




SPECIFICATION SHEET

SPECIFICATION SHEET NO.	N0208-CD2M000000S001
DATE	Feb. 08, 2021
REVISION	A0
DESCRIPTION	<p>Thru-Hole Ceramic Resonator, L9.5*W4.0*H5.5mm, 3 Pins Lead: 13.5mm 2.00000MHz, Built-in Capacitance, CRTWS Series</p> <p>Frequency Accuracy +/-0.5%, Operating Temp. Range -25°C ~+85°C</p> <p>RoHS/RoHS III compliant, Packed in AMNO-Pack, 2000pcs/Tape, 1 Tape/Box</p>
CUSTOMER	
CUSTOMER PART NUMBER	
CROSS REF. PART NUMBER	
ORIGINAL PART NUMBER	TGS CRTWS 2.0MG TLF
PART CODE	CD2M000000S001

VENDOR APPROVE			
Issued/Checked/Approved			
DATE: Feb. 08, 2021			

CUSTOMER APPROVE	
DATE:	

MHZ THRU-HOLE CERAMIC RESONATOR CRTWS SERIES

MAIN FEATURE

- MHz Thru-Hole Ceramic Resonator, L9.5*W4.0*H5.5mm, 3 pins
- Low cost, Built-in load capacitance type.
- Cross more competitors part
- RoHS/RoHS III compliant



APPLICATION

- Measurement Instrument
- Communication Electronics

PART CODE GUIDE

RFQ
Request For Quotation

CD	2M000000	S	001
1	2	3	4

- 1) CD: Part family Code for MHz Thru-Hole Ceramic Resonator, L9.5*W4.0*H5.5mm, 3 Pins , CRTWS series
- 2) 2M000000: Frequency range code for 2.00000MHz
- 3) S: Packed in AMNO-Pack, 2000pcs/Tape, 1 Tape/Box
- 4) 001 Specification code for original Part No. **TGS CRTWS 2.0MG TLF**

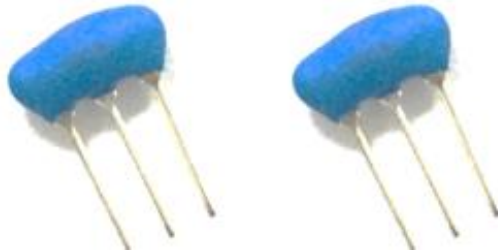
MORE FREQUENCY RANGE AVAILABLE (MHz)

2.000	4.000	6.00							

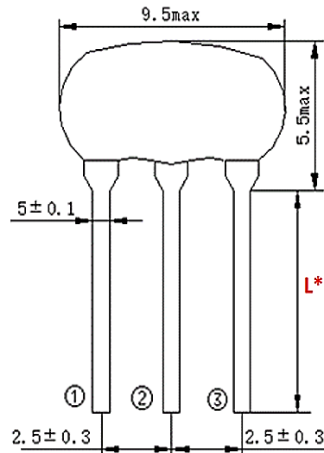
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DIMENSION (Unit: mm, Tol. +/-0.15mm)

Image for reference



CRTWS



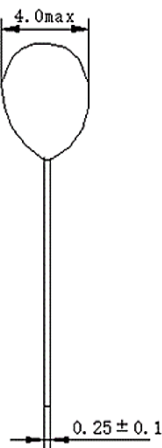
Marking

Line 1: Frequency Range + QC Code/stamp

L: 13.5 Max.

Connection

① Input ② Ground ③ Output



MHZ THRU-HOLE CERAMIC RESONATOR CRTWS SERIES

ELECTRICAL PARAMETERS

Parameter	Part No. Symbol	Units	Value			Condition
			Min.	Typical	Max.	
Original Manufacturer	TGS	TGS Crystals				
Holder Type	CRTWS	MHz Thru-Hole Ceramic Resonator L9.5*W4.0*H5.5mm, 3 Pins				
Frequency Range	2.0	MHz	2.0			
Withstanding Voltage		V	50			@DC, 1 min
Insulation Resistance		MΩ	500			@AV, 1 min.
Operation Temperature		°C	-25		+85	
Storage Temperature		°C	-55		+85	
Rating Voltage		V	6			DC
			15			p-p
Frequency Accuracy		%	0.5			
Resonant Impedance		Ω			30	
Temperature Coefficient of Oscillation Frequency		%			+/-0.3	Oscillation Frequency drift, -25°C ~ +85°C)
Oscillation Frequency Aging Rate (10 years)		%			+/-0.3	From initial value
IC Application			1/6TC4069UBPx2			
Design Mode	MG					
Built-in Capacitance		pF	30			
Other	Package	T	Packed in AMNO-Pack, 2000pcs/Tape, 1 Tape/Box			
	RoHS Status	LF	RoHS III compliant			
	Add Value		N/A			
	Internal Control Code *		N/A			

Note: 1) Original Part Number: **TGS CRTWS 2.0MG TLF**

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

MHZ THRU-HOLE CERAMIC RESONATOR CRTWS SERIES

RELIABILITY

Test Items	Test Method And Conditions	Performance Requirements
Humidity	Subject the resonator at 40±2°C and 90%-95% R.H. for 500h, resonator shall be measured after being placed in natural conditions for 1h.	It shall fulfill the specifications in Table 1.
High Temperature Exposure	Subject the resonator to 85±2°C for 500h, resonator shall be measured after being placed in natural conditions for 1h.	It shall fulfill the specifications in Table 1.
Low Temperature Exposure	Subject the resonator to -55°C±2°C for 96h, then release the resonator into the room conditions for 1h prior to the measurement.	It shall fulfill the specifications in Table 1.
Temperature Cycling	After temperature cycling of blow table was performed 5 times, resonator shall be measured after being placed in natural conditions for 1h. Time: 30 min. @ -25 +/-3°C Time: 30 min. @85 +/-3°C	It shall fulfill the specifications in Table 1.
Vibration	Subject the resonator to vibration for 2h each in x, y and z axis With the amplitude of 1.5mm, the frequency shall be varied uniformly between the limits of 10 Hz—55Hz.	It shall fulfill the specifications in Table 1.
Mechanical Shock	Drop the resonator randomly onto a wooden floor from the height of 100cm 3 times.	It shall fulfill the specifications in Table 1.
Resistance to Soldering Heat	Lead terminals are immersed up to 2 mm from resonator's body in soldering bath of 260°C±5°C for 10s±1s and then resonator shall be measured after being placed in natural conditions for 1h.	It shall fulfill the specifications in Table 1.
Solderability	Lead terminals are immersed up to 2mm from resonator's body in soldering bath of 250°C±5°C for 3s±0.5s.	More than 95% of the terminal surface of the filter shall be covered with fresh solder.
Terminal Strength	Pulling: Force of 5N is applied to each lead in axial direction for 10s±1s. Bending: When force of 5N is applied to each lead in axial direction, the lead shall folded up 90° from the axial direction and folded back to the axial direction. The speed of folding shall be each 3s.	No visible damage and it shall fulfill Table 1..

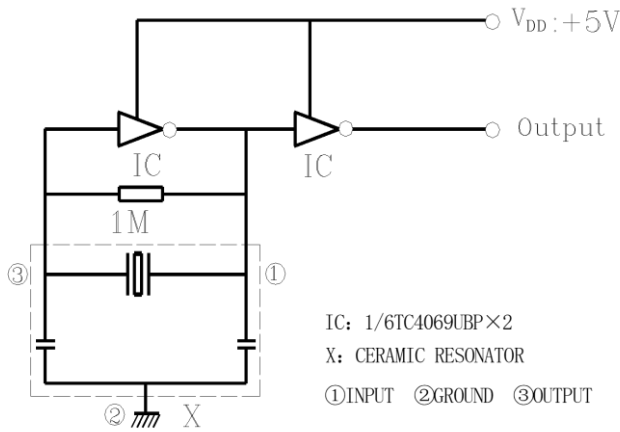
Table 1

Item	Specification after test
Oscillation Frequency Change $\Delta F_{osc}/F_{osc}$ (%) max	±0.3
Resonant Impedance (Ω) max	30

The limits in the above table are referenced to the initial measurements.

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TEST CIRCUIT (For Reference Only)



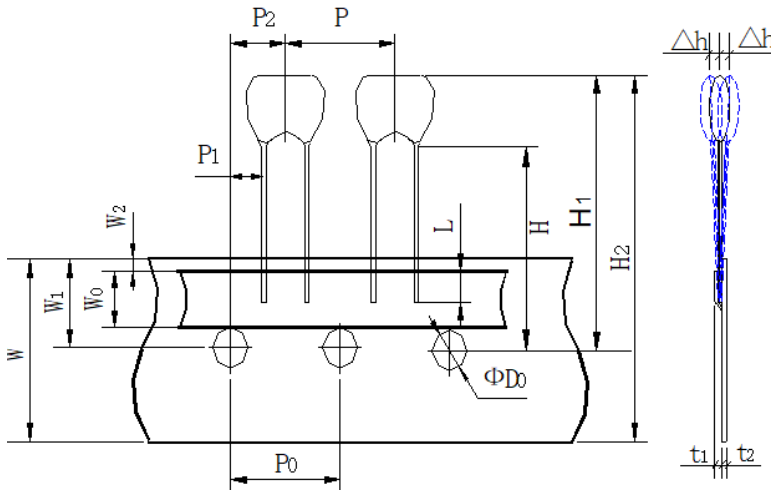
Note:

Parts shall be tested under the condition (Temp.: 20±15°C, Humidity 65±20% R.H.) unless the standard condition (Temp.: 25±3 °C, Humidity :65±10% R.H.) is regulated to measure.

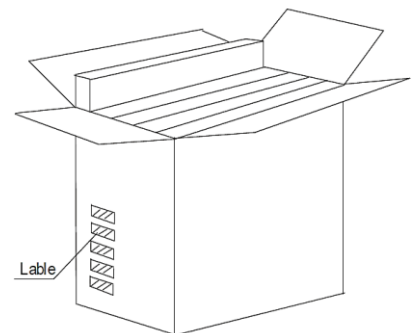
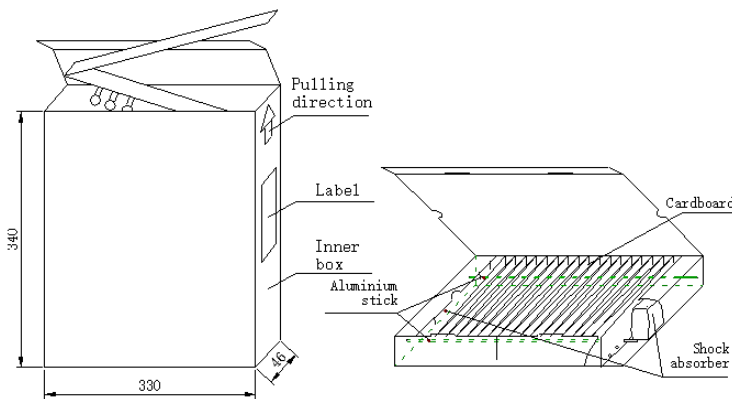
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TAPE AND AMNO-Pack (Unit: mm)

All Devices are packed in accordance with EIA standard RS-481-2 and Packed in AMNO-Pack
2000pcs/Tape, 1 Tape/Box



MARK	SIZE(mm)
P	12.7±0.5
Po	12.7±0.2
P1	3.85±0.5
P2	6.35±1.30 (include the slant of product)
F1	2.5±0.3
F2	2.5±0.3
Wo	5.5±0.5
W1	9.0±0.5
W2 max.	1
W	18.0±0.5
H	18
H1	27.0 max. (Varies with P/N)
H2	36.0 max. (Varies with P/N)
L min.	3
ΦDo	4.0±0.2
t1	0.6±0.2
t2 max	1.5.
Δh max.	1



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