

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: 16.000000 MHz

明德亨料号  
MDH P/N: 2.3.3.160000909

客户料号  
Customer P/N:

客户承认  
Approved By Customer

签章  
Signature:

日期  
Date:

Date: 2018年8月20日

批准	审核	拟制
Accepted	Checked	Issued
黄屹	乔润国	马赛



烟台明德亨电子科技有限公司  
MDH Technology Co., Ltd  
ADD: 中国山东烟台开发区黑龙江路6号

No.6 Heilongjiang Road Yantai Development Zone, Shandong, China

TEL: 86-535-6372640

FAX: 86-535-6394876

E-Mail: [dynamic@public.vtptt.sd.cn](mailto:dynamic@public.vtptt.sd.cn)

<http://www.mingdeheng.com>



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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		16.000000	MHz		
Nominal frequency					
振动模式		Fundamental			
Overtone order					
型 号		SMD3225			
Type					
动作温度		-20~70	°C		
Operating temperature					
保存温度		-40~85	°C		
Storage temperature					
1.2 电气特性 / Electric characteristics					
调整频差(+25°C基准)		±10	ppm		
Adjustment tolerance: (at+25°C)					
温度频差		±10	ppm		
Tolerance over the temperature:					
负 载		9.0	pF		
Load capacitance					
测试仪器		S&A 250B			
Measure Instrument					
激励功率		100.0	μw		
Drive level					
等效电阻		50.0	Ω Max		
Equivalent resistance					
分布电容 (C0)		3.0	pF Max		
Shut capacitance					
绝缘阻抗		500 MΩ Min	100VDC ±15VDC		
Insulation resistance					
老化率		±2ppm	ppm/First year		
Aging					
1.3 其它特性 / Other characteristics					
SPDB		<-3	dB	(以标称频率为基准)	

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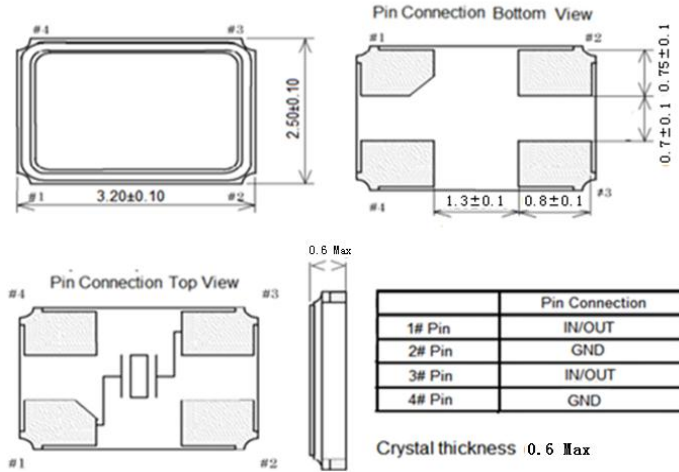
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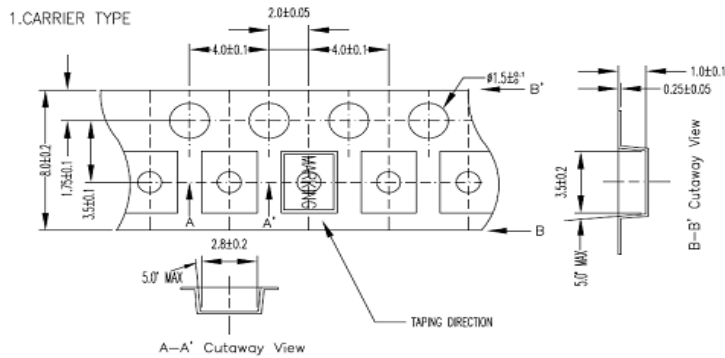
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2.0 外形尺寸、外观 / Outline dimensions、Appearances

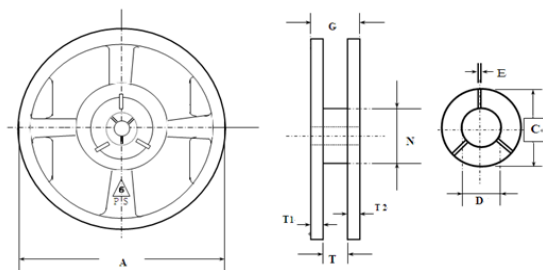
2.1 产品外形尺寸(mm) / Product outline dimension(mm)



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



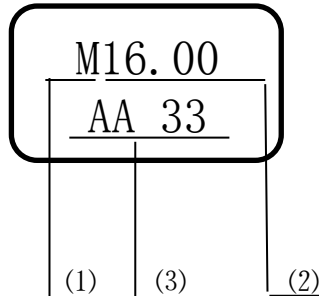
2.3 编带盘外形尺寸图(mm) /Reel Dimensional Drawing (mm)



☆图示尺寸及公差 (mm) :

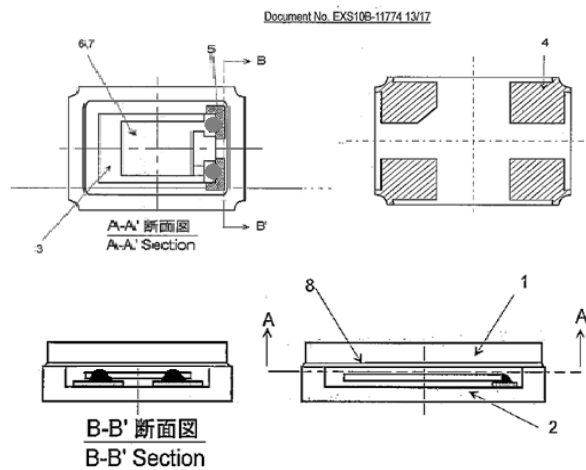
部位	A	T	T1, T2	N	C	D	E	G
尺寸	178	9.0	1.4	60.2	20.2	13.2	2.5	11.5
公差	±2.0	±0.5	±0.2	±0.5	±1.0	±0.5	±0.5	±1.4

## 2.4 印字 Marking



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

## 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 (SiO <sub>2</sub> )	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 $1000\pm 2$ 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 $1000\pm 2$ 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 $\pm 2$ 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 $48\pm 2$ 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 )
	$14700\text{m}/\text{S}^2$ 0.5sec 5times in each of 6 direction	
A.6	老化 (Aging)	( I )
	Stored at $85\pm 3^{\circ}\text{C}$ for $720\pm 12$ Hrs then $25\pm 2^{\circ}\text{C}$ 1~2 Hrs before testing Stored at $25\pm 2^{\circ}\text{C}$ for $1\pm 0.03$ 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><math>-40^{\circ}\text{C} \sim 85^{\circ}\text{C}</math>, Dwell 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℃; 时间: 3秒; 次数: 2次; 烙铁功率: 60W/Min Temperature: 370~400℃; Time: 3~4sec; Frequency: 2 times; Soldering iron: 60W/Min	
B.4	可焊性试验 (Solderability)	( II )
	240±2℃, 3±0.5sec	
B.5	耐焊接热 (Reflow) Resistance to soldering heat (Reflow)	( I )
	<p>260±5℃; 10s; 2Times</p> <p>Reflow温度曲线图</p> <p>TAMP. (°C)</p> <p>300</p> <p>250</p> <p>200</p> <p>180</p> <p>100</p> <p>50</p> <p>180±10° C</p> <p>260±5° C</p> <p>230±5° C</p> <p>10s MAX</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 M $\Omega$ Min 100VDC/ $\pm 15\text{VDC}$ There is no bubbles after the Crystal is dipped in the water Insulation Resistance: 500 M $\Omega$ Min 100VDC/ $\pm 15\text{VDC}$
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 )	$1*10^{-9}\text{Pa}\cdot\text{m}^3/\text{s}$ 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

