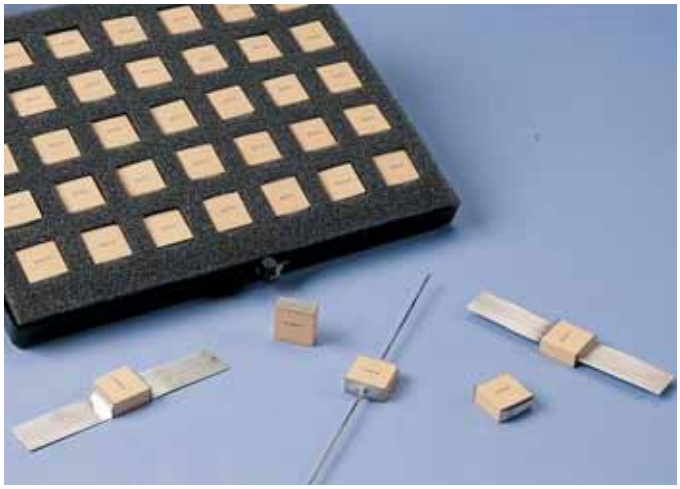
ATC 100 E Series Porcelain High RF Power Multilayer Capacitors

- **Case E Size (.380" x .380")**
- **Capacitance Range 1 pF to 5100 pF**
- **High Q**
- **Ultra-Stable Performance**
- **Low ESR/ESL**
- **High RF Current/Voltage**
- **High RF Power**
- **High Reliability**
- **Extended WVDC up to 7200 VDC**
- **Available with Encapsulation Option***



ATC, the industry leader, offers new improved ESR/ESL performance for the 100 E Series RF Capacitors. This high Q multilayer capacitor is ultra-stable under high RF current and voltage applications. High density porcelain construction provides a rugged, hermetic package.

ATC offers an encapsulation option for applications requiring extended protection agains arc-over and corona.

Typical functional applications: Bypass, Coupling, Tuning, Impedance Matching and DC Blocking.

Typical circuit applications: HF/RF Power Amplifiers, Transmitters, Antenna Tuning, Plasma Chambers and Medical (MRI coils).

*For leaded styles only

ENVIRONMENTAL TESTS

ATC 100 E Series Capacitors are designed and manufactured to meet and exceed the requirements of EIA-198, MIL-PRF-55681 and MIL-PRF-123.

THERMAL SHOCK:
MIL-STD-202, Method 107, Condition A.

MOISTURE RESISTANCE:
MIL-STD-202, Method 106.

LOW VOLTAGE HUMIDITY:
MIL-STD-202, Method 103, Condition A, with 1.5 Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours min.

LIFE TEST:
MIL-STD-202, Method 108, for 2000 hours, at 125°C.
Voltage applied.
200% of WVDC for capacitors rated at 500 volts DC or less.
120% of WVDC for capacitors rated at 1250 volts DC or less.
100% of WVDC for capacitors rated above 1250 volts DC.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

QUALITY FACTOR (Q):
Greater than 10,000 (1 pF to 1000 pF) @ 1 MHz.
Greater than 10,000 (1100 pF to 5100 pF) @ 1 KHz.

TEMPERATURE COEFFICIENT OF CAPACITANCE (TCC):
+90 ±30 PPM/°C (-55°C to +125°C)

INSULATION RESISTANCE (IR):
1 pF to 5100 pF:
10^5 Megohms min. @ +25°C at 500 VDC.
10^4 Megohms min. @ +125°C at 500 VDC.

WORKING VOLTAGE (WVDC):
See Capacitance Values Table, page 2.

DIELECTRIC WITHSTANDING VOLTAGE (DWV):
250% of WVDC for capacitors rated at 500 volts DC or less for 5 seconds.
150% of WVDC for capacitors rated at 1250 volts DC or less for 5 seconds.
120% of WVDC for capacitors rated above 1250 volts DC for 5 seconds.

RETRACE: Less than ±(0.02% or 0.02 pF), whichever is greater.

AGING EFFECTS: None

PIEZOELECTRIC EFFECTS: None
(No capacitance variation with voltage or pressure).

CAPACITANCE DRIFT: ±(0.02% or 0.02 pF), whichever is greater.

OPERATING TEMPERATURE RANGE:
From -55°C to +125°C (No derating of working voltage).

TERMINATION STYLES:
Available in various surface mount and leaded styles.
See Mechanical Configurations, page 3.

TERMINAL STRENGTH: Terminations for chips and pellets withstand a pull of 10 lbs. min., 25 lbs. typical, for 5 seconds in direction perpendicular to the termination surface of the capacitor. Test per MIL-STD-202, method 211.

AMERICAN TECHNICAL CERAMICS

ATC North America
+1-631-622-4700
sales@atceramics.com

ATC Europe
+46 8 6800410
sales@atceramics-europe.com

ATC Asia
+86-755-2386-8759
sales@atceramics-asia.com

THE ENGINEERS' CHOICE®
ISO 9001 REGISTERED

ATC 100 E Capacitance Values

CAP. CODE	CAP. (pF)	TOL.	RATED WVDC STD.	RATED WVDC EXT.	CAP. CODE	CAP. (pF)	TOL.	RATED WVDC STD.	RATED WVDC EXT.	CAP. CODE	CAP. (pF)	TOL.	RATED WVDC STD.	RATED WVDC EXT.	CAP. CODE	CAP. (pF)	TOL.	RATED WVDC STD.	RATED WVDC EXT.
1R0	1.0	B, C D	3600	EXTENDED VOLTAGE 7200	5R6	5.6	B, C D	3600	EXTENDED VOLTAGE 7200	470	47	F, G, J, K, M	3600	EXTENDED VOLTAGE 7200	391	390	F, G, J, K, M	3600	N/A
1R1	1.1				6R2	6.2				510	51				431	430			
1R2	1.2				6R8	6.8				560	56				471	470		2500	
1R3	1.3				7R5	7.5				620	62				511	510			
1R4	1.4				8R2	8.2				680	68				561	560			
1R5	1.5				9R1	9.1				750	75				621	620			
1R6	1.6				100	10	F, G, J K, M			820	82				681	680			
1R7	1.7				110	11				910	91				751	750			
1R8	1.8				120	12				101	100				821	820		1000	
1R9	1.9				130	13				111	110			EXT. VOLT. 5000	911	910			
2R0	2.0				150	15				121	120				102	1000			
2R1	2.1				160	16				131	130				112	1100			
2R2	2.2				180	18				151	150				122	1200			
2R4	2.4				200	20				161	160				152	1500			
2R7	2.7				220	22				181	180				182	1800			
3R0	3.0				240	24				201	200				222	2200			
3R3	3.3				270	27				221	220			N/A	272	2700			
3R6	3.6				300	30				241	240				302	3000			
3R9	3.9				330	33				271	270				332	3300	G, J, K, M	500	
4R3	4.3				360	36				301	300				392	3900			
4R7	4.7				390	39				331	330				472	4700			
5R1	5.1				430	43				361	360				512	5100			

VRMS = 0.707 X WVDC

• SPECIAL VALUES, TOLERANCES, MATCHING, AND CAPACITOR ASSEMBLIES ARE AVAILABLE. • ATC'S CUSTOM POWER CAPACITOR ASSEMBLY CATALOG, ATC # 001-900 LISTS ASSEMBLY OPTIONS. • EXTENDED WORKING VOLTAGES ARE AVAILABLE FOR COMMERCIAL ORDERS ONLY. • ENCAPSULATION OPTION AVAILABLE. PLEASE CONSULT FACTORY.

CAPACITANCE TOLERANCE								
Code	B	C	D	F	G	J	K	M
Tol.	±0.1 pF	±0.25 pF	±0.5 pF	±1%	±2%	±5%	±10%	±20%

ATC PART NUMBER CODE

ATC100 E 39 1 K W 3600 X C

- Series
- Case Size
- Capacitance Code: First 2 significant digits for capacitance. R=Decimal Point
- Indicates number of zeros following digits of capacitance in picofarads except for decimal values.
- Capacitance Tolerance
- Termination Code
- WVDC
- Laser Marking
- Packaging
  - C - ATC Matrix Tray (Standard)
  - T - Tape and Reel, 250 pc. qty.
  - I - Special Packaging. Consult Factory

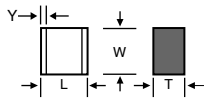
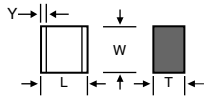
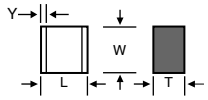
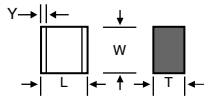
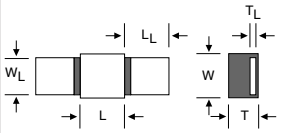
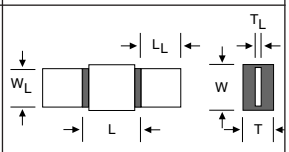
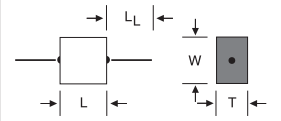
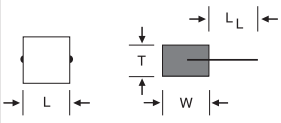
The above part number refers to a 100 E Series (case size E) 390 pF capacitor, K tolerance (±10%), 3600 WVDC, with W termination (Tin/Lead, Solder Plated over Nickel Barrier), laser marking and Waffle-packaging.

ATC accepts orders for our parts using designations ***with*** or ***without*** the "ATC" prefix. Both methods of defining the part number are equivalent, i.e., part numbers referenced with the "ATC" prefix are interchangeable to parts referenced without the "ATC" prefix. Customers are free to use either in specifying or procuring parts from American Technical Ceramics.

For additional information and catalogs contact your ATC representative or call direct at (+1-631) 622-4700.

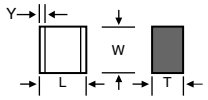
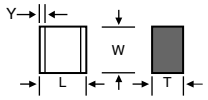
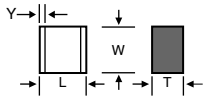
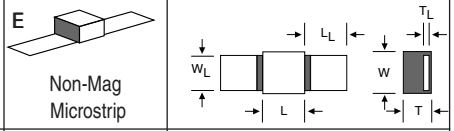
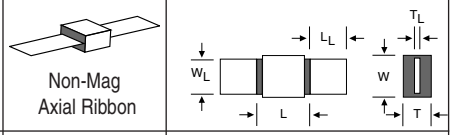
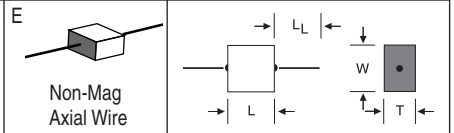
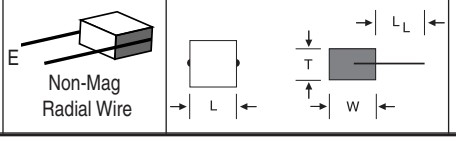
Consult factory for additional performance data.

ATC 100 E Capacitors: Mechanical Configurations

ATC SERIES & CASE SIZE	ATC TERM. CODE	CASE SIZE & TYPECASE SIZE & TYPE	OUTLINES W/T IS A TERMINATION SURFACE	BODY DIMENSIONS INCHES (mm)			LEAD AND TERMINATION DIMENSIONS AND MATERIALS	
				LENGTH (L)	WIDTH (W)	THICKNESS (T)	OVERLAP (Y)	MATERIALS
100E	W	E Solder Plate		.380 +.015 -.010 (9.65 +0.38 -0.25)	.380 ±.010 (9.65 ±0.25)	.170 (4.32) max.	.040 (1.02) max.	Tin/Lead, Solder Plated over Nickel Barrier Termination
100E	P	E Pellet		.380 +.040 -.010 (9.65 +1.02 -0.25)				Heavy Tin/Lead Coated, over Nickel Barrier Termination
100E	T	E Solderable Nickel Barrier		.380 +.015 -.010 (9.65 +0.38 -0.25)				***RoHS Compliant*** Tin Plated over Nickel Barrier Termination
100E	CA	E Gold Chip		.380 +.015 -.010 (9.65 +0.38 -0.25)				***RoHS Compliant*** Gold Plated over Nickel Barrier Termination
100E	MS	E Microstrip		.380 +.035 -.010 (9.65 +0.89 -0.25)			N/A	High Purity Silver Leads L_L = .750 (19.05) min. W_L = .350 ±.010 (8.89 ±0.25) T_L = .010 ±.005 (0.25 ±0.13) Leads are Attached with High Temperature Solder.
100E	AR	E Axial Ribbon						
100E	AW	E Axial Wire						Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) L_L = 2.25 (57.2) min.
100E	RW	E Radial Wire						Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) L_L = 1.0 (25.4) min.

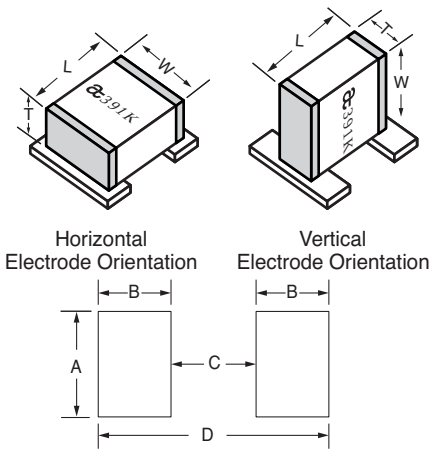
Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant.

ATC 100 E Capacitors: Non-Magnetic Mechanical Configurations

ATC SERIES & CASE SIZE	ATC TERM. CODE	CASE SIZE & TYPE	OUTLINES W/T IS A TERMINATION SURFACE	BODY DIMENSIONS INCHES (mm) LENGTH (L)	WIDTH (W)	THICKNESS (T)	LEAD AND TERMINATION DIMENSIONS AND MATERIALS OVERLAP (Y)	MATERIALS
100E	WN	E Non-Mag Solder Plate		.380 +.015 -.010 (9.65 +0.38 -0.25)	.380 +.015 -.010 (9.65 +0.38 -0.25)	.170 (4.32) max.	.040 (1.02) max.	Tin/Lead, Solder Plated over Non-Magnetic Barrier Termination
100E	PN	E Non-Mag Pellet		.380 +.040 -.010 (9.65 +1.02 -0.25)				Heavy Tin/Lead Coated, over Non-Magnetic Barrier Termination
100E	TN	E Non-Mag Solderable Barrier		.380 +.015 -.010 (9.65 +0.38 -0.25)				***RoHS Compliant*** Tin Plated over Non-Magnetic Barrier Termination
100E	MN	E Non-Mag Microstrip		.380 +.035 -.010 (9.65 +0.89 -0.25			N/A	High Purity Silver Leads L_L = .750 (19.05) min. W_L = .350 ±.010 (8.89 ±0.25) T_L = .010 ±.005 (0.25 ±0.13) Leads are Attached with High Temperature Solder.
100E	AN	Non-Mag Axial Ribbon						
100E	BN	E Non-Mag Axial Wire						Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) L_L = 2.25 (57.2) min.
100E	RN	E Non-Mag Radial Wire						Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) L_L = 1.0 (25.4) min

Custom lead styles and lengths are available; consult factory. All leads are high purity silver attached with high temperature solder and are **RoHS** compliant.

Suggested Mounting Pad Dimensions

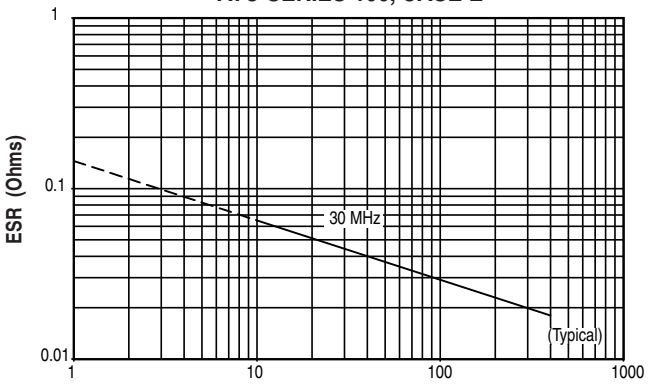


Case E

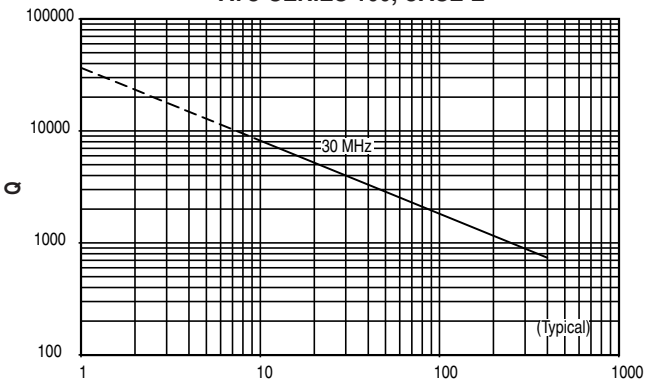
	Pad Size	A Min.	B Min.	C Min.	D Min.
Vertical Mount	Normal	.185	.050	.325	.425
	High Density	.165	.030	.325	.385
Horizontal Mount	Normal	.405	.050	.325	.425
	High Density	.385	.030	.325	.385

ATC 100 E Performance Data

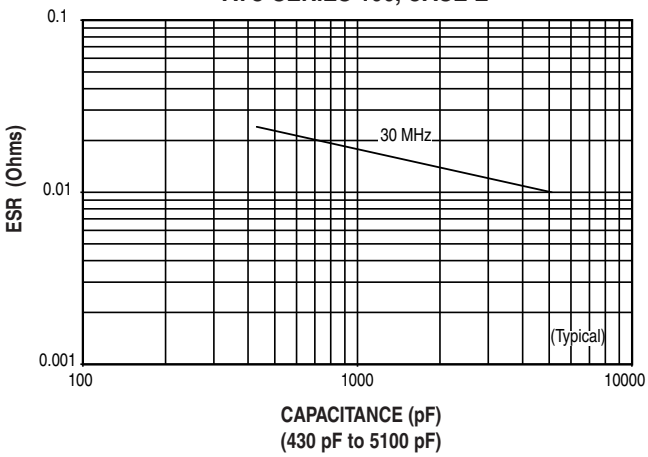
ESR VS. CAPACITANCE
ATC SERIES 100, CASE E



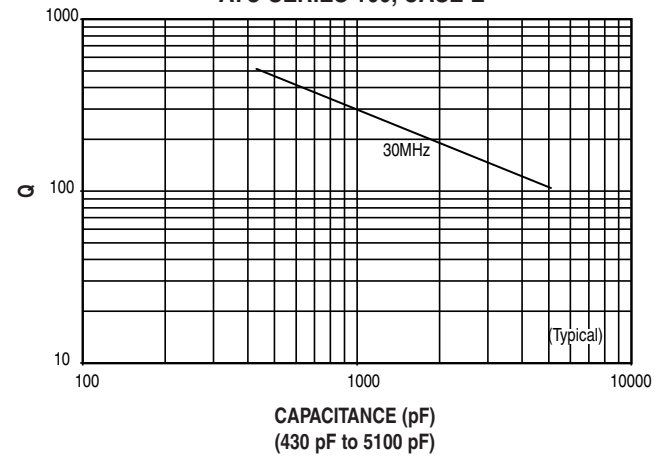
Q VS. CAPACITANCE
ATC SERIES 100, CASE E



ESR VS. CAPACITANCE
ATC SERIES 100, CASE E

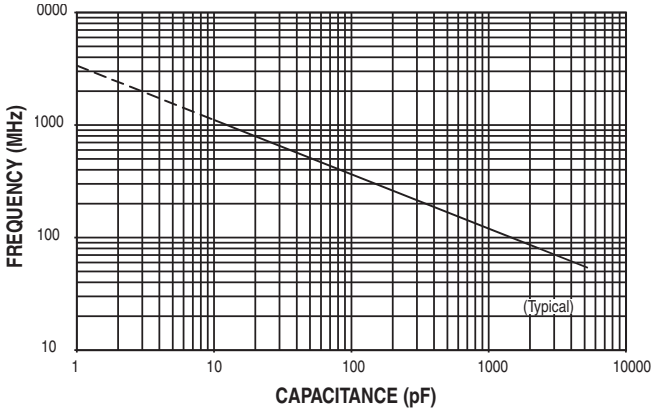


Q VS. CAPACITANCE
ATC SERIES 100, CASE E

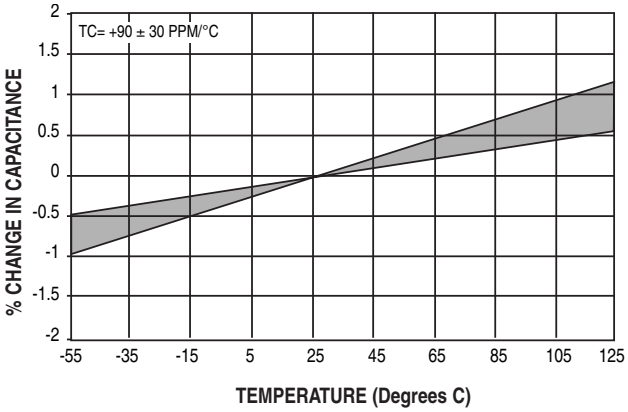


ATC 100 E Performance Data

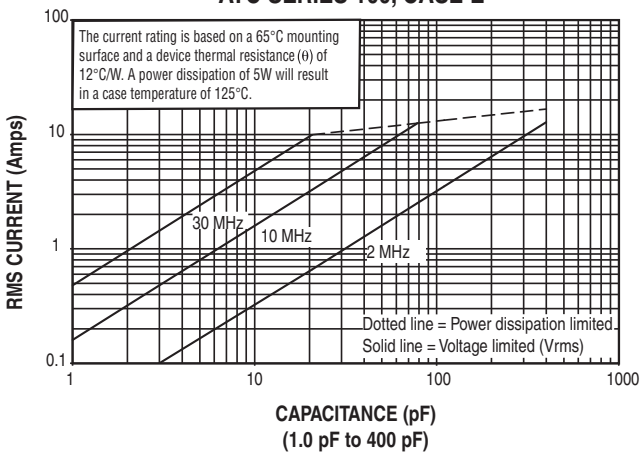
SERIES RESONANCE VS. CAPACITANCE
ATC SERIES 100, CASE E



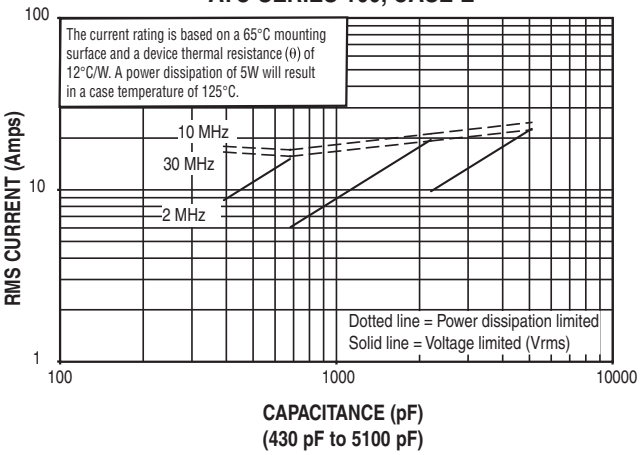
CAPACITANCE CHANGE VS. TEMPERATURE
ATC SERIES 100, CASE E



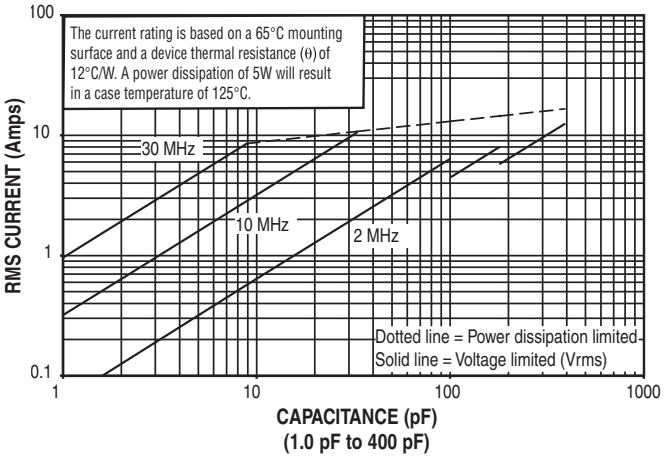
CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE E



CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE E



CURRENT RATING VS. CAPACITANCE
ATC SERIES 100, CASE E, EXTENDED VOLTAGE



Sales of ATC products are subject to the terms and conditions contained in American Technical Ceramics Corp. Terms and Conditions of Sale (ATC document #001-992 Rev. B; 12/05). Copies of these terms and conditions will be provided upon request. They may also be viewed on ATC's website at www.atceramics.com/productfinder/default.asp. Click on the link for Terms and Conditions of Sale.

ATC has made every effort to have this information as accurate as possible. However, no responsibility is assumed by ATC for its use, nor for any infringements of rights of third parties which may result from its use. ATC reserves the right to revise the content or modify its product without prior notice.

© 1996 American Technical Ceramics Corp. All Rights Reserved.

ATC # 001-809 Rev. K 3/10

AMERICAN TECHNICAL CERAMICS

ATC North America
+1-631-622-4700
sales@atceramics.com

ATC Europe
+46 8 6800410
sales@atceramics-europe.com

ATC Asia
+86-755-2386-8759
sales@atceramics-asia.com

THE ENGINEERS' CHOICE®
ISO 9001 REGISTERED

www.atceramics.com