

## **CRYSTAL SPECIFICATION**

	CS16M024000RD1	_
	49SMD-24-20-20	-
		_
	2018.12.28	_
(PLEASE R	ETURN A COPY WITH APPOVAL	
Hubei TKD	ETURN A COPY WITH APPOVAL Electronic Technology Co.,LT 晶电子科技股份有限公司	D
Hubei TKD	Electronic Technology Co.,LT 晶电子科技股份有限公司	DESIGNER
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REV.	Description of Revision History	Date	Designer	Checked By
Ą	New revision	2018-12-28	Sutingting	DaiWei



## **CRYSTAL SPECIFICATION**

- 1. Description:
- 2. Nominal Frequency: 24.00000MHz
- 3. Oscillation Mode: Fundamental
- 4. Cutting Mode:
- 5. Measurement Instrument: S&A 250B(Measured FL)

Quartz Crystal

AT cut

6. Electrical Characteristics:

[1]Operation Conditions:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Operating Temperature Range	Topt	-40		85	°C	
Storage Temperature Range	Tstg	-55		105	°C	
Load Capacitance	CL		20		pF	
Drive Level	DL	0.1		100	uW	

[2]Frequency Stability:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Tolerance	dF/Fo	-20		20	ppm	Refer to Center Frequency@25±3°C
Stability Over Temperature	dF/F25	-30		30	ppm	Refer to Operating Temperature @-40~+85℃
Aging	dF/F25	-3		3	ppm	Per Year

dF/Fo:Frequency Deviation Refer to Center Frequency dF/F25:Frequency Deviation Refer to 25  $^\circ\!\!C$  Frequency

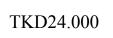
[3]Electrical Performance:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Equivalent Series Resistance	ESR			30	Ω	@Series
Shunt Capacitance	C0			7	pF	
Insulation Resistance	IR	500			MΩ	@DC 100 Volt

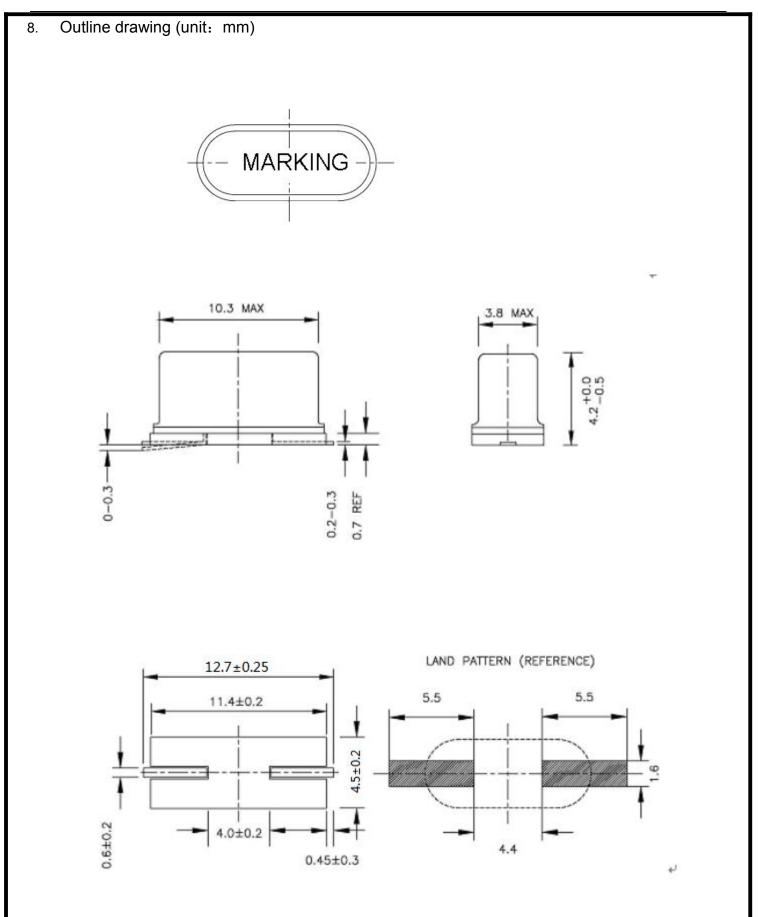
7. Marking:Laser

TKD:Company Logo

24.000:Nominal Frequency









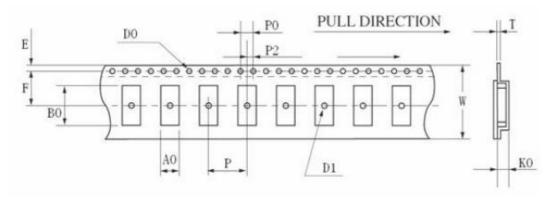
9. Reliability	Specification			
Test Item	Condition of test	Performance		
		Requirements		
Tensile Strength	The unit's lead wire should withstand a tensile force applied to the			
Termination	termination in the direction of its draw-out axis of up to 1000g			
	maintained as is for 10±2s	the unit		
Solder ability	The lead is immersed in a 235±5°C solder bath within 2±0.5	A new uniform coating of		
	seconds.	solder shall cover min		
		mun 95% of the surface		
		being immersed.		
Vibration	Endurance condition by a frequency sweep shall be made. The	(1).Frequency		
	entire frequency range from 10HZ to 50HZ and return to	Change:±5ppm		
	10HZ, shall be transverseb in 1min. Amplitude(total	(2).Resistance:±15%		
	excursion):1.5mm this motion shall be applied for a period of 2h			
	each of 3 mutually perpendicular axes(a total of 6h)			
Drop	Form 70cm height 3 times on 3cm hard wooden floor	(1).Frequency		
		Change:±5ppm		
		(2).Resistance:±15%		
Shock	Peak acceleration:981m/s <sup>2</sup> duration of the pulse :6ms three	(1).Frequency		
	successive shocks shall be applied in both direction of 3 mutually	• • • • •		
	perpendicular axes(a total of 18 shocks)	(2).Resistance:±15%		
Damp heat	The unit shall be stored at a temperature of 40±2°C with relative			
	humidity of 90%to95% for 48h, then it shall be subjected to	• • • • •		
	standard atmospheric conditions for 1 $\sim$ 2h after which	(2).Resistance:±15%		
Drubest	measurement shall be made.			
Dry heat	The unit shall be stored at a temperature of $100^{\circ}C\pm 5^{\circ}C$ for 24h,			
	then it shall be subjected to standard atmospheric conditions for	0		
Cold	$1 \sim 2h$ after which measurement shall be made. The unit shall be stored at a temperature of $40^{\circ}C \pm 5^{\circ}C$ for 48h, then	(2).Resistance:±15%		
Cold	it shall be subjected to standard atmospheric conditions for $1 \sim 2h$			
	after which measurement shall be made.	Change:±5ppm (2).Resistance:±15%		
Aging	The unit shall be stored at a temperature of $85^{\circ}C\pm5^{\circ}C$ for 7d then it	Refer to verdict		
Aging	shall be subjected to standard atmospheric conditions for $1 \sim 2h$	specification		
	after which measurement shall be made.	specification		
Temperature	The unit shall be subjected to 5 successive change of temperature	Refer to verdict		
cycling	cycles, each as show in table below, then it shall be subjected to	specification		
Gyönnig	standard atmospheric conditions for 1 $\sim$ 2h after which			
	measurement shall be made			
	Temperature Duration			
	$1 -40^{\circ}C \pm 3^{\circ}C \qquad 30 \text{min}$			
	2 Standard atmospheric Within 30s			
	conditions			
	3 100℃±3℃ 30min			
	4 Standard atmospheric Within 30s			
	conditions			



Sealing The crystal filter unit shall be immersed in a industry alcohol for 5±0.5 minutes then 25±3°C 1~2 Hr before testing Insulation Resistance>500MΩ   Resistance to soldering heat 205 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Test Item	Condition of test	Performance Requirements
Resistance to soldering heat Refer to verdict specification Refer to verdict speci	Sealing		Insulation
		PEAK 10S MAX	Refer to verdict

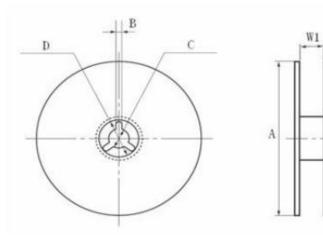


## 10. Packing Desrciption



T1

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	HC-49SMD	804.5	7050	6035	5032	4025	3225
w	24.00 ± 0.30	16.00 ± 0.05	16.00 ± 0.05	12.00 ± 0.05	12.00 ± 0.05	12.00 ± 0.05	12.00 ± 0.05
Е	$1.75 \pm 0.10$	1.75 ± 0.10	$1.75 \pm 0.10$	$1.75 \pm 0.10$	1.75 ± 0.10	1.75 ± 0.10	$1.75\pm0.10$
F	11.5 ± 0.10	7.5±0.10	7.5±0.10	5.5±0.10	5.5±0.10	5.5 ± 0.10	5.5±0.10
Т	0.40 ± 0.05	0.35 ± 0.05	0.35 ± 0.05	0.35 ± 0.05	0.35 ± 0.05	0.35 ± 0.05	0.30 ± 0.05
P	8.00 ± 0.10	0.00 ± 0.10	8.00 ± 0.10	8.00 ± 0.10	8.00 ± 0.10	8.00 ± 0.10	8.00 ± 0.10
PO	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	4.00 ± 0.10
P2	2.00 ± 0.10	2.00 ± 0.10	$2.00 \pm 0.10$	2.00 ± 0.10	2.00 ± 0.10	2.00 ± 0.10	2.00 ± 0.10
DO	ф1.50+0.10	ф1.50+0.10	ф1.50+0.10	ф1.50+0.10	ф1.50+0.10	Φ1.50+0.10	ф1.50+0.10
Dl	\$ 1.50MIN	ф1,501MIIN	ф1.50MIN	\$ 1.50MIN	@1.50MIN	@1.50MIN	ф1.50MIN
A0	4.60 ± 0.10	4.85 ± 0.10	5.40 ± 0.10	3.90 ± 0.10	3.60 ± 0.10	2.80 ± 0.10	2.85 ± 0.10
K0	4.40 ± 0.10	1.90 ± 0.10	1.80 ± 0.10	1.50 ± 0.10	1.10 ± 0.10	0.90 ± 0.10	0.85 ± 0.10
BO	14.20 ± 0.15	8.60 ± 0.15	7.40 ± 0.10	6.40 ± 0.10	5.40 ± 0.10	4.30 ± 0.10	3.55 ± 0.10
A	\$330 ± 1.0	Φ178±2.0	ф178±2.0	\$ 178 ± 2.0	¢ 178 ± 2.0	¢178±2.0	ф178±2.0
в	2.30 ± 0.20	2.00 ± 0.50	2.00 ± 0.50	2.00 ± 0.50	2.00 ± 0.50	2.00 ± 0.50	2.00 ± 0.50
С	Φ13.5±0.20	\$ 13.2 ± 0.20	\$ 13.2 ± 0.20	ф13.2±0.20	Φ13.2 ± 0.20	φ13.2±0.20	φ13.2±0.20
D	Φ21.5±0.20	Φ20.0±0.50	Ф 20.0 ± 0.50	ф 20.0 ± 0.50	Φ20.0 ± 0.50	\$20.0 ± 0.50	ф 20.0 ± 0.50
N	Φ100.0±0.5	φ60.5±1.0	Φ60.5±1.0	Φ60.5±1.0	Φ60.5±1.0	Φ60.5±1.0	ф60.5±1.0
W1	24.5 ± 0.20	16.5 ± 0.20	16.5 ± 0.20	12.5 ± 0.20	12.5 ± 0.20	12.5 ± 0.20	12.5 ± 0.20
T1	2.30 ± 0.20	1.80 ± 0.20	1.80 ± 0.20	1.80 ± 0.20	1.80 ± 0.20	1.80 ± 0.20	1.80 ± 0.20





