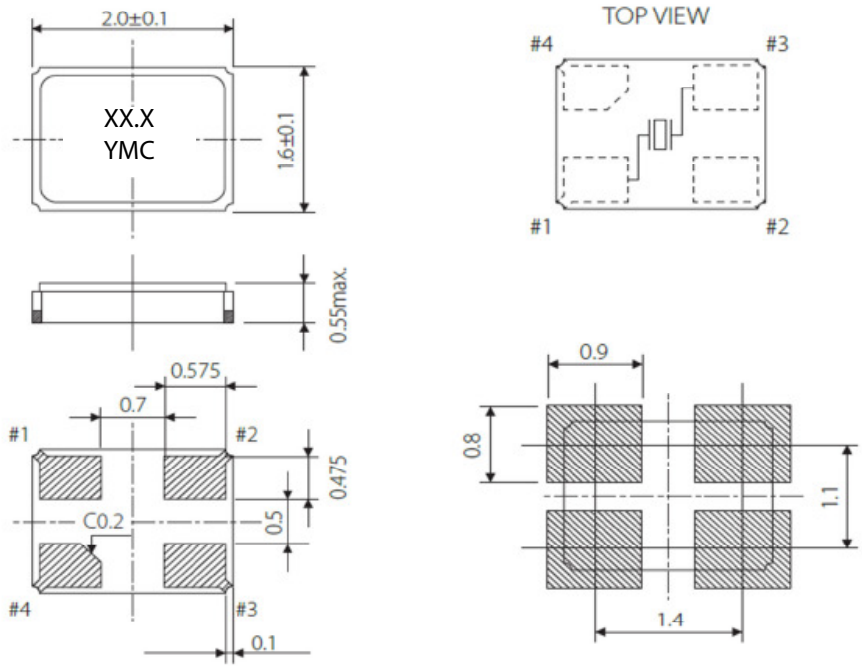
Table 1. Electrical Performance					
Parameter	Symbol	Min.	Typ	Max	Units
Nominal Frequency	F_{NOM}	16.000		60.000	MHz
Mode		Fundamental, AT - Cut			
Operating Temperature Range	T_{OP}	0/70, -10/70, -20/70, -40/85			°C
Stability Over T_{OP} [1]	F_{STAB}	±10		±100	ppm
Frequency Tolerance[2]	F_{TOL}		±10	±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 16.000MHz-20.000MHz 20.001MHz-30.000MHz 30.001MHz-60.000MHz	ESR			 200 100 80	Ohm

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



All Dimensions in mm

Part Marking:

XX.X = Frequency
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 = Manufacuting Location

Table 2. Pinout	
Pin	**Function**
1	Crystal
2	Connected to cover (Connect to GND
3	Crystal
4	Connected to cover (Connect to GND)

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 (0.2 um min) over Nickel
Weight	7 mg

Reliability & IR Compliance

Solderprofile:

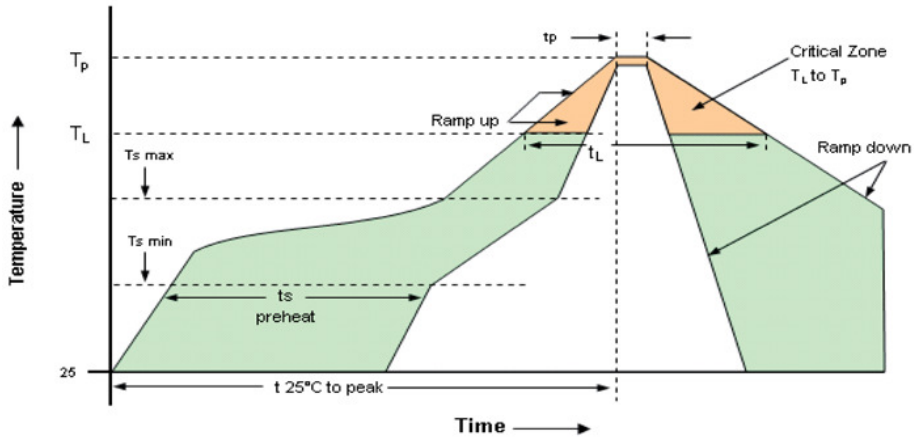


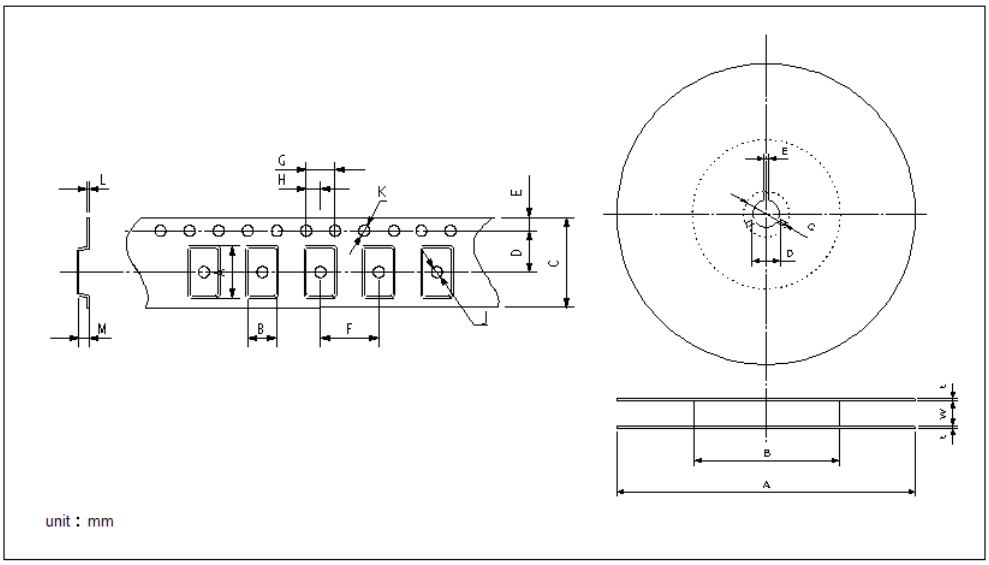
Table 4: Reflow Profile		
Parameter	**Symbol**	**Value**
PreHeat Time Ts-min Ts-max	t_S	60 sec Min, 260 sec Max 150°C 200°C
Ramp Up	R_{UP}	3 °C/sec Max
Time Above 217 °C	t_L	60 sec Min, 150 sec Max
Time To Peak Temperature	T_{AMB-P}	480 sec Max
Time at 260 °C	t_P	30 sec Max
Ramp Down	R_{DN}	6 °C/sec 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
2.25	1.85	8.0	3.5	1.75	4.0	4.0	2.0	0.5	1.55	0.25	0.65	180	60	21.0	13.0	2.0	9.0	2.0



Ordering Information

VXM9 - XXX - XX- xxMxxxxxxxXX

Product
2.0 x 1.6mm, Crystal

Mode
1: Fundamental

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.*

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

Load Capacitance
0: Series Resonance
06-32pF

Frequency in MHz

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

Example:

VXM9-1EE-12-25M0000000TR	**Tape and Reel**
VXM9-1EE-12-25M0000000	**Cut Tape**
VXM9-1EE-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.
August 10, 2018	FB	Update logo and contact information, add "SNPBDIP" ordering option
June 07, 2019	FB	Update logo and contact information, add Table 2 Environmental compliance, change "SNPBDIP" 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

VXM9-1G2-10M000

Package
VXM9 : 2.0x1.6x0.55

Mode
1 : Fundamental

Stability
A: ±100 ppm over -20º to 70ºC
B: ±50 ppm over -20º to 70ºC
C: ±100 ppm over -40º to 85ºC
D: ±50 ppm over -40º to 85ºC
F: ±30 ppm over -20º to 70ºC
A: ±10 ppm over -10º to 60ºC
A: ±15 ppm over -30º to 85ºC

Frequency

Load Capacitance
0: Series Resonator
1: 16 pf
2: 20 pf
3: 32 pf
4: 18 pf
5: 10 pF
6: 30 pf

The ordering codes for the VXM9 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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