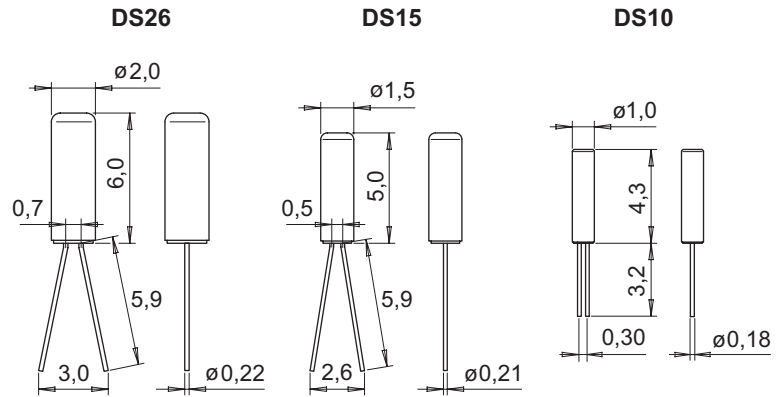




DIMENSIONS



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.

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 ppm/°C ² (T - T ₀) ² ±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 | $\Delta F/F$ | 5000 g, 0.3 ms, 1/2 sine | ±5 ppm |
| Vibration resistance | $\Delta F/F$ | 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 ———— 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 7.0 pF 8.2 pF 9.0 pF 12.5 pF Other C_L on request</p> <p>Frequency tolerance ———— ±20 ppm ±30 ppm ±100 ppm Tighter and wider freq. tolerances on request</p> <p>Temperature range ———— 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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