

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			
Stability Over T_{OP} ¹	F_{STAB}	±10		±100	ppm
Frequency Tolerance ²	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
Equivalent Series Resistance					
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	

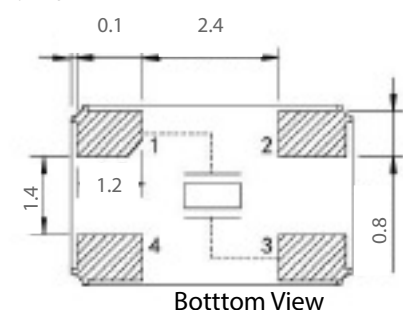
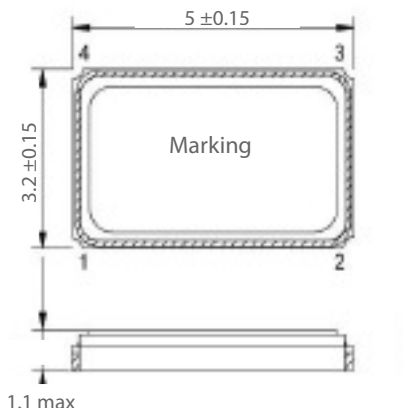
Notes:

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



Bottom View

Marking

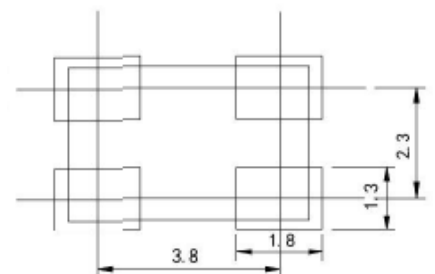
M2-YMC
XXMXXX
M2 = VXM2
Y = Year
M = Month
A = January
B = February
C = March
D = April
E = May
F = June
G = July
H = August
I = September
J = October
K = November
L = December
C = Manufacturing location
XXMXXX = Frequency

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)



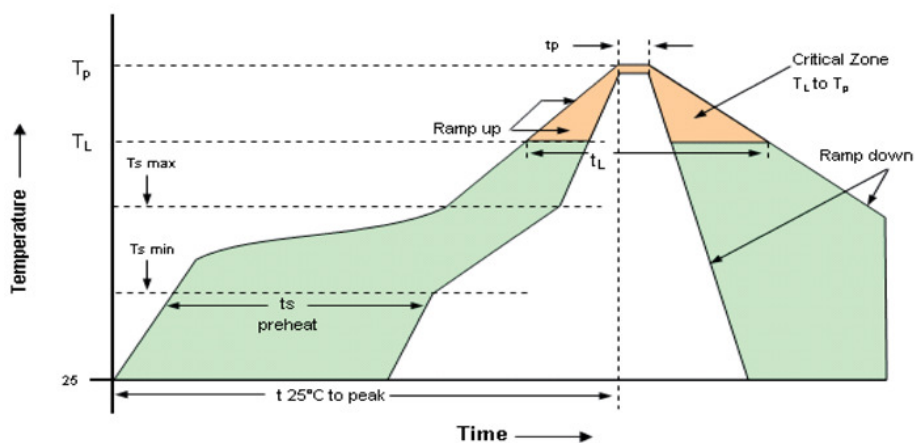
All Dimensions in mm

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

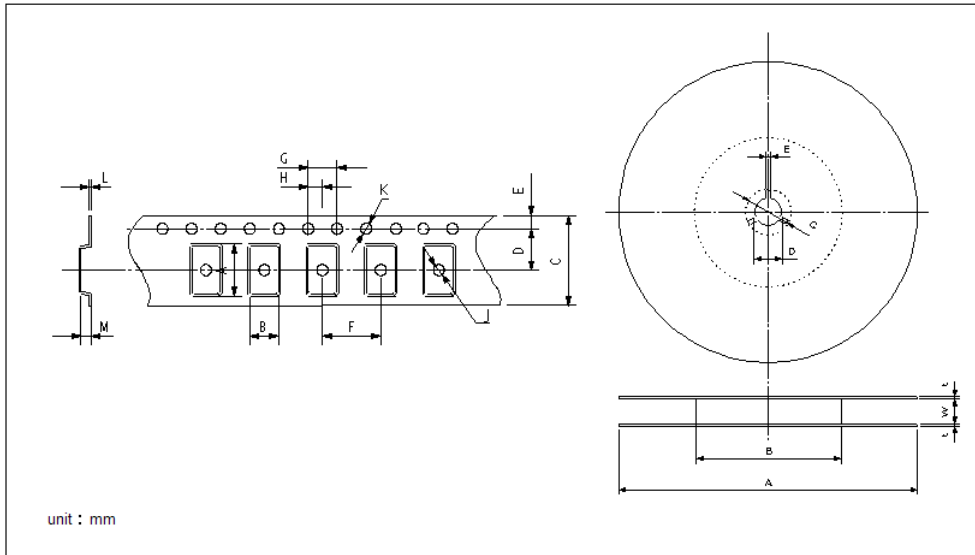
Pads are Au over Ni and compatible with either SnPb or Pb free attachment.

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

VXM2-1EE-12-25M0000000

VXM2-1EE-12-25M0000000_SNPB

Tape and Reel

Cut Tape

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

VXM2-1A2-10M000		
Package VXM2 : 5.0x3.2mm		Frequency
Mode 1 : Fundamental		Load Capacitance
Stability A: ±100 ppm over -20° C to 70° C B: ±50 ppm over -20° C to 70° C C: ±100 ppm over -40° C to 85° C D: ±50 ppm over -40° C to 85° C E: ±25 ppm over -20° C to 70° C F: ±30 ppm over -20° C to 70° C		0: Series Resonant 1: 16 pf 2: 20 pf 3: 32 pf 4: 18 pf 5: 10 pF 6: 30 pf

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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