

### FEATURES

- Standard HC-49/US [thru-hole] and HC-49/US-SM [surface mount] Packages
- Stable Frequency Over Temperature and Drive Level
- **Fundamental and 3<sup>rd</sup> Overtone Crystals**
- Frequency Range 3.2 – 64 MHz
- Frequency Tolerance,  $\pm 30$  ppm Standard
- Frequency Stability,  $\pm 50$  ppm Standard
- Operating Temperature,  $-20^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  Standard,  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  Available
- Tape & Reel Packaging Available
- **RoHS/Green Compliant [6/6]**

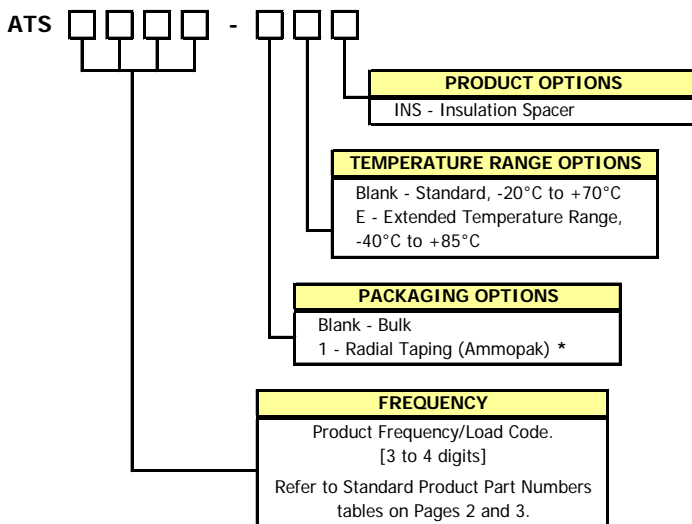


### APPLICATIONS

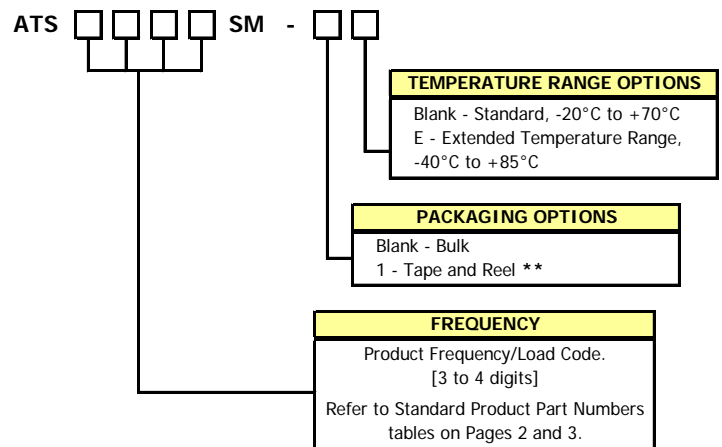
The ATS/ATS-SM crystal series offers excellent long-term stability and reliability in a proven resistance-weld metal package. The excellent shock performance makes it suitable for microprocessor, telecommunication, industrial, consumer electronics and networking applications.

### ORDERING INFORMATION

#### ATS



#### ATS-SM



\*\* Standard packaging is tape and reel.  
CTS Distributors may use -T for tape and reel indicator.

\* Standard packaging is bulk in a bag.

### Non-Standard Ordering Options

- Contact your local CTS Representative or CTS Inside Sales Representative for assistance.

**STANDARD PRODUCT PART NUMBERS - ATS**

Part numbers in **BOLD** are common stock items through CTS authorized distributors. Non-bold part numbers may be stocked or are available for order.

FREQUENCY (MHz)	PART NUMBER -20/70°C	PART NUMBER -40/85°C	LOAD CAPACITANCE	OPERATING MODE	FREQUENCY (MHz)	PART NUMBER -20/70°C	PART NUMBER -40/85°C	LOAD CAPACITANCE	OPERATING MODE
3.579545	ATS036B	ATS036B-E	Series	Fundamental	12.352000	ATS126	ATS126-E	Series	Fundamental
3.579545	<b>ATS036</b>	ATS036-E	18 pF	Fundamental	12.352000	ATS127	ATS127-E	20 pF	Fundamental
3.686400	ATS037A	ATS037A-E	Series	Fundamental	13.500000	ATS135	ATS135-E	20 pF	Fundamental
3.686400	<b>ATS037</b>	ATS037-E	20 pF	Fundamental	14.318180	<b>ATS143</b>	ATS143-E	Series	Fundamental
3.686400	<b>ATS037B</b>	<b>ATS037B-E</b>	18 pF	Fundamental	14.318180	ATS144A	ATS144A-E	20 pF	Fundamental
4.000000	ATS04A	ATS04A-E	Series	Fundamental	14.318180	<b>ATS143B</b>	<b>ATS143B-E</b>	18 pF	Fundamental
4.000000	<b>ATS040</b>	ATS040-E	20 pF	Fundamental	14.745600	ATS147	ATS147-E	Series	Fundamental
4.000000	<b>ATS040B</b>	<b>ATS040B-E</b>	18 pF	Fundamental	14.745600	<b>ATS147A</b>	<b>ATS147A-E</b>	20 pF	Fundamental
4.096000	ATS042A	ATS042A-E	20 pF	Fundamental	14.745600	<b>ATS147B</b>	<b>ATS147B-E</b>	18 pF	Fundamental
4.096000	ATS042B	ATS042B-E	18 pF	Fundamental	15.000000	ATS150	ATS150-E	Series	Fundamental
4.194304	ATS041C	ATS041C-E	12 pF	Fundamental	15.360000	<b>ATS15A</b>	ATS15A-E	20 pF	Fundamental
4.915200	ATS049A	ATS049A-E	Series	Fundamental	16.000000	<b>ATS160</b>	ATS160-E	Series	Fundamental
4.915200	<b>ATS042</b>	ATS042-E	20 pF	Fundamental	16.000000	<b>ATS16A</b>	ATS16A-E	20 pF	Fundamental
4.915200	<b>ATS049B</b>	<b>ATS049B-E</b>	18 pF	Fundamental	16.000000	ATS16B	ATS16B-E	18 pF	Fundamental
5.000000	ATS050C	ATS050C-E	Series	Fundamental	16.384000	ATS164B	ATS164B-E	18 pF	Fundamental
5.000000	ATS050A	ATS050A-E	20 pF	Fundamental	16.934400	ATS169	ATS169-E	20 pF	Fundamental
5.000000	ATS050B	ATS050B-E	18 pF	Fundamental	18.000000	ATS180A	ATS180A-E	20 pF	Fundamental
5.068800	ATS051	ATS051-E	Series	Fundamental	18.432000	ATS184	ATS184-E	Series	Fundamental
5.068800	<b>ATS050</b>	ATS050-E	20 pF	Fundamental	18.432000	ATS18A	ATS18A-E	20 pF	Fundamental
6.000000	ATS060A	ATS060A-E	Series	Fundamental	18.432000	ATS184B	ATS184B-E	18 pF	Fundamental
6.000000	<b>ATS060</b>	ATS060-E	20 pF	Fundamental	19.660800	ATS196	ATS196-E	Series	Fundamental
6.000000	<b>ATS060B</b>	<b>ATS060B-E</b>	18 pF	Fundamental	19.660800	ATS19A	ATS19A-E	20 pF	Fundamental
6.000000	ATS060C	ATS060C-E	32 pF	Fundamental	19.660800	ATS196B	ATS196B-E	18 pF	Fundamental
6.144000	ATS061	ATS061-E	20 pF	Fundamental	20.000000	<b>ATS200</b>	ATS200-E	Series	Fundamental
6.144000	<b>ATS061B</b>	<b>ATS061B-E</b>	18 pF	Fundamental	20.000000	ATS20A	ATS20A-E	20 pF	Fundamental
6.144000	ATS061C	ATS061C-E	32 pF	Fundamental	20.000000	<b>ATS200C</b>	<b>ATS200C-E</b>	18 pF	Fundamental
7.372800	ATS073A	ATS073A-E	Series	Fundamental	20.000000	ATS20B	ATS20B-E	50 pF	Fundamental
7.372800	ATS073	ATS073-E	20 pF	Fundamental	20.480000	<b>ATS204</b>	ATS204-E	20 pF	Fundamental
7.372800	ATS073B	ATS073B-E	18 pF	Fundamental	22.118400	ATS22A	ATS22A-E	20 pF	Fundamental
7.500000	ATS075	ATS075-E	Series	Fundamental	22.118400	ATS221B	ATS221B-E	18 pF	Fundamental
7.500000	ATS075A	ATS075A-E	20 pF	Fundamental	24.000000	ATS240	ATS240-E	Series	Fundamental
7.500000	ATS075B	ATS075B-E	18 pF	Fundamental	24.000000	ATS24A	ATS24A-E	20 pF	Fundamental
8.000000	ATS080	ATS080-E	Series	Fundamental	24.000000	ATS240B	ATS240B-E	18 pF	Fundamental
8.000000	<b>ATS08A</b>	ATS08A-E	20 pF	Fundamental	24.000000	ATS240C	ATS240C-E	12 pF	Fundamental
8.000000	<b>ATS080B</b>	<b>ATS080B-E</b>	18 pF	Fundamental	24.576000	<b>ATS245</b>	ATS245-E	Series	Fundamental
8.000000	ATS080C	ATS080C-E	32 pF	Fundamental	24.576000	ATS24B	ATS24B-E	20 pF	Fundamental
8.192000	ATS081B	ATS081B-E	18 pF	Fundamental	24.576000	<b>ATS245A</b>	<b>ATS245A-E</b>	18 pF	Fundamental
9.830400	ATS099	ATS099-E	Series	Fundamental	25.000000	<b>ATS250</b>	ATS250-E	Series	Fundamental
9.830400	<b>ATS098</b>	ATS098-E	20 pF	Fundamental	25.000000	<b>ATS25A</b>	ATS25A-E	20 pF	Fundamental
9.830400	<b>ATS098B</b>	<b>ATS098B-E</b>	18 pF	Fundamental	25.000000	<b>ATS250B</b>	<b>ATS250B-E</b>	18 pF	Fundamental
10.000000	<b>ATS100</b>	ATS100-E	Series	Fundamental	27.000000	ATS270A	ATS270A-E	20 pF	Fundamental
10.000000	ATS10A	ATS10A-E	20 pF	Fundamental	27.000000	ATS270B	ATS270B-E	18 pF	Fundamental
10.000000	<b>ATS100B</b>	<b>ATS100B-E</b>	18 pF	Fundamental	32.000000	ATS320	ATS320-E	Series	3rd Overtone
11.059200	ATS111A	ATS111A-E	Series	Fundamental	32.000000	ATS32A	ATS32A-E	20 pF	3rd Overtone
11.059200	<b>ATS111</b>	ATS111-E	20 pF	Fundamental	32.000000	ATS320B	ATS320B-E	18 pF	3rd Overtone
11.059200	<b>ATS111B</b>	<b>ATS111B-E</b>	18 pF	Fundamental	40.000000	ATS400	ATS400-E	Series	3rd Overtone
11.059200	ATS111C	ATS111C-E	32 pF	Fundamental	40.000000	ATS40A	ATS40A-E	20 pF	3rd Overtone
12.000000	<b>ATS120</b>	ATS120-E	Series	Fundamental	40.000000	ATS400B	ATS400B-E	18 pF	3rd Overtone
12.000000	ATS12A	ATS12A-E	20 pF	Fundamental	48.000000	ATS480A	ATS480A-E	20 pF	3rd Overtone
12.000000	<b>ATS120B</b>	<b>ATS120B-E</b>	18 pF	Fundamental	48.000000	ATS480B	ATS480B-E	18 pF	3rd Overtone
12.000000	ATS120C	ATS120C-E	32 pF	Fundamental	60.000000	ATS600A	ATS600A-E	20 pF	3rd Overtone
12.288000	ATS125	ATS125-E	Series	Fundamental	60.000000	ATS600B	ATS600B-E	18 pF	3rd Overtone
12.288000	<b>ATS122</b>	ATS122-E	20 pF	Fundamental	64.000000	ATS640A	ATS640A-E	20 pF	3rd Overtone
12.288000	<b>ATS122B</b>	<b>ATS122B-E</b>	18 pF	Fundamental	64.000000	ATS640B	ATS640B-E	18 pF	3rd Overtone
12.296000	ATS124	ATS124-E	Series	Fundamental					
12.296000	ATS123	ATS123-E	20 pF	Fundamental					
12.296000	ATS123B	ATS123B-E	18 pF	Fundamental					

**STANDARD PRODUCT PART NUMBERS - ATS-SM**

Part numbers in **BOLD** are common stock items through CTS authorized distributors. Non-bold part numbers may be stocked or are available for order.

FREQUENCY (MHz)	PART NUMBER -20/70°C	PART NUMBER -40/85°C	LOAD CAPACITANCE	OPERATING MODE	FREQUENCY (MHz)	PART NUMBER -20/70°C	PART NUMBER -40/85°C	LOAD CAPACITANCE	OPERATING MODE
3.579545	ATS036BSM-1	ATS036BSM-1E	Series	Fundamental	14.318180	<b>ATS143SM-1</b>	ATS143SM-1E	Series	Fundamental
3.579545	<b>ATS036SM-1</b>	ATS036SM-1E	18 pF	Fundamental	14.318180	ATS144SM-1	ATS144SM-1E	20 pF	Fundamental
3.686400	ATS037ASM-1	ATS037ASM-1E	Series	Fundamental	14.318180	<b>ATS143BSM-1</b>	ATS143BSM-1E	18 pF	Fundamental
3.686400	<b>ATS037SM-1</b>	ATS037SM-1E	20 pF	Fundamental	14.745600	ATS147SM-1	ATS147SM-1E	Series	Fundamental
3.686400	<b>ATS037BSM-1</b>	ATS037BSM-1E	18 pF	Fundamental	14.745600	<b>ATS147ASM-1</b>	ATS147ASM-1E	20 pF	Fundamental
4.000000	ATS04ASM-1	ATS04ASM-1E	Series	Fundamental	14.745600	<b>ATS147BSM-1</b>	ATS147BSM-1E	18 pF	Fundamental
4.000000	<b>ATS040SM-1</b>	ATS040SM-1E	20 pF	Fundamental	15.000000	ATS150SM-1	ATS150SM-1E	Series	Fundamental
4.000000	<b>ATS040BSM-1</b>	ATS040BSM-1E	18 pF	Fundamental	15.000000	ATS150BSM-1	ATS150BSM-1E	18 pF	Fundamental
4.096000	ATS042ASM-1	ATS042ASM-1E	20 pF	Fundamental	15.360000	<b>ATS15ASM-1</b>	ATS15ASM-1E	20 pF	Fundamental
4.096000	ATS042BSM-1	ATS042BSM-1E	18 pF	Fundamental	16.000000	<b>ATS160SM-1</b>	ATS160SM-1E	Series	Fundamental
4.194304	ATS041CSM-1	ATS041CSM-1E	12 pF	Fundamental	16.000000	ATS16ASM-1	ATS16ASM-1E	20 pF	Fundamental
4.915200	ATS049ASM-1	ATS049ASM-1E	Series	Fundamental	16.000000	ATS16BSM-1	ATS16BSM-1E	18 pF	Fundamental
4.915200	<b>ATS042SM-1</b>	ATS042SM-1E	20 pF	Fundamental	16.384000	ATS164BSM-1	ATS164BSM-1E	18 pF	Fundamental
4.915200	<b>ATS049BSM-1</b>	ATS049BSM-1E	18 pF	Fundamental	16.934400	ATS169SM-1	ATS169SM-1E	20 pF	Fundamental
5.000000	ATS050CSM-1	ATS050CSM-1E	Series	Fundamental	18.432000	ATS184SM-1	ATS184SM-1E	Series	Fundamental
5.000000	ATS050ASM-1	ATS050ASM-1E	20 pF	Fundamental	18.432000	ATS18ASM-1	ATS18ASM-1E	20 pF	Fundamental
5.000000	<b>ATS050BSM-1</b>	ATS050BSM-1E	18 pF	Fundamental	18.432000	ATS184BSM-1	ATS184BSM-1E	18 pF	Fundamental
5.068800	ATS051SM-1	ATS051SM-1E	Series	Fundamental	19.660800	ATS196SM-1	ATS196SM-1E	Series	Fundamental
5.068800	<b>ATS050SM-1</b>	ATS050SM-1E	20 pF	Fundamental	19.660800	ATS19ASM-1	ATS19ASM-1E	20 pF	Fundamental
6.000000	ATS060ASM-1	ATS060ASM-1E	Series	Fundamental	19.660800	ATS196BSM-1	ATS196BSM-1E	18 pF	Fundamental
6.000000	<b>ATS060SM-1</b>	ATS060SM-1E	20 pF	Fundamental	20.000000	<b>ATS200SM-1</b>	ATS200SM-1E	Series	Fundamental
6.000000	<b>ATS060BSM-1</b>	ATS060BSM-1E	18 pF	Fundamental	20.000000	ATS20ASM-1	ATS20ASM-1E	20 pF	Fundamental
6.000000	ATS060CSM-1	ATS060CSM-1E	32 pF	Fundamental	20.000000	<b>ATS200CSM-1</b>	ATS200CSM-1E	18 pF	Fundamental
6.144000	ATS061SM-1	ATS061SM-1E	20 pF	Fundamental	20.000000	ATS20BSM-1	ATS20BSM-1E	50 pF	Fundamental
6.144000	<b>ATS061BSM-1</b>	ATS061BSM-1E	18 pF	Fundamental	20.480000	<b>ATS204SM-1</b>	ATS204SM-1E	20 pF	Fundamental
6.144000	ATS061CSM-1	ATS061CSM-1E	32 pF	Fundamental	22.118400	ATS22ASM-1	ATS22ASM-1E	20 pF	Fundamental
7.372800	ATS073ASM-1	ATS073ASM-1E	Series	Fundamental	22.118400	ATS221BSM-1	ATS221BSM-1E	18 pF	Fundamental
7.372800	ATS073SM-1	ATS073SM-1E	20 pF	Fundamental	22.579200	ATS225BSM-1	ATS225BSM-1E	18 pF	Fundamental
7.372800	ATS073BSM-1	ATS073BSM-1E	18 pF	Fundamental	24.000000	ATS240SM-1	ATS240SM-1E	Series	Fundamental
8.000000	ATS080SM-1	ATS080SM-1E	Series	Fundamental	24.000000	ATS24ASM-1	ATS24ASM-1E	20 pF	Fundamental
8.000000	<b>ATS08ASM-1</b>	ATS08ASM-1E	20 pF	Fundamental	24.000000	ATS240BSM-1	ATS240BSM-1E	18 pF	Fundamental
8.000000	<b>ATS080BSM-1</b>	ATS080BSM-1E	18 pF	Fundamental	24.000000	ATS240CSM-1	ATS240CSM-1E	12 pF	Fundamental
8.000000	ATS080CSM-1	ATS080CSM-1E	32 pF	Fundamental	24.576000	<b>ATS245SM-1</b>	ATS245SM-1E	Series	Fundamental
8.192000	ATS081BSM-1	ATS081BSM-1E	18 pF	Fundamental	24.576000	ATS24BSM-1	ATS24BSM-1E	20 pF	Fundamental
9.830400	ATS099SM-1	ATS099SM-1E	Series	Fundamental	24.576000	<b>ATS245ASM-1</b>	ATS245ASM-1E	18 pF	Fundamental
9.830400	<b>ATS098SM-1</b>	ATS098SM-1E	20 pF	Fundamental	25.000000	ATS250SM-1	ATS250SM-1E	Series	Fundamental
9.830400	<b>ATS098BSM-1</b>	ATS098BSM-1E	18 pF	Fundamental	25.000000	ATS25ASM-1	ATS25ASM-1E	20 pF	Fundamental
10.000000	<b>ATS100SM-1</b>	ATS100SM-1E	Series	Fundamental	25.000000	ATS250BSM-1	ATS250BSM-1E	18 pF	Fundamental
10.000000	<b>ATS10ASM-1</b>	ATS10ASM-1E	20 pF	Fundamental	26.000000	ATS260ASM-1	ATS260ASM-1E	20 pF	Fundamental
10.000000	<b>ATS100BSM-1</b>	ATS100BSM-1E	18 pF	Fundamental	26.000000	ATS260BSM-1	ATS260BSM-1E	18 pF	Fundamental
11.059200	ATS111ASM-1	ATS111ASM-1E	Series	Fundamental	27.000000	ATS270ASM-1	ATS270ASM-1E	20 pF	Fundamental
11.059200	<b>ATS111SM-1</b>	ATS111SM-1E	20 pF	Fundamental	27.000000	ATS270BSM-1	ATS270BSM-1E	18 pF	Fundamental
11.059200	<b>ATS111BSM-1</b>	ATS111BSM-1E	18 pF	Fundamental	28.636360	ATS286ASM-1	ATS286ASM-1E	20 pF	Fundamental
11.059200	ATS111CSM-1	ATS111CSM-1E	32 pF	Fundamental	30.000000	ATS300ASM-1	ATS300ASM-1E	20 pF	Fundamental
12.000000	<b>ATS120SM-1</b>	ATS120SM-1E	Series	Fundamental	30.000000	ATS300BSM-1	ATS300BSM-1E	18 pF	Fundamental
12.000000	ATS12ASM-1	ATS12ASM-1E	20 pF	Fundamental	32.000000	ATS320SM-1	ATS320SM-1E	Series	3rd Overtone
12.000000	<b>ATS120BSM-1</b>	ATS120BSM-1E	18 pF	Fundamental	32.000000	ATS32ASM-1	ATS32ASM-1E	20 pF	3rd Overtone
12.000000	ATS120CSM-1	ATS120CSM-1E	32 pF	Fundamental	32.000000	ATS320BSM-1	ATS320BSM-1E	18 pF	3rd Overtone
12.288000	ATS125SM-1	ATS125SM-1E	Series	Fundamental	33.000000	ATS330ASM-1	ATS330ASM-1E	20 pF	3rd Overtone
12.288000	<b>ATS122SM-1</b>	ATS122SM-1E	20 pF	Fundamental	33.000000	ATS330BSM-1	ATS330BSM-1E	18 pF	3rd Overtone
12.288000	<b>ATS122BSM-1</b>	ATS122BSM-1E	18 pF	Fundamental	36.000000	ATS360ASM-1	ATS360ASM-1E	20 pF	3rd Overtone
12.296000	ATS123SM-1	ATS123SM-1E	Series	Fundamental	36.000000	ATS360BSM-1	ATS360BSM-1E	18 pF	3rd Overtone
12.296000	ATS124SM-1	ATS124SM-1E	20 pF	Fundamental	40.000000	ATS400SM-1	ATS400SM-1E	Series	3rd Overtone
12.352000	ATS127SM-1	ATS127SM-1E	Series	Fundamental	40.000000	ATS40ASM-1	ATS40ASM-1E	20 pF	3rd Overtone
12.352000	ATS126SM-1	ATS126SM-1E	20 pF	Fundamental	40.000000	ATS400BSM-1	ATS400BSM-1E	18 pF	3rd Overtone
12.500000	ATS125BSM-1	ATS125BSM-1E	18 pF	Fundamental	48.000000	ATS480ASM-1	ATS480ASM-1E	20 pF	3rd Overtone
13.000000	ATS130SM-1	ATS130SM-1E	20 pF	Fundamental	48.000000	ATS480BSM-1	ATS480BSM-1E	18 pF	3rd Overtone
13.500000	ATS135SM-1	ATS135SM-1E	20 pF	Fundamental	60.000000	ATS600ASM-1	ATS600ASM-1E	20 pF	3rd Overtone
13.500000	ATS135BSM-1	ATS135BSM-1E	18 pF	Fundamental	60.000000	ATS600BSM-1	ATS600BSM-1E	18 pF	3rd Overtone
14.000000	ATS140BSM-1	ATS140BSM-1E	18 pF	Fundamental	64.000000	ATS640ASM-1	ATS640ASM-1E	20 pF	3rd Overtone
					64.000000	ATS640BSM-1	ATS640BSM-1E	18 pF	3rd Overtone

**ELECTRICAL CHARACTERISTICS**

<b>ELECTRICAL PARAMETERS</b>	<b>PARAMETER</b>	<b>VALUE</b>
	Frequency Range	3.2 MHz to 64.0 MHz
	Operating Mode	Fundamental or 3rd Overtone
	Crystal Cut	AT-Cut
	Frequency Tolerance @ +25°C	± 30 ppm Standard *
	Frequency Stability Tolerance (Operating Temperature Range, Referenced to 25°C Reading)	± 50 ppm Standard *
	Operating Temperature Range	-20°C to +70°C * -40°C to +85°C Available, See Ordering Information
	Equivalent Series Resistance	See ESR Table
	Load Capacitance or Resonance Mode	See Standard Part Numbers tables *
	Shunt Capacitance (C <sub>0</sub> )	7.0 pF Maximum
	Drive Level	100 µW Typical, 1,000 µW Maximum
	Aging @ +25°C	±3 ppm/yr Typical, ±5 ppm/yr Maximum
	Insulation Resistance	500 Ohms @ DC 100V
	Storage Temperature Range	-40°C to +85°C
	Reflow Condition, per JEDEC J-STD-020	+260°C Maximum, 10 Seconds Maximum

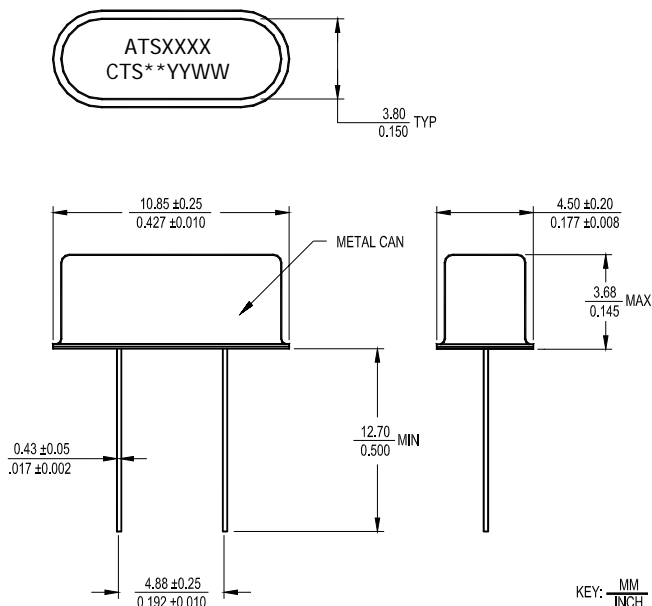
\* Custom requirements may be available upon request.

**EQUIVALENT SERIES RESISTANCE TABLE**

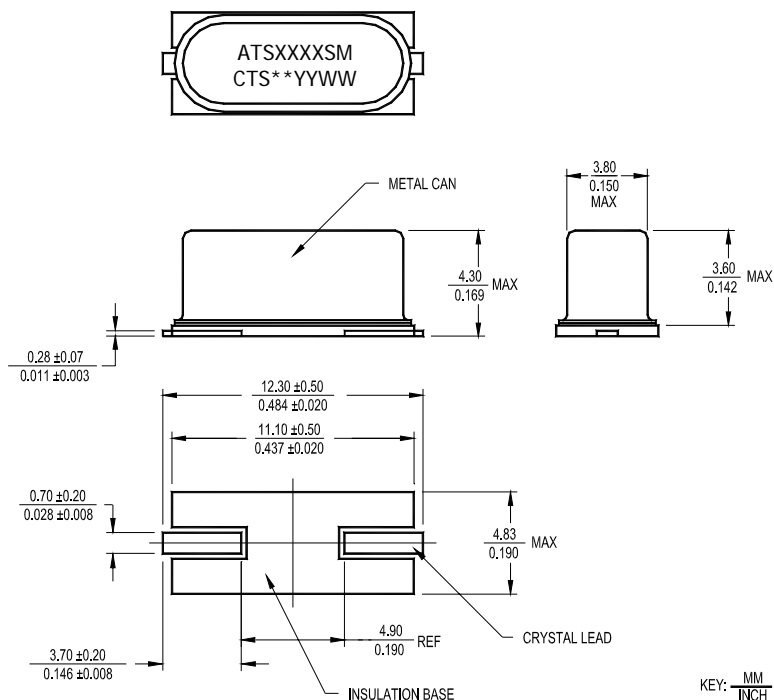
<b>FREQUENCY RANGE</b>	<b>OSCILLATION MODE</b>	<b>ESR MAXIMUM</b>
3.20 MHz - < 4.00 MHz	Fundamental	150 Ohms
4.00 MHz - < 5.00 MHz	Fundamental	120 Ohms
5.00 MHz - < 8.00 MHz	Fundamental	80 Ohms
8.00 MHz - < 12.00 MHz	Fundamental	60 Ohms
12.00 MHz - < 20.00 MHz	Fundamental	40 Ohms
20.00 MHz - < 30.00 MHz	Fundamental	30 Ohms
27.00 MHz - 64.00 MHz	3rd Overtone	80 Ohms

## MECHANICAL SPECIFICATIONS

### ATS PACKAGE DRAWING



### ATS-SM PACKAGE DRAWING



### MARKING INFORMATION

1. ATXXXXX - CTS Part Number.
  - a) The package code "1" is not required in the marking.
  - b) The -E is required in the marking for extended temperature range parts. [See Standard Product Part Numbers tables.]
2. \*\* - Manufacturing Site Code.
3. YYWW - Date Code, YY - year, WW - week.
4. Complete CTS part number, frequency value and date code information must appear on bag and box labels.

### NOTES

1. Lead finish (e1), SnAgCu.
2. MSL = 1.

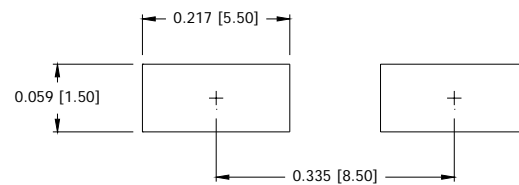
### MARKING INFORMATION

1. ATXXXXXSM - CTS Part Number.
  - a) The package code "1" is not required in the marking.
  - b) The -E is required in the marking for extended temperature range parts. [See Standard Product Part Numbers tables.]
2. \*\* - Manufacturing Site Code.
3. YYWW - Date Code, YY - year, WW - week.
4. Complete CTS part number, frequency value and date code information must appear on bag and box labels.

### NOTES

1. Lead finish (e1), SnAgCu.
2. MSL = 1.

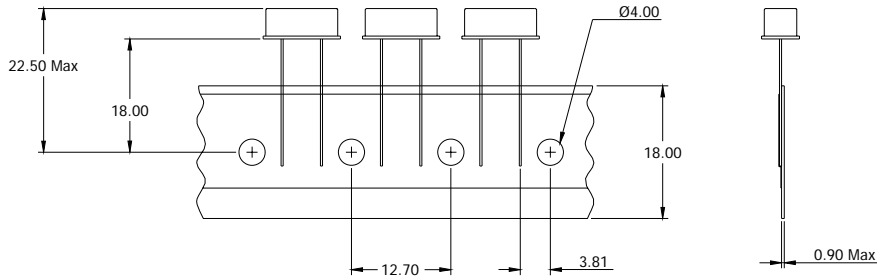
### SUGGESTED SOLDER PAD GEOMETRY



## PACKAGING INFORMATION

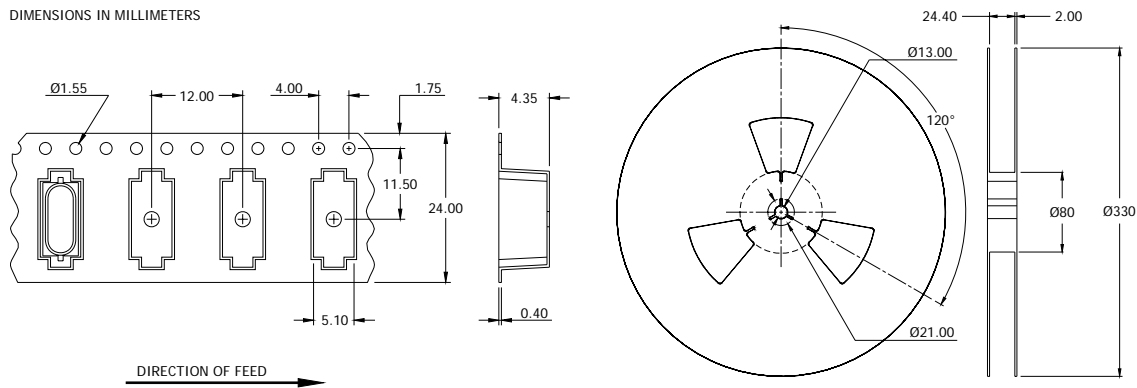
### ATS Radial Taping (Ammopak)

DIMENSIONS IN MILLIMETERS



### ATS-SM Tape and Reel

DIMENSIONS IN MILLIMETERS



# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## CTS:

[ATS036](#) [ATS036SM](#) [ATS036SM-1](#) [ATS037](#) [ATS037SM](#) [ATS037SM-1](#) [ATS040](#) [ATS040SM](#) [ATS040SM-1](#)  
[ATS042](#) [ATS042SM](#) [ATS042SM-1](#) [ATS050](#) [ATS050SM](#) [ATS050SM-1](#) [ATS060](#) [ATS060SM](#) [ATS060SM-1](#) [ATS08A](#)  
[ATS08ASM](#) [ATS08ASM-1](#) [ATS098](#) [ATS098SM](#) [ATS098SM-1](#) [ATS100](#) [ATS100SM](#) [ATS100SM-1](#) [ATS111](#)  
[ATS111SM](#) [ATS111SM-1](#) [ATS120](#) [ATS120SM](#) [ATS120SM-1](#) [ATS122](#) [ATS122SM](#) [ATS122SM-1](#) [ATS143](#)  
[ATS143SM](#) [ATS143SM-1](#) [ATS15A](#) [ATS15ASM](#) [ATS15ASM-1](#) [ATS160](#) [ATS160SM](#) [ATS160SM-1](#) [ATS16A](#)  
[ATS200](#) [ATS200SM](#) [ATS200SM-1](#) [ATS204](#) [ATS204SM](#) [ATS204SM-1](#) [ATS245](#) [ATS245SM](#) [ATS245SM-1](#) [ATS250](#)  
[ATS18ASM-1](#) [ATS22ASM-1](#) [ATS122SM-T](#) [ATS15ASM-T](#) [ATS204SM-T](#) [ATS036B](#) [ATS036B-E](#) [ATS036BSM-1](#)  
[ATS036BSM-1E](#) [ATS036-E](#) [ATS036SM-1E](#) [ATS037A](#) [ATS037A-E](#) [ATS037ASM-1](#) [ATS037ASM-1E](#) [ATS037-E](#)  
[ATS037SM-1E](#) [ATS040BSM-E](#) [ATS040-E](#) [ATS040SM-1E](#) [ATS041C](#) [ATS041C-E](#) [ATS041CSM-1](#) [ATS041CSM-1E](#)  
[ATS042A](#) [ATS042A-E](#) [ATS042ASM-1](#) [ATS042ASM-1E](#) [ATS042B](#) [ATS042B-E](#) [ATS042BSM-1](#) [ATS042BSM-1E](#)  
[ATS042-E](#) [ATS042SM-1E](#) [ATS049A](#) [ATS049A-E](#) [ATS049ASM-1](#) [ATS049ASM-1E](#) [ATS04A](#) [ATS04A-E](#)  
[ATS04ASM-1](#) [ATS04ASM-1E](#) [ATS050A](#) [ATS050A-E](#)