Hy-Q International

PRODUCT INFORMATION

AT - CUT STANDARD QUARTZ CRYSTALS

ORDERING INFORMATION

THE 3 COLUMN ORDERING CODE FOR CRYSTAL UNITS

Crystal units can be requested using International specifications (such as MIL, BS or IEC), or by the Hy-Q 3 column code ordering system Fig.1

The first column consists of two letters, specifying the operating temperature range and frequency stability over that range. The stability is quoted as a frequency tolerance in parts per million (ppm) relative to the actual frequency at the reference temperature. For non-temperature controlled crystal units, the reference temperature is 25˚C, otherwise it is nominal oven temperature. Available combinations of the two letters are shown in Fig. 2

The second column is a 2-digit code giving the preferred value of the calibration tolerance (in ppm). This is the tolerance to which the crystal frequency will be set at the reference temperature.

The third column is a single letter giving the preferred value of load capacity (in pF).

DEGREE OF MANUFACTURING DIFFICULTY

It is important to note that crystal unit cost increases with degree of manufacturing difficulty. As Fig.2 shows, the degree of manufacturing difficulty increases rapidly as requirements on operating temperature range (first letter of first column) and frequency tolerance (second letter of first column) are tightened.

SPECIAL REQUIREMENTS

In cases where the Hy-Q 3 column ordering code is insufficient to describe a particular set of requirements, the following essential data is required for manufacture:-

Nominal frequency.....MHz
Overtone order Fund 3rd 5th 7th 9th
Holder style.....
Circuit condition Series resonant
Load resonant pF Load
Calibration tolerance.....ppm
Operating temperature.....tempertaure˚C
Operating temperature range.....to.....˚C
Tolerance over temperature range..... ppm

In addition, the following parameters may need to be specified:-

Maximum equivalent series resistance (ESR)..... ohms
Shunt capacitance..... pF ± ..... %
Motional capacitance..... fF ± ..... %
Motional inductance..... mH ± ..... %
Drive level..... mW
Ageing (per year)..... ppm Max.

Our engineers will be pleased to assist in formulating a specification appropriate for any application and discuss the theoretical and practical limitations of any parameters.

IMPORTANT NOTE

When ordering crystal units with a frequency available in more than one mode, it is essential to specify both the frequency and the mode. for example, 75MHz within the 3rd and 5th overtone orders (see date sheet). When ordering a 75MHz crystal it is essential to quote the mode, because the parameters of the two types of crystal unit are different. The minimum information required when ordering is:-

Nominal frequency (MHz)
Overtone order (Fundamental,3rd,5th,7th, or 9th).
Holder style
3-column ordering code (refer next page)
Or other information.
Quantity required.

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PRODUCT INFORMATION

THREE COLUMN CODE AT-CUT CRYSTALS

FIRST COLUMN

CODE

CODE	TEMP RANGE ˚C	CODE	FREQ TOL ppm
A	- 55 to + 105	A	±100
B	- 40 to + 90	B	±50
C	- 30 to + 80	C	±30
D	- 25 to + 75	D	±25
E	- 20 to + 70	E	±20
F	- 15 to + 65	F	±15
G	- 10 to + 60	G	±10
H	- 5 to + 55	H	±7.5
J	0 to + 50	J	±5
K	+ 5 to + 45	M	±4
L	+10 to + 40	K	±3
		L	±2

OVENIZED CRYSTAL CODES
STABILITY ±0.5ppm PER
˚C OVER ±2 ˚C

CODE	TEMP
TR	45
TS	50
TT	55
TU	60
TV	65
TW	70
TX	75
TY	80
TZ	85

SECOND COLUMN

CODE	CAL TOL ppm
01	±50
02	±30
03	±20
04	±15
05	±10
06	±7.5
07	±5
08	+ 45 to + 65
09	+ 35 to + 55
10	+ 25 to + 45
11	+ 20 to + 40
12	+ 15 to + 35
13	+ 10 to + 30
14	+ 5 to + 25
15	0 to + 20
16	- 5 to + 15
17	- 15 to + 5
18	- 20 to 0
19	- 25 to - 5
20	- 30 to - 10
21	- 35 to - 15
22	- 40 to - 20
23	- 45 to - 25
24	- 50 to - 30
25	- 55 to - 35
26	- 60 to - 40
27	- 65 to - 45
28	- 70 to - 50
29	- 75 to - 55

THIRD COLUMN

CODE	CCT COND pF
A	10
B	15
C	20 *
D	25
E	30 *
F	32
G	40
H	45
I	—
J	50
K	60
L	70
M	80
N	90
O	—
P	100
Q	18
R	150
S	SERIES *
T	35
U	55
V	65
W	75
X	85
Y	95
Z	12

* PREFERRED VALUES

Fig. 1

AVAILABLE FIRST COLUMN CODE COMBINATIONS													
		A ±100	B ±50	C ±30	D ±25	E ±20	F ±15	G ±10	H ±7.5	J ±5	M ±4	K ±3	L ±2
A	- 55 to + 105	1	1	2	2	4	☎	☎	☎	☎	☎	☎	☎
B	- 40 to + 90	1	1	2	2	2	3	4	☎	☎	☎	☎	☎
C	- 30 to + 80	1	1	1	2	2	2	3	4	☎	☎	☎	☎
D	- 25 to + 75	1	1	1	1	2	2	2	3	4	☎	☎	☎
E	- 20 to + 70	1	1	1	1	2	2	2	3	4	☎	☎	☎
F	- 15 to + 65	1	1	1	1	2	2	2	3	3	4	☎	☎
G	- 10 to + 60	1	1	1	1	1	2	2	2	3	3	4	☎
H	- 5 to + 55	1	1	1	1	1	1	2	2	2	3	3	4
J	0 to + 50	1	1	1	1	1	1	2	2	2	2	3	4
K	+ 5 to + 45	1	1	1	1	1	1	1	1	2	2	2	2
L	+ 10 to + 40	1	1	1	1	1	1	1	1	1	1	2	2

Fig. 2

DEGREE OF MANUFACTURING DIFFICULTY

1	2	3	4	☎

☎ CONSULT OUR TECHNICAL DEPARTMENT

MINIMUM ORDER INFORMATION

- NOMINAL FREQUENCY
- OVERTONE ORDER - FUNDAMENTAL, 3rd, 5th, or 7th
- HOLDER STYLE
- THREE COLUMN CODE
- QUANTITY REQUIRED

EXAMPLES:

1. TEMPERATURE RANGE AND FREQUENCY TOLERANCE:
- 10˚ C to + 60˚ C AND ±15ppm. CALIBRATION TOLERANCE: ±20ppm
CIRCUIT CONDITION: 32pF INPUT CAPACITY. CODE = GF 03 F

2 TEMPERATURE AND FREQUENCY TOLERANCE:
+ 70˚ C (±2˚ C) AND ±1ppm. CALIBRATION TOLERANCE: ±10ppm
CIRCUIT CONDITION: SERIES RESONANCE CODE = TW 05 S

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