TRIMMER CAPACITORS
Standard, Non-Magnetic, SMD

EXXELIA

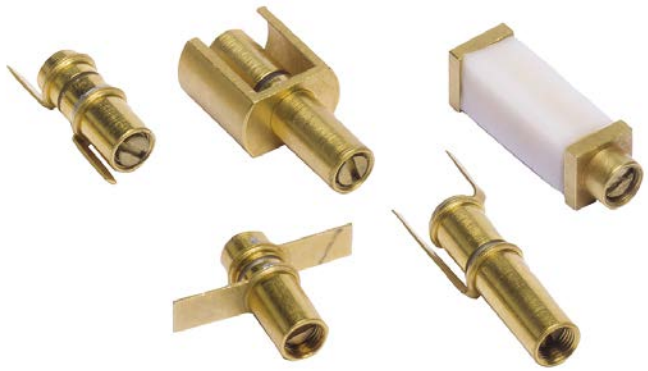
RoHS Compliant

GIGAHERTZ SAPPHIRE TRIMMER CAPACITORS

DESCRIPTION

Sapphire dielectric
High self resonance frequency and very good Q
Rated voltage 500 V_{DC}
Multi-turn, very fine resolution
Low temperature coefficient
Low capacitance drift and very stable over time
Self-locking constant torque drive mechanism
Surface mount models available on tape and reel
Meet MIL-C-144409
Compliant to ESA/SCC 3010
Terminations are **gold plated**
Non magnetic model
RoHS compliant
High Reliability versions available on special order
Custom design upon request

Maximum Soldering Temperature 260°C, 3 s Max



APPLICATIONS

RF power amplifier
Filter tuning
Crystal trimming
Impedance matching
Low power amplifiers
Medical applications

Dielectric constant of sapphire does not change with frequency and temperature. Sapphire is inert crystal, moisture resistant and mechanically strong.

I. ELECTRICAL SPECIFICATIONS

Designation	AT 2726X RoHS AT SM260 RoHS	AT 2727X RoHS AT SM270 RoHS	AT 2728X RoHS AT SM280 RoHS	AT 2729X RoHS AT SM290 RoHS
Capacitance range **Standard models** **AT 272X8 models**	0.3 to 1.2 pF 0.35 to 1.2 pF > 4 turns	0.6 to 4.5 pF 0.65 to 4.5 pF > 8 turns	0.4 to 2.5 pF 0.45 to 2.5 pF > 4 turns	0.8 to 8.0 pF 0.85 to 8.0 pF > 16 turns
Working Voltage	500 V_{DC}			
Test Voltage	1000 V_{DC}			
Working Temp. range	-55°C to + 125°C			
Temp. Coeff. **Standard models** **AT 272X8 models**	0 ±50 ppm/°C -50 ±75 ppm/°C	0 ±50 ppm/°C -50 ±75 ppm/°C	0 ±50 ppm/°C -50 ±75 ppm/°C	0 ±75 ppm/°C -50 ±75 ppm/°C
Q factor @ Max Capacitance	>5000 @250 MHz	>3000 @250 MHz	>4000 @250 MHz	>3000 @100 MHz
Insulation Resistance	>10000 MΩ min @ 500 V_{DC}			

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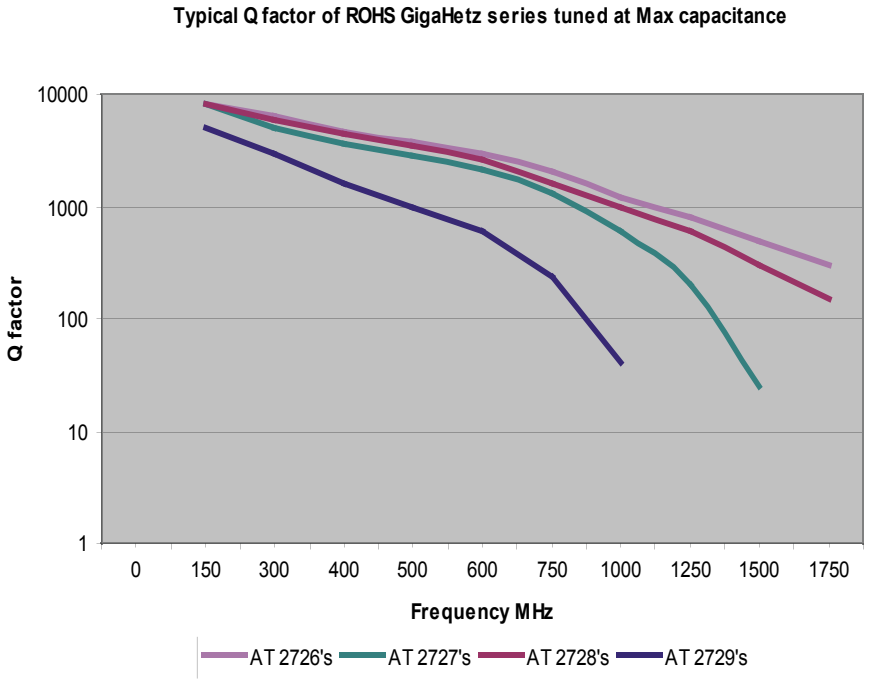
II. QUALITY FACTOR



III. MECHANICAL AND GENERAL SPECIFICATIONS

Designation	AT 2726X RoHS AT SM260 RoHS	AT 2727X RoHS AT SM270 RoHS	AT 2728X RoHS AT SM280 RoHS	AT 2729X RoHS AT SM290 RoHS
Rotating Torque	7 to 60 g.cm	10 to 100 g.cm	10 to 100 g.cm	10 to 100 g.cm
Max Torque on rotor stop	80 g.cm	150 g.cm	120 g.cm	150 g.cm
Rotational life	> 800 revolutions			
Vibration	60 g, 10-2000 Hz			
Shock	100 g, 6ms			

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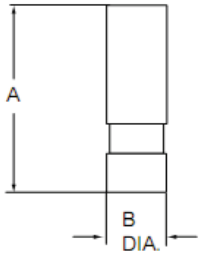
IV. SELF RESONANT FREQUENCY

For surface mount version, self resonant frequency is improving when width of terminal is increasing.

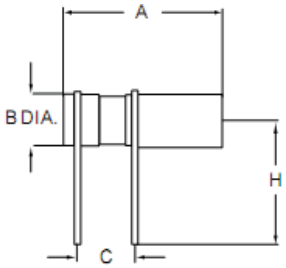
With more width terminal, Equivalent Serial Resistance (ESR) is lower.As example for the same capacity range, self resonant frequency of model 8 is higher than for model 3.

V. MODELS

Model 0

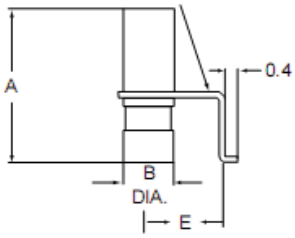


Model 1



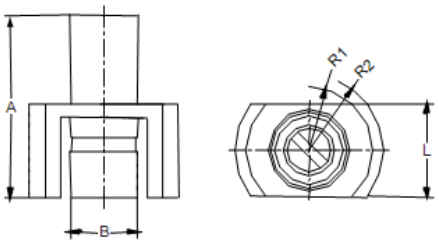
Terminal 1.0 mm width x 0.2 mm thickness

Model 3

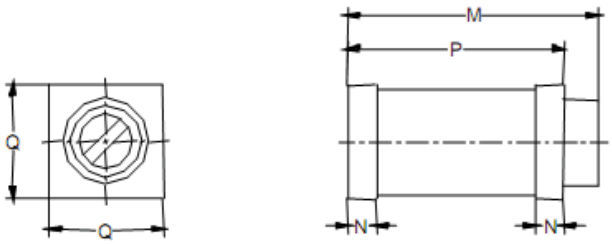


Terminal 1.0 mm width x 0.2 mm thickness

Model 8



AT SM Series



Terminals are gold plated

CUSTOM DESIGN upon request

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VI. DIMENSIONS

X is the model

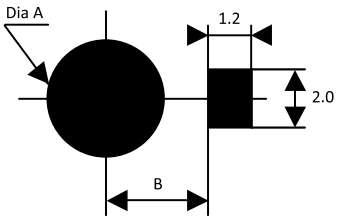
Designation	A		B		C		E		H		L		R1		R2	
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
AT 2726X RoHS	5.8	(0.228)	1.9	(0.075)	2.0	(0.079)	1.9	(0.075)	5.9	(0.232)	3.1	(0.122)	2.3	(0.091)	2.8	(0.110)
AT 2727X RoHS	8.0	(0.315)	3.0	(0.118)	3.2	(0.126)	2.8	(0.110)	5.9	(0.232)	4.1	(0.161)	2.8	(0.110)	3.3	(0.130)
AT 2728X RoHS	5.8	(0.228)	3.0	(0.118)	2.0	(0.079)	2.8	(0.110)	5.9	(0.232)	4.1	(0.161)	2.8	(0.110)	3.3	(0.130)
AT 2729X RoHS	12.3	(0.484)	3.0	(0.118)	6.4	(0.252)	2.8	(0.110)	5.9	(0.232)	4.1	(0.161)	2.8	(0.110)	3.3	(0.130)

Designation	M		N		P		Q	
	mm	inches	mm	inches	mm	inches	mm	inches
AT SM260 RoHS	6.4	(0.252)	0.8	(0.031)	5.1	(0.201)	3.0	(0.118)
AT SM270 RoHS	8.8	(0.346)	1.0	(0.039)	7.6	(0.299)	4.0	(0.157)
AT SM280 RoHS	6.6	(0.260)	1.0	(0.039)	5.1	(0.201)	4.0	(0.157)
AT SM290 RoHS	13.1	(0.516)	1.0	(0.039)	11.4	(0.449)	4.0	(0.157)

VII. SOLDERING

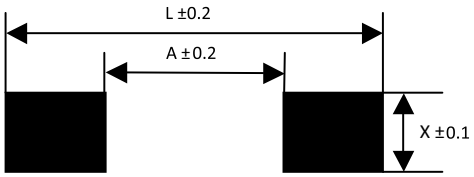
Typical solder pad layout

AT 27263 RoHS, AT 27273 RoHS, AT 27283 RoHS, AT 27293 RoHS models



Dimensions in mm (inches)	AT 27263 RoHS	AT 27273 RoHS AT 27283 RoHS AT 27293 RoHS
Dia A	2.4 (0.094)	3.6 (0.142)
B	1.7 (0.067)	2.3 (0.091)

AT SM Models



Dimensions in mm (inches)	AT SM260 RoHS	AT SM270 RoHS	AT SM280 RoHS	AT SM290 RoHS
L	6,2 (0.244)	8,7 (0.343)	6,2 (0.244)	12,5 (0.492)
A	3,2 (0.126)	5,2 (0.205)	2,8 (0.110)	9,0 (0.354)
X	3,4 (0.134)	4,4 (0.173)	4,4 (0.173)	4,4 (0.173)

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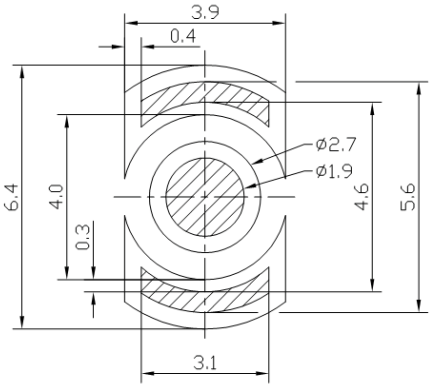
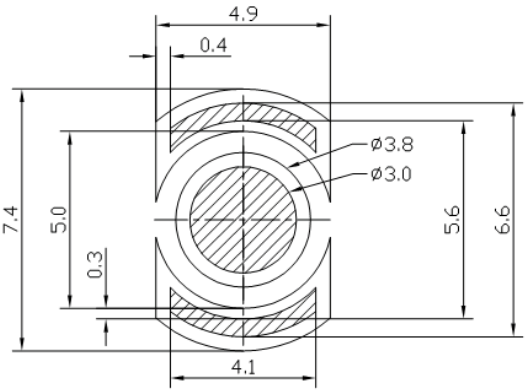
AT 27268 RoHS

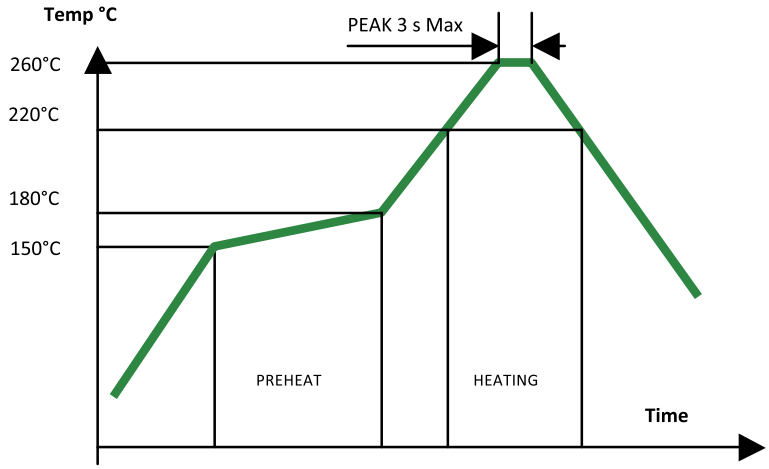


AT 27278 RoHS, AT 27288 RoHS, AT 27298 RoHS



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.

VIII. RECOMMENDATIONS FOR CLEANING

GigaHertz Trimmer capacitors are compatible with a wide variety of cleaning process including those that utilize 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 **EXXELIA** 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.

IX. PACKAGING

Parts are delivered in bulk for quantity lower than 500 pcs.

GigaHertz trimmers AT 27263 RoHS, AT 27273 RoHS, AT 27283 RoHS, AT 27268 RoHS, AT 27278 RoHS, AT 27288 RoHS, AT 27298 RoHS (also available in band), AT SM270 RoHS and AT SM280 RoHS are available on tape and reel, quantity per reel 500 pcs.

Models 0 and 1, trimmers AT 27293 RoHS and AT SM290 RoHS are not available on tape.

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When delivered on tape, GigaHertz trimmers include a permanent sealing cap which is moisture proof and resists intrusion of dirt, dust, solder flux and cleaning agents, and allows easy access, accurate tuning after assembly and cleaning. References of sealing caps are AT 69600 RoHS for AT 2726X RoHS family and AT 69700 for AT 2727X RoHS, AT 2728X RoHS and AT 2729X RoHS families. For sealing caps of AT SM series, contact **EXXELIA**.

Use of permanent sealing cap increases total length of the GigaHertz trimmer by 0.2 mm.

X. HOW TO ORDER

Parts in quantity < 500 pcs and for models 0 and 1, trimmers AT 27293 RoHS, AT 27298 RoHS and AT SM290 RoHS

Examples

Designation	RoHS
AT 27293	RoHS
AT SM270	RoHS
AT 27261	RoHS
AT 57290	RoHS

Parts with sealing cap, in quantity < 500 pcs

Example

Designation	+ CAP	RoHS
AT 27273	**+ CAP**	RoHS

Parts on tape and reel : (500 pcs/reel)

Examples

Designation	R1	RoHS
AT 27283	**R1**	RoHS
AT SM260	**R1**	RoHS

XI. TUNING TOOLS

Recommended Tuning Tools references:

AT 8762 for AT 2726X RoHS part numbers and AT SM260 RoHS

AT 8777 for AT 2727X RoHS, AT 2728X RoHS and AT 2729X RoHS part numbers and AT SM270 RoHS, AT SM280 RoHS and AT SM290 RoHS as well for AT 57290 RoHS.

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

XII. ADJUSTING

Sealing caps, available on GigaHertz trimmers delivered on tape and reel, are designed so that after assembly is complete they may be penetrated by the **EXXELIA** tuning tool and left in place.

The maximum torque on rotor stop value should not be exceeded or damage to the capacitor may result.

Always use the recommended tuning tool.