

# ATSSMLP Series

## Low Profile Quartz Crystal



Part Dimensions:  
11.1 x 4.83 x 3.2mm • 587.84mg

### Features

- Low Profile 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-418

### Applications

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

### Description

CTS ATSSMLP incorporates a high Q quartz resonator in a proven resistance-weld metal package. ATSSMLP 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	Load Capacitance	Packaging
LP	XXX	F	3	3	I	D	T
	Code    Frequency		Code    Tolerance		Code    Temp. Range		Code    Packing
	Product Frequency Code <sup>1</sup>		1    ±10ppm X    ±15ppm 2    ±20ppm Y    ±25ppm 3    ±30ppm		C    -20°C to +70°C I    -40°C to +85°C		T    Tape & Reel
		Code    Mode		Code    Stability		Code    Capacitance	Code    Capacitance
		F    Fundamental T    3rd Overtone		1    ±10ppm <sup>2</sup> X    ±15ppm 2    ±20ppm Y    ±25ppm 3    ±30ppm 5    ±50ppm		K    8pF    D    18pF J    9pF    E    20pF A    10pF    F    24pF L    12pF    G    30pF B    13pF    H    32pF C    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	$T_A$	-	-20 -40	+25	+70 +85	°C
Storage Temperature	$T_{STG}$	-	-40	-	+125	°C

### Frequency Stability

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

### Crystal Parameters

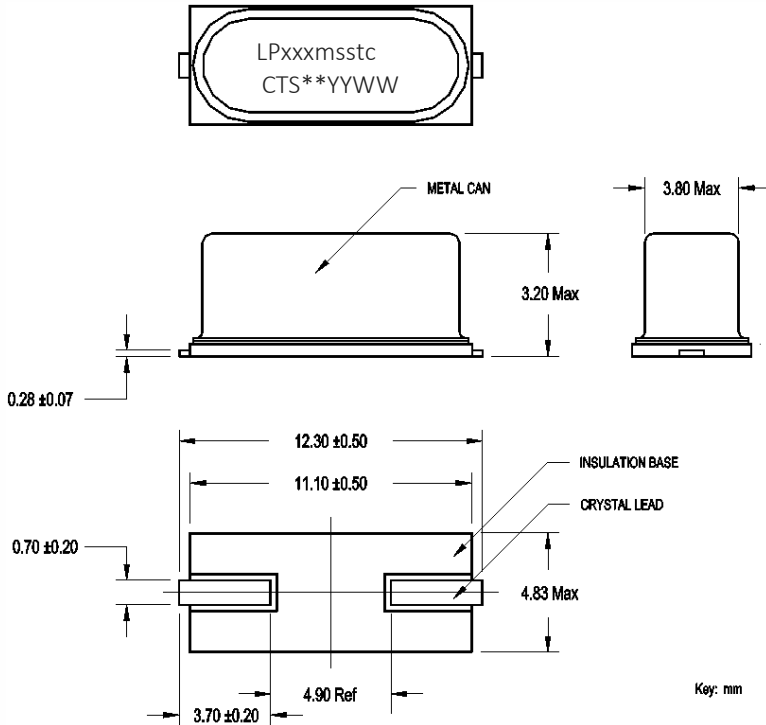
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Mode	-	-	Fundamental or 3rd Overtone			-
Crystal Cut	-	-	AT-Cut			-
Load Capacitance	$C_L$	-	See Ordering Information			pF
Shunt Capacitance	$C_0$	-	-	-	7.0	pF
<b>Series Resistance</b>						
Fundamental	R1	3.2MHz - <4.0MHz	-	-	150	Ω
		4.0MHz - <5.0MHz	-	-	120	
		5.0MHz - <8.0MHz	-	-	80	
		8.0MHz - <12.0MHz	-	-	60	
		12.0MHz - <20.0MHz	-	-	40	
3rd Overtone	R1	20.0MHz - 40.0MHz	-	-	30	
		24.0MHz - <48.0MHz	-	-	80	
		48.0MHz - 64.0MHz	-	-	60	
Drive Level	DL	-	-	100	1000	μW
Insulation Resistance	$R_i$	+100Vdc ±15Vdc	500	-	-	MΩ

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

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

## Mechanical Specifications

### Package Drawing



### Marking Information \*

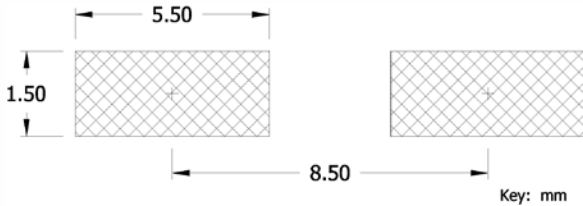
- LPxxxmsstc – Truncated CTS Part Number. [Packaging code is not required in the marking.]
  - LP – ATSSMLP platform.
  - xxx – 3-digit Frequency Code. [Reference document 016-1454-01]
  - m – Operating Mode. F = Fundamental, T = 3<sup>rd</sup> Overtone.
  - sstc – Tolerance, Stability, Temperature Range and Load Capacitance codes, Reference Ordering Information.
- \*\* – Manufacturing Site Code.
- YYWW – Date Code; YY = year, WW = week.

\*See Alternate Marking Information for “11” tolerance, stability, temperature product code only. [Tol = ±10ppm, Stab = ±10ppm, Temp = -40°C/+85°C]

### Schematic



### Recommended Pad Layout



### Notes

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

### Alternate Marking Information

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

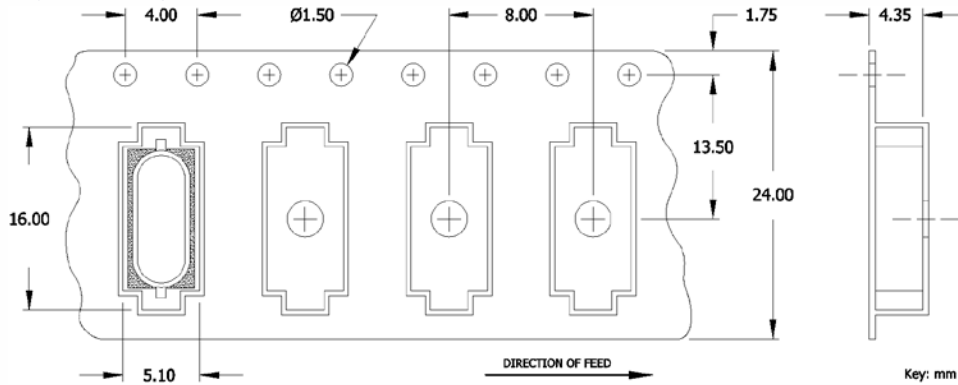


Table I – Date Code

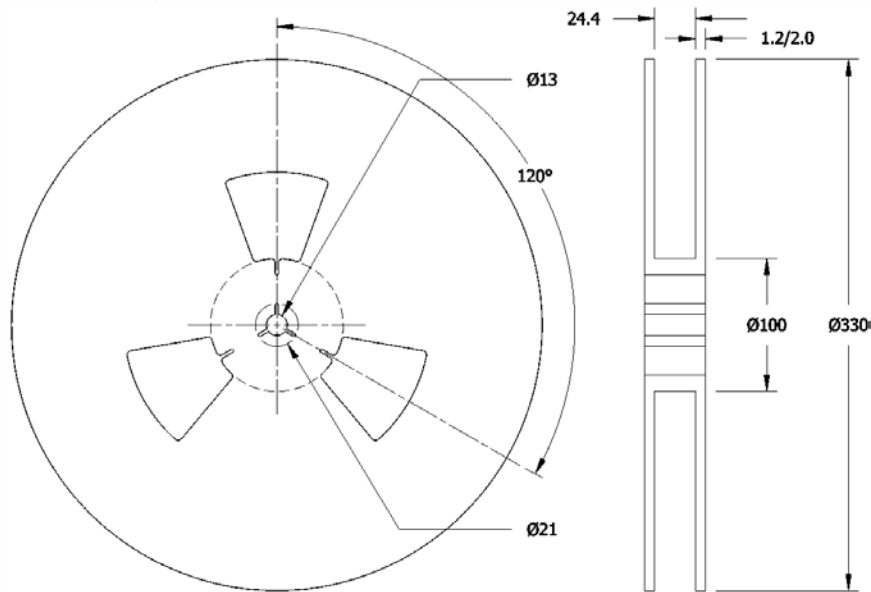
		MONTH															
YEAR		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC				
2001	2005	2009	2013	2017	A	B	C	D	E	F	G	H	J	K	L	M	
2002	2006	2010	2014	2018	N	P	Q	R	S	T	U	V	W	X	Y	Z	
2003	2007	2011	2015	2019	a	b	c	d	e	f	g	h	j	k	l	m	
2004	2008	2012	2016	2020	n	p	q	r	s	t	u	v	w	x	y	z	

### 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.