

### **SPECIFICATION SHEET**

SPECIFICATION SHEET NO.	Q0123- YG18M43200S418
DATE	Jan. 23, 2023
REVISION	AO
DESCRIPITION	MHz Plastic SMD Crystals, L8.0*W3.8*H2.5mm, 4 Pads, CCMD series  18.432MHz, Tolerance +/-20ppm, Load Capacitor 18pF, Frequency stability +/-30ppm @Operating Temp. Range -40°C ~+85°C, ESR 80 ohm Max, Reflow Profile Condition 260 °C Max.  Tape/Reel, 3000pcs/Reel RoHS/RoHS III compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863)
CUSTOMER	
CUSTOMER PART NUMBER	
CROSS REF. PART NUMBER	
ORIGINAL PART NUMBER	TGS CCMD 18M432A20-18-30-40-80TLH
PART CODE	YG18M43200S418

#### **VENDOR APPROVE**

Issued/Checked/Approved







DATE: Jan. 23, 2023

CUSTOMER APPROVE		

DATE:

1/23/2023



### MHZ PLASTIC SMD CRYSTALS 8038 TYPE CCMD SERIES

#### **MAIN FEATURE**

- SMD Package, 8038 Type, L8.0\*W3.8\*H2.5mm, 4 Pads
- Low cost and short lead time
- · Industry standard
- Reflow Profile Condition 260 °C Max.
- Cross more competitors part
- RoHS/RoHS III compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863)

#### **APPLICATION**

- Clock source for Portable
- Microcomputer & Automotive Equipment with Low power consumption

#### **PART CODE GUIDE**



YG	18M43200	18M43200 S	
1	2	3	4

- 1) YG: Part family Code for MHz Plastic SMD Crystals, L8.0\*W3.8\*H2.5mm, 4 Pads, CCMD series
- 2) 18M43200: Frequency range code for 18.432MHz
- 3) S: SMD type, Package Tape/Reel, 3000pcs/Reel
- 4) 418: Specification code for original part No.: TGS CCMD 18M432A20-18-30-40-80TLH

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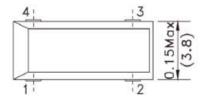
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### **DIMENSION (Unit: Inch/mm)**

#### Image for reference

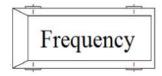


#### **CCMD**

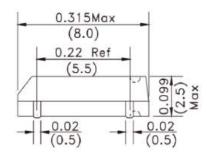


### Marking

Frequency Range



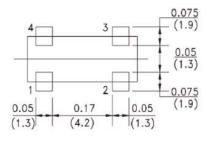
# 0.035 Ref (0.9)

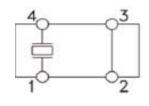


#### Note:

- Do not connect pad 2 and Pad 3 to external devices.
- Metal inside may be exposed on the top or bottom of plastic case
- It isn't Quality problem. This will not affect any quality, reliability and electrical specification when used

#### **Recommend Pad Layout**





#### Pin Function

#1 Crystal

#2 Ground

#3 Ground

#4 Crystal

3



# MHZ PLASTIC SMD CRYSTALS 8038 TYPE CCMD SERIES

#### **ELECTRICAL PARAMETERS**

Parameter Part No. Un Symbol		Units	Value			Condition	
				Min.	Typical	Max.	
Original	Manufacturer	TGS		TGS (	Crystals		
Holder T	·уре	CCMD	MHz SMD Ci	ystal, Plastic	case, L8.0*W3.8	3*H2.5mm	
Frequen	cy Range	18M432	MHz		18.432		
Mode of	Oscillation	А			AT Fundamenta	nl	
Frequen	cy Tolerance	20	ppm	-20		+20	@25°C
Load Ca	pacitance	-18	pF		18	•	
Stability Operation	over on Temperance	-30	ppm	-30		+30	
Operation	on Temperance	-40	°C	-40		+85	
Storage	Temperance		°C	-55		+125	
Equivale Resistan	ent Series ce (ESR)	-80	Ω			80	
Drive Le	vel		μW			100	
Shunt Ca	apacitance (CO)		pF	0		7.0	
Motiona (C1)	Il Capacitance		fF	N/A			
DLD2			Ω	N/A			
FLD2			ppm	N/A			
RDL2			Ω	N/A			
SPDB			dB	N/A			
Aging			ppm/year			±5	@1 <sup>st</sup> year
Insulatio	on Resistance		МΩ	500			@100Vpc ± 15Vpc
	Package	Т	Tape/Reel				
Others	RoHS Status	LH	RoHS III compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863				
	Add Value		N/A				
	Code *			Internal Co	ntrol or N/A		

Note: 1) Original Part Number: TGS CCMD 18M432A20-18-30-40-80TLH

2) \* Internal Control Code- 2 letter or digits; Blank: N/A

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### MHZ PLASTIC SMD CRYSTALS 8038 TYPE CCMD SERIES

#### **TEST STANDARD**

#### **General Electrical Characteristics And Visual testing**

1. LOT CLASSIFICATION: If The Quantity Is 1000 PCS Or More, 1000 PCS Is One Lot

2. Sampling Test Method: Mil-std-105e G-ii

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]

4. Defect Classification:

A) High Level: @No Frequency; @Mixing; @Leak Defect

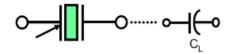
B) Medium Level - Electrical Characteristic Defect:

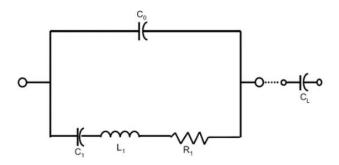
@Frequency; @Oscillation; @Electrical Current; @Other Electrical Characteristics Defect

C) Visual: @Marking; @Welding; @Leads; @Other Visual Defect

Testing Method And Its Standard Can Be Modified Depending On The Customer's Request

#### **EQUIVALENT CIRCUITS**





Symbol for crystal unit



# MHZ PLASTIC SMD CRYSTALS 8038 TYPE CCMD SERIES

#### **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±1°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:  $-55^{\circ}$ C to  $+125^{\circ}$ C



### MHZ PLASTIC SMD CRYSTALS 8038 TYPE CCMD SERIES

#### **CAUTION**

\* In Order To Maintain Quality. Without Change In Characteristics Of The crystal Units. Please Follow Below Recommendation

#### Shock

All Crystal Units Have A Thin Crystal Blanks Within If It Is Dropped Above The Recommended Dropping Height (500mm) The Specific Characteristics And Appearance Can Be Changed Please Pay Special Attention To External Shock

#### **Environmental**

- 1) Crystal Units' Frequency Can Be Changed Due To Surrounding Temperature If It Is Stored Next To A High Temperature Heter (Above+85'c) Or Below 40'c.And A Strong Light Source For Long Period Of Time. The Electrical Characteristics Can Be Changed It Is Suggested That These Environment Be Avoided 2) If The Unit Is Placed In A Humid Environment. Lead Terminal Can Be Damaged: Therefore. Do Not Store The Crystal Units In A Humid Environment
- 3) Crystal unit Has Vibrating Characteristics If It Is Placed Where Vibration Exists The Operating Characteristics Can Be Altered; Therefore This Environment Should Be Avoided

#### Leads

1) After Soldering Crystal Units Into A PCB Impacting The Unit From The top, bottom Left Or Right Side Of The Unit Can Shatter The Glass Portion Of The Base Aendering The Unit Useless

#### **Assembly Method**

- 1) Correct Ultrasonic Frequency For Cleaning Should Be Less Than 20khz
- 2) SOLDERING SHOULD BE BONE USING IEC 61760-1 OR Pb-free Products

#### **Storage**

5.5.1 If The Crystal Units Are Stored In Humid Or Salty Environment Appearance Can Be Changed And Solderability Can Deteriorate; Therefore avoid Storing In Such Environment Do Not Store The Crystal Unit More Than 3 Months



# MHZ PLASTIC SMD CRYSTALS 8038 TYPE CCMD SERIES

### RELIABILITY (MECHANICAL AND ENVIRONMENTAL ENDURANCE)

TEST ITEMS	TEST METHOD AND CONDITIONS	REQUIREMENTS
Vibration	Vibration (1) Vibration Frequency: 10 To 55hz	
	(2) Vibration Amplitude: 1.5mm	±10ppm Max.
	(3) Cycle Time: 1~2min(10-55-10hz)	
	(4) Direction: X.Y.Z	± 15% RRMax
	(5) Duration: 2h/Each Direction	
	(6) G-force: ≥5g	
SHOCK	3 Times Free Drop From 75cm Height To Hard Wooden	Frequency Change:
	Board Of Thickness More Than 30mm.	±10ppm Max.
		Resistance Change:
		± 15% RRMax.
LEAKAGE	Put Crystal Units Into A Hermetic Container And Helium	Leakage:1x10 <sup>-</sup> 8mbar.L/S
	For 0.5-0.6. MPA and Keep It For 1h;check The Leakage	Max.
	By A Helium Leak Detector.	
SOLDERABILITY	(1) Dip The Leads Into Flu X (ROJIN Methanol) For 3~5s.	The Dipped Part Of The
(2) Dip The Leads Into 245±5°C 99% Sn Dipping Solution		Leads Should Have
For 5s.		95% SN Coating.
SOLDERING HEAT	(1) Perform Electrical Characteristics Test Before Starting	Should Pass Sealing
RESISISTANCE TEST	This Procedure.	And Visual Test.
	(2) Dip The Leads Into Flux(rojin Methanol) 5±0.5s.	Frequency Change:
	(3) Dip The Leads Into 260±5°C 99% Sn Dipping Solution	
	For 5s.	
	(4) Take The Unit Out ,Store At Room Temper For 30s	
	Then Measure The Electrical Characteristics.	
LEAK TEST	Use Helium Leak Detector.	Gas Or Air Should Not
	Bombing Pressure:5kg/Cm <sup>2</sup>	Be Detected.
	Bombing Time: 2 Hours	
	Leak Should Be Less Than 1e-8 Atm. Cc/Sec.	



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### RELIABILITY(MECHANICAL AND ENVIRONMENTAL ENDURANCE)

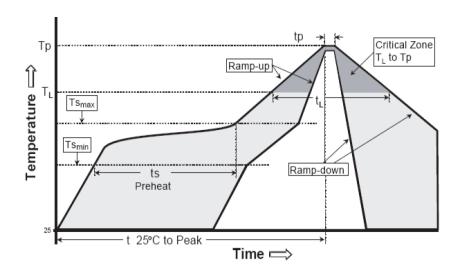
Test Items	Test Method And Conditions	Requirements
HIGH TEMPERATURE ENDURANCE	The Crystal Units Shall Be Put In  Somewhere For 500 Hours At Temperature Of	Frequency Change: ±10ppm Max.
	125°C ±5°C ,Then Keep It For 1 To 2 Hours Under Room Temperature.	Resistance Change: ± 15%rrmax.
LOW TEMPERATURE ENDURANCE	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 TENSILTY	<ul><li>(1) Fix The Unit.</li><li>(2) Apply 2lb Of Weight Axis To The Leads.</li><li>(3) Time:5s</li></ul>	Should Pass Sealing And Visual Test.
LEAD BENDING	<ul> <li>(1) Attach 1lb Of Weight To Each Of The Leads.</li> <li>(2) Bending Angle:90°(from The Nomal Position To</li> <li>45°oppostte Direction)</li> <li>(3) Bending Time:3s(each Direction) Number Of</li> <li>Bending:2times</li> <li>(4) Number Of Bending:2times</li> </ul>	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.



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### **SUGGESTED REFLOW PROFILE (For Reference Only)**

Total time: 200 Sec. Max. Solder melting point: 220°C



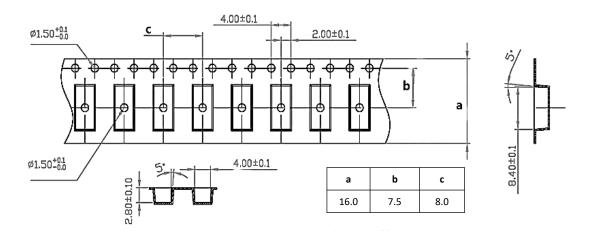
Profile Feature		Pb-Free Assembly	
Average Ramp-up Rate (Ts Max to Tp)		3°C/second Max	
Preheat Temperature Min (Ts Min.)		125°C	
	Temperature Max (Ts Max.)	200°C	
	Time (ts Min. to ts Max.)	60 ~ 180 seconds	
Time maintained above	Temperature (TL)	217°C	
45010	Time (tL)	60 ~ 150 seconds	
Peak/Classification Temperature (Tp)		260 °C	
Time within 5°C of actual Peak Temperature (tp)		20 ~ 40 seconds	
Ramp-down rate		6 °C /Second Max.	
Time 25 °C to Peak Temperature		8 minutes Max.	
Suggest reflow times		3 Times Max.	

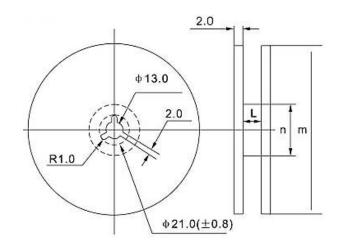
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### MHZ PLASTIC SMD CRYSTALS 8038 TYPE CCMD SERIES

#### TAPE/REEL (Unit: mm)

All Devices are packed in accordance with EIA standard RS-481-2 and specifications, 3000pcs/Reel





Pieces per reel	ф m	Фп	L	Carrier tape size
3000/reel	330±3	80min	17.5	16

#### **DISCLAIMER**

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