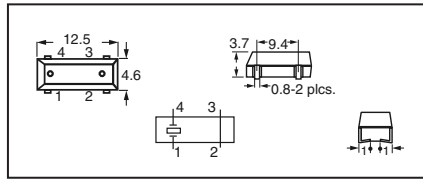


CTS ATP-SM Series SMT Crystals

Specifications:

- Calibration Tolerance: ±0.005ppm @ 25°C
- Temperature Tolerance: ±100ppm

- Operating Temperature: 0°C - 70°C
- Drive Level: 100µW
- Shunt Capacitance: 7pF Max.
- Aging (First Year): <10ppm



Frequency (MHz)	Load Cap.	Digi-Key Part No.	Price Each				CTS Part No.
			1	10	50	100	
3.579545	18pF	CTX600-ND	2.45	2.12	1.84	1.28	ATP036SM
3.686400	20pF	CTX601-ND	2.45	2.12	1.84	1.28	ATP037SM
4.000000	20pF	CTX602-ND	2.45	2.12	1.84	1.28	ATP040SM
4.915200	20pF	CTX603-ND	2.45	2.12	1.84	1.28	ATP042SM
6.000000	20pF	CTX605-ND	2.45	2.12	1.84	1.28	ATP060SM
10.000000	20pF	CTX609-ND	2.45	2.12	1.84	1.28	ATP10ASM
11.059200	20pF	CTX610-ND	2.45	2.12	1.84	1.28	ATP111SM
12.288000	20pF	CTX612-ND	2.45	2.12	1.84	1.28	ATP122SM
16.000000	20pF	CTX616-ND	2.45	2.12	1.84	1.28	ATP16ASM
20.480000	20pF	CTX618-ND	2.67	2.32	2.10	1.46	ATP204SM
24.576000	Series	CTX619-ND	2.67	2.32	2.10	1.46	ATP245SM

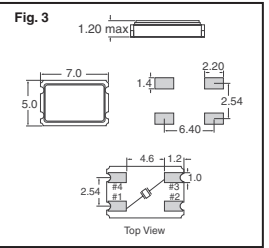
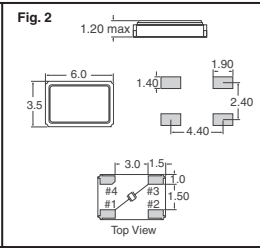
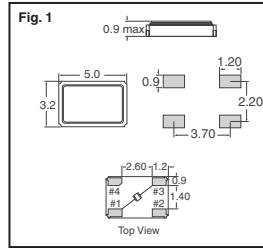
400 Series SMD Crystals

Features: • Lead (Pb) Free • Stable frequency over temperature and drive level • Ideal for application to high-density circuit boards with reliable precision and excellent shock performance in wireless telecommunications devices

Specifications:

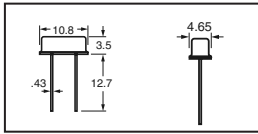
- Frequency Stability: ±50ppm
- Temperature Reflow Condition: 255°C ±5°C @ 10 seconds Max.
- Frequency Tolerance: ±30ppm
- Operating Temperature: -20°C - 70°C
- Storage Temperature: -55°C - 125°C
- Drive Level: 100µW Max.; 25µW Typ.

Model	Depth (mm)	Height (mm)	Width (mm)
405	3.2	0.9	5.0
406	3.5	1.2	6.0
407	5.0	1.2	7.0

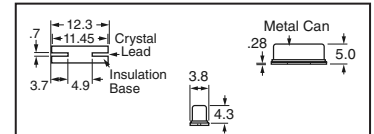


Frequency (MHz)	Operating Mode	Load Capacitance	Shunt Capacitance	ESR (Ω)	Digi-Key Part No.	Cut Tape Price Each			Digi-Key Part No.	Tape & Reel Pricing 1,000	CTS Part No.				
						1	10	100							
Fig. 1 - 405 Series															
11.05920	Fundamental	13.0pF	7pF	50	CTX638CT-ND	2.63	2.11	1.76	CTX638TR-ND	1019.31	405C35B11M05920				
12.00000					CTX639CT-ND	2.63	2.11	1.76	CTX639TR-ND	1019.31	405C35B12M00000				
12.80000					CTX640CT-ND	2.63	2.11	1.76	CTX640TR-ND	1019.31	405C35B12M80000				
13.00000					CTX641CT-ND	2.63	2.11	1.76	CTX641TR-ND	1019.31	405C35B13M00000				
14.31818					CTX642CT-ND	2.63	2.11	1.76	CTX642TR-ND	1019.31	405C35B14M31818				
14.40000					CTX643CT-ND	2.63	2.11	1.76	CTX643TR-ND	1019.31	405C35B14M40000				
14.74560					CTX644CT-ND	2.63	2.11	1.76	CTX644TR-ND	1019.31	405C35B14M74560				
15.36000					CTX645CT-ND	2.63	2.11	1.76	CTX645TR-ND	1019.31	405C35B15M36000				
16.00000					CTX646CT-ND	2.63	2.11	1.76	CTX646TR-ND	1019.31	405C35B16M00000				
16.36800					CTX647CT-ND	2.63	2.11	1.76	CTX647TR-ND	1019.31	405C35B16M36800				
19.20000					CTX648CT-ND	2.63	2.11	1.76	CTX648TR-ND	1019.31	405C35B19M20000				
19.68000					CTX649CT-ND	2.63	2.11	1.76	CTX649TR-ND	1019.31	405C35B19M68000				
20.00000					CTX650CT-ND	2.63	2.11	1.76	CTX650TR-ND	1019.31	405C35B20M00000				
24.00000					CTX651CT-ND	2.63	2.11	1.76	CTX651TR-ND	1019.31	405C35B24M00000				
25.00000					CTX652CT-ND	2.63	2.11	1.76	CTX652TR-ND	1019.31	405C35B25M00000				
26.00000					CTX653CT-ND	2.63	2.11	1.76	CTX653TR-ND	1019.31	405C35B26M00000				
32.00000					CTX654CT-ND	2.63	2.11	1.76	CTX654TR-ND	1019.31	405C35B32M00000				
33.00000					CTX655CT-ND	2.63	2.11	1.76	CTX655TR-ND	1019.31	405C35B33M00000				
40.00000					CTX656CT-ND	2.63	2.11	1.76	CTX656TR-ND	1019.31	405C35B40M00000				
44.00000					CTX657CT-ND	3.01	2.42	2.02	CTX657TR-ND	1166.61	405C35B44M00000				
Fig. 2 - 406 Series															
18.43200	Fundamental	13.0pF	4pF	40	CTX668CT-ND	2.38	1.91	1.59	CTX668TR-ND	921.10	406C35B18M43200				
19.44000					CTX669CT-ND	2.38	1.91	1.59	CTX669TR-ND	921.10	406C35B19M44000				
20.48000					CTX670CT-ND	2.38	1.91	1.59	CTX670TR-ND	921.10	406C35B20M48000				
22.00000					CTX671CT-ND	2.38	1.91	1.59	CTX671TR-ND	921.10	406C35B22M00000				
24.57600					CTX672CT-ND	2.38	1.91	1.59	CTX672TR-ND	921.10	406C35B24M57600				
27.00000					CTX673CT-ND	2.38	1.91	1.59	CTX673TR-ND	921.10	406C35B27M00000				
30.00000					CTX674CT-ND	2.38	1.91	1.59	CTX674TR-ND	921.10	406C35B30M00000				
32.76800					CTX675CT-ND	2.38	1.91	1.59	CTX675TR-ND	921.10	406C35B32M76800				
35.32800					CTX676CT-ND	2.38	1.91	1.59	CTX676TR-ND	921.10	406C35B35M32800				
38.88000					CTX677CT-ND	2.38	1.91	1.59	CTX677TR-ND	921.10	406C35B38M88000				
44.54500					CTX678CT-ND	2.63	2.11	1.76	CTX678TR-ND	1019.31	406C35B44M54500				
48.00000					CTX679CT-ND	2.63	2.11	1.76	CTX679TR-ND	1019.31	406C35B48M00000				
10.00000					60	20.0pF	4pF	CTX658CT-ND	2.38	1.91	1.59	CTX658TR-ND	921.10	406C35B10M00000	
10.24500								CTX659CT-ND	2.38	1.91	1.59	CTX659TR-ND	921.10	406C35B10M24500	
12.28800								CTX660CT-ND	2.38	1.91	1.59	CTX660TR-ND	921.10	406C35B12M28800	
12.68800								CTX661CT-ND	2.38	1.91	1.59	CTX661TR-ND	921.10	406C35B12M68800	
13.00000								CTX662CT-ND	2.38	1.91	1.59	CTX662TR-ND	921.10	406C35B13M00000	
13.22500								CTX663CT-ND	2.38	1.91	1.59	CTX663TR-ND	921.10	406C35B13M22500	
14.00000								CTX664CT-ND	2.38	1.91	1.59	CTX664TR-ND	921.10	406C35B14M00000	
14.31818								CTX665CT-ND	2.38	1.91	1.59	CTX665TR-ND	921.10	406C35B14M31818	
14.85000	CTX667CT-ND	2.38	1.91	1.59				CTX667TR-ND	921.10	406C35B14M85000					
Fig. 3 - 407 Series															
16.38400	Fundamental	20.0pF	4pF	40	CTX682CT-ND	2.38	1.91	1.59	CTX682TR-ND	921.10	407C35E16M38400				
16.67000					CTX683CT-ND	2.38	1.91	1.59	CTX683TR-ND	921.10	407C35E16M67000				
22.11840					CTX684CT-ND	2.38	1.91	1.59	CTX684TR-ND	921.10	407C35E22M11840				
29.49120					CTX685CT-ND	2.38	1.91	1.59	CTX685TR-ND	921.10	407C35E29M49120				
36.00000					CTX686CT-ND	2.63	2.11	1.76	CTX686TR-ND	1019.31	407C35E36M00000				
44.73600					CTX687CT-ND	2.63	2.11	1.76	CTX687TR-ND	1019.31	407C35E44M73600				
9.60000					60	20.0pF	4pF	CTX680CT-ND	2.38	1.91	1.59	CTX680TR-ND	921.10	407C35E09M60000	
12.50000								CTX681CT-ND	2.38	1.91	1.59	CTX681TR-ND	921.10	407C35E12M50000	
50.00000					3rd Overtone	20.0pF	4pF	80	CTX688CT-ND	2.63	2.11	1.76	CTX688TR-ND	1019.31	407C35E50M00000

CTS ATS Series Crystals



ATS-SM Series Crystals



Specifications:
 • Frequency Tolerance: ±50ppm • Shunt Capacitance: 7pF Max. • Drive Level: 100µW • Operating Temperature: 0°C - 70°C • Operating Mode: Fundamental

Specifications:
 • Frequency Tolerance: ±50ppm • Shunt Capacitance: 7.0pF Max. • Drive Level: 100µW • Operating Temperature: 0°C - 70°C • Operating Mode: Fundamental

Frequency (MHz)	Load Capacitance	Digi-Key Part No.	Price Each			CTS Part No.	
			1	10	100		
3.579545	18.0pF	CTX400-ND	1.11	.97	.88	.61	ATS036
3.686400	20.0pF	CTX401-ND	1.11	.97	.88	.61	ATS037
4.000000	20.0pF	CTX402-ND	1.11	.97	.88	.61	ATS040
4.915200	20.0pF	CTX403-ND	1.11	.97	.88	.61	ATS042
5.068800	20.0pF	CTX404-ND	1.11	.97	.88	.61	ATS050
6.000000	20.0pF	CTX405-ND	1.11	.97	.88	.61	ATS060
8.000000	20.0pF	CTX406-ND	1.11	.97	.88	.61	ATS08A
9.830400	20.0pF	CTX407-ND	1.11	.97	.88	.61	ATS098
10.000000	Series	CTX408-ND	1.11	.97	.88	.61	ATS100
11.059200	20.0pF	CTX409-ND	1.11	.97	.88	.61	ATS111
12.000000	Series	CTX410-ND	1.11	.97	.88	.61	ATS120
12.288000	20.0pF	CTX411-ND	1.11	.97	.88	.61	ATS122
14.318180	Series	CTX412-ND	1.11	.97	.88	.61	ATS143
15.360000	20.0pF	CTX413-ND	1.11	.97	.88	.61	ATS15A
16.000000	Series	CTX414-ND	1.11	.97	.88	.61	ATS190
16.000000	20.0pF	CTX415-ND	1.11	.97	.88	.61	ATS16A
20.000000	Series	CTX416-ND	1.11	.97	.88	.61	ATS200
20.480000	20.0pF	CTX417-ND	1.43	1.24	1.13	.78	ATS204
24.576000	Series	CTX418-ND	1.43	1.24	1.13	.78	ATS245
25.000000	Series	CTX419-ND	1.43	1.24	1.13	.78	ATS250

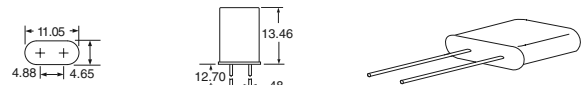
Frequency (MHz)	Load Cap.	Digi-Key Part No.	Bulk Price Each			Digi-Key Part No.	T & R Pricing 1,000	CTS Part No.	
			1	10	100				
3.579545	18.0pF	CTX500-ND	1.27	1.11	.96	.67	CTX500TR-ND	457.16	ATS036SM-T
3.686400	20.0pF	CTX501-ND	1.27	1.11	.96	.67	CTX501TR-ND	457.16	ATS037SM-T
4.000000	20.0pF	CTX502-ND	1.27	1.11	.96	.67	CTX502TR-ND	457.16	ATS040SM-T
4.915200	20.0pF	CTX503-ND	1.27	1.11	.96	.67	CTX503TR-ND	457.16	ATS042SM-T
5.068800	20.0pF	CTX504-ND	1.27	1.11	.96	.67	CTX504TR-ND	457.16	ATS050SM-T
6.000000	20.0pF	CTX505-ND	1.27	1.11	.96	.67	CTX505TR-ND	457.16	ATS060SM-T
8.000000	20.0pF	CTX506-ND	1.27	1.11	.96	.67	CTX506TR-ND	457.16	ATS08AS-M
9.830400	20.0pF	CTX507-ND	1.27	1.11	.96	.67	CTX507TR-ND	457.16	ATS098SM-T
10.000000	Series	CTX508-ND	1.27	1.11	.96	.67	CTX508TR-ND	457.16	ATS100SM-T
11.059200	20.0pF	CTX509-ND	1.27	1.11	.96	.67	CTX509TR-ND	457.16	ATS111SM-T
12.000000	Series	CTX510-ND	1.27	1.11	.96	.67	CTX510TR-ND	457.16	ATS120SM-T
12.288000	20.0pF	CTX511-ND	1.27	1.11	.96	.67	CTX511TR-ND	457.16	ATS122SM-T
14.318180	Series	CTX512-ND	1.27	1.11	.96	.67	CTX512TR-ND	457.16	ATS143SM-T
15.360000	20.0pF	CTX513-ND	1.27	1.11	.96	.67	CTX513TR-ND	457.16	ATS15AS-M
16.000000	Series	CTX514-ND	1.27	1.11	.96	.67	CTX514TR-ND	457.16	ATS160SM-T
20.000000	Series	CTX515-ND	1.27	1.11	.96	.67	CTX515TR-ND	457.16	ATS200SM-T
20.480000	20.0pF	CTX516-ND	1.59	1.38	1.21	.84	CTX516TR-ND	575.69	ATS204SM-T
24.576000	Series	CTX517-ND	1.59	1.38	1.21	.84	CTX517TR-ND	575.69	ATS245SM-T

HC49INS-ND Base Insulator76/10 6.35/100

Microprocessor Crystals

Specifications:
 • Frequency Tolerance: ±50ppm • Temperature Stability: ±0.005% (±50ppm) @ 25°C • Fully hermetic resistance weld package • Low start-up resistance

HC-49/UCase Case Style
 HC-49 has same dimensions as Solder Welded Case HC-18

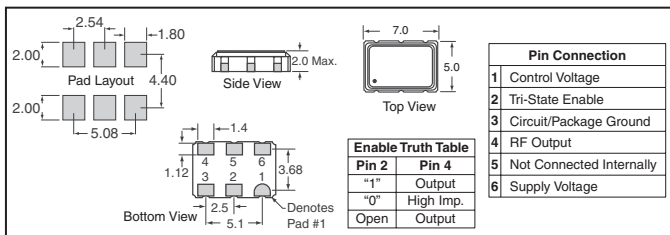


Frequency (MHz)	Load Capacitance	Usage	Digi-Key Part No.	Price Each			CTS Part No.
				1	100	1000	
1.843200	13.0pF	—	CTX067-ND	2.73	2.28	1.67	MP018S
2.000000	20.0pF	—	CTX068-ND	2.73	2.28	1.67	MP020S
2.457600	32.0pF	—	CTX069-ND	1.76	1.47	1.08	MP024S
3.579545	18.0pF	MMS369 (Color Burst), IM6102, PPS 8, MC6801, MC6802, MC6803, MC6809, CDP1802, CDP1802C, CDP1804, CDP1804C	CTX049-ND	.80	.67	.49	MP036S
3.686400	20.0pF	—	CTX071-ND	.80	.67	.49	MP037
4.000000	Series	Pace, MC6875, Z80, Z80A, TMS9940	CTX080-ND	.80	.67	.49	MP04A
4.000000	20.0pF	MCS40, 4004, 4040, 4201; MC6802, 6808, 6809; MK3870, 3872, 3876, 3883; IM6102, CDP1802, 1802C, 1804, 1804C	CTX006-ND	.80	.67	.49	MP040
4.194304	12.0pF	ICM7038, ICM7049, ICM7213, CDP1802, CDP1802C, CDP1804, CDP1804C	CTX007-ND	.80	.67	.49	MP041
4.915200	20.0pF	CDP1802, CDP1802C, CDP1804, CDP1804C	CTX050-ND	.80	.67	.49	MP042
5.000000	Series	CDP1802, CDP1802C, CDP1803, CDP1804, CDP1804C, TMS9985, 9940, IM6100A	CTX081-ND	.80	.67	.49	MP05B
5.000000	20.0pF	General Purpose, CDP1802, CDP1802C, CDP1804, CDP1804C	CTX051-ND	.80	.67	.49	MP05A
5.068800	Series	COM5016, COM5016T Dual Brg.	CTX052-ND	.80	.67	.49	MP050
6.000000	20.0pF	MCS48, MCS8035, MCS8041, MCS8048, MCS8741, MCS8748, IM8048, IM8748, CDP1802, CDP1802C, CDP1804, CDP1804C, MC68A09	CTX026-ND	.80	.67	.49	MP060
6.144000	20.0pF	MCS8086, MCS85, CDP1802, CDP1802C, CDP1804, CDP1804C	CTX054-ND	.80	.67	.49	MP061
7.372800	Series	—	CTX074-ND	.80	.67	.49	MP073
8.000000	Series	8 x 300, MC6875, MC68000, AMZ8000, Z8000	CTX056-ND	.80	.67	.49	MP080
8.000000	20.0pF	IM6100A, CDP1807, Z8, 9940 B, MC68B09	CTX082-ND	.80	.67	.49	MP080A
9.830400	20.0pF	General Purpose	CTX084-ND	.80	.67	.49	MP098
10.000000	Series	General Purpose	CTX057-ND	.80	.67	.49	MP100
10.000000	30.0pF	MCS85, MCS8085A 2, MC9940 10	CTX083-ND	.80	.67	.49	MP101
10.738635	32.0pF	T19918A	CTX085-ND	.80	.67	.49	MP107
11.000000	18.0pF	MCS48, MCS8039, MCS8049	CTX086-ND	.80	.67	.49	MP110
11.059200	Series	—	CTX078-ND	.80	.67	.49	MP111
12.000000	Series	MCS86, MCS8086/8284, MCS8202 RAM Controller, MCS9940-12	CTX058-ND	.80	.67	.49	MP120
12.288000	32.0pF	General Purpose	CTX087-ND	.80	.67	.49	MP122
14.318180	Series	General Purpose	CTX088-ND	.80	.67	.49	MP143
14.745600	Series	General Purpose	CTX089-ND	.80	.67	.49	MP147
15.000000	Series	MCS86, MCS8086/8284, MCS8202 RAM Controller	CTX059-ND	.80	.67	.49	MP150
16.000000	Series	General Purpose	CTX077-ND	.80	.67	.49	MP160
18.432000	Series	MCS80, MCS8080A/8224	CTX061-ND	.80	.67	.49	MP184
19.660800	Series	General Purpose	CTX090-ND	.80	.67	.49	MP196
20.000000	Series	MCS80, MCS8080A/8224	CTX062-ND	.80	.67	.49	MP200
22.118400	Series	MCS80, MCS8080A/8224	CTX063-ND	1.28	1.07	.78	MP221
24.000000	Series	MCS86, MCS8086, MCS8284	CTX091-ND	1.28	1.07	.78	MP240
24.576000	Series	General Purpose	CTX092-ND	1.28	1.07	.78	MP245
25.000000	Series	8202 RAM Controller	CTX093-ND	1.28	1.07	.78	MP250

HC49INS-ND Base Insulator76/10 6.35/100

357L Series Surface Mount VCXO

Specifications:
 • Output Voltage Level: Logic "1" Minimum 0.9V; Logic "0" Max. 0.1V • Output Transition Rise and Fall Time: 5.0ns • Output Duty Cycle (SYM): 45% Minimum, 55% Max. @ 50% level • Phase Shift (Bandwidth 12kHz-20MHz): 1ps RMS Max. • Linearity: 10% • Input Impedance: 50kΩ Minimum. • Modulation Roll-Off: 10kHz @ -3dB



Pin Connection	
1	Control Voltage
2	Tri-State Enable
3	Circuit/Package Ground
4	RF Output
5	Not Connected Internally
6	Supply Voltage

Enable Truth Table	
Pin 2	Pin 4
"1"	Output
"0"	High Imp.
Open	Output

Frequency (MHz)	Digi-Key Part No.	Cut Tape Price Each			Tape & Reel Pricing* 1,000	CTS Part No.
		1	100	1000		
1.5440	CTX630CT-ND	8.35	6.68	5.57	3228.93	357L3B3I001M5440
4.0960	CTX626CT-ND	8.35	6.68	5.57	3228.93	357L3B3I004M0960
6.1760	CTX631CT-ND	8.35	6.68	5.57	3228.93	357L3B3I006M1760
16.3840	CTX632CT-ND	8.35	6.68	5.57	3228.93	357L3B3I016M3840
19.4400	CTX627CT-ND	8.35	6.68	5.57	3228.93	357L3B3I019M4400
20.0000	CTX633CT-ND	8.35	6.68	5.57	3228.93	357L3B3I020M0000
27.0000	CTX634CT-ND	8.35	6.68	5.57	3228.93	357L3B3I027M0000
32.7680	CTX635CT-ND	9.30	7.45	6.21	3597.20	357L3B3I032M7680
35.3280	CTX628CT-ND	9.30	7.45	6.21	3597.20	357L3B3I035M3280
38.8800	CTX636CT-ND	9.30	7.45	6.21	3597.20	357L3B3I038M8800
40.0000	CTX637CT-ND	9.30	7.45	6.21	3597.20	357L3B3I040M0000
44.7360	CTX629CT-ND	9.69	7.75	6.46	3744.51	357L3B3I044M7360

* For Tape & Reel Part No., change CT-ND to TR-ND.