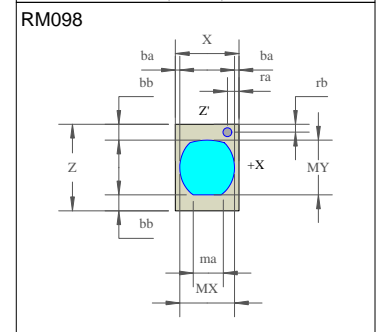
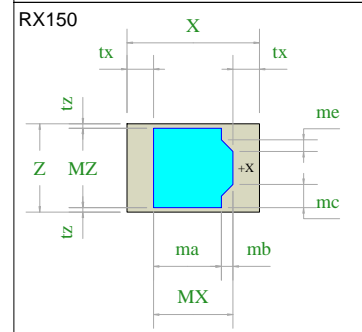
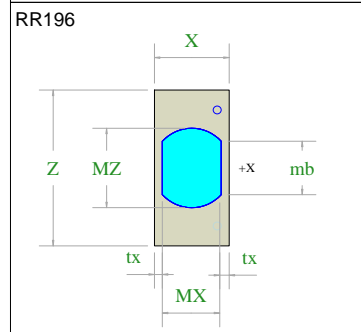
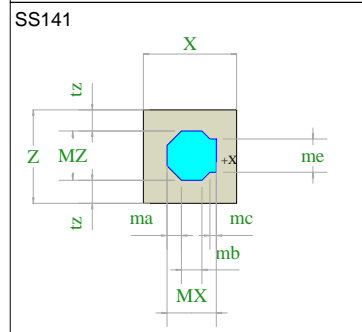
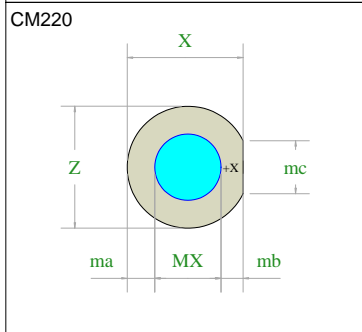
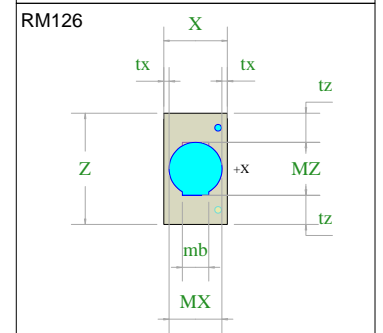
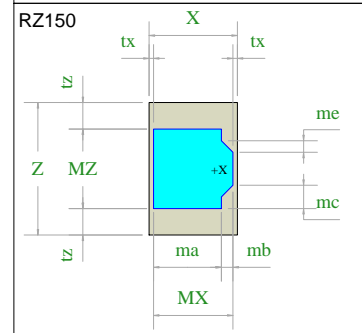
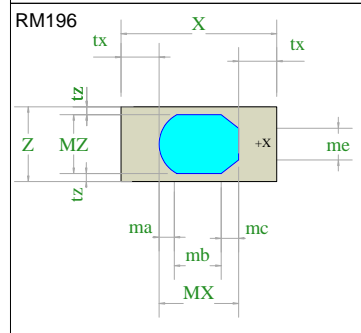
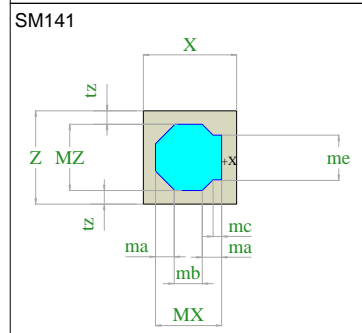
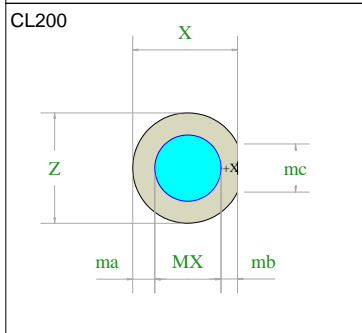
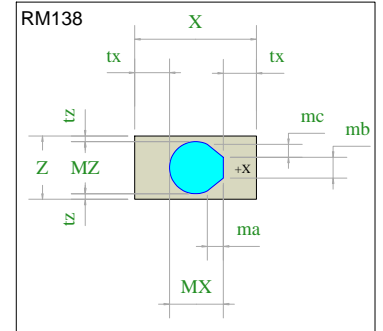
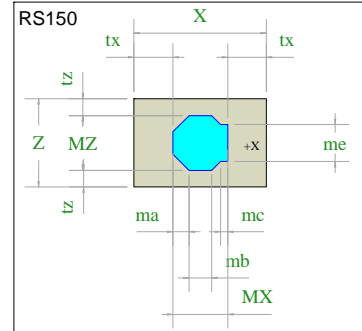
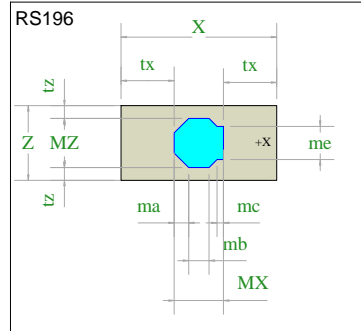
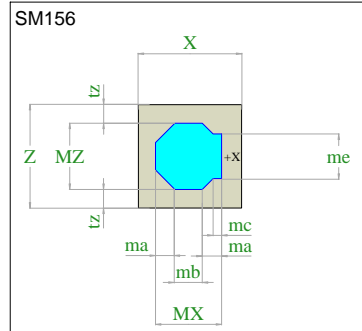
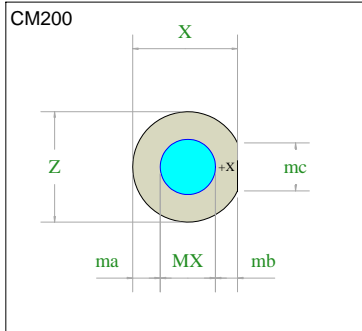


XECO, Inc.
The future of crystal technology

Inverted Mesa Blanks

sales@xeco.net





INVERTED MESA DIMENSIONS (mm)

TYPE	X	Z	MX	MZ	ma	mb	mc	md	me	tx	tz	mR	arcS
CL200	4.826	5.080	3.048	3.048	1.016	0.762	2.215	NA	NA	NA	NA	NA	51.683
CM200	4.826	5.080	2.540	2.540	1.270	1.016	2.215	NA	NA	NA	NA	NA	51.683
CM220	5.334	5.588	3.048	3.048	1.016	0.762	2.328	NA	NA	NA	NA	NA	49.240
RM098	2.388	4.978	1.880	2.540	NA	NA	NA	NA	NA	0.254	1.219	NA	NA
RM126	3.200	1.820	1.549	1.499	0.462	0.600	0.369	NA	NA	0.978	0.161	0.749	233.620
RM138	3.505	1.820	1.549	1.499	0.462	0.600	0.369	NA	NA	0.978	0.161	NA	NA
RM196	4.978	2.388	2.540	1.880	0.483	1.419	0.559	0.432	1.016	1.219	0.254	1.067	123.515
RR196	4.978	2.388	2.540	2.134	NA	NA	NA	NA	NA	1.219	0.127	NA	NA
RS150	3.810	2.540	1.600	1.600	0.469	0.663	0.208	0.260	1.079	1.105	0.470	NA	NA
RS196	4.978	2.388	1.600	1.600	0.469	0.663	0.208	0.260	1.079	1.689	0.394	NA	NA
RX150	3.810	2.540	2.286	2.286	1.951	0.335	0.670	0.947	0.335	0.762	0.127	NA	NA
RX196	4.978	2.388	2.540	2.134	0.581	1.367	0.559	0.508	1.118	1.219	0.127	1.067	114.227
RZ126	1.829	3.200	1.575	1.575	0.457	0.127	0.635	2.743	NA	0.127	0.813	NA	NA
RZ150	2.540	3.810	2.286	2.286	1.951	0.335	0.670	0.947	0.335	0.127	0.762	NA	NA
SB141	3.581	3.581	2.286	2.286	0.670	0.947	0.335	0.335	1.602	0.469	0.469	NA	NA
SM141	3.581	3.581	2.540	2.540	0.744	1.052	0.372	0.372	1.780	0.521	0.521	NA	NA
SM156	3.962	3.962	2.540	2.540	0.744	1.052	0.372	0.372	1.780	0.711	0.711	NA	NA
SS141	3.581	3.581	1.600	1.600	0.469	0.663	0.208	0.260	1.079	0.521	0.521	NA	NA
+(mm)	0.000	0.000	0.025	0.025	0.001	0.003	0.001	0.001	0.002	0.013	0.013		
-(mm)	-0.025	-0.025	-0.025	-0.025	-0.001	-0.003	-0.001	-0.001	-0.002	-0.013	-0.013		



INVERTED MESA DIMENSIONS (mils)

TYPE	X	Z	MX	MZ	ma	mb	mc	md	me	tx	tz	mR	arcS
CL200	190.00	200.00	120.00	120.00	40.00	30.00	87.20	NA	NA	NA	NA	NA	51.68
CM200	190.00	200.00	100.00	100.00	50.00	40.00	87.20	NA	NA	NA	NA	NA	51.68
CM220	210.00	220.00	120.00	120.00	40.00	30.00	91.65	NA	NA	NA	NA	NA	49.24
RM098	72.00	98.00	62.00	62.00	NA	NA	NA	NA	NA	5.00	18.00	NA	NA
RM126	126.00	71.65	61.00	59.00	18.18	23.62	14.54	NA	NA	38.50	6.34	29.49	233.62
RM138	150.00	100.00	90.00	90.00	76.82	13.18	26.36	37.28	13.18	30.00	5.00	29.49	233.62
RM196	196.00	94.00	100.00	74.00	19.00	55.88	22.00	17.00	40.00	48.00	10.00	42.00	123.52
RR196	94.00	196.00	74.00	100.00	NA	NA	NA	NA	NA	10.00	48.00	NA	NA
RS150	150.00	100.00	63.00	63.00	18.45	26.10	8.20	10.25	42.50	43.50	18.50	NA	NA
RS196	196.00	94.00	63.00	63.00	18.45	26.10	8.20	10.25	42.50	66.50	15.50	NA	NA
RX150	150.00	100.00	90.00	90.00	76.82	13.18	26.36	37.28	13.18	30.00	5.00	NA	NA
RX196	196.00	94.00	100.00	84.00	22.88	53.81	22.00	20.00	44.00	48.00	5.00	42.00	114.23
RZ126	72.00	126.00	62.00	62.00	18.00	5.00	25.00	108.00	NA	5.00	32.00	NA	NA
RZ150	100.00	150.00	90.00	90.00	76.82	13.18	26.36	37.28	13.18	5.00	30.00	NA	NA
SB141	141.00	141.00	90.00	90.00	26.36	37.28	13.19	13.19	63.06	18.45	18.45	NA	NA
SM141	141.00	141.00	100.00	100.00	29.29	41.42	14.65	14.65	70.07	20.50	20.50	NA	NA
SM156	156.00	156.00	100.00	100.00	29.29	41.42	14.65	14.65	70.07	28.00	28.00	NA	NA
SS141	141.00	141.00	63.00	63.00	18.45	26.10	8.20	10.25	42.50	20.50	20.50	NA	NA
+(mils)	0.00	0.00	1.00	1.00	0.05	0.10	0.05	0.05	0.08	0.50	0.50		
-(mils)	-1.00	-1.00	-1.00	-1.00	-0.05	-0.10	-0.05	-0.05	-0.08	-0.50	-0.50		

The CM200 series of round inverted Mesa blanks fit mount in standard 0.200" mounts. These high performance mesas exhibit excellent uniformity, enabling stable operation and low spurs.

This family has benefited from XECO processing improvements and is now supplied to frequencies with tighter frequency tolerance.

For lower cost with comparable performance, XECO recommends the SM141 series, which is supplied as blank or with electrodes, and which can be processed to higher frequencies.

Features

Round Blank design for standard round holders
XECO high quality crystals enable low spur operation with proper electrode design
High Q, chemically etched, free of etch channels

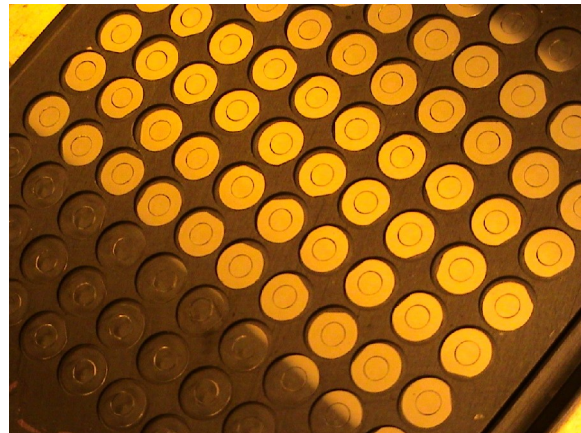
Benefits:

Excellent oscillator and filter performance
Fit standard mounts for legacy designs
Meet needs of specialized mounts

Applications

Standard 0.200 round mount applications
High performance VCXO, XO, OCXO and specials requiring hybrid design or specialized mountings across Telecom, communications, networking, and military applications

Operation Mode	Fundamental or Overtone
Frequency Range	30 to 330 MHz
Frequency Range 3Rd:	90 to 990 MHz
Frequency Tolerance	+/- 0.010 F ² (489KHz at 156.25)
Material and Q	Low Etch Channel Pure Z Quartz with a Q minimum of 1.8 Million, typical 2.2 to 2.4 Million
Surface Finish	Polished
Angle	Std AT cut 35D8' to 35D29' [EFG 3D6' t
Angle Tolerance	+/- 2' or +/- 1'
Dimensions (mm)	5.508 dia x 0.080 mm
Dimensions (inches)	0.200 diagonal x 0.00315
Electrode Size	
Electrode Style	
Electrode Material	
Electrode Freq. Tol.:	
Contact Material:	
Ship Pack Method	Vacuum sealed wafflepack
Specification Note	Custom or special requirements are available



XECO encourages you to compare cost and performance of the SM141 square with electrodes placed to work with standard round mounts.

For more information: Call 435.586.0507 or email sales@xeco.net

The SM141 series of electrode plated Square inverted Mesa blanks are designed to mount in standard 0.200" mounts, at much lower cost than CM200 round crystals, and offer excellent performance for both filter and oscillator applications.

XECO's proprietary process yields a mesa which is clean and free of defects, enabling high performance operation for oscillators and filters.

XECO plated versions provide cost effective high performance alternatives to in-house plating operations. XECO offers three plating options and a range of electrodes to match performance needs.

Special or custom designs are supported, including multiple-pole filter designs.

Features

XECO high quality low spurs crystals
Electrodes plated to opposite corners
Electrodes in various sizes targeted for frequencies and C1/C0 ratios
Tune Low and Tune High options
High Q, chemically etched, free of etch channels

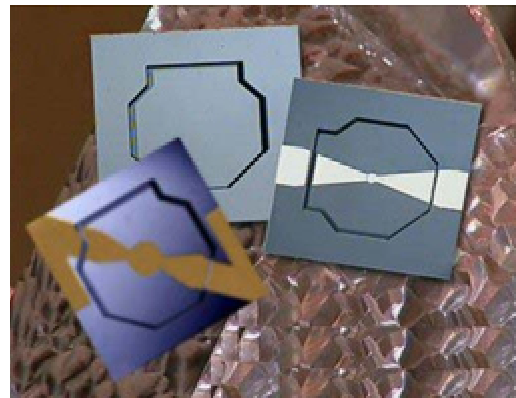
Benefits:

Lower cost implementation than with round blanks
Low spurs for filter (with small electrodes and Aluminum plating)
Fit wide range of mounts
High yield potential

Applications

Standard 0.200 round mount applications
High performance VCXO, XO, OCXO, filters, and specials requiring hybrid design
Telecom, communications, networking, military

Operation Mode	Fundamental or Overtone
Frequency Range	30 to 360 MHz
Frequency Range 3Rd:	90 to 1.08 GHz
Frequency Tolerance	+/- 0.010 F ² (489KHz at 156.25)
Material and Q	Low Etch Channel Pure Z Quartz with a Q minimum of 1.8 Million
Surface Finish	Polished
Angle	Std AT cut 35°8' to 35°29'
Angle Tolerance	+/- 2', +/-1', +/-0.5'
Dimensions (mm)	3.581 x 3.581 x 0.080 mm
Dimensions (inches)	0.141 x 0.141" (0.200 across diagonal) x
Electrode Size	0.125mm to 1.27 mm, 5 mils to 50 mils
Electrode Style	Plated to opposite corners and opposing sides
Electrode Material	Chrome Gold or Aluminum
Electrode Freq. Tol.:	+/- 0.015 F ² (4
Contact Material:	Same as Electrode or Chrome-Gold with Aluminum
Ship Pack Method	Vacuum sealed wafflepack
Specification Note	Custom or special requirements are available



For more information: Call 435.586.0507 or email sales@xeco.net

RM196

Inverted Mesa Crystal Blank

30 - 550MHz 5.0 x 7.0 SMD packages

The RM196 Series fits easily into typical 5.0 x 7.0 mm packages with excellent oscillator and filter performance; essentially a "ruggedized" upgrade from XECO's established RX196, which is more suitable for automatic assembly/mounting equipment, and able to be processed to higher frequencies and higher manufacturing yields, whether manual or automatic assembly is used.

XECO proprietary processes yield a clean mesa and transition area to achieve high performance, and XECO plated versions provide cost effective high performance alternatives to in-house plating operations. XECO offers three plating options and a range of electrodes to match performance needs.

Special or custom designs are supported.

Features

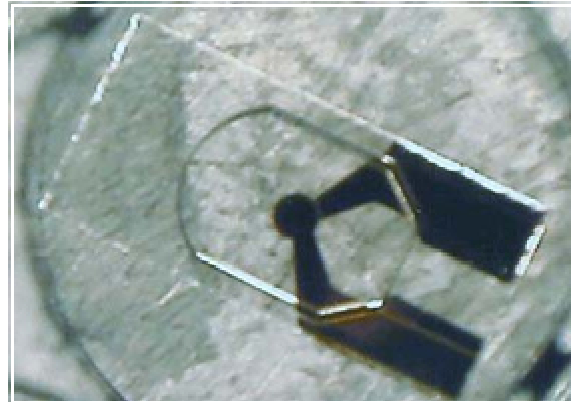
4.98 mm x 2.39 mm size for 5.0 x 7.0 (7.5) mm
High Q, chemically etched, free of etch channels
Mesa oriented across X-Axis
Electrodes in various sizes for specific frequency and C1/C0 ratios
Three metal plating options
Tune Low and Tune High options

Benefits:

High volume product which fit packages and tooling
High performance operation and wide frequency of operation
Cost effective solution

Applications

Crystals for precise frequency control applications in high volume packaging
Customer applications for SONET, 10G, 1G, Storage, network communications



Operation Mode	Fundamental or Overtone
Frequency Range	30 to 550MHz
Frequency Range 3Rd:	90 to 1.650 GHz
Frequency Tolerance	+/- 0.010 F ² (489KHz at 156.25)
Material and Q	Low Etch Channel Pure Z Quartz with a Q minimum of 1.8 Million
Surface Finish	Polished
Angle	Std AT cut 35°8' to 35°29'
Angle Tolerance	+/- 2', +/-1', +/-0.5'
Dimensions (mm)	4.98 x 2.39 mm
Dimensions (inches)	0.196 x 0.094"
Electrode Size	0.125mm to 1.27 mm, 5 mils to 50 mils
Electrode Style	Contacts at same end
Electrode Material	Chrome Gold or Aluminum
Electrode Freq. Tol.:	+/- 0.015 F ² (4
Contact Material:	Same as Electrode or Chrome-Gold with Aluminum
Ship Pack Method	Vacuum sealed wafflepack
Specification Note	Custom or special requirements are available

For more information: Call 435.586.0507 or email sales@xeco.net

Low Cost Inverted Mesa Crystal Blank 50 - 700 MHz for 5 x7 mm SMD & UM-1/HC45

XECO's RM126 series offers 50 to 700 MHz operation (measured in fundamental mode) and is designed to fit in 5x7mm packages and provide a cost effective solution to high volume high frequency production. The RM126 will fit into modified clip UM-1 and HC45 style packages. XECO proprietary processes yield a clean mesa and transition area to achieve high performance, and XECO plating assures accurate electrode placement for maximizing performance at high frequencies.

This series offers standard round electrodes from 5 to 45 mils and special shapes are possible using XECO proprietary plating process which provides excellent alignment accuracy. Standard plating processes for oscillator are chrome-gold, or Aluminum with gold contacts to assure good bond with mounting adhesives, or 100% Aluminum.

These crystals blanks are also supplied with Gold, Aluminum, or Aluminum electrodes with gold flags/contacts. Special or custom designs are supported.

Features

Stable oscillation
3.20 mm x 1.83 mm size for mounting across typical 5 x 7mm package crystal mounts
Various Electrodes sizes for frequency and C1/C0 ratios
Tune Low and Tune High options
High Q, chemically etched, free of etch channels or scratches in the Mesa area
Accurate placement of electrodes

Benefits:

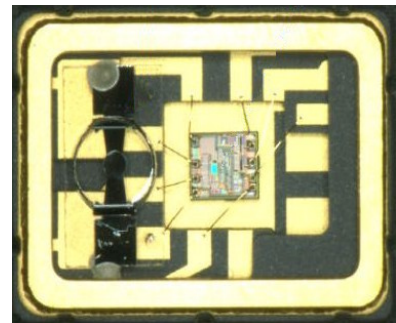
Excellent oscillator performance
Easy conversion to 5x7mm package
High Frequency Operation is available
Lower cost

Applications

Small packaged crystals for precise frequency control applications
Customer applications for SONET, 10G, 1G, Storage, network communications

Operation Mode	Fundamental or Overtone
Frequency Range	50 to 700 MHz
Frequency Range 3Rd:	150 to 2.10 GHz
Frequency Tolerance	+/- 0.010 F ² (489KHz at 156.25)
Material and Q	Low Etch Channel Pure Z Quartz with a Q minimum of 1.8 Million
Surface Finish	Polished
Angle	Std AT cut 35D8' to 35D29' [EFG 3D6' t
Angle Tolerance	+/- 2', +/-1', +/-0.5'
Dimensions (mm)	3.20 x 1.83 x 0.109 mm
Dimensions (inches)	0.126 x 0.071 x 0.00429"
Electrode Size	0.125mm to 1.15 mm, 5 mils to 45 mils
Electrode Style	Contacts at opposite ends or same end
Electrode Material	Chrome Gold or Aluminum
Electrode Freq. Tol.:	+/- 0.015 F ² (4
Contact Material:	Same as Electrode material or Chrome-Gold with Aluminum
Ship Pack Method	Vacuum sealed wafflepack
Specification Note	Custom or special requirements available

*Xeco standard plateback or per customer requirements



For more information: Call 435.586.0507 or email sales@xeco.net

Low Cost Inverted Mesa Crystal Blank 50 - 750 MHz for 5 x7 mm SMD & UM-1/HC45

XECO's RM098 series offer high performance and low cost plated crystals for 5x7 SMD assembly for frequencies ranging from 50 to 750 MHz operation. The RM098 will fit into modified clip UM-1 and HC45 style packages. XECO proprietary processes yield a clean mesa and transition area to achieve high performance, and XECO plating assures accurate electrode placement for maximizing performance at high frequencies.

This series of plated crystal blanks are tested for frequency and ESR in production, and have been characterized for C1, C0, L, and Q values, as well as spurious modes verified to be less than -4dB or -6dB for clock and VCXO applications. Plating process are chrome-gold for lower frequencies and Aluminum with gold contacts for higher frequencies where spurious response and mass loading effects increase. 100% aluminum metal and special element designs for filter and MCF applications is available. Please contact us with your requirements.

Features

Stable oscillation
2.489 mm x 1.829 mm size for mounting across typical 5 x 7mm SMD package or UM1/HC45 mounts
Tune Low and Tune High options
High Q, chemically etched, free of etch channels or scratches in the Mesa area
Accurate placement of electrodes

Benefits:

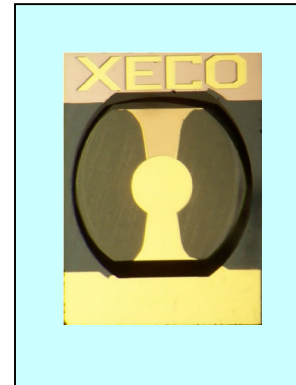
Lowest cost solution
Excellent oscillator performance
Tested Specifications increase yield potential
Optimized for 5x7mm package

Applications

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

Operation Mode	Fundamental or Overtone
Frequency Range	50 to 750 MHz
Frequency Range 3Rd:	150MHz to 2.25GHz
Frequency Tolerance	
Material and Q	Low Etch Channel Pure Z Quartz with a Q minimum of 1.8 Million
Surface Finish	Polished
Angle	Std AT cut 35D8' to 35D29' [EFG 3D6' to 2D45']
Angle Tolerance	+/- 2', +/-1', +/-0.5'
Dimensions (mm)	2.489 x 1.829 x 0.109 mm
Dimensions (inches)	0.098 x 0.072 x 0.00429"
Electrode Size	0.125mm to 1.35 mm, 5 mils to 53 mils
Electrode Style	Contacts at opposite ends
Electrode Material	Chrome Gold or Aluminum
Electrode Freq. Tol.:	+/- 0.015 F ² (4732KHz at 156.25)
Contact Material:	Electrode Chrome-Gold or Aluminum; Contact: Chrome-Gold
Ship Pack Method	Vacuum sealed wafflepack
Specification Note	Custom or special requirements available

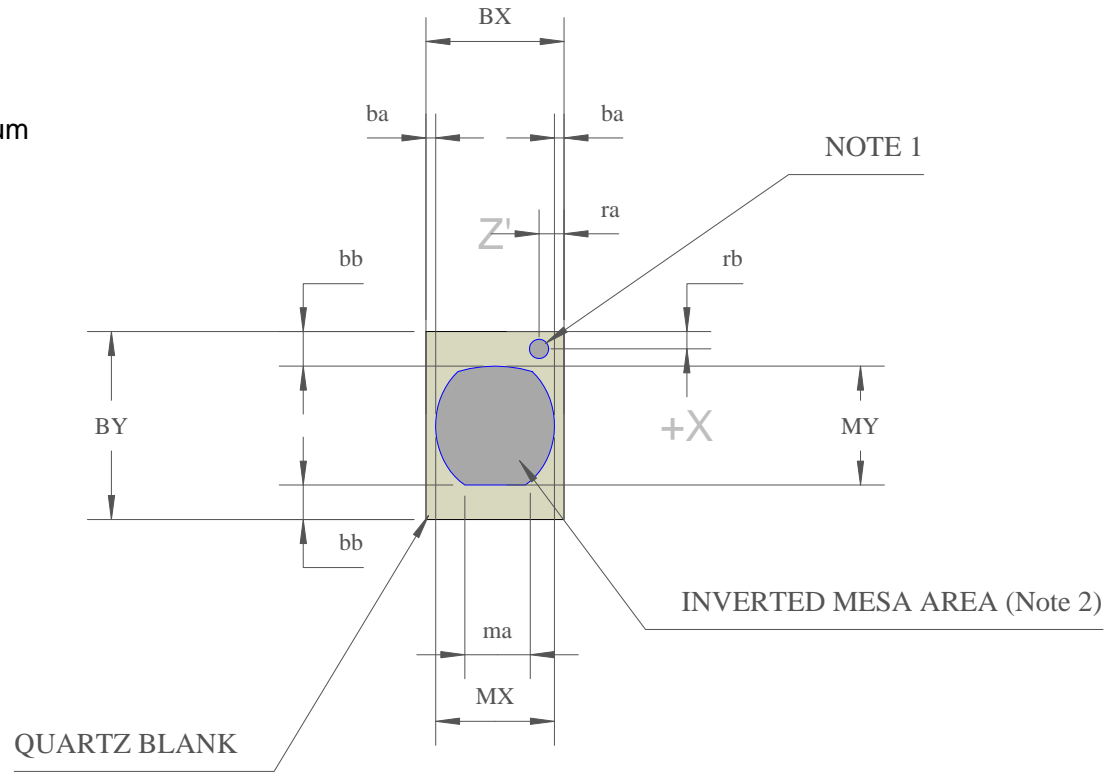
*Xeco standard plateback or per customer requirements



For more information: Call 435.586.0507 or email sales@xeco.net

SUBSTRATE MATERIAL

- pure Z-grown quartz
- "Q" > 1.8 million
- ECD < 5 cm³
- AT cut, 35° xx.x' ± 1.0'
- Polished Surface <25 Å ra
- Thickness: 80 um / 100 um ± 5 um




PHYSICAL DIMENSIONS

Label	nominal	minimum	maximum	units
BX	1.83	1.78	1.88	mm
BY	2.49	2.44	2.54	mm
MX	1.57	1.55	1.60	mm
MY	1.57	1.55	1.60	mm
ba	0.13	0.05	0.20	mm
bb	0.46	0.41	0.51	mm
ma	0.81	0.79	0.84	mm
ra	0.33	0.30	0.36	mm
rb	0.23	0.20	0.25	mm

NOTES:

1. Orientation ID Mark Etched into TOP side only.
2. Mesa Area to be parallel to less than three light bands.
3. Supplemental Specifications - Document No.: QBM-SS



Eng. By:	DN	2006-04-12	 size	RM098 QUARTZ BLANK title	D rev.
Dwg. By:	DN	2006-04-12			
Chk. By:	MS	2006-09-26	drwg no.:	RM098-QBM	
Appr. By:	MS	2006-09-26	part no.:	NA	page of

scale: 10:1