

SPECIFICATION FOR APPROVAL

规格承认书

Product Name 产品名称 SEAM SMD2016 QUARTZ CRYSTAL

Part Description 产品型号: SEAM SMD2016 24MHZ 9PF ± 10 PPM ROHS

Porcelain gold Part No 物料编码 : 82EA024000-09401000

Date 日期: 2026-07-14

CUSTOMER APPROVED BY 顾客承认章

REDACTOR:

姜之恒

APPROVER:

吴子健

瓷金科技（登封）有限公司

CiJin KeJi(Deng Feng) Technology Co., Ltd.

公司地址: 河南省郑州市登封市中岳街道先进制造业开发区创新创业科技园 7 号楼 4 层

电话: 0755-21380851

传真: 0755-21380851

Tel: 0755-21380851

Fax: 0755-21380851

E-mail: 646443499@qq.com

CONTENT 目录

ITEM项目	Page页
1. Electrical Specification 电气性能	02
2. Solder Dimension And Pattern 焊接模型尺寸图	03
3. Equivalent Circuit: 等效电路图	03
4. Structure drawing 结构图	03
5. Reliability Specification 可靠性说明	04
6. Marking specification 标识说明	05
7. Type & Reel 编带类型及卷盘	05
8. Packing Specification 包装说明	07

1. Electrical characteristics 电气性能

Items 项目	Symbol 符号	Specification 规格说明			Unit 单位	Notes
		Min 最小	Typ 标准	Max 最大		
Model No 型号		SEAM SMD 2016				
Blank Cutting Mode 晶片切型		AT FUND.				
Nominal Frequency 标称频率	FL	24.000000			MHz	
Oscillation Mode 振荡模式		■ Fundamental □ 3rd				
Load Capacitance 负载电容	CL		9		pF	
Frequency Stability 频率公差		-10ppm		10ppm	ppm	
Operating Temperature 工作温度	Topr	-20		70	℃	±10PPM
Storage Temperature 储存温度	Tstg	-40	~	85	℃	
Drive Level 驱动功率	DL		100		uW	
Effective Resistance RR 等效电阻	Rr	-	-	40	Ω	-
Shunt Capacitance C0 并联电容	C0	-	-	7	pF	-
Motional Capacitance C1 动态电容	C1	-	-	NA	fF	-
Insulation Resistance 绝缘电阻	Rins	500	-	-	MΩ	at DC 100V
Aging:老化率		-6		0	ppm	Per year
Weight 重量			0.006		g	

Remark备注:**Measure equipment测量设备 :**

Electrical characteristics measured by S&A 250B or equivalent.

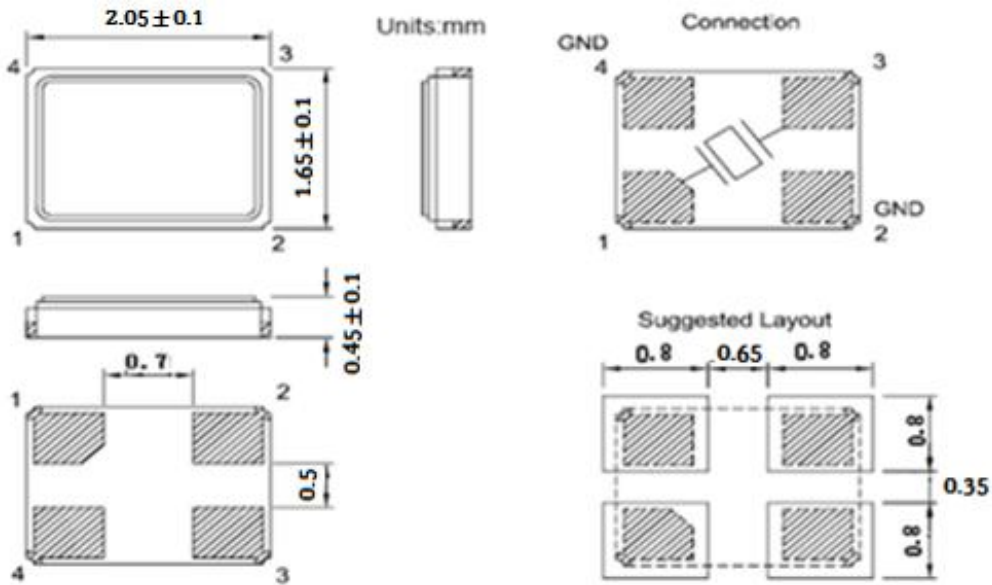
电气性能测量为S&A 250B或相当设备。

Hermetically密封性 :

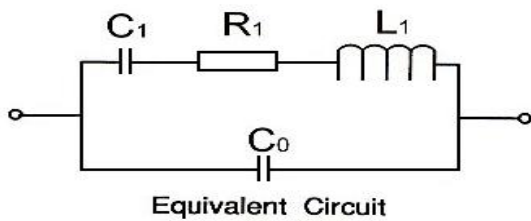
Fine Leak细漏: Helium Bombing 4kg/cm² for 1 Hour, Leak ate Less Than 1×10⁻⁹ atm.cc/sec

氦气加压4kg/cm²1小时, 氦质谱检漏仪检测泄漏小于1×10⁻⁹ atm.cc/sec

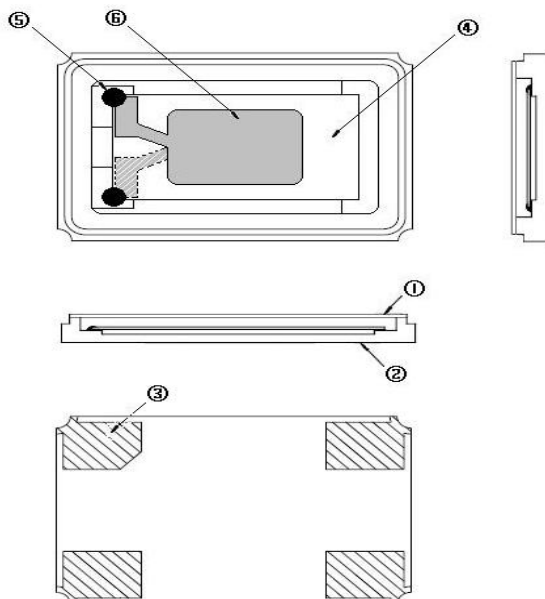
2. Solder Dimension And Pattern 封装模型尺寸图:



3、Equivalent Circuit 等效电路图:

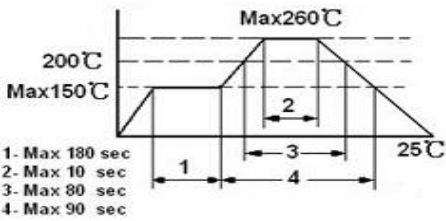


4. Structure drawing 结构图:



NO	COMPONENTS 构成	MATERIALS 原料	QTY 数量	FINISH / SPECIFICATIONS 结束/说明
1	Cap上盖	Metal (Fe) 金属	1	-
2	Base基座	Ceramic陶瓷制品	1	Color black炭黑色
3	PAD焊盘	Au金	4	Tungsten metalize钨合金 + Ni plating镍电镀 + Au plating金电镀
4	Crystal Blank石英晶片	SiO ₂ 二氧化硅	1	-
5	Conductive Adhesive 导电粘合剂	Ag银	3	Silicone硅树脂
6	Electrode电极	Ag银	1	-

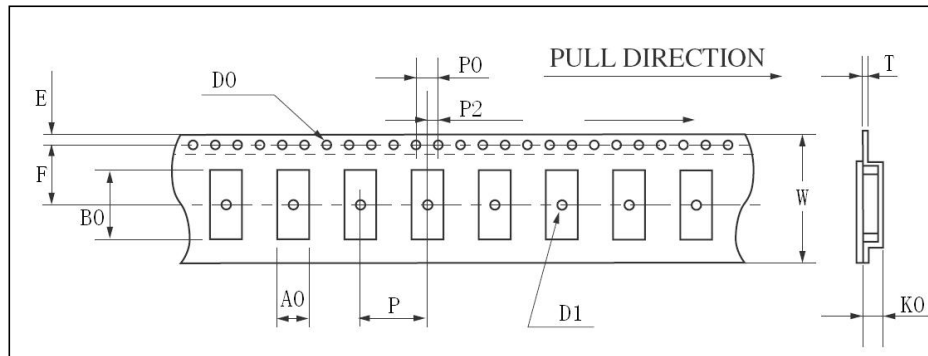
5. Reliability Specification可靠性说明

	Item 项目	Condition 条件	Standard 标准
1.	Drop characteristics 跌落特性	Free drop from 100cm height on a hard wooden board for 3 times. (Board is thickness more than 30 mm.)	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
2	Mechanical shock 机械冲击	Device are shocked to half sine wave (1000g) three mutually perpendicular axes each 3 times	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
3.	Shake characteristics 震动特性	Shake frequency 10~55Hz, cycl~2 minutes, swing 1.5mm, direction x/y/z, all 30 minutes, test after 1 hours.	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
4.	Humidity characteristics 湿度特性	+85 $\pm$ 2 $^{\circ}\text{C}$ & 80%~85% R.H. 168 hours	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
5.	Low temperature characteristics 低温特性	-40 $\pm$ 2 $^{\circ}\text{C}$, 168 hours, put in room temperature, test after 1 hours.	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
6.	High temperature characteristics 高温特性	+85 $\pm$ 2 $^{\circ}\text{C}$, 168 hours, put in room temperature, test after 1 hours.	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
7.	Temperature cycling 温度循环	-30 $\pm$ 3 $^{\circ}\text{C}$ /30 $\pm$ 3 min~+85 $\pm$ 2 $^{\circ}\text{C}$ /30 $\pm$ 3min, 5 cycles	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
8.	Refluence examination 回流焊特性	 1. Max 180 sec 2. Max 10 sec 3. Max 80 sec 4. Max 90 sec	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification

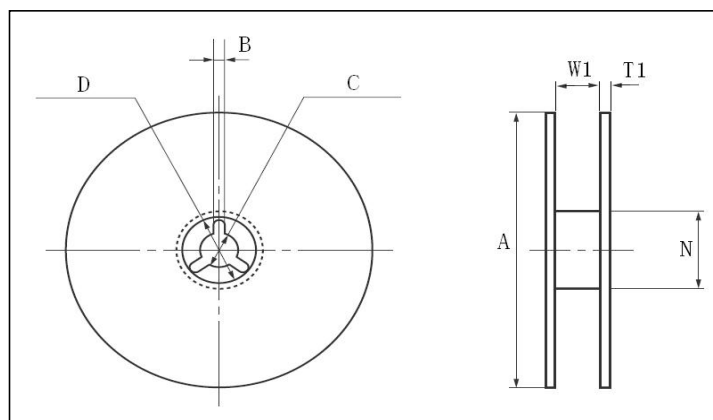
6. Marking specification标识说明



7. Type & Reel编带类型及卷盘



	7040	5032	3225	2520	2016
W	16.00±0.30	12.00±0.05	8.00±0.05	8.00±0.05	8.00±0.05
E	1.75±0.10	1.75±0.10	1.75±0.05	1.75±0.05	1.75±0.05
F	7.5±0.10	5.5±0.10	3.5±0.05	3.5±0.05	3.5±0.10
T	0.35±0.05	0.30±0.05	0.25±0.03	0.25±0.03	0.20±0.05
P	8.00±0.10	8.00±0.10	4.00±0.05	4.00±0.05	4.00±0.10
P0	4.00±0.10	4.00±0.10	4.00±0.05	4.00±0.05	4.00±0.10
P2	2.00±0.10	2.00±0.10	2.00±0.05	2.00±0.05	2.00±0.10
D0	φ 1.50±0.10	φ 1.50±0.10	φ 1.50±0.10	φ 1.50±0.10	1.00±0.10
D1	φ 1.50MIN	φ 1.50MIN	φ 1.00MIN	φ 1.00MIN	1.10±0.10
A0	4.50±0.10	3.50±0.10	2.70±0.05	2.25±0.05	1.80±0.05
K0	2.50±0.10	1.60±0.10	1.50±0.10	0.70±0.10	0.65±0.10
B0	8.00±0.15	5.20±0.10	3.50±0.05	2.75±0.05	2.20±0.10



	7040	5032	3225	2520	2016
A	$\phi 330 \pm 1.0$	$\phi 178 \pm 2.0$	$\phi 178 \pm 2.0$	$\phi 178 \pm 2.0$	$\phi 178 \pm 2.0$
B	2.30 ± 0.20	2.00 ± 0.50	2.50 ± 0.50	2.50 ± 0.50	2.50 ± 0.50
C	$\phi 13.2 \pm 0.20$	$\phi 13.2 \pm 0.20$	$\phi 13.5 \pm 0.20$	$\phi 13.5 \pm 0.20$	$\phi 13.5 \pm 0.20$
D	$\phi 10.7 \pm 0.20$	$\phi 20.0 \pm 0.50$	$\phi 56.8 \pm 0.50$	$\phi 56.8 \pm 0.50$	$\phi 56.8 \pm 0.50$
N	$\phi 100.0 \pm 0.5$	$\phi 60.5 \pm 1.0$	$\phi 60.5 \pm 1.0$	$\phi 60.5 \pm 1.0$	$\phi 60.5 \pm 1.0$
W1	24 ± 0.20	12.5 ± 0.20	9.4 ± 0.30	9.4 ± 0.30	9.4 ± 0.30
T1	2.10 ± 0.20	1.80 ± 0.20	1.40 ± 0.20	1.40 ± 0.20	1.40 ± 0.20

8. Packing Specification 包装说明

1. 每盘数量：3000PCS

每箱数量：120000PCS

