

Product Documentation

CC4V-T1A

**Quartz Crystal Unit
32.768 kHz**

2. 製品概要

CC4V-T1A は、音叉型水晶振動子を内蔵した低周波 SMT水晶振動子です。水晶振動子は、セラミックのリッド(カバー)が付いた真空密閉されたセラミックパッケージ内で動作します。

適切な発振回路を使用すると、非常に低消費電力で CC4V-T1A 水晶振動子を基本モードで動作させることができます。発振回路の最適化に関する技術サポートについては、Micro Crystal までお問い合わせください。
sales@microcrystal.com

CC4V-T1A は、他のサプライヤーの同じ設置面積のクリスタルと互換性があります。

2.1. アプリケーション事例

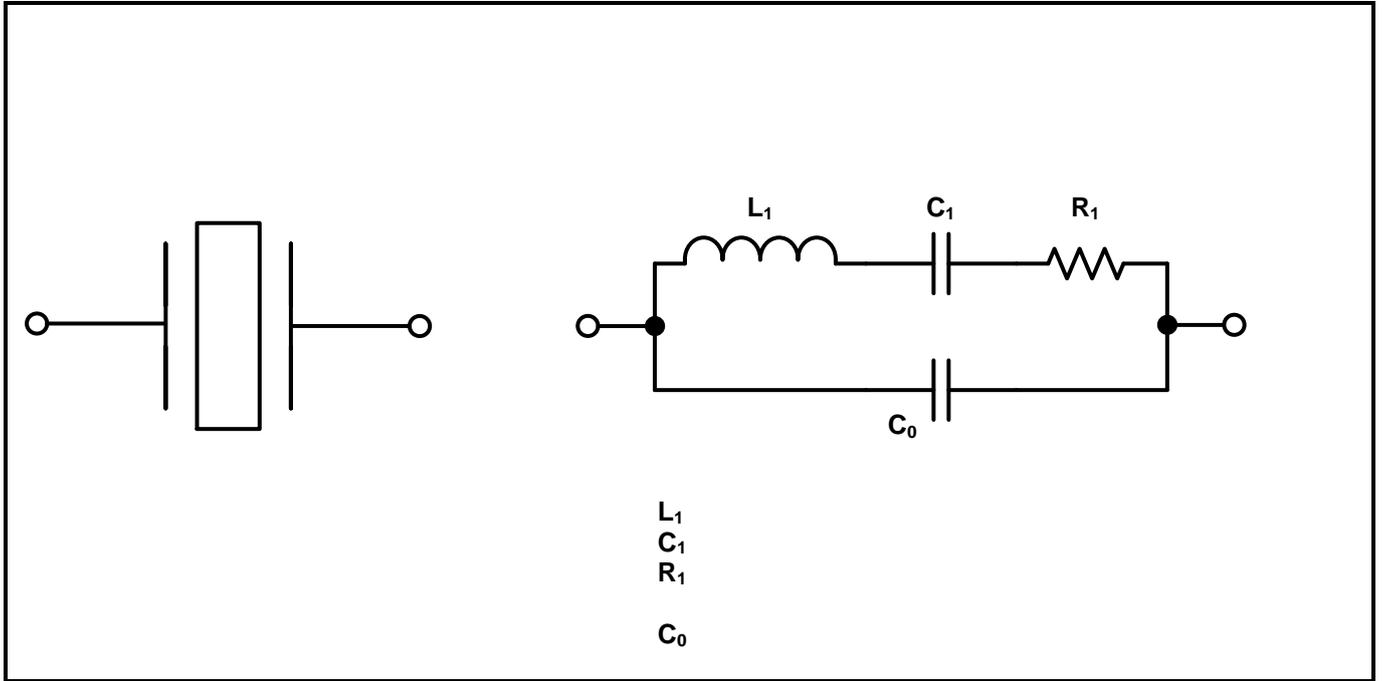
メーター機器
工業機器
自動車関連機器
ヘルスケア
メディカルインプラント
過酷な環境で使用される機器

2.2. オーダー情報

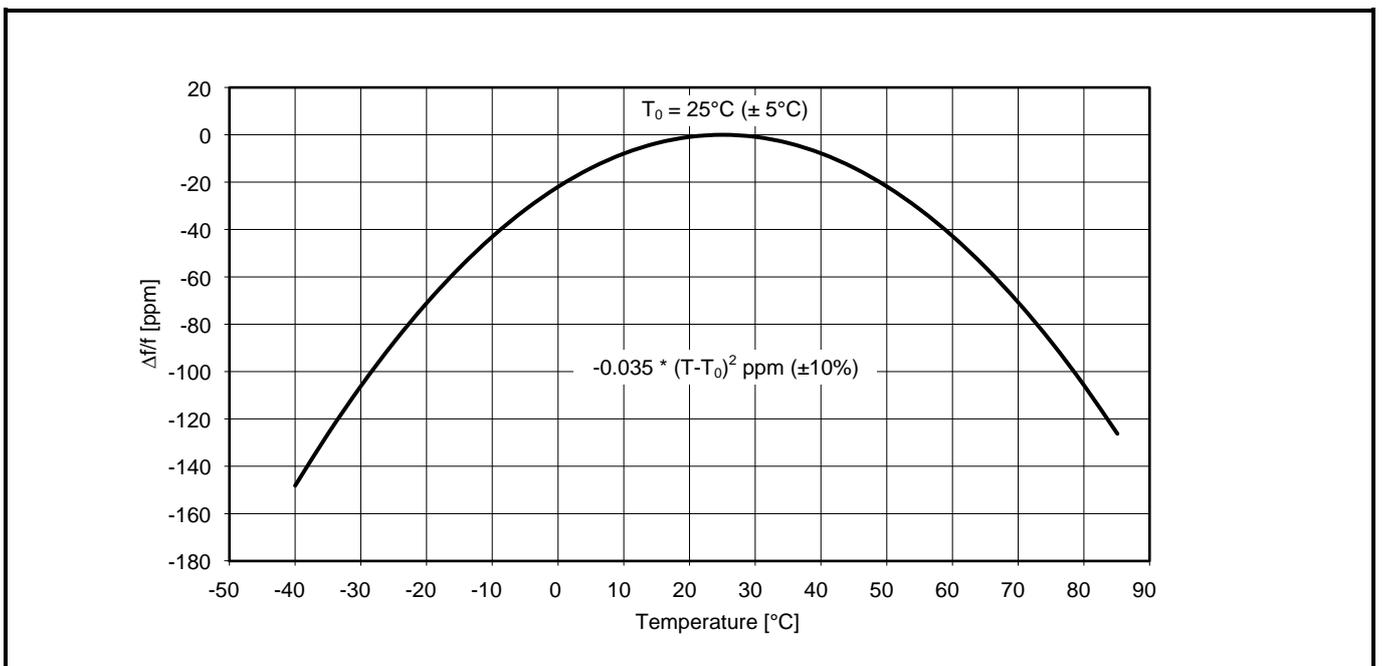
型番指定の例： CC4V-T1A 32.768 kHz CL: 12.5 pF -20/+20ppm TA QC

コード	動作温度範囲
TA (Standard)	-40 to +85°C
TB	-40 to +125°C
TC	-55 to +125°C

コード	クラス(用途)
QC (Standard)	一般産業機器用途
QA	車載用途 (AEC-Q200)
QM	メディカル用途

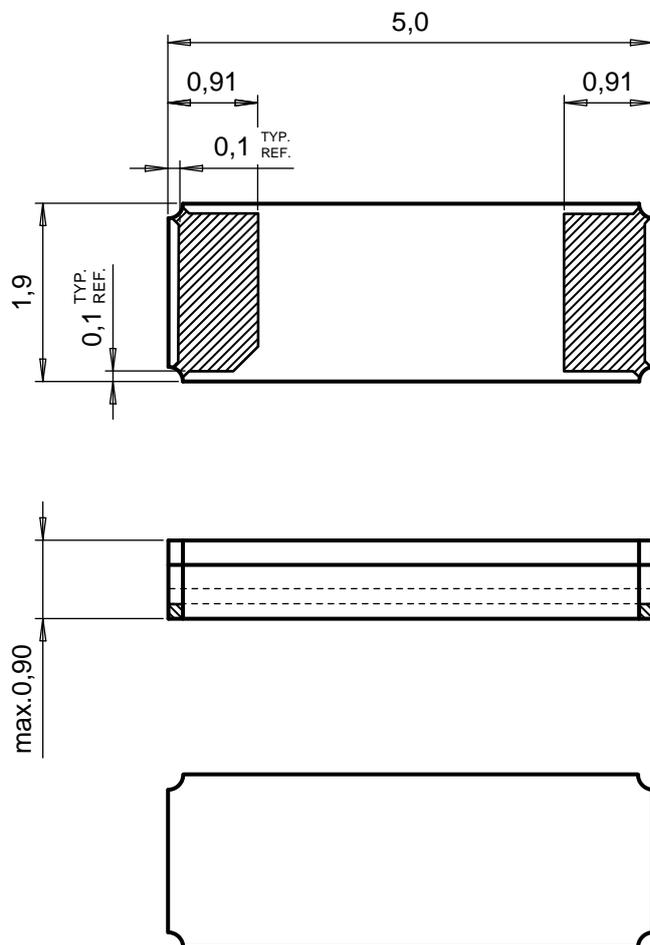


3.2. Frequency vs Temperature Characteristics



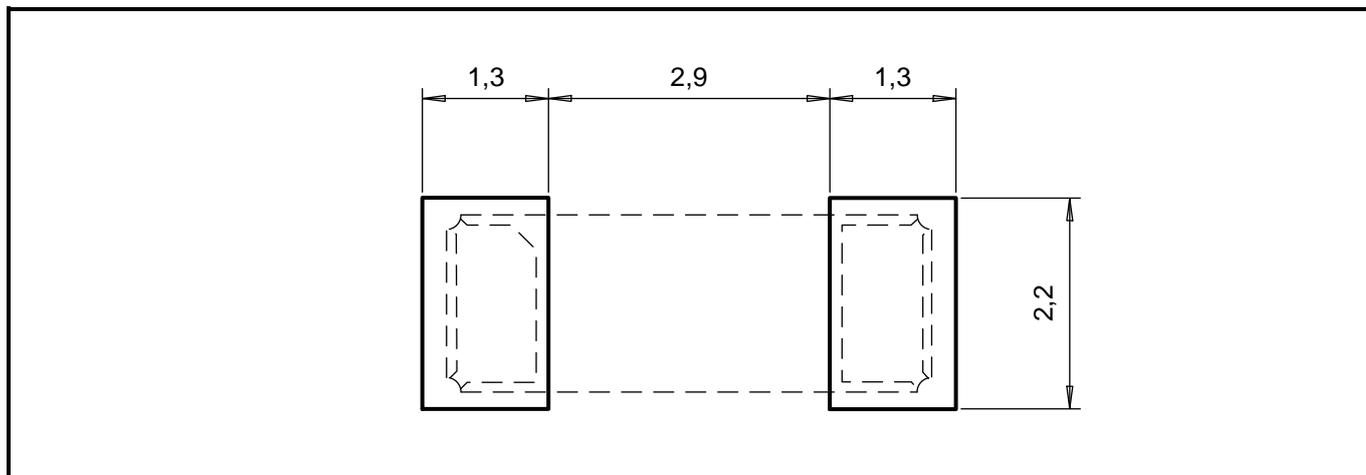
4. Mechanical Properties

4.1. Package Dimension



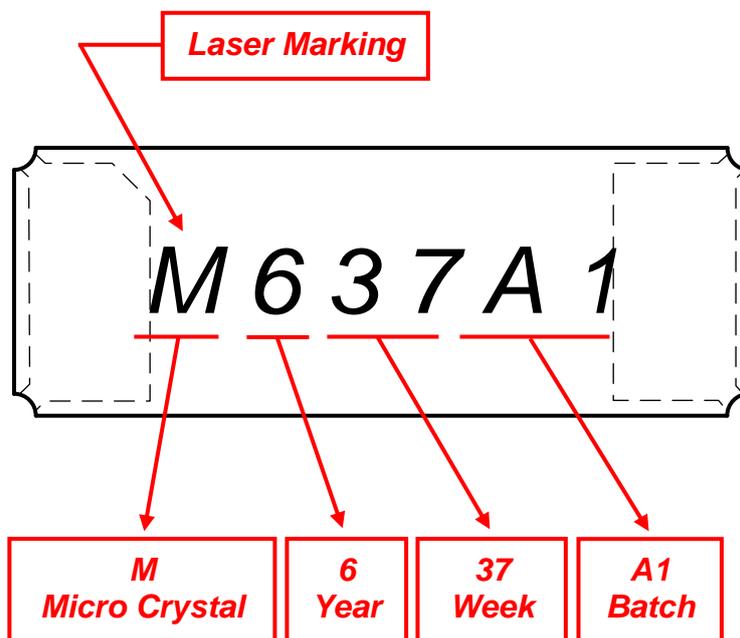
Tolerances: unless otherwise specified $\pm 0.1\text{mm}$
 Drawing: CC4V-T1A_Pack-drw_20170306

4.2. Recommended Solderpad Layout



4.3. Product Marking

Product Marking:



5. Material Composition Declaration & Environmental Information

5.1. Homogenous Material Composition Declaration

Homogenous material information according to IPC-1752 standard

Material Composition CC4V-T1A:							
<p>(Symbolic drawing)</p>							
No.	Item Component Name	Sub Item Material Name	Material Weight		Substance Element	CAS Number	Comment
			(mg)	(%)			
1	Resonator	Quartz Crystal	0.70	100%	SiO ₂	14808-60-7	
2	Electrodes	Cr+Au	0.01	6%	Cr	7440-47-3	
				94%	Au	7440-57-5	
3	Housing	Ceramic	22.85	100%	Al ₂ O ₃	1344-28-1	
4	Seal	Solder Preform	1.70	80%	Au80 / Sn20	Au: 7440-57-5	
				20%		Sn: 7440-31-5	
5	Terminations	Internal and external terminals	0.95	80%	W	W: 7440-33-7	Tungsten
				15%	Ni	Ni: 7440-02-0	Nickel plating
				5%	Au 0.5 micron	Au: 7440-57-5	Gold plating
6	Conductive adhesive	Silver filled Epoxy	0.29	70%	Ag	Ag: 7440-22-4	
				30%	EP	129915-35-1	
		Unit weight	26.5				

5.2. Material Analysis & Test Results

Homogenous material information according to IPC-1752 standard

No.	Item Component Name	Sub Item Material Name	RoHS						Halogen				Phthalates				
			Pb	Cd	Hg	Cr+6	PBB	PBDE	F	Cl	Br	-	BBP	DBP	DEHP	DINP	
1	Resonator	Quartz Crystal	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2	Electrodes	Cr+Au	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
3	Housing	Ceramic	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
4	Seal	Solder Preform	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
5	Terminations	Int. & ext. terminals	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
6	Conductive adhesive	Silver filled Epoxy	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	MDL	Measurement Detection Limit	2 ppm				5 ppm		50 ppm				0.003%		0.01%		

nd = not detectable

Test methods:

RoHS	Test method with reference to IEC 62321-5: 2013	MDL: 2 ppm (PBB / PBDE: 5 ppm)
Halogen	Test method with reference to BS EN 14582:2007	MDL: 50 ppm
Phthalates	Test method with reference to EN 14372	MDL: 0.003 % (DINP 0.01%)

5.3. Recycling Material Information

Recycling material information according to IPC-1752 standard.

Element weight is accumulated and referenced to the unit weight of 26.5 mg.

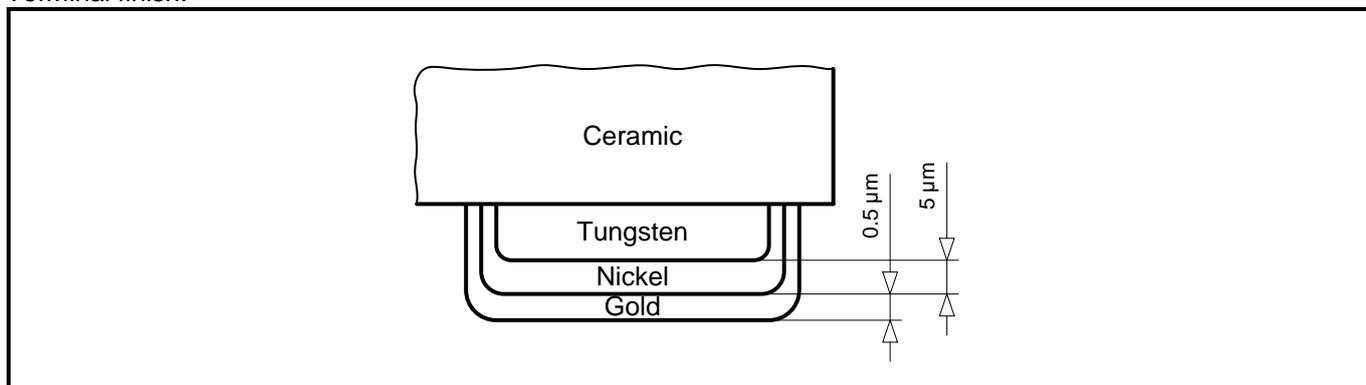
Item Material Name	No.	Item Component Name	Material Weight		Substance Element	CAS Number	Comment
			(mg)	(%)			
Quartz Crystal	1	Resonator	0.70	2.64	SiO ₂	14808-60-7	
Chromium	2	Electrodes	0.0006	0.0023	Cr	7440-47-3	
Ceramic	3	Housing	22.85	86.23	Al ₂ O ₃	1344-28-1	
Gold	2 4 5	Electrodes Seal Terminations	1.42	5.35	Au	7440-57-5	
Tin	4	Seal	0.34	1.28	Sn	Sn: 7440-31-5	
Nickel	5	Terminations	0.14	0.54	Ni	Ni: 7440-02-0	
Tungsten	5	Terminations	0.76	2.87	W	W: 7440-33-7	
Silver	6a	Conductive adhesive	0.20	0.77	Ag	Ag: 7440-22-4	
Epoxy	6b	Conductive adhesive	0.09	0.33	EP	129915-35-1	
Unit weight (total)			26.5	100			

5.4. Environmental Properties & Absolute Maximum Ratings

Package	Description
Ceramic Package	Hermetic ceramic-package, no-leads

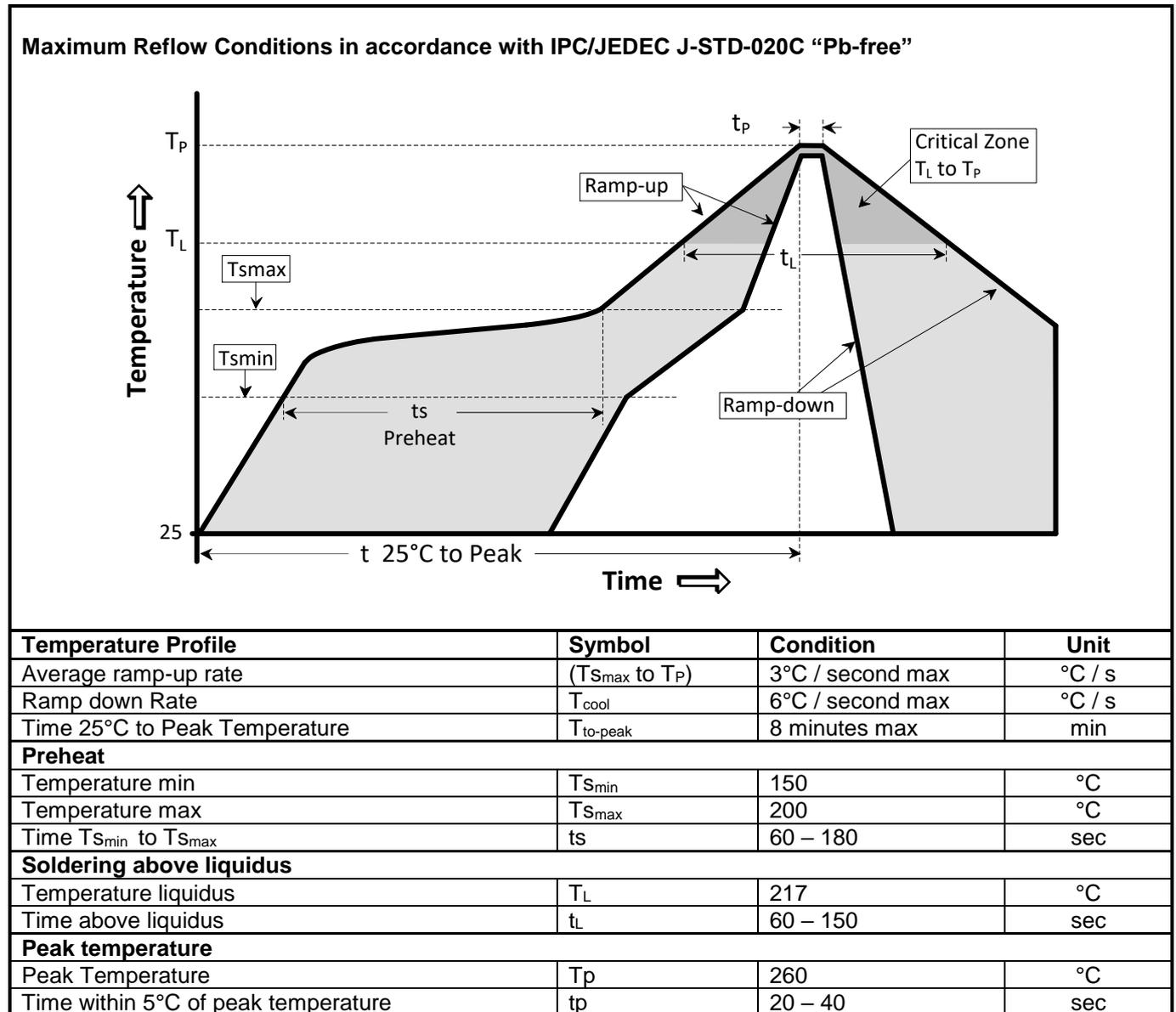
Parameter	Directive	Conditions	Value
Product weight (total)			26.5 mg
Storage temperature		Store as bare product	-55 to +125°C
Moisture sensitivity level (MSL)	IPC/JEDEC J-STD-020D		MSL 1
FIT / MTBF			available on request

Terminal finish:



6. Application Information

6.1. Soldering Information



6.2. Handling Instructions for Quartz Crystal Units

The built-in tuning-fork crystal consists of pure Silicon Dioxide in crystalline form. The cavity inside the package is evacuated and hermetically sealed in order for the crystal blank to function undisturbed from air molecules, humidity and other influences.

Shock and vibration:

Keep the crystal / module from being exposed to **excessive mechanical shock and vibration**. Micro Crystal guarantees that the crystal / module will bear a mechanical shock of 5000 g / 0.3 ms.

The following special situations may generate either shock or vibration:

Multiple PCB panels - Usually at the end of the pick & place process the single PCBs are cut out with a router. These machines sometimes generate vibrations on the PCB that have a fundamental or harmonic frequency close to 32.768 kHz. This might cause breakage of crystal blanks due to resonance. Router speed should be adjusted to avoid resonant vibration.

Ultrasonic cleaning - Avoid cleaning processes using ultrasonic energy. These processes can damage crystals due to mechanical resonance of the crystal blank.

Overheating, rework high temperature exposure:

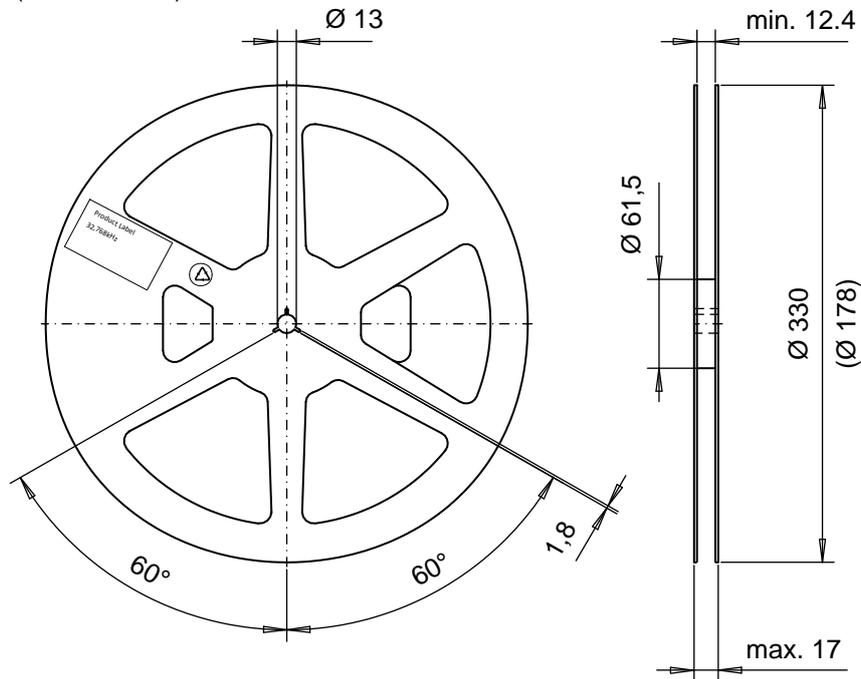
Avoid overheating the package. The package is sealed with a seal ring consisting of 80% Gold and 20% Tin. The eutectic melting temperature of this alloy is at 280°C. Heating the seal ring up to >280°C will cause melting of the metal seal which then, due to the vacuum, is sucked into the cavity forming an air duct. This happens when using hot-air-gun set at temperatures >300°C.

Use the following methods for rework:

- Use a hot-air- gun set at 270°C.
- Use 2 temperature controlled soldering irons, set at 270°C, with special-tips to contact all solder-joints from both sides of the package at the same time, remove part with tweezers when pad solder is liquid.

7. Packing & Shipping Information

Reel: 13" = 330 mm (7" = 178 mm)

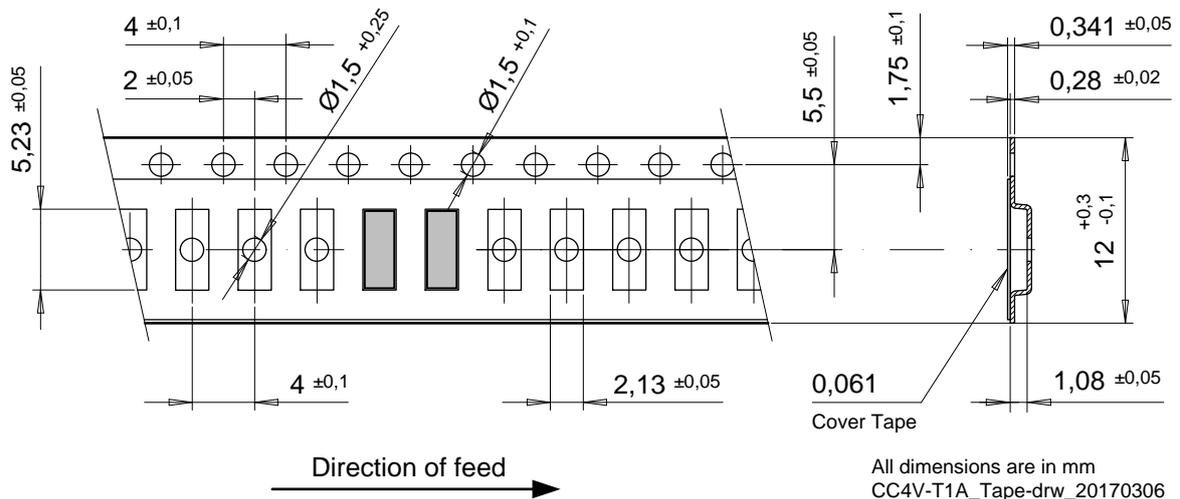


Carrier Tape:

Material: Polycarbonate

Width: 12 mm

Tape Leader and Trailer: Minimum length 300 mm



All dimensions are in mm
CC4V-T1A_Tape-drw_20170306

Cover Tape:

Tape: Polypropylene, 3M™ Universal Cover Tape (UCT)

Adhesive Type: Pressure sensitive, Synthetic Polymer

Thickness: 0.061 mm

Peel Method:

Medial section removal, both lateral stripes remain on carrier

8. Compliance Information

Micro Crystal confirms that the standard product Quartz Crystal Unit CC4V-T1A is compliant with “EU RoHS Directive” and “EU REACH Directives”.

Please find the actual Certificate of Conformance for Environmental Regulations on our website:

[CoC Environment CC&CM-Series.pdf](#)

9. Document Revision History

Date	Revision #	Revision Details
March 2017	1.0	First release
September 2020	1.1	Added that CC4V-T1A is compatible with other suppliers' same footprint crystals, 2.

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