

新品 变更

产品规格书

SPECIFICATION FOR APPROVAL

产品名称 Product Name:	石英晶体谐振器 Quartz crystal unit
产品型号 Product Type:	M518
标称频率 Nominal Freq:	32.768 KHz
明德电波料号 MDF P/N:	2.C.1.327680604
客户料号 Customer P/N:	

客户承认
Approved By Customer签章
Signature:日期
Date:

Date: 2025年11月24日

批准	审核	拟制
Accepted	Checked	Issued
邱振波	邱振波	余东灿

RoHS Compliant

Revision Record

[illegible]

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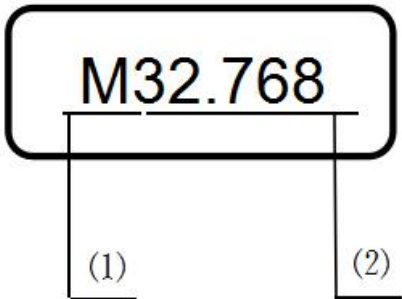
1 石英晶体产品规格及特性 / Product specification and features

1.1 一般特性 / General characteristics

Items	Electrical spec.			Unit	Notes
	Min.	Typ.	Max.		
1.Frequency(FL)	32.768			KHz	-
2.Mode of oscillation	Fundamental			-	-
3.Frequency tolerance	-20	~	20	ppm	At 25℃±3℃
4.Loading capacitance(CL)	6			pF	-
5.Equivalent resistance(RR)	-	-	70	KΩ	Series(ESR)
6.Drive Level (DL)	-	-	1	uW	-
7.Parabolic Coefficient	(-0.035±0.006)			PPM/℃^2	Measure this coefficient at 3 pointsof 10'c、 25'c、 and 40'c usingC-MOS circuit.
8. Turnover Temperature	25℃±5℃				
9.Operating temperature range	-40	~	85	℃	-
10.Storage temperature range	-55	~	125	℃	-
11.Shunt Capacitance(C0)	-	1.5	-	pF	-
12.Aging	-3	-	3	ppm/Year	1st year

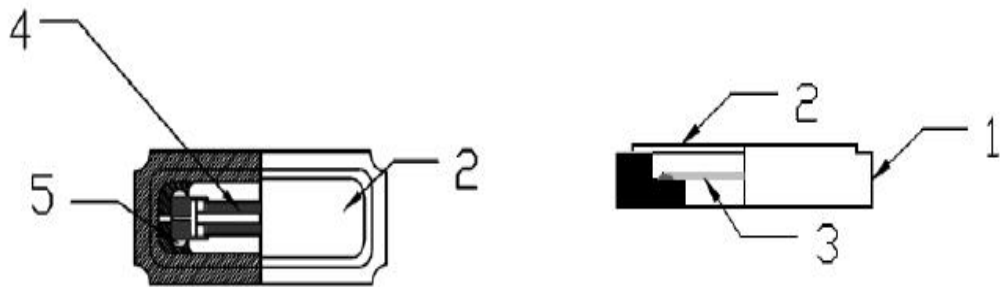
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3.0 印字 Marking



- (1) 代表公司Logo
- (2) 代表标称频率

3.1内部构造图 / Product internal structure



NO.	组件 COMPONENTS	材料成份MATERIALS
1	基座 Package	陶瓷 Ceramic (Al2O3)
2	外壳 LID	KV 合金 KV(Fe/Co/Ni)
3	水晶片 Crystal blank	二氧化硅 SiO2
4	电极 Electrode	贵金属
5	接着剂 Adhesive	树脂、银粉 Resin、Ag

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4.0 石英晶体之可靠性 / Product reliability							
项 目 (Item)	条 件 (Condition)					结 果 (Result)	
A.1	耐低温性（耐寒性）测试（Cold resistance）					（ I ）	
	Stored at -40±2℃ for 500±2 hrs then 25±2℃ 2 hrs before testing						
A.2	耐高温性（耐热性）测试（Heat resistance）					（ I ）	
	Stored at 125±2℃ for 500±2 hrs then 25±2℃ 2 hrs before testing						
A.3	耐湿热性 (Humidity Resistance Result)					（ I ）	
	稳态温度：85±2℃；湿度：85±3%RH；时间：500±2 hrs Steady temperature: 85±2℃;humidity: 85±3%RH; time:500±2 hrs						
A.4	老化测试（Aging）					（ I ）	
	Stored at 85±2℃ for 720±2Hrs then 25±2℃ 2 Hrs before testing						
A.5	气密性 (Leakage)					（ III ）	
	细漏Fine leak: Put the product in the Helium pressure tank, 4 ~ 5kgf/cm ² , 0.5hrs.						

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4.1机械性能 / Mechanism characteristics

B.1	跌落测试 (Drop Test)	(I)
	Device are dropped from a height of 75 cm onto 30mm thickness wood plate executing 3 times of random drops.	
B.2	耐振性 (Resistance of Vibration)	(I)
	Frequency: 10~55Hz, amplitude(total excursion): 1.5mm±15%,3 direction (X,Y,Z) each 2 hrs then 25±2℃ 2 hrs before testing	
B.3	可焊性试验 (Solderability)	(II)
	245±5℃, 5±1s	
B.4	耐焊接热 (Reflow) Resistance to soldering heat (Reflow)	(I)
	参考曲线图 (Reference Curve) :	

TEMP. (° C)

300

250

200

180

100

50

10~20S

260 ± 5° C

230 ± 5° C

180 ± 10° C

90~120s

≥40S

TIME (sec)

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项目 Item	结果编号Result NO.	规格要求 Specification Requirements
1	(I)	频率变化 $\leq \pm 10\text{ppm}$; 电阻变化 $\leq \pm 5\text{K}\Omega$ 或规格电阻的 $\pm 15\%$, 取大者 Frequency variation $\leq \pm 10\text{ppm}$; Resistance variation $\leq \pm 5\text{K}\Omega$ or $\pm 15\%$ of RR spec., select the bigger value.
2	(II)	上锡覆盖率高于95% The covering rate of Tin-plating is more than 95%.
3	(III)	$\leq 1 \times 10^{-9} \text{Pa.m}^3/\text{s}$ Max

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5.0 生产商及产地说明 / Manufacturer and origin

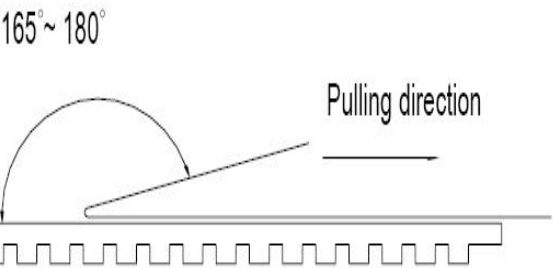
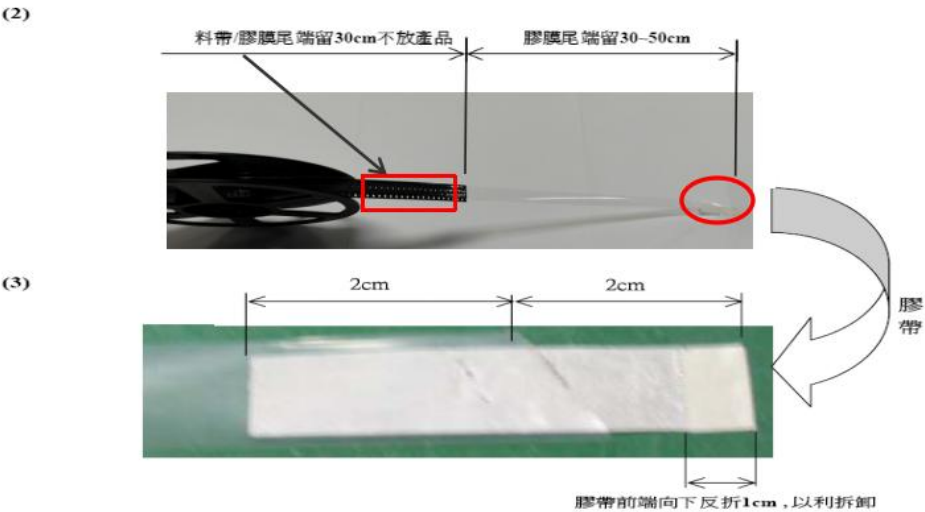
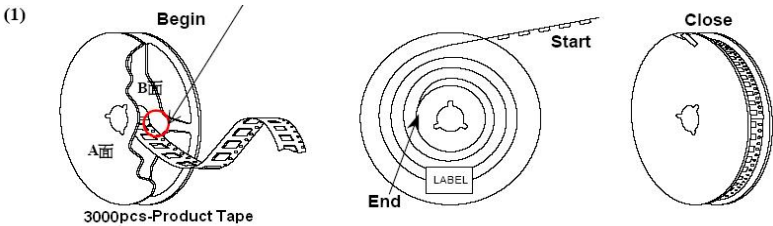
生产商/Manufacturer:

明德电波(四川)科技有限公司

SiChuan MDF Technology Co.,Ltd

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5.1 包装规格Package specification



It has to between 0.2N to 0.75N under following condition.
Pulling direction: 165° to 180°
Pulling Speed : 300mm/min
Otherwise unless specified