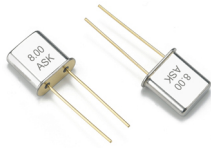


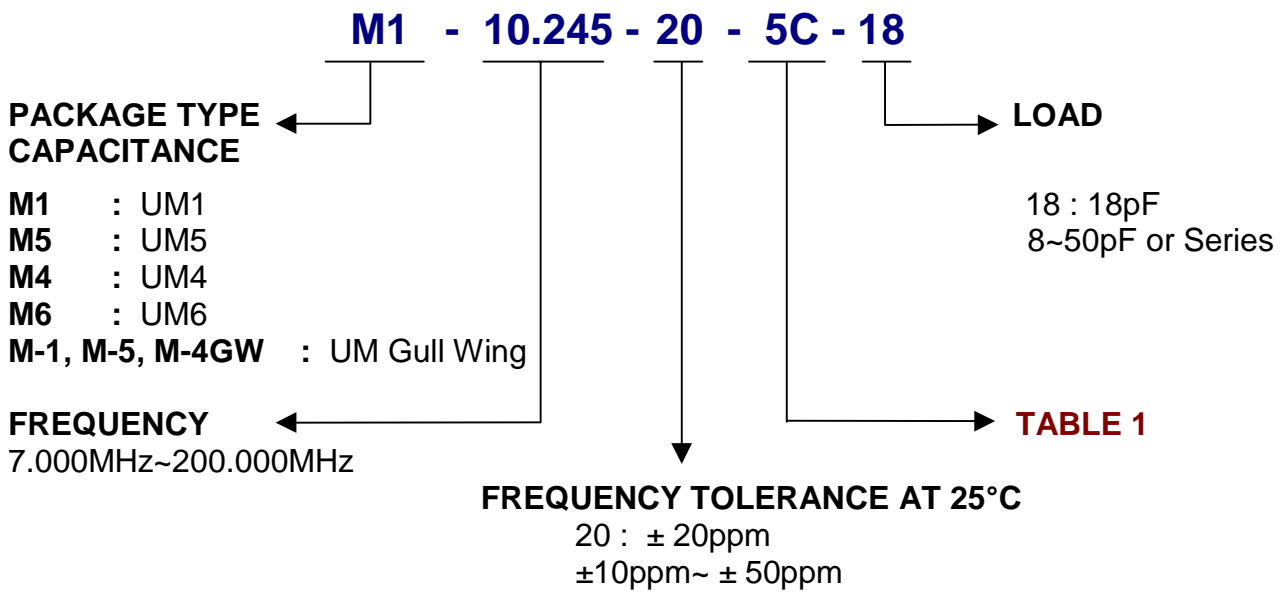
## M Series



- UM Type package
- AT cut available
- Tight tolerance / stability
- Wide temperature range
- Frequencies to 200.000MHz available



### PART NUMBER GUIDE



### ELECTRICAL SPECIFICATIONS

| MODEL  | X1S                  |
|--|----------------------|
| Frequency Range                                      | 10.245MHz            |
| Operating Temperature Range                          | -10 to +70°C         |
| Storage Temperature Range                            | -40 to +85°C         |
| Frequency Tolerance (at 25°C)                        | ±20ppm               |
| Frequency Stability over Operating Temperature Range | ±50ppm               |
| Load Capacitance (CL)                                | 18pF                 |
| Drive Level  | 0,01 to 1000 µW      |
| Shunt Capacitance (Co)                               | 7pF Max              |
| Aging (at 25°C)                                      | 5ppm/year Max        |
| Insulation Resistance                                | 500 MΩ Min at 100VDC |

**E.S.R (Equivalent Series Resistance)**

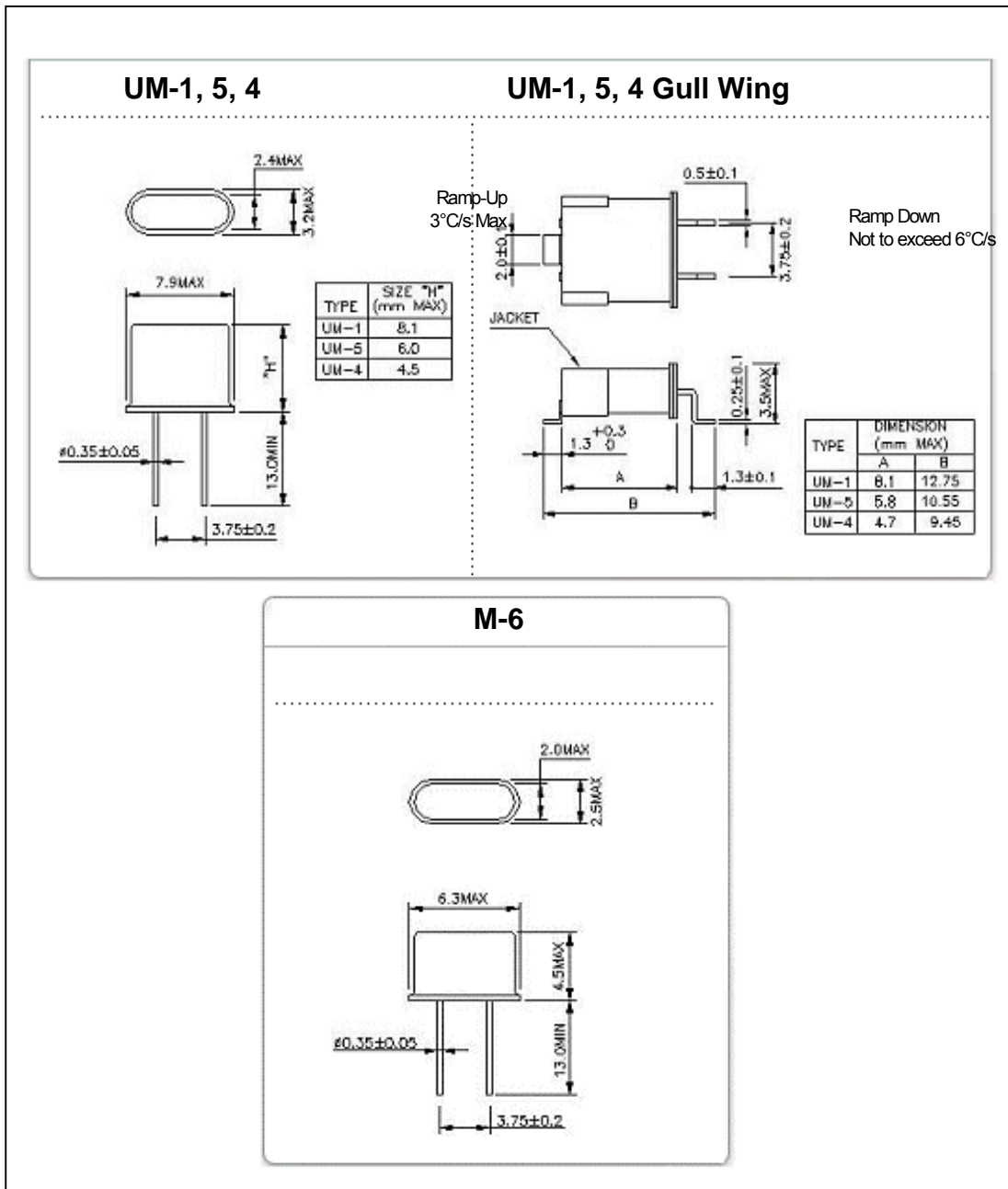
| Frequency Range (MHz) | ESR (Max)    | Mode of Oscillation | Package                   |
|-----------------------|--------------|---------------------|---------------------------|
| 7.000~9.999           | 80           | Fundamental         | UM-1                      |
| 10.000 ~ 15.999       | 60           | Fundamental         | UM-1 / UM-5 / UM-4 / UM-6 |
| 16.000 ~ 60.000       | 30 / 40 / 50 | Fundamental         | UM-1 / UM-5 / UM-4 / UM-6 |
| 30.000~79.999         | 80 / 80      | 3rd Overtone        | UM-1 / UM-5               |
| 80.000 ~ 150.000      | 80 / 80 / 80 | 3rd Overtone        | UM-1 / UM-5 / UM-4 / UM-6 |
| 80.000~200.000        | 100 / 100    | 5th Overtone        | UM-1 / UM-5               |

\* : Available

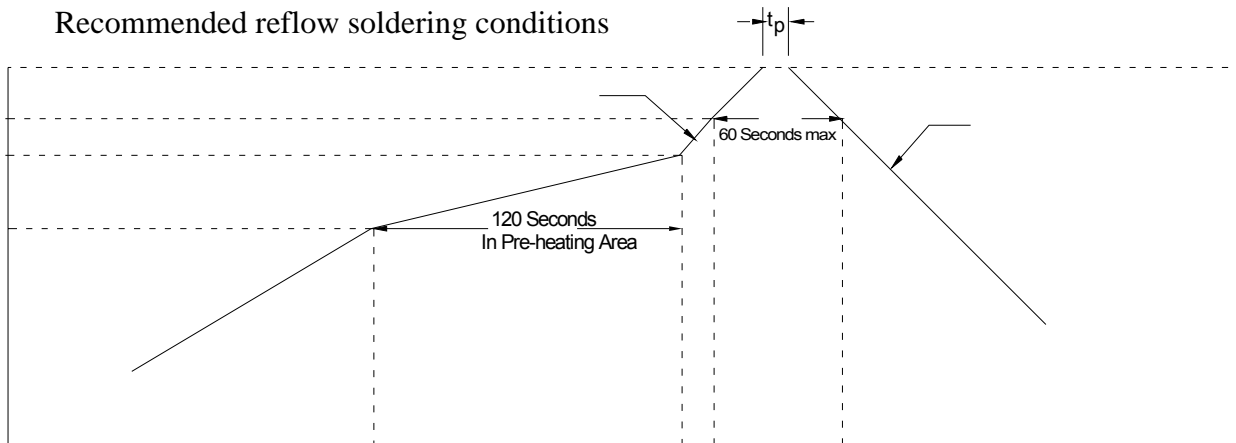
**TABLE 1**

| FREQUENCY STABILITY VS. TEMPERATURE RANGE |           |     |     |     |     |     |      |
|---|-----------|-----|-----|-----|-----|-----|------|
| Temp                                      | Stability | ±10 | ±15 | ±20 | ±30 | ±50 | ±100 |
|   |           | 1   | 2   | 3   | 4   | 5   | 6    |
| 0~+70°C                                   | <b>A</b>  | *   | *   | *   | *   | *   | *    |
| -10~+60°C                                 | <b>B</b>  | *   | *   | *   | *   | *   | *    |
| -20~+70°C                                 | <b>C</b>  | *   | *   | *   | *   | *   | *    |
| -40~+85°C                                 | <b>D</b>  |     |     | *   | *   | *   | *    |
| -40~+90°C                                 | <b>E</b>  |     |     | *   | *   | *   | *    |
| -40~+105°C                                | <b>F</b>  |     |     |     | *   | *   | *    |

MECHANICAL DIMENSION



Recommended reflow soldering conditions



RoHS compliance - Reflow soldering temperature : 260°C max.

## ENVIRONMENTAL / MECHANICAL SPECIFICATIONS

## RELIABILITY TEST SPECIFICATION

| Test item                                  | Equipment                              | Condition  | Specification   |
|--|--|--|---|
| 1.SOLDERABILITY TEST                       | ASK-REL001、RC-328A                     | 1.Soldering Temperature:235±5℃,<br>DIPPING time:5±0.5S<br>2.Soldering Temperature:260±5℃,<br>DIPPING time:10±1S              | 1. MIL-STD-883CMETHOD 2003.7<br>2. MIL-STD-202F,METHOD 210A |
| 2. HERMETICITY TEST                        | UL-306S                                | Miss and do not control roughly (hubble-bubble machine); Nothing air bubble creation s thin leave out 1 * 10 E-8 ATM.CC/SEC. | MIL-STD-883C METHOD 1014.9                                  |
| 3. VIBRATION TEST                          | HG-V4、S&A 250B                         | Enable Crystal(10g) from 10-55-10Hz,X、Y、 Z horizontal,1 Minute vibration/time, 1time/ 2 hours.                               | JIS C5025 TEST A<br>MIL-STD-883C,METHOD 2007.2              |
| 4. MECHANICAL SHOCK                        | HPC-200、S&A 250B                       | Enable Crystal 50G(490m/s <sup>2</sup> ) time=11 ms speed=3.4 m/s half sine wave oscillation                                 | JIS C5026<br>MIL-STD-883C,METHOD 2002                       |
| 5. DROP TEST                               | HARD BOARD.S&A250B                     | 75CM HIGH,3 TIMES ON HARD BOARD  | 'JIS C6701  |
| 6. SALT SPRAY                              | H-SST-60、RC-328A                       | 5% NaCL,35℃±2℃ CHAMBER,48 hrs., PH:6.5~7.2   | JIS C5028 & MIL-STD-202F'METHOD 101D                        |
| 7. HIGH&LOW TEMP STORAGE TEST(Static test) | H-PTH-80CK & HM101-3ABN, S&A 350B/250B | High temperature: 125℃±2℃,1000hr;<br>Low temperature:-40℃±3℃,1000hrs   | MIL-STD-883C,METHOD 1011.8&<br>JIS C5030                    |
| 8. Temp & Hum cycling test                 | H-PTH-80CK CHAMBER , S&A 350B/250B     | Temperature:-10℃±2℃ ~ 65℃±2℃,<br>Humidity:93±3%,1 cycle need 24 hrs. 5cycles.  | MIL-STD-883C,METHOD 1010.7                                  |
| 9. HIGH TEM. & HUM. STORAGE TEST           | H-PTH-80CK CHAMBER , S&A350B/250B      | Temperature:40℃±2 , Humidity:85+3,-2%,Store 96 hrs   | JIS C5023   |
| 10. Aging test                             | H-PTH-80CK CHAMBER , S&A350B/250       | Temperature: 85℃±2, 1000hrs  | JIS C5031   |