**Pb Free** RoHS

## Product Features:
Low Cost
RoHs Compliant
Compatible with Leadfree Processing

## Applications:
Fibre Channel
Server & Storage
Sonet /SDH
802.11 / Wifi
T1/E1, T3/E3
System Clock



UM1 / UM4 / UM5
H Max.
12 Min.
3.75 ±0.2
0.35 ±0.05
8.0 Max.
3.2 Max.

| Part | Max. Height (H) |
|---|---|
| UM1 | 8.0 Max. |
| UM4 | 4.7 Max. |
| UM5 | 6.0 Max. |

UM1S / UM4S / UM5S
8.0 Max.
3.75 ±0.2
0.5
1.0 Min.
3.5 Max.
2.5
1.3
L Max.

| Part | Max. Length (L) |
|---|---|
| UM1S | 12.5 Max. |
| UM4S | 8.6 Max. |
| UM5S | 10.3 Max. |

Dimension Units: mm

| | |
|---|---|
| **Frequency** | 7 MHz to 160.000 MHz |
| **ESR (Equivalent Series Resistance)** | |
| 7.0 MHz – 9.9 MHz | 100 Ω Max. |
| 10.0 MHz – 14.9 MHz | 60 Ω Max. |
| 15 MHz – 29.9 MHz | 30 Ω Max. |
| 30 MHz – 36 MHz | 20 Ω Max. |
| 30 MHz – 49.9 MHz (3rd O.T.) | 70 Ω Max. |
| 50 MHz – 100 MHz (3rd O.T.) | 50 Ω Max. |
| 75 MHz – 160 MHz (5th O.T.) | 100 Ω Max. |
| **Shunt Capacitance (C0)** | 7 pF Max. |
| **Frequency Tolerance @ 25° C** | ±30 ppm Standard (see Part Number Guide for more options) |
| **Frequency Stability over Temperature** | ±50 ppm Standard (see Part Number Guide for more options) |
| **Crystal Cut** | AT Cut Standard |
| **Load Capacitance** | 18 pF Standard (see Part Number Guide for more options) |
| **Drive Level** | 1 mW Max. |
| **Aging** | ±5 ppm Max. / Year Standard |
| **Temperature** | |
| Operating | 0° C to +70° C Standard (see Part Number Guide for more options) |
| Storage | -40° C to +85° C Standard |
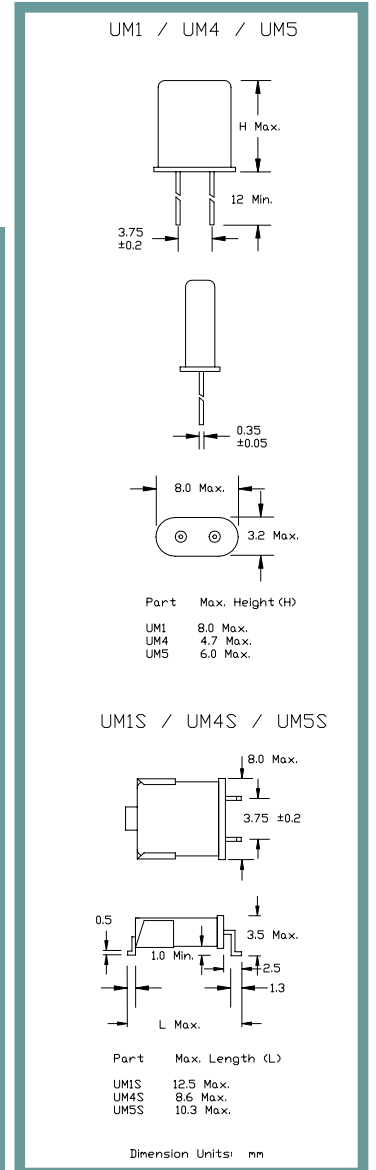
## Part Number Guide
**Sample Part Number:** UM1 - FB1F18 - 20.000

| Package | Stability (ppm) at Room Temperature | Stability (ppm) over Operating Temperature | Operating Temperature Range | Mode (overtone) | Load Capacitance (pF) | Frequency |
|---|---|---|---|---|---|---|
| UM1 - (8.0 mm H) UM4 - (4.7 mm H) UM5 - (6.0 mm H) | B = ±50 ppm | B = ±50 ppm | 0 = 0°C to +50°C | F = Fundamental | 18 pF Standard Or Specify | - 20.000 MHz |
| | F = ±30 ppm | F = ±30 ppm | 1 = 0°C to +70°C | 3 = 3rd overtone | | |
| | G = ±25 ppm | G = ±25 ppm | 2 = -10°C to +60°C | 5 = 5th overtone | | |
| | H = ±20 ppm | H = ±20 ppm | 3 = -20°C to +70°C | | | |
| | I = ±15 ppm | I = ±15 ppm** | 5 = -40°C to +85°C | | | |
| | J = ±10 ppm* | J = ±10 ppm** | 9 = -10°C to +50°C | | | |

\* Not available at all frequencies.   \*\* Not available for all temperature ranges.
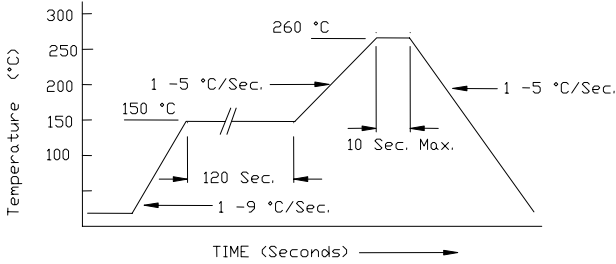
**Pb Free Solder Reflow Profile:**

**Typical Circuit:**

260 °C

1 –5 °C/Sec.

1 –5 °C/Sec.

150 °C

10 Sec. Max.

120 Sec.

1 –9 °C/Sec.

TIME (Seconds)

*Units are backward compatible with 240C reflow processes

Rf

Rlimit

Crystal

C1

C2
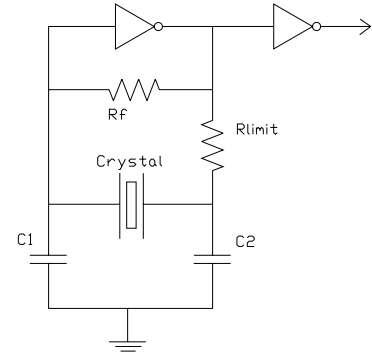
## Package Information:

MSL = 1
Termination = e1 (Sn / Cu / Ag over Ni over Kovar base metal).

## Environmental Specifications

| | |
|---|---|
| Thermal Shock | MIL-STD-883, Method 1011, Condition A |
| Moisture Resistance | MIL-STD-883, Method 1004 |
| Mechanical Shock | MIL-STD-883, Method 2002, Condition B |
| Mechanical Vibration | MIL-STD-883, Method 2007, Condition A |
| Resistance to Soldering Heat | J-STD-020C, Table 5-2 Pb-free devices (except 2 cycles max) |
| Hazardous Substance | Pb-Free / RoHS / Green Compliant |
| Solderability | JESD22-B102-D Method 2 (Preconditioning E) |
| Terminal Strength | MIL-STD-883, Method 2004, Test Condition D |
| Gross Leak | MIL-STD-883, Method 1014, Condition C |
| Fine Leak | MIL-STD-883, Method 1014, Condition A2, R1=2x10-8 atm cc/s |
| Solvent Resistance | MIL-STD-202, Method 215 |

## Marking

Line 1: ILSI
Line 2: Frequency
Line 3: Date Code