

SPECIFICATION SHEET

SPECIFICATION SHEET NO.	Q0125- YG27M12000S420
DATE	Jan. 25, 2023
REVISION	A0
DESCRIPITION	MHz Plastic SMD Crystals, L8.0*W3.8*H2.5mm, 4 Pads, CCMD series
	27.12000MHz, Tolerance +/-20ppm, Load Capacitor 20pF,
	Frequency stability +/-30ppm @Operating Temp. Range -40°C ~+85°C,
	ESR 60 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 27M12A20-20-30-40-60TLH
PART CODE	YG27M12000S420

VENDOR APPROVE

Issued/Checked/Approved







DATE: Jan. 25, 2023

CUSTOMER APPROVE	
DATE:	

1/25/2023



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	27M12000	S	420
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) 27M12000: Frequency range code for 27.120000MHz
- 3) S: SMD type, Package Tape/Reel, 3000pcs/Reel
- 4) 420: Specification code for original part No.: TGS CCMD 27M12A20-20-30-40-60TLH

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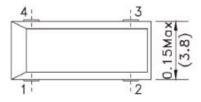
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DIMENSION (Unit: Inch/mm)

Image for reference

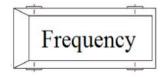


CCMD

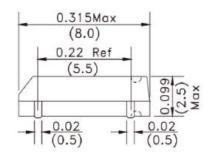


Marking

Frequency Range



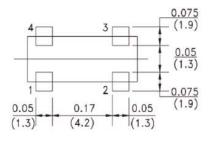
0.035 Ref (0.9)

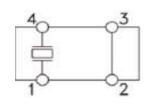


Note:

- 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

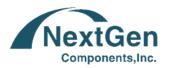
#1 Crystal

#2 Ground

#3 Ground

#4 Crystal

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ELECTRICAL PARAMETERS

Paramet	ter	Part No. Symbol	Units	Value		Condition	
				Min.	Typical	Max.	
Original	Manufacturer	TGS		TGS C	Crystals		
Holder T	⁻ уре	CCMD	MHz SMD Ci	rystal, Plastic	case, L8.0*W3.8	3*H2.5mm	
Frequen	cy Range	27M12	MHz		27.1200		
Mode of	f Oscillation	А			AT Fundamenta	ıl	
Frequen	cy Tolerance	20	ppm	-20		+20	@25°C
Load Ca _l	pacitance	-20	pF		20	•	
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 ice (ESR)	-60	Ω			60	
Drive Le	Orive Level		μW			100	
Shunt Ca	apacitance (CO)		pF	0 7.0		7.0	
Motiona (C1)	al 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 st year
Insulatio	on Resistance		МΩ	500			@100VDC ± 15VDC
	Package	Т	Tape/Reel				
Others	RoHS Status	LH		compliant, RoHS Annex III lead Exemption (exempt per RoHS EU 2015/863 N/A			
2	Add Value						
	Code *		Internal Control or N/A				

Note: 1) Original Part Number: TGS CCMD 27M12A20-20-30-40-60TLH

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

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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

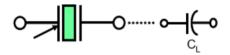
B) Medium Level - Electrical Characteristic Defect:

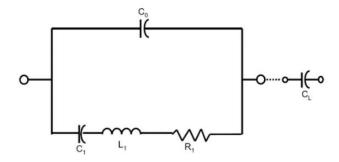
@Frequency; @Oscillation; @Electrical Current; @Other Electrical Characteristics Defect

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



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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°C to +125°C



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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

- 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
 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



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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		
	(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 ⁻ 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 Solutio		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	±10ppm Max.	
	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 ²		
	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 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		
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	(1) Fix The Unit.(2) Apply 2lb Of Weight Axis To The Leads.(3) Time:5s	Should Pass Sealing And Visual Test.	
LEAD BENDING	 (1) Attach 1lb Of Weight To Each Of The Leads. (2) Bending Angle:90°(from The Nomal Position To 45°oppostte Direction) (3) Bending Time:3s(each Direction) Number Of Bending:2times (4) 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.	

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SUGGESTED REFLOW PROFILE (For Reference Only)

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



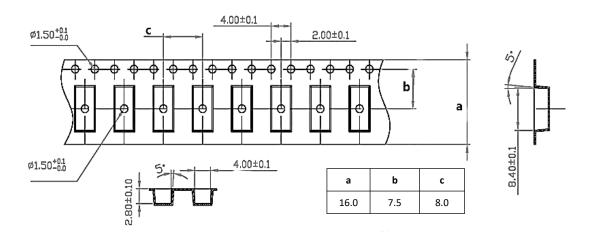
Profile Feature Average Ramp-up Rate (Ts Max to Tp) Preheat Temperature Min (Ts Min.) Temperature Max (Ts Max.) Time (ts Min. to ts Max.)		Pb-Free Assembly	
		3°C/second Max	
		125°C	
		200°C	
		60 ~ 180 seconds	
Time maintained above	Temperature (TL)	217°C	
45010	Time (tL)	60 ~ 150 seconds	
Peak/Classification 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.	

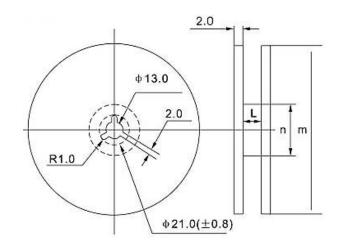
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TAPE/REEL (Unit: mm)

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





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

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