

# ATSSMTS Series Tight Stability Quartz Crystal

### **Features**

- Standard HC-49/US-SM Metal Package
- Fundamental and 3<sup>rd</sup> Overtone Crystal Design
- Frequency Range 3.2 64MHz
- Frequency Tolerance, ±30ppm Standard
- Frequency Stability, ±30ppm Standard
- Operating Temperature Range -20°C to +70°C or -40°C to +85°C
- Tape and Reel Packaging, EIA-481

### **Applications**

- Wireless Communications
- Broadband Access
- FPGA/Microcontrollers
- Computer Peripherals
- Microprocessors
- Test and Measurement
- Consumer Electronics
- Portable Equipment



### Description

CTS ATSSMTS incorporates a high Q quartz resonator in a proven resistance-weld metal package. ATSSMTS offers tight stability options that are ideal for supporting a wide range of commercial and industrial applications.

# **Ordering Information**

Model	Frequency Code [MHz]		Mode of Oscillation		Tolerance @ +25°C		Temperature Stability		Temperature Range I		Loa Capacit		Packagin	
TS	XXX	F		3		3					D		T	
	<u> </u>								<b>—</b>				<u> </u>	
	Code Frequency			Code	Tolerance	_		Code	Temp. Range	-			Code Packing	
	1	•		1	±10ppm	_		С	-20°C to +70°C	_			T Tape & Re	
	Product Frequency Code 1			X	±15ppm	_		$\Box$	-40°C to +85°C	_				
				2	±20ppm	_				-				
				Υ	±25ppm	_								
				3	±30ppm	_								
						_								
		Code	Mode	_		Code	Stability	-		Code	Capacitano	e Code	Capacitance	
		F	Fundamental			1	±10ppm <sup>2</sup>			K	8pF	D	18pF	
		Т	3rd Overtone	_		X	±15ppm	-		J	9pF	Е	20pF	
				-		2	±20ppm	-		А	10pF	F	24pF	
						Υ	±25ppm	-		L	12pF	G	30pF	
						3	±30ppm			В	13pF	Н	32pF	
						5	±50ppm	_			16pF	S	Series	

#### Notes:

- 1] Refer to document 016-1454-0, Frequency Code Tables. 3-digits for frequencies <100MHz.
- 2] Check factory availability when combined with -40°C to +85°C temperature range.

Not all performance combinations and frequencies may be available.

Contact your local CTS Representative or CTS Customer Service for availability.

This product is specified for use only in standard commercial applications. Supplier disclaims all express and implied warranties and liability in connection with any use of this product in any non-commercial applications or in any application that may expose the product to conditions that are outside of the tolerances provided in its specification.



# **Electrical Specifications**

### **Operating Conditions**

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Temperature	т		-20	+25	+70	۰٫
Operating Temperature	IA	-	-40	+25	+85	C
Storage Temperature	T <sub>STG</sub>	-	-40	-	+125	°C

### Frequency Stability

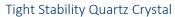
PARAMETER	SYMBOL	CONDITIONS	MIN TYP		MAX	UNIT
Frequency Range						
Fundamental	$f_{O}$	-		3.2 - 40		MHz
3rd Overtone				24 - 64		
Frequency Tolerance	$\Delta f/f_{O}$	@ +25°C	10, 15, 20, 25 or 30			±ppm
Frequency Stability	Δf/f <sub>25</sub>	Referenced to +25°C reading	10, 1	.5, 20, 25, 30	or 50	±ppm
Aging	$\Delta f/f_0$	Typical per year @ +25°C	-5	±3	5	ppm

### **Crystal Parameters**

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Mode	-	-	Fundam	-		
Crystal Cut	-	-		-		
Load Capacitance	C <sub>L</sub>	-	See O	rdering Inforr	nation	pF
Shunt Capacitance	C <sub>0</sub>	-	-	- 7.0		pF
Series Resistance						
		3.2MHz - <4.0MHz	-	-	150	
		4.0MHz - <5.0MHz	-	-	120	
For demonstral	R1	5.0MHz - <8.0MHz	-	-	80	
Fundamental	KI	8.0MHz - <12.0MHz	-	-	60	0
		12.0MHz - <20.0MHz	-	-	40	Ω
		20.0MHz - 40.0MHz	-	-	30	
2-4 0		24.0MHz - <48.0MHz	-	-	80	
3rd Overtone	R1	48.0MHz - 64.0MHz	-	-	60	
Drive Level	DL	-	-	100	1000	μW
Insulation Resistance	R <sub>i</sub>	+100Vdc ±15Vdc	500	-	-	МΩ

 $<sup>\</sup>Delta f/f_0$  - Frequency deviation referenced to nominal frequency.

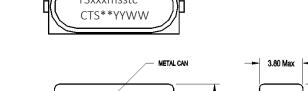
 $<sup>\</sup>Delta f/f_{25}$  - Frequency deviation over operating temperature range, referenced to +25°C frequency.

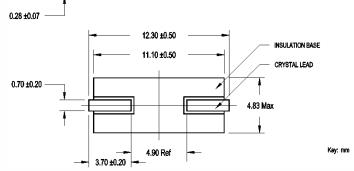




### **Mechanical Specifications**

# Package Drawing TSxxxmsstc CTS\*\*YYWW METAL CAN 4.30 Max

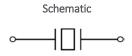




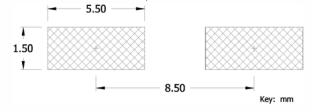
### Marking Information \*

- 1. TSxxxmsstc Truncated CTS Part Number. [Packaging code is not required in the marking.]
  - a] TS ATSSMTS platform.
  - b] xxx 3-digit Frequency Code. [Reference document 016-1454-01]
  - c] m Operating Mode. F = Fundamental, T =  $3^{rd}$
  - d] sstc Tolerance, Stability, Temperature Range and Load Capacitance codes, Reference Ordering Information.
- 2. \*\* Manufacturing Site Code.
- 3. YYWW Date Code; YY = year, WW = week.

\*See Alternate Marking Information for "111" tolerance, stability, temperature product code only. [Tol =  $\pm 10$ ppm, Stab =  $\pm 10$ ppm, Temp - -40°C/+85°C]



### Recommended Pad Layout



### **Notes**

3.60 Max

- 1. JEDEC termination code (e1). Barrier-plating is nickel [Ni] with tin-silver-copper [SnAgCu] lead
- 2. Reflow conditions per JEDEC J-STD-020; +260°C maximum, 20 seconds.
- 3. MSL = 1.

### Alternate Marking Information

- 1. xxxmsst\*\*D Truncated CTS Part Number. [Load and Packaging code is not required in the marking.]
  - a] xxx 3-digit Frequency Code. [Reference document 016-1454-01]
  - b] m Operating Mode. F = Fundamental, T = 3<sup>rd</sup> Overtone
  - c] sst Tolerance, Stability, Temperature Range and Load Capacitance codes, Reference Ordering Information.
  - d] \*\* Manufacturing Site Code.
  - e] D Date Code. See Table I for codes.



### Table I - Date Code, Beginning year 2021

MONTH					1.4.51	550	MAD	400	NA AV			4116	CED	OCT	NOV	DEC
YEAR				JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	ост	NOV	DEC	
2021	2025	2029	2033	2037	А	В	С	D	E	F	G	Н	J	K	L	М
2022	2026	2030	2034	2038	N	Р	Q	R	S	Т	U	V	W	Χ	Υ	Z
2023	2027	2031	2035	2039	а	b	С	d	е	f	g	h	j	k	I	m
2024	2028	2032	2036	2040	n	р	q	r	S	t	u	٧	W	Х	У	Z

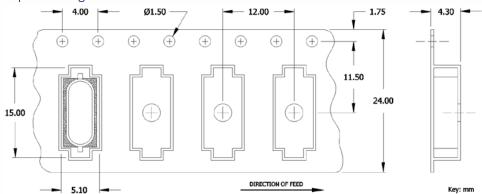
DOC# 008-0375-0 Rev. D

www.ctscorp.com

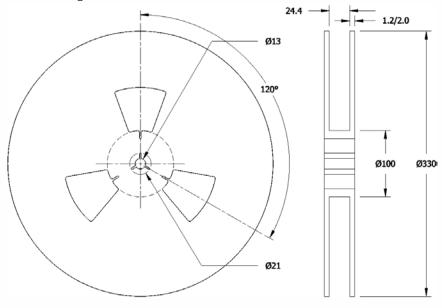


## Packaging - Tape and Reel

### Tape Drawing



### Reel Drawing



### Notes

- 1. Device quantity is 1k pieces maximum per 330mm reel.
- 2. Complete CTS part number, frequency value, date code and manufacturing site code information must appear on reel and carton labels.