

CRYSTAL SPECIFICATION

Customer : ______ 华强聚丰______

Customer P/N : _____

TKD P/N : CS16M012000RD1

Product Description : 49SMD-12-20-20

Issue Date : 2018.12.28

CUSTOMER'S APPROVAL

(PLEASE RETURN A COPY WITH APPOVAL

Hubei TKD Electronic Technology Co.,LTD

湖北泰晶电子科技股份有限公司

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REV.	Description of Revision History	Date	Designer	Checked By
	New revision	2018-12-28	Sutingting	<u>DaiWei</u>



CRYSTAL SPECIFICATION

Description: Quartz Crystal
 Nominal Frequency: 12.000000MHz
 Oscillation Mode: Fundamental

4. Cutting Mode: AT cut

5. Measurement Instrument: S&A 250B(Measured FL)

6. Electrical Characteristics:[1]Operation Conditions:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Operating Temperature Range	Topt	-40		85	$^{\circ}$	
Storage Temperature Range	Tstg	-55		105	$^{\circ}$	
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°		
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℃ Frequency

[3] Electrical Performance:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Equivalent Series Resistance	ESR			40	Ω	@Series
Shunt Capacitance	C0			7	pF	
Insulation Resistance	IR	500			ΜΩ	@DC 100 Volt

7. Marking:Laser

TKD:Company Logo

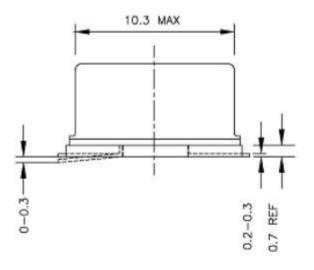
12.000:Nominal Frequency

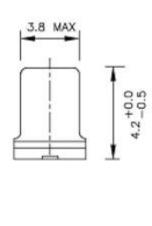
TKD12.000

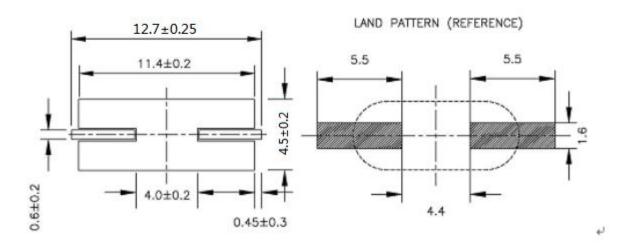


8. Outline drawing (unit: mm)











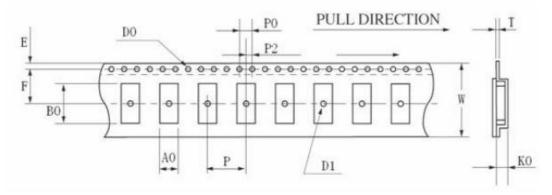
9. Reliability	/ Specification							
Test Item	Condition of test	Performance						
rest item	Gondition of test	Requirements						
Tensile Strength	The unit's lead wire should withstand a tensile force applied to the	There should be no						
Termination								
	maintained as is for 10±2s	the unit						
Solder ability	The lead is immersed in a 235±5℃ 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							
Dron	each of 3 mutually perpendicular axes(a total of 6h)	(1) Fraguency						
Drop	Form 70cm height 3 times on 3cm hard wooden floor	(1).Frequency Change:±5ppm						
		•						
Shock	Peak acceleration:981m/s ² duration of the pulse :6ms three	(2).Resistance:±15% (1).Frequency						
OHOCK	successive shocks shall be applied in both direction of 3 mutually	Change:±5ppm						
	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	Change:±5ppm						
	standard atmospheric conditions for 1 \sim 2h after which	(2).Resistance:±15%						
	measurement shall be made.							
Dry heat	The unit shall be stored at a temperature of 100°C±5°C for 24h,	(1).Frequency						
	then it shall be subjected to standard atmospheric conditions for	Change:±5ppm						
	1 \sim 2h after which measurement shall be made.	(2).Resistance:±15%						
Cold	The unit shall be stored at a temperature of-40°C±5°C for 48h, then	(1).Frequency						
	it shall be subjected to standard atmospheric conditions $1\sim2h$	Change:±5ppm						
	after which measurement shall be made.	(2).Resistance:±15%						
Aging	The unit shall be stored at a temperature of 85°C±5°C for 7d then it	Refer to verdict						
	shall be subjected to standard atmospheric conditions for 1~2h	specification						
	after which measurement shall be made.	- · · · · · · · · · · · · · · · · · · ·						
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						
	standard atmospheric conditions for 1 \sim 2h after which measurement shall be made							
	Temperature Duration 1 -40°C±3°C 30min							
	2 Standard atmospheric Within 30s							
	conditions							
	3 100℃±3℃ 30min							
	4 Standard atmospheric Within 30s							
	conditions							

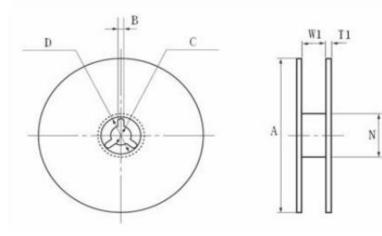


Test Item	Condition of test	Performal Requireme	
Sealing	The crystal filter unit shall be immersed in a industry alcohol for	Insulation	on
	5±0.5 minutes then 25±3℃ 1~2 Hr before testing	Resistance>5	500ΜΩ
Resistance to		Refer to	verdict
soldering heat	PEAK 10S MAX	specification	
	265 TO 200 TO 200 TO 150 TO 44 TO 90 S 60 TO 120 S 25 TO Peak : 360s TIME (Seconds) Total : 420S		
	Reflow soldering cure see the chart.		
	Soldering iron method:		
1	Bit temperature: 350 ℃ ±10 ℃		
	Application time of soldering iron:5s Max		



10. Packing Desrciption





	HC-49SMD	8045	7050	603.5	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
E	1.75 ± 0.10	1.75 ± 0.10	1.75 ± 0.10	1.75 ± 0.10	1.75 ± 0.10	1.75 ± 0.10	1.75 ± 0.10
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
T	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	3.00 ± 0.10	8.00 ± 0.10	8.00 ± 0.10	8.00 ± 0.10	8.00 ± 0.10	8.00 ± 0.10
P0	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 ± 0.10	2.00 ± 0.10	2.00 ± 0.10	2.00 ± 0.10	2.00 ± 0.10
D0	Ф1.50+0.10	ф1.50+0.10	ф1.50+0.10	ф1.50+0.10	ф1.50+0.10	ф1.50+0.10	ф 1.50+0.10
D1	ф 1.50MIN	ф 1.50MIN	ф 1.50MIN	ф 1.50MIN	ф 1.50MIN	ф 1.50MIN	ф1.50МПМ
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
B0	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	ф 178 ± 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	Φ 13.5 ± 0.20	ф 13.2 ± 0.20	ф 13.2 ± 0.20	ф 13.2 ± 0.20	ф 13.2 ± 0.20	ф 13.2 ± 0.20	ф 13.2 ± 0.20
D	Φ21.5 ± 0.20	Ф 20.0 ± 0.50	Φ20.0 ± 0.50	Ф20.0 ± 0.50			
N	Φ 100.0 ± 0.5	Φ60.5 ± 1.0	ф60.5±1.0	Φ60.5 ± 1.0	φ60.5 ± 1.0	Φ60.5 ± 1.0	Φ60.5 ± 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



