

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:	SMD2016
标称频率 Nominal Freq:	26.000000 MHz
明德亨料号 MDH P/N:	2.2.1.260000804
客户料号 Customer P/N:	

客户承认
Approved By Customer

签章
Signature:

日期
Date:

Date: 2019年11月7日

批准	审核	拟制
Accepted	Checked	Issued
林宗宏	马赛	乔润国

烟台明德亨电子科技有限公司
YanTai 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.ytppt.sd.cn

四川明德亨电子科技有限公司
SiChuan MDH Technology Co.,Ltd
ADD.: 中国四川泸州纳溪区东兴路1号
No.1 Dongxing Road Naxi Zone, Luzhou,
Sichuan,China
TEL: 86-830-2800890
<http://www.mingdeheng.com>

RoHS Compliant

SMD2016	QUARTZ CRYSTAL UNIT	MDH P/N	2.2.1.260000804		
		REV.	02	PAGE	3/10

CONTENT

NO.	ITEM	PAGE
1	石英晶体一般规格及特性 Product specification and features	4
2	石英晶体外观尺寸 Product outline dimension	5
3	石英晶体内部结构及印字 Product internal structure and marking	6
4	石英晶体之可靠性 Product reliability	7-9
5	生产商及产地说明 Manufacturer and origin	10

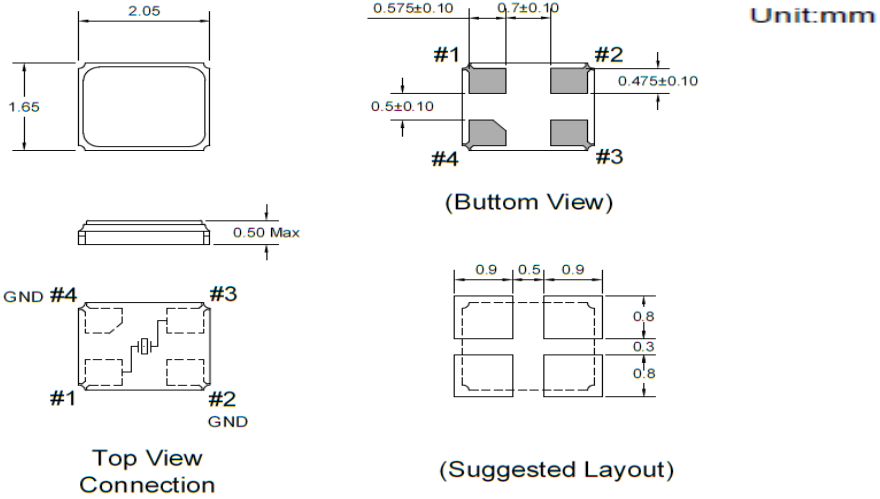
1 石英晶体产品规格及特性 / Product specification and features

1.1 一般特性 / General characteristics

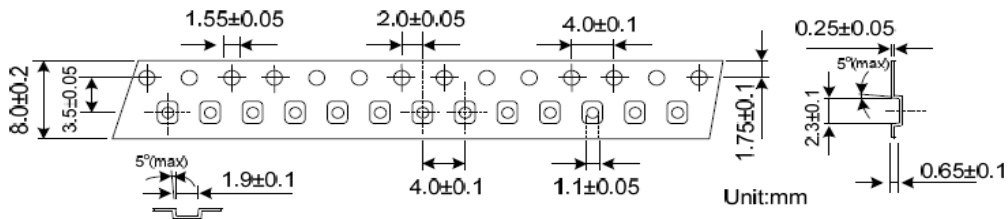
Items	Electrical spec.			Unit	Notes
	Min.	Typ.	Max.		
1.Frequency(FL)	26.000000			MHz	-
2.Mode of oscillation	Fundamental			-	-
3.Crystal Cutting Type	AT-CUT			-	Thickness shear mode
4.Frequency tolerance	-10	~	10	ppm	At 25°C ±3°C
5.Loading capacitance(CL)	8			pF	-
6.Equivalent resistance(RR)	-	-	80	Ω	Series(ESR)
7.Drive Level (DL)	0.01	100	200	uW	-
8.Temperature stability	-20	~	20	ppm	Ref. to 25°C
9.Operating temperature range	-40	~	85	°C	-
10.Storage temperature range	-55	~	125	°C	-
11.Shut Capacitance(C0)	-	-	3	pF	-
12.RLD2	-	-	80	Ω	-
13.SPDB	-	-	-3	dB	-
14.Aging	-	-	3	ppm/Year	Per Year
15.Insulation Resistance	500	-	-	MΩ	DC 100±10V

2.0 外形尺寸、外观 / Outline dimensions、Appearances

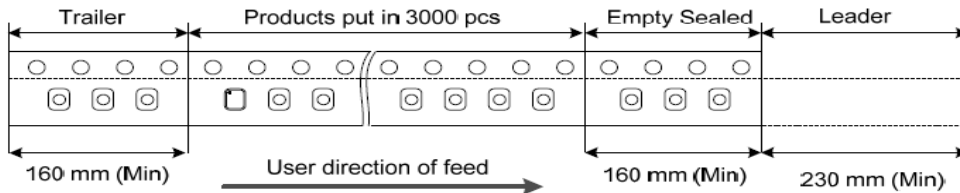
2.1 产品外形尺寸(mm)/ Product outline dimension(mm)



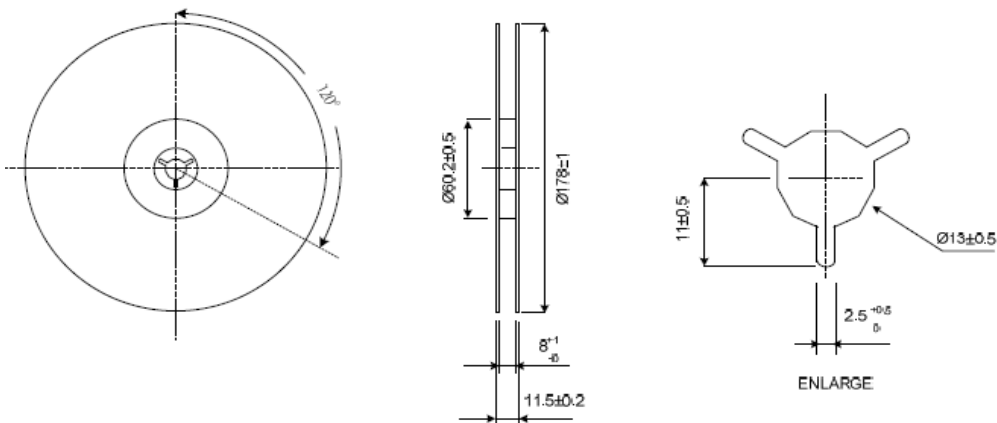
2.2 载带外形尺寸图 (mm) /Carrier Dimensional Drawing (mm)



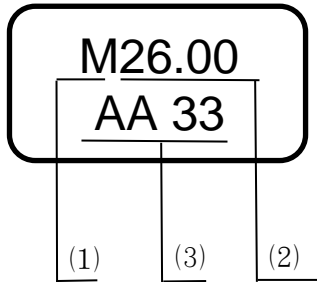
REMARK :



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

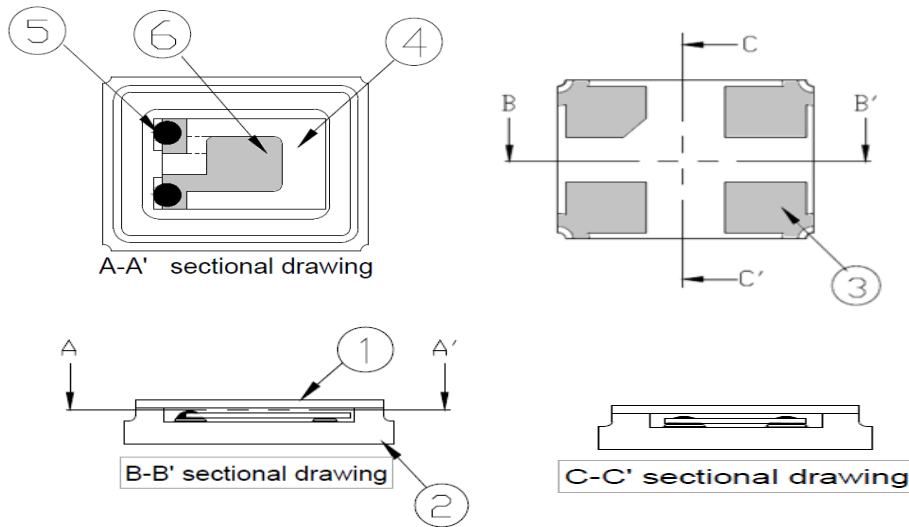


2.4 印字 Marking



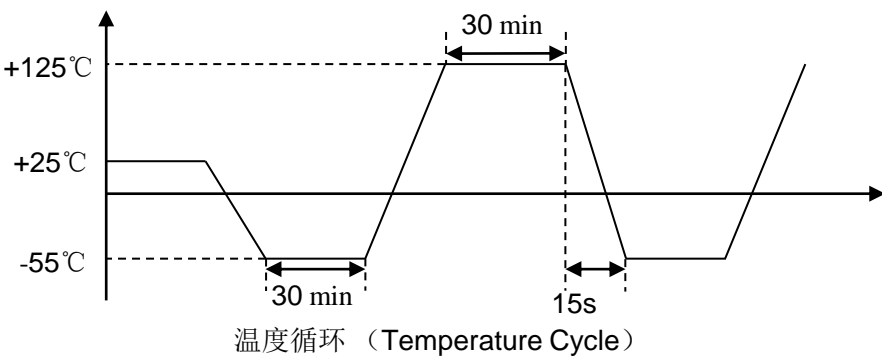
- (1) 代表公司Logo
- (2) 代表标称频率
- (3) 代表批次号

3.0 内部构造图 / Product internal structure



质量 (参考值) : 0.005±0.002 g/pcs			
NO.	COMPONENETS	MATERIALS	SPECIFICATIONS
1	LID	Kovar (Fe/Co/Ni)	-
2	Package	Ceramic (Al ₂ O ₃) + Kovar (Fe/Co/Ni)+ Ag/Cu	Color Blank
3	Pad	Au	Tungsten metalize+ Ni plating+ Au plating
4	Crystal blank	SiO ₂	-
5	Conductive adhesive	Resin+Ag	Silicon resin
6	Electrode	Noble Metal	-

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 $-55\pm 5^{\circ}\text{C}$ for 1000 ± 12 hrs then $25\pm 2^{\circ}\text{C}$ 2 hrs before testing	
A.2	耐高温性 (耐热性) 测试 (Heat resistance)	(I)
	Stored at $125\pm 5^{\circ}\text{C}$ for 1000 ± 12 hrs then $25\pm 2^{\circ}\text{C}$ 2 hrs before testing	
A.3	耐湿热性 (Humidity Resistance Result)	(I)
	稳态温度: $85\pm 2^{\circ}\text{C}$; 湿度: $85\pm 3\% \text{RH}$; 时间: 500h; Steady temperature: $85\pm 2^{\circ}\text{C}$; humidity: $85\pm 3\% \text{RH}$; time: 500h	
A.4	老化测试 (Aging)	(I)
	Stored at $85\pm 5^{\circ}\text{C}$ for 720 ± 12 Hrs then $25\pm 2^{\circ}\text{C}$ 2 Hrs before testing Stored at $25\pm 2^{\circ}\text{C}$ for 1 year	
A.5	气密性 (Leakage)	(IV)
	细漏 Fine leak: Put the product in the Helium pressure tank, $4 \sim 5 \text{kgf/cm}^2$, 1hrs.	
A.6	温度循环 (Temperature Cycle)	(I)
	<p>$-55^{\circ}\text{C} \sim 125^{\circ}\text{C}$, Retain 30Min, 100 cycles</p>  <p>温度循环 (Temperature Cycle)</p>	

SMD2016	QUARTZ CRYSTAL UNIT	MDH P/N		2.2.1.260000804	
		REV.	02	PAGE	8/10

4.1 机械性能 / Mechanism characteristics

B.1	跌落测试 (Drop Test)	(II)
	Device are dropped from a height of 75 cm onto 20mm thickness hard floor, 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	
B.3	耐焊接热 (手工)	(II)
	Resistance to soldering heat (Hand soldering method)	
	温度: 370~400℃; 时间: 3~4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)	(III)
	260±5℃, 3±0.5s	
B.5	耐焊接热 (Reflow) Resistance to soldering heat (Reflow)	(II)
	265±10℃; >10s; 3Times	
<p>耐焊接热 (Reflow) Resistance to soldering heat (Reflow)</p> <p>260±5℃ ; 10S ; 2Times</p> <p>Reflow:温度曲线图</p> <p>■ SUGGESTED REFLOW PROFILE</p> <p>Solder melting point :220±10℃, 60 sec. min.</p> <p>Peak temperature: 260 ± 5℃, 10 sec. max.</p> <p>SUGGESTED MANUAL SOLDER CONDITION</p> <p>Temperature: 350±10℃</p> <p>Time: 3 sec.</p> <p>Re-solder times:twice</p>		(I)

SMD2016

QUARTZ CRYSTAL UNIT

MDH P/N

2.2.1.260000804

REV.

02

PAGE

9/10

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 $<10\Omega$ 或规格电阻的20%, 取大者 Frequency variation $<\pm 10\text{ppm}$; Resistance variation $<10\Omega$ or 20% of RR spec., select the bigger value.
2	(II)	频率变化 $<\pm 5\text{ppm}$; 电阻变化 $<5\Omega$ 或规格电阻的20%, 取大者 Frequency variation $<\pm 5\text{ppm}$; Resistance variation $<5\Omega$ or 20% of RR spec., select the bigger value.
3	(III)	上锡覆盖率高于95% The covering rate of Tin-plating is more than 95%.
4	(IV)	$<1 \cdot 10^{-9}\text{Pa}\cdot\text{m}^3/\text{s}$ Max

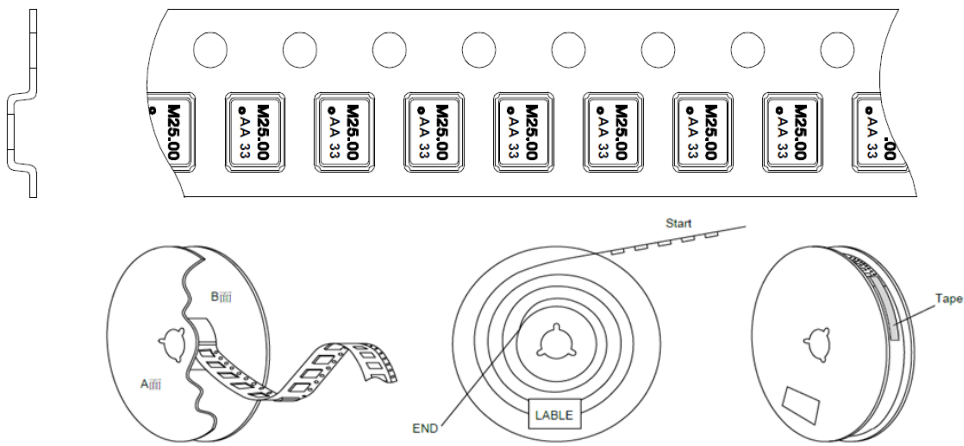
SMD2016	QUARTZ CRYSTAL UNIT	MDH P/N	2.2.1.260000804		
		REV.	02	PAGE	10/10

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
 YanTai MDH Technology Co.,Ltd

四川明德亨电子科技有限公司
 SiChuan MDH Technology Co.,Ltd

5.1 包装规格 Package specification



Standard Reel Quantity is 3,000 pcs per reel

