

SM11T Series Miniature SMD Crystal

November 2018

- The Pletronics' SM11T Series is a miniature surface mount crystal.
- Package is ideal for automated surface mount assembly and reflow practices.
- Tape and Reel packaging
- 8 MHz to 150 MHz Fundamental
- 70 MHz to 300 MHz 3rd Overtone
- 120 MHz to 250 MHz 5th Overtone
- 3.2 x 5 mm 4 pad
- AT Cut Crystal
- Ideal for use in hand held consumer products.

**Pletronics Inc. certifies this device is in accordance with the
RoHS 6/6 (2011/65/EC) and WEEE (2002/96/EC) directives.**

Pletronics Inc. guarantees the device does not contain the following:

Cadmium, Hexavalent Chromium, Lead, Mercury, PBB's, PBDE's

Weight of the Device: 0.06 grams

Moisture Sensitivity Level: 1 As defined in J-STD-020D.1

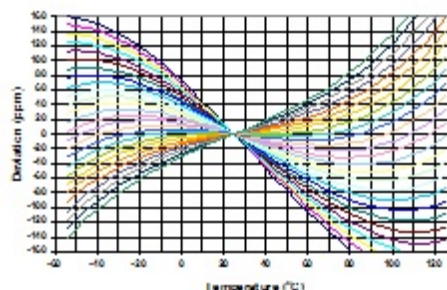
Second Level Interconnect code: e4



Electrical Specification:

Item	Min	Max	Unit	Condition	
Frequency Range	8	300	MHz	Fundamental, 3 rd and 5 th Overtone Modes	
Calibration Frequency Tolerance	10	50	ppm	at +25°C ± 3°C, see part number for options	
Frequency Stability over OTR	3	150	ppm	see part number for available options	
Equivalent Series Resistance (ESR)	-	100	Ohms	8MHz to 10MHz	Fundamental Mode
	-	80	Ohms	10 MHz to 16 MHz	
	-	60	Ohms	16 MHz to 20 MHz	
	-	50	Ohms	above 20 MHz	
	-	100	Ohms	70 MHz to 300 MHz	3 rd Overtone Mode
	-	160	Ohms	120 MHz to 250 MHz	5 th overtone Mode
Drive Level	-	100	µW	use 10 µW for testing	
Shunt Capacitance (C0)	-	5	pF	Pad to Pad capacitance	
Aging at 25°C ± 3°C	-3	+3	ppm /Yr	for the first year	
	-2	+2	ppm /Yr	after the first year	
Operating Temperature Range	-40	+125	°C	see part number for available options	
Storage Temperature Range	-55	+125	°C		

AT Cut Crystal Frequency versus Temperature Typical Performance:



Product information is current as of publication date. The product conforms to specifications per the terms of the Pletronics standard warranty. Production processing does not necessarily include testing of all parameters.

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Part Number:

SM11T -18 -14.31818M- 20 E 1 L K -XX

See chart below for available options

Internal code or blank
Highest Specified Operating Temperature A = 40°C G = 70°C N = 100°C B = 45°C H = 75°C P = 105°C C = 50°C J = 80°C R = 110°C D = 55°C K = 85°C S = 115°C E = 60°C L = 90°C T = 120°C F = 65°C M = 95°C U = 125°C
Lowest Specified Operating Temperature A = +10°C F = -15°C L = -40°C B = +5°C G = -20°C M = -45°C C = 0°C H = -25°C N = -50°C D = -5°C J = -30°C P = -55°C E = -10°C K = -35°C
Mode: 1 =Fundamental 3 = 3 rd OT 5 = 5 th OT
Frequency Stability See chart below
Calibration Frequency Tolerance (Typ. 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 30 = ± 30 ppm at 25°C ± 3°C 50 = ± 50 ppm at 25°C ± 3°C (Standard)
Frequency in MHz
Clload in pF Parallel Resonance from 06 to 32 pF or SR = Series Resonance
Model Number

Operating Temperature Range		Available Frequency Stability versus Temperature in ppm									
		CODE	A	B	C	D	E	F	G	H	J
0 to +45°C	CB	± 3.0	± 5.0	± 8.0	± 10	± 15	± 20	± 30	± 50	± 100	± 150
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 +75°C	EH			•	•	•	•	•	•	•	•
-20 to +70°C	GG			•	•	•	•	•	•	•	•
-20 to +75°C	GH				•	•	•	•	•	•	•
-30 to +75°C	JH				•	•	•	•	•	•	•
-30 to +80°C	JJ				•	•	•	•	•	•	•
-30 to +85°C	JK					•	•	•	•	•	•
-35 to +80°C	KJ					•	•	•	•	•	•
-40 to +85°C	LK					•	•	•	•	•	•
-40 to +90°C	LL					•	•	•	•	•	•
-40 to +105°C	LP						•	•	•	•	•
-40 to +125°C	LU							•	•	•	•

Legacy Part Number (not for new designs):





SM11T	B	E	-18	-14.31818M	-XX	
Internal code or blank						
Frequency in MHz						
Load in pF Parallel Resonance from 6 to 32 pF or SR = Series Resonance						
Operating Temperature Range Blank = 0 to + 70°C (STD) E = -40 to +85°C						
Calibration Tolerance / Frequency Stability Blank = 50/50 (STD) B = 30/30 C = 15/30 D = 10/20 (not all frequencies)						
Model Number						

Reliability: Environmental Compliance

Parameter	Condition
Mechanical Shock	MIL-STD-883 Method 2002, Condition B
Vibration	MIL-STD-883 Method 2007, Condition A
Solderability	MIL-STD-883 Method 2003
Thermal Shock	MIL-STD-883 Method 1011, Condition A

Package Labeling

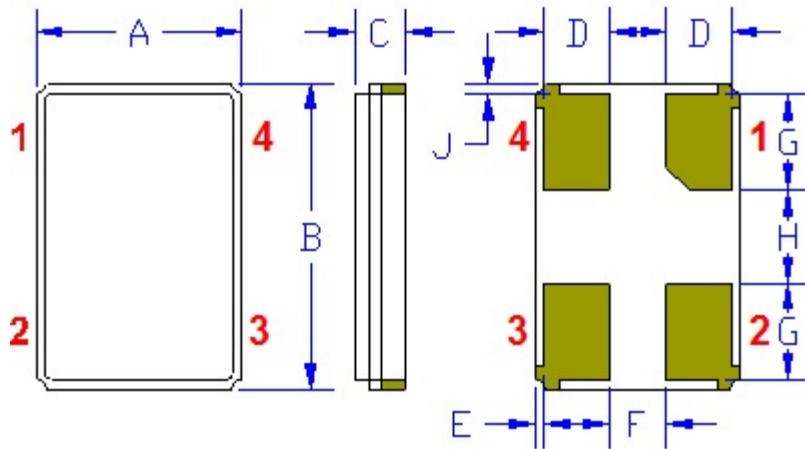
Label is 1" x 2.6" (25.4mm x 66.7mm)
Font is Courier New
Bar code is 39-Full ASCII

P/N:	
	SM11T-18-24.0M-1SD1EH
Customer P/N:	
	12345678
Qty:	
	1000
D/C	
	0526

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

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

Mechanical:



	Inches	mm
A	0.126 ± 0.004	3.2 ± 0.2
B	0.197 ± 0.004	5.0 ± 0.2
C	0.033 max	0.85 max
D ¹	0.031	0.8
E ¹	0.004	0.1
F ¹	0.055	1.4
G ¹	0.043	1.1
H ¹	0.102	2.6
J ¹	0.004	0.1

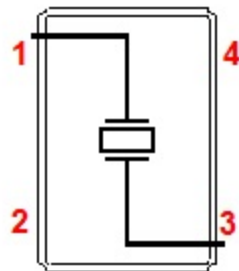
Contacts (pads):

Gold 11.8 to 39.3µinches (0.3 to 1.0µm)
over
Nickel 50 to 350 µinches (1.27 to 8.89 µm)

Not to Scale

¹ Typical dimensions

Connection (top view):



Pad 2 and Pad 4 are common and connected to the metal cover. They are not connected to the crystal.



Layout and application information

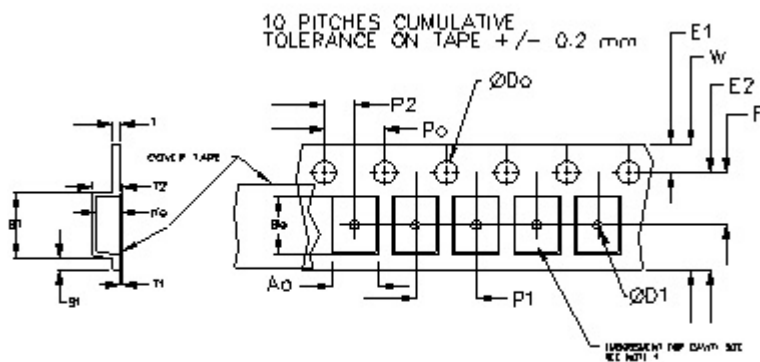
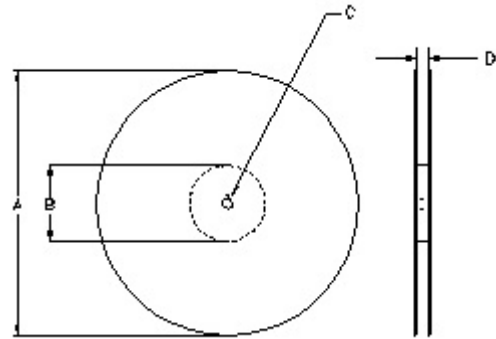
- Trace lengths to the crystal should be kept as short as possible.
- The crystal connections are sensitive to noise.
- The package should be grounded for optimum performance, pad 2 and/or pad 4 connected to ground.

Tape and Reel: available for quantities of 250 to 3000 per reel

Constant Dimensions Table 1								
Tape Size	D0	D1 Min	E1	P0	P2	S1 Min	T Max	T1 Max
8mm	1.5	1.0	1.75	4.0	2.0 ±0.05	0.6	0.25	0.1
12mm		1.5			2.0 ±0.1			
16mm		+0.1 -0.0			±0.1			
24mm		1.5			±0.1			

Variable Dimensions Table 2							
Tape Size	B1 Max	E2 Min	F	P1	T2 Max	W Max	Ao, Bo & Ko
16 mm	12.1	14.25	7.5 ±0.1	8.0 ±0.1	8.0	16.3	Note 1

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



		REEL DIMENSIONS			Tape Width
A	inches	7.0	10.0	13.0	
	mm	177.8	254.0	330.2	
B	inches	2.50	4.00	3.75	
	mm	63.5	101.6	95.3	
C	mm	13.0 +0.5 / -0.2			
D	mm	16.4 +2.0 -0.0	16.4 +2.0 -0.0	16.4 +2.0 -0.0	16.0

Reel dimensions may vary from the above

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