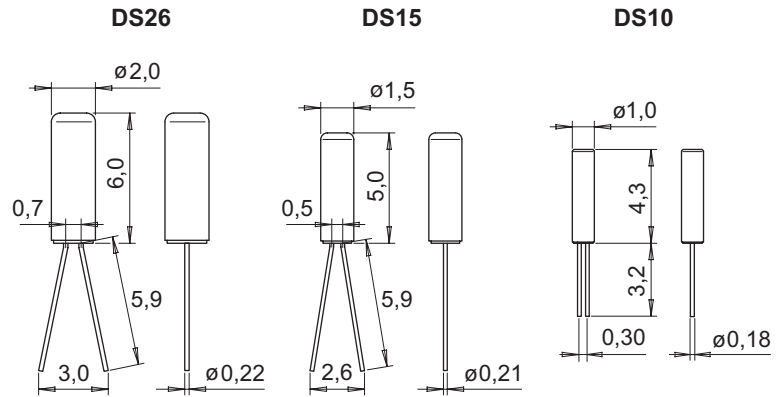




DIMENSIONS



All dimensions in mm typical

APPLICATIONS

IoT
Watches
Industrial
Consumer Electronics
Timers and Clock Sources

DESCRIPTION

The DS – Series are low frequency through-hole technology Watch Quartz Crystal Units which incorporate a tuning fork Quartz Crystal Resonator. They operate under vacuum in a hermetically sealed tubular metal can package.

DS10 and DS15 are compatible with other suppliers' same footprint crystals.

FEATURES

High stability is guaranteed by the hermetic sealed package.
High shock and vibration resistant.
Smallest available tubular package DS10 with Ø 1.0 mm.
Very price competitive product.
100% Pb-free, RoHS-compliant.

ELECTRICAL CHARACTERISTICS AT 25°C

| Package Size | | DS26 | DS15 | DS10 | |
|-----------------------------|----------------|--|---------|---------|-----|
| Standard frequency | F_L | 32.768 | | | kHz |
| Load capacitance | C_L | 7.0 / 8.2 / 9.0 / 12.5 | | | pF |
| Frequency tolerance | $\Delta F/F$ | ±20 | | | ppm |
| | $\Delta F/F$ | ±30 | | | ppm |
| | $\Delta F/F$ | ±100 | | | ppm |
| Series resistance typ./max. | R_S | 30 / 42 | 35 / 50 | 40 / 60 | kΩ |
| Motional capacitance typ. | C_1 | 2.25 | 2.25 | 2.4 | fF |
| Static capacitance typ. | C_0 | 0.9 | | | pF |
| Drive level max. | P | 1.0 | | | μW |
| Insulation resistance min. | R_i | 500 | | | MΩ |
| Aging first year max. | $\Delta F/F$ | ±3 | | | ppm |
| Turnover temperature | T_0 | 25 ±5 | | | °C |
| Frequency vs. temperature | $\Delta F/F_0$ | $-0.035 \text{ ppm}/^\circ\text{C}^2 (T - T_0)^2 \pm 10\%$ | | | ppm |

1) Other load capacitances on request.

2) Tighter and wider frequency tolerances on request.



STANDARD FREQUENCIES

| Frequency |
|------------|
| 32.768 kHz |

ENVIRONMENTAL CHARACTERISTICS

| | | Conditions | Max. Dev. |
|---------------------------|------|------------------------|-----------|
| Storage temperature range | | -20 to +70°C | |
| TW Operating temp. range | | -10 to +60°C | |
| Shock resistance | ΔF/F | 5000 g, 0.3 ms, ½ sine | ±5 ppm |
| Vibration resistance | ΔF/F | 20 g / 10–2000 Hz | ±5 ppm |

TERMINATIONS AND PROCESSING

| Type | Termination | Processing |
|----------|--|--|
| DS26-L3N | Can: Ni plated Leads: Straight leads SnCu plated | For through-hole mounting Wave or hand soldering Max. 230°C / 5 sec. leads only   |
| DS15-L3N | | |
| DS10-L3N | | |

ORDERING INFORMATION

DS10-L3N 32.768 kHz 8.2 pF ±30 ppm TW

| | |
|--|---|
| <p>Watch crystal ————</p> <p>Package size ————</p> <p>26 = Ø 2.0 x 6.0 mm 15 = Ø 1.5 x 5.0 mm 10 = Ø 1.0 x 4.3 mm</p> <p>SnCu plated leads (Pb-free) ————</p> <p>Straight leads ————</p> | <p>Frequency F_L ————</p> <p>Load capacitance C_L</p> <p>7.0 pF 8.2 pF 9.0 pF 12.5 pF Other C_L on request</p> <p>Frequency tolerance ————</p> <p>±20 ppm ±30 ppm ±100 ppm Tighter and wider freq. tolerances on request</p> <p>Temperature range ————</p> <p>TW = -10 to +60°C</p> |
|--|---|

| | |
|---|----------------------------|
| A unique part number will be generated for each product specification, i.e: | |
| 20xxxx-BA01 | 1'000 pcs (in plastic bag) |

All specifications subject to change without notice.



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