

1.2 mm x 1.0 mm Crystal

1.0 ELECTRICAL CHARACTERISTICS

ELECTRICAL PERFORMANCE

Parameter	Symbol	Min.	Typ.	Max.	Units
Nominal Frequency	f_{NOM}	24.000	—	80.000	MHz
Mode	—	Fundamental, AT - Cut			—
Operating Temperature Range	T_{OP}	-20	—	+70	°C
		-30	—	+85	
Stability over T_{OP} (Note 1) <i>ordering option</i>	f_{STAB}	±10, ±15, ±20			ppm
Frequency Tolerance (Note 2)	f_{TOL}	—	±10	±20	ppm
Load Capacitance, <i>ordering option</i>	C_{L}	Series, 6, 8, 10, or 12			pF
Shunt Capacitance	C_{O}	—	—	3.0	pF
Drive Level	—	—	10	100	μW
Aging, 1st Year (at +25°C)	f_{AGE}	—	—	±3	ppm
Insulation Resistance	—	500	—	—	MΩ
Storage Temperature	T_{STO}	-40	—	+85	°C
Equivalent Series Resistance					
Crystal Freq: 24.000 MHz to 27.120 MHz	ESR	—	—	150	Ω
Crystal Freq: 27.121 MHz to 37.400 MHz		—	—	100	Ω
Crystal Freq: 37.401 MHz to 80.000 MHz		—	—	60	Ω

Note 1: Referenced to the frequency at +25°C.

2: Frequency measured at +25°C, ±3°C.

3: Product is compliant with RoHS directive and fully compatible with lead-free assembly.

TABLE 1-1: PINOUT

Pin Number	Function
1	Crystal
2	Connected to cover (Connect to GND)
3	Crystal
4	Connect to GND

2.0 RELIABILITY AND IR COMPLIANCE

TABLE 2-1: ENVIRONMENTAL COMPLIANCE

Parameter	Conditions
Mechanical Shock	MIL-STD-883, Method 2002, Condition A
Mechanical Vibration	MIL-STD-883, Method 2007, Condition A
Temperature Cycle	MIL-STD-883, Method 1010, Condition B
Solderability	MIL-STD-202-210, Condition B
Gross and Fine Leak	MIL-STD-883, Method 1014
Altitude	MIL-STD-883, Method 1001, Condition B
Moisture Sensitivity Level	MSL 1
Contact Pads	Gold (0.2 μm min.) over Nickel
Weight	1.3 mg

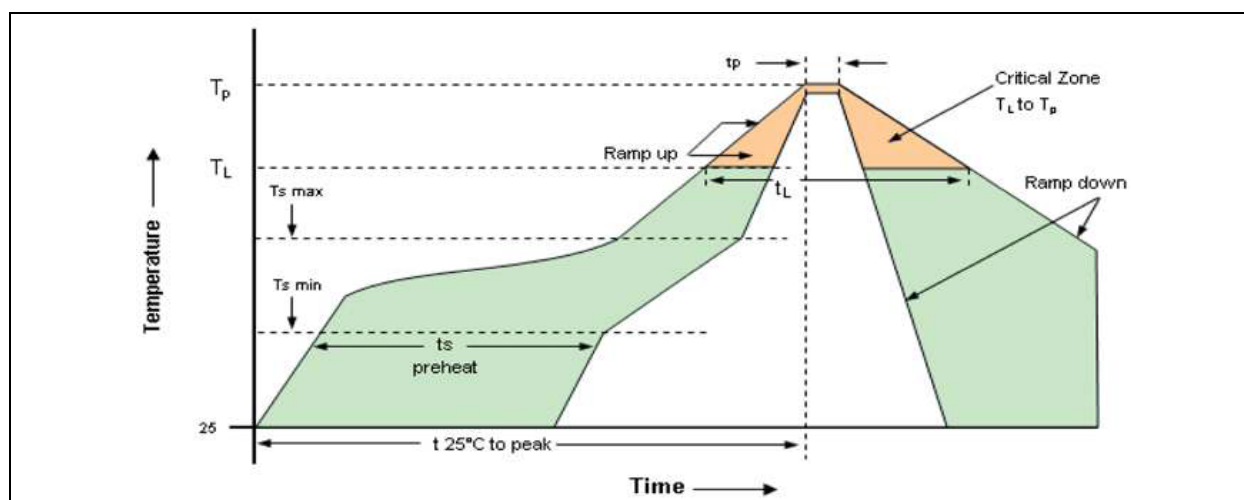


FIGURE 2-1: Solder Reflow Profile.

TABLE 2-2: REFLOW PROFILE

Parameter	Symbol	Value
Pre-Heat Time	t_S	60 sec. min.; 260 sec. max.
T_S min.	—	+150°C
T_S max.	—	+200°C
Ramp Up	R_{UP}	3°C/sec. max.
Time Above 217°C	t_L	60 sec. min.; 150 sec. max.
Time to Peak Temperature	t_{AMB-P}	480 sec. max.
Time at 260°C	t_P	30 sec. max.
Ramp Down	R_{DN}	6°C/sec. max.

Pads are Au over Ni and compatible with either SnPb or Pb-Free attachment.

MSL: 1

3.0 TAPE AND REEL

TABLE 3-1: TAPE AND REEL DIMENSIONS

Tape Dimensions (mm)												Reel Dimensions (mm)							
A	B	C	D	E	F	G	H	J	K	L	M	A	B	C	D	E	W	T	
1.3	1.1	8.0	4.0	1.75	4.0	4.0	2.0	0.5	1.55	0.25	0.45	178	60	21.0	13.0	2.0	8.0	2.0	

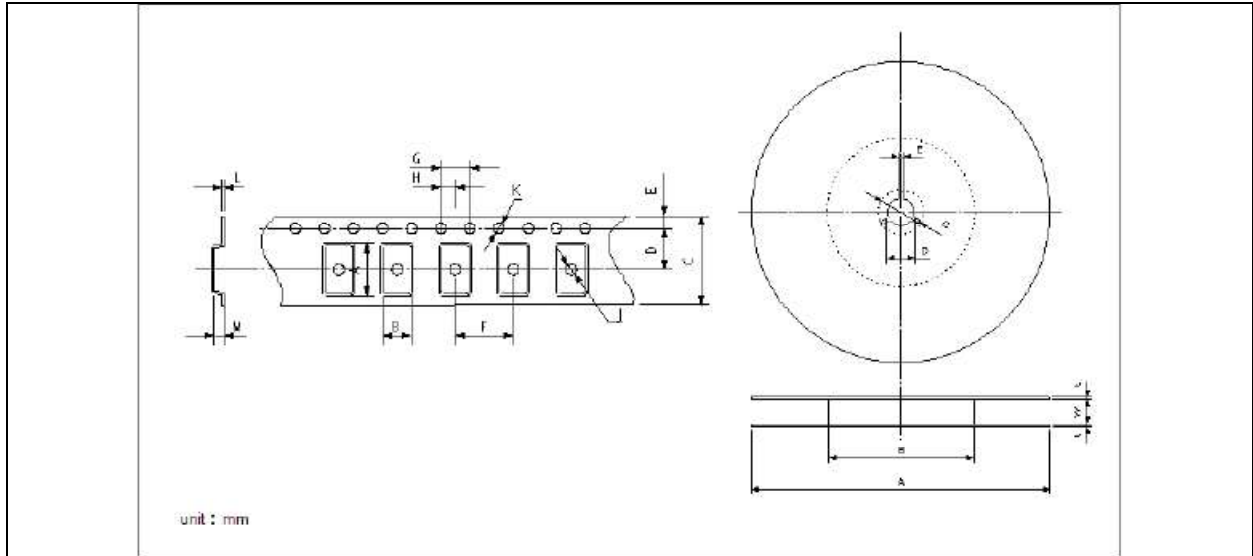
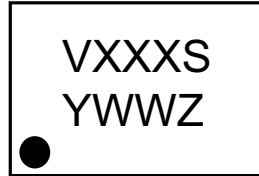


FIGURE 3-1: Tape and Reel Diagram.

4.0 PACKAGING INFORMATION

4.1 Package Marking Information

4-Lead CDFP*



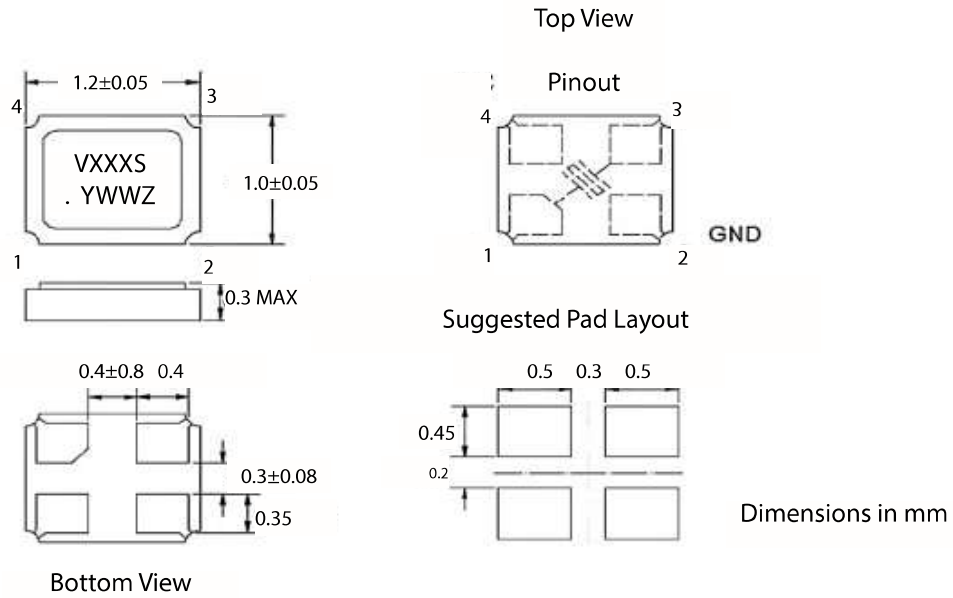
Example



Legend:	XXX	Frequency
	Y	Year code (last digit of calendar year)
	WW	Week code (week of January 1 is week '01')
	S	Spec/Load Indicator
	(e3)	Pb-free JEDEC® designator for Matte Tin (Sn)
	*	This package is Pb-free. The Pb-free JEDEC designator (e3) can be found on the outer packaging for this package.
	•, ▲, ▼	Pin one index is identified by a dot, delta up, or delta down (triangle mark).
Note:	In the event the full Microchip part number cannot be marked on one line, it will be carried over to the next line, thus limiting the number of available characters for customer-specific information. Package may or may not include the corporate logo.	
	Underbar (_) and/or Overbar (¯) symbol may not be to scale.	

4-Lead CDFP 1.2 mm x 1.0 mm Package Outline and Recommended Land Pattern

Note: For the most current package drawings, please see the Microchip Packaging Specification located at <http://www.microchip.com/packaging>



APPENDIX A: REVISION HISTORY

Revision A (January 2021)

- Initial release of VXN2 as Microchip data sheet DS20006441A.

PRODUCT IDENTIFICATION SYSTEM

To order or obtain information, e.g., on pricing or delivery, contact your local Microchip representative or sales office.

<u>Part No.</u>	<u>-X</u>	<u>X</u>	<u>X</u>	<u>-XX</u>	<u>-XXMXXXXXXX</u>	<u>XX</u>						
Device	Mode	Temperature Stability	Operating Temperature	Load Capacitance	Frequency (in MHz)	Media Type						
<p>Device: VXN: 1.2 mm x 1.0 mm Crystal</p> <p>Mode: 1 = Fundamental Tuning Fork</p> <p>Temperature Stability: C = ±10 ppm H = ±15 ppm E = ±20 ppm</p> <p>Operating Temperature: H = -30°C to +85°C J = -20°C to +70°C</p> <p>Load Capacitance: 00 = Series Resonance 06 = 6 pF 08 = 8 pF 10 = 10 pF 12 = 12 pF</p> <p>Frequency: xxMxxxxxx = Frequency in MHz</p> <p>Packing Option: <blank> = Cut Tape/non-TR Quantities TR = 3000/Reel</p>												
<p>Examples:</p> <p>a) VXN2-1CH-06-24M000000TR: 1.2 mm x 1.0 mm Crystal, Fundamental, ±10 ppm Stability, -30°C to +85°C Temp. Range, 6 pF Load Capacitance, 24.000 MHz, 3000/Reel</p> <p>b) VXN2-1EJ-12-37M400000TR: 1.2 mm x 1.0 mm Crystal, Fundamental, ±20 ppm Stability, -20°C to +70°C Temp. Range, 12 pF Load Capacitance, 37.400 MHz, 3000/Reel</p> <p>Note 1: Tape and Reel identifier only appears in the catalog part number description. This identifier is used for ordering purposes and is not printed on the device package. Check with your Microchip Sales Office for package availability with the Tape and Reel option.</p>												
<p>Standard Frequencies</p> <table border="1"> <tr> <td>24.000 MHz</td> <td>27.120 MHz</td> <td>32.000 MHz</td> <td>37.400 MHz</td> <td>40.000 MHz</td> <td>48.000 MHz</td> </tr> </table>							24.000 MHz	27.120 MHz	32.000 MHz	37.400 MHz	40.000 MHz	48.000 MHz
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