

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

产品型号
Product Type: SMD3225

标称频率
Nominal Freq: 24.000000 MHz

明德亨料号
MDH P/N: 2.3.3.240001218

客户料号
Customer P/N:

客户承认
Approved By Customer

签章
Signature:

日期
Date:

Date: 2019年5月18日

批准	审核	拟制
Accepted	Checked	Issued
黄屹	乔润国	马赛



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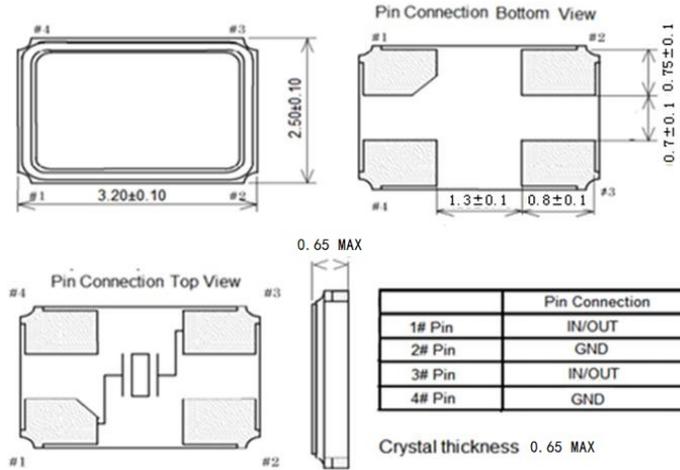
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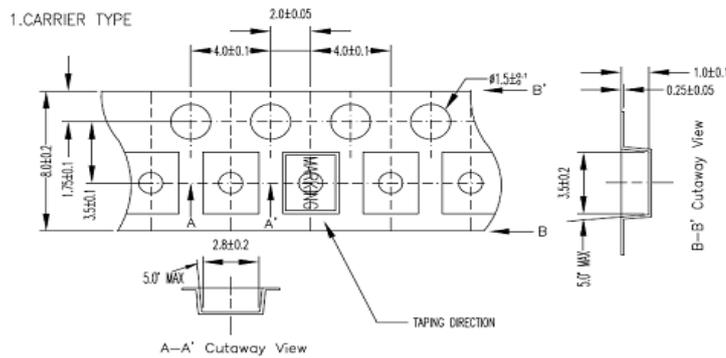
SMD3225	QUARTZ CRYSTAL UNIT	MDH P/N	2.3.3.240001218		
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1 石英晶体产品规格及特性 / Product specification and features					
1.1 一般特性 / General characteristics					
标称频率 Nominal frequency	24.000000	MHz			
振动模式 Overtone order	Fundamental				
型 号 Type	SMD3225				
动作温度 Operating temperature	-20~70	°C			
保存温度 Storage temperature	-40~85	°C			
1.2 电气特性 / Electric characteristics					
调整频差(+25°C基准) Adjustment tolerance: (at+25°C)	±10	ppm			
温度频差 Tolerance over the temperature:	±10	ppm			
负 载 Load capacitance	12.0	pF			
测试仪器 Measure Instrument	S&A 250B				
激励功率 Drive level	100.0	μw			
等效电阻 Equivalent resistance	30.0	Ω Max			
分布电容 (C0) Shut capacitance	3.0	pF Max			
绝缘阻抗 Insulation resistance	500 MΩ Min	100VDC ±15VDC			
老化率 Aging	±2ppm	ppm/First year			
1.3 其它特性 / Other characteristics					
SPDB	<-3	dB	(以标称频率为基准)		

2.0 外形尺寸、外观 / Outline dimensions、Appearances

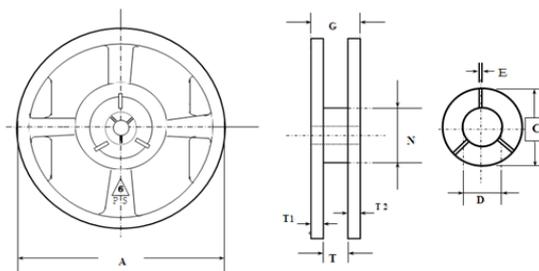
2.1 产品外形尺寸(mm) / Product outline dimension(mm)



2.2 载带外形尺寸图 (mm) /Carrier Dimensional Drawing (mm)



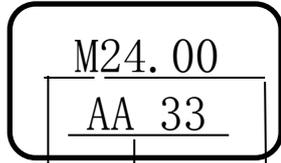
2.3 编带盘外形尺寸图 (mm) /Reel Dimensional Drawing (mm)



☆图示尺寸及公差 (mm) :

部位	A	T	T1, T2	N	C	D	E	G
尺寸	178	9.0	1.4	60.2	20.2	13.2	2.5	11.5
公差	±2.0	±0.5	±0.2	±0.5	±1.0	±0.5	±0.5	±1.4

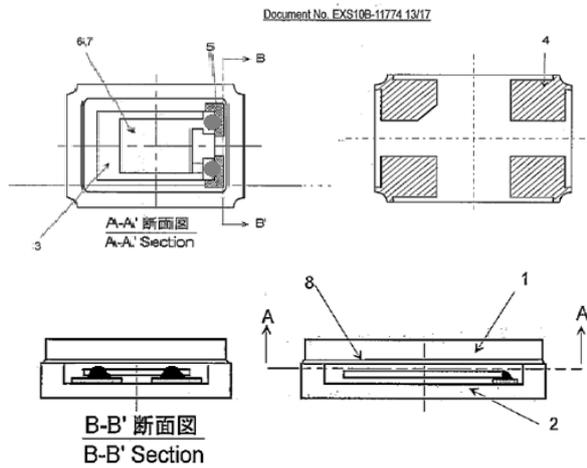
2.4 印字 Marking



- (1) 代表公司Logo
- (2) 代表标称频率
- (3) 代表批次号

(1) (3) (2)

3.0 内部构造图 / Product internal structure



封装方式/Seal		激光封装	质量 (参考值)		0.0144g
NO.	材料名/Material	备注/Notes	NO.	材料/Material	备注/Notes
1	金属盖板/LID	Fe-Ni-Co	5	导电胶 /Conductive adhesive	/
2	陶瓷/Ceramics	黑色/Color black	6	银/Ag	形状例/Form isexample
3	晶片/Crystal (SiO2)	晶片 /Crystal Water	7	铬/Cr	形状例/Form isexample
4	引脚 /Pad	镀镍/镀金 Ni plating/Au plating			

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 $-40\pm 2^{\circ}\text{C}$ for 1000 ± 2 hrs then $25\pm 2^{\circ}\text{C}$ 1~2 hrs before testing	
A.2	耐高温性 (耐热性) 测试 (Heat resistance)	(I)
	Stored at $85\pm 2^{\circ}\text{C}$ for 1000 ± 2 hrs then $25\pm 2^{\circ}\text{C}$ 1~2 hrs before testing	
A.3	盐雾测试 (Salt Mist Test)	(I)
	将温度 $35^{\circ}\text{C}\pm 2^{\circ}\text{C}$ 之盐水 (盐份浓度5%), 喷向石英晶体48小时 ± 2 小时, 再用清水洗净。 Spray the $35^{\circ}\text{C}\pm 2^{\circ}\text{C}$ salt water (salt density 5%) to crystal for 48 ± 2 hrs, then clean by water	
A.4	耐湿热性 (Humidity Resistance Result)	(I)
	稳态温度: $60\pm 2^{\circ}\text{C}$; 湿度: 90~95%RH; 时间: 500h; Steady temperature: $60\pm 2^{\circ}\text{C}$; humidity: 90~95%RH; time:500h	
A.5	撞击测试 (Mechanical Shock)	(I)
	14700m/S^2 0.5sec 5times in each of 6 direction	
A.6	老化 (Aging)	(I)
	Stored at $85\pm 3^{\circ}\text{C}$ for 720 ± 12 Hrs then $25\pm 2^{\circ}\text{C}$ 1~2 Hrs before testing Stored at $25\pm 2^{\circ}\text{C}$ for 1 ± 0.03 year	
A.7	气密性 (Leakage)	(V)
	细漏 Fine leak: Helium leak test *JIS C 6701 10.6	
A.8	温度循环 (Temperature Cycle)	(I)
	<p>$-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$, Dewell 30Min, 100 cycles</p> <p>温度循环 (Temperature Cycle)</p>	

4.1机械性能 / Mechanism characteristics

B.1	跌落测试 (Drop Test)	(I)
	Device are dropped from a height of 100 cm onto 20mm thickness stainless 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 hr	
B.3	耐焊接热 (手工)	(I)
	Resistance to soldering heat (Hand soldering method) 温度: 360±10°C; 时间: 3秒; 次数: 2次; 烙铁功率: 60W/Min Temperature: 370~400°C; Time: 3~4sec; Frequency: 2 times; Soldering iron: 60W/Min	
B.4	可焊性试验 (Solderability)	(II)
	240±2°C, 3±0.5sec	
B.5	耐焊接热 (Reflow) Resistance to soldering heat (Reflow)	(I)
	<p>260±5°C; 10S; 2Times</p> <p>Reflow温度曲线图</p> <p>TEMP. (°C)</p> <p>300</p> <p>250</p> <p>200</p> <p>180</p> <p>100</p> <p>50</p> <p>10s MAX</p> <p>260±5°C</p> <p>230±5°C</p> <p>180±10°C</p> <p>90-120s</p> <p>40s</p> <p>TIME (sec)</p>	

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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 $<\pm 10\text{ppm}$; 电阻变化 $<5\ \Omega$ 或规格电阻的15%, 取大者 Frequency variation $<\pm 10\text{ppm}$; Resistance variation $<5\ \Omega$ or 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)	无气泡在晶体表面沉淀或冒出水面, 绝缘阻抗 $500\ \text{M}\Omega\ \text{Min}$ $100\text{VDC}/\pm 15\text{VDC}$ There is no bubbles after the Crystal is dipped in the water Insulation Resistance: $500\ \text{M}\Omega\ \text{Min}$ $100\text{VDC}/\pm 15\text{VDC}$
4	(IV)	在10倍放大镜下观察石英晶体无裂纹 The Crystal is no crackle under the observation of 10 times Magnifier.
5	(V)	$1*10^{-9}\text{Pa}\cdot\text{m}^3/\text{s}\ \text{Max}$

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

生产商/Manufacturer: 烟台明德亨电子科技有限公司/ MDH Technology Co.,Ltd

工厂所在地/Address: 山东省烟台开发区黑龙江路6号

No.6 Heilongjiang Road, Yantai Development zone, Shandong

包装方式: 纸箱 52cm×37cm×38cm (±1.5cm)

Package: Paper carton 52cm×37cm×38cm (±1.5cm)

5.1 包装规格 Package specification

