



PLETRONICS SM7T Series Miniature SMD Crystal



SM7T
1.65 x 1.25 x 0.4 mm
Ceramic Package

Features

- Miniature low profile surface mount crystal.
- Package is ideal for automated surface mount assembly and reflow practices.
- Tape and Reel Packaging.
- AT Cut Crystal
- 24 MHz to 60 MHz

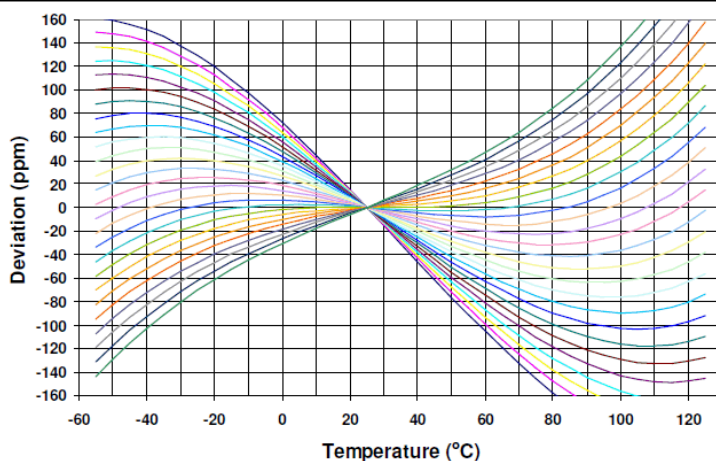
Applications

Bluetooth
WiFi
WLAN
IoT
Wearables
Zigbee

Electrical Characteristics

Parameter	Min	Typ	Max	Unit	Condition (Consult factory for other options)
Frequency Range	24	-	60	MHz	
Calibration Frequency Tolerance	±10	-	±50	ppm	at +25°C ± 3°C, see part number guide below for available options
Frequency Stability	±10	-	±50	ppm	see part number guide below for available options
Operable Temperature Range	-40	-	+85	°C	see part number guide below for available options
Equivalent Series Resistance (ESR)	-	-	150 100	Ω	24 MHz ≤ Freq < 40 MHz 40 MHz ≤ Freq ≤ 60 MHz
Drive Level	-	-	100	μW	Use 10μW for testing
Shunt Capacitance (C0)	-	-	3.0	pF	Pad to Pad Capacitance
Aging at 25°C ± 3°C	-	-	±5	ppm	for the first year
	-	-	±2	ppm	after the first year
Storage Temperature Range	-55	-	+125	°C	

AT Cut Crystal Frequency versus Temperature Typical Performance:





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Part Numbering

Series Model	Load Capacitance (C _{Load}) in pF	Frequency in MHz	Frequency Calibration Tolerance	Frequency Stability	Fundamental Mode AT Cut Crystal	Operating Temperature Range		Internal Code Or Blank
						Lowest	Highest	
SM7T	-8	-25.0M	-20	H	1	G	G	-xx
	Parallel Resonance from 06 to 18 pF SR = Series Resonance		(Typical Values Shown) 10 = ±10 ppm at 25°C ± 3°C 15 = ±15 ppm at 25°C ± 3°C 20 = ±20 ppm at 25°C ± 3°C (Standard) 25 = ±25 ppm at 25°C ± 3°C 50 = ±50 ppm at 25°C ± 3°C	See Table Below		C = 0°C E = -10°C G = -20°C J = -30°C K = -35°C L = -40°C	C = +50°C E = +60°C G = +70°C H = +75°C J = +80°C K = +85°C	

Available Frequency Stability versus Temperature in ppm

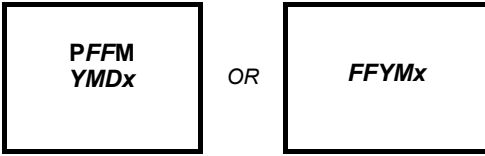
Operating Temperature Range		D	E	F	G	H
	CODE	±10	±15	±20	±30	±50
0 to +50°C	CC	•	•	•	•	•
0 to +60°C	CE	•	•	•	•	•
0 to +70°C	CG	•	•	•	•	STD
-10 to +50°C	EC	•	•	•	•	•
-10 to +60°C	EE	•	•	•	•	•
-10 to +70°C	EH	•	•	•	•	•
-20 to +70°C	GG	•	•	•	•	•
-20 to +75°C	GH	•	•	•	•	•
-30 to +75°C	JH		•	•	•	•
-30 to +85°C	JK		△	•	•	•
-35 to +80°C	KJ		△	•	•	•
-40 to +85°C	LK		△	•	•	•

• = Available △ = Check with Pletronics



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Device Marking



FF = Crystal Frequency in MHz
x = Internal factory codes
P = Pletronics
YMD or YM = Date code (Year-Month-Day or Year-Month see chart below)

Specifications such as part number, frequency stability, supply voltage and operating temperature range, etc. are not identified from marking. External packaging labels and packing list will correctly identify the ordered Pletronics part number.

Codes for Date Code YMD (Year Month Day)

Code	2	3	4	5	6	Code	A	B	C	D	E	F	G	H	J	K	L	M
Year	2022	2023	2024	2025	2026	Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Code	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	T	U	V	W	X	Y	Z
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Package Labeling

P/N Label is 1" x 2.6" (25.4mm x 66.7mm)
 Font is Courier New
 Bar code is 39-Full ASCII

RoHS Label is 1" x 2.6" (25.4mm x 66.7mm)
 Font is Arial

P/N: SM7T-8-24.576M-50H1LK
Customer P/N: 12345678
Qty: 1000 **D/C** 6A-HK
 MSL: 1

RoHS Compliant
 2nd Lvl Interconnect
 Category=e4
 Max Safe Temp=260C for 10s 2X Max

Pletronics Inc. certifies this device is in accordance with the RoHS and REACH directives.

Pletronics Inc. guarantees the device does not contain the following: Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's
 Weight of the Device: 0.003 grams

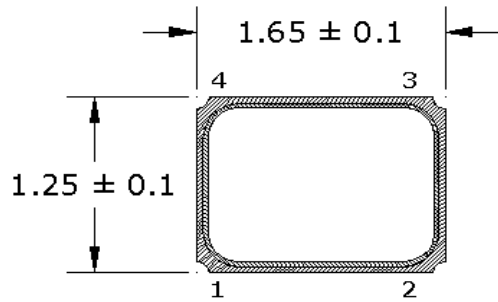
Reliability

Parameter	Condition
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
Vibration	MIL-STD-883, Method 2007, Condition A
Solderability	IPC J-STD-002
Thermal Cycle	MIL-STD-883 Method 1010, Condition B

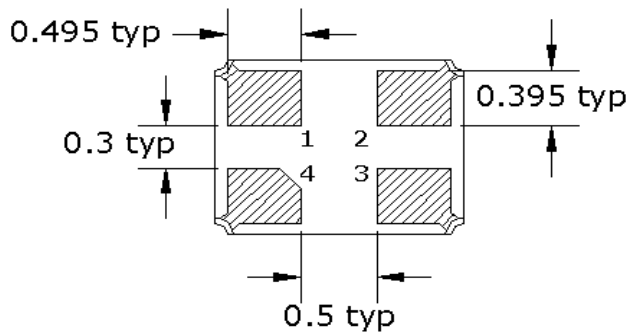
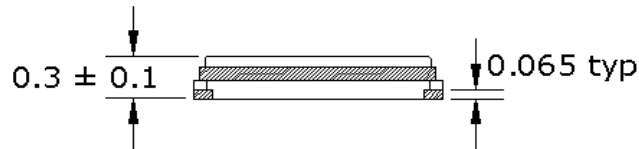


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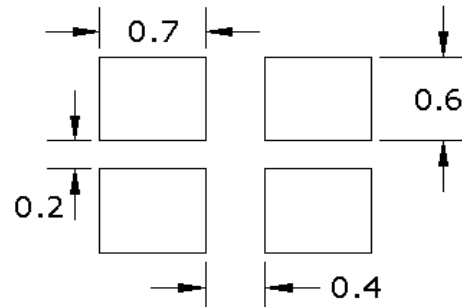
Mechanical Dimensions



- Pad # 1 - Crystal
- Pad # 2 - Cover (connect to ground)
- Pad # 3 - Crystal
- Pad # 4 - N.C.



Recommended Solder Pad Layout



Recommend to connect pad 2 and 4

Dimensions in mm

Contacts (pads): Gold (0.3 to 1µm) over Nickel (1.27 to 8.89 µm)
It is recommended to attach both pads 2 and 4 to ground, this will allow the part to be turned 180° and still be properly connected.

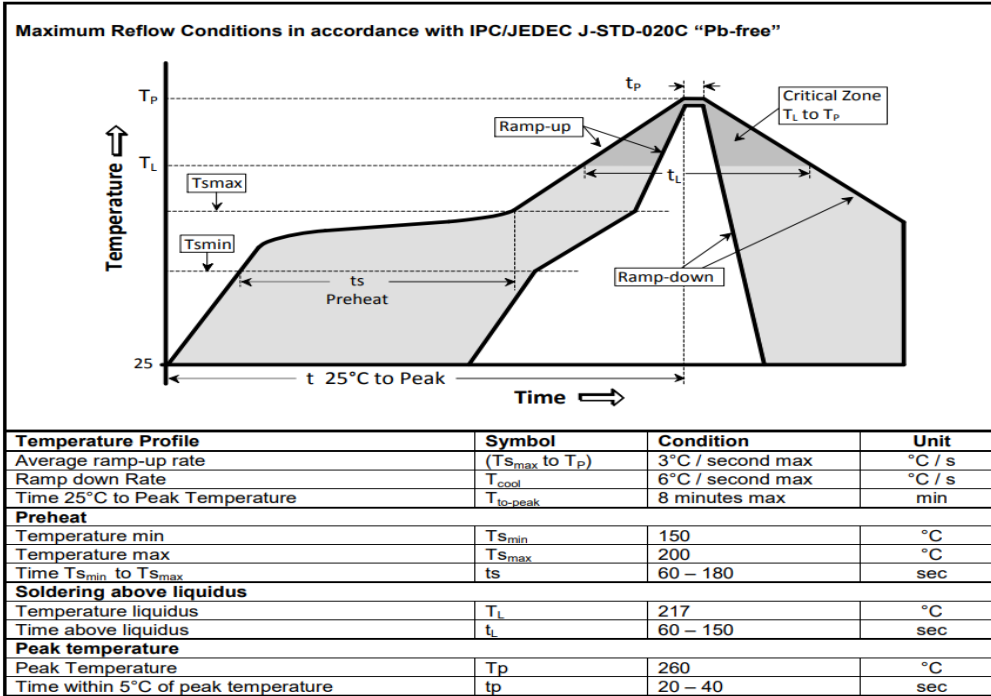
Pad Layout

Disclaimer: Recommended layout shown. Adjust layout as needed for individual process requirements.

For Optimum Jitter Performance, Pletronics recommends:

- Trace lengths to the crystal should be kept as short as possible.
- The crystal connections are sensitive to noise.
- The package should be grounded for optimum performance, pad 2 connected to ground.
- These very small crystals have high ESR, the oscillator start-up and operation should take this into consideration.
- These small crystals should have their maximum drive level limited to 100 µW.

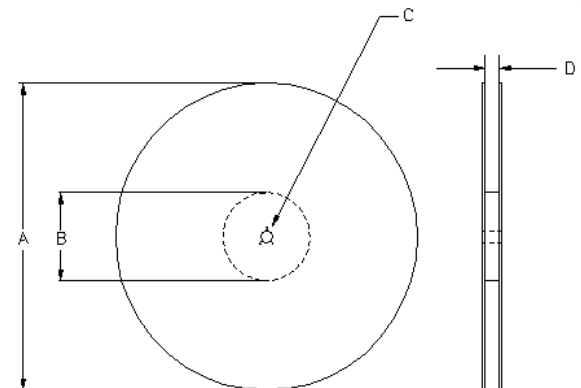
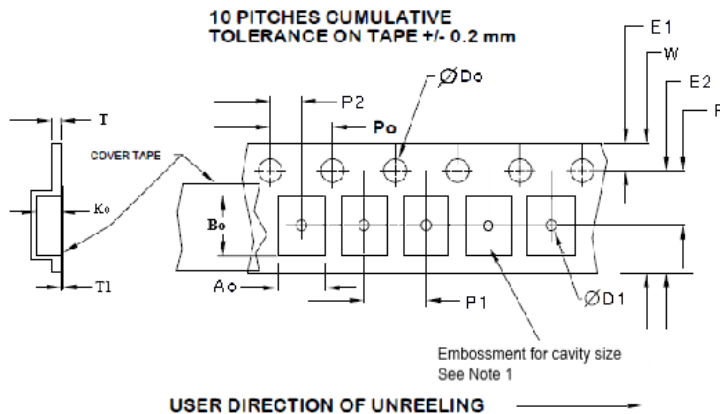
Reflow Cycle



The part may be reflowed 2 times without degradation (typical for lead free processing).

Tape and Reel

Tape and Reel available for quantities of 250 to 3000 per reel, cut tape for < 1000. 8mm tape, 4mm pitch.



Tape Size	E2 typ	F	P1	W max	Ao	Bo	Ko
8mm	6.25	3.5 ±0.05	4.0 ±0.1	8.3	1.45±0.1	1.85±0.1	0.45±0.1

Reel Size	A		B		C	D
	Inches	mm	Inches	mm	mm	mm
7	7.0	177.8	2.50	63.5	13.0 +0.5 -0.2	Tape size +0.4 +2.0 -0.0

Dimensions in mm Drawing Not to scale
Note 1: Embossed cavity to conform to EIA-481-B

Tape Size	Do	D1 typ	E1	Po	P2	T max	T1 max
8mm	1.5 +0.1 -0.0	0.6	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	0.25	0.1



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Contacting Pletronics Inc.

Pletronics, Inc.
19013 36th Ave. West
Lynnwood, WA 98036-5761
U.S.A.

Tel: 425.776.1880
Fax: 425.776.2760
email: ple-sales@pletronics.com
URL: www.pletronics.com