

# Air Trimmer Capacitors

## Miniature, Standard & High Voltage Series

### AIR DIELECTRIC TRIMMER CAPACITORS, RoHS COMPLIANT

#### DESCRIPTION

Air dielectric  
 Rated voltage 250 VDC (500 VDC for AT 5300's)  
 Low temperature coefficient  
 Low capacitance drift  
 Very stable over time  
 Terminations gold plated  
 High Q factor  
 Multi-turn, high resolution  
 Self-locking constant torque drive mechanism  
 Compliant to MIL-C-14409 and ESA/SCC 3010  
**ROHS** compliant  
**High Reliability** versions available on special order  
**Maximum Soldering Temperature 260°C, 3 s Max**



#### APPLICATIONS

RF amplifiers and oscillators  
 Impedance matching  
 Crystal trimming  
 Filter tuning  
 Interstage coupling  
 Space applications

#### AIR TRIMMER SERIES

SERIES	FAMILIES	CAPACITANCE RANGE	MIN Q @ 100 MHz	WORKING VOLTAGE
MINIATURE AIR TRIMMER	AT 5800's ROHS	0.35 to 3.5 pF > 9 turns	> 10000	250 VDC
	AT 5850's ROHS	0.5 to 5 pF > 12 turns	> 7500	
	AT 5700's ROHS	0.8 to 6 pF > 7 turns	> 10000	
	AT 5750's ROHS	0.8 to 10 pF > 6 turns	> 7500	
STANDARD AIR TRIMMER	AT 5200's ROHS	0.8 to 10 pF > 6 turns	> 5000	
	AT 5400's ROHS	1 to 14 pF > 6 turns	> 3000	
	AT 5450's ROHS	1 to 16 pF > 6 turns	> 3000	
	AT 5500's ROHS	1 to 20 pF > 12 turns	> 1500	
	AT 5600's ROHS	1 to 30 pF > 20 turns	> 800	
HIGH VOLTAGE AIR TRIMMER	AT 5300's ROHS	1 to 10 pF > 10 turns	> 2000	500 VDC

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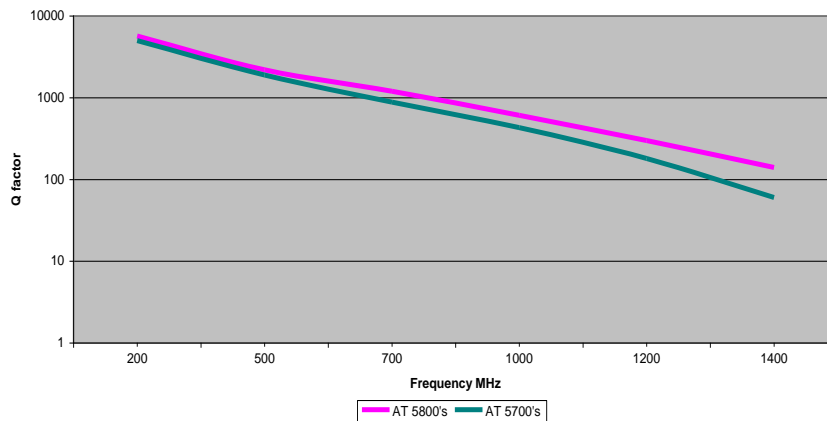
#### I. MINIATURE AIR TRIMMER SERIES

P/N	AT 5800 ROHS AT 5801 ROHS AT 5802 ROHS AT 8051 ROHS	AT 5850 ROHS AT 5851 ROHS AT 5852 ROHS AT 5853 ROHS	AT 5700 ROHS AT 5701 ROHS AT 5702 ROHS AT 8050 ROHS	AT 5750 ROHS AT 5751 ROHS AT 5752 ROHS AT 5753 ROHS
Capacitance range	0.35 to 3.5 pF >10 turns	0.5 to 5 pF >12 turns	0.8 to 6.0 pF >6 turns	0.8 to 10 pF >9 turns
Working voltage	250 VDC			
Test voltage	500 VDC			
Working Temp. range	-55°C to +125°C			
Temp. Coefficient	0+/-50 ppm/°C	0+/-50 ppm/°C	0+/-15 ppm/°C	0+/-50 ppm/°C
Q factor @ Max Capacitance	>10000	>7500	> 10000	> 7500
Insulation Resistance	>10 <sup>6</sup> MΩ min			

Capacitance change is linear versus rotation of mobile rotor.

#### I.1 MINIATURE AIR TRIMMER SERIES: QUALITY FACTOR

Typical Q factor of ROHS Miniature Air Trimmer series tuned at Max capacitance



#### I.2 MINIATURE AIR TRIMMER SERIES: MECHANICAL & GENERAL SPECIFICATIONS

P/N	AT 5800 ROHS AT 5801 ROHS AT 5802 ROHS AT 8051 ROHS	AT 5850 ROHS AT 5851 ROHS AT 5852 ROHS AT 5853 ROHS	AT 5700 ROHS AT 5701 ROHS AT 5702 ROHS AT 8050 ROHS	AT 5750 ROHS AT 5751 ROHS AT 5752 ROHS AT 5753 ROHS
Rotating torque	22 to 220 g.cm		30 to 290 g.cm	
Max torque on rotor stop	300 g.cm		400 g.cm	
Nut mounting torque	1000 g.cm		3000 g.cm	
Seal cap assembly torque	300 g.cm		600 g.cm	
Vibrations	60g, 10-2000 Hz			
Shocks	1500g, 0.5 ms			
	Brass and Invar structure			
	Glazed alumina insulation			
	306°C solder used in assembly			
	Silicone rubber seal washer			
	Gold, silver and chromate finish			

# Air Trimmer Capacitors

## Miniature, Standard & High Voltage Series

### AIR DIELECTRIC TRIMMER CAPACITORS, RoHS COMPLIANT

#### I.3 MINIATURE AIR TRIMMER SERIES: MODELS

<p>Figure 1</p>	<p>Figure 2</p>	
<p>Figure 3</p>	<p>Figure 4</p>	
<p>Figure 5</p>	<p><b>Terminals are gold plated</b></p> <p>Others models available upon request</p> <p>Custom designs available upon request</p>	<p>Figure 6</p>

#### I.4 MINIATURE AIR TRIMMER SERIES: DIMENSIONS in mm

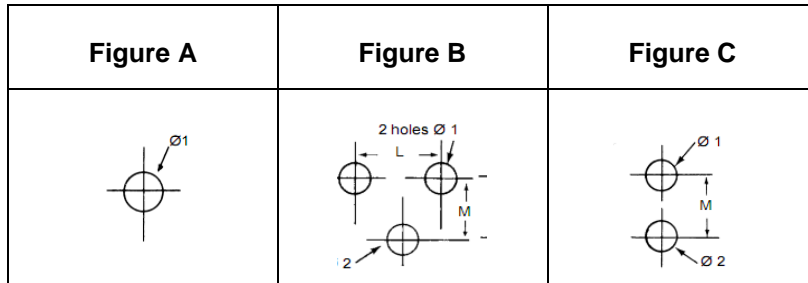
P/N	Figure	A	B	C	D	E	F	G	H	L	Thread
AT 5800 ROHS	1	6.7	5.9		4.6						
AT 5801 ROHS	2a	7.0	5.7	6.5	4.6	5.4		0.25			.120-80 UNS
AT 5802 ROHS	3	6.7	5.9		4.6						
AT 8051 ROHS	6	7.0	5.6	3.2	4.6	0.8	0.25	0.5		2.8	
AT 5850 ROHS	1	6.7	6.8		4.6						
AT 5851 ROHS	2a	7.0	6.6	6.5	4.6	5.4		0.25			.120-80 UNS
AT 5852 ROHS	3	6.7	6.8		4.6						
AT 5853 ROHS	6	7.0	6.6	3.2	4.6	0.8	0.25	0.5		2.8	
AT 5700 ROHS	4	7.0	5.6		6.2						
AT 5701 ROHS	2b	7.3	5.1	6.7	6.2	6.3		0.4			.190-64 UNS
AT 5702 ROHS	3	6.9	5.6		6.2						
AT 8050 ROHS	6	7.3	5.1	4.0	6.2	1.1	0.4	0.8		3.0	
AT 5750 ROHS	4	7.0	6.3		6.2						
AT 5751 ROHS	2b	7.3	6.0	6.7	6.2	6.3		0.4			.190-64 UNS
AT 5752 ROHS	3	6.9	6.3		6.2						
AT 5753 ROHS	5	7.3	5.8	4.0	6.2	1.1	0.4	0.8	4.0	3.0	

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## Miniature, Standard & High Voltage Series

### AIR DIELECTRIC TRIMMER CAPACITORS, RoHS COMPLIANT

#### I.5 MINIATURE AIR TRIMMER SERIES: SUGGESTED MOUNTING HOLES



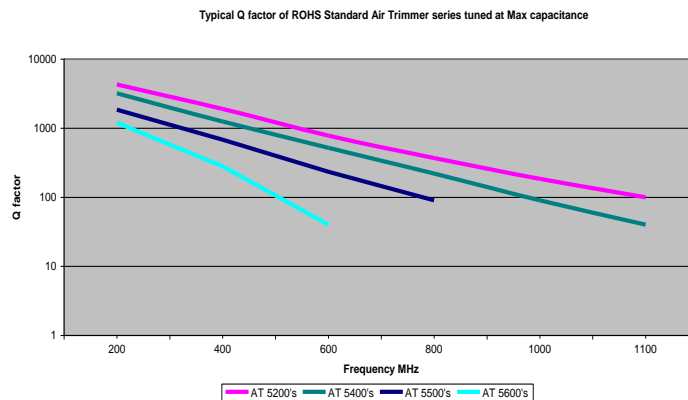
P/N	Figure	Φ1	Φ2	L	M
AT 5800 ROHS, AT 5802 ROHS, AT 5850 ROHS, AT 5852 ROHS	A	3.2			
AT 5801 ROHS, AT 5851 ROHS	C	1.3	1.3		6.5
AT 8051 ROHS, AT 5853 ROHS	C	1.3	1.3		3.2
AT 5700 ROHS, AT 5702 ROHS, AT 5750 ROHS, AT 5752 ROHS	A	4.9			
AT 5701 ROHS, AT 5751 ROHS	B	1.3	1.3	4.0	6.7
AT 8050 ROHS	C	1.3	1.3		4.0
AT 5753 ROHS	B	1.3	1.3	4.0	4.0

#### II. STANDARD AIR TRIMMER SERIES

P/N	AT 5200 ROHS AT 5201 ROHS AT 5202 ROHS AT 8052 ROHS	AT 5400 ROHS AT 5401 ROHS AT 5402 ROHS AT 8053 ROHS	AT 5450 ROHS AT 5451 ROHS AT 5452 ROHS AT 5453 ROHS	AT 5500 ROHS AT 5501 ROHS AT 5502 ROHS AT 8054 ROHS	AT 5600 ROHS AT 5601 ROHS AT 5602 ROHS
Capacitance range	0.8 to 10 pF > 6 turns	1 to 14 pF > 6 turns	1 to 16 pF > 6 turns	1 to 20 pF > 14 turns	1 to 30 pF >20 turns
Working voltage	250 VDC				
Test voltage	500 VDC				
Working Temp. range	- 55°C to + 125°C				
Temp. Coefficient	0+/-15 ppm/°C	0+/-25 ppm/°C	0+/-50 ppm/°C	0+/-30 ppm/°C	0+/-30 ppm/°C
Q factor @ Max Cap.	> 5000	> 3000	> 3000	> 1000	> 800
Insulation Resistance	>10 <sup>6</sup> MΩ min				

Capacitance change is linear versus rotation of mobile rotor.

#### II.1 STANDARD AIR TRIMMER SERIES: QUALITY FACTOR



# Air Trimmer Capacitors

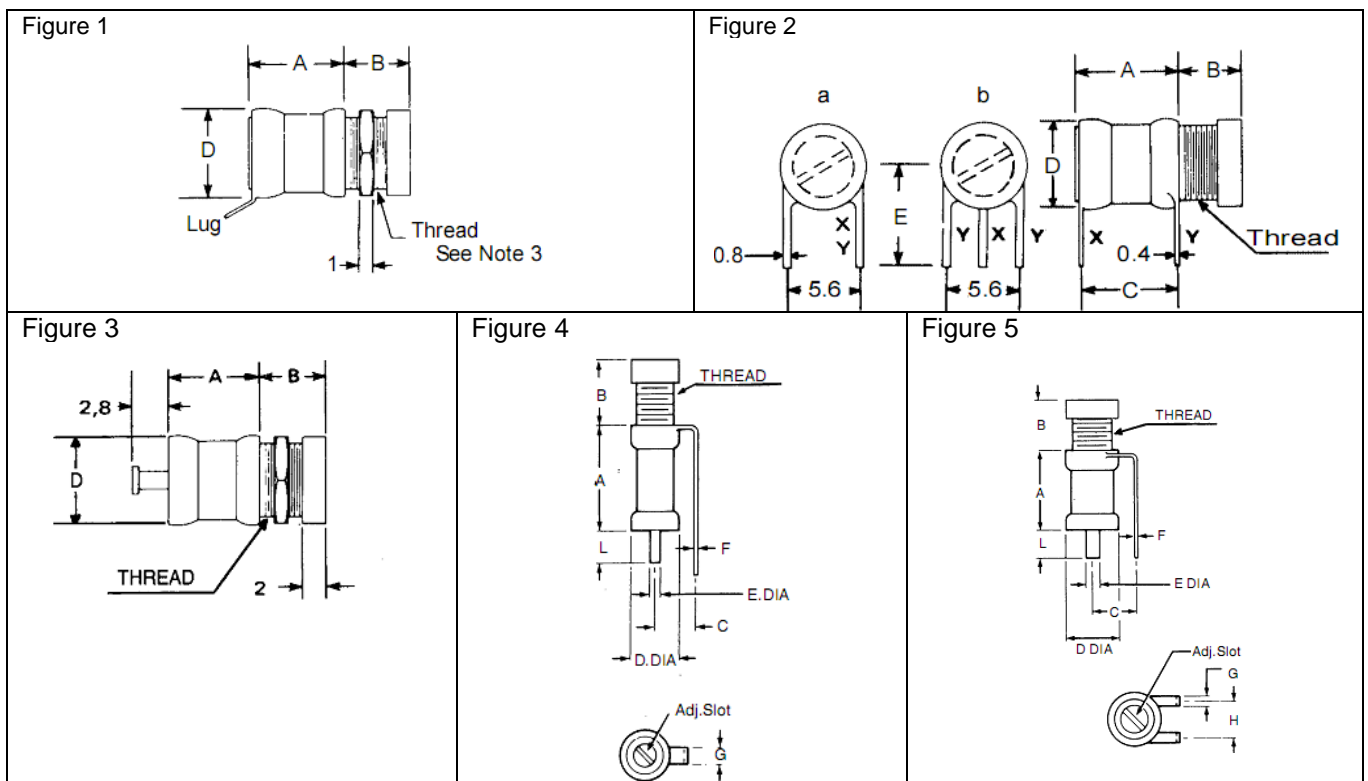
## Miniature, Standard & High Voltage Series

### AIR DIELECTRIC TRIMMER CAPACITORS, RoHS COMPLIANT

#### II.2 STANDARD AIR TRIMMER SERIES: MECHANICAL & GENERAL SPECIFICATIONS

P/N	AT 5200 ROHS AT 5201 ROHS AT 5202 ROHS AT 8052 ROHS	AT 5400 ROHS AT 5401 ROHS AT 5402 ROHS AT 8053 ROHS	AT 5450 ROHS AT 5451 ROHS AT 5452 ROHS AT 5453 ROHS	AT 5500 ROHS AT 5501 ROHS AT 5502 ROHS AT 8054 ROHS	AT 5600 ROHS AT 5601 ROHS AT 5602 ROHS
Rotating torque	70 to 350 g.cm				
Max torque on rotor stop	500 g.cm				
Nut mounting torque	5000 g.cm				
Seal cap assemb. torque	800 g.cm				
Vibrations	60g, 10-2000 Hz				
Shocks	1500g, 0.5 ms				
Brass and Invar structure					
Glazed alumina insulation					
306°C solder used in assembly					
Silicone rubber seal washer					
Gold, silver and chromate finish					

#### II.3 STANDARD AIR TRIMMER SERIES: MODELS



**Terminals are gold plated**  
 Others models available upon request  
 Custom design available upon request

TEMEX CERAMICS reserves the right to modify herein specifications and information at any time when necessary to provide optimum performance and cost.

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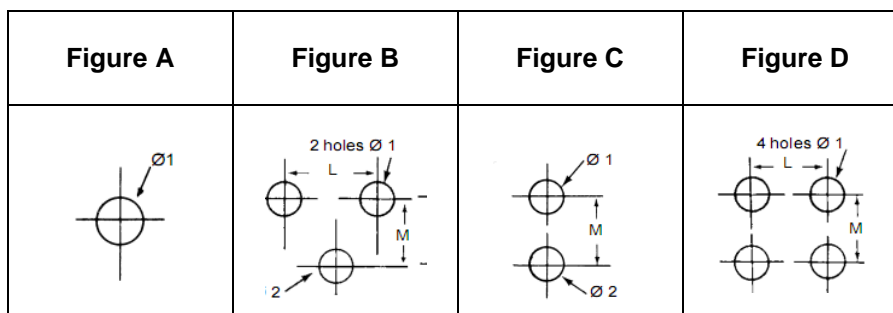
## Miniature, Standard & High Voltage Series

### AIR DIELECTRIC TRIMMER CAPACITORS, RoHS COMPLIANT

#### II.4 STANDARD AIR TRIMMER SERIES: DIMENSIONS in mm

P/N	Figure	A	B	C	D	E	F	G	H	L	Thread
AT 5200 ROHS	1	7.7	5.8		7.6						.234-64 UNS
AT 5201 ROHS	2b	8.0	5.4	7.2	7.6	7.9					
AT 5202 ROHS	3	7.2	5.8		7.6						
AT 8052 ROHS	4	7.5	5.6	5.2	7.6	1.6	0.4	1.0		2.8	
AT 5400 ROHS	1	7.7	5.8		7.6						
AT 5401 ROHS	2b	8.0	5.4	7.2	7.6	12.0					
AT 5402 ROHS	3	7.2	5.8		7.6						
AT 8053 ROHS	4	7.5	5.6	5.2	7.6	1.6	0.4	1.0		2.8	
AT 5450 ROHS	1	7.7	5.8		7.6						
AT 5451 ROHS	2b	8.0	5.4	7.2	7.6	12.0					
AT 5452 ROHS	3	7.2	5.8		7.6						
AT 5453 ROHS	5	7.5	5.6	5.2	7.6	1.6	0.4	1.0	5.6	2.8	
AT 5500 ROHS	1	12.5	6.7		8.0						
AT 5501 ROHS	2b	14.7	4.3	14.2	8.0	12.0					
AT 5502 ROHS	3	12.4	6.7		8.0						
AT 8054 ROHS	4	14.7	4.4	5.2	8.0	1.6	0.4	1.0		2.8	
AT 5600 ROHS	1	17.3	6.6		8.0						
AT 5601 ROHS	2a	19.4	4.4	18.8	8.0	12.0					
AT 5602 ROHS	3	17.3	6.6		8.0						

#### II.5 STANDARD AIR TRIMMER SERIES: SUGGESTED MOUNTING HOLES



Models	Figure	Φ1	Φ2	L	M
AT 5200 ROHS, AT 5202 ROHS, AT 5400 ROHS, AT 5402 ROHS, AT 5450 ROHS, AT 5452 ROHS, AT 5500 ROHS, AT 5502 ROHS, AT 5600ROHS, AT 5602 ROHS	A	6.2			
AT 5201 ROHS, AT 5401 ROHS, AT 5451 ROHS, AT 5501 ROHS, AT 5601 ROHS	B	1.3	1.3	5.6	7.2
	B	1.3	1.3	5.6	14.2
	D	1.3	1.3	5.6	18.8
AT 8052 ROHS, AT 8053 ROHS, AT 8054 ROHS	C	1.3	1.3		5.2
AT 5453 ROHS	B	1.3	1.7	5.6	5.2

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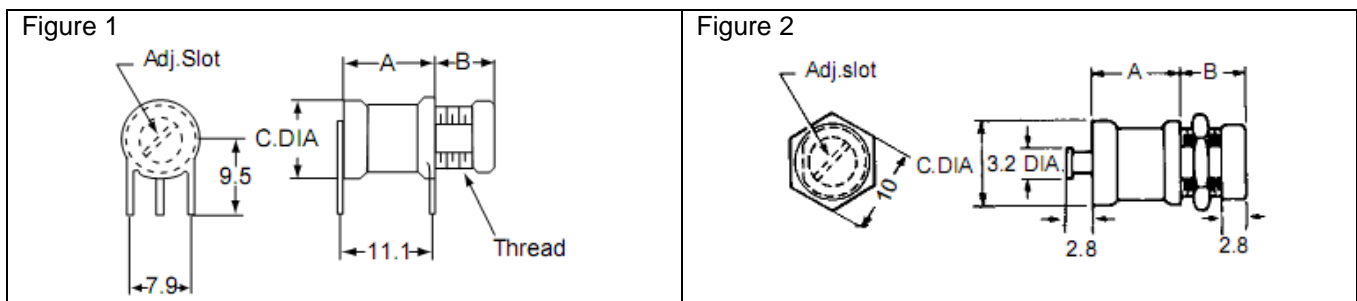
#### III. HIGH VOLTAGE AIR TRIMMER SERIES

P/N	AT 5301 ROHS AT 5302 ROHS
Capacitance range	0.8 to 10 pF > 10 turns
Working voltage	500 VDC
Test voltage	1000 VDC
Working Temp. range	-55°C to +125°C
Temp. Coefficient	0+/-20 ppm/°C
Q factor @ Max Cap.	> 2000
Insulation Resistance	> 10 <sup>9</sup> MΩ

#### III.1 HIGH VOLTAGE AIR TRIMMER SERIES: MECHANICAL & GENERAL SPECIFICATIONS

P/N	AT 5301 ROHS AT 5302 ROHS
Rotating torque	70 to 420 g.cm
Max torque on rotor stop	600 g.cm
Nut mounting torque	7000 g.cm
Seal cap assembly torque	1000 g.cm
Vibrations	60g, 10-2000 Hz
Glazed alumina insulation	
306°C solder used in assembly	
Silicone rubber seal washer	
Gold, silver and chromate finish	

#### III.2 HIGH VOLTAGE AIR TRIMMER SERIES: MODELS



**Terminals are gold plated**

Others models available upon request

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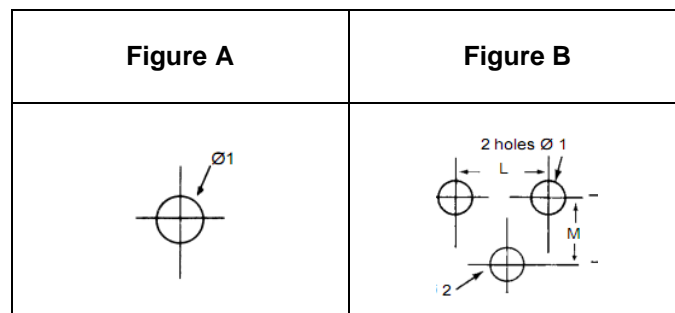
## Miniature, Standard & High Voltage Series

### AIR DIELECTRIC TRIMMER CAPACITORS, RoHS COMPLIANT

#### III.3 STANDARD AIR TRIMMER SERIES: DIMENSIONS in mm

P/N	Figure	A	B	C	Thread
AT 5301 ROHS	1	11.1	8.3	9.8	.312-64 UNS
AT 5302 ROHS	2	10.7	7.8	9.8	

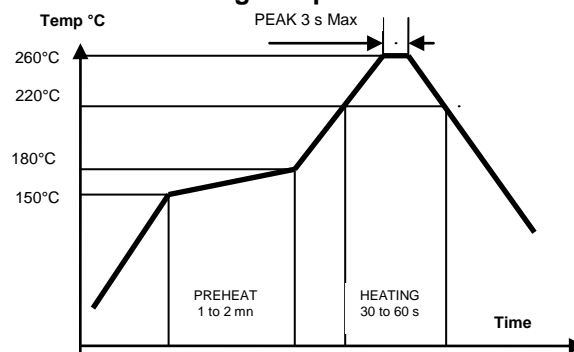
#### III.4 STANDARD AIR TRIMMER SERIES: SUGGESTED MOUNTING HOLES



P/N	Figure	Ø1	Ø2	L	M
AT 5301 ROHS	B	1.3	1.3	11.1	7.9
AT 5302 ROHS	A	8.1			

#### IV. SOLDERING AND MOUNTING

##### Recommended reflow solder temperature profile Maximum Soldering Temperature 260°C MAX



**Hand soldering:** Use a temperature controlled 40 watts iron set at 260°C maximum. The solder joint should be made on 3 seconds or less.

For panel mounting Air Trimmer capacitors (using a nut) minimum circuit thickness is 0.8 mm.

#### I.6 RECOMMENDATIONS FOR CLEANING

Air Trimmer capacitors are compatible with a wide variety of cleaning process including those that utilize

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aqueous or semi-aqueous solutions, alcohol solutions, de-ionized water and numerous other cleaners. However, due to the large variety of such processes, the customer through cleaning process evaluation in conjunction with TEMEX-CERAMICS product purchased must determine actual compatibility. Capacitors without sealing caps should be protected from intrusion of cleaning solutions in the internal bushing thread. It is recommended these units be installed after circuit boards have been cleaned. Units with seal caps may be immersed in liquid, vapour and ultrasonic system.

#### VIII. PACKAGING

Parts are delivered in bulk and with a standard sealing cap  
Special sealing caps with screwdriver slot are available except for AT 5300 series

#### IX. HOW TO ORDER

Air trimmer capacitors with standard sealing cap

	Reference	ROHS
Examples	AT 5202	ROHS
	AT 5301	ROHS

Air trimmer capacitors with special sealing cap with screwdriver slot

	Reference	S	ROHS
Examples	AT 5702	S	ROHS
	AT 5801	S	ROHS

#### X. TUNING TOOLS

Recommended Tuning Tools references:

**AT 8766** for AT 5800 ROHS and AT 5850 ROHS series

**AT 8777** for all others series

Improper screwdriver may damage the internal bushing thread causing rotor binding.

#### XI. ADJUSTING

The maximum torque on rotor stop value should not be exceeded or damage to capacitor may result. Always use the recommended tuning tool.