

# ATC 100 E Series Porcelain High RF Power Multilayer Capacitors

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

ATC, the industry leader, is announcing 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. Porcelain construction provides a rugged, hermetic package.

ATC offers an encapsulation option for applications requiring extended protection against 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.

1 pF to 680 pF: at WVDC

820 pF to 2200 pF: 120% of WVDC

2700 pF to 5100 pF: 200% of WVDC



## 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<sup>9</sup> Megohms min. @ +25°C at 500 VDC.

10<sup>8</sup> Megohms min. @ +125°C at 500 VDC.

### WORKING VOLTAGE (WVDC):

See Capacitance Values Table, page 2.

### DIELECTRIC WITHSTANDING VOLTAGE (DWV):

\* See page 2.

**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.

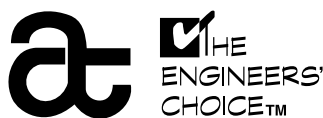
**OPERATING TEMPERATURE RANGE:**  
From -55°C to +125°C (No derating of working voltage).

### 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.



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# ATC 100 E Capacitance Values

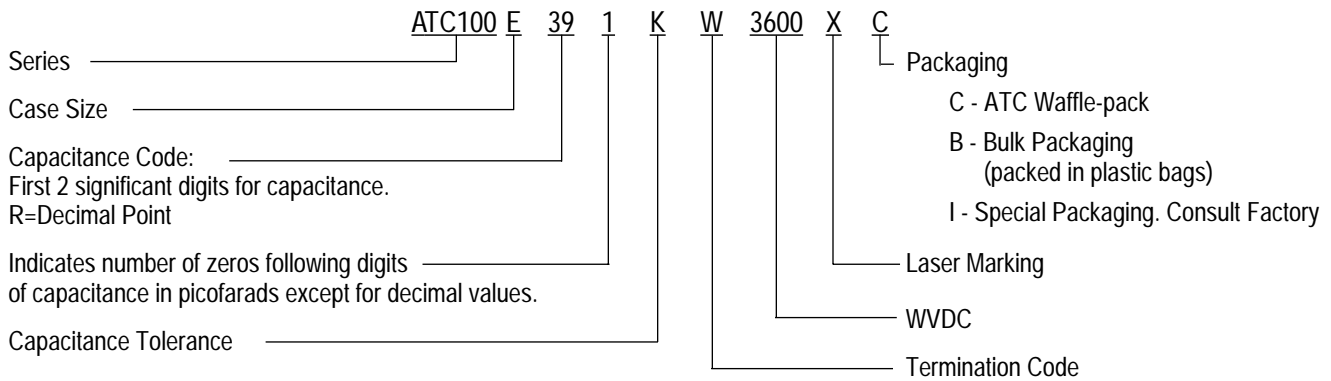
CAP. CODE	CAP. (pF)	TOL.	RATED WVDC		CAP. CODE	CAP. (pF)	TOL.	RATED WVDC		CAP. CODE	CAP. (pF)	TOL.	RATED WVDC
			STD.	EXT.				STD.	EXT.				
1R0	1.0	B, C, D	3600	7200	180	18	F, G, J, K, M	3600	7200	331	330	F, G, J, K, M	3600
1R2	1.2				220	22				391	390		
1R5	1.5				270	27				471	470		
1R8	1.8				330	33				561	560		
2R2	2.2				390	39				681	680		
2R7	2.7				470	47				821	820		
3R3	3.3				560	56				102	1000		
3R9	3.9				680	68				122	1200		
4R7	4.7				820	82				152	1500		
5R6	5.6				101	100				182	1800		
6R8	6.8	121	120	222	2200								
8R2	8.2	151	150	272	2700								
100	10	F, G, J, K, M			181	180				332	3300	G, J, K, M	500
120	12				221	220				472	4700		
150	15				271	270				512	5100		

VRMS = 0.707 X WVDC

- SPECIAL VALUES, TOLERANCES AND MATCHING AVAILABLE. • EXTENDED WORKING VOLTAGES ARE AVAILABLE FOR COMMERCIAL ORDERS ONLY.
- ENCAPSULATION OPTION AVAILABLE. PLEASE CONSULT FACTORY.
- \* DWV: 1 pF to 680 pF: 120% of rated WVDC for 5 secs.  
820 pF to 2200 pF: 150% of rated WVDC for 5 secs.  
2700 pF to 5100 pF: 250% of rated WVDC for 5 secs.

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



The above part number refers to a 100 E Series (case size E) 390 pF capacitor, K tolerance (±10%), 3600 WVDC, with W termination (solder plate), laser marking and Waffle-packaging.


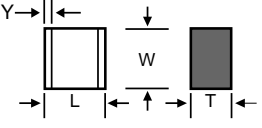

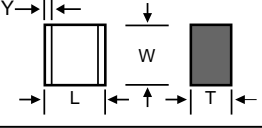

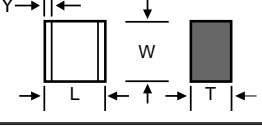

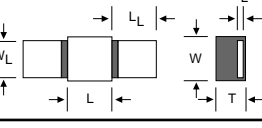
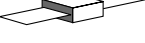
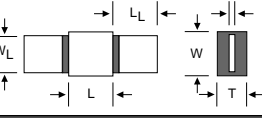

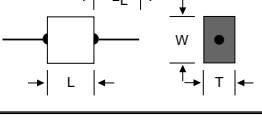
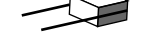
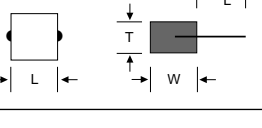
ATC accepts orders for our parts using designations *with* or *without* the "ATC" prefix. Both methods of defining the part number are equivalent, i.e., part numbers referenced with the "ATC" prefix are interchangeable to parts referenced without the "ATC" prefix. Customers are free to use either in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

For additional information and catalogs contact your ATC representative or call direct at (631) 622-4700.  
Consult factory for additional performance data.

## 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 100 E Capacitors: Mechanical Configurations

ATC SERIES & CASE SIZE	ATC TERM. CODE	CASE 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 +0.015 -.010 (9.65 +0.38 - 0.25)	.380 ±.010 (9.65 ±0.25)	.170 (4.32) max.	.040 (1.02) max.	<b>SOLDER PLATE</b> Nickel barrier, solder plated. Rugged, high performance termination for lower cost, high volume applications.		
100E	P	E  Pellet		.380 +0.080 -.010 (9.65 +2.03 - 0.25)				<b>BARRIER/CAP®</b> Nickel barrier, solder plated with the addition of hot solder dip process. Solder melting temperature is 355°F, 179°C.		
100E	CA	E  Gold Chip		.380 +0.015 -.010 (9.65 +0.38 - 0.25)				<b>UNI-TERM®</b> NICKEL BARRIER, GOLD PLATED TERMINATIONS		
100E	MS	E  Microstrip		.380 +0.035 -.010 (9.65 +0.89 - 0.25)				.170 (4.32) max.	.040 (1.02) max.	High Purity Silver Leads $L_L = .750$ (19.05) min. $W_L = .350 \pm 0.010$ (8.89 ±0.25) $T_L = .010 \pm 0.005$ (0.25 ±0.13) Leads are Attached with High Temperature Solder.
100E	AR	E  Axial Ribbon								Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) $L_L = 2.25$ (57.2) min.
100E	AW	E  Axial Wire								
100E	RW	E  Radial Wire								

Custom lead styles and lengths are available; consult factory.

All 100 E Capacitors are available laser marked with ATC's identification, capacitance code and tolerance.

\* Replaces C Termination

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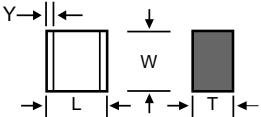

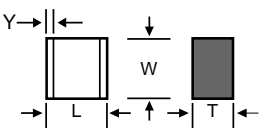

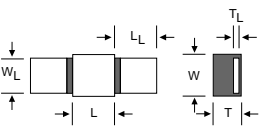

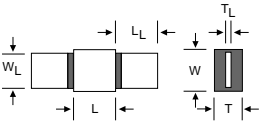

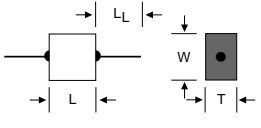

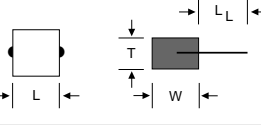
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# ATC 100 E Capacitors: Non-Magnetic Mechanical Configurations

ATC SERIES & CASE SIZE	ATC TERM. CODE	CASE SIZE & TYPE	OUTLINES W/T IS A TERMINATION SURFACE	BODY DIMENSIONS Inches (mm)			LEAD AND TERMINATION DIMENSIONS AND MATERIALS						
				LENGTH (L)	WIDTH (W)	THICKNESS (T)	OVERLAP (Y)	MATERIALS					
100E	*WN	 Non-Mag 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.	<b>NON-MAGNETIC</b> Copper barrier, solder plated. Rugged, high performance termination for lower cost, high volume applications.					
100E	PN	 Non-Mag Pellet		.380 +.080 -.010 (9.65 +2.03 - 0.25)				<b>NON-MAGNETIC</b> Copper barrier, solder plated Terminations with the addition of hot solder dip process. Solder melting temperature is 355°F, 179°C.					
100E	MN	 Microstrip		.380 +.035 -.010 (9.65 +0.89 - 0.25)				.380 ±.010 (9.65 ±0.25)	.170 (4.32) max.	.040 (1.02) max.	High Purity Silver Leads $L_L = .750$ (19.05) min. $W_L = .350 \pm .010$ (8.89 ±0.25) $T_L = .010 \pm .005$ (0.25 ±0.13) Leads are Attached with High Temperature Solder.		
100E	AN	 Axial Ribbon											
100E	BN	 Axial Wire											Silver-plated Copper Leads Dia. = .032 ±.002 (.813 ±.051) $L_L = 2.25$ (57.2) min.
100E	RN	 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 100 E Capacitors are available laser marked with ATC's identification, capacitance code and tolerance.

\* Replaces CN Termination

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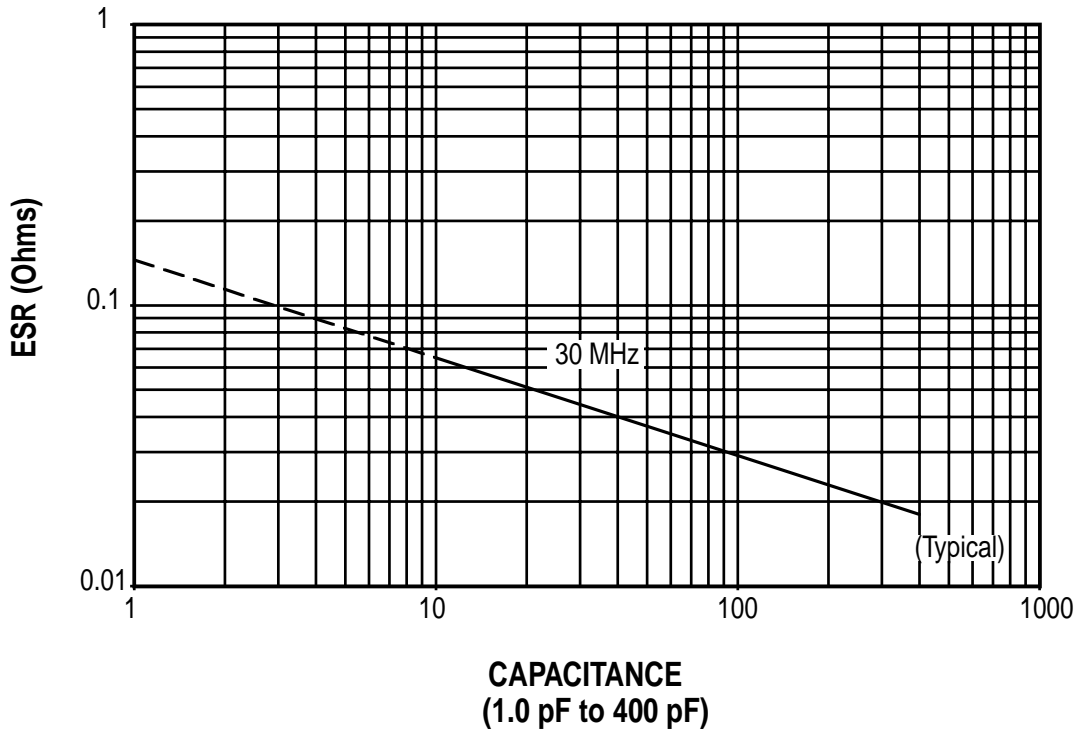
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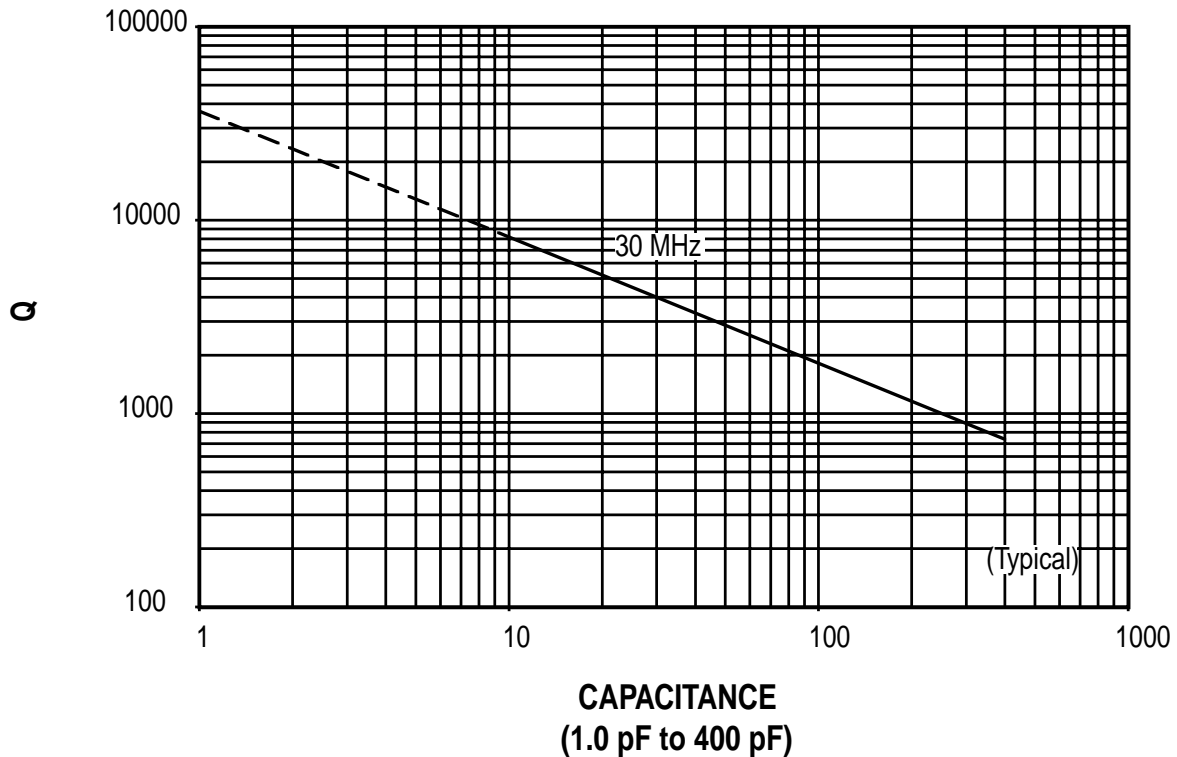
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# ATC 100 E Performance Data

## ESR VS CAPACITANCE ATC SERIES 100, CASE E



## Q VS CAPACITANCE ATC SERIES 100, CASE E



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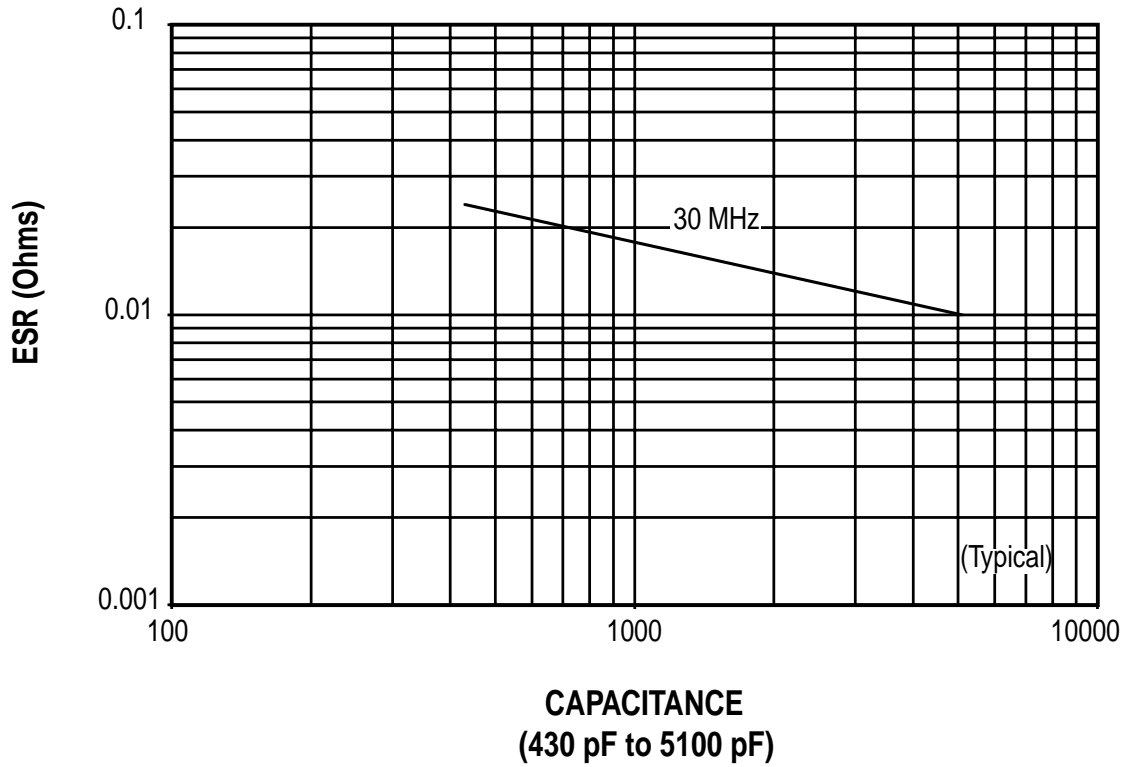
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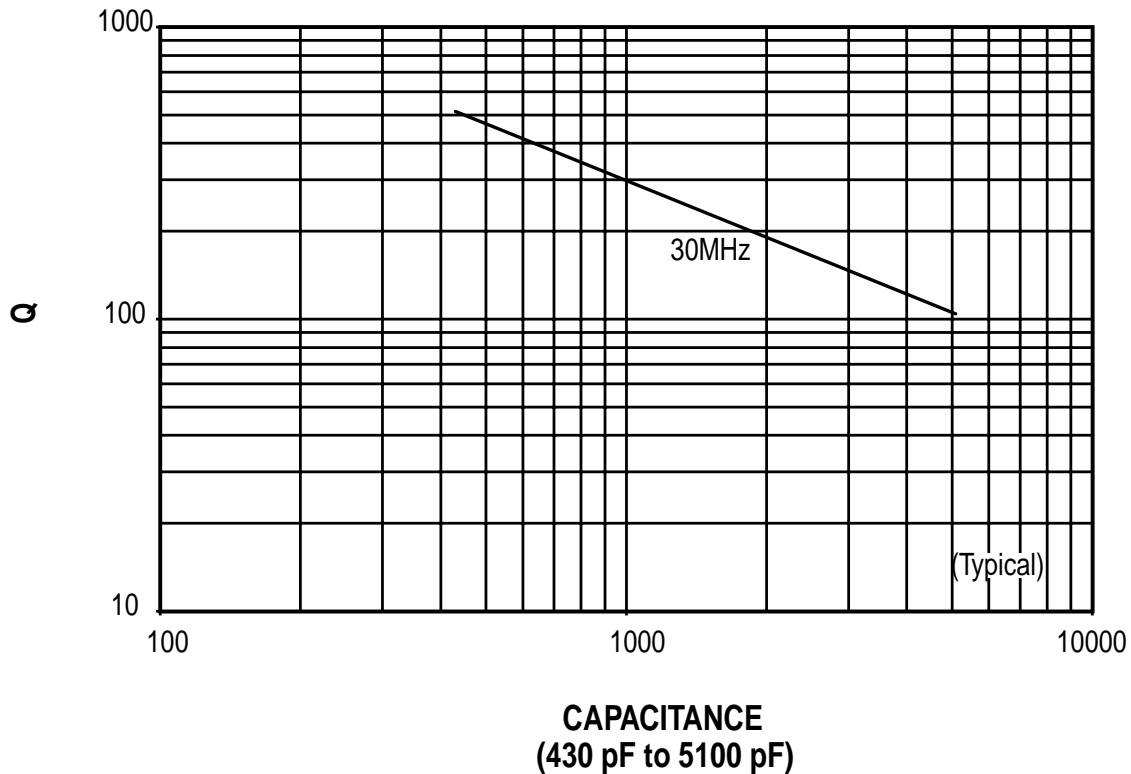
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# ATC 100 E Performance Data

## ESR VS CAPACITANCE ATC SERIES 100, CASE E



## Q VS CAPACITANCE ATC SERIES 100, CASE E



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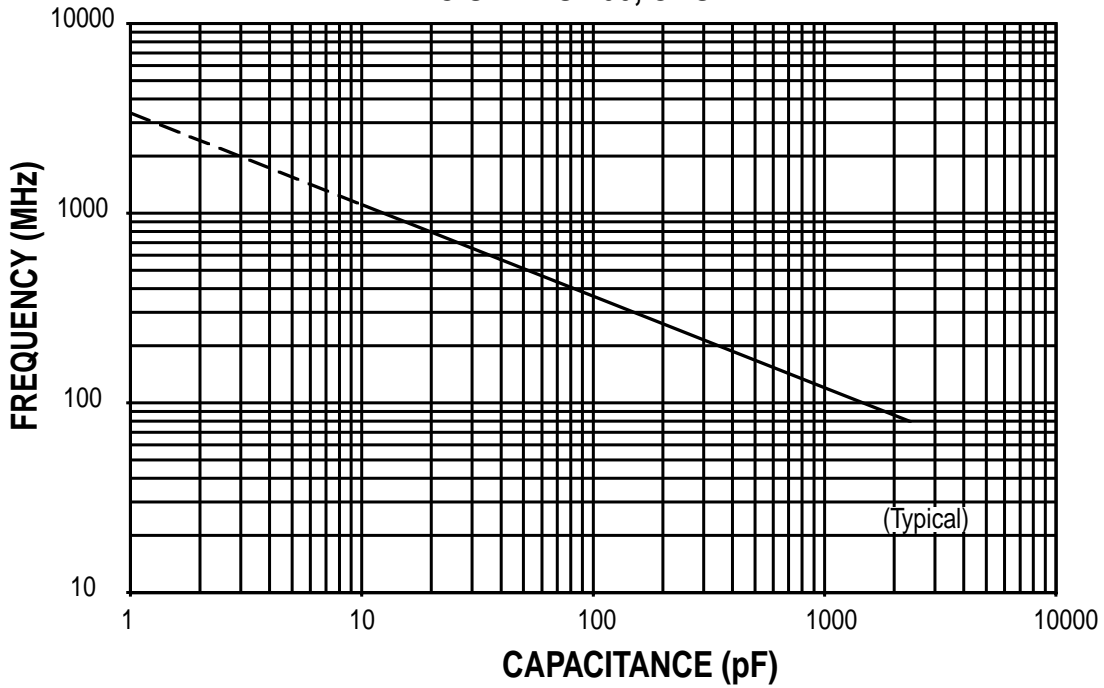
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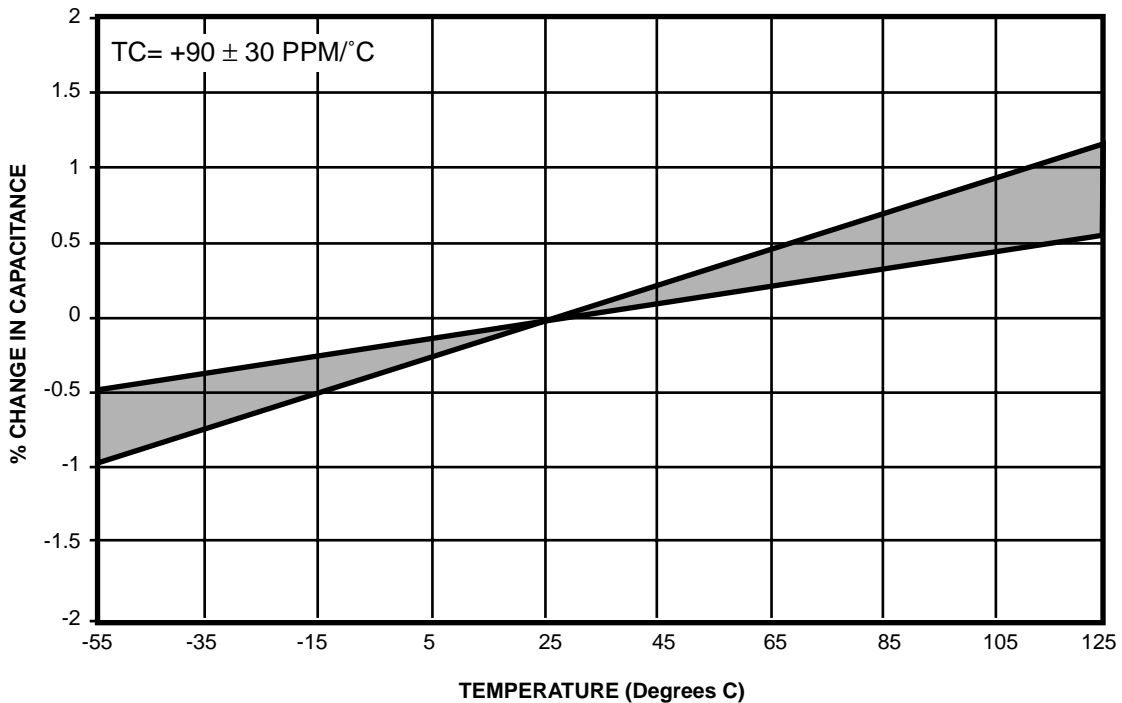
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# ATC 100 E Performance Data

## SERIES RESONANCE VS CAPACITANCE ATC SERIES 100, CASE E



## CAPACITANCE CHANGE VS TEMPERATURE ATC SERIES 100, CASE E



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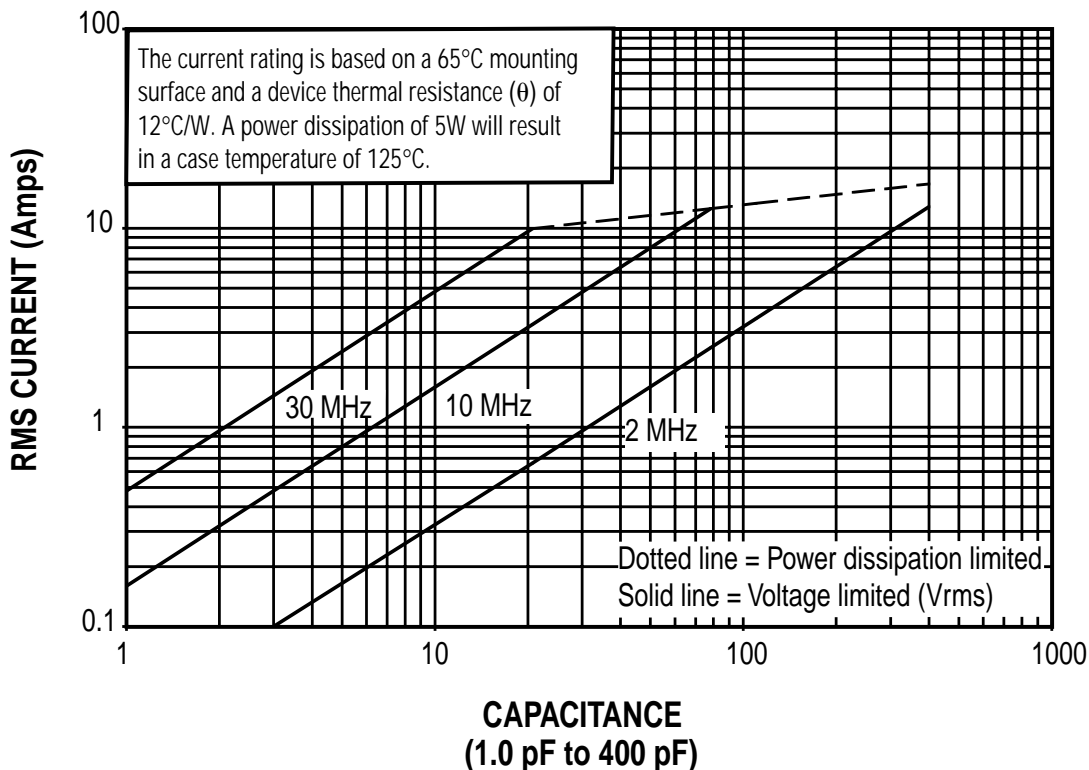
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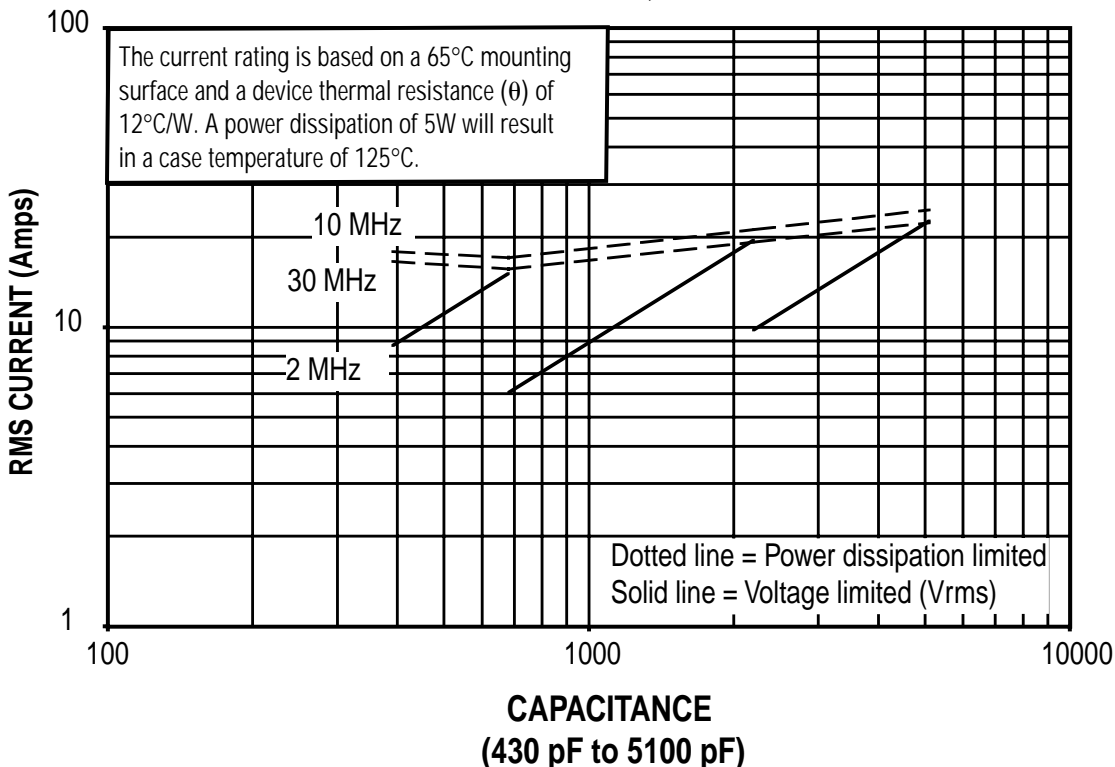
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# ATC 100 E Performance Data

## CURRENT RATING VS CAPACITANCE ATC SERIES 100, CASE E



## CURRENT RATING VS CAPACITANCE ATC SERIES 100, CASE E



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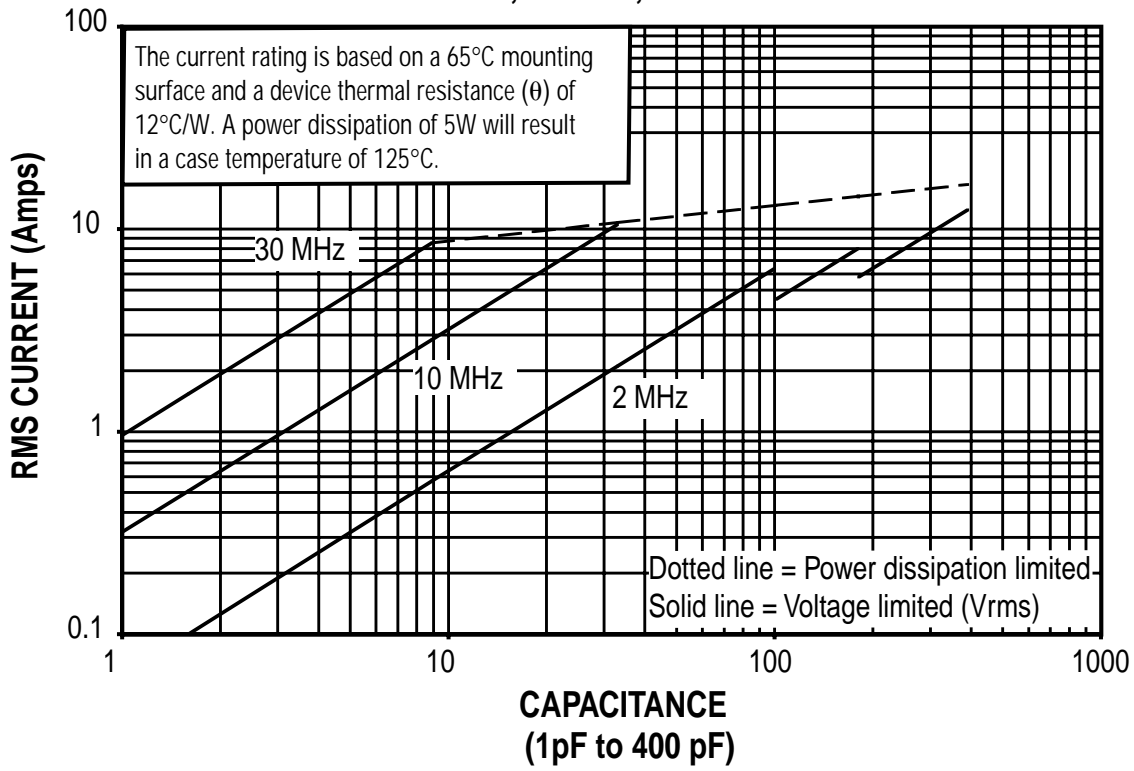
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# ATC 100 E Performance Data

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



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# Notes

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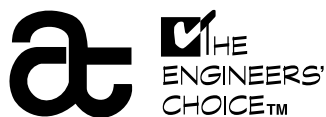
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