

SMD Crystal Resonator
3225 24.000MHz 09PF 40 Ω ±10PPM
Electrical characteristics

Items	Symbol	Specification			Unit	Notes
		Min	Typ	Max		
Model No		Seam Seal 3225				
Blank Cutting Mode		AT FUND.				
Nominal Frequency	FL	24.000000			MHz	
Oscillation Mode		<input checked="" type="checkbox"/> Fundamental <input type="checkbox"/> 3rd				
Load Capacitance	CL		09		pF	
Frequency Tolerance at 25 degrees		-10		10	ppm	
Operating Temperature	Topr	-20		70	°C	
Storage Temperatur	Tstg	-40	~	85	°C	
Drive Level	DL		100		uW	
Trim Sensitivity/Pulling Factor	TS			-	ppm/ pf	
Effective Resistance RR	Rr	-	-	40	Ω	-
Typical Shunt Capacitance	C0	-	-	7	pF	-
Motional Capacitance C1	C1	-	-	NA	fF	-
Insulation Resistance	Rins	500	-	-	MΩ	at DC 100V
Aging		-3		+3	ppm	Per year
Weight			0.018		g	

Remark: Sample Data See Attachment
Measure equipment:

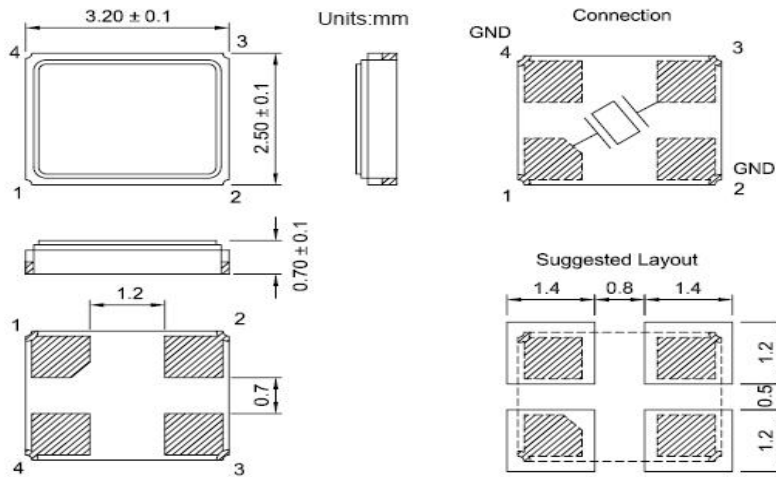
Electrical characteristics measured by S&A 250B or equivalent.

Hermetically:

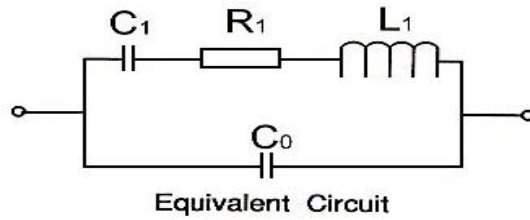
Fine Leak: Helium Bombing $4\text{kg}/\text{cm}^2$ for 1 Hour, Leak at Less Than 1×10^{-8} atm. cc/sec

Gross Leak: 125°C FC#40 , 120 Seconds, No Bubble

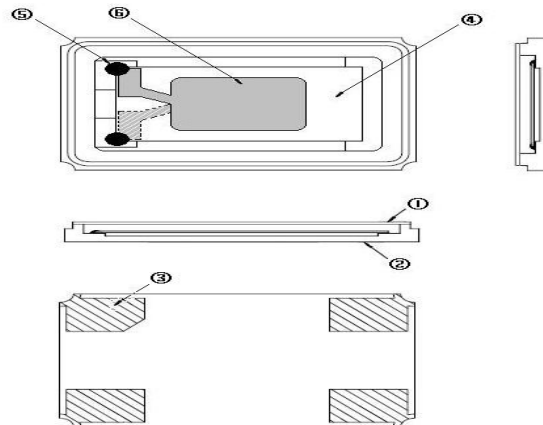
Solder Dimension And Pattern:



Equivalent Circuit:

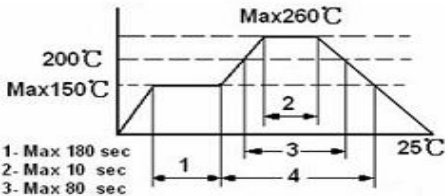


Structure drawing:

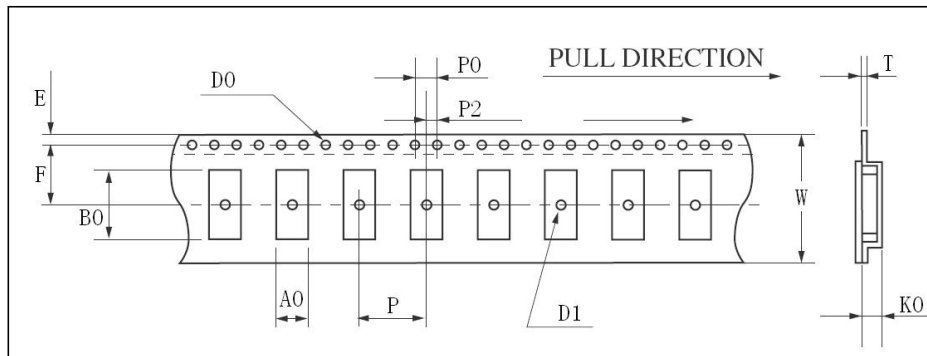


NO	COMPONENTS	MATERIALS	QTY	FINISH / SPECIFICATIONS
1	Cap	Metal (Fe)	1	-
2	Base	Ceramic	1	Color black
3	PAD	Au	4	Tungsten metalize + Ni plating + Au plating
4	Crystal Blank	SiO ₂	1	-
5	Conductive Adhesive	Ag	4	Silicone
6	Electrode	Ag+ Cr	2	-

Reliability Specification

	Item	Condition	Standard
1.	Drop characteristics	Free drop from 75cm 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	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	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	+40 \pm 2 $^{\circ}$ C & 90%~95% R.H. 250 hours	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
5.	Low temperature characteristics	-40 \pm 2 $^{\circ}$ C , 250 hours, put in room temperature, test after 1 hours.	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
6.	High temperature characteristics	+85 \pm 2 $^{\circ}$ C , 250 hours, put in room temperature, test after 1 hours.	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
7.	Temperature cycling	-30 \pm 3 $^{\circ}$ C/30 \pm 3 min~+85 \pm 2 $^{\circ}$ C/30 \pm 3min, 5 cycles	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification
8.	Refluence examination	 <p>1- Max 180 sec 2- Max 10 sec 3- Max 80 sec 4- Max 90 sec</p>	Frequency change: $\leq \pm 5\text{ppm}$ Rr as specification

Type & Reel



	HC-49SMD	5032	3225	2520	2016
W	24.00±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	11.5±0.10	5.5±0.10	3.5±0.05	3.5±0.05	3.5±0.10
T	0.40±0.05	0.30±0.05	0.25±0.03	0.25±0.03	0.20±0.05
P	12.00±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	4.60±0.10	3.50±0.10	2.70±0.05	2.25±0.05	1.80±0.05
K0	4.40±0.10	1.60±0.10	1.50±0.10	0.70±0.10	0.65±0.10
B0	14.20±0.15	5.20±0.10	3.50±0.05	2.75±0.05	2.20±0.10