

Helping Customers Innovate, Improve & Grow

**Table 1. Electrical Performance**

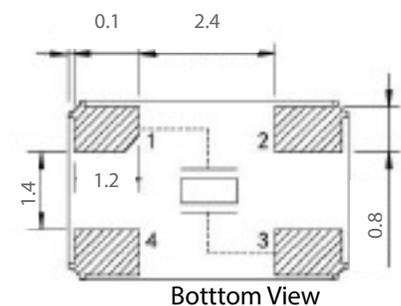
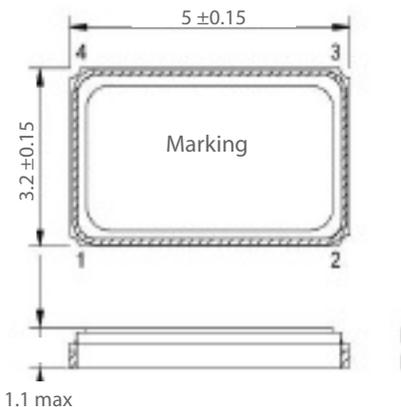
Parameter	Symbol	Min.	Typ	Max	Units
Nominal Frequency	$F_{NOM}$	8.000		150.000	MHz
Mode		Fundamental or 3rd Overtone			
Operating Temperature Range	$T_{OP}$	0/70, -10/70, -20/70, -40/85			°C
Stability Over $T_{OP}$ <sup>1</sup>	$F_{STAB}$	±10		±100	ppm
Frequency Tolerance <sup>2</sup>	$F_{TOL}$		±10	±20	ppm
Load Capacitance	$C_L$	6		32	pF
Shunt Capacitance	$C_o$			5	pF
Drive Level			10	100	uW
Aging / 1st year (at 25 °C)	$F_{AGE}$			±5	ppm
Insulation Resistance		500			MOhm
Storage Temperature	$T_{STO}$	-40		90	°C
<b>Equivalent Series Resistance</b>					
Crystal Frequency	ESR				Ohm
8.000MHz-12.000MHz				80	
12.001MHz-16.000MHz				60	
16.001MHz-20.000MHz				50	
20.001MHz-24.000MHz				40	
24.001MHz-54.000MHz				30	
40.000MHz-150.000MHz, 3rd Overtone				80	

Notes:

1. Referenced to the Frequency at 25 °C.
2. Frequency measured at 25 °C ± 3 °C.

Product is compliant to RoHS directive and fully compatible with lead free assembly. 

## Package Drawing



### Marking

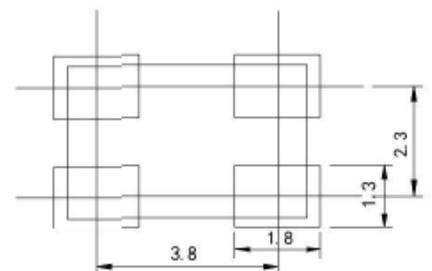
M2-YMC  
XXMXXX  
M2 = VXM2  
Y = Year  
M = Month  
A = January  
B = February  
C = March  
D = April  
E = May  
F = June  
G = July  
H = August  
I = September  
J = October  
K = November  
L = December  
C = Manufacturing location  
XXMXXX = Frequency

### Alternative Marking

XXMXXX  
YYWWC  
XXMXXX = Frequency  
YY = Year  
WW = Week  
C = Manufacturing location

**Table 2. Pinout**

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



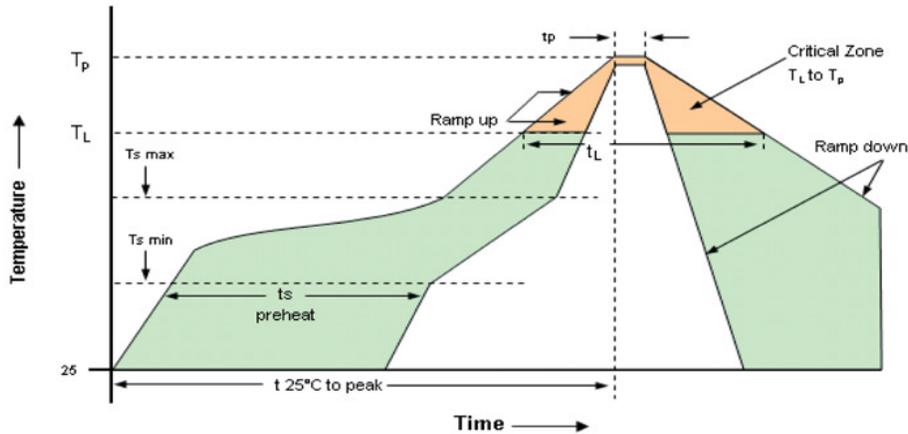
All Dimensions in mm

**Table 3. Environmental Compliance**

Parameter	Conditions
Mechanical Shock	MIL-STD-883, Method 2002, Condition B
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 (0.3 um min) over Nickel
Weight	45 mg

## Reliability & IR Compliance

Solderprofile:



**Table 4: Reflow Profile**

Parameter	Symbol	Value
PreHeat Time Ts-min Ts-max	$t_s$	60 sec Min, 260 sec Max 150°C 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

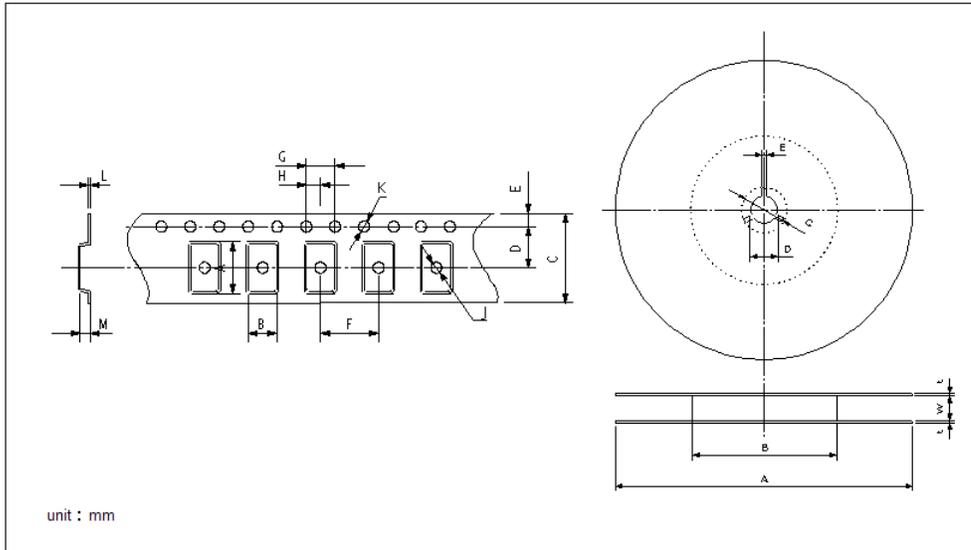
Pads are Au over Ni and compatible with either SnPb or Pb free attachment.

MSL: 1

# Tape & Reel

**Table 5. Tape and Reel Dimensions (mm)**

Tape												Reel							
A	B	C	D	E	F	G	H	J	K	L	M	A	B	C	D	E	W	T	
5.25	3.45	12.0	5.5	1.75	8.0	4.0	2.0	1.5	1.5	0.3	1.1	178	180	21.0	13.0	2.0	12.4	2.0	



1K pieces per reel

## Ordering Information

### VXM2 - XXX - XX- xxMxxxxxxxxXX

**Product**  
5.0 x 3.2mm, Crystal

**Mode**  
1: Fundamental  
3: 3rd Overtone

**Temp Stability**  
C: ±10ppm  
D: ±15ppm  
E: ±20ppm  
F: ±25ppm  
G: ±30ppm  
H: ±35ppm  
I: ±40ppm  
J: ±45ppm  
K: ±50ppm  
S: ±100ppm

*\*Note: not all combination of options are available.  
Other specifications may be available upon request.*

**Packaging**  
TR: Tape and Reel  
blank: Cut Tape / non Tape and Reel quantities  
\_SNPB: Tin lead solder dipped

**Frequency in MHz**

**Load Capacitance**  
0: Series Resonance  
06-32pF

**Operating Temperature**  
E: -40 to 85 °C  
J: -20 to 70 °C  
W: -10 to 70 °C  
T: 0 to 70 °C

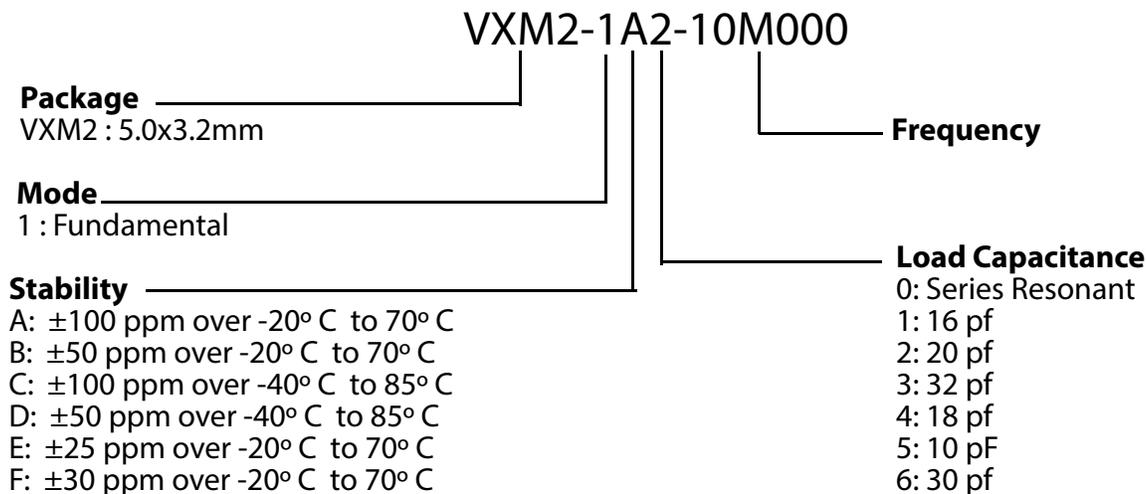
**Example:**

VXM2-1EE-12-25M0000000TR	Tape and Reel
VXM2-1EE-12-25M0000000	Cut Tape
VXM2-1EE-12-25M0000000_SNPB	Tin lead solder dipped

## Revision History

Revision Date	Approved	Description
August 29, 2016	RC	Initial datasheet for factory approval and release to customer.
September 17, 2018	FB	Update logo and contact information, add 1K pieces per reel and "SNPB-DIP" ordering option
June 07, 2019	FB	Update logo and contact information, add Table 2 Environmental compliance, change "SNPB-DIP" to "SNPB"
April 30, 2020	FB	Add tape and reel ordering option

**Previous Ordering Information for Reference Only**  
**Do Not Use to Build a New Part Number**



The ordering codes for the VXM2 were changed in 2016. If you had ordered a specific code based off this ordering method, it is still available for purchase under the old code however no new part numbers will be created using this system.

Due to the change in the 8th character from numeric to alphabetic, there is no opportunity for overlap between the two ordering methods.

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