



**THE DATASHEET OF
ABM11W-32.0000MHZ-8-B1U-T3**



IoT OPTIMIZED LOW PROFILE QUARTZ CRYSTAL



2.0 x 1.6 x 0.5mm



RoHS/RoHS II Compliant

MSL = N/A: NOT APPLICABLE

ABM11W SERIES

FEATURES

- Optimized for energy saving wearables, and IoT applications
- Plated at exceptionally low plating capacitance, as low as 4pF, with optimized ESR
- 0.5 mm max height ideally suited for height constrained designs
- Seam sealed for longterm reliability

APPLICATIONS

- Wearables
- Internet of Things (IoT)
- Bluetooth/Bluetooth Low Energy (BLE)
- Wireless modules
- Machine-to-machine (M2M) connectivity
- Ultra-low power MCU
- Near Field Communication (NFC)
- ISM Band

STANDARD SPECIFICATIONS

| Parameters | Minimum | Typical | Maximum | Units | Notes |
|---|-------------|---------|---------|-------|----------------------|
| Frequency Range | 16.0000 | | 50.0000 | MHz | |
| Operation Mode | Fundamental | | | | |
| Operating Temperature Range | -40 | | +125 | °C | See options |
| Storage Temperature | -55 | | +125 | °C | |
| Frequency Tolerance @ +25°C | -10 | | +10 | ppm | See options |
| Frequency Stability over the Operating Temperature (ref. to +25°C) | -10 | | +10 | ppm | See options |
| Equivalent series resistance "R1" (over Operating Temperature Range) (CL=4pF) | | < 150 | 200 | Ω | 16.0000 – 17.9999MHz |
| | | < 80 | 120 | | 18.0000 – 20.9999MHz |
| | | < 60 | 100 | | 21.0000 – 29.9999MHz |
| | | < 50 | 80 | | 30.0000 – 37.9999MHz |
| | | < 30 | 60 | | 38.0000 – 50.0000MHz |
| Equivalent series resistance "R1" (over Operating Temperature Range) (CL=6pF, 7pF, 8pF) | | < 120 | 150 | Ω | 16.0000 – 17.9999MHz |
| | | < 80 | 120 | | 18.0000 – 20.9999MHz |
| | | < 60 | 100 | | 21.0000 – 23.9999MHz |
| | | < 30 | 50 | | 24.0000 – 29.9999MHz |
| | | < 30 | 50 | | 30.0000 – 37.9999MHz |
| | | < 30 | 40 | | 38.0000 – 50.0000MHz |
| Shunt capacitance (C0) | | < 1.0 | 2.0 | pF | |
| Load capacitance (CL) | | 4.0 | | pF | See options |
| Drive Level | | 10 | 100 | μW | |
| Aging (1 year) | -2 | | +2 | ppm | @ 25°C±3°C |
| Insulation Resistance | 500 | | | MΩ | @ 100Vdc ± 15V |

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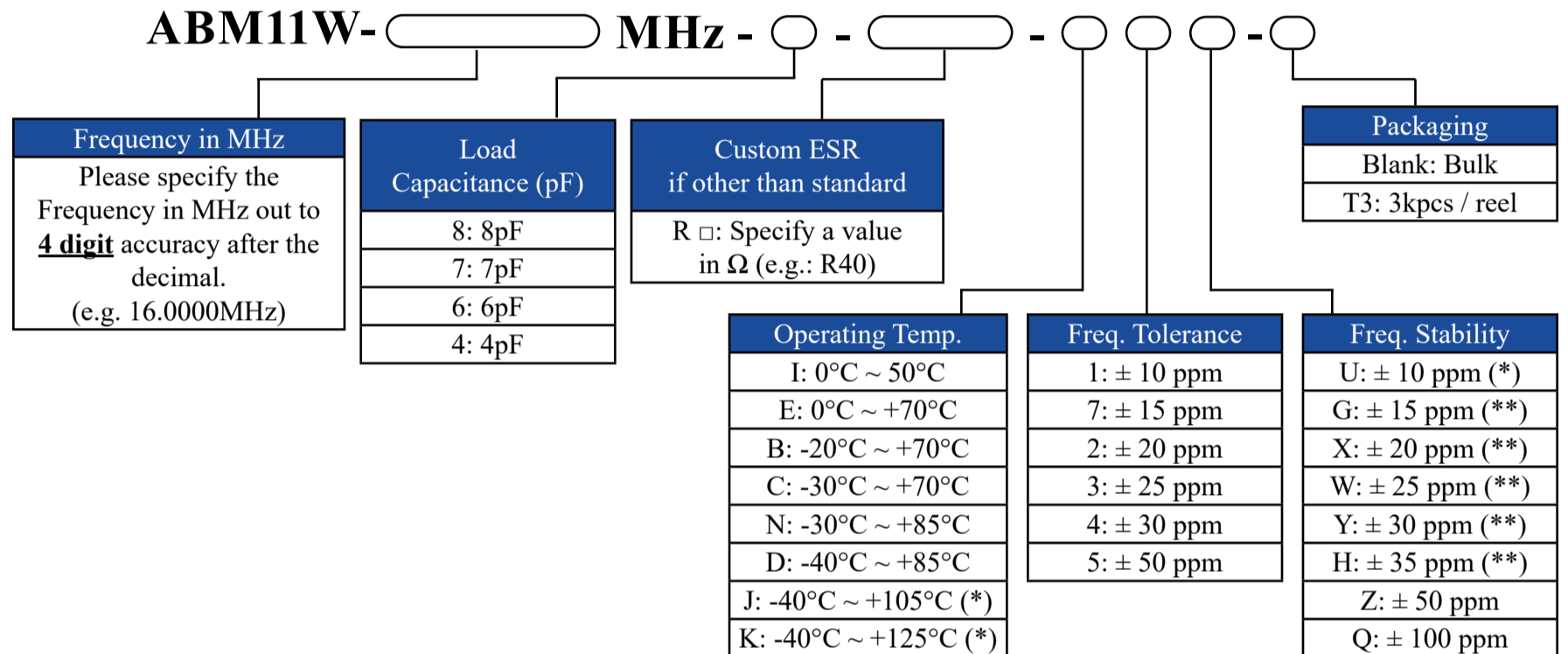


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OPTIONS AND PART IDENTIFICATION (NOTE 1)

Note 1: Contact Abracon for part number requests with carrier frequency callouts up to 5 & 6 digit accuracy after the decimal.



(*) Only offered @ Freq. Stability options: Z & Q.

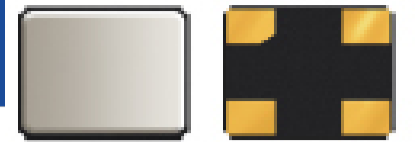
Contact ABRACON for tighter Frequency Stability.

(*) Only offered @ Operating Temp. Range options: I, E, & B

(**) Only offered @ Operating Temp. Range options: I, E, B, C, N, & D

Contact ABRACON for wider Operating Temp. Range.

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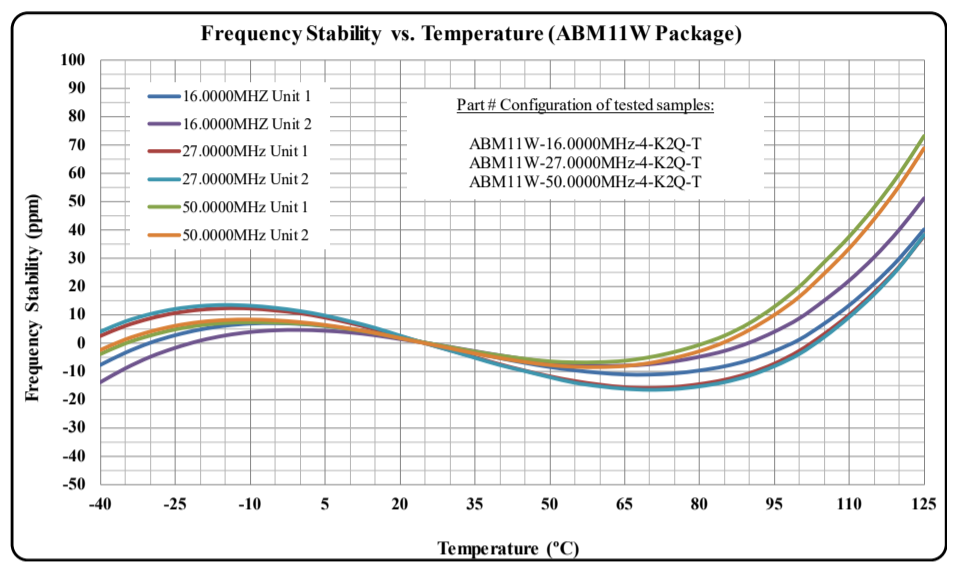
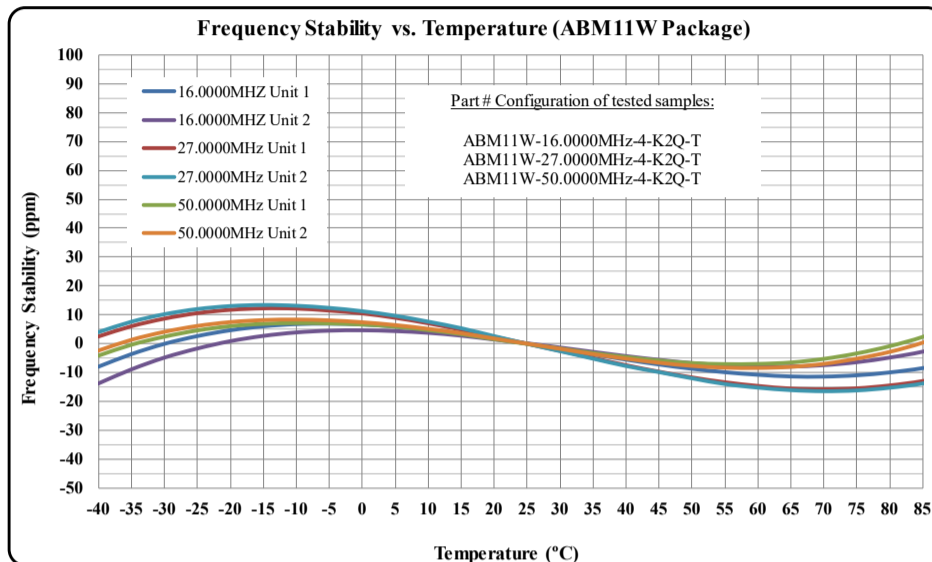
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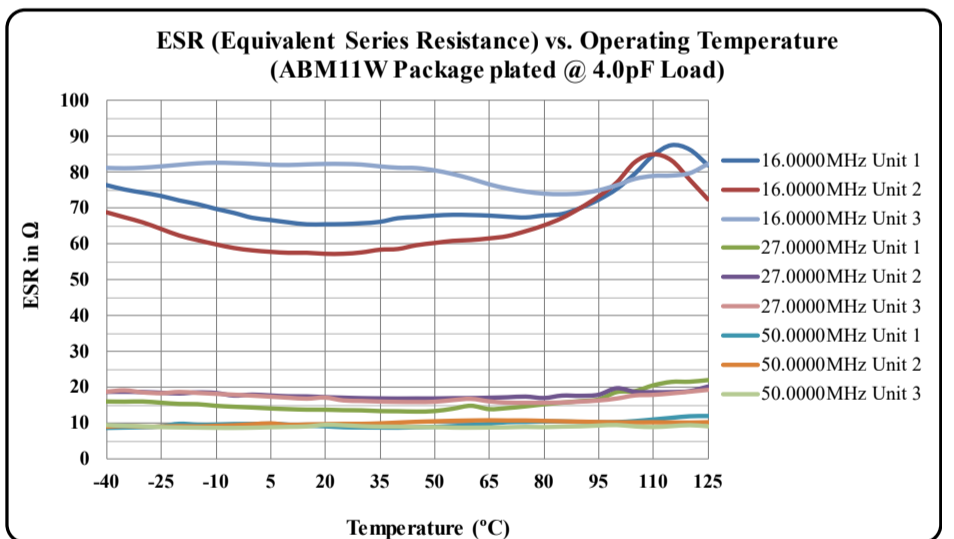
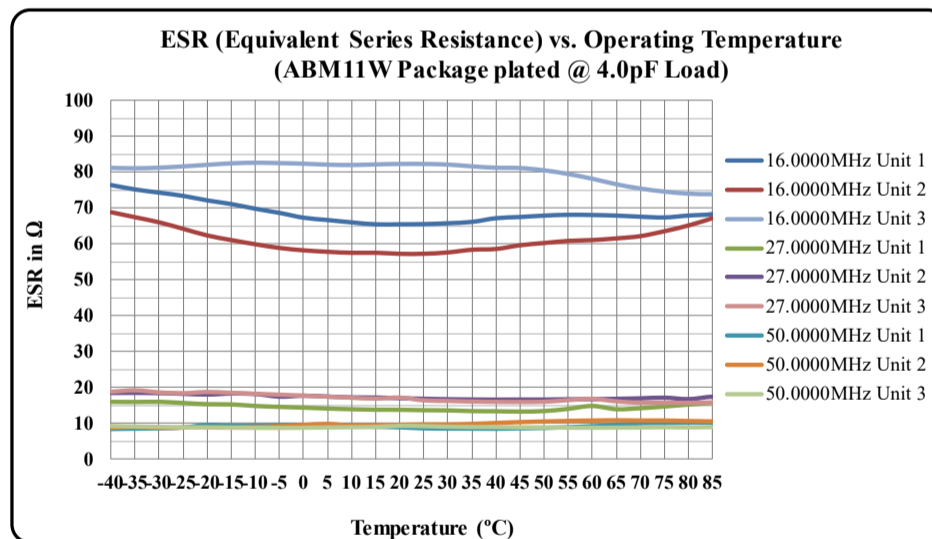
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TYPICAL FREQUENCY Vs. TEMPERATURE CHARACTERISTICS



TYPICAL ESR (EQUIVALENT SERIES RESISTANCE) Vs. TEMPERATURE CHARACTERISTICS



(*) Plating Load = Load Capacitance (CL)

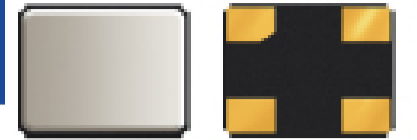


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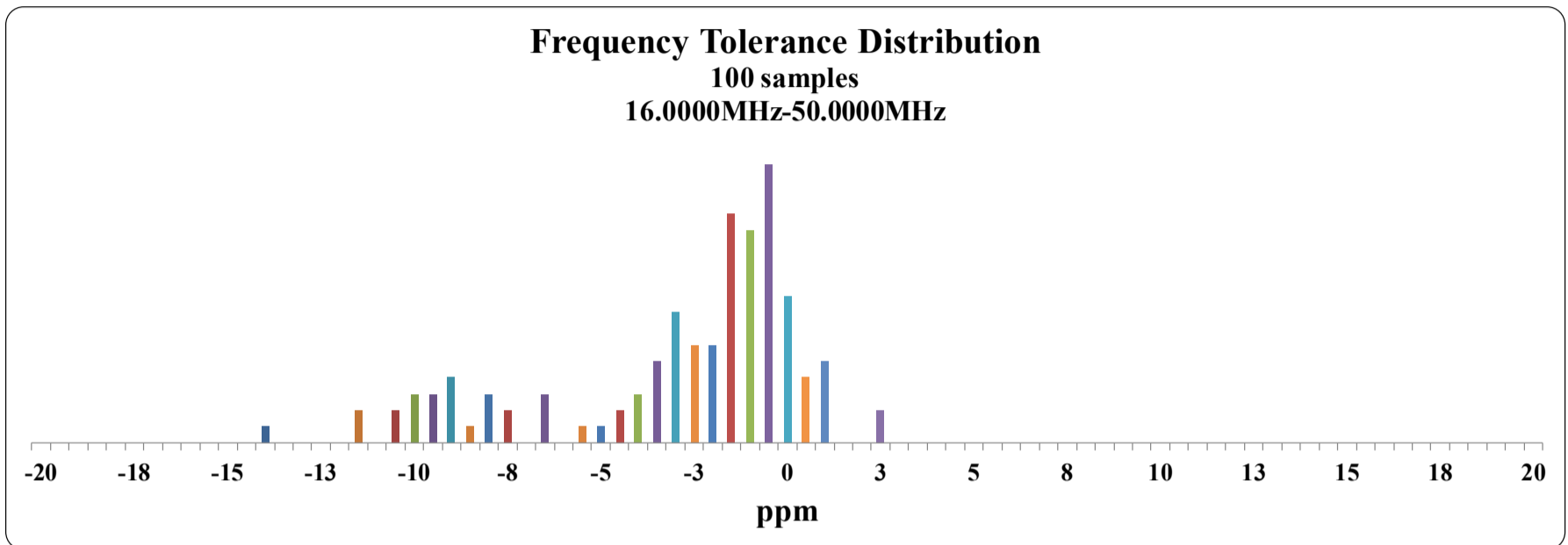
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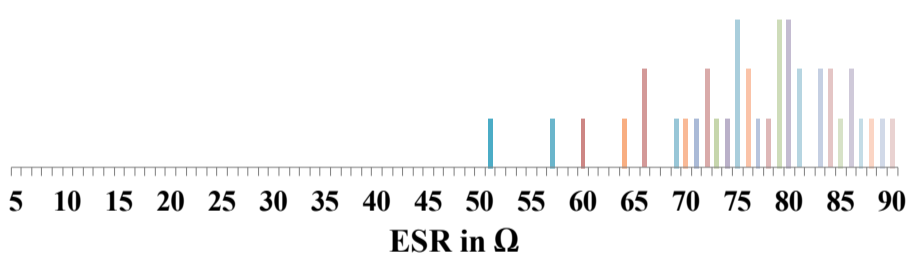
TYPICAL FREQUENCY TOLERANCE DISTRIBUTION (AT 25°C ± 3°C)



TYPICAL ESR DISTRIBUTION (AT 25°C ± 3°C)

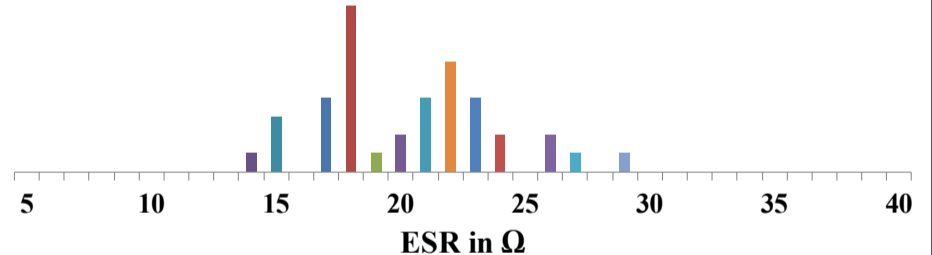
ESR Distribution @ 16.0000MHz

100 samples
MAX ESR = 89.5 Ω



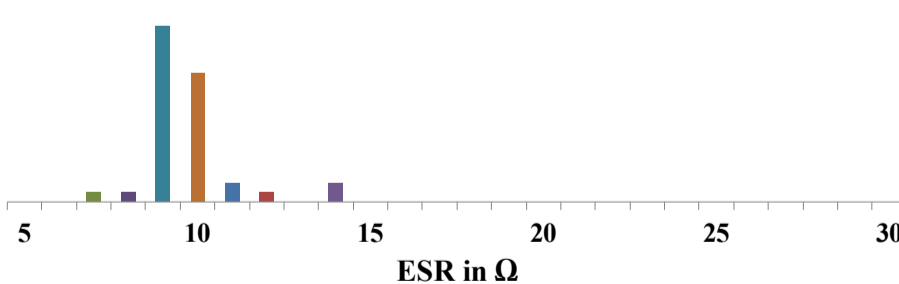
ESR Distribution @ 27.0000MHz

100 samples
MAX ESR = 28.3 Ω

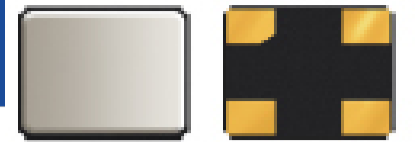


ESR Distribution @ 50.0000MHz

100 samples
MAX ESR = 13.4 Ω



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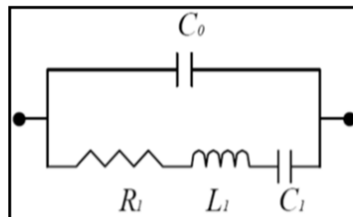
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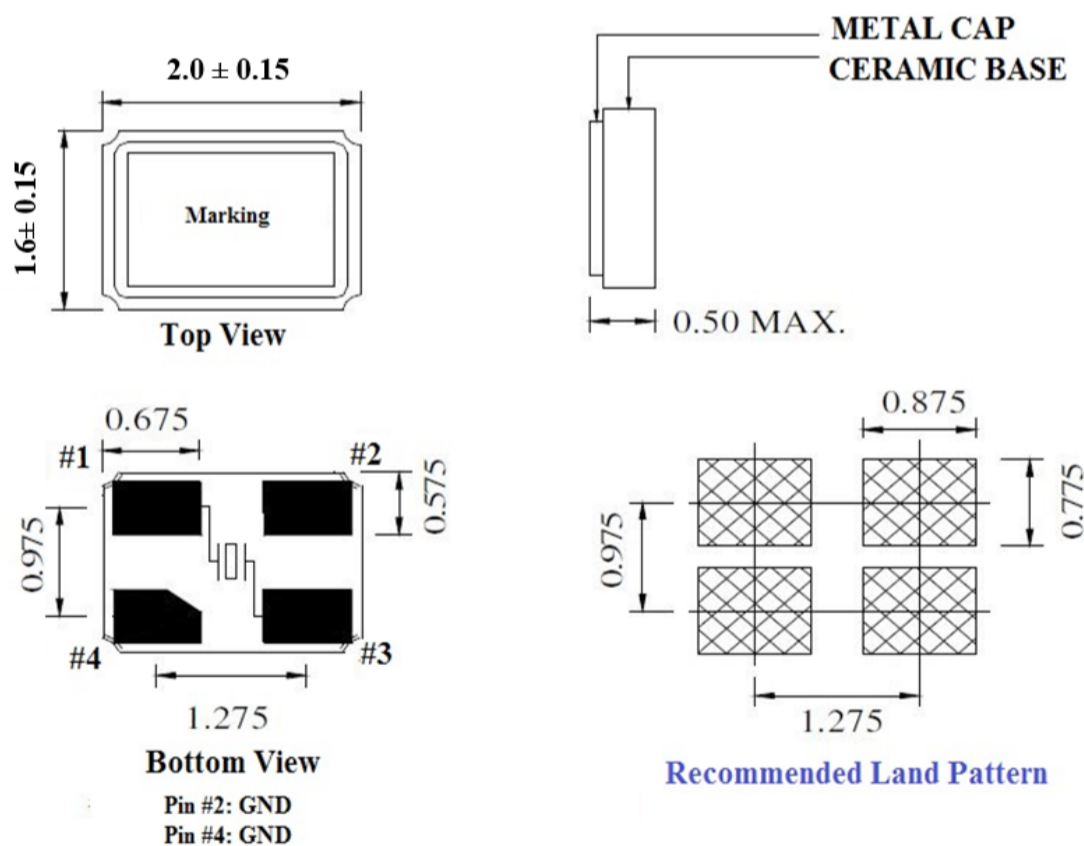
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SPICE MODELS (BASED ON TYPICAL VALUES AT 25°C ± 3°C)



| | | | |
|--|------------|--|------------|
| Frequency: 16.0000MHz Plating Load: 4pF | | Frequency: 16.0000MHz Plating Load: 6pF | |
| C0 | = 0.73 pF | C0 | = 0.71 pF |
| R1 | = 73.02 Ω | R1 | = 81.42 Ω |
| L1 | = 84.25 mH | L1 | = 81.33 mH |
| C1 | = 1.18 fF | C1 | = 1.22 fF |
| Frequency: 27.0000MHz Plating Load: 4pF | | Frequency: 27.0000MHz Plating Load: 6pF | |
| C0 | = 0.78 pF | C0 | = 0.76 pF |
| R1 | = 18.71 Ω | R1 | = 20.45 Ω |
| L1 | = 18.08 mH | L1 | = 18.44 mH |
| C1 | = 1.92 fF | C1 | = 1.89 fF |
| Frequency: 50.0000MHz Plating Load: 4pF | | Frequency: 50.0000MHz Plating Load: 6pF | |
| C0 | = 0.92 pF | C0 | = 0.97 pF |
| R1 | = 9.02 Ω | R1 | = 8.49 Ω |
| L1 | = 3.53 mH | L1 | = 3.21 mH |
| C1 | = 2.88 fF | C1 | = 3.15 fF |

MECHANICAL DIMENSIONS



Note:

Due to material availability the Chamfer could be located on pin #1, 2 or 4. Be advised that the Chamfer location has no impact on the electrical performance of the device.

DIMENSIONS: MM

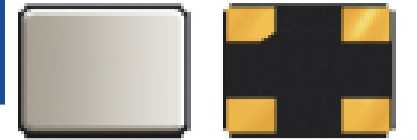


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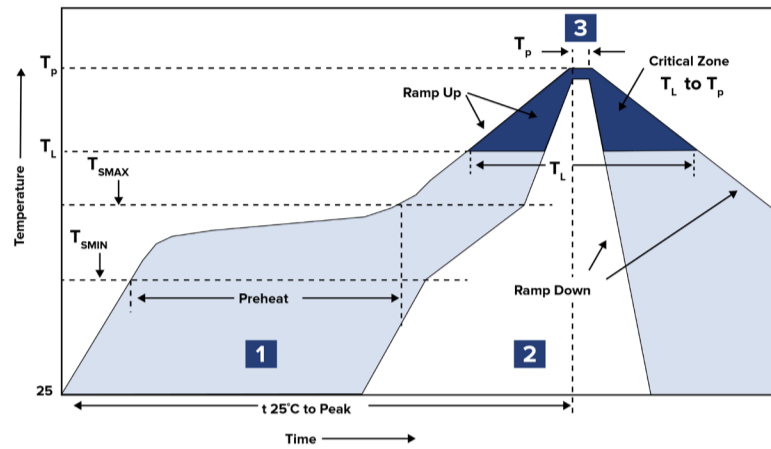
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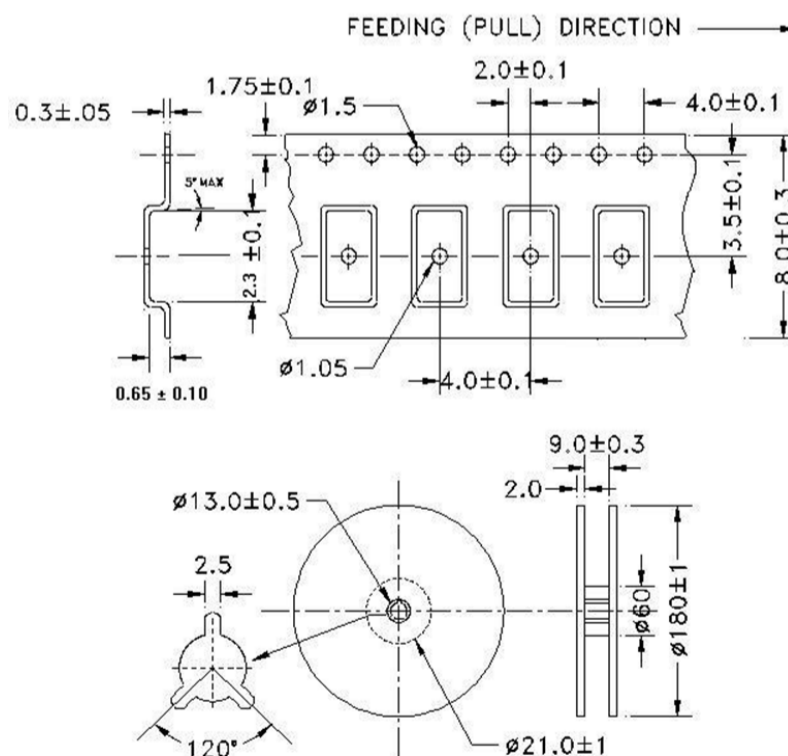
REFLOW PROFILE



| Zone | Description | Temperature | Time |
|------|-------------|---|---------------|
| 1 | Preheat | $T_{SMIN} \sim T_{SMAX}$ 150°C ~ 180°C | 60 ~ 120 sec. |
| 2 | Reflow | T_L 217°C | 45 ~ 90 sec. |
| 3 | Peak Heat | T_P 260°C MAX | 10 sec. |

PACKAGING

T3: Tape and reel (3,000 pcs/reel)



DIMENSIONS: mm



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