

SPECIFICATION SHEET NO.	S0319 - YQ4M000000S420	
ORIGINAL MFG/PART NO.	TGS Crystals/CCME 4M0A50-20-50-40-150TLH/PMX308	
NEXTGEN PART CODE	YQ4M000000S420	Indicate This Code For RFQ/ Order
DATE	Mar. 19, 2025	
REVISION	A2	Updated With Most Recent Data
DESCRIPTION AND MAIN PARAMETRICS	MHz SMD Crystal 4 pads, YQ series, Glass seal, Plastic Case, Dimension L12.5*W4.6*H3.7mm 4.000000MHz, Tolerance ±50ppm, Load Capacitor 20pF Frequency stability ±50ppm; Operating Temp. Range -40°C ~+85°C, ESR 150ohm Max, Reflow Profile Condition 260 °C Max. Package in Tape/Reel, 1000pcs/Reel RoHS/RoHS III compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863)	
CUSTOMER		
CUSTOMER PART NUMBER		
CROSS REF. PART NUMBER	MA406 & MA506	
MEMO		

VENDOR APPROVE

Issued/Checked/Approved



Effective Date: Mar. 19, 2025

CUSTOMER APPROVE

Date:

MAIN FEATURE

- MHz SMD Crystal L12.5*W4.6*H3.7mm 4 Pads
- Plastic Case, Glass Seal
- Low Profile and Short Lead time
- RoHS/RoHS III Compliant, RoHS Annex III Lead Exemption
(exempt per RoHS EU 2015/863)
- Moist are Sensitivity Level (MSL) Level 1
- Excellent Aging and Wide Frequency Range
- 4 Pad Fit MA406 & MA506 Footprint Surface Mount



*Image shown is a representation only.
Exact specifications should be
obtained from the product dimension.*



APPLICATION

- Microcontroller Systems, Microprocessors, Communication Interfaces
- Digital Signal Processors (DSPs), Test And Measurement Equipment

ELECTRICAL CHARACTERISTICS

- See Page 6 For Different Part Code.
- All Products Parameters are Subject To NextGen Components' Final Confirmation.

HOW TO ORDER

- Please Follow Up Part Code Guide And Indicate NextGen Part Code YQ4M000000S420 For RFQ and Order.

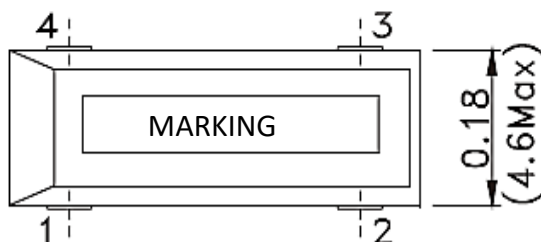
PART CODE GUIDE

RFQ
[Request For Quotation](#)

CODE	NAME	KEY SPECIFICATION OPTION
YQ	Series Code	MHz SMD Crystal Plastic Case, Glass Seal, 4 Pads Case Dimension L12.5*W4.6*H3.7mm
4M0	Frequency Range Code	4M0: 4.000000MHz
00000S420	Internal Control Code	Letter A~Z, a~z or digits (0~9)
XX	Special/Custom Parameters Code	Blank: N/A XX: Letter A~Z, a~z or digits (0~9) for Special/Custom Parameters

DIMENSION - Unit: Inch/mm

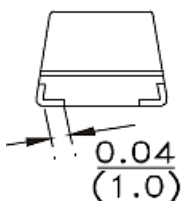
Top View



Side View



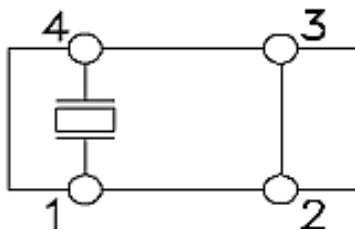
Side View



Note:

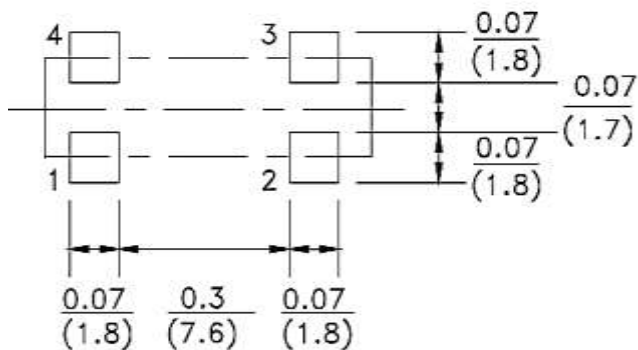
- Metal (Crystal inside) may be exposed on the top or bottom of plastic case. That will not be affect performance and reliability of the part in question.

Electrode Arrangement



Connection: 1# Crystal; 2# Ground; 3# Ground; 4# Crystal

Solder Pattern (Unit: inch/mm)



GENERAL SPECIFICATION

PARAMETER	SYMBOL	VALUE			UNIT	CONDITION
		MIN.	TYPE	MAX.		
Mode of Vibration Code		Fundamental				Optional: 3rd OT Or 5th OT
Frequency Tolerance	△F/F0		±50		ppm	at 25°C±3°C
Load Capacitance	CL	16	18	20	pF	
Frequency Stability	Tc		±50		ppm	
Operating Temp. Range	TOPR	-40	-	+85	°C	Standard
Storage Temp. Range	TSTG	-55	-	+125	°C	
Drive Level	DL	-	100	200	μW	
Insulation Resistance	IR	500	-		mΩ	At 100VDC
Shunt Capacitance	C0	-	-	5.0	pF	
Aging per year	Fa	-5	-	+5	ppm	1st Year

ELECTRICAL PARAMETERS – FOR DIFFERENT PART CODE- Ta = 25°C

PART CODE	FREQUENCY RANGE	FREQUENCY TOLERANCE	LOAD CAPACITANCE	FREQUENCY STABILITY	OPERATING TEMPE. RANGE	EQUIVALENT SERIES RESISTANCE
	MHz	ppm	pF	ppm	°C	Ω Max.
YQ3M579545S418	3.579545	±50	18	±50	-40 ~ +85	150
YQ3M686400S418	3.686400	±50	18	±50	-40 ~ +85	150
YQ3M686400S420	3.686400	±50	20	±50	-40 ~ +85	150
YQ4M000000S416	4.000000	±50	16	±50	-40 ~ +85	150
YQ4M000000S418	4.000000	±50	18	±50	-40 ~ +85	150
YQ4M000000S420	4.000000	±50	20	±50	-40 ~ +85	150
YQ4M915200S416	4.915200	±50	16	±50	-40 ~ +85	150
YQ4M915200S418	4.915200	±50	18	±50	-40 ~ +85	150
YQ6M144000S418	6.144000	±50	18	±50	-40 ~ +85	100

TEST STANDARD

1. General Electrical Characteristics And Visual Testing

1.1 Lot classification : if the quantity is 1000 PCS or more, 1000 PCS is one lot

1.2 Sampling test method : MII-STD-105E G-II

1.3 Test level

A) High level defect : AQL 0.065% [200 pcs]

B) Medium level defect : AQL 0.25% [50 pcs]

C) Low level defect : AQL 0.4% [32 pcs]

1.4 Defect classification

A) High level

@No frequency

@Mixing

@Leak defect

B) Medium level - Electrical characteristic defect

@Frequency

@Oscillation

@Electrical current

@Other electrical characteristics defect

C) Visual

@Marking

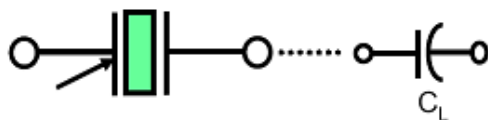
@Welding

@Leads

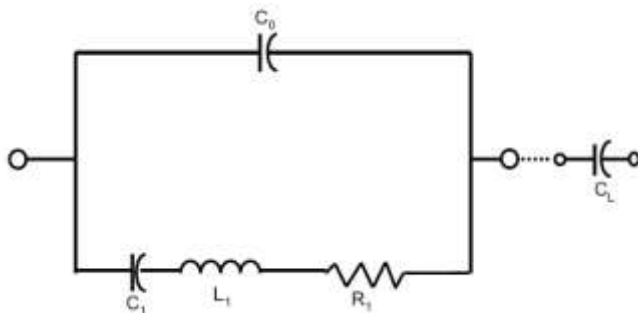
@Other visual defect

Testing method and its standard can be modified depending on the customer's request.

2. Equivalent Circuits



Symbol for crystal unit



CHARACTERISTICS

Units and values indicated with { } in this specification are the former units and the specified values.

Standard Atmospheric Conditions:

Unless otherwise specified the standard range of atmospheric conditions for making measurements and tests is as follows:

Ambient temperature: 15°C to 35°C

Relative humidity : 25% to 85%

Air pressure : 86 to 106 k Pa

If there is any doubt about the results measurements shall be made within the following limits:

Ambient temperature : $25 \pm 1^\circ\text{C}$

Relative humidity : 63% to 67%

Air pressure : 86 to 106 k Pa

Operating Temperature Range:

The operating temperature range is the range of ambient temperatures at which the quartz crystal oscillator can be stored without damage. Conditions are as specified elsewhere on these specifications.

Operating temperature range: -40°C to +85°C

Storage Temperature Range:

The storage temperature range is the range of ambient temperatures at which the quartz crystal oscillator can be stored without damage. Conditions are as specified elsewhere on these specifications.

Storage temperature range: -55°C to +125°C

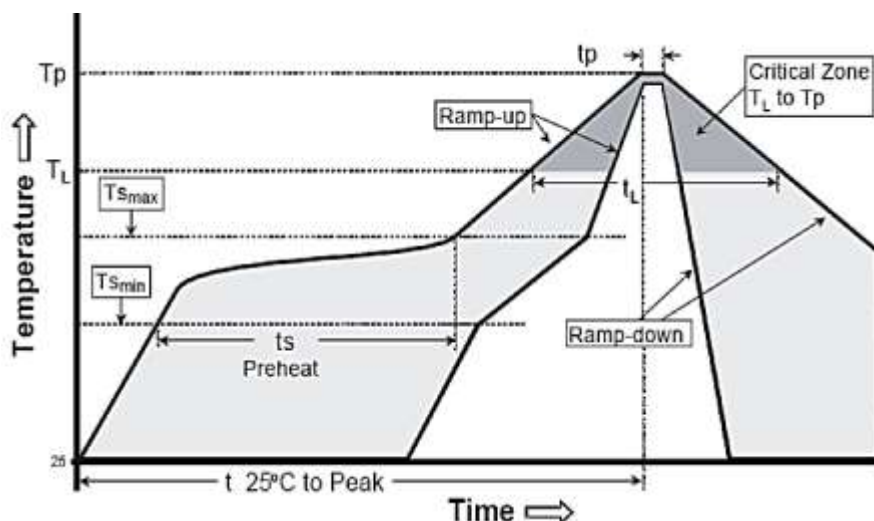
RELIABILITY - MECHANICAL AND ENVIRONMENTAL ENDURANCE

TEST ITEMS	TEST METHOD AND CONDITIONS	REQUIREMENTS
Vibration	a) Vibration Frequency: 10 To 55hz b) Vibration Amplitude: 1.5mm c) Cycle Time: 1~2min(10-55-10hz) d) Direction: X.Y.Z e) Duration: 2h/Each Direction, total 6Hours f) G-force: $\geq 5G$	Frequency change: $\pm 10\text{ppm max.}$ Resistance change: $\pm 15\%r_{\text{rmax}}$
Shock	3 times free drop from 75cm height to hard wooden board of thickness more than 30mm.	Frequency change: $\pm 10\text{ppm max.}$ Resistance change: $\pm 15\%r_{\text{rmax}}$
Leakage	Put crystal units into a hermetic container and helium for 0.5-0.6.Mpa, and keep it for 1h; Check the leakage by a helium leak detector.	Leakage: $1 \times 10^{-8} \text{mbar.L/s}$ Max
Solderability	a) Dip the leads into flux(Rojin methanol) for 3~5s. b) Dip the leads into $245 \pm 5^{\circ}\text{C}$ 99% SN dipping solution for 5s	The dipped part of the Leads should have 95% SN coating.
Soldering Heat Resistance Test	a) Perform electrical characteristics test before starting this procedure. b) Dip the leads into flux(Rojin methanol) $5 \pm 0.5\text{s}$. c) Dip the leads into $260 \pm 5^{\circ}\text{C}$ 99% SN dipping solution for 5s. d) Take the unit out ,store at room temperature for 30s then measure the Electrical characteristics.	Should pass sealing and visual test. Frequency change: $\pm 10\text{ppm max.}$
Leak Test	Use helium leak detector. Bombing pressure: 5kg/cm^2 Bombing time: 2 hours Leak should be less than $1\text{e-}8 \text{ atm.cc/sec.}$	Gas or air should not be detected.
High Temperature Endurance	The crystal units shall be put in somewhere for 500 hours at temperature of $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$, then keep it for 1 to 2 hours under room temperature.	Frequency change: $\pm 10\text{ppm max.}$ Resistance change: $\pm 15\%r_{\text{rmax}}$

RELIABILITY - MECHANICAL AND ENVIRONMENTAL ENDURANCE

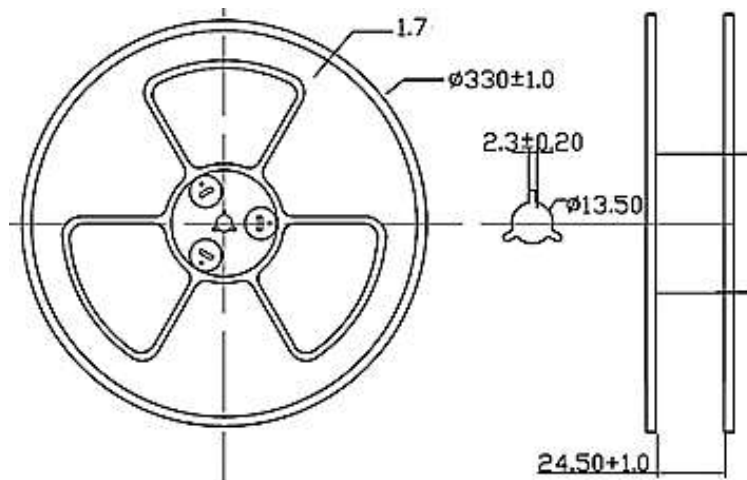
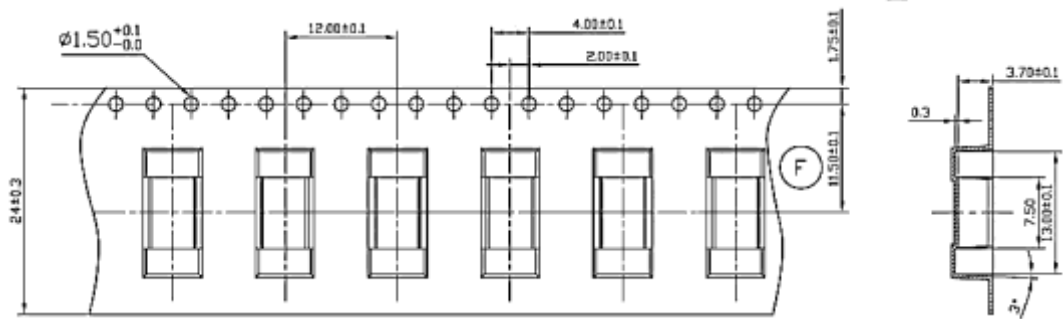
TEST ITEMS	TEST METHOD AND CONDITIONS	REQUIREMENTS
Low Temperature Endurance	The crystal units shall be put in somewhere for 500 hours at temperature of -40°C, then keep it for 1 to 2 hours under room	Frequency change: ±10ppm max. Resistance change: ± 15%rrmax
Humidity Endurance	Somewhere at 40°C±5°C in relative humidity of 90%~95% for 72 hours, then keep it for one or two hours under room temperature	Frequency change: ± 10ppm max. Resistance change: ± 15%rrmax
Temperature Cycle	Temperature shift from low(-40°C) to high(100°C,keep 30 minutes),satisfy high(100°C) to low(-40°C, keep 30 minutes), then go up to room temperature for 10 cycles	Frequency change: ± 10ppm max. Resistance change: ± 15%rrmax
Lead Tensity	a) Fix the unit. b) Apply 2LB of weight axis to the leads. c) Time: 5s	Should pass sealing and visual test.
Lead Bending	a) Attach 1lb of weight to each of the leads. b) Bending angle: 90° (from the normal position to 45° opposite direction) c) Bending time: 3s(each direction) Number of bending: 2times a) Number of bending: 2times	Should pass sealing and visual test.
Marking Erase	Submerge the unit into ipa [isopropyl alcohol] Solution for 10minutes and brush the marking 10 times with a tooth brush.	Marking should not be erased.

SUGGESTED REFLOW PROFILE - FOR REFERENCE ONLY



PROFILE FEATURE		HIGH-PB ASSEMBLY
Average Ramp-up Rate (Ts Max to Tp)		3°C/second Max
Preheat	Temperature Min (Ts Min.)	140°C
	Temperature Max (Ts Max.)	180°C
	Time (ts Min. to ts Max.)	70 ~ 100 seconds
Time maintained above	Temperature (Tl)	240°C
	Time (tl)	20 ~ 50 seconds
Peak/Classification Temperature (Tp)		260 °C
Time within 5°C of actual Peak Temperature (tp)		5 ~ 6 seconds
Ramp-down rate		6 °C /Second Max.
Time 25 °C to Peak Temperature		6 minutes Max.

TAPE AND REEL - Unit: mm, 1000pcs/Reel



IMPORTANT NOTES AND DISCLAIMER

1. **ROHS COMPLIANCE:** The levels of RoHS restricted materials in this product are below the maximum concentration values (also referred to as the threshold limits) permitted for such substances, or are used in an exempted application, in accordance with EU RoHS Directive (EU) 2015/863 EC (RoHS3). RoHS Test Report for this product can be obtained at Download Center.
2. **REACH COMPLIANCE:** REACH substances of high concern (SVHCs) information is available for this product. Since the European Chemical Agency (ECHA) has published notice of their intent to frequently revise the SVHC listing for the foreseeable future, REACH Test Report for this product can be obtained at Download Center.
3. All Product parametric performance is indicated in the Electrical Characteristics for the listed herein test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
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