

IoT Optimized Ultra-Miniature Quartz Crystal



ABM13W SERIES



1.20 x 1.00 x 0.33mm
RoHS/RoHS II Complaint
MSL = N/A: Not Applicable

FEATURES

- World's smallest At-Cut MHz Crystal (1.20 x 1.00 x 0.33 mm package)
- Ideally suited for space constraint IoT, Wearables & Wireless applications
- Simultaneously optimized for low plating load & ESR over extended temperature range
- Enhanced performance for start-up time and power savings with Low Energy SoC's
- Low profile ideal for height constraint designs
- Available with ± 10 ppm set-tolerance

APPLICATIONS

- Wearables
- Wireless Modules
- Internet of Things (IoT)
- Bluetooth / Bluetooth Low Energy (BLE)
- Machine-to-Machine (M2M) Connectivity
- Ultra-Low Power MCU's, SoC's, Transceivers
- Near Field Communication
- ISM Band Applications

Electrical Specifications

| Parameters | Min. | Typ. | Max. | Units | Note |
|---|--|------|---------|------------|---|
| Frequency Range | 32.0000 | | 80.0000 | MHz | |
| Standard Available Frequencies | 32.0000, 37.4000, 38.4000, 40.0000, 45.0000, 48.0000, 52.0000, 60.0000, 76.8000, 80.0000 | | | MHz | Contact Abracon for Nonstandard Frequencies |
| Operation Mode | Fundamental | | | | |
| Operating Temperature Range | -40 | | +85 | °C | See Options |
| Storage Temperature | -40 | | +125 | °C | |
| Frequency Tolerance @ +25°C | -10 | | +10 | ppm | See options |
| Frequency Stability over the Operating Temperature (ref. to +25°C) | -15 | | +15 | ppm | See options |
| Equivalent series resistance (R1) (over -40°C to +125°C) | | < 45 | 100 | Ω | 32.0000-32.9999MHz |
| | | < 35 | 80 | | 33.0000-36.9999MHz |
| | | < 25 | 50 | | 37.0000-80.0000MHz |
| Shunt capacitance (C0) | | | 1.0 | pF | |
| Load capacitance (CL) | | 5.0 | | pF | See options |
| Drive Level | | 10 | 100 | μ W | |
| Aging (1 year) | -2 | | +2 | ppm | @25°C \pm 3°C |
| Insulation Resistance | 500 | | | M Ω | @100 Vdc \pm 15V |



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Options and Part Identification [Note 1]



(*) Only offered @ Operating Temp. Range options: B & N
 (**) Only offered @ Operating Temp. Range options: B, N, & D
 (***) Only offered @ Operating Temp. Range options: B, N, D, & J
 Contact ABRACON for tighter Frequency Stability options.

Note 1:

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



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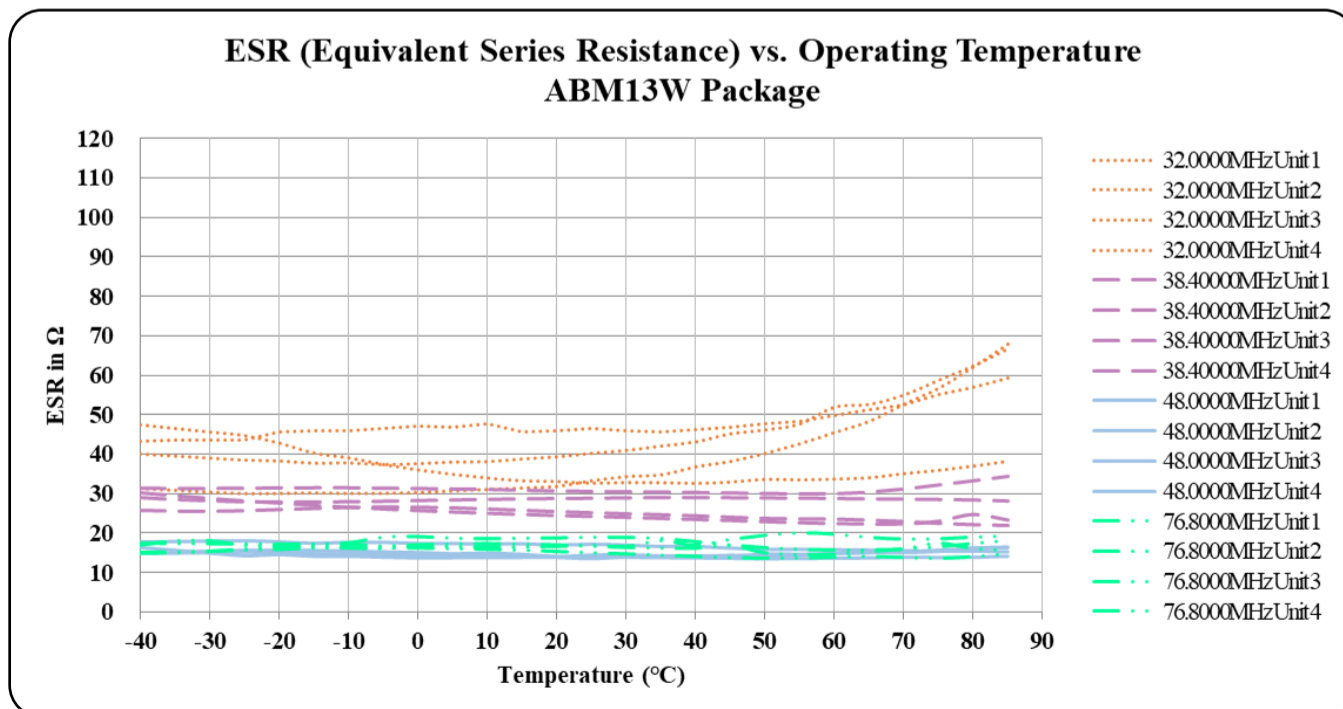


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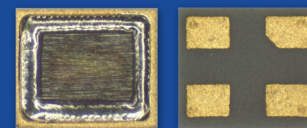
Typical Frequency vs. Temperature Characteristics (ref. to +25°C):



Typical ESR (Equivalent Series Resistance) vs. Temperature Characteristics:



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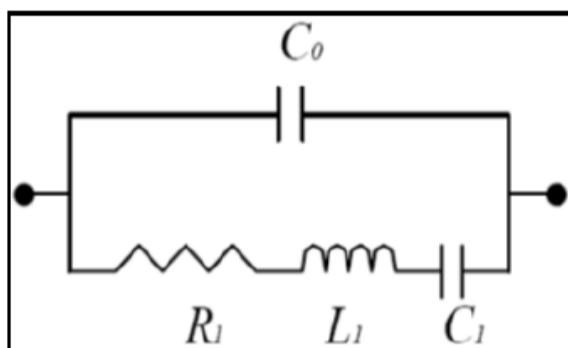


ABM13W SERIES



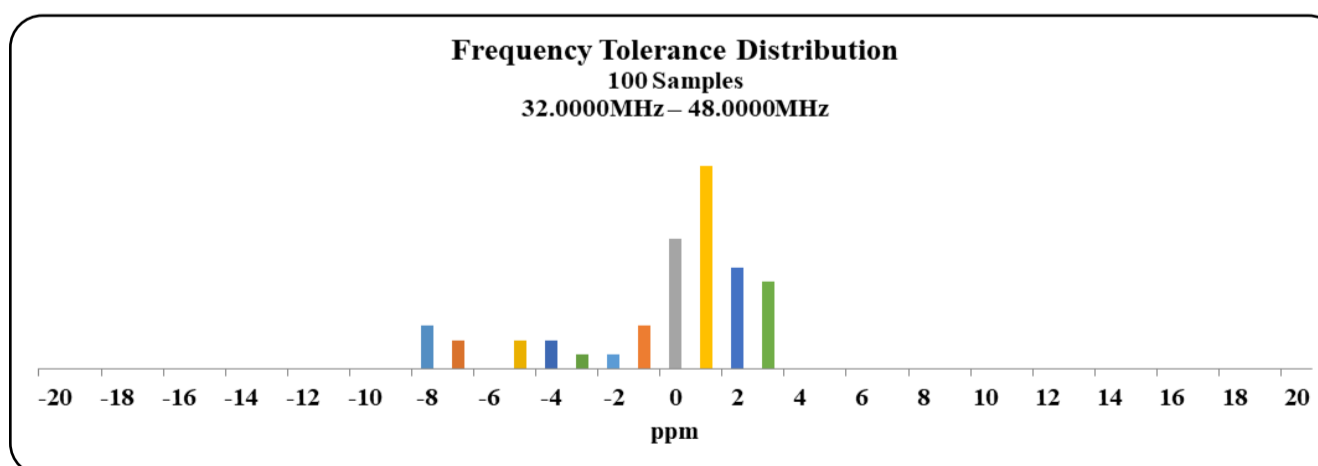
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SPICE Models (based on typical values at 25°C ± 3°C):



| | | | | | | | |
|------------------------------|---|-------|----|------------------------------|---|-------|----|
| Frequency: 32.0000MHz | | | | Frequency: 38.4000MHz | | | |
| Plating Load: 8pF | | | | Plating Load: 6pF | | | |
| C0 | = | 0.46 | pF | C0 | = | 0.48 | pF |
| R1 | = | 41.19 | Ω | R1 | = | 22.48 | Ω |
| L1 | = | 16.91 | mH | L1 | = | 10.99 | mH |
| C1 | = | 1.46 | fF | C1 | = | 1.57 | fF |
| Frequency: 48.0000MHz | | | | Frequency: 76.8000MHz | | | |
| Plating Load: 6pF | | | | Plating Load: 6pF | | | |
| C0 | = | 0.86 | pF | C0 | = | 0.77 | pF |
| R1 | = | 19.50 | Ω | R1 | = | 16.97 | Ω |
| L1 | = | 5.73 | mH | L1 | = | 1.58 | mH |
| C1 | = | 1.92 | fF | C1 | = | 2.74 | fF |

Typical Frequency Tolerance Distribution (at 25°C ± 3°C):



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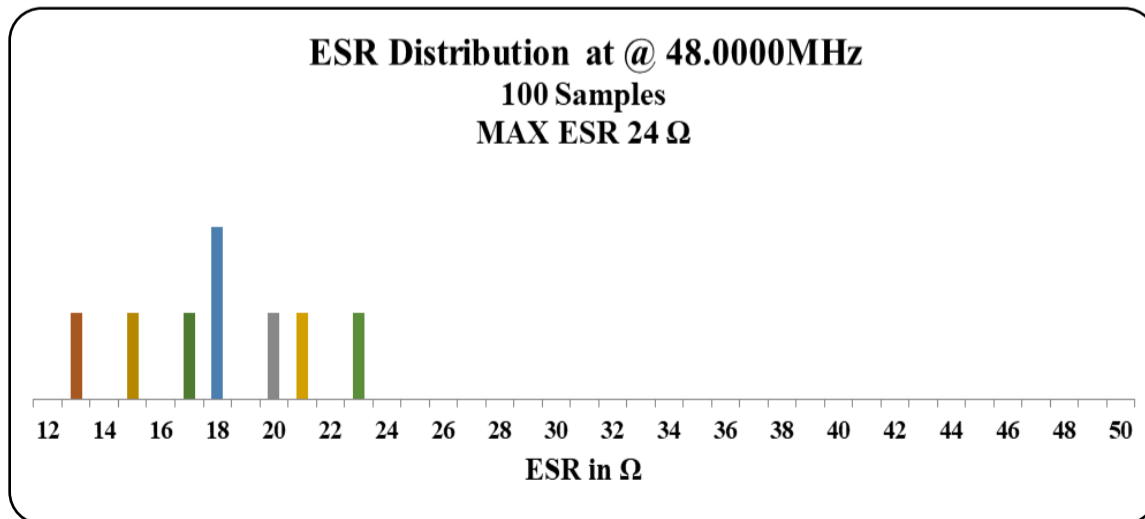
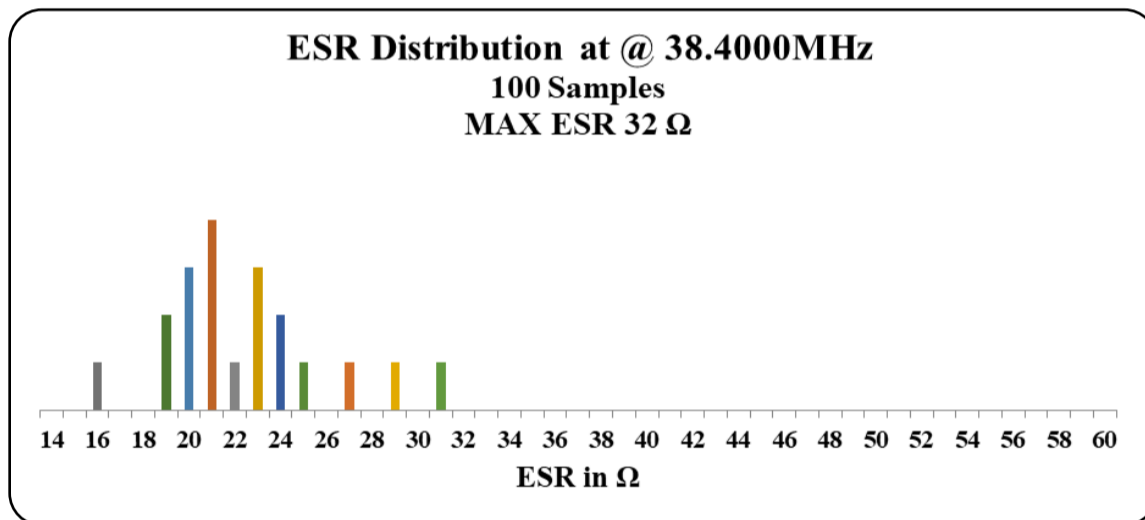
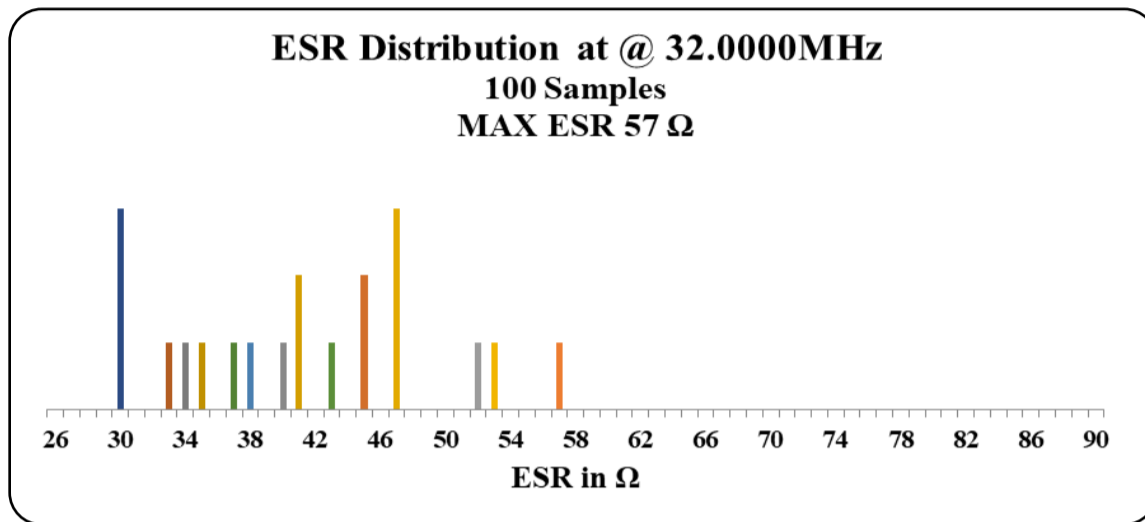


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Typical ESR Distribution (at 25°C ± 3°C):



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Mechanical Dimensions



Top View

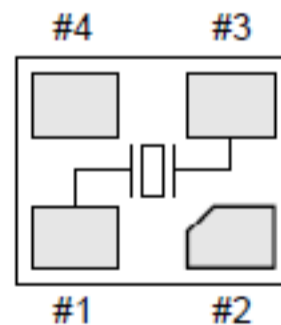


Recommended Land Pattern



Bottom View

Internal connection



Pin #2: GND (Electrically connected to metallic package lid)
 Pin #4: NC (No internal connection, leave floating or connect to GND)

Dimensions: mm



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Reflow Profile



| Zone | Description | Temperature | Time |
|------|----------------|--------------------------------------|---------------|
| 1 | Preheat / Soak | $T_{SMIN} \sim T_{SMAX}$ 160±10°C | 80 ~ 100 sec. |
| 2 | Reflow | T_L 220°C | 50 ~ 70 sec. |
| 3 | Peak heat | T_P 260±5°C | 5 sec. MAX. |

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Packaging:

T5: Tape and reel (5,000pcs/reel)



Dimensions: mm

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- Техническая поддержка проекта;
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Как с нами связаться

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