



X5024 series

Nominal 5 x 2.4 mm blanks for
5x7mm ceramic SMD High Frequency Oscillators

XECO's X5024 crystal blank series offer high performance inverted mesa crystals at lower cost via an economical process achieving a frequency tolerance of $0.12f^2$. The X5024 is intended for standard 5x7mm ceramic SMD package. Crystals are 100% tested and sorted by frequency and then sequentially packed into a waffle packs. Available to 170MHz on the fundamental and 240MHz for third overtone operation.

XECO proprietary processes yield a clean mesa and transition area to achieve good plating over the transitions and high crystal performance. The X5024 is a lower cost version of the RM196, which is supplied to a standard frequency tolerance of $0.02f^2$.

A frequency report included with the shipment allows crystals to be selected by columns and rows to use for a plating group. Plating calibration setup accuracy is improved as the frequency of the crystals used is known, not just part of a sort group range.

FEATURES

- Rugged Crystal 4.978mm x 2.388mm
- Plateback set for Chrome-Gold electrodes or Aluminum Electrodes
- Sized for 5x7mm ceramic SMD
- 100% tested blanks for highest yield potential
- Stable oscillation
- High Q, chemically etched, free of etch channels or scratches in the Mesa area

APPLICATIONS

- Volume clock oscillators and VCXO
- Customer applications for SONET, 10G, 1G, Storage, network communications
- Small packaged crystals for precise frequency control applications

BENEFITS

- Low unit cost
- Higher yield through lower breakage (rugged)
- Flexible sorting groups
- More accurate plating calibration setup
- Excellent oscillator performance

PRODUCT OFFERING/RANGE

- Fundamental or overtone applications
- 50MHz to 170MHz Fundamental mode*
- 150MHz to 240 MHz third overtone mode*
- AT angles from 35D8' to 35D29.5' [EFG3D6' to 2D45']
- Standard angle tolerance of $\pm 2'$
- Low etch Channel pure Z quartz with a Q minimum of 1.8 million
- Sorted and packed in order of frequency by each lot
- Cleaned and packed in vacuum sealed waffle packs



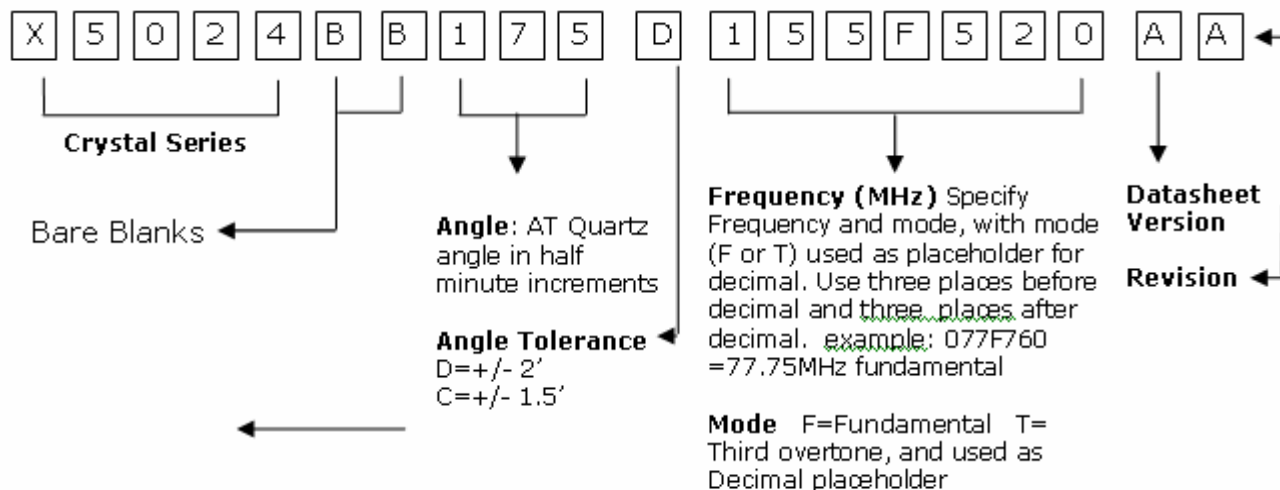
Typical electrode pattern for 5x7mm

*See RM196 series for higher frequencies or Z5024 for similar crystal for UM-1 packaging



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Ordering Information: XECO builds many frequency and specification combinations to meet specific customer requests. We list on the following tables those part types selected for general sale; however, you may specify or “build” your own part / specification using the part numbering system shown here. We will be pleased to make most any frequency inside our stated range — even higher! However, all manufacturing combinations may not be offered, so we recommend you contact VC America for assistance or pre-approval as to what is acceptable.

Below is a partial listing of some common frequencies. You may also specify the desired frequency range. In lieu of sort groups, XECO will supply a data report with all blanks pre-sorted and sequentially ordered into the waffle packs.

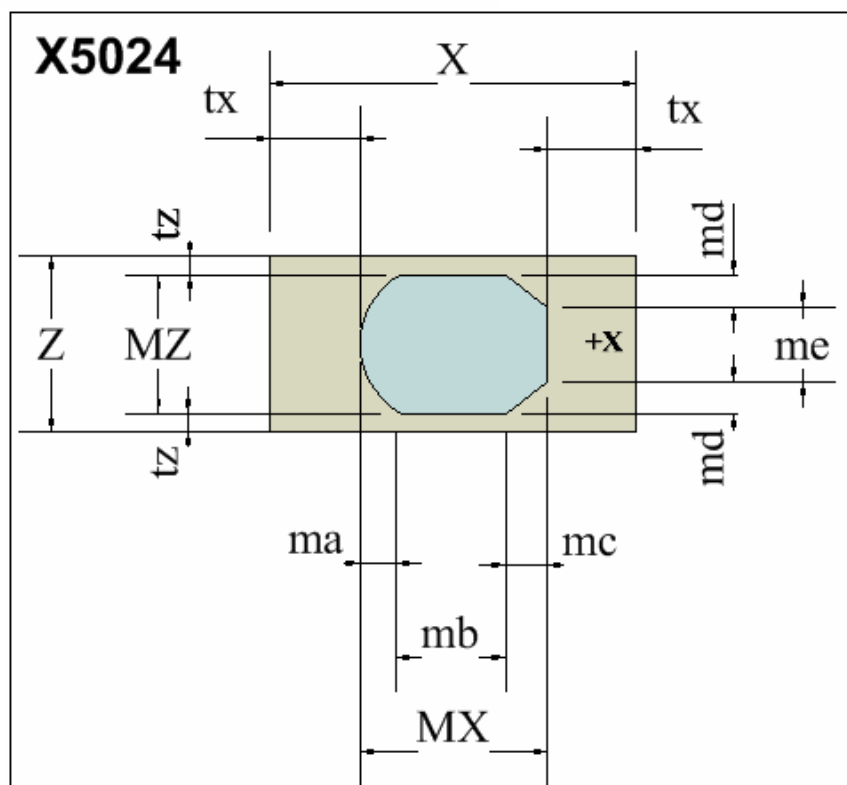
Part Number	Frequency	Mode	Cut_Angle	Angle Tol	Frequency Min	Frequency Max
X5024BB170D077F760AA	77.76	F	35° 17'	±2'	80.8446	81.5686
X5024BB170D155F520AA	155.52	F	35° 17'	±2'	167.0177	170.1437
X5024BB170D156F250AA	156.25	F	35° 17'	±2'	167.8557	171.0117
X5024BB170D161F133AA	161.13275	F	35° 17'	±2'	173.2116	176.5756
X5024BB245D155T520AA	155.52	T	35° 24.5'	±2'	53.4557	53.7717
X5024BB245D156T250AA	156.25	T	35° 24.5'	±2'	53.7147	54.0327
X5024BB245D161T133AA	161.13275	T	35° 24.5'	±2'	55.4171	55.7551
X5024BB245D187T500AA	187.5	T	35° 24.5'	±2'	64.729	65.193
X5024BB245D200T000AA	200	T	35° 24.5'	±2'	69.1138	69.6418
X5024BB245D212T500AA	212.5	T	35° 24.5'	±2'	73.594	74.194



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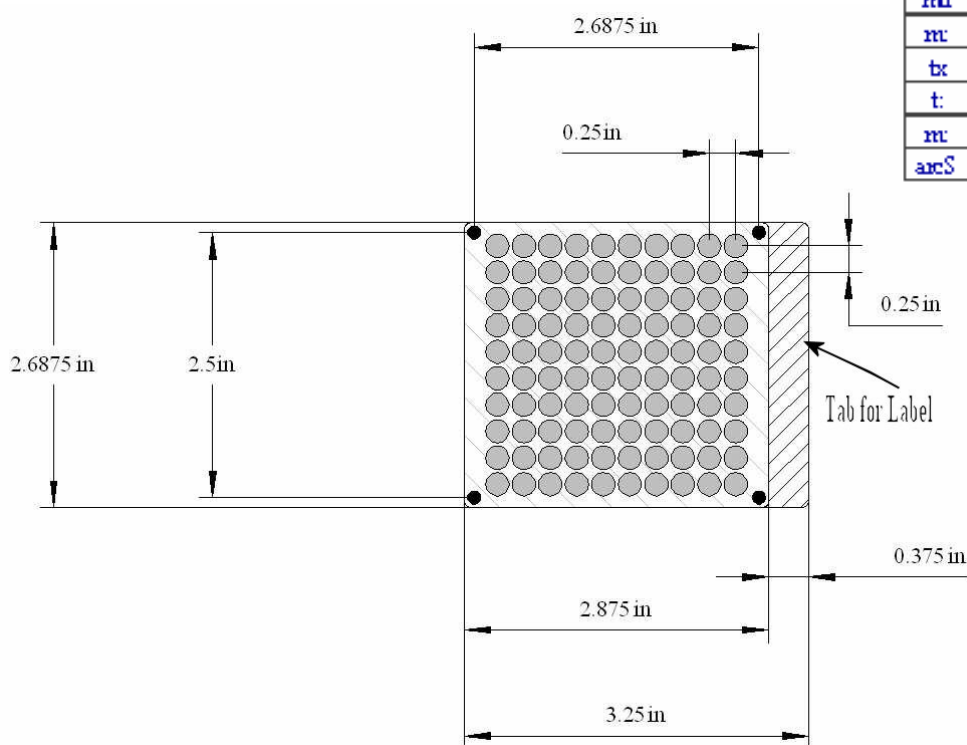
Device Dimensions



X5024 Blank drawing and dimensions

mm		
	mm	Tolerances
X	4.978	+0.000 -0.025
Z	2.388	+0.000 -0.025
MX	2.540	+0.025 -0.025
MZ	1.880	+0.025 -0.025
ma	0.483	+0.001 -0.001
mb	1.419	+0.003 -0.003
mc	0.559	+0.001 -0.001
md	0.432	+0.001 -0.001
me	1.016	+0.002 -0.002
tx	1.219	+0.013 -0.013
t	0.254	+0.013 -0.013
m		NA
arcS		NA

Inches		
	mils (0.001")	Tolerances
X	196.00	+0.00 -1.00
Z	94.00	+0.00 -1.00
MX	100.00	+1.00 -1.00
MZ	74.00	+1.00 -1.00
ma	19.00	+0.05 -0.05
mb	55.88	+0.10 -0.10
mc	22.00	+0.05 -0.05
md	17.00	+0.05 -0.05
me	40.00	+0.08 -0.08
tx	48.00	+0.5 -0.5
t	10.00	+0.5 -0.5
m		NA
arcS		NA



XECO waffle pack dimensions



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This is a portion of a 5 page report submitted with a 300 unit, 3-waffle pack shipment to show how crystals are loaded into the waffle packs already sorted by frequency.

"6081205CM0723160.txt, 6/6/2005 12:00:00 AM"

Control No.: 6081205CM0723160 Basket No.: 1234

Customer PO: 1234

Xeco Work Order: 7777

Target Freq: 79.3625

Freq Tol: 0.14

Min: 78.9216

Max: 79.8034

Shipping Total: 300

TRAY	ROW	COL	FREQ(MHz)	TRAY	ROW	COL	FREQ(MHz)
1	1	1	78.94	1	6	1	79.1025
1	1	2	78.94	1	6	2	79.1025
1	1	3	78.94	1	6	3	79.1105
1	1	4	78.94	1	6	4	79.111
1	1	5	78.94	1	6	5	79.111
1	1	6	78.9665	1	6	6	79.1125
1	1	7	78.9665	1	6	7	79.1125
1	1	8	78.9715	1	6	8	79.1175
1	1	9	78.9715	1	6	9	79.1175
1	1	10	78.985	1	6	10	79.1225
1	2	1	78.985	1	7	1	79.1275
1	2	2	78.985	1	7	2	79.1285
1	2	3	78.986	1	7	3	79.1285
1	2	4	78.986	1	7	4	79.131
1	2	5	78.986	1	7	5	79.131
1	2	6	78.9865	1	7	6	79.1335
1	2	7	78.9865	1	7	7	79.1335
1	2	8	78.9875	1	7	8	79.1335
1	2	9	78.9875	1	7	9	79.1335
1	2	10	78.989	1	7	10	79.136
1	3	1	78.989	1	8	1	79.136
1	3	2	78.9975	1	8	2	79.1385
1	3	3	78.9975	1	8	3	79.1385
1	3	4	79.02	1	8	4	79.141
1	3	5	79.02	1	8	5	79.141

Report continues until 100 locations are filled

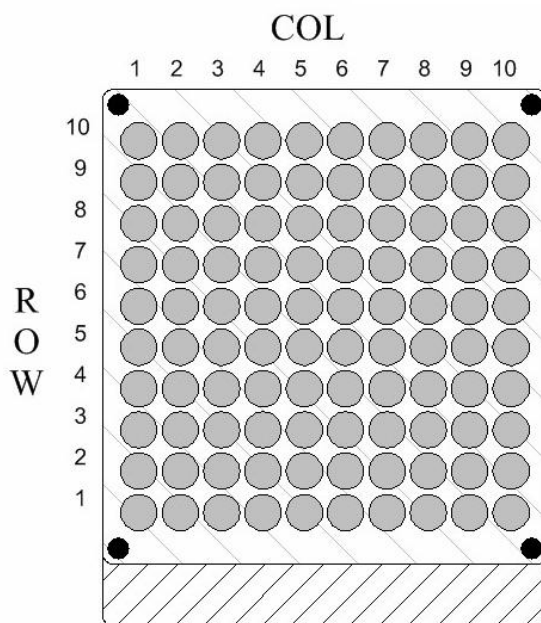
"6081205CM0723160.txt, 6/6/2005 12:00:00 AM"

TRAY	ROW	COL	FREQ(MHz)	TRAY	ROW	COL	FREQ(MHz)
2	3	4	79.1825	2	8	4	79.2125
2	3	5	79.1825	2	8	5	79.2135
2	3	6	79.1825	2	8	6	79.2135
2	3	7	79.184	2	8	7	79.214
2	3	8	79.184	2	8	8	79.214
2	3	9	79.185	2	8	9	79.215
2	3	10	79.185	2	8	10	79.215

Report continues until 100 locations are filled

"6081205CM0723160.txt, 6/6/2005 12:00:00 AM"

TRAY	ROW	COL	FREQ(MHz)	TRAY	ROW	COL	FREQ(MHz)
Break in data; report completes at bottom							
3	5	2	79.236	3	10	2	79.2475
3	5	3	79.236	3	10	3	79.2475
3	5	4	79.2405	3	10	4	79.2485
3	5	5	79.2405	3	10	5	79.2485
3	5	6	79.2405	3	10	6	79.2485
3	5	7	79.2405	3	10	7	79.2485
3	5	8	79.241	3	10	8	79.2485
3	5	9	79.241	3	10	9	79.2485
3	5	10	79.241	3	10	10	79.2485



SHIPPING TRAY LAYOUT



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The products shown in this document (hereafter "Products") are not intended to be used in medical life support applications or equipment where device failure may endanger human life. Customers are requested to obtain prior written agreement for such use from XECO Incorporated. Customer shall be solely responsible for, and indemnify and hold XECO Inc. free and harmless from any and all claims, damages, losses, expenses, or lawsuits, due to such use without such agreement. XECO Inc. reserves the right to change the specifications of the Products in order to improve the characteristic or reliability thereof. XECO Inc. makes no claim or warranty that the contents described in this document do not infringe any intellectual property right or other similar right owned by third parties. Therefore, XECO Inc. shall not be responsible for such problems, even if the use is in accordance with the descriptions provided in this document. Any descriptions including applications, circuits, and the parameters of the Products in this document are for reference to use the Products, and shall not be guaranteed free from defect, inapplicability to the design, or full production products without further testing or modification. Customers are requested not to export or re-export, directly or indirectly, the Products to any country or any entity not in compliance with or in violation of the US export laws, treaties, orders, and regulations. Customers are requested to take the appropriate steps to obtain required government permission or approvals for use or export.