (0.020") with punched holes
- Highest breakdown voltage
- NPO and P90 ultra stable dielectrics
- Available in tight tolerances

### APPLICATIONS:

- High RF Power Matching Networks
- High RF Power Tuning Circuits
- Antenna Tuning
- High RF Power Output Filter Networks

### Capacitance Value Table:

Capacitance Value (pF)	Number of Capacitors	Single Capacitance Value (pF)	Rms Current (1 cap.) @ 13.56 MHz	Rms Current (max.) @ 13.56 MHz	Mechanical Configuration
100	2	50	11	22	Single bracket
200	4	50	11	44	Single bracket
300	6	50	11	66	Single bracket
400	4	100	13	52	Single bracket
500	5	100	13	65	Single bracket
600	6	100	13	78	Single bracket
700	7	100	13	91	4 over 3
800	8	100	13	104	4 over 4
900	9	100	13	117	5 over 4
1000	10	100	13	130	5 over 5
1100	11	100	13	143	6 over 5
1200	12	100	13	156	6 over 6

Rated WVDC: 7200  
Available with 1% Tolerance



## 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 networked 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), 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: SiO<sub>2</sub>, 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<sub>3</sub>N<sub>4</sub>, BCB and polyimide
- Vias: Sputtered, enhanced plated, filled and castellations
- I/Os: BGA, LGA, edge wrap, through via and wire or ribbon bond
- Machining:
  - CO<sub>2</sub> 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 <sub>2</sub> O <sub>3</sub> 99.6%	Al <sub>2</sub> O <sub>3</sub> 96.0%	Fused Silica	BeO 99.5%	AlN	Glass Boro-silicate	Glass Ceramic	P-Silicon Boron Doped	N <sup>++</sup> -Silicon Arsenic Doped	FZ-Silicon Arsenic Doped
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 (Surface finish) μ''	<20	No	No	<20	<20	NA				
Polished (Surface 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 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>14</sup>	10 <sup>13</sup>	10 <sup>13</sup>	10 <sup>13</sup>	15	0.002	10 <sup>4</sup>
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
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 <sub>2</sub>	BCB	PI
pF/mm <sup>2</sup> Typical	55	35	25	30
Range	1-500 pF	1-500 pF	1-50 pF	0.5-10 pF
Trimable	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

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## ATC's Design Support Software – New Enhanced 2017 Version

Tech Select® is ATC's Design Support Software: a comprehensive tool that provides complete descriptions and illustrations of ATC products. Designers may select products by sorting on attributes. Included are RF Performance Parameters, Smith Charts, Exportable S-Parameter Files, Electrical, Mechanical and Environmental Specifications.

Also included are Technical Application Notes and Bulletins, Circuit Designers' Notebook Articles, and Product Data Sheets. Tech-Select is compatible with Windows XP, Vista, Windows 7, Windows 8 and Windows 10



These measurement-based models, available for selected ATC components, are both substrate and part-value scalable, and represent high-order resonant effects and accurate effective series resistance. Each model includes complete documentation detailing the test fixtures used, measurement conditions, range of validity, and model-to-measurement data comparisons.



## S-Parameter Data Files

Scattering parameters of ATC 100 Series A and B, 180 R, 700 Series A and B, and 500 S Capacitors measured in vertical orientation on Alumina. README file provides details on measurement conditions.

## 600 L, 600 S and 600 F Series S-Parameter Data

Scattering parameters of ATC 600 Series Ultra-Low ESR Capacitors measured in horizontal and vertical orientation on Rogers R04350 softboard. README file provides details of measurement conditions.

## 800 A, 800 B and 800 R Series S-Parameter Data

Scattering parameters of ATC 800 A / B Series and 800 R Series Ultra-Low ESR Capacitors, measured on Rogers R04350 softboard. 800 A measured in horizontal and vertical orientation; 800 R measured in horizontal orientation; 800 B measured in vertical orientation. README file provides details of measurement conditions.

## 400 W, 400 Z, 400 L, and 400 S Series Precision Tolerance NPO RF Microwave Capacitors S-Parameter Data

## WL Series Inductors S-Parameter Data

Scattering parameters of ATC WL Series Chip Inductors measured in horizontal orientation on Rogers R04350 softboard. README file provides details of measurement conditions.

## 506 WLC Series Inductor S-Parameter Data

All testing performed on 10-mil-thick Rogers RO4350 microstrip board, with the UBL leads connected between the microstrip trace and under the ground plane (nominal 50-ohm characteristic impedance).

## 506 WLS M Series and N Series Inductors S-Parameter Data

All testing performed on 10-mil-thick Rogers RO4350 microstrip board, with the UBL leads connected between the microstrip trace and under the ground plane (nominal 50-ohm characteristic impedance).

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