

No.11-3 Jianguo Rd., T.E.P.Z. 42760 Taiwan, ROC

## All dimensions are millimeters.

CAD:	TCR
Review:	EG
Appr:	JL
Page:	1/4 Date: August 01, 2022

## **Electrical Specifications:**

## Specification Title:

Microprocessor Crystal Unit Low Profile 6.0 x 3.5 millimeter Surface Mount - 4 Pad General Product Specification

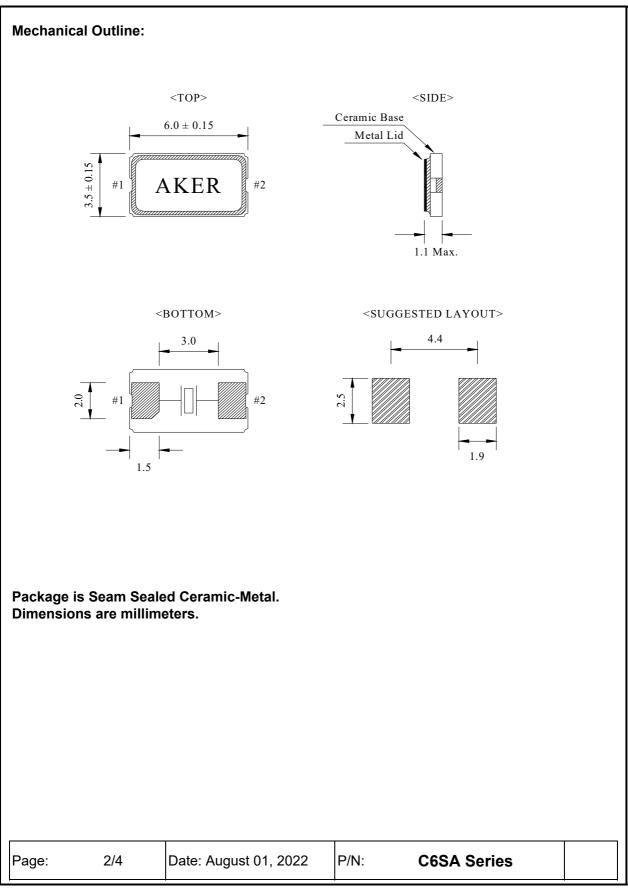
## Series Name: C6SA Series

Frequency Range			8.000 t	o 133.000	)	MHz	
Mode of Oscillation		Fundamental	8.000 to 52.000				
wode of Oscillation		Third Overtone	40.000 to 133.00		)	MHz	
		Standard	:	±30			
			1	±25			
Frequency Toleranc	e at 25°C	Ontional	ł	±20		PPM Max	
	Optional	1	±15				
		1	±10				
		Standard	1	±50		-	
			±	100			
			:	±30		РРМ Мах	
Frequency Stability Temperature Range	over	Ontional	±25				
remperature Range		Optional	±20				
			±15				
			±10*			1	
		Standard	-20 to +70				
Operating Temperat	ure Range	Extended	-40 to +85			°	
			-40 to +125				
Storage Temperatur	e Range		-55 t	o +125			
Aging	 jing			±3		PPM Max/Year	
Load Capacitance			6 to 47 and Se	eries Res	es Resonance pF		
Shunt Capacitance			7.0			рг	
Equivalent Series Resistance(ESR)			See ESR Table			Ohm	
Drive Level			100			uW Max	
Insulation Resistance			500 at 100 Vdc ± 15 Vdc M Ohm		M Ohm		
Frequency Rang	and ESR	Values:					
Frequency Range in MHz	ESR Ohm Max	Mode of Operation	Frequency MH		ESR Ohm Ma	x Mode of Operation	
8 000 to 8 999	60	Fundamental	40 000 to	51 999	90	Third Overtone	

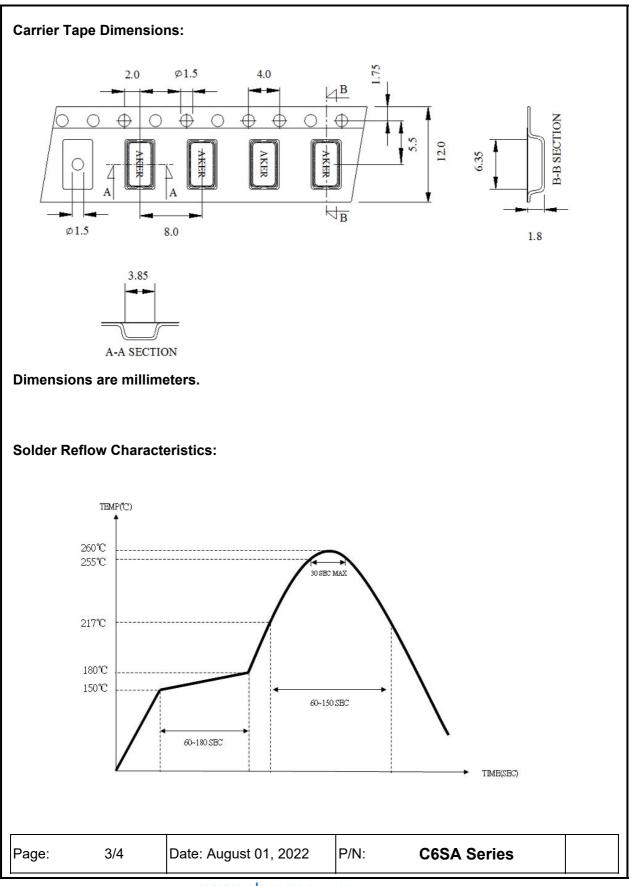
Frequency Range in MHz	ESR Ohm Max	Mode of Operation	Frequency Range in MHz	ESR Ohm Max	Mode of Operation
8.000 to 8.999	60	Fundamental	40.000 to 51.999	90	Third Overtone
9.000 to 9.999	50	Fundamental	52.000 to 79.999	80	Third Overtone
10.000 to 11.999	45	Fundamental	80.000 to 133.000	70	Third Overtone
12.000 to 19.999	30	Fundamental			
20.000 to 24.999	25	Fundamental			
25.000 to 52.000	20	Fundamental			

	Ltr	Revisions	Date	Appr
RoHS Compliant				
Pb - Lead Free				

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Series         C         Parameter           Package         6SA         6.0 x 3.5 mm - 2 Pad           Frequency         8.000 to 133.000         MHz	How to build a Par	t Number:			_		
Frequency       8.000 to 133.000       MHz         10       10 pF         12       12 pF         16       16 pF         20       20 pF         32       32 pF         32       32 pF         32       32 pF         S       Series         -       -         Option       25         25       120PPM         10       110PPM         15       115PPM         10       100PPM         30       130PPM         Standard       50         10       100PPM         30       130PPM         Qption       25         15       115PPM         10       100PPM*         10       10PPM*         10       20 to +70 °C         Qption       X         40 to +125 °C			-				
Image: Colspan="2">Image: Colspan="2" Colspan		Package	6SA	6.0 x 3.5 mm - 2 Pad			
1212121616 pF1818 pF2020 pF3232 pFSSeries	F	requency	8.000 to 133.000	MHz			
1212121616 pF1616 pF2020 pF3232 pFSSeriesSSeries0ption2015±10PPM10±10PPM10±10PPM10±10PPM10±10PPM10±10PPM10±10PPM10±10PPM25±25PPM0ption2525±25PPM0ption2525±25PPM10±10PPM*15±15PPM10±10PPM*15±15PPM10±10PPM*10±10PPM*10±10PPM*15±15PPM10±10PPM*10±10PPM*10±10PPM*15±15PPM10±10PPM*10±10PPM*10±10PPM*15±15PPM10±10PPM*10±10PPM*10±10PPM*10±10PPM*10±10PPM*11±10PPM*1240 to +105 °C12Qution1440 to +105 °C15±15PPM16150 PPM Frequency Tolerance and ±50 PPM Frequency Stability10pF Load Capacitance3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability10 to +70 °C Temperature Range15Frape and Reel Packaging				10 pF			
Intermediate of the second se		-					
20         20 pF           32         32 pF           S         Series	Load Capacitance		16				
3232 pFSSeriesStandard30 $\pm 30$ PPM25 $\pm 25$ PPM0ption20 $\pm 20$ PPM10 $\pm 10$ PPM10 $\pm 10$ PPMStandard50 $\pm 50$ PPM0ption15 $\pm 15$ PPM0ption25 $\pm 25$ PPM0ption25 $\pm 25$ PPM0ption20 $\pm 20$ PPM10 $\pm 100$ PPM10000 pcs ReelPackagingM250pcs ReelPackagingM250pcs Reel10000 pcs Reel2053 $\pm 30$ PPM Frequency Tolerance and $\pm 50$ PPM Frequency Stability10 to +70°C10 to +70°C Temperature Range8: Tape and Reel PackagingNotes:1- Fundamental mode does not need to be included in Part Number description.* ±10 PPM Temperature Stability is only available from -30 to +85° C.2- Standard Temperatu			18	18 pF			
S         Series			20	20 pF			
Standard       30       ±30PPM         25       ±25PPM         Option       15       ±15PPM         10       ±10PPM         30       ±30PPM         Standard       50       ±50PPM         0ption       15       ±15PPM         10       ±10PPM         30       ±30PPM         25       ±25PPM         0ption       20       ±20PPM         25       ±25PPM         0ption       20       ±20PPM         15       ±15PPM         10       ±10PPM*         240 to +105 °C       •20 to +70 °C         Option       X1       -40 to +125 °C      <			32	32 pF			
25 $\frac{25}{200}$ Trequency ToleranceOption $20$ $\pm 20PPM$ 10 $\pm 20PPM$ 10 $\pm 10PPM$ Standard $50$ $\pm 100PPM$ Option $\pm 100$ $\pm 100PPM$ $25$ $\pm 20PPM$ $25$ $\pm 100PPM*$ $26$ $\pm 20PPM$ $15$ $\pm 100PPM*$ $26$ $\pm 20PPM$ $10$ $25$ $10$ $25$ $10$ $25$ $10$ $25$ $10$ $25$ $25$ $25$ $10$ $25$ $25$ $25$ $25$ $25$ $25$ $25$ $25$ <td></td> <td></td> <td>S</td> <td>Series</td> <td></td> <td></td>			S	Series			
25 $\frac{25}{200}$ $\frac{25}{200}$ $\frac{25}{200}$ $\frac{220}{200}$ $\frac{20}{15}$ $\frac{220}{120PPM}$ $15$ $\frac{110PPM}{200}$ $\frac{100}{25}$ $\frac{1100}{25}$ $\frac{120PPM}{25}$ $\frac{100}{25}$ $\frac{100}{25}$ $\frac{100}{20}$ $\frac{120PPM}{25}$ $\frac{100}{25}$ $\frac{120PPM}{25}$ $\frac{100}{25}$ $\frac{1000}{20}$ $\frac{120PPM}{25}$ $\frac{100}{25}$ $\frac{1000PPM}{25}$ $\frac{1000}{25}$ $\frac{1000PPM}{15}$ $\frac{1000}{25}$ $\frac{1000PPM}{10}$ $\frac{1000}{25}$ $\frac{1000PPM}{10}$ $\frac{100}{25}$ $\frac{1000PPM}{10}$ $\frac{1000}{25}$ $\frac{1000PPM}{10}$ $\frac{1000}{25}$ $\frac{1000PPM}{10}$ $\frac{1000}{25}$ $\frac{1000PPM}{10}$ $\frac{1000}{25}$ $\frac{1000PPM}{10}$ <th colspan<="" td=""><td></td><td>Standard</td><td></td><td>+30PPM</td><td></td><td></td></th>	<td></td> <td>Standard</td> <td></td> <td>+30PPM</td> <td></td> <td></td>		Standard		+30PPM		
Image: Standard See Notes       Frequency Stability         Standard 50       ±10PPM         10       ±10PPM         30       ±30PPM         25       ±25PPM         0ption       20       ±20PPM         25       ±25PPM         20       ±20PPM         15       ±16PPM         10       ±10PPM*         20       ±20PPM         15       ±15PPM         10       ±10PPM*         -       -         Mode of Oscillation       See Notes         Standard See Notes       -20 to +70 °C         Option       X1       -40 to +85 °C         Option       X1       -40 to +125 °C         Option       X2       -40 to +105 °C         -       -       -         Packaging       M       250pcs Reel         Packaging       M       250pcs Reel         Packaging       M       250pcs Reel         Packaging       M       250pcs Reel         Packaging       N       1000pcs Reel         Packaging       N       250pcs Reel         10 to +70°C       Temperature Range       8         C ba		Otandara					
Option       15       ±15PPM         10       ±10PPM         Standard       50       ±50PPM         100       ±100PPM         30       ±30PPM         25       ±25PPM         20       ±20PPM         15       ±15PPM         10       ±10PPM*         11       -40 to +125 °C         Option       X1       -40 to +125 °C         Option       X2       -40 to +105 °C         C6SA: -6.0 × 3.5 mm Seam Seal Crystal Unit - 2 Pad         24.576 MHz Nominal Freque	Frequency Tolerance				1		
10 $\pm 100 PPM$ Standard50Standard50Option $\pm 100$ $\pm 1000$ $\pm 10000$ $\pm 100000$ $\pm 10000000$ $\pm 1000000000000000000000000000000000000$	requency loterance	Option			1		
Standard       50       ±50PPM         100       ±100PPM         30       ±30PPM         25       ±25PPM         20       ±20PPM         15       ±15PPM         10       ±10PPM*					1		
Frequency Stability       30       ±30PPM         25       ±25PPM         20       ±20PPM         15       ±15PPM         10       ±10PPM*         10       ±10PPM*         Mode of Oscillation       See Notes       Fundamental         Mode of Oscillation       See Notes       Fundamental         Mode of Oscillation       See Notes       -20 to +70 °C         Option       X       -40 to +85 °C         Option       X1       -40 to +105 °C         Option       X2       -40 to +105 °C         Packaging       M       250pcs Reel         Packaging       R       1000pcs Reel         Packaging       N       250pcs Reel         Packaging       R       1000pcs Reel         Packaging       R       1000pcs Reel         Packaging       R       1000pcs Reel         24.576       Mackage       100 + 70°C         Temperature Range       Standard Packaging		Standard	50		1		
Frequency StabilityOption $25$ $\pm 25PPM$ $20$ $\pm 20PPM$ $15$ $\pm 15PPM$ $10$ $\pm 10PPM^*$ $10$ $\pm 10PPM^*$ Mode of OscillationSee NotesFemperature RangeStandardStandardSee Notes $-20$ to +70 °COptionX $-40$ to +85 °COptionX1 $-40$ to +105 °COptionX2 $-40$ to +105 °CPackagingM $R$ $1000pcs$ ReelPart Number Example: C6SA: $6.0 \times 3.5$ mm Seam Seal Crystal Unit - 2 Pad 24.576 MHz Nominal Frequency 18 pF Load Capacitance $3050: \pm 30$ PPM Frequency Tolerance and $\pm 50$ PPM Frequency Stability -10 to +70°C Temperature Range R: Tape and Reel Packaging Notes:1- Fundamental mode does not need to be included in Part Number description. $* \pm 10$ PPM Temperature Stability is only available from -30 to +85° C. 2- Standard Temperature Range does not need to be included in Part Number description. $* \pm 10$ PPM Temperature Range does not need to be included in Part Number description. $* \pm 10$ PPM Temperature Range does not need to be included in Part Number description. $* \pm 10$ PPM Temperature Range does not need to be included in Part Number description. $* \pm 10$ PPM Temperature Range does not need to be included in Part Number description. $* \pm 10$ PPM Temperature Range does not need to be included in Part Number description. $* \pm 10$ PPM Temperature Range does not need to be included in Part Number description. $* \pm 10$ PPM Temperature Range does not need to be included in Part Nu			100	±100PPM	1		
Option       20       ±20PPM         15       ±15PPM         10       ±10PPM*         10       ±10PPM*         Mode of Oscillation       3         See Notes       Fundamental         3       Third Overtone         Option       X			30	±30PPM			
20       ±20PPM         15       ±15PPM         10       ±10PPM*         10       ±10PPM*         Mode of Oscillation       3         Standard       See Notes       Fundamental         3       Third Overtone	Frequency Stability	Ontion	25	±25PPM			
10       ±10PPM*         Mode of Oscillation       See Notes       Fundamental         3       Third Overtone         -       -         Temperature Range       Standard       See Notes         Option       X       -40 to +85 °C         Option       X1       -40 to +85 °C         Option       X1       -40 to +125 °C         Option       X2       -40 to +105 °C         Packaging       M       250pcs Reel         Packaging       M       250pcs Reel         Packaging       R       1000pcs Reel         Packaging       M       250pcs Reel         Packaging       R       1000pcs Reel         Packaging       M       250pcs Reel         Packaging       M       250pcs Reel         Packaging       M       250pcs Reel         Packaging       Notes:       1000pcs Stability         10 to +70°C       Temperature Range       1000pcs Stability         10 to +70°C       Temperature Range       1000pcs         R: Tape and Reel Packaging       Notes:       1         1- Fundamental mode does not need to be included in Part Number description.       * 10 PPM Temperature Stability is only available from -30 to +85°		Option		±20PPM			
Image: Standard       See Notes       Fundamental         3       Third Overtone         Image: Standard       See Notes       -20 to +70 °C         Option       X       -40 to +85 °C         Option       X1       -40 to +125 °C         Option       X2       -40 to +105 °C         Option       X2       -40 to +105 °C         Option       X2       -40 to +105 °C         Packaging       M       250pcs Reel         Packaging       R       1000pcs Reel         Packaging       R       1000pcs Reel         Packaging       R       1000pcs Reel         Packaging       R       1000pcs Reel         Packaging       N       250 pcs Reel         Packaging       R       1000pcs Reel         Packaging       N       250 pcs Reel         Packaging       N       200 pcs         Packaging       N       1000pcs Reel         Packaging       N       1000pcs Reel         Packaging       N       200 pcs         Stand Capacitance       30 pPM Frequency Tolerance and ±50 PPM Frequency Stability         10 to +70 °C Temperature Range       200 pcs         R: Tape and Reel Packaging <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td>			-				
Mode of Oscillation       3       Third Overtone         -       -       -         Femperature Range       Standard       See Notes       -20 to +70 °C         Option       X       -40 to +85 °C         Option       X1       -40 to +125 °C         Option       X2       -40 to +105 °C         -       -       -         Packaging       M       250pcs Reel         Packaging       R       1000pcs Reel         Part Number Example:       C6SA-24.576.000-18-3050-R       C6SA: 6.0 x 3.5 mm Seam Seal Crystal Unit - 2 Pad         24.576 MHz Nominal Frequency       18 pF Load Capacitance       3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability         -10 to +70°C Temperature Range       R: Tape and Reel Packaging       Notes:         1- Fundamental mode does not need to be included in Part Number description.       * ±10 PPM Temperature Stability is only available from -30 to +85° C.         2- Standard Temperature Range does not need to be included in Part Number description.       * ±10 PPM Temperature Range does not need to be included in Part Number description.         * ±10 PPM Temperature Range does not need to be included in Part Number description.       * ±10 PPM Temperature Range does not need to be included in Part Number description.			10	±10PPM*			
Mode of Oscillation       3       Third Overtone         -       -       -         Femperature Range       Standard       See Notes       -20 to +70 °C         Option       X       -40 to +85 °C         Option       X1       -40 to +125 °C         Option       X2       -40 to +105 °C         -       -       -         Packaging       M       250pcs Reel         Packaging       R       1000pcs Reel         Part Number Example:       C6SA-24.576.000-18-3050-R       C6SA: 6.0 x 3.5 mm Seam Seal Crystal Unit - 2 Pad         24.576 MHz Nominal Frequency       18 pF Load Capacitance       3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability         -10 to +70°C Temperature Range       R: Tape and Reel Packaging       Notes:         1- Fundamental mode does not need to be included in Part Number description.       * ±10 PPM Temperature Stability is only available from -30 to +85° C.         2- Standard Temperature Range does not need to be included in Part Number description.       * ±10 PPM Temperature Range does not need to be included in Part Number description.         * ±10 PPM Temperature Range does not need to be included in Part Number description.       * ±10 PPM Temperature Range does not need to be included in Part Number description.         * ±10 PPM Temperature Range does not need to be included in Part Number description.			See Notes	Fundamental			
Option       X       -40 to +85 °C         Option       X1       -40 to +125 °C         Option       X2       -40 to +105 °C         Packaging       M       250pcs Reel         Packaging       R       1000pcs Reel         Part Number Example:       CGSA-24.576.000-18-3050-R       CGSA: 6.0 x 3.5 mm Seam Seal Crystal Unit - 2 Pad         24.576 MHz Nominal Frequency       18 pF Load Capacitance       3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability         -10 to +70°C Temperature Range       R: Tape and Reel Packaging       Notes:         1- Fundamental mode does not need to be included in Part Number description.       * ±10 PPM Temperature Stability is only available from -30 to +85° C.         2- Standard Temperature Range does not need to be included in Part Number description.       * ±10 PPM Temperature Range does not need to be included in Part Number description.	Mode of C	Dscillation					
Option       X       -40 to +85 °C         Option       X1       -40 to +125 °C         Option       X2       -40 to +105 °C         Packaging       M       250pcs Reel         Packaging       R       1000pcs Reel         Part Number Example:       CGSA-24.576.000-18-3050-R       CGSA: 6.0 x 3.5 mm Seam Seal Crystal Unit - 2 Pad         24.576 MHz Nominal Frequency       18 pF Load Capacitance       3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability         -10 to +70°C Temperature Range       R: Tape and Reel Packaging       Notes:         1- Fundamental mode does not need to be included in Part Number description.       * ±10 PPM Temperature Stability is only available from -30 to +85° C.         2- Standard Temperature Range does not need to be included in Part Number description.       * ±10 PPM Temperature Range does not need to be included in Part Number description.							
Iemperature Range       Option       X1       -40 to +125 °C         Option       X2       -40 to +105 °C         Packaging       M       250pcs Reel         Packaging       R       1000pcs Reel         Packaging       R       1000pcs Reel         Packaging       R       1000pcs Reel         Part Number Example:       C6SA-24.576.000-18-3050-R       C6SA: 6.0 x 3.5 mm Seam Seal Crystal Unit - 2 Pad         24.576 MHz Nominal Frequency       18 pF Load Capacitance       3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability         -10 to +70°C Temperature Range       R: Tape and Reel Packaging       Notes:         1- Fundamental mode does not need to be included in Part Number description.       * ±10 PPM Temperature Stability is only available from -30 to +85° C.         2- Standard Temperature Range does not need to be included in Part Number description.       * ±10 PPM Temperature Range does not need to be included in Part Number description.         * ±10 PPM Temperature Range does not need to be included in Part Number description.       * ±10 PPM Temperature Range does not need to be included in Part Number description.         * ±10 PPM Temperature Range does not need to be included in Part Number description.       * ±10 PPM Temperature Range does not need to be included in Part Number description.         * ±10 PPM Temperature Range does not need to be included in Part Number description.       * ±10 PPM Temperature				-			
Option         X2         -40 to +105 °C           Packaging         M         250pcs Reel           Packaging         R         1000pcs Reel   Part Number Example: C6SA-24.576.000-18-3050-R C6SA: 6.0 x 3.5 mm Seam Seal Crystal Unit - 2 Pad 24.576 MHz Nominal Frequency 18 pF Load Capacitance 3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability -10 to +70°C Temperature Range R: Tape and Reel Packaging Notes: 1- Fundamental mode does not need to be included in Part Number description. * ±10 PPM Temperature Stability is only available from -30 to +85° C. 2- Standard Temperature Range does not need to be included in Part Number descriptiof. 3- Quantities less than 250pcs are shipped bulk in tape only.	Temperature Range	•					
Packaging       M       250pcs Reel         Packaging       R       1000pcs Reel         Part Number Example:       C6SA-24.576.000-18-3050-R       C6SA: 6.0 x 3.5 mm Seam Seal Crystal Unit - 2 Pad         24.576 MHz Nominal Frequency       18 pF Load Capacitance       3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability         -10 to +70°C Temperature Range       R: Tape and Reel Packaging       Notes:         1- Fundamental mode does not need to be included in Part Number description.       * ±10 PPM Temperature Stability is only available from -30 to +85° C.         2- Standard Temperature Range does not need to be included in Part Number description.       * ±10 PPM Temperature Range does not need to be included in Part Number description.				-			
Packaging       R       1000pcs Reel         Part Number Example:       C6SA-24.576.000-18-3050-R       C6SA: 6.0 x 3.5 mm Seam Seal Crystal Unit - 2 Pad         24.576 MHz Nominal Frequency       1000pcs Reel       24.576 MHz Nominal Frequency         18 pF Load Capacitance       3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability       -10 to +70°C Temperature Range         R: Tape and Reel Packaging       Notes:       1- Fundamental mode does not need to be included in Part Number description.         * ±10 PPM Temperature Stability is only available from -30 to +85° C.       2- Standard Temperature Range does not need to be included in Part Number description.		Option		-40 10 +103 (			
Packaging       R       1000pcs Reel         Part Number Example:       C6SA-24.576.000-18-3050-R       C6SA: 6.0 x 3.5 mm Seam Seal Crystal Unit - 2 Pad         24.576 MHz Nominal Frequency       1000pcs Reel       24.576 MHz Nominal Frequency         18 pF Load Capacitance       3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability       -10 to +70°C Temperature Range         R: Tape and Reel Packaging       Notes:       1- Fundamental mode does not need to be included in Part Number description.         * ±10 PPM Temperature Stability is only available from -30 to +85° C.       2- Standard Temperature Range does not need to be included in Part Number description.			Μ	250pcs Reel			
C6SA-24.576.000-18-3050-R C6SA: 6.0 x 3.5 mm Seam Seal Crystal Unit - 2 Pad 24.576 MHz Nominal Frequency 18 pF Load Capacitance 3050: ±30 PPM Frequency Tolerance and ±50 PPM Frequency Stability -10 to +70°C Temperature Range R: Tape and Reel Packaging Notes: 1- Fundamental mode does not need to be included in Part Number description. * ±10 PPM Temperature Stability is only available from -30 to +85° C. 2- Standard Temperature Range does not need to be included in Part Number description.		ackaging	R	1000pcs Reel			
4- Specification subject to change without notice.	C6SA-24.576.000-1 C6SA: 6.0 x 3.5 mr 24.576 MHz Nomin 18 pF Load Capac 3050: ±30 PPM Fre -10 to +70°C Temp R: Tape and Reel I Notes: 1- Fundamental m * ±10 PPM Tempe 2- Standard Tempe 3- Quantities less	18-3050-R m Seam Se aal Frequer itance equency Tc erature Ra Packaging ode does r erature Sta erature Ra than 250pc	ncy blerance and ±50 PF nge not need to be inclu bility is only availal nge does not need t s are shipped bulk	PM Frequency Stability ded in Part Number des ble from -30 to +85° C. to be included in Part N in tape only.	-	riptior	
Page: 4/4 Date: August 01, 2022 P/N: C6SA Series	-				ries		