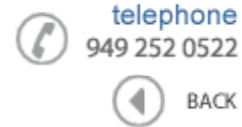


**Data Sheet**

Product Category: SMD Quartz Crystal

Series Number	Package	Description	Last Modified
223	SMD	32.768 KHz Crystal	Jan. 01 2008

FEATURES

- Low profile
- Tape & Reel
- Long term stability
- Industry standard footprint
- Excellent shock resistance
- Excellent environmental characteristics
- RoHs / Lead Free compliant

**OPERATING CONDITIONS / ELECTRICAL CHARACTERISTICS**

PARAMETERS		CHARACTERISTICS	UNITS
Nominal Frequency	f_0	32.768 (typ.)	KHz
Calibration Tolerance	@25°C	±20	PPM
Turnover Temperature	T_O	+25 ±5	°C
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-55 ~ +125	°C
Equivalent Series Resistance	R_1	50 max.	Kohm
Load Capacitance	C_L	12.5 (typ.) / 6.0 (Optional)	pF
Motional Capacitance	C_1	0.003 (typ.)	pF
Shunt Capacitance	C_0	1.35 (typ.)	pF
Temperature Coefficient	-	-0.040 PPM / °C² max.	PPM/(ΔC°)
Drive Level	D_L	1 max.	μW
Insulation Resistance	IR	500 min. DC 100V	Mohm
Aging (First Year)	@25°C	±3 PPM max.	PPM
Q Factor	Q	50,000 min.	-

PACKAGE DIMENSIONS (mm)

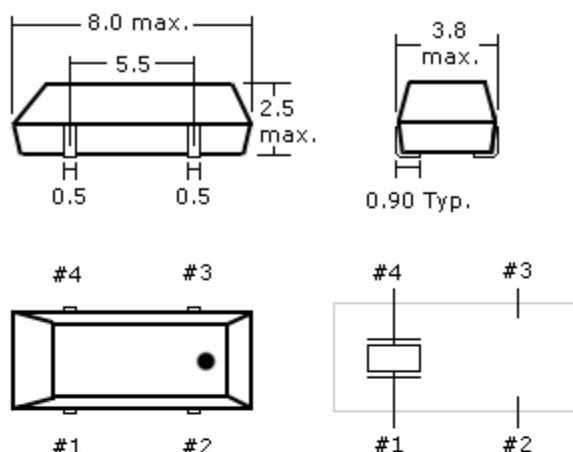


Figure 1) Pin Connection

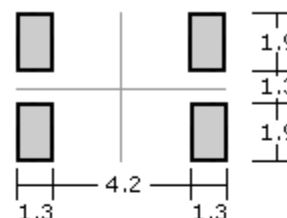
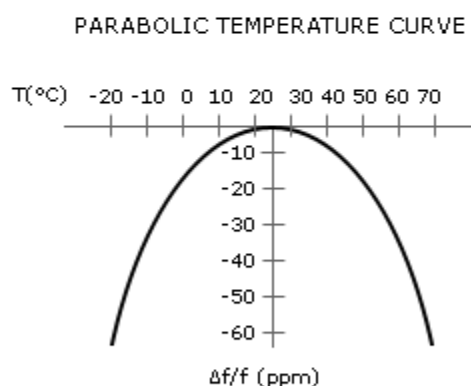


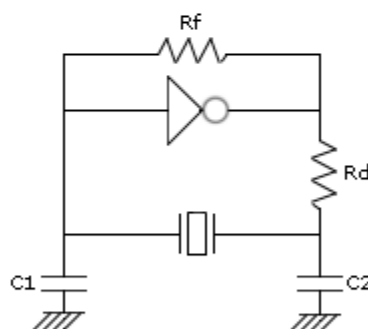
Figure 2) Land Pattern - Top View



To determine frequency stability, use parabolic curvature.
For example: What is the stability at 45°C?

- 1) Change in $T(^{\circ}\text{C}) = 45 - 25 = 20^{\circ}\text{C}$
- 2) Change in frequency = $-0.04\text{ppm} \times (\Delta T)^2$
 $= -0.04\text{ppm} \times (20)^2$
 $= -16.0\text{ppm}$

RECOMMENDED OSCILLATION CIRCUIT



ELECTRICAL CHARACTERISTICS

IC: TC 4069P
 Rf: 10 Megohms
 Rd: 330 Kohms (As required)
 C1 = 22pF, C2 = 22pF
 Vdd = 3.0V

In this circuit, low drive level with a maximum of 1uW is recommended. If excessive drive is applied, irregular oscillation or quartz element fractures may occur.

PART NUMBER GUIDE

Size	Frequency	Load Capacitance	Part Number	Option	Packaging
SMD	32.768	12.5	223-000312-20	Blank* = RoHs / Lead Free compliant -LF = RoHs / Lead Free compliant *ALL parts are RoHs / Lead Free as of Jan 2006.	Blank* = Bulk -TR = Tape and Reel
		6.0	223-000306-20		

NOTE: - Deviations on all parameters available. Please consult Oscilent for details.

DEFINITIONS: - Click on the characteristic names above, for definitions of the particular characteristic.

***STANDARDS:** - "Blank" part number selections, indicate standard variables for the particular characteristic.

Oscilent Corporation - CALL 949.252.0522

Series No.: 223

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