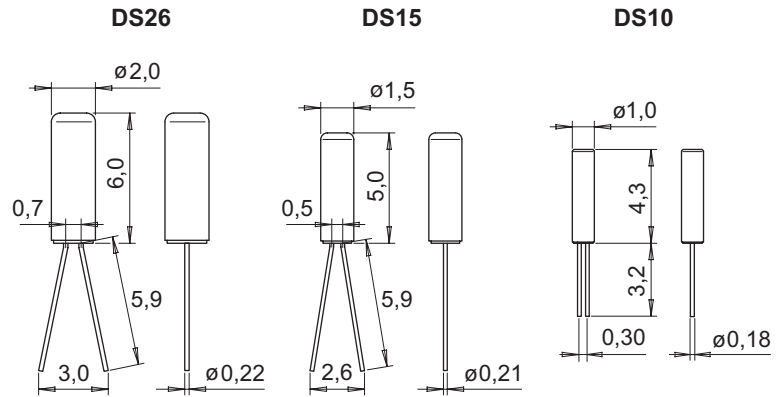




### DIMENSIONS



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.  
RoHS-compliant. 100% Pb-free available.

### 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	
TA Operating temperature 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		
DS15-T1N	Can: Ni plated Leads: Straight leads Au flashed	For through-hole mounting Wave or hand soldering Max. 230°C / 5 sec. leads only 
DS10-T1N		

**ORDERING INFORMATION**

**DS10 - L3N 32.768 kHz 8.2 pF ±30 ppm TA**

<p><b>Watch crystal</b> ————</p> <p><b>Package size</b> ————</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><b>Package type</b> ————</p> <p>L3 = SnCu plated leads (Pb-free)                  T1 = Au flashed leads</p> <p><b>Straight leads</b> ————</p>	<p><b>Frequency <math>F_L</math></b> ————</p> <p><b>Load capacitance <math>C_L</math></b></p> <p>7.0 pF                  8.2 pF                  9.0 pF                  12.5 pF                  Other <math>C_L</math> on request</p> <p><b>Frequency tolerance</b> ————</p> <p>±20 ppm                  ±30 ppm                  ±100 ppm                  Tighter and wider freq. tolerances on request</p> <p><b>Temperature range</b> ————</p> <p>TA = -10 to +60°C</p>
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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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